

Case #: 27-DR-2024

Review Cycle: 4

Reviewed By: GA

Date: 05/12/2025

Status: Accepted

Preliminary
Drainage Report
For

Palm Lane Townhomes Phase 1
7300 E Palm Lane
Scottsdale, AZ

Prepared by:



16815 S. Desert Foothills Pkwy, Suite 138
Phoenix, Arizona 85048
480.598.0270
480.598.0273 fax

September 22, 2024
Revised January 24, 2025
Revised March 14, 2025
Revised April 17, 2025

RCC Project No.: 24-034-50
27-DR-2024



Expires 12/31/25

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1.0 Introduction

The project is 7300 E. Palm Lane. The Phase 1 site consists of a total of 0.25 acres that is developed as a single-family residence. The site is bounded to the west and north by apartment complexes and to the east by a private driveway serving the apartment complex to the north, and to the south by Palm Lane.

The project will include demolition of the existing site improvements and building and construction of 3 new residential condominium units with a private drive that connects to Palm Lane.

2.0 Location

The Phase 1 site is located at 7300 E Palm Lane. The site is described as a portion of the Southwest Quarter of Section 35, Township 2N, Range 4E of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

3.0 Site Description

Currently, the site is developed as a single family residence. The site slopes to the south with outfall onto Palm Lane.

4.0 FEMA Floodplain Classification

According to FEMA Flood Insurance Rate Maps, Map Number 04013C2235M, dated September 18, 2020, the subject property is located in Zone X. Zone X is defined as “Areas of minimal flood hazard. See Figure 3 for the FEMA Map.

5.0 Off-site Drainage

The site is located within the Lower Indian Bend Wash – South ADMS. The current flow 2D model results show off-site flows entering the site from the west, See Figure 5. However, per

the drainage management plan of an approved drainage report and plans for a new residential development, Alexan Scottsdale (City of Scottsdale Plan check # 6625-19-1) on the west side of this project, no off-site drainage from the west will continue to impact this project site. A new solid block wall has been constructed with that development along the west boundary of the Phase 1 parcel.

6.0 On-site Drainage

The proposed development will drain to an underground retention system located within the landscape setback. Perc tests will be performed at the proper depth to prove dissipation rates of the retention volume in the required timeframe of 36 hours as discussed in the following section.

7.0 Retention Requirements

Since the site is already developed, the stormwater retention requirements will be for the greater of the first flush volume or pre-development vs. post-development 100-yr/2hr runoff volume.

The new development will provide retention for the first flush storm event as it is greater than the pre-development vs post-development volume based on the 100-yr/2-hr storm event. The retention for the proposed development will be provided in an underground stormwater retention system that utilizes HDPE chambers and basin bottom percolation. See the complete calculations in the Appendix.

All developments shall be designed to have positive outfall to adjacent streets once the on-site stormwater storage basins are filled. The ultimate outfall for this site is onto Palm Lane on the south side of the site.

The first flush volume is determined by the following equation:

$V = C (P/12) A$ where;

$C = 1.0$

$P=0.5$ in

A=size of the contributing drainage area.

The pre-development vs post-development was determined with C values calculated using the a weight runoff coefficient based on the actual pre and post development improvements using the coefficients from Table 3.2.

The retention volume is required to be drained within a time period of 36 hours following a storm event. Disposal of retention will be accomplished through infiltration through the bottom of the underground retention chamber system. one of the following means:

