PRELIMINARY DRAINAGE REPORT

For

MERCADO COURTYARD

10301 N. 92nd Street
Scottsdale, AZ 85254

Prepared For:

CALIBER

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Scottsdale, AZ 85258
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Plan # 12-ZN-2022

Case # _____

Q-S # _____

X Accepted

____ Corrections

M.R. 10/03/2022
Reviewed By Date

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Project Number: 210414

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Case No: 6-ZN-2021 **Plan Check No.: TBD**

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1. INTRODUCTION

This Preliminary Drainage Report represents the storm water analysis for Mercado Courtyard development proposed in Scottsdale, Arizona. Mercado Courtyard is a proposed multi-family residential development located south and east of the Shea Boulevard and 92nd Street intersection. The purpose of this report is to provide the hydrologic and hydraulic analysis, required by the City of Scottsdale, to support the proposed rezoning for said development. This report includes discussions and calculations defining the storm water management concepts for the collection and conveyance necessary to comply with the drainage requirements of the City of Scottsdale and Maricopa County. Preparation of this report has been done in accordance with the requirements of the City of Scottsdale Design Standards & Policies Manual (DS&PM) 2018 [1], and the Drainage Design Manuals for Maricopa County, Arizona, Volumes I[2] and Volume II[3].

2. LOCATION AND PROJECT DESCRIPTION

2.1 LOCATION:

The subject property consists of four contiguous parcels located south and east of Shea Boulevard and 92nd Street in Scottsdale, AZ.

- A Portion of the Northeast Quarter of Section 30, Township 3 North, Range 5 East of The Gila And Salt River Base And Meridian, Maricopa County, Arizona.
- Parcel ID: Parcel 217-39-536, Zoning is PUD
  Parcel 217-39-537A, Zoning is PUD
  Parcel 217-39-537B, Zoning is PUD
  Parcel 217-36-989B, Zoning is C-O PCD
- Address: 10301 N. 92nd Street. Scottsdale, Arizona 85258.

Refer to **FIGURE 1** - **Vicinity Map** for the project's location with respect to major cross streets.

2.2 EXISTING AND PROPOSED DEVELOPMENTS SURROUNDING THE SITE:

- South: Parcel with APN 217-74-038, a medical office development; Zoning is C-O PCD.
- North: Parcel with APN 217-36-960L, Sprouts shopping center; Zoning is C-3 PCD.
- East: Parcel 217-36-001P; paved area and medical offices, Zoning is C-O PCD.
- West: Across N. 92th St. is Parcel 217-36-962G; medical offices; Zoning is SC PCD.

2.3 EXISTING SITE DESCRIPTION:

The project area includes approximately 257,362 sq. ft. (5.91 acres) of land designated as PUD, with the exception of parcel with APN 217-36-989B at the east which has a zoning of C-O PCD. The site is partially developed, the west side includes medical offices with associated parking lot, driveways and landscape areas; the east area is mainly undeveloped but has a small parking lot constructed at the south which connects to the eastern area of the site. The parcels generally slope towards the southwest corner.

Refer to **FIGURE 2** attached for an aerial of the site.

2.4 PROPOSED SITE DEVELOPMENT:

The proposed project will require the demolition of existing structures and associated parking lots. The proposed site will include a new high-density residential facility with 273 units, the building will have a central at-grade parking garage and rise to five floors.

Refer to **Appendix III** – Preliminary Grading and Drainage Plan for site layout.

2.5 FLOOD HAZARD ZONE:

FIRM Map Number 04013C1760L dated October 16, 2013 indicates the site has a Zone X-Shaded designation. Zone X-Shaded is defined as 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.

Refer to **FIGURE 3** for the FIRM and FIRMette.

3. EXISTING DRAINAGE CONDITIONS

3.1 OFF-SITE DRAINAGE PATTERNS

The topographic survey provides the following information for offsite drainage:

- The north of the site is bounded by Sprouts Shopping center, which has its own drainage system. A ridgeline prevents stormwater from Sprouts Shopping Center parking lot to enter the site. No offsite flows from the north affect the site.
- The west of the site is bounded by N. 92nd Street. Half of the street run-off drains towards the property and is conveyed via curb and gutter into an existing catch basin adjacent to the property. No offsite flows from the west affect the site.
- The south of the site is bounded by a medical office development. The medical office development has its own drainage system and a wall separating the two properties prevents stormwater from entering the site. An existing 48" CIP pipe conveys flows from the southern property without affecting the site. No offsite flows from the south affect the site.
- The east of the site is adjacent to a paved area and medical offices. The medical office has its own drainage system and grades on the paved area go away from the site. The existing 48" CIP pipe conveys flows from the east without affecting the site. No offsite flows from the east affect the site.

3.3 ON-SITE DRAINAGE

Most of the runoff from the site is collected by existing catch basins (EX. CB-1, EX. CB-2, and EX. CB-3) and slotted drains (EX. SD-1, EX. SD-2, EX. SD-3) ultimately conveyed to the public network storm system at 92nd Street. The majority of stormwater from drainage area EX-1 flows easterly into a gutter and then proceeds to flow south into EX. CB-1. A small portion of runoff from drainage area EX-1 flows towards the northeast into EX. CB-1. Runoff from drainage area EX-2 flows westerly into a wall opening which leads stormwater into a slotted drain (EX. SD-1). Stormwater on drainage area EX-3 follows the same pattern as drainage area EX-2, flowing westerly into an opening and discharging into a slotted drain (EX. SD-2). Runoff from drainage area EX-4 flows southerly into an on-site curb and gutter, and then proceeds to flow westerly

into a wall opening leading stormwater into a slotted drain (EX-SD-3). Open retention basin, EX. Basin 1, collects stormwater on drainage area EX-5. Runoff from drainage area EX-6 flows towards EX. CB-2 located in the mid-west of the drainage area. Stormwater from EX-7 flows westerly into N. 92nd Street, where half of the runoff flows northwesterly into EX-CB-3 and the other half flows southeasterly along the street via curb and gutter. Stormwater collected on EX-R-1 drains through roof drains towards drainage area EX-1 ultimately draining into EX-CB-1. Stormwater collected on EX-R-2 drains through roof drains towards drainage area EX-3 ultimately draining into EX. SD-2.

Refer to **Appendix II** for **Existing Conditions Drainage Area Map**.

Existing runoff coefficients and flows for the 100-year, 5 min. event are presented in the tables below. Coefficients of 0.95 and 0.45 were chosen for building or concrete and desert landscape respectively, in accordance with the city of Scottsdale DS&PM.

Table 1. Existing Weighted Runoff Coefficients.

Weighted Runoff Coefficient-Calculations (Cw)				
EXISTING OVERALL SITE C_w				
	BUILDING or CONCRETE	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	3.33	2.73	**6.06**	**0.72**
EX-1	1.39	0.44	1.83	0.83
EX-2	0.29	0.08	0.37	0.84
EX-3	0.31	0.21	0.52	0.75
EX-4	0.23	0.16	0.39	0.74
EX-5	0.00	1.58	1.58	0.45
EX-6	0.17	0.25	0.42	0.65
EX-7	0.05	0.00	0.05	0.95
EX-R-1	0.69	0.00	0.69	0.95
EX-R-2	0.20	0.00	0.20	0.95

The open retention Ex. Basin 1 provided volume is displayed in the table below:

Table 2. EX. Basin 1 Provided Volume

EX. Basin 1					
ELEV.	AREA	DEPTH	AVG V	SUM V	COMMENT
(FT)	(SF)	(FT)	(CF)	(CF)	
1369.0	382			0.00	Bottom
		2.00	1,704.33		
1371.0	1,314			1,704.33	Volume

Table 3. Existing Onsite Flows

EXISTING ONSITE 100 YR 5 MIN				
Drainage Area	Area (ac)	Cw	i (in/hr)	Q (cfs)
EX-1	1.83	0.83	7.54	11.44
EX-2	0.37	0.84	7.54	2.37
EX-3	0.52	0.75	7.54	2.93
EX-4	0.39	0.74	7.54	2.17
EX-5	1.58	0.45	7.54	5.37
EX-6	0.42	0.65	7.54	2.04
EX-7	0.05	0.95	7.54	0.39
EX-R-1	0.69	0.95	7.54	4.93
EX-R-2	0.20	0.95	7.54	1.47

Overall existing project area includes **6.06 Acres at C_{wt} = 0.72**

Refer to **Appendix II** for 100-year and 10-year event calculations.

4. PROPOSED STORM WATER MANAGEMENT

4.1 DESIGN INTENT:

Most of the on-site drainage will be directed off-site through a storm drain system to the historical outlets. The drainage proposal will be consistent with previous conditions of the site to avoid disrupting existing drainage patterns. Flows exposed to contaminated surfaces will also be treated prior to being released as a measure to control the quality of stormwater. Drainage areas A1 through A3 will be directed towards basin 1 via catch basins and storm pipes. Drainage area A1 will flow southerly into CB-1. Stormwater from drainage area A2 will flow towards its center into CB-2. Stormwater from drainage area A3 will flow into roof drain RD-1. Drainage areas B1 through B6 will be directed to the city's public storm system. Drainage area B1 will discharge into CB-3. Drainage area B2 will discharge runoff into the existing EX. SD-1 via a wall opening. Stormwater from Drainage area B3 will discharge into the EX. SD-2. Runoff from drainage area B4 will flow southwesterly into CB-4. Drainage area B5 will flow into CB-5. Flows discharging to the existing slotted drains are reduced. The table below summarizes the flow reduction in the slotted drains.

Table 4. Proposed and Existing Flows Comparison

P. DA	Ex. DA	Proposed Q CFS	Existing Q CFS	Difference	Inlet
B2	EX-2	0.42	2.37	-1.95	EX. SD 1
B3	Ex-3	0.98	2.93	-1.95	EX. SD 2

Since the site has been previously developed, on-site retention shall be calculated per City of Scottsdale DSPM 4-1.201.

4.2 DESIGN STORM REQUIREMENTS:

In accordance with City of Scottsdale requirements, stormwater storage for the 100-year 2-hour storm event is required based on maintaining existing retention volume plus the difference between the pre vs. post development runoff from the 100-year 2-hour storm event if increased or first flush, whichever is greater. Per topographic information, there is an existing open retention basin in the site. As such, retention shall be provided by the sum of the existing retention volume plus the pre vs. post difference in volume or first flush.

4.3 LAND CHARACTERISTICS:

The proposed project site consists of residential spaces with a main drive and landscape areas. Based on the City of Scottsdale Design Standards & Policies Manual (DSPM), runoff coefficients for the 100-year storm event used are as follows:

- C=0.95 for building or concrete
- C=0.95 for paved surface
- C=0.45 for undisturbed natural desert or desert landscape

HYDROLOGIC ANALYSIS: The hydrologic analysis is determined using the procedures in the DSPM and the Drainage Design Manual for Maricopa County, Arizona, Volume I.

TABLE 5: PROPOSED CONDITIONS RUNOFF CALCULATIONS

Weighted Runoff Coefficient-Calculations (Cw)				
PROPOSED OVERALL SITE C_w				
	BUILDING or CONCRETE	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	4.48	1.58	**6.06**	**0.82**
A1	0.29	0.33	0.62	0.68
A2	0.28	0.15	0.43	0.77
A3	0.11	0.00	0.11	0.95
B1	0.42	0.26	0.68	0.76
B2	0.03	0.06	0.09	0.61
B3	0.03	0.23	0.26	0.50
B4	0.34	0.32	0.65	0.71
B5	0.07	0.23	0.29	0.56
B6	2.92	0.00	2.92	0.95

Overall project area includes **6.06 Acres at C_{wt} = 0.82**.

