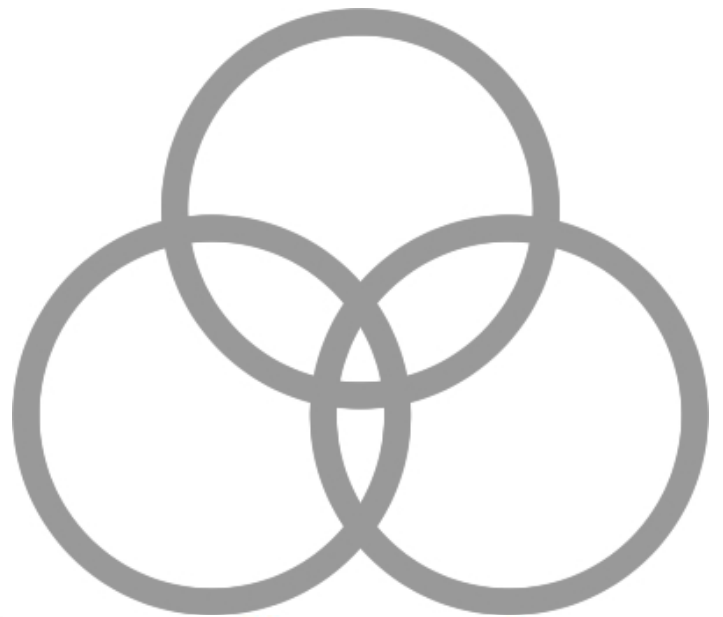
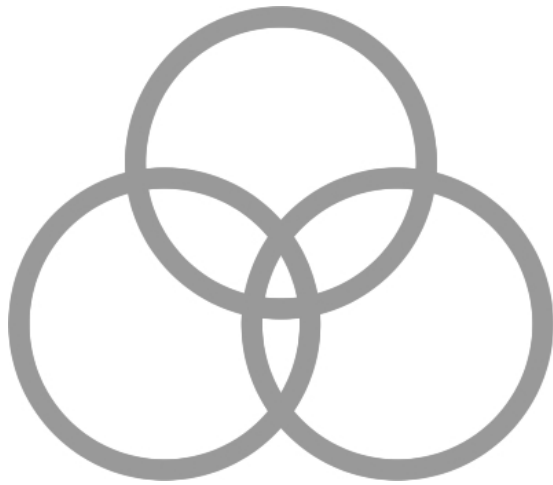


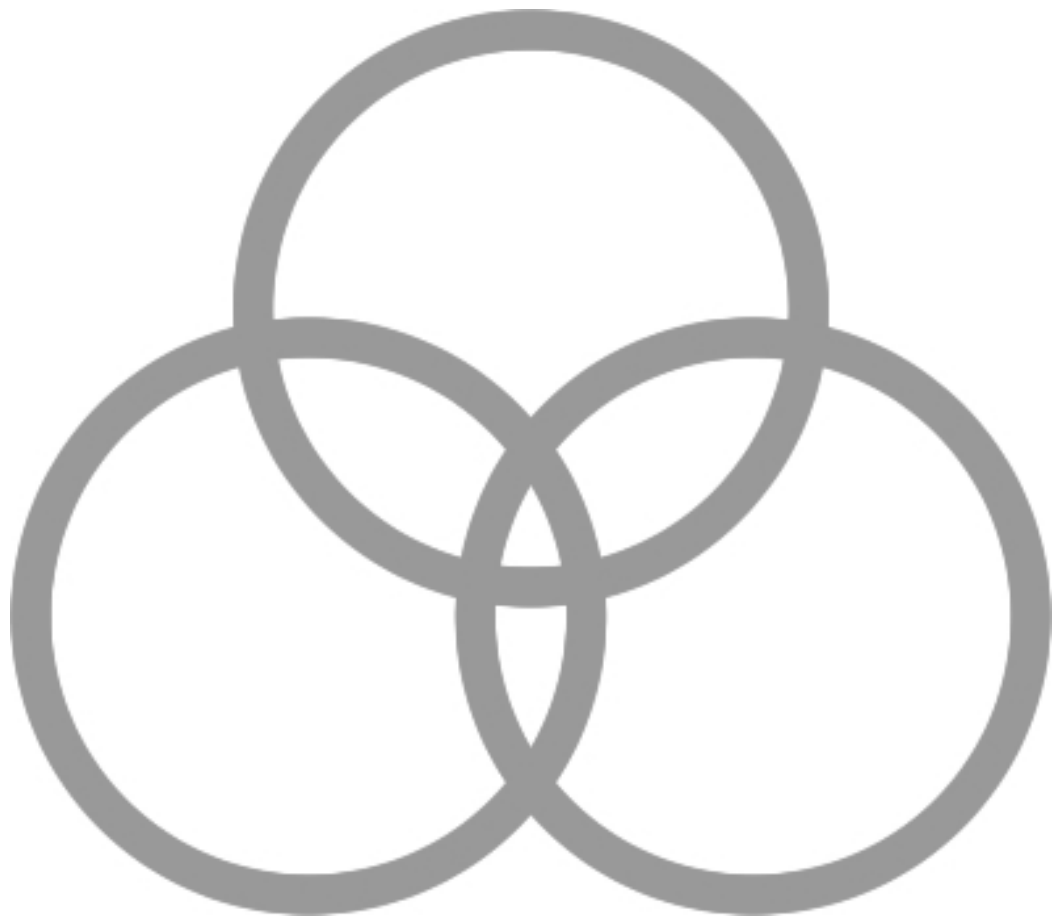


114th & Shea Retail

Preliminary Drainage Report

3 engineering Job #: 1831

April 21, 2022



114TH & SHEA RETAIL

SWC 114TH STREET & SHEA BLVD, SCOTTSDALE, AZ 85259

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.

April 21, 2022

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 1831

Table of Contents

	<i>Page</i>
1. <i>Introduction.....</i>	1
2. <i>Site Description.....</i>	1
3. <i>Drainage Design – Offsite.....</i>	1
4. <i>Drainage Design – Onsite.....</i>	2
5. <i>Conclusions.....</i>	3
6. <i>References.....</i>	3

Appendix

<i>Appendix A – Vicinity Map.....</i>	A-1
<i>Appendix B – FEMA FIRM Map.....</i>	A-2
<i>Appendix C – Warning and Disclaimer of Liability.....</i>	A-3
<i>Appendix D – Watershed Delineation and Topography Map.....</i>	A-4
<i>Appendix E – Offsite Drainage Calculations.....</i>	A-5
<i>Appendix F – Aerial Site Photographs.....</i>	A-6
<i>Appendix G – Offsite Aerial Photographs.....</i>	A-7
<i>Appendix H – Onsite Drainage Area Map.....</i>	A-8
<i>Appendix I – Inlet Area Exhibit.....</i>	A-9
<i>Appendix J – Onsite Drainage Calculations.....</i>	A-10
<i>Appendix K – Mirage Crossing As-Built.....</i>	A-11
<i>Appendix L – Preliminary Grading and Drainage Plans.....</i>	A-12

1. Introduction

The purpose of this report is to present the existing and proposed drainage plan for the project site, 114th & Shea Retail. It is our opinion the proposed grading and drainage concept is in accordance with the City of Scottsdale drainage requirements.

The project site, 114th & Shea Retail, is located in the northwest quarter of Section 27, Township 3 North, Range 5 East of the Gila and Salt River Meridian, Maricopa County, Arizona within the City of Scottsdale. The project is located at the southwest corner of 114th Street and Shea Boulevard, Scottsdale, AZ 85259. The site is bounded on the north by Shea Boulevard, on the east by 114th Street, on the south by Beryl Avenue, and on the west by single family residential homes. See Appendix A for a vicinity map and Appendix G for offsite aerial photographs.

The existing zoning is C-O and R1-18. The site is currently undeveloped. The proposed zoning is C1, SR, and R1-18. The City of Scottsdale 2001 General Plan shows the site land use is Office and Rural Neighborhood. Additionally, the site is located within the Shea Corridor. The proposed site consists of two portions that are separated by an existing wash that runs west through the site. The northern portion is a mixed-use office, medical office, and retail center with three pads. Access is provided by 114th Street. The southern portion consists of one residential lot with access provided by Beryl Avenue. The residential lot will be developed at a future date. See Appendix H for an onsite map. The site currently lies within the "Zone X-shaded" floodplain designation.

2. Site Description

Existing

The project site currently consists of undeveloped land. The existing topography of the site generally slopes from northeast to southwest at approximately 1.5 percent (1.5%). There is a wash that runs east to west through the site. The site currently does not retain stormwater and discharges to the west property line within the wash. 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) # 04013C1780L, dated October 16, 2013, the site is located within the "Zone X – shaded" floodplain designation.

"Zone X – Shaded" is described as follows:

"Areas of 0.2% annual chance of flood; areas of 1% annual chance of 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 the updated Flood Insurance Rate Map information in Appendix B.

Proposed

The proposed project includes constructing a retail, office and medical office center with three buildings. The site also includes drive aisles, surface parking, landscape, and retention. Additionally, the site includes a residential lot with final grading being done when a house is developed on the lot. See the proposed improvements in the Onsite Drainage Area Map in Appendix H.

3. Drainage Design - Offsite

The site is affected by offsite flows. There is an existing 3 – 36" R.G.R.C.P Culvert under 114th Street, that outlets directly to the wash at the east property line. As-built information for the culvert is shown in the Paving plans for Mirage Crossing, located in Appendix K.

The plans show a 100-year flow of 152 cfs being conveyed through the culvert. The existing wash was analyzed at two cross-sections within the site. Cross section locations are shown in the Onsite Drainage Area Map, Appendix H. The flow was found to be contained within the top banks of the wash at both upstream and downstream locations, with respective water surface elevations of 1437.62 and 1435.92. The proposed buildings have a lowest finish floor of 1441.00, which exceeds the requirement to be 12" above the water surface elevation. See Appendix E for Flowmaster Results.

There are no other offsite flows that affect the site. Shea Boulevard and 114th Street are both fully developed with curb & gutter. Flows in Shea Boulevard travel west to a curb opening catch basin west of the site. Flows in 114th Street travel south to a curb opening catch basin south of the site. There is an existing block wall along the south and west property lines that protects the site from offsite flows.

Refer to Appendix D for a Watershed Delineation and Topography map.

Hydraulic Parameters

Bentley Flowmaster V8i was used to calculate the water surface elevations in the existing wash through the site. 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 commercial site provides retention for the 100-year, 2-hour storm event, with a weighted runoff coefficient. See Appendix J for Onsite Drainage Calculations.

The required retention volume for Drainage Area A is 5,780 c.f. There is 6,234 c.f. provided in a proposed surface retention basin. Flows generated within this drainage area are conveyed via surface flow and curb openings to the retention basin. The basin outlets to retention basin B via a bleed off pipe with a 2" orifice plate will provide a dry up time within 36 hours.

The required retention volume for Drainage Area B is 8,031 c.f. There is 10,110 c.f. provided in a proposed surface retention basin. Flows generated within this drainage area are conveyed via surface flow and curb openings to the retention basin. The basin outlets to the existing wash via a bleed off pipe with a 2" orifice plate will provide a dry up time within 36 hours including the volumes from the other two basins.

The required retention volume for Drainage Area C is 1,758 c.f. There is 2,050 c.f. provided in a proposed surface retention basin. Flows generated within this drainage area are conveyed via surface flow to the retention basin. The basin outlets to a swale leading to retention basin B via a bleed off pipe with a 2" orifice plate will provide a dry up time within 36 hours.

The required retention volume for Drainage Area D (The residential lot) is 6,251 c.f. This volume will be required to be retained on the lot. This volume will be non-waivable and will be required with the house plans. The residential lot will not be graded at this time.

The lowest finish floor of the proposed buildings is 1441.00, which is 12" above the highest proposed retention basin high water of 1439.50. 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 1432.80, 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_c

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.

Bentley Flowmaster V8i was used to calculate the bleed off rates of the orifice openings for the retention basins. The dry up time was calculated by dividing the volume of the retention basin by the bleed off rate to ensure a time less than 36 hours. See results in Appendix J.

