

PRELIMINARY DRAINAGE REPORT

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1. INTRODUCTION

This Preliminary Drainage Report represents the storm water analysis for a multi-family residential development proposed in Scottsdale, Arizona. The purpose of this report is to provide hydrologic and hydraulic analysis, required by the City of Scottsdale, to support the proposed site plan 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) 2018¹, and the Drainage Design Manuals for Maricopa County, Arizona, Volume I² and Volume II³.

2. LOCATION AND PROJECT DESCRIPTION

2.1 LOCATION:

The subject property consists of land located in a portion of the Southeast Quarter of Section 22, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County Arizona:

- Parcel ID: Portion of 175-42-140. Zoned PUD-PSD.
- Address: 7000 E. Shea Boulevard, Scottsdale, AZ 85254

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:
 - Parcels 175-42-141 & -142; Commercial development; Zoning is C-2.
 - Parcels 175-42-136R & -136F; Parking lot; Zoning is C-2.
 - Across E. Shea Blvd: Parcels 175-49-001 & -008; Commercial developments; Zoning is C-3 & C-2 respectively.
- North:
 - Across E. Sahuaro Dr: Parcel 175-42-136E; Apartment complex; Zoning is R-5.
 - Parcel 130-13-063; Extended Stay America (hotel); Zoning is C-3.
- West:
 - Remainder of Parcel 175-42-140; Commercial development; Zoning is PUD-PSD.
- East:
 - Parcel 175-42-032A, & -034 through -043; Commercial developments; Zoning is C-3.

2.3 EXISTING SITE DESCRIPTION:

The project area includes approximately 4.36 acres of disturbed land. The site is a portion of parcel 175-42-140 and consists of a commercial building and parking lot.

Per Topographic Survey received from the client, the site topography slopes to the south and west with approximately five feet of fall.

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

2.4 PROPOSED SITE DEVELOPMENT:

Site development includes the demolition of existing structures and designated parking lots for the construction of a new multi-use high density multifamily project. The development will include two access points proposed at E. Shea Boulevard and one access point at E. Sahuaro Drive.

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 is designated as Zone “X” Shaded. As such, this is defined as “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.”.

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

3. EXISTING DRAINAGE CONDITIONS

3.1 OFF-SITE DRAINAGE PATTERNS

The topographic survey and FLO-2D maps provide the following information for offsite drainage:

- *North:* Half of the runoff from E Sahuaro Drive flow towards the site, where it is conveyed through curb and gutter westerly away from the site. No offsite flows from the north affect the site.
- *East:* Runoff from a portion the eastern alley (EX-OFF-2) flow westerly overland into the site, combining with on-site flows and draining into an existing catch basin (EX-CB-1) located at the southeastern corner of the site. Runoff from the remainder portion of the alley (EX-OFF-3) flows southerly overland into EX-CB-2 located south of EX-CB-1.
- *West:* A portion of the runoff from the southwest (EX-OFF-5) flows easterly overland, combining with on-site flows and ultimately discharging south onto existing catch basin EX-CB-4 at E Shea Boulevard. Another portion of the runoff from the northwest (EX-OFF-1) flows easterly overland, combining with on-site flows being directed into existing catch basin EX-CB-1 at the southeastern corner of the property.
- *South:* Half of the runoff from E Shea Boulevard (EX-OFF-4 and EX-OFF-6) flows towards the site, where it is conveyed through curb and gutter into existing catch basins south of the site along E Shea Boulevard (EX-CB-3 & EX-CB-4 respectively).

Refer to **FIGURE 4 - FLO-2D Map (North)**, **FIGURE 5 - FLO-2D Map (South)** and **APPENDIX II for Existing Conditions Drainage Area Map**.

3.2 ON-SITE DRAINAGE

Based on the topographic information, the historical outfalls are as follows:

- Flows from drainage areas EX-A1 flow southerly overland into existing catch basin EX-CB-1 located at the southeastern corner of the site.
- Flows from drainage area EX-B1 flow southerly overland into existing catch basin EX-CB-4 located south of the property along E Shea Boulevard.
- Flows from drainage area EX-C1 flow southwesterly overland onto the western portion of the parcel (CP-1).

All on-site and off-site runoffs are ultimately discharged into an existing 17'x 8' Concrete Box Culvert, which is part of the City of Scottsdale's public stormwater system, located at the eastern portion of the parcel. No stormwater is retained on-site.

Refer to **FIGURE 6** for **City of Scottsdale Storm Water GIS** and **FIGURE 7** for **Storm Water 29-44 QS Map**.

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

Table 1 below is a summary of existing conditions runoff calculations:

TABLE 1:

EXISTING SITE DISCHARGES									
	TOTAL AREA	Cwt	Intensity 10 yr	Q 10	Intensity 100 yr	Q 100	Concentration Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	4.78		-	-	-	-	-	13.45	28.71
EX-A1	2.36	0.91	3.14	6.74	6.70	14.38	EX-CB-1	8.03	17.14
EX-OFF-1	0.20	0.90	4.74	0.57	7.49	1.22			
EX-OFF-2	0.24	0.95	4.74	0.73	7.49	1.55			
EX-OFF-3	0.08	0.86	4.74	0.20	7.49	0.43	EX-CB-2	0.20	0.43
EX-OFF-4	0.13	0.92	4.74	0.37	7.49	0.80	EX-CB-3	0.37	0.80
EX-B1	1.21	0.88	5.58	3.34	7.49	7.13	EX-CB-4	4.40	9.39
EX-OFF-5	0.03	0.95	4.74	0.10	7.49	0.21			
EX-OFF-6	0.36	0.85	4.74	0.96	7.49	2.06			
EX-C1	0.16	0.85	4.74	0.44	7.49	0.94	CP-1	0.44	0.94

Overall on-site project area includes **3.73 Acres** at **Cwt = 0.90** (Existing conditions)

Refer to the **Existing Conditions Cwt** and **Existing Conditions Drainage Area Map** in **APPENDIX II**.

4. PROPOSED STORM WATER MANAGEMENT

4.1 DESIGN INTENT:

Given that the site has been previously developed, on-site retention shall be calculated per City of Scottsdale DSPM 4-1.201. In order to preserve existing drainage patterns, all on-site runoffs will ultimately be discharged to the City of Scottsdale public storm network via the existing 17' X 8' Concrete Box Culvert located at the eastern side of the site.

Refer to **APPENDIX II** for **Proposed Conditions Drainage Area Map**.

- Runoff from drainage areas DA-A1 through DA-A6; roof areas DA-R1, DA-R2, DA-R4 and DA-R5; and finally, offsite areas OFF-1, OFF-2A, OFF-2B & OFF-5. Will ultimately be conveyed into the Concrete Box Culvert located alongside the east of the property and 71st, via different catch basins and roof drains, and exit offsite via a headwall near the northeast corner of the site.
- Runoff from drainage area OFF-3 will be conveyed overland into proposed CB-E1 located at the southeast corner of the site.
- Runoff from drainage area OFF-4 will be conveyed overland into proposed CB-D1 located at the southeast corner of the site, facing Shea Blvd.
- Runoff from drainage area DA-B1, DA-R3 and OFF-6, will be conveyed into existing EX-CB-4 located at the southwest corner of the site.

4.2 DESIGN STORM REQUIREMENTS:

In accordance with City of Scottsdale requirements for lots that are already developed, 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.

4.3 LAND CHARACTERISTICS:

The proposed project site consists of a multi-family residential building with a retail space and landscape areas along the perimeter of the structure. Based on the DS&PM, 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 City of Scottsdale Design Standards & Policies Manual and the Drainage Design Manual for Maricopa County, Arizona, Volume I.

Table 2 below is a summary of proposed conditions runoff calculations:

TABLE 2:

PROPOSED SITE DISCHARGES									
	TOTAL AREA	Cwt	Intensity 10 yr 5-min	Q 10	Intensity 100 yr 5-min	Q 100	Concentration Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	4.78		4.74	-	7.49	-	-	19.73	31.18
DA-A1	0.28	0.86	4.74	1.12	7.49	1.77	CB-A1	3.57	5.64
DA-R1	0.35	0.95	4.74	1.59	7.49	2.52			
OFF-1	0.20	0.89	4.74	0.85	7.49	1.35			
DA-A2	0.41	0.83	4.74	1.60	7.49	2.52	CB-A4	3.74	5.90
DA-R2	0.44	0.95	4.74	1.99	7.49	3.15			
OFF-5	0.03	0.95	4.74	0.15	7.49	0.23			
DA-A3	0.56	0.74	4.74	1.97	7.49	3.11	CB-C4	2.75	4.34
OFF-2A	0.17	0.95	4.74	0.78	7.49	1.23			
DA-A4	0.40	0.82	4.74	1.56	7.49	2.46	EX-CB-1	1.88	2.97
OFF-2B	0.07	0.95	4.74	0.32	7.49	0.51			
DA-A5	0.17	0.89	4.74	0.70	7.49	1.11	CB-A1-2	0.70	1.11
DA-A6	0.23	0.91	4.74	0.97	7.49	1.53	CB-A1-3	0.97	1.53
DA-R4	0.24	0.95	4.74	1.07	7.49	1.68	STUB-B1	1.07	1.68
DA-R5	0.23	0.95	4.74	1.03	7.49	1.63	STUB-C1	1.03	1.63
DA-R3	0.26	0.95	4.74	1.19	7.49	1.88	EX-CB-4	3.12	4.93
DA-B1	0.17	0.56	4.74	0.45	7.49	0.72			
OFF-6	0.35	0.88	4.74	1.48	7.49	2.33			
OFF-3	0.06	0.95	4.74	0.28	7.49	0.44	CB-E1	0.28	0.44
OFF-4	0.15	0.89	4.74	0.64	7.49	1.02	CB-D1	0.64	1.02

Overall project area includes **3.73 Acres at C_{wt} = 0.86** (Proposed conditions)

Refer to the **Proposed Conditions Cwt and Proposed Conditions Drainage Area Map** 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 = 2.20 in per NOAA Atlas 14 Precipitation Frequency Estimates

A = Total area of site (sf)

$\Delta C = C_{post} - C_{pre}$

$$V_r = (0.86 - 0.90) \left(\frac{2.20}{12} \right) (162,562) = -1,192 \text{ cf}$$

Since the difference of the weighted coefficients is negative, stormwater flows in the project area will decrease. Therefore, stormwater retention is not required for the development following pre vs post analysis.

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. As shown in the Proposed Conditions Cwt Exhibit, first flush area is calculated as the disturbed area of proposed development (162,562 sf). The first flush calculation is as follows:

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

where:

V_{FF} = Required first flush storage volume (cf)

P = Required precipitation depth of 0.5 inches

A = Disturbed area of proposed development (sf)

C = Weighted average runoff coefficient

$$V_{FF} = (0.86) \left(\frac{0.5}{12} \right) (162,562) = 5,825 \text{ cf}$$

First flush volume is not required to be held as long as stormwater quality control (stormceptor) is provided.

The requirement of First Flush will be fulfilled via treatment of the project's peak flow discharge to the existing 17' X 8' Concrete Box Culvert, following Section 3.6.6 of the Drainage Policies and Standards for Maricopa County dated 2018. Stormwater runoff associated to this outfall will receive treatment through Stormceptor or similar structure prior to being discharged into the existing 17' X 8' Concrete Box Culvert. The "first flush" treatment discharge design flow will be calculated for susceptible contamination areas. The "first flush" treatment discharge design flow is calculated with the following equation:

$$Q_{FF} = C * I * A$$

where:

Q_{FF} = Minimum First flush discharge (cfs)

C = Runoff coefficient (set at 1)

I = 0.50 inches/hour rainfall excess intensity divided by the time of concentration in minutes, calculated as follow:

$$I = \frac{0.50 \frac{\text{in}}{\text{hr}} * 60 \frac{\text{min}}{\text{hr}}}{TC} \quad I = \frac{0.5 \frac{\text{in}}{\text{hr}} * 60 \frac{\text{min}}{\text{hr}}}{10 \text{ min}} = 3 \text{ in/hr}$$

A = Disturbed area of the proposed development (ac)

$$A = \text{Site Area} = 3.73 \text{ AC}$$

$$Q_{FF} = (1)(3)(3.73) = 11.19 \text{ CFS}$$

No retention will be provided for on-site flows. Existing drainage patterns will be maintained during proposed conditions and first flush treatment will be provided via two Stormceptors, one located near the southeast corner of the site and another one located east of the proposed building.

4.5 STORMWATER RETENTION WAIVER:

Since no retention is required per pre vs post analysis, and first flush treatment will consist of discharge treatment via two Stormceptors, no retention is proposed. A Stormwater Storage Waiver will be applied based on section 4-1.203 of the DS&PM to handle runoff from the subject property and convey it to this site adequately. Refer to **APPENDIX** for **Stormwater Storage Waiver**.

4.6 STORMWATER DISCHARGE

Pre vs post discharges

Proposed conditions will ultimately increase site flow contributions to the existing public storm drain system due to change in time of concentration. The overall run-off coefficient of the site will decrease by 0.04.

Table 5 below summarizes the project discharges per outfall for the 10-year and 100-year storm events, providing the differences between existing and proposed peak flows for each case.

TABLE 5:

Outfall	Q10 (cfs)			Q100 (cfs)		
	Existing	Proposed	Δ	Existing	Proposed	Δ
17' x 8' Concrete Box Culvert	13.45	19.73	6.28	28.71	31.18	2.48

During the 100-year storm event, discharges to the overall public storm system will be increased by 2.48 cfs.

Refer to **Existing Conditions Drainage Area Map** and **Proposed Conditions Drainage Area Map** in **APPENDIX II**.

4.7 PIPE CAPACITY CALCULATIONS

Pipe capacity calculations will be provided in the Final Drainage Report.

4.8 STORM DRAIN INLET CALCULATIONS

Flo-2D Map marks the site as located in the study area 120_EastShea – 100YR24HR With Walls SD01, the recorded Maximum Discharge at the 17' x 8' concrete box culvert location north of the site is 380.23 cfs. The project site discharges a total of 31.18 cfs in proposed conditions into the culvert. The capacity of the culvert of 1,000 cfs, therefore the 2.48 cfs increase in site discharge (28.71 cfs in existing conditions) can be handled by the existing culvert.

Refer to **Flo-2D Map Culvert location (maximum discharge)** in **FIGURE 8** and refer to **8' x 17' Culvert Calculations** in **APPENDIX II**.

4.9 ADEQ WATER QUALITY REQUIREMENTS

The total disturbed area of this site is approximately 4.36 acres. The Arizona Department of Environmental Quality requires that any site disturbance over an acre is required to submit an NOI. A 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.

5. FLOOD SAFETY FOR DWELLINGS

5.1 FINISHED FLOOR ELEVATIONS

This project lies in an "X" Flood Zone. Therefore, the proposed building finished floor elevation (1356') will be set a minimum of 14 inches above the lot ultimate outfall, located at the southeast corner of the site at an elevation of 1351.65'.

6. CONCLUSIONS

6.1 OVERALL PROJECT:

1. The finish floor elevations will be designed a minimum of 14 inches above the low top of curb of the lot.
2. The historical outfalls will not be affected by proposed conditions and overall discharge to the public storm drain system will be decreased.
3. On-site treatment will be provided for the First Flush discharge.
4. A stormwater retention waiver will be applied to handle runoff from the subject property and convey it to this site adequately.

6.2 PROJECT PHASING:

This project will be constructed in a single phase.

7. WARNING AND DISCLAIMER OF LIABILITY

RE: following page.

8. 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.