Table 6. Proposed Onsite Flows.

PROPOSED ONSITE 100 YR 5 MIN				
Drainage Area	Area (ac)	Cw	i (in/hr)	Q (cfs)
A1	0.62	0.68	7.54	3.20
A2	0.43	0.77	7.54	2.50
A3	0.11	0.95	7.54	0.81
B1	0.68	0.76	7.54	3.92
B2	0.09	0.61	7.54	0.42
B3	0.26	0.50	7.54	0.98
B4	0.65	0.71	7.54	3.48
B5	0.29	0.56	7.54	1.24
B6	2.92	0.95	7.54	20.91

Refer to the **Proposed Cwt Exhibit (Exhibit B)**, **Proposed Conditions Drainage Area Map (Exhibit D)** and Calculations in **Appendix II**.

4.4 STORMWATER RETENTION:

100-YR, 2-HR STORM: Per City of Scottsdale DSPM 4-1.201, development storage requirements for the 100-yr, 2-hr storm event are calculated as follows:

$$V_r = \Delta C \left(\frac{R}{12}\right) A$$

where:
V_r = Required storage (cf)
R = Precipitation amount =2.22 in per NOAA Atlas 14 Precipitation Frequency Estimates
A = Total area of site (sf)
$\Delta C = C_{post} - C_{pre}$

$$V_r = (0.82 - 0.72)\left(\frac{2.22}{12}\right)(263{,}940.61) = 4{,}882.90\ cf$$

Since the difference of the weighted coefficient is greater than 0, an increase in stormwater flows will be generated. Therefore, stormwater retention is required for the development following the pre vs. post analysis. The volume provided by EX. Basin 1 must be added to the pre vs. post analysis volume to compare it with the first flush volume. The addition of the volumes is 1,704.33 cf + 4,882.90 cf = 6,587.23 cf.

FIRST FLUSH: First Flush storage required is calculated in accordance with City of Scottsdale DSPM 4-1.201. Only the areas where runoff could be affected by vehicular contact are considered in the first flush calculation. The roof drainage is considered to be free of heavy traffic pollutants, therefore, on-site driveway areas and sidewalks will be considered for the calculation.

$$FF_r = C\left(\frac{P}{12}\right) A$$

where:
FF_r = First Flush required storage volume (cf)
A = Area of site excluding roofs and landscape (sf)
C = The weighted average runoff coefficient =0.95

$$FF_r = (0.95)\left(\frac{0.5}{12}\right) 62{,}999.82 = 2{,}493.74\ cf$$

The above assessment indicates that First Flush storage is required (2,493.74 cf). Since the volume from the pre vs. post analysis is greater than the volume from the first flush analysis, retention must be provided for 6,587.23 cf per the City of Scottsdale DS&PM.

Given that stormwater volume will be increased, underground storage (Basin 1) is proposed to retain the required pre vs post volume plus existing required volume.

To comply with the City of Scottsdale DS&PM, flows from drainage areas A1 through A3 will be directed to Basin 1. Below is a summary of their required volumes.

Table 7. Proposed Conditions Required Storage Volume

Required Storage Volume					
				Vr=1*(P/12)*Cw*A P=100-yr, 2-hr=2.24 in.	
Drainage Area ID	Area (acres)	C_w (-)	Precipitation (in)	Volume Req. (acre-ft)	Volume Req. (CF)
A1	0.62	0.68	2.22	0.08	3,420.97
A2	0.43	0.77	2.22	0.06	2,668.47
A3	0.11	0.95	2.22	0.02	865.33
BASIN 1			**Total Retention:**		**6,954.78**

A volume of 6,955 cf will be retained by the proposed underground storage Basin 1.

PROVIDED STORMWATER STORAGE

The proposed development will provide storage for the pre vs post analysis and existing required volume through a corrugated metal pipe underground system. Stormwater will be discharged by the use of drywells.

Basin 1 provided storage:
Basin 1 will consist of 10' diameter corrugated metal pipe and will have a length of 110 lf.
$V_P = \pi$* Pipe radius^2 * Pipe length
$V_P = (\pi * 5^2)*(90) = 7{,}068$ cf

Refer to **Appendix II** for existing and proposed volume calculations.

4.6 STORMWATER DISCHARGE

For Basins with no direct bleed-off available, drywells are proposed in the on-site storage facilities to dispose of stormwater within thirty six (36) hours. The calculation is as follows:

- Minimum percolating rate of a drywell (for planning purposes)= 0.1 cfs
- Volume to be drained in 36 hours= 0.1 cfs * 36 hours * 3600 sec/hour= 12,960 cf = 0.298 acre-feet.
- The number of drywells will be reduced if geotechnical testing for percolation rates determine adequate infiltration is available in the native souls at lower depths. If the percolation rate of the drywells is less than 0.1 cfs the number of drywells may have to e increased.

Basin 1:

Total provided storage = 7,068 CF

7,068 CF / 12,960 CF per drywell = 0.55 = 1 drywell required.

4.7 ADEQ WATER QUALITY REQUIREMENTS

The Arizona Department of Environmental Quality (ADEQ) requires that any site disturbance over an acre is required to submit an NOI. An NOI will be submitted to ADEQ for this site after the first submittal of the construction documents as this site disturbance is over 1 acre and has flows going off-site.

5. FLOOD SAFETY FOR DWELLINGS

5.1 FINISHED FLOOR ELEVATIONS

Since project lies in an "X-Shaded" Flood Zone, finished floor elevations will also comply with the minimum elevation of 14 inches above the Ultimate Outfall of the site (1,368.66'), located on the southwest corner of the site and at least 12 inches above adjacent HWE's. The minimum proposed finish floor elevation of 1,371.25' within the project is in accordance with the previous criteria, ensuring that the building will be safe from flooding during a 100-year storm.

6. CONCLUSIONS

6.1 OVERALL PROJECT:

1. The finish floor elevations will be designed a minimum of 14 inches above the lot Ultimate Outfall.
2. Historical outfalls will be maintained at proposed conditions and no detrimental effects will be posed to existing drainage patterns.
3. On-site retention facilities will be provided to account for pre vs. post analysis plus existing retention.

7. REFERENCES

1. *Design Standards & Policies Manual, City of Scottsdale – January 2018*
2. *Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology, Flood Control District of Maricopa County, Fourth Edition, December 14, 2018*
3. *Drainage Design Manual for Maricopa County, Arizona, Volume II, Hydraulics, Flood Control District of Maricopa County, December 14, 2018*

GRADING & DRAINAGE LANGUAGE

WARNING AND DISCLAIMER OF LIABILITY

The City's Stormwater and Floodplain Management Ordinance is intended to minimize the occurrence of losses, hazards and conditions adversely affecting the public health, safety and general welfare which might result from flooding.

The Stormwater and Floodplain Management Ordinance identifies floodplains, floodways, flood fringes and special flood hazard areas. However, a property outside these areas could be inundated by floods. Also, much of the city is a dynamic flood area; floodways, floodplains, flood fringes and special flood hazard areas may shift from one location to another, over time, due to natural processes.

WARNING AND DISCLAIMER OF LIABILITY

The flood protection provided by the Stormwater and Floodplain Management Ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Floods larger than the base flood can and will occur on rare occasions. Floodwater heights may be increased by constructed or natural causes. The Stormwater and Floodplain Management Ordinance does not create liability on the part of the city, any officer or employee thereof, or the federal, state or county government for any flood damages that result from reliance on the Ordinance or any administrative decision lawfully made thereunder.

Compliance with the Stormwater and Floodplain Management Ordinance does not ensure complete protection from flooding. Flood-related problems such as natural erosion, streambed meander, or constructed obstructions and diversions may occur and have an adverse effect in the event of a flood. You are advised to consult your own engineer or other expert regarding these considerations.

I have read and understand the above.

_____ _____ _____

Plan Check # Owner Date

FIGURES

Figure 1. Vicinity Map

Figure 2. Aerial

Figure 3. FIRM

Figure 4. FIRMette

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Figure 1. Vicinity Map

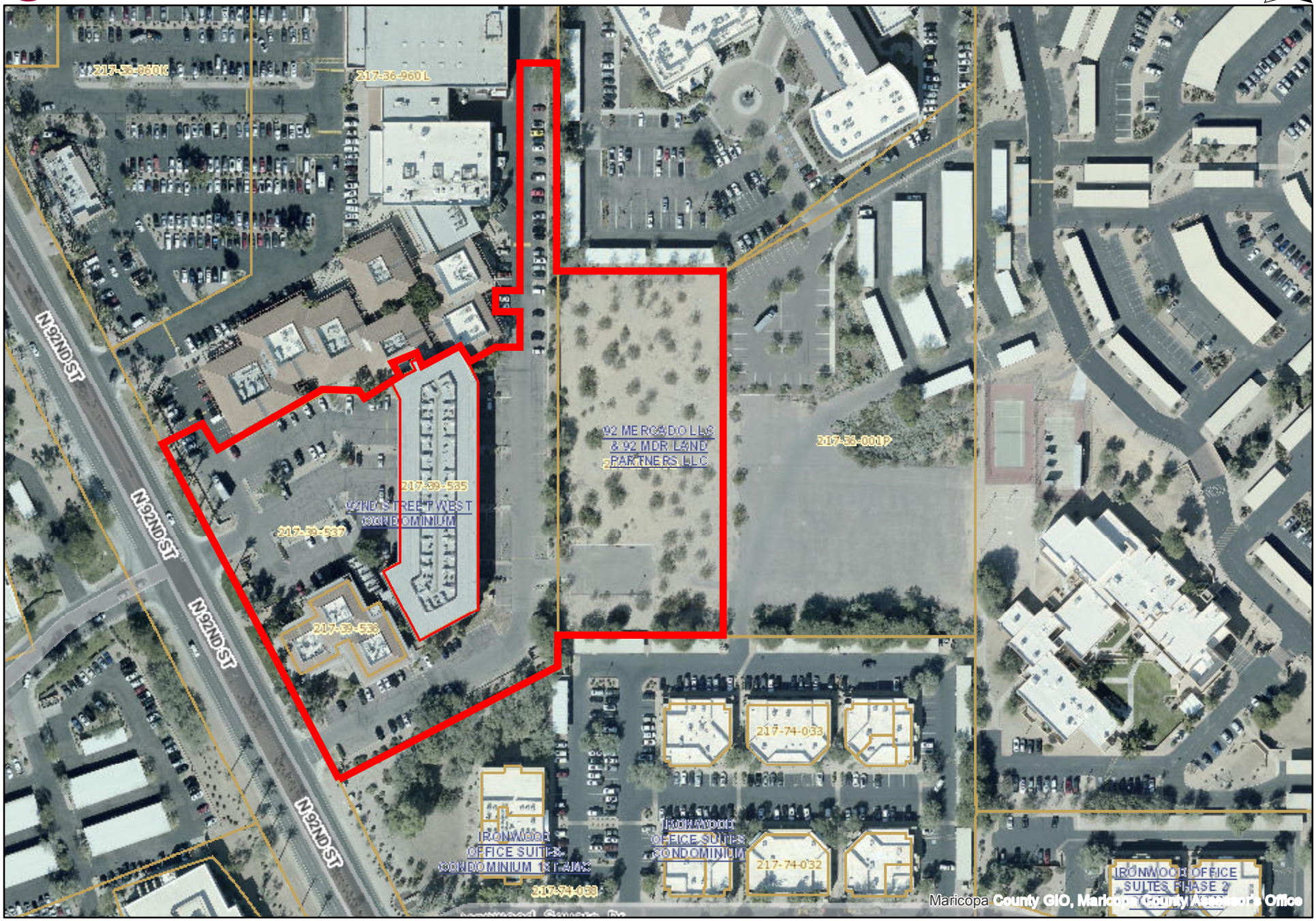


Figure 2. Aerial

NOTES TO USERS

This map is for use in administering the Nation Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arizona State Plane Central zone (FIPSZONE 0202). The **horizontal datum** was NAD 83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. Map users wishing to obtain flood elevations referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29) may use the following Maricopa County website application: http://www.fcd.maricopa.gov/Maps/gismaps/apps/gdacs/application/index.cfm

This web tool allows users to obtain point-specific datum conversion values by zooming in and hovering over a VERTCON checkbox on the layers menu on the left side of the screen. The VERTCON grid referenced in this web application was also used to convert existing flood elevations from NGVD 29 to NAVD 88.

