# PRELIMINARY DRAINAGE REPORT

## COSANTI COMMONS

**7000 E. Shea Boulevard**

**Scottsdale, Arizona 85254**

**Prepared For:**

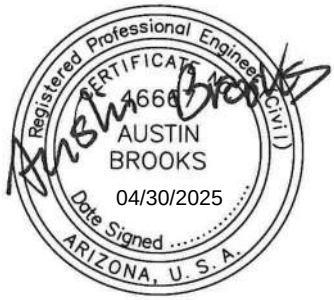

**ESG Architecture & Design**

**500 Washington Avenue South, Suite 1080**

**Minneapolis, MN 55415**

**612.339.5508 www.esgarch.com**


**Prepared by:**



**Sustainability Engineering Group**

**5240 N. 16th Street, Suite 105**

**Phoenix, AZ 85016**

**480.588.7226 www.azSEG.com**


**Project Number: 230113**

**Submittal Date: December 18th, 2023**

**Submittal Date: April; 8th, 2024**

**Submittal Date: April 30, 2025 (DRB)**

**COS CASE No.: 973-PA-2022; 6-ZN-2023; 2-GP-2023 Plan Check No.: TBD**

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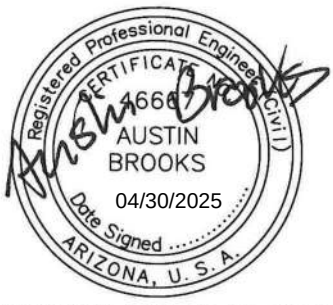


EXPIRATION DATE: 09–30–2025

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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) 2018[1], and the Drainage Design Manuals for Maricopa County, Arizona, Volume I[2] and Volume II[3].

# 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)

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

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

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

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

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:

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

$A$ = Disturbed area of the proposed development (ac)

$$A = Site\ Area = 3.73\ AC$$

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

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:**

| | Q10 (cfs) | | | Q100 (cfs) | | |
|---|---|---|---|---|---|---|
| Outfall | 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*

# FIGURE 1 - VICINITY MAP


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# FIGURE 2 - AERIAL MAP


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# FIGURE 3 - FEMA FIRM MAP

## 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.

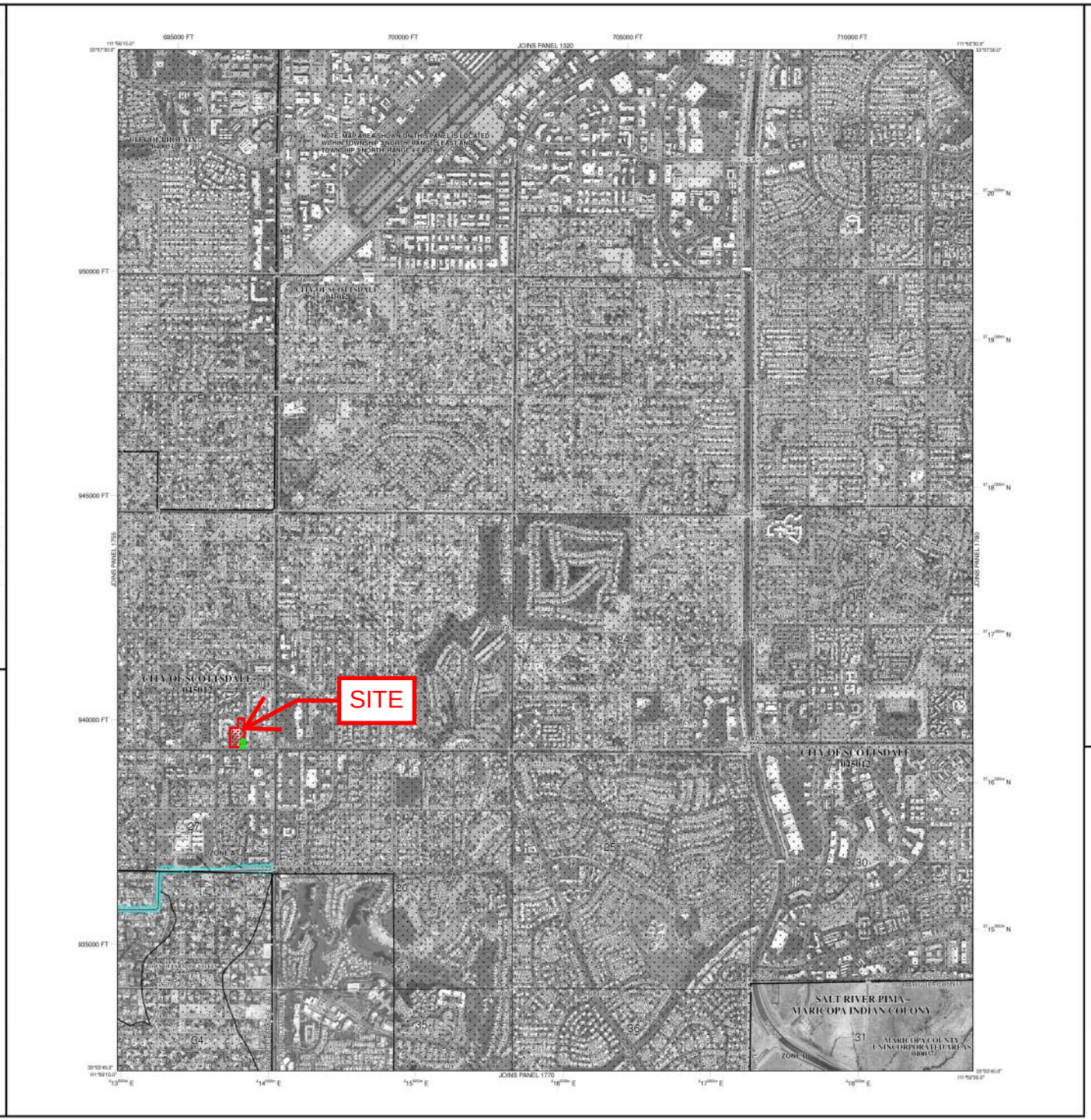
The **profile base line** depicted on this map represents the hydraulic modeling baselines that match flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

**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 equalled 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)
4275000 N — 1000-meter Universal Transverse Mercator grid ticks, zone 12
6000000 M — 5000-foot grid ticks: Arizona State Plane coordinate system, central zone (FIPSZONE 0302), 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 19, 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 dats, 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
NATIONAL FLOOD INSURANCE PROGRAM

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 | 040010 | 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

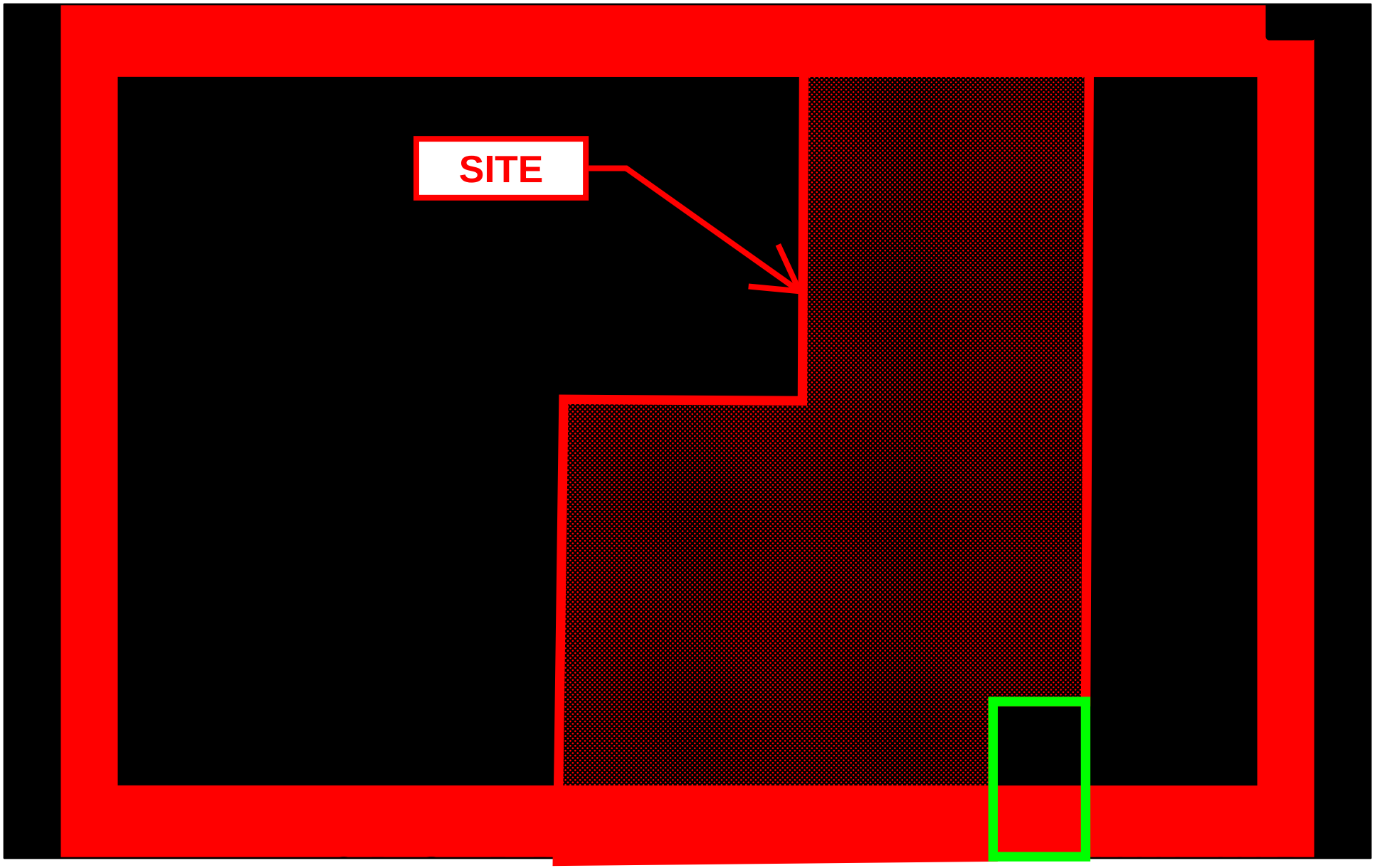



FIGURE 4 - FLO2D MAP (NORTH)

