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

Public Notice

Notice is hereby given that the Hillside Review Board of the City of St. George, Washington County, Utah, will hold a meeting at the reference site on **Wednesday, February 26, 2025**, commencing on site at 9:00 a.m.

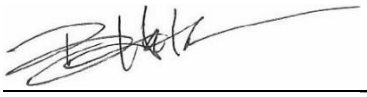
The agenda for the meeting is as follows:

Call to Order
Call for disclosure of conflicts of interest

1. **Hillside Tennis Court –** This is a request to obtain a hillside 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 and rockfall areas. **Meeting time is approximately 9:00 am on the Northwest corner of 800 S and 200 W (approximately 350 feet west of Bluff Street).**

2. **Minutes**

   Consider a request to approve the meeting minutes from the January 22, 2025, meeting.

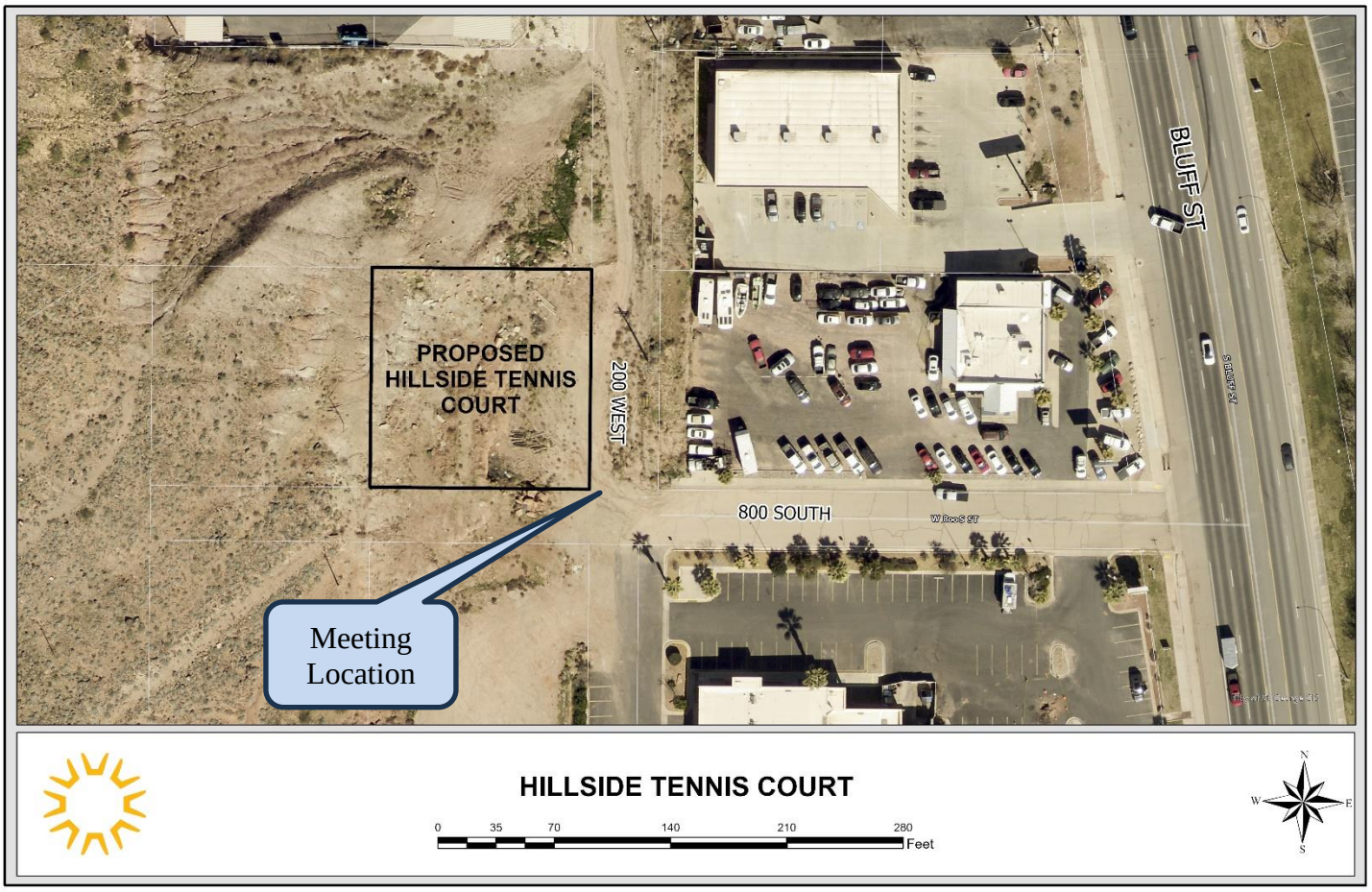


Brenda Hatch – Planner II

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

Item # 1 Meeting Location

Northwest corner of 800 S and 200 W

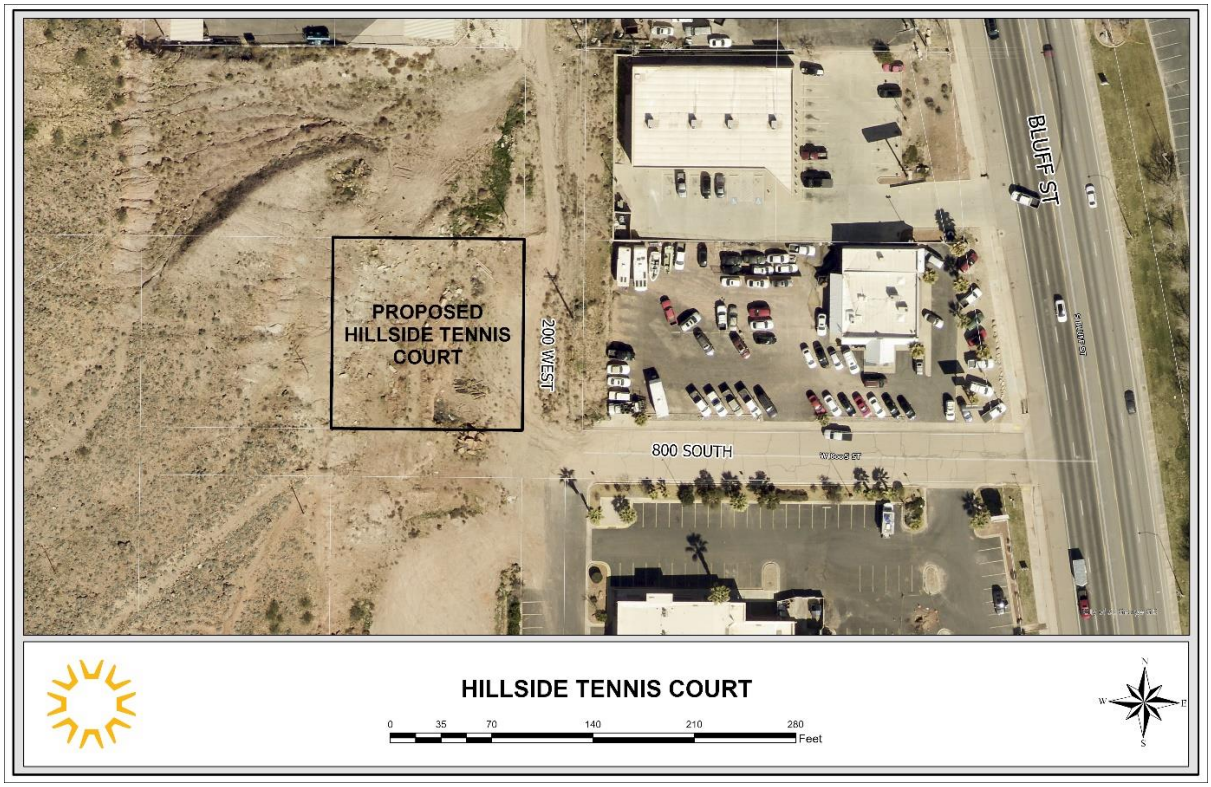


St.George
Community Development

ITEM 1
Hillside Permit

HILLSIDE REVIEW BOARD AGENDA REPORT: **02/26/2025**

Hillside Tennis Court Hillside Development Permit (Case No. 2025-HS-002)		
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 and rockfall areas.	
Applicant:	Brown Consulting Engineers (BCE)	
Representative:	Travis Fewkes	
Location:	Northwest corner of 800 S and 200 W (approximately 350 feet west of Bluff Street)	
General Plan:	DTCC (Downtown Connected Corridor)	
Existing Zoning:	C-2 (Highway Commercial)	
Surrounding Zoning:	North	C-2 (Highway Commercial)
	South	C-2 (Highway Commercial)
	East	C-2 (Highway Commercial)
	West	C-2 (Highway Commercial)
Land Area:	Approximately 17,424 ft² (0.40 acres)	



BACKGROUND

The current application is to review a covered tennis court and a 20'x26' office building with restrooms. The tennis court would be for private use. Improvements would include curb, gutter, parking lot, retaining walls, landscaping, lighting, and utilities necessary for the development. The lot was created in 1948 through the Worthen Subdivision plat. The proposed project would require approximately 16 feet of cut in the northwest corner and fill in the southwest corner of the tennis court area. Retaining walls would consist of reinforced concrete between tiers and stacked/segmented blocks along a portion of the south, north, and west sides. The lower area with the parking lot and office building would require a cut of approximately 15 feet in the northwest corner. The Hillside Review Board must weigh in and make a recommendation to Planning Commission and City Council on all applications in hillside overlay areas.

Based on the slopes map, the site has areas that exceed 20%, with many in excess of 40%. However, the site has previously been disturbed and it appears that much of the natural slope no longer remains. The Hillside Review Board must determine which slopes may be excluded from the slope determination due to slopes being distinctly different from surrounding property and having noncontiguous topography.

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 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 21% to 30%, development activity shall not disturb more than 30% of the parcel within this slope category.

D. For those portions of a proposed development with natural slopes from 31% to 40%, development activity shall not disturb more than 5% of the area within this slope category.

E. A proposed development may not disturb slopes in excess of 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 20%, 30%, and 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 500' on the downthrown side and 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.

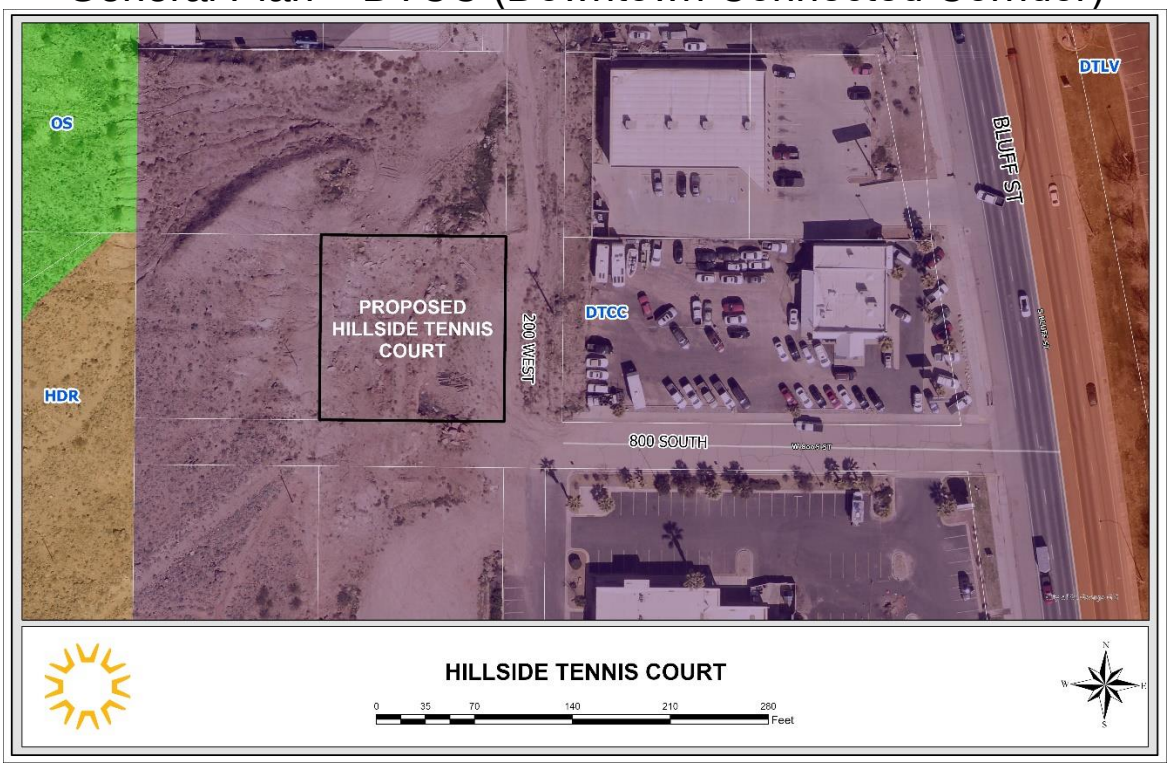
EXHIBITS PROVIDED

1. Exhibit A – Site Plan
2. Exhibit B – Grading Plan & Wall Details
3. Exhibit C – Landscape Plan
4. Exhibit D – Slope Analysis
5. Exhibit E – 2024 BCE Drainage Report
6. Exhibit F – 2024 AGEC Geotechnical Investigation
7. Exhibit G – Site Survey

RECOMMENDATION

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

General Plan – DTCC (Downtown Connected Corridor)



Zoning – C-2 (Highway Commercial)

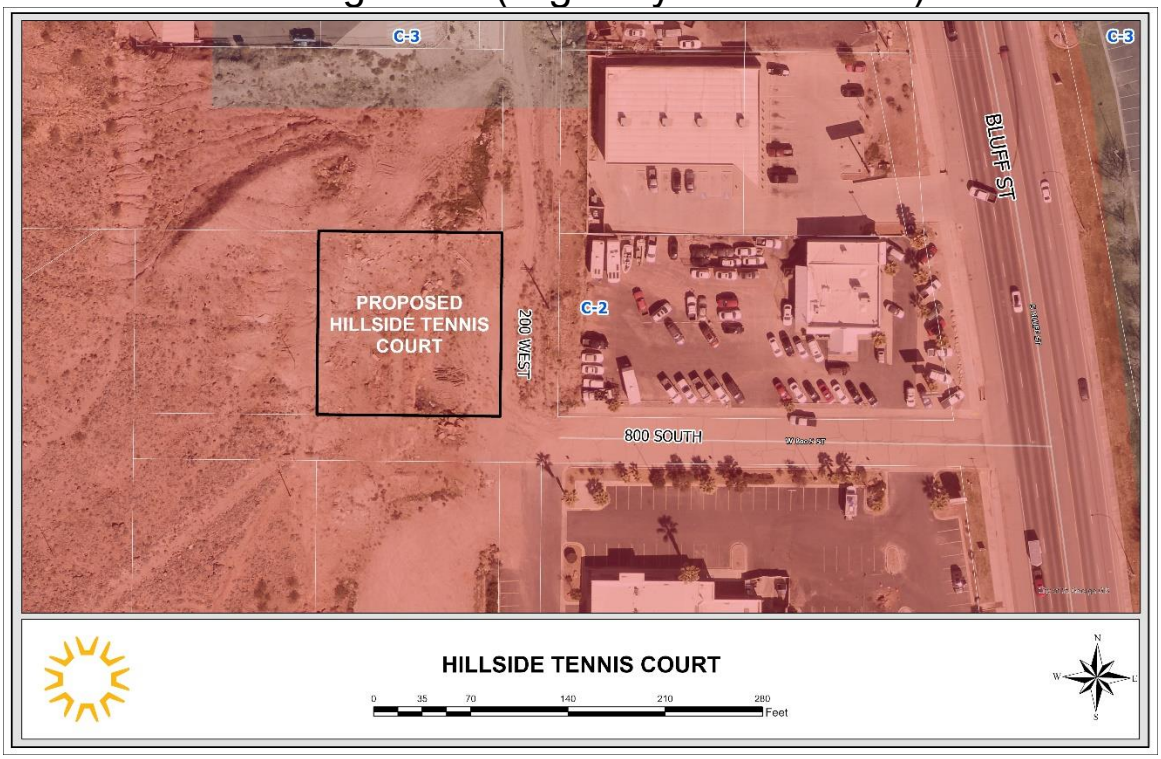
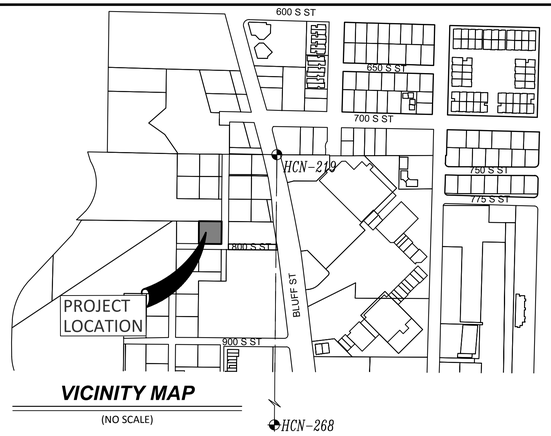


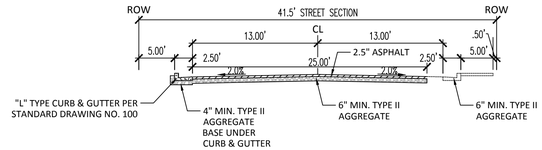
EXHIBIT A

Site Plan



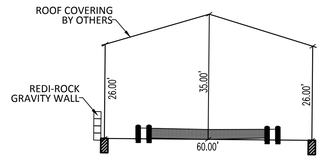
VICINITY MAP

(NO SCALE)



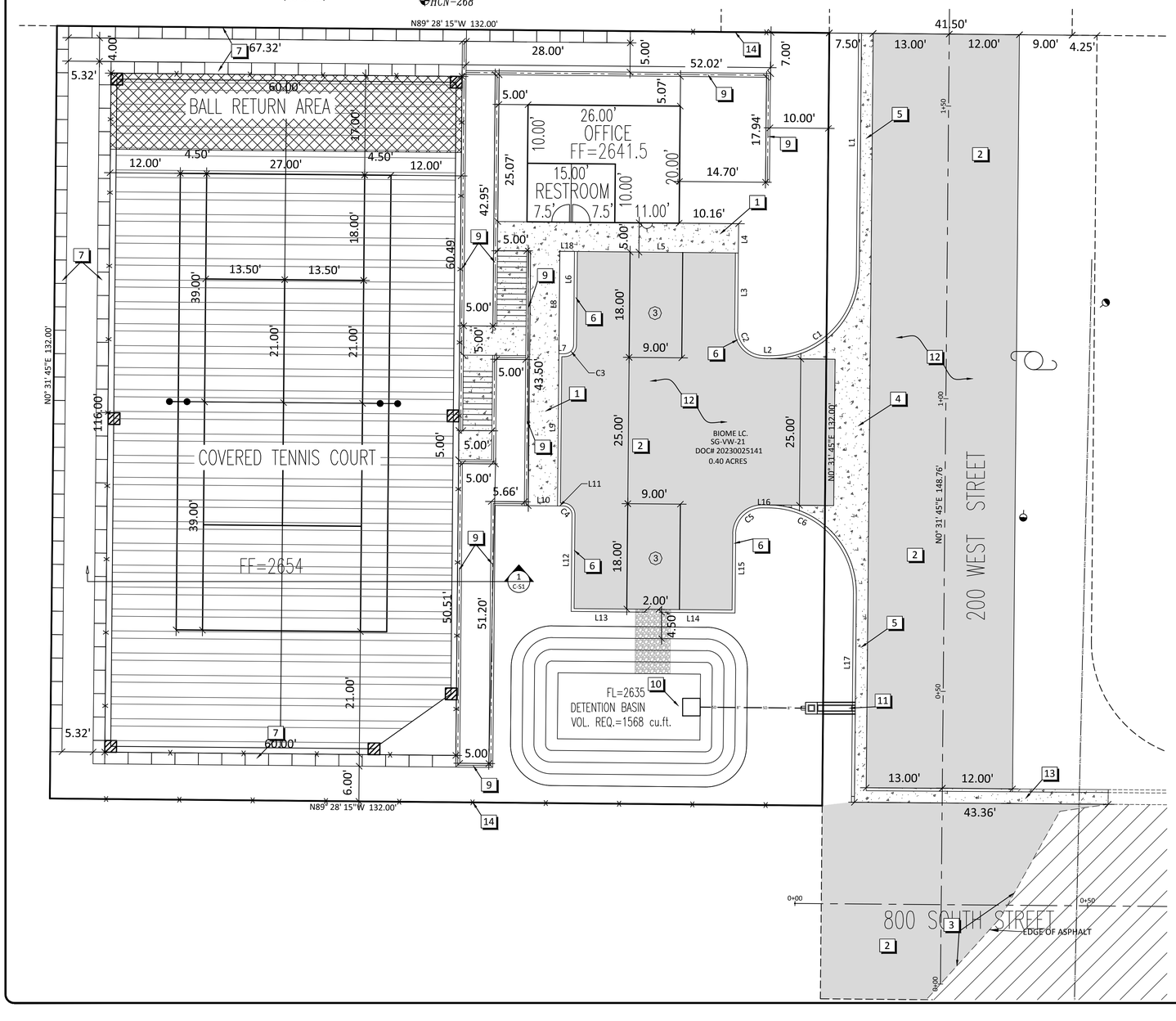
TYPICAL STREET SECTION (200 WEST)

