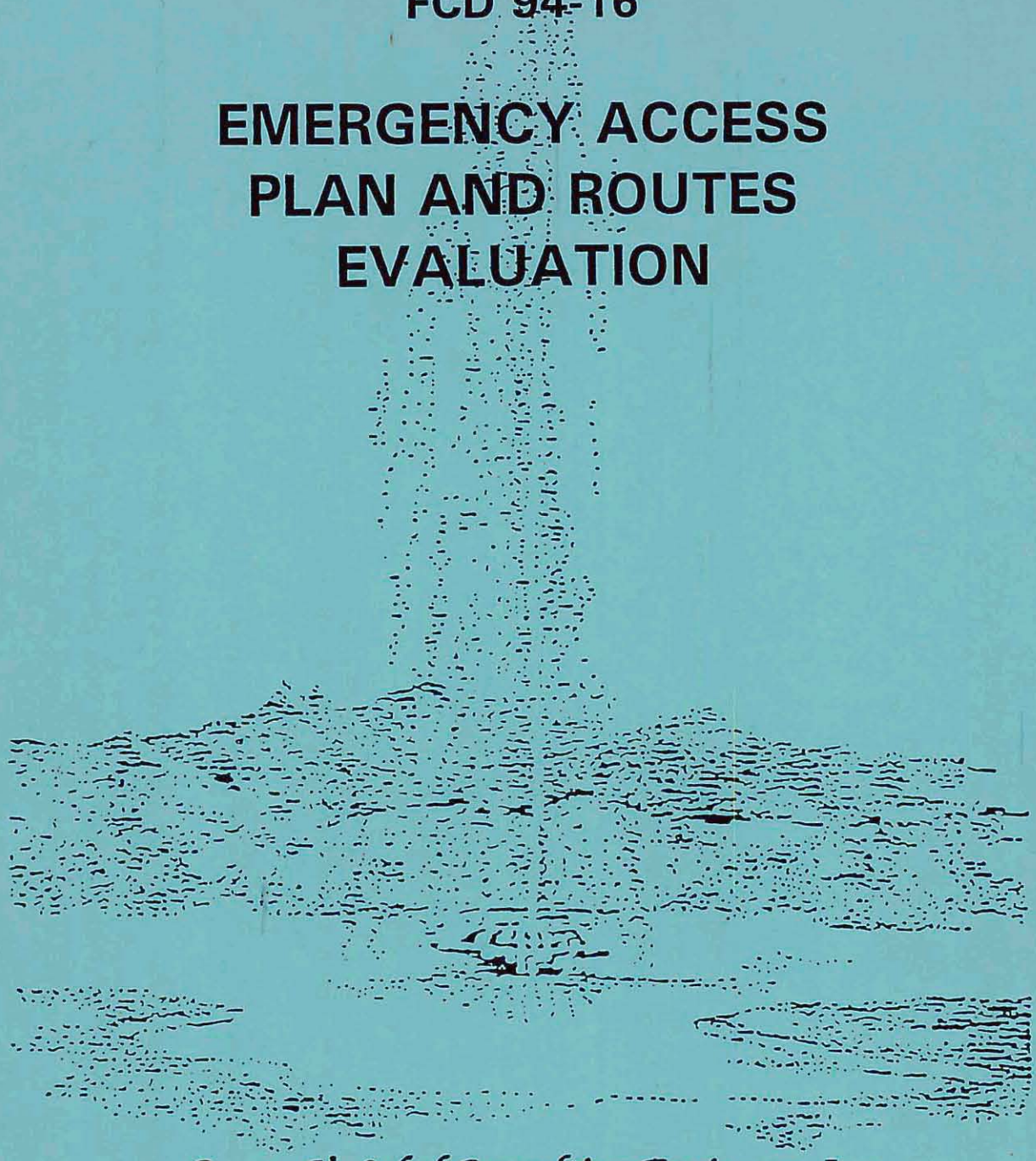
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PHOENIX, ARIZONA

FOUNTAIN HILLS AREA DRAINAGE MASTER PLAN FCD 94-16

EMERGENCY ACCESS PLAN AND ROUTES EVALUATION



George V. Sabol Consulting Engineers, Inc.
Scottsdale, Arizona

JULY 1997

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PHOENIX, ARIZONA

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INTRODUCTION

Purpose

This study is performed as part of a contract issued by the Flood Control District of Maricopa (FCDMC) to prepare an Area Drainage Master Plan (ADMP) for the Town of Fountain Hills (FCD 94-16). The purpose of this phase of the ADMP is to conduct a 100-year flood accessibility analysis and emergency routes evaluation for roadways within the Town of Fountain Hills. That work involves the identification and analysis of impassable roadway locations at wash crossings, sags, and areas of high runoff concentration that are due to 100-year storm flooding, delineate and map areas that are inaccessible during a 100-year flood, and provide a prioritized listing of recommended improvement locations for mitigation of those inaccessible areas.

Most of the flooding locations evaluated in this study were identified during the analysis and preparation of hydrology and hydraulics models for recent floodplain delineation studies of watercourses within the Town of Fountain Hills. Other sources include personnel working for the Town of Fountain Hills and their experience with past and current flooding problem locations, and field reconnaissance of the study area.

Project Area Description

The Town of Fountain Hills is a small, but rapidly growing community located in northeastern Maricopa County. Situated on the eastern hillslopes of the southern McDowell Mountains, the upper (western) terrain is characterized by rugged, mountain terrain with well defined, incised washes. Progressing easterly, the terrain flattens to more gentle hillslopes and broader washes as they approach the Verde River. Most of the major watercourses are maintained as natural drainage corridors with urbanization of the ridge areas and intervening slopes. The older downtown portion of Fountain Hills is relatively flat as compared to the western reaches, with broad streets and lesser preservation of the natural watercourses. Roadway crossings of the washes are either dipped through the wash bottom or are equipped with culverts. In general, most of the older, existing culverts are undersized, with significant magnitudes of flow overtopping the roadway. Flooding of roadways in the area consists of overtopping at wash crossings, excess ponding at low points in the street grade, and longitudinal street flows exceeding the capacity of the street section.

Hydrologic Setting

The overall watershed size is 24.1 square miles, and is bounded on the north by McDowell Mountain Park and state owned land, on the east by the Fort McDowell Indian Reservation, on the south by the Salt River Pima Maricopa Indian Reservation, and on the west by the City of Scottsdale and McDowell Mountain Park. The watershed generally drains from west to east, with elevations ranging from a low of 1,486 feet near the Fort McDowell Indian Reservation boundary, to a high of 4,025 feet in the McDowell Mountains. The watershed is a mix of undeveloped mountain areas, hillslopes with light to moderate urban development, natural wash corridors, and concentrated higher density commercial and residential development in the older areas of town.

Rainfall consist of short duration, high intensity convective thunderstorms during the summer months and general storms of longer duration and lower intensity during the winter months. The high intensity, short duration summer rainfalls typically cause the most flooding problems.

Recent Studies

Two recent studies of the Fountain Hills area provide most of the hydrologic and hydraulic data used to evaluate flood accessibility and emergency routes in this study. The first is a floodplain delineation study of the northern Fountain Hills area conducted by George V. Sabol Consulting Engineers, Inc. (GVSCE) under contract to the FCDMC (Contract FCD 92-04). The results of that study (FDS North) are documented in the following reports:

1. GVSCE, October 1994, *Fountain Hills North Floodplain Delineation Study, Technical Data Notebook - Hydrology, Existing Conditions*, Books 1, 2 and 3;

2. *Technical Data Notebook - Hydrology, Future Conditions*;

3. GVSCE, April 1995, *Fountain Hills North Floodplain Delineation Study, Technical Data Notebook - Hydraulics, Existing Conditions*.

The second is a floodplain delineation study of the southern Fountain Hills area conducted by AGK Engineers under contract to the FCDMC (Contract FCD 92-05). The results of that study (FDS South) are documented in the following reports:

1. AGK Engineers, Inc., August 1995, *Fountain Hills South Floodplain Delineation Study, Technical Data Notebook - Hydrology,* Volumes 1-4; and

2. AGK Engineers, Inc., February 1996, *Fountain Hills South Floodplain Delineation Study, Technical Data Notebook - Hydraulics,* Volumes 1 and 2.

Scope

The scope of this study involves analyzing existing roadway flooding areas, identifying impassable locations, delineating and mapping existing inaccessible areas, and providing a prioritized list of recommended locations for improvement to mitigate the inaccessible areas. The design peak discharges used in this evaluation are the 100-year "full build-out" or future condition flows determined in the FDS North and FDS South studies. The following are general discussions of each work task of this study.

Roadway Flooding Analysis

The evaluation of roadway flooding at problem locations considers the following:

- maximum depth of flow in or over roadway,
- the duration of impassable flow,
- roadway classification (arterial, collector or local roadway), and
- scour/wash-out potential.

The passable/impassable condition of each roadway location is analyzed based on the existing roadway geometry, existing drainage improvements and the surrounding topography. Those locations found to be passable are not considered further and are not documented in this study. The base mapping used for this analysis is the same 200 scale, 2-foot contour interval mapping used in the FDS North and FDS South studies. That mapping covers Sections 4, 5, 9-11, 14-16, 21-23, and 26-28 of Township 4 North, Range 6 East and a portion of Sections 8 and 17 of Township 3 North, Range 6 East, Gila and Salt River Base. The aerial photography date for the base mapping is August 1991.

For a detailed description of the mapping and survey control refer to the FDS North and FDS South reports. Supplemental field reconnaissance and surveying was performed at locations where topographic detail was considered insufficient to adequately perform the analysis.

Impassable Location Identification

The criteria for an impassable roadway is established by the scope of work as a 100-year flood flow depth exceeding 0.5 feet at the critical location in the roadway for cross street flows (wash crossing overflows), longitudinal flows, or ponded areas. Typically, the crown for normal streets or high-side curb on one-way sloped roadways is considered to be the critical location. It is assumed that Shea Boulevard, both from the west (Scottsdale) and the east (Beeline Highway), will provide the only access to and from the Town for the 100-year flood event.

Inaccessible Area Delineation (Existing)

Existing inaccessible areas are delineated by locating the impassable roadway crossings and/or longitudinal roadway segments on a current plat map of the Town of Fountain Hills, and determining the areas that have no 100-year flood access route via public streets.

Prioritization of Recommended Locations for Improvement

Prioritization of existing impassable locations, recommended for improvement to mitigate the inaccessible areas, is developed according to the following criteria:

- No more than 30 contiguous single family residential lots, or equivalent multi-family or commercial/industrial areas are inaccessible during the design 100-year flood.
- No lot or commercial building is inaccessible for more than 12 hours.
- No local street providing a 100-year flood accessible route carries a traffic volume greater than 10,000 vehicles per day (vpd).

Inaccessible Area Delineation (Future)

Inaccessible areas that are not mitigated by the recommended improvements are delineated on a current plat map of the Town of Fountain Hills.

EXHISTING CONDITION ANALYSES

General

Existing condition impassable locations are identified using the previously discussed criteria and are referenced in this study as Emergency Access Plan Flooding Locations (EAPFL). The following is a description of the data and procedures used in the evaluation of the EAPFLs.

Emergency Access Plan Flooding Locations (EAPFLs)

A general physical description is provided for each EAPFL and includes the location to the nearest quarter section, the roadway name, classification and nearest intersection, the wash name (if applicable), the type of flooding (i.e. cross street, longitudinal or ponding), and a description of any hydraulic structures such as culverts or storm drains.

All impassable locations are analyzed using the hydrology developed for the FDS North and South studies. The design flow is the 100-year flood assuming future build-out conditions. A comparison of the 6-hour and 24-hours storms is made at the nearest downstream concentration point to the impassable location, and the controlling storm is used as the discharge for that location. For a detailed description of the methodologies used in the development of the hydrology models, refer to the FDS North and FDS South reports.

The maximum flow depth at the roadway crown (or other critical roadway elevation) is calculated by one of several methods. EAPFLs that lie within a FDS North or South floodplain delineation reach are modeled using the U.S. Army Corps of Engineers' HEC-RAS program. For EAPFLs that do not lie within a floodplain delineation reach, the hydraulic characteristics of the site determine the calculation method. Generally for dipped roadway crossings or longitudinal flow locations, normal depth calculations using Manning's Equation are performed to calculate the maximum flow depth. EAPFLs with existing culvert crossings or storm drains are analyzed using HY8 to model the pipe capacity and an uneven weir program to model overflow. All available data on existing hydraulic structures and road crossings are taken from the FDS North and South reports or base mapping whenever possible. Physical data for EAPFLs not specifically addressed in

the FDS North and South reports, or not adequately detailed on the base mapping, were obtained by field reconnaissance.

Only the existing condition peak discharges were hydraulically modeled in the FDS North and South studies. It is therefore necessary to modify and re-run those hydraulic models for EAPFLs that have a significant increase in peak discharge between the existing and future build-out condition flows. This is accomplished by importing the HEC-2 model into HEC-RAS, inputting the appropriate discharges, and running HEC-RAS to calculate the maximum depth of flow for future condition discharges. HEC-RAS is chosen for its simplified techniques of modeling multiple discharges and developing rating curves. Those rating curve results are necessary to determine the duration of impassable flow (discussed in the following paragraph) at an EAPFL.

The duration of impassable flow is the time period for which the depth of flow exceeds 0.5 feet at the EAPFL. Accordingly, the 0.5-foot hydraulic capacity value must be estimated for each EAPFL. The duration of impassable flow is then determined by analyzing the design flood hydrograph used for the EAPFL and calculating the period of time for which the hydrograph indices remain greater than the estimated 0.5-foot hydraulic capacity. The HEC-1 models prepared for the FDS North and South studies are used for this purpose.

The scour/wash-out potential at an EAPFL is categorized as either low, medium or high. A low scour/wash-out potential indicates that some form of armoring or other erosion protection is provided and considered competent. Medium potential indicates that minimal or inadequate protection is provided or naturally exists. High potential indicates that no protection is provided and physical conditions are such that destructive erosion is likely. The determination of scour/wash-out potential for all EAPFLs is based on field reconnaissance and judgement. No calculations or analyses are performed to substantiate the classifications.

Summary

Based on the criteria set forth in the scope of work and initial consideration of more than 100 potential flooding locations, a total of 86 roadway locations are identified as impassable due to future build-out condition 100-year flooding. Of these, 69 result from overflow at wash crossings , 13 result from longitudinal flows within the roadway, and 4 result from ponding at roadway sags. Plate 1 shows each EAPFL annotated on a plat and roadway map of the Town of Fountain Hills. The major washes within the study area are also included and annotated on Plate 1.

Data sheets detailing the characteristics for each EAPFL are provided in Appendix A, and are organized by wash with a general upstream to downstream progression. Table 1 summarizes the characteristics for each of the EAPFL's. In general, the majority of EAPFLs result in maximum flow depths of less than 2 feet and impassable durations of less than 3 hours, and are typically inadequately protected against scour/wash-out. The greatest maximum depth of flow occurs at EAPFL 35 and is 6.9 feet. The longest impassable duration is 28.9 hours and occurs at EAPFL 34. Both EAPFL 34 and 35 are dipped roadway crossings of Ashbrook Wash, and are impacted by discharge from Golden Eagle Park Dam and other upstream dams with respect to duration of impassable flows.

TABLE 1

Summary of Emergency Action Plan Flooding Location Characteristics

EAPFL ID (1)	ADMP ID (2)	Street Location (3)	Wash Name (4)	Existing Structure (5)	Future Condition 100-year Peak Discharge cfs (6)	Flow Depth feet (7)	Impassable Duration hours (8)	Scour/Wash Out Potential (9)
1	N/A	Boulder Avenue	N/A	Culvert	380	1.2	0.75	Medium
2	N/A	Boulder Avenue	Hesperus	Culvert	456	0.7	5.10	Low
3	N/A	Richwood Avenue	Hesperus	Dip	358	2.4	17.05	Medium
4	7	Glenbrook Boulevard	Balboa	Dip	658	2.3	15.00	Medium
5	5	Fountain Hills Boulevard	Balboa	Culvert	747	0.7	7.52	Low
6	11	El Pueblo Boulevard	Caliente	Dip	555	2.5	1.52	Medium
7	N/A	Del Cambre Boulevard	Caliente	Dip	798	4.1	1.67	Medium
8	N/A	Sobrante Avenue	Caliente	Dip	798	2.3	1.78	Medium
9	12	El Pueblo Boulevard	Caliente	Dip	987	3.2	2.37	Medium
44	N/A	Richwood Avenue	N/A	N/A	205	1.1	0.70	Low
10	N/A	Bahia Drive	Escalante	Dip	1,321	3.1	6.20	Medium
11	N/A	Escalante Drive	Escalante	Dip	1,453	5.5	7.32	Low
12	10	Glenbrook Boulevard	Oxford	Dip	252	2.1	1.33	Medium
13	N/A	Maple Drive	Oxford	Dip	252	2.1	1.10	Medium
14	N/A	Shagbark Court	Oxford	Dip	758	3.3	1.40	Medium
15	N/A	Palmetto Lane	Oxford	Dip	758	3.0	1.50	Medium

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EAPFL ID (1)	ADMP ID (2)	Street Location (3)	Wash Name (4)	Existing Structure (5)	Future Condition 100-year Peak Discharge cfs (6)	Flow Depth feet (7)	Impassable Duration hours (8)	Scour/Wash Out Potential (9)
16	N/A	Tanglewood Court	Oxford	Culvert	758	2.8	0.50	Low
17	N/A	Tamarack Lane	Oxford	Dip	758	2.9	1.60	Medium
18	N/A	Mayflower Drive	Oxford	Dip	758	3.0	1.70	Medium
19	N/A	Greenhurst Avenue	Oxford	Dip	758	2.8	1.60	Low
20	N/A	Glenbrook Boulevard	N/A	Dip	271	0.9	0.90	Low
21	9	Fairlynn Drive	Oxford	Dip	883	3.6	2.20	Medium
22	8	Fountain Hills Boulevard	Oxford	Dip	883	2.7	1.30	Low
23	N/A	Kings Way	Oxford	Dip	1,241	6.4	16.80	High
24	N/A	Glenbrook Boulevard	Tulip	Culvert	661	1.6	0.40	Low
25	N/A	Hampstead Drive	Tulip	Dip	950	4.2	1.90	Low
26	N/A	Greenhurst Avenue	Legend	Dip	1,313	4.8	5.50	Low
27	N/A	Fairlynn Drive	Legend	Dip	1,313	4.9	5.90	Low
28	N/A	Fountain Hills Boulevard	Legend	Dip	1,313	3.7	4.75	Medium
29	N/A	Galatea Drive	Legend	Dip	1,474	4.2	6.30	Medium
36	N/A	Eagle Feather	Tulip	Culvert	661	1.8	0.25	Low
30	4	Golden Eagle Park Blvd	Ashbrook	Culvert	2,067	3.7	1.90	Low

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EAPFL ID (1)	ADMP ID (2)	Street Location (3)	Wash Name (4)	Existing Structure (5)	Future Condition 100-year Peak Discharge cfs (6)	Flow Depth feet (7)	Impassable Duration hours (8)	Scour/Wash Out Potential (9)
32	3	Bayfield Drive	Ashbrook	Culvert	1,877	2.2	9.00	High
33	2	Saguaro Boulevard	Ashbrook	Culvert	2,697	3.0	8.50	High
34	1	Del Cambre Boulevard	Ashbrook	Dip	4,013	6.5	28.90	High
35	N/A	El Pueblo Boulevard	Ashbrook	Dip	4,117	6.9	28.70	Medium
37	N/A	Marathon Drive	N/A	N/A	236	1.2	0.80	Low
38	N/A	Aspen Drive	N/A	N/A	160	0.9		Medium
57a	N/A	Grande Boulevard	N/A	N/A	149	1.0	1.10	Low
57b	N/A	Rosita Drive	N/A	N/A	238	1.5	0.90	Low
39	N/A	Zapata Drive	Zapata	Culvert	1,391	2.3	0.80	Low
48	N/A	Mountainside Drive	Sunflower	Dip	278	1.2	0.80	Medium
40	N/A	Cavern Drive	Arrow	Culvert	372	1.6	0.90	Medium
41	N/A	Mimosa Drive	Arrow	Culvert	482	>0.5	1.00	Medium
42	N/A	Mountainside Drive	Arrow	Culvert	655	2.1	0.90	High
43	14	Arrow Drive	Arrow	Culvert	741	3.0	1.10	Low
46 (North)	N/A	Saguaro Boulevard	Fountain Channel	Culvert	632	0.7	0.70	Low

TABLE 1

Summary of Emergency Action Plan Flooding Location Characteristics

EAPFL ID (1)	ADMP ID (2)	Street Location (3)	Wash Name (4)	Existing Structure (5)	Future Condition 100-year Peak Discharge cfs (6)	Flow Depth feet (7)	Impassable Duration hours (8)	Scour/Wash Out Potential (9)
46 (South)	N/A	Saguaro Boulevard	Fountain Channel	Culvert	632	2.0	3.00	Low
47 (North)	N/A	Saguaro Boulevard	Fountain Channel	Culvert	301	0.5	1.00	Low
47 (South)	N/A	Saguaro Boulevard	Fountain Channel	Culvert	301	1.1	2.00	Low
49	N/A	Saguaro Boulevard	N/A	Culvert	451	1.0	0.60	Low
50	N/A	Mimosa Drive	N/A	Dip	133	1.0	0.60	High
51	N/A	Mountainside Drive	Trib/Fountain Channel	Culvert	133	1.5	1.20	Medium
52	17	Kiwanis Drive	Fountain Channel	Dip	982	3.1	2.00	Medium
55	15	Saguaro Boulevard	Colony	Culvert	662	2.8	0.70	Low
58	N/A	Burro Drive	Emerald	Dip	113	0.9	1.20	High
59	N/A	Baron Drive	Emerald	Culvert	217	0.8	2.20	Medium
53	N/A	Cromwell Drive	Malta Drain	Dip	88	1.8	1.10	Medium
54	N/A	Hawk Drive	Malta Drain	N/A	187	0.7	0.30	Low
60	25	Nightingale Circle	Malta Drain	Culvert	378	1.0	1.25	Medium
61	25	Oasis Drive	Malta Drain	Culvert	378	1.2	1.25	Medium

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Summary of Emergency Action Plan Flooding Location Characteristics

EAPFL ID (1)	ADMP ID (2)	Street Location (3)	Wash Name (4)	Existing Structure (5)	Future Condition 100-year Peak Discharge cfs (6)	Flow Depth feet (7)	Impassable Duration hours (8)	Scour/Wash Out Potential (9)
62	25	Dawn Ridge Circle	Malta Drain	Culvert	378	0.9	0.60	Medium
63	25	Mission Bell Circle	Malta Drain	Culvert	378	1.0	0.60	Medium
64	25	Quinto Drive	Malta Drain	Culvert	378	1.6	1.25	Medium
65	21	Rand Drive	Malta Drain	Dip	448	2.9	2.00	High
66	20&22	Saguaro Boulevard and Malta Drive	Malta Drain/ Emerald Wash	Culvert	907	1.2	3.30	Low
56	N/A	Frisco Drive	Kingstree	Culvert	118	1.0	1.00	Low
67	23	Kingstree Boulevard	Kingstree	N/A	368	1.4	1.50	Low
68	23	Kingstree Boulevard	Kingstree	N/A	368	1.5	1.50	Low
69	23	Kingstree Boulevard	Kingstree	N/A	368	1.4	1.20	Low
70	23	Kingstree Boulevard	Kingstree	N/A	496	1.5	1.60	Low
71	23	Kingstree Boulevard	Kingstree	N/A	496	1.6	1.60	Low
72	23	Kingstree Wash	Kingstree	N/A	496	1.8	2.00	Low
73	23	Kingstree Wash	Kingstree	N/A	496	1.8	1.90	Low
74	23	Kingstree Boulevard	Kingstree	N/A	496	1.9	1.40	Low
75	N/A	Jacklin Drive	Jacklin	Dip	369	1.8	3.00	Low

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Summary of Emergency Action Plan Flooding Location Characteristics

EAPFL ID (1)	ADMP ID (2)	Street Location (3)	Wash Name (4)	Existing Structure (5)	Future Condition 100-year Peak Discharge cfs (6)	Flow Depth feet (7)	Impassable Duration hours (8)	Scour/Wash Out Potential (9)
76	N/A	Indian Wells Drive	Jacklin	Culvert	1,021	2.2	0.70	Low
77	N/A	Nicklaus Drive	Cyprus Point	Dip	118	0.5	0.20	Low
78	N/A	Demaret Drive	Cyprus Point	Dip	208	2.0	1.50	Medium
79	N/A	Nicklaus Drive	Cyprus Point	Dip	315	1.8	1.80	Medium
83	N/A	Laser Drive	Laser Drain	N/A	272	1.0	0.70	Low
84	N/A	Laser Drive	Laser Drain	N/A	439	1.2	1.00	Low
85	N/A	Laser Drive	Laser Drain	N/A	494	3.0	5.80	Low
86	N/A	Firebrick Drive	Laser Drain	Dip	494	2.2	2.60	Low
88	N/A	Firebrick Drive	N/A	Dip	143	0.9	1.00	Low
89	N/A	Powderhorn Drive	Powder	Dip	562	1.7	1.20	Medium
90	N/A	Leo Drive	Powder	Dip	629	1.9	1.40	Medium
91	N/A	Saguaro Boulevard	Hogan/Palmer Washes	Culvert	164	0.6	> 1.00	Low

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Twenty-eight (28) of the 86 EAPFL's are identified as preliminary roadway crossing improvement locations per the road crossing study phase of this ADMP (referred to as ADMP locations) in the separate road crossing study report of this project. Table 2 lists each EAPFL identifier and the corresponding ADMP location. Two of the ADMP sites, Malta Drain and Kingstree Wash, are channel improvements with multiple EAPFL's identified for each.

TABLE 2

Emergency Access Plan Flooding locations and corresponding road crossing study locations

EAPFL ID (1)	ADMP ID (2)	Street Location (3)	Wash Name (4)	Existing Structure (5)
2	6	Boulder Drive	Hesperus	Culvert
4	7	Glenbrook Boulevard	Balboa	Dip
5	5	Fountain Hills Boulevard	Balboa	Culvert
6	12	El Pueblo Boulevard	Caliente	Dip
9	11	El Pueblo Boulevard	Caliente	Dip
12	10	Glenbrook Boulevard	Oxford	Dip
21	9	Fairlynn Drive	Oxford	Dip
22	8	Fountain Hills Boulevard	Oxford	Dip
32	3	Bayfield Drive	Ashbrook	Culvert
33	2	Saguaro Boulevard	Ashbrook	Culvert
34	1	Del Cambre Avenue	Ashbrook	Dip
43	14	Arrow Drive	Arrow	Culvert
52	17	Kiwanis Drive	Fountain Channel	Dip
55	15	Saguaro Boulevard	Fountain Channel	Culvert
45	25	Hawk Drive	Malta	N/A
60	25	Nightingale Circle	Malta	Culvert
61	25	Oasis Drive	Malta	Culvert
62	25	Dawn Ridge Circle	Malta	Culvert
63	25	Mission Bell Circle	Malta	Culvert
64	25	Quinto Drive	Malta	Culvert
65	25	Rand Drive	Malta	Dip
66	25	Saguaro Boulevard	Malta	Culvert
67	23	Kingstree Boulevard	Kingstree	N/A
68	23	Kingstree Boulevard	Kingstree	N/A
69	23	Kingstree Boulevard	Kingstree	N/A
70	23	Kingstree Boulevard	Kingstree	N/A
71	23	Kingstree Boulevard	Kingstree	N/A
72	23	Kingstree Boulevard	Kingstree	N/A
73	23	Kingstree Boulevard	Kingstree	N/A
74	23	Saguaro Boulevard	Kingstree	Culvert

Inaccessible areas that result from impassable 100-year flooding of roadways within the Town of Fountain Hills are shown on Plate 2. In general, the major inaccessible areas are identified as follows:

1. North of Hesperus/Balboa Wash in Section 4;
2. North of Oxford Wash in Section 10;
3. North of the alignment formed by Hesperus/Balboa Wash and Ashbrook Wash east of the confluence in Section 11;
4. The area bounded by Ashbrook Wash on the north, the Fort McDowell Indian Community on the east, approximately Arrowweed Drive on the west and approximately the southern limit of El Pueblo Drive; and,
5. The area comprising most of the south half of Section 27 and most of the southwest quarter of Section 26.
6. North of Ashbrook Wash along Aspen Drive in Section 4.

Several other smaller areas along Malta Drain, along Kingstree Wash, and near Ashbrook, Arrow and Tulip/Legend Washes are also inaccessible.

RECOMMENDATIONS

EAPFL Improvement Plan

Improvement of eight (8) EAPFLs are required in order to satisfy the criteria for emergency access set forth in the scope. Table 3 summarizes the eight EAPFLs recommended for improvement, with all of the improvements considered to be high priority.

TABLE 3

Recommended EAPFL Improvement Locations

EAPFL ID (1)	ADMP ID (2)	Street Locations (3)	Wash Name (4)	Existing Structure (5)	Recommended Improvement (6)
3	---	Richwood Avenue	Hesperus	Dip	Culvert
44	---	Richwood Avenue	N/A	N/A	Storm Drain
4	7	Glenbrook Boulevard	Balboa	Dip	Culvert
12	10	Glenbrook Boulevard	Oxford	Dip	Culvert
5	5	Fountain Hills Boulevard	Balboa	Culvert	Culvert
22	8	Fountain Hills Boulevard	Oxford	Dip	Culvert
28	---	Fountain Hills Boulevard	Legend	Dip	Culvert
38	---	Aspen Drive	NA	N/A	Storm Drain
57	---	Grande Boulevard	N/A	Dip	Storm Drain
85	---	Shea Boulevard	Laser Drain	Dip	Storm Drain
86	---	Firebrick Drive	Laser Drain	Dip	Culvert

Improvement of these EAPFLs will provide access to the six major areas currently inaccessible per the criteria of this study. Plate 3 shows the EAPFLs recommended for improvement and the areas that would remain inaccessible upon their completion.

One of the conditions requiring improvements is a limitation restricting traffic volumes to less than 10,000 vehicles per day (vpd) on local streets providing flood access routes. Examination of the most recent traffic count records received from the Town of Fountain Hills indicates an unlikely possibility that any of the emergency access routes proposed by this study to travel local streets, will produce traffic counts of 10,000 vpd. Additionally, the relatively short duration of impassable flows due to flooding at most EAPFLs will not cause extended periods of non-access. These findings were discussed with the Town's engineering staff during a presentation of preliminary inaccessible area delineations and EAPFLs, and it was agreed at that time that the traffic volumes would not be an issue in the identification of EAPFLs for improvement. Accordingly, all access routes proposed by this report for local streets, are not considered to be influenced or dictated by the 10,000 vpd criterion. Copies of the Town's traffic count maps obtained for this study are supplied in Appendix B.

Flood Access Routes Summary

The following discussions summarize the EAPFLs recommended for improvement. The improvements establish flood routes into the six areas currently identified as inaccessible per the criteria of this study.

Area One is situated in the northeast quarter of Section 4. Normal (dry) access to this area is gained via two roadway crossings of Hesperus Wash. One of the crossings is EAPFL 2 (also ADMP location 6) and the other is EAPFL 3. Improvement of two locations, EAPFL 3 and EAPFL 44, will provide access to all of the area except 23 lots north of Mountain Wash. Recommended improvements for EAPFL 3 will most likely involve construction of a culvert. Flooding at EAPFL 44 is classified as longitudinal within Richwood Avenue and cross street at Boulder Drive. Potential solutions to this problem will most likely involve collection of runoff in Richwood Avenue prior to the Boulder Drive intersection, using catch basins and storm drain. Flooding condition access will be attained by traveling north on Palisades Boulevard (arterial) to Golden Eagle Boulevard (arterial), then north-northwest on Golden Eagle Boulevard to Richwood Avenue (collector), then east on Richwood Avenue to Boulder Drive (collector), and finally north on Boulder Drive.

Area Two is situated in the northern portion of Section 10. Access to this area during normal conditions can be attained by use of several routes. Improvement of four locations, EAPFL 5 (ADMP location 5), EAPFL 22 (ADMP location 8), EAPFL 28 and EAPFL 12 (ADMP location 10), will provide flooding condition access to all of the area except 29 lots along the south side of Oxford Wash. Recommended improvements for EAPFL 5, 12 and 22 are those proposed for ADMP locations 5, 10 and 8, respectively. Recommended improvements for EAPFL 28 will most likely involve the construction of a culvert. Flooding condition access to this area will be from two sides. Areas will be accessed from the west by traveling north on Palisades Boulevard (arterial) to Golden Eagle Boulevard (arterial), then northwest on Golden Eagle Boulevard to Boulder Drive (collector), then north on Boulder Drive to Blackbird Drive (local), and finally southeast on Blackbird Drive to Glenbrook Boulevard (collector). Areas to the east will be accessed by traveling north on Fountain Hills Boulevard to either Oxford Drive (local) or Glenbrook Boulevard (collector).

Area Three comprises a majority of Section 11. Access to this area during normal conditions can be attained by use of several routes. Improvement to EAPFL 5 (ADMP location 5), EAPFL 22 (ADMP location 8) and EAPFL 28 will provide flooding condition access to all of the area except 17 lots north of Escalante Wash. Flood access to areas south of Caliente Wash will be attained by traveling north on Fountain Hills Boulevard (arterial) to El Pueblo Boulevard (collector). Access to areas north of Caliente Wash will be attained by traveling north on Fountain Hills Boulevard (arterial) to Glenbrook Boulevard (local), then east on Glenbrook Boulevard to Ivory Drive (local), and finally north on Ivory Drive to Delray Drive (local).

Area Four is situated in the southeast quarter of Section 11 and the northeast quarter of Section 14. Normal condition access to this area is attained from Grande Boulevard and improvement of EAPFL 57 will provide flood access via this same route, to all portions of this area. Flooding at EAPFL 57 is caused by ponding in Grande Boulevard, longitudinal flows along Rosita Drive, and cross street flows in Vallecito Drive. Mitigation measures will probably include a storm system to collect and convey runoff to Ashbrook Wash.

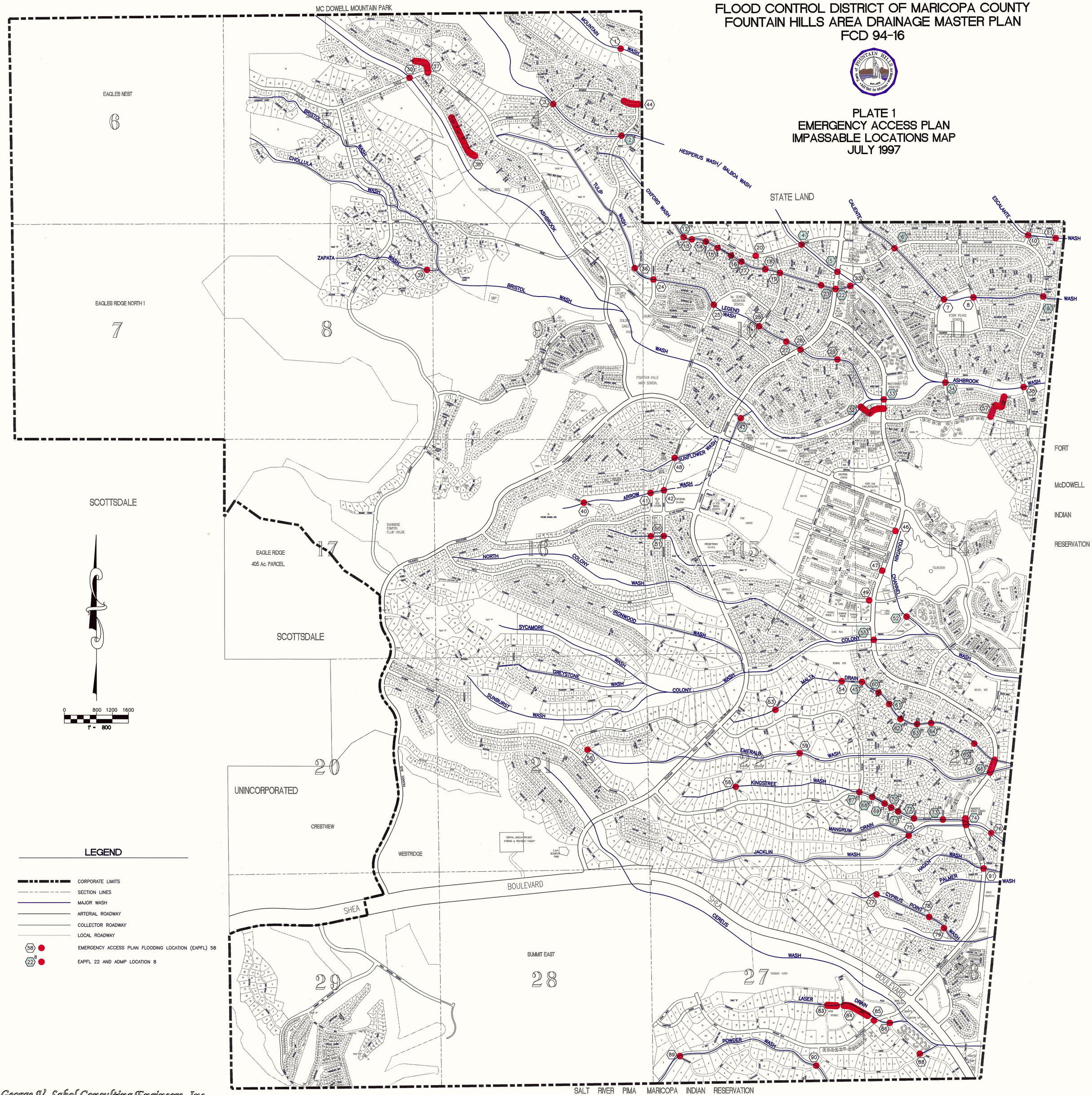
Area Five is generally located south of Cereus Wash, and situated in the extreme southwest corner of Section 26 and the south half of Section 27. The only access to this area is via Saguaro Boulevard from Shea Boulevard. Improvements to EAPFL 85 and 86 are recommended to provide flood condition access to all of the area except 11 lots located on Firebrick Drive south of Last Trail Drive. Flooding at EAPFL 85 is classified as longitudinal within Laser Drive and ponding at the intersection with Shea Boulevard. Improvement of this location will most likely involve a storm drain system along Laser Drive to collect and convey runoff to Laser Drain. Installation of a storm drain system along Laser Drive will mitigate flooding at EAPFL's 83 and 84Installation of a storm drain system along Laser Drive will mitigate flooding at EAPFL's 83 and 84. Flooding at EAPFL 86 is identified as cross street flooding at the dipped road crossing and improvement of that location will most likely involve construction of a culvert.

Area Six is located along Aspen Drive north of Ashbrook Wash and is situated in Section 4. Aspen Drive is a loop road that starts and ends at Golden Eagle Boulevard. Improvement to EAPFL 38 is recommended to provide flood condition access to all of the area. Flooding at this location is classified as longitudinal within Aspen Drive and ponding at a roadway sag with curb cut. Improvement to this location would involve a storm drain system along Aspen Drive to collect and convey runoff to Ashbrook Wash. Flood access will be attained by traveling Palisades Boulevard (arterial) to Golden Eagle Boulevard (collector), then northwest on Golden Eagle Boulevard to Aspen Drive.

The emergency access routes discussed in this section are shown with a dashed orange line on Plate 3 along with the remaining inaccessible areas not mitigated by the recommended improvements. All of these areas are excluded from requiring improvements according to the criteria set forth in this report, and the duration of inaccessible conditions is generally less than 2 hours.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FOUNTAIN HILLS AREA DRAINAGE MASTER PLAN
FCD 94-16

PLATE 1
EMERGENCY ACCESS PLAN
IMPASSABLE LOCATIONS MAP
JULY 1997



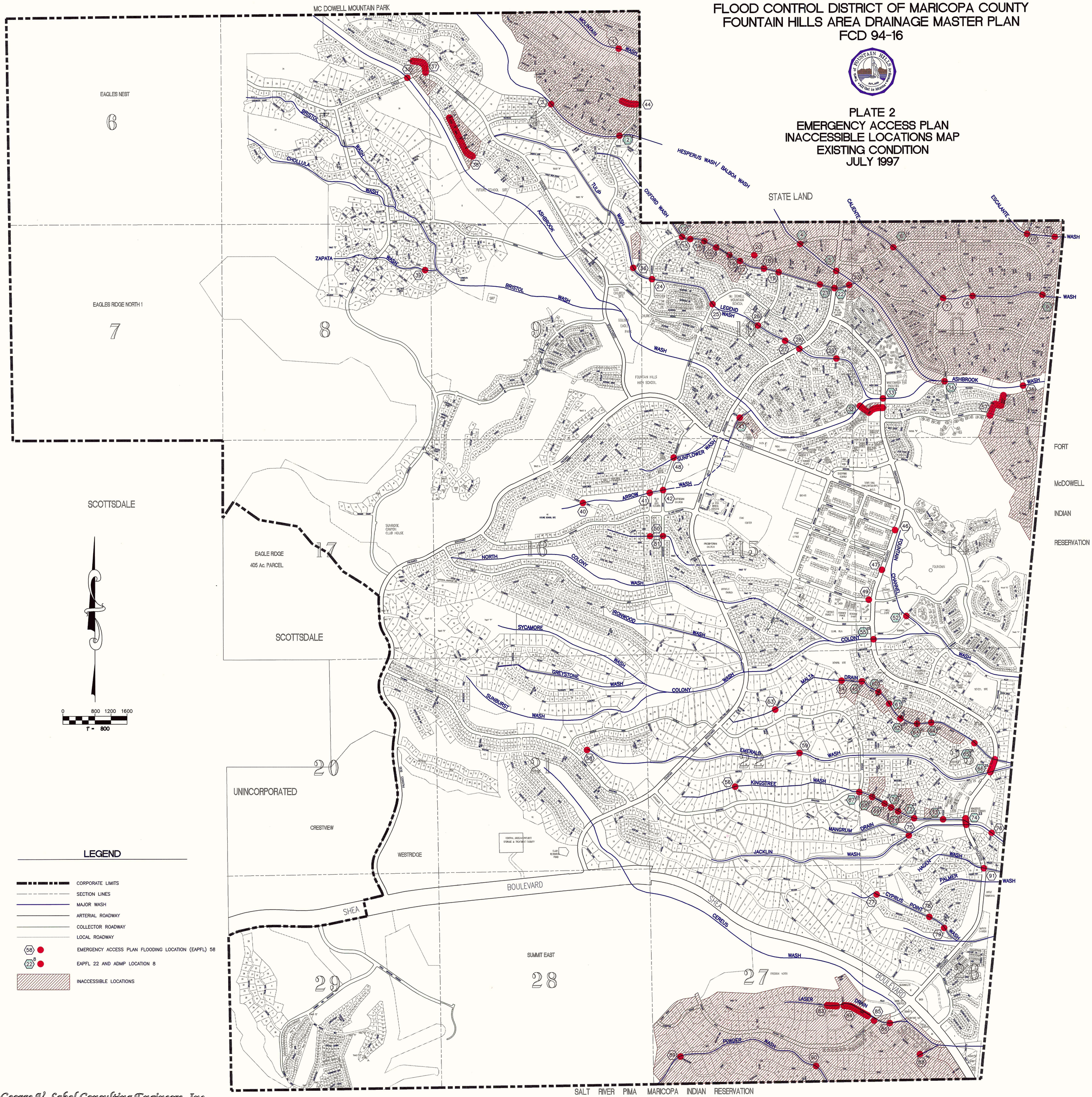
LEGEND

- CORPORATE LIMITS
- SECTION LINES
- MAJOR WASH
- ARTERIAL ROADWAY
- COLLECTOR ROADWAY
- LOCAL ROADWAY
- (58) EMERGENCY ACCESS PLAN FLOODING LOCATION (EAPFL) 58
- (22) 8 EAPFL 22 AND ADMP LOCATION 8

George V. Sabol Consulting Engineers, Inc.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FOUNTAIN HILLS AREA DRAINAGE MASTER PLAN
FCD 94-16

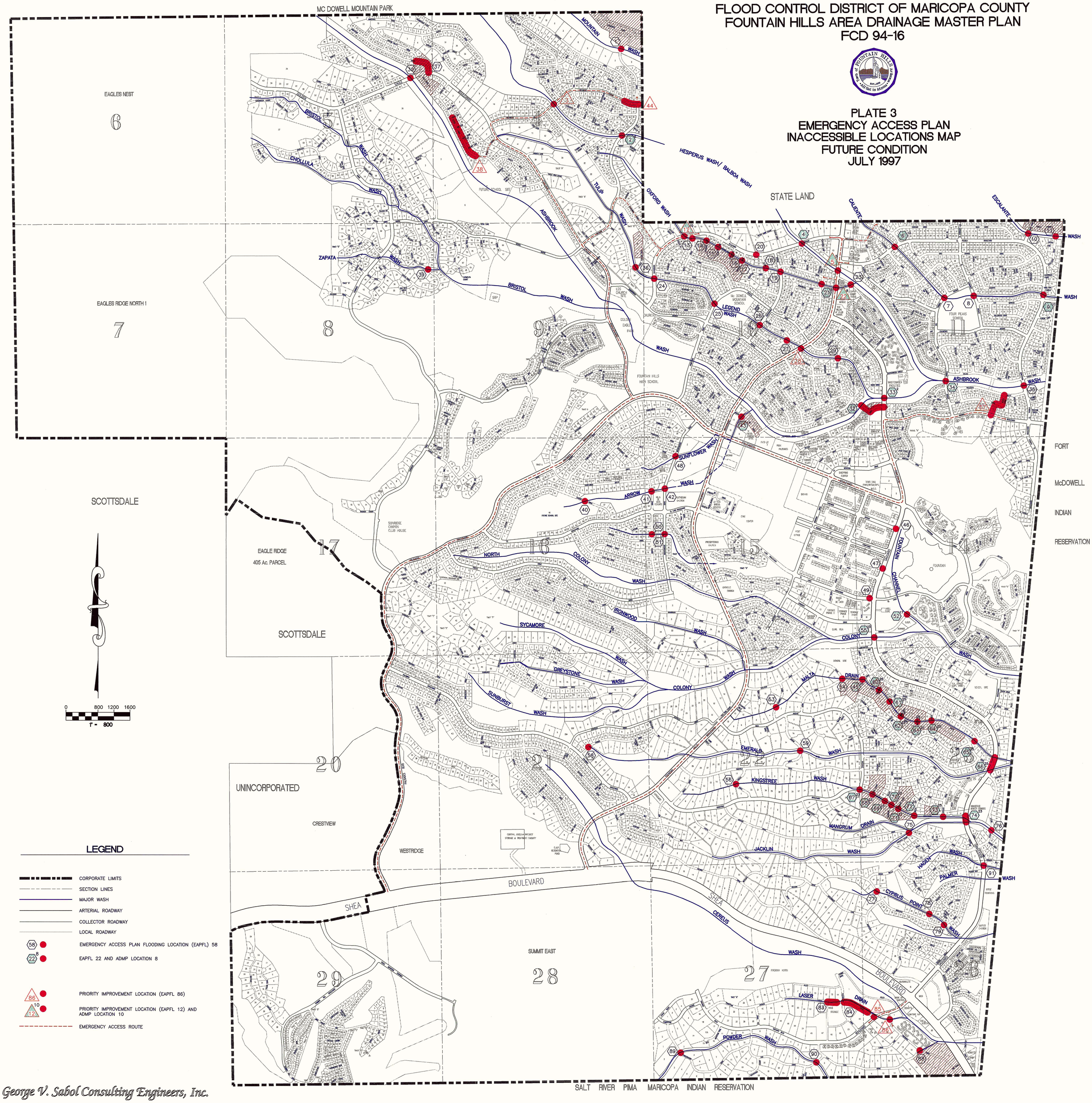
PLATE 2
EMERGENCY ACCESS PLAN
INACCESSIBLE LOCATIONS MAP
EXISTING CONDITION
JULY 1997



George V. Sabol Consulting Engineers, Inc.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FOUNTAIN HILLS AREA DRAINAGE MASTER PLAN
FCD 94-16

PLATE 3
EMERGENCY ACCESS PLAN
INACCESSIBLE LOCATIONS MAP
FUTURE CONDITION
JULY 1997



LEGEND

- CORPORATE LIMITS
- SECTION LINES
- MAJOR WASH
- ARTERIAL ROADWAY
- COLLECTOR ROADWAY
- LOCAL ROADWAY
- 58 — EMERGENCY ACCESS PLAN FLOODING LOCATION (EAPFL) 58
- 22 / 8 — EAPFL 22 AND ADMP LOCATION 8
- 86 — PRIORITY IMPROVEMENT LOCATION (EAPFL 86)
- 12 / 10 — PRIORITY IMPROVEMENT LOCATION (EAPFL 12) AND ADMP LOCATION 10
- EMERGENCY ACCESS ROUTE

George V. Sabol Consulting Engineers, Inc.

