

FINAL DRAINAGE REPORT

FOR

**LAS SENDAS OFFICE CONDOMINIUMS
7565 E. EAGLE CREST DRIVE
MESA, ARIZONA**

FEBRUARY 19, 2007

**PREPARED BY
DESERT DEVELOPMENT ENGINEERING, LLC
10000 N. 31ST AVENUE, SUITE A109
PHOENIX, ARIZONA 85051**



D.D.E. JOB NO. 0552

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 FLOOD ZONE..... 1

3.0 EXISTING DRAINAGE 2

4.0 PROPOSED DRAINAGE 3

- APPENDIX A:**
Vicinity Map
Aerial Map
Flood Insurance Rate Map

- APPENDIX B:**
Drainage Exhibit
Hydrology Calculations
Hydraulic Calculations

- APPENDIX C:**
Excerpts from Drainage Report for Pinnacle Point at Las Sendas Parcel 5/6
by Wood, Patel & Associates

1.0 INTRODUCTION

This report has been prepared to provide the drainage analysis for Las Sendas Office Condominiums. The property is located in the master planned Las Sendas Subdivision along Eagle Crest Drive as it curves to the north. The site is situated within the Northeast Quarter of Section 30, Township 2 North, Range 7 East of the Gila and Salt River Base and Meridian, Maricopa, Arizona. The site is bordered to the north by Eagle Crest Drive, to the west by a private road (with ingress/egress easement), to the south and by desert landscape for the golf course property, and to the east by a residential subdivision. This lot encompasses just over 1.5-acres and will include a new 2-story building and 2 parking lots while keeping about a third of the site untouched. Refer to the Vicinity Map and Aerial Map provided in Appendix 'A'.

Las Sendas is a master planned community previously known as "Falcon Ridge". The Master Drainage Report for Falcon Ridge was prepared by Greiner Engineering Sciences, Inc., dated May 1987 which was approved by the City of Mesa and the Flood Control District of Maricopa County. One addendum to the original report was prepared by GeoDimensions, Inc. and was approved by the City of Mesa and the Flood Control District of Maricopa County. This site will conform to the Master Drainage Report.

The site is also affected by drainage from the subdivision to the east known as Pinnacle Point at Las Sendas. A copy of that drainage report prepared by Wood, Patel & Associates, Inc. dated May 2000 has been obtained for verifying the affects of cross drainage. Excerpts from that report are provided in Appendix 'C'.

2.0 FLOOD ZONE

The property is located in Zone X (Shaded/Dotted) according to Flood Insurance Rate Map (FIRM) Panel Number 04013C2210 F, dated September 30, 2005, as published by FEMA. Zone X (Shaded) is defined as "Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas

less than 1 square mile; and areas protected by levees from 1% annual chance flood." A copy of the FIRM is provided in Appendix 'A'.

3.0 EXISTING DRAINAGE

The existing property is unique in many ways. The undeveloped site has a natural looking hilltop, is covered with moderate desert vegetation, has a multiple small rock outcroppings, has 2 washes, and the property is next to a curve linear road. The hilltop is somewhat centered within the property. The hilltop splits storm water runoff to the north and southeast. Storm water then flows to the north wash along Eagle Crest Drive or to a wash flowing south along the east property line.

Refer to the Drainage Exhibit in Appendix 'B' for the following discussion. The washes accept runoff from the upstream subdivision of Pinnacle Point at Las Sendas. The wash at the north end of the site does not appear to carry a lot of flow since the continuation of the wash upstream along Eagle Crest Drive is rather small in cross section. Also, the golf course property constructed a 24" culvert for the drive along the west property line and generally speaking does not carry significant flow. According to Drainage Report for Pinnacle Point at Las Sendas, there is a 100-year peak flow of 3 cfs (CP-B) in the north wash entering the site at the northeast corner. The wash along the east property line receives runoff from the adjacent subdivision contributing a 100-year peak flow of 11 cfs (CP-D). Further downstream of the site the peak flow from the subdivision is 38 cfs (slightly south of CP-C).

The Master Drainage Report for Falcon Ridge (Las Sendas) states that regional retention basins will be provided for the 50-year, 24-hour storm. This means that existing storm water runoff from the site currently flows offsite to regional retention basins. Consequently, offsite flows also enter this site from the east before being routed offsite again toward the regional retention basins.

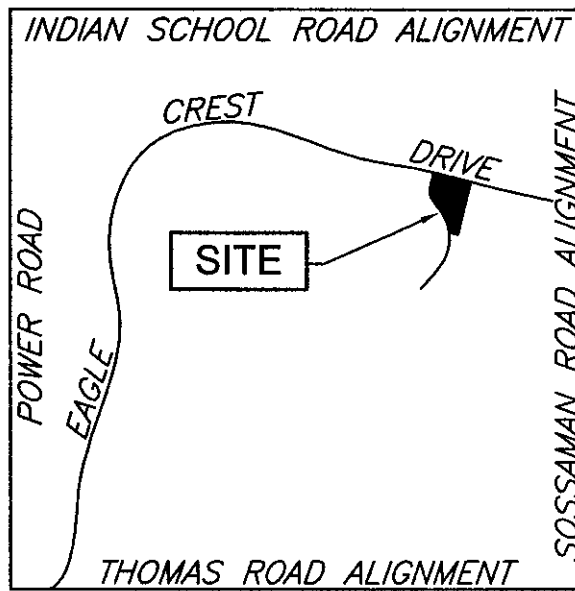
4.0 PROPOSED DRAINAGE

The property has been analyzed for retention requirements and to make sure that building floors are safe from flooding. According to the Master Drainage Report for Falcon Ridge (Las Sendas), regional retention basins are provided for the 50-year, 24-hours storm. Therefore, onsite retention is not required.

