DRAINAGE REPORT

For

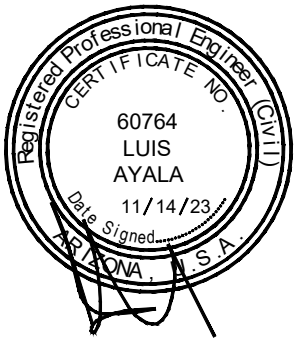
Pickleball Facility

7300 E. McDowell Road
Scottsdale, Arizona

APN: 131-18-091C

Prepared for:

Motor McDowell Holdings, LLC
7300 E. McDowell Road
Scottsdale, AZ 85257



November 14, 2023

KAEKO Job # 7023044

4655 N Flowing Wells Road
Tucson, AZ 85705
(520) 690-1669

KAEKO
a KDS company

12409 W Indian School Road, Ste C303
Avondale, AZ 85392
(623) 536-1993

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APPENDICES

1.0 Introduction

This Drainage Report addresses the redevelopment of an existing commercial/retail building and associated asphalt paved parking located at 7300 E. Mc Dowell Road in the City of Scottsdale

The proposed development project (Site) involves the demolition of the existing building and removal of the existing asphalt pavement for the construction of a new office style building and approximately 12-new pickleball courts, with new asphalt paved parking. The footprint of the new building will be approximately 3,500-sf. The Site's APN is 131-18-091C, where Maricopa County Assessors office reports the parcel to be 94,090-sf and zoned C3 (Highway Commercial).

Elevation datum for this report is 1988 NAVD.

A *Vicinity Map* and *Parcel Map* are provided in Appendix A.

2.0 Description of Existing Site and Existing Hydrology

Per FEMA Map 04013C2235M, effective date September 18, 2020 the Site is in a Shaded Flood Zone X, which is defined as an 'area of 0.2% annual chance flood, areas of 1% annual chance flood with average depths less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood.'

A *FIRMette* depicting the Site is provided in Appendix B.

Per the NRCS Web Soil Survey, the soil on Site is Laveen loam (LaA). Laveen loams are typically on slopes less than 2-percent, are loam at the surface and continue to be loam as the depth of the soil profile increases, have capacity to transmit water from 0.57 to 1.98-in/hr, and belong to Hydrologic Soil Group C.

See *Site Soil Information* in Appendix C.

Local topography generally slopes from the northwest to the southeast at slopes approximating 60-feet per mile. A *Regional Topography Map* is in Appendix D.

The existing Site is fully developed and located within an existing fully developed neighborhood. The Site is bounded by E. McDowell Road to the south and by a single-family residential area to

the north. The adjacent properties to both the east and west of the Site are both fully developed with existing commercial buildings and associated asphalt paved parking. The roadway profile along E. McDowell Road adjacent to the Site is a typical urban cross section with existing curb and gutter with existing storm drain scuppers and storm sewer utilities to manage stormwater runoff within the roadway and associated R.O.W along the north ½ of E. McDowell Road adjacent to the Site. Stormwater runoff along E. McDowell Road is managed by existing infrastructure within the roadway and associated R.O.W. and does not impact the Site. Stormwater runoff within the adjacent single-family residential development adjacent to the north of the Site is managed internal to the residential development and does not impact Site. The existing commercial/retail properties to both the east and west of the Site also manage stormwater runoff internal to their individual Sites and runoff from these adjacent properties to the east and west do not impact the Site.

The discharge rates across the Site in the existing condition are summarized below in Table 1 – Summary of Existing Discharge Rates.

Table 1 – Summary of Existing Discharge Rates

Description	$C_{2,10}$	C_{100}	i_{2yr} (in/hr)	i_{10yr} (in/hr)	i_{100yr} (in/hr)	A (acres)	Q_2 (cfs)	Q_{10} (cfs)	Q_{100} (cfs)
Site	0.95	0.95	2.83	4.66	7.37	2.16	5.81	9.56	15.12

The ultimate outfall is generally near the southeast corner of the Site at elevation 23.24'.

The *Existing Conditions Drainage Map* is in Appendix F.

3.0 Proposed Redevelopment

Proposed Site redevelopment includes the construction of one new office style building, reconstructing a portion of the existing paved parking area, construction of approximately 12 pickleball courts, stormwater facilities, civil improvements, and final landscaping. The new building will be approximately 3,500-sf. The existing Site if fully developed and covered in full

by impervious surfaces. The redeveloped Site will also be fully developed and covered in full by impervious surfaces. There are no proposed changes in the amount of impervious land cover area and also no changes to existing drainage patterns across the Site, nor to any proposed drainage changes to off-site areas. The existing lot is fully developed with a land cover of existing roof and asphalt paved parking. Runoff volumes remain unchanged between the redeveloped condition and the existing condition across the Site. Table 2 – Summary of Redevelopment Discharge Rates provides a summary of the discharge runoff rates in the proposed, redeveloped condition.

Table 2 – Summary of Redeveloped Discharge Rates

Description	$C_{2,10}$	C_{100}	i_{2yr} (in/hr)	i_{10yr} (in/hr)	i_{100yr} (in/hr)	A (acres)	Q_2 (cfs)	Q_{10} (cfs)	Q_{100} (cfs)
Site	0.95	0.95	2.83	4.66	7.37	2.16	5.81	9.56	15.12

The City of Scottsdale Design Standards and Policies Manual uses the Rational Method to determine volume of stormwater runoff produced across the developed Site in a 100-yr, 2-hr rainfall event. Volume of rainfall runoff produced by the Site in the redeveloped condition will be identical to the existing condition of the Site.

The required retention volume was determined using the Rational Method. The formula for the Rational Method to determine required volume (V) is → $V = C * \frac{P}{12} * A$, where C=runoff coefficient based on final land use cover; P= rainfall depth (inches) for the 100-yr, 2-hr event; A=drainage area (square feet).

Land cover runoff coefficient (C)=0.95 (pavement and rooftop), = 0.90 (Business/Commercial Areas), = 0.50 (Undeveloped Desert); Per NOAA Atlas 14 rainfall depth (P) =2.14-in; Drainage area (A) = area in square feet.

NOTE: NOAA Rainfall Atlas 14 rainfall depth is reported at 2.14-inches, this report uses rainfall depth of 2.20-inches for stormwater calculations.

Example stormwater **required retention** volume calculation for the Site is provided below:

North Drainage Area (Parking Lot) ➔ C= 0.95; P=2.20-in; A=34,610-sf

$V(cf) = 0.95 * \frac{2.20(in)}{\frac{12(in)}{ft}}$*34,610 (sf) = **6,028-cf.**

South Drainage Area (Building and Courts) ➔ C= 0.95; P=2.20-in; A=59,480-sf

$V(cf) = 0.95 * \frac{2.20(in)}{\frac{12(in)}{ft}}$*59,480 (sf) = **10,359-cf.**

The retention basin at the north of the Site provides 6,028-cf of volume for stormwater retention. The underground retention tank for the south area of the Site provides 10,362-cf volume for stormwater retention. Table 3 provides a summary of the retention required and provided across the Site.

Table 3, Retention Summary

Description	C (unitless)	P (in)	A (sf)	Drains To	Volume Required (cf)	Volume Provided (cf)
North Drainage Area (Parking Lot)	0.95	2.20	34,610	Retention Basin	6,028	6,028
South Drainage Area (Building and Courts)	0.95	2.20	59,480	Tank	10,359	10,362
SITE	0.95	2.20	94,090	Basin or Tank	16,387	16,390

The underground retention tank will utilize one drywell to promote infiltration and empty the tank within 36-hours. The retention basin will also utilize one drywell and will also drain the basin in less than 36-hours. Table 4 – Drywell Drain Rate Summary provides the dry up times in both the basin and the tank.

Table 4, Drywell Drain Rate Summary

Description	Drains To	Volume Provided (cf)	Number of Drywells	Drain Rate (cfs)	Time to Drain (hrs)
North Drainage Area (Parking Lot)	Retention Basin	6,028	1	0.1	16.7
South Drainage Area (Building and Courts)	Tank	10,362	1	0.1	28.8

The calculated time to drain the underground retention tank is 28.8-hours. The calculated time to drain the basin is 16.7-hrs. A drywell is estimated to drain at a rate of 0.10-cfs. A sample calculation follows for the tank drywell is below:

Equation: Total volume (cf) / Total Rate (cf/hr) = Drain time (hrs.) (T=V/R)
Where: T=Time to Drain (hrs); V=Volume (cf); R=Drain Rate (cfs)

Sample Calculation:
Volume (V) = 10,362-cf
Drain Rate (R) = 0.10-cfs/drywell
Unit Conversion $3{,}660\,\frac{sec}{hr}$
Time to Drain (T) = $\frac{10{,}362cf}{\frac{0..10}{sec}} * \frac{1hr}{3{,}600sec}$ = **28.8-hrs**

Also, the roadway R.O.W. adjacent to the Site maintains both the 10-year and 100-year stormwater runoff flows within the R.O.W. and does not impact the Site. Information related to the runoff flows within the R.O.W. are in Appendix G.