Determination of Curb Opening capacity operating as a weir by using the following formula:

$$Q=C_w \times L \times d^{1.5} \rightarrow L=(Q/(C_w \times d^{1.5})) \times 1.20$$

where:

C_w = Weir coefficient (3.0)

L = Length of Opening

d = Depth at the lip of the weir

CF = Clogging Factor = 0.20 $\rightarrow$ 1.20xL (20% clogging)

5. Conclusions

The following is a summary of the 114th & Shea Retail Preliminary Drainage Report.

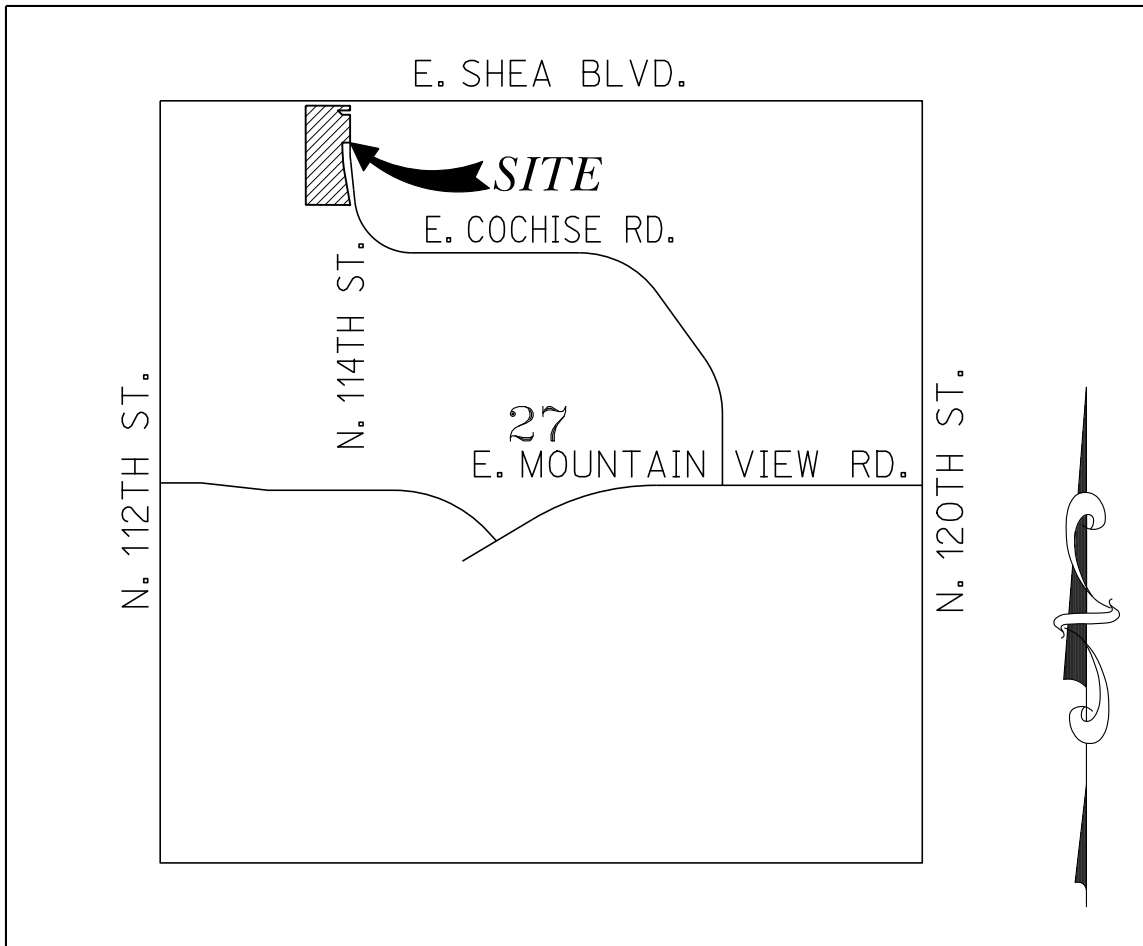
- The site currently lies within the "Zone X – Shaded" floodplain designation.
- Retention is provided for the 100-year, 2-hour storm event for the commercial site.
- Retention will be provided for the residential lot with the house plans.
- The site is affected by offsite flows.
- The finish floors 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. Mirac Crossing Paving Plans, C.O.S. As-built no. 41625

APPENDIX A

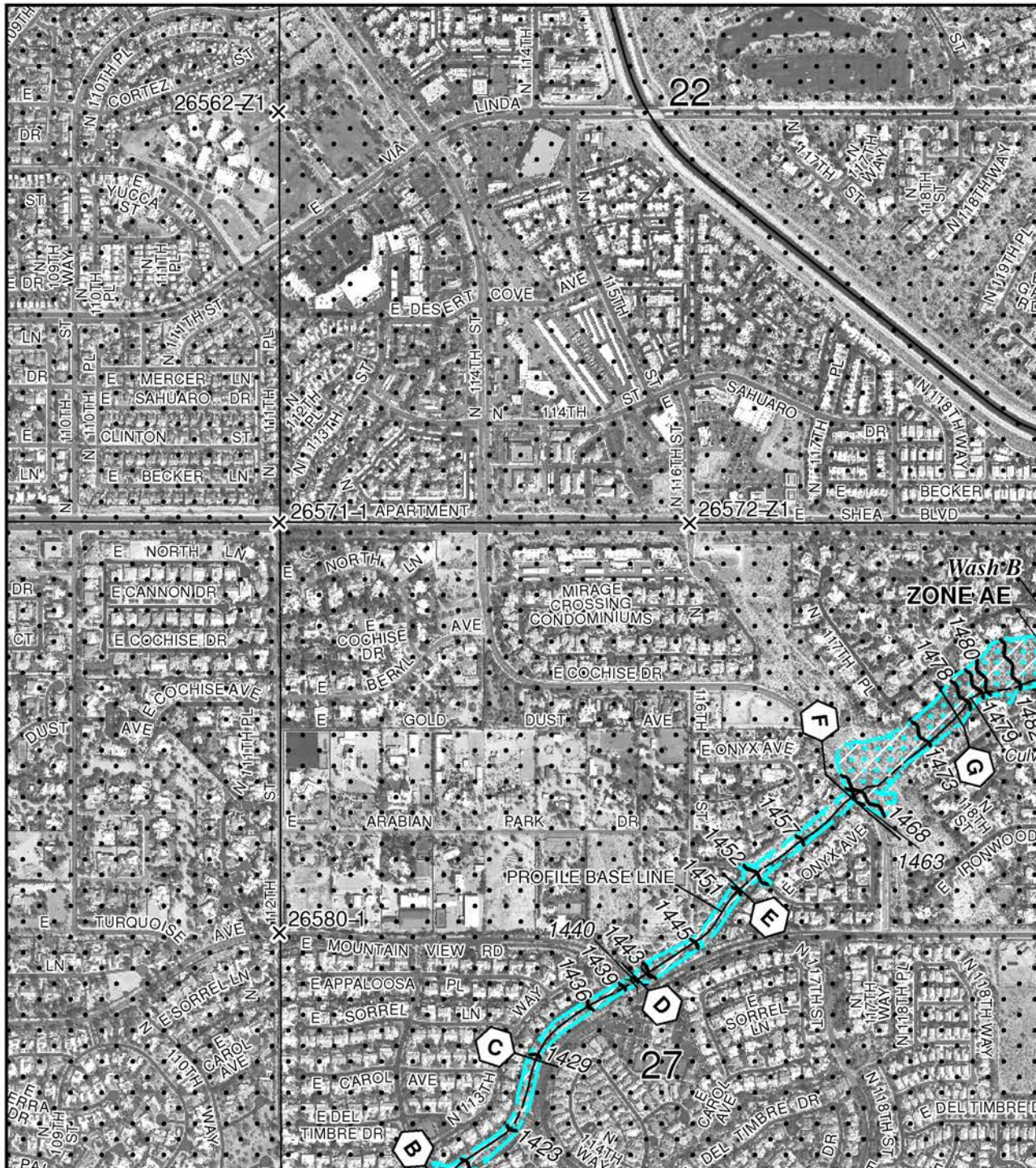
Vicinity Map



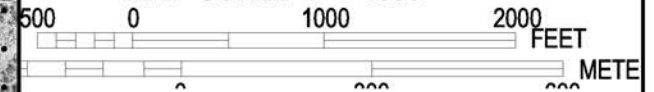
VICINITY MAP

N.T.S.

APPENDIX B
FEMA FIRM Map



MAP SCALE 1" = 1000'



NFIP

PANEL 1780L

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA

AND INCORPORATED AREAS

PANEL 1780 OF 4425

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	1780	L
SCOTTSDALE, CITY OF	045012	1780	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
04013C1780L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

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.

Plan Check #



Owner

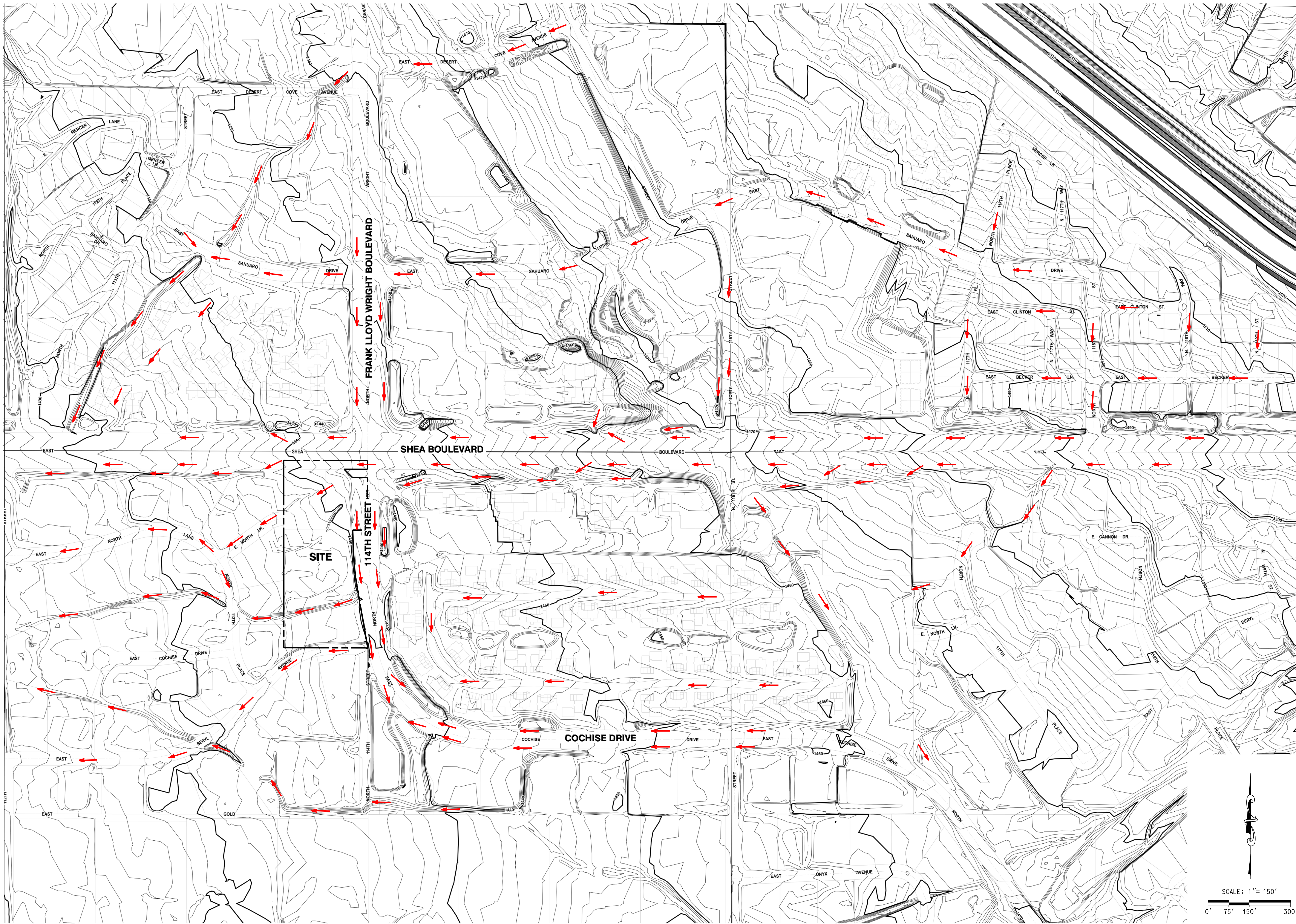
4/23/20
Date

APPENDIX D

Watershed Delineation and Topography Map

C:\My Documents\Projects\1831_114th_Shea\Reports\Preliminary Drainage\1831_114th_Shea\watershed_delineation.dgn