NOT TO SCALE



TENNIS COURT COVER CROSS SECTION 1

NOT TO SCALE



LEGEND

- CENTER LINE
- PROPERTY BOUNDARY
- ADJACENT PROPERTY
- EASEMENT BOUNDARY
- PROPOSED FENCE
- EXISTING TBC
- PROPOSED CONCRETE WALL
- REDI-ROCK GRAVITY WALL
- PROPOSED LIGHT
- L1 LINE LABEL
- C1 CURVE LABEL
- (3) PARKING STALL COUNT
- PROPOSED ASPHALT PAVEMENT
- EXISTING ASPHALT PAVEMENT
- PROPOSED CONCRETE
- PROPOSE METAL STYLE ROOFING
- PROPOSED BALL RETURN AREA
- PROPOSED ROOF SUPPORT COLUMN

CONSTRUCTION NOTES

1. 5' WIDE CONC. SIDEWALK
2. 2.5" AC PAVEMENT OVER 6" TYPE II BASE
3. SAW CUT AND MATCH EXISTING
4. CONC. CROSS GUTTER PER ST. GEORGE STANDARD DRAWINGS No. 151
5. NEW 30" HB30-7 CURB AND GUTTER PER ST, GEORGE STANDARD DRAWINGS No. 110
6. INSTALL NEW "A" CURB, SEE DETAIL ON SHEET C-D1
7. REDI BLOCK GRAVITY WALL-SEE SHEET C-G2 FOR DETAIL
9. CONCRETE RETAINING WALL. SEE ELEVATIONS ON C-G2 SEE DETAIL ON SHT C-G2
10. DRAINAGE STRUCTURE-SEE DETAIL THIS SHEET.
11. SIDEWALK DRAINAGE STRUCTURE PER ST. GEORGE STANDARD DRAWINGS No. 204. SEE C-D1
12. GRADE SITE TO ELEVATIONS SHOWN
13. INSTALL 2.5' GUTTER PER DETAIL ON C-D1
14. INSTALL CHAIN LINK FENCE

LINE TABLE		
LINE	BEARING	LENGTH
L1	N0°31'45"E	40.73'
L2	S89°28'15"E	1.20'
L3	N0°31'45"E	13.00'
L4	N0°31'45"E	5.00'
L5	S89°28'15"E	28.00'
L6	N0°31'45"E	16.00'
L7	S89°28'15"E	1.00'
L8	N0°31'45"E	17.50'
L9	N0°31'45"E	26.00'
L10	S89°28'15"E	5.00'
L11	S89°28'15"E	1.00'
L12	N0°31'45"E	16.50'
L13	S89°28'15"E	13.00'
L14	S89°28'15"E	13.00'
L15	N0°31'45"E	13.50'
L16	S89°28'15"E	1.20'
L17	N0°31'45"E	35.65'
L18	N89°28'15"W	2.50'

CURVE TABLE				
CURVE	RADIUS	LENGTH	DELTA	TANGENT
C1	14.50'	22.78'	90°00'00"	14.50'
C2	4.50'	7.07'	90°00'00"	4.50'
C3	1.50'	2.36'	90°00'00"	1.50'
C4	1.50'	2.36'	90°00'00"	1.50'
C5	4.50'	7.07'	90°00'00"	4.50'
C6	14.50'	22.78'	90°00'00"	14.50'

N

W E

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10 0 10 20

SCALE IN FEET

PROJECT DATA

ASSESSOR PARCEL NUMBER	SG-VW-21
ZONING	C-2
TOTAL PROPERTY SIZE	0.40 ACRES
DISTURBED AREA	0.40 ACRES
BUILDING SETBACKS (REQUIRED)	FRONT STREET: 25' 10' SIDE 10' REAR
DENSITY	0.4 DU/AC
GENERAL PLAN	DTCC
STANDARD PARKING STALLS REQUIRED	BUILDING OFFICE, 5200 S.F. @ 1/250 = 2
TOTAL PARKING STALLS PROVIDED	6 SPACES

GENERAL NOTES

1. ALL PROPERTY CORNERS SHALL BE STAKED/PINNED.
2. ALL WORK SHALL BE CONTAINED ONTO PROPERTY ONLY.
3. NO STOCKPILING OR CONSTRUCTION ACTIVITY SHALL OCCUR OFF OF THE APPROVED LOT AREA.
4. THE CONTRACTOR SHALL PROVIDE A TEMPORARY TRASH ENCLOSURE ON SITE DURING ALL CONSTRUCTION ACTIVITIES TO CONTAIN DEBRIS AND PREVENT AIRBORNE LITTERING OFF SITE.
5. A WATER TRUCK SHALL BE USED ON SITE TO WET DOWN ALL EARTHWORK AND TO CONTROL AIRBORNE PARTICLES.
6. PROVIDE TRACKING PAD FOR REMOVAL OF ONSITE MATERIAL FROM VEHICLE TIRES BEFORE ENTERING EAST COMMERECE DRIVE.
7. THE OWNER IS RESPONSIBLE FOR ALL MAINTENANCE OF ONSITE DRAINAGE.

DEVELOPER INFORMATION

OWNER INFORMATION
BENJAMIN SORENSEN
77W 4800 N UNIT B235
PROVO, UT 846040
bstephensoronsen@gmail.com
805-319-5205

ENGINEER INFORMATION

BROWN CONSULTING ENGINEERS
STEVE KAMLOWSKY, PE
736 S. 900 E, STE B105
ST. GEORGE, UT 84790
435-628-4700

811 Know what's below. Call before you dig.

NOTICE!

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION, PROTECTION, AND RESTORATION OF ALL BURIED OR ABOVE GROUND UTILITIES, SHOWN OR NOT SHOWN ON THE PLANS.

NOTE: ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT ST. GEORGE CITY STANDARDS

REVISIONS

NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
736 SOUTH 900 EAST, SUITE B 105
ST. GEORGE, UTAH 84790
(435) 628-4700 FAX (435) 628-4725

SITE PLAN

FOR

HILLSIDE TENNIS COURT

LOCATED IN SECTIONS 36, T42S, R16W, SLB&M
ST GEORGE CITY, UTAH

PROFESSIONAL ENGINEER
STEVEN M. KAMLOWSKY
No. 8362092
05/20/24
STATE OF UTAH

CHECKED BY : SK
DRAWN BY : SWB
DATE : 05/20/24
JOB NO. : 23-94

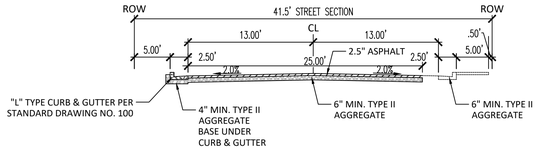
SCALE : 1"=10'

SHEET NO. : C-S1

\\server\BCE files\2023 PROJECTS\23-94 Sorensen, Benjamin, Hillside Tennis Court\dwg\23-94 SORENSEN HILLSIDE COURT.dwg, 6/6/2024 5:06:26 PM, 1:1

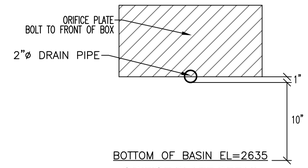
EXHIBIT B

Grading Plan & Wall Details



TYPICAL STREET SECTION (200 WEST)

NOT TO SCALE



ORIFICE PLATE DETAIL

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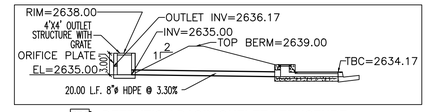

10 **DETENTION BASIN OUTLET STRUCTURE CROSS SECTION**

1"=10'

CONSTRUCTION NOTES

1. 5' WIDE CONC. SIDEWALK
2. 2.5" AC PAVEMENT OVER 6" TYPE II BASE
3. SAW CUT AND MATCH EXISTING
4. CONC. CROSS GUTTER PER ST. GEORGE STANDARD DRAWINGS No. 151
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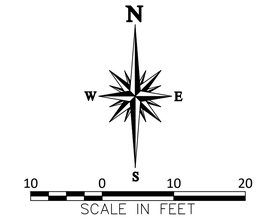
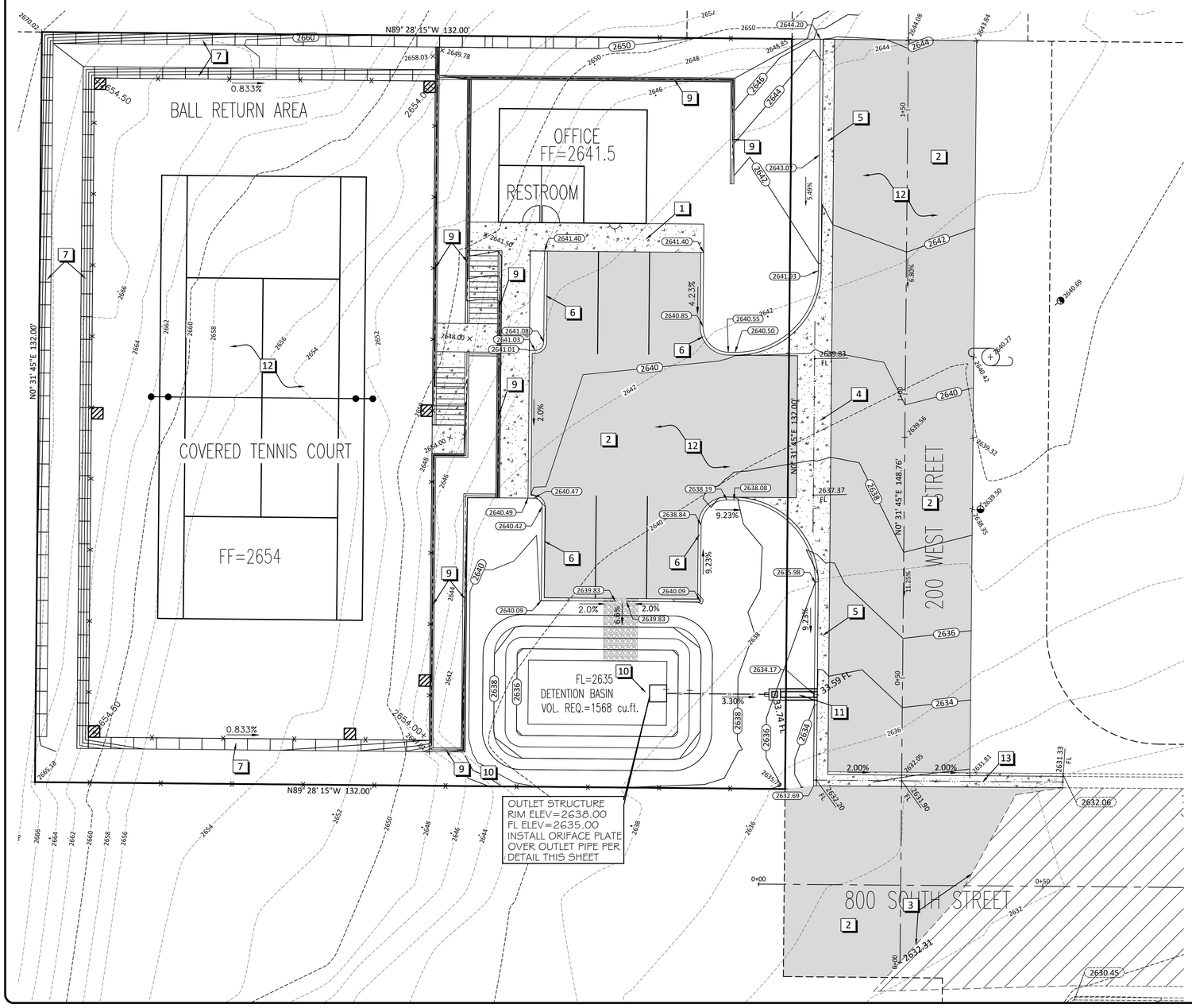
13. INSTALL 2.5' GUTTER PER DETAIL ON C-D1



LEGEND

	PROPOSED CURB
	BOUNDARY LINE
	ADJACENT PROPERTY LINE
2985	PROPOSED CONTOUR MAJOR
	PROPOSED CONTOUR MINOR
2985	EXISTING CONTOUR MAJOR
	EXISTING CONTOUR MINOR
	EXISTING CURB
	EDGE OF ASPHALT (EOA)
	PROPOSED CONCRETE WALL
	REDI-ROCK GRAVITY WALL
	PROPOSED 18"Ø STORM DRAIN
	PHASE LINE
	NEW ASPHALT
2596.36	PROPOSED TBC GRADES
+2654.50	TENNIS COURT GRADES
2632.06	EXISTING TBC GRADES



GRADING PLAN NOTES:

1. ALL EXCAVATIONS AND GRADING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF IVINS, SPECIFICALLY THE "UTAH UNIFORM STANDARD ACT RULES", APPENDIX "K", AND THE SPECIFICATIONS AND REQUIREMENTS INCLUDED IN THE GEOTECHNICAL INVESTIGATION PREPARED BY ????, PROJECT No. ???
2. THE CONTRACTOR SHALL PROVIDE SUITABLE EQUIPMENT TO CONTROL DUST AND AIR POLLUTION CAUSED BY CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL ALSO PROVIDE SUITABLE MUD AND DIRT CONTAINMENT TO MAINTAIN THE WORK SITE, ACCESS ROADWAYS AND ADJACENT PROPERTIES IN A CLEAN CONDITION.

3. A DRAINAGE CONTROL PLAN AND REPORT HAS BEEN PREPARED FOR THIS DEVELOPMENT BY BROWN CONSULTING ENGINEERS.

4. ENTRANCES/EXITS TO BUILDING SHALL HAVE A MIN. 4' LANDING WITH A SLOPE OF NOT MORE THAN 2.0% IN ANY DIRECTION.

5 THE OWNER SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE DRAINAGE CHANNEL AND THE ONSITE DETENTION BASINS.

7. NO GRADING BEYOND PROPERTY LINE.

8. CONTRACTOR SHALL VERIFY ELEVATION IN THE FIELD.

9. SEE RETAINING WALL DETAILS ON SHEETS C-G1 AND C-G2.

EARTHWORK

ESTIMATED EARTHWORK VOLUMES
PHASE 1 BUILDING SITE:
CUT = 2,180 c.y. CUT
FILL = 268 c.y. FILL
NET = 1,892 c.y. (CUT)

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ALL EARTH WORK VOLUMES. VOLUMES SHOWN ARE FOR ESTIMATING PURPOSES ONLY. THEY REPRESENT ESTIMATED VOLUMES BETWEEN EXISTING AND FINISHED SURFACES.

ALL GRADING ACTIVITY SHALL COMPLY WITH APPENDIX "K" SECTION 33 GUIDELINES.

NOTICE OF INTENT (N.O.I.) TO BE SUBMITTED PRIOR TO OBTAINING BUILDING PERMIT.

811 Know what's below. Call before you dig.

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NO.	DESCRIPTION	DATE	BY

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CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
736 SOUTH 900 EAST, SUITE B 105
ST. GEORGE, UTAH 84790
(435) 628-4700 FAX (435) 628-4725

GRADIING PLAN

FOR

HILLSIDE TENNIS COURT

LOCATED IN SECTIONS 36, T42S, R16W, SLB&M
ST GEORGE CITY, UTAH

PROFESSIONAL ENGINEER
STEVEN M. KAMLOWSKY
No. 8362092
05/20/24
STATE OF UTAH

CHECKED BY :	SK
DRAWN BY :	SWB
DATE :	5/6/24
JOB NO. :	23-94
SCALE :	1"=10'
SHEET NO. :	C-G1

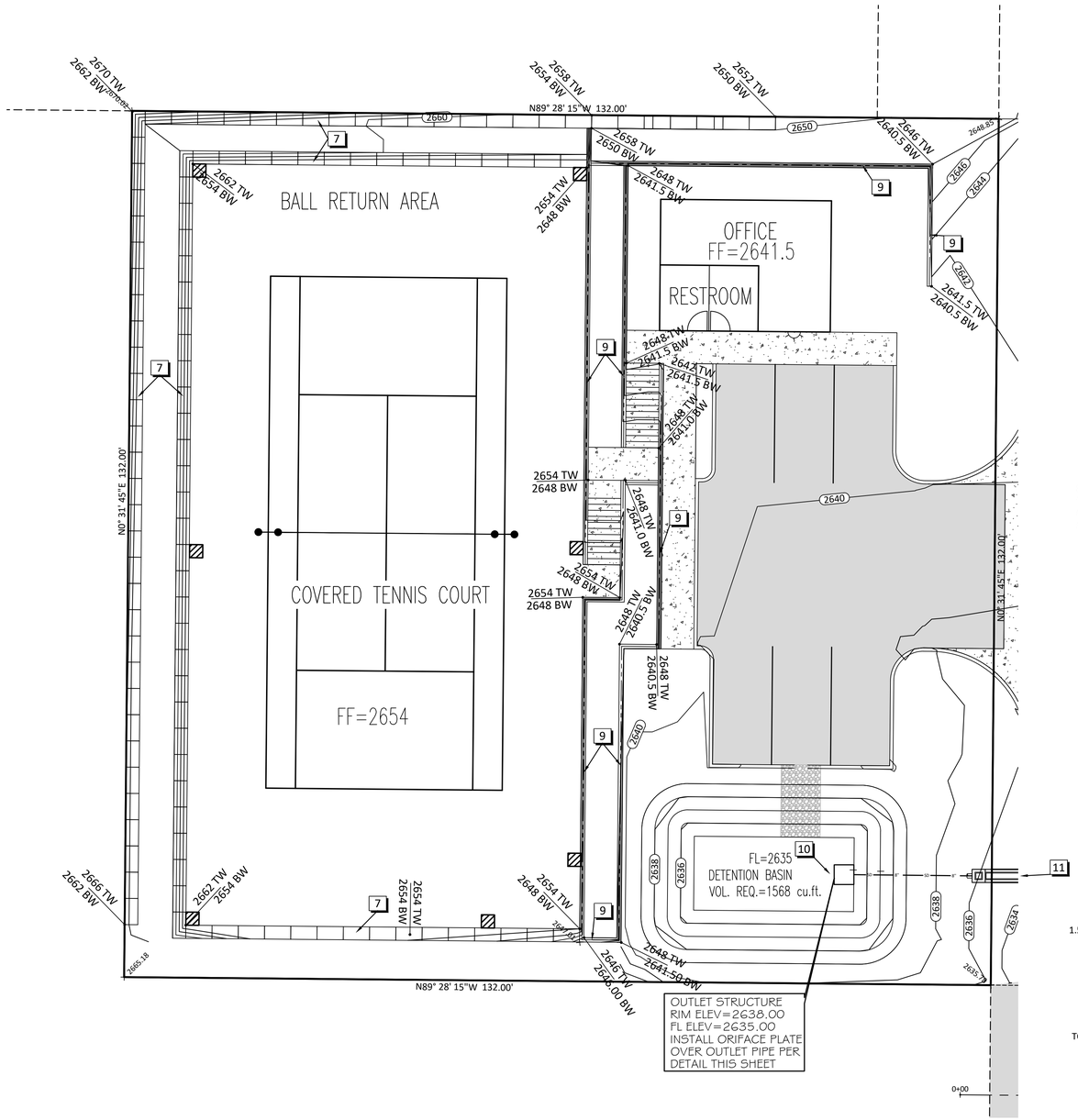
CONSTRUCTION NOTES

7 REDI BLOCK GRAVITY WALL-SEE SHEET C-G2 FOR DETAIL

9 CONCRETE RETAINING WALL. SEE ELEVATIONS ON C-G2 SEE DETAIL ON SHT C-G2

10 DRAINAGE STRUCTURE-SEE DETAIL THIS SHEET.

11 SIDEWALK DRAINAGE STRUCTURE PER ST. GEORGE STANDARD DRAWINGS No. 204. SEE C-D1



GRADING PLAN NOTES:

1. ALL EXCAVATIONS AND GRADING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF IVINS, SPECIFICALLY THE "UTAH UNIFORM STANDARD ACT RULES", APPENDIX "K", AND THE SPECIFICATIONS AND REQUIREMENTS INCLUDED IN THE GEOTECHNICAL INVESTIGATION PREPARED BY ????, PROJECT No. ???
2. THE CONTRACTOR SHALL PROVIDE SUITABLE EQUIPMENT TO CONTROL DUST AND AIR POLLUTION CAUSED BY CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL ALSO PROVIDE SUITABLE MUD AND DIRT CONTAINMENT TO MAINTAIN THE WORK SITE, ACCESS ROADWAYS AND ADJACENT PROPERTIES IN A CLEAN CONDITION.