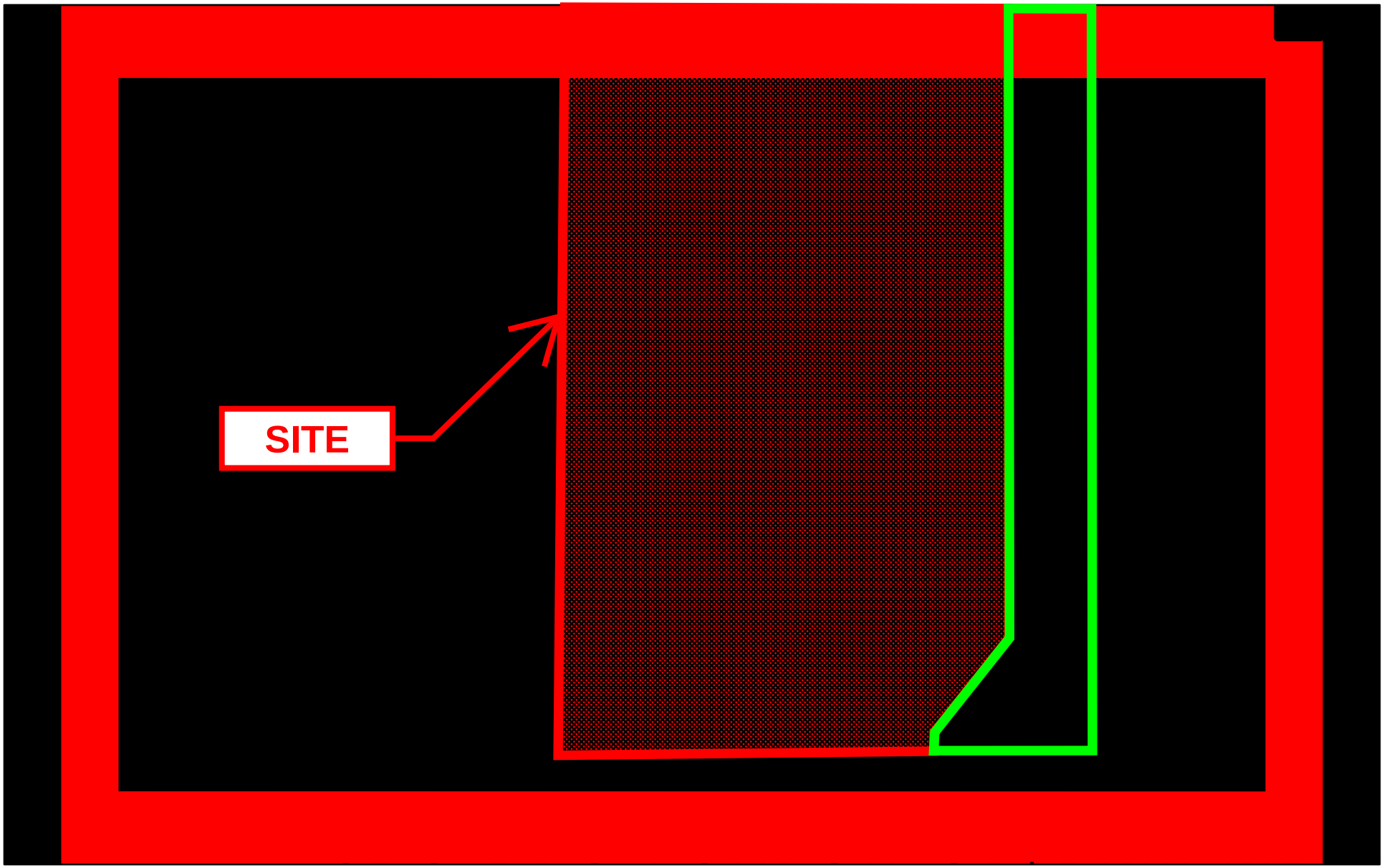
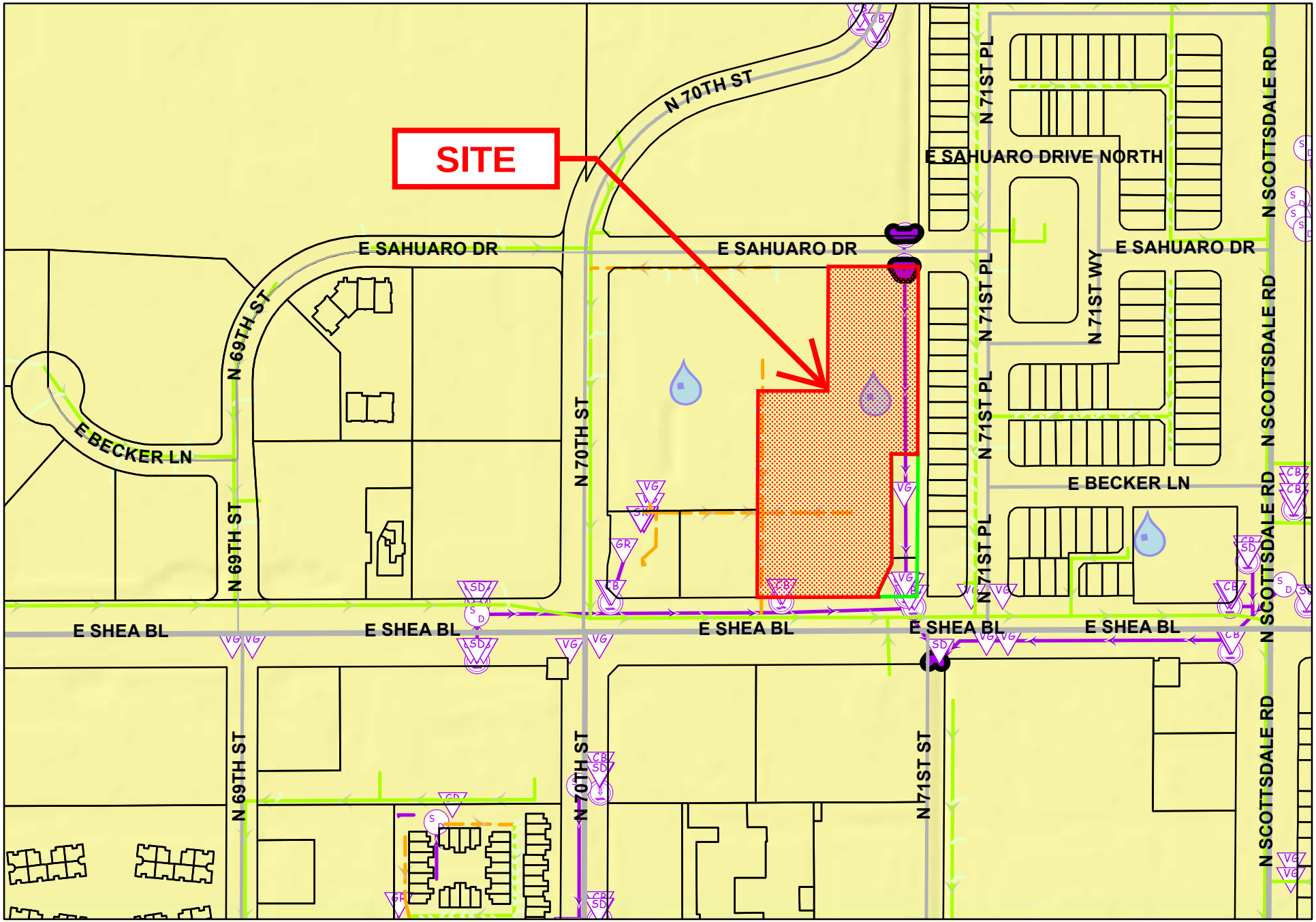



FIGURE 5 - FLO2D MAP (SOUTH)

STORM WATER

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2/14/2023 2:30:38 PM



CITY OF SCOTTSDALE
INFORMATION TECHNOLOGY

FIGURE 6 - CITY OF SCOTTSDALE STORM WATER GIS

30-44

# FIGURE 7 - STORM WATER QS MAP

29-43

29-45

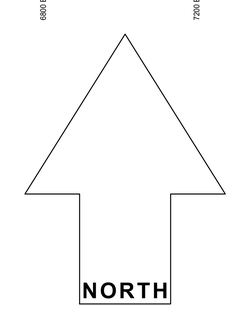
15-JAN-23

**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




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

B(DVW6KHD <5 +5 :LWK :DOOV 6'

