Initial Drainage Report
Valencia Road

Alvernon Way to Wilmot Road

Prepared for:
Pima County Department of Transportation
201 North Stone Avenue, 4th Floor
Tucson, AZ 58701

April 29, 2011

Prepared by:
PSOMAS
800 E. Wetmore Road, Suite 110
Tucson, AZ 85719
Project No. 7PIM090302

TABLE OF CONTENTS

1.0 Introduction 4
1.1 Project Description 4
1.2 Major Drainage Features 6
1.2.1 Storm Drain Locations 6
1.2.2 Culvert Locations 6
1.2.3 Channel/Wash Locations 6
1.3 Proposed Improvements 7
1.4 Design Criteria 7
2.0 Existing Conditions 8
2.1 Overview 8
2.2 Existing Conditions Hydrology 11
2.3 Existing Conditions Hydraulics 22
2.3.1 Culverts 22
2.1.1 Channels 22
2.1.2 Stormdrain 23
3.0 Proposed Cross Drainage Improvements 24
3.1 Offsite Drainage Approach 24
3.2 Proposed Conditions Hydrology 24
3.3 Proposed Conditions Hydraulics 35
3.3.1 Culverts 35
3.3.2 Channels 35
3.3.3 Stormdrain 35
3.3.4 Outlet Protection 35
3.4 Right-of-Way Requirements 36
3.5 Permitting Requirements 36
4.0 Storm Drain Inlet Design 37
5.0 Storm Drain Design 37
6.0 Summary and Conclusions 37
7.0 Reference Section Style Guideline 38

TABLES

Table 1 Existing Conditions Hydrologic Analysis Summary (1 of 3)..... 12
Table 2 Existing Conditions Hydrologic Analysis Summary (2 of 3)..... 13
Table 3 Existing Conditions Hydrologic Analysis Summary (3 of 3)..... 14
Table 4 Existing Conditions Culvert Analysis Summary..... 22
Table 5 Existing Conditions Channel Analysis Summary..... 23
Table 6 Proposed Conditions Hydrologic Analysis Summary (1 of 3) 25
Table 7 Proposed Conditions Hydrologic Analysis Summary (2 of 3) 26
Table 8 Proposed Conditions Hydrologic Analysis Summary (3 of 3) 27

FIGURES

Figure 1 Location Map..... 5
Figure 2 FEMA FIRM Panel 10
Figure 3 Existing Conditions Watershed Maps 15
Figure 4 Proposed Conditions Watershed Maps..... 28

APPENDICES

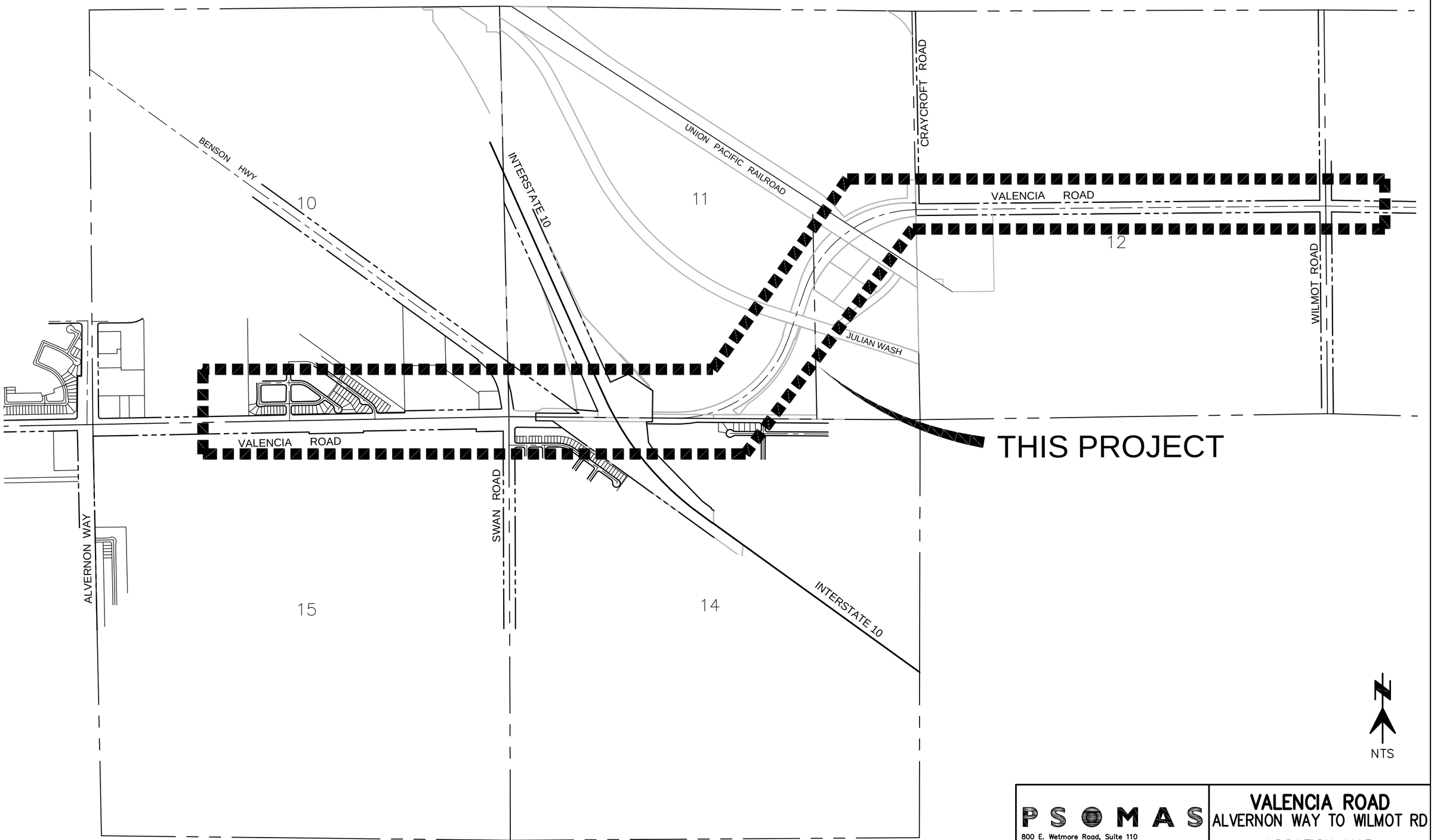
Appendix 1 Hydrologic Analyses
Appendix 2 Culvert Analyses
Appendix 3 Stormdrain Analyses

1.0 Introduction

1.1 Project Description

The proposed project will widen Valencia Road from approximately 1500 feet east of its intersection with Alvernon Way, west to the intersection of Wilmot Road. In general, the widening will be accomplished by adding an outside lane in each direction of travel. Most of the existing median will remain as is. In addition to the widening, there will be new turn lanes, modification to turn lanes, bus pullouts and other improvements at intersections and driveways. Modifications to the existing stormdrain systems and culverts are necessary due to the roadway improvements.

This project, and its associated improvements, are located within Sections 10, 11, 12, 13, 14 and 15 of Township 15 South, Range 14 East and within Sections 7 and 18 of Township 15 South, Range 15 East. Portions of the project are located within the City of Tucson and Unincorporated Pima County. Figure 1, Location Map, displays the approximate project limits.



PSOMAS
800 E. Wetmore Road, Suite 110
Tucson, AZ 85719
(520) 292-2300 (520) 292-1290 fax
www.psomas.com

VALENCIA ROAD
ALVERNON WAY TO WILMOT RD
LOCATION MAP
FIGURE 1

1.2 Major Drainage Features

Within the project limits there are multiple storm drain systems, two minor cross culverts, driveway culverts, roadside channels, and the Julian Wash crossing.

1.2.1 Storm Drain Locations

Between Alvernon Way and Interstate 10, there are numerous catch basins located along the north and south sides of the roadway which collect the pavement runoff. These catch basins discharge into an unnamed channel along the south side of the road that flows west to a regional detention basin. Between Interstate 10 and the Union Pacific Railroad crossing to the east, there are two short storm drain systems. Immediately east of the interstate, the first system collects pavement runoff and discharges adjacent to the northbound Interstate 10 onramp. The next stormdrain system to the east discharges into the Julian Wash cross culvert and is conveyed to the north. Between the Union Pacific Railroad and Wilmot Road, there is a single stormdrain system collecting pavement runoff and offsite runoff from the south. This system outlets south of Valencia Road at the Craycroft Road intersection, where the runoff is conveyed west, under the railroad tracks and eventually discharges into the Julian Wash. This project ends at the intersection of Valencia Road and Wilmot Road, however, the upstream end of this existing stormdrain system is to the east at the intersection of Valencia Road and Kolb Road.

1.2.2 Culvert Locations

Within the project vicinity, there are numerous culvert crossings which convey offsite flows adjacent to and under Valencia Road. A culvert crossing consisting of 4-24” RCPs is located immediately east of Swan Road that conveys flow from the north side of the road to the south, where it is then conveyed west through a culvert crossing under Swan Road and into the unnamed channel which conveys flow to a regional detention facility located offsite. A second culvert crossing is located under the Interstate 10 southbound offramp and conveys runoff west towards the 4-24” RCP culverts. Just east of the Interstate 10 northbound onramp, there is a cross culvert that conveys offsite runoff from the south under Valencia road to the north. Five 10’ x 9’ CBCs convey the Julian Wash flow north, under Valencia Road. A 36” RCP culvert with a drop inlet at the toe of the east abutment to the Union Pacific Railroad (UPRR) bridge conveys flow north. Under the railroad tracks, there are 6-10’x4’ CBCs that convey discharge from the stormdrain mainline and Pima Air Museum Wash towards the Julian Wash to the west.

1.2.3 Channel/Wash Locations

With the exception of the Julian Wash crossing under Valencia Road, all channels within the project limits convey flow parallel to the roadway. Between Alvernon Way and Interstate 10, an unnamed channel along the south side of Valencia Road conveys offsite and roadway runoff west towards a regional detention facility. A ditch conveys offsite runoff from the north between Swan Road and Interstate 10 to a culvert crossing which

directs flow to the south side of the roadway. East of Interstate 10, a channel is located along the south side of the roadway that conveys subdivision and offsite runoff east towards the Julian Wash. A second channel, originating at the outlet of the stormdrain mainline at Craycroft Road, also conveys flow towards the Julian Wash.

1.3 Proposed Improvements

The proposed improvements to the drainage structures throughout the project include culvert extensions, new culverts, culvert replacements, stormdrain lateral extensions, stormdrain mainline upsizing, construction of new catch basins and area inlets, and may include channel or ditch modifications.

1.4 Design Criteria

Section 2.10 of the Pima County Roadway Design Manual provides drainage design criteria to be incorporated in the roadway design. For this project, the criteria used to ensure the safe and efficient conveyance of flow throughout the project is as follows:

1) **Cross Drainage** – The capacity of cross drainage structures must at a minimum convey the 50-year storm event peak discharge under the roadway, though conveyance of the 100-year storm event peak discharge is preferable. If it is not possible to convey the 100-year peak discharge under the roadway, there must be less than one foot in depth of flow over the roadway and no breakout into adjacent watersheds.
2) **Stormdrain** – The stormdrain shall have capacity to convey the peak discharge during the 10-year storm event. The hydraulic grade line shall be one foot below the gutter or one foot below the inlet lip of the catch basin unless approved by Pima County.
3) **Pavement Spread** – For a six lane roadway, a 20 foot pavement section must be kept free of flow during the 10-year storm event. During the 100-year storm event, the depth of flow within the roadway must be less than one foot.
4) **Inlets** – Stormdrain inlets shall be located such that pavement spread criteria is met and inlets shall be provided to prevent side street flow from crossing travel lanes. Grate inlets both on grade and in a sump shall have a factor of safety of 2.0 applied to the minimum size required for conveyance. Curb inlets shall have a factor of safety of 1.25 applied the minimum length required for conveyance in a sump and on grade. The factors of safety are applied to account for potential clogging issues.

2.0 Existing Conditions

2.1 Overview

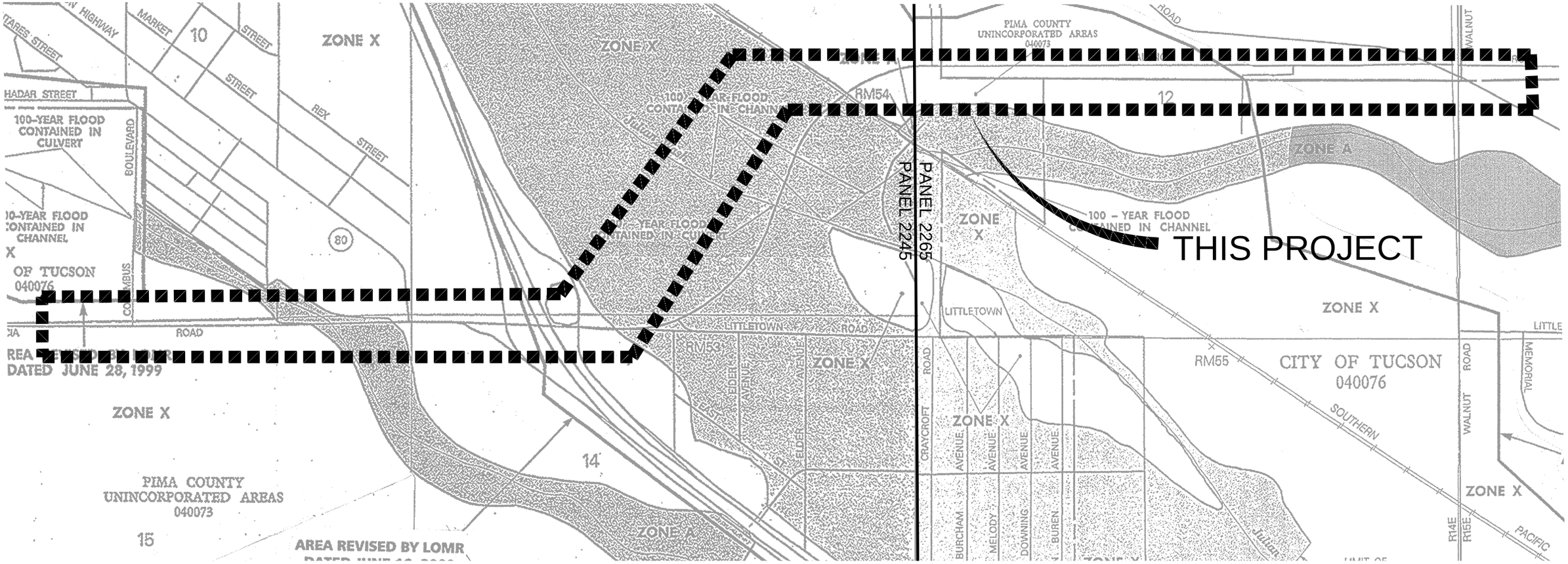
In general, offsite runoff originates to the southeast and is conveyed via channels or shallow sheet flow to the northwest. The vast majority of offsite flow is conveyed to the Julian Wash, which crosses Valencia Road between Littletown Road and Craycroft Road, or is collect and conveyed by the unnamed channel to the regional detention basin located west of the project limits. The remaining watersheds contributing to drainage crossings under Valencia Road are relatively small. All other runoff impacting this project is generated within the roadway and is conveyed though various stormdrain systems.

Offsite watersheds contributing runoff to the unnamed channel and the Julian Wash have discharges associated with TSMS and FEMA, respectively, thus no watersheds were delineated. Land use for these watersheds and other watersheds adjacent to the project consist of undeveloped, commercial, residential and industrial land. The smaller offsite watersheds contributing runoff to the culverts crossings and stormdrain consist of undeveloped and commercial land. Soil types for the delineated watersheds are primarily 100% Hydrologic Group D. Within the project limits, there are patches of soils that are classified as Hydrologic Soil Groups B and C. Vegetative soil cover for the undeveloped areas was estimated at 25% from recent aerial photography.

The project spans two effective FEMA FIRM Panels (04019C2245K and 04019C2265K). According to the Pima County Regional Flood Control District, these will be replaced June 16, 2011 with the new "L" Series FIRM Panels (04019C2295L and 04019C2315L). The new FIRM Panels cover essentially the same area and have essentially no changes to floodplain limits within the project boundaries. Figure 2, FEMA FIRM Panel displays the approximate project boundary over the currently effective FIRM Panel. Two FEMA floodplains cross the roadway within the project limits. Immediately west of the intersection of Valencia Road and Swan Road, the Earp Wash is mapped as a Zone A that crosses the roadway, flowing from the south to the north. Zone A is described on the Effective FIRM Panel legend as being an area where no base flood elevations have been determined. Between Interstate 10 and the UPRR tracks is a Zone X-shaded area containing the Julian Wash. The Julian Wash is called out on the effective FIRM Panel as have the base flood (100-year) contained within the channel. Zone X Shaded is described as an area of 500-year flood; or area of 100-year flooding with average depths less than one foot; or with drainage areas less than one square mile; or areas protected by levees from the 100-year flood.

Review of the PAG Topography indicates that between the Earp Wash outlet from the subdivision at the southeast corner of the Valencia Road and Swan Road intersection and Valencia Road, flow within the Earp Wash would actually be conveyed to the west, and not cross over the roadway itself. Runoff which does flow to the north would be collected by the unnamed wash paralleling the roadway and discharge into a regional detention basin. Since the Julian wash is called out as containing the 100-year floodplain, the Zone-X shaded floodplain is either flow with average depths of less than 1 foot or is the 500-

year floodplain limits. Figure 2, FEMA Firm Panel shows the project boundary overlaid on the effective FIRM panels. This figure will be updated in subsequent submittals after the new panels become effective.



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction ; no base flood elevations determined.

ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X Areas determined to be outside 500-year floodplain.

ZONE D Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

Identified 1983 | Identified 1990 | Otherwise Protected Areas

Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet. See Map Index for Elevation Datum.

D — D — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone. See Map Index for Elevation Datum.

RM7 × — Elevation Reference Mark

• M2 — River Mile

National Coordinates Based on North

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

PIMA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 2265 OF 4700
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
TUCSON, CITY OF	040076	2265	K
PIMA COUNTY, UNINCORPORATED AREAS	040073	2265	K

MAP NUMBER
04019C2265 K

EFFECTIVE DATE:
FEBRUARY 8, 1999

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

PIMA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 2245 OF 4700
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
TUCSON, CITY OF	040076	2245	K
PIMA COUNTY, UNINCORPORATED AREAS	040073	2245	K

MAP NUMBER
04019C2245 K

MAP REVISED:
FEBRUARY 8, 1999

Federal Emergency Management Agency

1000 0 500 1000 1500 2000

PSOMAS
800 E. Wetmore Road, Suite 110
Tucson, AZ 85719
(520) 292-2300 (520) 292-1290 fax
www.psomas.com

VALENCIA ROAD
ALVERNON WAY TO WILMOT RD
FEMA FIRM PANELS
FIGURE 2

2.2 Existing Conditions Hydrology

The existing conditions hydrologic analysis was performed using the methodologies outlined in the Hydrology Manual for Engineering Design in Pima County for all onsite watersheds and several of the offsite watersheds. Offsite watersheds for the Julian Wash and unnamed wash were not delineated; their discharges were obtained from FEMA and the TSMS. Due to the nature of the offsite flow for watersheds located outside of the project limits, between Wilmot Road and Kolb Road, peak discharges were calculated using the NOAA Atlas rainfall data in the computer program Flo-2D. Results of this analysis show that the time of concentration at the grate inlet is significantly greater and not coincident with the roadway runoff and are not included in the stormdrain analysis. The computer program PC Hydro, Version 5.4.2, developed by Arroyo Engineering, L.L.C, and distributed by the Pima County Regional Flood Control District was used to input watershed characteristics and calculate peak discharges for various design storms for the remainder of the watersheds. Input variables necessary to calculate the peak discharges include watershed area, length of the longest watercourse, length to the center of gravity, change in elevation, basin factor, rainfall data, soil type, vegetative cover type and impervious cover.

A combination of project topography and PAG topography was used to delineate the watersheds, calculate the areas, lengths and change in elevations. Recent aerial photography was used to estimate percent imperviousness and vegetative cover and type. NOAA Atlas 14 values were obtained online using coordinates within the project limits. The Upper Bound of the 90 Percentile rainfall values were used. Soils information was obtained online from the NRCS Soil Data Mart for soils within Eastern Pima County, Arizona. Tables 1-3 summarize the characteristics of each watershed. Calculation sheets are provided in Appendix 1. Watershed delineations and important drainage features are displayed on Figure 3, Existing Conditions Watershed Map.

Table 1
Existing Conditions Hydrologic Analysis Summary (1 of 3)

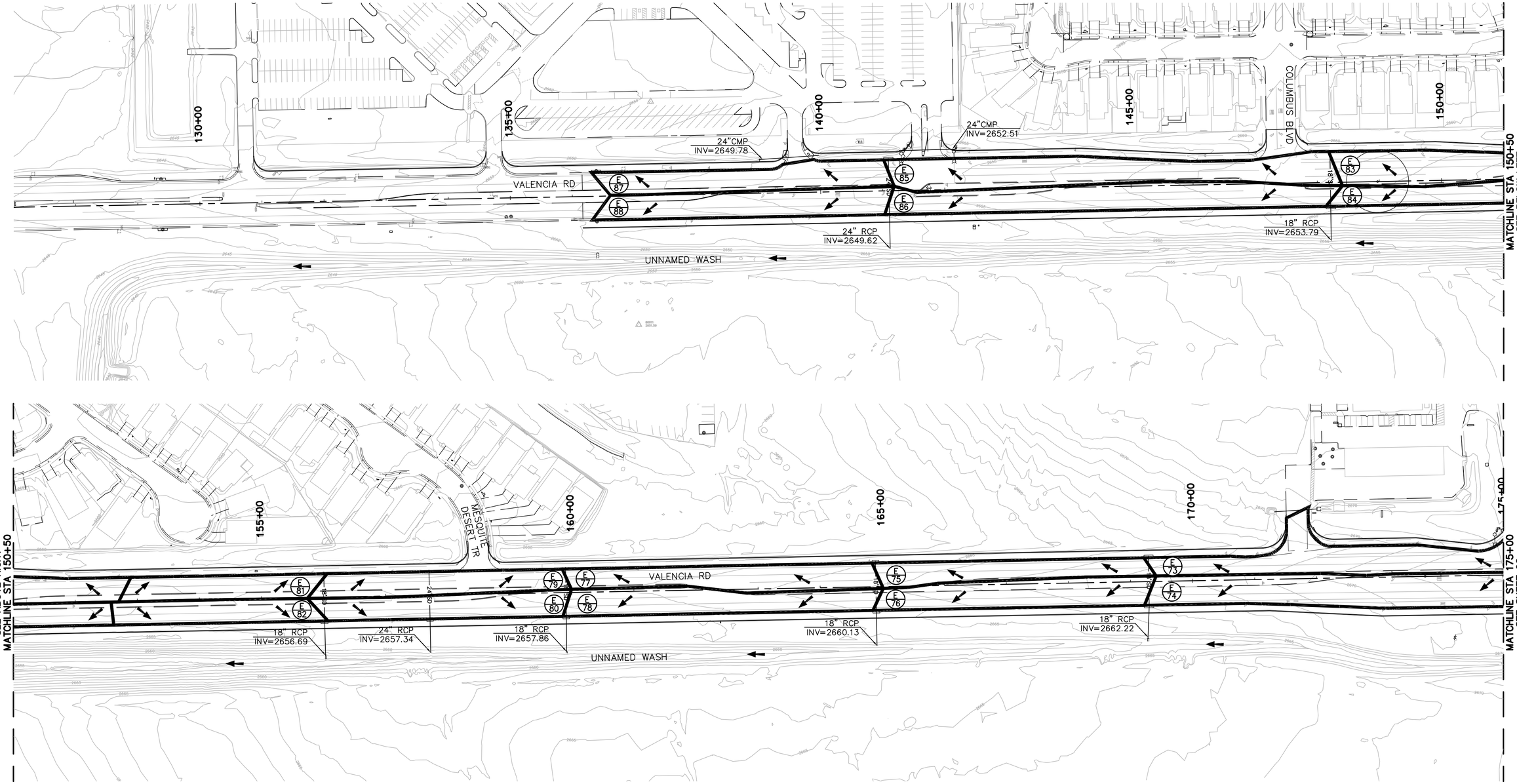
WS	Area (AC)	Length (FT)	ΔH (FT)	Soil			Impervious %	N_b	Q_{10} (cfs)	Q_{100} (cfs)
				%B	%C	%D				
E1	0.46	392	5.0	0	100	0	95	0.018	2.3	4.7
E2	0.47	544	5.0	0	100	0	95	0.018	2.4	4.8
E3	0.49	479	3.0	0	100	0	95	0.018	2.5	5.0
E4	0.38	497	3.0	0	100	0	95	0.018	1.9	3.9
E5	0.43	446	3.0	0	100	0	95	0.018	2.2	4.4
E6	0.43	490	5.0	0	100	0	95	0.018	2.2	4.4
E7	0.36	411	4.0	0	100	0	95	0.018	1.8	3.7
E8	0.40	400	3.0	0	100	0	95	0.018	2.0	4.1
E9	0.39	490	3.0	0	100	0	95	0.018	2.0	4.0
E10	0.21	221	2.0	0	100	0	95	0.018	1.1	2.1
E11	0.48	496	3.5	65	35	0	95	0.018	2.4	4.9
E12	0.45	540	4.5	90	10	0	95	0.018	2.3	4.6
E13	0.71	479	4.0	100	0	0	95	0.018	3.6	7.2
E14	0.53	527	4.0	100	0	0	95	0.018	2.7	5.4
E15	0.41	481	4.0	100	0	0	95	0.018	2.1	4.1
E16	0.50	565	5.0	100	0	0	95	0.018	2.5	5.1
E17	0.47	526	4.0	100	0	0	95	0.018	2.4	4.8
E18	0.59	214	3.5	100	0	0	95	0.018	3.0	6.0
E19	0.31	357	1.5	100	0	0	95	0.018	1.6	3.1
E20	0.44	557	2.5	100	0	0	95	0.018	2.2	4.4
E21	0.54	487	2.0	100	0	0	95	0.018	2.7	5.5
E22	0.30	443	3.0	100	0	0	95	0.018	1.5	3.0
E23	0.34	313	2.0	100	0	0	95	0.018	1.7	3.4
E24	0.10	204	2.0	100	0	0	95	0.018	0.5	1.0
E25	0.07	202	2.0	100	0	0	95	0.018	0.5	0.7
E26	0.59	551	4.0	100	0	0	95	0.018	3.0	6.0
E27	0.56	572	4.0	100	0	0	95	0.018	2.8	5.7
E28	0.34	468	4.0	100	0	0	95	0.018	1.7	3.4
E29	0.53	501	4.0	100	0	0	95	0.018	2.7	5.4
E30	0.55	577	4.0	50	50	0	95	0.018	2.8	5.6
E31	0.44	571	4.0	50	50	0	95	0.018	2.2	4.5
E32	0.31	325	2.5	90	10	0	95	0.018	1.6	3.1
E33	0.67	323	3.0	90	10	0	95	0.018	3.4	6.8
E34	0.72	339	1.5	90	10	0	95	0.018	3.6	7.3
E35	0.48	484	5.0	0	100	0	95	0.018	2.4	4.9

Table 2
Existing Conditions Hydrologic Analysis Summary (2 of 3)

WS	Area (AC)	Length (FT)	ΔH (FT)	Soil			Impervious %	N_b	Q_{10} (cfs)	Q_{100} (cfs)
				%B	%C	%D				
E36	0.38	475	5.0	0	100	0	95	0.018	1.9	3.9
E37	0.46	513	7.0	0	100	0	95	0.018	2.3	4.7
E38	0.41	482	7.0	0	100	0	95	0.018	2.1	4.2
E39	0.56	523	3.0	100	0	0	95	0.018	2.8	5.7
E40	0.34	516	3.0	100	0	0	95	0.018	1.7	3.4
E41	0.37	383	2.0	100	0	0	95	0.018	1.9	3.7
E42	0.26	366	2.0	100	0	0	95	0.018	1.3	2.6
E43	0.33	361	1.5	100	0	0	95	0.018	1.7	3.3
E44	0.29	363	1.5	100	0	0	95	0.018	1.5	2.9
E45	0.69	414	5.0	100	0	0	95	0.018	3.5	7.0
E46	0.74	360	4.0	100	0	0	95	0.018	3.7	7.5
E46A	0.18	200	6.0	100	0	0	95	0.018	0.9	1.8
E47	0.39	403	9.0	100	0	0	95	0.018	2.0	3.9
E48	0.20	273	5.0	100	0	0	95	0.018	1.0	2.0
E49	0.17	252	2.5	75	25	0	95	0.018	0.9	1.7
E50	0.31	281	2.5	75	25	0	95	0.018	1.6	3.1
E51	0.11	290	1.5	100	0	0	95	0.018	0.6	1.1
E52	0.12	311	1.5	100	0	0	95	0.018	0.6	1.2
E53	0.56	499	7.3	0	0	100	95	0.018	2.8	5.7
E54	0.34	501	7.0	0	0	100	95	0.018	1.7	3.5
E55	0.53	593	16.0	0	0	100	95	0.018	2.7	5.3
E56	0.59	598	16.5	0	0	100	95	0.018	3.0	6.0
E57	0.82	602	10.0	0	0	100	95	0.018	4.2	8.4
E58	1.15	592	10.5	0	0	100	95	0.018	5.9	12.0
E59	0.24	360	1.5	0	0	100	95	0.018	1.2	2.5
E60	0.39	349	1.5	0	0	100	95	0.018	1.9	3.9
E61	0.32	399	2.5	0	0	100	95	0.018	1.6	3.3
E62	0.48	398	2.5	0	0	100	95	0.018	1.6	3.3
E63	0.41	378	2.5	0	75	100	25	0.018	2.0	4.1
E64	0.25	378	2.0	0	75	100	25	0.018	1.3	2.5
E65	0.68	630	7.5	0	75	100	25	0.018	3.4	6.9
E66	0.61	625	8.0	0	75	100	25	0.018	3.0	6.1
E67	0.46	407	2.5	0	0	100	95	0.018	2.4	4.7
E68	0.31	414	2.5	0	0	100	95	0.018	1.5	3.1
E69	0.72	387	5.5	0	0	100	95	0.018	3.7	7.4
E70	0.65	689	5.5	0	0	100	95	0.018	3.3	6.6

Table 3
Existing Conditions Hydrologic Analysis Summary (3 of 3)

WS	Area (AC)	Length (FT)	ΔH (FT)	Soil			Impervious %	N_b	Q_{10} (cfs)	Q_{100} (cfs)
				%B	%C	%D				
E71	0.38	346	3.5	0	0	100	95	0.018	1.9	3.9
E72	0.33	348	3.0	0	0	100	95	0.018	1.6	6.7
E73	0.91	459	6.5	0	0	100	95	0.018	4.7	9.3
E74	0.95	749	6.5	0	0	100	95	0.018	4.8	9.6
E75	0.33	435	3.0	0	0	100	95	0.018	1.7	3.4
E76	0.44	443	3.0	0	0	100	95	0.018	2.2	4.4
E77	0.43	491	2.5	0	0	100	95	0.018	2.2	4.4
E78	0.44	500	2.5	0	0	100	95	0.018	2.2	4.5
E79	0.34	224	2.0	0	0	100	95	0.018	1.5	4.5
E80	0.36	225	2.0	0	0	100	95	0.018	1.8	3.0
E81	0.28	321	2.0	0	0	100	95	0.018	1.4	3.5
E82	0.28	330	1.5	0	0	100	95	0.018	1.4	2.9
E83	0.50	443	3.5	0	0	100	95	0.018	2.6	2.9
E84	0.33	430	3.5	0	0	100	95	0.018	1.7	5.1
E85	0.73	715	6.0	0	0	100	95	0.018	3.7	3.4
E86	0.73	718	6.0	0	0	100	95	0.018	3.3	7.5
E87	0.41	482	4.0	0	0	100	95	0.018	2.1	4.2
E88	0.45	486	4.0	0	0	100	95	0.018	2.1	4.2
OE1	5.21	724	8.0	0	100	0	0	0.06	10.0	29.0
OE2	2.93	870	10.0	0	100	0	0	0.06	5.5	16.0
OE3	10.01	1514	17.0	0	100	0	0	0.06	16.0	44.0
OE4	0.60	602	6.0	0	100	0	0	0.035	1.5	4.4
OE5	0.44	374	3.0	100	0	0	0	0.035	0.9	2.6
OE6	0.59	439	4.0	100	0	0	0	0.035	1.2	3.5
OE7	0.63	512	5.0	100	0	0	0	0.035	1.3	3.7
OE8	33.24	3019	31.0	80	20	0	0	0.06	30.0	85.0
OE9	6.74	959	8.0	100	0	0	10	0.035	12.0	33.0
OE10	3.10	694	7.0	100	0	0	0	0.035	6.2	18.0
OE11	0.73	336	5.0	0	100	0	0	0.035	1.9	5.3
OE12	6.62	809	10.0	50	0	50	0	0.035	16.0	46.0
OE13	10.23	1829	24.0	25	0	75	0	0.035	21.0	61.0



Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES:	HORIZ.	SHEET 01 OF 07
	VERT.	

PRISCILLA S. CORNELIO, P.E., DIRECTOR

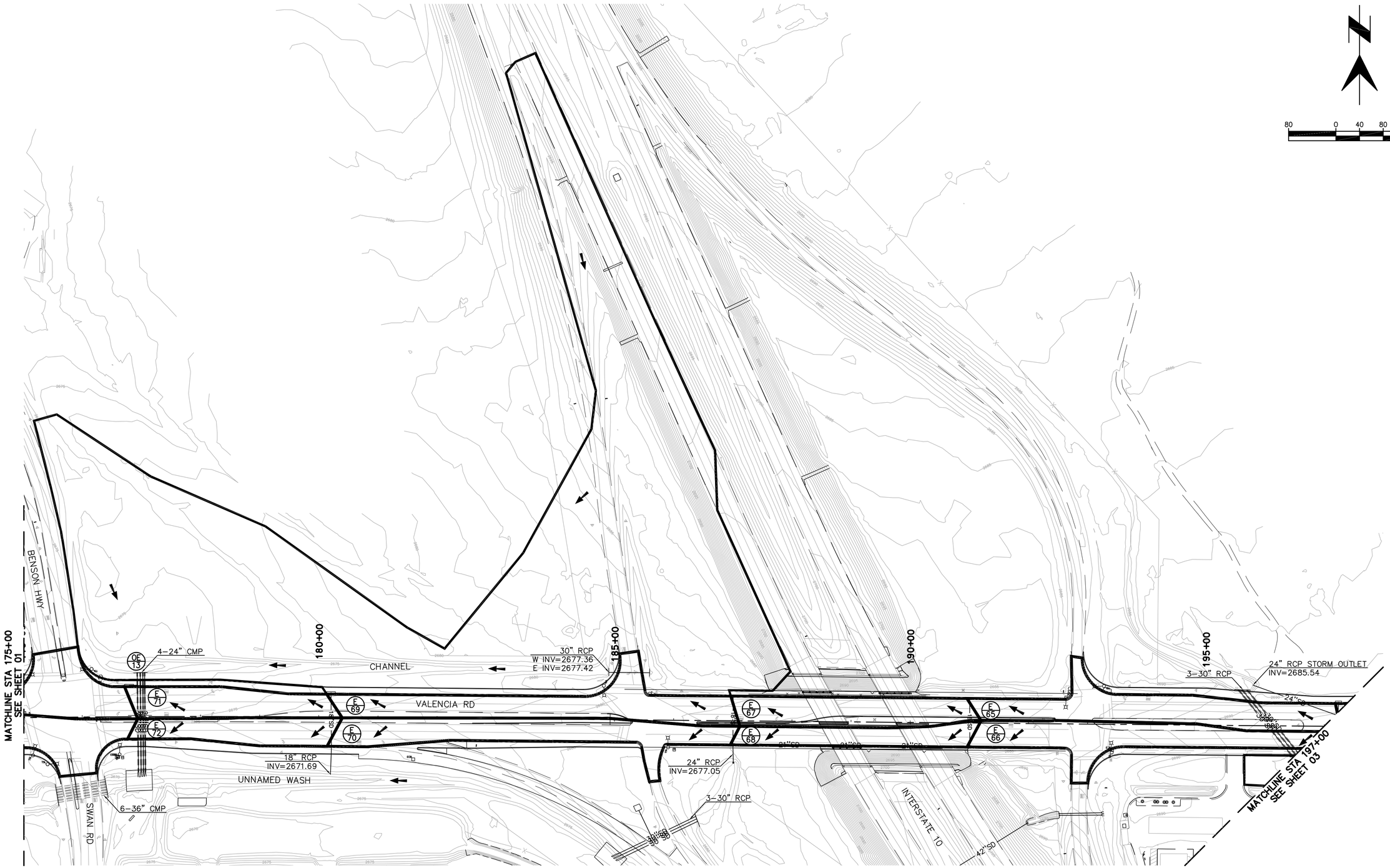
		DATE
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Belmore Road, Suite 110
Tucson, Arizona 85775
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
EXISTING CONDITIONS
FIGURE 3



LEGEND

- WATERSHED BOUNDARY
- E 20 — ONSITE WATERSHED ID
- OF 3 — OFFSITE WATERSHED ID
- SURFACE FLOW ARROW

Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES:	HORIZ.	SHEET 02 OF 07
	VERT.	

PRISCILLA S. CORNELIO, P.E., DIRECTOR

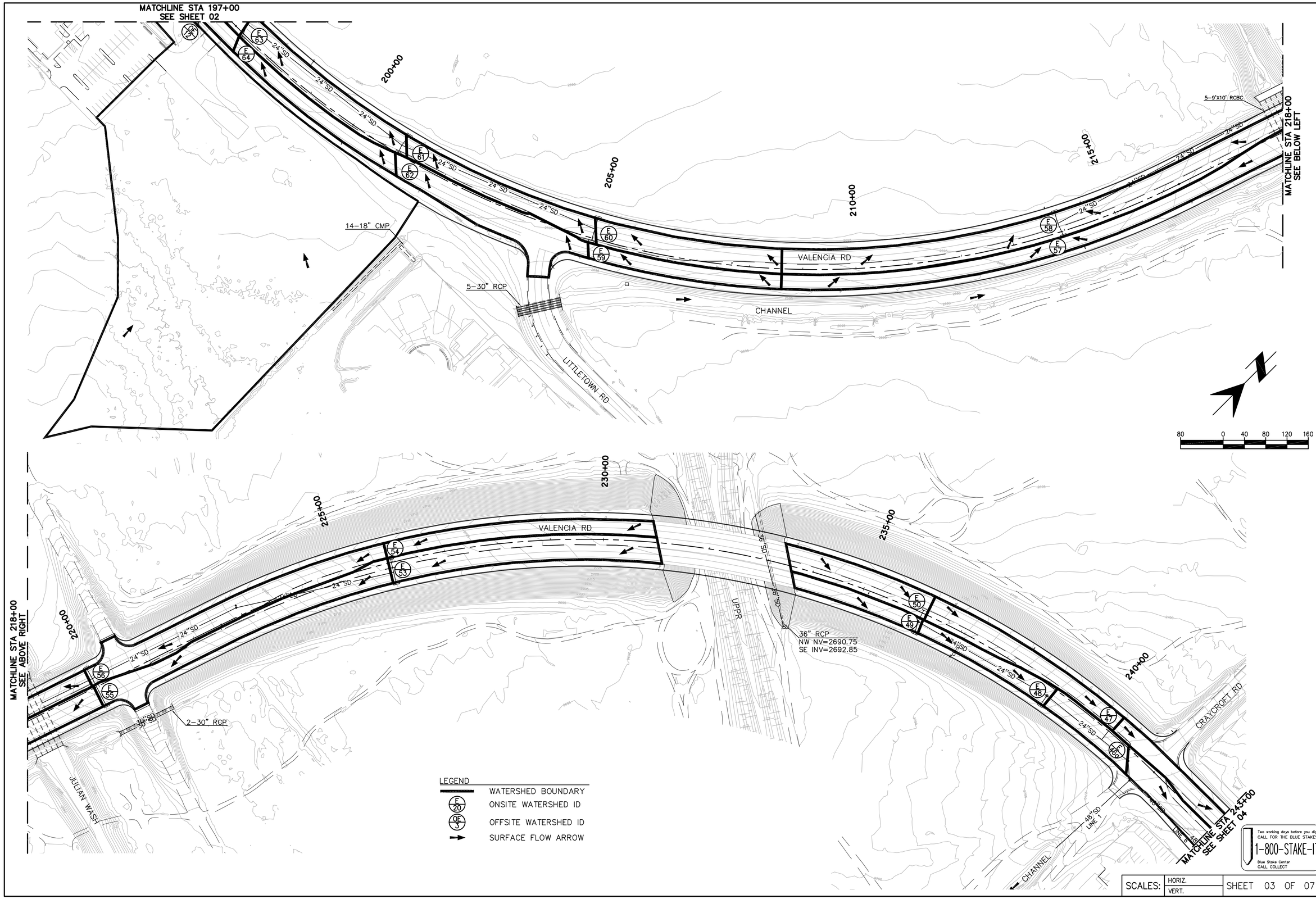
		DATE
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Belmore Road, Suite 110
Lake Havasu City, AZ 86403
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
EXISTING CONDITIONS
FIGURE 3



SCALES: HORIZ. / VERT.

SHEET 03 OF 07

PRISCILLA S. CORNELIO, P.E., DIRECTOR

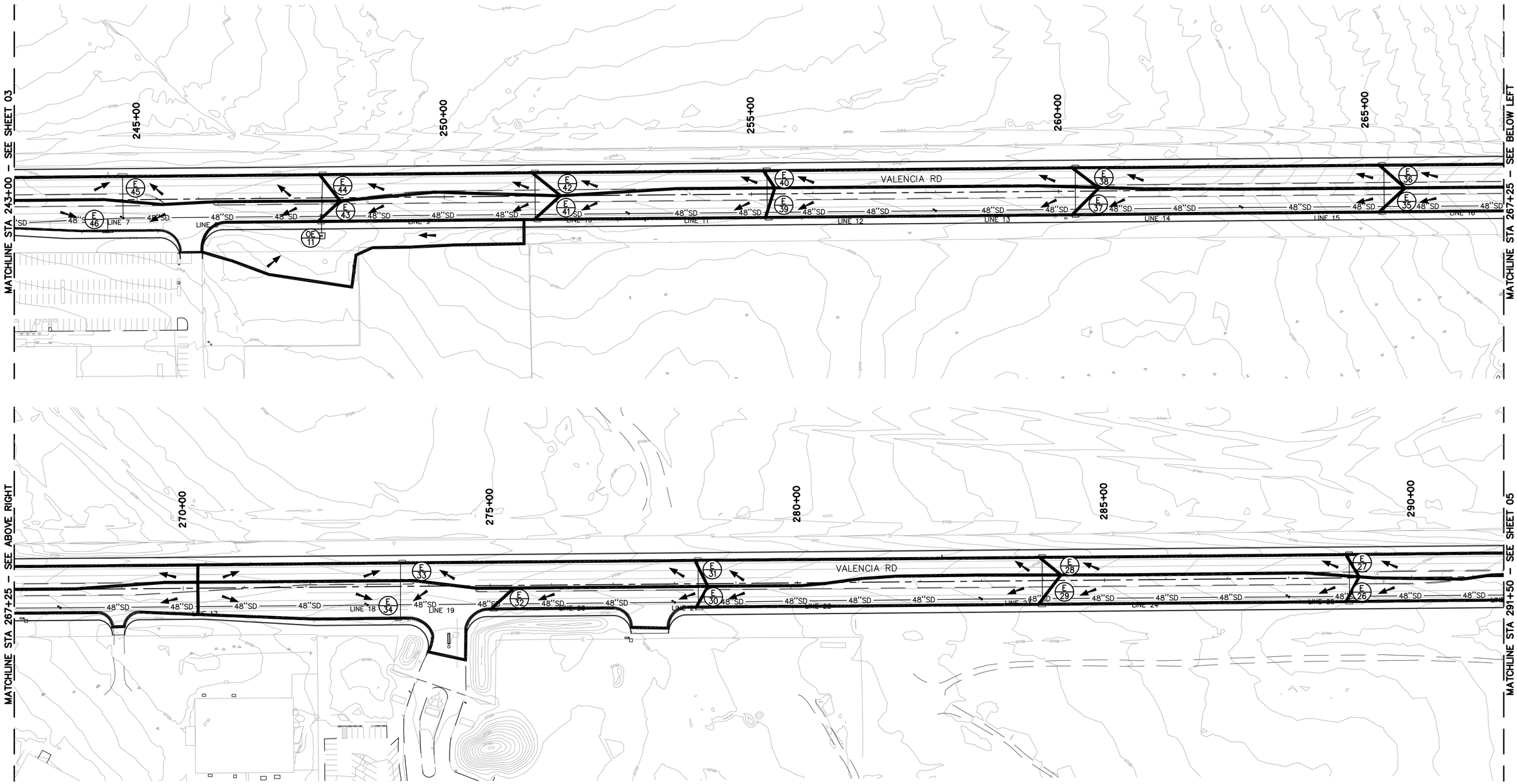
		DATE
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Weitmore Road, Suite 110
Tucson, Arizona 85737
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
EXISTING CONDITIONS
FIGURE 3



LEGEND

- WATERSHED BOUNDARY
- (E 20) ONSITE WATERSHED ID
- (OF 3) OFFSITE WATERSHED ID
- SURFACE FLOW ARROW

N

80 0 40 80 120 160

Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES:	HORIZ.	SHEET 04 OF 07
	VERT.	

PRISCILLA S. CORNELIO, P.E., DIRECTOR

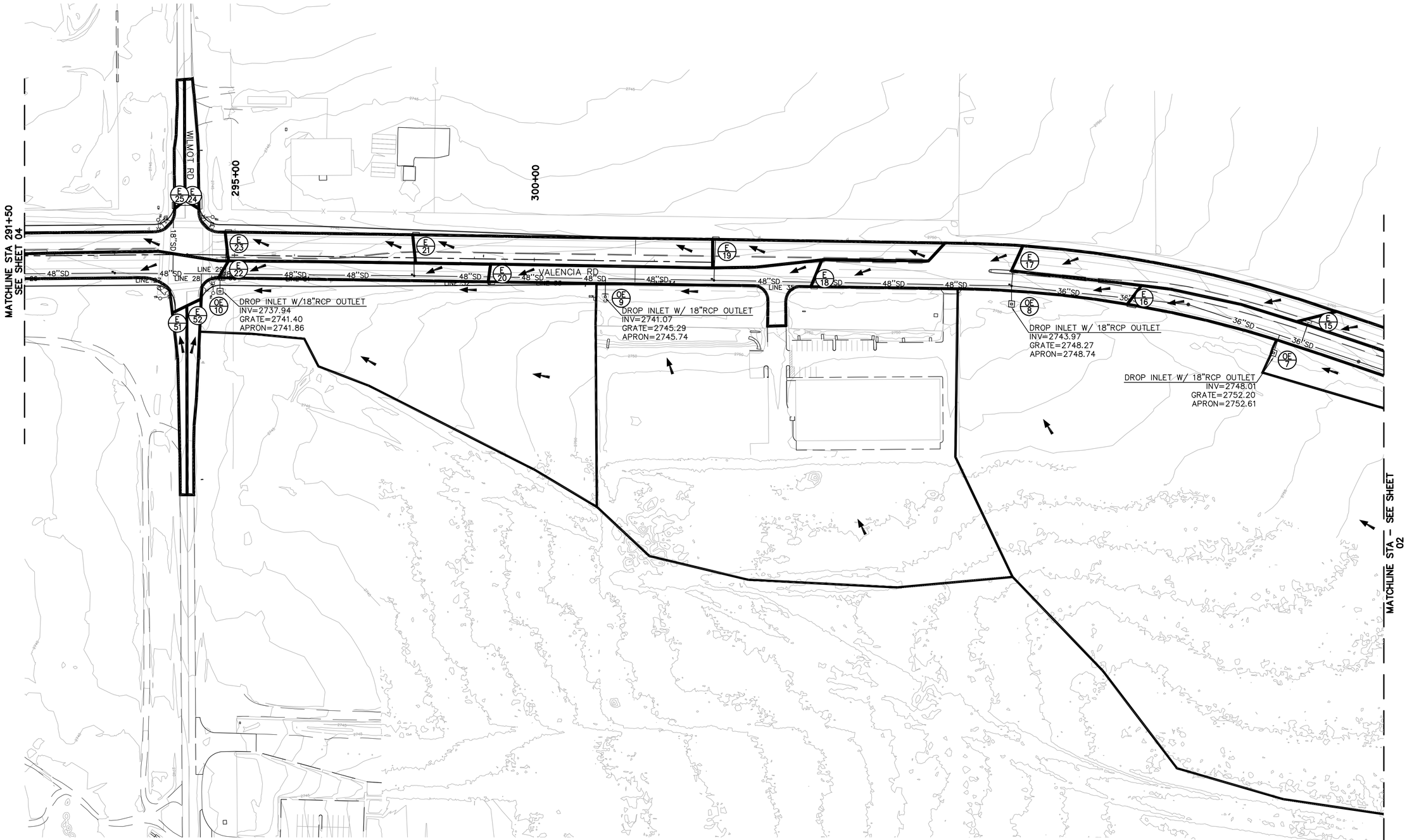
		DATE
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Helmore Road, Suite 110
Tucson, Arizona 85705
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
EXISTING CONDITIONS
FIGURE 3



LEGEND

- WATERSHED BOUNDARY
- E 20 — ONSITE WATERSHED ID
- OE 3 — OFFSITE WATERSHED ID
- SURFACE FLOW ARROW

80 0 40 80 120 160

Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES: HORIZ. / VERT.

SHEET 05 OF 07

PRISCILLA S. CORNELIO, P.E., DIRECTOR

		DATE
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Belmore Road, Suite 110
Lucson, Arizona 85775
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
EXISTING CONDITIONS
FIGURE 3

MATCHLINE – SEE SHEET 5

MANN AVE

VALENCIA RD

MCCULLOCH DR

36"SD

30"SD

E 14

E 13

E 12

E 11

E 10

E 9

E 8

E 7

E 6

OF 6

OF 5

OF 4

OF 3

DROP INLET W/24"RCP OUTLET
INV=2752.91
GRATE=2756.93
APRON=2757.39

DROP INLET W/18"RCP OUTLET
INV=2757.14
GRATE=2760.94
APRON=2761.40

DROP INLET W/ 20" RCP OUTLET
INV=2760.93
GRATE=2764.28
APRON=2764.71

DROP INLET W/ 18"RCP OUTLET
INV=2765.57
GRATE=2769.65
APRON=2770.04

MATCHLINE – SEE SHEET 07

LEGEND

WATERSHED BOUNDARY

E/20 ONSITE WATERSHED ID

OF/3 OFFSITE WATERSHED ID

SURFACE FLOW ARROW

80 0 40 80 120 160

Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES: HORIZ. VERT.

SHEET 06 OF 07

PRISCILLA S. CORNELIO, P.E., DIRECTOR

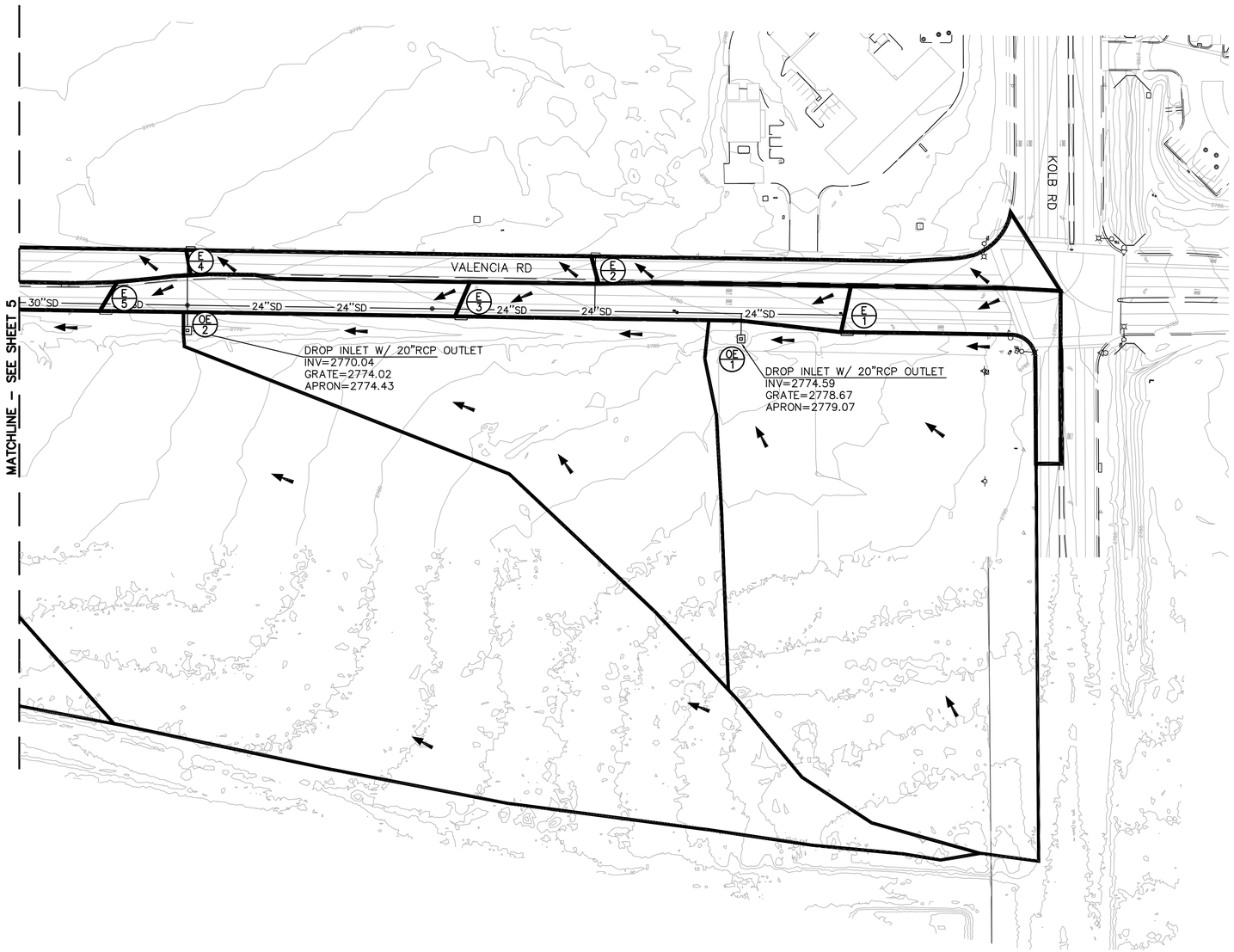
DESIGNED:	JO	DATE 04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Belmore Road, Suite 110
Tucson, Arizona 85775
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
EXISTING CONDITIONS
FIGURE 3



LEGEND

- WATERSHED BOUNDARY
- E 20 — ONSITE WATERSHED ID
- OE 3 — OFFSITE WATERSHED ID
- SURFACE FLOW ARROW

80 0 40 80 120 160

Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES: HORIZ. VERT.

SHEET 07 OF 07

PRISCILLA S. CORNELIO, P.E., DIRECTOR

DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
500 E. Wetmore Road, Suite 110
Tucson, Arizona 85705
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
EXISTING CONDITIONS
FIGURE 3

2.3 Existing Conditions Hydraulics

2.3.1 Culverts

Culvert locations are discussed in Section 1.2.2. Four of these crossings may be impacted by the proposed design. A hydraulic analysis of each of the potentially impacted culvert crossings was performed using the computer program Culvertmaster©, which calculates headwater based on the methodologies presented in the FHWA document HDS-5. Input variables such as inlet and outlet elevations were obtained from the as-built survey performed by Psomas. Lengths were calculated from the project topography and tailwater conditions were assumed to be one half the culvert height. Table 2 provides a summary of the existing conditions hydraulic analysis. Calculated headwater elevations were compared to the adjacent roadway elevations and it was determined that during the 100-year storm event, the existing conditions headwater is below the edge of pavement. Existing culverts will be extended as necessary and replaced if the roadway widening results in insufficient cover. Culvert calculation sheets are provided in Appendix 2.

Table 4
Existing Conditions Culvert Analysis Summary

CP	Culvert Type	Length	Invert Elevation (ft)		Slope	HW_{100}	Velocity	Q_{100}
		(ft)	US	DS	(%)	(ft)	(fps)	(cfs)
OE12	3-30" RCP	143.29	2686.67	2685.72	0.66	2688.78	6.66	46
OE13	4-24" RCP	167.52	2669.88	2669.18	0.42	2672.25	5.88	61
JULIAN WASH	5-10'X9' CBC	140.00	2682.98	2682.30	0.49	2689.98	12.69	2270
UPRR	6-10'X4' CBC	33.00	2697.30	2697.24	0.18	2700.75	8.34	1082*

* Discharge shown is available capacity of the culvert.

2.1.1 Channels

Within the project limits, there are four roadside channels that flow parallel to Valencia Road and one that crosses. Three of the parallel channels are located along the southern side of the road and one along the north. One parallel unnamed earthen channel conveys flow to the west between Interstate 10 and Alvernon Way. A second parallel channel conveys runoff from the ADOT right-of-way north of Valencia Road, between Swan Road and Interstate 10, to a culvert crossing which discharges to the unnamed channel to the south. East of Interstate 10, the third parallel channel is a Julian Wash tributary that begins at Littletown Road and conveys offsite runoff from the Empire Vista Subdivision to the east. The Julian Wash, a FEMA regulated channel, flows from the southeast to the northwest. A LOMR was issued for the effective FIRM Panel that states that the 100-year peak discharge is contained within the bank of the Julian Wash at its crossing with Valencia Road. The remaining parallel channel is also tributary to the Julian Wash, originating at Craycroft Road and conveying flow to the west. This channel conveys the roadway runoff discharged by the existing stormdrain system along Valencia Road. Flow

within the Pima Air Museum Wash converges with this channel at the culvert under the railroad tracks. A discharge is currently unknown for the Pima Air Museum Wash, but it is expected to have a significantly different time of concentration since its floodplain is primarily undeveloped and consists of sheet flow rather than pavement drainage being conveyed through a stormdrain system. Floodplains will be mapped in subsequent report submittals, utilizing HEC-RAS to determine existing water surface elevations.

Table 5
Existing Conditions Channel Analysis Summary

Channel ID	Discharge Source	Q_{100} (cfs)
Unnamed Channel	TSMS Node BR-N0106	1021
Empire Vista Outlet	Empire Vista Plat	208
Julian Wash	FEMA	2270
Stormdrain Outlet	Direct Summation	218
Channel in CPOE13	PC Hydro Calc	61

2.1.2 Stormdrain

There are multiple stormdrain systems of varying length within the project limits. Between Interstate 10 and Alvernon Way, the stormdrain systems are comprised of relatively short lengths of pipe spanning from the north side of the road to a discharge point just south of the roadway, into the unnamed channel. Between Interstate 10 and the UPRR crossing, there are longer stormdrain systems, which collect pavement drainage from more than two catch basins and convey the flow to a nearby culvert crossing. Between the UPRR crossing and Kolb Road, a single stormdrain system collects all pavement drainage and some offsite runoff. This system begins at Kolb Road and discharges south of Valencia Road at Craycroft Road, directing flow towards the Julian Wash.

