Monday, July 10, 2023

CONCEPTUAL
DRAINAGE REPORT
For
PINNACLE PEAK
"PET RESORT"

7474 E. Pinnacle Peak Road
Scottsdale, Arizona
Maricopa County

APN #21-05-531

Prepared By
Keogh Engineering, Inc.
650 N. 137TH Avenue #110
Goodyear, Arizona 85338

Job No. 22270

July, 2023

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APPENDICES

1. INTRODUCTION

1.1 Location and Site Description

The project is located at 7474 E. Pinnacle Peak Road in Scottsdale, Arizona, Maricopa County, as shown on the Vicinity Map. The 0.95 ac. site is a commercial lot located in FEMA Zone AE.

1.2 Existing Conditions

The proposed site as of today consists of a barren dirt commercial lot with water and sewer stubouts.

1.3 Proposed Hydraulic Analysis

This site consists of a commercial building on a compacted pad, The site will also connect to existing onsite water and sewer stubouts.

2. HYDROLOGIC ANALYSIS

2.1 Discussion

The grading and drainage plan shows the passing of historical drainage flows entering the site from the north property line and traversing as concentrated flow in the drainage easements located along the ease and south property lines (see the Onsite Drainage Exhibit).

- The site is also affected by FEMA LOMR 2509-185P enacted in 6/10/16. The under the building pad will require 2'-3' of compacted fill to be imported to the site.
- The sites on site drainage will drain to (3) catch basins being proposed that will release into the Drainage Easements.
- This drainage report and grading and drainage plan is being prepared to support the drainage and FEMA required designs.

2.2 Offsite Hydrology

The only offsite runoff that apply to this project is the runoff that enter into the existing 50' Drainage Easement located along the east and south property lines (see the "Onsite Drainage Exhibit).

This report calculates and shows in Appendix B typical Cross-Sections with water surface elevation and spreads that indicate that the Q100=223 c.f.s. AND q100= 234 C.F.S. will not spread outside the proposed, reduced in width, drainage easement. .

This report also shows that the construction of the new commercial building is free from inundation from the offsite 100-yr. storm event and that the integrity of the structure is not undermined.

Peak Discharge From the "PINNACLE PEAK OFFICE PARK" Grading and Drainage Plans By "Gilberson Associates"

The 223 c.f.s. from the *From the "PINNACLE PEAK OFFICE PARK" Grading and Drainage Plans By "Gilberson Associates"* that enters the 50' Drainage Easements *Is contained within the drainage easements except Cross-Section E-E which spills over into Pinnacle Peak Road*

2.3 Onsite Hydrology – See Exhibit "B"

2.3.1 Discussion

The criteria used to determine the onsite peak discharge is the following:

SUB BASIN (watershed)

A = Watershed Area=0.4 (ac.)

L = Length of Watershed =142'

USEG = Upstream Existing Ground=1874.4

DSEG = Downstream Existing Ground=1871.9

LAND USE

Runoff Coefficient from Table 6.3 pf the Maricopa County's Policies and Stds. Manual.

Land Use Code: 240 (C-0 Zoning)

C= 0.95

RAINFALL (NOAA) DATA

Maps: 64

From: 645

To: 645

Onsite drainage will drain to (3) catch basins that will release into the 50' Drainage Easement.

2.3.2 Erosion Protection-per Appendix D

The calculated erosion setback for the new 15.3' and falls inside the 20' minimum. Because retaining scour walls are provided, erosion protection is not necessary and none is provided. Riprap is provide for storm drain pipe outfalls.

2.3.3 FEMA Note:

This site is located within Zone AE as delineated on Insurance Rate Map/flood Hazard Boundary Map Panel No. 04013C1310M dated July 20, 2021 published by the Federal Emergency Management Agency. Zone AE is defined by the Federal emergency Management Agency as areas subject to 100-year flooding with BFE determinated (see "Onsite Drainage Exhibit").

2.3.4 Site Ultimate Outfall

The site ultimate outfall is at the southwest property corner at elevation 1862.96.

2.3.5 Typical Cross-Sections Description

Cross-Sections in Appendix B are provided that indicate that the building is fee from inundation from the 100-yr storm event and that the spreads from the 223 c.f.s. and 223 c.f.s. are contained in the 53' drainage easements. Runoff in Cross-Section E-E historically spills over in the Pinnacle Peak Road as the section indicates.

3. CONCLUSION

- No offsite runoff enters the site. A Q100 of 223 and 234 c.f.s. enters the existing wash located within the drainage easement and flow south along the east property line and west along the south property line.

- The Finish floor elevation 1873.00 for the new commercial building is free from inundation from the 100-year storm event.

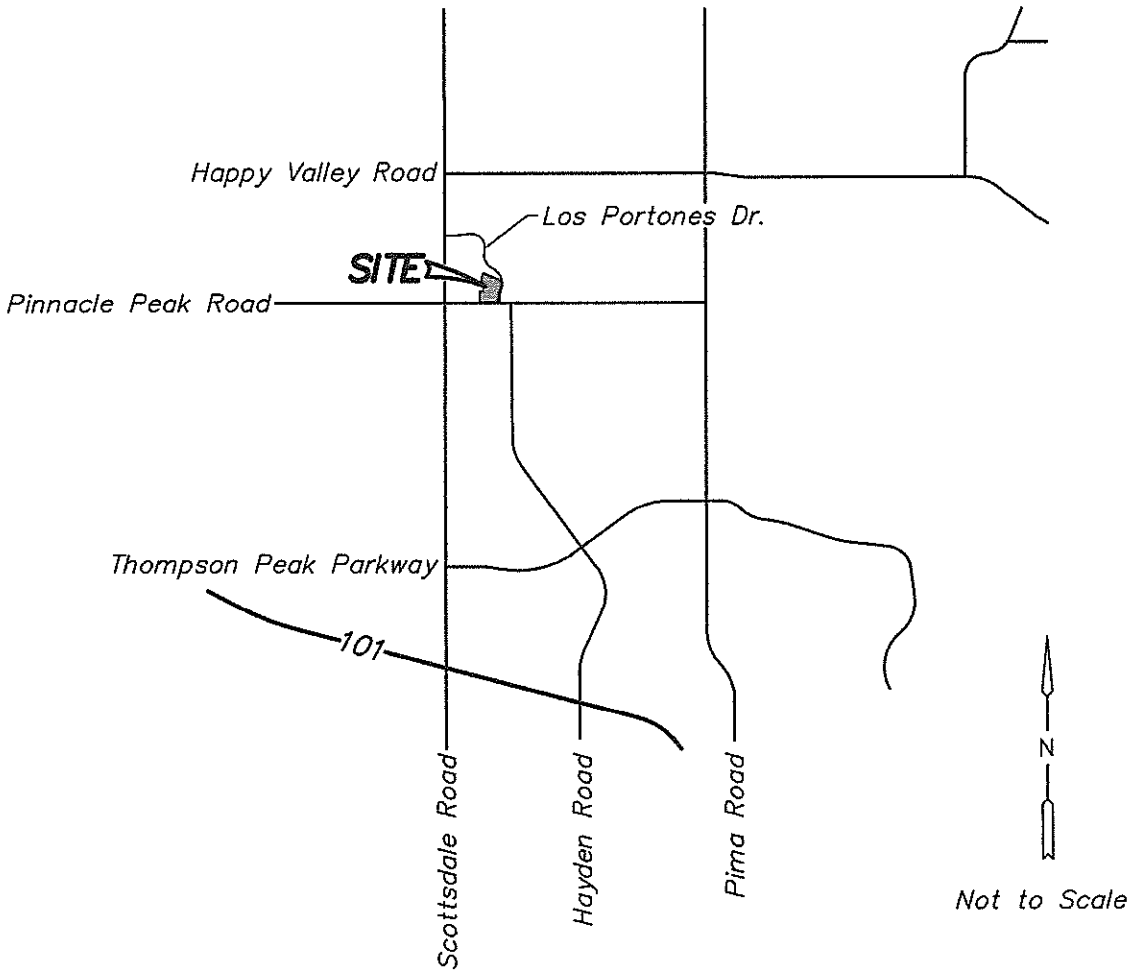
- The construction of the project will not cause adverse condition to adjacent properties.

