

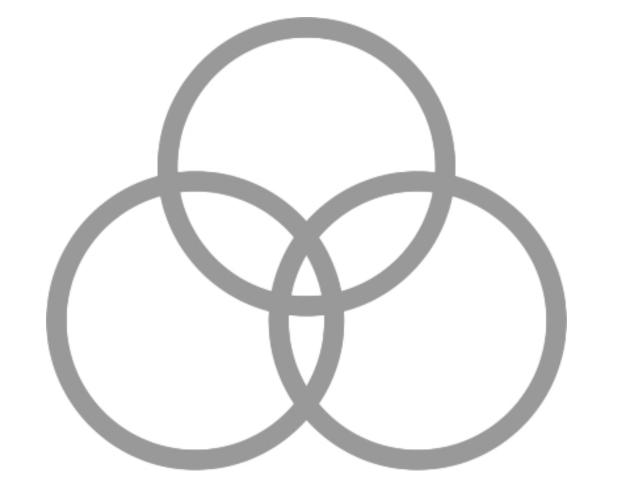


# SOUTHDALE

Preliminary Drainage Report

3 engineering Job #: 1872

June 28, 2021 COS #: 5-ZN-2020





# **SOUTHDALE**

# 7000 E. MCDOWELL ROAD, SCOTTSDALE, AZ 85257

# PRELIMINARY DRAINAGE REPORT Prepared for:

Hawkins Companies LLC 4700 S. McClintock Drive #160 Scottsdale, Arizona 85257 Contact: Mark Mitchell Phone: (480) 223-8239



Daniel G. Mann, P.E.

June 28, 2021

### Submittal to:

City of Scottsdale 7447 E. Indian School Road, Suite 105 Scottsdale, AZ 85251

### Prepared by:

3 engineering, LLC 6370 E. Thomas Road, Suite #200 Scottsdale, Arizona 85251 Contact: Dan G. Mann, P.E.

Job Number 1872



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#### 1. Introduction

The purpose of this report is to present the existing and proposed drainage plan for the project site, Southdale. It is our opinion the proposed grading and drainage concept is in accordance with the City of Scottsdale drainage requirements.

The project site, Southdale, is located in the southeast quarter of Section 34, Township 2 North, Range 4 East of the Gila and Salt River Meridian, Maricopa County, Arizona within the City of Scottsdale. The project is located at 7000 E. McDowell Road, Scottsdale, AZ 85257. The site is bounded on the north by an apartment complex, on the east by a commercial development, on the south by McDowell Road, and on the west by 70th Street. See Appendix A for a vicinity map and Appendix G for offsite aerial photographs.

The existing zoning is C-3. The land is currently used as a commercial development. The proposed zoning is PUD. The City of Scottsdale 2001 General Plan shows the site as a Mixed-Use Neighborhood. The proposed site is a 267-unit apartment complex with office and retail space. The site currently lies within the "Zone X" floodplain designation.

#### 2. Site Description

#### **Existing**

The project site currently consists of a fully developed commercial development with landscaping, drive aisles, parking, and utilities. The existing topography of the site generally slopes from northwest to southeast at approximately 1.0 percent (1.0%). The site currently does not retain stormwater and discharges flows to McDowell Road at the site outfall located at the southeast corner of the site. The site does not show any signs of containing waters of the US (404 washes). See Appendix F for an aerial photograph of the site.

#### Federal Emergency Management Agency (FEMA) Designation

According to FEMA Flood Insurance Rate Map (FIRM) # 04013C2235L, dated October 16, 2013, the site is located within the "Zone X" floodplain designation.

"Zone X" is described as follows:

"Areas determined to be outside the 0.2% annual chance floodplain."

Refer to the updated Flood Insurance Rate Map information in Appendix B.

#### **Proposed**

The proposed project includes constructing a 267-unit multi-family apartment complex with office and retail space. The site also includes drive aisles, surface parking, a parking structure, and landscape. See the proposed improvements in the Onsite Drainage Area Map in Appendix H.

#### 3. Drainage Design - Offsite

The site is not considered to be affected by offsite flows. The Maricopa County Flood Control District Flo-2d maps from the Lower Indian bend Wash Study show offsite flows entering the site from the west. See Appendix K for Flo-2d maps. The physical conditions of the site differ from the assumptions in the Flo-2d analysis. The site is blocked from offsite flows and is discussed below.

Flows are generated within an offsite drainage area west of the site that travel east toward 70<sup>th</sup> Street through Coronado Road, Almeria Road and an alley south of Almeria Road. See Watershed Delineation and Topography Map in Appendix D. The peak discharge for the



drainage area was determined to be 34 cfs for the 100-year storm event using the FCDMC DDMSW HEC-1 Model, which is consistent with the flows shown in the Flo-2d map. The flow is conveyed to the west half of 70th Street which has a capacity of 21.53 cfs (cross section A). Therefore, 12.47 cfs breaks over to the east side of 70th Street. With a flow of 12.47 cfs, the water surface elevation in the east side of 70th street is at an elevation of 42.35 at the location of a 20-ft wide driveway to the apartment complex north of the site (cross section B). The back of the driveway has an elevation of 42.17. The breakover was modeled as a weir with a width of 20-ft and a depth of 0.18-ft, resulting in a flow of 4.58 cfs that enters the apartment complex (weir section B). The remaining 7.89 cfs travels south in the east half of 70th street, adjacent to the site, which has a capacity of 11.34 cfs (cross section C). There is a block wall/solid building walls that extend the entire property line between the project site and the apartment complex. There is an opening at a foot-gate along the wall, however it is 1.3-ft above the adjacent catch basin in the apartment complex drive aisle. Therefore, no offsite flows affect the site. There is a drywell in the alley behind the existing apartment complex to the northwest that dissipates any storm water in this area.

Refer to Appendix D for a Watershed Delineation and Topography map and Appendix E for Offsite Drainage Calculations including HEC-1 Results and Flowmaster Calculations. Cross section locations are shown in the Onsite Drainage Area Map, Appendix H.

#### Hydraulic Parameters

Bentley Flowmaster V8i was used to calculate the street capacity for sections in 70<sup>th</sup> Street for 100-year flows. The Flood Control District of Maricopa County Drainage Design Management System for Windows (DDMSW) was used to determine the flow for 100-year storm event . See results in Appendix E.

#### 4. Drainage Design - Onsite

The City of Scottsdale Design Standards and Policies Manual and the Drainage Design Manual for Maricopa County, Volume 1 was followed in designing on-site drainage facilities for the site.

Refer to the Preliminary Grading and Drainage Plan in Appendix L, the Onsite Drainage Map in Appendix H and Inlet Area Exhibit in Appendix I for the following discussion. The proposed site is required to provide retention for the pre- vs. post-project runoff for the 100-year, 2-hour storm or the 0.5" First Flush Storm (with weighted runoff coefficient), whichever is greater. The c value for the proposed site is less than the existing site, so the pre- vs. post- runoff method results in no required volume. Therefore, the First Flush Storm is used. There is no retention provided for the "true rooftop" areas with no amenities, see Appendix H for areas. See Appendix J for Onsite Drainage Calculations.

The required retention volume for Drainage Area A is 2,706 c.f. There is 2,764 c.f. provided in 220-L.F. of 48" storm drain pipe. Flows generated within this drainage area are conveyed via roof drains and surface flow to five catch basins that connect directly into the underground retention pipe. In a storm event greater than the 0.5" first flush the retention pipe will fill and overflow through the southernmost catch basin to McDowell Road. The system is modeled in Bentley StormCAD using a tail water elevation of 6" above the highpoint breakover at the driveway. A proposed dry-well will provide a dry up time of 36 hours with an infiltration rate of 0.02 cfs. Additionally, the two courtyard areas have secondary overflow catch basins elevated 0.25-ft above the primary catch basin. The overflow catch basins will not receive flow until the



underground retention is full or the primary catch basins are clogged. The overflow catch basin in the north courtyard, area A-4, is conveyed to a bubble-up outlet in the fire lane west of the building. The bubble-up structure is connected to the underground retention with a bleed off pipe and does not require an additional drywell. The overflow catch basin for the south courtyard, area A-5, outlets to the right of way in McDowell Road.

The required retention volume for Drainage Area B is 479 c.f. There is 528 c.f. provided in 42-L.F. of 48" storm drain pipe. Flows generated within this drainage area are conveyed via surface flow to two catch basins that connect directly into the underground retention pipe. In a storm event greater than the 0.5" first flush the retention pipe will fill and overflow through the north catch basin to 70th Street. The system is modeled in Bentley StormCAD using a tail water elevation of 0.13-ft above the highpoint breakover at the driveway. A proposed dry-well will provide a dry up time of 36 hours with an infiltration rate of 0.01 cfs.

The proposed finish floor of the new building is 1243.00, which is 12" above the highest adjacent catch basin inlet elevation of 1242.00. Therefore, the finish floor meets the requirement of 12" above the adjacent high-water elevation per the Maricopa County Drainage Standards. Additionally, the proposed finish floor elevations are greater than 14" above the site outfall of 1237.85, exceeding the Maricopa County Drainage Standard requirement.

#### Hydraulic Parameters

For onsite peak flows, the Rational Method will be used as follows:

Q=CiA

where: C = Composite runoff coefficient = weighted by ground cover

i = Intensity corresponding to T<sub>C</sub>

 $T_c$  = Time of concentration (10 minute minimum used)

A = Area in acres

The 100-year runoff coefficient for this development to be used is 0.95 for impervious areas and 0.45 for pervious areas per the Maricopa County Drainage Policies and Standards. The rainfall is based upon the NOAA Atlas 14, Volume 1, Version 5, dated 2011, 90% confidence interval, mean partial duration time series data.

Determination of Catch Basin capacity operating as a weir by using the following formula:  $Q=C_wxPxd^{1.5}x$  (1-CF)

where:  $C_W$  = Weir coefficient (3.0)

Q = Discharge Capacity (cfs)

P = Inlet Perimeterd = Flow depth

CF = Clogging Factor. 40% clogging (or 0.40) used

Please refer to APPENDIX J for catch basin computations.

The on-site storm drain pipes are designed to accommodate flows resulting from the 100-year storm event. To calculate the capacity of the storm drain pipes, StormCAD V8i by Bentley Systems, Inc. was used, see results in Appendix J. The 100-year flow calculated for a given drainage area was assigned to the corresponding catch basin. Inlet areas are shown in the Inlet Area Exhibit in Appendix I. The tailwater for each outlet of the retention pipes were set above the adjacent driveway breakover elevations.



### 5. Conclusions

The following is a summary of the Southdale Preliminary Drainage Report.

- The site currently lies within the "Zone X" floodplain designation.
- Retention is provided for the 0.5" first flush storm for the site.
- No offsite flows affect the site.
- The finish floors are safe from the 100-year storm event.