Refer to the Drainage Exhibit in Appendix 'B'. The site is broken into 2 drainage tributaries as split by the proposed building (high point). The north portion (Tributary A) of the site will drain north and the south portion (Tributary C) will drain south similar to the existing condition. The existing wash along Eagle Crest Drive will intercept post development runoff from the Tributary A and combine with offsite flow from the subdivision to the east (Tributary B). A 100-year peak flow of 8 cfs will occur at CP-A. The existing wash flowing south along the east property line will intercept post development runoff from Tributary C and offsite flow from the subdivision (Tributary D). A 100-year peak flow of 13 cfs will occur at CP-C. However, because just downstream of CP-C is another existing point for runoff from the subdivision with a 100-year peak of 38 cfs, a backwater effect will occur upstream of CP-C. Flow depths in the washes are all less than one foot.

The developers intent is to keep a natural looking site, therefore new pavement and the building will be kept somewhat down in size. Proposed grading contours are designed to resemble the existing natural condition. Special landscaping will also be used to resemble the existing condition as well. The finish floor of the building is set at 1716.00 for the north entrance and 1728.00 for the south entrance. Having such a design helps earthwork among other things. The floors are elevated well above any storm water elevations in the adjacent washes.

APPENDIX A



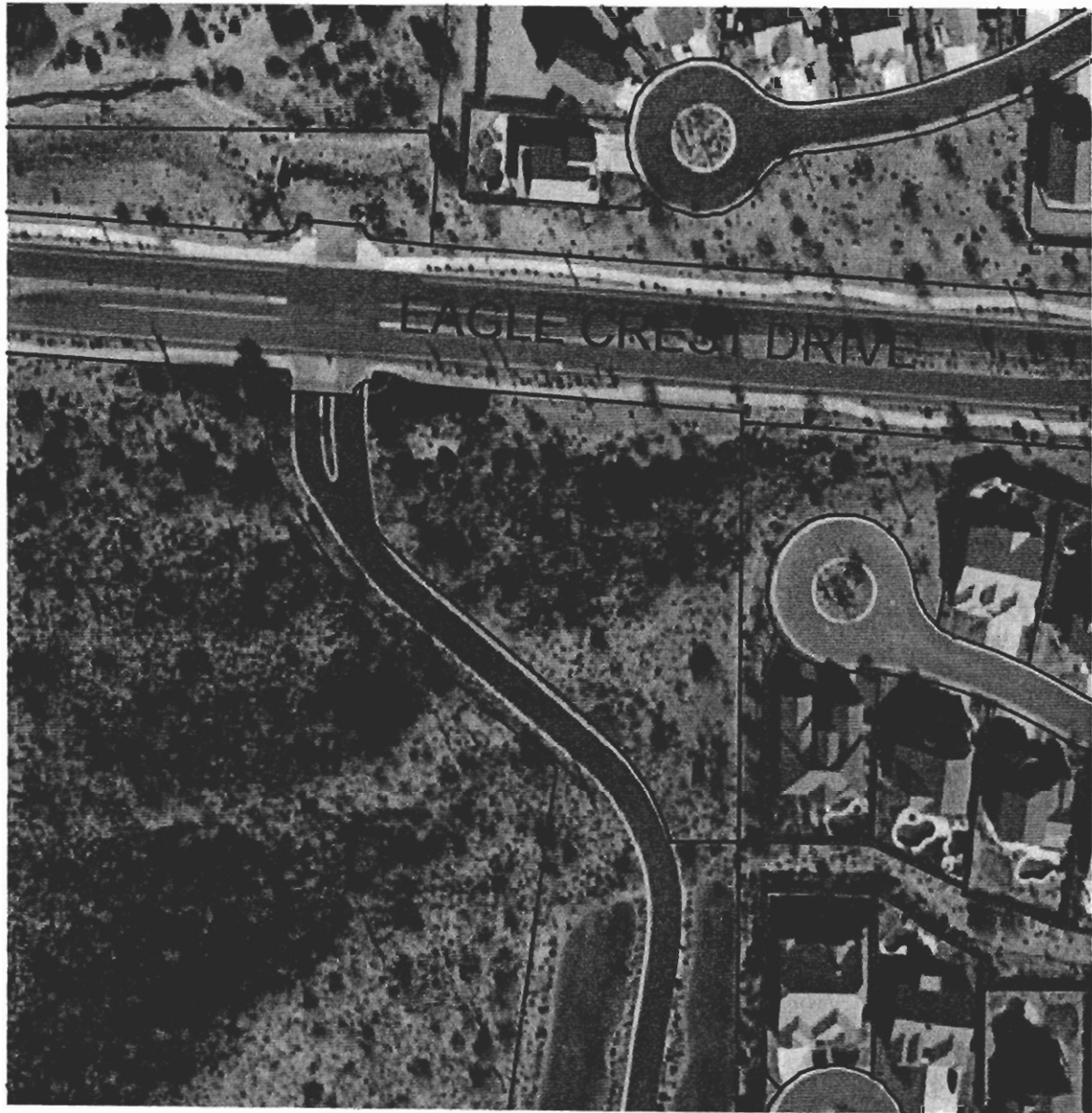
N.T.S.

de Desert
Development
Engineering, LLC

CIVIL ENGINEERING SERVICES

10000 N. 31st Avenue • Suite A109 • Phoenix, Arizona 85051
P. 602-997-2005 • F. 602-997-4006

PLAN TYPE:	VICINITY MAP
PROJECT NAME:	LAS SENDAS OFFICE CONDOMINIUMS
PROJECT NO.:	0552
SCALE:	N.T.S.
DATE:	JAN.'06
PAGE:	1 OF 1



N.T.S.

dE Desert
Development
Engineering, LLC

CIVIL ENGINEERING SERVICES

10000 N. 31st Avenue • Suite A109 • Phoenix, Arizona 85051
P. 602-997-2005 • F. 602-997-4006

PLAN TYPE: AERIAL MAP

PROJECT NAME: LAS SENDAS OFFICE CONDOMINIUMS

PROJECT NO.: 0552

SCALE: N.T.S.

