PRELIMINARY DRAINAGE REPORT

August 5, 2019
Revised: May 7, 2020

SMOKE TREE RESORT

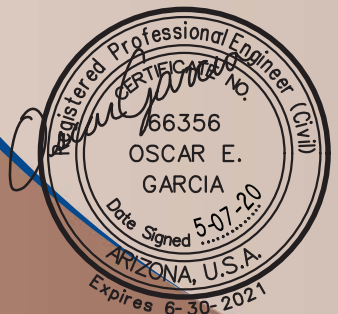
Town of Paradise Valley, AZ

Prepared for:

Gentree, LLC
3620 E Campbell Ave, Suite B
Phoenix, AZ 85018
(602) 952-8811

Prepared by:

CVL Consultants, Inc.
4550 N 12th Street
Phoenix, AZ 85014
(602) 264-6831



CVL CONSULTANTS

Job #:1-01-03153-01

Preliminary Drainage Report

For

SMOKE TREE RESORT

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1.0 INTRODUCTION

1.1 SCOPE

Coe & Van Loo Consultants, Inc. (CVL) has been contracted by Gentree, LLC to provide engineering services in support of the proposed improvements to Smoke Tree Resort, herein referred to as the site. The purpose of this report is to provide on-site and off-site hydrologic and hydraulic analysis for the proposed development.

This report is focused on providing design information, evaluation, and analysis for statistical flood events up to and including the 100-year storm. The scope of this assessment does not include, neither did CVL's client request that, evaluation of storm-water runoff resulting from storm events exceeding the 100-year frequency event. Hence, it should be noted that a storm event exceeding the 100-year frequency may cause or create the risk of greater flood impact than is addressed and presented in this assessment.

The procedures used herein are derived from, and performed with, currently accepted engineering methodologies and practices.

1.2 REGULATORY JURISDICTION

The development is designed to meet the drainage requirements as stated in the Town of Paradise Valley's *Storm Drain Design Manual (2018)* [1] and Flood Control District of Maricopa County (FCDMC), *Drainage Design Manuals for Maricopa County, Arizona, Volume I, Hydrology* [2], *Volume II, Hydraulics* [3], and *Drainage Policies and Standards Manual for Maricopa County, Arizona* [4].

2.0 SITE CONDITIONS

2.1 LOCATION

The site is located within the Town of Paradise Valley, Maricopa County, Arizona. The site is bordered on the north by Lincoln Drive, on the east by commercial property, on the south by the Andaz Resort Hotel and on the west by Quail Run Road and custom residences. Furthermore, the site is located within Section 10, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Arizona.

2.2 Existing Conditions

A field reconnaissance of the existing resort complex on approximately 5-acres of existing special use permit land and its surroundings was performed on February 5th, 2019. It was observed that the site and surrounding properties are flat and generally drain to east then to the north towards Lincoln Drive. The resort's landscaping is characterized by hedges around all but the north perimeter, mature trees throughout the site and open space consisting of lawn and dirt drive lanes and parking.

2.3 Proposed Conditions

The resort was originally opened in 1966 and has yet to undergo any significant renovations beyond general maintenance measures. The resort is notably dated and in need of renovations and refurbishment of amenities. The vision for the transformation of the Smoke Tree Resort is to welcome guests to a four-star "local-centric" hospitality experience in both form and substance. This is to be achieved through active forward-facing components and lifestyle programmatic aspects. The existing resort often goes unnoticed in its unassuming character along Lincoln Drive, with only 23 of its 32 guest rooms currently in use. The revitalization of the site will retain its charming essence while providing the scale and quality of amenities sought by today's traveler; the specifics of which include 122 total keys, a restaurant, a special events pavilion, a neighborhood local-centric fresh market & coffee shop. The relaxed, pedestrian friendly environment will not include the typical resort perimeter walls or gates; instead, setbacks that align with existing buildings are desired, including a bicycle/pedestrian path that shall weave the resort into the local tapestry.

3.0 Flood Zone Information

The Maricopa County, Arizona and Incorporated Areas Flood Insurance Rate Map (FIRM), panel numbers 04013C1770L, Map Revised October 16, 2013 [5], indicates the site falls within Zone D.

Zone D is defined by FEMA as:

> "The Zone D designation is used for areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted. The Zone D designation is also used when a community incorporates portions of another community's area where no map has been prepared."

Refer to Figure 2 for a copy of the Flood Insurance Rate Map (FIRM).

4.0 OFFSITE AND ONSITE RUNOFF

4.1 OFFSITE RUNOFF MANAGEMENT PLAN

The offsite watershed affecting the site is urbanized by mainly low density custom residential lots to the west. These residential lots are flat with no concentrated flow paths. During the field reconnaissance, it was observed that some of the custom residences with perimeter block walls have weepholes in order to keep flow moving through their sites while others do not. At a meeting with the Paradise Valley Town Engineer on January 30th, 2019, it was agreed that the proposed site would handle offsite runoff similarly by allowing it to move through the site. The proposed site will consist of small drainage swales around the perimeter of the site to convey off-site flow to the east. Weepholes will be provided along any east perimeter walls to ensure offsite flows are safely conveyed away from the site. Quail Run Road will be improved with ribbon curb from Lincoln Drive to the south boundary of the site. These improvements will keep the majority of runoff flowing east across Quail Run Road and onto the site.