The *Proposed Condition Drainage Map is* in Appendix G.

4.0 Summary

This Drainage Report addresses the redevelopment of an existing fully developed parcel at 7300 E. McDowell Road in Scottsdale, Arizona. The proposed redevelopment project (Site) involves the redevelopment of an existing commercial property, and includes improvements to parking, drainage, and final landscaping. The footprint of the new building is approximately 3,500-sf. The ultimate outfall is generally near the southeast corner of the Site elevation 23.24'. The FFE of the new building is set to 26.00'. The highwater elevation of the north retention basin is set to 23.00.'

Runoff volumes across the Site in the proposed drainage condition is identical to the runoff volume produced across the Site in the existing drainage condition. The Site is surrounded by a fully developed neighborhood with existing commercial properties and a single-family residential development adjacent to the Site. There is no change in stormwater runoff volume produced across the Site between the proposed development and the existing development.

5.0 References

NOAA 14. Hydrometeorological Design Studies Center Precipitation Frequency Data Server. (http://hdsc.nws.noaa.gov/hdsc/pfds/).

Federal Emergency Management Agency, Flood Map Service Center, (https://msc.fema.gov/portal/home).

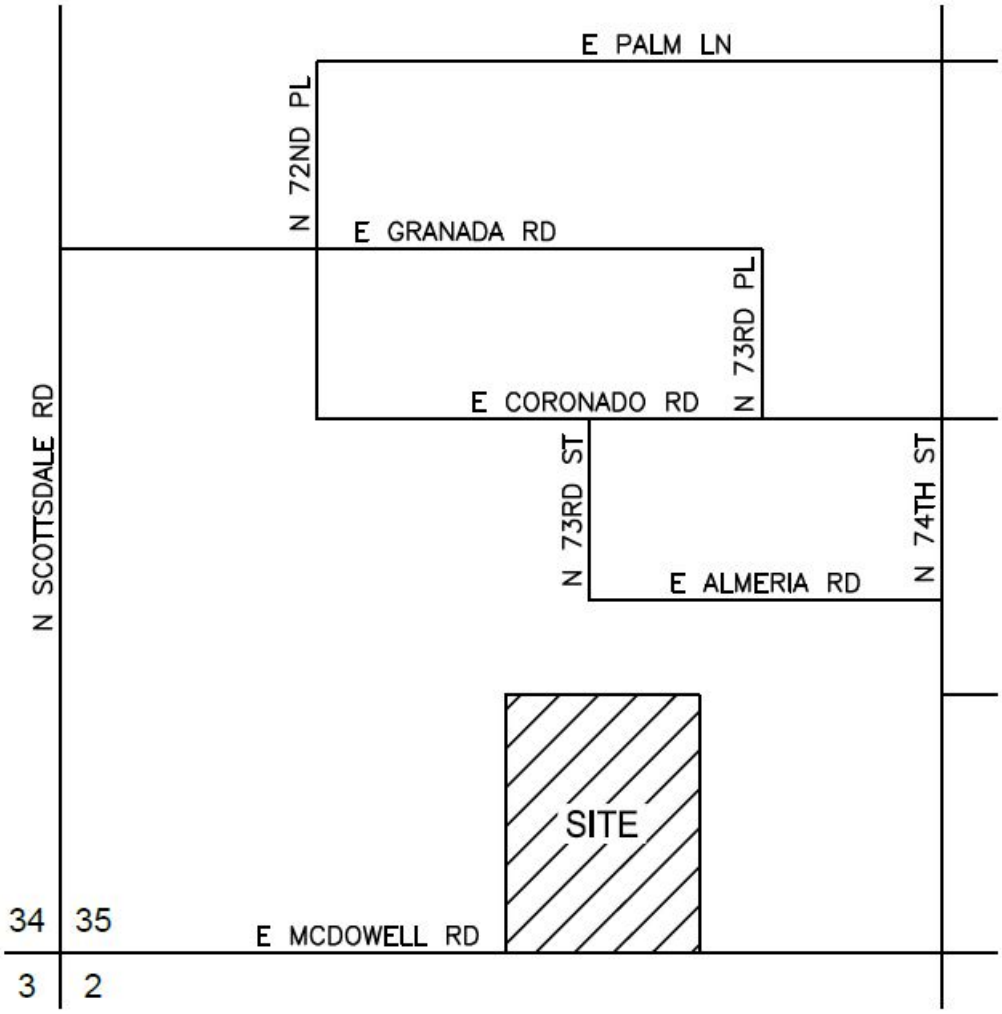
US Geological Survey, USGS Store Map Locator (https:// store.usgs.gov/map-locator)

USDA-NRCS. Web Soil Survey. (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm).

City of Scottsdale *Design Standards & Policies Manual,* 2018.

APPENDIX A

Vicinity Map and Parcel Map

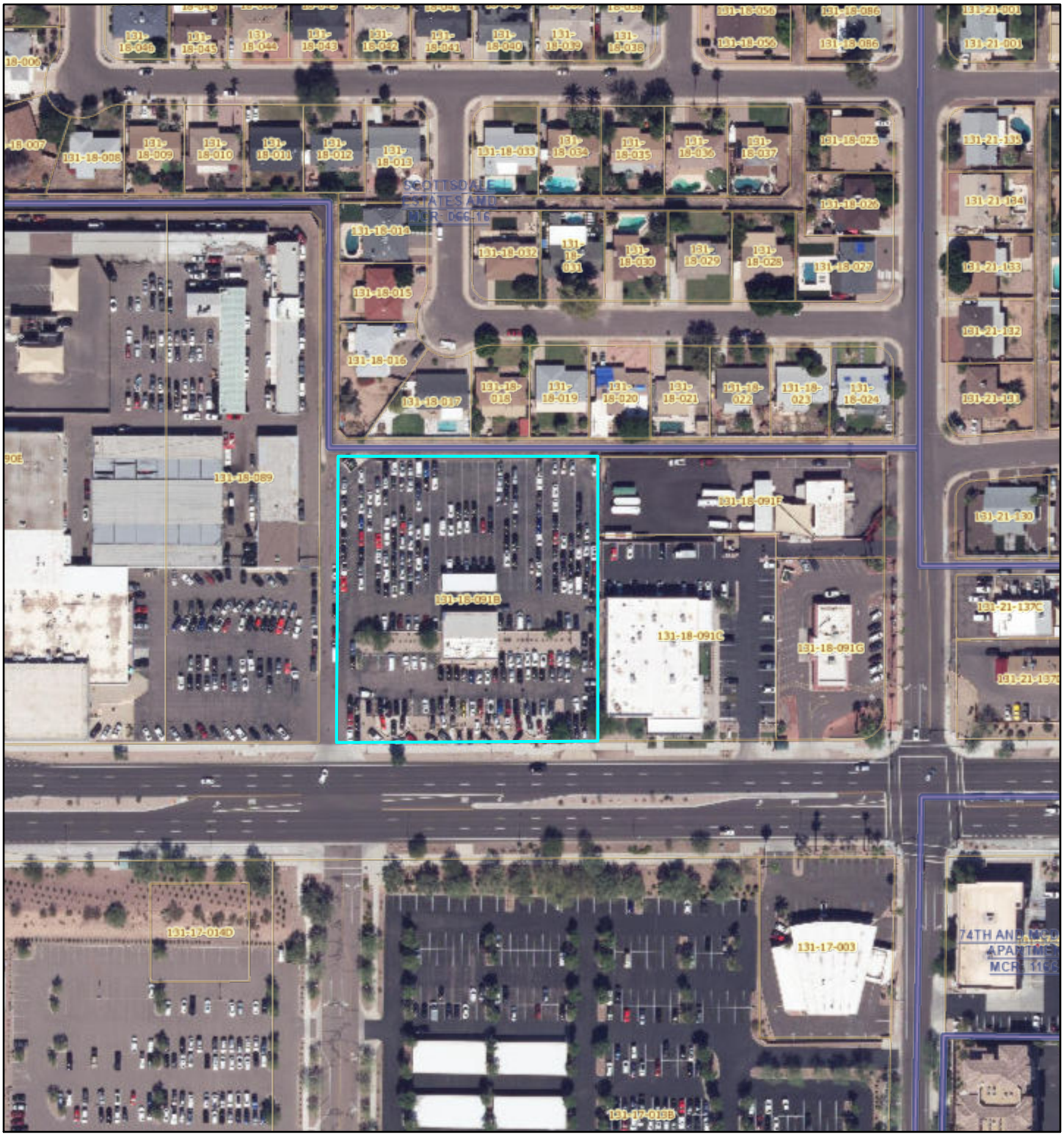


VICINITY MAP

N.T.S.