The existing stormdrain system is comprised of concrete pipe. At the outlet, the pipe diameter is 48 inches and varies in size along the mainline to a 24 inch pipe at the upstream ends of the system. The laterals are comprised primarily of 18 inch diameter pipe. The existing system was first analyzed using the peak discharges calculated during the hydrologic analysis for the 10-year storm event. This analysis showed that the existing system is undersized. The analysis was then revised by reducing discharges within the system until the hydraulic grade line was no longer surcharging, to make a determination of the existing capacity. The existing capacity was determined to be 105 cfs, which is between the 2-year (70 cfs) and the 5-year (116 cfs) peak discharges. Summary tables and the mainline profile from the capacity analysis can be found in Appendix 3.

3.0 Proposed Cross Drainage Improvements

3.1 Offsite Drainage Approach

Offsite drainage patterns will remain the same under proposed conditions. Roadside channels will be reconstructed as necessary to maintain existing capacity when impacted. Existing culverts will be extended or reconstructed to ensure the headwater elevation is below the edge of pavement. Stormdrain grate inlets located along the south side of the roadway will be relocated as necessary, shifting their location to the south. One additional culvert is proposed under a new driveway no additional channels or grate inlets are anticipated.

3.2 Proposed Conditions Hydrology

The hydrologic analysis for the proposed condition was performed in the same manner as existing conditions, using the Pima County Modified Rational Method. Watersheds within the project limits were modified based upon the proposed roadway layout. Roadway watersheds located outside the project limits east of Wilmot Road were not modified. Their peak discharges were, however, increased by 30% for the proposed conditions stormdrain analysis to account for future widening. Proposed conditions watershed delineations are displayed on Figure 3. Results from the proposed conditions hydrologic analysis are summarized on Tables 7, 8 and 9. On average, there is a 28% increase in peak discharge during the 10- and 100-year storm events for roadway watersheds due to the widening.

Table 6
Proposed Conditions Hydrologic Analysis Summary (1 of 3)

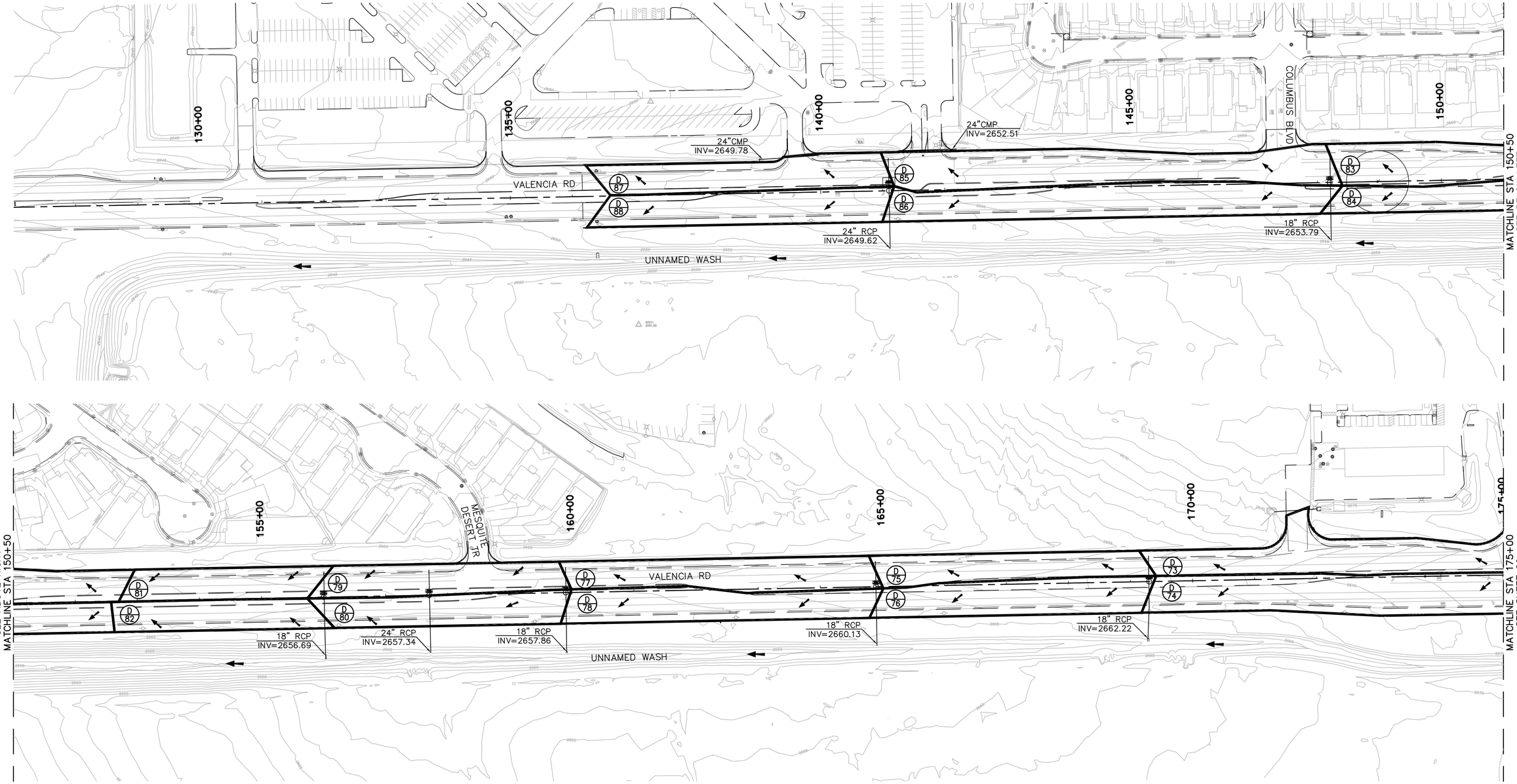
WS	Area (AC)	Length (FT)	ΔH (FT)	Soil			Impervious %	N_b	Q_{10} (cfs)	Q_{100} (cfs)
				%B	%C	%D				
D1	0.46	392	5.0	0	100	0	95	0.018	3.0	4.7
D2	0.47	544	5.0	0	100	0	95	0.018	3.1	4.8
D3	0.49	479	3.0	0	100	0	95	0.018	3.3	5.0
D4	0.38	497	3.0	0	100	0	95	0.018	2.5	3.9
D5	0.43	446	3.0	0	100	0	95	0.018	2.9	4.4
D6	0.43	490	5.0	0	100	0	95	0.018	2.9	4.4
D7	0.36	411	4.0	0	100	0	95	0.018	2.3	3.7
D8	0.40	400	3.0	0	100	0	95	0.018	2.6	4.1
D9	0.39	490	3.0	0	100	0	95	0.018	2.6	4.0
D10	0.21	221	2.0	0	100	0	95	0.018	1.4	2.1
D11	0.48	496	3.5	65	35	0	95	0.018	3.1	4.9
D12	0.45	540	4.5	90	10	0	95	0.018	3.0	4.6
D13	0.71	479	4.0	100	0	0	95	0.018	4.7	7.2
D14	0.53	527	4.0	100	0	0	95	0.018	3.5	5.4
D15	0.41	481	4.0	100	0	0	95	0.018	2.7	4.1
D16	0.50	565	5.0	100	0	0	95	0.018	3.3	5.1
D17	0.47	526	4.0	100	0	0	95	0.018	3.1	4.8
D18	0.59	214	3.5	100	0	0	95	0.018	3.9	6.0
D19	0.31	357	1.5	100	0	0	95	0.018	2.1	3.1
D20	0.45	557	2.5	100	0	0	95	0.018	2.3	4.5
D21	0.57	487	2.0	100	0	0	95	0.018	2.9	5.8
D22	0.39	443	3.0	100	0	0	95	0.018	2.0	3.9
D23	0.42	313	2.0	100	0	0	95	0.018	2.1	4.2
D24	0.10	204	2.0	100	0	0	95	0.018	0.5	1.0
D25	0.07	202	2.0	100	0	0	95	0.018	0.4	0.7
D26	0.73	551	4.0	100	0	0	95	0.018	3.7	7.4
D27	0.70	572	4.0	100	0	0	95	0.018	3.5	7.1
D28	0.48	468	4.0	100	0	0	95	0.018	2.4	4.9
D29	0.66	501	4.0	100	0	0	95	0.018	3.3	6.7
D30	0.70	577	4.0	50	50	0	95	0.018	3.6	7.1
D31	0.60	571	4.0	50	50	0	95	0.018	3.0	6.1
D32	0.39	325	2.5	90	10	0	95	0.018	2.0	3.9
D33	0.89	323	3.0	90	10	0	95	0.018	4.5	9.0
D34	0.82	339	1.5	90	10	0	95	0.018	4.1	8.3
D35	0.61	484	5.0	0	100	0	95	0.018	3.1	6.2

Table 7
Proposed Conditions Hydrologic Analysis Summary (2 of 3)

WS	Area (AC)	Length (FT)	ΔH (FT)	Soil			Impervious (%)	N_b	Q_{10} (cfs)	Q_{100} (cfs)
				%B	%C	%D				
D36	0.53	475	5.0	0	100	0	95	0.018	2.7	5.4
D37	0.59	513	7.0	0	100	0	95	0.018	3.0	6.0
D38	0.55	482	7.0	0	100	0	95	0.018	2.8	5.6
D39	0.69	523	3.0	100	0	0	95	0.018	3.5	7.0
D40	0.48	516	3.0	100	0	0	95	0.018	2.4	4.9
D41	0.48	383	2.0	100	0	0	95	0.018	2.4	4.9
D42	0.37	366	2.0	100	0	0	95	0.018	1.9	3.7
D43	0.43	361	1.5	100	0	0	95	0.018	2.2	4.3
D44	0.38	363	1.5	100	0	0	95	0.018	1.9	3.8
D45	0.94	414	5.0	100	0	0	95	0.018	4.8	9.5
D46	0.92	360	4.0	100	0	0	95	0.018	4.7	9.3
D47	0.51	403	9.0	100	0	0	95	0.018	2.6	5.2
D48	0.28	273	5.0	100	0	0	95	0.018	1.4	2.8
D49	0.23	252	2.5	75	25	0	95	0.018	1.2	2.3
D50	0.39	281	2.5	75	25	0	95	0.018	2.0	4.0
D51	0.11	290	1.5	100	0	0	95	0.018	0.6	1.1
D52	0.12	311	1.5	100	0	0	95	0.018	0.6	1.2
D53	0.70	499	7.3	0	0	100	95	0.018	2.8	5.7
D54	0.47	501	7.0	0	0	100	95	0.018	1.7	3.5
D55	0.68	593	16.0	0	0	100	95	0.018	3.5	7.0
D56	0.75	598	16.5	0	0	100	95	0.018	3.8	7.7
D57	1.14	602	10.0	0	0	100	95	0.018	5.8	12.0
D58	1.46	592	10.5	0	0	100	95	0.018	7.5	15.0
D59	0.34	360	1.5	0	0	100	95	0.018	1.7	3.5
D60	0.49	349	1.5	0	0	100	95	0.018	2.5	5.0
D61	0.42	399	2.5	0	0	100	95	0.018	2.1	4.3
D62	0.61	398	2.5	0	0	100	95	0.018	3.1	6.2
D63	0.50	378	2.5	0	75	100	25	0.018	2.5	5.1
D64	0.37	378	2.0	0	75	100	25	0.018	1.9	3.8
D65	0.85	630	7.5	0	75	100	25	0.018	4.3	8.6
D66	0.76	625	8.0	0	75	100	25	0.018	3.9	7.7
D67	0.55	407	2.5	0	0	100	95	0.018	2.8	5.6
D68	0.36	414	2.5	0	0	100	95	0.018	1.8	3.7
D69	0.88	387	5.5	0	0	100	95	0.018	4.5	9.0
D70	0.79	689	5.5	0	0	100	95	0.018	4.0	8.1

Table 8
Proposed Conditions Hydrologic Analysis Summary (3 of 3)

WS	Area (AC)	Length (FT)	ΔH (FT)	Soil			Impervious (%)	N_b	Q_{10} (cfs)	Q_{100} (cfs)
				%B	%C	%D				
D71	0.48	346	3.5	0	0	100	95	0.018	2.5	4.9
D72	0.43	348	3.0	0	0	100	95	0.018	2.2	4.4
D73	1.09	459	6.5	0	0	100	95	0.018	5.6	11.0
D74	1.15	749	6.5	0	0	100	95	0.018	5.8	12.0
D75	0.45	435	3.0	0	0	100	95	0.018	2.3	4.6
D76	0.56	443	3.0	0	0	100	95	0.018	2.9	5.7
D77	0.57	491	2.5	0	0	100	95	0.018	2.9	5.8
D78	0.58	500	2.5	0	0	100	95	0.018	2.9	5.8
D79	0.45	224	2.0	0	0	100	95	0.018	2.3	4.6
D80	0.46	225	2.0	0	0	100	95	0.018	2.4	4.7
D81	0.37	321	2.0	0	0	100	95	0.018	1.9	3.8
D82	0.37	330	1.5	0	0	100	95	0.018	1.9	3.8
D83	0.64	443	3.5	0	0	100	95	0.018	3.3	6.5
D84	0.45	430	3.5	0	0	100	95	0.018	2.3	4.6
D85	0.93	715	6.0	0	0	100	95	0.018	4.8	9.5
D86	0.85	718	6.0	0	0	100	95	0.018	4.3	8.7
D87	0.54	482	4.0	0	0	100	95	0.018	2.8	5.5
D88	0.57	486	4.0	0	0	100	95	0.018	2.9	5.8
OE1	5.21	724	8.0	0	100	0	0	0.035	13.0	38.0
OE2	2.93	870	10.0	0	100	0	0	0.035	7.1	20.0
OE3	10.01	1514	17.0	0	100	0	0	0.035	21.0	59.0
OE4	0.60	602	6.0	0	100	0	0	0.035	1.5	4.4
OE5	0.44	374	3.0	100	0	0	0	0.035	0.9	2.6
OE6	0.59	439	4.0	100	0	0	0	0.035	1.2	3.5
OE7	0.63	512	5.0	100	0	0	0	0.035	1.3	3.7
OE8	33.24	3019	31.0	80	20	0	0	0.035	45.0	128.0
OE9	6.74	959	8.0	100	0	0	10	0.035	12.0	33.0
OE10	3.10	694	7.0	100	0	0	0	0.035	6.2	18.0
OE11	0.73	336	5.0	0	100	0	0	0.035	1.9	5.3
OE12	6.62	809	10.0	50	0	50	0	0.035	16.0	46.0
OE13	10.23	1829	24.0	25	0	75	0	0.035	21.0	61.0



LEGEND

- WATERSHED BOUNDARY
- D 20 — ONSITE WATERSHED ID
- OF 3 — OFFSITE WATERSHED ID
- SURFACE FLOW ARROW

80 0 40 80 120 160

Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES:	HORIZ.	SHEET 01 OF 07
	VERT.	

PRISCILLA S. CORNELIO, P.E., DIRECTOR

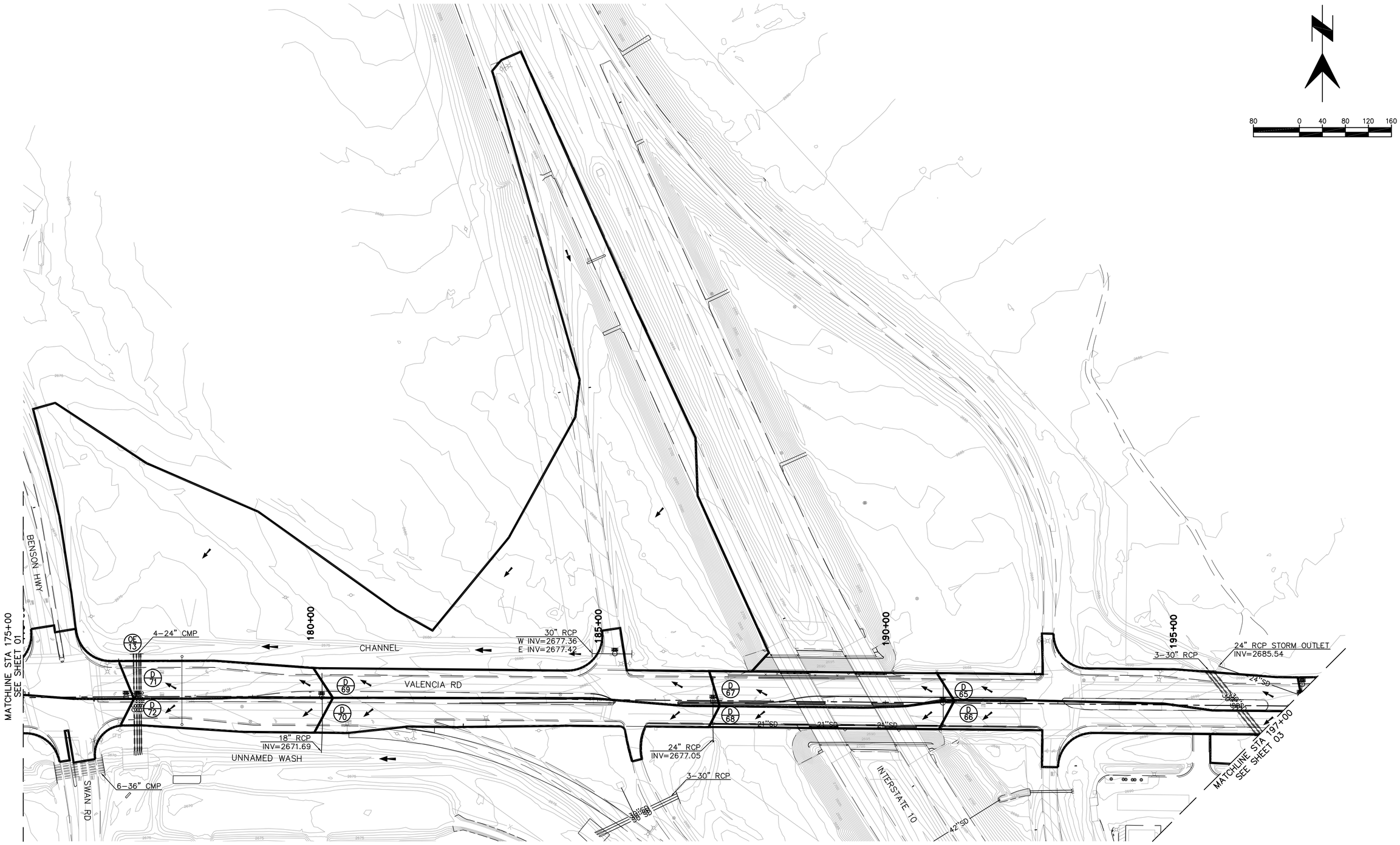
		DATE
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Helmore Road, Suite 110
Tucson, Arizona 85705
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
DEVELOPED CONDITIONS
FIGURE 4



LEGEND

- WATERSHED BOUNDARY
- D/20 ONSITE WATERSHED ID
- OF/3 OFFSITE WATERSHED ID
- SURFACE FLOW ARROW

Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES: HORIZ. / VERT.

SHEET 02 OF 07

PRISCILLA S. CORNELIO, P.E., DIRECTOR

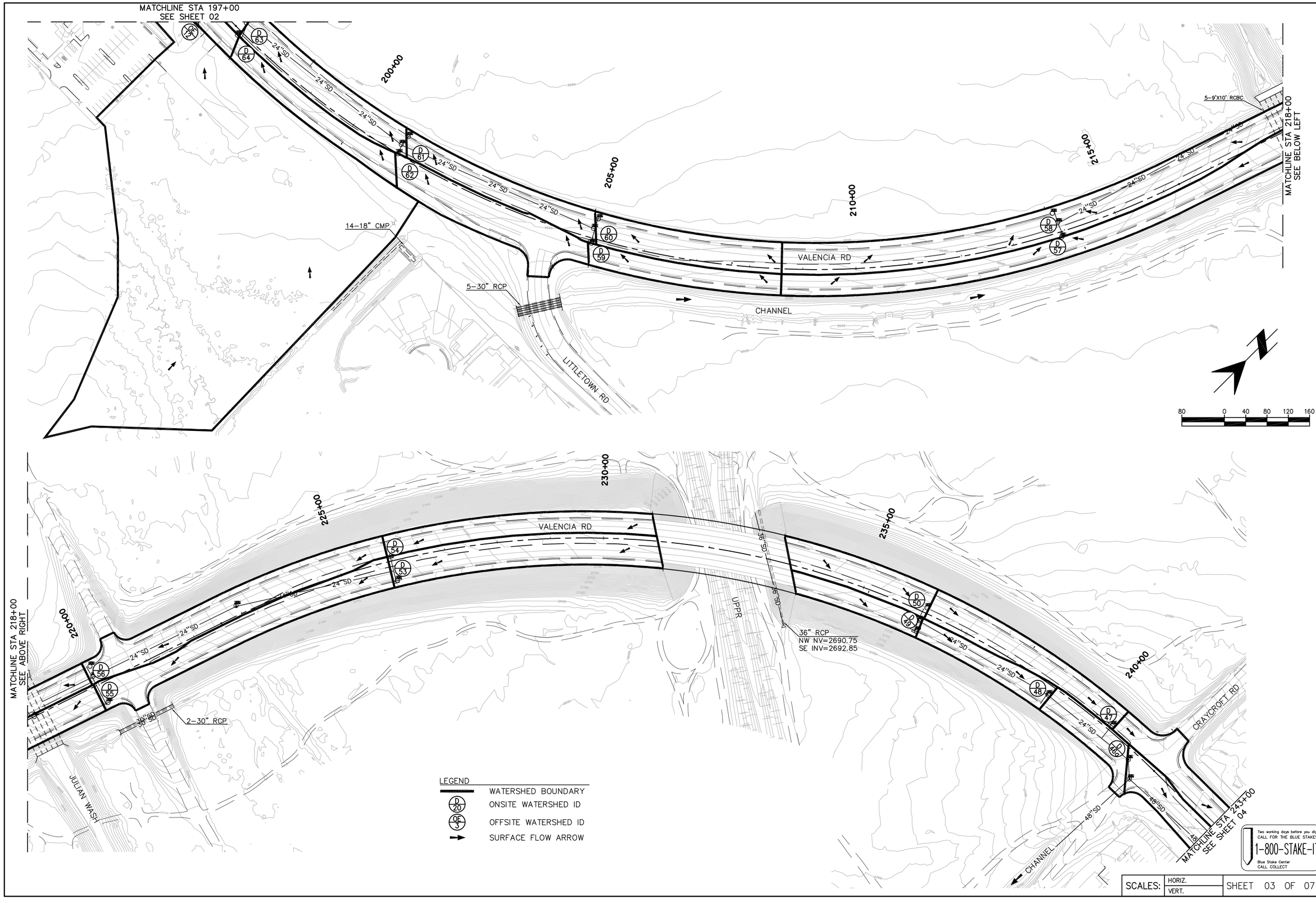
		DATE
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Weltmore Road, Suite 110
Tucson, Arizona 85705
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
DEVELOPED CONDITIONS
FIGURE 4



SCALES: HORIZ. / VERT.

SHEET 03 OF 07

PRISCILLA S. CORNELIO, P.E., DIRECTOR

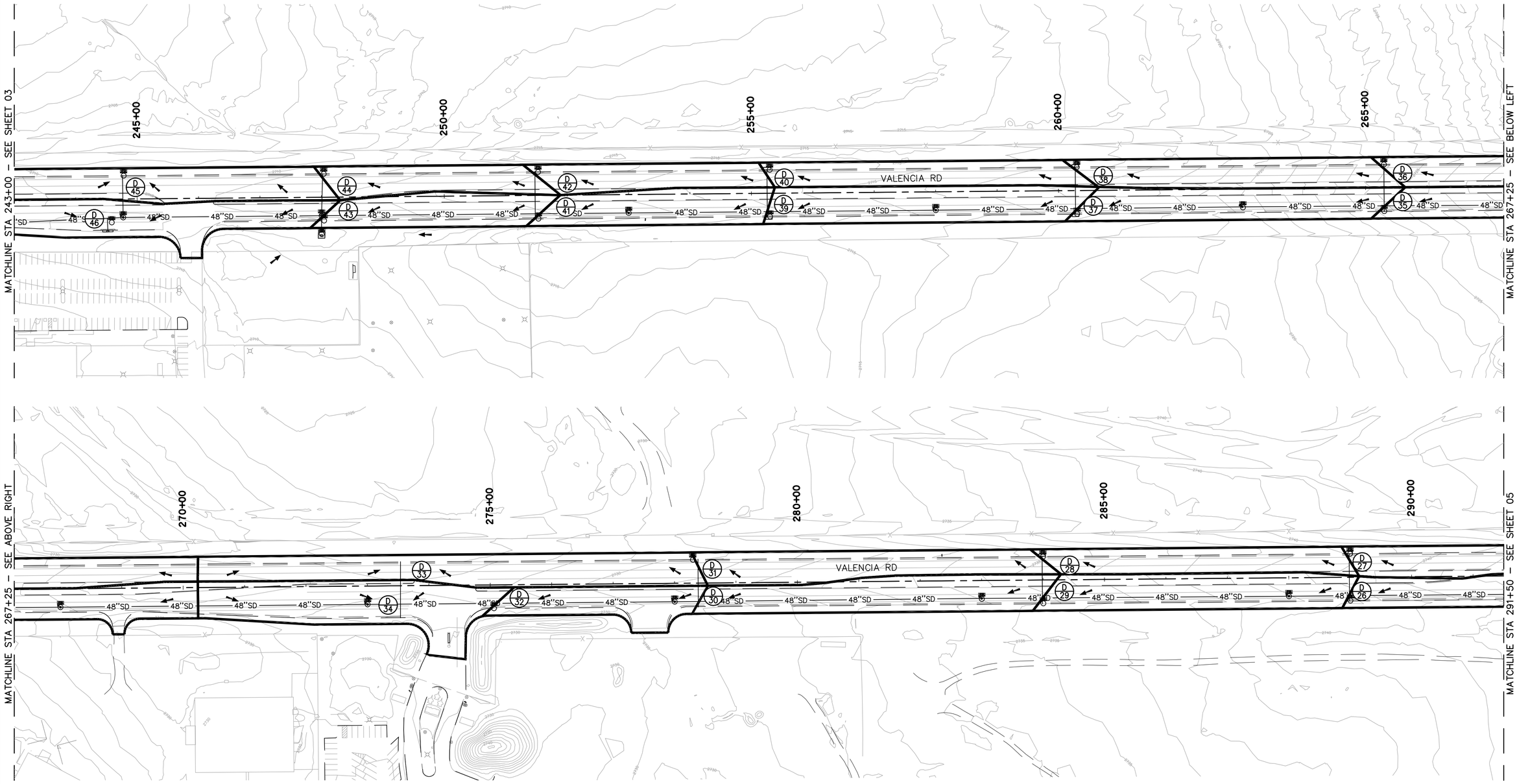
		DATE
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Weimore Road, Suite 110
Tucson, Arizona 85705
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
DEVELOPED CONDITIONS
FIGURE 4



LEGEND

- WATERSHED BOUNDARY
- (D 20) ONSITE WATERSHED ID
- (OF 3) OFFSITE WATERSHED ID
- SURFACE FLOW ARROW

80 0 40 80 120 160

Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES:	HORIZ.	SHEET 04 OF 07
	VERT.	

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
DEVELOPED CONDITIONS
FIGURE 4

PRISCILLA S. CORNELIO, P.E., DIRECTOR

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

		DATE
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

PSOMAS
800 E. Wetmore Road, Suite 110
Tucson, Arizona 85705
(520) 292-2300 (520) 292-1290 (FAX)

MATCHLINE STA 291+50
SEE SHEET 04

WILMOT RD

295+00

300+00

VALENCIA RD

D 25 D 24 D 23 D 22 D 21 D 20 D 19 D 18 D 17 D 16 D 15 D 52 D 51

OE 10 OE 9 OE 8 OE 7

18"SD 48"SD 36"SD

DROP INLET W/18"RCP OUTLET
INV=2737.94
GRATE=2741.40
APRON=2741.86

DROP INLET W/ 18"RCP OUTLET
INV=2741.07
GRATE=2745.29
APRON=2745.74

DROP INLET W/ 18"RCP OUTLET
INV=2743.97
GRATE=2748.27
APRON=2748.74

DROP INLET W/ 18"RCP OUTLET
INV=2748.01
GRATE=2752.20
APRON=2752.61

MATCHLINE STA 02 SEE SHEET

LEGEND

▬	WATERSHED BOUNDARY
(D 20)	ONSITE WATERSHED ID
(OE 3)	OFFSITE WATERSHED ID
→	SURFACE FLOW ARROW

N

80 0 40 80 120 160

Two working days before you dig,
CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES: HORIZ. VERT.

SHEET 05 OF 07

PRISCILLA S. CORNELIO, P.E., DIRECTOR

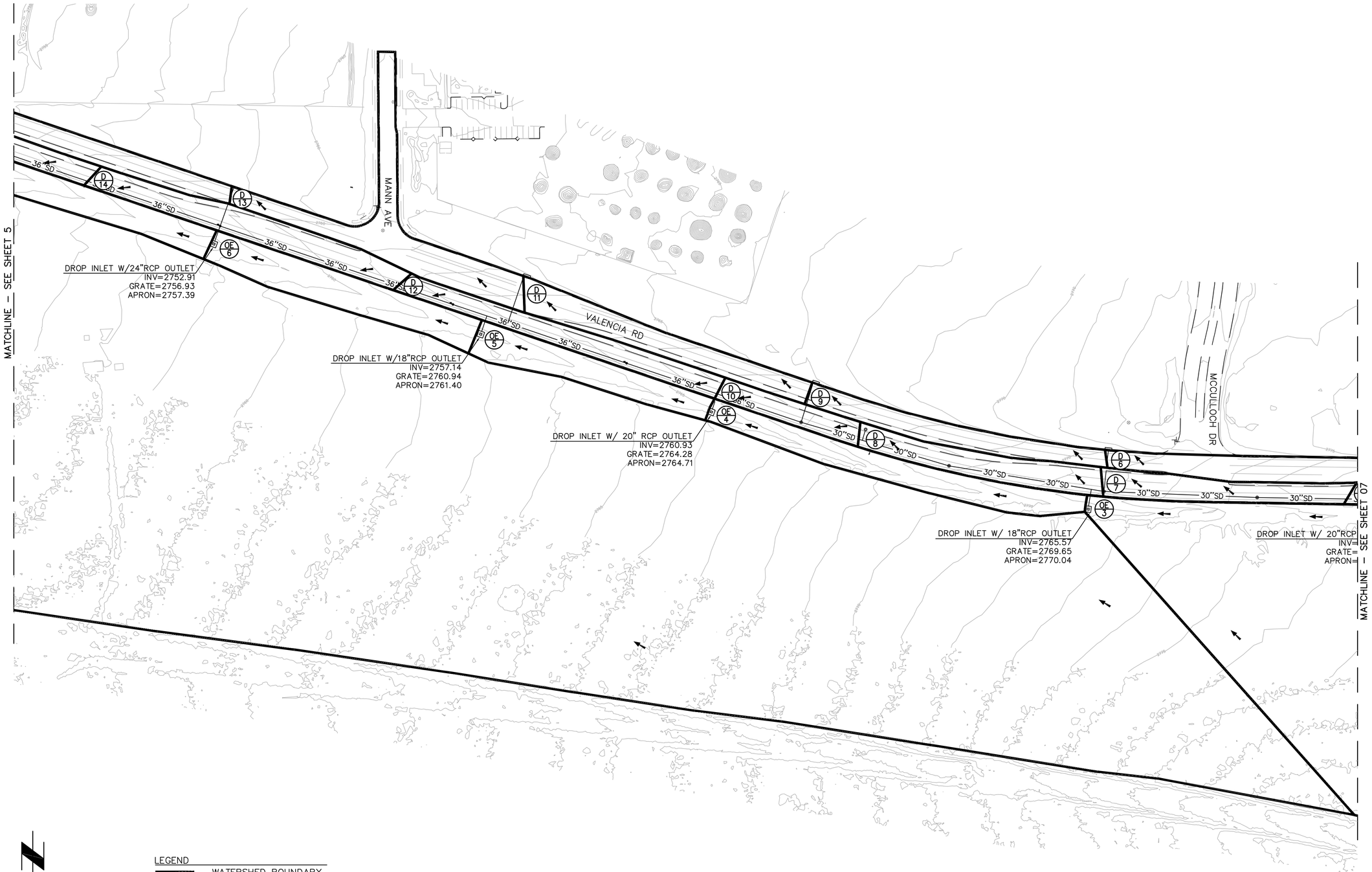
		DATE
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Wetmore Road, Suite 110
Tucson, Arizona 85705
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
DEVELOPED CONDITIONS
FIGURE 4



LEGEND

- WATERSHED BOUNDARY
- D 20 — ONSITE WATERSHED ID
- OF 3 — OFFSITE WATERSHED ID
- SURFACE FLOW ARROW

80 0 40 80 120 160

Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center
CALL COLLECT

SCALES: HORIZ. / VERT.

SHEET 06 OF 07

PRISCILLA S. CORNELIO, P.E., DIRECTOR

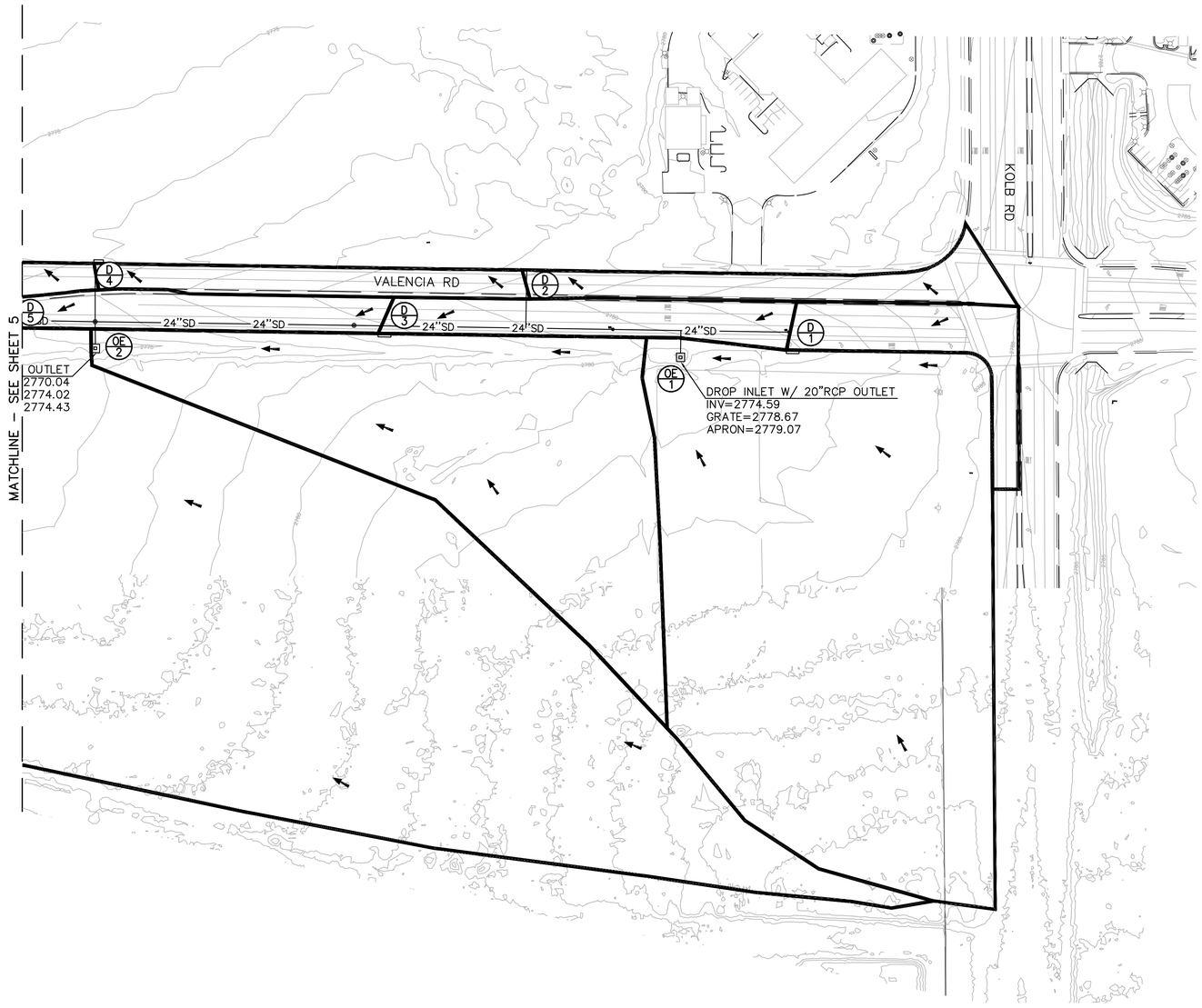
DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
500 E. Wetmore Road, Suite 110
Tucson, Arizona 85705
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
DEVELOPED CONDITIONS
FIGURE 4



LEGEND

- WATERSHED BOUNDARY
- D/20 ONSITE WATERSHED ID
- OF/3 OFFSITE WATERSHED ID
- SURFACE FLOW ARROW

80 0 40 80 120 160

Two working days before you dig, CALL FOR THE BLUE STAKES
1-800-STAKE-IT
Blue Stake Center CALL COLLECT

SCALES: HORIZ. VERT.

SHEET 07 OF 07

PRISCILLA S. CORNELIO, P.E., DIRECTOR

DESIGNED:	JO	04/11
DRAWN:	JO/CLR	04/11
CHECKED:	MED	04/11
PROJ. ENG.:	KTT	04/11

NO.	REVISION DESCRIPTION	DIV. ENGINEER	DATE

PSOMAS
800 E. Weldmore Road, Suite 110
Tucson, Arizona 85705
(520) 292-2300 (520) 292-1290 (FAX)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

WATERSHED DELINEATION
FOR
VALENCIA ROAD
DEVELOPED CONDITIONS
FIGURE 4

3.3 Proposed Conditions Hydraulics

3.3.1 Culverts

Since the existing culverts are sized adequately to maintain headwater below the existing edge of pavement and the new edge of pavement is not significantly different in elevation, replacement of culverts will not only be required where cover over the pipe becomes an issue. Calculations will be provided for proposed conditions in subsequent submittals following design of any culvert replacements or extensions. One new culvert will be required under a new turnout located east of Littletown Road. Design of this culvert will be incorporated in future submittals.

3.3.2 Channels

Two channels will be impacted by the proposed improvements. The channel conveying flow between the Empire Vista subdivision and Julian Wash will be encroached by fill and will require a culvert under a new turnout. The channel at the stormdrain outlet will be impacted by an increased discharge due to additional flows within the stormdrain system. The capacity of the remaining channels will not be impacted by the proposed improvements and are currently assumed to have adequate capacity. Analysis of these channels will be provided in subsequent submittals. HEC-RAS will be utilized to map the proposed conditions floodplains and compare the water surface elevations to those under existing conditions. Any impacts outside of the right-of-way will be mitigated or contained within easements.

3.3.3 Stormdrain

The existing stormdrain systems between Alvernon Way and the UPRR crossing will be modified by extending existing laterals to new catch basins located at the new curb line. The stormdrain system located between the UPRR crossing and Kolb Road is proposed to have the laterals extended to catch basins at the new curb line and the mainline upsized from the outlet, approximately 1900 feet to the east, in order to provide 10-year conveyance capacity. The first 1000 feet of existing 48 inch pipe will be replaced with 60 inch pipe and the remaining 900 feet of existing 48 inch pipe is to be replaced with 54 inch pipe. Summary tables and mainline profiles from the hydraulic analysis are provided in Appendix 3.

3.3.4 Outlet Protection

Riprap aprons will be designed for each culvert and stormdrain outlet in subsequent submittals following the formal design of these structures.

3.4 Right-of-Way Requirements

Pending analysis of the proposed culvert and channel conditions, no additional right-of-way or easements are currently anticipated due to increased discharges or changes in water surface elevation.

3.5 Permitting Requirements

This project is anticipated to fall under the Nationwide 404 Permit due to minimal disturbance of any potential jurisdictional waters.

4.0 Storm Drain Inlet Design

Stormdrain inlet design will be completed in subsequent submittals.

5.0 Storm Drain Design

Stormdrain design will be completed in subsequent submittals.

6.0 Summary and Conclusions

Valencia Road is to be widened to from four to six lanes between Alvernon Way and Wilmot Road. A hydrologic analysis was performed for existing and proposed conditions to determine design discharges for use in hydraulic analyses. Design discharges for a 10-year storm event are utilized for pavement drainage and stormdrain design and 100-year discharges used for analyses of culverts and channels. At this point in the design process, hydraulic analyses of the existing stormdrain mainline and existing culverts have been performed. Hydraulic analysis of existing channels and delineation of regulatory floodplains will be included in subsequent submittals. Analyses of proposed conditions culverts, channels and inlet design will also be included in subsequent submittals.

The additional lane of pavement added in each direction of travel will be on the outside of the roadway with a few changes made to the median. This results in the need to relocate 65 of 69 existing catch basins within the project limits and extend existing laterals. The additional lane also results in increased discharges at the catch basins, which will be resized, and in addition to already being under sized, also results in the need to increase 1900 linear feet of stormdrain mainline east of Craycroft Road. No additional upsizing is anticipated.

The submittal of this report accompanies the 15% design plans. Calculations performed thus far and included in this report are limited and will be expanded upon in subsequent submittals to include floodplain delineations, proposed conditions culvert analyses, inlet sizing, analysis of all stormdrain systems, and outlet protection.

7.0 Reference Section Style Guideline

1) 1) FEMA Map Service Center, P.O. Box 1038 Jessup, Maryland 20794-1038
http://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-&content=floodZones&title=FEMA%20Flood%20Zone%20Designations

2) 2) NRCS Soil Survey

http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

3) 3) Pima County MapGuide

http://www.dot.co.pima.az.us/gis/maps/mapguide/mgmap.cfm?path=/gis/maps/mapguide/dotmap65.mwf

4) 4) U.S. Department of Transportation, Federal Highway Administration; Hydraulic Engineering Circular No. 14, Third Edition: Hydraulic Design of Energy Dissipators for Culverts and Channels. Publication No. FHWA-NHI—06-086, July 2006

APPENDIX 1

NOAA ATLAS 14
RAINFALL DATA

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

Arizona 32.140365 N 110.856751 W 2742 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 4
G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2006

Extracted: Mon Jan 10 2011

Confidence Limits | Seasonality | Related Info | GIS data | Maps | Docs | Return to State Map

Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.26	0.39	0.48	0.65	0.81	0.93	0.99	1.12	1.27	1.41	1.55	1.75	2.03	2.29	3.00	3.66	4.46	5.05
2	0.33	0.50	0.62	0.84	1.04	1.19	1.25	1.41	1.59	1.76	1.94	2.19	2.54	2.86	3.76	4.56	5.55	6.29
5	0.44	0.66	0.82	1.11	1.37	1.55	1.60	1.76	1.98	2.20	2.43	2.76	3.21	3.60	4.72	5.65	6.80	7.71
10	0.52	0.79	0.97	1.31	1.62	1.82	1.88	2.06	2.29	2.56	2.83	3.25	3.79	4.22	5.51	6.52	7.76	8.80
25	0.62	0.95	1.18	1.59	1.96	2.20	2.28	2.47	2.73	3.05	3.38	3.94	4.63	5.12	6.62	7.70	9.00	10.21
50	0.71	1.07	1.33	1.79	2.22	2.50	2.58	2.80	3.06	3.44	3.81	4.51	5.32	5.86	7.51	8.62	9.92	11.26
100	0.79	1.20	1.49	2.01	2.49	2.80	2.91	3.14	3.41	3.85	4.26	5.13	6.08	6.66	8.45	9.57	10.82	12.30
200	0.87	1.33	1.65	2.22	2.75	3.10	3.25	3.50	3.78	4.27	4.73	5.78	6.89	7.52	9.44	10.54	11.71	13.31
500	0.99	1.50	1.86	2.51	3.10	3.52	3.73	3.99	4.26	4.85	5.37	6.72	8.07	8.76	10.82	11.85	12.84	14.62
1000	1.07	1.63	2.02	2.73	3.37	3.84	4.10	4.40	4.65	5.30	5.87	7.48	9.05	9.77	11.93	12.87	13.68	15.58

* These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting forces estimates near zero to appear as zero.

* Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.29	0.44	0.55	0.73	0.91	1.04	1.11	1.26	1.42	1.54	1.70	1.93	2.24	2.52	3.29	3.98	4.82	5.47
2	0.37	0.57	0.70	0.95	1.17	1.34	1.40	1.57	1.77	1.93	2.13	2.41	2.80	3.14	4.12	4.96	6.02	6.83
5	0.49	0.74	0.92	1.24	1.54	1.73	1.79	1.97	2.20	2.41	2.66	3.04	3.54	3.95	5.18	6.14	7.37	8.36
10	0.58	0.88	1.09	1.47	1.82	2.03	2.10	2.30	2.55	2.81	3.10	3.57	4.17	4.64	6.04	7.09	8.40	9.54
25	0.70	1.06	1.31	1.77	2.19	2.45	2.54	2.75	3.03	3.36	3.70	4.34	5.11	5.64	7.28	8.40	9.77	11.11
50	0.79	1.20	1.49	2.01	2.48	2.77	2.88	3.12	3.41	3.79	4.20	4.99	5.90	6.48	8.28	9.42	10.79	12.29
100	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26	4.72	5.70	6.80	7.41	9.37	10.51	11.84	13.48
200	0.99	1.50	1.86	2.51	3.10	3.47	3.66	3.92	4.24	4.76	5.28	6.48	7.78	8.44	10.55	11.65	12.88	14.66
500	1.12	1.71	2.12	2.85	3.53	3.97	4.23	4.51	4.84	5.46	6.07	7.63	9.25	9.96	12.26	13.28	14.25	16.28
1000	1.23	1.87	2.32	3.12	3.87	4.38	4.71	5.01	5.33	6.02	6.72	8.59	10.52	11.26	13.69	14.57	15.31	17.51

* The **upper** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **greater** than.
** These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval.

Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

* Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

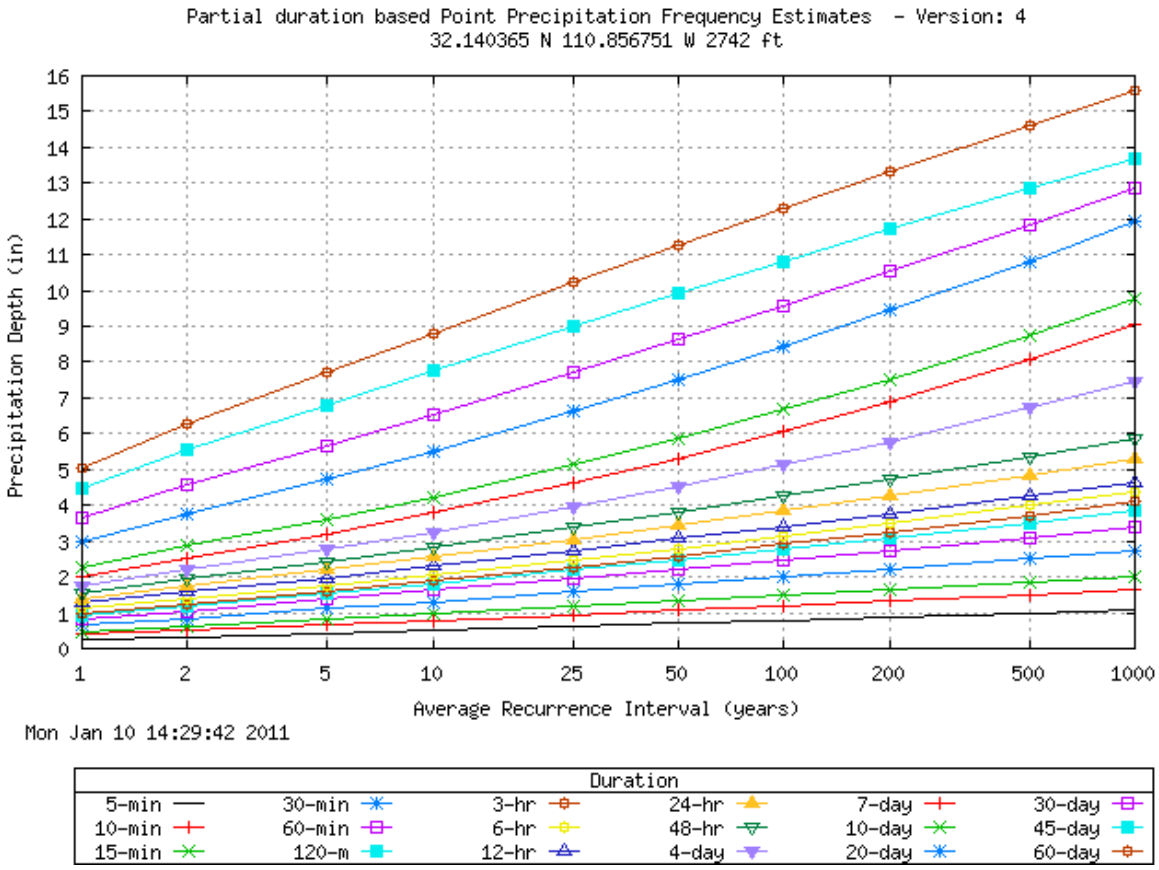
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.23	0.35	0.43	0.58	0.72	0.84	0.89	1.01	1.15	1.29	1.43	1.61	1.86	2.09	2.75	3.37	4.12	4.67
2	0.30	0.45	0.56	0.75	0.93	1.07	1.12	1.27	1.44	1.62	1.79	2.01	2.32	2.61	3.44	4.20	5.13	5.82
5	0.39	0.59	0.73	0.99	1.22	1.39	1.44	1.58	1.78	2.01	2.23	2.52	2.93	3.27	4.31	5.19	6.29	7.13
10	0.46	0.69	0.86	1.16	1.43	1.62	1.68	1.84	2.05	2.33	2.59	2.95	3.43	3.83	5.01	5.98	7.17	8.12
25	0.54	0.83	1.03	1.38	1.71	1.94	2.01	2.17	2.41	2.77	3.07	3.55	4.15	4.59	5.97	7.02	8.28	9.38

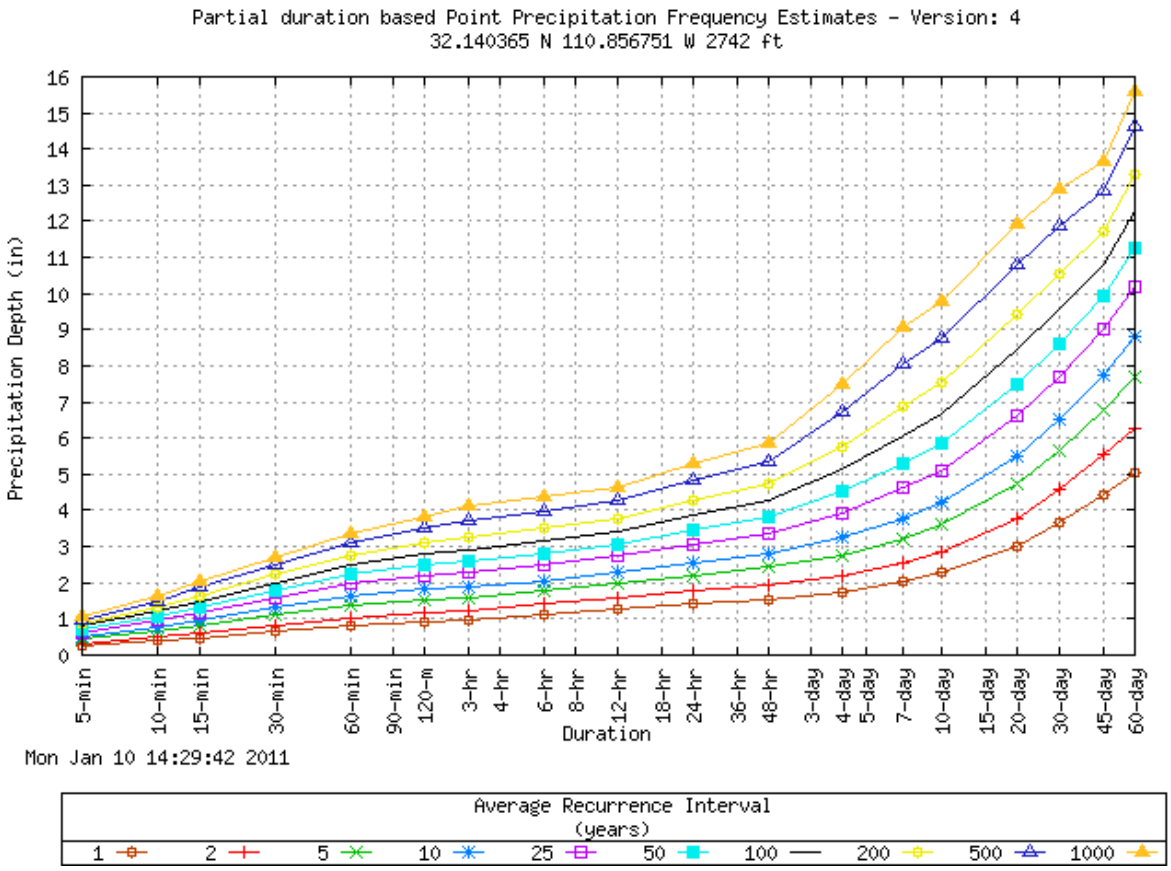
50	0.61	0.93	1.15	1.54	1.91	2.17	2.25	2.43	2.67	3.09	3.43	4.01	4.72	5.21	6.71	7.80	9.08	10.31
100	0.67	1.02	1.26	1.70	2.11	2.39	2.48	2.68	2.93	3.42	3.80	4.50	5.32	5.84	7.45	8.58	9.84	11.20
200	0.73	1.11	1.38	1.85	2.29	2.60	2.72	2.93	3.19	3.75	4.17	5.00	5.94	6.49	8.22	9.36	10.57	12.04
500	0.80	1.22	1.51	2.04	2.52	2.88	3.02	3.25	3.52	4.18	4.64	5.66	6.80	7.37	9.22	10.33	11.46	13.06
1000	0.85	1.30	1.61	2.17	2.68	3.08	3.24	3.50	3.76	4.51	5.00	6.18	7.48	8.06	9.99	11.05	12.10	13.78

* The **lower** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **less** than.
** These precipitation frequency estimates are based on a partial duration maxima series. **ARI** is the Average Recurrence Interval.

Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

Text version of tables





Related Information

Maps & Aerials

Click here to see topographic maps and aerial photographs available for this location from Microsoft Research Maps

Watershed/Streamflow Information

Click here to see watershed and streamflow information available for this location from the U.S. Environmental Protection Agency's site

Climate Data Sources

National Climatic Data Center (NCDC) database

Locate NCDC climate stations within:

+/-30 minutes or +/-1 degree of this location. Digital ASCII data can be obtained directly from **NCDC**.

Note: Precipitation frequency results are based on analysis of precipitation data from a variety of sources, but largely NCDC. The following links provide general information about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study, please refer to the matching documentation available at the PF Document page

Natural Resources Conservation Service's (NRCS) SNOTEL dataset

At present, there are more than 700 SNOTEL sites typically located in the mountainous regions of the Western U.S. that report daily and/or hourly precipitation, air temperture, snow water equivalent and snow depth data.