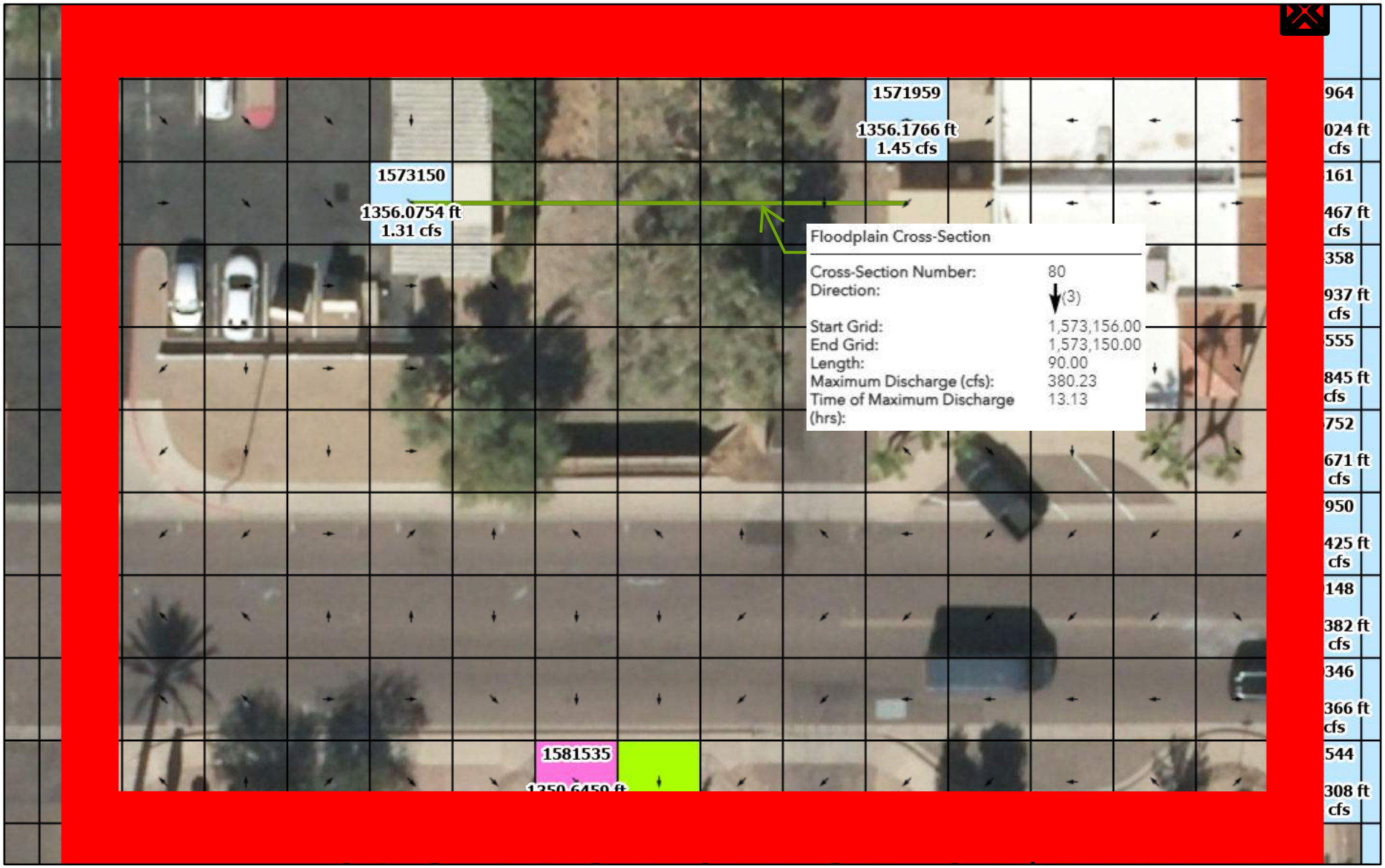



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FIGURE 8 - FLO-2D MAP MAXIMUM DISCHARGE 17' x 8' CONCRETE BOX CULVERT LOCATION

# *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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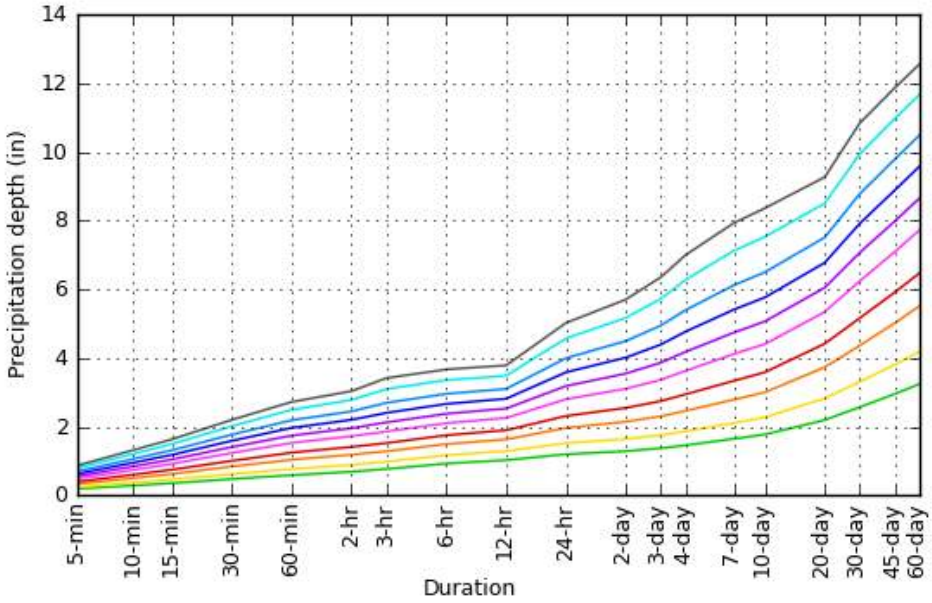
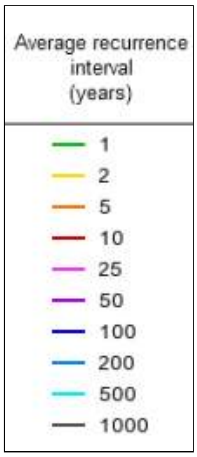
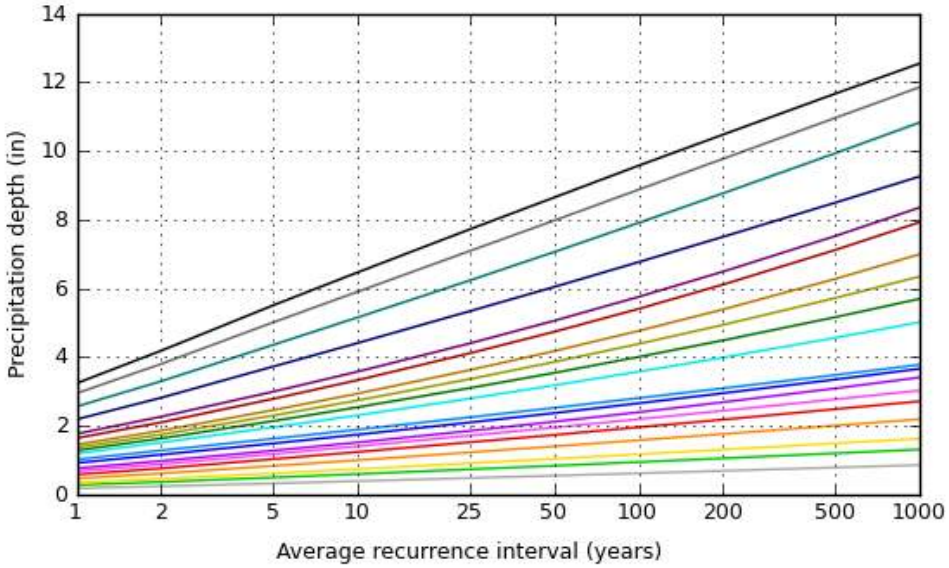
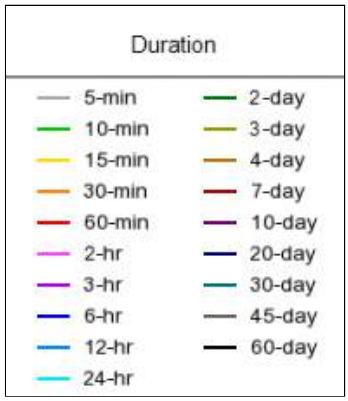
## PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 33.5829°, Longitude: -111.9295°




NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Mon May 8 16:56:29 2023

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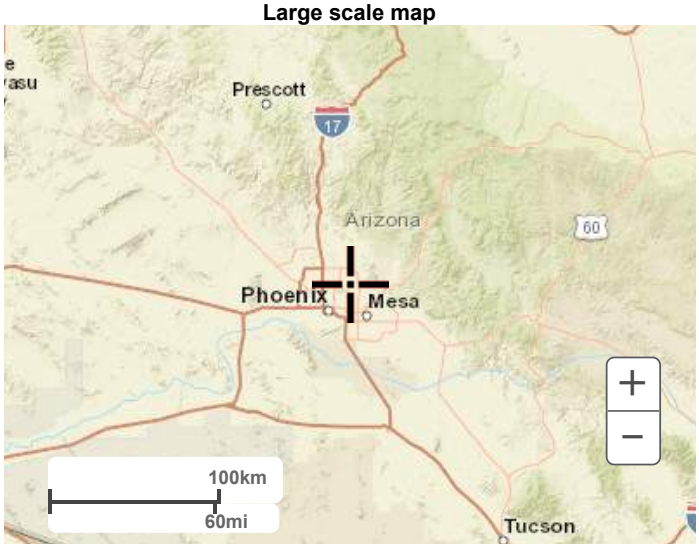
## Maps & aerials

**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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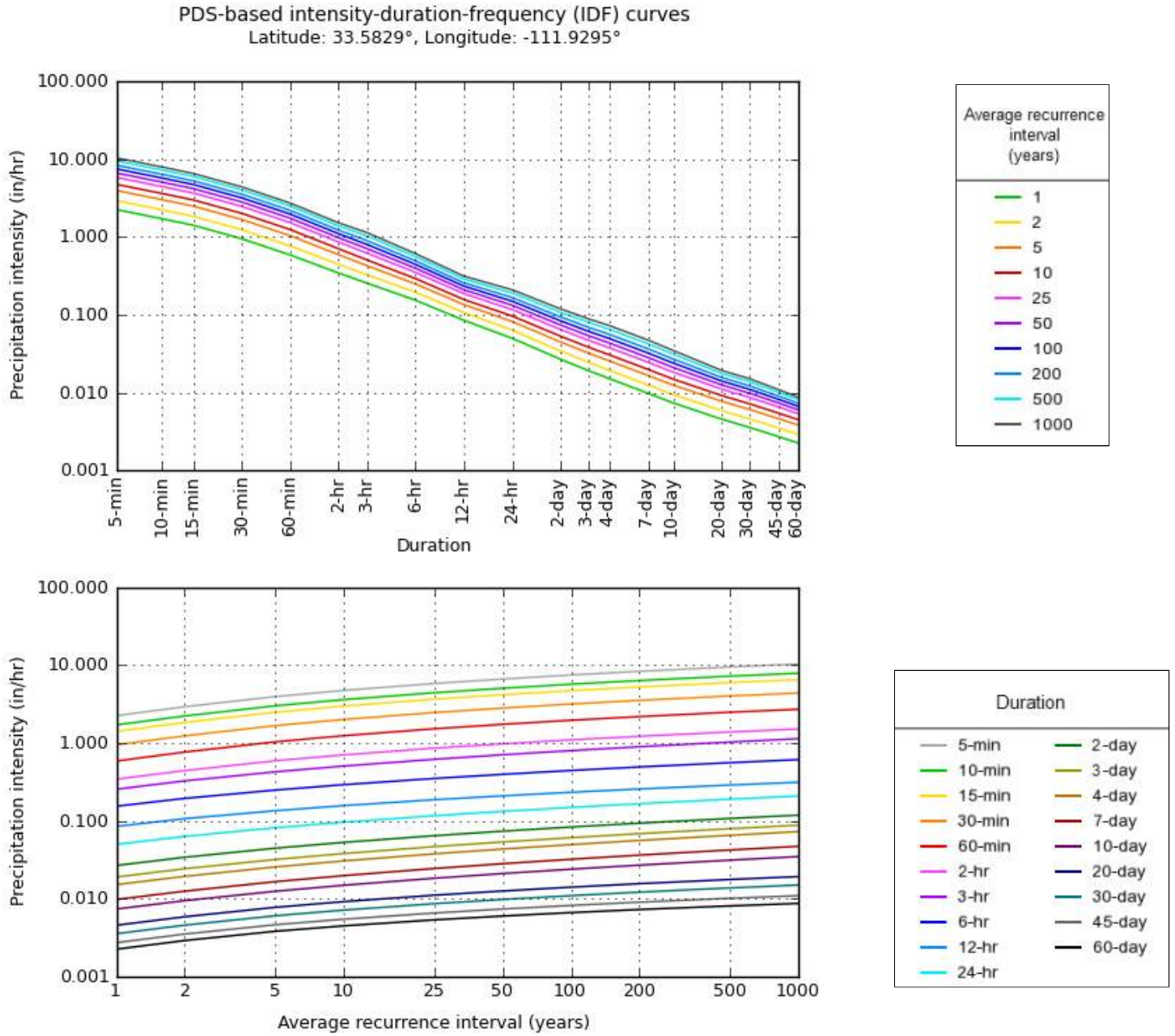
## PF graphical




NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Mon May 8 16:58:03 2023

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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 |

NORTH

0' 40' 80' 120'

SCALE: 1" = 40'

NOT FOR CONSTRUCTION


SUSTAINABILITY ENGINEERING GROUP

5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.256.3534


Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 Call 811 or visit Arizona811.com

PROJECT: COSANTI COMMONS

LOCATION: 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: |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

JOB NO.: 230113

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

PAGE NO.: 1 OF 1

SHEET NO.: **EX-Cwt**

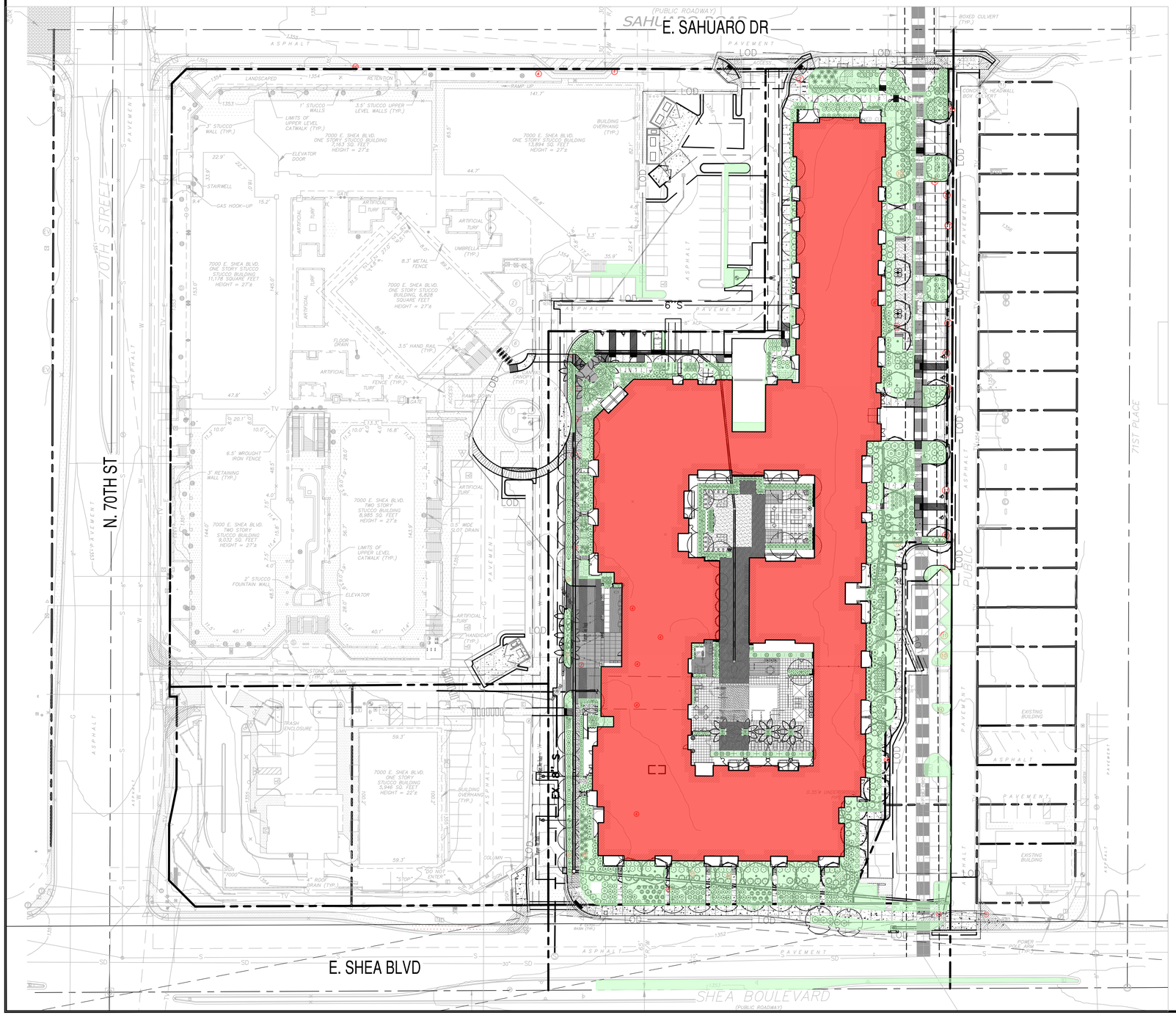


CASE FILE NO's: 973-PA-2022, 6-ZN-2023, 2-GP-2023

# 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 |

NORTH

0' 40' 80' 120'

SCALE: 1" = 40'

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PROJECT: COSANTI COMMONS

LOCATION: 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: |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

JOB NO.: 230113

SHEET TITLE: **PROPOSED CONDITIONS $C_{WT}$ EXHIBIT**

PAGE NO.: 1 OF 1

SHEET NO.: **P-Cwt**

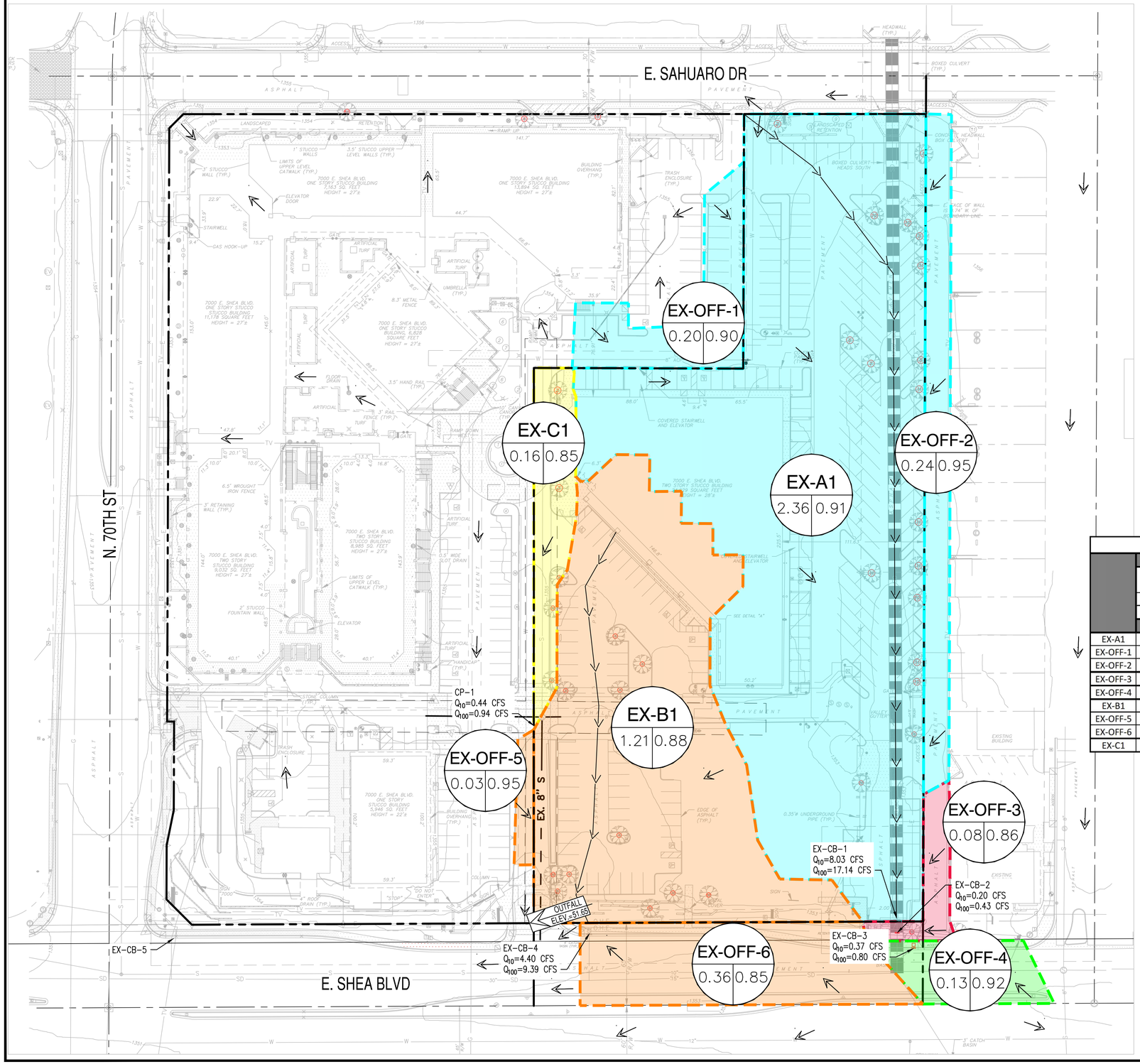


CASE FILE NO's: 973-PA-2022, 6-ZN-2023, 2-GP-2023

# COSANTI COMMONS

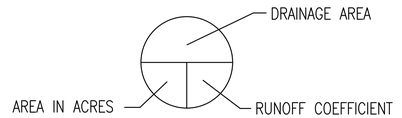
## EXISTING CONDITIONS DRAINAGE AREA MAP