- The Finish Floor Elevation of 1873.00 is 1' above the calculated Base Flood Elevation of 1872.00 which is the regulatory Floor Elevation.

FIGURES

Figure 1 - VICINITY MAP

Figure 2 - FEMA FLOOD INSURANCE RATE MAP



C:\KEOGH JOBS\22270-ATLANTIC DEVELOPMENT\DRAINAGE REPORT\22270-VICINITY MAP 11-13-22.DWG SHEET 1 (11-13-22 10:16:10PM) RUDY-153

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DESIGNED	DATE	JOB NO.
DFK/RMV	11-13-22	22270

DRAINAGE REPORT
"PET"
ATLANIC DEVELOPMENT

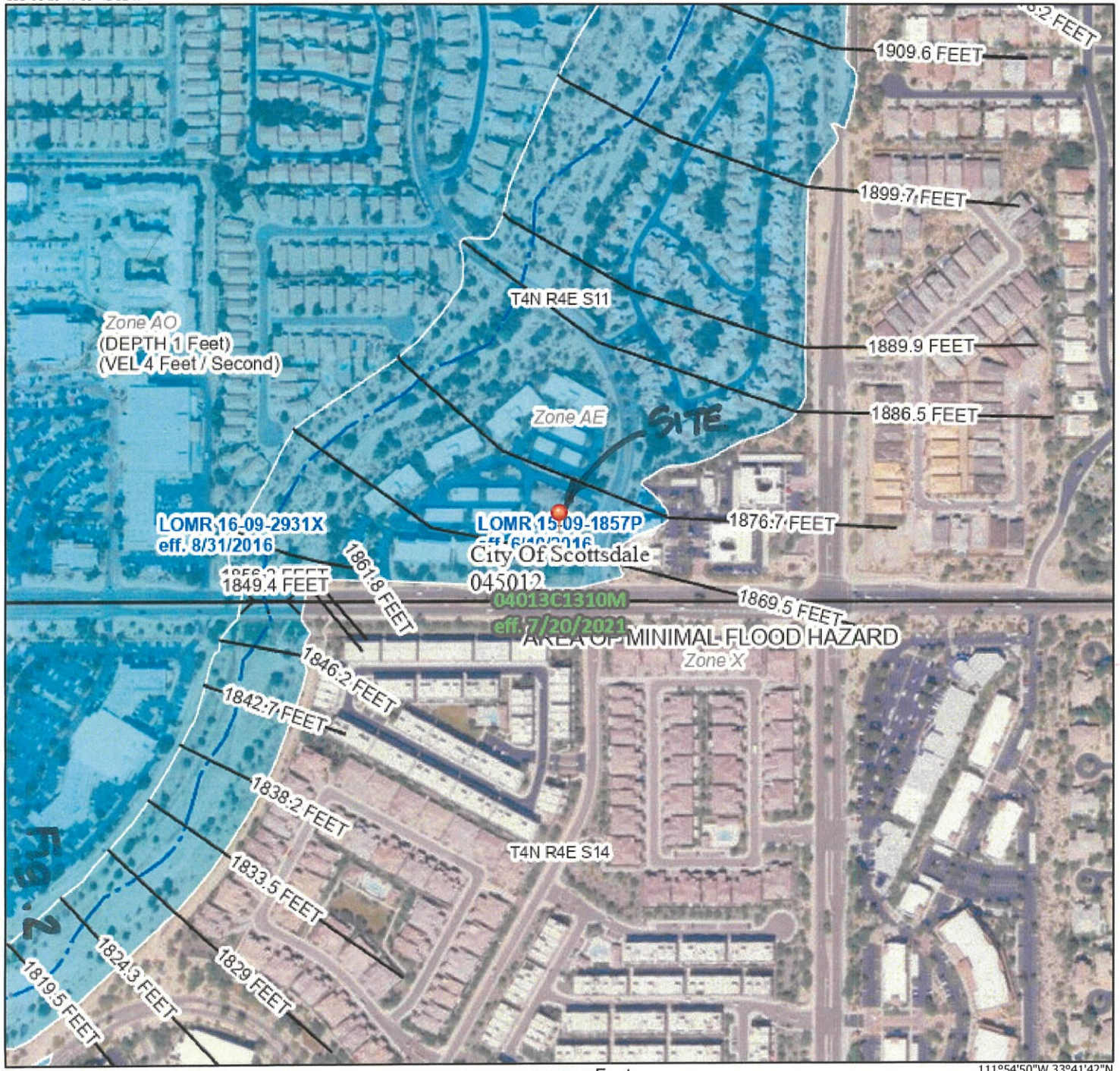
"VICINITY MAP"

7474 E. PINNACLE PEAK ROAD
SCOTTSDALE, ARIZONA 85255

Fig. 1

National Flood Hazard Layer FIRMette

FEMA



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, Area of 1% annual chance flood with average depth less than one foot or with drainag 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*

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
- 513 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 represe 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 7/10/2023 at 6:03 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.

EXHIBITS

OFFSITE DRANAGE EXHIBIT

See Except from the "Pinnacle Peak Office Park"