4.2 ONSITE RUNOFF MANAGEMENT PLAN

The resort was developed in 1966 when drainage regulations were non-existent. The site has a single small drain located just south of the abandoned restaurant building for localized flow which is to be removed as part of this project. The remainder of the site is graded to drain to the east. The site currently provides no onsite retention. The proposed improvements to the resort will utilize parking and drive corridors as drainage pathways to drain flow to the east and north where runoff will be captured by grated catch basins. The flow from the catch basins will be treated by VortSentry(R) HS Stormwater Treatment (or equivalent) prior to being retained by 12-ft diameter underground tanks. The separators specification and details can be found in Appendix B. The location of the VortSentry hydronamic separators can be seen on the Drainage Map in Plate 1. Stormwater runoff from rooftops will drain into roofdrains then underground to a storm sewer system outfalling to the underground retention tanks. The site will be graded so that stormwater runoff that falls between buildings will drain towards the parking lots. Onsite retention will be provided for the pre vs. post condition as agreed at a meeting with the Paradise Valley Town Engineer on January 30th, 2019. Basins will be designed to dispose of the storm water within 36 hours through drywells. Rainfall data was taken from NOAA Atlas 14 (see Appendix A). Retention

and drywell calculations can be found in Appendix B. Runoff coefficients based on land use of [2] for pre-development and post-development condition (see Appendix B).

5.0 Storm Water Pollution Prevention Plan

During final engineering design, the Storm Water Pollution Prevention Plan (SWPPP) will be prepared and submitted for approval.

6.0 Summary and Conclusions

1. Retention will be provided for pre-development versus post-development conditions.
2. Underground retention basins will be designed to drain within 36 hours.
3. According to the FIRM panel number 04013C1770L, Map Revised: October 16, 2013, the site is located in Zone D.
4. All finished floor elevations (FFE) will be at least 14 inches above the lowest drainage outfall for the site.

7.0 References

[1] Town of Paradise Valley, "Storm Drain Design Manual," June 2018.

[2] Flood Control District of Maricopa County, "Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology," December 14, 2018.

[3] Flood Control District of Maricopa County, Arizona, "Drainage Design Manual for Maricopa County, Volume II, Hydraulics," December 14, 2018.

[4] Flood Control District of Maricopa County, "Drainage Policies and Standards," Revised August 22, 2018.

[5] Federal Emergency Management Agency (FEMA), "National Flood Insurance Program, Flood Insurance Rate Map, Maricopa County, Arizona and Incorporated Areas, Panel Number 04013C1770L," Revised October 16, 2013.

FIGURES

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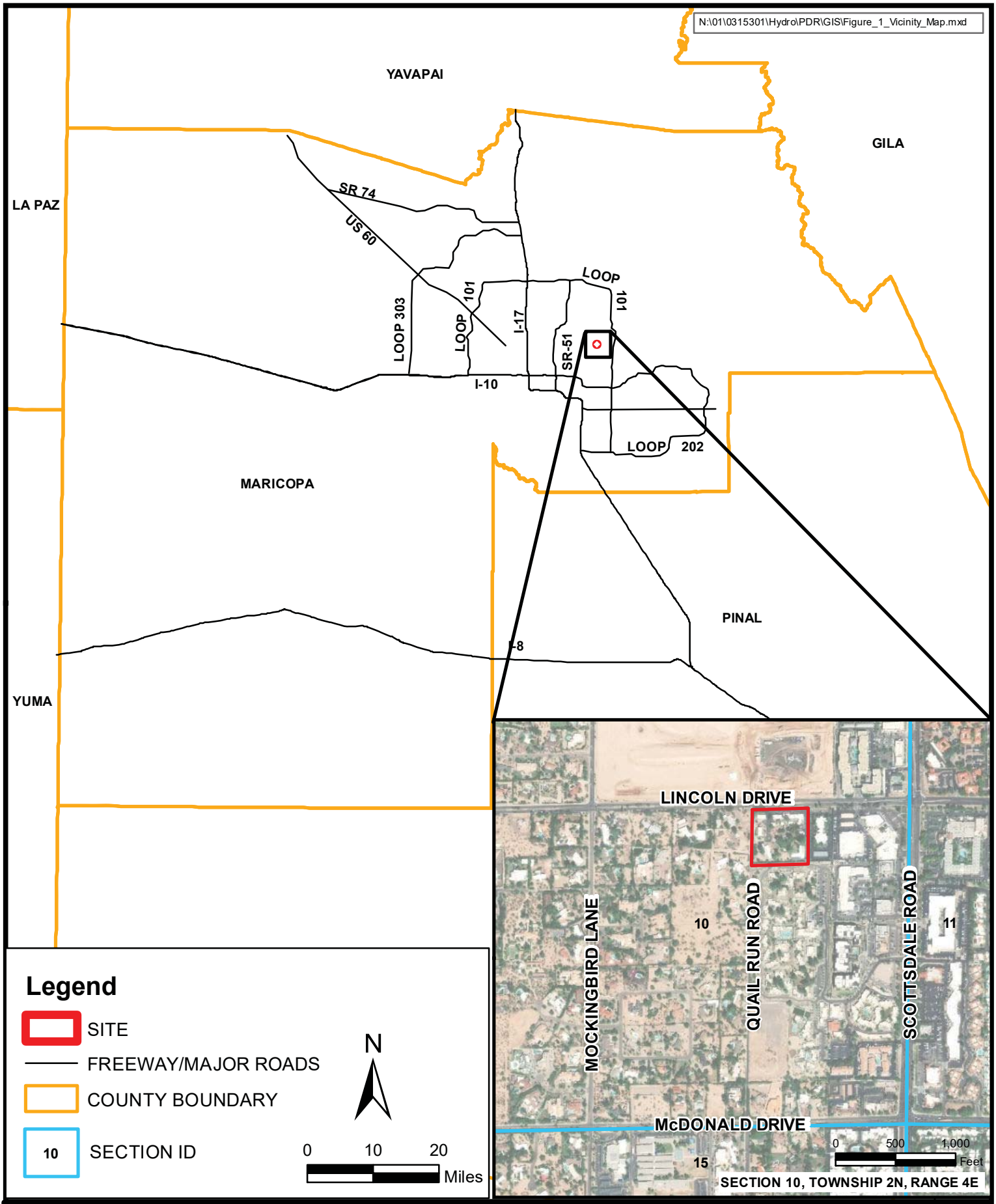