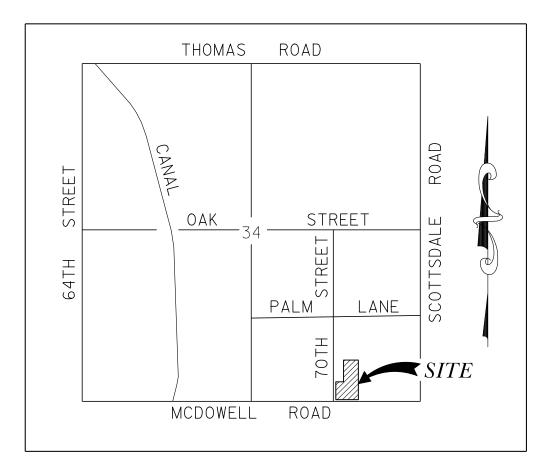
### 6. References

- 1. City of Scottsdale, Design Standards and Policies Manual, 2018.
- 2. Maricopa County, Drainage Policies and Standards, August 2018.
- 3. Maricopa County Flood Control District Flo-2d maps from the Lower Indian bend Wash Study



APPENDIX A

Vicinity Map

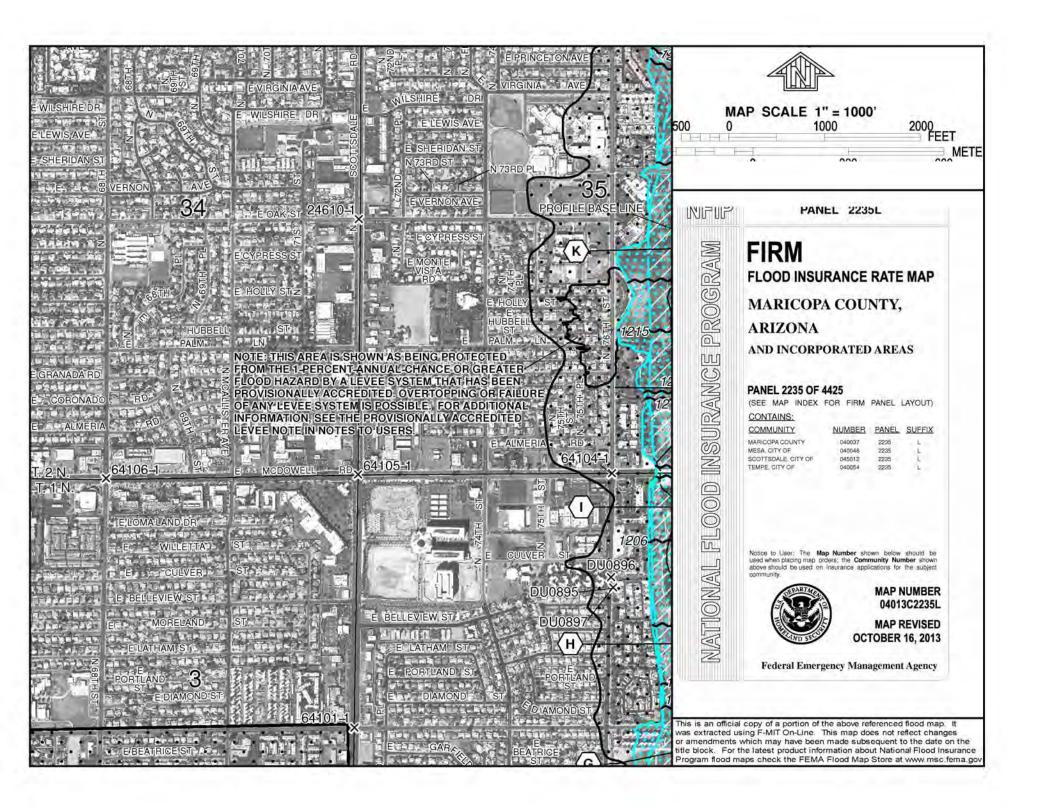


VICINITY MAP

N.T.S.



APPENDIX B
FEMA FIRM Map





# APPENDIX C

Warning and Disclaimer of Liability

# **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.

	20	OF PARTY	
Plan Check #	Owner		Date



# APPENDIX D

Watershed Delineation and Topography Map

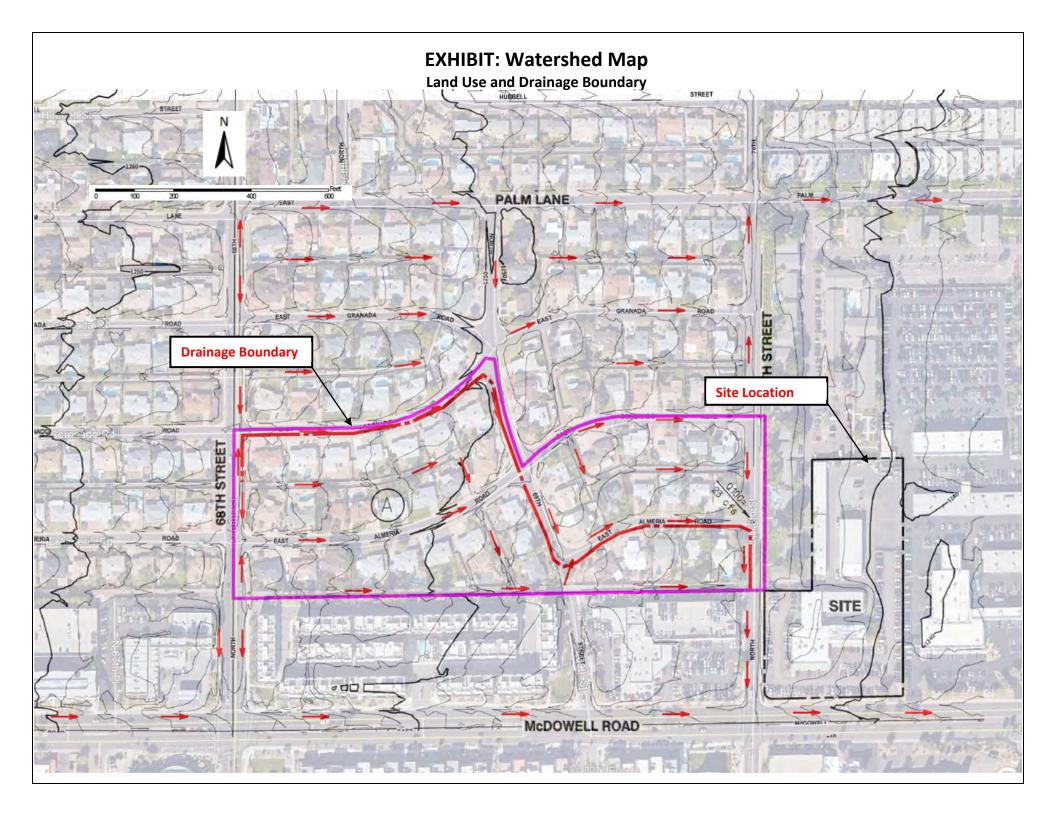
COPYRIGHT 2020 3 ENGINEERING, LLC

AZ 85257 WATERSHED

3 ENGINEERING, LLC 6370 E. THOMAS ROAD SUITE # 200 SCOTTSDALE, ARIZONA 85251 PHONE: (602) 334-4387 FAX: (602) 490-3230

WWW.3ENGINEERING.COM

DATE: 06/25/20 PROJECT NO. 1872 SHEET NO.
WS01
1 of 1





# APPENDIX E

Offsite Drainage Calculations

# **EXHIBIT: SOILS MAP Source: Web Soil Survey** 413110 413160 413510 413560 E Granada Rd Almenia Rd **Site Location** 413110 413160 413210 413260 413310 413300 413410 413480 413510 413560 ables — Hydrologic Soil Group — Summary By Map Unit Summary by Map Unit — Eastern Maricopa and Northern Pinal Counties Area, Arizona (AZ655) Map Scale: 1:2,240 if printed on A landscape (11" x 8.5") sheet. Summary by Map Unit - Eastern Maricopa and Northern Pinal Counties Area, Arizona (AZ655) 180 LaA Laveen loam, 0 to 1 percent slopes 1.9 13.9% 200 11.6 86.1% 400 Rillito gravelly loam, 0 to 1 percent slopes Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84 **Totals for Area of Interest** 13.4 100.0%

#### MAP LEGEND

#### Area of Interest (AOI)

Area of Interest (AOI)

#### Soils

Soil Map Unit Polygons



Soil Map Unit Points

#### **Special Point Features**

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

#### OLIND

00

Spoil Area

Stony Spot

Wet Spot

Other

Special Line Features

Very Stony Spot

#### Water Features

Streams and Canals

#### Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

#### Background

Aerial Photography

#### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20.000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Maricopa and Northern Pinal Counties Area, Arizona

Survey Area Data: Version 12, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2018—Jun 1, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# **Map Unit Legend**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LaA	Laveen loam, 0 to 1 percent slopes	1.9	14.2%
RiA	Rillito gravelly loam, 0 to 1 percent slopes	11.7	85.8%
Totals for Area of Interest	•	13.7	100.0%

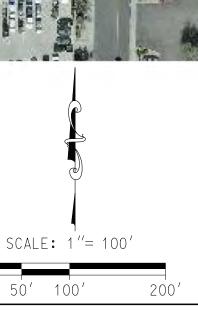


DRAINAGE BOUNDARY

IMPERVIOUS AREA

IMPERVIOUS AREA = 295,882 SF

IMPERVIOUS AREA PERCENTAGE = 49.74% (50% USED IN HEC-1)



50′

3@engineering surveying

7000 E.

AZ 85257

**ALE** Ottsdale,

EXHIBIT

IMPERVIOUS AREA

DATE: 06/28/21

PROJECT NO. 1872

### **EXHIBIT: DDMSW HEC-1**

Flood Control District of Maricopa County
Drainage Design Management System
SOILS
Project Reference: 70TH&MCDOWEL

_	_	_	•

655

RiA

655543720

0.018

#### Area ID Book Мар Soil ID Area Area XKSAT Rock Effective Comments Percent Rock (%) Number Unit (%) (sq mi) (%) Major Basin ID: 01 655 655422120 0.003 13.80 0.250 5

86.20

0.400

Flood Control District of Maricopa County Drainage Design Management System LAND USE Project Reference: 70TH&MCDOWEL

100

6/28/2021

Page 1

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major B	asin ID: 01								
Α	160	13.4000	100.0	0.25	50 *	50.0	NORMAL	0.033	
		13.4000	100.0						

Flood Control District of Maricopa County
Drainage Design Management System

	SUB BASINS	
Page 1	Project Reference: 70TH&MCDOWEL	

			Sub Basir	Parame	eters				Rainfall L	osses					Return	Period Par	ameters	
Area ID	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)	_	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major	Basin ID:	01																
A	0.021	0.25	48.0	48.0	URBAN	0.033	0.25	0.25	4.08	0.540	50	Tc (Hrs) Vel (f/s) R (Hrs)	0.379 0.97 0.376	0.327 1.12 0.320	0.300 1.22 0.290	0.272* 1.35 0.281	0.257* 1.43 0.244	0.243 * 1.51 0.229

Flood Control District of Maricopa County Drainage Design Management System HEC-1 FLOW SUMMARY Project Reference: 70TH&MCDOWEL

Page 1 6/28/2021

ID	Type	Area	Discharge cfs					
		(sq mi)	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin 01								
A	Hydrograph	0.02		12	17	23	28	34