US Department of Commerce
National Oceanic and Atmospheric Administration

National Weather Service
Office of Hydrologic Development
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

EXISTING CONDITIONS HYDROLOGY

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E1 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	392	0.0128	.018

Length of Watercourse (Lc): 392 feet Mean Slope: 0.0128

Length to Cen. of Gravity (Lca): 196 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.6
10-year	0.50	2.3
25-year	0.70	3.3
50-year	0.90	4.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E2 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	544	0.0092	.018

Length of Watercourse (Lc): 544 feet Mean Slope: 0.0092

Length to Cen. of Gravity (Lca): 272 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.4
50-year	0.90	4.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E3 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	497	0.0060	.018

Length of Watercourse (Lc): 497 feet Mean Slope: 0.0060

Length to Cen. of Gravity (Lca): 249 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 5.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.5
25-year	0.70	3.5
50-year	0.90	4.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E4 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	497	0.0060	.018

Length of Watercourse (Lc): 497 feet Mean Slope: 0.0060

Length to Cen. of Gravity (Lca): 249 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 3.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	1.9
25-year	0.70	2.7
50-year	0.90	3.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E5 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	446	0.0067	.018

Length of Watercourse (Lc): 446 feet Mean Slope: 0.0067

Length to Cen. of Gravity (Lca): 223 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.5
10-year	0.50	2.2
25-year	0.70	3.1
50-year	0.90	3.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E6 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	490	0.0102	.018

Length of Watercourse (Lc): 490 feet Mean Slope: 0.0102

Length to Cen. of Gravity (Lca): 245 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.5
10-year	0.50	2.2
25-year	0.70	3.1
50-year	0.90	3.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E7 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	411	0.0097	.018

Length of Watercourse (Lc): 411 feet Mean Slope: 0.0097

Length to Cen. of Gravity (Lca): 205 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 3.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.3
10-year	0.50	1.8
25-year	0.70	2.6
50-year	0.90	3.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E8 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	400	0.0075	.018

Length of Watercourse (Lc): 400 feet Mean Slope: 0.0075

Length to Cen. of Gravity (Lca): 200 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	2.0
25-year	0.70	2.9
50-year	0.90	3.7

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E9 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	490	0.0061	.018

Length of Watercourse (Lc): 490 feet Mean Slope: 0.0061

Length to Cen. of Gravity (Lca): 245 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	2.0
25-year	0.70	2.8
50-year	0.90	3.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E10 Job #: 7PIM090302

Watershed Area: 0.2 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	221	0.0090	.018

Length of Watercourse (Lc): 221 feet Mean Slope: 0.0090

Length to Cen. of Gravity (Lca): 111 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 2.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.5
5-year	0.35	0.7
10-year	0.50	1.1
25-year	0.70	1.5
50-year	0.90	1.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E11 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.5	496	0.0071	.018

Length of Watercourse (Lc): 496 feet Mean Slope: 0.0071

Length to Cen. of Gravity (Lca): 248 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	65	84.	87.98	0.585
C	35	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.942

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.06 in/hr

PEAK DISCHARGE: 4.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.4
50-year	0.90	4.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E12 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.5	540	0.0083	.018

Length of Watercourse (Lc): 540 feet Mean Slope: 0.0083

Length to Cen. of Gravity (Lca): 270 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	90	84.	87.98	0.585
C	10	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.940

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.04 in/hr

PEAK DISCHARGE: 4.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.6
10-year	0.50	2.3
25-year	0.70	3.2
50-year	0.90	4.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E13 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	479	0.0083	.018

Length of Watercourse (Lc): 479 feet Mean Slope: 0.0083

Length to Cen. of Gravity (Lca): 240 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 7.2 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.8
5-year	0.35	2.5
10-year	0.50	3.6
25-year	0.70	5.0
50-year	0.90	6.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E14 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	527	0.0076	.018

Length of Watercourse (Lc): 527 feet Mean Slope: 0.0076

Length to Cen. of Gravity (Lca): 264 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 5.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.9
10-year	0.50	2.7
25-year	0.70	3.8
50-year	0.90	4.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E15 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	481	0.0083	.018

Length of Watercourse (Lc): 481 feet Mean Slope: 0.0083

Length to Cen. of Gravity (Lca): 240 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.5
10-year	0.50	2.1
25-year	0.70	2.9
50-year	0.90	3.7

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E16 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	565	0.0088	.018

Length of Watercourse (Lc): 565 feet Mean Slope: 0.0088

Length to Cen. of Gravity (Lca): 283 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 5.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.8
10-year	0.50	2.5
25-year	0.70	3.5
50-year	0.90	4.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E17 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	526	0.0076	.018

Length of Watercourse (Lc): 526 feet Mean Slope: 0.0076

Length to Cen. of Gravity (Lca): 263 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.3
50-year	0.90	4.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E18 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.5	214	0.0164	.018

Length of Watercourse (Lc): 214 feet Mean Slope: 0.0164

Length to Cen. of Gravity (Lca): 107 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 6.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.5
5-year	0.35	2.1
10-year	0.50	3.0
25-year	0.70	4.2
50-year	0.90	5.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E19 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	357	0.0042	.018

Length of Watercourse (Lc): 357 feet Mean Slope: 0.0042

Length to Cen. of Gravity (Lca): 178 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.1
10-year	0.50	1.6
25-year	0.70	2.2
50-year	0.90	2.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E20 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	557	0.0045	.018

Length of Watercourse (Lc): 557 feet Mean Slope: 0.0045

Length to Cen. of Gravity (Lca): 279 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.6
10-year	0.50	2.2
25-year	0.70	3.1
50-year	0.90	4.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E21 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	487	0.0041	.018

Length of Watercourse (Lc): 487 feet Mean Slope: 0.0041

Length to Cen. of Gravity (Lca): 244 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 5.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.4
5-year	0.35	1.9
10-year	0.50	2.7
25-year	0.70	3.8
50-year	0.90	4.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E22 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	443	0.0068	.018

Length of Watercourse (Lc): 443 feet Mean Slope: 0.0068

Length to Cen. of Gravity (Lca): 222 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.1
10-year	0.50	1.5
25-year	0.70	2.1
50-year	0.90	2.7

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E23 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	313	0.0064	.018

Length of Watercourse (Lc): 313 feet Mean Slope: 0.0064

Length to Cen. of Gravity (Lca): 157 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.2
10-year	0.50	1.7
25-year	0.70	2.4
50-year	0.90	3.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E24 Job #: 7PIM090302

Watershed Area: 0.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	204	0.0098	.018

Length of Watercourse (Lc): 204 feet Mean Slope: 0.0098

Length to Cen. of Gravity (Lca): 102 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 1.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.3
5-year	0.35	0.4
10-year	0.50	0.5
25-year	0.70	0.7
50-year	0.90	0.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E25 Job #: 7PIM090302

Watershed Area: 0.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	202	0.0099	.018

Length of Watercourse (Lc): 202 feet Mean Slope: 0.0099

Length to Cen. of Gravity (Lca): 101 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 0.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.2
5-year	0.35	0.2
10-year	0.50	0.4
25-year	0.70	0.5
50-year	0.90	0.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E26 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	551	0.0073	.018

Length of Watercourse (Lc): 551 feet Mean Slope: 0.0073

Length to Cen. of Gravity (Lca): 276 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 6.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.5
5-year	0.35	2.1
10-year	0.50	3.0
25-year	0.70	4.2
50-year	0.90	5.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E27 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	572	0.0070	.018

Length of Watercourse (Lc): 572 feet Mean Slope: 0.0070

Length to Cen. of Gravity (Lca): 286 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 5.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.4
5-year	0.35	2.0
10-year	0.50	2.8
25-year	0.70	4.0
50-year	0.90	5.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E28 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	468	0.0086	.018

Length of Watercourse (Lc): 468 feet Mean Slope: 0.0086

Length to Cen. of Gravity (Lca): 234 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.2
10-year	0.50	1.7
25-year	0.70	2.4
50-year	0.90	3.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E29 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	502	0.0080	.018

Length of Watercourse (Lc): 502 feet Mean Slope: 0.0080

Length to Cen. of Gravity (Lca): 251 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 5.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.9
10-year	0.50	2.7
25-year	0.70	3.8
50-year	0.90	4.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E30 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	577	0.0069	.018

Length of Watercourse (Lc): 577 feet Mean Slope: 0.0069

Length to Cen. of Gravity (Lca): 288 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	50	84.	87.98	0.585
C	50	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.943

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.07 in/hr

PEAK DISCHARGE: 5.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.4
5-year	0.35	2.0
10-year	0.50	2.8
25-year	0.70	3.9
50-year	0.90	5.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E31 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	571	0.0070	.018

Length of Watercourse (Lc): 571 feet Mean Slope: 0.0070

Length to Cen. of Gravity (Lca): 286 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	50	84.	87.98	0.585
C	50	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.943

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.07 in/hr

PEAK DISCHARGE: 4.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.6
10-year	0.50	2.2
25-year	0.70	3.1
50-year	0.90	4.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E32 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	325	0.0077	.018

Length of Watercourse (Lc): 325 feet Mean Slope: 0.0077

Length to Cen. of Gravity (Lca): 162 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	90	84.	87.98	0.585
C	10	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.940

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.04 in/hr

PEAK DISCHARGE: 3.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.1
10-year	0.50	1.6
25-year	0.70	2.2
50-year	0.90	2.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E33 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	323	0.0093	.018

Length of Watercourse (Lc): 323 feet Mean Slope: 0.0093

Length to Cen. of Gravity (Lca): 162 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	90	84.	87.98	0.585
C	10	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.940

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.04 in/hr

PEAK DISCHARGE: 6.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.7
5-year	0.35	2.4
10-year	0.50	3.4
25-year	0.70	4.7
50-year	0.90	6.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E34 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	339	0.0044	.018

Length of Watercourse (Lc): 339 feet Mean Slope: 0.0044

Length to Cen. of Gravity (Lca): 170 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	90	84.	87.98	0.585
C	10	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.940

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.04 in/hr

PEAK DISCHARGE: 7.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.8
5-year	0.35	2.5
10-year	0.50	3.6
25-year	0.70	5.1
50-year	0.90	6.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E35 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	484	0.0103	.018

Length of Watercourse (Lc): 484 feet Mean Slope: 0.0103

Length to Cen. of Gravity (Lca): 242 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.4
50-year	0.90	4.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E36 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	475	0.0105	.018

Length of Watercourse (Lc): 475 feet Mean Slope: 0.0105

Length to Cen. of Gravity (Lca): 237 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 3.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	1.9
25-year	0.70	2.7
50-year	0.90	3.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E37 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.0	513	0.0136	.018

Length of Watercourse (Lc): 513 feet Mean Slope: 0.0136

Length to Cen. of Gravity (Lca): 257 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.6
10-year	0.50	2.3
25-year	0.70	3.3
50-year	0.90	4.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E38 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.0	482	0.0145	.018

Length of Watercourse (Lc): 482 feet Mean Slope: 0.0145

Length to Cen. of Gravity (Lca): 241 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.2 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.5
10-year	0.50	2.1
25-year	0.70	2.9
50-year	0.90	3.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E39 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	523	0.0057	.018

Length of Watercourse (Lc): 523 feet Mean Slope: 0.0057

Length to Cen. of Gravity (Lca): 261 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 5.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.4
5-year	0.35	2.0
10-year	0.50	2.8
25-year	0.70	4.0
50-year	0.90	5.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E40 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	516	0.0058	.018

Length of Watercourse (Lc): 516 feet Mean Slope: 0.0058

Length to Cen. of Gravity (Lca): 258 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.2
10-year	0.50	1.7
25-year	0.70	2.4
50-year	0.90	3.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E41 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	383	0.0052	.018

Length of Watercourse (Lc): 383 feet Mean Slope: 0.0052

Length to Cen. of Gravity (Lca): 191 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.3
10-year	0.50	1.9
25-year	0.70	2.6
50-year	0.90	3.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E42 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	366	0.0055	.018

Length of Watercourse (Lc): 366 feet Mean Slope: 0.0055

Length to Cen. of Gravity (Lca): 183 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 2.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.7
5-year	0.35	0.9
10-year	0.50	1.3
25-year	0.70	1.8
50-year	0.90	2.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E43 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	361	0.0042	.018

Length of Watercourse (Lc): 361 feet Mean Slope: 0.0042

Length to Cen. of Gravity (Lca): 180 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.2
10-year	0.50	1.7
25-year	0.70	2.3
50-year	0.90	3.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E44 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	363	0.0041	.018

Length of Watercourse (Lc): 363 feet Mean Slope: 0.0041

Length to Cen. of Gravity (Lca): 182 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 2.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.7
5-year	0.35	1.0
10-year	0.50	1.5
25-year	0.70	2.1
50-year	0.90	2.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E45 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	414	0.0036	.018

Length of Watercourse (Lc): 414 feet Mean Slope: 0.0036

Length to Cen. of Gravity (Lca): 207 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 7.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.7
5-year	0.35	2.4
10-year	0.50	3.5
25-year	0.70	4.9
50-year	0.90	6.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E46 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	360	0.0111	.018

Length of Watercourse (Lc): 360 feet Mean Slope: 0.0111

Length to Cen. of Gravity (Lca): 180 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 7.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.9
5-year	0.35	2.6
10-year	0.50	3.7
25-year	0.70	5.2
50-year	0.90	6.7

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E46A Job #: 7PIM090302

Watershed Area: 0.2 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.0	200	0.0300	.018

Length of Watercourse (Lc): 200 feet Mean Slope: 0.0300

Length to Cen. of Gravity (Lca): 100 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 1.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.5
5-year	0.35	0.6
10-year	0.50	0.9
25-year	0.70	1.3
50-year	0.90	1.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E47 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	9.0	403	0.0224	.018

Length of Watercourse (Lc): 403 feet Mean Slope: 0.0224

Length to Cen. of Gravity (Lca): 201 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	2.0
25-year	0.70	2.8
50-year	0.90	3.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E48 Job #: 7PIM090302

Watershed Area: 0.2 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	273	0.0183	.018

Length of Watercourse (Lc): 273 feet Mean Slope: 0.0183

Length to Cen. of Gravity (Lca): 136 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 2.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.5
5-year	0.35	0.7
10-year	0.50	1.0
25-year	0.70	1.4
50-year	0.90	1.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E49 Job #: 7PIM090302

Watershed Area: 0.2 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	252	0.0099	.018

Length of Watercourse (Lc): 252 feet Mean Slope: 0.0099

Length to Cen. of Gravity (Lca): 126 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	25	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.941

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.05 in/hr

PEAK DISCHARGE: 1.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.4
5-year	0.35	0.6
10-year	0.50	0.9
25-year	0.70	1.2
50-year	0.90	1.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E50 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	281	0.0089	.018

Length of Watercourse (Lc): 281 feet Mean Slope: 0.0089

Length to Cen. of Gravity (Lca): 140 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	25	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.941

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.05 in/hr

PEAK DISCHARGE: 3.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.1
10-year	0.50	1.6
25-year	0.70	2.2
50-year	0.90	2.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E51 Job #: 7PIM090302

Watershed Area: 0.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	290	0.0052	.018

Length of Watercourse (Lc): 290 feet Mean Slope: 0.0052

Length to Cen. of Gravity (Lca): 145 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 1.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.3
5-year	0.35	0.4
10-year	0.50	0.6
25-year	0.70	0.8
50-year	0.90	1.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E52 Job #: 7PIM090302

Watershed Area: 0.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	311	0.0048	.018

Length of Watercourse (Lc): 311 feet Mean Slope: 0.0048

Length to Cen. of Gravity (Lca): 155 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 1.2 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.3
5-year	0.35	0.4
10-year	0.50	0.6
25-year	0.70	0.8
50-year	0.90	1.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E53 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.3	499	0.0146	.018

Length of Watercourse (Lc): 499 feet Mean Slope: 0.0146

Length to Cen. of Gravity (Lca): 250 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	25	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.941

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.05 in/hr

PEAK DISCHARGE: 5.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.4
5-year	0.35	2.0
10-year	0.50	2.8
25-year	0.70	4.0
50-year	0.90	5.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E54 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.0	501	0.0140	.018

Length of Watercourse (Lc): 501 feet Mean Slope: 0.0140

Length to Cen. of Gravity (Lca): 251 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	90.	92.56	0.722
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 3.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.2
10-year	0.50	1.7
25-year	0.70	2.4
50-year	0.90	3.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E55 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	16.0	593	0.0270	.018

Length of Watercourse (Lc): 593 feet Mean Slope: 0.0270

Length to Cen. of Gravity (Lca): 297 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 5.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.9
10-year	0.50	2.7
25-year	0.70	3.7
50-year	0.90	4.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E56 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	16.5	598	0.0276	.018

Length of Watercourse (Lc): 598 feet Mean Slope: 0.0276

Length to Cen. of Gravity (Lca): 299 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 6.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.5
5-year	0.35	2.1
10-year	0.50	3.0
25-year	0.70	4.2
50-year	0.90	5.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E57 Job #: 7PIM090302

Watershed Area: 0.8 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	10.0	602	0.0166	.018

Length of Watercourse (Lc): 602 feet Mean Slope: 0.0166

Length to Cen. of Gravity (Lca): 301 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 8.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.1
5-year	0.35	2.9
10-year	0.50	4.2
25-year	0.70	5.9
50-year	0.90	7.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E58 Job #: 7PIM090302

Watershed Area: 1.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	10.5	592	0.0177	.018

Length of Watercourse (Lc): 592 feet Mean Slope: 0.0177

Length to Cen. of Gravity (Lca): 296 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 12 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.9
5-year	0.35	4.1
10-year	0.50	5.9
25-year	0.70	8.2
50-year	0.90	11

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E59 Job #: 7PIM090302

Watershed Area: 0.2 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	360	0.0042	.018

Length of Watercourse (Lc): 360 feet Mean Slope: 0.0042

Length to Cen. of Gravity (Lca): 180 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 2.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.6
5-year	0.35	0.9
10-year	0.50	1.2
25-year	0.70	1.7
50-year	0.90	2.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E60 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	349	0.0043	.018

Length of Watercourse (Lc): 349 feet Mean Slope: 0.0043

Length to Cen. of Gravity (Lca): 175 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	1.9
25-year	0.70	2.7
50-year	0.90	3.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E61 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	399	0.0063	.018

Length of Watercourse (Lc): 399 feet Mean Slope: 0.0063

Length to Cen. of Gravity (Lca): 200 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.1
10-year	0.50	1.6
25-year	0.70	2.3
50-year	0.90	2.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E62 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	398	0.0063	.018

Length of Watercourse (Lc): 398 feet Mean Slope: 0.0063

Length to Cen. of Gravity (Lca): 199 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.1
10-year	0.50	1.6
25-year	0.70	2.3
50-year	0.90	2.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E63 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	378	0.0066	.018

Length of Watercourse (Lc): 378 feet Mean Slope: 0.0066

Length to Cen. of Gravity (Lca): 198 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	0	.	.	0.000
D	25	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.942

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.06 in/hr

PEAK DISCHARGE: 4.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	2.0
25-year	0.70	2.8
50-year	0.90	3.7

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E64 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	378	0.0053	.018

Length of Watercourse (Lc): 378 feet Mean Slope: 0.0053

Length to Cen. of Gravity (Lca): 198 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	0	.	.	0.000
D	25	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.942

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.06 in/hr

PEAK DISCHARGE: 2.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.6
5-year	0.35	0.9
10-year	0.50	1.3
25-year	0.70	1.8
50-year	0.90	2.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E65 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.5	630	0.0119	.018

Length of Watercourse (Lc): 630 feet Mean Slope: 0.0119

Length to Cen. of Gravity (Lca): 315 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	0	.	.	0.000
D	25	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.942

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.06 in/hr

PEAK DISCHARGE: 6.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.7
5-year	0.35	2.4
10-year	0.50	3.4
25-year	0.70	4.8
50-year	0.90	6.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E66 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	8.0	625	0.0128	.018

Length of Watercourse (Lc): 625 feet Mean Slope: 0.0128

Length to Cen. of Gravity (Lca): 313 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	0	.	.	0.000
D	25	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.942

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.06 in/hr

PEAK DISCHARGE: 6.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.5
5-year	0.35	2.1
10-year	0.50	3.0
25-year	0.70	4.3
50-year	0.90	5.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E67 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	407	0.0061	.018

Length of Watercourse (Lc): 407 feet Mean Slope: 0.0061

Length to Cen. of Gravity (Lca): 204 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.6
10-year	0.50	2.4
25-year	0.70	3.3
50-year	0.90	4.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E68 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	414	0.0060	.018

Length of Watercourse (Lc): 414 feet Mean Slope: 0.0060

Length to Cen. of Gravity (Lca): 207 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.1
10-year	0.50	1.5
25-year	0.70	2.1
50-year	0.90	2.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E69 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.5	687	0.0080	.018

Length of Watercourse (Lc): 687 feet Mean Slope: 0.0080

Length to Cen. of Gravity (Lca): 344 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 7.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.8
5-year	0.35	2.6
10-year	0.50	3.7
25-year	0.70	5.2
50-year	0.90	6.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E70 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.5	689	0.0080	.018

Length of Watercourse (Lc): 689 feet Mean Slope: 0.0080

Length to Cen. of Gravity (Lca): 345 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 6.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.7
5-year	0.35	2.3
10-year	0.50	3.3
25-year	0.70	4.7
50-year	0.90	6.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E71 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.5	346	0.0101	.018

Length of Watercourse (Lc): 346 feet Mean Slope: 0.0101

Length to Cen. of Gravity (Lca): 173 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	1.9
25-year	0.70	2.7
50-year	0.90	3.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E72 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	348	0.0086	.018

Length of Watercourse (Lc): 348 feet Mean Slope: 0.0086

Length to Cen. of Gravity (Lca): 174 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.1
10-year	0.50	1.6
25-year	0.70	2.3
50-year	0.90	2.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E73 Job #: 7PIM090302

Watershed Area: 0.9 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.5	759	0.0086	.018

Length of Watercourse (Lc): 759 feet Mean Slope: 0.0086

Length to Cen. of Gravity (Lca): 380 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 9.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.3
5-year	0.35	3.3
10-year	0.50	4.7
25-year	0.70	6.5
50-year	0.90	8.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E74 Job #: 7PIM090302

Watershed Area: 0.9 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.5	749	0.0087	.018

Length of Watercourse (Lc): 749 feet Mean Slope: 0.0087

Length to Cen. of Gravity (Lca): 375 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	25	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.941

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.05 in/hr

PEAK DISCHARGE: 9.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.4
5-year	0.35	3.4
10-year	0.50	4.8
25-year	0.70	6.7
50-year	0.90	8.7

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E75 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	435	0.0069	.018

Length of Watercourse (Lc): 435 feet Mean Slope: 0.0069

Length to Cen. of Gravity (Lca): 218 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.2
10-year	0.50	1.7
25-year	0.70	2.4
50-year	0.90	3.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E76 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	443	0.0068	.018

Length of Watercourse (Lc): 443 feet Mean Slope: 0.0068

Length to Cen. of Gravity (Lca): 222 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.5
10-year	0.50	2.2
25-year	0.70	3.1
50-year	0.90	4.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E77 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	491	0.0051	.018

Length of Watercourse (Lc): 491 feet Mean Slope: 0.0051

Length to Cen. of Gravity (Lca): 246 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.5
10-year	0.50	2.2
25-year	0.70	3.1
50-year	0.90	4.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E78 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	500	0.0050	.018

Length of Watercourse (Lc): 500 feet Mean Slope: 0.0050

Length to Cen. of Gravity (Lca): 250 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.6
10-year	0.50	2.2
25-year	0.70	3.1
50-year	0.90	4.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E79 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	224	0.0089	.018

Length of Watercourse (Lc): 224 feet Mean Slope: 0.0089

Length to Cen. of Gravity (Lca): 112 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.1
10-year	0.50	1.5
25-year	0.70	2.1
50-year	0.90	2.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E80 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	225	0.0089	.018

Length of Watercourse (Lc): 225 feet Mean Slope: 0.0089

Length to Cen. of Gravity (Lca): 113 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.3
10-year	0.50	1.8
25-year	0.70	2.5
50-year	0.90	3.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E81 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	321	0.0062	.018

Length of Watercourse (Lc): 321 feet Mean Slope: 0.0062

Length to Cen. of Gravity (Lca): 161 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 2.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.7
5-year	0.35	1.0
10-year	0.50	1.4
25-year	0.70	2.0
50-year	0.90	2.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E82 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	330	0.0045	.018

Length of Watercourse (Lc): 330 feet Mean Slope: 0.0045

Length to Cen. of Gravity (Lca): 165 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 2.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.7
5-year	0.35	1.0
10-year	0.50	1.4
25-year	0.70	2.0
50-year	0.90	2.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E83 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.5	443	0.0079	.018

Length of Watercourse (Lc): 443 feet Mean Slope: 0.0079

Length to Cen. of Gravity (Lca): 222 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 5.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.8
10-year	0.50	2.6
25-year	0.70	3.6
50-year	0.90	4.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E84 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.5	430	0.0081	.018

Length of Watercourse (Lc): 430 feet Mean Slope: 0.0081

Length to Cen. of Gravity (Lca): 215 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.2
10-year	0.50	1.7
25-year	0.70	2.4
50-year	0.90	3.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E85 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.0	715	0.0084	.018

Length of Watercourse (Lc): 715 feet Mean Slope: 0.0084

Length to Cen. of Gravity (Lca): 358 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 7.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.9
5-year	0.35	2.6
10-year	0.50	3.7
25-year	0.70	5.2
50-year	0.90	6.7

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E86 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.0	718	0.0084	.018

Length of Watercourse (Lc): 718 feet Mean Slope: 0.0084

Length to Cen. of Gravity (Lca): 359 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 6.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.7
5-year	0.35	2.4
10-year	0.50	3.4
25-year	0.70	4.7
50-year	0.90	6.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E87 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	482	0.0083	.018

Length of Watercourse (Lc): 482 feet Mean Slope: 0.0083

Length to Cen. of Gravity (Lca): 241 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.2 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.5
10-year	0.50	2.1
25-year	0.70	2.9
50-year	0.90	3.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E88 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	486	0.0082	.018

Length of Watercourse (Lc): 486 feet Mean Slope: 0.0082

Length to Cen. of Gravity (Lca): 243 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	2.0
25-year	0.70	2.9
50-year	0.90	3.7

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE1 Job #: 7PIM090302

Watershed Area: 5.2 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	8.0	724	0.0110	.060

Length of Watercourse (Lc): 724 feet Mean Slope: 0.0110

Length to Cen. of Gravity (Lca): 362 feet Weighted Basin Fac.: 0.060

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.675

Time of Concentration: 9.3 min

Rainfall Intensity (i) @ Tc: 8.31 in/hr

Runoff Supply Rate (q) @ Tc: 5.61 in/hr

PEAK DISCHARGE: 29 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	2.9
5-year	0.23	6.8
10-year	0.35	10
25-year	0.55	16
50-year	0.75	22

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE2 Job #: 7PIM090302

Watershed Area: 2.9 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	10.0	870	0.0115	.060

Length of Watercourse (Lc): 870 feet Mean Slope: 0.0115

Length to Cen. of Gravity (Lca): 435 feet Weighted Basin Fac.: 0.060

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.675

Time of Concentration: 10.4 min

Rainfall Intensity (i) @ Tc: 7.95 in/hr

Runoff Supply Rate (q) @ Tc: 5.37 in/hr

PEAK DISCHARGE: 16 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	1.6
5-year	0.23	3.6
10-year	0.35	5.5
25-year	0.55	8.7
50-year	0.75	12

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE3 Job #: 7PIM090302

Watershed Area: 10.0 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	17.0	1,514	0.0112	.060

Length of Watercourse (Lc): 1,514 feet Mean Slope: 0.0112

Length to Cen. of Gravity (Lca): 747 feet Weighted Basin Fac.: 0.060

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.675

Time of Concentration: 15.7 min

Rainfall Intensity (i) @ Tc: 6.52 in/hr

Runoff Supply Rate (q) @ Tc: 4.40 in/hr

PEAK DISCHARGE: 44 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	4.4
5-year	0.23	10
10-year	0.35	16
25-year	0.55	24
50-year	0.75	33

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE4 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.0	602	0.0100	.035

Length of Watercourse (Lc): 602 feet Mean Slope: 0.0100

Length to Cen. of Gravity (Lca): 301 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.675

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 7.21 in/hr

PEAK DISCHARGE: 4.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	0.4
5-year	0.23	1.0
10-year	0.35	1.5
25-year	0.55	2.4
50-year	0.75	3.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE5 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	374	0.0080	.035

Length of Watercourse (Lc): 374 feet Mean Slope: 0.0080

Length to Cen. of Gravity (Lca): 187 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	82.	86.66	0.549
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.549

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 5.87 in/hr

PEAK DISCHARGE: 2.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	0.3
5-year	0.23	0.6
10-year	0.35	0.9
25-year	0.55	1.4
50-year	0.75	2.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE6 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	439	0.0091	.035

Length of Watercourse (Lc): 439 feet Mean Slope: 0.0091

Length to Cen. of Gravity (Lca): 219 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	82.	86.66	0.549
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.549

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 5.87 in/hr

PEAK DISCHARGE: 3.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	0.3
5-year	0.23	0.8
10-year	0.35	1.2
25-year	0.55	1.9
50-year	0.75	2.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE7 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	512	0.0098	.035

Length of Watercourse (Lc): 512 feet Mean Slope: 0.0098

Length to Cen. of Gravity (Lca): 256 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	82.	86.66	0.549
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.549

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 5.87 in/hr

PEAK DISCHARGE: 3.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	0.4
5-year	0.23	0.9
10-year	0.35	1.3
25-year	0.55	2.0
50-year	0.75	2.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE8 Job #: 7PIM090302

Watershed Area: 33.2 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	31.0	3,019	0.0103	.060

Length of Watercourse (Lc): 3,019 feet Mean Slope: 0.0103

Length to Cen. of Gravity (Lca): 1,510 feet Weighted Basin Fac.: 0.060

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	80	82.	86.66	0.549
C	20	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.574

Time of Concentration: 30.8 min

Rainfall Intensity (i) @ Tc: 4.43 in/hr

Runoff Supply Rate (q) @ Tc: 2.54 in/hr

PEAK DISCHARGE: 85 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	8.5
5-year	0.23	20
10-year	0.35	30
25-year	0.55	47
50-year	0.75	64

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE9 Job #: 7PIM090302

Watershed Area: 6.7 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	8.0	959	0.0083	.035

Length of Watercourse (Lc): 959 feet Mean Slope: 0.0083

Length to Cen. of Gravity (Lca): 479 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	82.	86.66	0.549
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.549

Time of Concentration: 7.5 min

Rainfall Intensity (i) @ Tc: 8.94 in/hr

Runoff Supply Rate (q) @ Tc: 4.91 in/hr

PEAK DISCHARGE: 33 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	3.3
5-year	0.23	7.7
10-year	0.35	12
25-year	0.55	18
50-year	0.75	25

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE10 Job #: 7PIM090302

Watershed Area: 3.1 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.0	694	0.0101	.035

Length of Watercourse (Lc): 694 feet Mean Slope: 0.0101

Length to Cen. of Gravity (Lca): 347 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	82.	86.66	0.549
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.549

Time of Concentration: 5.5 min

Rainfall Intensity (i) @ Tc: 10.24 in/hr

Runoff Supply Rate (q) @ Tc: 5.63 in/hr

PEAK DISCHARGE: 18 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	1.8
5-year	0.23	4.0
10-year	0.35	6.2
25-year	0.55	9.7
50-year	0.75	13

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE11 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	336	0.0149	.035

Length of Watercourse (Lc): 336 feet Mean Slope: 0.0149

Length to Cen. of Gravity (Lca): 168 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.675

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 7.21 in/hr

PEAK DISCHARGE: 5.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	0.5
5-year	0.23	1.2
10-year	0.35	1.9
25-year	0.55	2.9
50-year	0.75	4.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE12 Job #: 7PIM090302

Watershed Area: 6.6 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	10.0	809	0.0124	.035

Length of Watercourse (Lc): 809 feet Mean Slope: 0.0124

Length to Cen. of Gravity (Lca): 405 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	50	82.	86.66	0.549
C	0	.	.	0.000
D	50	91.	93.37	0.748
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.649

Time of Concentration: 5.1 min

Rainfall Intensity (i) @ Tc: 10.58 in/hr

Runoff Supply Rate (q) @ Tc: 6.86 in/hr

PEAK DISCHARGE: 46 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	4.6
5-year	0.23	11
10-year	0.35	16
25-year	0.55	25
50-year	0.75	34

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: OE13 Job #: 7PIM090302

Watershed Area: 10.2 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	15.0	958	0.0157	.035
2	9.0	871	0.0103	.035

Length of Watercourse (Lc): 1,829 feet Mean Slope: 0.0127

Length to Cen. of Gravity (Lca): 915 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	25	82.	86.66	0.549
C	0	.	.	0.000
D	75	91.	93.37	0.748
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.699

Time of Concentration: 8.7 min

Rainfall Intensity (i) @ Tc: 8.48 in/hr

Runoff Supply Rate (q) @ Tc: 5.93 in/hr

PEAK DISCHARGE: 61 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	6.1
5-year	0.23	14
10-year	0.35	21
25-year	0.55	34
50-year	0.75	46

PC-Hydro, Ver 5.4.2

PROPOSED CONDITIONS HYDROLOGY

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E1 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	392	0.0128	.018

Length of Watercourse (Lc): 392 feet Mean Slope: 0.0128

Length to Cen. of Gravity (Lca): 196 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.6
10-year	0.50	2.3
25-year	0.70	3.3
50-year	0.90	4.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E2 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	544	0.0092	.018

Length of Watercourse (Lc): 544 feet Mean Slope: 0.0092

Length to Cen. of Gravity (Lca): 272 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.4
50-year	0.90	4.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E3 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	497	0.0060	.018

Length of Watercourse (Lc): 497 feet Mean Slope: 0.0060

Length to Cen. of Gravity (Lca): 249 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 5.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.5
25-year	0.70	3.5
50-year	0.90	4.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E4 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	497	0.0060	.018

Length of Watercourse (Lc): 497 feet Mean Slope: 0.0060

Length to Cen. of Gravity (Lca): 249 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 3.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	1.9
25-year	0.70	2.7
50-year	0.90	3.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E5 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	446	0.0067	.018

Length of Watercourse (Lc): 446 feet Mean Slope: 0.0067

Length to Cen. of Gravity (Lca): 223 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.5
10-year	0.50	2.2
25-year	0.70	3.1
50-year	0.90	3.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E6 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	490	0.0102	.018

Length of Watercourse (Lc): 490 feet Mean Slope: 0.0102

Length to Cen. of Gravity (Lca): 245 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.5
10-year	0.50	2.2
25-year	0.70	3.1
50-year	0.90	3.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E7 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	411	0.0097	.018

Length of Watercourse (Lc): 411 feet Mean Slope: 0.0097

Length to Cen. of Gravity (Lca): 205 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 3.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.3
10-year	0.50	1.8
25-year	0.70	2.6
50-year	0.90	3.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E8 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	400	0.0075	.018

Length of Watercourse (Lc): 400 feet Mean Slope: 0.0075

Length to Cen. of Gravity (Lca): 200 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	2.0
25-year	0.70	2.9
50-year	0.90	3.7

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E9 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	490	0.0061	.018

Length of Watercourse (Lc): 490 feet Mean Slope: 0.0061

Length to Cen. of Gravity (Lca): 245 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	2.0
25-year	0.70	2.8
50-year	0.90	3.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E10 Job #: 7PIM090302

Watershed Area: 0.2 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	221	0.0090	.018

Length of Watercourse (Lc): 221 feet Mean Slope: 0.0090

Length to Cen. of Gravity (Lca): 111 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 2.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.5
5-year	0.35	0.7
10-year	0.50	1.1
25-year	0.70	1.5
50-year	0.90	1.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E11 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.5	496	0.0071	.018

Length of Watercourse (Lc): 496 feet Mean Slope: 0.0071

Length to Cen. of Gravity (Lca): 248 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	65	84.	87.98	0.585
C	35	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.942

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.06 in/hr

PEAK DISCHARGE: 4.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.4
50-year	0.90	4.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E12 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.5	540	0.0083	.018

Length of Watercourse (Lc): 540 feet Mean Slope: 0.0083

Length to Cen. of Gravity (Lca): 270 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	90	84.	87.98	0.585
C	10	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.940

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.04 in/hr

PEAK DISCHARGE: 4.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.6
10-year	0.50	2.3
25-year	0.70	3.2
50-year	0.90	4.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E13 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	479	0.0083	.018

Length of Watercourse (Lc): 479 feet Mean Slope: 0.0083

Length to Cen. of Gravity (Lca): 240 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 7.2 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.8
5-year	0.35	2.5
10-year	0.50	3.6
25-year	0.70	5.0
50-year	0.90	6.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E14 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	527	0.0076	.018

Length of Watercourse (Lc): 527 feet Mean Slope: 0.0076

Length to Cen. of Gravity (Lca): 264 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 5.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.9
10-year	0.50	2.7
25-year	0.70	3.8
50-year	0.90	4.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E15 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	481	0.0083	.018

Length of Watercourse (Lc): 481 feet Mean Slope: 0.0083

Length to Cen. of Gravity (Lca): 240 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.5
10-year	0.50	2.1
25-year	0.70	2.9
50-year	0.90	3.7

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E16 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	565	0.0088	.018

Length of Watercourse (Lc): 565 feet Mean Slope: 0.0088

Length to Cen. of Gravity (Lca): 283 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 5.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.8
10-year	0.50	2.5
25-year	0.70	3.5
50-year	0.90	4.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E17 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	526	0.0076	.018

Length of Watercourse (Lc): 526 feet Mean Slope: 0.0076

Length to Cen. of Gravity (Lca): 263 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.3
50-year	0.90	4.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E18 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.5	214	0.0164	.018

Length of Watercourse (Lc): 214 feet Mean Slope: 0.0164

Length to Cen. of Gravity (Lca): 107 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 6.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.5
5-year	0.35	2.1
10-year	0.50	3.0
25-year	0.70	4.2
50-year	0.90	5.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E19 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	357	0.0042	.018

Length of Watercourse (Lc): 357 feet Mean Slope: 0.0042

Length to Cen. of Gravity (Lca): 178 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.8
5-year	0.35	1.1
10-year	0.50	1.6
25-year	0.70	2.2
50-year	0.90	2.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E20 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	557	0.0045	.018

Length of Watercourse (Lc): 557 feet Mean Slope: 0.0045

Length to Cen. of Gravity (Lca): 279 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.6
10-year	0.50	2.3
25-year	0.70	3.2
50-year	0.90	4.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D21 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	487	0.0041	.018

Length of Watercourse (Lc): 487 feet Mean Slope: 0.0041

Length to Cen. of Gravity (Lca): 244 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 5.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.4
5-year	0.35	2.0
10-year	0.50	2.9
25-year	0.70	4.0
50-year	0.90	5.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D22 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	443	0.0068	.018

Length of Watercourse (Lc): 443 feet Mean Slope: 0.0068

Length to Cen. of Gravity (Lca): 222 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	2.0
25-year	0.70	2.8
50-year	0.90	3.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D23 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	313	0.0064	.018

Length of Watercourse (Lc): 313 feet Mean Slope: 0.0064

Length to Cen. of Gravity (Lca): 157 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.2 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.5
10-year	0.50	2.1
25-year	0.70	3.0
50-year	0.90	3.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D24 Job #: 7PIM090302

Watershed Area: 0.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	204	0.0098	.018

Length of Watercourse (Lc): 204 feet Mean Slope: 0.0098

Length to Cen. of Gravity (Lca): 102 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 1.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.3
5-year	0.35	0.4
10-year	0.50	0.5
25-year	0.70	0.7
50-year	0.90	0.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D25 Job #: 7PIM090302

Watershed Area: 0.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	202	0.0099	.018

Length of Watercourse (Lc): 202 feet Mean Slope: 0.0099

Length to Cen. of Gravity (Lca): 101 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 0.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.2
5-year	0.35	0.2
10-year	0.50	0.4
25-year	0.70	0.5
50-year	0.90	0.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D26 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	551	0.0073	.018

Length of Watercourse (Lc): 551 feet Mean Slope: 0.0073

Length to Cen. of Gravity (Lca): 276 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 7.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.8
5-year	0.35	2.6
10-year	0.50	3.7
25-year	0.70	5.2
50-year	0.90	6.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D27 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	572	0.0070	.018

Length of Watercourse (Lc): 572 feet Mean Slope: 0.0070

Length to Cen. of Gravity (Lca): 286 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 7.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.8
5-year	0.35	2.5
10-year	0.50	3.5
25-year	0.70	5.0
50-year	0.90	6.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D28 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	468	0.0086	.018

Length of Watercourse (Lc): 468 feet Mean Slope: 0.0086

Length to Cen. of Gravity (Lca): 234 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.4
50-year	0.90	4.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D29 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	502	0.0080	.018

Length of Watercourse (Lc): 502 feet Mean Slope: 0.0080

Length to Cen. of Gravity (Lca): 251 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 6.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.7
5-year	0.35	2.3
10-year	0.50	3.3
25-year	0.70	4.7
50-year	0.90	6.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D30 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	577	0.0069	.018

Length of Watercourse (Lc): 577 feet Mean Slope: 0.0069

Length to Cen. of Gravity (Lca): 288 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	50	84.	87.98	0.585
C	50	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.943

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.07 in/hr

PEAK DISCHARGE: 7.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.8
5-year	0.35	2.5
10-year	0.50	3.6
25-year	0.70	5.0
50-year	0.90	6.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D31 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	571	0.0070	.018

Length of Watercourse (Lc): 571 feet Mean Slope: 0.0070

Length to Cen. of Gravity (Lca): 286 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	50	84.	87.98	0.585
C	50	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.943

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.07 in/hr

PEAK DISCHARGE: 6.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.5
5-year	0.35	2.1
10-year	0.50	3.0
25-year	0.70	4.3
50-year	0.90	5.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D32 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	325	0.0077	.018

Length of Watercourse (Lc): 325 feet Mean Slope: 0.0077

Length to Cen. of Gravity (Lca): 162 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	90	84.	87.98	0.585
C	10	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.940

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.04 in/hr

PEAK DISCHARGE: 3.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	2.0
25-year	0.70	2.8
50-year	0.90	3.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D33 Job #: 7PIM090302

Watershed Area: 0.9 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	323	0.0093	.018

Length of Watercourse (Lc): 323 feet Mean Slope: 0.0093

Length to Cen. of Gravity (Lca): 162 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	90	84.	87.98	0.585
C	10	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.940

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.04 in/hr

PEAK DISCHARGE: 9.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.3
5-year	0.35	3.2
10-year	0.50	4.5
25-year	0.70	6.3
50-year	0.90	8.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D34 Job #: 7PIM090302

Watershed Area: 0.8 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	339	0.0044	.018

Length of Watercourse (Lc): 339 feet Mean Slope: 0.0044

Length to Cen. of Gravity (Lca): 170 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	90	84.	87.98	0.585
C	10	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.940

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.04 in/hr

PEAK DISCHARGE: 8.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.1
5-year	0.35	2.9
10-year	0.50	4.1
25-year	0.70	5.8
50-year	0.90	7.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D35 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	484	0.0103	.018

Length of Watercourse (Lc): 484 feet Mean Slope: 0.0103

Length to Cen. of Gravity (Lca): 242 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 6.2 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.6
5-year	0.35	2.2
10-year	0.50	3.1
25-year	0.70	4.3
50-year	0.90	5.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D36 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	475	0.0105	.018

Length of Watercourse (Lc): 475 feet Mean Slope: 0.0105

Length to Cen. of Gravity (Lca): 237 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 5.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.9
10-year	0.50	2.7
25-year	0.70	3.8
50-year	0.90	4.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D37 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.0	513	0.0136	.018

Length of Watercourse (Lc): 513 feet Mean Slope: 0.0136

Length to Cen. of Gravity (Lca): 257 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 6.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.5
5-year	0.35	2.1
10-year	0.50	3.0
25-year	0.70	4.2
50-year	0.90	5.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D38 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.0	482	0.0145	.018

Length of Watercourse (Lc): 482 feet Mean Slope: 0.0145

Length to Cen. of Gravity (Lca): 241 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 5.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.4
5-year	0.35	2.0
10-year	0.50	2.8
25-year	0.70	3.9
50-year	0.90	5.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D39 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	523	0.0057	.018

Length of Watercourse (Lc): 523 feet Mean Slope: 0.0057

Length to Cen. of Gravity (Lca): 261 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 7.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.7
5-year	0.35	2.4
10-year	0.50	3.5
25-year	0.70	4.9
50-year	0.90	6.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D40 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	516	0.0058	.018

Length of Watercourse (Lc): 516 feet Mean Slope: 0.0058

Length to Cen. of Gravity (Lca): 258 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.4
50-year	0.90	4.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D41 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	383	0.0052	.018

Length of Watercourse (Lc): 383 feet Mean Slope: 0.0052

Length to Cen. of Gravity (Lca): 191 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.4
50-year	0.90	4.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D42 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	366	0.0055	.018

Length of Watercourse (Lc): 366 feet Mean Slope: 0.0055

Length to Cen. of Gravity (Lca): 183 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.3
10-year	0.50	1.9
25-year	0.70	2.6
50-year	0.90	3.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D43 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	361	0.0042	.018

Length of Watercourse (Lc): 361 feet Mean Slope: 0.0042

Length to Cen. of Gravity (Lca): 180 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 4.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.5
10-year	0.50	2.2
25-year	0.70	3.0
50-year	0.90	3.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D44 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	363	0.0041	.018

Length of Watercourse (Lc): 363 feet Mean Slope: 0.0041

Length to Cen. of Gravity (Lca): 182 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 3.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.3
10-year	0.50	1.9
25-year	0.70	2.7
50-year	0.90	3.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D45 Job #: 7PIM090302

Watershed Area: 0.9 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	414	0.0036	.018

Length of Watercourse (Lc): 414 feet Mean Slope: 0.0036

Length to Cen. of Gravity (Lca): 207 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 9.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.4
5-year	0.35	3.3
10-year	0.50	4.8
25-year	0.70	6.7
50-year	0.90	8.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D46 Job #: 7PIM090302

Watershed Area: 0.9 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	360	0.0111	.018

Length of Watercourse (Lc): 360 feet Mean Slope: 0.0111

Length to Cen. of Gravity (Lca): 180 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 9.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.3
5-year	0.35	3.3
10-year	0.50	4.7
25-year	0.70	6.5
50-year	0.90	8.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D47 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	9.0	403	0.0224	.018

Length of Watercourse (Lc): 403 feet Mean Slope: 0.0224

Length to Cen. of Gravity (Lca): 201 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 5.2 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.8
10-year	0.50	2.6
25-year	0.70	3.6
50-year	0.90	4.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E48 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	273	0.0183	.018

Length of Watercourse (Lc): 273 feet Mean Slope: 0.0183

Length to Cen. of Gravity (Lca): 136 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 2.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.7
5-year	0.35	1.0
10-year	0.50	1.4
25-year	0.70	2.0
50-year	0.90	2.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D49 Job #: 7PIM090302

Watershed Area: 0.2 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	252	0.0099	.018

Length of Watercourse (Lc): 252 feet Mean Slope: 0.0099

Length to Cen. of Gravity (Lca): 126 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	25	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.941

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.05 in/hr

PEAK DISCHARGE: 2.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.6
5-year	0.35	0.8
10-year	0.50	1.2
25-year	0.70	1.6
50-year	0.90	2.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D50 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	281	0.0089	.018

Length of Watercourse (Lc): 281 feet Mean Slope: 0.0089

Length to Cen. of Gravity (Lca): 140 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	25	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.941

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.05 in/hr

PEAK DISCHARGE: 4.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.0
5-year	0.35	1.4
10-year	0.50	2.0
25-year	0.70	2.8
50-year	0.90	3.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: E51 Job #: 7PIM090302

Watershed Area: 0.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	290	0.0052	.018

Length of Watercourse (Lc): 290 feet Mean Slope: 0.0052

Length to Cen. of Gravity (Lca): 145 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 1.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.3
5-year	0.35	0.4
10-year	0.50	0.6
25-year	0.70	0.8
50-year	0.90	1.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)E52 Job #: 7PIM090302

Watershed Area: 0.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	311	0.0048	.018

Length of Watercourse (Lc): 311 feet Mean Slope: 0.0048

Length to Cen. of Gravity (Lca): 155 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	84.	87.98	0.585
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.939

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.03 in/hr

PEAK DISCHARGE: 1.2 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.3
5-year	0.35	0.4
10-year	0.50	0.6
25-year	0.70	0.8
50-year	0.90	1.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D53 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.3	499	0.0146	.018

Length of Watercourse (Lc): 499 feet Mean Slope: 0.0146

Length to Cen. of Gravity (Lca): 250 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	25	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.941

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.05 in/hr

PEAK DISCHARGE: 7.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.8
5-year	0.35	2.5
10-year	0.50	3.5
25-year	0.70	5.0
50-year	0.90	6.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D54 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.0	501	0.0140	.018

Length of Watercourse (Lc): 501 feet Mean Slope: 0.0140

Length to Cen. of Gravity (Lca): 251 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	90.	92.56	0.722
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.946

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.10 in/hr

PEAK DISCHARGE: 4.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.4
25-year	0.70	3.4
50-year	0.90	4.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D55 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	16.0	593	0.0270	.018

Length of Watercourse (Lc): 593 feet Mean Slope: 0.0270

Length to Cen. of Gravity (Lca): 297 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 7.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.7
5-year	0.35	2.4
10-year	0.50	3.5
25-year	0.70	4.9
50-year	0.90	6.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D56 Job #: 7PIM090302

Watershed Area: 0.8 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	16.5	598	0.0276	.018

Length of Watercourse (Lc): 598 feet Mean Slope: 0.0276

Length to Cen. of Gravity (Lca): 299 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 7.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.9
5-year	0.35	2.7
10-year	0.50	3.8
25-year	0.70	5.4
50-year	0.90	6.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D57 Job #: 7PIM090302

Watershed Area: 1.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	10.0	602	0.0166	.018

Length of Watercourse (Lc): 602 feet Mean Slope: 0.0166

Length to Cen. of Gravity (Lca): 301 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 12 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.9
5-year	0.35	4.1
10-year	0.50	5.8
25-year	0.70	8.2
50-year	0.90	10

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D58 Job #: 7PIM090302

Watershed Area: 1.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	10.5	592	0.0177	.018

Length of Watercourse (Lc): 592 feet Mean Slope: 0.0177

Length to Cen. of Gravity (Lca): 296 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 15 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	3.7
5-year	0.35	5.2
10-year	0.50	7.5
25-year	0.70	10
50-year	0.90	13

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D59 Job #: 7PIM090302

Watershed Area: 0.3 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	360	0.0042	.018

Length of Watercourse (Lc): 360 feet Mean Slope: 0.0042

Length to Cen. of Gravity (Lca): 180 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.2
10-year	0.50	1.7
25-year	0.70	2.4
50-year	0.90	3.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D60 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	349	0.0043	.018

Length of Watercourse (Lc): 349 feet Mean Slope: 0.0043

Length to Cen. of Gravity (Lca): 175 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 5.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.8
10-year	0.50	2.5
25-year	0.70	3.5
50-year	0.90	4.5

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D61 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	399	0.0063	.018

Length of Watercourse (Lc): 399 feet Mean Slope: 0.0063

Length to Cen. of Gravity (Lca): 200 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.5
10-year	0.50	2.1
25-year	0.70	3.0
50-year	0.90	3.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D62 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	398	0.0063	.018

Length of Watercourse (Lc): 398 feet Mean Slope: 0.0063

Length to Cen. of Gravity (Lca): 199 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 6.2 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.6
5-year	0.35	2.2
10-year	0.50	3.1
25-year	0.70	4.4
50-year	0.90	5.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D63 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	378	0.0066	.018

Length of Watercourse (Lc): 378 feet Mean Slope: 0.0066

Length to Cen. of Gravity (Lca): 198 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	0	.	.	0.000
D	25	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.942

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.06 in/hr

PEAK DISCHARGE: 5.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.3
5-year	0.35	1.8
10-year	0.50	2.5
25-year	0.70	3.5
50-year	0.90	4.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D64 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	378	0.0053	.018

Length of Watercourse (Lc): 378 feet Mean Slope: 0.0053

Length to Cen. of Gravity (Lca): 198 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	0	.	.	0.000
D	25	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.942

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.06 in/hr

PEAK DISCHARGE: 3.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.3
10-year	0.50	1.9
25-year	0.70	2.6
50-year	0.90	3.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D65 Job #: 7PIM090302

Watershed Area: 0.9 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.5	630	0.0119	.018

Length of Watercourse (Lc): 630 feet Mean Slope: 0.0119

Length to Cen. of Gravity (Lca): 315 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	0	.	.	0.000
D	25	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.942

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.06 in/hr

PEAK DISCHARGE: 8.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.2
5-year	0.35	3.0
10-year	0.50	4.3
25-year	0.70	6.0
50-year	0.90	7.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D66 Job #: 7PIM090302

Watershed Area: 0.8 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	8.0	625	0.0128	.018

Length of Watercourse (Lc): 625 feet Mean Slope: 0.0128

Length to Cen. of Gravity (Lca): 313 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	0	.	.	0.000
D	25	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.942

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.06 in/hr

PEAK DISCHARGE: 7.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.9
5-year	0.35	2.7
10-year	0.50	3.9
25-year	0.70	5.4
50-year	0.90	6.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D67 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	407	0.0061	.018

Length of Watercourse (Lc): 407 feet Mean Slope: 0.0061

Length to Cen. of Gravity (Lca): 204 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 5.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.4
5-year	0.35	2.0
10-year	0.50	2.8
25-year	0.70	3.9
50-year	0.90	5.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D68 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	414	0.0060	.018

Length of Watercourse (Lc): 414 feet Mean Slope: 0.0060

Length to Cen. of Gravity (Lca): 207 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.3
10-year	0.50	1.8
25-year	0.70	2.6
50-year	0.90	3.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D69 Job #: 7PIM090302

Watershed Area: 0.9 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.5	687	0.0080	.018

Length of Watercourse (Lc): 687 feet Mean Slope: 0.0080

Length to Cen. of Gravity (Lca): 344 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 9.0 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.2
5-year	0.35	3.1
10-year	0.50	4.5
25-year	0.70	6.3
50-year	0.90	8.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D70 Job #: 7PIM090302

Watershed Area: 0.8 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.5	689	0.0080	.018

Length of Watercourse (Lc): 689 feet Mean Slope: 0.0080

Length to Cen. of Gravity (Lca): 345 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 8.1 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.0
5-year	0.35	2.8
10-year	0.50	4.0
25-year	0.70	5.7
50-year	0.90	7.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D71 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.5	346	0.0101	.018

Length of Watercourse (Lc): 346 feet Mean Slope: 0.0101

Length to Cen. of Gravity (Lca): 173 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.9 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.7
10-year	0.50	2.5
25-year	0.70	3.4
50-year	0.90	4.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D72 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	348	0.0086	.018

Length of Watercourse (Lc): 348 feet Mean Slope: 0.0086

Length to Cen. of Gravity (Lca): 174 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.1
5-year	0.35	1.5
10-year	0.50	2.2
25-year	0.70	3.1
50-year	0.90	4.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D73 Job #: 7PIM090302

Watershed Area: 1.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.5	759	0.0086	.018

Length of Watercourse (Lc): 759 feet Mean Slope: 0.0086

Length to Cen. of Gravity (Lca): 380 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 11 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.8
5-year	0.35	3.9
10-year	0.50	5.6
25-year	0.70	7.8
50-year	0.90	10

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D74 Job #: 7PIM090302

Watershed Area: 1.1 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.5	749	0.0087	.018

Length of Watercourse (Lc): 749 feet Mean Slope: 0.0087

Length to Cen. of Gravity (Lca): 375 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	75	84.	87.98	0.585
C	25	90.	92.56	0.722
D	0	.	.	0.000
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.941

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.05 in/hr

PEAK DISCHARGE: 12 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.9
5-year	0.35	4.1
10-year	0.50	5.8
25-year	0.70	8.2
50-year	0.90	10

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D75 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	435	0.0069	.018

Length of Watercourse (Lc): 435 feet Mean Slope: 0.0069

Length to Cen. of Gravity (Lca): 218 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.6
10-year	0.50	2.3
25-year	0.70	3.2
50-year	0.90	4.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D76 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	443	0.0068	.018

Length of Watercourse (Lc): 443 feet Mean Slope: 0.0068

Length to Cen. of Gravity (Lca): 222 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 5.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.4
5-year	0.35	2.0
10-year	0.50	2.9
25-year	0.70	4.0
50-year	0.90	5.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D77 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	491	0.0051	.018

Length of Watercourse (Lc): 491 feet Mean Slope: 0.0051

Length to Cen. of Gravity (Lca): 246 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 5.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.5
5-year	0.35	2.0
10-year	0.50	2.9
25-year	0.70	4.1
50-year	0.90	5.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D78 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.5	500	0.0050	.018

Length of Watercourse (Lc): 500 feet Mean Slope: 0.0050

Length to Cen. of Gravity (Lca): 250 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 5.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.5
5-year	0.35	2.0
10-year	0.50	2.9
25-year	0.70	4.1
50-year	0.90	5.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D80 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	225	0.0089	.018

Length of Watercourse (Lc): 225 feet Mean Slope: 0.0089

Length to Cen. of Gravity (Lca): 113 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.6
10-year	0.50	2.4
25-year	0.70	3.3
50-year	0.90	4.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D81 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	2.0	321	0.0062	.018

Length of Watercourse (Lc): 321 feet Mean Slope: 0.0062

Length to Cen. of Gravity (Lca): 161 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.3
10-year	0.50	1.9
25-year	0.70	2.6
50-year	0.90	3.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D82 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	1.5	330	0.0045	.018

Length of Watercourse (Lc): 330 feet Mean Slope: 0.0045

Length to Cen. of Gravity (Lca): 165 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 3.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	0.9
5-year	0.35	1.3
10-year	0.50	1.9
25-year	0.70	2.6
50-year	0.90	3.4

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D83 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.5	443	0.0079	.018

Length of Watercourse (Lc): 443 feet Mean Slope: 0.0079

Length to Cen. of Gravity (Lca): 222 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 6.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.6
5-year	0.35	2.3
10-year	0.50	3.3
25-year	0.70	4.6
50-year	0.90	5.9

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D84 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.5	430	0.0081	.018

Length of Watercourse (Lc): 430 feet Mean Slope: 0.0081

Length to Cen. of Gravity (Lca): 215 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 4.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.2
5-year	0.35	1.6
10-year	0.50	2.3
25-year	0.70	3.2
50-year	0.90	4.1

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D85 Job #: 7PIM090302

Watershed Area: 0.9 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.0	715	0.0084	.018

Length of Watercourse (Lc): 715 feet Mean Slope: 0.0084

Length to Cen. of Gravity (Lca): 358 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 9.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.4
5-year	0.35	3.3
10-year	0.50	4.8
25-year	0.70	6.7
50-year	0.90	8.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D86 Job #: 7PIM090302

Watershed Area: 0.9 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.0	718	0.0084	.018

Length of Watercourse (Lc): 718 feet Mean Slope: 0.0084

Length to Cen. of Gravity (Lca): 359 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 8.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	2.2
5-year	0.35	3.0
10-year	0.50	4.3
25-year	0.70	6.1
50-year	0.90	7.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D87 Job #: 7PIM090302

Watershed Area: 0.5 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	482	0.0083	.018

Length of Watercourse (Lc): 482 feet Mean Slope: 0.0083

Length to Cen. of Gravity (Lca): 241 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 5.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.4
5-year	0.35	1.9
10-year	0.50	2.8
25-year	0.70	3.9
50-year	0.90	5.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: D88 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Shallow Steetflow - Paved

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	486	0.0082	.018

Length of Watercourse (Lc): 486 feet Mean Slope: 0.0082

Length to Cen. of Gravity (Lca): 243 feet Weighted Basin Fac.: 0.018

Veg. Cover Type(s): Desert Brush Veg. Cover Density: _____ %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	0	.	.	0.000
D	100	93.	94.85	0.799
Imp.	95	99.	99.	0.958

Weighted Runoff Coef. (Cw): 0.950

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 10.14 in/hr

PEAK DISCHARGE: 5.8 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.25	1.5
5-year	0.35	2.0
10-year	0.50	2.9
25-year	0.70	4.1
50-year	0.90	5.2

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE1 Job #: 7PIM090302

Watershed Area: 5.2 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	8.0	724	0.0110	.060

Length of Watercourse (Lc): 724 feet Mean Slope: 0.0110

Length to Cen. of Gravity (Lca): 362 feet Weighted Basin Fac.: 0.060

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.675

Time of Concentration: 9.3 min

Rainfall Intensity (i) @ Tc: 8.31 in/hr

Runoff Supply Rate (q) @ Tc: 5.61 in/hr

PEAK DISCHARGE: 29 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	2.9
5-year	0.23	6.8
10-year	0.35	10
25-year	0.55	16
50-year	0.75	22

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE2 Job #: 7PIM090302

Watershed Area: 2.9 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	10.0	870	0.0115	.060

Length of Watercourse (Lc): 870 feet Mean Slope: 0.0115

Length to Cen. of Gravity (Lca): 435 feet Weighted Basin Fac.: 0.060

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.675

Time of Concentration: 10.4 min

Rainfall Intensity (i) @ Tc: 7.95 in/hr

Runoff Supply Rate (q) @ Tc: 5.37 in/hr

PEAK DISCHARGE: 16 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	1.6
5-year	0.23	3.6
10-year	0.35	5.5
25-year	0.55	8.7
50-year	0.75	12

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE3 Job #: 7PIM090302

Watershed Area: 10.0 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	17.0	1,514	0.0112	.060

Length of Watercourse (Lc): 1,514 feet Mean Slope: 0.0112

Length to Cen. of Gravity (Lca): 747 feet Weighted Basin Fac.: 0.060

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.675

Time of Concentration: 15.7 min

Rainfall Intensity (i) @ Tc: 6.52 in/hr

Runoff Supply Rate (q) @ Tc: 4.40 in/hr

PEAK DISCHARGE: 44 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	4.4
5-year	0.23	10
10-year	0.35	16
25-year	0.55	24
50-year	0.75	33

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE4 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	6.0	602	0.0100	.035

Length of Watercourse (Lc): 602 feet Mean Slope: 0.0100

Length to Cen. of Gravity (Lca): 301 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.675

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 7.21 in/hr

PEAK DISCHARGE: 4.4 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	0.4
5-year	0.23	1.0
10-year	0.35	1.5
25-year	0.55	2.4
50-year	0.75	3.3

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE5 Job #: 7PIM090302

Watershed Area: 0.4 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	3.0	374	0.0080	.035

Length of Watercourse (Lc): 374 feet Mean Slope: 0.0080

Length to Cen. of Gravity (Lca): 187 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	82.	86.66	0.549
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.549

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 5.87 in/hr

PEAK DISCHARGE: 2.6 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	0.3
5-year	0.23	0.6
10-year	0.35	0.9
25-year	0.55	1.4
50-year	0.75	2.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE6 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	4.0	439	0.0091	.035

Length of Watercourse (Lc): 439 feet Mean Slope: 0.0091

Length to Cen. of Gravity (Lca): 219 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	82.	86.66	0.549
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.549

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 5.87 in/hr

PEAK DISCHARGE: 3.5 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	0.3
5-year	0.23	0.8
10-year	0.35	1.2
25-year	0.55	1.9
50-year	0.75	2.6

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE7 Job #: 7PIM090302

Watershed Area: 0.6 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	512	0.0098	.035

Length of Watercourse (Lc): 512 feet Mean Slope: 0.0098

Length to Cen. of Gravity (Lca): 256 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	82.	86.66	0.549
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.549

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 5.87 in/hr

PEAK DISCHARGE: 3.7 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	0.4
5-year	0.23	0.9
10-year	0.35	1.3
25-year	0.55	2.0
50-year	0.75	2.8

