By participating in the time payment program, the home builder paid $2,500 known as the Builder Payment. The time payment fee is paid prior to the issuance of a certificate of occupancy while the home buyer, as part of their property tax bill, pays the remaining $2,255 over 20 years, amounting to approximately $230 per year.

Time Payment of Fees Example

Fee Breakdown	Amount	When Paid
Homebuilder	$ 2,500	Certificate of Occupancy
Homebuyer	2,255	Amortized over 20 years.
Total	$ 4,755	

Participation in the time payment system is voluntary and home builders have the option to participate in the time payment program or to pay the fees themselves and include them in the cost of the home. Home buyers who purchase homes participating in the time payment system have the option to pay the annual assessments or to prepay the fees at any time without penalty.

OUTCOME

The time payment program of water and sewer fees has been in effect since 1997 and has been beneficial to the county government as well as the building industry. Following the adoption of the initial program, the County performed a rate/services study that concluded additional funds would be necessary to support the time payment system. The County agreed to maintain the builder fee at $2,500 but increase the AGRF to $5,865, with the home buyer paying $3,365 over 20 years.

Since the adoption of the time payment system, several rate adjustments have been made based on the results of annual studies conducted by the County. In 2002, the home builder payment was **reduced** to $2,170, and the total fees for a single family residence were $5,495, with home buyers financing $3,325 over 20 years. Without the implementation of the time payment program, home builders in the County would pay a total of $5,495 in water and sewer Fees. The time payment system reduces the Fees paid by the home builder by $3,325 per single family residence and allows the home buyer to finance the balance through a tax assessment, potentially at lower interest rates than conventional home mortgages.

The development of the time payment system offers the following benefits:
* Reduces home builder's direct costs.
* Passes some fees to the home buyer and potentially at lower interest rates.
* Provides an alternative to conventional fees.

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IV. LEVELS OF SERVICE

Yuba City, California

BACKGROUND

In October 2006, the North State Building Industry Association (BIA), working with an outside consulting firm, began reviewing the proposed development impact fees (fees) prepared by consultants on behalf of the City of Yuba City, California (City). As the City offered a variety of public services, the fees and nexus studies covered the following categories:

1) Community Services (police, fire, corporation yard and city hall)
2) Roads
3) Parks & Recreation
4) Library
5) Levee
6) Sewer
7) Water
8) Storm Drainage

The initial fees circulated by the City had increased the single-family rate from $24,270 to $64,193.

Fees within the State of California are controlled by Government Code 66000-6605 (Mitigation Fee Act) which was adopted in 1987 as AB 1600. The power to collect fees is contained in the city's police powers to protect the public health, safety and welfare of the citizens. Section 66001(a) of the Government Code requires any imposition of a Fee as part condition of development must show the following nexus:

- Identify the purpose of the fee;
- Identify how the fee is to be used;
- Determine how a reasonable relationship exists between the fee's use and the type of development project on which the fee is imposed;
- Determine how a reasonable relationship exists between the need for the public facility and the type of development project on which the Fee is imposed.

The nexus findings are typically made in a fee program's corresponding fee study (Nexus Study) or must be made in the ordinance that establishes the fee program. Additionally, AB 2751 created Section 66001(g) in 2007, which clearly states new development is not responsible for curing any existing deficiency in the current fee program. Understanding AB 1600 and the nexus requirements are critical in negotiating with any jurisdiction regarding fees.

As such, the BIA and their outside consultant focused on the following key assumptions: population build-out, interest rates, existing deficiencies, level of service standards, residential equivalency rates

and construction cost contingencies. For example, the City had originally estimated design, engineering and construction contingency as 65 percent of the hard construction costs. This is 30 to 40 higher than most jurisdictions typically estimate in any fee program. Additionally, the City utilized the fee program to increase the de-facto level of standard from 4.06 acres per 1,000 residents to 10.0 acres per 1,000 residents. Adjustments made to these two assumptions reduced the proposed fees by more than $15,000 per residential unit.

The goal was to ensure that development paid its fair share of future infrastructure needs, recognizing the temporal economic conditions currently facing business interest in the City. In addition to negotiating with key the City staff members, an Ad Hoc committee was created which included two members of the City council to provide input on key level of service standards, existing deficiencies and interest rate assumptions associated with financing infrastructure improvements. Through this process the BIA and their outside consulting group were able to significantly reduce the fees to be paid by new development.

OUTCOME

In September 2007, the City council adopted revised fees that were substantially reduced from the originally proposed fees proposed in October 2006. The revised fees reflect a position that provides for development paying its fair share of future infrastructure cost and ensures that the proposed fees are justifiable under state guidelines while meeting the City's desired level of service standards. The table below illustrates the results realized by the BIA working with their outside consultants upon the completion of the fee review and subsequent adoption by the City:

Yuba City Fee Update

				Numerical Variance			Percentage Variance		
Fee Category	Existing Fee	Oct 2006 Proposed Fee	September 2007 Adopted Fee	Existing - Proposed	Proposed - Adopted	Existing - Adopted	Existing - Proposed	Proposed - Adopted	Existing - Adopted
Police	$ 593	$ 1,876	$ 1,196	$ 1,283	$ (680)	$ 603	216%	-36%	102%
Fire	749	1,587	1,361	838	(226)	612	112%	-14%	82%
Roads	3,583	14,117	9,094	10,534	(5,023)	5,511	294%	-36%	154%
Corporation Yard	-	934	814	934	(120)	814	0%	-13%	0%
Parks & Recreation	2,692	9,320	6,160	6,628	(3,160)	3,468	246%	-34%	129%
Library	954	1,082	912	128	(170)	(42)	13%	-16%	-4%
Levee	-	5,366	2,874	5,366	(2,492)	2,874	0%	-46%	0%
City Hall	-	667	516	667	(151)	516	0%	-23%	0%
Sewer	4,990	7,826	5,261	2,836	(2,565)	271	57%	-33%	5%
Drainage	-	6,575	3,061	6,575	(3,514)	3,061	0%	-53%	0%
Water	7,209	10,644	5,796	3,435	(4,848)	(1,413)	48%	-46%	-20%
Administration	-	699	496	699	(203)	496	0%	-29%	0%
Affordable Housing	3,500	3,500	1,750	-	(1,750)	(1,750)	0%	-50%	-50%
Total	$ 24,270	$ 64,193	$ 39,291	$ 39,923	$ (24,902)	$ 15,021			

When there are substantial increases in fees, there is a good chance that a jurisdiction may be attempting to increase its levels of service standards or to remedy existing deficiencies with Fee revenues generated by new growth. Special attention needs to be placed on construction cost estimates, as these costs are often times significantly higher than those currently being experienced in the market place. Lastly, consideration should be given to bringing in outside fee consultants who work solely for the private sector to augment the BIA review team.

V. SIZE-BASED RESIDENTIAL FEE ASSESSMENTS

BACKGROUND

It is common among jurisdictions to assess fees for residential dwellings based upon unit type. For example, a flat fee is charged for all single family residences, without taking into consideration the size of the residence. In recent years, the notion of assessing residential fees based upon the size of the unit (square footage or the number of bedrooms) has become popular throughout jurisdictions in the United States. Several communities, such as Missoula, Montana; Baton Rouge, Louisiana; Palo Alto, California; Burlington, Vermont; and Hillsborough and Manatee County, Florida, have adopted size-based residential fee programs.

For example, the Manatee County, Florida impact fee schedule for single-family detached homes is presented below.[2] Except for public education, the fees are based on unit size. The square footage ranges for most categories are minor (300 to 500 square feet); however, the methodology assumes demand for public facilities, other than schools, is homogenous for all homes greater than 2,200 square feet.

			Multi-Modal Transportation						
Single-Family Detached	Law Enforcement	Libraries	NE District	NW District	SE District	SW District	Parks & Natural Resources	Public Safety	Public Education	Admin Surcharge
1,000 sq ft or less	$ 178	$ 95	$ 2,290	$ 2,185	$ 1,686	$ 1,335	$ 430	$ 96	$ 3,238	$ 44
1001 - 1300 sq ft	$ 276	$ 148	$ 3,564	$ 3,400	$ 2,623	$ 2,078	$ 669	$ 149	$ 3,238	$ 69
1301 - 1700 sq ft	$ 378	$ 202	$ 4,874	$ 4,650	$ 3,588	$ 2,833	$ 915	$ 204	$ 3,238	$ 94
1701- 2200 sq ft	$ 477	$ 255	$ 6,126	$ 5,843	$ 4,509	$ 3,560	$ 1,154	$ 257	$ 3,238	$ 119
2201 or more sq ft	$ 595	$ 319	$ 7,633	$ 7,282	$ 5,619	$ 4,434	$ 1,441	$ 321	$ 3,238	$ 149

Total Single-Family Fee	NE District	NW District	SE District	SW District
1,000 sq ft or less	$ 6,371	$ 6,266	$ 5,767	$ 5,416
1001 - 1300 sq ft	$ 8,113	$ 7,949	$ 7,172	$ 6,627
1301 - 1700 sq ft	$ 9,905	$ 9,681	$ 8,619	$ 7,864
1701- 2200 sq ft	$ 11,626	$ 11,343	$ 10,009	$ 9,060
2201 or more sq ft	$ 13,696	$ 13,345	$ 11,682	$ 10,497

An impetus to the emergence of this approach to assessing fees is the argument revolving around the regressive nature of impact fees. Fees that are regressive increase as a percentage of residential dwelling size as the residential dwelling size decreases. Therefore, the fee remains the same without regard to the size of the unit.

The purpose of this discussion is to emphasize the primary arguments of proponents and opponents to this method of calculating residential fees.

PROPONENTS

Proponents of square foot and number of bedroom based residential fee assessments argue that assessing fees based on unit size provides a more equitable assessment of fees as smaller residences are not paying a proportionately higher share of fees compared to larger residences. Basing the

assessment of fees on the size of a residential dwelling or the number of bedrooms in that dwelling makes the fee less regressive than assessing fees based upon unit type.[1]

The central premise of the argument is that, in general, larger residences house more people, and with a greater number of people, there results a greater demand for public services. On the other hand, small residences house fewer people and as such would require fewer public services. It is argued that the dwelling does not have an impact on the demand for public services, but it is the people residing in the dwelling that have the impact, and assessing fees based upon housing size proportionately places the burden of paying the fees on those who create the greatest demand for public infrastructure and services.

OPPONENTS

Opponents to the assessment of residential fees based upon square footage and number of bedrooms argue that it is not feasible to transform fees from something regressive to something that is not regressive.

The difficulty in assessing residential fees based upon unit size is that the assumption that larger residences house a greater number of people does not always follow the aspects of the argument set forth by proponents of this approach. As a simple example, some households nearing retirement or with fewer dependents may purchase housing that is much larger than is necessary to provide space for visiting relatives or entertaining guests. Additionally, the definition of what constitutes a "bedroom" varies from source to source. A room may be defined as a "den" to one person, while the very same room may be considered a "bedroom" by another.

It is important that home builder associations stay abreast of the developments in this approach as it is likely that this method of calculating residential fees will become more common in the future.[3]

For further information on recent fee trends and ways to deal with fee proposals, it may be helpful to work with the NAHB to ascertain how HBAs in other parts of the United States manage impact fees.

Endnote

1. Nicholas, James C. 1992. "On the Progression of Impact Fees," *Journal of the American Planning Association* 58: 517–525
2. This schedule reflects impact fees in effect for the period April 18, 2016 to April 17, 2017.
3. National Association of Home Builders, *Proportionate-Share Impact Fees*

APPENDIX B

State Impact Fee Summary Chart

		Fees May Be Imposed For											Requirements					
State	Legislative Reference	Roads	Water	Sewer	Storm Water	Parks	Fire	Police	Library	Solid Waste	School	Utilities	Improvements Plan	Interest Bearing Account	Spend Within "X" Years	Waiver for Affordable Housing	Advisory Committee	Stage for Payment (1)
Alabama																		
Alaska																		Anytime
Arizona (Cities)	AZ Rev. Stat. Ann., § 9-463.05	X	X	X	X	X	X	X	X				X	X	10		X	BP/CO
Arizona (Counties)	AZ Rev. Stat. Ann., § 11-1102 et seq.	X	X	X	X	X	X	X					X	X	10		X	BP/CO
Arkansas	AK Code, § 14-56-103 (cities only)	X	X	X	X	X	X	X	X				X	X	7			CO
California	CA Gov't Code, § 66000 et seq. (mitigation fee act); § 66477 (Quimby Act for park dedication/fee-in-lieu); § 17620 et. seq. (school fees)	X	X	X	X	X	X	X	X	X	X	X	Yes		6			Certificate of occupancy
Colorado	CO Rev. Stat., § 29-20-104.5; § 29-1-801804 (earmarking requirements); § 22-54-102 (school fee prohibition)	X	X	X	X	X	X	X	X	X		X		X		X		
Connecticut																		
Delaware																		
Florida	FL. Stat., § 163.31801	X	X	X	X	X	X	X	X	X	X							Anytime
Georgia	GA Code Ann., § 36-71-1 et seq.	X	X	X	X	X	X	X	X				X	X	6	X	X	BP
Hawaii	HI Rev. Stat., § 46-141 et seq.; § 264-121 et seq.	X	X	X	X	X	X	X	X	X	X	Yes	X	X	6			BP
Idaho	ID Code, § 67-8201 et seq.	X	X	X	X	X	X	X					X	X	8 (2)	X	X	BP
Illinois	605 Ill. Comp. Stat. Ann., § 5/5-901 et seq.	X											X	X	5		X	BP/CO
Indiana	ID Code Ann., § 36-7-4-1300 et seq.	X	X	X	X	X							X	X	6	X	X	BP
Iowa																		
Kansas																		
Kentucky																		
Louisiana																		
Maine	ME. Rev. State. Ann., Title 30-A, § 4354	X	X	X		X	X			X			X					
Maryland	MD Code, Art. 25B, § 13D	X	X	X	X	X	X	X	X	X	X							
Massachusetts																		
Michigan																		
Minnesota																		
Mississippi																		
Missouri																		
Montana	MT Code Annotated, Title 7, Chapter 6, Part 16	X	X	X	X	X	X	X	X	X	X	X	X	X			X	BP
Nebraska																		
Nevada	NV. Rev. Stat., § 278B	X	X	X	X	X	X	X					X	X	10		X	BP/CO
New Hampshire	NH Rev. Stat. Ann., § 674:21	X	X	X	X	X	X	X	X	X	X		X		6			CO
New Jersey	NJ Perm. Stat., § 27:1C-1 et seq.; § 40:55D-42	X	X	X	X								Yes					BP
New Mexico	NM. Stat. Ann., § 5-8-1 et seq.	X	X	X	X	X	X	X					X	X	7	X	X	BP
New York																		
North Carolina																		
North Dakota																		
Ohio																		
Oklahoma	OK Statutes, § 62-895	X	X	X	X	X	X	X		X								
Oregon	OR Rev. State, § 223.297 et seq.	X	X	X	X	X							X					
Pennsylvania	PA Stat. Ann., Title 53, § 10502-A et seq.	X											Yes			Yes		BP
Rhode Island	General Laws of RI, §45-22.4	X	X	X	X	X	X	X	X	X	X			X	8			CO
South Carolina	Code of Laws of SC, § 6-1-910 et seq.	X	X	X	X	X	X	X					X	X	3	X		BP
South Dakota																		
Tennessee																		
Texas	TX Local Gov't Code Ann., Title 12, § 395.001 et seq.	X	X	X	X								X	X	10	X	X	BP/CO
Utah	UT Code, § 11-36-101 et. seq.	X	X	X	X	X	X	X				X	X (3)	X	6	X		
Vermont	VT Stat. Ann., Title 24, § 5200 et seq.	X	X	X	X	X	X	X	X	X	X	X	X		6	X		
Virginia	VA Code Ann., § 15.2-2317 et seq.	X											X	X	15		X	CO
Washington	WA Rev. Code Ann., § 82.02.050 et seq.	X				X	X				X		X	X	6	X		
West Virginia	WV Code, § 7-20-1 et seq.	X	X	X	X	X	X	X			X		X	X	6	X		
Wisconsin	WI Stats., § 66.0617	X	X	X	X	X	X	X	X	X			X	X	7	X		BP/CO
Wyoming																		

Source: National Impact Fee Survey, 2015

Footnotes:

(1) BP = Building Permit; CO = Certificate of Occupancy.

(2) Idaho - 20 years for wastewater and drainage.

(3) Political Subdivisions serving populations under 5,000 as of the last federal census need not comply with the capital facilities plan requirements.

APPENDIX C

General Impact Fee Statute Considerations

The following document aims to serve as a reference for homebuilders to review common issues discussed in impact fee statutes. While all state impact fee statutes are unique, the majority of impact fee statutes share the following common characteristics.

- Definitions
- Minimum Standards for Development Impact Fee Ordinances
- Advisory Committee
- Service Areas
- Imposition of Development Impact Fees
- Proportionate Share of Improvement Costs Determination
- Capital Improvements Plan
- Credits
- Accounting for Collected Development Impact Fees
- Refunds
- Collection

A thorough discussion about the characteristics outlined above can be found in its respective section below.

DEFINITIONS

- The definitions section should include a detailed list of the public facilities for which impact fees are assessed.
- Examples of public facilities may include: Water supply production, treatment, storage and distribution facilities, wastewater collection, treatment and disposal facilities roads, streets and bridges, including rights-of-way, traffic signals, storm water collection, retention, detention, treatment and disposal facilities, flood control facilities, parks, open space and recreation areas, public safety facilities, including law enforcement, fire, emergency medical and rescue and street lighting facilities.

MINIMUM STANDARDS FOR DEVELOPMENT IMPACT FEES ORDINANCES

Minimum standard requirements for development impact fee ordinances may include:

- Should be based upon the proportionate share of the cost of system improvements. Development impact fees shall be based on actual system improvement costs or reasonable estimates of such costs.

- Should be calculated on the basis of levels of service for public facilities in the development impact fee applicable to existing development as well as new growth and development. The construction, improvement, expansion or enlargement of new or existing public facilities for which a development impact fee is imposed must be attributable to the capacity demands generated by the new development.
- Should specify the time in the development process at which the development impact fee is to be collected. Times for the collection of the development impact fee may include: (i) the commencement of construction of the development, (ii) the issuance of a building permit or (iii) as may be agreed by the developer and the governmental entity.
- Should include a provision for credits in accordance with the requirements of the "Credits" section.
- Should include a provision prohibiting the expenditure of development impact fees except in accordance with the requirements of the "Earmarking and Expenditure of Collected Development Impact Fees" section.
- Should make a determination as to whether one service area or more than one service area is necessary to establish a correlation between impact fees and benefits.
- May exempt all or part of a particular development project from development impact fees provided that such project is determined to create affordable housing.
- Should provide that development impact fees shall only be spent for the category of system improvements for which the fees were collected and either within or for the benefit of the service area in which the project is located.
- Should provide for a refund of development impact fees in accordance with the requirements of the "Refunds" section.
- Should provide for appeals regarding development impact fees in accordance with the requirements of the "Appeals" section.
- Should provide a detailed description of the methodology by which costs per service unit are determined.
- Should include a schedule of development impact fees for various land uses per unit of development.
- Should not subject any development to double payment of impact fees. (i.e. Homebuilder should not be responsible to pay impact fees and also pay to retire the debt to pay for the infrastructure)
- May exempt from development impact fees for the following activities:
    (i) Rebuilding the same amount of floor space of a structure, which was destroyed by fire or other catastrophe, providing the structure is rebuilt and ready for occupancy within two (2) years of its destruction;
    (ii) Remodeling or repairing a structure which does not increase the number of service units;
- Should include a description of acceptable levels of service for system improvements.

DEVELOPMENT IMPACT FEE ADVISORY COMMITTEE

- The governmental entity should establish a development impact fee advisory committee.
- The composition of the advisory committee should have representatives from the home building community. It would be wise to have no less than 40% of the committee members

selected from the building community. An example composition may include a total of five (5) members appointed by the governing authority of the governmental entity, where two (2) or more members are active in development, building or real estate and are not employees of the governmental entity.

- The advisory committee should:
  (i) Monitor and evaluate implementation of the capital improvements plan;
  (ii) Recommend to the governmental entity that the capital improvements plan and development impact fees be updated or revised periodically.

SERVICE AREAS

- Service areas are defined as geographic areas identified by a governmental entity or by intergovernmental agreement in which specific public facilities provide service to development within the area. An important note on service areas is that impact fees collected for the intent to be spent on public facilities located within a specific service area should be separately accounted for to ensure that the impact fees are appropriately spent on public facilities located within the service area.

IMPOSITION OF DEVELOPMENT IMPACT FEES

- The advisory committee should be consulted on the development of the capital improvements plan.
- The public should be notified, through a public hearing, of any changes to be made to the capital improvements plan. Notification should be made by circulation in a recognized county newspaper.
- The public should be notified, through a public hearing, of the governmental entity's intent to consider adoption of an ordinance for the imposition of development impact fees.

PROPORTIONATE SHARE OF IMPROVEMENT COSTS DETERMINATION

- The impact fees should be based on a reasonable and fair formula or method, so that the impact fees do not exceed a proportionate share of the costs of the improvements to serve the new development.
- The following should be considered in the determination of proportionate share and accounted for in the calculation of the impact fee:
  (i) Any offsets, credits, contribution of money, dedication of land, or construction of system improvements;
  (ii) Payments anticipated to be made in the form of user fees and debt service payments;
  (iii) The portion of general taxes or other revenues allocated to system improvements;
  (iv) The cost of existing system improvements within the service area or areas;
  (v) The extent to which new development will contribute to the cost of system improvements through taxation, assessment, or developer or landowner contributions, or has previously contributed to the cost of system improvements through developer or landowner contributions.
  (vi) The extent to which the new development is required to contribute to the cost of existing system improvements in the future.

(vii) The extent to which the new development should be credited for providing system improvements, without charge to other properties within the service area or areas;
(viii) The availability of other sources of funding system improvements. (user charges, general tax levies, intergovernmental transfers, and special taxation)

CAPITAL IMPROVEMENTS PLAN

It is recommended that a capital improvements plan be prepared and that it be included as an element of the comprehensive plan. The capital improvements plan may contain the following:

(i) A general description of all existing public facility deficiencies within the service area or areas and a reasonable estimate of all costs and a plan to develop the funding resources related to curing the existing deficiencies.
(ii) Means by which the governmental entity will use revenue sources other than impact fees to cure existing system deficiencies.
(iii) An analysis of the total capacity, the level of current usage, and commitments for usage of capacity of existing capital improvements to ascertain the current level of service.
(iv) The capital improvements plan should provide a table establishing the specific level or quantity of use of a service unit for each category of system improvements as well as an equivalency ratio of a service unit to various types of land uses, including residential, commercial, agricultural and industrial.
(v) A description of all system improvements and their costs necessitated by new development in the service area, to provide a level of service not to exceed the level of service adopted in the development impact fee ordinance.
(vi) The total number of service units necessitated by and attributable to new development within the service area.
(vii) The projected demand for system improvements required by new service units projected over a reasonable period of time. (The longer the timeframe, the less accurate the projected demand)
(viii) Identification of all sources available to the governmental entity for the financing of the system improvements.
(ix) A schedule setting forth estimated dates for commencing and completing construction of all improvements identified in the capital improvements plan.

- There should be a provision that the capital improvements plan will be periodically updated.

CREDITS

Provisions for impact fee credits may include:

- A credit or reimbursement for the present value of any construction of system improvements or contribution or dedication of land or money.
- Amount of Credit or the amount, time and form of reimbursement.
- A credit on future impact fees or reimbursement at the developer's choice for excess construction, funding or contribution from development impact fees.
- A credit on future impact fees for the amount in excess of the development’s proportionate share.

ACCOUNTING/EXPENDITURE OF COLLECTED DEVELOPMENT IMPACT FEES

Suggestions for the allocation and expenditure of collected impact fees can be found below:

- Impact fees should be maintained in interest-bearing accounts. This could be further delineated by category of system improvements and the service area in which the fees are collected.
- Interest earned should be considered funds of the account, and should be subject to all restrictions placed on the use of development impact fees.
- Expenditures of development impact fees should be made only for the category of system improvements of the service area shown in the capital improvements plan.
- Annual reports should be produced that describe the amount of all development impact fees collected, or spent during the preceding year delineated by category of public facility and service area.
- A timeframe for the expenditure of development impact fees that have been collected should be specified. If the funds are not expended within the prescribed timeframe they should be refunded.

REFUNDS

Suggestions for impact fee refund language:

- Development impact fees that have been paid should be refunded if:
    (i) The governmental entity, has failed to appropriate and expend the collected development impact fees.
    (ii) The impact fees are paid under protest and a review of the fee paid determines that it exceeded the proportionate share.
- Refunds should be sent to the owner of record within a specified timeframe after it is determined that a refund is due.
- Interest accrued from the date on which the fee was originally paid should also be refunded.

COLLECTION

The collection of development impact fees primarily occurs at one of the following two stages in the construction process:

(i) The issuance of a building permit; or
(ii) The issuance of a certificate of occupancy.

For an example of how many of the aforementioned concepts were implemented into law by the home builders of Arizona, See Arizona’s Impact Fee Statute included as Appendix D.

APPENDIX D

Arizona, Montana, and Texas Impact Fee Statutes

ARIZONA

Arizona's Response to Development Impact Fee Abuses

In 2011, after years of being on the receiving end of abusive development impact fee ordinances imposed by some of the rapidly growing cities in Arizona, the home building industry in Arizona, led by the Home Builders Association of Central Arizona, drafted Senate Bill 1525 (SB1525). This bill not only addressed these abuses but enacted comprehensive requirements for municipalities in Arizona that charge impact fees.

Background

During the housing boom years some of the fastest growing communities in Arizona began enacting development impact fee ordinances based on development impact fee studies that were lacking in many respects. Some of the more common challenges with these impact fees studies included:

- Inclusion of non-essential public improvements (e.g. cultural centers) in eligible costs;
- No delineation of service areas;
- Incomplete analysis of existing levels of service;
- Use of inconsistent levels of service;
- Using development fees to address existing infrastructure deficiencies;
- No consideration of funding offsets, or credits;
- Inaccurate cost estimates, and
- Logic and mathematical errors.

The result of these errors was to force new growth to fund more than its proportionate share of the public infrastructure burden.

SB 1525

As a result, the building industry drafted, lobbied for, and passed SB1525 in 2011. Among other things, this bill:

- Immediately required municipalities to remove "unnecessary public services" from their impact fee programs;
- Required existing municipal impact fee programs to be replaced with impact fees estimated pursuant to the tenets of SB 1525;

- Established strict deadlines for the adoption of impact fees which, if not met, required municipalities to stop collecting impact fees;
- Adopted constitutional "proportionality" requirements based on standardized service units;
- Required use of service areas in which there is a "substantial nexus" between public services and demand;
- Necessitated the preparation of infrastructure improvement plans by Arizona licensed engineers pursuant to approved land use assumptions;
- Required a detailed existing level of service analysis;
- Defined "necessary public services" and the facilities that would be eligible for funding through development impact fees;
- Required an offset to public service costs for other fees and taxes paid by new growth which will be used by the jurisdiction to fund public infrastructure costs, including but not limited to construction sales taxes, state shared revenues, existing municipal general obligation bonds, grants, etc.;
- Increased the amount of time and frequency of public hearings and industry input into the impact fee process; and
- Required a bi-annual audit of the impact fee program if the jurisdictions did not work with an impact fee advisory panel during the preparation of the impact fee program.

Result

As result of the enactment of SB1525, many jurisdictions' impact fees were reduced by as much as 20 percent as they were forced to remove "unnecessary public services" from their impact fee calculations. Other jurisdictions decided to abandon their impact fee programs altogether given the amount of time and cost involved in revising the fees to be compliant with SB1525. Still other municipalities followed the tenets of SB1525, which led to a much more transparent and reasonable allocation of public service costs to new growth. In all, SB1525 was a huge success in reining in the jurisdictional abuses related to impact fee calculations and serves as a good model for other state impact fee statutes. Arizona's full impact fee statute follows.

9-463.05. Development fees; imposition by cities and towns; infrastructure improvements plan; annual report; advisory committee; limitation on actions; definitions

A. A municipality may assess development fees to offset costs to the municipality associated with providing necessary public services to a development, including the costs of infrastructure, improvements, real property, engineering and architectural services, financing and professional services required for the preparation or revision of a development fee pursuant to this section, including the relevant portion of the infrastructure improvements plan.

B. Development fees assessed by a municipality under this section are subject to the following requirements:

    1. Development fees shall result in a beneficial use to the development.

    2. The municipality shall calculate the development fee based on the infrastructure improvements plan adopted pursuant to this section.

3. The development fee shall not exceed a proportionate share of the cost of necessary public services, based on service units, needed to provide necessary public services to the development.

4. Costs for necessary public services made necessary by new development shall be based on the same level of service provided to existing development in the service area.

5. Development fees may not be used for any of the following:

    a) Construction, acquisition or expansion of public facilities or assets other than necessary public services or facility expansions identified in the infrastructure improvements plan.
    b) Repair, operation or maintenance of existing or new necessary public services or facility expansions.
    c) Upgrading, updating, expanding, correcting or replacing existing necessary public services to serve existing development in order to meet stricter safety, efficiency, environmental or regulatory standards.
    d) Upgrading, updating, expanding, correcting or replacing existing necessary public services to provide a higher level of service to existing development.
    e) Administrative, maintenance or operating costs of the municipality.

6. Any development for which a development fee has been paid is entitled to the use and benefit of the services for which the fee was imposed and is entitled to receive immediate service from any existing facility with available capacity to serve the new service units if the available capacity has not been reserved or pledged in connection with the construction or financing of the facility.

7. Development fees may be collected if any of the following occurs:

    a) The collection is made to pay for a necessary public service or facility expansion that is identified in the infrastructure improvements plan and the municipality plans to complete construction and to have the service available within the time period established in the infrastructure improvement plan, but in no event longer than the time period provided in subsection H, paragraph 3 of this section.

    b) The municipality reserves in the infrastructure improvements plan adopted pursuant to this section or otherwise agrees to reserve capacity to serve future development.

    c) The municipality requires or agrees to allow the owner of a development to construct or finance the necessary public service or facility expansion and any of the following apply:

        i. The costs incurred or money advanced are credited against or reimbursed from the development fees otherwise due from a development.

ii. The municipality reimburses the owner for those costs from the development fees paid from all developments that will use those necessary public services or facility expansions.

iii. For those costs incurred the municipality allows the owner to assign the credits or reimbursement rights from the development fees otherwise due from a development to other developments for the same category of necessary public services in the same service area.

8. Projected interest charges and other finance costs may be included in determining the amount of development fees only if the monies are used for the payment of principal and interest on the portion of the bonds, notes or other obligations issued to finance construction of necessary public services or facility expansions identified in the infrastructure improvements plan.

9. Monies received from development fees assessed pursuant to this section shall be placed in a separate fund and accounted for separately and may only be used for the purposes authorized by this section. Monies received from a development fee identified in an infrastructure improvements plan adopted or updated pursuant to subsection D of this section shall be used to provide the same category of necessary public services or facility expansions for which the development fee was assessed and for the benefit of the same service area, as defined in the infrastructure improvements plan, in which the development fee was assessed. Interest earned on monies in the separate fund shall be credited to the fund.

10. The schedule for payment of fees shall be provided by the municipality. Based on the cost identified in the infrastructure improvements plan, the municipality shall provide a credit toward the payment of a development fee for the required or agreed to dedication of public sites, improvements and other necessary public services or facility expansions included in the infrastructure improvements plan and for which a development fee is assessed, to the extent the public sites, improvements and necessary public services or facility expansions are provided by the developer. The developer of residential dwelling units shall be required to pay development fees when construction permits for the dwelling units are issued, or at a later time if specified in a development agreement pursuant to section 9-500.05. If a development agreement provides for fees to be paid at a time later than the issuance of construction permits, the deferred fees shall be paid no later than fifteen days after the issuance of a certificate of occupancy. The development agreement shall provide for the value of any deferred fees to be supported by appropriate security, including a surety bond, letter of credit or cash bond.

11. If a municipality requires as a condition of development approval the construction or improvement of, contributions to or dedication of any facilities that were not included in a previously adopted infrastructure improvements plan, the municipality shall cause the infrastructure improvements plan to be amended to include the facilities and shall provide a credit toward the payment of a development fee for the construction, improvement, contribution or dedication of the facilities to the extent that the facilities

will substitute for or otherwise reduce the need for other similar facilities in the infrastructure improvements plan for which development fees were assessed.

12. The municipality shall forecast the contribution to be made in the future in cash or by taxes, fees, assessments or other sources of revenue derived from the property owner towards the capital costs of the necessary public service covered by the development fee and shall include these contributions in determining the extent of the burden imposed by the development. Beginning August 1, 2014, for purposes of calculating the required offset to development fees pursuant to this subsection, if a municipality imposes a construction contracting or similar excise tax rate in excess of the percentage amount of the transaction privilege tax rate imposed on the majority of other transaction privilege tax classifications, the entire excess portion of the construction contracting or similar excise tax shall be treated as a contribution to the capital costs of necessary public services provided to development for which development fees are assessed, unless the excess portion was already taken into account for such purpose pursuant to this subsection.

13. If development fees are assessed by a municipality, the fees shall be assessed against commercial, residential and industrial development, except that the municipality may distinguish between different categories of residential, commercial and industrial development in assessing the costs to the municipality of providing necessary public services to new development and in determining the amount of the development fee applicable to the category of development. If a municipality agrees to waive any of the development fees assessed on a development, the municipality shall reimburse the appropriate development fee accounts for the amount that was waived. The municipality shall provide notice of any such waiver to the advisory committee established pursuant to subsection G of this section within thirty days.

14. In determining and assessing a development fee applying to land in a community facilities district established under title 48, chapter 4, article 6, the municipality shall take into account all public infrastructure provided by the district and capital costs paid by the district for necessary public services and shall not assess a portion of the development fee based on the infrastructure or costs.

C. A municipality shall give at least thirty days' advance notice of intention to assess a development fee and shall release to the public and post on its website or the website of an association of cities and towns if a municipality does not have a website a written report of the land use assumptions and infrastructure improvements plan adopted pursuant to subsection D of this section. The municipality shall conduct a public hearing on the proposed development fee at any time after the expiration of the thirty day notice of intention to assess a development fee and at least thirty days before the scheduled date of adoption of the fee by the governing body. Within sixty days after the date of the public hearing on the proposed development fee, a municipality shall approve or disapprove the imposition of the development fee. A municipality shall not adopt an ordinance, order or resolution approving a development fee as an emergency measure. A development fee assessed pursuant to this section shall not be effective until seventy-five days after its formal

adoption by the governing body of the municipality. Nothing in this subsection shall affect any development fee adopted before July 24, 1982.

D. Before the adoption or amendment of a development fee, the governing body of the municipality shall adopt or update the land use assumptions and infrastructure improvements plan for the designated service area. The municipality shall conduct a public hearing on the land use assumptions and infrastructure improvements plan at least thirty days before the adoption or update of the plan. The municipality shall release the plan to the public, post the plan on its website or the website of an association of cities and towns if the municipality does not have a website, including in the posting its land use assumptions, the time period of the projections, a description of the necessary public services included in the infrastructure improvements plan and a map of the service area to which the land use assumptions apply, make available to the public the documents used to prepare the assumptions and plan and provide public notice at least sixty days before the public hearing, subject to the following:

1. The land use assumptions and infrastructure improvements plan shall be approved or disapproved within sixty days after the public hearing on the land use assumptions and infrastructure improvements plan and at least thirty days before the public hearing on the report required by subsection C of this section. A municipality shall not adopt an ordinance, order or resolution approving the land use assumptions or infrastructure improvements plan as an emergency measure.

2. An infrastructure improvements plan shall be developed by qualified professionals using generally accepted engineering and planning practices pursuant to subsection E of this section.

3. A municipality shall update the land use assumptions and infrastructure improvements plan at least every five years. The initial five year period begins on the day the infrastructure improvements plan is adopted. The municipality shall review and evaluate its current land use assumptions and shall cause an update of the infrastructure improvements plan to be prepared pursuant to this section.

4. Within sixty days after completion of the updated land use assumptions and infrastructure improvements plan, the municipality shall schedule and provide notice of a public hearing to discuss and review the update and shall determine whether to amend the assumptions and plan.

5. A municipality shall hold a public hearing to discuss the proposed amendments to the land use assumptions, the infrastructure improvements plan or the development fee. The land use assumptions and the infrastructure improvements plan, including the amount of any proposed changes to the development fee per service unit, shall be made available to the public on or before the date of the first publication of the notice of the hearing on the amendments.

6. The notice and hearing procedures prescribed in paragraph 1 of this subsection apply to a hearing on the amendment of land use assumptions, an infrastructure improvements

plan or a development fee. Within sixty days after the date of the public hearing on the amendments, a municipality shall approve or disapprove the amendments to the land use assumptions, infrastructure improvements plan or development fee. A municipality shall not adopt an ordinance, order or resolution approving the amended land use assumptions, infrastructure improvements plan or development fee as an emergency measure.

7. The advisory committee established under subsection G of this section shall file its written comments on any proposed or updated land use assumptions, infrastructure improvements plan and development fees before the fifth business day before the date of the public hearing on the proposed or updated assumptions, plan and fees.

8. If, at the time an update as prescribed in paragraph 3 of this subsection is required, the municipality determines that no changes to the land use assumptions, infrastructure improvements plan or development fees are needed, the municipality may as an alternative to the updating requirements of this subsection publish notice of its determination on its website and include the following:

    a) A statement that the municipality has determined that no change to the land use assumptions, infrastructure improvements plan or development fee is necessary.
    b) A description and map of the service area in which an update has been determined to be unnecessary.
    c) A statement that by a specified date, which shall be at least sixty days after the date of publication of the first notice, a person may make a written request to the municipality requesting that the land use assumptions, infrastructure improvements plan or development fee be updated.
    d) A statement identifying the person or entity to whom the written request for an update should be sent.

9. If, by the date specified pursuant to paragraph 8 of this subsection, a person requests in writing that the land use assumptions, infrastructure improvements plan or development fee be updated, the municipality shall cause, accept or reject an update of the assumptions and plan to be prepared pursuant to this subsection.

10. Notwithstanding the notice and hearing requirements for adoption of an infrastructure improvements plan, a municipality may amend an infrastructure improvements plan adopted pursuant to this section without a public hearing if the amendment addresses only elements of necessary public services in the existing infrastructure improvements plan and the changes to the plan will not, individually or cumulatively with other amendments adopted pursuant to this subsection, increase the level of service in the service area or cause a development fee increase of greater than five per cent when a new or modified development fee is assessed pursuant to this section. The municipality shall provide notice of any such amendment at least thirty days before adoption, shall post the amendment on its website or on the website of an association of cities and towns if the municipality does not have a website and shall provide notice to the

advisory committee established pursuant to subsection G of this section that the amendment complies with this subsection.

E. For each necessary public service that is the subject of a development fee, the infrastructure improvements plan shall include:

1. A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable.

2. An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable.

3. A description of all or the parts of the necessary public services or facility expansions and their costs necessitated by and attributable to development in the service area based on the approved land use assumptions, including a forecast of the costs of infrastructure, improvements, real property, financing, engineering and architectural services, which shall be prepared by qualified professionals licensed in this state, as applicable.

4. A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial.

5. The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria.

6. The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years.

7. A forecast of revenues generated by new service units other than development fees, which shall include estimated state-shared revenue, highway users revenue, federal revenue, ad valorem property taxes, construction contracting or similar excise taxes and the capital recovery portion of utility fees attributable to development based on the approved land use assumptions, and a plan to include these contributions in determining the extent of the burden imposed by the development as required in subsection B, paragraph 12 of this section.

F. A municipality's development fee ordinance shall provide that a new development fee or an increased portion of a modified development fee shall not be assessed against a development for twenty-four months after the date that the municipality issues the final approval for a commercial, industrial or multifamily development or the date that the first building permit is issued for a

residential development pursuant to an approved site plan or subdivision plat, provided that no subsequent changes are made to the approved site plan or subdivision plat that would increase the number of service units. If the number of service units increases, the new or increased portion of a modified development fee shall be limited to the amount attributable to the additional service units. The twenty-four month period shall not be extended by a renewal or amendment of the site plan or the final subdivision plat that was the subject of the final approval. The municipality shall issue, on request, a written statement of the development fee schedule applicable to the development. If, after the date of the municipality's final approval of a development, the municipality reduces the development fee assessed on development, the reduced fee shall apply to the development.

G. A municipality shall do one of the following:

1. Before the adoption of proposed or updated land use assumptions, infrastructure improvements plan and development fees as prescribed in subsection D of this section, the municipality shall appoint an infrastructure improvements advisory committee, subject to the following requirements:

a) The advisory committee shall be composed of at least five members who are appointed by the governing body of the municipality. At least fifty per cent of the members of the advisory committee must be representatives of the real estate, development or building industries, of which at least one member of the committee must be from the home building industry. Members shall not be employees or officials of the municipality.

b) The advisory committee shall serve in an advisory capacity and shall:

i. Advise the municipality in adopting land use assumptions and in determining whether the assumptions are in conformance with the general plan of the municipality.
ii. Review the infrastructure improvements plan and file written comments.
iii. Monitor and evaluate implementation of the infrastructure improvements plan.
iv. Every year file reports with respect to the progress of the infrastructure improvements plan and the collection and expenditures of development fees and report to the municipality any perceived inequities in implementing the plan or imposing the development fee.
v. Advise the municipality of the need to update or revise the land use assumptions, infrastructure improvements plan and development fee.

c) The municipality shall make available to the advisory committee any professional reports with respect to developing and implementing the infrastructure improvements plan.

d) The municipality shall adopt procedural rules for the advisory committee to follow in carrying out the committee's duties.

2. In lieu of creating an advisory committee pursuant to paragraph 1 of this subsection, provide for a biennial certified audit of the municipality's land use assumptions, infrastructure improvements plan and development fees. An audit pursuant to this paragraph shall be conducted by one or more qualified professionals who are not employees or officials of the municipality and who did not prepare the infrastructure improvements plan. The audit shall review the progress of the infrastructure improvements plan, including the collection and expenditures of development fees for each project in the plan, and evaluate any inequities in implementing the plan or imposing the development fee. The municipality shall post the findings of the audit on the municipality's website or the website of an association of cities and towns if the municipality does not have a website and shall conduct a public hearing on the audit within sixty days of the release of the audit to the public.

H. On written request, an owner of real property for which a development fee has been paid after July 31, 2014 is entitled to a refund of a development fee or any part of a development fee if:

1. Pursuant to subsection B, paragraph 6 of this section, existing facilities are available and service is not provided.

2. The municipality has, after collecting the fee to construct a facility when service is not available, failed to complete construction within the time period identified in the infrastructure improvements plan, but in no event later than the time period specified in paragraph 3 of this subsection.

3. For a development fee other than a development fee for water or wastewater facilities, any part of the development fee is not spent as authorized by this section within ten years after the fee has been paid or, for a development fee for water or wastewater facilities, any part of the development fee is not spent as authorized by this section within fifteen years after the fee has been paid.

I. If the development fee was collected for the construction of all or a portion of a specific item of infrastructure, and on completion of the infrastructure the municipality determines that the actual cost of construction was less than the forecasted cost of construction on which the development fee was based and the difference between the actual and estimated cost is greater than ten per cent, the current owner may receive a refund of the portion of the development fee equal to the difference between the development fee paid and the development fee that would have been due if the development fee had been calculated at the actual construction cost.

J. A refund shall include any interest earned by the municipality from the date of collection to the date of refund on the amount of the refunded fee. All refunds shall be made to the record owner of the property at the time the refund is paid. If the development fee is paid by a governmental entity, the refund shall be paid to the governmental entity.

K. A development fee that was adopted before January 1, 2012 may continue to be assessed only to the extent that it will be used to provide a necessary public service for which development fees can

be assessed pursuant to this section and shall be replaced by a development fee imposed under this section on or before August 1, 2014. Any municipality having a development fee that has not been replaced under this section on or before August 1, 2014 shall not collect development fees until the development fee has been replaced with a fee that complies with this section. Any development fee monies collected before January 1, 2012 remaining in a development fee account:

1. Shall be used towards the same category of necessary public services as authorized by this section.

2. If development fees were collected for a purpose not authorized by this section, shall be used for the purpose for which they were collected on or before January 1, 2020, and after which, if not spent, shall be distributed equally among the categories of necessary public services authorized by this section.

L. A moratorium shall not be placed on development for the sole purpose of awaiting completion of all or any part of the process necessary to develop, adopt or update development fees.

M. In any judicial action interpreting this section, all powers conferred on municipal governments in this section shall be narrowly construed to ensure that development fees are not used to impose on new residents a burden all taxpayers of a municipality should bear equally.

N. Each municipality that assesses development fees shall submit an annual report accounting for the collection and use of the fees for each service area. The annual report shall include the following:

1. The amount assessed by the municipality for each type of development fee.

2. The balance of each fund maintained for each type of development fee assessed as of the beginning and end of the fiscal year.

3. The amount of interest or other earnings on the monies in each fund as of the end of the fiscal year.

4. The amount of development fee monies used to repay:

    a) Bonds issued by the municipality to pay the cost of a capital improvement project that is the subject of a development fee assessment, including the amount needed to repay the debt service obligations on each facility for which development fees have been identified as the source of funding and the time frames in which the debt service will be repaid.
    b) Monies advanced by the municipality from funds other than the funds established for development fees in order to pay the cost of a capital improvement project that is the subject of a development fee assessment, the total amount advanced by the municipality for each facility, the source of the monies advanced and the terms under which the monies will be repaid to the municipality.

5. The amount of development fee monies spent on each capital improvement project that is the subject of a development fee assessment and the physical location of each capital improvement project.

6. The amount of development fee monies spent for each purpose other than a capital improvement project that is the subject of a development fee assessment.

O. Within ninety days following the end of each fiscal year, each municipality shall submit a copy of the annual report to the city clerk and post the report on the municipality's website or the website of an association of cities and towns if the municipality does not have a website. Copies shall be made available to the public on request. The annual report may contain financial information that has not been audited.

P. A municipality that fails to file the report and post the report on the municipality's website or the website of an association of cities and towns if the municipality does not have a website as required by this section shall not collect development fees until the report is filed and posted.

Q. Any action to collect a development fee shall be commenced within two years after the obligation to pay the fee accrues.

R. A municipality may continue to assess a development fee adopted before January 1, 2012 for any facility that was financed before June 1, 2011 if:

1. Development fees were pledged to repay debt service obligations related to the construction of the facility.

2. After August 1, 2014, any development fees collected under this subsection are used solely for the payment of principal and interest on the portion of the bonds, notes or other debt service obligations issued before June 1, 2011 to finance construction of the facility.

S. Through August 1, 2014, a development fee adopted before January 1, 2012 may be used to finance construction of a facility and may be pledged to repay debt service obligations if:

1. The facility that is being financed is a facility that is described under subsection T, paragraph 7, subdivisions (a) through (g) of this section.

2. The facility was included in an infrastructure improvements plan adopted before June 1, 2011.

3. The development fees are used for the payment of principal and interest on the portion of the bonds, notes or other debt service obligations issued to finance construction of the necessary public services or facility expansions identified in the infrastructure improvement plan.

T. For the purposes of this section:

1. "Dedication" means the actual conveyance date or the date an improvement, facility or real or personal property is placed into service, whichever occurs first.

2. "Development" means:
    a) The subdivision of land.
    b) The construction, reconstruction, conversion, structural alteration, relocation or enlargement of any structure that adds or increases the number of service units.
    c) Any use or extension of the use of land that increases the number of service units.

3. "Facility expansion" means the expansion of the capacity of an existing facility that serves the same function as an otherwise new necessary public service in order that the existing facility may serve new development. Facility expansion does not include the repair, maintenance, modernization or expansion of an existing facility to better serve existing development.

4. "Final approval" means:

    a) For a nonresidential or multifamily development, the approval of a site plan or, if no site plan is submitted for the development, the approval of a final subdivision plat.
    b) For a single family residential development, the approval of a final subdivision plat.

5. "Infrastructure improvements plan" means a written plan that identifies each necessary public service or facility expansion that is proposed to be the subject of a development fee and otherwise complies with the requirements of this section, and may be the municipality's capital improvements plan.

6. "Land use assumptions" means projections of changes in land uses, densities, intensities and population for a specified service area over a period of at least ten years and pursuant to the general plan of the municipality.

7. "Necessary public service" means any of the following facilities that have a life expectancy of three or more years and that are owned and operated by or on behalf of the municipality:

    a) Water facilities, including the supply, transportation, treatment, purification and distribution of water, and any appurtenances for those facilities.
    b) Wastewater facilities, including collection, interception, transportation, treatment and disposal of wastewater, and any appurtenances for those facilities.
    c) Storm water, drainage and flood control facilities, including any appurtenances for those facilities.
    d) Library facilities of up to ten thousand square feet that provide a direct benefit to development, not including equipment, vehicles or appurtenances.
    e) Street facilities located in the service area, including arterial or collector streets or roads that have been designated on an officially adopted plan of the municipality, traffic signals and rights-of-way and improvements thereon.
    f) Fire and police facilities, including all appurtenances, equipment and vehicles. Fire and police facilities do not include a facility or portion of a facility that is used to replace services that were once provided elsewhere in the municipality, vehicles and equipment used to provide administrative services, helicopters or airplanes or a facility that is used for training firefighters or officers from more than one station or substation.

g) Neighborhood parks and recreational facilities on real property up to thirty acres in area, or parks and recreational facilities larger than thirty acres if the facilities provide a direct benefit to the development. Park and recreational facilities do not include vehicles, equipment or that portion of any facility that is used for amusement parks, aquariums, aquatic centers, auditoriums, arenas, arts and cultural facilities, bandstand and orchestra facilities, bathhouses, boathouses, clubhouses, community centers greater than three thousand square feet in floor area, environmental education centers, equestrian facilities, golf course facilities, greenhouses, lakes, museums, theme parks, water reclamation or riparian areas, wetlands, zoo facilities or similar recreational facilities, but may include swimming pools.

h) Any facility that was financed and that meets all of the requirements prescribed in subsection R of this section.

8. "Qualified professional" means a professional engineer, surveyor, financial analyst or planner providing services within the scope of the person's license, education or experience.

9. "Service area" means any specified area within the boundaries of a municipality in which development will be served by necessary public services or facility expansions and within which a substantial nexus exists between the necessary public services or facility expansions and the development being served as prescribed in the infrastructure improvements plan.

10. "Service unit" means a standardized measure of consumption, use, generation or discharge attributable to an individual unit of development calculated pursuant to generally accepted engineering or planning standards for a particular category of necessary public services or facility expansions.

Montana Impact Fee Statute

7-6-1601. Definitions. As used in this part, the following definitions apply:

(1) (a) "Capital improvements" means improvements, land, and equipment with a useful life of 10 years or more that increase or improve the service capacity of a public facility.

(b) The term does not include consumable supplies.

(2) "Connection charge" means the actual cost of connecting a property to a public utility system and is limited to the labor, materials, and overhead involved in making connections and installing meters.

(3) "Development" means construction, renovation, or installation of a building or structure, a change in use of a building or structure, or a change in the use of land when the construction, installation, or other action creates additional demand for public facilities.

(4) "Governmental entity" means a county, city, town, or consolidated government.

(5) (a) "Impact fee" means any charge imposed upon development by a governmental entity as part of the development approval process to fund the additional service capacity required by the development from which it is collected. An impact fee may include a fee for the administration of the impact fee not to exceed 5% of the total impact fee collected.

(b) The term does not include:

(i) a charge or fee to pay for administration, plan review, or inspection costs associated with a permit required for development;
(ii) a connection charge;
(iii) any other fee authorized by law, including but not limited to user fees, special improvement district assessments, fees authorized under Title 7 for county, municipal, and consolidated government sewer and water districts and systems, and costs of ongoing maintenance; or
(iv) onsite or offsite improvements necessary for new development to meet the safety, level of service, and other minimum development standards that have been adopted by the governmental entity.

(6) "Proportionate share" means that portion of the cost of capital system improvements that reasonably relates to the service demands and needs of the project. A proportionate share must take into account the limitations provided in 7-6-1602.

(7) "Public facilities" means:

(a) a water supply production, treatment, storage, or distribution facility;

(b) a wastewater collection, treatment, or disposal facility;

(c) a transportation facility, including roads, streets, bridges, rights-of-way, traffic signals, and landscaping;

(d) a storm water collection, retention, detention, treatment, or disposal facility or a flood control facility;

(e) a police, emergency medical rescue, or fire protection facility; and

(f) other facilities for which documentation is prepared as provided in 7-6-1602 that have been approved as part of an impact fee ordinance or resolution by:

(i) a two-thirds majority of the governing body of an incorporated city, town, or consolidated local government; or
(ii) a unanimous vote of the board of county commissioners of a county government

7-6-1602. Calculation of impact fees -- documentation required -- ordinance or resolution -- requirements for impact fees.

(1) For each public facility for which an impact fee is imposed, the governmental entity shall prepare and approve a service area report.

(2) The service area report is a written analysis that must:

(a) describe existing conditions of the facility;

(b) establish level-of-service standards;

(c) forecast future additional needs for service for a defined period of time;

(d) identify capital improvements necessary to meet future needs for service;

(e) identify those capital improvements needed for continued operation and maintenance of the facility;

(f) make a determination as to whether one service area or more than one service area is necessary to establish a correlation between impact fees and benefits;

(g) make a determination as to whether one service area or more than one service area for transportation facilities is needed to establish a correlation between impact fees and benefits;

(h) establish the methodology and time period over which the governmental entity will assign the proportionate share of capital costs for expansion of the facility to provide service to new development within each service area;

(i) establish the methodology that the governmental entity will use to exclude operations and maintenance costs and correction of existing deficiencies from the impact fee;

(j) establish the amount of the impact fee that will be imposed for each unit of increased service demand; and

(k) have a component of the budget of the governmental entity that:

(i) schedules construction of public facility capital improvements to serve projected growth;
(ii) projects costs of the capital improvements;
(iii) allocates collected impact fees for construction of the capital improvements; and
(iv) covers at least a 5-year period and is reviewed and updated at least every 5 years.

(3) The service area report is a written analysis that must contain documentation of sources and methodology used for purposes of subsection (2) and must document how each impact fee meets the requirements of subsection (7).

(4) The service area report that supports adoption and calculation of an impact fee must be available to the public upon request.

(5) The amount of each impact fee imposed must be based upon the actual cost of public facility expansion or improvements or reasonable estimates of the cost to be incurred by the governmental entity as a result of new development. The calculation of each impact fee must be in accordance with generally accepted accounting principles.

(6) The ordinance or resolution adopting the impact fee must include a time schedule for periodically updating the documentation required under subsection (2).

(7) An impact fee must meet the following requirements:

(a) The amount of the impact fee must be reasonably related to and reasonably attributable to the development's share of the cost of infrastructure improvements made necessary by the new development.

(b) The impact fees imposed may not exceed a proportionate share of the costs incurred or to be incurred by the governmental entity in accommodating the development. The following factors must be considered in determining a proportionate share of public facilities capital improvements costs:

(i) the need for public facilities capital improvements required to serve new development; and
(ii) consideration of payments for system improvements reasonably anticipated to be made by or as a result of the development in the form of user fees, debt service payments, taxes, and other available sources of funding the system improvements.

(c) Costs for correction of existing deficiencies in a public facility may not be included in the impact fee.

(d) New development may not be held to a higher level of service than existing users unless there is a mechanism in place for the existing users to make improvements to the existing system to match the higher level of service.

(e) Impact fees may not include expenses for operations and maintenance of the facility.

7-6-1603. Collection and expenditure of impact fees -- refunds or credits -- mechanism for appeal required.

(1) The collection and expenditure of impact fees must comply with this part. The collection and expenditure of impact fees must be reasonably related to the benefits accruing to the development paying the impact fees. The ordinance or resolution adopted by the governmental entity must include the following requirements:

(a) Upon collection, impact fees must be deposited in a special proprietary fund, which must be invested with all interest accruing to the fund.

(b) A governmental entity may impose impact fees on behalf of local districts.

(c) If the impact fees are not collected or spent in accordance with the impact fee ordinance or resolution or in accordance with 7-6-1602, any impact fees that were collected must be refunded to the person who owned the property at the time that the refund was due.

(2) All impact fees imposed pursuant to the authority granted in this part must be paid no earlier than the date of issuance of a building permit if a building permit is required for the development or no earlier than the time of wastewater or water service connection or well or septic permitting.

(3) A governmental entity may recoup costs of excess capacity in existing capital facilities, when the excess capacity has been provided in anticipation of the needs of new development, by requiring impact fees for that portion of the facilities constructed for future users. The need to recoup costs for excess capacity must have been documented pursuant to 7-6-1602 in a manner that demonstrates the need for the excess capacity. This part does not prevent a governmental entity from continuing to assess an impact fee that recoups costs for excess capacity in an existing facility. The impact fees imposed to recoup the costs to provide the excess capacity must be based on the governmental entity's actual cost of acquiring, constructing, or upgrading the facility and must be no more than a proportionate share of the costs to provide the excess capacity.

(4) Governmental entities may accept the dedication of land or the construction of public facilities in lieu of payment of impact fees if:

(a) the need for the dedication or construction is clearly documented pursuant to 7-6-1602;

(b) the land proposed for dedication for the public facilities to be constructed is determined to be appropriate for the proposed use by the governmental entity;

(c) formulas or procedures for determining the worth of proposed dedications or constructions are established as part of the impact fee ordinance or resolution; and

(d) a means to establish credits against future impact fee revenue has been created as part of the adopting ordinance or resolution if the dedication of land or construction of public facilities is of worth in excess of the impact fee due from an individual development.

(5) Impact fees may not be imposed for remodeling, rehabilitation, or other improvements to an existing structure or for rebuilding a damaged structure unless there is an increase in units that increase service demand as described in 7-6-1602(2)(j). If impact fees are imposed for remodeling, rehabilitation, or other improvements to an existing structure or use, only the net increase between the old and new demand may be imposed.

(6) This part does not prevent a governmental entity from granting refunds or credits:

(a) that it considers appropriate and that are consistent with the provisions of 7-6-1602 and this chapter; or

(b) in accordance with a voluntary agreement, consistent with the provisions of 7-6-1602 and this chapter, between the governmental entity and the individual or entity being assessed the impact fees.

(7) An impact fee represents a fee for service payable by all users creating additional demand on the facility.

(8) An impact fee ordinance or resolution must include a mechanism whereby a person charged an impact fee may appeal the charge if the person believes an error has been made.

7-6-1604. Impact fee advisory committee.

(1) A governmental entity that intends to propose an impact fee ordinance or resolution shall establish an impact fee advisory committee.

(2) An impact fee advisory committee must include at least one representative of the development community. The committee shall review and monitor the process of calculating, assessing, and spending impact fees.

(3) The impact fee advisory committee shall serve in an advisory capacity to the governing body of the governmental entity.

Texas Impact Fee Statute

Sec. 395.001. DEFINITIONS.

In this chapter:

(1) "Capital improvement" means any of the following facilities that have a life expectancy of three or more years and are owned and operated by or on behalf of a political subdivision:

(A) water supply, treatment, and distribution facilities; wastewater collection and treatment facilities; and storm water, drainage, and flood control facilities; whether or not they are located within the service area; and

(B) roadway facilities.

(2) "Capital improvements plan" means a plan required by this chapter that identifies capital improvements or facility expansions for which impact fees may be assessed.

(3) "Facility expansion" means the expansion of the capacity of an existing facility that serves the same function as an otherwise necessary new capital improvement, in order that the existing facility may serve new development. The term does not include the repair, maintenance, modernization, or expansion of an existing facility to better serve existing development.

(4) "Impact fee" means a charge or assessment imposed by a political subdivision against new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development. The term includes amortized charges, lump-sum charges, capital recovery fees, contributions in aid of construction, and any other fee that functions as described by this definition. The term does not include:

(A) dedication of land for public parks or payment in lieu of the dedication to serve park needs;

(B) dedication of rights-of-way or easements or construction or dedication of on-site or off-site water distribution, wastewater collection or drainage facilities, or streets, sidewalks, or curbs if the dedication or construction is required by a valid ordinance and is necessitated by and attributable to the new development;

(C) lot or acreage fees to be placed in trust funds for the purpose of reimbursing developers for oversizing or constructing water or sewer mains or lines; or

(D) other pro rata fees for reimbursement of water or sewer mains or lines extended by the political subdivision.

However, an item included in the capital improvements plan may not be required to be constructed except in accordance with Section 395.019(2), and an owner may not be required to construct or dedicate facilities and to pay impact fees for those facilities.

(5) "Land use assumptions" includes a description of the service area and projections of changes in land uses, densities, intensities, and population in the service area over at least a 10-year period.

(6) "New development" means the subdivision of land; the construction, reconstruction, redevelopment, conversion, structural alteration, relocation, or enlargement of any structure; or any use or extension of the use of land; any of which increases the number of service units.

(7) "Political subdivision" means a municipality, a district or authority created under Article III, Section 52, or Article XVI, Section 59, of the Texas Constitution, or, for the purposes set forth by Section 395.079, certain counties described by that section.

(8) "Roadway facilities" means arterial or collector streets or roads that have been designated on an officially adopted roadway plan of the political subdivision, together with all necessary appurtenances. The term includes the political subdivision's share of costs for roadways and associated improvements designated on the federal or Texas highway system, including local matching funds and costs related to utility line relocation and the establishment of curbs, gutters, sidewalks, drainage appurtenances, and rights-of-way.

(9) "Service area" means the area within the corporate boundaries or extraterritorial jurisdiction, as determined under Chapter 42, of the political subdivision to be served by the capital improvements or facilities expansions specified in the capital improvements plan, except roadway facilities and storm water, drainage, and flood control facilities. The service area, for the purposes of this chapter, may include all or part of the land within the political subdivision or its extraterritorial jurisdiction, except for roadway facilities and storm water, drainage, and flood control facilities. For roadway facilities, the service area is limited to an area within the corporate boundaries of the political subdivision and shall not exceed six miles. For storm water, drainage, and flood control facilities, the service area may include all or part of the land within the political subdivision or its extraterritorial jurisdiction, but shall not exceed the area actually served by the storm water, drainage, and flood control facilities designated in the capital improvements plan and shall not extend across watershed boundaries.

(10) "Service unit" means a standardized measure of consumption, use, generation, or discharge attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards and based on historical data and trends applicable to the political subdivision in which the individual unit of development is located during the previous 10 years.

SUBCHAPTER B. AUTHORIZATION OF IMPACT FEE

Sec. 395.011. AUTHORIZATION OF FEE.

(a) Unless otherwise specifically authorized by state law or this chapter, a governmental entity or political subdivision may not enact or impose an impact fee.

(b) Political subdivisions may enact or impose impact fees on land within their corporate boundaries or extraterritorial jurisdictions only by complying with this chapter, except that impact fees may not be enacted or imposed in the extraterritorial jurisdiction for roadway facilities.

(c) A municipality may contract to provide capital improvements, except roadway facilities, to an area outside its corporate boundaries and extraterritorial jurisdiction and may charge an impact fee under the contract, but if an impact fee is charged in that area, the municipality must comply with this chapter.

Sec. 395.012. ITEMS PAYABLE BY FEE.

(a) An impact fee may be imposed only to pay the costs of constructing capital improvements or facility expansions, including and limited to the:

(1) construction contract price;
(2) surveying and engineering fees;
(3) land acquisition costs, including land purchases, court awards and costs, attorney ’s fees, and expert witness fees; and
(4) fees actually paid or contracted to be paid to an independent qualified engineer or financial consultant preparing or updating the capital improvements plan who is not an employee of the political subdivision.

(b) Projected interest charges and other finance costs may be included in determining the amount of impact fees only if the impact fees are used for the payment of principal and interest on bonds, notes, or other obligations issued by or on behalf of the political subdivision to finance the capital improvements or facility expansions identified in the capital improvements plan and are not used to reimburse bond funds expended for facilities that are not identified in the capital improvements plan.

(c) Notwithstanding any other provision of this chapter, the Edwards Underground Water District or a river authority that is authorized elsewhere by state law to charge fees that function as impact fees may use impact fees to pay a staff engineer who prepares or updates a capital improvements plan under this chapter.

(d) A municipality may pledge an impact fee as security for the payment of debt service on a bond, note, or other obligation issued to finance a capital improvement or public facility expansion if:

(1) the improvement or expansion is identified in a capital improvements plan; and

(2) at the time of the pledge, the governing body of the municipality certifies in a written order, ordinance, or resolution that none of the impact fee will be used or expended for an improvement or expansion not identified in the plan.

(e) A certification under Subsection (d)(2) is sufficient evidence that an impact fee pledged will not be used or expended for an improvement or expansion that is not identified in the capital improvements plan.

Sec. 395.013. ITEMS NOT PAYABLE BY FEE.

Impact fees may not be adopted or used to pay for:

(1) construction, acquisition, or expansion of public facilities or assets other than capital improvements or facility expansions identified in the capital improvements plan;

(2) repair, operation, or maintenance of existing or new capital improvements or facility expansions;

(3) upgrading, updating, expanding, or replacing existing capital improvements to serve existing development in order to meet stricter safety, efficiency, environmental, or regulatory standards;

(4) upgrading, updating, expanding, or replacing existing capital improvements to provide better service to existing development;

(5) administrative and operating costs of the political subdivision, except the Edwards Underground Water District or a river authority that is authorized elsewhere by state law to charge fees that function as impact fees may use impact fees to pay its administrative and operating costs;

(6) principal payments and interest or other finance charges on bonds or other indebtedness, except as allowed by Section 395.012.

Sec. 395.014. CAPITAL IMPROVEMENTS PLAN.

(a) The political subdivision shall use qualified professionals to prepare the capital improvements plan and to calculate the impact fee. The capital improvements plan must contain specific enumeration of the following items:

(1) a description of the existing capital improvements within the service area and the costs to upgrade, update, improve, expand, or replace the improvements to meet existing needs and usage and stricter safety, efficiency, environmental, or regulatory standards, which shall be prepared by a qualified professional engineer licensed to perform the professional engineering services in this state;

(2) an analysis of the total capacity, the level of current usage, and commitments for usage of capacity of the existing capital improvements, which shall be prepared by a qualified professional engineer licensed to perform the professional engineering services in this state;

(3) a description of all or the parts of the capital improvements or facility expansions and their costs necessitated by and attributable to new development in the service area based on the approved land use assumptions, which shall be prepared by a qualified professional engineer licensed to perform the professional engineering services in this state;

(4) a definitive table establishing the specific level or quantity of use, consumption, generation, or discharge of a service unit for each category of capital improvements or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial, and industrial;

(5) the total number of projected service units necessitated by and attributable to new development within the service area based on the approved land use assumptions and calculated in accordance with generally accepted engineering or planning criteria;

(6) the projected demand for capital improvements or facility expansions required by new service units projected over a reasonable period of time, not to exceed 10 years; and

(7) a plan for awarding:

(A) a credit for the portion of ad valorem tax and utility service revenues generated by new service units during the program period that is used for the payment of improvements, including the payment of debt, that are included in the capital improvements plan; or

(B) in the alternative, a credit equal to 50 percent of the total projected cost of implementing the capital improvements plan.

(b) The analysis required by Subsection (a)(3) may be prepared on a system-wide basis within the service area for each major category of capital improvement or facility expansion for the designated service area.

(c) The governing body of the political subdivision is responsible for supervising the implementation of the capital improvements plan in a timely manner.

Sec. 395.015. MAXIMUM FEE PER SERVICE UNIT.

(a) The impact fee per service unit may not exceed the amount determined by subtracting the amount in Section 395.014(a)(7) from the costs of the capital improvements described by Section 395.014(a)(3) and dividing that amount by the total number of projected service units described by Section 395.014(a)(5).

(b) If the number of new service units projected over a reasonable period of time is less than the total number of new service units shown by the approved land use assumptions at full development of the service area, the maximum impact fee per service unit shall be calculated by dividing the costs of the part of the capital improvements necessitated by and attributable to projected new service units described by Section 395.014(a)(6) by the projected new service units described in that section.

Sec. 395.016. TIME FOR ASSESSMENT AND COLLECTION OF FEE.

(a) This subsection applies only to impact fees adopted and land platted before June 20, 1987. For land that has been platted in accordance with Subchapter A, Chapter 212, or the subdivision or platting procedures of a political subdivision before June 20, 1987, or land on which new development occurs or is proposed without platting, the political subdivision may assess the impact fees at any time during the development approval and building process. Except as provided by Section 395.019, the political subdivision may collect the fees at either the time of recordation of the subdivision plat or connection

to the political subdivision ’s water or sewer system or at the time the political subdivision issues either the building permit or the certificate of occupancy.

(b) This subsection applies only to impact fees adopted before June 20, 1987, and land platted after that date. For new development which is platted in accordance with Subchapter A, Chapter 212, or the subdivision or platting procedures of a political subdivision after June 20, 1987, the political subdivision may assess the impact fees before or at the time of recordation. Except as provided by Section 395.019, the political subdivision may collect the fees at either the time of recordation of the subdivision plat or connection to the political subdivision ’s water or sewer system or at the time the political subdivision issues either the building permit or the certificate of occupancy.

(c) This subsection applies only to impact fees adopted after June 20, 1987. For new development which is platted in accordance with Subchapter A, Chapter 212, or the subdivision or platting procedures of a political subdivision before the adoption of an impact fee, an impact fee may not be collected on any service unit for which a valid building permit is issued within one year after the date of adoption of the impact fee.

(d) This subsection applies only to land platted in accordance with Subchapter A, Chapter 212, or the subdivision or platting procedures of a political subdivision after adoption of an impact fee adopted after June 20, 1987. The political subdivision shall assess the impact fees before or at the time of recordation of a subdivision plat or other plat under Subchapter A, Chapter 212, or the subdivision or platting ordinance or procedures of any political subdivision in the official records of the county clerk of the county in which the tract is located. Except as provided by Section 395.019, if the political subdivision has water and wastewater capacity available:

> (1) the political subdivision shall collect the fees at the time the political subdivision issues a building permit;
>
> (2) for land platted outside the corporate boundaries of a municipality, the municipality shall collect the fees at the time an application for an individual meter connection to the municipality ’s water or wastewater system is filed; or
>
> (3) a political subdivision that lacks authority to issue building permits in the area where the impact fee applies shall collect the fees at the time an application is filed for an individual meter connection to the political subdivision ’s water or wastewater system.

(e) For land on which new development occurs or is proposed to occur without platting, the political subdivision may assess the impact fees at any time during the development and building process and may collect the fees at either the time of recordation of the subdivision plat or connection to the political subdivision’s water or sewer system or at the time the political subdivision issues either the building permit or the certificate of occupancy.

(f) An "assessment" means a determination of the amount of the impact fee in effect on the date or occurrence provided in this section and is the maximum amount that can be charged per service unit of such development. No specific act by the political subdivision is required.

(g) Notwithstanding Subsections (a)-(e) and Section 395.017, the political subdivision may reduce or waive an impact fee for any service unit that would qualify as affordable housing under 42 U.S.C. Section 12745, as amended, once the service unit is constructed. If affordable housing as defined by 42 U.S.C. Section 12745, as amended, is not constructed, the political subdivision may reverse its decision to waive or reduce the impact fee, and the political subdivision may assess an impact fee at any time during the development approval or building process or after the building process if an impact fee was not already assessed.

Sec. 395.017. ADDITIONAL FEE PROHIBITED; EXCEPTION.

After assessment of the impact fees attributable to the new development or execution of an agreement for payment of impact fees, additional impact fees or increases in fees may not be assessed against the tract for any reason unless the number of service units to be developed on the tract increases. In the event of the increase in the number of service units, the impact fees to be imposed are limited to the amount attributable to the additional service units.

Sec. 395.018. AGREEMENT WITH OWNER REGARDING PAYMENT.

A political subdivision is authorized to enter into an agreement with the owner of a tract of land for which the plat has been recorded providing for the time and method of payment of the impact fees.

Sec. 395.019. COLLECTION OF FEES IF SERVICES NOT AVAILABLE.

Except for roadway facilities, impact fees may be assessed but may not be collected in areas where services are not currently available, unless:

(1) the collection is made to pay for a capital improvement or facility expansion that has been identified in the capital improvements plan and the political subdivision commits to commence construction within two years, under duly awarded and executed contracts or commitments of staff time covering substantially all of the work required to provide service, and to have the service available within a reasonable period of time considering the type of capital improvement or facility expansion to be constructed, but in no event longer than five years;

(2) the political subdivision agrees that the owner of a new development may construct or finance the capital improvements or facility expansions and agrees that the costs incurred or funds advanced will be credited against the impact fees otherwise due from the new development or agrees to reimburse the owner for such costs from impact fees paid from other new developments that will use such capital improvements or facility expansions, which fees shall be collected and reimbursed to the owner at the time the other new development records its plat; or

(3) an owner voluntarily requests the political subdivision to reserve capacity to serve future development, and the political subdivision and owner enter into a valid written agreement.

Sec. 395.020. ENTITLEMENT TO SERVICES.

Any new development for which an impact fee has been paid is entitled to the permanent use and benefit of the services for which the fee was exacted and is entitled to receive immediate service from any existing facilities with actual capacity to serve the new service units, subject to compliance with other valid regulations.

Sec. 395.021. AUTHORITY OF POLITICAL SUBDIVISIONS TO SPEND FUNDS TO REDUCE FEES.

Political subdivisions may spend funds from any lawful source to pay for all or a part of the capital improvements or facility expansions to reduce the amount of impact fees.

Sec. 395.022. AUTHORITY OF POLITICAL SUBDIVISION TO PAY FEES.

Political subdivisions and other governmental entities may pay impact fees imposed under this chapter.

Sec. 395.023. CREDITS AGAINST ROADWAY FACILITIES FEES.

Any construction of, contributions to, or dedications of off-site roadway facilities agreed to or required by a political subdivision as a condition of development approval shall be credited against roadway facilities impact fees otherwise due from the development.

Sec. 395.024. ACCOUNTING FOR FEES AND INTEREST.

(a) The order, ordinance, or resolution levying an impact fee must provide that all funds collected through the adoption of an impact fee shall be deposited in interest-bearing accounts clearly identifying the category of capital improvements or facility expansions within the service area for which the fee was adopted.

(b) Interest earned on impact fees is considered funds of the account on which it is earned and is subject to all restrictions placed on use of impact fees under this chapter.

(c) Impact fee funds may be spent only for the purposes for which the impact fee was imposed as shown by the capital improvements plan and as authorized by this chapter.

(d) The records of the accounts into which impact fees are deposited shall be open for public inspection and copying during ordinary business hours.

Sec. 395.025. REFUNDS.

(a) On the request of an owner of the property on which an impact fee has been paid, the political subdivision shall refund the impact fee if existing facilities are available and service is denied or the political subdivision has, after collecting the fee when service was not available, failed to commence construction within two years or service is not available within a reasonable period considering the

type of capital improvement or facility expansion to be constructed, but in no event later than five years from the date of payment under Section 395.019(1).

(b) Repealed by Acts 2001, 77th Leg., ch. 345, Sec. 9, eff. Sept. 1, 2001.

(c) The political subdivision shall refund any impact fee or part of it that is not spent as authorized by this chapter within 10 years after the date of payment.

(d) Any refund shall bear interest calculated from the date of collection to the date of refund at the statutory rate as set forth in Section 302.002, Finance Code, or its successor statute.

(e) All refunds shall be made to the record owner of the property at the time the refund is paid. However, if the impact fees were paid by another political subdivision or governmental entity, payment shall be made to the political subdivision or governmental entity.

(f) The owner of the property on which an impact fee has been paid or another political subdivision or governmental entity that paid the impact fee has standing to sue for a refund under this section.

SUBCHAPTER C. PROCEDURES FOR ADOPTION OF IMPACT FEE

Sec. 395.041. COMPLIANCE WITH PROCEDURES REQUIRED.

Except as otherwise provided by this chapter, a political subdivision must comply with this subchapter to levy an impact fee.

Sec. 395.0411. CAPITAL IMPROVEMENTS PLAN.

The political subdivision shall provide for a capital improvements plan to be developed by qualified professionals using generally accepted engineering and planning practices in accordance with Section 395.014.

Sec. 395.042. HEARING ON LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN.

To impose an impact fee, a political subdivision must adopt an order, ordinance, or resolution establishing a public hearing date to consider the land use assumptions and capital improvements plan for the designated service area.

Sec. 395.043. INFORMATION ABOUT LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN AVAILABLE TO PUBLIC.

On or before the date of the first publication of the notice of the hearing on the land use assumptions and capital improvements plan, the political subdivision shall make available to the public its land use assumptions, the time period of the projections, and a description of the capital improvement facilities that may be proposed.

Sec. 395.044. NOTICE OF HEARING ON LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN.

(a) Before the 30th day before the date of the hearing on the land use assumptions and capital improvements plan, the political subdivision shall send a notice of the hearing by certified mail to any person who has given written notice by certified or registered mail to the municipal secretary or other designated official of the political subdivision requesting notice of the hearing within two years preceding the date of adoption of the order, ordinance, or resolution setting the public hearing.

(b) The political subdivision shall publish notice of the hearing before the 30th day before the date set for the hearing, in one or more newspapers of general circulation in each county in which the political subdivision lies. However, a river authority that is authorized elsewhere by state law to charge fees that function as impact fees may publish the required newspaper notice only in each county in which the service area lies.

(c) The notice must contain:

(1) a headline to read as follows:
"NOTICE OF PUBLIC HEARING ON LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN RELATING TO POSSIBLE ADOPTION OF IMPACT FEES"

(2) the time, date, and location of the hearing;

(3) a statement that the purpose of the hearing is to consider the land use assumptions and capital improvements plan under which an impact fee may be imposed; and

(4) a statement that any member of the public has the right to appear at the hearing and present evidence for or against the land use assumptions and capital improvements plan.

Sec. 395.045. APPROVAL OF LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN REQUIRED.

(a) After the public hearing on the land use assumptions and capital improvements plan, the political subdivision shall determine whether to adopt or reject an ordinance, order, or resolution approving the land use assumptions and capital improvements plan.

(b) The political subdivision, within 30 days after the date of the public hearing, shall approve or disapprove the land use assumptions and capital improvements plan.

(c) An ordinance, order, or resolution approving the land use assumptions and capital improvements plan may not be adopted as an emergency measure.

Sec. 395.0455. SYSTEMWIDE LAND USE ASSUMPTIONS.

(a) In lieu of adopting land use assumptions for each service area, a political subdivision may, except for storm water, drainage, flood control, and roadway facilities, adopt system-wide land use

assumptions, which cover all of the area subject to the jurisdiction of the political subdivision for the purpose of imposing impact fees under this chapter.

(b) Prior to adopting system-wide land use assumptions, a political subdivision shall follow the public notice, hearing, and other requirements for adopting land use assumptions.

(c) After adoption of system-wide land use assumptions, a political subdivision is not required to adopt additional land use assumptions for a service area for water supply, treatment, and distribution facilities or wastewater collection and treatment facilities as a prerequisite to the adoption of a capital improvements plan or impact fee, provided the capital improvements plan and impact fee are consistent with the system-wide land use assumptions.

Sec. 395.047. HEARING ON IMPACT FEE.

On adoption of the land use assumptions and capital improvements plan, the governing body shall adopt an order or resolution setting a public hearing to discuss the imposition of the impact fee. The public hearing must be held by the governing body of the political subdivision to discuss the proposed ordinance, order, or resolution imposing an impact fee.

Sec. 395.049. NOTICE OF HEARING ON IMPACT FEE.

(a) Before the 30th day before the date of the hearing on the imposition of an impact fee, the political subdivision shall send a notice of the hearing by certified mail to any person who has given written notice by certified or registered mail to the municipal secretary or other designated official of the political subdivision requesting notice of the hearing within two years preceding the date of adoption of the order or resolution setting the public hearing.

(b) The political subdivision shall publish notice of the hearing before the 30th day before the date set for the hearing, in one or more newspapers of general circulation in each county in which the political subdivision lies. However, a river authority that is authorized elsewhere by state law to charge fees that function as impact fees may publish the required newspaper notice only in each county in which the service area lies.

(c) The notice must contain the following:

(1) a headline to read as follows:
"NOTICE OF PUBLIC HEARING ON ADOPTION OF IMPACT FEES"

(2) the time, date, and location of the hearing;

(3) a statement that the purpose of the hearing is to consider the adoption of an impact fee;

(4) the amount of the proposed impact fee per service unit; and

(5) a statement that any member of the public has the right to appear at the hearing and present evidence for or against the plan and proposed fee.

Sec. 395.050. ADVISORY COMMITTEE COMMENTS ON IMPACT FEES.

The advisory committee created under Section 395.058 shall file its written comments on the proposed impact fees before the fifth business day before the date of the public hearing on the imposition of the fees.

Sec. 395.051. APPROVAL OF IMPACT FEE REQUIRED.

(a) The political subdivision, within 30 days after the date of the public hearing on the imposition of an impact fee, shall approve or disapprove the imposition of an impact fee.

(b) An ordinance, order, or resolution approving the imposition of an impact fee may not be adopted as an emergency measure.

Sec. 395.052. PERIODIC UPDATE OF LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN REQUIRED.

(a) A political subdivision imposing an impact fee shall update the land use assumptions and capital improvements plan at least every five years. The initial five-year period begins on the day the capital improvements plan is adopted.

(b) The political subdivision shall review and evaluate its current land use assumptions and shall cause an update of the capital improvements plan to be prepared in accordance with Subchapter B.

Sec. 395.053. HEARING ON UPDATED LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN.

The governing body of the political subdivision shall, within 60 days after the date it receives the update of the land use assumptions and the capital improvements plan, adopt an order setting a public hearing to discuss and review the update and shall determine whether to amend the plan.

Sec. 395.054. HEARING ON AMENDMENTS TO LAND USE ASSUMPTIONS, CAPITAL IMPROVEMENTS PLAN, OR IMPACT FEE.

A public hearing must be held by the governing body of the political subdivision to discuss the proposed ordinance, order, or resolution amending land use assumptions, the capital improvements plan, or the impact fee. On or before the date of the first publication of the notice of the hearing on the amendments, the land use assumptions and the capital improvements plan, including the amount of any proposed amended impact fee per service unit, shall be made available to the public.

Sec. 395.055. NOTICE OF HEARING ON AMENDMENTS TO LAND USE ASSUMPTIONS, CAPITAL IMPROVEMENTS PLAN, OR IMPACT FEE.

(a) The notice and hearing procedures prescribed by Sections 395.044(a) and

(b) apply to a hearing on the amendment of land use assumptions, a capital improvements plan, or an impact fee.

(c) The notice of a hearing under this section must contain the following:

(1) a headline to read as follows:
"NOTICE OF PUBLIC HEARING ON AMENDMENT OF IMPACT FEES"

(2) the time, date, and location of the hearing;

(3) a statement that the purpose of the hearing is to consider the amendment of land use assumptions and a capital improvements plan and the imposition of an impact fee; and

(4) a statement that any member of the public has the right to appear at the hearing and present evidence for or against the update.

Sec. 395.056. ADVISORY COMMITTEE COMMENTS ON AMENDMENTS.

The advisory committee created under Section 395.058 shall file its written comments on the proposed amendments to the land use assumptions, capital improvements plan, and impact fee before the fifth business day before the date of the public hearing on the amendments.

Sec. 395.057. APPROVAL OF AMENDMENTS REQUIRED.

(a) The political subdivision, within 30 days after the date of the public hearing on the amendments, shall approve or disapprove the amendments of the land use assumptions and the capital improvements plan and modification of an impact fee.

(b) An ordinance, order, or resolution approving the amendments to the land use assumptions, the capital improvements plan, and imposition of an impact fee may not be adopted as an emergency measure.

Sec. 395.0575. DETERMINATION THAT NO UPDATE OF LAND USE ASSUMPTIONS, CAPITAL IMPROVEMENTS PLAN OR IMPACT FEES IS NEEDED.