To obtain current elevation, description, and/or location information for National Geodetic Survey bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov. To obtain information about Geodetic Densification and Cadastral Survey bench marks produced by the Maricopa County Department of Transportation, please visit the Flood Control District of Maricopa County website at:
http://www.fcd.maricopa.gov/Maps/gismaps/apps/gdacs/application/index.cfm.

Base map information shown on this FIRM was derived from multiple sources. Aerial imagery was provided in digital format by the Maricopa County Department of Public Works, Flood Control District. The imagery is dated October 2009 to November 2009. Additional National Agricultural Imagery Program (NAIP) imagery was provided by the Arizona State Land Department (ALRIS) and is dated 2007. The coordinate system used for the production of the digital FIRM is State Plane Arizona Central NAD83 HARN, International Feet.

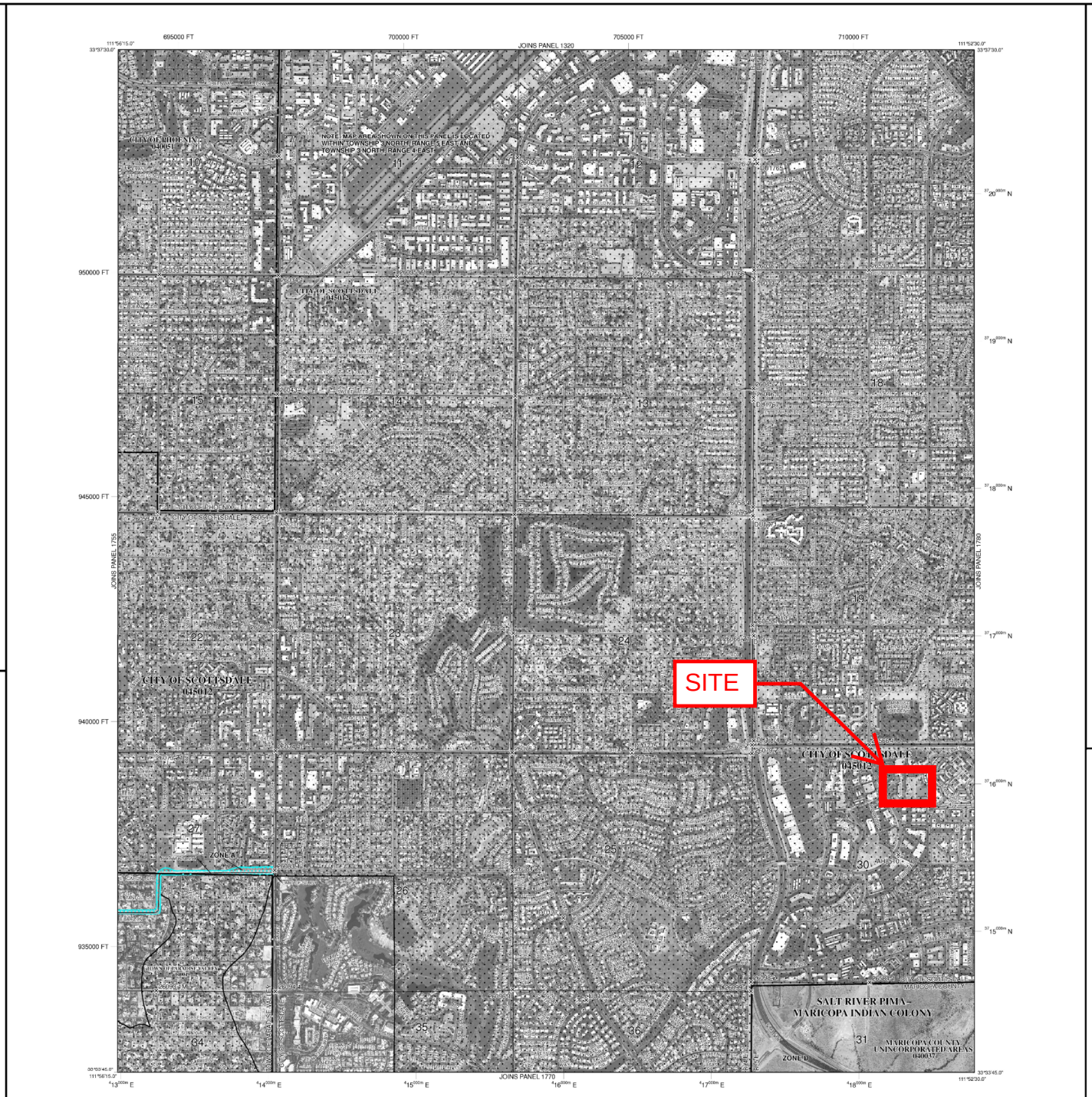
The **profile base line** depicted on this map represents the hydraulic modeling baselines that match flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community, as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM, visit the **FEMA Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.
ZONE AE — Base Flood Elevations determined.
ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance 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.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A — Cross section line
23 — 23 — Transect line
97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 12
6000000 M — 5000-foot grid ticks: Arizona State Plane coordinate system, central zone (FIPSZONE 0202), Transverse Mercator
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
April 15, 1988
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
July 15, 2001 - September 30, 2005

October 16, 2013 –to incorporate previously issued letters of map revision, to update corporate limits, to change base flood elevations, to add base flood elevation, to add roads and road names, to change floodway, to add special flood hazard areas, to advance suffix, and to add floodway.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

PANEL 1760L

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 1760 OF 4425

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	1760	L
PARADISE VALLEY, TOWN OF	040049	1760	L
PHOENIX, CITY OF	040051	1760	L
SCOTTSDALE, CITY OF	045012	1760	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 04013C1760L

MAP REVISED OCTOBER 16, 2013

Federal Emergency Management Agency

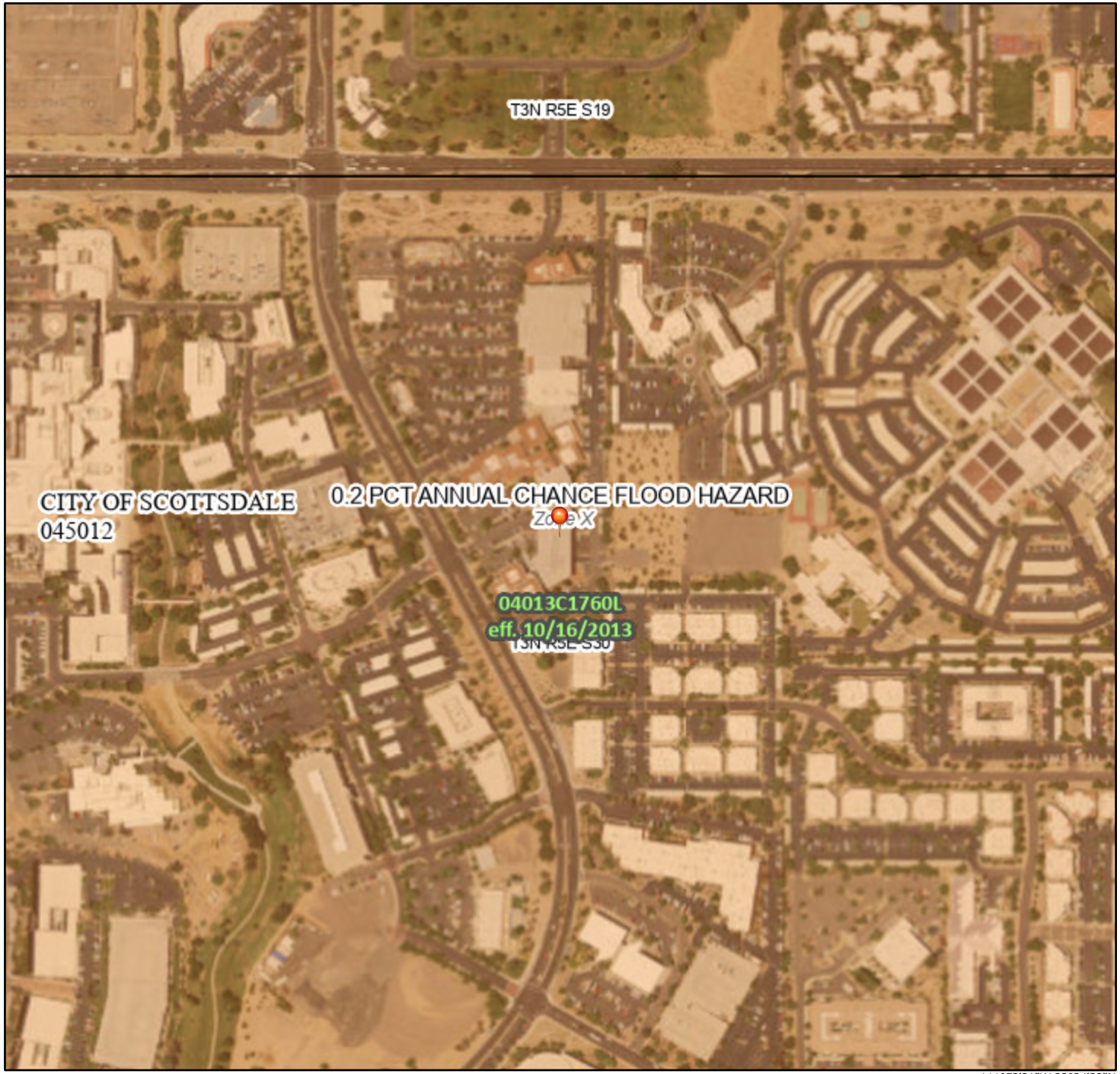
NATIONAL FLOOD INSURANCE PROGRAM

FIGURE 3. FIRM

National Flood Hazard Layer FIRMette

FEMA

111°53'8"W 33°35'2"N



111°52'31"W 33°34'32"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 Cross Sections with 1% Annual Chance
- 17.5 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 4/28/2021 at 12:52 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.