By

Gilbertson Associates

In

Appendix F

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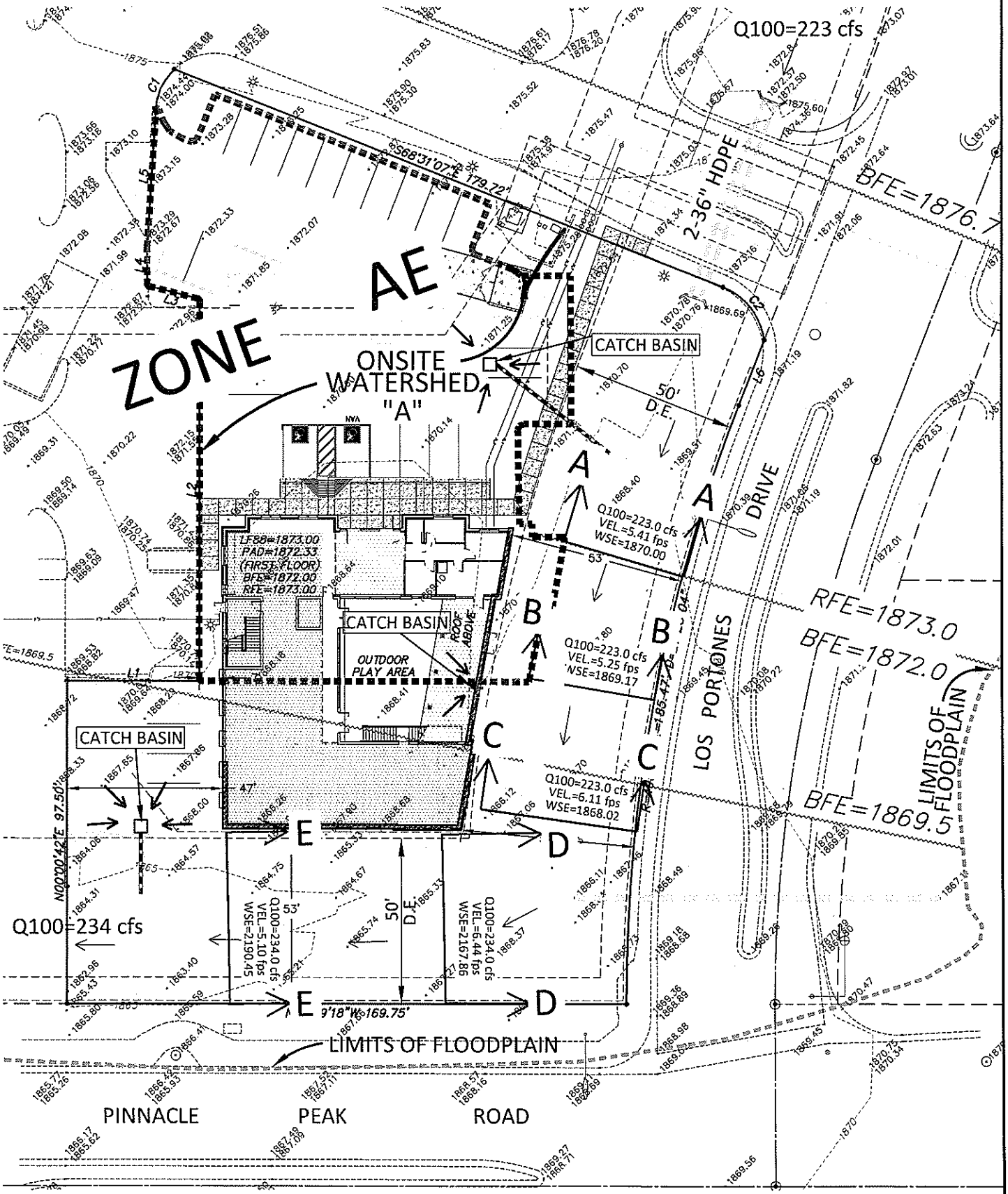
ONSITE DRAINAGE EXHIBIT



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DESIGNED	DATE	JOB NO.
DFK/RMV	7-10-23	22270

DRAINAGE REPORT

"PINNACLE PEAK PET RESORT"

ONSITE DRAINAGE EXHIBIT

7474 E. PINNACLE PEAK ROAD
SCOTTSDALE, ARIZONA 85255

APPENDIX A

Onsite

Peak Discharge
per
Drainage Design Management System for Windows
Program
(DDMSW)

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: 22270-ATLANTIC DEV.

ID	Sub Basin Data							Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
A	0.4	142	1,874.40	1,871.90	93.0	0.042	Q (cfs)	1.1	1.5	1.8	2.5	2.9	3.2
							C	0.85	0.85	0.85	0.94	0.95	0.95
							CA (ac)	0.34	0.34	0.34	0.38	0.38	0.38
							Volume (ac-ft)	0.0101	0.0138	0.0165	0.0230	0.0267	0.0294
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	3.32	4.52	5.42	6.62	7.55	8.48

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: 22270-ATLANTIC DEV.

Sub Basin	Land Use Code	Area (acres)	Area (%)	Kb	Runoff Coefficient C						Description
					2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
Major Basin ID: 01											
A	240	0.40	100.0	0.042	0.85	0.85	0.85	0.94	0.95	0.95	Regional Commercial (500,000 to 1,000,000 sq. ft.)
		0.400	**100.0**								

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
RAINFALL DATA
Project Reference: 22270-ATLANTIC DEV.

11/14/2022

ID	Method	Duration	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
DEFAULT	NOAA14	5 MIN	0.258	0.348	0.418	0.511	0.582	0.655
	NOAA14	10 MIN	0.393	0.529	0.635	0.777	0.886	0.998
	NOAA14	15 MIN	0.487	0.656	0.788	0.964	1.098	1.237
	NOAA14	30 MIN	0.655	0.884	1.061	1.298	1.479	1.665
	NOAA14	1 HOUR	0.811	1.094	1.313	1.606	1.830	2.061
	NOAA14	2 HOUR	0.939	1.250	1.489	1.813	2.059	2.314
	NOAA14	3 HOUR	1.022	1.336	1.585	1.932	2.208	2.494
	NOAA14	6 HOUR	1.209	1.544	1.811	2.174	2.457	2.752
	NOAA14	12 HOUR	1.366	1.724	2.006	2.386	2.677	2.978
	NOAA14	24 HOUR	1.610	2.083	2.459	2.985	3.403	3.841

APPENDIX B

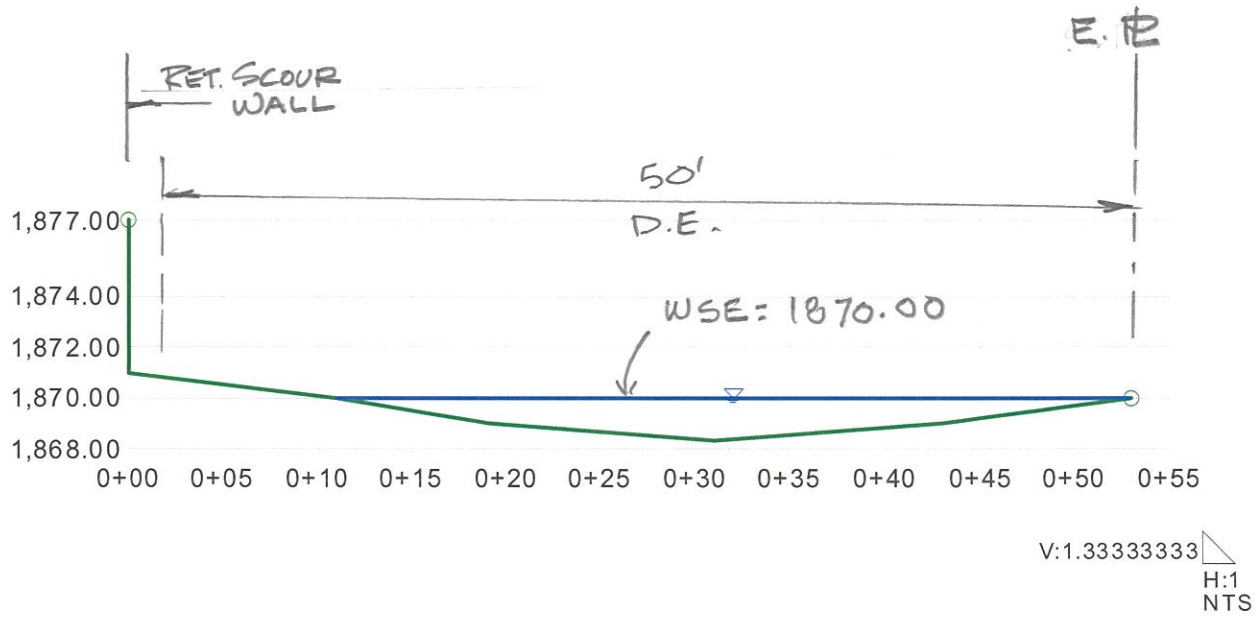
Typical Cross-Sections

(see "Onsite Drainage Exhibit)

22270 - Atlantic Dev. - CROSS-SECTION A-A (WSE)
Cross Section for Irregular Channel

Project Description	
Worksheet	22270 - Pet Resort - CROSS-SECTI
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficie	0.035	
Slope	0.016700	ft/ft
Water Surface Elev	1,870.00	ft
Elevation Range	68.30 to 1,877.00	
Discharge	223.00	cfs