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE8 Job #: 7PIM090302

Watershed Area: 33.2 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	31.0	3,019	0.0103	.060

Length of Watercourse (Lc): 3,019 feet Mean Slope: 0.0103

Length to Cen. of Gravity (Lca): 1,510 feet Weighted Basin Fac.: 0.060

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	80	82.	86.66	0.549
C	20	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.574

Time of Concentration: 30.8 min

Rainfall Intensity (i) @ Tc: 4.43 in/hr

Runoff Supply Rate (q) @ Tc: 2.54 in/hr

PEAK DISCHARGE: 85 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	8.5
5-year	0.23	20
10-year	0.35	30
25-year	0.55	47
50-year	0.75	64

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE9 Job #: 7PIM090302

Watershed Area: 6.7 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	8.0	959	0.0083	.035

Length of Watercourse (Lc): 959 feet Mean Slope: 0.0083

Length to Cen. of Gravity (Lca): 479 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	82.	86.66	0.549
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.549

Time of Concentration: 7.5 min

Rainfall Intensity (i) @ Tc: 8.94 in/hr

Runoff Supply Rate (q) @ Tc: 4.91 in/hr

PEAK DISCHARGE: 33 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	3.3
5-year	0.23	7.7
10-year	0.35	12
25-year	0.55	18
50-year	0.75	25

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE10 Job #: 7PIM090302

Watershed Area: 3.1 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	7.0	694	0.0101	.035

Length of Watercourse (Lc): 694 feet Mean Slope: 0.0101

Length to Cen. of Gravity (Lca): 347 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	100	82.	86.66	0.549
C	0	.	.	0.000
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.549

Time of Concentration: 5.5 min

Rainfall Intensity (i) @ Tc: 10.24 in/hr

Runoff Supply Rate (q) @ Tc: 5.63 in/hr

PEAK DISCHARGE: 18 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	1.8
5-year	0.23	4.0
10-year	0.35	6.2
25-year	0.55	9.7
50-year	0.75	13

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE11 Job #: 7PIM090302

Watershed Area: 0.7 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	5.0	336	0.0149	.035

Length of Watercourse (Lc): 336 feet Mean Slope: 0.0149

Length to Cen. of Gravity (Lca): 168 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	0	.	.	0.000
C	100	88.	91.08	0.675
D	0	.	.	0.000
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.675

Time of Concentration: 5.0 min

Rainfall Intensity (i) @ Tc: 10.68 in/hr

Runoff Supply Rate (q) @ Tc: 7.21 in/hr

PEAK DISCHARGE: 5.3 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	0.5
5-year	0.23	1.2
10-year	0.35	1.9
25-year	0.55	2.9
50-year	0.75	4.0

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE12 Job #: 7PIM090302

Watershed Area: 6.6 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	10.0	809	0.0124	.035

Length of Watercourse (Lc): 809 feet Mean Slope: 0.0124

Length to Cen. of Gravity (Lca): 405 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	50	82.	86.66	0.549
C	0	.	.	0.000
D	50	91.	93.37	0.748
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.649

Time of Concentration: 5.1 min

Rainfall Intensity (i) @ Tc: 10.58 in/hr

Runoff Supply Rate (q) @ Tc: 6.86 in/hr

PEAK DISCHARGE: 46 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	4.6
5-year	0.23	11
10-year	0.35	16
25-year	0.55	25
50-year	0.75	34

PC-Hydro, Ver 5.4.2

HYDROLOGIC DATA SHEET FOR PIMA COUNTY FLOOD PEAK PROCEDURE

Pima County Regional Flood Control District

Client: _____ Prepared by: JCO

Project Name: Valencia- Alvernon to Wilmot Date: 1/10/2011

Concentration Point: (D)OE13 Job #: 7PIM090302

Watershed Area: 10.2 ac Watershed Type: Undeveloped-Valley

Watercourse Data By Reach

Reach No.	Height (Hi)	Length (Li)	Slope (Si)	Basin Factor (Nb)
1	15.0	958	0.0157	.035
2	9.0	871	0.0103	.035

Length of Watercourse (Lc): 1,829 feet Mean Slope: 0.0127

Length to Cen. of Gravity (Lca): 915 feet Weighted Basin Fac.: 0.035

Veg. Cover Type(s): Desert Brush Veg. Cover Density: 25 %

RETURN PERIOD: 100-years

Rainfall Depths: Manual Input of Rainfal Depths by User

Duration:	5-min	10-min	15-min	30-min	60-min	2-hr	3-hr	6-hr	12-hr	24-hr
Point Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26
Areal Values (in)	0.89	1.35	1.68	2.26	2.79	3.11	3.26	3.51	3.81	4.26

Soils Data

Soil Type	Percent	Curve # (CN)	Adj. Curve # (CN*)	Runoff Coef. (C)
B	25	82.	86.66	0.549
C	0	.	.	0.000
D	75	91.	93.37	0.748
Imp.	0	99.	99.	0.000

Weighted Runoff Coef. (Cw): 0.699

Time of Concentration: 8.7 min

Rainfall Intensity (i) @ Tc: 8.48 in/hr

Runoff Supply Rate (q) @ Tc: 5.93 in/hr

PEAK DISCHARGE: 61 cfs

Lesser Return Periods

Return Period	Ratio	Qpeak
2-year	0.10	6.1
5-year	0.23	14
10-year	0.35	21
25-year	0.55	34
50-year	0.75	46

PC-Hydro, Ver 5.4.2

APPENDIX 2

EXISTING CONDITIONS
CULVERT ANALYSIS

Culvert Calculator Report
OE12

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	2,690.00	ft	Headwater Depth/Height	0.84	
Computed Headwater Elevation	2,688.78	ft	Discharge	46.00	cfs
Inlet Control HW Elev.	2,688.61	ft	Tailwater Elevation	2,686.52	ft
Outlet Control HW Elev.	2,688.78	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	2,686.67	ft	Downstream Invert	2,685.72	ft
Length	143.29	ft	Constructed Slope	0.006630	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	1.19	ft
Slope Type	Steep		Normal Depth	1.19	ft
Flow Regime	Supercritical		Critical Depth	1.32	ft
Velocity Downstream	6.66	ft/s	Critical Slope	0.004643	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	2.50	ft
Section Size	30 inch		Rise	2.50	ft
Number Sections	3				

Outlet Control Properties					
Outlet Control HW Elev.	2,688.78	ft	Upstream Velocity Head	0.53	ft
Ke	0.50		Entrance Loss	0.26	ft

Inlet Control Properties					
Inlet Control HW Elev.	2,688.61	ft	Flow Control	N/A	
Inlet Type	Square edge w/headwall		Area Full	14.7	ft^2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
OE13

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	2,673.00	ft	Headwater Depth/Height	1.18	
Computed Headwater Elevation	2,672.25	ft	Discharge	61.00	cfs
Inlet Control HW Elev.	2,672.16	ft	Tailwater Elevation	2,670.72	ft
Outlet Control HW Elev.	2,672.25	ft	Control Type	Outlet Control	

Grades					
Upstream Invert	2,669.88	ft	Downstream Invert	2,669.18	ft
Length	167.52	ft	Constructed Slope	0.004179	ft/ft

Hydraulic Profile					
Profile	M2		Depth, Downstream	1.54	ft
Slope Type	Mild		Normal Depth	1.73	ft
Flow Regime	Subcritical		Critical Depth	1.41	ft
Velocity Downstream	5.88	ft/s	Critical Slope	0.006391	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	2.00	ft
Section Size	24 inch		Rise	2.00	ft
Number Sections	4				

Outlet Control Properties					
Outlet Control HW Elev.	2,672.25	ft	Upstream Velocity Head	0.45	ft
Ke	0.50		Entrance Loss	0.23	ft

Inlet Control Properties					
Inlet Control HW Elev.	2,672.16	ft	Flow Control	N/A	
Inlet Type	Square edge w/headwall		Area Full	12.6	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
FEMA FLOW @ JULIAN WASH

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	2,693.00	ft	Headwater Depth/Height	0.78	
Computed Headwater Elevation	2,689.98	ft	Discharge	2,270.00	cfs
Inlet Control HW Elev.	2,689.35	ft	Tailwater Elevation	2,686.00	ft
Outlet Control HW Elev.	2,689.98	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	2,682.98	ft	Downstream Invert	2,682.30	ft
Length	140.00	ft	Constructed Slope	0.004857	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	3.58	ft
Slope Type	Steep		Normal Depth	3.52	ft
Flow Regime	Supercritical		Critical Depth	4.00	ft
Velocity Downstream	12.69	ft/s	Critical Slope	0.003397	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.013	
Section Material	Concrete		Span	10.00	ft
Section Size	10 x 9 ft		Rise	9.00	ft
Number Sections	5				

Outlet Control Properties					
Outlet Control HW Elev.	2,689.98	ft	Upstream Velocity Head	2.00	ft
Ke	0.50		Entrance Loss	1.00	ft

Inlet Control Properties					
Inlet Control HW Elev.	2,689.35	ft	Flow Control	N/A	
Inlet Type	30 to 75° wingwall flares		Area Full	450.0	ft²
K	0.02600		HDS 5 Chart	8	
M	1.00000		HDS 5 Scale	1	
C	0.03470		Equation Form	1	
Y	0.86000				

Culvert Calculator Report
UPRR

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	2,700.75	ft	Headwater Depth/Height	0.86	
Computed Headwater Elevation	2,700.75	ft	Discharge	1,082.38	cfs
Inlet Control HW Elev.	2,700.71	ft	Tailwater Elevation	2,698.74	ft
Outlet Control HW Elev.	2,700.75	ft	Control Type	Outlet Control	

Grades					
Upstream Invert	2,697.30	ft	Downstream Invert	2,697.24	ft
Length	33.00	ft	Constructed Slope	0.001818	ft/ft

Hydraulic Profile					
Profile	M2		Depth, Downstream	2.16	ft
Slope Type	Mild		Normal Depth	2.59	ft
Flow Regime	Subcritical		Critical Depth	2.16	ft
Velocity Downstream	8.34	ft/s	Critical Slope	0.003075	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.013	
Section Material	Concrete		Span	10.00	ft
Section Size	10 x 4 ft		Rise	4.00	ft
Number Sections	6				

Outlet Control Properties					
Outlet Control HW Elev.	2,700.75	ft	Upstream Velocity Head	0.90	ft
Ke	0.20		Entrance Loss	0.18	ft

Inlet Control Properties					
Inlet Control HW Elev.	2,700.71	ft	Flow Control	N/A	
Inlet Type	90° headwall w 45° bevels		Area Full	240.0	ft²
K	0.49500		HDS 5 Chart	10	
M	0.66700		HDS 5 Scale	2	
C	0.03140		Equation Form	2	
Y	0.82000				

PROPOSED CONDITIONS
CULVERT ANALYSIS

Culvert Calculator Report
OE12 <proposed>

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	2,690.00	ft	Headwater Depth/Height	1.19	
Computed Headwater Elevation	2,689.06	ft	Discharge	46.00	cfs
Inlet Control HW Elev.	2,688.96	ft	Tailwater Elevation	2,686.72	ft
Outlet Control HW Elev.	2,689.06	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	2,686.67	ft	Downstream Invert	2,685.72	ft
Length	143.29	ft	Constructed Slope	0.006630	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	1.39	ft
Slope Type	Steep		Normal Depth	1.39	ft
Flow Regime	Supercritical		Critical Depth	1.41	ft
Velocity Downstream	6.56	ft/s	Critical Slope	0.006416	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	2.00	ft
Section Size	24 inch		Rise	2.00	ft
Number Sections	3				

Outlet Control Properties					
Outlet Control HW Elev.	2,689.06	ft	Upstream Velocity Head	0.65	ft
Ke	0.50		Entrance Loss	0.33	ft

Inlet Control Properties					
Inlet Control HW Elev.	2,688.96	ft	Flow Control	N/A	
Inlet Type	Square edge w/headwall		Area Full	9.4	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

APPENDIX 3

VERTCON DATUM ADJUSTMENT INFORMATION

Questions concerning the VERTCON process may be mailed to NGS

Latitude: 32.140365

Longitude: 110.856751

NGVD 29 height: 1 ft

Datum shift(NAVD 88 minus NGVD 29): 2.106 feet

Converted to NAVD 88 height: 3.106 feet

Questions concerning the VERTCON process may be mailed to NGS

Latitude: 32.133742

Longitude: 110.885831

NGVD 29 height: 1 ft

Datum shift(NAVD 88 minus NGVD 29): 2.031 feet

Converted to NAVD 88 height: 3.031 feet

Questions concerning the VERTCON process may be mailed to NGS

Latitude: 32.134691

Longitude: 110.902537

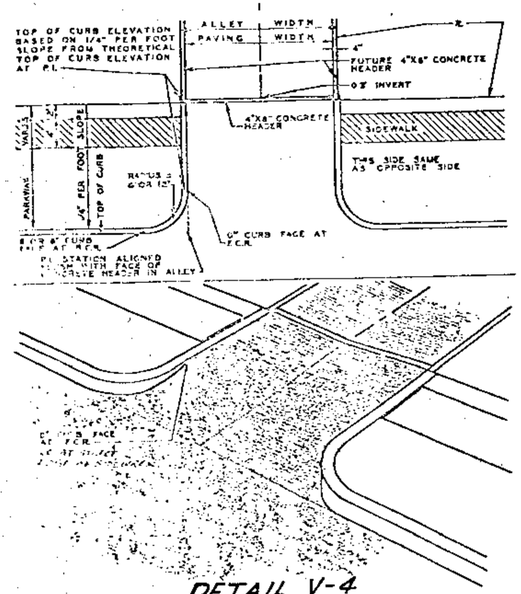
NGVD 29 height: 1 FT

Datum shift(NAVD 88 minus NGVD 29): 1.991 feet

Converted to NAVD 88 height: 2.991 feet

STORMDRAIN AS-BUILTS

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	FFD 08Z-1(1)	10A	36	



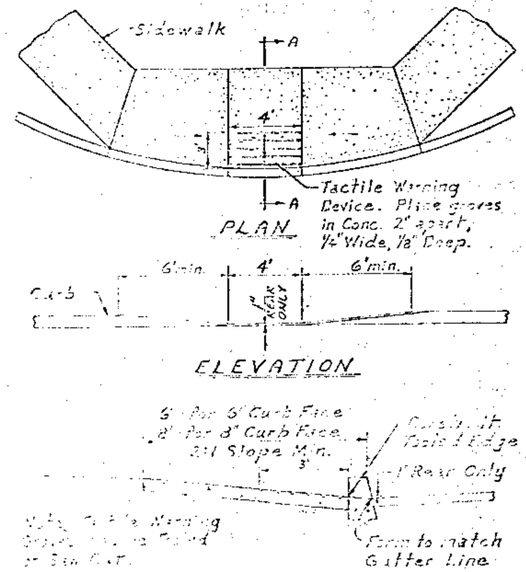
DETAIL V-4

STANDARD DETAIL NO. 8-1202-018

ALLEY RETURNS - VERTICAL CURB

CITY OF TUCSON, ARIZONA-DEPT. OF PUBLIC WORKS

ENGINEERING DIV.-ACTIVE PRACTICES INSTRUCTION



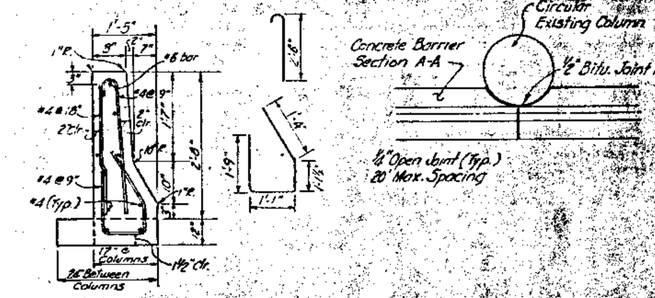
DETAIL V-7

STANDARD DETAIL NO. 8-1202-021

CONCRETE WHEELCHAIR RAMP

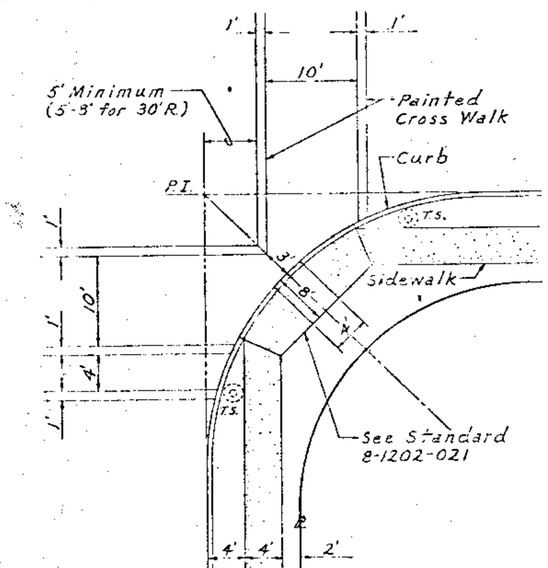
CITY OF TUCSON, ARIZONA-DEPT. OF PUBLIC WORKS

ENGINEERING DIV.-ACTIVE PRACTICES INSTRUCTION



CONCRETE BARRIER DETAIL

N.T.S.



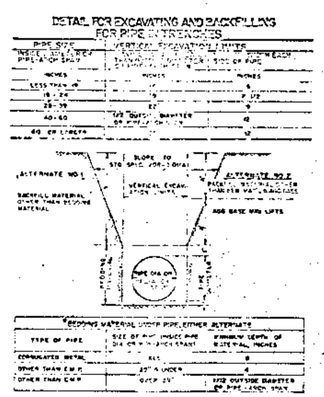
DETAIL V-5

STANDARD DETAIL NO. 8-1202-022

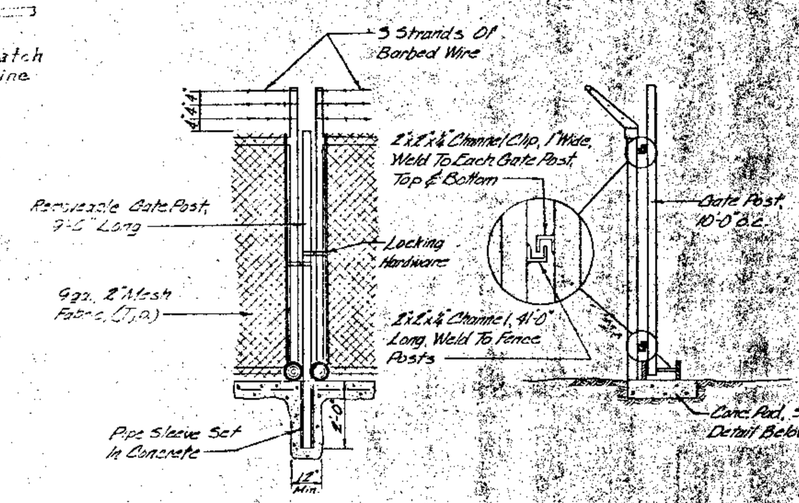
WHEELCHAIR RAMP LOCATION AT MAJOR STREET INTERSECTIONS

CITY OF TUCSON, ARIZONA-DEPT. OF PUBLIC WORKS

ENGINEERING DIV.-ACTIVE PRACTICES INSTRUCTION

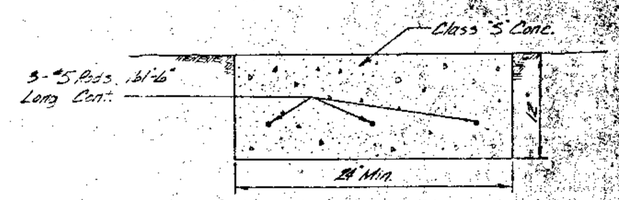


DETAIL V-6



ROLLING GATE DETAILS

N.T.S.



CONC. PAD DETAILS

N.T.S.

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C.H. HUCKELBERRY, P.E., P.L.S. DIRECTOR

NO.	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

	DATE
DESIGNED	
DRAWN	
CHECKED	
PROJ. ENGR.	

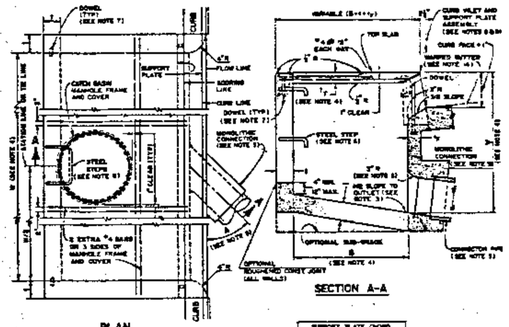
rgg consulting engineers

FASTER_PL_S010A

SHEET 10A OF 36

MISCELLANEOUS CONSTRUCTION DETAILS

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	FFD 082-1-(1)	108	36	



STRUCTURAL DATA

WALL AND SLAB DIMENSIONS AND REINFORCEMENT REQUIREMENTS

MAX. INSIDE H	W	T	t_2	REINFORCEMENT FRONT WALL	REINFORCEMENT BOTTOM SLAB	REINFORCEMENT SIDE WALL
3.0	2'	6"	6"	3	4	3
3.5	2'	6"	7"	3	4	3
4.0	2'	6"	7"	3	4	3
4.5	2'	6"	8"	3	4	3
5.0	2'	6"	8"	3	4	3
5.5	2'	6"	9"	3	4	3
6.0	2'	6"	9"	3	4	3
6.5	2'	6"	9"	3	4	3
7.0	2'	6"	9"	3	4	3
7.5	2'	6"	9"	3	4	3
8.0	2'	6"	9"	3	4	3

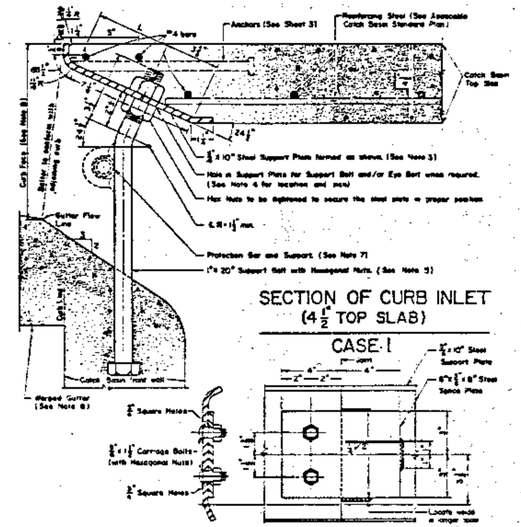
SEE NOTE 13

FOR WIDTHS OF 1'-0 SEE PROJECT PLANS

SUPPORT PLATE CHORD LENGTHS ON CURVES (SEE NOTE 5)	
MINIMUM RADIUS	MAX. CHORD LENGTH
200	16'
150	13'
100	9'
75	7'
50	5'
150	13'

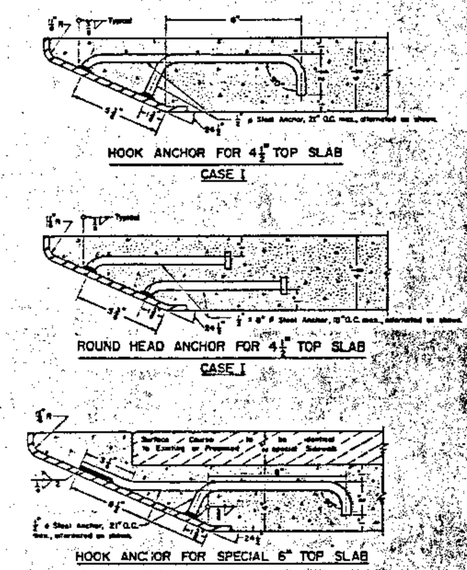
DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

CATCH BASIN NO. 1 — STANDARD PLAN SD-100-0

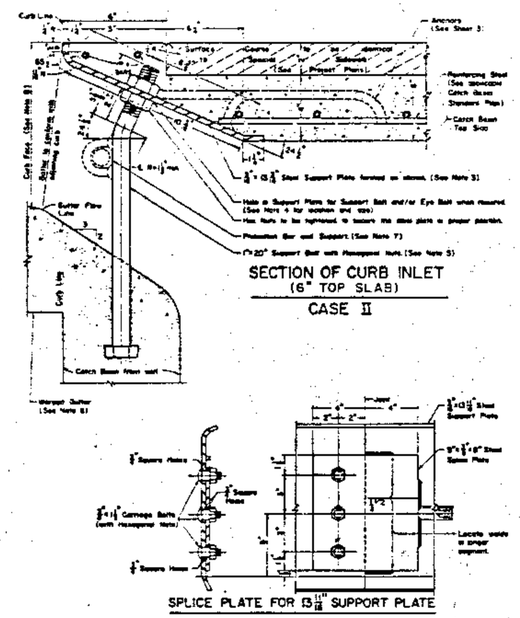


DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

CATCH BASIN CURB INLET AND SUPPORT DETAILS — STANDARD PLAN SD-110-0



ALTERNATE METHODS FOR SUPPORT PLATE ANCHORAGE



NOTES FOR SIDE OPENING CATCH BASINS

1. CONCRETE SHALL BE CLASS S-3250.
2. ALL CURVED CONCRETE SURFACES SHALL BE FORMED BY CURVED FORMS, AND SHALL NOT BE SHAPED BY PLASTERING. SURFACE OF ALL EXPOSED CONCRETE SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH, AND BONDING TO EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN.
3. FLOOR OF BASIN SHALL BE GIVEN A STEEL TROWEL FINISH AND SHALL HAVE A LONGITUDINAL AND LATERAL SLOPE OF 1:12, EXCEPT WHERE THE GUTTER GRADE EXCEEDS 8 PERCENT, IN WHICH CASE THE LONGITUDINAL SLOPE OF THE FLOOR SHALL BE THE SAME AS THE GUTTER GRADE. SLOPE FLOOR FROM ALL DIRECTIONS TO THE OUTLET.
4. DIMENSIONS:
   - D = 3.0 FEET
   - V = 4.5 FEET — WHERE CATCH BASINS ARE IN SERIES "V" - SHALL BE THE DEPTH TO THE INVERT OF THE INLET PIPE AND "V" SHALL BE THE DEPTH TO THE INVERT OF THE OUTLET PIPE.)
   - W = AS INDICATED ON THE PROJECT PLANS.
   - C & t_2 = SEE STRUCTURAL DATA HEREON.
   - t_1 = 6-1/2 INCHES FOR STANDARD SIDEWALK, AND 6 INCHES FOR SPECIAL SIDEWALK. (SEE PROJECT PLANS)
   - A = THE ANGLE, IN DEGREES, INTERCEPTED BY THE CENTERLINE OF THE CONNECTOR PIPE AND THE CATCH BASIN WALL TO WHICH THE CONNECTOR PIPE IS ATTACHED.
5. PLACE CONNECTOR PIPES AS INDICATED ON THE PROJECT PLANS. UNLESS OTHERWISE DETAILED ON THE PROJECT PLANS, A CONNECTOR PIPE CENTERLINE SHALL INTERSECT THE MID POINT OF THE INSIDE FACE OF THE INDICATED CATCH BASIN WALL, OR IF INDICATED AT A CORNER, IT SHALL INTERSECT THE INSIDE CORNER. THE PIPE MAY BE CUT AND TRIMMED AT A SKEW NECESSARY TO ENSURE MINIMUM 3 INCH PIPE EMBEDMENT, ALL AROUND, WITHIN THE CATCH BASIN WALL, AND 3 INCH RADIUS OF ROUNDING OF STRUCTURE CONCRETE, ALL AROUND, ADJACENT TO PIPE EDGE. A MONOLITHIC CONNECTION PER STANDARD PLAN SD-117 SHALL BE USED TO JOIN THE CONNECTOR PIPE TO THE CATCH BASIN WHENEVER ANGLE "A" IS LESS THAN 30 DEGREES OF GREATER THAN 150 DEGREES, OR WHENEVER THE CONNECTOR PIPE IS LOCATED IN A CORNER. THE OPTIONAL USE OF MONOLITHIC CONNECTION IN ANY CASE IS PERMITTED. MONOLITHIC CONNECTIONS MAY BE EXTENDED UP TO 4 FEET IN LENGTH TO AVOID CUTTING STANDARD LENGTHS OF PIPE. CONNECTOR PIPE MAY NOT BE CUT FOR ANY REASON EXCEPT TO AVOID CONSTRUCTION OF A MONOLITHIC CONNECTION.
6. STEPS SHALL CONFORM TO STANDARD PLAN SD-118, AND SHALL BE DIRECTLY BELOW THE MANHOLE FRAME AND COVER.
7. DOWELS SHALL BE REQUIRED AT EACH CORNER AND AT 7 FEET O.C. (MAXIMUM) ALONG THE BACKWALL WHEN THE TOP SLAB IS POURED SEPARATELY. WHEN TOP SLAB IS POURED MONOLITHIC WITH ADJACENT SIDEWALK, THE DOWELS MAY BE OMITTED.
8. CURB INLET, SUPPORT PLATE, SUPPORT BOLTS, AND ANCHORS SHALL CONFORM TO STANDARD PLAN SD-110.
9. PROTECTION BAR AND SUPPORTS SHALL CONFORM TO STANDARD PLAN SD-113.
10. CATCH BASIN MANHOLE FRAMES AND COVERS SHALL CONFORM TO ADOT STANDARDS.
11. WALL AND BOTTOM SLAB THICKNESS SHALL BE AS SHOWN HEREON. REINFORCEMENT, WHEN REQUIRED, SHALL CONFORM TO STANDARD PLAN SD-111. FOR ANY VALUE OF "W" OR "V" NOT INDICATED HEREON, USE THE VALUE FOR THE NEXT HIGHER "W" OR "V" THAT IS INDICATED.
12. ALL CONSTRUCTION JOINTS SHALL HAVE KEYED SURFACES.
13. CATCH BASINS LOCATED ON A CURVE, MAY, AT THE OPTION OF THE CONTRACTOR, BE CONSTRUCTED OF CHORDS AS INDICATED HEREON. IF MORE THAN ONE CHORD IS USED ON ANY CATCH BASIN, THE CHORD LENGTH SHALL BE IDENTICAL. THE SUPPORT PLATE SEGMENTS SHALL BE SPLICED AS SHOWN ON STANDARD PLAN SD-110.
14. CONSTRUCT WARPED GUTTER TO CONFORM TO STANDARD PLAN SD-114.

NOTES FOR CATCH BASIN CURB INLET AND SUPPORT DETAILS

1. ALL METAL PARTS SHALL BE PAINTED PER ADOT SPECIFICATIONS AFTER FABRICATION.
2. LOCATION AND SPACING OF ANCHORS:
   - A. SET ONE ANCHOR 2 INCHES FROM EACH END OF THE SUPPORT PLATE.
   - B. SPACE ANCHORS AS SHOWN FOR EACH ALTERNATE.
   - C. PLACE ONE ANCHOR WITHIN 6 INCHES ON EACH SIDE OF SPLICE JOINT.
3. THE LENGTH OF THE SUPPORT PLATE SHALL BE EQUAL TO THE NOMINAL CATCH BASIN LENGTH, PLUS 5 FOOT. INSTALL THE SUPPORT PLATE SO THAT IT EXTENDS 6 INCHES BEYOND THE DOOR OF THE CATCH BASIN OPENING WHEN THE LENGTH OF SUPPORT PLATE IS SHORTER THAN 12 FEET. THE SUPPORT PLATE MAY BE FABRICATED IN SECTIONS PROVIDED THE SECTIONS ARE SPLICED AS SHOWN HEREON, AND THE JOINT IS LOCATED A MINIMUM OF ONE FOOT FROM A SUPPORT BOLT.
4. PROVIDE A 1-1/8 INCH DIAMETER HOLE IN THE SUPPORT PLATE AT C = 3-1/2 INCHES AT EACH LOCATION A SUPPORT BOLT IS REQUIRED. PROVIDE A 3/4 INCH DIAMETER HOLE IN THE SUPPORT PLATE AT t_2 = 3 INCHES, 12 INCHES FROM EACH END OF THE SUPPORT PLATE, WHENEVER A PROTECTION BAR IS REQUIRED.
5. SUPPORT BOLTS ARE REQUIRED WHEN THE LENGTH OF CATCH BASIN OPENING IS 7 FEET, OR GREATER, AND SHALL BE EVENLY SPACED ACROSS THE OPENING. SPACING SHALL NOT BE LESS THAN 3 FEET 6 INCHES O.C. NOR GREATER THAN 5 FEET O.C.
6. CASE II CURB INLET AND SUPPORT DETAILS SHALL APPLY UNDER SPECIAL SIDEWALK IS INDICATED ON THE PROJECT PLANS. OTHERWISE, CASE I CURB INLET AND SUPPORT PLATE DETAILS SHALL APPLY.
7. PROTECTION BAR AND SUPPORT CONFORMING TO STANDARD PLAN SD-113 ARE REQUIRED WHEN CURB FACE AT CATCH BASIN EXCEEDS 9-1/4 INCHES.
8. SEE STANDARD PLAN SD-116 FOR DETAILS OF WARPED GUTTER AND FOR CURB FACE AT THE INLET (4 INCHES UNLESS OTHERWISE INDICATED ON THE PROJECT PLANS).

DETAIL V-8

NO.	REVISION	DESCRIPTION	DN/SPECT. ENGR.	DATE	DATE

DESIGNED
DRAWN
CHECKED
PROJ. ENGR.

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

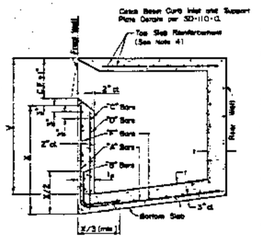
rgg consulting engineers — P.O. Box 50650, Tucson, Arizona 85728 — (602) 881-4004

FAS152_P1_S4008

SHEET 108 OF 36

MISCELLANEOUS DRAINAGE DETAILS

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT #
9	ARIZ.	FFD 082-1-(1)	10C	36	



TYPICAL REINFORCEMENT DETAILS

NOTES FOR CATCH BASIN REINFORCEMENT

1. For any "W" or "V" not indicated herein, use the value for the next higher "W" or "V" than is indicated.
2. Bar spacings are center to center of bars. Bar cover is the clear distance between surface of bar and face of concrete, and shall be exactly as otherwise indicated. 2 inches when poured against a formed surface, or 3 inches when poured against earth.
3. Except where otherwise indicated, reinforcement shall terminate 2 inches from face of concrete.
4. For thickness and reinforcement of top slab, see Standard Plan SD-100.

DESIGN DATA

Allowable Stresses (Reinforced Concrete):

f_c = 3250 psi

f_s = 30,000 psi

f_v = 20,000 psi

Allowable Tensile Stresses (Unreinforced Concrete):

f_t = 142 psi (F.S. of 4.0 based upon an assumed modulus of rupture = 570 psi.)

Loads:

L.L. Top Slab = 300 psf.

Earth Equiv. Fluid Pressure = 36 psf.

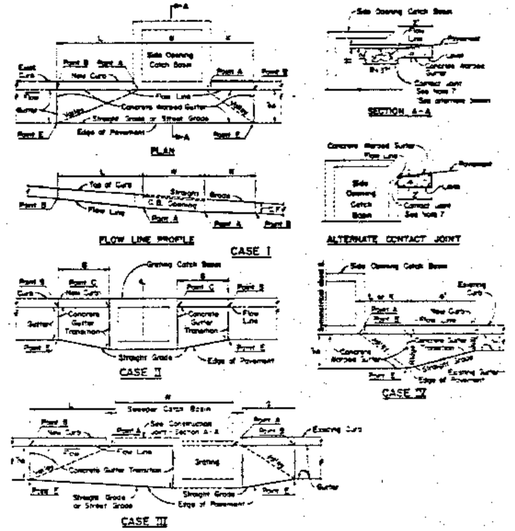
Truck L.L. on front wall = HS20-44

SIDE OPENING CATCH BASINS							
MAX. W	MAX. V	T	T_f	"A" & "B" BARS	"C" BARS	"D" BARS	"F" BARS
3.5'	8'	6"	6"	—	—	—	—
7'	6'	6"	6"	—	—	—	—
14'	4.5'	6"	6"	—	#4@2"	#3@2"	—
14'	8'	6"	8"	—	#4@2"	#3@2"	—
28'	4.5'	6"	8"	#5@24"	—	—	#3@2"
28'	5'	6"	8"	#5@20"	—	—	#3@2"
28'	6'	6"	8"	#5@12"	—	—	#3@2"
28'	7'	6"	8"	#6@17"	—	—	#3@2"
28'	8'	6"	8"	#6@15"	—	—	#3@2"

FOR W > 28' OR V > 8', SEE PROJECT PLANS

DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C.H. HUCKELBERRY, R.L.S., P.E., DIRECTOR

CATCH BASIN REINFORCEMENT — STANDARD PLAN SD-111-0

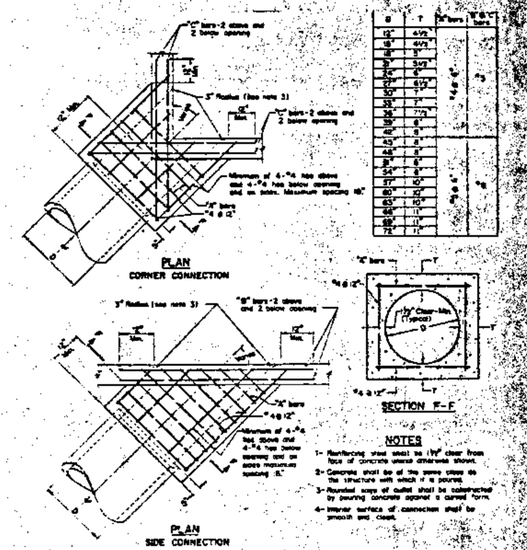


DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C.H. HUCKELBERRY, R.L.S., P.E., DIRECTOR

WARPED GUTTER AT CATCH BASINS — STANDARD PLAN SD-114-C

NOTES FOR WARPED GUTTER AT CATCH BASINS

1. WARPED GUTTERS AND GUTTER TRANSITIONS SHALL BE CONSTRUCTED OF CLASS S-2110 PORTLAND CEMENT CONCRETE. WARPED GUTTERS SHALL FINAL SURFACE WITH CONCRETE PAVEMENT SHALL BE THE SAME CLASS OF CONCRETE AS THE PAVEMENT.
2. DIMENSIONS: (UNLESS OTHERWISE SPECIFIED ON THE PLANS)
   A. L = 5 FEET (UNLESS OTHERWISE SPECIFIED).
   B. R = 3 FEET.
   C. S = 3 FEET (S = 4 FEET WHEN JOINING EXISTING 1 FOOT GUTTER)
   D. GRADEBREAK AT POINT "B" SHALL BE 6% OR LESS. C, E, AND F SHALL BE DETERMINED TO MEET THIS REQUIREMENT.
   E. GUTTER WIDTH "W" = "M" SHALL BE 2 FEET.
   F. Q = 3-1/2 INCHES.
   G. H PER PLAN.
   H. D = 3 INCHES.
3. CURB FACE DIMENSIONS: (UNLESS OTHERWISE SPECIFIED ON THE PLANS)
   A. POINT "A" = 8 INCHES.
   B. POINT "B" AS EXISTING OR PROPOSED CURB FACE.
   C. POINT "C" AS EXISTING OR PROPOSED CURB FACE.
4. POINT "B" SHALL BE 1-1/2 INCHES ABOVE POINT "B", OVER EXISTING PAVEMENT OR SPECIFIED ON THE PLANS.
5. THE CURB FACE BETWEEN NON-OPENING CATCH BASINS IN SERIES SHALL BE EQUAL TO THE CURB FACE AT POINT "A".
6. THE CURB FACE BETWEEN GRATING BASINS IN SERIES SHALL BE EQUAL TO THE CURB FACE AT POINT "C". THE GRADE OF GUTTER BETWEEN GRATING BASINS IN SERIES SHALL BE THE GUTTER GRADE OF THE BASIN.
7. WARPED GUTTER AND OR GUTTER TRANSITION SHALL BE POURED MONOLITHIC WITH THE CURB.
8. THE CONTACT JOINT SHOWN BETWEEN THE WARPED GUTTER AND THE FRONT WALL OF THE CATCH BASIN SHALL BE CONSTRUCTED, AT THE OPTION OF THE CONTRACTOR, WITH EITHER A 1 INCH BY 2 INCH CONTINUOUS KEYWAY OR NO. 4 DOWELS 12 INCHES LONG AND 18 INCHES ON CENTER.



B	T	"A" bars	"B" & "C" bars
12"	4-1/2		
18"	4-1/2		
24"	5"		
30"	5-1/2		
36"	6"	4-#4 @ 6"	#3 @ 6"
42"	6-1/2		
48"	7"		
54"	7"		
60"	7-1/2		
66"	8"		
72"	8"		
36"	6"		
42"	6"		
48"	6"		
54"	6"	4-#4 @ 12"	#3 @ 12"
60"	6"		
66"	6"		
72"	6"		

NOTES

1- Reinforcing steel shall be 1½" clear from face of concrete unless otherwise shown.

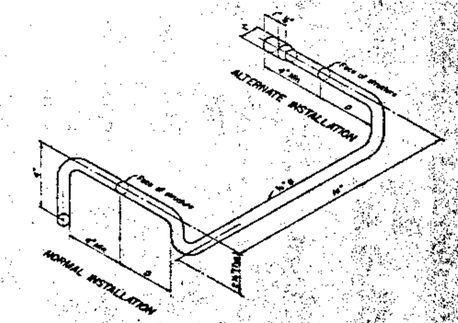
2- Concrete shall be of the same class as the structure with which it is poured.

3- Rounded ways of outlet shall be substituted by pouring concrete against a curved form.

4- Interior surface of connection shall be smooth and clean.

DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C.H. HUCKELBERRY, R.L.S., P.E., DIRECTOR

MONOLITHIC CONNECTION — STANDARD PLAN SD-217-0



NOTE:

Steps shall be steel conforming to ASTM designation A307 and shall be galvanized after bending.

Depth At Wingwalls	Steps Required	Location	"Q"
3'-6" or Less	0	—	—
3'-6" thru 4'-6"	1	12" Above Floor	6"
Greater than 4'-6"	Varies	1. Top step 6" below top surface 2. Steps spaced 12" apart 3. Bottom step max. of 18" above floor	Top step = 2 3/4" Others 4"

DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C.H. HUCKELBERRY, R.L.S., P.E., DIRECTOR

STEEL STEP FOR CONCRETE STRUCTURES — STANDARD PLAN SD-218-0

DETAIL V-9

FAS152_PI_S610C

SHEET 10C OF 36

FY 2021 Plan Set 98 of 36

MISCELLANEOUS DRAINAGE DETAILS

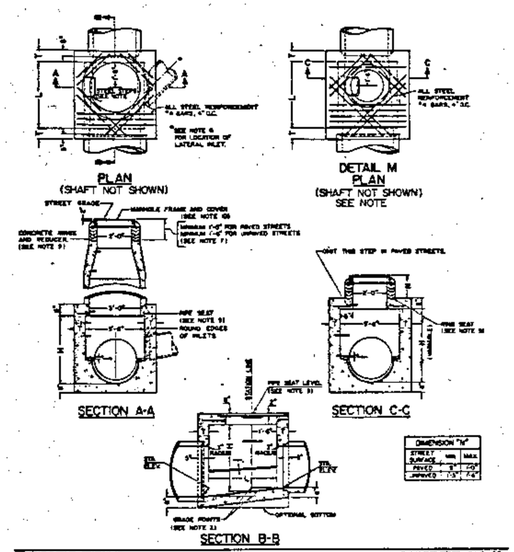
PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — C.H. HUCKELBERRY, R.L.S., P.E., DIRECTOR

NO.	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

DESIGNED / DRAWN / CHECKED / PROJ. ENGR. — DATE

rga consulting engineers — P.O. Box, Mesa, AZ 85204-0850 — Telephone/Fax: (480) 835-7276 — (602) 926-3206

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	FFO 082-1-(1)	100	36	

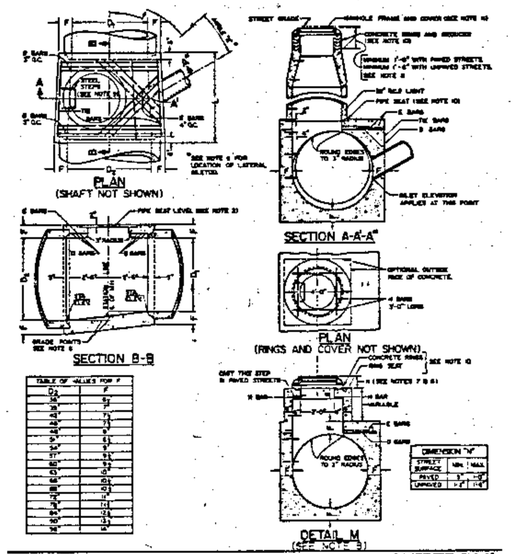


DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

MANHOLE NO. 1 — STANDARD PLAN SD-310-0

NOTES FOR MANHOLE NO. 1

1. CONCRETE SHALL BE CLASS S-3250.
2. DIMENSIONS:
   A. "L" = 4'-0" UNLESS SHOWN OTHERWISE ON IMPROVEMENT PLAN. THE LENGTH "L" MAY BE INCREASED, AT THE OPTION OF THE CONTRACTOR, TO MEET PIPE ENDS;
   B. "W" = 4'-0" UNLESS SHOWN OTHERWISE ON THE IMPROVEMENT PLANS. "W" MAY BE INCREASED AT THE OPTION OF THE CONTRACTOR, PROVIDED THAT THE VALUE OF "W" SHALL BE NOT LESS THAN THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED;
   C. MAIN-LINE ELEVATIONS SHOWN ON THE IMPROVEMENT PLANS REFER TO ENDS OF PIPE AND ARE BASED ON ANY CHANGES IN GRADE AND/OR PIPE DIAMETER OCCURRING AT THE STATION LINE (SEE SECTION B-B);
   D. THICKNESS OF THE DECK SHALL VARY AS NECESSARY TO PROVIDE A LEVEL PIPE SEAT, BUT SHALL NOT BE LESS THAN 5";
   E. "T" = 8" FOR VALUES OF "W", UP TO AND INCLUDING 8'. "T" = 10" FOR VALUES OF "W" OVER 8'.
3. REINFORCEMENT SHALL CONFORM TO SECTION 506 OF THE STANDARD SPECIFICATIONS, AND TO DETAILS SHOWN HEREON;
   A. ALL STEEL REINFORCEMENT SHALL BE #4 BARS SPACED 6" O.C.;
   B. REINFORCEMENT SHALL BE PLACED 1-1/2" CLEAR FROM THE INSIDE FACE OF CONCRETE.
4. A STEEL TROWEL SURFACE SHALL BE PROVIDED FOR THE CONCRETE FLOOR OF THE STRUCTURE AND TO THE CONCRETE SIDES FROM THE INVERT TO THE SPRING LINE.
5. CONCRETE FOR THE STRUCTURE SHALL BE PLACED IN ONE CONTINUOUS OPERATION. EXCEPT THAT THE CONTRACTOR MAY, AT HIS OPTION, PLACE AT THE SPRING LINE A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MEASURING NOT LESS THAN 1/2 "T" IN BOTH HEIGHT AND WIDTH.
6. STATIONING APPLICABLE TO THIS STRUCTURE APPLIES ALONG THE CENTER LINE OF THE MAIN LINE AS SHOWN ON SECTION B-B AND REFERS TO CENTER OF MANHOLE SHAFT. ANY INLETS TO THIS STRUCTURE SHALL BE CONSTRUCTED USING A JUNCTION STRUCTURE NO. 1. SEE STANDARD PLAN SD-121 FOR APPLICABLE DETAILS.
7. WHEN THE DEPTH OF THE MANHOLE FROM THE STREET GRADE TO THE TOP OF THE REDUCER IS LESS THAN 1 FOOT FOR PAVED STREETS OR 1 FOOT 6 INCHES FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION "C-C" HEREON. THE CONTRACTOR MAY, AT HIS OPTION, CONSTRUCT THE SHAFT AS PER SECTION "C-C" HEREON FOR ANY HEIGHT OF MANHOLE.
8. INSTALL STEPS CONFORMING TO STANDARD PLAN SD-119 OR APPROVED EQUAL.
9. CONSTRUCT PIPE SEAT, INSTALL RINGS, REDUCER, AND PIPE FOR MANHOLE SHAFT CONFORMING TO STANDARD PLAN SD-300.
10. INSTALL MANHOLE FRAME AND COVER CONFORMING TO ADOT STANDARDS.



DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

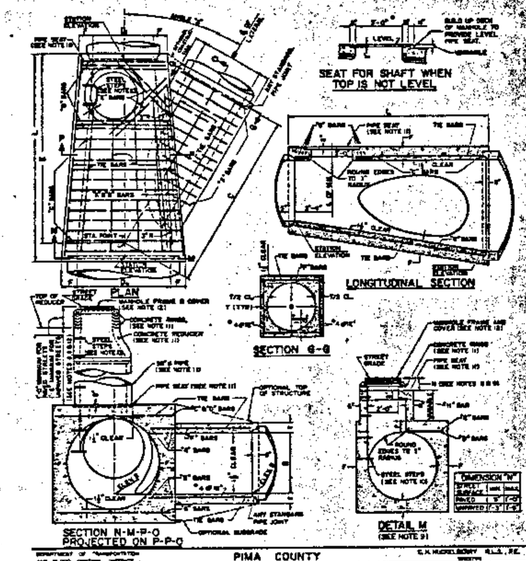
MANHOLE NO. 2 — STANDARD PLAN SD-311-0

NOTES FOR MANHOLE NO. 2

1. CONCRETE SHALL BE CLASS S-3250.
2. DIMENSIONS:
   A. "L" = 5'-10" UNLESS SHOWN OTHERWISE ON IMPROVEMENT PLAN. THE LENGTH "L" MAY BE INCREASED, AT THE OPTION OF THE CONTRACTOR, TO MEET PIPE ENDS;
   B. MAINLINE ELEVATIONS SHOWN ON THE IMPROVEMENT PLAN REFER TO ENDS OF PIPE AND ARE BASED ON ANY CHANGES IN GRADE AND/OR PIPE DIAMETER OCCURRING AT THE STATION LINE (SEE SECTION B-B);
   C. THICKNESS OF THE DECK SHALL VARY AS NECESSARY TO PROVIDE A LEVEL PIPE SEAT, BUT SHALL NOT BE LESS THAN THE TABULAR VALUE OF "F" AS SHOWN HEREON.
3. REINFORCEMENT SHALL CONFORM TO SECTION 506 OF THE STANDARD SPECIFICATIONS, AND TO DETAILS SHOWN HEREON.
   A. ALL STEEL REINFORCEMENT SHALL BE #4 BARS, SPACING AS SHOWN HEREON;
   B. "B" BARS SHALL BE SPACED 3" O.C.;
   C. "E" BARS SHALL BE SPACED 6" O.C.;
   D. TIE BARS SHALL BE #3, SPACED 18" O.C. OR CLOSER;
   E. REINFORCEMENT SHALL BE PLACED 1-1/2" CLEAR FROM THE INSIDE FACE OF CONCRETE EXCEPT AS OTHERWISE NOTED HEREON;
   F. WHEN "L" GREATER THAN 5'10" IS SPECIFIED ON IMPROVEMENT PLAN, CONTINUE "B" BARS AT 6" O.C. LENGTHS SHOWN IN TABLE HEREON ARE FOR LONGEST BARS. WHERE SHORTER BARS ARE REQUIRED, BEND OR CUT TO MEET FIELD REQUIREMENTS.
   G. FOR "D" GREATER THAN 96", SEE PROJECT PLANS;
4. A STEEL TROWEL SURFACE SHALL BE PROVIDED FOR THE CONCRETE FLOOR OF THE STRUCTURE AND TO THE CONCRETE SIDES FROM THE INVERT TO THE SPRING LINE.
5. CONCRETE FOR THE STRUCTURE SHALL BE PLACED IN ONE CONTINUOUS OPERATION. EXCEPT THAT THE CONTRACTOR MAY, AT HIS OPTION, PLACE AT THE SPRING LINE A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MEASURING NOT LESS THAN HALF THE WALL THICKNESS IN BOTH HEIGHT AND WIDTH.
6. STATIONING APPLICABLE TO THIS STRUCTURE APPLIES ALONG THE CENTER LINE OF THE MAIN LINE AS SHOWN ON SECTION B-B AND REFERS TO CENTER OF MANHOLE SHAFT.
7. THE CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTER OF STORM DRAIN WHEN DIAMETER D, IS 48" OR LESS. IN WHICH CASE "E" BARS SHOULD BE PLACED SYMMETRICALLY AROUND SHAFT AT 45° ANGLE WITH CENTER LINE.
8. WHEN THE DEPTH OF THE MANHOLE FROM THE STREET GRADE TO THE TOP OF THE REDUCER IS LESS THAN 1 FOOT FOR PAVED STREETS OR 1 FOOT 6 INCHES FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER DETAIL "W" HEREON. THE CONTRACTOR MAY, AT HIS OPTION, CONSTRUCT THE SHAFT AS PER DETAIL "W" HEREON FOR ANY HEIGHT OF MANHOLE.
9. INSTALL STEPS CONFORMING TO STANDARD PLAN SD-119 OR APPROVED EQUAL.
10. CONSTRUCT PIPE SEAT, INSTALL RINGS, REDUCER, AND PIPE FOR MANHOLE SHAFT CONFORMING TO STANDARD PLAN SD-300.
11. INSTALL MANHOLE FRAME AND COVER CONFORMING TO ADOT STANDARDS.

STEEL TABLE FOR MANHOLE NO. 2

	D bars				E bars		
Diam D	No. Req'd	Size	Length	No. Req'd	Size	Length
36"	8	#4	1'-10"	4	"	1'-8"
39"	8	"	1'-11"	4	"	1'-10"
42"	9	#5	1'-8"	4	"	1'-1"
45"	9	"	1'-10"	4	"	1'-5"
48"	9	"	1'-11"	4	"	1'-7"
51"	9	"	2'-0"	4	"	1'-8"
54"	9	"	2'-2"	4	"	1'-10"
57"	9	"	2'-3"	4	"	1'-11"
60"	9	"	2'-4"	4	"	2'-0"
63"	9	"	2'-5"	4	"	2'-1"
66"	9	"	2'-6"	4	"	2'-2"
69"	9	"	2'-7"	4	"	2'-3"
72"	9	"	2'-8"	4	"	2'-4"
75"	9	"	2'-9"	4	"	2'-5"
78"	9	"	2'-10"	4	"	2'-6"
81"	9	"	2'-11"	4	"	2'-7"
84"	9	"	3'-0"	4	"	2'-8"
87"	9	"	3'-1"	4	"	2'-9"
90"	9	"	3'-2"	4	"	2'-10"
96"	9	"	3'-4"	4	"	3'-0"



DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

MANHOLE NO. 4 — STANDARD PLAN SD-313-0

NOTES FOR MANHOLE NO. 4

1. CONCRETE SHALL BE CLASS S-3250.
2. DIMENSIONS:
   A. SEE PROJECT PLANS FOR VALUES OF "A", "B", "C", "D", "E", "F", "G", ELEVATION "A", & ELEVATION "B";
   B. THE LENGTH OF DIMENSIONS "C", "E", & "L" MAY BE INCREASED AT THE OPTION OF THE CONTRACTOR TO MEET PIPE ENDS, PROVIDED PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER.
   C. LATERALS SHOULD ENTER THE MAINLINE RADIALLY WHENEVER POSSIBLE. WHEN DIMENSION "C" IS NOT INDICATED ON THE PROJECT PLANS, NO LATERAL SHALL BE CONSTRUCTED, AND "A", "B", AND "F" BARS SHALL BE OMITTED.
3. REINFORCEMENT SHALL CONFORM TO SECTION 506 OF THE STANDARD SPECIFICATIONS, AND TO DETAILS AND SCHEDULES SHOWN IN THE "REINFORCEMENT SCHEDULE" SHOWN HEREON:
   A. "A", "E", & "F" BARS REFER TO DIMENSION "A"; EXTEND "A" & "F" BARS 6" BEYOND THE OPENING;
   B. "C", "D", & "C" BARS REFER TO DIMENSION "D";
   C. "E" BARS REFER TO DIMENSION "E";
   D. "COVER" MEANS THE DIFFERENCE BETWEEN THE TOP OF THE STRUCTURE & THE SURFACE GRADE ABOVE;
   E. TIE BARS SHALL BE NO. 4 AT 18 INCHES;
   F. REINFORCEMENT SHALL BE PLACED 1-1/2 INCHES CLEAR FROM THE INSIDE FACE OF CONCRETE EXCEPT AS OTHERWISE INDICATED HEREON;
   G. WALL AND SLAB THICKNESSES ("T") SHALL BE AS SHOWN HEREON;
   H. FOR "D" GREATER THAN 72 INCHES OR "D" GREATER THAN 96 INCHES, SEE PROJECT PLANS.
4. A STEEL TROWEL SURFACE SHALL BE PROVIDED FOR THE CONCRETE FLOOR OF THE STRUCTURE AND TO THE CONCRETE SIDES FROM THE INVERT TO THE SPRING LINE.
5. CONCRETE FOR THE STRUCTURE, INCLUDING THE LATERAL (S) SHALL BE PLACED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR MAY AT HIS OPTION PLACE AT THE SPRING LINE A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MEASURING NOT LESS THAN HALF THE WALL THICKNESS IN BOTH HEIGHT AND WIDTH.
6. STATIONING APPLICABLE TO THIS STRUCTURE APPLY ALONG THE CENTER LINES OF THE MAIN LINE AND THE LATERAL(S). THE STATION POINT IS AT THE INTERSECTION OF THE CENTER LINES OF THE MAIN LINE AND THE LATERAL(S). ELEVATION "A" IS ON THE PROLONGATION OF THE LATERAL(S) INVERT GRADE AT THE STATION POINT.
7. WHERE LATERALS ENTER ON BOTH SIDES OF THE STRUCTURE, THEY SHALL BE DESIGNATED ON THE PROJECT PLANS AS RIGHT OR LEFT, FACING IN THE DIRECTION OF STATIONING.
8. MANHOLES SHALL BE LOCATED SO THAT THE INSIDE EDGE OF THE SHAFT IS DIRECTLY OVER THE INSIDE FACE OF THE STRUCTURE, AND SHALL BE LOCATED ON THE SIDE OPPOSITE THE LATERAL. IF LATERALS ENTER BOTH SIDES OF THE STRUCTURE, THE MANHOLE SHALL BE LOCATED ON THE SAME SIDE AS THE SMALLER LATERAL.
9. WHEN THE DEPTH OF THE MANHOLE FROM THE STREET GRADE TO THE TOP OF THE REDUCER IS LESS THAN 1 FOOT FOR PAVED STREETS OR 1 FOOT 6 INCHES FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER DETAIL "W" HEREON. THE CONTRACTOR MAY CONSTRUCT THE SHAFT AS PER DETAIL "X" HEREON FOR ANY HEIGHT OF MANHOLE, PROVIDED PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER.
10. INSTALL STEPS CONFORMING TO STANDARD PLAN SD-118.
11. CONSTRUCT PIPE SEAT, INSTALL RINGS, REDUCER, AND PIPE FOR MANHOLE SHAFT CONFORMING TO STANDARD PLAN SD-300.
12. INSTALL MANHOLE FRAME AND COVER CONFORMING TO ADOT STANDARDS.