- Infiltration
- Drywells – if infiltration is insufficient

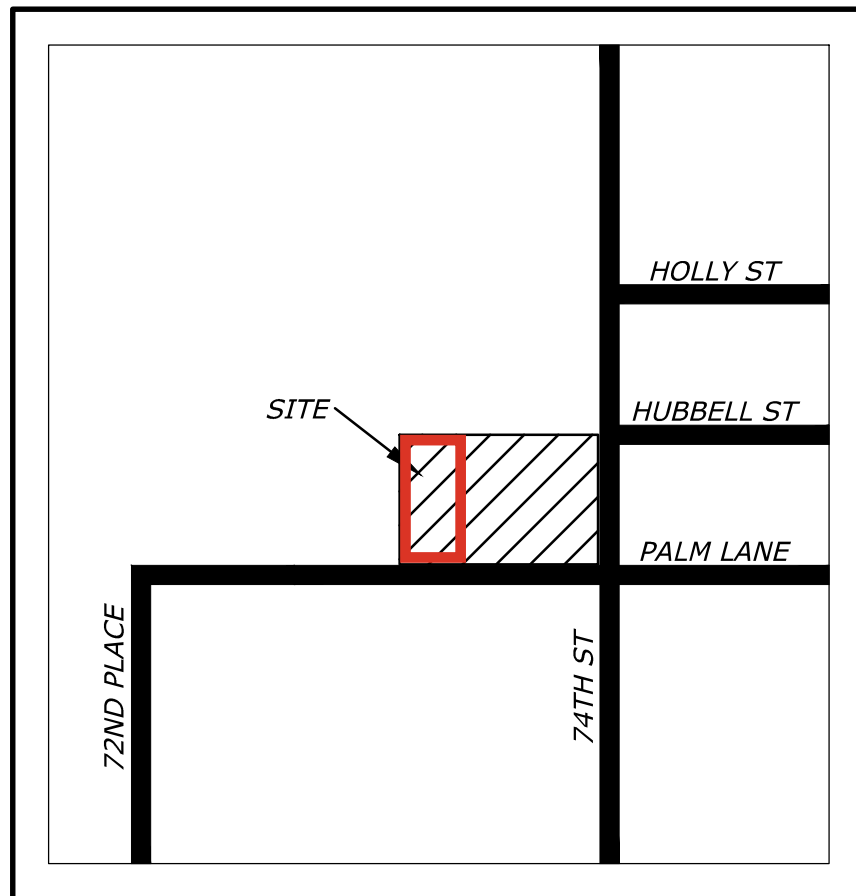
8.0 Finished Floor Elevations

The finished floor elevation for the new buildings will be determined based on the proposed retention basin overflow elevations and the site outfall. Finished floor elevations of structures have been set and the elevation deemed to be protected from flooding for up to the 100-yr storm event.

9.0 References

City of Scottsdale DS&PM, 2021 edition.

Flood Control District of Maricopa County Drainage Design Manual, Hydrology, 2003 Edition.



VICINITY MAP
NOT TO SCALE

FIGURE 1

Map



September 26, 2024

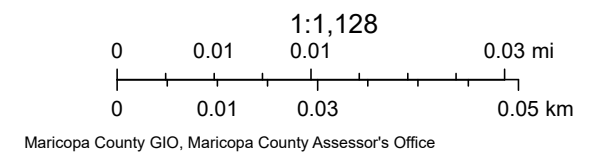
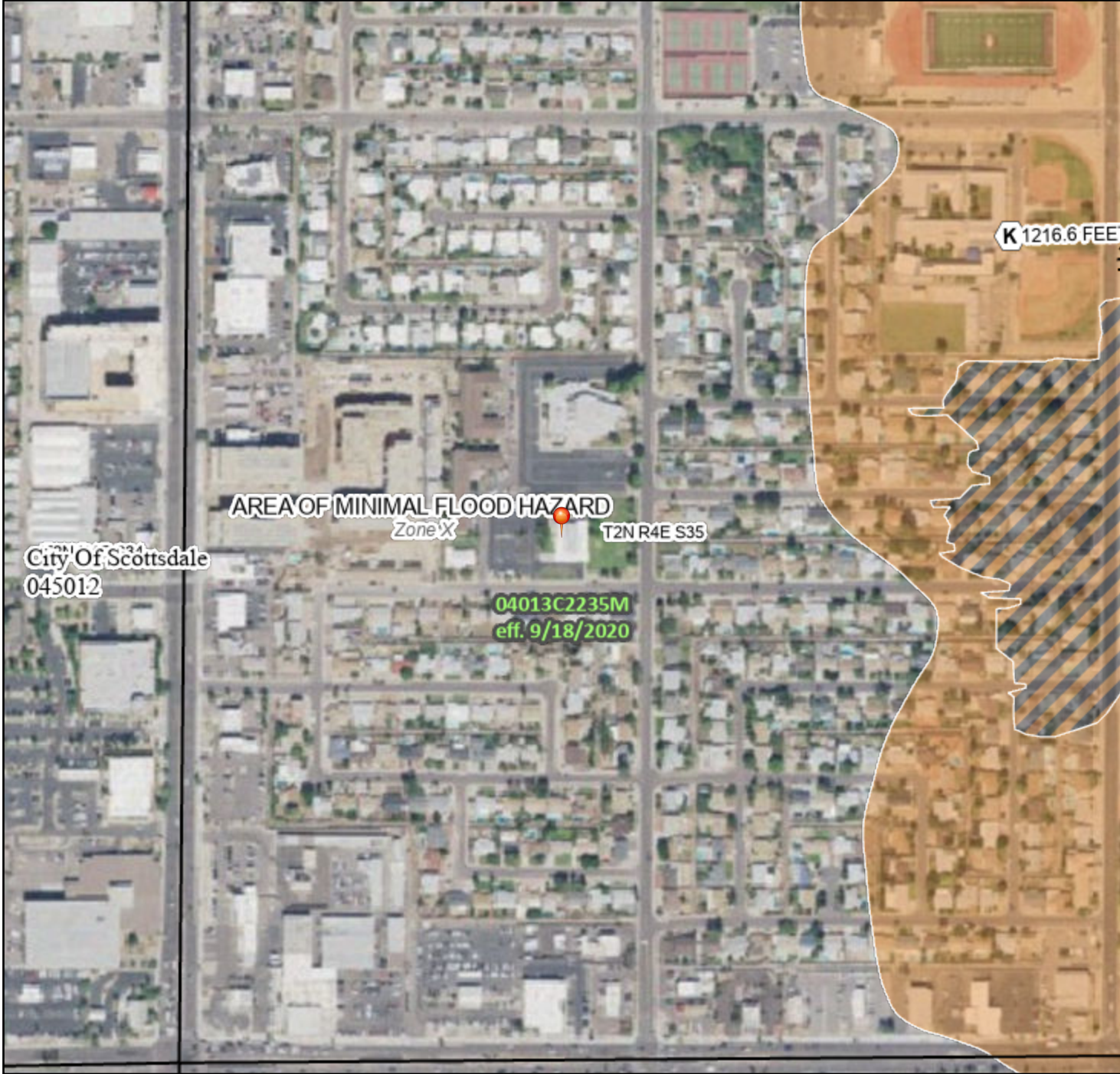