Keogh Enginerring, Inc.
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

22270 - Pet Resort - CROSS-SECTION A-A (WSE)
Worksheet for Irregular Channel

Project Description	
Worksheet	22270 - Pet Resort - CROSS-SECTI
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	016700	ft/ft
Dischargı	223.00	cfs

Options	
Current Roughness Methc	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficie	0.035	
Water Surface Elev	1,870.00	ft
Elevation Range	38.30 to 1,877.00	
Flow Area	41.2	ft²
Wetted Perimeter	42.07	ft
Top Width	41.92	ft
Actual Depth	1.70	ft
Critical Elevation	1,869.97	ft
Critical Slope	0.018143	ft/ft
Velocity	5.41	ft/s
Velocity Head	0.46	ft
Specific Energy	1,870.45	ft
Froude Number	0.96	
Flow Type	Subcritical	

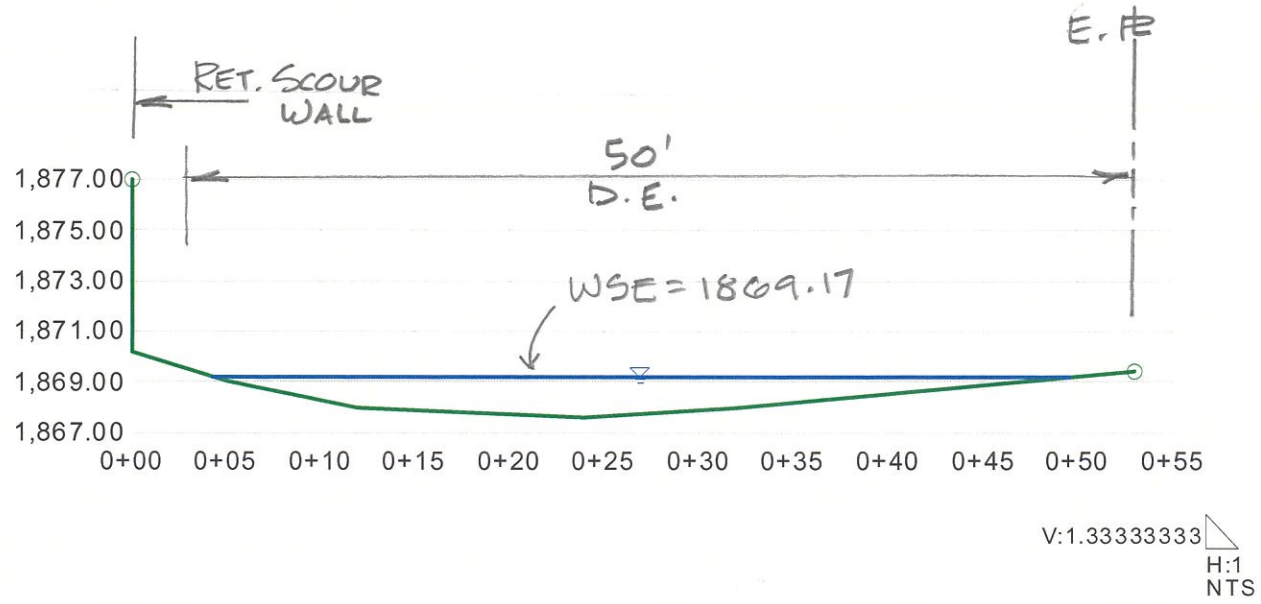
Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00	0+53	0.035

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00	1,877.00
0+00	1,871.00
0+11	1,870.00
0+19	1,869.00
0+31	1,868.30
0+43	1,869.00
0+53	1,870.00

22270 - Atlantic Dev. - CROSS-SECTION B-B (WSE)
Cross Section for Irregular Channel

Project Description	
Worksheet	22270 - Pet Resort - CROSS-SECTIC
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficie	0.035	
Slope	0.016700	ft/ft
Water Surface Elev	1,869.17	ft
Elevation Range	67.60 to 1,877.00	
Discharge	223.00	cfs



Keogh Enginerring, Inc.
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

22270 - Atlantic Dev. - CROSS-SECTION B-B (WSE)
Worksheet for Irregular Channel

Project Description	
Worksheet	22270 - Pet Resort - CROSS-SECTI(
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	016700	ft/ft
Dischargı	223.00	cfs

Options	
Current Roughness Methc	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin(	Horton's Method

Results		
Mannings Coefficie	0.035	
Water Surface Elev	1,869.17	ft
Elevation Range	37.60 to 1,877.00	
Flow Area	42.5	ft²
Wetted Perimeter	45.44	ft
Top Width	45.29	ft
Actual Depth	1.57	ft
Critical Elevation	1,869.14	ft
Critical Slope	0.018442	ft/ft
Velocity	5.25	ft/s
Velocity Head	0.43	ft
Specific Energy	1,869.60	ft
Froude Number	0.95	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+53	0.035

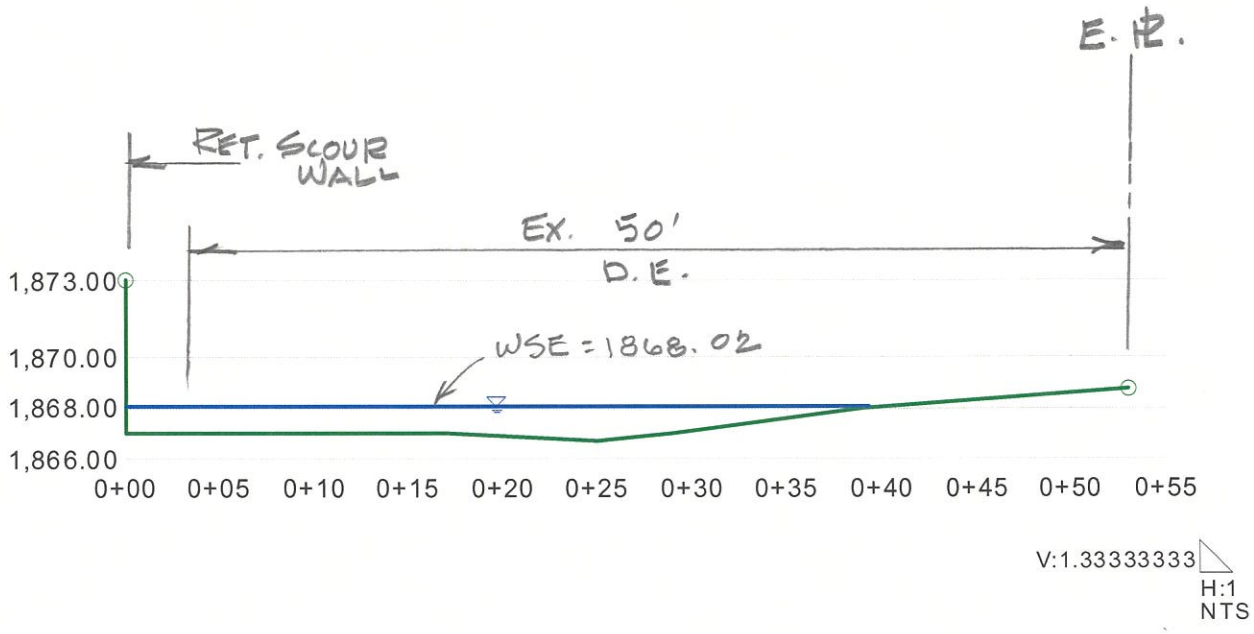
Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1,877.00
0+00	1,870.20
0+05	1,869.00
0+12	1,868.00
0+24	1,867.60
0+32	1,868.00
0+53	1,869.40