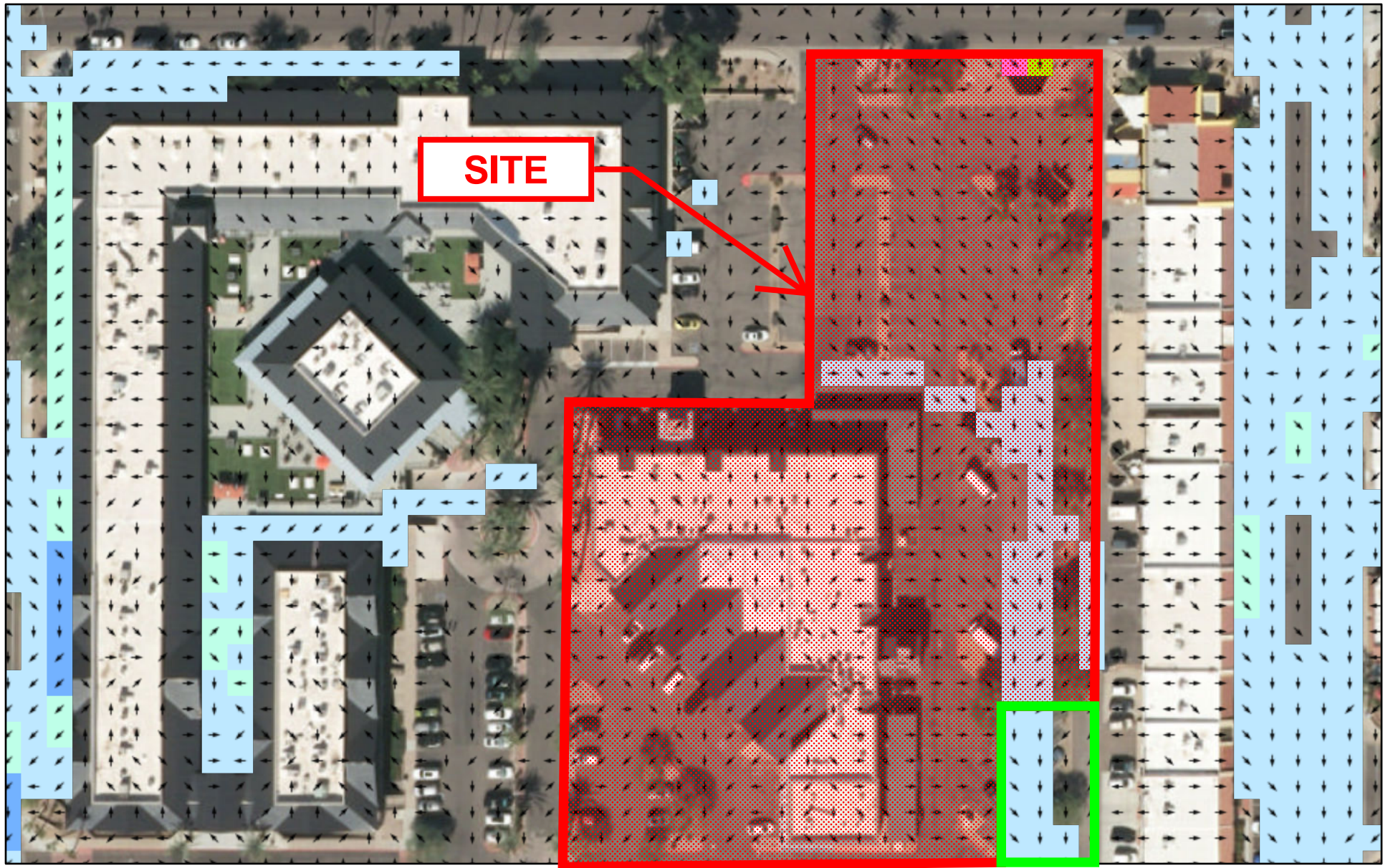
Plan Check #

Owner

Date

FIGURES

120_EastShea - 100YR24HR With Walls SD01



January 7, 2025

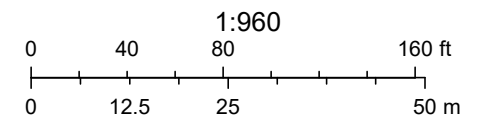
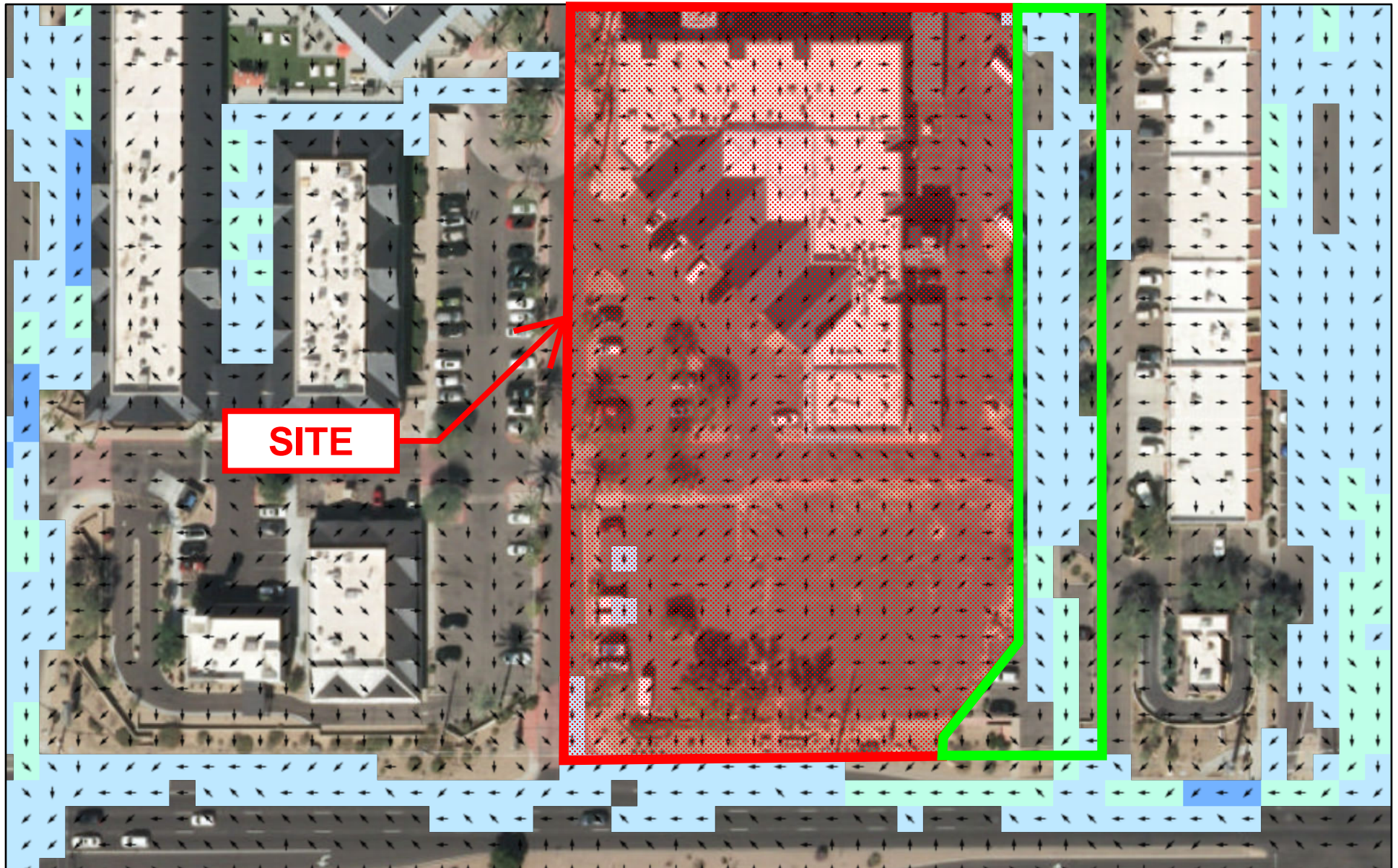


FIGURE 4 - FLO2D MAP (NORTH)

120_EastShea - 100YR24HR With Walls SD01



January 7, 2025

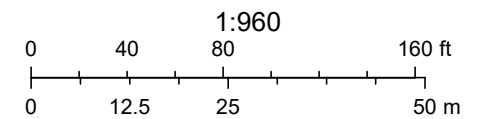


FIGURE 5 - FLO2D MAP (SOUTH)

The map displays the Scottsdale area with the following streets and features:

- Streets:** E SHEA BL, E SAHUARO DR, N 69TH ST, N 70TH ST, N 71ST ST, N SCOTTSDALE RD, E BECKER LN, N 71ST PL, N 71ST WY.
- Site Location:** A red box labeled "SITE" points to a specific area on E SAHUARO DR, bounded by N 70TH ST and N 71ST ST.
- Utilities:** Various utility lines are shown, including water (blue lines with 'W' markers) and sewer (purple lines with 'S' markers).
- Scale:** A scale bar at the bottom indicates distances of 150, 0, and 300 feet.
- North Arrow:** A north arrow is located in the bottom left corner.
- City of Scottsdale GIS:** The map is credited to the City of Scottsdale GIS.

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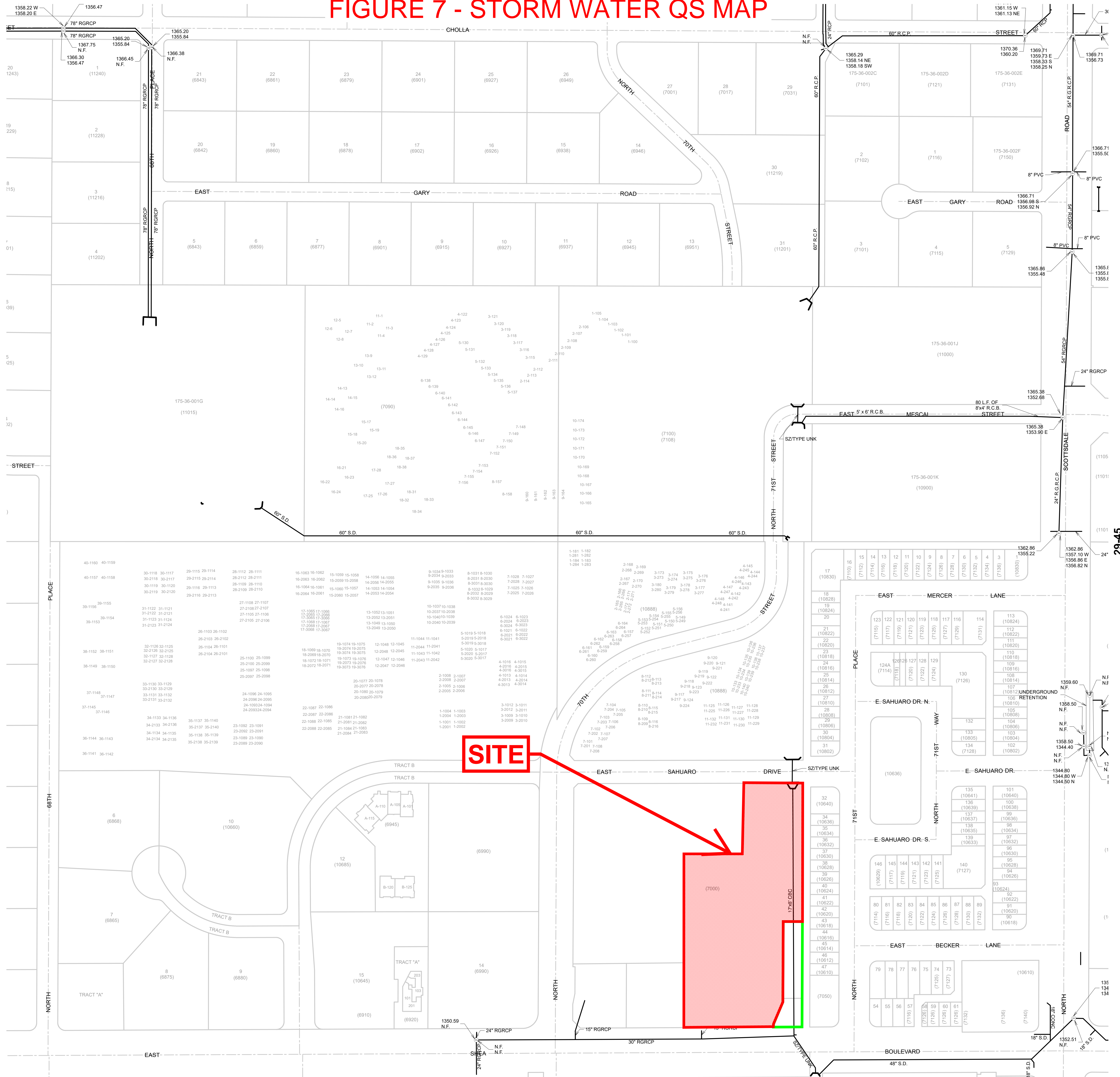
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FIGURE 6 - CITY OF SCOTTSDALE STORM WATER GIS

30-44

FIGURE 7 - STORM WATER QS MAP



GENERAL NOTES:

- THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
- THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER, 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED TO GROUND. WHERE NO CORNER WAS FOUND THE DIMENSIONS ARE GIVEN TO CALCULATED SECTION CORNERS AND ARE NOTED AS "CALCULATED" ON THE MAP.

LEGEND:

VICINITY MAP

CENTER CHOLLA STREET E 1/4 COR. 11400 N
S 1/4 COR. 6800 E
SHEA BOULEVARD
SCOTTSDALE ROAD
10000 N
7200 E
SE COR.

NORTH

SCALE: 1" = 100'

0 50 100 200

The map scale of 1" = 100' is based on a full size print of 30" x 36"

STORM WATER

QUARTER SECTION MAP

29-44

SE 1/4 SEC. 22 T3N R4E

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

N O T I C E

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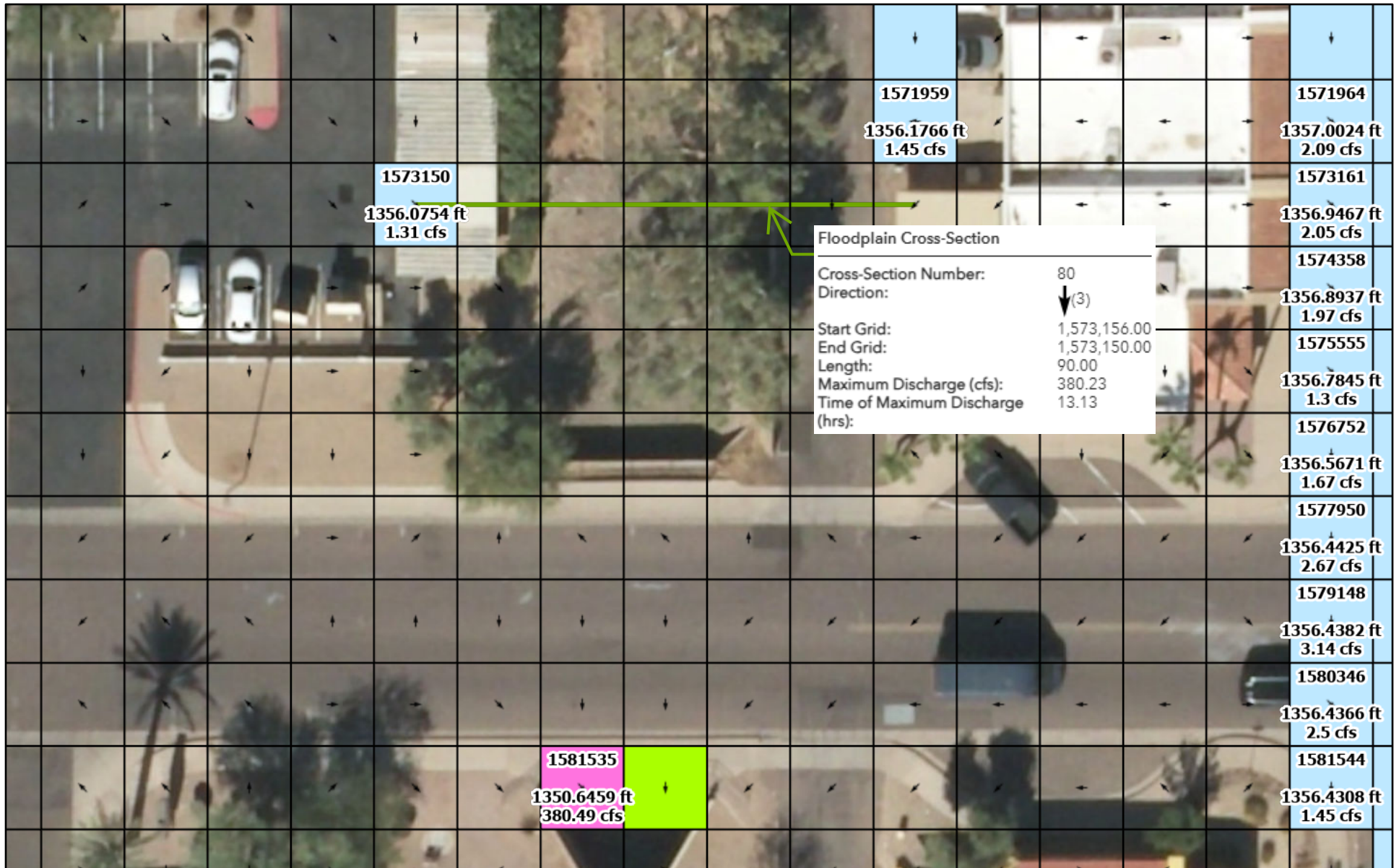
THE CITY OF SCOTTSDALE