DATE: JAN.'06

PAGE: 1 OF 1



MAP SCALE 1" = 1000'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2210F

FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY,
ARIZONA
AND INCORPORATED AREAS

PANEL 2210 OF 4350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040027	2210	F
MEHA, CITY OF	040048	3770	F

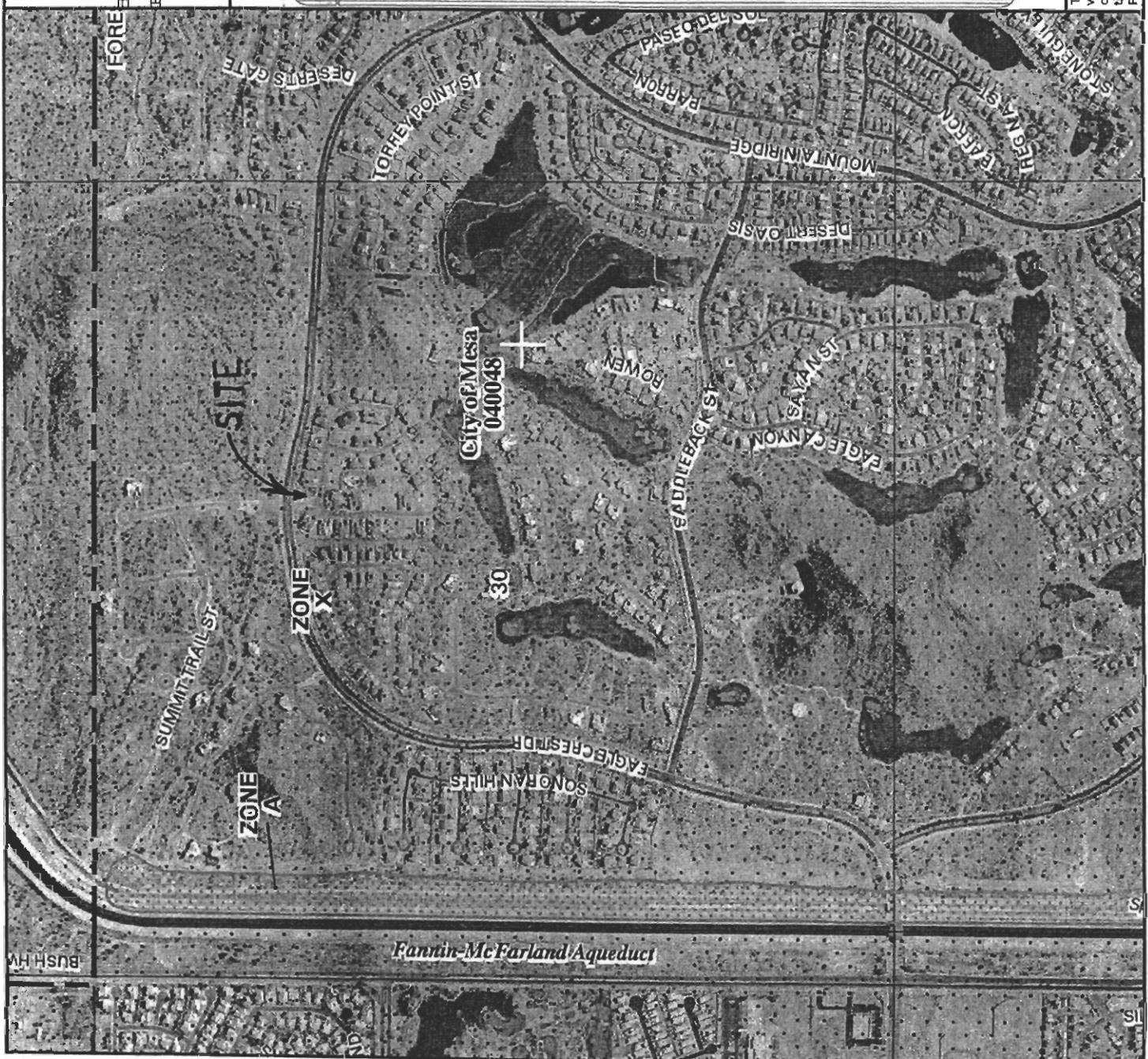
Notice to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
04013C2210F
MAP REVISED