3. A DRAINAGE CONTROL PLAN AND REPORT HAS BEEN PREPARED FOR THIS DEVELOPMENT BY BROWN CONSULTING ENGINEERS.

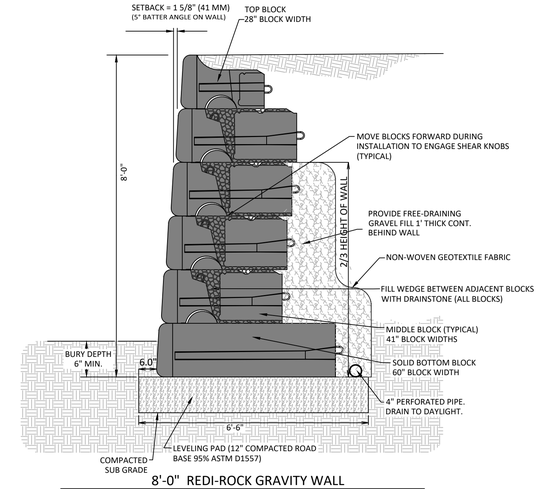
4. ENTRANCES/EXITS TO BUILDING SHALL HAVE A MIN. 4' LANDING WITH A SLOPE OF NOT MORE THAN 2.0% IN ANY DIRECTION.

5 THE OWNER SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE DRAINAGE CHANNEL AND THE ONSITE DETENTION BASINS.

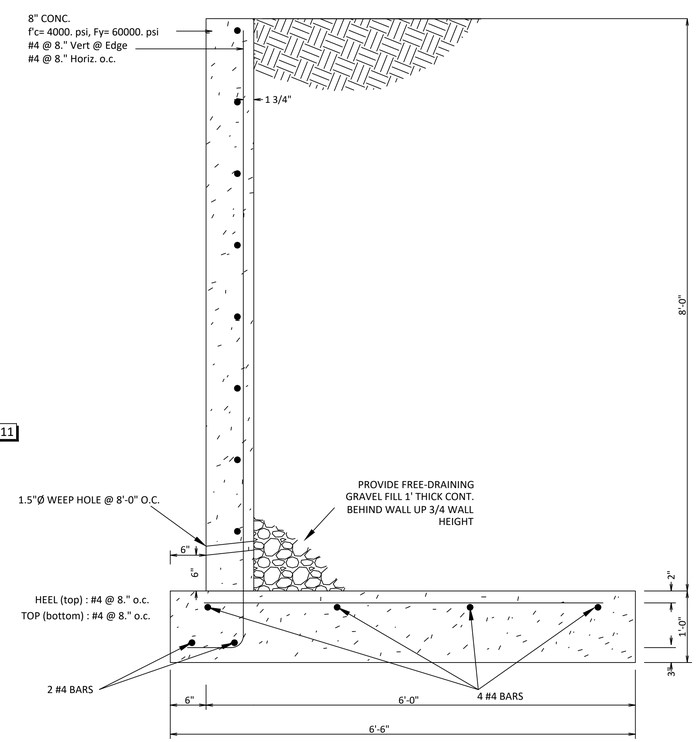
7. NO GRADING BEYOND PROPERTY LINE.

8. CONTRACTOR SHALL VERIFY ELEVATION IN THE FIELD.

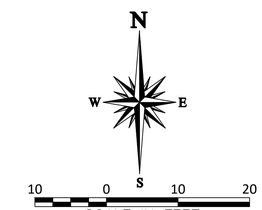
9. SEE RETAINING WALL DETAILS ON SHEETS C-G1 AND C-G2.



8'-0" REDI-ROCK GRAVITY WALL
Scale: 1/2" = 1'-0"



8' RETAINING WALL
Scale: 1" = 2'-0"



LEGEND

- PROPOSED CURB
- BOUNDARY LINE
- 2985 — PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 2985 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONCRETE WALL
- REDI-ROCK GRAVITY WALL
- PROPOSED 8"Ø STORM DRAIN
- NEW ASPHALT

NOTICE!

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Know what's below. Call before you dig.

NOTE: ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT ST. GEORGE CITY STANDARDS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
736 SOUTH 900 EAST, SUITE B 105
ST. GEORGE, UTAH 84790
(435) 628-4700 FAX (435) 628-4725

GRADIING PLAN
WALL DETAILS
FOR
HILLSIDE TENNIS COURT
LOCATED IN SECTIONS 36, T42S, R16W, SLB&M
ST GEORGE CITY, UTAH

REGISTERED PROFESSIONAL ENGINEER
STEVEN M. KAMLOWSKY
No. 8362092
05/20/24
STATE OF UTAH

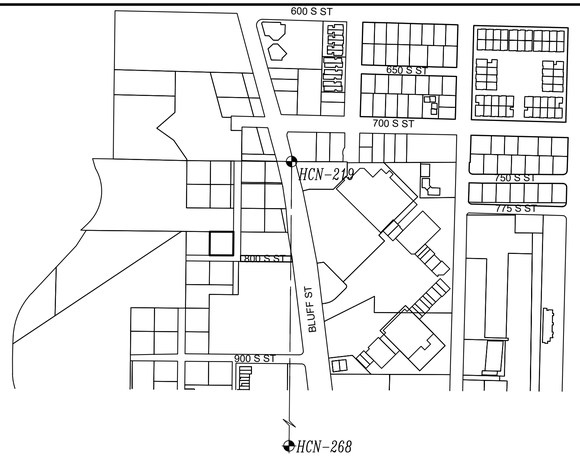
CHECKED BY : SK
DRAWN BY : SWB
DATE : 05/20/24
JOB NO. : 23-94

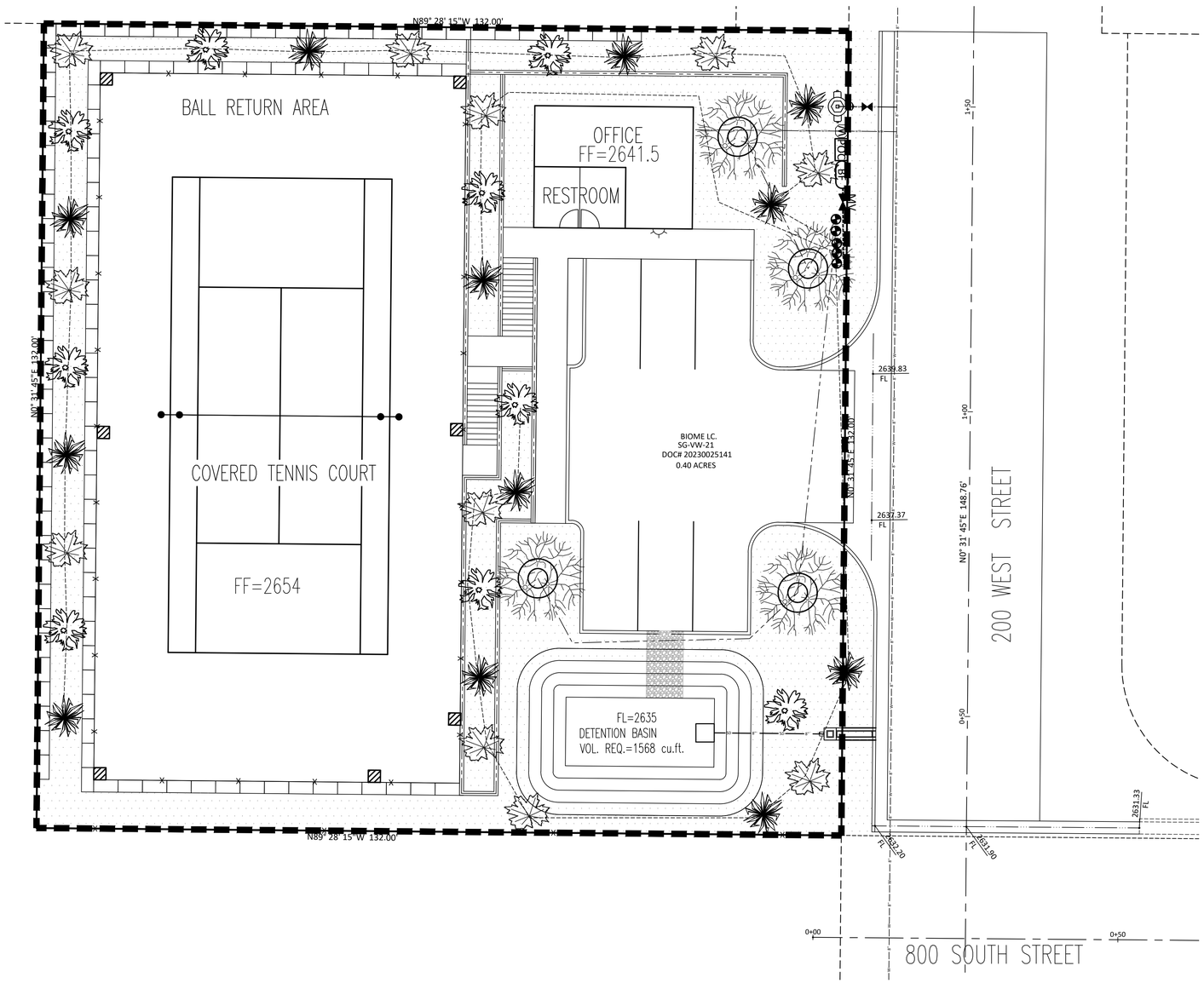
SCALE : 1"=10'

SHEET NO. : C-G2

EXHIBIT C

Landscape Plan





IRRIGATION NOTES

1. THESE DRAWINGS ARE SCHEMATIC ONLY AND ARE INTENDED TO CONVEY THE IDEA OF FULL COVERAGE OF THE IRRIGATION SYSTEM. PRINTS SHALL NOT BE SCALED. IRRIGATION LINES SHALL BE INSTALLED IN PLANTERS AND TURF AREAS. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION LAYOUT OF THE SYSTEM IN ACCORDANCE WITH THESE DRAWINGS.
2. ALL MAINLINE PIPES SHALL BE NEW SCHEDULE 40 PVC PIPE. ALL MAINLINE FITTINGS SHALL BE SCHEDULE 80 ASTM 2466 OR ASTM 2465 FITTINGS. ALL LATERAL LINE PIPES SHALL BE NEW SCHEDULE 40 PVC PIPE OR FLEXIBLE DISTRIBUTION TUBING.
3. SERVICE MAINLINES SHALL BE INSTALLED A MINIMUM OF 24" BELOW FINISH GRADE. LATERAL LINES SHALL BE PLACED A MINIMUM OF 18" BELOW FINISH GRADE.
4. ALL MAINLINES SHALL SLOPE TO DRAIN. MAINLINE DRAINS SHALL BE INSTALLED FOR COMPLETE DRAINAGE OF THE ENTIRE SYSTEM. NO MAINLINE SUMPS WITHOUT A DRAIN SHALL BE PERMITTED.
5. ALL VALVES SHALL BE LOCATED IN GROUPS AS SHOWN ON THE DRAWINGS WITHIN LANDSCAPE AREAS. VALVES SHALL BE LOCATED A MINIMUM OF 12" AWAY FROM ANY BUILDING, FENCE, CURB, OR SIDEWALK.
6. ALL VALVES TO BE WIRED TO CONTROLLERS USING #14 U.F. WIRE AND WATER RESISTANT WIRE CONNECTORS. ALL VALVE WIRES INSTALLED UNDER PAVEMENT SHALL BE INSTALLED IN SCHEDULE 40 PVC SLEEVES AND BURIED 24" DEEP.
7. THE IRRIGATION CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS SHOWING EXACT MEASURED LOCATIONS OF ALL VALVE BOXES, PULL BOXES, QUICK COUPLERS, CONTROLLERS, SLEEVES, ETC.

PLANTING NOTES

1. CONTRACTOR SHALL LOCATE & VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANTING MATERIALS IN THE QUANTITIES AND SIZES ACCORDING TO THE PLANS.
3. NO PLANTING SHALL BE ALLOWED BEFORE FINAL GRADING HAS BEEN COMPLETED AND APPROVED BY THE PROJECT MANAGER.
4. ALL ROOT WRAPPING MATERIAL SHALL BE REMOVED PRIOR TO PLANTING.
5. ALL PLANTS AND SUPPORT STAKES SHALL BE SET PLUMB UNLESS OTHERWISE SPECIFIED.
6. ALL PLANTS SHALL BE INSTALLED A MINIMUM OF 18" FROM BACK OF CURB/SIDEWALK WHICHEVER DISTANCE IS GREATER.
7. CONTRACTOR SHALL PROVIDE BACKFILL IN ANY AREAS REQUIRING ADDITIONAL MATERIAL TO BRING PLANT FLUSH AND LEVEL WITH GROUND.
8. ALL PLANTS SHALL BE WATERED THOROUGHLY AT LEAST TWICE DURING THE FIRST 24 HOURS AFTER PLANTING.
9. THE CONTRACTOR SHALL WARRANTY ALL PLANT MATERIALS FOR 1 YEAR AFTER INSTALLATION DATE.
10. FINISH GRADE OF ROCK MULCH/GRAVEL TO BE 1" BELOW TOP BACK OF CURB/SIDEWALK.
11. ALL WORK AND MATERIALS MUST MEET CITY OF ST. GEORGE STANDARDS.

ADDITIONAL NOTES

AT LEAST 50 PERCENT (50%) OF THE REQUIRED LANDSCAPED AREA SHALL BE COVERED WITH FOLIAGE OF SHRUBS, GRASS AND LIVE-VEGETATIVE GROUND COVER WITHIN 5 YEARS OF PLANTING. TREES AND THE TREE CANOPY SHALL NOT BE COUNTED IN THIS FIFTY PERCENT (50%) REQUIREMENT. IN ADDITION TO THE SHRUBS, GRASS, AND GROUND COVER, ONE (1) TREE WITH A MINIMUM ONE-AND-OVE-HALF-INCH (1 1/2") CALIPER TRUNK SHALL BE PLANTED FOR EVERY FOUR THOUSAND (4,000) SQUARE FEET OF LANDSCAPED AREA WITH A MINIMUM OF ONE (1) TREE PER PROPERTY. THE TREES MAY BE ARRANGED BY THE LANDSCAPE ARCHITECT AS BEST FITS THE PLAN EITHER IN ROWS OR CLUSTERS. TREE SPECIES SUITABLE FOR DESERT LANDSCAPE ARE ACCEPTABLE TO MEET THIS REQUIREMENT.

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SCALE IN FEET

PLANT LIST

		QTY.
TREES:		
RAYWOOD ASH	1-1/2" CALIPER MIN. PLACED 30' ON CENTER MAX.	4
BUSHES		
TEXAS SAGE	MIN. 5 GALLON	5
WILSON OLIVE	MIN. 5 GALLON	5
DESERT SPOON	MIN. 5 GALLON	3
	3/4" CHAMPAGNE COLOR GRAVEL (5,850 SQ. FT.)	
	3' DIA. LANDSCAPE BOULDER DESERT VARNISH OR TAN LIMESTONE	3

POINT SOURCE EMITTER NOTES

PLANT SIZE	EMITTER SIZE
1 GAL.	2 GPH
3 GAL.	2 GPH
5 GAL.	2 GPH
15 GAL.	2 GPH

IRRIGATION LEGEND

SYMBOL

- POC — POINT OF CONNECTION
- W — WATER METER (SIZE AS NOTED)
- BF — BACK FLOW PROTECTION VALVE
- MV — MASTER VALVE (BALL VALVE)
- C — CONTROLLER - TORO SENTINEL 2 WIRE SYSTEM OR APPROVED EQUAL
- M — POWER METER
- PVC BALL VALVE
- PB — PULL BOX
- RAINBIRD 3/4" DRIP VALVE ASSEMBLY W/ 2-WIRE DECODER OR APPROVED EQUAL
- TREE DRIP RING - SEE DETAIL
- SIGNATURE 3/4" QUICK COUPLER HOSE BIB OR APPROVED EQUAL - SEE DETAIL
- MAIN LINE PIPING - PVC SCH. 40 (1")
- TORO WHITE STRIPE 3/4" POLY TUBING (TREES)
- TORO BLUE STRIPE 3/4" POLY TUBING (SHRUBS)
- PVC SCH. 40 IRRIGATION SLEEVE - SIZE AS NOTED ON PLAN
- 1 — INDICATES VALVE NUMBER
- 1.00 — INDICATES VALVE FLOW (GPM)
- 1" — INDICATES VALVE SIZE

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REVISIONS

NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
736 SOUTH 900 EAST, SUITE B 105
ST. GEORGE, UTAH 84790
(435) 628-4700 FAX (435) 628-4725

LANDSCAPE PLAN
FOR
HILLSIDE TENNIS COURT
LOCATED IN SECTIONS 36, T42S, R16W, SLB&M
ST GEORGE CITY, UTAH

PROFESSIONAL ENGINEER
STEVEN M. KAMLOWSKY
No. 8362092
5/7/24
STATE OF UTAH

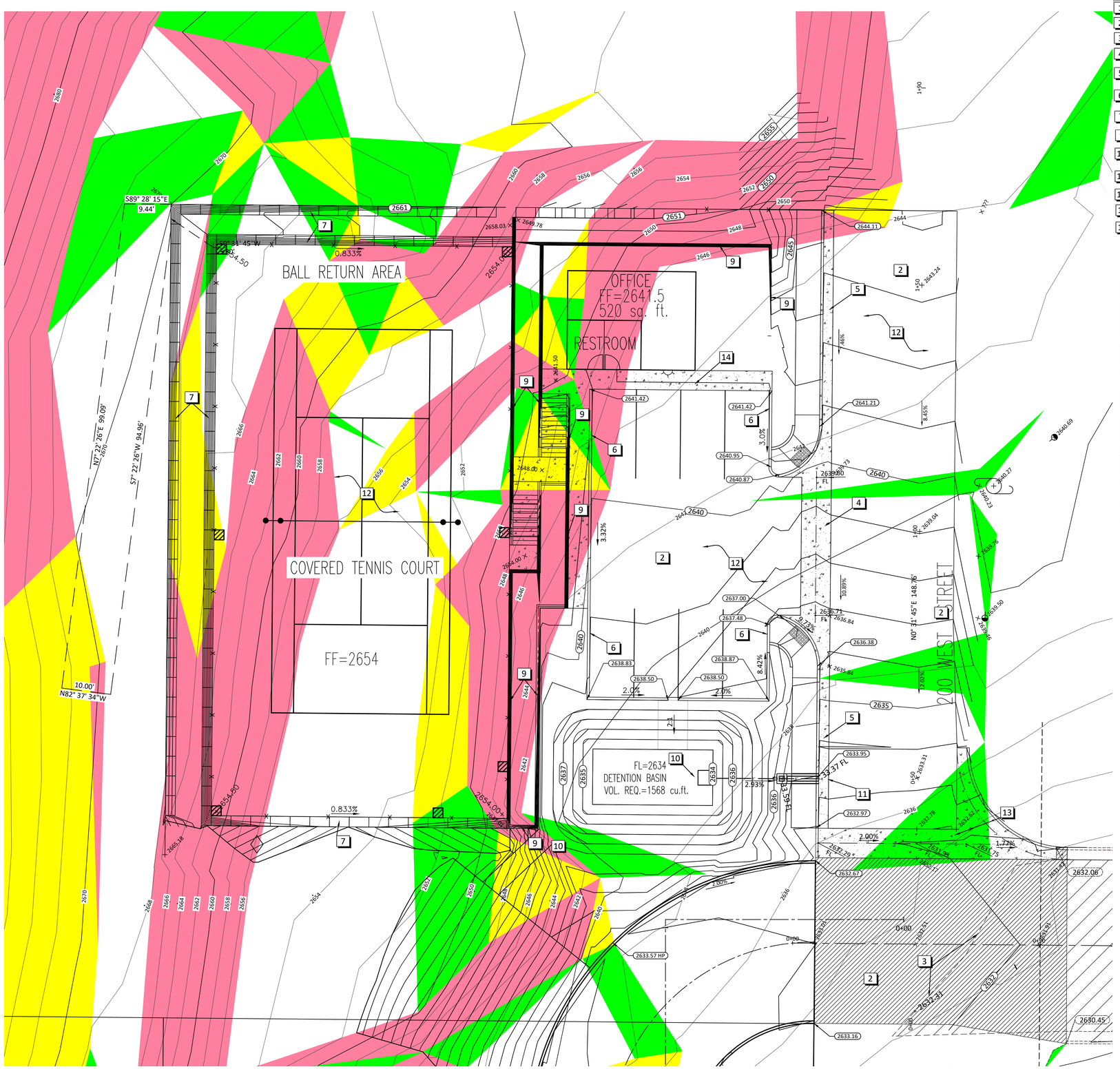
CHECKED BY : SK
DRAWN BY : SWB
DATE : 5/7/24
JOB NO. : 23-94

SCALE : 1"=10'

SHEET NO. : C-LS

EXHIBIT D

Slope Analysis



CONSTRUCTION NOTES

1. 5' WIDE CONC. SIDEWALK
2. 2.5" AC PAVEMENT OVER 6" TYPE II BASE
3. SAW CUT AND MATCH EXISTING
4. CONC. CROSS GUTTER PER ST. GEORGE STANDARD DRAWINGS No. 151
5. NEW HB30-7 CURB AND GUTTER PER ST, GEORGE STANDARD DRAWINGS No. 110
6. INSTALL NEW "A" CURB, SEE DETAIL ON SHEET C-D1
7. REDI BLOCK GRAVITY WALL-SEE SHEET C-G2 FOR DETAIL
9. CONCRETE RETAINING WALL. SEE ELEVATIONS ON C-G2 SEE DETAIL ON SHT C-G2
10. DRAINAGE STRUCTURE-SEE DETAIL THIS SHEET.
11. SIDEWALK DRAINAGE STRUCTURE PER ST. GEORGE STANDARD DRAWINGS No. 204. SEE C-D1
12. GRADE SITE TO ELEVATIONS SHOWN
13. INSTALL 6' CROSS GUTTER PER STD. DWG 151 ON C-D1
14. 4' WIDE CONC. SIDEWALK

GRADING PLAN NOTES:

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7. NO GRADING BEYOND PROPERTY LINE.
8. CONTRACTOR SHALL VERIFY ELEVATION IN THE FIELD.
9. SEE RETAINING WALL DETAILS ON SHEETS C-G1 AND C-G2.