(a) If, at the time an update under Section 395.052 is required, the governing body determines that no change to the land use assumptions, capital improvements plan, or impact fee is needed, it may, as an alternative to the updating requirements of Sections 395.052-395.057, do the following:

(1) The governing body of the political subdivision shall, upon determining that an update is unnecessary and 60 days before publishing the final notice under this section, send notice of its determination not to update the land use assumptions, capital improvements plan, and impact fee by certified mail to any person who has, within two years preceding the date that the final notice of this matter is to be published, give written notice by certified or registered mail to the municipal secretary or other designated official of the political subdivision requesting notice

of hearings related to impact fees. The notice must contain the information in Subsections (b)(2)-(5).

(2) The political subdivision shall publish notice of its determination once a week for three consecutive weeks in one or more newspapers with general circulation in each county in which the political subdivision lies. However, a river authority that is authorized elsewhere by state law to charge fees that function as impact fees may publish the required newspaper notice only in each county in which the service area lies. The notice of public hearing may not be in the part of the paper in which legal notices and classified ads appear and may not be smaller than one-quarter page of a standard-size or tabloid-size newspaper, and the headline on the notice must be in 18-point or larger type.

(b) The notice must contain the following:

(1) a headline to read as follows: "NOTICE OF DETERMINATION NOT TO UPDATE LAND USE ASSUMPTIONS, CAPITAL IMPROVEMENTS PLAN, OR IMPACT FEES";

(2) a statement that the governing body of the political subdivision has determined that no change to the land use assumptions, capital improvements plan, or impact fee is necessary;

(3) an easily understandable description and a map of the service area in which the updating has been determined to be unnecessary;

(4) a statement that if, within a specified date, which date shall be at least 60 days after publication of the first notice, a person makes a written request to the designated official of the political subdivision requesting that the land use assumptions, capital improvements plan, or impact fee be updated, the governing body must comply with the request by following the requirements of Sections 395.052-395.057; and

(5) a statement identifying the name and mailing address of the official of the political subdivision to whom a request for an update should be sent.

(c) The advisory committee shall file its written comments on the need for updating the land use assumptions, capital improvements plans, and impact fee before the fifth business day before the earliest notice of the government’s decision that no update is necessary is mailed or published.

(d) If, by the date specified in Subsection (b)(4), a person requests in writing that the land use assumptions, capital improvements plan, or impact fee be updated, the governing body shall cause an update of the land use assumptions and capital improvements plan to be prepared in accordance with Sections 395.052-395.057.

(e) An ordinance, order, or resolution determining the need for updating land use assumptions, a capital improvements plan, or an impact fee may not be adopted as an emergency measure.

Sec. 395.058. ADVISORY COMMITTEE.

(a) On or before the date on which the order, ordinance, or resolution is adopted under Section 395.042, the political subdivision shall appoint a capital improvements advisory committee.

(b) The advisory committee is composed of not less than five members who shall be appointed by a majority vote of the governing body of the political subdivision. Not less than 40 percent of the membership of the advisory committee must be representatives of the real estate, development, or building industries who are not employees or officials of a political subdivision or governmental entity. If the political subdivision has a planning and zoning commission, the commission may act as the advisory committee if the commission includes at least one representative of the real estate, development, or building industry who is not an employee or official of a political subdivision or governmental entity. If no such representative is a member of the planning and zoning commission, the commission may still act as the advisory committee if at least one such representative is appointed by the political subdivision as an ad hoc voting member of the planning and zoning commission when it acts as the advisory committee. If the impact fee is to be applied in the extraterritorial jurisdiction of the political subdivision, the membership must include a representative from that area.

(c) The advisory committee serves in an advisory capacity and is established to:

(1) advise and assist the political subdivision in adopting land use assumptions;

(2) review the capital improvements plan and file written comments;

(3) monitor and evaluate implementation of the capital improvements plan;

(4) file semiannual reports with respect to the progress of the capital improvements plan and report to the political subdivision any perceived inequities in implementing the plan or imposing the impact fee; and

(5) advise the political subdivision of the need to update or revise the land use assumptions, capital improvements plan, and impact fee.

(d) The political subdivision shall make available to the advisory committee any professional reports with respect to developing and implementing the capital improvements plan.

(e) The governing body of the political subdivision shall adopt procedural rules for the advisory committee to follow in carrying out its duties.

SUBCHAPTER D. OTHER PROVISIONS

Sec. 395.071. DUTIES TO BE PERFORMED WITHIN TIME LIMITS.

If the governing body of the political subdivision does not perform a duty imposed under this chapter within the prescribed period, a person who has paid an impact fee or an owner of land on which an impact fee has been paid has the right to present a written request to the governing body of the

political subdivision stating the nature of the unperformed duty and requesting that it be performed within 60 days after the date of the request. If the governing body of the political subdivision finds that the duty is required under this chapter and is late in being performed, it shall cause the duty to commence within 60 days after the date of the request and continue until completion.

Sec. 395.072. RECORDS OF HEARINGS.

A record must be made of any public hearing provided for by this chapter. The record shall be maintained and be made available for public inspection by the political subdivision for at least 10 years after the date of the hearing.

Sec. 395.073. CUMULATIVE EFFECT OF STATE AND LOCAL RESTRICTIONS.

Any state or local restrictions that apply to the imposition of an impact fee in a political subdivision where an impact fee is proposed are cumulative with the restrictions in this chapter.

Sec. 395.074. PRIOR IMPACT FEES REPLACED BY FEES UNDER THIS CHAPTER.

An impact fee that is in place on June 20, 1987, must be replaced by an impact fee made under this chapter on or before June 20, 1990. However, any political subdivision having an impact fee that has not been replaced under this chapter on or before June 20, 1988, is liable to any party who, after June 20, 1988, pays an impact fee that exceeds the maximum permitted under Subchapter B by more than 10 percent for an amount equal to two times the difference between the maximum impact fee allowed and the actual impact fee imposed, plus reasonable attorney's fees and court costs.

Sec. 395.075. NO EFFECT ON TAXES OR OTHER CHARGES.

This chapter does not prohibit, affect, or regulate any tax, fee, charge, or assessment specifically authorized by state law.

Sec. 395.076. MORATORIUM ON DEVELOPMENT PROHIBITED.

A moratorium may not be placed on new development for the purpose of awaiting the completion of all or any part of the process necessary to develop, adopt, or update land use assumptions, a capital improvements plan, or an impact fee.

Sec. 395.077. APPEALS.

(a) A person who has exhausted all administrative remedies within the political subdivision and who is aggrieved by a final decision is entitled to trial de novo under this chapter.

(b) A suit to contest an impact fee must be filed within 90 days after the date of adoption of the ordinance, order, or resolution establishing the impact fee.

(c) Except for roadway facilities, a person who has paid an impact fee or an owner of property on which an impact fee has been paid is entitled to specific performance of the services by the political subdivision for which the fee was paid.

(d) This section does not require construction of a specific facility to provide the services.

(e) Any suit must be filed in the county in which the major part of the land area of the political subdivision is located. A successful litigant shall be entitled to recover reasonable attorney's fees and court costs.

Sec. 395.078. SUBSTANTIAL COMPLIANCE WITH NOTICE REQUIREMENTS.

An impact fee may not be held invalid because the public notice requirements were not complied with if compliance was substantial and in good faith.

Sec. 395.079. IMPACT FEE FOR STORM WATER, DRAINAGE, AND FLOOD CONTROL IN POPULOUS COUNTY.

(a) Any county that has a population of 3.3 million or more or that borders a county with a population of 3.3 million or more, and any district or authority created under Article XVI, Section 59, of the Texas Constitution within any such county that is authorized to provide storm water, drainage, and flood control facilities, is authorized to impose impact fees to provide storm water, drainage, and flood control improvements necessary to accommodate new development.

(b) The imposition of impact fees authorized by Subsection (a) is exempt from the requirements of Sections 395.025, 395.052-395.057, and 395.074 unless the political subdivision proposes to increase the impact fee.

(c) Any political subdivision described by Subsection (a) is authorized to pledge or otherwise contractually obligate all or part of the impact fees to the payment of principal and interest on bonds, notes, or other obligations issued or incurred by or on behalf of the political subdivision and to the payment of any other contractual obligations.
(d) An impact fee adopted by a political subdivision under Subsection (a) may not be reduced if:

(1) the political subdivision has pledged or otherwise contractually obligated all or part of the impact fees to the payment of principal and interest on bonds, notes, or other obligations issued by or on behalf of the political subdivision; and

(2) the political subdivision agrees in the pledge or contract not to reduce the impact fees during the term of the bonds, notes, or other contractual obligations.

Sec. 395.080. CHAPTER NOT APPLICABLE TO CERTAIN WATER-RELATED SPECIAL DISTRICTS.

(a) This chapter does not apply to impact fees, charges, fees, assessments, or contributions:

(1) paid by or charged to a district created under Article XVI, Section 59, of the Texas Constitution to another district created under that constitutional provision if both districts are required by law to obtain approval of their bonds by the Texas Natural Resource Conservation Commission; or

(2) charged by an entity if the impact fees, charges, fees, assessments, or contributions are approved by the Texas Natural Resource Conservation Commission.

(b) Any district created under Article XVI, Section 59, or Article III, Section 52, of the Texas Constitution may petition the Texas Natural Resource Conservation Commission for approval of any proposed impact fees, charges, fees, assessments, or contributions. The commission shall adopt rules for reviewing the petition and may charge the petitioner fees adequate to cover the cost of processing and considering the petition. The rules shall require notice substantially the same as that required by this chapter for the adoption of impact fees and shall afford opportunity for all affected parties to participate.

Sec. 395.081. FEES FOR ADJOINING LANDOWNERS IN CERTAIN MUNICIPALITIES.

(a) This section applies only to a municipality with a population of 105,000 or less that constitutes more than three-fourths of the population of the county in which the majority of the area of the municipality is located.

(b) A municipality that has not adopted an impact fee under this chapter that is constructing a capital improvement, including sewer or waterline or drainage or roadway facilities, from the municipality to a development located within or outside the municipality ’s boundaries, in its discretion, may allow a landowner whose land adjoins the capital improvement or is within a specified distance from the capital improvement, as determined by the governing body of the municipality, to connect to the capital improvement if:

(1) the governing body of the municipality has adopted a finding under Subsection (c); and

(2) the landowner agrees to pay a proportional share of the cost of the capital improvement as determined by the governing body of the municipality and agreed to by the landowner.

(c) Before a municipality may allow a landowner to connect to a capital improvement under Subsection (b), the municipality shall adopt a finding that the municipality will benefit from allowing the landowner to connect to the capital improvement. The finding shall describe the benefit to be received by the municipality.

(d) A determination of the governing body of a municipality, or its officers or employees, under this section is a discretionary function of the municipality and the municipality and its officers or employees are not liable for a determination made under this section.

Sec. 395.082. CERTIFICATION OF COMPLIANCE REQUIRED.

(a) A political subdivision that imposes an impact fee shall submit a written certification verifying compliance with this chapter to the attorney general each year not later than the last day of the political subdivision's fiscal year.

(b) The certification must be signed by the presiding officer of the governing body of a political subdivision and include a statement that reads substantially similar to the following: "This statement certifies compliance with Chapter 395, Local Government Code."

(c) A political subdivision that fails to submit a certification as required by this section is liable to the state for a civil penalty in an amount equal to 10 percent of the amount of the impact fees erroneously charged. The attorney general shall collect the civil penalty and deposit the amount collected to the credit of the housing trust fund.

APPENDIX E

Resources

Web Resources

Impact Fees
NAHB www.nahb.org/infrastructurefinance
Impact Fees.com (Duncan and Associates) www.impactfees.com
National Impact Fee Roundtable www.impactfees.org
National Association of REALTORS http://www.realtor.org/library/library/fg805
American Planning Association http://www.planning.org/policyguides/impactfees.html
HUD http://www.huduser.org/publications/affhsg/impactfees.html

School Impact Fees
National Clearinghouse for Educational Facilities www.edfacilities.org/rl/impact_fees.cfm

Infrastructure Finance Alternatives
Council of Development Finance Agencies www.cdfa.net
National Conference of State Legislatures www.ncsl.org

NAHB PUBLISHED RESOURCES

An Overview of Special Purpose Taxing Districts Proportionate-Share Impact Fees
Building for Tomorrow: Innovative Infrastructure Solutions
Infrastructure Finance: Does Your State Encourage Innovation
Infrastructure Solutions – Best Practices from Solution Oriented States

AGENDA FORM

Date of City Council meeting: February 3rd

Name of Person Making Presentation: Kyle Arbizu

Address: PO BOX 727
Santa Clara, Utah 84765

Contact #:

Phone: 435-632-1493

e-mail: karbizu@pprmco.com

Approximate length of discussion: 10 Minutes may depend on council's questions

Description of item to be discussed: See explanation at the bottom of the page

If this is a complaint issue:

Have you tried to resolve the issue with staff? __ yes __x__ no

If yes, with whom? _____

If you have a power point presentation, we would encourage you to keep it under 10 minutes. All other items discussed will be done as quickly and as efficiently as possible.

We appreciate the time and consideration of the Hurricane City Council considering this request. Between construction costs, inflation, and higher interest rates, it's become challenging to bring medium to high-density projects to fruition. We feel that these types of projects fill a necessary gap in the housing market. Not all person(s) moving to Southern Utah are looking to buy a home. It also provides additional housing to those person(s) just starting out, relocating, or experiencing changes in their living circumstances.

We're constructing 18 apartments on parcel H-4-2-4-3211. Our project contains only four two-bedrooms, six one-bedrooms, and eight studio apartments. This project site requires little to no additional work from the City for roads, and any new parking and roads for this project are being paid for, maintained, and installed by the developer. The estimate for our project that was provided by the City is $41,292. We're seeking a reduction of 60% or $24,775.20 so the project would still be paying $16,516.80.

Lastly, we believe that City parks and trails are an essential part of the feel of Southern Utah. That being said, due to our unit sizing and the fact that the apartments will house fewer citizens than most homes and townhomes. Our estimate that was provided has Park and Recreation for the project at $55,962. We're seeking a 50% reduction or $27,981. This still leaves this single project contributing over $27,981 to parks and trails or $1,554.50 per residence.

Thank you for your time and consideration.

Estimate Fees

↳ **Multi-Family**

First, complete the information below. Then, click the "Estimate" button on the bottom of the page.

Fee Based Occupancies

:: use numbers only

ICC R-2 Residential Multiple Family 5B Garage Area (remove)
Square Feet: 2430
Declared Value: $30,000.00
Calculated Value: $60,750.00 ← selected

ICC R-2 Residential Multiple Family 5B Living Area (remove)
Square Feet: 11920
Declared Value: $500,000.00
Calculated Value: $679,440.00 ← selected

Fee Based Information

:: use numbers only

☑	Number of Units	18 *

Project Fees

:: use numbers only

☐		**GROUP > 120/240 - Single Phase**		
☐		Clean Up Deposit Commercial	1 @	$1,500.00 +
☑		Habitat Fee - Multifamily	1 @	(0.2% x selected occupancy types) *
☑		Multi-Family Permit Fee	1 @	(Table 1-A based on selected occupancy types) *
☑		Multi-Family State Tax Fee	1 @	(1% x Multi-Family Permit Fee) *
☑	ⓘ	Park & Rec	1 @	($3,109.00 per Number of Units)
☐		Parks-MultiFamily Adjusted	1 @	$3109.00
☑	ⓘ	Plan Review	1 @	$2846.00
☐		Plan Review Deposit	1 @	$1,000.00
☐		Plan Review-Multi Family	1 @	$1000.00
☑		Power Conn-Multi Family-Adjusted	1 @	$4503.00
☐		Power Conn. - Residential Underground (New)	1 @	$237.00
☐	ⓘ	Power Impact - Residential 200 AMP	1 @	($1,946.00 per Number of Units)
☑		Power Impact 200 amp-Multi Family-Adjusted	1 @	$36974.00

Your Fee Estimate

Based On Your Selection

FEES	> $173,030.67
Habitat Fee - Multifamily	$1,480.38
Multi-Family Permit Fee	$4,378.50
Multi-Family State Tax Fee	$43.79
Park & Rec	$55,962.00
Plan Review	$2,846.00
Power Conn-Multi Family-Adjusted	$4,503.00
Power Impact 200 amp-Multi Family-Adjusted	$36,974.00
Public Safety-Multi Family	$4,626.00
Streets Impact - Residential	$41,292.00
Water Connection 2"	$5,483.00
Water Impact Fee 2"	$15,442.00

Questions

For questions, use this contact information.

Tami Jones
Building
(435) 635-2811 x122 Ph.
(435) 635-2184 Fax
tami@cityofhurricane.com
www.cityofhurricane.com

Mailing Address
147 N 870 W
Hurricane, UT 84737

Physical Address
147 N 870 W
Hurricane, UT 84737
(view map)

☐		Power Impact-Residential 125 amp	1 @	$0
☐	ⓘ	Public Safety Impact - Residential	1 @	($421.00 per Number of Units)
☑		Public Safety-Multi Family	1 @	($257.00 per Number of Units)
☐		Public Safety-Multi Family-Adjusted	1 @	$257.00
☑	ⓘ	Streets Impact - Residential	1 @	($2,294.00 per Number of Units)
☐		Streets-MultiFamily Adjusted	1 @	$2294.00
☐		Water Connection 1"	1 @	$1,315.00
☐		Water Connection 1.5"	1 @	$2,924.00
☑		Water Connection 2"	1 @	$5,483.00
☐		Water Connection 3/4"	1 @	$731.00
☐	ⓘ	Water Connection 5/8"	1 @	($550.00 per Number of Units)
☐		Water Impact 1"-New	1 @	$3,860.00
☐	ⓘ	Water Impact 5/8"	1 @	($884.00 per Number of Units)
☐		Water Impact 5/8"-New	1 @	$1,508.00
☐		Water Impact Fee 1.5"	1 @	$5,092.00
☑		Water Impact Fee 2"	1 @	$15,442.00
☐		Water Impact Fee 3/4"	1 @	$1,273.00

Disclaimer

This information is to give you a general idea of permit fees and is subject to change.

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS

LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CITY OF HURRICANE AND ASH CREEK SPECIAL SERVICE DISTRICT "STANDARD SPECIFICATIONS FOR DESIGN AND CONSTRUCTION".

2. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE. ANY AND ALL IMPROVEMENTS OR STRUCTURES WHICH ARE DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED SATISFACTORY TO THE CITY OF HURRICANE AND THE OWNER AT THE EXPENSE OF THE CONTRACTOR.

3. THE CONTRACTOR SHALL NOT BACKFILL ANY UTILITY OR DRAINAGE TRENCHES UNTIL THEY HAVE BEEN INSPECTED AND APPROVED BY THE CITY OF HURRICANE AND ASH CREEK SPECIAL SERVICE DISTRICT. THE CITY AND ASH CREEK SPECIAL SERVICE DISTRICT SHALL BE NOTIFIED AT LEAST 1 WORKING DAY IN ADVANCE OF ALL CONSTRUCTION.

4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY ALTERATIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE ENGINEER AND THE CITY OF HURRICANE.

5. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL OVERHEAD INTERFERENCE WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD OR UNDERGROUND POWER, TELEPHONE, GAS AND OTHER UTILITIES FOR THE SAFETY OF ALL PERSONNEL AND EQUIPMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS AND LIABILITY IN CONNECTION THEREWITH.

6. AN ENCROACHMENT PERMIT IS REQUIRED FOR WORK IN THE PUBLIC RIGHT OF WAY, THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.

7. HANDICAP RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION AS PER THE CITY STANDARD DRAWINGS (SEE ADOPTED DETAIL ON DETAIL SHEET). EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY ENGINEER.

8. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO SAID CONSTRUCTION. THE EXTENT OF TRANSITIONS TO BE AS SHOWN ON PLANS.

9. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR BY A REGISTERED LAND SURVEYOR.

10. BEFORE ANY WORK IS STARTED IN THE RIGHT OF WAY, THE CONTRACTOR SHALL INSTALL CONSTRUCTION ZONE SIGNING AS REQUIRED BY THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES-LATEST EDITION".

11. ALL CONSTRUCTION SIGNING, BARRICADING AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES-LATEST EDITION".

12. FINAL SURVEY MONUMENTS TO BE INSTALLED AS PER HURRICANE CITY ADOPTED DRAWING AND LOCATION TO BE AS PER THE FINAL PLAT.

13. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL BEST MANAGEMENT PRACTICES TO LIMIT ON SITE EROSION AND SEDIMENT FROM LEAVING THE SITE. ALL BEST MANAGEMENT PRACTICES WILL BE APPROVED BY THE ENGINEER AND THE CITY OF HURRICANE

14. ALL WORK SHALL BE CONTAINED ON SITE.

15. A TEMPORARY TRASH ENCLOSURE SHALL BE PROVIDED.

16. DUST CONTROL SHALL BE MAINTAINED; CONTRACTOR SHALL USE A WATER TRUCK DURING ALL EARTH MOVING ACTIVITIES.

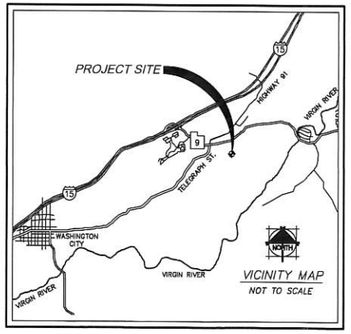
17. PROJECTS SHALL INSTALL AN INFORMATIONAL SIGN ON SITE BEFORE CONSTRUCTION BEGINS. THIS SIGN WILL HAVE A MINIMUM SIZE, PLACEMENT LOCATION AND CONTENT INFORMATION WITH THE COMPANY NAME, PHONE CONTACT & GRADING PERMIT NUMBER.

18. PROJECTS SHALL SUBMIT A DUST CONTROL PLAN WITH DETAILS ON EQUIPMENT, SCHEDULING AND REPORTING OF DUST CONTROL ACTIVITIES.

19. A MANDATORY PRE-CONSTRUCTION MEETING WILL BE REQUIRED ON ALL PROJECTS PRIOR TO ANY GRUBBING, GRADING, OR CONSTRUCTION ACTIVITIES. THE PERMIT HOLDER WILL BE REQUIRED TO NOTIFY ALL DEVELOPMENT SERVICES INSPECTORS

20. ALL LANDSCAPING TO BE MAINTAINED BY PROPERTY OWNER (CITY WILL NOT MAINTAIN)

21. A SPECIAL INSPECTOR FOR PAVING WILL BE REQUIRED.(COST BORNE BY DEVELOPER)



SHEET INDEX

C0.00	TITLE SHEET
C1.00	SITE PLAN
C2.00	UTILITY PLAN
C3.00	GRADING & DRAINAGE PLAN
C4.00	LIFE SAFETY PLAN
C5.00	EROSION PLAN
C6.00	LANDSCAPE PLAN
C10.00	DETAIL SHEET

APPROVAL

ASH CREEK SEWER DISTRICT	DATE:
DOMINION ENERGY	DATE:
TDS COMMUNICATIONS	DATE:
CENTURYLINK	DATE:
WASHINGTON COUNTY WATER CONSERVANCY DISTRICT	DATE:
HURRICANE POWER DEPARTMENT	DATE:
HURRICANE PARKS DEPARTMENT	DATE:
HURRICANE VALLEY FIRE DISTRICT	DATE:
HURRICANE WATER DEPARTMENT	DATE:
HURRICANE STREETS DEPARTMENT	DATE:
HURRICANE PLANNING DEPARTMENT	DATE:
HURRICANE CITY ENGINEER	DATE:
HURRICANE PUBLIC WORKS DEPARTMENT	DATE:
HURRICANE CITY GIS	DATE:

CALL BEFORE YOU DIG

Call before you DIG 1-800-662-4111

1. UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING ANY CONSTRUCTION.
3. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON.
4. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS

NO.	DATE	BY	APP'VD	REVISION DESCRIPTION

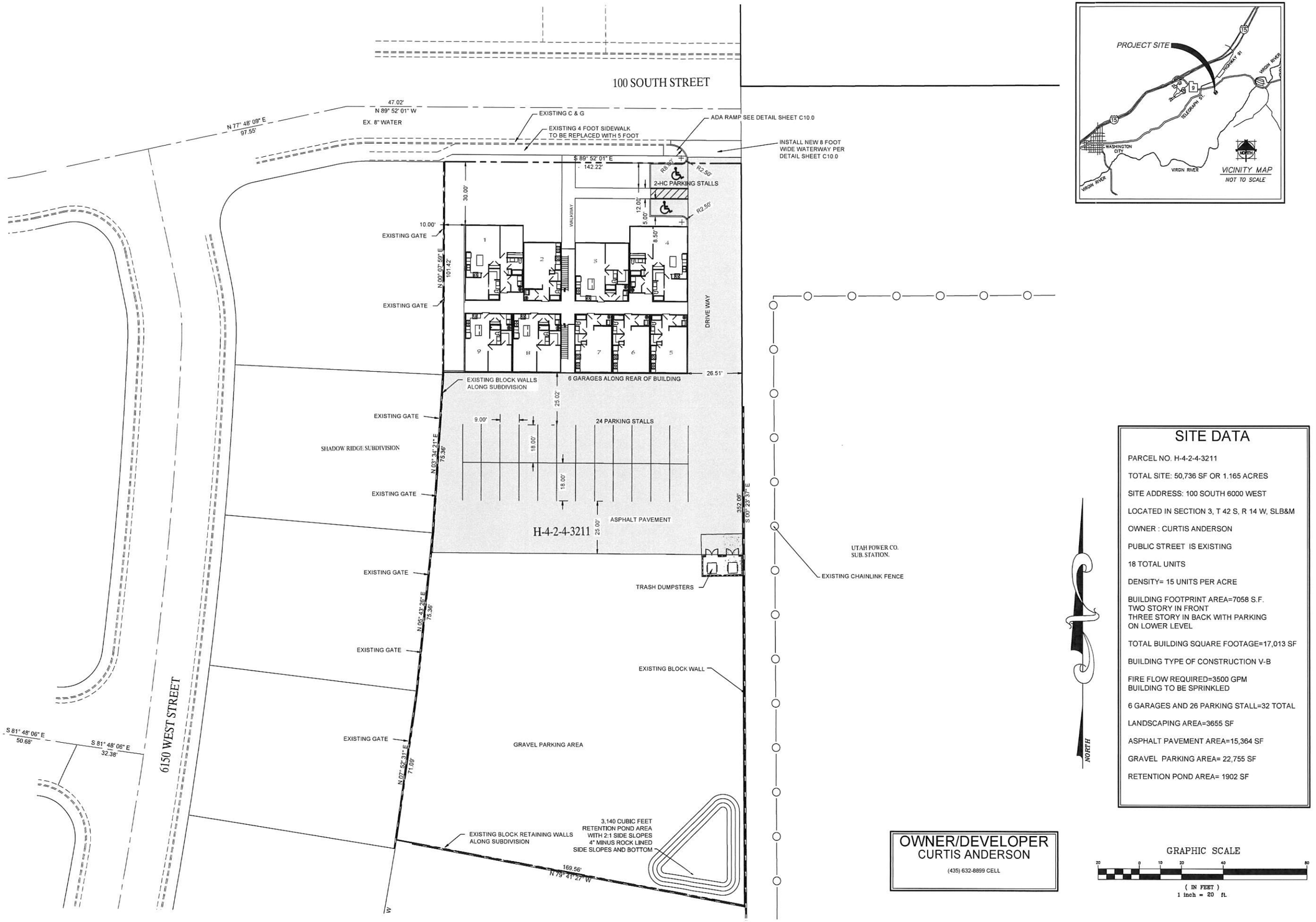
STATE OF UTAH — 155869 — LLOYD RIED POPE — 10-26-20 — REGISTERED PROFESSIONAL ENGINEER

L.R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
1245 EAST 180 SOUTH SUITE 1-9
ST. GEORGE, UTAH 84790
(PHONE) 435-628-1676
(FAX) 435-628-7199
(EMAIL) lrpope@infowest.com

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
TITLE SHEET
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY LRP
DATE 10-26-20
FILE NAME CURTIS ANDERSON

24" x 36" SCALE 1" = 1"
12" x 18" SCALE 1" = 1"
SHEET NUMBER C0.00



SITE DATA

PARCEL NO. H-4-2-4-3211

TOTAL SITE: 50,736 SF OR 1.165 ACRES

SITE ADDRESS: 100 SOUTH 6000 WEST

LOCATED IN SECTION 3, T 42 S, R 14 W, SLB&M

OWNER : CURTIS ANDERSON

PUBLIC STREET IS EXISTING

18 TOTAL UNITS

DENSITY= 15 UNITS PER ACRE

BUILDING FOOTPRINT AREA=7058 S.F.
TWO STORY IN FRONT
THREE STORY IN BACK WITH PARKING
ON LOWER LEVEL

TOTAL BUILDING SQUARE FOOTAGE=17,013 SF

BUILDING TYPE OF CONSTRUCTION V-B

FIRE FLOW REQUIRED=3500 GPM
BUILDING TO BE SPRINKLED

6 GARAGES AND 26 PARKING STALL=32 TOTAL

LANDSCAPING AREA=3655 SF

ASPHALT PAVEMENT AREA=15,364 SF

GRAVEL PARKING AREA= 22,755 SF

RETENTION POND AREA= 1902 SF

OWNER/DEVELOPER
CURTIS ANDERSON
(435) 632-8899 CELL

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

NORTH

NO.	DATE	BY	APP'D	REVISION DESCRIPTION

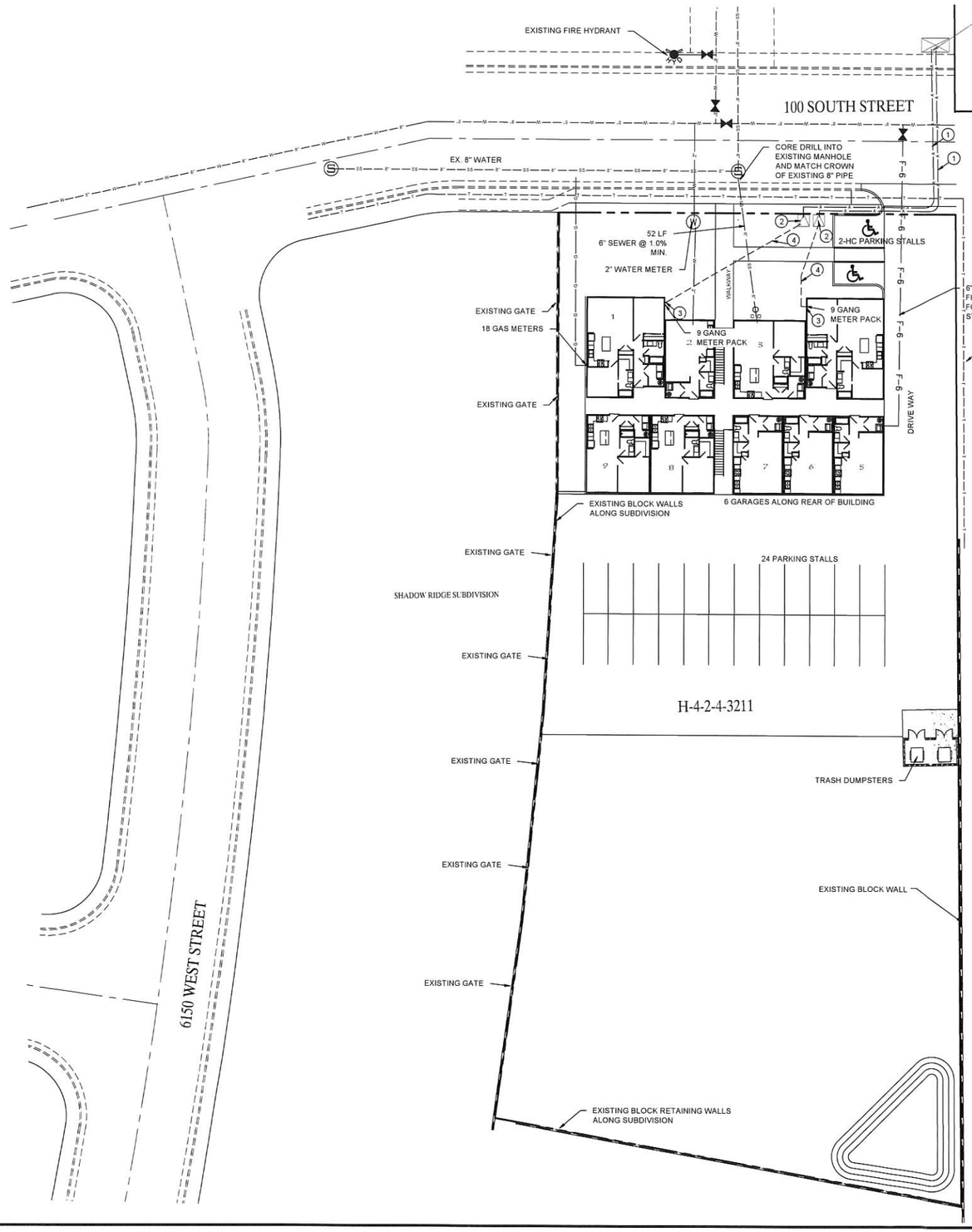
STATE OF UTAH
153899
LLOYD R. POPE
10-26-20
REGISTERED PROFESSIONAL ENGINEER

L. R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
1246 EAST 180 SOUTH SUITE 1-S2
ST. GEORGE, UTAH 84790
(PHONE) 435-628-1976
(FAX) 435-628-1768
(EMAIL) lrpope@infowest.com

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
SITE PLAN
LOCATED IN SECTION 4, TOWNSHIP 41 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY: LRP
DATE: 10-26-20
FILE NAME: CURTIS ANDERSON

24" x 36" SCALE 1" = 20'
12" x 18" SCALE 1" = 40'
SHEET NUMBER
C1.00



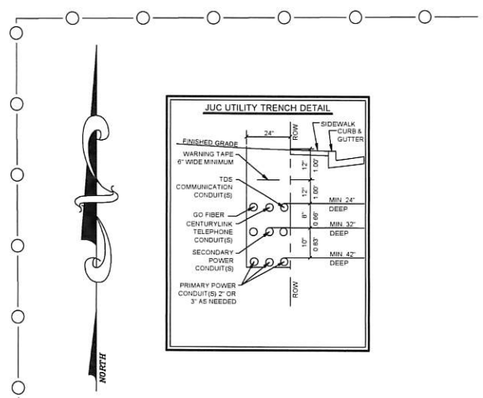
CALL BEFORE YOU DIG

Call before you DIG 1-800-662-4111

1. UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING ANY CONSTRUCTION.
3. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON.
4. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS

POWER KEY

1. INSTALL 2 1/2" PVC WITH 1/0 15 KV SINGLE PHASE
2. INSTALL 75 KVA 120/240 VOLT SINGLE PHASE TRANSFORMER
3. INSTALL SERVICE MAIN WITH 9 SOCKET METER PACEK (125 AMP EACH)
4. INSTALL SECONDARY POWER SERVICE. SIZE OF ACCEPTABLE CONDUITS FROM THE TRANSFORMER TO METER PANELS IS 3" OR 4" PVC. YOU MAY NEED MULTIPLE RUNS OF CONDUIT FROM THE TRANSFORMER TO THE PANEL. QUANTITY NEEDED TO BE DETERMINED BY ELECTRICIAN. SIZE OF ACCEPTABLE WIRE IS 350 OR 500 ALUMINUM.



UTAH POWER CO.
SUB. STATION.

CENTURYLINK INTERNET FIBER OPTIC NOTES: (RESIDENTIAL)
1. DEVELOPER TO PROVIDE ALL TRENCH, BACKFILL AND ROAD CROSSINGS. CENTRYLINK SUB CONTRACTOR (NEILS FUGAL) WILL PLACE CONDUIT IN TRENCH. CALL 435-632-6553 15 DAYS PRIOR TO REQUIRING CONDUIT TO SCHEDULE DELIVERY.
2. ANY BREAKS/BLOCKAGES IN CONDUIT RESULTING FROM IMPROPER BACKFILL OR OTHER CONSTRUCTION UTILITY PLACEMENT ARE THE DEVEOPER RESPONSIBILITY TO REPAIR AND MAY RESULT IN DELAY OF SERVICE.
3. CONTACT CENTURYLINK ENGINEER AT 435-673-9639 WITH ANY QUESTIONS OR CHANGES TO JUC PLANS.
4. ANY CENTURYLINK FACILITY RELOCATIONS ASSOCIATED WITH PROJECT WILL BE BILLABLE 100% TO OWNER/DEVELOPER AND MUST BE SCHEDULED A MINIMUM OF 45 DAYS IN ADVANCE.

WATER SERVICE METER CONNECTION TO MEET THE FOLLOWING ITEMS PER WCWCD.

1. TAPPING SADDLE TO CONNECT SERVICE LINES ON PVC LINES.
2. 2" MALE X MALE CORPORATION STOP VALVE.
3. FEMALE X COMPRESSION FITTING
4. 2" COPPER SERVICE LINE FROM MAIN LINE TO METER SETTER.
5. METER SETTER MUST HAVE LOCKABLE SHUTOFF AND DUAL CHECK VALVE. FORD OR APPROVED EQUAL MFG.
6. 3' X 2" COPPER LINE FROM METER SETTER FOR FUTURE CONNECTION.
7. ROUND HDPE METER BARREL WITH METAL RING AND COVER.
8. DISTANCE FROM METER TO TOP OF BARREL SHOULD BE 9" TO 12".
9. 14 GAUGE LOCATE WIRE FROM MAIN CONNECTION TO METER BARREL W/ MINIMUM OF 24" BROUGHT UP IN METER BARREL

NOTE:
NO COMPONENT SHALL BE INSTALLED FOR WATER DELIVERY WITHIN THE SUBDIVISION THAT HAS NOT BEEN APPROVED AND INSPECTED BY THE WCWCD. PLEASE CALL DAVE JESSOP, OPERATIONS MANAGER, AT 435-668-7416 OR 435-673-3617 TO ARRANGE FOR INSPECTIONS.

LEGEND

SEWER
- NEW SEWER LINES (SIZE AS NOTED)
- EXISTING SEWER LINES (SIZE AS NOTED)
- SERVICE LATERALS (SIZE AS NOTED)
- SEWER MANHOLES (SIZE AS NOTED)

WATER
- NEW WATER LINE (SIZE AS NOTED)
- EXISTING WATER LINES (SIZE AS NOTED)
- SERVICE LINE (SIZE AS NOTED)
- FIRE LINE (SIZE AS NOTED)
- EXISTING FIRE LINE (SIZE AS NOTED)
- NEW FIRE HYDRANT W/ GATE VALVE
- EXISTING FIRE HYDRANT W/ GATE VALVE
- NEW WATER GATE VALVE
- EXISTING WATER GATE VALVE
- SINGLE WATER METER (SIZE AS NOTED) (DETECTOR LINE TO BE INSTALLED TO MAIN)

POWER
- PRIMARY THREE PHASE POWER LINE
- SECONDARY THREE PHASE POWER LINE
- PRIMARY POWER LINE (PHASE NOTED)
- SECONDARY POWER LINE (PHASE NOTED)
- PMH SWITCH (SIZE AS NOTED)
- TRANSFORMER (SIZE AND PHASE NOTED)
- 4-WAY VAULT
- SECONDARY POWER BOX
- POWER POLE

GAS
- NEW GAS LINE

POWER NOTES:

1. ONLY A PRE-APPROVED CONTRACTOR TO WORK ON AND INSTALL ANY PART OF THE ELECTRIC SYSTEM.
2. LINES ARE FOR SCHEMATIC PURPOSES ONLY. ALL EQUIPMENT AND PLACEMENT OF TO BE TO HURRICANE POWER SPECS.
3 EXISTING PRIMARY POWER LINE WILL NEED TO BE RELOCATED AS SHOWN ON PLAN
4. PRE-APPROVED CONTRACTOR TO GO OVER PRINTS WITH HURRICANE POWER BEFORE BEGINNING WORK. CONTACT HURRICANE POWER FOR AN APPOINTMENT 435-635-5536 EXT 4
5. ANY CHANGES TO THE SIGNED SET OF PLANS MUST BE APPROVED BY HURRICANE POWER.
6. THE ENTIRE JUC TRENCH MUST BE BACKFILLED WITH 1" MINUS FROM THE BOTTOM TO THE TOP OF THE TRENCH. ALSO AROUND ELECTRICAL BOXES AND EQUIPMENT.
7. IMPACT FEES FOR ADDITIONAL POWER SERVICE WILL BE COLLECTED BY BUILDING DEPARTMENT. IMPACT FEES TO BE CHARGED BY THE MAIN PANEL SIZE. CONTACT HURRICANE POWER
8. METERS SHALL NOT BE LOCATED IN FENCED AREA. METERS SHALL BE KEPT ACCESSIBLE AT ALL TIMES.
9. DEVELOPER WILL CHARGE FOR OUR LINEMAN TO TERMINATE ALL PRIMARY ELBOW TERMINATIONS. CHARGE WILL BE $99 PER ELBOW.
10. DEPENDING ON TRANSFORMER LOCATION TRANSFORMER MAY NEED BOLLARDS TO PROTECT IT FROM TRAFFIC. CONTACT HURRICANE POWER REGARDING QUESTIONS ON THIS.

TDS TELECOM NOTES:
1. THE DEVELOPER WILL PROVIDE ALL REQUIRED TRENCH WITHIN THE PROJECT. ANY MODIFICATIONS ALONG THE PERIPHERY TO FEED THIS PROJECT WILL BE BILLED TO THE DEVELOPER.
2. TDS WILL PROVIDE CONDUITS. PLEASE CONTACT DAVID AT 435-703-8932 AT LEAST 3 WEEKS PRIOR TO OPENING TRENCH TO SCHEDULE WORK.
3. ANY QUESTIONS REGARDING CONSTRUCTION OF SERVICE SHOULD BE DIRECTED TO DAVID TRAUNTVEIN WITH TDS AT 435-703-8932
4. RELOCATION OF NEW OR EXISTING TDS FACILITIES WILL BE BILLABLE TO THE DEVELOPER/CONTRACTOR
5. ANY MODIFICATIONS AFTER CONDUIT/CABLE PLACEMENT WILL BE BILLABLE TO THE DEVELOPER CONTRACTOR AS WELL DAMAGES CAUSED BY OTHER CONTRACTORS WORKING FOR THE DEVELOPER ON THIS PROJECT.

OWNER/DEVELOPER
CURTIS ANDERSON
(435) 632-8899 CELL

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

NO.	DATE	BY	APPVD	REVISION DESCRIPTION

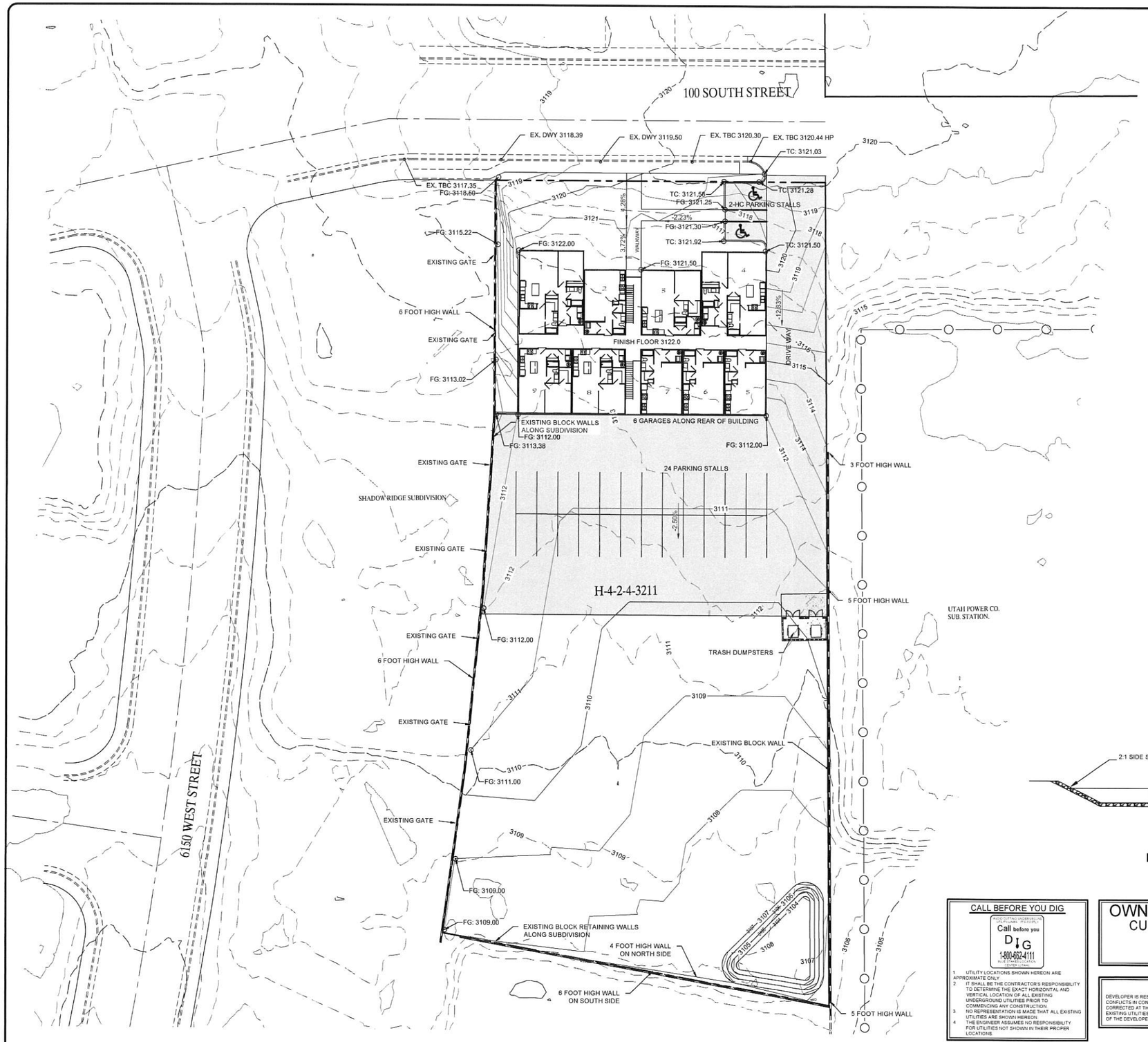
STATE OF UTAH — LICENSED PROFESSIONAL ENGINEER — 170069 — LLOYD RIED POPE — 10-26-20 — PROFESSIONAL SEAL

L. R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS CIVIL ENGINEERS & SURVEYORS
124 EAST 100 SOUTH SUITE 1&8
ST. GEORGE, UTAH
(PHONE) 435-628-1870
(FAX) 435-628-1871
(EMAIL) lrpope@lrpope.com

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CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
SITE UTILITY PLAN
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY	LRP
DATE	10-26-20
FILE NAME	CURTIS ANDERSON
24" x 36"	SCALE 1" = 20'
12" x 18"	SCALE 1" = 40'
SHEET NUMBER	C2.00



LEGEND

PAVEMENT / SURFACES

- NEW ASPHALT

ELEVATIONS

- STA: 1+50.80 / 2972.29 TC — NEW TOP BACK OF CURB ELEVATION (UNLESS NOTED)
- 2972.29 EX — EXISTING TOP BACK OF CURB ELEVATION
- PAD: 2983.50 — FINISH PAD ELEVATION
- UL: 2983.50 — UPPER LEVEL PAD ELEV.
- LL: 2983.50 — LOWER LEVEL PAD ELEV.

SLOPES & CONTOURS

- 4.00% — GRADE SLOPE TAG (SLOPE AS NOTED)
- DIRECTION OF DRAINAGE FLOW
- 2618 — EXISTING CONTOUR
- 2620 — FINISH CONTOUR

DRAINAGE

- OPEN BACK CATCH BASIN
- CATCH BASIN
- EX. STORM DRAIN PIPE (Ø, TYPE & SLOPE NOTED)
- NEW STORM DRAIN PIPE (Ø, TYPE & SLOPE NOTED)

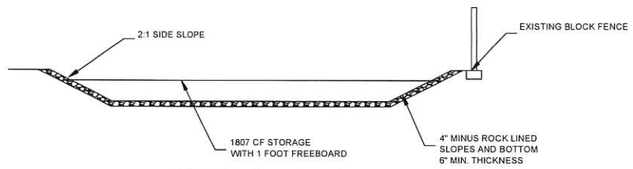
WALLS

- EXISTING CMU BLOCK WALLS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
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RETENTION POND CROSS SECTION

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OWNER/DEVELOPER

CURTIS ANDERSON

(435) 632-8899 CELL

NOTICE

DEVELOPER IS RESPONSIBLE FOR ALL CONDITIONS IN THE FIELD. ANY CONFLICTS IN CONDITIONS FROM THAT ON THESE PLANS SHALL BE CORRECTED AT THE EXPENSE OF THE DEVELOPER. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED AND CORRECTED AT THE EXPENSE OF THE DEVELOPER

DRAINAGE NOTE

PROPERTY OWNER IS RESPONSIBLE FOR ALL ON SITE DRAINAGE AND DETENTION

STORM DRAIN PROTECTION

STRAW OR HAY BAILS ARE TO PROVIDE INLET PROTECTION AND WILL REMAIN IN PLACE UNTIL CONSTRUCTION OR THE SURFACE IS FINISHED

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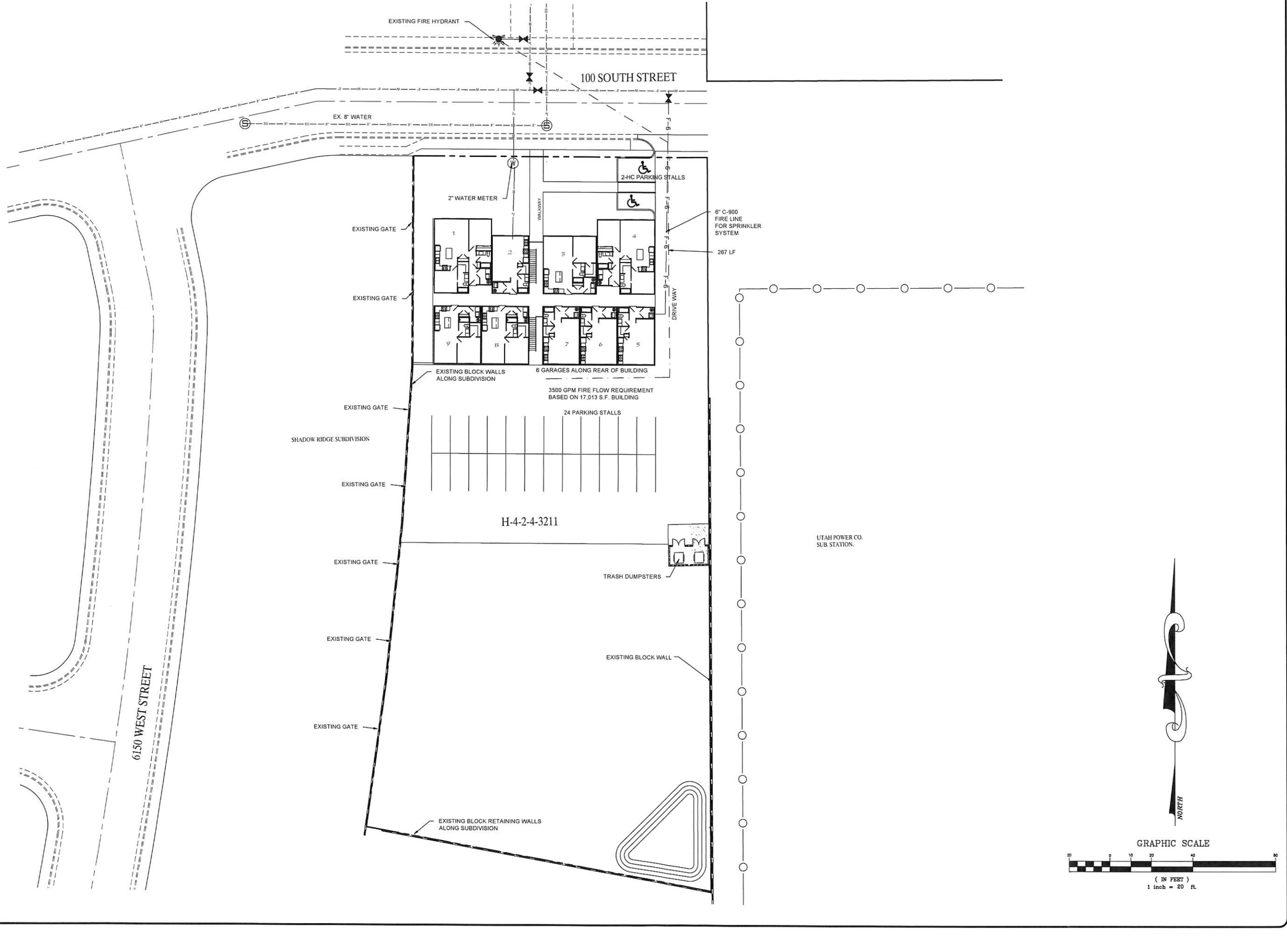
STATE OF UTAH — 155069 — LLOYD RIED POPE — 10-26-20 — REGISTERED PROFESSIONAL ENGINEER

L. R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

GRADING AND DRAINAGE PLAN

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SHEET NUMBER	C3.00



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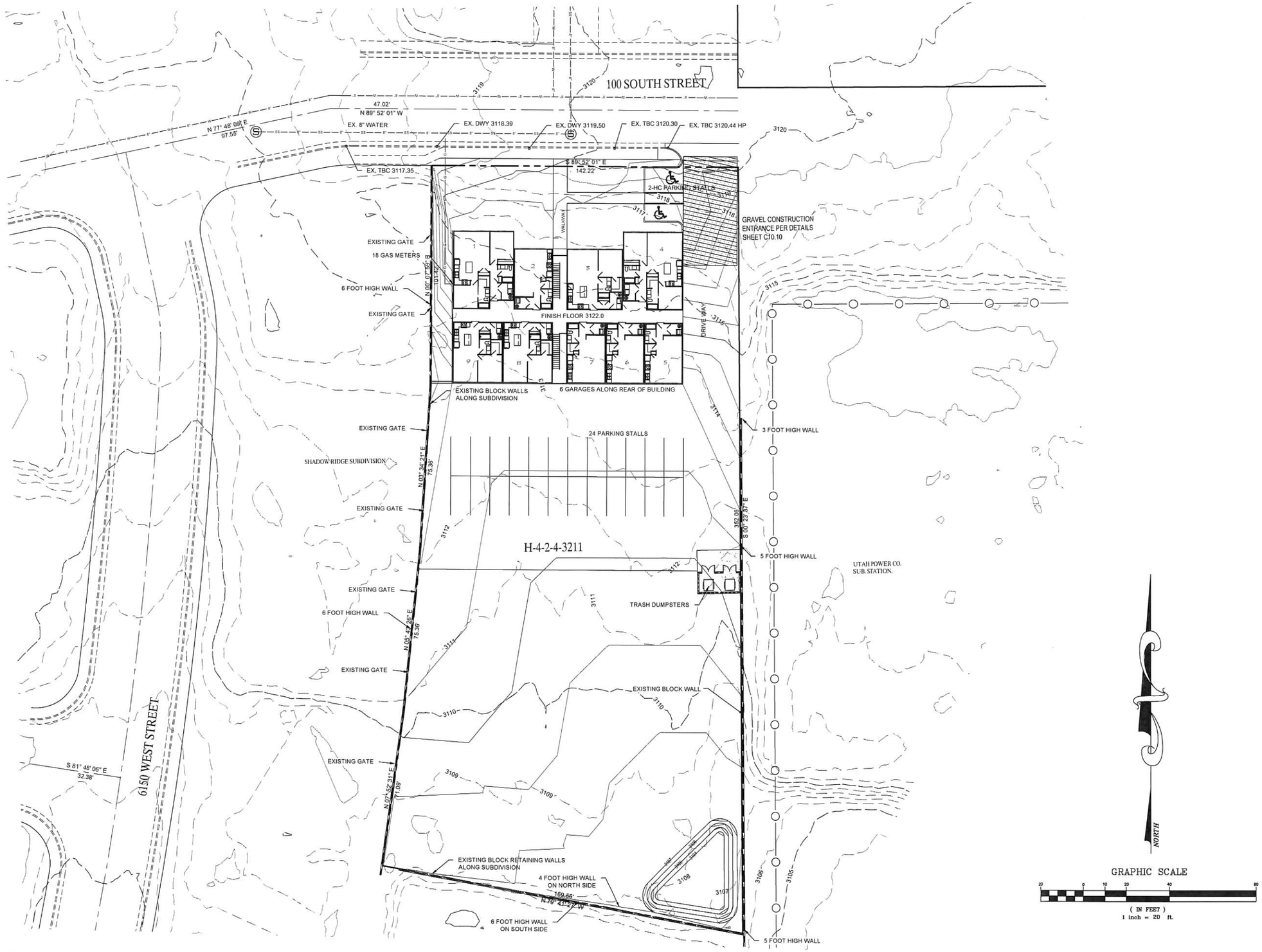
STATE OF UTAH
TS369
LLOYD RIED
POPE
10-26-20
REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR

L. R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
136 EAST 100 SOUTH SUITE 1-5
ST. GEORGE, UTAH 84770
(PHONE) 435-628-1974
(FAX) 435-628-7189
(EMAIL) lrpope@infowest.com

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CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
LIFE SAVINGS PLAN
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY	LRP
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24" x 36"	SCALE 1" = 20'
12" x 18"	SCALE 1" = 40'
SHEET NUMBER	C4.00



NO	DATE	BY	APPVD	REVISION DESCRIPTION

153069
LLOYD RIED
POPE
10-26-20

124 EAST 100 SOUTH SUITE 1&B
ST. GEORGE, UTAH
(PHONE) 435-319-7378
(FAX) 435-628-2718
(EMAIL) lrpope@ztmpoe.com

L.R. POPE ENGINEERING INC.
DIRECTIONAL DRILLING ■ CIVIL ENGINEERING & SURVEYING

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CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
EROSION PLAN
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

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100 SOUTH STREET

EX. 8" WATER

2-HC PARKING STALLS

WALKWAY

DRIVE WAY

EXISTING GATE

EXISTING GATE

EXISTING BLOCK WALLS ALONG SUBDIVISION

6 GARAGES ALONG REAR OF BUILDING

EXISTING GATE

24 PARKING STALLS

SHADOW RIDGE SUBDIVISION

EXISTING GATE

H-4-2-4-3211

EXISTING GATE

TRASH DUMPSTERS

EXISTING GATE

EXISTING BLOCK WALL

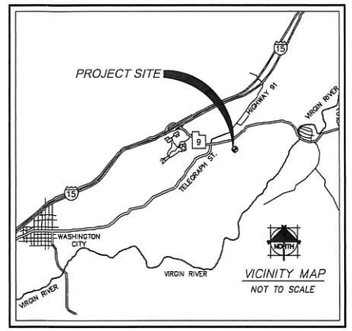
GRAVEL PARKING AREA

EXISTING GATE

EXISTING BLOCK RETAINING WALLS ALONG SUBDIVISION

6150 WEST STREET

UTAH POWER CO. SUB. STATION.



VICINITY MAP
NOT TO SCALE

LANDSCAPE LEGEND

TREES

5-PLUMB. PURPLE LEAF

7-ARIZONA ASH

6-MONDALE PINE

TREES AND CALIPER OF TWO INCHES

PLANTS & GROUND COVER

12-DWARF PINK OLEANDER

6-SAGE, TEXAS RANGER

8-EUONYMUS, GOLDEN

3'-6' BOULDERS TO BE PLACED RANDOMLY AMONG LANDSCAPING AREAS

ALL VEGETATION TO BE IRRIGATED BY LOW PRESSURE DRIP SYSTEM WITH BACKFLOW VALVES

ALL LANDSCAPE AREAS TO BE COVERED BY 1"-3" ROCK MULCH 2" MIN. DEPTH OVER DEWITT WEED FABRIC TO MATCH EXISTING ROCK MULCH

SHRUBS TO HAVE MIN. HEIGHT OF 18" AT TIME OF PLANTING

IRRIGATION MAIN LINES TO BE 1 1/2" DIA. SCH. 40 PVC

NORTH

OWNER/DEVELOPER
CURTIS ANDERSON
(435) 632-8899 CELL

GRAPHIC SCALE

25 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NO.	DATE	BY	APPVD	REVISION DESCRIPTION

STATE OF UTAH
153969
LLOYD R. POPE
10-26-20
REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR

L.R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
136 EAST 100 SOUTH SUITE 1-A3
ST. GEORGE, UTAH
PHONE) 435-634-1971
FAX) 435-634-1972
EMAIL) lrpope@inpope.com

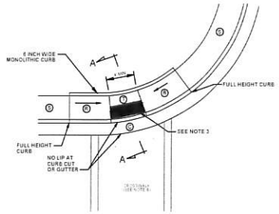
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CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
LANDSCAPE PLAN
LOCATED IN SECTION 4, TOWNSHIP 41 SOUTH, RANGE 14 WEST, SLB&M

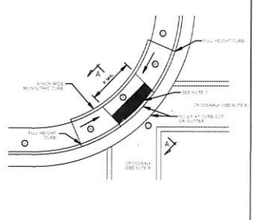
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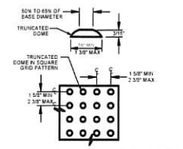
SHEET NUMBER
C6.00



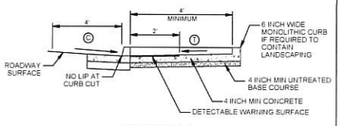
CORNER PEDESTRIAN RAMP
SINGLE CROSSING



CORNER PEDESTRIAN RAMP
DUAL CROSSING



DETECTABLE WARNING SURFACE



SECTION A-A

SLOPE TABLE				
	ITEM	MAX. RUNNING SLOPE *	MAX. CROSS SLOPE *	
A	TURNING SPACE	2%	2%	(c)
B	RAMP	8.33% (a)	2%	(c)
C	CLEAR SPACE	5% (b)	2%	(c)
D	SIDEWALK	STREET GRADE	2%	

* RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL. CROSS SLOPE IS PERPENDICULAR TO PEDESTRIAN TRAVEL.

(a) - LENGTH OF RUNNING SLOPE FOR PARALLEL RAMPS IS NOT REQUIRED TO EXCEED 15 FT.

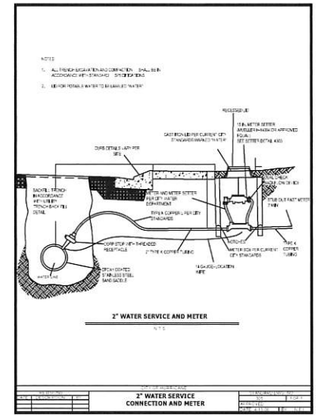
(b) MAINTAIN CONSISTENCY OF CLEAR SPACE RUNNING SLOPE ACROSS ENTIRE CURB CUT. WARP GUTTER PAN TO MEET REQUIRED CLEAR SPACE SLOPE AT CURB CUT.

(c) DO NOT EXCEED THE ROADWAY PROFILE GRADE FOR THE CROSS SLOPE AT CROSSWALKS WITHOUT STOP OR YIELD CONTROL AND AT MID-BLOCK CROSSWALKS

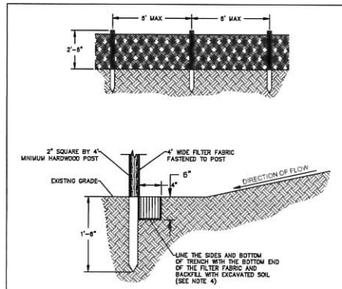
NOTES:

1. DIMENSIONS SHOWN IN THE SLOPE TABLE ON ARE NOT SUBJECT TO CONVENTIONAL INDUSTRY TOLERANCES. CONSTRUCT SIDEWALKS AND RAMPS SUCH THAT THE MAXIMUM OR MINIMUM VALUES ARE NOT EXCEEDED. WORK THAT EXCEEDS THOSE VALUES WILL NOT BE ACCEPTED.
2. PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT.
3. LOCATE DETECTABLE WARNING SURFACE SO THE CORNERS NEAREST THE STREET ARE WITHIN 1 INCH OF THE BACK OF CURB.
4. RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.
5. CLEAR SPACE AND TURNING SPACE SIZE: 4 FT MIN. X 4 FT MIN.
6. CROSSWALK DELINEATION IF REQUIRED ON PROJECT STRIPING PLAN.

NOT TO SCALE



NOT TO SCALE

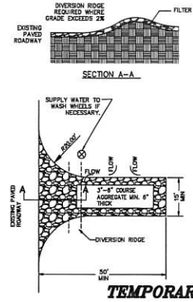


NOTES

1. WHERE POSSIBLE, LAYOUT THE SILT FENCE 5' TO 10' BEYOND THE TOE OF SLOPE.
2. ALIGN THE FENCE ALONG THE CONTOUR AS CLOSE AS POSSIBLE
3. WHEN EXCAVATING THE TRENCH, USE MACHINERY THAT WILL PROVIDE NO MORE THAN THE DESIRED DIMENSIONS.
4. EXTEND THE BOTTOM 1'-4" OF THE FABRIC TO LINE ALL THREE SIDES OF THE TRENCH.
5. TO AVOID EXCESSIVE PONDING OF WATER AT LOW POINTS ALONG THE FENCE, PROVIDE AN OPENING IN THE SILT FENCE AND INSTALL A CHECK DAM.
6. AVOID USING JOINTS ALONG THE FENCE AS MUCH AS POSSIBLE. IF A JOINT IS NECESSARY, SPLICE THE FILTER FABRIC AT A POST WITH 6" OVERLAPS AND SECURELY FASTEN BOTH ENDS TO THE POST.
7. MAINTAIN A PROPERLY FUNCTIONING SILT FENCE THROUGHOUT THE DURATION OF THE PROJECT OR UNTIL DISTURBED AREAS HAVE BEEN VEGETATED.
8. REMOVE SEDIMENT AS IF ACCUMULATES AND PLACE IT IN A STABLE AREA APPROVED BY THE ENGINEER.

SPECIFICATIONS FOR SILT FENCE DETAIL

NOT TO SCALE



NOTES

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

CONSTRUCTION SPECIFICATIONS

THE AGGREGATE SIZE FOR CONSTRUCTION OF THE PAD SHALL BE 3 TO 6 INCH STONE, PLACE GRAVEL TO THE SPECIFIC GRADE AND DIMENSIONS SHOWN ON THE PLANS, AND SMOOTH IT. USE GEOTEXTILE FABRICS, IF NECESSARY, TO IMPROVE STABILITY OF THE FOUNDATION IN LOCATIONS SUBJECT TO SEEPAGE OR HIGH WATER TABLE. THE WIDTH OF THE PAD SHALL NOT BE LESS THAN THE FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS AND IN ANY CASE SHALL NOT BE LESS THEN 12 FEET WIDE. THE LENGTH OF THE PAD S-HALL BE REQUIRED, BUT NOT LESS THAN 50.

LOCATE CONSTRUCTION ENTRANCES AND EXITS TO LIMIT SEDIMENT LEAVING THE SITE AND TO PROVIDE FOR MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES. AVOID ENTRANCES WHICH HAVE STEEP GRADES AND ENTRANCES AT CURVES IN PUBLIC ROADS. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC WAY OF WAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND. AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAY SHALL BE REMOVED IMMEDIATELY. PROVIDE DRAINAGE TO CARRY WATER TO A SEDIMENT TRAP OR OTHER SUITABLE OUTLET, WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE THROUGH USE OF SAND BAGS, GRAVEL, STRAW BALES, OR OTHER APPROVED METHODS.

MAINTENANCE:
MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. REPLACE GRAVEL MATERIAL WHEN SURFACE VOIDS ARE VISIBLE. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS. REMOVE ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS WITHIN 24 HOURS.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE / EXIT

NOT TO SCALE

EROSION CONTROL NOTES:

1. PROVIDE SEDIMENT BASINS AT THE BOTTOM OF EVERY DRAINAGE AREA PRODUCING SEDIMENT RUNOFF, THE BASINS SHALL BE MAINTAINED AND CLEANED AFTER EVERY STORM EVENT. THE BASINS MAY BE REMOVED AFTER SOIL STABILIZATION AND VEGETATION IS ESTABLISHED ON ERODABLE SLOPES

2.PROVIDE SEDIMENT CONTROL AROUND EVERY STORM DRAIN INLET TO PREVENT SEDIMENT FROM ENTERING THE STORM DRAIN SYSTEM

3.ALL EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPS) SHALL BE INSPECTED AND MAINTAINED REGULARLY AND AFTER EVERY STORM EVENT.

4.ANY ALTERNATIVE CONTROL MEASURES MUST BE APPROVED IN ADVANCE BY THE ENGINEER AND THE CITY OF HURRICANE.

5.THE CONTRACTOR SHOULD FOLLOW A WORK SCHEDULE THAT COORDINATES THE TIMING OF LAND-DISTURBING ACTIVITIES.

6.LIMIT LAND CLEARING AND RESTORE ALL GRADING AS SOON AS POSSIBLE

7.PRACTICE STAGED SEEDING TO RE-VEGETATE CUT AND FILL SLOPES AS THE WORK IS IN PROGRESS

8.AT ALL TIMES DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING AND CONTROLLING EROSION DUE TO WIND AND OTHER EROSION. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING ALL EROSION CONTROL BMP'S

9.ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY THE ENGINEER OR THE CITY OF HURRICANE.

10.THE CONTRACTOR IS RESPONSIBLE FOR KEEPING THE STREETS CLEAN AND FREE FROM DEBRIS.

11.CONTRACTOR SHALL USE VEHICLE TRACKING CONTROL AT ALL ENTRANCES AND EXITS.

12.ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, ETC.) SHALL BE DISPOSED AS TO NOT ENTER THE STORM WATER SYSTEM.

13.CONTRACTOR SHALL PROVIDE DUST CONTROL AT ALL TIMES DURING CONSTRUCTION.

14.THE LIMITS OF DISTURBANCE SHALL BE STAKED BEFORE CONSTRUCTION BEGINS

15.COMPLY WITH ANY AND ALL REQUIREMENTS FROM THE CITY OF ST.GEORGE AND THE UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY.

16.A COPY OF THIS STORM WATER POLLUTION PREVENTION PLAN SHALL BE KEPT ON SITE DURING ALL CONSTRUCTION ACTIVITY.
LONG TERM MAINTENANCE (POST CONSTRUCTION)

1. EROSION CONTROL STRUCTURES MAY BE REMOVED ONCE FINAL LANDSCAPING IS IN PLACE. EROSION CONTROL STRUCTURES BELOW SEEDED AREAS MUST REMAIN IN PLACE UNTIL THE ENTIRE AREA HAS BEEN ESTABLISHED. EROSION CONTROL IN PROPOSED PAVEMENT AREAS SHALL REMAIN IN PLACE UNTIL PAVEMENT IS COMPLETE

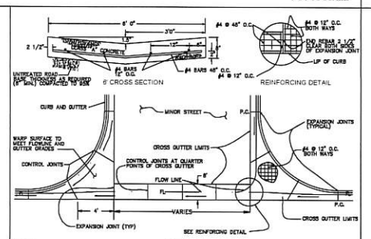
2. THE PROPERTY OWNER IS RESPONSIBLE TO COMPLY WITH ALL APPLICABLE STORM WATER REGULATIONS AT ALL TIMES. ALL BMP'S SHALL BE MAINTAINED TO EFFECTIVELY PREVENT THE IMPACTS OF THIS PROJECTS CONSTRUCTION AND USE ON STORM WATER QUALITY.

3. THE FOLLOWING PRECAUTIONS SHALL BE PERFORMED

a. PERIODIC INSPECTION OF CATCH BASIN SEDIMENT TRAPS AND CLEANING WHEN THE BASIN IS MORE THAN ¼ FULL. INSPECTIONS SHALL BE DONE AFTER EVERY MAJOR RAINFALL AND EVERY 6 MONTHS AS A MINIMUM. DISPOSAL OF ANY GREASE OR OIL MUST BE DONE IN ACCORDANCE WITH CURRENT ENVIRONMENTAL REGULATIONS.

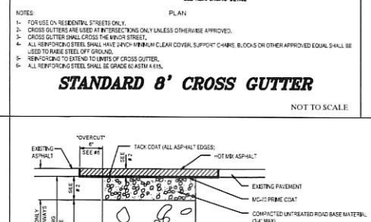
b. LITTER, DEBRIS, AND CHEMICALS MUST BE PICKED UP AND KEPT IN A LOCATION TO PREVENT POLLUTION OF STORM WATER DISCHARGE.

c. PARKING AREAS SHALL BE KEPT FREE FROM AUTOMOBILE FLUIDS AS TO NOT WASH INTO THE STORM DRAIN SYSTEM.



TRASH ENCLOSURE DETAILS

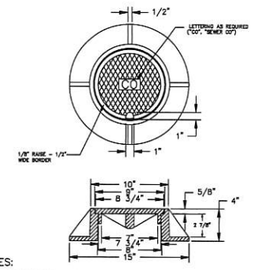
NOT TO SCALE



NOTES:
1- FOR USE ON RESIDENTIAL STREETS ONLY.
2- CROSS GUTTERS ARE USED AT INTERSECTIONS ONLY UNLESS OTHERWISE APPROVED.
3- CROSS GUTTER SHALL CROSS THE MINOR STREET.
4- ALL REINFORCING STEEL SHALL HAVE 2INCH MINIMUM CLEAR COVER, SUPPORT CHAIRS, BLOCKS OR OTHER APPROVED EQUAL SHALL BE USED TO RAISE STEEL OFF GROUND.
5- REINFORCING TO EXTEND TO LIMITS OF CROSS GUTTER.
6- ALL REINFORCING STEEL SHALL BE GRADE 60 ASTM A 615.

STANDARD 6' CROSS GUTTER

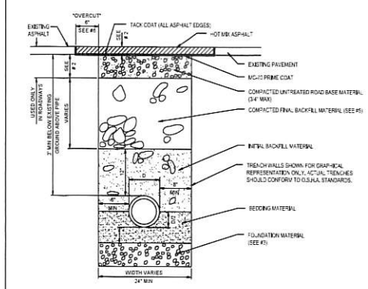
NOT TO SCALE



NOTES:
1- MATERIAL SHALL BE CAST IRON ASTM A48, CL30

SEWER CLEANOUT COVER

NOT TO SCALE



NOTES

1. ALL EXCAVATIONS WITHIN PUBLIC RIGHT-OF-WAY REQUIRE AN ENCROACHMENT PERMIT FROM THE CITY ENCROACHMENT OFFICER.
2. MINIMUM THICKNESS OF ASPHALT AND BASE SHALL BE AS OUTLINED IN THE ROADWAY STRUCTURAL REQUIREMENTS, IN NO CASE SHALL THE THICKNESS BE LESS THAN THE EXISTING.
3. FOUNDATION MATERIAL SHALL BE USED WHEN TRENCH BOTTOM IS UNSTABLE.
4. ALL STATE HIGHWAY CROSSING SHALL BE APPROVED BY THE U.D.O.T., DISTRICT ENGINEER (U.D.O.T., PERMIT REQUIRED)
5. MINIMUM COMPACTING SHALL BE 95% WHEN APPROVED FLOW ABLE FILL OR SLURRY IS USED COMPACTING TEST WILL NOT BE REQUIRED.
6. WHEN MATERIAL UNDER THE 6" OVER CUT SLUFFS OFF OR IS REMOVED, BASE SHALL BE COMPACTED, TO THE BOTTOM LEVEL OF EXISTING ASPHALT, AN ADDITIONAL 6" IN WIDTH OF ASPHALT SHALL BE CUT, REMOVED AND REPLACED AS OF THE OVERALL PATCH.
7. WHERE ROAD SECTION HAS A DESIGNED GRANULAR SUB-BASE, 8" SHALL BE REPLACED IN KIND OR WITH ROAD BASE GRAVEL.
8. IN GENERAL, STREET SURFACE LESS THAN 24 MONTHS OLD WILL NOT BE CUT IF A CUT MUST BE MADE, ADDITIONAL STRICTER REQUIREMENTS MAY BE INVOKED, SEE ENCROACHMENT OFFICER.
9. 24 HOUR NOTES REQUIRED ON ALL INSPECTIONS.
10. ALL TRENCH BACK FILL SHALL MEET MIN. COMPACTING REQUIREMENTS.
11. EXCLUDING EMERGENCY CLOSURES ALL ROAD CLOSURES AND DETOURS REQUIRE 48 HOURS PRIOR NOTICE.

TRENCH BACKFILL

NOT TO SCALE

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call before you DIG
1-800-662-4111
UNDERGROUND SERVICE ALERT (USA)

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING ANY CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS.

DISCLAIMER

NO.	DATE	BY	APPVD	REVISION DESCRIPTION

13069
LLOYD RIED POPE
10-26-20
PROFESSIONAL ENGINEER
STATE OF UTAH

L.R. POPE ENGINEERING INC.
CIVIL/STRUCTURAL ENGINEERS, LAND SURVEYORS
1345 EAST 180 SOUTH SUITE 1-5-B
ST. GEORGE, UTAH
(PHONE) 435-656-1015
(FAX) 435-656-1034
(EMAIL) lrpope@msn.com

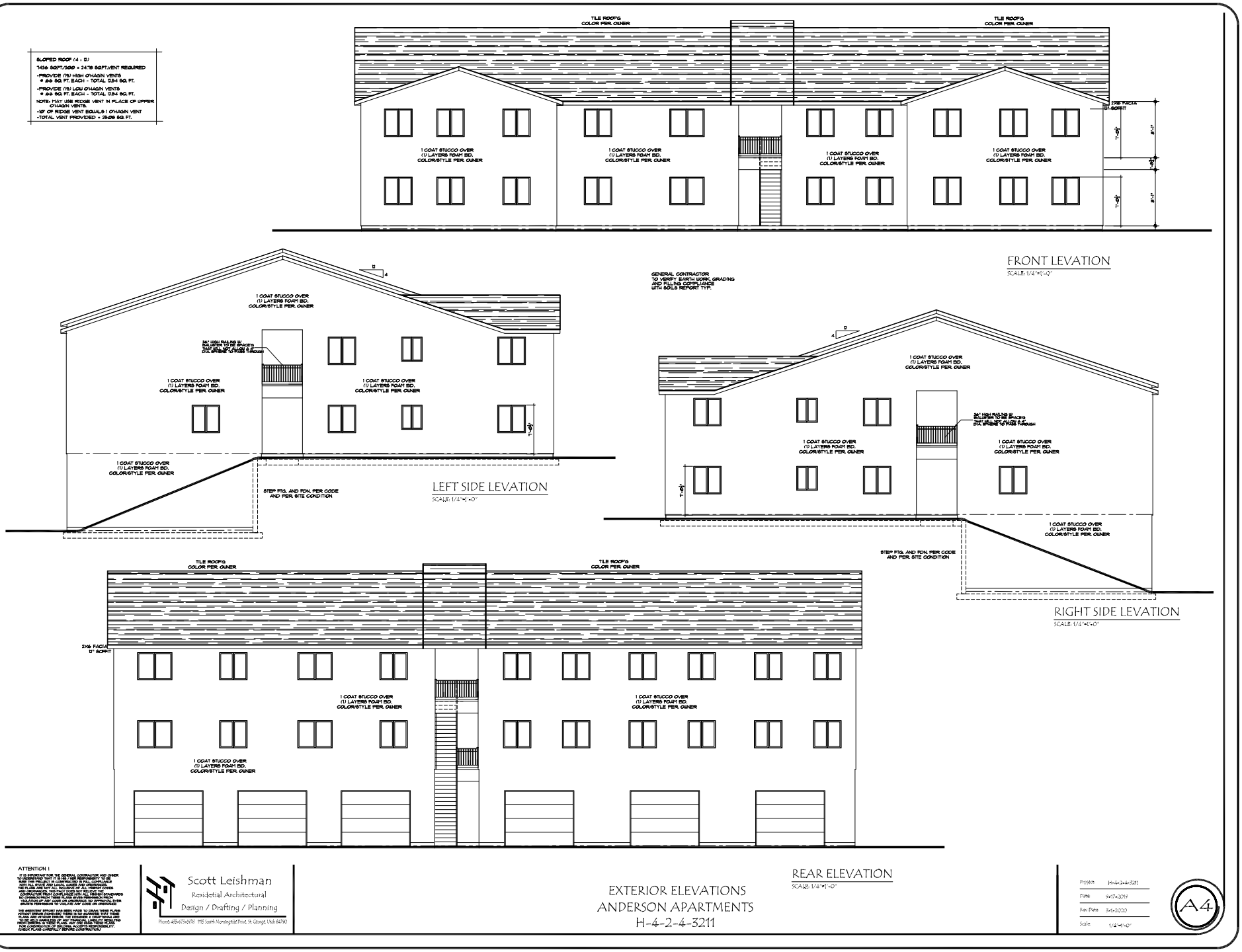
The Engineer/Surveyor expressly reserves its common law copyright and other property rights in these plans. These plans are not to be changed or copied in any form or manner whatsoever nor are they to be assigned to any third party without first obtaining the expressed written permission and consent of the Engineer/Surveyor. In the event the Engineer/Surveyor is not retained for the completion of the project, the Engineer/Surveyor retains all rights to the plans as instruments of service.

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
DETAILS
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY	LRP
DATE	10-26-20
FILE NAME	CURTIS ANDERSON

24" x 36"
SCALE 1" = 1"
12" x 18"
SCALE 1" = 1"
SHEET NUMBER
C10.00

PDF created with pdfFactory Pro trial version www.pdffactory.com



ATTENTION !

IT IS IMPORTANT FOR THE GENERAL CONTRACTOR AND OWNER TO UNDERSTAND THAT IT IS HIS / HER RESPONSIBILITY TO SEE THAT THE PROJECT CONSTRUCTED IS FULL COMPLIANCE WITH ALL LOCAL CODES AND ORDINANCES. THESE PLANS ARE NOT ALL INCLUSIVE OF ALL TRENDY CODES AND ORDINANCES, THIS FACT DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO MEET THESE STANDARDS. NO CHANGES FROM THESE PLANS GIVEN PERMISSION FROM VIOLATION OF ANY CODE OR ORDINANCE, NO APPROVAL GIVEN UNLESS PERMISSION TO VIOLATE ANY CODE OR ORDINANCE

THIS ARCHITECTS REPORT HAS BEEN MADE TO DRAW THESE PLANS ACCORDING TO THE INFORMATION PROVIDED BY THE OWNER. THESE PLANS ARE NOT AN ENGINEERED DESIGN. THE DESIGNER IS NOT A CONSTRUCTION AND TO BE HELD LIABLE FOR ANY FINANCIAL LIABILITY RESULTING FROM THE USE OF THESE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION OF BUILDING. IT GETS RESPONSIBILITY. (LOOK PLANS CAREFULLY BEFORE CONSTRUCTION)

Scott Leishman
Residetial Architectural
Design / Drafting / Planning
Phone: 435-673-0978 1115 South Morningside Drive, St. George, Utah 84790

EXTERIOR ELEVATIONS
ANDERSON APARTMENTS
H-4-2-4-3211

Project:	H-4-2-4-3211
Date:	9-17-2019
Rev Date:	5-5-2020
Scale:	1/4"=1'-0"

A4

100 SOUTH STREET

EX. 8" WATER

EXISTING GATE

EXISTING GATE

EXISTING GATE

SHADOW RIDGE SUBDIVISION

EXISTING GATE

EXISTING GATE

EXISTING GATE

6150 WEST STREET

2-HC PARKING STALLS

WALKWAY

DRIVE WAY

1 2 3 4 5 6 7 8 9

6 GARAGES ALONG REAR OF BUILDING

EXISTING BLOCK WALLS ALONG SUBDIVISION

OUTSIDE LIGHTING ON BUILDING

24 PARKING STALLS

H-4-2-4-3211

COLORED GRAVEL

OVERHEAD POWER LIGHT WITH DOWN LIGHTLY

TRASH DUMPSTERS

EXISTING BLOCK WALL

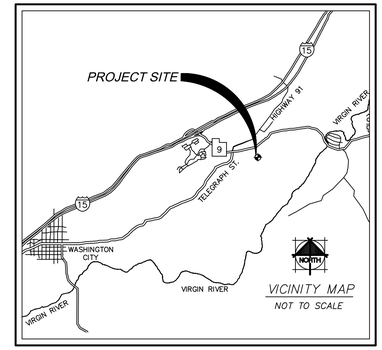
GRAVEL PARKING AREA

GRAVEL PARKING AREA

3,140 CUBIC FEET
RETENTION POND AREA
WITH 2:1 SIDE SLOPES
4" MINUS ROCK LINED
SIDE SLOPES AND BOTTOM

EXISTING BLOCK RETAINING WALLS ALONG SUBDIVISION

UTAH POWER CO.
SUB. STATION.