STRUCTURAL DATA

DIMENSION B OR D INCHES	DIMENSION F OR T INCHES	A & B BARS 3'-10" COVER	C BARS 1'-10" COVER	C BARS 18'-20" COVER	D BARS 1'-20" COVER	E BARS (SPACE 6") NO. REQ'D	E BARS (SPACE 6") LENGTH	F BARS 1'-20" COVER	G BARS	H BARS 2'-0" LONG
36	6-1/2	2'8½-1/2	#4@6	#4@6	#4@6		3/8	3/8	#4@6	
39	7	2'10½	#4@6							
42	7-1/2	2'8½	#4@6-1/2							
45	8	2'10½	#4@6-1/2							
48	8-1/2	3'0½	#4@6-1/2							
51	9	3'2½	#4@6-1/2							
54	9-1/2	3'4½	#4@6-1/2							
57	10	3'6½	#4@6-1/2							
60	10-1/2	3'8½	#4@6-1/2	#4@6	#4@6					
63	11	3'10½	#4@6-1/2	#4@6	#4@6					
66	11-1/2	4'0½	#4@6-1/2	#4@6	#4@6					
69	12	4'2½	#4@6-1/2	#4@6	#4@6					
72	12-1/2	4'4½	#4@6-1/2	#4@6	#4@6					
75	13	4'6½	#4@6-1/2	#4@6	#4@6					
78	13-1/2	4'8½	#4@6-1/2	#4@6	#4@6					
81	14	4'10½	#4@6-1/2	#4@6	#4@6					
84	14-1/2	5'0½	#4@6-1/2	#4@6	#4@6					
87	15	5'2½	#4@6-1/2	#4@6	#4@6					
90	15-1/2	5'4½	#4@6-1/2	#4@6	#4@6					
96	16	5'8½	#4@6-1/2	#4@6	#4@6	10	8'-8"	3'-8"	#4@18	#4@6

SEE PROJECT PLANS

DETAIL V-10

NO.	REVISION	DESCRIPTION	DRV/SECT ENGR.	DATE

DESIGNED / DRAWN / CHECKED / PROJ. ENGR. — DATE

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

rgg consulting engineers — P.O. Box No. 26860, Tucson, Arizona 85726, (602) 881-4300

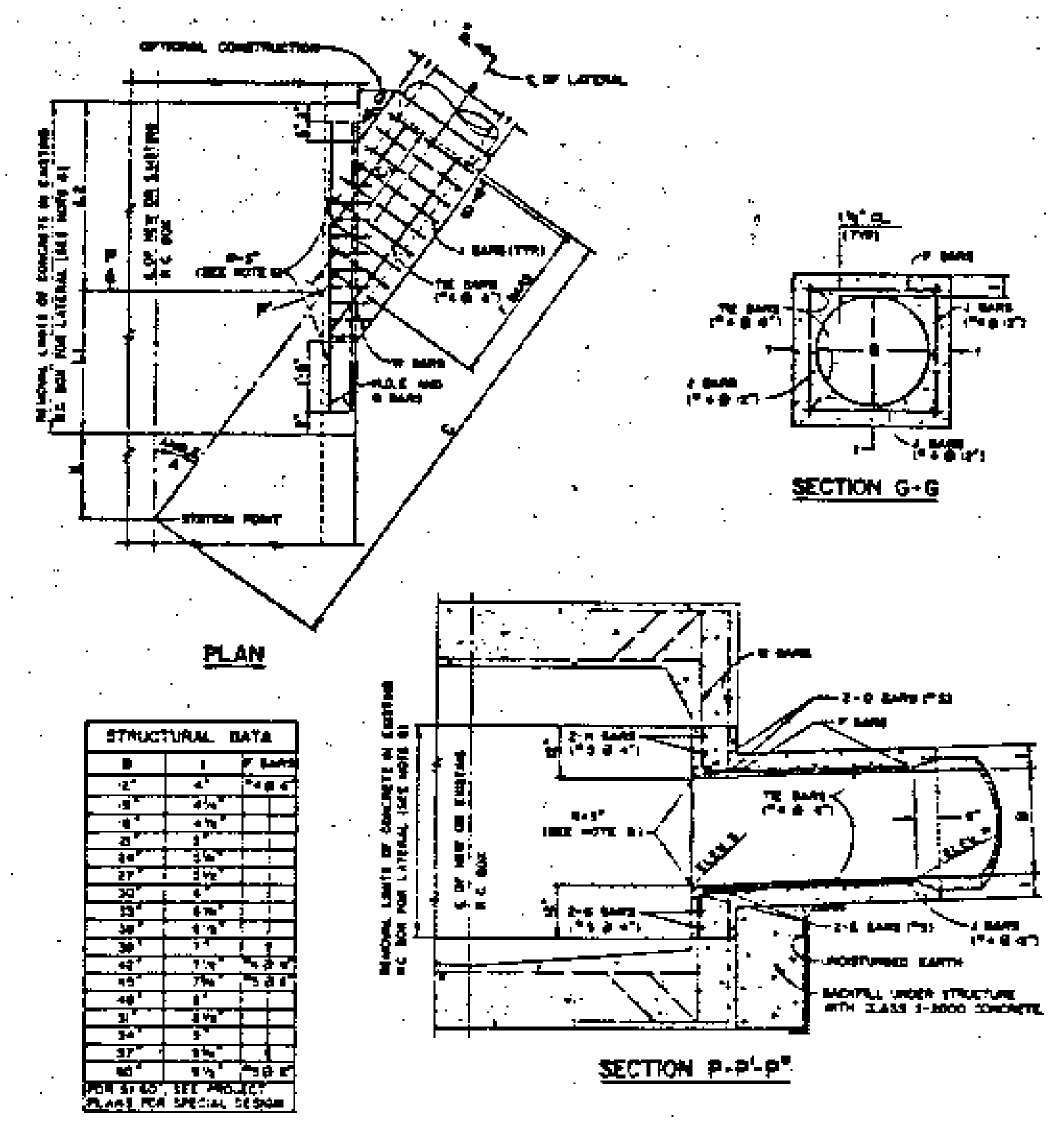
SHEET 100 OF 36

MISCELLANEOUS DRAINAGE DETAILS

FFO 082-1-(1) | 10 | 10 Dec of 36

JAS152 - 01-S0100

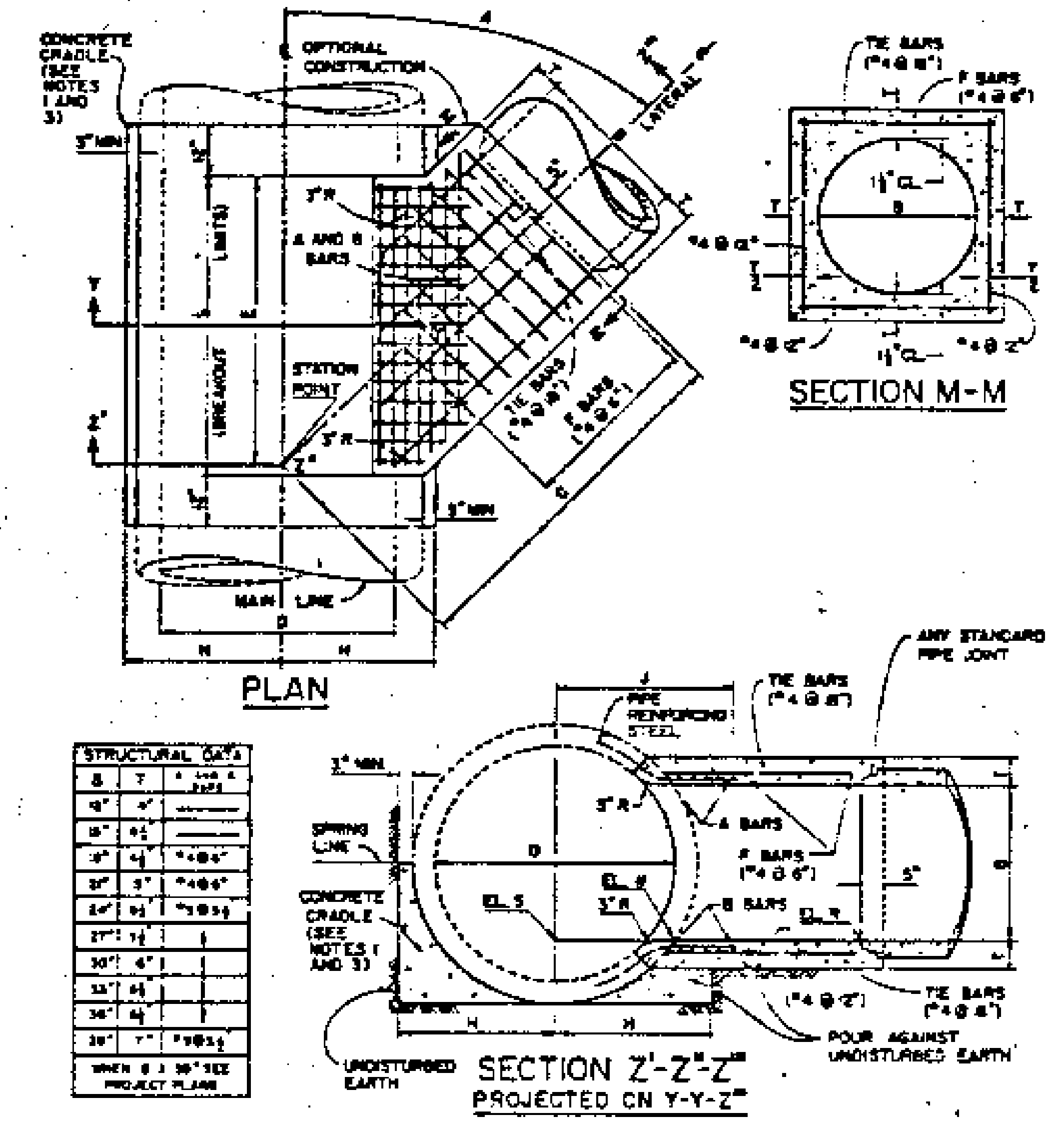
FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	FFD-082-1(1)	10E	36	



STRUCTURAL DATA		
B	I	F BARS
12"	4"	#4 @ 6"
15"	4½"	
18"	4½"	
21"	5"	
24"	5¼"	
27"	5½"	
30"	6"	
33"	6¼"	
36"	6½"	
39"	7"	
42"	7¼"	#5 @ 8"
45"	7½"	#5 @ 8"
48"	8"	
51"	8¼"	
54"	9"	
57"	9¼"	
60"	9½"	#5 @ 8"
FOR B > 60, SEE PROJECT PLANS FOR SPECIAL DESIGN		

DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C. H. HUCKELBERRY, R.L.S., P.E. DIRECTOR

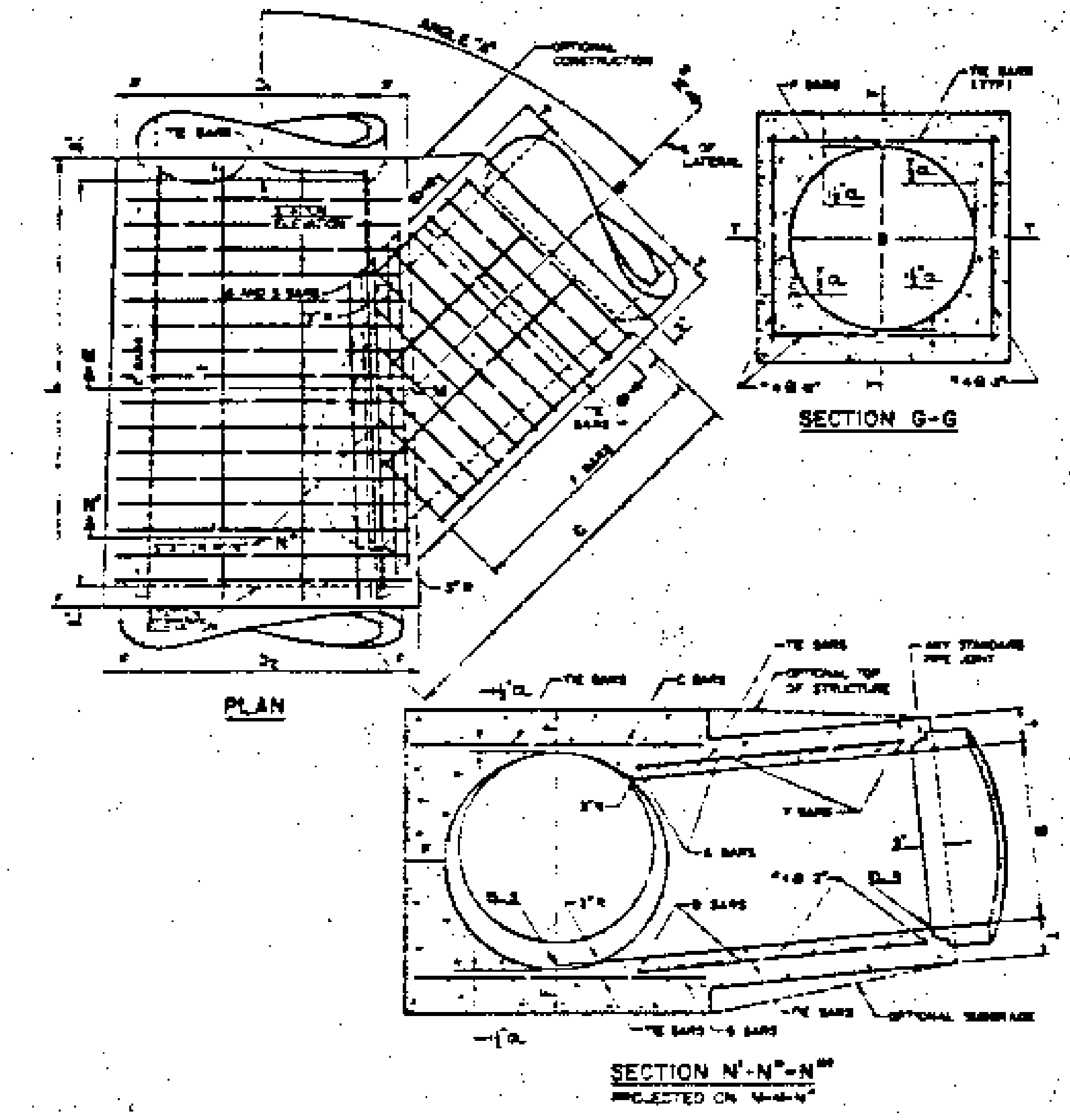
JUNCTION STRUCTURE NO. 1 — STANDARD PLAN SD-321-0



STRUCTURAL DATA		
B	T	A AND B BARS
12"	4"	——
15"	4½"	——
18"	4½"	#4 @ 6"
21"	5"	#4 @ 6"
24"	5½"	#5 @ 5½
27"	5½"	
30"	6"	
33"	6½"	
36"	6½"	
39"	7"	#5 @ 5½
WHEN B ≥ 39" SEE PROJECT PLANS		

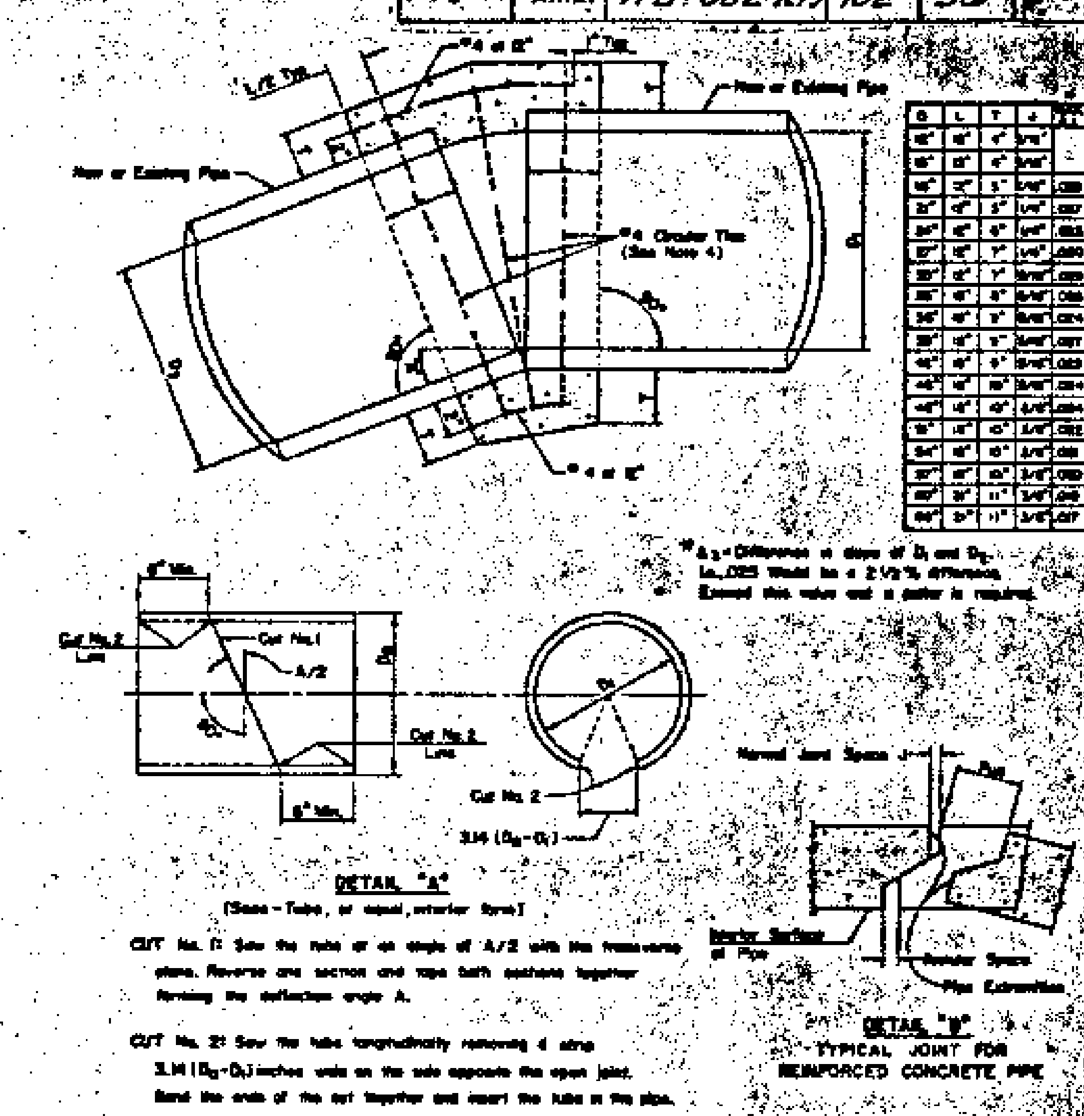
DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C. H. HUCKELBERRY, R.L.S., P.E. DIRECTOR

JUNCTION STRUCTURE NO. 2 — STANDARD PLAN SD-322-0



DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C. H. HUCKELBERRY, R.L.S., P.E. DIRECTOR

TRANSITION STRUCTURE NO. 3 — STANDARD PLAN SD-333-0



DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT — PIMA COUNTY — C. H. HUCKELBERRY, R.L.S., P.E. DIRECTOR

CONCRETE COLLAR FOR STORM DRAIN PIPE — STANDARD PLAN SD-341-0

NOTES FOR JUNCTION STRUCTURE 1

1. CONCRETE FOR MAIN LINE AND LATERAL SHALL BE CLASS S-3250. CONCRETE BACKFILL SHALL BE CLASS S-2000.
2. DIMENSIONS:
   A. SEE PROJECT PLANS FOR VALUES OF A, B, C, C_1, L_1, L_2, R, ELEVATION S AND ELEVATION Z.
   B. THE LENGTH OF DIMENSIONS C AND C_1 MAY BE INCREASED TO MEET PIPE ENDS, PROVIDED PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER.
3. STRUCTURAL DATA:
   A. REINFORCING STEEL SHALL BE 1-1/2 INCHES CLEAR FROM FACE OF CONCRETE.
   B. OMIT "H" BARS WHEN SOFFIT OF LATERAL IS LESS THAN ONE FOOT BELOW SOFFIT OF MAIN LINE. OMIT "G" BARS WHEN INVERT OF LATERAL IS LESS THAN ONE FOOT ABOVE FLOOR OF MAIN LINE.
4. ELEVATION "S" IS ON THE PROLONGATION OF THE LATERAL INVERT GRADE AT THE INSIDE FACE OF THE MAIN LINE.
5. SEE PROJECT PLANS FOR ADDITIONAL REQUIREMENTS WHEN PROJECT PLANS REQUIRE A MANHOLE TO BE CONSTRUCTED AT THE SAME LOCATION AS THIS JUNCTION.
6. PROVIDE A 3-INCH RADIUS OF ROUNDING AT THE INTERSECTION OF THE FACE OF THE LATERAL WITH THE MAIN LINE. THE RADIUS SHALL BE FORMED BY CURVED FORMS AND SHALL NOT BE MADE BY PLASTERING.
7. CONCURRENT CONSTRUCTION OF JUNCTION STRUCTURE WITH R.C. BOX:
   A. THE CONTRACTOR MAY BLOCK OUT AN OPENING FOR THE JUNCTION, PROVIDED HE SUBMITS A PLAN SATISFACTORY TO AND APPROVED BY THE ENGINEER WHICH PROVIDES FOR SUCH BLOCKING AND THE BRACING, SUPPORT, AND STRUCTURAL INTEGRITY OF THE BOX. OTHERWISE, THE JUNCTION STRUCTURE AND THE MAIN LINE STRUCTURAL CONCRETE SHALL BE POURED MONOLITHICALLY IN ONE CONTINUOUS OPERATION.
   B. W BARS SHALL BE CUT IN THE CENTER OF THE OPENING AND BENT INTO THE LATERAL AS SHOWN HEREON. SEE PROJECT PLANS FOR SIZE AND SPACING OF W BARS FOR BOX TO BE CONSTRUCTED.
8. CONNECTION OF JUNCTION STRUCTURE "D" TO AN EXISTING R.C. BOX:
   A. REMOVE ALL SOIL AND ANY OTHER BURDEN OVER TOP OF EXISTING R.C. BOX WITHIN INDICATED REMOVAL LIMITS PRIOR TO BREAKING OUT OF ANY CONCRETE OR CONSTRUCTING THE JUNCTION. SUCH SOIL AND OTHER BURDEN MAY BE ALLOWED TO REMAIN IN PLACE DURING CONSTRUCTION OF THE JUNCTION PROVIDED THE CONTRACTOR SUBMITS A PLAN SATISFACTORY TO AND APPROVED BY THE ENGINEER WHICH PROVIDES FOR THE BRACING, SUPPORT, AND STRUCTURAL INTEGRITY OF THE EXISTING R.C. BOX, AND THE BYPASSING OF FLOWS AROUND SUCH BRACING AND SUPPORTS.
   B. THE CONCRETE WITHIN THE REMOVAL LIMITS SHALL BE REMOVED BY FIRST MAKING A ONE-INCH DEEP SAWCUT ON THE EXPOSED CONCRETE AT THE INDICATED REMOVAL LIMIT LINES USING AN APPROVED CONCRETE SAW. THEN ADJACENT TO THE SAWCUT LINES, AND WITHIN THE REMOVAL LIMITS, CUT A GROOVE EQUAL TO THE DEPTH OF THE SAWCUT USING AN APPROVED CHIPPING HAMMER; THEN REMOVE THE REMAINING CONCRETE USING HAND OPERATED EQUIPMENT AND TOOLS, LEAVING A CLEAN PLANE SURFACE FOR JOINING WITH THE NEW CONCRETE.
   C. THE EXPOSED EXISTING REINFORCEMENT SHALL BE CUT IN THE CENTER OF THE OPENING, CLEANED, AND BENT INTO THE NEW LATERAL.

NOTES FOR JUNCTION STRUCTURE 2

1. CONCRETE SHALL BE CLASS S-3250.
2. DIMENSIONS:
   A. SEE PROJECT PLANS FOR VALUES OF: A, B, C, D, E, L, ELEVATION R, ELEVATION 4, AND ELEVATION S. THE LENGTH OF DIMENSION C, E, AND L MAY BE INCREASED BY THE CONTRACTOR TO MEET PIPE ENDS, PROVIDED PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER.
   B. "H" = 1/2 PIPE O.D. + 3 INCHES, MINIMUM.
   C. "J" = $\frac{7D}{12}$ + 4 INCHES.
   D. ELEVATION "S" OCCURS AT THE INTERSECTION OF THE CENTERLINES OF THE MAIN LINE AND LATERAL ON THE PROLONGATION OF THE INVERT GRADE OF THE LATERAL.
   E. ELEVATION "R" OCCURS AT THE INTERSECTION OF THE LATERAL INVERT WITH THE OUTSIDE WALL OF THE EXISTING PIPE AND IS GIVEN AS AN AID TO THE CONTRACTOR IN DETERMINING THE LOCATION OF THE BREAKOUT.
3. THE MAIN-LINE PIPE SHALL BE SUPPORTED LONGITUDINALLY FOR ITS ENTIRE WIDTH BY A CONCRETE CRADLE TO ONE FOOT BEYOND THE LIMITS OF "L" ON BOTH ENDS. WHERE CONSTRUCTION OF THIS STRUCTURE OCCURS IN CONNECTION WITH AN EXISTING MAIN-LINE PIPE, THAT PORTION OF THE CRADLE MAY BE OMITTED THAT WOULD BE PLACED ON THE SIDE OPPOSITE THE LATERAL AND BETWEEN THE OUTSIDE EDGE OF AND TO THE CENTERLINE OF THE EXISTING PIPE.
4. THE OPENING IN THE MAIN-LINE PIPE SHALL BE RECTANGULAR, CUT WITHIN THE LIMITS SHOWN HEREON NORMAL TO THE PIPE SURFACE WITHOUT DAMAGING THE PIPE REINFORCEMENT. IF A JOINT IN THE MAIN LINE PIPE FALLS WITHIN THE LIMITS OF THE CONCRETE CRADLE, PROVIDE A CONCRETE ENCASEMENT SIX INCHES ABOVE THE TOP OF THE MAIN-LINE PIPE TO THE LIMITS OF THE CRADLE.
5. REINFORCEMENT SHALL CONFORM TO SECTION 506 OF THE STANDARD SPECIFICATIONS, AND TO DETAILS SHOWN HEREON. "A" AND "B" BARS SHALL BE CARRIED TO A POINT NOT LESS THAN A DISTANCE EQUAL TO "J" FROM THE CENTERLINE. TRANSVERSE REINFORCEMENT IN PIPE SHALL BE CUT IN CENTER OF OPENING AND BENT TO UNIFORM DISTANCE FROM TOP AND BOTTOM OF JUNCTION STRUCTURE.
6. A STEEL TROWEL SURFACE SHALL BE PROVIDED FOR THE CONCRETE FLOOR OF THE STRUCTURE AND TO THE CONCRETE SIDES FROM THE INVERT TO THE SPRING LINE.
7. THE CONTRACTOR MAY, AT HIS OPTION, CONSTRUCT A TRANSITION STRUCTURE NO. 3 CONFORMING TO STANDARD PLAN SD-333 IN LIEU OF A JUNCTION STRUCTURE NO. 2.

NOTES FOR TRANSITION STRUCTURE NO. 3

1. CONCRETE SHALL BE CLASS S-3250.
2. DIMENSIONS:
   A. SEE PROJECT PLANS FOR VALUES OF A, B, C, D_1, E, L, ELEVATION "R", ELEVATION "S", AND MAINLINE STATIONS AND ELEVATIONS.
   B. THE LENGTH OF DIMENSIONS "C", "E", AND "L" MAY BE INCREASED AT THE OPTION OF THE CONTRACTOR TO MEET PIPE ENDS.
   C. ELEVATION "S" OCCURS AT THE INTERSECTION OF THE CENTERLINE OF THE MAIN LINE AND LATERAL ON THE PROLONGATION OF THE INVERT GRADE OF THE LATERAL.
3. REINFORCEMENT SHALL CONFORM TO SECTION 506 OF THE STANDARD SPECIFICATIONS, AND TO DETAILS AND SCHEDULES SHOWN IN THE REINFORCEMENT SCHEDULE SHOWN HEREON.
   A. "A", "B", AND "C" BARS REFER TO DIMENSION "D";
   B. "E" AND "F" BARS REFER TO DIMENSION "D_1".
   C. "COVER" MEANS THE DIFFERENCE IN VERTICAL ELEVATION BETWEEN THE TOP OF THE STRUCTURE AND THE SURFACE GRADE ABOVE.
   D. TIE BARS SHALL BE NO. 4 AT 18 INCHES.
   E. REINFORCEMENT SHALL BE PLACED 1-1/2 INCHES CLEAR FROM THE INSIDE FACE OF CONCRETE EXCEPT AS OTHERWISE SHOWN HEREON;
   F. WALL AND SLAB THICKNESS (T) SHALL BE AS SHOWN HEREON;
   G. FOR "D" GREATER THAN 72 INCHES OR D_2 GREATER THAN 96 INCHES, SEE PROJECT PLANS.
4. A STEEL TROWEL SURFACE SHALL BE PROVIDED FOR THE CONCRETE FLOOR OF THE STRUCTURE AND TO THE CONCRETE SIDES FROM THE INVERT TO THE SPRING LINE.
5. CONCRETE FOR THE STRUCTURE, INCLUDING THE LATERAL(S) SHALL BE PLACED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR MAY, AT HIS OPTION, PLACE AT THE SPRING LINE A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MEASURING NOT LESS THAN HALF THE WALL THICKNESS IN BOTH HEIGHT AND WIDTH.
6. STATIONING WHERE APPLICABLE TO THIS STRUCTURE APPLY ALONG THE CENTER LINES OF THE MAIN LINE AND THE LATERAL S. THE STATION POINT IS AT THE INTERSECTION OF THE CENTER LINES OF THE MAIN LINE AND LATERAL #1. ELEVATION "S" IS ON THE PROLONGATION OF THE LATERAL(S) INVERT GRADE AT THE STATION POINT.
7. WHERE LATERALS ENTER ON BOTH SIDES OF THE STRUCTURE, THEY SHALL BE DESIGNATED ON THE PROJECT PLANS AS RIGHT OR LEFT, FACING IN THE DIRECTION OF STATIONING.

STRUCTURAL DATA

DIMENSION D OR D_1	DIMENSION T OR T_1	A & B BARS COVER 1'-12'	A & B BARS COVER 12'-20'	C BARS COVER 1-15'	C BARS COVER 15-20'	F BARS COVER 1-20'	G BARS
INCHES	INCHES						
18	4-1/2	#3 @ 6"	#3 @ 4-1/2"	#4 @ 6"	#4 @ 5"	#4 @ 6"	
21	5	#3 @ 6"	#3 @ 4-1/2"				——
24	5-1/4	#4 @ 6"	#5 @ 5-1/2"				——
27	5-1/2						——
30	6						——
33	6-1/4						——
36	6-1/2						——
39	7	#4 @ 4"	#5 @ 5-1/2"	#4 @ 5"	#4 @ 5"		——
42	7-1/2	#5 @ 5-1/2"	#6 @ 4"	#5 @ 6"	#5 @ 6"	#4 @ 6"	——
45	7-1/4					#5 @ 5"	——
48	8						——
51	8-1/2						——
54	9						——
57	9-1/4						——
60	9-1/2	#5 @ 5-1/2"	#6 @ 4"				#4 @ 6"
63	10	#5 @ 4"	#6 @ 3"				
66	10-1/4						
69	10-1/4						
72	11	#5 @ 4"	#6 @ 3"			#5 @ 5"	
75	11-1/2	SEE PROJECT PLANS				SEE PROJECT PLANS	
78	11-1/4						
81	12						
84	12-1/2				#5 @ 6"		
87	12-1/4				#5 @ 5"		
90	13-1/4						
93	13-1/2						
96	14			#5 @ 4"	#5 @ 3"		#4 @ 18"

NOTES FOR CONCRETE COLLAR STORM DRAIN PIPE

1. A CONCRETE COLLAR IS REQUIRED IF THE PERMITTED PULL AT THE PIPE JOINT IS EXCEEDED. PULLING OF JOINTS SHALL BE LIMITED TO 3/4-INCH FROM NORMAL CLOSURE FOR PIPE 36-INCHES OR LESS IN DIAMETER AND TO 1-INCH FROM NORMAL CLOSURE FOR PIPE 39-INCHES OR MORE IN DIAMETER.
2. CONCRETE COLLARS SHALL NOT BE CONSTRUCTED ON MAIN LINE STORM DRAIN UNLESS SHOWN ON THE PLANS OR ORDERED BY THE ENGINEER.
3. REINFORCING SHALL BE USED WHERE THE PIPE DIAMETER IS GREATER THAN 21-INCHES AND ON ALL PIPES WHERE THE SPACE BETWEEN THE EXTREMITIES (OUTERMOST ELEMENTS) IS 2-1/2-INCHES OR LARGER.
4. CIRCULAR TIES:

PIPE DIAMETER	SPACE BETWEEN PIPE EXTREMITIES	NO. OF CIRCULAR TIES
21" or less	2-1/2"	3
24" to 30"	2-1/2" or less	3
33" to 57"	2-1/2" or less	4
60" to 84"	2-1/2" or less	5

WHERE THE SPACE BETWEEN THE PIPE EXTREMITIES EXCEEDS 2-1/2-INCHES, THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN AN APPROXIMATE SPACING OF 6-INCHES CENTER TO CENTER.

5. CONCRETE SHALL BE CLASS S-3000.
6. FOR PIPE LARGER THAN 84-INCHES IN DIAMETER A SPECIAL COLLAR DETAIL SHALL BE DELINEATED ON THE PROJECT PLANS.
7. WHERE THE PIPE IS 21-INCHES OR LESS IN DIAMETER, AN INTERIOR FORM OF UNSEALED SONO-TUBE, OR EQUAL, SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. THE PAPER FORM MAY BE LEFT IN PLACE. WHEN THE PIPE IS 24-INCHES OR LARGER A REMOVABLE INTERIOR FORM SHALL BE USED OR THE INTERIOR JOINT SHALL BE COMPLETELY FILLED WITH MORTAR AND NEATLY POINTED.
8. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHALL BE THOSE OF THE LARGER PIPE. A CONCRETE COLLAR SHALL NOT BE CONSTRUCTED CONNECTING A LARGER DIAMETER PIPE UPSTREAM TO A SMALLER DIAMETER PIPE DOWNSTREAM UNLESS SHOWN ON THE IMPROVEMENT PLANS OR ORDERED BY THE ENGINEER.
9. THE VALUE FOR ANGLE A SHALL BE SHOWN ON THE IMPROVEMENT PLANS.

FAS152 PL-S010E

DETAIL V-11

SHEET 10E OF 36

MISCELLANEOUS DRAINAGE DETAILS

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C. H. HUCKELBERRY, R.L.S., P.E., DIRECTOR

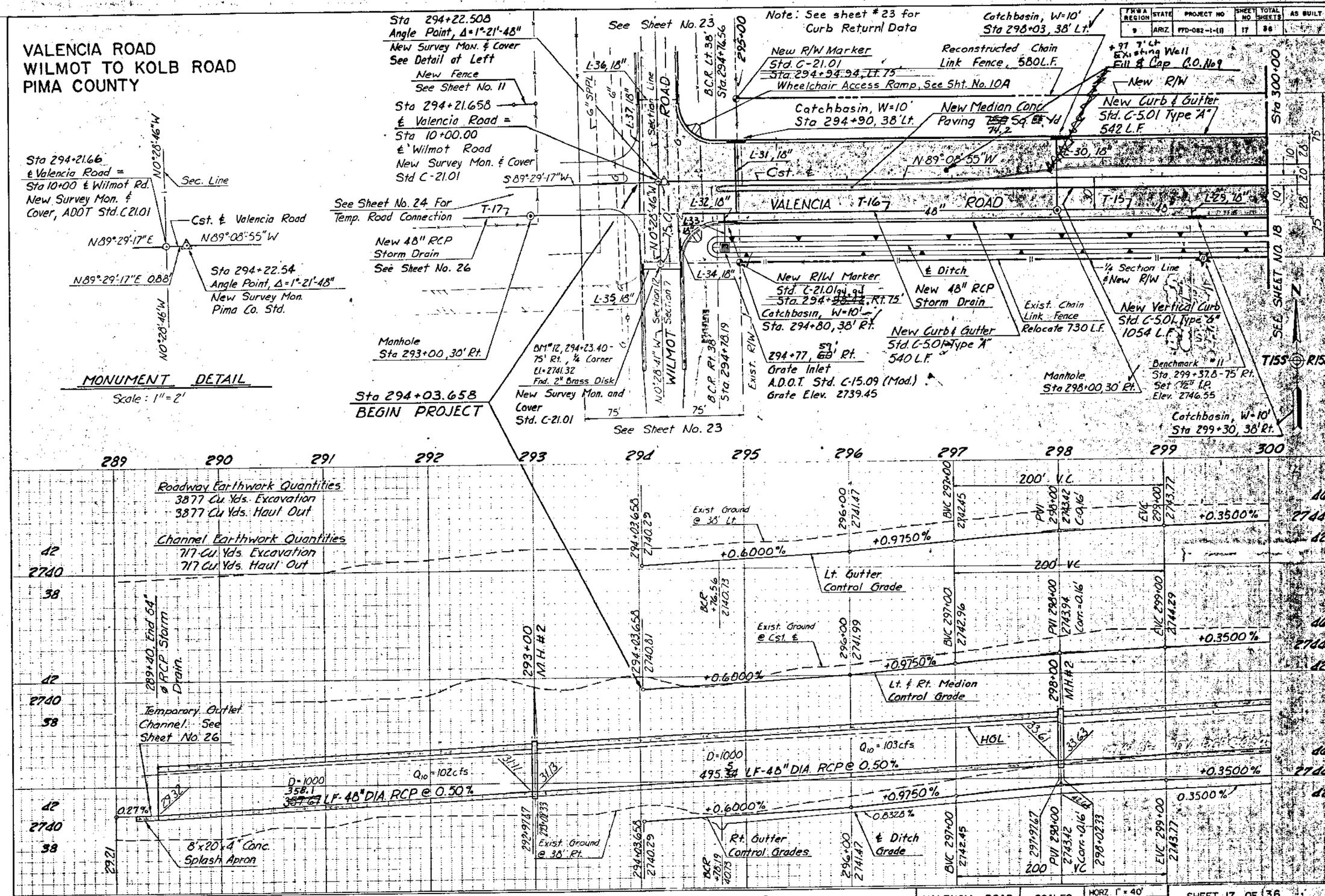
NO.	REVISION	DESCRIPTION	DIV./SECT. ENGR.	DATE

DESIGNED	DATE
DRAWN	
CHECKED	
PROJ. ENGR.	

rga consulting engineers — P.O. Box No. 26450, Tucson, Arizona 85726

FHWA REGION	STATE	PROJECT NO	SHEET NO	TOTAL SHEETS	AS BUILT
9	ARIZ.	FFD-082-1-(1)	17	36	

VALENCIA ROAD
WILMOT TO KOLB ROAD
PIMA COUNTY



DATE	
3/02	
3/03	
3/03	
3/03	
3/03	

DESIGNED RE
DRAWN RE
CHECKED
PROJ. ENGR.

H. HUCKELBERRY R.L.S. PIMA COUNTY DIRECTOR

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

NO	REVISION & DESCRIPTION	DR./ DESIGN	DATE

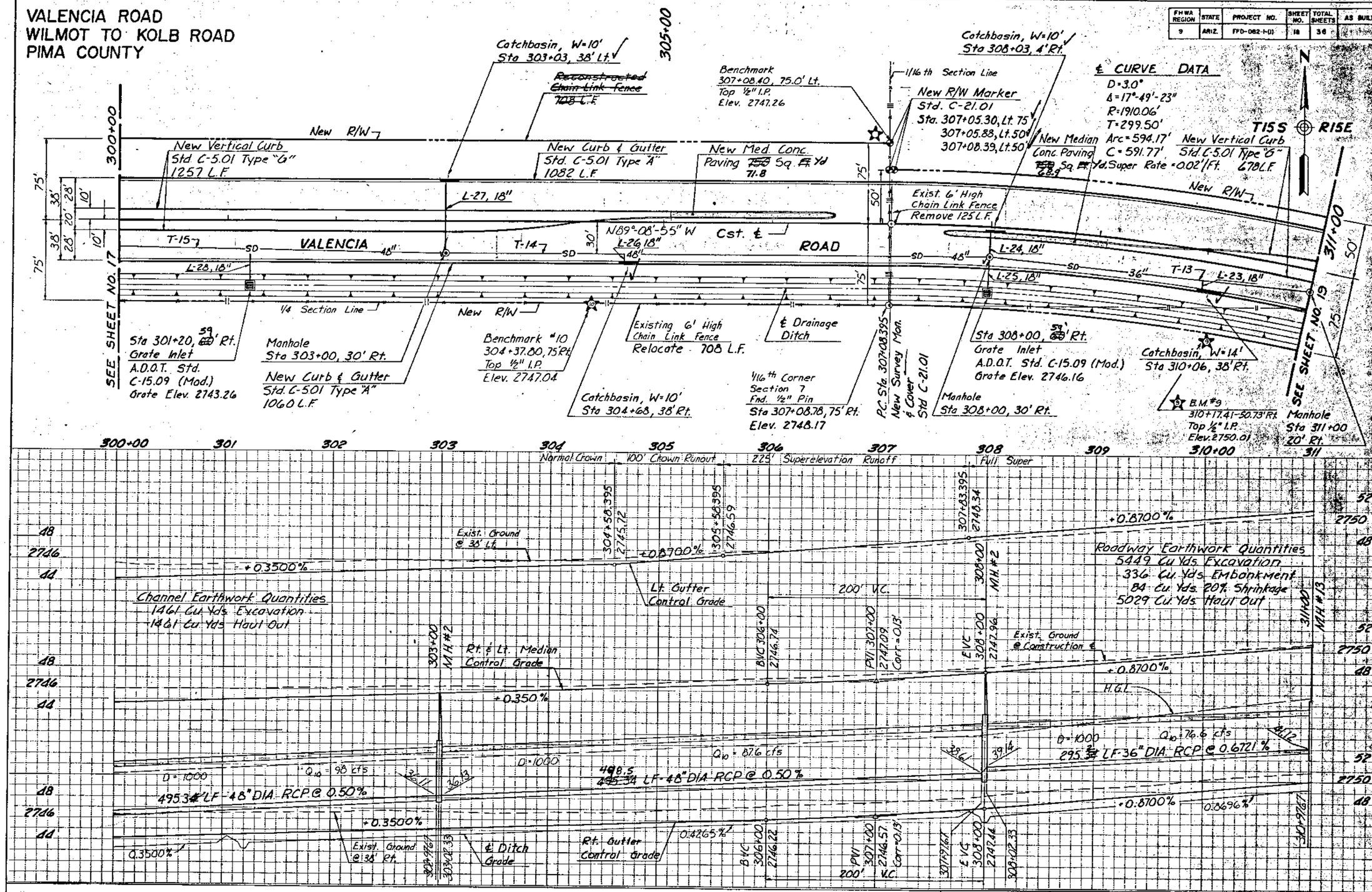
rgg consulting engineers

FAS152-P1-S017

VALENCIA ROAD	SCALES	HORZ. 1" = 40' VERT. 1" = 4'	SHEET 17 OF 36
10	FFD-082-1-(1)	17 of 36	STA. 289+40 TO STA. 300+00

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	FFD-082-1-(1)	18	36	

VALENCIA ROAD
WILMOT TO KOLB ROAD
PIMA COUNTY



FA5152-P1-S018

VALENCIA ROAD	SCALES	HORZ. 1" = 40' VERT. 1" = 4'	SHEET 18 OF 36
			STA. 300+00 TO STA. 311+00

FFD-082-1-(1) 18 of 36

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C.H. HUCKELBERRY R.L.S., P.E., DIRECTOR

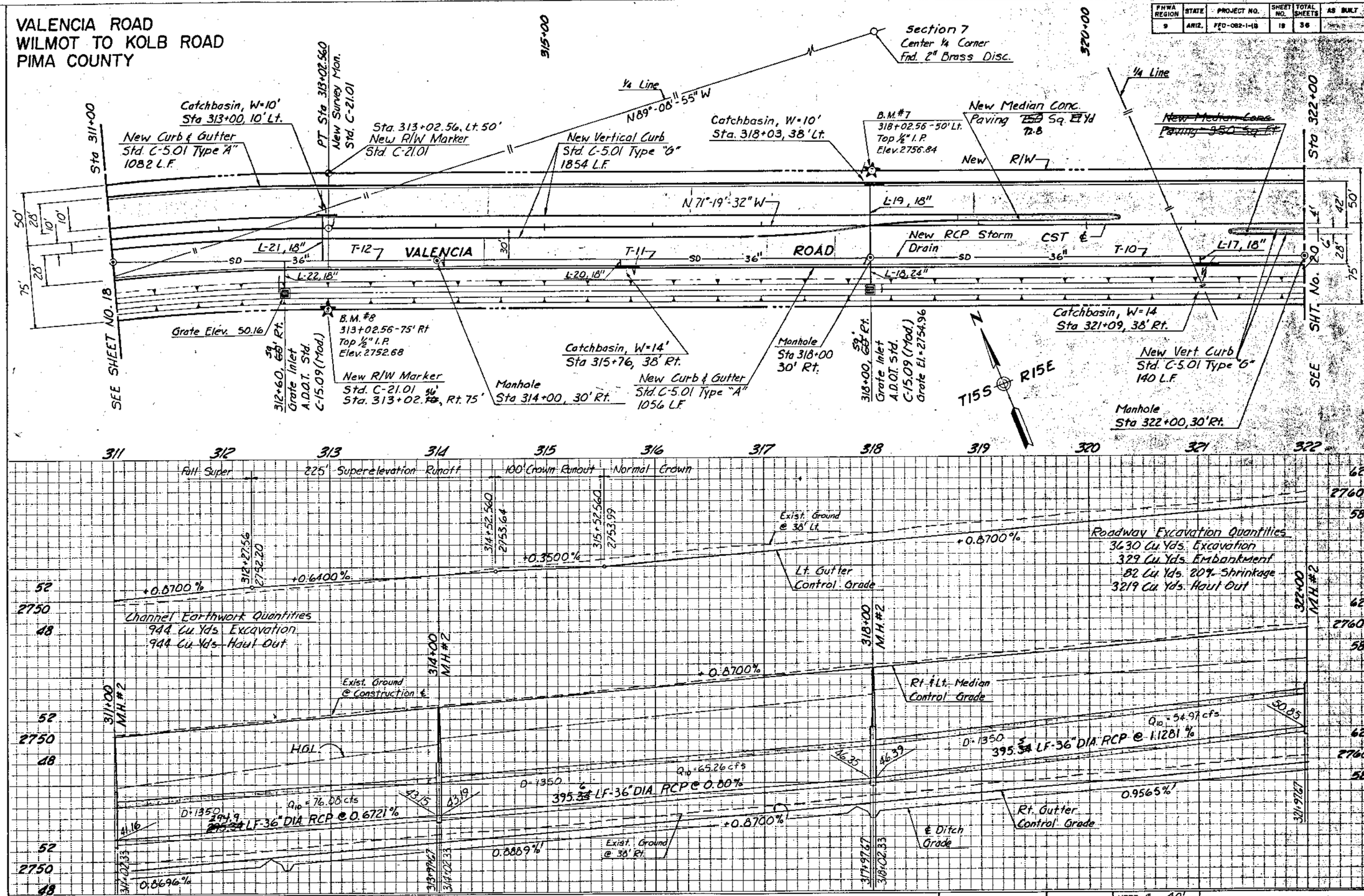
NO.	REVISION	DESCRIPTION	DIV/SECT. ENGR.	DATE

		DATE
DESIGNED	RF	3/02
DRAWN	RG JRG	3/02
CHECKED	VFB	3/02
PROJ. ENGR.	VL	3/02

rga consulting engineers
P.O. Box No. 34660 Tucson, Arizona 85733 (602) 881-4029

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	FED-082-1-(1)	19	36	

VALENCIA ROAD
WILMOT TO KOLB ROAD
PIMA COUNTY



FAS152-P1-S019

VALENCIA ROAD	SCALES	HORZ. 1" = 40' VERT. 1" = 4'	SHEET 19 OF 36
			STA. 311+00 TO STA. 322+00

FED-082-1(1) 19 of 36

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL "DISTRICT"

C. H. HUCKELBERRY, R.L.S., PCDOT DIRECTOR

NO.	REVISION: DESCRIPTION	DW/SECT. ENGR.	DATE

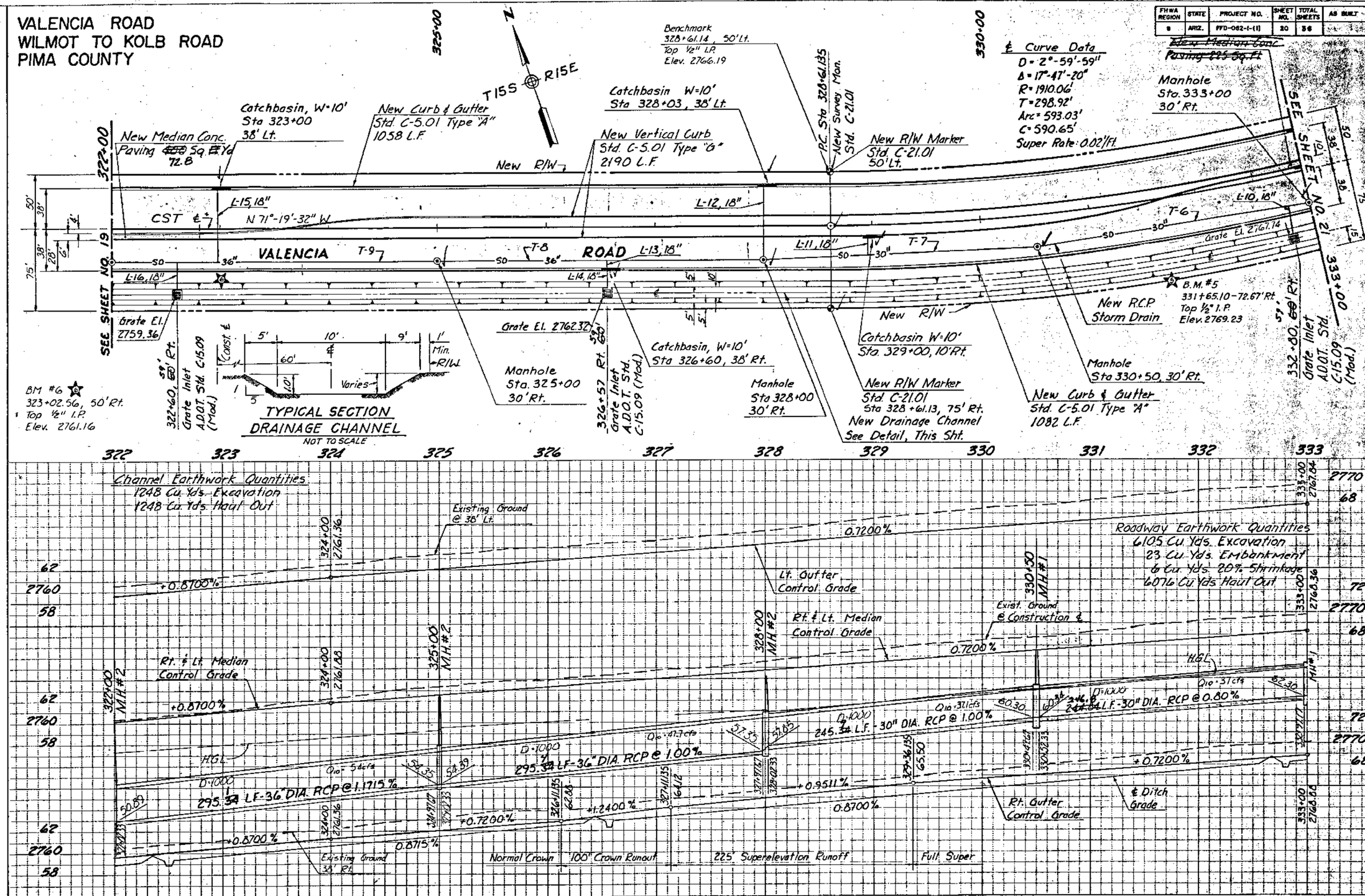
		DATE
DESIGNED	RP	3/06
DRAWN	JG	3/06
CHECKED	JFE	3/06
PROJ. ENGR.	JFE	3/06

rga consulting engineers

P.O. Box No. 26460, Tucson, Arizona 85726 (602) 881-4309

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	FFD-082-1-(1)	20	36	

VALENCIA ROAD
WILMOT TO KOLB ROAD
PIMA COUNTY



FAS 192-P1-S020

VALENCIA ROAD	SCALES	HORZ. 1" = 40' VERT. 1" = 4'	SHEET 20 OF 36
	FFD-082-1-(1)	20 of 36	STA. 322+00 TO STA. 333+00

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C. H. HUCKELBERRY R.L.S., P.E., DIRECTOR

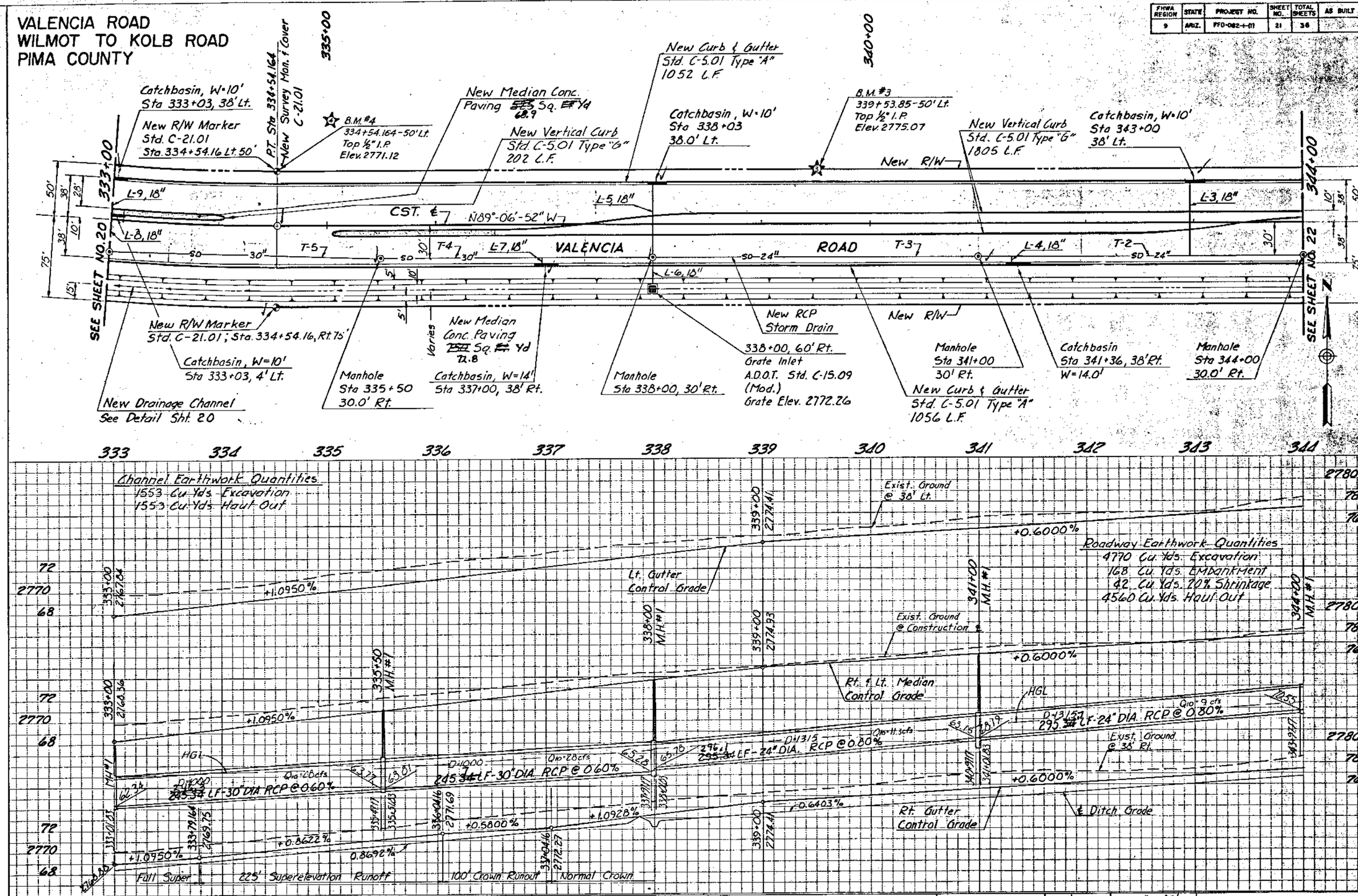
NO.	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

		DATE
DESIGNED	RPG	3/02
DRAWN	ACT/RG	3/02
CHECKED	JTP	3/02
PROJ. ENGR.	JL	3/02

rgg consulting engineers
P.O. Box No. 26860, Tucson, Arizona 85726, (602) 881-4300

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	FFD-082-1-(1)	21	36	

VALENCIA ROAD
WILMOT TO KOLB ROAD
PIMA COUNTY



DATE	
3/02	
3/02	
3/02	
3/02	
3/02	

DESIGNED P.J.R.D.
DRAWN P.J.R.D.
CHECKED J.H.R.
PROJ ENGR T.L.