## **EXHIBIT: HEC-1 Output 100Yr**

```
SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE
          (V) ROUTING
                            (--->) DIVERSION OR PUMP FLOW
          (.) CONNECTOR
                            (<---) RETURN OF DIVERTED OR PUMPED FLOW
 NO.
  19
(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
                                                                                     *******************************
   FLOOD HYDROGRAPH PACKAGE (HEC-1)
                                                                                         U.S. ARMY CORPS OF ENGINEERS
              JUN 1998
                                                                                         HYDROLOGIC ENGINEERING CENTER
           VERSION 4.1
                                                                                              609 SECOND STREET
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                             Flood Control District of Maricopa County
                             70TH&MCDOWEL - 3 Engineers
                             100 YEAR
                             6 Hour Storm
                             Unit Hydrograph: Clark
                             Storm: Multiple
                             06/28/2021
  9 IO
               OUTPUT CONTROL VARIABLES
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                                   0 PLOT CONTROL
                     IPLOT
                     QSCAL
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                                0000 STARTING TIME
                     ITIME
                       NQ
                                 2000 NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE
                               7JAN99 ENDING DATE
                                2235 ENDING TIME
                    NDTIME
                    ICENT
                                  19 CENTURY MARK
                                        .08 HOURS
                 COMPUTATION INTERVAL
                      TOTAL TIME BASE 166.58 HOURS
         ENGLISH UNITS
             DRAINAGE AREA
                                  SQUARE MILES
             PRECIPITATION DEPTH INCHES
             LENGTH, ELEVATION
                                  FFFT
             FLOW
                                 CUBIC FEET PER SECOND
             STORAGE VOLUME
                                 ACRE-FEET
             SURFACE AREA
                                 ACRES
             TEMPERATURE
                                 DEGREES FAHRENHEIT
               INDEX STORM NO. 1
 11 JD
                                 2.52 PRECIPITATION DEPTH
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<b>EXHIBIT: HEC</b>	1 Outp	out 100Yr
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15 JD	INDEX	STORM NO. 2 STRM TRDA	2.50 P	RECIPITATION RANSPOSITION	ON DEPTH	AREA					
16 PI	PREC	IPITATION P	ATTERN								
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				.00 .			00	.00	.00	.00	.00
							00		.00	.00	.00
		.00 .	99	.00 .	.01	31 .	01	.01	.01	.01	.03
		.03 .	03	.05 .	.05	35 .:	15	.15	.15	.03	.03
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	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE	FLOW FOR I	MAXIMUM P	PERIOD	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+					6-HOUR	24-H0	UR 72	-HOUR			
	HYDROGRAPH AT										
+	HIDROGRAPH AT	А	34.	4.08	4.		1.	0.	.02		

\*\*\* NORMAL END OF HEC-1 \*\*\*

## **Cross Section for 70th Street West Section A**

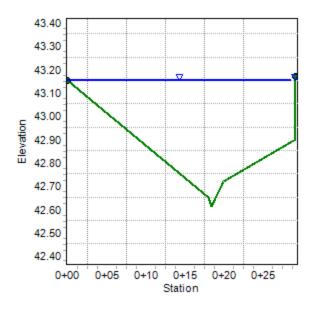
### **Project Description**

Friction Method Manning Formula Solve For Discharge

### Input Data

Channel Slope 0.25 % Normal Depth 0.54 ft Discharge 21.53 ft<sup>3</sup>/s

### Cross Section Image



## **Worksheet for 70th Street West Section A**

### **Project Description**

Friction Method Manning Formula
Solve For Discharge

### Input Data

Channel Slope 0.25 % Normal Depth 0.54 ft

Section Definitions

Station (ft)	Elevation (ft)
(	()
0+29	43.17
0+29	42.90
0+20	42.72
0+18	42.61
0+18	42.65
0+00	43.15

#### Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+29, 4	3.17) (0+00, 43.1	5) 0.013

### **Options**

Current Roughness Weighted Method
Open Channel Weighting Method
Closed Channel Weighting Method
Pavlovskii's Method
Pavlovskii's Method

#### Results

Discharge		21.53	ft³/s
Elevation Range	42.61 to 43.17 ft		
Flow Area		8.55	ft²
Wetted Perimeter		29.26	ft
Hydraulic Radius		0.29	ft
Top Width		29.00	ft
Normal Depth		0.54	ft

# **Worksheet for 70th Street West Section A**

Results			
Critical Depth		0.50	ft
Critical Slope		0.00386	ft/ft
Velocity		2.52	ft/s
Velocity Head		0.10	ft
Specific Energy		0.64	ft
Froude Number		0.82	
Flow Type	Subcritical		
GVF Input Data			
Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	
GVF Output Data			
Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		0.54	ft
Critical Depth		0.50	ft
Channel Slope		0.25	%
Critical Slope		0.00386	ft/ft

## **Cross Section for 70th Street East Section B**

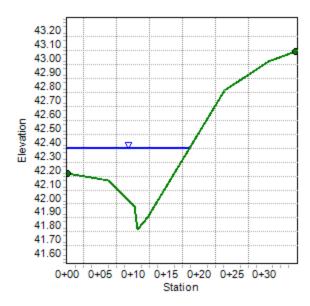
### **Project Description**

Friction Method Manning Formula Solve For Normal Depth

### Input Data

Channel Slope 0.25 % Normal Depth 0.58 ft Discharge 12.47 ft<sup>3</sup>/s

### Cross Section Image



## **Worksheet for 70th Street East Section B**

### **Project Description**

Friction Method Manning Formula
Solve For Normal Depth

### Input Data

Channel Slope 0.25 % Discharge 12.47  $ft^3/s$ 

Section Definitions

Station (ft)		Elevation (ft)	
	0+00	4	12.17
	0+06	4	12.12
	0+10	4	11.93
	0+11	4	11.77
	0+12	4	11.85
	0+24	4	12.76
	0+31	4	12.97
	0+35	4	13.04

Roughness Segment Definitions

Charle Charlian		En din n Chatinn	Davishusas Castisiant	
Start Station		Ending Station	Roughness Coefficient	
	(0+00, 42.17)	(0+35, 43.04)		0.013

### **Options**

Current Roughness Weighted Method
Open Channel Weighting Method
Pavlovskii's Method
Closed Channel Weighting Method
Pavlovskii's Method

#### Results

 Normal Depth
 0.58
 ft

 Elevation Range
 41.77 to 43.04 ft

 Flow Area
 5.17
 ft²

 Wetted Perimeter
 18.81
 ft

 Hydraulic Radius
 0.27
 ft

# **Worksheet for 70th Street East Section B**

Results			
Top Width		18.58	ft
Normal Depth		0.58	ft
Critical Depth		0.54	ft
Critical Slope		0.00399	ft/ft
Velocity		2.41	ft/s
Velocity Head		0.09	ft
Specific Energy		0.67	ft
Froude Number		0.81	
Flow Type	Subcritical		
GVF Input Data			
Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	
GVF Output Data			
Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		0.58	ft
Critical Depth		0.54	ft
Channel Slope		0.25	%
Critical Slope		0.00399	ft/ft