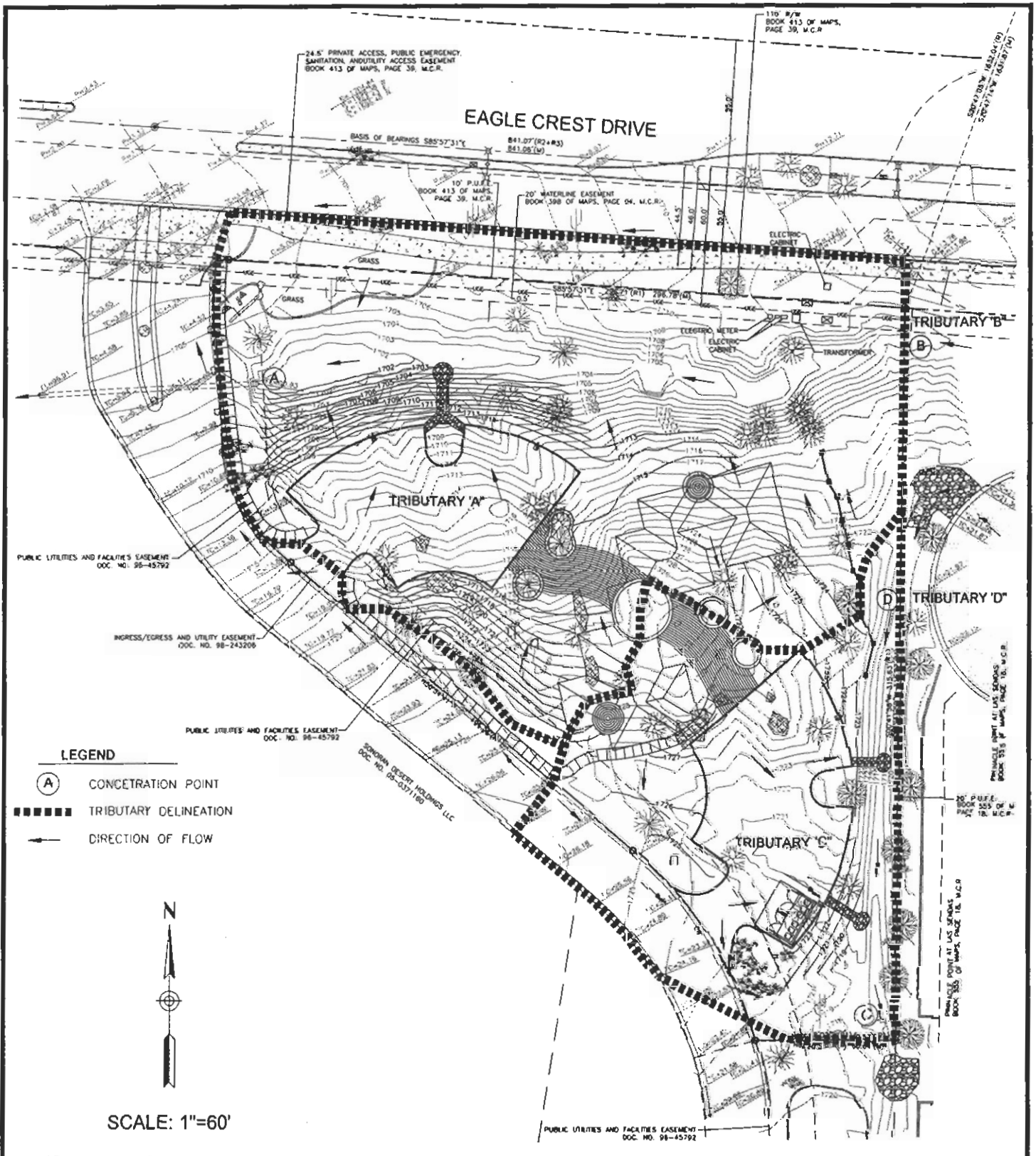
SEPTEMBER 30, 2005

Federal Emergency Management Agency



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

APPENDIX B



Desert Development Engineering, LLC
CIVIL ENGINEERING SERVICES
 10000 N. 31st Avenue • Suite A109 • Phoenix, Arizona 85051
 P. 602-997-2005 • F. 602-997-4006

PLAN TYPE:	DRAINAGE EXHIBIT
PROJECT NAME:	LAS SENDAS OFFICE CONDOMINIUMS
PROJECT NO.:	0552
SCALE:	1"=60'
DATE:	JAN.'07
PAGE:	1 OF 1

HYDROLOGY DATA - RATIONAL METHOD

General Data	
Project Name:	Las Sendas Office Condominiums
Project No.:	0552
Return Period	100 yr
Concentration Point:	A

Weighted Runoff Coefficient			
Description	Area	C	Area x C
grass landscape	0.000	0.15	0.000 acres
desert (no liner)	0.896	0.50	0.448 acres
commercial development	0.252	0.90	0.227 acres
total	1.148		0.675 acres
weighted C		0.59	

Design Data	
Drainage Area:	49,997 ft ² = 1.148 acres
Drainage Length:	370 ft
Top Elevation:	1727 ft
Bottom Elevation:	1701 ft
Slope:	0.07027 ft/ft = 7.0%
Lot Outfall Time:	0 min
Travel Time:	5 min
Time of Concentration:	5 min
Rainfall Intensity (I):	8.5 in/hr
Runoff Coefficient (C):	0.59
Peak Discharge (Q):	5.8 cfs

Formulas:

1. Drainage Area per plan
2. Drainage Length per plan
3. Top Elevation per plan
4. Bottom Elevation per plan
5. Lot Outfall Time not used
6. Time of Concentration=Lot Outfall Time + Travel Time
7. Rainfall Intensity from I-D-F Curve for Maricopa County
8. Runoff Coefficient from City Drainage Manual
9. $Q=CIA$

HYDROLOGY DATA - RATIONAL METHOD

General Data	
Project Name:	Las Sendas Office Condominiums
Project No.:	0552
Return Period	100 yr
Concentration Point:	A+B

Weighted Runoff Coefficient			
Description	Area	C	Area x C
grass landscape	0.000	0.20	0.000 acres
desert (no liner)	0.896	0.50	0.448 acres
commercial development	0.252	0.90	0.227 acres
offsite CP-19 (old report)	1.080	0.50	0.540 acres
total	2.228		1.215 acres
weighted C		0.55	

Design Data	
Drainage Area:	97,051 ft ² = 2.228 acres
Drainage Length:	1010 ft
Top Elevation:	1733 ft
Bottom Elevation:	1701 ft
Slope:	0.03168 ft/ft = 3.2%
Lot Outfall Time:	0 min
Travel Time:	11 min
Time of Concentration:	11 min
Rainfall Intensity (I):	6.3 in/hr
Runoff Coefficient (C):	0.55
Peak Discharge (Q):	7.7 cfs

Formulas:

1. Drainage Area per plan
2. Drainage Length per plan
3. Top Elevation per plan
4. Bottom Elevation per plan
5. Lot Outfall Time not used
6. Time of Concentration=Lot Outfall Time + Travel Time
7. Rainfall Intensity from I-D-F Curve for Maricopa County
8. Runoff Coefficient from City Drainage Manual
9. $Q=CIA$