N
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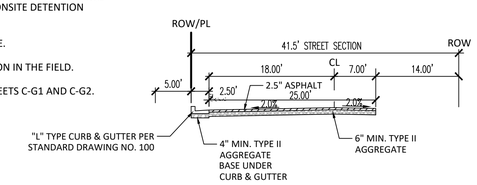
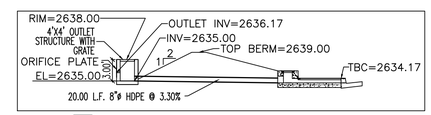
10 0 10 20
SCALE IN FEET

LEGEND

- PROPOSED CURB
- BOUNDARY LINE
- ADJACENT PROPERTY LINE
- 2985 — PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 2985 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- EXISTING CURB
- EDGE OF ASPHALT (EOA)
- PROPOSED CONCRETE WALL
- REDI-ROCK GRAVITY WALL
- PROPOSED 18"Ø STORM DRAIN
- PHASE LINE
- NEW ASPHALT
- 2596.36 — PROPOSED TBC GRADES
- +2654.50 — TENNIS COURT GRADES
- 2632.06 — EXISTING TBC GRADES
- EXISTING ASPHALT
- ASPHALT AND TBC TO BE REMOVED

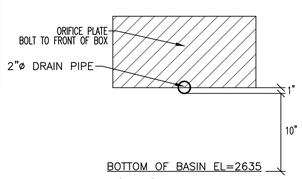


TYPICAL STREET SECTION (200 WEST)
NOT TO SCALE



10 ***DETENTION BASIN OUTLET STRUCTURE CROSS SECTION***
1"=10'

Slopes Table				
Number	Minimum Slope	Maximum Slope	Area	Color
1	0.00%	20.00%	62486.06	
2	20.00%	30.00%	5454.11	
3	30.00%	40.00%	5326.87	
4	40.00%	Vertical	14945.12	



ORIFICE PLATE DETAIL
NO SCALE

EARTHWORK

ESTIMATED EARTHWORK VOLUMES
PHASE 1 BUILDING SITE:
CUT = 2,180 c.y. CUT
FILL = 268 c.y. FILL
NET = 1,892 c.y. (CUT)

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ALL EARTH WORK VOLUMES. VOLUMES SHOWN ARE FOR ESTIMATING PURPOSES ONLY. THEY REPRESENT ESTIMATED VOLUMES BETWEEN EXISTING AND FINISHED SURFACES.

ALL GRADING ACTIVITY SHALL COMPLY WITH APPENDIX "K" SECTION 33 GUIDELINES.

NOTICE OF INTENT (N.O.I.) TO BE SUBMITTED PRIOR TO OBTAINING BUILDING PERMIT.

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CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
736 SOUTH 900 EAST, SUITE B 105
ST. GEORGE, UTAH 84790
(435) 628-4700 FAX (435) 628-4725

GRADIING PLAN
FOR
HILLSIDE TENNIS COURT
LOCATED IN SECTIONS 36, T42S, R16W, SLB&M
ST GEORGE CITY, UTAH

PROFESSIONAL ENGINEER
STEVEN M. KAMLOWSKY
No. 8362092
07/10/24
STATE OF UTAH

CHECKED BY : SK
DRAWN BY : SWB
DATE : 7/11/24
JOB NO. : 23-94
SCALE : 1"=10'
SHEET NO. : C-G1

EXHIBIT E

2024 BCE Drainage Report

STORM WATER DRAINAGE REPORT

Hillside Tennis Court

Site Address:
Parcel ID SG-VW-21
St. George, UT

Prepared for:

Prepared by:

Brown Consulting Engineers, Inc.
736 S. 900 E., Ste B105
St. George, UT 84790
(435) 628-4700

May 6, 2024

Project Number 23-94

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1.2 Purpose and need 3
1.3 Reference materials 3
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2.2 Proposed property improvements 3
3.0 Off-site drainage description 3
3.1 Upstream drainage 3
3.2 Downstream drainage 3
4.0 On-site drainage description 3
4.1 Pre-development drainage 3
4.2 Post-development drainage 3
5.0 FEMA floodplain requirements 4
6.0 Other drainage studies affecting the property 4
7.0 Description of proposed drainage facilities 4
7.1 Grading 4
7.2 Roadway improvements 4
7.3 Conveyance improvements 4
8.0 Compliance with local FEMA requirements 4
9.0 Design runoff computations 4
9.1 Selection of hydrologic model 4
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9.7 Distribution of rainfall 6
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10.1 Roadway improvements 6
10.2 Detention requirements 6

10.3 Detention basin description 6
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10.5 Geotechnical site drainage recommendations 7
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1.0 Introduction

The purpose of this drainage report is to study the effects that development will have on the proposed 0.40-acre property to be known as Hillside Tennis Court.

1.1 Background

This property is located in St. George, Utah, at the intersection of 200 West Street and 800 South Street and is currently an undeveloped lot. This site is located in the Northeast 1/4 corner of Section. 36, T42S, R16W SLB&M.

1.2 Purpose and need

This report has been prepared to evaluate the drainage needs affecting the proposed construction of the site. As the site develops, the post-development flows will not increase, but through the use of storm drain and facility improvements, the storm water flows will not exceed the existing conditions.

1.3 Reference materials

Various refence materials were used in the preparation of this report as shown in the appendix.

2.0 Property Description

The property is currently unaddressed and is located near the intersection of 200 West Street and 800 South Street in St. George, Utah and is proposed site is to be developed into a tennis court.

2.1 Existing property description

This property is currently undeveloped land. It is not active agricultural land and there is an existing barn structure within the project boundary.

2.2 Proposed property improvements

The proposed improvements will include curb, gutter, and utilities typical of this type of development. The building pads will have a minimum slope of 0.5%. All stormwater runoff will be conveyed by means of surface and storm drain flow.

3.0 Off-site drainage description

3.1 Upstream drainage

There is a 1.28-acre upstream basin that flows through the site. This upstream basin will be routed around the proposed site and towards 200 West Street. The existing point of discharge will remain the same.

3.2 Downstream drainage

Existing flows from the site drain primarily to the southeast corner and eventually flow into the public street.

4.0 On-site drainage description

4.1 Pre-development drainage

Runoff from the existing site consists mainly of surface flow and shallow concentrated flow. There are no existing storm drain facilities within the project boundary.

4.2 Post-development drainage

The proposed development will include a new tennis court, office building, curb, gutter, and utilities typical of this type of residential development. The public streets will have a minimum slope of 0.50%.

All stormwater runoff will be conveyed by means of street and storm drain flow and will outlet into 200 West Street.

As the site develops, the peak runoff will not increase as shown in Table 1 below:

Table 1 – Peak Runoff Summary

	$Q_{10\text{-yr 24-hr}}$ (cfs)	$Q_{100\text{-yr 24-hr}}$ (cfs)	$Q_{10\text{-yr 3-hr}}$ (cfs)	$Q_{100\text{-yr 3-hr}}$ (cfs)
Pre-Development	0.26	0.59	0.10	0.55
Post-Development	0.65	1.04	0.48	1.24

5.0 FEMA floodplain requirements

There are no floodplain requirements for this site. This site lies within FEMA zone X which is an area determined to be outside the 0.2% annual flood chance.

6.0 Other drainage studies affecting the property

This site lies within the West Black Ridge Master Drainage Basin Area as shown on the St. George storm drain master plan.

7.0 Description of proposed drainage facilities

7.1 Grading

The proposed development will include a new tennis court, office building, curb, gutter, and public streets. The proposed building pads will be graded to provide positive drainage away from the buildings in accordance with St. George City requirements.

7.2 Roadway improvements

The development will improve the existing 200 West Street and 800 South Street roadways as shown on the grading plans.

7.3 Conveyance improvements

Storm drain improvements will be installed with the development. Storm drain lines will be designed to convey the 10-yr 3-hr storm event. The storm drain improvements will also be analyzed under the 100-yr 24-hr and the 100-yr 3-hr storm to ensure no flooding occurs. Storm drain lines will have a minimum pipe size of 8 inches and a minimum slope of 0.50%.

8.0 Compliance with local FEMA requirements

There are no FEMA floodplain requirements for this site.

9.0 Design runoff computations

9.1 Selection of hydrologic model

The Soil Conservation Service (SCS) method and the computer program HEC-HMS was used to model the storm water runoff.

$$Q_P = C\frac{A}{T_P}$$

Where:

Q_P = Peak runoff
C = Conversion constant (2.08 SI and 484 in foot-pound system)
A = Watershed area
T_P = Time of peak, calculated as follows:

$$T_P = \frac{\Delta t}{2} + t_{lag}$$

Where:

T_p = time of peak discharge
Δt = the excess precipitation duration (which is also the computational interval in the simulation)
t_{lag} = the basin lag time, defined as the difference between the center of mass of rainfall excess and the peak of the unit hydrograph.

9.2 Model input parameters

The input parameters were derived in accordance with St. George City's Stormwater Master Plan and Analysis. The key input parameters used are:

- Watershed area.
- SCS Curve Number.
- SCS lag Time.
- Rainfall depth.
- Time distribution of rainfall.

9.3 Watershed area

The total watershed area is 0.40 acres for the proposed development. This area consists of 1 drainage basin that flows into the proposed storm drain system.

9.4 Curve number

The NRCS web soil survey was used to determine the site's Hydrologic Soil Group. According to the survey, a Hydrologic Soil Group of "C" was used for all curve number calculations (see Appendix). The existing and developed site curve numbers were calculated using the SCS TR-55 method. A weighted curve number average was calculated for each sub-basin based on impervious and pervious area. A summary of the curve numbers used for each sub-basin are shown in the table below and detailed calculations are shown in the appendix.

Table 2 - Curve Numbers

Basin Name	Curve Number
Existing	83
Developed	96
Upstream	88

9.5 Time of concentration

The SCS lag time method was used for all time of concentration calculations.

$$T_{lag} = 0.6(T_c)$$

$$T_c = T_i + T_t$$

Where:

T_c = Time of concentration
T_i = Initial, sheet flow travel time
T_t = Travel time for shallow concentrated flow

$$T_i = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5}S^{0.4}}$$

Where:

n = Manning's roughness coefficient
L = flow length (ft)
P_2 = 2-year 24-hour rainfall (in) = 0.76 inches
S = slope (ft/ft)

$$T_t = \frac{L}{3600\,V}$$

Where:
L = flow length (ft)
V = average velocity (ft/s)
The velocity used in the travel time computations was estimated using TR-55's Figure 3-1. The time of concentration numbers for each sub-basin are shown in the appendix.

9.6 Rainfall data

The 10-yr 24-hr and 100-yr 24-hr storm events were used to analyze the site hydrology. The 10-yr 24-hr rainfall total is 1.68 inches and the 100-yr 24-hr rainfall total is 2.51 inches. These storm totals are per the St. George Stormwater Master Plan as presented in the appendix.

9.7 Distribution of rainfall

The SCS type II distribution was used for the 10-yr 24-hr and 100-yr 24-hr storm calculations.

9.8 Model output

Complete HEC-HMS output files are included in the appendix.

10.0 Drainage facility design

10.1 Roadway improvements

No new roadways are proposed for this development.

10.2 Detention requirements

The required detention volume was calculated by limiting the outflow of the site to 0.2 cfs per acre as specified in the St. George City Drainage Manual. The combined outflow from the site will not exceed

0.2x0.40=0.08 cfs and the total detention volume required for the site is 1568 cu. ft. This required volume will be held in a detention basin and an outlet structure will be constructed at the basin outlet to limit the outflow. The details for the outlet structures will be included in the construction drawings and will be presented at that time.

The table below summarizes the detention basin results:

Table 3 - Detention results

	$Q_{100\text{-yr } 24\text{-hr}}$ Inlet (cfs)	$Q_{100\text{-yr } 24\text{-hr}}$ Outlet (cfs)	Volume (cu. ft.)	Water Height (ft)
Detention Basin	1.04	0.08	1568	3.0

10.3 Detention basin description

The detention basin will consist of an underground detention basin which runoff will be conveyed into by means of surface flow or storm drain infrastructure. The outlet from the detention basin will consist of an orifice plate that limits the flow to not exceed existing conditions. The detention basin is designed to handle the 100-yr storm. The details for the outlet structure will be included in the construction drawings and will be presented at that time.

10.4 Erosion Protection

The detention basin outlet pipe will flow into paved/concrete areas to minimize erosion out of the proposed detention basins.

10.5 Geotechnical site drainage recommendations

The soils report provides recommendations for site preparation and foundation design. Inadequate surface drainage or failure to control moisture will result in excessive differential movement of slabs, walkways, porches, or patios and structural damage, regardless of the site preparation. The following moisture control measures are recommended:

(1) Once the finish floor elevation has been established, the site grades should be constructed and maintained to drain surface and roof runoff away from the building foundation at a slope of ten percent for at least ten feet beyond the structure for unpaved surfaces. The ground surface should be graded to drain away from the building in all directions. Water should not be allowed to pond adjacent to foundations or on-site.

(2) Xeriscape (landscaping that eliminates the need for supplemental irrigation of plants) is recommended within 10 feet of the building foundation. Bubblers, although more efficient than sprinkler irrigation, still have a significant potential of introducing excessive water into the ground and saturating foundation soils. Bubblers are not recommended in the 10 feet buffer zone area. As an alternative, sealed bottom planter boxes may be used.

(3) Inadequate compaction of utility trench backfill provides a conduit for water migration. All utility trenches within the building footprint and extending 5 feet beyond the footprint should be backfilled with structural fill similar to that approved for the foundations. Backfill adjacent to structures should be compacted to at least 90 percent of the maximum dry density as determined by ASTM D-1557 and the minimum slope requirements should be followed. Backfill beneath structures should be compacted to at least 95 percent of the maximum dry density.

(4) Grading should be such that surface water is directed away from all cut and fill slopes and collected only in channels protected against erosion. Water should not be allowed to pond on-site.

11.0 Required drainage easements

No new drainage easements will be required for this site.

12.0 FEMA floodway and floodplain calculations

There are no FEMA floodplain requirements for this site.

13.0 Conclusion and statement of compliance

13.1 Conclusions

The following conclusions summarize the proposed development:

1. This report complies with the St. George Stormwater Master Plan.
2. The proposed improvements include curb, gutter, and utilities typical of this type of development.
3. All stormwater runoff will be conveyed by means of street and storm drain flow and will outlet into 200 West.
4. This site is not located within a FEMA floodplain area.
5. It is in our opinion that the proposed storm drain infrastructure is adequate to safely convey flows around the proposed lots and into the public storm drain system.

14.0 References

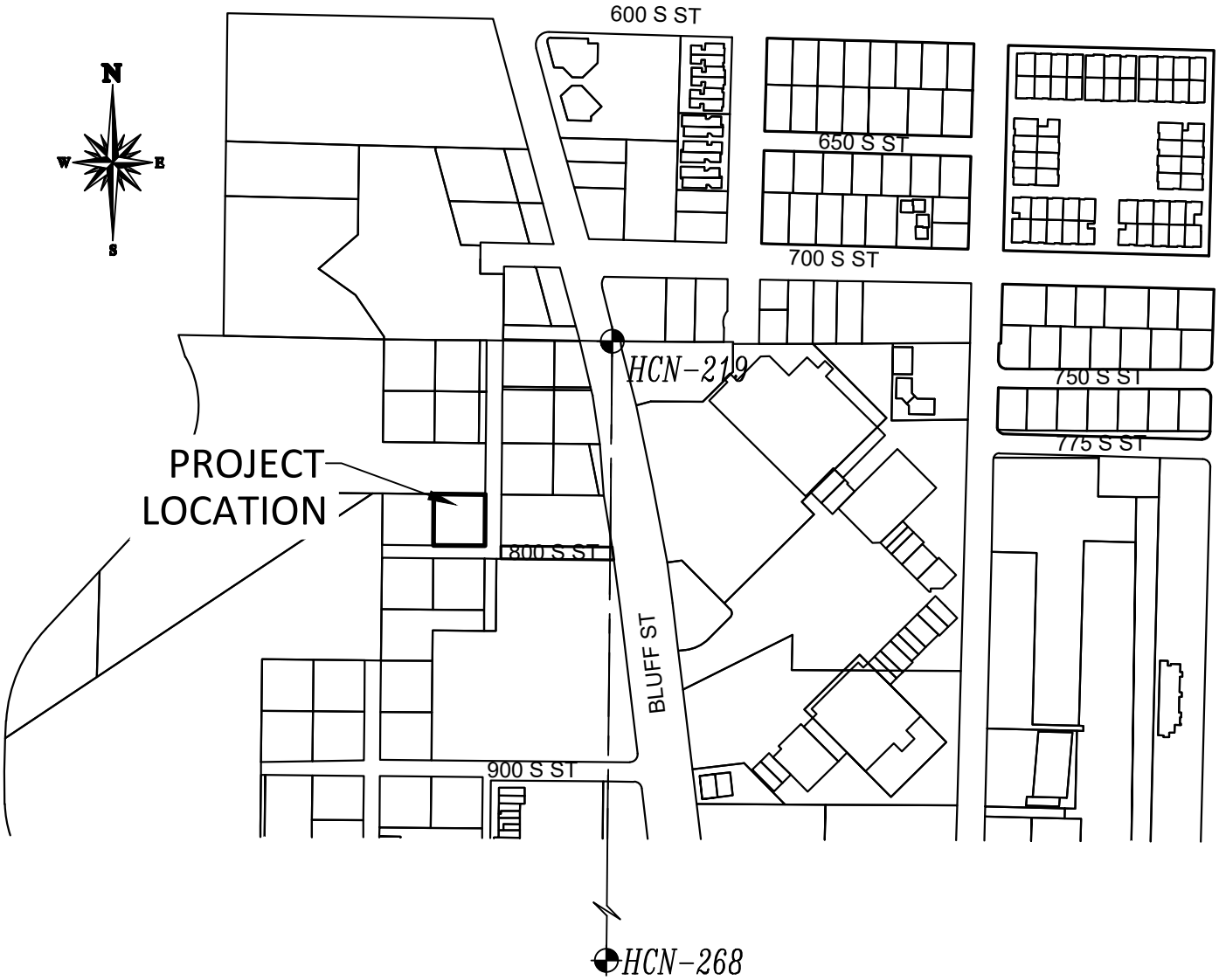
1. St. George, *Storm Water Master Plan.* Dated 2009.