# **Cross Section for Section B Weir**

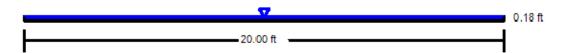
## **Project Description**

Solve For Discharge

### Input Data

Discharge		4.58	ft³/s
Headwater Elevation		0.18	ft
Crest Elevation		0.00	ft
Tailwater Elevation		0.00	ft
Weir Coefficient		3.00	US
Crest Length		20.00	ft
Number Of Contractions	0		

### Cross Section Image



# **Worksheet for Section B Weir**

Project Description				
Solve For	Discharge			
Input Data				
Headwater Elevation		0.18	ft	
Crest Elevation		0.00	ft	
Tailwater Elevation		0.00	ft	
Weir Coefficient		3.00	US	
Crest Length		20.00	ft	
Number Of Contractions	0			
Results				

i (Couito	

Discharge	4.58	ft³/s
Headwater Height Above Crest	0.18	ft
Tailwater Height Above Crest	0.00	ft
Flow Area	3.60	ft²
Velocity	1.27	ft/s
Wetted Perimeter	20.36	ft
Top Width	20.00	ft

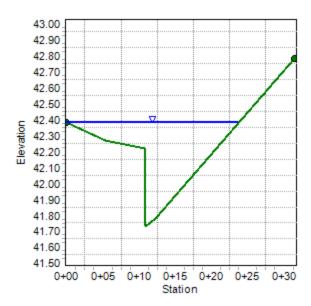
## **Cross Section for 70th Street Section C**

### **Project Description**

Friction Method Manning Formula
Solve For Discharge

### Input Data

### Cross Section Image



## **Worksheet for 70th Street Section C**

### **Project Description**

Friction Method Manning Formula Solve For Discharge

### Input Data

Channel Slope 0.25 % 0.65 ft Normal Depth

Section Definitions

Station (ft)		Elevation (ft)	
Station (it)		Lievation (it)	
	0+00		42.38
	0+05		42.27
	0+11		42.22
	0+11		41.73
	0+12		41.78
	0+31		42.78

Roughness Segment Definitions

Start Station		Ending Station		Roughness Coefficient	
	(0+00, 42.38)	(0+	31, 42.78)		0.013

### **Options**

Current Roughness Weighted Pavlovskii's Method Method Open Channel Weighting Method Pavlovskii's Method Pavlovskii's Method Closed Channel Weighting Method

#### Results

Discharge		11.34	ft³/s
Elevation Range	41.73 to 42.78 ft		
Flow Area		5.40	ft²
Wetted Perimeter		24.27	ft
Hydraulic Radius		0.22	ft
Top Width		23.76	ft
Normal Depth		0.65	ft

# **Worksheet for 70th Street Section C**

Results
Critical Depth 0.60 ft
Critical Slope 0.00427 ft/ft
Velocity 2.10 ft/s
Velocity Head 0.07 ft
Specific Energy 0.72 ft
Froude Number 0.78
Flow Type Subcritical
GVF Input Data
Downstream Depth 0.00 ft
Length 0.00 ft
Number Of Steps 0
GVF Output Data
Upstream Depth 0.00 ft
Profile Description
Profile Headloss 0.00 ft
Downstream Velocity Infinity ft/s
Upstream Velocity Infinity ft/s
Normal Depth 0.65 ft
Critical Depth 0.60 ft
Channel Slope 0.25 %
Critical Slope 0.00427 ft/ft



# APPENDIX F Aerial Site Photographs





7000 E. MCDOWELL ROAD, SCOTTSDALE, AZ 85257 SOUTHDALE

AERIAL SITE PHOTOGRAPHS

3&engineering civil engineering

3 ENGINEERING, LLC 6370 E. THOMAS ROAD, SUITE # 200- PHOENIX, ARIZONA 85251 PHONE: (602) 334-4387 - FAX: (602) 490-3230 WWW.3ENGINEERING; COM





# APPENDIX G

Offsite Aerial Photographs





1"=600'

7000 E. MCDOWELL ROAD,

SCOTTSDALE, AZ 85257

**PHOTOGRAPHS** 

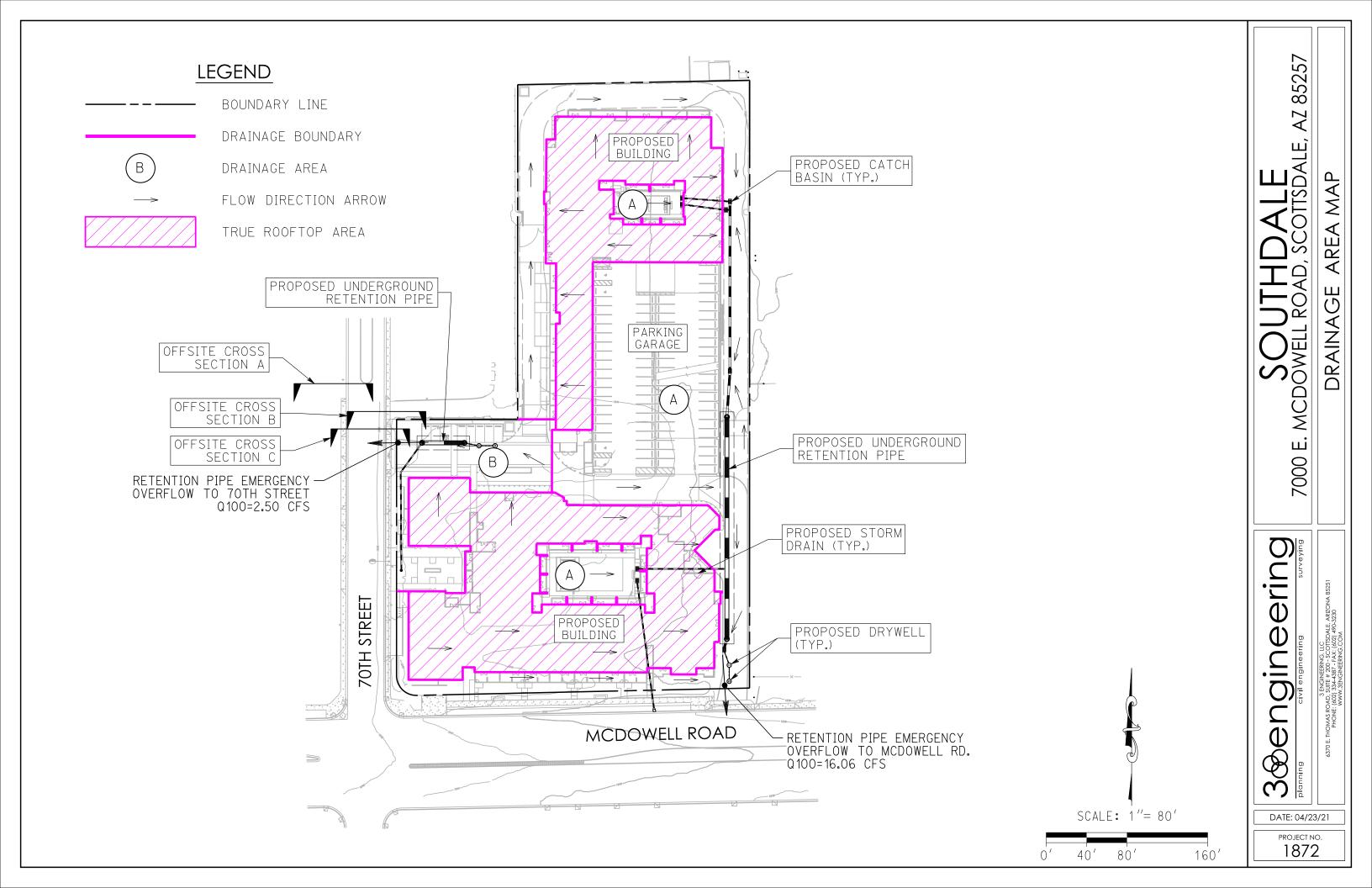
SITE

**AERIAL** 



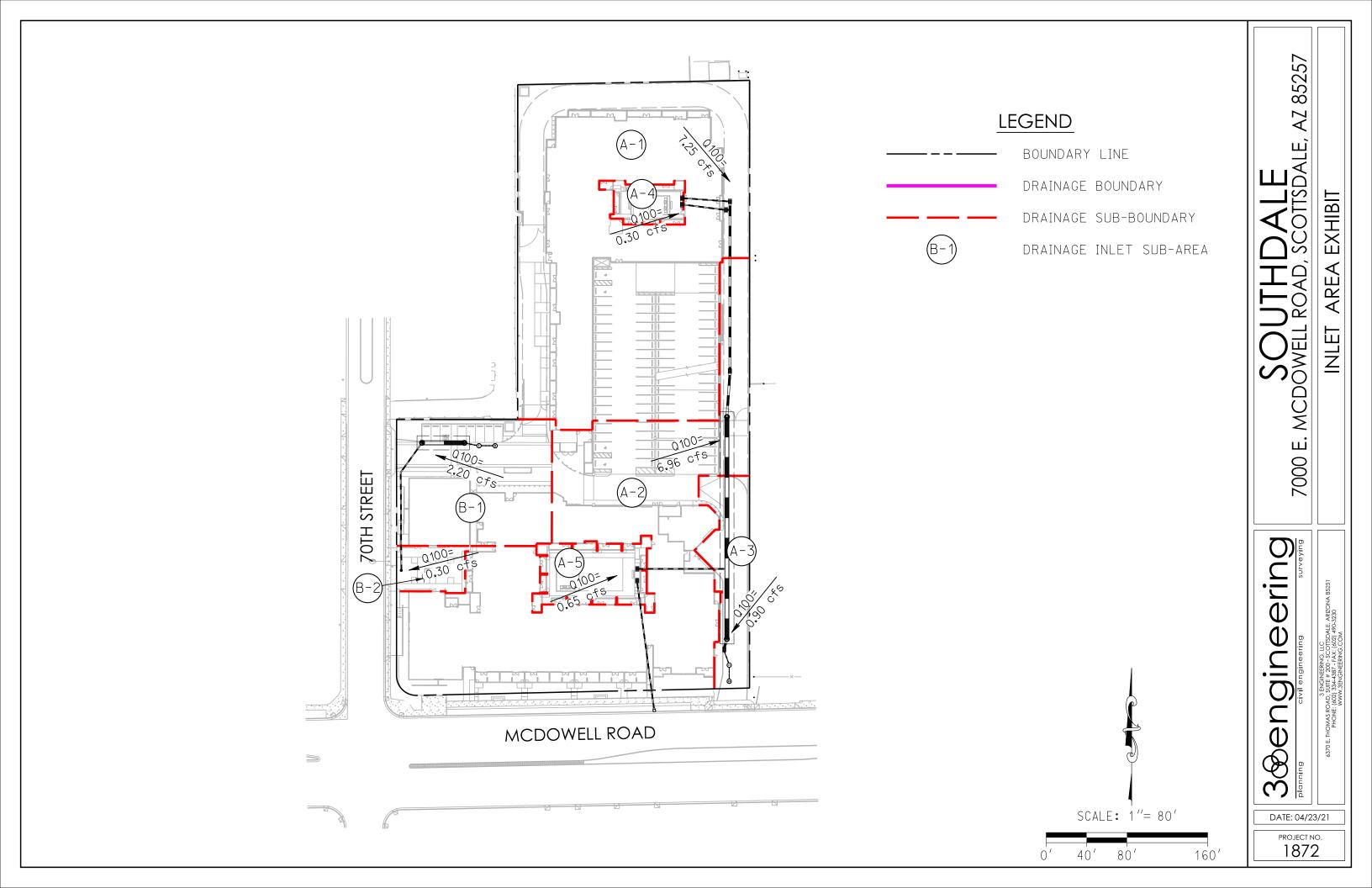
# APPENDIX H

Onsite Drainage Area Map





# APPENDIX I Inlet Area Exhibit





# APPENDIX J

Onsite Drainage Calculations



Post-Development Rational Method Calculations

Sub-Area	Area	C <sub>10</sub>	C <sub>100</sub>	Tc	<b>İ</b> 10	<b>İ</b> 100	<b>Q</b> 10	Q <sub>100</sub>
	(acre)	(weighted)	(weighted)	(min)	(in/hr)	(in/hr)	(cfs)	(cfs)
A-1	1.60	0.76	0.81	10	3.53	5.6	4.29	7.25
A-2	1.41	0.83	0.88	10	3.53	5.6	4.14	6.96
A-3	0.18	0.84	0.89	10	3.53	5.6	0.53	0.90
A-4	0.07	0.76	0.81	10	3.53	5.6	0.18	0.30
A-5	0.16	0.70	0.75	10	3.53	5.6	0.39	0.65
B-1	0.44	0.84	0.89	10	3.53	5.6	1.31	2.20
B-2	0.07	0.69	0.74	10	3.53	5.6	0.17	0.30

#### On-Site Retention for the First Flush Storm

						U.G.	
				Total	Surface	Retention	Total
Sub-Area	Area	C <sub>100</sub>	Р	Vol. Req.	Vol. Prov.	Provided	Vol. Prov.
	(acre)		(in)	(cf)	(cf)	(cf)	(cf)
Α	1.97	0.76	0.50	2,706	-	2,764	2,764
В	0.32	0.82	0.50	479	-	528	528

### PRE V. POST RETENTION CALCULATIONS

C = 0.95 (IMPERVIOUS), C = 0.45 (PERVIOUS)

P = 2.14 IN

AREA OF LOT = 171,290 SF

#### PRE (EXISTING)

AREA OF IMPERVIOUS = 161,857 SF

AREA OF PERVIOUS = 9,433 SF

WEIGHTED C = 
$$\left( \frac{(161,857 \times 0.95) + (9,433 \times 0.45)}{171,290} \right)$$

WEIGHTED C = 0.92

### POST (PROPOSED)

AREA OF IMPERVIOUS = 134,825 SF

AREA OF PERVIOUS = 36,465 SF

WEIGHTED C = 
$$\left(\frac{(134,825 \times 0.95) + (36,465 \times 0.45)}{171,290}\right)$$

WEIGHTED C = 0.84

$$(0.84-0.92)$$
  $\left(\frac{2.14}{12}\right)$   $(171,290) = 0$  O CF REQUIRED



**Grated Inlet Capacity - Weir Condition** 

			Inlet Capacity			
			w/ 40%			
Inlet Type	Inlet	Q <sub>100</sub>	Clogging	d	Cw	Р
		(cfs)	(cfs)	(ft)		(ft)
M.A.G. type "F"	A-1	7.25	7.53	0.50	3	11.83
M.A.G. type "F"	A-2	6.96	7.53	0.50	3	11.83
M.A.G. type "F"	A-3	0.90	7.53	0.50	3	11.83
M.A.G. type "F"	A-4	0.30	2.66	0.25	3	11.83
M.A.G. type "F"	A-5	0.65	2.66	0.25	3	11.83
30" Grated Inlet	B-1	2.20	5.00	0.50	3	7.85
24" Grated Inlet	B-2	0.30	0.86	0.18	3	6.28

Cw= 3.0 weir coefficient Q=Cw\*P\*d^1.5

Q = discharge capacity
P = inlet perimeter
d = flow depth



Weighted C Coefficient Calculations

		Building &				
	Overall	Parking Area	Landscape	Overall		
	Area (s.f.)	(s.f.)	Area (s.f.)	Area (Ac.)	C <sub>10</sub>	C <sub>100</sub>
Α	85633	52,841	32,793	1.97	0.71	0.76
В	14091	10,312	3,779	0.32	0.77	0.82
A-1	69664	50,135	19,529	1.60	0.76	0.81
A-2	61567	52,908	8,658	1.41	0.83	0.88
A-3	7881	6,866	1,015	0.18	0.84	0.89
A-4	2912	2,122	790	0.07	0.76	0.81
A-5	6806	4,059	2,748	0.16	0.70	0.75
B-1	19342	16,883	2,459	0.44	0.84	0.89
B-2	3117	1,797	1,320	0.07	0.69	0.74

C=((Building & Hardscape Area x 0.95) + (Landscape Area x 0.45)) / Overall Area

C<sub>100</sub> Building & Hardscape = 0.95

C<sub>100</sub> Landscape = 0.45



**Drywell Percolation Rates** 

_			# of	Drywell
	Total	Dry-Up	Drywells	Perc Rate
Sub-Area	Basin Vol.	Time	Provided	Required
	(cf)	(hr)		(cf/s)
Α	2,764	36.00	1	0.021
В	528	36.00	1	0.004



#### NOAA Atlas 14, Volume 1, Version 5 Location name: Scottsdale, Arizona, USA\* Latitude: 33.4662°, Longitude: -111.93° Elevation: 1237.91 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 po	oint preci	pitation fr	equency	estimates	with 90%	confiden	ce interv	als (in inc	hes) <sup>1</sup>
Duration				Averaç	ge recurrenc	e interval (y	/ears)			
Duration	1	2	5	10	25	50	100	200	500	1000
5-min	<b>0.180</b> (0.152-0.218)	<b>0.235</b> (0.199-0.286)	<b>0.321</b> (0.269-0.387)	<b>0.386</b> (0.322-0.464)	<b>0.475</b> (0.390-0.567)	<b>0.544</b> (0.440-0.647)	<b>0.613</b> (0.487-0.727)	<b>0.684</b> (0.535-0.812)	<b>0.780</b> (0.594-0.926)	<b>0.853</b> (0.637-1.02)
