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Hayden and McDowell Drainage Report Case No. 94-PA-2021

8101 E McDowell Road
Scottsdale, AZ 85257

PREPARED BY:

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Plan # _____ www.larsonengr.com

Case # 32-DR-21 October 15, 2021

Q-S # 12-47

Approved

Corrections

Richard M. Anderson 11/17/2021
Reviewed By Date



Prepared by: MH

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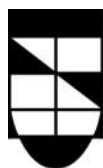
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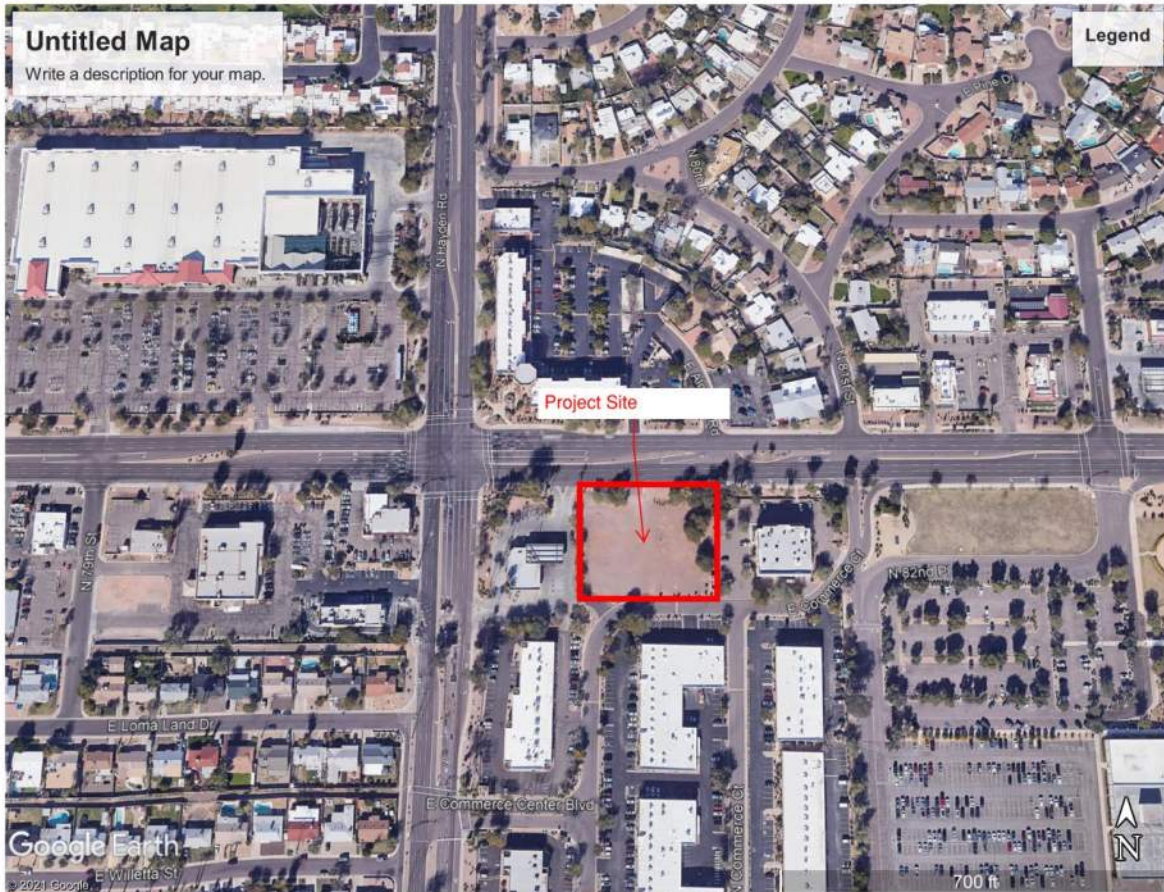
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Introduction

The proposed Hayden and McDowell Commercial (The Project) is located at 8101 E McDowell Road in Scottsdale, Arizona. The parcel number for this project is 131-09-002N. The Project consists of adding two new buildings, curbing, refuse container and landscaping. The buildings are 2,400 square feet and 4,000 square feet in size. The Project is located just east of the intersection of Hayden Road at McDowell Road. See Location Map below:



The Project will not alter the existing zoning, which is C-3. The surrounding area at his locations is commercial businesses and consists of commercial services and offices. The new buildings will remain consistent with the City of Scottsdale's general plan.