22270 - Pet Resort - CROSS-SECTION C-C (WSE)
Cross Section for Irregular Channel

Project Description	
Worksheet	22270 - Pet Resort - CROSS-SECTIC
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficie	0.035	
Slope	0.023800	ft/ft
Water Surface Elev	1,868.02	ft
Elevation Range	66.70 to 1,873.00	
Discharge	223.00	cfs



Keogh Enginerring, Inc.
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

22270 - Pet Resort - CROSS-SECTION C-C (WSE)
Worksheet for Irregular Channel

Project Description	
Worksheet	22270 - Pet Resort - CROSS-SECTI(
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	023800	ft/ft
Discharg(	223.00	cfs

Options	
Current Roughness Meth(	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin(	Horton's Method

Results		
Mannings Coefficie(	0.035	
Water Surface Elev	1,868.02	ft
Elevation Range	36.70 to 1,873.00	
Flow Area	36.5	ft²
Wetted Perimeter	40.43	ft
Top Width	39.34	ft
Actual Depth	1.32	ft
Critical Elevation	1,868.10	ft
Critical Slope	0.018711	ft/ft
Velocity	6.11	ft/s
Velocity Head	0.58	ft
Specific Energy	1,868.60	ft
Froude Number	1.12	
Flow Type	Supercritical	

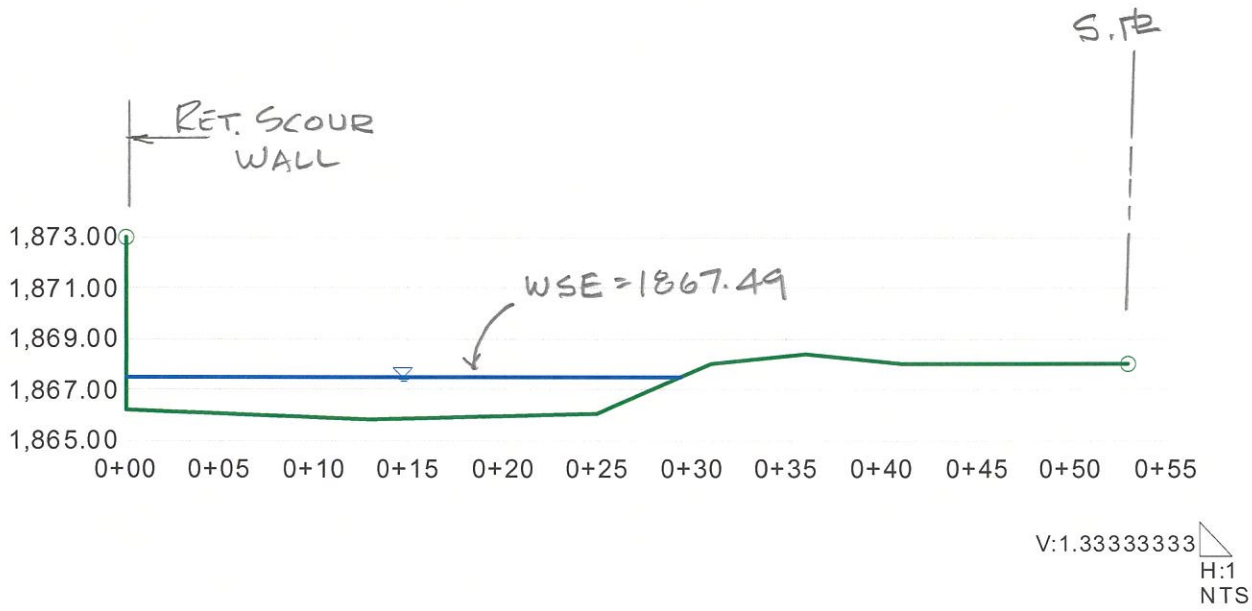
Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00	0+53	0.035

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00	1,873.00
0+00	1,867.00
0+03	1,867.00
0+17	1,867.00
0+25	1,866.70
0+29	1,867.00
0+39	1,868.00
0+53	1,868.70

22270 - Atlantic Dev. - CROSS-SECTION D-D (WSE)
Cross Section for Irregular Channel

Project Description	
Worksheet	22270 - Pet Resort - CROSS-SECTIC
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficie	0.035	
Slope	0.011800	ft/ft
Water Surface Elev	1,867.49	ft
Elevation Range	35.80 to 1,873.00	
Discharge	234.00	cfs



22270 - Pet Resort - CROSS-SECTION D-D (WSE)
Worksheet for Irregular Channel

Project Description	
Worksheet	22270 - Pet Resort - CROSS-SECTIC
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	011800	ft/ft
Discharg	234.00	cfs

Options	
Current Roughness Metho	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficie	0.035	
Water Surface Elev	1,867.49	ft
Elevation Range	35.80 to 1,873.00	
Flow Area	41.7	ft²
Wetted Perimeter	30.99	ft
Top Width	29.46	ft
Actual Depth	1.69	ft
Critical Elevation	1,867.31	ft
Critical Slope	0.017522	ft/ft
Velocity	5.62	ft/s
Velocity Head	0.49	ft
Specific Energy	1,867.98	ft
Froude Number	0.83	
Flow Type	Subcritical	

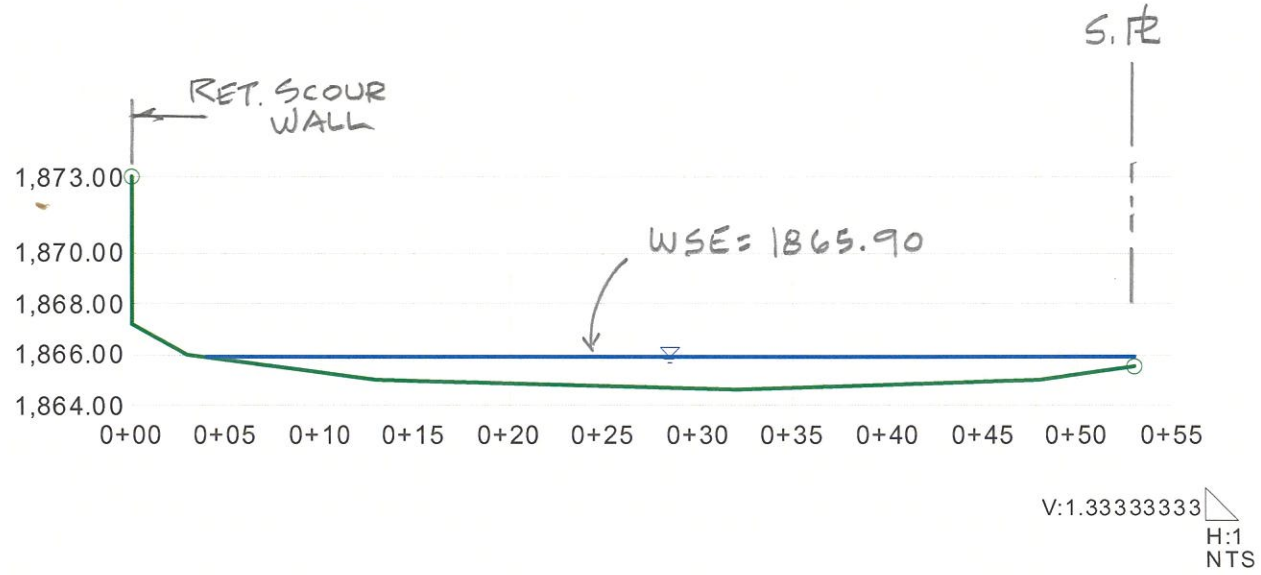
Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00	0+53	0.035

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00	1,873.00
0+00	1,866.20
0+13	1,865.80
0+25	1,866.00
0+28	1,867.00
0+31	1,868.00
0+36	1,868.40
0+41	1,868.00
0+53	1,868.00