COPYRIGHT 2020 3ENGINEERING, LLC



3eengineering
planning
civil engineering
surveying

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

DATE: 04/22/20

PROJECT NO.
1831

SHEET NO.
WS01
1 of 1

114TH & SHEA RETAIL
SWC 114TH ST. & SHEA BLVD., SCOTTSDALE, AZ 85259
WATERSHED DELINEATION AND TOPOGRAPHY MAP

APPENDIX E

Offsite Drainage Calculations

Cross Section for Wash Section A

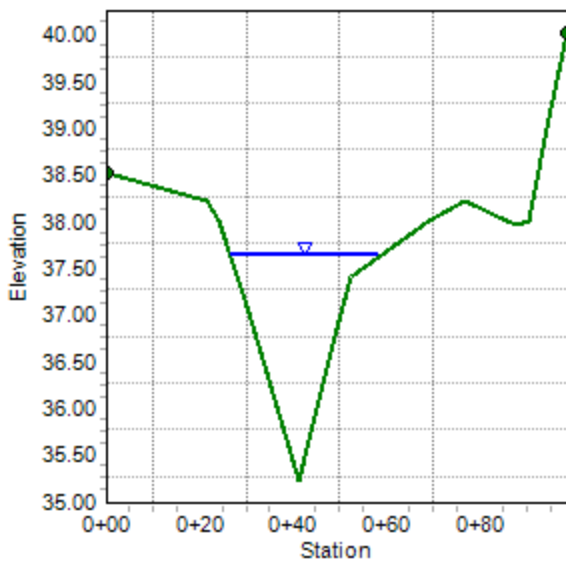
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.25000	%
Normal Depth	2.41	ft
Discharge	152.00	ft ³ /s

Cross Section Image



Worksheet for Wash Section A

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 1.25000 %
Discharge 152.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00	38.50
0+21	38.20
0+24	38.00
0+30	37.00
0+37	36.00
0+41	35.21
0+45	36.00
0+50	37.00
0+52	37.40
0+69	38.00
0+77	38.20
0+86	38.00
0+88	37.95
0+90	38.00
0+94	39.00
0+98	40.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 38.50)	(0+98, 40.00)	0.035

Options

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

Worksheet for Wash Section A

Options

Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth	2.41	ft
Elevation Range	35.21 to 40.00	ft
Flow Area	32.12	ft ²
Wetted Perimeter	32.27	ft
Hydraulic Radius	1.00	ft
Top Width	31.86	ft
Normal Depth	2.41	ft
Critical Depth	2.19	ft
Critical Slope	0.01784	ft/ft
Velocity	4.73	ft/s
Velocity Head	0.35	ft
Specific Energy	2.76	ft
Froude Number	0.83	
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	2.41	ft
Critical Depth	2.19	ft
Channel Slope	1.25000	%
Critical Slope	0.01784	ft/ft

Cross Section for Wash Section B

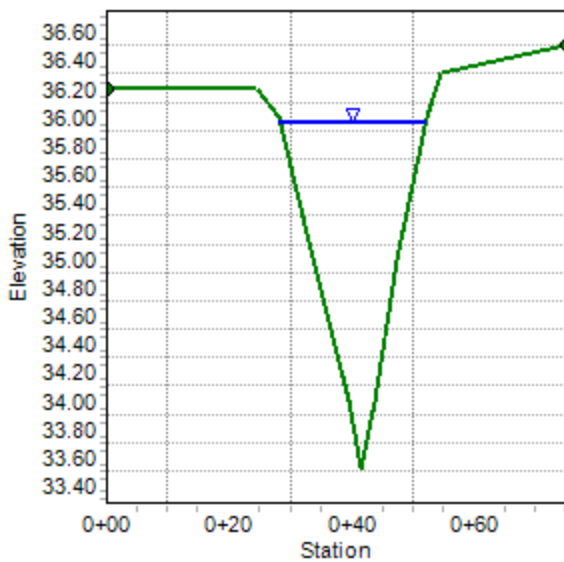
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.39000	%
Normal Depth	2.44	ft
Discharge	152.00	ft ³ /s

Cross Section Image



Worksheet for Wash Section B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.39000	%
Discharge	152.00	ft³/s
Section Definitions		

Station (ft)	Elevation (ft)
--------------	----------------

0+00	36.20
0+25	36.20
0+28	36.00
0+34	35.00
0+40	34.00
0+42	33.52
0+44	34.00
0+47	35.00
0+52	36.00
0+55	36.30
0+75	36.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 36.20)	(0+75, 36.50)	0.035

Options

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

Results

Normal Depth	2.44	ft
Elevation Range	33.52 to 36.50	ft

Worksheet for Wash Section B

Results

Flow Area	27.89	ft ²
Wetted Perimeter	24.56	ft
Hydraulic Radius	1.14	ft
Top Width	24.05	ft
Normal Depth	2.44	ft
Critical Depth	2.34	ft
Critical Slope	0.01773	ft/ft
Velocity	5.45	ft/s
Velocity Head	0.46	ft
Specific Energy	2.90	ft
Froude Number	0.89	
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	2.44	ft
Critical Depth	2.34	ft
Channel Slope	1.39000	%
Critical Slope	0.01773	ft/ft

Cross Section for Proposed Wash

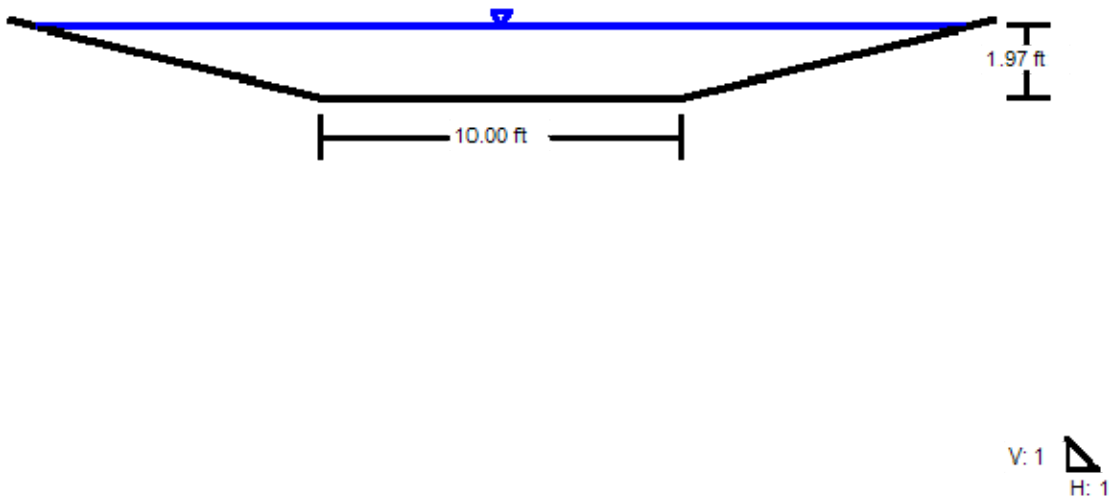
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Roughness Coefficient	0.035
Channel Slope	0.70 %
Normal Depth	1.97 ft
Left Side Slope	4.00 ft/ft (H:V)
Right Side Slope	4.00 ft/ft (H:V)
Bottom Width	10.00 ft
Discharge	152.00 ft³/s

Cross Section Image



Worksheet for Proposed Wash

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.70	%
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	152.00	ft ³ /s

Results

Normal Depth	1.97	ft
Flow Area	35.18	ft ²
Wetted Perimeter	26.23	ft
Hydraulic Radius	1.34	ft
Top Width	25.75	ft
Critical Depth	1.56	ft
Critical Slope	0.01755	ft/ft
Velocity	4.32	ft/s
Velocity Head	0.29	ft
Specific Energy	2.26	ft
Froude Number	0.65	
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	1.97	ft
Critical Depth	1.56	ft
Channel Slope	0.70	%

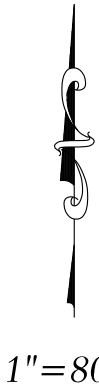
Worksheet for Proposed Wash

GVF Output Data

Critical Slope 0.01755 ft/ft

APPENDIX F

Aerial Site Photographs



1"=80'

300engineering

planning civil engineering surveying

300 ENGINEERING, LLC
6370 E. THOMAS ROAD, SUITE # 200 - SCOTTSDALE, ARIZONA 85251
PHONE: (602) 334-4387 - FAX: (602) 490-3230
WWW.300ENGINEERING.COM

DATE: 04/21/22

PROJECT NO.
1831

114TH & SHEA RETAIL
SWC 114TH ST. & SHEA BLVD., SCOTTSDALE, AZ 85259

AERIAL SITE PHOTOGRAPH

APPENDIX G

Offsite Aerial Photographs



1"=600'



114TH & SHEA RETAIL

SWC 114TH ST. & SHEA BLVD., SCOTTSDALE, AZ 85259

AERIAL OFFSITE PHOTOGRAPH

3eengineering

planning civil engineering surveying

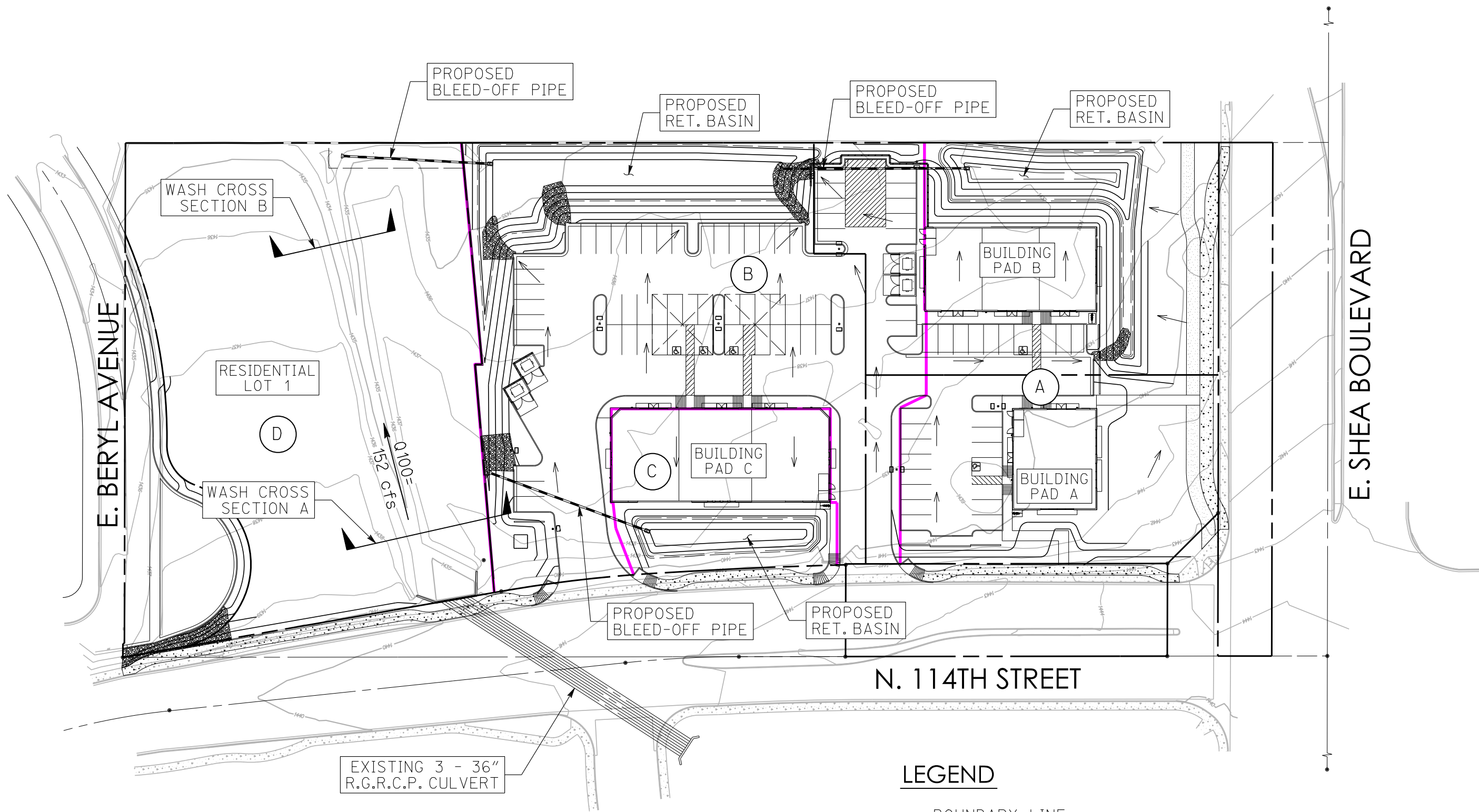
3e ENGINEERING, LLC
6370 E. THOMAS ROAD, SUITE # 200 - SCOTTSDALE, ARIZONA 85251
PHONE: (602) 334-4387 - FAX: (602) 490-3230
WWW.3ENGINEERING.COM