Design Documentation

Drainage Design Flows are based on criteria provided in the City of Scottsdale's Design Standards & Policies Manual Chapter 4 dated 2009 and the Flood Control District of Maricopa County Volume I & II. Specifically, the criteria used are as follows:

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This project will utilize the new access aisles and parking to convey stormwater runoff. The site currently has no retention and directs to the west and south. The site has not been previously developed. This project proposes to capture the 100-year 2-hour storm event

The elevations for this design are based on the survey performed by Synergy Geomatics performed on May 2021. The benchmark used is the City of Scottsdale Point Number 5022 Brass Cap in handhole at elevation 1221.29.

Existing Conditions

The Project will not alter the existing zoning, which is C-3. The existing lot currently has no structures on site and consist of weeds and dirt.

Currently, the site has no retention provided. All runoff is directed to west and south. The site slopes at less than 0.5%.

Offsite flows do not affect this property. McDowell Road conveys stormwater to the City's System and serves as the property's outfall. The adjacent sites have retention provided on site.

FEMA Information

According to the FEMA Flood Insurance Rate Map (FIRM), panel number 04013C2235M Dated September 18, 2020 the project site is within a Zone "X". A Zone "X" is described as follows:

"Areas of 0.2% annual chance of flood; areas of 1% annual chance of flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood."

Proposed Conditions

The proposed condition includes a 2,400 square foot building and a 4,000 square foot building, parking lot, curb stops, vertical curb, a refuse enclosure and landscaping. The site is proposed to have moderate slopes of around 0.5-3%. Stormwater will be conveyed away from the building into the underground retention areas

The building finish floors has been designed to protected during the 100-year peak runoff event.

Calculations

The Project has been designed to provide positive drainage away from the building. The project will convey runoff into the parking lots where adequate retention will be provided in the form of underground retention units. The grading plan shows the 2 proposed underground retention units and volume provided. The appendix includes the calculations for the required retention.

The proposed site is broken down by open space and a weighted C value is calculated and included. The grading plan includes callouts for the proposed landscaping and square footage and a calculations sheet for the proposed C factor. Utilizing the City of Scottsdale's Design

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Standards & Policies Manual Chapter 4 Figure 4.1-4 yields the C values utilized for the calculations. The Depth of precipitation was gathered from the City's Isopluvial Map in the Design Standards & Policies Manual Appendix 4-1D, which has been included in the appendix of this report.

Stormwater Storage

This site will provide underground storage for the 100year-2 hour storm event for the onsite storm water generated. A storm water easement will be dedicated to the City of Scottsdale with the final plan submittal.

The proposed retention basin will include a drywell to ensure drainage within 36 hours. This drywell will drain the basin by gravity. The drywell will be governed by the City of Scottsdale Design Standards and Policy Manual and the FCD of Maricopa County Hydraulic Manual. The drywell must be permitted through ADEQ. The maintenance of the dry well will be the sole responsibility of the property owner. The underground tank will drain within 36 hours.

The proposed underground storage tank has a life cycle that exceeds 75 years including the lining and coating. A signed and sealed statement from the Geotechnical Engineer that the Underground Storage System is designed to meet a 75 year life cycle will be submitted with the final plan set to the City of Scottsdale. An separate Operations and Maintenance Manual for the underground storage will also be submitted to the City. It will provide a detailed breakdown of all underground Stormwater items and how they need to be maintained.

The underground Storage Tank will also include signs on each end of the underground storage tank indicating the tank location and depth.

This site will also be required to account to flow from the site to the east. This site has 11,385 CF of retention in an above ground basin that extends onto this site. The basin will be reworked to account for 4,925 CF above ground and underground storage will be added to account for the remaining requirements.