HYDROLOGY DATA - RATIONAL METHOD

General Data	
Project Name:	Las Sendas Office Condominiums
Project No.:	0552
Return Period	100 yr
Concentration Point:	C

Weighted Runoff Coefficient			
Description	Area	C	Area x C
grass landscape	0.000	0.15	0.000 acres
desert (no liner)	0.224	0.50	0.112 acres
commercial development	0.293	0.90	0.264 acres
total	0.517		0.376 acres
weighted C		0.73	

Design Data	
Drainage Area:	23,383 ft ² = 0.537 acres
Drainage Length:	220 ft
Top Elevation:	1721 ft
Bottom Elevation:	1716 ft
Slope:	0.02273 ft/ft = 2.3%
Lot Outfall Time:	0 min
Travel Time:	5 min
Time of Concentration:	5 min
Rainfall Intensity (I):	8.5 in/hr
Runoff Coefficient (C):	0.73
Peak Discharge (Q):	3.3 cfs

Formulas:

1. Drainage Area per plan
2. Drainage Length per plan
3. Top Elevation per plan
4. Bottom Elevation per plan
5. Lot Outfall Time not used
6. Time of Concentration=Lot Outfall Time + Travel Time
7. Rainfall Intensity from I-D-F Curve for Maricopa County
8. Runoff Coefficient from City Drainage Manual
9. $Q=CIA$

HYDROLOGY DATA - RATIONAL METHOD

General Data	
Project Name:	Las Sendas Office Condominiums
Project No.:	0552
Return Period	100 yr
Concentration Point:	C+D

Weighted Runoff Coefficient			
Description	Area	C	Area x C
grass landscape	0.000	0.20	0.000 acres
desert (no liner)	0.224	0.50	0.112 acres
commercial development	0.293	0.90	0.264 acres
offsite CP-E (old report)	2.710	0.70	1.897 acres
total	3.227		2.273 acres
weighted C		0.70	

Design Data	
Drainage Area:	140,568 ft ² = 3.227 acres
Drainage Length:	893 ft
Top Elevation:	1732 ft
Bottom Elevation:	1716 ft
Slope:	0.01792 ft/ft = 1.8%
Lot Outfall Time:	5 min (from old report for subdivision)
Travel Time:	11 min (9 offsite + 2 onsite)
Time of Concentration:	16 min
Rainfall Intensity (I):	5.8 in/hr
Runoff Coefficient (C):	0.70
Peak Discharge (Q):	13.1 cfs

Formulas:

1. Drainage Area per plan
2. Drainage Length per plan
3. Top Elevation per plan
4. Bottom Elevation per plan
5. Lot Outfall Time is 5 minutes minimum
6. Time of Concentration=Lot Outfall Time + Travel Time
7. Rainfall Intensity from I-D-F Curve for Maricopa County
8. Runoff Coefficient from City Drainage Manual
9. $Q=CIA$

CONCENTRATION POINT A (TRIBUTARY A):

```

Rational.exe

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Wtrcrse. Length = 370 (feet)           Kb = .1485
Top Elev. = 1727 (feet)               P(10,6) = 1.95 (inches)
Bottom Elev. = 1701 (feet)           Area = 1.148 (acres)
Slope = .0703 (feet/feet)           C(10) = .48

Hydrological Summary Table
-----
PARAMETER      2-Yr      5-Yr      10-Yr     25-Yr     50-Yr     100-Yr
-----
Q (cfs):       2          2          3          4          5          6
C : 0.480      0.480     0.480     0.528     0.576     0.600
Tc (min):      6.9        6.1        5.7        5.3        5.0        5.0
i(Adj) (in/hr): 3.2        4.4        5.3        6.5        7.5        8.5
i(Phx) (in/hr): 3.4        4.7        5.6        6.9        8.0        9.0

<press 'p' to print or any key to continue>
    
```

CONCENTRATION POINT A (TRIBUTARY A+B):

```

Rational.exe

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Wtrcrse. Length = 1010 (feet)         Kb = .1413
Top Elev. = 1733 (feet)               P(10,6) = 1.95 (inches)
Bottom Elev. = 1701 (feet)           Area = 2.228 (acres)
Slope = .0317 (feet/feet)           C(10) = .44

Hydrological Summary Table
-----
PARAMETER      2-Yr      5-Yr      10-Yr     25-Yr     50-Yr     100-Yr
-----
Q (cfs):       2          3          4          5          6          8
C : 0.440      0.440     0.440     0.484     0.528     0.550
Tc (min):     16.3       14.4       13.5       12.2       11.6       11.0
i(Adj) (in/hr): 2.2        3.1        3.7        4.8        5.5        6.3
i(Phx) (in/hr): 2.4        3.3        3.9        5.0        5.8        6.7

<press 'p' to print or any key to continue>
    
```

CONCENTRATION POINT C (TRIBUTARY C):

Rational.exe

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Wtrcrse. Length = 220 (feet) Kb = .0417
 Top Elev. = 1721 (feet) P(10,6) = 1.95 (inches)
 Bottom Elev. = 1716 (feet) Area = .537 (acres)
 Slope = .0227 (feet/feet) C(10) = .58

