

HTE #07-2047

March 14, 2008

Mr. Kevin R. Attebery
City of Goodyear
Community Development
195 N. 145th Avenue, Bldg D
Goodyear, AZ 85338

APPROVED

DATE 3/17/08 BY K.R. Attebery
CITY OF GOODYEAR ENGINEERING

Re: Canyon Trails Towne Center – Revision #1
Drainage Memorandum/Addendum
Optimus File No. 031039
HTE# - 07-2047

Dear Kevin:

The attached calculations are being submitted as a Drainage Addendum to the approved Canyon Trails Towne Center development to support the proposed revision noted as Delta 1 on the Offsite Paving Plans. More specifically, the project site is located within the west half of Section 12, Township 1 North, Range 2 West, of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

Thank you for your review of this analysis to warrant your approval of the revision Delta 1 of the Offsite Paving Plans.

Sincerely,
Optimus Civil Design Group


Adam J. Rauscher, PE



Canyon Trails Blvd Offsite Earthen Channel

Worksheet for Triangular Channel

Project Description

Worksheet	Canyon Trails Blvd 100
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Mannings Coeffic	0.030
Slope	002000 ft/ft
Left Side Slope	4.00 H : V
Right Side Slope	4.00 H : V
Discharge	60.00 cfs

Results

Depth	2.46 ft
Flow Area	24.1 ft ²
Wetted Perim	20.24 ft
Top Width	19.64 ft
Critical Depth	1.69 ft
Critical Slope	0.014430 ft/ft
Velocity	2.49 ft/s
Velocity Head	0.10 ft
Specific Energ	2.55 ft
Froude Numb	0.40
Flow Type	Subcritical

36" Storm Drain - Canyon Trails Boulevard 100-Year Storm Worksheet for Pressure Pipe

Project Description	
Worksheet	Canyon Trail 100-year Stor
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Discharge

Input Data	
Pressure at	0.00 psi
Pressure at	0.00 psi
Elevation at	80.77 ft
Elevation at	74.50 ft
Length	59.00 ft
C Coefficient	150.0
Diameter	36 in

Results	
Discharge	156.30 cfs
Headloss	6.27 ft
Energy Grade at	88.37 ft
Energy Grade at	82.10 ft
Hydraulic Grade	80.77 ft
Hydraulic Grade	74.50 ft
Flow Area	7.1 ft ²
Wetted Perimeter	9.42 ft
Velocity	22.11 ft/s
Velocity Head	7.60 ft
Friction Slope	0.24208 ft/ft

← $Q_{100 \text{ ACTUAL}} = 122.3 \text{ cfs.}$

113 cfs from upstream parcel
9.3 cfs from 1/2 street Canyon Trails Blvd

$$Q_{100} = C I A$$

$$A = 1.09 \text{ ac}$$

$$Q_{100} = 0.95 \times 9.0\% \text{ yr} \times 1.09 = 9.3 \text{ cfs.}$$

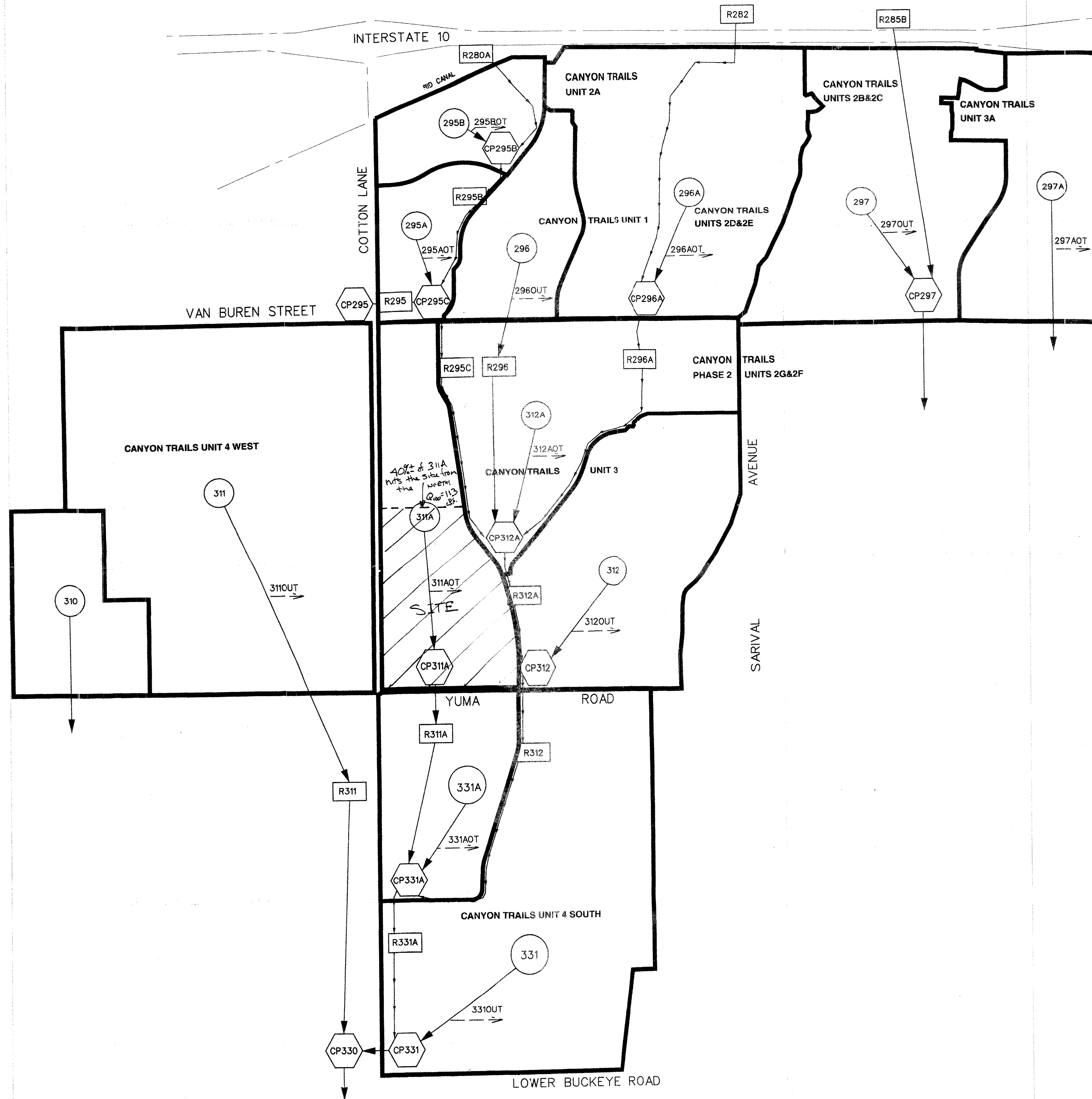
* This assumes the same T_c , which is conservative.