29-43

29-45

15-JAN-23

120_EastShea - 100YR24HR With Walls SD01



March 24, 2025

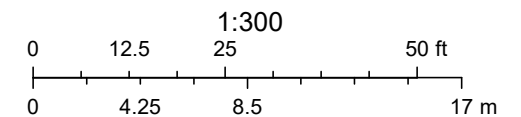


FIGURE 8 - FLO-2D MAP MAXIMUM DISCHARGE 17' x 8' CONCRETE BOX CULVERT LOCATION

APPENDIX I

RAINFALL DATA



NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.5829°, Longitude: -111.9295°
Elevation: m/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	0.187 (0.155-0.228)	0.244 (0.204-0.298)	0.329 (0.273-0.401)	0.395 (0.327-0.480)	0.485 (0.394-0.587)	0.553 (0.444-0.665)	0.624 (0.492-0.749)	0.695 (0.539-0.832)	0.791 (0.598-0.949)	0.864 (0.640-1.04)
10-min	0.285 (0.236-0.347)	0.371 (0.311-0.454)	0.501 (0.416-0.611)	0.602 (0.497-0.731)	0.738 (0.599-0.893)	0.842 (0.676-1.01)	0.950 (0.749-1.14)	1.06 (0.820-1.27)	1.21 (0.910-1.44)	1.32 (0.974-1.58)
15-min	0.353 (0.293-0.430)	0.460 (0.385-0.563)	0.622 (0.515-0.757)	0.746 (0.616-0.907)	0.915 (0.743-1.11)	1.04 (0.838-1.25)	1.18 (0.929-1.41)	1.31 (1.02-1.57)	1.49 (1.13-1.79)	1.63 (1.21-1.96)
30-min	0.474 (0.394-0.579)	0.619 (0.519-0.758)	0.837 (0.694-1.02)	1.00 (0.830-1.22)	1.23 (1.00-1.49)	1.41 (1.13-1.69)	1.59 (1.25-1.90)	1.77 (1.37-2.12)	2.01 (1.52-2.41)	2.20 (1.63-2.64)
60-min	0.587 (0.488-0.717)	0.766 (0.642-0.938)	1.04 (0.859-1.26)	1.24 (1.03-1.51)	1.53 (1.24-1.85)	1.74 (1.40-2.09)	1.96 (1.55-2.36)	2.19 (1.69-2.62)	2.49 (1.88-2.98)	2.72 (2.01-3.26)
2-hr	0.687 (0.579-0.819)	0.887 (0.752-1.06)	1.18 (0.996-1.41)	1.41 (1.17-1.67)	1.72 (1.42-2.03)	1.95 (1.59-2.30)	2.20 (1.76-2.58)	2.44 (1.92-2.87)	2.78 (2.13-3.26)	3.03 (2.28-3.58)
3-hr	0.766 (0.646-0.936)	0.981 (0.831-1.20)	1.28 (1.08-1.57)	1.52 (1.27-1.84)	1.86 (1.53-2.24)	2.12 (1.72-2.54)	2.40 (1.91-2.87)	2.69 (2.11-3.21)	3.09 (2.35-3.69)	3.41 (2.53-4.08)
6-hr	0.924 (0.793-1.10)	1.17 (1.00-1.39)	1.49 (1.27-1.76)	1.75 (1.48-2.06)	2.10 (1.76-2.46)	2.37 (1.95-2.77)	2.66 (2.16-3.09)	2.95 (2.35-3.44)	3.35 (2.60-3.90)	3.67 (2.78-4.28)
12-hr	1.02 (0.882-1.20)	1.29 (1.11-1.52)	1.63 (1.40-1.91)	1.89 (1.62-2.22)	2.25 (1.90-2.63)	2.53 (2.11-2.94)	2.81 (2.31-3.27)	3.10 (2.52-3.60)	3.48 (2.75-4.07)	3.78 (2.94-4.45)
24-hr	1.20 (1.04-1.41)	1.52 (1.32-1.79)	1.96 (1.70-2.32)	2.31 (1.99-2.72)	2.80 (2.39-3.29)	3.18 (2.70-3.73)	3.58 (3.01-4.21)	3.99 (3.33-4.68)	4.57 (3.75-5.35)	5.02 (4.07-5.91)
2-day	1.29 (1.11-1.50)	1.64 (1.42-1.92)	2.14 (1.85-2.51)	2.55 (2.19-2.97)	3.10 (2.65-3.62)	3.54 (3.00-4.13)	4.01 (3.37-4.68)	4.49 (3.74-5.25)	5.17 (4.24-6.04)	5.70 (4.62-6.69)
3-day	1.37 (1.19-1.60)	1.75 (1.52-2.04)	2.30 (1.99-2.68)	2.74 (2.37-3.19)	3.36 (2.89-3.91)	3.86 (3.29-4.48)	4.39 (3.71-5.09)	4.94 (4.14-5.75)	5.72 (4.73-6.65)	6.35 (5.19-7.40)
4-day	1.46 (1.27-1.69)	1.86 (1.63-2.16)	2.46 (2.14-2.84)	2.94 (2.55-3.40)	3.63 (3.12-4.19)	4.18 (3.58-4.83)	4.77 (4.05-5.50)	5.39 (4.54-6.25)	6.28 (5.22-7.25)	7.00 (5.76-8.11)
7-day	1.65 (1.43-1.92)	2.11 (1.83-2.45)	2.79 (2.41-3.24)	3.33 (2.87-3.87)	4.11 (3.52-4.77)	4.74 (4.04-5.49)	5.41 (4.57-6.26)	6.12 (5.13-7.11)	7.12 (5.89-8.27)	7.93 (6.50-9.22)
10-day	1.77 (1.54-2.05)	2.27 (1.98-2.63)	3.00 (2.60-3.47)	3.58 (3.10-4.14)	4.40 (3.79-5.07)	5.06 (4.33-5.82)	5.76 (4.89-6.63)	6.49 (5.48-7.49)	7.53 (6.27-8.67)	8.36 (6.89-9.65)
20-day	2.19 (1.92-2.52)	2.82 (2.46-3.24)	3.73 (3.25-4.28)	4.41 (3.84-5.06)	5.34 (4.62-6.12)	6.05 (5.22-6.93)	6.77 (5.81-7.77)	7.51 (6.41-8.63)	8.50 (7.19-9.79)	9.26 (7.78-10.7)
30-day	2.57 (2.23-2.95)	3.30 (2.88-3.80)	4.36 (3.79-4.99)	5.16 (4.48-5.91)	6.23 (5.39-7.14)	7.06 (6.08-8.07)	7.91 (6.78-9.04)	8.77 (7.48-10.0)	9.93 (8.41-11.4)	10.8 (9.10-12.4)
45-day	2.95 (2.59-3.37)	3.81 (3.34-4.35)	5.01 (4.39-5.72)	5.91 (5.16-6.74)	7.09 (6.17-8.08)	7.98 (6.92-9.09)	8.88 (7.65-10.1)	9.78 (8.40-11.2)	11.0 (9.34-12.6)	11.9 (10.0-13.6)
60-day	3.24 (2.86-3.69)	4.19 (3.69-4.77)	5.51 (4.85-6.26)	6.47 (5.68-7.35)	7.72 (6.76-8.76)	8.65 (7.54-9.81)	9.58 (8.31-10.9)	10.5 (9.07-11.9)	11.7 (10.0-13.3)	12.6 (10.7-14.3)

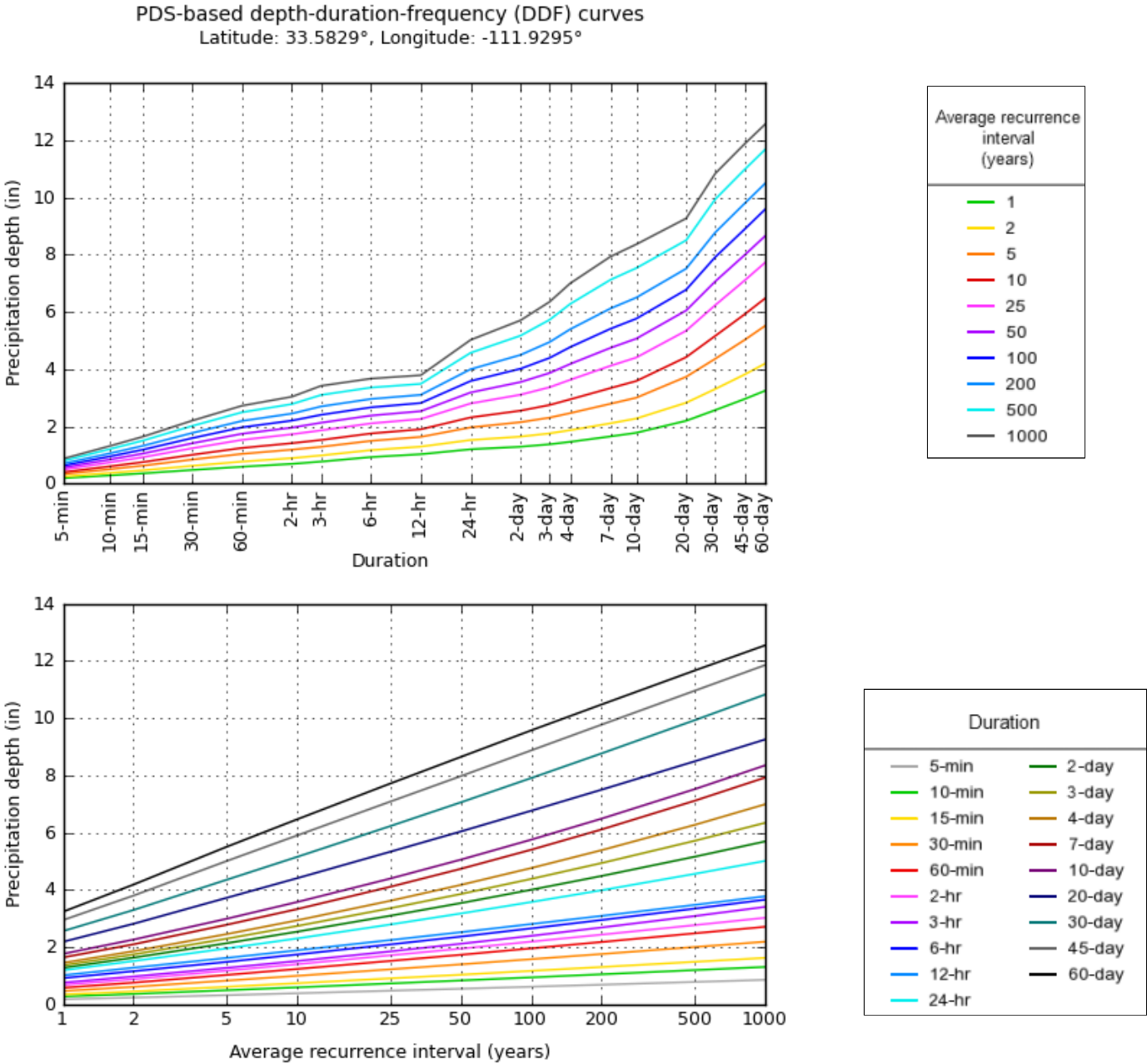
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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



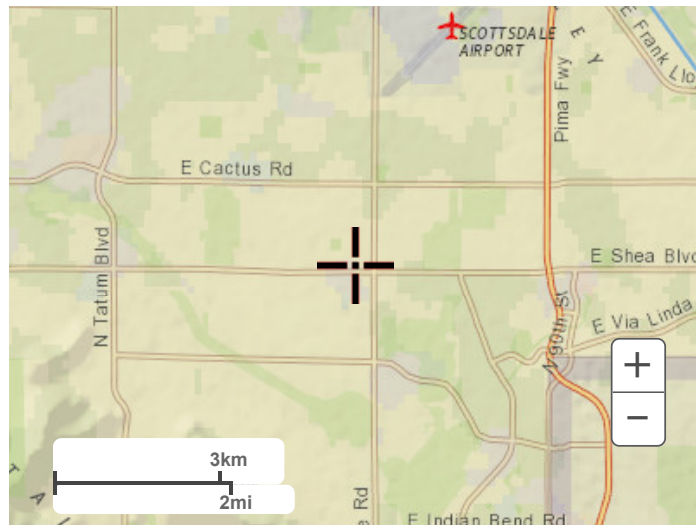
NOAA Atlas 14, Volume 1, Version 5

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Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.5829°, Longitude: -111.9295°
Elevation: m/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](#)