2. NRCS, *Soil Survey of Washington County Area, Utah.*

3. NRCS, *Urban Hydrology for Small Watersheds – Technical Release 55 (TR-55).*

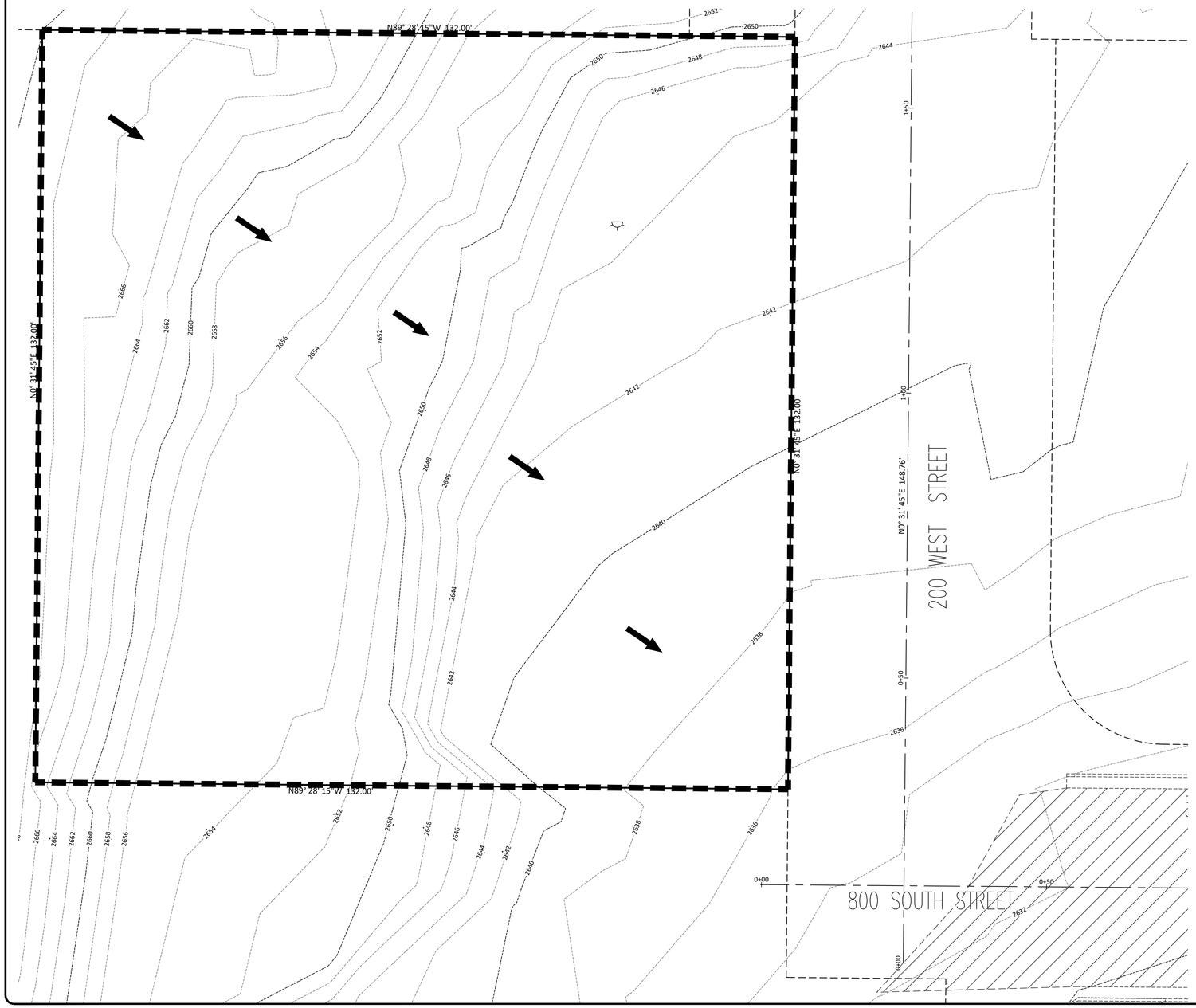
4. NRCS, *Soil Conservation Service Curve Number (SCS-CN) Methodology – Mishra, Singh.*

Appendix



VICINITY MAP

EXISTING CONDITIONS



N
W E
S

10 0 10 20
SCALE IN FEET

LEGEND

DRAINAGE BASIN BOUNDARY

DRAINAGE DIRECTION ARROW

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
736 SOUTH 900 EAST, SUITE B 105
ST. GEORGE, UTAH 84790
(435) 628-4700 FAX (435) 628-4725

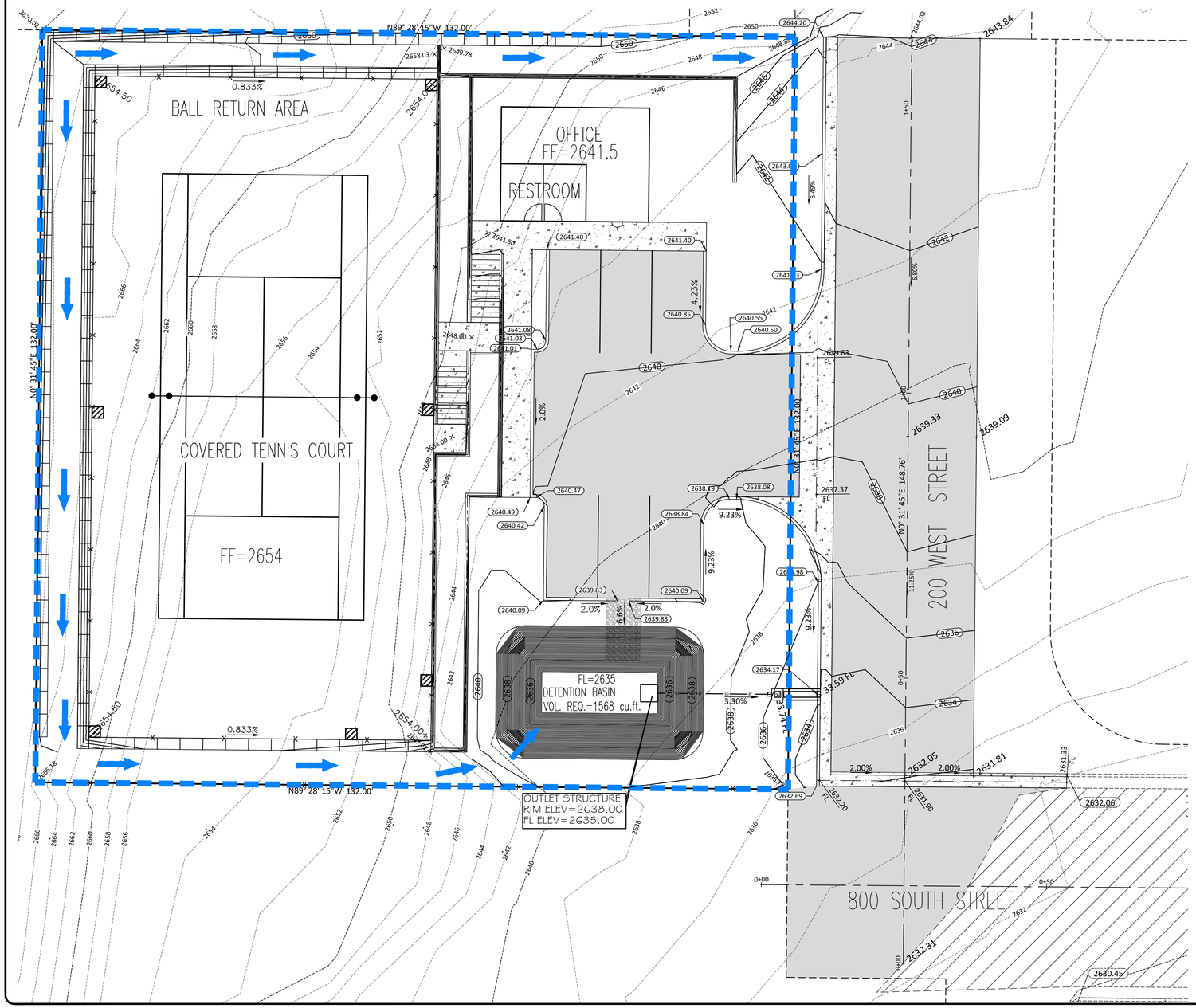
EXISTING DRAINAGE BASIN
FOR
HILLSIDE TENNIS COURT
LOCATED IN SECTIONS 36, T42S, R16W, SLB&M
ST GEORGE CITY, UTAH

CHECKED BY : SK
DRAWN BY : TF
DATE : 05/06/24
JOB NO. : 23-94

SCALE : 1"=10'

SHEET NO. : EX-1

DEVELOPED CONDITIONS



N
W E
S

10 0 10 20
SCALE IN FEET

LEGEND

- DRAINAGE BASIN BOUNDARY
- DRAINAGE DIRECTION ARROW

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
736 SOUTH 900 EAST, SUITE B 105
ST. GEORGE, UTAH 84790
(435) 628-4700 FAX (435) 628-4725

DEVELOPED DRAINAGE BASIN
FOR
HILLSIDE TENNIS COURT
LOCATED IN SECTIONS 36, T42S, R16W, SLB&M
ST GEORGE CITY, UTAH

CHECKED BY : SK
DRAWN BY : TF
DATE : 05/06/24
JOB NO. : 23-94

SCALE : 1"=10'

SHEET NO. : DV-1

National Flood Hazard Layer FIRMette

FEMA

113°35'35"W 37°5'54"N

113°34'58"W 37°5'26"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

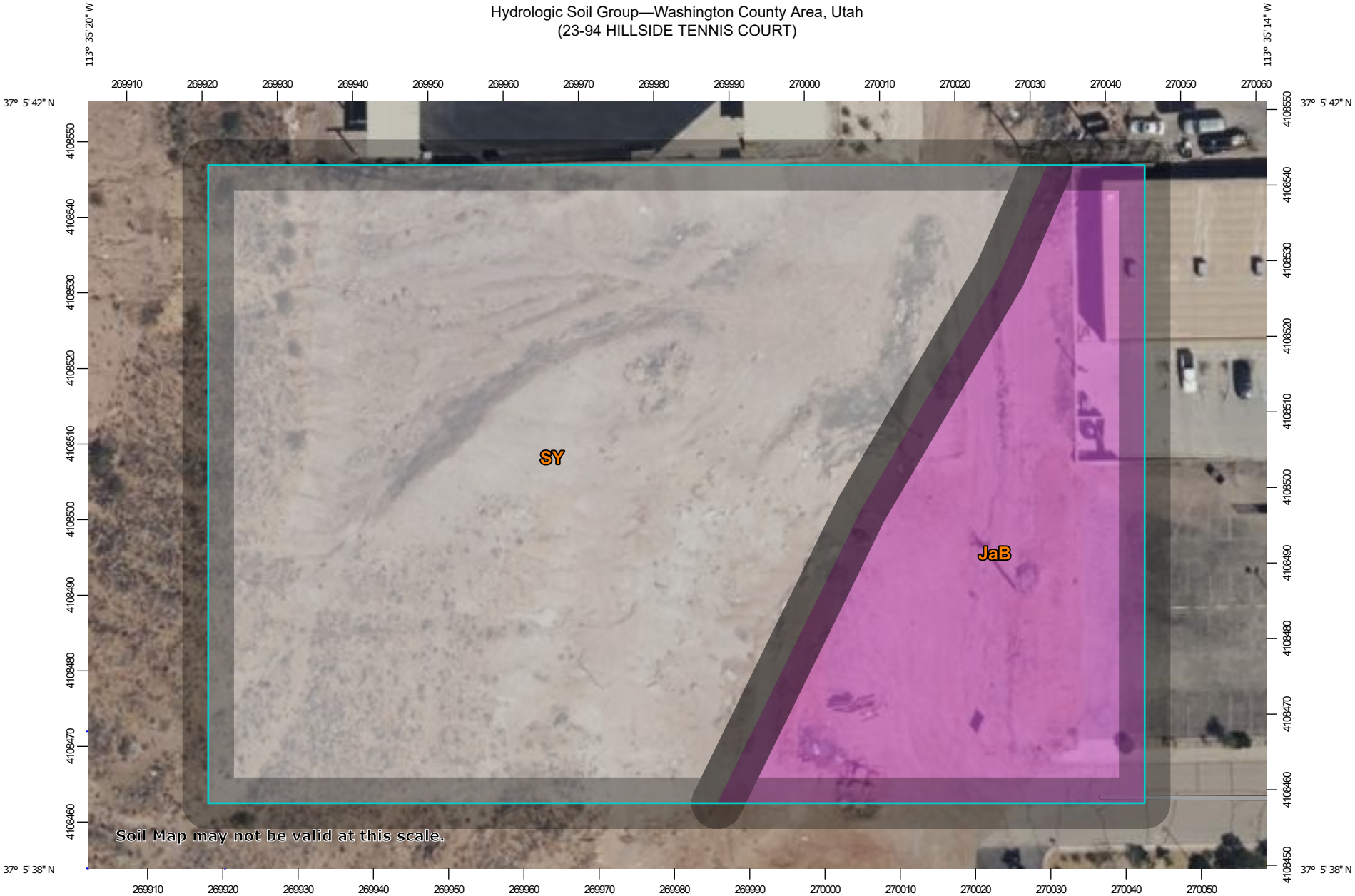
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/29/2024 at 5:56 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Hydrologic Soil Group—Washington County Area, Utah
(23-94 HILLSIDE TENNIS COURT)



Map Scale: 1:716 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County Area, Utah
Survey Area Data: Version 17, Sep 9, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 8, 2022—Sep 29, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
JaB	Junction fine sandy loam, 1 to 2 percent slopes	A	0.7	28.1%
SY	Stony colluvial land		1.9	71.9%
Totals for Area of Interest			**2.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

- Distribution: time distribution of rainfall within storms is important in estimating flood hydrographs. Distributions vary with storm type (orthographic, convective), intensity and duration. There is no typical distribution that is applicable to all situations.

Design Storm Depth

Historical records of rainfall depth collected at climate stations throughout the United States are used to estimate the depth, frequency, and duration of design storms. The major climate station is located at the current airport. This climate station has rainfall records dating back to 1892. Data from these and numerous other climate stations have been compiled by the National Oceanic and Atmospheric Administration (NOAA) to estimate point precipitation depth, duration, and frequency for all locations in Utah. The resulting estimates for St. George were taken from the NOAA Atlas 14 (USDOC, 2006) via the Precipitation Frequency Data Server (http://hdsc.nws.noaa.gov/hdsc/pfds/sa/ut_pfds.html) and are summarized in Table 2-1.

Table 2-1
Precipitation Depth-Frequency Estimates for St. George, Utah*

Estimated Precipitation Depth (inches)						
Duration	**Annual Exceedance Probability**					
	2-yr	**5-yr**	**10-yr**	**25-yr**	**50-yr**	**100-yr**
5 min	0.15	0.21	0.26	0.34	0.40	0.48
10 min	0..22	0.32	0.40	0.52	0.62	0.73
15 min	0.28	0.40	0.50	0.64	0.76	0.90
30 min	0.37	0.54	0.67	0.86	1.03	1.22
60 min	0.46	0.67	0.83	1.07	1.27	1.51
2 hr	0.54	0.76	0.93	1.18	1.38	1.60
3 hr	0.60	0.83	1.00	1.24	1.43	1.64
6 hr	0.75	1.03	1.22	1.50	1.72	1.96
12 hr	0.91	1.23	1.46	1.76	1.94	2.22
24 hr	1.05	1.42	1.68	2.01	2.26	2.51
2 day	1.15	1.56	1.83	2.19	2.47	2.74
4 day	1.30	1.76	2.06	2.46	2.77	3.07

* From NOAA Atlas 14, 2006 (see Appendix A).

Design Storm Duration

Cloudburst rainfall events in southwestern Utah typically have durations ranging from a few minutes to three hours. Storms producing general rainfall over longer periods of time are rare,

TF 23-94 HILLSIDE TENNIS COURT

Washington County, Utah

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Existing							
SHEET	100	0.2240	0.130				0.079
SHALLOW	87	0.1367	0.050				0.004
					Time of Concentration		0.1
Developed							
SHEET	100	0.0800	0.130				0.119
SHALLOW	118	0.2700	0.050				0.004
					Time of Concentration		.123

TF 23-94 HILLSIDE TENNIS COURT

Washington County, Utah

Sub-Area Land Use and Curve Number Details

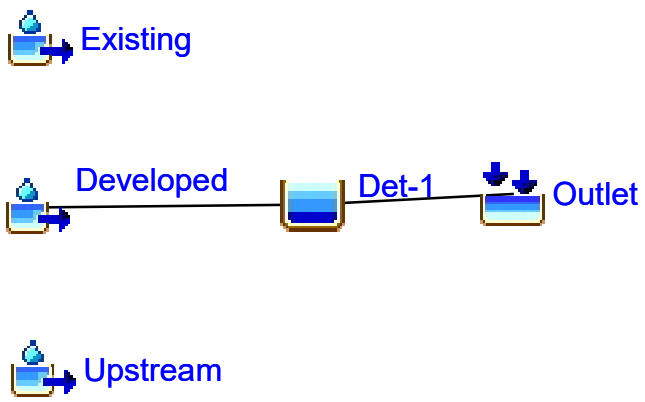
Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Existing	Desert shrub	(poor)	C	.2	85
	Desert shrub	(fair)	C	.2	81
	Total Area / Weighted Curve Number			.4	83
				==	==
Developed	Paved parking lots, roofs, driveways		C	.264	98
	Newly graded area (pervious only)		C	.136	91
	Total Area / Weighted Curve Number			.4	96
				==	==

HEC-HMS

Project : Hillside Tennis

Basin Model : Basin 1

May 02 16:13:42 MDT 2024



Project: Hillside Tennis Simulation Run: 10-YR 3-HR

Start of Run: 01Jan2023, 00:00 Basin Model: Basin 1
End of Run: 02Jan2023, 00:05 Meteorologic Model: 10-yr 3-hr
Compute Time: 02May2024, 16:14:10 Control Specifications: 24 hr window

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
Upstream	0.002000	0.61	01Jan2023, 01:40	0.026
Existing	0.000625	0.10	01Jan2023, 01:45	0.004
Developed	0.000625	0.48	01Jan2023, 01:40	0.021
Det-1	0.000625	0.05	01Jan2023, 02:15	0.021
Outlet	0.000625	0.05	01Jan2023, 02:15	0.021

Project: Hillside Tennis Simulation Run: 10-YR 24-HR

Start of Run: 01Jan2023, 00:00 Basin Model: Basin 1
End of Run: 02Jan2023, 00:05 Meteorologic Model: 10-YR 24-HR
Compute Time: 02May2024, 16:13:48 Control Specifications: 24 hr window

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
Upstream	0.002000	1.26	01Jan2023, 12:00	0.076
Existing	0.000625	0.26	01Jan2023, 12:00	0.016
Developed	0.000625	0.65	01Jan2023, 11:55	0.042
Det-1	0.000625	0.06	01Jan2023, 12:35	0.040
Outlet	0.000625	0.06	01Jan2023, 12:35	0.040

Project: Hillside Tennis Simulation Run: 100-YR 3-HR

Start of Run: 01Jan2023, 00:00 Basin Model: Basin 1
End of Run: 02Jan2023, 00:05 Meteorologic Model: 100-yr 3-hr
Compute Time: 02May2024, 16:12:13 Control Specifications: 24 hr window

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
Upstream	0.002000	2.38	01Jan2023, 01:40	0.073
Existing	0.000625	0.55	01Jan2023, 01:40	0.015
Developed	0.000625	1.24	01Jan2023, 01:40	0.041
Det-1	0.000625	0.08	01Jan2023, 02:10	0.041
Outlet	0.000625	0.08	01Jan2023, 02:10	0.041

Project: Hillside Tennis Simulation Run: 100-yr 24-hr storm

Start of Run: 01Jan2023, 00:00 Basin Model: Basin 1
End of Run: 02Jan2023, 00:05 Meteorologic Model: 100-YR 24-HR STORM
Compute Time: 02May2024, 16:08:44 Control Specifications: 24 hr window

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
Upstream	0.002000	2.42	01Jan2023, 12:00	0.148
Existing	0.000625	0.59	01Jan2023, 11:55	0.035
Developed	0.000625	1.04	01Jan2023, 11:55	0.069
Det-1	0.000625	0.08	01Jan2023, 12:45	0.064
Outlet	0.000625	0.08	01Jan2023, 12:45	0.064

Project: Hillside Tennis

Simulation Run: 100-YR 3-HR Reservoir: Det-1

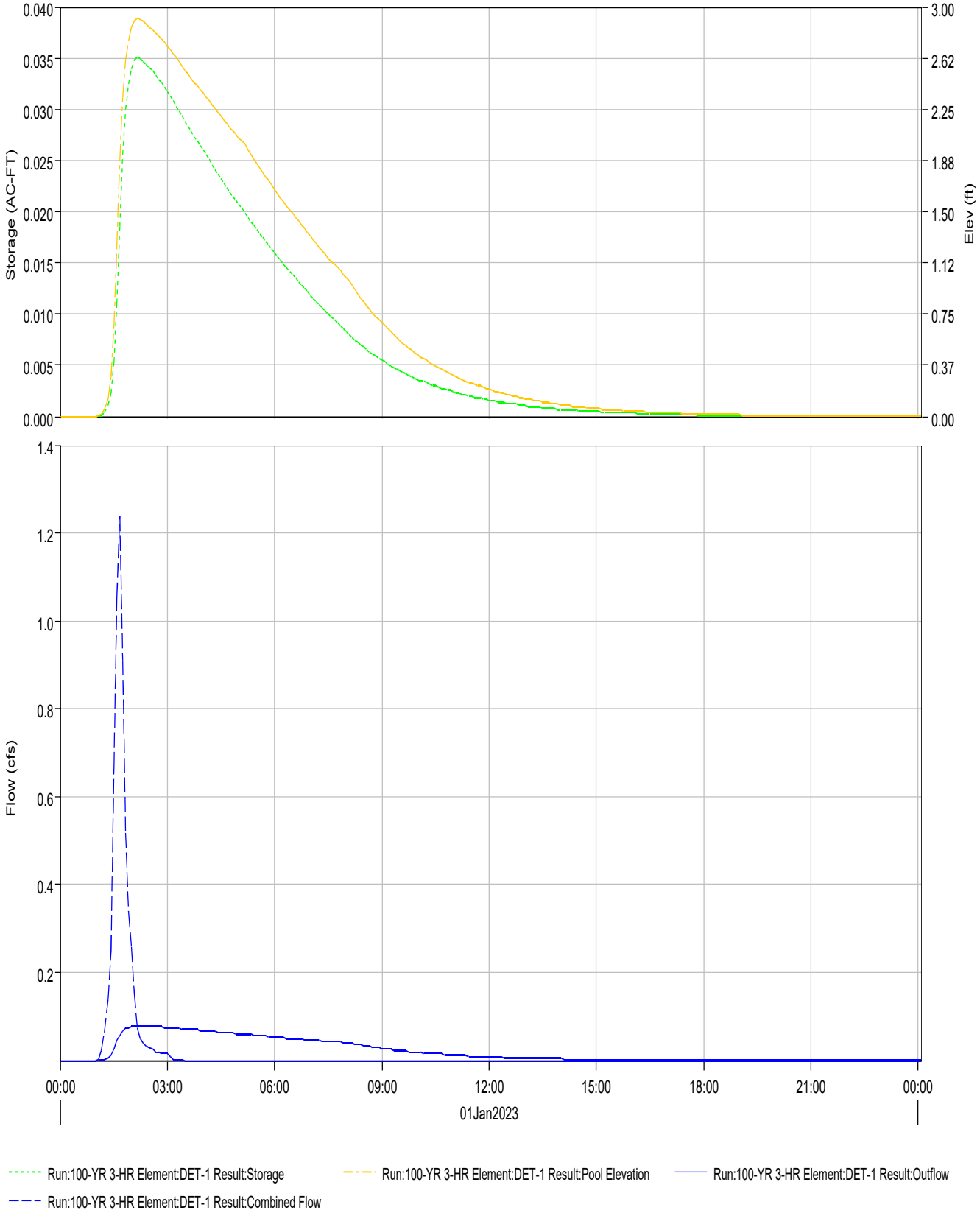
Start of Run:	01Jan2023, 00:00	Basin Model:	Basin 1
End of Run:	02Jan2023, 00:05	Meteorologic Model:	100-yr 3-hr
Compute Time:	02May2024, 16:12:13	Control Specifications:	24 hr window