C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

NO.	REVISION	DESCRIPTION	DIV/SECT. ENGR.	DATE

CONTROL DISTRICT

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

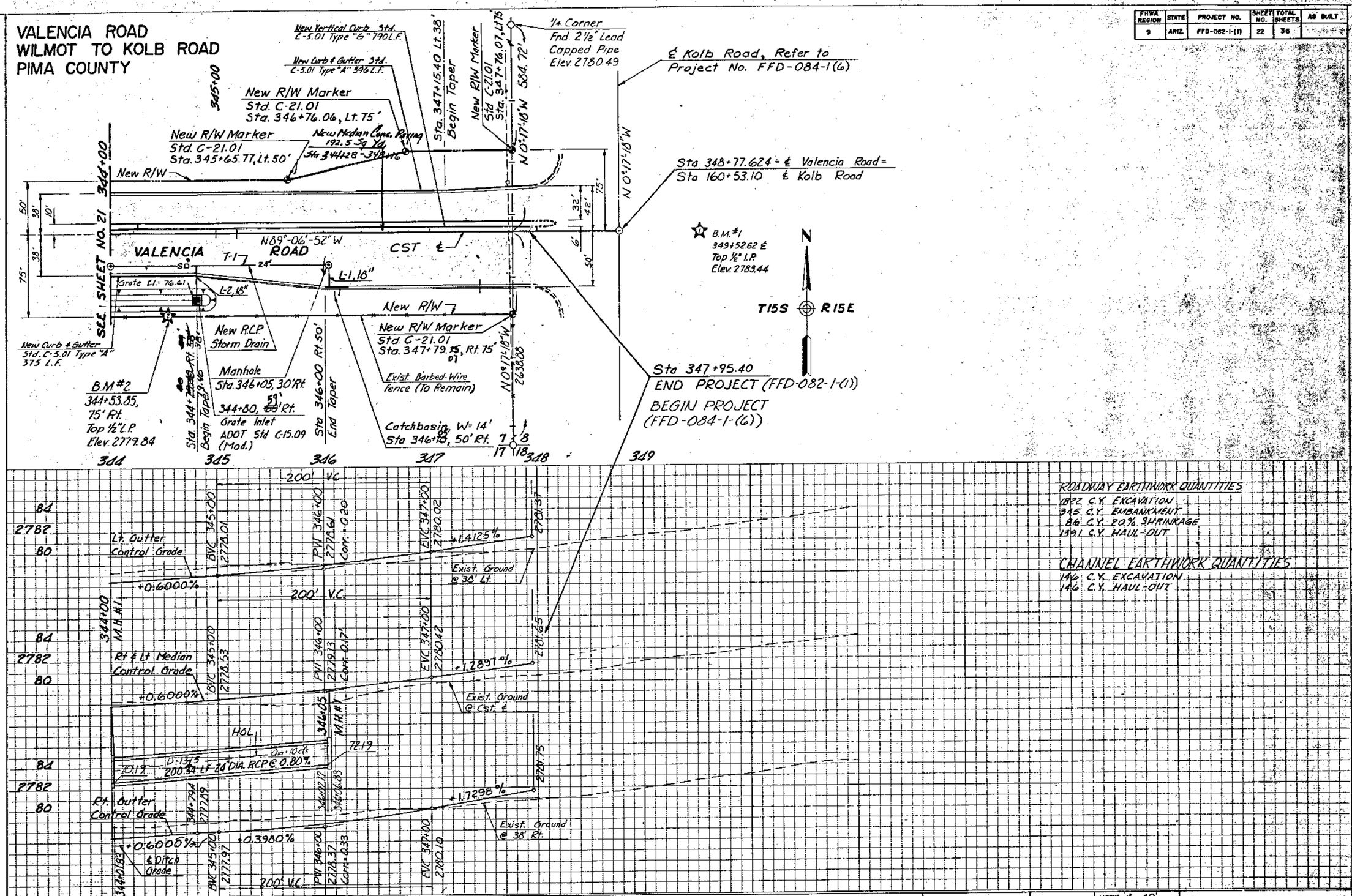
rgg consulting engineers
P.O. Box No. 26650 Tucson, Arizona 85726 (602) 881-4309

FAS152_P1_S021

VALENCIA ROAD	SCALES	HORZ. 1" = 40' VERT. 1" = 4'	SHEET 21 OF 36
			STA. 333+00 TO STA. 344+00

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	FFD-082-1-(1)	22	36	

VALENCIA ROAD
WILMOT TO KOLB ROAD
PIMA COUNTY



ROADWAY EARTHWORK QUANTITIES
1822 C.Y. EXCAVATION
345 C.Y. EMBANKMENT
86 C.Y. 20% SHRINKAGE
1391 C.Y. HAUL-OUT

CHANNEL EARTHWORK QUANTITIES
146 C.Y. EXCAVATION
146 C.Y. HAUL-OUT

FAS132-PL-S022

VALENCIA ROAD	SCALES	HORZ. 1" = 40' VERT. 1" = 4'	SHEET 22 OF 36
			STA. 344+00 TO STA. 347+95

FFD-082-1-(1) 22 of 36

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C. H. HUCKELBERRY R.L.S., P.E. DIRECTOR

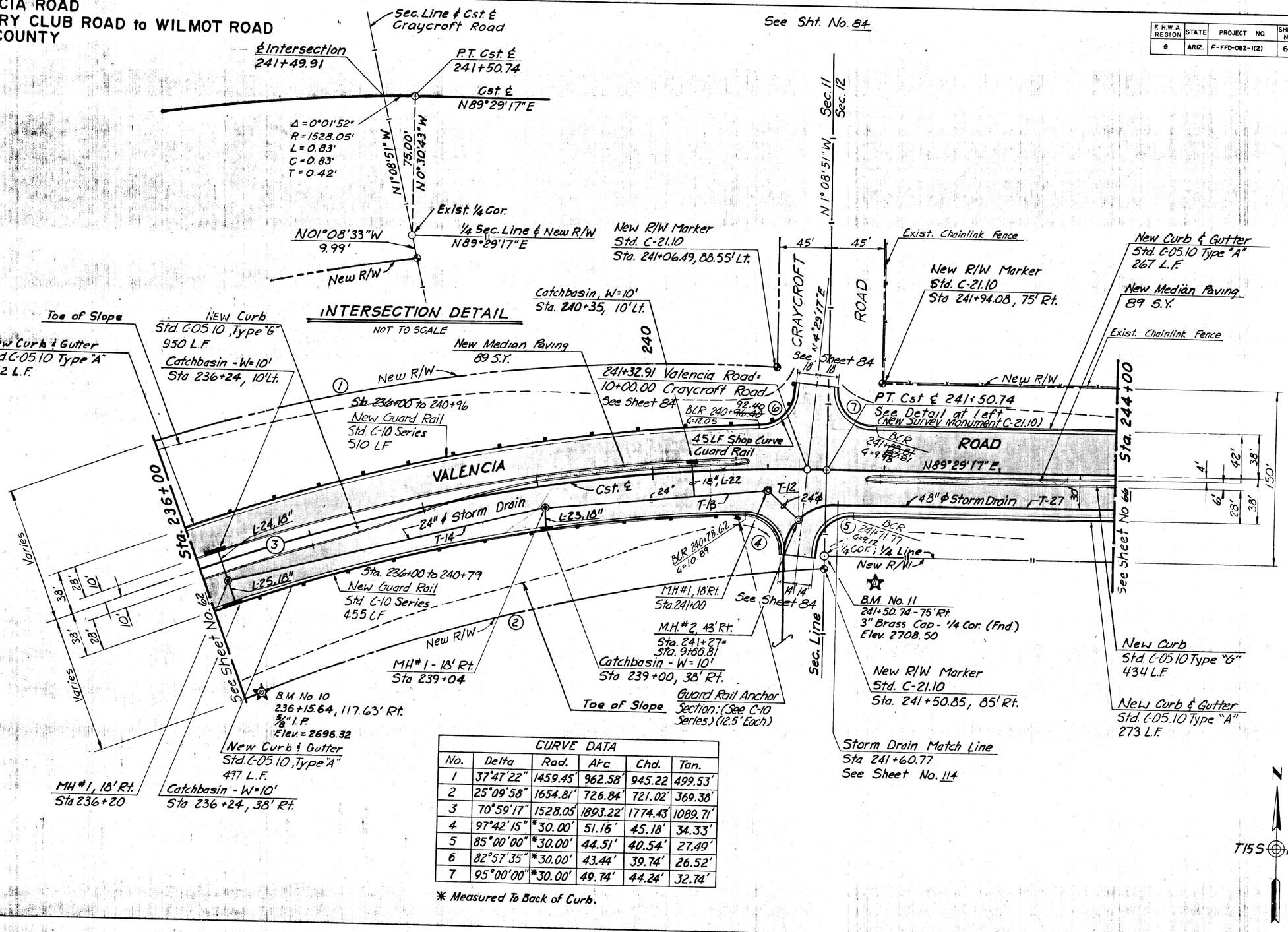
NO.	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

		DATE
DESIGNED	TPC	3/02
DRAWN	RJB	3/02
CHECKED	JDP	3/02
PROJ. ENGR.	JL	3/02

rgg consulting engineers
P.O. Box No. 26860 Tucson, Arizona 85726 (602) 881-4309

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	F-FFD-082-1(2)	64	195	



CURVE DATA					
No.	Delta	Rad.	Arc	Chd.	Tan.
1	37°47'22"	1459.45'	962.58'	945.22'	499.53'
2	25°09'58"	1654.81'	726.84'	721.02'	369.38'
3	70°59'17"	1528.05'	1893.22'	1774.43'	1089.71'
4	97°42'15"	*30.00'	51.16'	45.18'	34.33'
5	85°00'00"	*30.00'	44.51'	40.54'	27.49'
6	82°57'35"	*30.00'	43.44'	39.74'	26.52'
7	95°00'00"	*30.00'	49.74'	44.24'	32.74'

* Measured To Back of Curb.

C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

		DATE
DESIGNED	RE	2/83
DRAWN	AE, JG	2/83
CHECKED	JG	2/83
PROJ. ENGR.	JL	2/83

NO.	REVISION	DESCRIPTION	DATE
		DIV/SECT ENGR.	

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

rga consulting engineers
P.O. Box No. 26850, Tucson, Arizona 85726, (602) 881-4309

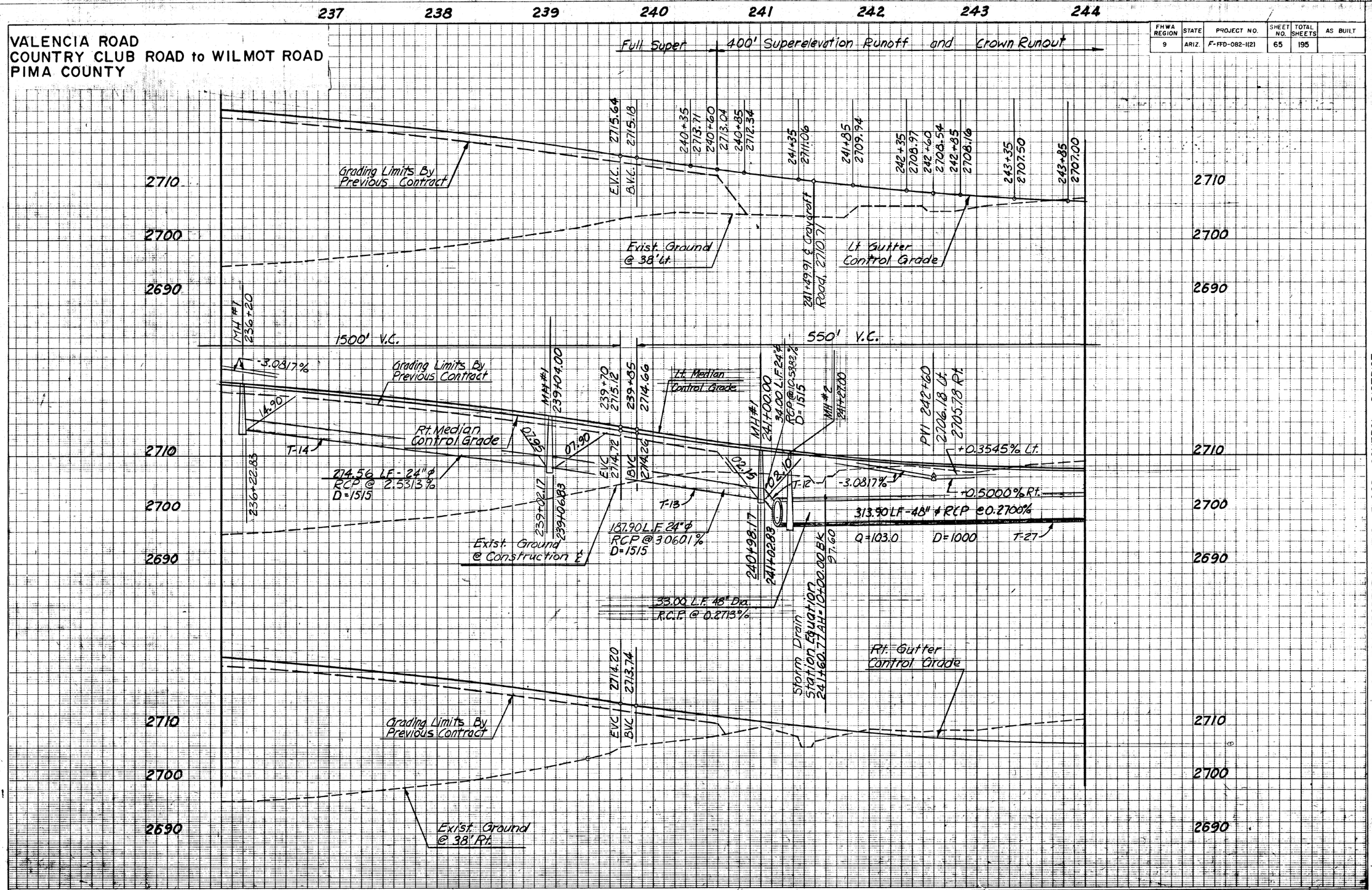
F.A.S. 164 PI_SP(164)

VALENCIA ROAD	SCALE	HORZ. 1" = 40'	SHEET 64 OF 195

STA. 236+00 TO STA. 244+00

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	F-FFD-082-1(2)	65	195	

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY



VALENCIA ROAD | SCALES HORZ. 1" = 40' VERT. 1" = 8' | SHEET 65 OF 195

STA. 236+00 TO STA. 244+00

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

DESIGNED	RF	DATE 2/83
DRAWN	AR JG	2/83
CHECKED	JT	2/83
PROJ. ENGR.	JL	2/83

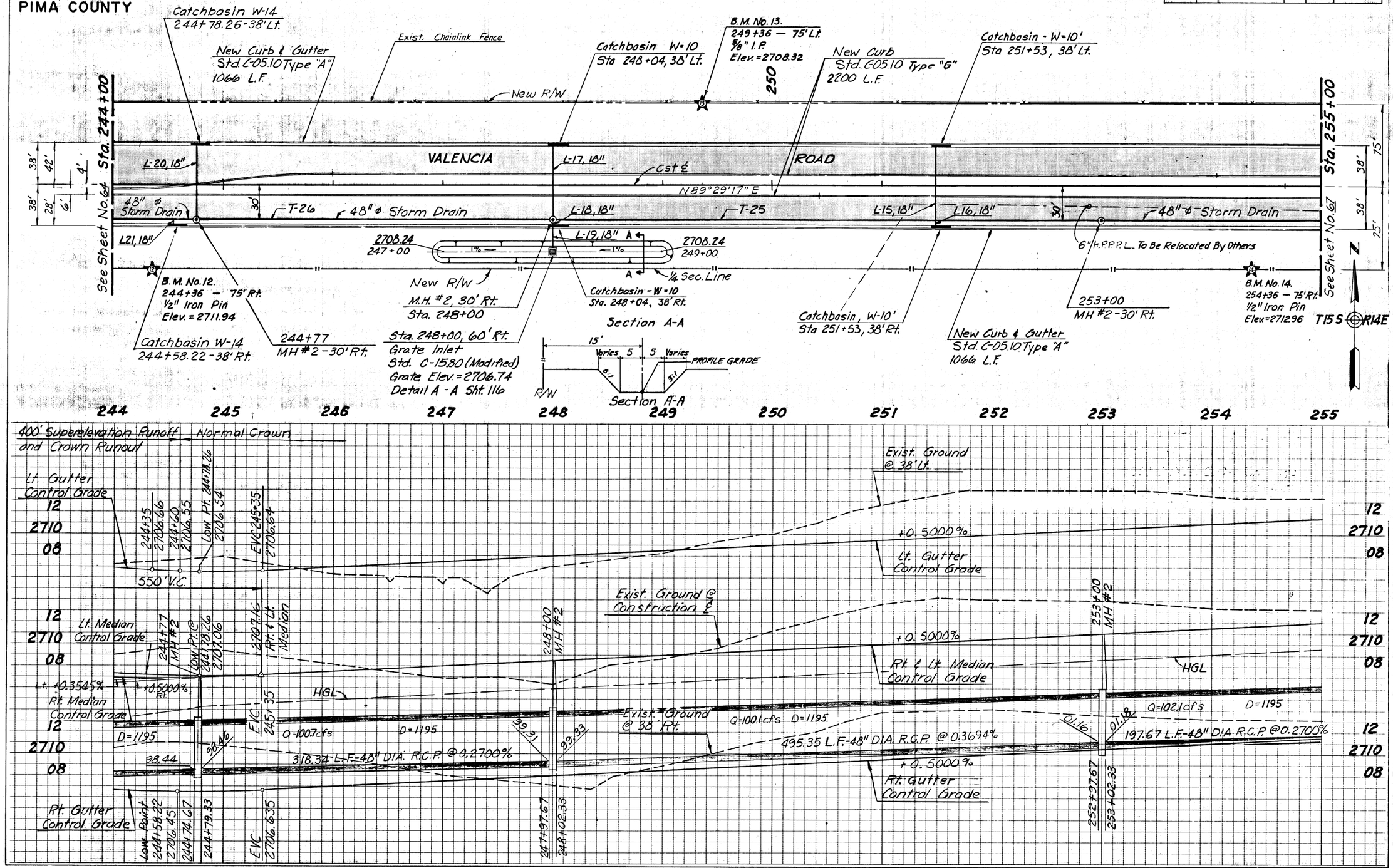
NO.	REVISION	DESCRIPTION	DIV./SECT. ENGR.	DATE

rgg consulting engineers
P.O. Box No. 26850
Tucson, Arizona 85726
(602) 881-4300

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY

D.M.A.F.B.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	F-FFD-082-1(2)	66	195	



VALENCIA ROAD	SCALES	HORZ. 1" = 40' VERT. 1" = 4'	SHEET 66 OF 195
			STA. 244+00 TO STA. 255+00

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

NO	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

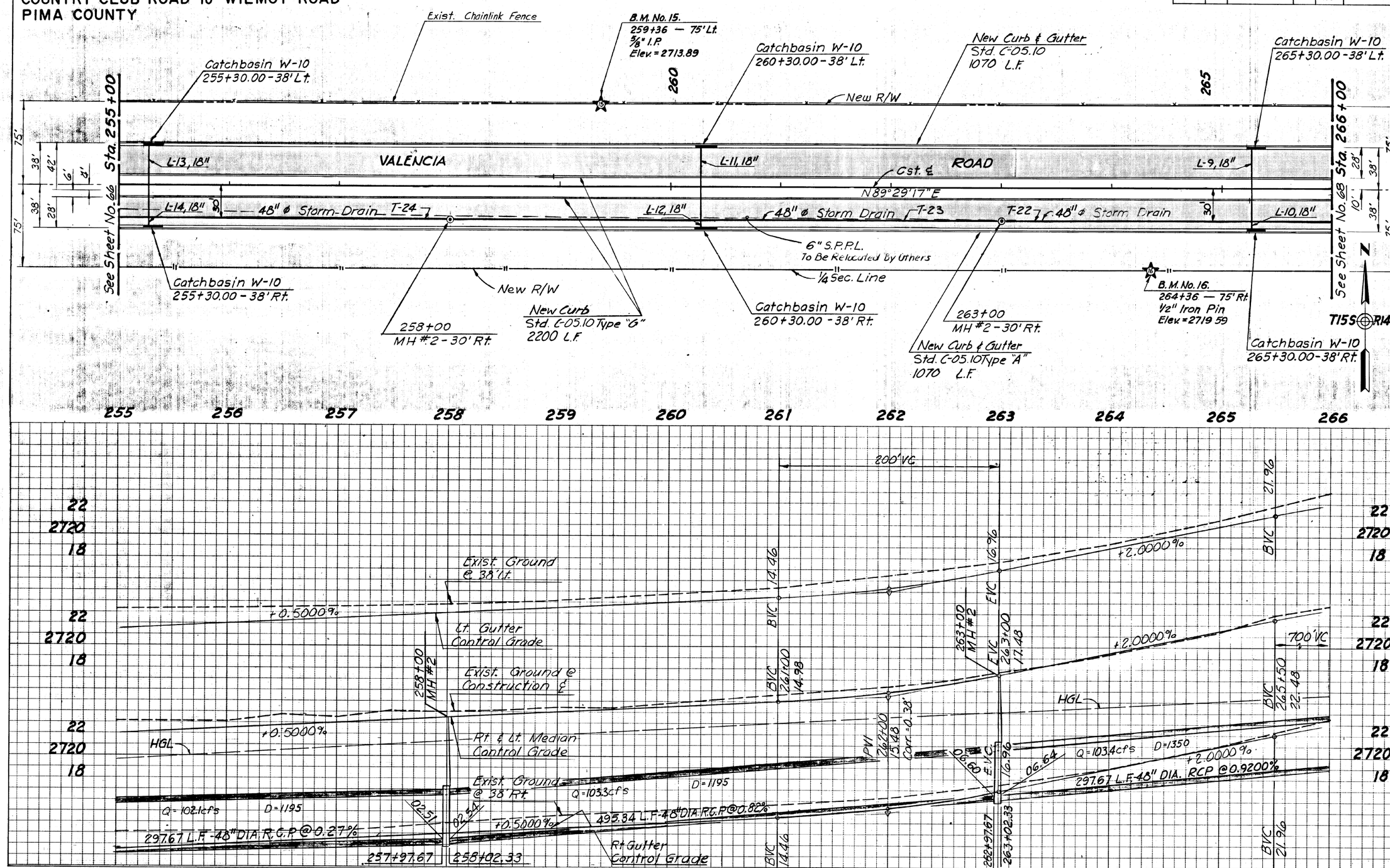
		DATE
DESIGNED	A.F.	2/83
DRAWN	A.R.	2/83
CHECKED	J.R.	2/83
PROJ ENGR	J.L.	2/83

rgg consulting engineers
P.O. Box No. 26850
Tucson, Arizona 85726
(602) 881-4309

FAP54_PI_SOUG

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	F-FFD-082-1(2)	67	195	

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY



VALENCIA ROAD	SCALES	HORZ. 1" = 40' VERT. 1" = 4'	SHEET 67 OF 195

STA. 255+00 TO STA. 266+00

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

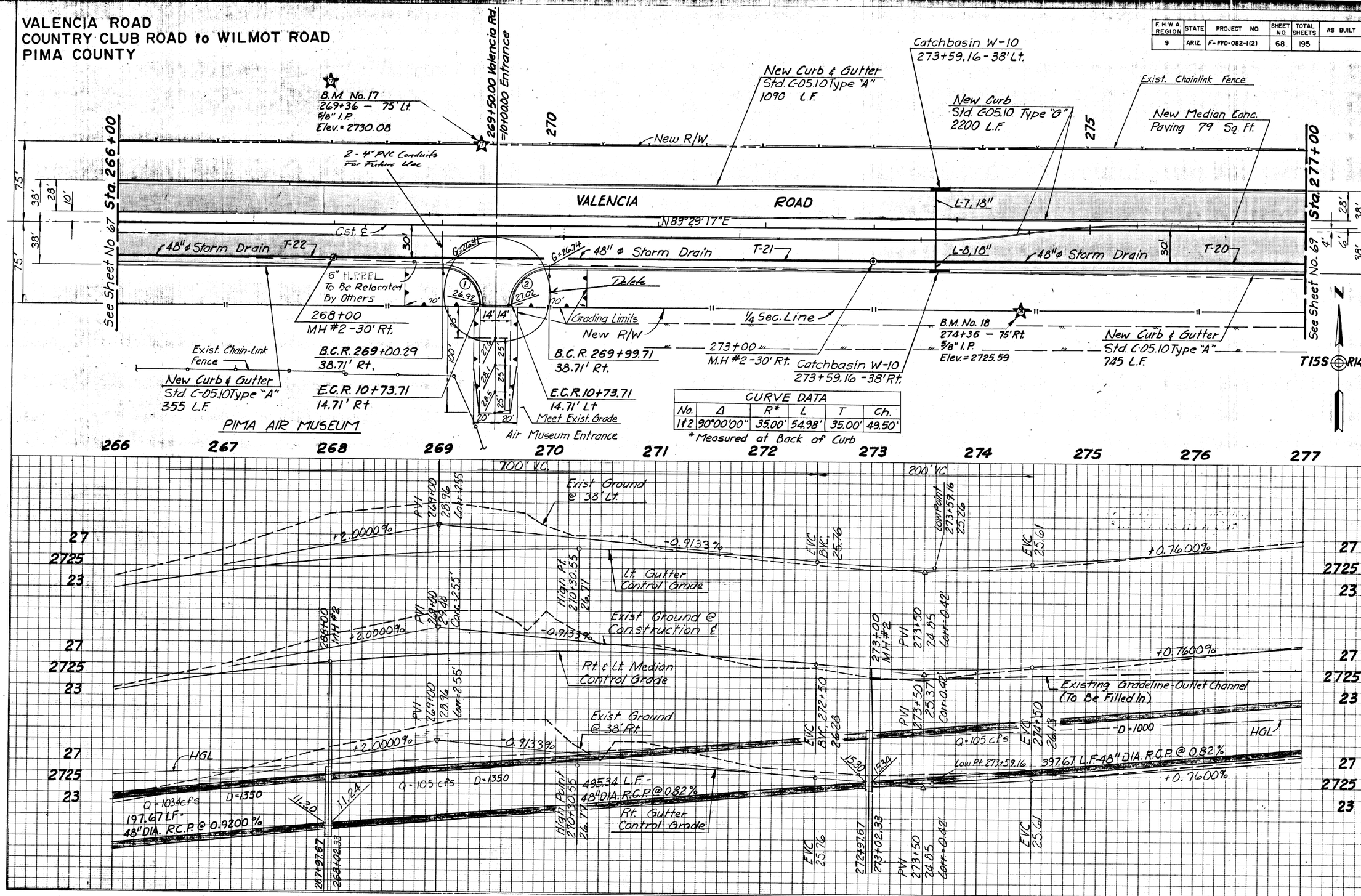
DESIGNED	RE	2/83
DRAWN	AR JG	2/83
CHECKED	JR	2/83
PROJ. ENGR.	JE	2/83

NO	REVISION	DESCRIPTION	DIV/SECT. ENGR.	DATE

rgg consulting engineers
P.O. Box No. 26850
Tucson, Arizona 85726
(602) 881-4309

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	F-FFD-082-1(2)	68	195	

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY



CURVE DATA					
No.	Δ	R*	L	T	Ch.
1 & 2	90°00'00"	35.00'	54.98'	35.00'	49.50'

*Measured at Back of Curb

VALENCIA ROAD	SCALES	HORZ. 1" = 40' VERT. 1" = 4'	SHEET 68 OF 195
			STA. 266+00 TO STA. 277+00

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

NO.	REVISION	DESCRIPTION	DIV./SECT. ENGR.	DATE

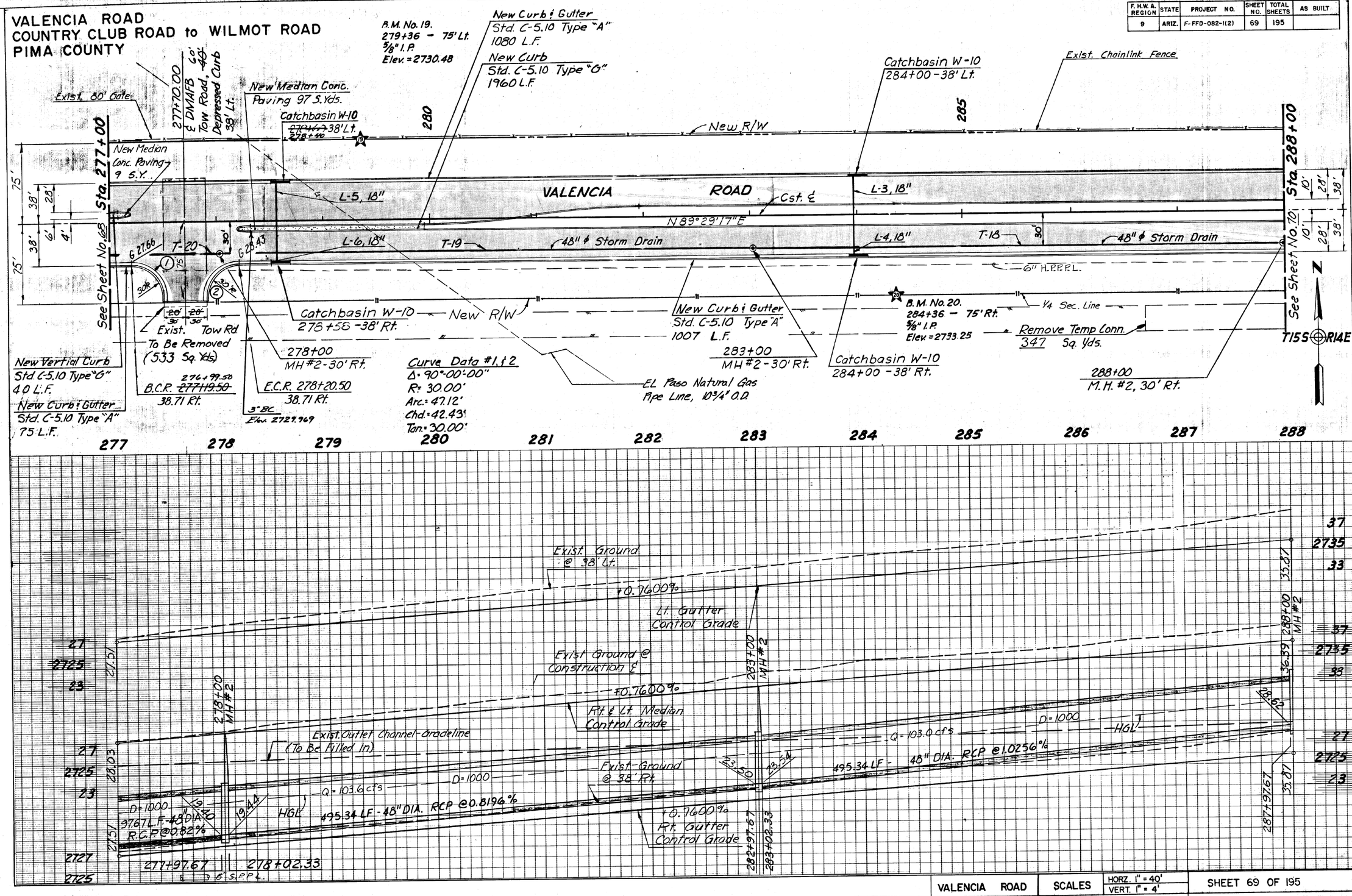
		DATE
DESIGNED	JL	2/83
DRAWN	RE, JRG, KDS	2/83
CHECKED	JL, JR	2/83
PROJ. ENGR.		2/83

rga consulting engineers
P.O. Box No. 26850
Tucson, Arizona 85726
(602) 881-4309

1101 P.-FFD-082-1(2) 1/2 1/2 of 195 - FINAL DESIGN

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	F-FFD-082-1(2)	69	195	

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY



VALENCIA ROAD | SCALES: HORZ. 1" = 40' VERT. 1" = 4' | SHEET 69 OF 195

STA. 277+00 TO STA. 288+00

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C. H. HUCKELBERRY R.L.S., P.E. DIRECTOR

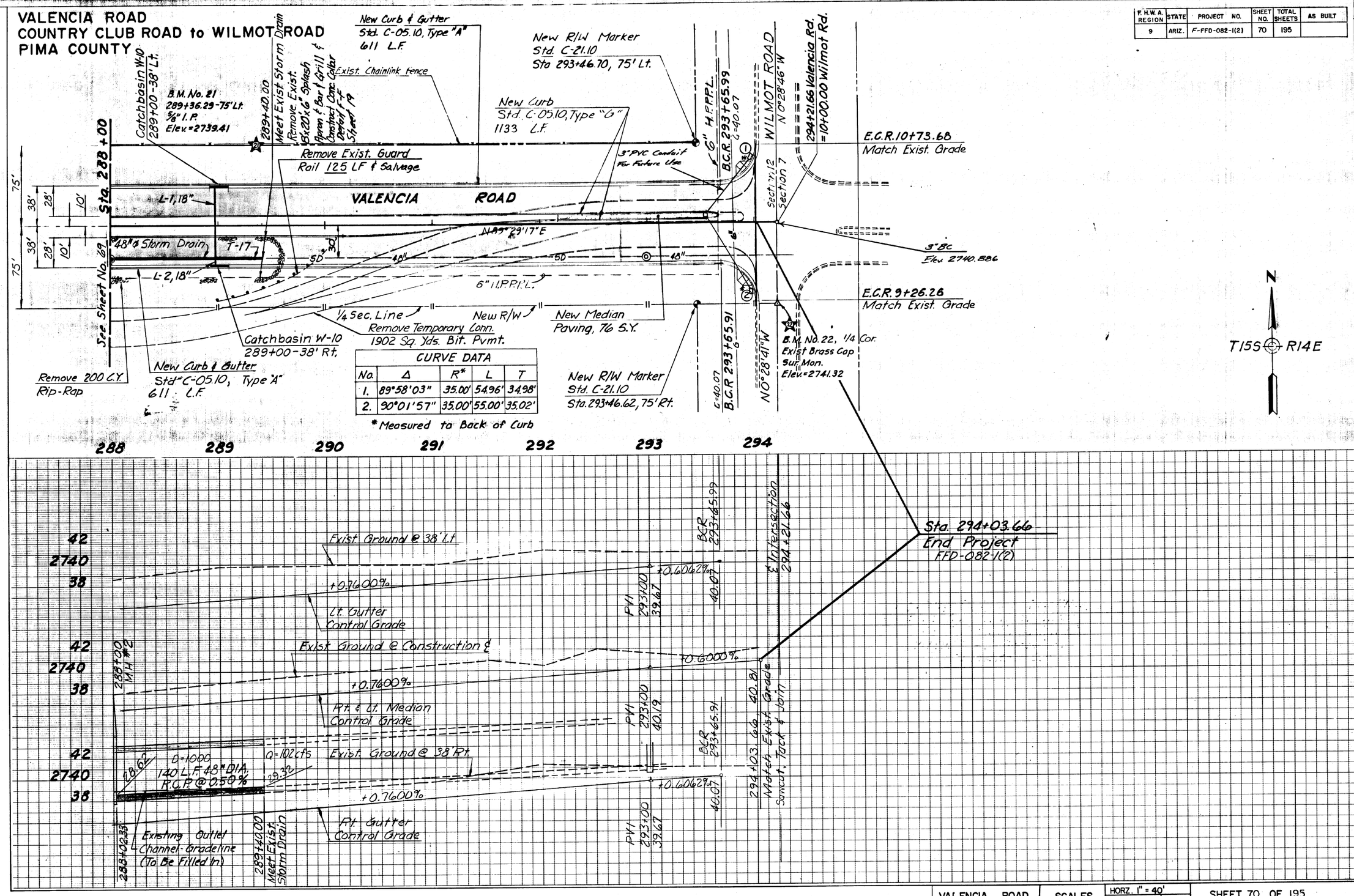
NO.	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

		DATE
DESIGNED	RF	2/83
DRAWN	AA, JG	2/83
CHECKED	JR	2/83
PROJ. ENGR.	JI	2/83

rga consulting engineers
P.O. Box No. 26850
Tucson, Arizona 85726
(602) 881-4309

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	F-FFD-082-1(2)	70	195	

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY



CURVE DATA				
No.	Δ	R*	L	T
1.	89°58'03"	35.00'	54.96'	34.98'
2.	90°01'57"	35.00'	55.00'	35.02'

*Measured to Back of Curb

VALENCIA ROAD | SCALES HORZ. 1" = 40' VERT. 1" = 4' | SHEET 70 OF 195

STA. 288+00 TO STA. 294+21.66

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C.H. HUCKELBERRY R.L.S., P.E., DIRECTOR

NO.	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

		DATE
DESIGNED	RF	2/83
DRAWN	ARLG	2/83
CHECKED	JR	2/83
PROJ. ENGR.	JL	2/83

consulting engineers
P.O. Box No. 26850
Tucson, Arizona 85726
(602) 881-4309

10 | E-PFD-082-1(2) | 70 of 195 — FASTA-PL-SOTO

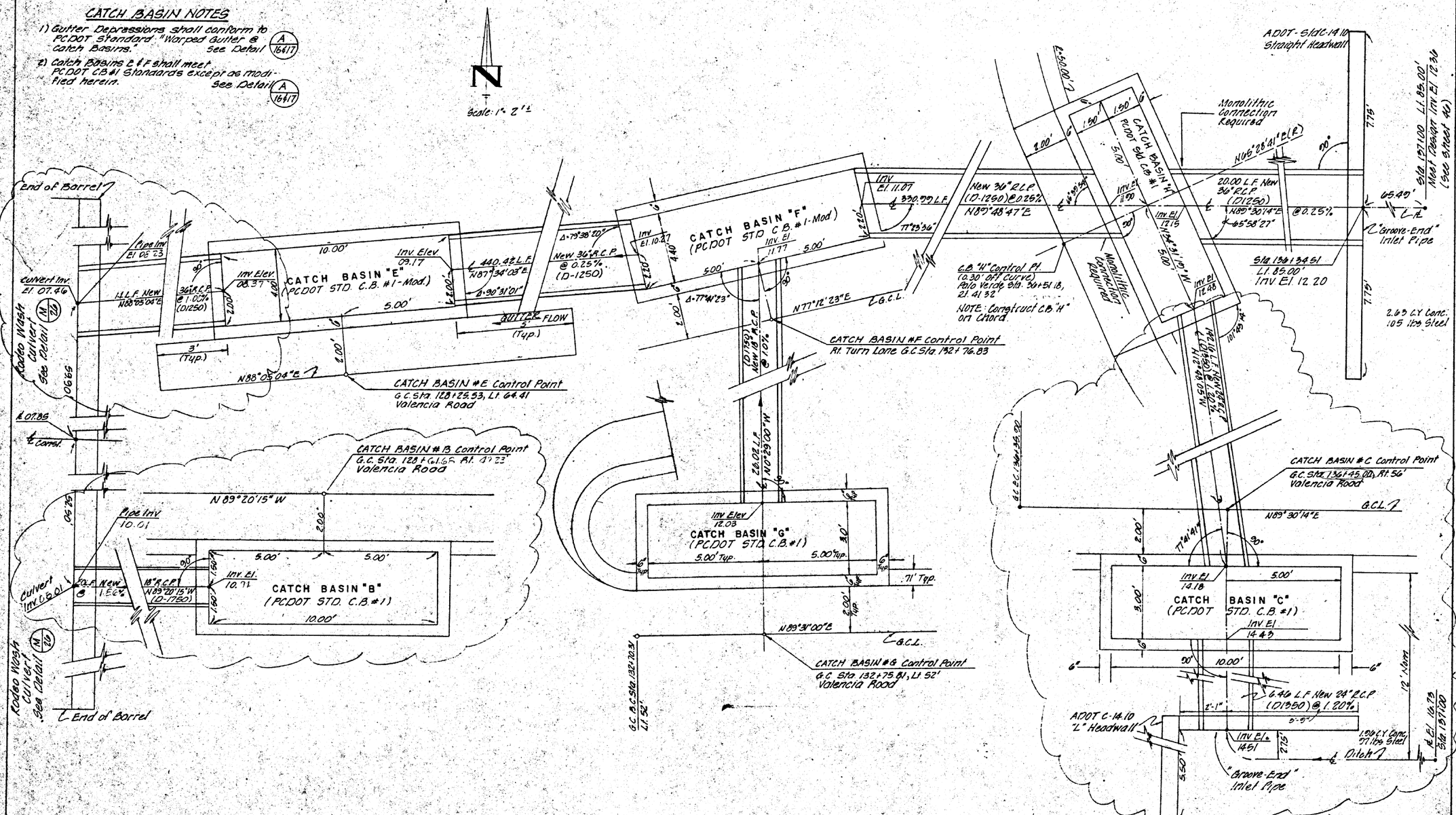
FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	FFD-082-1(2)	115	195	

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY

CATCH BASIN NOTES

1) Gutter Depressions shall conform to PCDOT Standard "Warped Gutter & Catch Basins." See Detail (A/16617)

2) Catch Basins E & F shall meet PCDOT CB#1 Standards except as modified herein. See Detail (A/16617)



D STORM DRAIN SYSTEM LAYOUT

SCALE: N.T.S.

SHEET 115 OF 195

DESIGNED	WILLIAM H. BAKER, JR.	9-93
DRAWN	BARBARA L. MILLER	9-93
CHECKED	PATRICK W. MAREUM	9-93
PROJ ENGR	ANDREW B. MAREUM	9-93

C.H. HUCKELBERRY R.L.S., P.E. DIRECTOR

NO.	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

7 — 38 SHEETS

2201-10

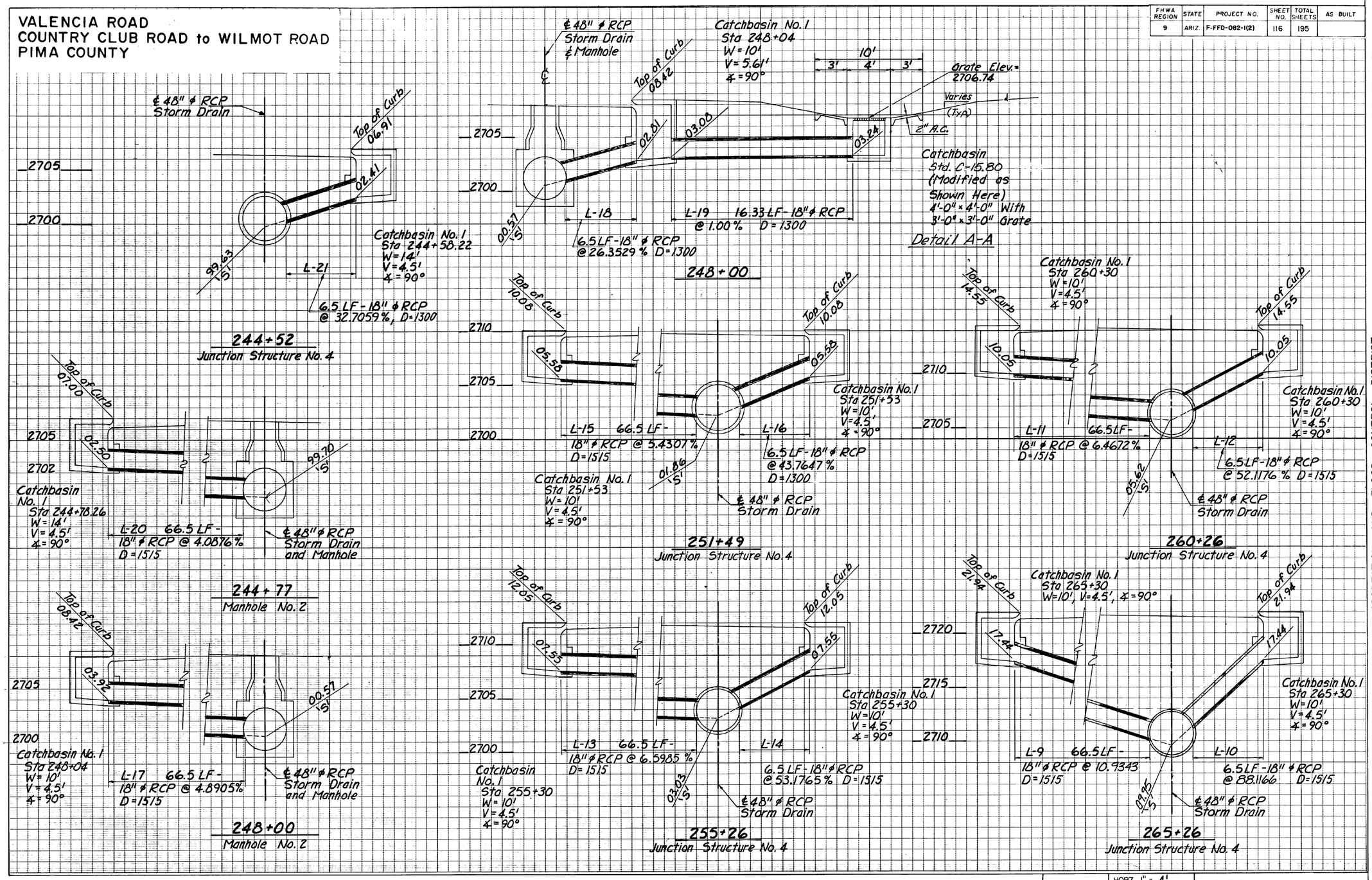
2201A

MARUM AND MARUM, INC. CONSULTING ENGINEERS

115 F-FFD-082-1(2) 115 05195 FAS154-P1-S115

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	F-FFD-082-1(2)	116	195	

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY



SCALES	
HORZ. 1" = 4'	
VERT. 1" = 4'	

SHEET 116 OF 195

CONNECTING PIPE DETAILS

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C. H. HUCKELBERRY R.L.S., P.E. DIRECTOR

NO.	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

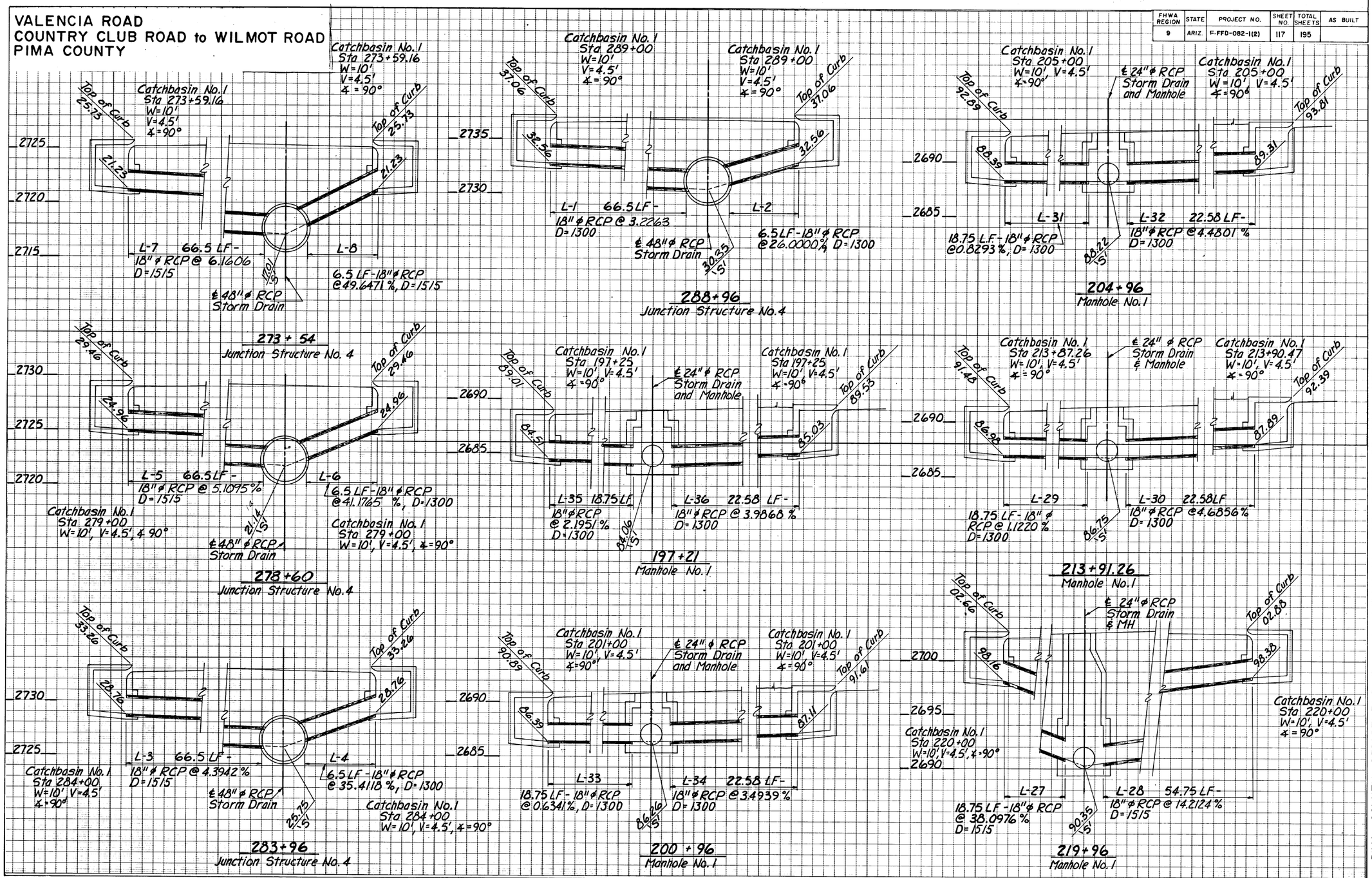
		DATE
DESIGNED	JL	2/83
DRAWN	AR	2/83
CHECKED	JR	2/83
PROJ ENGR	JL	2/83

rga consulting engineers
P.O. Box No. 26850 Tucson, Arizona 85726 (602) 881-4309

EXISTING

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	F-FFD-082-1(2)	117	195	

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY



SCALES	HORZ. 1" = 4'
	VERT. 1" = 4'

SHEET 117 OF 195

CONNECTING PIPE DETAILS

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C. H. HUCKELBERRY R.L.S., P.E. DIRECTOR

DESIGNED	J.L.	2/83
DRAWN	A.R.	2/83
CHECKED	J.R.	2/83
PROJ ENGR	J.L.	2/83

NO	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

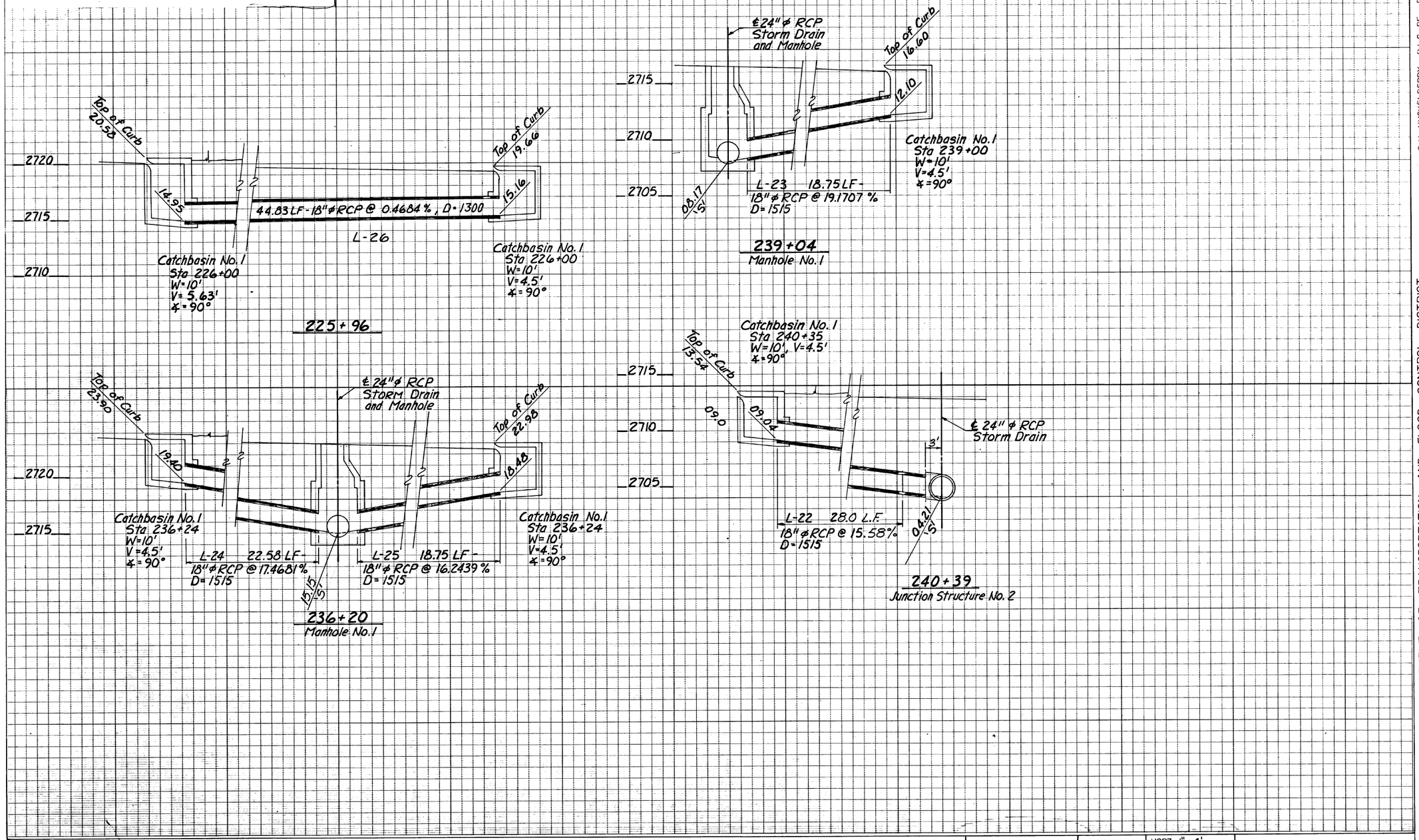
P.O. Box No. 26850
Tucson, Arizona 85726
(602) 881-4309

consulting engineers

FAS164_P1_S117

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	F-FFD-082-1(2)	118	195	

VALENCIA ROAD
COUNTRY CLUB ROAD to WILMOT ROAD
PIMA COUNTY



VALENCIA ROAD	SCALES	HORZ. 1" = 4' / VERT. 1" = 4'	SHEET 118 OF 195
			CONNECTING PIPE DETAILS

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

C H HUCKELBERRY R.L.S., P.E. DIRECTOR

NO	REVISION	DESCRIPTION	DIV/SECT ENGR.	DATE

		DATE
DESIGNED	JL	2/83
DRAWN	AR	2/83
CHECKED	JR	2/83
PROJ ENGR	JL	2/83

P.O. Box No. 26850
Tucson, Arizona 85726
(602) 881-4309
consulting engineers

EXISTING CONDITIONS
STORMDRAIN CAPACITY ANALYSIS

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
1		108.4	48	Cir	188.000	2699.03	2699.31	0.149	2703.03*	2704.10*	0.00	2704.10	End	Manhole
2	T12	7.27	24	Cir	34.000	2700.60	2704.20	10.588	2704.10	2705.16	n/a	2705.16 j	1	Manhole
3	T13	0.07	24	Cir	67.320	2704.25	2706.31	3.060	2706.25	2706.41	0.01	2706.42	2	None
4	T13(2)	0.05	24	Cir	120.580	2706.31	2710.00	3.060	2708.31	2710.08	n/a	2710.08 j	3	Manhole
5	T14	0.03	24	Cir	274.560	2710.05	2717.00	2.531	2712.05	2717.06	n/a	2717.06 j	4	Manhole
6	T27	101.1	48	Cir	328.000	2699.61	2700.49	0.268	2704.10*	2705.73*	0.50	2706.23	1	None
7	T27(2)	101.1	48	Cir	18.780	2700.49	2700.54	0.267	2706.23*	2706.32*	0.50	2706.83	6	Manhole
8	T26	101.1	48	Cir	318.000	2700.56	2701.42	0.270	2706.83*	2708.40*	0.50	2708.91	7	Manhole
9	T25	101.0	48	Cir	347.830	2701.43	2702.72	0.371	2708.91*	2710.63*	0.50	2711.13	8	None
10	T25(2)	101.0	48	Cir	147.520	2702.72	2703.27	0.373	2711.13*	2711.86*	0.50	2712.36	9	Manhole
11	T24	101.0	48	Cir	225.340	2703.28	2703.89	0.271	2712.36*	2713.48*	0.15	2713.63	10	None
12	T24(2)	101.0	48	Cir	270.000	2703.89	2704.62	0.270	2713.63*	2714.96*	0.15	2715.11	11	Manhole
13	T23	101.0	48	Cir	265.340	2704.64	2706.82	0.822	2715.11*	2716.43*	0.15	2716.58	12	None
14	T23(2)	100.9	48	Cir	230.000	2706.82	2708.71	0.822	2716.58*	2717.71*	0.15	2717.86	13	Manhole
15	T22	100.9	48	Cir	230.000	2708.74	2710.86	0.922	2717.86*	2719.00*	0.15	2719.15	14	None
16	T22(2)	100.9	48	Cir	265.340	2710.86	2713.30	0.920	2719.15*	2720.46*	0.15	2720.61	15	Manhole
17	T21	100.9	48	Cir	495.340	2713.34	2717.40	0.820	2720.61*	2723.05*	0.15	2723.20	16	Manhole
18	T-20	100.9	48	Cir	59.160	2717.44	2717.93	0.828	2723.20*	2723.50*	0.00	2723.50	17	None
19	T-20(2)	100.8	48	Cir	149.000	2717.93	2719.15	0.819	2723.50*	2724.23*	0.00	2724.23	18	None
20	T-20(2)(2)	100.8	48	Cir	287.180	2719.15	2721.50	0.818	2724.23*	2725.65*	0.00	2725.65	19	Manhole
21	T-19	100.8	48	Cir	58.000	2721.54	2722.02	0.828	2725.65	2725.90	0.15	2726.05	20	None
22	T-19(2)	100.8	48	Cir	437.340	2722.02	2725.61	0.821	2726.05	2728.58	0.24	2728.58	21	Manhole
23	T-18	100.8	48	Cir	100.000	2725.64	2726.67	1.030	2729.64	2729.65	0.24	2729.88	22	None
24	T-18(2)	100.7	48	Cir	395.340	2726.67	2730.74	1.030	2730.67	2733.71	0.24	2733.71	23	Manhole

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
25	T-17	100.7	48	Cir	100.000	2730.74	2731.24	0.500	2734.74	2735.21	0.15	2735.37	24	None
26	T-17(2)	100.7	48	Cir	395.340	2731.24	2733.22	0.501	2735.37	2737.18	0.15	2737.33	25	Manhole
27	T-16	100.7	48	Cir	100.000	2733.23	2733.73	0.500	2737.33*	2737.82*	0.50	2738.32	26	None
28	T-16(2)	100.7	48	Cir	45.000	2733.73	2733.96	0.511	2738.32*	2738.54*	0.50	2739.04	27	None
29	T-16(2)(2)	100.6	48	Cir	35.000	2733.96	2734.14	0.514	2739.04*	2739.21*	0.50	2739.71	28	None
30	T-16(2)(2)(2)	100.6	48	Cir	15.000	2734.14	2734.22	0.534	2739.71*	2739.78*	0.50	2740.28	29	None
31	T-16(2)(2)(2)(2)	100.6	48	Cir	300.540	2734.22	2735.72	0.499	2740.28*	2741.76*	0.50	2742.26	30	Manhole
32	T-15	100.6	48	Cir	120.000	2735.73	2736.33	0.500	2742.26*	2742.84*	0.50	2743.34	31	Manhole
33	T-15(2)	100.6	48	Cir	195.000	2736.33	2737.31	0.503	2743.34*	2744.30*	0.50	2744.80	32	None
34	T-15(2)	80.54	48	Cir	180.000	2737.31	2738.21	0.500	2744.80*	2745.36*	0.32	2745.68	33	Manhole
35	T-14	80.52	48	Cir	168.000	2738.23	2739.07	0.500	2745.68*	2746.21*	0.32	2746.53	34	None
36	T-14(2)	80.50	48	Cir	330.500	2739.07	2740.72	0.499	2746.53*	2747.57*	0.32	2747.89	35	Manhole
37	T-13	60.48	36	Cir	206.000	2741.24	2742.62	0.670	2747.89*	2749.58*	0.17	2749.75	36	None
38	T-13(2)	60.46	36	Cir	89.200	2742.62	2743.22	0.672	2749.75*	2750.49*	0.17	2750.66	37	Manhole
39	T-12(1)	60.45	36	Cir	160.000	2743.26	2744.33	0.669	2750.66*	2751.97*	0.17	2752.14	38	None
40	T-12(2)	60.43	36	Cir	40.000	2744.33	2744.60	0.675	2752.14*	2752.47*	0.17	2752.64	39	None
41	T-12(3)	60.41	36	Cir	94.900	2744.60	2745.24	0.674	2752.64*	2753.42*	0.17	2753.59	40	Manhole
42	T-11	60.40	36	Cir	176.000	2745.29	2746.70	0.801	2753.59*	2755.04*	0.57	2755.60	41	None
43	T-11(2)	60.38	36	Cir	219.600	2746.70	2748.46	0.801	2755.60*	2757.40*	0.57	2757.97	42	Manhole
44	T-10	40.36	36	Cir	309.000	2748.49	2751.98	1.129	2757.97*	2759.10*	0.08	2759.18	43	None
45	T-10(2)	40.34	36	Cir	86.500	2751.98	2752.96	1.133	2759.18*	2759.50*	0.08	2759.57	44	Manhole
46	T-9	40.33	36	Cir	60.000	2752.99	2753.69	1.167	2759.57*	2759.79*	0.08	2759.87	45	None
47	T-9(2)	40.31	36	Cir	40.000	2753.69	2754.16	1.175	2759.87*	2760.01*	0.08	2760.09	46	None
48	T-9(2)(2)	40.29	36	Cir	195.100	2754.16	2756.44	1.169	2760.09*	2760.80*	0.08	2760.88	47	Manhole