FIGURE 4. FIRMette

APPENDIX I

RAINFALL DATA

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.5798°, Longitude: -111.8816°
Elevation: 1370.67 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	**2.26** (1.87-2.77)	**2.94** (2.46-3.61)	**3.98** (3.29-4.87)	**4.78** (3.94-5.83)	**5.86** (4.74-7.13)	**6.68** (5.35-8.08)	**7.54** (5.93-9.08)	**8.40** (6.49-10.1)	**9.56** (7.20-11.5)	**10.4** (7.70-12.6)
10-min	**1.72** (1.43-2.11)	**2.24** (1.87-2.75)	**3.03** (2.51-3.71)	**3.64** (2.99-4.44)	**4.46** (3.61-5.42)	**5.09** (4.07-6.14)	**5.74** (4.51-6.92)	**6.39** (4.94-7.69)	**7.28** (5.48-8.76)	**7.95** (5.87-9.58)
15-min	**1.42** (1.18-1.74)	**1.85** (1.55-2.28)	**2.50** (2.07-3.06)	**3.00** (2.47-3.67)	**3.68** (2.98-4.48)	**4.20** (3.36-5.08)	**4.74** (3.73-5.72)	**5.28** (4.08-6.36)	**6.01** (4.53-7.24)	**6.57** (4.85-7.92)
30-min	**0.954** (0.792-1.17)	**1.25** (1.04-1.53)	**1.69** (1.39-2.06)	**2.02** (1.67-2.47)	**2.48** (2.01-3.02)	**2.83** (2.27-3.42)	**3.19** (2.51-3.85)	**3.56** (2.75-4.28)	**4.05** (3.05-4.87)	**4.42** (3.26-5.33)
60-min	**0.591** (0.491-0.725)	**0.771** (0.645-0.948)	**1.04** (0.863-1.28)	**1.25** (1.03-1.53)	**1.53** (1.24-1.87)	**1.75** (1.40-2.12)	**1.98** (1.55-2.38)	**2.20** (1.70-2.65)	**2.51** (1.89-3.02)	**2.74** (2.02-3.30)
2-hr	**0.346** (0.292-0.415)	**0.448** (0.378-0.538)	**0.596** (0.501-0.714)	**0.710** (0.590-0.850)	**0.866** (0.714-1.03)	**0.984** (0.800-1.17)	**1.11** (0.884-1.31)	**1.23** (0.966-1.46)	**1.40** (1.07-1.65)	**1.53** (1.15-1.81)
3-hr	**0.256** (0.215-0.313)	**0.328** (0.277-0.404)	**0.429** (0.360-0.524)	**0.509** (0.423-0.618)	**0.621** (0.508-0.750)	**0.710** (0.573-0.853)	**0.803** (0.636-0.964)	**0.900** (0.701-1.08)	**1.03** (0.781-1.24)	**1.14** (0.842-1.37)
6-hr	**0.154** (0.132-0.184)	**0.195** (0.168-0.232)	**0.249** (0.213-0.295)	**0.293** (0.247-0.345)	**0.351** (0.293-0.412)	**0.397** (0.326-0.465)	**0.445** (0.360-0.519)	**0.494** (0.393-0.578)	**0.561** (0.434-0.655)	**0.613** (0.464-0.718)
12-hr	**0.085** (0.074-0.100)	**0.107** (0.093-0.126)	**0.136** (0.117-0.159)	**0.158** (0.135-0.184)	**0.188** (0.159-0.219)	**0.210** (0.176-0.245)	**0.234** (0.193-0.272)	**0.258** (0.210-0.299)	**0.290** (0.230-0.338)	**0.315** (0.245-0.370)
24-hr	**0.050** (0.044-0.057)	**0.063** (0.056-0.073)	**0.082** (0.072-0.094)	**0.096** (0.085-0.111)	**0.117** (0.102-0.134)	**0.133** (0.115-0.152)	**0.149** (0.128-0.171)	**0.167** (0.142-0.190)	**0.191** (0.160-0.218)	**0.209** (0.173-0.240)
2-day	**0.027** (0.024-0.031)	**0.034** (0.030-0.039)	**0.045** (0.039-0.051)	**0.053** (0.047-0.061)	**0.065** (0.056-0.074)	**0.074** (0.064-0.085)	**0.084** (0.072-0.096)	**0.094** (0.080-0.108)	**0.109** (0.091-0.125)	**0.120** (0.099-0.138)
3-day	**0.019** (0.017-0.022)	**0.025** (0.022-0.028)	**0.032** (0.028-0.037)	**0.038** (0.034-0.044)	**0.047** (0.041-0.054)	**0.054** (0.047-0.062)	**0.062** (0.053-0.070)	**0.069** (0.059-0.079)	**0.080** (0.067-0.092)	**0.089** (0.074-0.102)
4-day	**0.015** (0.014-0.018)	**0.020** (0.017-0.022)	**0.026** (0.023-0.030)	**0.031** (0.027-0.035)	**0.038** (0.033-0.043)	**0.044** (0.038-0.050)	**0.050** (0.043-0.057)	**0.057** (0.048-0.065)	**0.066** (0.056-0.075)	**0.074** (0.062-0.084)
7-day	**0.010** (0.009-0.011)	**0.013** (0.011-0.014)	**0.017** (0.015-0.019)	**0.020** (0.017-0.023)	**0.025** (0.021-0.028)	**0.028** (0.024-0.032)	**0.032** (0.028-0.037)	**0.037** (0.031-0.042)	**0.043** (0.036-0.049)	**0.047** (0.039-0.054)
10-day	**0.007** (0.007-0.009)	**0.010** (0.008-0.011)	**0.013** (0.011-0.014)	**0.015** (0.013-0.017)	**0.019** (0.016-0.021)	**0.021** (0.018-0.024)	**0.024** (0.021-0.027)	**0.027** (0.023-0.031)	**0.032** (0.027-0.036)	**0.035** (0.029-0.040)
20-day	**0.005** (0.004-0.005)	**0.006** (0.005-0.007)	**0.008** (0.007-0.009)	**0.009** (0.008-0.010)	**0.011** (0.010-0.013)	**0.013** (0.011-0.014)	**0.014** (0.012-0.016)	**0.016** (0.014-0.018)	**0.018** (0.015-0.020)	**0.019** (0.016-0.022)
30-day	**0.004** (0.003-0.004)	**0.005** (0.004-0.005)	**0.006** (0.005-0.007)	**0.007** (0.006-0.008)	**0.009** (0.008-0.010)	**0.010** (0.009-0.011)	**0.011** (0.010-0.012)	**0.012** (0.011-0.014)	**0.014** (0.012-0.016)	**0.015** (0.013-0.017)
45-day	**0.003** (0.002-0.003)	**0.004** (0.003-0.004)	**0.005** (0.004-0.005)	**0.006** (0.005-0.006)	**0.007** (0.006-0.008)	**0.008** (0.007-0.008)	**0.008** (0.007-0.009)	**0.009** (0.008-0.010)	**0.010** (0.009-0.012)	**0.011** (0.010-0.013)
60-day	**0.002** (0.002-0.003)	**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** (0.005-0.007)	**0.007** (0.006-0.008)	**0.007** (0.007-0.008)	**0.008** (0.007-0.009)	**0.009** (0.008-0.010)

[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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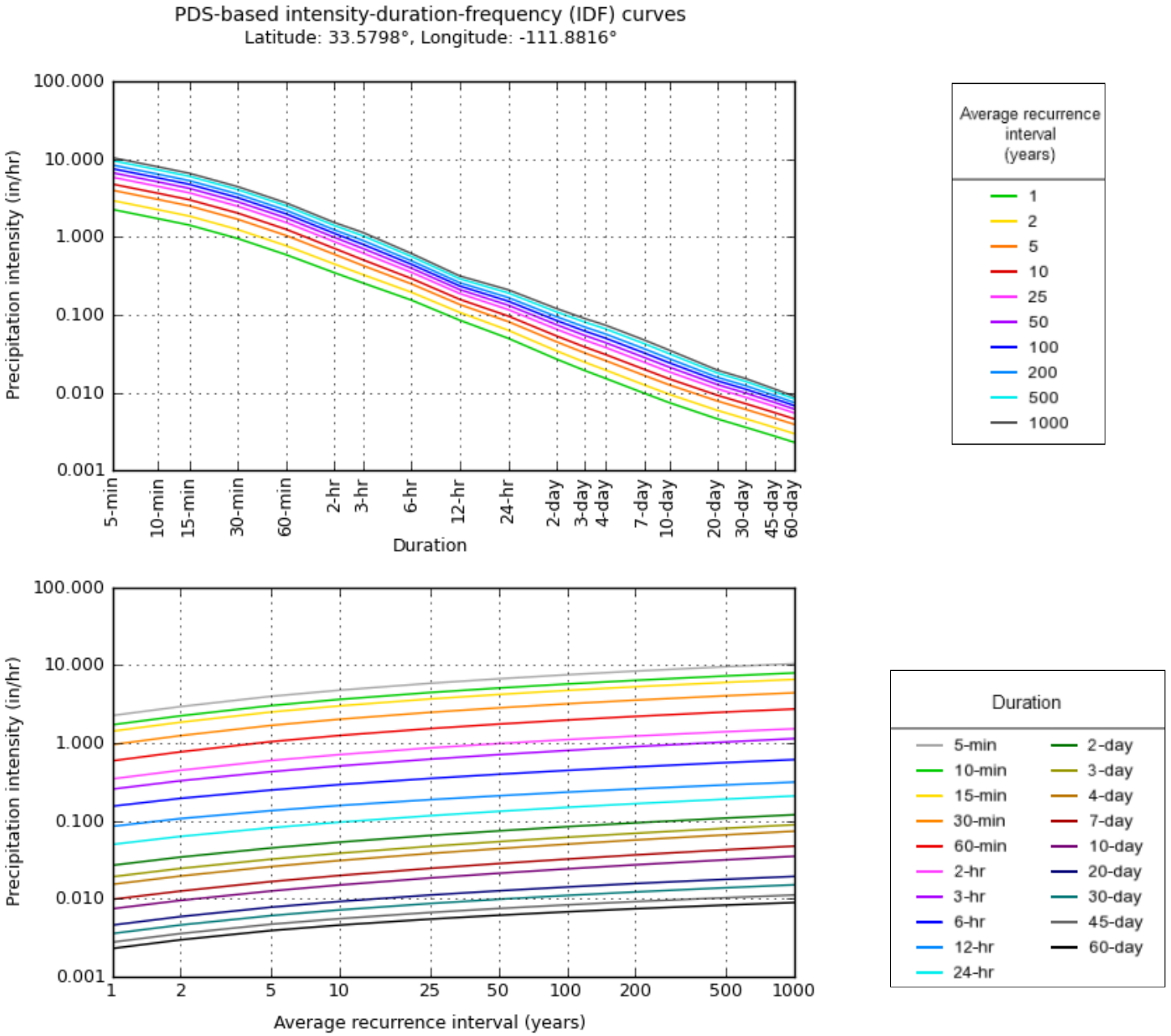
PF graphical



NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Tue Apr 27 19:35:19 2021

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Maps & aerials

Small scale terrain

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.5798°, Longitude: -111.8816°
Elevation: 1370.67 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	**0.188** (0.156-0.231)	**0.245** (0.205-0.301)	**0.332** (0.274-0.406)	**0.398** (0.328-0.486)	**0.488** (0.395-0.594)	**0.557** (0.446-0.673)	**0.628** (0.494-0.757)	**0.700** (0.541-0.842)	**0.797** (0.600-0.959)	**0.870** (0.642-1.05)
10-min	**0.286** (0.238-0.351)	**0.373** (0.312-0.459)	**0.505** (0.418-0.618)	**0.606** (0.499-0.740)	**0.743** (0.602-0.903)	**0.848** (0.679-1.02)	**0.956** (0.752-1.15)	**1.07** (0.823-1.28)	**1.21** (0.913-1.46)	**1.33** (0.978-1.60)
15-min	**0.355** (0.295-0.435)	**0.463** (0.387-0.569)	**0.626** (0.518-0.766)	**0.751** (0.618-0.917)	**0.921** (0.746-1.12)	**1.05** (0.841-1.27)	**1.19** (0.932-1.43)	**1.32** (1.02-1.59)	**1.50** (1.13-1.81)	**1.64** (1.21-1.98)
30-min	**0.477** (0.396-0.586)	**0.623** (0.521-0.766)	**0.843** (0.697-1.03)	**1.01** (0.833-1.23)	**1.24** (1.00-1.51)	**1.42** (1.13-1.71)	**1.60** (1.25-1.92)	**1.78** (1.37-2.14)	**2.03** (1.52-2.44)	**2.21** (1.63-2.67)
60-min	**0.591** (0.491-0.725)	**0.771** (0.645-0.948)	**1.04** (0.863-1.28)	**1.25** (1.03-1.53)	**1.53** (1.24-1.87)	**1.75** (1.40-2.12)	**1.98** (1.55-2.38)	**2.20** (1.70-2.65)	**2.51** (1.89-3.02)	**2.74** (2.02-3.30)
2-hr	**0.693** (0.583-0.830)	**0.895** (0.756-1.08)	**1.19** (1.00-1.43)	**1.42** (1.18-1.70)	**1.73** (1.43-2.06)	**1.97** (1.60-2.34)	**2.22** (1.77-2.62)	**2.46** (1.93-2.91)	**2.80** (2.14-3.31)	**3.05** (2.29-3.63)
3-hr	**0.769** (0.647-0.941)	**0.985** (0.831-1.21)	**1.29** (1.08-1.58)	**1.53** (1.27-1.86)	**1.87** (1.53-2.25)	**2.13** (1.72-2.56)	**2.41** (1.91-2.90)	**2.70** (2.11-3.24)	**3.10** (2.35-3.72)	**3.43** (2.53-4.11)
6-hr	**0.925** (0.793-1.10)	**1.17** (1.00-1.39)	**1.49** (1.27-1.77)	**1.75** (1.48-2.06)	**2.10** (1.76-2.47)	**2.38** (1.95-2.78)	**2.67** (2.16-3.11)	**2.96** (2.35-3.46)	**3.36** (2.60-3.92)	**3.67** (2.78-4.30)
12-hr	**1.03** (0.887-1.21)	**1.29** (1.12-1.52)	**1.63** (1.41-1.91)	**1.90** (1.62-2.22)	**2.26** (1.91-2.63)	**2.54** (2.12-2.95)	**2.82** (2.32-3.27)	**3.11** (2.53-3.61)	**3.49** (2.77-4.08)	**3.80** (2.95-4.45)
24-hr	**1.20** (1.06-1.38)	**1.52** (1.34-1.75)	**1.96** (1.73-2.26)	**2.31** (2.03-2.65)	**2.80** (2.44-3.21)	**3.19** (2.75-3.64)	**3.59** (3.08-4.10)	**4.00** (3.40-4.57)	**4.57** (3.83-5.23)	**5.03** (4.16-5.77)
2-day	**1.29** (1.14-1.48)	**1.65** (1.45-1.89)	**2.16** (1.89-2.47)	**2.56** (2.24-2.93)	**3.13** (2.71-3.57)	**3.57** (3.08-4.08)	**4.05** (3.45-4.63)	**4.54** (3.84-5.19)	**5.22** (4.36-5.99)	**5.76** (4.76-6.63)
3-day	**1.38** (1.22-1.58)	**1.77** (1.55-2.02)	**2.32** (2.04-2.65)	**2.77** (2.42-3.16)	**3.40** (2.96-3.87)	**3.90** (3.37-4.44)	**4.44** (3.80-5.05)	**5.00** (4.25-5.71)	**5.79** (4.86-6.61)	**6.43** (5.33-7.36)
4-day	**1.47** (1.30-1.68)	**1.88** (1.66-2.15)	**2.49** (2.19-2.83)	**2.98** (2.61-3.39)	**3.67** (3.20-4.17)	**4.23** (3.66-4.80)	**4.83** (4.15-5.48)	**5.46** (4.66-6.22)	**6.36** (5.35-7.23)	**7.09** (5.91-8.08)
7-day	**1.65** (1.45-1.90)	**2.11** (1.85-2.42)	**2.80** (2.45-3.20)	**3.35** (2.92-3.83)	**4.13** (3.58-4.72)	**4.76** (4.11-5.43)	**5.44** (4.65-6.20)	**6.15** (5.22-7.02)	**7.16** (6.00-8.18)	**7.97** (6.61-9.13)
10-day	**1.79** (1.57-2.04)	**2.29** (2.01-2.61)	**3.02** (2.65-3.44)	**3.61** (3.16-4.11)	**4.44** (3.86-5.04)	**5.11** (4.42-5.79)	**5.81** (4.99-6.59)	**6.56** (5.59-7.44)	**7.60** (6.40-8.63)	**8.44** (7.04-9.60)
20-day	**2.20** (1.95-2.51)	**2.84** (2.50-3.22)	**3.75** (3.30-4.25)	**4.44** (3.89-5.03)	**5.37** (4.69-6.07)	**6.08** (5.30-6.88)	**6.81** (5.90-7.72)	**7.55** (6.51-8.57)	**8.55** (7.31-9.72)	**9.32** (7.90-10.6)
30-day	**2.58** (2.27-2.93)	**3.32** (2.93-3.77)	**4.38** (3.86-4.96)	**5.19** (4.56-5.86)	**6.27** (5.48-7.08)	**7.10** (6.19-8.01)	**7.96** (6.90-8.97)	**8.82** (7.61-9.95)	**9.99** (8.56-11.3)	**10.9** (9.26-12.3)
45-day	**3.00** (2.65-3.39)	**3.86** (3.42-4.37)	**5.09** (4.51-5.75)	**6.01** (5.30-6.78)	**7.21** (6.34-8.13)	**8.11** (7.11-9.16)	**9.03** (7.87-10.2)	**9.95** (8.63-11.3)	**11.2** (9.61-12.7)	**12.1** (10.3-13.7)
60-day	**3.31** (2.95-3.74)	**4.28** (3.81-4.83)	**5.64** (5.00-6.35)	**6.62** (5.86-7.46)	**7.90** (6.98-8.89)	**8.85** (7.79-9.97)	**9.80** (8.59-11.1)	**10.7** (9.37-12.1)	**12.0** (10.4-13.5)	**12.9** (11.1-14.6)

[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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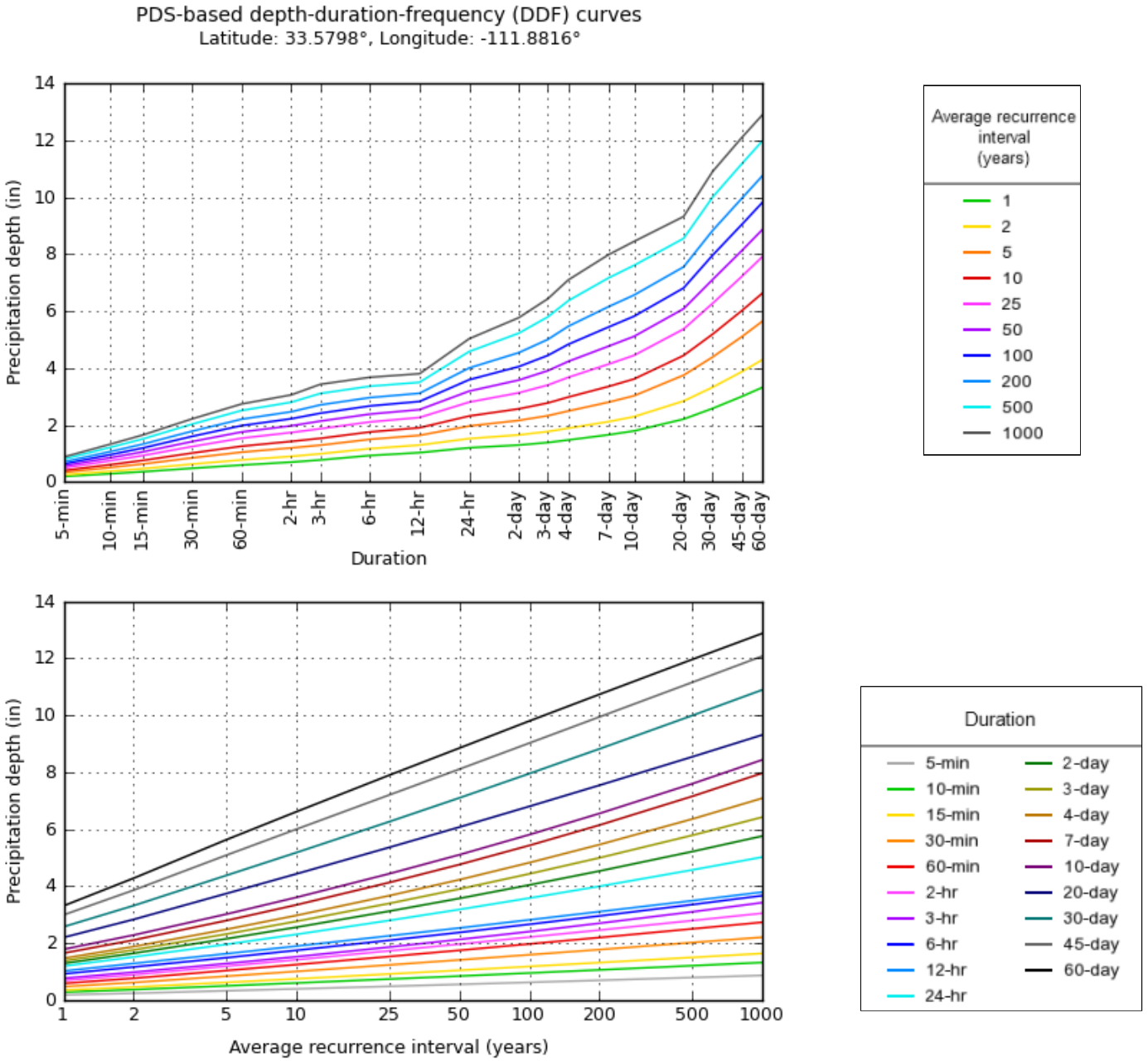
PF graphical