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-OFF-1 | 0.20 | 0.90 | 4.74 | 0.57 | 7.49 | 1.22 | EX-CB-1 | 8.03 | 17.14 |
| 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-OFF-5 | 0.03 | 0.95 | 4.74 | 0.10 | 7.49 | 0.21 | EX-CB-4 | 4.40 | 9.39 |
| 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 |

NORTH

0' 40' 80' 120'

SCALE: 1" = 40'

NOT FOR CONSTRUCTION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PROJECT: COSANTI COMMONS

LOCATION: 7000 E. SHEA BLVD. SCOTTSDALE, AZ 85254

| | | |
|---|---|---|
| DRAWN | LR | 12/27/2024 |
| DESIGNED | DJ | 12/27/2024 |
| CHECKED | SC | 01/15/2025 |
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| PROJ. MGR. | AB | 04/29/2025 |

DATE: 04/29/2025

ISSUED FOR: DRB

| REVISION NO.: | DATE: |
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| 4 | |

JOB NO.: 230113

SHEET TITLE: EXISTING CONDITIONS DRAINAGE AREA MAP

PAGE NO.: 1 OF 1

SHEET NO.: EX-DAM

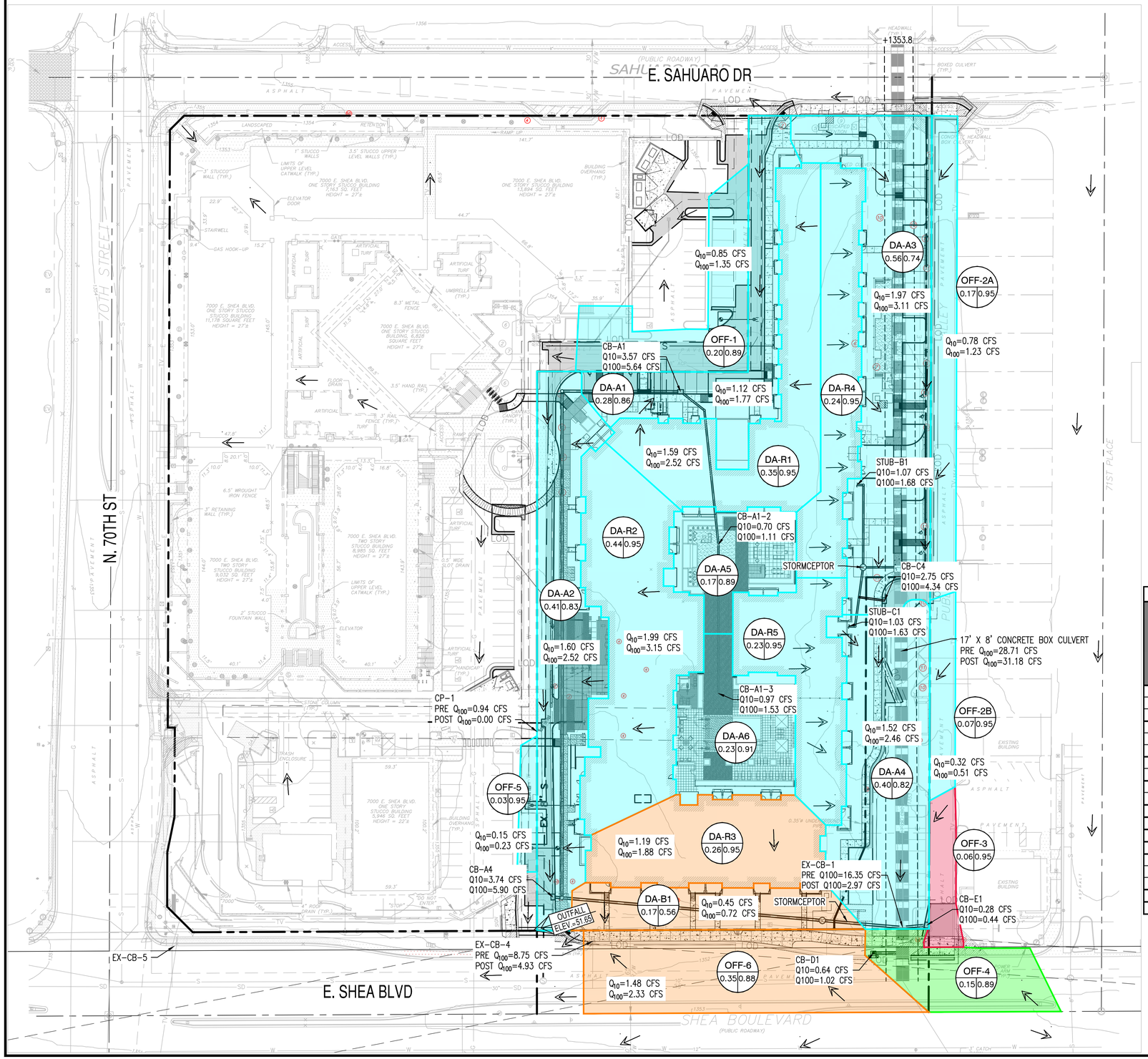


CASE FILE NO'S: 973-PA-2022, 6-ZN-2023, 2-GP-2023

# COSANTI COMMONS

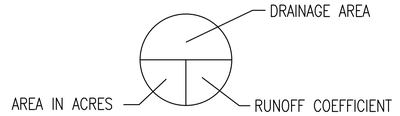
## PROPOSED CONDITIONS DRAINAGE AREA MAP

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




DRAINAGE AREA KEY

**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 | | | |
| DA-R1 | 0.35 | 0.95 | 4.74 | 1.59 | 7.49 | 2.52 | CB-A1 | 3.57 | 5.64 |
| 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 | | | |
| DA-R2 | 0.44 | 0.95 | 4.74 | 1.99 | 7.49 | 3.15 | CB-A4 | 3.74 | 5.90 |
| 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 | | | |
| 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 | 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 |

NORTH

0' 40' 80' 120'

SCALE: 1" = 40'

NOT FOR CONSTRUCTION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PROJECT: COSANTI COMMONS
LOCATION: 7000 E. SHEA BLVD. SCOTTSDALE, AZ 85254

| | | |
|---|---|---|
| DRAWN | LR | 12/27/2024 |
| DESIGNED | DJ | 12/27/2024 |
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| PROJ. MGR. | AB | 04/29/2025 |

DATE: 04/29/2025

ISSUED FOR: DRB

| REVISION NO.: | DATE: |
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JOB NO.: 230113

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

PAGE NO.: 1 OF 1

SHEET NO.: **P-DAM**

CASE FILE NO's: 973-PA-2022, 6-ZN-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**

| $T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$ | **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 |

| Elevations | | |
|---|---|---|
| High point' | Outfall' | Diff |
| 1356.14 | 1351.75 | 4.39 |

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**

| $T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$ | **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 | |

| Q=CiA | **6.74 CFS** |
|---|---|
| C= | 0.91 |
| i= | 3.140 IN/HR |
| A= | 2.36 ACRES |

| Elevations | | |
|---|---|---|
| High point' | Outfall' | Diff |
| 1356.14 | 1351.75 | 4.39 |

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 |

## TC FOR EX-B1, 100 YR STORM

**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 | |

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

| Elevations | | |
|---|---|---|
| High point' | Outfall' | Diff |
| 1355.85 | 1352.24 | 3.61 |

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** |

## TC FOR EX-B1, 10 YR STORM

**EX-B1**

| $T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$ | **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 |

| Elevations | | |
|---|---|---|
| High point' | Outfall' | Diff |
| 1355.85 | 1352.24 | 3.61 |

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**

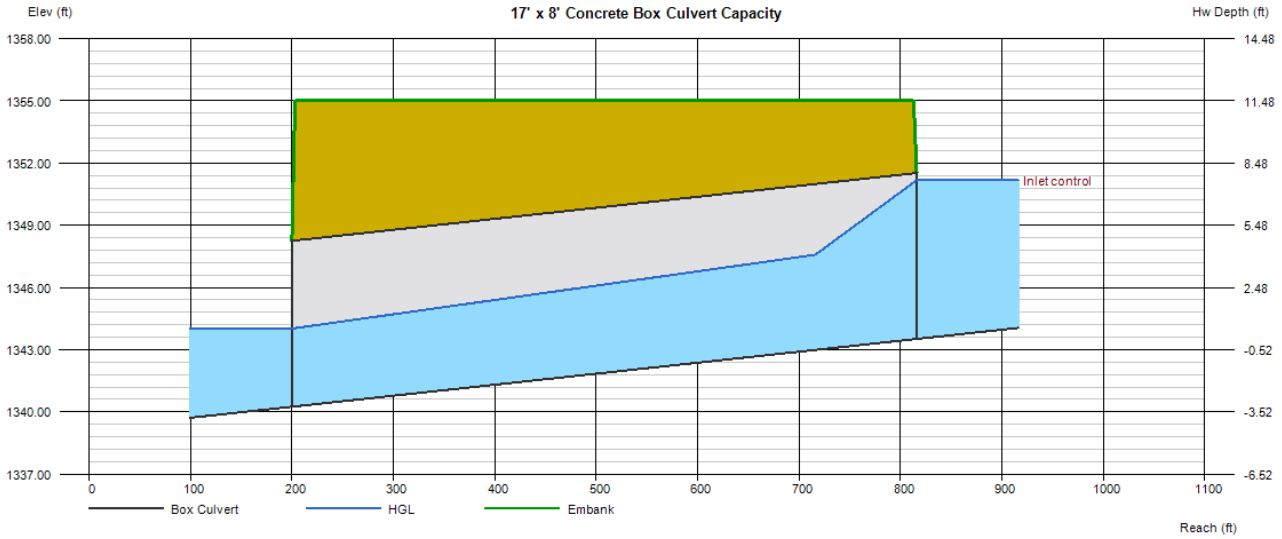
| | | |
|---|---|---|
| Top Elevation (ft) | = | 1355.00 |
| Top Width (ft) | = | 610.00 |
| Crest Width (ft) | = | 100.00 |