10-min	<b>0.274</b> (0.231-0.332)	<b>0.359</b> (0.303-0.435)	<b>0.488</b> (0.410-0.589)	<b>0.588</b> (0.491-0.705)	<b>0.722</b> (0.593-0.864)	<b>0.827</b> (0.670-0.984)	<b>0.933</b> (0.742-1.11)	<b>1.04</b> (0.815-1.24)	<b>1.19</b> (0.904-1.41)	<b>1.30</b> (0.969-1.55)
15-min	<b>0.340</b> (0.286-0.412)	<b>0.444</b> (0.376-0.538)	<b>0.606</b> (0.508-0.730)	<b>0.729</b> (0.608-0.874)	<b>0.895</b> (0.735-1.07)	<b>1.02</b> (0.831-1.22)	<b>1.16</b> (0.920-1.37)	<b>1.29</b> (1.01-1.53)	<b>1.47</b> (1.12-1.75)	<b>1.61</b> (1.20-1.92)
30-min	<b>0.457</b> (0.385-0.555)	<b>0.598</b> (0.506-0.725)	<b>0.815</b> (0.684-0.983)	<b>0.982</b> (0.819-1.18)	<b>1.21</b> (0.990-1.44)	<b>1.38</b> (1.12-1.64)	<b>1.56</b> (1.24-1.85)	<b>1.74</b> (1.36-2.06)	<b>1.98</b> (1.51-2.35)	<b>2.17</b> (1.62-2.58)
60-min	<b>0.566</b> (0.477-0.686)	<b>0.740</b> (0.626-0.897)	<b>1.01</b> (0.847-1.22)	<b>1.22</b> (1.01-1.46)	<b>1.49</b> (1.23-1.78)	<b>1.71</b> (1.39-2.03)	<b>1.93</b> (1.53-2.29)	<b>2.15</b> (1.68-2.55)	<b>2.45</b> (1.87-2.91)	<b>2.68</b> (2.00-3.19)
2-hr	<b>0.657</b> (0.563-0.781)	<b>0.851</b> (0.728-1.01)	<b>1.14</b> (0.974-1.35)	<b>1.36</b> (1.15-1.61)	<b>1.67</b> (1.39-1.95)	<b>1.90</b> (1.56-2.22)	<b>2.14</b> (1.73-2.50)	<b>2.38</b> (1.89-2.78)	<b>2.71</b> (2.10-3.17)	<b>2.96</b> (2.25-3.49)
3-hr	<b>0.712</b> (0.606-0.850)	<b>0.912</b> (0.781-1.10)	<b>1.20</b> (1.02-1.44)	<b>1.43</b> (1.21-1.70)	<b>1.75</b> (1.46-2.07)	<b>2.00</b> (1.65-2.36)	<b>2.27</b> (1.83-2.68)	<b>2.55</b> (2.02-3.00)	<b>2.94</b> (2.26-3.46)	<b>3.25</b> (2.43-3.84)
6-hr	<b>0.857</b> (0.745-1.00)	<b>1.09</b> (0.949-1.27)	<b>1.40</b> (1.21-1.63)	<b>1.64</b> (1.42-1.91)	<b>1.98</b> (1.68-2.29)	<b>2.24</b> (1.88-2.58)	<b>2.52</b> (2.07-2.90)	<b>2.80</b> (2.26-3.23)	<b>3.18</b> (2.51-3.68)	<b>3.49</b> (2.68-4.05)
12-hr	<b>0.961</b> (0.843-1.11)	<b>1.22</b> (1.07-1.41)	<b>1.54</b> (1.35-1.78)	<b>1.80</b> (1.56-2.07)	<b>2.15</b> (1.84-2.47)	<b>2.41</b> (2.05-2.77)	<b>2.69</b> (2.25-3.08)	<b>2.96</b> (2.44-3.41)	<b>3.34</b> (2.68-3.85)	<b>3.63</b> (2.86-4.22)
24-hr	<b>1.16</b> (1.04-1.30)	<b>1.47</b> (1.32-1.65)	<b>1.90</b> (1.70-2.13)	<b>2.25</b> (2.00-2.51)	<b>2.72</b> (2.41-3.04)	<b>3.10</b> (2.73-3.45)	<b>3.49</b> (3.05-3.89)	<b>3.90</b> (3.38-4.34)	<b>4.46</b> (3.82-4.97)	<b>4.90</b> (4.16-5.47)
2-day	<b>1.25</b> (1.12-1.40)	<b>1.60</b> (1.44-1.79)	<b>2.10</b> (1.88-2.35)	<b>2.50</b> (2.23-2.79)	<b>3.06</b> (2.71-3.41)	<b>3.50</b> (3.08-3.91)	<b>3.97</b> (3.48-4.44)	<b>4.45</b> (3.87-4.98)	<b>5.14</b> (4.41-5.76)	<b>5.68</b> (4.83-6.40)
3-day	<b>1.32</b> (1.19-1.48)	<b>1.69</b> (1.52-1.90)	<b>2.22</b> (1.99-2.49)	<b>2.65</b> (2.37-2.96)	<b>3.26</b> (2.89-3.63)	<b>3.74</b> (3.30-4.17)	<b>4.26</b> (3.73-4.75)	<b>4.80</b> (4.17-5.36)	<b>5.56</b> (4.77-6.21)	<b>6.17</b> (5.24-6.92)
4-day	<b>1.39</b> (1.25-1.56)	<b>1.78</b> (1.60-2.00)	<b>2.35</b> (2.10-2.62)	<b>2.81</b> (2.50-3.13)	<b>3.46</b> (3.07-3.85)	<b>3.98</b> (3.51-4.43)	<b>4.55</b> (3.98-5.06)	<b>5.14</b> (4.46-5.73)	<b>5.98</b> (5.12-6.67)	<b>6.66</b> (5.65-7.45)
7-day	<b>1.54</b> (1.38-1.73)	<b>1.97</b> (1.77-2.20)	<b>2.60</b> (2.32-2.90)	<b>3.10</b> (2.77-3.47)	<b>3.82</b> (3.39-4.27)	<b>4.40</b> (3.88-4.91)	<b>5.02</b> (4.39-5.60)	<b>5.67</b> (4.92-6.33)	<b>6.60</b> (5.65-7.36)	<b>7.34</b> (6.22-8.21)
10-day	<b>1.68</b> (1.50-1.87)	<b>2.14</b> (1.92-2.40)	<b>2.83</b> (2.53-3.15)	<b>3.38</b> (3.01-3.76)	<b>4.14</b> (3.68-4.61)	<b>4.76</b> (4.20-5.30)	<b>5.42</b> (4.75-6.03)	<b>6.11</b> (5.31-6.80)	<b>7.07</b> (6.07-7.88)	<b>7.85</b> (6.67-8.76)
20-day	<b>2.06</b> (1.85-2.29)	<b>2.65</b> (2.38-2.94)	<b>3.49</b> (3.13-3.88)	<b>4.13</b> (3.70-4.58)	<b>4.99</b> (4.45-5.54)	<b>5.65</b> (5.02-6.27)	<b>6.33</b> (5.59-7.03)	<b>7.01</b> (6.16-7.79)	<b>7.93</b> (6.91-8.84)	<b>8.64</b> (7.47-9.64)
30-day	<b>2.40</b> (2.15-2.67)	<b>3.09</b> (2.78-3.44)	<b>4.07</b> (3.65-4.51)	<b>4.82</b> (4.31-5.33)	<b>5.82</b> (5.18-6.44)	<b>6.59</b> (5.84-7.28)	<b>7.37</b> (6.51-8.15)	<b>8.17</b> (7.18-9.04)	<b>9.25</b> (8.07-10.2)	<b>10.1</b> (8.71-11.2)
45-day	<b>2.79</b> (2.51-3.10)	<b>3.59</b> (3.24-3.99)	<b>4.73</b> (4.26-5.25)	<b>5.57</b> (5.00-6.18)	<b>6.68</b> (5.98-7.41)	<b>7.52</b> (6.70-8.33)	<b>8.36</b> (7.42-9.27)	<b>9.20</b> (8.13-10.2)	<b>10.3</b> (9.04-11.5)	<b>11.1</b> (9.72-12.4)
60-day	<b>3.09</b> (2.79-3.42)	<b>3.99</b> (3.60-4.42)	<b>5.25</b> (4.73-5.81)	<b>6.16</b> (5.54-6.81)	<b>7.35</b> (6.59-8.13)	<b>8.23</b> (7.35-9.11)	<b>9.11</b> (8.11-10.1)	<b>9.97</b> (8.84-11.0)	<b>11.1</b> (9.78-12.3)	<b>11.9</b> (10.5-13.3)

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.

Back to Top



#### NOAA Atlas 14, Volume 1, Version 5 Location name: Scottsdale, Arizona, USA\* Latitude: 33.4662°, Longitude: -111.93° Elevation: 1237.91 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-b	ased poin	nt precipit	ation freq	uency es	timates w	ith 90% c	onfidence	intervals	(in inche	s/hour) <sup>1</sup>
Duration				Avera	ge recurren	ce interval (	years)			
Duration	1	2	5	10	25	50	100	200	500	1000
5-min	<b>2.16</b> (1.82-2.62)	<b>2.82</b> (2.39-3.43)	<b>3.85</b> (3.23-4.64)	<b>4.63</b> (3.86-5.57)	<b>5.70</b> (4.68-6.80)	<b>6.53</b> (5.28-7.76)	<b>7.36</b> (5.84-8.72)	<b>8.21</b> (6.42-9.74)	<b>9.36</b> (7.13-11.1)	<b>10.2</b> (7.64-12.2)
10-min	<b>1.64</b> (1.39-1.99)	<b>2.15</b> (1.82-2.61)	<b>2.93</b> (2.46-3.53)	<b>3.53</b> (2.95-4.23)	<b>4.33</b> (3.56-5.18)	<b>4.96</b> (4.02-5.90)	<b>5.60</b> (4.45-6.64)	<b>6.25</b> (4.89-7.41)	<b>7.12</b> (5.42-8.46)	<b>7.79</b> (5.81-9.28)
15-min	<b>1.36</b> (1.14-1.65)	<b>1.78</b> (1.50-2.15)	<b>2.42</b> (2.03-2.92)	<b>2.92</b> (2.43-3.50)	<b>3.58</b> (2.94-4.28)	<b>4.10</b> (3.32-4.88)	<b>4.63</b> (3.68-5.49)	<b>5.16</b> (4.04-6.12)	<b>5.88</b> (4.48-6.99)	<b>6.44</b> (4.80-7.66)
30-min	<b>0.914</b> (0.770-1.11)	<b>1.20</b> (1.01-1.45)	<b>1.63</b> (1.37-1.97)	<b>1.96</b> (1.64-2.36)	<b>2.41</b> (1.98-2.88)	<b>2.76</b> (2.24-3.29)	<b>3.11</b> (2.48-3.70)	<b>3.48</b> (2.72-4.12)	<b>3.96</b> (3.02-4.71)	<b>4.34</b> (3.24-5.16)
60-min	<b>0.566</b> (0.477-0.686)	<b>0.740</b> (0.626-0.897)	<b>1.01</b> (0.847-1.22)	<b>1.22</b> (1.01-1.46)	<b>1.49</b> (1.23-1.78)	<b>1.71</b> (1.39-2.03)	<b>1.93</b> (1.53-2.29)	<b>2.15</b> (1.68-2.55)	<b>2.45</b> (1.87-2.91)	<b>2.68</b> (2.00-3.19)
2-hr	<b>0.328</b> (0.282-0.390)	<b>0.426</b> (0.364-0.506)	<b>0.571</b> (0.487-0.676)	<b>0.682</b> (0.575-0.804)	<b>0.832</b> (0.694-0.977)	<b>0.949</b> (0.780-1.11)	<b>1.07</b> (0.866-1.25)	<b>1.19</b> (0.947-1.39)	<b>1.35</b> (1.05-1.59)	<b>1.48</b> (1.12-1.75)
3-hr	<b>0.237</b> (0.202-0.283)	<b>0.304</b> (0.260-0.365)	<b>0.400</b> (0.340-0.478)	<b>0.476</b> (0.402-0.566)	<b>0.582</b> (0.485-0.689)	<b>0.667</b> (0.548-0.787)	<b>0.757</b> (0.610-0.892)	<b>0.849</b> (0.673-0.999)	<b>0.978</b> (0.751-1.15)	<b>1.08</b> (0.811-1.28)