FIGURE 2

National Flood Hazard Layer FIRMette



111°55'40"W 33°28'26"N



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

1:6,000

111°55'3"W 33°27'56"N

Basemap Imagery Source: USGS National Map 2023

Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance Water Surface Elevation
MAP PANELS		Coastal Transect
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
OTHER FEATURES		Hydrographic Feature
		Digital Data Available
MAP PANELS		No Digital Data Available
		Unmapped



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 7/22/2024 at 11:29 AM 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.

FIGURE 3



NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.4698°, Longitude: -111.9227°
Elevation: 1225 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

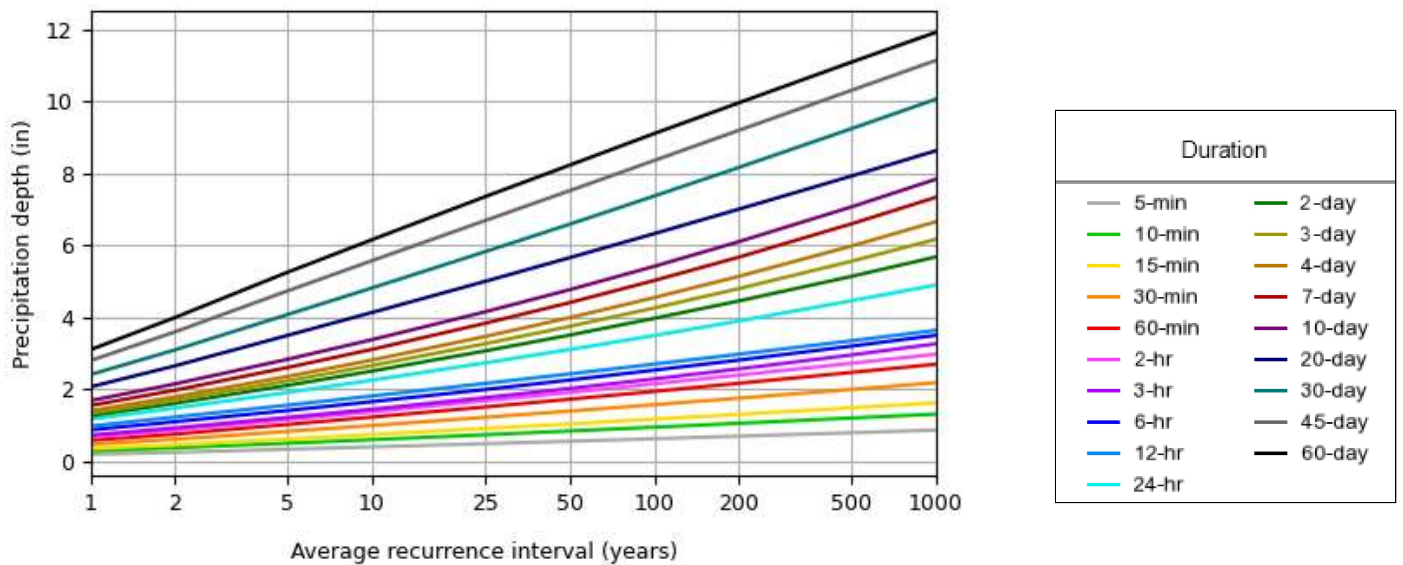
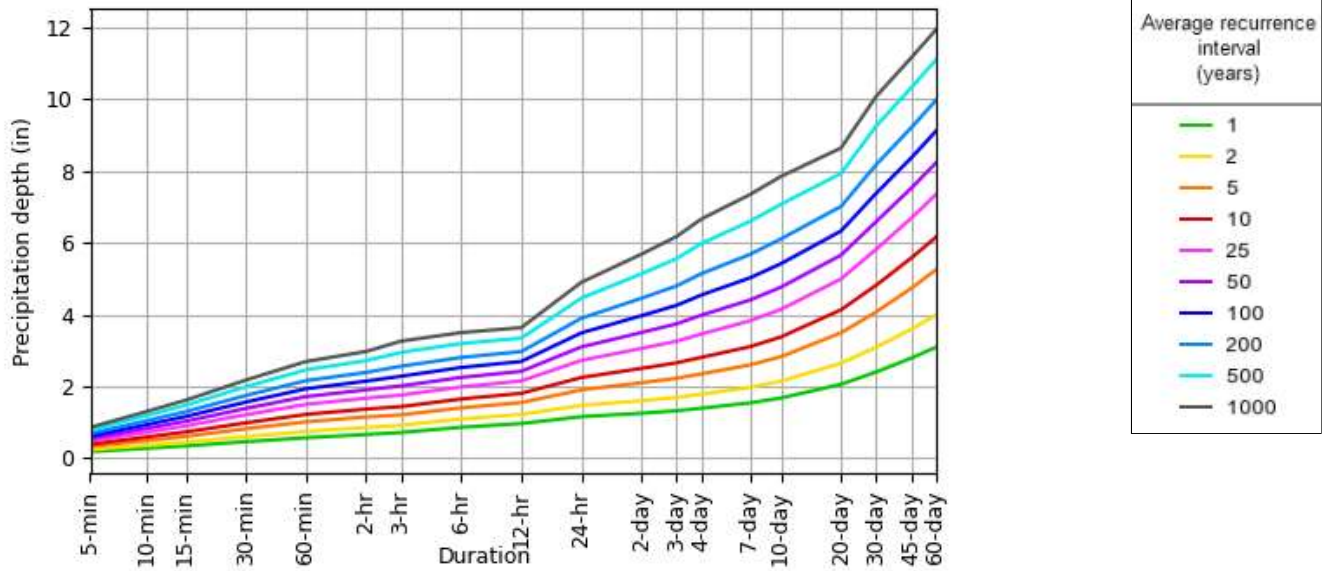
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.181 (0.152-0.219)	0.236 (0.200-0.287)	0.322 (0.270-0.389)	0.388 (0.323-0.466)	0.476 (0.391-0.570)	0.545 (0.441-0.650)	0.614 (0.488-0.730)	0.686 (0.536-0.815)	0.782 (0.595-0.930)	0.856 (0.638-1.02)
10-min	0.275 (0.231-0.334)	0.360 (0.304-0.437)	0.490 (0.411-0.592)	0.590 (0.492-0.709)	0.724 (0.595-0.867)	0.830 (0.672-0.988)	0.935 (0.743-1.11)	1.04 (0.817-1.24)	1.19 (0.906-1.42)	1.30 (0.971-1.55)
15-min	0.341 (0.287-0.414)	0.446 (0.377-0.541)	0.607 (0.509-0.734)	0.731 (0.609-0.879)	0.898 (0.737-1.08)	1.03 (0.832-1.22)	1.16 (0.922-1.38)	1.30 (1.01-1.54)	1.48 (1.12-1.76)	1.61 (1.20-1.92)