APPENDIX A

Emergency Access Plan Flooding Location Existing Condition Characteristics

Hesperus/Balboa Washes

Escalante Wash

Oxford Wash

Tulip/Legend Washes

Ashbrook Wash

Zapata Wash

Sunflower Wash

Arrow Wash

Fountain Channel

Colony Wash

Emerald Wash

Malta Drain

Kingstree Wash

Jacklin Wash

Cyprus Point Wash

Laser Drain

Cereus Wash

Powder Wash

Hogan and Palmer Washes

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/3/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 1

Location to nearest Quarter Section: NE 1/4 of Section 4

Roadway Name: Boulder Avenue (S. of Stoneridge Ct)

Roadway Classification: LOCAL

Wash Name (if applicable): No name (Southern tributary to Escalante Wash)

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 1 - 60" x 72' CMP

Culvert Description: corrugated metal pipe projecting from embankment, roadway defines overflow weir

Future Condition 100-year Discharge: 380 cfs (HEC-1 operation C5130) (6-hr)

Maximum Depth of Flow: 1.2 feet

Duration of Impassable Flow: 0.75 hours

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium X *

High ____ *

Comments: Estimated passable Q = 167 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/4/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 2

Location to nearest Quarter Section: SE 1/4 of Section 4

Roadway Name: Boulder Avenue (N. of Rocky Mtn Pl.)

Roadway Classification: Collector

Wash Name (if applicable): Hesperus Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding ___

Culvert Size: 1 - 60" x 164' CMP

Culvert Description: corrugated metal pipe w/ projecting ends. overflow weir defined by N/G upstream of roadway

Future Condition 100-year Discharge: 456 cfs (HEC-1 operation C5380)(24-hr)

Maximum Depth of Flow: 0.7 feet [a]

Duration of Impassable Flow: 5.1 hours [b]

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

Comments: [a] - Based on normal depth calcs (see additional calcs)

[b] - Extended duration due to draw-down of upstream Hesperus Dam (No 36). Est possible Q = 308 cfs

Normal depth calculations for EAPFL_2
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_2
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data

Channel Slope 0.040000 ft/ft

Elevation range: 1,787.50 ft to 1,805.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
1,000.00	1,790.00	1,000.00	1,048.00	0.060
1,012.00	1,790.00	1,048.00	1,090.00	0.025
1,040.00	1,788.00	1,090.00	1,235.00	0.060
1,048.00	1,787.80			
1,090.00	1,787.50			
1,098.00	1,788.00			
1,135.00	1,788.70			
1,136.00	1,805.00			
1,200.00	1,805.00			
1,201.00	1,789.20			
1,235.00	1,790.00			

Discharge 210.00 cfs

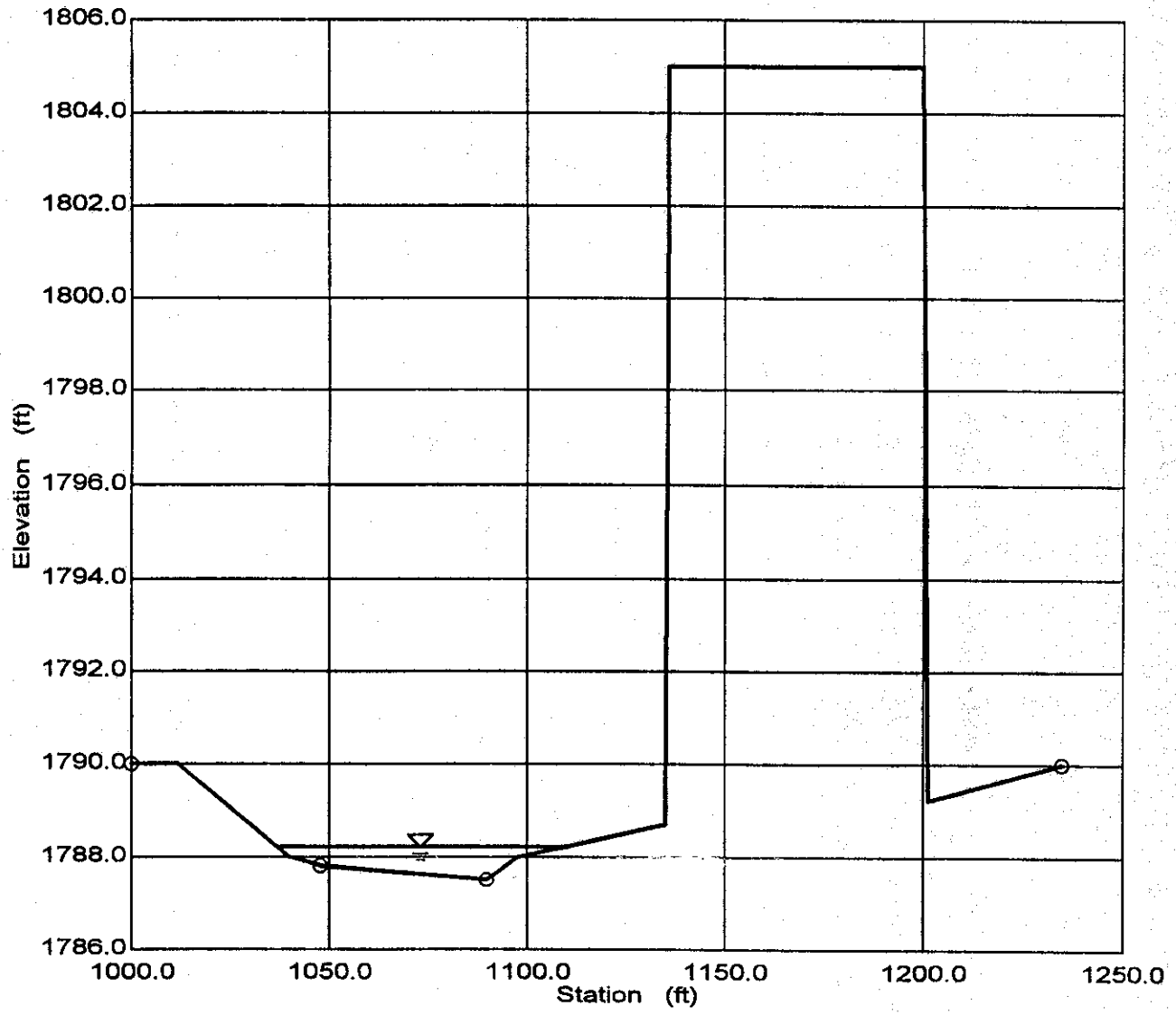
Results		
Wtd. Mannings Coefficient	0.026	
Water Surface Elevation	1,788.22	ft
Flow Area	31.70	ft^2
Wetted Perimeter	72.57	ft
Top Width	72.55	ft
Height	0.72	ft
Critical Depth	1,788.44	ft
Critical Slope	0.012491	ft/ft
Velocity	6.62	ft/s
Velocity Head	0.68	ft
Specific Energy	1,788.90	ft
Froude Number	1.77	

Flow is supercritical.

EAPFL_2 normal depth calculation
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_2
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.026	
Channel Slope	0.040000	ft/ft
Water Surface Elevation	1,788.22	ft
Discharge	210.00	cfs



George V. Sabol Consulting Engineers, Inc.

CLIENT FCDMC
PROJECT Ftn Hills ADMP, FCD 94-16
SUBJECT EAP FL # 2

SHEET ____ OF ____
DATE 12/4/96
BY WSO
PROJECT NO. 1204101

Geometry and Manning's n estimates for normal depth cross section at overflow crossing:

Station	Description[a]	Elevation[a]	n[b]
10+00	N/G	1790.0	
			0.060
10+12	N/G	1790.0	
			0.060
10+40	N/G	1788.0	
			0.060
10+48	E. edge road	1787.8	
			0.020
10+90	W. edge road	1787.5	
			0.060
10+98	N/G	1788.0	
			"
11+35	Toe of Bldg	1788.7	
			"
11+36	Top of Bldg	1805.0	
			"
12+00	Top of Structure	1805.0	
			"
12+01	Toe of Structure	1789.2	
			0.060
12+35	N/G	1790.0	

[a] - Taken from Ftn Hills North FDS 200 Scale mapping
[b] - Estimated from 1993 photos and field reconnaissance

Slope = 0.04 ft/ft[a]

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/4/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 3

Location to nearest Quarter Section: NE 1/4 of Section 4

Roadway Name: Richwood Avenue (N. of Tepee Dr)

Roadway Classification: Collector

Wash Name (if applicable): Hesperus Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped roadway crossing. Road at flowline elev.

Future Condition 100-year Discharge: 358 cfs (HEC-1 operation C537)(24-hr)

Maximum Depth of Flow: 2.4 feet

Duration of Impassable Flow: 17.05 hours[a]

Scour/Wash-out Potential: Low ___ * *Notes:

Medium X *

High ___ *

Comments: [a] - Estimated passable Q = 27 cfs, as shown by normal depth calcs on separate sheets. Extended duration due to drawdown of Hesperus Dam (No. 36).

EAPFL_3 normal depth calc (0.5 ft)
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_3
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.020000	ft/ft
Water Surface Elevation	1,822.10	ft

Elevation range: 1,821.60 ft to 1,824.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
1,000.00	1,824.00	1,000.00	1,115.00	0.045
1,030.00	1,822.00			
1,050.00	1,821.60			
1,075.00	1,822.00			
1,115.00	1,824.00			

Results		
Wtd. Mannings Coefficient	0.045	
Discharge	27.45	cfs
Flow Area	13.68	ft²
Wetted Perimeter	48.51	ft
Top Width	48.50	ft
Height	0.50	ft
Critical Depth	1,822.03	ft
Critical Slope	0.048672	ft/ft
Velocity	2.01	ft/s
Velocity Head	0.06	ft
Specific Energy	1,822.16	ft
Froude Number	0.67	
Flow is subcritical.		

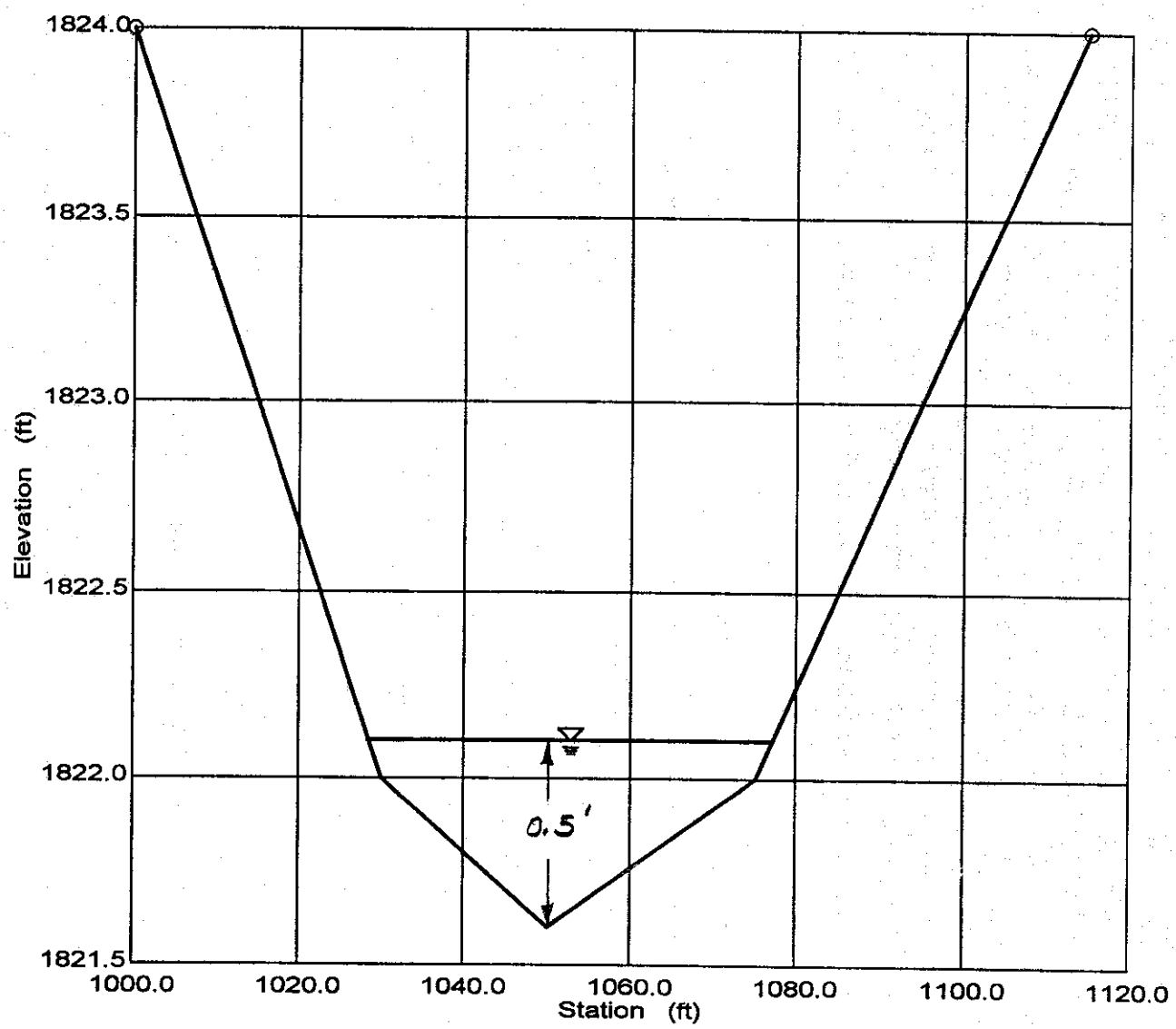
Notes:

Manning's n adjusted to 0.045 to account for backwater effects by assuming that the hydraulic roughness of the upstream and downstream sections control the flow.

EAPFL_3: centerline of Richwood Avenue
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_3
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.045	
Channel Slope	0.020000	ft/ft
Water Surface Elevation	1,822.10	ft
Discharge	27.45	cfs



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/5/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 4 (ADMP 7)

Location to nearest Quarter Section: NE 1/4 of Section 10

Roadway Name: Glenbrook Boulevard (E of Pelican Dr.)

Roadway Classification: Collector

Wash Name (if applicable): Balboa Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped roadway crossing. Road at flowline of wash.

Future Condition 100-year Discharge: 658 cfs (HEC-1 operation C541)(6-hr)

Maximum Depth of Flow: 2.3 feet

Duration of Impassable Flow: 15.0 hours [a]

Scour/Wash-out Potential: Low ____ * *Notes:

Medium X *

High ____ *

Comments: [a] - Estimated impassable Q = 41 cfs, as shown by normal depth calcs on separate sheets. Extended duration due to drawdown of Herperus Dam (No. 36).

EAPFL_4: Glenbrook low flow crossing
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_4
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.014300	ft/ft
Water Surface Elevation	1,646.30	ft

Elevation range: 1,645.80 ft to 1,648.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
1,000.00	1,648.00	1,000.00	1,128.00	0.045
1,007.00	1,646.00			
1,014.00	1,645.80			
1,020.00	1,646.00			
1,075.00	1,646.00			
1,128.00	1,648.00			

Results		
Wtd. Mannings Coefficient	0.045	
Discharge	40.71	cfs
Flow Area	23.05	ft²
Wetted Perimeter	77.05	ft
Top Width	77.00	ft
Height	0.50	ft
Critical Depth	1,646.20	ft
Critical Slope	0.049600	ft/ft
Velocity	1.77	ft/s
Velocity Head	0.05	ft
Specific Energy	1,646.35	ft
Froude Number	0.57	
Flow is subcritical.		

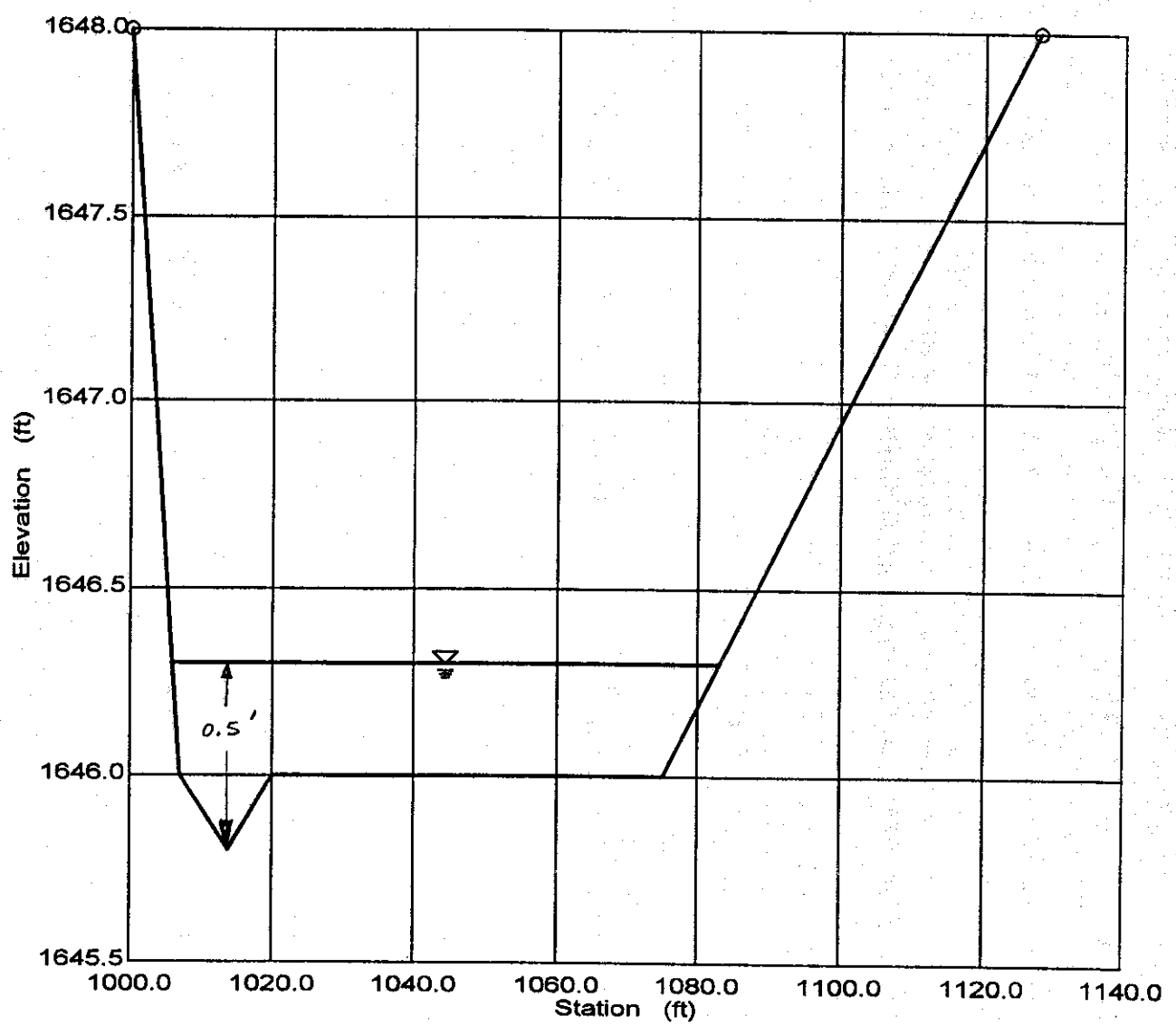
Notes:

Manning's n adjusted to 0.045 to account for backwater effects by assuming that the hydraulic roughness of the upstream and downstream sections control the flow.

EAPFL_4: Glenbrook prpndicular to flow pattern
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_4
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.045	
Channel Slope	0.014300	ft/ft
Water Surface Elevation	1,646.30	ft
Discharge	40.71	cfs



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/5/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 5 (ADMP 5)

Location to nearest Quarter Section: NE 1/4 of Section 10

Roadway Name: Fountain Hills Boulevard (N. of Oxford Dr)

Roadway Classification: Arterial

Wash Name (if applicable): Balboa Wash

EAPFL Type and Description

Type of Flooding:

Cross Street	X [a]	Is there a culvert? (Y) or N
Longitudinal Flow	X [a]	a - Flows overtopping the culvert are generally directed to south/southeast along F.H. Blvd.
Ponding		

Culvert Size: 2 - 54" X 122' CMP's

Culvert Description: corrugated metal pipes w/ ends projecting from embankment.

Future Condition 100-year Discharge: 747 cfs (HEC-1 operation C548L) (6-hr)

Maximum Depth of Flow: 0.66 [b] feet (at ℄ of F.H. Boulevard)

Duration of Impassable Flow: 7.52 hours [c]

Scour/Wash-out Potential:

Low	X *	*Notes:
Medium	___ *	
High	___ *	

Comments: b - See calcs on separate sheet

c - Estimated passable Q = 280 cfs (see calcs on separate sheets).
Duration due to drawdown of Hesperus Dam (No. 36).

EAPFL_5: 100-year overflow normal depth
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_5
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.015000 ft/ft	
Elevation range: 1,630.70 ft to 1,634.00 ft.		
Station (ft)	Elevation (ft)	
890.00	1,632.00	
955.00	1,631.00	
957.00	1,630.70	
1,000.00	1,631.20	
1,035.00	1,632.00	
1,037.00	1,632.30	
1,090.00	1,634.00	
Discharge	410.00	cfs

Start Station	End Station	Roughness
890.00	955.00	0.050
955.00	1,037.00	0.020
1,037.00	1,090.00	0.050

Results		
Wtd. Mannings Coefficient	0.023	
Water Surface Elevation	1,631.86	ft
Flow Area	74.95	ft^2
Wetted Perimeter	130.01	ft
Top Width	129.97	ft
Height	1.16	ft
Critical Depth	1,631.98	ft
Critical Slope	0.009341	ft/ft
Velocity	5.47	ft/s
Velocity Head	0.47	ft
Specific Energy	1,632.33	ft
Froude Number	1.27	
Flow is supercritical.		

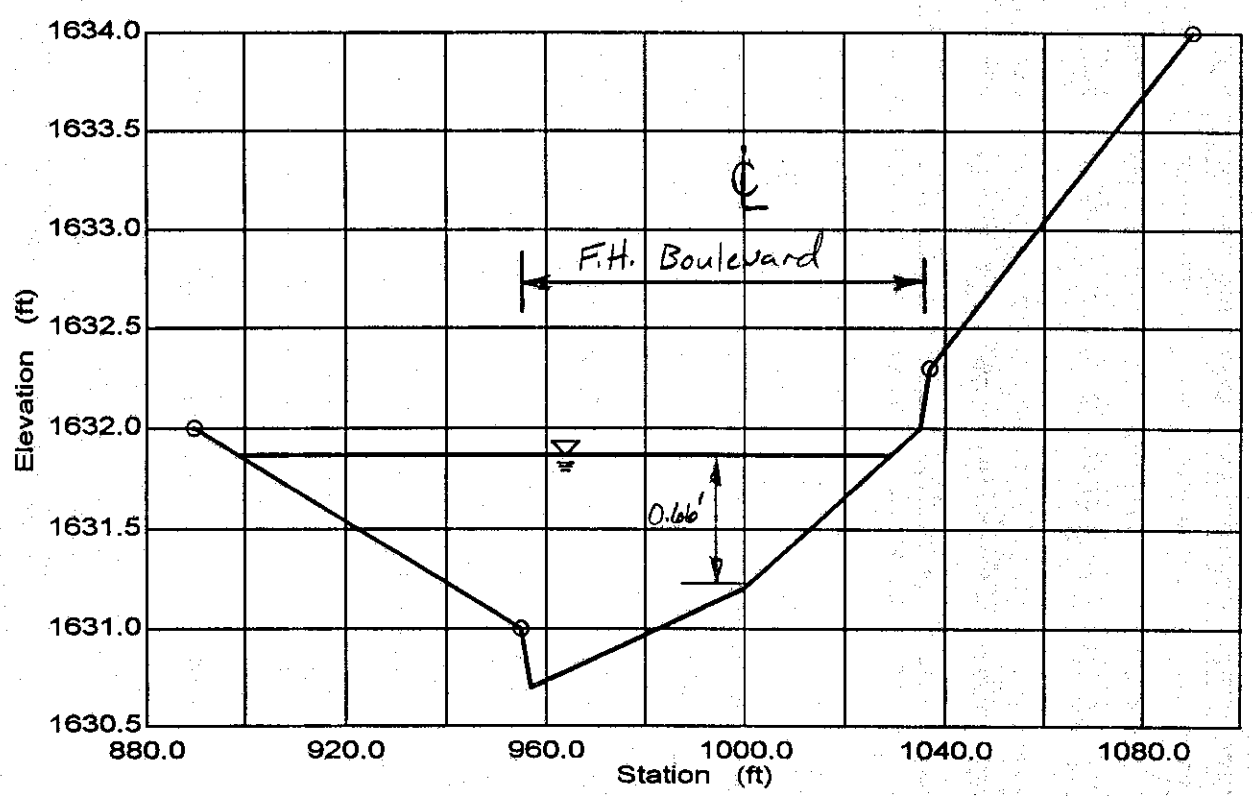
Notes:

Q100 = 410 cfs estimate based on Ftn Hills North FDS HEC-2 results. Estimate is approximate.

EAPFL_5: 100-yr overflow normal depth
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_5
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.023	
Channel Slope	0.015000	ft/ft
Water Surface Elevation	1,631.86	ft
Discharge	410.00	cfs



Notes:

Station 1000 = centerline of F.H. Blvd.

Q100 = 410 cfs estimate based on Ftn Hills North FDS HEC-2 results. Estimate is approximate.

EAPFL_5: Impass duration nrml dpth calc
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_5
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.015000	ft/ft
Elevation range: 1,630.70 ft to 1,634.00 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
890.00	1,632.00	890.00	955.00	0.050
955.00	1,631.00	955.00	1,037.00	0.020
957.00	1,630.70	1,037.00	1,090.00	0.050
1,000.00	1,631.20			
1,035.00	1,632.00			
1,037.00	1,632.30			
1,090.00	1,634.00			
Discharge	280.00	cfs		

Results		
Wtd. Mannings Coefficient	0.022	
Water Surface Elevation	1,631.70	ft
Flow Area	55.21	ft²
Wetted Perimeter	112.28	ft
Top Width	112.24	ft
Height	1.00	ft
Critical Depth	1,631.80	ft
Critical Slope	0.009273	ft/ft
Velocity	5.07	ft/s
Velocity Head	0.40	ft
Specific Energy	1,632.10	ft
Froude Number	1.27	
Flow is supercritical.		

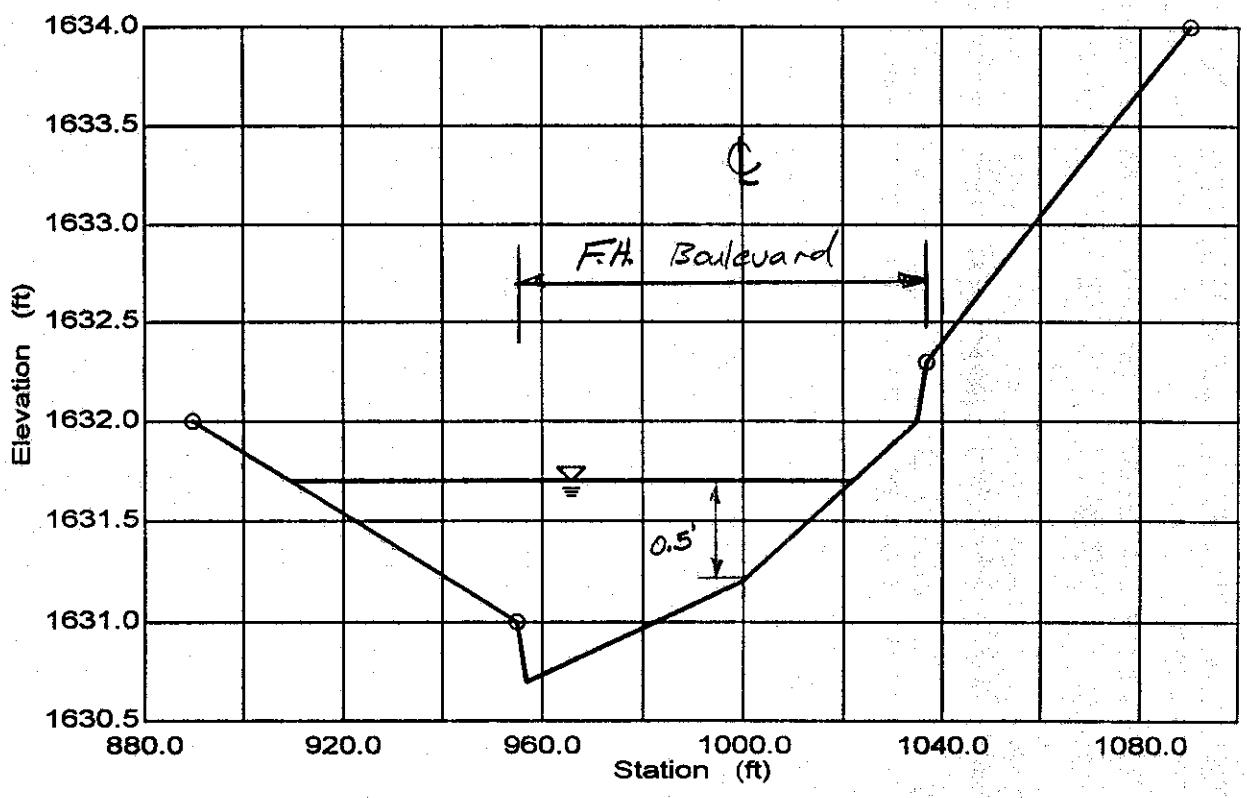
Notes:

Q = 280 cfs is shown by this normal depth calculation to cause a flooding depth at the centerline of Fountain Hills Boulevard of 0.5 feet, per the estimated cross section. Value is used to estimate the duration of impass from HEC-1 hydrograph.

EAPFL_5: Impass duration nrml dpth calc
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_5
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.022	
Channel Slope	0.015000	ft/ft
Water Surface Elevation	1,631.70	ft
Discharge	280.00	cfs



Notes:

Station 1000 = centerline of F.H. Blvd.

Q = 280 cfs is shown by this normal depth calculation to cause a flooding depth at the centerline of Fountain Hills Boulevard of 0.5 feet, per the estimated cross section. Value is used to estimate the duration of impass from HEC-1 hydrograph.

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/6/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 6 (ADMP 11)

Location to nearest Quarter Section: NW 1/4 of Section 11

Roadway Name: El Pueblo Boulevard (NE of Escondido Dr)

Roadway Classification: Collector

Wash Name (if applicable): Caliente Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped roadway crossing. Road at flowline elevation of wash

Future Condition 100-year Discharge: 555 cfs (HEC-1 operation C52A) (6-hr)

Maximum Depth of Flow: 2.5 feet (based on Future Cond. HEC-2 run)

Duration of Impassable Flow: 1.52 hours[a]

Scour/Wash-out Potential: Low ___ * *Notes:

Medium X *

High ___ *

Comments: [a] - Estimated passable Q = 49 cfs (see calcs on separate sheets)

EAPFL_6: Nrml dpth calc for impass dur.
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_6
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.025000	ft/ft
Water Surface Elevation	1,620.30	ft

Elevation range: 1,619.80 ft to 1,622.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
930.00	1,622.00	930.00	1,100.00	0.045
992.00	1,620.00			
1,008.00	1,619.80			
1,035.00	1,620.00			
1,100.00	1,622.00			

Results		
Wtd. Mannings Coefficient	0.045	
Discharge	49.32	cfs
Flow Area	20.06	ft²
Wetted Perimeter	62.06	ft
Top Width	62.05	ft
Height	0.50	ft
Critical Depth	1,620.24	ft
Critical Slope	0.045026	ft/ft
Velocity	2.46	ft/s
Velocity Head	0.09	ft
Specific Energy	1,620.39	ft
Froude Number	0.76	
Flow is subcritical.		

Notes:

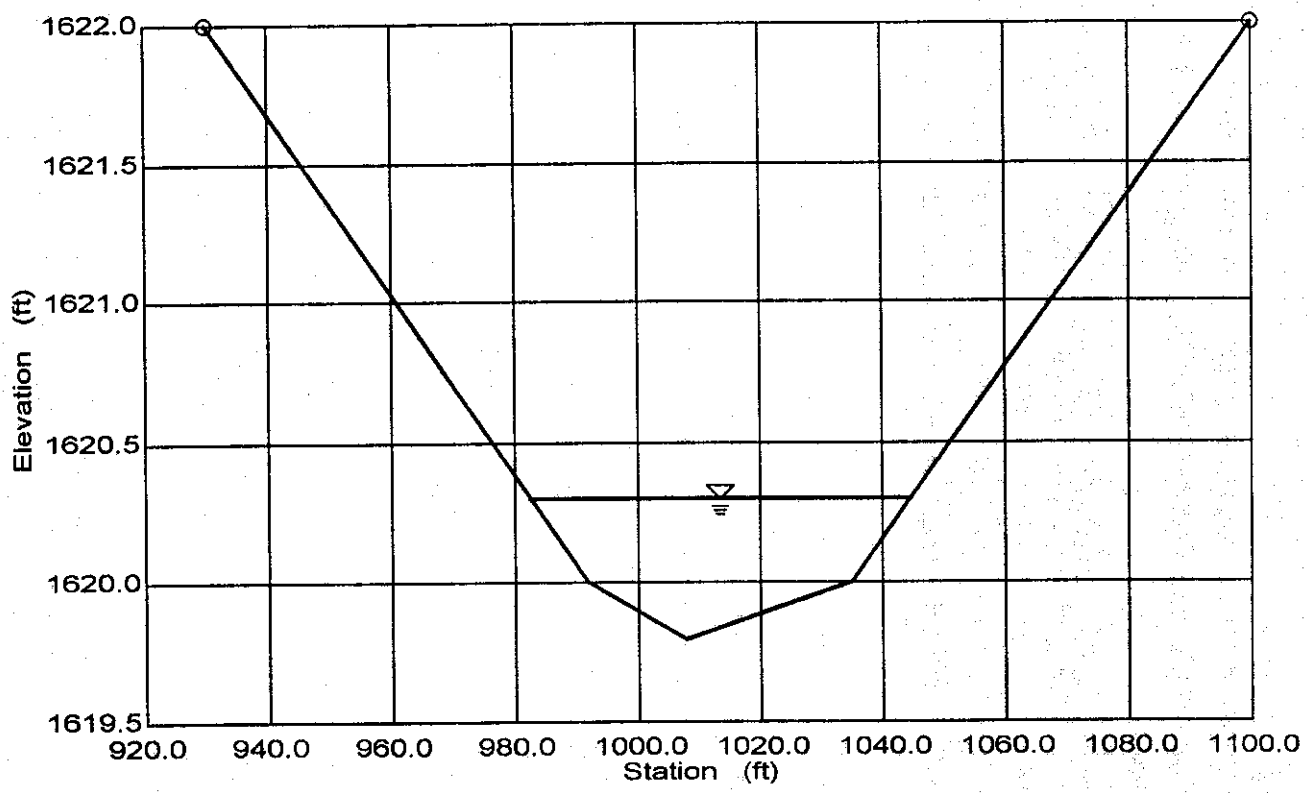
Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater from downstream reach.

EAPFL_6: Nrml dpth calc for impass dur.
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_6
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.045	
Channel Slope	0.025000	ft/ft
Water Surface Elevation	1,620.30	ft
Discharge	49.32	cfs



Notes:

Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater from downstream reach.

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/6/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 7

Location to nearest Quarter Section: NW 1/4 of Section 11

Roadway Name: Del Cambre Boulevard (N of Alamosa Ave)

Roadway Classification: Collector

Wash Name (if applicable): Caliente Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Description: Dipped roadway crossing. Road elevation matches flowline of wash.

Future Condition 100-year Discharge: 798 cfs (HEC-1 operation C526) (6-hr)

Maximum Depth of Flow: 4.1 feet (Based on Future Cond. HEC-2 run)

Duration of Impassable Flow: 1.67 hours[a]

Scour/Wash-out Potential: Low ___ * *Notes:

Medium X *

High ___ *

Comments: a - Estimate of passable Q = 63 cfs (see calcs on separate sheet)

EAPFL_7: Nrml dpth calcs for impass dur.
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_7
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.018000	ft/ft
Water Surface Elevation	1,582.30	ft

Elevation range: 1,581.80 ft to 1,584.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
925.00	1,584.00	925.00	1,085.00	0.045
975.00	1,582.00			
1,005.00	1,581.80			
1,040.00	1,582.00			
1,085.00	1,584.00			

Results		
Wtd. Mannings Coefficient	0.045	
Discharge	62.49	cfs
Flow Area	28.14	ft²
Wetted Perimeter	79.26	ft
Top Width	79.25	ft
Height	0.50	ft
Critical Depth	1,582.21	ft
Critical Slope	0.045163	ft/ft
Velocity	2.22	ft/s
Velocity Head	0.08	ft
Specific Energy	1,582.38	ft
Froude Number	0.66	
Flow is subcritical.		

Notes:

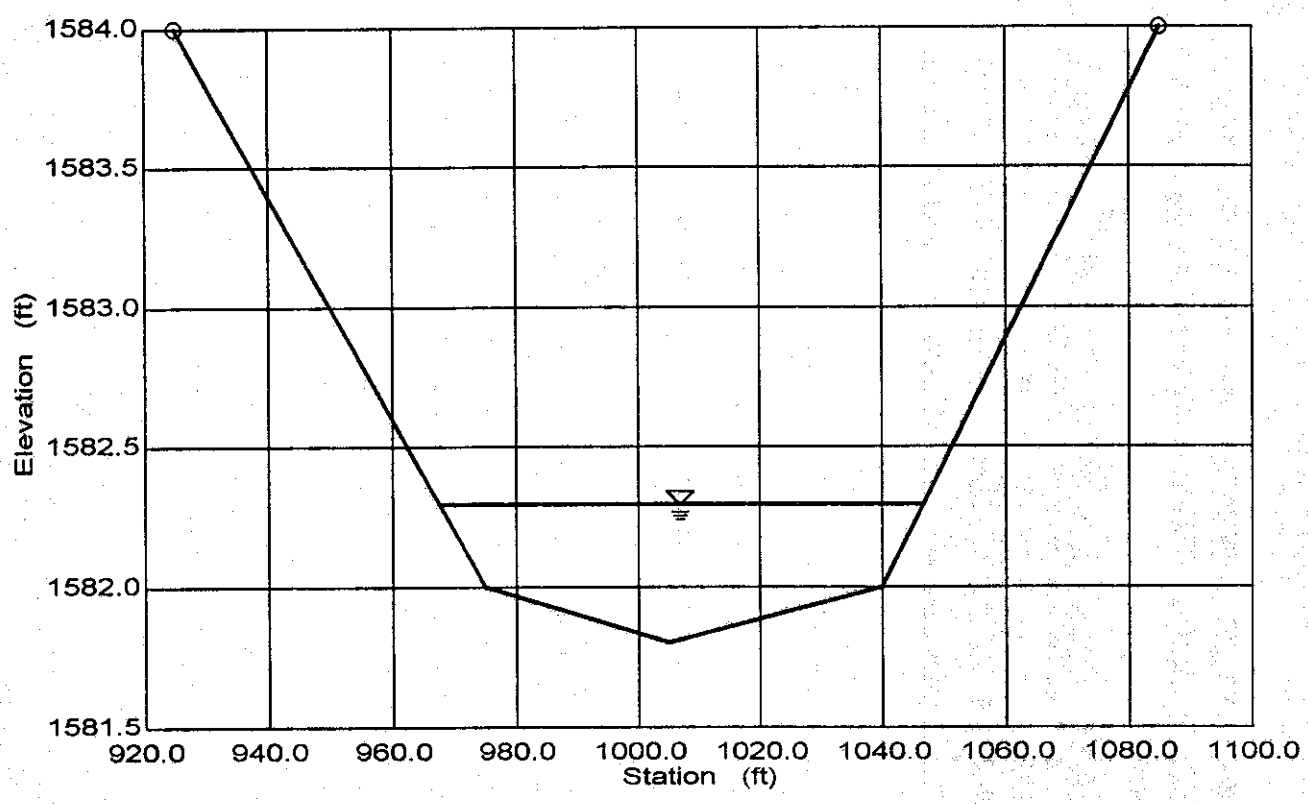
Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater effects of downstream channel

EAPFL_7: Nrml dpth calcs for impass dur.
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_7
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.045	
Channel Slope	0.018000	ft/ft
Water Surface Elevation	1,582.30	ft
Discharge	62.49	cfs



Notes:

Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater effects of downstream channel

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/6/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 8

Location to nearest Quarter Section: NE 1/4 of Section 11

Roadway Name: Sobrante Avenue (N of San Marcus)

Roadway Classification: Collector

Wash Name (if applicable): Caliente Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped roadway crossing. Road matches wash flowline

Future Condition 100-year Discharge: 798 cfs (HEC-1 operation C526) (6-hr)

Maximum Depth of Flow: 2.3 feet (Based on Future Cond. HEC-2 run)

Duration of Impassable Flow: 1.78 hours[a]

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium X * ____

High ____ * ____

Comments: a - Estimated passable Q = 45 cfs (see calcs on separate sheet)

EAPFL_8: Nrml dpth calc for impass dur.
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_8
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.014800	ft/ft
Water Surface Elevation	1,566.20	ft

Elevation range: 1,565.70 ft to 1,568.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
949.00	1,568.00	949.00	1,070.00	0.045
972.00	1,566.00			
1,000.00	1,565.70			
1,038.00	1,566.00			
1,070.00	1,568.00			

Results		
Wtd. Mannings Coefficient	0.045	
Discharge	45.43	cfs
Flow Area	23.65	ft^2
Wetted Perimeter	71.52	ft
Top Width	71.50	ft
Height	0.50	ft
Critical Depth	1,566.10	ft
Critical Slope	0.047573	ft/ft
Velocity	1.92	ft/s
Velocity Head	0.06	ft
Specific Energy	1,566.26	ft
Froude Number	0.59	
Flow is subcritical.		

Notes:

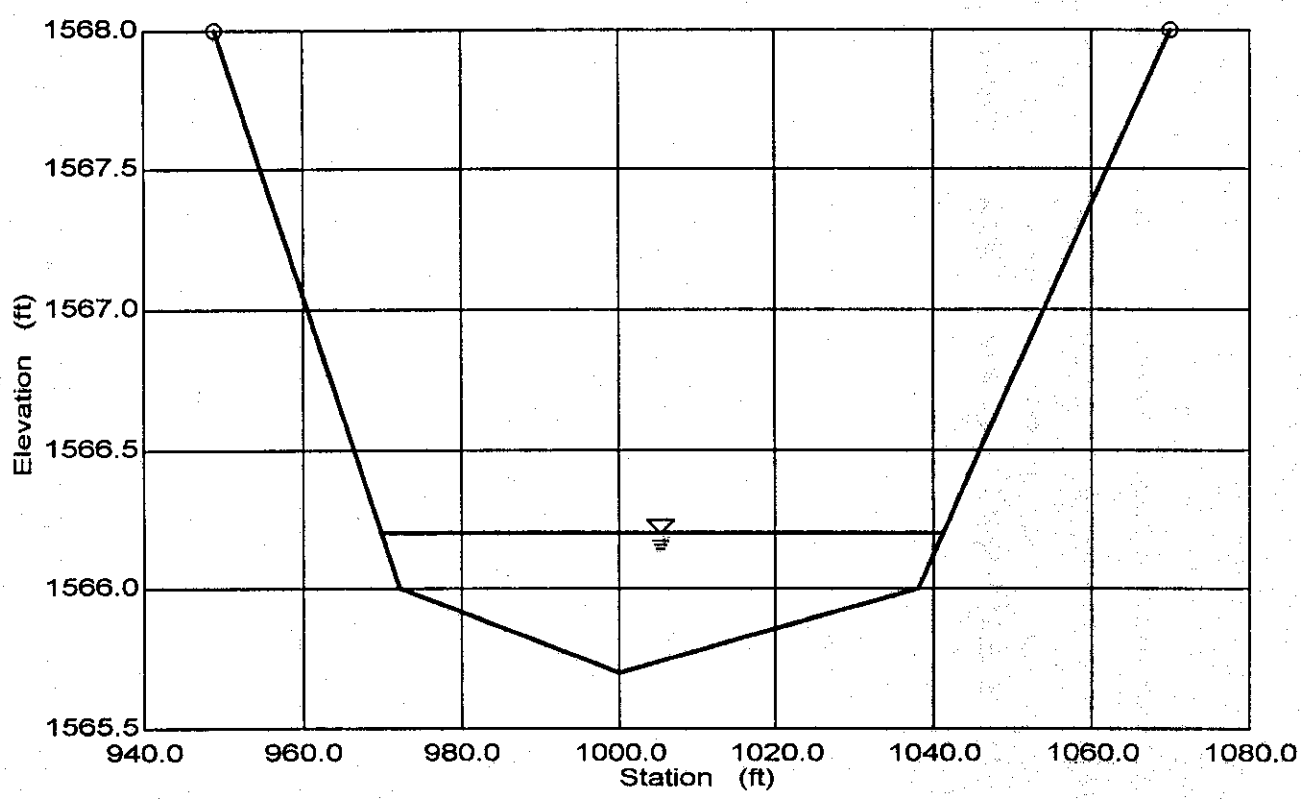
Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater effects of downstream channel

EAPFL_8: Nrml dpth calc for impass dur.
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_8
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.045	
Channel Slope	0.014800	ft/ft
Water Surface Elevation	1,566.20	ft
Discharge	45.43	cfs



Notes:

Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater effects of downstream channel

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/6/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 9 (ADMP 12)

Location to nearest Quarter Section: NE 1/4 of Section 11

Roadway Name: El Pueblo Boulevard (N of San Marcus)

Roadway Classification: Collector

Wash Name (if applicable): Caliente Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped roadway crossing. Road matches wash flowline.

Future Condition 100-year Discharge: 987 cfs (HEC-1 operation C527) (6-hr)

Maximum Depth of Flow: 3.2 feet (Based on Future Cond. HEC-2 run)

Duration of Impassable Flow: 2.37 hours[a]

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium X *

High ____ *

Comments: [a] - Estimated passable Q = 29 cfs (see calcs on separate sheet)

EAPFL_9: Nrml dpth calc for impass dur.
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_9
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.015400	ft/ft
Water Surface Elevation	1,533.90	ft

Elevation range: 1,533.40 ft to 1,535.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
940.00	1,534.00	940.00	1,075.00	0.045
950.00	1,534.10			
960.00	1,534.00			
1,000.00	1,533.40			
1,045.00	1,534.00			
1,075.00	1,535.00			

Results		
Wtd. Mannings Coefficient	0.045	
Discharge	28.80	cfs
Flow Area	17.71	ft^2
Wetted Perimeter	70.84	ft
Top Width	70.83	ft
Height	0.50	ft
Critical Depth	1,533.80	ft
Critical Slope	0.050457	ft/ft
Velocity	1.63	ft/s
Velocity Head	0.04	ft
Specific Energy	1,533.94	ft
Froude Number	0.57	
Flow is subcritical.		