Volume Units: AC-FT

Computed Results

Peak Inflow :	1.24 (CFS)	Date/Time of Peak Inflow :	01Jan2023, 01:40
Peak Outflow :	0.08 (CFS)	Date/Time of Peak Outflow :	01Jan2023, 02:10
Total Inflow :	0.041 (AC-FT)	Peak Storage :	0.035 (AC-FT)
Total Outflow :	0.041 (AC-FT)	Peak Elevation :	2.9 (FT)

Reservoir "Det-1" Results for Run "100-YR 3-HR"



Project: Hillside Tennis

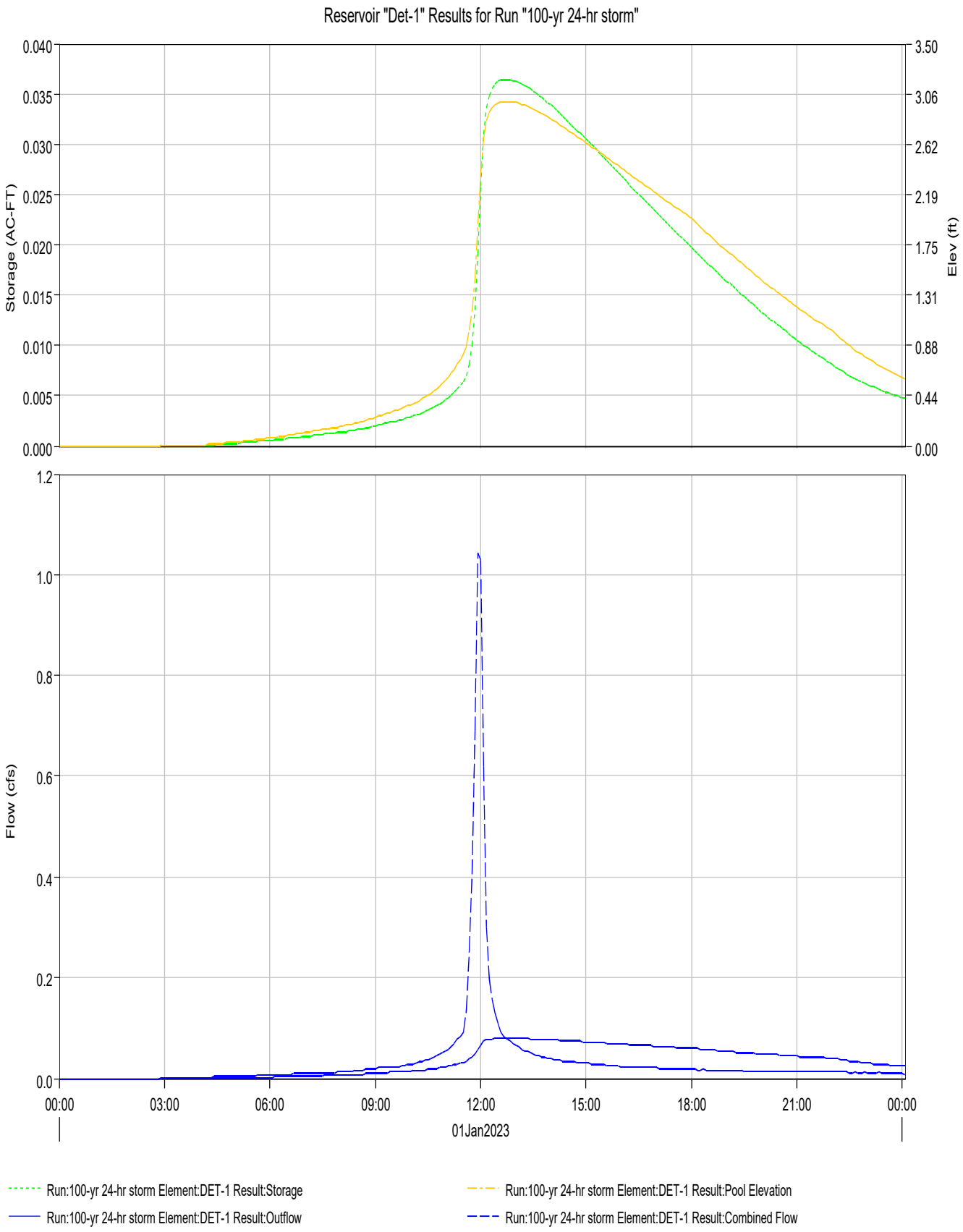
Simulation Run: 100-yr 24-hr storm Reservoir: Det-1

Start of Run:	01Jan2023, 00:00	Basin Model:	Basin 1
End of Run:	02Jan2023, 00:05	Meteorologic Model:	100-YR 24-HR STORM
Compute Time:	02May2024, 16:08:44	Control Specifications:	24 hr window

Volume Units: AC-FT

Computed Results

Peak Inflow :	1.04 (CFS)	Date/Time of Peak Inflow :	01Jan2023, 11:55
Peak Outflow :	0.08 (CFS)	Date/Time of Peak Outflow :	01Jan2023, 12:45
Total Inflow :	0.069 (AC-FT)	Peak Storage :	0.036 (AC-FT)
Total Outflow :	0.064 (AC-FT)	Peak Elevation :	3.0 (FT)


Reservoir "Det-1" Results for Run "100-yr 24-hr storm"
Storage (AC-FT)
Elev (ft)
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
3.50
3.06
2.62
2.19
1.75
1.31
0.88
0.44
0.00
Flow (cfs)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Jan2023
Run:100-yr 24-hr storm Element:DET-1 Result:Storage
Run:100-yr 24-hr storm Element:DET-1 Result:Pool Elevation
Run:100-yr 24-hr storm Element:DET-1 Result:Outflow
Run:100-yr 24-hr storm Element:DET-1 Result:Combined Flow

BASIN NAME: DET-1

Orifice Flow

$$Q \quad CA\sqrt{2gH}$$

C =	0.62	
g =	32.2	
Dia. Pipe =	2	in
% restricted	56.8%	

Stage-Discharge Table

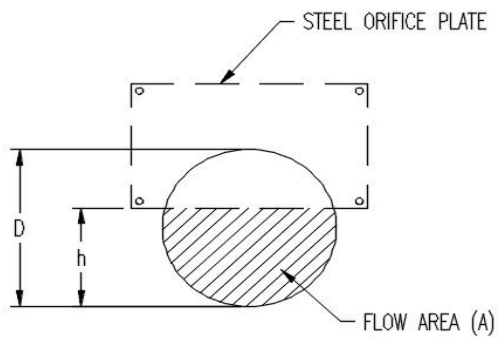
Stage (Z)	Depth to center (H)	Area (A)	Flow (Q)
0.00	0.00	0.000	0.00
1.00	0.92	0.009	0.04
2.00	1.92	0.009	0.06
3.00	2.92	0.009	0.08
4.00	3.92	0.009	0.09

Orifice Plate

$$h = R\left(1 - \cos\frac{\theta}{2}\right) \qquad A = \frac{R^2}{2}(\theta - \sin\theta)$$

$$\theta = 2\cos^{-1}\left(1 - \frac{h}{R}\right)$$

A =	0.010	ft^2
θ =	2.973	rad
h =	0.076	ft



Average End Area Volume

$$V = \sum L\,\frac{A_1 + A_2}{2}$$

Stage-Storage Table

Stage (ft)	Contour Area (ft^2)	Contour Area (ac)	Incr. Volume (ft^3)	Total Volume (ft^3)
0.00	274.57	0.00630	0.00	0.00
1.00	432.24	0.00992	353.41	353.41
2.00	615.90	0.01414	524.07	877.48
3.00	824.69	0.01893	720.30	1597.77
4.00	1058.61	0.02430	941.65	2539.42

Storm Drain Capacity Rating Table				
Size (in)	**n**	**S (ft/ft)**	**Depth (ft)**	**Max. Flow (cfs)**
4	0.013	0.01	0.3	0.2
6	0.013	0.01	0.5	0.7
8	0.013	0.01	0.7	1.2
10	0.013	0.01	0.8	2.2
12	0.013	0.01	1.0	3.6
18	0.013	0.01	1.5	10.5
24	0.013	0.01	2.0	22.6
30	0.013	0.01	2.5	41.0
36	0.013	0.01	3.0	66.7

$$Q = \frac{K}{n} A R^{2/3} S^{1/2}$$

EXHIBIT F

2024 AGEC Geotechnical Investigation

AGEC
Applied GeoTech

GEOTECHNICAL INVESTIGATION

HILLSIDE TENNIS COURT AND PAVILION
WORTHEN LOT 21
NWC 800 SOUTH 200 WEST
ST. GEORGE, UTAH

PREPARED FOR:

BENJAMIN SORENSEN
77 WEST 4800 NORTH #B235
PROVO, UTAH 84604

PROJECT NO. 2231822 **MARCH 15, 2024**

1420 South 270 East • St. George, Utah 84790 • (435) 673-6850 • FAX (435) 673-1044

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SUMMARY

1. The subsurface soil/bedrock conditions encountered at the site consist primarily of near surface silty sand underlain by siltstone and sandstone bedrock, with bedrock exposed at the surface in several locations. The silty sand was 2 to 3 feet in thickness and is underlain by siltstone and sandstone bedrock to the maximum depth investigated, approximately 24 feet. The siltstone and sandstone bedrock are interlayered. Their properties are similar with the sandstone having a slightly higher content of fine grained sand, thus, the anticipated conditions will be very similar through the profile with occasional layers of mudstone/claystone.

2. Subsurface water was not encountered to the depths investigated, approximately 24 feet. Fluctuations in the groundwater level will occur over time. An evaluation of such fluctuations is beyond the scope of this report.

3. The site consists of approximately 0.4 acres that slopes down from the northwest to the southeast with approximately 34 feet of elevation change. The site is planned to have a tennis court with a pavilion on the west half of the site at a grade of approximately 2,654 feet, which requires up to approximately 16 feet of cut in the northwest corner and a slight fill in the southwest corner of the court area. There will be retaining walls along the north, west and between the court and lower parking tier. The lower area will be at an elevation of approximately 2641 which also requires a cut of approximately 15 feet in the northwest corner and based on the proposed grades, minimal fill in the southeast corner. There is an approximately 5 feet deep detention basin on the south central portion of the site.

4. The site is suitable for the proposed construction provided recommendations within this report are followed.

5. The site excavation will primarily be in bedrock. The bedrock is moderately hard and will require heavy duty excavation equipment for grading. The use of an excavator with a rock hammer may be required in confined areas. The excavation will primarily be in siltstone bedrock.

6. The proposed Hillside Tennis court and restroom building may be supported on a layer of processed and compacted fill (approximately 6-12 inches) overlying the on site bedrock. Footings may be supported directly on the bedrock. If fill is required during grading, the existing sand over the surface may be used as fill.

7. The proposed pavilion footings may be supported directly on the bedrock. The proposed restroom may also be supported directly on the bedrock.

8. Retaining walls are planned to consist of stacked segmented concrete blocks. The use of geo-synthetic reinforcement (geogrid) may be eliminated if the bedrock cut is less than 2 feet behind the concrete blocks. If more than 2 feet of backfill or a non-bedrock condition exists, geogrid will be necessary. We anticipate that the upper few feet of wall will require geogrid in each location. Stacked wall design profile details are provided.

9. Due to the shallow bedrock, the use of storm water "retention" is not recommended.

10. Recommendations for subgrade preparation, materials, foundations and drainage are included in the report.

11. The information provided in this summary should not be used independent of what is provided in the body of this report.

SCOPE

This report presents the results of a geotechnical investigation for the proposed Hillside Tennis Court located at the northwest corner of 200 West and 800 South in St. George, Utah (See Figure 1). The report presents the subsurface conditions encountered, laboratory test results, and geotechnical recommendations for the project. This report was prepared in general accordance with our proposal dated January 18, 2024.

Field exploration was conducted to obtain information on the subsurface conditions and to obtain samples for laboratory testing. Information obtained from the field and laboratory was used to define conditions at the site and to develop 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 approximately 0.4 acres that slopes down from the northwest to the southeast with approximately 34 feet of elevation change. The site consists of a partially graded hillside. There is vacant property to the north and west, with the property to the north also partially graded. Located to the west is a large hillside. The proposed alignment of 200 West bounds the site to the east. The roadway improvements for 800 south ends near the southeast corner of the site.

There are several overhead power lines across and around the site. It is our understanding that the power line that crosses the site diagonally from SW to NE will be relocated around the site.

The site slopes down from the northwest to the southeast by approximately 34 feet. There is some debris and larger rocks that have been left on the site during previous grading or adjacent property grading.

Several photos of the site are attached. (Photos 1-6).

FIELD STUDY

The field study consisted of drilling 3 borings at the approximate locations shown on Figure 2. The borings were drilled on January 19, 2024 with a truck mounted rig using hollow stem augers and HQ size coring equipment. The borings were logged and samples obtained by a representative of AGEC. The logs, legend and notes of the borings are presented on Figure 3.

SUBSURFACE CONDITIONS

The subsurface soil/bedrock conditions encountered at the site consist primarily of near surface silty sand underlain by siltstone and sandstone bedrock, with bedrock exposed at the surface in several locations. The silty sand was 2 to 3 feet in thickness and is underlain by siltstone and sandstone bedrock to the maximum depth investigated, approximately 24 feet. The siltstone and sandstone bedrock are interlayered. Their properties are similar with the sandstone having a slightly higher content of fine grained sand, thus, the anticipated conditions will be very similar through the profile with occasional layers of mudstone/claystone.

Descriptions of soils and bedrock encountered in the borings are described below:

> Silty Sand - The sand contains varied amounts of silt and occasional gravel consisting of chunks of bedrock. It is medium dense, slightly moist and brown in color.

Siltstone - The siltstone was encountered near the surface and is exposed in several locations across the site. It extended to approximately 14 to 18 feet below the surface. There were layers/lenses of mudstone/claystone within the siltstone which are visible near the surface at the northwest corner of the site. The siltstone is moderately hard to hard and dry, light brown to reddish brown in color. It is very dense. The siltstone is part of the Whitmore Point Member of the Moenave Formation. This geologic member primarily consists of various colors of siltstone, fine grained sandstone and claystone.

Laboratory testing conducted on the siltstone indicates moisture contents varying from less than 1 to 3 percent, in-place dry density values of 145 to 162 pounds per cubic These in-place density values are very high. Gradation tests on ground up samples of the siltstone indicate fines contents (percent passing the No. 200 sieve) of 51 to 94 percent. There were several Atterberg Limit tests that indicate Liquid Limit values of 27 to 30 percent and plastic indexes of 6 to 10 percent. The majority of the siltstone is low to non-plastic.

Sandstone - The sandstone was encountered below the siltstone and is hard to very hard with occasional layers/lenses of siltstone and mudstone/claystone. The sandstone is generally dry to slightly moist and light reddish brown in color

The laboratory test results are included on the boring logs, Figure 3 and summarized in Table 1, Summary of Laboratory Test Results. Photos of the core samples obtained from each boring are also included in the appendix. (Photos 7-11)

SUBSURFACE WATER

Subsurface water was not encountered within the depths investigated approximately 24 feet. Fluctuations in the groundwater level will occur over time. An evaluation of such fluctuations is beyond the scope of this report. Our experience has shown that groundwater perched on various layers of bedrock exists in the properties to the south and southwest.

PROPOSED CONSTRUCTION

We understand the site is planned for a two tier (elevation) development including a tennis court with a covered pavilion type structure over the court on the upper tier. There will be parking and a restroom on the lower tier.

The site is planned with the tennis court/pavilion on the west half of the site at a grade of approximately 2,654 feet, which requires up to approximately 16 feet of cut in the northwest corner and a slight fill in the southwest corner of the court area. There will be retaining walls consisting of reinforced concrete between tiers and stacked/segmented blocks along a portion of the south, north, and west sides. The lower area will be at an elevation of approximately 2641 which also requires a cut of approximately 15 feet in the northwest corner and based on the proposed grades, minimal fill in the southeast corner. There is also an approximately 5 feet deep detention basin on th southeast corner of the site as shown on Figure 2.

We also anticipate that 200 West will be constructed and the extension of 800 South (50 foot right of way) will also be included. The existing power line is proposed to be relocated from crossing the site, to around the perimeter to the northwest.

We anticipate relatively light loads on foundations for the restroom and the pavilion. The parking lot pavement section should also be lightly loaded. We have used foundation loads of less than 2 kips per lineal foot and column (pavilion support loads) less than 30 kips. A traffic index of 5 was also used for traffic for the parking and roadways in accordance with 50-foot right-of-way as specified by St. George City.

If the proposed construction or building loads are significantly different from those listed, we should be notified so that we can reevaluate our recommendations.

RECOMMENDATIONS

Based on our experience in the area, the subsurface conditions encountered, laboratory test results and the proposed construction, the following recommendations are given:

A. Site Grading

1. Subgrade Preparation

a. *General Subgrade Preparation*

The majority of the site is a cut condition where the proposed grade is lower than the existing grade. There is a slight fill condition along the east and southeast sections of the site. In the fill zones, the existing sand should be removed down to bedrock, which is anticipated to vary from 0 to 3 feet. The exposed excavation should be observed by AGEC prior to placing fill, particularly in structure or wall zones. Once the bedrock is exposed the on-site sand or broken up bedrock (as described in the materials section below) may be used as fill.

b. *Tennis Court/Restroom Pad*

Based on the proposed grading, these areas are primarily in a cut condition as described above. We anticipate that siltstone or sandstone bedrock will primarily be exposed. We recommend that consideration be given to removing 1 to 2 feet of rock below the proposed slab for ease of construction and for even curing of the concrete slabs. If on the surface mudstone/claystone is exposed, this material should be removed from below the slab/pad area and replaced with on site sand or broken up bedrock (as described in the materials section below). We recommend the upper 4 to 6 inches of material consist of basecourse type material. The compaction and processing of this material is also described in the compaction section below. AGEC should observed the base of the excavation prior to placing fill.

c. *Pavement, Flatwork and Improvements*

The pavement and flatwork areas should be prepared by removing loose materials (as described above) and replacing with compacted on site sand and broken up bedrock. If the exposed subgrade consists of sand (non bedrock), the material should be scarified and properly recompacted.

2. Excavation

We anticipate that excavation of the bedrock at the site will be difficult and will require the use of heavy duty excavation equipment. The cut slopes in confined locations may require the use of an excavator equipped with a rock hammer.

For the excavations along property lines, care should be taken to cut vertically rather than to rip horizontally to avoid large slabs being removed from the adjacent property and from having a less than desirable cut face (uneven and more cut zone than necessary)

The following table summarizes recommendations for excavation of temporary and permanent cut slope excavations, trench excavations and permanent fill slope construction. Slopes should include benches in accordance with the 2021 IBC.

Slope Condition	Maximum Slope (Horizontal:Vertical)
Permanent Cut Slopes in Overburden Soils/Compacted fills	2:1
Permanent Cut Slopes - Bedrock	¼:1
Utility Trenches in Onsite Soils (OSHA Soil Class A)	½:1*

*Steeper trenches will require the use of shoring or a trench box to provide a safe work environment. Safe trench excavation is the responsibility of the contractor.

Fill slopes should be graded by overbuilding and then cutting back to the desired grade to provide a compacted slope face.

3. Materials

The proposed grading plan primarily consists of a cut condition, thus the majority of the on-site materials will be exported from the site. There will be small amounts of materials needed for the shallow bedrock overexcavation below the tennis court and restroom building along with removed materials from utility excavations. The on site sand (near surface soils) and processed bedrock may be used as replacement fill. Several "slabs" of bedrock existing on the surface of the site from previous excavation work indicate typical type of bedrock chunks or slabs that will come out of the excavation. The bedrock will require processing, breaking up or crushing of the materials by mechanical means. We recommend that the material be screened or processed to less than 4 inches in size below structures and slabs and less than 8 inches in size for utility trench backfill.

If import materials are required, they should be non-expansive, granular soil. We recommend import materials meet the criteria listed in the following table.