6-hr	<b>0.143</b> (0.124-0.168)	<b>0.181</b> (0.158-0.213)	<b>0.233</b> (0.203-0.272)	<b>0.274</b> (0.236-0.319)	<b>0.330</b> (0.281-0.382)	<b>0.374</b> (0.313-0.431)	<b>0.420</b> (0.346-0.484)	<b>0.467</b> (0.377-0.539)	<b>0.532</b> (0.419-0.615)	<b>0.582</b> (0.448-0.676)
12-hr	<b>0.080</b> (0.070-0.092)	<b>0.101</b> (0.089-0.117)	<b>0.128</b> (0.112-0.148)	<b>0.150</b> (0.130-0.172)	<b>0.178</b> (0.153-0.205)	<b>0.200</b> (0.170-0.229)	<b>0.223</b> (0.186-0.256)	<b>0.246</b> (0.203-0.283)	<b>0.277</b> (0.223-0.320)	<b>0.301</b> (0.237-0.350)
24-hr	<b>0.048</b> (0.043-0.054)	<b>0.061</b> (0.055-0.069)	<b>0.079</b> (0.071-0.089)	<b>0.094</b> (0.083-0.105)	<b>0.113</b> (0.100-0.127)	<b>0.129</b> (0.114-0.144)	<b>0.145</b> (0.127-0.162)	<b>0.162</b> (0.141-0.181)	<b>0.186</b> (0.159-0.207)	<b>0.204</b> (0.173-0.228)
2-day	<b>0.026</b> (0.023-0.029)	<b>0.033</b> (0.030-0.037)	<b>0.044</b> (0.039-0.049)	<b>0.052</b> (0.046-0.058)	<b>0.064</b> (0.056-0.071)	<b>0.073</b> (0.064-0.081)	<b>0.083</b> (0.072-0.092)	<b>0.093</b> (0.081-0.104)	<b>0.107</b> (0.092-0.120)	<b>0.118</b> (0.101-0.133)
3-day	<b>0.018</b> (0.016-0.021)	<b>0.023</b> (0.021-0.026)	<b>0.031</b> (0.028-0.035)	<b>0.037</b> (0.033-0.041)	<b>0.045</b> (0.040-0.050)	<b>0.052</b> (0.046-0.058)	<b>0.059</b> (0.052-0.066)	<b>0.067</b> (0.058-0.074)	<b>0.077</b> (0.066-0.086)	<b>0.086</b> (0.073-0.096)
4-day	<b>0.015</b> (0.013-0.016)	<b>0.019</b> (0.017-0.021)	<b>0.024</b> (0.022-0.027)	<b>0.029</b> (0.026-0.033)	<b>0.036</b> (0.032-0.040)	<b>0.041</b> (0.037-0.046)	<b>0.047</b> (0.041-0.053)	<b>0.054</b> (0.046-0.060)	<b>0.062</b> (0.053-0.069)	<b>0.069</b> (0.059-0.078)
7-day	<b>0.009</b> (0.008-0.010)	<b>0.012</b> (0.011-0.013)	<b>0.015</b> (0.014-0.017)	<b>0.018</b> (0.016-0.021)	<b>0.023</b> (0.020-0.025)	<b>0.026</b> (0.023-0.029)	<b>0.030</b> (0.026-0.033)	<b>0.034</b> (0.029-0.038)	<b>0.039</b> (0.034-0.044)	<b>0.044</b> (0.037-0.049)
10-day	<b>0.007</b> (0.006-0.008)	<b>0.009</b> (0.008-0.010)	<b>0.012</b> (0.011-0.013)	<b>0.014</b> (0.013-0.016)	<b>0.017</b> (0.015-0.019)	<b>0.020</b> (0.018-0.022)	<b>0.023</b> (0.020-0.025)	<b>0.025</b> (0.022-0.028)	<b>0.029</b> (0.025-0.033)	<b>0.033</b> (0.028-0.036)
20-day	<b>0.004</b> (0.004-0.005)	<b>0.006</b> (0.005-0.006)	<b>0.007</b> (0.007-0.008)	<b>0.009</b> (0.008-0.010)	<b>0.010</b> (0.009-0.012)	<b>0.012</b> (0.010-0.013)	<b>0.013</b> (0.012-0.015)	<b>0.015</b> (0.013-0.016)	<b>0.017</b> (0.014-0.018)	<b>0.018</b> (0.016-0.020)
30-day	<b>0.003</b> (0.003-0.004)	<b>0.004</b> (0.004-0.005)	<b>0.006</b> (0.005-0.006)	<b>0.007</b> (0.006-0.007)	<b>0.008</b> (0.007-0.009)	<b>0.009</b> (0.008-0.010)	<b>0.010</b> (0.009-0.011)	<b>0.011</b> (0.010-0.013)	<b>0.013</b> (0.011-0.014)	<b>0.014</b> (0.012-0.016)
45-day	<b>0.003</b> (0.002-0.003)	<b>0.003</b> (0.003-0.004)	<b>0.004</b> (0.004-0.005)	<b>0.005</b> (0.005-0.006)	<b>0.006</b> (0.006-0.007)	<b>0.007</b> (0.006-0.008)	<b>0.008</b> (0.007-0.009)	<b>0.009</b> (0.008-0.009)	<b>0.010</b> (0.008-0.011)	<b>0.010</b> (0.009-0.012)
60-day	<b>0.002</b> (0.002-0.002)	<b>0.003</b> (0.002-0.003)	<b>0.004</b> (0.003-0.004)	<b>0.004</b> (0.004-0.005)	<b>0.005</b> (0.005-0.006)	<b>0.006</b> (0.005-0.006)	<b>0.006</b> (0.006-0.007)	<b>0.007</b> (0.006-0.008)	<b>0.008</b> (0.007-0.009)	<b>0.008</b> (0.007-0.009)

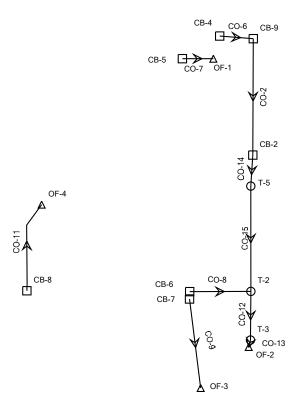
<sup>&</sup>lt;sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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.

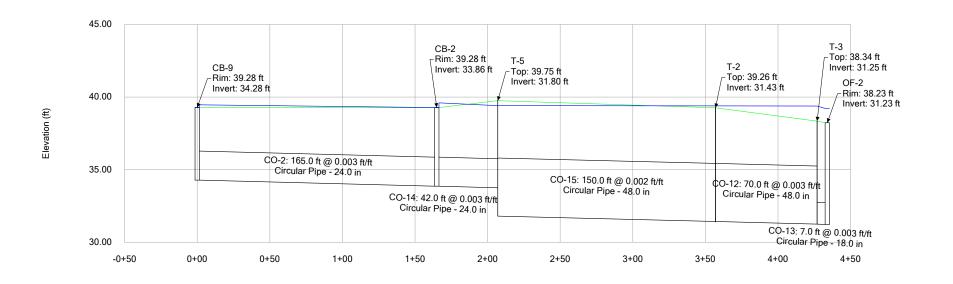
Please refer to NOAA Atlas 14 document for more information.

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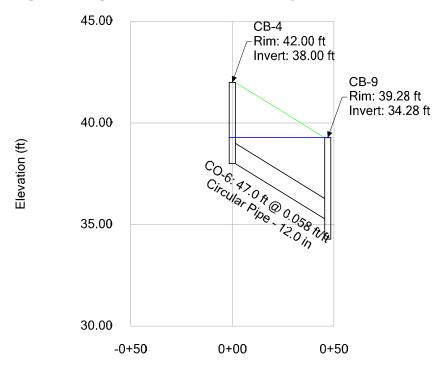
### Scenario: Base



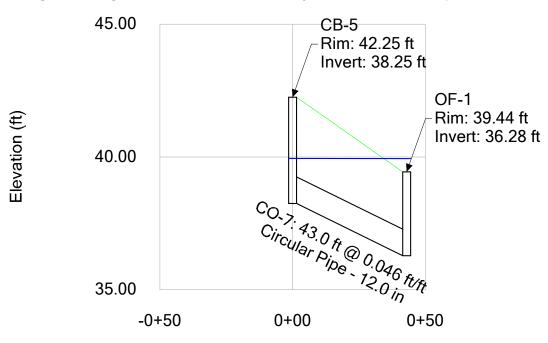
# Profile Report Engineering Profile - East Retention Pipe (1872.stc)



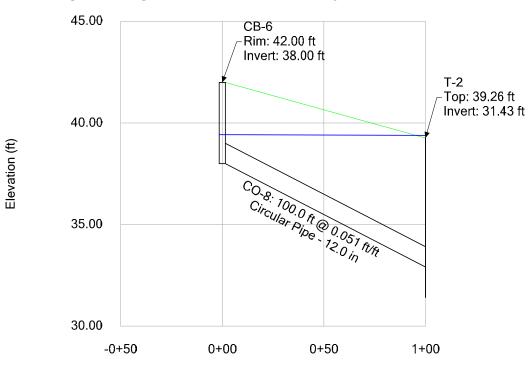
# Profile Report Engineering Profile - North Courtyard Inlet (1872.stc)



# Profile Report Engineering Profile - North Courtyard Overflow Pipe (1872.stc)

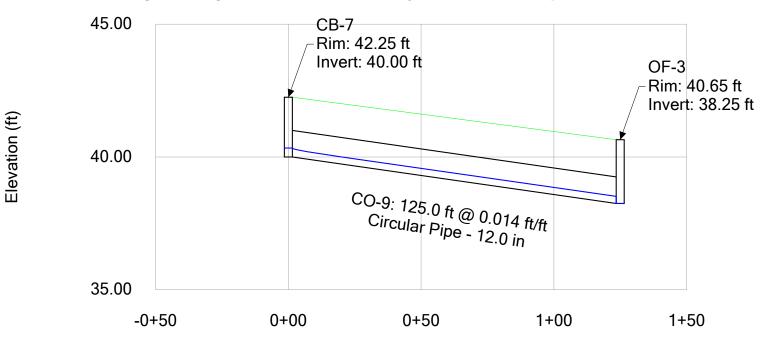


# Profile Report Engineering Profile - South Courtyard Inlet (1872.stc)

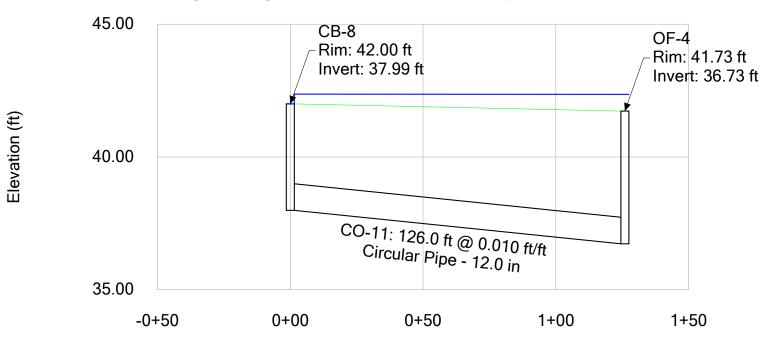


Profile Report

Engineering Profile - South Courtyard Overflow Pipe (1872.stc)



# Profile Report Engineering Profile - West Retention Pipe (1872.stc)



### Conduit FlexTable: Combined Pipe/Node Report (1872.stc)

Label	Start Node	Stop Node	Length (Unified ) (ft)	Total Flow (ft³/s)	Rise (Unifie d) (in)	Capacity (Full Flow) (ft³/s)	Velocity (Average) (ft/s)	Invert (Upstr eam) (ft)	Invert (Downstr eam) (ft)	Slope (ft/ft)	Mannin g's n	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
CO-9	CB-7	OF-3	125.0	0.65	12.0	4.22	3.89	40.00	38.25	0.014	0.013	40.34	38.52
CO-11	CB-8	OF-4	126.0	0.30	12.0	3.56	0.38	37.99	36.73	0.010	0.013	42.37	42.36
CO-7	CB-5	OF-1	43.0	0.37	12.0	7.63	0.47	38.25	36.28	0.046	0.013	39.94	39.94
CO-8	CB-6	T-2	100.0	0.65	12.0	8.04	0.83	38.00	32.91	0.051	0.013	39.43	39.39
CO-6	CB-4	CB-9	47.0	0.30	12.0	8.57	0.38	38.00	35.28	0.058	0.013	39.28	39.28
CO-2	CB-9	CB-2	165.0	7.55	24.0	11.41	2.40	34.28	33.86	0.003	0.013	39.46	39.28
CO-14	CB-2	T-5	42.0	15.41	24.0	11.58	4.91	33.86	33.75	0.003	0.013	39.60	39.41
CO-15	T-5	T-2	150.0	15.41	48.0	71.58	1.23	31.80	31.43	0.002	0.013	39.41	39.39
CO-12	T-2	T-3	70.0	16.06	48.0	72.84	1.28	31.43	31.25	0.003	0.013	39.39	39.38
CO-13	T-3	OF-2	7.0	16.06	18.0	5.61	9.09	31.25	31.23	0.003	0.013	39.38	39.22

### FlexTable: Catch Basin Table (1872.stc)

Label	Station (Calculated) (ft)	Elevation (Ground) (ft)	Set Rim to Ground Elevation?	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Flow (Additional) (ft³/s)	Carryover Additional Flow (ft³/s)	Flow (Known) (ft³/s)	Inlet Type	Maximum Inflow (ft³/s)	Capture Efficiency (%)
CB-2	2+69	39.28	True	39.28	33.86	7.86	0.00	0.00	Percent Capture	0.00	100.0
CB-4	4+81	42.00	True	42.00	38.00	0.30	0.00	0.00	Percent Capture	0.00	100.0
CB-5	0+43	42.25	True	42.25	38.25	0.37	0.00	0.00	Percent Capture	0.00	100.0
CB-6	1+77	42.00	True	42.00	38.00	0.65	0.00	0.00	Percent Capture	0.00	100.0
CB-7	1+25	42.25	True	42.25	40.00	0.65	0.00	0.00	Percent Capture	0.00	100.0
CB-8	1+26	42.00	True	42.00	37.99	0.30	0.00	0.00	Percent Capture	0.00	100.0
CB-9	4+34	39.28	True	39.28	34.28	7.25	0.00	0.00	Percent Capture	0.00	100.0
Inlet	Desired	Depth (In)	Depth	Hydraulic	Hydraulic	System Fix	red		•	•	•
Location	Sump	(ft)	(Out)	Grade Line	Grade Line						
	Depth		(ft)	(In)	(Out)	(ft³/s)					
	(ft)	1	<b>1</b>	(ft)	(ft)						
On Grade	0.00	5.42	5.42	39.28	39.2	28 15	.41				