VICINITY MAP
NOT TO SCALE

LANDSCAPE LEGEND

TREES

5-PLUMB, PURPLE LEAF

7-ARIZONA ASH

6-MONDALE PINE

TREES AND CALIPER OF TWO INCHES

PLANTS & GROUND COVER

12-DWARF PINK OLEANDER

6-SAGE, TEXAS RANGER

8-EUONYMUS, GOLDEN

3'-6' BOULDERS TO BE PLACED RANDOMLY AMONG LANDSCAPING AREAS.

ALL VEGETATION TO BE IRRIGATED BY LOW PRESSURE "DRIP" SYSTEM WITH BACKFLOW VALVES

ALL LANDSCAPE AREAS TO BE COVERED BY 1"-3" ROCK MULCH 2" MIN. DEPTH OVER DEWITT WEED FABRIC TO MATCH EXISTING ROCK MULCH.

SHRUBS TO HAVE MIN. HEIGHT OF 18" AT TIME OF PLANTING

IRRIGATION MAIN LINES TO BE 1 1/2" DIA. SCH. 40 PVC

NORTH

OWNER/DEVELOPER
CURTIS ANDERSON

(435) 632-8899 CELL

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NO.	DATE	BY	APP'D	REVISION DESCRIPTION

STATE OF UTAH
153069
LANCE R. POPE
1-14-21
REGISTERED PROFESSIONAL ENGINEER

L. R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
1104 EAST 100 SOUTH SUITE 1-B
ST. GEORGE, UTAH
(PHONE) 435-625-1676
(FAX) 435-628-1935
(EMAIL) lrpope@infowest.com

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CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
LANDSCAPE PLAN
LOCATED IN SECTION 4, TOWNSHIP 41 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY
LRP

DATE
10-26-20

FILE NAME
CURTIS ANDERSON

24" x 36"
SCALE 1" = 20'

12" x 18"
SCALE 1" = 40'

SHEET NUMBER
C6.00

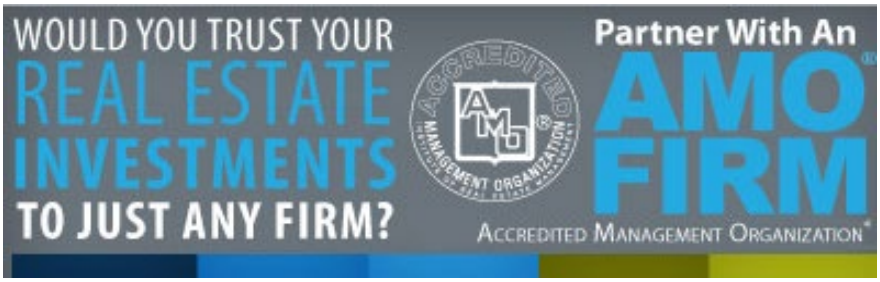
From: Kyle Arbizu
To: Cindy Beteag
Cc: Landon A
Subject: Re: agenda form
Date: Wednesday, January 26, 2022 11:08:12 AM
Attachments: impactfees.pdf
impact-fee-handbook.pdf

Cindy,

I've attached two studies on impact fees, one by HUD and one by The National Association of Home Builders. I'd put in our narrative that the location of this project requires little to no spending for street and parking infrastructure. We believe these costs should be reduced, so they commiserate with costs the City would incur. The other request was the reduction in Park fees which the proposed reduction we believe is still a large sum and pays for a good portion of a new park or would cover a long extension of walking or biking paths.

Kyle Arbizu
ARM®, HCCP©, CPM® Candidate
Managing Partner
Parkplace Residential, AMO®
560 South Valley View Drive #3
Saint George, Utah 84770
Office: (435) 656-0770
Mobile: (435) 632-1493
Fax: (844) 672-5753

Mailing
PO BOX 727
Santa Clara, Utah 84765
https://www.pprmco.com



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From: Cindy Beteag <cindy@cityofhurricane.com>
Date: Wednesday, January 26, 2022 at 10:21 AM
To: Kyle Arbizu <karbizu@pprmco.com>

Cc: Landon A <andersonlandon06@gmail.com>
Subject: RE: agenda form

Kyle,

You have been added to the agenda. This is how our code reads for adjustment requests:

- **Sec. 9-2-5. - Adjustments.**

A. *Request.* In order to ensure that impact fees are imposed fairly, and in order to respond to unusual circumstances in specific cases, the City may adjust the standard impact fee at the time the fee is charged. Such adjustment shall be made only upon specific written request to the City by persons subject to payment of such fees and after consideration of the matter by the City at a regular meeting of the City Council.
B. *Submission of application; decision.* The City may adjust the amount of impact fees to be paid on any specific development based upon studies and data submitted by the developer evidencing that the impact fee imposed is unfair or not reasonably related to the impacts caused by such new development. The application to adjust fees, together with any supporting data and studies, shall be submitted to the City staff for review and recommendation to the City Council. Within 30 days, the City Council shall consider all pertinent information and make any adjustments deemed appropriate at a regular meeting of the City Council.
Do you have any other supporting documents or studies that you want to include with your request?

Thank you,

Cindy Beteag

Cindy Beteag
City Recorder
Hurricane City
Office 435-635-2811 x 106

From: Kyle Arbizu <karbizu@pprmco.com>
Sent: Tuesday, January 25, 2022 10:25 AM
To: Cindy Beteag <cindy@cityofhurricane.com>
Cc: Landon A <andersonlandon06@gmail.com>
Subject: Re: agenda form

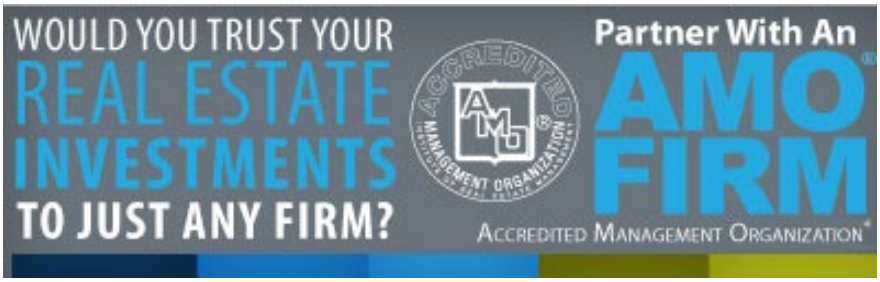
Cindy,

See completed form that has been attached. Please let us know if we can make it for the February 3rd agenda.

Thanks,

Kyle Arbizu
ARM®, HCCP©, CPM® Candidate
Managing Partner
Parkplace Residential, AMO®
560 South Valley View Drive #3
Saint George, Utah 84770
Office: (435) 656-0770
Mobile: (435) 632-1493
Fax: (844) 672-5753

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From: Cindy Beteag <cindy@cityofhurricane.com>
Date: Tuesday, January 25, 2022 at 9:46 AM
To: Kyle Arbizu <karbizu@pprmco.com>
Subject: agenda form

Cindy Beteag

Cindy Beteag
City Recorder
Hurricane City
Office 435-635-2811 x 106

Impact Fees

• An impact fee is a one-time charge imposed by local political subdivision (a municipality, county, special service district, etc) to mitigate the impact on local infrastructure caused by new development.

• Growth in the form of new homes and businesses requires expansion or enlargement of public facilities to maintain the same level and quality of public services for all residents of a community. Impact fees help fund expansion of public facilities necessary to accommodate new growth.

• Impact fees are governed by the Utah Impact Fees Act, found in Utah Code §11-36a-101 et. seq. A local political subdivision may charge impact fees by following the terms of the Impact Fees Act which requires approval and adoption of:
(a) a capital facilities plan, and
(b) an ordinance (Hurricane's impact fee ordinance is found in §9-2-1 et. seq of the Hurricane City Code.)

• A capital facilities plan is a complex analysis of a local government's existing level of public services, future needs due to anticipated growth and new development, and the anticipated cost to maintain the existing level of service. Adoption of a capital facilities plan requires notice and public hearing and is required if a governmental entity wishes to adopt an impact fee Ordinance.

• Impact fees may be used for permanent buildings and other physical facilities owned by the local government which have a life expectancy of more than 10 years. A local government may charge impact fees to fund the following public facilities:
(a) water systems and water rights
(b) roads
(c) wastewater systems
(d) stormwater control systems
(e) parks
(f) municipal power facilities
(g) public safety facilities (*i.e.,* police and fire facilities)

• Impact fees are intended to help fund expansion of public facilities, including acquisition of property or water rights, materials, and construction. Impact fees may <u>not</u> be used for routine maintenance of existing facilities, or for employee salaries.

• Impact fees may <u>not</u> be used to cure deficiencies in a public facility serving existing development or to raise the established level of service of a public facility serving existing development.

• In addition to containing a schedule of impact fees, an impact fee ordinance must contain provisions that:
(a) allows the local political subdivision to adjust the standard impact fee at the time the fee is charged to respond to unusual circumstances in specific cases and ensure that impact fees are fairly imposed,

(b) governs calculation of the amount of the impact fee on a particular development in a way that permits adjustment of the impact fee based upon studies and data submitted by the developer, and
(c) permits impact fee credit for dedication by the developer of a system improvement.

• An impact fee ordinance may not take effect until 90 days after the day on which the impact fee ordinance is approved.

• Low income housing, development activity attributable to the state, or other development activity with a broad public purpose may be exempt from impact fees if:
(a) the impact fee ordinance allows such exemption, and
(b) the ordinance establishes one or more sources of funds other than impact fees for that development activity.

• A local political subdivision may expend impact fees only for a system improvement identified in the capital facilities plan and for the specific public facility type for which the fee was collected. For example, a road impact fee must be spent on road construction, and a park impact fee must be spent on parks, etc.

• A local political subdivision must expend an impact fee within six (6) years after the impact fee is collected, except that impact fees may be held longer than six (6) years if the local political subdivision identifies in writing an extraordinary and compelling reason why the fees should be held longer than six (6) years and an absolute date by which the fees shall be expended.

• Impact fees must be kept in separate interest bearing accounts. At the end of each fiscal year, a report must be made which shows:
(a) the amount and source for all money collected during the year
(b) each expenditure from each account
(c) the funds in each account by showing the year in which they were collected, the project for which they were collected, and the projected schedule for expenditure

• Impact fees are "exactions" within the meaning of exaction law. In order for such exaction to be valid:
(a) there must be an essential link or "nexus" between a legitimate government interest and the impact fee, and
(b) the amount of the impact fee must be "roughly proportionate" both in *nature* and *extent* to the impact of the proposed development.

MODIFIED AGREEMENT

THIS AGREEMENT is made and entered into on this _____ day of _____, 1996, by and between the CITY OF HURRICANE, UTAH, a municipal corporation of the State of Utah, hereinafter referred to as ”city”, and BRIAN JAMES STRATTON, TRACEY LEE STRATTON DONALD NEIL STRATTON, JOYCE STRATTON GORMAN, DIANE STRATTON NAY, CRAIG STRATTON STEVEN STRATTON, LAYNE STRATTON and LINDA STRAON PEARSON, hereinafter collectively referred to as “The Strattons.”

RECITALS:

A. City and Stratton Brothers, a Utah General Partnership, have previously entered into an Agreement dated the 17th day of August 1979 (hereinafter referred to as the “1979 Agreement”), a copy of which is attached hereto as Exhibit A and incorporated herein as if fully set for and an agreement dated the 6th day of June 1996
B. Brian James Stratton, Tracey Lee Stratton, Donald Neil Stratton, Joyce Stratton Gorman, Diane Stratton Nay, Craig Stratton, Steven Stratton, Layne Stratton, and Linda Stratton Pearson are the assignees of all of Stratton Brothers partnership’s right, title and interest in and to the 1979 Agreement.
C. Since the execution of the 1996 agreement, Stratton’s have discovered two water rights which they believe should have been added to the agreement and are referred to as 81-1108 representing 21.72-acre feet and 81-1202 which represents 1.06-acre feet of water.

NOW, THEREFORE, IN CONSIDERATION of the mutual covenants and obligations contained herein, the parties hereto agree as follows:

1. City is duly organized and validly existing under the laws of the State of Utah, and has full governmental powers to execute, deliver and perform its obligations under the terms of this agreement.
2. The Stratton’s represent, covenant and warrant that they are the sole holders/owners of record, free and clear of any liens, claims or encumbrances of the following described water right:
   (a) Water right # 81-1202 with a diversion limit of 1.064-acre feet, as filed at the office Water right # 81-1202 with a diversion limit of 1.064-acre feet, as filed at the office of the State Water Engineer in Cedar City, Utah of the State Water Engineer in Cedar City, Utah and
   (b) Water right # 81-1108 with a diversion limit of 21.72-acre feet, as filed at the office of the State Water Engineer in Cedar City, Utah
3. The Strattons hereby agree to sell, transfer and convey to City all of their right, title and interest in and to the above described water right and, immediately upon execution of this agreement, to execute and deliver to City all deeds, certificates or other documents as may be deemed necessary for the transfer and conveyance to City of said water rights.

4. The Stratton's, their successors and assigns shall be entitled to receive an additional 24 fully pre-paid residential water connections, in accordance with the following:

(a) For purposes of this paragraph, the term "fully prepaid" shall include all fees or charges commonly referred to or included within the term "water impact fee", including water acquisition fees, etc., excepting only the cost of the water meter and the cost of the installation thereof.

(b) The cost of said residential connections may also be used or applied towards the cost of a commercial connection, provided that the value of any residential connection or commercial connection shall be determined at the time of connection to the water system.

(c) Said water connections may be used at any time during the term hereof at any location within the corporate limits of City, subject to all other applicable rules, regulations, or ordinances of City.

(d) City shall be responsible for maintaining adequate books and records for the purpose of keeping a running account of all transactions involving said residential water connections and shall provide Strattons, upon written request, an annual review and accounting showing the status of water connections unused by Strattons.

5. The term of this amendment to agreement shall be for a period of (50) years.
6. In the event of a breach of any term or condition of hereof, the party in breach shall be liable to the other party for all damages, fees, costs and expenses incurred as a result of said breach, including all costs of court and a reasonable attorney's fee incurred as a result of the commencement or maintenance of anyt legal action to enforce the terms and conditions hereof.
7. This agreement constitutes the entire understanding and agreement of the parties, all prior negotiations and discussions having been merged herein, and shall not be altered or modified except in writing signed by the parties hereto.
8. This agreement shall be construed under the laws of the State of Utah.
9. This agreement is binding on the parties heirs and assigns.

Resolution No. 2022-10

A RESOLUTION OF THE HURRICANE CITY COUNCIL OF HURRICANE, UTAH, RECOGNIZING PARENTS' RIGHTS, STAKEHOLDER AUTHORITY, AND POLITICAL PARTICIPATION.

WHEREAS, on October 22nd, 2021, the National School Board Association (NSBA) apologized exclusively to its policy of this state that a parent retains the fundamental right and duty to exercise primary control over the care, 30-5a-103 6 and 62A-4a-201, it is the public supervision, upbringing, and education of the parent's children," and association members, and

WHEREAS, on November 16th, 2021, a FBI whistleblower disclosed evidence of Federal Counter-Terrorism tools being used to target parents, based upon U.S. AG Garland's October 4th directive to FBI detachments, and directly contradicting U.S. AG's October 21st Congressional testimony that (1) the NSBA letter inspired his directive and (2) counter-terrorism tools were not being used against parents, and

WHEREAS, on November 16th, 2021, a FBI SWAT team broke into a home with children present, in Grand Junction, Colorado to arrest a parent whose political activities included attending school board meetings, supporting school board candidates, and organizing parents, and

WHEREAS, as of December 8th, 2021, twenty-seven (27) States have repudiated the repercussions of the NSBA letter and eighteen (18) States have rescinded their membership with NSBA, and

WHEREAS, as of January 28, 2022, the Utah School Directors Association has (1) not repudiated the NSBA's September 29th, 2021 'domestic terrorism' letter or (2) withdrawn its NSBA membership from NSBA, and

WHEREAS, the Utah State Legislature is the primary stakeholder in the establishment, maintenance, and success of the State's entire Education system, including, but not limited to public, charter, private, and home-based education sub-systems, and

WHEREAS, "The Utah State recognizes that: The State's role is secondary and supportive to the primary role of a parent," and

WHEREAS, The Utah State has legally stated, "A fundamentally fair process must be provided to parents if The State moves to challenge or interfere with parental rights. Utah State supports any actions or allegations made in opposition to the rights and desires of a parent regarding the parent's children by sufficient evidence to satisfy a parent's constitutional entitlement to heightened protection against government interference with the parent's fundamental rights and liberty interests and, concomitantly, the right of the child to be reared by the child's natural parent."

WHEREAS, Parents are the primary stakeholders in their children's upbringing, and

WHEREAS, as stakeholders, Parents are responsible for what and how their children are taught, and

WHEREAS being responsible, Parents have the unalienable right to participate in the political process on behalf of their children, and

WHEREAS, both Parents, the Utah State Legislature, and the Utah Board of Education, as Primary Stakeholders in their respective areas of education, should seek joint partnership in ensuring the success of Utah State's children and the entire Education System, therefore

BE IT RESOLVED that based on Utah State code Hurricane City Council and Mayor affirms that parents are the PRIMARY stakeholders in their children's upbringing and PRIMARY political participants on behalf of their children.

BE IT FURTHER RESOLVED that Hurricane City Council and Mayor agree by the clearly define law that terrorism and domestic terrorism in Utah State code and distinguish it from criminal activity to ensure due process for all Utahans.

BE IT FINALLY RESOLVED that this resolution will be forwarded to The Washington County School District, Washington County School Board, Utah State School Board, and Utah State Board of Education showing support from The Hurricane City Council and Mayor, who recognizing parents' rights, stakeholder authority, and political participation.

DATED this 3rd day of February 2022.

_____
Nanette Billings, Mayor

Attest:

_____
Cindy Beteag, City Recorder

Resolution No. 2022-10

A RESOLUTION OF THE CITY COUNCIL OF HURRICANE, UTAH, AFFIRMING FUNDAMENTAL RIGHTS AND FREEDOMS GUARANTEED UNDER THE UNITED STATES CONSTITUTION.

WHEREAS, when sworn in as public servants, the Mayor and each member of the Hurricane City Council pledged to uphold and defend the United States Constitution and to discharge their duties with fidelity; and

WHEREAS, the United States Constitution and, more specifically, the Due Process Clause of the Fourteenth Amendment, protects the fundamental right of parents to direct the care, upbringing, and education of their children; and

WHEREAS, in recent months there have been reports of government overreach that include the misapplication of domestic terrorism laws to wrongfully silence parents from voicing legitimate concerns at school board meetings regarding the education of their children; and

WHEREAS, the Mayor and undersigned City Council members feel duty bound to raise an unequivocal voice against those things or actions that directly or indirectly attack or erode our constitutional rights and freedoms,

NOW, THEREFORE, BE IT HEREBY RESOLVED by the City Council of Hurricane, Utah that the City of Hurricane and its elected officials reaffirm their commitment to maintain and defend rights and freedoms guaranteed to all Americans under the United States Constitution, including freedom of speech and the right to peacefully voice legitimate concerns at school board meetings and at other public forums, and the fundamental right of parents to direct the care, upbringing, and education of their children.

DATED this _____ day of February 2022.

CITY OF HURRICANE

_____
Nanette Billings, Mayor

Council Member	Aye	Nay
Kevin Thomas	____	____
David Sanders	____	____
Joseph Prete	____	____
David Hirschi	____	____
Doug Heideman	____	____

Attest:

_____
Cindy Beteag, City Recorder

PRELIMINARY PLAT APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $150.00

For Office Use Only:
File No. 2022-PP-02
Receipt No. _____

Name: TAMMY ENGEL Craig Engel, RAC INC **Telephone:** 435-229-7360

Address: 1267 No. 1390 W St. George **Fax No.** _____

Email: racinc19@gmail.com **Agent Email:** marc@browncivil.com

Agent (If Applicable): MARC BROWN BCE **Telephone:** 435-628-4700

Address/Location of Subject Property: 1300 W, 650 South

Tax ID of Subject Property: H-3-2-4-124 **Zone District:** R-1-10

Proposed Use: (Describe, use extra sheet if necessary. Include total number of lots) _____

37 Lot, 10,000 s.f. min residential sub.

Submittal Requirements: The preliminary plat application shall provide the following:

✓ 1. Description: In a title block located in the lower right-hand corner of the sheet the following is required:
- ✓ a. The proposed name of the subdivision.
- ✓ b. The location of the subdivision, including the address and section, township and range.
- ✓ c. The names and addresses of the owner or subdivider, if other than the owner.
- ✓ d. Date of preparation, and north point.
- ✓ e. Scale shall be of sufficient size to adequately describe in legible form, all required conditions of Chapter 39, City Subdivision regulations.

✓ 2. Existing Conditions: The preliminary plat shall show:
- ✓ a. The location of the nearest monument.
- ✓ b. The boundary of the proposed subdivision and the acreage included.
- ✓ c. All property under the control of the subdivider, even though only a portion is being subdivided. (Where the plat submitted covers only a part of the subdivider's tract, a sketch of the prospective street system of the unplatted parts of the subdivider's land shall be submitted, and the street system of the part submitted shall be considered in light of existing Master Street Plan or other Commission studies.)
- ✓ d. The location, width and names/numbers of all existing streets within two hundred (200) feet of the subdivision and of all prior streets or other public ways, utility rights of way, parks and other public open spaces, within and adjacent to the tract.
- ✓ e. The location of all wells and springs or seeps, proposed, active and abandoned, and of all reservoirs or ponds within the tract and at a distance of at least one hundred feet (100') beyond the tract boundaries.
- ✓ f. Existing sewers, water mains, culverts or other underground facilities within the tract, indicating the pipe sizes, grades, manholes and the exact locations.

1-4-22

✓ g. Existing Hurricane Canal Company facilities; other ditches, canals, natural drainage channels and open waterways and any proposed realignments.

✓ h. Contours at vertical intervals not greater than five (5) feet.

✓ i. Identification of potential geotechnical constraints on the project site (such as expansive rock and soil, collapsible soil, shallow bedrock and caliche, gypsiferous rock and soil, potentially unstable rock or soil units including fault lines, shallow groundwater, and windblown sand) and recommendations for their mitigation.

N/A j. Information on whether property is located in desert tortoise take area

✓ 3. Proposed Plan: The subdivision plans shall show:

✓ a. The layout of streets, showing location, widths, and other dimensions of proposed streets, crosswalks, alleys and easements.

✓ b. The layout, numbers and typical dimensions of lots.

✓ c. Parcels of land intended to be dedicated or temporarily reserved for public use or set aside for use of property owners in the subdivision.

✓ d. Easements for water, sewers, drainage, utilities, lines and other purposes.

✓ e. Typical street cross sections and street grades where required by the Planning Commission. (All street grades over 5% should be noted on the preliminary plat)

✓ f. A tentative plan or method by which the subdivider proposes to handle the storm water drainage for the subdivision.

✓ g. Approximate radius of all center line curves on highways or streets.

✓ h. Each lot shall abut a street shown on the subdivision plat or on an existing publicly-dedicated street. (Double frontage or flag lots shall be prohibited except where conditions make other design undesirable)

✓ i. In general, all remnants of lots below minimum size left over after subdividing of a larger tract must be added to adjacent lots, rather than allow to remain as unusable parcels.

N/A j. Where necessary, copies of any agreements with adjacent property owners relevant to the proposed subdivision shall be presented to the Planning Commission.

✓ k. A letter from both the local sanitary sewer provider and culinary water provider indicating availability of service.

N/A l. Will this subdivision be phased? If yes show possible phasing lines.

✓ m. A tentative plan or method for providing non-discriminatory access to the subdivision for purposes of placement of communications infrastructure, and for purposes of placement of utility infrastructure.

_____ 4. Required copies of plans:

____ a. Three copies of all full scale drawings

____ b. One copy of each drawing on a 11 x 17 inch sheets. (8 ½ x 11 is acceptable if the project is small and the plans are readable at that size).

5. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application, could result in a month's delay. Planning Commission meetings are held on the second Thursday and fourth Wednesday of each month at 6:00 p.m. The deadline to submit an application to be placed on an agenda is no later than <u>12:00 noon</u> 10 full business days before the Planning Commission meeting at which you plan for your application to be heard.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete:_____ Completion determination made by: _____

PURPOSE
The preliminary plat application is the first step in land development process in those instances where land is divided for eventual sale. The process is established to insure that all proposed divisions of land conform to the City General Plan and to adopted development standards of the Land Use Ordinance.

WHEN REQUIRED
The preliminary plat is required any time land is to be divided, re-subdivided or proposed to be divided into two (2) or more lots, parcels, sites, units, plots or other division of land for the purpose, whether immediate or future, for offer, sale, lease or development either on installment plan or upon any and all other plans, terms and conditions. It is not required on agricultural divisions where the agricultural parcel is divided to be combined with another agricultural parcel, nor is it required when two un-subdivided properties are merged, or where the boundary between two un-subdivided properties are adjusted.

The preliminary plat must be approved before a final plat can be processed and recorded.

Subdivision approval process:

- Determine current zoning for property.
- If zoning fits desired subdivision, meet with Planning staff to discussed the proposed project.
- Obtain a preliminary plat application form and complete the application and have a plat prepared by an engineer to meet the requirements on the preliminary plat application.
- Submit completed application, preliminary plat, and required $150 fee to Planning Department before noon on the Wednesday two weeks before desired Planning Commission meeting. (see submittal dates sheet)
- Appear at the scheduled Planning Commission meeting to discuss preliminary plat, hear comments, answer questions, and receive recommendation of approval or disapproval from Planning Commission.
- Appear at the next scheduled City Council meeting that occurs after the Planning Commission meeting at which a recommendation was received. Hear City Council comments, answer questions, and receive City Council decision. City Council can approve the plat with conditions, recommend changes and send it back to the Planning Commission, or deny the plat.

If the preliminary plat is approved, have construction drawings for utilities and streets prepared by an engineer according to Hurricane City standards. Construction drawings must be approved by both the Hurricane Joint Utilities Committee and the Ash Creek Special Service District. Approval means changes are made and all required signatures are obtained.

Once the preliminary plat is approved by the City Council, the applicant has one year after receiving approval of the preliminary plat to submit the final plat to the Planning Commission for action. The Planning Commission may authorize a one-year time extension, provided the extension request is made before the one year time limit is reached. The Planning Commission will review and make recommendation to the City Council on the final plat when submitted. The City Council will typically review the Planning Commission recommendation within 1-2 weeks after the Commission action on the final plat.

APPEALS
The Planning Commission makes a recommendation to the City Council, so there is no appeal. The City Council's action on a preliminary plat is final unless appealed to the appropriate court.

3/4

AFFIDAVIT
PROPERTY OWNER

STATE OF UTAH)
:ss
COUNTY OF Washington)

I (we), Tammy Eirgel, being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

Tammy Engel
(Property Owner)

N/A
(Property Owner)

WENDY THOMAS
Notary Public - State of Utah
Comm. No. 702623
My Commission Expires on
Oct 1, 2022

Subscribed and sworn to me this 4 day of January 2022.

Wendy Thomas
(Notary Public)

Residing in: Washington County.

My Commission Expires: 10.01.2022

Agent Authorization

I (we), Tammy Eirgel, the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s) Marc Brown to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application.

Brown consulting

Tammy Engel
(Property Owner)

N/A
(Property Owner)

Subscribed and sworn to me this 4 day of January 2022

Wendy Thomas
(Notary Public)

Residing in: Washington County

My Commission Expires: 10.01.2022

WENDY THOMAS
Notary Public - State of Utah
Comm. No. 702623
My Commission Expires on
Oct 1, 2022

SENSITIVE LANDS APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $

For Office Use Only:
File No. 2022-HIL-01
Receipt No. _____

Name: RAC INC Craig Engel **Telephone:** 1-435-229-7360

Address: 1267 No 1390 W St. George **Fax No.** _____

MARC BROWN
Agent (If Applicable): BROWN CONSULTING **Telephone:** 435-628-4700

Email: racinc19@gmail.com **Agent Email:** marc@browncivil.com

Address/Location of Subject Property: 1300 W. 650 So.

Tax ID of Subject Property: H-3-2-4-124 **Zone District:** R-1-10

Proposed Use: (Describe, use extra sheet if necessary) 3Z-10,000 sf. min.
Residential subdivision

Other companion application submitted with the Development Plan:

- ✓ **Preliminary Plat**
- _____ **Site Plan Review**
- _____ **Conditional Use Permit**
- _____ **Rezone**
- _____ **Other**

Submittal Requirements:
Please review the attached Supplemental Information to determine additional information that must be submitted with this application.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

DEVELOPMENT PLAN SUBMITTAL REQUIREMENTS

Development Plan Submittal: The following information shall be submitted with the application for Development Plan approval, and may be in addition to information required for a companion application being processed concurrently with the Development Plan:

_____1. Development plan: The development plan shall clearly show:

✓ a. Two (2) foot contours. The contour map shall be prepared and certified by a licensed professional civil engineer or surveyor drawn at a scale no smaller than one (1) inch equals one hundred (100) feet. Contour maps based on interpolation of maps with larger contour intervals are not acceptable.

✓ b. Field surveys may be required of the applicant by the City to verify the accuracy of the contour lines shown on the contour map.)

✓ c. Slopes having grades of 10-29 percent and natural slopes of thirty (30) percent or greater shall be color shaded clearly showing the difference between the two categories. This contour information shall either be computer based, or based on profile lines drawn perpendicular to contours at intervals no less than one hundred fifty (150') feet apart, nor greater than seventy-five (75') feet from an existing or proposed property line. Grades shall then be determined by calculating the slope along one hundred (100) foot segments of the profile. (See Appendix Diagram-A of the Land Use Ordinance)

✓ d. To determine required minimum lot size (Section 10-24-6B of the Sensitive Land Ordinance), the average natural grade on each proposed parcel shall be calculated and indicated on the development plan. The average grade is determined by calculating the grade of the natural slope between two opposing property lines, based on profiles taken perpendicular to the contours, no less than one hundred fifty (150) apart, nor greater than seventy-five (75) feet from an existing or proposed property line.

✓ e. The proposed development layout of lots, roads, proposed road grades, open space, area of disturbances, and existing native vegetation.

_____2. Soils Investigation Report: A soils investigation report which contains the following information:

✓ a. Nature, distribution and classification (Unified Soil Classification) of existing soils to the appropriate depth of influence by the proposed development, but not less than ten (10) feet deeper than the proposed excavations or to bedrock.

✓ b. Strength of existing soils, bearing capacity of supporting soils, settlement estimates, collapse and shrink-swell characteristics, lateral pressures and trench excavation limitations.

✓ c. Ground water levels that may affect development and estimated elevation of high ground water levels.

✓ d. Appropriate laboratory testing for classification, consistency, strength and consolidation conditions.

✓ e. Slope stability.

✓ f. A written statement by the persons or firm preparing the soils report describing the general suitability of the site for the owner=s intended use.

✓ 3. Geotechnical Report: A geotechnical and geological report shall be prepared by a geologist licensed to practice in the State of Utah, whenever a proposed building permit or development project:

a. Is located within one thousand (1,000) feet of an identified fault; or
b. Is located on slopes estimated to be twenty (20) percent or greater; or
c. Is determined to have potential hazards by the City Engineer, County Geologist or State Geologist.

The geotechnical and geological report when required above shall include:

✓ a. A geologic map showing topography, surface and subsurface geologic features and any geologic limitations to the proposed use;

✓ b. Depth to bedrock;

✓ c. Subsurface investigative logs and reports;

✓ d. Identification of all geologic hazards; and

✓ e. Measures to mitigate or eliminate geologic hazards and problems.

4. Grading and Drainage Plan: A grading and drainage plan report which includes storm water management, erosion, and grading plans describing the methods by which surface water, natural drainages, flooding (including identification of 100 year flood where applicable), erosion and sedimentation loss, and hydrologic hazards will be controlled during and after construction. The plan shall include the following information:

✓ a. The grading plan shall show present topography, including the location and depth of all proposed fills and cuts of finished earth surfaces, and/or use of retaining walls including height, using a contour interval of two (2) foot when grades are 0-29% and five (5) foot contours when grades 30% and over.

✓ b. The proposed area to be graded shall be clearly delineated on the plan.

c. Preliminary street grades shall be identified on the plan.

✓ d. All calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "Rational Method," "SCS Curve Number Method," or appropriate equivalent. Data provided should include:

(1) Rainfall depth, duration and distribution;
(2) Watershed slope and drainage area delineation;
(3) Land condition of watershed surface;
(4) Topography of drainage area; and
(5) Soil Descriptions in Watershed. Erosion calculations shall employ predictions of soil loss sheet erosion using the Universal Soil Loss Equation or equivalent. Data to be provided should include factors of:
    (a) Rainfall intensity and duration;
    (b) Soil erodability;
    (c) Land slope and length of slope or topography;
    (d) Condition the soil surface and land management practices in use; and
    (e) Surface cover, grass, pavements, etc.

5. License Required: All required reports shall be prepared by persons licensed to practice their specialty or expertise in the State of Utah, if such license for practice is required.

6. Expert Advice: In reviewing technical reports, calculations, and plans which may be required, the City staff or City Engineer may find it necessary to obtain the advice of other experts regarding the adequacy of the reports submitted, and the validity of the conclusions and recommendations reached in the reports. In such cases the City staff or City Engineer may consult with such experts, with the reasonable costs of these consultations to be borne by the developer prior to any public hearing. The Planning Commission or City Council may require payment by the developer of the costs of such consultations as a condition of preliminary or final plat approval.

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application could result in a month's delay. Call the Planning Department to determine the submittal deadline.

PROJECTS SUBJECT TO SENSITIVE LANDS REQUIREMENTS

The following projects are subject to Sensitive Land requirements:

1. All preliminary plats, planned developments, site plan reviews, conditional use permits and any other land use development permits authorized by City Codes when they are:
    (a) Located on lands defined in Section 10-24-2 of the Land Use Code or identified as sensitive lands on the General Plan Sensitive Lands Map;
    (b) Located within one thousand (1000) feet of a fault identified on a published geologic map.
    (c) Located within one hundred (100) feet, measured perpendicularly from a fault identified as a result of on-site investigation by a registered geologist.
    (d) Hillside and ridge and bluff areas (as set forth in section 10-24-5A of the Land Use Ordinance.).
2. Any grading on sensitive land not associated with an approved project of the types listed in subsection 1 above, when such grading will:
    a. Disturb ten thousand (10,000) square feet or more of land area;
    b. Create a cut or fill over three (3) feet in height; or
    c. Create trenching over two hundred (200) feet in length.

    (A development plan is not required, however sufficient information must be submitted to determine compliance with Chapter 24, Sensitive Lands)
3. All building permits, including grading on vacant lots or parcels not previously processed in accordance with the provisions of this Chapter 24 of the Land Use Ordinance. (A development plan is not required, however sufficient information must be submitted to determine compliance with Chapter 24, Sensitive Lands)

PROJECT REVIEW PROCEDURE

When a preliminary plat, site plan, planned development or conditional use permit or other application is located on sensitive lands, the Development Plan application is submitted as a companion application and processed concurrently. The Planning Commission will review the application(s) and on conditional use permits and site plan reviews they will approve, approve with conditions or deny the Development Plan application. On preliminary plats, or zone changes, the Planning Commission will forward a recommendation to the City Council. Following receipt of a recommendation from the Planning Commission, or on appeal, the City Council will hold a public hearing on the application and approve, approve with conditions, or deny the proposed Development Plan.

NOTE: To fully understand the requirements for projects on sensitive lands, you should request a copy of Chapter 24 of the Land Use Ordinance from the City of Hurricane Planning Department.

PLANNING & ZONING
HURRICANE CITY
UTAH

STAFF COMMENTS

Agenda Date:	**02/17/2022**
Application Number:	2022-PP-02 2022-HIL-01
Type of Application:	Preliminary Plat and Hillside Application
Action Type:	Administrative
Applicant:	Marc Brown
Agent:	Marc Brown
Request:	Approval of a Preliminary Plat and Sensitive Lands
Location:	1380 W 825 S
Zoning:	R1-10
General Plan Map:	Single-Family

Planning Commission Recommendation
The Planning Commission gave a positive recommendation subject to JUC and staff comments and granting the exception based on sound engineering principles as listed within the staff report.

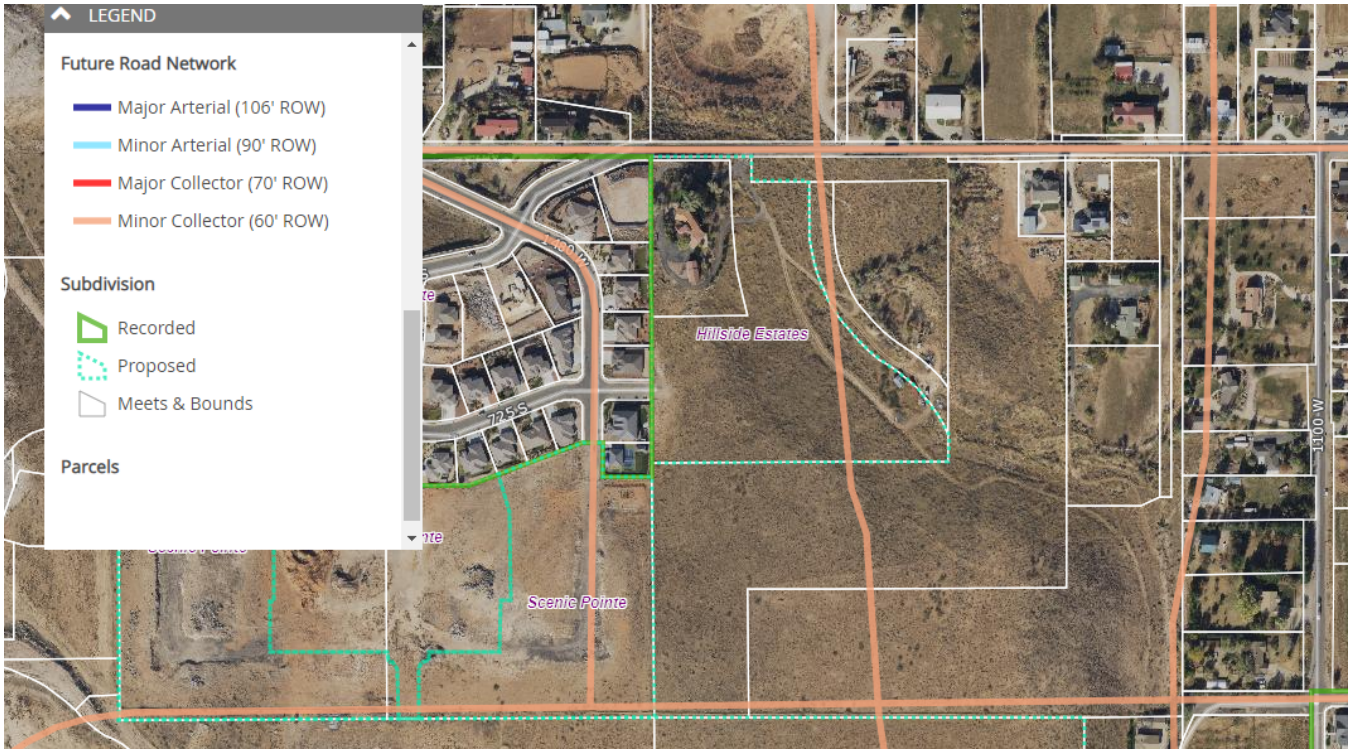
Discussion:
The applicant has submitted a preliminary plat application for 14.19 acres preliminary subdivision plat containing 37 lots. This application was approved by the Planning Commission last year but the applicant decided to resubmit as they found a way to reconfigure the layout in order to get five more lots. This application requires extensive connections with neighboring properties such as Hillside Estates and Collina Tinta. The subdivision is located on hillsides of slopes greater than 10% and has submitted an updated Sensitive Lands/Hillside Application.

JUC Comments
1. **Power:** Power has reviewed construction drawings. Power will be off 650 S. Power can serve the property
2. **Sewer:** A will serve letter has been sent
3. **Streets:** Need to comply with the master plan roadways
4. **Water:** Water is on 650 S. Will need to loop through Hillside Estates and Scenic Pointe to make the water loop work.
5. **Fire:** Make sure there are two access points for over 30 units. Roads that are over 10% grade will need to sprinkle the homes that access off that road. Off-site turnaround will require an agreement with the neighboring property owner
6. **Gas:** Good, two inch line in 650 S, just need it looped.

7. **Water Conservancy:** No comments

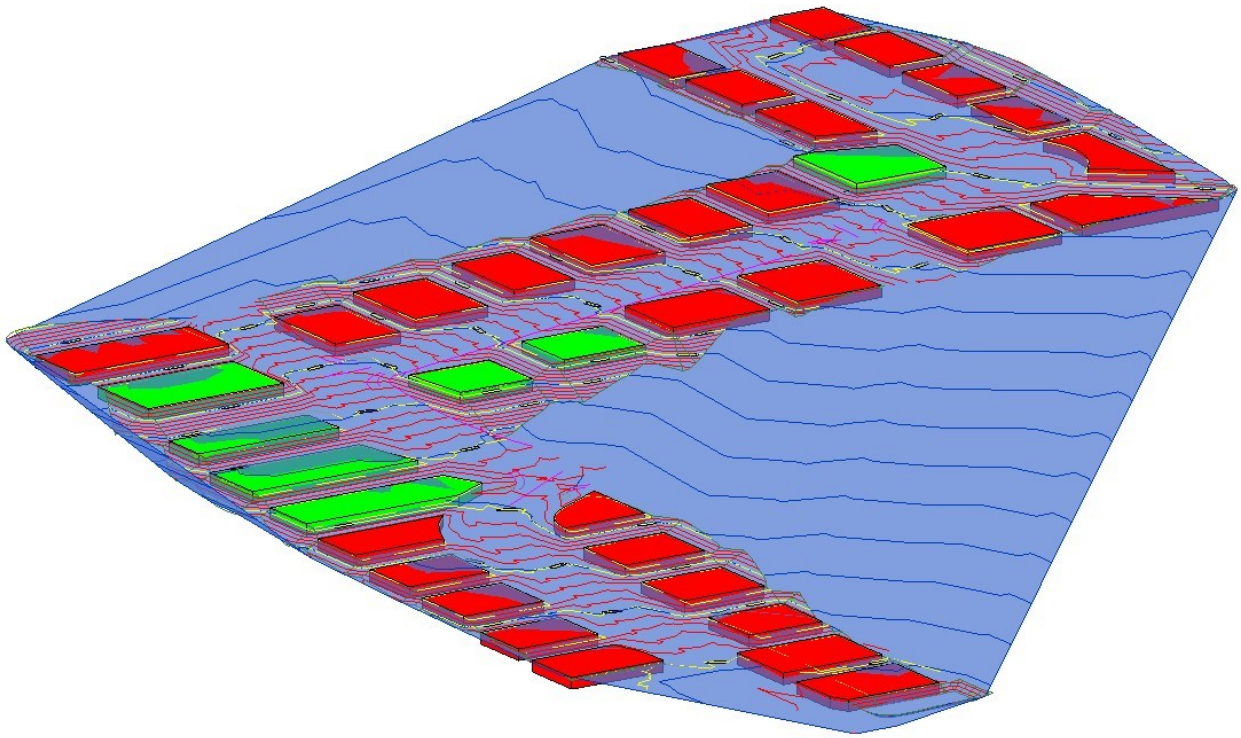
Staff Comments: Preliminary Plat

1. Zoning is R1-10, and the lots comply with the underlying zone. Several of the lots along proposed 825 W do not meet city standards for sensitive lands and will require an exception. These issues are address in the following section.
2. Staff believes a canal goes through the property as shown on the Hillside Estates Preliminary Plat (recently approved to the north). The applicant will need to investigate the location of this water line and ensure proper steps are taken.
3. There is a 60' master plan roadway that goes north and south that the applicant is providing, if at a slightly different alignment.
4. There is a master plan roadway that runs along the southern property boundary. The property owner to the south has indicated that they are planning on realigning the roadway based on their plan for their own project. This plan has not been seen or approved by the City. Any approval of the current layout of this property needs to be subject to a change of the 900 S Master Planned Roadway.



5. The City has not received a letter from the local culinary water provider indicating service availability, but they have indicated services are in the area.
6. A geotechnical and drainage report were submitted for the first submittal on this project. Staff will not require another one at this stage
7. Plat shows the east to west street to be "825 West" this should be "825 South"
8. The applicant is proposing a fire turnaround within property of the Collina Tinta development; an agreement will have to be made with the developers for that turnaround to be valid.
9. The applicant has noted that the property isn't located in a desert tortoise take area.

10. The plat is planned to be developed in a single phase.



Sensitive Lands

1. Update: The applicant is wishing to create five additional lots by splitting the lots shown above in green. The initial application was approved on Nov 29, 2021 by the City Council. The new lots are 28-32 and 7-10. As will be mention below, these lots do not comply with the sensitive lands table minimum lot size for the slop. Staff has talked to the applicant's engineer and has received a letter to address the above exception. See HCC 10-24-6. - Hillsides and ridge areas; general development standards.
2. The Sensitive Land Application is complete. The applicant has provided an updated sloping map and has shown the slope of each lot . The applicant also provided a geotechnical report, drainage Plan, and grading plan with the previous application.

10-24-5: HILLSIDES AND RIDGE AREAS:

A. Applicability: The following procedures, submittal requirements and standards shall apply to those projects located on lands identified as having at least one of the following characteristics:

1. Slopes over ten percent (10%) which are:

a. Identified through computer generated programs capable of calculating slopes on topographic maps prepared with two foot (2') contour interval accuracy; or

b. Established by profile lines drawn perpendicular to contour lines at intervals no greater than one hundred fifty feet (150') apart, when the slope, measured along any one hundred foot (100') segment of the profile line is ten percent (10%) or greater. (See section 10-24-9, appendix diagram A, of this chapter.)

c. A slope shall be subject to this chapter only when a contiguous identified area of ten percent (10%) or greater exceeds two (2) acres, or if the site is less than one acre and the entire site is ten percent (10%) or greater.

2. Soils Investigation Report: A soils investigation report which contains the following information:

a. Nature, distribution and classification (unified soil classification) of existing soils to the appropriate depth of influence by the proposed development, but not less than ten feet (10') deeper than the proposed excavations or to bedrock.

b. Strength of existing soils, bearing capacity of supporting soils, settlement estimates, collapse and shrink-swell characteristics, lateral pressures and trench excavation limitations.

c. Groundwater levels that may affect development and estimated elevation of high groundwater levels.

d. Appropriate laboratory testing for classification, consistency, strength and consolidation conditions.

e. Slope stability.

f. A written statement by the geotechnical engineer, civil engineer, or geologist preparing the soils report describing the general suitability of the site for the owner's intended use. The report shall identify soil constraints to development and shall state the professional opinion of the author as to whether the proposed development plan will mitigate and/or eliminate said constraints in a manner as to prevent hazard to life, hazard to property, and adverse effects. If the soil report prepared for a subdivision shows the presence of critically expansive soils, high water table, organic soils, liquefiable soils, collapsible soils, or other soil problems which, if not corrected, would lead to structural defects of the proposed buildings, damage to the building from the water, or premature deterioration of the public improvements, a soil investigation of each lot in the subdivision shall be required by the city.

3. Geotechnical Report: A geotechnical and geological report subject to the standards and requirements provided therein.

4. Grading And Drainage Plan: A grading and drainage plan report which includes stormwater management, erosion, and grading plans describing the methods by which surface water, natural drainage, erosion and sedimentation loss, and hydrologic hazards that will be controlled during and after construction. The plan shall include the following information:

a. The grading plan shall show present topography, including the location and depth of all proposed fills and cuts of finished earth surfaces, and/or use of retaining walls including height, using a contour interval of two feet (2') when grades are zero to twenty nine percent (0 - 29%) and five foot (5') contours when grades thirty percent (30%) and over.

b. The proposed area to be graded shall be clearly delineated on the plan.

c. All calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "rational method", "SCS curve number method", or appropriate equivalent. Data provided should include:

(1) Rainfall depth, duration and distribution;
(2) Watershed slope and drainage area delineation;
(3) Land condition of watershed surface;
(4) Topography of drainage area; and
(5) Soil descriptions in watershed. Erosion calculations shall employ predictions of soil loss sheet erosion using the universal soil loss equation or equivalent. Data to be provided should include factors of:
(A) Rainfall intensity and duration;
(B) Soil erodibility;
(C) Land slope and length of slope or topography;
(D) Condition of the soil surface and land management practices in use; and
(E) Surface cover, grass, pavements, etc.

3. Staff has reviewed each lot and the slopes. Each of the newly created lots, 28-32 and 7-10 will require a size exception. These lots were made smaller to accommodate more lots

10-24-5 (C)(1) d. To determine required minimum lot size (subsection 10-24-6B of this chapter) the average natural grade of each proposed parcel shall be calculated, and indicated on the development plan. The average grade shall be determined by calculating the grade of the natural slope between two (2) opposing property lines, based on profiles taken perpendicular to the contours, no less than one hundred fifty feet (150') apart, nor greater than seventy five feet (75') from an existing or proposed property line. Small washes or rock outcrops which have slopes distinctly different from surrounding property may be excluded from slope determination, if the exclusion of such small areas from slope determination will not be contrary to the overall purpose of this chapter, as reasonably determined by the zoning administrator.

The Planning Commission can approve an exception to the lot sizes based on the criteria listed below:

10-24-3: DETERMINATION OF APPLICABILITY:

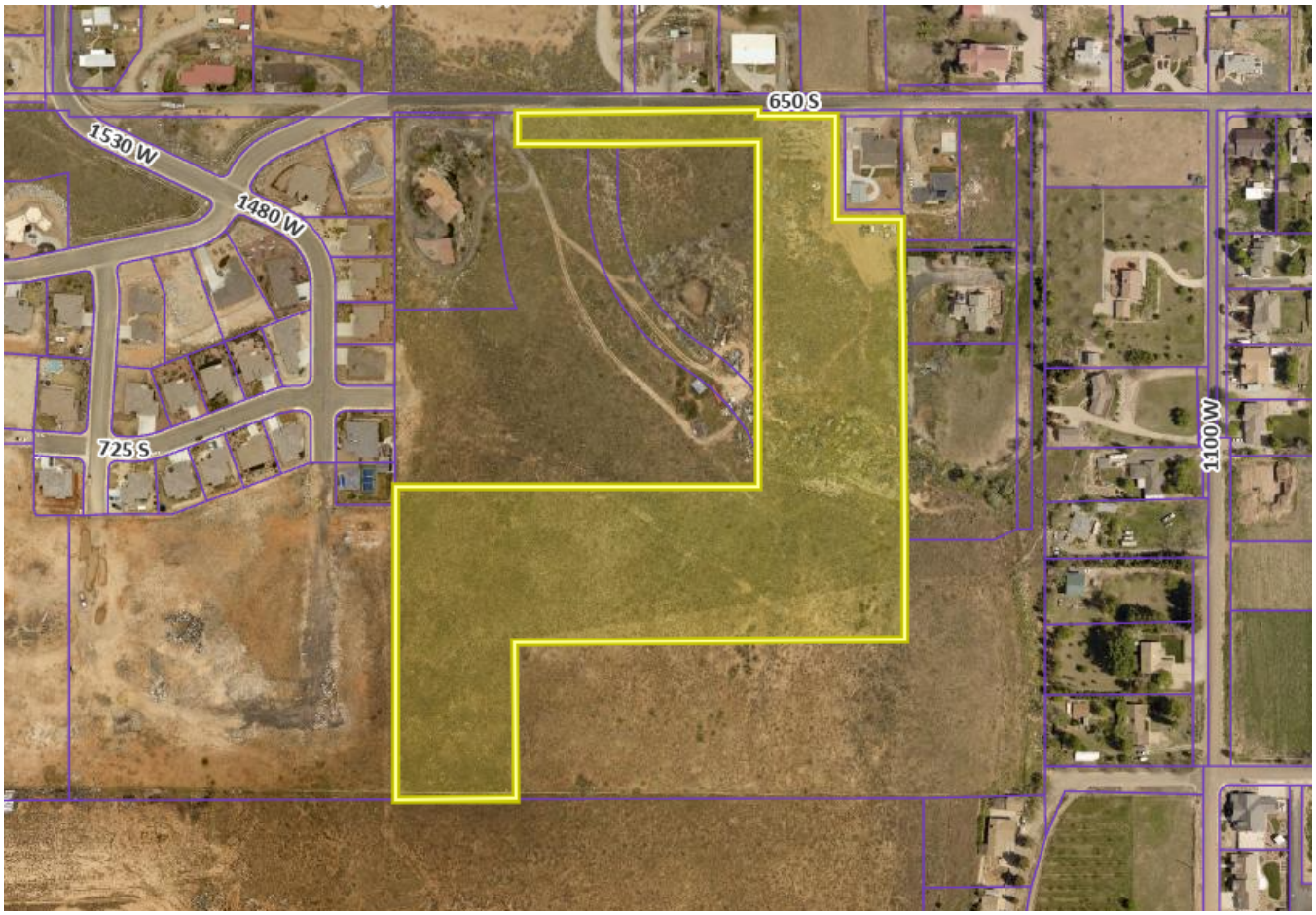
G. Exceptions: Exceptions to the provisions of this chapter may be granted by the city council upon recommendation from the planning commission when:

1. An alternative solution is proposed for the protection of the sensitive land, based on sound and generally accepted engineering and land development principles, and said alternative will result in equal or better protection than development under the standards of this chapter; and is consistent with the purposes of this chapter. The alternative shall also be consistent with the general plan policies affecting sensitive lands;

2. The size of the parcel existing before the effective date of the adoption of this chapter is determined by the planning commission to be too small to effectively apply the provisions of this chapter, and conditions can be added to the project to minimize safety and general welfare concerns.

3. The parcel is zoned for a nonresidential use and the planning commission determines the site requires grading inconsistent with the provisions of this chapter, and conditions can be added to the project to minimize safety and general welfare concerns. (Ord. 2014-6, 5-1-2014)

Staff has talked to the applicant's engineer and requested a letter to address the above exception. Each lot asking for an exception is under 20% slope. The City has typically allowed exceptions for lots under 20% based on a sound grading plan. 10%-20% slope is considered moderate slop for home construction.



4. The applicant has submitted a grading plan. Grading Plan generally complies with Hurricane Standards with the following notes:

- Slops maximums need to be 2:1. Lot 7 east side and Lot 12 southwest side does not seem to comply.
- Any walls must be under 16 ft within a run of 50' area.
- No walls should be placed in PUE. None are shown on the preliminary grading plan.
- The full grading plan will be reviewed with construction drawings by JUC.
- Grading Plan Notes 1 appears to be incomplete.

Recommendation: Staff recommends the City Council review this application based on standards with Hurricane City Code. Staff would recommend approval based on findings or changes listed within this report, that the City approves the realignment of 900 S and based on the letter received by the engineer.

1267 N. 1390 W. St. George Ut. 84770
435-229-7360
racinc19@gmail.com

RAC Development would like to request an increase of 5 additional lots for a total of 37 lots on the Mountain View Estates application from the previously approved 32 preliminary plat.

This alternate layout is in harmony with the protection of the sensitive lands. It is based on sound and generally accepted standards. The proposed revised plan provides equal or better protection for the development and is consistent with the general plan policy affecting sensitive lands.

The changes, slope, and grade issues, are as follows.

1 Lot was added on the south east boundary. 1 Lot added on the north boundary. 2 lots added on the lower west boundary. 1 lot added on the west and east upper boundary.

The larger lots were impractical with very tall 20’ walls. To reduce the wall height we terraced the walls. When we terraced the lots. We added to the usable layout.

The cut and fill was off and the additional lots balanced the grading.

Adding the lots helped with keeping the road under 10% grade.

The lots are all similar in size and are conducive to similar building structures. The larger lots were very out of place.

All lot slopes are under 15% and conform to accepted standards.

The terracing will reduce the slope of the roadways and increase stability of retaining walls, balance the grading, and make the lots of a consistent size. Improving the project viability.

Craig Engel President RAC
Craig Engel

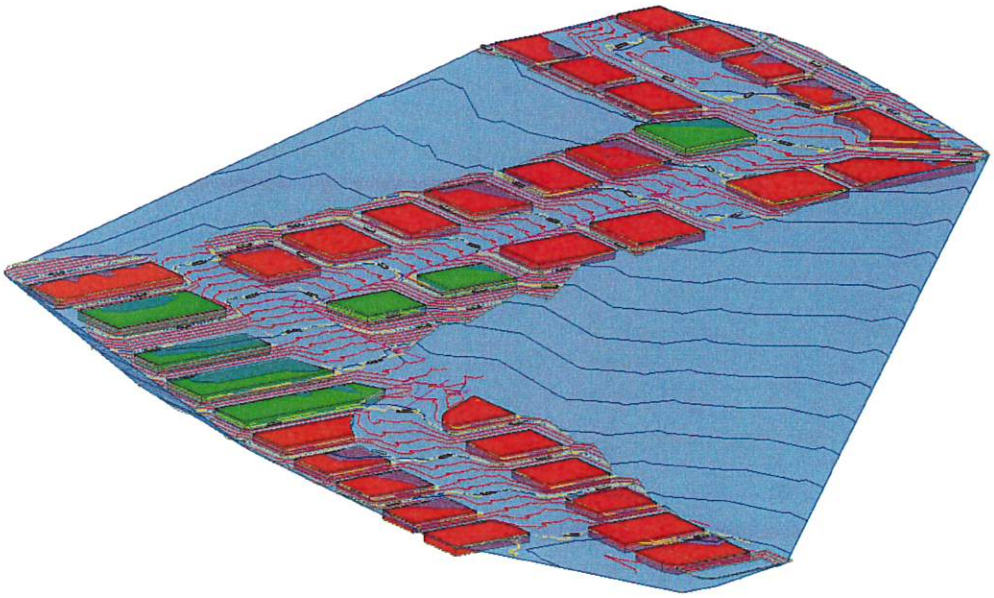
Marc Brown BCE Engineering.
Marc Brown

Stephen Nelson

From: RAC INC. <racinc19@gmail.com>
Sent: Wednesday, January 12, 2022 7:51 AM
To: Stephen Nelson
Cc: Marc Brown
Subject: Please add to RAC submittal

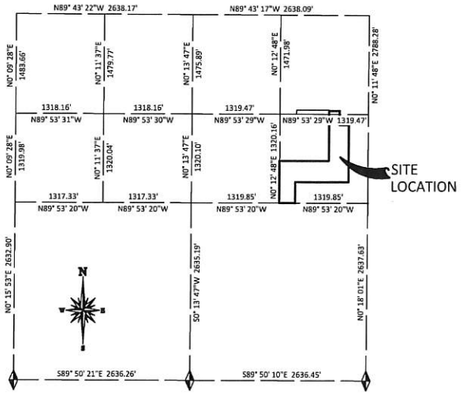
Hello Stephen,

Can you add the attached drawing to the RAC application for the meeting 1/13/21?



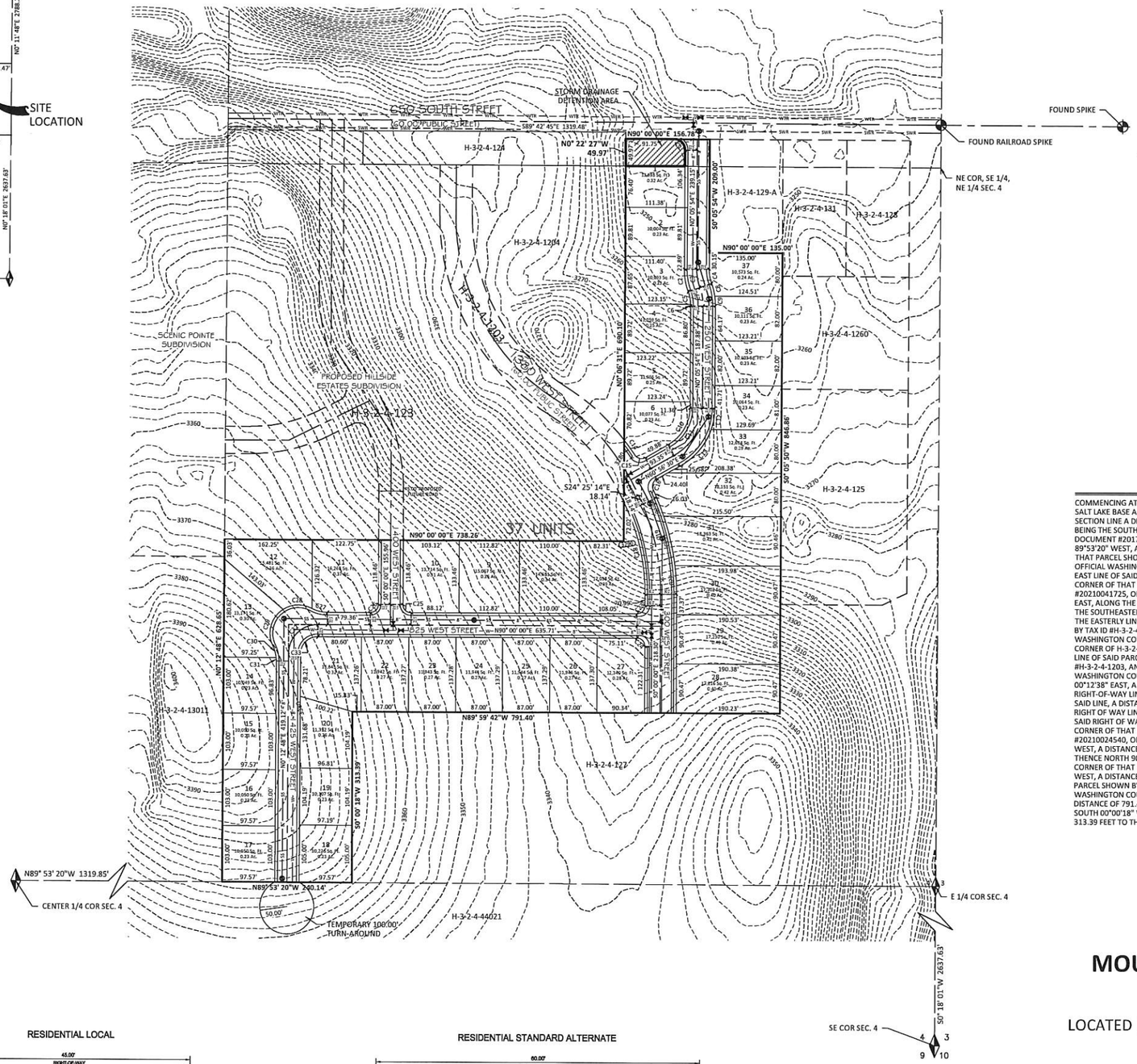
Thank you

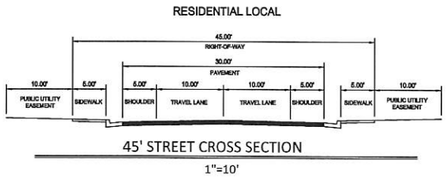
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Craig Engel
RAC Inc.
1267 N 1390 W.
St. George UT 84770
435-229-7360

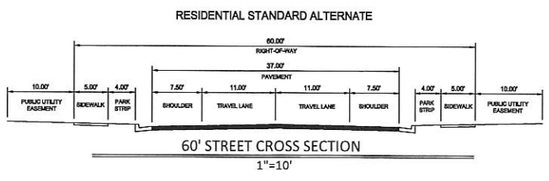


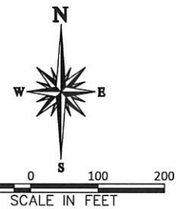
PROJECT LOCATION
SEC. 4 T42S R13W, SLB&M
NOT TO SCALE

CURVE TABLE				
CURVE	RADIUS	LENGTH	DELTA	TANGENT
C1	20.00'	31.45'	90°05'54"	20.03'
C2	122.50'	42.27'	19°46'21"	21.35'
C3	100.00'	34.51'	19°46'21"	17.43'
C4	77.50'	26.74'	19°46'21"	13.51'
C5	77.50'	23.74'	17°33'15"	11.97'
C6	77.50'	3.00'	2°13'06"	1.50'
C7	100.00'	34.51'	19°46'21"	17.43'
C8	122.50'	24.39'	11°24'21"	12.23'
C9	122.50'	17.89'	8°22'00"	8.96'
C10	77.50'	82.30'	60°50'36"	45.51'
C11	100.00'	106.19'	60°50'36"	58.72'
C12	122.50'	40.01'	18°42'53"	20.19'
C13	122.50'	90.07'	42°07'43"	47.18'
C14	430.00'	34.20'	4°33'23"	17.11'
C15	15.00'	22.32'	85°14'31"	13.80'
C16	15.00'	22.35'	85°21'44"	13.83'
C17	400.00'	57.04'	8°10'12"	28.57'
C18	370.00'	157.70'	24°25'14"	80.07'
C19	400.00'	170.49'	24°25'14"	86.56'
C20	430.00'	36.93'	4°55'16"	18.48'
C21	430.00'	93.11'	12°24'25"	46.74'
C22	430.00'	53.23'	7°05'32"	26.65'
C23	15.00'	23.56'	90°00'00"	15.00'
C24	15.00'	23.56'	90°00'00"	15.00'
C25	15.00'	23.56'	90°00'00"	15.00'
C26	15.00'	23.56'	90°00'00"	15.00'
C27	60.00'	29.57'	28°14'29"	15.09'
C28	52.50'	55.74'	60°50'02"	30.82'
C29	52.50'	76.90'	83°55'11"	47.20'
C30	60.00'	21.80'	20°49'13"	11.02'
C31	60.00'	6.18'	5°54'19"	3.09'
C32	54.00'	84.62'	89°47'12"	53.80'
C33	31.50'	49.36'	89°47'11"	31.38'









LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 1896 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- SWR SEWER LINE
- WTR WATER LINE
- SWR PROPOSED SEWER LINE
- WTR PROPOSED WATER LINE

PROJECT DATA	
SINGLE FAMILY HOMES	PARCEL = 14.18 ACRES
PARCEL ID	H-3-2-4-124
PROJECT ADDRESS	1250 W 650 SOUTH
PROJECT	37 SINGLE FAMILY HOMES
ZONE	R-1-10

LEGAL DESCRIPTION

COMMENCING AT THE EAST 1/4 SECTION 4, TOWNSHIP 42 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN; THENCE NORTH 89°53'20" WEST, ALONG THE CENTER SECTION LINE A DISTANCE OF 1079.71 FEET TO THE POINT OF BEGINNING, SAID POINT BEING THE SOUTHWEST CORNER OF THAT PARCEL SHOWN BY TAX ID # H-3-2-4-127 AND DOCUMENT #20170002484, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 89°53'20" WEST, A DISTANCE OF 240.14 FEET, TO THE SOUTHEASTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-13011 AND DOCUMENT #20150044906, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 00°12'48" EAST, ALONG THE EAST LINE OF SAID PARCEL, A DISTANCE OF 628.65 FEET, TO THE SOUTHWESTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-123 AND DOCUMENT #20210041725, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 90°00'00" EAST, ALONG THE SOUTHERLY LINE OF SAID PARCEL, A DISTANCE OF 738.26 FEET, TO THE SOUTHEASTERLY CORNER OF SAID PARCEL; THENCE NORTH 00°06'31" EAST, ALONG THE EASTERLY LINE OF SAID PARCEL AND THE EASTERLY LINE OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-1204, H-3-2-4-1203, AND DOCUMENT #20170014334, OFFICIAL WASHINGTON COUNTY RECORDS, A DISTANCE OF 690.10 FEET, TO THE NORTHEASTERLY CORNER OF H-3-2-4-1204 PARCEL; THENCE NORTH 89°53'29" WEST, ALONG THE NORTH LINE OF SAID PARCEL AND THE NORTH LINE OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-1203, AND H-3-2-4-123 AND DOCUMENT #20210041725, OFFICIAL WASHINGTON COUNTY RECORDS, A DISTANCE OF 486.99 FEET; THENCE NORTH 00°12'38" EAST, A DISTANCE OF 61.64 FEET, TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY LINE OF 650 SOUTH STREET; THENCE SOUTH 89°59'16" EAST, ALONG SAID LINE, A DISTANCE OF 486.43 FEET; THENCE SOUTH 00°00'00" EAST, ALONG THE RIGHT OF WAY LINE, A DISTANCE OF 12.50 FEET; THENCE NORTH 90°00'00" EAST, ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 156.78 FEET, TO THE NORTHWESTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-129 AND DOCUMENT #20210024540, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE SOUTH 00°05'54" WEST, A DISTANCE OF 209.00 FEET, TO THE SOUTHWEST CORNER OF SAID PARCEL; THENCE NORTH 90°00'00" EAST, A DISTANCE OF 135.00 FEET, TO THE SOUTHEAST CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-129; THENCE SOUTH 00°05'50" WEST, A DISTANCE OF 846.86 FEET, TO A POINT ON THE BOUNDARY LINE OF THAT PARCEL SHOWN BY SAID TAX ID #H-3-2-4-127 AND DOCUMENT #20170002484, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 89°59'42" WEST, ALONG SAID LINE, A DISTANCE OF 791.40 FEET, TO THE NORTHWESTERLY CORNER OF SAID PARCEL; THENCE SOUTH 00°00'18" WEST, ALONG THE WESTERLY LINE OF SAID PARCEL, A DISTANCE OF 313.39 FEET TO THE POINT OF BEGINNING.

PRELIMINARY PLAT FOR

MOUNTAIN VIEW ESTATES SUBDIVISION

LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 13 WEST, SLB&M

DEVELOPER/OWNER INFORMATION

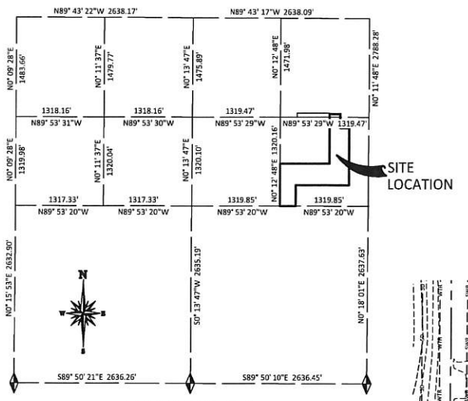
RAC INC. / CRAIG ENGEL
1267 N 1390 W
ST. GEORGE, UT 84770
435-229-7360
CRAIG_ENGEL@MSN.COM

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
163 WEST 1600 SOUTH, UNIT 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

PRELIMINARY PLAT
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4, SEC 4, T42NS R13W S.L.B.&M.
HURRICANE CITY, UTAH

CHECKED BY : MB
DRAWN BY : TF
DATE : JANUARY 2022
JOB NO. : 21-138
SCALE : 1"=100'
SHEET NO. : P-1



PROJECT LOCATION
SEC. 4 T42S R13W, SLB&M
NOT TO SCALE

GRADING PLAN NOTES:

1. ALL EXCAVATIONS AND GRADING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF HURRICANE, SPECIFICALLY THE "UTAH UNIFORM STANDARD ACT RULES", APPENDIX "K", AND THE SPECIFICATIONS AND REQUIREMENTS INCLUDED IN THE GEOTECHNICAL INVESTIGATION PREPARED BY ???

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

5. NO GRADING BEYOND PROPERTY LINE.

6. CONTRACTOR SHALL VERIFY ELEVATION IN THE FIELD.

CONSTRUCTION NOTES

1. GRADE SITE TO ELEVATIONS AND CONTOURS SHOWN ON PLAN.
2. NEW STORM DRAIN CATCH BASIN
3. NEW 12"Ø HDPE STORM DRAIN PIPE
4. STANDARD 8' CROSS GUTTER PER HURRICANE STD DETAIL #CG100
5. PROPOSED STORM WATER DETENTION AREA.
10. NEW 2 1/2" ASPHALT OVER 6" TYPE II AGGREGATE BASE
11. CONSTRUCT NEW 5' SIDEWALK PER HURRICANE CITY STD. DWG #120

EARTHWORK

ESTIMATED EARTHWORK VOLUMES
PHASE 1 BUILDING SITE:
CUT = 40,951 c.y.
FILL = 40,985 c.y.
NET = 34 c.y. (FILL)

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.

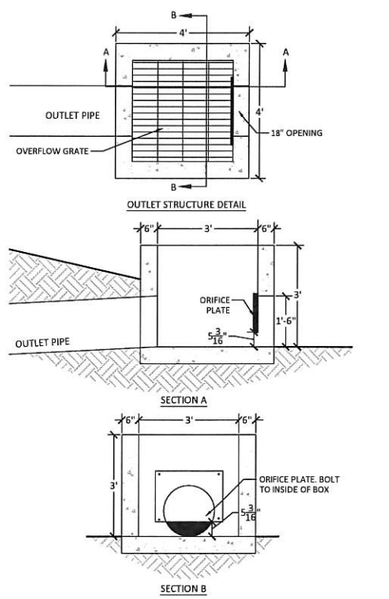
ALL GRADING ACTIVITY SHALL COMPLY WITH APPENDIX "K" SECTION 33 GUIDELINES.

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

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 1896 EXISTING CONTOUR, MAJOR
- EXISTING CONTOUR, MINOR
- 3350 PROPOSED CONTOUR, MAJOR
- PROPOSED CONTOUR, MINOR
- PROPOSED PAD
- TBC: 3278.38 STA: 4456.53 PROPOSED TBC STATION 7 ELEVATION
- PROPOSED WALL

N
W E
S
60 0 60 120
SCALE IN FEET



OUTLET STRUCTURE DETAIL
N.T.S.



CONTACT INFORMATION

CRAIG ENGEL
1267 NORTH 1390 WEST
ST. GEORGE, UT 84770
PHONE (435)229-7360

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 HURRICANE CITY STANDARDS

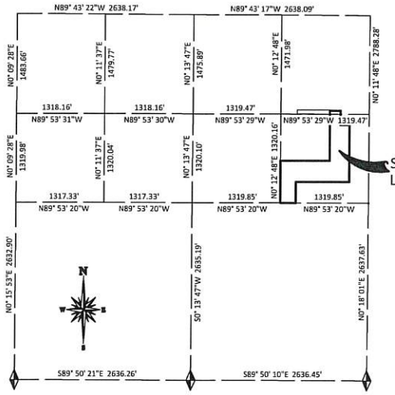
REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING
450 WEST 1600 SOUTH, SUITE E
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

GRADING PLAN
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4, SEC 4, T42NS R13W S.L.B.&M.
HURRICANE CITY, UTAH

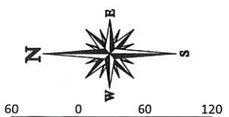
PROFESSIONAL STRUCTURAL ENGINEER — MARC BROWN — 10023 — 01-03-22 — STATE OF UTAH

CHECKED BY : MB
DRAWN BY : TF
DATE : JANUARY 2022
JOB NO. : 21-138
SCALE : 1"=60'
SHEET NO. : C-G2



SITE LOCATION

PROJECT LOCATION
SEC. 4 T42S R13W, SLB&M
NOT TO SCALE



60 0 60 120
SCALE IN FEET

LEGEND

PROPERTY LINE
ADJACENT PROPERTY LINE
1896 EXISTING CONTOUR MAJOR
EXISTING CONTOUR MINOR

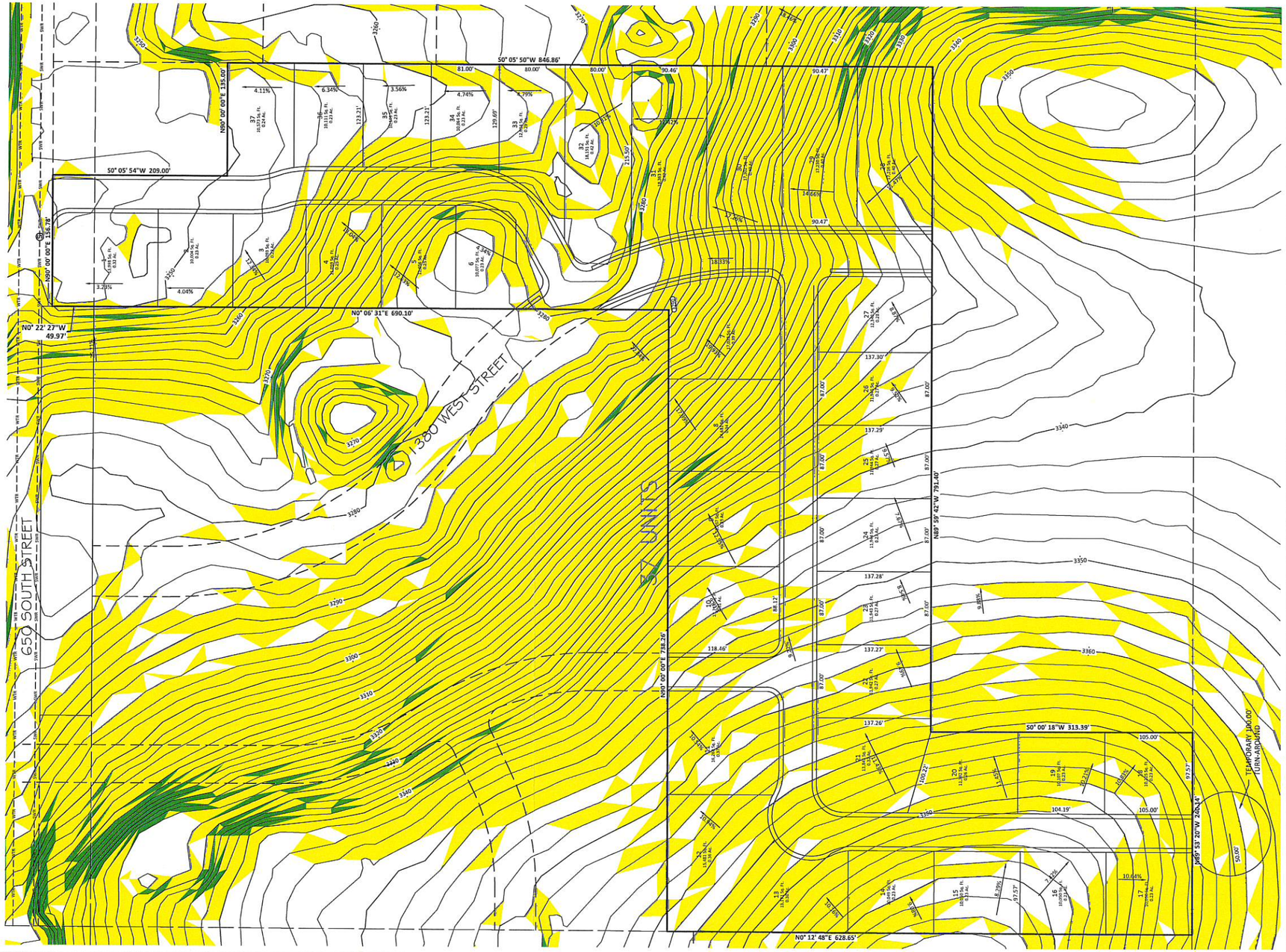
Slopes Table			
Number	Minimum Slope	Maximum Slope	Color
1	0.00%	10.00%	
2	10.00%	30.00%	
3	30.00%	Vertical	

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 HURRICANE CITY STANDARDS



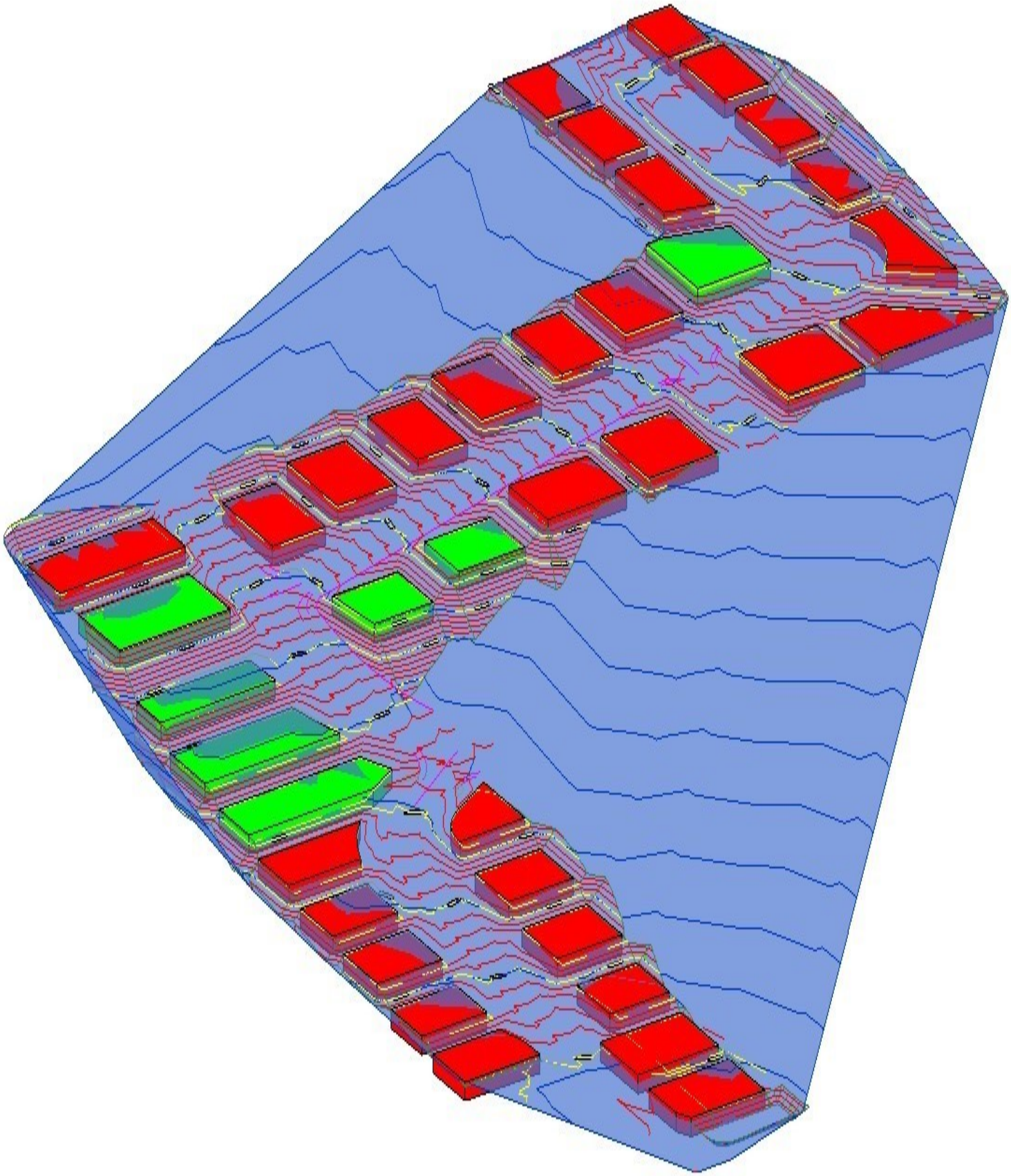
REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
193 WEST 1100 SOUTH, UNIT 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

SLOPE DISPLAY MAP
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4, SEC 4, T42NS R13W S.L.B.&M.
HURRICANE CITY, UTAH

PROFESSIONAL STRUCTURAL ENGINEER
MARC L BROWN
10223
01-03-22
STATE OF UTAH

CHECKED BY : MB
DRAWN BY : TF
DATE : JANUARY 2022
JOB NO. : 21-138
SCALE : 1"=60'
SHEET NO. : C-G1



HURRICANE CITY
UTAH
Water Department
Ken Richins, Superintendent

November 3, 2021

To Whom It May Concern:

A will serve letter has been requested for Mountain View Estates located at approximately 1300 W 650 S in Hurricane, Utah.