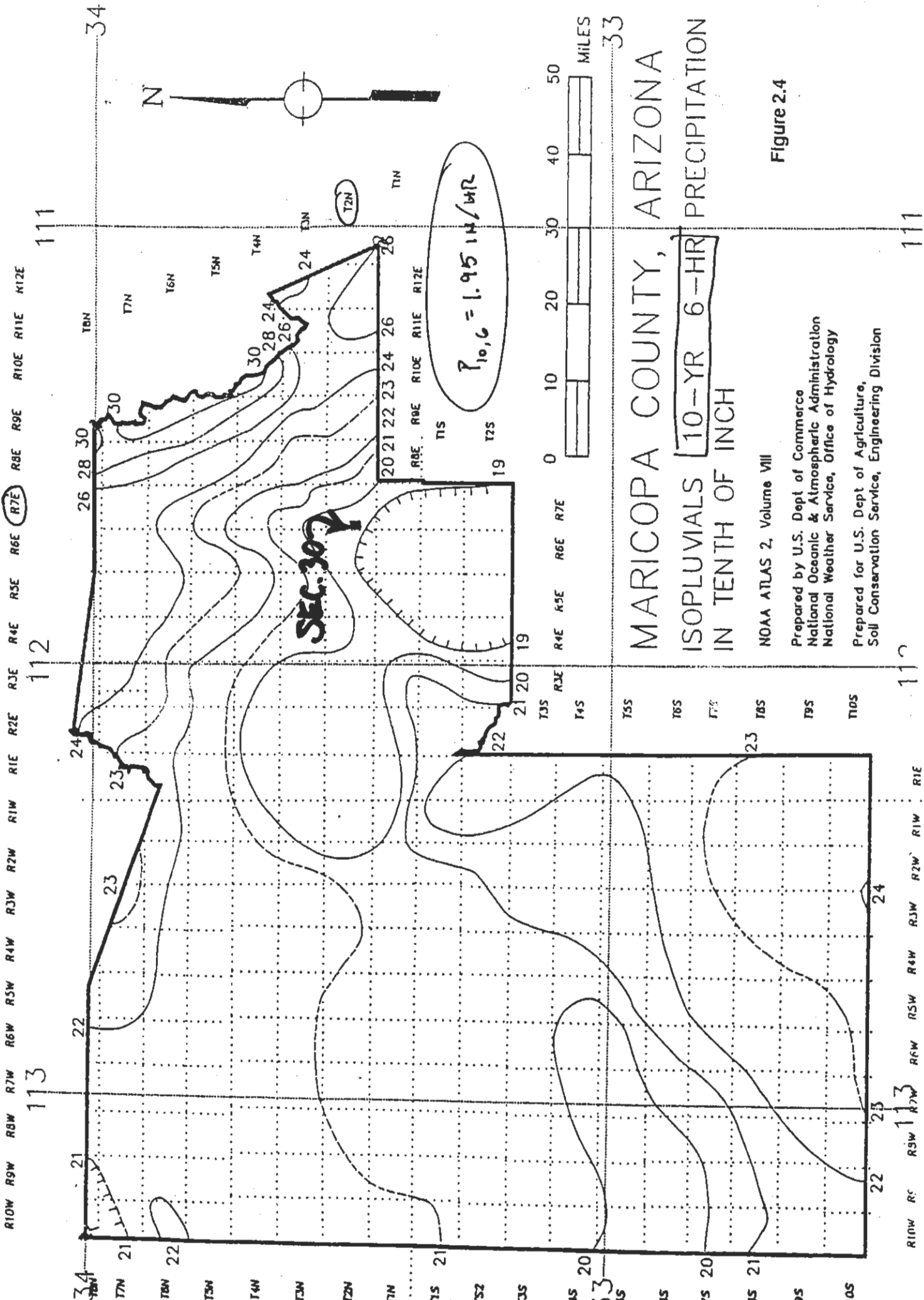
Hydrological Summary Table

PARAMETER	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs):	1	1	2	2	3	3
C :	0.580	0.580	0.580	0.638	0.696	0.725
Tc (min):	5.0	5.0	5.0	5.0	5.0	5.0
i(Adj) (in/hr):	3.6	4.7	5.6	6.6	7.5	8.5
i(Phx) (in/hr):	3.8	5.0	5.9	7.0	8.0	9.0

<press 'p' to print or any key to continue>

CONCENTRATION POINT C (TRIBUTARY C+D):

Calculated with spreadsheet and Fig. 3.2, I-D-F Curve from Maricopa County because the time of concentration for the original offsite flow (report by Wood, Patel and Associates) had to be manually added to onsite time of concentration to allow use of 5 minute lot outfall in subdivision. Maricopa County Rational Method Software does not allow the user to manually include additional lot outfall time.



MARICOPA COUNTY, ARIZONA
 ISOPLUVIALS [10-YR 6-HR] PRECIPITATION
 IN TENTH OF INCH

NOAA ATLAS 2, Volume VIII
 Prepared by U.S. Dept. of Commerce
 National Oceanic & Atmospheric Administration
 National Weather Service, Office of Hydrology
 Prepared for U.S. Dept. of Agriculture,
 Soil Conservation Service, Engineering Division