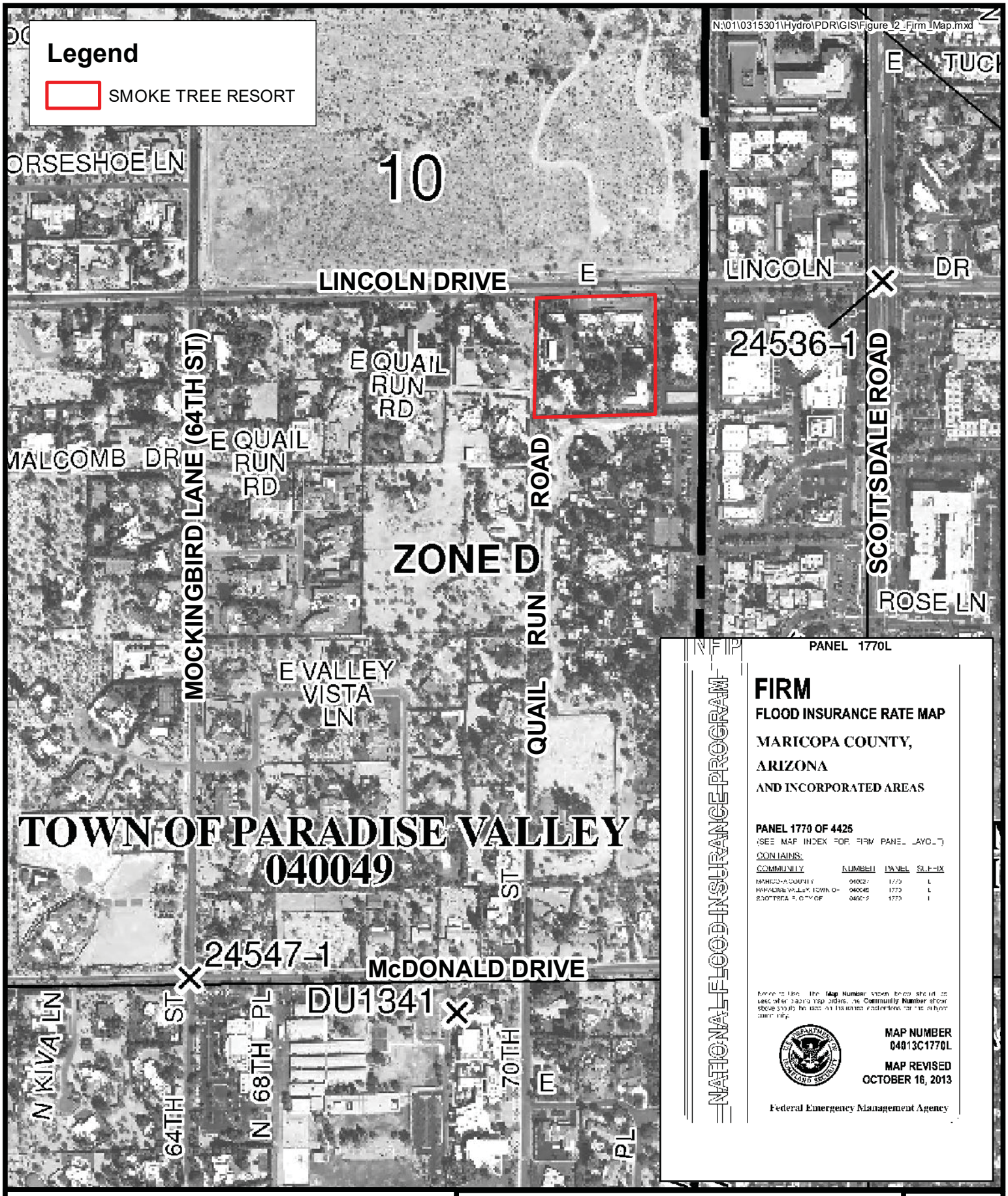
CVL CONSULTANTS
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264-6831