On Grade	0.00	1.28	1.28	39.28	39.2	28 0	.30				
On Grade	0.00	1.69	1.69	39.94	39.9	0 0	.37				
On Grade	0.00	1.43	1.43	39.43	39.4	13 0	.65				
On Grade	0.00	0.34	0.34	40.34	40.3	84 0	.65				
On Grade	0.00	4.01	4.01	42.00	42.0	0 0	.30				
On Grade	0.00	5.00	5.00	39.28	39.2	28 7	.55				

### FlexTable: Outfall Table (1872.stc)

Label	Station (ft)	Elevation (Ground) (ft)	Set Rim to Ground Elevation	Elevation (Invert) (ft)	Boundary Condition Type	Elevation (Tailwater) (ft)	Flow (Outfall) (ft³/s)
OF-1	0+00	39.44	True	36.28	User Defined Tailwater	39.94	0.37
OF-2	0+00	38.23	True	31.23	User Defined Tailwater	39.22	16.06
OF-3	0+00	40.65	True	38.25	Free Outfall	0.00	0.65
OF-4	0+00	41.73	True	36.73	User Defined Tailwater	42.36	0.30

### FlexTable: Transition Table (1872.stc)

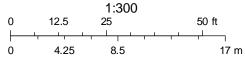
Label	Elevation (Ground) (ft)	Elevation (Top) (ft)	Elevation (Invert) (ft)	Transition Length (ft)	Headloss Method	Hydraulic Grade Line (Out) (ft)	System Fixed Flow (ft³/s)
T-2	39.26	39.26	31.43	0.0	Absolute	39.39	16.06
T-3	38.34	38.34	31.25	0.0	Absolute	39.38	16.06
T-5	39.75	39.75	31.80	0.0	Absolute	39.41	15.41



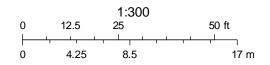
APPENDIX K

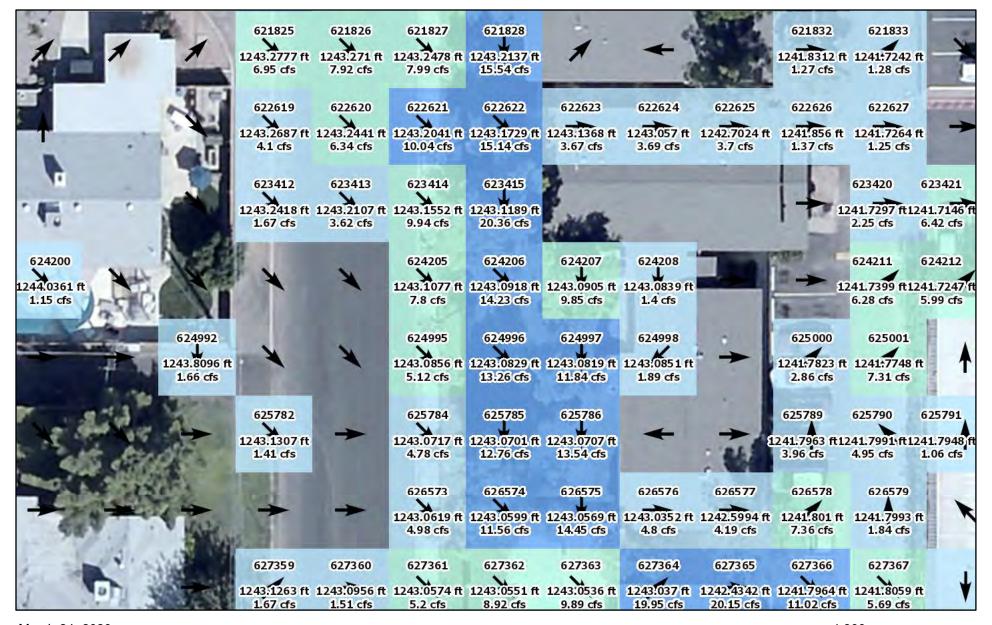
Flo-2d Maps

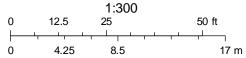




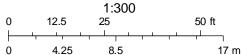
4	01 3		627359	627360	627361	627362	627363	627364	627365	627366	627367	
17	4	3 15 2 3	1243.1263 ft 1.67 cfs	1243.0956 ft 1.51 cfs	1243.0574 ft 5.2 cfs	1243.0551 ft 8,92 cfs	1243.0536 ft 9.89 cfs	1243.037 ft 19.95 cfs	1242.4342 ft 20.15 cfs		1241.8059 5.69 cfs	all to the same of
	6 3	628145	628146	628147	628148	628149	628150		4	628153	628154	100
170	1	1243.5028 ft	1243:1403 ft	1243.0964 ft	1243.0543 ft	1243.054 ft	1243.0525 ft	-	1-	1241.7957 ft	1241.7957	off Y
200	- 4	3.17 cfs	2.84 cfs	3.45 cfs	5.69 cfs	8.43 cfs	6.29 cfs		March 1	8.3 cfs	2.5 cfs	
628930	628931	628932	628933	628934	628935	628936	628937	628938		628940		628942
				_	200	-	1	- 1		1	7	7
1243.826 ft 8.16 cfs	1243.7852 ft 7.68 cfs	1243.5455 ft 5.16 cfs	1243:1724 ft 3.92 cfs	1243.1022 ft 3.36 cfs	1243.051 ft 4.63 cfs	1243.052 ft 5.44 cfs	1243.0516 ft 4.94 cfs	1243.024 ft 4.28 cfs	days	1241.795 ft 4.24 cfs	12	241.7721 ft 4 cfs
914/20			1000		-1-14				Marine.	The same of		
629716	629717	629718	629719	629720	629721	629722	629723	629724	629725	629726		629728
1243.8265 ft	the State of the S				1243.0491 ft	And the second s		The second secon	1242.5955 ft	The second secon	1 1	241.7531 ft
9.8 cfs	7.8 cfs	4.55 cfs	7.35 cfs	5.37 cfs	6.7 cfs	6.03 cfs	3.08 cfs	4.08 cfs	7.57 cfs	6.3 cfs		5.05 cfs
630501	630502	630503	630504	630505	630506	630507	1			630511	630512	630513
				-	1243.0331 ft		Market .			241.7766 ft12	-	
9.7 cfs	11.71 cfs	12.89 cfs	5.79 cfs	5.14 cfs	8.55 cfs	9.59 cfs	Maria	1,000			41.7682 R L 5.93 cfs	4.82 cfs
		and Assessed			and the last	1	The same	1	200	TO DO		A C
631285	631286	631287	631288	631289	631290	631291	Section 1		SECTION .	631295	631296	631297
		1243.4628 ft					AME IN			1241.7714 ft	Secretary States of the Manager Property and	management on the first of the
8.77 cfs	7.98 cfs	8.66 cfs	9.08 cfs	4.93 cfs	10.9 cfs	13.07 cfs		Transport		3.64 cfs	4.48 cfs	4.75 cfs
-		1 1 20	632072	632073	632074	632075	632076	632077	632078	632079	632080	632081
	The state of		1243.056 ft	1242 0206 #		12/2 02/1 #	1242 0255 #		1242.3179 ft	241 7550 #1	241 7526 #	1241 717 6
	Will size	<b>建</b>	7.55 cfs	3.87 cfs	11.65 cfs	11.53 cfs	8.89 cfs	12.43 cfs	12.48 cfs	6.68 cfs	5.07 cfs	4.7 cfs
		1000	Total Control			-		THE REAL PROPERTY.	4			
	Mr. The		632854	632855	632856	632857	632858	6 1	2	632861	632862	632863
	91	P C			1242.9307 ft		1242.9237 ft		E STATE	241.7518 ft12 5.79 cfs	the same of the sa	241.7097 ft 4.91 cfs
	-		4.65 cfs	4.33 cfs	9.86 cfs	9.87 cfs	6.21 cfs	Land .	MAN	5.79 CIS	4.91 cfs	4.91 CIS
		- S S (1)		- 0			0.0	4	N. Contraction	10		HEAT.



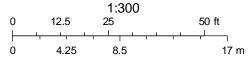














# APPENDIX L

Preliminary Grading and Drainage Plans

BEGINNING AT A POINT ON THE NORTH LINE OF THE SOUTH HALF OF SAID SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER,A DISTANCE OF 380.00 FEET EAST OF THE WEST LINE OF SAID SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER:

THENCE WEST ALONG SAID NORTH LINE TO A POINT ON THE EAST LINE OF A NORTH-SOUTH ALLEY AS SHOWN ON THE PLAT OF WONDERLAND, ACCORDING TO BOOK 100 OF MAPS, PAGE 19, RECORDS OF MARICOPA COUNTY, ARIZONA;

THENCE SOUTH ALONG THE EAST LINE OF AFORESAID ALLEY TO AN ANGLE POINT

THENCE WEST ALONG THE SOUTH LINE OF AN EAST-WEST ALLEY AS SHOWN ON AFORESAID PLAT OF WONDERLAND, TO A POINT ON THE EAST LINE OF 70TH STREET AS SHOWN ON AFORESAID PLAT:

THENCE SOUTH ALONG SAID EAST LINE, A DISTANCE OF 253.88 FEET TO THE BEGINNING OF A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 91 DEGREES 14 MINUTES 49 SECONDS AND A TANGENT OF 20.00 FEET;

THENCE SOUTHEASTERLY ALONG SAID CURVE TO THE LEFT, AN ARC DISTANCE OF

THENCE SOUTH PARALLEL WITH THE WEST LINE OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 34, A DISTANCE OF 65.00 FEET TO A POINT ON THE SOUTH LINE OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 34, FROM WHICH THE SOUTHWEST CORNER THEREOF BEARS WEST, A DISTANCE OF 52.42 FEET; THENCE EAST ALONG THE SOUTH LINE OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 34, TO A POINT 380.00 FEET EAST OF THE SOUTHWEST CORNER OF SAID SOUTHEAST QUARTER OF THE

THENCE NORTH ALONG A LINE PARALLEL TO AND 380.00 FEET EAST OF THE WEST LINE OF SAID SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER TO THE POINT OF BEGINNING:

EXCEPT THE SOUTH 65.00 FEET THEREOF.

## GENERAL NOTES FOR PUBLIC WORKS CONSTRUCTION:

- . ALL CONSTRUCTION IN THE PUBLIC RIGHTS-OF-WAY OR IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO THE LATEST MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST VERSION OF THE CITY OF SCOTTSDALE STANDARD SPECIFICATIONS AND SUPPLEMENTAL STANDARD DETAILS. IF THERE IS A CONFLICT, THE CITY'S SUPPLEMENTAL STANDARD DETAILS WILL
- THE CITY ONLY APPROVES THE SCOPE, NOT THE DETAIL OF ENGINEERING DESIGNS; THEREFORE IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE NOT VERIFIED BY THE CITY.
- THE APPROVAL OF PLANS IS VALID FOR SIX (6) MONTHS. IF ASSOCIATED PERMIT HAS NOT BEEN ISSUED WITHIN THIS TIME FRAME, THE PLANS MUST BE RESUBMITTED TO THE CITY FOR RE-APPROVAL.
- 4. A CITY INSPECTOR WILL INSPECT ALL WORKS WITHIN THE CITY OF SCOTTSDALE. NOTIFY INSPECTION SERVICES 72 HOURS BEFORE BEGINNING
- . WHENEVER EXCAVATION IS NECESSARY, CALL THE BLUE STAKE CENTER, 811, TWO WORKING DAYS BEFORE EXCAVATION BEGINS.