30-min	0.459 (0.386-0.557)	0.600 (0.507-0.728)	0.818 (0.686-0.988)	0.984 (0.821-1.18)	1.21 (0.993-1.45)	1.38 (1.12-1.65)	1.56 (1.24-1.86)	1.74 (1.36-2.07)	1.99 (1.51-2.36)	2.17 (1.62-2.59)
60-min	0.568 (0.478-0.690)	0.743 (0.628-0.901)	1.01 (0.849-1.22)	1.22 (1.02-1.46)	1.50 (1.23-1.79)	1.71 (1.39-2.04)	1.93 (1.54-2.30)	2.16 (1.69-2.56)	2.46 (1.87-2.92)	2.69 (2.01-3.20)
2-hr	0.659 (0.564-0.785)	0.854 (0.731-1.02)	1.14 (0.976-1.36)	1.37 (1.15-1.62)	1.67 (1.39-1.96)	1.90 (1.56-2.23)	2.14 (1.73-2.51)	2.39 (1.90-2.80)	2.71 (2.10-3.18)	2.97 (2.25-3.51)
3-hr	0.714 (0.608-0.855)	0.916 (0.784-1.10)	1.21 (1.02-1.44)	1.44 (1.21-1.71)	1.76 (1.46-2.08)	2.01 (1.65-2.38)	2.28 (1.83-2.69)	2.56 (2.02-3.02)	2.94 (2.26-3.48)	3.26 (2.44-3.86)
6-hr	0.860 (0.747-1.01)	1.09 (0.951-1.28)	1.40 (1.22-1.64)	1.65 (1.42-1.92)	1.98 (1.68-2.29)	2.25 (1.88-2.59)	2.52 (2.08-2.91)	2.80 (2.26-3.24)	3.19 (2.51-3.70)	3.50 (2.68-4.06)
12-hr	0.964 (0.845-1.12)	1.22 (1.07-1.41)	1.55 (1.35-1.79)	1.80 (1.57-2.08)	2.15 (1.85-2.47)	2.42 (2.05-2.77)	2.69 (2.25-3.09)	2.97 (2.45-3.41)	3.34 (2.69-3.86)	3.63 (2.87-4.23)
24-hr	1.16 (1.04-1.29)	1.47 (1.32-1.64)	1.90 (1.70-2.13)	2.24 (2.00-2.51)	2.72 (2.41-3.04)	3.10 (2.73-3.44)	3.49 (3.05-3.88)	3.89 (3.38-4.33)	4.45 (3.82-4.96)	4.90 (4.16-5.47)
2-day	1.25 (1.12-1.40)	1.60 (1.44-1.79)	2.10 (1.88-2.35)	2.50 (2.23-2.79)	3.06 (2.71-3.41)	3.50 (3.08-3.90)	3.96 (3.48-4.43)	4.45 (3.87-4.98)	5.13 (4.41-5.75)	5.68 (4.83-6.39)