SMOKE TREE RESORT

JOB NO.
01-03153-01

VICINITY & LOCATION MAP

FIGURE 1



CVL CONSULTANTS
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264-6831

SMOKE TREE RESORT

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FLOOD INSURANCE RATE MAP

FIGURE 2

APPENDICES

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APPENDIX A

NOAA Atlas 14 Rainfall Data

CVL

NOAA Atlas 14, Volume 1, Version 5
Location name: Paradise Valley, Arizona, USA*
Latitude: 33.5306°, Longitude: -111.9293°
Elevation: 1310.38 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	**0.186** (0.156-0.228)	**0.243** (0.204-0.298)	**0.331** (0.275-0.403)	**0.397** (0.329-0.482)	**0.487** (0.397-0.589)	**0.556** (0.447-0.668)	**0.627** (0.495-0.752)	**0.700** (0.543-0.837)	**0.796** (0.602-0.954)	**0.870** (0.645-1.04)
10-min	**0.284** (0.237-0.347)	**0.371** (0.311-0.454)	**0.503** (0.419-0.613)	**0.605** (0.500-0.734)	**0.742** (0.604-0.896)	**0.847** (0.681-1.02)	**0.955** (0.754-1.15)	**1.07** (0.827-1.27)	**1.21** (0.916-1.45)	**1.32** (0.981-1.59)
15-min	**0.352** (0.294-0.430)	**0.459** (0.386-0.562)	**0.624** (0.519-0.760)	**0.750** (0.620-0.910)	**0.919** (0.749-1.11)	**1.05** (0.844-1.26)	**1.18** (0.935-1.42)	**1.32** (1.02-1.58)	**1.50** (1.14-1.80)	**1.64** (1.22-1.97)
30-min	**0.473** (0.396-0.579)	**0.619** (0.520-0.757)	**0.840** (0.699-1.02)	**1.01** (0.835-1.23)	**1.24** (1.01-1.50)	**1.41** (1.14-1.70)	**1.60** (1.26-1.91)	**1.78** (1.38-2.13)	**2.02** (1.53-2.42)	**2.21** (1.64-2.65)
60-min	**0.586** (0.490-0.717)	**0.766** (0.643-0.937)	**1.04** (0.865-1.27)	**1.25** (1.03-1.52)	**1.53** (1.25-1.85)	**1.75** (1.41-2.10)	**1.97** (1.56-2.37)	**2.20** (1.71-2.63)	**2.50** (1.89-3.00)	**2.74** (2.03-3.29)
2-hr	**0.680** (0.577-0.814)	**0.881** (0.748-1.06)	**1.18** (0.995-1.41)	**1.40** (1.17-1.67)	**1.71** (1.42-2.03)	**1.95** (1.59-2.30)	**2.19** (1.76-2.59)	**2.44** (1.92-2.88)	**2.77** (2.13-3.27)	**3.03** (2.28-3.60)
3-hr	**0.748** (0.632-0.906)	**0.959** (0.814-1.17)	**1.26** (1.06-1.52)	**1.49** (1.25-1.80)	**1.83** (1.50-2.18)	**2.09** (1.70-2.49)	**2.37** (1.89-2.82)	**2.65** (2.08-3.15)	**3.05** (2.32-3.62)	**3.37** (2.50-4.01)
6-hr	**0.900** (0.777-1.07)	**1.14** (0.985-1.35)	**1.46** (1.25-1.72)	**1.71** (1.46-2.01)	**2.06** (1.73-2.40)	**2.33** (1.93-2.71)	**2.62** (2.13-3.04)	**2.91** (2.33-3.38)	**3.30** (2.58-3.84)	**3.61** (2.75-4.21)
12-hr	**1.00** (0.875-1.17)	**1.27** (1.10-1.48)	**1.61** (1.39-1.87)	**1.87** (1.61-2.17)	**2.23** (1.90-2.58)	**2.50** (2.10-2.89)	**2.78** (2.31-3.21)	**3.07** (2.51-3.54)	**3.45** (2.75-4.01)	**3.75** (2.94-4.38)
24-hr	**1.19** (1.05-1.38)	**1.52** (1.33-1.75)	**1.96** (1.72-2.27)	**2.32** (2.02-2.68)	**2.81** (2.44-3.24)	**3.20** (2.75-3.68)	**3.60** (3.08-4.15)	**4.02** (3.41-4.63)	**4.60** (3.85-5.30)	**5.06** (4.20-5.84)
2-day	**1.29** (1.13-1.48)	**1.65** (1.45-1.90)	**2.16** (1.90-2.49)	**2.58** (2.25-2.96)	**3.15** (2.74-3.62)	**3.61** (3.11-4.14)	**4.10** (3.51-4.70)	**4.60** (3.91-5.28)	**5.31** (4.46-6.10)	**5.87** (4.88-6.77)
3-day	**1.37** (1.20-1.57)	**1.75** (1.54-2.01)	**2.31** (2.02-2.65)	**2.76** (2.40-3.16)	**3.38** (2.94-3.87)	**3.89** (3.35-4.45)	**4.43** (3.79-5.07)	**4.99** (4.24-5.72)	**5.79** (4.86-6.63)	**6.43** (5.34-7.39)
4-day	**1.45** (1.27-1.66)	**1.86** (1.63-2.13)	**2.45** (2.15-2.80)	**2.93** (2.56-3.35)	**3.62** (3.14-4.13)	**4.17** (3.59-4.76)	**4.76** (4.07-5.43)	**5.39** (4.57-6.16)	**6.27** (5.26-7.16)	**6.99** (5.80-8.01)
7-day	**1.63** (1.43-1.87)	**2.08** (1.82-2.39)	**2.76** (2.40-3.17)	**3.30** (2.87-3.79)	**4.08** (3.52-4.67)	**4.70** (4.04-5.37)	**5.36** (4.57-6.14)	**6.07** (5.13-6.96)	**7.07** (5.90-8.10)	**7.87** (6.51-9.04)
10-day	**1.76** (1.54-2.02)	**2.25** (1.98-2.58)	**2.98** (2.60-3.40)	**3.56** (3.10-4.07)	**4.38** (3.80-4.99)	**5.04** (4.34-5.72)	**5.74** (4.91-6.53)	**6.47** (5.50-7.37)	**7.50** (6.29-8.54)	**8.33** (6.92-9.50)
20-day	**2.17** (1.91-2.47)	**2.79** (2.46-3.18)	**3.69** (3.25-4.20)	**4.37** (3.83-4.96)	**5.29** (4.62-6.00)	**6.00** (5.21-6.80)	**6.72** (5.81-7.63)	**7.45** (6.41-8.47)	**8.44** (7.20-9.61)	**9.20** (7.79-10.5)
30-day	**2.54** (2.23-2.89)	**3.27** (2.87-3.72)	**4.31** (3.78-4.90)	**5.11** (4.47-5.79)	**6.17** (5.37-7.00)	**7.00** (6.07-7.92)	**7.84** (6.77-8.87)	**8.70** (7.47-9.83)	**9.86** (8.40-11.2)	**10.7** (9.10-12.2)
45-day	**2.93** (2.59-3.32)	**3.78** (3.33-4.28)	**4.98** (4.39-5.64)	**5.87** (5.17-6.64)	**7.05** (6.18-7.97)	**7.94** (6.93-8.98)	**8.84** (7.68-10.00)	**9.74** (8.43-11.0)	**10.9** (9.39-12.4)	**11.8** (10.1-13.5)
60-day	**3.23** (2.86-3.64)	**4.17** (3.70-4.71)	**5.49** (4.86-6.19)	**6.45** (5.70-7.28)	**7.71** (6.79-8.68)	**8.64** (7.57-9.73)	**9.57** (8.36-10.8)	**10.5** (9.12-11.8)	**11.7** (10.1-13.2)	**12.6** (10.8-14.3)

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

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

Please refer to NOAA Atlas 14 document for more information.