Notes:

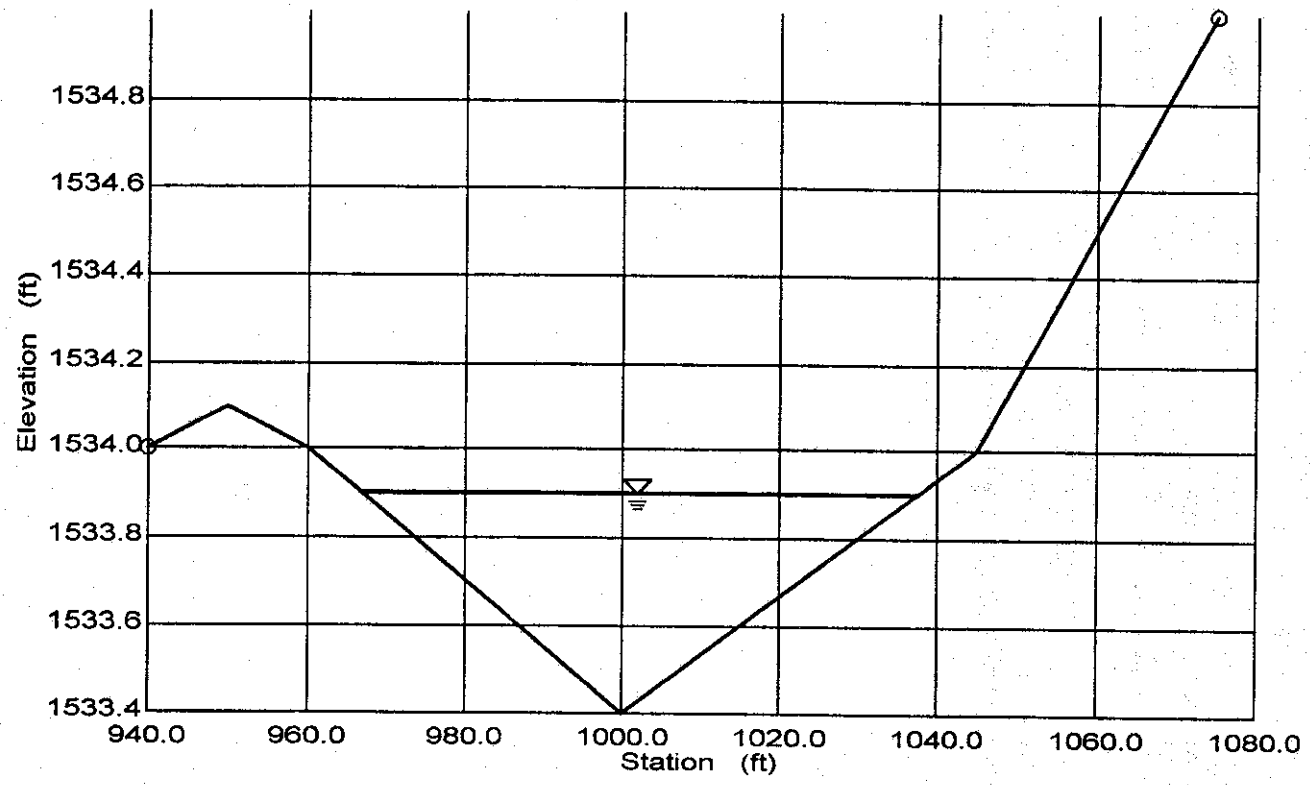
Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater effects of downstream channel

EAPFL_9: Nrml dpth calc for impass dur.
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_9
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.045	
Channel Slope	0.015400	ft/ft
Water Surface Elevation	1,533.90	ft
Discharge	28.80	cfs



Notes:

Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater effects of downstream channel

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Mar 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 44

Location to nearest Quarter Section: NE 1/4 of Section 4

Roadway Name: Richwood Avenue and Boulder Drive

Roadway Classification: Collector

Wash Name (if applicable): Tributary of Lesser's Wash

EAPFL Type and Description

Type of Flooding: Cross Street ____ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ____

Culvert Size: N/A

Culvert Description: Longitudinal flow down Richwood Ave crossing Boulder Drive

Future Condition 100-year Discharge: 205 cfs (HEC-1 operation 206D) (6 hr)

Maximum Depth of Flow: 1.1'

Duration of Impassable Flow: 0.7 hrs

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ____ * ____

High ____ * ____

Comments: Estimated passable Q = 47 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_44
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

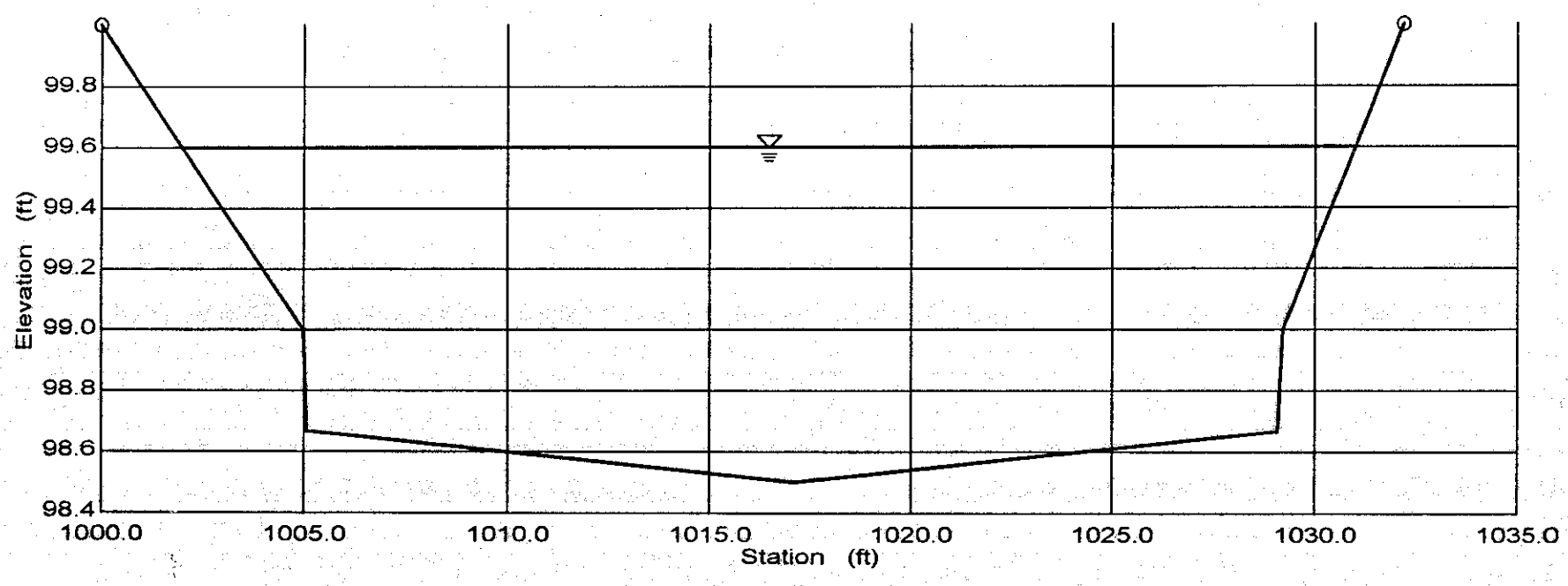
Input Data					
Channel Slope	0.021000 ft/ft				
Elevation range: 98.50 ft to 100.00 ft.					
Station (ft)	Elevation (ft)		Start Station	End Station	Roughness
1,000.00	100.00		1,000.00	1,032.20	0.025
1,005.00	99.00				
1,005.10	98.67				
1,017.10	98.50				
1,029.10	98.67				
1,029.20	99.00				
1,032.20	100.00				
Discharge	205.00	cfs			

Results		
Wtd. Mannings Coefficient	0.025	
Water Surface Elevation	99.60	ft
Flow Area	25.99	ft²
Wetted Perimeter	29.66	ft
Top Width	29.01	ft
Height	1.10	ft
Critical Depth	99.88	ft
Critical Slope	0.009091	ft/ft
Velocity	7.89	ft/s
Velocity Head	0.97	ft
Specific Energy	100.57	ft
Froude Number	1.47	
Flow is supercritical.		

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_44
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.025	
Channel Slope	0.021000	ft/ft
Water Surface Elevation	99.60	ft
Discharge	205.00	cfs



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/6/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 10

Location to nearest Quarter Section: NE 1/4 of Section 11

Roadway Name: Bahia Drive (N. of El Pueblo Blvd)

Roadway Classification: Collector

Wash Name (if applicable): Escalante Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped roadway crossing. Road matches flowline elevation of wash

Future Condition 100-year Discharge: 1321 cfs[a] (HEC-1 operation C591) (6-hr)

Maximum Depth of Flow: 3.1 feet (From Ftn Hills FDS using Ex Cond. Q100 = 1400 cfs)

Duration of Impassable Flow: 6.2 hours[b]

Scour/Wash-out Potential: Low ____ * *Notes:

Medium X *

High ____ *

Comments: [a] - Existing condition Q = 1401 cfs

[b] - Estimate of passable Q = 15 cfs (see calcs on separate sheets)

EAPFL_10: Nrml dpth calc for impass dur.
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_10
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.019000	ft/ft
Water Surface Elevation	1,527.00	ft

Elevation range: 1,526.50 ft to 1,530.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
880.00	1,530.00	880.00	1,055.00	0.045
915.00	1,529.00			
930.00	1,528.00			
1,000.00	1,526.50			
1,030.00	1,528.00			
1,055.00	1,530.00			

Results		
Wtd. Mannings Coefficient	0.045	
Discharge	15.05	cfs
Flow Area	8.33	ft^2
Wetted Perimeter	33.35	ft
Top Width	33.33	ft
Height	0.50	ft
Critical Depth	1,526.92	ft
Critical Slope	0.049783	ft/ft
Velocity	1.81	ft/s
Velocity Head	0.05	ft
Specific Energy	1,527.05	ft
Froude Number	0.64	
Flow is subcritical.		

Notes:

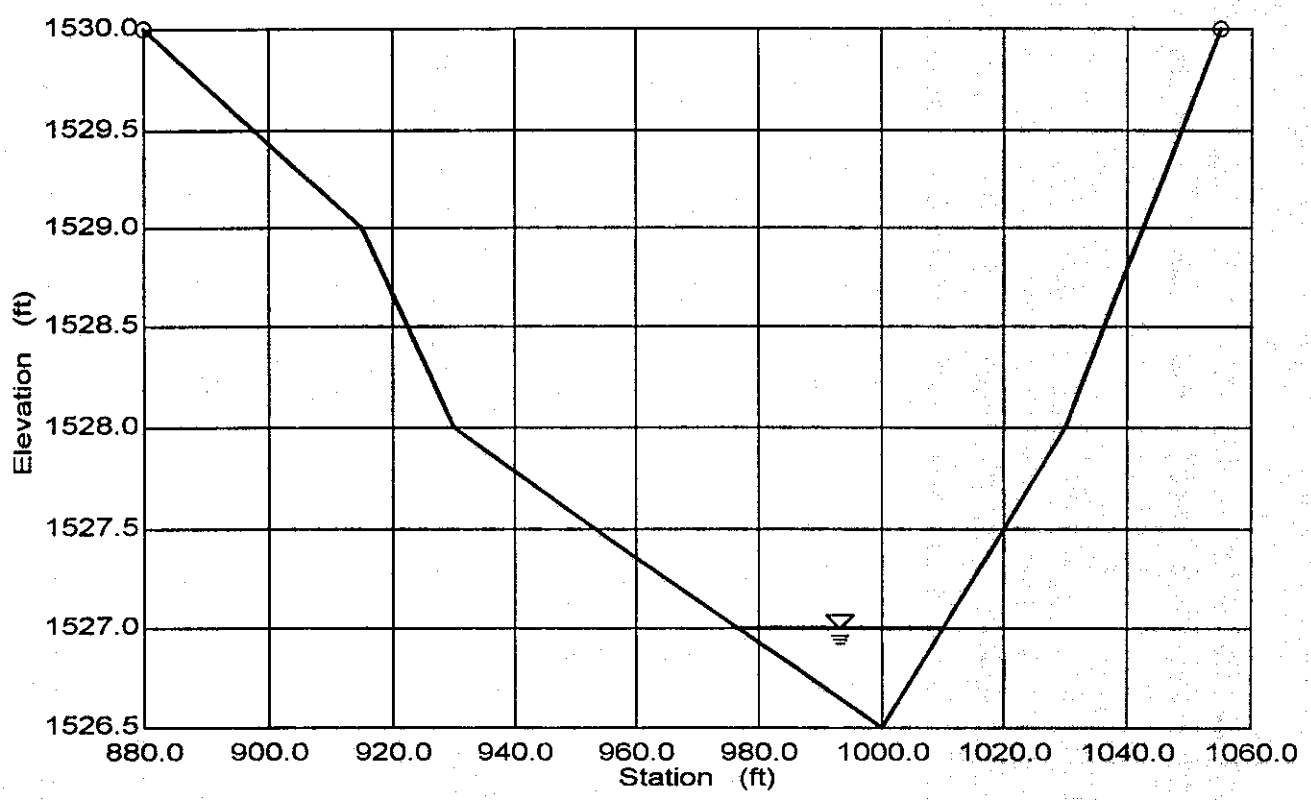
Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater effects of downstream channel

EAPFL_10: Nrml dpth calc for impass dur.
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_10
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.045	
Channel Slope	0.019000	ft/ft
Water Surface Elevation	1,527.00	ft
Discharge	15.05	cfs



Notes:

Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater effects of downstream channel

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12/9/96

Project: Fountain Hills ADMP, FCD 94-16 By: WSO

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 11

Location to nearest Quarter Section: NE 1/4 of Section 11

Roadway Name: Escalante Drive (N of Cayuga Ln)

Roadway Classification: Local

Wash Name (if applicable): Escalante Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped roadway crossing. Road matches wash flowline elevation

Future Condition 100-year Discharge: 1,453 cfs (HEC-1 operation C521) (6-hr)

Maximum Depth of Flow: 5.5 feet (From Ftn Hills FDS Ex Cond. HEC-2 Q=1410 cfs)

Duration of Impassable Flow: 7.32 hours[a]

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

Comments: [a] - Estimated passable Q = 9 cfs (see calcs on separate sheet)

EAPFL_11: Nrml dpth calc for impass dur.
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_11
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.016700	ft/ft
Water Surface Elevation	1,514.70	ft

Elevation range: 1,514.20 ft to 1,518.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
950.00	1,518.00	950.00	1,042.00	0.045
970.00	1,516.00			
997.00	1,514.30			
1,000.00	1,514.20			
1,003.00	1,514.30			
1,025.00	1,516.00			
1,042.00	1,518.00			

Results		
Wtd. Mannings Coefficient	0.045	
Discharge	9.25	cfs
Flow Area	5.01	ft²
Wetted Perimeter	17.56	ft
Top Width	17.53	ft
Height	0.50	ft
Critical Depth	1,514.60	ft
Critical Slope	0.048151	ft/ft
Velocity	1.85	ft/s
Velocity Head	0.05	ft
Specific Energy	1,514.75	ft
Froude Number	0.61	
Flow is subcritical.		

Notes:

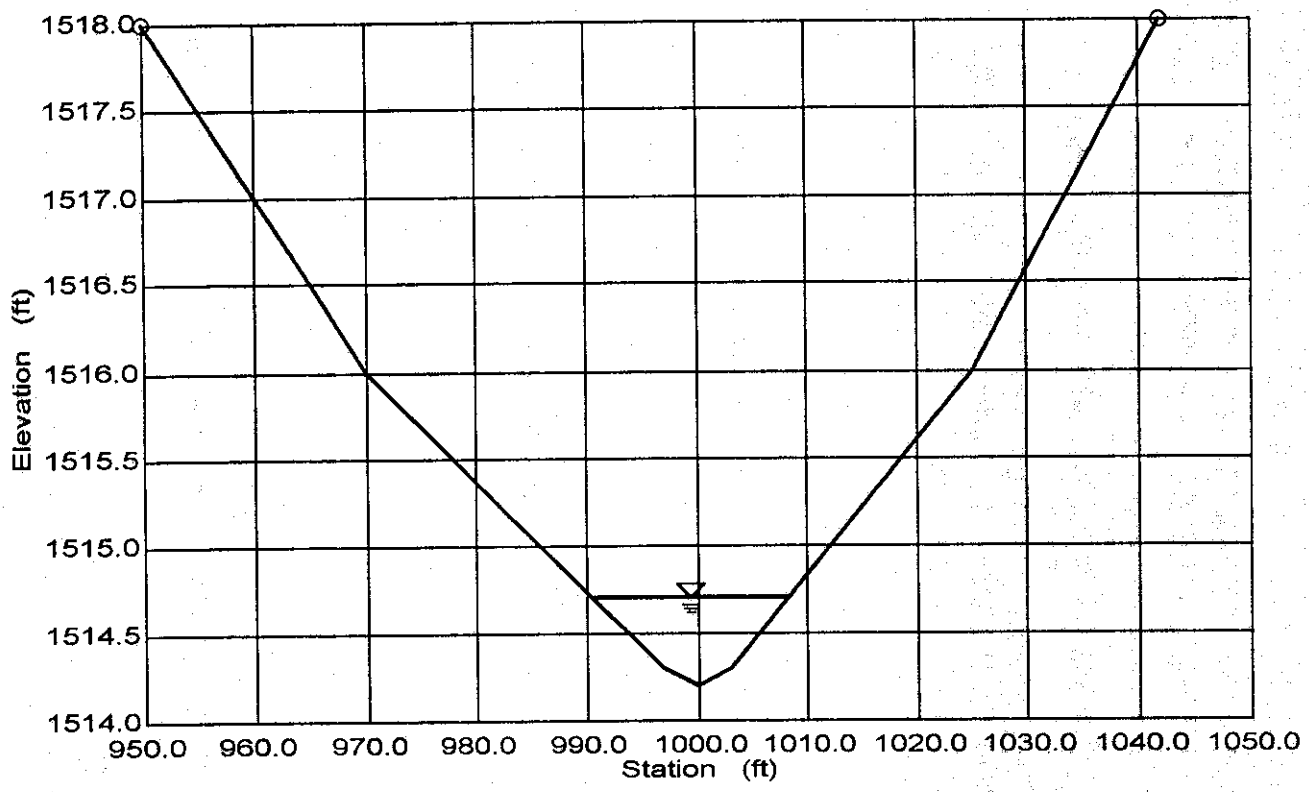
Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater effects of downstream channel

EAPFL_11: Nrml dpth calc for impass dur.
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_11
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.045	
Channel Slope	0.016700	ft/ft
Water Surface Elevation	1,514.70	ft
Discharge	9.25	cfs



Notes:

Station 1000 = HEC-2 thalweg

Manning's n set to 0.045 to account for backwater effects of downstream channel

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 11 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCF

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 12 (ADMP 10)

Location to nearest Quarter Section: NW 1/4 of Section 10

Roadway Name: Glenbrook Blvd. (W. of Maple Dr)

Roadway Classification: Collector

Wash Name (if applicable): Oxford Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 252 cfs (HEC-1 operation C543) (6-hr)

Maximum Depth of Flow: 2.1' (From HEC-RAS model using future cond. Q's)

Duration of Impassable Flow: 1.33 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium X * ____

High ____ * ____

Comments: Estimated passable Q = 10 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 13

Location to nearest Quarter Section: NW 1/4 Section 10

Roadway Name: Maple Drive (S. of Glenbrook Blvd.)

Roadway Classification: Local

Wash Name (if applicable): Oxford Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 252 cfs (HEC-1 operation C543) (6-hr)

Maximum Depth of Flow: 2.1' (From HEC-RAS model using future Qs)

Duration of Impassable Flow: 1.1 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium X *

High ____ *

Comments: Estimated passable Q = 18 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: _____

Project: Fountain Hills ADMP, FCD 94-16 By: _____

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 14

Location to nearest Quarter Section: NW 1/4 Section 10

Roadway Name: Shagbark Court (S. of Glenbrook Blvd.)

Roadway Classification: Local

Wash Name (if applicable): Oxford Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 758 cfs (HEC-1 operation C547) (6-hr)

Maximum Depth of Flow: 3.3' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 1.4 hrs

Scour/Wash-out Potential: Low ____ * *Notes: _____

Medium X *

High ____ *

Comments: Estimated passable Q = 30 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 15

Location to nearest Quarter Section: NW 1/4 Section 10

Roadway Name: Palmetto Lane (S. of Glenbrook Blvd.)

Roadway Classification: Local

Wash Name (if applicable): Oxford Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 758 cfs (HEC-1 operation C547)(6-hr)

Maximum Depth of Flow: 3.0' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 1.5 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium X *

High ____ *

Comments: Estimated passable Q = 25 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 16

Location to nearest Quarter Section: NW 1/4 Section 10

Roadway Name: Tanglewood Court (S. of Glenbrook Blvd.)

Roadway Classification: Local

Wash Name (if applicable): Oxford Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 3 - 42" x 74' cmp's

Culvert Description: Corrugated metal pipes w/ mitered ends

Future Condition 100-year Discharge: 758 cfs (HEC-1 operation C547) (6-hr)

Maximum Depth of Flow: 2.8' (From HEC-RAS model using future Q)

Duration of Impassable Flow: 0.5 hrs

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ____ *

High ____ *

Comments: Estimated passable Q = 280 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 17

Location to nearest Quarter Section: NW 1/4 of Section 10

Roadway Name: Tamarack Lane

Roadway Classification: Local

Wash Name (if applicable): Oxford Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 758 cfs (HEC-1 operation C547)(6-hr)

Maximum Depth of Flow: 2.9' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 16 hrs

Scour/Wash-out Potential: Low ___ * *Notes:

Medium X *

High ___ *

Comments: Estimated passable Q = 20 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 18

Location to nearest Quarter Section: NE 1/4 of Section 10

Roadway Name: Mayflower Drive

Roadway Classification: Local

Wash Name (if applicable): Oxford Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 759 cfs (HEC-1 operation C547) (6-hr)

Maximum Depth of Flow: 3.0'

Duration of Impassable Flow: 1.7 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium X *

High ____ *

Comments: Estimated passable Q = 15 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 19

Location to nearest Quarter Section: NE 1/4 of Section 10

Roadway Name: Greenhurst Ave (S of Glenbrook Blvd.)

Roadway Classification: Collector

Wash Name (if applicable): Oxford Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 758 cfs (HEC-1 operation C547) (6-hr)

Maximum Depth of Flow: 2.8' (From HEC-RAS model using future Qs)

Duration of Impassable Flow: 1.6 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

Comments: Estimated passable Q = 19 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: _____

Project: Fountain Hills ADMP, FCD 94-16 By: _____

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 20

Location to nearest Quarter Section: NE 1/4 of Section 10

Roadway Name: Glenbrook Blvd and Mayflower Drive

Roadway Classification: Collector

Wash Name (if applicable): Tributary of Oxford Wash (entering from North)

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 271 cfs (HEC-1 operation CS46)(6-hr)

Maximum Depth of Flow: 0.9' (see attached worksheets)

Duration of Impassable Flow: 0.9 hrs

Scour/Wash-out Potential: Low X * *Notes: _____

Medium ___ *

High ___ *

Comments: Estimated passable Q = 88 cfs

George V. Sabol Consulting Engineers, Inc.

SHEET _____ OF _____

CLIENT FCDMC

DATE _____

PROJECT FOUNTAIN HILLS ADMP

BY _____

SUBJECT EAFPL ID # 20

PROJECT NO. _____

Geometry and mannings n estimate for normal depth cross section at dip crossing

Station	Description	Elevation	n
10+00	N. EOP	1674	0.045
10+55	℄ of Glenbrook	1672	0.045
11+00	S. EOP	1672	0.045
11+40	Existing structure	1672.9	0.045

slope = 2.5%

EAFPL 20: Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	eafpl_20
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data					
Channel Slope	0.025000 ft/ft				
Elevation range: 1,672.00 ft to 1,674.00 ft.					
Station (ft)	Elevation (ft)		Start Station	End Station	Roughness
1,000.00	1,674.00		1,000.00	1,141.00	0.045
1,055.00	1,672.00				
1,100.00	1,672.00				
1,140.00	1,672.90				
1,141.00	1,674.00				
Discharge	271.00	cfs			

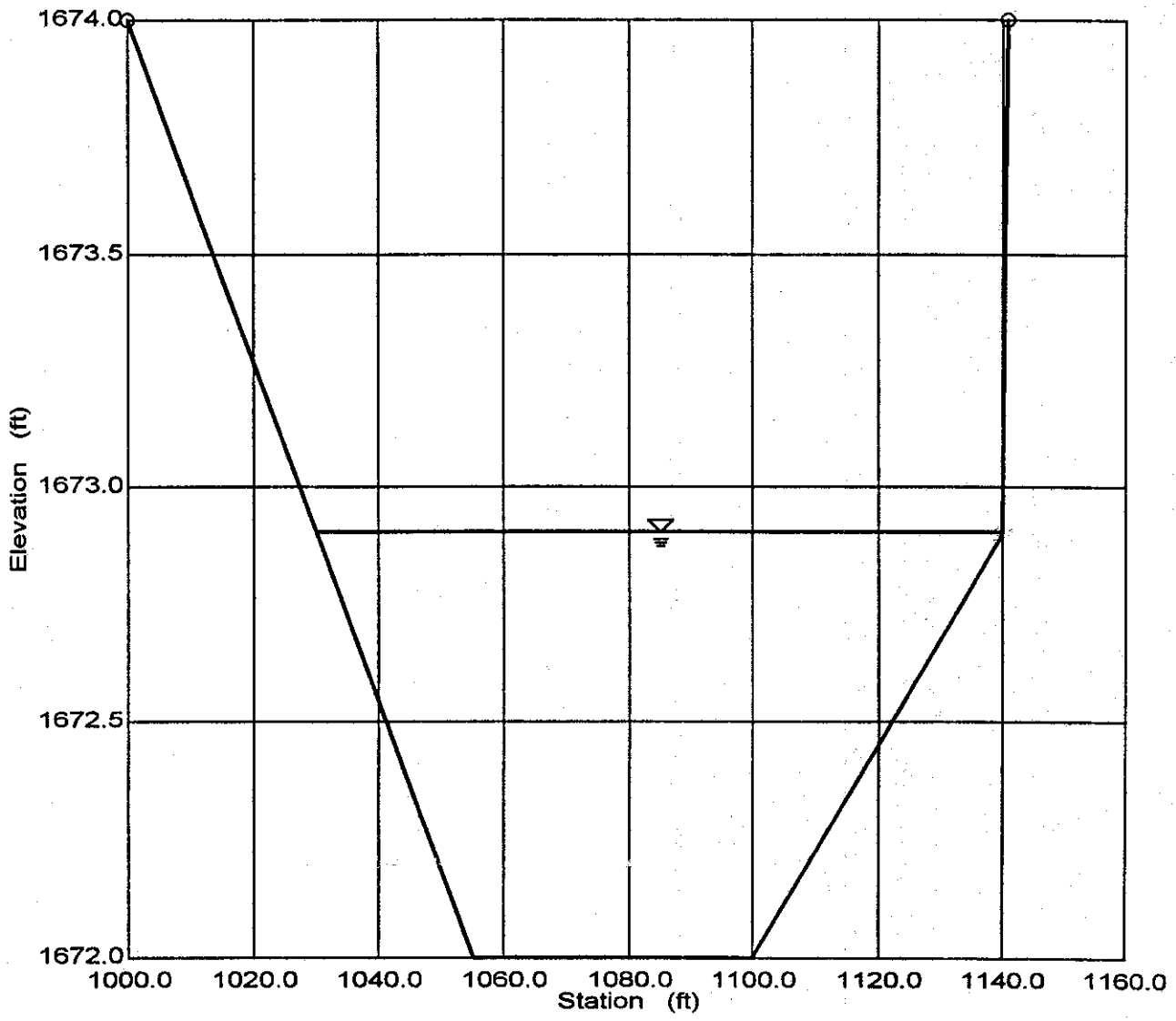
Results		
Wtd. Mannings Coefficient	0.045	
Water Surface Elevation	1,672.90	ft
Flow Area	70.07	ft^2
Wetted Perimeter	109.89	ft
Top Width	109.86	ft
Height	0.90	ft
Critical Depth	1,672.83	ft
Critical Slope	0.035135	ft/ft
Velocity	3.87	ft/s
Velocity Head	0.23	ft
Specific Energy	1,673.14	ft
Froude Number	0.85	
Flow is subcritical.		

Cross Section for irregular channel

Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	eafpl_20
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.045	
Channel Slope	0.025000	ft/ft
Water Surface Elevation	1,672.90	ft
Discharge	271.00	cfs



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 21 (ADMP 9)

Location to nearest Quarter Section: NE 1/4 of Section 10

Roadway Name: Fairlynn Dr. (S. of Oxford Dr.)

Roadway Classification: Local

Wash Name (if applicable): Tatera Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 883 cfs (HEC-1 operation C518R)(6-hr

Maximum Depth of Flow: 3.6' (From HEC-RAS model using future Q

Duration of Impassable Flow: 2.2 hrs

Scour/Wash-out Potential: Low ___ * *Notes:

Medium X *

High ___ *

Comments: Estimated passable Q = 15 cfs

NOTE: Break out flows down Oxford Dr toward Fountain Hills Blvd. (see FIS TDN)

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 22 (ADMP 8)

Location to nearest Quarter Section: NE 1/4 of Section 10

Roadway Name: Fountain Hills Blvd

Roadway Classification: Arterial

Wash Name (if applicable): Oxford Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road Crossing

Future Condition 100-year Discharge: 883 cfs (HEC-1 operation C5418R)(6-hr

Maximum Depth of Flow: 2.7' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 1.3 hrs

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ____ *

High ____ *

Comments: Estimated passable Q = 55 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 23

Location to nearest Quarter Section: NW 1/4 of Section 9

Roadway Name: Kings Way (East of Fountain Hills Blvd)

Roadway Classification: Local

Wash Name (if applicable): Sheard Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 1,241 cfs (HEC-1 operation CS48)(6-HR)

Maximum Depth of Flow: 6.4' (From HEC-RAS model using future Q's

Duration of Impassable Flow: 16.8 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium ____ *

High X *

Comments: Estimated passable Q = 9 cfs

Oxford Wash; EAP HEC-RAS Model for estimating Future Cond depths and passable Q's

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Max Chl Dpth (ft)
0.986	150	1715.6	1718.89	1716.83	1718.93	0.000437	1.61	106.47	44.36	0.16	3.29
0.986	188	1715.6	1719.14	1716.98	1719.19	0.000516	1.85	117.73	45.9	0.18	3.54
0.986	10	1715.6	1716.87	1715.88	1716.87	0.000091	0.35	29.76	31.36	0.06	1.27
0.986	20	1715.6	1717.13	1716	1717.13	0.000168	0.55	38.03	33.12	0.09	1.53
0.986	30	1715.6	1717.32	1716.09	1717.33	0.000231	0.71	44.56	34.35	0.11	1.72
0.986	40	1715.6	1717.49	1716.19	1717.5	0.000283	0.85	50.29	35.4	0.12	1.89
0.986	50	1715.6	1717.62	1716.25	1717.63	0.000336	0.98	55.06	36.25	0.13	2.02
0.986	200	1715.6	1718.91	1717.03	1718.97	0.000766	2.14	107.03	44.44	0.22	3.31
0.986	220	1715.6	1719.03	1717.09	1719.11	0.000801	2.25	112.69	45.22	0.22	3.43
0.986	240	1715.6	1719.15	1717.17	1719.23	0.000834	2.35	118.11	45.96	0.23	3.55
0.986	260	1715.6	1719.27	1717.24	1719.35	0.000863	2.45	123.48	46.67	0.24	3.67
0.986	280	1715.6	1719.38	1717.31	1719.47	0.00089	2.54	128.78	47.37	0.24	3.78
0.986	300	1715.6	1719.49	1717.37	1719.59	0.000915	2.63	133.91	48.03	0.24	3.89
0.931	210	1716.2	1718.26	1717.74	1718.52	0.00622	4.17	53.91	34.8	0.56	2.06
0.931	252	1716.2	1718.43	1717.88	1718.74	0.006515	4.54	59.75	35.47	0.59	2.23
0.931	10	1716.2	1716.75	1716.62	1716.78	0.00784	1.46	7.01	23.75	0.47	0.55
0.931	20	1716.2	1716.93	1716.73	1716.98	0.006764	1.77	11.61	26.52	0.47	0.73
0.931	30	1716.2	1717.07	1716.83	1717.13	0.006539	2	15.42	28.61	0.48	0.87
0.931	40	1716.2	1717.2	1716.91	1717.27	0.006256	2.17	19.05	30.48	0.48	1
0.931	50	1716.2	1717.28	1716.99	1717.37	0.006389	2.38	21.71	30.87	0.49	1.08
0.931	200	1716.2	1718.22	1717.69	1718.47	0.006102	4.07	52.56	34.65	0.56	2.02
0.931	220	1716.2	1718.32	1717.78	1718.59	0.006061	4.21	56.02	35.05	0.56	2.12
0.931	240	1716.2	1718.42	1717.84	1718.7	0.006013	4.35	59.41	35.43	0.56	2.22
0.931	260	1716.2	1718.51	1717.91	1718.81	0.005995	4.48	62.65	35.8	0.57	2.31
0.931	280	1716.2	1718.6	1717.97	1718.92	0.00594	4.6	65.95	36.17	0.57	2.4
0.931	300	1716.2	1718.69	1718.04	1719.02	0.005922	4.72	69.06	36.51	0.57	2.49
0.888	210	1714	1715.62	1715.49	1716.03	0.023383	5.15	41.24	36.13	0.83	1.62
0.888	252	1714	1715.79	1715.64	1716.24	0.021465	5.39	47.43	37.02	0.82	1.79
0.888	10	1714	1714.48	1714.37	1714.53	0.014365	1.71	5.83	20.58	0.57	0.48
0.888	20	1714	1714.63	1714.51	1714.7	0.016195	2.16	9.27	25.04	0.62	0.63
0.888	30	1714	1714.74	1714.61	1714.83	0.017256	2.45	12.22	28.32	0.66	0.74
0.888	40	1714	1714.82	1714.7	1714.94	0.019248	2.77	14.45	30.18	0.7	0.82
0.888	50	1714	1714.9	1714.77	1715.03	0.018805	2.97	16.82	30.76	0.71	0.9
0.888	200	1714	1715.57	1715.46	1715.98	0.024871	5.17	39.12	35.75	0.85	1.57
0.888	220	1714	1715.63	1715.52	1716.07	0.025292	5.37	41.43	36.16	0.87	1.63
0.888	240	1714	1715.68	1715.6	1716.17	0.026313	5.62	43.19	36.41	0.89	1.68
0.888	260	1714	1715.73	1715.67	1716.26	0.026889	5.84	45.08	36.68	0.91	1.73
0.888	280	1714	1715.77	1715.71	1716.34	0.027998	6.09	46.62	36.9	0.93	1.77

Oxford Wash; EAP HEC-RAS Model for estimating Future Cond depths and passable Q's

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Max Chl Dpth (ft)
0.888	300	1714	1715.82	1715.78	1716.43	0.02862	6.3	48.35	37.15	0.94	1.82
0.832	530	1707.2	1709.31	1709.31	1710.21	0.018325	7.73	73.1	43.29	0.99	2.11
0.832	758	1707.2	1709.81	1709.81	1710.92	0.016785	8.64	95.42	45.98	0.98	2.61
0.832	10	1707.2	1707.52	1707.52	1707.6	0.044663	2.18	4.59	31.41	1	0.32
0.832	20	1707.2	1707.61	1707.61	1707.72	0.037575	2.7	7.43	32.61	0.99	0.41
0.832	30	1707.2	1707.68	1707.68	1707.83	0.035209	3.08	9.77	33.57	1	0.48
0.832	40	1707.2	1707.75	1707.75	1707.92	0.032438	3.34	12.03	34.47	0.99	0.55
0.832	50	1707.2	1707.81	1707.81	1708	0.030871	3.57	14.07	35.21	0.99	0.61
0.832	200	1707.2	1708.41	1708.41	1708.9	0.023083	5.67	36.25	38.44	1	1.21
0.832	220	1707.2	1708.47	1708.47	1709	0.02263	5.85	38.74	38.79	1	1.27
0.832	240	1707.2	1708.54	1708.54	1709.09	0.021909	5.99	41.37	39.15	0.99	1.34
0.832	260	1707.2	1708.6	1708.6	1709.18	0.021455	6.15	43.82	39.49	0.99	1.4
0.832	280	1707.2	1708.67	1708.67	1709.27	0.020772	6.27	46.42	39.84	0.98	1.47
0.832	300	1707.2	1708.73	1708.73	1709.35	0.020356	6.4	48.83	40.16	0.98	1.53
0.751	530	1693.3	1695.7	1695.7	1696.59	0.032099	7.58	69.92	128.77	1	2.5
0.751	758	1693.3	1696.21	1696.21	1697.29	0.032277	8.35	90.81	183.9	1	3.01
0.751	10	1693.3	1693.65	1693.6	1693.71	0.020292	1.89	5.3	41.65	0.69	0.45
0.751	20	1693.3	1693.78	1693.71	1693.87	0.020453	2.38	8.42	48.65	0.73	0.58
0.751	30	1693.3	1693.87	1693.8	1693.99	0.021667	2.79	10.76	52.67	0.76	0.67
0.751	40	1693.3	1693.96	1693.88	1694.1	0.021989	3.09	12.95	56.35	0.78	0.76
0.751	50	1693.3	1694.03	1693.95	1694.2	0.022558	3.36	14.9	60.21	0.8	0.83
0.751	200	1693.3	1694.77	1694.67	1695.23	0.026212	5.41	36.99	111.83	0.89	1.57
0.751	220	1693.3	1694.83	1694.75	1695.33	0.027279	5.64	39.04	113	0.91	1.63
0.751	240	1693.3	1694.92	1694.82	1695.43	0.026934	5.75	41.76	114.5	0.91	1.72
0.751	260	1693.3	1694.98	1694.89	1695.52	0.027838	5.95	43.72	115.58	0.92	1.78
0.751	280	1693.3	1695.04	1694.96	1695.62	0.028425	6.12	45.79	116.69	0.93	1.84
0.751	300	1693.3	1695.1	1695.03	1695.71	0.028947	6.27	47.82	117.78	0.94	1.9
0.678	530	1682.5	1685.31	1684.62	1685.78	0.008608	5.62	98.62	42.63	0.62	2.81
0.678	758	1682.5	1686.05	1685.14	1686.62	0.007327	6.14	132.17	60.06	0.59	3.55
0.678	10	1682.5	1682.77	1682.77	1682.85	0.044466	2.28	4.38	27.1	1	0.27
0.678	20	1682.5	1682.86	1682.86	1682.99	0.041186	2.84	7.04	28.54	1.01	0.36
0.678	30	1682.5	1682.94	1682.94	1683.1	0.040055	3.23	9.29	29.7	1.02	0.44
0.678	40	1682.5	1683.01	1683.01	1683.2	0.038165	3.49	11.46	30.78	1.01	0.51
0.678	50	1682.5	1683.07	1683.07	1683.29	0.037678	3.73	13.4	31.72	1.01	0.57
0.678	200	1682.5	1683.71	1683.71	1684.21	0.031551	5.68	35.39	36.49	1	1.21
0.678	220	1682.5	1683.78	1683.78	1684.3	0.030077	5.81	38.07	36.77	0.99	1.28
0.678	240	1682.5	1683.84	1683.84	1684.4	0.02998	6.01	40.21	37	1	1.34

Oxford Wash; EAP HEC-RAS Model for estimating Future Cond depths and passable Q's

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Max Chl Dpth (ft)
0.678	260	1682.5	1683.9	1683.9	1684.49	0.02939	6.17	42.51	37.23	1	1.4
0.678	280	1682.5	1683.96	1683.96	1684.58	0.02889	6.32	44.74	37.46	1	1.46
0.678	300	1682.5	1684.02	1684.02	1684.66	0.02844	6.46	46.93	37.69	1	1.52
0.669	530	1677.78	1685.51	1681.72	1685.61	0.000455	3.1	221.14	46.26	0.71	7.73
0.669	758	1677.78	1686.26	1682.78	1686.43	0.000631	3.88	257.53	50.03	0.93	8.48
0.669	10	1677.78	1678.61	1678.05	1678.62	0.000941	1.01	9.94	15.35	0.4	0.83
0.669	20	1677.78	1678.96	1678.22	1678.99	0.001168	1.42	14.13	16.76	0.49	1.18
0.669	30	1677.78	1679.23	1678.36	1679.28	0.00131	1.72	17.41	17.86	0.54	1.45
0.669	40	1677.78	1679.46	1678.48	1679.52	0.001419	1.98	20.2	18.8	0.58	1.68
0.669	50	1677.78	1679.68	1678.59	1679.75	0.001489	2.2	22.76	19.67	0.61	1.9
0.669	200	1677.78	1682.3	1679.82	1682.51	0.001318	3.69	54.24	31.22	0.95	4.52
0.669	220	1677.78	1682.9	1679.96	1683.1	0.00105	3.58	61.5	34.31	0.99	5.12
0.669	240	1677.78	1683.6	1680.11	1683.66	0.000302	2.09	140.96	37.89	1	5.82
0.669	260	1677.78	1683.85	1680.22	1683.9	0.000299	2.14	150.29	39.07	1	6.07
0.669	280	1677.78	1684.05	1680.34	1684.11	0.000303	2.2	158.32	40.06	0.99	6.27
0.669	300	1677.78	1684.19	1680.46	1684.26	0.000316	2.28	164.21	40.7	1	6.41
0.6625	530										
0.6625	758										
0.6625	10										
0.6625	20										
0.6625	30										
0.6625	40										
0.6625	50										
0.6625	200										
0.6625	220										
0.6625	240										
0.6625	260										
0.6625	280										
0.6625	300										
0.656	530	1677.4	1681.11	1681.11	1681.83	0.007648	7.78	86.72	36.75	0.71	3.71
0.656	758	1677.4	1681.28	1681.28	1682.56	0.012936	10.44	93.2	37.44	0.93	3.88
0.656	10	1677.4	1677.91	1677.68	1677.95	0.004643	1.62	6.16	14.31	0.4	0.51
0.656	20	1677.4	1678.11	1677.85	1678.19	0.006349	2.35	8.5	15.19	0.49	0.71
0.656	30	1677.4	1678.27	1677.98	1678.4	0.007168	2.87	10.46	15.93	0.54	0.87
0.656	40	1677.4	1678.41	1678.1	1678.58	0.007833	3.31	12.1	16.54	0.58	1.01
0.656	50	1677.4	1678.53	1678.21	1678.74	0.008389	3.69	13.55	17.09	0.61	1.13
0.656	200	1677.4	1679.52	1679.44	1680.48	0.01656	7.88	25.39	23.68	0.95	2.12

Oxford Wash; EAP HEC-RAS Model for estimating Future Cond depths and passable Q's

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Max Chl Dpth (ft)
0.656	220	1677.4	1679.6	1679.58	1680.68	0.017706	8.35	26.35	24.73	0.99	2.2
0.656	240	1677.4	1679.71	1679.71	1680.87	0.017769	8.66	27.73	26.24	1	2.31
0.656	260	1677.4	1679.85	1679.85	1681.06	0.017143	8.84	29.41	28.07	1	2.45
0.656	280	1677.4	1679.97	1679.97	1681.25	0.016892	9.07	30.88	29.68	0.99	2.57
0.656	300	1677.4	1680.08	1680.08	1681.43	0.016948	9.33	32.15	31.07	1	2.68
0.638	530	1676.5	1678.85	1678.85	1679.8	0.019163	8.08	71.37	38.77	0.98	2.35
0.638	758	1676.5	1679.38	1679.38	1680.56	0.017875	9.04	92.35	40.32	0.98	2.88
0.638	10	1676.5	1676.86	1676.86	1676.96	0.039947	2.46	4.07	22.68	1.02	0.36
0.638	20	1676.5	1677.01	1676.98	1677.11	0.026144	2.53	7.92	28.81	0.85	0.51
0.638	30	1676.5	1677.09	1677.06	1677.22	0.026095	2.95	10.2	29.32	0.87	0.59
0.638	40	1676.5	1677.15	1677.13	1677.32	0.027348	3.34	12.04	29.72	0.91	0.65
0.638	50	1676.5	1677.21	1677.19	1677.42	0.027104	3.64	13.89	30.12	0.93	0.71
0.638	200	1676.5	1677.88	1677.88	1678.41	0.023435	5.94	35.24	34.4	0.98	1.38
0.638	220	1676.5	1677.95	1677.95	1678.51	0.02293	6.12	37.77	34.87	0.98	1.45
0.638	240	1676.5	1678.02	1678.02	1678.61	0.022156	6.26	40.44	35.36	0.97	1.52
0.638	260	1676.5	1678.08	1678.08	1678.71	0.022302	6.47	42.53	35.75	0.98	1.58
0.638	280	1676.5	1678.15	1678.15	1678.81	0.021622	6.59	45.11	36.21	0.97	1.65
0.638	300	1676.5	1678.21	1678.21	1678.9	0.021566	6.76	47.26	36.59	0.98	1.71
0.542	530	1662.2	1664.7	1664.7	1665.64	0.020769	7.82	70.01	38.79	0.98	2.5
0.542	758	1662.2	1665.22	1665.22	1666.39	0.019077	8.77	90.8	41.12	0.98	3.02
0.542	10	1662.2	1662.67	1662.58	1662.72	0.012172	1.74	5.73	20.25	0.58	0.47
0.542	20	1662.2	1662.71	1662.71	1662.86	0.032896	3.06	6.53	20.88	0.96	0.51
0.542	30	1662.2	1662.82	1662.8	1663	0.029495	3.36	8.93	22.64	0.94	0.62
0.542	40	1662.2	1662.9	1662.89	1663.11	0.030129	3.7	10.8	23.94	0.97	0.7
0.542	50	1662.2	1662.97	1662.97	1663.22	0.030308	3.97	12.58	25.1	0.99	0.77
0.542	200	1662.2	1663.76	1663.71	1664.25	0.021874	5.63	35.82	32.91	0.94	1.56
0.542	220	1662.2	1663.82	1663.79	1664.35	0.022147	5.84	38.07	33.42	0.95	1.63
0.542	240	1662.2	1663.91	1663.86	1664.45	0.02154	5.96	40.79	34.02	0.94	1.71
0.542	260	1662.2	1663.98	1663.92	1664.55	0.021041	6.07	43.46	34.61	0.93	1.78
0.542	280	1662.2	1664.05	1664	1664.65	0.02094	6.21	45.82	35.12	0.94	1.85
0.542	300	1662.2	1664.12	1664.07	1664.74	0.020708	6.32	48.26	35.64	0.94	1.92
0.473	530	1654.5	1656.96	1656.96	1657.94	0.021698	8.03	68.78	37.06	0.99	2.46
0.473	758	1654.5	1657.51	1657.51	1658.72	0.019534	8.94	89.93	39.29	0.98	3.01
0.473	10	1654.5	1654.96	1654.96	1655.04	0.051041	2.37	4.21	26.29	1.04	0.46
0.473	20	1654.5	1655.16	1655.06	1655.22	0.014354	2.07	9.65	27.54	0.62	0.66
0.473	30	1654.5	1655.24	1655.14	1655.34	0.01592	2.49	12.05	28.09	0.67	0.74
0.473	40	1654.5	1655.33	1655.21	1655.45	0.015518	2.75	14.55	28.65	0.68	0.83

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Max Chl Dpth (ft)
0.473	50	1654.5	1655.41	1655.28	1655.55	0.015324	2.98	16.82	29.16	0.69	0.91
0.473	200	1654.5	1656.08	1655.98	1656.53	0.02059	5.39	37.72	33.48	0.88	1.58
0.473	220	1654.5	1656.15	1656.05	1656.63	0.020307	5.56	40.24	33.84	0.88	1.65
0.473	240	1654.5	1656.21	1656.13	1656.73	0.020915	5.81	42.09	34.05	0.9	1.71
0.473	260	1654.5	1656.26	1656.18	1656.82	0.021498	6.05	43.87	34.26	0.92	1.76
0.473	280	1654.5	1656.32	1656.25	1656.92	0.021644	6.24	45.85	34.49	0.93	1.82
0.473	300	1654.5	1656.37	1656.32	1657.01	0.021874	6.43	47.72	34.71	0.94	1.87
0.397	640	1645.9	1648.22	1648.22	1649.16	0.019334	7.97	86.97	48.5	0.98	2.32
0.397	883	1645.9	1648.68	1648.68	1649.83	0.018108	8.83	110.05	50.73	0.98	2.78
0.397	10	1645.9	1646.25	1646.25	1646.33	0.036965	2.3	4.36	25.13	0.97	0.35
0.397	20	1645.9	1646.35	1646.35	1646.47	0.037767	2.78	7.2	31.06	1.01	0.45
0.397	30	1645.9	1646.43	1646.43	1646.57	0.035157	3.01	9.99	34.86	0.99	0.53
0.397	40	1645.9	1646.49	1646.49	1646.66	0.036336	3.29	12.2	37.59	1.01	0.59
0.397	50	1645.9	1646.55	1646.55	1646.74	0.034468	3.52	14.29	38.27	1.01	0.65
0.397	200	1645.9	1647.13	1647.13	1647.59	0.024648	5.47	37.78	41.91	0.98	1.23
0.397	220	1645.9	1647.18	1647.18	1647.68	0.02503	5.7	39.95	42.23	1	1.28
0.397	240	1645.9	1647.24	1647.24	1647.77	0.024541	5.87	42.5	42.61	1	1.34
0.397	260	1645.9	1647.31	1647.31	1647.85	0.023663	5.99	45.25	43.01	0.99	1.41
0.397	280	1645.9	1647.36	1647.36	1647.94	0.023526	6.15	47.55	43.34	0.99	1.46
0.397	300	1645.9	1647.41	1647.41	1648.02	0.023281	6.3	49.87	43.67	0.99	1.51
0.338	640	1641.29	1644.49	1643.56	1644.74	0.00461	4.47	190.03	99.78	0.47	3.2
0.338	883	1641.29	1645.06	1643.96	1645.34	0.004256	4.83	249.85	111.13	0.46	3.77
0.338	10	1641.29	1641.84	1641.64	1641.87	0.004139	1.21	8.29	28.27	0.39	0.55
0.338	20	1641.29	1642.01	1641.78	1642.04	0.004367	1.42	14.1	40.3	0.42	0.72
0.338	30	1641.29	1642.12	1641.88	1642.17	0.004647	1.61	18.81	43.12	0.42	0.83
0.338	40	1641.29	1642.22	1641.96	1642.27	0.004839	1.78	22.99	45.48	0.42	0.93
0.338	50	1641.29	1642.3	1642.02	1642.36	0.005025	1.93	26.75	47.5	0.43	1.01
0.338	200	1641.29	1643.09	1642.58	1643.24	0.005649	3.22	71.95	67.2	0.47	1.8
0.338	220	1641.29	1643.17	1642.64	1643.33	0.005622	3.32	77.49	69.23	0.48	1.88
0.338	240	1641.29	1643.24	1642.69	1643.41	0.005635	3.42	82.72	71.1	0.48	1.95
0.338	260	1641.29	1643.32	1642.75	1643.49	0.005593	3.51	88.18	72.99	0.48	2.03
0.338	280	1641.29	1643.39	1642.8	1643.57	0.00555	3.59	93.61	74.83	0.48	2.1
0.338	300	1641.29	1643.46	1642.85	1643.65	0.005505	3.67	99	76.61	0.48	2.17
0.327	640	1641.1	1643.53	1643.32	1644.26	0.01266	7.23	106.92	64.88	0.84	2.43
0.327	883	1641.1	1644.1	1643.85	1644.91	0.010592	7.68	147.95	78.57	0.8	3
0.327	10	1641.1	1641.43	1641.35	1641.47	0.012694	1.5	6.87	32.63	0.57	0.33
0.327	20	1641.1	1641.53	1641.45	1641.59	0.016087	2.01	10.28	37.66	0.67	0.43