Figure 2.4

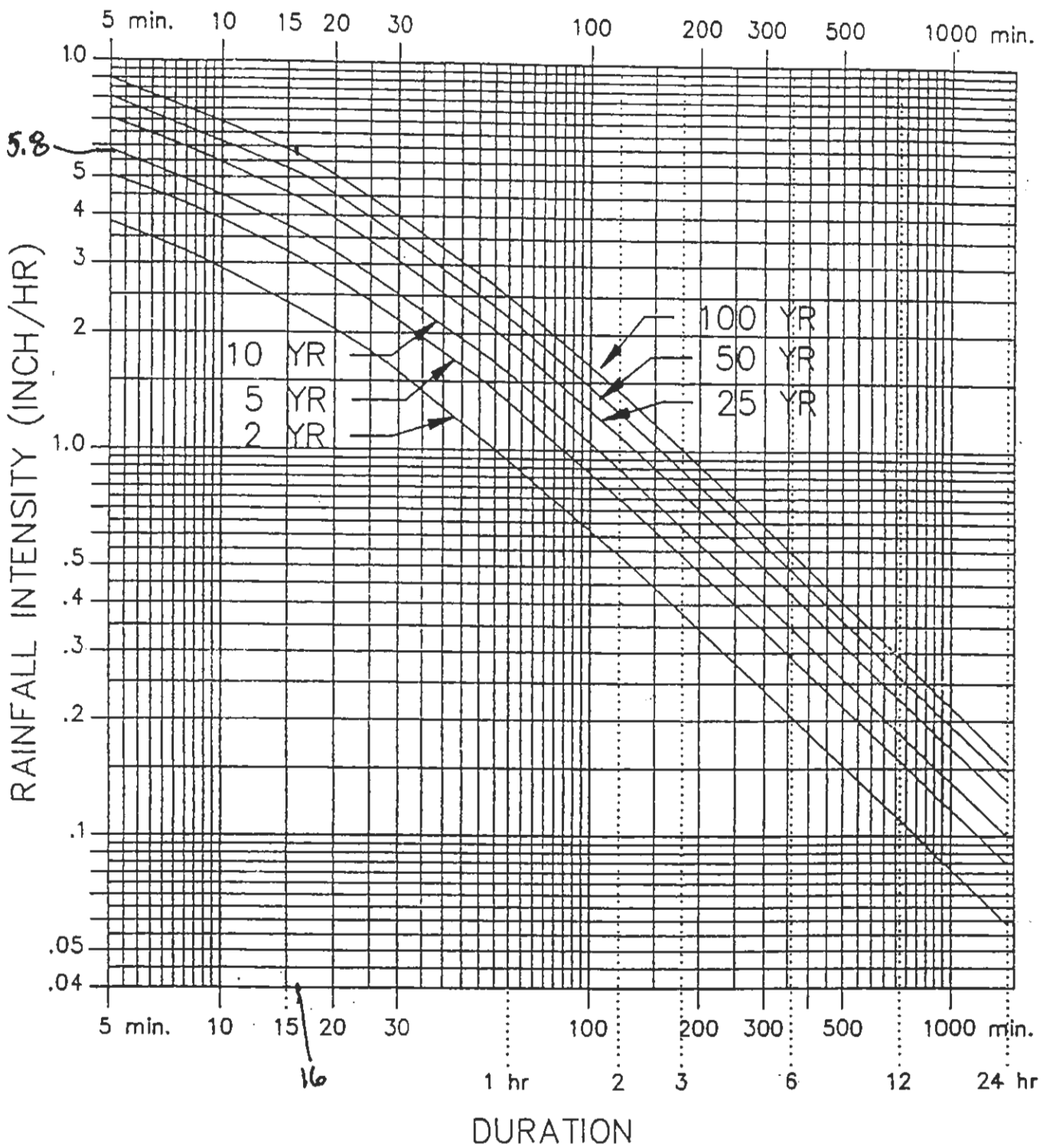


Figure 3.2
Rainfall Intensity-Duration-Frequency Relation
(Phoenix Metro Area)

Worksheet

Worksheet for Trapezoidal Channel

Project Description

Worksheet	CP-A
Flow Element	Trapezoidal Cha
Method	Manning's Form
Solve For	Channel Depth

Input Data

Mannings Coeffic	.035
Channel Slope	.014 ft/ft
Left Side Slope	2.00 H : V
Right Side Slope	3.00 H : V
Bottom Width	4.0 ft
Discharge	8 cfs

Results

Depth	0.54 ft
Flow Area	2.9 ft ²
Wetted Perim	6.9 ft
Top Width	6.7 ft
Critical Depth	0.45 ft
Critical Slope	0.026 ft/ft
Velocity	2.80 ft/s
Velocity Head	0.12 ft
Specific Energ	0.66 ft
Froude Numb	0.75
Flow Type	Subcritical

Worksheet

Worksheet for Trapezoidal Channel

Project Description

Worksheet	CP-C
Flow Element	Trapezoidal Cha
Method	Manning's Form
Solve For	Channel Depth

Input Data

Mannings Coeff	0.035
Channel Slope	0.019 ft/ft
Left Side Slope	3.00 H : V
Right Side Slope	5.00 H : V
Bottom Width	2.0 ft
Discharge	13 cfs

Results

Depth	0.75 ft
Flow Area	3.7 ft ²
Wetted Perim	8.2 ft
Top Width	8.0 ft
Critical Depth	0.71 ft
Critical Slope	0.024 ft/ft
Velocity	3.47 ft/s
Velocity Head	0.19 ft
Specific Energ	0.94 ft
Froude Numb	0.89
Flow Type	Subcritical

APPENDIX C

**CITY OF MESA
APPROVED**

Date 1/2/01 By DLH

**DRAINAGE REPORT
FOR
PINNACLE POINT AT LAS SENDAS
PARCEL 5/6**

Prepared For: **Sonoran Desert Holdings, L.L.C.**
c/o Bob Proehl
3651 East Baseline Road, Suite 108
Gilbert, Arizona 85234
(602) 892-4492

Submitted To: **City of Mesa**
55 North Center Street
P.O. Box 1466
Mesa, Arizona 85211-1466
(602) 644-2185

Prepared By: **Wood, Patel & Associates, Inc.**
932 West Southern
Suite 7
Mesa, Arizona 85210
(480) 834-3300