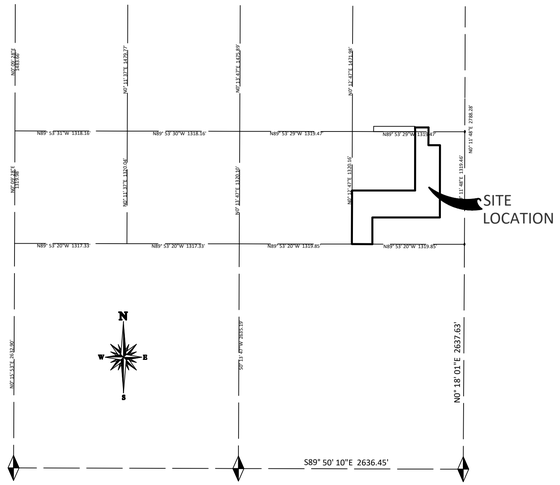
Yes, we do have culinary water in the area of 1300 W 650 S in Hurricane, Utah.

A hydraulic water study may be required to ensure the waterline will deliver the required fire flows. A looped water system may be required

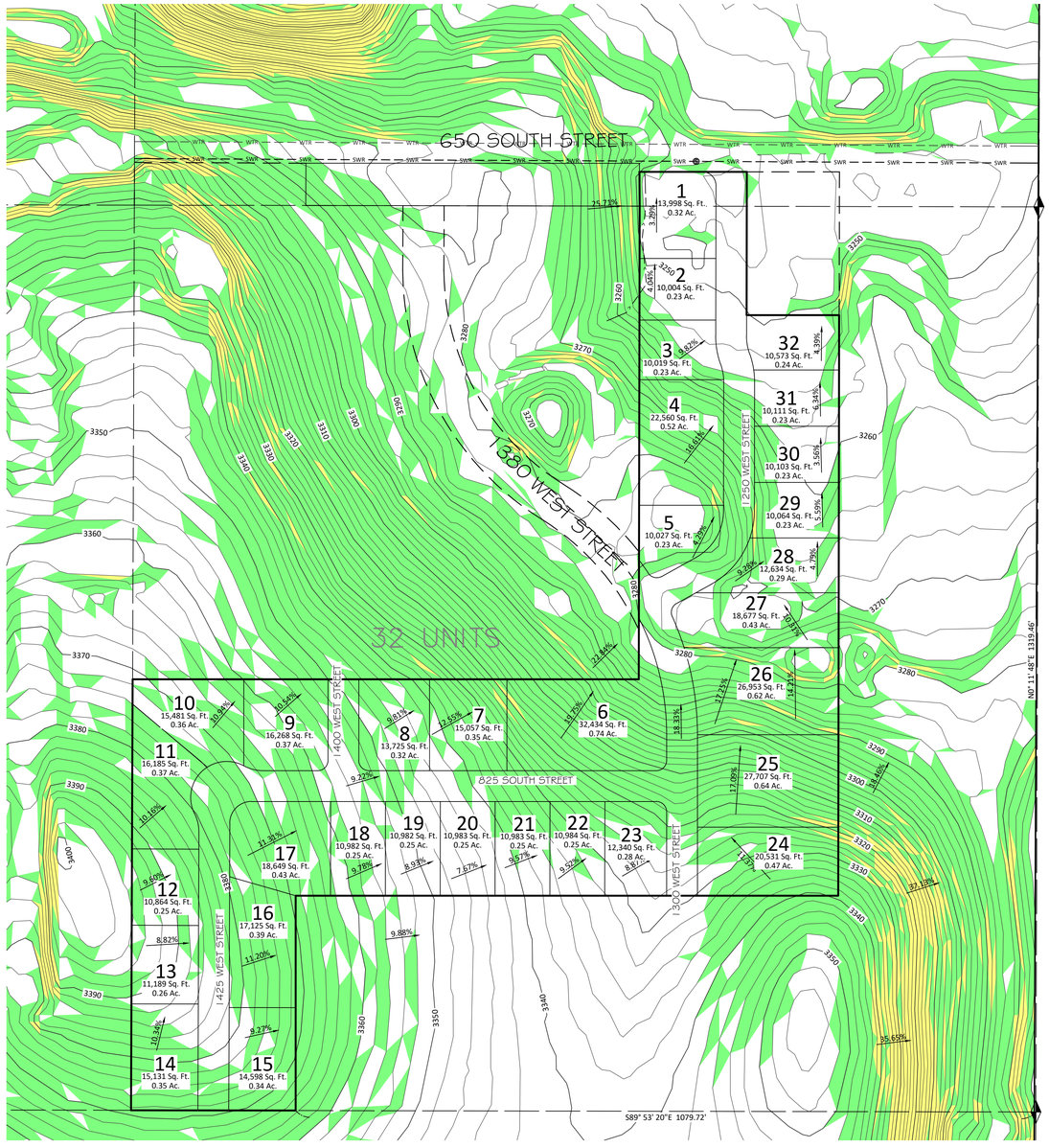
Sincerely,

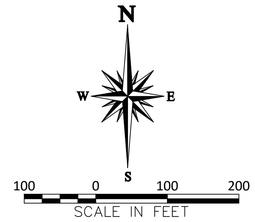
Hurricane City Water – Dallan Wadsworth

646 West 600 North • Hurricane, UT • 84737
Phone: (435) 635-9442 • Fax: (435) 635-2616
WEB: www.cityofhurricane.com



PROJECT LOCATION
SEC. 4 T42S R13W,
SLB&M
NOT TO SCALE





LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 1896 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR

Slopes Table			
Number	Minimum Slope	Maximum Slope	Color
1	0.00%	10.00%	
2	10.00%	30.00%	
3	30.00%	Vertical	

REVISIONS

NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
163 WEST 1600 SOUTH, UNIT 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

SLOPE DISPLAY MAP
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4, SEC 4, T42NS R13W S.L.B.&M.
HURRICANE CITY, UTAH

PROFESSIONAL STRUCTURAL ENGINEER
MARC L. BROWN
10223
10-28-21
STATE OF UTAH

CHECKED BY : MB
DRAWN BY : SWB
DATE : SEPTEMBER 2021
JOB NO. : 20-54

SCALE :
1"=100'

SHEET NO. :
C-G1

BROWN CONSULTING ENGINEERS
CIVIL ENGINEERING•LAND SURVEYING•LAND PLANNING
163 WEST 1600 SOUTH UNIT #5•ST. GEORGE UTAH, 84770
PHONE 435-628-4700•FAX 435-628-4725•WWW.BROWNCIVIL.COM

October 27, 2021

City of Hurricane
147 N 570 W
Hurricane, UT 84737
ATTN: Arthur LeBaron

RE: Mountain View Estates Drainage Study

Brown Consulting Engineers has completed a drainage study analysis for the Mountain View Estates Subdivision using the HEC-HMS software in order to determine the existing and developed flows created by this development.

Existing Conditions

The existing site consists of an undeveloped parcel on 650 South St. The site generally slopes from west to east with an average slope of 10%. The ground cover consists of sage brush and desert shrub and a hydrologic soil group of B has been assumed for this site.

Proposed Construction

The developed site will be landscaped with homes, driveway, and sidewalk areas The building pads will be graded such that all runoff will be directed away from any structures via surface sheet flow and curb and gutter into a detention basin. The total disturbed area for the site will be 14.19 acres.

Runoff Computations & Methods

Rainfall was simulated using a the 10-yr 3-hr and the 100-yr 3-hr modified type II distribution with point rainfall depths of 1.10 inches and 1.89 inches respectively as specified in the City of Hurricane drainage manual. The SCS curve number method was used for all infiltration calculations and the SCS TR-55 lag method was used for all time of concentration calculations. The SCS unit hydrograph method was used for all runoff calculations.

Table 1 – Sub basin Summary

	Area (ac)	CN	Tc (hrs)
Pre-Development	14.19	72	0.237
Post-Development	14.19	77	0.236

Onsite Drainage Results

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.

As the site develops the post-development flows will increase as shown in Table 2 below.

Table 2 – Peak Runoff Summary

	$Q_{10\text{-yr }3\text{-hr}}$ (cfs)	$Q_{100\text{-yr }3\text{-hr}}$ (cfs)
Pre-Development	0.43	7.02
Post-Development	1.61	11.99

Detention Basin Design

Since the developed flows exceed existing flows a detention basin is required to reduce the peak runoff from the site. Flows from the site shall not exceed 0.20 cfs per acre, and the developed site area is 14.19 acres, therefore the detention basin outflow was calculated as 2.13 cfs and a detention basin volume of 14,201 cu. ft. is required. An outlet structure with an orifice plate will be constructed within the detention basin to reduce the flows to 0.20 cfs per acre. The table below summarizes the detention basin results.

Table 3 – Detention Basin Results

	$Q_{100\text{-yr }3\text{-hr}}$ inlet (cfs)	$Q_{100\text{-yr }3\text{-hr}}$ outlet (cfs)	Volume (cu. ft.)	Water height (ft)
Detention Basin #1	11.99	2.13	14,201	1.5

Details of the grading and the detention basin are presented in the construction drawings for Mountain View Estates.

Sincerely,

Steve Kamlowsky, PE
Brown Consulting Engineers



DETENTION BASIN CALCULATIONS

PROJECT: MOCCASIN FLATS LOT 8 **Date:** 3/8/2021

BASIN NAME: DET-1 **By:** SK

Stage-Discharge Calculations

$Q = CA\sqrt{2gH}$

C = 0.62

g = 32.2

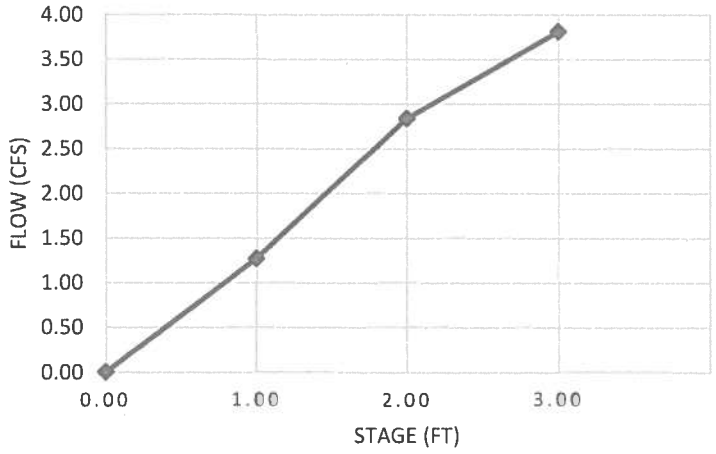
Dia. Pipe = 18 in

% restricted 71.1%

Stage-Discharge Table

Stage (Z)	Depth to center (H)	Area (A)	Flow (Q)
0.00	0.00	0.000	0.00
1.00	0.25	0.510	1.27
2.00	1.25	0.510	2.84
3.00	2.25	0.510	3.81

STAGE-DISCHARGE CURVE



Orifice Plate Calculations

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

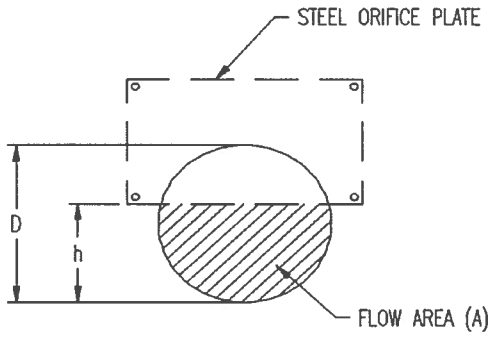
$\theta = 2\cos^{-1}\left(1 - \frac{h}{R}\right)$

D = 18 in

A = 0.510 ft^2

Θ = 2.451 rad. = 140.41 deg.

h = 0.496 ft



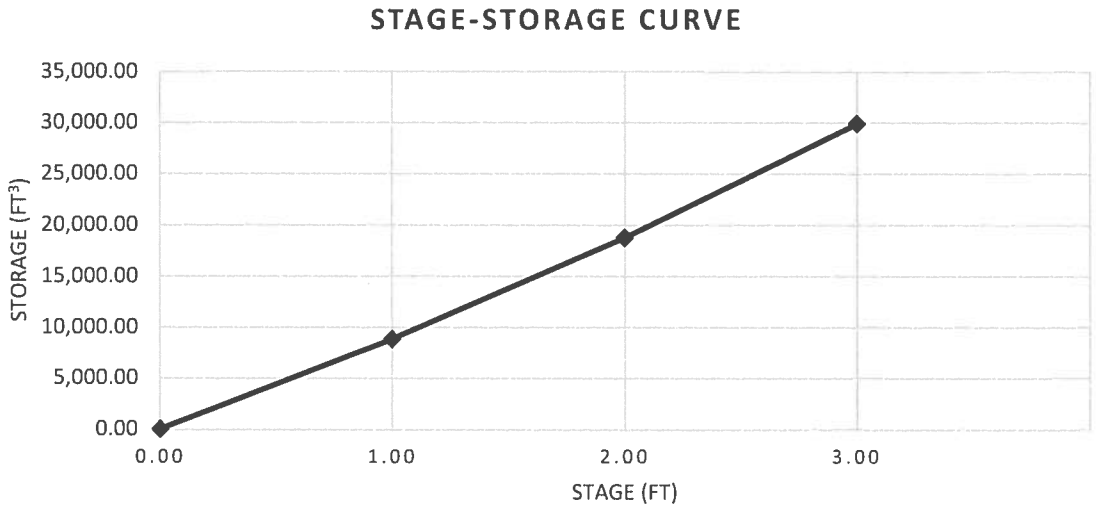
DETENTION BASIN CALCULATIONS

Stage-Storage Calculations

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

Stage-Storage Table

Stage (ft)	Contour Area (ft^2)	Contour Area (ac)	Incr. Volume (ft^3)	Total Volume (ft^3)	Total Volume (ac-ft)
0.00	8241.50	0.18920	0.00	0.00	0.000
1.00	9351.46	0.21468	8,796.48	8,796.48	0.202
2.00	10533.62	0.24182	9,942.54	18,739.02	0.430
3.00	11781.98	0.27048	11,157.80	29,896.82	0.686



PRELIMINARY PLAT APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $150.00

For Office Use Only:
File No. _____
Receipt No. _____

Name: Virginia M Ashton Trust **Telephone:** 435-635-4425

Address: 2654 Red Cliffs Drive #148 ST G, UT **Fax No.** 84790

Email: _____ **Agent Email:** RACINC19@gmail.com

Agent (If Applicable): Craig Engel RAC, INC. **Telephone:** 435-229-7360

Address/Location of Subject Property: 1300 West, 650 South

Tax ID of Subject Property: H-3-2-4-124 **Zone District:** R-1-10

Proposed Use: (Describe, use extra sheet if necessary. Include total number of lots)

35 LOTS - 10,000 s.f. Min. Residential Subdivision

Submittal Requirements: The preliminary plat application shall provide the following:

✓ 1. Description: In a title block located in the lower right-hand corner of the sheet the following is required:
- ✓ a. The proposed name of the subdivision.
- ✓ b. The location of the subdivision, including the address and section, township and range.
- ✓ c. The names and addresses of the owner or subdivider, if other than the owner.
- ✓ d. Date of preparation, and north point.
- ✓ e. Scale shall be of sufficient size to adequately describe in legible form, all required conditions of Chapter 39, City Subdivision regulations.

_____ 2. Existing Conditions: The preliminary plat shall show:
- ✓ a. The location of the nearest monument.
- ✓ b. The boundary of the proposed subdivision and the acreage included.
- ✓ c. All property under the control of the subdivider, even though only a portion is being subdivided. (Where the plat submitted covers only a part of the subdivider's tract, a sketch of the prospective street system of the unplatted parts of the subdivider's land shall be submitted, and the street system of the part submitted shall be considered in light of existing Master Street Plan or other Commission studies.)
- ✓ d. The location, width and names/numbers of all existing streets within two hundred (200) feet of the subdivision and of all prior streets or other public ways, utility rights of way, parks and other public open spaces, within and adjacent to the tract.
- ✓ e. The location of all wells and springs or seeps, proposed, active and abandoned, and of all reservoirs or ponds within the tract and at a distance of at least one hundred feet (100') beyond the tract boundaries.
- ✓ f. Existing sewers, water mains, culverts or other underground facilities within the tract, indicating the pipe sizes, grades, manholes and the exact locations.

✓ g. Existing Hurricane Canal Company facilities; other ditches, canals, natural drainage channels and open waterways and any proposed realignments.

✓ h. Contours at vertical intervals not greater than five (5) feet.

✓ i. Identification of potential geotechnical constraints on the project site (such as expansive rock and soil, collapsible soil, shallow bedrock and caliche, gypsiferous rock and soil, potentially unstable rock or soil units including fault lines, shallow groundwater, and windblown sand) and recommendations for their mitigation.

N/A j. Information on whether property is located in desert tortoise take area

✓ 3. Proposed Plan: The subdivision plans shall show:

✓ a. The layout of streets, showing location, widths, and other dimensions of proposed streets, crosswalks, alleys and easements.

✓ b. The layout, numbers and typical dimensions of lots.

✓ c. Parcels of land intended to be dedicated or temporarily reserved for public use or set aside for use of property owners in the subdivision.

✓ d. Easements for water, sewers, drainage, utilities, lines and other purposes.

✓ e. Typical street cross sections and street grades where required by the Planning Commission. (All street grades over 5% should be noted on the preliminary plat)

✓ f. A tentative plan or method by which the subdivider proposes to handle the storm water drainage for the subdivision.

✓ g. Approximate radius of all center line curves on highways or streets.

✓ h. Each lot shall abut a street shown on the subdivision plat or on an existing publicly-dedicated street. (Double frontage or flag lots shall be prohibited except where conditions make other design undesirable)

✓ i. In general, all remnants of lots below minimum size left over after subdividing of a larger tract must be added to adjacent lots, rather than allow to remain as unusable parcels.

N/A j. Where necessary, copies of any agreements with adjacent property owners relevant to the proposed subdivision shall be presented to the Planning Commission.

N/A k. A letter from both the local sanitary sewer provider and culinary water provider indicating availability of service.

N/A l. Will this subdivision be phased? If yes show possible phasing lines.

✓ m. A tentative plan or method for providing non-discriminatory access to the subdivision for purposes of placement of communications infrastructure, and for purposes of placement of utility infrastructure.

✓ 4. Required copies of plans:

____ a. Three copies of all full scale drawings

____ b. One copy of each drawing on a 11 x 17 inch sheets. (8 ½ x 11 is acceptable if the project is small and the plans are readable at that size).

5. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application, could result in a month's delay. Planning Commission meetings are held on the second Thursday and fourth Wednesday of each month at 6:00 p.m. The deadline to submit an application to be placed on an agenda is no later than 12:00 noon 10 full business days before the Planning Commission meeting at which you plan for your application to be heard.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

2014

PURPOSE

The preliminary plat application is the first step in land development process in those instances where land is divided for eventual sale. The process is established to insure that all proposed divisions of land conform to the City General Plan and to adopted development standards of the Land Use Ordinance.

WHEN REQUIRED

The preliminary plat is required any time land is to be divided, re-subdivided or proposed to be divided into two (2) or more lots, parcels, sites, units, plots or other division of land for the purpose, whether immediate or future, for offer, sale, lease or development either on installment plan or upon any and all other plans, terms and conditions. It is not required on agricultural divisions where the agricultural parcel is divided to be combined with another agricultural parcel, nor is it required when two un-subdivided properties are merged, or where the boundary between two un-subdivided properties are adjusted.

The preliminary plat must be approved before a final plat can be processed and recorded.

Subdivision approval process:

- Determine current zoning for property.
- If zoning fits desired subdivision, meet with Planning staff to discussed the proposed project.
- Obtain a preliminary plat application form and complete the application and have a plat prepared by an engineer to meet the requirements on the preliminary plat application.
- Submit completed application, preliminary plat, and required $150 fee to Planning Department before noon on the Wednesday two weeks before desired Planning Commission meeting. (see submittal dates sheet)
- Appear at the scheduled Planning Commission meeting to discuss preliminary plat, hear comments, answer questions, and receive recommendation of approval or disapproval from Planning Commission.
- Appear at the next scheduled City Council meeting that occurs after the Planning Commission meeting at which a recommendation was received. Hear City Council comments, answer questions, and receive City Council decision. City Council can approve the plat with conditions, recommend changes and send it back to the Planning Commission, or deny the plat.

If the preliminary plat is approved, have construction drawings for utilities and streets prepared by an engineer according to Hurricane City standards. Construction drawings must be approved by both the Hurricane Joint Utilities Committee and the Ash Creek Special Service District. Approval means changes are made and all required signatures are obtained.

Once the preliminary plat is approved by the City Council, the applicant has one year after receiving approval of the preliminary plat to submit the final plat to the Planning Commission for action. The Planning Commission may authorize a one-year time extension, provided the extension request is made before the one year time limit is reached. The Planning Commission will review and make recommendation to the City Council on the final plat when submitted. The City Council will typically review the Planning Commission recommendation within 1-2 weeks after the Commission action on the final plat.

APPEALS

The Planning Commission makes a recommendation to the City Council, so there is no appeal. The City Council's action on a preliminary plat is final unless appealed to the appropriate court.

AFFIDAVIT
PROPERTY OWNER

STATE OF UTAH)
:ss
COUNTY OF Washington

I (we), Virginia M Ashton Trust, being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

Virginia M Ashton Trust
(Property Owner)

Virginia M. Ashton
(Property Owner)

Subscribed and sworn to me this 4th day of October 2021.

(Notary Public)

ANGEL ANTUNEZ
Notary Public - State of Utah
Comm. No. 718397
My Commission Expires on
May 25, 2025

Residing in: MACU

My Commission Expires: 5/25/2025

Agent Authorization

I (we), Virginia M Ashton Trust, the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s) ** ** to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application. ** CRAIG ENGEL, BROWN CONSULTING ENG

Virginia M Ashton Trust
(Property Owner)

Virginia M. Ashton
(Property Owner)

Subscribed and sworn to me this 4th day of October 2021.

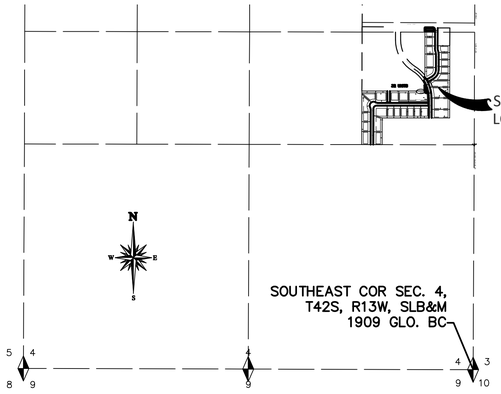
(Notary Public)

ANGEL ANTUNEZ
Notary Public - State of Utah
Comm. No. 718397
My Commission Expires on
May 25, 2025

Residing in: MACU

My Commission Expires: 5/25/2025

4054



PROJECT LOCATION
SEC. 4 T42S R13W,
SLB&M

NOT TO SCALE

CONSTRUCTION NOTES

1. GRADE SITE TO ELEVATIONS AND CONTOURS SHOWN ON PLAN.
2. NEW STORM DRAIN CATCH BASIN
3. NEW 12"Ø HDPE STORM DRAIN PIPE
4. STANDARD 8' CROSS GUTTER-PER HURRICANE STD DETAIL #CG100
5. PROPOSED STORM WATER DETENTION AREA.
6. CURB OUTLET STRUCTURE
10. NEW 2 1/2" ASPHALT OVER 6" TYPE II AGGREGATE BASE
11. CONSTRUCT NEW 5' SIDEWALK PER HURRICANE CITY STD. DWG #120

GRADING PLAN NOTES:

1. ALL EXCAVATIONS AND GRADING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF HURRICANE, SPECIFICALLY THE "UTAH UNIFORM STANDARD ACT RULES", APPENDIX "K", AND THE SPECIFICATIONS AND REQUIREMENTS INCLUDED IN THE GEOTECHNICAL INVESTIGATION PREPARED BY ???

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

5. NO GRADING BEYOND PROPERTY LINE.

6. CONTRACTOR SHALL VERIFY ELEVATION IN THE FIELD.

7. ADD 3100.00 TO ALL ABBREVIATED ELEVATIONS.

CONTACT INFORMATION

CRAIG ENGEL
1267 NORTH 1390 WEST
ST. GEORGE, UT 84770
PHONE (435)229-7360

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 HURRICANE CITY STANDARDS

EARTHWORK

ESTIMATED EARTHWORK VOLUMES
PHASE 1 BUILDING SITE:
CUT = 30,466 c.y.
FILL = 76,302 c.y.
NET = 45,836 c.y. (FILL)

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.

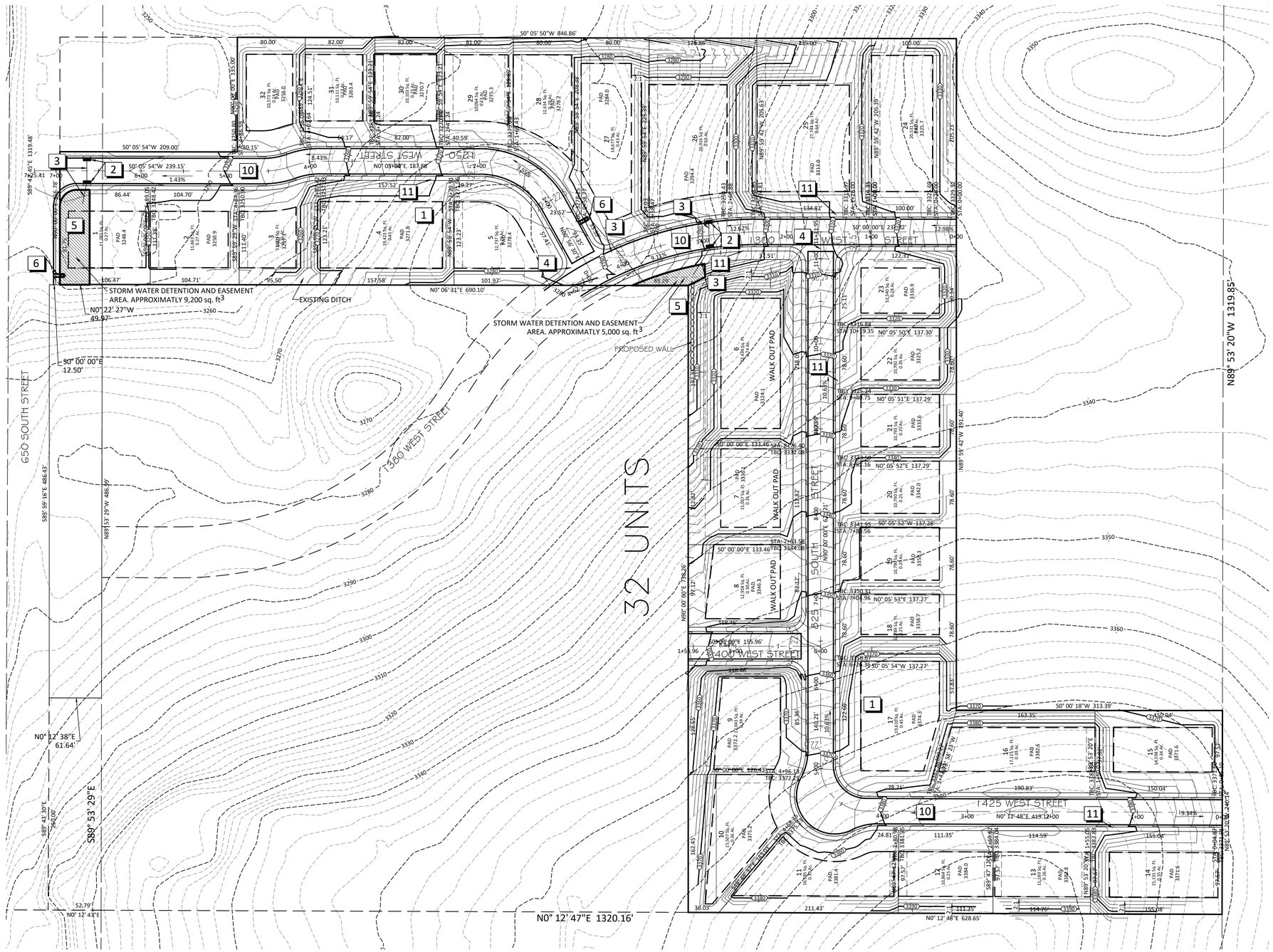
NOTICE OF INTENT (N.O.I.) TO BE SUBMITTED PRIOR TO OBTAINING BUILDING PERMIT.

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 1896 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 3350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- PROPOSED PAD
- TBC: 3278.38 STA: 4+56.53 PROPOSED TBC STATION 7 ELEVATION
- PROPOSED WALL

N E S W

60 0 60 120
SCALE IN FEET



REVISIONS		
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
163 WEST 1600 SOUTH, UNIT 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

GRADING PLAN
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4 SEC 4, T42NS R13W S.L.B.&M.
HURRICANE CITY, UTAH

PROFESSIONAL STRUCTURAL ENGINEER
MARC L. BROWN
9223
11-2-21
STATE OF UTAH

CHECKED BY : MB
DRAWN BY : SWB
DATE : SEPTEMBER 2021
JOB NO. : 21-138
SCALE : 1"=60'
SHEET NO. : C-G2

From: RAC INC. <racinc19@gmail.com>
Sent: Tuesday, November 30, 2021 6:51 PM
To: Stephen Nelson
Cc: Marc Brown
Subject: Permit # 56 JUC comments and preliminary Plat

Hello Stephen,

I hope your holiday was restful.

In response to planning and JUC comments. We are addressing all and revising the plat. The document will not be ready for the December 2 City Council review. The items we will address in the amended plat are.

All Master-planned roadways will be 65' in width
No transportation grades will exceed 10%
Water and Gas will be looped into hillside estates. I have confirmed with Chris Wyler.
Hillside Estates will provide the secondary needed fire access to exceed 30 Lots.
Chris is suggesting he will be starting his project in January. I hope to start mine in February. We are using the same excavation company.
A drainage report was submitted with the application.

The master-planned road to the south was brought up by planning. I have attempted to contact the owner with no success. Not sure how to address this. Fire asked for a turnaround on the south end. I was hoping to put in a temp on the adjacent property. this is the same contact for the road. I will keep trying.

I need to work our the 60' strip on 650. The piece adjacent to Chris's property I will negotiate with Chris. The piece adjacent to the city can either be sold to the city or the city can sell me their piece for development.

Please let me know of any other concerns.

Craig Engel
RAC Inc.
1267 N 1390 W.
St. George UT 84770
435-229-7360

GEOTECHNICAL INVESTIGATION REPORT

Prepared for:

RAC Inc.
Attn.: Craig Engel
1627 North 1390 West
St. George, Utah 84770

November 2, 2020

Parcel H-3-2-4-124



Prepared by:

795 East Factory Drive
St. George, UT 84790

Landmark Project No: 210848

November 2, 2021

RAC Inc.
Attn.: Craig Engel
1627 North 1390 West
St. George, Utah 84770

Subject: Geotechnical Investigation Report
Parcel H-3-2-4-124
Hurricane, Utah
Landmark Project No.: 210848

Craig Engel,

As requested, we have completed our Geotechnical Investigation for the above noted project. Our geotechnical recommendations, along with our field and laboratory data are presented in this report.

Our field investigation consisted of excavating twelve (12) test pits to depths between 1.0 and 8.0 feet below the existing ground surface (bgs) throughout the area of the proposed development. Site grading recommendations are detailed in Section 5.0 of this report. Foundation recommendations are found in Section 6.0 of this report.

Landmark has great interest in providing materials testing and special inspection services during the construction phase of this project. If you advise us of the appropriate time to discuss these engineering services, we will be pleased to meet with you at your convenience.

Please feel free to contact our office at (435) 986-0566 if you have any questions.

Sincerely,
LANDMARK TESTING AND ENGINEERING

Steven Wells, P.E.
Geotechnical Manager

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PARCEL H-3-2-4-124
HURRICANE, UTAH

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PARCEL H-3-2-4-124
HURRICANE, UTAH

FIGURE 1: **VICINITY MAP**

FIGURE 2: **SITE MAP**

FIGURES 3 - 8: **TEST PIT LOGS**

FIGURE 9: **UNIFIED SOIL CLASSIFICATION SYSTEM**

1.0 INTRODUCTION

This report presents the results of Landmark Testing & Engineering's geotechnical investigation for a single-family residential development on Parcel H-3-2-4-124 in Hurricane, Utah. Figure 1 is a Vicinity Map showing the project location relative to surrounding features. Figure 2 is a Site Map showing the site and the approximate locations of the test pits completed for this investigation.

This investigation was completed to assist in developing opinions and recommendations concerning site earthwork and foundation design.

2.0 PROPOSED CONSTRUCTION

We understand that construction will consist of a single-family residential development with 35 lots. We anticipate residences will be wood-framed, slab-on-grade construction supported on conventional spread footings. We understand that the residences will be both one- and two stories with anticipated loads between 1,200 and 2,500 pounds per lineal foot. We anticipated a new public street with asphalt pavement, and concrete curb, gutter and sidewalk are also planned for the residential development.

A traffic index of 5.5 is assumed for the residential street. Any significant changes to the anticipated development should be reviewed by Landmark to evaluate the continued applicability of the recommendations contained in this report.

3.0 SITE SETTING

3.1 SURFACE CONDITIONS

The project site is 14.19-acre parcel located south of 650 South Street. The site generally slopes up to the south, southwest towards a lava basalt Ridge. The project site spans to the top of the basalt lava ridge near the southwest corner of the parcel. The site is covered with basalt cobbles and boulders with a moderate to dense amount of vegetation consisting of tall field grasses. There are single family residences located near the northwest corner and southwest end of the parcel. The other surrounding parcels are vacant.

3.2 GEOLOGIC SETTING

According to the Utah Geological Survey, the site is mapped as being located on the Ivans Knoll lava flow (lower Pleistocene, Qbi) consisting of "Medium-gray, fine- to medium-grained basalt (Qbi) with small olivine phenocrysts." The age of the basalt lava flow is estimated to be around a million years old.[1] The material encountered during our site investigation was consistent with the geologic maps for the project area.

1 Interactive Geologic Map Portal, Retrieved October 29, 2021, from Utah Geological Survey, https://geology.utah.gov/apps/intgeomap.

3.3 SEISMICITY

Seismicity at the site was determined using the Structural Engineers Association (SEA), OSHPD Seismic Design Maps website. The following values are presented to assist with seismic design:

- Latitude = 37.165047 North, Longitude = 113.31196 West
- Site Class = C (Very Dense Soil Soft Rock) based on ASCE 7-16 (Table 20.3.1) as referenced in 2018 IBC 1613.3.2
- Risk Category II

Period (sec)	Sa (g)	Site Class
0.2	0.617 = S_S	B / C
1.0	0.203 = S_1	B / C
0.2	0.515 = S_{DS}	C
1.0	0.203 = SD_1	C

(2016 ASCE-7-16, SEA, Structural Engineers Association, https://seismicmaps.org/)

As per section 20.1 of ASCE 7-16, "The soil shall be classified in accordance with Table 20.3-1 and section 20.3 based on the upper 100 feet of the site profile." However, section 20.1 continues, "Where site specific data are not available to a depth of 100 feet, appropriate soil properties are permitted to be estimated by the registered design professional preparing the soil investigation report based on known geologic conditions." Based on the mapped geology, experience this area, and our findings during our field investigation, it is the opinion of Landmark Testing and Engineering that the soils on site classify as Site Class C.

3.4 GEOLOGIC HAZARDS

Fault Rupture

The Utah Geologic Survey maps the Volcano Mountain Fault running through the proposed development from north to south as shown on Figure 2. According to the UGS, the Volcano Mountain Fault is a Class A fault and is estimated to be less than 750,000 years old. [2] Faults less 10,000 years old (Quaternary period) are considered to be active. Due to the fault having an unknown actively level and because the exact location of the fault is unknown, the Surface-Fault-Rupture-Hazard Map for the St. George-Hurricane Metropolitan Area classifies the area as a Surface-fault-rupture hazard special-study area.[3] A fault study has been completed on similar faults approximately 3.0 miles south of the project, which did show to be older than 10,000 years old and therefore deemed not active. Additionally, a fault study is currently being conducted on a fault approximately 9.5 miles north of the site. The OSL testing is expected to be completed shorty to determine the age of the fault. Though the Volcano Mountain faults are similar to the faults

2 Interactive quaternary Fault and Fold Map, Retrieved January 7, 2020, from Utah Geological Survey, https://geology.utah.gov/apps/intgeomap.

3 Lund, W., Knudsen, T., Vice, G., Shaw, L., 2008, Surface-Fault Rupture Hazard Map for the St. George-Hurricane Metropolitan Area, Utah Geologic Survey Special Study 127, Plate 1

located to the north and south, we cannot be certain of the activity level or the exact location of the fault without further investigation.

Based on the current site plan, it appears that a sewer line will be placed across the mapped location of the fault. We request the opportunity to observe the sewer excavation in order to possibly locate the fault at that time and get an idea of the age of the fault.

Additionally, the Hurricane fault is located approximately 1.5 miles east of the site. This fault displaces late Quaternary sediments and is considered active.[4] Strong ground motion associated with movement along the Hurricane fault is possible however, the potential for surface fault rupture from this fault is considered low.

Landslide

The Utah Geologic Survey maps the northeast end of the property as an existing landslide. The mapped landslide is outlined in orange on Figure 2. Basalt bedrock, boulders and caliche were encountered between depths of 1 and 6 feet below the existing ground surface (bgs) within the location of the mapped landslide, indicating that the landslide to be shallow. Additionally, the landslide has a shallow slope of approximately 10 percent. Based on the shallow slope and shallow basalt and caliche encountered, we believe that the landslide susceptibility to be low.[5]

Liquefaction

Liquefaction is the sudden loss of shear strength in the soil due to the build-up of excess pore water pressure.[6] This can occur when the soil is subjected to intense shaking such as during a seismic event. The soils that are most susceptible to liquefaction are loose, saturated sandy soils with a low fines content (material passing the #200 sieve).

Due shallow bedrock encountered throughout the site and lack of groundwater we believe the liquefaction potential at the project site is low. A liquefaction study is beyond the scope of this report.

4.0 INVESTIGATION

4.1 FIELD INVESTIGATION

To investigate the subsurface soil conditions, twelve (12) test pits, designated as TP-1 through TP-12, were excavated throughout the project site as shown on Figure 2, Site Map. The test pits were excavated to depths between 1.0 and 8.0 feet bgs with a Kobelco SK45SRX mini excavator. All test pits encountered refusal on caliche or basalt.

4 Interactive quaternary Fault and Fold Map, Retrieved January 7, 2020, from Utah Geological Survey, https://geology.utah.gov/apps/intgeomap.

5 Lund, R. William, Knudsen, R. Tyler, Vice, S. Garrett, and Shaw, M. Lucas. Landslide-Hazard Map for the St. George-Hurricane Metropolitan Area, Utah Geologic Survey, 2008.

6 Coduto, Donald P. (1999), Geotechnical Engineering: Principles and Practices, Prentice Hall, Upper Saddle River, NJ

The soils encountered in our test pits consisted of silty sand with gravel and various amounts cobbles and boulders. Generally, the upper 1.0 to 2.0 feet of soil was loose and increased in density with depth. The silty sand was underlain by strongly cemented caliche and basalt. Majority of the test pits encountered refusal on the strongly cemented caliche or basalt between depths of 1 and 3 feet bgs. Caliche and basalt were encountered at deeper depths between 4.0 and 8.0 bgs in test pit TP-3 and in test pits TP-6 through TP-8. Groundwater was not encountered in our test pits at the time of our investigation.

A detailed description of the subsurface soils encountered in the test pits is included in the test pit logs on Figures 3 through 8. A key to the symbols and soil classifications used on the logs is presented on Figure 9.

4.2 LABORATORY TESTING

Soil samples from the test pits were taken to our St. George laboratory for testing. Tests performed on the samples included mechanical sieve analyses. Laboratory results are shown on the test pit logs on Figures 3 through 8.

Sieve analyses classified the on-site soils as silty sand. The moisture contents of the soils tested ranged from 1.4 to 3.9 percent.

4.3 CONCLUSIONS

The material encountered in our test pits during our investigation generally consisted of loose to medium dense silty sand underlain by strongly cemented caliche and basalt bedrock. Groundwater was not encountered in our test pits at the time of our investigation. Refusal was encountered on the caliche and basalt between depths of 1.0 and 8.0 feet bgs. The use of heavy equipment, a hoe ram or possibly blasting may be required in order to install utilities and make cuts for building pads and roads. Loose surficial soils should be removed from within all building pad locations.

General grading recommendations are provided in Section 5.0 and foundation recommendations are provided in Section 6.0.

5.0 SITE GRADING AND EARTHWORK

5.1 GENERAL GRADING

Prior to general site grading, the project site should be cleared and grubbed of all vegetation and other deleterious materials. We anticipate clearing and grubbing to extend approximately 6 inches below the existing grade.

Following clearing and grubbing, we recommend the on-site soils are over-excavated down to strongly cemented caliche or basalt bedrock. In areas were strongly cemented caliche or basalt bedrock is not encountered in the upper 3 feet, we recommend that the soils within the building pad area are over excavated a minimum of 2 feet below the existing grade or 1 foot below the bottom of footings, whichever is greater. Based on our investigation, strongly cemented caliche

and basalt bedrock was encountered at depths greater than 3 feet in areas were test pit TP-3 and test pits TP-6 through TP-8 were excavated.

Following over-excavation, we recommend that the caliche be proof rolled to a firm and unyielding surface. If soil is encountered in the bottom the excavation, we recommend the upper 8 inches of soil in the bottom of the excavation is scarified, moisture conditioned to with within 2 percent of the optimum moisture content and compacted to a minimum of 90 percent of the maximum dry density.

A geotechnical engineer should observe the bottom of the excavations to confirm the depth of excavation and suitability of the material for construction.

The on-site soils are suitable for use as structure fill, provided all vegetation, material greater than 6 inches and other deleterious materials are removed and is placed to structural fill standards as subsequently outlined.

5.2 ROADWAY AND UTILITY EXCAVATION

The test pits for this investigation were excavated with a Kobelco SK45SRX mini excavator. Refusal was encountered on strongly cemented caliche and basalt bedrock between depths of 1.0 to 8.0 feet bgs throughout the project site. The use of a hoe ram, larger equipment, blasting or a combination of these will be required where basalt is encountered at shallower depths where removal of bedrock is required.

The upper 8-inches of native soil within the proposed roadways should be scarified and recompacted to structural fill standards prior to the placement of any road base. All excavations and backfilling procedures for roadways and utility trenches should conform to the City of Hurricane Standards for Design and Construction. Imported soil may be required for pipe bedding.

5.3 FILL PLACEMENT AND COMPACTION

All fill to be placed for support of footings and slabs-on-grade, whether it is on-site or imported, should be considered structural fill. On-site soils are suitable for use as structural fill provided all deleterious materials and oversized material greater than 6-inches in size are removed prior to placement of structural fill. We recommend that the footings and floor slabs be established directly on bedrock, caliche, or a minimum of 1 foot of structurally placed, granular fill with a maximum particle size of 6-inches, overlying properly compacted native material. Foundations should not transition from bedrock or caliche to structural fill.

Imported, granular fill should be well-graded, non-expansive, and free of organics and all deleterious materials. Soils used for granular, imported, structural fill should meet the following specifications and preferably would classify as gravel.

GRADATION	PERCENT PASSING
6- inch	100
3-inch	80-100
No. 200 sieve	10-25
ATTERBERG LIMITS	
Liquid Limit	30 or less
Plasticity Index	9 or less

Material not meeting the above requirements may be suitable for use as structural fill at the discretion of the geotechnical engineer. Samples of structural fill should be submitted for testing prior to being transported to the site.

Any on-site soils used as structural fill or imported structural fill should be compacted to the following specifications.

FILL PLACEMENT AND COMPACTION	
Maximum lift thickness	8-inch (loose)
Minimum compaction	95% ASTM D-1557
Compacted Moisture Content	within 2% of optimum

Compaction of structural fill should be completed with equipment suitable for the conditions encountered in the field such that compaction requirements are met, including those areas that may be inaccessible to large rolling compactors. All structural fill should be evenly spread on a horizontal plane in eight-inch loose lifts. Each eight-inch lift of structural fill material placed at the site should be tested for compliance with the required relative compaction and moisture content prior to proceeding with additional lifts.

5.4 LIGHTLY LOADED ELEMENTS

Exterior concrete slabs on grade (sidewalks, curbs, gutters, and misc.) should be established on a minimum of 6-inches of structurally placed, granular soils overlying 8-inches of scarified and recompacted on-site soils. Sidewalks and curbs and gutters will need to be underlain by approved road base as per Hurricane City Standards.

Structural fill, including road base, should be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D-1557.

5.5 CUT AND FILL SLOPES

It is recommended that permanent cut or fill slopes in on-site or imported soils be maintained at a slope of one vertical to two horizontal (1V:2H) or flatter unless structurally retained. Basalt bedrock may be slopes to a 3 vertical to 1 horizontal (3V:1H).

Grading of both cut and fill slopes should be such that surface water is directed away from the slopes and not concentrated on slopes or in unprotected channels. Construction procedures should ensure adequate compaction of slope faces. All excavations should conform to OSHA standards.

6.0 FOUNDATION & CONSTRUCTION CONSIDERATIONS

The following recommendations apply to conventional strip and spot footings. Footings should be established on bedrock, caliche or a minimum of 1-foot of structurally placed granular fill as indicated in Section 5.0. Foundations should not transition from bedrock or caliche to fill. Foundation excavations should be visually observed and tested by qualified personnel prior to placement of reinforcing steel or concrete. Additional foundation recommendations are subsequently presented.

DESCRIPTION	VALUE
Foundation Type	Continuous or spread footings
Bearing Material	Bedrock, Caliche or 1 foot of structurally placed fill
Allowable Bearing Capacity	1,800 psf on structural fill. 3,500 psf on basalt bedrock
Minimum embedment depth below finished grade	12 inches (for frost and confinement)
Minimum footing width	12 inches (continuous) for single-story 18-inches for two stories 24-inches (isolated spread)
Total estimated settlement	1-inch
Total differential settlement	less than 3/4 inch

The allowable bearing capacity is based upon dead load plus long-term live load. A one-third increase in allowable bearing capacity for short duration loads such as wind or seismic loads is permitted with the alternative load combinations given in Section 1605.3.2 of the IBC.

7.0 FLOOR SLABS

It is recommended that concrete floor slabs be constructed on a pad that has been prepared as previously indicated. A minimum of 4-inches of relatively free-draining material should be used

beneath the slab in order to help distribute floor loads, break the rise of capillary water, and aid in the concrete curing process. Alternatively, 6 inches of road base may be used in place of the free draining-material.

Concrete slabs should be designed using rebar reinforcement and frequent crack control joints to help control normal shrinkage and stress cracking. Concrete placement and curing should meet ACI[7] requirements including following hot or cold weather placement recommendations, when appropriate. If a moisture-sensitive floor covering will be installed, we recommend that a vapor barrier be installed beneath the concrete slab. The moisture sensitivity of floor finishes, anticipated project conditions, and the potential effects of slab curling and cracking should be considered in determining if the barrier should be placed directly beneath the slab or beneath the free-draining gravel (see ACI 302.IR-96 for more information regarding vapor barrier location). If the vapor barrier is installed directly beneath the slab, measures should be taken to minimize excessive slab curl such as reduced joint spacing and use of a low shrinkage (low water-cement ratio) mix.

8.0 LATERAL EARTH PRESSURES

Lateral loads imposed on footings may be resisted by the development of passive earth pressures against the sides of footings and friction between the base of the footing and the supporting soils. Lateral earth pressure values are presented in the following table.

Case Evaluated	Soil Type	Value
Active	On-site Soils	34 psf/ft
		54 psf/ft (with seismic)
At-Rest	On-site Soils	53 psf/ft
Passive	On-site Soils	424 psf/ft
		364 psf/ft (with seismic)
Coefficient of friction tan(φ*0.6) where φ = 34°	On-site Soils	0.35

The lateral earth pressures presented do not include any safety factors except where the friction angle (φ) used to determine the coefficient of friction has been multiplied by 0.6 to account for smooth contact conditions. The pressures also assume horizontal backfill and that the backfill is in a drained condition with no build-up of hydrostatic pressure. The additional effects of sloping backfill, surcharge, structural loads and groundwater conditions should be included in calculating lateral earth pressures. Backfill should be placed in accordance with the requirements of structural fill except that backfill in landscape and areas that will not be subject to structural loadings may be reduced to 90% of the maximum dry density as determined by ASTM D-1557.

[7] American Concrete Institute

9.0 MOISTURE CONTROL

This soils report provides recommendations for site preparation and foundation design. Inadequate surface drainage or failure to control moisture will likely result in excessive differential movement and structural damage. The following moisture control measures are highly recommended:

1. The ground surface should be graded to drain surface water away from the building in all directions. A minimum grade of 5% in the first 10 feet is recommended. Impervious surfaces such as concrete walkways or asphalt pavement adjacent to the structure are effective in reducing the potential for water migration beneath foundations and slabs and should be considered in design. Impervious surfaces such as concrete within 10 feet of the building foundation should be sloped a minimum of 2% away from the building.

2. Roof runoff should be collected, and downspouts should be designed to discharge collected water a minimum of 10 feet beyond the building footprint.

3. Grass should not be placed within 10 feet of the foundation. Large areas of grass are discouraged. Grass, if planted, should have a minimum slope of 5% away from the foundation.

4. 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.

5. 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 and the garage slab should be compacted to at least 95% of the maximum dry density.

6. 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.

It should be emphasized that final grading and landscaping generally occurs after construction of the structures and observation of these features is outside of normal geotechnical inspection and observation. The owner/contractor is responsible to ensure that these surface drainage and moisture control recommendations are followed throughout the life of the structures.

10.0 PAVEMENT DESIGN RECOMMENDATIONS

Design of the pavement section is based on the procedures outlined in the 1993 Guidelines for Design of Pavement Structures by the American Association of State Highway and Transportation Officials (AASHTO). A traffic index of 5.5 was used for design for the residential streets based of City of Hurricane Standards for Design and Construction. Any roadway removed along 650 South during construction of the proposed development should be replaced to match the existing pavement thickness. Based on the soils encountered during our investigation a CBR value of 10 was used for design.

For pavement design, the following design parameters have been assumed:

< Pavement Design Life - 20 years
< Structural Layer Coefficients
- Asphalt = 0.42
- Type II = 0.12

Based on design parameters, the following pavement section is provided for the minor residential road.

Location	Asphalt Thickness (in.)	Base Course (in.)	Scarified and Compacted Subgrade (in.)
Residential Streets (T.I = 5.5)	2.5	6.0	8.0

Recompacted on-site soils should be compacted to a minimum of 95% of the maximum dry density as determined by ASTM D-1557 and base course soils should be compacted to a minimum of 95% of the maximum dry density (ASTM D-1557). Asphalt should be compacted to at least 96% of the Marshall maximum density. Asphaltic concrete and base should be approved prior to site delivery and tested during placement for conformance with project specifications.

11.0 SOIL CORROSIVITY

Soils in the area have shown to be moderately corrosive. Therefore, we recommend that all concrete in contact with or within 6 inches of native soils be designed in accordance with ACI 318, Section Table 19.3.2.2 for Exposure Category S1. Buried pipes should be plastic (PVC or HDPE) instead of metal, where possible.

12.0 FOUNDATION REVIEW AND TESTING

This report has been prepared to assist in project design and construction. Variations from the conditions portrayed in the exploratory investigations may occur which are sometimes sufficient to require modifications to the design. In order to incorporate recommendations provided into

actual field conditions and to confirm that the project specifications are implemented, we recommend that observation and testing be performed during construction to monitor over-excavation, grading, and preparation of soils upon which foundations elements or structural loads may be established.

13.0 LIMITATIONS

The exploratory data presented in this report were collected to provide geotechnical design recommendations for this project and subsurface site descriptions represent conditions observed at the time and at the locations explored. The investigation may not be indicative of subsurface conditions beyond the investigation locations and conditions may change with passage of time. If subsurface conditions are encountered that are significantly different than those reported herein, Landmark should be contacted immediately for the continued applicability of the recommendations. In the event changes to the project are made that differ from those presented in this report, Landmark should be made aware of the changes. Landmark will provide written verification that the recommendations and conclusions remain valid or that modifications are required.

This report has been prepared to assist in project design and construction. We respectfully request the opportunity to review the final design drawings and specifications in order to determine whether the assumptions and recommendations presented herein are applicable to the anticipated designs.

This report is not intended to be used as a bid document. Any information concerning the environmental conditions of the site is beyond the scope of this geotechnical study. This geotechnical report has been prepared to meet the specific needs of our client and may not be appropriate to satisfy the needs of other users.

Site conditions and standards of practice change, therefore, we should be notified to review and update the report and its recommendations if construction is not commenced within 3 years of the date it was issued.

LANDMARK TESTING & ENGINEERING

Reviewed by:

Chad Coffey, P.E.
Project Engineer

PROFESSIONAL ENGINEER
11 - 2 - 2021
No. 12440204
CHAD
COFFEY
STATE OF UTAH

John Anderson, P.E.
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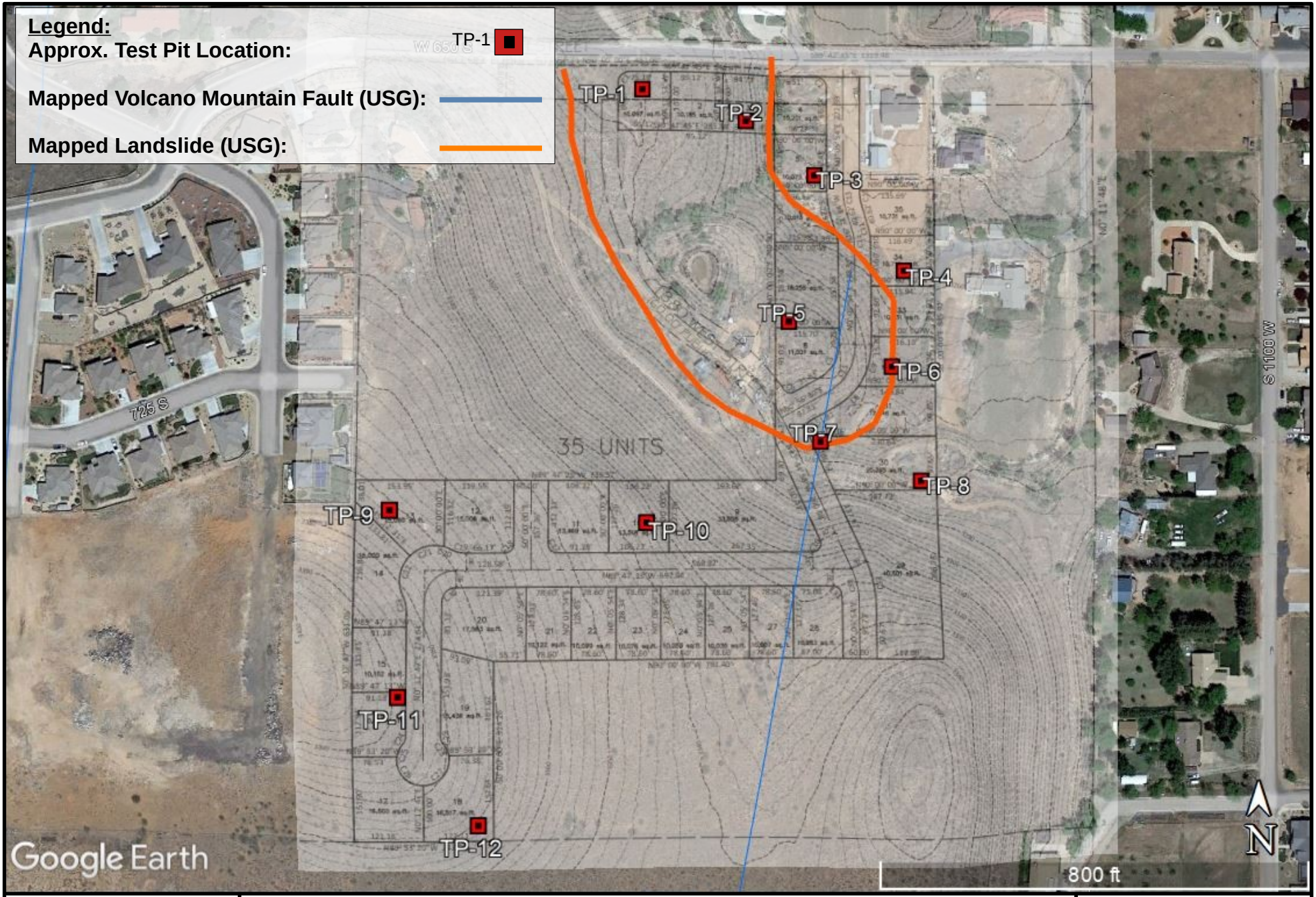


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Vicinity Map

Landmark Project No. 210848

Figure 1



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Site Map

Landmark Project No. 210848

Figure 2

TEST PIT NUMBER TP-1

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose, dry, fine to coarse grained, abundant fine roots to 5", common <1mm pinholes to 1.25', weak caliche cementation, brown.		3.9			5	56	39	
		2	POORLY GRADED GRAVEL (GP), medium dense, dry, caliche cementation.								
			CALICHE, dense, dry, white.								
			Refusal at 2 feet on caliche. Bottom of test pit at 2.0 feet.								

TEST PIT NUMBER TP-2

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose, dry, fine to coarse grained, common subangular to subround vesicular basalt boulders, abundant fine roots to 3", scattered <2mm pinholes to 1', brown.								
			Refusal at 1.0 foot on basalt boulders. Bottom of test pit at 1.0 feet.								

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PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 3

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

TEST PIT NUMBER TP-3

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0			SILTY SAND (SM), loose to medium dense, dry, fine to coarse grained, rare fine roots to 6", brown.								
5		1									
		2									
			Refusal at 6.0 feet on caliche. Bottom of test pit at 6.0 feet.								

TEST PIT NUMBER TP-4

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose to medium dense, dry, fine grained, abundant fine roots to .5", brown.								
			Caliche cementation, light brown.								
		2	Dense.								
			Refusal at 3.0 feet on caliche. Bottom of test pit at 3.0 feet.								

LANDMARK TESTING & ENGINEERING
Landmark Testing and Engineering
795 Factory Drive
84790
Telephone: 435-986-0566
Fax: 435-986-0568

PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 4

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

TEST PIT NUMBER TP-5

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0											
		1	SILTY SAND (SM), loose, dry, fine grained, <1mm roots to 6", scattered 1mm pinholes to 0.75', brown.								
			Abundant subround basalt boulders, weak caliche cementation.								

Refusal at 1.5 feet on basalt.
Bottom of test pit at 1.5 feet.

TEST PIT NUMBER TP-6

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0											
		1	SILTY SAND (SM), loose, dry, fine to coarse grained, fine roots to 18", reddish brown.								
		2	SILTY SAND (SM), medium dense, dry, fine grained, scattered <1" subangular gravel, rare 1mm pinholes to 2.5', reddish brown.								
		3	SILTY SAND (SM), dense, dry, fine grained, caliche cementation, brown.								

Refusal at 4.0 feet on caliche.
Bottom of test pit at 4.0 feet.

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PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 5

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

TEST PIT NUMBER TP-7

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION** _____

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES _____ **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose, dry, fine to coarse grained, abundant fine roots to 3", brown. POORLY GRADED GRAVEL (GP), medium dense to dense, dry, <3" subangular, common subangular cobble and boulders, caliche cementation, light brown. No caliche, reddish brown.								

Refusal at 4.5 feet on basalt.
Bottom of test pit at 4.5 feet.

TEST PIT NUMBER TP-8

DATE STARTED 10/5/21 **COMPLETED** 10/5/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION** _____

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES _____ **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose to medium dense, dry, fine to coarse grained, scattered subround cobble, fine roots to 4', scattered 1mm pinholes to 7', reddish brown.								
		2									
5			Abundant subround basalt boulders.								

Refusal at 8 feet on Basalt.
Bottom of test pit at 8.0 feet.

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PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 6

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

TEST PIT NUMBER TP-9

DATE STARTED 10/5/21 **COMPLETED** 10/5/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose, fine to coarse grained, granular, fine roots to 1.5', brown.								
			Medium dense, rare 1mm pinholes.								
			Caliche cementation.								
			Refusal at 1.5 feet on basalt.								
			Bottom of test pit at 1.5 feet.								

TEST PIT NUMBER TP-10

DATE STARTED 10/5/21 **COMPLETED** 10/5/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose to medium dense, dry, fine to coarse grained, granular, fine to 1mm roots to 1', 1mm pinholes to 1', brown.								
			Caliche cementation, angular to subangular basalt gravel and cobble, white.								
			Refusal at 1.5 feet on basalt.								
			Bottom of test pit at 1.5 feet.								

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PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 7

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

TEST PIT NUMBER TP-11

DATE STARTED 10/5/21 **COMPLETED** 10/5/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0											
		1	SILTY SAND (SM), loose, dry, fine to course grained, fine to 2mm thick roots to 2', brown.		1.4			4	55	41	
			Caliche cementation.								

Refusal at 2.0 feet on caliche.
Bottom of test pit at 2.0 feet.

TEST PIT NUMBER TP-12

DATE STARTED 10/5/21 **COMPLETED** 10/5/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0											
		1	SILTY SAND (SM), loose, dry, fine to coarse grained, abundant subangular to subround cobble and boulders, fine roots to 6", <1mm pinholes to 1', brown.								

Refusal at 1.0 foot on basalt.
Bottom of test pit at 1.0 feet.

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PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 8

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS (More than 50% of soil Retained on No. 200 sieve size)	GRAVELS More than 1/2 of coarse fraction > No.4 sieve size	GW	Well graded gravels or gravel-sand mixtures little or no fines.
		GP	Poorly graded gravels or gravel-sand mixtures little or no fines.
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS More than 1/2 of coarse fraction < No.4 sieve size	SW	Well graded sands or gravelly sand mixtures little or no fines.
		SP	Poorly graded sands or gravelly sand mixtures little or no fines.
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (Less than 50% of soil Retained on No. 200 sieve size)	SILTS & CLAYS Liquid Limit < 50	ML	Inorganic silts and very fine sands, rock flour, silty fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS Liquid Limit > 50	MH	Inorganic silts, micaceous of diatomaceous fine sand or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

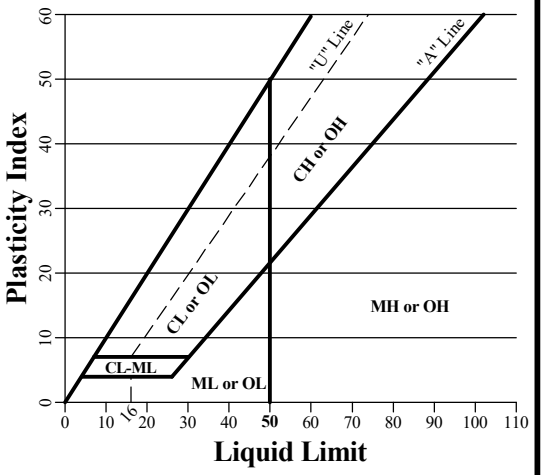
GRAIN SIZE CHART

CLASSIFICATION	Range of Grain Size: U.S. Standard Sieve Size	Range of Grain Size: Grain Size in Millimeters
BOULDERS	**Above 12"**	**Above 305**
COBBLES	**12" to 3"**	**305 to 76.2**
GRAVEL	**3" to No. 4**	**76.2 to 4.76**
Coarse	3" to 3/4"	76.2 to 19.1
Fine	3/4" to No. 4	19.1 to 4.76
SAND	**No. 4 to No. 200**	**4.76 to 0.074**
Coarse	No. 4 to No. 10	4.76 to 2.00
Medium	No. 10 to No. 40	2.00 to 0.42
Fine	No. 40 to No. 200	0.420 to 0.074
SILT & CLAY	Below No. 200	Below 0.074

SAMPLES

- Relatively Undisturbed Sample
- Block Sample
- Bag Sample
- Auger Cuttings
- B — Bucket Sample
- Core
- No Recovery

PLASTICITY CURVE



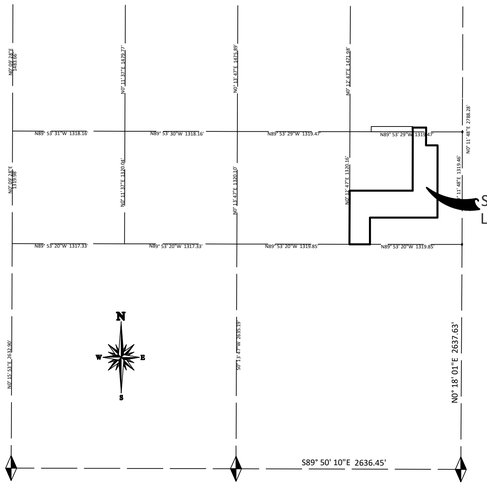
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PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
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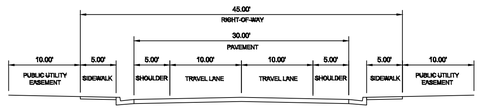
Figure No. 9

USCS SUMMARY - LANDMARK NEW.GDT - 10/29/21 12:02 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ



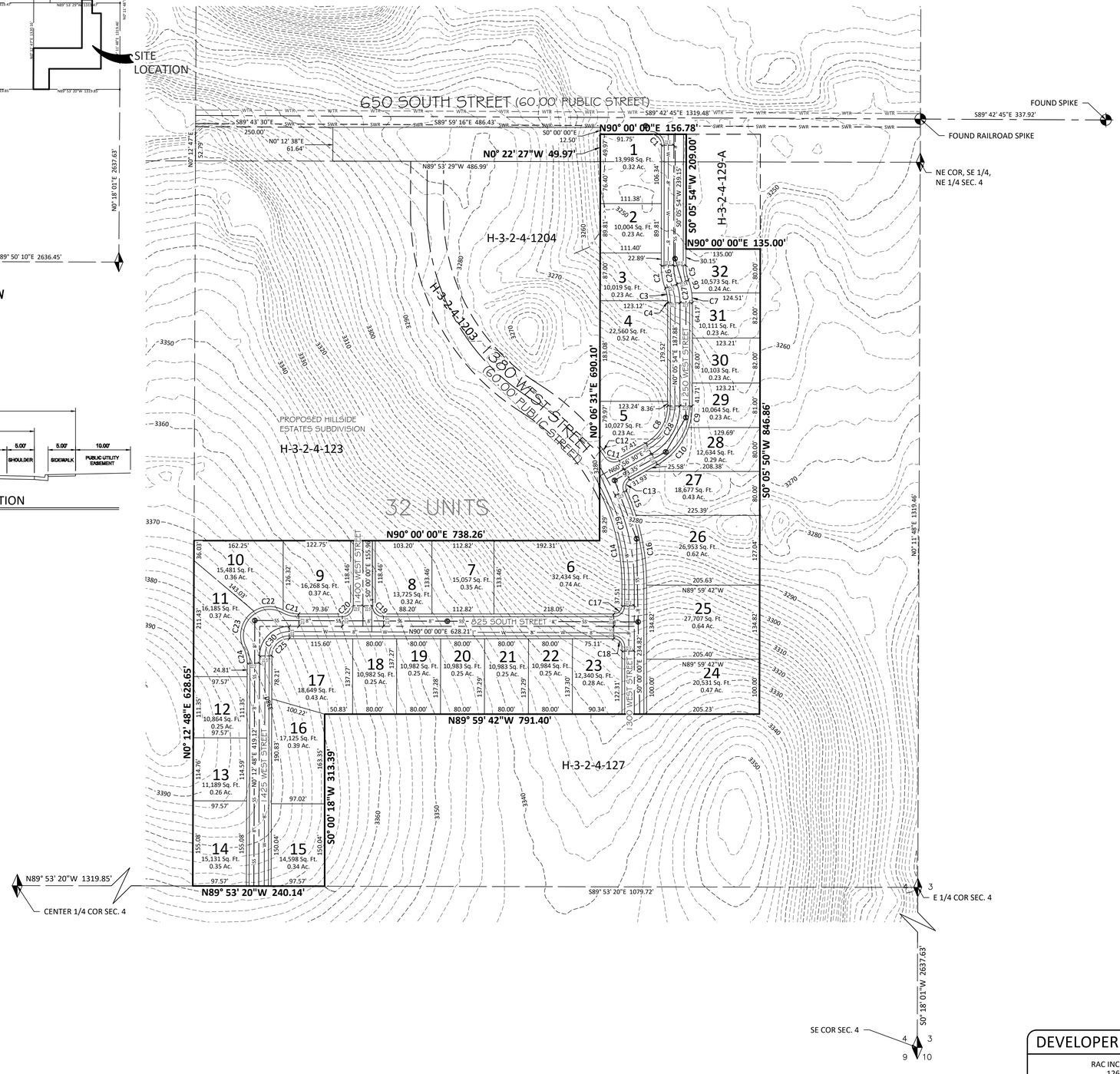
PROJECT LOCATION
SEC. 4 T42S R13W,
SLB&M
NOT TO SCALE

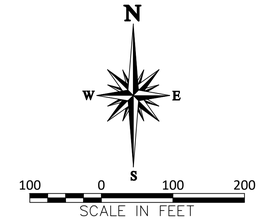
RESIDENTIAL LOCAL



45' STREET CROSS SECTION

CURVE TABLE				
CURVE	RADIUS	LENGTH	DELTA	TANGENT
C1	20.00'	31.45'	90°05'54"	20.03'
C2	122.50'	42.27'	19°46'21"	21.35'
C3	77.50'	23.18'	17°08'04"	11.68'
C5	77.50'	26.74'	19°46'21"	13.51'
C6	122.50'	24.39'	11°24'21"	12.23'
C7	122.50'	17.89'	8°22'00"	8.96'
C8	77.50'	82.30'	60°50'36"	45.51'
C9	122.50'	40.01'	18°42'53"	20.19'
C10	122.50'	90.07'	42°07'43"	47.18'
C11	15.00'	22.32'	85°14'21"	13.80'
C12	430.00'	23.46'	3°07'35"	11.73'
C13	15.00'	22.25'	85°00'21"	13.75'
C14	377.50'	176.62'	26°48'24"	89.96'
C15	422.50'	48.44'	6°34'08"	24.25'
C16	422.50'	129.01'	17°29'42"	65.01'
C17	15.00'	23.56'	90°00'00"	15.00'
C18	15.00'	23.56'	90°00'00"	15.00'
C19	15.00'	23.56'	90°00'00"	15.00'
C20	15.00'	23.56'	90°00'00"	15.00'
C21	60.00'	29.57'	28°14'29"	15.09'
C22	52.50'	55.74'	60°50'02"	30.82'
C23	52.50'	76.90'	83°55'11"	47.20'
C24	60.00'	27.99'	26°43'33"	14.25'
C25	31.50'	49.36'	89°47'12"	31.38'
C26	100.00'	34.51'	19°46'21"	17.43'
C27	100.00'	34.51'	19°46'21"	17.43'
C28	100.00'	106.19'	60°50'36"	58.72'
C29	400.00'	227.52'	32°35'26"	116.93'
C30	54.00'	84.62'	89°47'12"	53.80'





LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 1896 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- SWR SWR EXISTING SEWER LINE
- WTR WTR EXISTING WATER LINE
- SWR SWR PROPOSED SEWER LINE
- WTR WTR PROPOSED WATER LINE

PROJECT DATA	
SINGLE FAMILY HOMES	PARCEL = 14.19 ACRES
PARCEL ID	H-3-2-4-124
PROJECT ADDRESS	650 SOUTH
PROJECT	32 SINGLE FAMILY HOMES
ZONE	R-1-10

LEGAL DESCRIPTION

COMMENCING AT THE EAST 1/4 SECTION 4, TOWNSHIP 42 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN; THENCE NORTH 89°53'20" WEST, ALONG THE CENTER SECTION LINE A DISTANCE OF 1079.71 FEET TO THE POINT OF BEGINNING, SAID POINT BEING THE SOUTHWEST CORNER OF THAT PARCEL SHOWN BY TAX ID # H-3-2-4-127 AND DOCUMENT #20170002484, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 89°53'20" WEST, A DISTANCE OF 240.14 FEET, TO THE SOUTHEASTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-13011 AND DOCUMENT #20150044906, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 00°12'48" EAST, ALONG THE EAST LINE OF SAID PARCEL, A DISTANCE OF 628.65 FEET, TO THE SOUTHWESTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-123 AND DOCUMENT #20210041725, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 90°00'00" EAST, ALONG THE SOUTHERLY LINE OF SAID PARCEL, A DISTANCE OF 738.26 FEET, TO THE SOUTHEASTERLY CORNER OF SAID PARCEL; THENCE NORTH 00°06'31" EAST, ALONG THE EASTERLY LINE OF SAID PARCEL AND THE EASTERLY LINE OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-1204, H-3-2-4-1203, AND DOCUMENT #20170014334, OFFICIAL WASHINGTON COUNTY RECORDS, A DISTANCE OF 690.10 FEET, TO THE NORTHEASTERLY CORNER OF H-3-2-4-1204 PARCEL; THENCE NORTH 89°53'29" WEST, ALONG THE NORTH LINE OF SAID PARCEL AND THE NORTH LINE OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-1203, AND H-3-2-4-123 AND DOCUMENT #20210041725, OFFICIAL WASHINGTON COUNTY RECORDS, A DISTANCE OF 486.99 FEET; THENCE NORTH 00°12'38" EAST, A DISTANCE OF 61.64 FEET, TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY LINE OF 650 SOUTH STREET; THENCE SOUTH 89°59'16" EAST, ALONG SAID LINE, A DISTANCE OF 486.43 FEET; THENCE SOUTH 00°00'00" EAST, ALONG THE RIGHT OF WAY LINE, A DISTANCE OF 12.50 FEET; THENCE NORTH 90°00'00" EAST, ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 156.78 FEET, TO THE NORTHWESTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-129 AND DOCUMENT #20210024540, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE SOUTH 00°05'54" WEST, A DISTANCE OF 209.00 FEET, TO THE SOUTHWEST CORNER OF SAID PARCEL; THENCE NORTH 90°00'00" EAST, A DISTANCE OF 135.00 FEET, TO THE SOUTHEAST CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-129; THENCE SOUTH 00°05'50" WEST, A DISTANCE OF 846.86 FEET, TO A POINT ON THE BOUNDARY LINE OF THAT PARCEL SHOWN BY SAID TAX ID #H-3-2-4-127 AND DOCUMENT #20170002484, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 89°59'42" WEST, ALONG SAID LINE, A DISTANCE OF 791.40 FEET, TO THE NORTHWESTERLY CORNER OF SAID PARCEL; THENCE SOUTH 00°00'18" WEST, ALONG THE WESTERLY LINE OF SAID PARCEL, A DISTANCE OF 313.39 FEET TO THE POINT OF BEGINNING.

PRELIMINARY PLAT FOR

MOUNTAIN VIEW ESTATES SUBDIVISION

LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 13 WEST, SLB&M

DEVELOPER INFORMATION	OWNER INFORMATION
RAC INC. / CRAIG ENGEL 1267 N 1390 W ST. GEORGE, UT 84770 435-229-7360 CRAIG_ENGEL@MSN.COM	W.V. ASHTON FAMILY TRUST, DATED JUNE 6, 2007 C/O RORY & WENDY BRINGHURST 6202 MYRTLE HILL RD VALLEY CITY, OH 44280

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
163 WEST 1600 SOUTH, UNIT 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

PRELIMINARY PLAT
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4, SEC 4, T42S R13W S.L.B.&M.
HURRICANE CITY, UTAH

CHECKED BY : MB
DRAWN BY : SWB
DATE : SEPTEMBER 2021
JOB NO. : 21-138
SCALE : 1"=100'
SHEET NO. : P-1

SENSITIVE LANDS APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $ _____

For Office Use Only:
File No. _____
Receipt No. _____

Name: RAC INC Craig Engel **Telephone:** 1-435-229-7360

Address: 1267 No 1390 W St. George **Fax No.** _____

MARC BROWN
Agent (If Applicable): BROWN CONSULTING **Telephone:** 435-628-4700

Email: racinc19@gmail.com **Agent Email:** marc@browncivil.com

Address/Location of Subject Property: 1300 W. 650 So.

Tax ID of Subject Property: H-3-2-4-124 **Zone District:** R-1-10

Proposed Use: (Describe, use extra sheet if necessary) 32-10,000 sf. min.
Residential subdivision

Other companion application submitted with the Development Plan:

- ✓ **Preliminary Plat**
- _____ **Site Plan Review**
- _____ **Conditional Use Permit**
- _____ **Rezone**
- _____ **Other**

Submittal Requirements:
Please review the attached Supplemental Information to determine additional information that must be submitted with this application.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

DEVELOPMENT PLAN SUBMITTAL REQUIREMENTS

Development Plan Submittal: The following information shall be submitted with the application for Development Plan approval, and may be in addition to information required for a companion application being processed concurrently with the Development Plan:

_____ 1. Development plan: The development plan shall clearly show:

✓ a. Two (2) foot contours. The contour map shall be prepared and certified by a licensed professional civil engineer or surveyor drawn at a scale no smaller than one (1) inch equals one hundred (100) feet. Contour maps based on interpolation of maps with larger contour intervals are not acceptable.

✓ b. Field surveys may be required of the applicant by the City to verify the accuracy of the contour lines shown on the contour map.)

✓ c. Slopes having grades of 10-29 percent and natural slopes of thirty (30) percent or greater shall be color shaded clearly showing the difference between the two categories. This contour information shall either be computer based, or based on profile lines drawn perpendicular to contours at intervals no less than one hundred fifty (150') feet apart, nor greater than seventy-five (75') feet from an existing or proposed property line. Grades shall then be determined by calculating the slope along one hundred (100) foot segments of the profile. (See Appendix Diagram-A of the Land Use Ordinance)

✓ d. To determine required minimum lot size (Section 10-24-6B of the Sensitive Land Ordinance), the average natural grade on each proposed parcel shall be calculated and indicated on the development plan. The average grade is determined by calculating the grade of the natural slope between two opposing property lines, based on profiles taken perpendicular to the contours, no less than one hundred fifty (150) apart, nor greater than seventy-five (75) feet from an existing or proposed property line.

✓ e. The proposed development layout of lots, roads, proposed road grades, open space, area of disturbances, and existing native vegetation.

_____ 2. Soils Investigation Report: A soils investigation report which contains the following information:

✓ a. Nature, distribution and classification (Unified Soil Classification) of existing soils to the appropriate depth of influence by the proposed development, but not less than ten (10) feet deeper than the proposed excavations or to bedrock.

✓ b. Strength of existing soils, bearing capacity of supporting soils, settlement estimates, collapse and shrink-swell characteristics, lateral pressures and trench excavation limitations.

✓ c. Ground water levels that may affect development and estimated elevation of high ground water levels.

✓ d. Appropriate laboratory testing for classification, consistency, strength and consolidation conditions.

✓ e. Slope stability.

✓ f. A written statement by the persons or firm preparing the soils report describing the general suitability of the site for the owner=s intended use.

✓ 3. Geotechnical Report: A geotechnical and geological report shall be prepared by a geologist licensed to practice in the State of Utah, whenever a proposed building permit or development project:

a. Is located within one thousand (1,000) feet of an identified fault; or
b. Is located on slopes estimated to be twenty (20) percent or greater; or
c. Is determined to have potential hazards by the City Engineer, County Geologist or State Geologist.

The geotechnical and geological report when required above shall include:

✓ a. A geologic map showing topography, surface and subsurface geologic features and any geologic limitations to the proposed use;

✓ b. Depth to bedrock;

✓ c. Subsurface investigative logs and reports;

✓ d. Identification of all geologic hazards; and

✓ e. Measures to mitigate or eliminate geologic hazards and problems.

_____ 4. Grading and Drainage Plan: A grading and drainage plan report which includes storm water management, erosion, and grading plans describing the methods by which surface water, natural drainages, flooding (including identification of 100 year flood where applicable), erosion and sedimentation loss, and hydrologic hazards will be controlled during and after construction. The plan shall include the following information:

✓ a. The grading plan shall show present topography, including the location and depth of all proposed fills and cuts of finished earth surfaces, and/or use of retaining walls including height, using a contour interval of two (2) foot when grades are 0-29% and five (5) foot contours when grades 30% and over.

✓ b. The proposed area to be graded shall be clearly delineated on the plan.

c. Preliminary street grades shall be identified on the plan.

✓ d. All calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "Rational Method," "SCS Curve Number Method," or appropriate equivalent. Data provided should include:

(1) Rainfall depth, duration and distribution;
(2) Watershed slope and drainage area delineation;
(3) Land condition of watershed surface;
(4) Topography of drainage area; and
(5) Soil Descriptions in Watershed. Erosion calculations shall employ predictions of soil loss sheet erosion using the Universal Soil Loss Equation or equivalent. Data to be provided should include factors of:
    (a) Rainfall intensity and duration;
    (b) Soil erodability;
    (c) Land slope and length of slope or topography;
    (d) Condition the soil surface and land management practices in use; and
    (e) Surface cover, grass, pavements, etc.

5. License Required: All required reports shall be prepared by persons licensed to practice their specialty or expertise in the State of Utah, if such license for practice is required.

6. Expert Advice: In reviewing technical reports, calculations, and plans which may be required, the City staff or City Engineer may find it necessary to obtain the advice of other experts regarding the adequacy of the reports submitted, and the validity of the conclusions and recommendations reached in the reports. In such cases the City staff or City Engineer may consult with such experts, with the reasonable costs of these consultations to be borne by the developer prior to any public hearing. The Planning Commission or City Council may require payment by the developer of the costs of such consultations as a condition of preliminary or final plat approval.

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application could result in a month's delay. Call the Planning Department to determine the submittal deadline.

PROJECTS SUBJECT TO SENSITIVE LANDS REQUIREMENTS

The following projects are subject to Sensitive Land requirements:

1. All preliminary plats, planned developments, site plan reviews, conditional use permits and any other land use development permits authorized by City Codes when they are:
    - (a) Located on lands defined in Section 10-24-2 of the Land Use Code or identified as sensitive lands on the General Plan Sensitive Lands Map;
    - (b) Located within one thousand (1000) feet of a fault identified on a published geologic map.
    - (c) Located within one hundred (100) feet, measured perpendicularly from a fault identified as a result of on-site investigation by a registered geologist.
    - (d) Hillside and ridge and bluff areas (as set forth in section 10-24-5A of the Land Use Ordinance.).
2. Any grading on sensitive land not associated with an approved project of the types listed in subsection 1 above, when such grading will:
    a. Disturb ten thousand (10,000) square feet or more of land area;
    b. Create a cut or fill over three (3) feet in height; or
    c. Create trenching over two hundred (200) feet in length.

    (A development plan is not required, however sufficient information must be submitted to determine compliance with Chapter 24, Sensitive Lands)
3. All building permits, including grading on vacant lots or parcels not previously processed in accordance with the provisions of this Chapter 24 of the Land Use Ordinance. (A development plan is not required, however sufficient information must be submitted to determine compliance with Chapter 24, Sensitive Lands)

PROJECT REVIEW PROCEDURE

When a preliminary plat, site plan, planned development or conditional use permit or other application is located on sensitive lands, the Development Plan application is submitted as a companion application and processed concurrently. The Planning Commission will review the application(s) and on conditional use permits and site plan reviews they will approve, approve with conditions or deny the Development Plan application. On preliminary plats, or zone changes, the Planning Commission will forward a recommendation to the City Council. Following receipt of a recommendation from the Planning Commission, or on appeal, the City Council will hold a public hearing on the application and approve, approve with conditions, or deny the proposed Development Plan.

NOTE: To fully understand the requirements for projects on sensitive lands, you should request a copy of Chapter 24 of the Land Use Ordinance from the City of Hurricane Planning Department.

DISSENTING RECOMMENDATION OF THE HURRICANE CITY PLANNING COMMISSION TO THE HURRICANE CITY COUNCIL

RE: **Mountain View Estates;**
Application No. 2022-PP-01 and 2022-HIL-01;
Preliminary plat application and request for an exception to the City's Hillside Ordinance;
Location: 1300 South 650 South.