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Max Chl Dpth (ft)
0.327	30	1641.1	1641.6	1641.53	1641.68	0.017263	2.41	12.9	38.34	0.72	0.5
0.327	40	1641.1	1641.67	1641.59	1641.77	0.016649	2.67	15.59	39.03	0.73	0.57
0.327	50	1641.1	1641.73	1641.64	1641.86	0.016023	2.89	18.13	39.66	0.73	0.63
0.327	200	1641.1	1642.39	1642.23	1642.72	0.013709	4.74	46.31	46.13	0.78	1.29
0.327	220	1641.1	1642.45	1642.3	1642.81	0.013638	4.91	49.4	46.79	0.79	1.35
0.327	240	1641.1	1642.53	1642.36	1642.9	0.013154	5.02	52.97	47.54	0.78	1.43
0.327	260	1641.1	1642.6	1642.41	1642.98	0.01289	5.15	56.25	48.21	0.78	1.5
0.327	280	1641.1	1642.65	1642.47	1643.06	0.012957	5.31	59	48.77	0.79	1.55
0.327	300	1641.1	1642.71	1642.52	1643.14	0.013058	5.46	61.63	49.3	0.8	1.61
0.235	640	1635.4	1639.14	1638.29	1639.51	0.007553	5.53	164.88	109.94	0.54	3.74
0.235	883	1635.4	1639.42	1639.06	1639.92	0.00973	6.62	195.14	111.01	0.62	4.02
0.235	10	1635.4	1636.17	1635.96	1636.21	0.009496	1.55	6.44	16.35	0.44	0.77
0.235	20	1635.4	1636.42	1636.14	1636.47	0.007808	1.8	11.42	26.67	0.42	1.02
0.235	30	1635.4	1636.59	1636.26	1636.64	0.006949	1.97	16.51	32.66	0.42	1.19
0.235	40	1635.4	1636.7	1636.37	1636.77	0.006998	2.15	20.35	33.75	0.43	1.3
0.235	50	1635.4	1636.79	1636.48	1636.87	0.007145	2.33	23.55	34.76	0.44	1.39
0.235	200	1635.4	1637.73	1637.17	1637.92	0.007334	3.75	60.89	44.91	0.49	2.33
0.235	220	1635.4	1637.83	1637.23	1638.03	0.007315	3.87	65.2	45.94	0.49	2.43
0.235	240	1635.4	1637.9	1637.3	1638.12	0.007523	4.02	68.67	46.75	0.5	2.5
0.235	260	1635.4	1637.98	1637.37	1638.21	0.007619	4.15	72.38	47.6	0.51	2.58
0.235	280	1635.4	1638.07	1637.42	1638.31	0.007527	4.24	76.66	48.57	0.51	2.67
0.235	300	1635.4	1638.16	1637.48	1638.4	0.007426	4.32	80.95	49.51	0.51	2.76
0.158	640	1630.2	1632.86	1632.86	1633.73	0.035788	7.46	85.77	84.97	1	2.66
0.158	883	1630.2	1633.4	1633.4	1633.94	0.025643	6.33	163.43	127.77	0.81	3.2
0.158	10	1630.2	1630.57	1630.5	1630.64	0.021391	2.11	4.73	16.51	0.7	0.37
0.158	20	1630.2	1630.69	1630.65	1630.82	0.030768	2.91	6.86	18.94	0.85	0.49
0.158	30	1630.2	1630.77	1630.76	1630.97	0.040919	3.61	8.32	20.44	1	0.57
0.158	40	1630.2	1630.86	1630.86	1631.09	0.040953	3.89	10.29	22.31	1.01	0.66
0.158	50	1630.2	1630.95	1630.95	1631.2	0.038279	4.02	12.44	24.19	1.01	0.75
0.158	200	1630.2	1631.68	1631.68	1632.18	0.037532	5.66	35.33	36.66	1.01	1.48
0.158	220	1630.2	1631.74	1631.74	1632.27	0.037972	5.84	37.69	40.44	1.01	1.54
0.158	240	1630.2	1631.83	1631.83	1632.36	0.03593	5.86	40.96	47.71	1	1.63
0.158	260	1630.2	1631.9	1631.9	1632.45	0.035377	5.96	43.66	53.61	0.99	1.7
0.158	280	1630.2	1631.95	1631.95	1632.53	0.036573	6.15	45.53	55.17	1.01	1.75
0.158	300	1630.2	1632.01	1632.01	1632.62	0.036548	6.26	47.9	57.07	1.01	1.81
0.14	640	1629	1631.48	1630.3	1631.5	0.000159	1.66	512.03	344.05	0.19	2.48
0.14	883	1629	1631.7	1630.55	1631.73	0.000199	1.97	587.65	354.46	0.22	2.7

Oxford Wash; EAP HEC-RAS Model for estimating Future Cond depths and passable Q's

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Max Chl Dpth (ft)
0.14	10	1629	1629.24	1629.24	1629.31	0.010282	2.11	5.13	41.94	0.97	0.24
0.14	20	1629	1629.32	1629.32	1629.41	0.008709	2.48	9	55.54	0.94	0.32
0.14	30	1629	1629.38	1629.38	1629.48	0.007639	2.74	12.64	65.83	0.92	0.38
0.14	40	1629	1629.43	1629.43	1629.54	0.007004	2.93	16.15	74.41	0.91	0.43
0.14	50	1629	1629.47	1629.47	1629.6	0.006906	3.14	19.19	81.11	0.92	0.47
0.14	200	1629	1630.01	1629.84	1630.11	0.002026	3.13	87.34	169.76	0.58	1.01
0.14	220	1629	1630.08	1629.87	1630.17	0.001809	3.09	98.84	184.19	0.55	1.08
0.14	240	1629	1630.14	1629.9	1630.23	0.001669	3.09	109.53	196.67	0.54	1.14
0.14	260	1629	1630.19	1629.93	1630.28	0.00153	3.06	120.92	209.14	0.52	1.19
0.14	280	1629	1630.26	1629.96	1630.34	0.001333	2.98	135.55	224.14	0.49	1.26
0.14	300	1629	1630.3	1629.97	1630.38	0.001274	2.98	146.01	235.1	0.48	1.3
0.129	1020	1627	1630.86	1630.86	1631.41	0.015549	8.31	237.32	196.93	0.86	3.86
0.129	1241	1627	1631.13	1631.04	1631.64	0.013706	8.27	293.35	217.67	0.82	4.13
0.129	10	1627	1627.84	1627.77	1627.97	0.025409	2.91	3.43	8.16	0.79	0.84
0.129	20	1627	1628.07	1628	1628.27	0.028038	3.6	5.56	10.39	0.87	1.07
0.129	30	1627	1628.23	1628.18	1628.49	0.030262	4.09	7.33	11.93	0.92	1.23
0.129	40	1627	1628.35	1628.34	1628.67	0.032812	4.54	8.82	13.08	0.97	1.35
0.129	50	1627	1628.45	1628.45	1628.82	0.03502	4.91	10.18	14.05	1.02	1.45
0.129	200	1627	1629.49	1629.49	1629.84	0.015248	5.39	53.82	72.06	0.76	2.49
0.129	220	1627	1629.52	1629.52	1629.91	0.016376	5.68	56.56	73.65	0.79	2.52
0.129	240	1627	1629.59	1629.59	1629.98	0.015987	5.76	61.44	77.38	0.79	2.59
0.129	260	1627	1629.64	1629.64	1630.04	0.016288	5.93	65.18	80.12	0.8	2.64
0.129	280	1627	1629.63	1629.63	1630.11	0.018992	6.39	65.04	80.01	0.86	2.63
0.129	300	1627	1629.7	1629.7	1630.16	0.018202	6.41	70.13	83.6	0.85	2.7
0.075	1020	1618.9	1625.33	1624.87	1626.42	0.013681	8.39	125.18	46.22	0.8	6.43
0.075	1241	1618.9	1625.39	1625.35	1626.94	0.019138	10.03	127.83	47.95	0.95	6.49
0.075	10	1618.9	1619.72	1619.68	1619.92	0.032805	3.58	2.79	5.75	0.91	0.82
0.075	20	1618.9	1620.03	1619.97	1620.3	0.028897	4.12	4.85	7.32	0.89	1.13
0.075	30	1618.9	1620.28	1620.19	1620.58	0.025975	4.41	6.81	8.54	0.87	1.38
0.075	40	1618.9	1620.49	1620.37	1620.82	0.02346	4.57	8.75	9.61	0.84	1.59
0.075	50	1618.9	1620.68	1620.53	1621.02	0.021703	4.7	10.63	10.53	0.83	1.78
0.075	200	1618.9	1622.39	1621.92	1622.86	0.013709	5.52	36.25	19.99	0.72	3.49
0.075	220	1618.9	1622.56	1622.06	1623.03	0.013077	5.54	39.73	21.05	0.71	3.66
0.075	240	1618.9	1622.71	1622.17	1623.19	0.012675	5.58	42.99	21.99	0.7	3.81
0.075	260	1618.9	1622.86	1622.28	1623.35	0.012291	5.62	46.26	22.89	0.7	3.96
0.075	280	1618.9	1622.99	1622.4	1623.49	0.011954	5.66	49.48	23.75	0.69	4.09
0.075	300	1618.9	1623.13	1622.5	1623.63	0.011658	5.7	52.67	24.57	0.69	4.23

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Max Chl Dpth (ft)
0.071	1020	1618.4	1625.2	1625.2	1626.07	0.0104	8.03	177.28	129.9	0.71	6.8
0.071	1241	1618.4	1625.4	1625.4	1626.42	0.011965	8.9	203.65	135.98	0.77	7
0.071	10	1618.4	1619.09	1618.99	1619.25	0.022918	3.21	3.12	5.7	0.76	0.69
0.071	20	1618.4	1619.38	1619.28	1619.64	0.025765	4.09	4.89	6.68	0.84	0.98
0.071	30	1618.4	1619.59	1619.51	1619.93	0.02781	4.71	6.37	7.41	0.89	1.19
0.071	40	1618.4	1619.76	1619.71	1620.18	0.02949	5.2	7.69	8	0.94	1.36
0.071	50	1618.4	1619.91	1619.88	1620.4	0.030464	5.59	8.94	8.52	0.96	1.51
0.071	200	1618.4	1621.42	1621.42	1622.36	0.027955	7.78	25.71	13.73	1	3.02
0.071	220	1618.4	1621.56	1621.56	1622.54	0.027947	7.94	27.7	14.34	1.01	3.16
0.071	240	1618.4	1621.72	1621.72	1622.71	0.02738	7.99	30.02	15.18	1	3.32
0.071	260	1618.4	1621.86	1621.86	1622.87	0.027093	8.08	32.19	15.93	1	3.46
0.071	280	1618.4	1621.99	1621.99	1623.02	0.026896	8.17	34.29	16.62	1	3.59
0.071	300	1618.4	1622.11	1622.11	1623.17	0.026709	8.26	36.34	17.3	1	3.71
0	1040	1605.2	1609.78	1609.15	1610.32	0.008072	6.78	210.8	95	0.64	4.58
0	1241	1605.2	1610	1609.44	1610.64	0.008934	7.43	232.14	99	0.68	4.8
0	10	1605.2	1605.82	1605.82	1605.97	0.04463	3.17	3.15	10.2	1	0.62
0	20	1605.2	1606.02	1606.02	1606.22	0.040532	3.65	5.49	13.38	1	0.82
0	30	1605.2	1606.15	1606.15	1606.41	0.038226	4.02	7.45	14.99	1.01	0.95
0	40	1605.2	1606.28	1606.28	1606.56	0.03587	4.27	9.36	16.4	1	1.08
0	50	1605.2	1606.38	1606.38	1606.69	0.034946	4.51	11.09	17.58	1	1.18
0	200	1605.2	1607.36	1607.36	1607.84	0.022401	5.66	39.04	42.69	0.9	2.16
0	220	1605.2	1607.43	1607.43	1607.93	0.022467	5.81	42.13	43.47	0.9	2.23
0	240	1605.2	1607.5	1607.5	1608.02	0.022649	5.96	45	44.18	0.91	2.3
0	260	1605.2	1607.56	1607.56	1608.1	0.023105	6.13	47.55	44.8	0.92	2.36
0	280	1605.2	1607.63	1607.63	1608.18	0.02258	6.19	50.82	45.58	0.92	2.43
0	300	1605.2	1607.69	1607.69	1608.26	0.022581	6.31	53.59	46.24	0.92	2.49

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 24

Location to nearest Quarter Section: NW 1/4 of Section 10

Roadway Name: Glenbrook Blvd. (S. of Balsam Dr)

Roadway Classification: Collector

Wash Name (if applicable): Tulip Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 2 - 60" x 88' cmp's

Culvert Description: Corrugated metal pipes w/ headwalls

Future Condition 100-year Discharge: 661 cfs (HEC-1 operation CC01)(6-hr)

Maximum Depth of Flow: 1.6' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 0.4 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ____ *

High ____ *

Comments: Estimated passable Q = 430 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 16 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 25

Location to nearest Quarter Section: NW 1/4 Section 10

Roadway Name: Hampstead Drive (S. of Balsam Dr)

Roadway Classification: Collector

Wash Name (if applicable): Tulip Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 950 cfs (HEC-1 operation c6002) (6-hr)

Maximum Depth of Flow: 4.2' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 1.9 hrs

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ____ *

High ____ *

Comments: Estimated passable Q = 15 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 16 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 26

Location to nearest Quarter Section: NE 1/4 of Section 10

Roadway Name: Greenhurst Ave (S of Heather Dr)

Roadway Classification: Collector

Wash Name (if applicable): Legend Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ___

Ponding ___

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 1313 cfs (HEC-1 operation CC03)(6-hr

Maximum Depth of Flow: 4.8' (From HEC-RAS model using future Q's

Duration of Impassable Flow: 5.5 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

Comments: Estimated passable Q = 9 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 16 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 27

Location to nearest Quarter Section: SE 1/4 of Section 10

Roadway Name: Fairlynn Drive (S. of Heather Dr)

Roadway Classification: Local

Wash Name (if applicable): Legend Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 1313 cfs (HEC-1 operation C603)(6-hr)

Maximum Depth of Flow: 4.9' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 5.9 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

Comments: Estimated passable Q = 7 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 16 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 28

Location to nearest Quarter Section: SE 1/4 of Section 10

Roadway Name: Fountain Hills Blvd. (N. of Edgewood Dr.)

Roadway Classification: Arterial

Wash Name (if applicable): Legend Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 1313 cfs (HEC-1 operation c6003)(6-hr)

Maximum Depth of Flow: 3.7' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 4.75 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium X *

High ____ *

Comments: Estimated passable Q = 12 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 16 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 29

Location to nearest Quarter Section: SE 1/4 of Section 10

Roadway Name: Galatea Drive (N of Asbrook Dr)

Roadway Classification: Local

Wash Name (if applicable): Legend Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 1474 cfs (HEC-1 operation c622L)(6-hr)

Maximum Depth of Flow: 4.2' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 6.3 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium X *

High ____

Comments: Estimated passable Q = 7 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 11 Feb 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 36

Location to nearest Quarter Section: NE 1/4 of Section 9

Roadway Name: Eagle Feather (E. of Eagle Rock Dr)

Roadway Classification: Local

Wash Name (if applicable): Tulip Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding X

Culvert Size: 60" cmp

Culvert Description: 60" corrugated metal pipe w/ Headwall

Future Condition 100-year Discharge: 661 cfs (HEC-1 operation c601) (6 hr)

Maximum Depth of Flow: 1.8' (see attached worksheets)

Duration of Impassable Flow: 0.25 hrs

Scour/Wash-out Potential: Low L * *Notes:

Medium ___ *

High ___ *

Comments: Estimated passable Q = 352 cfs

PROJECT: F. HILLS ADMP	
PROJECT No.: 12 041 01	DATE: 11 Feb 97
PAGE: 1 of 1	SCALE:

EAPFL 36

Overflow profile : North top of curb
surveyed using a laser level and linker rod

Pt #	Distance	Elevation
1	10+00	35.43
2	10+58	34.00
3	10+59	33.63
4	10+69	33.62
5	10+70	34.00
6	11+20	34.92

Tailwater section :

assume inlet control — use constant water surface elevation of 20.0

Pipe inverts :

inlet = 20.0
outlet ≈ 16.0
length ≈ 100'

Q = 661 cfs ⇒ WSEL = 35.37

WSEL = 34.12 ⇒ Q = 352 cfs

* neglect the ponding effects on the pipe hydraulics

DESIGNED BY: CHECKED BY:

CURRENT DATE: 02-11-1997 FILE DATE: 02-11-1997
CURRENT TIME: 09:58:47 FILE NAME: EAPFL-36

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	20.00	16.00	100.08	1 CSP	5.00	5.00	.024	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (cfs) FILE: EAPFL-36 DATE: 02-11-1997

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
20.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
23.17	66.0	66.0	0.0	0.0	0.0	0.0	0.0	0.00	1
25.02	132.0	132.0	0.0	0.0	0.0	0.0	0.0	0.00	1
27.22	198.0	198.0	0.0	0.0	0.0	0.0	0.0	0.00	1
30.22	264.0	264.0	0.0	0.0	0.0	0.0	0.0	0.00	1
33.88	330.0	325.9	0.0	0.0	0.0	0.0	0.0	3.92	8
34.58	396.0	336.4	0.0	0.0	0.0	0.0	0.0	57.57	4
34.86	462.0	340.5	0.0	0.0	0.0	0.0	0.0	117.23	4
35.06	528.0	343.5	0.0	0.0	0.0	0.0	0.0	182.41	4
35.22	594.0	345.7	0.0	0.0	0.0	0.0	0.0	242.86	3
35.37	660.0	347.8	0.0	0.0	0.0	0.0	0.0	306.91	3
33.62	321.9	321.9	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: EAPFL-36 DATE: 02-11-1997

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
20.00	0.000	0.00	0.00	0.00
23.17	0.000	66.00	0.00	0.00
25.02	0.000	132.00	0.00	0.00
27.22	0.000	198.00	0.00	0.00
30.22	0.000	264.00	0.00	0.00
33.88	-0.004	330.00	0.21	0.06
34.58	-0.009	396.00	2.07	0.52
34.86	-0.010	462.00	4.28	0.93
35.06	-0.004	528.00	2.13	0.40
35.22	-0.009	594.00	5.44	0.92
35.37	-0.008	660.00	5.29	0.80

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

****

CURRENT DATE: 02-11-1997 FILE DATE: 02-11-1997
CURRENT TIME: 09:58:47 FILE NAME: EAPFL-36

****

PERFORMANCE CURVE FOR CULVERT 1 - 1(5.00 (ft) BY 5.00 (ft)) CSP

****

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	20.00	0.00	0.00	0-NF	0.00	0.00	0.00	4.00	0.00	0.00
66.00	23.17	3.17	0.48	1-S2n	1.63	2.28	1.58	4.00	12.40	0.00
132.00	25.02	5.02	2.06	1-S2n	2.40	3.28	2.43	4.00	13.95	0.00
198.00	27.22	7.22	4.84	1-S2n	3.09	4.01	3.13	4.00	15.30	0.00
264.00	30.22	10.22	8.45	5-S2n	3.84	4.51	3.89	4.00	16.15	0.00
325.87	33.88	13.88	12.73	2-M2c	5.00	4.97	4.97	4.00	16.65	0.00
336.36	34.57	14.57	13.49	6-FFc	5.00	5.00	5.00	4.00	17.13	0.00
340.48	34.85	14.85	13.80	6-FFc	5.00	5.00	5.00	4.00	17.34	0.00
343.45	35.06	15.06	14.03	6-FFc	5.00	5.00	5.00	4.00	17.49	0.00
345.70	35.21	15.21	14.20	6-FFc	5.00	5.00	5.00	4.00	17.61	0.00
347.80	35.36	15.36	14.36	6-FFc	5.00	5.00	5.00	4.00	17.71	0.00

****

El. inlet face invert 20.00 ft El. outlet invert 16.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	20.00 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	16.00 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0400
CULVERT LENGTH ALONG SLOPE	100.08 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	5.00 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

****

CURRENT DATE: 02-11-1997 FILE DATE: 02-11-1997
CURRENT TIME: 09:58:47 FILE NAME: EAPFL-36

****
********** TAILWATER **********
****
****

CONSTANT WATER SURFACE ELEVATION
20.00

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********** ROADWAY OVERTOPPING DATA **********
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ROADWAY SURFACE PAVED
EMBANKMENT TOP WIDTH 32.00 ft
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	1000.00	35.43
2	1058.00	34.00
3	1059.00	33.63
4	1069.00	33.62
5	1070.00	34.00
6	1120.00	34.92
7	1121.00	37.00

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Profile Ou put Table Table 1
HEC-RAS Plan: Tulip /Legend Reach: 1 12/16/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
1.455	460	1717	1719.21	1719.21	1719.91	0.010483	7.62	76.03	51.55	0.98
1.455	663	1717	1719.63	1719.61	1720.49	0.010066	8.47	98.5	53.14	0.98
1.455	10	1717	1717.49	1717.37	1717.54	0.004249	1.9	5.36	16.07	0.58
1.455	20	1717	1717.69	1717.52	1717.77	0.004344	2.3	8.88	19.58	0.6
1.455	30	1717	1717.84	1717.65	1717.94	0.004374	2.55	12.1	24.99	0.61
1.455	40	1717	1717.75	1717.75	1718	0.01207	4.01	10.19	20.74	1
1.455	50	1717	1718.04	1717.84	1718.17	0.004578	2.97	19.01	41.28	0.61
1.455	270	1717	1718.76	1718.76	1719.27	0.010043	6.36	53.54	49.9	0.93
1.455	290	1717	1718.81	1718.81	1719.35	0.010104	6.51	56.16	50.1	0.94
1.455	310	1717	1718.86	1718.86	1719.42	0.01017	6.66	58.68	50.28	0.94
1.455	350	1717	1718.96	1718.96	1719.56	0.010316	6.95	63.48	50.64	0.96
1.455	400	1717	1719.07	1719.07	1719.72	0.010609	7.32	68.88	51.03	0.98
1.373	460	1711.2	1716.79	1713.51	1716.87	0.003213	2.39	205	52.71	0.18
1.373	663	1711.2	1717.7	1714.01	1717.81	0.003633	2.83	256.97	60.76	0.2
1.373	10	1711.2	1711.57	1711.57	1711.7	0.294505	2.85	3.51	14.14	1.01
1.373	20	1711.2	1711.74	1711.74	1711.91	0.234158	3.31	6.04	16.74	0.97
1.373	30	1711.2	1711.85	1711.85	1712.07	0.234272	3.77	7.96	18.48	1.01
1.373	40	1711.2	1711.95	1711.95	1712.2	0.217371	4.01	9.96	20.14	1.01
1.373	50	1711.2	1712.08	1712.07	1712.31	0.158525	3.87	13.34	29.65	0.89
1.373	270	1711.2	1714.73	1712.97	1714.82	0.006823	2.49	110.16	41.68	0.25
1.373	290	1711.2	1714.96	1713.04	1715.05	0.006064	2.46	119.93	42.54	0.24
1.373	310	1711.2	1715.2	1713.11	1715.29	0.005404	2.43	130.09	43.42	0.23
1.373	350	1711.2	1715.72	1713.21	1715.81	0.004165	2.34	153.52	45.39	0.2
1.373	400	1711.2	1716.36	1713.37	1716.44	0.003266	2.28	183.49	49.06	0.18
1.365	460	1709.07	1716.59	1712.63	1716.71	0.004175	3.12	175.1	40.84	0.3
1.365	663	1709.07	1717.46	1713.64	1717.63	0.005312	3.79	213.4	49.51	0.31
1.365	10	1709.07	1709.96	1709.35	1709.97	0.006523	0.94	10.65	13.96	0.1
1.365	20	1709.07	1710.33	1709.51	1710.36	0.008129	1.32	15.11	14.78	0.13
1.365	30	1709.07	1710.62	1709.64	1710.66	0.00921	1.62	18.56	15.42	0.16
1.365	40	1709.07	1710.86	1709.77	1710.91	0.010039	1.86	21.5	15.96	0.18

Profile Ou put Table Table 1
HEC-RAS Plan: Tulip /Legend Reach: 1 12/16/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
1.365	50	1709.07	1711.08	1709.89	1711.15	0.010702	2.07	24.11	16.54	0.2
1.365	270	1709.07	1714.09	1711.58	1714.4	0.014723	4.48	60.26	26.4	0.38
1.365	290	1709.07	1714.33	1711.71	1714.66	0.014527	4.59	63.15	27.19	0.4
1.365	310	1709.07	1714.58	1711.82	1714.92	0.014258	4.69	66.1	28	0.41
1.365	350	1709.07	1715.14	1712.05	1715.5	0.013155	4.81	72.83	31.01	0.43
1.365	400	1709.07	1716.18	1712.33	1716.29	0.004086	2.98	158.65	37.96	0.46
1.357 Culvert										
1.349	460	1708.1	1713.56	1711.69	1713.75	0.010361	3.98	139.23	49.39	0.3
1.349	663	1708.1	1714.4	1712.68	1714.62	0.01024	4.35	186.24	60.34	0.31
1.349	10	1708.1	1709.4	1708.38	1709.4	0.001838	0.64	15.57	17.6	0.1
1.349	20	1708.1	1709.78	1708.54	1709.8	0.003102	0.99	20.17	19.22	0.13
1.349	30	1708.1	1710.07	1708.68	1710.09	0.004141	1.27	23.59	20.35	0.16
1.349	40	1708.1	1710.3	1708.8	1710.34	0.00505	1.51	26.42	21.29	0.18
1.349	50	1708.1	1710.5	1708.92	1710.55	0.005898	1.73	28.83	22.09	0.2
1.349	270	1708.1	1712.84	1710.61	1713.19	0.017874	4.75	56.85	39.01	0.38
1.349	290	1708.1	1712.96	1710.72	1713.34	0.01894	4.97	58.32	39.42	0.4
1.349	310	1708.1	1713.08	1710.85	1713.49	0.020013	5.19	59.71	40.88	0.41
1.349	350	1708.1	1713.29	1711.07	1713.78	0.022165	5.62	62.28	44.63	0.43
1.349	400	1708.1	1713.53	1711.35	1714.12	0.024836	6.13	65.21	48.91	0.46
1.329	460	1708.3	1712.67	1710.51	1712.79	0.008365	2.95	166.63	58.97	0.26
1.329	663	1708.3	1713.59	1711.04	1713.73	0.007216	3.14	223.95	64.63	0.25
1.329	10	1708.3	1709.07	1708.66	1709.08	0.00709	0.68	14.65	29.36	0.17
1.329	20	1708.3	1709.31	1708.8	1709.33	0.007603	0.91	21.95	30.45	0.18
1.329	30	1708.3	1709.49	1708.88	1709.51	0.008203	1.09	27.55	31.25	0.2
1.329	40	1708.3	1709.65	1708.95	1709.67	0.008645	1.24	32.41	31.94	0.21
1.329	50	1708.3	1709.79	1709.02	1709.82	0.008862	1.36	36.96	32.56	0.22
1.329	270	1708.3	1711.64	1709.96	1711.74	0.009895	2.66	109.59	52.74	0.27
1.329	290	1708.3	1711.74	1710.01	1711.85	0.009967	2.72	114.84	53.34	0.27
1.329	310	1708.3	1711.85	1710.08	1711.96	0.00992	2.77	120.41	53.97	0.27

Profile Output Table Table 1
HEC-RAS Plan: Tulip /Legend Reach: 1 12/16/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
1.329	350	1708.3	1712.05	1710.19	1712.16	0.00977	2.87	131.48	55.21	0.27
1.329	400	1708.3	1712.27	1710.34	1712.39	0.009798	2.99	143.78	56.56	0.27
1.213	640	1699.7	1704.45	1702.69	1704.78	0.019315	4.79	139.61	40.61	0.4
1.213	950	1699.7	1705.32	1703.41	1705.78	0.022206	5.78	177.42	48.28	0.44
1.213	10	1699.7	1700.25	1700.07	1700.28	0.044211	1.29	7.67	22.73	0.39
1.213	20	1699.7	1700.45	1700.2	1700.49	0.037513	1.62	12.31	23.56	0.39
1.213	30	1699.7	1700.63	1700.3	1700.68	0.032212	1.82	16.57	24.29	0.38
1.213	40	1699.7	1700.79	1700.38	1700.85	0.028681	1.96	20.53	24.96	0.37
1.213	50	1699.7	1700.92	1700.45	1700.99	0.027879	2.12	23.81	25.5	0.37
1.213	270	1699.7	1702.65	1701.52	1702.86	0.023203	3.75	73.98	32.64	0.4
1.213	290	1699.7	1702.76	1701.6	1702.98	0.023169	3.85	77.55	33.09	0.4
1.213	310	1699.7	1702.86	1701.67	1703.09	0.023329	3.95	80.83	33.49	0.41
1.213	350	1699.7	1703.05	1701.81	1703.3	0.023491	4.13	87.34	34.29	0.41
1.213	400	1699.7	1703.28	1701.97	1703.56	0.023396	4.33	95.5	35.26	0.42
1.102	640	1688.8	1692.53	1692.33	1693.51	0.019148	8.59	86.84	36.83	0.88
1.102	950	1688.8	1693.39	1693.07	1694.54	0.016729	9.46	120.49	41.24	0.86
1.102	10	1688.8	1689.75	1689.53	1689.81	0.009276	2.13	5.05	13.33	0.63
1.102	20	1688.8	1689.96	1689.83	1690.04	0.010596	2.25	9.26	23.71	0.65
1.102	30	1688.8	1690.09	1689.94	1690.19	0.011452	2.55	12.32	24.36	0.64
1.102	40	1688.8	1690.19	1690.01	1690.31	0.01251	2.85	14.74	24.86	0.65
1.102	50	1688.8	1690.28	1690.09	1690.42	0.012765	3.08	17.17	25.36	0.65
1.102	270	1688.8	1691.49	1691.17	1691.97	0.015332	5.87	51.51	31.54	0.75
1.102	290	1688.8	1691.57	1691.24	1692.07	0.0154	6.03	54.02	31.94	0.76
1.102	310	1688.8	1691.65	1691.32	1692.18	0.015316	6.17	56.67	32.37	0.76
1.102	350	1688.8	1691.81	1691.46	1692.37	0.015279	6.44	61.68	33.15	0.76
1.102	400	1688.8	1691.98	1691.61	1692.6	0.015417	6.77	67.45	34.03	0.77
1.043	640	1684.3	1687.35	1687.22	1688.5	0.013461	8.92	81.4	32.86	0.91
1.043	950	1684.3	1688.02	1688.02	1689.62	0.014516	10.6	104.18	35.34	0.98
1.043	10	1684.3	1684.57	1684.57	1684.66	0.036596	2.36	4.26	22.55	0.95

Profile Ou put Table Table 1
HEC-RAS Plan: Tulip /Legend Reach: 1 12/16/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
1.043	20	1684.3	1684.69	1684.67	1684.82	0.0299	2.93	6.9	22.98	0.93
1.043	30	1684.3	1684.78	1684.75	1684.95	0.027003	3.33	9.13	23.33	0.92
1.043	40	1684.3	1684.88	1684.85	1685.08	0.02366	3.59	11.36	23.68	0.9
1.043	50	1684.3	1684.95	1684.92	1685.18	0.02282	3.88	13.19	23.97	0.9
1.043	270	1684.3	1686.05	1686	1686.77	0.017659	6.96	41.75	28.04	0.95
1.043	290	1684.3	1686.13	1686.08	1686.89	0.01754	7.14	43.85	28.31	0.95
1.043	310	1684.3	1686.19	1686.17	1686.99	0.017615	7.34	45.75	28.56	0.96
1.043	350	1684.3	1686.33	1686.3	1687.2	0.017573	7.68	49.6	29.06	0.97
1.043	400	1684.3	1686.49	1686.49	1687.45	0.017269	8.04	54.51	29.68	0.97
0.945	940	1671.8	1676.71	1676.71	1678.24	0.026989	10.15	100.32	35.37	0.92
0.945	1313	1671.8	1677.58	1677.58	1679.33	0.024208	11.05	133.34	40.63	0.91
0.945	10	1671.8	1672.57	1672.4	1672.65	0.017446	2.24	4.46	9.57	0.58
0.945	20	1671.8	1672.85	1672.62	1672.96	0.017802	2.71	7.37	11.52	0.6
0.945	30	1671.8	1673.03	1672.79	1673.18	0.019581	3.12	9.62	12.83	0.63
0.945	40	1671.8	1673.18	1672.94	1673.36	0.021442	3.47	11.53	13.84	0.67
0.945	50	1671.8	1673.31	1673.06	1673.52	0.022313	3.72	13.43	14.78	0.69
0.945	270	1671.8	1674.78	1674.55	1675.41	0.027913	6.38	42.55	24.35	0.83
0.945	290	1671.8	1674.85	1674.64	1675.52	0.028092	6.56	44.46	24.78	0.84
0.945	310	1671.8	1674.93	1674.73	1675.63	0.028168	6.74	46.33	25.21	0.85
0.945	350	1671.8	1675.08	1674.89	1675.85	0.02818	7.08	50.07	26.04	0.86
0.945	400	1671.8	1675.24	1675.07	1676.1	0.028397	7.47	54.5	26.99	0.87
0.855	940	1664.2	1668.46	1667.92	1669.53	0.010882	8.92	126.98	39.86	0.77
0.855	1313	1664.2	1669.18	1668.73	1670.59	0.011768	10.32	156.98	43.12	0.82
0.855	10	1664.2	1664.56	1664.48	1664.61	0.016477	1.75	5.79	22.3	0.6
0.855	20	1664.2	1664.7	1664.59	1664.78	0.016318	2.3	8.88	22.91	0.64
0.855	30	1664.2	1664.81	1664.68	1664.92	0.015531	2.66	11.6	23.44	0.65
0.855	40	1664.2	1664.92	1664.77	1665.05	0.014644	2.93	14.14	23.92	0.65
0.855	50	1664.2	1665.02	1664.85	1665.17	0.014197	3.17	16.42	24.35	0.66
0.855	270	1664.2	1666.28	1665.94	1666.78	0.012664	5.87	50.84	30.05	0.73
0.855	290	1664.2	1666.37	1666.02	1666.89	0.012548	6.02	53.51	30.45	0.74

Profile Ou put Table Table 1
HEC-RAS Plan: Tulip /Legend Reach: 1 12/16/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.855	310	1664.2	1666.45	1666.1	1667	0.012605	6.18	55.88	30.8	0.74
0.855	350	1664.2	1666.6	1666.24	1667.2	0.012644	6.48	60.6	31.48	0.75
0.855	400	1664.2	1666.78	1666.43	1667.44	0.01258	6.8	66.48	32.31	0.76
0.768	940	1656.9	1660.75	1660.75	1662.2	0.025388	9.98	102.99	38	0.95
0.768	1313	1656.9	1661.55	1661.55	1663.24	0.022896	10.92	135.25	42.25	0.94
0.768	10	1656.9	1657.4	1657.27	1657.45	0.014696	1.74	5.76	17.25	0.53
0.768	20	1656.9	1657.6	1657.42	1657.67	0.014845	2.11	9.47	20.28	0.54
0.768	30	1656.9	1657.74	1657.53	1657.83	0.015387	2.41	12.44	22.04	0.56
0.768	40	1656.9	1657.83	1657.63	1657.95	0.016441	2.74	14.6	22.57	0.6
0.768	50	1656.9	1657.93	1657.71	1658.07	0.016937	3.01	16.67	23.06	0.62
0.768	270	1656.9	1659.14	1658.84	1659.64	0.019555	5.73	48.64	29.64	0.75
0.768	290	1656.9	1659.21	1658.92	1659.74	0.019868	5.92	50.67	29.99	0.76
0.768	310	1656.9	1659.28	1659	1659.84	0.019778	6.07	52.99	30.39	0.77
0.768	350	1656.9	1659.43	1659.13	1660.04	0.019755	6.36	57.38	31.13	0.77
0.768	400	1656.9	1659.59	1659.3	1660.26	0.01998	6.72	62.43	31.97	0.79
0.672	940	1644	1648.45	1648.3	1649.71	0.020611	9.2	110.33	40.96	0.88
0.672	1313	1644	1649.08	1649.08	1650.71	0.021687	10.58	137.08	44.43	0.93
0.672	10	1644	1644.67	1644.66	1644.83	0.054591	3.18	3.14	9.38	0.97
0.672	20	1644	1644.87	1644.87	1645.09	0.054686	3.79	5.28	12.16	1.02
0.672	30	1644	1645.03	1645.02	1645.28	0.048025	4.02	7.45	14.18	0.98
0.672	40	1644	1645.18	1645.14	1645.45	0.04288	4.17	9.59	15.88	0.95
0.672	50	1644	1645.29	1645.25	1645.58	0.04078	4.35	11.5	17.25	0.94
0.672	270	1644	1646.53	1646.49	1647.18	0.031862	6.48	41.84	30.32	0.95
0.672	290	1644	1646.6	1646.55	1647.29	0.031244	6.63	44.02	30.71	0.95
0.672	310	1644	1646.66	1646.64	1647.38	0.031454	6.82	45.81	31.04	0.96
0.672	350	1644	1646.78	1646.76	1647.57	0.03154	7.17	49.44	31.68	0.97
0.672	400	1644	1646.92	1646.92	1647.8	0.031143	7.53	54.08	32.48	0.98
0.577	940	1633.1	1637.09	1637.09	1638.43	0.024435	9.68	108.07	42.06	0.94
0.577	1313	1633.1	1637.94	1637.82	1639.42	0.020425	10.31	145.66	46.55	0.89

Profile Ou put Table Table 1
HEC-RAS Plan: Tulip /Legend Reach: 1 12/16/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.577	10	1633.1	1633.9	1633.68	1633.94	0.01136	1.64	6.11	15.21	0.45
0.577	20	1633.1	1634.14	1633.87	1634.2	0.011592	1.96	10.19	19.58	0.48
0.577	30	1633.1	1634.3	1634.01	1634.37	0.012138	2.21	13.56	22.57	0.5
0.577	40	1633.1	1634.41	1634.12	1634.51	0.012975	2.44	16.36	24.71	0.53
0.577	50	1633.1	1634.51	1634.22	1634.62	0.01337	2.66	18.82	26.06	0.55
0.577	270	1633.1	1635.65	1635.29	1636.08	0.015983	5.34	53.09	33.75	0.69
0.577	290	1633.1	1635.71	1635.37	1636.17	0.016223	5.51	55.43	34.17	0.7
0.577	310	1633.1	1635.79	1635.43	1636.27	0.016115	5.64	58.11	34.65	0.71
0.577	350	1633.1	1635.94	1635.56	1636.46	0.016072	5.9	63.14	35.54	0.71
0.577	400	1633.1	1636.09	1635.73	1636.67	0.016333	6.23	68.79	36.5	0.73
0.507	1120	1625.7	1628.98	1628.75	1629.73	0.020924	7.02	165.35	80.86	0.81
0.507	1474	1625.7	1629.14	1629.14	1630.26	0.029039	8.61	178.23	82.24	0.97
0.507	10	1625.7	1626.11	1626.11	1626.23	0.047551	2.8	3.57	13.85	0.97
0.507	20	1625.7	1626.26	1626.26	1626.44	0.047329	3.36	5.95	17.26	1.03
0.507	30	1625.7	1626.38	1626.38	1626.59	0.044779	3.66	8.2	19.96	1.01
0.507	40	1625.7	1626.49	1626.49	1626.72	0.039578	3.86	10.35	21.69	0.99
0.507	50	1625.7	1626.56	1626.56	1626.83	0.039326	4.15	12.05	22.89	1.01
0.507	270	1625.7	1627.45	1627.45	1627.85	0.0328	5.1	52.98	64.52	0.99
0.507	290	1625.7	1627.49	1627.49	1627.91	0.033079	5.22	55.62	65.04	0.99
0.507	310	1625.7	1627.53	1627.53	1627.97	0.033768	5.36	57.93	65.5	1
0.507	350	1625.7	1627.6	1627.6	1628.08	0.034335	5.58	62.8	66.45	1
0.507	400	1625.7	1627.7	1627.7	1628.22	0.033944	5.79	69.31	67.7	1
0.434	1120	1617.6	1620.84	1620.67	1621.71	0.021419	8.5	160.67	73.04	0.9
0.434	1474	1617.6	1621.61	1621.1	1622.42	0.014804	8.31	218.91	78.35	0.78
0.434	10	1617.6	1618.22	1618.08	1618.25	0.011787	1.51	7.25	25.93	0.48
0.434	20	1617.6	1618.39	1618.21	1618.44	0.0119	1.78	12.33	34.03	0.5
0.434	30	1617.6	1618.5	1618.3	1618.56	0.011786	2.04	16.25	37.05	0.52
0.434	40	1617.6	1618.59	1618.39	1618.66	0.012069	2.26	19.6	39.31	0.54
0.434	50	1617.6	1618.66	1618.45	1618.74	0.012924	2.48	22.32	41.06	0.57
0.434	270	1617.6	1619.52	1619.25	1619.78	0.014672	4.59	70.54	62.19	0.68

Profile Output Table Table 1
HEC-RAS Plan: Tulip /Legend Reach: 1 12/16/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.434	290	1617.6	1619.58	1619.29	1619.85	0.014552	4.69	74.19	62.75	0.68
0.434	310	1617.6	1619.63	1619.34	1619.92	0.014477	4.79	77.7	63.28	0.68
0.434	350	1617.6	1619.74	1619.42	1620.05	0.014116	4.95	84.95	64.32	0.68
0.434	400	1617.6	1619.86	1619.53	1620.19	0.014355	5.21	92.31	65.3	0.69
0.371	1120	1610.7	1614.69	1614.29	1615.42	0.016651	7.89	176.07	74.34	0.76
0.371	1474	1610.7	1614.77	1614.76	1615.96	0.026354	10.07	181.64	74.98	0.96
0.371	10	1610.7	1611.25	1611.23	1611.37	0.046218	2.85	3.51	12.47	0.95
0.371	20	1610.7	1611.43	1611.41	1611.6	0.043304	3.34	5.99	14.96	0.93
0.371	30	1610.7	1611.57	1611.53	1611.77	0.041685	3.64	8.23	16.89	0.92
0.371	40	1610.7	1611.68	1611.64	1611.92	0.041603	3.91	10.24	18.44	0.92
0.371	50	1610.7	1611.84	1611.75	1612.06	0.032782	3.77	13.26	20.57	0.83
0.371	270	1610.7	1612.8	1612.75	1613.24	0.02731	5.82	55.27	53.01	0.85
0.371	290	1610.7	1612.85	1612.8	1613.31	0.027515	5.97	57.89	53.58	0.85
0.371	310	1610.7	1612.9	1612.86	1613.38	0.027781	6.12	60.39	54.13	0.86
0.371	350	1610.7	1612.98	1612.95	1613.51	0.028832	6.45	64.8	55.08	0.89
0.371	400	1610.7	1613.1	1613.07	1613.67	0.028051	6.67	71.69	56.53	0.88
0.287	1120	1601.9	1605.31	1605.27	1606.38	0.025776	9.02	143.34	64.62	0.97
0.287	1474	1601.9	1606.23	1605.75	1607.14	0.015534	8.42	206.09	71.28	0.78
0.287	10	1601.9	1602.53	1602.36	1602.58	0.01097	1.88	5.56	14.3	0.52
0.287	20	1601.9	1602.73	1602.54	1602.81	0.011297	2.33	9	20.69	0.62
0.287	30	1601.9	1602.87	1602.7	1602.97	0.011532	2.56	12.28	26.21	0.66
0.287	40	1601.9	1602.99	1602.81	1603.09	0.011541	2.68	15.59	30.78	0.67
0.287	50	1601.9	1603.05	1602.9	1603.18	0.013646	2.97	17.54	33.18	0.72
0.287	270	1601.9	1603.98	1603.76	1604.29	0.015548	4.72	64.14	55.19	0.71
0.287	290	1601.9	1604.05	1603.8	1604.37	0.015453	4.82	67.57	55.63	0.71
0.287	310	1601.9	1604.11	1603.85	1604.44	0.015317	4.91	71	56.07	0.71
0.287	350	1601.9	1604.23	1603.94	1604.58	0.014854	5.06	78.05	56.96	0.7
0.287	400	1601.9	1604.35	1604.04	1604.74	0.015156	5.32	84.97	57.82	0.71
0.209	1120	1594.2	1597.63	1597.17	1598.24	0.015378	7.97	191.69	81.08	0.78

Profile Ou put Table Table 1
HEC-RAS Plan: Tulip /Legend Reach: 1 12/16/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.209	1474	1594.2	1597.57	1597.57	1598.68	0.028747	10.77	186.91	80.71	1.07
0.209	10	1594.2	1594.58	1594.58	1594.72	0.045524	3.05	3.33	11.86	1
0.209	20	1594.2	1594.76	1594.76	1594.96	0.039222	3.64	5.62	13.83	0.99
0.209	30	1594.2	1594.9	1594.9	1595.14	0.036966	4.04	7.63	15.34	0.99
0.209	40	1594.2	1595.01	1595.01	1595.3	0.036933	4.4	9.36	16.85	1.01
0.209	50	1594.2	1595.14	1595.14	1595.43	0.02903	4.37	12.57	33.22	0.9
0.209	270	1594.2	1595.93	1595.93	1596.32	0.025038	6.28	63.08	70.21	0.9
0.209	290	1594.2	1595.97	1595.97	1596.38	0.025357	6.43	65.98	70.47	0.91
0.209	310	1594.2	1596.01	1596.01	1596.44	0.025746	6.58	68.72	70.72	0.92
0.209	350	1594.2	1596.07	1596.07	1596.54	0.027239	6.93	73.23	71.13	0.95
0.209	400	1594.2	1596.17	1596.17	1596.67	0.026744	7.14	80.65	71.79	0.95
0.115	1420	1585	1588.63	1588.63	1589.62	0.019372	8.86	159.73	77.56	0.89
0.115	1474	1585	1590.55	1589.05	1590.97	0.004707	5.98	319.94	90.78	0.47
0.115	10	1585	1585.74	1585.55	1585.75	0.005004	1.1	9.22	28.88	0.35
0.115	20	1585	1585.92	1585.66	1585.95	0.004865	1.4	14.6	29.84	0.35
0.115	30	1585	1586.06	1585.74	1586.1	0.00502	1.64	18.75	30.57	0.37
0.115	40	1585	1586.17	1585.81	1586.22	0.005194	1.84	22.31	31.18	0.38
0.115	50	1585	1586.29	1585.87	1586.34	0.005106	1.99	25.9	31.78	0.38
0.115	270	1585	1587.57	1586.8	1587.78	0.006305	3.86	81.39	69.68	0.48
0.115	290	1585	1587.64	1586.87	1587.86	0.006325	3.96	86.46	70.3	0.48
0.115	310	1585	1587.71	1586.93	1587.94	0.006289	4.03	91.68	70.93	0.48
0.115	350	1585	1587.84	1587.07	1588.08	0.006379	4.21	100.69	72.01	0.49
0.115	400	1585	1587.99	1587.23	1588.25	0.00646	4.41	111.4	73.27	0.5
0	2050	1579.3	1586.77	1582.13	1586.81	0.00179	1.81	1243.76	232.34	0.12
0	2422	1579.3	1582.3	1582.3	1583.16	0.149804	8.18	334.3	190.44	0.93
0	10	1579.3	1579.6	1579.6	1579.69	0.21267	1.54	4.76	24.06	0.7
0	20	1579.3	1579.71	1579.71	1579.83	0.247561	2.09	7.93	31.48	0.8
0	30	1579.3	1579.79	1579.79	1579.93	0.251591	2.53	10.51	33.5	0.85
0	40	1579.3	1579.86	1579.86	1580.02	0.260363	2.87	12.69	35.12	0.89
0	50	1579.3	1579.91	1579.91	1580.1	0.262124	3.14	14.79	36.61	0.91

Profile Ou put Table Table 1
HEC-RAS Plan: Tulip /Legend Reach: 1 12/16/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0	270	1579.3	1580.76	1580.76	1581.02	0.136724	4.25	74.31	140.35	0.77
0	290	1579.3	1580.79	1580.79	1581.05	0.140111	4.37	77.97	140.8	0.78
0	310	1579.3	1580.8	1580.8	1581.09	0.149668	4.55	80.08	141.06	0.81
0	350	1579.3	1580.86	1580.86	1581.15	0.14815	4.68	88.29	142.06	0.81
0	400	1579.3	1580.92	1580.92	1581.23	0.151615	4.89	96.66	143.07	0.83

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County — Date: 16 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 — By: MCG

Subject: Emergency Access Plan — Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 30 (ADMP 4)

Location to nearest Quarter Section: NE 1/4 of Section 5

Roadway Name: Golden Eagle Park Blvd (E of Paradox Dr)

Roadway Classification: Collector

Wash Name (if applicable): Ashbrook Wash

EAPFL Type and Description

Type of Flooding: Cross Street X — Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 60" x 110' cmp

Culvert Description: Corrugated metal pipe, projecting inlet

Future Condition 100-year Discharge: 2,067 cfs (HEC-1 operation C557)(6-hr)

Maximum Depth of Flow: 3.7' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 1.9 hrs

Scour/Wash-out Potential: Low X * — *Notes:

Medium ____ *

High ____ *

Comments: Estimated passable Q = 270 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County — Date: 16 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 — By: MCG

Subject: Emergency Access Plan — Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 32 (ADMP 3)

Location to nearest Quarter Section: SW 1/4 of Section 11

Roadway Name: Bayfield Drive (S. of Ashbrook Dr.)