DATE: 04/22/20

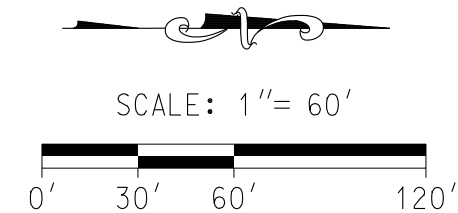
PROJECT NO.
1831

APPENDIX H

Onsite Drainage Area Map



- LEGEND**
- BOUNDARY LINE
 - DRAINAGE BOUNDARY
 - (B) DRAINAGE AREA
 - FLOW DIRECTION ARROW



3engineering

planning

civil engineering

surveying

3 ENGINEERING, LLC

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

PHONE: (602) 334-4387 - FAX: (602) 490-3230

WWW.3ENGINEERING.COM

DATE: 04/21/22

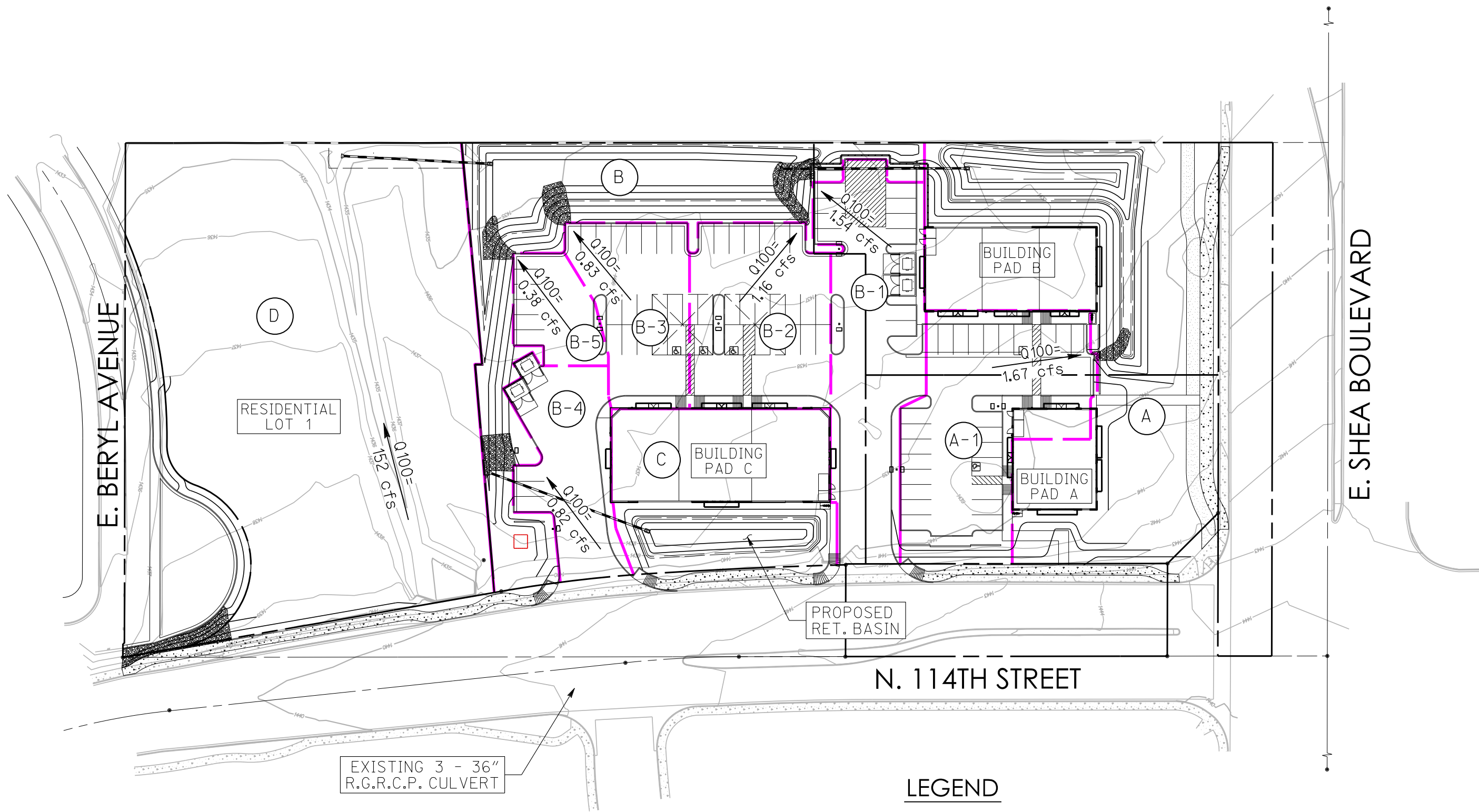
PROJECT NO.
1831

114TH & SHEA RETAIL

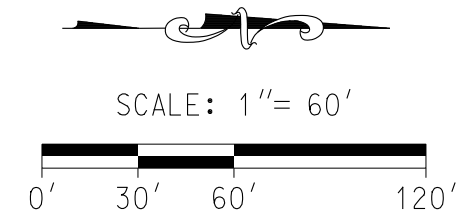
SWC 114TH ST. & SHEA BLVD., SCOTTSDALE, AZ 85259

DRAINAGE AREA MAP

APPENDIX I
Inlet Area Exhibit



- LEGEND**
- BOUNDARY LINE
 - DRAINAGE BOUNDARY
 - - - DRAINAGE SUB-BOUNDARY
 - (B-1) DRAINAGE INLET SUB-AREA



114TH & SHEA RETAIL SWC 114TH ST. & SHEA BLVD., SCOTTSDALE, AZ 85259	
3eengineering planning civil engineering surveying 3 ENGINEERING, LLC 6370 E. THOMAS ROAD, SUITE # 200 - SCOTTSDALE, ARIZONA 85251 PHONE: (602) 334-4387 - FAX: (602) 490-3230 WWW.3ENGINEERING.COM	INLET AREA EXHIBIT
DATE: 11/03/21 PROJECT NO. 1831	

APPENDIX J

Onsite Drainage Calculations

Post-Development Rational Method Calculations

Sub-Area	Area	C ₁₀	C ₁₀₀	T _c	i ₁₀	i ₁₀₀	Q ₁₀	Q ₁₀₀
	(acre)	(weighted)	(weighted)	(min)	(in/hr)	(in/hr)	(cfs)	(cfs)
A-1	0.29	0.90	0.95	10	3.79	5.96	1.01	1.67
B-1	0.27	0.90	0.95	10	3.79	5.96	0.93	1.54
B-2	0.20	0.90	0.95	10	3.79	5.96	0.70	1.16
B-3	0.15	0.90	0.95	10	3.79	5.96	0.50	0.83
B-4	0.15	0.90	0.95	10	3.79	5.96	0.50	0.82
B-5	0.07	0.90	0.95	10	3.79	5.96	0.23	0.38

On-Site Retention for the 100-year, 2-hour Storm

Sub-Area	Area	C ₁₀₀	P _{100yr, 2hr}		Total Vol. Req.	Surface Vol. Prov.	U.G. Retention Provided	Total Vol. Prov.
	(acre)		(in)		(cf)	(cf)	(cf)	(cf)
A	1.02	0.68	2.30		5,780	6,234	-	6,234
B	1.24	0.78	2.30		8,031	10,110	-	10,110
C	0.28	0.74	2.30		1,758	2,050	-	2,050
D	1.17	0.64	2.30		6,251	*	-	*

* Volume is required to be provided onsite. To be shown on final grading plan for lot.

	Overall Area (s.f.)	Building & Parking Area (s.f.)	Landscape Area (s.f.)	Overall Area (Ac.)	C ₁₀	C ₁₀₀
A	44556	20,210	24,346	1.02	0.63	0.68
B	54059	35,146	18,913	1.24	0.73	0.78
C	12339	7,237	5,102	0.28	0.69	0.74

$C = ((\text{Building \& Hardscape Area} \times 0.95) + (\text{Landscape Area} \times 0.45)) / \text{Overall Area}$

C₁₀₀ Building & Hardscape = 0.95

C₁₀₀ Landscape = 0.45

Curb Opening - Weir Condition

Inlet Type	Inlet	Q ₁₀₀	Inlet Capacity W/ 20% Clogging	d	Cw	L
		(cfs)	(cfs)	(ft)		(ft)
2.5' Curb Opening	A-1	1.67	1.70	0.42	3	2.5
2.0' Curb Opening	B-1	1.54	1.77	0.50	3	2
2.0' Curb Opening	B-2	1.16	1.77	0.50	3	2
2.0' Curb Opening	B-3	0.83	1.77	0.50	3	2
2.0' Curb Opening	B-4	0.82	1.77	0.50	3	2
2.0' Curb Opening	B-5	0.38	1.77	0.50	3	2

$$Q = Cw * L * d^{1.5}$$

$$L = (Q / (Cw * d^{1.5}))^{1.20}$$

Cw = 3.0 weir coefficient

Q = discharge capacity

L = curb opening length

d = flow depth

CF = clogging factor = 20% (1.20xL)



NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.5816°, Longitude: -111.8357°
Elevation: 1440.71 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 & aeriels](#)