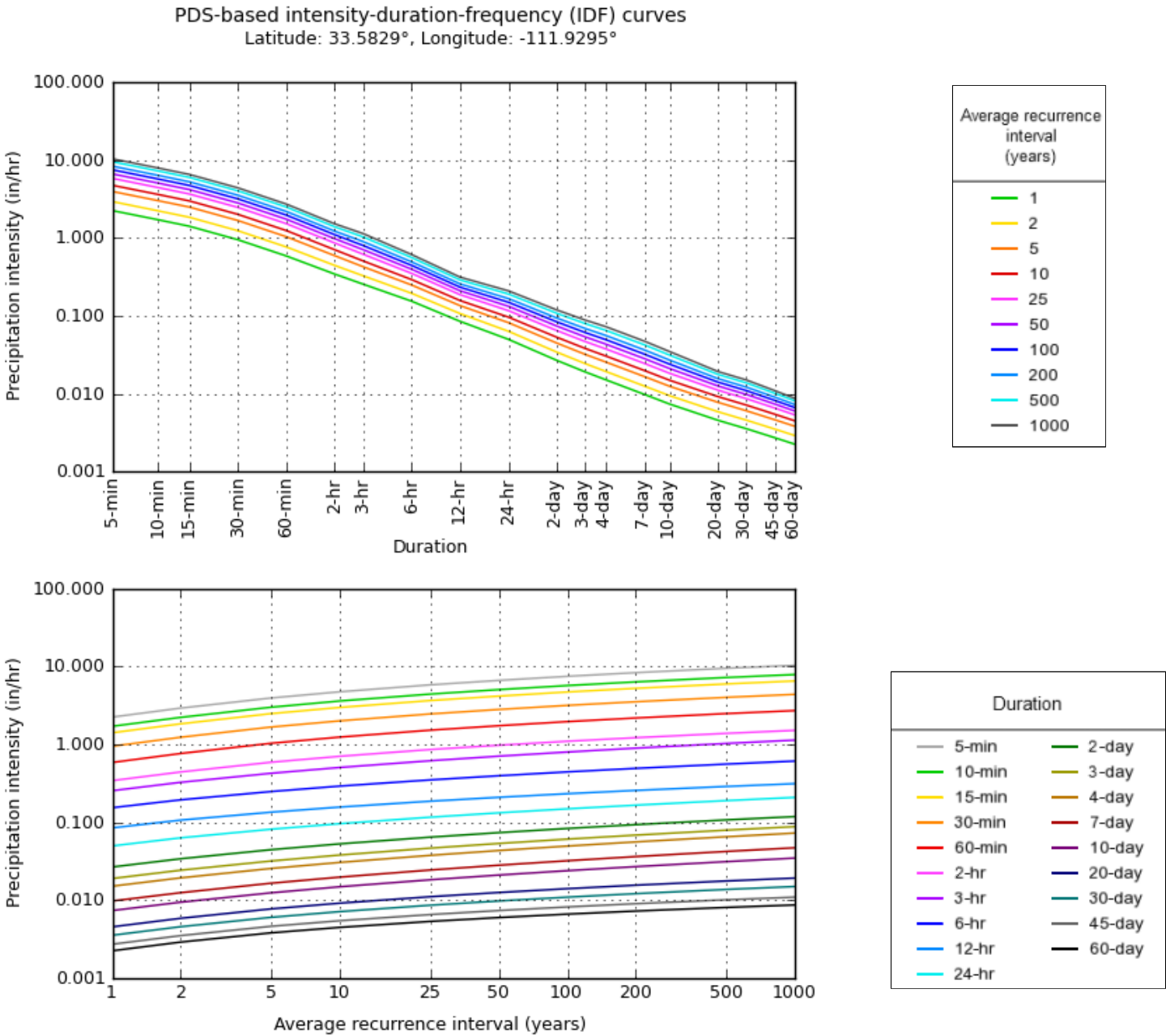
PF tabular

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	2.24 (1.86-2.74)	2.93 (2.45-3.58)	3.95 (3.28-4.81)	4.74 (3.92-5.76)	5.82 (4.73-7.04)	6.64 (5.33-7.98)	7.49 (5.90-8.99)	8.34 (6.47-9.98)	9.49 (7.18-11.4)	10.4 (7.68-12.4)
10-min	1.71 (1.42-2.08)	2.23 (1.87-2.72)	3.01 (2.50-3.67)	3.61 (2.98-4.39)	4.43 (3.59-5.36)	5.05 (4.06-6.07)	5.70 (4.49-6.84)	6.35 (4.92-7.60)	7.23 (5.46-8.66)	7.89 (5.84-9.47)
15-min	1.41 (1.17-1.72)	1.84 (1.54-2.25)	2.49 (2.06-3.03)	2.98 (2.46-3.63)	3.66 (2.97-4.43)	4.17 (3.35-5.02)	4.71 (3.72-5.65)	5.25 (4.06-6.28)	5.98 (4.51-7.16)	6.52 (4.83-7.83)
30-min	0.948 (0.788-1.16)	1.24 (1.04-1.52)	1.67 (1.39-2.04)	2.01 (1.66-2.44)	2.46 (2.00-2.98)	2.81 (2.26-3.38)	3.17 (2.50-3.81)	3.53 (2.74-4.23)	4.02 (3.04-4.82)	4.39 (3.25-5.27)
60-min	0.587 (0.488-0.717)	0.766 (0.642-0.938)	1.04 (0.859-1.26)	1.24 (1.03-1.51)	1.53 (1.24-1.85)	1.74 (1.40-2.09)	1.96 (1.55-2.36)	2.19 (1.69-2.62)	2.49 (1.88-2.98)	2.72 (2.01-3.26)
2-hr	0.344 (0.290-0.410)	0.444 (0.376-0.531)	0.592 (0.498-0.704)	0.704 (0.587-0.837)	0.860 (0.710-1.02)	0.976 (0.795-1.15)	1.10 (0.878-1.29)	1.22 (0.960-1.44)	1.39 (1.07-1.63)	1.52 (1.14-1.79)
3-hr	0.255 (0.215-0.312)	0.327 (0.277-0.401)	0.427 (0.360-0.521)	0.506 (0.422-0.614)	0.618 (0.508-0.744)	0.707 (0.573-0.847)	0.799 (0.636-0.957)	0.897 (0.701-1.07)	1.03 (0.781-1.23)	1.14 (0.842-1.36)
6-hr	0.154 (0.132-0.183)	0.195 (0.167-0.231)	0.249 (0.212-0.294)	0.292 (0.247-0.343)	0.351 (0.293-0.410)	0.396 (0.326-0.463)	0.444 (0.360-0.516)	0.493 (0.393-0.575)	0.560 (0.434-0.652)	0.612 (0.463-0.715)
12-hr	0.085 (0.073-0.100)	0.107 (0.092-0.126)	0.135 (0.116-0.159)	0.157 (0.134-0.184)	0.187 (0.158-0.218)	0.210 (0.175-0.244)	0.233 (0.192-0.271)	0.257 (0.209-0.299)	0.289 (0.229-0.338)	0.314 (0.244-0.369)
24-hr	0.050 (0.043-0.059)	0.063 (0.055-0.075)	0.082 (0.071-0.096)	0.096 (0.083-0.113)	0.117 (0.100-0.137)	0.133 (0.112-0.155)	0.149 (0.126-0.175)	0.166 (0.139-0.195)	0.190 (0.156-0.223)	0.209 (0.170-0.246)
2-day	0.027 (0.023-0.031)	0.034 (0.030-0.040)	0.045 (0.038-0.052)	0.053 (0.046-0.062)	0.065 (0.055-0.075)	0.074 (0.062-0.086)	0.084 (0.070-0.098)	0.094 (0.078-0.109)	0.108 (0.088-0.126)	0.119 (0.096-0.139)
3-day	0.019 (0.017-0.022)	0.024 (0.021-0.028)	0.032 (0.028-0.037)	0.038 (0.033-0.044)	0.047 (0.040-0.054)	0.054 (0.046-0.062)	0.061 (0.052-0.071)	0.069 (0.058-0.080)	0.079 (0.066-0.092)	0.088 (0.072-0.103)
4-day	0.015 (0.013-0.018)	0.019 (0.017-0.022)	0.026 (0.022-0.030)	0.031 (0.027-0.035)	0.038 (0.033-0.044)	0.044 (0.037-0.050)	0.050 (0.042-0.057)	0.056 (0.047-0.065)	0.065 (0.054-0.076)	0.073 (0.060-0.084)
7-day	0.010 (0.009-0.011)	0.013 (0.011-0.015)	0.017 (0.014-0.019)	0.020 (0.017-0.023)	0.024 (0.021-0.028)	0.028 (0.024-0.033)	0.032 (0.027-0.037)	0.036 (0.031-0.042)	0.042 (0.035-0.049)	0.047 (0.039-0.055)
10-day	0.007 (0.006-0.009)	0.009 (0.008-0.011)	0.012 (0.011-0.014)	0.015 (0.013-0.017)	0.018 (0.016-0.021)	0.021 (0.018-0.024)	0.024 (0.020-0.028)	0.027 (0.023-0.031)	0.031 (0.026-0.036)	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 (0.008-0.011)	0.011 (0.010-0.013)	0.013 (0.011-0.014)	0.014 (0.012-0.016)	0.016 (0.013-0.018)	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 (0.007-0.010)	0.010 (0.008-0.011)	0.011 (0.009-0.013)	0.012 (0.010-0.014)	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)	0.005 (0.005-0.006)	0.007 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.009-0.012)	0.011 (0.009-0.013)
60-day	0.002 (0.002-0.003)	0.003 (0.003-0.003)	0.004 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.008)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.007-0.010)

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



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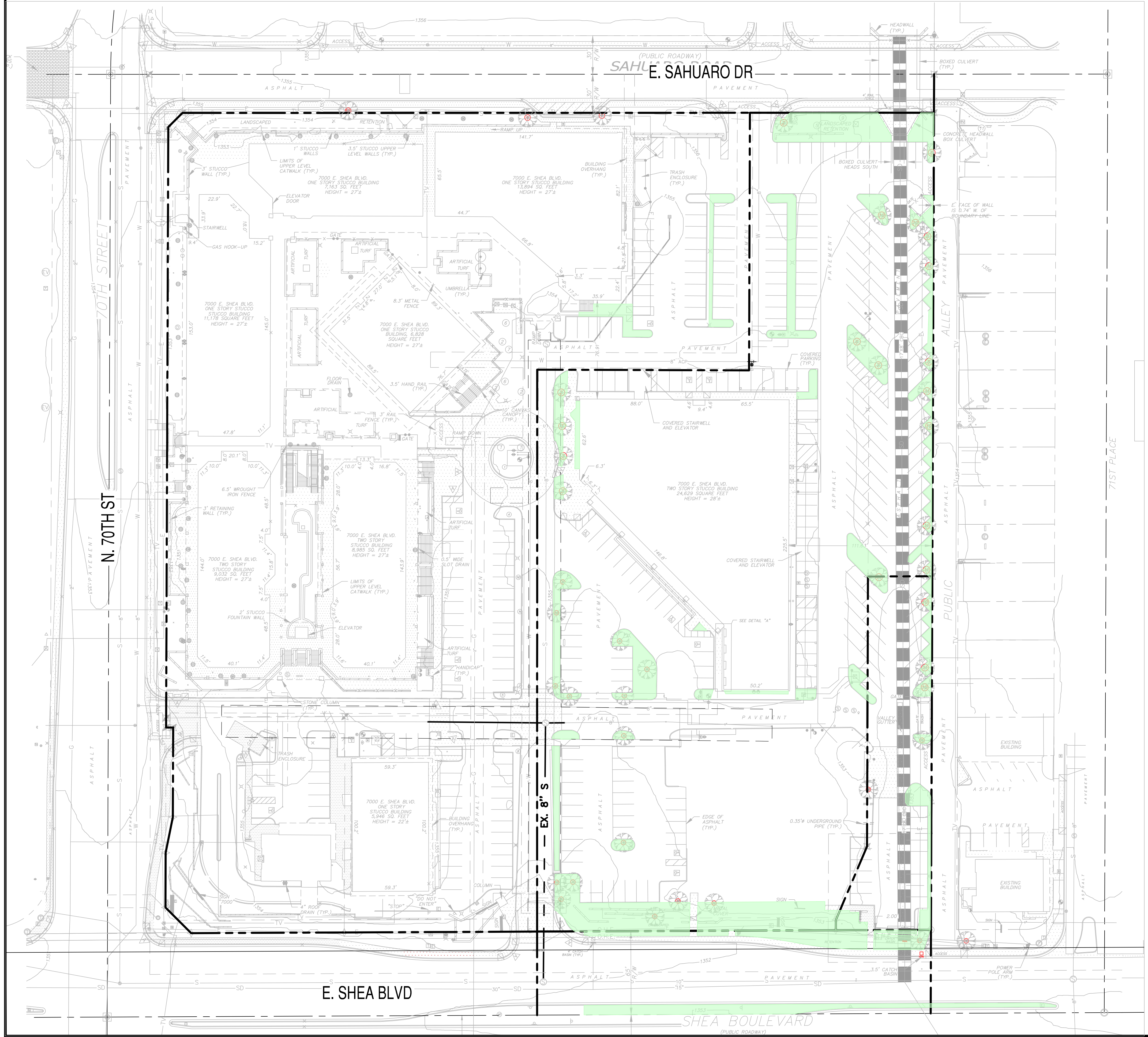
Maps & aerials

Small scale terrain

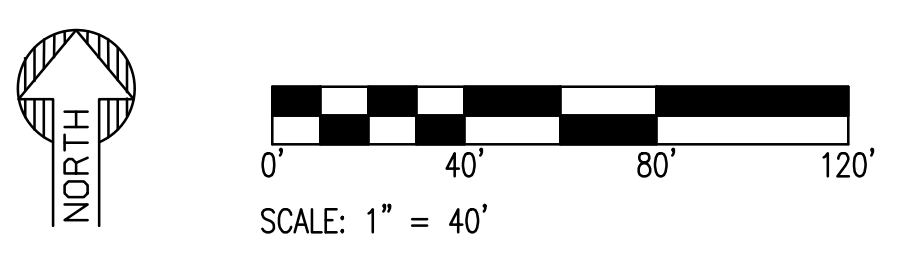
APPENDIX II

CALCULATIONS

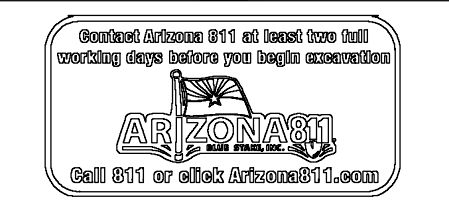
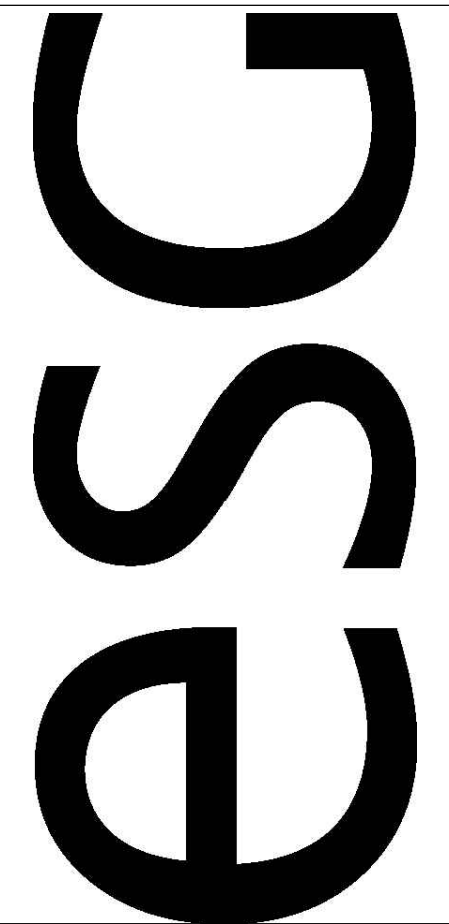
COSANTI COMMONS
EXISTING CONDITIONS C_{WT} EXHIBIT
7000 E. SHEA BOULEVARD SCOTTSDALE, AZ 85254



ON-SITE			
PROPERTY LINE			
BUILDING/PAVED SURFACE =	145,830 SF (3.35 AC)	@ CWT=0.95	
NATURAL DESERT/LANDSCAPE =	16,732 SF (0.38 AC)	@ CWT=0.45	
TOTAL ON-SITE CWT =	162,562 SF (3.73 AC)	@ CWT=0.90	
OFF-SITE			
PROPERTY LINE			
BUILDING/PAVED SURFACE =	40,583 SF (0.93 AC)	@ CWT=0.95	
NATURAL DESERT/LANDSCAPE =	4,870 SF (0.11 AC)	@ CWT=0.45	
TOTAL OFF-SITE CWT =	45,453 SF (1.04 AC)	@ CWT=0.90	



NOT FOR
CONSTRUCTION



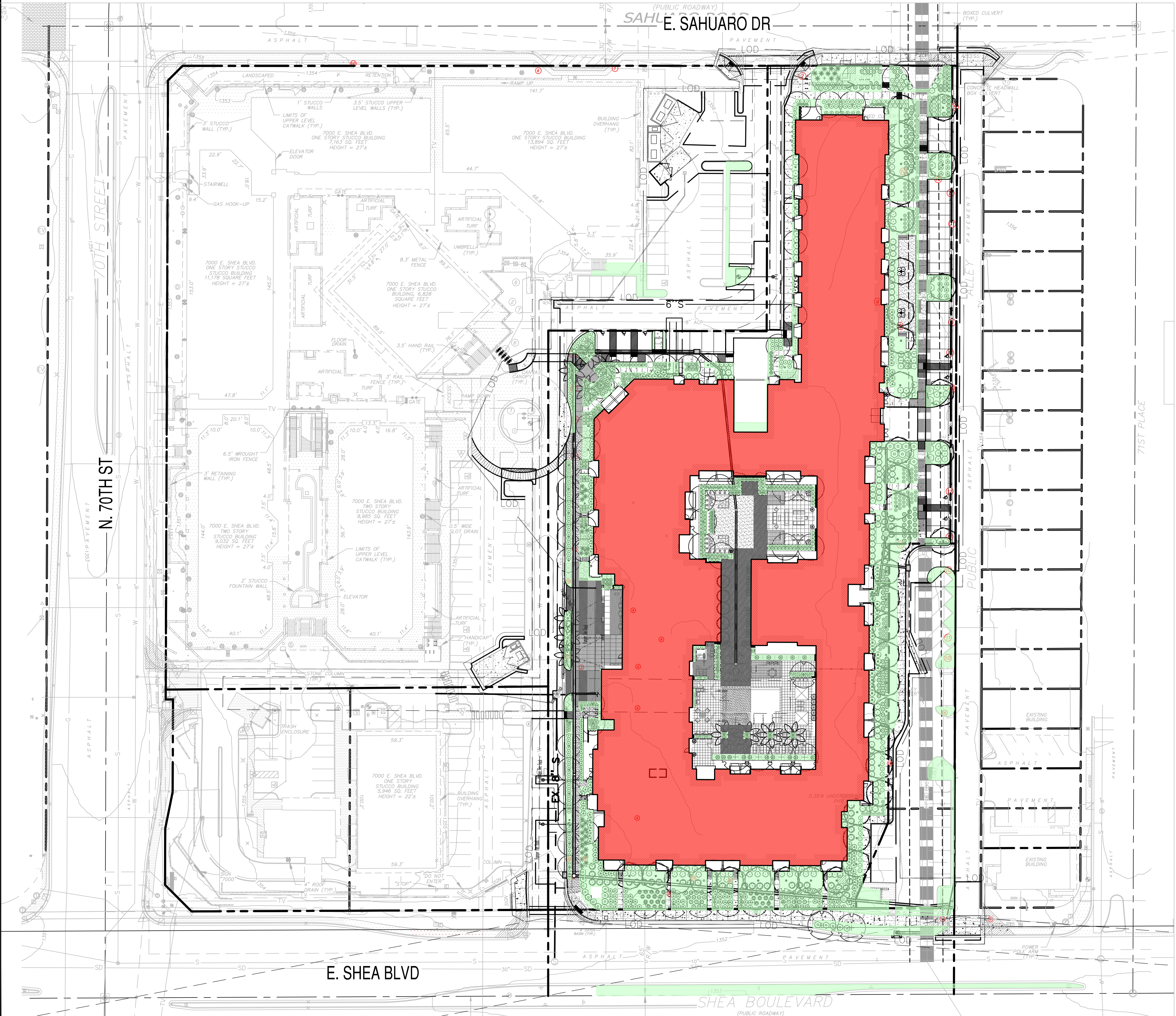
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DRAWN	LR	12/27/2024	
DESIGNED	DJ	12/27/2024	
CHECKED	SC	01/15/2025	
FINAL QC	AB	01/21/2025	
PROJ. MGR.	AB	04/29/2025	