Roadway Classification: Local

Wash Name (if applicable): Ashbrook Wash

EAPFL Type and Description

Type of Flooding: Cross Street X — Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 3 – 60" x 84' cmp's

Culvert Description: Corrugated metal pipes, projecting inlet

Future Condition 100-year Discharge: 1,877 cfs (HEC-1 operation CG22R)(6-hr)

Maximum Depth of Flow: 2.2' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 90 hrs

Scour/Wash-out Potential: Low ____ * — *Notes:

Medium ____ *

High X *

Comments: Estimated passable Q = 595 cfs

Break out flows down Bayfield, eventually reaching Saguaro Blvd

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 16 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 33 (ADMP 2)

Location to nearest Quarter Section: SW 1/4 of Section 11

Roadway Name: Saguaro Blvd (N. of Hamilton Dr)

Roadway Classification: Arterial

Wash Name (if applicable): Ashbrook Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 3 - 60" x 121' cmp's

Culvert Description: Corrugated metal pipes, projecting inlet

Future Condition 100-year Discharge: 2,697 cfs (HEC-1 operation C622)(24-hr)

Maximum Depth of Flow: 3.0' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 8.5 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium ____ *

High X *

Comments: Estimated passable Q = 660 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 16 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 34 (ADMP 1)

Location to nearest Quarter Section: SW 1/4 of Section 11

Roadway Name: Del Cambre Blvd (N. of Rosita Dr.)

Roadway Classification: Collector

Wash Name (if applicable): Ashbrook Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 4,013 cfs (HEC-1 operation C547)(24 hr)

Maximum Depth of Flow: 6.5' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 28.9 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium ____ *

High X *

Comments: Estimated passable Q = 10 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County — Date: 16 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 — By: MCG

Subject: Emergency Access Plan — Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 35

Location to nearest Quarter Section: SE 1/4 of Section 11

Roadway Name: El Pueblo Blvd (S of Calico Dr.)

Roadway Classification: Collector

Wash Name (if applicable): Ashbrook Wash

EAPFL Type and Description

Type of Flooding: Cross Street X — Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 4,117 cfs (HEC-1 operation C026)(24-hr)

Maximum Depth of Flow: 6.9' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 28.7 hrs

Scour/Wash-out Potential: Low ____ * — *Notes:

Medium X *

High ____ *

Comments: Estimated passable Q = 8 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 MAR 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : EAPFL 37

Location to nearest Quarter Section: NE 1/4 of Section 5

Roadway Name: Marathon Drive and Golden Eagle Blvd.

Roadway Classification: Local

Wash Name (if applicable): Tributary of Ashbrook Wash

EAPFL Type and Description

Type of Flooding: Cross Street ____ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ____

Culvert Size: N/A

Culvert Description: Flow runs down Marathon to Golden Eagle Blvd (Marathon has an inverted crown

Future Condition 100-year Discharge: 236 cfs (HEC-1 operation 207L)(6 hr)

Maximum Depth of Flow: 1.2'

Duration of Impassable Flow: 0.8 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium ____ *

High ____ *

Comments: Estimated passable Q = 46 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_37
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

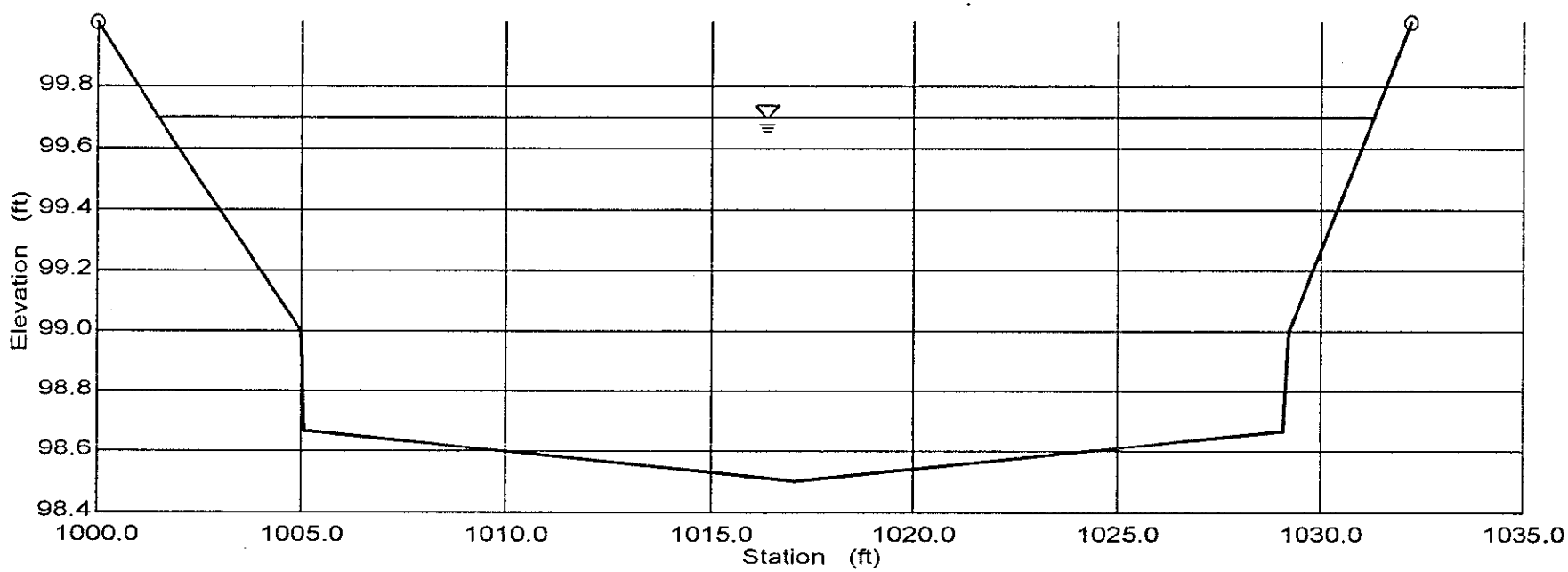
Input Data					
Channel Slope	0.020000 ft/ft				
Elevation range: 98.50 ft to 100.00 ft.					
Station (ft)	Elevation (ft)		Start Station	End Station	Roughness
1,000.00	100.00		1,000.00	1,032.20	0.025
1,005.00	99.00				
1,005.10	98.67				
1,017.10	98.50				
1,029.10	98.67				
1,029.20	99.00				
1,032.20	100.00				
Discharge	236.00	cfs			

Results		
Wtd. Mannings Coefficient	0.025	
Water Surface Elevation	99.70	ft
Flow Area	29.03	ft^2
Wetted Perimeter	30.51	ft
Top Width	29.84	ft
Height	1.20	ft
Critical Depth	100.00	ft
Critical Slope	0.008873	ft/ft
Velocity	8.13	ft/s
Velocity Head	1.03	ft
Specific Energy	100.73	ft
Froude Number	1.45	
Flow is supercritical.		

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_37
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.025	
Channel Slope	0.020000	ft/ft
Water Surface Elevation	99.70	ft
Discharge	236.00	cfs



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County — Date: 13 Mar 97

Project: Fountain Hills ADMP, FCD 94-16 — By: MCG

Subject: Emergency Access Plan — Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 38

Location to nearest Quarter Section: SW 1/4 of Section 4

Roadway Name: Aspen Drive (W. of Nyack Dr.)

Roadway Classification: Local

Wash Name (if applicable): Tributary of Ashbrook Wash

EAPFL Type and Description

Type of Flooding: Cross Street ____ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding X

Culvert Size: N/A

Culvert Description: Longitudinal flow down Aspen to a small curb cut in sag

Future Condition 100-year Discharge: 160 cfs (HEC-1 operation 207N)(6 hr)

Maximum Depth of Flow: 0.9' *

Duration of Impassable Flow: ____

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium X *

High ____ *

Comments: Estimated passable Q = 52 cfs

* 0.9' is max depth for longitudinal flow, the depth will increase at the sag slightly where the curb cut and channel control.

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_38
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

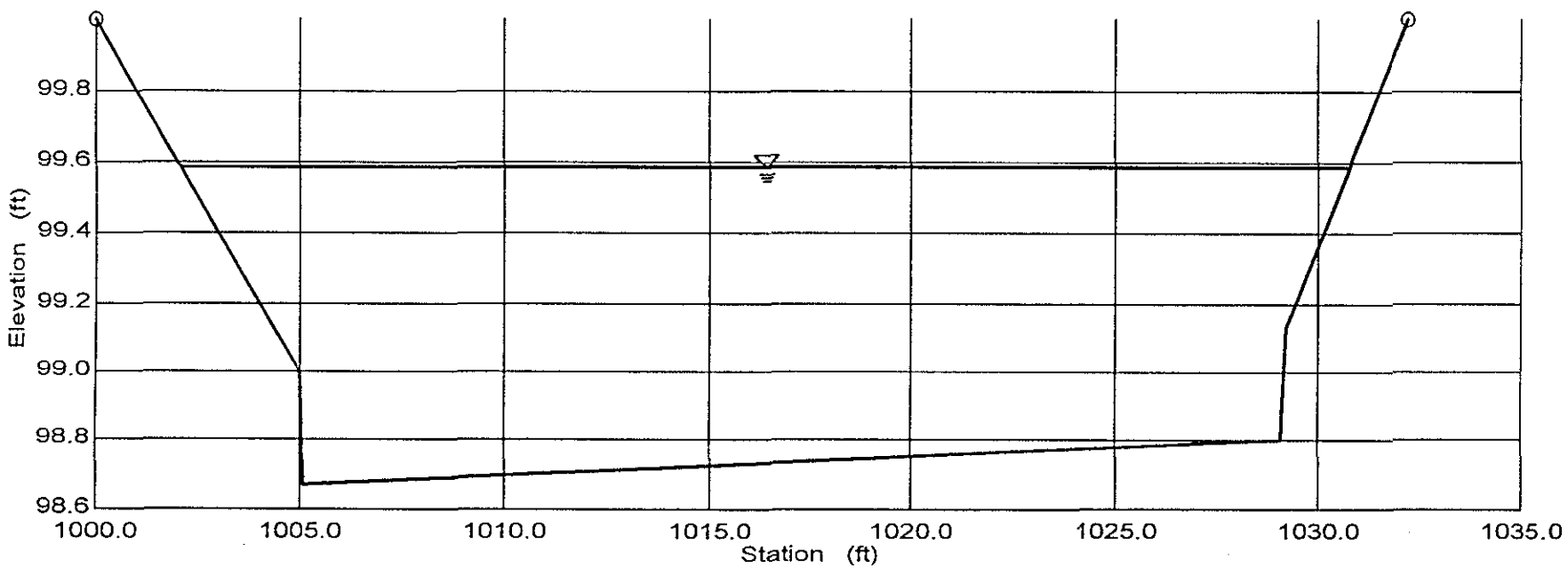
Input Data					
Channel Slope	0.022700 ft/ft				
Elevation range: 98.67 ft to 100.00 ft.					
Station (ft)	Elevation (ft)		Start Station	End Station	Roughness
1,000.00	100.00		1,000.00	1,032.20	0.025
1,005.00	99.00				
1,005.10	98.67				
1,029.10	98.80				
1,029.20	99.13				
1,032.20	100.00				
Discharge	160.00	cfs			

Results		
Wtd. Mannings Coefficient	0.025	
Water Surface Elevation	99.59	ft
Flow Area	21.78	ft^2
Wetted Perimeter	29.32	ft
Top Width	28.70	ft
Height	0.92	ft
Critical Depth	99.83	ft
Critical Slope	0.009556	ft/ft
Velocity	7.35	ft/s
Velocity Head	0.84	ft
Specific Energy	100.42	ft
Froude Number	1.49	
Flow is supercritical.		

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_38
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.025	
Channel Slope	0.022700	ft/ft
Water Surface Elevation	99.59	ft
Discharge	160.00	cfs



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Mar 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 57 A

Location to nearest Quarter Section: SW 1/4 of Section 11

Roadway Name: Grande Blvd (W. of Arrowhead Dr.)

Roadway Classification: Collector

Wash Name (if applicable): Tributary of Ashbrook Wash

EAPFL Type and Description

Type of Flooding: Cross Street ____ Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding X

Culvert Size: N/A

~~Culvert~~ Description: Ponding in sag controlled by small drainage channel (connecting Grande w/ Rosita)

Future Condition 100-year Discharge: 149 cfs (HEC-1 operation 211 AP3)(6 hr)

Maximum Depth of Flow: 1' *

Duration of Impassable Flow: 1.1 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium ____ *

High ____ *

Comments: Estimated passable Q = 10 cfs

* max depth in channel is 2.2' – assume max depth in roadway (@ crown) = 1'

Nrml dpth calc for impass dur
Worksheet for Trapezoidal Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_57a
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.035	
Channel Slope	0.027000	ft/ft
Left Side Slope	3.000000	H : V
Right Side Slope	3.000000	H : V
Bottom Width	2.00	ft
Discharge	149.00	cfs

Results		
Depth	2.21	ft
Flow Area	19.00	ft^2
Wetted Perimeter	15.95	ft
Top Width	15.23	ft
Critical Depth	2.43	ft
Critical Slope	0.017141	ft/ft
Velocity	7.84	ft/s
Velocity Head	0.96	ft
Specific Energy	3.16	ft
Froude Number	1.24	
Flow is supercritical.		

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Mar 97

Project: Fountain Hills ADMP, FCD 94-16 By: McG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 57b

Location to nearest Quarter Section: SW 1/4 of Section 11

Roadway Name: Rosita Drive & Vellecito Drive

Roadway Classification: Local

Wash Name (if applicable): Tributary of Ashbrook Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or N

Longitudinal Flow X

Ponding ___

Culvert Size: N/A

Culvert Description: Longitudinal flow on Rosita begins approx 170' west of "bubble". The flow crosses Vellecito and enters Ashbrook Wash

Future Condition 100-year Discharge: 238 cfs (HEC-1 operation C624)(6 hr)

Maximum Depth of Flow: 1.5'

Duration of Impassable Flow: 0.9 hrs

Scour/Wash-out Potential: Low ___ * *Notes:

Medium ___ *

High ___ *

Comments: Estimated passable Q = 33 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_57b
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

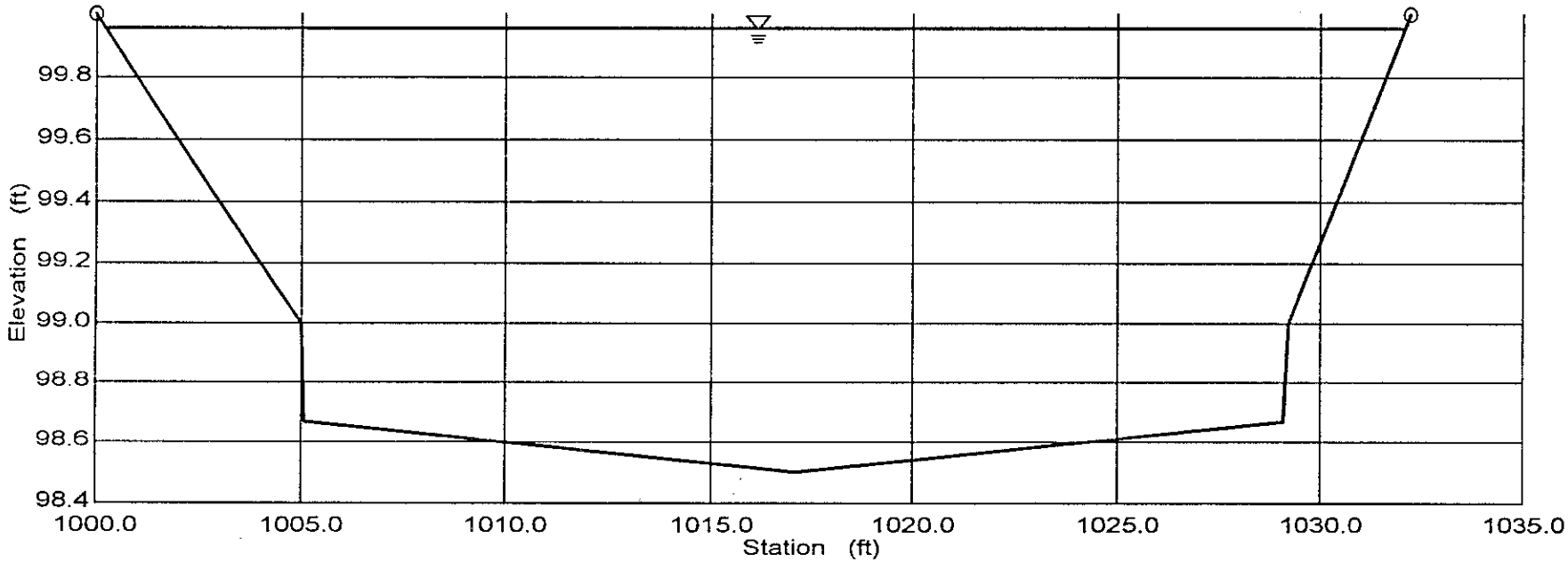
Input Data					
Channel Slope	0.010000 ft/ft				
Elevation range: 98.50 ft to 100.00 ft.					
Station (ft)	Elevation (ft)		Start Station	End Station	Roughness
1,000.00	100.00		1,000.00	1,032.20	0.025
1,005.00	99.00				
1,005.10	98.67				
1,017.10	98.50				
1,029.10	98.67				
1,029.20	99.00				
1,032.20	100.00				
Discharge	238.00	cfs			

Results		
Wtd. Mannings Coefficient	0.025	
Water Surface Elevation	99.96	ft
Flow Area	36.89	ft^2
Wetted Perimeter	32.62	ft
Top Width	31.87	ft
Height	1.46	ft
Critical Depth	100.01	ft
Critical Slope	0.008861	ft/ft
Velocity	6.45	ft/s
Velocity Head	0.65	ft
Specific Energy	100.61	ft
Froude Number	1.06	
Flow is supercritical.		

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_57b
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.025	
Channel Slope	0.010000	ft/ft
Water Surface Elevation	99.96	ft
Discharge	238.00	cfs



Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
6.118	10	1984.2	1984.52	1984.49	1984.59	0.036193	2.32	4.81	26.18	0.86
6.118	20	1984.2	1984.65	1984.62	1984.74	0.028531	2.59	8.79	33.1	0.81
6.118	30	1984.2	1984.74	1984.69	1984.85	0.025008	2.85	11.99	34.54	0.79
6.118	40	1984.2	1984.83	1984.76	1984.95	0.021926	3.01	15.14	35.9	0.76
6.118	50	1984.2	1984.89	1984.81	1985.03	0.022174	3.26	17.48	36.88	0.78
6.118	60	1984.2	1984.97	1984.87	1985.12	0.020362	3.4	20.3	40.41	0.76
6.118	70	1984.2	1985.04	1984.92	1985.2	0.018873	3.51	23.21	43.94	0.75
6.118	80	1984.2	1985.11	1984.96	1985.27	0.017307	3.59	26.4	47.49	0.73
6.118	90	1984.2	1985.17	1985.02	1985.34	0.016512	3.69	29.33	50.54	0.72
6.118	100	1984.2	1985.22	1985.07	1985.4	0.016164	3.8	32.02	53.19	0.72
6.118	200	1984.2	1985.53	1985.45	1985.84	0.019568	5.13	50.03	60.57	0.83
6.118	240	1984.2	1985.61	1985.55	1985.98	0.021778	5.65	54.84	61.6	0.89
6.118	260	1984.2	1985.62	1985.61	1986.05	0.024613	6.04	55.55	61.66	0.95
6.118	270	1984.2	1985.64	1985.64	1986.08	0.024527	6.11	57.05	61.78	0.95
6.118	290	1984.2	1985.69	1985.69	1986.14	0.024575	6.26	59.83	61.99	0.95
6.073	10	1977.9	1978.58		1978.68	0.017959	2.57	3.9	8.59	0.67
6.073	20	1977.9	1978.82		1978.98	0.019508	3.27	6.12	9.97	0.73
6.073	30	1977.9	1978.98		1979.21	0.022154	3.85	7.8	10.89	0.8
6.073	40	1977.9	1979.11		1979.4	0.024523	4.33	9.23	11.62	0.86
6.073	50	1977.9	1979.26		1979.58	0.023268	4.53	11.04	12.48	0.85
6.073	60	1977.9	1979.35		1979.72	0.025026	4.89	12.26	13.03	0.89
6.073	70	1977.9	1979.44		1979.86	0.026879	5.24	13.36	13.5	0.93
6.073	80	1977.9	1979.5	1979.49	1979.99	0.029178	5.6	14.28	13.89	0.97
6.073	90	1977.9	1979.58	1979.58	1980.11	0.030023	5.85	15.4	14.34	0.99
6.073	100	1977.9	1979.66	1979.66	1980.23	0.030217	6.03	16.59	14.81	1
6.073	200	1977.9	1980.47	1980.47	1981.09	0.019887	6.39	34.62	32.75	0.87
6.073	240	1977.9	1980.71	1980.71	1981.31	0.017806	6.45	42.95	58.11	0.84

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
6.073	260	1977.9	1980.84	1980.84	1981.4	0.015668	6.33	50.6	60.11	0.79
6.073	270	1977.9	1980.89	1980.89	1981.45	0.015104	6.32	53.65	60.89	0.78
6.073	290	1977.9	1980.97	1980.97	1981.53	0.014762	6.4	58.28	62.06	0.78
5.978	10	1964.7	1965.31	1965.31	1965.49	0.043209	3.43	2.91	8.1	1.01
5.978	20	1964.7	1965.54	1965.54	1965.79	0.037811	3.98	5.03	10.11	1.01
5.978	30	1964.7	1965.74	1965.71	1966.01	0.031781	4.17	7.19	11.82	0.94
5.978	40	1964.7	1965.91	1965.86	1966.2	0.028104	4.31	9.28	13.43	0.91
5.978	50	1964.7	1965.99	1965.97	1966.35	0.030523	4.79	10.55	16.07	0.96
5.978	60	1964.7	1966.11	1966.11	1966.49	0.028308	4.97	12.55	19.54	0.94
5.978	70	1964.7	1966.22	1966.22	1966.61	0.025504	5.04	14.97	23.04	0.91
5.978	80	1964.7	1966.32	1966.32	1966.71	0.023851	5.13	17.37	26.04	0.89
5.978	90	1964.7	1966.4	1966.4	1966.81	0.023325	5.27	19.52	28.47	0.89
5.978	100	1964.7	1966.48	1966.48	1966.89	0.021567	5.33	22.23	35.58	0.86
5.978	200	1964.7	1967.04	1967.04	1967.41	0.014323	5.62	54.95	76.38	0.75
5.978	240	1964.7	1967.15	1967.15	1967.55	0.014722	5.94	63.88	80.67	0.77
5.978	260	1964.7	1967.21	1967.21	1967.61	0.014871	6.09	68.18	82.66	0.78
5.978	270	1964.7	1967.23	1967.23	1967.64	0.014791	6.13	70.6	83.75	0.78
5.978	290	1964.7	1967.28	1967.28	1967.7	0.014938	6.27	74.72	85.59	0.78
5.873	10	1950.6	1951.04	1950.95	1951.08	0.017071	1.58	6.32	28.46	0.59
5.873	20	1950.6	1951.15	1951.07	1951.21	0.019522	1.98	10.09	35.76	0.66
5.873	30	1950.6	1951.23	1951.15	1951.31	0.022698	2.32	12.91	40.38	0.72
5.873	40	1950.6	1951.29	1951.22	1951.39	0.02546	2.61	15.33	43.97	0.78
5.873	50	1950.6	1951.35	1951.28	1951.47	0.023894	2.76	18.12	46.2	0.77
5.873	60	1950.6	1951.39	1951.32	1951.53	0.024881	2.99	20.09	47.39	0.8
5.873	70	1950.6	1951.44	1951.37	1951.59	0.024407	3.15	22.34	48.71	0.8
5.873	80	1950.6	1951.47	1951.41	1951.64	0.02581	3.37	23.94	49.62	0.83

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
5.873	90	1950.6	1951.5	1951.45	1951.7	0.02624	3.53	25.72	50.69	0.85
5.873	100	1950.6	1951.54	1951.49	1951.75	0.026003	3.67	27.58	52.36	0.85
5.873	200	1950.6	1951.8	1951.8	1952.17	0.028477	4.94	42.84	64.45	0.95
5.873	240	1950.6	1951.91	1951.91	1952.31	0.026658	5.18	50.03	69.42	0.94
5.873	260	1950.6	1951.96	1951.96	1952.38	0.026234	5.31	53.36	71.61	0.94
5.873	270	1950.6	1951.99	1951.99	1952.41	0.024962	5.3	55.88	73.22	0.92
5.873	290	1950.6	1952.05	1952.05	1952.47	0.023784	5.35	59.93	75.1	0.91
5.765	10	1935.4	1935.94	1935.94	1936.09	0.04345	3.12	3.23	10.84	0.99
5.765	20	1935.4	1936.13	1936.13	1936.34	0.036982	3.67	5.56	14.31	0.97
5.765	30	1935.4	1936.29	1936.29	1936.51	0.030846	3.86	8.48	22.23	0.92
5.765	40	1935.4	1936.41	1936.41	1936.64	0.02802	4.02	11.52	28.21	0.9
5.765	50	1935.4	1936.5	1936.5	1936.75	0.028252	4.25	14.07	32.39	0.91
5.765	60	1935.4	1936.59	1936.59	1936.84	0.026017	4.3	17.23	36.91	0.89
5.765	70	1935.4	1936.65	1936.65	1936.92	0.026241	4.47	19.82	41.51	0.99
5.765	80	1935.4	1936.72	1936.72	1936.99	0.025267	4.57	22.72	45.85	1.02
5.765	90	1935.4	1936.78	1936.78	1937.06	0.024163	4.67	25.44	48.44	0.98
5.765	100	1935.4	1936.82	1936.82	1937.12	0.024222	4.84	27.66	50.46	0.96
5.765	200	1935.4	1937.25	1937.19	1937.59	0.019225	5.55	53.07	69.58	0.84
5.765	240	1935.4	1937.31	1937.31	1937.73	0.022232	6.17	57.99	72.85	0.92
5.765	260	1935.4	1937.37	1937.37	1937.79	0.022294	6.33	61.79	75.29	1.08
5.765	270	1935.4	1937.39	1937.39	1937.83	0.022501	6.42	63.47	76.33	0.93
5.765	290	1935.4	1937.44	1937.44	1937.89	0.022474	6.56	67.27	78.66	0.93
5.651	10	1920.4	1921.06	1920.89	1921.12	0.010555	1.95	5.17	12.1	0.52
5.651	20	1920.4	1921.25	1921.07	1921.36	0.012211	2.63	8.46	24.18	0.59
5.651	30	1920.4	1921.39	1921.24	1921.52	0.012468	3	12.61	35.16	0.61
5.651	40	1920.4	1921.49	1921.39	1921.64	0.012843	3.28	16.64	43.21	0.63

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
5.651	50	1920.4	1921.57	1921.49	1921.73	0.013713	3.55	19.89	46.28	0.66
5.651	60	1920.4	1921.57	1921.57	1921.8	0.019225	4.22	20.13	46.49	0.78
5.651	70	1920.4	1921.62	1921.62	1921.87	0.020153	4.46	22.63	48.55	0.81
5.651	80	1920.4	1921.68	1921.68	1921.93	0.02006	4.6	25.49	50.81	0.81
5.651	90	1920.4	1921.73	1921.73	1921.99	0.020461	4.77	27.96	52.68	0.82
5.651	100	1920.4	1921.76	1921.76	1922.05	0.022405	5.06	29.43	53.76	0.86
5.651	200	1920.4	1922	1922	1922.52	0.034502	7.05	43.79	63.89	1.1
5.651	240	1920.4	1922.29	1922.29	1922.62	0.019202	5.96	67.07	87.21	0.85
5.651	260	1920.4	1922.31	1922.31	1922.67	0.020405	6.22	69.51	87.49	0.88
5.651	270	1920.4	1922.35	1922.35	1922.7	0.019726	6.2	72.28	87.81	0.86
5.651	290	1920.4	1922.39	1922.39	1922.75	0.019812	6.32	75.93	88.22	0.87
5.572	10	1912.2	1912.47	1912.47	1912.58	0.053058	2.61	3.83	19	1.03
5.572	20	1912.2	1912.6	1912.6	1912.75	0.043024	3.11	6.43	20.99	0.99
5.572	30	1912.2	1912.7	1912.7	1912.89	0.041627	3.52	8.51	22.45	1.01
5.572	40	1912.2	1912.79	1912.79	1913.01	0.038749	3.78	10.59	23.82	1
5.572	50	1912.2	1912.86	1912.86	1913.11	0.037534	4.01	12.46	24.99	1
5.572	60	1912.2	1913.14		1913.28	0.01395	3.01	19.91	29.19	0.64
5.572	70	1912.2	1913.51		1913.59	0.00458	2.17	33.92	47.09	0.39
5.572	80	1912.2	1913.85		1913.89	0.002128	1.73	51.07	54.49	0.28
5.572	90	1912.2	1914.17		1914.2	0.00121	1.45	69.51	61.46	0.21
5.572	100	1912.2	1914.48		1914.5	0.000736	1.27	89.25	67.29	0.17
5.572	200	1912.2	1917.76		1917.76	0.000047	0.66	384.75	105.51	0.05
5.572	240	1912.2	1919.78		1919.78	0.000018	0.51	613.04	119.55	0.03
5.572	260	1912.2	1919.94		1919.94	0.000019	0.54	632.06	120.46	0.04
5.572	270	1912.2	1919.99		1920	0.00002	0.55	639.24	120.8	0.04
5.572	290	1912.2	1920.17		1920.17	0.000021	0.58	660.14	121.79	0.04

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
5.563	10	1909.38	1910.79	1909.83	1910.82	0.000811	1.18	8.46	9.65	0.49
5.563	20	1909.38	1911.4	1910.09	1911.44	0.000983	1.65	12.1	11.24	0.54
5.563	30	1909.38	1911.88	1910.3	1911.94	0.00109	2	14.97	12.48	0.59
5.563	40	1909.38	1912.29	1910.5	1912.37	0.001162	2.29	17.44	13.56	0.63
5.563	50	1909.38	1912.67	1910.68	1912.77	0.001214	2.54	19.68	14.6	0.66
5.563	60	1909.38	1913.01	1910.83	1913.13	0.001251	2.76	21.76	15.59	0.74
5.563	70	1909.38	1913.34	1911	1913.48	0.001276	2.95	23.73	16.52	0.73
5.563	80	1909.38	1913.65	1911.15	1913.81	0.001292	3.12	25.61	17.42	0.78
5.563	90	1909.38	1913.96	1911.29	1914.13	0.0013	3.28	27.44	18.29	0.82
5.563	100	1909.38	1914.25	1911.43	1914.44	0.001301	3.42	29.22	19.13	0.85
5.563	200	1909.38	1917.47	1912.63	1917.73	0.000962	4.12	48.49	35.64	1
5.563	240	1909.38	1919.76	1913.05	1919.78	0.000086	1.45	281.86	96.63	1
5.563	260	1909.38	1919.92	1913.25	1919.94	0.00009	1.51	297.33	99.04	1
5.563	270	1909.38	1919.98	1913.35	1919.99	0.000094	1.54	303.19	99.72	1.01
5.563	290	1909.38	1920.15	1913.54	1920.17	0.000096	1.58	320.49	101.73	1
5.5525 Culvert										
5.542	10	1905.77	1906.49	1906.22	1906.57	0.008029	2.35	4.25	7.67	0.49
5.542	20	1905.77	1906.83	1906.48	1906.99	0.008578	3.17	6.32	8.5	0.54
5.542	30	1905.77	1907.08	1906.7	1907.31	0.00945	3.83	7.83	9.1	0.59
5.542	40	1905.77	1907.29	1906.89	1907.59	0.010164	4.39	9.1	9.61	0.63
5.542	50	1905.77	1907.49	1907.07	1907.86	0.010669	4.88	10.26	10.07	0.66
5.542	60	1905.77	1907.56	1907.24	1908.05	0.013319	5.61	10.7	10.25	0.74
5.542	70	1905.77	1907.77	1907.4	1908.3	0.012583	5.86	11.94	10.75	0.73
5.542	80	1905.77	1907.87	1907.54	1908.5	0.013901	6.37	12.56	10.99	0.78
5.542	90	1905.77	1907.95	1907.68	1908.69	0.015492	6.9	13.05	11.19	0.82
5.542	100	1905.77	1908.07	1907.82	1908.89	0.016153	7.29	13.73	11.46	0.85

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
5.542	200	1905.77	1909.05	1909.05	1910.66	0.019654	10.2	19.61	13.81	1
5.542	240	1905.77	1909.45	1909.45	1911.29	0.019164	10.89	22.05	14.79	1
5.542	260	1905.77	1909.65	1909.65	1911.59	0.018846	11.18	23.25	15.27	1
5.542	270	1905.77	1909.74	1909.74	1911.74	0.018857	11.36	23.78	15.48	1.01
5.542	290	1905.77	1909.94	1909.94	1912.03	0.018432	11.6	24.99	15.96	1
5.519	10	1903.9	1904.8	1904.71	1904.93	0.026039	2.85	3.51	7.77	0.75
5.519	20	1903.9	1905.06		1905.24	0.027985	3.48	5.75	9.94	0.81
5.519	30	1903.9	1905.25		1905.48	0.027717	3.84	7.82	11.59	0.82
5.519	40	1903.9	1905.41		1905.67	0.027254	4.1	9.77	12.96	0.83
5.519	50	1903.9	1905.58	1905.43	1905.84	0.027261	4.06	12.71	27.9	0.84
5.519	60	1903.9	1905.79		1905.95	0.019578	3.33	20.57	46.46	0.71
5.519	70	1903.9	1905.8		1906.01	0.026045	3.84	20.83	46.92	0.82
5.519	80	1903.9	1905.87		1906.07	0.024832	3.78	24.59	53.07	0.81
5.519	90	1903.9	1905.94		1906.13	0.023284	3.7	28.49	58.76	0.79
5.519	100	1903.9	1905.98		1906.18	0.024638	3.84	30.64	61.67	0.81
5.519	200	1903.9	1906.26	1906.22	1906.56	0.024991	4.75	49.13	64.73	0.86
5.519	240	1903.9	1906.43	1906.31	1906.71	0.019537	4.64	59.92	65.4	0.78
5.519	260	1903.9	1906.48	1906.35	1906.77	0.019495	4.75	63.14	65.6	0.78
5.519	270	1903.9	1906.5	1906.37	1906.8	0.019421	4.81	64.78	65.7	0.78
5.519	290	1903.9	1906.57	1906.4	1906.87	0.018139	4.81	69.33	65.98	0.76
5.436	10	1896.1	1896.85	1896.67	1896.93	0.013181	2.28	4.38	9.2	0.58
5.436	20	1896.1	1897.13		1897.25	0.012903	2.75	7.28	11.37	0.6
5.436	30	1896.1	1897.33		1897.48	0.012943	3.07	9.78	12.95	0.62
5.436	40	1896.1	1897.5		1897.67	0.013264	3.34	11.97	14.19	0.64
5.436	50	1896.1	1897.64		1897.84	0.013196	3.54	14.14	15.32	0.65
5.436	60	1896.1	1897.68		1897.94	0.017205	4.09	14.67	15.58	0.74

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
5.436	70	1896.1	1897.89		1898.12	0.013182	3.86	18.14	17.21	0.66
5.436	80	1896.1	1897.98		1898.24	0.013573	4.04	19.81	17.93	0.68
5.436	90	1896.1	1898.06		1898.34	0.014371	4.25	21.17	18.5	0.7
5.436	100	1896.1	1898.18		1898.46	0.013317	4.25	23.54	19.47	0.68
5.436	200	1896.1	1898.97	1898.6	1899.21	0.012365	4.03	52.68	61	0.66
5.436	240	1896.1	1899.03	1898.83	1899.34	0.014723	4.53	56.88	61.96	0.72
5.436	260	1896.1	1899.09	1898.91	1899.42	0.01475	4.64	60.56	62.8	0.73
5.436	270	1896.1	1899.12	1898.94	1899.45	0.014797	4.71	62.2	65.26	0.73
5.436	290	1896.1	1899.14	1899	1899.51	0.015904	4.94	63.87	68.35	0.76
5.349	10	1887.8	1888.65	1888.55	1888.77	0.025474	2.79	3.59	8.25	0.75
5.349	20	1887.8	1888.89	1888.81	1889.06	0.025246	3.33	6.37	15.21	0.77
5.349	30	1887.8	1889.04	1889	1889.25	0.026722	3.74	9.03	20.25	0.81
5.349	40	1887.8	1889.17	1889.13	1889.39	0.026205	3.95	11.86	24.5	0.82
5.349	50	1887.8	1889.26	1889.22	1889.5	0.027197	4.2	14.26	27.58	0.84
5.349	60	1887.8	1889.46	1889.34	1889.62	0.019362	3.48	20.78	37.55	0.72
5.349	70	1887.8	1889.45	1889.42	1889.68	0.027704	4.17	20.27	36.82	0.86
5.349	80	1887.8	1889.53	1889.48	1889.75	0.026972	4.11	23.4	41.07	0.85
5.349	90	1887.8	1889.61	1889.54	1889.82	0.025749	4.05	26.65	45.06	0.83
5.349	100	1887.8	1889.64	1889.59	1889.87	0.027773	4.22	28.31	46.96	0.87
5.349	200	1887.8	1889.98	1889.8	1890.31	0.035365	5.32	50.4	91.22	1.01
5.349	240	1887.8	1890.11	1890.11	1890.41	0.027611	5.11	62.33	92	1.02
5.349	260	1887.8	1890.14	1890.14	1890.46	0.028477	5.28	65.13	92.19	1
5.349	270	1887.8	1890.15	1890.15	1890.48	0.028528	5.34	66.77	92.29	1
5.349	290	1887.8	1890.22	1890.19	1890.53	0.025588	5.24	72.67	92.67	0.89
5.277	10	1878.4	1879.02	1878.96	1879.11	0.026771	2.37	4.22	13.66	0.75
5.277	20	1878.4	1879.2	1879.12	1879.33	0.026058	2.92	6.86	15.87	0.78

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
5.277	30	1878.4	1879.34	1879.25	1879.5	0.025009	3.24	9.26	17.64	0.79
5.277	40	1878.4	1879.45	1879.36	1879.65	0.025518	3.55	11.28	19.01	0.81
5.277	50	1878.4	1879.56	1879.45	1879.78	0.024888	3.75	13.35	20.31	0.81
5.277	60	1878.4	1879.55	1879.55	1879.87	0.036951	4.54	13.2	20.23	0.72
5.277	70	1878.4	1879.74		1879.99	0.02418	4.07	17.55	28.43	0.82
5.277	80	1878.4	1879.81		1880.08	0.024176	4.21	19.75	32.49	0.83
5.277	90	1878.4	1879.86	1879.79	1880.16	0.025245	4.41	21.56	35.48	0.85
5.277	100	1878.4	1879.94		1880.23	0.02336	4.39	24.65	40.07	0.83
5.277	200	1878.4	1880.39	1880.39	1880.72	0.019013	4.96	52.85	81.61	0.78
5.277	240	1878.4	1880.49	1880.49	1880.84	0.019068	5.19	61.51	82.92	0.79
5.277	260	1878.4	1880.54	1880.54	1880.9	0.019518	5.34	64.97	83.21	0.8
5.277	270	1878.4	1880.55	1880.55	1880.92	0.019882	5.42	66.44	83.32	0.81
5.277	290	1878.4	1880.52		1880.99	0.025245	6.04	63.97	83.14	0.91
5.182	10	1866.4	1866.74		1866.79	0.022863	1.59	5.46	18.71	0.66
5.182	20	1866.4	1866.9	1866.79	1866.98	0.024269	2.27	8.85	22.64	0.73
5.182	30	1866.4	1867.02	1866.88	1867.12	0.025218	2.69	11.71	25.49	0.77
5.182	40	1866.4	1867.14		1867.25	0.024557	2.98	14.92	29.71	0.77
5.182	50	1866.4	1867.24		1867.36	0.025334	3.27	18.07	35.34	0.8
5.182	60	1866.4	1867.32		1867.46	0.02484	3.44	21.39	44.98	0.8
5.182	70	1866.4	1867.38		1867.52	0.026595	3.68	24.1	58.29	0.84
5.182	80	1866.4	1867.43		1867.58	0.026439	3.82	27.44	68.55	0.84
5.182	90	1866.4	1867.47		1867.63	0.025936	3.93	30.74	75.4	0.84
5.182	100	1866.4	1867.54		1867.71	0.027636	4.26	35.88	79.94	0.87
5.182	200	1866.4	1867.81	1867.74	1868.03	0.026823	4.95	57.92	84.61	0.89
5.182	240	1866.4	1867.91	1867.81	1868.14	0.025709	5.09	66.35	86.33	0.88
5.182	260	1866.4	1867.95	1867.85	1868.2	0.025836	5.2	69.87	87.04	0.89
5.182	270	1866.4	1867.96	1867.87	1868.22	0.026365	5.29	71.17	87.3	0.9

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
5.182	290	1866.4	1867.99	1867.9	1868.27	0.026973	5.43	74.08	87.88	0.91
5.076	10	1848.3	1848.44	1848.44	1848.59	0.053318	1.27	3.3	11.83	0.85
5.076	20	1848.3	1848.63	1848.63	1848.8	0.046933	2.27	6.22	17.84	0.94
5.076	30	1848.3	1848.76	1848.76	1848.95	0.044845	2.89	8.64	20.64	0.98
5.076	40	1848.3	1848.83	1848.83	1849.07	0.048917	3.49	10.31	21.87	1.06
5.076	50	1848.3	1848.92	1848.91	1849.18	0.046131	3.86	12.32	23.12	1.06
5.076	60	1848.3	1848.99	1848.99	1849.28	0.046535	4.19	13.87	23.76	1.09
5.076	70	1848.3	1849.06	1849.06	1849.37	0.044098	4.41	15.66	24.48	1.08
5.076	80	1848.3	1849.12	1849.11	1849.46	0.044106	4.66	17.13	25.05	1.09
5.076	90	1848.3	1849.18	1849.18	1849.54	0.043911	4.88	18.58	25.6	1.1
5.076	100	1848.3	1849.24	1849.24	1849.62	0.043077	5.05	20.09	26.17	1.1
5.076	200	1848.3	1849.7	1849.7	1850.27	0.040309	6.33	33.12	30.61	1.13
5.076	240	1848.3	1849.88	1849.88	1850.48	0.040961	6.88	39.21	36.11	1.16
5.076	260	1848.3	1849.97	1849.97	1850.57	0.040089	7.04	42.54	38.82	1.16
5.076	270	1848.3	1850.01	1850.01	1850.62	0.039553	7.1	44.24	40.13	1.15
5.076	290	1848.3	1850.1	1850.1	1850.71	0.038001	7.17	47.88	42.79	1.14
4.954	10	1832.3	1832.83	1832.69	1832.9	0.012497	2	5	12.32	0.55
4.954	20	1832.3	1833.16		1833.23	0.00748	2.17	9.24	13.63	0.46
4.954	30	1832.3	1833.36		1833.46	0.007523	2.49	12.06	14.43	0.48
4.954	40	1832.3	1833.52		1833.64	0.007829	2.77	14.43	15.08	0.5
4.954	50	1832.3	1833.45		1833.67	0.015387	3.74	13.36	14.79	0.69
4.954	60	1832.3	1833.78		1833.95	0.008523	3.25	18.46	16.11	0.53
4.954	70	1832.3	1833.67		1833.94	0.015739	4.21	16.64	15.65	0.72
4.954	80	1832.3	1833.78		1834.07	0.015289	4.35	18.41	16.1	0.72
4.954	90	1832.3	1833.88		1834.2	0.014888	4.47	20.14	16.53	0.71
4.954	100	1832.3	1833.97		1834.3	0.015154	4.65	21.52	16.86	0.72

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
4.954	200	1832.3	1834.71		1835.21	0.014951	5.68	35.24	20.06	0.75
4.954	240	1832.3	1834.93	1834.57	1835.5	0.015319	6.06	39.7	22.08	0.77
4.954	260	1832.3	1835.04	1834.68	1835.63	0.015088	6.19	42.27	23.48	0.77
4.954	270	1832.3	1835.09	1834.73	1835.7	0.015098	6.27	43.44	24.09	0.78
4.954	290	1832.3	1835.18	1834.83	1835.82	0.015322	6.45	45.57	25.17	0.79
4.839	10	1822.8	1823.58	1823.5	1823.62	0.018839	1.57	6.37	29.45	0.6
4.839	20	1822.8	1823.62	1823.62	1823.73	0.051803	2.72	7.35	31.84	1
4.839	30	1822.8	1823.7	1823.7	1823.83	0.049338	2.94	10.19	37.93	1
4.839	40	1822.8	1823.76	1823.76	1823.91	0.048819	3.14	12.72	42.62	1.01
4.839	50	1822.8	1823.95	1823.82	1824.03	0.016363	2.26	22.09	53.39	0.62
4.839	60	1822.8	1823.88	1823.88	1824.05	0.043066	3.31	18.12	51.21	0.98
4.839	70	1822.8	1824.04	1823.91	1824.15	0.016451	2.58	27.16	53.97	0.64
4.839	80	1822.8	1824.08	1823.94	1824.2	0.017228	2.75	29.08	54.19	0.66
4.839	90	1822.8	1824.12		1824.25	0.017798	2.91	30.98	54.4	0.68
4.839	100	1822.8	1824.16		1824.3	0.017626	3.01	33.18	54.65	0.68
4.839	200	1822.8	1824.45	1824.29	1824.7	0.020011	4.06	49.3	56.42	0.76
4.839	240	1822.8	1824.55	1824.39	1824.84	0.019956	4.34	55.38	60.14	0.78
4.839	260	1822.8	1824.59	1824.44	1824.91	0.020579	4.52	57.8	62.72	0.79
4.839	270	1822.8	1824.61	1824.47	1824.94	0.02069	4.59	59.18	64.15	0.8
4.839	290	1822.8	1824.66	1824.51	1825	0.020503	4.7	62.39	67.34	0.8
4.637	10	1799.2	1799.68	1799.63	1799.76	0.024812	2.28	4.4	15.4	0.75
4.637	20	1799.2	1799.81	1799.77	1799.96	0.031657	3.17	6.37	16.69	0.89
4.637	30	1799.2	1799.91	1799.9	1800.12	0.033494	3.72	8.19	17.79	0.94
4.637	40	1799.2	1800.01	1800	1800.27	0.033066	4.09	10	18.82	0.96
4.637	50	1799.2	1800.1	1800.09	1800.39	0.032033	4.36	11.78	19.82	0.96
4.637	60	1799.2	1800.18	1800.18	1800.51	0.0325	4.66	13.35	21.95	0.98