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	0.196 (0.163-0.243)	0.257 (0.214-0.317)	0.346 (0.286-0.427)	0.416 (0.341-0.510)	0.508 (0.410-0.621)	0.579 (0.462-0.703)	0.652 (0.511-0.790)	0.725 (0.559-0.877)	0.823 (0.619-0.996)	0.898 (0.661-1.09)
10-min	0.299 (0.247-0.369)	0.390 (0.325-0.482)	0.527 (0.435-0.649)	0.632 (0.518-0.776)	0.773 (0.625-0.945)	0.882 (0.703-1.07)	0.993 (0.778-1.20)	1.10 (0.851-1.33)	1.25 (0.942-1.52)	1.37 (1.01-1.66)
15-min	0.370 (0.307-0.457)	0.483 (0.403-0.598)	0.654 (0.539-0.805)	0.784 (0.643-0.961)	0.959 (0.774-1.17)	1.09 (0.872-1.33)	1.23 (0.964-1.49)	1.37 (1.06-1.65)	1.55 (1.17-1.88)	1.70 (1.25-2.05)
30-min	0.498 (0.413-0.615)	0.652 (0.543-0.805)	0.880 (0.726-1.08)	1.06 (0.865-1.30)	1.29 (1.04-1.58)	1.47 (1.17-1.79)	1.66 (1.30-2.01)	1.84 (1.42-2.23)	2.09 (1.57-2.53)	2.28 (1.68-2.77)
60-min	0.617 (0.511-0.762)	0.806 (0.672-0.996)	1.09 (0.899-1.34)	1.31 (1.07-1.60)	1.60 (1.29-1.95)	1.82 (1.45-2.21)	2.05 (1.61-2.48)	2.28 (1.76-2.76)	2.59 (1.95-3.13)	2.82 (2.08-3.42)
2-hr	0.721 (0.605-0.868)	0.933 (0.785-1.13)	1.24 (1.04-1.50)	1.48 (1.23-1.78)	1.80 (1.48-2.15)	2.05 (1.65-2.44)	2.30 (1.83-2.74)	2.55 (1.99-3.04)	2.89 (2.21-3.44)	3.16 (2.36-3.78)
3-hr	0.788 (0.661-0.967)	1.01 (0.850-1.24)	1.32 (1.11-1.62)	1.57 (1.30-1.91)	1.91 (1.56-2.32)	2.19 (1.76-2.64)	2.47 (1.95-2.98)	2.77 (2.15-3.33)	3.17 (2.39-3.81)	3.50 (2.58-4.21)
6-hr	0.947 (0.813-1.13)	1.20 (1.03-1.42)	1.53 (1.31-1.81)	1.79 (1.52-2.11)	2.15 (1.80-2.53)	2.43 (2.00-2.84)	2.72 (2.21-3.18)	3.02 (2.40-3.54)	3.42 (2.66-4.01)	3.74 (2.84-4.39)
12-hr	1.07 (0.925-1.25)	1.35 (1.17-1.58)	1.70 (1.47-1.98)	1.98 (1.69-2.30)	2.35 (1.99-2.73)	2.64 (2.21-3.06)	2.94 (2.42-3.40)	3.24 (2.64-3.75)	3.64 (2.89-4.23)	3.95 (3.08-4.62)
24-hr	1.26 (1.12-1.44)	1.60 (1.43-1.84)	2.08 (1.84-2.37)	2.45 (2.16-2.79)	2.97 (2.60-3.38)	3.38 (2.94-3.84)	3.81 (3.28-4.33)	4.25 (3.63-4.83)	4.86 (4.10-5.53)	5.35 (4.45-6.10)
2-day	1.38 (1.22-1.58)	1.77 (1.56-2.02)	2.32 (2.05-2.65)	2.76 (2.43-3.15)	3.38 (2.95-3.84)	3.87 (3.35-4.40)	4.39 (3.77-5.00)	4.93 (4.21-5.62)	5.69 (4.78-6.50)	6.30 (5.23-7.22)
3-day	1.49 (1.32-1.69)	1.91 (1.69-2.17)	2.52 (2.22-2.86)	3.01 (2.64-3.41)	3.70 (3.23-4.19)	4.26 (3.70-4.82)	4.85 (4.18-5.50)	5.48 (4.68-6.22)	6.37 (5.36-7.24)	7.08 (5.90-8.08)
4-day	1.59 (1.41-1.81)	2.04 (1.81-2.32)	2.71 (2.39-3.07)	3.25 (2.86-3.67)	4.02 (3.52-4.54)	4.64 (4.04-5.24)	5.31 (4.59-6.00)	6.03 (5.15-6.82)	7.04 (5.93-7.97)	7.86 (6.56-8.94)
7-day	1.79 (1.58-2.04)	2.29 (2.02-2.61)	3.05 (2.68-3.47)	3.66 (3.20-4.16)	4.53 (3.94-5.14)	5.24 (4.53-5.94)	6.00 (5.15-6.80)	6.80 (5.79-7.74)	7.95 (6.67-9.05)	8.89 (7.37-10.2)
10-day	1.95 (1.73-2.22)	2.51 (2.22-2.85)	3.33 (2.93-3.77)	3.99 (3.50-4.51)	4.92 (4.30-5.56)	5.67 (4.92-6.40)	6.48 (5.58-7.32)	7.33 (6.26-8.29)	8.53 (7.19-9.66)	9.50 (7.92-10.8)
20-day	2.42 (2.14-2.74)	3.12 (2.76-3.53)	4.13 (3.65-4.67)	4.90 (4.31-5.53)	5.94 (5.21-6.71)	6.75 (5.89-7.62)	7.58 (6.58-8.57)	8.42 (7.27-9.54)	9.57 (8.19-10.9)	10.5 (8.87-11.9)
30-day	2.84 (2.51-3.21)	3.66 (3.25-4.14)	4.85 (4.28-5.46)	5.75 (5.07-6.47)	6.97 (6.12-7.84)	7.91 (6.91-8.89)	8.89 (7.72-9.98)	9.88 (8.53-11.1)	11.2 (9.61-12.7)	12.3 (10.4-13.9)
45-day	3.35 (2.97-3.78)	4.32 (3.84-4.88)	5.72 (5.07-6.45)	6.76 (5.97-7.62)	8.15 (7.17-9.19)	9.21 (8.06-10.4)	10.3 (8.96-11.6)	11.4 (9.85-12.9)	12.8 (11.0-14.6)	14.0 (11.9-15.9)
60-day	3.74 (3.33-4.21)	4.85 (4.31-5.46)	6.40 (5.68-7.20)	7.54 (6.67-8.49)	9.03 (7.97-10.2)	10.2 (8.91-11.4)	11.3 (9.86-12.7)	12.4 (10.8-14.0)	13.9 (12.0-15.7)	15.0 (12.9-17.1)

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.

[Back to Top](#)



NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.5816°, Longitude: -111.8357°
Elevation: 1440.71 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 & aeriels](#)

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	2.35 (1.96-2.92)	3.08 (2.57-3.80)	4.15 (3.43-5.12)	4.99 (4.09-6.12)	6.10 (4.92-7.45)	6.95 (5.54-8.44)	7.82 (6.13-9.48)	8.70 (6.71-10.5)	9.88 (7.43-12.0)	10.8 (7.93-13.1)
10-min	1.79 (1.48-2.21)	2.34 (1.95-2.89)	3.16 (2.61-3.89)	3.79 (3.11-4.66)	4.64 (3.75-5.67)	5.29 (4.22-6.42)	5.96 (4.67-7.21)	6.62 (5.11-8.00)	7.52 (5.65-9.10)	8.20 (6.04-9.94)
15-min	1.48 (1.23-1.83)	1.93 (1.61-2.39)	2.62 (2.16-3.22)	3.14 (2.57-3.84)	3.84 (3.10-4.68)	4.37 (3.49-5.31)	4.92 (3.86-5.96)	5.47 (4.22-6.62)	6.21 (4.67-7.52)	6.78 (4.99-8.22)
30-min	0.996 (0.826-1.23)	1.30 (1.09-1.61)	1.76 (1.45-2.17)	2.11 (1.73-2.59)	2.58 (2.08-3.15)	2.94 (2.35-3.57)	3.31 (2.60-4.01)	3.69 (2.84-4.45)	4.18 (3.14-5.06)	4.56 (3.36-5.53)
60-min	0.617 (0.511-0.762)	0.806 (0.672-0.996)	1.09 (0.899-1.34)	1.31 (1.07-1.60)	1.60 (1.29-1.95)	1.82 (1.45-2.21)	2.05 (1.61-2.48)	2.28 (1.76-2.76)	2.59 (1.95-3.13)	2.82 (2.08-3.42)
2-hr	0.360 (0.302-0.434)	0.466 (0.392-0.564)	0.621 (0.520-0.748)	0.740 (0.612-0.889)	0.900 (0.738-1.08)	1.02 (0.827-1.22)	1.15 (0.914-1.37)	1.28 (0.997-1.52)	1.45 (1.10-1.72)	1.58 (1.18-1.89)
3-hr	0.262 (0.220-0.322)	0.336 (0.283-0.414)	0.440 (0.368-0.540)	0.522 (0.433-0.637)	0.637 (0.519-0.771)	0.728 (0.585-0.878)	0.822 (0.650-0.991)	0.921 (0.716-1.11)	1.06 (0.797-1.27)	1.17 (0.859-1.40)
6-hr	0.158 (0.136-0.188)	0.200 (0.172-0.238)	0.255 (0.218-0.302)	0.299 (0.253-0.353)	0.359 (0.300-0.422)	0.406 (0.334-0.475)	0.454 (0.368-0.532)	0.504 (0.402-0.591)	0.572 (0.444-0.669)	0.625 (0.474-0.733)
12-hr	0.089 (0.077-0.104)	0.112 (0.097-0.131)	0.141 (0.122-0.165)	0.164 (0.141-0.191)	0.195 (0.165-0.227)	0.219 (0.184-0.254)	0.244 (0.201-0.282)	0.269 (0.219-0.311)	0.302 (0.240-0.351)	0.328 (0.256-0.383)
24-hr	0.053 (0.047-0.060)	0.067 (0.059-0.077)	0.086 (0.077-0.099)	0.102 (0.090-0.116)	0.124 (0.108-0.141)	0.141 (0.122-0.160)	0.159 (0.137-0.180)	0.177 (0.151-0.201)	0.203 (0.171-0.230)	0.223 (0.186-0.254)
2-day	0.029 (0.020-0.033)	0.037 (0.033-0.042)	0.048 (0.043-0.055)	0.058 (0.051-0.066)	0.070 (0.061-0.080)	0.081 (0.070-0.092)	0.091 (0.079-0.104)	0.103 (0.088-0.117)	0.119 (0.100-0.135)	0.131 (0.109-0.150)
3-day	0.021 (0.018-0.024)	0.026 (0.023-0.030)	0.035 (0.031-0.040)	0.042 (0.037-0.047)	0.051 (0.045-0.058)	0.059 (0.051-0.067)	0.067 (0.058-0.076)	0.076 (0.065-0.086)	0.088 (0.074-0.101)	0.098 (0.082-0.112)
4-day	0.017 (0.015-0.019)	0.021 (0.019-0.024)	0.028 (0.025-0.032)	0.034 (0.030-0.038)	0.042 (0.037-0.047)	0.048 (0.042-0.055)	0.055 (0.048-0.062)	0.063 (0.054-0.071)	0.073 (0.062-0.083)	0.082 (0.068-0.093)
7-day	0.011 (0.009-0.012)	0.014 (0.012-0.016)	0.018 (0.016-0.021)	0.022 (0.019-0.025)	0.027 (0.023-0.031)	0.031 (0.027-0.035)	0.036 (0.031-0.040)	0.040 (0.034-0.046)	0.047 (0.040-0.054)	0.053 (0.044-0.060)
10-day	0.008 (0.007-0.009)	0.010 (0.009-0.012)	0.014 (0.012-0.016)	0.017 (0.015-0.019)	0.021 (0.018-0.023)	0.024 (0.021-0.027)	0.027 (0.023-0.030)	0.031 (0.026-0.035)	0.036 (0.030-0.040)	0.040 (0.033-0.045)
20-day	0.005 (0.004-0.006)	0.006 (0.006-0.007)	0.009 (0.008-0.010)	0.010 (0.009-0.012)	0.012 (0.011-0.014)	0.014 (0.012-0.016)	0.016 (0.014-0.018)	0.018 (0.015-0.020)	0.020 (0.017-0.023)	0.022 (0.018-0.025)
30-day	0.004 (0.003-0.004)	0.005 (0.005-0.006)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.010 (0.008-0.011)	0.011 (0.010-0.012)	0.012 (0.011-0.014)	0.014 (0.012-0.015)	0.016 (0.013-0.018)	0.017 (0.014-0.019)
45-day	0.003 (0.003-0.003)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.006-0.007)	0.008 (0.007-0.009)	0.009 (0.007-0.010)	0.010 (0.008-0.011)	0.011 (0.009-0.012)	0.012 (0.010-0.014)	0.013 (0.011-0.015)
60-day	0.003 (0.002-0.003)	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.007-0.010)	0.010 (0.008-0.011)	0.010 (0.009-0.012)

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.