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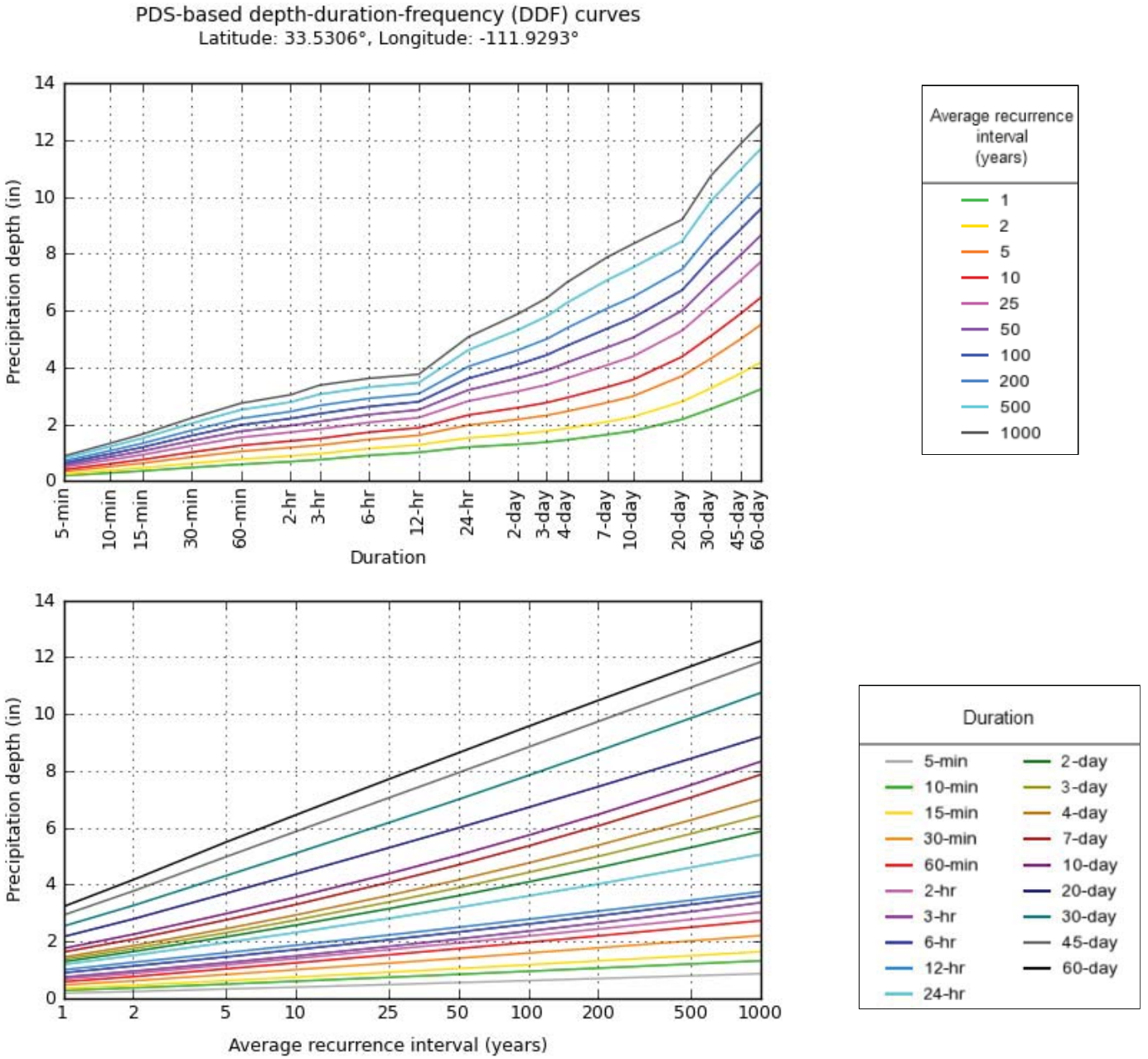
PF graphical



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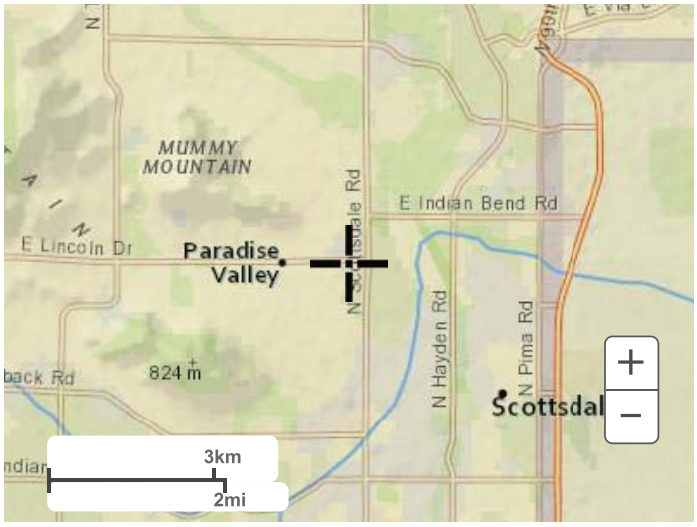
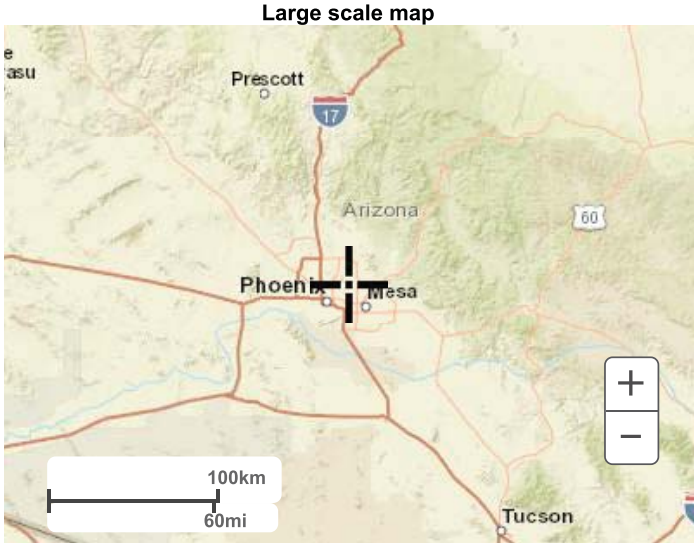
Maps & aerials