DATE:	04/29/2025
ISSUED FOR:	DRB
REVISION NO.:	DATE:
1	
2	
3	
4	
JOB NO.:	230113
SHEET TITLE:	

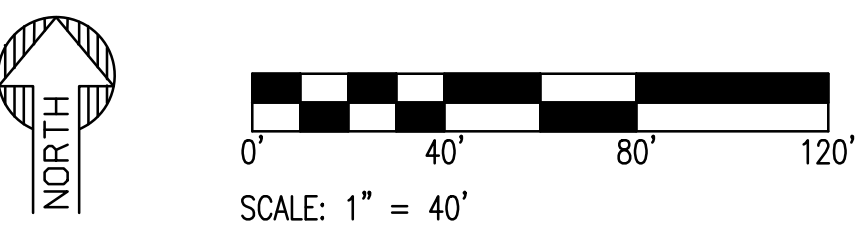
EXISTING CONDITIONS
C_{WT} EXHIBIT

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CASE FILE NO'S: 973-PA-2022, 62N-2023, 2-CP-2023

COSANTI COMMONS
PROPOSED CONDITIONS C_{WT} EXHIBIT
7000 E. SHEA BOULEVARD SCOTTSDALE, AZ 85254



ON-SITE			
---	PROPERTY LINE		
	PAVED SURFACE =	66,925 SF (1.53 AC)	⊗ CWT=0.95
	ROOF SURFACE =	66,464 SF (1.53 AC)	⊗ CWT=0.95
	NATURAL DESERT/LANDSCAPE =	29,173 SF (0.67 AC)	⊗ CWT=0.45
	TOTAL ON-SITE CWT =	162,562 SF (3.73 AC)	⊗ CWT=0.86
OFF-SITE			
---	PROPERTY LINE		
	BUILDING/PAVED SURFACE =	41,453 SF (0.95 AC)	⊗ CWT=0.95
	NATURAL DESERT/LANDSCAPE =	4,087 SF (0.10 AC)	⊗ CWT=0.45
	TOTAL OFF-SITE CWT =	45,540 SF (1.05 AC)	⊗ CWT=0.91



NOT FOR
CONSTRUCTION



PROJECT	LOCATION
COSANTI COMMONS	7000 E. SHEA BLVD SCOTTSDALE, AZ 85254
DRAWN	LR 12/27/2024
DESIGNED	DJ 12/27/2024
CHECKED	SC 01/15/2025
FINAL QC	AB 01/21/2025
PROJ. MGR.	AB 04/29/2025

DATE: 04/29/2025
ISSUED FOR: DRB

REVISION NO.	DATE
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2	
3	
4	

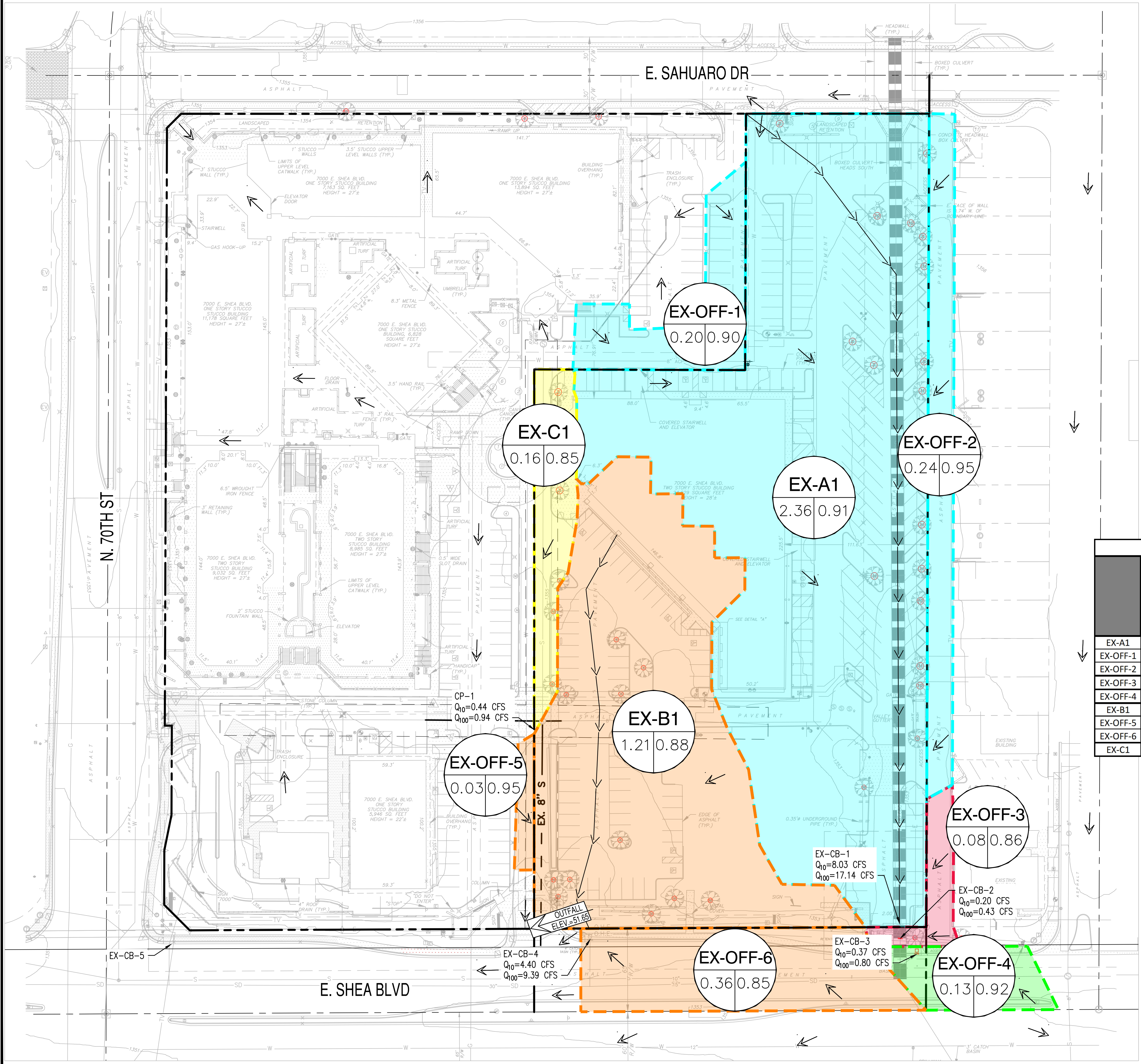
JOB NO.: 230113
SHEET TITLE:

PROPOSED CONDITIONS
C_{WT} EXHIBIT

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CASE FILE NO'S: 973-PA-2022, 62N-2023, 2-CP-2023

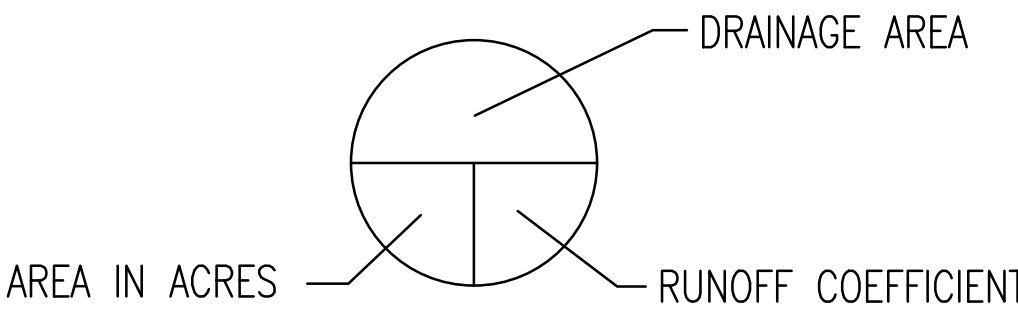
COSANTI COMMONS
EXISTING CONDITIONS DRAINAGE AREA MAP

7000 E. SHEA BOULEVARD SCOTTSDALE, AZ 85254



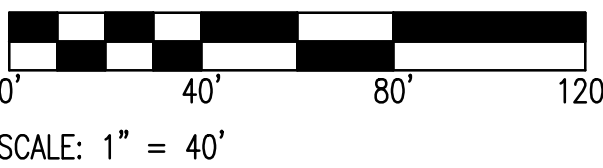
EXISTING LEGEND

- DRAINAGE AREAS DISCHARGING TO EX-CB-1
- DRAINAGE AREAS DISCHARGING TO EX-CB-2
- DRAINAGE AREAS DISCHARGING TO EX-CB-3
- DRAINAGE AREAS DISCHARGING TO EX-CB-4
- DRAINAGE AREAS DISCHARGING TO CP-1
- FLOW ARROW



DRAINAGE AREA KEY

EXISTING SITE DISCHARGES									
	TOTAL AREA	Cwt	Intensity 10 yr	Q 10	Intensity 100 yr	Q 100	Concentration Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	4.78	-	-	-	-	-	-	13.45	28.71
EX-A1	2.36	0.91	3.14	6.74	6.70	14.38	EX-CB-1	8.03	17.14
EX-OFF-1	0.20	0.90	4.74	0.57	7.49	1.22			
EX-OFF-2	0.24	0.95	4.74	0.73	7.49	1.55			
EX-OFF-3	0.08	0.86	4.74	0.20	7.49	0.43	EX-CB-2	0.20	0.43
EX-OFF-4	0.13	0.92	4.74	0.37	7.49	0.80	EX-CB-3	0.37	0.80
EX-B1	1.21	0.88	5.58	3.34	7.49	7.13	EX-CB-4	4.40	9.39
EX-OFF-5	0.03	0.95	4.74	0.10	7.49	0.21			
EX-OFF-6	0.36	0.85	4.74	0.96	7.49	2.06			
EX-C1	0.16	0.85	4.74	0.44	7.49	0.94	CP-1	0.44	0.94



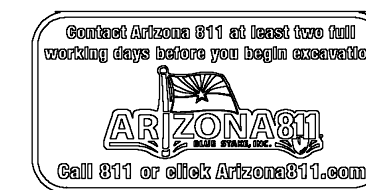
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CONSTRUCTION

SUSTAINABILITY
ENGINEERING
GROUP

SEG



SEG



PROJECT
COSANTI COMMONS

LOCATION
7000 E. SHEA BLVD
SCOTTSDALE, AZ 85254

DATE: 04/29/2025
ISSUED FOR: DRB

REVISION NO.	DATE
1	
2	
3	
4	

JOB NO.: 230113

SHEET TITLE:

EXISTING CONDITIONS
DRAINAGE AREA MAP

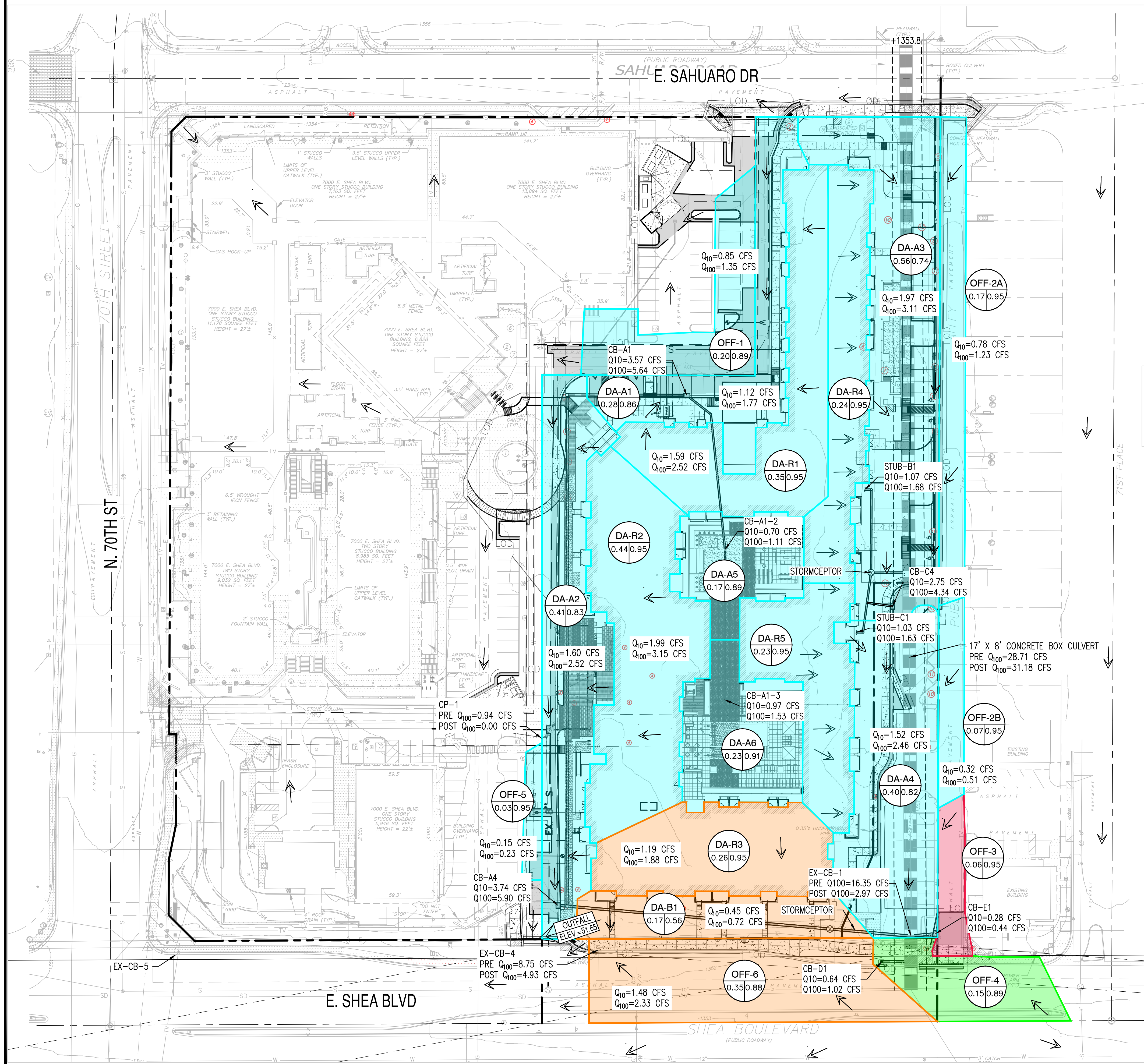
PAGE NO.: 1 OF 1
SHEET NO.: EX-DAM

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COSANTI COMMONS

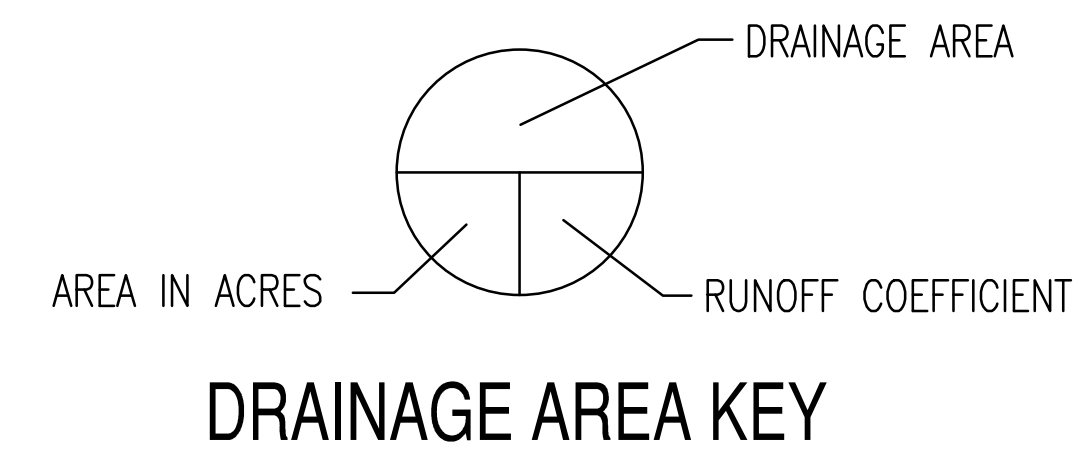
PROPOSED CONDITIONS DRAINAGE AREA MAP

7000 E. SHEA BOULEVARD SCOTTSDALE, AZ 85254



PROPOSED LEGEND

- DRAINAGE AREAS DISCHARGING TO EX-CB-1
- DRAINAGE AREAS DISCHARGING TO CB-E1
- DRAINAGE AREAS DISCHARGING TO CB-D1
- DRAINAGE AREAS DISCHARGING TO EX-CB-4
- FLOW ARROW