[Back to Top](#)

Worksheet for 2" Orifice Basin A

Project Description

Solve For Discharge

Input Data

Headwater Elevation	1436.50	ft
Centroid Elevation	1433.58	ft
Tailwater Elevation	1435.00	ft
Discharge Coefficient	3.00	
Diameter	2.00	in

Results

Discharge	0.64	ft ³ /s
Headwater Height Above Centroid	2.92	ft
Tailwater Height Above Centroid	1.42	ft
Flow Area	0.02	ft ²
Velocity	29.47	ft/s

Worksheet for 2" Orifice Basin B

Project Description

Solve For Discharge

Input Data

Headwater Elevation	1435.00	ft
Centroid Elevation	1433.08	ft
Tailwater Elevation	1432.80	ft
Discharge Coefficient	3.00	
Diameter	2.00	in

Results

Discharge	0.73	ft ³ /s
Headwater Height Above Centroid	1.92	ft
Tailwater Height Above Centroid	-0.28	ft
Flow Area	0.02	ft ²
Velocity	33.35	ft/s

Worksheet for 2" Orifice Basin C

Project Description

Solve For Discharge

Input Data

Headwater Elevation	1439.50	ft
Centroid Elevation	1438.08	ft
Tailwater Elevation	1437.00	ft
Discharge Coefficient	3.00	
Diameter	2.00	in

Results

Discharge	0.63	ft ³ /s
Headwater Height Above Centroid	1.42	ft
Tailwater Height Above Centroid	-1.08	ft
Flow Area	0.02	ft ²
Velocity	28.68	ft/s

Basin Percolation Rates

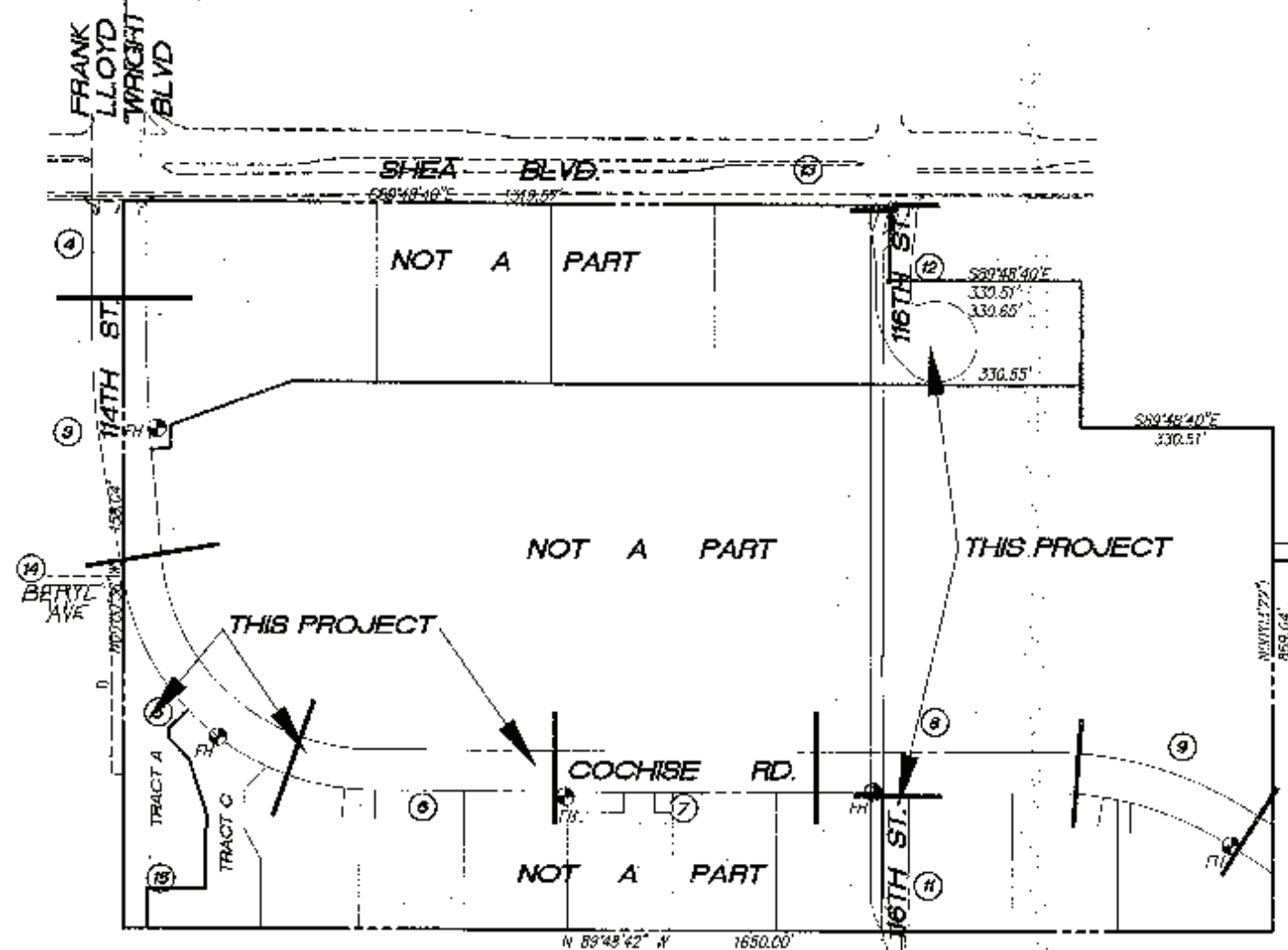
Sub-Area	Total Basin Vol.	Rate of Bleedoff	Dry-Up Time
	(cf)	(cfs)	(hr)
A	6,234	0.64	2.71
A+B+C	18,394	0.73	7.00
C	2,050	0.63	0.90

APPENDIX K

Mirage Crossing As-Builts

COCHISE ROAD, 114TH STREET AND 116TH STREET PAVING, SEWER, WATER AND GRADING PLANS

A PORTION OF THE NORTH HALF OF SECTION 27, T. 3 N., R. 5 E., OF THE
GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA



KEY MAP

③ SHEET NUMBER
1 LOT/TRACT NUMBER

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS (DENOTED AS "AB") AS SHOWN HEREON OF IMPROVEMENTS DONE INSIDE CITY OF SCOTTSDALE RIGHT-OF-WAY AND PUBLIC EASEMENTS WERE MADE UNDER MY SUPERVISION AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

[Signature]
REGISTERED LAND SURVEYOR
217640
REGISTRATION NO.

DATE

WATER CERTIFICATION

THE WATER SYSTEM SHOWN HEREON HAS BEEN DESIGNED TO ADEQUATELY SUPPLY WATER IN SUFFICIENT QUANTITY AND PRESSURE TO MEET THE LOCAL FIRE PROTECTION REQUIREMENTS.

FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

COMMUNITY NUMBER	PANEL # PANEL DATE	SUFFIX	DATE OF FIRM (Index Date)	FIRM ZONE	DATE FLOOD ELEVATION (in AD Zone, Use Depth)
045012	1705 SEPT. 30, 1985	E	SEPT. 30, 1985	X	N/A

LEGEND

---	PROPERTY LINE
---	RIGHT-OF-WAY
---	CENTER LINE
---	EXISTING CONTOUR
---	PROPOSED CONTOUR
---	EXISTING GAS
---	EXISTING TELEPHONE
---	EXISTING WATERLINE
---	EXISTING UNDERGROUND ELECTRIC
---	EXISTING FIRE HYDRANT
---	PROPOSED FIRE HYDRANT
---	EXISTING WATER VALVE
---	PROPOSED WATER VALVE
---	10' OF CURB
---	CUTTER
---	EDGE OF PAVEMENT
---	PAVEMENT
---	FLOW LINE
---	FINISHED GRADE
---	EXISTING GRADE
---	TOP OF RETAINING WALL
---	RIGHT-OF-WAY
---	BACK OF CURB
---	POINT OF CURVE
---	POINT OF TANGENT
---	CENTERLINE
---	MONUMENT LINE
---	PUBLIC UTILITY EASEMENT
---	DRIVEWAY
---	INVERT
---	FIRE HYDRANT

DEVELOPER

MIRAGE HOMES CONSTRUCTION, INC.
18927 EAST SAGUARO BLVD.
MOUNTAIN VIEWS, ARIZONA 85208
(602) 837-0700

ENGINEER

SCOTTSDALE, INC.
3030 EAST CAMELBACK ROAD, SUITE 200
PHOENIX, ARIZONA 85044
(602) 952-8788

BENCHMARK

CITY OF SCOTTSDALE STATION NUMBER 8271
CITY OF SCOTTSDALE BRASS CAP FLUSH AT
THE INTERSECTION OF 116TH STREET & SHEA BOULEVARD
ELEV. - 1488.475 (NAD 80 DATUM)

BASIS OF BEARING

ASSUMED 5 89°48'40" E ALONG THE NORTH LINE
OF SECTION 27, T. 3 N., R. 5 E., OF THE
GILA AND SALT RIVER BASE & MERIDIAN,
MARICOPA COUNTY, ARIZONA

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER
2	NOTES, DETAILS, QUANTITIES
3-4	114TH STREET
5-10	COCHISE ROAD
11-13	116TH STREET
14	SEWER PLAN AND STORM DRAIN SECTIONS
15	GRADING PLAN
16	WALL DETAILS

UTILITY COMPANIES

THE PLANS HAVE BEEN SUBMITTED TO THE FOLLOWING UTILITY COMPANIES. THE SIZE AND LOCATIONS AS SHOWN OF THE GAS, TELEPHONE, AND POWER LINES, AND CONNECTIONS AGREE WITH THE INFORMATION CONTAINED IN THE UTILITY COMPANY RECORDS. WHERE THE WORK TO BE PERFORMED IS IN CONFLICT WITH ANY OF THESE UTILITIES, THE CONFLICT SHALL BE RESOLVED FOR THE SPECIAL PROVISIONS OR AS INDICATED ON THESE PLANS. CONFLICTS ARISING DURING THE COURSE OF CONSTRUCTION FROM UNDISCOVERED CIRCUMSTANCES SHALL BE REPORTED TO THE INTERESTED UTILITY COMPANY AND BE RESOLVED BY THEM AND THE DESIGN ENGINEER. THE CONTRACTOR SHALL CONTRACT BLUESTAKE 48 HOURS PRIOR TO ANY EXCAVATION FOR UTILITY LOCATIONS, 2653-1100.

ELECTRIC - ARIZONA PUBLIC SERVICE	GAIV - COX COMMUNICATIONS
GAS - SOUTHWEST GAS	WALBY - CITY OF SCOTTSDALE
TELEPHONE - US WEST COMMUNICATIONS	SWMT - CITY OF SCOTTSDALE

APPROVALS:

[Signature] 990489, 990690 8/10/99
MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPT.
NOTE: SIGNS REQUIRE SEPARATE APPROVALS AND PERMITS.

CITY OF SCOTTSDALE

REVIEW AND RECOMMENDED APPROVAL BY:

FIRE DEPT.	4-3-99	GRADING & DRAINAGE	8-31-99
PLANNING	8-31-99	WATER & SEWER	8-31-99
TRAFFIC	N/A	PAVING	8-31-99
		RETAINING WALLS	

APPROVED BY:

[Signature] 9-3-99
PROJECT REVIEW OR ENGINEER DATE

41625

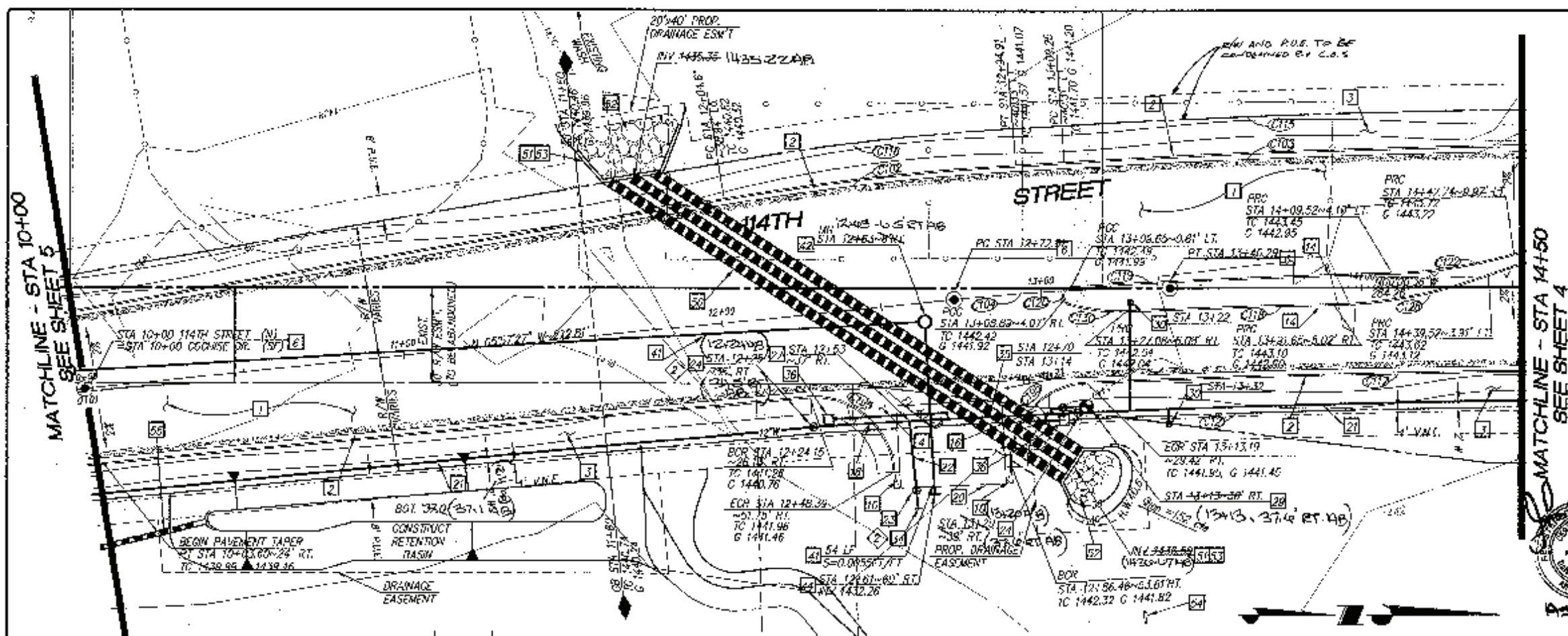


GeoDimensions



CITY OF SCOTTSDALE
MIRAGE CROSSING
PAVING PLANS
12-DR-99
1753-99

98582
1 OF 16



CONSTRUCTION KEY NOTES PAVING NOTES

1. CONSTRUCT A.C. PAVEMENT PER TYPICAL SECTION, SHEET 2.
2. CONSTRUCT 6" VERTICAL CURB & GUTTER PER M.A.G. STD. DET. 220, TYPE "A".
3. CONSTRUCT 5" SIDEWALK PER M.A.G. STD. DET. 230.
4. CONSTRUCT 6" WIDE VALLEY GUTTER AND APRON PER C.O.S. STD. DET. 224.
5. INSTALL SURVEY MARKER PER M.A.G. STD. DET. 120-1, TYPE "B".
6. CONSTRUCT CURB TERMINATION PER M.A.G. STD. DET. 222.
7. CONSTRUCT 6" SINGLE CURB PER M.A.G. STD. DET. 222, TYPE "A".
8. CONSTRUCT SIDEWALK RAMP PER M.A.G. STD. DET. 232, TYPE "B".
9. CONSTRUCT PAVEMENT TERMINATION PER M.A.G. STD. DET. 201, TYPE "A".

WATER NOTES

10. INSTALL 12" WATERLINE (D.I.P.).
11. INSTALL 8" WATERLINE (D.I.P.).
12. INSTALL 8" GATE VALVE WITH V.B. & C. PER M.A.G. STD. DET. 391-1, TYPE "C".
13. INSTALL 12" GATE VALVE WITH V.B. & C. PER M.A.G. STD. DET. 391-2, TYPE "C".
14. INSTALL 12" W/ 1/2" WITH MFG. OR RES. MARKS AND ELECTRONIC BALL MARKER.
15. INSTALL FIRE HYDRANT PER STD. DET. 360 WITH PAVEMENT MARKERS PER C.O.S. STD. DET. 2363.
16. INSTALL 1" IRRIGATION SERVICE.
17. INSTALL CURB STOP WITH FLUSHING PIPE PER M.A.G. STD. DET. 390, TYPE "B".
18. CONSTRUCT VERTICAL ALIGNMENT OF WATER MAIN PER C.O.S. STD. DET. 2370.
19. INSTALL AIR/VACUUM RELEASE VALVE PER C.O.S. STD. DET. 2348.
20. INSTALL 8"-45" BEND WITH MFG. OR RES. MARKS AND ELECTRONIC BALL MARKER.

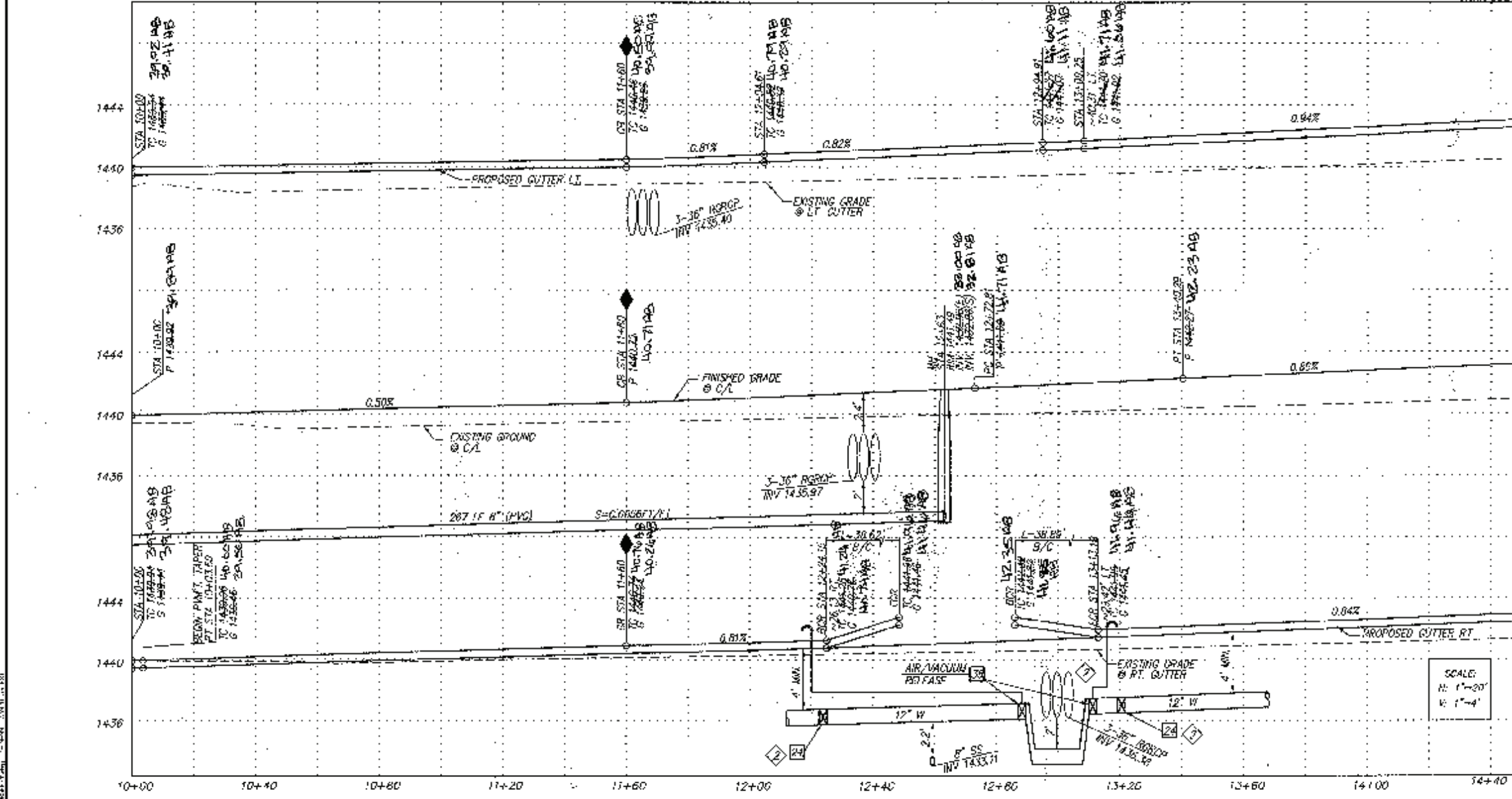
SEWER NOTES

21. INSTALL 8" SEWERLINE (PVC).
22. CONSTRUCT 4" DIA. SANITARY SEWER MANHOLE PER M.A.G. STD. DET. 420. ADJUST PER M.A.G. STD. DET. 422, WITH BOTTOM LINE.
23. INSTALL SEWER LINE PLUG PER M.A.G. STD. DET. 427.

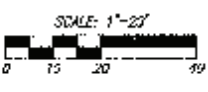
DRAINAGE NOTES

24. INSTALL 18" RCP CULVERT, SET SECTION DET. 14. STA. SHOW 1" SLOPE CLASS. SLOPE 12+30 80' RT. 175 3-36" II 0.17%.
25. CONSTRUCT HEADWALL PER M.A.G. STD. DET. 501-1 & 501-2, "U" TYPE.
26. CONSTRUCT 12" DIA. NATIVE RIP-RAP DRAINAGE PAD AT DEPTH=30" MIN. TO LIMITS SHOWN ON PLAN.
27. INSTALL SAFETY RAILING ON HEADWALL PER C.O.S. STD. DET. 2508.
28. REGRADE EXISTING WASH TO CULVERT INLET.
29. FUTURE IMPROVEMENTS PER MIRAGE CROSSING CONDOMINIUM PLANS.

CURVE TABLE			
CURVE	LENGTH	RADIUS	DELTA
C100 B/C	91.72	800.00	06°34'09"
C103 B/C	171.88	2910.15	03°18'57"
C105 B/C	38.89	24.50	90°57'08"
C115 P/W	182.53	2981.15	03°30'20"
C116 P/W	58.21	811.00	06°35'17"
C119 B/C	38.89	24.50	90°57'08"
C120 B/C	164.71	3938.84	02°13'45"
C121 B/C	24.46	3981.34	06°55'57"
C122 B/C	59.88	2030.65	01°57'17"
C123 B/C	1.04	2.50	161°14'50"
C124 P/W	250.78	3927.84	03°39'28"
C125 B/C	38.77	150.00	14°48'35"
C126 B/C	18.31	59.50	17°39'01"
C127 B/C	48.62	150.00	18°41'04"
C128 C/L	87.47	650.00	05°58'51"



41627



2630000
14TH STREET
CITY OF SCOTTSDALE

14TH STREET
MIRAGE CROSSING
CITY OF SCOTTSDALE

ARIZONA
CITY OF SCOTTSDALE

14TH STREET
MIRAGE CROSSING
CITY OF SCOTTSDALE

14TH STREET
MIRAGE CROSSING
CITY OF SCOTTSDALE

APPENDIX L

Preliminary Grading and Drainage Plans

GENERAL NOTES FOR PUBLIC WORKS CONSTRUCTION:

1. 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 GOVERN.
2. 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.
3. 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 WORK.
5. WHENEVER EXCAVATION IS NECESSARY, CALL THE BLUE STAKE CENTER, 811, TWO WORKING DAYS BEFORE EXCAVATION BEGINS.
6. 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.

WEIGHTED C CALCULATIONS

DRAINAGE AREA A

AREA OF IMPERVIOUS = 20,210 SF
AREA OF PERVIOUS = 24,346 SF

$$\text{WEIGHTED C} = \frac{(20,210 \times 0.95) + (24,346 \times 0.45)}{44,556}$$

$$\text{WEIGHTED C} = 0.68$$

DRAINAGE AREA B

AREA OF IMPERVIOUS = 35,146 SF
AREA OF PERVIOUS = 18,913 SF

$$\text{WEIGHTED C} = \frac{(35,146 \times 0.95) + (18,913 \times 0.45)}{54,059}$$

$$\text{WEIGHTED C} = 0.78$$

DRAINAGE AREA C

AREA OF IMPERVIOUS = 7,237 SF
AREA OF PERVIOUS = 5,102 SF

$$\text{WEIGHTED C} = \frac{(7,237 \times 0.95) + (5,102 \times 0.45)}{12,339}$$

$$\text{WEIGHTED C} = 0.74$$

RETENTION CALCULATIONS

100-YEAR 2-HOUR STORM EVENT

DRAINAGE AREA A

C = 0.68

P = 2.30 IN

AREA = 44,556 SF

$$(0.68) \left(\frac{2.30}{12} \right) (44,556) = 5,780 \text{ CF REQUIRED}$$

DRAINAGE AREA B

C = 0.78

P = 2.30 IN

AREA = 54,059 SF

$$(0.78) \left(\frac{2.30}{12} \right) (54,059) = 8,031 \text{ CF REQUIRED}$$

DRAINAGE AREA C

C = 0.74

P = 2.30 IN

AREA = 12,339 SF

$$(0.74) \left(\frac{2.30}{12} \right) (12,339) = 1,758 \text{ CF REQUIRED}$$

DRAINAGE AREA D

C = 0.64 (R1-18 ZONING)