- PERMISSION TO WORK IN THE RIGHT-OF-WAY (PWR) PERMITS ARE REQUIRED FOR ALL WORKS WITHIN THE RIGHTS-OF-WAY AND EASEMENTS GRANTED FOR PUBLIC PURPOSES. COPIES OF ALL PERMITS MUST BE RETAINED ON-SITE AND BE AVAILABLE FOR INSPECTION AT ALL TIMES. FAILURE TO PRODUCE THE REQUIRED PERMITS WILL RESULT IN IMMEDIATE SUSPENSION OF ALL WORK UNTIL THE PROPER PERMIT DOCUMENTATION IS OBTAINED.

## DRAINAGE AREA A AREA OF IMPERVIOUS = 52,841 SF AREA OF PERVIOUS = 32,793 SF $(52,841 \times 0.95) + (32,793 \times 0.45)$ WEIGHTED C = WEIGHTED C = 0.76DRAINAGE AREA B AREA OF IMPERVIOUS = 10,312 SF AREA OF PERVIOUS = 3,779 SF

10,312 X 0.95) + (3,779 X 0.45)\

WEIGHTED C CALCULATIONS

UTILITY	UTILITY COMPANY	NAME OF COMPANY REPRESENTATIVE	TELEPHONE NUMBER	DATE SIGNED
ELECTRIC	APS			
TELEPHONE	CENTURY LINK			
NATURAL GAS	SOUTHWEST GAS			
CABLE TV	COX COMMUNICATIONS			
OTHER	A.T.&T.			
OTHER				

ENGINEER'S CERTIFICATION

WEIGHTED C = 0.82

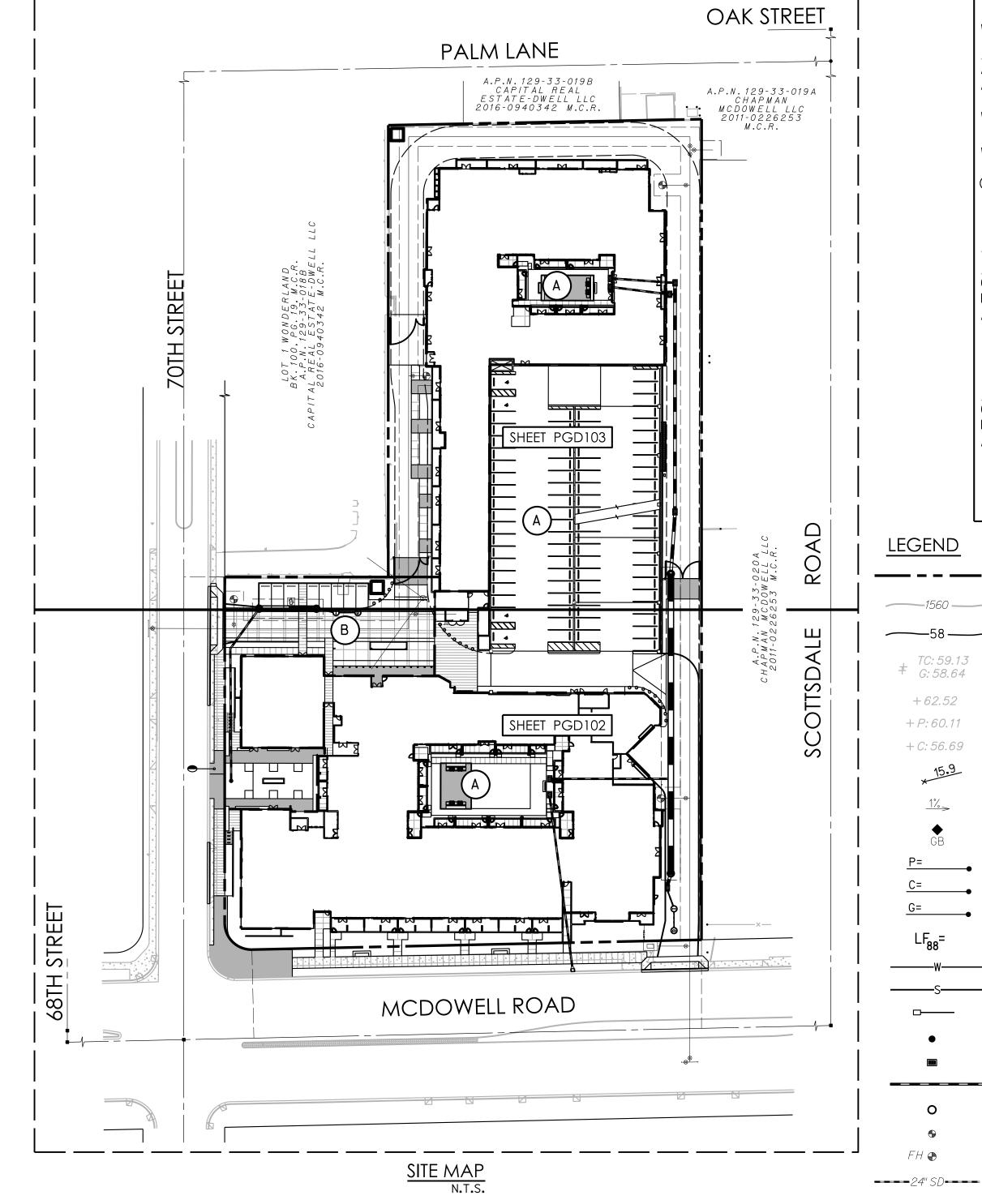
DANIEL G. MANN, AS THE ENGINEER OF RECORD FOR THIS DEVELOPMENT, HEREBY CERTIFY THAT LL UTILITY COMPANIES LISTED ABOVE HAVE BEEN PROVIDED FINAL IMPROVEMENT PLANS FOR REVIEW, AND THAT ALL CONFLICTS IDENTIFIED BY THE UTILITIES HAVE BEEN RESOLVED. IN ADDITION "NO CONFLICT" FORMS HAVE BEEN OBTAINED FROM EACH UTILITY COMPANY AND ARE INCLUDED IN THIS SUBMITTAL.

DATE SIGNATURE

# PRELIMINARY GRADING & DRAINAGE PLAN FOR SOUTHDALE

7000 E. MCDOWELL ROAD, SCOTTSDALE, ARIZONA 85257

LOCATED IN A PORTION OF THE SOUTHEAST QUARTER OF SECTION 34, TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA



	INDEX OF SHEETS	
SHEET NO.	HEET NO. DESCRIPTION	
PGD 10 1	COVER SHEET - PRELIMINARY GRADING & DRAINAGE PLAN	
PGD102	PRELIMINARY GRADING & DRAINAGE PLAN	
PGD103	PRELIMINARY GRADING & DRAINAGE PLAN	

# FLOOD INSURANCE RATE MAP (FIRM) INFORMATION:

	12000 110010 (110210 (1210) (1 (1110) (1 (110) (					
COMMUNITY NUMBER	PANEL NUMBER	PANEL DATE	SUFFIX	FIRM DATE	FIRM ZONE	BASE FLOOD ELEVATION
045012	2235	OCTOBER 16, 2013	L	OCTOBER 16, 2013	X	N/A

# **ENGINEER'S CERTIFICATION:**

THE LOWEST FINISH FLOOR ELEVATION(S) AND/OR FLOOD PROOFING ELEVATION(S) ON THIS PLAN ARE SUFFICIENTLY HIGH TO PROVIDE PROTECTION FROM FLOODING CAUSED BY A 100-YEAR STORM.AND ARE IN ACCORDANCE WITH SCOTTSDALE REVISED CODE, CHAPTER 37 - FLOODPLAIN AND STORMWATER REGULATION.

# **RETENTION CALCULATIONS**

PRE V. POST
C = 0.95 (IMPERVIOUS), C = 0.45 (PERVIOUS)
P = 2.14 IN AREA OF LOT = 171,290 SF
AREA OF LOT = 171,290 SF
PRE (EXISTING)

AREA OF IMPERVIOUS = 161,857 SF AREA OF PERVIOUS = 9.433 SF

′(161,857 X 0.95)+ (9,433 X 0.45)\ WEIGHTED C

WEIGHTED C = 0.92POST (PROPOSED)

> AREA OF IMPERVIOUS = 134,825 SF AREA OF PERVIOUS = 36,465 SF

/(134,825 X 0.95) + (36,465 X 0.45)\ 171.290

WEIGHTED C = 0.84

(0.84 - 0.92)O CF REQUIRED

FIRST FLUSH STORM EVENT IS GREATER THAN PRE V POS FIRST FLUSH STORM EVENT

DRAINAGE AREA A C = 0.76

P = 0.5 IN

AREA = 85.633 SF = 2,706 CF REQUIRED

2,764 CF PROVIDED DRAINAGE AREA B

0.82P = 0.5 INAREA = 14.091 SF

+ C: 56.69

FH 😱

BWV∞⊲

(14,091) = |479 CF REQUIRED|

528 CF PROVIDED

----- INDICATES PROPERTY / BOUNDARY LINE

1560 — INDICATES EXISTING CONTOUR ELEVATION

——58 — INDICATES PROPOSED CONTOUR ELEVATION INDICATES EXISTING TOP OF CURB ELEVATION INDICATES EXISTING GUTTER ELEVATION

> INDICATES EXISTING GROUND ELEVATION INDICATES EXISTING PAVEMENT ELEVATION

> INDICATES EXISTING CONCRETE ELEVATION INDICATES PROPOSED GROUND ELEVATION

INDICATES DIRECTION OF FLOW & SLOPE

INDICATES GRADE BREAK

INDICATES PROPOSED PAVEMENT ELEVATION INDICATES PROPOSED TOP OF CONC. ELEVATION INDICATES PROPOSED GUTTER ELEVATION

INDICATES LOWEST FINISH FLOOR ELEVATION

INDICATES PROPOSED WATERLINE INDICATES PROPOSED SEWERLINE

INDICATES PROPOSED METER INDICATES PROPOSED SEWER CLEANOUT

INDICATES PROPOSED CATCH BASIN

INDICATES PROPOSED STORM DRAIN PIPE INDICATES PROPOSED STORM DRAIN MANHOLE

INDICATES PROPOSED FIRE HYDRANT INDICATES EXISTING FIRE HYDRANT

INDICATES EXISTING STORM DRAIN PIPE

INDICATES EXISTING SEWER LINE & SIZE INDICATES EXISTING WATER LINE, VALVE & SIZE

INDICATES EXISTING BURIED ELECTRIC CONDUIT INDICATES EXISTING GAS LINE

INDICATES EXISTING OVERHEAD ELECTRIC

INDICATES EXISTING POWER POLE

INDICATES EXISTING LIGHT POLE  $ET \boxtimes$ INDICATES EXISTING ELECTRIC TRANSFORMER INDICATES EXISTING ELECTRIC BOX EB 🛮

 $WM \square$ INDICATES EXISTING WATER METER INDICATES EXISTING BACKFLOW PREVENTER VALVE

THOMAS ROAD PALM LANE MCDOWELL

Call 811 or click Arizona811.co

*KENIZION2* 

46857

DANIEL G.

# VICINITY MAP

**ENGINEER**:

N.T.S.

PROJECT SCOPE: THE SCOPE OF THIS PROJECT IS A NEW RESIDENTIAL APARTMENT COMPLEX WITH 267 UNITS ALSO WITH PARKING GARAGE, UTILITY IMPROVEMENTS AND LANDSCAPE.

**CLIENT:** HAWKINS COMPANIES LLC 4700 S. MCCLINTOCK DR. #160

3 ENGINEERING 6370 E. THOMAS ROAD, SUITE #200 SCOTTSDALE, ARIZONA 85251

CONTACT: DANIEL G. MANN. P.E. PHONE: (602) 334-4387 EMAIL: DAN@3ENGINEERING.COM

PARCEL ADDRESS:

EMAIL: MMITCHELL@HCOLLC.COM

TEMPE, ARIZONA 85282

PHONE: (480) 223-8239

CONTACT: MARK MITCHELL

7000 E. MCDOWELL ROAD, SCOTTSDALE, ARIZONA 85257

ASSESSORS PARCEL NUMBERS

129-33-001S

LOT AREA

GROSS AREA: 4.690 ACRES 3.932 ACRES NET AREA: DISTURBED AREA: 3.932 ACRES

**BENCHMARK:** 

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION UNIQUE ID: 12052, BEING A 3" CITY OF SCOTTSDALE BRASS CAP IN HANDHOLE, LOCATED AT THE INTERSECTION OF SCOTTSDALE

ELEVATION = 1230.474 (NAVD'88)CITY OF SCOTTSDALE DATUM

IHEREBY CERTIFY THAT ALL ELEVATIONS REPRESENTED ON THIS PLAN ARE BASED ON THE ELEVATION DATUM FOR THE CITY OF SCOTTSDALE BENCHMARK PROVIDED ABOVE.



BASIS OF BEARING

THE BASIS OF BEARING IS THE MONUMENT LINE OF SCOTTSDALE ROAD, ALSO BEING THE WEST LINE OF THE SOUTHEAST CORNER, SECTION 34, USING A BEARING OF NORTH OO DEGREES OO MINUTES OO SECONDS EAST, AS PER THE RECORD OF SURVEY IN BOOK 1250 OF MAPS, PAGE 15, RECORDS OF MARICOPA COUNTY,

**ENGINEER'S STATEMENT:** 

THE ENGINEER OF RECORD ON THESE PLANS HAS RECEIVED A COPY OF THE APPROVED STIPULATIONS FOR THIS PROJECT AND HAS DESIGNED THESE PLANS IN CONFORMANCE WITH THE APPROVED STIPULATIONS

AS-BUILT CERTIFICATION:

HEREBY CERTIFY THAT THE RECORD DRAWING MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED ENGINEER/LAND SURVEYOR

DATE

6/28/2021

DATE

REGISTRATION NUMBER

CIVIL APPROVAL					
EVIEW & RECOMMENDED APRROVAL BY:					
PAVING		TRAFFIC			
6 & D		PLANNING			
V & S		FIRE			
RET. WALLS					

ENGINEERING COORDINATION MGR.(OR DESIGNEE)

3 ENGINEERING, LLC 6370 E. THOMAS ROAD SUITE # 200 SCOTTSDALE, ARIZONA 852: PHONE: (602) 334-4387 FAX: (602) 490-3230 WWW.3ENGINEERING.CC

PROJECT NO.

PGD101 1 of 3