N

Parcel Map



October 26, 2023

1:2,257

0 0.01 0.03 0.06 mi

0 0.03 0.05 0.1 km

Maricopa County Assessor's Office

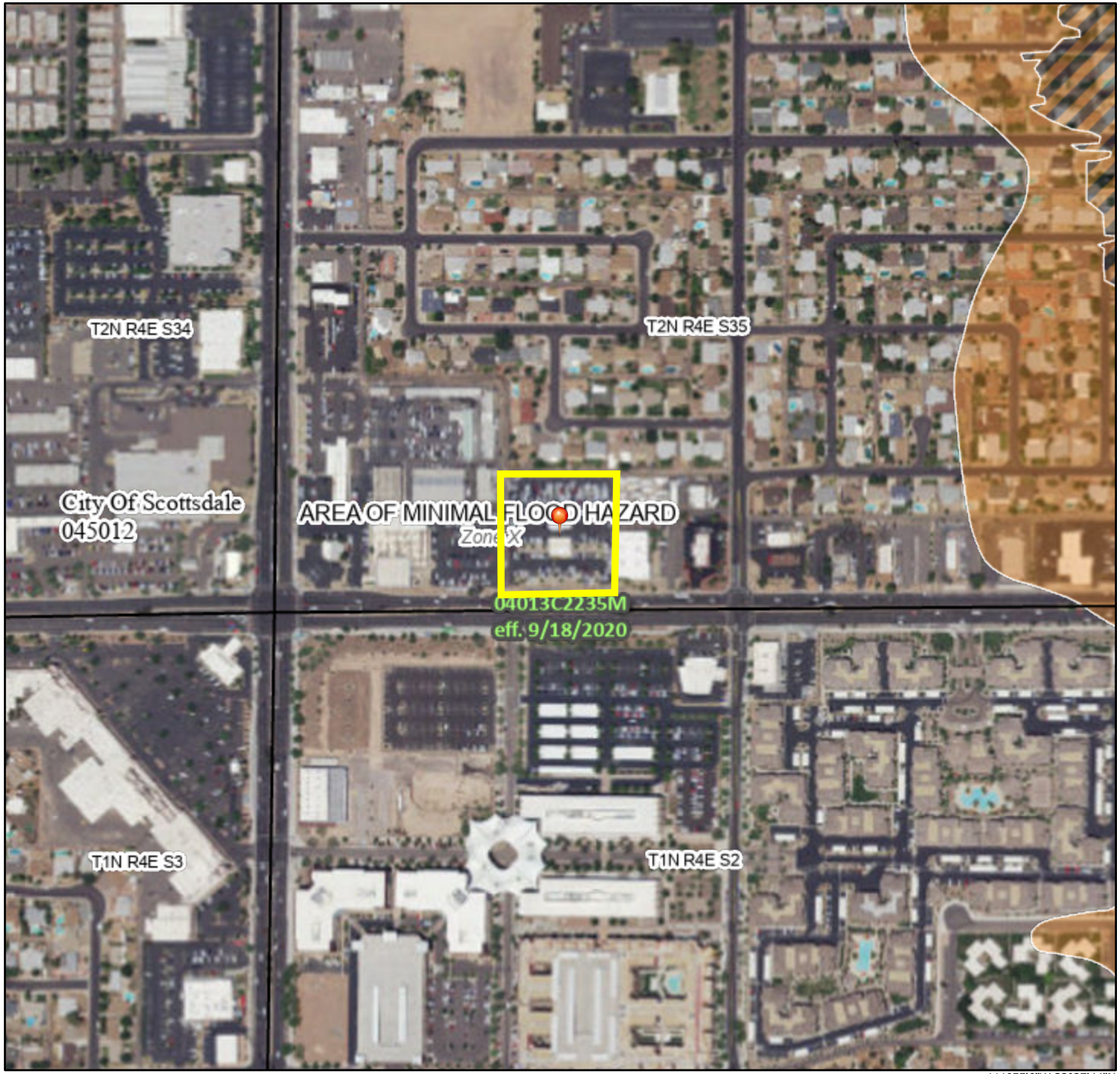
APPENDIX B

FIRMette

National Flood Hazard Layer FIRMette

FEMA

111°55'44"W 33°28'14"N



111°55'6"W 33°27'44"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/26/2023 at 5:18 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX C

Site Soil Information

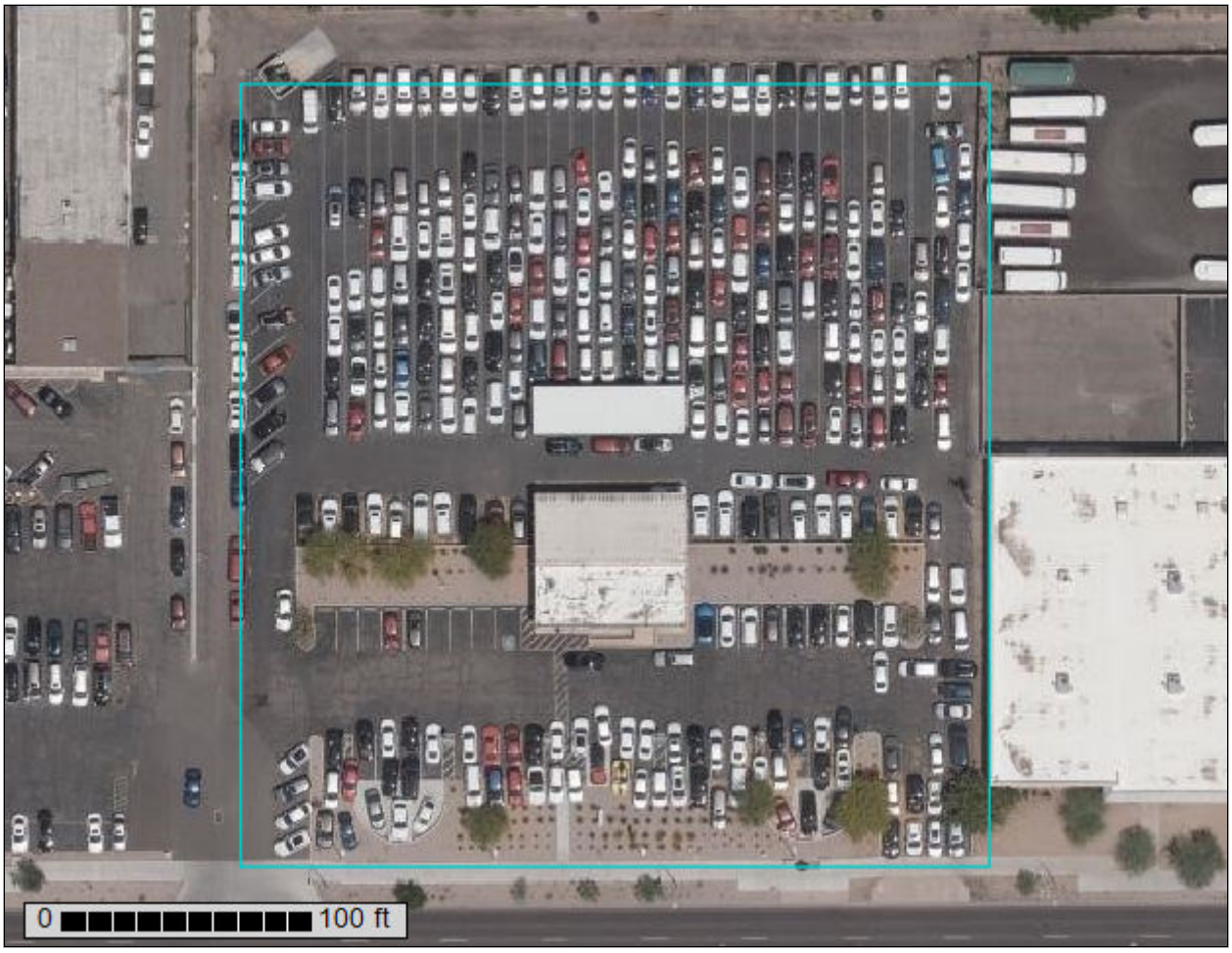
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