Area	Fill Type	Recommendations
Foundations/slabs	Site grading/ structural fill	**-200** <35%, **LL** <30% Maximum size: <4 inches Solubility < 1%
Underslab (upper 4 inches)	Base course	**-200** <12% Maximum size: <1 inch Solubility < 1%

-200 = Percent Passing the No. 200 Sieve
LL = Liquid Limit

4. Compaction

Compaction of materials placed at the site should equal or exceed the following minimum densities when compared to the maximum dry density as determined by ASTM D1557:

Area	Percent Compaction
Subgrade	90
Footings/tennis court pad	95
Site grading	95
Utility trenches	95
Pipe zone (utility trenches)	90
Wall backfill	95

To facilitate the compaction process, the fill should be moisture conditioned to within 2 percent of the optimum moisture content as determined by ASTM D1557 prior to placement. Fill should be placed in loose lift thicknesses not to exceed the capacity of the equipment being utilized. Generally, 6 to 8-inch loose lifts are adequate. Lift thicknesses should be reduced to 4 inches for hand compaction equipment.

5. Surface Drainage

Positive site drainage should be maintained during the course of construction. After construction has been completed, positive drainage of the surface water should be provided.

a. A minimum slope of 6 inches in the first 10 feet from the perimeters of the structures should be provided.

b. Roof gutter systems should be installed around the perimeters of the restroom structure. Roof downspouts should discharge away from the buildings so as to prevent ponding adjacent to foundations. Roof drains should be piped to the curb and gutter downslope from the structures.

c. Placement of concrete aprons around the perimeters of the structures is recommended.

d. Landscaping requiring water should be minimized.

e. Below grade portions of walls and fences backfilled with soil should be protected with an impermeable membrane and a subsurface drain. A gravel covered, perforated PVC pipe should 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 and masonry.

B. Foundations

We anticipate that the pavilion will be constructed with footings embedded deeper for uplift resistance or on shallow caissons (deep foundations). We have provided recommendations for design of conventional spread footings below. If deep foundation recommendations are needed, AGEC should be contacted to provide.

1. Bearing Material

   The proposed restroom building may be constructed on conventional footings bearing on bedrock of on compacted structural fill.

2. Bearing Pressure

   Footings bearing on properly compacted structural fill may be designed for a net allowable bearing pressure of 2,500 pounds per square foot.

3. Footing Width and Embedment

   Footings should have a minimum width of 18 inches and should be embedded at least 12 inches below the lowest adjacent grade.

4. Temporary Loading Conditions

   The allowable bearing pressures may be increased by one-half for temporary loading conditions such as wind or seismic loads.

5. Settlement

   We estimate that settlement will be less than 1 inch for footings designed as indicated above due to the load of the structure. Differential settlement is estimated to be approximately ½ inch.

6. Foundation Base

   The base of excavations should be cleared of loose or deleterious material prior to placement of fill or concrete.

D. Concrete Slab-on-Grade

1. Slab Support

Concrete slabs may be supported on a zone of properly prepared (over excavated) and compacted fill as stated in the Subgrade Preparation section of this report. Fill placed in slab areas should be tested frequently to verify compaction meets the recommendations provided within this report.

2. Underslab Base Course

A 4-inch layer of properly compacted base course should be placed below slabs to provide a firm and consistent subgrade and promote even curing of the concrete.

3. Vapor Barrier

Consideration should be given to providing a vapor barrier should be placed below the tennis court slab to provide protection from sulfate attack on the concrete slab due to the potentially high water soluble sulfates of the underlying soil.

E. Lateral Earth Pressures

1. Lateral Resistance for Footings

Lateral resistance for spread footings is controlled by sliding resistance developed between the footing and the subgrade soil. An ultimate friction value of 0.45 may be used in design for ultimate lateral resistance of footings bearing on properly compacted fill.

2. 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.

The values listed below assume a horizontal surface adjacent the top and bottom of the wall.

Description	Active	At-Rest	Passive
Imported or on-site granular backfill (sand or broken up bedrock)-Equivalent Fluid Weight	35 pcf	55 pcf	325 pcf
Imported or on-site granular backfill - Earth Pressure Coefficient	0.28	0.44	-

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.

3. Seismic Conditions

Under seismic conditions, the equivalent fluid weight should be modified as follows:

Lateral Earth Pressure Condition	Seismic Modification (2% PE in 50 yrs)
Active	17 pcf increase
At-rest	2 pcf increase
Passive	17 pcf decrease

The resultant of the seismic increase should be placed up one-third from the base of the wall.

4. 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. Listed below is a summary of the site parameters as required by the 2021 International Building Code:

Description	Seismic Event - 2% PE in 50 Yrs
	Value
Site Class	C
S_s (0.2 second period)	0.51g
S_1 (1 second period)	0.16g
PGA	0.22g
F_a	1.3
F_v	1.5
F_{PGA}	1.2

The values provided above were obtained from seismicmaps.org and reference design codes found in ASCE7-16.

2. Liquefaction

Based on subsurface conditions encountered in the borings, liquefaction is not considered to be a significant hazard at the site.

3. Faulting

There on no active faults mapped in close proximity to the site.

G. **Low Impact Development (LID)**

Using the Low-impact Development Application Guidance for Washington County, Utah", Updated: June 20, 2020, Dixie Storm Water Coalition (DSWC), the following criteria should be considered when implementing BMP's for LID design:

a. Using the referenced website, the following soil types and characteristics were determined:

Soil Type	Location	Hydrologic Soil Group	Infiltration Rate (inches/hr)
JaB Junction Five - Sandy Loam	East	A	<1 inches/hr
SY- Stony Colluvial Land	West	A	<1 inches/hr

(https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm).

b. LID design constraints:

- Shallow Bedrock: High (anticipated at or near surface)
- Collapsible soil risk: Low (near surface soils only)
- Expansive soil risk: Low (not encountered, but known in the area)

Using DSWC Table 3 (Matrix), appropriate Best Management Practices (BMP) are limited and AGEC does not recommend the use of infiltration methods or on-site retention due to the shallow bedrock condition.

H. Soil Corrosion

Based upon our experience in the area and laboratory testing, the on-site soils and many imported sources may contain sulfates in sufficient concentration to be corrosive to concrete. 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) 318-14. Tables 19.3.1.1 and 19.3.2.1 of ACI 318-14 should be referenced for design of concrete elements utilizing a Sulfate Exposure Class of S2.

Consideration should also be given to cathodic protection of buried metal pipes. We recommend utilizing PVC pipes where local building codes allow.

I. Pavement

1. Subgrade Support

We anticipate that the subgrade materials beneath the pavement areas will consist of silty sand. Prior to placement of road base, the subgrade should be prepared as recommended in the subgrade preparation section of this report. A California Bearing Ratio (CBR) of 10 percent was assumed for a properly compacted silty sand subgrade for purposes of design.

2. Pavement Thickness

Based on the assumed traffic loadings and listed traffic indexes, a 20-year design life and AASHTO design methods, the following pavement sections are recommended.

Roadway	TI	Asphalt (in.)	Base Course (in.)
Extension of 800 South, and Construction of 200 West	5	2½	6
Parking	5	2½	6

3. Pavement Materials

The pavement materials should meet City of St. George specifications for gradation and quality. The pavement thicknesses indicated above assume that the base course is a high quality material with a CBR of at least 50 percent and the asphaltic concrete has a minimum Marshall stability of 1,800 pounds.

4. 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.

J. Construction Testing and Observations

We recommend the following testing and observations be done as a minimum as required by the City of St. George.

a. Observe excavations subsequent to removal of bedrock or loose silty sand from building and the tennis court area.

b. Observe retaining wall cuts for appropriate use of wall designs.

c. Conduct compaction testing on fill placed below foundations and in the tennis court, wall backfill and utility trench backfills. We recommend testing each foot of fill placed.

e. Conduct construction materials testing on city improvements at a frequency which meets or exceeds St. George City requirements.

K. Geotechnical Recommendation Review

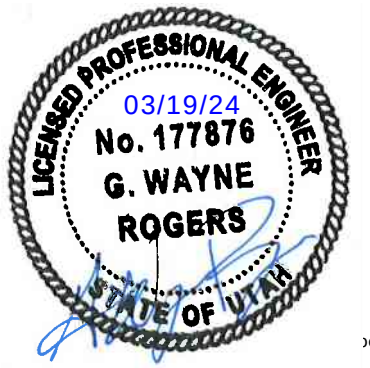
The client should familiarize themselves with the information contained in this letter. If specific questions arise or if the client does not fully understand the conclusions or recommendations provided, we should be contacted to provide clarification.

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 drilled borings, the data obtained from laboratory testing, and our experience in the area. Variations in the subsurface conditions may not become evident until excavation is conducted. If the subsurface conditions or groundwater level are found to be significantly different from those described above, we should be notified to reevaluate our recommendations.

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

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.



G. Wayne Rogers, P.E.

Reviewed by; Jake Erickson, P.E.

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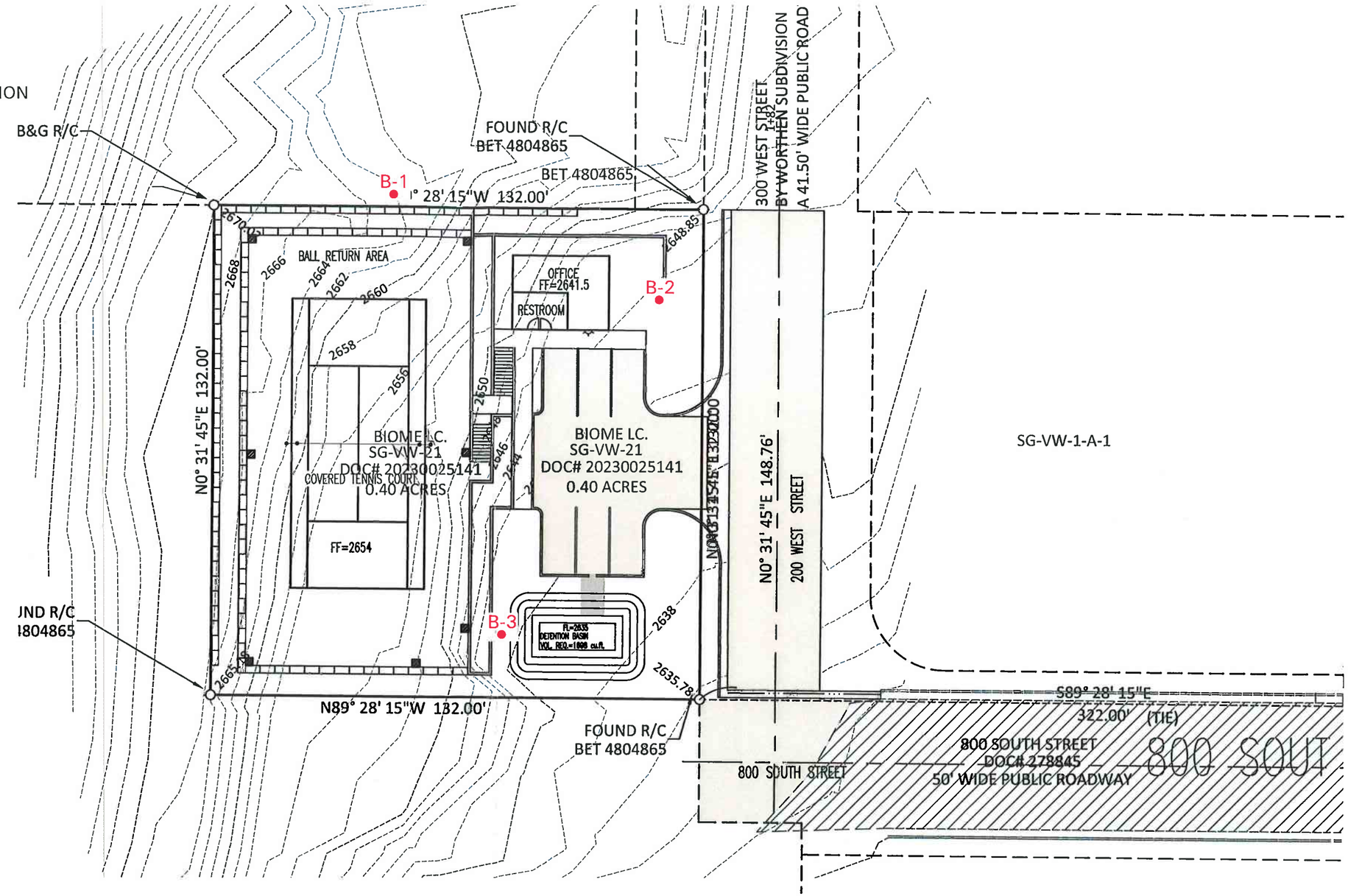
N

Not to Scale

WORTHEN, LOT 21
HILLSIDE TENNIS COURT AND PAVILION
ST. GEORGE, UTAH

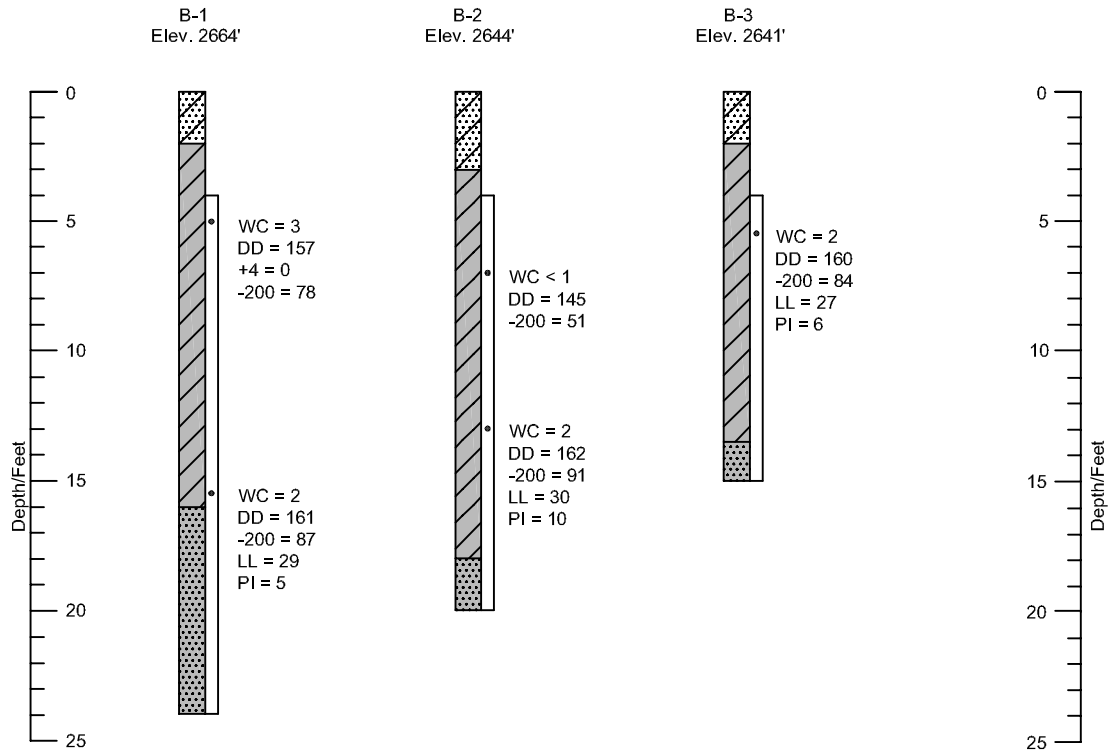
2231822	AGEC	Vicinity Map	Figure 1

HILLSIDE TENNIS COURT AND PAVILION
WORTHEN LOT 21
ST. GEORGE, UTAH



● Approximate boring location

2231822	AGEC	Site Plan	Figure 2



LEGEND:

Silty Sand (SM); medium dense, slightly moist, occasional gravel, brown.

Siltstone Bedrock; moderately hard to hard, dry to slightly moist, lenses/layers of mudstone/claystone, light brown to reddish brown.

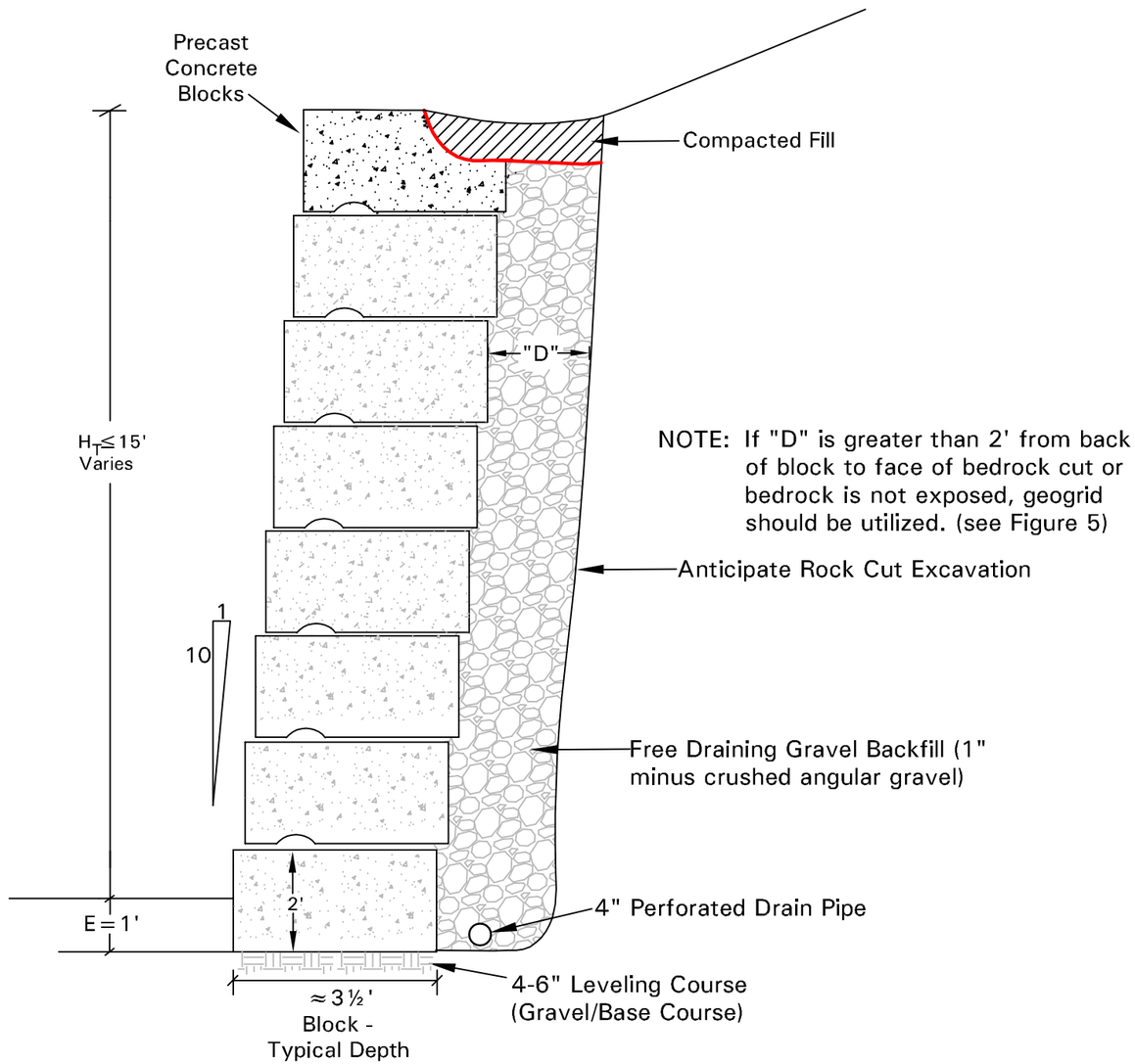
Sandstone Bedrock; moderately hard, dry to slightly moist, fine grained, siltstone and mudstone/claystone lenses, red-brown.

Indicates core sample taken.