**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*

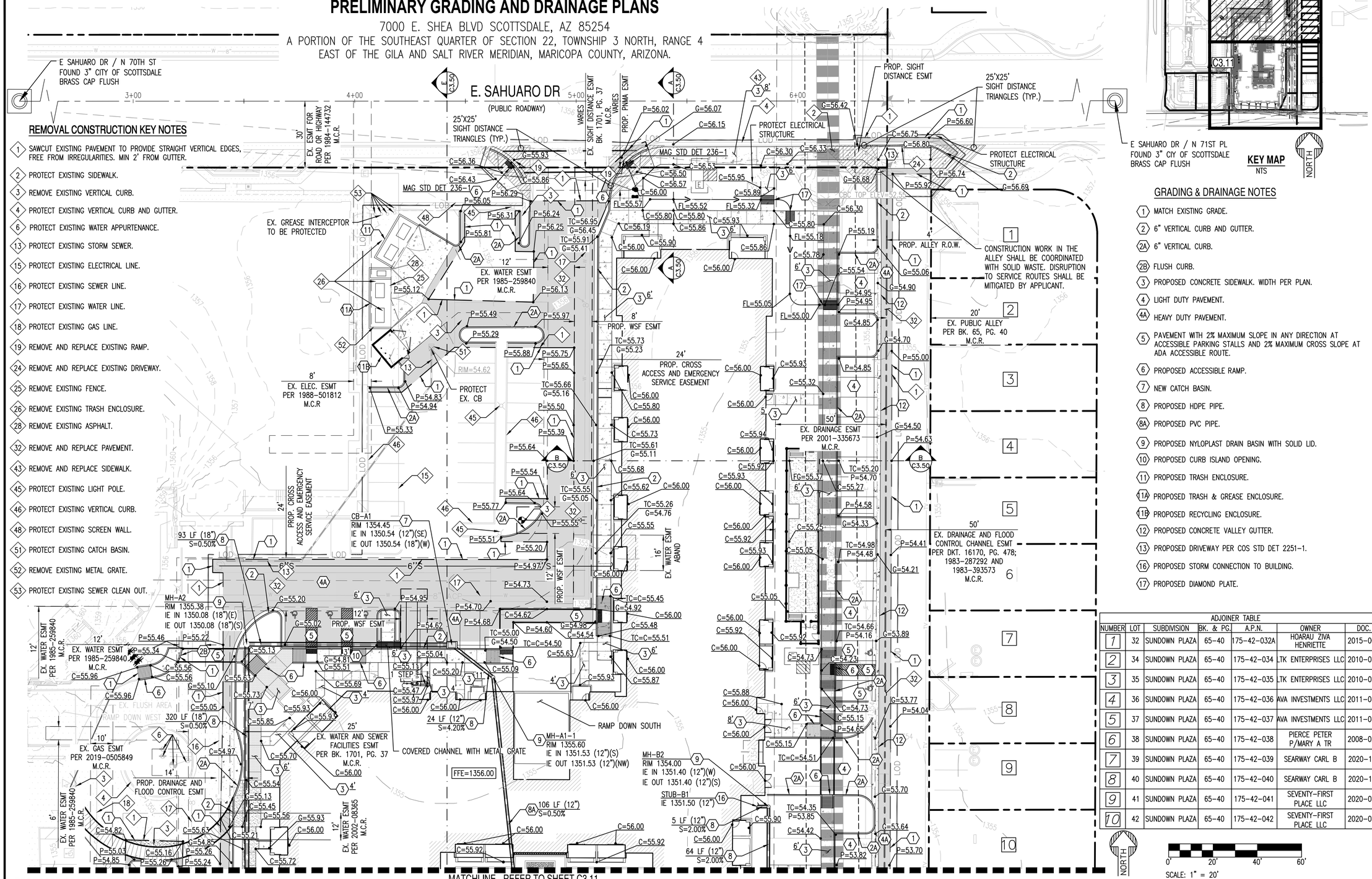
# *GRADING & DRAINAGE PLANS*

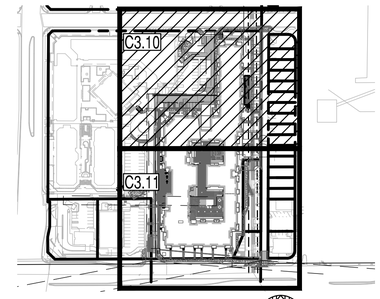
# COSANTI COMMONS

## PRELIMINARY GRADING AND DRAINAGE PLANS

7000 E. SHEA BLVD SCOTTSDALE, AZ 85254

A PORTION OF THE SOUTHEAST QUARTER OF SECTION 22, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.




**KEY MAP**
NTS

## REMOVAL CONSTRUCTION KEY NOTES

1. SAWCUT EXISTING PAVEMENT TO PROVIDE STRAIGHT VERTICAL EDGES, FREE FROM IRREGULARITIES. MIN 2' FROM GUTTER.
2. PROTECT EXISTING SIDEWALK.
3. REMOVE EXISTING VERTICAL CURB.
4. PROTECT EXISTING VERTICAL CURB AND GUTTER.
6. PROTECT EXISTING WATER APPURTENANCE.
13. PROTECT EXISTING STORM SEWER.
15. PROTECT EXISTING ELECTRICAL LINE.
16. PROTECT EXISTING SEWER LINE.
17. PROTECT EXISTING WATER LINE.
18. PROTECT EXISTING GAS LINE.
19. REMOVE AND REPLACE EXISTING RAMP.
24. REMOVE AND REPLACE EXISTING DRIVEWAY.
25. REMOVE EXISTING FENCE.
26. REMOVE EXISTING TRASH ENCLOSURE.
28. REMOVE EXISTING ASPHALT.
32. REMOVE AND REPLACE PAVEMENT.
43. REMOVE AND REPLACE SIDEWALK.
45. PROTECT EXISTING LIGHT POLE.
46. PROTECT EXISTING VERTICAL CURB.
48. PROTECT EXISTING SCREEN WALL.
51. PROTECT EXISTING CATCH BASIN.
52. REMOVE EXISTING METAL GRATE.
53. PROTECT EXISTING SEWER CLEAN OUT.

## GRADING & DRAINAGE NOTES

1. MATCH EXISTING GRADE.
2. 6" VERTICAL CURB AND GUTTER.
2A. 6" VERTICAL CURB.
2B. FLUSH CURB.
3. PROPOSED CONCRETE SIDEWALK. WIDTH PER PLAN.
4. LIGHT DUTY PAVEMENT.
4A. HEAVY DUTY PAVEMENT.
5. PAVEMENT WITH 2% MAXIMUM SLOPE IN ANY DIRECTION AT ACCESSIBLE PARKING STALLS AND 2% MAXIMUM CROSS SLOPE AT ADA ACCESSIBLE ROUTE.
6. PROPOSED ACCESSIBLE RAMP.
7. NEW CATCH BASIN.
8. PROPOSED HDPE PIPE.
8A. PROPOSED PVC PIPE.
9. PROPOSED NYLOPLAST DRAIN BASIN WITH SOLID LID.
10. PROPOSED CURB ISLAND OPENING.
11. PROPOSED TRASH ENCLOSURE.
11A. PROPOSED TRASH & GREASE ENCLOSURE.
11B. PROPOSED RECYCLING ENCLOSURE.
12. PROPOSED CONCRETE VALLEY GUTTER.
13. PROPOSED DRIVEWAY PER COS STD DET 2251-1.
16. PROPOSED STORM CONNECTION TO BUILDING.
17. PROPOSED DIAMOND PLATE.

| ADJOINER TABLE | | | | | | |
|---|---|---|---|---|---|---|
| NUMBER | LOT | SUBDIVISION | BK. & PG. | A.P.N. | OWNER | DOC. NO. |
| 1 | 32 | SUNDOWN PLAZA | 65-40 | 175-42-032A | HOARAU ZIVA HENRIETTE | 2015-0004077 |
| 2 | 34 | SUNDOWN PLAZA | 65-40 | 175-42-034 | LTK ENTERPRISES LLC | 2010-0653909 |
| 3 | 35 | SUNDOWN PLAZA | 65-40 | 175-42-035 | LTK ENTERPRISES LLC | 2010-0653909 |
| 4 | 36 | SUNDOWN PLAZA | 65-40 | 175-42-036 | AVA INVESTMENTS LLC | 2011-0497663 |
| 5 | 37 | SUNDOWN PLAZA | 65-40 | 175-42-037 | AVA INVESTMENTS LLC | 2011-0498108 |
| 6 | 38 | SUNDOWN PLAZA | 65-40 | 175-42-038 | PIERCE PETER P/MARY A TR | 2008-0291475 |
| 7 | 39 | SUNDOWN PLAZA | 65-40 | 175-42-039 | SEARWAY CARL B | 2020-1016921 |
| 8 | 40 | SUNDOWN PLAZA | 65-40 | 175-42-040 | SEARWAY CARL B | 2020-1016921 |
| 9 | 41 | SUNDOWN PLAZA | 65-40 | 175-42-041 | SEVENTY-FIRST PLACE LLC | 2020-0498629 |
| 10 | 42 | SUNDOWN PLAZA | 65-40 | 175-42-042 | SEVENTY-FIRST PLACE LLC | 2020-0498629 |

NORTH

0' 20' 40' 60'

SCALE: 1" = 20'

## PROPOSED GRADING LEGEND:

G=XX.XX — GUTTER ELEVATION,
P=XX.XX — PAVEMENT ELEVATION
C=XX.XX — CONCRETE ELEVATION
TC=XX.XX — TOP OF CURB

CURB AND GUTTER
LOD — LIMIT OF DISTUBANCE
RL — RIDGELINE
SETBACK

CATCH BASIN
STORM PIPE
NYLOPLAST BASIN
CONCRETE PAVEMENT
HEAVY DUTY PAVEMENT
LIGHT DUTY PAVEMENT

## EXISTING LEGEND:

EX. MAJOR CONTOURS
EX. MINOR CONTOURS
EX. SPOT ELEVATION
EASEMENT LINE AS NOTED
SEWER LINE
SEWER MANHOLE
WATER LINE
WATER VALVE
FIRE HYDRANT
STORM DRAIN LINE
STORM CATCH BASIN
STORM MANHOLE
GAS LINE
FENCE
SIGN
STREET LIGHT
TREE
ROAD CENTERLINE
UNDERGROUND TELEVISION LINE
UNDERGROUND ELECTRIC LINE
OVERHEAD ELECTRIC LINE
PEDESTRIAN ACCESS RAMP
ELECTRIC TRANSFORMER
ELECTRIC JUNCTION BOX
ELECTRIC METER