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
4.637	70	1799.2	1800.27	1800.26	1800.61	0.029713	4.75	15.51	24.58	0.96
4.637	80	1799.2	1800.34	1800.34	1800.7	0.029157	4.92	17.34	26.61	0.96
4.637	90	1799.2	1800.41	1800.41	1800.79	0.028227	5.05	19.25	28.35	0.95
4.637	100	1799.2	1800.48	1800.48	1800.87	0.02667	5.15	21.17	28.86	0.94
4.637	200	1799.2	1800.96		1801.53	0.023257	6.35	36.02	32.49	0.94
4.637	240	1799.2	1801.11	1801.11	1801.75	0.023313	6.79	40.86	33.59	0.95
4.637	260	1799.2	1801.19	1801.19	1801.85	0.022517	6.91	43.73	34.23	0.97
4.637	270	1799.2	1801.23	1801.23	1801.9	0.022492	7	44.91	34.47	0.98
4.637	290	1799.2	1801.29	1801.29	1802	0.022544	7.19	47.17	34.91	0.99
4.559	10	1789.8	1790.44		1790.5	0.018818	2.09	4.79	15.26	0.66
4.559	20	1789.8	1790.65	1790.51	1790.73	0.016458	2.35	8.52	20.56	0.64
4.559	30	1789.8	1790.79	1790.63	1790.89	0.015964	2.56	11.7	24.18	0.65
4.559	40	1789.8	1790.9	1790.73	1791.02	0.016024	2.76	14.51	26.98	0.66
4.559	50	1789.8	1790.97	1790.82	1791.11	0.016486	3.02	16.6	28.18	0.68
4.559	60	1789.8	1791.06	1790.9	1791.22	0.015253	3.14	19.19	29.56	0.67
4.559	70	1789.8	1791.1	1790.95	1791.29	0.017464	3.47	20.33	30.14	0.72
4.559	80	1789.8	1791.17	1791.01	1791.37	0.016956	3.6	22.46	31.22	0.72
4.559	90	1789.8	1791.22	1791.07	1791.44	0.017298	3.79	24.12	32.18	0.74
4.559	100	1789.8	1791.3	1791.12	1791.52	0.01589	3.84	26.57	33.85	0.72
4.559	200	1789.8	1791.6	1791.56	1792.08	0.022738	5.6	38	40.72	0.9
4.559	240	1789.8	1791.74	1791.72	1792.27	0.022512	5.97	43.58	43.68	0.91
4.559	260	1789.8	1791.8	1791.8	1792.36	0.022026	6.11	46.62	45.22	0.91
4.559	270	1789.8	1791.83	1791.81	1792.4	0.022025	6.2	47.96	45.87	0.91
4.559	290	1789.8	1791.89	1791.89	1792.49	0.02215	6.37	50.5	47.1	0.93
4.493	10	1784.2	1784.75	1784.69	1784.79	0.014956	1.66	7.42	40.75	0.57
4.493	20	1784.2	1784.85	1784.78	1784.91	0.017329	2.14	11.65	44.96	0.64

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
4.493	30	1784.2	1784.92	1784.85	1785	0.018602	2.47	15.06	47.02	0.68
4.493	40	1784.2	1785	1784.91	1785.08	0.017652	2.63	18.69	49.12	0.68
4.493	50	1784.2	1785.06	1784.96	1785.15	0.018553	2.86	21.42	50.64	0.71
4.493	60	1784.2	1785.1	1785.01	1785.21	0.02019	3.11	23.59	51.81	0.74
4.493	70	1784.2	1785.17		1785.28	0.01742	3.13	27.25	52.32	0.71
4.493	80	1784.2	1785.21		1785.34	0.018092	3.32	29.29	52.57	0.73
4.493	90	1784.2	1785.25		1785.39	0.017755	3.45	31.74	52.86	0.73
4.493	100	1784.2	1785.27		1785.44	0.019813	3.71	32.76	52.99	0.77
4.493	200	1784.2	1785.71		1785.93	0.014188	4.31	56.45	55.77	0.71
4.493	240	1784.2	1785.83		1786.08	0.014355	4.63	63.17	56.54	0.72
4.493	260	1784.2	1785.88		1786.15	0.014706	4.81	65.97	56.85	0.74
4.493	270	1784.2	1785.91		1786.18	0.014715	4.88	67.57	57.03	0.74
4.493	290	1784.2	1785.96		1786.25	0.014669	5.01	70.81	57.39	0.74
4.412	10	1777.2	1777.9	1777.85	1777.92	0.018237	1.12	8.93	69.2	0.55
4.412	20	1777.2	1777.98	1777.91	1778.01	0.014083	1.36	14.8	73.42	0.52
4.412	30	1777.2	1778.04	1777.95	1778.08	0.013723	1.58	19.28	76.47	0.54
4.412	40	1777.2	1778.09	1777.99	1778.14	0.014339	1.79	22.85	78.83	0.56
4.412	50	1777.2	1778.14	1778.03	1778.19	0.014004	1.94	26.6	81.23	0.57
4.412	60	1777.2	1778.18	1778.05	1778.24	0.013617	2.06	30.24	83.49	0.57
4.412	70	1777.2	1778.21	1778.09	1778.28	0.01467	2.23	32.66	84.96	0.6
4.412	80	1777.2	1778.24	1778.12	1778.33	0.014627	2.34	35.71	86.78	0.61
4.412	90	1777.2	1778.28	1778.15	1778.37	0.014605	2.45	38.64	88.5	0.61
4.412	100	1777.2	1778.32	1778.17	1778.42	0.013594	2.49	42.66	95.01	0.6
4.412	200	1777.2	1778.5	1778.42	1778.69	0.019571	3.58	62.25	115.03	0.75
4.412	240	1777.2	1778.57	1778.5	1778.78	0.019521	3.8	70.71	115.74	0.76
4.412	260	1777.2	1778.61	1778.53	1778.82	0.019115	3.88	75.23	116.12	0.75
4.412	270	1777.2	1778.63	1778.54	1778.85	0.019133	3.93	77.16	116.28	0.76

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
4.412	290	1777.2	1778.66	1778.57	1778.89	0.019361	4.04	80.65	116.57	0.77
4.362	10	1771.5	1771.83	1771.78	1771.87	0.026184	1.6	6.26	38.31	0.7
4.362	20	1771.5	1771.88	1771.87	1771.97	0.049336	2.41	8.3	44.11	0.98
4.362	30	1771.5	1771.94	1771.94	1772.05	0.046253	2.68	11.19	48.33	1.19
4.362	40	1771.5	1771.98	1771.98	1772.12	0.046283	2.97	13.48	50.11	1.01
4.362	50	1771.5	1772.03	1772.03	1772.19	0.043803	3.15	15.88	51.92	1
4.362	60	1771.5	1772.08	1772.08	1772.25	0.041129	3.29	18.29	53.67	0.99
4.362	70	1771.5	1772.12	1772.12	1772.3	0.0393	3.41	20.58	55.28	0.98
4.362	80	1771.5	1772.15	1772.15	1772.35	0.03974	3.58	22.42	56.54	1
4.362	90	1771.5	1772.19	1772.19	1772.4	0.038315	3.68	24.57	57.98	0.99
4.362	100	1771.5	1772.21	1772.21	1772.45	0.040394	3.89	25.85	60.23	1.02
4.362	200	1771.5	1772.51	1772.51	1772.8	0.026086	4.4	50.21	91.31	0.9
4.362	240	1771.5	1772.59	1772.59	1772.91	0.025677	4.67	57.47	92.13	0.9
4.362	260	1771.5	1772.62	1772.62	1772.96	0.02614	4.83	60.39	92.46	0.92
4.362	270	1771.5	1772.64	1772.64	1772.98	0.02616	4.89	61.97	92.63	0.92
4.362	290	1771.5	1772.68	1772.68	1773.03	0.025605	4.98	65.57	93.03	0.92
4.349	10	1770	1770.22	1770.17	1770.25	0.02108	1.32	7.59	52.9	0.42
4.349	20	1770	1770.32	1770.24	1770.36	0.01462	1.56	12.83	53.39	0.46
4.349	30	1770	1770.4	1770.29	1770.45	0.0125	1.75	17.15	53.8	0.48
4.349	40	1770	1770.47	1770.34	1770.53	0.011264	1.9	21.03	54.17	0.48
4.349	50	1770	1770.54	1770.37	1770.6	0.010555	2.04	24.52	54.49	0.51
4.349	60	1770	1770.6	1770.42	1770.68	0.009923	2.15	27.86	54.81	0.52
4.349	70	1770	1770.66	1770.45	1770.74	0.009501	2.26	30.96	55.1	0.54
4.349	80	1770	1770.72	1770.49	1770.81	0.009119	2.36	33.96	55.38	0.55
4.349	90	1770	1770.77	1770.52	1770.87	0.008807	2.44	36.83	55.66	0.55
4.349	100	1770	1770.83	1770.56	1770.93	0.00854	2.53	39.6	55.92	0.57

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
4.349	200	1770	1771.3	1770.84	1771.45	0.006802	3.11	64.26	58.24	0.64
4.349	240	1770	1771.46	1770.94	1771.63	0.006496	3.3	72.69	59.03	0.66
4.349	260	1770	1771.53	1770.96	1771.71	0.006367	3.39	76.73	59.41	0.68
4.349	270	1770	1771.57	1771	1771.75	0.006306	3.43	78.71	59.6	0.68
4.349	290	1770	1771.64	1771.06	1771.84	0.006194	3.51	82.6	59.97	0.69
4.34199 Culvert										
4.335	10	1767.3	1767.86	1767.7	1767.89	0.007798	1.27	7.9	27.58	0.42
4.335	20	1767.3	1768.01	1767.82	1768.05	0.008806	1.6	12.46	33.4	0.46
4.335	30	1767.3	1768.13	1767.91	1768.18	0.008978	1.8	16.63	37.94	0.48
4.335	40	1767.3	1768.23	1767.99	1768.29	0.008767	1.93	20.72	41.92	0.48
4.335	50	1767.3	1768.3	1768.05	1768.37	0.009548	2.11	23.66	44.57	0.51
4.335	60	1767.3	1768.36	1768.11	1768.44	0.009613	2.24	26.73	46.38	0.52
4.335	70	1767.3	1768.41	1768.16	1768.5	0.010348	2.42	28.97	47.64	0.54
4.335	80	1767.3	1768.47	1768.21	1768.57	0.010165	2.5	31.95	49.26	0.55
4.335	90	1767.3	1768.53	1768.26	1768.63	0.010299	2.61	34.5	50.62	0.55
4.335	100	1767.3	1768.57	1768.3	1768.69	0.010594	2.72	36.76	51.78	0.57
4.335	200	1767.3	1768.9	1768.63	1769.11	0.012165	3.72	53.75	53.92	0.64
4.335	240	1767.3	1769.02	1768.73	1769.27	0.012182	4	59.94	54.46	0.66
4.335	260	1767.3	1769.06	1768.77	1769.33	0.012781	4.19	61.99	54.64	0.68
4.335	270	1767.3	1769.08	1768.8	1769.36	0.012882	4.27	63.26	54.75	0.68
4.335	290	1767.3	1769.13	1768.84	1769.43	0.013043	4.41	65.79	54.97	0.69
4.311	10	1765.4	1765.69	1765.69	1765.76	0.051393	2.08	4.82	32.97	0.96
4.311	20	1765.4	1765.78	1765.78	1765.87	0.050153	2.45	8.16	42.7	0.99
4.311	30	1765.4	1765.85	1765.85	1765.94	0.0506	2.5	12.02	62.02	1
4.311	40	1765.4	1765.88	1765.88	1766.01	0.050403	2.79	14.35	62.7	1.02

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
4.311	50	1765.4	1765.93	1765.93	1766.06	0.044719	2.94	17.08	63.47	0.99
4.311	60	1765.4	1765.96	1765.96	1766.11	0.043408	3.12	19.29	64.1	0.99
4.311	70	1765.4	1766	1766	1766.16	0.040146	3.24	21.74	64.78	0.97
4.311	80	1765.4	1766.03	1766.03	1766.21	0.039766	3.4	23.7	65.32	0.98
4.311	90	1765.4	1766.06	1766.06	1766.25	0.039004	3.54	25.66	65.86	0.99
4.311	100	1765.4	1766.09	1766.09	1766.3	0.037946	3.65	27.64	66.4	0.98
4.311	200	1765.4	1766.33	1766.33	1766.66	0.033165	4.61	44.25	69.5	0.99
4.311	240	1765.4	1766.41	1766.41	1766.79	0.03305	4.95	49.64	70.46	1.01
4.311	260	1765.4	1766.47	1766.47	1766.85	0.030585	4.99	53.49	71.13	0.98
4.311	270	1765.4	1766.49	1766.49	1766.88	0.030368	5.05	54.9	71.38	0.98
4.311	290	1765.4	1766.52	1766.52	1766.93	0.030098	5.18	57.59	71.85	0.98
4.252	10	1754.2	1755.19	1755.19	1755.44	0.01299	4.04	2.48	5.01	1.01
4.252	20	1754.2	1755.51	1755.51	1755.84	0.011626	4.61	4.34	6.63	1
4.252	30	1754.2	1755.73	1755.73	1756.13	0.011372	5.05	5.93	7.75	1.02
4.252	40	1754.2	1755.93	1755.93	1756.36	0.010577	5.29	7.57	8.75	1
4.252	50	1754.2	1756.08	1756.08	1756.57	0.010487	5.57	8.97	9.53	1.01
4.252	60	1754.2	1756.23	1756.23	1756.74	0.010166	5.76	10.41	10.26	1.01
4.252	70	1754.2	1756.36	1756.36	1756.91	0.009688	5.92	11.84	11.71	1
4.252	80	1754.2	1756.48	1756.48	1757.06	0.009151	6.07	13.42	13.89	0.98
4.252	90	1754.2	1756.61	1756.61	1757.19	0.008526	6.15	15.26	16.44	0.96
4.252	100	1754.2	1756.76	1756.76	1757.31	0.007016	6.02	18.76	31.69	0.89
4.252	200	1754.2	1757.45	1757.45	1757.93	0.004596	6.33	55.36	59.38	0.77
4.252	240	1754.2	1757.58	1757.58	1758.12	0.004878	6.8	63.4	60.52	0.8
4.252	260	1754.2	1757.66	1757.66	1758.2	0.004889	6.95	67.86	61.15	0.8
4.252	270	1754.2	1757.69	1757.69	1758.25	0.004949	7.05	69.7	61.41	0.81
4.252	290	1754.2	1757.7	1757.7	1758.33	0.005591	7.52	70.32	61.49	0.86

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
4.177	10	1742.9	1743.38	1743.38	1743.53	0.013439	3.1	3.22	10.58	0.99
4.177	20	1742.9	1743.57	1743.57	1743.78	0.01251	3.65	5.47	13.32	1
4.177	30	1742.9	1743.71	1743.71	1743.96	0.011248	4.04	7.43	14.84	1.01
4.177	40	1742.9	1743.82	1743.82	1744.11	0.010409	4.33	9.25	16.01	1
4.177	50	1742.9	1743.93	1743.93	1744.25	0.009783	4.53	11.03	17.08	0.99
4.177	60	1742.9	1744.02	1744.02	1744.37	0.009564	4.74	12.65	18	1
4.177	70	1742.9	1744.1	1744.1	1744.49	0.009639	4.97	14.09	18.78	1.01
4.177	80	1742.9	1744.18	1744.18	1744.59	0.009482	5.12	15.62	19.57	1.01
4.177	90	1742.9	1744.26	1744.26	1744.69	0.009358	5.26	17.11	20.31	1.01
4.177	100	1742.9	1744.33	1744.33	1744.78	0.009249	5.38	18.58	21.02	1.01
4.177	200	1742.9	1744.89	1744.89	1745.5	0.008838	6.25	31.99	26.62	1
4.177	240	1742.9	1745.07	1745.07	1745.73	0.008493	6.51	36.98	29.44	1
4.177	260	1742.9	1745.15	1745.15	1745.83	0.008354	6.63	39.49	30.79	0.99
4.177	270	1742.9	1745.19	1745.19	1745.89	0.008293	6.69	40.75	31.44	0.99
4.177	290	1742.9	1745.27	1745.27	1745.99	0.008284	6.83	43.07	32.61	0.99
4.119	10	1722.47	1722.95		1722.97	0.001129	1	10.01	22.76	0.27
4.119	20	1722.47	1723.2		1723.22	0.001216	1.27	15.71	24.21	0.28
4.119	30	1722.47	1723.39		1723.43	0.001271	1.46	20.6	25.38	0.28
4.119	40	1722.47	1723.57		1723.61	0.001301	1.59	25.13	26.43	0.29
4.119	50	1722.47	1723.73		1723.77	0.001316	1.7	29.46	27.38	0.29
4.119	60	1722.47	1723.88		1723.93	0.001322	1.78	33.64	28.28	0.29
4.119	70	1722.47	1724.02		1724.07	0.001319	1.86	37.7	29.12	0.29
4.119	80	1722.47	1724.15		1724.21	0.001292	1.92	41.66	29.9	0.29
4.119	90	1722.47	1724.28		1724.34	0.001267	1.98	45.56	30.66	0.28
4.119	100	1722.47	1724.41		1724.47	0.001245	2.03	49.42	31.38	0.28
4.119	200	1722.47	1725.5		1725.58	0.001064	2.33	87.19	37.75	0.26
4.119	240	1722.47	1725.88		1725.97	0.00101	2.4	102.1	39.99	0.26

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
4.119	260	1722.47	1726.07		1726.16	0.000972	2.43	109.53	40.93	0.25
4.119	270	1722.47	1726.16		1726.25	0.000945	2.45	113.18	41.27	0.25
4.119	290	1722.47	1726.33		1726.43	0.000896	2.47	120.49	41.94	0.25
4.11	10	1722.4	1722.79	1722.7	1722.87	0.005246	2.17	4.61	19.97	0.08
4.11	20	1722.4	1722.98	1722.86	1723.11	0.005051	2.83	7.07	23.72	0.07
4.11	30	1722.4	1723.13	1722.99	1723.3	0.005109	3.34	8.99	26.65	0.34
4.11	40	1722.4	1723.26	1723.1	1723.48	0.005124	3.75	10.67	28.69	0.37
4.11	50	1722.4	1723.38	1723.21	1723.64	0.005082	4.09	12.23	30.04	0.39
4.11	60	1722.4	1723.49	1723.31	1723.79	0.00505	4.39	13.67	31.29	0.41
4.11	70	1722.4	1723.6	1723.4	1723.94	0.005022	4.66	15.02	32.46	0.43
4.11	80	1722.4	1723.7	1723.5	1724.07	0.004981	4.9	16.31	33.57	0.45
4.11	90	1722.4	1723.8	1723.59	1724.2	0.004934	5.13	17.55	34.65	0.46
4.11	100	1722.4	1723.89	1723.67	1724.33	0.0049	5.34	18.74	35.68	0.48
4.11	200	1722.4	1724.71	1724.39	1725.43	0.004418	6.83	29.3	40.13	0.57
4.11	240	1722.4	1724.99	1724.64	1725.81	0.004314	7.29	32.92	41.1	0.6
4.11	260	1722.4	1725.12	1724.77	1726	0.004267	7.5	34.65	41.56	0.62
4.11	270	1722.4	1725.19	1724.82	1726.08	0.004251	7.61	35.49	41.78	0.63
4.11	290	1722.4	1725.32	1724.93	1726.26	0.004209	7.81	37.15	42.22	0.64
4.0875	Culvert									
4.065	10	1714.7	1715.81	1714.92	1715.81	0.000187	0.48	20.88	23.5	0.08
4.065	20	1714.7	1716.6	1715.04	1716.61	0.000121	0.55	36.08	26.72	0.07
4.065	30	1714.7	1715.59	1715.14	1715.64	0.003505	1.79	16.75	22.63	0.34
4.065	40	1714.7	1715.72	1715.23	1715.79	0.003959	2.08	19.19	23.14	0.37
4.065	50	1714.7	1715.83	1715.31	1715.92	0.004316	2.34	21.38	23.61	0.39
4.065	60	1714.7	1715.93	1715.39	1716.04	0.00467	2.58	23.29	24.01	0.41

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
4.065	70	1714.7	1716.03	1715.46	1716.15	0.004956	2.79	25.1	24.39	0.43
4.065	80	1714.7	1716.11	1715.53	1716.25	0.005292	3	26.66	24.72	0.45
4.065	90	1714.7	1716.19	1715.6	1716.35	0.005566	3.19	28.19	25.05	0.46
4.065	100	1714.7	1716.27	1715.66	1716.44	0.005816	3.37	29.63	25.35	0.48
4.065	200	1714.7	1716.91	1716.22	1717.26	0.007331	4.77	41.9	27.95	0.57
4.065	240	1714.7	1717.1	1716.41	1717.53	0.007939	5.26	45.64	28.74	0.6
4.065	260	1714.7	1717.18	1716.52	1717.65	0.0084	5.52	47.08	29.04	0.62
4.065	270	1714.7	1717.22	1716.56	1717.72	0.00853	5.63	47.94	29.23	0.63
4.065	290	1714.7	1717.31	1716.65	1717.84	0.008834	5.86	49.51	29.56	0.64
4.058	10	1714.7	1715.8		1715.8	0.000313	0.37	27.14	30.07	0.07
4.058	20	1714.7	1716.6		1716.6	0.000174	0.37	55.21	40.96	0.05
4.058	30	1714.7	1715.18	1715.12	1715.31	0.039609	2.92	10.26	24.28	0.79
4.058	40	1714.7	1715.27	1715.19	1715.43	0.039761	3.18	12.59	25.16	0.79
4.058	50	1714.7	1715.36	1715.27	1715.54	0.038981	3.35	14.91	26	0.78
4.058	60	1714.7	1715.47	1715.34	1715.65	0.035465	3.4	17.65	26.97	0.74
4.058	70	1714.7	1715.52	1715.41	1715.73	0.039239	3.67	19.07	27.45	0.78
4.058	80	1714.7	1715.6	1715.46	1715.82	0.037996	3.75	21.32	28.21	0.76
4.058	90	1714.7	1715.66	1715.5	1715.9	0.038802	3.89	23.11	28.8	0.77
4.058	100	1714.7	1715.7	1715.57	1715.97	0.041937	4.11	24.3	29.18	0.79
4.058	200	1714.7	1716.57	1716.03	1716.79	0.018543	3.81	53.95	40.49	0.54
4.058	240	1714.7	1716.78		1717.02	0.017916	3.99	62.75	43.64	0.54
4.058	260	1714.7	1716.84		1717.11	0.018677	4.15	65.68	44.64	0.55
4.058	270	1714.7	1716.9		1717.16	0.018421	4.18	68	45.41	0.55
4.058	290	1714.7	1716.99		1717.26	0.018235	4.26	72.18	46.77	0.54
3.764	10	1689.7	1690.69	1690.5	1690.72	0.007709	1.35	7.42	23.16	0.42
3.764	20	1689.7	1690.65	1690.65	1690.8	0.044675	3.09	6.48	21.77	1

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
3.764	30	1689.7	1691.01	1690.75	1691.06	0.008256	1.83	16.39	34.07	0.46
3.764	40	1689.7	1691.12	1690.83	1691.18	0.008319	1.97	20.33	38.13	0.47
3.764	50	1689.7	1691.21	1690.92	1691.28	0.008366	2.09	23.97	41.37	0.48
3.764	60	1689.7	1691.28	1690.98	1691.35	0.008647	2.24	26.82	42.7	0.5
3.764	70	1689.7	1691.36	1691.04	1691.44	0.008277	2.32	30.23	44.24	0.49
3.764	80	1689.7	1691.42	1691.09	1691.51	0.008441	2.43	32.9	45.41	0.5
3.764	90	1689.7	1691.48		1691.58	0.008371	2.52	35.77	46.63	0.51
3.764	100	1689.7	1691.54		1691.65	0.008094	2.57	38.96	49.78	0.5
3.764	200	1689.7	1691.8		1692.03	0.013719	3.8	54.01	65.47	0.68
3.764	240	1689.7	1691.9		1692.16	0.014486	4.13	60.09	66.07	0.7
3.764	260	1689.7	1691.96	1691.75	1692.23	0.013928	4.19	64.29	66.48	0.7
3.764	270	1689.7	1691.98	1691.77	1692.26	0.014127	4.27	65.63	66.61	0.7
3.764	290	1689.7	1692.03		1692.32	0.01429	4.39	68.59	66.89	0.71
3.701	10	1684.8	1685.33	1685.33	1685.49	0.048853	3.23	3.1	10.43	1.04
3.701	20	1684.8	1685.52	1685.52	1685.74	0.040856	3.77	5.3	12.31	1.01
3.701	30	1684.8	1685.67	1685.67	1685.94	0.037524	4.13	7.26	13.77	1
3.701	40	1684.8	1685.8	1685.8	1686.1	0.035742	4.41	9.06	14.99	1
3.701	50	1684.8	1685.9	1685.9	1686.24	0.03567	4.7	10.64	15.98	1.01
3.701	60	1684.8	1686.01	1686.01	1686.37	0.033784	4.85	12.38	17	1
3.701	70	1684.8	1686.09	1686.09	1686.49	0.033567	5.05	13.87	17.84	1.01
3.701	80	1684.8	1686.17	1686.17	1686.59	0.033022	5.2	15.37	18.64	1.01
3.701	90	1684.8	1686.26	1686.26	1686.69	0.032013	5.31	16.94	19.44	1
3.701	100	1684.8	1686.33	1686.33	1686.79	0.031845	5.43	18.42	20.39	1.01
3.701	200	1684.8	1687.3		1687.59	0.013138	4.33	46.21	37.02	0.68
3.701	240	1684.8	1687.73	1687.1	1687.94	0.011092	3.66	65.55	59.75	0.62
3.701	260	1684.8	1687.82	1687.18	1688.03	0.011287	3.65	71.21	66.12	0.62
3.701	270	1684.8	1687.85	1687.21	1688.06	0.011255	3.69	73.23	66.86	0.62

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
3.701	290	1684.8	1687.9	1687.29	1688.13	0.01131	3.77	76.93	68.24	0.63
3.621	10	1678.3	1678.98		1679	0.004743	1.26	7.91	18.96	0.35
3.621	20	1678.3	1679.2	1678.87	1679.24	0.004978	1.58	12.63	22.42	0.37
3.621	30	1678.3	1679.35	1678.99	1679.4	0.005568	1.88	15.96	23.77	0.4
3.621	40	1678.3	1679.5	1679.09	1679.56	0.005409	2.04	19.58	25.17	0.41
3.621	50	1678.3	1679.6	1679.17	1679.68	0.005806	2.25	22.26	26.16	0.43
3.621	60	1678.3	1679.7	1679.25	1679.79	0.005956	2.4	25.01	27.13	0.44
3.621	70	1678.3	1679.8	1679.32	1679.9	0.006048	2.53	27.68	28.05	0.45
3.621	80	1678.3	1679.89	1679.38	1680	0.00618	2.65	30.14	28.86	0.46
3.621	90	1678.3	1679.97	1679.44	1680.09	0.006281	2.77	32.54	29.64	0.47
3.621	100	1678.3	1679.99	1679.5	1680.13	0.007384	3.02	33.1	29.82	0.51
3.621	200	1678.3	1680.11		1680.57	0.02167	5.42	36.89	31	0.88
3.621	240	1678.3	1680.15	1680.15	1680.77	0.028471	6.3	38.11	31.36	1.01
3.621	260	1678.3	1680.23	1680.23	1680.87	0.028036	6.41	40.54	32.09	1.01
3.621	270	1678.3	1680.26	1680.26	1680.92	0.027985	6.48	41.66	32.42	1.01
3.621	290	1678.3	1680.33	1680.33	1681.01	0.02769	6.59	43.99	33.09	1.01
3.544	10	1673.7	1674.06	1674.06	1674.13	0.066162	2.15	4.66	34.28	1.03
3.544	20	1673.7	1674.15	1674.15	1674.23	0.059516	2.34	8.55	51.3	1.01
3.544	30	1673.7	1674.21	1674.21	1674.31	0.054072	2.49	12.04	61.31	0.99
3.544	40	1673.7	1674.24	1674.24	1674.37	0.05629	2.81	14.23	62.06	1.03
3.544	50	1673.7	1674.28	1674.28	1674.42	0.052308	2.98	16.76	62.92	1.02
3.544	60	1673.7	1674.32	1674.32	1674.48	0.051102	3.17	18.94	63.65	1.02
3.544	70	1673.7	1674.35	1674.35	1674.52	0.049534	3.32	21.1	64.36	1.02
3.544	80	1673.7	1674.39	1674.39	1674.57	0.047897	3.44	23.23	65.06	1.02
3.544	90	1673.7	1674.42	1674.42	1674.61	0.047058	3.57	25.19	65.7	1.02
3.544	100	1673.7	1674.49		1674.66	0.033086	3.31	30.21	67.3	0.87

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
3.544	200	1673.7	1675.27		1675.34	0.008313	2.17	91.96	91.43	0.38
3.544	240	1673.7	1675.52		1675.59	0.006089	2.08	115.25	94.04	0.33
3.544	260	1673.7	1675.64		1675.7	0.005417	2.05	126.55	95.29	0.31
3.544	270	1673.7	1675.7		1675.76	0.005144	2.04	132.13	95.89	0.31
3.544	290	1673.7	1675.81		1675.88	0.004689	2.03	143.18	97.08	0.29
3.531	10	1671.7	1673.45	1672.3	1673.45	0.000088	0.31	32.65	43.26	0.77
3.531	20	1671.7	1673.61	1672.47	1673.61	0.000219	0.53	37.68	43.59	0.99
3.531	30	1671.7	1673.73	1672.6	1673.74	0.000347	0.72	41.86	43.86	1
3.531	40	1671.7	1673.84	1672.7	1673.86	0.000465	0.88	45.56	44.1	1
3.531	50	1671.7	1673.95	1672.77	1673.96	0.000572	1.02	48.94	44.32	1.01
3.531	60	1671.7	1674.04	1672.86	1674.06	0.000669	1.15	52.1	44.53	0.99
3.531	70	1671.7	1674.13	1672.93	1674.16	0.000757	1.27	55.07	44.72	1.01
3.531	80	1671.7	1674.22	1673	1674.25	0.000837	1.38	57.89	44.9	0.99
3.531	90	1671.7	1674.3	1673.06	1674.33	0.00091	1.49	60.59	45.08	1.01
3.531	100	1671.7	1674.38	1673.12	1674.42	0.000977	1.58	63.18	45.25	1.02
3.531	200	1671.7	1675.05	1673.51	1675.14	0.001431	2.34	85.41	46.7	1
3.531	240	1671.7	1675.29	1673.65	1675.39	0.001545	2.58	93.11	47.2	1.01
3.531	260	1671.7	1675.4	1673.71	1675.51	0.001594	2.69	96.78	47.44	0.99
3.531	270	1671.7	1675.45	1673.74	1675.57	0.001617	2.74	98.58	47.55	0.99
3.531	290	1671.7	1675.56	1673.8	1675.68	0.001659	2.84	102.11	47.79	1
3.52499	Culvert									
3.519	10	1670.6	1670.93	1670.9	1670.98	0.030245	1.88	5.32	32.82	0.77
3.519	20	1670.6	1671	1671	1671.11	0.041614	2.73	7.33	34.04	0.99
3.519	30	1670.6	1671.07	1671.06	1671.23	0.042718	3.24	9.27	35.21	1
3.519	40	1670.6	1671.14	1671.14	1671.33	0.038956	3.53	11.33	36.46	1

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
3.519	50	1670.6	1671.2	1671.2	1671.43	0.037767	3.83	13.07	37.51	1.01
3.519	60	1670.6	1671.26	1671.26	1671.52	0.035881	4.05	14.81	38.56	0.99
3.519	70	1670.6	1671.31	1671.31	1671.6	0.035726	4.3	16.26	39.44	1.01
3.519	80	1670.6	1671.35	1671.35	1671.68	0.037128	4.59	17.42	40.14	0.99
3.519	90	1670.6	1671.42	1671.42	1671.76	0.033039	4.65	19.36	41.32	1.01
3.519	100	1670.6	1671.47	1671.47	1671.83	0.032807	4.84	20.67	42.11	1.02
3.519	200	1670.6	1671.89	1671.89	1672.47	0.028241	6.1	32.77	48.41	1
3.519	240	1670.6	1672.05	1672.05	1672.7	0.026498	6.44	37.26	50.3	1.01
3.519	260	1670.6	1672.12	1672.11	1672.8	0.026255	6.63	39.2	51.12	0.99
3.519	270	1670.6	1672.16	1672.16	1672.86	0.02571	6.69	40.35	51.6	0.99
3.519	290	1670.6	1672.22	1672.22	1672.96	0.0259	6.9	42.03	52.31	1
3.487	10	1666.6	1666.87	1666.81	1666.92	0.019643	1.71	5.84	25.92	0.64
3.487	20	1666.6	1667.05		1667.1	0.01247	1.88	10.61	29	0.55
3.487	30	1666.6	1667.15		1667.22	0.013334	2.21	13.59	30.75	0.59
3.487	40	1666.6	1667.23		1667.33	0.013677	2.45	16.32	32.21	0.61
3.487	50	1666.6	1667.3		1667.42	0.014292	2.68	18.67	33.3	0.63
3.487	60	1666.6	1667.37		1667.5	0.014458	2.85	21.02	34.36	0.64
3.487	70	1666.6	1667.44		1667.58	0.014562	3.01	23.27	35.34	0.65
3.487	80	1666.6	1667.5		1667.65	0.014669	3.15	25.41	36.26	0.66
3.487	90	1666.6	1667.56		1667.72	0.014759	3.27	27.48	37.12	0.67
3.487	100	1666.6	1667.6		1667.78	0.015101	3.41	29.31	37.86	0.68
3.487	200	1666.6	1667.99		1668.29	0.017719	4.46	44.85	43.67	0.78
3.487	240	1666.6	1668.11		1668.46	0.017633	4.76	50.45	44.91	0.79
3.487	260	1666.6	1668.15		1668.54	0.018606	4.99	52.18	45.26	0.81
3.487	270	1666.6	1668.19		1668.58	0.01798	5	54.04	45.63	0.8
3.487	290	1666.6	1668.24		1668.65	0.018338	5.17	56.22	46.05	0.81

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
3.421	10	1660	1660.36	1660.26	1660.39	0.015748	1.54	6.51	26.57	0.55
3.421	20	1660	1660.42	1660.38	1660.51	0.031156	2.39	8.36	28.99	0.78
3.421	30	1660	1660.53	1660.46	1660.63	0.028938	2.61	11.48	32.46	0.77
3.421	40	1660	1660.61	1660.54	1660.73	0.027346	2.79	14.35	34.91	0.77
3.421	50	1660	1660.69	1660.6	1660.82	0.0265	2.94	17.02	37.05	0.76
3.421	60	1660	1660.75	1660.66	1660.9	0.0255	3.05	19.68	39.06	0.76
3.421	70	1660	1660.82	1660.71	1660.97	0.025166	3.17	22.11	40.81	0.76
3.421	80	1660	1660.86	1660.77	1661.04	0.025771	3.31	24.15	42.22	0.77
3.421	90	1660	1660.92	1660.81	1661.1	0.024944	3.38	26.63	43.88	0.76
3.421	100	1660	1660.98	1660.85	1661.16	0.024197	3.44	29.09	45.46	0.76
3.421	200	1660	1661.38	1661.19	1661.64	0.020163	4.1	52.09	68.63	0.72
3.421	240	1660	1661.51	1661.32	1661.79	0.020013	4.34	60.67	71.42	0.72
3.421	260	1660	1661.57	1661.37	1661.86	0.019304	4.39	65.67	72.59	0.71
3.421	270	1660	1661.59	1661.4	1661.89	0.020073	4.51	66.64	72.82	0.73
3.421	290	1660	1661.65	1661.46	1661.96	0.019719	4.58	71.07	73.84	0.72
3.323	10	1649.8	1650.34	1650.22	1650.42	0.022874	2.33	4.31	12.3	0.65
3.323	20	1649.8	1650.68	1650.43	1650.75	0.012207	2.17	10.99	26.1	0.5
3.323	30	1649.8	1650.83	1650.59	1650.91	0.013069	2.44	15.49	31.95	0.52
3.323	40	1649.8	1650.96	1650.7	1651.06	0.013097	2.6	20.07	36.96	0.53
3.323	50	1649.8	1651.07	1650.81	1651.17	0.013392	2.75	24.33	41.84	0.54
3.323	60	1649.8	1651.17	1650.88	1651.27	0.013691	2.88	28.43	46.35	0.55
3.323	70	1649.8	1651.25		1651.36	0.013882	2.99	32.47	50.4	0.55
3.323	80	1649.8	1651.33		1651.45	0.01373	3.06	36.78	54.39	0.55
3.323	90	1649.8	1651.47		1651.56	0.013826	2.8	44.52	62.63	0.51
3.323	100	1649.8	1651.6		1651.67	0.014415	2.47	53.45	73.23	0.46
3.323	200	1649.8	1652.08		1652.15	0.016741	2.42	97.91	106.66	0.42
3.323	240	1649.8	1652.18		1652.26	0.016947	2.59	109.22	107.05	0.43

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
3.323	260	1649.8	1652.22		1652.31	0.017611	2.7	113.42	107.2	0.44
3.323	270	1649.8	1652.27		1652.35	0.01659	2.68	118.28	107.37	0.43
3.323	290	1649.8	1652.31		1652.4	0.016981	2.77	122.75	107.53	0.44
3.241	10	1640.9	1641.48		1641.54	0.018765	1.9	5.26	19.42	0.64
3.241	20	1640.9	1641.54	1641.54	1641.69	0.044449	3.08	6.52	22.41	1
3.241	30	1640.9	1641.65	1641.65	1641.82	0.041126	3.25	9.3	27.91	0.98
3.241	40	1640.9	1641.73	1641.73	1641.92	0.040632	3.45	11.73	31.95	0.99
3.241	50	1640.9	1641.8	1641.8	1642	0.040943	3.64	13.93	35.2	1.01
3.241	60	1640.9	1641.87	1641.87	1642.08	0.037323	3.66	16.64	38.84	0.98
3.241	70	1640.9	1641.92	1641.92	1642.15	0.037622	3.86	18.48	40.42	0.99
3.241	80	1640.9	1641.96	1641.96	1642.21	0.0371	4.05	20.14	40.94	1
3.241	90	1640.9	1641.99	1641.99	1642.28	0.037743	4.27	21.56	41.37	1.02
3.241	100	1640.9	1642.04	1642.04	1642.33	0.035653	4.37	23.44	41.94	1
3.241	200	1640.9	1642.39	1642.39	1642.84	0.029569	5.43	38.88	46.34	0.99
3.241	240	1640.9	1642.51	1642.51	1643.01	0.02792	5.74	44.72	47.91	0.98
3.241	260	1640.9	1642.58	1642.58	1643.1	0.027046	5.86	47.7	48.68	0.97
3.241	270	1640.9	1642.58	1642.58	1643.14	0.028359	6.04	48.15	48.8	1
3.241	290	1640.9	1642.65	1642.65	1643.22	0.026829	6.1	51.48	49.65	0.98
3.208	10	1635.9	1636.39	1636.39	1636.51	0.047427	2.8	3.57	14.6	1
3.208	20	1635.9	1636.66	1636.53	1636.74	0.01763	2.3	8.69	22.79	0.66
3.208	30	1635.9	1636.78	1636.65	1636.88	0.018564	2.6	11.55	26.27	0.69
3.208	40	1635.9	1636.89	1636.74	1637	0.017918	2.75	14.53	29.46	0.69
3.208	50	1635.9	1636.98	1636.83	1637.11	0.016961	2.85	17.53	32.37	0.68
3.208	60	1635.9	1637.04	1636.9	1637.19	0.017745	3.08	19.51	33.68	0.71
3.208	70	1635.9	1637.1	1636.96	1637.26	0.018181	3.27	21.4	34.72	0.73
3.208	80	1635.9	1637.15	1637.01	1637.33	0.018833	3.46	23.11	35.63	0.76

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
3.208	90	1635.9	1637.19	1637.07	1637.4	0.019353	3.63	24.79	36.5	0.78
3.208	100	1635.9	1637.24	1637.11	1637.46	0.019607	3.77	26.5	37.38	0.79
3.208	200	1635.9	1637.71	1637.51	1638	0.016469	4.35	46	46.16	0.77
3.208	240	1635.9	1637.73	1637.64	1638.13	0.022093	5.08	47.21	46.65	0.89
3.208	260	1635.9	1637.76	1637.7	1638.21	0.024021	5.36	48.55	47.18	0.93
3.208	270	1635.9	1637.79	1637.73	1638.24	0.023948	5.4	49.97	47.75	0.93
3.208	290	1635.9	1637.84	1637.79	1638.32	0.024271	5.53	52.41	48.7	0.94
3.121	10	1625.8	1626.93	1626.59	1626.98	0.006605	1.8	5.56	9.85	0.42
3.121	20	1625.8	1626.93		1627.13	0.025968	3.58	5.59	9.88	0.84
3.121	30	1625.8	1627.14	1627.04	1627.37	0.023581	3.82	7.86	11.71	0.82
3.121	40	1625.8	1627.29	1627.19	1627.55	0.024261	4.15	9.65	12.98	0.85
3.121	50	1625.8	1627.41	1627.32	1627.71	0.024555	4.4	11.35	14.08	0.86
3.121	60	1625.8	1627.53	1627.44	1627.86	0.024216	4.59	13.08	15.12	0.87
3.121	70	1625.8	1627.65	1627.54	1627.99	0.02299	4.67	14.98	16.17	0.86
3.121	80	1625.8	1627.77	1627.63	1628.11	0.021853	4.74	16.87	17.16	0.84
3.121	90	1625.8	1627.87	1627.72	1628.23	0.020986	4.81	18.71	18.08	0.83
3.121	100	1625.8	1627.97	1627.8	1628.34	0.020292	4.88	20.51	18.92	0.83
3.121	200	1625.8	1628.54	1628.44	1629.12	0.023202	6.1	32.8	23.93	0.92
3.121	240	1625.8	1628.92	1628.65	1629.42	0.01662	5.64	42.56	28.47	0.79
3.121	260	1625.8	1629.05	1628.73	1629.54	0.015361	5.63	46.8	36.74	0.77
3.121	270	1625.8	1629.09	1628.78	1629.6	0.015344	5.7	48.44	39.46	0.77
3.121	290	1625.8	1629.19	1628.88	1629.7	0.015094	5.79	52.35	46.99	0.77
3.008	10	1617.8	1618.34	1618.34	1618.46	0.051332	2.75	3.64	16.21	1.02
3.008	20	1617.8	1618.7	1618.48	1618.74	0.008646	1.64	12.22	31.21	0.46
3.008	30	1617.8	1618.8	1618.59	1618.86	0.009648	1.94	15.5	34.64	0.5
3.008	40	1617.8	1618.9	1618.67	1618.97	0.009367	2.11	19.21	38.14	0.51

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
3.008	50	1617.8	1618.99	1618.74	1619.07	0.009407	2.27	22.56	41.06	0.52
3.008	60	1617.8	1619.06	1618.8	1619.15	0.009593	2.42	25.64	43.56	0.53
3.008	70	1617.8	1619.12	1618.86	1619.22	0.010039	2.58	28.3	45.61	0.55
3.008	80	1617.8	1619.17	1618.91	1619.29	0.010519	2.73	30.76	47.43	0.56
3.008	90	1617.8	1619.22	1618.95	1619.35	0.010918	2.86	33.17	49.15	0.58
3.008	100	1617.8	1619.27	1619	1619.4	0.011314	2.99	35.47	50.73	0.59
3.008	200	1617.8	1619.72	1619.38	1619.91	0.01072	3.59	61.59	64.45	0.61
3.008	240	1617.8	1619.74		1620.01	0.014616	4.23	62.75	64.85	0.71
3.008	260	1617.8	1619.76		1620.06	0.016138	4.49	64.08	65.3	0.75
3.008	270	1617.8	1619.78		1620.09	0.016419	4.58	65.37	65.74	0.76
3.008	290	1617.8	1619.82		1620.16	0.016725	4.73	68.24	66.71	0.77
2.899	10	1609.6	1610.28		1610.29	0.004923	1.12	11.69	40.91	0.34
2.899	20	1609.6	1610.22	1610.2	1610.32	0.03128	2.68	9.69	37.79	0.85
2.899	30	1609.6	1610.34	1610.28	1610.44	0.025573	2.76	14.38	45.13	0.81
2.899	40	1609.6	1610.41	1610.35	1610.53	0.026202	3.02	17.67	50.05	0.85
2.899	50	1609.6	1610.47	1610.41	1610.6	0.026543	3.21	20.86	54.42	0.88
2.899	60	1609.6	1610.53	1610.47	1610.67	0.025114	3.27	24.58	59.1	0.87
2.899	70	1609.6	1610.6	1610.51	1610.73	0.023532	3.29	28.5	63.65	0.85
2.899	80	1609.6	1610.65	1610.56	1610.79	0.022244	3.3	32.2	64.96	0.81
2.899	90	1609.6	1610.71	1610.61	1610.85	0.020875	3.32	35.91	66.35	0.78
2.899	100	1609.6	1610.76	1610.64	1610.9	0.019891	3.37	39.25	68.4	0.78
2.899	200	1609.6	1611.06	1610.94	1611.28	0.022331	4.21	61.6	79.14	0.85
2.899	240	1609.6	1611.3	1611.01	1611.48	0.014885	3.83	80.65	81.94	0.67
2.899	260	1609.6	1611.39	1611.06	1611.56	0.013579	3.8	87.89	82.7	0.64
2.899	270	1609.6	1611.42	1611.07	1611.6	0.013227	3.81	90.99	83.02	0.63
2.899	290	1609.6	1611.48	1611.12	1611.67	0.012976	3.87	96.13	83.55	0.62

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
2.807	10	1602.3	1602.82	1602.82	1602.95	0.229933	2.88	3.47	13.42	216.21
2.807	20	1602.3	1603.22		1603.27	0.008556	1.84	10.89	22.12	0.46
2.807	30	1602.3	1603.38		1603.44	0.009018	2.09	14.59	25.88	0.47
2.807	40	1602.3	1603.53		1603.6	0.008739	2.21	18.75	29.53	0.46
2.807	50	1602.3	1603.66		1603.74	0.008626	2.32	22.82	32.71	0.45
2.807	60	1602.3	1603.77		1603.86	0.008799	2.44	26.51	35.35	0.45
2.807	70	1602.3	1603.86		1603.96	0.009077	2.56	29.94	37.64	0.46
2.807	80	1602.3	1603.96		1604.06	0.009288	2.62	33.86	44.97	0.46
2.807	90	1602.3	1604.04		1604.15	0.009548	2.68	38.26	54.81	0.47
2.807	100	1602.3	1604.13		1604.24	0.009695	2.72	43.51	69.03	0.47
2.807	200	1602.3	1604.66		1604.77	0.008717	2.94	92.27	97.67	0.45
2.807	240	1602.3	1604.66		1604.82	0.012499	3.52	92.42	97.69	0.53
2.807	260	1602.3	1604.69		1604.86	0.013831	3.72	94.61	97.89	0.56
2.807	270	1602.3	1604.7		1604.89	0.01428	3.8	96.25	98.05	0.57
2.807	290	1602.3	1604.75		1604.94	0.014645	3.9	100.79	98.48	0.58
2.785	10	1600.4	1601.1	1601.09	1601.27	0.040629	3.28	3.05	8.7	0.97
2.785	20	1600.4	1601.34	1601.31	1601.55	0.034867	3.68	5.44	11.61	0.95
2.785	30	1600.4	1601.52	1601.48	1601.75	0.030259	3.86	7.77	13.88	0.91
2.785	40	1600.4	1601.64	1601.61	1601.91	0.031067	4.19	9.54	15.35	0.94
2.785	50	1600.4	1601.74	1601.73	1602.05	0.031491	4.48	11.22	19.54	0.96
2.785	60	1600.4	1601.84	1601.84	1602.18	0.030486	4.67	13.44	25.64	0.96
2.785	70	1600.4	1601.94	1601.94	1602.28	0.028378	4.75	16.1	29.03	0.94
2.785	80	1600.4	1602.02	1602.02	1602.38	0.027005	4.84	18.72	32.02	0.92
2.785	90	1600.4	1602.09	1602.09	1602.46	0.026505	4.96	21.13	34.53	0.92
2.785	100	1600.4	1602.16	1602.16	1602.54	0.025746	5.04	23.59	35.76	0.92
2.785	200	1600.4	1602.62	1602.62	1603.14	0.026627	6.1	41.7	42.97	0.97
2.785	240	1600.4	1603.1		1603.44	0.01163	5.03	63.97	49.65	0.68