3-day	1.32 (1.19-1.48)	1.69 (1.52-1.89)	2.22 (1.99-2.48)	2.65 (2.37-2.96)	3.26 (2.89-3.63)	3.74 (3.30-4.17)	4.25 (3.73-4.74)	4.79 (4.16-5.35)	5.55 (4.76-6.21)	6.17 (5.24-6.91)
4-day	1.39 (1.25-1.56)	1.78 (1.60-1.99)	2.35 (2.10-2.62)	2.81 (2.50-3.13)	3.46 (3.07-3.85)	3.98 (3.51-4.43)	4.54 (3.98-5.06)	5.14 (4.46-5.72)	5.98 (5.12-6.66)	6.66 (5.64-7.44)
7-day	1.54 (1.38-1.72)	1.97 (1.77-2.20)	2.60 (2.32-2.90)	3.10 (2.77-3.46)	3.82 (3.39-4.26)	4.40 (3.88-4.90)	5.02 (4.39-5.59)	5.67 (4.92-6.32)	6.59 (5.65-7.36)	7.34 (6.22-8.20)
10-day	1.67 (1.50-1.87)	2.14 (1.92-2.39)	2.82 (2.53-3.15)	3.37 (3.01-3.76)	4.14 (3.68-4.61)	4.76 (4.20-5.29)	5.41 (4.75-6.02)	6.10 (5.31-6.79)	7.07 (6.07-7.87)	7.84 (6.67-8.75)
20-day	2.06 (1.85-2.29)	2.64 (2.38-2.94)	3.49 (3.14-3.88)	4.13 (3.70-4.58)	4.99 (4.45-5.53)	5.65 (5.02-6.27)	6.32 (5.60-7.02)	7.01 (6.17-7.79)	7.92 (6.91-8.83)	8.63 (7.47-9.63)
30-day	2.40 (2.16-2.67)	3.09 (2.78-3.43)	4.07 (3.65-4.51)	4.81 (4.31-5.33)	5.81 (5.18-6.43)	6.58 (5.85-7.27)	7.37 (6.52-8.15)	8.17 (7.19-9.03)	9.24 (8.07-10.2)	10.1 (8.72-11.2)
45-day	2.79 (2.51-3.09)	3.59 (3.24-3.98)	4.73 (4.26-5.24)	5.57 (5.00-6.18)	6.68 (5.98-7.40)	7.52 (6.71-8.33)	8.36 (7.43-9.26)	9.20 (8.14-10.2)	10.3 (9.05-11.5)	11.1 (9.73-12.4)
60-day	3.09 (2.79-3.42)	3.99 (3.60-4.41)	5.25 (4.73-5.80)	6.16 (5.54-6.81)	7.34 (6.59-8.12)	8.23 (7.35-9.10)	9.11 (8.11-10.1)	9.97 (8.84-11.0)	11.1 (9.78-12.3)	11.9 (10.5-13.3)
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.										