NOT FOR CONSTRUCTION


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


Contact Arizona 811 at least two full working days before you begin excavation
Call 811 or click Arizona811.com

PROJECT: COSANTI COMMONS
LOCATION: 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 | |
| 2 | |
| 3 | |
| 4 | |

JOB NO.: 230113

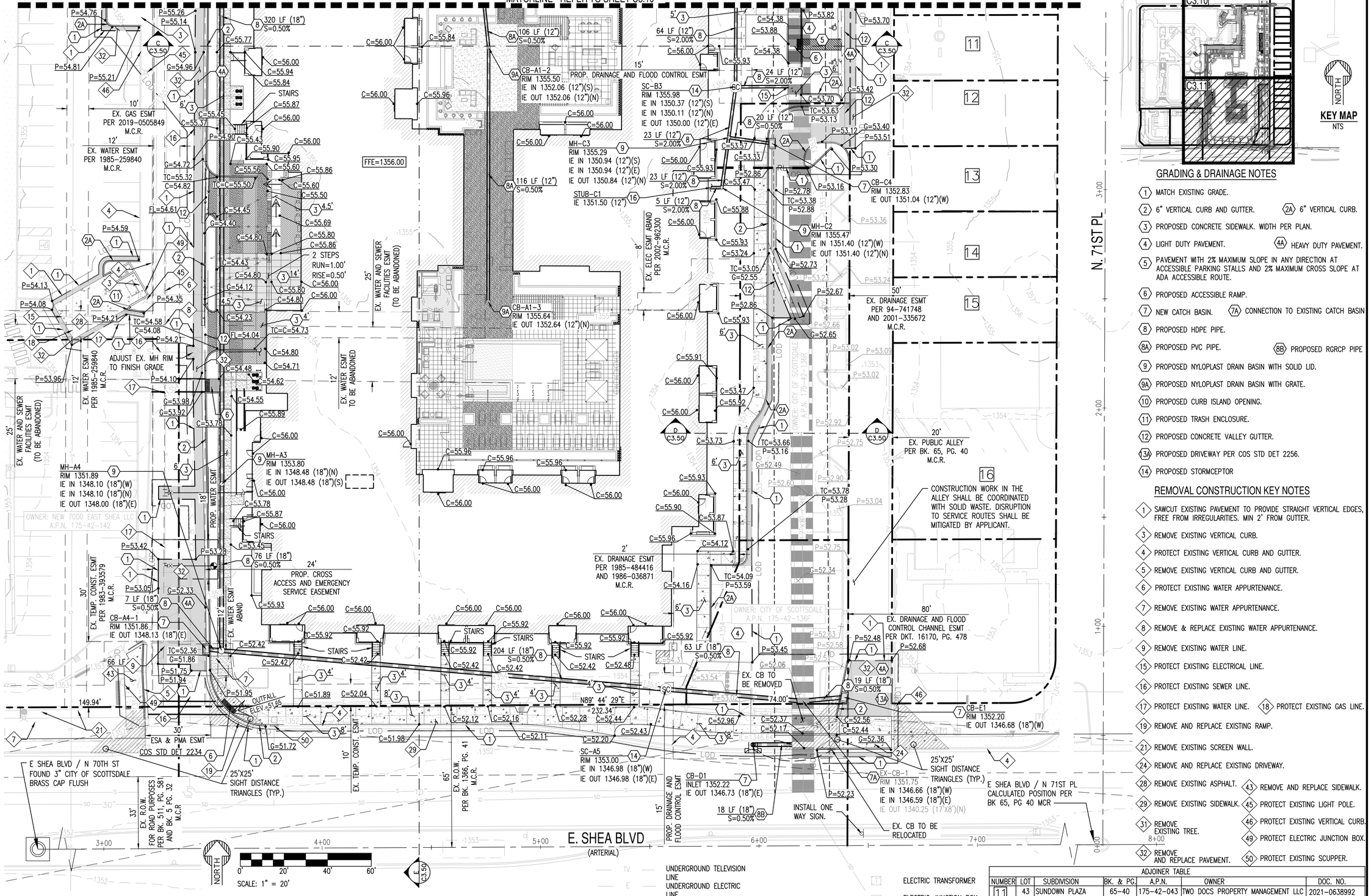
SHEET TITLE: **PRELIMINARY GRADING AND DRAINAGE PLAN**

PAGE NO.: 3 OF 5
SHEET NO.: **C3.10**



CASE FILE NO's: 973-PA-2022, 6-ZN-2023, 2-GP-2023

MATCHLINE - REFER TO SHEET C3.10







KEY MAP
NTS

## GRADING & DRAINAGE NOTES

1. MATCH EXISTING GRADE.
2. 6" VERTICAL CURB AND GUTTER.
2A. 6" VERTICAL CURB.
3. PROPOSED CONCRETE SIDEWALK. WIDTH PER PLAN.
4. LIGHT DUTY PAVEMENT.
4A. HEAVY DUTY PAVEMENT.
5. PAVEMENT WITH 2% MAXIMUM SLOPE IN ANY DIRECTION AT ACCESSIBLE PARKING STALLS AND 2% MAXIMUM CROSS SLOPE AT ADA ACCESSIBLE ROUTE.
6. PROPOSED ACCESSIBLE RAMP.
7. NEW CATCH BASIN.
7A. CONNECTION TO EXISTING CATCH BASIN
8. PROPOSED HDPE PIPE.
8A. PROPOSED PVC PIPE.
8B. PROPOSED RGRCP PIPE
9. PROPOSED NYLOPLAST DRAIN BASIN WITH SOLID LID.
9A. PROPOSED NYLOPLAST DRAIN BASIN WITH GRATE.
10. PROPOSED CURB ISLAND OPENING.
11. PROPOSED TRASH ENCLOSURE.
12. PROPOSED CONCRETE VALLEY GUTTER.
13A. PROPOSED DRIVEWAY PER COS STD DET 2256.
14. PROPOSED STORMCEPTOR

## REMOVAL CONSTRUCTION KEY NOTES

1. SAWCUT EXISTING PAVEMENT TO PROVIDE STRAIGHT VERTICAL EDGES, FREE FROM IRREGULARITIES. MIN 2' FROM GUTTER.
3. REMOVE EXISTING VERTICAL CURB.
4. PROTECT EXISTING VERTICAL CURB AND GUTTER.
5. REMOVE EXISTING VERTICAL CURB AND GUTTER.
6. PROTECT EXISTING WATER APPURTENANCE.
7. REMOVE EXISTING WATER APPURTENANCE.
8. REMOVE & REPLACE EXISTING WATER APPURTENANCE.
9. REMOVE EXISTING WATER LINE.
15. PROTECT EXISTING ELECTRICAL LINE.
16. PROTECT EXISTING SEWER LINE.
17. PROTECT EXISTING WATER LINE.
18. PROTECT EXISTING GAS LINE.
19. REMOVE AND REPLACE EXISTING RAMP.
21. REMOVE EXISTING SCREEN WALL.
24. REMOVE AND REPLACE EXISTING DRIVEWAY.
28. REMOVE EXISTING ASPHALT.
29. REMOVE EXISTING SIDEWALK.
31. REMOVE EXISTING TREE.
32. REMOVE AND REPLACE PAVEMENT.
43. REMOVE AND REPLACE SIDEWALK.
45. PROTECT EXISTING LIGHT POLE.
46. PROTECT EXISTING VERTICAL CURB.
49. PROTECT ELECTRIC JUNCTION BOX.
50. PROTECT EXISTING SCUPPER.

## PROPOSED GRADING LEGEND:

- G=XX.XX — GUTTER ELEVATION,
- P=XX.XX — PAVEMENT ELEVATION
- C=XX.XX — CONCRETE ELEVATION
- TC=XX.XX — TOP OF CURB
- LIGHT DUTY PAVEMENT
- HEAVY DUTY PAVEMENT
- CURB AND GUTTER
- CATCH BASIN
- LOD — LIMIT OF DISTUBANCE
- STORM PIPE
- RL — RIDGELINE
- NYLOPLAST BASIN
- SETBACK
- CONCRETE PAVEMENT

## EXISTING LEGEND:

- XXXX — EX. MAJOR CONTOURS
- XXXX — EX. MINOR CONTOURS
- TC:XX.XX GE:XX.XX — EX. SPOT ELEVATION
- EASEMENT LINE AS NOTED
- TV — UNDERGROUND TELEVISION LINE
- E — UNDERGROUND ELECTRIC LINE
- OHE — OVERHEAD ELECTRIC LINE
- PEDESTRIAN ACCESS RAMP
- S — SEWER LINE
- SEWER MANHOLE
- W — WATER LINE
- WATER VALVE
- FIRE HYDRANT
- SD — STORM DRAIN LINE
- CB — STORM CATCH BASIN
- STORM MANHOLE
- G — GAS LINE
- FENCE
- ELECTRIC TRANSFORMER
- ELECTRIC JUNCTION BOX
- ELECTRIC METER
- SIGN
- STREET LIGHT
- TREE
- ROAD CENTERLINE

### 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 ASSEMBLAGE | 1009-18 | 175-42-139 | RODDIMEYER III LLC | 2013-1012110 |

NOT FOR CONSTRUCTION


SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.568.7226 FAX. 480.259.3534


Blue Stake, Inc. 811 or (602) 263-1100
Arizona Law (A.R.S. 40-360.21, 40-360.22) requires you to notify all utility companies with underground facilities before you begin excavation. Call 811 or visit blutstake811.com

PROJECT: COSANTI COMMONS
LOCATION: 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 | |
| 2 | |
| 3 | |
| 4 | |