NOAA Atlas 14, Volume 1, Version 5

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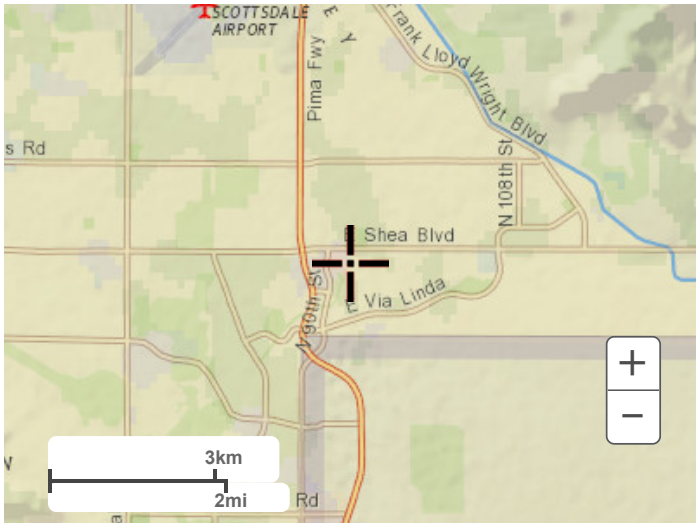
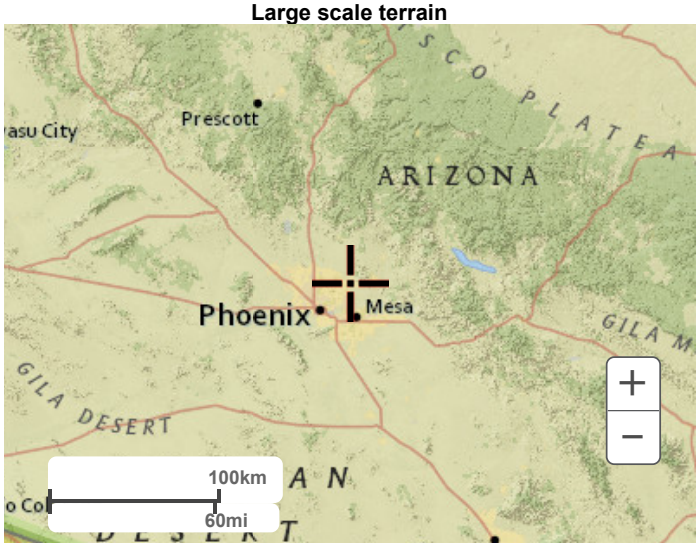
Maps & aerials

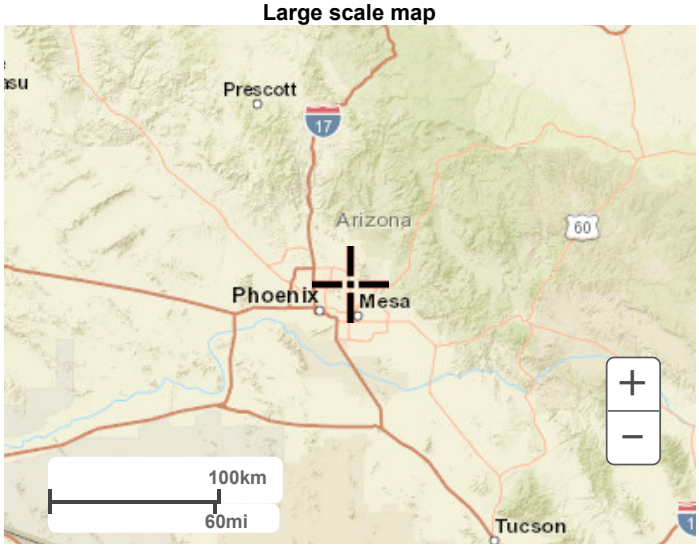
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

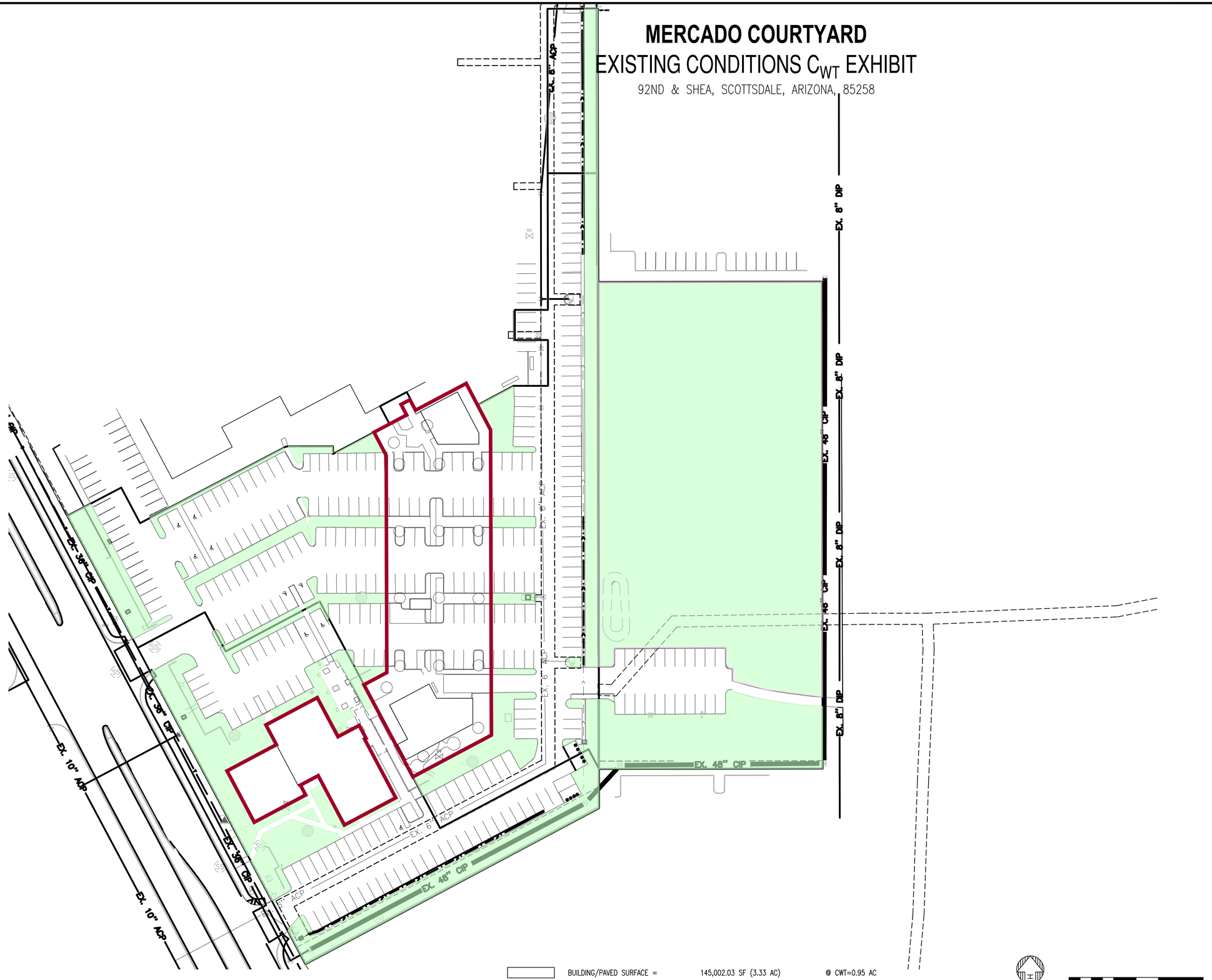
APPENDIX II

CALCULATIONS

MERCADO COURTYARD

EXISTING CONDITIONS C_{WT} EXHIBIT

92ND & SHEA, SCOTTSDALE, ARIZONA, 85258



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PROJECT: MERCADO COURTYARD
LOCATION: 92ND & SHEA, SCOTTSDALE, AZ 85258

DRAWN	JC	07/29/2022
DESIGNED	JC	07/29/2022
QC		
FINAL QC		
PROJ. MGR.	AF	07/29/2022

DATE: 07/29/2022
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JOB NO.: 210414

SHEET TITLE: **EXISTING CONDITIONS C_{WT} EXHIBIT**

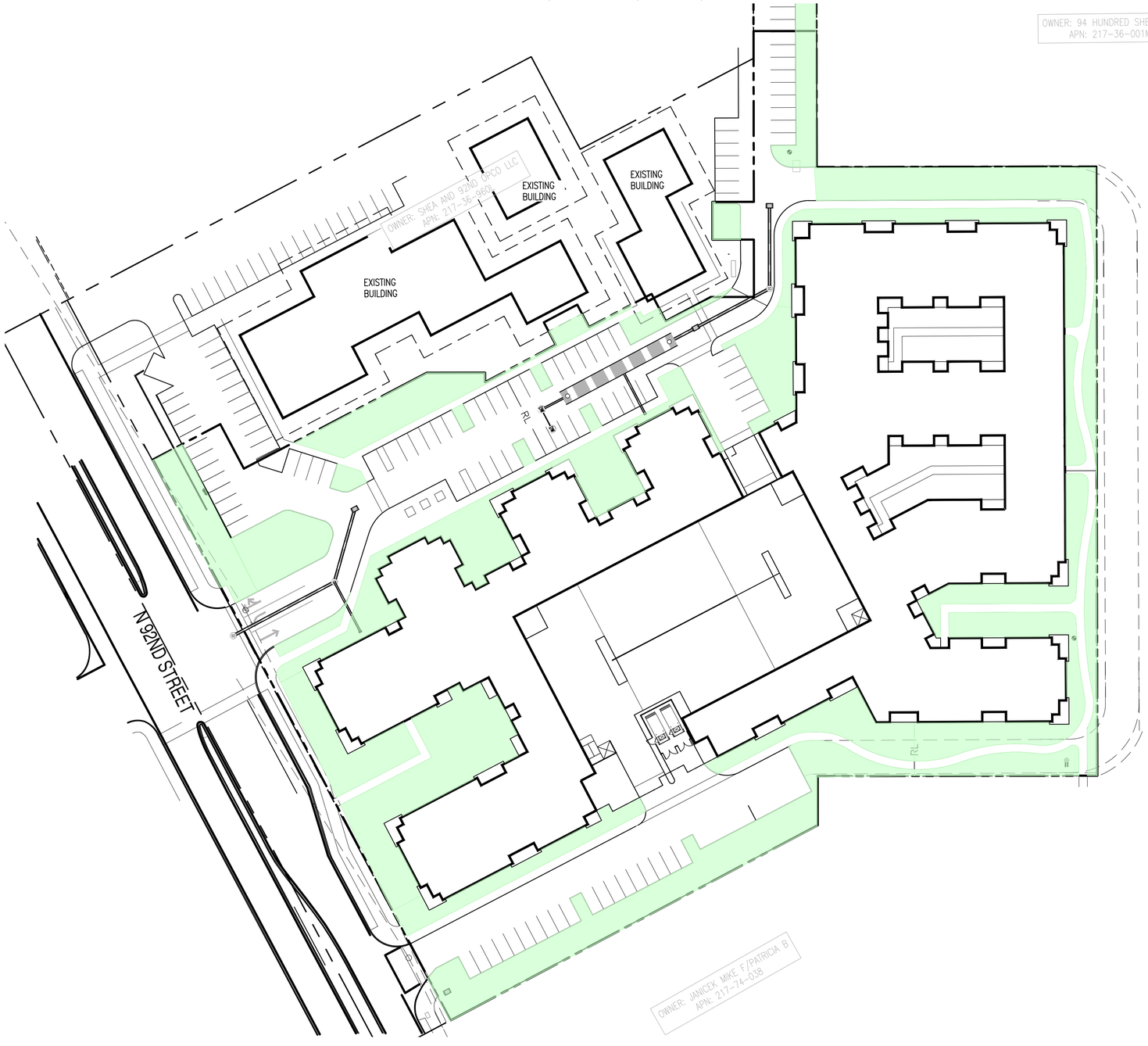
PAGE NO.: 1 OF 1
SHEET NO.: **X-CWT**

LOCATION: Z:\SHARED\PROJECTS\DAVIS GROUP\MOUNTAIN VIEW RESIDENTIAL - SCOTTSDALE - 92ND & SHEA - 21041A\11 CAD (SEG)\11.3 ENTITLEMENT-PLANNING\210414-X-CWT.DWG SAVED BY: JUANCARLOSCHACON DATE: 7/29/2022