PROPOSED SITE DISCHARGES

	TOTAL AREA	Cwt	Intensity 10 yr 5-min	Intensity Q 10	Intensity 100 yr 5-min	Q 100	Concentration Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	4.78		4.74	-	7.49	-	-	19.73	31.18
DA-A1	0.28	0.86	4.74	1.12	7.49	1.77	CB-A1	3.57	5.64
DA-R1	0.35	0.95	4.74	1.59	7.49	2.52			
OFF-1	0.20	0.89	4.74	0.85	7.49	1.35			
DA-A2	0.41	0.83	4.74	1.60	7.49	2.52	CB-A4	3.74	5.90
DA-R2	0.44	0.95	4.74	1.99	7.49	3.15			
OFF-5	0.03	0.95	4.74	0.15	7.49	0.23			
DA-A3	0.56	0.74	4.74	1.97	7.49	3.11	CB-C4	2.75	4.34
OFF-2A	0.17	0.95	4.74	0.78	7.49	1.23			
DA-A4	0.40	0.82	4.74	1.56	7.49	2.46			
OFF-2B	0.07	0.95	4.74	0.32	7.49	0.51	EX-CB-1	1.88	2.97
DA-A5	0.17	0.89	4.74	0.70	7.49	1.11			
DA-A6	0.23	0.91	4.74	0.97	7.49	1.53			
DA-R4	0.24	0.95	4.74	1.07	7.49	1.68	STUB-B1	1.07	1.68
DA-R5	0.23	0.95	4.74	1.03	7.49	1.63			
DA-R3	0.26	0.95	4.74	1.19	7.49	1.88			
DA-B1	0.17	0.56	4.74	0.45	7.49	0.72	EX-CB-4	3.12	4.93
OFF-6	0.35	0.88	4.74	1.48	7.49	2.33			
OFF-3	0.06	0.95	4.74	0.28	7.49	0.44			
OFF-4	0.15	0.89	4.74	0.64	7.49	1.02	CB-E1	0.28	0.44
							CB-D1	0.64	1.02

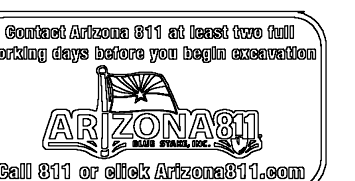
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CONSTRUCTION

SUSTAINABILITY
ENGINEERING
GROUP

SEG



SG
S
E



PROJECT
COSANTI COMMONS

DRAWN
DESIGNED
CHECKED
FINAL QC
PROJ. MGR.

DATE:
04/29/2025

ISSUED FOR:
DRB

REVISION NO.:

DATE:

1

2

3

4

JOB NO.:

230113

SHEET TITLE:

PROPOSED CONDITIONS

DRAINAGE AREA MAP

PAGE NO.:

1 OF 1

SHEET NO.:

P-DM

5240 N. 16TH STREET SUITE 105 PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX 480.259.3534

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CASE FILE NO'S: 973-PA-2022, 62N-2023, 2-CP-2023

EXISTING OVERALL SITE C _w				
	Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	3.35	0.38	3.73	0.90
EX-A1	2.17	0.19	2.36	0.91
EX-B1	1.04	0.17	1.21	0.88
EX-C1	0.13	0.03	0.16	0.85

EXISTING OFF-SITE C _w				
	Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	0.93	0.11	1.04	0.90
EX-OFF-1	0.18	0.02	0.20	0.90
EX-OFF-2	0.24	0.00	0.24	0.95
EX-OFF-3	0.06	0.01	0.08	0.86
EX-OFF-4	0.12	0.01	0.13	0.92
EX-OFF-5	0.03	0.00	0.03	0.95
EX-OFF-6	0.29	0.07	0.36	0.85

PROPOSED OVERALL SITE C_w				
	Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	3.06	0.67	3.73	0.86
DA-A1	0.23	0.05	0.28	0.86
DA-A2	0.31	0.10	0.41	0.83
DA-A3	0.29	0.22	0.51	0.74
DA-A4	0.32	0.13	0.45	0.80
DA-A5	0.14	0.02	0.17	0.89
DA-A6	0.21	0.02	0.23	0.91
DA-R1	0.35	0.00	0.35	0.95
DA-R2	0.44	0.00	0.44	0.95
DA-R3	0.26	0.00	0.26	0.95
DA-R4	0.06	0.00	0.06	0.95
DA-R5	0.06	0.00	0.06	0.95
DA-R6	0.06	0.00	0.06	0.95
DA-R7	0.05	0.00	0.05	0.95
DA-R8	0.11	0.00	0.11	0.95
DA-R9	0.08	0.00	0.08	0.95
DA-R10	0.05	0.00	0.05	0.95
DA-B1	0.04	0.13	0.17	0.56

PROPOSED OFFSITE C_w				
	Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	0.95	0.09	1.05	0.91
OFF-1	0.18	0.02	0.20	0.89
OFF-2A	0.17	0.00	0.17	0.95
OFF-2B	0.07	0.00	0.07	0.95
OFF-3	0.06	0.00	0.06	0.95
OFF-4	0.13	0.02	0.15	0.89
OFF-5	0.03	0.00	0.03	0.95
OFF-6	0.30	0.05	0.35	0.88

TC FOR EX-A1, 100 YR STORM											
EX-A1			Elevations		Diff 4.39						
			High point'	Outfall'							
			1356.14	1351.75							
$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$			0.120 Hours			7.22 Min.					
L=			0.13 MILES								
K _b =			0.0377			m log ₁₀ A+b=					
S=			34.30 FT/MILE								
i=			6.700 IN/HR			From NOAA					
m =			-0.00625			n Table 3.1 of FCDMC Hydrology Manual (Typ					
b=			0.04			n Table 3.1 of FCDMC Hydrology Manual (Typ					
A=			2.36 ACRES								
Q=CiA			14.38 CFS								
C=			0.91								
i=			6.700 IN/HR								
A=			2.36 ACRES								
100 YR INTENSITY INTERPOLATION (NOAA)											
X1	DESIRED TC	X3	Y1	Y3	"i" adjusted						
5	6.92	10	7.49	5.7	6.80						
5	7.18	10	7.49	5.7	6.71						
5	7.21	10	7.49	5.7	6.70						
5	7.22	10	7.49	5.7	6.70						

TC FOR EX-A1, 10 YR STORM					
EX-A1			Elevations		Diff
			High point'	Outfall'	
$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$			1356.14	1351.75	4.39
0.229 Hours			13.76 Min.		
L= 0.13 MILES					
K _b = 0.0749			m log ₁₀ A+b=		
S= 34.30 FT/MILE					
i= 3.140 IN/HR			From NOAA		
m = -0.01375			n Table 3.1 of FCDMC Hydrology Manual (Typ		
b= 0.08			n Table 3.1 of FCDMC Hydrology Manual (Typ		
A= 2.36 ACRES					
10 YR INTENSITY INTERPOLATION (NOAA)					
X1	DESIRED TC	X3	Y1	Y3	"i" adjusted
10	11.77	15	3.61	2.98	3.39
10	13.36	15	3.61	2.98	3.19
10	13.68	15	3.61	2.98	3.15
10	13.74	15	3.61	2.98	3.14
10	13.76	15	3.61	2.98	3.14
Q=CiA					
C= 0.91					
i= 3.140 IN/HR					
A= 2.36 ACRES					

EX-B1		
$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	0.072 Hours	4.31 Min.
L=	0.06 MILES	
K _b =	0.0395	$m \log_{10}A+b=$
S=	60.17 FT/MILE	
i=	6.460 IN/HR	From NOAA
m =	-0.00625	n Table 3.1 of FCDMC Hydrology Manual (Typ
b=	0.04	n Table 3.1 of FCDMC Hydrology Manual (Typ
A=	1.21 ACRES	

Elevations		Diff 3.61
High point'	Outfall'	
1355.85	1352.24	

100 YR INTENSITY INTERPOLATION (NOAA)					
X1	DESIRED TC	X3	Y1	Y3	"i" adjusted
0	4.08	5	0	7.49	6.11
0	4.41	5	0	7.49	6.61
0	4.28	5	0	7.49	6.41
0	4.33	5	0	7.49	6.49
0	4.31	5	0	7.49	6.46
0	4.31	5	0	7.49	6.46

Q=CiA	6.87 CFS
C=	0.88
i=	6.460 IN/HR
A=	1.21 ACRES

TC FOR EX-B1, 10 YR STORM									
EX-B1				Elevations		Diff 3.61			
T _c =11.4L ^{0.5} K _b ^{0.52} S ^{-0.31} i ^{-0.38} =		0.109 Hours		6.53 Min.					
L=		0.06 MILES							
K _b =		0.0789		m log ₁₀ A+b=					
S=		60.17 FT/MILE							
i=		5.580 IN/HR		From NOAA					
m =		-0.01375		n Table 3.1 of FCDMC Hydrology Manual (Typ					
b=		0.08		n Table 3.1 of FCDMC Hydrology Manual (Typ					
A=		1.21 ACRES							
Q=CiA		5.94 CFS							
C=		0.88							
i=		5.580 IN/HR							
A=		1.21 ACRES							

10 YR INTENSITY INTERPOLATION (NOAA)					
X1	DESIRED TC	X3	Y1	Y3	"i" adjusted
5	6.95	10	4.74	7.49	5.81
5	6.43	10	4.74	7.49	5.53
5	6.56	10	4.74	7.49	5.60
5	6.53	10	4.74	7.49	5.58
5	6.53	10	4.74	7.49	5.58

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Monday, Mar 24 2025

17' x 8' Concrete Box Culvert Capacity

Invert Elev Dn (ft) = 1340.25
Pipe Length (ft) = 616.00
Slope (%) = 0.53
Invert Elev Up (ft) = 1343.52
Rise (in) = 96.0
Shape = Box
Span (in) = 204.0
No. Barrels = 1
n-Value = 0.013
Culvert Type = Flared Wingwalls
Culvert Entrance = 30D to 75D wingwall flares
Coeff. K,M,c,Y,k = 0.026, 1, 0.0347, 0.81, 0.4

Embankment

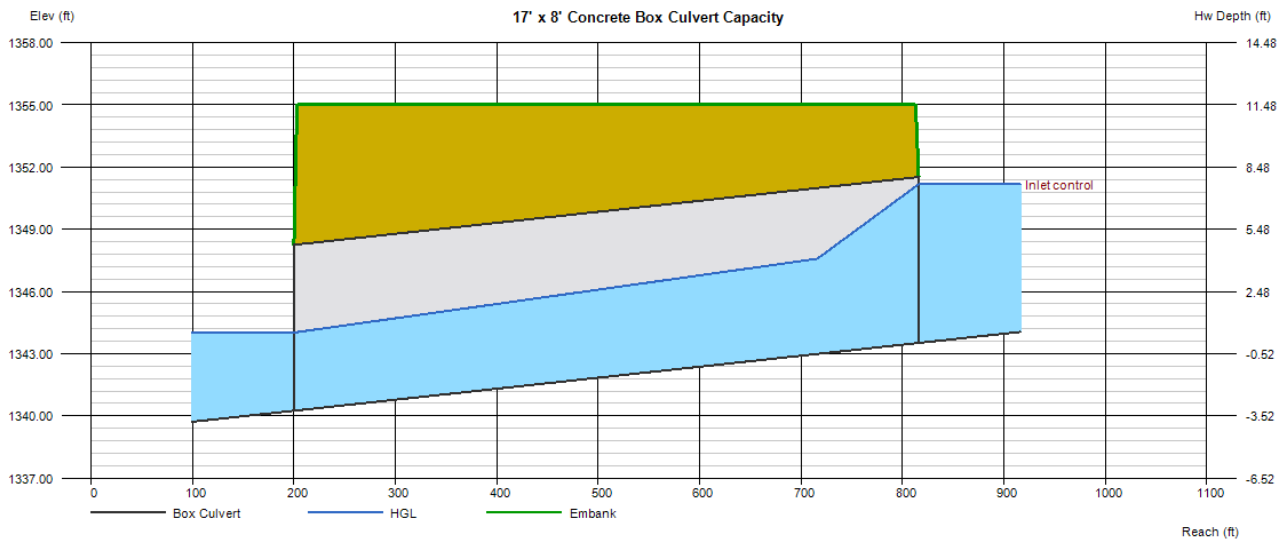
Top Elevation (ft) = 1355.00
Top Width (ft) = 610.00
Crest Width (ft) = 100.00