Summary

Based on the results of the Project Drainage design, the following can be concluded:

- The Project resides in a FEMA Designated Zone X per the FIRM panel number 04013C2235M Dated September 18, 2020
- The development retention will be provided in underground retention
- The Finish Floors has been designed to protect the building from flooding

GRADING PLAN

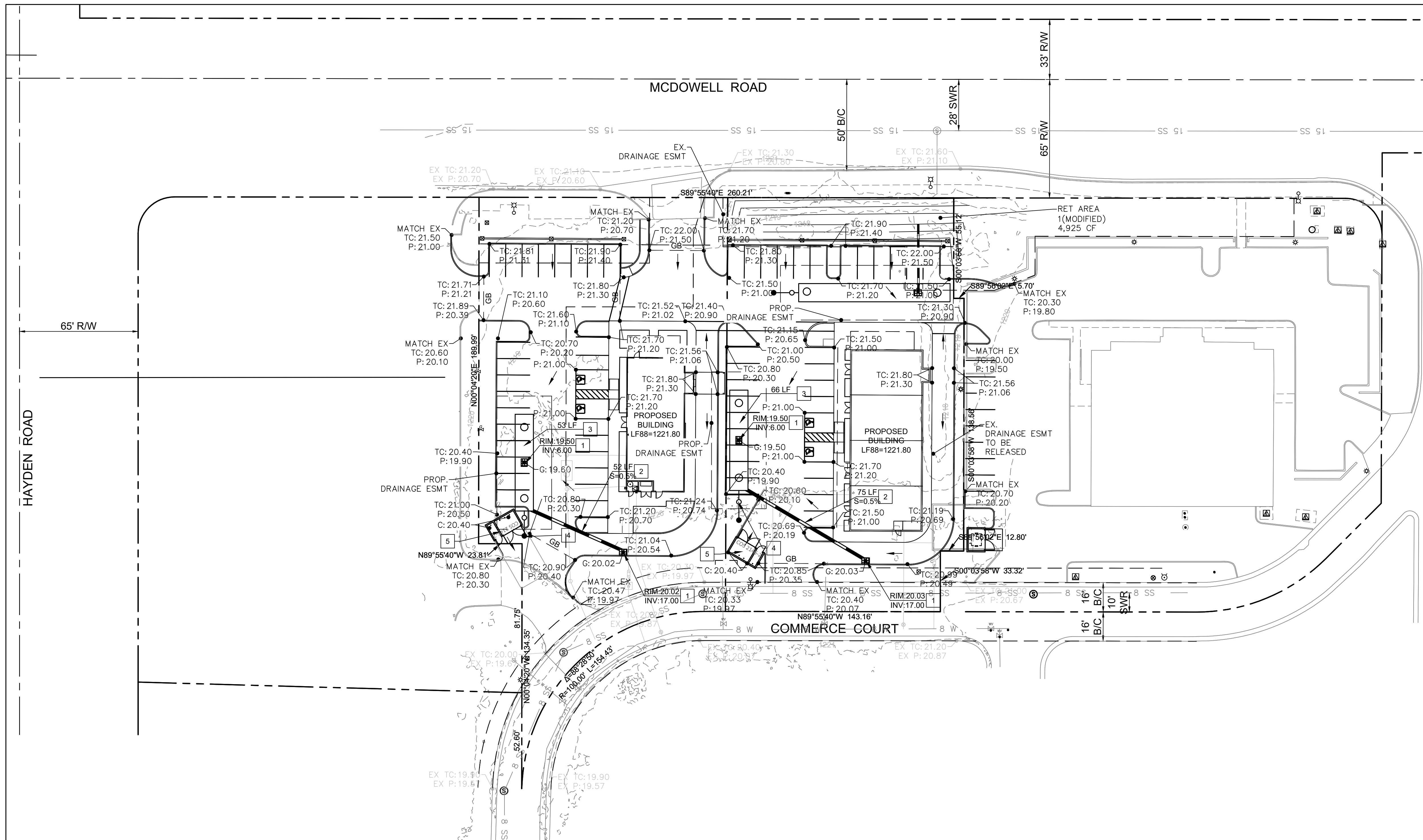
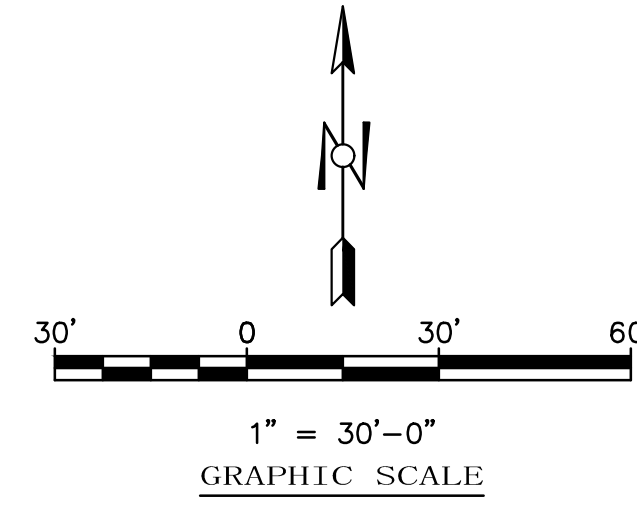
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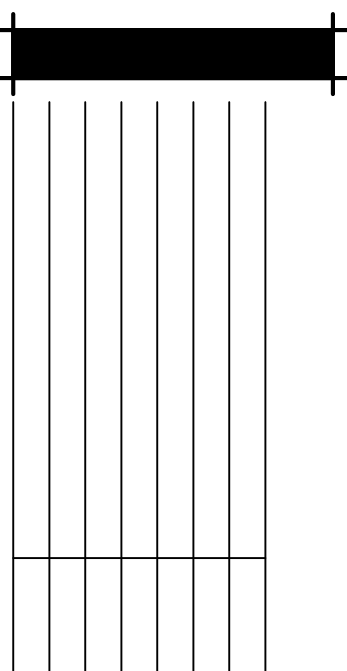
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PRELIMINARY GRADING & DRAINAGE PLAN FOR MCDOWELL - HAYDEN RETAIL