22270 - Pet Resort - CROSS-SECTION E-E (WSE)
Cross Section for Irregular Channel

Project Description	
Worksheet	22270 - Pet Resort. - CROSS-SECTIC
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficier	0.035	
Slope	0.016000	ft/ft
Water Surface Elev	1,865.90	ft
Elevation Range	34.60 to 1,873.00	
Discharge	234.00	cfs



22270 - Pet Resort - CROSS-SECTION E-E (WSE)
Worksheet for Irregular Channel

Project Description	
Worksheet	22270 - Pet Resort. - CROSS-SECTIC
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	016000	ft/ft
Dischargı	234.00	cfs

Options	
Current Roughness Methc	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficie	0.035	
Water Surface Elev	1,865.90	ft
Elevation Range	34.60 to 1,873.00	
Flow Area	45.9	ft²
Wetted Perimeter	49.49	ft
Top Width	49.01	ft
Actual Depth	1.30	ft
Critical Elevation	1,865.85	ft
Critical Slope	0.018727	ft/ft
Velocity	5.10	ft/s
Velocity Head	0.40	ft
Specific Energy	1,866.31	ft
Froude Number	0.93	
Flow Type	Subcritical	

Calculation Messages:
Water elevation exceeds lowest end station by 0.40103455 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00	0+53	0.035

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00	1,873.00
0+00	1,867.20
0+03	1,866.00
0+13	1,865.00
0+32	1,864.60
0+48	1,865.00
0+53	1,865.50

APPENDIX C

Erosion Setback Line
Calculations
per

Arizona Department of Water Resources

SSA 5-96

"PINNACLE PEAK PET RESORT"
#22270

ARIZONA DEPARTMENT OF WATER RESOURCES
FLOOD WARNING AND DAM SAFETY SECTION

Watercourse System Sediment Balance

500 North Third Street
Phoenix, Arizona 85004

(602) 417-2445

STATE STANDARD ATTACHMENT **SEPTEMBER 1996**
SSA 5-96

"PINNACLE PEAK PET RESORT" #22270

For watercourses which have drainage areas of less than 30 square miles, the recommended setback allowances are as follows:

for straight channel reaches or reaches with minor curvature:	setback = $1.0(Q_{100})^{0.5}$
for channels with obvious curvature or channel bend:	setback = $2.5(Q_{100})^{0.5}$

where setback is in feet and Q_{100} is in cubic feet per second.

S.B. $= 1.0(Q_{100})^{0.5}$

$= 1.0(234\ cfs)^{0.5}$

$= 15.3'$ (20 min.)

RET. SCOUR WALL PROVIDED.
EROSION PROTECTION NOT NECESSARY - NONE PROVIDED

APPENDIX D

Scour Depth Calculations
per
Arizona Department of Water Resources
SSA 5-96

FOR STRAIGHT CHANNEL REACHES OR REACHES WITH MINOR CURVATURE

ARIZONA DEPARTMENT OF WATER RESOURCES
SSA 5-96

LEVEL I

THIS LEVEL OF ANALYSIS REQUIRES THE FOLLOWING INFORMATION;

Q_{100} = 223.00 C.F.S.

(1)

THE TOTAL SCOUR DEPTH, d_s , IS THE COMINATION OF GENERAL DEGRADATION AND LONG TERN DEGRADATION AND CAN BE COMPUTED AS FOLLOWS:;

$$d_s = d_{gs} + d_{its}$$

d_s = TOTAL SCOUR, IN FEET

d_{gs} = GENERAL DEGRADATION IN FEET

d_{its} = LONG TERM DEGRADATION, IN FEET

(2)

GENERAL DEGRADATION IS COMPUTED AS FOLOOWS:

USE THIS FORMULA

d_{gs} = GENERAL DEGRADATION IN FEET

$d_{gs} = 0.157(Q_{100})^{0.4}$

$d_{gs} = 0.157(223.0)^{0.4} =$ 1.37'

(3)

LONG TERM DEGRADATION IS COMPUTED AS FOLLOWS:

USE THIS FORMULA

d_{its} = LONG TERM DEGRADATION

$d_{its} = 0.02(Q_{100})^{0.6}$

$d_{its} = 0.02(223.0)^{0.6} =$ 0.51'

(4)

THE TOTAL SCOUR DEPTH SHOULD BE APPLIED TO THE LOWEST POINT IN THE LOCAL CROSS SECTION FOR DETERMINATION OF THE ELEVATION TO WHICH SCOUR WILL OCCUR;

$d_s =$ 1.37 $_{gs}$ + 0.51 $_{its}$ = 1.88'

3.0 MIN.

C:\ENGINEERING DESIGN\DRAINAGE DESIGN-CCCCCCCCCCCCCCCCCCLONE\EROSION MIN. DEPTH DEPTH.DWG MODEL (11-13-22 8:54:00AM) RUDY-153

Keogh Engineering, Inc.
650 N. 137TH AVENUE #110 • GOODYEAR, ARIZONA 85338
PHONE: (623) 535-7260 FAX: (623) 535-7262
EMAIL: keogh@keoghengineering.com

DESIGNED	DATE	JOB NO.
RMV/DFK		

PINNACLE PEAK "PET RESORT"

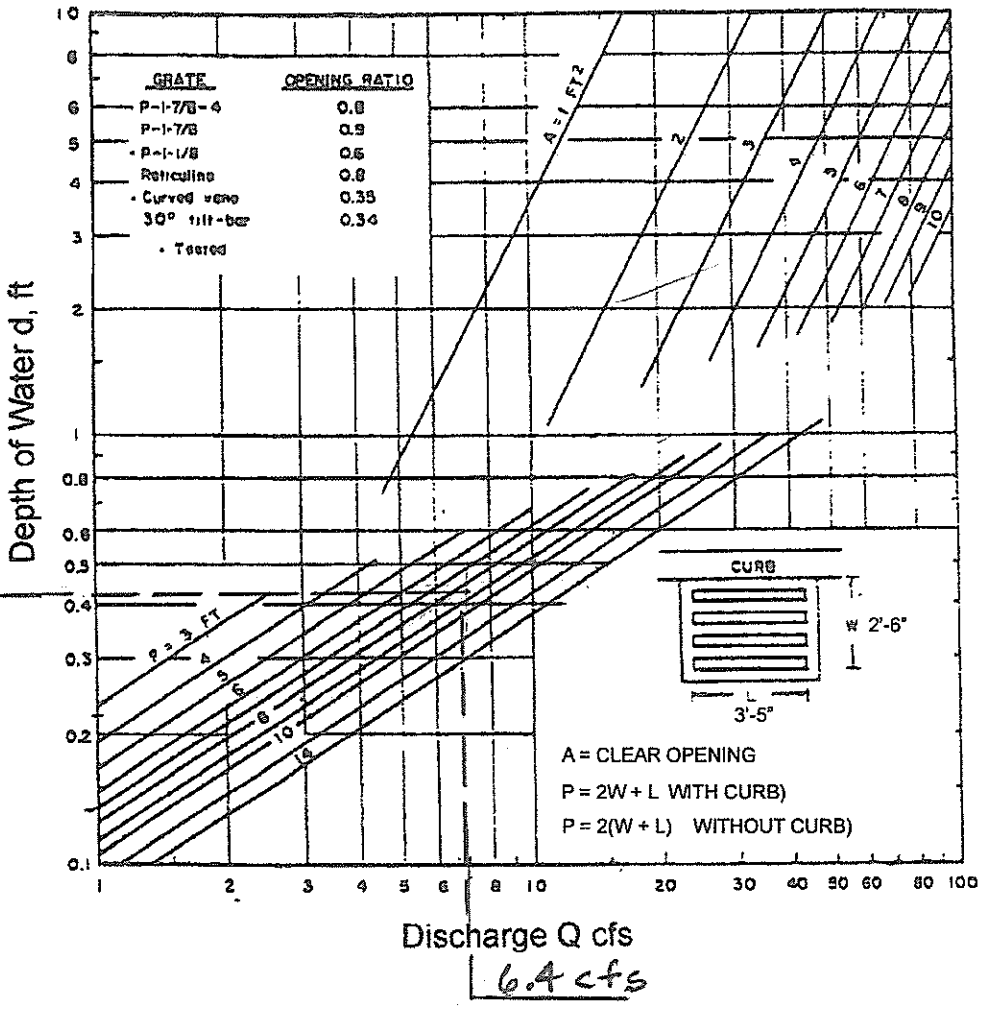
SCOUR DEPTH CALCULATIONS

APPENDIX E

Inlet Design/Detail

Job No. 22270
Job Name ATLANTIC DEV.