DATE: **January 26, 2022**

DISSENTING RECOMMENDATION

The Planning Commission recommended approval of the application on a 6 to 1 vote. This dissenting recommendation recommends that the City Council DENY the requested exception to the City's Hillside/Sensitive Lands Ordinance.

The City's Hillside Ordinance requires that lots with slopes in excess of 10% be larger than the standard lot size permitted by the underlying zone. *See* HCC § 10-24-6. The purposes of the Hillside Ordinance include maintaining open space, minimizing site grading, minimizing scars from cuts and fills, stabilizing steep hillsides, retaining moisture, preventing erosion, and preserving the beauty of unique landscapes. *See* HCC 10-24-1.

A prior preliminary plat for this property was approved on December 2, 2021, for a total of 32 lots. However, the applicant has submitted a new, proposed preliminary plat with a total of 37 lots for the purpose of creating five additional lots. Eight of the proposed lots (7-10, 28-32) do not comply with the Hillside Ordinance because they have slopes in excess of 10% but do not meet the corresponding minimum lot size set out in the Hillside Ordinance.

The City Council may grant an exception to the Hillside Ordinance when:

> "An alternative solution is proposed for the protection of the sensitive land, based on sound and generally accepted engineering and land development principles, and said alternative will result in equal or better protection than the development under the standards of this chapter; and is consistent with the purposes of this chapter."

The applicant is requesting an exception to the Hillside Ordinance and has submitted a letter in support of the requested exception. The applicant's position is, in essence, that additional lots will result in additional retaining walls, so the height of the additional retaining walls will not be as tall. The applicant also suggests that additional lots will reduce the slope of the roadways.

The applicant's reasons for adding more lots does not justify an exception to the Hillside Ordinance. Additional terracing, as well as reasonably sloped roadways, can be accomplished without increasing the density of the development. For example, one lot can incorporate a terracing wall without dividing the lot into two lots. Instead of placing a home on every terrace—lots with steep slopes could incorporate a side yard or a back yard with a terraced landscaped area or open space. This approach would be "consistent with the purposes" of the

Hillside Ordinance because it would promote open space on hillsides, reduce the inherent risks when homes are terraced on steep slopes in close proximately to each other, and minimize the visual impact of structures on highly visible slopes. The applicant's proposal does not provide "equal or better" protection than the generally applicable Hillside standards, nor is the proposal "consistent with the purposes" of the Hillside Ordinance, so an exception to the Hillside Ordinance is not warranted and should not be granted.

It is recommended that the application for a preliminary plat be denied on the grounds that it does not satisfy the standards of the Hillside Ordinance and that an exception to the Ordinance is not warranted.

APPROVAL

This Dissenting Recommendation is made by Commissioner Dayton Hall.

PRELIMINARY PLAT APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $150.00

For Office Use Only:
File No. 2022-PP-05
Receipt No. 8.154961

Name: GVS Holdings LLC **Telephone:** 435-313-6700

Address: 748 W. Morby St., Washington, UT 84780 **Fax No.** --

Email: Dwain@redrockrealestate.com **Agent Email:** Dwain@redrockrealestate.com

Agent (If Applicable): Dwain Schallenberger **Telephone:** 435-313-6700

Address/Location of Subject Property: 1117 W. 600 N.

Tax ID of Subject Property: H-3-1-34-4400 **Zone District:** PUD (RM-2 & R1-10)

Proposed Use: (Describe, use extra sheet if necessary. Include total number of lots)

PD Overlay with RM-2 at the north end, R1-10 at the south end, and open space between.

Submittal Requirements: The preliminary plat application shall provide the following:

X 1. Description: In a title block located in the lower right-hand corner of the sheet the following is required:
- X a. The proposed name of the subdivision.
- X b. The location of the subdivision, including the address and section, township and range.
- X c. The names and addresses of the owner or subdivider, if other than the owner.
- X d. Date of preparation, and north point.
- X e. Scale shall be of sufficient size to adequately describe in legible form, all required conditions of Chapter 39, City Subdivision regulations.

X 2. Existing Conditions: The preliminary plat shall show:
- X a. The location of the nearest monument.
- X b. The boundary of the proposed subdivision and the acreage included.
- N/A c. All property under the control of the subdivider, even though only a portion is being subdivided. (Where the plat submitted covers only a part of the subdivider's tract, a sketch of the prospective street system of the unplatted parts of the subdivider's land shall be submitted, and the street system of the part submitted shall be considered in light of existing Master Street Plan or other Commission studies.)
- X d. The location, width and names/numbers of all existing streets within two hundred (200) feet of the subdivision and of all prior streets or other public ways, utility rights of way, parks and other public open spaces, within and adjacent to the tract.
- X e. The location of all wells and springs or seeps, proposed, active and abandoned, and of all reservoirs or ponds within the tract and at a distance of at least one hundred feet (100') beyond the tract boundaries.
- N/A f. Existing sewers, water mains, culverts or other underground facilities within the tract, indicating the pipe sizes, grades, manholes and the exact locations.

X g. Existing Hurricane Canal Company facilities; other ditches, canals, natural drainage channels and open waterways and any proposed realignments.

X h. Contours at vertical intervals not greater than five (5) feet.

X i. Identification of potential geotechnical constraints on the project site (such as expansive rock and soil, collapsible soil, shallow bedrock and caliche, gypsiferous rock and soil, potentially unstable rock or soil units including fault lines, shallow groundwater, and windblown sand) and recommendations for their mitigation.

X j. Information on whether property is located in desert tortoise take area

X 3. Proposed Plan: The subdivision plans shall show:

X a. The layout of streets, showing location, widths, and other dimensions of proposed streets, crosswalks, alleys and easements.

X b. The layout, numbers and typical dimensions of lots.

X c. Parcels of land intended to be dedicated or temporarily reserved for public use or set aside for use of property owners in the subdivision.

X d. Easements for water, sewers, drainage, utilities, lines and other purposes.

X e. Typical street cross sections and street grades where required by the Planning Commission. (All street grades over 5% should be noted on the preliminary plat)

X f. A tentative plan or method by which the subdivider proposes to handle the storm water drainage for the subdivision.

X g. Approximate radius of all center line curves on highways or streets.

X h. Each lot shall abut a street shown on the subdivision plat or on an existing publicly-dedicated street. (Double frontage or flag lots shall be prohibited except where conditions make other design undesirable)

N/A i. In general, all remnants of lots below minimum size left over after subdividing of a larger tract must be added to adjacent lots, rather than allow to remain as unusable parcels.

N/A j. Where necessary, copies of any agreements with adjacent property owners relevant to the proposed subdivision shall be presented to the Planning Commission.

X k. A letter from both the local sanitary sewer provider and culinary water provider indicating availability of service.

N/A l. Will this subdivision be phased? If yes show possible phasing lines.

X m. A tentative plan or method for providing non-discriminatory access to the subdivision for purposes of placement of communications infrastructure, and for purposes of placement of utility infrastructure.

X 4. Required copies of plans:

X a. Three copies of all full scale drawings

X b. One copy of each drawing on a 11 x 17 inch sheets. (8 ½ x 11 is acceptable if the project is small and the plans are readable at that size).

X 5. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application, could result in a month's delay. Planning Commission meetings are held on the second Thursday and fourth Wednesday of each month at 6:00 p.m. The deadline to submit an application to be placed on an agenda is no later than <u>12:00 noon</u> 10 full business days before the Planning Commission meeting at which you plan for your application to be heard.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

Ash Creek Special Service District

1350 S. Sand Hollow Road
Hurricane, UT 84737
Office: (435) 635-2348 Fax: (435) 635-8550
ashcreek@infowest.com

January 3, 2022

Hurricane City
Stephen Nelson
127 N. 870 W.
Hurricane, UT 84737

RE: GVS - Parcel H-3-1-34-4400

Stephen,

There is sewer capacity for this project. The developers understand and agree that they will need to get plan approval for the sewer system.

After approval they agree to pay all costs associated with construction and impact fees. Please let us know if you have any questions.

Sincerely,

Amber Gillette, PE
Engineering Tech
Ash Creek Special Service District

HURRICANE CITY
UTAH

Water Department
Ken Richins, Superintendent

December 30, 2021

To Whom It May Concern:

A will serve letter has been requested for residential subdivision on Parcel H-3-4-34-4400 located at approximately 600 N at 1117 W in Hurricane, Utah.

Yes, we do have culinary water in the area of 600 N 1117 W in Hurricane, Utah.

A hydraulic water study may be required to ensure the waterline will deliver the required fire flows. A looped water system may be required

Sincerely,

Hurricane City Water – Dallan Wadsworth

646 West 600 North • Hurricane, UT • 84737
Phone: (435) 635-9442 • Fax: (435) 635-2616
WEB: www.cityofhurricane.com

AFFIDAVIT
PROPERTY OWNER

STATE OF UTAH)
:ss
COUNTY OF Utah)

I (we) Sterling Nelson, Randi C. Nelson-Frausto, being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

Sterling D Nelson
(Property Owner)

Randi C. Nelson-Frausto
(Property Owner)

Subscribed and sworn to me this 3 day of November 2021.

C. Ashdown
(Notary Public)

Residing in: Pleasant Grove, UT

My Commission Expires: 7-25-2023

CELIA ASHDOWN
NOTARY PUBLIC • STATE OF UTAH
COMMISSION# 707412
COMM. EXP. 07-25-2023

Agent Authorization

I (we), Sterling Nelson, Randi C. Nelson-Frausto the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s) TAYLOR RICKI / CVS HOLDINGS to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application.

Sterling D Nelson
(Property Owner)

Randi C. Nelson-Frausto
(Property Owner)

Subscribed and sworn to me this 3 day of November 2021.

C. Ashdown
(Notary Public)

Residing in: Pleasant Grove, UT

My Commission Expires: 7-25-2023

CELIA ASHDOWN
NOTARY PUBLIC • STATE OF UTAH
COMMISSION# 707412
COMM. EXP. 07-25-2023

Account 0075856

Location

Account Number 0075856

Parcel Number H-3-1-34-4400

Tax District 03 - Hurricane City

Acres 19.16

Situs 0, 0

Legal S: 34 T: 41S R: 13W W1/2 NW1/4 NW1/4 SEC 34 T41S R13W SLM. LESS: BEG ON NE COR LOT 6 BLK 16 HFS, TH N89*52'13 W ALG N LN LOTS 5 & 6 660.36 FT TO W LN SEC 34 T41S R13W, TH N0*03'04 E ALG SEC/L 16.5 FT; TH N89*53'06 E ALG EXST F/L 660.35 FT; TH S0*02'22 W 19.25 FT TO POB. LESS: ALL N 37.50 FT OF W1/2 NW1/4 NW1/4 SEC 34 T41S R13W DESC AS FOL: BEG NW COR SEC 34 T41S R13W, SD PT BEING ON CTR LN OF SD PROJ ENG STA 67+53.91, TH ALG SD CTR LN & N LN OF SD SEC N89*51'47" E 660.29 FT; TH S00*14'22" E 37.50 FT TO PT ON LN 37.50 FT DIST & PRL TO SD CTR LN; TH ALG SD PRL LN S89*51'47" W 660.31 FT TO PT ON W LN OF SD SEC; TH ALG SD W LN N00*12'38" W 37.50 FT TO PT ON SD CTR LN SD NW COR & POB.

Parent Accounts

Parent Parcels

Child Accounts

Child Parcels

Sibling Accounts

Sibling Parcels

Owner

Name NELSON STERLING D & RANDI C

9447 MECKAILEE CV
SANDY, UT 84094-3682

Value

Market (2021) $871,800

Taxable $871,800

Tax Area: 03 **Tax Rate:** 0.009782

Type	Actual	Assessed	Acres
Non Primary Land	$871,800	$871,800	19.160

Transfers

Entry Number	Recording Date	
00262686	06/14/1984 02:52:00 AM	B: 351 P: 748
20090017916	05/08/2009 03:03:49 PM	
20090048182	12/22/2009 03:58:25 PM	
20100006647	03/01/2010 04:23:46 PM	
20100006648	03/01/2010 04:23:46 PM	
20100043974	12/30/2010 10:52:48 AM	
20110000235	01/04/2011 09:18:39 AM	

"Tax"

Tax Year	Taxes
2021	$8,527.95
2020	$6,315.63

Images

- GIS

Send - this notice - to

Randi C. Nelson and Sterling D. Nelson
557 West Pinewood Drive
Cedar City, Utah 84720
801-586-6200

Durham Morris
Attorney For Estate
172 North Main Street
Cedar City, Utah 84720
Telephone: 586-8391

262686

IN THE FIFTH JUDICIAL DISTRICT COURT OF WASHINGTON COUNTY, STATE OF UTAH

In the Matter of the Estate of DAWN GRAFF SETZER, Deceased.	DECREE OF FINAL DISTRIBUTION Probate No. 2528

This matter came on for hearing before this Court at St. George, Utah, on the 11th day of June, 1984, upon the Petition of Emil J. Graff, Personal Representative of the estate of Dawn G. Setzer, deceased, heretofore filed herein praying for a Decree of Final Distribution of all property and assets now belonging to the estate of said deceased; and it appearing to the Court that due and legal notice has been given of the time and place of the hearing of said Petition, and that no protests or objections have been filed or made to the granting of said Petition, and that the time for filing protests or objections has expired; and it appearing to the Court that due and legal notice to the creditors of said deceased has been given in the manner and for the length of time required by law, and that a Decree establishing that due and legal notice to such creditors has been given, has been made and filed herein; and it appearing further to the Court that all of the expenses of the last illness and funeral and burial of said deceased, and all of the costs and expenses of administration of the estate of said deceased, and all of the Estate Taxes which were due from the estate of said deceased to the United States Government have been fully paid; that said estate is not subject to the payment of any inheritance

718 -

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taxesto the State of Utah; and it appearing further that all of the taxes which have been levidd and assessad against the property belonging to said estate have been fully paid; and it further appearing to the Court that the names of the heirs at law of said deceased, and of the beneficiaries named in the Last Will and Testament of said deceased, together with their respective addresses and relationships to said deceased are as follows:

Name:	Relationship to said Deceased:	Address:
Jane S. Nelson	Major Daughter and Beneficiary named in Will	557 West Pinewood Drive Cedar City, Utah 84720
Richard W. Nelson	Major Son-in-law and Beneficiary named in Will	557 West Pinewood Drive Cedar City, Utah 84720
Randi Carroll Nelson	Major Granddaughter, 19 years of age, and Beneficiary named in Will	557 West Pinewood Drive Cedar City, Utah 84720
Sterling D. Nelson	Major Grandson, 18 years of age and Beneficiary named in Will	557 West Pinewood Drive Cedar City, Utah 84720

It further appearing to the Court that said Personal Representative of said estate has made and caused to be filed herein a First and Final Account and Report of his administration of said estate, which said First and Final Account and Report has been allowed and approved by this Court; and it further appearing that the property and cash now belonging to the estate of said deceased on hand for distribution is the property and cash designated in paragraph No. 6 of the said Petition For Final Distribution on file herein as being on hand for distribution and hereinafter described and distributed; and it further appearing to the Court that said deceased left a Last Will and Testament, which has heretofore been admitted to probate in this Court; that by the terms of which said Last Will and Testament said deceased did give and bequeath

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unto her beloved daughter, Jane S. Nelson, the sum of $5,000.00 in cash, and did give and bequeath unto her beloved son-in-law, Richard W. Nelson, the sum of $1,000.00 in cash, and that she did give, devise and bequeath unto her two beloved grandchildren, Randi Carroll Nelson and Sterling D. Nelson, all of the rest, residue and remainder of her property and assets which she owned at the time of her death, and to which she shall be entitled at the time of her death, and which remains after the said bequests to her beloved daughter, Jane S. Nelson, and to her beloved son-in-law, Richard W. Nelson, have been fulfilled, and after all of her just debts and funeral expenses, and all other financial obligations of her estate have been paid, they to take share and share alike. The Court finds that all property, cash and assets which now remain in said estate for distribution should be distributed in accordance with the terms and provisions of said Last Will and Testament, and as hereinafter set forth and provided for, and that said estate is now in a condition to be closed.

NOW THEREFORE, IT IS HEREBY ORDERED, ADJUDGED AND DECREED that all of the property, assets and cash now belonging to the estate of said Dawn G. Setzer, deceased, BE AND THE SAME IS HEREBY DISTRIBUTED to the said beneficiaries named in the said Last Will and Testament of said deceased as follows:

TO JANE S. NELSON the sum of $5,000.00 in cash.

TO RICHARD W. NELSON the sum of $1,000.00 in cash.

TO RANDI CARROLL NELSON, the sum of $5,144.57 in cash.

TO STERLING D. NELSON, the sum of $5,144.57 in cash.

TO RANDI CARROLL NELSON AND TO STERLING D. NELSON, as tenants in common, the following described real property situated in Washington County, Utah:

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Parcel 1: Commencing at the Northwest corner of Lot 80, LaVerkin Townsite & Field Survey; thence N 89°46'00" E along the North line of said Lot 80, a distance of 57.68 feet; thence S 18°08'25" E 253.91 feet; thence S 17°37'43" E 115.60 feet to Point of Beginning; thence N 89°50'25" E 57.06 feet; thence S 46°27'00" E 27.60 feet; thence S 18°03'30" E 77.41 feet to the North right-of-way line of Utah Highway SR-15; thence S 89°50'25" W 5.88 feet along said right-of-way; thence S 0°09'35" E 10.00 feet along said right-of-way; thence S 89°50'25" W 67.64 feet along said right-of-way; thence N 17°37'43" E 114.94 feet to the Point of Beginning, containing 0.184 acres, more or less.

Parcel 2: The Northwest quarter of the Southeast quarter of Section 26, Township 41 South, Range 13 West, Salt Lake Meridian, containing 40 acres, more or less.

Parcel 3: The West half of the Northwest quarter of the Northwest quarter of Section 34, Township 41 South, Range 13 West, Salt Lake Meridian, containing 20 acres, more or less.

Parcel 4: Beginning at a point 21 rods West of the Southeast corner of the Southeast quarter of the Northwest quarter of Section 34, Township 41 South, Range 13 West, Salt Lake Meridian, and running thence North 28 rods; thence 20° North of West 31 rods 7 feet; thence 15° West of South 47 rods 7 feet; thence East 47 rods 10 feet to the place of beginning, containing 8.4 acres, more or less.

Parcel 5: The South half of the Southeast quarter of Section 20, Township 42 South, Range 11 West, Salt Lake Meridian, containing 80 acres, more or less.

Parcel 6: The Northwest quarter of Section 21, Township 42 South, Range 13 West, Salt Lake Meridian, containing 160 acres, more or less.

Parcel 7: The Northeast quarter of Section 29, Township 42 South, Range 11 West, Salt Lake Meridian, containing 160 acres, more or less.

TO RANDI CARROLL NELSON AND TO STERLING D. NELSON, as tenants in common, the following described personal property:

All amounts now remaining unpaid on principal, the same being $124,164.05, and all amounts which will hereafter become due on interest on that certain Escrow Agreement, dated November 14, 1975, made and entered into by and between Dawn Setzer, Seller, and Marvin Prince and Dorothy Prince, and Clyde G. Hunt and Delora P. Hunt, Buyers, for the original principal purchase price of $140,000.00, which said Escrow Agreement is being held in Escrow in Zions First National Bank, Hurricane, Utah.

Also all amounts now remaining unpaid on principal, the same being $24,164.04, and all amounts which will hereafter become due on interest on that certain Escrow Agreement, dated November 14, 1975, made and entered into by and between Dawn Setzer, Seller, and Marvin Prince and Dorothy Prince, and Clyde G. Hunt and Delora P. Hunt,

Unofficial Copy

Buyers, for the original principal purchase price of $40,000.00, which said Escrow Agreement is now being held in Escrow in Zions First National Bank, Hurricane, Utah.

Also All amounts which will hereafter become due on principal and interest on that certain Savings Certificate #356923847 issued by Zions First National Bank to Dawn G. Setzer, dated 9-14-82, payable 3-14-85, for the original principal amount of $48,413.44, and upon which Savings Certificate there is now a balance of principal and accrued interest totaling $51,598.02 now remaining unpaid.

Also one 1975 Chevrolet 2-door automobile, Identification No. IN47V5J181288.

Dated this 9th day of June, 1984.

/s/ Harlan Burns
District Judge

351 14.00
1984 JUN 14 PM 2:52
262686
Randi C. & Sterling D. Nelson
748-7[illegible]

752

SENSITIVE LANDS APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $

For Office Use Only:
File No. 2022-HIL-02
Receipt No. 8154961

Name: GVS Holdings LLC **Telephone:** 435-313-6700

Address: 748 W. Morby St., Washington, UT 84780 **Fax No.** --

Agent (If Applicable): Dwain Schallenberger **Telephone:** 435-313-6700

Email: Dwain@redrockrealestate.com **Agent Email:** Dwain@redrockrealestate.com

Address/Location of Subject Property: 1117 W. 600 N.

Tax ID of Subject Property: H-3-1-34-4400 **Zone District:** PUD (RM-2 & R1-10)

Proposed Use: (Describe, use extra sheet if necessary)

PD Overlay with RM-2 at the north end, R1-10 at the south end, and open space between.

Other companion application submitted with the Development Plan:

- [X] **Preliminary Plat**
- [ ] **Site Plan Review**
- [ ] **Conditional Use Permit**
- [ ] **Rezone**
- [ ] **Other**

Submittal Requirements:
Please review the attached Supplemental Information to determine additional information that must be submitted with this application.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

DEVELOPMENT PLAN SUBMITTAL REQUIREMENTS

Development Plan Submittal: The following information shall be submitted with the application for Development Plan approval, and may be in addition to information required for a companion application being processed concurrently with the Development Plan:

X 1. Development plan: The development plan shall clearly show:

X a. Two (2) foot contours. The contour map shall be prepared and certified by a licensed professional civil engineer or surveyor drawn at a scale no smaller than one (1) inch equals one hundred (100) feet. Contour maps based on interpolation of maps with larger contour intervals are not acceptable.

X b. Field surveys may be required of the applicant by the City to verify the accuracy of the contour lines shown on the contour map.)

X c. Slopes having grades of 10-29 percent and natural slopes of thirty (30) percent or greater shall be color shaded clearly showing the difference between the two categories. This contour information shall either be computer based, or based on profile lines drawn perpendicular to contours at intervals no less than one hundred fifty (150') feet apart, nor greater than seventy-five (75') feet from an existing or proposed property line. Grades shall then be determined by calculating the slope along one hundred (100) foot segments of the profile. (See Appendix Diagram-A of the Land Use Ordinance)

X d. To determine required minimum lot size (Section 10-24-6B of the Sensitive Land Ordinance), the average natural grade on each proposed parcel shall be calculated and indicated on the development plan. The average grade is determined by calculating the grade of the natural slope between two opposing property lines, based on profiles taken perpendicular to the contours, no less than one hundred fifty (150) apart, nor greater than seventy-five (75) feet from an existing or proposed property line.

X e. The proposed development layout of lots, roads, proposed road grades, open space, area of disturbances, and existing native vegetation.

_____ 2. Soils Investigation Report: A soils investigation report which contains the following information:

_____ a. Nature, distribution and classification (Unified Soil Classification) of existing soils to the appropriate depth of influence by the proposed development, but not less than ten (10) feet deeper than the proposed excavations or to bedrock.

_____ b. Strength of existing soils, bearing capacity of supporting soils, settlement estimates, collapse and shrink-swell characteristics, lateral pressures and trench excavation limitations.

_____ c. Ground water levels that may affect development and estimated elevation of high ground water levels.

_____ d. Appropriate laboratory testing for classification, consistency, strength and consolidation conditions.

_____ e. Slope stability.

_____ f. A written statement by the persons or firm preparing the soils report describing the general suitability of the site for the owner=s intended use.

_____ 3. Geotechnical Report: A geotechnical and geological report shall be prepared by a geologist licensed to practice in the State of Utah, whenever a proposed building permit or development project:

a. Is located within one thousand (1,000) feet of an identified fault; or
b. Is located on slopes estimated to be twenty (20) percent or greater; or
c. Is determined to have potential hazards by the City Engineer, County Geologist or State Geologist.

The geotechnical and geological report when required above shall include:

_____a. A geologic map showing topography, surface and subsurface geologic features and any geologic limitations to the proposed use;

_____b. Depth to bedrock;

_____c. Subsurface investigative logs and reports;

_____d. Identification of all geologic hazards; and

_____e. Measures to mitigate or eliminate geologic hazards and problems.

X 4. Grading and Drainage Plan: A grading and drainage plan report which includes storm water management, erosion, and grading plans describing the methods by which surface water, natural drainages, flooding (including identification of 100 year flood where applicable), erosion and sedimentation loss, and hydrologic hazards will be controlled during and after construction. The plan shall include the following information:

X a. The grading plan shall show present topography, including the location and depth of all proposed fills and cuts of finished earth surfaces, and/or use of retaining walls including height, using a contour interval of two (2) foot when grades are 0-29% and five (5) foot contours when grades 30% and over.

X b. The proposed area to be graded shall be clearly delineated on the plan.

X c. Preliminary street grades shall be identified on the plan.

X d. All calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "Rational Method," "SCS Curve Number Method," or appropriate equivalent. Data provided should include:

(1) Rainfall depth, duration and distribution;
(2) Watershed slope and drainage area delineation;
(3) Land condition of watershed surface;
(4) Topography of drainage area; and
(5) Soil Descriptions in Watershed. Erosion calculations shall employ predictions of soil loss sheet erosion using the Universal Soil Loss Equation or equivalent. Data to be provided should include factors of:
(a) Rainfall intensity and duration;
(b) Soil erodability;
(c) Land slope and length of slope or topography;
(d) Condition the soil surface and land management practices in use; and
(e) Surface cover, grass, pavements, etc.

5. License Required: All required reports shall be prepared by persons licensed to practice their specialty or expertise in the State of Utah, if such license for practice is required.

6. Expert Advice: In reviewing technical reports, calculations, and plans which may be required, the City staff or City Engineer may find it necessary to obtain the advice of other experts regarding the adequacy of the reports submitted, and the validity of the conclusions and recommendations reached in the reports. In such cases the City staff or City Engineer may consult with such experts, with the reasonable costs of these consultations to be borne by the developer prior to any public hearing. The Planning Commission or City Council may require payment by the developer of the costs of such consultations as a condition of preliminary or final plat approval.

AGEC
Applied GeoTech

January 18, 2022

Attention: Dave Nasal
Email: davenasal@gmail.com

Subject: Geotechnical Consultation
Mesa Cove Subdivision
Hurricane, Utah
AGEC Project No. 2212879

Applied Geotechnical Engineering Consultants, Inc., (AGEC) was requested to conduct a geotechnical investigation for the proposed Mesa Cove Subdivision located in Hurricane, Utah as shown on Figure 1. The study is currently in progress. We have scheduled to excavate 12 exploratory test pits across the 19-acre development. A final report will be provided upon completion of the study. The report summarizes the work to date and the conditions of the site along with conclusions to the suitability of the property for the proposed development.

Site Conditions

The property is located south of 600 North and east of 1150 East in Hurricane, Utah. The property consists of undeveloped property with residential developments to the south and southwest. There is vacant property to the east and an elementary school further to the east. The north is bounded by 600 North Street.

The property slopes down to the south with approximately 120 feet of elevation change. There is a moderately steep slope through the center of the site. The property is primarily Basalt rock surface infilled with wind blown sand and silt. The site sparsely to moderate vegetated with desert grasses and brush. There is an overhead power line along the western portion of the property.

Several photos of the site are attached.

Geology

AGEC has reviewed the available literature for the property including the following:

Literature Document No. 1: Geologic Map of the Hurricane 7.5′ Quadrangle, Washington County, Utah, Map M-187, 2003, Robert F. Biek.

Literature Document No. 2: Geologic Hazards and adverse Construction Conditions, St. George-hurricane Metropolitan Area, Washington County, Utah, SS-127, 2008, Lund etal.

Based on the literature review the following conclusions are made:

1. The site geology consists of two basalt flows, the Cinder Pits Lava Flow (lower bench) and the Radio Tower Lava Flow (upper bench). The thickness of these basalt flows vary from tens of feet up to 180 feet.
2. There is minor amounts of wind blown or aeolian type deposits overlying the basalt with greater amounts along the south end of the site.
3. There are not faults on or near the property. The nearest fault, the Hurricane Fault is on the order of 1½ miles to the east.
4. The geologic hazard of Hard Rock is designated on the site that will make construction and grading difficult.

The geologic map for the site is shown on Figure 3.

Subsurface Conditions

AGEC has scheduled the excavation of 12 test pits (explorations) as shown on Figure 2. AGEC has also reviewed previous geotechnical studies in the area including:

Geotechnical Study No. 1: Geotechnical Investigation, "Valley Academy", Prepared by AGEC, Project no. 2111038, dated January 9, 2012. Located east of property and south of 600 North.

Geotechnical Study No. 2: Geotechnical Investigation, "Hurricane Elementary School", Prepared by AGEC, Project No. 2051890, dated October 16, 2008. Located east of the property north of 325 North and east of 1040 West.

Geotechnical Study No. 3: Geotechnical Investigation, "Hurricane Preschool", Prepared by AGEC, Project No. 2190861, dated June 6, 2019. Located on east side of Elementary School (Ref No. 2).

In addition, several other residential developments in the area were investigated by AGEC.

Based on our experience and review of the property, the basalt caprock visible throughout the site will be the dominant soil/rock type on the property. Based on previous borings to the east, the rock extends at least 22 to 23 feet below the surface. Typical excavator refusal has been encountered at depths varying from approximately 1 to 13 feet below the surface.

Groundwater was not encountered, nor anticipated throughout the property.

Proposed Construction

The property consists of approximately 19 acres and is to be developed with two types of residential product. The lower portion will have 27 single family lots approximately ¼ acre in size and the upper bench or portion will have 65 townhomes based on the Preliminary Plat map provided by Mainline Engineering. (See Figure 2a). We also understand that 1150 West will be constructed along the west side of the property. The roadway will be a 60 foot right of way (ROW). This roadway will require significant grading, cutting and filling with approximately 120 feet of elevation change from north to south. There are also several other public roads (52-foot ROW) throughout the development. We also anticipate that 600 North will require widening. There will be other public improvements through the property.

Conclusions

Based on the review of the various items noted above, the following conclusions are noted:

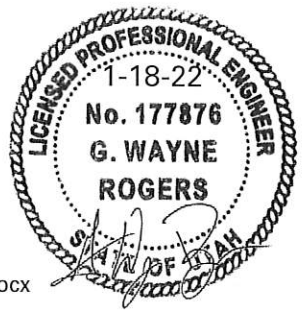
1. The site is suitable for the proposed development. No geologic hazards other than hard rock for excavation purposes are noted on the property.
2. The site will require significant cuts and fills, primarily for the construction of 1150 West Street. We anticipate the cuts will be in basalt caprock. Fills will require processing (screening and/or crushing) of the rock to use as fill. The on-site rock may be used as rockery wall rock for retaining purposes.

Limitations

AGEC will be providing a final report upon completion of the field exploration and the necessary laboratory testing. The information within this report may be used for review and preliminary design details.

Sincerely,

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.



G. Wayne Rogers, P.E.

P:\2021 PROJECT FILES\2212800\2212879 - MESA COVE (HURRICANE 19 ACRES)\GEOTECHNICAL CONSULTATION LETTER.DOCX

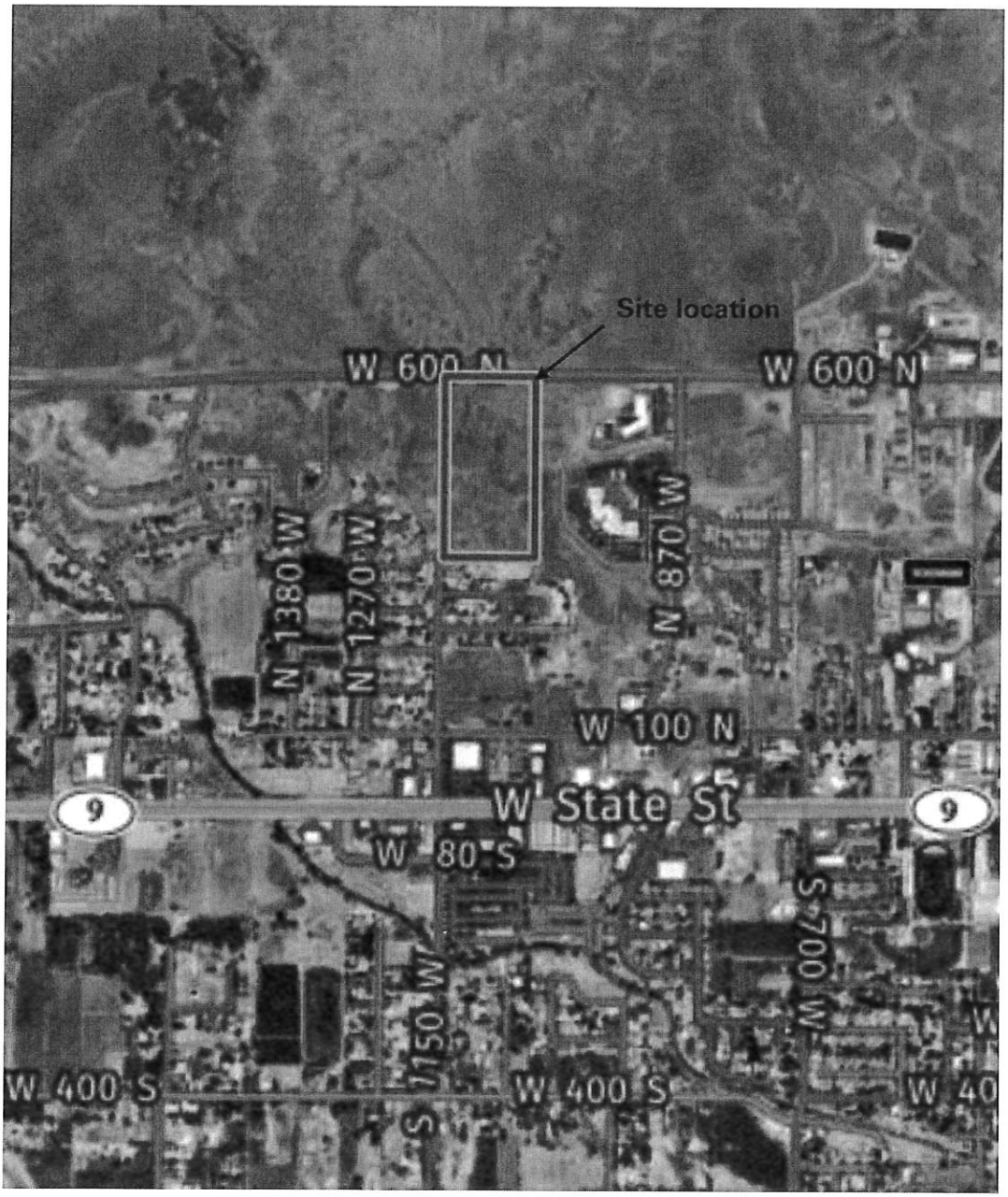


Figure 1, Site location Map

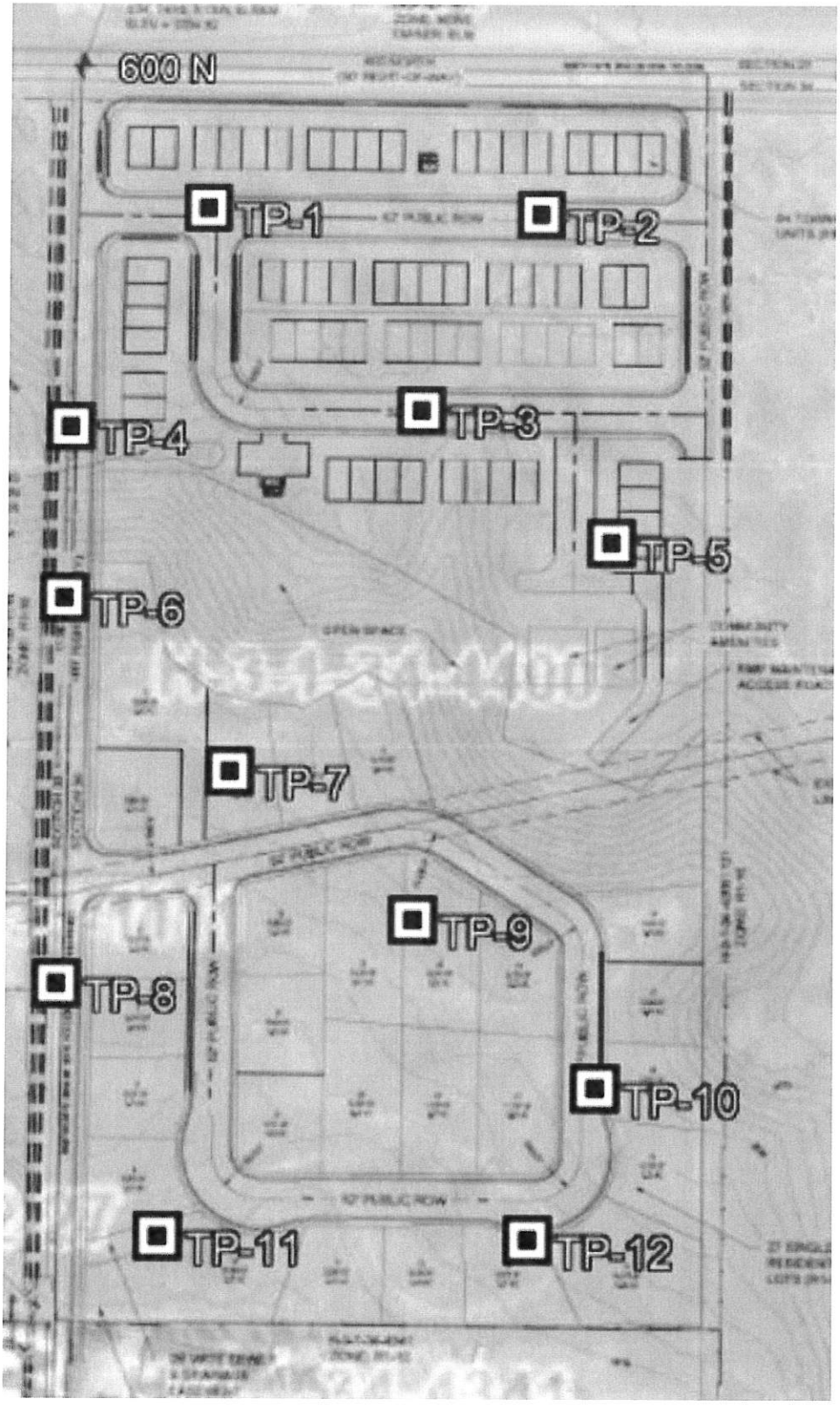


Figure 2, Proposed Exploration Map

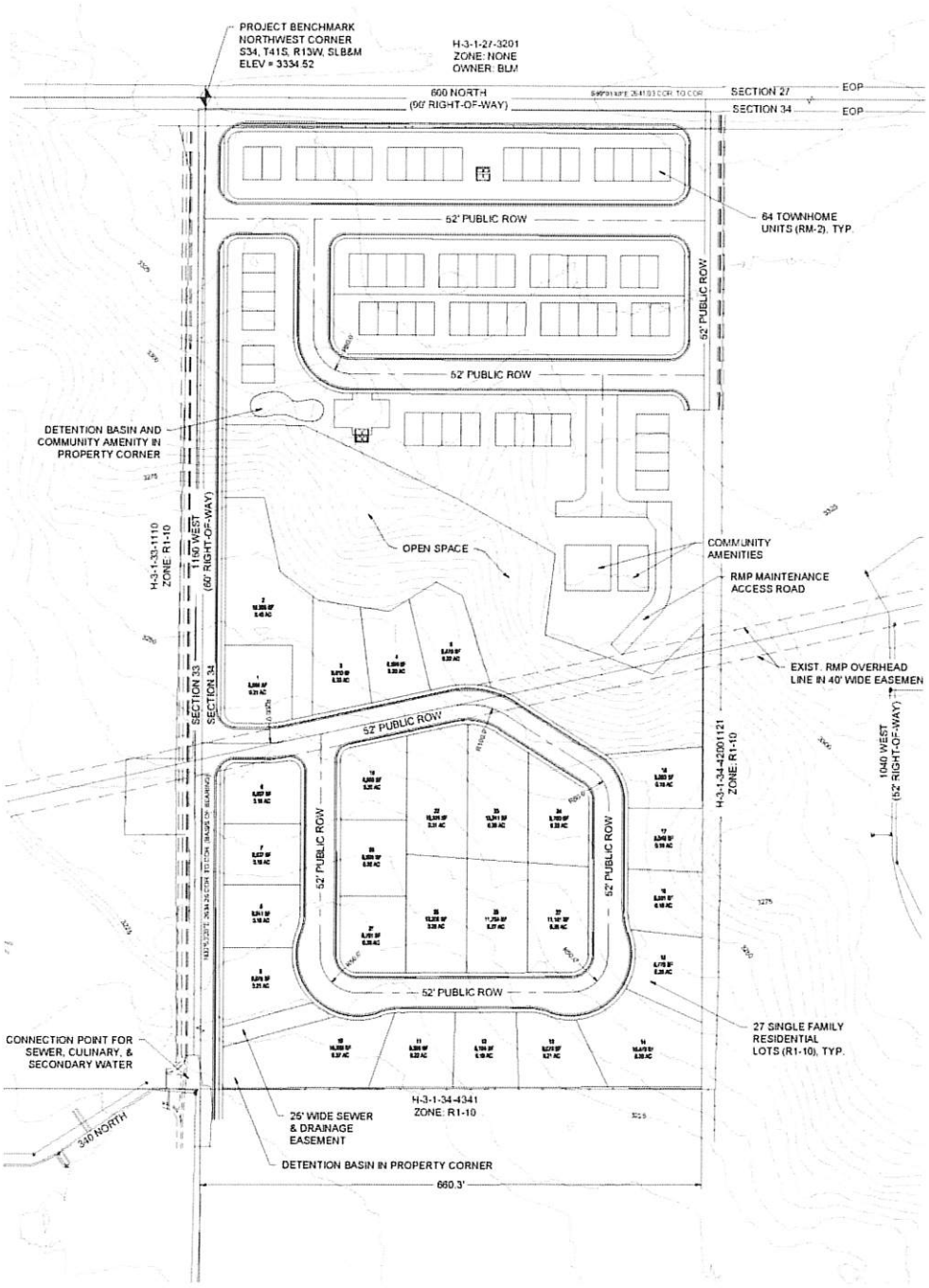


Figure 2a, Preliminary Plat Map with topography

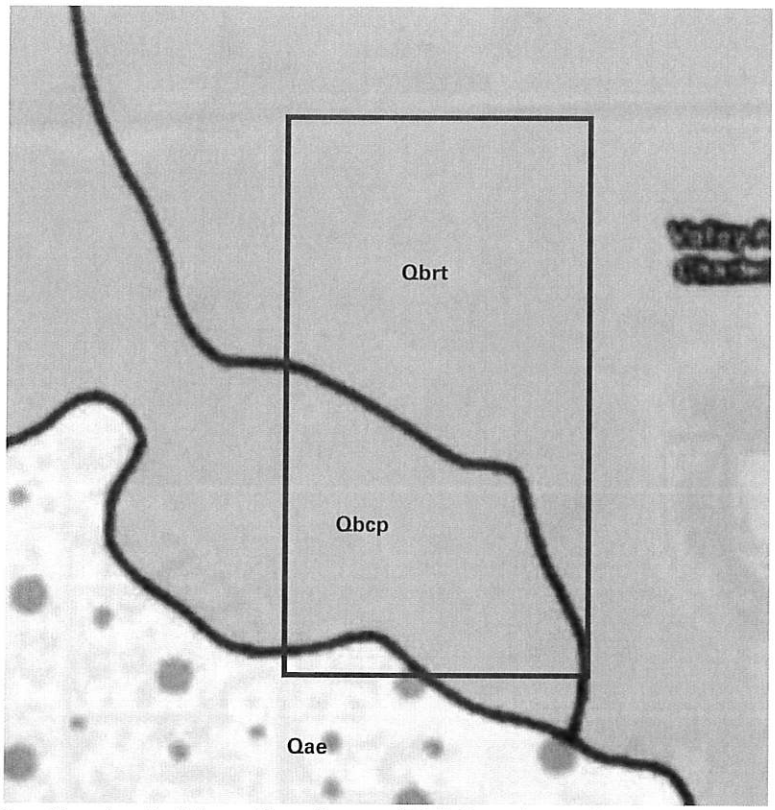


Figure 3 – Geologic Map, Hurricane 7.5' Quadrangle, M-187, Biek 2003

Key to Map:

Qbcp: **Cinder pits lava flow (middle Pleistocene),** Medium- to dark-gray, fine grained basalt (Qbcp) with small olivine phenocrysts; yielded an 40Ar/39Ar age of 0.24 +_ 0.02 Ma (Biek, 2003b); erupted from vents at two overlapping cinder cones (Qbcpc) northwest of Hurricane; lava flow is as much as several tens of feet thick.

Qbrt: **Radio tower lava flow (middle Pleistocene),** Medium- to dark-gray, fine-grained basalt to Basanite (Qbrt) with small olivine penocrysts; erupted from vents at four overlapping cinder cones (Qbrtc) west of Hurricane; yielded an 40Ar/39Ar plateau age of 0.14+_ 0.06 Ma (0.13+_ 0.07 Ma isochron), (Biek 2003b); lava flow is as much as 180 feet (55m) thick where it fill the ancestral Virgin River Channel.

Qae: **Alluvial and eaolian deposits (Holocene to upper Pleistocene),** Moderately sorted gravel, sand and silt deposited in small channels and on alluvial flats, and well-sorted, fine-to medium-grained, reddish-brown eaolian sand locally reworked by alluvial processes; younger deposits (Qaeo) typically form incised, inactive surfaces; as much as about 20 feet (6 m) thick.

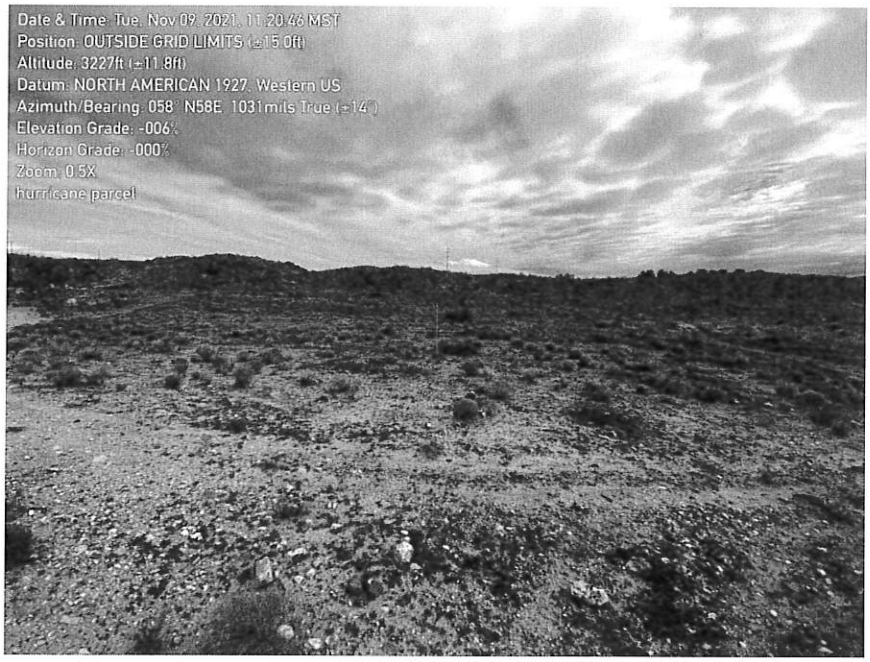


Photo No. 1, View of property looking NE from SWC

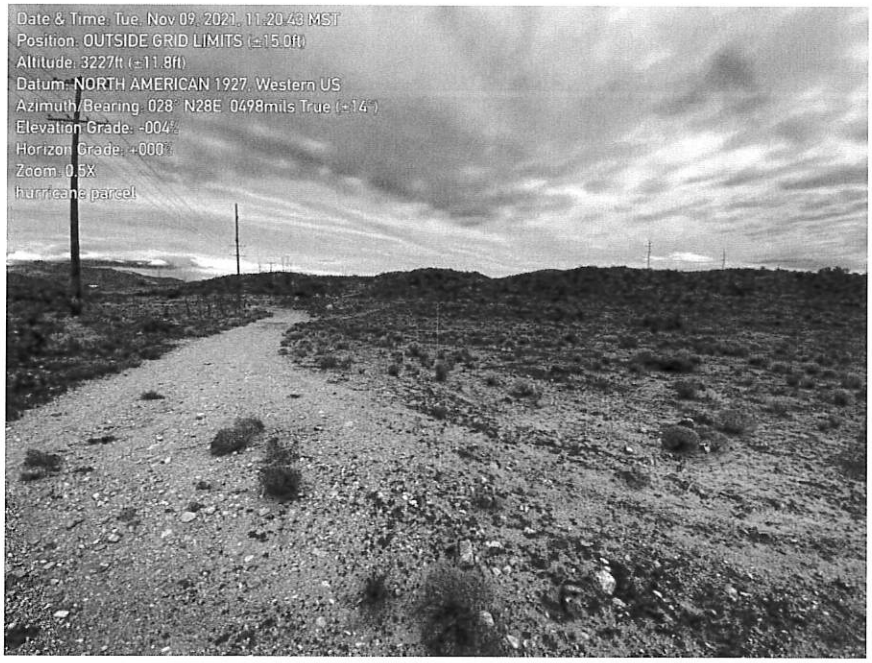


Photo No. 2, View of property looking north from SWC

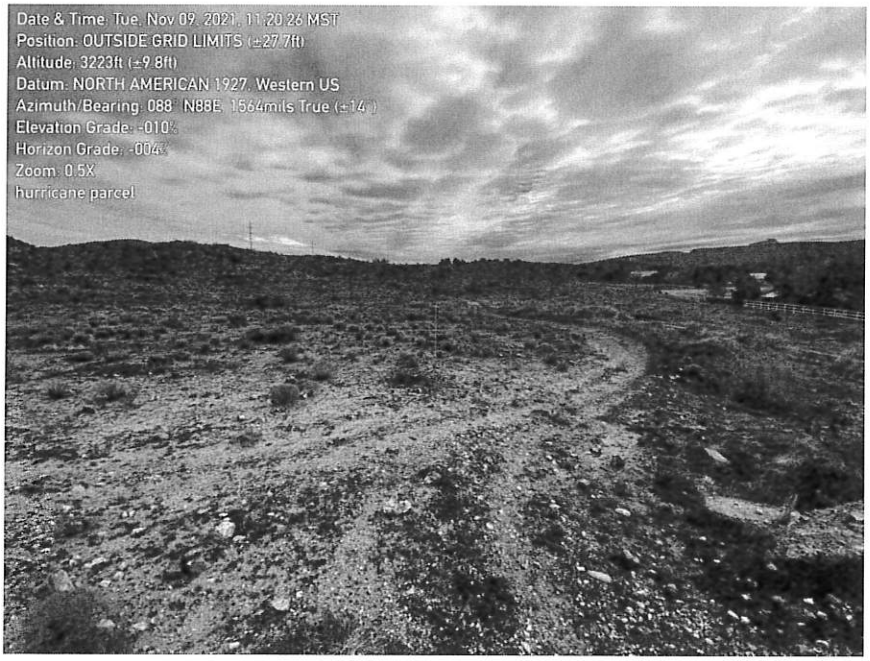


Photo No. 3, View of property looking east from SWC

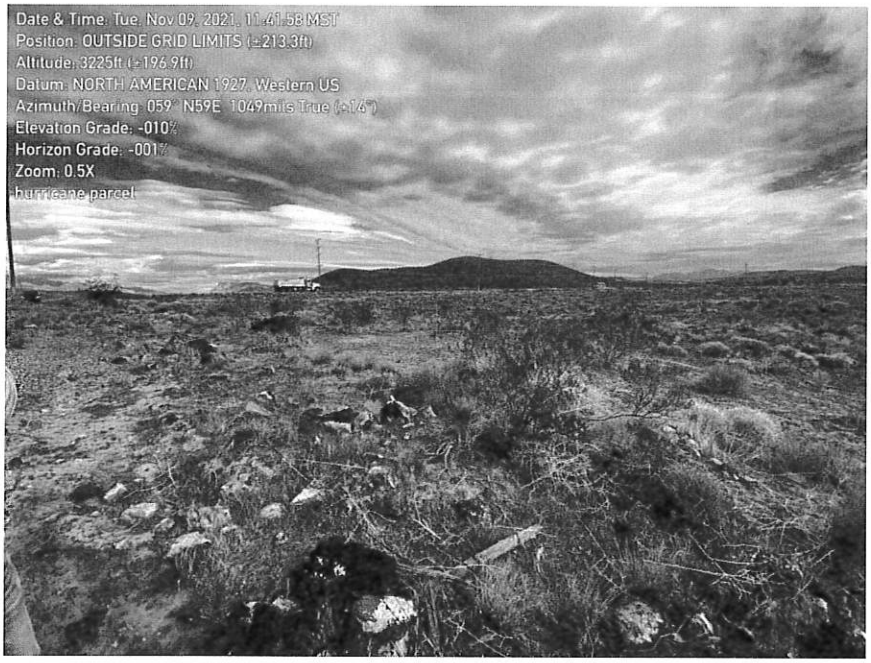


Photo No. 4, View of property looking NE from near West to NWC.

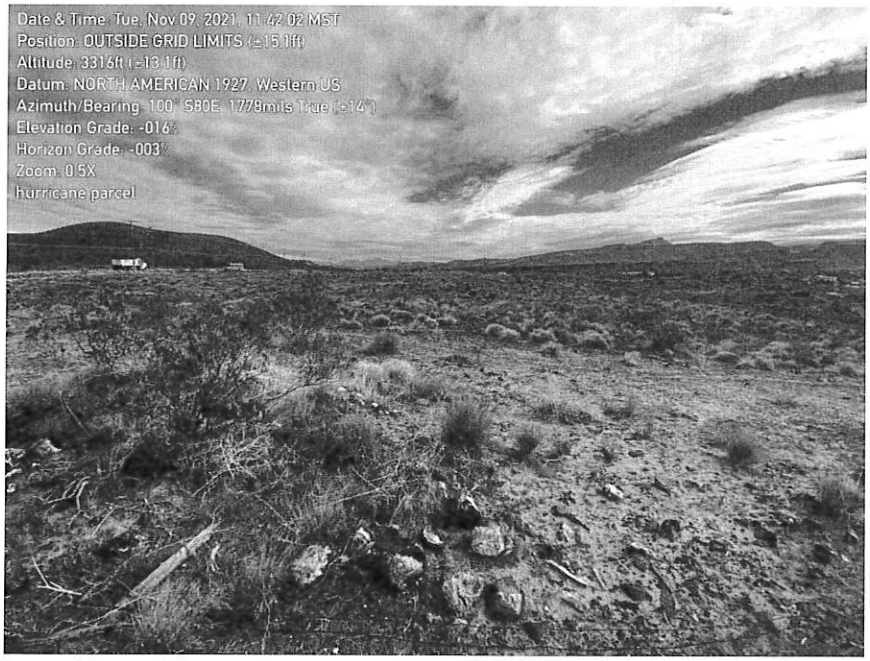


Photo No. 5, View of property looking east from near west center.

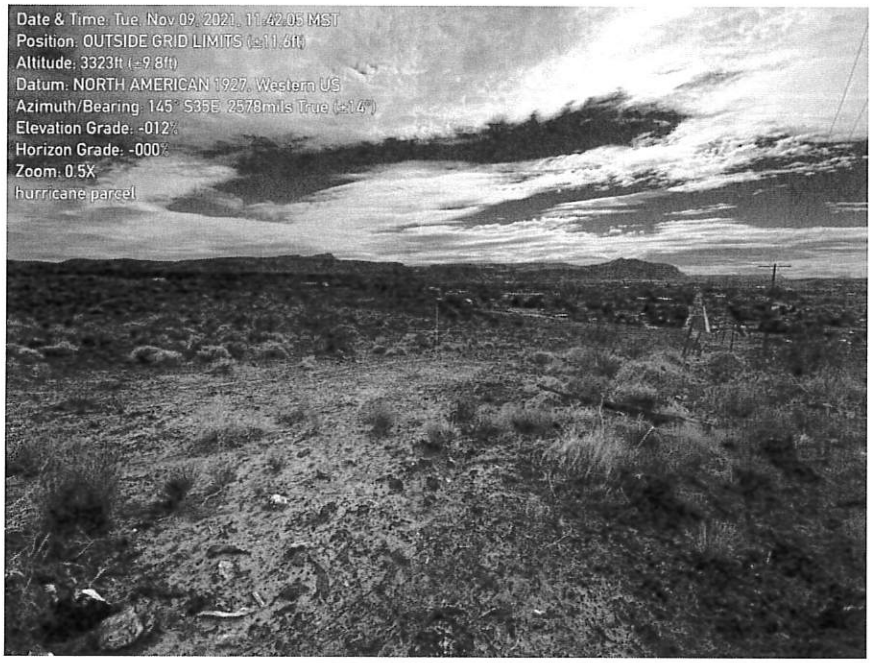


Photo No. 6, View of property looking south along west property boundary.

Preliminary
Drainage Study Report

Mesa Cove Subdivision

Owner:
GVS Holdings LLC

Prepared by:
Mainline Engineering LLC
Taylor Ricks, PE
321 N. Mall Drive, Ste. T101
St. George, UT 84790
435-669-2261

Prepared January, 2022

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Section 1: Introduction

1.1 Background

The following Drainage Control Plan and Report is submitted in support of the proposed Mesa Cove Subdivision, located in Hurricane, Utah in the west half of the northwest ¼ of the northwest ¼ of Section 34, Township 41 South, Range 13 West, Salt Lake Base and Meridian.

1.2 Purpose and Need

This report has been prepared to evaluate the drainage needs affecting the proposed construction of the project site. The 20-acre subdivision with a PD-Overlay will consist of two densities including RM-2 at the north (64 townhomes units) and R1-10 to the south (27 residential lots) and associated streets. The purpose of this study is to:

- determine the drainage patterns of the stormwater within the proposed site improvements, both prior to, and following, project construction;
- estimate peak runoff amounts and subsequent storage capacity for stormwater detention; and
- design hydraulic improvements as required by Hurricane City Standards.

1.3 Reference Materials

This study references and demonstrates compliance with the following published documents:

- Hurricane City General Plan dated December 2011
- Hurricane City Drainage Manual dated June 2008
- Hurricane City Storm Drain Master Plan dated June 2008

Additional reference materials prepared as part of this report can be found in the following appendices:

- Appendix A, Figures, Maps, and Calculations

Section 2: Property Description

2.1 Existing Property Description

The undeveloped site is covered in native vegetation with varying slopes draining from northeast to southwest. There is a steep slope that bisects the site side west to east, is approximately 60-70 feet tall, and runs at a 2:1 slope. The site consists primarily of gravelly and rocky soils with shallow bedrock. The site discharges to the existing 1150 West street. See Appendix A, Figure 2 for existing watershed boundary and topographic information. The site is relatively steep with slopes ranging from 5% to 50%.

Bordering properties including 1150 West street to the west, 600 North street to the north, Valley Charter school to the east, residential (R1-10) to the south.

The subject site is part of the Gould Wash North (GN) as defined in the Hurricane City Storm Drain Master Plan. The Gould Wash Basin encompasses most of the northeast downtown area.

There are no existing irrigation facilities that flow through or directly adjacent to the subject site that would be impacted by development. Similarly, there are no facilities downstream of the subject site that would be impacted by proposed local drainage improvements.

2.2 Proposed Property Improvements

The proposed Mesa Cove Subdivision has a PD Overlay with RM-2 zoning on the north half consisting of 64 townhome units and R1-10 zoning on the south half consisting of 27 residential lots. The improvements total approximately 20 acres with 7.78 acres in the north basin and 16.30 acres in the south basin. These lot sizes and the planned roadways comply with Hurricane City's current General Plan. There are no existing irrigation facilities on the site and no downstream irrigation facilities that will be negatively impacted by modification of the drainage patterns within the local site.

Roadways within the proposed development and adjacent to the proposed development include the following:

- 1150 West is a collector roadway (60' ROW) running north/south along the west boundary of the proposed subdivision. It will be widened along the proposed project frontage.
- 600 North is an arterial roadway (90' ROW) running west/east along the north boundary of the proposed subdivision. It will be widened along the proposed project frontage.
- All proposed roadways within the subdivision will be 50' ROW local public roadways.

Existing private property borders the project to the east and south. Neither of these properties will be improved with this project. The proposed site grading plan will convey water through the subdivision by a combination of lot grading and street improvements to two detention facilities located at the low point of the subdivision basins at the southwest corner of each sub basin. All streets will have a minimum running slope of 0.5% and a cross slope of 2%. Detention will be used to limit offsite discharges which will outfall to the existing surface drainage in 1150 West.

Refer to Appendix A, Figure A3 for developed conditions.

Section 3: Off-Site Drainage Description

Due to the existing topography, there are no offsite sheet flow or point discharges onto the proposed subdivision from the north. There is a small pie-shaped piece to the east that flows to and across the existing property. All drainage leaves the project to the south and west. There are no other storm drain systems, washes, or conveyance that need to be considered with the project.

Section 4: On-Site Drainage Description

The undeveloped site drains to the south and west boundaries. There is no existing storm infrastructure adjacent to the project site and all storm water from the project site surface flows down 1150 West street to the south.

The proposed site grading plan will continue to convey water to the south and west through the subdivision by a combination of lot grading, street improvements, and surface swales. Both the existing site and the developed site were modeled as two separate sub basins (upper/north and lower/south) given the two distinct elevation differences between the two. A composite curve number was used to represent each of the sub basins within the site.

Section 5: FEMA Floodplain Requirements

According to the FEMA Flood Insurance Rate Map number 49053C0845G, dated April 2, 2009 the site is located in Zone X. Zone X is defined as "Area of Minimal Flood Hazard" or "Areas Determined to be Outside the 0.2% Annual Chance Floodplain". The web-based dynamic FIRM is located in Appendix A as Figure A4. This site is not located in any floodplain or floodways as designated by FEMA.

Section 6: Other Drainage Studies Affecting the Property

With the exception of regional studies including the Hurricane City Storm Drain Master Plan, there are no other drainage studies that are specific to the subject site that would need to be considered as part of the evaluation herein.

Section 7: Description of Proposed Drainage Facilities

The proposed project drainage improvements will include site grading and roadway improvements. All proposed interior drainage improvements were designed in accordance with the Hurricane City Drainage Manual using the 10-year, 24-hour storm event runoff values for the minimum initial system (storm drain) and the 100-year, 24-hour storm even runoff values for the major system (roadways). Detention was designed for the 24-hour event. An emergency spillway will be provided to discharge twice the 100-year undetained peak flow. Refer to Appendix A for output tables and worksheets.

The proposed improvements comply with the Storm Water Master Plan Report which shows improvements to the Gould's Wash North (GN-2) south and west of the subject site (Figure 6-1-A in the Master Plan). The Master Plan does not show any uncompleted project improvements within the proposed subdivision or directly adjacent to the proposed subdivision.

7.1 Grading

The proposed grading plans include the establishment of proposed building pads to be above the street flow lines in accordance with Hurricane City requirements.

7.2 Roadway Improvements

There are currently no roadways within the proposed site. Planned roads will be built to convey the 100-year, 3-hour storm event inside the right-of-way.

7.3 Conveyance Improvements

No significant conveyance improvements will be constructed with this project.

Section 8: Compliance with Local and FEMA Requirements

The hydrologic calculations, hydraulic design, and construction recommendations summarized in this report were performed in accordance with standard and accepted engineering practice. Other calculations, design methods, and assumptions utilized in this report not specifically addressed in the Hydrology Manual or by FEMA were based on civil engineering practices acceptable to the industry, with specific references cited in the report. No part of this project is located within, or adjacent to, a floodplain designated by FEMA.

The only deviation from the Hurricane City Drainage Manual was to use site-specific rainfall data from the NOAA Atlas 14 rather than a generic city-wide rainfall event. No other deviations from the processes approved in the Drainage Manual were made during the analysis of the subject site or preparation of this report.

Section 9: Design Runoff Computations

9.1 Selection of Hydrologic Model

Storm run-off (or discharge) resulting from a precipitation event is the portion of the rainfall that remains after losses from reservoir storage, interception by vegetation, and infiltration into the soil. The amount of rainfall that is lost depends on soil type and moisture content, vegetation type and cover density, rainfall rate and duration, and amount and location of impervious surfaces. Several methods have been developed for estimating the run-off rate and volume from a watershed in response to rainfall when statistical information is not available. The NRCS WinTR-55 software was used for the evaluation in this study.

9.2 Model Input Parameters

The input parameters selected for computing discharge were derived in accordance with procedures developed by the City of Hurricane. The model uses the following input parameters to compute peak flow runoff values for each sub-area evaluated:

- SCS Curve number, used to estimate loss rates and resulting storm water run-off excess, based on soil type, land use and vegetation type and cover density.
- Watershed area
- SCS Lag Time, the time required for a particle of water to flow hydraulically from the most distant point in the watershed to the outlet or design point.
- Rainfall depth for a given storm duration.
- Time distribution of rainfall, describes how the total rainfall depth is distributed over the storm duration.

9.3 Curve Number

Table 9-1 lists the estimated SCS run-off curve number for the pre- and post-developed site, which is based upon soil type, land use, vegetation type, and vegetation cover density. Site soil type was identified as Soil Group D using the NRCS Soils Hydrologic Soil Group (HSG) county map. The post-developed site consists of residential development of both townhomes and single family residential lots.

9.4 Watershed Area

The watershed boundary was delineated for both the existing site and the proposed developed site, and is illustrated in Appendix A, Figures A2 and A3, and summarized in Table 9-2.

9.5 SCS Lag Time

Watershed lag time (t_p) is the time from the center of mass of rainfall excess to the peak of the storm runoff hydrograph. This was determined using the SCS lag equation and are summarized in Table 9-2. Watershed calculations can be found in Appendix A. For this model, the kinematic wave method was used to simulate rainfall runoff routing. This method simulates the travel time for overland flow, gutter flow and collector pipe flow. Utilizing this method in WinTR-55 will attenuate and translate basin rainfall to runoff.

9.6 Rainfall Depth

A 100-year, 3-hour cloudburst design storm was used to determine peak flows at the site. 10-year and 100-year, 24-hour design storms were calculated to evaluate storm runoff detention volumes. The NOAA Atlas 14 was used to obtain site-specific precipitation for the 3-hour, 100-year rainfall depth of 1.89 inches, the 24-hour, 10-year rainfall depth of 1.86 inches, and the 24-hour, 100-year rainfall depth of 2.76 inches.

9.7 Time Distribution of Rainfall

The Farmer-Fletcher distribution was used for the 3-hour 10-year and 100-year events. The SCS Type II distribution was used for the 24-hour, 100-year event. Table 9-2 summarizes additional model input data that was used to calculate the storm data.

TABLE 9-1 - CURVE NUMBER DEVELOPMENT

		Basin							
		Pre Development				Post Development			
		Upper Basin		Lower Basin		Upper Basin		Lower Basin	
Cover Type	CN	Area (SF)	% Area	Area (SF)	% Area	Area (SF)	% Area	Area (SF)	% Area
Undeveloped (Desert, fair)	86	338,810	100%	710,070	100%	0	0%	319,154	45%
Natural Desert Landscaping	88					76,536	23%	114,369	16%
Lawn	80					51,024	15%	114,369	16%
Impervious Area	98					211,250	62%	162,179	23%
Total (SF)		**338,810**		**710,070**		**338,810**		**710,070**	
Total (Ac)		**7.78**		**16.30**		**7.78**		**16.30**	
Weighted CN			**86**		**86**		**93**		**88**

TABLE 9-2 - SUB-BASIN CHARACTERISTICS AND MODEL INPUT						
Basin Name	Area		Avg Slope	SCS Curve #	Longest Length	t_c
	(ac)	(sq mi)	%		L_0 (Feet)	(min)
Upper Pre-Dev	7.78	0.012	10.25%	86	747	11.8
Lower Pre-Dev	16.30	0.025	8.74%	86	1,472	12.4
Upper Post-Dev	7.78	0.012	6.93%	93	1,933	12.6
Lower Post-Dev	16.30	0.025	8.43%	88	1,211	6.7

9.8 Model Output

Table 9-3 provides detail for the model output including maximum discharge rates, piped flow rates, and detention discharge rates. The routing of 24-hour flows (10 year & 100 year) was performed in Microsoft Excel using time-data output from the WinTR-55 model for post-developed flows and is shown in the appendices.

TABLE 9-3 - PEAK FLOWS				
	UPPER BASIN		LOWER BASIN	
STORM EVENT	PRE-DEV PEAK FLOW (CFS)	POST-DEV ENTERING DETENTION BASIN (CFS)	PRE-DEV PEAK FLOW (CFS)	POST-DEV ENTERING DETENTION BASIN (CFS)
10-YR, 24-HR	7.7	12.0	15.9	21.0
100-YR, 3-HR	18.0	28.6	37.8	43.5
100-YR, 24-HR	15.2	20.1	31.3	39.5

Section 10: Drainage Facility Design Calculations

10.1 Storm Improvements

Onsite runoff from the 10-year, 24-hour storm event will be contained within the streets without overtopping the curb and will be captured by a sidewalk pass-through and conveyed via a new swale to the onsite detention basins.

Storm drain improvements will be maintained by access through 20' minimum width maintenance access easements.

10.2 Roadway Improvements

Runoff from the 100-year, 24-hour storm event will be contained in the interior streets without overtopping the curb.

10.3 Detention Requirements

The 10-year, 24-hour storm event will be discharged from the detention basin using appropriately sized orifices. The 100-year, 24-hour storm event requires 2,387 cubic feet of detention for the upper basin and 1,808 cubic feet of detention for the lower basin. This detention will be accommodated by two

onsite detention basins located at the southwest corner of each subbasin within the subdivision. To control the discharge from the detention basin area, an outlet structure will be constructed including accommodations for initial discharge, overflow discharge, and emergency overflow. A circular 18-inch pipe outlet will accommodate discharge flows from each detention basin. Calculation sheets are included in the appendix.

Access to the detention basin for maintenance of the facilities will be from 1150 West which borders the proposed basins on the west side.

Section 11: Required Drainage Easement and Rights-of-Way

The following easements will be required to accommodate drainage:

- A 25' wide no-build drainage easement between Lots 9 and 10 (centered on the property line) to accommodate the sewer and storm water outfall from the R1-10 development.
- An 20' unobstructed easement through the common space located at the southwest corner of the townhome development.

No additional easements or rights-of-way will be required beyond the use of public street rights-of-way for storm drainage collection and conveyance.

Section 12: FEMA Floodway and Floodplain Calculations

This site is not located in or next to any floodplain or floodways as designated by FEMA. Refer to Sections 5 and 8 for a detailed description.

Section 13: Conclusions and Statement of Compliance

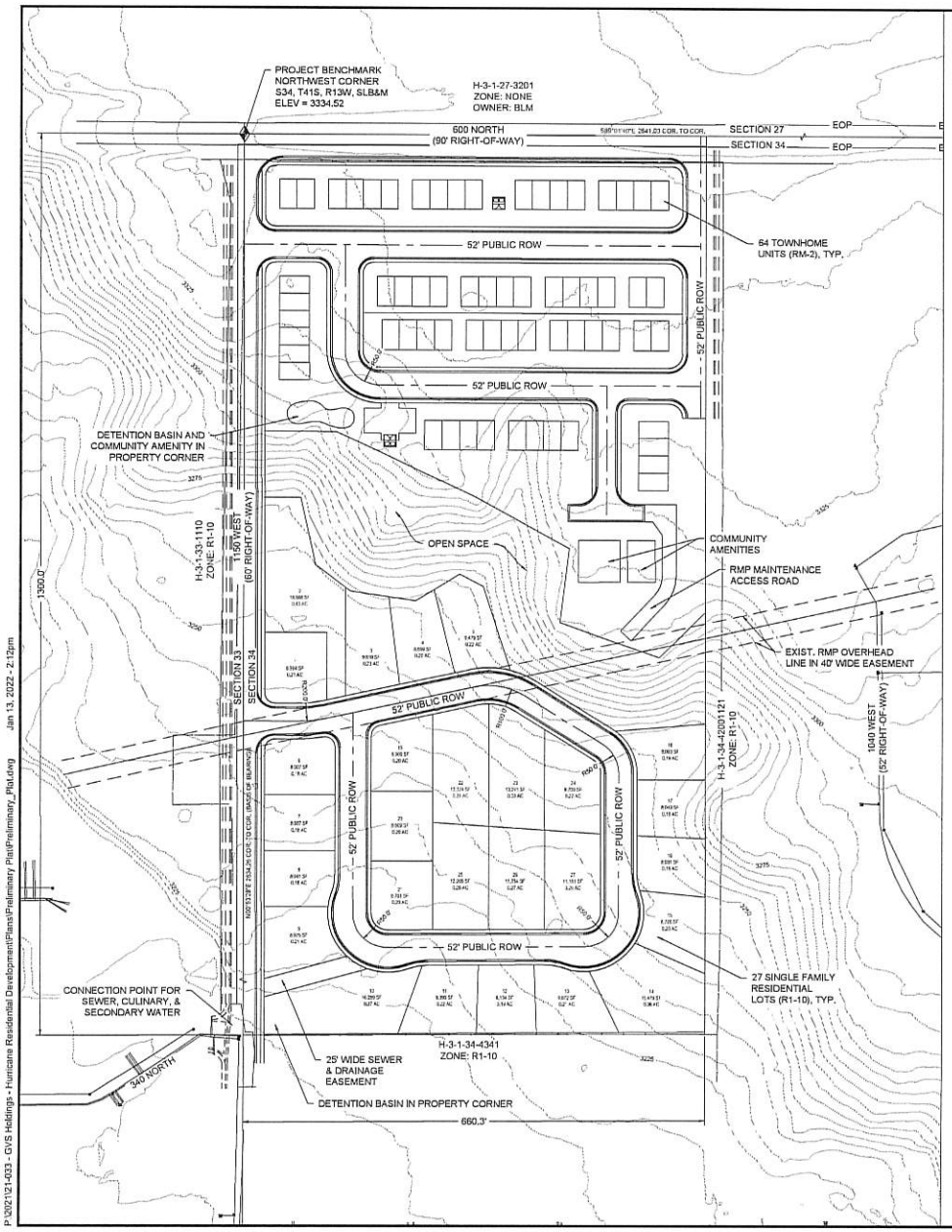
13.1 Conclusions

The following conclusions summarize the recommendations proposed for this development:

A. Offsite Drainage: A small area to the east of the project is considered as part of the drainage basin associated with this project.
B. Onsite Drainage: Storm water will be collected in interior streets. Runoff from the subdivided lots will run southwesterly through the public rights-of-way to the southwest corner of each sub basin (upper/north and lower/south) where it will be collected at the low point in the roadway and discharged into the onsite detention basin via a surface swale. Detention basins will be discharged at pre-development rates to the 1150 West right-of-way.
C. Detention Requirements: Total volume for the upper/north basin was calculated as 2,387 cubic feet and the lower/south basin was calculated as 1,808 cubic feet. Additional capacity will be provided for freeboard and an emergency spillway.
D. FEMA Floodplain: This site is not located inside any floodplains designated by FEMA.

Appendix A – Figures, References & Calculations

Figure A1 Preliminary Plat (Location and Layout)
Figure A2 Existing Drainage Conditions
Figure A3 Developed Drainage Conditions
Figure A4 Floodplain Boundary Map (FIRM)
Figure A5 Soils Map
Figure A6 NOAA Atlas 14 Site-Specific Precipitation Frequency
Figure A7 Unimproved Site Conditions
Figure A8 Improved Site Conditions
Figure A9 Modified Type II Storm 3-Hour Rainfall Data (Farmer Fletcher Distribution)
Figure A10 SCS Rainfall Data & Detention Routing
Figure A11 NRCS Soil Data and Properties
Figure A12 RUSLE Erosion Analysis
Figure A13 Orifice Sizing / Discharge Pipe Size Calculator (not included with draft)
Figure A14 Detention Outfall – Storm Drain Pipe Sizing (not included with draft)
Figure A15 Detention Basin and Discharge Layout (not included with draft)



PRELIMINARY PLAT OF

MESA COVE

SUBDIVISION

JANUARY, 2022

PLAT DATA

LOCATION & BOUNDARY: THE WEST HALF OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN LESS THE FOLLOWING:
ALL OF THE NORTH 37.50 FEET OF THE WEST ONE-HALF OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST OF THE SALT LAKE BASE AND MERIDIAN BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT THE NORTHWEST CORNER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13WEST OF THE SALT LAKE BASE AND MERIDIAN AND RUNNING THENCE ALONG THE NORTH LINE OF SAID SECTION NORTH 89°51'47" EAST 660.29 FEET; THENCE SOUTH 00°14'22" EAST 37.50 FEET TO A POINT ON A LINE 37.50 FEET DISTANT AND PARALLEL TO SAID NORTH SECTION LINE; THENCE ALONG SAID PARALLEL LINE SOUTH 89°51'47" WEST 660.31 FEET TO A POINT ON THE WEST LINE OF SAID SECTION; THENCE ALONG SAID WEST LINE NORTH 00°12'38" WEST 37.50 FEET TO THE POINT OF BEGINNING.

PARCEL IDS: H-3-1-34-4402

ZONING: PUD WITH RM-2 (NORTH) AND R1-10 (SOUTH)

PARCEL AREA: 10.16 ACRES

PLATTED AREA: 10.16 ACRES

TOTAL LOTS:
RM-2 (NORTH): 64 UNITS
R1-10 (SOUTH): 27 LOTS
TOTAL: 91 UNITS/LOTS

BENCHMARK: NORTHWEST CORNER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST, SLB&M, AN EXISTING STONE AT ELEVATION 3334.52.

CURRENT OWNERSHIP: NELSON STERLING D & RANDI C
9447 MECKAILEE CV
SANDY, UT 84094-3682

TORTOISE: THE ENTIRE PARCEL LIES WITHIN DESERT TORTOISE TAKE AREA 7 OF THE RED CLIFFS DESERT RESERVE.

GEOTECH: ACCORDING TO HURRICANE CITY GIS MAPPING, THE SUBJECT PARCEL HAS A SIGNIFICANT AMOUNT OF SHALLOW BEDROCK AND CALICHE. THERE ARE NO OTHER ANTICIPATED GEOTECHNICAL CHALLENGES. A FULL GEOTECHNICAL INVESTIGATION WILL BE COMPLETED AND ALL RECOMMENDED MITIGATION WILL BE INCORPORATED IN TO THE CONSTRUCTION DRAWINGS.

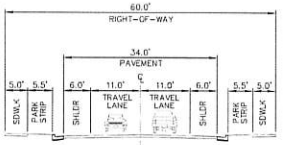
DRAINAGE: ALL STORM WATER FOR THE RM-2 SECTION WILL DRAIN TO A DETENTION BASIN IN THE SOUTHWEST CORNER OF THE TOWNHOMES AND STORM WATER IN THE R1-10 SECTION WILL DRAIN TO A DETENTION BASIN IN THE SOUTHWEST CORNER OF THE PROPERTY.

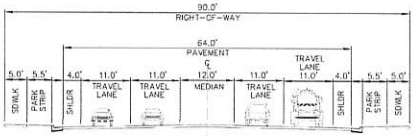
EASEMENTS: A 10' PUBLIC UTILITY EASEMENT WILL BE ASSIGNED ALONG ALL STREET-SIDE PROPERTY LINES. THIS EASEMENT WILL BE RESERVED FOR BOTH PUBLIC UTILITY AND COMMUNICATIONS INFRASTRUCTURE. A PUBLIC SEWER AND STORM DRAIN EASEMENT WILL BE RECORDED BETWEEN LOTS 9 & 10.

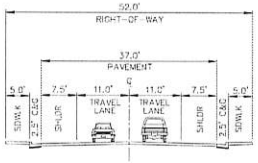
ROAD GRADES: 1150 WEST WILL HAVE A MAXIMUM GRADE OF 16%, AS COORDINATED WITH HURRICANE VALLEY FIRE, ALL INTERNAL ROADS FRONTING HOMES WILL HAVE A MAXIMUM GRADE OF 10% OR LESS FOR EMERGENCY SERVICE ACCESS.

HURRICANE CANAL COMPANY: THERE ARE NO HURRICANE CANAL FACILITIES WITHIN THE LIMITS OF THE PROJECT. THERE ARE NO KNOWN WELLS OR SEEPS ON THE PROPERTY.

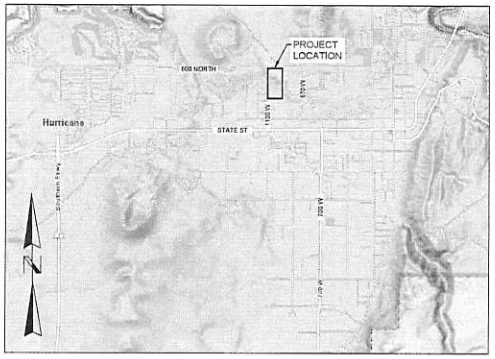
WATER AND SEWER SERVICE: THE PROPERTY CAN BE SERVED BY HURRICANE CITY FOR WATER AND ASH CREEK SPECIAL SERVICE DISTRICT FOR SEWER BASED ON THE INITIAL JUC COMMENTS RECEIVED IN CONJUNCTION WITH THE ZONE CHANGE IN EARLY DECEMBER, 2021.