8101 EAST MCDOWELL ROAD, SCOTTSDALE, AZ 85257
A PORTION OF THE NORTHEAST QUARTER OF SECTION 1, TOWNSHIP 1 NORTH, RANGE 4 EAST,
OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA



- GRADING AND STORM DRAIN CONSTRUCTION NOTES
1. INSTALL CATCH BASIN PER MAG STD DTL 535
 2. INSTALL 18" HDPE, LENGTH AND SLOPE PER PLAN
 3. INSTALL 10' Ø RETENTION PIPE WITH ACCESS RISERS PER MAG STD DTL 535
 4. INSTALL DRYWELL PER MANUFACTURES SPECIFICATIONS
 5. INSTALL REFUSE ENCLOSURE PER ARCHITECTURAL PLANS



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Arizona State Board of Professional Engineers and Surveyors
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NOTICE OF ALTERNATE BILLING OR PAYMENT CYCLE:
THIS CONTRACT MAY ALLOW THE OWNER TO REQUIRE THE COMPLETION OF BILLING OR ESTIMATE IN BILLING CYCLES OTHER THAN THIRTY DAYS. THIS CONTRACT MAY REQUIRE OWNER TO MAKE PAYMENT CERTIFICATION AND APPROVAL OF BILLING AND ESTIMATES. A WRITTEN DESCRIPTION OF BILLING CYCLE APPLICABLE TO THE PROJECT IS AVAILABLE FROM OWNER OR REGISTERED AGENT.

MCDOWELL - HAYDEN RETAIL
8101 E MCDOWELL ROAD, SCOTTSDALE AZ 85257
E OF SEC OF MCDOWELL RD AND HAYDEN RD
DATE: 07-15-2021 (PRELIMINARY)

PRELIMINARY
GRADING &
DRAINAGE PLAN

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design by: -
drawn by: -
checked by: -

GD1
project: 18107.00

CALCULATIONS

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**McDowell and Hayden
RETENTION SUMMARY**