FIGURE 3.16
GRATE INLET CAPACITY IN SUMP CONDITIONS
(USDOT, FHWA, 1984, HEC-12, Chart 11)



0.41'

6.4 cfs

$Q_{100} = 3.2 \times 2$ c.f. $= 6.4$ cfs

$P = 2W + L$

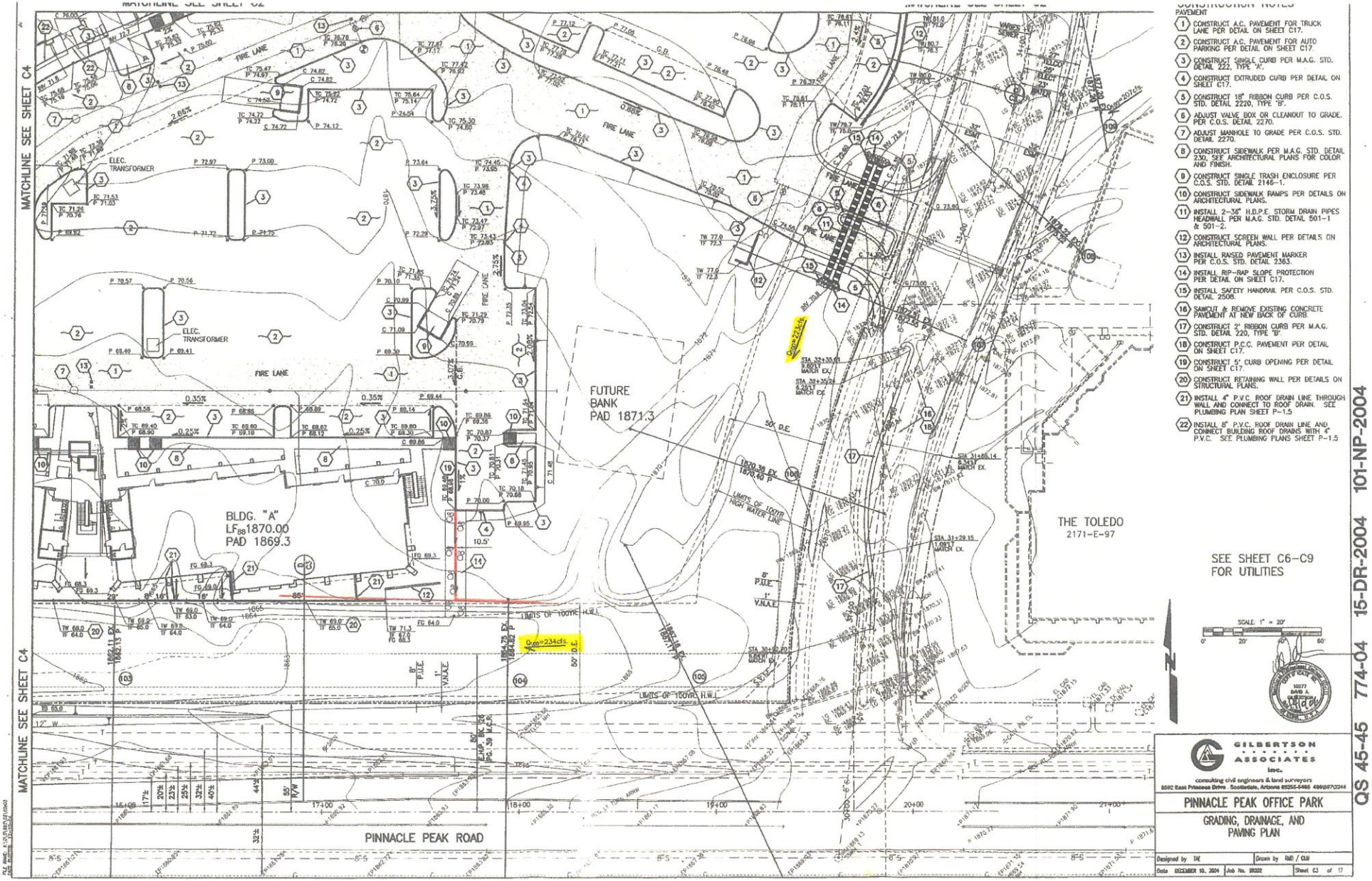
$= 2(2.5") + 3.42"$

$= 8.4$

DEPTH $= 0.42' < 0.50'$ OK

APPENDIX F

Excerpt from the
Pinnacle Peak Office Park
By
"Gilbertson Associates"
Plans



CONSTRUCTION NOTES

PAVEMENT

1. CONSTRUCT A.C. PAVEMENT FOR TRUCK LANE PER DETAIL ON SHEET C17.
2. CONSTRUCT A.C. PAVEMENT FOR AUTO PARKING PER DETAIL ON SHEET C17.
3. CONSTRUCT SINGLE CURB PER M.A.G. STD. DETAIL 222, TYPE 'A'.
4. CONSTRUCT EXTRUDED CURB PER DETAIL ON SHEET C17.
5. CONSTRUCT 18" RIBBON CURB PER C.O.S. STD. DETAIL 2220, TYPE 'B'.
6. ADJUST VALVE BOX OR CLEANOUT TO GRADE. PER C.O.S. DETAIL 2270.
7. ADJUST MANHOLE TO GRADE PER C.O.S. STD. DETAIL 2270.
8. CONSTRUCT SIDEWALK PER M.A.G. STD. DETAIL 230, SEE ARCHITECTURAL PLANS FOR COLOR AND FINISH.
9. CONSTRUCT SINGLE TRASH ENCLOSURE PER C.O.S. STD. DETAIL 2146-1.
10. CONSTRUCT SIDEWALK RAMPS PER DETAILS ON ARCHITECTURAL PLANS.
11. INSTALL 2-36" H.D.P.E. STORM DRAIN PIPES HEADWALL PER M.A.G. STD. DETAIL 501-1 & 501-2.
12. CONSTRUCT SCREEN WALL PER DETAILS ON ARCHITECTURAL PLANS.
13. INSTALL RAISED PAVEMENT MARKER PER C.O.S. STD. DETAIL 2363.
14. INSTALL RIP-RAP SLOPE PROTECTION PER DETAIL ON SHEET C17.
15. INSTALL SAFETY HANDRAIL PER C.O.S. STD. DETAIL 2508.
16. SAWCUT & REMOVE EXISTING CONCRETE PAVEMENT AT NEW BACK OF CURB.
17. CONSTRUCT 2' RIBBON CURB PER M.A.G. STD. DETAIL 220, TYPE 'B'.
18. CONSTRUCT P.C.C. PAVEMENT PER DETAIL ON SHEET C17.
19. CONSTRUCT 5' CURB OPENING PER DETAIL ON SHEET C17.
20. CONSTRUCT RETAINING WALL PER DETAILS ON STRUCTURAL PLANS.
21. INSTALL 4" P.V.C. ROOF DRAIN LINE THROUGH WALL AND CONNECT TO ROOF DRAIN. SEE PLUMBING PLAN SHEET P-1.5
22. INSTALL 8" P.V.C. ROOF DRAIN LINE AND CONNECT BUILDING ROOF DRAINS WITH 4" P.V.C. SEE PLUMBING PLANS SHEET P-1.5