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
2.785	260	1600.4	1603.33		1603.62	0.008749	4.74	75.38	52.74	0.6
2.785	270	1600.4	1603.43		1603.71	0.007753	4.62	81.11	54.23	0.57
2.785	290	1600.4	1603.63		1603.89	0.006355	4.45	92.24	57.01	0.53
2.67	10	1592.6	1594.46	1593.56	1594.46	0.005097	0.58	17.3	47.63	0.17
2.67	20	1592.6	1594.65	1593.88	1594.66	0.005562	0.74	27.47	58.47	0.18
2.67	30	1592.6	1594.8	1594.22	1594.81	0.005897	0.83	37.43	71.1	0.19
2.67	40	1592.6	1594.94	1594.35	1594.95	0.005831	0.86	48.14	84.31	0.19
2.67	50	1592.6	1595.04	1594.39	1595.05	0.005815	0.91	56.88	90.3	0.19
2.67	60	1592.6	1595.11	1594.45	1595.13	0.005883	0.98	63.54	90.8	0.2
2.67	70	1592.6	1595.19	1594.49	1595.2	0.00579	1.03	70.33	91.32	0.2
2.67	80	1592.6	1595.26	1594.54	1595.27	0.005723	1.08	76.74	91.8	0.2
2.67	90	1592.6	1595.32	1594.58	1595.34	0.005822	1.14	82.16	92.21	0.2
2.67	100	1592.6	1595.37	1594.61	1595.39	0.006056	1.2	86.68	92.54	0.21
2.67	200	1592.6	1595.84	1594.93	1595.87	0.006472	1.58	131.08	95.8	0.23
2.67	240	1592.6	1595.69		1595.75	0.013457	2.13	116.8	94.76	0.33
2.67	260	1592.6	1595.57		1595.67	0.021617	2.55	105.85	93.96	0.41
2.67	270	1592.6	1595.51		1595.63	0.027448	2.78	100.58	93.57	0.46
2.67	290	1592.6	1595.38		1595.55	0.048165	3.41	88.21	92.66	0.59
2.558	10	1587	1587.47	1587.47	1587.64	0.042591	3.24	3.09	9.32	0.99
2.558	20	1587	1587.68	1587.68	1587.9	0.040374	3.84	5.21	11.72	1.01
2.558	30	1587	1587.87	1587.87	1588.09	0.030727	3.85	8.57	22.26	0.92
2.558	40	1587	1587.97	1587.97	1588.23	0.031174	4.14	11.11	24.42	0.94
2.558	50	1587	1588.07	1588.07	1588.35	0.030768	4.34	13.59	26.36	0.94
2.558	60	1587	1588.16	1588.16	1588.45	0.030599	4.53	15.89	28.04	0.95
2.558	70	1587	1588.23	1588.23	1588.55	0.030485	4.69	18.09	29.56	0.96
2.558	80	1587	1588.3	1588.3	1588.63	0.03114	4.87	20.01	30.82	0.98

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
2.558	90	1587	1588.38	1588.38	1588.71	0.029122	4.88	23.11	45.86	0.95
2.558	100	1587	1588.44	1588.44	1588.78	0.027934	4.95	26.36	51.26	0.94
2.558	200	1587	1588.88		1589.3	0.023044	5.85	56.71	79.16	0.91
2.558	240	1587	1589.38		1589.59	0.008224	4.36	100.71	94.48	0.58
2.558	260	1587	1589.61		1589.77	0.005731	3.94	122.23	95.84	0.49
2.558	270	1587	1589.71		1589.86	0.004944	3.79	132.55	96.49	0.46
2.558	290	1587	1589.92		1590.05	0.00383	3.55	152.84	97.74	0.41
2.545	10	1584.98	1585.78	1585.23	1585.79	0.000978	0.89	11.25	16.91	1.02
2.545	20	1584.98	1586.1	1585.37	1586.13	0.001263	1.27	15.8	18.04	0.99
2.545	30	1584.98	1586.35	1585.51	1586.39	0.001461	1.56	19.29	18.91	1.26
2.545	40	1584.98	1586.56	1585.61	1586.61	0.001616	1.8	22.24	19.65	0.97
2.545	50	1584.98	1586.74	1585.71	1586.81	0.001744	2.01	24.85	20.3	0.99
2.545	60	1584.98	1586.91	1585.8	1586.99	0.001853	2.2	27.23	20.89	1
2.545	70	1584.98	1587.07	1585.89	1587.15	0.001947	2.38	29.42	21.44	1.09
2.545	80	1584.98	1587.21	1585.98	1587.31	0.00203	2.54	31.48	21.95	1.04
2.545	90	1584.98	1587.35	1586.06	1587.46	0.002104	2.69	33.42	22.44	1.02
2.545	100	1584.98	1587.48	1586.14	1587.61	0.00217	2.83	35.28	22.9	1.01
2.545	200	1584.98	1588.59	1586.82	1588.83	0.002548	3.93	50.95	26.81	1.05
2.545	240	1584.98	1589	1587.05	1589.28	0.00257	4.23	56.69	31.31	1.06
2.545	260	1584.98	1589.19	1587.17	1589.49	0.002579	4.38	59.42	35.63	1.01
2.545	270	1584.98	1589.29	1587.22	1589.6	0.00258	4.44	60.78	38.14	1.01
2.545	290	1584.98	1589.48	1587.33	1589.81	0.002574	4.57	63.48	43.14	1
2.537 Culvert										
2.529	10	1583.15	1583.5	1583.5	1583.61	0.051897	2.61	3.83	41.52	1.02
2.529	20	1583.15	1583.63	1583.63	1583.79	0.041814	3.23	6.19	42.5	0.99

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
2.529	30	1583.15	1583.73	1583.73	1583.95	0.040048	3.75	8	43.25	1.26
2.529	40	1583.15	1583.83	1583.82	1584.08	0.03457	4.03	9.93	44.05	0.97
2.529	50	1583.15	1583.91	1583.9	1584.21	0.03403	4.38	11.41	44.67	0.99
2.529	60	1583.15	1583.98	1583.98	1584.32	0.033286	4.68	12.82	45.25	1
2.529	70	1583.15	1584.06	1584.06	1584.44	0.032366	4.94	14.18	45.82	1.09
2.529	80	1583.15	1584.13	1584.13	1584.54	0.031238	5.15	15.52	46.38	1.04
2.529	90	1583.15	1584.19	1584.19	1584.64	0.030855	5.38	16.72	46.87	1.02
2.529	100	1583.15	1584.26	1584.26	1584.74	0.030437	5.59	17.89	47.36	1.01
2.529	200	1583.15	1584.83	1584.83	1585.59	0.025576	7	28.56	51.79	1.05
2.529	240	1583.15	1585.02	1585.02	1585.88	0.024935	7.48	32.11	53.03	1.06
2.529	260	1583.15	1585.11	1585.11	1586.03	0.024512	7.68	33.86	53.57	1.01
2.529	270	1583.15	1585.16	1585.16	1586.09	0.024344	7.78	34.71	53.83	1.01
2.529	290	1583.15	1585.25	1585.25	1586.23	0.02389	7.96	36.43	54.36	1
2.494	10	1581.2	1581.95		1581.97	0.002982	0.94	10.6	27.88	0.27
2.494	20	1581.2	1582.18		1582.19	0.003033	1.13	17.67	35.87	0.28
2.494	30	1581.2	1582.34		1582.36	0.002999	1.25	24.04	41.77	0.29
2.494	40	1581.2	1582.46		1582.49	0.003106	1.36	29.4	46.1	0.3
2.494	50	1581.2	1582.57		1582.6	0.003141	1.45	34.57	49.84	0.31
2.494	60	1581.2	1582.65		1582.68	0.003372	1.56	38.56	52.56	0.32
2.494	70	1581.2	1582.73		1582.77	0.003436	1.62	43.28	56.45	0.33
2.494	80	1581.2	1582.8		1582.85	0.003653	1.69	47.39	60.7	0.34
2.494	90	1581.2	1582.87		1582.92	0.003782	1.74	51.67	64.82	0.34
2.494	100	1581.2	1582.94		1582.98	0.003882	1.79	55.87	68.63	0.35
2.494	200	1581.2	1583.25		1583.34	0.005391	2.52	83.6	99.91	0.43
2.494	240	1581.2	1583.33		1583.45	0.006059	2.8	91.67	100.48	0.46
2.494	260	1581.2	1583.38		1583.5	0.006165	2.9	96.59	100.83	0.47
2.494	270	1581.2	1583.4		1583.53	0.00624	2.95	98.84	100.99	0.47

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
2.494	290	1581.2	1583.42		1583.57	0.006791	3.11	100.95	101.14	0.49
2.448	10	1579.3	1579.6	1579.6	1579.69	0.21267	1.54	4.76	24.06	0.7
2.448	20	1579.3	1579.71	1579.71	1579.83	0.247561	2.09	7.93	31.48	0.8
2.448	30	1579.3	1579.79	1579.79	1579.93	0.251591	2.53	10.51	33.5	0.85
2.448	40	1579.3	1579.86	1579.86	1580.02	0.260363	2.87	12.69	35.12	1.89
2.448	50	1579.3	1579.92	1579.91	1580.1	0.256489	3.12	14.9	36.69	0.9
2.448	60	1579.3	1580.06		1580.2	0.151428	2.82	20.32	40.27	0.72
2.448	70	1579.3	1580.17	1580.01	1580.3	0.111547	2.69	25.19	43.24	0.63
2.448	80	1579.3	1580.28		1580.39	0.088723	2.6	30.22	52.21	0.58
2.448	90	1579.3	1580.38		1580.48	0.072543	2.52	36.03	62.53	0.53
2.448	100	1579.3	1580.48	1580.14	1580.57	0.059852	2.42	42.66	72.53	0.49
2.448	200	1579.3	1581.15		1581.19	0.016116	1.78	130.49	147.09	0.28
2.448	240	1579.3	1581.39		1581.43	0.011309	1.63	165.95	151.18	0.24
2.448	260	1579.3	1581.53		1581.57	0.009897	1.62	190.29	185.72	0.23
2.448	270	1579.3	1581.59		1581.62	0.009122	1.59	200.48	186.12	0.22
2.448	290	1579.3	1581.71		1581.74	0.007574	1.52	223.35	187.01	0.2
2.428	10	1575.8	1576.63	1576.04	1576.64	0.004701	0.71	14.04	30.12	0.99
2.428	20	1575.8	1576.97	1576.17	1576.99	0.005891	1.01	19.89	31.33	0.24
2.428	30	1575.8	1577.23	1576.27	1577.26	0.006687	1.23	24.43	32.26	0.24
2.428	40	1575.8	1577.46	1576.36	1577.49	0.007294	1.41	28.28	33.05	0.22
2.428	50	1575.8	1577.66	1576.45	1577.69	0.007785	1.58	31.71	33.75	0.23
2.428	60	1575.8	1577.84	1576.54	1577.88	0.008197	1.72	34.83	34.39	0.24
2.428	70	1575.8	1578.01	1576.62	1578.06	0.008551	1.86	37.72	34.99	0.25
2.428	80	1575.8	1578.16	1576.68	1578.22	0.008856	1.98	40.44	35.55	0.25
2.428	90	1575.8	1578.31	1576.76	1578.38	0.009129	2.09	43.01	57.08	0.26
2.428	100	1575.8	1578.46	1576.84	1578.53	0.009367	2.2	45.47	59.06	0.26

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
2.428	200	1575.8	1579.66	1577.42	1579.8	0.010728	3.02	66.17	75.77	0.33
2.428	240	1575.8	1580.08	1577.63	1580.24	0.010945	3.27	73.37	81.59	0.36
2.428	260	1575.8	1580.28	1577.73	1580.46	0.011006	3.38	76.85	84.5	0.37
2.428	270	1575.8	1580.38	1577.78	1580.56	0.011027	3.44	78.57	86.01	0.37
2.428	290	1575.8	1580.58	1577.87	1580.77	0.011047	3.54	81.97	87.67	0.39
2.41649 Culvert										
2.405	10	1574	1574.2	1574.2	1574.3	0.399773	2.57	3.89	48.72	0.99
2.405	20	1574	1574.83	1574.32	1574.85	0.013971	1.24	16.11	79.56	0.24
2.405	30	1574	1575.09	1574.42	1575.12	0.012679	1.42	21.16	86.12	0.24
2.405	40	1574	1575.4	1574.51	1575.43	0.009805	1.47	27.16	90.27	0.22
2.405	50	1574	1575.58	1574.6	1575.62	0.010291	1.63	30.6	91.21	0.23
2.405	60	1574	1575.74	1574.66	1575.79	0.01068	1.78	33.76	92.08	0.24
2.405	70	1574	1575.88	1574.74	1575.94	0.011137	1.91	36.57	92.85	0.25
2.405	80	1574	1576.03	1574.81	1576.09	0.011397	2.03	39.35	93.61	0.25
2.405	90	1574	1576.15	1574.88	1576.22	0.01187	2.16	41.71	94.26	0.26
2.405	100	1574	1576.28	1574.94	1576.35	0.012141	2.27	44.14	94.92	0.26
2.405	200	1574	1577.12	1575.48	1577.29	0.016903	3.3	60.58	99.42	0.33
2.405	240	1574	1577.35	1575.68	1577.56	0.019302	3.7	64.94	100.62	0.36
2.405	260	1574	1577.45	1575.77	1577.69	0.020413	3.88	67	101.18	0.37
2.405	270	1574	1577.51	1575.81	1577.75	0.020951	3.97	68	101.45	0.37
2.405	290	1574	1577.58	1575.9	1577.85	0.022557	4.18	69.43	101.84	0.39
2.382	10	1571.2	1571.9		1571.91	0.004307	0.43	23.15	56.19	0.12
2.382	20	1571.2	1571.77	1571.61	1571.79	0.055927	1.26	15.88	52.89	0.41
2.382	30	1571.2	1571.81	1571.68	1571.86	0.08189	1.65	18.21	53.95	0.5
2.382	40	1571.2	1571.73	1571.73	1571.86	0.343981	2.89	13.86	51.95	0.99

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
2.382	50	1571.2	1571.77	1571.77	1571.92	0.333898	3.1	16.11	53	0.99
2.382	60	1571.2	1571.81	1571.81	1571.98	0.324977	3.29	18.25	53.97	1
2.382	70	1571.2	1571.85	1571.85	1572.04	0.310987	3.43	20.43	54.94	0.99
2.382	80	1571.2	1571.89	1571.89	1572.09	0.316479	3.61	22.14	55.69	1.01
2.382	90	1571.2	1571.93	1571.93	1572.14	0.297936	3.69	24.37	57.12	0.99
2.382	100	1571.2	1571.96	1571.96	1572.18	0.294826	3.82	26.2	58.48	1
2.382	200	1571.2	1572.35	1572.24	1572.58	0.154199	3.87	53.2	84.98	0.78
2.382	240	1571.2	1572.5	1572.34	1572.71	0.121035	3.75	67.44	101.65	0.71
2.382	260	1571.2	1572.57	1572.39	1572.77	0.110127	3.73	74.47	116.15	0.69
2.382	270	1571.2	1572.6	1572.41	1572.8	0.105723	3.72	78.09	122.95	0.67
2.382	290	1571.2	1572.68	1572.45	1572.87	0.090652	3.61	88.52	140.72	0.63
2.304	10	1565.3	1565.95	1565.95	1566.1	0.325637	3.18	3.15	9.73	0.73
2.304	20	1565.3	1566.49		1566.5	0.005579	0.43	46.55	142.67	0.13
2.304	30	1565.3	1566.6	1566.26	1566.6	0.004947	0.49	61.9	144.78	0.13
2.304	40	1565.3	1566.77	1566.29	1566.77	0.002982	0.46	86.37	148.09	0.11
2.304	50	1565.3	1566.85	1566.32	1566.85	0.003027	0.51	98.71	149.74	0.11
2.304	60	1565.3	1566.92	1566.34	1566.92	0.003144	0.55	109.27	151.13	0.11
2.304	70	1565.3	1566.99	1566.36	1566.99	0.003197	0.59	119.67	152.49	0.12
2.304	80	1565.3	1567.05	1566.36	1567.06	0.003274	0.62	129.13	153.71	0.12
2.304	90	1565.3	1567.11	1566.4	1567.12	0.003319	0.65	138.43	154.91	0.12
2.304	100	1565.3	1567.16	1566.4	1567.17	0.003418	0.68	146.55	155.94	0.12
2.304	200	1565.3	1567.57		1567.58	0.004067	0.94	218.08	190.57	0.14
2.304	240	1565.3	1567.7		1567.71	0.00427	1.02	242.08	191.51	0.15
2.304	260	1565.3	1567.76		1567.77	0.004352	1.06	253.5	191.96	0.15
2.304	270	1565.3	1567.79		1567.8	0.004386	1.08	259.15	192.18	0.15
2.304	290	1565.3	1567.83		1567.85	0.004551	1.12	268.21	192.54	0.16

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
2.279	10	1565.1	1565.33	1565.33	1565.4	0.491578	2.03	4.92	40.91	1.03
2.279	20	1565.1	1565.88		1565.88	0.003988	0.43	46.27	105.81	0.12
2.279	30	1565.1	1566.01		1566.02	0.004019	0.49	61.35	122.14	0.12
2.279	40	1565.1	1565.73	1565.52	1565.76	0.045818	1.25	31.94	92.44	0.38
2.279	50	1565.1	1565.78	1565.56	1565.81	0.049565	1.38	36.31	96.72	0.4
2.279	60	1565.1	1565.85	1565.6	1565.88	0.044461	1.4	42.89	102.82	0.38
2.279	70	1565.1	1565.89	1565.63	1565.92	0.045388	1.47	47.49	106.87	0.39
2.279	80	1565.1	1565.94	1565.66	1565.98	0.042516	1.5	53.44	111.91	0.38
2.279	90	1565.1	1565.98	1565.69	1566.02	0.043941	1.57	57.45	115.17	0.39
2.279	100	1565.1	1566.02	1565.72	1566.06	0.0422	1.6	62.47	125.71	0.39
2.279	200	1565.1	1566.3	1565.93	1566.35	0.037436	1.97	109.95	196.81	0.39
2.279	240	1565.1	1566.38	1565.99	1566.44	0.036918	2.08	125.69	197.58	0.39
2.279	260	1565.1	1566.42	1566.03	1566.48	0.035507	2.11	134.57	198.02	0.39
2.279	270	1565.1	1566.44	1566.05	1566.5	0.035772	2.14	137.72	198.17	0.39
2.279	290	1565.1	1566.49	1566.08	1566.55	0.033593	2.14	147.57	198.65	0.38
2.2	10	1559.9	1560.94		1560.94	0.000751	0.23	44.41	91.92	0.05
2.2	20	1559.9	1560.39	1560.39	1560.49	0.371869	2.44	8.11	41.05	0
2.2	30	1559.9	1560.46	1560.46	1560.57	0.359169	2.66	11.2	48.69	1.56
2.2	40	1559.9	1561.11		1561.11	0.004935	0.7	61.71	115.73	0.14
2.2	50	1559.9	1561.21		1561.22	0.004744	0.74	74.37	130.29	0.14
2.2	60	1559.9	1561.29		1561.3	0.004864	0.8	84.79	140.11	0.14
2.2	70	1559.9	1561.36		1561.37	0.004819	0.84	96.05	156.19	0.15
2.2	80	1559.9	1561.42		1561.43	0.00494	0.88	105.94	170.08	0.15
2.2	90	1559.9	1561.49		1561.5	0.004837	0.91	117.77	185.32	0.15
2.2	100	1559.9	1561.54		1561.55	0.004909	0.94	127.82	188.03	0.15
2.2	200	1559.9	1561.95		1561.96	0.004995	1.15	204.45	191.4	0.16
2.2	240	1559.9	1562.08		1562.1	0.00495	1.21	230.84	192.54	0.16

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
2.2	260	1559.9	1562.14		1562.16	0.005047	1.25	241.52	193.01	0.16
2.2	270	1559.9	1562.17		1562.19	0.005034	1.26	247.65	193.27	0.16
2.2	290	1559.9	1562.23		1562.25	0.005088	1.29	258.35	193.73	0.17
2.095	10	1551.9	1552.36	1552.36	1552.47	0.360414	2.67	3.84	18.31	0.98
2.095	20	1551.9	1552.5	1552.5	1552.63	0.319948	3	6.89	25.28	0.97
2.095	30	1551.9	1552.6	1552.6	1552.75	0.304482	3.24	9.6	30.14	0.97
2.095	40	1551.9	1552.67	1552.67	1552.85	0.309429	3.49	11.89	33.72	0.99
2.095	50	1551.9	1552.74	1552.74	1552.93	0.298657	3.6	14.39	37.68	0.99
2.095	60	1551.9	1552.79	1552.79	1553	0.302439	3.74	16.58	41.11	1
2.095	70	1551.9	1552.85	1552.85	1553.06	0.301081	3.84	18.78	44.29	1.01
2.095	80	1551.9	1552.89	1552.89	1553.12	0.295952	3.91	21.01	47.3	1
2.095	90	1551.9	1552.94	1552.94	1553.18	0.293151	3.99	23.13	49.99	1.01
2.095	100	1551.9	1552.98	1552.98	1553.23	0.293047	4.08	25.12	52.39	1.01
2.095	200	1551.9	1553.28	1553.28	1553.61	0.257258	4.65	43.99	69.84	1.01
2.095	240	1551.9	1553.39	1553.39	1553.73	0.229219	4.77	51.66	74.56	1.1
2.095	260	1551.9	1553.43	1553.43	1553.78	0.225929	4.88	54.82	76.42	1
2.095	270	1551.9	1553.46	1553.44	1553.81	0.219077	4.89	56.85	77.59	0.98
2.095	290	1551.9	1553.54	1553.46	1553.88	0.204041	4.96	63.29	91.84	0.97
2.071	10	1547.2	1548.31	1547.6	1548.32	0.004763	0.67	14.87	19.83	0.14
2.071	20	1547.2	1548.72	1547.77	1548.73	0.005123	0.84	23.82	24.03	0.15
2.071	30	1547.2	1548.99		1549.01	0.005599	0.97	30.84	30.02	0.17
2.071	40	1547.2	1549.24	1548.01	1549.25	0.005322	1.01	39.68	41.33	0.18
2.071	50	1547.2	1549.42	1548.11	1549.43	0.005422	1.05	47.82	49.52	0.19
2.071	60	1547.2	1549.57	1548.2	1549.59	0.00548	1.07	55.98	56.54	0.19
2.071	70	1547.2	1549.7	1548.28	1549.72	0.005634	1.1	63.43	62.27	0.19
2.071	80	1547.2	1549.81	1548.36	1549.83	0.005615	1.13	70.5	65.43	0.19

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
2.071	90	1547.2	1549.89	1548.43	1549.91	0.005925	1.19	75.65	67.61	0.2
2.071	100	1547.2	1549.97	1548.5	1549.99	0.006049	1.23	81.42	69.97	0.2
2.071	200	1547.2	1550.62	1549.13	1550.66	0.006748	1.5	133.15	89.45	0.22
2.071	240	1547.2	1550.8		1550.84	0.007164	1.6	150	96.22	0.23
2.071	260	1547.2	1550.88		1550.92	0.007438	1.65	157.39	99.04	0.23
2.071	270	1547.2	1550.94	1549.42	1550.98	0.007374	1.66	163.14	102.05	0.23
2.071	290	1547.2	1551.03	1549.49	1551.08	0.007439	1.67	173.2	107.91	0.23
1.98	10	1540.4	1540.7	1540.7	1540.82	0.371477	2.74	3.65	15.64	1
1.98	20	1540.4	1540.85	1540.85	1541.01	0.333818	3.24	6.18	19.02	1
1.98	30	1540.4	1540.98	1540.98	1541.1	0.371277	2.83	10.6	43.31	1.01
1.98	40	1540.4	1541.04	1541.04	1541.18	0.331916	3.04	13.14	44.23	0.98
1.98	50	1540.4	1541.08	1541.08	1541.25	0.322677	3.28	15.25	44.98	0.99
1.98	60	1540.4	1541.12	1541.12	1541.32	0.331653	3.54	16.96	45.58	1.02
1.98	70	1540.4	1541.16	1541.16	1541.38	0.319703	3.7	18.93	46.25	1.02
1.98	80	1540.4	1541.21	1541.21	1541.43	0.307976	3.84	20.85	46.9	1.01
1.98	90	1540.4	1541.3	1541.24	1541.5	0.209452	3.54	25.45	48.43	0.86
1.98	100	1540.4	1541.34	1541.28	1541.55	0.208773	3.67	27.27	49.02	0.87
1.98	200	1540.4	1541.77	1541.59	1542.02	0.132177	4	49.97	55.85	0.75
1.98	240	1540.4	1542.06	1541.7	1542.25	0.097946	3.49	68.71	75.27	0.64
1.98	260	1540.4	1542.17	1541.75	1542.34	0.089599	3.38	76.92	82.81	0.62
1.98	270	1540.4	1542.18	1541.77	1542.36	0.093891	3.47	77.9	83.67	0.63
1.98	290	1540.4	1542.23	1541.83	1542.42	0.092514	3.52	82.43	89.8	0.65
1.855	10	1527.4	1528.35		1528.38	0.004947	1.23	8.14	13.54	0.28
1.855	20	1527.4	1528.7		1528.73	0.005003	1.51	13.22	16.2	0.3
1.855	30	1527.4	1528.95		1528.99	0.005155	1.71	17.51	18.15	0.31
1.855	40	1527.4	1529.15		1529.2	0.005319	1.88	21.32	19.73	0.32

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
1.686	10	1512.11	1513.04		1513.08	0.005844	1.47	6.81	9.6	0.31
1.686	20	1512.11	1513.4		1513.45	0.006922	1.9	10.52	11.35	0.35
1.686	30	1512.11	1513.65		1513.72	0.007823	2.22	13.49	12.57	0.38
1.686	40	1512.11	1513.87		1513.96	0.008148	2.44	16.39	13.66	0.39
1.686	50	1512.11	1514.04		1514.15	0.008684	2.65	18.85	14.52	0.41
1.686	60	1512.11	1514.21		1514.33	0.008892	2.81	21.36	15.35	0.42
1.686	70	1512.11	1514.37		1514.5	0.009158	2.92	23.98	16.66	0.43
1.686	80	1512.11	1514.51		1514.65	0.009534	3.04	26.32	17.74	0.44
1.686	90	1512.11	1514.62		1514.78	0.010026	3.17	28.37	18.64	0.45
1.686	100	1512.11	1514.73		1514.9	0.010306	3.27	30.54	19.54	0.46
1.686	200	1512.11	1515.65	1514.63	1515.88	0.01134	3.8	52.68	29.31	0.5
1.686	240	1512.11	1515.92	1514.87	1516.16	0.011468	3.94	60.94	32.43	0.51
1.686	260	1512.11	1516.04	1514.97	1516.29	0.011547	4.01	64.85	33.81	0.51
1.686	270	1512.11	1516.1	1515.03	1516.35	0.011569	4.04	66.81	34.48	0.51
1.686	290	1512.11	1516.21	1515.16	1516.47	0.011547	4.1	70.81	35.87	0.51
1.636	10	1510.6	1511.15		1511.17	0.009281	1.06	9.41	31.4	0.34
1.636	20	1510.6	1511.31		1511.34	0.009421	1.39	14.41	32.28	0.37
1.636	30	1510.6	1511.44		1511.48	0.009257	1.6	18.71	33.01	0.38
1.636	40	1510.6	1511.54		1511.59	0.009923	1.82	21.97	33.56	0.4
1.636	50	1510.6	1511.64		1511.7	0.009945	1.97	25.33	34.11	0.4
1.636	60	1510.6	1511.72		1511.79	0.01049	2.14	28	34.55	0.42
1.636	70	1510.6	1511.79		1511.87	0.010742	2.28	30.69	34.98	0.43
1.636	80	1510.6	1511.87		1511.96	0.010832	2.4	33.39	35.41	0.43
1.636	90	1510.6	1511.95		1512.05	0.010603	2.48	36.31	35.86	0.43
1.636	100	1510.6	1512.02		1512.12	0.010681	2.58	38.82	36.25	0.44
1.636	200	1510.6	1512.53		1512.72	0.012707	3.44	58.1	39.11	0.5
1.636	240	1510.6	1512.7		1512.91	0.01333	3.71	64.67	40.03	0.51

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
1.636	260	1510.6	1512.78		1513.01	0.013514	3.83	67.97	40.49	0.52
1.636	270	1510.6	1512.82		1513.05	0.013628	3.88	69.54	40.7	0.52
1.636	290	1510.6	1512.89		1513.14	0.013918	4	72.5	45.12	0.53
1.602	10	1506.9	1507.27	1507.27	1507.36	0.087844	2.38	4.2	22.69	0.98
1.602	20	1506.9	1507.38	1507.38	1507.5	0.086395	2.82	7.1	29.52	1.01
1.602	30	1506.9	1507.47	1507.47	1507.61	0.082157	3.06	9.81	34.7	1.01
1.602	40	1506.9	1507.55	1507.55	1507.7	0.074928	3.04	13.15	43.75	0.98
1.602	50	1506.9	1507.61	1507.61	1507.76	0.075272	3.11	16.07	51.84	0.98
1.602	60	1506.9	1507.66	1507.66	1507.82	0.075969	3.2	18.73	58.24	1
1.602	70	1506.9	1507.71	1507.71	1507.87	0.073848	3.25	21.57	64.37	0.99
1.602	80	1506.9	1507.74	1507.74	1507.92	0.076027	3.36	23.79	68.78	1.01
1.602	90	1506.9	1507.77	1507.77	1507.96	0.076663	3.45	26.09	73.08	1.02
1.602	100	1506.9	1507.8	1507.8	1508	0.076776	3.53	28.33	76.79	1.02
1.602	200	1506.9	1508.07	1508.07	1508.3	0.065483	3.91	51.16	105.84	0.99
1.602	240	1506.9	1508.13	1508.13	1508.39	0.065664	4.09	58.76	114.13	3.21
1.602	260	1506.9	1508.16	1508.16	1508.44	0.066027	4.23	61.57	114.25	1.01
1.602	270	1506.9	1508.18	1508.18	1508.46	0.064196	4.26	63.52	114.33	1
1.602	290	1506.9	1508.2	1508.2	1508.5	0.06293	4.36	66.72	114.47	1
1.577	10	1503.2	1503.64		1503.66	0.010034	1.14	8.81	29.45	0.36
1.577	20	1503.2	1503.8		1503.83	0.010305	1.46	14.11	36.59	0.39
1.577	30	1503.2	1503.92		1503.96	0.010539	1.69	18.86	41.96	0.4
1.577	40	1503.2	1504.03		1504.08	0.010244	1.83	23.68	46.8	0.41
1.577	50	1503.2	1504.11		1504.17	0.010368	1.97	27.97	50.71	0.42
1.577	60	1503.2	1504.19		1504.25	0.010547	2.1	31.99	54.12	0.43
1.577	70	1503.2	1504.25		1504.33	0.01098	2.23	35.5	56.93	0.44
1.577	80	1503.2	1504.33		1504.41	0.011018	2.34	40.38	75.12	0.45

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
1.577	90	1503.2	1504.38		1504.47	0.011025	2.43	44.4	76.47	0.45
1.577	100	1503.2	1504.43		1504.52	0.011017	2.5	48.22	77.15	0.45
1.577	200	1503.2	1504.81		1504.94	0.011294	3.16	78.65	83.86	0.48
1.577	240	1503.2	1504.94	1504.55	1505.08	0.01116	3.34	89.75	86.45	0.49
1.577	260	1503.2	1505		1505.15	0.011213	3.44	94.77	87.6	0.49
1.577	270	1503.2	1505.02		1505.18	0.011419	3.51	96.69	88.03	0.5
1.577	290	1503.2	1505.08		1505.24	0.011331	3.58	101.92	89.2	0.5
1.527	10	1499.9	1500.19		1500.21	0.019915	1.01	9.93	64.22	0.45
1.527	20	1499.9	1500.28		1500.3	0.019951	1.28	15.58	70.08	0.48
1.527	30	1499.9	1500.34		1500.38	0.020027	1.48	20.36	74.69	0.5
1.527	40	1499.9	1500.4		1500.44	0.019999	1.62	24.71	78.64	0.51
1.527	50	1499.9	1500.44		1500.49	0.020001	1.77	28.27	78.86	0.52
1.527	60	1499.9	1500.49		1500.54	0.020009	1.91	31.54	79	0.53
1.527	70	1499.9	1500.52		1500.59	0.020012	2.03	34.61	79.12	0.54
1.527	80	1499.9	1500.56		1500.63	0.02	2.14	37.52	79.24	0.55
1.527	90	1499.9	1500.6		1500.67	0.02001	2.24	40.28	79.36	0.55
1.527	100	1499.9	1500.63		1500.71	0.02001	2.34	42.93	79.46	0.56
1.527	200	1499.9	1500.91		1501.06	0.019998	3.08	65.33	80.37	0.6
1.527	240	1499.9	1501		1501.17	0.020001	3.31	72.97	80.68	0.61
1.527	260	1499.9	1501.05		1501.23	0.020003	3.42	76.61	80.83	0.61
1.527	270	1499.9	1501.07		1501.26	0.020005	3.47	78.39	80.9	0.62
1.527	290	1499.9	1501.11		1501.31	0.020002	3.57	81.88	81.04	0.62
1.525	10	1499.7	1499.99		1500.01	0.020051	1.01	9.91	64.19	0.45
1.525	20	1499.7	1500.08		1500.1	0.020044	1.29	15.55	70.06	0.48
1.525	30	1499.7	1500.14		1500.18	0.019995	1.47	20.37	74.7	0.5
1.525	40	1499.7	1500.2		1500.24	0.020017	1.62	24.7	78.64	0.51

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
1.525	50	1499.7	1500.24		1500.29	0.020017	1.77	28.26	78.86	0.52
1.525	60	1499.7	1500.29		1500.34	0.020003	1.91	31.55	79	0.53
1.525	70	1499.7	1500.32		1500.39	0.020006	2.03	34.62	79.12	0.54
1.525	80	1499.7	1500.36		1500.43	0.019995	2.14	37.52	79.24	0.55
1.525	90	1499.7	1500.4		1500.47	0.020005	2.24	40.28	79.36	0.55
1.525	100	1499.7	1500.43		1500.51	0.020005	2.34	42.93	79.46	0.56
1.525	200	1499.7	1500.71		1500.86	0.019995	3.08	65.33	80.37	0.6
1.525	240	1499.7	1500.8		1500.97	0.019998	3.31	72.98	80.68	0.61
1.525	260	1499.7	1500.85		1501.03	0.02	3.42	76.61	80.83	0.61
1.525	270	1499.7	1500.87		1501.06	0.020003	3.47	78.39	80.9	0.62
1.525	290	1499.7	1500.91		1501.11	0.02	3.57	81.88	81.04	0.62
1.523	10	1499.5	1499.79		1499.81	0.019964	1.01	9.92	64.21	0.45
1.523	20	1499.5	1499.88		1499.9	0.019951	1.28	15.58	70.08	0.48
1.523	30	1499.5	1499.94		1499.98	0.02	1.47	20.37	74.7	0.5
1.523	40	1499.5	1500		1500.04	0.019976	1.62	24.72	78.65	0.51
1.523	50	1499.5	1500.04		1500.09	0.019979	1.77	28.28	78.86	0.52
1.523	60	1499.5	1500.09		1500.14	0.019989	1.9	31.55	79	0.53
1.523	70	1499.5	1500.12		1500.19	0.019994	2.03	34.62	79.12	0.54
1.523	80	1499.5	1500.16		1500.23	0.019983	2.14	37.53	79.24	0.55
1.523	90	1499.5	1500.2		1500.27	0.019994	2.24	40.29	79.36	0.55
1.523	100	1499.5	1500.23		1500.31	0.019995	2.34	42.94	79.46	0.56
1.523	200	1499.5	1500.51		1500.66	0.019998	3.08	65.33	80.37	0.6
1.523	240	1499.5	1500.6		1500.77	0.020001	3.31	72.97	80.68	0.61
1.523	260	1499.5	1500.65		1500.83	0.019994	3.42	76.62	80.83	0.61
1.523	270	1499.5	1500.67		1500.86	0.019997	3.47	78.4	80.9	0.62
1.523	290	1499.5	1500.71		1500.91	0.019994	3.57	81.89	81.04	0.62

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: low flow Re ach: 1 1 2/16/96

Hydraulic Reaches = 1
River Sta tions = 78
Plans = 1
Profiles = 15

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
1.521	10	1499.3	1499.59	1499.52	1499.61	0.020013	1.01	9.91	64.2	0.45
1.521	20	1499.3	1499.68	1499.58	1499.7	0.020018	1.29	15.56	70.06	0.48
1.521	30	1499.3	1499.74	1499.63	1499.78	0.02	1.47	20.37	74.7	0.5
1.521	40	1499.3	1499.8	1499.67	1499.84	0.020022	1.62	24.7	78.63	0.51
1.521	50	1499.3	1499.84	1499.71	1499.89	0.020024	1.77	28.26	78.86	0.52
1.521	60	1499.3	1499.89	1499.74	1499.94	0.020009	1.91	31.54	79	0.53
1.521	70	1499.3	1499.92	1499.77	1499.99	0.019994	2.03	34.62	79.12	0.54
1.521	80	1499.3	1499.96	1499.8	1500.03	0.020018	2.14	37.51	79.24	0.55
1.521	90	1499.3	1500	1499.83	1500.07	0.02001	2.24	40.28	79.36	0.55
1.521	100	1499.3	1500.03	1499.86	1500.11	0.02001	2.34	42.93	79.46	0.56
1.521	200	1499.3	1500.31	1500.07	1500.46	0.020018	3.08	65.31	80.37	0.6
1.521	240	1499.3	1500.4	1500.15	1500.57	0.02001	3.31	72.96	80.68	0.61
1.521	260	1499.3	1500.45	1500.18	1500.63	0.020003	3.42	76.61	80.83	0.61
1.521	270	1499.3	1500.47	1500.2	1500.66	0.020005	3.47	78.39	80.9	0.62
1.521	290	1499.3	1500.51	1500.23	1500.71	0.020002	3.57	81.88	81.04	0.62

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 11 Feb 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 39

Location to nearest Quarter Section: NE 1/4 of Section 8

Roadway Name: Zapata Drive (S. of Poncho Villa Pl.)

Roadway Classification: Local

Wash Name (if applicable): Zapata Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 3 - 36" x 72' RCP's

Culvert Description: concrete lined corrugated metal pipes w/ headwalls

Future Condition 100-year Discharge: 1,391 cfs (HEC-1 operation C573R)(6-hr)

Maximum Depth of Flow: 2.3' (see attached sheets)

Duration of Impassable Flow: 0.8 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ____ *

High ____ *

Comments: Estimated passable Q = 234 cfs

SFC

PROJECT: F HILLS ADMP

PROJECT No.: 12 041 01 DATE: 11 Feb 97

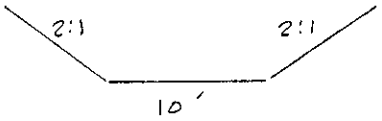
PAGE: 1 OF 1 SCALE:

EAPFL 39

Overflow profile : west top of curb
- surveyed using a Laser level and linker rod

Pt#	Distance	Elevation
1	10+00	17.17
2	10+50	15.72
3	11+00	14.81
4	11+50	14.41
5	12+00	14.63
6	12+04	14.63
7	12+14	24.6

Tailwater section :



n = 0.06

Pipe inverts :

inlet = 10.93
outlet = 8.73
length ≈ 73'

Q = 1391 cfs ⇒ WSEL = 16.66

WSEL = 14.91 ⇒ Q = 234 cfs

DESIGNED BY: CHECKED BY:

CURRENT DATE: 02-11-1997 FILE DATE: 02-11-1997
CURRENT TIME: 09:13:37 FILE NAME: EAPFL-39

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS	SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	10.93	8.73	73.03	3	RCP	3.00	3.00	.012	CONVENTIONAL
2									
3									
4									
5									
6									

****

SUMMARY OF CULVERT FLOWS (cfs) FILE: EAPFL-39 DATE: 02-11-1997

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
10.93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
14.54	140.0	136.4	0.0	0.0	0.0	0.0	0.0	2.35	11
15.09	280.0	157.4	0.0	0.0	0.0	0.0	0.0	119.86	4
15.39	420.0	168.2	0.0	0.0	0.0	0.0	0.0	249.45	4
15.63	560.0	176.4	0.0	0.0	0.0	0.0	0.0	381.85	4
15.83	700.0	182.2	0.0	0.0	0.0	0.0	0.0	512.34	3
16.03	840.0	172.1	0.0	0.0	0.0	0.0	0.0	660.41	3
16.21	980.0	162.1	0.0	0.0	0.0	0.0	0.0	811.01	3
16.38	1120.0	152.1	0.0	0.0	0.0	0.0	0.0	961.55	3
16.53	1260.0	144.0	0.0	0.0	0.0	0.0	0.0	1109.64	3
16.67	1400.0	140.9	0.0	0.0	0.0	0.0	0.0	1253.47	3
14.41	130.4	130.4	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: EAPFL-39 DATE: 02-11-1997

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
10.93	0.000	0.00	0.00	0.00
14.54	-0.006	140.00	1.22	0.87
15.09	-0.005	280.00	2.72	0.97
15.39	-0.003	420.00	2.34	0.56
15.63	-0.002	560.00	1.79	0.32
15.83	-0.006	700.00	5.43	0.78
16.03	-0.008	840.00	7.48	0.89
16.21	-0.006	980.00	6.94	0.71
16.38	-0.006	1120.00	6.34	0.57
16.53	-0.005	1260.00	6.37	0.51
16.67	-0.004	1400.00	5.63	0.40

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

****

CURRENT DATE: 02-11-1997 FILE DATE: 02-11-1997
CURRENT TIME: 09:13:37 FILE NAME: EAPFL-39

****

PERFORMANCE CURVE FOR CULVERT 1 - 3(3.00 (ft) BY 3.00 (ft)) RCP

****

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	10.93	0.00	-2.20	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
136.43	14.55	3.62	1.65	1-S2n	1.25	2.19	1.41	2.11	13.93	4.68
157.41	15.08	4.15	4.15	1-S1f	1.35	2.35	2.50	3.05	8.36	5.70
168.21	15.38	4.45	3.46	4-FFt	1.40	2.42	1.40	3.76	17.30	6.38
176.36	15.62	4.69	4.24	4-FFt	1.44	2.47	1.44	4.35	17.50	6.89
182.23	15.82	4.88	4.89	4-FFt	1.47	2.50	3.00	4.86	8.59	7.31
172.11	16.03	4.57	5.10	4-FFt	1.42	2.44	3.00	5.31	8.12	7.68
162.05	16.22	4.28	5.29	4-FFt	1.37	2.38	3.00	5.72	7.64	7.99
152.11	16.38	4.01	5.45	4-FFt	1.32	2.31	3.00	6.10	7.17	8.28
143.99	16.57	3.81	5.64	4-FFt	1.28	2.25	3.00	6.45	6.79	8.53
140.89	16.84	3.73	5.91	4-FFt	1.27	2.22	3.00	6.78	6.64	8.77

****

El. inlet face invert 10.93 ft El. outlet invert 8.73 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	10.93 ft
OUTLET STATION	73.00 ft
OUTLET ELEVATION	8.73 ft
NUMBER OF BARRELS	3
SLOPE (V/H)	0.0301
CULVERT LENGTH ALONG SLOPE	73.03 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	3.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

****

CURRENT DATE: 02-11-1997 FILE DATE: 02-11-1997
CURRENT TIME: 09:13:37 FILE NAME: EAPFL-39

****
********** TAILWATER **********
****

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH	10.00 ft
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (ft/ft)	0.020
MANNING'S n (.01-0.1)	0.060
CHANNEL INVERT ELEVATION	8.73 ft
CULVERT NO.1 OUTLET INVERT ELEVATION	8.73 ft

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	8.73	0.000	0.00	0.00	0.00
140.00	10.84	0.568	2.11	4.68	2.63
280.00	11.78	0.575	3.05	5.70	3.81
420.00	12.49	0.580	3.76	6.38	4.69
560.00	13.08	0.582	4.35	6.89	5.43
700.00	13.59	0.585	4.86	7.31	6.06
840.00	14.04	0.587	5.31	7.68	6.62
980.00	14.45	0.589	5.72	7.99	7.14
1120.00	14.83	0.591	6.10	8.28	7.61
1260.00	15.18	0.592	6.45	8.53	8.05
1400.00	15.51	0.594	6.78	8.77	8.46

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	32.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	1000.00	17.17
2	1050.00	15.72
3	1100.00	14.81
4	1150.00	14.41
5	1200.00	14.63
6	1204.00	14.63
7	1214.00	24.60

****

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Mar 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 48

Location to nearest Quarter Section: NW 1/4 of Section 15

Roadway Name: Mountainside Drive and Lost Hills Drive

Roadway Classification: Collector

Wash Name (if applicable): Sunflower Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped roadway crossing

Future Condition 100-year Discharge: 278 cfs (HEC-1 operation 211M)(6-hr)

Maximum Depth of Flow: 1.2'

Duration of Impassable Flow: 0.8 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium X *

High ____ *

Comments: Estimated passable Q = 50 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_48
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

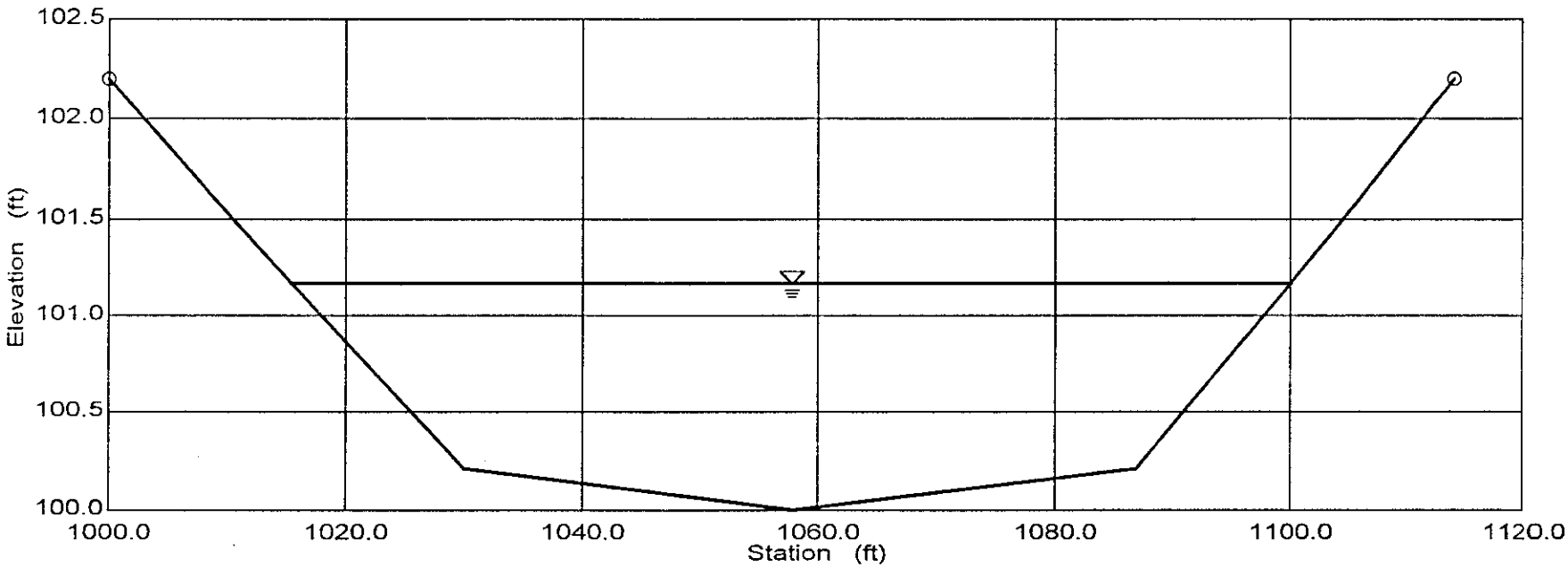
Input Data				
Channel Slope	0.027000 ft/ft			
Elevation range: 100.00 ft to 102.20 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
1,000.00	102.20	1,000.00	1,114.00	0.060
1,030.00	100.20			
1,058.00	100.00			
1,087.00	100.20			
1,114.00	102.20			
Discharge	278.00 cfs			

Results		
Wtd. Mannings Coefficient	0.060	
Water Surface Elevation	101.17	ft
Flow Area	74.46	ft^2
Wetted Perimeter	84.74	ft
Top Width	84.67	ft
Height	1.17	ft
Critical Depth	100.96	ft
Critical Slope	0.058336	ft/ft
Velocity	3.73	ft/s
Velocity Head	0.22	ft
Specific Energy	101.39	ft
Froude Number	0.70	
Flow is subcritical.		