Small scale terrain



Large scale terrain

Large scale map



Large scale aerial

APPENDIX B

Runoff Coefficients, Retention and Drywell Calculations, VortSentry(R) HS Stormwater Treatment Detail

CVL

Table 3.2
RUNOFF COEFFICIENTS FOR MARICOPA COUNTY

Land Use Code	Land Use Category	Runoff Coefficients by Storm Frequency[1, 2]							
		2-10 Year		25 Year		50 Year		100 Year	
		min	max	min	max	min	max	min	max
VLDR	Very L						0.60	0.45	0.65
LDR	Low D						0.64	0.53	0.70
MDR	Mediu						0.78	0.60	0.80
MFR	Multiple Family Residential[3, 4]	0.65	0.75	0.72	0.83	0.78	0.90	0.82	0.94
I1	Industrial 1[3]	0.60	0.70	0.66	0.77	0.72	0.84	0.75	0.88
I2	Industrial 2[3]	0.70	0.80	0.77	0.88	0.84	0.95	0.88	0.95
C1	Commercial 1[3]	0.55	0.65	0.61	0.72	0.66	0.78	0.69	0.81
C2	Commercial 2[3]	0.75	0.85	0.83	0.94	0.90	0.95	0.94	0.95
P	Pavement and Rooftops	0.75	0.85	0.83	0.94	0.90	0.95	0.94	0.95
GR	Gravel Roadways & Shoulders	0.60	0.70	0.66	0.77	0.72	0.84	0.75	0.88
AG	Agricultural	0.10	0.20	0.11	0.22	0.12	0.24	0.13	0.25
LPC	Lawns/Parks/Cemeteries	0.10	0.25	0.11	0.28	0.12	0.30	0.13	0.31
DL1	Desert Landscaping 1	0.55	0.85	0.61	0.94	0.66	0.95	0.69	0.95
DL2	Desert Landscaping 2	0.30	0.40	0.33	0.44	0.36	0.48	0.38	0.50
NDR	Undeveloped Desert Rangeland	0.30	0.40	0.33	0.44	0.36	0.48	0.38	0.50
NHS	Hillslopes, Sonoran Desert	0.40	0.55	0.45	0.60	0.48	0.66	0.50	0.70
NMT	Mountain Terrain	0.50	0.70	0.65	0.80	0.70	0.90	0.75	0.90

POST-DEVELOPMENT
Most of the site will be covered with pavement and rooftops with the exception of medians/islands found between parking area and adjacent streets

PRE-DEVELOPMENT
average C value of 0.44 used

Notes:

1. Runoff coefficients for 25-, 50- and 100-Year storm frequencies were derived using adjustment factors of 1.10, 1.20 and 1.25, respectively, applied to the 2-10 Year values with an upper limit of 0.95.

2. The ranges of runoff coefficients shown for urban land uses were derived from lot coverage standards specified in the zoning ordinances for Maricopa County.

3. Runoff coefficients for urban land uses are for lot coverage only and do not include the adjacent street and right-of-way, or alleys.

4, Values are based on the NDR terrain class. Values should be increased for NHS and NMT terrain classes by the difference between NHS (or NMT) and the NDR C values, up to a maximum of 0.95. Engineering judgement should be used.

5. Maricopa County has adopted specific values of C for each land use and storm frequency in the Drainage Policies and Standards for Maricopa County, Arizona (Maricopa County, 2007). These are the standard default values. The engineer/hydrologist may develop a computed composite value of C based on actual land uses, but must fully document the computations and assumptions and submit them to Maricopa County for approval. Many jurisdictions in Maricopa County may have adopted specific C coefficient values and procedures. The user should check with the appropriate agency before proceeding.

SMOKE TREE RESORT
Retention Volume Calculations

Pre vs. Post										
Development Condition	**Drainage [1] Area A** (acres)	**Drainage [1] Area A** (feet^2)	**Runoff [2] Coefficient C**	**Precipitation [3] Depth P** (inches)	**Volume [4] Required V_{req}** (acre-ft)	**Volume [4] Required V_{req}** (cubic feet)	**Retention Basin/Tank ID**	**12' Dia. Underground Tank** (LF)	**Volume [5] Provided V_{prov}** (acre-ft)	**Volume [5] Provided V_{prov}** (cubic feet)
PRE	4.61	200,829	0.44	2.19	0.37	**16,127**				
POST			0.95	2.19	0.80	**34,819**	**RET**	175	0.45	**19,792**
DIFFERENCE					**0.43**	**18,692**			**0.45**	**19,792**

Reference: Drainage Design Manual for Maricopa County (2018)

Notes:

1. Drainage sub-basin delineated per Drainage Map (Plate 1).
2. Runoff coefficient values of 0.44 for undevelopd area and 0.95 for resorts per Drainage Design Manual for Maricopa County (see Appendix B).
3. Precipitation depth per NOAA Atlas 14 rainfall data (see Appendix A).
4. V_{req} = A x C x (P/12) = Volume required
5. V_{prov} = 12' Diameter Pipe LF x π $(6')^2$

SMOKE TREE RESORT
Drywell Calculations

Retention Basin ID	Volume Required to Drain[2] (ft^3)	Soil Infiltration Rate[3] ($ft^3/hr/ft^2$)	Flowrate Required to Drain Within 36 hrs [4] (cfs)	Drywell Flow Rate[5] (cfs)	Number Of Drywells Required [6]	Number Of Drywells Provided*
RET	19,792	0.00	0.15	0.10	**2**	**1**
				TOTAL	**2**	**1**

Notes:

(1) Bottom area per preliminary grading and drainage plans prepared by CVL Consultants, Inc.