P = 2.30 IN

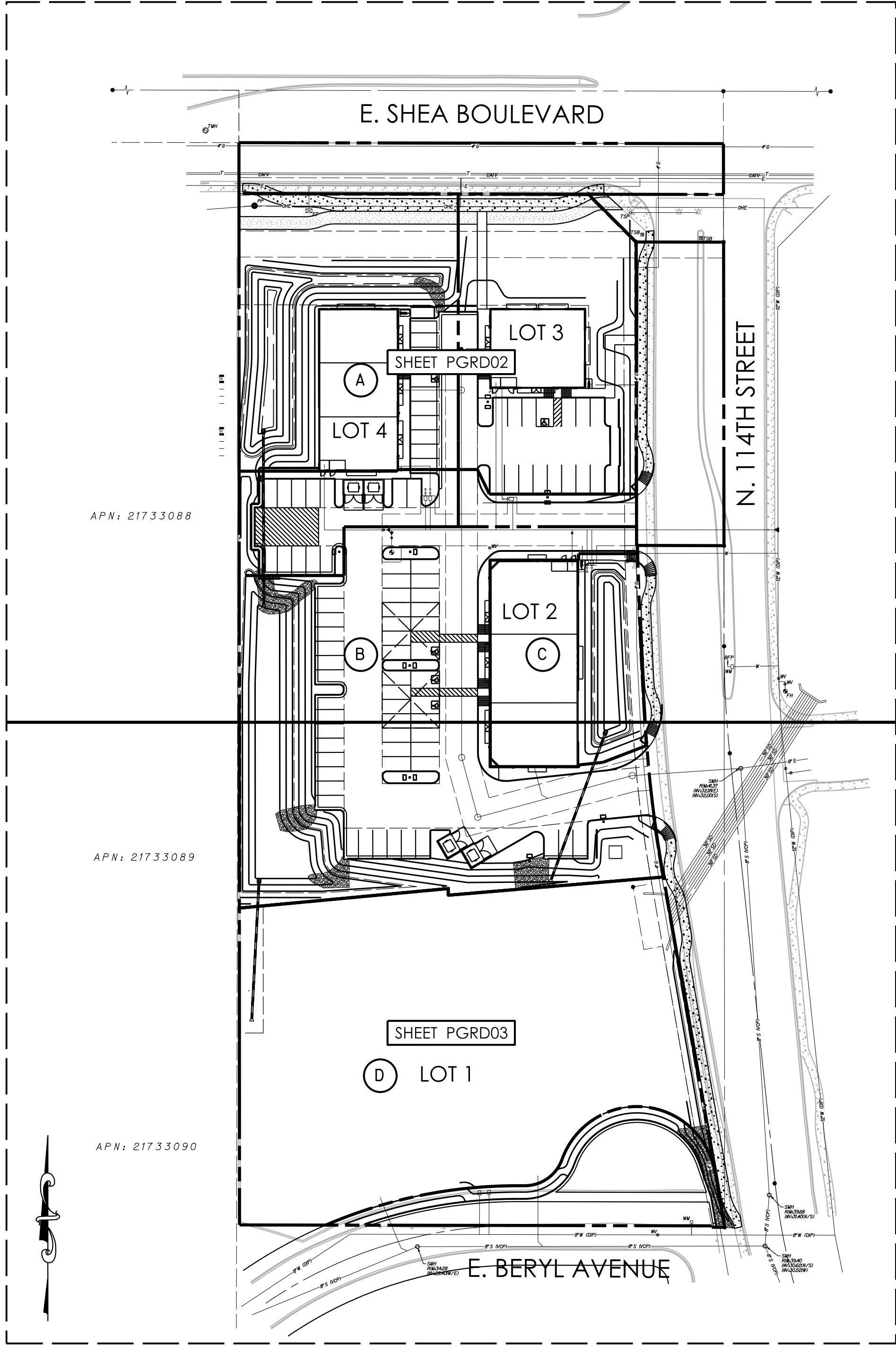
AREA = 50,962 SF

$$(0.64) \left(\frac{2.30}{12} \right) (50,962) = 6,251 \text{ CF REQUIRED}$$

*NOTE: 6,251 CUBIC FEET OF RETENTION IS REQUIRED FOR LOT 1.
THIS VOLUME WILL BE REQUIRED TO BE RETAINED ON THE LOT.
THIS VOLUME WILL BE NON-WAIVABLE AND WILL BE REQUIRED WITH THE HOUSE PLANS.

PRELIMINARY GRADING & DRAINAGE PLAN FOR
114TH & SHEA RETAIL
SWC 114TH ST. & SHEA BLVD., SCOTTSDALE, AZ 85259

LOCATED IN A PORTION OF THE NORTHWEST QUARTER OF SECTION 27, TOWNSHIP 3 NORTH, RANGE 5 EAST
OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA



SITE MAP
N.T.S.

INDEX OF SHEETS

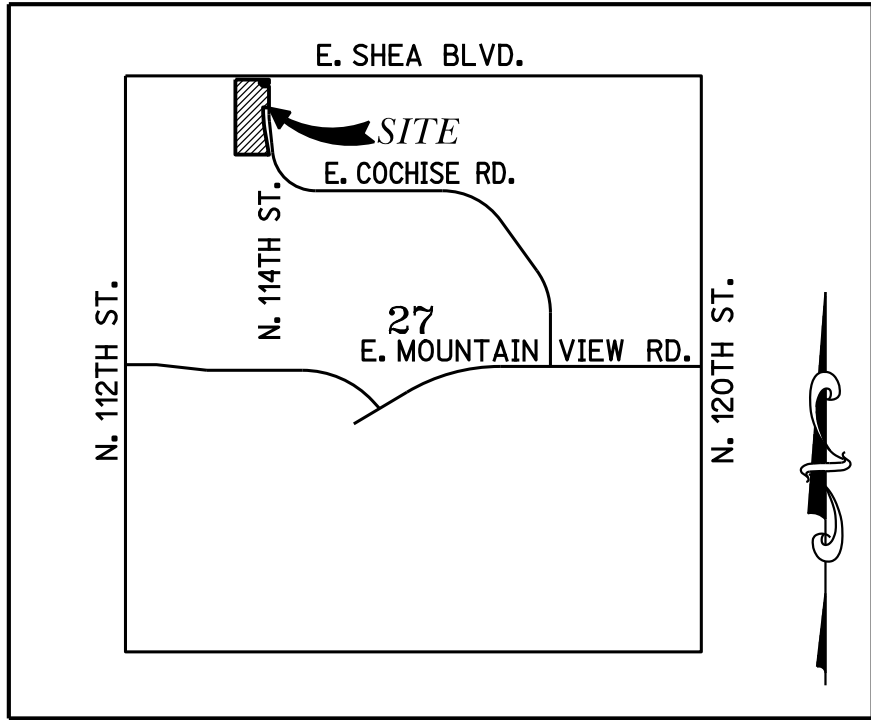
SHEET NO.	DESCRIPTION
PGRD01	COVER SHEET - PRELIMINARY GRADING & DRAINAGE PLAN
PGRD02	PRELIMINARY GRADING & DRAINAGE PLAN
PGRD03	PRELIMINARY GRADING & DRAINAGE PLAN

FLOOD INSURANCE RATE MAP (FIRM) INFORMATION:

COMMUNITY NUMBER	PANEL NUMBER	PANEL DATE	SUFFIX	FIRM DATE	FIRM ZONE	BASE FLOOD ELEVATION
045012	1780	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.



VICINITY MAP
N.T.S.

PROJECT SCOPE:

THE SCOPE OF THIS PROJECT IS A NEW RETAIL DEVELOPEMENT, UTILITY IMPROVEMENTS AND LANDSCAPE.

CLIENT:

HAWKINS COMPANIES LLC
4700 S. MCCLINTOCK DR. #160
TEMPE, ARIZONA 85282

CONTACT: MARK MITCHELL
PHONE: (480) 223-8239
EMAIL: MMITCHELL@HCOLLC.COM

ENGINEER:

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

ASSESSORS PARCEL NUMBERS:

PORTIONS OF APN 217-33-034G, 034F, 034M, 034K, & 034N.

BENCHMARK:

3" BRASS DISK, LOCATED AT THE INTERSECTION OF SHEA BOULEVARD & 114TH STREET.

ELEVATION = 1444.23 (NAVD'88)
CITY OF SCOTTSDALE DATUM

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

ENGINEER
DATE 4/21/2022

BASIS OF BEARING

THE BASIS OF BEARING IS THE CENTERLINE OF EAST SHEA BOULEVARD, ALSO BEING THE NORTHERN SECTION LINE OF SECTION 27, TOWNSHIP 3 NORTH, RANGE 5 EAST, WHICH BEARS N89°53'00"W PER GPS COORDINATE OBSERVATIONS ARIZONA STATE PLANE, CENTRAL ZONE NAD83.

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:

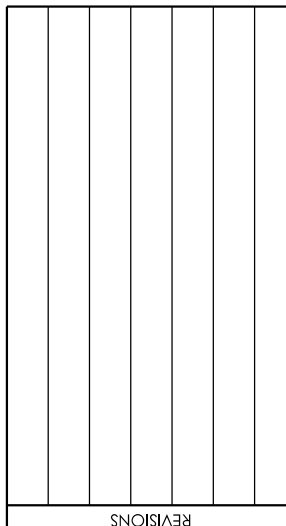
I HEREBY CERTIFY THAT THE RECORD DRAWING MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED ENGINEER/LAND SURVEYOR
DATE
REGISTRATION NUMBER

CIVIL APPROVAL

REVIEW & RECOMMENDED APPROVAL BY:			
PAVING		TRAFFIC	
G & D		PLANNING	
W & S		FIRE	
RET. WALLS			
ENGINEERING COORDINATION MGR. (OR DESIGNEE)		DATE	

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



114TH & SHEA RETAIL
SWC 114TH ST. & SHEA BLVD., SCOTTSDALE, AZ 85259
PRELIMINARY GRADING & DRAINAGE PLAN



3 engineering
planning
civil engineering
surveying
COPYRIGHT 2022 3 ENGINEERING, LLC
DESIGNED BY: D. MANN
CHECKED BY: D. MANN
DATE: 4/21/22

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

DATE: 04/21/22

PROJECT NO.
1831

SHEET NO.
PGRD01
1 of 3

Q.S.#28-55

C:\V\SecurSync\Projects\1831_114th_Shea_Preliminary\1831.dgn 02/22

MEASURED LINE TABLE		
LINE	BEARING	DISTANCE
L1	N89°52'10"W	8.12'

RECORD LINE TABLE		
LINE	BEARING	DISTANCE
L1	N89°48'40"W	8.12'

MEASURED CURVE TABLE					
CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	98.24'	811.00'	6°56'26"	N06°26'53"W	98.18'
C2	107.09'	2979.97'	2°03'32"	N02°30'43"W	107.08'
C3	67.47'	650.00'	5°56'50"	S03°02'31"E	67.44'
C4	585.41'	400.00'	83°5'14"	S47°59'03"E	534.55'

RECORD CURVE TABLE					
CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	98.21'	811.00'	6°56'17"	N/A	N/A
C2	107.13'	2981.15'	2°03'32"	N/A	N/A
C3	67.47'	650.00'	5°56'50"	S03°02'31"E	67.44'
C4	585.41'	400.00'	83°5'14"	S47°59'03"E	534.55'

APN: 21733087

APN: 21733088

RETENTION BASIN B
H.W.=35.0
BTM.=33.0
VOL. REQUIRED = 8,031 c.f.
VOL. PROVIDED = 10,110 c.f.

RETENTION BASIN A
H.W.=36.5
BTM.=33.5
VOL. REQUIRED = 5,780 c.f.
VOL. PROVIDED = 6,234 c.f.

RETENTION BASIN C
H.W.=39.5
BTM.=38.0
VOL. REQUIRED = 1,758 c.f.
VOL. PROVIDED = 2,050 c.f.

MATCHLINE - SEE SHEET 3

SCALE: 1"= 20'

Contact Arizona 911 at least two full working days before you begin excavation.
Call 911 or click Arizona911.com

114TH & SHEA RETAIL
SWC 114TH ST. & SHEA BLVD., SCOTTSDALE, AZ 85259
PRELIMINARY GRADING & DRAINAGE PLAN



300engineering
planning
civil engineering
SURVEYING
DESIGNER: D. MANN
CHECKER: D. MANN
CADD TECH: PHILIP Y.
COPYRIGHT 2022 300ENGINEERING, LLC

300ENGINEERING, LLC
6370 E. THOMAS ROAD
SUITE # 200
SCOTTSDALE, ARIZONA 85251
PHONE: (602) 334-4387
FAX: (602) 490-3230
WWW.300ENGINEERING.COM

DATE: 04/21/22
PROJECT NO.
1831
SHEET NO.
PGRD02
2 of 3

Q.S.#28-55

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

Q.S.#28-55