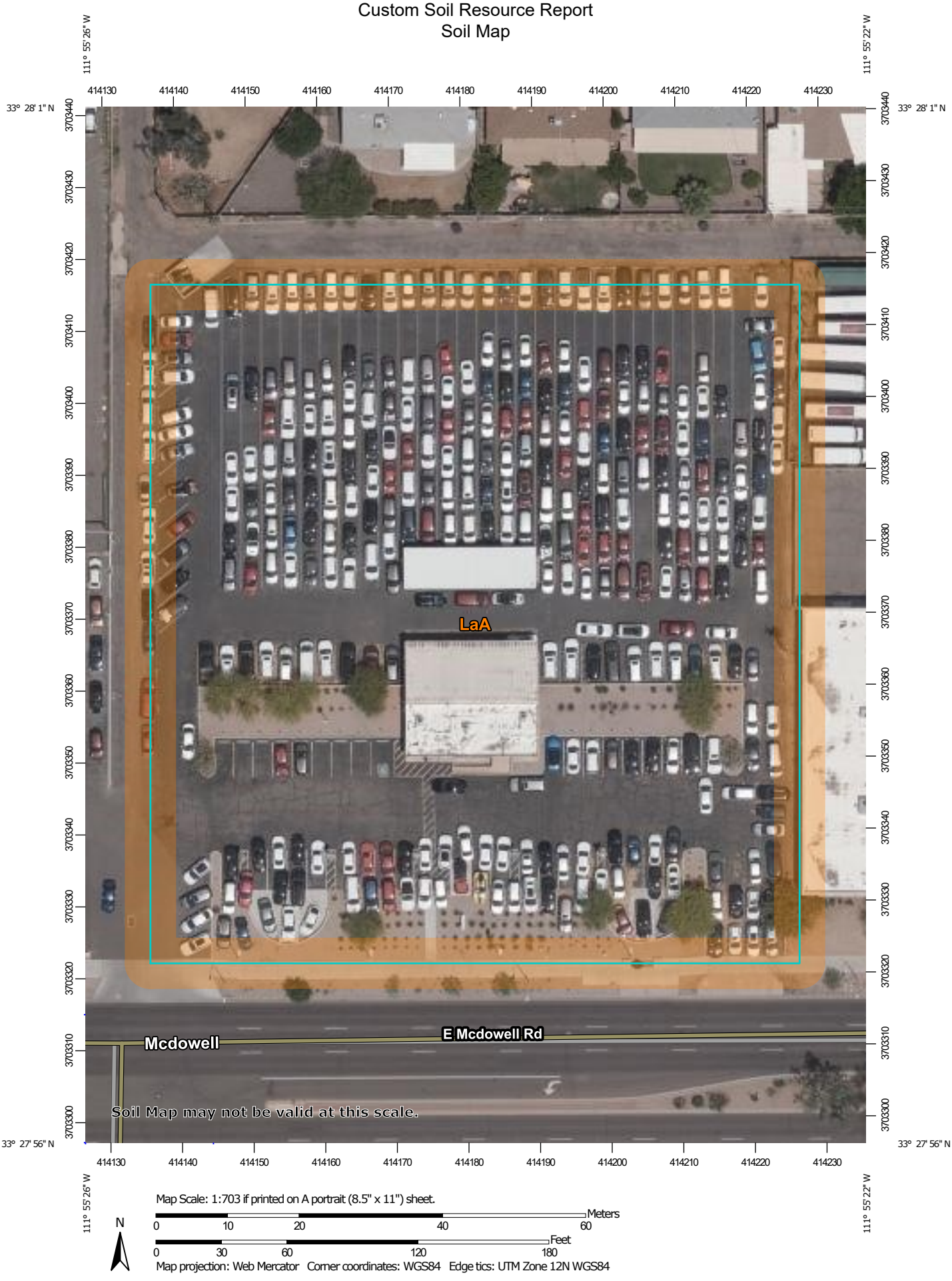
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Eastern Maricopa and Northern Pinal Counties Area, Arizona



October 26, 2023

Custom Soil Resource Report
Soil Map



Map Scale: 1:703 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- 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
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 17, Sep 8, 2023

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

Date(s) aerial images were photographed: May 7, 2020—May 21, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LaA	Laveen loam, 0 to 1 percent slopes	2.1	100.0%
Totals for Area of Interest		**2.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Eastern Maricopa and Northern Pinal Counties Area, Arizona

LaA—Laveen loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 1sp4
Elevation: 1,100 to 1,700 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Laveen and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Laveen

Setting

Landform: Alluvial fans, stream terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 14 inches: loam
Bk - 14 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R040XB207AZ - Limy Fan 7"-10" p.z.
Hydric soil rating: No

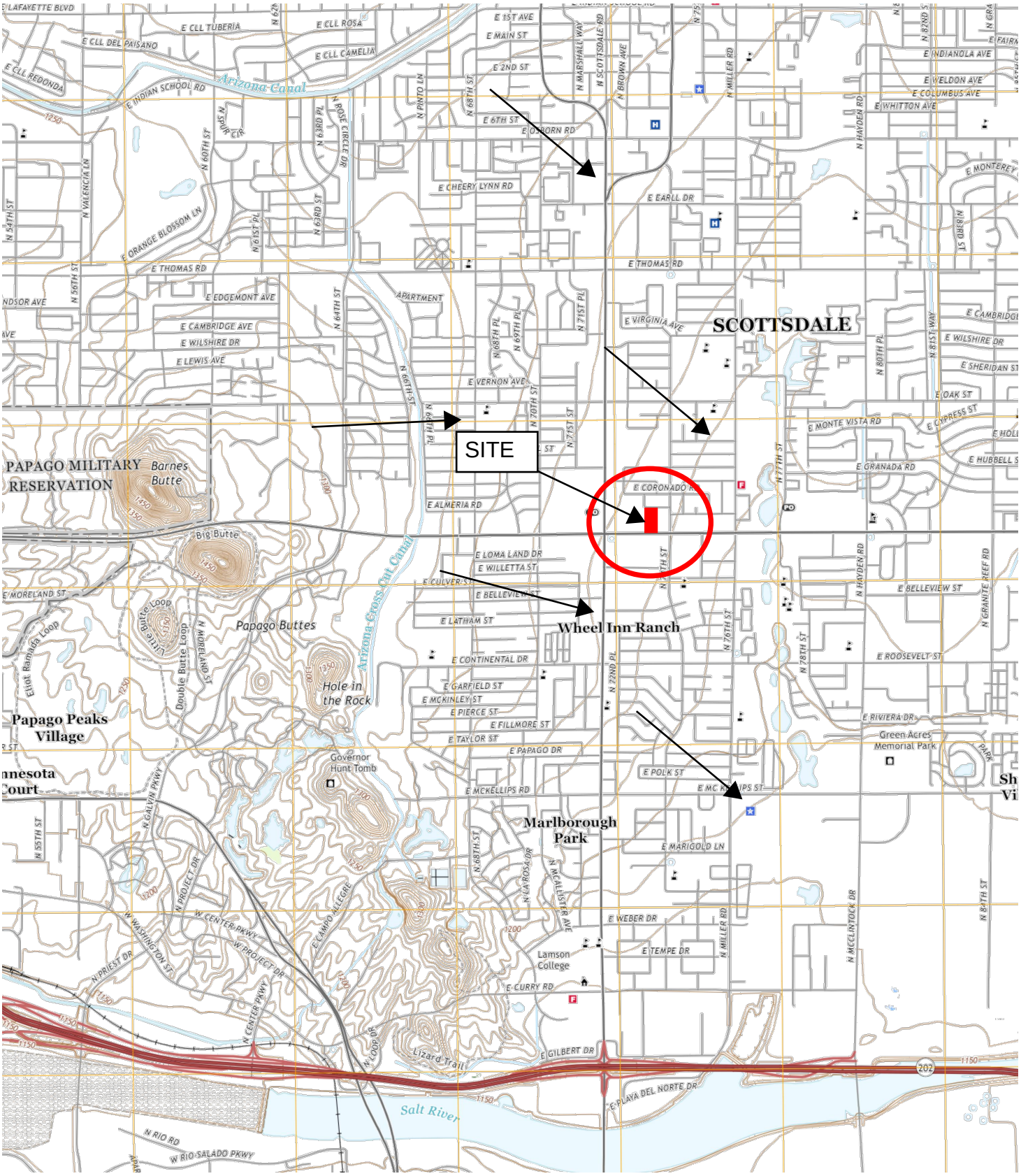
APPENDIX D

Regional Topography Exhibit

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

TEMPE QUADRANGLE
ARIZONA - MARICOPA COUNTY
7.5-MINUTE SERIES



SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

GENERAL FLOW DIRECTION
(APPROX 60-FT/MILE)