VICINITY MAP

NO.	REVISIONS	BY	DATE

MAINLINE ENGINEERING
MAINLINE ENGINEERING
2302 N. GREEN VALLEY PKWY
SUITE 1101
ST. GEORGE, UT 84790

GVS HOLDINGS LLC
2302 N. GREEN VALLEY PKWY
SUITE 1101
ST. GEORGE, UT 84790

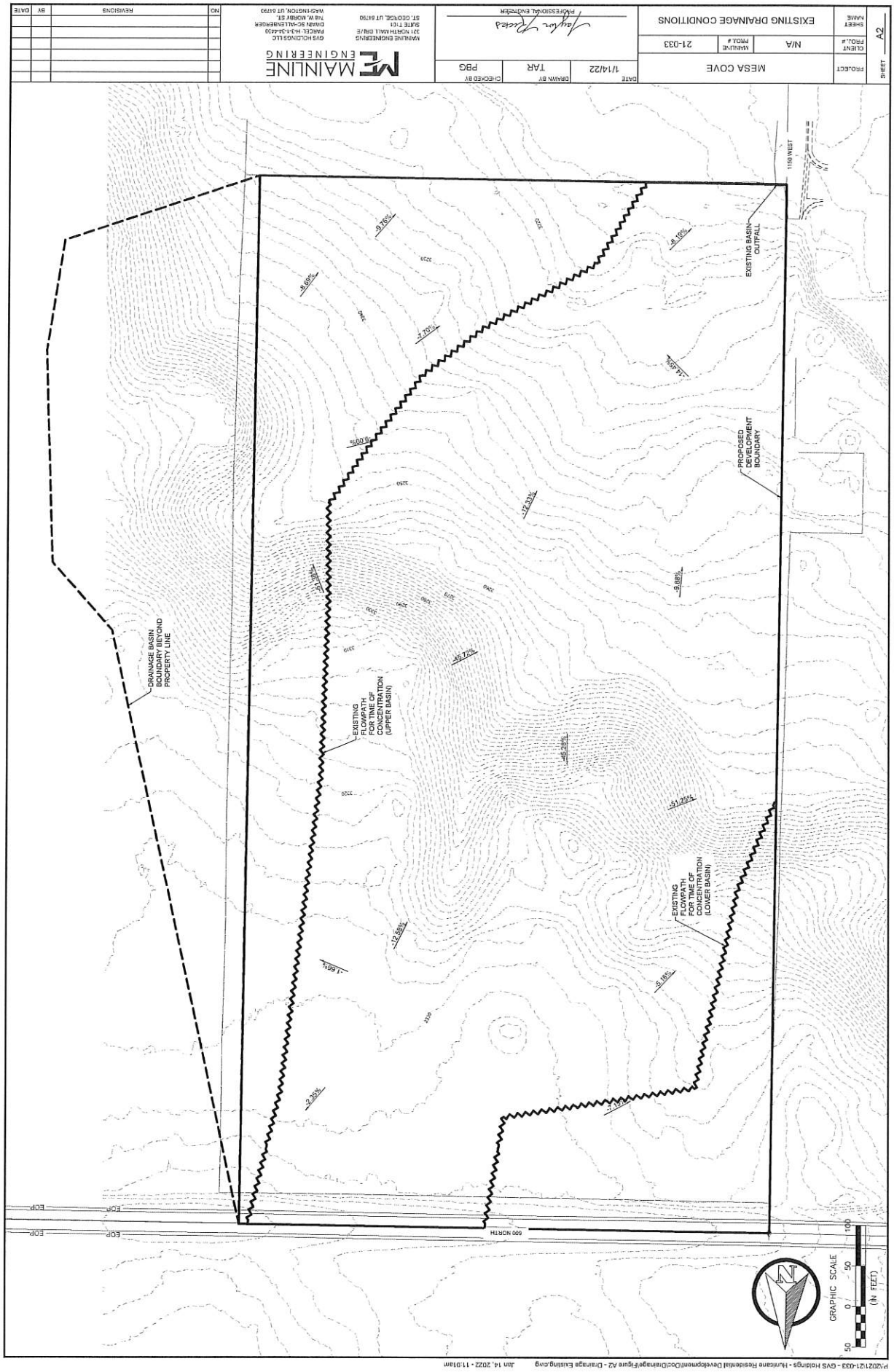
DAVID C. HALL-EBERSER
748 N. MORRI ST.
WASHINGTON, UT 84780

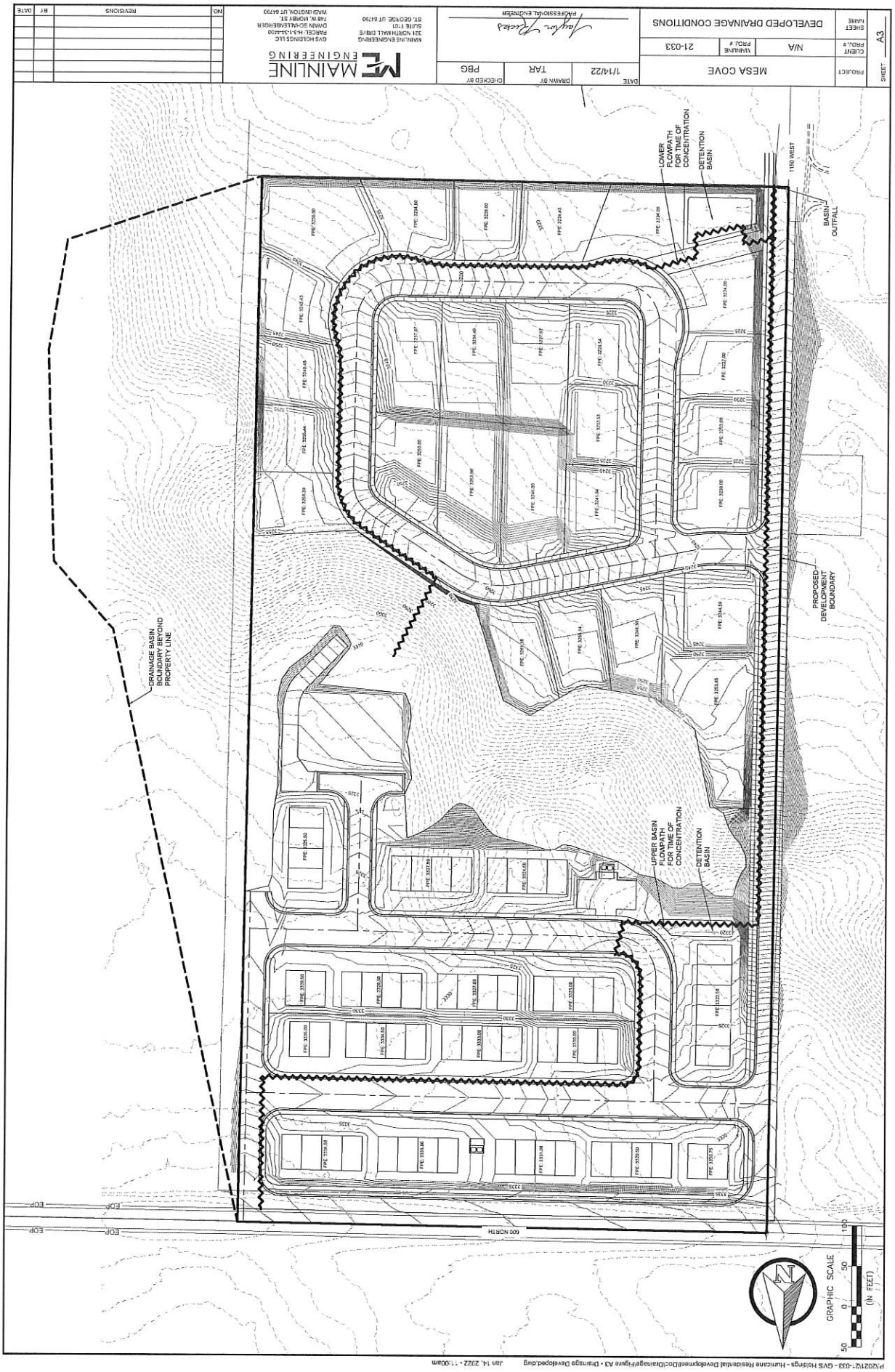
DATE	1/13/22
DRAWN BY	TAR
CHECKED BY	PBG

PROFESSIONAL ENGINEER

PROJECT	MESA COVE
CLIENT PROJ.#	N/A
MAINLINE PROJ.#	21-033
SHEET NAME	PRELIMINARY PLAT
SHEET	PRELIM

P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Plans\Preliminary Plat\Preliminary_Plat.dwg Jan 13, 2022 - 2:12pm


EXISTING DRAINAGE CONDITIONS
MESA COVE
21-033
N/A
1/14/22
TAR
PBG
A2
EXISTING BASIN OUTFALL
PROPOSED DEVELOPMENT BOUNDARY
DRAINAGE BASIN BOUNDARY BEYOND PROPERTY LINE
EXISTING FLOWPATH FOR TIME OF CONCENTRATION (UPPER BASIN)
EXISTING FLOWPATH FOR TIME OF CONCENTRATION (LOWER BASIN)
1150 WEST
600 NORTH
EOP
GRAPHIC SCALE
(IN FEET)
P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Civil\Drainage\Figure A2 - Drainage Existing.dwg Jan 14, 2022 - 11:01am


LOWER FLOWPATH FOR TIME OF CONCENTRATION
DETENTION BASIN
1150 WEST
BASIN OUTFALL
PROPOSED DEVELOPMENT BOUNDARY
DRAINAGE BASIN BOUNDARY BEYOND PROPERTY LINE
UPPER BASIN FLOWPATH FOR TIME OF CONCENTRATION
DETENTION BASIN
600 NORTH
EOP
GRAPHIC SCALE
0
50
100
(IN FEET)
N
PROJECT
MESA COVE
CLIENT PROJ.#
21-033
MAINLINE PROJ.#
N/A
SHEET NAME
DEVELOPED DRAINAGE CONDITIONS
SHEET
A3
DATE
1/14/22
DRAWN BY
TAR
CHECKED BY
PBG
PROFESSIONAL ENGINEER
MAINLINE ENGINEERING
GVS HOLDINGS LLC
PARCEL: H-3-1-34-4330
DAWN SCHULENBERGER
748 W. MOMBY ST.
WASHINGTON, UT 84790
MAINLINE ENGINEERING
331 NORTH MALL DRIVE
SUITE F101
ST. GEORGE, UT 84790
NO.
REVISIONS
BY
DATE
P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Docs\Drainage\Figure A3 - Drainage Developed.dwg Jan 14, 2022 - 11:00am

National Flood Hazard Layer FIRMette

FEMA

113°18'50"W 37°11'10"N



113°18'13"W 37°10'41"N

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

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

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
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation
- 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

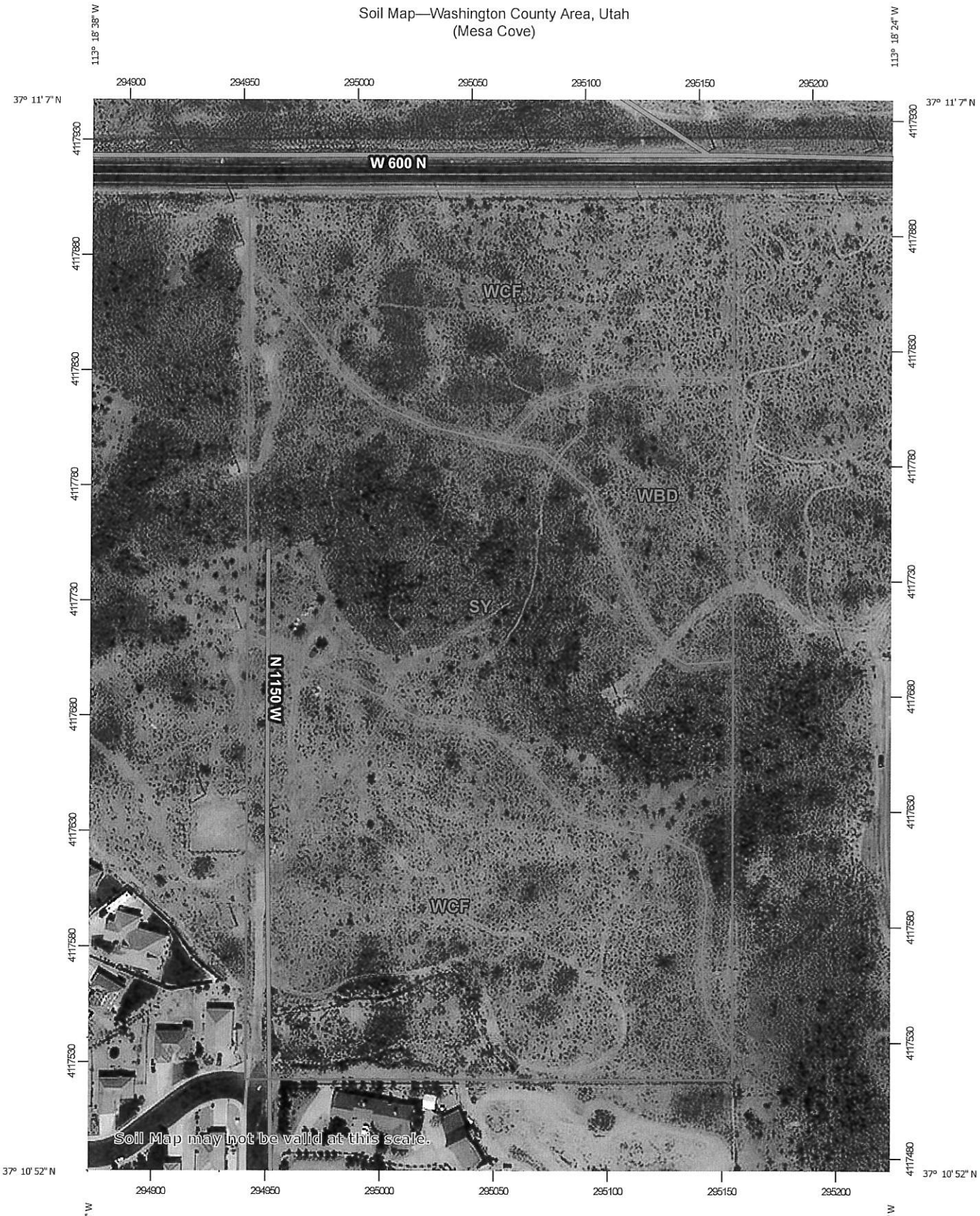
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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 1/13/2022 at 5:12 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.

Soil Map—Washington County Area, Utah
(Mesa Cove)



Map Scale: 1:2,270 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

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 Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 15, Sep 7, 2021

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

Date(s) aerial images were photographed: Mar 7, 2015—Oct 22, 2017

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
SY	Stony colluvial land	6.8	33.4%
WBD	Winkel gravelly fine sandy loam, 1 to 8 percent slopes	1.8	9.0%
WCF	Winkel-Rock outcrop complex, 8 to 30 percent slopes	11.8	57.7%
Totals for Area of Interest		**20.4**	**100.0%**

NOAA Atlas 14, Volume 1, Version 5
Location name: Hurricane, Utah, USA*
Latitude: 37.1835°, Longitude: -113.3089°
Elevation: 3277.55 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.134 (0.114-0.159)	0.173 (0.148-0.205)	0.236 (0.201-0.281)	0.293 (0.247-0.349)	0.380 (0.315-0.452)	0.456 (0.373-0.542)	0.544 (0.435-0.650)	0.644 (0.501-0.775)	0.799 (0.597-0.977)	0.936 (0.677-1.15)
10-min	0.204 (0.174-0.242)	0.263 (0.226-0.312)	0.360 (0.306-0.427)	0.446 (0.376-0.531)	0.579 (0.480-0.687)	0.695 (0.567-0.825)	0.828 (0.662-0.989)	0.981 (0.762-1.18)	1.22 (0.909-1.49)	1.42 (1.03-1.76)
15-min	0.253 (0.216-0.299)	0.326 (0.280-0.387)	0.446 (0.380-0.530)	0.553 (0.466-0.658)	0.718 (0.595-0.852)	0.861 (0.703-1.02)	1.03 (0.820-1.23)	1.22 (0.944-1.46)	1.51 (1.13-1.84)	1.77 (1.28-2.18)
30-min	0.341 (0.291-0.403)	0.439 (0.377-0.522)	0.600 (0.512-0.714)	0.745 (0.628-0.886)	0.967 (0.802-1.15)	1.16 (0.947-1.38)	1.38 (1.10-1.65)	1.64 (1.27-1.97)	2.03 (1.52-2.48)	2.38 (1.72-2.93)
60-min	0.422 (0.361-0.499)	0.543 (0.466-0.646)	0.743 (0.633-0.883)	0.921 (0.777-1.10)	1.20 (0.992-1.42)	1.43 (1.17-1.70)	1.71 (1.37-2.04)	2.03 (1.57-2.44)	2.51 (1.88-3.07)	2.94 (2.13-3.63)
2-hr	0.510 (0.446-0.592)	0.646 (0.562-0.749)	0.855 (0.742-0.990)	1.04 (0.896-1.21)	1.32 (1.12-1.53)	1.57 (1.31-1.82)	1.85 (1.51-2.16)	2.17 (1.73-2.55)	2.66 (2.04-3.18)	3.09 (2.30-3.73)
3-hr	0.572 (0.507-0.654)	0.719 (0.637-0.823)	0.934 (0.825-1.07)	1.12 (0.980-1.27)	1.39 (1.20-1.59)	1.62 (1.38-1.86)	1.89 (1.58-2.18)	2.20 (1.80-2.56)	2.68 (2.12-3.21)	3.10 (2.40-3.77)
6-hr	0.713 (0.637-0.808)	0.893 (0.800-1.01)	1.14 (1.02-1.29)	1.34 (1.19-1.53)	1.64 (1.44-1.86)	1.88 (1.63-2.14)	2.14 (1.83-2.46)	2.45 (2.06-2.83)	2.94 (2.40-3.45)	3.36 (2.69-3.99)
12-hr	0.875 (0.787-0.979)	1.10 (0.983-1.23)	1.38 (1.23-1.55)	1.61 (1.44-1.81)	1.93 (1.70-2.16)	2.17 (1.90-2.44)	2.42 (2.10-2.75)	2.70 (2.31-3.07)	3.09 (2.59-3.56)	3.48 (2.87-4.05)
24-hr	1.03 (0.957-1.12)	1.29 (1.20-1.40)	1.61 (1.49-1.74)	1.86 (1.73-2.02)	2.21 (2.04-2.39)	2.48 (2.28-2.68)	2.76 (2.52-2.99)	3.05 (2.76-3.30)	3.43 (3.07-3.72)	3.72 (3.31-4.06)
2-day	1.17 (1.09-1.26)	1.46 (1.35-1.58)	1.81 (1.68-1.96)	2.10 (1.94-2.26)	2.48 (2.30-2.68)	2.79 (2.57-3.01)	3.10 (2.84-3.35)	3.42 (3.11-3.69)	3.84 (3.46-4.17)	4.17 (3.74-4.54)
3-day	1.25 (1.17-1.36)	1.57 (1.46-1.69)	1.95 (1.81-2.10)	2.25 (2.10-2.42)	2.67 (2.48-2.87)	3.00 (2.77-3.22)	3.33 (3.06-3.58)	3.66 (3.34-3.96)	4.12 (3.72-4.47)	4.47 (4.01-4.86)
4-day	1.34 (1.25-1.45)	1.68 (1.57-1.81)	2.09 (1.95-2.24)	2.41 (2.25-2.59)	2.86 (2.65-3.06)	3.20 (2.96-3.43)	3.56 (3.27-3.82)	3.91 (3.58-4.22)	4.40 (3.98-4.76)	4.77 (4.29-5.18)
7-day	1.59 (1.47-1.72)	1.99 (1.84-2.15)	2.47 (2.29-2.67)	2.85 (2.63-3.07)	3.36 (3.09-3.61)	3.75 (3.44-4.03)	4.14 (3.78-4.46)	4.53 (4.12-4.90)	5.05 (4.56-5.49)	5.44 (4.88-5.93)
10-day	1.76 (1.63-1.91)	2.21 (2.04-2.40)	2.76 (2.55-2.98)	3.18 (2.94-3.44)	3.75 (3.45-4.05)	4.18 (3.84-4.52)	4.61 (4.21-5.00)	5.04 (4.59-5.48)	5.61 (5.06-6.12)	6.04 (5.42-6.62)
20-day	2.27 (2.10-2.45)	2.85 (2.63-3.08)	3.51 (3.24-3.79)	4.00 (3.69-4.32)	4.62 (4.26-4.98)	5.07 (4.67-5.47)	5.51 (5.06-5.94)	5.92 (5.41-6.41)	6.43 (5.85-6.98)	6.79 (6.16-7.39)
30-day	2.74 (2.52-2.98)	3.44 (3.16-3.73)	4.26 (3.91-4.62)	4.86 (4.46-5.27)	5.63 (5.15-6.10)	6.19 (5.66-6.71)	6.74 (6.14-7.31)	7.25 (6.58-7.89)	7.90 (7.13-8.62)	8.37 (7.52-9.17)
45-day	3.27 (2.99-3.57)	4.10 (3.75-4.48)	5.10 (4.67-5.57)	5.86 (5.35-6.38)	6.82 (6.22-7.43)	7.52 (6.85-8.19)	8.20 (7.46-8.96)	8.86 (8.02-9.70)	9.68 (8.72-10.6)	10.3 (9.22-11.3)
60-day	3.79 (3.45-4.15)	4.76 (4.34-5.22)	5.93 (5.39-6.50)	6.79 (6.18-7.44)	7.90 (7.17-8.65)	8.70 (7.88-9.54)	9.48 (8.56-10.4)	10.2 (9.19-11.2)	11.2 (9.98-12.3)	11.8 (10.5-13.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

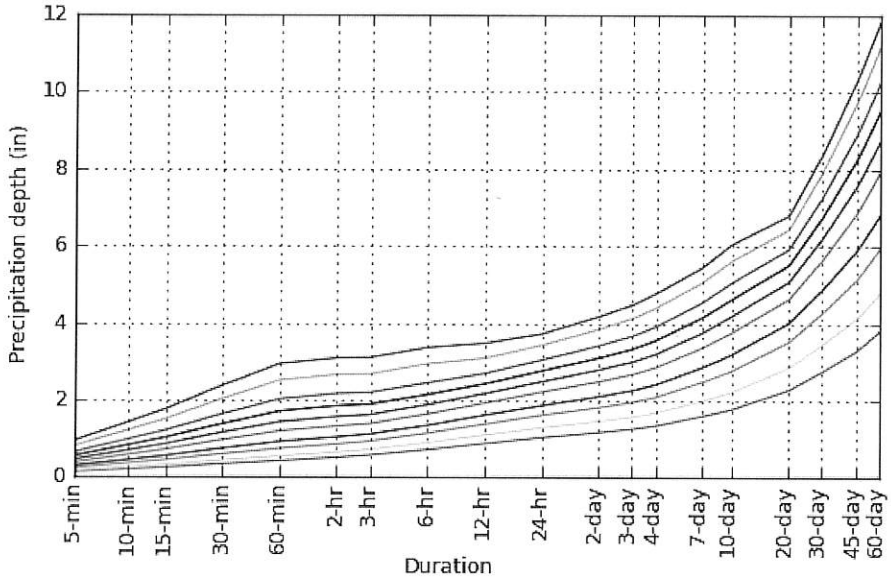
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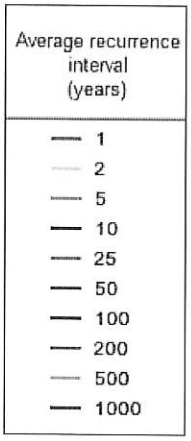
Please refer to NOAA Atlas 14 document for more information.

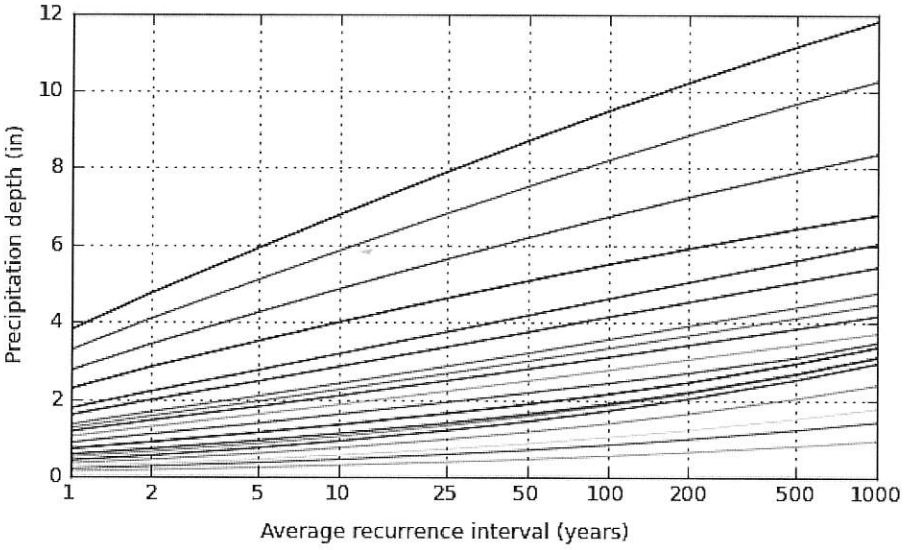
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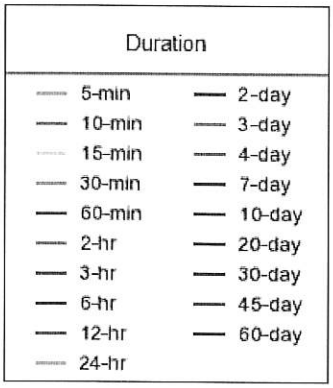
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 37.1835°, Longitude: -113.3089°









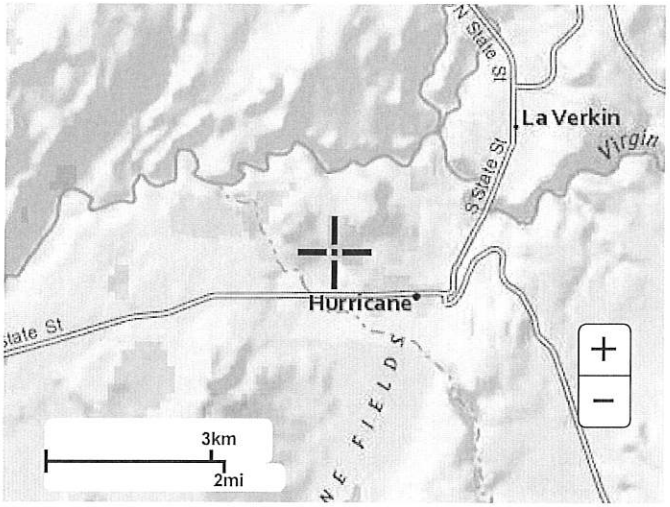
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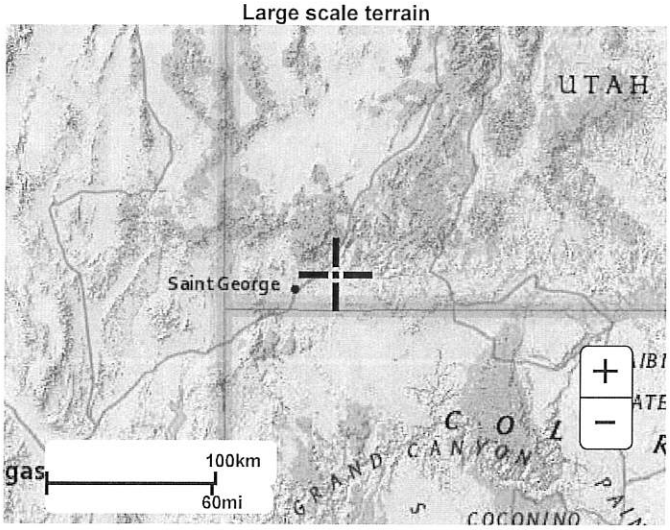
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Maps & aerials

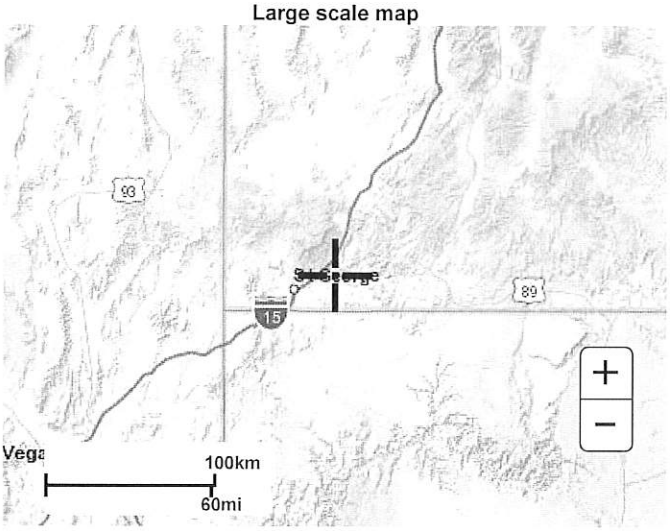
Small scale terrain



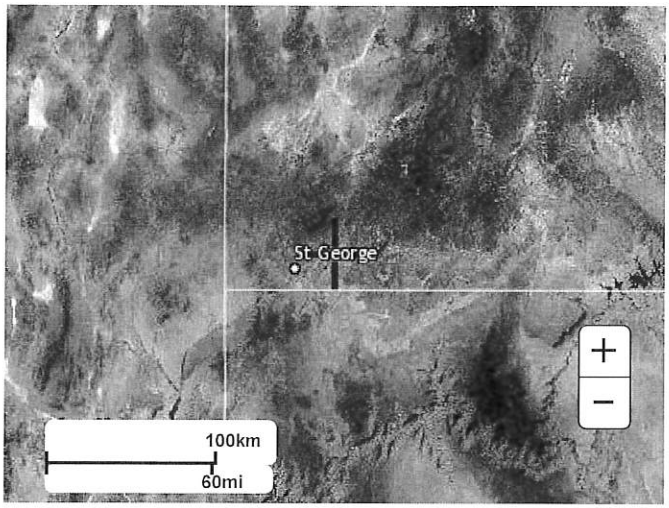
Large scale terrain



Large scale map



Large scale aerial



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NOAA Atlas 14, Volume 1, Version 5
Location name: Hurricane, Utah, USA*
Latitude: 37.1835°, Longitude: -113.3089°
Elevation: 3277.55 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.61 (1.37-1.91)	2.08 (1.78-2.46)	2.83 (2.41-3.37)	3.52 (2.96-4.19)	4.56 (3.78-5.42)	5.47 (4.48-6.50)	6.53 (5.22-7.80)	7.73 (6.01-9.30)	9.59 (7.16-11.7)	11.2 (8.12-13.8)
10-min	1.22 (1.04-1.45)	1.58 (1.36-1.87)	2.16 (1.84-2.56)	2.68 (2.26-3.19)	3.47 (2.88-4.12)	4.17 (3.40-4.95)	4.97 (3.97-5.93)	5.89 (4.57-7.07)	7.30 (5.45-8.92)	8.54 (6.19-10.5)
15-min	1.01 (0.864-1.20)	1.30 (1.12-1.55)	1.78 (1.52-2.12)	2.21 (1.86-2.63)	2.87 (2.38-3.41)	3.44 (2.81-4.09)	4.10 (3.28-4.91)	4.86 (3.78-5.85)	6.04 (4.51-7.37)	7.06 (5.11-8.71)
30-min	0.682 (0.582-0.806)	0.878 (0.754-1.04)	1.20 (1.02-1.43)	1.49 (1.26-1.77)	1.93 (1.60-2.29)	2.32 (1.89-2.75)	2.76 (2.21-3.30)	3.27 (2.54-3.94)	4.06 (3.04-4.96)	4.75 (3.44-5.87)
60-min	0.422 (0.361-0.499)	0.543 (0.466-0.646)	0.743 (0.633-0.883)	0.921 (0.777-1.10)	1.20 (0.992-1.42)	1.43 (1.17-1.70)	1.71 (1.37-2.04)	2.03 (1.57-2.44)	2.51 (1.88-3.07)	2.94 (2.13-3.63)
2-hr	0.255 (0.223-0.296)	0.323 (0.281-0.374)	0.428 (0.371-0.495)	0.520 (0.448-0.602)	0.662 (0.561-0.766)	0.784 (0.654-0.908)	0.924 (0.754-1.08)	1.08 (0.862-1.28)	1.33 (1.02-1.59)	1.55 (1.15-1.87)
3-hr	0.190 (0.169-0.218)	0.239 (0.212-0.274)	0.311 (0.275-0.355)	0.372 (0.326-0.424)	0.463 (0.400-0.528)	0.540 (0.460-0.619)	0.630 (0.527-0.727)	0.732 (0.599-0.851)	0.891 (0.707-1.07)	1.03 (0.799-1.26)
6-hr	0.119 (0.106-0.135)	0.149 (0.134-0.169)	0.191 (0.170-0.216)	0.224 (0.199-0.255)	0.273 (0.240-0.311)	0.314 (0.272-0.358)	0.358 (0.306-0.410)	0.409 (0.343-0.473)	0.491 (0.401-0.575)	0.561 (0.449-0.666)
12-hr	0.073 (0.065-0.081)	0.091 (0.082-0.102)	0.115 (0.102-0.129)	0.134 (0.119-0.150)	0.160 (0.141-0.179)	0.180 (0.158-0.203)	0.201 (0.174-0.228)	0.224 (0.191-0.255)	0.257 (0.215-0.296)	0.289 (0.238-0.336)
24-hr	0.043 (0.040-0.047)	0.054 (0.050-0.058)	0.067 (0.062-0.073)	0.078 (0.072-0.084)	0.092 (0.085-0.100)	0.103 (0.095-0.112)	0.115 (0.105-0.124)	0.127 (0.115-0.138)	0.143 (0.128-0.155)	0.155 (0.138-0.169)
2-day	0.024 (0.023-0.026)	0.030 (0.028-0.033)	0.038 (0.035-0.041)	0.044 (0.040-0.047)	0.052 (0.048-0.056)	0.058 (0.053-0.063)	0.065 (0.059-0.070)	0.071 (0.065-0.077)	0.080 (0.072-0.087)	0.087 (0.078-0.095)
3-day	0.017 (0.016-0.019)	0.022 (0.020-0.024)	0.027 (0.025-0.029)	0.031 (0.029-0.034)	0.037 (0.034-0.040)	0.042 (0.038-0.045)	0.046 (0.042-0.050)	0.051 (0.046-0.055)	0.057 (0.052-0.062)	0.062 (0.056-0.068)
4-day	0.014 (0.013-0.015)	0.017 (0.016-0.019)	0.022 (0.020-0.023)	0.025 (0.023-0.027)	0.030 (0.028-0.032)	0.033 (0.031-0.036)	0.037 (0.034-0.040)	0.041 (0.037-0.044)	0.046 (0.041-0.050)	0.050 (0.045-0.054)
7-day	0.009 (0.009-0.010)	0.012 (0.011-0.013)	0.015 (0.014-0.016)	0.017 (0.016-0.018)	0.020 (0.018-0.021)	0.022 (0.020-0.024)	0.025 (0.023-0.027)	0.027 (0.024-0.029)	0.030 (0.027-0.033)	0.032 (0.029-0.035)
10-day	0.007 (0.007-0.008)	0.009 (0.009-0.010)	0.011 (0.011-0.012)	0.013 (0.012-0.014)	0.016 (0.014-0.017)	0.017 (0.016-0.019)	0.019 (0.018-0.021)	0.021 (0.019-0.023)	0.023 (0.021-0.025)	0.025 (0.023-0.028)
20-day	0.005 (0.004-0.005)	0.006 (0.005-0.006)	0.007 (0.007-0.008)	0.008 (0.008-0.009)	0.010 (0.009-0.010)	0.011 (0.010-0.011)	0.011 (0.011-0.012)	0.012 (0.011-0.013)	0.013 (0.012-0.015)	0.014 (0.013-0.015)
30-day	0.004 (0.003-0.004)	0.005 (0.004-0.005)	0.006 (0.005-0.006)	0.007 (0.006-0.007)	0.008 (0.007-0.008)	0.009 (0.008-0.009)	0.009 (0.009-0.010)	0.010 (0.009-0.011)	0.011 (0.010-0.012)	0.012 (0.010-0.013)
45-day	0.003 (0.003-0.003)	0.004 (0.003-0.004)	0.005 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.009 (0.009-0.010)
60-day	0.003 (0.002-0.003)	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.008 (0.007-0.009)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

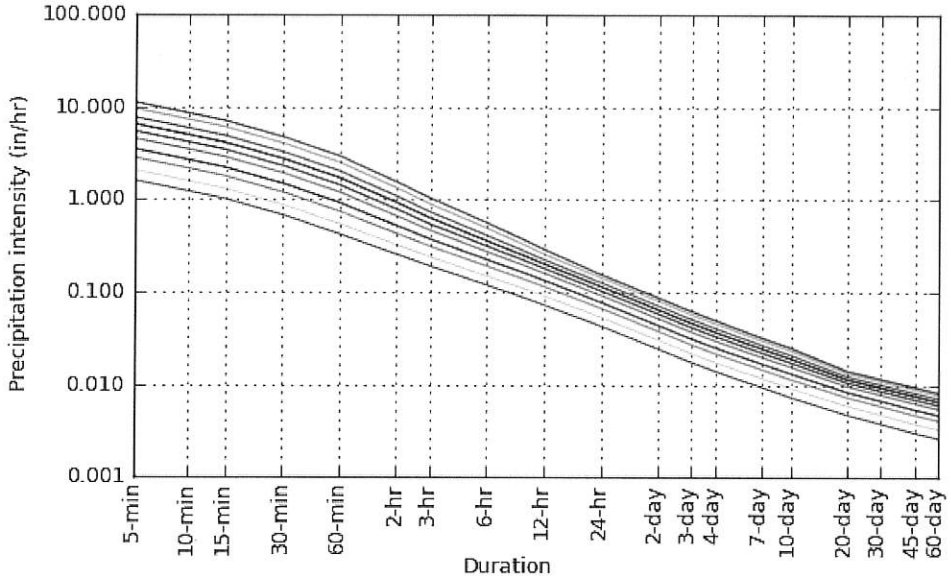
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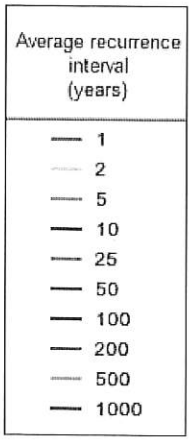
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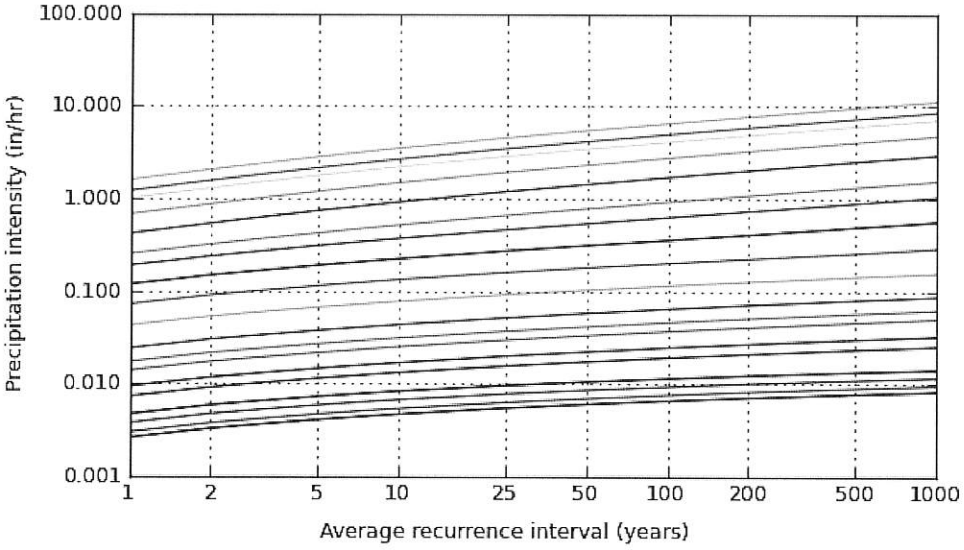
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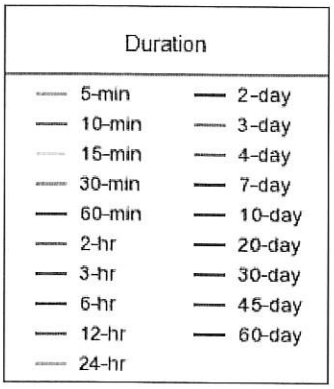
PF graphical

PDS-based intensity-duration-frequency (IDF) curves
Latitude: 37.1835°, Longitude: -113.3089°









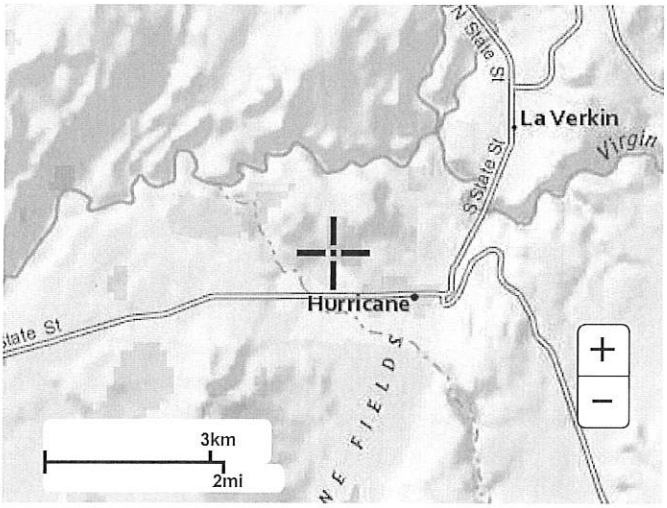
NOAA Atlas 14, Volume 1, Version 5

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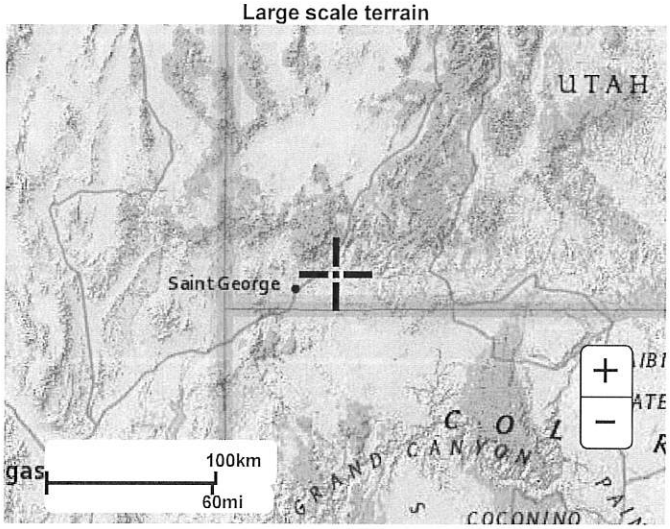
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Maps & aerials

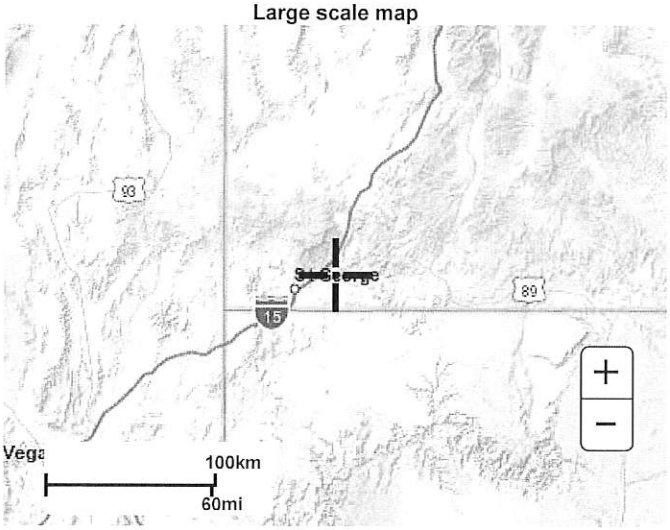
Small scale terrain



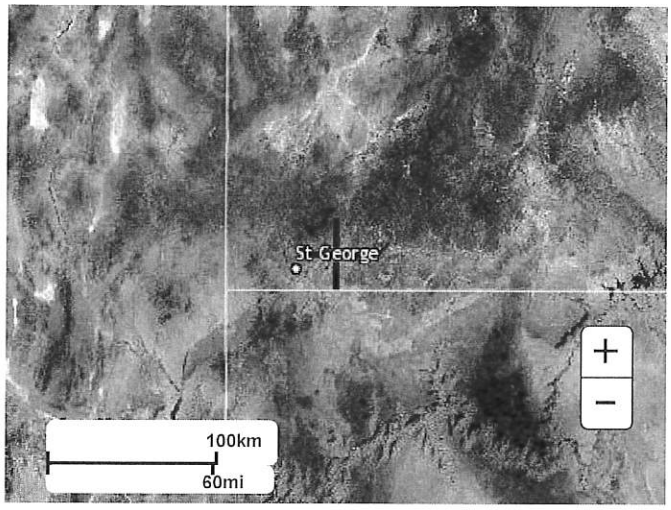
Large scale terrain



Large scale map



Large scale aerial



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Disclaimer

UNIMPROVED ANALYSIS FOR

Mesa Cove

Upper Basin

UNIMPROVED CONDITION (TR-55)

Description of Area	*Area (SF)*	*Area (Ac)*	*Curve No.*	*% of Area*
Undeveloped (Desert, fair)	338,810	7.78	86	100.0%
Natural Desert Landscaping			88	0.0%
Lawn			80	0.0%
Impervious Area			98	0.0%
Total Area (SF) & Composite CN	**338,810**	**7.78**	**86**	**100.0%**

Max Retention (S)	1.63	inches
Initial Abstraction	0.33	inches
Time of Concentration	11.8	min

Storm --->	**10y 24hr**	**100y 24hr**	**10y 3hr**	**100y 3hr**
Runoff Depth (in)	0.74	1.46	0.26	0.77
Runoff Vol (CF)	21,021	41,190	7,356	21,646
Runoff Vol (Gal)	157,238	308,100	55,023	161,911
Ia/P	0.20	0.10		
Unit Discharge	753.3	806.1		
Theoretical Peak Discharge (cfs)	6.8	14.3		
Calc'd Peak Discharge (cfs)	7.7	15.17	6.1	18.0

Time of Conc. Calc	**Lenth (ft)**	**Slope**	**Manning n**
Sheet	100	4.70%	0.13
Shallow Concentrated	647	11.11%	Unpaved

UNIMPROVED ANALYSIS FOR

Mesa Cove

Lower Basin

UNIMPROVED CONDITION (TR-55)

Description of Area	*Area (SF)*	*Area (Ac)*	*Curve No.*	% of Area
Undeveloped (Desert, fair)	710,070	16.30	86	100.0%
Natural Desert Landscaping			88	0.0%
Lawn			80	0.0%
Impervious Area			98	0.0%
Total Area (SF) & Composite CN	**710,070**	**16.30**	**86**	**100.0%**

Max Retention (S)	1.63	inches
Initial Abstraction	0.33	inches
Time of Concentration	12.4	min

Storm --->	**10y 24hr**	**100y 24hr**	**10y 3hr**	**100y 3hr**
Runoff Depth (in)	0.74	1.46	0.26	0.77
Runoff Vol (CF)	44,056	86,325	15,417	45,365
Runoff Vol (Gal)	329,536	645,710	115,316	339,328
Ia/P	0.20	0.10		
Unit Discharge	753.3	806.1		
Theoretical Peak Discharge (cfs)	14.3	30.0		
Calc'd Peak Discharge (cfs)	15.88	31.34	12.8	37.8

Time of Conc. Calc	**Lenth (ft)**	**Slope**	**Manning n**
Sheet	100	8.80%	0.13
Shallow Concentrated	1372	8.74%	Unpaved

IMPROVED ANALYSIS FOR

Mesa Cove

Upper Basin

DEVELOPED CONDITION (TR-55)

Description of Area	*Area (SF)*	*Area (Ac)*	*Curve No.*	*% of Area*
Undeveloped (Desert, fair)			86	0.0%
Natural Desert Landscaping	76,536	1.757	88	22.6%
Lawn	51,024	1.171	80	15.1%
Impervious Area	211,250	4.850	98	62.4%
Total Area (SF) & Composite CN	**338,810**	**7.778**	**93**	**100.0%**

Max Retention (S)	0.75	inches
Initial Abstraction	0.15	inches
Time of Concentration	12.6	min

Storm --->	**10y 24hr**	**100y 24hr**	**10y 3hr**	**100y 3hr**
Runoff Depth (in)	1.19	2.03	0.55	1.22
Runoff Vol (CF)	33,576	57,260	15,456	34,345
Runoff Vol (Gal)	251,149	428,308	115,611	256,903
Ia/P	0.10	0.05		
Unit Discharge	784.9	807.2		
Theoretical Peak Discharge (cfs)	11.3	19.9		
Calc'd Peak Discharge (cfs)	11.99	20.07	12.9	28.6

Time of Conc. Calc Upper Basin	**Lenth (ft)**	**Slope**	**Manning n**	
Sheet	44	2.05%	0.13	
Shallow Concentrated 1	830	2.61%	Paved	
Shallow Concentrated 2				
Channel 1	140	11.50%	0.015	
Channel Addt'l	Area	0.49	WP	1.807
Channel 2	919	10.37%	0.015	
Channel Addt'l	Area	0.492	WP	1.811
Total/Avg	1933	6.93%		

Volumetric Summary

Description	*Required*	*Provided*	*Units*
Total Detention	2,387		CF

IMPROVED ANALYSIS FOR

Mesa Cove

Lower Basin

DEVELOPED CONDITION (TR-55)

Description of Area	*Area (SF)*	*Area (Ac)*	*Curve No.*	*% of Area*
Undeveloped (Desert, fair)	319,154	7.327	86	44.9%
Natural Desert Landscaping	114,369	2.626	88	16.1%
Lawn	114,369	2.626	80	16.1%
Impervious Area	162,179	3.723	98	22.8%
Total Area (SF) & Composite CN	**710,070**	**16.301**	**88**	**100.0%**

Max Retention (S)	1.35	inches
Initial Abstraction	0.27	inches
Time of Concentration	6.7	min

Storm --->	**10y 24hr**	**100y 24hr**	**10y 3hr**	**100y 3hr**
Runoff Depth (in)	0.86	1.61	0.33	0.88
Runoff Vol (CF)	50,851	95,499	19,414	52,255
Runoff Vol (Gal)	380,363	714,330	145,213	390,867
Ia/P	0.15	0.10		
Unit Discharge	757.8	784.9		
Theoretical Peak Discharge (cfs)	16.6	32.3		
Calc'd Peak Discharge (cfs)	20.95	39.52	16.2	43.5

Time of Conc. Calc Upper Basin	**Lenth (ft)**	**Slope**	**Manning n**	
Sheet	110	44.55%	0.15	
Shallow Concentrated 1	325	5.48%	Paved	
Shallow Concentrated 2				
Channel 1	508	3.92%	0.015	
Channel Addt'l	Area	1.242	WP	2.852
Channel 2	268	5.75%	0.015	
Channel Addt'l	Area	1.068	WP	2.604
Total/Avg	1211	8.43%		

Volumetric Summary

Description	*Required*	*Provided*	*Units*
Total Detention	1,808		CF

Site-Specific Modified Type II Storm 3-Hour Rainfall Data
Farmer Fletcher Distribution - Upper Basin

						Qmax							
								6.13	18.04			12.88	28.62
		Precip.				Runoff Pre-dev (delay timestep by Tc)				Runoff Post-dev (delay timestep by Tc)			
		Cumulative		Incremental		Cumulative		Incremental		Cumulative		Incremental	
Minutes	Distribution (%)	10y3h	100y3h	10y3h	100y3h	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)
5	0	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
10	0	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
15	1	0.011	0.019	0.011	0.019	74	216	74	216	155	343	155	343
20	1	0.011	0.019	0.000	0.000	74	216	0	0	155	343	0	0
25	2	0.022	0.038	0.011	0.019	147	433	74	216	309	687	155	343
30	2	0.022	0.038	0.000	0.000	147	433	0	0	309	687	0	0
35	3	0.034	0.057	0.011	0.019	221	649	74	216	464	1,030	155	343
40	28	0.314	0.529	0.280	0.473	2,060	6,061	1,839	5,411	4,328	9,617	3,864	8,586
45	48	0.538	0.907	0.224	0.378	3,531	10,390	1,471	4,329	7,419	16,486	3,091	6,869
50	62	0.694	1.172	0.157	0.265	4,561	13,420	1,030	3,030	9,583	21,294	2,164	4,808
55	71	0.795	1.342	0.101	0.170	5,223	15,369	662	1,948	10,974	24,385	1,391	3,091
60	77	0.862	1.455	0.067	0.113	5,664	16,667	441	1,299	11,901	26,446	927	2,061
65	81	0.907	1.531	0.045	0.076	5,958	17,533	294	866	12,519	27,820	618	1,374
70	84	0.941	1.588	0.034	0.057	6,179	18,182	221	649	12,983	28,850	464	1,030
75	86	0.963	1.625	0.022	0.038	6,326	18,615	147	433	13,292	29,537	309	687
80	88	0.986	1.663	0.022	0.038	6,473	19,048	147	433	13,601	30,224	309	687
85	90	1.008	1.701	0.022	0.038	6,620	19,481	147	433	13,910	30,911	309	687
90	91	1.019	1.720	0.011	0.019	6,694	19,698	74	216	14,065	31,254	155	343
95	92	1.030	1.739	0.011	0.019	6,768	19,914	74	216	14,220	31,598	155	343
100	93	1.042	1.758	0.011	0.019	6,841	20,131	74	216	14,374	31,941	155	343
105	93	1.042	1.758	0.000	0.000	6,841	20,131	0	0	14,374	31,941	0	0
110	94	1.053	1.777	0.011	0.019	6,915	20,347	74	216	14,529	32,285	155	343
115	94	1.053	1.777	0.000	0.000	6,915	20,347	0	0	14,529	32,285	0	0
120	94	1.053	1.777	0.000	0.000	6,915	20,347	0	0	14,529	32,285	0	0
125	95	1.064	1.796	0.011	0.019	6,988	20,564	74	216	14,683	32,628	155	343
130	95	1.064	1.796	0.000	0.000	6,988	20,564	0	0	14,683	32,628	0	0
135	96	1.075	1.814	0.011	0.019	7,062	20,780	74	216	14,838	32,972	155	343
140	96	1.075	1.814	0.000	0.000	7,062	20,780	0	0	14,838	32,972	0	0
145	97	1.086	1.833	0.011	0.019	7,135	20,996	74	216	14,992	33,315	155	343
150	97	1.086	1.833	0.000	0.000	7,135	20,996	0	0	14,992	33,315	0	0
155	97	1.086	1.833	0.000	0.000	7,135	20,996	0	0	14,992	33,315	0	0
160	98	1.098	1.852	0.011	0.019	7,209	21,213	74	216	15,147	33,658	155	343
165	98	1.098	1.852	0.000	0.000	7,209	21,213	0	0	15,147	33,658	0	0
170	99	1.109	1.871	0.011	0.019	7,282	21,429	74	216	15,302	34,002	155	343
175	99	1.109	1.871	0.000	0.000	7,282	21,429	0	0	15,302	34,002	0	0
180	100	1.120	1.890	0.011	0.019	7,356	21,646	74	216	15,456	34,345	155	343
185	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
190	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
195	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
200	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
205	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
210	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
215	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
220	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
225	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
230	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
235	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
240	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
245	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
250	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
255	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
260	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
265	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
270	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
275	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
280	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
285	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
290	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
295	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
300	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
305	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
310	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
315	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
320	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
325	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
330	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
335	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
340	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
345	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
350	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
355	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
360	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0

Site-Specific Modified Type II Storm 3-Hour Rainfall Data
Farmer Fletcher Distribution - Lower Basin

						Qmax							
								12.85	37.80			16.18	43.55
		Precip.				Runoff Pre-dev (delay timestep by Tc)				Runoff Post-dev (delay timestep by Tc)			
		Cumulative		Incremental		Cumulative		Incremental		Cumulative		Incremental	
Minutes	Distribution (%)	10y3h	100y3h	10y3h	100y3h	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)
5	0	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
10	0	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
15	1	0.011	0.019	0.011	0.019	154	454	154	454	194	523	194	523
20	1	0.011	0.019	0.000	0.000	154	454	0	0	194	523	0	0
25	2	0.022	0.038	0.011	0.019	308	907	154	454	388	1,045	194	523
30	2	0.022	0.038	0.000	0.000	308	907	0	0	388	1,045	0	0
35	3	0.034	0.057	0.011	0.019	462	1,361	154	454	582	1,568	194	523
40	28	0.314	0.529	0.280	0.473	4,317	12,702	3,854	11,341	5,436	14,631	4,853	13,064
45	48	0.538	0.907	0.224	0.378	7,400	21,775	3,083	9,073	9,319	25,082	3,883	10,451
50	62	0.694	1.172	0.157	0.265	9,558	28,126	2,158	6,351	12,036	32,398	2,718	7,316
55	71	0.795	1.342	0.101	0.170	10,946	32,209	1,387	4,083	13,784	37,101	1,747	4,703
60	77	0.862	1.455	0.067	0.113	11,871	34,931	925	2,722	14,948	40,236	1,165	3,135
65	81	0.907	1.531	0.045	0.076	12,487	36,745	617	1,815	15,725	42,327	777	2,090
70	84	0.941	1.588	0.034	0.057	12,950	38,106	462	1,361	16,307	43,894	582	1,568
75	86	0.963	1.625	0.022	0.038	13,258	39,014	308	907	16,696	44,939	388	1,045
80	88	0.986	1.663	0.022	0.038	13,567	39,921	308	907	17,084	45,984	388	1,045
85	90	1.008	1.701	0.022	0.038	13,875	40,828	308	907	17,472	47,029	388	1,045
90	91	1.019	1.720	0.011	0.019	14,029	41,282	154	454	17,666	47,552	194	523
95	92	1.030	1.739	0.011	0.019	14,183	41,736	154	454	17,860	48,075	194	523
100	93	1.042	1.758	0.011	0.019	14,337	42,189	154	454	18,055	48,597	194	523
105	93	1.042	1.758	0.000	0.000	14,337	42,189	0	0	18,055	48,597	0	0
110	94	1.053	1.777	0.011	0.019	14,492	42,643	154	454	18,249	49,120	194	523
115	94	1.053	1.777	0.000	0.000	14,492	42,643	0	0	18,249	49,120	0	0
120	94	1.053	1.777	0.000	0.000	14,492	42,643	0	0	18,249	49,120	0	0
125	95	1.064	1.796	0.011	0.019	14,646	43,097	154	454	18,443	49,642	194	523
130	95	1.064	1.796	0.000	0.000	14,646	43,097	0	0	18,443	49,642	0	0
135	96	1.075	1.814	0.011	0.019	14,800	43,550	154	454	18,637	50,165	194	523
140	96	1.075	1.814	0.000	0.000	14,800	43,550	0	0	18,637	50,165	0	0
145	97	1.086	1.833	0.011	0.019	14,954	44,004	154	454	18,831	50,687	194	523
150	97	1.086	1.833	0.000	0.000	14,954	44,004	0	0	18,831	50,687	0	0
155	97	1.086	1.833	0.000	0.000	14,954	44,004	0	0	18,831	50,687	0	0
160	98	1.098	1.852	0.011	0.019	15,108	44,457	154	454	19,025	51,210	194	523
165	98	1.098	1.852	0.000	0.000	15,108	44,457	0	0	19,025	51,210	0	0
170	99	1.109	1.871	0.011	0.019	15,262	44,911	154	454	19,219	51,732	194	523
175	99	1.109	1.871	0.000	0.000	15,262	44,911	0	0	19,219	51,732	0	0
180	100	1.120	1.890	0.011	0.019	15,417	45,365	154	454	19,414	52,255	194	523
185	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
190	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
195	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
200	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
205	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
210	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
215	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
220	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
225	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
230	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
235	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
240	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
245	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
250	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
255	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
260	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
265	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
270	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
275	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
280	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
285	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
290	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
295	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
300	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
305	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
310	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
315	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
320	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
325	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
330	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
335	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
340	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
345	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
350	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
355	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
360	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge 15.17 cfs Allowable Vol. Discharge 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
0	0.00%	0.000	0.000	0.000	0.000	0	0	0	0
0.1	0.10%	0.002	0.003	0.002	0.003	58	58	0	0
0.2	0.20%	0.004	0.006	0.002	0.003	116	58	0	0
0.3	0.31%	0.006	0.008	0.002	0.003	175	59	0	0
0.4	0.41%	0.008	0.011	0.002	0.003	234	59	0	0
0.5	0.51%	0.010	0.014	0.002	0.003	294	60	0	0
0.6	0.62%	0.011	0.017	0.002	0.003	354	60	0	0
0.7	0.73%	0.013	0.020	0.002	0.003	415	61	0	0
0.8	0.83%	0.015	0.023	0.002	0.003	476	61	0	0
0.9	0.94%	0.018	0.026	0.002	0.003	539	62	0	0
1	1.05%	0.020	0.029	0.002	0.003	601	62	0	0
1.1	1.16%	0.022	0.032	0.002	0.003	665	64	0	0
1.2	1.27%	0.024	0.035	0.002	0.003	728	64	0	0
1.3	1.39%	0.026	0.038	0.002	0.003	793	65	0	0
1.4	1.50%	0.028	0.041	0.002	0.003	858	65	0	0
1.5	1.61%	0.030	0.045	0.002	0.003	924	66	0	0
1.6	1.73%	0.032	0.048	0.002	0.003	989	66	0	0
1.7	1.85%	0.034	0.051	0.002	0.003	1,056	67	0	0
1.8	1.96%	0.036	0.054	0.002	0.003	1,123	67	0	0
1.9	2.08%	0.039	0.057	0.002	0.003	1,192	68	0	0
2	2.20%	0.041	0.061	0.002	0.003	1,260	68	0	0
2.1	2.32%	0.043	0.064	0.002	0.003	1,329	69	0	0
2.2	2.44%	0.045	0.067	0.002	0.003	1,398	69	0	0
2.3	2.57%	0.048	0.071	0.002	0.003	1,469	70	0	0
2.4	2.69%	0.050	0.074	0.002	0.003	1,539	70	0	0
2.5	2.81%	0.052	0.078	0.002	0.003	1,611	72	0	0
2.6	2.94%	0.055	0.081	0.002	0.003	1,682	72	0	0
2.7	3.07%	0.057	0.085	0.002	0.004	1,755	73	0	0
2.8	3.19%	0.059	0.088	0.002	0.004	1,828	73	0	0
2.9	3.32%	0.062	0.092	0.002	0.004	1,902	74	0	0
3	3.45%	0.064	0.095	0.002	0.004	1,975	74	0	0
3.1	3.58%	0.067	0.099	0.002	0.004	2,050	75	0	0
3.2	3.71%	0.069	0.102	0.002	0.004	2,126	75	0	0
3.3	3.85%	0.072	0.106	0.002	0.004	2,202	76	0	0
3.4	3.98%	0.074	0.110	0.002	0.004	2,278	76	0	0
3.5	4.11%	0.077	0.114	0.003	0.004	2,355	77	0	0
3.6	4.25%	0.079	0.117	0.003	0.004	2,432	77	0	0
3.7	4.39%	0.082	0.121	0.003	0.004	2,511	78	0	0
3.8	4.52%	0.084	0.125	0.003	0.004	2,589	78	0	0
3.9	4.66%	0.087	0.129	0.003	0.004	2,669	80	0	0
4	4.80%	0.089	0.132	0.003	0.004	2,749	80	0	0
4.1	4.94%	0.092	0.136	0.003	0.004	2,829	81	0	0

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge 15.17 cfs Allowable Vol. Discharge 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
4.2	5.08%	0.095	0.140	0.003	0.004	2,911	82	0	0
4.3	5.23%	0.097	0.144	0.003	0.004	2,994	83	0	0
4.4	5.38%	0.100	0.148	0.003	0.004	3,078	84	0	0
4.5	5.53%	0.103	0.152	0.003	0.004	3,164	85	0	0
4.6	5.68%	0.106	0.157	0.003	0.004	3,250	86	0	0
4.7	5.83%	0.108	0.161	0.003	0.004	3,338	88	0	0
4.8	5.98%	0.111	0.165	0.003	0.004	3,426	89	0	0
4.9	6.14%	0.114	0.169	0.003	0.004	3,516	90	0	0
5	6.30%	0.117	0.174	0.003	0.004	3,607	91	0	0
5.1	6.46%	0.120	0.178	0.003	0.004	3,700	92	0	0
5.2	6.62%	0.123	0.183	0.003	0.004	3,793	93	0	0
5.3	6.79%	0.126	0.187	0.003	0.005	3,887	94	0	0
5.4	6.96%	0.129	0.192	0.003	0.005	3,983	96	0	0
5.5	7.13%	0.133	0.197	0.003	0.005	4,080	97	0	0
5.6	7.30%	0.136	0.201	0.003	0.005	4,178	98	0	0
5.7	7.47%	0.139	0.206	0.003	0.005	4,277	99	0	0
5.8	7.64%	0.142	0.211	0.003	0.005	4,377	100	0	0
5.9	7.82%	0.145	0.216	0.003	0.005	4,478	101	0	0
6	8.00%	0.149	0.221	0.003	0.005	4,581	102	0	0
6.1	8.18%	0.152	0.226	0.003	0.005	4,684	104	0	0
6.2	8.36%	0.156	0.231	0.003	0.005	4,789	105	0	0
6.3	8.55%	0.159	0.236	0.003	0.005	4,895	106	0	0
6.4	8.74%	0.162	0.241	0.003	0.005	5,002	107	0	0
6.5	8.93%	0.166	0.246	0.004	0.005	5,110	108	0	0
6.6	9.12%	0.170	0.252	0.004	0.005	5,220	109	0	0
6.7	9.31%	0.173	0.257	0.004	0.005	5,330	111	0	0
6.8	9.50%	0.177	0.262	0.004	0.005	5,442	112	0	0
6.9	9.70%	0.180	0.268	0.004	0.005	5,555	113	0	0
7	9.90%	0.184	0.273	0.004	0.005	5,669	114	0	0
7.1	10.10%	0.188	0.279	0.004	0.006	5,784	115	0	0
7.2	10.30%	0.192	0.284	0.004	0.006	5,900	116	0	0
7.3	10.51%	0.195	0.290	0.004	0.006	6,017	117	0	0
7.4	10.72%	0.199	0.296	0.004	0.006	6,136	119	0	0
7.5	10.93%	0.203	0.302	0.004	0.006	6,256	120	0	0
7.6	11.14%	0.207	0.307	0.004	0.006	6,377	121	0	0
7.7	11.35%	0.211	0.313	0.004	0.006	6,498	122	0	0
7.8	11.56%	0.215	0.319	0.004	0.006	6,622	123	0	0
7.9	11.78%	0.219	0.325	0.004	0.006	6,746	124	0	0
8	12.00%	0.223	0.331	0.004	0.006	6,871	125	0	0
8.1	12.23%	0.227	0.337	0.004	0.006	7,000	129	0	0
8.2	12.46%	0.232	0.344	0.004	0.006	7,135	135	0	0
8.3	12.71%	0.236	0.351	0.005	0.007	7,275	140	0	0

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge 15.17 cfs Allowable Vol. Discharge 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in) 10y24h	Cumulative (in) 100y24h	Incremental (in) 10y24h	Incremental (in) 100y24h	100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
8.4	12.96%	0.241	0.358	0.005	0.007	7,421	146	0	0
8.5	13.23%	0.246	0.365	0.005	0.007	7,573	152	0	0
8.6	13.50%	0.251	0.373	0.005	0.008	7,730	157	0	0
8.7	13.79%	0.256	0.380	0.005	0.008	7,893	163	0	0
8.8	14.08%	0.262	0.389	0.005	0.008	8,062	169	0	0
8.9	14.39%	0.268	0.397	0.006	0.008	8,237	175	0	0
9	14.70%	0.273	0.406	0.006	0.009	8,417	180	0	0
9.1	15.02%	0.279	0.415	0.006	0.009	8,601	183	0	0
9.2	15.34%	0.285	0.423	0.006	0.009	8,784	183	0	0
9.3	15.66%	0.291	0.432	0.006	0.009	8,967	183	0	0
9.4	15.98%	0.297	0.441	0.006	0.009	9,150	183	0	0
9.5	16.30%	0.303	0.450	0.006	0.009	9,333	183	0	0
9.6	16.63%	0.309	0.459	0.006	0.009	9,521	188	0	0
9.7	16.97%	0.316	0.468	0.006	0.009	9,718	197	0	0
9.8	17.33%	0.322	0.478	0.007	0.010	9,924	206	0	0
9.9	17.71%	0.329	0.489	0.007	0.010	10,140	215	0	0
10	18.10%	0.337	0.500	0.007	0.011	10,364	224	0	0
10.1	18.51%	0.344	0.511	0.008	0.011	10,600	236	0	0
10.2	18.95%	0.352	0.523	0.008	0.012	10,850	250	0	0
10.3	19.41%	0.361	0.536	0.009	0.013	11,113	263	0	0
10.4	19.89%	0.370	0.549	0.009	0.013	11,390	277	0	0
10.5	20.40%	0.379	0.563	0.009	0.014	11,681	291	0	0
10.6	20.94%	0.389	0.578	0.010	0.015	11,990	309	0	0
10.7	21.52%	0.400	0.594	0.011	0.016	12,322	332	0	0
10.8	22.14%	0.412	0.611	0.012	0.017	12,677	355	0	0
10.9	22.80%	0.424	0.629	0.012	0.018	13,055	378	0	0
11	23.50%	0.437	0.649	0.013	0.019	13,456	401	0	0
11.1	24.27%	0.451	0.670	0.014	0.021	13,896	440	0	0
11.2	25.13%	0.467	0.694	0.016	0.024	14,391	495	0	0
11.3	26.09%	0.485	0.720	0.018	0.026	14,940	550	0	0
11.4	27.15%	0.505	0.749	0.020	0.029	15,545	605	0	0
11.5	28.30%	0.526	0.781	0.021	0.032	16,205	660	0	0
11.6	30.68%	0.571	0.847	0.044	0.066	17,570	1,365	0	0
11.7	35.44%	0.659	0.978	0.088	0.131	20,291	2,721	0	0
11.8	43.08%	0.801	1.189	0.142	0.211	24,667	4,376	0	0
11.9	56.79%	1.056	1.567	0.255	0.378	32,516	7,849	2,387	2,387
12	66.30%	1.233	1.830	0.177	0.263	37,964	5,448	0	2,387
12.1	68.20%	1.268	1.882	0.035	0.052	39,049	1,086	0	2,387
12.2	69.86%	1.299	1.928	0.031	0.046	40,004	955	0	2,387
12.3	71.30%	1.326	1.968	0.027	0.040	40,829	825	0	2,387
12.4	72.52%	1.349	2.001	0.023	0.033	41,523	694	0	2,387
12.5	73.50%	1.367	2.029	0.018	0.027	42,086	563	0	2,387

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge 15.17 cfs Allowable Vol. Discharge 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in) 10y24h	Cumulative (in) 100y24h	Incremental (in) 10y24h	Incremental (in) 100y24h	100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
12.6	74.34%	1.383	2.052	0.016	0.023	42,570	483	0	2,387
12.7	75.14%	1.398	2.074	0.015	0.022	43,023	454	0	2,387
12.8	75.88%	1.411	2.094	0.014	0.020	43,447	424	0	2,387
12.9	76.56%	1.424	2.113	0.013	0.019	43,841	394	0	2,387
13	77.20%	1.436	2.131	0.012	0.018	44,205	364	0	2,387
13.1	77.80%	1.447	2.147	0.011	0.016	44,546	341	0	2,387
13.2	78.36%	1.458	2.163	0.011	0.016	44,872	325	0	2,387
13.3	78.90%	1.468	2.178	0.010	0.015	45,181	309	0	2,387
13.4	79.42%	1.477	2.192	0.010	0.014	45,474	293	0	2,387
13.5	79.90%	1.486	2.205	0.009	0.013	45,751	277	0	2,387
13.6	80.36%	1.495	2.218	0.009	0.013	46,014	263	0	2,387
13.7	80.80%	1.503	2.230	0.008	0.012	46,266	252	0	2,387
13.8	81.22%	1.511	2.242	0.008	0.012	46,507	240	0	2,387
13.9	81.62%	1.518	2.253	0.007	0.011	46,736	229	0	2,387
14	82.00%	1.525	2.263	0.007	0.010	46,954	218	0	2,387
14.1	82.37%	1.532	2.273	0.007	0.010	47,164	210	0	2,387
14.2	82.73%	1.539	2.283	0.007	0.010	47,369	206	0	2,387
14.3	83.08%	1.545	2.293	0.007	0.010	47,571	202	0	2,387
14.4	83.42%	1.552	2.303	0.006	0.010	47,769	198	0	2,387
14.5	83.76%	1.558	2.312	0.006	0.009	47,963	194	0	2,387
14.6	84.09%	1.564	2.321	0.006	0.009	48,153	190	0	2,387
14.7	84.42%	1.570	2.330	0.006	0.009	48,339	186	0	2,387
14.8	84.74%	1.576	2.339	0.006	0.009	48,520	182	0	2,387
14.9	85.05%	1.582	2.347	0.006	0.009	48,698	178	0	2,387
15	85.35%	1.588	2.356	0.006	0.008	48,872	173	0	2,387
15.1	85.65%	1.593	2.364	0.006	0.008	49,042	170	0	2,387
15.2	85.94%	1.598	2.372	0.005	0.008	49,207	165	0	2,387
15.3	86.22%	1.604	2.380	0.005	0.008	49,369	162	0	2,387
15.4	86.49%	1.609	2.387	0.005	0.008	49,527	157	0	2,387
15.5	86.76%	1.614	2.395	0.005	0.007	49,681	154	0	2,387
15.6	87.02%	1.619	2.402	0.005	0.007	49,830	149	0	2,387
15.7	87.28%	1.623	2.409	0.005	0.007	49,976	146	0	2,387
15.8	87.53%	1.628	2.416	0.005	0.007	50,118	141	0	2,387
15.9	87.77%	1.632	2.422	0.004	0.007	50,256	138	0	2,387
16	88.00%	1.637	2.429	0.004	0.006	50,389	133	0	2,387
16.1	88.23%	1.641	2.435	0.004	0.006	50,520	131	0	2,387
16.2	88.46%	1.645	2.441	0.004	0.006	50,650	129	0	2,387
16.3	88.68%	1.649	2.448	0.004	0.006	50,778	128	0	2,387
16.4	88.90%	1.654	2.454	0.004	0.006	50,905	127	0	2,387
16.5	89.12%	1.658	2.460	0.004	0.006	51,030	125	0	2,387
16.6	89.34%	1.662	2.466	0.004	0.006	51,154	124	0	2,387
16.7	89.55%	1.666	2.472	0.004	0.006	51,276	123	0	2,387

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge: 15.17 cfs Allowable Vol. Discharge: 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
16.8	89.76%	1.670	2.477	0.004	0.006	51,397	121	0	2,387
16.9	89.97%	1.673	2.483	0.004	0.006	51,517	120	0	2,387
17	90.18%	1.677	2.489	0.004	0.006	51,635	118	0	2,387
17.1	90.38%	1.681	2.494	0.004	0.006	51,751	117	0	2,387
17.2	90.58%	1.685	2.500	0.004	0.006	51,866	115	0	2,387
17.3	90.78%	1.688	2.506	0.004	0.005	51,980	114	0	2,387
17.4	90.98%	1.692	2.511	0.004	0.005	52,093	112	0	2,387
17.5	91.17%	1.696	2.516	0.004	0.005	52,204	111	0	2,387
17.6	91.36%	1.699	2.522	0.004	0.005	52,313	109	0	2,387
17.7	91.55%	1.703	2.527	0.004	0.005	52,421	108	0	2,387
17.8	91.74%	1.706	2.532	0.003	0.005	52,528	107	0	2,387
17.9	91.92%	1.710	2.537	0.003	0.005	52,633	105	0	2,387
18	92.10%	1.713	2.542	0.003	0.005	52,737	104	0	2,387
18.1	92.28%	1.716	2.547	0.003	0.005	52,839	102	0	2,387
18.2	92.46%	1.720	2.552	0.003	0.005	52,940	101	0	2,387
18.3	92.63%	1.723	2.557	0.003	0.005	53,040	100	0	2,387
18.4	92.80%	1.726	2.561	0.003	0.005	53,138	98	0	2,387
18.5	92.97%	1.729	2.566	0.003	0.005	53,234	97	0	2,387
18.6	93.14%	1.732	2.571	0.003	0.005	53,330	95	0	2,387
18.7	93.30%	1.735	2.575	0.003	0.005	53,423	94	0	2,387
18.8	93.46%	1.738	2.579	0.003	0.004	53,516	92	0	2,387
18.9	93.62%	1.741	2.584	0.003	0.004	53,607	91	0	2,387
19	93.78%	1.744	2.588	0.003	0.004	53,696	89	0	2,387
19.1	93.93%	1.747	2.592	0.003	0.004	53,784	88	0	2,387
19.2	94.08%	1.750	2.597	0.003	0.004	53,871	86	0	2,387
19.3	94.23%	1.753	2.601	0.003	0.004	53,956	85	0	2,387
19.4	94.38%	1.755	2.605	0.003	0.004	54,040	84	0	2,387
19.5	94.52%	1.758	2.609	0.003	0.004	54,122	82	0	2,387
19.6	94.66%	1.761	2.613	0.003	0.004	54,203	81	0	2,387
19.7	94.80%	1.763	2.616	0.003	0.004	54,282	80	0	2,387
19.8	94.94%	1.766	2.620	0.003	0.004	54,360	78	0	2,387
19.9	95.07%	1.768	2.624	0.002	0.004	54,437	77	0	2,387
20	95.20%	1.771	2.628	0.002	0.004	54,512	75	0	2,387
20.1	95.33%	1.773	2.631	0.002	0.004	54,586	74	0	2,387
20.2	95.46%	1.776	2.635	0.002	0.004	54,660	74	0	2,387
20.3	95.59%	1.778	2.638	0.002	0.004	54,734	74	0	2,387
20.4	95.72%	1.780	2.642	0.002	0.004	54,807	73	0	2,387
20.5	95.84%	1.783	2.645	0.002	0.004	54,881	73	0	2,387
20.6	95.97%	1.785	2.649	0.002	0.004	54,953	73	0	2,387
20.7	96.10%	1.787	2.652	0.002	0.004	55,026	73	0	2,387
20.8	96.22%	1.790	2.656	0.002	0.003	55,098	72	0	2,387
20.9	96.35%	1.792	2.659	0.002	0.003	55,170	72	0	2,387

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge 15.17 cfs Allowable Vol. Discharge 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in) 10y24h	Cumulative (in) 100y24h	Incremental (in) 10y24h	Incremental (in) 100y24h	100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
21	96.48%	1.794	2.663	0.002	0.003	55,242	72	0	2,387
21.1	96.60%	1.797	2.666	0.002	0.003	55,314	72	0	2,387
21.2	96.72%	1.799	2.670	0.002	0.003	55,385	71	0	2,387
21.3	96.85%	1.801	2.673	0.002	0.003	55,456	71	0	2,387
21.4	96.97%	1.804	2.676	0.002	0.003	55,526	70	0	2,387
21.5	97.09%	1.806	2.680	0.002	0.003	55,596	70	0	2,387
21.6	97.22%	1.808	2.683	0.002	0.003	55,666	70	0	2,387
21.7	97.34%	1.810	2.687	0.002	0.003	55,736	70	0	2,387
21.8	97.46%	1.813	2.690	0.002	0.003	55,805	69	0	2,387
21.9	97.58%	1.815	2.693	0.002	0.003	55,875	69	0	2,387
22	97.70%	1.817	2.697	0.002	0.003	55,943	69	0	2,387
22.1	97.82%	1.819	2.700	0.002	0.003	56,012	69	0	2,387
22.2	97.94%	1.822	2.703	0.002	0.003	56,080	68	0	2,387
22.3	98.06%	1.824	2.706	0.002	0.003	56,148	68	0	2,387
22.4	98.18%	1.826	2.710	0.002	0.003	56,216	68	0	2,387
22.5	98.29%	1.828	2.713	0.002	0.003	56,284	68	0	2,387
22.6	98.41%	1.830	2.716	0.002	0.003	56,351	67	0	2,387
22.7	98.53%	1.833	2.719	0.002	0.003	56,418	67	0	2,387
22.8	98.64%	1.835	2.723	0.002	0.003	56,484	66	0	2,387
22.9	98.76%	1.837	2.726	0.002	0.003	56,550	66	0	2,387
23	98.88%	1.839	2.729	0.002	0.003	56,616	66	0	2,387
23.1	98.99%	1.841	2.732	0.002	0.003	56,682	66	0	2,387
23.2	99.10%	1.843	2.735	0.002	0.003	56,747	65	0	2,387
23.3	99.22%	1.845	2.738	0.002	0.003	56,813	65	0	2,387
23.4	99.33%	1.848	2.742	0.002	0.003	56,877	65	0	2,387
23.5	99.44%	1.850	2.745	0.002	0.003	56,942	65	0	2,387
23.6	99.56%	1.852	2.748	0.002	0.003	57,006	64	0	2,387
23.7	99.67%	1.854	2.751	0.002	0.003	57,070	64	0	2,387
23.8	99.78%	1.856	2.754	0.002	0.003	57,134	64	0	2,387
23.9	99.89%	1.858	2.757	0.002	0.003	57,197	64	0	2,387
24	100.00%	1.860	2.760	0.002	0.003	57,260	63	0	2,387

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
0	0.00%	0.000	0.000	0.000	0.000	0	0	0	0
0.1	0.10%	0.002	0.003	0.002	0.003	96	96	0	0
0.2	0.20%	0.004	0.006	0.002	0.003	193	96	0	0
0.3	0.31%	0.006	0.008	0.002	0.003	291	98	0	0
0.4	0.41%	0.008	0.011	0.002	0.003	390	98	0	0
0.5	0.51%	0.010	0.014	0.002	0.003	490	100	0	0
0.6	0.62%	0.011	0.017	0.002	0.003	590	100	0	0
0.7	0.73%	0.013	0.020	0.002	0.003	692	102	0	0
0.8	0.83%	0.015	0.023	0.002	0.003	795	102	0	0
0.9	0.94%	0.018	0.026	0.002	0.003	899	104	0	0
1	1.05%	0.020	0.029	0.002	0.003	1,003	104	0	0
1.1	1.16%	0.022	0.032	0.002	0.003	1,109	106	0	0
1.2	1.27%	0.024	0.035	0.002	0.003	1,215	106	0	0
1.3	1.39%	0.026	0.038	0.002	0.003	1,323	108	0	0
1.4	1.50%	0.028	0.041	0.002	0.003	1,431	108	0	0
1.5	1.61%	0.030	0.045	0.002	0.003	1,540	110	0	0
1.6	1.73%	0.032	0.048	0.002	0.003	1,650	110	0	0
1.7	1.85%	0.034	0.051	0.002	0.003	1,762	112	0	0
1.8	1.96%	0.036	0.054	0.002	0.003	1,874	112	0	0
1.9	2.08%	0.039	0.057	0.002	0.003	1,987	114	0	0
2	2.20%	0.041	0.061	0.002	0.003	2,101	114	0	0
2.1	2.32%	0.043	0.064	0.002	0.003	2,217	116	0	0
2.2	2.44%	0.045	0.067	0.002	0.003	2,332	116	0	0
2.3	2.57%	0.048	0.071	0.002	0.003	2,450	117	0	0
2.4	2.69%	0.050	0.074	0.002	0.003	2,567	117	0	0
2.5	2.81%	0.052	0.078	0.002	0.003	2,686	119	0	0
2.6	2.94%	0.055	0.081	0.002	0.003	2,806	119	0	0
2.7	3.07%	0.057	0.085	0.002	0.004	2,927	121	0	0
2.8	3.19%	0.059	0.088	0.002	0.004	3,048	121	0	0
2.9	3.32%	0.062	0.092	0.002	0.004	3,172	123	0	0
3	3.45%	0.064	0.095	0.002	0.004	3,295	123	0	0
3.1	3.58%	0.067	0.099	0.002	0.004	3,420	125	0	0
3.2	3.71%	0.069	0.102	0.002	0.004	3,545	125	0	0
3.3	3.85%	0.072	0.106	0.002	0.004	3,672	127	0	0
3.4	3.98%	0.074	0.110	0.002	0.004	3,799	127	0	0
3.5	4.11%	0.077	0.114	0.003	0.004	3,928	129	0	0
3.6	4.25%	0.079	0.117	0.003	0.004	4,057	129	0	0
3.7	4.39%	0.082	0.121	0.003	0.004	4,188	131	0	0
3.8	4.52%	0.084	0.125	0.003	0.004	4,318	131	0	0
3.9	4.66%	0.087	0.129	0.003	0.004	4,451	133	0	0
4	4.80%	0.089	0.132	0.003	0.004	4,584	133	0	0
4.1	4.94%	0.092	0.136	0.003	0.004	4,719	135	0	0