MERCADO COURTYARD

POST CONDITIONS C_{WT} EXHIBIT

92ND & SHEA, SCOTTSDALE, ARIZONA, 85258



	BUILDING/PAVED SURFACE =	195,181.54 SF (4.48 AC)	@ CWT=0.95 AC
	UNDISTURBED NATURAL DESERT =	68,847.54 SF (1.58 AC)	@ CWT=0.45 AC
	TOTAL ON-SITE CWT =	264,029.08 SF (6.06 AC)	@ CWT=0.82

NORTH

0' 40' 80' 120'

SCALE: 1" = 40'

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PROJECT	MERCADO COURTYARD
LOCATION	92ND & SHEA, SCOTTSDALE, AZ 85258

DRAWN	JC	07/29/2022
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SHEET TITLE: **POST CONDITIONS C_{WT} EXHIBIT**

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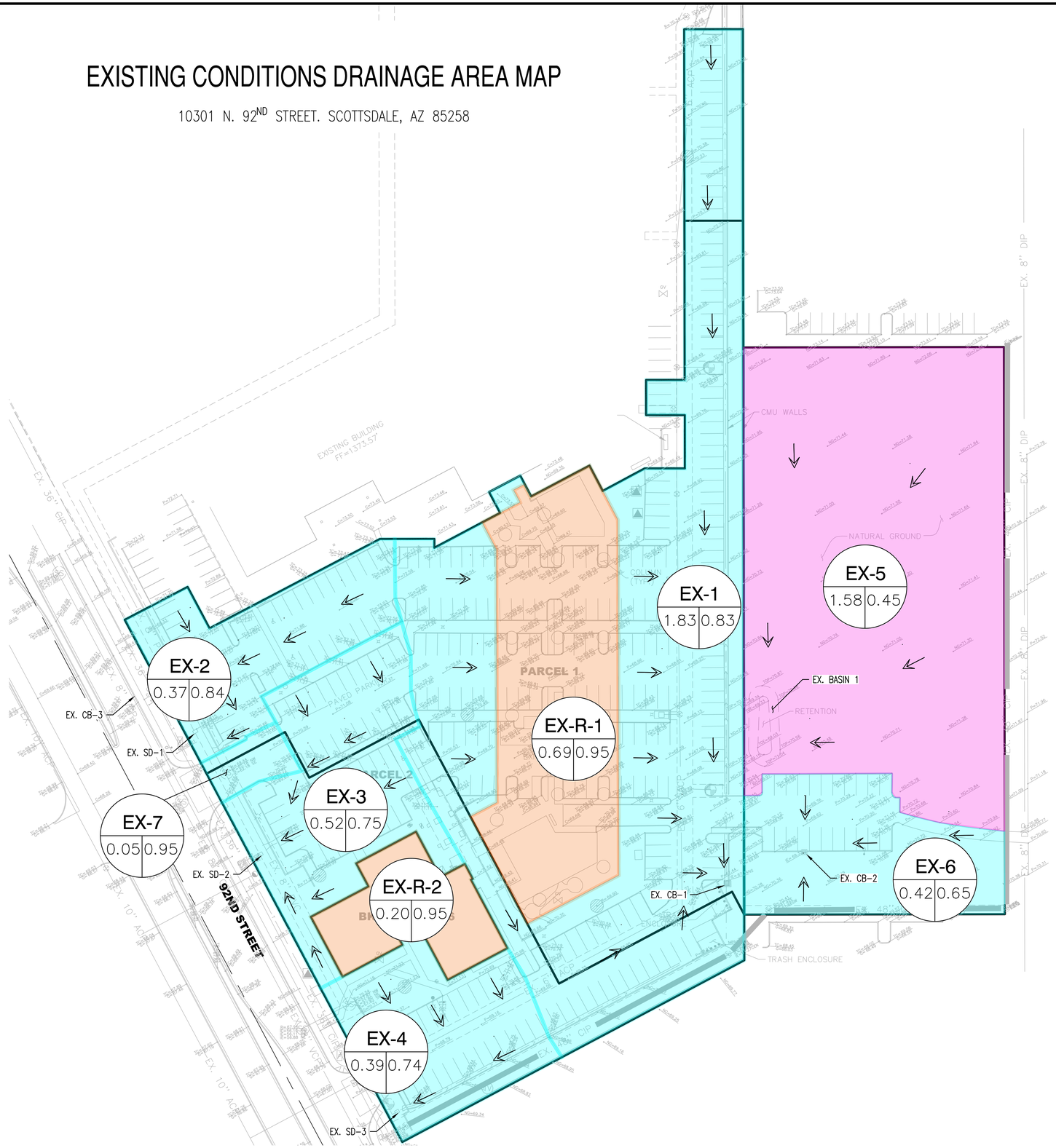
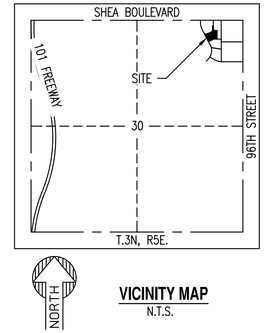
SHEET NO.: **P-CWT**

LOCATION: Z:\SHARED\PROJECTS\DAVIS GROUP\MOUNTAIN VIEW RESIDENTIAL - SCOTTSDALE - 92ND & SHEA - 210414\11 CAD (SEG)\11.3 ENTITLEMENT-PLANNING\210414-P-CWT.DWG SAVED BY: JUANCARLOSCHACON DATE: 7/29/2022

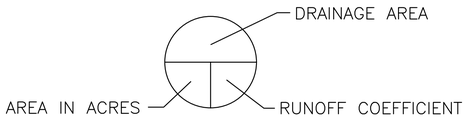
EXISTING CONDITIONS DRAINAGE AREA MAP

10301 N. 92ND STREET. SCOTTSDALE, AZ 85258





VICINITY MAP
N.T.S.



DRAINAGE AREA KEY

PROPOSED LEGEND

- DRAINAGE AREAS DISCHARGING TO PUBLIC STORM DRAIN SYSTEM AT 92ND STREET.
- DRAINAGE AREAS DISCHARGING TO EXISTING OPEN RETENTION BASIN.
- ROOF DRAINAGE AREAS.
- ONSITE DRAINAGE AREAS
- FLOW ARROW

EXISTING ONSITE 100 YR 5 MIN

Drainage Area	Area (ac)	Cw	i (in/hr)	Q (cfs)
EX-1	1.83	0.83	7.54	11.44
EX-2	0.37	0.84	7.54	2.37
EX-3	0.52	0.75	7.54	2.93
EX-4	0.39	0.74	7.54	2.17
EX-5	1.58	0.45	7.54	5.37
EX-6	0.42	0.65	7.54	2.04
EX-7	0.05	0.95	7.54	0.39
EX-R-1	0.69	0.95	7.54	4.93
EX-R-2	0.20	0.95	7.54	1.47

NORTH
0' 40' 80' 120'
SCALE: 1" = 40'

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LOCATION: 92ND & SHEA, SCOTTSDALE, AZ 85258

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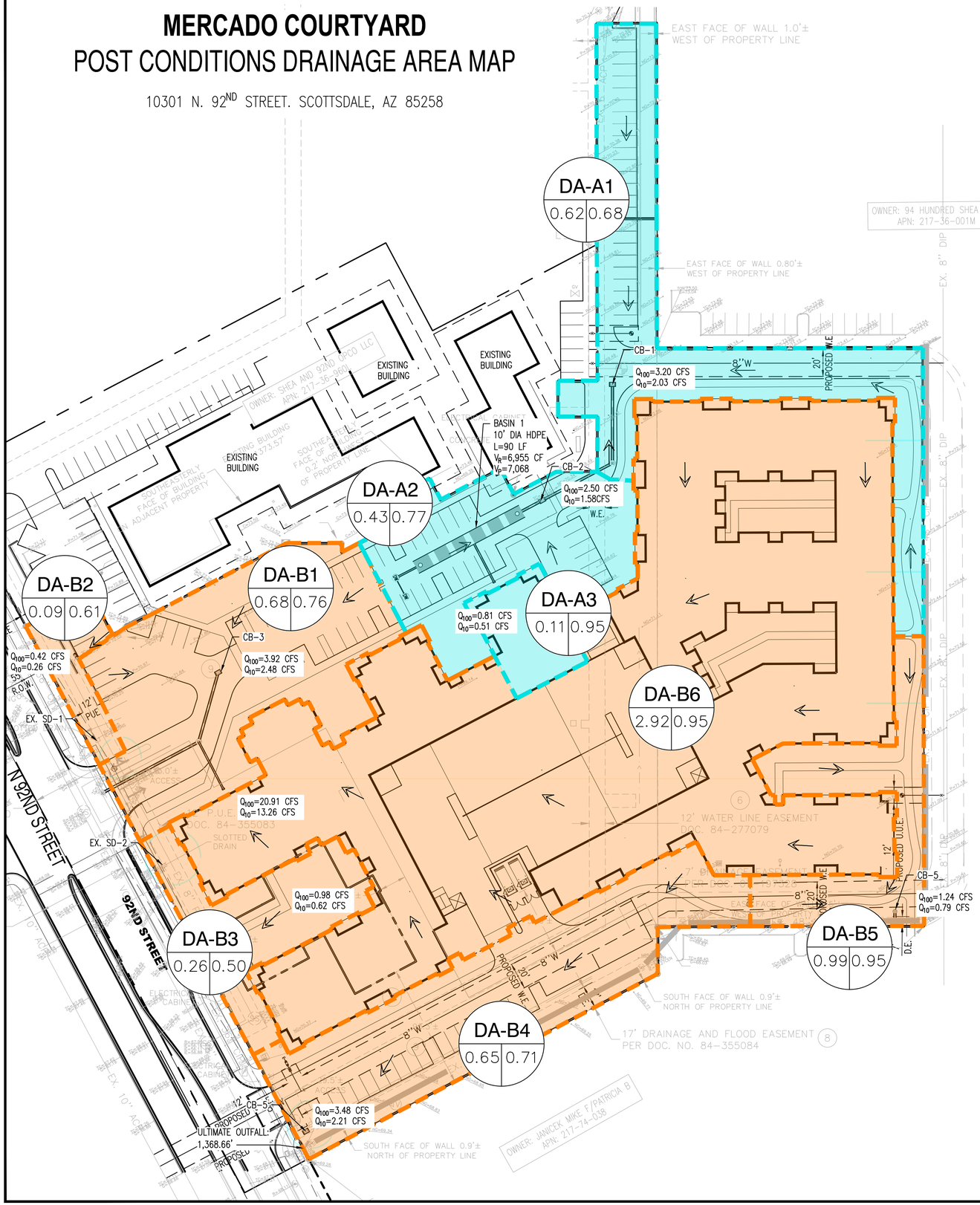
SHEET TITLE: X-DAM

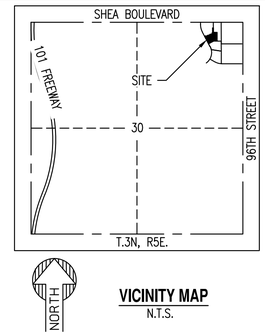
PAGE NO.: 1 OF 1
SHEET NO.: X-DAM

LOCATION: Z:\SHARED\PROJECTS\DAVIS GROUP\MOUNTAIN VIEW RESIDENTIAL - SCOTTSDALE - 92ND & SHEA - 210414\11 CAD (SEG)\11.3 ENTITLEMENT-PLANNING\210414-XDAM.DWG SAVED BY: JUANCARLOSCHACON DATE: 7/29/2022

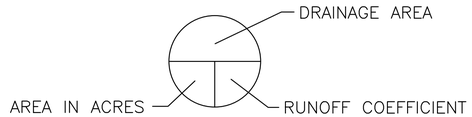
MERCADO COURTYARD
POST CONDITIONS DRAINAGE AREA MAP

10301 N. 92ND STREET. SCOTTSDALE, AZ 85258





VICINITY MAP
N.T.S.