(2) Volume required to drain = Volume provided for retention basins.

(3) Soil infiltration rate at the bottom of a compacted basin is below the minimum requirement of 0.5in/hr per DPSM Std 6.10.12, Hence, no infiltration was assumed.

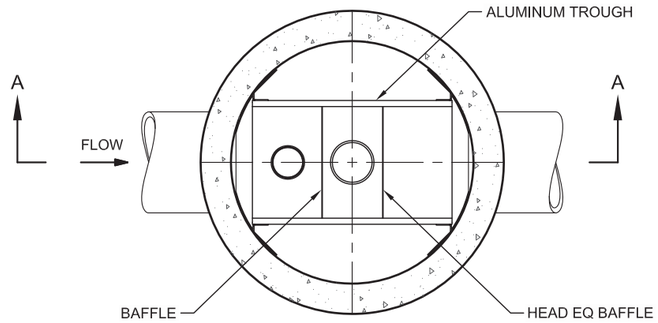
(4) Flowrate Required to Drain Basin Within 36 hrs = (Volume Required to Drain)/(36 x 3600)

(5) Drywell flow rate assumed to be minimum required per DPSM Std 6.10.13. Field test should be performed to calculate actual dry well flow rate.

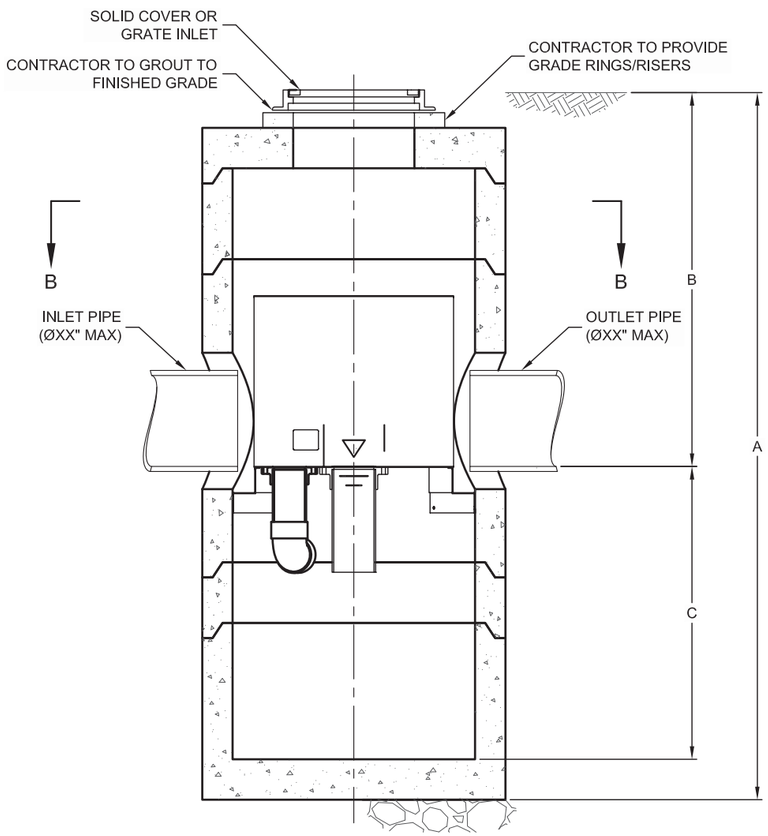
(6) (Number Of Dry Well(s) Required)=(Flowrate Required to Drain Basin Within 36 hrs)/(Dry Well Flowrate Capacity)

Note to contractor:

*Initially one drywell will be installed and field tests performed per the DPSM Standard 6.10.12 to check the actual flow rate of drywell.
Drywells will be provided and tested until the percolation requirement is achieved per DPSM Standard 6.10.12.
The amount of drywells needed shall be changed in accordance to the newly calculated flow rate.



PLAN VIEW B-B



SECTION A-A

VortSentry®

VORTSENTRY HS DESIGN NOTES

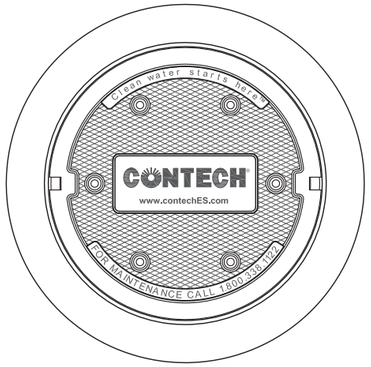
VSHS RATED TREATMENT CAPACITY IS SHOWN IN THE TABLE BELOW, OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY VARIES. CONTACT YOUR CONTECH REPRESENTATIVE FOR ADITIONAL INFORMATION.

THE STANDARD SOLID COVER CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW.