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
4.2	5.08%	0.095	0.140	0.003	0.004	4,855	137	0	0
4.3	5.23%	0.097	0.144	0.003	0.004	4,994	138	0	0
4.4	5.38%	0.100	0.148	0.003	0.004	5,134	140	0	0
4.5	5.53%	0.103	0.152	0.003	0.004	5,276	142	0	0
4.6	5.68%	0.106	0.157	0.003	0.004	5,421	144	0	0
4.7	5.83%	0.108	0.161	0.003	0.004	5,567	146	0	0
4.8	5.98%	0.111	0.165	0.003	0.004	5,715	148	0	0
4.9	6.14%	0.114	0.169	0.003	0.004	5,865	150	0	0
5	6.30%	0.117	0.174	0.003	0.004	6,016	152	0	0
5.1	6.46%	0.120	0.178	0.003	0.004	6,170	154	0	0
5.2	6.62%	0.123	0.183	0.003	0.004	6,326	156	0	0
5.3	6.79%	0.126	0.187	0.003	0.005	6,483	158	0	0
5.4	6.96%	0.129	0.192	0.003	0.005	6,643	159	0	0
5.5	7.13%	0.133	0.197	0.003	0.005	6,804	161	0	0
5.6	7.30%	0.136	0.201	0.003	0.005	6,968	163	0	0
5.7	7.47%	0.139	0.206	0.003	0.005	7,133	165	0	0
5.8	7.64%	0.142	0.211	0.003	0.005	7,300	167	0	0
5.9	7.82%	0.145	0.216	0.003	0.005	7,469	169	0	0
6	8.00%	0.149	0.221	0.003	0.005	7,640	171	0	0
6.1	8.18%	0.152	0.226	0.003	0.005	7,813	173	0	0
6.2	8.36%	0.156	0.231	0.003	0.005	7,988	175	0	0
6.3	8.55%	0.159	0.236	0.003	0.005	8,164	177	0	0
6.4	8.74%	0.162	0.241	0.003	0.005	8,343	179	0	0
6.5	8.93%	0.166	0.246	0.004	0.005	8,523	180	0	0
6.6	9.12%	0.170	0.252	0.004	0.005	8,706	182	0	0
6.7	9.31%	0.173	0.257	0.004	0.005	8,890	184	0	0
6.8	9.50%	0.177	0.262	0.004	0.005	9,076	186	0	0
6.9	9.70%	0.180	0.268	0.004	0.005	9,264	188	0	0
7	9.90%	0.184	0.273	0.004	0.005	9,454	190	0	0
7.1	10.10%	0.188	0.279	0.004	0.006	9,646	192	0	0
7.2	10.30%	0.192	0.284	0.004	0.006	9,840	194	0	0
7.3	10.51%	0.195	0.290	0.004	0.006	10,036	196	0	0
7.4	10.72%	0.199	0.296	0.004	0.006	10,234	198	0	0
7.5	10.93%	0.203	0.302	0.004	0.006	10,433	200	0	0
7.6	11.14%	0.207	0.307	0.004	0.006	10,635	202	0	0
7.7	11.35%	0.211	0.313	0.004	0.006	10,838	203	0	0
7.8	11.56%	0.215	0.319	0.004	0.006	11,043	205	0	0
7.9	11.78%	0.219	0.325	0.004	0.006	11,251	207	0	0
8	12.00%	0.223	0.331	0.004	0.006	11,460	209	0	0
8.1	12.23%	0.227	0.337	0.004	0.006	11,675	215	0	0
8.2	12.46%	0.232	0.344	0.004	0.006	11,899	224	0	0
8.3	12.71%	0.236	0.351	0.005	0.007	12,133	234	0	0

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
8.4	12.96%	0.241	0.358	0.005	0.007	12,377	244	0	0
8.5	13.23%	0.246	0.365	0.005	0.007	12,630	253	0	0
8.6	13.50%	0.251	0.373	0.005	0.008	12,892	263	0	0
8.7	13.79%	0.256	0.380	0.005	0.008	13,164	272	0	0
8.8	14.08%	0.262	0.389	0.005	0.008	13,446	282	0	0
8.9	14.39%	0.268	0.397	0.006	0.008	13,737	291	0	0
9	14.70%	0.273	0.406	0.006	0.009	14,038	301	0	0
9.1	15.02%	0.279	0.415	0.006	0.009	14,344	306	0	0
9.2	15.34%	0.285	0.423	0.006	0.009	14,649	306	0	0
9.3	15.66%	0.291	0.432	0.006	0.009	14,955	306	0	0
9.4	15.98%	0.297	0.441	0.006	0.009	15,261	306	0	0
9.5	16.30%	0.303	0.450	0.006	0.009	15,566	306	0	0
9.6	16.63%	0.309	0.459	0.006	0.009	15,880	313	0	0
9.7	16.97%	0.316	0.468	0.006	0.009	16,208	329	0	0
9.8	17.33%	0.322	0.478	0.007	0.010	16,552	344	0	0
9.9	17.71%	0.329	0.489	0.007	0.010	16,911	359	0	0
10	18.10%	0.337	0.500	0.007	0.011	17,285	374	0	0
10.1	18.51%	0.344	0.511	0.008	0.011	17,679	393	0	0
10.2	18.95%	0.352	0.523	0.008	0.012	18,095	416	0	0
10.3	19.41%	0.361	0.536	0.009	0.013	18,534	439	0	0
10.4	19.89%	0.370	0.549	0.009	0.013	18,997	462	0	0
10.5	20.40%	0.379	0.563	0.009	0.014	19,482	485	0	0
10.6	20.94%	0.389	0.578	0.010	0.015	19,997	516	0	0
10.7	21.52%	0.400	0.594	0.011	0.016	20,551	554	0	0
10.8	22.14%	0.412	0.611	0.012	0.017	21,143	592	0	0
10.9	22.80%	0.424	0.629	0.012	0.018	21,774	630	0	0
11	23.50%	0.437	0.649	0.013	0.019	22,442	668	0	0
11.1	24.27%	0.451	0.670	0.014	0.021	23,176	733	0	0
11.2	25.13%	0.467	0.694	0.016	0.024	24,001	825	0	0
11.3	26.09%	0.485	0.720	0.018	0.026	24,918	917	0	0
11.4	27.15%	0.505	0.749	0.020	0.029	25,926	1,008	0	0
11.5	28.30%	0.526	0.781	0.021	0.032	27,026	1,100	0	0
11.6	30.68%	0.571	0.847	0.044	0.066	29,303	2,277	0	0
11.7	35.44%	0.659	0.978	0.088	0.131	33,841	4,538	0	0
11.8	43.08%	0.801	1.189	0.142	0.211	41,140	7,299	0	0
11.9	56.79%	1.056	1.567	0.255	0.378	54,230	13,090	1,808	1,808
12	66.30%	1.233	1.830	0.177	0.263	63,316	9,086	0	1,808
12.1	68.20%	1.268	1.882	0.035	0.052	65,126	1,811	0	1,808
12.2	69.86%	1.299	1.928	0.031	0.046	66,719	1,593	0	1,808
12.3	71.30%	1.326	1.968	0.027	0.040	68,094	1,375	0	1,808
12.4	72.52%	1.349	2.001	0.023	0.033	69,252	1,157	0	1,808
12.5	73.50%	1.367	2.029	0.018	0.027	70,192	940	0	1,808

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
12.6	74.34%	1.383	2.052	0.016	0.023	70,998	806	0	1,808
12.7	75.14%	1.398	2.074	0.015	0.022	71,754	756	0	1,808
12.8	75.88%	1.411	2.094	0.014	0.020	72,461	707	0	1,808
12.9	76.56%	1.424	2.113	0.013	0.019	73,118	657	0	1,808
13	77.20%	1.436	2.131	0.012	0.018	73,725	607	0	1,808
13.1	77.80%	1.447	2.147	0.011	0.016	74,294	569	0	1,808
13.2	78.36%	1.458	2.163	0.011	0.016	74,837	542	0	1,808
13.3	78.90%	1.468	2.178	0.010	0.015	75,352	516	0	1,808
13.4	79.42%	1.477	2.192	0.010	0.014	75,841	489	0	1,808
13.5	79.90%	1.486	2.205	0.009	0.013	76,303	462	0	1,808
13.6	80.36%	1.495	2.218	0.009	0.013	76,743	439	0	1,808
13.7	80.80%	1.503	2.230	0.008	0.012	77,163	420	0	1,808
13.8	81.22%	1.511	2.242	0.008	0.012	77,564	401	0	1,808
13.9	81.62%	1.518	2.253	0.007	0.011	77,946	382	0	1,808
14	82.00%	1.525	2.263	0.007	0.010	78,309	363	0	1,808
14.1	82.37%	1.532	2.273	0.007	0.010	78,659	350	0	1,808
14.2	82.73%	1.539	2.283	0.007	0.010	79,002	343	0	1,808
14.3	83.08%	1.545	2.293	0.007	0.010	79,339	337	0	1,808
14.4	83.42%	1.552	2.303	0.006	0.010	79,669	329	0	1,808
14.5	83.76%	1.558	2.312	0.006	0.009	79,993	324	0	1,808
14.6	84.09%	1.564	2.321	0.006	0.009	80,309	316	0	1,808
14.7	84.42%	1.570	2.330	0.006	0.009	80,619	310	0	1,808
14.8	84.74%	1.576	2.339	0.006	0.009	80,922	303	0	1,808
14.9	85.05%	1.582	2.347	0.006	0.009	81,219	297	0	1,808
15	85.35%	1.588	2.356	0.006	0.008	81,508	289	0	1,808
15.1	85.65%	1.593	2.364	0.006	0.008	81,792	284	0	1,808
15.2	85.94%	1.598	2.372	0.005	0.008	82,068	276	0	1,808
15.3	86.22%	1.604	2.380	0.005	0.008	82,338	270	0	1,808
15.4	86.49%	1.609	2.387	0.005	0.008	82,601	263	0	1,808
15.5	86.76%	1.614	2.395	0.005	0.007	82,857	257	0	1,808
15.6	87.02%	1.619	2.402	0.005	0.007	83,107	249	0	1,808
15.7	87.28%	1.623	2.409	0.005	0.007	83,350	244	0	1,808
15.8	87.53%	1.628	2.416	0.005	0.007	83,586	236	0	1,808
15.9	87.77%	1.632	2.422	0.004	0.007	83,816	230	0	1,808
16	88.00%	1.637	2.429	0.004	0.006	84,039	223	0	1,808
16.1	88.23%	1.641	2.435	0.004	0.006	84,258	219	0	1,808
16.2	88.46%	1.645	2.441	0.004	0.006	84,473	216	0	1,808
16.3	88.68%	1.649	2.448	0.004	0.006	84,687	214	0	1,808
16.4	88.90%	1.654	2.454	0.004	0.006	84,898	211	0	1,808
16.5	89.12%	1.658	2.460	0.004	0.006	85,107	209	0	1,808
16.6	89.34%	1.662	2.466	0.004	0.006	85,314	206	0	1,808
16.7	89.55%	1.666	2.472	0.004	0.006	85,518	204	0	1,808

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in) 10y24h	Cumulative (in) 100y24h	Incremental (in) 10y24h	Incremental (in) 100y24h	100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
16.8	89.76%	1.670	2.477	0.004	0.006	85,720	202	0	1,808
16.9	89.97%	1.673	2.483	0.004	0.006	85,919	200	0	1,808
17	90.18%	1.677	2.489	0.004	0.006	86,116	197	0	1,808
17.1	90.38%	1.681	2.494	0.004	0.006	86,311	195	0	1,808
17.2	90.58%	1.685	2.500	0.004	0.006	86,503	192	0	1,808
17.3	90.78%	1.688	2.506	0.004	0.005	86,693	190	0	1,808
17.4	90.98%	1.692	2.511	0.004	0.005	86,880	187	0	1,808
17.5	91.17%	1.696	2.516	0.004	0.005	87,065	185	0	1,808
17.6	91.36%	1.699	2.522	0.004	0.005	87,248	182	0	1,808
17.7	91.55%	1.703	2.527	0.004	0.005	87,428	180	0	1,808
17.8	91.74%	1.706	2.532	0.003	0.005	87,606	178	0	1,808
17.9	91.92%	1.710	2.537	0.003	0.005	87,781	176	0	1,808
18	92.10%	1.713	2.542	0.003	0.005	87,954	173	0	1,808
18.1	92.28%	1.716	2.547	0.003	0.005	88,125	171	0	1,808
18.2	92.46%	1.720	2.552	0.003	0.005	88,293	168	0	1,808
18.3	92.63%	1.723	2.557	0.003	0.005	88,459	166	0	1,808
18.4	92.80%	1.726	2.561	0.003	0.005	88,623	163	0	1,808
18.5	92.97%	1.729	2.566	0.003	0.005	88,784	161	0	1,808
18.6	93.14%	1.732	2.571	0.003	0.005	88,943	159	0	1,808
18.7	93.30%	1.735	2.575	0.003	0.005	89,099	157	0	1,808
18.8	93.46%	1.738	2.579	0.003	0.004	89,253	154	0	1,808
18.9	93.62%	1.741	2.584	0.003	0.004	89,405	152	0	1,808
19	93.78%	1.744	2.588	0.003	0.004	89,554	149	0	1,808
19.1	93.93%	1.747	2.592	0.003	0.004	89,701	147	0	1,808
19.2	94.08%	1.750	2.597	0.003	0.004	89,845	144	0	1,808
19.3	94.23%	1.753	2.601	0.003	0.004	89,987	142	0	1,808
19.4	94.38%	1.755	2.605	0.003	0.004	90,127	139	0	1,808
19.5	94.52%	1.758	2.609	0.003	0.004	90,264	138	0	1,808
19.6	94.66%	1.761	2.613	0.003	0.004	90,399	135	0	1,808
19.7	94.80%	1.763	2.616	0.003	0.004	90,532	133	0	1,808
19.8	94.94%	1.766	2.620	0.003	0.004	90,662	130	0	1,808
19.9	95.07%	1.768	2.624	0.002	0.004	90,790	128	0	1,808
20	95.20%	1.771	2.628	0.002	0.004	90,915	125	0	1,808
20.1	95.33%	1.773	2.631	0.002	0.004	91,039	124	0	1,808
20.2	95.46%	1.776	2.635	0.002	0.004	91,162	123	0	1,808
20.3	95.59%	1.778	2.638	0.002	0.004	91,285	123	0	1,808
20.4	95.72%	1.780	2.642	0.002	0.004	91,407	122	0	1,808
20.5	95.84%	1.783	2.645	0.002	0.004	91,530	122	0	1,808
20.6	95.97%	1.785	2.649	0.002	0.004	91,651	121	0	1,808
20.7	96.10%	1.787	2.652	0.002	0.004	91,772	121	0	1,808
20.8	96.22%	1.790	2.656	0.002	0.003	91,893	120	0	1,808
20.9	96.35%	1.792	2.659	0.002	0.003	92,013	120	0	1,808

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge: 31.34 cfs

Allowable Vol. Discharge: 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
21	96.48%	1.794	2.663	0.002	0.003	92,132	119	0	1,808
21.1	96.60%	1.797	2.666	0.002	0.003	92,252	119	0	1,808
21.2	96.72%	1.799	2.670	0.002	0.003	92,370	118	0	1,808
21.3	96.85%	1.801	2.673	0.002	0.003	92,489	118	0	1,808
21.4	96.97%	1.804	2.676	0.002	0.003	92,606	117	0	1,808
21.5	97.09%	1.806	2.680	0.002	0.003	92,723	117	0	1,808
21.6	97.22%	1.808	2.683	0.002	0.003	92,840	117	0	1,808
21.7	97.34%	1.810	2.687	0.002	0.003	92,956	117	0	1,808
21.8	97.46%	1.813	2.690	0.002	0.003	93,072	116	0	1,808
21.9	97.58%	1.815	2.693	0.002	0.003	93,188	116	0	1,808
22	97.70%	1.817	2.697	0.002	0.003	93,302	115	0	1,808
22.1	97.82%	1.819	2.700	0.002	0.003	93,417	115	0	1,808
22.2	97.94%	1.822	2.703	0.002	0.003	93,530	114	0	1,808
22.3	98.06%	1.824	2.706	0.002	0.003	93,644	114	0	1,808
22.4	98.18%	1.826	2.710	0.002	0.003	93,757	113	0	1,808
22.5	98.29%	1.828	2.713	0.002	0.003	93,869	113	0	1,808
22.6	98.41%	1.830	2.716	0.002	0.003	93,981	112	0	1,808
22.7	98.53%	1.833	2.719	0.002	0.003	94,093	112	0	1,808
22.8	98.64%	1.835	2.723	0.002	0.003	94,204	111	0	1,808
22.9	98.76%	1.837	2.726	0.002	0.003	94,314	111	0	1,808
23	98.88%	1.839	2.729	0.002	0.003	94,424	110	0	1,808
23.1	98.99%	1.841	2.732	0.002	0.003	94,534	110	0	1,808
23.2	99.10%	1.843	2.735	0.002	0.003	94,643	109	0	1,808
23.3	99.22%	1.845	2.738	0.002	0.003	94,752	109	0	1,808
23.4	99.33%	1.848	2.742	0.002	0.003	94,860	108	0	1,808
23.5	99.44%	1.850	2.745	0.002	0.003	94,968	108	0	1,808
23.6	99.56%	1.852	2.748	0.002	0.003	95,075	107	0	1,808
23.7	99.67%	1.854	2.751	0.002	0.003	95,182	107	0	1,808
23.8	99.78%	1.856	2.754	0.002	0.003	95,288	106	0	1,808
23.9	99.89%	1.858	2.757	0.002	0.003	95,394	106	0	1,808
24	100.00%	1.860	2.760	0.002	0.003	95,499	105	0	1,808

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

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.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–Washington County Area, Utah

Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
WBD—Winkel gravelly fine sandy loam, 1 to 8 percent slopes														
Winkel	85	D	0-1	Gravelly fine sandy loam	SM	A-4, A-2-4	0- 0- 0	0- 5- 10	75-80-85	70-75-80	50-55-60	30-35-40	15-20-25	NP-3 -5
			1-6	Gravelly fine sandy loam	SM	A-4, A-2-4	0- 0- 0	0- 5- 10	75-80-85	70-75-80	50-55-60	30-35-40	15-20-25	NP-3 -5
			6-12	Very gravelly fine sandy loam	GM	A-1-b	0- 0- 0	10-15-20	40-45-50	35-40-45	25-30-35	15-20-25	15-20-25	NP-3 -5
			12-16	Extremely cobbly fine sandy loam	GC-GM, GM	A-2, A-1-b	0- 0- 0	50-55-60	40-45-50	35-40-45	30-35-40	15-23-30	15-20-25	NP-3 -5
			16-20	Indurated	—	—	—	—	—	—	—	—	—	—
			20-24	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Washington County Area, Utah														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
WCF—Winkel-Rock outcrop complex, 8 to 30 percent slopes														
Winkel	65	D	0-1	Gravelly fine sandy loam	SM	A-2-4, A-4	0- 0- 0	0- 5- 10	75-80-85	70-75-80	50-55-60	30-35-40	15-20-25	NP-3 -5
			1-6	Gravelly fine sandy loam	SM	A-4, A-2-4	0- 0- 0	0- 5- 10	75-80-85	70-75-80	50-55-60	30-35-40	15-20-25	NP-3 -5
			6-12	Very gravelly fine sandy loam	GM	A-1-b	0- 0- 0	10-15-20	40-45-50	35-40-45	25-30-35	15-20-25	15-20-25	NP-3 -5
			12-16	Extremely cobbly fine sandy loam	GC-GM, GM	A-2, A-1-b	0- 0- 0	50-55-60	40-45-50	35-40-45	30-35-40	15-23-30	15-20-25	NP-3 -5
			16-20	Indurated	—	—	—	—	—	—	—	—	—	—
			20-24	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Data Source Information

Soil Survey Area: Washington County Area, Utah
Survey Area Data: Version 15, Sep 7, 2021

Hydrologic Soil Group and Surface Runoff

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

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 four hydrologic soil groups are:

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.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff–Washington County Area, Utah			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
SY—Stony colluvial land			
Stony colluvial land	100	—	—

Hydrologic Soil Group and Surface Runoff–Washington County Area, Utah			
Map symbol and soil name	Pct. of map unit	Surface Runoff	Hydrologic Soil Group
WBD—Winkel gravelly fine sandy loam, 1 to 8 percent slopes			
Winkel	85	Medium	D
WCF—Winkel-Rock outcrop complex, 8 to 30 percent slopes			
Winkel	65	Medium	D
Rock outcrop	25	—	—

Data Source Information

Soil Survey Area: Washington County Area, Utah
Survey Area Data: Version 15, Sep 7, 2021

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

Report—Physical Soil Properties

Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Physical Soil Properties–Washington County Area, Utah														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
SY—Stony colluvial land														
Stony colluvial land	—	—	—	—	—	—	—	—	—					
WBD—Winkel gravelly fine sandy loam, 1 to 8 percent slopes														
Winkel	0-1	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.07-0.08-0. 09	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.20	.32	1	5	56
	1-6	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.07-0.08-0. 09	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.24	.37			
	6-12	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.05-0.06-0. 07	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.15	.37			
	12-16	-70-	-22-	3- 8- 12	1.40-1.48 -1.55	14.11-28.23-42. 34	0.04-0.05-0. 06	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.10	.37			
	16-20	—	—	—	—	0.00-2.12-4.23	—	—	—					
	20-24	—	—	—	—	0.07-70.61-141. 14	—	—	—					

Physical Soil Properties–Washington County Area, Utah														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
WCF—Winkel-Rock outcrop complex, 8 to 30 percent slopes														
Winkel	0-1	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.07-0.08-0. 09	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.20	.32	1	5	56
	1-6	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.07-0.08-0. 09	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.24	.37			
	6-12	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.05-0.06-0. 07	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.15	.37			
	12-16	-70-	-22-	3- 8- 12	1.40-1.48 -1.55	14.11-28.23-42. 34	0.04-0.05-0. 06	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.10	.37			
	16-20	—	—	—	—	0.00-2.12-4.23	—	—	—					
	20-24	—	—	—	—	0.07-70.61-141. 14	—	—	—					
Rock outcrop	—	—	—	—	—	—	—	—	—					

Data Source Information

Soil Survey Area: Washington County Area, Utah
Survey Area Data: Version 15, Sep 7, 2021

RUSLE2 Related Attributes

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factor Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic layer.

Report—RUSLE2 Related Attributes

Soil properties and interpretations for erosion runoff calculations. The surface mineral horizon properties are displayed or the first mineral horizon below an organic surface horizon. Organic horizons are not displayed.

RUSLE2 Related Attributes–Washington County Area, Utah

Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
WBD—Winkel gravelly fine sandy loam, 1 to 8 percent slopes								
Winkel	85	—	D	.32	1	70.4	22.1	7.5
WCF—Winkel-Rock outcrop complex, 8 to 30 percent slopes								
Winkel	65	—	D	.32	1	70.4	22.1	7.5

Data Source Information

Soil Survey Area: Washington County Area, Utah
Survey Area Data: Version 15, Sep 7, 2021

Modified Universal Soil Loss Equation (MUSLE)

Project Name	Mesa Cove Subdivision
Project Location	Hurricane City, Utah
Date	Jan-22
Project Manger	Dave Nasal
Project Engineer	Taylor Ricks
Begin Construction	May 2022
End Construction	December 2022

INPUT	UPPER BASIN	LOWER BASIN	
V = volume of runoff (10 yr, 24 hr)	21,021	44,056	cubic feet
V = volume of runoff (10 yr, 24 hr)	0.48	1.01	acre-feet
Qp = peak flow per storm event	7.7	15.88	cfs
K = soil erodibility factor	0.32	0.32	
LS = Hill slope length and steepness	6	5.5	
C = cover-management factor	1.0	1.0	
P = land management practices	0.6	0.6	

OUTPUT

Total Soil Loss	228	475	tons
Conversion Factor (Table 3.4)	0.7	0.7	Sandy Loam
Total Soil Volume	160	333	Cu Yd
Total Soil Volume in Basin	4,320	8,991	Cu Ft
Total Soil Volume in Project	13,311		Cu Ft

Storage

Sediment Storage	# of Devices	Total Storage (ft^3)
Check Dams @ 26 ft^3/device	TBD	TBD
Silt Fence @ 0.25 ft^3/ft	TBD	TBD

Total Storage Required	13,311	cu ft
Total Storage Provided	0	cu ft

PLANNING & ZONING
HURRICANE CITY
UTAH

STAFF COMMENTS

Agenda Date:	**02/17/2022**
Application Number:	2022-PP-05 and 2022-HIL-02
Type of Application:	Preliminary Plat and Sensitive Lands Application
Action Type:	Administrative
Applicant:	GVS Holdings LLC
Agent:	Dwain Schallenberger
Request:	Approval of a Preliminary Plat and Sensitive Lands Application
Location:	1117 W 600 N
Zoning:	R1-10 and RM-2 PDO
General Plan Map:	Planned Community

Discussion:
The applicant has filed a preliminary plat for the Mesa Cove subdivision. A zone change was passed for this property in November 2021 under the name of the property's owners "GVS Holdings". They are proposing 91 total lots on 19.3 acres with the northern half being townhomes and the southern half being single-family homes. As part of the zone change, the city council approved it at R1-10 instead of the proposed R1-6. Plat includes some community amenities and vital connection points for traffic flow through the city.

JUC Comments
The Joint Utility Committee had the following comments:

1. **Power:** There is a transmission line on the east property line that the power department is looking to redo. Rocky Mountain Power has a powerline easement that needs to be maintained
2. **Sewer:** Line on 1150 W will be difficult for drainage, might need to loop around to 870 W.
3. **Street:** Access on 600 N will need to be reviewed.
4. **Water:** 600 N line needs to be extended to 870 W. The line will be 12" ductile iron. Secondary irrigation in the area. Each townhome will need its own meter. Need a second access for water looping
5. **Engineering:** The 52' right of way on the local streets within the development can be lowered to 45'. Will need turn lanes on 600 N. Will need to review slope of 1150 W, should be fine since there are other accesses. The City and the developer need to review drainage and both participate in the construction. Lot 2 will be allowed to access 1150 W

6. **Fire:** Will need to review construction drawings. Will need a fire hydrant near Lot 2
7. **Cable:** No concerns.
8. **Phone:** No comments
9. **WCWCD:** No comments



Staff Comments: Preliminary Plat

1. Plat has 27 lots in the R1-10 section and 64 townhouses in the RM-2 section. Both of these match the underlying zoning.
2. Plat indicates the zoning is *"PUD with RM-2 (North) and R1-10 (South)";* it is actually PDO not PUD
3. There is a large cliff in the open space portion of the property. It appears most buildings will be avoiding the cliff face. Will need a 25' setback from any drop-offs.
4. The detention basin in the southwest corner should be dedicated to the city not on private property.



5. Proposed 1150 W will have a grade of 18%. This is steeper than usually permissible, however, the Planning Commission and City Council can grant an exception. After review with the City Engineer, they have found it acceptable because emergency access and access in inclement weather can be rerouted down 870 W.
    a. 1150 W is also a Master Planned Roadway with plans to connect the road from 600 N all the way to the south end of town
6. Sightlines at the proposed corner of 1150 W and 600 N are poor, as shown in the picture below; this will have to be resolved in construction drawings by moving the intersection slightly or rerouting traffic to the eastern boundary. The intersection will need to be approved by JUC during construction drawings.



7. Lot 2 was a flag lot. By code, flag lots are generally to be avoided. City design standards allow for driveway access on 60’ right of ways like 1150 W, so the flag lot was eliminated; otherwise, the design standards for flag lots would apply. Flag Lot standards can be found at the end of this report. After review, staff and JUC felt either option could be acceptable.
8. Details on the community amenities would be appreciated
9. A will serve letter has been provided by Hurricane City Water and Ash Creek Sewer District
10. A sensitive lands application has been provided. Lots 17 and 16 both have unbuildable areas that need to be clearly labeled on the preliminary plat.

Sensitive Lands

1. The Sensitive Land Application requires the following items

10-24-5: HILLSIDES AND RIDGE AREAS:

A. Applicability: The following procedures, submittal requirements and standards shall apply to those projects located on lands identified as having at least one of the following characteristics:

1. Slopes over ten percent (10%) which are:

a. Identified through computer generated programs capable of calculating slopes on topographic maps prepared with two foot (2') contour interval accuracy; or

b. Established by profile lines drawn perpendicular to contour lines at intervals no greater than one hundred fifty feet (150') apart, when the slope, measured along any one hundred foot (100') segment of the profile line is ten percent (10%) or greater. (See section 10-24-9, appendix diagram A, of this chapter.)

c. A slope shall be subject to this chapter only when a contiguous identified area of ten percent (10%) or greater exceeds two (2) acres, or if the site is less than one acre and the entire site is ten percent (10%) or greater.

2. Soils Investigation Report: A soils investigation report which contains the following information:

a. Nature, distribution and classification (unified soil classification) of existing soils to the appropriate depth of influence by the proposed development, but not less than ten feet (10') deeper than the proposed excavations or to bedrock.

b. Strength of existing soils, bearing capacity of supporting soils, settlement estimates, collapse and shrink-swell characteristics, lateral pressures and trench excavation limitations.

c. Groundwater levels that may affect development and estimated elevation of high groundwater levels.

d. Appropriate laboratory testing for classification, consistency, strength and consolidation conditions.

e. Slope stability.

f. A written statement by the geotechnical engineer, civil engineer, or geologist preparing the soils report describing the general suitability of the site for the owner's intended use. The report shall identify soil constraints to development and shall state the professional opinion of the author as to whether the proposed development plan will mitigate and/or eliminate said constraints in a manner as to prevent hazard to life, hazard to property, and adverse effects. If the soil report prepared for a subdivision shows the presence of critically expansive soils, high water table, organic soils, liquefiable soils, collapsible soils, or other soil problems which, if not corrected, would lead to structural defects of the proposed buildings, damage to the building from the water, or premature deterioration of the public improvements, a soil investigation of each lot in the subdivision shall be required by the city.

3. Geotechnical Report: A geotechnical and geological report subject to the standards and requirements provided therein.

4. Grading And Drainage Plan: A grading and drainage plan report which includes stormwater management, erosion, and grading plans describing the methods by which surface water, natural drainage, erosion and sedimentation loss, and hydrologic hazards that will be controlled during and after construction. The plan shall include the following information:

a. The grading plan shall show present topography, including the location and depth of all proposed fills and cuts of finished earth surfaces, and/or use of retaining walls including height, using a contour interval of two feet (2') when grades are zero to twenty nine percent (0 - 29%) and five foot (5') contours when grades thirty percent (30%) and over.

b. The proposed area to be graded shall be clearly delineated on the plan.

c. All calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "rational method", "SCS curve number method", or appropriate equivalent. Data provided should include:

(1) Rainfall depth, duration and distribution;
(2) Watershed slope and drainage area delineation;
(3) Land condition of watershed surface;
(4) Topography of drainage area; and
(5) Soil descriptions in watershed. Erosion calculations shall employ predictions of soil loss sheet erosion using the universal soil loss equation or equivalent. Data to be provided should include factors of:
(A) Rainfall intensity and duration;
(B) Soil erodibility;
(C) Land slope and length of slope or topography;
(D) Condition of the soil surface and land management practices in use; and
(E) Surface cover, grass, pavements, etc.

2. City staff has received a topographic map, a slope map, a grading plan, soil map, and drainage plan
3. Generally, the steep slopes have remained in open space, and the housing is on relatively flat areas.
4. The setback from any cliffside will need to be a minimum of 25'. The townhomes and amenity structure will need to ensure they meet this setback.
5. A grading plan has been provided. Retaining walls are staying under the minimum of 16' tall and the grading appears to be workable.
6. Lots 17 and 16 both have unbuildable areas that need to be clearly labeled on the preliminary plat.
7. Public Utility Easement along the front will need to be accessible and no retaining walls are allowed.
8. Retaining walls are shown on the plan. They are labeled as 3'-10' in height. This meets our code for size. More details on each of these walls will need to be shown on the construction drawings.
9. A slope map has been provided. Several of the lots in the lower section require exceptions for lower size.

10-24-3: DETERMINATION OF APPLICABILITY:

G. Exceptions: Exceptions to the provisions of this chapter may be granted by the city council upon recommendation from the planning commission when:

1. An alternative solution is proposed for the protection of the sensitive land, based on sound and generally accepted engineering and land development principles, and said alternative will result in equal or better protection than development under the standards of this chapter; and is consistent with the purposes of this chapter. The alternative shall also be consistent with the general plan policies affecting sensitive lands;

2. The size of the parcel existing before the effective date of the adoption of this chapter is determined by the planning commission to be too small to effectively apply the provisions of this chapter, and conditions can be added to the project to minimize safety and general welfare concerns.

3. The parcel is zoned for a nonresidential use and the planning commission determines the site requires grading inconsistent with the provisions of this chapter, and conditions can be added to the project to minimize safety and general welfare concerns. (Ord. 2014-6, 5-1-2014)

Staff has reached out to the applicant's engineer and requested a letter to address the above exception. Each lot asking for an exception is under 20% slope except for lot 17 at 24.5%. The City has typically allowed exceptions for lots under 20% based on a sound grading plan. 10%-20% slope is considered moderate slope for home construction. Slopes over 20% are more severe and deserve a high level of scrutiny for any exception based on the grading report. Lots 23 and 24 are. Lot 19 is just over 19% slope, and the grading along the east side is very steep.

Lots 7, 14, 19, 22, 23, and 24	These lots are under 15% slope and staff do not have any concern about the grading as shown
Lot 19	Just over 19% slope, and the grading along the east side is very steep. There is a retaining wall, but the grade of the slope should be labeled on the map of the sensitive lands to ensure it will not exceed 2:1.
Lots 17 and 16	Lot 17 is at 24.58% and Lot 16 is at 19.52%. Each lot has an area that is over 30% slope and should be labeled as a non-buildable area. Staff believes the site engineer needs to address each lot beyond what the grading plan has shown before the City may grant any type of exception. Based on city code, slopes over 30% do not count toward the slope of the lot since these areas are to remain undisturbed unless height and size of the slope is minimal.

Recommendation: Staff recommends the City Council review this application based on standards with Hurricane City Code. Staff would like more information for lots 16, 17, and 19 before approval should be granted.

Sec. 10-37-10. Flag lots.

A flag lot for one single-family dwelling may be allowed to accommodate the development of property that otherwise could not reasonably be developed under the regulations contained in this title or other titles adopted by the City. The primary purpose of this section is not to make development of property easier and more profitable. Rather, it is to serve as a "last resort" for property which may not otherwise be reasonably developed.

A. Factors. When property is subdivided, flag lots shall not be approved by right but may be allowed after considering the following:

1. More than two flag lots with contiguous staffs should be avoided;

2. Whether development of the property in question under normal City land use and subdivision regulations is reasonable and practical; and

3. Creation of a flag lot should not foreclose the possibility of future development of other large interior parcels that are not developable unless a street is extended to them across other adjacent properties.

B. Development standards. When flag lots are permitted, they shall be subject to the following conditions:

1. A flag lot shall be comprised of a staff (narrow) portion that is contiguous with a flag (wide) portion.

2. The staff portion of the lot shall front on and be contiguous to a public street. The minimum width of the staff portion at any point shall be 26 feet. However, a greater staff width for lots within the sensitive lands overlay zone may be required. The maximum length of a staff shall be 500 feet. The maximum grade of a staff shall not exceed 12 percent.

3. The size of the flag portion of a lot shall conform to the minimum lot size requirement of the zone in which the lot is located. Sufficient turnaround space per the fire code shall be provided.

4. No building or structure shall be located within the staff portion of a flag lot.

5. The front yard of a flag lot shall be on the side of the flag portion which connects to the staff. Yard setbacks shall conform to the setback requirements of the zone in which the flag lot is located.

6. A main building shall be located no more than 250 feet from a fire hydrant, measured along a public or private right-of-way or along the staff portion of a flag lot. An easement for any fire hydrant located on private property shall be provided to the City for access to and maintenance of the hydrant.

7. Upon review the City may require installation of curb, gutter and other drainage control measures in the staff portion of a flag lot to prevent runoff from entering neighboring properties.

8. Clear address signage shall be installed and maintained at the street by the owner, including notice that the driveway is a private right-of-way.

9. The new residential structure to be constructed on a flag lot shall be no higher than the average height of all residential structures within a 300-foot radius of the proposed structure.

10. Before a flag lot is approved the joint utility committee must approve the design and location of all facilities needed to accommodate a single-family dwelling. Construction of the approved facilities must be complete before a building permit will be issued for the lot.

HURRICANE
ELEMENTARY

52' PUBLIC ROADWAY
EXTENSION

H-3-1-34-42001121
ZONE: R1-10

OPEN SPACE

H-3-1-27-3201
ZONE: NONE
OWNER: BLM

600 NORTH

H-3-1-33-1110
ZONE: R1-10

RM-2 (TOWNHOME UNITS)

1150 WEST

R1-10 SINGLE
FAMILY LOTS

H-3-1-34-4341
ZONE: R1-10

340 NORTH

EOP

AVG SLOPE -3.29%
AVG SLOPE -1.61%
AVG SLOPE -1.19%
AVG SLOPE -3.97%
AVG SLOPE -1.31%
AVG SLOPE -1.59%
AVG SLOPE -3.32%
AVG SLOPE -7.61%
AVG SLOPE -5.99%
AVG SLOPE -4.01%
AVG SLOPE -3.63%
AVG SLOPE -5.80%
AVG SLOPE -4.88%
AVG SLOPE -9.10%
AVG SLOPE -4.29%
AVG SLOPE -7.11%
AVG SLOPE -9.80%
AVG SLOPE -10.62%
AVG SLOPE -9.44%
AVG SLOPE -6.08%
AVG SLOPE -6.88%
AVG SLOPE -10.31%
AVG SLOPE -7.34%
AVG SLOPE -11.94%
AVG SLOPE -11.91%
AVG SLOPE -12.27%
AVG SLOPE -9.64%
AVG SLOPE -13.89%
AVG SLOPE -6.68%
AVG SLOPE -9.41%
AVG SLOPE -11.39%
AVG SLOPE -4.77%
AVG SLOPE -6.60%
AVG SLOPE -6.24%
AVG SLOPE -18.22%
AVG SLOPE -14.32%
AVG SLOPE -8.28%
AVG SLOPE -10.92%
AVG SLOPE -7.83%
AVG SLOPE -9.18%
AVG SLOPE -6.16%
AVG SLOPE -3.09%
AVG SLOPE -3.59%

3320 3310 3300 3290 3280 3270 3260 3250 3240 3230 3220 3340 3330

LEGEND

SLOPES 10% - 29%

SLOPES > 30%

AVERAGE GRADE ACROSS ENTIRE PARCEL NORTH TO SOUTH = 9.54%

AVERAGE GRADE ACROSS NORTH SECTION (RM-2) NORTH TO SOUTH = 2.54%

AVERAGE GRADE ACROSS SOUTH SECTION (R1-10) NORTH TO SOUTH = 9.19%

MINIMUM LOTS SIZE BASED ON SLOPES < 10% IS UNDERLYING ZONE PER 10-24-6B OF THE SENSITIVE LAND ORDINANCE.

Know what's below. Call before you dig.

GRAPHIC SCALE
100 0 100 200
(IN FEET)

NO.	REVISIONS	BY	DATE

MAINLINE ENGINEERING
321 NORTH MALL DRIVE
SUITE T101
ST. GEORGE, UT 84790

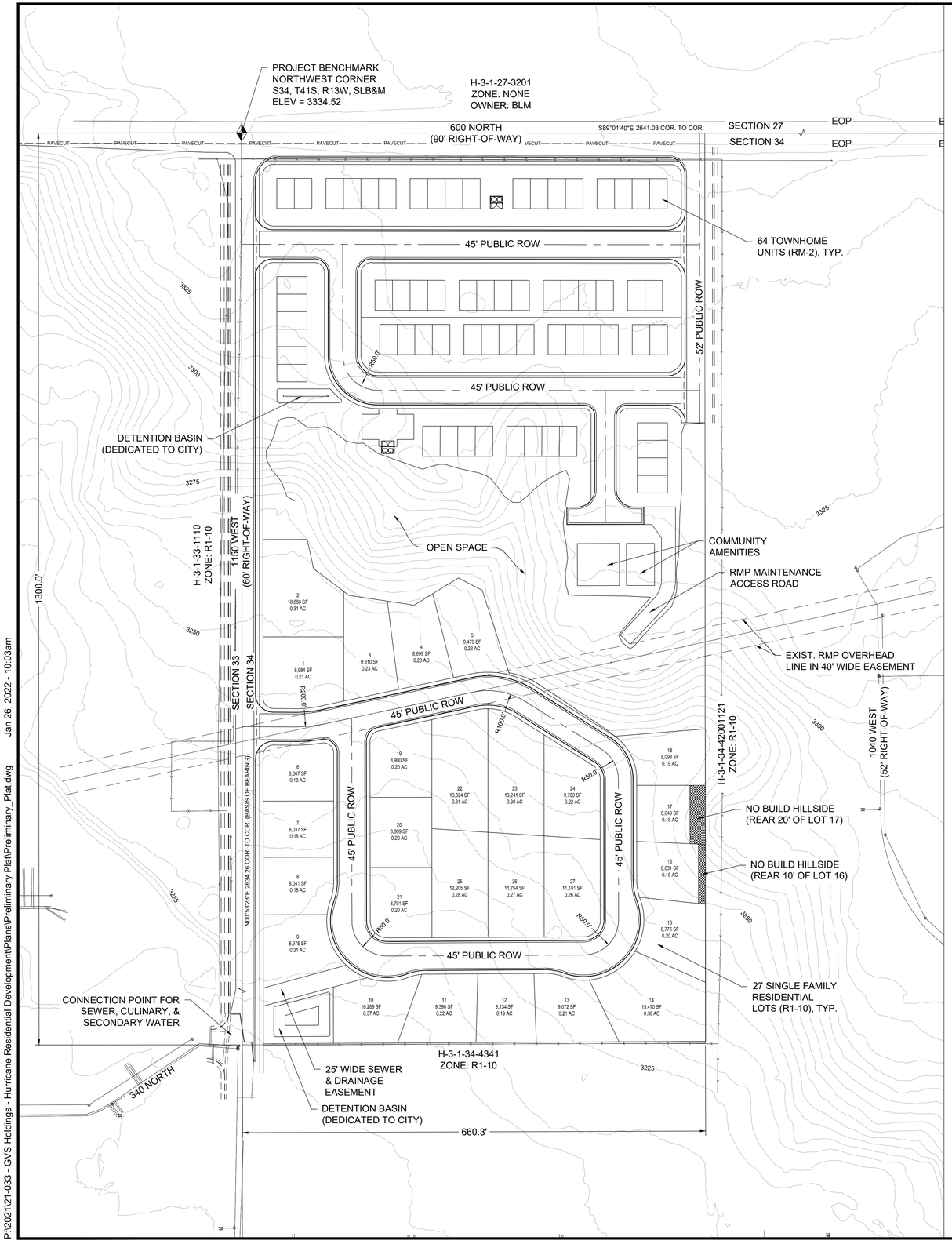
GVS HOLDINGS LLC
PARCEL: H-3-1-34-4400
DWAIN SCHALLENBERGER
748 W. MORBY ST
WASHINGTON, UT 84790

DATE 1/26/22
DRAWN BY TAR
CHECKED BY PBG

Taylor Peters
PROFESSIONAL ENGINEER

PROJECT: MESA COVE
CLIENT PROJ. #: N/A
MAINLINE PROJ. #: 21-033
SHEET NAME: SENSITIVE LANDS SLOPE EXHIBIT
SHEET: EXHIBIT

P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Exhibits\Mesa Cove Sensitive Lands Slope Exhibit.dwg Jan 26, 2022 - 10:12am



PRELIMINARY PLAT OF

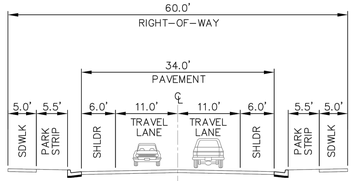
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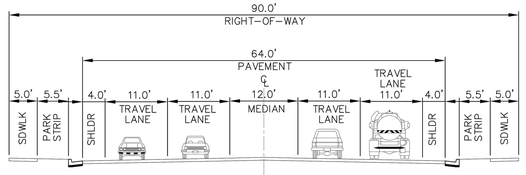
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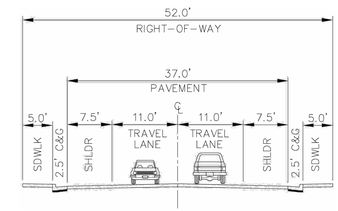
JANUARY, 2022

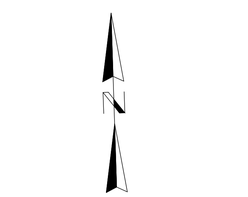
PLAT DATA

LOCATION & BOUNDARY:	THE WEST HALF OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN LESS THE FOLLOWING: ALL OF THE NORTH 37.50 FEET OF THE WEST ONE-HALF OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST OF THE SALT LAKE BASE AND MERIDIAN BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE NORTHWEST CORNER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13WEST OF THE SALT LAKE BASE AND MERIDIAN AND RUNNING THENCE ALONG THE NORTH LINE OF SAID SECTION NORTH 89°51'47" EAST 660.29 FEET; THENCE SOUTH 00°14'22" EAST 37.50 FEET TO A POINT ON A LINE 37.50 FEET DISTANT AND PARALLEL TO SAID NORTH SECTION LINE; THENCE ALONG SAID PARALLEL LINE SOUTH 89°51'47" WEST 660.31 FEET TO A POINT ON THE WEST LINE OF SAID SECTION; THENCE ALONG SAID WEST LINE NORTH 00°12'38" WEST 37.50 FEET TO THE POINT OF BEGINNING.
PARCEL IDS:	H-3-1-34-4400
ZONING:	PDO WITH RM-2 (NORTH) AND R1-10 (SOUTH)
PARCEL AREA:	19.16 ACRES
PLATTED AREA:	19.16 ACRES
TOTAL LOTS:	RM-2 (NORTH): 64 UNITS R1-10 (SOUTH): 27 LOTS TOTAL: 91 UNITS/LOTS
BENCHMARK:	NORTHWEST CORNER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST, SLB&M, AN EXISTING STONE AT ELEVATION 3334.52.
CURRENT OWNERSHIP:	NELSON STERLING D & RANDI C 9447 MECKAILEE CV SANDY, UT 84094-3682
TORTOISE:	THE ENTIRE PARCEL LIES WITHIN DESERT TORTOISE TAKE AREA 7 OF THE RED CLIFFS DESERT RESERVE.
GEOTECH:	ACCORDING TO HURRICANE CITY GIS MAPPING, THE SUBJECT PARCEL HAS A SIGNIFICANT AMOUNT OF SHALLOW BEDROCK AND CALICHE. THERE ARE NO OTHER ANTICIPATED GEOTECHNICAL CHALLENGES. A FULL GEOTECHNICAL INVESTIGATION WILL BE COMPLETED AND ALL RECOMMENDED MITIGATION WILL BE INCORPORATED IN TO THE CONSTRUCTION DRAWINGS.
DRAINAGE:	ALL STORM WATER FOR THE RM-2 SECTION WILL DRAIN TO A DETENTION BASIN IN THE SOUTHWEST CORNER OF THE TOWNHOMES AND STORM WATER IN THE R1-10 SECTION WILL DRAIN TO A DETENTION BASIN IN THE SOUTHWEST CORNER OF THE PROPERTY.
EASEMENTS:	A 10' PUBLIC UTILITY EASEMENT WILL BE ASSIGNED ALONG ALL STREET-SIDE PROPERTY LINES. THIS EASEMENT WILL BE RESERVED FOR BOTH PUBLIC UTILITY AND COMMUNICATIONS INFRASTRUCTURE. A PUBLIC SEWER AND STORM DRAIN EASEMENT WILL BE RECORDED BETWEEN LOTS 9 & 10.
ROAD GRADES:	1150 WEST WILL HAVE A MAXIMUM GRADE OF 18% AS COORDINATED WITH HURRICANE VALLEY FIRE. ALL INTERNAL ROADS FRONTING HOMES WILL HAVE A MAXIMUM GRADE OF 10% OR LESS FOR EMERGENCY SERVICE ACCESS.
HURRICANE CANAL COMPANY:	THERE ARE NO HURRICANE CANAL FACILITIES WITHIN THE LIMITS OF THE PROJECT. THERE ARE NO KNOWN WELLS OR SEEPS ON THE PROPERTY.
WATER AND SEWER SERVICE:	THE PROPERTY CAN BE SERVED BY HURRICANE CITY FOR WATER AND ASH CREEK SPECIAL SERVICE DISTRICT FOR SEWER BASED ON THE INITIAL JUC COMMENTS RECEIVED IN CONJUNCTION WITH THE ZONE CHANGE IN EARLY DECEMBER, 2021.











VICINITY MAP

NO.	REVISIONS
BY	
DATE	

MAINLINE ENGINEERING
321 NORTH MALL DRIVE
SUITE T101
ST. GEORGE, UT 84790

GVS HOLDINGS LLC
PARCEL: H-3-1-34-4400
DWAIN SCHALLENBERGER
748 W. MORBY ST
WASHINGTON, UT 84790

CHECKED BY	PBG
DRAWN BY	TAR
DATE	1/26/22

PROFESSIONAL ENGINEER

PROJECT	MESA COVE	MAINLINE PROJ.#	21-033
CLIENT PROJ.#	N/A	SHEET NAME	PRELIMINARY PLAT

SHEET PRELIM

P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Plans\Preliminary Plat\Preliminary_Plat.dwg Jan 26, 2022 - 10:03am

MAINLINE ENGINEERING

January 26, 2022

Stephen Nelson
Planning Director
Hurricane City
147 N 870 W
Hurricane, UT 84737

RE: Mesa Cove Preliminary Plat and Sensitive Lands Updates and Exception Request

Dear Stephen,

This letter is written in support of the Mesa Cove Preliminary Plat and Sensitive Lands applications submitted January 18, 2022, for presentation to Planning Commission January 26, 2022. Based on comments received from staff and a follow-up phone call between us the morning of January 26, 2022, this letter and supporting materials are being sent to address the following items:

1. Preliminary Plat updates based on Staff findings including the following:
    a. Reduced public rights-of-way for internal circulation roads from 52' to 45'.
    b. Updated current zoning from PUD to PDO.
    c. Indicated that detention basins will be dedicated to the City.
    d. Modified Lot 1 and 2 layouts to have Lot 2 front 1150 West instead of being a flag lot.
    e. Labeled no-build zones on Lots 16 and 17 due to the existing hillside.
2. Slope & Grading Exhibit updated to better show existing slopes and impacts.
3. Request for exception to Ordinance 10-24-3 for slope violations on Lots 5, 16, and 17. For information, Lot 19 was referenced in Staff comments instead of Lot 5 but, upon further review, the comment was intended for Lot 5 and not Lot 19.

Request for Exception to Ordinance 10-24-3

Per Chapter 10-24-3 of the Hurricane City ordinances, an exception to the provisions contained in the Chapter can be sought if:

> *"An alternative solution is proposed for the protection of the sensitive land, based on sound and generally accepted engineering and land development principles, and said alternative will result in equal or better protection than development under the standards of this chapter; and is consistent with the purposes of this chapter. The alternative shall also be consistent with the general plan policies affecting sensitive lands;"*

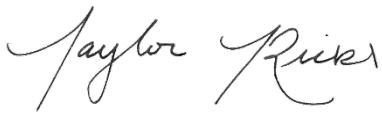
An exception is being sought for Lots 5, 16, and 17 of the Mesa Cove subdivision as shown on the preliminary plat dated January 26, 2022. Each Lot exception is described in detail below.

Lot 5 Exception: The average slope across the width of the lot is 19.19% but the average slope from the back to the front of the lot is only 9.80% as shown on the updated exhibit. An existing 2:1 slope borders the east and north sides of the lot. Lot lines directly adjacent to the hillside will match the existing topography and the remainder of the lot will be lifted (into a fill condition) in order to avoid any cut into the existing 2:1 hillside. The lot will also be graded to slope toward the roadway at the front of the lot at approximately 2% to promote drainage away from the hillside. Using this approach, there will not be any cut into the existing hillside and no vegetation will be removed on the hillside to reduce the likelihood of erosion from the hillside.

Lot 16 & Lot 17 Exceptions: The average slopes shown on the original slope exhibit for Lots 16 and 17 were 24.58% and 19.52% respectively. These slopes were artificially inflated due to a narrow band of very steep slope at the back of these lots. This steep portion has since been labeled as a no-build zone on the preliminary plat and the average slope has been adjusted to reflect the buildable portion only. The average slope is now 18.22% for Lot 16 and 14.32% for Lot 17. In order to create a usable building bad for these lots, the roadway profile and front setbacks were elevated to lift the lot pad several feet above the existing ground. Additionally, a retaining wall varying from 2' to 6' tall will be installed at the back of the two lots' buildable areas in order to maximize the buildable area. No additional vegetation will be removed from the steep hillside in order to reduce erosion.

Proposed grading on each of the three lots described will not exceed 2% without the use of retaining walls and no cut scars or excessive fills are anticipated during grading of these lots. Thank you for your consideration and please respond with any additional concerns.

Sincerely,



tricks@mainline-eng.com

P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Exhibits\Mesa Cove Sensitive Lands Grading Exhibit.dwg Jan 26, 2022 - 10:08am

HURRICANE ELEMENTARY

52' PUBLIC ROADWAY

H-3-1-34-42001121
ZONE: R1-10

HEAVY LINE REPRESENTS ANTICIPATED RETAINING WALL, TYP.

600 NORTH

H-3-1-27-3201
ZONE: NONE
OWNER: BLM

OPEN SPACE (NO GRADING)

TOWNHOME DRAINAGE LOW POINT, PIPED TO 1150 WEST

SINGLE FAMILY LOW POINT DETENTION BASIN PIPED TO 1150 WEST

H-3-1-34-4341
ZONE: R1-10

1150 WEST

RM-2 (TOWNHOME UNITS)

HEAVY LINE REPRESENTS ANTICIPATED RETAINING WALL, TYP.

H-3-1-33-1110
ZONE: R1-10

R1-10 SINGLE FAMILY LOTS

340 NORTH

ROAD SLOPE -4.94%
ROAD SLOPE -2.70%
ROAD SLOPE -1.46%
ROAD SLOPE -1.45%
ROAD SLOPE -2.30%
ROAD SLOPE -4.07%
ROAD SLOPE -4.85%
ROAD SLOPE -0.01%
ROAD SLOPE -8.70%
ROAD SLOPE -18.00%
ROAD SLOPE -6.69%
ROAD SLOPE -5.07%
ROAD SLOPE -8.45%
ROAD SLOPE -7.65%
ROAD SLOPE -10.00%
ROAD SLOPE -5.46%
ROAD SLOPE -3.02%

1 6,984 SF 0.21 AC
2 18,888 SF 0.31 AC
3 9,810 SF 0.23 AC
4 8,699 SF 0.20 AC
5 9,479 SF 0.22 AC
6 8,007 SF 0.18 AC
7 8,037 SF 0.18 AC
8 8,041 SF 0.18 AC
9 8,975 SF 0.21 AC
10 16,289 SF 0.37 AC
11 9,390 SF 0.22 AC
12 8,134 SF 0.19 AC
13 9,072 SF 0.21 AC
14 15,470 SF 0.36 AC
15 8,770 SF 0.20 AC
16 8,031 SF 0.18 AC
17 8,049 SF 0.18 AC
18 8,093 SF 0.19 AC
19 8,900 SF 0.20 AC
20 8,869 SF 0.20 AC
21 8,701 SF 0.20 AC
22 13,324 SF 0.31 AC
23 13,241 SF 0.30 AC
24 9,700 SF 0.22 AC
25 12,226 SF 0.28 AC
26 11,754 SF 0.27 AC
27 11,165 SF 0.26 AC

LEGEND

ANTICIPATED RETAINING WALL (HEIGHT VARIES 3'-10')

MINIMUM ROAD GRADE	0.50%
MAXIMUM ROAD GRADE (1150 WEST)	18.00%
MAXIMUM ROAD GRADE FOR EMERGENCY VEHICLE ACCESS	10.00%

Know what's below. Call before you dig.

GRAPHIC SCALE
100 0 100 200
(IN FEET)

NO.	REVISIONS	BY	DATE

MAINLINE ENGINEERING
MAINLINE ENGINEERING
321 NORTH MALL DRIVE
SUITE T101
ST. GEORGE, UT 84790

GVS HOLDINGS LLC
PARCEL: H-3-1-34-4400
DWAIN SCHALLENBERGER
748 W. MOREY ST
WASHINGTON, UT 84790

DRAWN BY TAR
CHECKED BY PBG
DATE 1/26/22

PROFESSIONAL ENGINEER

PROJECT MESA COVE
CLIENT PROJ. # N/A
MAINLINE PROJ. # 21-033
SHEET NAME SENSITIVE LANDS GRADING EXHIBIT

SHEET EXHIBIT

HURRICANE CITY
UTAH

STAFF COMMENTS

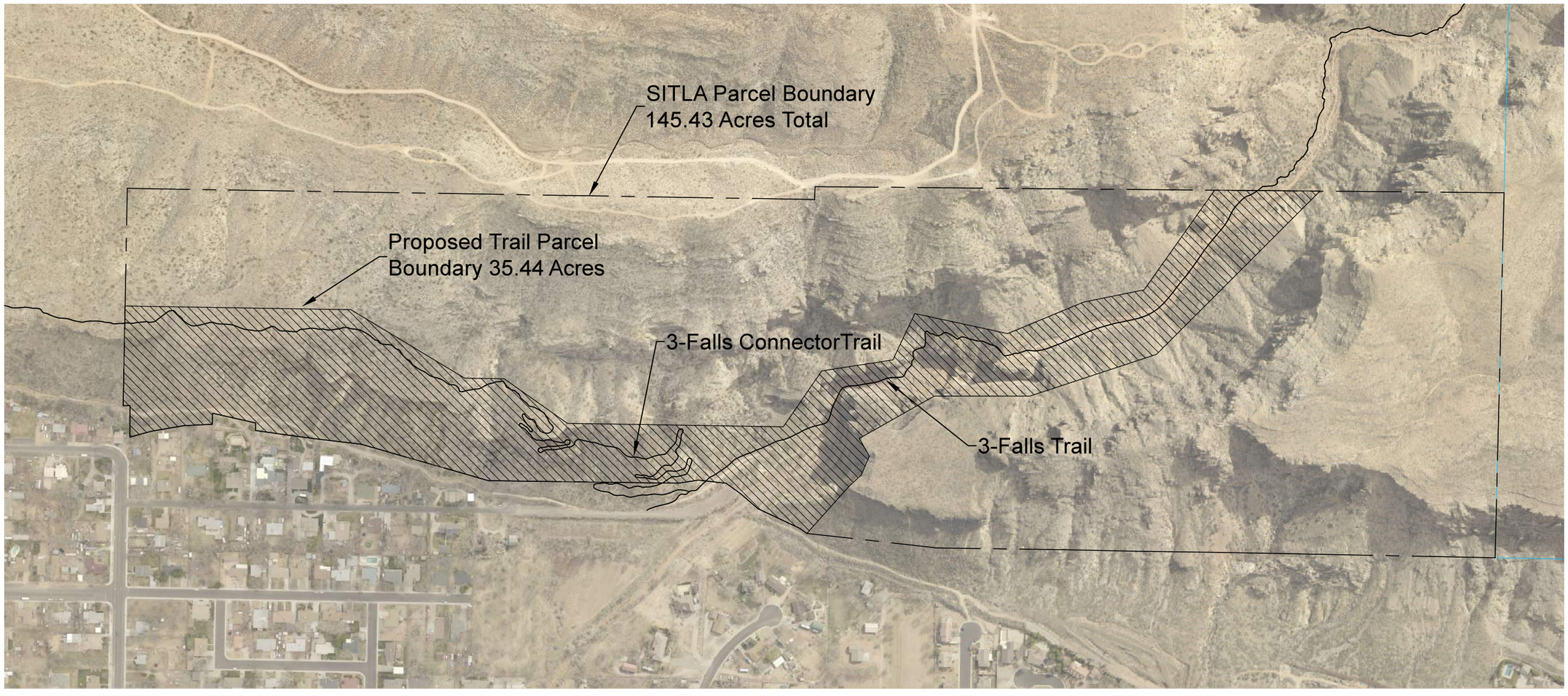
Consideration and possible approval of a **Certificate of Sale and Restrictive Covenant for purchase and acceptance of property from SITLA**.

Discussion:
The Water Department and Engineering Department have been working with SITLA to obtain a well site near the 3-Falls trailhead along with cliffside property for parks and trails use. The well site and associated access easement are to be purchased and the trails and parks property is proposed to be gifted to the city by dedication. SITLA is requiring that the city agree to a certificate of sale for the land purchase, as well as a restrictive covenant that would protect archeological resources in the area, such as the old Hurricane Canal alignment.

Findings:

Recommendation:
Staff is recommending approval of these documents.

Attachments:
1. 3-Falls Trail Exhibit
2. C26990 Hurricane City Wellsite 10.26.21 Purchaser Review
3. Hurricane Restrictive Covenant 10.6.21 Purchaser Review
4. Goulds Wash Well Site Legal Descriptions and Exhibit 9-24-2021



GRAPHIC SCALE

200 0 100 200 400

(IN FEET)
1 inch = 200 ft.

No	Date	By	Revision

HURRICANE CITY ENGINEERING
DEPARTMENT
Hurricane, Utah 84737
Phone (435) 635-2811 / Fax (435) 635-4284

DATE: 5/15/2020 DRAWN: AOL APPROVED: APPROVED SCALE: 1" = 200' JOB NO. JOB NO.

3-FALLS TRAIL EXHIBIT

FOR

SITLA,
HURRICANE, UT

SHEET 1 OF 1

THE STATE OF UTAH
SCHOOL AND INSTITUTIONAL TRUST LANDS ADMINISTRATION
CERTIFICATE OF SALE

Certificate No. 26990
Fund: School

This Certificate of Sale ("**Certificate**"), dated _____ ____, ~~2021~~2022 (the "**Effective Date**"), is between the State of Utah, through the School and Institutional Trust Lands Administration ("**SITLA**") and Hurricane City, a Utah municipality, with its office located at 147 North 870 West, Hurricane, Utah 84737 ("**Purchaser**").

RECITALS

WHEREAS, SITLA manages lands held in trust by the State of Utah for the benefit of certain named beneficiaries ("**Trust Lands**"), pursuant to Sections 6, 8, and 12 of the Utah Enabling Act, Article XX, Section 2 of the Utah State Constitution, and Title 53C of the Utah Code, and

WHEREAS, SITLA holds certain Trust Lands located in Section 2, Township 42 South, Range 13 West, Washington County, State of Utah, and

WHEREAS, SITLA has agreed to sell, and Purchaser has agreed to purchase, those certain Trust Lands described on Exhibit A (the "**Well Site**") and Exhibit B (the "**Trail**", and collectively with the Well Site, the "**Property**").

AGREEMENT

NOW THEREFORE, for and in consideration of the covenants and obligations contained herein, the parties agree as follows:

1. **PURCHASE AND SALE**. Subject to the terms and conditions of this Certificate, SITLA does hereby agree to sell, and the Purchaser does hereby agree to buy, in a manner provided by law and as set forth herein, the Property.

    a. Patent; Plat; Exceptions and Reservations. At Closing, defined below, SITLA shall issue a patent for the Well Site and a dedication plat for the Trail, each subject to the following:

        i. an exception and reservation of all coal, oil and gas and other mineral deposits, along with the right for SITLA or other authorized persons or entities to prospect for, mine, and remove such deposits;
        ii. any valid, existing rights of way of and easements of any kind, including, without limitation, Easement 1886 with Hurricane City, Right of Entry No. 6918, and Right of Entry No. 6931;

iii. any right, interest, reservation or exception appearing of record, including, without limitation, the restrictive covenant described below;
iv. any exceptions and reservations contained in federal patents and clear lists;
v. all rights of way for ditches, tunnels, and telephone and transmission lines that have been or may be constructed by the United States as provided by statute;
vi. an exception and reservation of all water rights and shares of any kind; and
vii. an exception and reservation of all sub-surface void and pore spaces in the Property whether naturally existing or created upon the removal of coal, oil and gas and other mineral deposits, and the right to reasonably access and use the Property and to use those sub-surface void and pore spaces for any purpose.

b. Purchase Price and Fees.

i. At Closing, Purchaser shall pay SITLA Three Thousand Six Hundred Eighty Dollars and No Cents ($3,680.00) (the "**Purchase Price**").

2. **CLOSING**.

a. **Closing.** The closing of the transaction contemplated by this Certificate, including the payment of the Purchase Price, and issuance of a patent and dedication plat (the "**Closing**") will occur on or before _____ ___, ~~2021~~2022, or upon such other date prior thereto as the parties agree in writing (the "**Closing Date**"). Purchaser and SITLA agree that Closing on or before the Closing Date is a material inducement to SITLA entering into this Certificate. If the transaction contemplated in this Certificate does not close on or before the Closing Date, this Certificate will automatically terminate at 11:59 p.m. on the Closing Date, unless SITLA elects in writing, in its reasonable discretion, to extend the Closing Date.

b. **SITLA's Obligations**. At Closing, subject to Purchaser performing all of its obligations under this Certificate, including payment in full of the Purchase Price, SITLA shall issue to Purchaser a patent for the Well Site and a dedication plat for the Trail, which patent and plat will contain the reservations and exceptions in this Certificate. The patent will be in the form attached hereto as Exhibit C.

c. **Purchaser's Obligations**. At Closing, subject to SITLA performing all of its obligations under this Certificate, Purchaser shall pay to SITLA in cash or by wire transfer of ready funds, the Purchase Price along with other amounts due as set forth in this Certificate.

d. **Possession**. SITLA shall deliver possession of the Property to Purchaser upon Closing. All risk of loss, destruction and expenses of the Property will be borne by

SITLA until the date of possession at which time all risk and expenses will be borne by the Purchaser.

3. **TAXES**. Purchaser hereby acknowledges and agrees that the Property has not been subject to taxes during the period it was held by the State, but that such Property may be subject to general and special real estate and other ad valorem taxes and assessments, including Farmland Assessment (Greenbelt) rollback taxes, and charges for utilities, if any, and other charges, all of which charges, when applicable, are the sole responsibility of Purchaser.

4. **INSPECTION; NO WARRANTIES**. Purchaser acknowledges that Purchaser is acquiring the Property subject to all existing laws, ordinances, rules and regulations and that Purchaser has had the opportunity to inspect the Property to determine the condition and suitability of the Property for Purchaser's intended purposes, and for the presence or absence of any hazardous material or condition. Purchaser agrees that Purchaser is acquiring the Property in an "As-Is" condition with all faults and defects, including latent and patent defects, and neither SITLA's agents, representatives or employees have made any representations or warranty as to title, zoning, legal or physical access, location or availability of utilities, soil conditions, floodplains and watercourses, the presence or absence of any hazardous material or condition, or other physical or legal attributes of the Property or Purchaser's ability to obtain approvals for Purchaser's development of the Property, or the physical conditions of the Property. **SITLA HEREBY DISCLAIMS ANY AND ALL WARRANTIES WITH RESPECT TO THE PROPERTY IT IS CONVEYING, AND PURCHASER ASSUMES THE RISK THAT ADVERSE PAST, PRESENT OR FUTURE PHYSICAL CHARACTERISTICS AND CONDITIONS OF THE PROPERTY WHICH PURCHASER IS ACQUIRING UNDER THIS CERTIFICATE MAY NOT HAVE BEEN REVEALED BY INSPECTION OR INVESTIGATION.**

5. **ENVIRONMENTAL RELEASE**. Purchaser expressly assumes the risk that any Hazardous Substance (defined below) is or hereafter may be located on the Property, excepting use by the State or its lessees of void spaces reserved herein. **PURCHASER HEREBY FOREVER RELEASES AND DISCHARGES THE STATE, SITLA AND ANY SUBSIDIARY OR AFFILIATE OF THE STATE, AND THEIR RESPECTIVE DIRECTORS, OFFICERS (APPOINTED AND ELECTED), EMPLOYEES, BOARD OF TRUSTEES, BENEFICIARIES, REPRESENTATIVES AND AGENTS, FROM AND AGAINST ANY AND ALL JUDGMENTS, CLAIMS, EXPENSES (INCLUDING ATTORNEYS' AND OTHER CONSULTANTS' REASONABLE FEES AND COSTS), CAUSES OF ACTION, DAMAGES, LOSSES, LIABILITIES, INCLUDING WITHOUT LIMITATION, (A) ALL FORESEEABLE AND ALL UNFORESEEABLE CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY ARISING OUT OF THE USE, GENERATION, STORAGE, DISPOSAL, RELEASE OR THREATENED RELEASE OF HAZARDOUS MATERIALS ON THE PROPERTY AND (B) THE COST OF ANY REASONABLY NECESSARY INVESTIGATION, REPAIR, CLEANUP, REMEDIATION OR DETOXIFICATION OF THE PROPERTY AND OTHER AFFECTED PROPERTY AND THE PREPARATION OF ANY CORRECTIVE ACTION, CLOSURE OR OTHER REQUIRED PLANS OR REPORTS TO THE FULL EXTENT THAT SUCH ACTIONS ARE ALLEGED TO BE ATTRIBUTABLE, DIRECTLY OR INDIRECTLY, TO THE PRESENCE OR USE, GENERATION, STORAGE, RELEASE, THREATENED**

RELEASE, OR DISPOSAL OF HAZARDOUS MATERIALS BY ANY PERSON AND RELATE TO OR INVOLVE THE PROPERTY.

a. "Hazardous Substance" as used herein means: (a) any substance, material, or waste that is included within the definitions of "hazardous substances," "hazardous materials," "hazardous waste," "toxic substances," "toxic materials," "toxic waste," or words of similar import in any Environmental Law; (b) those substances listed as hazardous substances by the United States Department of Transportation (or any successor agency) (49 C.F.R. 172.101 and amendments thereto) or by the Environmental Protection Agency (or any successor agency) (40 C.F.R. Part 302 and amendments thereto); and (c) any substance, material, or waste that contains petroleum or is petroleum, petroleum-related, or a petroleum by-product, asbestos or asbestos-containing material, polychlorinated biphenyls, flammable, explosive, radioactive, freon gas, radon, or a pesticide, herbicide, or any other agricultural chemical, except as otherwise provided by law.

6. **CULTURAL, ARCHAEOLOGICAL, PALEONTOLOGICAL AND ANTIQUITIES RESOURCES**. Conveyance of the Property will be subject to that certain restrictive covenant dated _____ ___, ~~2021~~2022 recorded on _____ ___, ~~2021~~2022 at instrument number _____ of the Washington County Recorder's Office. Pursuant to all applicable laws regarding cultural, archaeological, paleontological, and antiquities resources, and pursuant to Utah Administrative Code R850-60-900, upon discovery of a site, historic property, remains, antiquities, or critical paleontological resources, whether before or after Closing, Purchaser shall immediately cease all activities on the Property until such time as the discovery has been evaluated and treated to the Director of SITLA's satisfaction. Any and all discoveries remain the property of the State of Utah. These obligations will survive the Closing and issuance of a patent. Definitions in this clause:

"Antiquities" UCA 76-6-901(1)
"Critical Paleontological Resources" UCA 79-3-102(4)
"Cultural Resources" R850-1-200(8)
"Historic Properties" UCA 9-8-302(5)
"Remains" UCA 9-9-402(11)
"Site":
Archaeology UCA 9-8-302(17), R850-1-200(31)
Paleontological UCA 79-3-102(14), R850-1-200(20)
"Specimen":
Archaeology UCA 9-8-302(18), R850-1-200(33)
Paleontological UCA 79-3-102(15)

7. **PURCHASER'S REPRESENTATIONS AND WARRANTIES**. Purchaser represents and warrants to SITLA as of the Effective Date and the date of Closing, that:

a. Purchaser is an entity in good standing and licensed to do business in the State of Utah;

b. Purchaser has full power and authority to execute and deliver this Certificate and to perform its obligations hereunder and has obtained all necessary company authorizations to do so;

c. The Purchaser's signatory to this Certificate has all power and authority to execute this Certificate on behalf of Purchaser;

d. The execution, delivery, and performance by Purchaser of this Certificate does not and will not violate, nor be in conflict with, any agreement or instrument to which Purchaser is a part or is bound, or any judgment, decree, order, statute, rule or regulation applicable to Purchaser;

e. To Purchaser's knowledge, there are no claims, actions, suits, or other legal proceedings by any governmental department or agency, or any other entity or person, including any threatened claims or demands in writing, pertaining to the transactions contemplated by this Certificate;

f. Purchaser has no liability or obligation to pay fees or commissions to any broker, finder, or agent with respect to its acquisition of the Property; and

g. Purchaser shall pay all taxes, assessments and fees assessed against the Property.

8. **DEFAULT**. If either party defaults in the performance of any of its obligations under this Certificate and upon failure to cure the default within thirty (30) days after written notice of default is given to the defaulting party, then the non-defaulting party may terminate this agreement and pursue any other remedies afforded it by law or in equity, including specific performance.

9. **INDEMNIFICATION BY PURCHASER**. In addition to any other indemnity obligations of Purchaser under this Certificate, Purchaser further agrees to protect, indemnify and hold harmless the State, including SITLA, and their respective directors, officers (appointed and elected), employees, board of trustees, beneficiaries, representatives and agents from and against all judgments, claims, demands, expenses, damages, losses, liabilities and causes of action of every kind or character on account of bodily injuries, death, or damage to property arising because of, for, out of, or in any way connected with Purchaser's performance of this Certificate, including, without limitation, a breach of any of Purchaser's representations or warranties. The Purchaser shall defend all suits brought upon such claims and pay all costs and expenses incidental thereto, but the State, SITLA, and the other indemnified parties have the right, at its option, to participate in the defense of any such suit without relieving the Purchaser of any obligation hereunder. Such duty of indemnification includes, but is not limited to, damage, liability, or loss pursuant to all federal and state environmental laws, strict liability and common law. These obligations will survive the Closing and issuance of a patent.

10. **NOTICES**. All notices, requests, demands, and other communications under this Certificate must be in writing and must be given by (a) established express delivery service which maintains delivery records, (b) hand delivery, or (c) certified or registered mail, postage prepaid, return receipt requested, to the applicable party at the following address, or at such other address as a party may designate by written notice in the above manner:

To SITLA:

State of Utah School and Institutional Trust Lands Administration

675 East 500 South, Suite 500
Salt Lake City, Utah 84102
Attention: Planning and Development

To Purchaser:

Hurricane City
147 North 870 West
Hurricane, Utah 84737

Communications may also be given by fax or electronic mail, provided the communication is concurrently given by one of the above methods. Notices are effective upon receipt, or upon attempted delivery if delivery is refused or if delivery is impossible because of the recipient's failure to provide a reasonable means for accomplishing delivery.

11. **MISCELLANEOUS**.

a. **Binding Terms**. It is understood that the terms of this Certificate are to apply to and bind the heirs, executors, administrators, successors, and assigns of the respective parties hereto.

b. **Time of the Essence**. Time is of the essence of this Certificate and each and all of its terms, covenants, or conditions in which performance are a factor.

c. **Assignment**. This Certificate may be assigned pursuant to statute and rule, but the assignment does not relieve the assignor from responsibility under the original contract.

d. **No Merger**. The assurances, obligations, and covenants of the Purchaser will not merge with but will survive the delivery of the patent to the Purchaser.

e. **Entire Agreement**. This Certificate and the exhibits and schedules attached hereto constitute the entire agreement between the parties hereto with respect to the subject matter hereof, incorporates all prior agreements, and may only be modified by a subsequent writing duly executed by the parties.

f. **Waivers**. No waiver of any of the provisions of this Certificate constitutes a waiver of any other provision, whether or not similar, nor is any waiver a continuing waiver. Except as expressly provided in this Certificate, no waiver is binding unless executed in writing by the party making the waiver.

g. **Governing Law**. This Certificate is to be construed and enforced in accordance with, and governed by, the law of the State of Utah without regard to its choice or conflicts of laws provisions that may refer the interpretation hereof to the laws of another state. Any action, legal or equitable, arising from or in connection with this Certificate, must be conducted exclusively in the Third District Court for the State of Utah, and each party hereby submits to the exclusive jurisdiction of such court, subject to the prior exhaustion of administrative remedies.

h. **Captions**. The captions in this Certificate are for convenience only and do not constitute a part of the provisions hereof.

i. **Applicability**. If any term or provision of this Certificate or the application of it to any person, entity or circumstance, to any extent, be invalid and unenforceable, the remainder of this Certificate or the application of such term or provision to persons or circumstances other than those as to which it is invalid or unenforceable will not be affected thereby, and each term and provision of this Certificate will be valid and enforced to the extent permitted by law.

j. **Numbering of Days**. If the last day of any time period stated herein falls on a Saturday, Sunday or federal legal holiday, then such time period is extended to the next succeeding day which is not a Saturday, Sunday or a federal legal holiday.

k. **Allocation of Professional Fees**. Regardless of whether the transaction contemplated by this Certificate is consummated, each respective party is responsible for its own legal, accounting, and other professional fees incurred in relation to this Agreement or the transaction contemplated by this Agreement.

l. **No Waiver of Governmental Immunity**. Notwithstanding anything in this Certificate to the contrary, by entering into this Certificate, neither the State of Utah nor SITLA has waived, limited or modified any governmental immunity from suit.

m. **Counterparts**. This Certificate may be executed in one or more counterparts, including by electronic portable document signature, each of which will be deemed an original, and together constitute the same Certificate whether or not all parties execute each counterpart.

[Remainder of Page Intentionally Left Blank. Signature Page to Follow.]

IN WITNESS WHEREOF, the parties hereto have caused this Certificate to be executed the day and year first above written.

STATE OF UTAH
SCHOOL AND INSTITUTIONAL TRUST LANDS ADMINISTRATION

By: _____
Name: David Ure
Title: Director

APPROVED AS TO FORM:

By: _____
Special Assistant Attorney General

HURRICANE CITY:

_____
John Bramall, Mayor

(Date) (County)

EXHIBIT A

WELL SITE

Commencing at the Northwest corner of Section 2, Township 42 South, Range 13 West, Salt Lake Base and Meridian; thence South 89°00'26" East 1563.19 feet along the section line; thence South 2225.23 feet to the point of beginning, and running thence South 32°48'47" East 200.00 feet; thence South 57°11'13" West 200.00 feet; thence North 32°48'47" West 200.00 feet; thence North 57°11'13" East 200.00 feet to the point of beginning.

Contains 40,000 square feet or 0.92 acres, more or less.

EXHIBIT B

TRAIL DESCRIPTION

[Insert Description]

EXHIBIT C

Form of Patent

STATE OF UTAH PATENT NO. _____

WHEREAS, Hurricane City a Utah municipality, heretofore purchased from the State of Utah School and Institutional Trust Lands Administration, the lands hereinafter described, pursuant to the laws of said State; and

WHEREAS, Hurricane City has paid for said lands, pursuant to the conditions of said sale, the sum of _____ Dollars and _____ Cents ($_____), and all legal interest thereon accrued, as fully appears by the certificate of sale.

NOW THEREFORE I, SPENCER J. COX, Governor, by virtue of the power and authority vested in me by the laws of the State of Utah, do issue this PATENT, in the name of the State of Utah, hereby quitclaiming, without warranty of any kind, unto the said Hurricane City, the tract or parcel of land situated in the County of Washington, State of Utah, more particularly described in **Exhibit A** attached hereto and incorporated by reference.

TO HAVE AND TO HOLD the above described and granted premises unto Hurricane City, and to its successors and assigns forever.

[Insert exceptions and reservations as provided in the Certificate of Sale]

[Insert restrictive covenant and information]

[Signature blocks omitted in exhibit.]

END

Restrictive Covenant

This restrictive covenant ("**Restrictive Covenant**") is entered into as of the ___ day of _____, 2022 by the State of Utah School and Institutional Trust Lands Administration ("**SITLA**").

WHEREAS, SITLA is the owner of that certain tract of land located in Section 2, Township 42 South, Range 13 West, in Washington County, Utah more particularly described on Exhibit A (the "**Property**");

WHEREAS, Hurricane City desires to purchase the Property from SITLA for use as a hiking trail and water well site; and

WHEREAS, SITLA desires to record this Restrictive Covenant against the Property prior to sale so that a certain prehistoric archaeological sites known as the Hurricane Canal is protected from and by all future owners.

NOW THEREFORE, SITLA hereby causes this Restrictive Covenant to be entered into and recorded against the Property.

1. Restrictive Covenant. SITLA hereby subjects the Property and all future owners to the restrictions and covenants set forth on Exhibit B attached hereto and made a part hereof. The map set forth on Exhibit C attached hereto and made a part hereof shows the general location of the Site, as defined in Exhibit B.

In witness whereof, the SITLA has caused this restrictive covenant to be entered into the day and year first written above.

State of Utah
School and Institutional Trust Lands Administration

By: _____
Name: _____
Title: _____

STATE OF UTAH)
:ss.
COUNTY OF SALT LAKE)

On this ____ day of _____, 2022, personally appeared before me _____, the _____ of the State of Utah School and Institutional Trust Lands Administration, who acknowledged that he, being duly authorized, did execute the foregoing instrument on behalf of the State of Utah School and Institutional Trust Lands Administration.

Given under my hand and seal this _____ day of _____, 2022.

_____
Notary Public

EXHIBIT A

The Property

[INSERT LEGALS]

END

EXHIBIT B

Restrictive Covenant

EXHIBIT C

Location of the Site

ALPHA ENGINEERING
43 South 100 East, Suite 100
St George, Utah 84770
T 435.628.6500
F 435.628.6553
alphaengineering.com

EXHIBIT "A"

WELL SITE, DEED RESTRICTION AREA, AND EASEMENT
3437-TR-HV
(September 23, 2021)

WELL SITE

Commencing at the Northwest corner of Section 2, Township 42 South, Range 13 West, Salt Lake Base and Meridian; thence South 89°00'26" East 1563.19 feet along the section line; thence South 2225.23 feet to the point of beginning, and running thence South 32°48'47" East 200.00 feet; thence South 57°11'13" West 200.00 feet; thence North 32°48'47" West 200.00 feet; thence North 57°11'13" East 200.00 feet to the point of beginning.

Contains 40,000 square feet or 0.92 acres, more or less.

DEED RESTRICTION AREA

Commencing at the Northwest corner of Section 2, Township 42 South, Range 13 West, Salt Lake Base and Meridian; thence South 89°00'26" East 1563.19 feet along the section line; thence South 2225.23 feet to the point of beginning, and running thence South 32°48'47" East 200.00 feet; thence South 57°11'13" West 50.00 feet; thence North 32°48'47" West 200.00 feet; thence North 57°11'13" East 50.00 feet to the point of beginning.

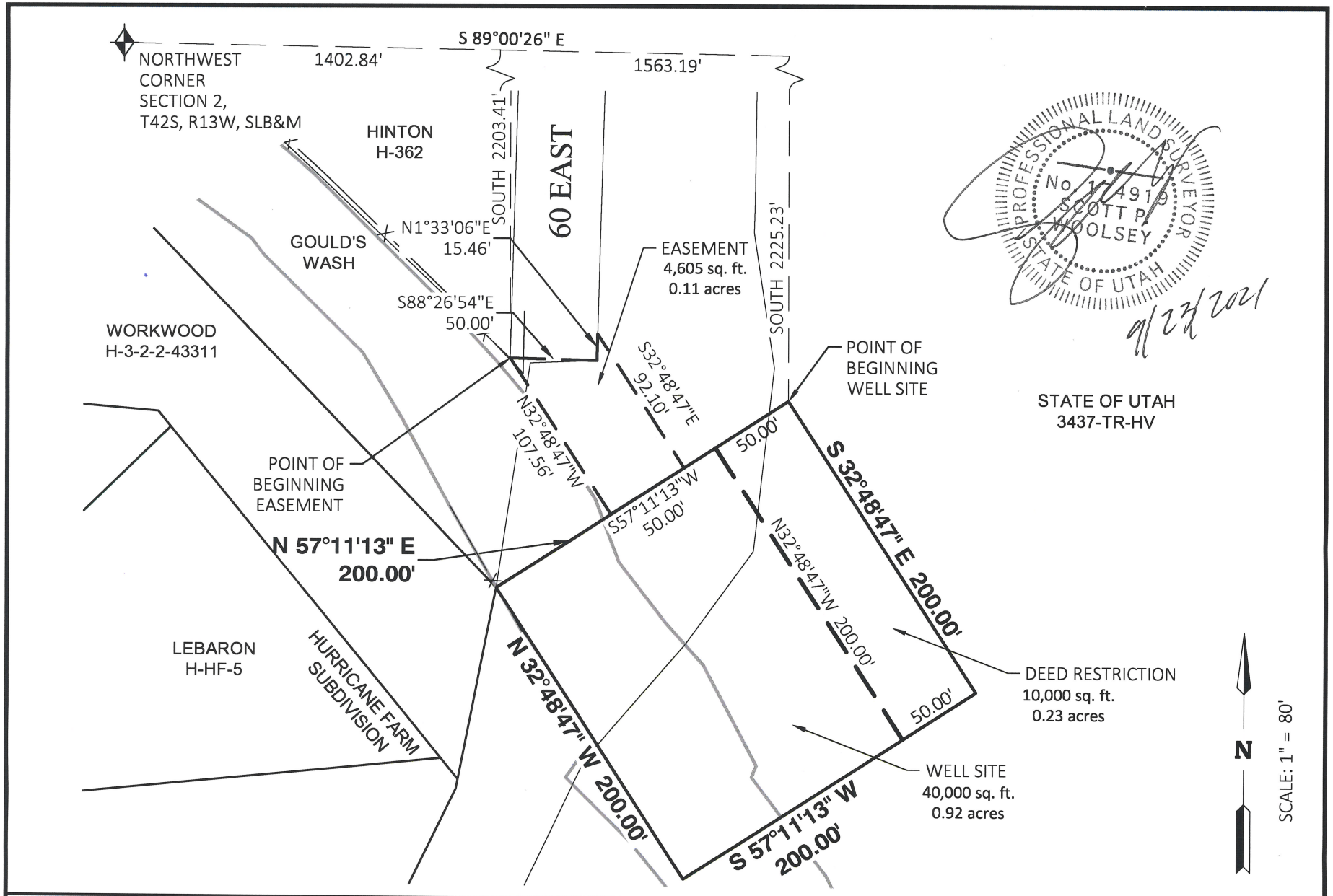
Contains 10,000 square feet or 0.23 acres, more or less.