DRAINAGE AREA KEY

- DRAINAGE AREAS DISCHARGING TO BASIN 1
- DRAINAGE AREAS DISCHARGING TO PUBLIC STORM DRAIN SYSTEM AT 92ND STREET
- FLOW ARROW

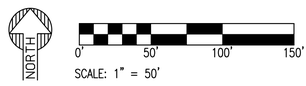
PROPOSED ONSITE 100 YR 5 MIN

Drainage Area	Area (ac)	Cw	i (in/hr)	Q (cfs)
A1	0.62	0.68	7.54	3.20
A2	0.43	0.77	7.54	2.50
A3	0.11	0.95	7.54	0.81
B1	0.68	0.76	7.54	3.92
B2	0.09	0.61	7.54	0.42
B3	0.26	0.50	7.54	0.98
B4	0.65	0.71	7.54	3.48
B5	0.29	0.56	7.54	1.24
B6	2.92	0.95	7.54	20.91

Required Storage Volume

Vr=1*(P/12)*Cw*A
P=100-yr, 2-hr=2.24 in.

Drainage Area ID	Area (acres)	C_w (-)	Precipitation (in)	Volume Req. (acre-ft)	Volume Req. (CF)
A1	0.62	0.68	2.22	0.08	3,420.97
A2	0.43	0.77	2.22	0.06	2,668.47
A3	0.11	0.95	2.22	0.02	865.33
BASIN 1			**Total Retention:**		**6,954.78**



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LOCATION	92ND & SHEA, SCOTTSDALE, AZ 85258

DRAWN	JC	07/29/2022
DESIGNED	JC	07/29/2022
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FINAL QC		
PROJ. MGR.	AF	07/29/2022

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SHEET TITLE: **POST CONDITIONS DRAINAGE AREA MAP**

PAGE NO.: 1 OF 1
SHEET NO.: **P-DAM**

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EXISTING ONSITE 10 YR 5 MIN				
Drainage Area	Area (ac)	Cw	i (in/hr)	Q (cfs)
EX-1	1.83	0.83	4.78	7.25
EX-2	0.37	0.84	4.78	1.50
EX-3	0.52	0.75	4.78	1.86
EX-4	0.39	0.74	4.78	1.37
EX-5	1.58	0.45	4.78	3.40
EX-6	0.42	0.65	4.78	1.29
EX-7	0.05	0.95	4.78	0.25
EX-R-1	0.69	0.95	4.78	3.13
EX-R-2	0.20	0.95	4.78	0.93

EXISTING ONSITE 100 YR 5 MIN				
Drainage Area	Area (ac)	Cw	i (in/hr)	Q (cfs)
EX-1	1.83	0.83	7.54	11.44
EX-2	0.37	0.84	7.54	2.37
EX-3	0.52	0.75	7.54	2.93
EX-4	0.39	0.74	7.54	2.17
EX-5	1.58	0.45	7.54	5.37
EX-6	0.42	0.65	7.54	2.04
EX-7	0.05	0.95	7.54	0.39
EX-R-1	0.69	0.95	7.54	4.93
EX-R-2	0.20	0.95	7.54	1.47

Existing Volume Calculations

							Vr=1*(P/12)*Cw*A P=100-yr, 2-hr=2.22 in.
Drainage Area ID	Area (acres)	C_w (-)	intensity (in/hr)	Precipitation (in)	Q (cfs)	Volume Req. (acre-ft)	Volume Req. (CF)
EXISTING Volumes							
EX-1	1.83	0.83	7.54	2.22	11.44	0.281	12,229.30
EX-2	0.37	0.84	7.54	2.22	2.37	0.058	2,536.38
EX-3	0.52	0.75	7.54	2.22	2.93	0.072	3,135.71
EX-4	0.39	0.74	7.54	2.22	2.17	0.053	2,314.66
EX-5	1.58	0.45	7.54	2.22	5.37	0.132	5,735.68
EX-6	0.42	0.65	7.54	2.22	2.04	0.050	2,179.95
EX-7	0.05	0.95	7.54	2.22	0.39	0.010	415.06
EX-R-1	0.69	0.95	7.54	2.22	4.93	0.121	5,268.70
Total	**5.85**	**0.72**			**31.64**	**0.776**	**33,815.43**

PROPOSED ONSITE 10 YR 5 MIN				
Drainage Area	Area (ac)	Cw	i (in/hr)	Q (cfs)
A1	0.62	0.68	4.78	2.03
A2	0.43	0.77	4.78	1.58
A3	0.11	0.95	4.78	0.51
B1	0.68	0.76	4.78	2.48
B2	0.09	0.61	4.78	0.26
B3	0.26	0.50	4.78	0.62
B4	0.65	0.71	4.78	2.21
B5	0.29	0.56	4.78	0.79
B6	2.92	0.95	4.78	13.26

PROPOSED ONSITE 100 YR 5 MIN				
Drainage Area	Area (ac)	Cw	i (in/hr)	Q (cfs)
A1	0.62	0.68	7.54	3.20
A2	0.43	0.77	7.54	2.50
A3	0.11	0.95	7.54	0.81
B1	0.68	0.76	7.54	3.92
B2	0.09	0.61	7.54	0.42
B3	0.26	0.50	7.54	0.98
B4	0.65	0.71	7.54	3.48
B5	0.29	0.56	7.54	1.24
B6	2.92	0.95	7.54	20.91

Proposed Volume Calculations

							Vr=1*(P/12)*Cw*A P=100-yr, 2-hr=2.22 in.
Drainage Area ID	Area (acres)	C_w (-)	intensity (in/hr)	Precipitation (in)	Q (cfs)	Volume Req. (acre-ft)	Volume Req. (CF)
STORM CAPTURE							
A1	0.62	0.68	7.54	2.22	3.20	0.08	3,420.97
A2	0.43	0.77	7.54	2.22	2.50	0.06	2,668.47
A3	0.11	0.95	7.54	2.22	0.81	0.02	865.33
B1	0.68	0.76	7.54	2.22	3.92	0.10	4,185.76
B2	0.09	0.61	7.54	2.22	0.42	0.01	445.11
B3	0.26	0.50	7.54	2.22	0.98	0.02	1,049.05
B4	0.65	0.71	7.54	2.22	3.48	0.09	3,723.59
B5	0.29	0.56	7.54	2.22	1.24	0.03	1,326.29
B6	2.92	0.95	7.54	2.22	20.91	0.51	22,349.96
Basin 1 Totals:	**6.06**	**0.82**			**37.46**	**0.919**	**40,034.55**

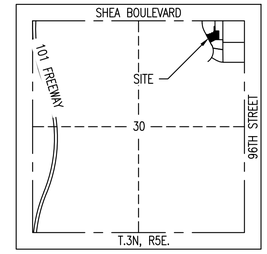
APPENDIX III

Grading & Drainage Plans

MERCADO COURTYARD

PRELIMINARY GRADING AND DRAINAGE PLAN

10301 N. 92ND STREET. SCOTTSDALE, AZ 85258



VICINITY MAP
N.T.S.

PRELIMINARY GRADING NOTES

1. MATCH EXISTING GRADE
2. 6" VERTICAL CURB
3. CONCRETE SIDEWALK. WIDTH PER PLAN.
4. UNDERGROUND STORAGE
5. DRYWELL
6. CATCH BASIN
7. ROOF DRAIN BUILDING CONNECTION.
8. 4' DIAMETER STORM MANHOLE STRUCTURE.
9. 30" NYLOPLAST DRAIN BASIN WITH STANDARD SOLID LID.
10. HDPE DOUBLE WALL PIPE. LENGTH, SIZE AND SLOPE PER PLAN.
11. SAWCUT EXISTING PAVEMENT TO PROVIDE STRAIGHT VERTICAL EDGES, FREE FROM IRREGULARITIES.

EXISTING LEGEND:

- EX. MAJOR CONTOURS (XXXX)
- EX. MINOR CONTOURS (XXXX)
- EX. SPOT ELEVATION (TC:XX.XX GE:XX.XX)
- EASEMENT LINE AS NOTED
- EX. S — SEWER LINE
- SEWER MANHOLE (S)
- EX. W — WATER LINE
- WATER VALVE (WV)
- FIRE HYDRANT
- STORM DRAIN LINE
- STORM CATCH BASIN (CB)
- STORM MANHOLE (D)
- GAS — GAS LINE
- X — X — FENCE
- SIGN
- STREET LIGHT
- TREE
- ROAD CENTERLINE

PROPOSED GRADING LEGEND:

- G=XX.XX — GUTTER ELEVATION, TC = G+0.5'
- P=XX.XX — PAVEMENT ELEVATION
- C=XX.XX — CONCRETE ELEVATION
- PROPERTY LINE
- CURB AND GUTTER
- VERTICAL CURB
- RL — RIDGELINE
- LOC — LIMIT OF ONSITE CONSTRUCTION
- XX — MAJOR CONTOUR
- XX — MINOR CONTOUR
- FLOW ARROW
- CATCH BASIN
- STORM PIPE
- END SECTION
- (SD) STORM MANHOLE
- (DW)—(DW) DRYWELL
- (WM) WATER METER
- GATE VALVE
- FIRE HYDRANT
- RIP-RAP
- CONCRETE PAVEMENT
- HEAVY DUTY PAVEMENT
- LIGHT DUTY PAVEMENT

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PROJECT	MERCADO COURTYARD
LOCATION	92ND & SHEA, SCOTTSDALE, AZ 85258

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DESIGNED	JC	07/29/2022
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FINAL QC		
PROJ. MGR.	AF	07/29/2022

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SHEET TITLE: **PRELIMINARY GRADING & DRAINAGE PLAN**

PAGE NO.:	SHEET NO.:
1 OF 2	C3.00

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