Calculations

Qmin (cfs) = 0.00
Qmax (cfs) = 1000.00
Tailwater Elev (ft) = Normal

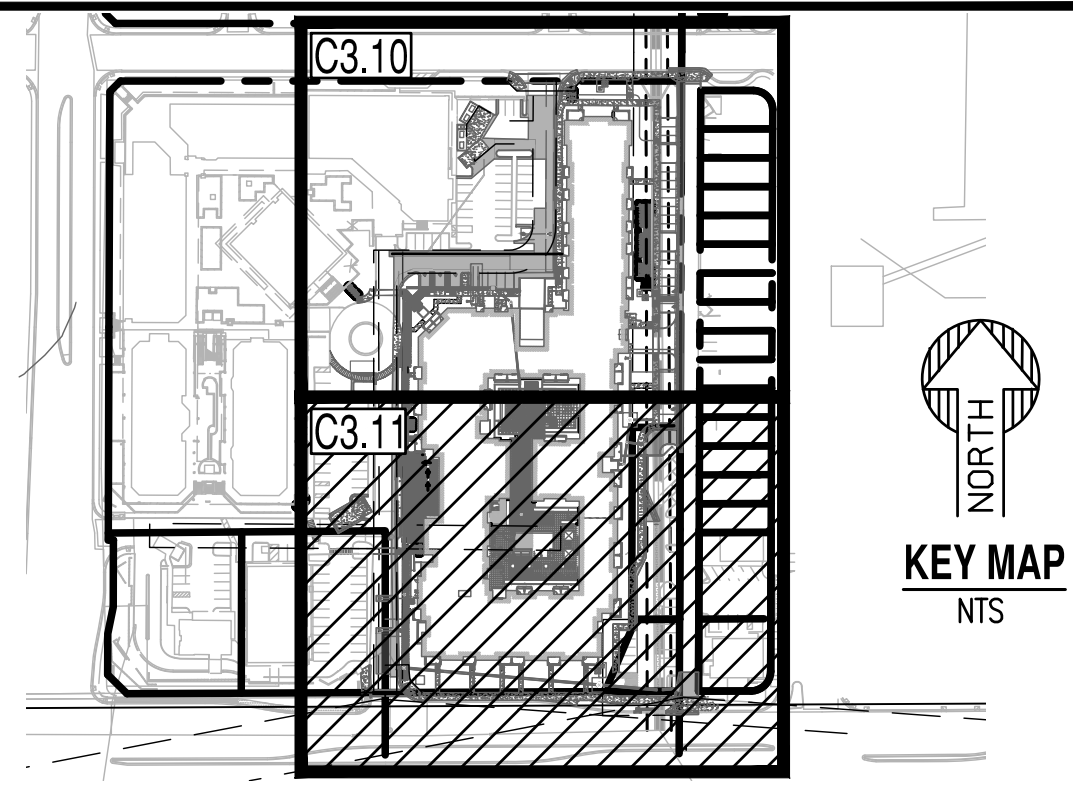
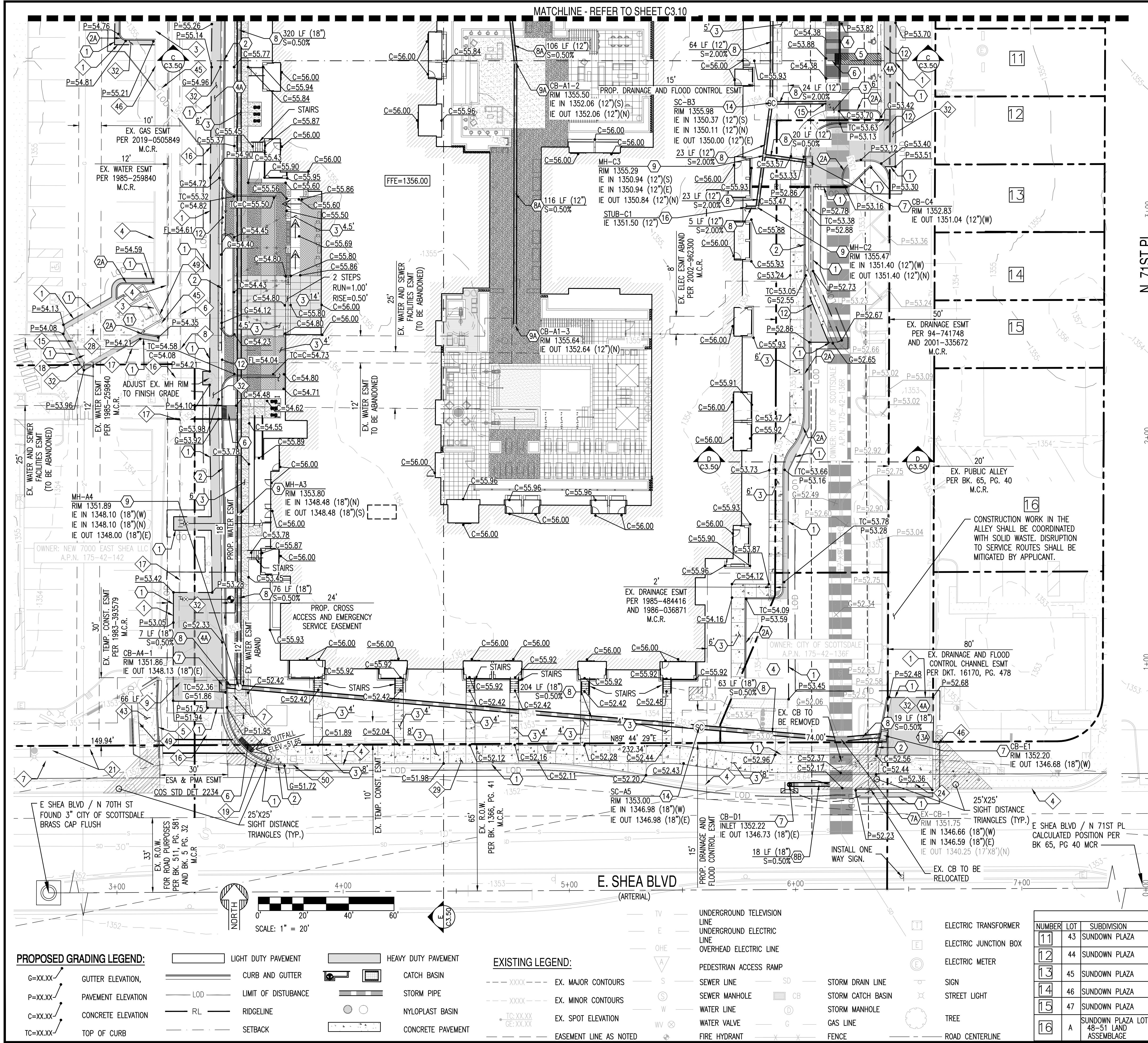
Highlighted

Qtotal (cfs) = 1000.00
Qpipe (cfs) = 1000.00
Qovertop (cfs) = 0.00
Veloc Dn (ft/s) = 15.60
Veloc Up (ft/s) = 12.39
HGL Dn (ft) = 1344.02
HGL Up (ft) = 1348.27
Hw Elev (ft) = 1351.17
Hw/D (ft) = 0.96
Flow Regime = Inlet Control



APPENDIX III

GRADING & DRAINAGE PLANS



- GRADING & DRAINAGE NOTES**
- MATCH EXISTING GRADE.
 - 6" VERTICAL CURB AND GUTTER.
 - PROPOSED CONCRETE SIDEWALK. WIDTH PER PLAN.
 - LIGHT DUTY PAVEMENT.
 - PAVEMENT WITH 2% MAXIMUM SLOPE IN ANY DIRECTION AT ACCESSIBLE PARKING STALLS AND 2% MAXIMUM CROSS SLOPE AT ADA ACCESSIBLE ROUTE.
 - PROPOSED ACCESSIBLE RAMP.
 - NEW CATCH BASIN.
 - PROPOSED HDPE PIPE.
 - PROPOSED PVC PIPE.
 - PROPOSED NYLOPLAST DRAIN BASIN WITH SOLID LID.
 - PROPOSED NYLOPLAST DRAIN BASIN WITH GRATE.
 - PROPOSED CURB ISLAND OPENING.
 - PROPOSED TRASH ENCLOSURE.
 - PROPOSED CONCRETE VALLEY GUTTER.
 - PROPOSED DRIVEWAY PER COS STD DET 2256.
 - PROPOSED STORMCEPTOR.
- REMOVAL CONSTRUCTION KEY NOTES**
- SAWCUT EXISTING PAVEMENT TO PROVIDE STRAIGHT VERTICAL EDGES, FREE FROM IRREGULARITIES. MIN 2' FROM GUTTER.
 - REMOVE EXISTING VERTICAL CURB.
 - PROTECT EXISTING VERTICAL CURB AND GUTTER.
 - REMOVE EXISTING VERTICAL CURB AND GUTTER.
 - PROTECT EXISTING WATER APPURTENANCE.
 - REMOVE EXISTING WATER APPURTENANCE.
 - REMOVE & REPLACE EXISTING WATER APPURTENANCE.
 - REMOVE EXISTING WATER LINE.
 - PROTECT EXISTING ELECTRICAL LINE.
 - PROTECT EXISTING SEWER LINE.
 - PROTECT EXISTING WATER LINE.
 - REMOVE AND REPLACE EXISTING RAMP.
 - REMOVE EXISTING SCREEN WALL.
 - REMOVE AND REPLACE EXISTING DRIVEWAY.
 - REMOVE EXISTING ASPHALT.
 - REMOVE EXISTING SIDEWALK.
 - REMOVE EXISTING TREE.
 - REMOVE AND REPLACE PAVEMENT.

ADJOINER TABLE

NUMBER	LOT	SUBDIVISION	BK. & PG.	A.P.N.	OWNER	DOC. NO.
11	43	SUNDOWN PLAZA	65-40	175-42-043	TWO DOCS PROPERTY MANAGEMENT LLC	2021-0638992
12	44	SUNDOWN PLAZA	65-40	175-42-044	TWO DOCS PROPERTY MANAGEMENT LLC	2021-0638992
13	45	SUNDOWN PLAZA	65-40	175-42-045	AVA INVESTMENTS LLC	2011-0497664
14	46	SUNDOWN PLAZA	65-40	175-42-046	AVA INVESTMENTS LLC	2011-0497667
15	47	SUNDOWN PLAZA	65-40	175-42-047	AVA INVESTMENTS LLC	2011-0497667
16	A	SUNDOWN PLAZA LOTS 48-51 LAND ASSEMBLY	1009-18	175-42-139	RODDIMEYER III LLC	2013-1012110