50.0' WIDE EASEMENT

Commencing at the Northwest corner of Section 2, Township 42 South, Range 13 West, Salt Lake Base and Meridian; thence South 89°00'26" East 1402.84 feet along the section line; thence South 2203.41 feet to the point of beginning, said point being the southeast corner of Lot 16, Hurricane Local Survey, and running thence South 88°26'54" East 50.00 feet; thence North 01°33'06" East 15.46 feet; thence South 32°48'47" East 92.10 feet; thence South 57°11'13" West 50.00 feet; thence North 32°48'47" West 107.56 feet to the point of beginning.

Contains 4,605 square feet or 0.11 acres, more or less.

PROFESSIONAL LAND SURVEYOR
PRO. No. 7719
SCOTT P. WOOLSEY
STATE OF UTAH
9/23/2021



WELL SITE, DEED RESTRICTION AREA, AND ACCESS EASEMENT EXHIBIT "B"

046-185	RS 9/23/2021

ALPHA ENGINEERING
43 South 100 East, Suite 100 • St George, Utah 84770
T: 435.628.6500 • F: 435.628.6553 • alphaengineering.com

HURRICANE CITY
UTAH

STAFF COMMENTS

Consideration and possible decision on the **flood modeling approach for Gould Wash**.

Discussion:
The Utah Division of Emergency Management is partnering with FEMA and local communities to update floodplain mapping in Washington County. In their analysis, the project team has identified flood risk that is currently underrepresented on the effective flood maps. In order to proceed with the modeling effort, the Division needs the city to choose between the Regulatory Floodway Option and the Administrative Floodway Option. This request from the Division requires some homework on the city's end in order to understand the risk, what the options mean, and how this decision will affect the citizens. This item has come before the Council previously and several questions were asked, and the answers to those questions are addressed in a few emails and attachments from Jamie Huff from the Division.

Findings:
The current effective mapping is based on a hydraulic analysis that acknowledges that certain reaches of Gould Wash in Hurricane proper will not contain the 100-year flood. Although this acknowledgement exists, the flood risk is not identified on the maps. The recent modeling also identifies the capacity of the wash being exceeded and flood waters exiting the channel and flowing through town and then entering back into the wash further downstream. Responsible floodplain management dictates that known flood risks should be managed through proper floodplain management practices.

Recommendation:
It is my recommendation as the city's Floodplain Administrator that the city choose the Regulatory Floodway Option for the same reasons that have been stated by the Utah Division of Emergency Management.

Attachments:
1. 11-04-2021 Email from Jamie Huff
2. 12-13-2021 Email from Jamie Huff
3. Gould Wash Community Presentation 8-26-2021
4. Hurricane Admin Floodway Inquiry Response_v3
5. Hurricane City_Gould Wash_Meeting_Notes_8-26-2021
6. Hydraulics Analysis Report

Arthur Lebaron

From: Jamie Huff <jhuff@utah.gov>
Sent: Thursday, November 4, 2021 5:44 PM
To: Arthur Lebaron
Cc: Angela Crowther; Hurwitch, Brie
Subject: Re: Hurricane Flood Plain Modeling
Attachments: Hurricane Admin Floodway Inquiry Response_v3.pdf

Arthur,

I apologize for the delay in reply. Because there are no other Administrative Floodway's in Utah we wanted to seek some additional guidance from FEMA. Please keep in mind Administrative Floodways would be a new mapping process for us. There does not appear to be any clear guidance developed, so we may learn more as a model is produced and questions arise. The attached information is in no way an exhaustive list of issues, but we hope this helps aid in the initial decisions being made.

Based on your questions attached are some initial responses, but again, may not be an exhaustive list of issues.

Please let me know if you would like to discuss further or have any further questions.

Regards,

Jamie Huff, CFM
Risk MAP Program Manager
Utah Division of Emergency Management
Taylorsville State Office Building
4315 S 2700 W., 2nd Fl., Suite 2200
Taylorsville, UT 84129-2128
Phone: 385-549-0746
Email: jhuff@utah.gov

(Please note address and phone number changes)

On Tue, Oct 19, 2021 at 6:27 AM Arthur Lebaron <arthur@cityofhurricane.com> wrote:

> Jamie,
>
> After the last discussion, the City Council asked me to advise them on which option we should choose: Regulatory, or Administrative (Planning).
>
> Based on what I know now, I would advise them to choose the regulatory floodway option but I had a few follow-up questions for you:

1. What is your preferred option, and what would your reason be?
2. Which option encumbers more land with the requirement to do a hydraulic analysis?

Thanks,

Arthur LeBaron, PE, PLS, CFM

City Engineer

147 North 870 West

Hurricane, UT 84737

435-635-2811 x113

arthur@cityofhurricane.com

Arthur Lebaron

From: Jamie Huff <jhuff@utah.gov>
Sent: Monday, December 13, 2021 11:26 AM
To: Arthur Lebaron; John Bramall; Kaden DeMille; Mike Vercimak; David Sanders; Nanette Billings; kdtervort@gmail.com; Council
Cc: Hurwitch, Brie; Tom Wright; Newton, Brady; Angela Crowther; Chaney, Matt
Subject: Re: Gould Wash Meeting Notes 8/26/2021
Attachments: Hydraulics Analysis Report.pdf; Gould Wash Community Presentation 8-26-2021.pdf; Hurricane City_Gould Wash_Meeting_Notes_8-26-2021.pdf; Hurricane Admin Floodway Inquiry Response_v3.pdf

Greetings Hurricane City,

This is a follow up to the City Council working meeting held on October 7, 2021 regarding flood modeling approaches for Gould Wash. We are requesting feedback from the city on which modeling option you want to choose in order to take the next step in this study. The choices are: 1) a Regulatory Floodway Option or 2) an Administrative Floodway Option.

As discussed at the meeting, this study--requested by the city--has revealed that flood risk is greatly underrepresented on the effective flood maps. This underrepresentation stems from the methods used in the older study (detailed in the 2006 Hydraulic Report for Gould Wash (Citation from the 2006 Effective Hydraulic Report - Gould Wash model discussion begins on page 21: Section 2.4.6)). Additionally a recent Hydraulic Analysis performed by Bowen Collins and Associates for an NRCS project is in agreement with our current analysis. Please see the 2006 Effective Hydraulic Report attached for your review. In addition to the report, I have attached information provided to the Hurricane City Engineer including more detail on the reasons why our team recommends the Regulatory Floodway option vs. the Administrative Floodway Option.

We understand either model option is likely to result in a significant change to the identified flood risk in Hurricane. We are aware of ongoing discussions to mitigate the increased risk, but the outcome of the NRCS project is not yet certain. The project has not yet been approved for construction, nor is construction occurring which will take several years to complete. In the meantime, this increased flood risk exists today, so our flood study needs to continue.

We have appreciated the city's support during this study effort and welcome continued conversation as the study progresses. Please let us know if there is any additional information we can provide in order for you to make an informed decision about the study model that best meets the city's needs.

Regards,

Jamie Huff, CFM
Risk MAP Program Manager
Utah Division of Emergency Management
Phone: 385-549-0746
Email: jhuff@utah.gov

On Fri, Sep 24, 2021 at 11:45 AM Jamie Huff <jhuff@utah.gov> wrote:
> Hi Arthur,

I am checking in to see if any questions have come up in your discussions or if you need any support. I believe you might have already had your council meeting on this subject and I am a little curious how it went.

Regards,

Jamie Huff, CFM
Risk MAP Program Manager
Utah Division of Emergency Management
Taylorsville State Office Building
4315 S 2700 W., 2nd Fl., Suite 2200
Taylorsville, UT 84129-2128
Phone: 385-549-0746
Email: jhuff@utah.gov

(Please note address and phone number changes)

On Fri, Sep 3, 2021 at 9:27 AM Arthur Lebaron <arthur@cityofhurricane.com> wrote:

> Thanks Jamie. We will review and respond.
>
> ---
>
> **From:** Jamie Huff <jhuff@utah.gov>
> **Sent:** Thursday, September 2, 2021 4:20 PM
> **To:** Arthur Lebaron <arthur@cityofhurricane.com>; John Bramall <jbramall@cityofhurricane.com>; Kaden DeMille <kaden@cityofhurricane.com>; Mike Vercimak <mike@cityofhurricane.com>; David Sanders <sanders@cityofhurricane.com>; clark@cityofhurricane.com
> **Cc:** Bob Carey <bcarey@utah.gov>; Hurwitch, Brie <brie.hurwitch@aecom.com>; Tom Wright <tom.c.wright@aecom.com>; Newton, Brady <brady.newton@aecom.com>; Angela Crowther <acrowther@utah.gov>; Chaney, Matt <matt.chaney@aecom.com>
> **Subject:** Gould Wash Meeting Notes 8/26/2021
>
> Greetings Hurricane City,
>
> We wanted to thank you for meeting with us virtually on August 26, 2021 to discuss the ongoing floodplain study on Gould Wash. As a follow-up to our meeting, I wanted to provide you with the list of attendees, detailed notes, and the slide presentation for your reference. I have also included links at the end of the notes to identify guidance documents we referenced during the discussion.
>
> As a summary we are seeking your decision on how to model and revise the floodway on Gould Wash. As the city is aware, Utah DEM is currently performing a study within Washington County on 110 stream miles. Gould Wash is included in this study, as requested by the city in 2018. During our initial analysis of the flood risk on Gould Wash, we have determined the current effective flood model does not meet current FEMAs mapping standards and it will need to be updated. We are seeking your decision on how to model the revised Floodway. We have two options to consider: 1. a Regulatory Floodway – preferred option and 2. an Administrative (Planning) Floodway – less preferred

option. Both have advantages and disadvantages and both have a strong possibility to supersede the current effective floodway and any associated effective LOMRs the city is currently regulating to.

We ask that you please review the attached information, feel free to discuss internally and provide your response by September 30, 2021. If additional meetings or coordination is necessary to provide additional clarification, please do not hesitate to contact me.

Regards,

Jamie Huff, CFM

Risk MAP Program Manager

Utah Division of Emergency Management

Taylorsville State Office Building

4315 S 2700 W., 2nd Fl., Suite 2200

Taylorsville, UT 84129-2128

Phone: 385-549-0746

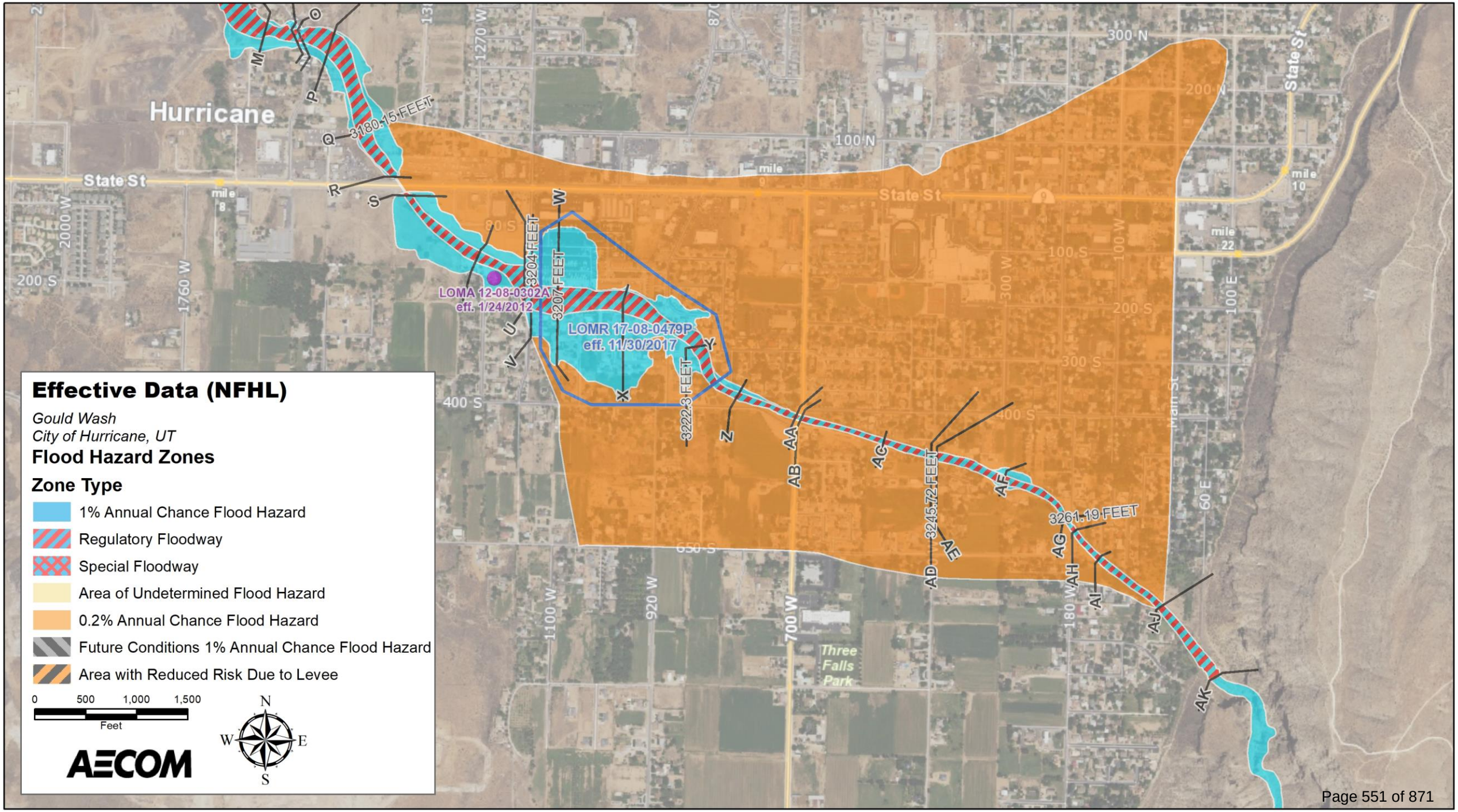
Email: jhuff@utah.gov

(Please note address and phone number changes)

Washington County Study Timeline

Hurricane Gould Wash Timeline	
	Date
Current Effective Flood Insurance Rate Maps (FIRMs) for Washington County	4/2/09
Current Effective LOMR	11/30/17
BLE (Phase 1) funded by FEMA	9/1/17
DEM Risk MAP (BLE) Study Kickoff Meeting (virtual)	4/11/2018
BLE maps provided (via email) to Hurricane (to prep for Discovery Meeting)	4/13/18
DEM Risk MAP Discovery Meeting (Gould Wash Requested to be restudied by Hurricane City Floodplain Administrator):	5/17/18
Phase 2-3 Study awarded by FEMA	7/1/18
DEM hosted BLE training in Santa Clara	7/15/19
DEM Risk MAP (Detailed) Flood Study Kickoff Meeting	7/16/19
Washington County Study Kickoff Meeting follow-up (email)	7/31/19
Engineering Modeling letter sent to communities (email)	8/15/19
Washington County Hydrology Meeting and Erosion Hazard analysis (virtual)	1/30/20
Washington County Hydrology Webinar Follow-up email to all communities (email)	3/20/20

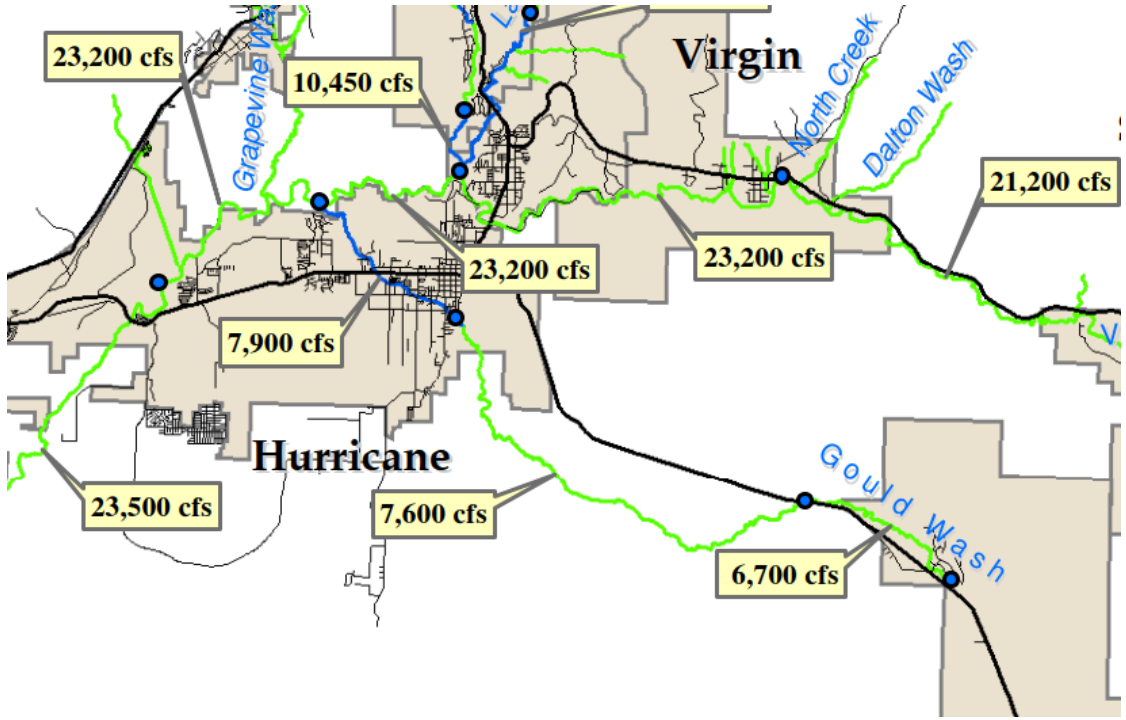
- Since the Hydrology Meeting, we have been developing models for the 110 streams being studied.


Hurricane
State St
mile 8
mile 9
mile 10
mile 22
300 N
200 N
100 N
100 S
200 S
300 S
400 S
650 S
2000 W
1760 W
1270 W
1100 W
920 W
700 W
300 W
100 W
100 E
60 E
Main St
State St
3180.15 FEET
3204 FEET
3207 FEET
3222.3 FEET
3245.72 FEET
3261.19 FEET
LOMA 12-08-0302A
eff. 1/24/2012
LOMR 17-08-0479P
eff. 11/30/2017
Three Falls Park
M
O
P
Q
R
S
U
V
W
X
Y
Z
AA
AB
AC
AD
AE
AF
AG
AH
AI
AJ
AK
Effective Data (NFHL)
Gould Wash
City of Hurricane, UT
Flood Hazard Zones
Zone Type
1% Annual Chance Flood Hazard
Regulatory Floodway
Special Floodway
Area of Undetermined Flood Hazard
0.2% Annual Chance Flood Hazard
Future Conditions 1% Annual Chance Flood Hazard
Area with Reduced Risk Due to Levee
0
500
1,000
1,500
Feet
N
W
E
S
AECOM

2006 Hydrology Report

Table 7
Summary of 100-year Discharge Values For
Detailed and Limited Detailed Study Reaches – (CONTINUED)

Flooding Source and Location	Area (mi^2)	100-year Discharge (cfs)					
		New Hydrology	City Storm Drain Master Plan	Effective FIS /LOMR	USGS Analysis	UDOT Regression Equations	NFF Regression Equations
Cottonwood Wash Tributary (Washington City)							
From State Street to confluence with unnamed wash east of Telegraph Road	1.6	--	**320**	--	--	--	--
From confluence with unnamed wash east of Telegraph Road to confluence with Cottonwood Wash	2.3	--	**800**	--	--	--	--
Coyote Wash							
From foothill to confluence with two unnamed washes (2.25 miles upstream from Santa Clara River)	0.7	**240**	--	--	--	--	--
From confluence with two unnamed washes to confluence with Santa Clara River	2.4	**470**	--	--	--	--	--
Fort Pierce Wash							
From Utah State line to confluence with Virgin River	1,680	--	--	25,000	28,500	17,000	**22,000**[3]
Gould Wash							
From canyon mouth to confluence with Virgin River	74.1	--	--	--	--	**7,900**	9,600



2006 Hydraulics Report

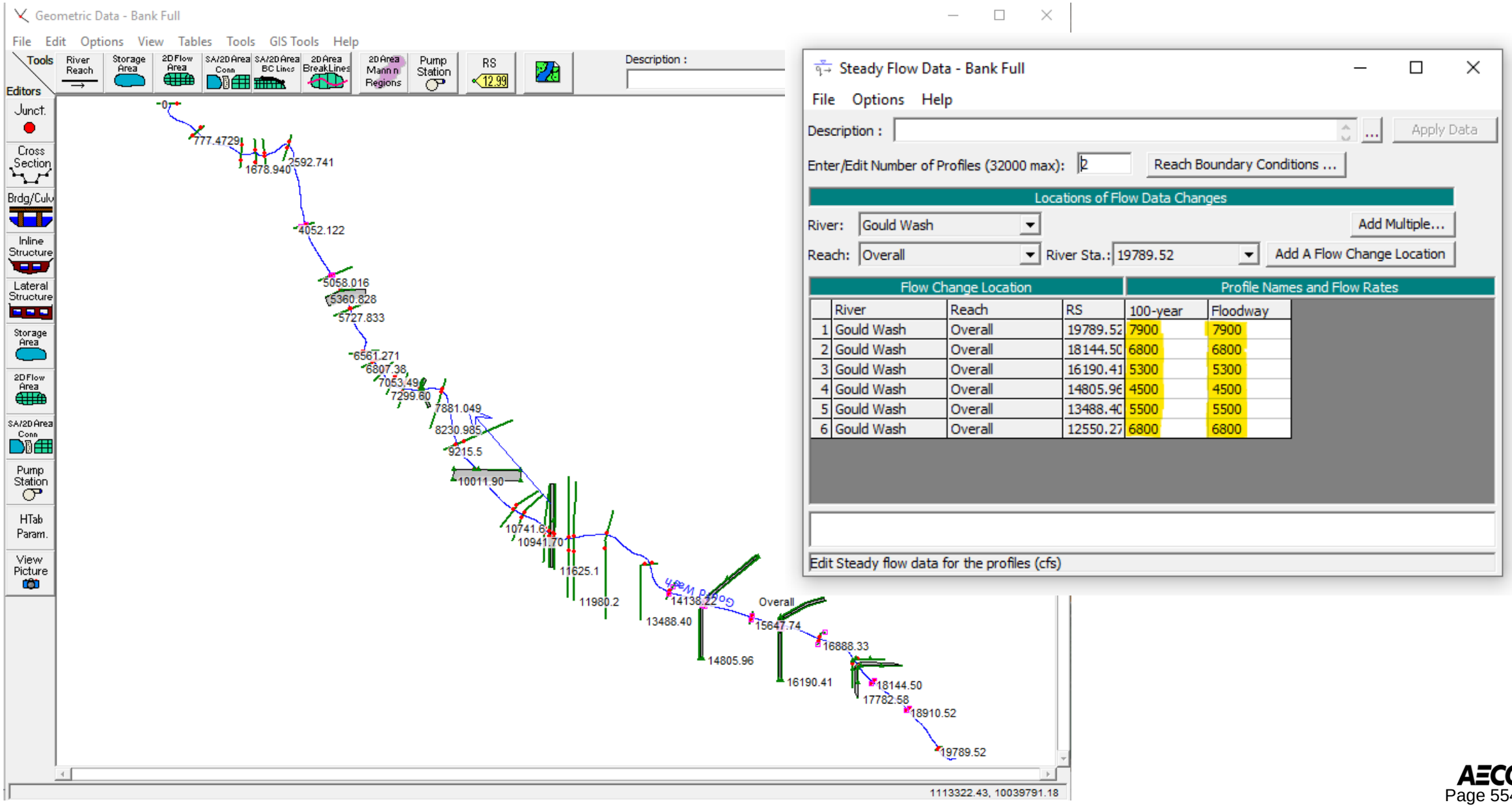
Special Conditions and Notes to Reviewer. The channel capacity for the Gould Wash study reach is significantly less than the estimated 100-year discharge of 7,900 cfs for this reach. Upstream of 700 West Street, the topography adjacent to the channel is such that once water overtops the bank it will either flow away from the channel or flow hydraulically disconnected from the channel. Downstream of 700 West Street water that is not contained in the channel will remain hydraulically connected to the channel. No special modeling considerations were required for the lower study reach. However, special consideration for modeling the upper upper study reach was required, as described below.

Channel Floodplain Mapping. The base-flood elevations for the upper study reach were established by estimating the bank-full capacity of the channel. It was assumed that since the channel does not have capacity to convey the entire base flood, water will overtop the channel banks and flow onto the overbanks. In an effort to estimate the depth of water overtopping the banks, the levee option was used in the HEC-RAS model. In general, artificial one-foot-high levees were established in the model at the top of the channel banks and utilized to estimate the bank-full capacity and the channel base flood elevations. The one-foot limit was utilized because it is believed that it is unlikely that the depth of water overtopping the banks in a linear fashion would be more than one foot deep. The base-flood elevations for the channel that resulted from this analysis are conservative from a regulatory perspective because the water surface elevations can be a foot higher than the bank elevation.

To estimate the bank-full capacity of the channel in determining flood flows routed down the channel versus overbank flow routed out of the channel, the hydraulic structures were temporarily removed from the model and no additional channel flow reductions were made

- From the canyon mouth to 120 West Street: 7,900 cfs (100-year discharge documented in the hydrology report)
- From 120 West Street to 400 West Street: 6,800 cfs (estimated bank-full capacity). It is estimated that 700 cfs will flow into the right overbank, and 400 cfs will flow into the left overbank due to water overtopping the banks, reducing the channel flow by 1,100 cfs.
- From 400 West Street to 700 West Street: 5,200 cfs (estimated bank-full capacity). It is estimated that due to the channel constriction at 400 West Street, 1,000 cfs will flow into the right overbank and 600 cfs will flow into the left overbank, reducing the channel flow by 1,600 cfs
- From 700 West Street to 850 West Street: 4,500 cfs (estimated bank-full capacity). It is estimated that due to the channel constriction at 700 West Street, 400 cfs will flow into the right overbank and 300 cfs will flow into the left overbank, reducing the channel flow by 700 cfs.
- From 850 West Street to about 1000 West: 5,500 cfs (estimated bank-full capacity). At this point water from the left overbank will become hydraulically connected with the channel again.
- From about 1000 West to the confluence with the Virgin River: 6,800 cfs (estimated bank-full capacity). At this point water from both overbanks will become hydraulically connected with the channel again. It is estimated that the 1,100 cfs lost at 180 West Street will attenuate such that even though the water eventually returns to the channel, it will not be until after the peak has past.

2006 Effective Model



Steady Flow Data - Bank Full

File Options Help

Description : ... Apply Data

Enter/Edit Number of Profiles (32000 max): 2 Reach Boundary Conditions ...

Locations of Flow Data Changes

River: Gould Wash Add Multiple...

Reach: Overall River Sta.: 19789.52 Add A Flow Change Location

Flow Change Location				Profile Names and Flow Rates	
	River	Reach	RS	100-year	Floodway
1	Gould Wash	Overall	19789.52	7900	7900
2	Gould Wash	Overall	18144.50	6800	6800
3	Gould Wash	Overall	16190.41	5300	5300
4	Gould Wash	Overall	14805.96	4500	4500
5	Gould Wash	Overall	13488.40	5500	5500
6	Gould Wash	Overall	12550.27	6800	6800

Edit Steady flow data for the profiles (cfs)

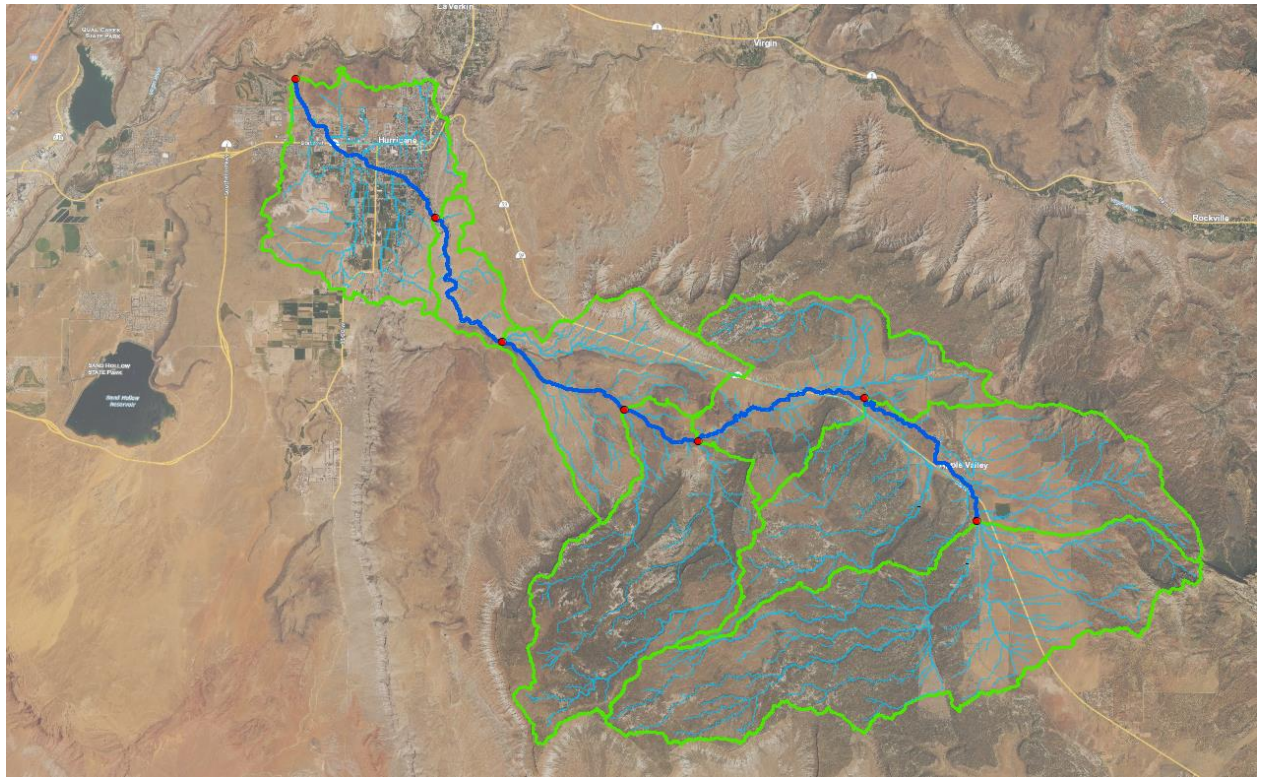
Floodway Definition

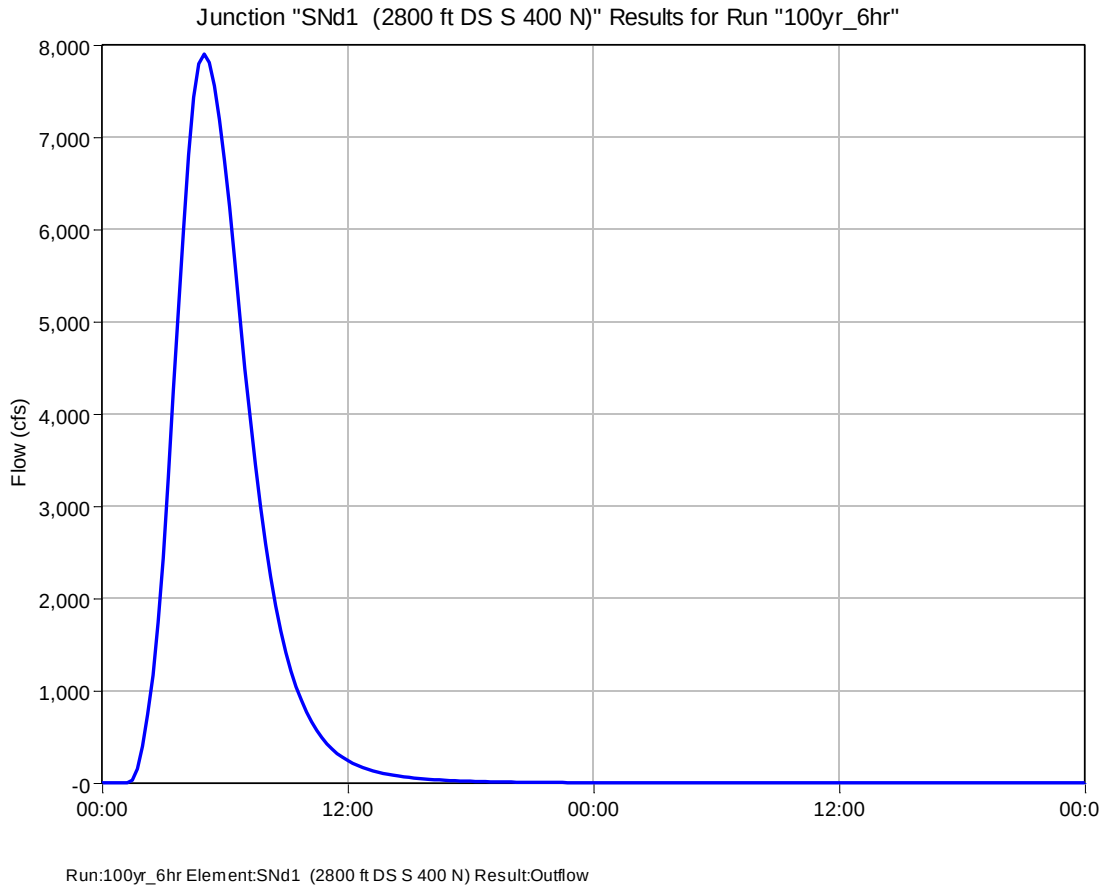
– From 44 CFR 59.1:

> *Regulatory floodway* means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

– This floodway is not discharging the base flood, just the “bank full” flood

Detailed Hydrology Approach



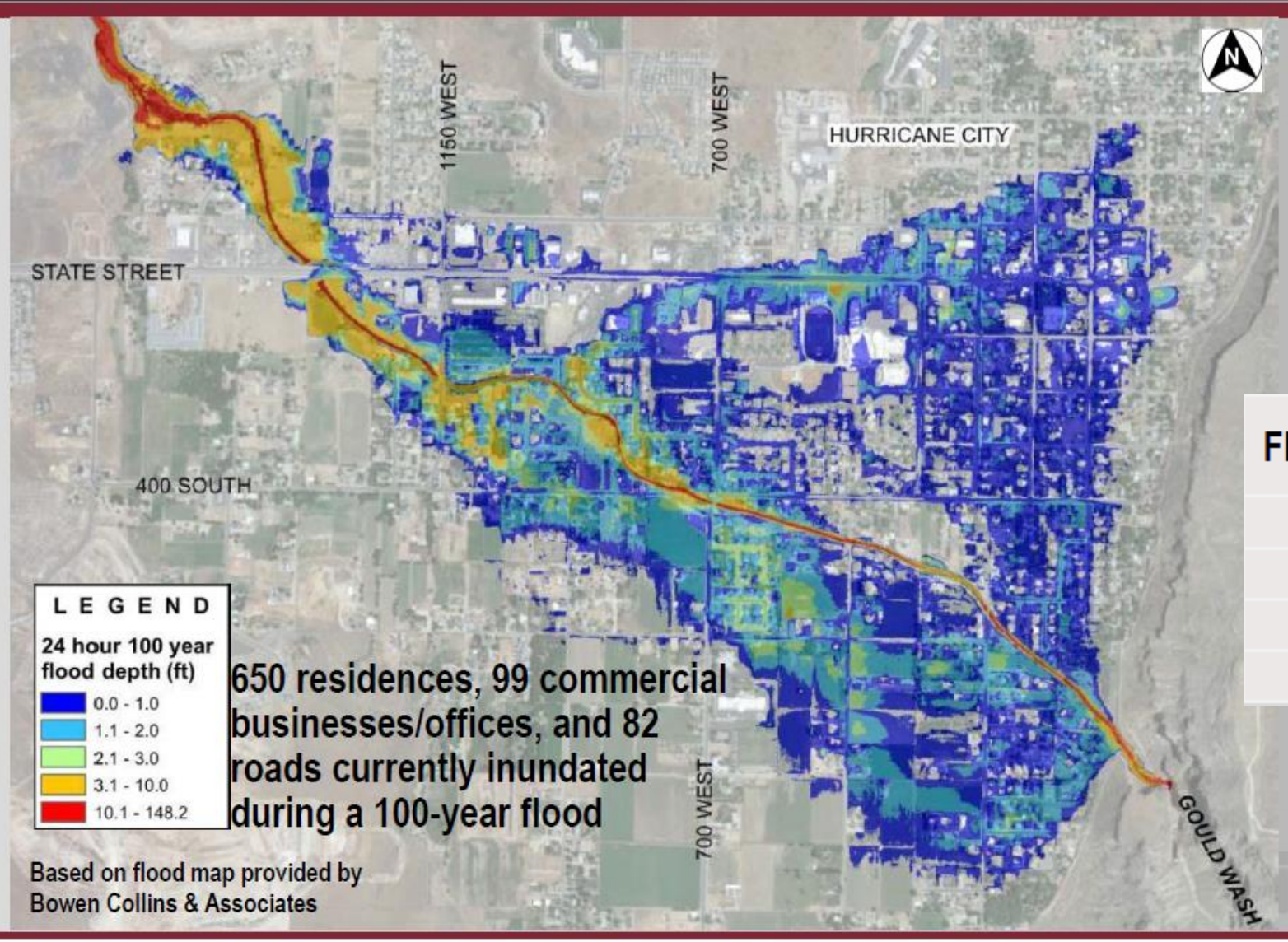


Detailed Hydrology Results

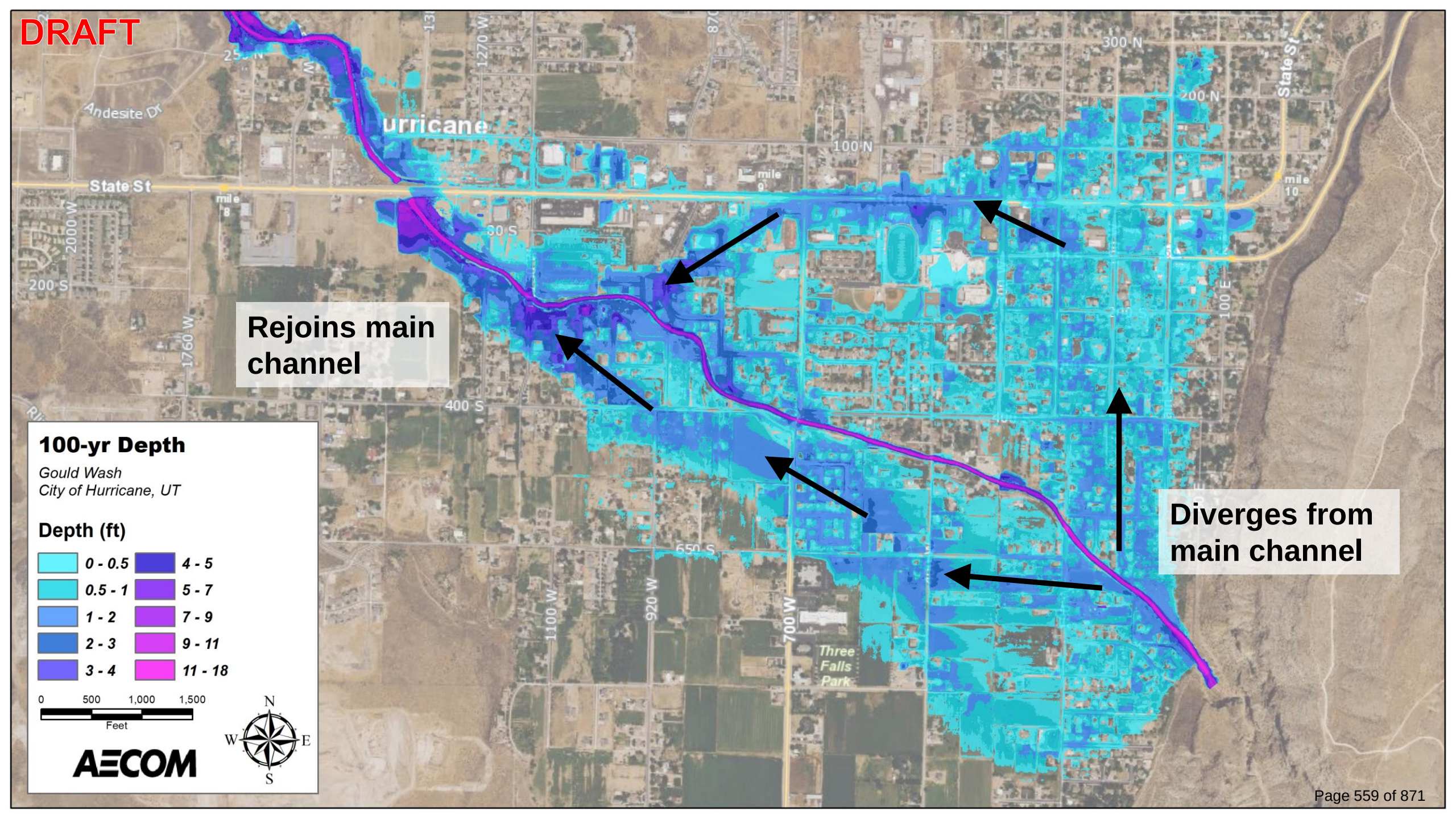
Flooding Source and Location	Drainage Area (Sq. Mi.)	Peak Discharges					
		10-yr	25-yr	50-yr	100-yr	100-yr Plus	500-yr
GOULD WASH							
2800 ft downstream from W 600 N	73.5	2,435	4,185	5,865	7,900	12,960	15,110

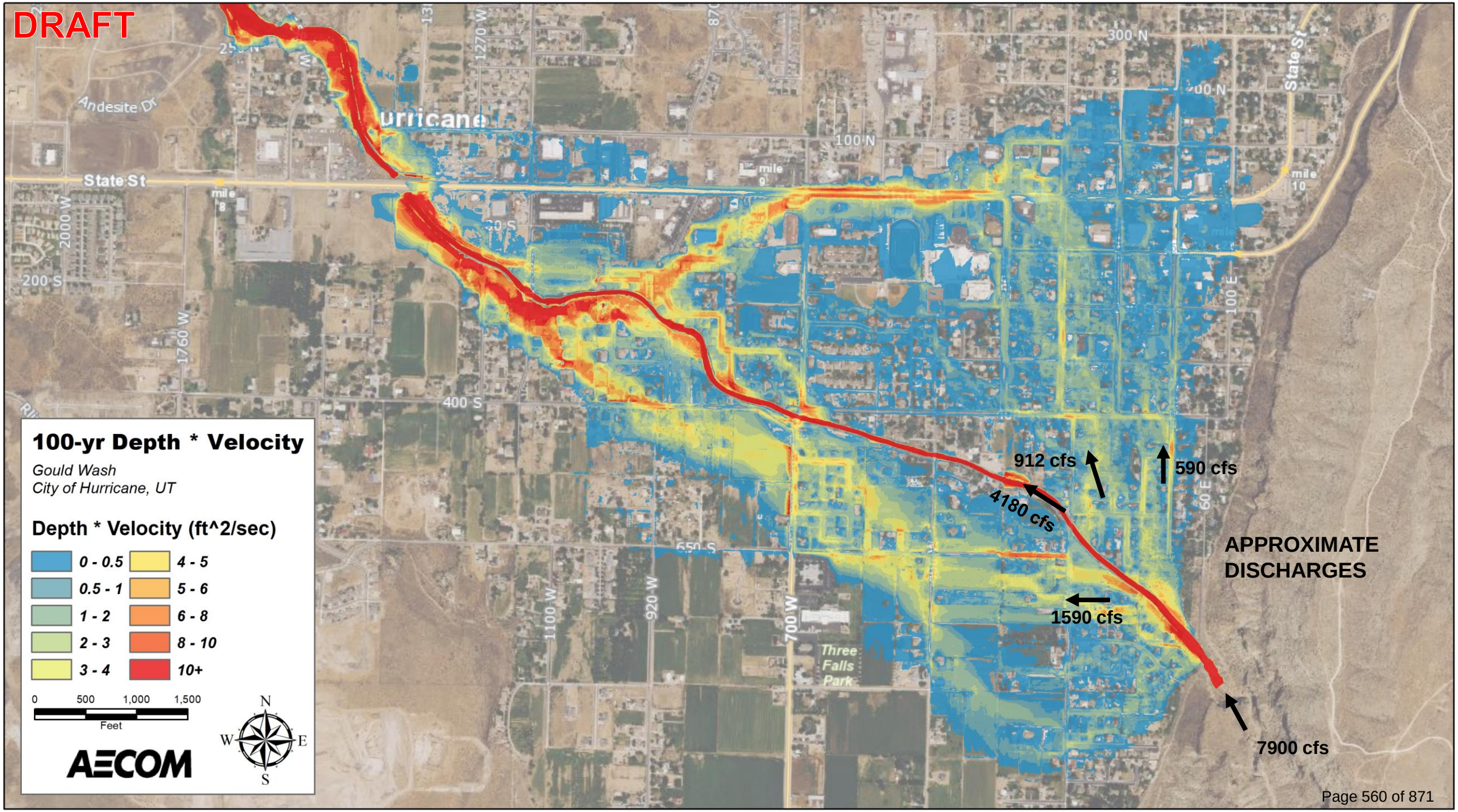
– 100-yr flow same as effective

Project Overview
Existing Condition 100-Year Flood



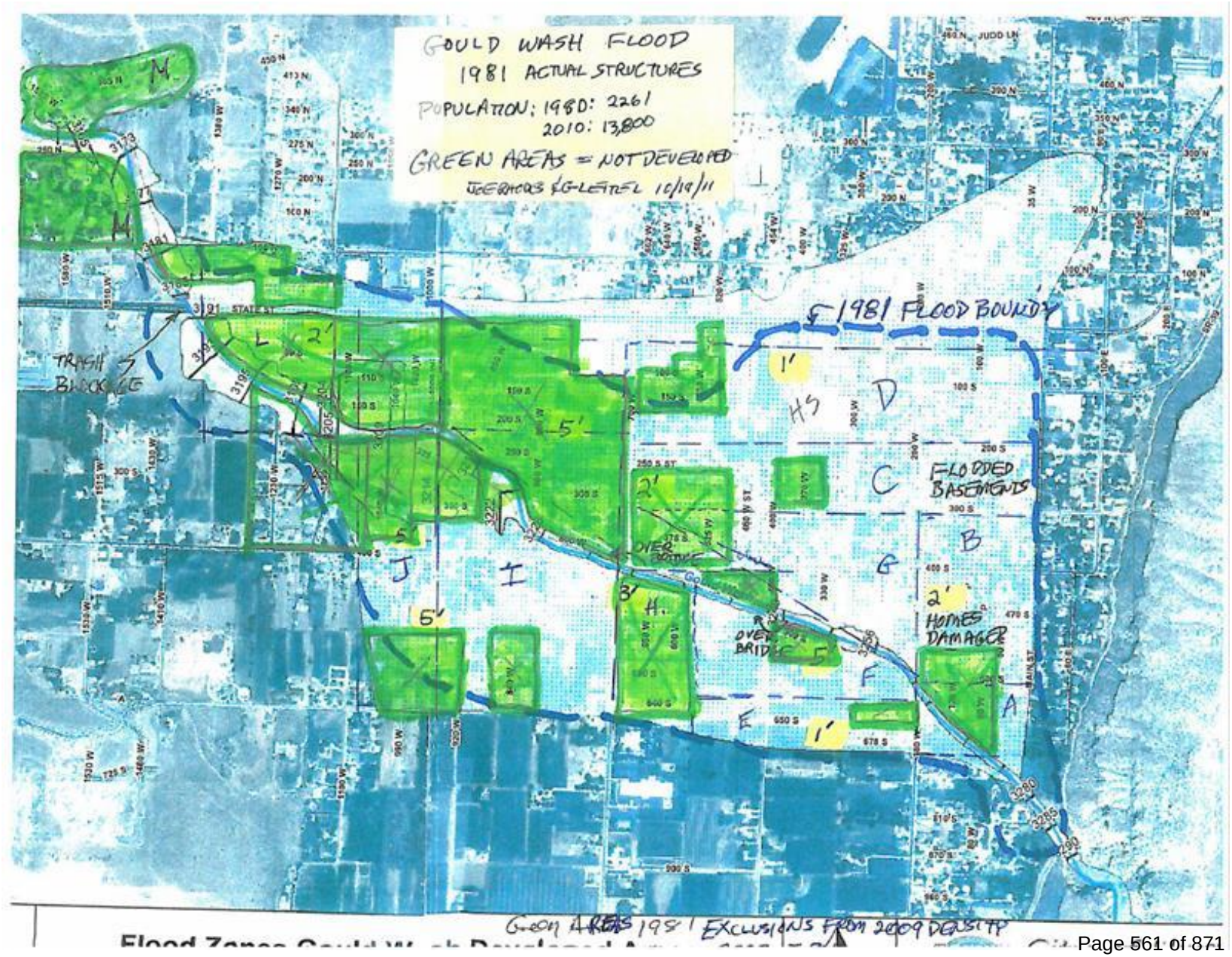
Flood Event	Discharge at Hurricane Cliffs (cfs)
2-Year	760
10-Year	2,810
50-Year	6,580
100-Year	8,820


DRAFT
Rejoins main channel
Diverges from main channel
100-yr Depth
Gould Wash
City of Hurricane, UT
Depth (ft)
0 - 0.5
0.5 - 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 7
7 - 9
9 - 11
11 - 18
0 500 1,000 1,500
Feet
AECOM
N
W
E
S
State St
300 N
200 N
100 N
100 S
200 S
400 S
650 S
700 W
920 W
1100 W
1760 W
2000 W
1270 W
100 E
Andesite Dr
Three Falls Park
mile 8
mile 9
mile 10


DRAFT
Hurricane
State St
Andesite Dr
300 N
100 N
100 S
200 S
400 S
650 S
1270 W
2000 W
1760 W
1100 W
920 W
700 W
100 E
mile 8
mile 9
mile 10
912 cfs
590 cfs
4180 cfs
1590 cfs
7900 cfs
APPROXIMATE DISCHARGES
Three Falls Park
100-yr Depth * Velocity
Gould Wash
City of Hurricane, UT
Depth * Velocity (ft^2/sec)
0 - 0.5
0.5 - 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 8
8 - 10
10+
0 500 1,000 1,500
Feet
N
W
E
S
AECOM

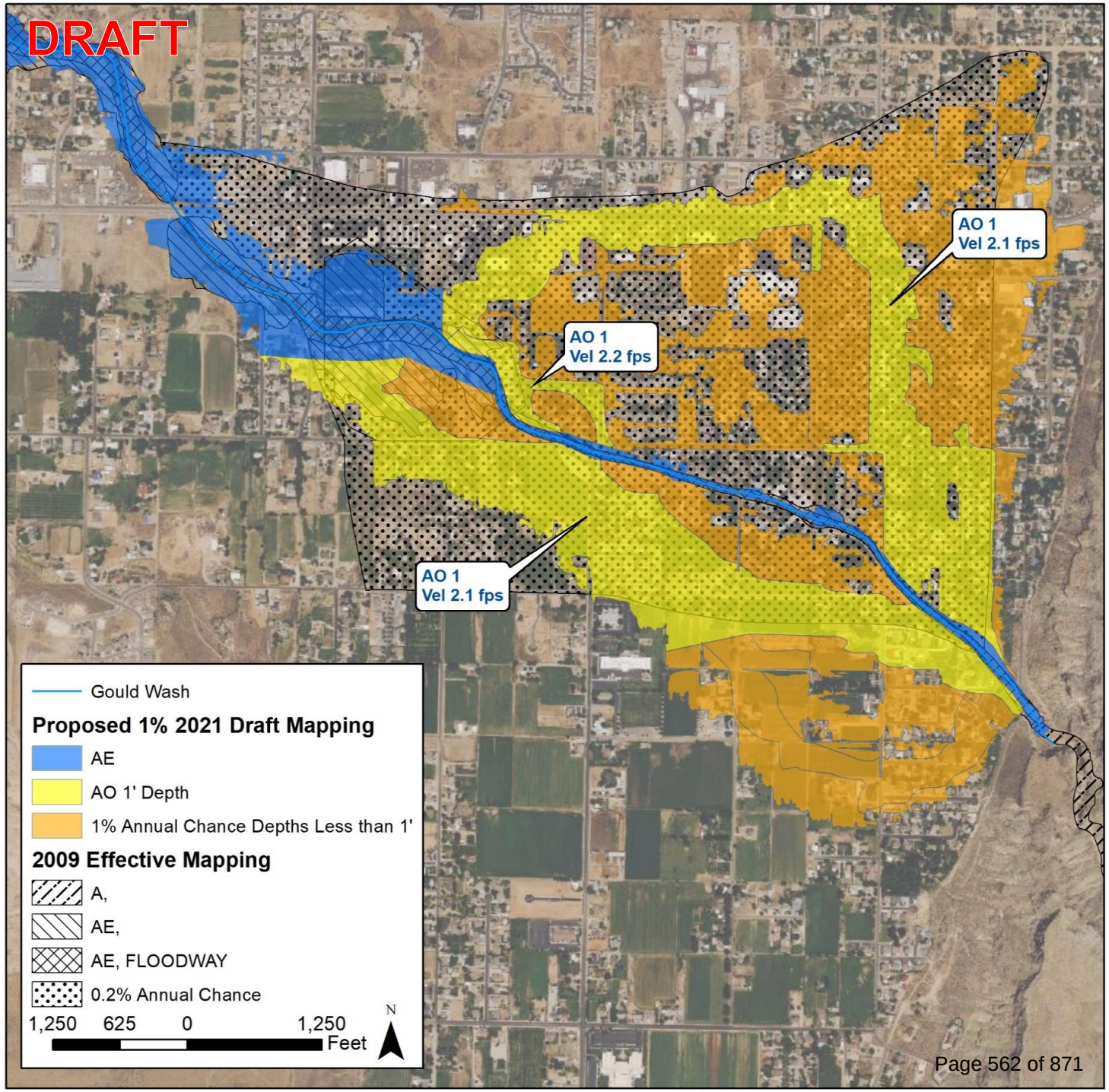
Historical Flooding

– 1956
  - Took all 3 bridges out
– 1981
  - Estimated flood flow 12,400 cfs
– 2011



Proposed Mapping Approach

– Shallow flooding flow paths follow D*V



Gould Wash Currently has a Floodway

– Cannot downgrade study level

– Challenge: including a floodway that meets FEMA mapping guidelines

– 2 Proposed Approaches:
  - Regulatory Floodway Option
  - Administrative Floodway Option



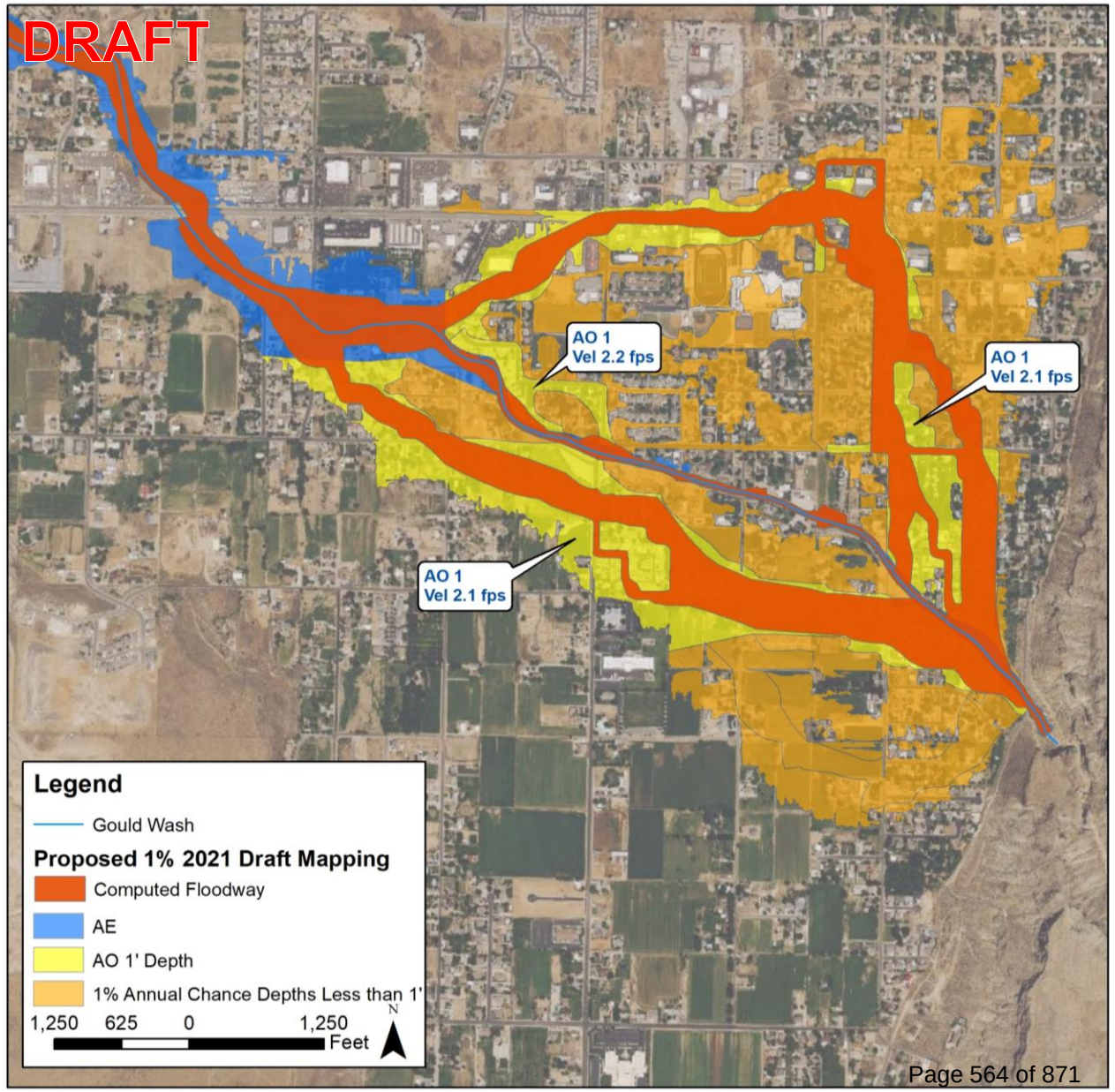
Looking upstream from 180 W

Regulatory Floodway Option

(Preferred Option)

– Advantages
  - Clear understanding of regulatory expectations & development requirements
  - *"…considerably reduces the administrative burden of regulating floodplain development since hydraulic studies do not have to be undertaken for individual development proposals."* (Floodway Guidance Section 5.1)
  - Follows floodway guidance

– Challenges
  - Establishes floodway through an area that is almost completely developed

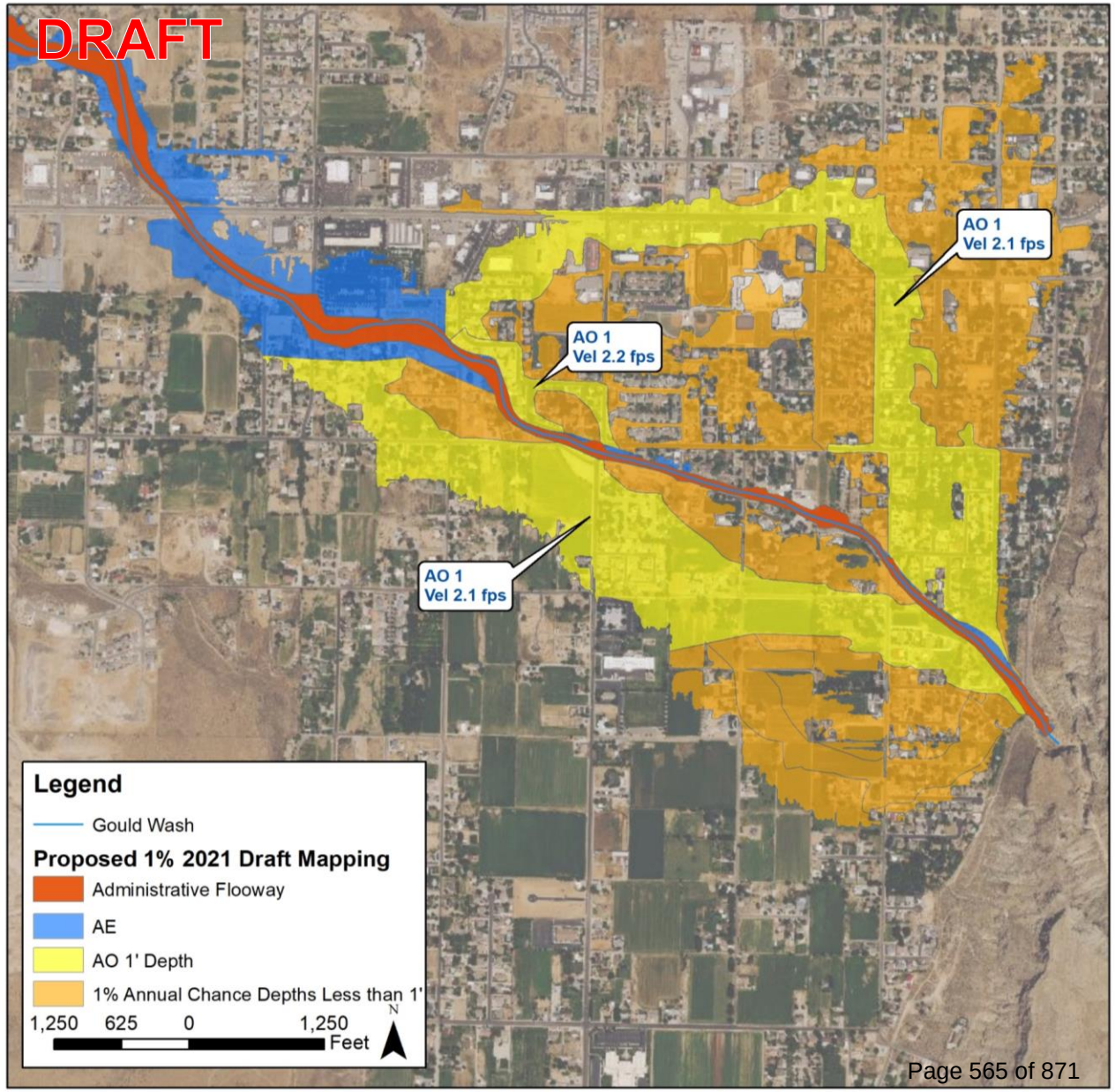


Administrative (Planning) Floodway Option

(Less Preferred Option)

– Advantages
  - Administrative Floodway appears similar to current effective Floodway

– Challenges
  - Not a regulatory floodway
  - Resource intensive and challenging to manage [60.3 (c)(10)]
    - Every new development proposal would require a hydraulic analysis
    - Not necessarily less restrictive than the Regulatory Floodway Option
  - Could be confused with the requirements for a regulatory floodway
  - Mapping Appeals
    - May impact availability of MT-1 (LOMAs)
    - CLOMR/LOMRs may not be available, but unclear



Summary

- Hurricane City requested re-study in 2018
- Using current Hydrology, flooding exits the main channel
- Current Floodway does not meet FEMA Guides & Specs (bank full)
- Using 1D/2D approach, new flood risk is being modeled
- FEMA studies cannot be downgraded, floodway cannot be removed
- Floodway options
  - Regulatory Floodway – Preferred option
  - Administrative (Planning) Floodway – less preferred option
  - Both have advantages and disadvantages
- Request community decision for Floodway approach

12.0 Encroachment Requirements for Rivers and Streams without Floodways

FEMA may also issue a FIRM that include rivers or streams where FEMA has conducted a detailed study and established base flood elevations, but not designated a floodway. Generally, these Studies are conducted in less densely populated areas where it is difficult to justify the expense of conducting an engineering study that would include a floodway. These areas are subject to the requirements at 44 CFR 60.3(c)(10) which requires a hydraulic analysis to ensure that each development in the floodplain does not increase base flood levels by more than one foot at any point in the community. The requirement at 44 CFR 60.3(c)(10) essentially applies the same standard to these areas as would apply if a floodway were designated (the maximum one foot rise in flood stage). The main difference is that the hydraulic analyses are conducted on a case-by-case basis for each proposed development in the floodplain. Most communities pass on the cost of performing this analysis to the permit applicant. The advantage of having a floodway designated is that is that the community can review and permit development outside of the floodway without requiring a hydraulic analysis and without passing the costs of that analysis on to the permit applicant.

The requirement in 63.3(c)(10) only applies along rivers, streams, and other watercourses where FEMA has provided base flood elevations. The requirement does not apply along lakes, bays and estuaries, and the ocean coast. Generally, this type of data is provided as interim data and the intent is to eventually re-map these areas to add floodways when funding becomes available and the amount of development warrants the added cost to develop floodways.

Sometimes a decision is made not to designate a floodway on a stream because hydraulic conditions on the river or stream do not lend themselves to modeling a floodway using standard methodologies. Generally, FEMA, the state, and the community agree to an alternative management scheme for the stream that achieves the same purpose as designating a floodway or performing an encroachment analyses under 60.3(c)(10).

---

44 CFR 60.3(c)(10): *Require until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within zones A1-30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.*

Source: FEMA Floodway Analysis and Mapping Guidance Document (Dec. 2020)

12.1 Ways to Meet the 60.3(c)(10) Requirement

Section 60.3(c)(10) of NFIP regulations requires a hydraulic analysis to ensure that each development in the floodplain does not increase base flood levels by more than one foot at any point in the community. One of the concerns that have been expressed about implementing the requirement has been the cost of performing a hydraulic analyses for a small development such as a single home. The costs of this analysis must be considered as part of the cost of developing in the floodplain. The potential adverse impacts of development in the floodplain on upstream and adjacent property owners can be significant and must be evaluated before the development is allowed to occur. However, there are several ways a community can avoid or minimize these costs:

- **Stay out of the floodplain entirely.** Usually limited detail studies without floodways are provided in rural areas or less densely populated areas where parcels are large and there is a choice of building sites. In these cases, it is often in everyone's best interest to design the development so that the building sites are located outside of the floodplain. The floodplain is preserved, and the permit applicant avoids the added costs of performing the hydraulic analysis and of developing in the floodplain.

Very few backwater areas along Gould Wash

- **Limit development to backwater areas.** It may also be possible to limit the development to backwater areas that are not effective flow areas. Most floodplains have irregular boundaries and include backwater areas that provide storage of floodwaters but play little or no role in the conveyance of floodwaters. The velocity of floodwaters in these areas may be zero or close to zero. There may also be floodplain areas that are separated from the river or stream by a railroad or road embankment or a substantial levee that is at or near the base flood elevation that parallels the river or stream. Areas behind these obstructions also may not convey flood flows. These areas are not taken into account as flow areas when the hydraulic model is developed of the floodplain. Development of these areas will not increase flood stages. A qualified engineer can apply basic hydraulic principles to identify these areas. The remainder of the floodplain is sometimes referred to as a natural floodway.

- **Establish setbacks:** Finally, it may be possible to develop a standard setback or an algorithm for establishing setbacks along smaller streams in your community that would serve the same purpose as 44 CFR 60.3(c)(10). You may already have adopted a setback to preserve a natural stream buffer to protect water quality. Back-up your setback or algorithm with engineering calculations to show that development will cause no more than a one foot rise in flood stage. Be conservative. Test the setback or algorithm on a reasonable number of cross-sections given the variety of stream conditions in your community. If you choose this alternative, check with your state or FEMA Regional Office first.

If you adopt either the second or third alternative and feel that permit applicants may challenge your setbacks or other requirements, you can always allow the applicant the option of hiring an engineer and submitting a (c)(10) analysis if they disagree. Most permit applicants are likely to comply with your requirement as long as it is reasonable rather than to go to the expense of paying for a hydraulic analysis.

This type of analysis would be required for every development application in the floodplain

12.2 Performing a 60.3(c)(10) Analysis

In those floodplains where FEMA has provided the community with base flood elevations, but no floodway, the community must prohibit development unless it is demonstrated that the cumulative effect of the proposed development when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

When evaluating the proposed encroachment into the floodway, you must assume that other like situated property owners will want to develop their properties in the same manner as the permit applicant and that eventually their properties will be developed. You must take their rights to develop into account when evaluating a proposed encroachment to determine if it will cause rise in flood stage for the base flood. For example, if the permit applicant wants to build a house on fill that extends 100 feet into the floodway, you must assume that the property owners across the stream encroach into the floodway an equal amount. You must also make the same assumption for upstream and downstream property owners on both sides of the river or stream. You need to extend your hydraulic analysis far enough upstream and downstream to capture the cumulative impacts of all of this development.

11/4/2021

Repose to Hurricane, UT questions regarding Administrative Floodway Option vs Regulatory Floodway

Based on the city's questions, below are some initial responses, but may not be an exhaustive list.

1. **What is your preferred option, and what would your reason be?**
    a. Our preferred approach continues to be the Regulatory Floodway.
    b. The revised regulatory model would show the true risk of flooding because it models the full flows through Gould Wash, which lacks the channel capacity to convey the 1%-annual-chance flood event causing water to overtop. Since the current effective model only uses the "bank full" (reduced) flows, it is showing a much lower flood risk than what actually exists. This is also confirmed by the Bowen Collins "Existing Condition 100-Year Flood" map (February 4, 2020 EIS scoping meeting presentation) in support of the NRCS project that proposes a detention facility in the upper Gould Wash watershed to reduce peak flows through Hurricane City.
    c. There are clear requirements for development in regulatory floodways adopted in your floodplain ordinance.
    d. Development of the regulatory floodway provides the community the modeling backup needed to ensure any new development will not increase the flood risk to any other properties. The model simulates that all properties in the floodway have been fully developed; this reduces the administrative burden for the city to determine if any proposed development would increase the flood risk.
    e. While there may be more properties identified in the regulatory floodway, if much of the area is already developed this may only impact permitting when new development or substantial improvements outside of the original foundation footprint is proposed.
    f. The increased depicted risk could be beneficial for the NRCS detention basin application by creating a more favorable Benefit Cost Ratio.
    g. FEMA Letters of Map Change (LOMCs), such as LOMRs and CLOMRs would be allowed.
    h. The model would meet current FEMA Floodway Mapping guidance.
2. The City did not ask this, but we want to ensure we provide a more detailed response as to why we would not recommend the "Administrative Floodway".
    a. The "Administrative Floodway" will not meet current FEMA Mapping Standards. Due to the city's flat topography, a 1D/2D model was developed per FEMA guidance to more accurately model and map areas of shallow flooding (AO zones) in the overbanks adjacent to the regulatory floodway delineation. Per FEMA Shallow Flooding Analyses and Mapping guidance, communities can choose to have administrative floodways for such areas.
    b. An "Administrative Floodway" is not considered a "Regulatory Floodway" and the current model does not reflect today's risk, nor does it meet FEMA Floodway Mapping Standards.
    c. When the final model is produced, an "Administrative Floodway" might appear to be smaller in size than the proposed Regulatory Floodway option. However, with this option, we would not be performing a revised floodway analysis. The current and inaccurate floodway model would be refined using more recent high-resolution topography data but would still only show "bank full" (reduced) flows.

d. Because this is not a Regulatory Floodway, any FEMA CLOMRs, LOMRs, and possibly some LOMAs (on the Administrative Floodway boundary) would not be allowed as there is no "regulatory" model-backed data for FEMA to compare it to. Therefore, the mapping that becomes effective on the revised FIRM will not be changed through the FEMA Letter of Map Change (LOMC) process until a new regulatory model is developed.
e. What if there is proposed development in this area?
    i. Many questions may be received as to what this area means.
    ii. The city would need to develop a process to track all development in this area to ensure that all development is not causing more than one foot of rise per 44 CFR 60.3(c)(10) in the Zone AE areas without a regulatory floodway. All proposed development in Zone AE would need an engineering analysis to determine if one development increases BFEs by one foot. When the one foot elevation is reached, all future development in the entire Administrative Floodway would have to meet the no-rise requirements. This places a heavy burden on the city to review and approve H&H engineering analyses on their own and track all BFE increases on Gould Wash. See additional information below in 3a.
    iii. In other states that have an Administrative Floodway designation, communities have required a no-rise for all development in any AE zone to reduce the administrative burden of tracking BFE increases. Some communities identify the area as a "no-build zone".
f. This area may be misinterpreted as a Regulatory Floodway and developers may want to seek a FEMA map change. Explaining the limitation could pose to be a difficult conversation.

3. Which option encumbers more land with the requirement to do a hydraulic analysis?

a. Both floodway options will require some level of hydraulic analysis depending on which zone the proposed development falls in. Below is a description of when a hydraulic analysis would be required under different scenarios.
    i. **Regulatory Floodway Option** – 44 CFR 60.3(d) applies:
        1. Since a regulatory floodway is established, all projects that fall outside the floodway boundary can be permitted without any hydraulic analysis but would still need a floodplain development permit.
        2. All new developments or substantial improvements that fall within the floodway require a “no-rise” certification where an engineer performs a hydraulic analysis to compare pre-project and post-project conditions and certify that the project causes no increases in flood heights [44 CFR 60.3(d)(3)].
            a. This is typically a more localized analysis that only looks in the vicinity of the proposed project.
            b. There are also exceptions for “minor projects” that can be permitted without an engineering analysis, such as signposts, telephone poles, re-paving at-grade (e.g. no fill), and small additions or accessory buildings that are placed in the

conveyance shadow of an existing structure (see FEMA 480, February 2005, pages 5-23 to 5-24).

ii. **Administrative Floodway Option** – 44 CFR 60.3(c) applies:

1. All new developments or substantial improvements that fall within the administrative floodway require a "no-rise" certification in the same manner as the regulatory floodway.
2. All new developments or substantial improvements that fall within zone AE will require a hydraulic analysis to demonstrate that "the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community." [44 CFR 60.3(c)(10)]
    a. A separate individual analysis is required for each proposed development or substantial improvement.
    b. This hydraulic analysis must evaluate the entire community every time.
3. While an H&H analysis may not be required to demonstrative the cumulative impact, all new developments or substantial improvements that fall within zone AH or AO will require an analysis to show that adequate drainage paths are provided to guide floodwaters around and away from proposed structures [44 CFR 60.3(c)(11)].

b. After speaking with FEMA, the 44 CFR 60.3(c)(10) requirements only apply to areas where no floodway has been determined (Zone AE without floodway or Administrative Floodway). The final mapping determination for what area this includes has not yet been developed. If much of the area is already developed this may only impact permitting when new development or substantial improvement outside of the original foundation footprint are proposed. The City should determine which properties are currently undeveloped to help inform this decision.

Project Meeting:	*Hurricane City Meeting – Gould Wash (Virtual)* *Washington County, Utah Phase 2 Risk MAP Study*
Date and Time:	*August 26, 2021, 3:00 PM - 4:00 PM*
Place:	*Webinar*

Meeting Summary

Introduction

Jamie Huff, Utah Division of Emergency Management (DEM), opened the meeting by welcoming the group. Introductions were made for the study team and community representatives.

Attendees:

Jamie Huff, DEM State Risk MAP Program Manager

Angelia Crowther, DEM NFIP Coordinator

Brie Hurwitch, AECOM

Tom Wright, AECOM

Matt Chaney, AECOM

Arthur LeBaron, City Engineer

Clark Fawcett, Hurricane City Manager

Mayor John Bremmell, Hurricane City Mayor

Dave Sanders, Hurricane City Councilman

Mike Vercimak, Hurricane City Public Works Director

Presentation

See attached presentation for details.

In 2018, Hurricane City requested a new floodplain study for Gould Wash as part of a larger Washington County FEMA flood study. Study timline provided on Slide 1. The new Gould Wash study cannot be modeled and mapped similar to the current effective study (2009) because the methodology used then does not meet current FEMA guidelines and standards. The revised study performed by AECOM (and a concurrent independent study by Bowen Collins and Associates) shows the community is at considerable risk of flooding from the 1%-annual-chance ("100-year") flood event. There are two options for mapping the floodway which produce very different results. Hurricane City will need to decide which option is best for their community in order for the study to move forward.

Questions / Discussion

AECOM provided an overview of the flood study pointing out the hydrologic flow rate for the 1%-annual-chance storm event is 7,900 cfs, the same as the previous mapped floodplain (current effective 2009 study). (Illustration on slide 2 and 3)

AECOM explained that we would not be permitted by FEMA requirements to model the wash in the same manner as the current effective data, with a narrow floodplain and floodway contained along the banks of the wash, and a wide shallow flooding 0.2%-annual-chance ("500-year") event spreading across the city. This is because the current floodway is only modeling the "bank full" flood, not the entire base flood, going against the standards required in 44 CFR 59.1. (Illustration on slides 4-8)

A comparison was made to the NRCS study, which used 8,820 cfs, showing very comparable modeling results with the 1%-annual-chance flood escaping the channel to both the north and south of the wash in the developed areas of the city. (Illustration on slide 9)

Arthur indicated that the NRCS project is years out but they are hoping the project will help with mitigating the flood risk.

AECOM showed the draft results and discussed that, due to the capacity limitations of the channel at various locations through the city, flow diverges from the channel in several locations. This is in contrast with the effective mapping, and clearly shows many more structures in the 100-year floodplain, where an insurance requirement would be implemented for these structures. (illustration on slide 10-11)

Historical flooding events were discussed; particularly the flood events of 1956, 1981, and 2011 where significant damage occurred. (Illustration on slide 12)

The proposed mapping approach includes shallow flooding with a combination of AE and AO zones. (Illustration on slide 13)

Arthur asked for explanation on AO flood zones. Jamie explained that these zones are mapped with depths instead of elevations. Any structure within an AO zone with a depth of 1 foot would need to elevate to a depth of one foot above the identify base flood elevation (or AO depth), and basements would not be permitted. Arthur asked whether a variance could be allowed to avoid any development restrictions associated with substantial improvements made on a structure, and the answer is no. Variances should be rare and need to meet specific criteria identified 44CFR 60.6, these requirements are also located in the Hurricane City Code.

AECOM then presented two options for modeling the floodway, which include a Regulatory Floodway (preferred option) and an Administrative (Planning) Floodway (less preferred option). Both have advantages and disadvantages; with the Administrative Floodway being resource intensive and challenging for the community to manage (illustration on slides 14-16).

The city expressed concerns about flood risk along the wash, indicating that a private entity hired Rosenberg Associates to remap the floodplain and floodway via a LOMR (effective October 25, 2021) and build two large homes right next to Gould Wash in the current effective floodway. However, the LOMR is revising the current effective model, which does not meet current FEMA guidance.

Jamie noted the new 2021 LOMR (as well as the 2017 LOMR) would likely be superseded by the new study and could potentially put properties/structures back in the mapped floodplain or floodway. Since the results are still draft, it is not known what the exact impacts will be.

The city noted that property owners are pulling a development permit between now and September 17, 2021 and need to be told about the upcoming changes. Jamie indicated the the LOMR will not become effective until October 2021 and the current floodway designation is still in effecti until the date the LOMR becomes effective.

Angelia mentioned that variances are "red flags" for FEMA and catch their attention if they are granted.

Arthur indicated that the city's priority is protecting life and property regardless of the flood insurance burden on homeowners. One point of clarification on insurance. Jamie made a comment that flood insurance is a "last resport" for property owners, however, this point was meant that flood insurance is the "last line of defense" for property owners to protect their property and recover from flooding.

Arthur noted that City Council will need to review the information, including the CFRs, and vote on the floodway options being presented.

The study team with send the presentation in pdf format that can be taken to City Council.

There were no further questions.

Meeting Adjourned at 4:25 PM

These notes are an interpretation of discussions held. Please provide any additions or corrections to **Jamie Huff, Utah DEM,** within 5 days of the date below; otherwise they will be assumed correct as written.

Prepared by: ___Utah DEM and AECOM____

Date completed:_____9/2/2021_____

Post Meeting Guidance for Consideration

- 44CFR 59.1: Floodplain Management Defination
- 44 CFR Part 60: Requirements for Flood Plain Management Regulations https://www.govregs.com/regulations/title44_chapterI_part60_subpartA
- 44 CFR Part 65. IDENTIFICATION AND MAPPING OF SPECIAL HAZARD AREAS: https://www.govregs.com/regulations/title44_chapterI_part65
- Variance Guidance: https://www.fema.gov/sites/default/files/2020-08/FEMA_P-993_FPM-Bulletin_Variance.pdf
- FEMA POLICY: GUIDANCE ON THE USE OF AVAILABLE FLOOD HAZARD INFORMATION FEMA Policy #104-008-2 https://www.fema.gov/sites/default/files/2020 04/Available_Flood_Hazard_Information_Policy_104-008-2.pdf-
- Guidance for Flood Risk Analysis and Mapping: Floodway Analysis and Mapping (reference slides 18-21) https://www.fema.gov/sites/default/files/documents/fema_floodway-analysis-and-mapping.pdf

Washington County Map Modernization
DFIRM and FIS Update Project

HYDRAULICS ANALYSIS REPORT

Prepared for:

State of Utah Division of Emergency Services and FEMA Region VIII

Prepared by:



In association with



Bowen Collins & Associates, Inc.
756 East 12200 South
Draper, Utah 84020

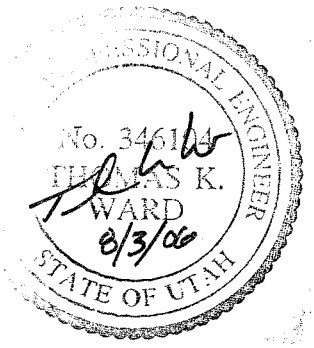
August 2006

Washington County Map Modernization
DFIRM and FIS Update Project

HYDRAULIC ANALYSES REPORT

Prepared for:

State of Utah Division of Emergency Services
and FEMA Region VIII



Prepared by:

Bowen, Collins & Associates, Inc.
in association with
AMEC Earth & Environmental, Inc.

August 2006

STANDARD ACRONYMS/ABBREVIATIONS

BC&A	Bowen, Collins & Associates
BFE	Base Flood Elevations
CTP	Cooperating Technical Partner
D	Detailed Flood Study
DEMs	Digital Elevation Models
DES	Division of Emergency Services (a.k.a. Office of Emergency Services)
DFIRM	Digital Flood Insurance Rate Map
FEMA	Federal Emergency Management Agency
FIRMs	Flood Insurance Rate Maps
FIS	Flood Insurance Study
G&S	*Guidelines & Specifications for Cooperating Technical Partners, May 2005*
HMTAP	Hazard Mitigation Technical Assistance Project
LD	Limited Detail Flood Study
LIDAR	Light Detection and Ranging
MAS	Mapping Activity Statement
NAIP	National Agricultural Imagery Program
NAVD 88	North American Vertical Datum of 1988
NGVD 29	National Geodetic Vertical Datum of 1929
OES	Office of Emergency Services (State of Utah)
TDSN	Technical Data Support Notebook
TIN	Triangular Irregular Network

Washington County DFIRM
Hydraulics and Floodplain Development Report

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