APPENDIX E

NOAA Atlas 14

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.4659°, Longitude: -111.9235°
Elevation: 1224 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.181** (0.152-0.219)	**0.236** (0.200-0.287)	**0.322** (0.270-0.389)	**0.388** (0.323-0.466)	**0.476** (0.391-0.570)	**0.545** (0.441-0.650)	**0.614** (0.488-0.730)	**0.686** (0.536-0.815)	**0.782** (0.595-0.930)	**0.856** (0.638-1.02)
10-min	**0.275** (0.231-0.334)	**0.360** (0.304-0.437)	**0.490** (0.411-0.592)	**0.590** (0.492-0.709)	**0.724** (0.595-0.867)	**0.830** (0.672-0.988)	**0.935** (0.743-1.11)	**1.04** (0.817-1.24)	**1.19** (0.906-1.42)	**1.30** (0.971-1.55)
15-min	**0.341** (0.287-0.414)	**0.446** (0.377-0.541)	**0.607** (0.509-0.734)	**0.731** (0.609-0.879)	**0.898** (0.737-1.08)	**1.03** (0.832-1.22)	**1.16** (0.922-1.38)	**1.30** (1.01-1.54)	**1.48** (1.12-1.76)	**1.61** (1.20-1.92)
30-min	**0.459** (0.386-0.557)	**0.600** (0.507-0.728)	**0.818** (0.686-0.988)	**0.984** (0.821-1.18)	**1.21** (0.993-1.45)	**1.38** (1.12-1.65)	**1.56** (1.24-1.86)	**1.74** (1.36-2.07)	**1.99** (1.51-2.36)	**2.17** (1.62-2.59)
60-min	**0.568** (0.478-0.690)	**0.743** (0.628-0.901)	**1.01** (0.849-1.22)	**1.22** (1.02-1.46)	**1.50** (1.23-1.79)	**1.71** (1.39-2.04)	**1.93** (1.54-2.30)	**2.16** (1.69-2.56)	**2.46** (1.87-2.92)	**2.69** (2.01-3.20)
2-hr	**0.659** (0.564-0.785)	**0.854** (0.731-1.02)	**1.14** (0.976-1.36)	**1.37** (1.15-1.62)	**1.67** (1.39-1.96)	**1.90** (1.56-2.23)	**2.14** (1.73-2.51)	**2.39** (1.90-2.80)	**2.71** (2.10-3.18)	**2.97** (2.25-3.51)
3-hr	**0.714** (0.608-0.855)	**0.916** (0.784-1.10)	**1.21** (1.02-1.44)	**1.44** (1.21-1.71)	**1.76** (1.46-2.08)	**2.01** (1.65-2.38)	**2.28** (1.83-2.69)	**2.56** (2.02-3.02)	**2.94** (2.26-3.48)	**3.26** (2.44-3.86)
6-hr	**0.860** (0.747-1.01)	**1.09** (0.951-1.28)	**1.40** (1.22-1.64)	**1.65** (1.42-1.92)	**1.98** (1.68-2.29)	**2.25** (1.88-2.59)	**2.52** (2.08-2.91)	**2.80** (2.26-3.24)	**3.19** (2.51-3.70)	**3.50** (2.68-4.06)
12-hr	**0.964** (0.845-1.12)	**1.22** (1.07-1.41)	**1.55** (1.35-1.79)	**1.80** (1.57-2.08)	**2.15** (1.85-2.47)	**2.42** (2.05-2.77)	**2.69** (2.25-3.09)	**2.97** (2.45-3.41)	**3.34** (2.69-3.86)	**3.63** (2.87-4.23)
24-hr	**1.16** (1.04-1.29)	**1.47** (1.32-1.64)	**1.90** (1.70-2.13)	**2.24** (2.00-2.51)	**2.72** (2.41-3.04)	**3.10** (2.73-3.44)	**3.49** (3.05-3.88)	**3.89** (3.38-4.33)	**4.45** (3.82-4.96)	**4.90** (4.16-5.47)
2-day	**1.25** (1.12-1.40)	**1.60** (1.44-1.79)	**2.10** (1.88-2.35)	**2.50** (2.23-2.79)	**3.06** (2.71-3.41)	**3.50** (3.08-3.90)	**3.96** (3.48-4.43)	**4.45** (3.87-4.98)	**5.13** (4.41-5.75)	**5.68** (4.83-6.39)
3-day	**1.32** (1.19-1.48)	**1.69** (1.52-1.89)	**2.22** (1.99-2.48)	**2.65** (2.37-2.96)	**3.26** (2.89-3.63)	**3.74** (3.30-4.17)	**4.25** (3.73-4.74)	**4.79** (4.16-5.35)	**5.55** (4.76-6.21)	**6.17** (5.24-6.91)
4-day	**1.39** (1.25-1.56)	**1.78** (1.60-1.99)	**2.35** (2.10-2.62)	**2.81** (2.50-3.13)	**3.46** (3.07-3.85)	**3.98** (3.51-4.43)	**4.54** (3.98-5.06)	**5.14** (4.46-5.72)	**5.98** (5.12-6.66)	**6.66** (5.64-7.44)
7-day	**1.54** (1.38-1.72)	**1.97** (1.77-2.20)	**2.60** (2.32-2.90)	**3.10** (2.77-3.46)	**3.82** (3.39-4.26)	**4.40** (3.88-4.90)	**5.02** (4.39-5.59)	**5.67** (4.92-6.32)	**6.59** (5.65-7.36)	**7.34** (6.22-8.20)
10-day	**1.67** (1.50-1.87)	**2.14** (1.92-2.39)	**2.82** (2.53-3.15)	**3.37** (3.01-3.76)	**4.14** (3.68-4.61)	**4.76** (4.20-5.29)	**5.41** (4.75-6.02)	**6.10** (5.31-6.79)	**7.07** (6.07-7.87)	**7.84** (6.67-8.75)
20-day	**2.06** (1.85-2.29)	**2.64** (2.38-2.94)	**3.49** (3.14-3.88)	**4.13** (3.70-4.58)	**4.99** (4.45-5.53)	**5.65** (5.02-6.27)	**6.32** (5.60-7.02)	**7.01** (6.17-7.79)	**7.92** (6.91-8.83)	**8.63** (7.47-9.63)
30-day	**2.40** (2.16-2.67)	**3.09** (2.78-3.43)	**4.07** (3.65-4.51)	**4.81** (4.31-5.33)	**5.81** (5.18-6.43)	**6.58** (5.85-7.27)	**7.37** (6.52-8.15)	**8.17** (7.19-9.03)	**9.24** (8.07-10.2)	**10.1** (8.72-11.2)
45-day	**2.79** (2.51-3.09)	**3.59** (3.24-3.98)	**4.73** (4.26-5.24)	**5.57** (5.00-6.18)	**6.68** (5.98-7.40)	**7.52** (6.71-8.33)	**8.36** (7.43-9.26)	**9.20** (8.14-10.2)	**10.3** (9.05-11.5)	**11.1** (9.73-12.4)
60-day	**3.09** (2.79-3.42)	**3.99** (3.60-4.41)	**5.25** (4.73-5.80)	**6.16** (5.54-6.81)	**7.34** (6.59-8.12)	**8.23** (7.35-9.10)	**9.11** (8.11-10.1)	**9.97** (8.84-11.0)	**11.1** (9.78-12.3)	**11.9** (10.5-13.3)