NOT FOR CONSTRUCTION

SUSTAINABILITY ENGINEERING GROUP

SEG

CSG

PROJECT COMMONS

LOCATION

7000 E. SHEA BLVD
SCOTTSDALE, AZ 85254

DATE: 04/30/2025

ISSUED FOR: DRB

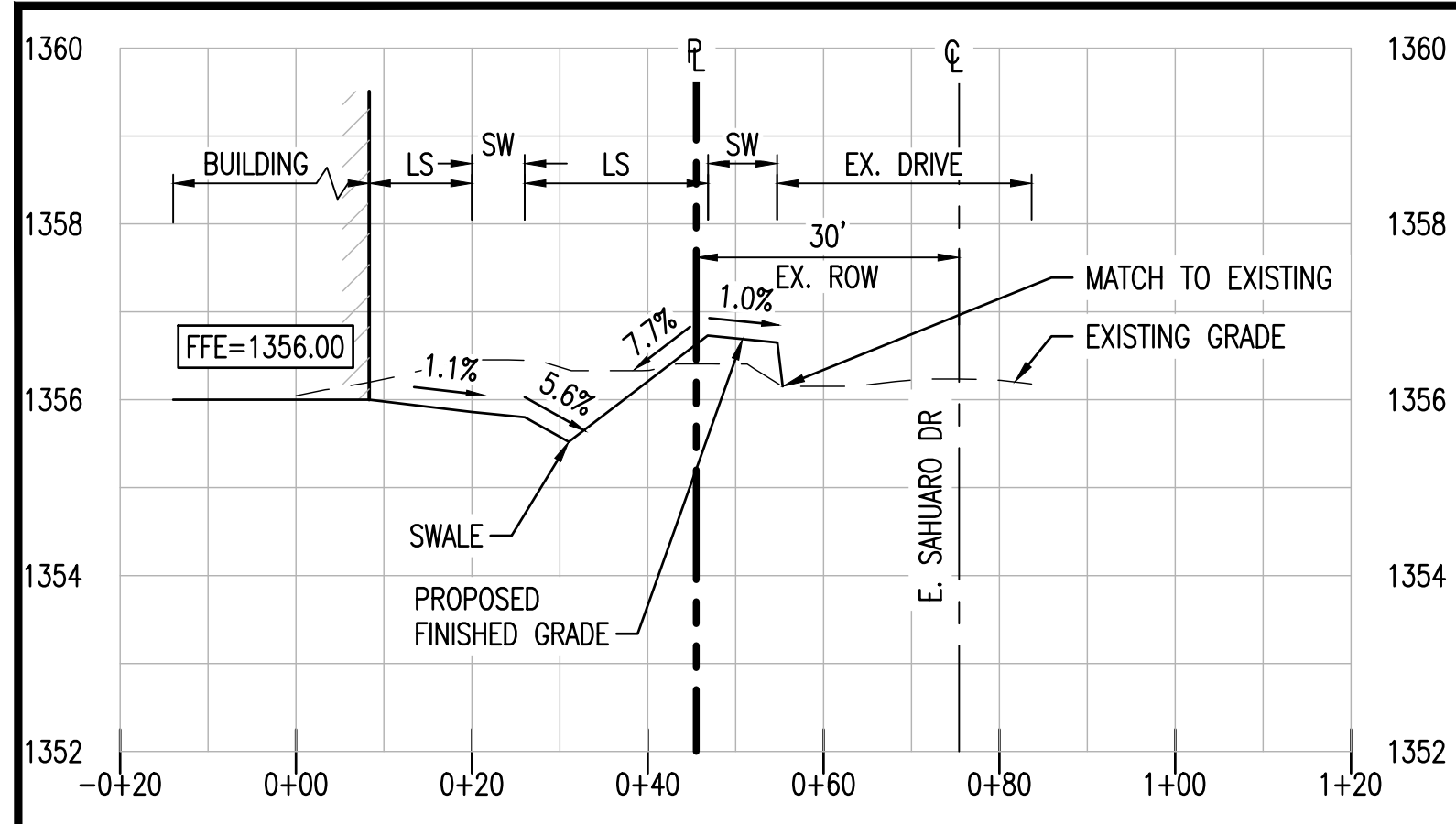
REVISION NO.: _____ **DATE:** _____

JOB NO.: 230113

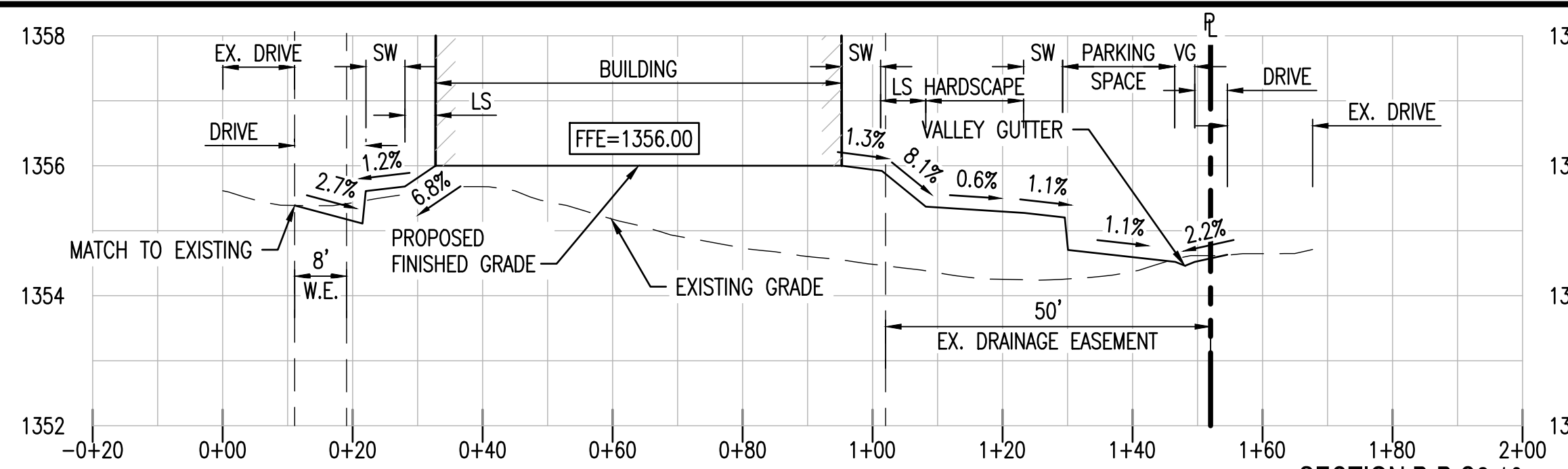
SHEET TITLE: PRELIMINARY GRADING AND DRAINAGE PLAN

PAGE NO.: 4 OF 5 **SHEET NO.:** C3.11

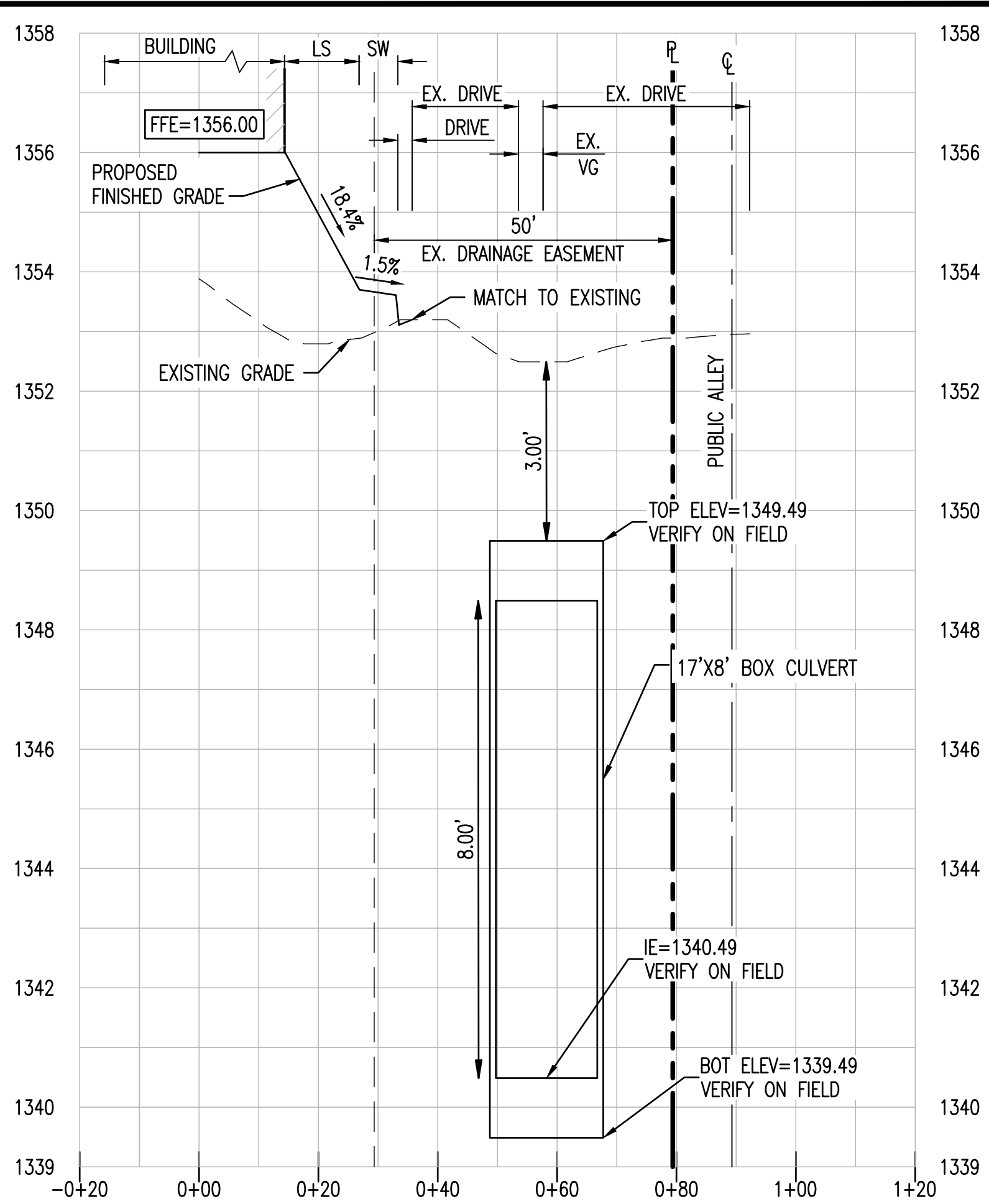
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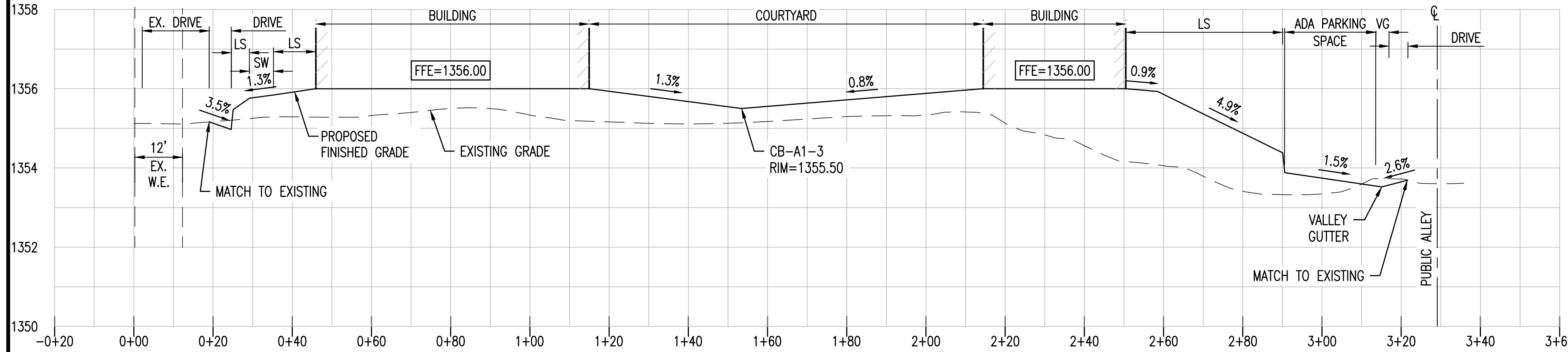
SECTION A-A C3.10
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



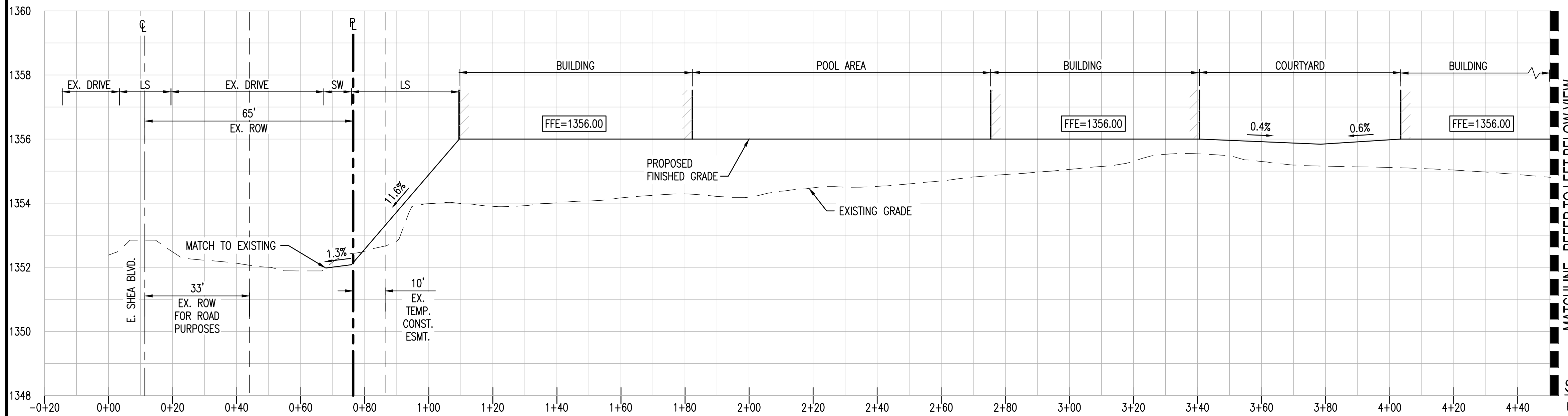
SECTION B-B C3.10
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



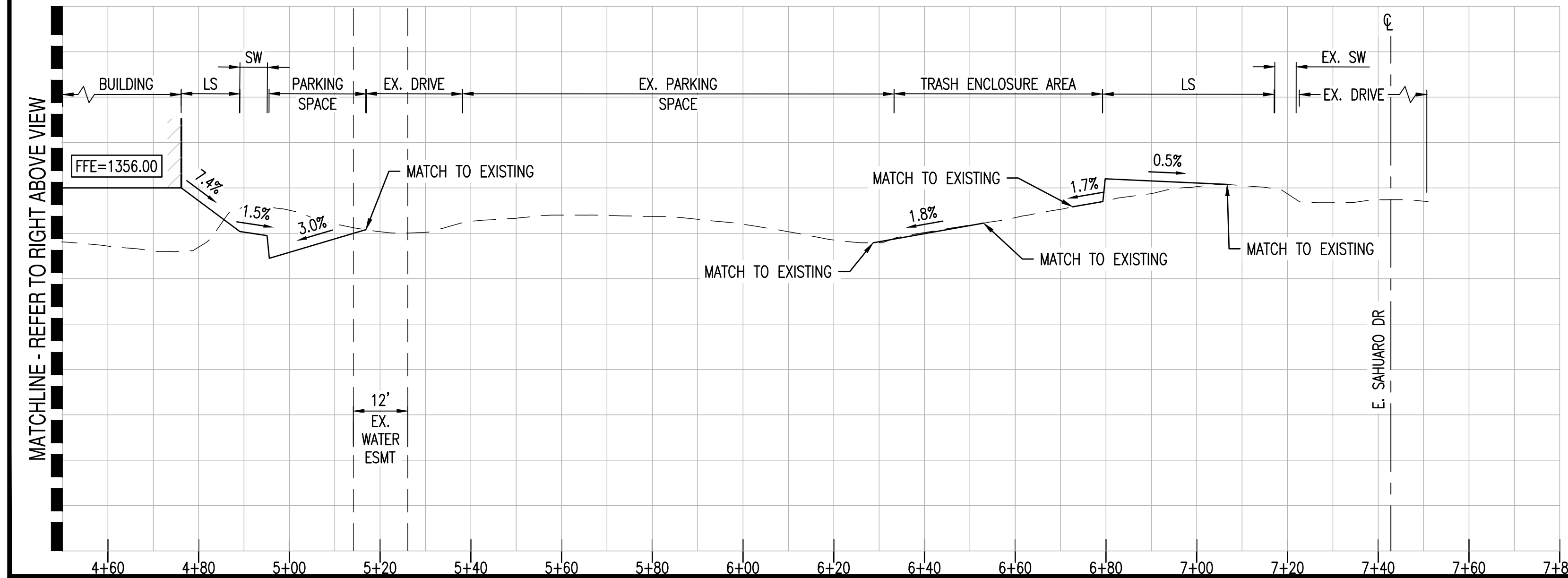
SECTION D-D C3.11
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



SECTION C-C C3.11
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

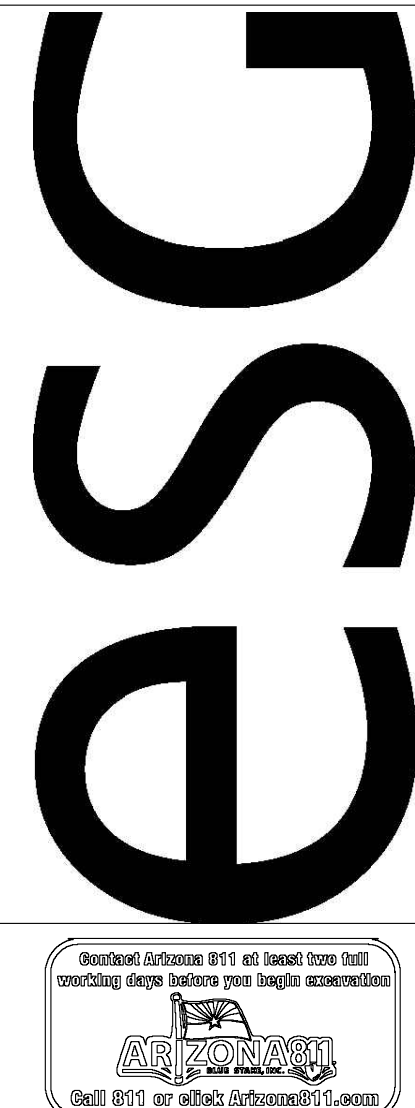


SECTION E-E C3.10 & C3.11 BEGIN
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



SECTION E-E C3.10 & C3.11 END
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

NOT FOR
CONSTRUCTION



PROJECT		LOCATION	
COSANTI COMMONS		7000 E. SHEA BLVD SCOTTSDALE, AZ 85254	
DRAWN	LR	12/27/2024	
DESIGNED	DJ	12/27/2024	
CHECKED	SC	01/15/2025	
FINAL QC	AB	04/30/2025	
PROJ. MGR.	AB	04/30/2025	
DATE:		04/30/2025	
ISSUED FOR:		DRB	
REVISION NO.:		DATE:	
1			
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JOB NO.:		230113	
SHEET TITLE:		PRELIMINARY SITE CROSS SECTIONS	
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CASE FILE NO'S: 973-PA-2022, 672N-2023, 2 GP-2023

APPENDIX IV

STORMWATER STORAGE WAIVER

Request for Stormwater Storage Waiver



City of Scottsdale Plan/Case Numbers:

_____ - DR - _____ - PP - _____ PC# _____

Requests for stormwater storage waivers are reviewed as part of case submittals for the associated project. This form should be included in the preliminary drainage report with the applicant's portion completed. The preliminary drainage report shall include supporting documentation and analysis as needed to support the requested waiver.

Date _____ Project Name _____
Project Location _____
Applicant Contact _____ Company Name _____
Phone _____ E-mail _____
Address _____

Waiver Criteria

A project must meet at least one of three criteria listed below for the city to consider waiving some or all required stormwater storage. **However, regardless of the criteria, a waiver will only be granted if the applicant can demonstrate that the effect of a waiver will not increase the potential for flooding on any property.** Check the applicable box and provide a signed and sealed engineering report and supporting engineering analysis that demonstrate the project meets the criteria and that the effect of a waiver will not increase the potential for flooding on any property.

If the runoff for the project has been included in a storage facility at another location, the applicant must demonstrate that the stormwater storage facility was specifically designed to accommodate runoff from the subject property and that the runoff will be conveyed to this location through an adequately designed conveyance facility.

It should be noted that reductions in stormwater storage relating to

- ☐ 1. The development is adjacent to a conveyance facility that an engineering analysis shows is designed and constructed to handle the additional runoff from the site as a result of development.
- ☐ 2. The development is on a parcel less than one-half acre in size.
- ☐ 3. Stormwater storage requirements conflict with requirements of the Environmentally Sensitive Lands Ordinance (ESLO).

For a full storage waiver, a conflict with ESLO is limited to:

- Property located in the hillside landform as defined in the city Zoning Ordinance
- Property in the upper desert landform that has a land slope steeper than 5% as defined in the city Zoning Ordinance
- Property within the ESL zoning overlay district where the only viable location for a stormwater storage basin requires blasting

This full waiver only applies to those portions of property meeting one of these three requirements.

100-year/2-hour storage is allowed, but not required for redevelopment projects and development within the ESL zoning overlay. Rather, these projects must store enough stormwater to attenuate post-development flows to predevelopment levels, considering the 10- and 100-year storm events (S.R.C. Sections 37-50 and 37-51).

By signing below, I certify that the stated project meets the waiver criteria selected above as demonstrated by the attached documentation.

Stormwater Management Department

7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 • Phone: 480-312-2500

Request for Stormwater Storage Waiver



City of Scottsdale Plan/Case Numbers:

____ - DR - ____

____ - PP - ____

PC# _____

CITY STAFF TO COMPLETE THIS PAGE

Project Name _____

Check Appropriate Boxes:

☐ Meets waiver criteria (specify): ☐ 1 ☐ 2 ☐ 3

Recommended Conditions of Waiver:

- ☐ All storage requirements waived.
- ☐ Post-development peak discharge rates do not exceed pre-development conditions.
- ☐ Other:

Explain: _____

☐ **Waiver approved per above conditions.**

Floodplain Administrator or Designee

Date

Stormwater Management Department

7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 ♦ Phone: 480-312-2500

Request for Stormwater Storage Waiver



City of Scottsdale Plan/Case Numbers:

_____ - DR - _____ - PP - _____ PC# _____

In-Lieu Fee and In-Kind Contributions

In-lieu fees are only applicable to projects where post-development peak discharge rates exceed pre-development levels, based on the 10- and 100-year storm events. If the city grants a waiver, the developer is required to calculate and contribute an in-lieu fee based on what it would cost the city to provide a storage basin, sized as described below, including costs such as land acquisition, construction, landscaping, design, construction management, and maintenance over a 75-year design life. The fee for this cost is \$3.00 per cubic foot of stormwater storage for a virtual storage basin designed to mitigate the increase in runoff associated with the 100-year/2-hour storm event. The applicant may submit site-specific in-lieu fee calculations subject to the Floodplain Administrator's approval.

The Floodplain Administrator considers in-kind contributions on a case-by-case basis. An in-kind contribution can serve as part of or instead of the calculated in-lieu fee. In-kind contributions must be stormwater-related and must constitute a public benefit. In-lieu fees and in-kind contributions are subject to the approval of the Floodplain Administrator or designee.

Project Name _____

The waived stormwater storage volume is calculated using a simplified approach as follows:

$V = \Delta CRA$; where

V = stormwater storage volume required, in cubic feet,

ΔC = increase in weighted average runoff coefficient over disturbed area ($C_{\text{post}} - C_{\text{pre}}$),

R = 100-year/2-hour precipitation depth, in feet (DSPM, Appendix 4-1D, page 11), and

A = area of disturbed ground, in square feet

Furthermore,

$V_w = V - V_p$; where

V_w = volume waived,

V = volume required, and

V_p = volume provided

R = _____

ΔC = _____

A = _____

V = _____

V_p = _____

V_w = _____

☐ An in-lieu fee will be paid, based on the following calculations and supporting documentation:
In-lieu fee (\$) = V_w (cu. ft.) x \$3.00 per cubic foot = _____

☐ An in-kind contribution will be made, as follows:

☐ No in-lieu fee is required. Reason:

Approved by:

Floodplain Administrator or Designee

Date

Stormwater Management Department

7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 • Phone: 480-312-2500