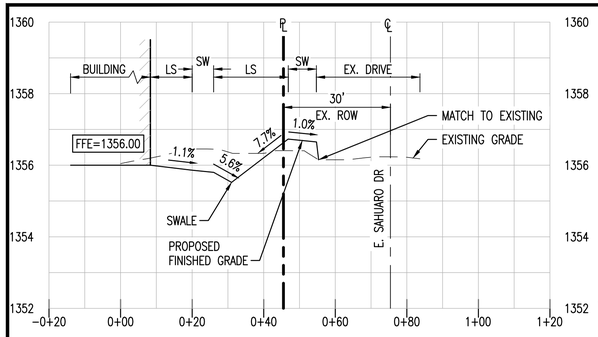
JOB NO.: 230113

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

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

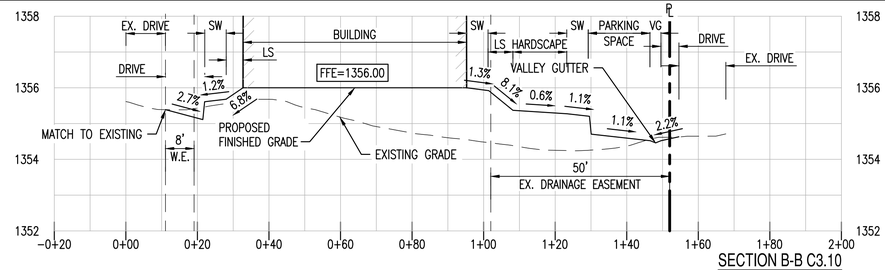


CASE FILE NO's: 973-PA-2022, 6-ZN-2023, 2-GP-2023



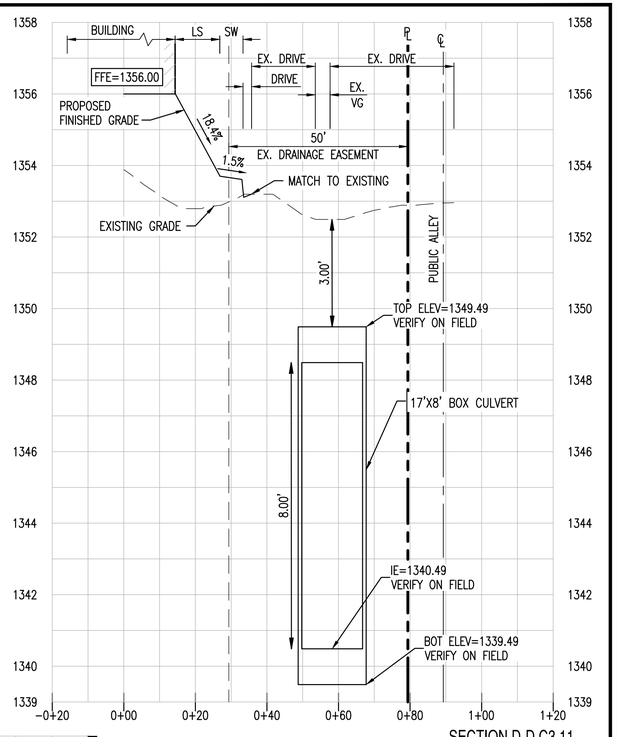

## SECTION A-A C3.10

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



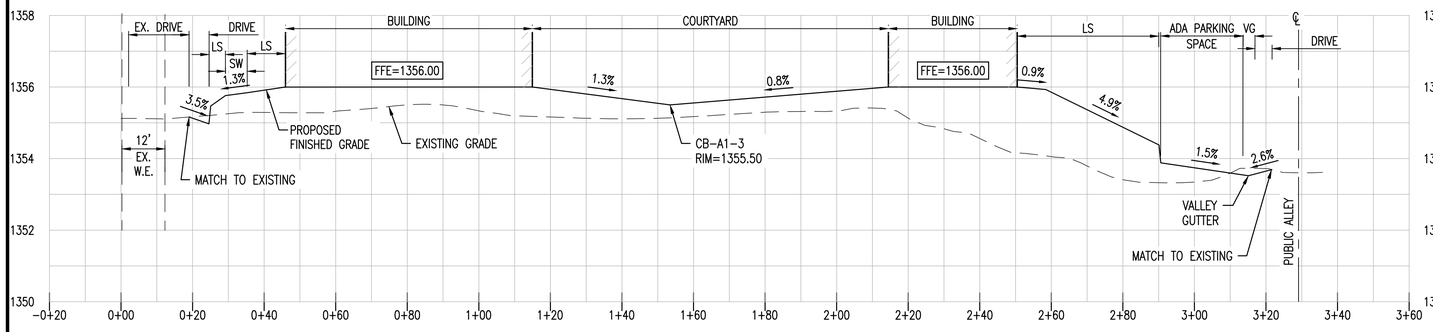

## SECTION B-B C3.10

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



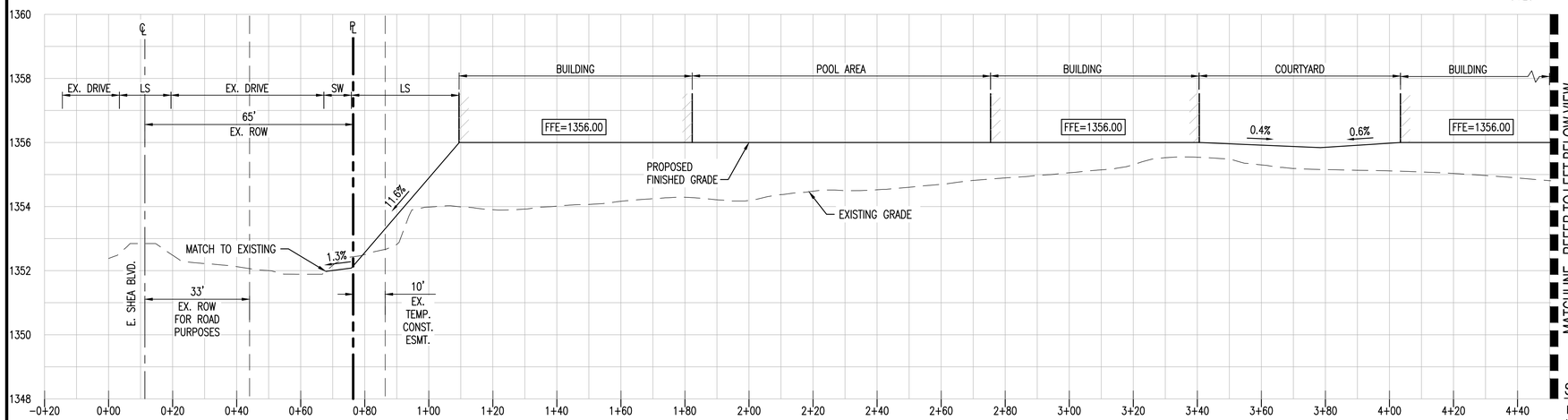

## SECTION D-D C3.11

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



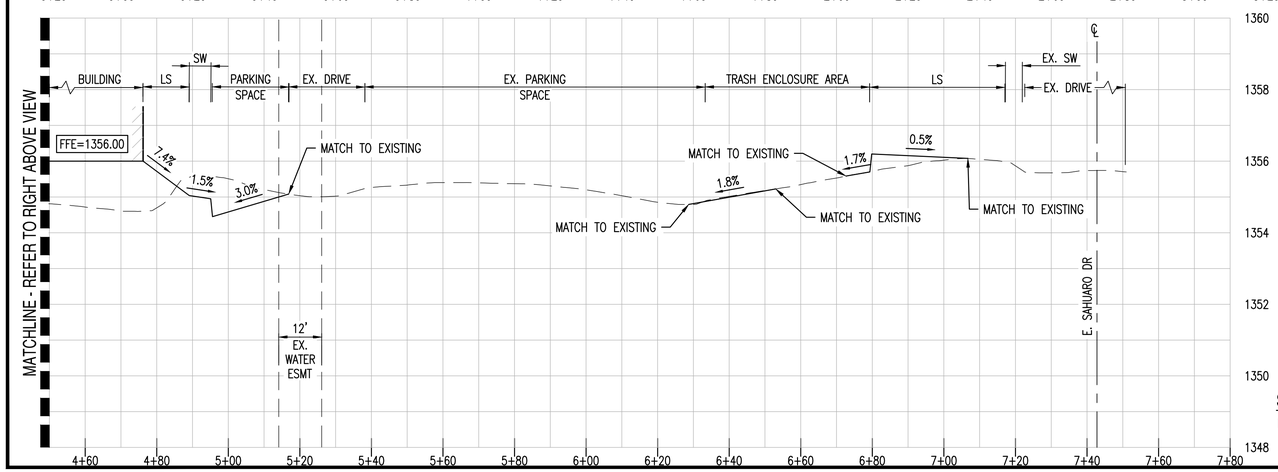

## SECTION C-C C3.11

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

SUSTAINABILITY ENGINEERING GROUP
SEG
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.568.7226 FAX. 480.259.3534







PROJECT: COSANTI COMMONS
LOCATION: 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 | |
| 2 | |
| 3 | |
| 4 | |

JOB NO.: 230113

SHEET TITLE: **PRELIMINARY SITE CROSS SECTIONS**

PAGE NO.: 5 OF 5
SHEET NO.: **C3.50**

CASE FILE NO's: 973-PA-2022, 6-ZN-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 wavier.

Date 01/20/2025 Project Name Cosanti Commons

Project Location 7000 E. Shea Boulevard, Scottsdale, AZ

Applicant Contact Ali Fakih Company Name Sustainability Engineering Group LLC

Phone 480-588-7226 E-mail ali@seg.com

Address 5240 N. 16th Street, Phoenix, AZ 85016

**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 Cosanti Commons

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 Cosanti Commons

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,
$\Delta C$ = increase in weighted average runoff coefficient over disturbed area ($C_{post} - C_{pre}$),
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 = 2.20/12 = 0.183
$\Delta C$= -0.04
A = 162,562
V = -1,192
$V_p$= 0
$V_w$= _____

☐ 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:
Weighted runoff coefficient is decreased during proposed conditions. No retention provided during existing conditions.

**Approved by:**

_____ _____
Floodplain Administrator or Designee Date


**Stormwater Management Department**
7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 ◆ Phone: 480-312-2500