LOOP 303 CORRIDOR WHITE TANKS ADMP UPDATED BY CVL (100-YR, 24-HOUR STORM)

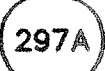
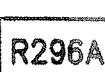
HYDROGRAPH AT	312A	257.	12.33	39.	12.	6.	0.33
DIVERSION TO	296AOT	257.	12.33	39.	12.	6.	0.33
HYDROGRAPH AT	312ART	0.	0.08	0.	0.	0.	0.33
4 COMBINED AT	CP312A	1057.	18.50	750.	258.	124.	109.87
ROUTED TO	R312A	1056.	18.50	749.	258.	124.	109.87
HYDROGRAPH AT	312	232.	12.33	32.	10.	5.	0.36
DIVERSION TO	312OUT	232.	12.33	32.	9.	4.	0.36
HYDROGRAPH AT	312RET	1.	17.00	1.	0.	0.	0.36
2 COMBINED AT	CP312	1056.	18.50	749.	258.	124.	110.23
ROUTED TO	R312	1055.	18.67	749.	258.	124.	110.23
→ HYDROGRAPH AT	311A	283.	12.17	35.	11.	5.	0.26
DIVERSION TO	311AOT	283.	12.17	35.	11.	5.	0.26
HYDROGRAPH AT	311ART	3.	20.50	2.	1.	0.	0.26
ROUTED TO	R311A	3.	21.67	2.	1.	0.	0.26
HYDROGRAPH AT	331A	208.	12.25	31.	10.	5.	0.19
DIVERSION TO	331AOT	208.	12.25	29.	8.	4.	0.19
HYDROGRAPH AT	331ART	11.	13.17	4.	2.	1.	0.19
3 COMBINED AT	CP331A	1055.	18.67	749.	258.	124.	110.67
ROUTED TO	R331A	1054.	18.75	748.	258.	124.	110.67
HYDROGRAPH AT	331	367.	12.42	70.	22.	11.	0.55
DIVERSION TO	331OUT	367.	12.42	49.	14.	7.	0.55
HYDROGRAPH AT	331RET	212.	12.83	28.	8.	4.	0.55
2 COMBINED AT	CP331	1059.	18.75	753.	262.	126.	111.23
HYDROGRAPH AT	311	703.	12.25	111.	36.	17.	0.77
DIVERSION TO	311OUT	703.	12.25	91.	25.	12.	0.77
HYDROGRAPH AT	311RET	197.	12.83	35.	11.	5.	0.77
ROUTED TO	R311	125.	13.25	34.	11.	5.	0.77
HYDROGRAPH AT	330	484.	12.67	80.	22.	10.	0.59
DIVERSION TO	330RET	460.	12.58	41.	11.	5.	0.59
HYDROGRAPH AT	330OUT	460.	12.75	42.	11.	5.	0.59
2 COMBINED AT	11330	352.	12.83	52.	16.	8.	38.03
2 COMBINED AT	CP330	1059.	18.75	756.	271.	130.	149.26
ROUTED TO	R330	1008.	19.25	727.	262.	126.	149.26
HYDROGRAPH AT	346A	102.	13.00	21.	5.	3.	0.16
2 COMBINED AT	CP346A	1176.	19.00	843.	308.	148.	48.75
DIVERSION TO	DI346C	1090.	19.00	801.	297.	143.	48.75
HYDROGRAPH AT	D346A	86.	19.00	42.	10.	5.	48.75
ROUTED TO	R346A	84.	20.17	42.	10.	5.	48.75

← 40% of 311A affects
Canyon Trails Towne
Center.
= .40 x 283
= 113 cfs

Jun. 18, 2004
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KEY TO SYMBOLS

-  SUB-BASIN ID
-  CONCENTRATION POINT
-  ROUTE ID
-  SUB-BASIN BOUNDARY
-  CHANNEL (GREENBELT) FLOWLINE
-  RETENTION DIVERSION



800' 400' 0 800'
SCALE: 1" = 800'

CANYON TRAILS

HEC-1 ROUTING MAP

JOB NO

020026

PLATE 2

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

COE & VAN LOO
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