GILBERTSON ASSOCIATES inc.
consulting civil engineers & land surveyors
8502 East Princess Drive · Scottsdale, Arizona 85255-5466 480/8072244

PINNACLE PEAK OFFICE PARK

GRADING, DRAINAGE, AND PAVING PLAN

Designed by TAE	Drawn by RMB / CLM
Date DECEMBER 10, 2004	Job No. 99202
	Sheet C3 of 17

QS 45-45 774-04 15-DR-2004 101-NP-2004

APPENDIX G

Rational Method Developed Condition C Coefficient

Table 6.3 Rational Method Developed Condition C Coefficients

Land Use[1]		Return Period				K_b Type[2]
Class	Maricopa Association of Governments/County Zoning Classifications	2-, 5-, & 10-Year	25-Year	50-Year	100-Year	
110	Rural Residential (<= 1/5 dwelling units (du) per acre Rural-190	0.42	0.46	0.50	0.53	A
120	Estate Residential (1/5 du per acre to 1 du per acre) Rural-70, Rural-43	0.42	0.46	0.50	0.53	A
130	Large Lot Residential - Single Family (1 du per acre to 2 du per acre) R1-35	0.48	0.53	0.58	0.60	A
140	Medium Lot Residential - Single Family (2-4 du per acre) R1-18, R1-10	0.48	0.53	0.58	0.60	A
150	Small Lot Residential - Single Family (4-6 du per acre) R1-8	0.65	0.72	0.78	0.82	A
160	Very Small Lot Residential - Single Family (>6 du per acre-includes mobile home) R1-7, R1-6	0.75	0.83	0.90	0.94	A
170	Medium Density Residential - Multi Family (5-10 du per acre) R-2	0.75	0.83	0.90	0.94	A
180	High Density Residential - Multi Family (10-15 du per acre) R-3	0.75	0.83	0.90	0.94	A
190	Very High Density Residential - Multi Family (> 15 du per acre) R-4, R-5	0.75	0.83	0.90	0.94	A
200	General Commercial (Commercial where no detail available) C-3	0.85	0.94	0.95	0.95	A

[1] From MAG 2000 Land Use Plan and Maricopa County Zoning Ordinance
[2] Refer to the Hydrology Manual, Chapter 5, Table 5.3 for descriptions of each type.

APPENDIX H

Riprap Sizing
Per
Arizona Department of Water Resources
SSA 7-98
Figure 1

ARIZONA DEPARTMENT OF WATER RESOURCES
FLOOD MITIGATION SECTION

Watercourse Bank Stabilization

500 North Third Street
Phoenix, Arizona 85004

(602) 417-2445

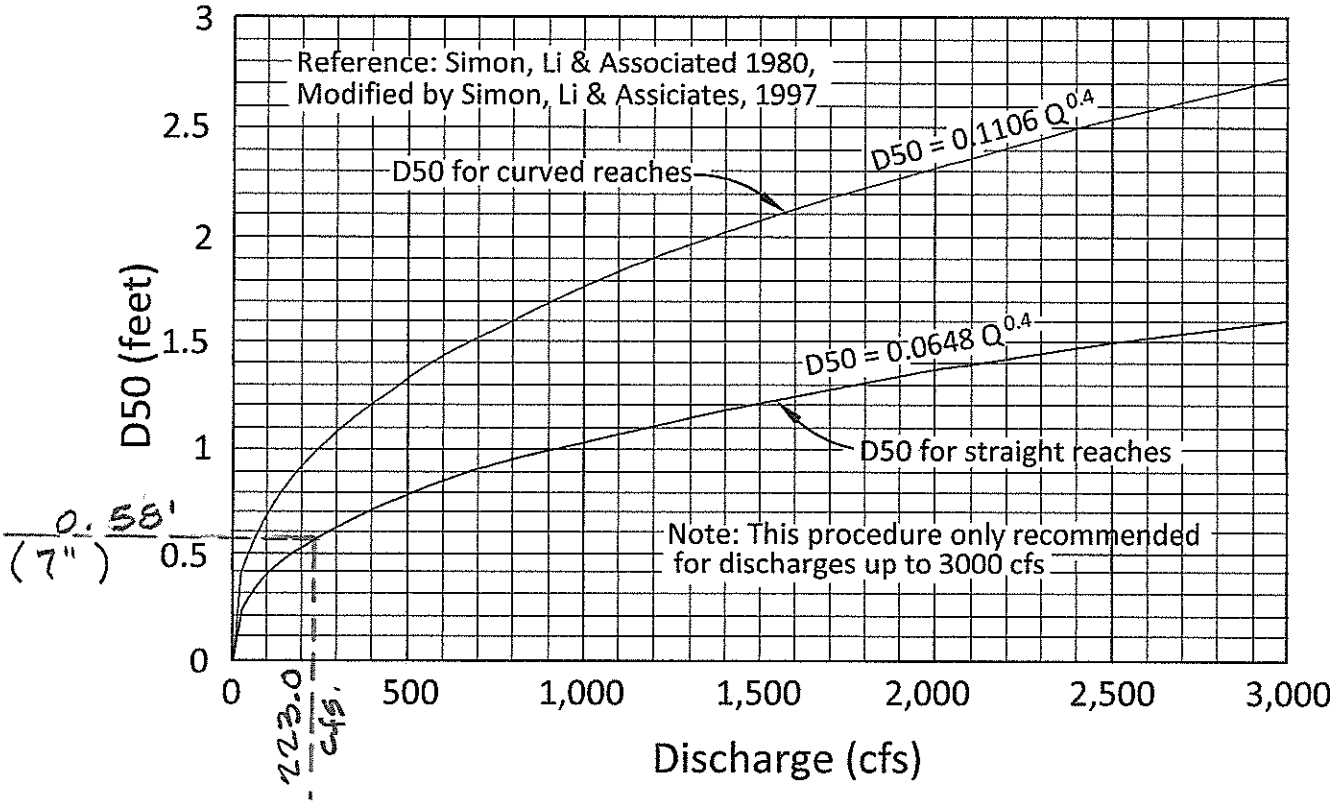
STATE STANDARD ATTACHMENT **MAY 1998**
SSA 7-98

PROJEC NAME "PET" ATLANTIC DEV.
PROJEC NO. 22270

ARIZONA DEPARTMENT OF WATER RESOURCES

SSA 7-98
WATERCOURSE BANK STABILIZATION
RIPRAP SIZING

FIGURE 1
LEVEL 1 MEDIAN RIPRAP STONE SIZE (D50)



SSA 5-96 LMSA-3 September 1996

Q100 = 223.0 cfs.
D50 = 7"
T = 14"

AT STORM DRAIN PIPE OUTFALLS

"RIPRAP SIZING"
SSA 7-98

C:\ENGINEERING DESIGN\DRAINAGE DESIGN-CCCCCCCCCCCCCLONE\RIPRAP CALCS\FIGUF RIPRAP SIZING ADWR SSA 7-98 OCT.13, 2022.DWG MGDE