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

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.4659°, Longitude: -111.9235°
Elevation: 1224 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	2.17 (1.82-2.63)	2.83 (2.40-3.44)	3.86 (3.24-4.67)	4.66 (3.88-5.59)	5.71 (4.69-6.84)	6.54 (5.29-7.80)	7.37 (5.86-8.76)	8.23 (6.43-9.78)	9.38 (7.14-11.2)	10.3 (7.66-12.2)
10-min	1.65 (1.39-2.00)	2.16 (1.82-2.62)	2.94 (2.47-3.55)	3.54 (2.95-4.25)	4.34 (3.57-5.20)	4.98 (4.03-5.93)	5.61 (4.46-6.67)	6.26 (4.90-7.44)	7.15 (5.44-8.50)	7.81 (5.83-9.31)
15-min	1.36 (1.15-1.66)	1.78 (1.51-2.16)	2.43 (2.04-2.94)	2.92 (2.44-3.52)	3.59 (2.95-4.30)	4.11 (3.33-4.90)	4.64 (3.69-5.51)	5.18 (4.05-6.15)	5.90 (4.49-7.02)	6.46 (4.82-7.69)
30-min	0.918 (0.772-1.11)	1.20 (1.01-1.46)	1.64 (1.37-1.98)	1.97 (1.64-2.37)	2.42 (1.99-2.90)	2.77 (2.24-3.30)	3.12 (2.48-3.71)	3.49 (2.73-4.14)	3.97 (3.02-4.73)	4.35 (3.24-5.18)
60-min	0.568 (0.478-0.690)	0.743 (0.628-0.901)	1.01 (0.849-1.22)	1.22 (1.02-1.46)	1.50 (1.23-1.79)	1.71 (1.39-2.04)	1.93 (1.54-2.30)	2.16 (1.69-2.56)	2.46 (1.87-2.92)	2.69 (2.01-3.20)
2-hr	0.329 (0.282-0.392)	0.427 (0.365-0.509)	0.572 (0.488-0.679)	0.683 (0.576-0.808)	0.834 (0.695-0.981)	0.951 (0.781-1.12)	1.07 (0.867-1.26)	1.19 (0.948-1.40)	1.36 (1.05-1.59)	1.48 (1.12-1.75)
3-hr	0.237 (0.202-0.284)	0.305 (0.261-0.366)	0.401 (0.341-0.480)	0.477 (0.402-0.568)	0.584 (0.486-0.692)	0.669 (0.549-0.791)	0.759 (0.610-0.896)	0.852 (0.673-1.00)	0.980 (0.752-1.16)	1.08 (0.811-1.28)
6-hr	0.143 (0.124-0.168)	0.181 (0.158-0.213)	0.233 (0.203-0.273)	0.275 (0.236-0.320)	0.330 (0.281-0.383)	0.375 (0.313-0.432)	0.421 (0.346-0.486)	0.468 (0.377-0.541)	0.532 (0.419-0.617)	0.583 (0.448-0.678)
12-hr	0.080 (0.070-0.092)	0.101 (0.088-0.117)	0.128 (0.112-0.148)	0.149 (0.129-0.172)	0.178 (0.153-0.205)	0.200 (0.170-0.229)	0.223 (0.186-0.256)	0.246 (0.203-0.283)	0.277 (0.222-0.320)	0.301 (0.237-0.350)
24-hr	0.048 (0.043-0.053)	0.061 (0.054-0.068)	0.079 (0.071-0.088)	0.093 (0.083-0.104)	0.113 (0.100-0.126)	0.129 (0.113-0.143)	0.145 (0.127-0.161)	0.162 (0.140-0.180)	0.185 (0.159-0.206)	0.203 (0.173-0.227)
2-day	0.026 (0.023-0.029)	0.033 (0.029-0.037)	0.043 (0.039-0.048)	0.052 (0.046-0.058)	0.063 (0.056-0.070)	0.072 (0.064-0.081)	0.082 (0.072-0.092)	0.092 (0.080-0.103)	0.106 (0.091-0.119)	0.118 (0.100-0.133)
3-day	0.018 (0.016-0.020)	0.023 (0.021-0.026)	0.030 (0.027-0.034)	0.036 (0.032-0.041)	0.045 (0.040-0.050)	0.051 (0.045-0.057)	0.059 (0.051-0.065)	0.066 (0.057-0.074)	0.077 (0.066-0.086)	0.085 (0.072-0.096)
4-day	0.014 (0.013-0.016)	0.018 (0.016-0.020)	0.024 (0.021-0.027)	0.029 (0.026-0.032)	0.036 (0.031-0.040)	0.041 (0.036-0.046)	0.047 (0.041-0.052)	0.053 (0.046-0.059)	0.062 (0.053-0.069)	0.069 (0.058-0.077)
7-day	0.009 (0.008-0.010)	0.011 (0.010-0.013)	0.015 (0.013-0.017)	0.018 (0.016-0.020)	0.022 (0.020-0.025)	0.026 (0.023-0.029)	0.029 (0.026-0.033)	0.033 (0.029-0.037)	0.039 (0.033-0.043)	0.043 (0.037-0.048)
10-day	0.006 (0.006-0.007)	0.008 (0.008-0.009)	0.011 (0.010-0.013)	0.014 (0.012-0.015)	0.017 (0.015-0.019)	0.019 (0.017-0.022)	0.022 (0.019-0.025)	0.025 (0.022-0.028)	0.029 (0.025-0.032)	0.032 (0.027-0.036)
20-day	0.004 (0.003-0.004)	0.005 (0.004-0.006)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.010 (0.009-0.011)	0.011 (0.010-0.013)	0.013 (0.011-0.014)	0.014 (0.012-0.016)	0.016 (0.014-0.018)	0.017 (0.015-0.020)
30-day	0.003 (0.002-0.003)	0.004 (0.003-0.004)	0.005 (0.005-0.006)	0.006 (0.005-0.007)	0.008 (0.007-0.008)	0.009 (0.008-0.010)	0.010 (0.009-0.011)	0.011 (0.009-0.012)	0.012 (0.011-0.014)	0.013 (0.012-0.015)
45-day	0.002 (0.002-0.002)	0.003 (0.002-0.003)	0.004 (0.003-0.004)	0.005 (0.004-0.005)	0.006 (0.005-0.006)	0.006 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.009-0.011)
60-day	0.002 (0.001-0.002)	0.002 (0.002-0.003)	0.003 (0.003-0.004)	0.004 (0.003-0.004)	0.005 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.005-0.007)	0.006 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)

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

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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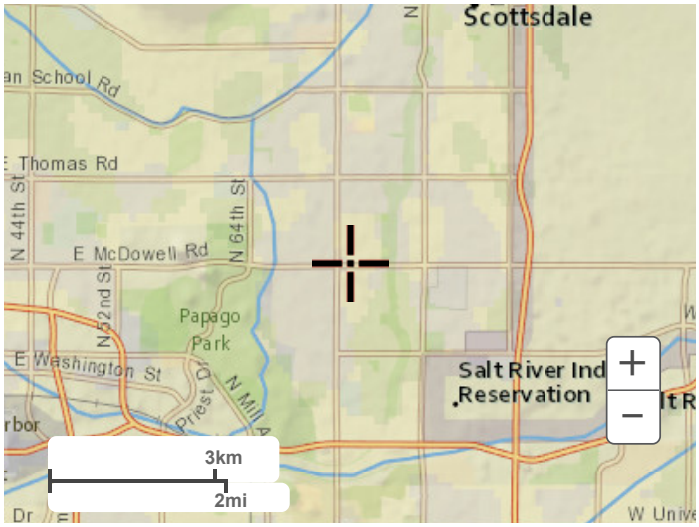
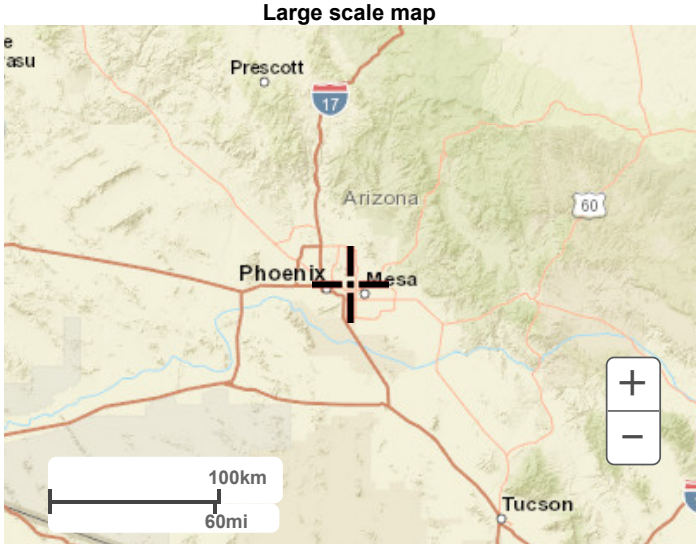
PF graphical



Large scale terrain

Large scale map



Large scale aerial

APPENDIX F

Existing Conditions Drainage Exhibit

APPROXIMATE PROPERTY LINE

DRAINGE FLOW DIRECTION

SITE OUTFALL

HIGH OR LOW CURB LOCATION

Description	$C_{2,10}$	C_{100}	i_{2yr} (in/hr)	i_{10yr} (in/hr)	i_{100yr} (in/hr)	A (acres)	Q_2 (cfs)	Q_{10} (cfs)	Q_{100} (cfs)
Site	0.95	0.95	2.83	4.66	7.37	2.16	5.81	9.56	15.12

N

1" = 20'