Revised August 1, 2000
May 31, 2000
WP #991040

Concentration Point	Watersheds	Area (ac)	Coefficient	Length of Area (ft)	Avg. Slope (%)	Average Velocity (fps)	Time of Concentration (min)	10-Year				100-Year				Channel Flowrate (cfs)
								Intensity (in/hr)	Q (cfs)	Captured (cfs)	Resultant (cfs)	Critical Slope (%)	Road Condition	St. Capacity (cfs)	Intensity (in/hr)	
A	1	2.70	0.70	639	4.71	4.3	12	4.10	8	0	8	6.70	12	0	12	
	2	1.02	0.70	286	2.75	3.4	11	4.25	3	0	3	2.75	5	0	5	
B	1 to 2	3.72	0.70	639	4.71	4.3	12	4.10	11	11	0	2.72	17	16	1	
	3	2.15	0.70	549	3.75	4.0	12	4.10	6	0	6	1.54	10	0	10	
	4	2.19	0.70	530	4.95	4.4	12	4.10	6	0	6	3.28	10	0	10	
	5	3.11	0.70	530	2.61	3.2	13	3.95	9	0	9	3.84	14	0	14	
C	3 to 5	7.45	0.70	1,078	3.18	3.6	15	3.75	20	0	20	3.84	31	0	31	
	6	0.40	0.70	258	3.00	3.4	11	4.25	1	0	1	na	2	0	2	
D	7	1.24	0.50	739	3.00	2.8	14	3.80	2	0	2	na	4	0	4	
	1 to 7	12.81	0.70	1,332	3.15	3.6	16	3.60	32	0	32	na	52	0	52	
	8	2.04	0.70	1,066	3.50	3.0	16	3.60	5	0	5	na	8	0	8	
	9	1.66	0.70	351	7.61	5.6	11	4.25	5	0	5	7.61	8	0	8	
E	10	2.25	0.70	627	4.12	4.1	13	3.95	6	0	6	2.93	10	0	10	
	11	0.89	0.70	440	4.75	3.4	12	4.10	3	0	3	na	4	0	4	
F	9 to 11	4.80	0.70	830	4.55	4.3	13	3.95	13	0	13	2.93	21	20	2	
	12	2.71	0.70	673	1.65	2.6	14	3.80	7	0	7	1.85	11	0	11	
G	13	0.73	0.70	501	3.50	3.0	13	3.95	2	0	2	na	3	0	3	
	14	0.77	0.50	501	3.00	2.8	13	3.95	2	0	2	na	2	0	2	
	9 to 14	9.01	0.70	1,282	4.27	4.2	15	3.75	24	0	24	na	38	0	38	
	15	2.29	0.70	529	3.07	3.5	13	3.95	6	0	6	3.07	10	0	10	
H	16	2.23	0.70	459	2.39	3.1	12	4.10	6	0	6	2.73	10	0	10	
	15 to 16	4.52	0.70	896	2.44	3.1	15	3.75	12	0	12	2.73	19	0	19	
I	17	0.63	0.70	334	3.00	2.8	12	4.10	2	0	2	na	3	0	3	
	18	0.69	0.70	374	3.00	2.8	12	4.10	2	0	2	na	3	0	3	
J	1 to 18	27.66	0.70	2,000	3.12	3.5	20	3.20	62	0	62	na	97	0	97	
	19	1.08	0.50	733	3.00	2.8	14	3.80	2	0	2	na	3	0	3	

- (A) 2% Crown Road with roll curb
- (B) 2% Crown Road with vertical curb
- (C) 2% Super Road with roll curb
- (D) 2% Super Road with vertical curb
- (NA) Not Applicable

CP E: 1.65% x 673 FT = 11 FT of drop in elevation

CP 19: 3% x 733 FT = 22 FT of drop in elevation

ON-SITE WEIGHTED "C" FACTOR

Site: Pinnacle Point - Parcels 5/6
 Location: Mesa, Arizona
 Description: Average Single Family Residential
 References: Drainage Design Manual for Maricopa County, Vol. I, Hydrology
 Table 3.2, C Coefficients for Use with the Rational Method
 Date: 4/22/00

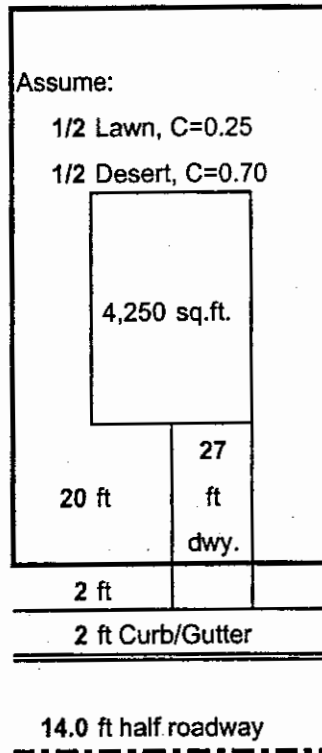
Known Values:

Average Lot Area: 10,625 sq.ft.
 Minimum Lot Width 85 ft
 Minimum Lot Depth 125 ft
 Maximum Lot Coverage 40 %

Weighted "C" Factor:

Description	Width (ft)	Length (ft)	Area (sf)	"C"	"C" x A
Asphalt	14.0	85	1,190	0.90	1,071
Curb/Gutter	2	85	170	0.95	162
Driveway	22	27	594	0.95	564
Landscape	2	58	116	0.70	81
House			4,250	0.90	3,825
Landscape			5,835	0.48	2,772
Totals			12,155		8,475

Weighted "C" Factor = 0.70



Section E-E

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION

May 31, 2000

PROGRAM INPUT DATA

DESCRIPTION	VALUE
Flow Rate (cfs).....	38.0
Channel Bottom Slope (ft/ft).....	0.022
Manning's Roughness Coefficient (n-value).....	0.035
Channel Left Side Slope (horizontal/vertical).....	3.0
Channel Right Side Slope (horizontal/vertical).....	3.0
Channel Bottom Width (ft).....	5.0

COMPUTATION RESULTS

DESCRIPTION	VALUE
Normal Depth (ft).....	0.97
Flow Velocity (fps).....	4.92
Froude Number.....	1.029
Velocity Head (ft).....	0.38
Energy Head (ft).....	1.35
Cross-Sectional Area of Flow (sq ft).....	7.72
Top Width of Flow (ft).....	10.84

HYDROCALC Hydraulics for Windows, Version 1.2a Copyright (c) 1996
 Dodson & Associates, Inc., 5629 FM 1960 West, Suite 314, Houston, TX 77069
 Phone: (281)440-3787, Fax: (281)440-4742, Email: software@dodson-hydro.com
 All Rights Reserved.