NOTES:

1. The borings were drilled on January 19, 2024 with a truck mounted drill rig equipped with 4-inch solid flight augers. The bedrock was cored using an HQ size core barrel using air to remove cuttings.
2. The locations of the borings were measured by a hand held GPS.
3. The elevations of the borings are based on interpolating between 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 boring logs represent the approximate boundaries between material types and the transitions may be gradual.
6. Free water was not encountered in the borings at the time of drilling.
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 (%);

HILLSIDE TENNIS COURT AND PAVILION
WORTHEN, LOT 21
ST. GEORGE, UTAH



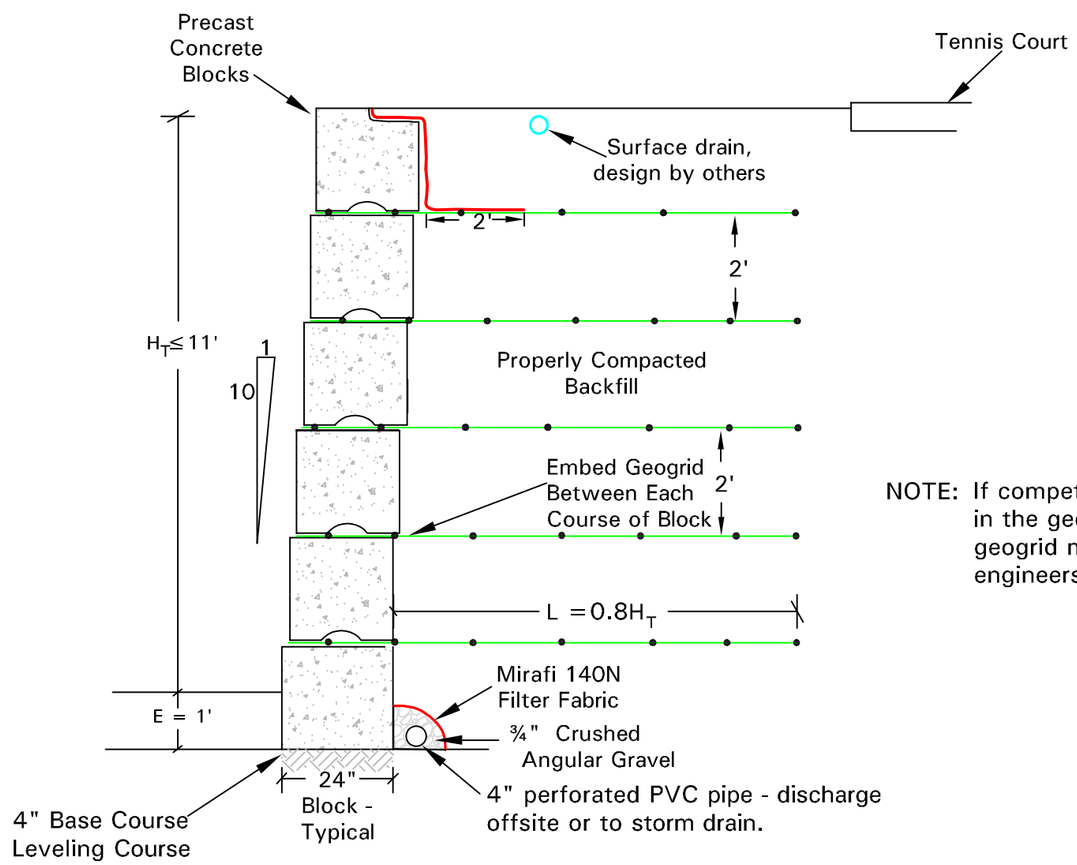
Key:

Mirafi 140N Filter Fabric or Equivalent

By: G. Wayne Rogers, P.E.

2231822	AGEC	SINGLE TIER SEGMENTED CONCRETE BLOCK WALL - WITHOUT GEOGRID	Figure 4

HILLSIDE TENNIS COURT AND PAVILION
WORTHEN, LOT 21
ST. GEORGE, UTAH



NOTE: If competent bedrock is exposed in the geogrid zone, the length of geogrid may be reduced at the engineers discretion.

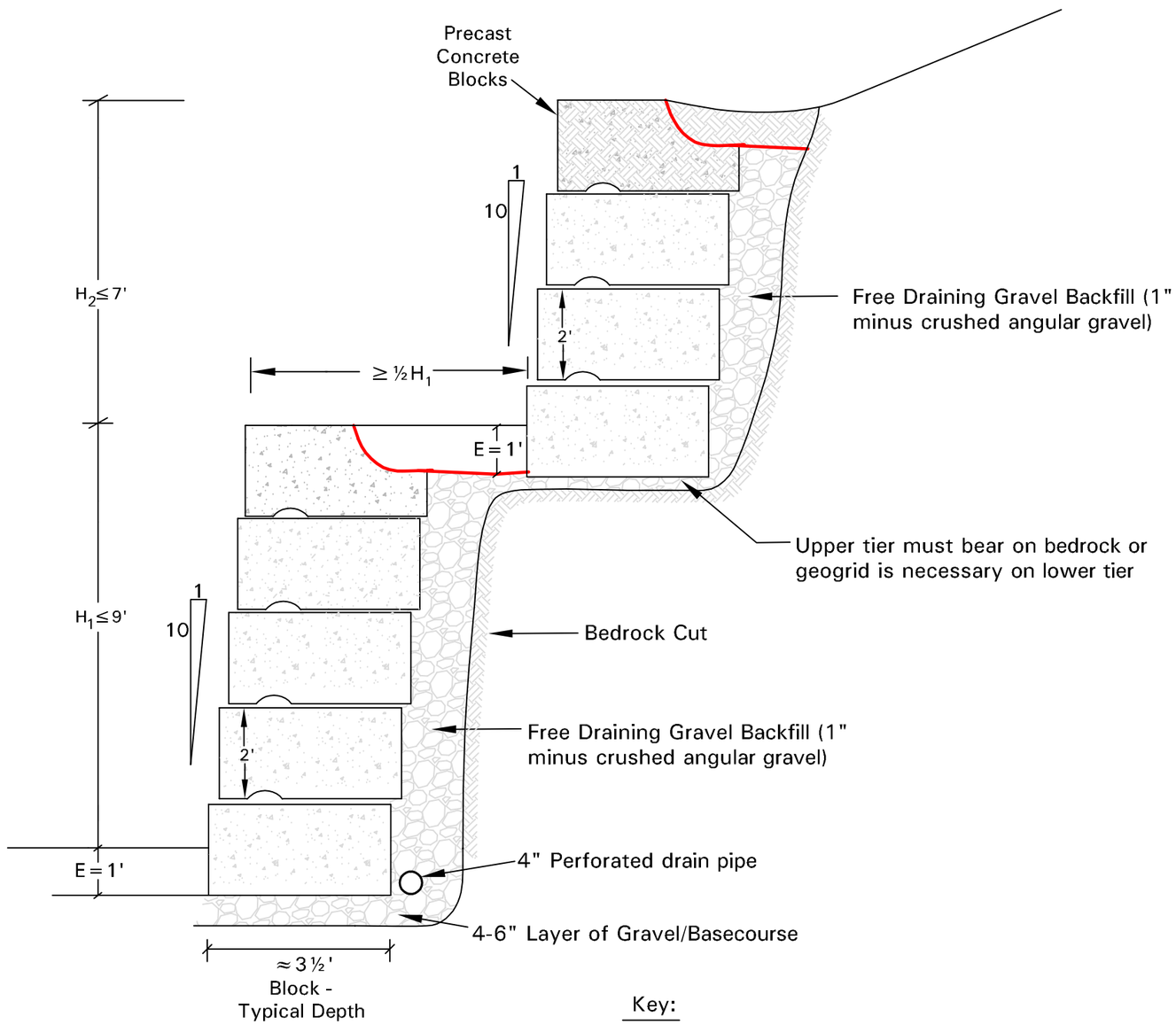
Key:

Mirafi 140N Filter Fabric or Equivalent

Geosynthetic Reinforcment (Miragrid 3XT or Equivalent

By: G. Wayne Rogers, P.E.

HILLSIDE TENNIS COURT AND PAVILION
WORTHEN, LOT 21
ST. GEORGE, UTAH



Key:

Mirafi 140N Filter Fabric or Equivalent

By: G. Wayne Rogers, P.E.

2231822	AGEC	SEGMENTED CONCRETE TWO-TIER BLOCK WALL - WITHOUT GEOGRID	Figure 6

HILLSIDE TENNIS COURT AND PAVILION
WORTHEN, LOT 21
ST. GEORGE, UTAH

A. SEGMENTED BLOCK CONSTRUCTION NOTES

1. Blocks should consist of at least 4,000 psi strength (28-day strength) concrete. Concrete type should meet or exceed the 2021 IBC 1904.3 and Table 193.2.1 of the ACI 318-14 category for "severe, S2" sulfate attack.
2. The base block should be placed on a level surface. Gravel or base course may be used as the leveling course.
3. The base block should be embedded at least 12 inches.
4. Structures should be setback a distance equal to or greater than the overall height "H_T", from the top of the wall.
5. The pre-cast concrete blocks should be stacked with a batter of at least 1 to 10 (Horizontal to Vertical).

B. GEOSYNTHETIC NOTES:

1. Geosynthetic reinforcement should be placed continuously in the primary strength direction. It may not be spliced in the primary strength direction.
2. The placement of the geosynthetic should be observed by a representative of AGEC to verify the specified geosynthetic is being used and properly placed. It should be stretched by hand until taut and free of wrinkles.
3. The filter fabric should consist of Mirafi 140N non-woven filter fabric or equivalent.
4. Geogrid should be embedded between the concrete blocks to secure the geogrid at the block face.

Geosynthetic Reinforcement Schedule

Segmented Block Wall Fill Slope Height (ft)	Geosynthetic Reinforcement Required	Approved Geosynthetic Reinforcement *	Grid Length (L)
$4 < H_T < 11$	Yes	Miragrid 3XT	$0.8H_T$

* Approved Equivalents - Miragrid 3XT = WG5 = SG200
** Geogrid may not be necessary if bedrock cut with "D" less than 2' (see Figure 4)

C. GRADING AND DRAINAGE NOTES

1. Backfill utilized where geosynthetic reinforcement is placed should consist of granular material. The backfill may consist of the onsite sand soils or import material meeting criteria found in materials section on page 9 of report.
2. Backfill placed behind the blocks should be properly moisture conditioned and compacted to at least 95% of the maximum dry density as determined be ASTM D-1557. Care should be taken to compact the soil adjacent the block to avoid moving the block outward. AGEC should conduct compaction testing on each vertical foot of fill placed at least every 50 feet of wall length. Fill should be placed in 6 to 8-inch loose lifts prior to compaction of each lift.
3. The subgrade below blocks should be properly prepared as directed by the geotechnical engineer prior to placing blocks or backfill. Underlying loose or disturbed soil should be removed its full depth and recompacted prior to placing the leveling course.
4. A 4-inch perforated pipe should be placed at the base of the wall as shown in the figure.

LICENSED PROFESSIONAL ENGINEER
3/19/24
No. 177876
G. WAYNE ROGERS
STATE OF UTAH

By: G. Wayne Rogers, P.E.

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

TABLE I
SUMMARY OF LABORATORY TEST RESULTS

Worthen, Lot 21Tennis Court and Pavilion

Project Number 2231822

Sample Location		Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg Limits		Sample Classification
Boring No.	Depth (feet)			Gravel (%)	Sand (%)	Silt/ clay (%)	Liquid Limit (%)	Plasticity Index (%)	
B-1	5	3	157	0	22	78			Siltstone Bedrock
B-1	15½	2	161			87	29	5	Siltstone Bedrock
B-2	7	<1	145			51			Siltstone Bedrock
B-2	13	2	162			91	30	10	Siltstone Bedrock
B-3	5½	2	160			84	27	6	Siltstone Bedrock

APPENDIX

Photo No. 1- view of site from SEC

Photo No. 2, view of site, note previous grading, slabs of rocks on left and exposed bedrock.

Photo No. 3, View of site from near NWC, looking SE. Note previous grading

Photo No. 4, view of site from near NWC, looking south along west boundary.

Photo No. 5, view of upper portion of site (west side) note bedrock exposed, greyish purple rock is a layer of mudstone/claystone that was near top elevation of the site.

Photo No. 6, view of north property line looking west from near NEC.

Photo No. 7, view of Core Sample, Boring B-1, @ 4-14 ft.

Photo No. 8, view of Core Sample, Boring B-1 @ 14-24 ft.

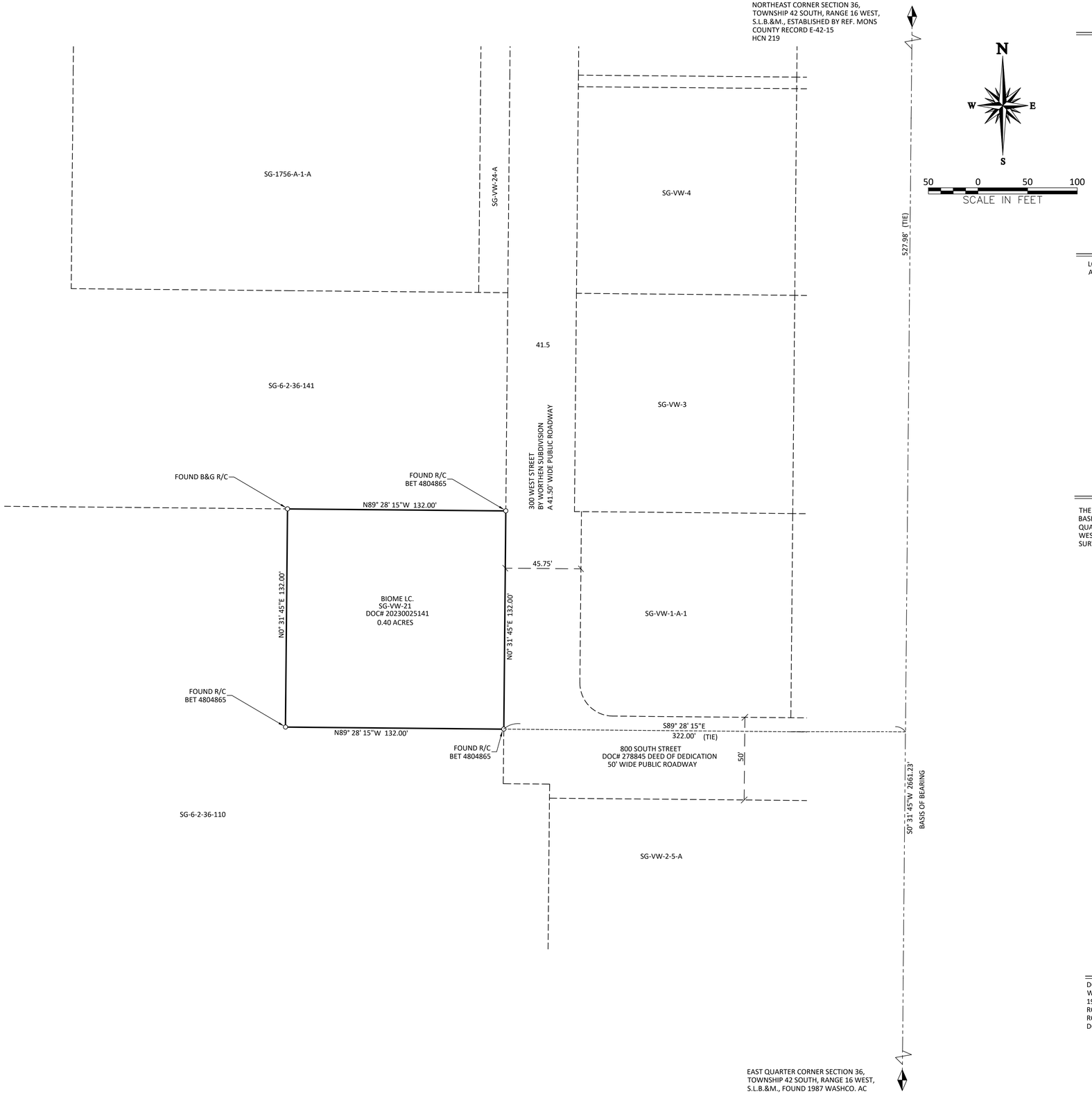
Photo No. 9, view of Core Sample, Boring B-2 @ 4-14 ft.

Photo No. 10, view of Core Sample, Boring B-2 @ 14-19 ft.

Photo No. 11, view of Core Sample, Boring B-3 @ 4-14 ft.

EXHIBIT G

Site Survey



SURVEYORS CERTIFICATE

I, MICHAEL W. PURDY, PROFESSIONAL UTAH LAND SURVEYOR, NO. 334571, HOLD A LICENSE IN ACCORDANCE WITH TITLE 58, CHAPTER 22, PROFESSIONAL ENGINEERS AND LAND SURVEYORS LICENSING ACT, HEREBY CERTIFY THAT THIS MAP REPRESENTS A SURVEY MADE UNDER MY DIRECTION OF THE FOLLOWING DESCRIBED PROPERTY:

PROFESSIONAL LAND SURVEYOR No. 334571 MICHAEL W. PURDY STATE OF UTAH
12/29/2023

MICHAEL W. PURDY PLS # 334571

RECORD PARCEL DESCRIPTION DOC# 20230025141

LOT 1, BLOCK 4, WORTHEN SUBDIVISION, ACCORDING TO THE OFFICIAL PLAT THEREOF, ON FILE AND OF RECORD IN THE OFFICE OF THE WASHINGTON COUNTY RECIRDER, STATE OF UTAH.

NARRATIVE

THE PURPOSE OF THIS SURVEY WAS TO REESTABLISH THE CORNERS OF THE ABOVE DESCRIBED PARCEL. BASIS OF BEARING FOR THIS SURVEY IS N00°31'45"E BETWEEN FOUND MONUMENTS AT THE EAST QUARTER CORNER AND THE NORTHEAST CORNER OF SECTION 36 TOWNSHIP 42 SOUTH, RANGE 16 WEST, SALT LAKE BASE AND MERIDIAN. ALL MONUMENTATION USED OR SET IN THE COURSE OF THIS SURVEY IS AS NOTED ON THIS PLAT. THIS SURVEY WAS PERFORMED AT THE REQUEST OF OUR CLIENT.

LEGEND

- PROPERTY BOUNDARY
- ADJACENT PROPERTY LINE
- CENTER LINE
- SECTION LINE
- FOUND SECTION CORNER (AS NOTED)
- SET BCE REBAR & CAP
- FOUND REBAR & CAP (AS NOTED)

REFERENCE DOCUMENTS

DOC# 278845 DEED OF DEDICATION
WORTHEN SUBDIVISION PLAT
1948 ADDITION TO WORTHEN SUBDIVISION
ROS ROSENBERG ENG. 8651-19
ROS BUSH & GUDGELL 7474-19
DOC# 301979 ROADWAY VACATION

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
736 SOUTH 900 EAST, SUITE B 105
ST. GEORGE, UTAH 84790
(435) 628-4700

RECORD OF SURVEY

FOR

BENJAMIN SORENSEN

LOCATED IN SECTION 36, T42S, R16W, SLB&M
ST GEORGE CITY, UTAH

JOB 23-95

CHECKED BY :	MWP
DRAWN BY :	MWP
DATE :	12/29/23
JOB NO. :	23-94

SCALE : 1"=50'

SHEET NO. : 1

ST. GEORGE HILLSIDE REVIEW BOARD MINUTES
JANUARY 22, 2024, 9:00 A.M.
ON SITE

PRESENT:

Hillside Review Board Chair, James Sullivan
Board Member, Jeff Mathis
Board Member, Russ Owens
Board Member, Dave Black
Board Member, Kevin Holyoak

EXCUSED:

STAFF MEMBERS PRESENT:

Assistant Public Works Director, Wes Jenkins
Planner, Dan Boles
City Landscape Architect, Mark Goble
Planner, Brenda Hatch
Assistant City Attorney, Daniel Baldwin

OTHERS PRESENT:

Ben Willits

Link to Call to Order by Chair Sullivan: 00:00:00

HILLSIDE DEVELOPMENT PERMIT:

Consider a request for a Hillside Development Permit . This is a request to obtain a hillside permit for the property located on the east side of Five Sisters Drive at approximately 400 South in anticipation of construction of a residential home. The purpose of the meeting is to make a recommendation to the Planning Commission on the location of the ridgeline. This property is in the hillside overlay. The project is called Wilson Formaster. Applicant – Desert Shadow Development – Representative – Ben Willits - Case No. 2024-HS-015 – ON SITE. (Staff – Dan Boles).

Link to comment by Ben Willits: 00:00:43

Link to discussion between Hillside Committee members: 00:04:21

Agenda packet [3]

Link to motion: 00:25:14

MOTION:

A motion was made by Board Member Black to recommend approval the ridgeline that has been marked in the field with orange paint, with that provide some recommendations and comments on the aethestics 1) This lot is more condusive to a walk out basement scenario as far as impact to aesthetics and they consider strongly the possibility of a walk out 2) There be no disturbance of the basalt rocks below the ridgeline, during construction the contractor put up a safety fence and is advised that no material be dumped over the ridge 3) Existing grading that has been done has created an uphill slope that needs to be mitigated, either pulled back or have rock basalt

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landscaping material placed on it to mitigate that light brown soil surface 4) Any retaining walls that are associated with construction of this lot consist of basalt type rock that would match the surroundings.

SECOND:

The motion was seconded by Board Member Holyoak.

VOTE:

Chair Sullivan called for a vote, as follows:

Chair Sullivan – aye
Board Member Mathis – aye
Board Member Owens – aye
Board Member Black – aye
Board Member Holyoak – aye

The vote was unanimous and the motion carried

APPROVAL OF MINUTES:

Approval of the meeting minutes from December 18, 2024, meeting.

Agenda packet [12]

Link to motion: 00:27:48

MOTION:

A motion was made by Board Member Mathis to approve the minutes.

SECOND:

The motion was seconded by Board Member Owens.

VOTE:

Chair Sullivan called for a vote, as follows:

Chair Sullivan – aye
Board Member Black – aye
Board Member Mathis – aye
Board Member Owens – aye
Board Member Holyoak – aye

ADJOURN:

Link to move to adjourn: 00:30:56

MOTION:

A motion was made by Board Member to adjourn Mathis.

SECOND:

The motion was seconded by Board Member Holyoak.

VOTE:

Chair Sullivan called for a vote, as follows:

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Chair Sullivan – aye
Board Member Black – aye
Board Member Mathis – aye
Board Member Owens – aye
Board Member Holyoak – aye

The vote was unanimous and the motion carried.

/s/

_____
Brenda Hatch, Planner II – CDBG and Housing

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