EXISTING CONDITIONS DRAINAGE EXHIBIT

FOR

PICKLEBALL FACILITY - MCDOWELL PICKLE

7300 EAST MCDOWELL ROAD
SCOTTSDALE, ARIZONA 85257

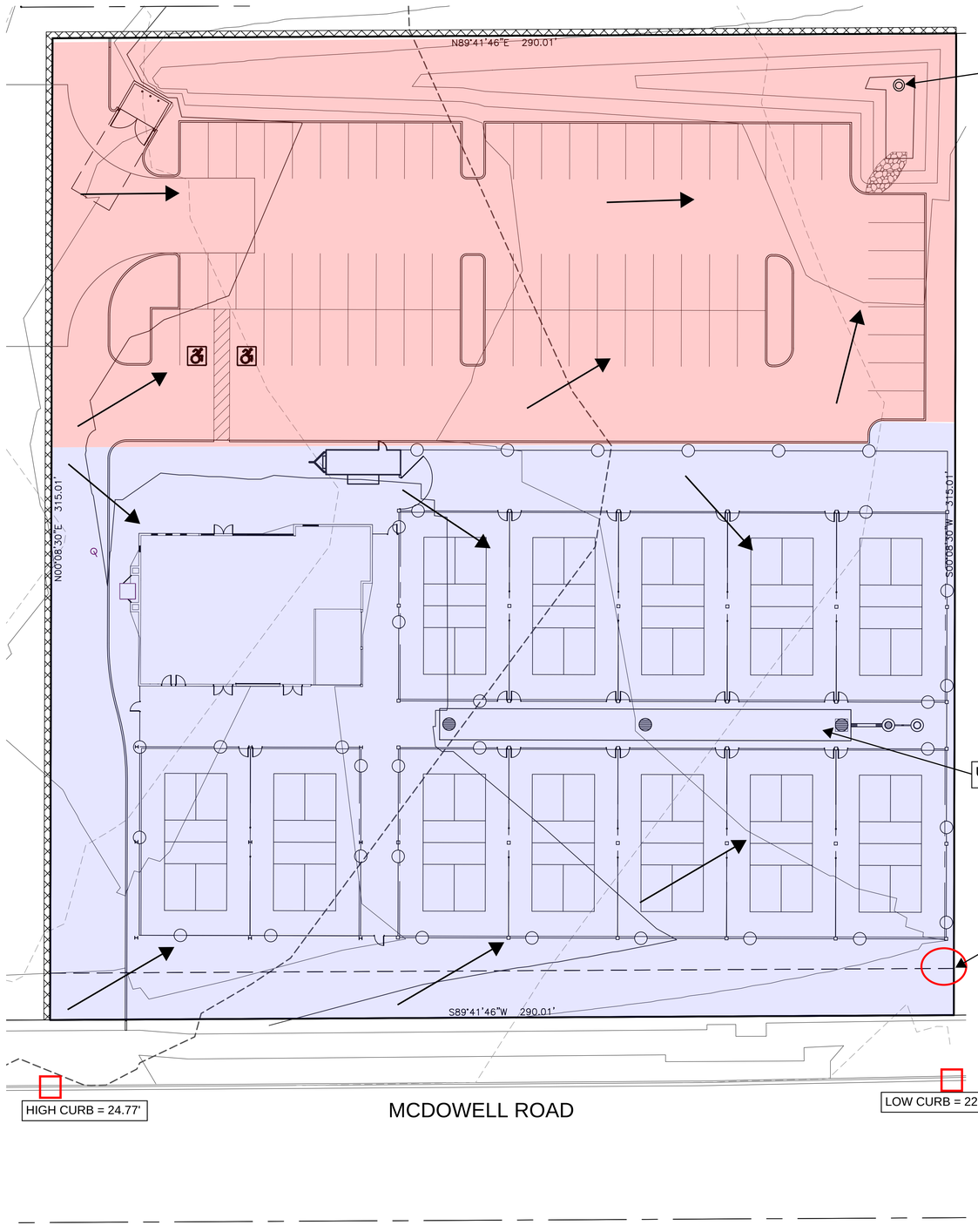
KAEKO
12409 W. INDIAN SCHOOL ROAD
AVONDALE, ARIZONA 85392
PHONE: 623.536.1993

DRAWN BY:
DESIGN BY:
CHECKED BY:
DATE:
PROJECT #: 7023044
PURPOSE:

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

APPENDIX G

Proposed Conditions Drainage Exhibit and R.O.W. Calculations



NORTH DRAINAGE AREA (PARKING LOT)

SOUTH DRAINAGE AREA (BUILDING AND COURTS)

RUNOFF FLOW DIRECTION

SITE OUTFALL

HIGH OR LOW CURB LOCATION

PROPSED DRYWELL

Description	C (unitless)	P (in)	A (sf)	Drains To	Volume Required (cf)	Volume Provided (cf)
North Drainage Area (Parking Lot)	0.95	2.20	34,610	Retention Basin	6,028	6,028
South Drainage Area (Building and Courts)	0.95	2.20	59,480	Tank	10,359	10,362
SITE	0.95	2.20	94,090	Basin or Tank	16,387	16,390

STREET AND R.O.W. CALCULATIONS:

Q=CiA

C= 0.95

i10 = 4.66-INCHES/HR

i100 = 7.37-INCHES/HR

A= 0.98-ACRES

Q10 = 4.33-CFS

Q100 = 6.85-CFS

Description	C (unitless)	P (in)	A (sf)	Drains To	Volume Required (cf)	Volume Provided (cf)
North Drainage Area (Parking Lot)	0.95	2.20	34,610	Retention Basin	6,028	6,028
South Drainage Area (Building and Courts)	0.95	2.20	59,480	Tank	10,359	10,362
SITE	0.95	2.20	94,090	Basin or Tank	16,387	16,390

Description	Drains To	Volume Provided (cf)	Number of Drywells	Drain Rate (cfs)	Time to Drain (hrs)
North Drainage Area (Parking Lot)	Retention Basin	6,028	1	0.1	16.7
South Drainage Area (Building and Courts)	Tank	10,362	1	0.1	28.8

N

1" = 20'

KAEKO

12409 W. INDIAN SCHOOL ROAD
AVONDALE, ARIZONA 85392
PHONE: 623.536.1993

PROPOSED CONDITIONS DRAINAGE EXHIBIT

FOR

PICKLEBALL FACILITY - MCDOWELL PICKLE

7300 EAST MCDOWELL ROAD
SCOTTSDALE, ARIZONA 85257

DRAWN BY:
DESIGN BY:
CHECKED BY:
DATE:
PROJECT #: 7023044
PURPOSE:

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

10-YEAR RAINFALL EVENT

Station ID	Station	Elevation	Station ID	Station	Elevation
1	0.00	23.74	26		
2	7.00	23.70	27		
3	9.00	23.65	28		
4	18.00	23.48	29		
5	18.05	22.98	30		
6	18.06	22.48	31		
7	18.21	22.58	32		
8	66.21	24.58	33		
9	66.22	25.08	34		
10	66.23	25.08	35		
11	86.23	25.08	36		
12	86.24	24.58	37		
13	122.23	22.51	38		
14	122.24	23.01	39		
15	147.24	23.60	40		
16			41		
17			42		
18			43		
19			44		
20			45		
21			46		
22			47		
23			48		
24			49		
25			50		

Title:

Paul Davis Restoration

Channel properties:

Slope:	0.00200	ft/ft
Manning's coeff:	0.0180	

Desired Q:

Flow rate:	5.00	cfs

USED 5.0-CFS FOR GRAPHING PURPOSES

Water surface elevation at flow rate of 5.00 cfs

22.98 ft

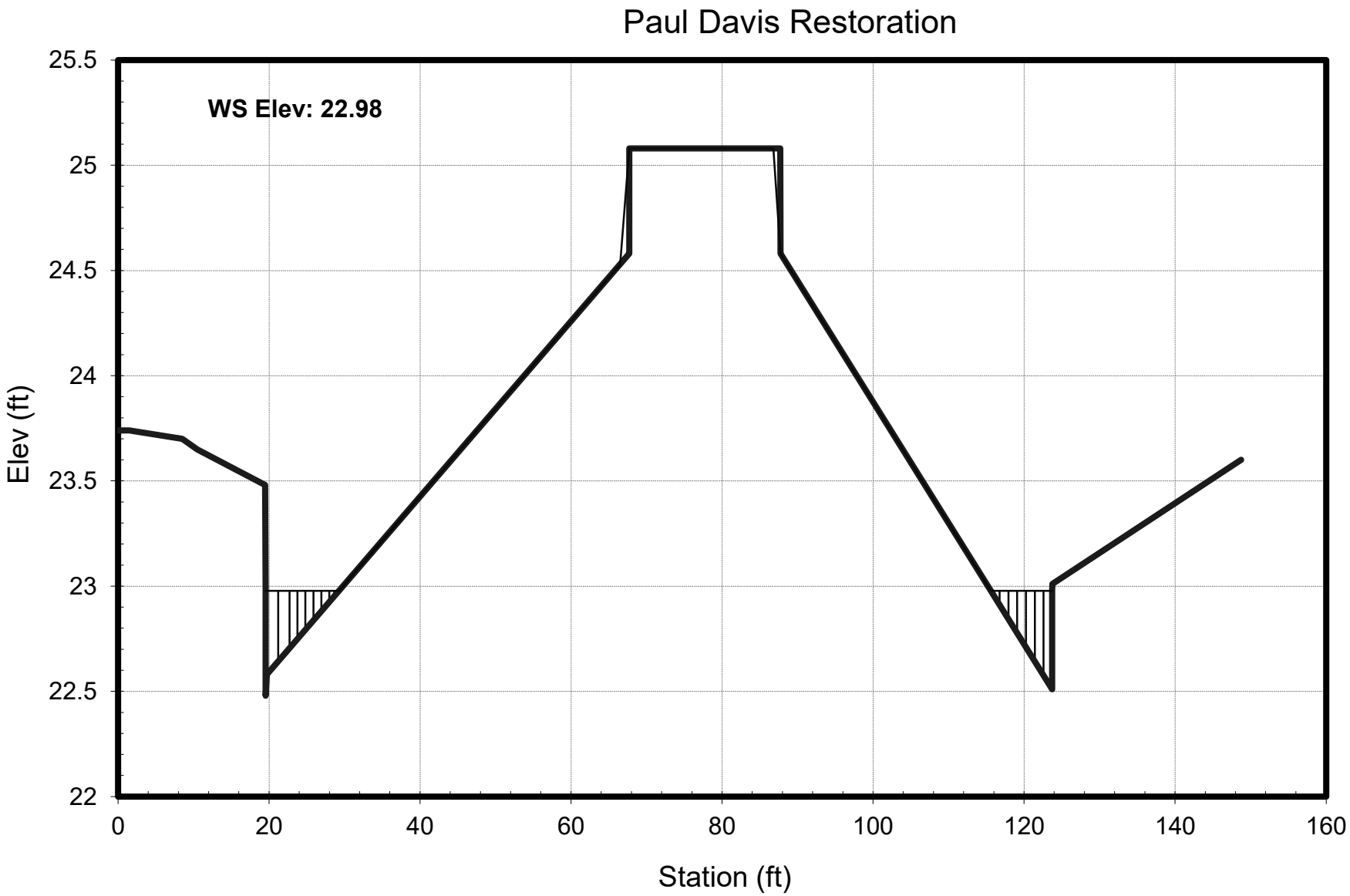
Maximum allowed values:

Maximum channel capacity
149.36 cfs
Maximum water surface elevation
23.60 ft

Other values:

Velocity:	1.29	fps
Hyd. Radius:	0.21	ft
Area:	3.89	sq.ft.
Wet perimeter:	18.88	ft
Top width:	104.19	ft
Max depth:	0.402	ft
Average depth:	0.037	ft

10-YEAR RAINFALL EVENT



100-YEAR RAINFALL EVENT

Station ID	Station	Elevation
1	0.00	23.74
2	7.00	23.70
3	9.00	23.65
4	18.00	23.48
5	18.05	22.98
6	18.06	22.48
7	18.21	22.58
8	66.21	24.58
9	66.22	25.08
10	66.23	25.08
11	86.23	25.08
12	86.24	24.58
13	122.23	22.51
14	122.24	23.01
15	147.24	23.60
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

Station ID	Station	Elevation
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
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Title:

Paul Davis Restoration

Channel properties:

Slope:	0.00200	ft/ft
Manning's coeff:	0.0180	

Desired Q:

Flow rate:	7.00	cfs

USED 7.0-CFS FOR GRAPHING PURPOSES

Water surface elevation at flow rate of 7.00 cfs

23.04 ft

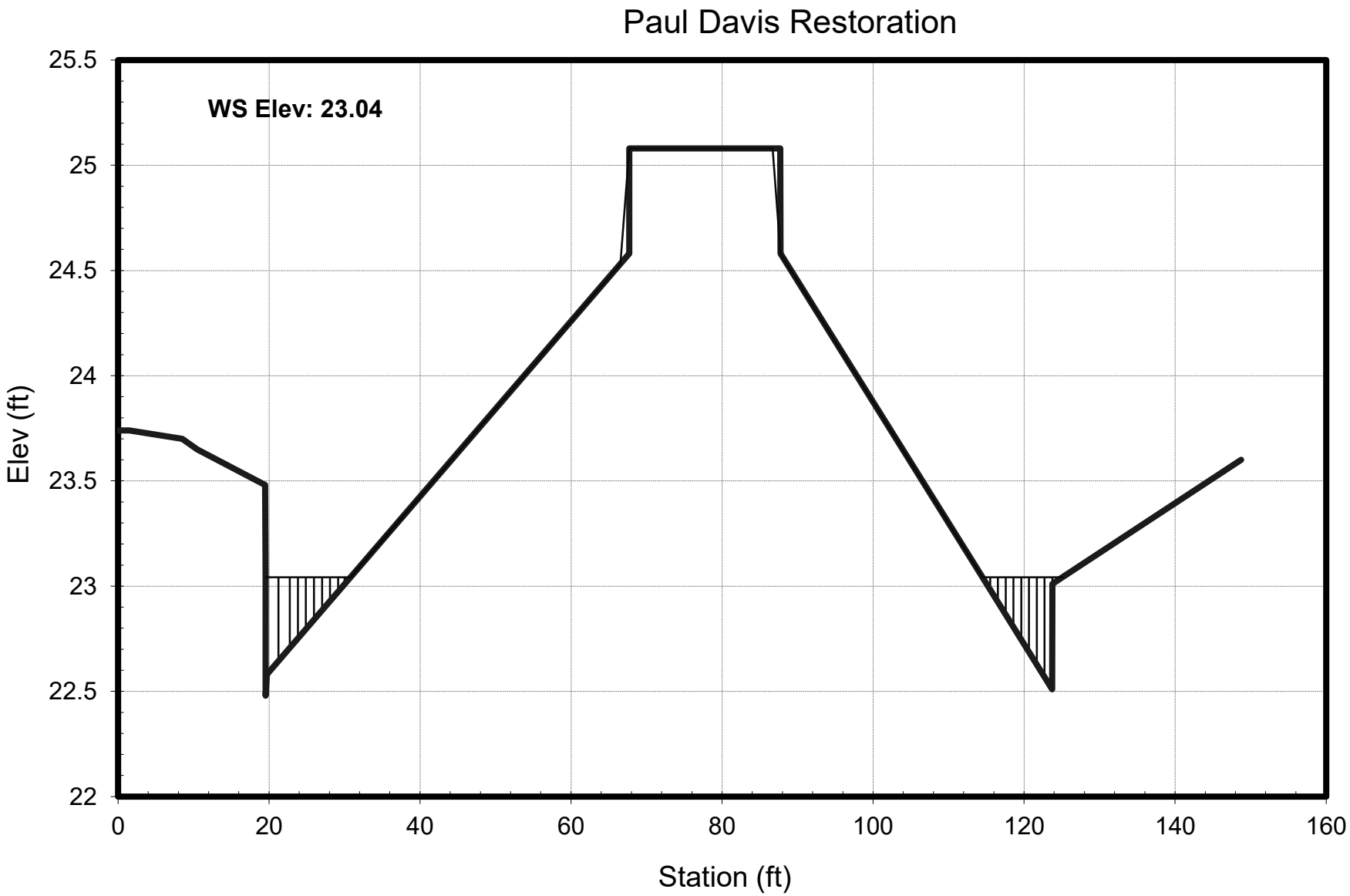
Maximum allowed values:

Maximum channel capacity
149.36 cfs
Maximum water surface elevation
23.60 ft

Other values:

Velocity:	1.36	fps
Hyd. Radius:	0.22	ft
Area:	5.15	sq.ft.
Wet perimeter:	23.05	ft
Top width:	105.60	ft
Max depth:	0.474	ft
Average depth:	0.049	ft

100-YEAR RAINFALL EVENT



LIMITATIONS

The above services consist of professional opinions and conclusions by a consulting civil engineer. The only warranty or guarantee made by the Consultant, in connection with the services performed for this project, is that such services are performed with the care and skill ordinarily exercised by members of the profession practicing under similar conditions, at the same time, and in the same or a similar locality. No other warranty, expressed or implied, is made or intended by rendering such consulting services or by furnishing written reports of the findings.