DRAINAGE AREA	AREA (SF)	R _R (CF)	Underground Diameter(FT)	Underground Length (FT)	R _P (CF)		Basin ID	D (FT)	A _T (SF)	A _B (SF)	R _P (CF)	R _P > R _R ?	EXCESS (CF)	EXCESS (%)	DRYWELLS REQ.
DA West	27245	4,090	10	53	4,162							OK	72	2%	1
							Total				4,162				
DA East	34130	5,124	10	66	5,183							OK	60	1%	
							Total				5,183				1
REP WEST		11,385	10	83	6,519			3.0	2,145	1,138	4,925	OK	58	1%	
							Total				11,443				1

Retention Required (R_R) = C x (P/12) x A x 1.1

Where:

C = Weighted runoff coefficient = 0.84
P = 100-year 2-hour rainfall depth = 2.15 inches
A = Contributing Area (SF)

Retention Provided (R_P) = [(A_T + A_B) / 2] x D

Where:

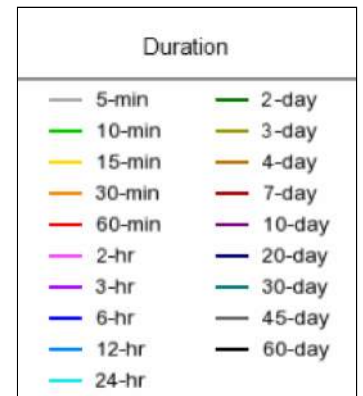
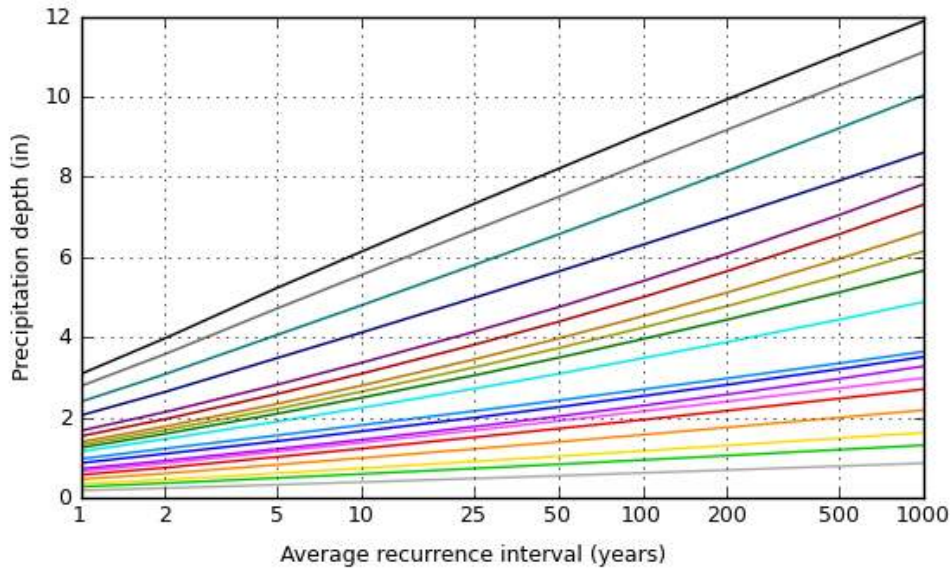
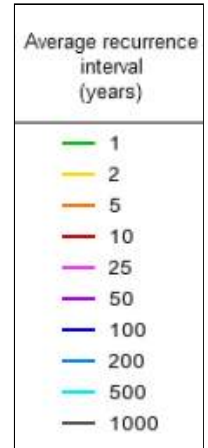
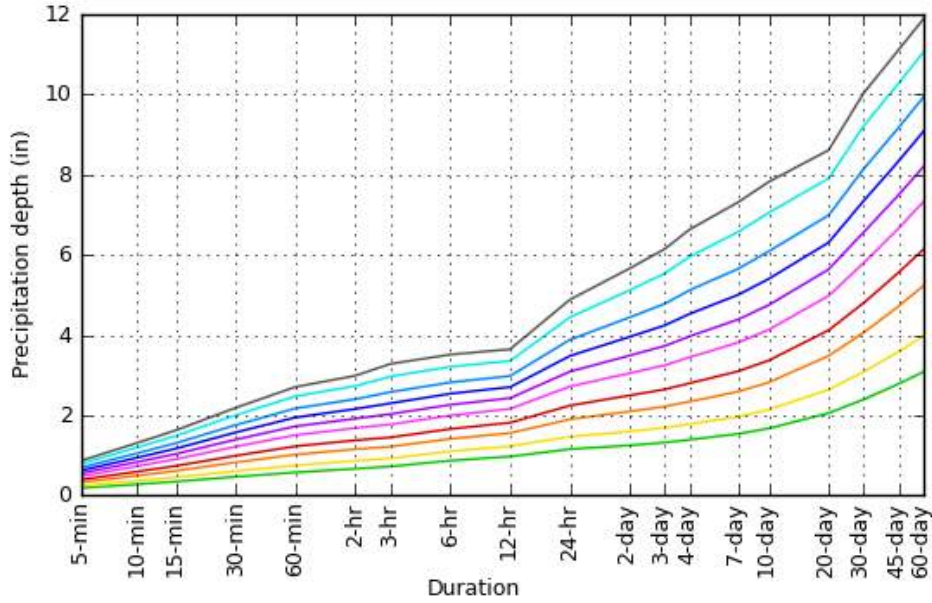
A_T = Basin Top Area (SF)
A_B = Basin Bottom Area (SF)
D = Basin Depth (FT)