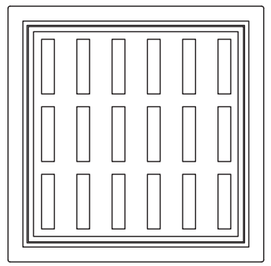
	CONFIGURATION OPTION DESCRIPTION
	GRATE INLET (NO INLET PIPE)
	GRATE INLET WITH INLET PIPE

VORTSENTRY HS GENERAL INFORMATION

	Model	Manhole Diameter (ID)		Total Treatment Flow Rate		Typical Total Distance Rim to Outside Bottom A		Typical Distance Rim to Invert B		Typical Depth Below Invert (inside) C		Approximate Minimum Distance Rim to Invert		Maximum Pipe Diameter (ID)	
		FT	mm	CFS	L/S	FT	m	FT	m	FT	mm	FT	m	IN	mm
	HS36	3	900	0.55	15.6	10.16	3.10	4.08	1.24	5.58	1702	3.00	0.91	18	450
2	HS48	4	1200	1.20	34.0	13.25	4.04	6.00	1.83	6.75	2057	4.00	1.22	24	600
3	HS60	5	1500	2.20	62.3	15.13	4.61	6.50	1.98	7.96	2426	4.82	1.47	30	750
	HS72	6	1800	3.70	104.8	16.56	5.05	6.75	2.06	9.15	2788	5.59	1.70	36	900
	HS84	7	2100	5.60	158.6	18.85	5.75	7.75	2.36	10.35	3156	5.00	1.52	42	1050
1	HS96	8	2400	8.10	229.4	20.87	6.36	8.50	2.59	11.54	3518	6.91	2.11	48	1200



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.



FRAME AND GRATE
(24" SQUARE)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS)	*
PEAK FLOW RATE (CFS)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

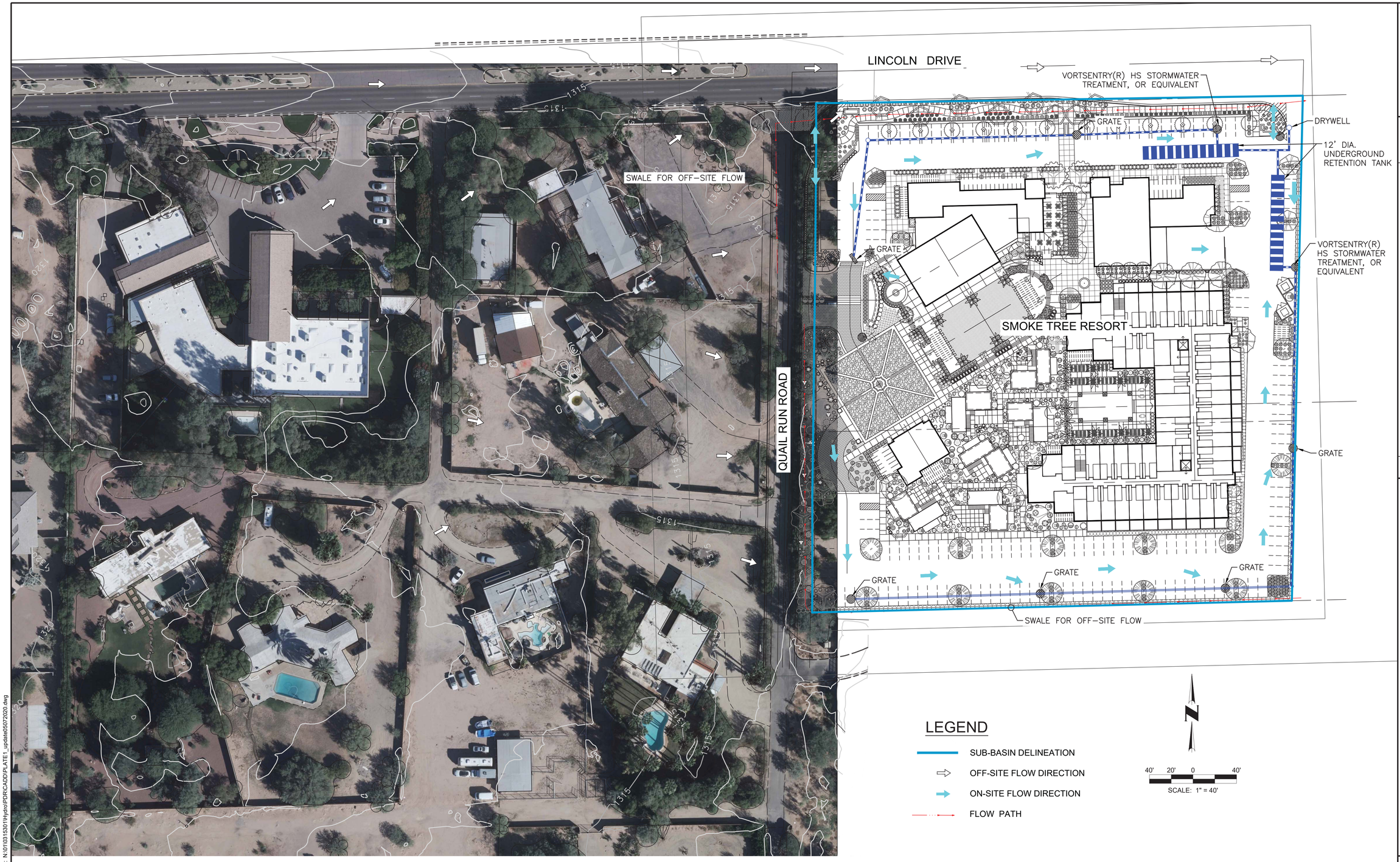
GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. VORTSENTRY HS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.

INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE VORTSENTRY HS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH® ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

VORTSENTRY HS STANDARD DETAIL

PLATE



CVL CONSULTANTS
CELEBRATING 60 YEARS
4550 North 12th Street
Phoenix, Arizona 85014
602.264.6831
www.cvlci.com

NO.	REVISION	DATE

Coe & Van Loo Consultants, Inc.

DRAINAGE MAP

SMOKE TREE RESORT
TOWN OF PARADISE VALLEY, ARIZONA

PLATE

SHEET 1 OF 1

CVL Contact: OSCAR GARCIA
CVL Project #: SMOKE TREE

PROJECT NO. 1-01-03153-01

Printed By: **AnaR** Print Date: **May 7, 2020** Filename: N:\01\03153\01\Hydro\PDR\CADD\PLATE1_update050720220.dwg