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PF graphical

PDS-based depth-duration-frequency (DDF) curves

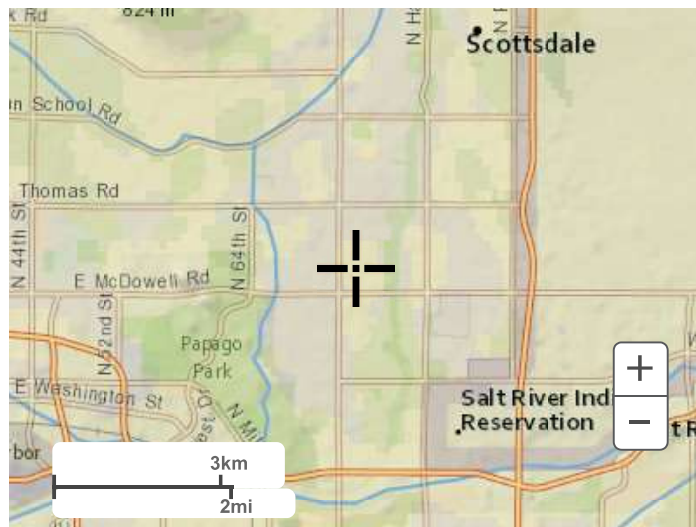
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Maps & aerials