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
49	T-8	40.28	36	Cir	157.000	2756.49	2758.06	1.000	2760.88*	2761.45*	0.25	2761.70	48	None
50	T-8(2)	40.25	36	Cir	138.400	2758.06	2759.44	0.997	2761.70	2762.11	0.29	2762.40	49	Manhole
51	T-7	40.23	30	Cir	100.000	2759.95	2760.95	1.000	2762.45	2763.29	0.17	2763.45	50	None
52	T-7(2)	40.21	30	Cir	145.900	2760.95	2762.41	1.001	2763.45	2764.65	0.18	2764.83	51	Manhole
53	T-6	40.20	30	Cir	166.800	2762.44	2763.77	0.797	2764.94*	2766.54*	0.16	2766.70	52	None
54	T-6(2)	40.18	30	Cir	80.000	2763.77	2764.41	0.800	2766.70*	2767.47*	0.16	2767.63	53	Manhole
55	T-5	20.16	30	Cir	246.300	2764.44	2765.92	0.601	2767.63	2768.15	0.04	2768.20	54	Manhole
56	T-4	20.15	30	Cir	150.000	2765.92	2766.82	0.600	2768.42	2768.67	0.21	2768.88	55	None
57	T-4(2)	20.13	30	Cir	95.700	2766.82	2767.39	0.595	2769.32	2769.48	0.16	2769.64	56	Manhole
58	T-3	20.10	24	Cir	100.000	2767.88	2768.68	0.800	2769.88	2770.60	0.10	2770.70	57	None
59	T-3(2)	20.09	24	Cir	196.100	2768.68	2770.25	0.801	2770.70	2772.10	0.10	2772.20	58	Manhole
60	T-2	20.08	24	Cir	36.000	2770.29	2770.58	0.806	2772.29	2772.56	0.10	2772.66	59	None
61	T-2(2)	20.06	24	Cir	159.000	2770.58	2771.85	0.799	2772.66	2773.82	0.10	2773.92	60	None
62	T-2(2)(2)	20.04	24	Cir	100.000	2771.85	2772.65	0.800	2773.92	2774.63	0.10	2774.73	61	Manhole
63	T-1	20.03	24	Cir	80.000	2772.69	2773.33	0.800	2774.73	2775.32	0.32	2775.64	62	None
64	T-1(2)	20.01	24	Cir	120.340	2773.33	2774.29	0.798	2775.64*	2776.58*	0.32	2776.89	63	Manhole
65	D50	0.01	18	Cir	22.580	2517.25	2521.19	17.449	2717.06*	2717.06*	0.00	2717.06	5	Generic
66	D49	0.01	18	Cir	18.750	2717.53	2720.58	16.267	2719.03	2720.62	n/a	2720.62 j	5	Generic
67	D48	0.01	18	Cir	18.750	2710.61	2714.20	19.146	2712.11	2714.24	n/a	2714.24 j	4	Generic
68	D47	0.01	18	Cir	28.000	2706.78	2711.14	15.571	2708.28	2711.18	n/a	2711.18 j	3	Generic
69	D46	0.01	18	Cir	6.500	2702.38	2704.51	32.771	2706.23*	2706.23*	0.00	2706.23	6	Generic
70	D45	0.01	18	Cir	66.500	2701.88	2704.60	4.091	2706.83*	2706.83*	0.00	2706.83	7	Generic
71	D43	0.02	18	Cir	6.500	2703.10	2704.81	26.307	2708.91*	2708.91*	0.00	2708.91	8	Generic
72	OE11	0.01	18	Cir	16.330	2705.09	2705.25	0.979	2708.91*	2708.91*	0.00	2708.91	71	Generic

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
73	D44	0.01	18	Cir	66.500	2702.77	2706.02	4.887	2708.91*	2708.91*	0.00	2708.91	8	Generic
74	D41	0.01	18	Cir	6.500	2706.19	2709.65	53.230	2711.13	2711.13	0.00	2711.13	9	Generic
75	D42	0.01	18	Cir	66.500	2705.26	2709.65	6.601	2711.13	2711.13	0.00	2711.13	9	Generic
76	D39	0.01	18	Cir	6.500	2706.19	2709.65	53.230	2713.63*	2713.63*	0.00	2713.63	11	Generic
77	D40	0.01	18	Cir	66.500	2705.26	2709.65	6.601	2713.63*	2713.63*	0.00	2713.63	11	Generic
78	D37	0.01	18	Cir	6.500	2708.76	2712.15	52.152	2716.58*	2716.58*	0.00	2716.58	13	Generic
79	D38	0.01	18	Cir	66.500	2708.75	2713.05	6.466	2716.58*	2716.58*	0.00	2716.58	13	Generic
80	D35	0.01	18	Cir	6.500	2713.81	2719.54	88.154	2719.15	2719.58	n/a	2719.58	15	Generic
81	D36	0.01	18	Cir	66.500	2712.27	2719.54	10.932	2719.15	2719.58	n/a	2719.58	15	Generic
82	D34	0.01	18	Cir	6.500	2720.65	2723.33	41.233	2723.50	2723.50	0.00	2723.50	18	Generic
83	D33	0.01	18	Cir	66.500	2719.23	2723.33	6.166	2723.50	2723.50	0.00	2723.50	18	Generic
84	D30	0.01	18	Cir	6.500	2720.65	2723.33	41.233	2726.05*	2726.05*	0.00	2726.05	21	Generic
85	D31	0.01	18	Cir	66.500	2723.66	2727.06	5.113	2726.05	2727.10	n/a	2727.10 j	21	Generic
86	D29	0.01	18	Cir	6.500	2728.56	2730.86	35.385	2730.06	2730.90	n/a	2730.90 j	23	Generic
87	D28	0.01	18	Cir	66.500	2727.94	2730.86	4.391	2729.88	2730.90	n/a	2730.90 j	23	Generic
88	D26	0.01	18	Cir	6.500	2732.97	2734.66	25.999	2735.37	2735.37	0.00	2735.37	25	Generic
89	D27	0.01	18	Cir	66.500	2732.51	2734.66	3.233	2735.37	2735.37	0.00	2735.37	25	Generic
90	D25	0.02	18	Cir	109.700	2735.03	2737.21	1.987	2738.32	2738.32	0.00	2738.32	27	Generic
91	D24	0.01	18	Cir	41.700	2737.31	2737.81	1.199	2738.81	2738.81	0.00	2738.81	90	Generic
92	D52	0.02	18	Cir	43.200	2735.30	2737.21	4.421	2739.04*	2739.04*	0.00	2739.04	28	Generic
93	D51	0.01	18	Cir	41.500	2737.21	2738.11	2.169	2739.04	2739.04	0.00	2739.04	92	Generic
94	D22	0.02	18	Cir	6.500	2736.30	2738.78	38.154	2739.71	2739.71	0.00	2739.71	29	Generic
95	OE10	0.01	18	Cir	16.900	2739.04	2739.07	0.178	2740.54	2740.54	0.00	2740.54	94	DropGrate
96	D23	0.01	18	Cir	66.200	2735.54	2738.84	4.985	2740.28	2740.28	0.00	2740.28	30	Generic

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
97	D21	0.01	18	Cir	66.800	2737.04	2741.34	6.437	2742.26	2742.25	0.00	2742.25	31	Generic
98	OE9	0.01	18	Cir	28.300	2738.54	2741.36	9.965	2744.80*	2744.80*	0.00	2744.80	33	Generic
99	D19(+30%)	0.01	18	Cir	66.400	2739.56	2743.19	5.467	2745.68*	2745.68*	0.00	2745.68	34	Generic
100	D18(+30%)	0.01	18	Cir	6.800	2740.99	2743.79	41.177	2746.53*	2746.53*	0.00	2746.53	35	Generic
101	OE8	0.01	18	Cir	26.900	2742.01	2744.36	8.736	2747.89*	2747.89*	0.00	2747.89	36	Generic
102	D17(+30%)	0.01	18	Cir	22.200	2741.91	2746.01	18.469	2747.89*	2747.89*	0.00	2747.89	36	Generic
103	D16(+30%)	0.01	18	Cir	7.000	2743.40	2747.28	55.430	2749.75*	2749.75*	0.00	2749.75	37	Generic
104	OE7	0.01	18	Cir	21.300	2745.83	2748.26	11.408	2752.14*	2752.14*	0.00	2752.14	39	Generic
105	D15(+30%)	0.01	18	Cir	35.300	2745.49	2750.55	14.334	2752.64*	2752.64*	0.00	2752.64	40	Generic
106	D14(+30%)	0.01	18	Cir	7.000	2748.00	2752.19	59.856	2755.60*	2755.60*	0.00	2755.60	42	Generic
107	OE6	0.01	18	Cir	26.600	2749.41	2753.06	13.722	2757.97*	2757.97*	0.00	2757.97	43	Generic
108	D13(+30%)	0.01	18	Cir	66.100	2749.36	2754.19	7.307	2757.97*	2757.97*	0.00	2757.97	43	Generic
109	D12(+30%)	0.01	18	Cir	6.600	2754.30	2756.83	38.334	2759.18*	2759.18*	0.00	2759.18	44	Generic
110	OE5	0.01	18	Cir	25.800	2754.66	2757.46	10.853	2759.87*	2759.87*	0.00	2759.87	46	Generic
111	D11(+30%)	0.01	18	Cir	64.700	2755.38	2758.51	4.838	2760.09*	2760.09*	0.00	2760.09	47	OpenHeadwall
112	D10(+30%)	0.02	18	Cir	5.700	2759.03	2759.64	10.699	2761.70*	2761.70*	0.00	2761.70	49	Generic
113	OE4	0.01	18	Cir	17.700	2759.90	2761.11	6.837	2761.70	2761.70	0.00	2761.70	112	Generic
114	D9(+30%)	0.01	18	Cir	65.800	2760.28	2762.16	2.857	2762.40	2762.40	0.00	2762.40	50	Generic
115	D8(+30%)	0.01	18	Cir	16.200	2761.29	2763.30	12.407	2763.45	2763.45	0.00	2763.45	51	Generic
116	OE3	0.01	18	Cir	28.100	2764.86	2765.84	3.487	2766.70	2766.70	0.00	2766.70	53	Generic
117	D7(+30%)	0.02	18	Cir	32.400	2764.90	2765.39	1.512	2767.63*	2767.63*	0.00	2767.63	54	Generic
118	D6(+30%)	0.01	18	Cir	31.300	2765.43	2765.91	1.533	2767.63*	2767.63*	0.00	2767.63	117	Generic
119	D5(+30%)	0.01	18	Cir	7.100	2767.94	2770.67	38.450	2769.44	2770.71	n/a	2770.71 j	56	Generic
120	OE2	0.01	18	Cir	25.800	2768.14	2770.17	7.868	2769.64	2770.21	n/a	2770.21 j	57	Generic

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
121	D4(+30%)	0.01	18	Cir	68.000	2767.97	2771.56	5.280	2769.64	2771.60	n/a	2771.60 j	57	Generic
122	D3(+30%)	0.01	18	Cir	6.000	2771.46	2773.84	39.669	2772.96	2773.88	n/a	2773.88 j	60	Generic
123	OE1	0.01	18	Cir	28.000	2773.57	2774.72	4.107	2775.64	2775.64	0.00	2775.64	63	Generic
124	D1(+30%)	0.01	18	Cir	19.000	2774.78	2776.73	10.263	2776.89	2776.89	0.00	2776.89	64	Generic
125	D2(+30%)	0.01	18	Cir	66.600	2772.27	2774.84	3.859	2773.92	2774.88	n/a	2774.88 j	61	Generic
126	D20	0.01	18	Cir	10.000	2736.33	2736.38	0.498	2743.34*	2743.34*	0.00	2743.34	32	None
127	D32	0.01	18	Cir	21.000	2719.15	2719.26	0.524	2724.23*	2724.23*	0.00	2724.23	19	None

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
1	48	108.4	2699.03	2703.03	4.00	12.56	8.63	1.16	2704.19	0.570	188.000	2699.31	2704.10	4.00	12.57	8.63	1.16	2705.26	0.569	0.570	1.071	0.00	0.00
2	24	7.27	2700.60	2704.10	2.00	3.14	2.31	0.08	2704.19	0.103	34.000	2704.20	2705.16 j	0.96**	1.48	4.91	0.37	2705.53	0.484	0.294	n/a	0.50	0.19
3	24	0.07	2704.25	2706.25	2.00*	3.14	0.02	0.00	2706.25	0.000	67.320	2706.31	2706.41	0.10**	0.06	1.27	0.03	2706.43	0.499	0.249	0.168	0.50	0.01
4	24	0.05	2706.31	2708.31	2.00*	3.14	0.02	0.00	2708.31	0.000	120.580	2710.00	2710.08 j	0.08**	0.04	1.20	0.02	2710.10	0.576	0.288	n/a	0.50	n/a
5	24	0.03	2710.05	2712.05	2.00*	3.14	0.01	0.00	2712.05	0.000	274.560	2717.00	2717.06 j	0.06**	0.03	1.06	0.02	2717.08	0.620	0.310	n/a	0.50	n/a
6	48	101.1	2699.61	2704.10	4.00	12.56	8.05	1.01	2705.11	0.496	328.000	2700.49	2705.73	4.00	12.57	8.05	1.01	2706.73	0.496	0.496	1.626	0.50	0.50
7	48	101.1	2700.49	2706.23	4.00	12.56	8.05	1.01	2707.24	0.496	18.780	2700.54	2706.32	4.00	12.57	8.05	1.01	2707.33	0.495	0.495	0.093	0.50	0.50
8	48	101.1	2700.56	2706.83	4.00	12.56	8.05	1.01	2707.83	0.495	318.000	2701.42	2708.40	4.00	12.57	8.04	1.01	2709.41	0.495	0.495	1.575	0.50	0.50
9	48	101.0	2701.43	2708.91	4.00	12.56	8.04	1.01	2709.91	0.495	347.830	2702.72	2710.63	4.00	12.57	8.04	1.01	2711.63	0.495	0.495	1.721	0.50	0.50
10	48	101.0	2702.72	2711.13	4.00	12.56	8.04	1.00	2712.14	0.495	147.520	2703.27	2711.86	4.00	12.57	8.04	1.00	2712.87	0.494	0.495	0.730	0.50	0.50
11	48	101.0	2703.28	2712.36	4.00	12.56	8.04	1.00	2713.37	0.495	225.340	2703.89	2713.48	4.00	12.57	8.04	1.00	2714.48	0.494	0.494	1.114	0.15	0.15
12	48	101.0	2703.89	2713.63	4.00	12.56	8.04	1.00	2714.63	0.494	270.000	2704.62	2714.96	4.00	12.57	8.03	1.00	2715.97	0.494	0.494	1.334	0.15	0.15
13	48	101.0	2704.64	2715.11	4.00	12.56	8.04	1.00	2716.12	0.494	265.340	2706.82	2716.43	4.00	12.57	8.03	1.00	2717.43	0.494	0.494	1.311	0.15	0.15
14	48	100.9	2706.82	2716.58	4.00	12.56	8.03	1.00	2717.58	0.494	230.000	2708.71	2717.71	4.00	12.57	8.03	1.00	2718.72	0.494	0.494	1.136	0.15	0.15
15	48	100.9	2708.74	2717.86	4.00	12.56	8.03	1.00	2718.87	0.494	230.000	2710.86	2719.00	4.00	12.57	8.03	1.00	2720.00	0.494	0.494	1.136	0.15	0.15
16	48	100.9	2710.86	2719.15	4.00	12.56	8.03	1.00	2720.15	0.494	265.340	2713.30	2720.46	4.00	12.57	8.03	1.00	2721.46	0.493	0.493	1.309	0.15	0.15
17	48	100.9	2713.34	2720.61	4.00	12.56	8.03	1.00	2721.61	0.493	495.340	2717.40	2723.05	4.00	12.57	8.03	1.00	2724.05	0.493	0.493	2.444	0.15	0.15
18	48	100.9	2717.44	2723.20	4.00	12.56	8.03	1.00	2724.21	0.493	59.160	2717.93	2723.50	4.00	12.57	8.03	1.00	2724.50	0.493	0.493	0.292	0.00	0.00
19	48	100.8	2717.93	2723.50	4.00	12.56	8.03	1.00	2724.50	0.493	149.000	2719.15	2724.23	4.00	12.57	8.02	1.00	2725.23	0.493	0.493	0.734	0.00	0.00
20	48	100.8	2719.15	2724.23	4.00	12.56	8.02	1.00	2725.23	0.493	287.180	2721.50	2725.65	4.00	12.57	8.02	1.00	2726.65	0.493	0.493	1.415	0.00	0.00
21	48	100.8	2721.54	2725.65	4.00	12.56	8.02	1.00	2726.65	0.493	58.000	2722.02	2725.90	3.88	12.45	8.10	1.02	2726.92	0.433	0.463	0.268	0.15	0.15
22	48	100.8	2722.02	2726.05	4.00	12.56	8.02	1.00	2727.05	0.492	437.340	2725.61	2728.58	2.97**	10.00	10.08	1.58	2730.16	0.606	0.549	n/a	0.15	0.24

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
23	48	100.8	2725.64	2729.64	4.00*	12.56	8.02	1.00	2730.64	0.492	100.000	2726.67	2729.65	2.98**	10.03	10.04	1.57	2731.22	0.602	0.547	0.547	0.15	0.24
24	48	100.7	2726.67	2730.67	4.00*	12.56	8.02	1.00	2731.67	0.492	395.340	2730.74	2733.71	2.97**	10.00	10.07	1.58	2735.29	0.606	0.549	n/a	0.15	0.24
25	48	100.7	2730.74	2734.74	4.00*	12.56	8.02	1.00	2735.74	0.492	100.000	2731.24	2735.21	3.97	12.56	8.02	1.00	2736.22	0.460	0.476	0.476	0.15	0.15
26	48	100.7	2731.24	2735.37	4.00	12.56	8.01	1.00	2736.36	0.492	395.340	2733.22	2737.18	3.96	12.54	8.03	1.00	2738.18	0.452	0.472	1.865	0.15	0.15
27	48	100.7	2733.23	2737.33	4.00	12.56	8.01	1.00	2738.33	0.492	100.000	2733.73	2737.82	4.00	12.57	8.01	1.00	2738.82	0.491	0.492	0.492	0.50	0.50
28	48	100.7	2733.73	2738.32	4.00	12.56	8.01	1.00	2739.32	0.491	45.000	2733.96	2738.54	4.00	12.57	8.01	1.00	2739.54	0.491	0.491	0.221	0.50	0.50
29	48	100.6	2733.96	2739.04	4.00	12.56	8.01	1.00	2740.04	0.491	35.000	2734.14	2739.21	4.00	12.57	8.01	1.00	2740.21	0.491	0.491	0.172	0.50	0.50
30	48	100.6	2734.14	2739.71	4.00	12.56	8.01	1.00	2740.71	0.491	15.000	2734.22	2739.78	4.00	12.57	8.01	1.00	2740.78	0.491	0.491	0.074	0.50	0.50
31	48	100.6	2734.22	2740.28	4.00	12.56	8.01	1.00	2741.28	0.491	300.540	2735.72	2741.76	4.00	12.57	8.00	1.00	2742.75	0.490	0.490	1.474	0.50	0.50
32	48	100.6	2735.73	2742.26	4.00	12.56	8.00	1.00	2743.25	0.490	120.000	2736.33	2742.84	4.00	12.57	8.00	1.00	2743.84	0.490	0.490	0.588	0.50	0.50
33	48	100.6	2736.33	2743.34	4.00	12.56	8.00	1.00	2744.34	0.490	195.000	2737.31	2744.30	4.00	12.57	8.00	1.00	2745.29	0.490	0.490	0.956	0.50	0.50
34	48	80.54	2737.31	2744.80	4.00	12.56	6.41	0.64	2745.43	0.314	180.000	2738.21	2745.36	4.00	12.57	6.41	0.64	2746.00	0.314	0.314	0.566	0.50	0.32
35	48	80.52	2738.23	2745.68	4.00	12.56	6.41	0.64	2746.32	0.314	168.000	2739.07	2746.21	4.00	12.57	6.41	0.64	2746.85	0.314	0.314	0.528	0.50	0.32
36	48	80.50	2739.07	2746.53	4.00	12.56	6.41	0.64	2747.17	0.314	330.500	2740.72	2747.57	4.00	12.57	6.41	0.64	2748.21	0.314	0.314	1.038	0.50	0.32
37	36	60.48	2741.24	2747.89	3.00	7.07	8.56	1.14	2749.02	0.823	206.000	2742.62	2749.58	3.00	7.07	8.56	1.14	2750.72	0.822	0.823	1.694	0.15	0.17
38	36	60.46	2742.62	2749.75	3.00	7.07	8.55	1.14	2750.89	0.822	89.200	2743.22	2750.49	3.00	7.07	8.55	1.14	2751.62	0.822	0.822	0.733	0.15	0.17
39	36	60.45	2743.26	2750.66	3.00	7.07	8.55	1.14	2751.79	0.822	160.000	2744.33	2751.97	3.00	7.07	8.55	1.14	2753.11	0.822	0.822	1.315	0.15	0.17
40	36	60.43	2744.33	2752.14	3.00	7.07	8.55	1.14	2753.28	0.821	40.000	2744.60	2752.47	3.00	7.07	8.55	1.14	2753.61	0.821	0.821	0.328	0.15	0.17
41	36	60.41	2744.60	2752.64	3.00	7.07	8.55	1.14	2753.78	0.821	94.900	2745.24	2753.42	3.00	7.07	8.55	1.14	2754.56	0.820	0.821	0.779	0.15	0.17
42	36	60.40	2745.29	2753.59	3.00	7.07	8.55	1.14	2754.73	0.821	176.000	2746.70	2755.04	3.00	7.07	8.54	1.14	2756.17	0.820	0.820	1.444	0.50	0.57
43	36	60.38	2746.70	2755.60	3.00	7.07	8.54	1.13	2756.74	0.820	219.600	2748.46	2757.40	3.00	7.07	8.54	1.13	2758.54	0.820	0.820	1.800	0.50	0.57
44	36	40.36	2748.49	2757.97	3.00	7.07	5.71	0.51	2758.48	0.366	309.000	2751.98	2759.10	3.00	7.07	5.71	0.51	2759.61	0.366	0.366	1.132	0.15	0.08

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
45	36	40.34	2751.98	2759.18	3.00	7.07	5.71	0.51	2759.69	0.366	86.500	2752.96	2759.50	3.00	7.07	5.71	0.51	2760.00	0.366	0.366	0.317	0.15	0.08
46	36	40.33	2752.99	2759.57	3.00	7.07	5.71	0.51	2760.08	0.366	60.000	2753.69	2759.79	3.00	7.07	5.71	0.51	2760.30	0.366	0.366	0.219	0.15	0.08
47	36	40.31	2753.69	2759.87	3.00	7.07	5.70	0.51	2760.37	0.365	40.000	2754.16	2760.01	3.00	7.07	5.70	0.51	2760.52	0.365	0.365	0.146	0.15	0.08
48	36	40.29	2754.16	2760.09	3.00	7.07	5.70	0.51	2760.59	0.365	195.100	2756.44	2760.80	3.00	7.07	5.70	0.51	2761.31	0.365	0.365	0.712	0.15	0.08
49	36	40.28	2756.49	2760.88	3.00	7.07	5.70	0.51	2761.38	0.365	157.000	2758.06	2761.45	3.00	7.07	5.70	0.50	2761.96	0.365	0.365	0.573	0.50	0.25
50	36	40.25	2758.06	2761.70	3.00	7.07	5.70	0.50	2762.21	0.364	138.400	2759.44	2762.11	2.67	6.65	6.06	0.57	2762.68	0.324	0.344	0.476	0.50	0.29
51	30	40.23	2759.95	2762.45	2.50*	4.91	8.20	1.04	2763.50	0.963	100.000	2760.95	2763.29	2.34	4.77	8.43	1.10	2764.39	0.832	0.897	0.897	0.15	0.17
52	30	40.21	2760.95	2763.45	2.50	4.91	8.19	1.04	2764.50	0.962	145.900	2762.41	2764.65	2.24	4.64	8.67	1.17	2765.82	0.849	0.906	1.321	0.15	0.18
53	30	40.20	2762.44	2764.94	2.50*	4.91	8.19	1.04	2765.98	0.961	166.800	2763.77	2766.54	2.50	4.91	8.19	1.04	2767.59	0.961	0.961	1.603	0.15	0.16
54	30	40.18	2763.77	2766.70	2.50	4.91	8.19	1.04	2767.74	0.960	80.000	2764.41	2767.47	2.50	4.91	8.19	1.04	2768.51	0.960	0.960	0.768	0.15	0.16
55	30	20.16	2764.44	2767.63	2.50	4.91	4.11	0.26	2767.89	0.242	246.300	2765.92	2768.15	2.23	4.63	4.35	0.29	2768.45	0.214	0.228	0.561	0.15	0.04
56	30	20.15	2765.92	2768.42	2.50*	4.91	4.11	0.26	2768.68	0.242	150.000	2766.82	2768.67	1.85	3.90	5.17	0.42	2769.09	0.299	0.270	0.406	0.50	0.21
57	30	20.13	2766.82	2769.32	2.50*	4.91	4.10	0.26	2769.58	0.241	95.700	2767.39	2769.48	2.09	4.38	4.59	0.33	2769.81	0.233	0.237	0.227	0.50	0.16
58	24	20.10	2767.88	2769.88	2.00*	3.14	6.40	0.64	2770.52	0.790	100.000	2768.68	2770.60	1.92	3.10	6.48	0.65	2771.26	0.689	0.740	0.740	0.15	0.10
59	24	20.09	2768.68	2770.70	2.00	3.14	6.40	0.64	2771.34	0.789	196.100	2770.25	2772.10	1.85	3.04	6.62	0.68	2772.78	0.683	0.736	1.444	0.15	0.10
60	24	20.08	2770.29	2772.29	2.00*	3.14	6.39	0.64	2772.93	0.789	36.000	2770.58	2772.56	1.98	3.14	6.40	0.64	2773.20	0.727	0.758	0.273	0.15	0.10
61	24	20.06	2770.58	2772.66	2.00	3.14	6.39	0.63	2773.29	0.787	159.000	2771.85	2773.82	1.97	3.13	6.40	0.64	2774.46	0.715	0.751	1.194	0.15	0.10
62	24	20.04	2771.85	2773.92	2.00	3.14	6.38	0.63	2774.55	0.785	100.000	2772.65	2774.63	1.98	3.14	6.39	0.63	2775.27	0.729	0.757	0.757	0.15	0.10
63	24	20.03	2772.69	2774.73	2.00	3.14	6.38	0.63	2775.36	0.785	80.000	2773.33	2775.32	1.99	3.14	6.38	0.63	2775.95	0.736	0.760	0.608	0.50	0.32
64	24	20.01	2773.33	2775.64	2.00	3.14	6.37	0.63	2776.27	0.783	120.340	2774.29	2776.58	2.00	3.14	6.37	0.63	2777.21	0.783	0.783	0.942	0.50	0.32
65	18	0.01	2517.25	2717.06	1.50	1.77	0.01	0.00	2717.06	0.000	22.580	2521.19	2717.06	1.50	1.77	0.01	0.00	2717.06	0.000	0.000	0.000	0.50	0.00
66	18	0.01	2717.53	2719.03	1.50*	1.77	0.01	0.00	2719.03	0.000	18.750	2720.58	2720.62 j	0.04**	0.01	0.83	0.01	2720.63	0.713	0.357	n/a	0.50	n/a

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
67	18	0.01	2710.61	2712.11	1.50*	1.77	0.01	0.00	2712.11	0.000	18.750	2714.20	2714.24 j	0.04**	0.01	0.83	0.01	2714.25	0.713	0.357	n/a	0.50	n/a
68	18	0.01	2706.78	2708.28	1.50*	1.77	0.01	0.00	2708.28	0.000	28.000	2711.14	2711.18 j	0.04**	0.01	0.83	0.01	2711.19	0.713	0.357	n/a	0.50	n/a
69	18	0.01	2702.38	2706.23	1.50	1.77	0.01	0.00	2706.23	0.000	6.500	2704.51	2706.23	1.50	1.77	0.01	0.00	2706.23	0.000	0.000	0.000	0.50	0.00
70	18	0.01	2701.88	2706.83	1.50	1.77	0.01	0.00	2706.83	0.000	66.500	2704.60	2706.83	1.50	1.77	0.01	0.00	2706.83	0.000	0.000	0.000	0.50	0.00
71	18	0.02	2703.10	2708.91	1.50	1.77	0.01	0.00	2708.91	0.000	6.500	2704.81	2708.91	1.50	1.77	0.01	0.00	2708.91	0.000	0.000	0.000	0.50	0.00
72	18	0.01	2705.09	2708.91	1.50	1.77	0.01	0.00	2708.91	0.000	16.330	2705.25	2708.91	1.50	1.77	0.01	0.00	2708.91	0.000	0.000	0.000	0.50	0.00
73	18	0.01	2702.77	2708.91	1.50	1.77	0.01	0.00	2708.91	0.000	66.500	2706.02	2708.91	1.50	1.77	0.01	0.00	2708.91	0.000	0.000	0.000	0.50	0.00
74	18	0.01	2706.19	2711.13	1.50	1.77	0.01	0.00	2711.13	0.000	6.500	2709.65	2711.13	1.48	1.76	0.01	0.00	2711.13	0.000	0.000	0.000	0.50	0.00
75	18	0.01	2705.26	2711.13	1.50	1.77	0.01	0.00	2711.13	0.000	66.500	2709.65	2711.13	1.48	1.76	0.01	0.00	2711.13	0.000	0.000	0.000	0.50	0.00
76	18	0.01	2706.19	2713.63	1.50	1.77	0.01	0.00	2713.63	0.000	6.500	2709.65	2713.63	1.50	1.77	0.01	0.00	2713.63	0.000	0.000	0.000	0.50	0.00
77	18	0.01	2705.26	2713.63	1.50	1.77	0.01	0.00	2713.63	0.000	66.500	2709.65	2713.63	1.50	1.77	0.01	0.00	2713.63	0.000	0.000	0.000	0.50	0.00
78	18	0.01	2708.76	2716.58	1.50	1.77	0.01	0.00	2716.58	0.000	6.500	2712.15	2716.58	1.50	1.77	0.01	0.00	2716.58	0.000	0.000	0.000	0.50	0.00
79	18	0.01	2708.75	2716.58	1.50	1.77	0.01	0.00	2716.58	0.000	66.500	2713.05	2716.58	1.50	1.77	0.01	0.00	2716.58	0.000	0.000	0.000	0.50	0.00
80	18	0.01	2713.81	2719.15	1.50	1.77	0.01	0.00	2719.15	0.000	6.500	2719.54	2719.58	0.04**	0.01	0.83	0.01	2719.59	0.713	0.357	n/a	0.50	n/a
81	18	0.01	2712.27	2719.15	1.50	1.77	0.01	0.00	2719.15	0.000	66.500	2719.54	2719.58	0.04**	0.01	0.83	0.01	2719.59	0.713	0.357	n/a	0.50	n/a
82	18	0.01	2720.65	2723.50	1.50	1.77	0.01	0.00	2723.50	0.000	6.500	2723.33	2723.50	0.16	0.11	0.09	0.00	2723.50	0.001	0.001	0.000	0.50	0.00
83	18	0.01	2719.23	2723.50	1.50	1.77	0.01	0.00	2723.50	0.000	66.500	2723.33	2723.50	0.16	0.11	0.09	0.00	2723.50	0.001	0.001	0.000	0.50	0.00
84	18	0.01	2720.65	2726.05	1.50	1.77	0.01	0.00	2726.05	0.000	6.500	2723.33	2726.05	1.50	1.77	0.01	0.00	2726.05	0.000	0.000	0.000	0.50	0.00
85	18	0.01	2723.66	2726.05	1.50	1.77	0.01	0.00	2726.05	0.000	66.500	2727.06	2727.10 j	0.04**	0.01	0.83	0.01	2727.11	0.713	0.357	n/a	0.50	n/a
86	18	0.01	2728.56	2730.06	1.50*	1.77	0.01	0.00	2730.06	0.000	6.500	2730.86	2730.90 j	0.04**	0.01	0.83	0.01	2730.91	0.713	0.357	n/a	0.50	n/a
87	18	0.01	2727.94	2729.88	1.50	1.77	0.01	0.00	2729.88	0.000	66.500	2730.86	2730.90 j	0.04**	0.01	0.83	0.01	2730.91	0.713	0.357	n/a	0.50	n/a
88	18	0.01	2732.97	2735.37	1.50	1.77	0.01	0.00	2735.37	0.000	6.500	2734.66	2735.37	0.70	0.82	0.01	0.00	2735.37	0.000	0.000	0.000	0.50	0.00

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
89	18	0.01	2732.51	2735.37	1.50	1.77	0.01	0.00	2735.37	0.000	66.500	2734.66	2735.37	0.70	0.82	0.01	0.00	2735.37	0.000	0.000	0.000	0.50	0.00
90	18	0.02	2735.03	2738.32	1.50	1.77	0.01	0.00	2738.32	0.000	109.700	2737.21	2738.32	1.11	1.40	0.01	0.00	2738.32	0.000	0.000	0.000	0.50	0.00
91	18	0.01	2737.31	2738.81	1.50*	1.77	0.01	0.00	2738.81	0.000	41.700	2737.81	2738.81	1.00	1.25	0.01	0.00	2738.81	0.000	0.000	0.000	0.50	0.00
92	18	0.02	2735.30	2739.04	1.50	1.77	0.01	0.00	2739.04	0.000	43.200	2737.21	2739.04	1.50	1.77	0.01	0.00	2739.04	0.000	0.000	0.000	0.50	0.00
93	18	0.01	2737.21	2739.04	1.50	1.77	0.01	0.00	2739.04	0.000	41.500	2738.11	2739.04	0.93	1.15	0.01	0.00	2739.04	0.000	0.000	0.000	0.50	0.00
94	18	0.02	2736.30	2739.71	1.50	1.77	0.01	0.00	2739.71	0.000	6.500	2738.78	2739.71	0.93	1.15	0.02	0.00	2739.71	0.000	0.000	0.000	0.50	0.00
95	18	0.01	2739.04	2740.54	1.50*	1.77	0.01	0.00	2740.54	0.000	16.900	2739.07	2740.54	1.47	1.76	0.01	0.00	2740.54	0.000	0.000	0.000	0.50	0.00
96	18	0.01	2735.54	2740.28	1.50	1.77	0.01	0.00	2740.28	0.000	66.200	2738.84	2740.28	1.44	1.74	0.01	0.00	2740.28	0.000	0.000	0.000	0.50	0.00
97	18	0.01	2737.04	2742.26	1.50	1.77	0.01	0.00	2742.26	0.000	66.800	2741.34	2742.25	0.91	1.13	0.01	0.00	2742.25	0.000	0.000	0.000	0.50	0.00
98	18	0.01	2738.54	2744.80	1.50	1.77	0.01	0.00	2744.80	0.000	28.300	2741.36	2744.80	1.50	1.77	0.01	0.00	2744.80	0.000	0.000	0.000	0.50	0.00
99	18	0.01	2739.56	2745.68	1.50	1.77	0.01	0.00	2745.68	0.000	66.400	2743.19	2745.68	1.50	1.77	0.01	0.00	2745.68	0.000	0.000	0.000	0.50	0.00
100	18	0.01	2740.99	2746.53	1.50	1.77	0.01	0.00	2746.53	0.000	6.800	2743.79	2746.53	1.50	1.77	0.01	0.00	2746.53	0.000	0.000	0.000	0.50	0.00
101	18	0.01	2742.01	2747.89	1.50	1.77	0.01	0.00	2747.89	0.000	26.900	2744.36	2747.89	1.50	1.77	0.01	0.00	2747.89	0.000	0.000	0.000	0.51	0.00
102	18	0.01	2741.91	2747.89	1.50	1.77	0.01	0.00	2747.89	0.000	22.200	2746.01	2747.89	1.50	1.77	0.01	0.00	2747.89	0.000	0.000	0.000	0.50	0.00
103	18	0.01	2743.40	2749.75	1.50	1.77	0.01	0.00	2749.75	0.000	7.000	2747.28	2749.75	1.50	1.77	0.01	0.00	2749.75	0.000	0.000	0.000	0.50	0.00
104	18	0.01	2745.83	2752.14	1.50	1.77	0.01	0.00	2752.14	0.000	21.300	2748.26	2752.14	1.50	1.77	0.01	0.00	2752.14	0.000	0.000	0.000	0.50	0.00
105	18	0.01	2745.49	2752.64	1.50	1.77	0.01	0.00	2752.64	0.000	35.300	2750.55	2752.64	1.50	1.77	0.01	0.00	2752.64	0.000	0.000	0.000	0.50	0.00
106	18	0.01	2748.00	2755.60	1.50	1.77	0.01	0.00	2755.60	0.000	7.000	2752.19	2755.60	1.50	1.77	0.01	0.00	2755.60	0.000	0.000	0.000	0.50	0.00
107	18	0.01	2749.41	2757.97	1.50	1.77	0.01	0.00	2757.97	0.000	26.600	2753.06	2757.97	1.50	1.77	0.01	0.00	2757.97	0.000	0.000	0.000	0.50	0.00
108	18	0.01	2749.36	2757.97	1.50	1.77	0.01	0.00	2757.97	0.000	66.100	2754.19	2757.97	1.50	1.77	0.01	0.00	2757.97	0.000	0.000	0.000	0.50	0.00
109	18	0.01	2754.30	2759.18	1.50	1.77	0.01	0.00	2759.18	0.000	6.600	2756.83	2759.18	1.50	1.77	0.01	0.00	2759.18	0.000	0.000	0.000	0.50	0.00
110	18	0.01	2754.66	2759.87	1.50	1.77	0.01	0.00	2759.87	0.000	25.800	2757.46	2759.87	1.50	1.77	0.01	0.00	2759.87	0.000	0.000	0.000	0.50	0.00

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
111	18	0.01	2755.38	2760.09	1.50	1.77	0.01	0.00	2760.09	0.000	64.700	2758.51	2760.09	1.50	1.77	0.01	0.00	2760.09	0.000	0.000	0.000	0.50	0.00
112	18	0.02	2759.03	2761.70	1.50	1.77	0.01	0.00	2761.70	0.000	5.700	2759.64	2761.70	1.50	1.77	0.01	0.00	2761.70	0.000	0.000	0.000	0.50	0.00
113	18	0.01	2759.90	2761.70	1.50	1.77	0.01	0.00	2761.70	0.000	17.700	2761.11	2761.70	0.59	0.65	0.02	0.00	2761.70	0.000	0.000	0.000	0.50	0.00
114	18	0.01	2760.28	2762.40	1.50	1.77	0.01	0.00	2762.40	0.000	65.800	2762.16	2762.40	0.24	0.18	0.06	0.00	2762.40	0.000	0.000	0.000	0.50	0.00
115	18	0.01	2761.29	2763.45	1.50	1.77	0.01	0.00	2763.45	0.000	16.200	2763.30	2763.45	0.15	0.09	0.11	0.00	2763.45	0.002	0.001	0.000	0.50	0.00
116	18	0.01	2764.86	2766.70	1.50	1.77	0.01	0.00	2766.70	0.000	28.100	2765.84	2766.70	0.86	1.05	0.01	0.00	2766.70	0.000	0.000	0.000	0.50	0.00
117	18	0.02	2764.90	2767.63	1.50	1.77	0.01	0.00	2767.63	0.000	32.400	2765.39	2767.63	1.50	1.77	0.01	0.00	2767.63	0.000	0.000	0.000	0.50	0.00
118	18	0.01	2765.43	2767.63	1.50	1.77	0.01	0.00	2767.63	0.000	31.300	2765.91	2767.63	1.50	1.77	0.01	0.00	2767.63	0.000	0.000	0.000	0.50	0.00
119	18	0.01	2767.94	2769.44	1.50*	1.77	0.01	0.00	2769.44	0.000	7.100	2770.67	2770.71 j	0.04**	0.01	0.83	0.01	2770.72	0.713	0.357	n/a	0.50	n/a
120	18	0.01	2768.14	2769.64	1.50	1.77	0.01	0.00	2769.64	0.000	25.800	2770.17	2770.21 j	0.04**	0.01	0.83	0.01	2770.22	0.713	0.357	n/a	0.50	n/a
121	18	0.01	2767.97	2769.64	1.50	1.77	0.01	0.00	2769.64	0.000	68.000	2771.56	2771.60 j	0.04**	0.01	0.83	0.01	2771.61	0.713	0.357	n/a	0.50	n/a
122	18	0.01	2771.46	2772.96	1.50*	1.77	0.01	0.00	2772.96	0.000	6.000	2773.84	2773.88 j	0.04**	0.01	0.83	0.01	2773.89	0.713	0.357	n/a	0.50	n/a
123	18	0.01	2773.57	2775.64	1.50	1.77	0.01	0.00	2775.64	0.000	28.000	2774.72	2775.64	0.92	1.13	0.01	0.00	2775.64	0.000	0.000	0.000	0.50	0.00
124	18	0.01	2774.78	2776.89	1.50	1.77	0.01	0.00	2776.89	0.000	19.000	2776.73	2776.89	0.16	0.10	0.10	0.00	2776.89	0.001	0.001	0.000	0.50	0.00
125	18	0.01	2772.27	2773.92	1.50	1.77	0.01	0.00	2773.92	0.000	66.600	2774.84	2774.88 j	0.04**	0.01	0.83	0.01	2774.89	0.713	0.357	n/a	0.50	n/a
126	18	0.01	2736.33	2743.34	1.50	1.77	0.01	0.00	2743.34	0.000	10.000	2736.38	2743.34	1.50	1.77	0.01	0.00	2743.34	0.000	0.000	0.000	0.00	0.00
127	18	0.01	2719.15	2724.23	1.50	1.77	0.01	0.00	2724.23	0.000	21.000	2719.26	2724.23	1.50	1.77	0.01	0.00	2724.23	0.000	0.000	0.000	0.00	0.00

Project File: TEST CAPACITY 2.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraflow HGL Computation Procedure

General Procedure: Hydraflow computes the HGL using the Bernoulli energy equation. Manning's equation is used to determine energy losses due to pipe friction. In a standard step, iterative procedure, Hydraflow assumes upstream HGLs until the energy equation balances. If the energy equation cannot balance, supercritical flow exists and critical depth is temporarily assumed at the upstream end. A supercritical flow Profile is then computed using the same procedure in a downstream direction using momentum principles.

Col. 1 The line number being computed. Calculations begin at Line 1 and proceed upstream.

Col. 2 The line size. In the case of non-circular pipes, the line rise is printed above the span.

Col. 3 Total flow rate in the line.

Col. 4 The elevation of the downstream invert.

Col. 5 Elevation of the hydraulic grade line at the downstream end. This is computed as the upstream HGL + Minor loss of this line's downstream line.

Col. 6 The downstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.

Col. 7 Cross-sectional area of the flow at the downstream end.

Col. 8 The velocity of the flow at the downstream end, (Col. 3 / Col. 7).

Col. 9 Velocity head (Velocity squared / 2g).

Col. 10 The elevation of the energy grade line at the downstream end, HGL + Velocity head, (Col. 5 + Col. 9).

Col. 11 The friction slope at the downstream end (the S or Slope term in Manning's equation).

Col. 12 The line length.

Col. 13 The elevation of the upstream invert.

Col. 14 Elevation of the hydraulic grade line at the upstream end.

Col. 15 The upstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.

Col. 16 Cross-sectional area of the flow at the upstream end.

Col. 17 The velocity of the flow at the upstream end, (Col. 3 / Col. 16).

Col. 18 Velocity head (Velocity squared / 2g).

Col. 19 The elevation of the energy grade line at the upstream end, HGL + Velocity head, (Col. 14 + Col. 18) .

Col. 20 The friction slope at the upstream end (the S or Slope term in Manning's equation).

Col. 21 The average of the downstream and upstream friction slopes.

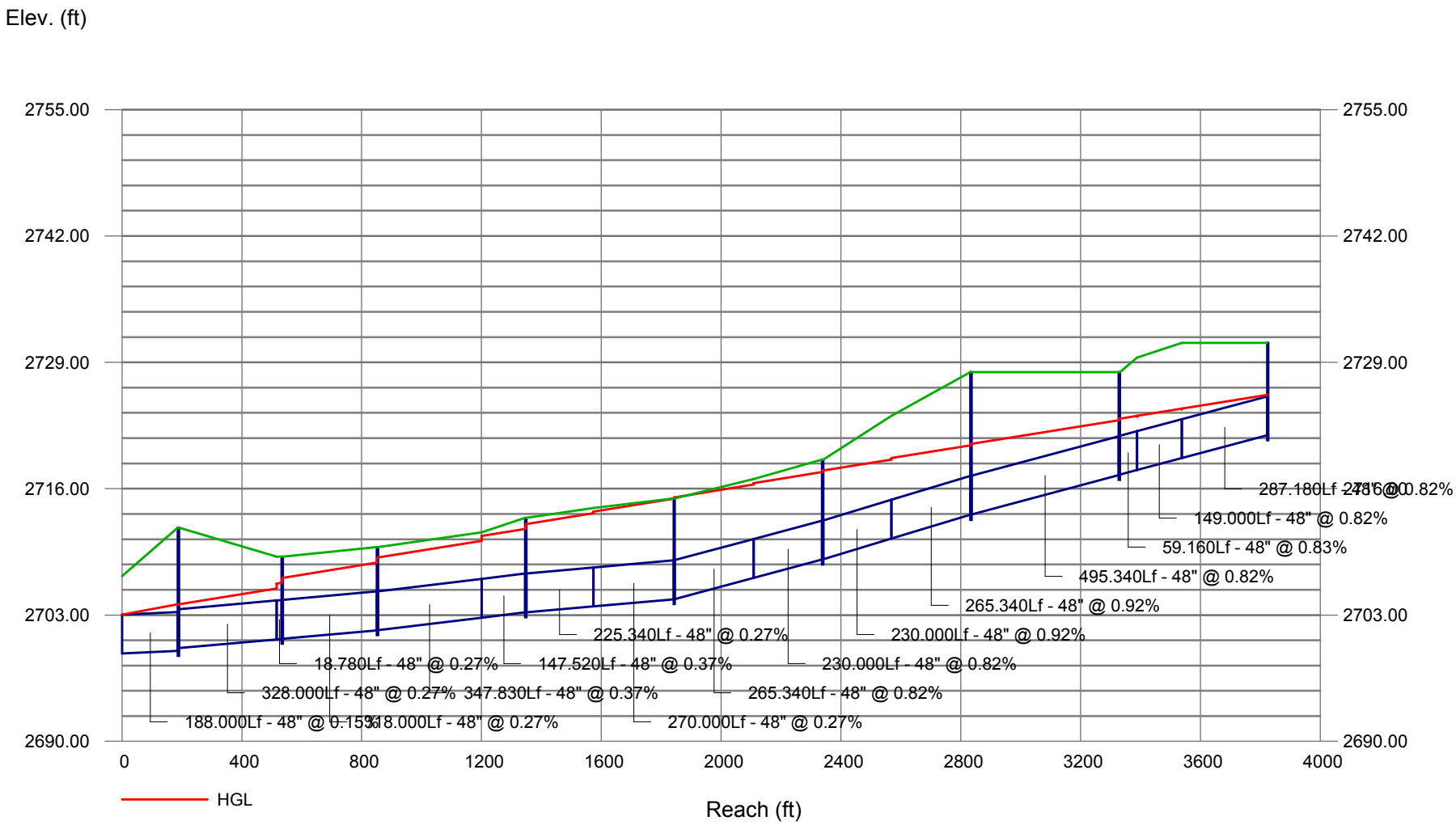
Col. 22 Energy loss. Average Sf/100 x Line Length (Col. 21/100 x Col. 12). Equals (EGL upstream - EGL downstream) +/- tolerance.

Col. 23 The junction loss coefficient (K).

Col. 24 Minor loss. (Col. 23 x Col. 18). Is added to upstream HGL and used as the starting HGL for the next upstream line(s).

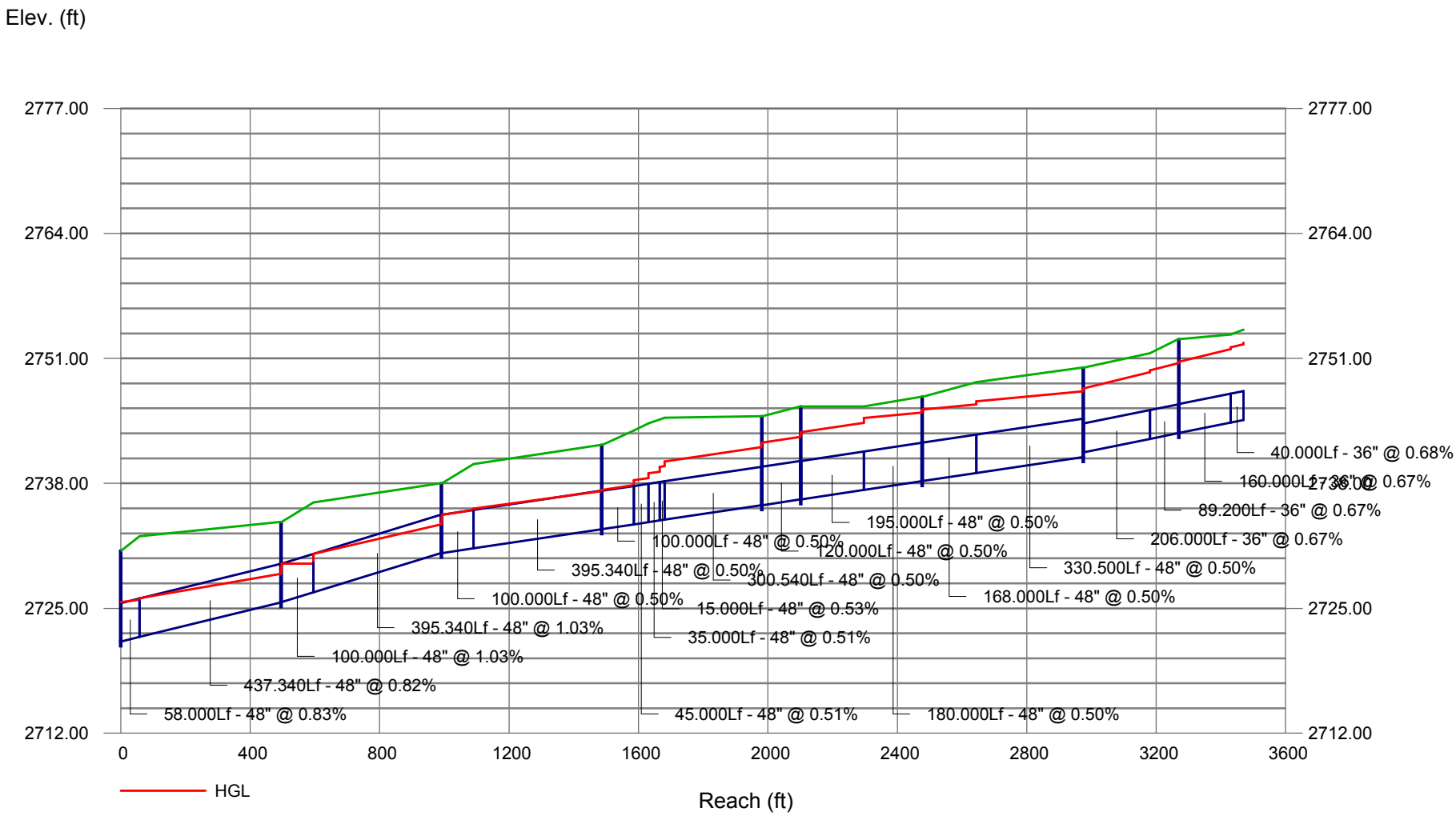
Storm Sewer Profile

Proj. file: TEST CAPACITY 2.stm



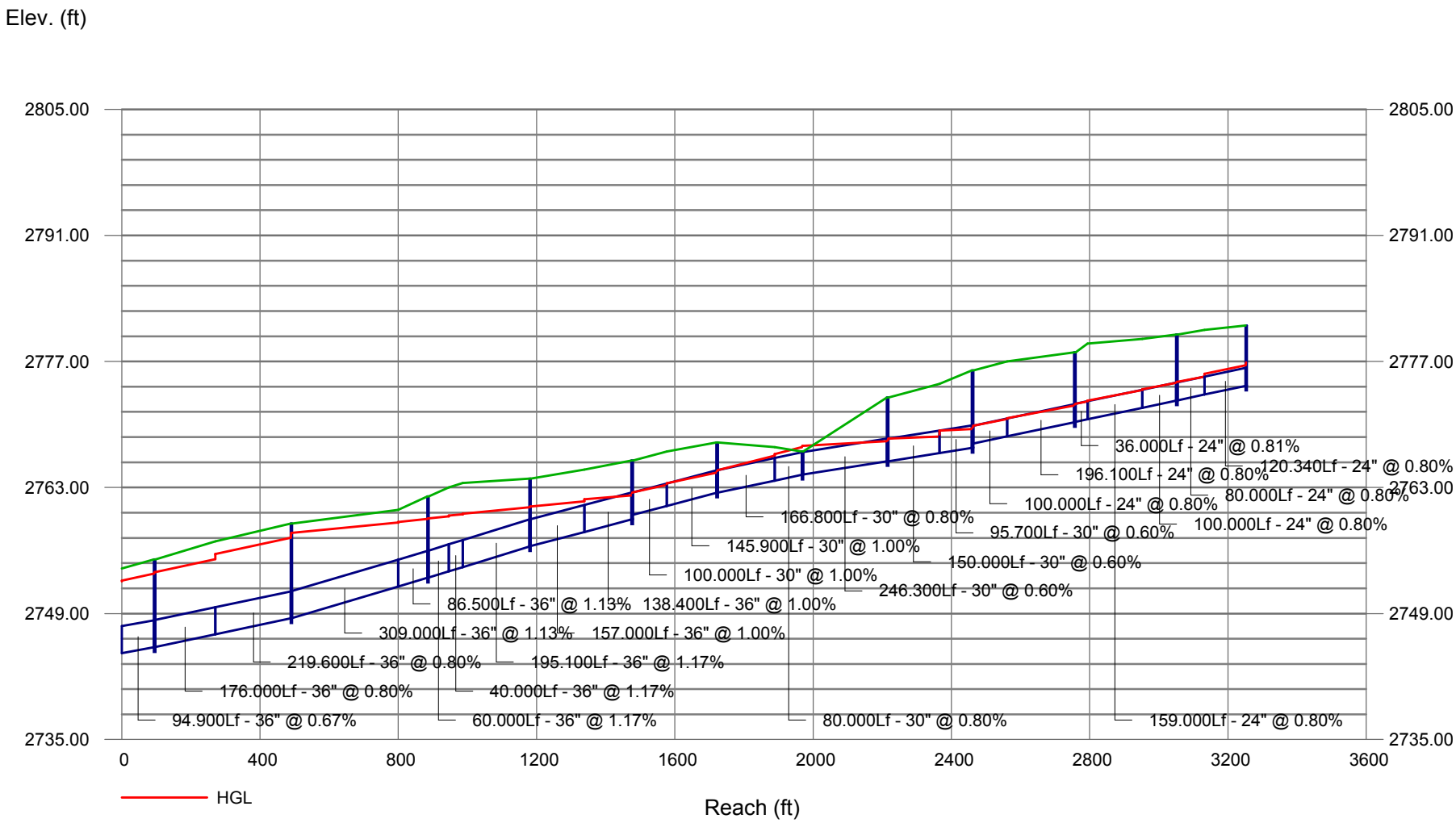
Storm Sewer Profile

Proj. file: TEST CAPACITY 2.stm



Storm Sewer Profile

Proj. file: TEST CAPACITY 2.stm



PROPOSED CONDITIONS
STORMDRAIN ANALYSIS

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
1		167.2	60	Cir	188.000	2699.03	2699.31	0.149	2703.03	2704.16	0.00	2704.16	End	Manhole
2	T12	7.20	24	Cir	34.000	2700.60	2704.20	10.588	2704.16	2705.15	n/a	2705.15 j	1	Manhole
3	T13	7.20	24	Cir	67.320	2704.25	2706.31	3.060	2706.25	2707.26	n/a	2707.26 j	2	None
4	T13(2)	4.60	24	Cir	120.580	2706.31	2710.00	3.060	2708.31	2710.76	n/a	2710.76 j	3	Manhole
5	T14	3.20	24	Cir	274.560	2710.05	2717.00	2.531	2712.05	2717.63	n/a	2717.63 j	4	Manhole
6	T27	160.0	60	Cir	328.000	2699.61	2700.49	0.268	2704.61*	2705.85*	0.52	2706.36	1	None
7	T27(2)	155.3	60	Cir	18.780	2700.49	2700.54	0.267	2706.36*	2706.43*	0.49	2706.92	6	Manhole
8	T26	150.8	60	Cir	318.000	2700.56	2701.42	0.270	2706.92*	2707.98*	0.46	2708.44	7	Manhole
9	T25	144.8	60	Cir	347.830	2701.43	2702.72	0.371	2708.44*	2709.52*	0.42	2709.94	8	None
10	T25(2)	140.5	54	Cir	147.520	2702.72	2703.27	0.373	2709.94*	2710.69*	0.61	2711.30	9	Manhole
11	T24	140.5	54	Cir	225.340	2703.28	2703.89	0.271	2711.30*	2712.45*	0.18	2712.63	10	None
12	T24(2)	134.6	54	Cir	270.000	2703.89	2704.62	0.270	2712.63*	2713.90*	0.17	2714.06	11	Manhole
13	T23	134.6	54	Cir	265.340	2704.64	2706.82	0.822	2714.06*	2715.31*	0.17	2715.48	12	None
14	T23(2)	128.8	48	Cir	230.000	2706.82	2708.71	0.822	2715.48*	2717.32*	0.24	2717.57	13	Manhole
15	T22	128.8	48	Cir	230.000	2708.74	2710.86	0.922	2717.57*	2719.42*	0.24	2719.66	14	None
16	T22(2)	123.0	48	Cir	265.340	2710.86	2713.30	0.920	2719.66*	2721.61*	0.22	2721.83	15	Manhole
17	T21	123.0	48	Cir	495.340	2713.34	2717.40	0.820	2721.83*	2725.47*	0.22	2725.69	16	Manhole
18	T-20	123.0	48	Cir	59.160	2717.44	2717.93	0.828	2725.69*	2726.12*	0.00	2726.12	17	None
19	T-20(2)	114.4	48	Cir	149.000	2717.93	2719.15	0.819	2726.12*	2727.07*	0.00	2727.07	18	None
20	T-20(2)(2)	112.4	48	Cir	287.180	2719.15	2721.50	0.818	2727.07*	2728.83*	0.00	2728.83	19	Manhole
21	T-19	112.4	48	Cir	58.000	2721.54	2722.02	0.828	2728.83*	2729.18*	0.19	2729.37	20	None
22	T-19(2)	105.8	48	Cir	437.340	2722.02	2725.61	0.821	2729.37*	2731.74*	0.17	2731.91	21	Manhole
23	T-18	105.8	48	Cir	100.000	2725.64	2726.67	1.030	2731.91*	2732.45*	0.17	2732.62	22	None
24	T-18(2)	100.1	48	Cir	395.340	2726.67	2730.74	1.030	2732.62	2734.30	0.17	2734.47	23	Manhole