Drywells Required* = (R_R / Q) / (60*60*36)

Where:

R_R = Retention Required (actual 100-year, 2 hour retention volume)
Q = Percolation rate per drywell = 0.1 cfs
** See retention basin dryup sheet for drywell calculations

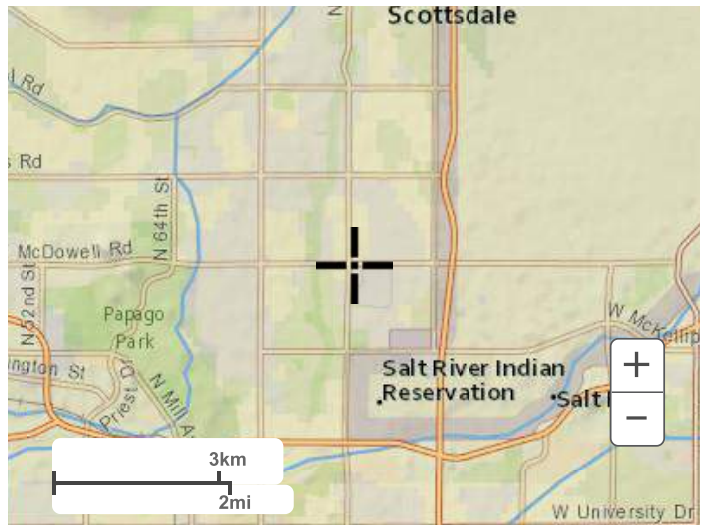
PDS-based depth-duration-frequency (DDF) curves
 Latitude: 33.4653°, Longitude: -111.9076°



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Maps & aerials

Small scale terrain



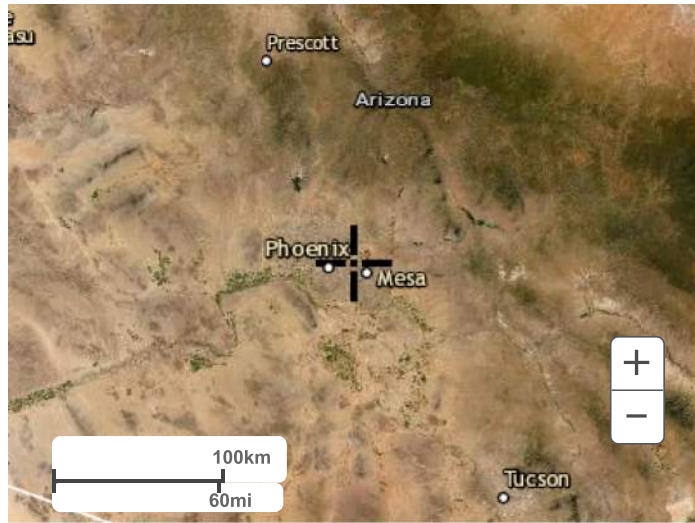
Large scale terrain



Large scale map



Large scale aerial



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FEMA FIRM

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