Small scale terrain



Large scale terrain

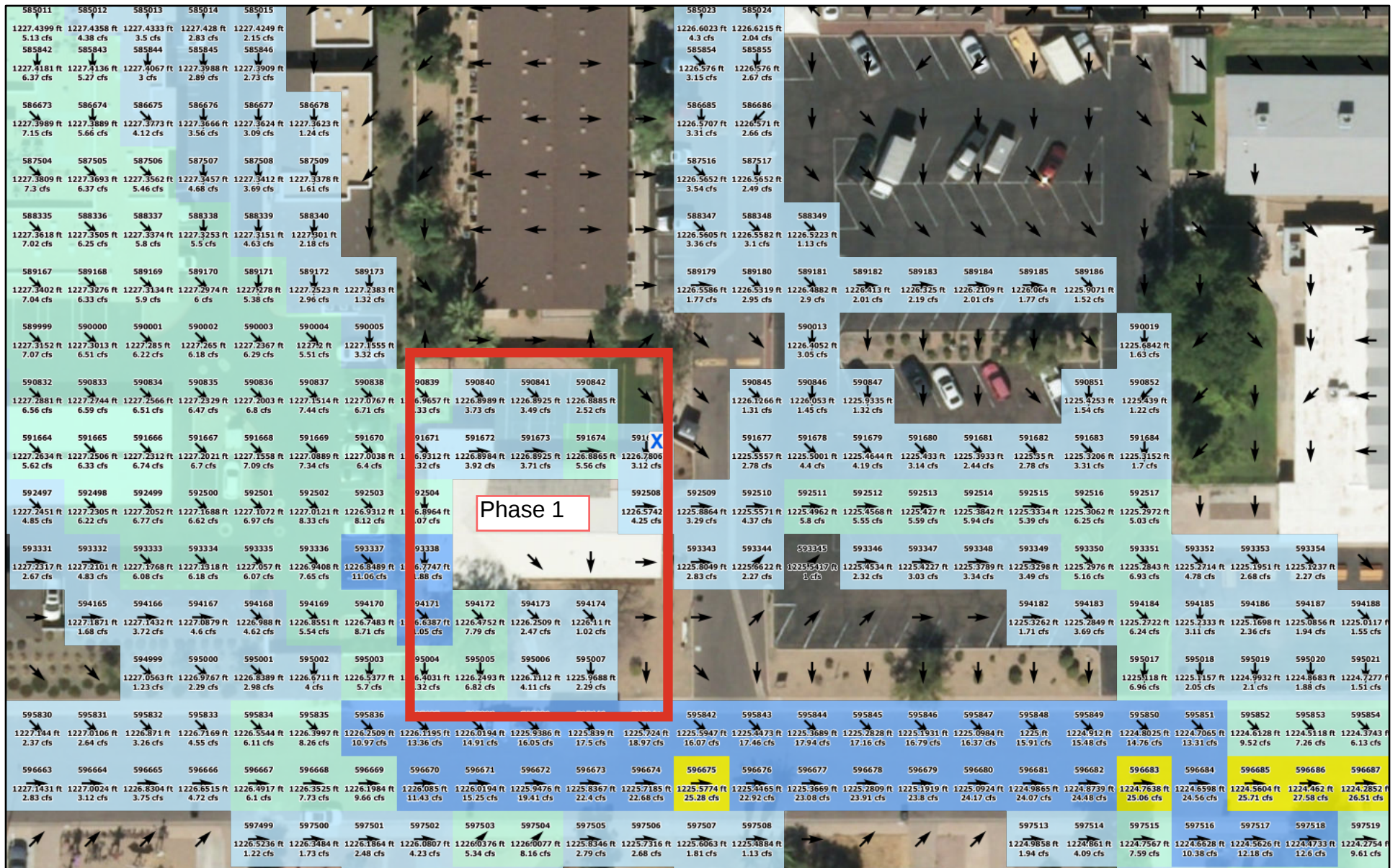


Large scale map



Large scale aerial

679_LIBW - South 100YR6HR



April 17, 2025

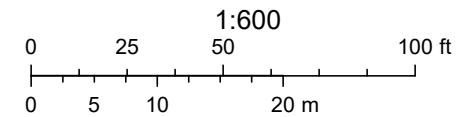


FIGURE 5

DRAINAGE AREA MAP
FOR
PALM LANES RESIDENCES PHASE 2
7320 E PALM LANE

PROJECT NO. 24-034-50
DRAWING NO. 00000
DATE: 7/22/24
DRAWN BY: LJR/SWR
CHECKED BY: JSR/SWR
REVISIONS:

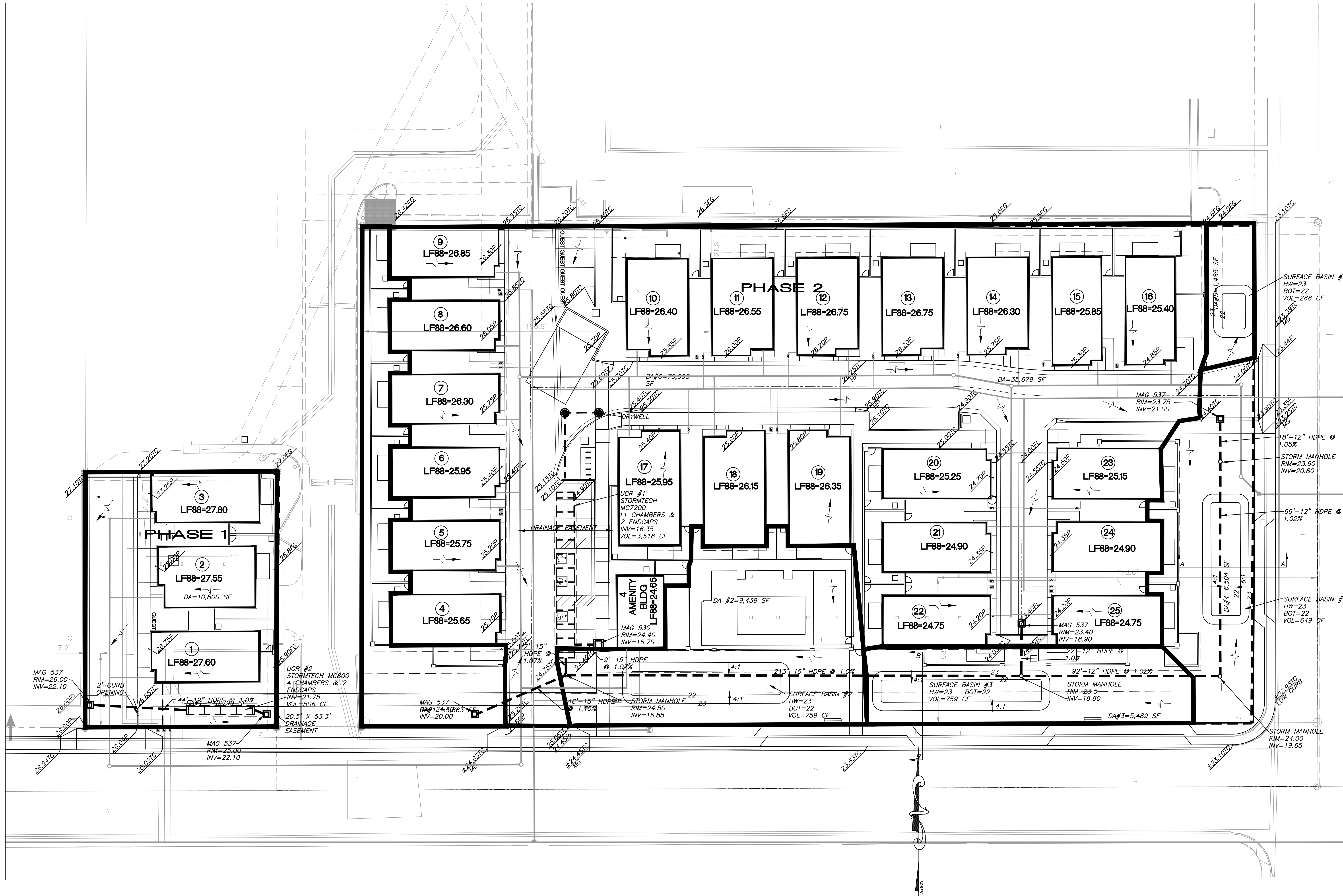
SHEET NO.

DRAINAGE AREA MAP

DA

FIGURE 6

28-DR-2024



APPENDIX A – PEAK FLOW CALCULATIONS

(to be provided in final report)

APPENDIX B – RETENTION CALCULATIONS

PRELIMINARY RETENTION CALCULATIONS:

SITE IS CURRENTLY DEVELOPED. PROVIDE RETENTION FOR FIRST FLUSH STORM EVENT OR PRE-DEVELOPMENT VS. POST-DEVELOPMENT, WHICH EVERY IS GREATER

FIRST FLUSH VOLUME

$$V_r = (0.5/12) \times 1.0 \times DA$$

DA #7

AREA=10,799 SF

$$V_r = (0.5/12) \times 1.0 \times 10,799 = 450 \text{ CF}$$

PRE-DEVELOPMENT VS POST DEVELOPMENT

$$V_r = (P/12) \times (C_{\text{post}} - C_{\text{pre}}) \times 10,799$$

C PRE=0.69 (weighted coefficient calculation)

C POST=0.84 (weighted coefficient calculation)

P=2.14 in

$$V_r = (2.14/12) \times (0.84 - 0.69) \times 10,799 = 289 \text{ cf}$$

VOLUME PROVIDED IN STORMTECH MODEL MC800 UNDERGROUND RETENTION SYSTEM

4 CHAMBERS AND 2 END CAPS IN STONE BED

V_p=506 CF

DISCHARGE THROUGH INFILTRATION. IF INFILTRATION IS INSUFFICIENT, A DRYWELL WILL BE PROVIDED.

Weight C calculations

Pre-development

	<u>area</u>	<u>C (Table 3.2)</u>
Buildings, pavement and concrete:	4453 sf	0.95
Desert Landscape (DL2):	4111 sf	0.50
Artificial turf	2236	<u>0.50</u>
C _w =		0.69

Post-development

Building, pavement, and concrete	8173	0.95
Desert Landscape (DL2)	2627	<u>0.50</u>
C _w		0.84