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
25	T-17	100.1	48	Cir	100.000	2730.74	2731.24	0.500	2734.74	2735.21	0.15	2735.35	24	None
26	T-17(2)	92.88	48	Cir	395.340	2731.24	2733.22	0.501	2735.35	2736.81	0.14	2736.95	25	Manhole
27	T-16	92.88	48	Cir	100.000	2733.23	2733.73	0.500	2737.23	2737.61	0.43	2738.04	26	None
28	T-16(2)	91.98	48	Cir	45.000	2733.73	2733.96	0.511	2738.04*	2738.23*	0.42	2738.64	27	None
29	T-16(2)(2)	90.78	48	Cir	35.000	2733.96	2734.14	0.514	2738.64*	2738.78*	0.41	2739.19	28	None
30	T-16(2)(2)(2)	82.58	48	Cir	15.000	2734.14	2734.22	0.534	2739.19*	2739.24*	0.34	2739.57	29	None
31	T-16(2)(2)(2)(2)	80.48	48	Cir	300.540	2734.22	2735.72	0.499	2739.57*	2740.52*	0.32	2740.84	30	Manhole
32	T-15	77.58	48	Cir	120.000	2735.73	2736.33	0.500	2740.84*	2741.19*	0.30	2741.48	31	Manhole
33	T-15(2)	75.28	48	Cir	195.000	2736.33	2737.31	0.503	2741.48*	2742.02*	0.28	2742.30	32	None
34	T-15(2)	64.78	48	Cir	180.000	2737.31	2738.21	0.500	2742.30*	2742.66*	0.21	2742.87	33	Manhole
35	T-14	62.70	48	Cir	168.000	2738.23	2739.07	0.500	2742.87*	2743.19*	0.19	2743.38	34	None
36	T-14(2)	58.80	48	Cir	330.500	2739.07	2740.72	0.499	2743.38	2743.82	0.25	2744.06	35	Manhole
37	T-13	54.68	36	Cir	206.000	2741.24	2742.62	0.670	2744.24	2745.62	0.14	2745.76	36	None
38	T-13(2)	51.43	36	Cir	89.200	2742.62	2743.22	0.672	2745.76*	2746.29*	0.12	2746.41	37	Manhole
39	T-12(1)	51.43	36	Cir	160.000	2743.26	2744.33	0.669	2746.41	2747.31	0.12	2747.44	38	None
40	T-12(2)	50.13	36	Cir	40.000	2744.33	2744.60	0.675	2747.44*	2747.66*	0.12	2747.78	39	None
41	T-12(3)	47.40	36	Cir	94.900	2744.60	2745.24	0.674	2747.78	2748.24	0.10	2748.34	40	Manhole
42	T-11	47.40	36	Cir	176.000	2745.29	2746.70	0.801	2748.34	2748.93	0.55	2749.48	41	None
43	T-11(2)	43.89	36	Cir	219.600	2746.70	2748.46	0.801	2749.70	2750.57	n/a	2750.57 j	42	Manhole
44	T-10	38.01	36	Cir	309.000	2748.49	2751.98	1.129	2751.49	2753.95	n/a	2753.95 j	43	None
45	T-10(2)	35.02	36	Cir	86.500	2751.98	2752.96	1.133	2754.98	2754.85	n/a	2754.98 j	44	Manhole
46	T-9	35.02	36	Cir	60.000	2752.99	2753.69	1.167	2755.99	2755.98	0.09	2756.07	45	None
47	T-9(2)	34.12	36	Cir	40.000	2753.69	2754.16	1.175	2756.69	2756.71	0.07	2756.78	46	None
48	T-9(2)(2)	31.00	36	Cir	195.100	2754.16	2756.44	1.169	2757.16	2758.22	n/a	2758.22 j	47	Manhole

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
49	T-8	31.00	36	Cir	157.000	2756.49	2758.06	1.000	2759.49	2759.84	n/a	2759.84 j	48	None
50	T-8(2)	28.07	36	Cir	138.400	2758.06	2759.44	0.997	2761.06	2761.13	n/a	2761.13 j	49	Manhole
51	T-7	25.47	30	Cir	100.000	2759.95	2760.95	1.000	2762.45	2762.64	n/a	2762.64 j	50	None
52	T-7(2)	22.87	30	Cir	145.900	2760.95	2762.41	1.001	2763.45	2764.01	n/a	2764.01 j	51	Manhole
53	T-6	22.87	30	Cir	166.800	2762.44	2763.77	0.797	2764.94	2765.37	n/a	2765.37 j	52	None
54	T-6(2)	21.87	30	Cir	80.000	2763.77	2764.41	0.800	2766.27	2766.38	0.06	2766.45	53	Manhole
55	T-5	16.67	30	Cir	246.300	2764.44	2765.92	0.601	2766.94	2767.33	0.08	2767.41	54	Manhole
56	T-4	16.67	30	Cir	150.000	2765.92	2766.82	0.600	2768.42	2768.58	0.16	2768.74	55	None
57	T-4(2)	13.81	30	Cir	95.700	2766.82	2767.39	0.595	2769.32	2769.39	0.08	2769.47	56	Manhole
58	T-3	10.34	24	Cir	100.000	2767.88	2768.68	0.800	2769.88	2769.98	0.05	2770.03	57	None
59	T-3(2)	10.34	24	Cir	196.100	2768.68	2770.25	0.801	2770.68	2771.39	n/a	2771.39 j	58	Manhole
60	T-2	10.34	24	Cir	36.000	2770.29	2770.58	0.806	2772.29	2772.33	0.03	2772.36	59	None
61	T-2(2)	7.09	24	Cir	159.000	2770.58	2771.85	0.799	2772.58	2772.80	n/a	2772.85 j	60	None
62	T-2(2)(2)	3.99	24	Cir	100.000	2771.85	2772.65	0.800	2773.85	2773.86	0.01	2773.87	61	Manhole
63	T-1	3.99	24	Cir	80.000	2772.69	2773.33	0.800	2774.69	2774.70	0.02	2774.72	62	None
64	T-1(2)	2.99	24	Cir	120.340	2773.33	2774.29	0.798	2775.33	2775.34	0.02	2775.37	63	Manhole
65	D50	2.00	18	Cir	22.580	2517.25	2521.19	17.449	2717.63*	2717.64*	0.01	2717.65	5	Generic
66	D49	1.20	18	Cir	18.750	2717.53	2720.58	16.267	2719.03	2721.00	n/a	2721.00 j	5	Generic
67	D48	1.40	18	Cir	18.750	2710.61	2714.20	19.146	2712.11	2714.65	n/a	2714.65 j	4	Generic
68	D47	2.60	18	Cir	28.000	2706.78	2711.14	15.571	2708.28	2711.76	n/a	2711.76 j	3	Generic
69	D46	4.70	18	Cir	6.500	2702.38	2704.51	32.771	2706.36*	2706.38*	0.05	2706.43	6	Generic
70	D45	4.50	18	Cir	66.500	2701.88	2704.60	4.091	2706.92*	2707.04*	0.05	2707.09	7	Generic
71	D43	4.10	18	Cir	6.500	2703.10	2704.81	26.307	2708.44*	2708.45*	0.04	2708.49	8	Generic
72	OE11	1.90	18	Cir	16.330	2705.09	2705.25	0.979	2708.49*	2708.50*	0.01	2708.51	71	Generic

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
73	D44	1.90	18	Cir	66.500	2702.77	2706.02	4.887	2708.44*	2708.46*	0.01	2708.47	8	Generic
74	D41	2.40	18	Cir	6.500	2706.19	2709.65	53.230	2709.94	2710.24	n/a	2710.24	9	Generic
75	D42	1.90	18	Cir	66.500	2705.26	2709.65	6.601	2709.94	2710.18	n/a	2710.18 j	9	Generic
76	D39	3.50	18	Cir	6.500	2706.19	2709.65	53.230	2712.63*	2712.64*	0.03	2712.67	11	Generic
77	D40	2.40	18	Cir	66.500	2705.26	2709.65	6.601	2712.63*	2712.67*	0.01	2712.68	11	Generic
78	D37	3.00	18	Cir	6.500	2708.76	2712.15	52.152	2715.48*	2715.48*	0.02	2715.50	13	Generic
79	D38	2.80	18	Cir	66.500	2708.75	2713.05	6.466	2715.48*	2715.52*	0.02	2715.54	13	Generic
80	D35	3.10	18	Cir	6.500	2713.81	2719.54	88.154	2719.66	2720.21	0.13	2720.21	15	Generic
81	D36	2.70	18	Cir	66.500	2712.27	2719.54	10.932	2719.66	2720.17	0.12	2720.17	15	Generic
82	D34	4.10	18	Cir	6.500	2720.65	2723.33	41.233	2726.12*	2726.13*	0.04	2726.18	18	Generic
83	D33	4.50	18	Cir	66.500	2719.23	2723.33	6.166	2726.12*	2726.25*	0.05	2726.30	18	Generic
84	D30	3.60	18	Cir	6.500	2720.65	2723.33	41.233	2729.37*	2729.38*	0.03	2729.41	21	Generic
85	D31	3.00	18	Cir	66.500	2723.66	2727.06	5.113	2729.37*	2729.42*	0.02	2729.45	21	Generic
86	D29	3.30	18	Cir	6.500	2728.56	2730.86	35.385	2732.62*	2732.62*	0.03	2732.65	23	Generic
87	D28	2.40	18	Cir	66.500	2727.94	2730.86	4.391	2732.62*	2732.65*	0.01	2732.66	23	Generic
88	D26	3.70	18	Cir	6.500	2732.97	2734.66	25.999	2735.35	2735.39	n/a	2735.39	25	Generic
89	D27	3.50	18	Cir	66.500	2732.51	2734.66	3.233	2735.35	2735.38	n/a	2735.51 j	25	Generic
90	D25	0.90	18	Cir	109.700	2735.03	2737.21	1.987	2738.04	2738.05	0.01	2738.05	27	Generic
91	D24	0.50	18	Cir	41.700	2737.31	2737.81	1.199	2738.81	2738.81	0.00	2738.81	90	Generic
92	D52	1.20	18	Cir	43.200	2735.30	2737.21	4.421	2738.64	2738.65	0.00	2738.65	28	Generic
93	D51	0.60	18	Cir	41.500	2737.21	2738.11	2.169	2738.71	2738.71	0.01	2738.71	92	Generic
94	D22	8.20	18	Cir	6.500	2736.30	2738.78	38.154	2739.19	2739.87	0.27	2739.87	29	Generic
95	OE10	6.20	18	Cir	16.900	2739.04	2739.07	0.178	2740.54	2740.57	0.10	2740.67	94	DropGrate
96	D23	2.10	18	Cir	66.200	2735.54	2738.84	4.985	2739.57	2739.57	0.05	2739.62	30	Generic

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
97	D21	2.90	18	Cir	66.800	2737.04	2741.34	6.437	2740.84	2741.99	n/a	2741.99 j	31	Generic
98	OE9	10.50	18	Cir	28.300	2738.54	2741.36	9.965	2742.30	2742.60	0.35	2742.60	33	Generic
99	D19(+30%)	2.08	18	Cir	66.400	2739.56	2743.19	5.467	2742.87	2743.74	n/a	2743.74 j	34	Generic
100	D18(+30%)	3.90	18	Cir	6.800	2740.99	2743.79	41.177	2743.38	2744.54	n/a	2744.54	35	Generic
101	OE8	1.00	18	Cir	26.900	2742.01	2744.36	8.736	2744.06	2744.74	n/a	2744.74 j	36	Generic
102	D17(+30%)	3.12	18	Cir	22.200	2741.91	2746.01	18.469	2744.06	2746.68	n/a	2746.68 j	36	Generic
103	D16(+30%)	3.25	18	Cir	7.000	2743.40	2747.28	55.430	2745.76	2747.97	n/a	2747.97	37	Generic
104	OE7	1.30	18	Cir	21.300	2745.83	2748.26	11.408	2747.44	2748.70	n/a	2748.70 j	39	Generic
105	D15(+30%)	2.73	18	Cir	35.300	2745.49	2750.55	14.334	2747.78	2751.18	n/a	2751.18 j	40	Generic
106	D14(+30%)	3.51	18	Cir	7.000	2748.00	2752.19	59.856	2749.50	2752.91	n/a	2752.91 j	42	Generic
107	OE6	1.20	18	Cir	26.600	2749.41	2753.06	13.722	2750.91	2753.48	n/a	2753.48 j	43	Generic
108	D13(+30%)	4.68	18	Cir	66.100	2749.36	2754.19	7.307	2750.86	2755.02	n/a	2755.02 j	43	Generic
109	D12(+30%)	2.99	18	Cir	6.600	2754.30	2756.83	38.334	2755.80	2757.49	n/a	2757.49 j	44	Generic
110	OE5	0.90	18	Cir	25.800	2754.66	2757.46	10.853	2756.16	2757.82	n/a	2757.82 j	46	Generic
111	D11(+30%)	3.12	18	Cir	64.700	2755.38	2758.51	4.838	2756.88	2759.18	n/a	2759.18 j	47	OpenHeadwall
112	D10(+30%)	2.93	18	Cir	5.700	2759.03	2759.64	10.699	2760.53	2760.44	0.07	2760.51	49	Generic
113	OE4	1.50	18	Cir	17.700	2759.90	2761.11	6.837	2761.40	2761.58	n/a	2761.58 j	112	Generic
114	D9(+30%)	2.60	18	Cir	65.800	2760.28	2762.16	2.857	2761.78	2762.78	n/a	2762.78 j	50	Generic
115	D8(+30%)	2.60	18	Cir	16.200	2761.29	2763.30	12.407	2762.79	2763.92	n/a	2763.92 j	51	Generic
116	OE3	1.00	18	Cir	28.100	2764.86	2765.84	3.487	2766.36	2766.33	0.03	2766.36	53	Generic
117	D7(+30%)	5.20	18	Cir	32.400	2764.90	2765.39	1.512	2766.45	2766.44	0.12	2766.56	54	Generic
118	D6(+30%)	2.86	18	Cir	31.300	2765.43	2765.91	1.533	2766.93	2766.92	0.04	2766.96	117	Generic
119	D5(+30%)	2.86	18	Cir	7.100	2767.94	2770.67	38.450	2769.44	2771.32	n/a	2771.32 j	56	Generic
120	OE2	1.00	18	Cir	25.800	2768.14	2770.17	7.868	2769.64	2770.55	n/a	2770.55 j	57	Generic

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
121	D4(+30%)	2.47	18	Cir	68.000	2767.97	2771.56	5.280	2769.47	2772.16	n/a	2772.16 j	57	Generic
122	D3(+30%)	3.25	18	Cir	6.000	2771.46	2773.84	39.669	2772.96	2774.53	n/a	2774.53 j	60	Generic
123	OE1	1.00	18	Cir	28.000	2773.57	2774.72	4.107	2775.07	2775.10	n/a	2775.10 j	63	Generic
124	D1(+30%)	2.99	18	Cir	19.000	2774.78	2776.73	10.263	2776.28	2777.39	n/a	2777.39 j	64	Generic
125	D2(+30%)	3.10	18	Cir	66.600	2772.27	2774.84	3.859	2773.77	2775.51	n/a	2775.51 j	61	Generic
126	D20	2.30	18	Cir	10.000	2736.33	2736.38	0.498	2741.48*	2741.49*	0.00	2741.49	32	None
127	D32	2.00	18	Cir	21.000	2719.15	2719.26	0.524	2727.07*	2727.08*	0.00	2727.08	19	None

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm

Number of lines: 127

Run Date: 04-26-2011

NOTES: Known Qs only ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
1	60	167.2	2699.03	2703.03	4.00	16.84	9.93	1.53	2704.56	0.431	188.000	2699.31	2704.16	4.85	19.47	8.59	1.15	2705.31	0.363	0.397	0.746	0.00	0.00
2	24	7.20	2700.60	2704.16	2.00	3.14	2.29	0.08	2704.24	0.101	34.000	2704.20	2705.15 j	0.95**	1.47	4.89	0.37	2705.52	0.483	0.292	n/a	0.50	0.19
3	24	7.20	2704.25	2706.25	2.00*	3.14	2.29	0.08	2706.33	0.101	67.320	2706.31	2707.26 j	0.95**	1.47	4.89	0.37	2707.63	0.483	0.292	n/a	0.50	0.19
4	24	4.60	2706.31	2708.31	2.00*	3.14	1.46	0.03	2708.34	0.041	120.580	2710.00	2710.76 j	0.76**	1.09	4.20	0.27	2711.03	0.441	0.241	n/a	0.50	n/a
5	24	3.20	2710.05	2712.05	2.00*	3.14	1.02	0.02	2712.07	0.020	274.560	2717.00	2717.63 j	0.63**	0.85	3.74	0.22	2717.85	0.423	0.222	n/a	0.50	n/a
6	60	160.0	2699.61	2704.61	5.00*	19.63	8.15	1.03	2705.64	0.377	328.000	2700.49	2705.85	5.00	19.63	8.15	1.03	2706.88	0.377	0.377	1.238	0.50	0.52
7	60	155.3	2700.49	2706.36	5.00	19.63	7.91	0.97	2707.34	0.356	18.780	2700.54	2706.43	5.00	19.63	7.91	0.97	2707.40	0.355	0.355	0.067	0.50	0.49
8	60	150.8	2700.56	2706.92	5.00	19.63	7.68	0.92	2707.84	0.335	318.000	2701.42	2707.98	5.00	19.63	7.68	0.92	2708.90	0.335	0.335	1.066	0.50	0.46
9	60	144.8	2701.43	2708.44	5.00	19.63	7.37	0.85	2709.29	0.309	347.830	2702.72	2709.52	5.00	19.63	7.37	0.85	2710.36	0.309	0.309	1.075	0.50	0.42
10	54	140.5	2702.72	2709.94	4.50	15.90	8.83	1.21	2711.15	0.510	147.520	2703.27	2710.69	4.50	15.90	8.83	1.21	2711.91	0.510	0.510	0.753	0.50	0.61
11	54	140.5	2703.28	2711.30	4.50	15.90	8.83	1.21	2712.51	0.510	225.340	2703.89	2712.45	4.50	15.90	8.83	1.21	2713.66	0.510	0.510	1.150	0.15	0.18
12	54	134.6	2703.89	2712.63	4.50	15.90	8.46	1.11	2713.75	0.468	270.000	2704.62	2713.90	4.50	15.90	8.46	1.11	2715.01	0.468	0.468	1.265	0.15	0.17
13	54	134.6	2704.64	2714.06	4.50	15.90	8.46	1.11	2715.18	0.468	265.340	2706.82	2715.31	4.50	15.90	8.46	1.11	2716.42	0.468	0.468	1.243	0.15	0.17
14	48	128.8	2706.82	2715.48	4.00	12.56	10.25	1.63	2717.11	0.804	230.000	2708.71	2717.32	4.00	12.57	10.25	1.63	2718.96	0.804	0.804	1.849	0.15	0.24
15	48	128.8	2708.74	2717.57	4.00	12.56	10.25	1.63	2719.20	0.804	230.000	2710.86	2719.42	4.00	12.57	10.25	1.63	2721.05	0.804	0.804	1.849	0.15	0.24
16	48	123.0	2710.86	2719.66	4.00	12.56	9.79	1.49	2721.15	0.733	265.340	2713.30	2721.61	4.00	12.57	9.79	1.49	2723.10	0.733	0.733	1.945	0.15	0.22
17	48	123.0	2713.34	2721.83	4.00	12.56	9.79	1.49	2723.32	0.733	495.340	2717.40	2725.47	4.00	12.57	9.79	1.49	2726.95	0.733	0.733	3.631	0.15	0.22
18	48	123.0	2717.44	2725.69	4.00	12.56	9.79	1.49	2727.18	0.733	59.160	2717.93	2726.12	4.00	12.57	9.79	1.49	2727.61	0.733	0.733	0.434	0.00	0.00
19	48	114.4	2717.93	2726.12	4.00	12.56	9.10	1.29	2727.41	0.634	149.000	2719.15	2727.07	4.00	12.57	9.10	1.29	2728.36	0.634	0.634	0.945	0.00	0.00
20	48	112.4	2719.15	2727.07	4.00	12.56	8.94	1.24	2728.31	0.612	287.180	2721.50	2728.83	4.00	12.57	8.94	1.24	2730.07	0.612	0.612	1.758	0.00	0.00
21	48	112.4	2721.54	2728.83	4.00	12.56	8.94	1.24	2730.07	0.612	58.000	2722.02	2729.18	4.00	12.57	8.94	1.24	2730.43	0.612	0.612	0.355	0.15	0.19
22	48	105.8	2722.02	2729.37	4.00	12.56	8.42	1.10	2730.47	0.543	437.340	2725.61	2731.74	4.00	12.57	8.42	1.10	2732.84	0.542	0.542	2.372	0.15	0.17

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
23	48	105.8	2725.64	2731.91	4.00	12.56	8.42	1.10	2733.01	0.543	100.000	2726.67	2732.45	4.00	12.57	8.42	1.10	2733.55	0.542	0.542	0.542	0.15	0.17
24	48	100.1	2726.67	2732.62	4.00	12.56	7.97	0.99	2733.60	0.486	395.340	2730.74	2734.30	3.56	11.82	8.47	1.12	2735.42	0.432	0.459	1.813	0.15	0.17
25	48	100.1	2730.74	2734.74	4.00*	12.56	7.97	0.99	2735.73	0.486	100.000	2731.24	2735.21	3.97	12.55	7.97	0.99	2736.19	0.450	0.468	0.468	0.15	0.15
26	48	92.88	2731.24	2735.35	4.00	12.56	7.39	0.85	2736.20	0.418	395.340	2733.22	2736.81	3.59	11.89	7.81	0.95	2737.76	0.369	0.394	1.556	0.15	0.14
27	48	92.88	2733.23	2737.23	4.00*	12.56	7.39	0.85	2738.08	0.418	100.000	2733.73	2737.61	3.88	12.45	7.46	0.86	2738.47	0.368	0.393	0.393	0.50	0.43
28	48	91.98	2733.73	2738.04	4.00	12.56	7.32	0.83	2738.87	0.410	45.000	2733.96	2738.23	4.00	12.57	7.32	0.83	2739.06	0.410	0.410	0.185	0.50	0.42
29	48	90.78	2733.96	2738.64	4.00	12.56	7.23	0.81	2739.45	0.400	35.000	2734.14	2738.78	4.00	12.57	7.22	0.81	2739.59	0.399	0.399	0.140	0.50	0.41
30	48	82.58	2734.14	2739.19	4.00	12.56	6.57	0.67	2739.86	0.331	15.000	2734.22	2739.24	4.00	12.57	6.57	0.67	2739.91	0.331	0.331	0.050	0.50	0.34
31	48	80.48	2734.22	2739.57	4.00	12.56	6.41	0.64	2740.21	0.314	300.540	2735.72	2740.52	4.00	12.57	6.40	0.64	2741.15	0.314	0.314	0.944	0.50	0.32
32	48	77.58	2735.73	2740.84	4.00	12.56	6.17	0.59	2741.43	0.292	120.000	2736.33	2741.19	4.00	12.57	6.17	0.59	2741.78	0.292	0.292	0.350	0.50	0.30
33	48	75.28	2736.33	2741.48	4.00	12.56	5.99	0.56	2742.04	0.275	195.000	2737.31	2742.02	4.00	12.57	5.99	0.56	2742.58	0.275	0.275	0.536	0.50	0.28
34	48	64.78	2737.31	2742.30	4.00	12.56	5.16	0.41	2742.71	0.203	180.000	2738.21	2742.66	4.00	12.57	5.16	0.41	2743.08	0.203	0.203	0.366	0.50	0.21
35	48	62.70	2738.23	2742.87	4.00	12.56	4.99	0.39	2743.26	0.191	168.000	2739.07	2743.19	4.00	12.57	4.99	0.39	2743.58	0.191	0.191	0.320	0.50	0.19
36	48	58.80	2739.07	2743.38	4.00	12.56	4.68	0.34	2743.72	0.168	330.500	2740.72	2743.82	3.09	10.43	5.64	0.49	2744.31	0.188	0.178	0.587	0.50	0.25
37	36	54.68	2741.24	2744.24	3.00*	7.07	7.74	0.93	2745.17	0.672	206.000	2742.62	2745.62	3.00	7.07	7.74	0.93	2746.55	0.667	0.670	1.380	0.15	0.14
38	36	51.43	2742.62	2745.76	3.00	7.07	7.28	0.82	2746.58	0.595	89.200	2743.22	2746.29	3.00	7.07	7.28	0.82	2747.11	0.595	0.595	0.531	0.15	0.12
39	36	51.43	2743.26	2746.41	3.00	7.07	7.28	0.82	2747.24	0.595	160.000	2744.33	2747.31	2.98	7.06	7.28	0.82	2748.14	0.559	0.577	0.923	0.15	0.12
40	36	50.13	2744.33	2747.44	3.00	7.07	7.09	0.78	2748.22	0.565	40.000	2744.60	2747.66	3.00	7.07	7.09	0.78	2748.45	0.565	0.565	0.226	0.15	0.12
41	36	47.40	2744.60	2747.78	3.00	7.07	6.71	0.70	2748.48	0.505	94.900	2745.24	2748.24	3.00	7.07	6.71	0.70	2748.94	0.488	0.497	0.471	0.15	0.10
42	36	47.40	2745.29	2748.34	3.00	7.07	6.71	0.70	2749.04	0.505	176.000	2746.70	2748.93	2.23	5.63	8.42	1.10	2750.03	0.622	0.564	0.992	0.50	0.55
43	36	43.89	2746.70	2749.70	3.00*	7.07	6.21	0.60	2750.30	0.433	219.600	2748.46	2750.57 j	2.11**	5.32	8.25	1.06	2751.63	0.609	0.521	n/a	0.50	n/a
44	36	38.01	2748.49	2751.49	3.00*	7.07	5.38	0.45	2751.94	0.325	309.000	2751.98	2753.95 j	1.97**	4.91	7.75	0.93	2754.88	0.555	0.440	n/a	0.15	n/a

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
45	36	35.02	2751.98	2754.98	3.00*	7.07	4.96	0.38	2755.36	0.276	86.500	2752.96	2754.85 j	1.89**	4.70	7.45	0.86	2755.72	0.525	0.400	0.346	0.15	0.13
46	36	35.02	2752.99	2755.99	3.00*	7.07	4.96	0.38	2756.37	0.276	60.000	2753.69	2755.98	2.29	5.79	6.05	0.57	2756.55	0.318	0.297	0.178	0.15	0.09
47	36	34.12	2753.69	2756.69	3.00*	7.07	4.83	0.36	2757.05	0.262	40.000	2754.16	2756.71	2.55	6.41	5.32	0.44	2757.15	0.246	0.254	0.102	0.15	0.07
48	36	31.00	2754.16	2757.16	3.00*	7.07	4.39	0.30	2757.46	0.216	195.100	2756.44	2758.22 j	1.77**	4.35	7.12	0.79	2759.00	0.500	0.358	n/a	0.15	n/a
49	36	31.00	2756.49	2759.49	3.00*	7.07	4.39	0.30	2759.79	0.216	157.000	2758.06	2759.84 j	1.77**	4.35	7.12	0.79	2760.62	0.500	0.358	n/a	0.50	n/a
50	36	28.07	2758.06	2761.06	3.00*	7.07	3.97	0.25	2761.31	0.177	138.400	2759.44	2761.13 j	1.69**	4.10	6.85	0.73	2761.86	0.479	0.328	n/a	0.50	n/a
51	30	25.47	2759.95	2762.45	2.50*	4.91	5.19	0.42	2762.87	0.386	100.000	2760.95	2762.64 j	1.69**	3.52	7.23	0.81	2763.45	0.607	0.497	n/a	0.15	0.12
52	30	22.87	2760.95	2763.45	2.50*	4.91	4.66	0.34	2763.79	0.311	145.900	2762.41	2764.01 j	1.60**	3.31	6.90	0.74	2764.75	0.570	0.441	n/a	0.15	0.11
53	30	22.87	2762.44	2764.94	2.50*	4.91	4.66	0.34	2765.28	0.311	166.800	2763.77	2765.37 j	1.60**	3.31	6.90	0.74	2766.11	0.570	0.441	n/a	0.15	0.11
54	30	21.87	2763.77	2766.27	2.50*	4.91	4.46	0.31	2766.58	0.284	80.000	2764.41	2766.38	1.97	4.16	5.26	0.43	2766.81	0.305	0.295	0.236	0.15	0.06
55	30	16.67	2764.44	2766.94	2.50*	4.91	3.40	0.18	2767.12	0.165	246.300	2765.92	2767.33	1.41	2.86	5.82	0.53	2767.86	0.440	0.303	0.745	0.15	0.08
56	30	16.67	2765.92	2768.42	2.50*	4.91	3.40	0.18	2768.60	0.165	150.000	2766.82	2768.58	1.76	3.70	4.51	0.32	2768.90	0.232	0.198	0.298	0.50	0.16
57	30	13.81	2766.82	2769.32	2.50*	4.91	2.81	0.12	2769.44	0.113	95.700	2767.39	2769.39	2.00	4.20	3.29	0.17	2769.55	0.119	0.116	0.111	0.50	0.08
58	24	10.34	2767.88	2769.88	2.00*	3.14	3.29	0.17	2770.05	0.209	100.000	2768.68	2769.98	1.30	2.16	4.78	0.36	2770.34	0.366	0.287	0.287	0.15	0.05
59	24	10.34	2768.68	2770.68	2.00*	3.14	3.29	0.17	2770.85	0.209	196.100	2770.25	2771.39 j	1.14**	1.85	5.60	0.49	2771.88	0.545	0.377	n/a	0.15	0.07
60	24	10.34	2770.29	2772.29	2.00*	3.14	3.29	0.17	2772.46	0.209	36.000	2770.58	2772.33	1.75	2.92	3.54	0.19	2772.53	0.189	0.199	0.072	0.15	0.03
61	24	7.09	2770.58	2772.58	2.00*	3.14	2.26	0.08	2772.66	0.098	159.000	2771.85	2772.80 j	0.95**	1.47	4.83	0.36	2773.16	0.472	0.285	0.453	0.15	0.05
62	24	3.99	2771.85	2773.85	2.00*	3.14	1.27	0.03	2773.88	0.031	100.000	2772.65	2773.86	1.21	1.99	2.00	0.06	2773.92	0.067	0.049	0.049	0.15	0.01
63	24	3.99	2772.69	2774.69	2.00*	3.14	1.27	0.03	2774.72	0.031	80.000	2773.33	2774.70	1.37	2.29	1.74	0.05	2774.75	0.047	0.039	0.031	0.50	0.02
64	24	2.99	2773.33	2775.33	2.00*	3.14	0.95	0.01	2775.34	0.017	120.340	2774.29	2775.34	1.05	1.67	1.79	0.05	2775.39	0.059	0.038	0.046	0.50	0.02
65	18	2.00	2517.25	2717.63	1.50	1.77	1.13	0.02	2717.65	0.036	22.580	2521.19	2717.64	1.50	1.77	1.13	0.02	2717.66	0.036	0.036	0.008	0.50	0.01
66	18	1.20	2717.53	2719.03	1.50*	1.77	0.68	0.01	2719.04	0.013	18.750	2720.58	2721.00 j	0.42**	0.40	2.98	0.14	2721.14	0.453	0.233	n/a	0.50	0.07

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
67	18	1.40	2710.61	2712.11	1.50*	1.77	0.79	0.01	2712.12	0.018	18.750	2714.20	2714.65 j	0.45**	0.45	3.12	0.15	2714.80	0.457	0.237	n/a	0.50	0.08
68	18	2.60	2706.78	2708.28	1.50*	1.77	1.47	0.03	2708.31	0.061	28.000	2711.14	2711.76 j	0.62**	0.68	3.81	0.23	2711.98	0.492	0.277	n/a	0.50	0.11
69	18	4.70	2702.38	2706.36	1.50	1.77	2.66	0.11	2706.47	0.200	6.500	2704.51	2706.38	1.50	1.77	2.66	0.11	2706.49	0.200	0.200	0.013	0.50	0.05
70	18	4.50	2701.88	2706.92	1.50	1.77	2.55	0.10	2707.02	0.184	66.500	2704.60	2707.04	1.50	1.77	2.55	0.10	2707.14	0.184	0.184	0.122	0.50	0.05
71	18	4.10	2703.10	2708.44	1.50	1.77	2.32	0.08	2708.53	0.153	6.500	2704.81	2708.45	1.50	1.77	2.32	0.08	2708.54	0.152	0.152	0.010	0.50	0.04
72	18	1.90	2705.09	2708.49	1.50	1.77	1.08	0.02	2708.51	0.033	16.330	2705.25	2708.50	1.50	1.77	1.08	0.02	2708.52	0.033	0.033	0.005	0.50	0.01
73	18	1.90	2702.77	2708.44	1.50	1.77	1.08	0.02	2708.46	0.033	66.500	2706.02	2708.46	1.50	1.77	1.08	0.02	2708.48	0.033	0.033	0.022	0.50	0.01
74	18	2.40	2706.19	2709.94	1.50	1.77	1.36	0.03	2709.97	0.052	6.500	2709.65	2710.24	0.59**	0.65	3.71	0.21	2710.46	0.485	0.269	n/a	0.50	n/a
75	18	1.90	2705.26	2709.94	1.50	1.77	1.08	0.02	2709.96	0.033	66.500	2709.65	2710.18 j	0.53**	0.55	3.44	0.18	2710.36	0.470	0.251	n/a	0.50	0.09
76	18	3.50	2706.19	2712.63	1.50	1.77	1.98	0.06	2712.69	0.111	6.500	2709.65	2712.64	1.50	1.77	1.98	0.06	2712.70	0.111	0.111	0.007	0.50	0.03
77	18	2.40	2705.26	2712.63	1.50	1.77	1.36	0.03	2712.66	0.052	66.500	2709.65	2712.67	1.50	1.77	1.36	0.03	2712.70	0.052	0.052	0.035	0.50	0.01
78	18	3.00	2708.76	2715.48	1.50	1.77	1.70	0.04	2715.52	0.082	6.500	2712.15	2715.48	1.50	1.77	1.70	0.04	2715.53	0.082	0.082	0.005	0.50	0.02
79	18	2.80	2708.75	2715.48	1.50	1.77	1.58	0.04	2715.51	0.071	66.500	2713.05	2715.52	1.50	1.77	1.58	0.04	2715.56	0.071	0.071	0.047	0.50	0.02
80	18	3.10	2713.81	2719.66	1.50	1.77	1.75	0.05	2719.71	0.087	6.500	2719.54	2720.21	0.67**	0.77	4.04	0.25	2720.47	0.510	0.299	n/a	0.50	0.13
81	18	2.70	2712.27	2719.66	1.50	1.77	1.53	0.04	2719.70	0.066	66.500	2719.54	2720.17	0.63**	0.70	3.86	0.23	2720.40	0.496	0.281	n/a	0.50	0.12
82	18	4.10	2720.65	2726.12	1.50	1.77	2.32	0.08	2726.21	0.153	6.500	2723.33	2726.13	1.50	1.77	2.32	0.08	2726.22	0.152	0.152	0.010	0.50	0.04
83	18	4.50	2719.23	2726.12	1.50	1.77	2.55	0.10	2726.22	0.184	66.500	2723.33	2726.25	1.50	1.77	2.55	0.10	2726.35	0.184	0.184	0.122	0.50	0.05
84	18	3.60	2720.65	2729.37	1.50	1.77	2.04	0.06	2729.43	0.118	6.500	2723.33	2729.38	1.50	1.77	2.04	0.06	2729.44	0.118	0.118	0.008	0.50	0.03
85	18	3.00	2723.66	2729.37	1.50	1.77	1.70	0.04	2729.41	0.082	66.500	2727.06	2729.42	1.50	1.77	1.70	0.04	2729.47	0.082	0.082	0.054	0.50	0.02
86	18	3.30	2728.56	2732.62	1.50	1.77	1.87	0.05	2732.67	0.099	6.500	2730.86	2732.62	1.50	1.77	1.87	0.05	2732.68	0.099	0.099	0.006	0.50	0.03
87	18	2.40	2727.94	2732.62	1.50	1.77	1.36	0.03	2732.64	0.052	66.500	2730.86	2732.65	1.50	1.77	1.36	0.03	2732.68	0.052	0.052	0.035	0.50	0.01
88	18	3.70	2732.97	2735.35	1.50	1.77	2.09	0.07	2735.42	0.124	6.500	2734.66	2735.39	0.73**	0.86	4.30	0.29	2735.68	0.534	0.329	n/a	0.50	n/a

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
89	18	3.50	2732.51	2735.35	1.50	1.77	1.98	0.06	2735.42	0.111	66.500	2734.66	2735.38 j	0.72**	0.84	4.19	0.27	2735.65	0.516	0.314	0.209	0.50	0.14
90	18	0.90	2735.03	2738.04	1.50	1.77	0.51	0.00	2738.04	0.007	109.700	2737.21	2738.05	0.84	1.01	0.89	0.01	2738.06	0.020	0.014	0.015	0.50	0.01
91	18	0.50	2737.31	2738.81	1.50*	1.77	0.28	0.00	2738.81	0.002	41.700	2737.81	2738.81	1.00	1.25	0.40	0.00	2738.81	0.004	0.003	0.001	0.50	0.00
92	18	1.20	2735.30	2738.64	1.50	1.77	0.68	0.01	2738.65	0.013	43.200	2737.21	2738.65	1.44	1.74	0.69	0.01	2738.65	0.011	0.012	0.005	0.50	0.00
93	18	0.60	2737.21	2738.71	1.50*	1.77	0.34	0.00	2738.71	0.003	41.500	2738.11	2738.71	0.60	0.66	0.92	0.01	2738.72	0.029	0.016	0.007	0.50	0.01
94	18	8.20	2736.30	2739.19	1.50	1.77	4.64	0.33	2739.52	0.610	6.500	2738.78	2739.87	1.09**	1.38	5.94	0.55	2740.42	0.786	0.698	n/a	0.50	0.27
95	18	6.20	2739.04	2740.54	1.50*	1.77	3.51	0.19	2740.73	0.349	16.900	2739.07	2740.57	1.50	1.77	3.51	0.19	2740.76	0.344	0.346	0.059	0.50	0.10
96	18	2.10	2735.54	2739.57	1.50	1.77	1.19	0.02	2739.60	0.040	66.200	2738.84	2739.57	0.73	0.85	2.46	0.09	2739.67	0.175	0.107	0.071	0.50	0.05
97	18	2.90	2737.04	2740.84	1.50	1.77	1.64	0.04	2740.88	0.076	66.800	2741.34	2741.99 j	0.65**	0.73	3.95	0.24	2742.23	0.503	0.290	n/a	0.50	n/a
98	18	10.50	2738.54	2742.30	1.50	1.77	5.94	0.55	2742.85	1.000	28.300	2741.36	2742.60	1.24**	1.56	6.74	0.71	2743.30	0.989	0.995	n/a	0.50	0.35
99	18	2.08	2739.56	2742.87	1.50	1.77	1.18	0.02	2742.89	0.039	66.400	2743.19	2743.74 j	0.55**	0.59	3.54	0.19	2743.94	0.475	0.257	n/a	0.50	0.10
100	18	3.90	2740.99	2743.38	1.50	1.77	2.21	0.08	2743.46	0.138	6.800	2743.79	2744.54	0.75**	0.89	4.39	0.30	2744.84	0.542	0.340	n/a	0.50	n/a
101	18	1.00	2742.01	2744.06	1.50	1.77	0.57	0.00	2744.07	0.009	26.900	2744.36	2744.74 j	0.38**	0.35	2.82	0.12	2744.87	0.451	0.230	n/a	0.51	n/a
102	18	3.12	2741.91	2744.06	1.50	1.77	1.77	0.05	2744.11	0.088	22.200	2746.01	2746.68 j	0.67**	0.77	4.05	0.26	2746.94	0.511	0.300	n/a	0.50	0.13
103	18	3.25	2743.40	2745.76	1.50	1.77	1.84	0.05	2745.81	0.096	7.000	2747.28	2747.97	0.69**	0.79	4.11	0.26	2748.23	0.516	0.306	n/a	0.50	n/a
104	18	1.30	2745.83	2747.44	1.50	1.77	0.74	0.01	2747.45	0.015	21.300	2748.26	2748.70 j	0.44**	0.43	3.05	0.15	2748.84	0.455	0.235	n/a	0.50	0.07
105	18	2.73	2745.49	2747.78	1.50	1.77	1.55	0.04	2747.82	0.068	35.300	2750.55	2751.18 j	0.63**	0.71	3.87	0.23	2751.41	0.497	0.282	n/a	0.50	n/a
106	18	3.51	2748.00	2749.50	1.50*	1.77	1.99	0.06	2749.56	0.112	7.000	2752.19	2752.91 j	0.72**	0.83	4.22	0.28	2753.18	0.526	0.319	n/a	0.50	n/a
107	18	1.20	2749.41	2750.91	1.50*	1.77	0.68	0.01	2750.92	0.013	26.600	2753.06	2753.48 j	0.42**	0.40	2.98	0.14	2753.62	0.453	0.233	n/a	0.50	0.07
108	18	4.68	2749.36	2750.86	1.50*	1.77	2.65	0.11	2750.97	0.199	66.100	2754.19	2755.02 j	0.83**	1.00	4.69	0.34	2755.36	0.577	0.388	n/a	0.50	n/a
109	18	2.99	2754.30	2755.80	1.50*	1.77	1.69	0.04	2755.84	0.081	6.600	2756.83	2757.49 j	0.66**	0.75	3.99	0.25	2757.74	0.506	0.294	n/a	0.50	n/a
110	18	0.90	2754.66	2756.16	1.50*	1.77	0.51	0.00	2756.16	0.007	25.800	2757.46	2757.82 j	0.36**	0.33	2.74	0.12	2757.94	0.450	0.229	n/a	0.50	n/a

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
111	18	3.12	2755.38	2756.88	1.50*	1.77	1.77	0.05	2756.93	0.088	64.700	2758.51	2759.18 j	0.67**	0.77	4.05	0.26	2759.44	0.511	0.300	n/a	0.50	0.13
112	18	2.93	2759.03	2760.53	1.50*	1.77	1.66	0.04	2760.57	0.078	5.700	2759.64	2760.44	0.80	0.95	3.08	0.15	2760.58	0.256	0.167	0.010	0.50	0.07
113	18	1.50	2759.90	2761.40	1.50*	1.77	0.85	0.01	2761.41	0.020	17.700	2761.11	2761.58 j	0.47**	0.47	3.19	0.16	2761.74	0.459	0.240	n/a	0.50	0.08
114	18	2.60	2760.28	2761.78	1.50*	1.77	1.47	0.03	2761.81	0.061	65.800	2762.16	2762.78 j	0.62**	0.68	3.81	0.23	2763.00	0.492	0.277	n/a	0.50	0.11
115	18	2.60	2761.29	2762.79	1.50*	1.77	1.47	0.03	2762.82	0.061	16.200	2763.30	2763.92 j	0.62**	0.68	3.81	0.23	2764.14	0.492	0.277	n/a	0.50	0.11
116	18	1.00	2764.86	2766.36	1.50*	1.77	0.57	0.00	2766.37	0.009	28.100	2765.84	2766.33	0.49	0.50	2.01	0.06	2766.39	0.175	0.092	0.026	0.50	0.03
117	18	5.20	2764.90	2766.45	1.50	1.77	2.94	0.13	2766.58	0.245	32.400	2765.39	2766.44	1.05	1.32	3.94	0.24	2766.68	0.350	0.298	0.096	0.50	0.12
118	18	2.86	2765.43	2766.93	1.50*	1.77	1.62	0.04	2766.97	0.074	31.300	2765.91	2766.92	1.01	1.27	2.26	0.08	2767.00	0.117	0.096	0.030	0.50	0.04
119	18	2.86	2767.94	2769.44	1.50*	1.77	1.62	0.04	2769.48	0.074	7.100	2770.67	2771.32 j	0.65**	0.73	3.93	0.24	2771.56	0.501	0.288	n/a	0.50	0.12
120	18	1.00	2768.14	2769.64	1.50*	1.77	0.57	0.00	2769.65	0.009	25.800	2770.17	2770.55 j	0.38**	0.35	2.82	0.12	2770.68	0.451	0.230	n/a	0.50	n/a
121	18	2.47	2767.97	2769.47	1.50*	1.77	1.40	0.03	2769.50	0.055	68.000	2771.56	2772.16 j	0.60**	0.66	3.74	0.22	2772.38	0.488	0.271	n/a	0.50	n/a
122	18	3.25	2771.46	2772.96	1.50*	1.77	1.84	0.05	2773.01	0.096	6.000	2773.84	2774.53 j	0.69**	0.79	4.11	0.26	2774.79	0.516	0.306	n/a	0.50	n/a
123	18	1.00	2773.57	2775.07	1.50*	1.77	0.57	0.00	2775.08	0.009	28.000	2774.72	2775.10 j	0.38**	0.35	2.82	0.12	2775.23	0.451	0.230	n/a	0.50	n/a
124	18	2.99	2774.78	2776.28	1.50*	1.77	1.69	0.04	2776.32	0.081	19.000	2776.73	2777.39 j	0.66**	0.75	3.99	0.25	2777.64	0.506	0.294	n/a	0.50	n/a
125	18	3.10	2772.27	2773.77	1.50*	1.77	1.75	0.05	2773.82	0.087	66.600	2774.84	2775.51 j	0.67**	0.77	4.04	0.25	2775.77	0.510	0.299	n/a	0.50	0.13
126	18	2.30	2736.33	2741.48	1.50	1.77	1.30	0.03	2741.51	0.048	10.000	2736.38	2741.49	1.50	1.77	1.30	0.03	2741.51	0.048	0.048	0.005	0.00	0.00
127	18	2.00	2719.15	2727.07	1.50	1.77	1.13	0.02	2727.09	0.036	21.000	2719.26	2727.08	1.50	1.77	1.13	0.02	2727.10	0.036	0.036	0.008	0.00	0.00

Project File: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm | Number of lines: 127 | Run Date: 04-26-2011

Notes: * Crown depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraflow HGL Computation Procedure

General Procedure: Hydraflow computes the HGL using the Bernoulli energy equation. Manning's equation is used to determine energy losses due to pipe friction. In a standard step, iterative procedure, Hydraflow assumes upstream HGLs until the energy equation balances. If the energy equation cannot balance, supercritical flow exists and critical depth is temporarily assumed at the upstream end. A supercritical flow Profile is then computed using the same procedure in a downstream direction using momentum principles.

Col. 1 The line number being computed. Calculations begin at Line 1 and proceed upstream.

Col. 2 The line size. In the case of non-circular pipes, the line rise is printed above the span.

Col. 3 Total flow rate in the line.

Col. 4 The elevation of the downstream invert.

Col. 5 Elevation of the hydraulic grade line at the downstream end. This is computed as the upstream HGL + Minor loss of this line's downstream line.

Col. 6 The downstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.

Col. 7 Cross-sectional area of the flow at the downstream end.

Col. 8 The velocity of the flow at the downstream end, (Col. 3 / Col. 7).

Col. 9 Velocity head (Velocity squared / 2g).

Col. 10 The elevation of the energy grade line at the downstream end, HGL + Velocity head, (Col. 5 + Col. 9).

Col. 11 The friction slope at the downstream end (the S or Slope term in Manning's equation).

Col. 12 The line length.

Col. 13 The elevation of the upstream invert.

Col. 14 Elevation of the hydraulic grade line at the upstream end.

Col. 15 The upstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.

Col. 16 Cross-sectional area of the flow at the upstream end.

Col. 17 The velocity of the flow at the upstream end, (Col. 3 / Col. 16).

Col. 18 Velocity head (Velocity squared / 2g).

Col. 19 The elevation of the energy grade line at the upstream end, HGL + Velocity head, (Col. 14 + Col. 18) .

Col. 20 The friction slope at the upstream end (the S or Slope term in Manning's equation).

Col. 21 The average of the downstream and upstream friction slopes.

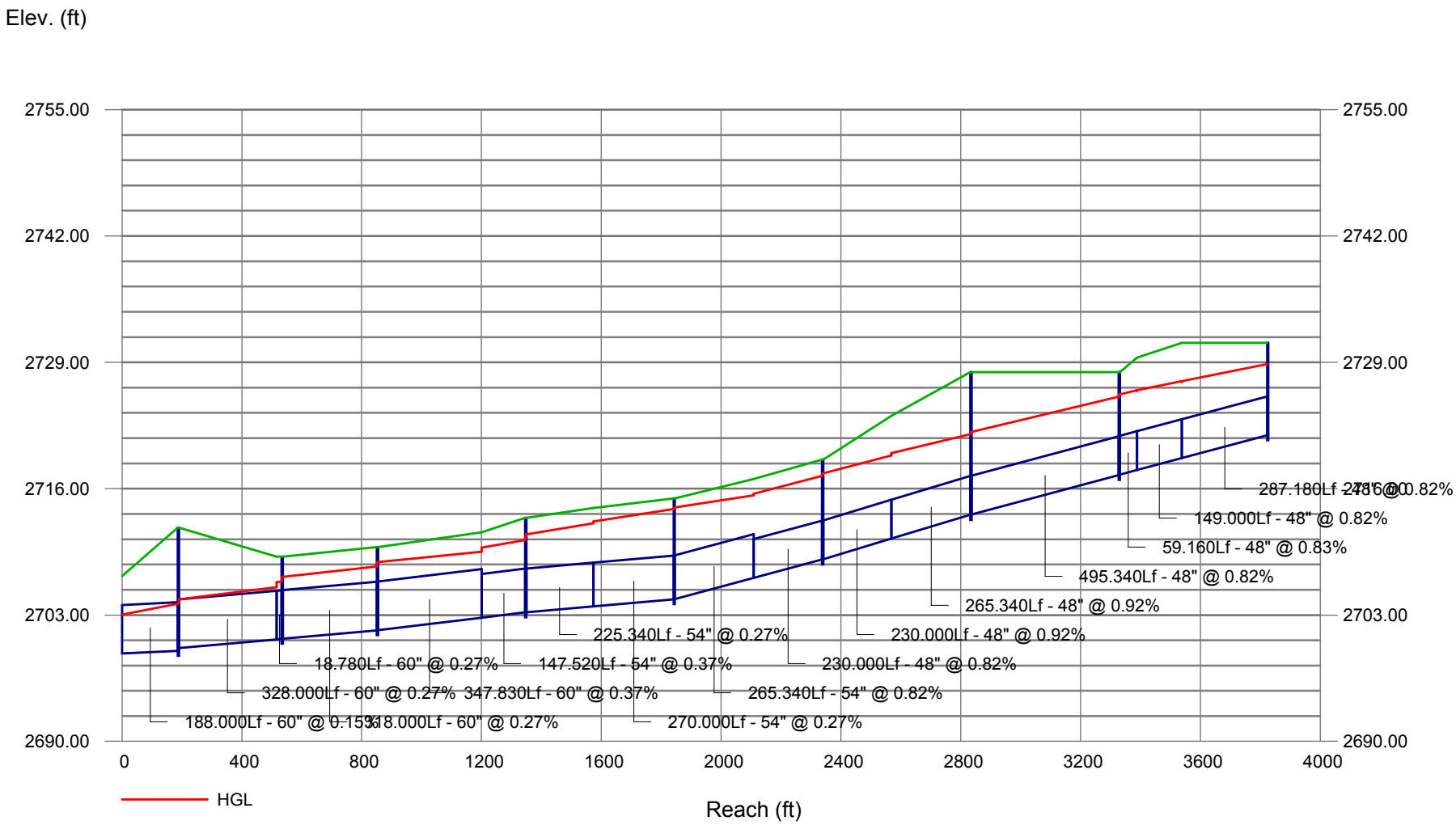
Col. 22 Energy loss. Average Sf/100 x Line Length (Col. 21/100 x Col. 12). Equals (EGL upstream - EGL downstream) +/- tolerance.

Col. 23 The junction loss coefficient (K).

Col. 24 Minor loss. (Col. 23 x Col. 18). Is added to upstream HGL and used as the starting HGL for the next upstream line(s).

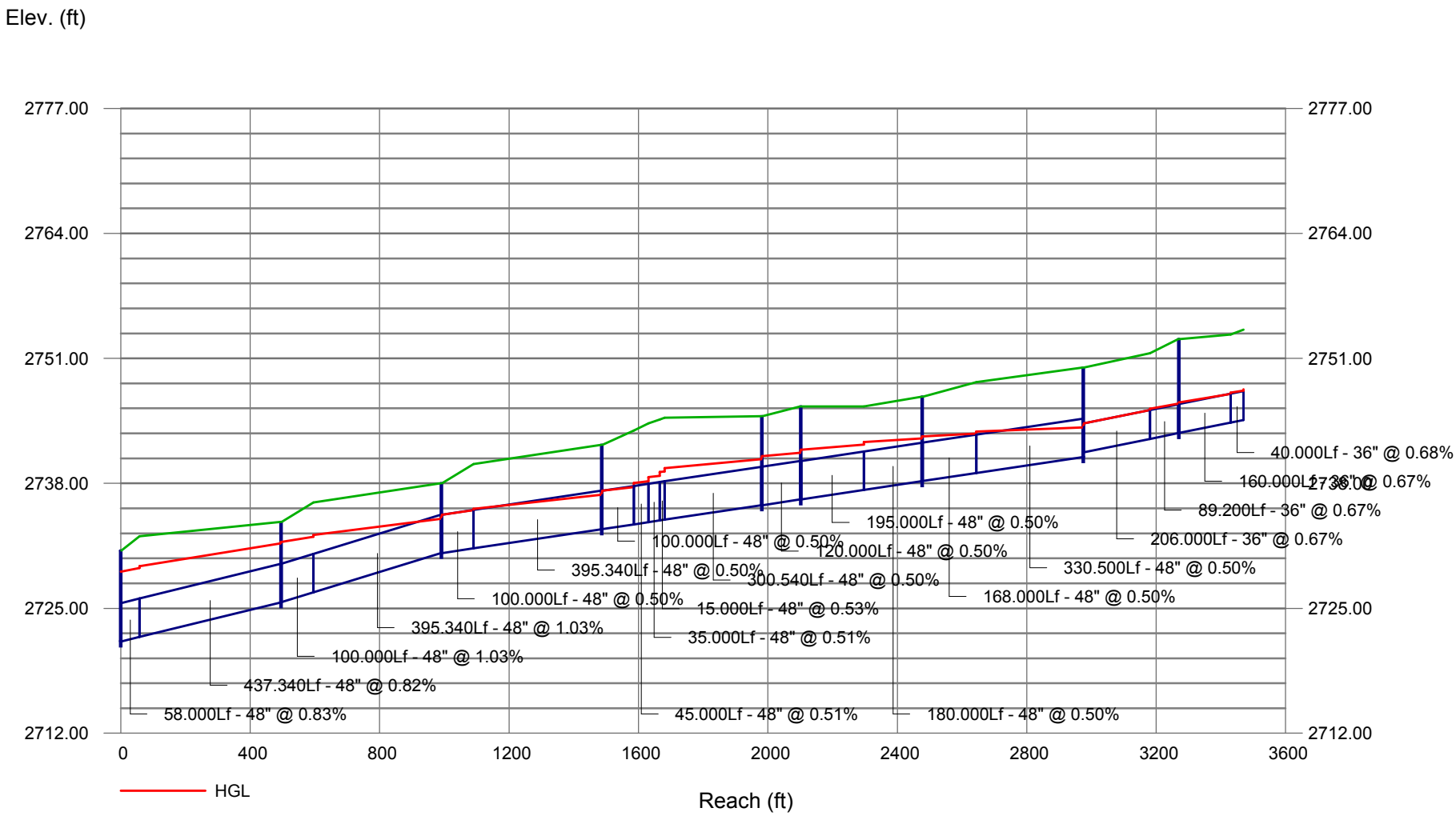
Storm Sewer Profile

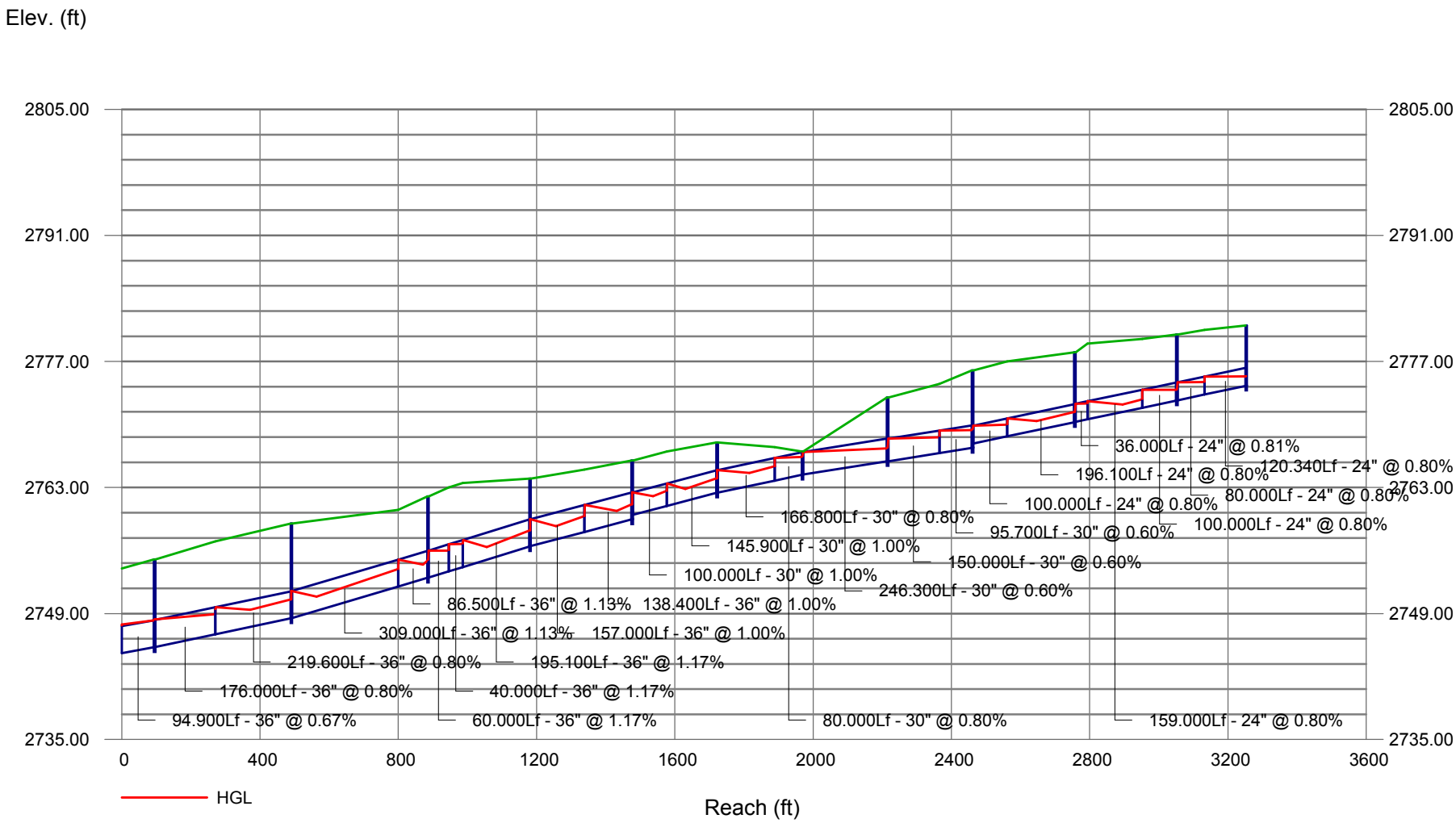
Proj. file: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm



Storm Sewer Profile

Proj. file: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm



Storm Sewer Profile

Proj. file: 10-year flows Proposed(removed OS1238)LARGERPIPE54INCH.stm