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_48
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.060	
Channel Slope	0.027000	ft/ft
Water Surface Elevation	101.17	ft
Discharge	278.00	cfs



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 17 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 40

Location to nearest Quarter Section: NE 1/4 of Section 16

Roadway Name: Cavern Drive (N of El Lago Blvd)

Roadway Classification: Local

Wash Name (if applicable): Arrow Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding X

Culvert Size: Culvert outlet is completely plugged — assume

Culvert Description: ineffective

Future Condition 100-year Discharge: 372 cfs (HEC-1 operation C617)(6-hr)

Maximum Depth of Flow: 1.6' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 0.9 hrs

Scour/Wash-out Potential: Low ___ * *Notes:

Medium X *

High ___ *

Comments: Estimated passable Q = 40 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 19 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 41

Location to nearest Quarter Section: NW 1/4 of Section 15

Roadway Name: Mimosa Drive (S. of Sunflower Dr)

Roadway Classification: Local

Wash Name (if applicable): Arrow Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding X

Culvert Size: 1-36" x 97' cmp

Culvert Description: Corrugated metal pipe, projecting inlet

Outlet is 7/8 plugged - effective diameter is 0.75'

Future Condition 100-year Discharge: 482 cfs (HEC-1 operation cc180)(6-hr)

Maximum Depth of Flow: > 0.5'

Duration of Impassable Flow: 1 hr

Scour/Wash-out Potential: Low ___ * *Notes: ___

Medium X *

High ___ *

Comments: Estimated passable Q = 30 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 19 Dec 96

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 42

Location to nearest Quarter Section: NW 1/4 of Section 15

Roadway Name: Mountainside Drive (S. of Sunflower Dr.)

Roadway Classification: Collector

Wash Name (if applicable): Arrow Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 1-36"x120' cmp

Culvert Description: Corrugated metal pipe, projecting inlet

Future Condition 100-year Discharge: 655 cfs (HEC-1 operation C619I)(6-hr)

Maximum Depth of Flow: 2.1' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 0.9 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium ____ *

High X *

Comments: Estimated passable Q = 90 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 43 ADMP 14

Location to nearest Quarter Section: SW 1/4 of Section 10

Roadway Name: Arrow Drive (W. of Fountain Hills Blvd)

Roadway Classification: Local

Wash Name (if applicable): Arrow Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 3 - 48" x 72'

Culvert Description: Corrugated metal pipe, mitered inlet

Future Condition 100-year Discharge: 741 cfs (HEC-1 operation CC20) (6-HR

Maximum Depth of Flow: 3.0' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 1.1 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ____ *

High ____ *

Comments: Estimated passable Q = 295 cfs

Profile Out put Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1.061	270	1803.9	1807.68	1806.2	1807.79	0.005116	2.6	103.86	46.28	0.31
1.061	372	1803.9	1808.11	1806.5	1808.25	0.005873	3	124.14	49.4	0.33
1.061	10	1803.9	1805.85	1804.28	1805.85	0.000192	0.31	31.98	29.76	0.05
1.061	20	1803.9	1806.01	1804.47	1806.02	0.000532	0.54	36.92	32.32	0.09
1.061	30	1803.9	1806.14	1804.63	1806.15	0.000907	0.73	41.17	34.37	0.12
1.061	40	1803.9	1806.25	1804.76	1806.26	0.001262	0.89	45.02	35.71	0.14
1.061	50	1803.9	1806.35	1804.87	1806.36	0.001575	1.03	48.58	36.43	0.16
1.061	60	1803.9	1806.44	1804.97	1806.46	0.001866	1.16	51.91	37.1	0.17
1.061	70	1803.9	1806.52	1805.08	1806.55	0.002132	1.27	55.1	37.73	0.19
1.061	80	1803.9	1806.6	1805.17	1806.63	0.00238	1.38	58.15	38.32	0.2
1.061	100	1803.9	1806.75	1805.33	1806.79	0.002819	1.56	63.94	39.42	0.22
1.061	200	1803.9	1807.35	1805.91	1807.43	0.004371	2.25	88.88	43.83	0.28
1.039	270	1801.5	1807.37	1804.75	1807.45	0.001787	2.65	129.04	46.9	0.22
1.039	372	1801.5	1807.66	1805.24	1807.8	0.002695	3.39	143.56	53.1	0.27
1.039	10	1801.5	1805.85	1802.33	1805.85	0.000014	0.18	65.41	37.07	0.02
1.039	20	1801.5	1806	1802.58	1806	0.000045	0.33	71.12	38.04	0.03
1.039	30	1801.5	1806.12	1802.77	1806.12	0.000087	0.47	75.65	38.8	0.05
1.039	40	1801.5	1806.22	1802.92	1806.22	0.000137	0.6	79.51	39.44	0.06
1.039	50	1801.5	1806.3	1803.05	1806.31	0.000192	0.72	82.96	39.99	0.07
1.039	60	1801.5	1806.38	1803.15	1806.39	0.000251	0.84	86.12	40.5	0.08
1.039	70	1801.5	1806.46	1803.28	1806.47	0.000314	0.95	89.07	40.96	0.09
1.039	80	1801.5	1806.52	1803.38	1806.54	0.000379	1.06	91.84	41.4	0.1
1.039	100	1801.5	1806.65	1803.56	1806.67	0.000515	1.26	96.99	42.19	0.12
1.039	200	1801.5	1807.12	1804.34	1807.18	0.001249	2.13	117.62	45.22	0.18
1.032	270	1805.5	1806.83	1806.83	1807.27	0.017333	5.28	51.1	59.95	1.01
1.032	372	1805.5	1807.06	1807.06	1807.56	0.016199	5.67	65.6	66.7	1.01
1.032	10	1805.5	1805.75	1805.75	1805.84	0.040523	2.39	4.19	24.02	1.01
1.032	20	1805.5	1805.86	1805.86	1805.98	0.032608	2.83	7.06	28.5	1
1.032	30	1805.5	1805.94	1805.94	1806.1	0.029722	3.15	9.53	31.84	1.01
1.032	40	1805.5	1806.01	1806.01	1806.19	0.026784	3.34	11.97	34.83	1.01

Profile Out put Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1.032	50	1805.5	1806.08	1806.08	1806.27	0.025219	3.52	14.2	37.37	1.01
1.032	60	1805.5	1806.13	1806.13	1806.34	0.024215	3.69	16.27	39.23	1.01
1.032	70	1805.5	1806.18	1806.18	1806.41	0.023359	3.83	18.26	40.69	1.01
1.032	80	1805.5	1806.23	1806.23	1806.47	0.022558	3.96	20.21	42.08	1.01
1.032	100	1805.5	1806.31	1806.31	1806.58	0.02155	4.19	23.87	44.58	1.01
1.032	200	1805.5	1806.65	1806.65	1807.03	0.018526	4.94	40.49	54.48	1.01
1.013	370	1793.8	1796.23	1796.23	1797.05	0.053658	7.26	51.4	32	0.99
1.013	500	1793.8	1796.62	1796.62	1797.58	0.050655	7.9	64.15	33.9	0.99
1.013	10	1793.8	1794.39	1794.3	1794.46	0.036324	2.11	4.73	14.99	0.66
1.013	20	1793.8	1794.46	1794.46	1794.64	0.078506	3.41	5.86	15.92	0.99
1.013	30	1793.8	1794.68	1794.58	1794.83	0.042016	3.08	9.75	18.78	0.75
1.013	40	1793.8	1794.8	1794.69	1794.97	0.042588	3.35	11.94	20.21	0.77
1.013	50	1793.8	1794.9	1794.78	1795.1	0.042383	3.55	14.07	21.52	0.77
1.013	60	1793.8	1794.86	1794.86	1795.18	0.072795	4.55	13.19	20.99	1.01
1.013	70	1793.8	1795.05	1794.94	1795.3	0.045562	3.99	17.52	23.48	0.81
1.013	80	1793.8	1795.12	1795.01	1795.39	0.046634	4.17	19.17	24.35	0.83
1.013	100	1793.8	1795.25	1795.14	1795.56	0.047942	4.47	22.37	25.98	0.85
1.013	200	1793.8	1795.66	1795.63	1796.2	0.056571	5.93	33.77	29.17	0.96
0.984	370	1786.1	1788.17	1788.14	1788.99	0.045488	7.35	52.3	31.06	0.96
0.984	500	1786.1	1788.57	1788.54	1789.55	0.042391	8.08	64.99	32.26	0.95
0.984	10	1786.1	1786.42	1786.42	1786.53	0.088795	2.59	3.87	18.34	0.99
0.984	20	1786.1	1786.71	1786.54	1786.77	0.021708	2	10.08	24.89	0.55
0.984	30	1786.1	1786.65	1786.65	1786.84	0.073641	3.46	8.73	23.61	1
0.984	40	1786.1	1786.74	1786.74	1786.95	0.069252	3.68	10.92	25.64	0.99
0.984	50	1786.1	1786.81	1786.81	1787.05	0.069748	3.95	12.74	27.01	1.01
0.984	60	1786.1	1787.07	1786.87	1787.21	0.02526	3.06	19.82	27.78	0.63
0.984	70	1786.1	1786.94	1786.94	1787.23	0.063944	4.34	16.27	27.4	0.98
0.984	80	1786.1	1786.99	1786.99	1787.31	0.063627	4.55	17.74	27.55	0.99
0.984	100	1786.1	1787.1	1787.1	1787.47	0.061072	4.88	20.72	27.88	0.98
0.984	200	1786.1	1787.57	1787.54	1788.12	0.051247	6.02	33.99	29.26	0.96

Profile Out put Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
0.916	370	1772.9	1775.22	1775.08	1775.86	0.029617	7.04	64.94	45.52	0.84
0.916	500	1772.9	1775.53	1775.49	1776.33	0.031866	7.98	80.05	51.78	0.89
0.916	10	1772.9	1773.23	1773.23	1773.33	0.092719	2.58	3.89	19.37	1
0.916	20	1772.9	1773.35	1773.35	1773.51	0.0758	3.19	6.38	20.69	0.98
0.916	30	1772.9	1773.64	1773.45	1773.73	0.019786	2.47	12.77	23.75	0.55
0.916	40	1772.9	1773.74	1773.54	1773.86	0.020291	2.78	15.32	24.87	0.58
0.916	50	1772.9	1773.83	1773.62	1773.97	0.02135	3.07	17.49	25.78	0.6
0.916	60	1772.9	1773.7	1773.7	1774	0.056453	4.45	14.28	24.42	0.95
0.916	70	1772.9	1774	1773.77	1774.17	0.021266	3.48	21.99	27.58	0.62
0.916	80	1772.9	1774.06	1773.83	1774.26	0.0224	3.71	23.67	28.22	0.64
0.916	100	1772.9	1774.17	1773.95	1774.41	0.02376	4.11	27.05	29.47	0.67
0.916	200	1772.9	1774.65	1774.44	1775.06	0.026801	5.48	42.16	34.5	0.76
0.836	370	1757.6	1759.1	1759.1	1759.71	0.053561	6.6	60.06	50.64	1.05
0.836	500	1757.6	1759.39	1759.39	1760.12	0.048712	7.23	74.75	51.95	1.03
0.836	10	1757.6	1758	1757.89	1758.03	0.018814	1.17	8.41	37.52	0.46
0.836	20	1757.6	1758.13	1757.98	1758.16	0.018879	1.53	13.21	41.4	0.49
0.836	30	1757.6	1758.05	1758.05	1758.18	0.093735	2.94	10.18	39	1.05
0.836	40	1757.6	1758.11	1758.11	1758.27	0.08749	3.21	12.58	40.92	1.05
0.836	50	1757.6	1758.17	1758.17	1758.34	0.080069	3.39	15.03	42.78	1.03
0.836	60	1757.6	1758.22	1758.22	1758.41	0.078362	3.59	17.11	44.3	1.04
0.836	70	1757.6	1758.26	1758.26	1758.47	0.078905	3.79	18.94	45.6	1.05
0.836	80	1757.6	1758.3	1758.3	1758.53	0.077128	3.94	20.9	46.95	1.05
0.836	100	1757.6	1758.38	1758.38	1758.64	0.069647	4.2	24.71	47.33	1.03
0.836	200	1757.6	1758.69	1758.69	1759.1	0.059601	5.32	39.65	48.76	1.03
0.757	370	1742.8	1745.85	1745.21	1746.04	0.010631	3.78	116.97	86.59	0.45
0.757	500	1742.8	1747.07	1745.46	1747.15	0.002867	2.62	232.78	100.68	0.25
0.757	10	1742.8	1743.27	1743.27	1743.41	0.099338	2.95	3.39	12.37	0.99
0.757	20	1742.8	1743.44	1743.44	1743.63	0.093332	3.43	5.83	15.96	1
0.757	30	1742.8	1744.87	1743.57	1744.88	0.000731	0.69	48.13	58.89	0.11

Profile Out put Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
0.757	40	1742.8	1744.95	1743.67	1744.96	0.001044	0.85	52.73	59.73	0.13
0.757	50	1742.8	1745	1743.75	1745.02	0.001409	1.01	55.94	60.32	0.15
0.757	60	1742.8	1745.05	1743.83	1745.06	0.0018	1.16	58.65	60.81	0.17
0.757	70	1742.8	1745.1	1743.91	1745.12	0.002122	1.28	62.02	61.42	0.19
0.757	80	1742.8	1745.14	1743.97	1745.17	0.002506	1.42	64.28	62.06	0.2
0.757	100	1742.8	1745.2	1744.1	1745.24	0.003285	1.67	68.42	63.23	0.23
0.757	200	1742.8	1745.53	1744.69	1745.62	0.006096	2.57	90.11	74.01	0.33
0.679	370	1733.4	1745.96	1735.63	1745.96	0.000016	0.35	1086.06	155.85	0.02
0.679	500	1733.4	1747.1	1735.98	1747.1	0.000019	0.41	1269.78	165.47	0.02
0.679	10	1733.4	1738.28	1733.85	1738.28	0.000001	0.06	169.96	51.42	0.01
0.679	20	1733.4	1738.61	1734.03	1738.61	0.000005	0.11	187.93	56.03	0.01
0.679	30	1733.4	1744.87	1734.15	1744.87	0	0.03	922.74	145.8	0
0.679	40	1733.4	1744.95	1734.26	1744.95	0	0.04	934.39	146.53	0
0.679	50	1733.4	1745.01	1734.43	1745.01	0	0.05	942.61	147.04	0
0.679	60	1733.4	1745.06	1734.48	1745.06	0.000001	0.06	949.62	147.48	0
0.679	70	1733.4	1745.12	1734.54	1745.12	0.000001	0.08	958.15	148.01	0
0.679	80	1733.4	1745.16	1734.6	1745.16	0.000001	0.09	964.03	148.38	0.01
0.679	100	1733.4	1745.23	1734.68	1745.23	0.000002	0.11	974.8	149.04	0.01
0.679	200	1733.4	1745.58	1735.09	1745.58	0.000006	0.2	1027.82	152.27	0.01
0.672	370	1732.7	1745.96	1740.5	1745.96	0.000026	0.71	977.25	172.39	0.83
0.672	482	1732.7	1741.98	1741.98	1746.63	0.025069	17.31	27.84	133.33	0.79
0.672	10	1732.7	1738.27	1733.41	1738.27	0.000059	0.6	16.71	37.9	1.04
0.672	20	1732.7	1738.59	1733.82	1738.61	0.000197	1.13	17.66	40.06	1.37
0.672	30	1732.7	1744.87	1734.15	1744.87	0	0.07	802.37	152.45	1
0.672	40	1732.7	1744.95	1734.47	1744.95	0	0.09	814.54	152.98	0.91
0.672	50	1732.7	1745.01	1734.76	1745.01	0.000001	0.11	823.12	153.49	1
0.672	60	1732.7	1745.06	1735.02	1745.06	0.000001	0.13	830.45	154.44	0.99
0.672	70	1732.7	1745.12	1735.26	1745.12	0.000001	0.16	839.4	155.6	1.01
0.672	80	1732.7	1745.16	1735.5	1745.16	0.000002	0.18	845.59	156.39	1
0.672	100	1732.7	1745.23	1735.96	1745.23	0.000003	0.22	856.93	157.83	1

Profile Output Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
0.672	200	1732.7	1745.58	1737.85	1745.58	0.000009	0.41	913.67	164.86	1
0.662999 Culvert										
0.654	370	1729.08	1735.72	1735.72	1737.34	0.019317	12.16	47.16	16.72	0.83
0.654	482	1729.08	1736.65	1736.65	1738.18	0.016851	12.4	66.35	24.37	0.79
0.654	10	1729.08	1729.78	1729.78	1730.13	0.059638	4.77	2.1	3.76	1.04
0.654	20	1729.08	1730.18	1730.18	1730.75	0.052049	6.04	3.31	4.21	1.37
0.654	30	1729.08	1730.55	1730.55	1731.27	0.045535	6.82	4.4	4.6	1
0.654	40	1729.08	1730.96	1730.85	1731.74	0.035521	7.1	5.63	5.05	0.91
0.654	50	1729.08	1731.14	1731.14	1732.16	0.040964	8.11	6.17	5.25	1
0.654	60	1729.08	1731.4	1731.4	1732.55	0.039463	8.62	6.96	5.54	0.99
0.654	70	1729.08	1731.64	1731.64	1732.93	0.038786	9.12	7.67	5.8	1.01
0.654	80	1729.08	1731.88	1731.88	1733.29	0.037558	9.53	8.39	6.06	1
0.654	100	1729.08	1732.33	1732.33	1733.96	0.035477	10.24	9.76	6.56	1
0.654	200	1729.08	1734.24	1734.24	1736.83	0.030436	12.91	15.49	8.65	1
0.645	400	1727.8	1730.4	1730.4	1731.27	0.059595	7.51	53.23	30.87	1.01
0.645	520	1727.8	1730.74	1730.74	1731.76	0.057013	8.11	64.13	31.85	1.01
0.645	10	1727.8	1728.75	1728.44	1728.78	0.015191	1.42	7.05	18.09	0.4
0.645	20	1727.8	1728.97	1728.66	1729.02	0.015594	1.64	12.19	26.25	0.42
0.645	30	1727.8	1729.12	1728.81	1729.17	0.01473	1.87	16.07	27.25	0.43
0.645	40	1727.8	1728.91	1728.91	1729.13	0.090337	3.76	10.64	24.72	1.01
0.645	50	1727.8	1729	1729	1729.23	0.08395	3.88	12.87	26.91	0.99
0.645	60	1727.8	1729.06	1729.06	1729.33	0.081953	4.13	14.51	27.09	1
0.645	70	1727.8	1729.12	1729.12	1729.41	0.079667	4.35	16.1	27.26	1
0.645	80	1727.8	1729.17	1729.17	1729.49	0.078688	4.56	17.56	27.41	1
0.645	100	1727.8	1729.28	1729.28	1729.65	0.075645	4.9	20.43	27.7	1
0.645	200	1727.8	1729.72	1729.72	1730.29	0.06592	6.06	33	28.96	1
0.602	520	1720.8	1727.07	1722.43	1727.08	0.000181	0.88	594.39	119.61	0.07
0.602	655	1720.8	1727.27	1722.6	1727.29	0.000255	1.07	618.18	120.65	0.08

Profile Out put Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
0.602	10	1720.8	1721.27	1721.27	1721.42	0.104117	3.12	3.21	10.35	0.99
0.602	20	1720.8	1721.49	1721.49	1721.59	0.11791	2.54	7.87	40.62	1.02
0.602	30	1720.8	1721.57	1721.57	1721.67	0.116733	2.62	11.44	56.93	1.03
0.602	40	1720.8	1721.82	1721.63	1721.84	0.011053	1.18	33.86	94.73	0.35
0.602	50	1720.8	1722.25	1721.66	1722.25	0.001281	0.67	74.61	96.64	0.13
0.602	60	1720.8	1723.21	1721.69	1723.21	0.000127	0.35	170.15	100.98	0.05
0.602	70	1720.8	1724.71	1721.72	1724.71	0.000022	0.21	326.17	107.68	0.02
0.602	80	1720.8	1725.49	1721.74	1725.49	0.000014	0.19	411.94	111.27	0.02
0.602	100	1720.8	1725.73	1721.78	1725.73	0.000017	0.23	438.73	112.54	0.02
0.602	200	1720.8	1726.24	1721.98	1726.24	0.000047	0.4	496.77	115.22	0.03
0.583	520	1717.6	1727.06	1725.16	1727.07	0.000149	1.35	629.53	135.3	1
0.583	655	1717.6	1727.25	1725.16	1727.26	0.000212	1.63	655.62	137.16	0.14
0.583	10	1717.6	1719.27	1718.19	1719.3	0.001871	1.5	6.65	15.98	0.99
0.583	20	1717.6	1720.04	1718.52	1720.1	0.002108	2.06	9.73	21.54	0.82
0.583	30	1717.6	1720.69	1718.81	1720.78	0.002139	2.43	12.35	26.28	0.99
0.583	40	1717.6	1721.32	1719.06	1721.43	0.002054	2.69	14.86	45.86	1
0.583	50	1717.6	1721.96	1719.3	1722.09	0.001888	2.87	17.42	57.19	1
0.583	60	1717.6	1723.06	1719.52	1723.17	0.001287	2.75	21.81	85.31	0.99
0.583	70	1717.6	1724.6	1719.72	1724.69	0.000764	2.5	27.96	108.15	1
0.583	80	1717.6	1725.49	1719.93	1725.49	0.00001	0.3	430.7	118.24	1
0.583	100	1717.6	1725.73	1720.28	1725.73	0.000013	0.36	459.29	120.94	1.01
0.583	200	1717.6	1726.24	1721.87	1726.24	0.000036	0.63	522.06	126.71	1.01
0.572 Culvert										
0.561	520	1714.4	1722.52	1722.52	1726.53	0.026039	16.09	32.32	105.51	1
0.561	655	1714.4	1724.75	1724.75	1724.78	0.000448	2.48	533.24	157.83	0.14
0.561	10	1714.4	1715.01	1715.01	1715.3	0.062937	4.32	2.32	5.76	0.99
0.561	20	1714.4	1715.49	1715.36	1715.84	0.034499	4.75	4.21	7.28	0.82
0.561	30	1714.4	1715.63	1715.63	1716.24	0.051225	6.3	4.76	7.73	0.99
0.561	40	1714.4	1715.89	1715.89	1716.62	0.047289	6.9	5.8	8.57	1

Profile Out put Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
0.561	50	1714.4	1716.12	1716.12	1716.97	0.044411	7.4	6.76	9.34	1
0.561	60	1714.4	1716.36	1716.36	1717.3	0.04172	7.81	7.68	10.09	0.99
0.561	70	1714.4	1716.55	1716.55	1717.61	0.040926	8.26	8.47	10.73	1
0.561	80	1714.4	1716.76	1716.76	1717.91	0.039229	8.6	9.3	11.39	1
0.561	100	1714.4	1717.11	1717.11	1718.47	0.038243	9.34	10.71	12.54	1.01
0.561	200	1714.4	1718.7	1718.7	1720.83	0.032417	11.72	17.06	17.66	1.01
0.541	520	1709.5	1714.74	1714.74	1716.15	0.046556	9.57	55.79	22.18	0.95
0.541	655	1709.5	1715.38	1715.38	1716.81	0.040767	9.73	71.63	27.55	0.9
0.541	10	1709.5	1710.44	1710.2	1710.56	0.02524	2.72	3.67	5.43	0.58
0.541	20	1709.5	1710.52	1710.52	1710.89	0.074071	4.87	4.11	5.66	1.01
0.541	30	1709.5	1711.12	1710.77	1711.34	0.026903	3.73	8.04	7.43	0.63
0.541	40	1709.5	1711.34	1710.98	1711.6	0.028522	4.11	9.74	8.08	0.66
0.541	50	1709.5	1711.56	1711.16	1711.85	0.027989	4.31	11.59	8.73	0.66
0.541	60	1709.5	1711.73	1711.33	1712.06	0.028818	4.57	13.14	9.24	0.67
0.541	70	1709.5	1711.9	1711.48	1712.25	0.028891	4.75	14.73	9.73	0.68
0.541	80	1709.5	1712.05	1711.62	1712.43	0.029363	4.94	16.19	10.16	0.69
0.541	100	1709.5	1712.31	1711.87	1712.74	0.029936	5.26	19	10.95	0.7
0.541	200	1709.5	1712.81	1712.81	1713.82	0.059066	8.07	24.78	12.41	1.01
0.441	520	1688.4	1693.01	1691.69	1693.33	0.010915	4.49	115.7	40.04	0.47
0.441	655	1688.4	1693.61	1692.03	1693.95	0.009949	4.67	140.28	42.47	0.45
0.441	10	1688.4	1688.91	1688.9	1689.04	0.074288	2.91	3.44	11.62	0.94
0.441	20	1688.4	1689.39	1689.07	1689.46	0.013566	2.06	9.73	14.55	0.44
0.441	30	1688.4	1689.22	1689.22	1689.48	0.071447	4.13	7.26	13.47	0.99
0.441	40	1688.4	1689.34	1689.34	1689.65	0.067249	4.43	9.03	14.25	0.98
0.441	50	1688.4	1689.44	1689.44	1689.8	0.069469	4.8	10.43	14.84	1.01
0.441	60	1688.4	1689.54	1689.54	1689.93	0.067864	5.02	11.95	15.45	1.01
0.441	70	1688.4	1689.63	1689.63	1690.06	0.067443	5.24	13.35	15.99	1.01
0.441	80	1688.4	1689.72	1689.72	1690.17	0.065419	5.39	14.84	16.55	1
0.441	100	1688.4	1689.88	1689.88	1690.38	0.064734	5.72	17.47	17.49	1.01
0.441	200	1688.4	1695.59	1690.54	1695.61	0.000222	0.86	232.58	50.57	0.07

Profile Out put Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
0.338	520	1677.2	1693.2	1680.01	1693.2	0.000016	0.41	1281.89	117.61	0.02
0.338	655	1677.2	1693.8	1680.23	1693.8	0.000022	0.48	1353.29	120.36	0.03
0.338	10	1677.2	1678	1677.69	1678.03	0.009281	1.49	6.69	12.11	0.35
0.338	20	1677.2	1678	1677.88	1678.14	0.037123	2.99	6.69	12.11	0.71
0.338	30	1677.2	1679	1678.02	1679.02	0.002967	1.01	29.72	37.52	0.2
0.338	40	1677.2	1679	1678.16	1679.03	0.005275	1.35	29.72	37.52	0.27
0.338	50	1677.2	1679	1678.31	1679.04	0.008242	1.68	29.72	37.52	0.33
0.338	60	1677.2	1679.5	1678.43	1679.52	0.002826	1.16	51.77	50.7	0.2
0.338	70	1677.2	1680	1678.53	1680.01	0.001216	0.87	80.41	63.87	0.14
0.338	80	1677.2	1680	1678.61	1680.02	0.001589	0.99	80.41	63.87	0.16
0.338	100	1677.2	1681	1678.74	1681.01	0.000372	0.68	146.62	68.55	0.08
0.338	200	1677.2	1695.6	1679.2	1695.6	0.000001	0.13	1580.56	141.45	0.01
0.165	490	1660.2	1664.9	1663.44	1665.31	0.006808	5.11	95.86	29.61	0.5
0.165	741	1660.2	1665.97	1664.26	1666.48	0.006816	5.73	129.34	33.46	0.51
0.165	10	1660.2	1660.91	1660.65	1660.94	0.006888	1.46	6.84	14.74	0.38
0.165	20	1660.2	1661.16	1660.83	1661.22	0.006851	1.87	10.67	15.71	0.4
0.165	30	1660.2	1661.36	1660.95	1661.44	0.006781	2.15	13.95	16.5	0.41
0.165	40	1660.2	1661.54	1661.06	1661.63	0.006754	2.37	16.89	17.17	0.42
0.165	50	1660.2	1661.69	1661.16	1661.8	0.006741	2.55	19.62	17.77	0.43
0.165	60	1660.2	1661.84	1661.25	1661.95	0.006758	2.71	22.16	18.31	0.43
0.165	70	1660.2	1661.97	1661.34	1662.09	0.00674	2.84	24.61	18.82	0.44
0.165	80	1660.2	1662.09	1661.42	1662.23	0.006744	2.97	26.95	19.29	0.44
0.165	100	1660.2	1662.32	1661.58	1662.47	0.006734	3.18	31.42	20.16	0.45
0.165	200	1660.2	1663.2	1662.2	1663.45	0.006755	3.94	50.78	23.44	0.47
0.151	490	1659.6	1663.34	1663.14	1664.41	0.02437	8.31	58.96	22.64	0.91
0.151	741	1659.6	1664.11	1664.02	1665.53	0.026356	9.57	77.45	25.37	0.97
0.151	10	1659.6	1660.13	1660.01	1660.21	0.017603	2.15	4.65	11.29	0.59
0.151	20	1659.6	1660.36	1660.18	1660.48	0.017061	2.73	7.34	12.1	0.62
0.151	30	1659.6	1660.56	1660.33	1660.71	0.015989	3.07	9.78	12.8	0.62

Profile Out put Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
0.151	40	1659.6	1660.7	1660.47	1660.89	0.01693	3.44	11.62	13.3	0.65
0.151	50	1659.6	1660.83	1660.58	1661.05	0.017441	3.74	13.37	13.75	0.67
0.151	60	1659.6	1660.96	1660.68	1661.2	0.017476	3.97	15.11	14.2	0.68
0.151	70	1659.6	1661.06	1660.78	1661.34	0.017945	4.21	16.64	14.57	0.69
0.151	80	1659.6	1661.17	1660.88	1661.47	0.018077	4.4	18.18	14.94	0.7
0.151	100	1659.6	1661.35	1661.05	1661.7	0.018757	4.78	20.94	15.58	0.73
0.151	200	1659.6	1662.06	1661.76	1662.63	0.020649	6.08	32.9	18.1	0.79
0.115	490	1654.8	1658.11	1658.11	1659.22	0.029942	8.42	58.21	85.07	1.01
0.115	741	1654.8	1658.88	1658.88	1660.21	0.028582	9.23	80.25	127.24	1.01
0.115	10	1654.8	1655.21	1655.18	1655.33	0.039692	2.79	3.58	10.96	0.86
0.115	20	1654.8	1655.37	1655.35	1655.58	0.043448	3.66	5.46	11.85	0.95
0.115	30	1654.8	1655.5	1655.5	1655.78	0.045627	4.27	7.03	12.54	1.03
0.115	40	1654.8	1655.64	1655.62	1655.96	0.0416	4.55	8.8	13.28	0.98
0.115	50	1654.8	1655.74	1655.74	1656.11	0.042034	4.9	10.2	13.83	1.01
0.115	60	1654.8	1655.85	1655.85	1656.26	0.040736	5.14	11.68	14.4	1
0.115	70	1654.8	1655.94	1655.94	1656.39	0.039836	5.35	13.09	14.92	1.01
0.115	80	1654.8	1656.03	1656.03	1656.51	0.039191	5.54	14.44	15.4	1
0.115	100	1654.8	1656.2	1656.2	1656.73	0.037809	5.85	17.09	16.3	1.01
0.115	200	1654.8	1656.86	1656.86	1657.6	0.03372	6.87	29.1	19.88	1.01
0.081	490	1646.6	1649.88	1649.88	1651.02	0.029698	8.54	57.36	25.32	1
0.081	741	1646.6	1650.68	1650.68	1652.04	0.02812	9.36	79.16	29.12	1
0.081	10	1646.6	1646.93	1646.93	1647.08	0.056238	3.06	3.27	11.35	1
0.081	20	1646.6	1647.1	1647.1	1647.33	0.05006	3.78	5.29	12.16	1.01
0.081	30	1646.6	1647.25	1647.25	1647.53	0.046322	4.24	7.07	12.83	1.01
0.081	40	1646.6	1647.36	1647.36	1647.7	0.046229	4.68	8.55	13.37	1.03
0.081	50	1646.6	1647.49	1647.49	1647.85	0.041137	4.84	10.32	13.98	0.99
0.081	60	1646.6	1647.59	1647.59	1647.99	0.040601	5.12	11.72	14.45	1
0.081	70	1646.6	1647.68	1647.68	1648.13	0.040071	5.36	13.07	14.89	1.01
0.081	80	1646.6	1647.77	1647.77	1648.25	0.038961	5.53	14.46	15.32	1
0.081	100	1646.6	1647.94	1647.94	1648.47	0.037766	5.87	17.03	16.1	1.01

Profile Out put Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
0.081	200	1646.6	1648.61	1648.61	1649.35	0.033312	6.92	28.91	19.28	1
0.071	490	1642.3	1649.4	1645.38	1649.49	0.000913	2.36	213.3	65.1	1
0.071	741	1642.3	1650.11	1646.14	1650.25	0.00129	3	263.94	91.06	1.72
0.071	10	1642.3	1644.1	1642.71	1644.1	0.000108	0.36	27.55	20.96	0.02
0.071	20	1642.3	1643.79	1642.88	1643.8	0.000918	0.94	21.29	19.45	0.98
0.071	30	1642.3	1644.05	1643	1644.07	0.001078	1.13	26.58	20.73	1.01
0.071	40	1642.3	1644.28	1643.11	1644.3	0.001186	1.28	31.37	21.82	1.01
0.071	50	1642.3	1644.48	1643.21	1644.51	0.001262	1.39	35.86	22.8	1
0.071	60	1642.3	1644.66	1643.31	1644.7	0.001316	1.49	40.14	23.69	1.01
0.071	70	1642.3	1644.83	1643.39	1644.87	0.001355	1.58	44.28	24.53	1
0.071	80	1642.3	1644.99	1643.47	1645.04	0.001383	1.66	48.31	25.31	1
0.071	100	1642.3	1645.3	1643.62	1645.35	0.001414	1.78	56.17	26.78	1
0.071	200	1642.3	1646.57	1644.2	1646.64	0.001343	2.12	94.23	32.97	1
0.0645 Culvert										
0.058	490	1641.6	1644.39	1644.39	1645.47	0.029745	8.32	58.87	27.25	1
0.058	741	1641.6	1645.45	1645.45	1645.73	0.008329	5.25	265.49	445.46	1.72
0.058	10	1641.6	1644.09	1644.09	1644.09	0.000019	0.2	50.76	25.96	0.02
0.058	20	1641.6	1642.01	1642.01	1642.18	0.050166	3.31	6.05	17.13	0.98
0.058	30	1641.6	1642.12	1642.12	1642.34	0.046657	3.76	7.97	17.6	1.01
0.058	40	1641.6	1642.21	1642.21	1642.48	0.046148	4.17	9.6	17.99	1.01
0.058	50	1641.6	1642.3	1642.3	1642.61	0.04392	4.45	11.24	18.38	1
0.058	60	1641.6	1642.38	1642.38	1642.73	0.043025	4.72	12.72	18.71	1.01
0.058	70	1641.6	1642.46	1642.46	1642.84	0.041423	4.92	14.22	19.05	1
0.058	80	1641.6	1642.54	1642.54	1642.94	0.040501	5.12	15.62	19.36	1
0.058	100	1641.6	1642.67	1642.67	1643.14	0.03893	5.46	18.31	19.94	1
0.058	200	1641.6	1643.23	1643.23	1643.92	0.034622	6.63	30.18	22.33	1
0.038	490	1636.1	1639.29	1639.29	1640.37	0.029568	8.36	58.64	308.7	1.01
0.038	741	1636.1	1640.05	1640.05	1641.36	0.028289	9.19	80.6	356.58	1

Profile Out put Table Table 1
HEC-RAS Plan: Ex & Fu Cond Reach: 1 12/17/96

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
0.038	10	1636.1	1636.44	1636.44	1636.58	0.056406	3	3.34	117.69	0.98
0.038	20	1636.1	1636.61	1636.61	1636.82	0.049591	3.69	5.42	128.65	0.99
0.038	30	1636.1	1636.74	1636.74	1637.01	0.04696	4.18	7.19	137.4	1.01
0.038	40	1636.1	1636.86	1636.86	1637.18	0.043996	4.51	8.88	145.38	1
0.038	50	1636.1	1636.97	1636.97	1637.33	0.042548	4.8	10.42	177.58	0.99
0.038	60	1636.1	1637.07	1637.07	1637.46	0.04127	5.04	11.9	191.96	1.01
0.038	70	1636.1	1637.16	1637.16	1637.59	0.040338	5.26	13.32	194.93	1
0.038	80	1636.1	1637.24	1637.24	1637.71	0.039484	5.44	14.69	198.78	1
0.038	100	1636.1	1637.4	1637.4	1637.92	0.038047	5.76	17.35	205.92	1.01
0.038	200	1636.1	1638.04	1638.04	1638.77	0.03415	6.84	29.25	236.11	1.01
-0.011	1380	1625.8	1631.35	1631.35	1632.75	0.013088	10.3	203.63	85.28	0.92
-0.011	1880	1625.8	1632.06	1632.06	1633.68	0.012559	11.31	268.45	95.2	0.93
-0.011	10	1625.8	1632	1626.59	1632	0	0.06	262.3	94.3	0.01
-0.011	20	1625.8	1632	1626.85	1632	0.000002	0.12	262.3	94.3	0.01
-0.011	30	1625.8	1632	1627.04	1632	0.000003	0.18	262.3	94.3	0.02
-0.011	40	1625.8	1632	1627.18	1632	0.000006	0.24	262.3	94.3	0.02
-0.011	50	1625.8	1632	1627.32	1632	0.000009	0.31	262.3	94.3	0.03
-0.011	60	1625.8	1632	1627.44	1632	0.000014	0.37	262.3	94.3	0.03
-0.011	70	1625.8	1632	1627.53	1632	0.000018	0.43	262.3	94.3	0.04
-0.011	80	1625.8	1632	1627.63	1632	0.000024	0.49	262.3	94.3	0.04
-0.011	100	1625.8	1632	1627.8	1632	0.000038	0.61	262.3	94.3	0.05
-0.011	200	1625.8	1632	1628.45	1632.02	0.00015	1.22	262.3	94.3	0.1

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 11 Feb 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 46 (North Bound lane)

Location to nearest Quarter Section: NW 1/4 of Section 14

Roadway Name: Saguaro Blvd and Parkview Ave

Roadway Classification: Arterial

Wash Name (if applicable): Fountain Channel

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or N
Longitudinal Flow ____
Ponding ____

Culvert Size: 54" cmp

Culvert Description: Culvert inlet is a grated catch basin.
Catch basin capacity controls

Future Condition 100-year Discharge: 632 cfs (HEC-1 operation FC2)(6 hr)

Maximum Depth of Flow: 0.7' @ ℄ (see attached sheets)

Duration of Impassable Flow: 0.7 hrs

Scour/Wash-out Potential: Low X * *Notes:
Medium ___ *
High ___ *

Comments: Estimated passable Q = 235 cfs
* S. bound lane & intersection w/ Parkview Ave is unaccessible.
* Assume 12' drive lane — min passable depth @ ℄ is ∴ 0.3'

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 11 Feb 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 46 (South bound lane)

Location to nearest Quarter Section: NW 1/4 of Section 14

Roadway Name: Saguaro Blvd and Parkview Ave

Roadway Classification: Arterial

Wash Name (if applicable): Fountain Channel

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 54" cmp

Culvert Description: Culvert inlet is a grated catch basin. Catch basin capacity controls

Future Condition 100-year Discharge: 632 cfs (HEC-1 operation FC2)(6 hr)

Maximum Depth of Flow: 2' @ Flow line of Grate

Duration of Impassable Flow: 3 hrs

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ____ *

High ____ *

Comments: Estimated passable Q = 20 cfs

PROJECT: F. Hills AcMP

PROJECT No.: 2 041 01 DATE: 11 Feb 97

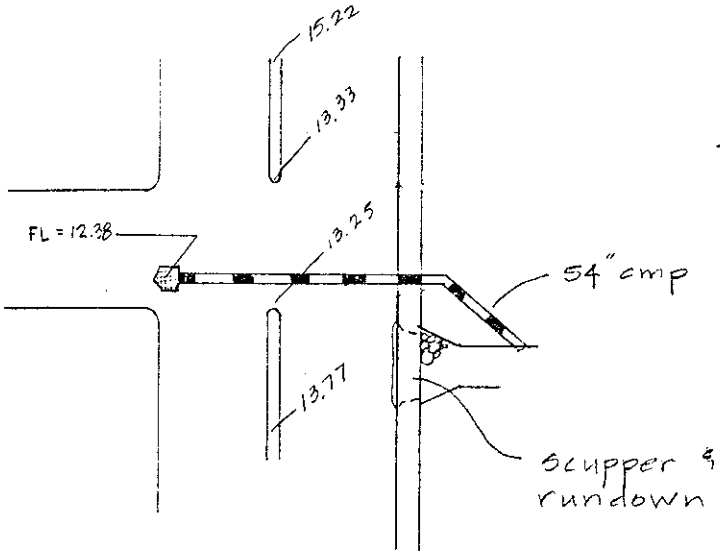
PAGE: 1 of 2 SCALE:

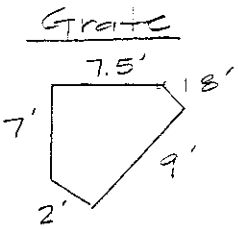
EAPFL_46

Overflow profile @ ℄ of median survey using a laser level and linker rod.

PT#	Distance	Elevation
1	10+00	15.22
2	10+30	14.05
3	10+60	13.94
4	10+60.1	13.33
5	11+37.9	13.25
6	11+38	13.77
7	12+38	13.64
8	13+38	13.77

Grate in the concrete apron controlls overflow Q.





$A \cong 40^{FT^2}$ $A_c \cong 20^{FT^2}$

$P \cong 27^{FT}$ $P_c \cong 20^{FT}$

* VALUES EXCEED CHART, ASSUME $A_c = 10^{FT^2}$ CORRESPONDS TO 2*Q

At $d = 2'$, Grate capacity = 120^{cfs} (WSEL = 14.38)

At WSEL = 14.38, Weir capacity = 529^{cfs}

$Q_T = Q_G + Q_W = 632^{cfs}$

$Q_T = 120 + 529 = 649^{cfs} \approx 632$

DESIGNED BY: CHECKED BY:

SFC

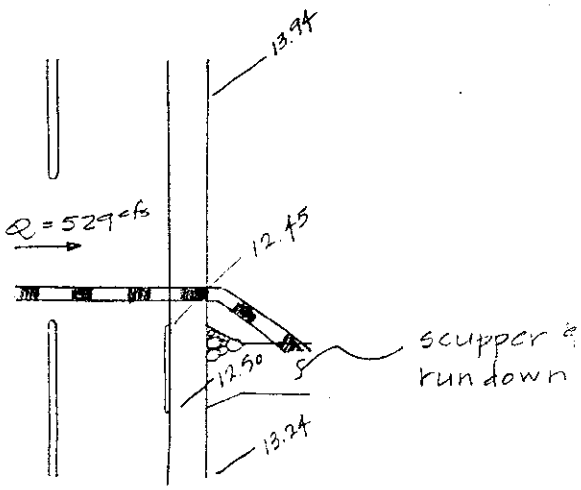
PROJECT:

PROJECT No.: DATE:

PAGE: 2 OF 2 SCALE:

Overflow profile B : East back of sidewalk

PT#	Distance	Elevation
1	10+00	13.94
2	10+63	13.55
3	11+63	13.31
4	12+63	13.05
5	12+63.1	12.45
6	12+99.9	12.50
7	13+00	13.10
8	14+00	13.24



DESIGNED BY: CHECKED BY:

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*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
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EAPFL 46

PROJECT: Fountain Hills ADMP @ ℄ of Saguaro Blvd.
ENGINEER: mcg
DATE: 2/11/1997
TIME: 13:50.40

INPUT PARAMETERS

STARTING WSEL:	13.25
MAXIMUM WSEL:	14.40
STEP SIZE:	0.01
BREADTH OF WEIR:	62.00

```
*********************************************
    INPUT ELEVATION/STATION TABLE.
    PROJECT:  Fountain Hills ADMP
    DATE:   2/11/1997
    TIME:  13:50.40
*********************************************
```

POINT	ELEVATION	STATION
1	15.22	1000.00
2	14.05	1030.00
3	13.94	1060.00
4	13.33	1060.10
5	13.25	1137.90
6	13.77	1138.00
7	13.64	1238.00
8	13.77	1338.00
9	15.22	1340.00

****
WEIR COEFFICIENT TABLE
PROJECT: Fountain Hills ADMP
DATE: 2/11/1997
TIME: 13:50.40
****

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT	POINT	HEAD	COEFFICIENT
1	0.00	2.5000	16	0.15	2.5081
2	0.01	2.5005	17	0.16	2.5086
3	0.02	2.5011	18	0.17	2.5091
4	0.03	2.5016	19	0.18	2.5097
5	0.04	2.5022	20	0.19	2.5102
6	0.05	2.5027	21	0.20	2.5108
7	0.06	2.5032	22	0.21	2.5113
8	0.07	2.5038	23	0.22	2.5118
9	0.08	2.5043	24	0.23	2.5124
10	0.09	2.5048	25	0.24	2.5129
11	0.10	2.5054	26	0.25	2.5134
12	0.11	2.5059	27	0.26	2.5140
13	0.12	2.5065	28	0.27	2.5145
14	0.13	2.5070	29	0.28	2.5151
15	0.14	2.5075	30	0.29	2.5156

```
*****************************************
    WEIR COEFFICIENT TABLE
    PROJECT:  Fountain Hills ADMP
    DATE:   2/11/1997
    TIME:  13:50.40
*****************************************
```

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT	POINT	HEAD	COEFFICIENT
31	0.30	2.5161	46	0.45	2.5242
32	0.31	2.5167	47	0.46	2.5247
33	0.32	2.5172	48	0.47	2.5253
34	0.33	2.5177	49	0.48	2.5258
35	0.34	2.5183	50	0.49	2.5263
36	0.35	2.5188	51	0.50	2.5269
37	0.36	2.5194	52	0.51	2.5274
38	0.37	2.5199	53	0.52	2.5280
39	0.38	2.5204	54	0.53	2.5285
40	0.39	2.5210	55	0.54	2.5290
41	0.40	2.5215	56	0.55	2.5296
42	0.41	2.5220	57	0.56	2.5301
43	0.42	2.5226	58	0.57	2.5306
44	0.43	2.5231	59	0.58	2.5312
45	0.44	2.5237	60	0.59	2.5317

****
WEIR COEFFICIENT TABLE
PROJECT: Fountain Hills ADMP
DATE: 2/11/1997
TIME: 13:50.40
****

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT	POINT	HEAD	COEFFICIENT
61	0.60	2.5323	76	0.75	2.5403
62	0.61	2.5328	77	0.76	2.5409
63	0.62	2.5333	78	0.77	2.5414
64	0.63	2.5339	79	0.78	2.5419
65	0.64	2.5344	80	0.79	2.5425
66	0.65	2.5349	81	0.80	2.5430
67	0.66	2.5355	82	0.81	2.5435
68	0.67	2.5360	83	0.82	2.5441
69	0.68	2.5366	84	0.83	2.5446
70	0.69	2.5371	85	0.84	2.5452
71	0.70	2.5376	86	0.85	2.5457
72	0.71	2.5382	87	0.86	2.5462
73	0.72	2.5387	88	0.87	2.5468
74	0.73	2.5392	89	0.88	2.5473
75	0.74	2.5398	90	0.89	2.5478

****
WEIR COEFFICIENT TABLE
PROJECT: Fountain Hills ADMP
DATE: 2/11/1997
TIME: 13:50.40
****

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT	POINT	HEAD	COEFFICIENT
91	0.90	2.5484	106	1.05	2.5565
92	0.91	2.5489	107	1.06	2.5570
93	0.92	2.5495	108	1.07	2.5575
94	0.93	2.5500	109	1.08	2.5581
95	0.94	2.5505	110	1.09	2.5586
96	0.95	2.5511	111	1.10	2.5591
97	0.96	2.5516	112	1.11	2.5597
98	0.97	2.5522	113	1.12	2.5602
99	0.98	2.5527	114	1.13	2.5608
100	0.99	2.5532	115	1.14	2.5613
101	1.00	2.5538			
102	1.01	2.5543			
103	1.02	2.5548			
104	1.03	2.5554			
105	1.04	2.5559			

```
*******************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   2/11/1997
    TIME:  13:50.40
*******************************************
```

ELEVATION	DISCHARGE (CFS)	ELEVATION	DISCHARGE (CFS)
13.25	0.00	13.40	7.23
13.26	0.01	13.41	8.22
13.27	0.06	13.42	9.25
13.28	0.15	13.43	10.33
13.29	0.31	13.44	11.44
13.30	0.54	13.45	12.59
13.31	0.86	13.46	13.78
13.32	1.26	13.47	15.01
13.33	1.76	13.48	16.27
13.34	2.36	13.49	17.57
13.35	3.02	13.50	18.90
13.36	3.76	13.51	20.26
13.37	4.55	13.52	21.65
13.38	5.39	13.53	23.08
13.39	6.29	13.54	24.53

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   2/11/1997
    TIME:  13:50.40
*********************************************
```

ELEVATION	DISCHARGE (CFS)	ELEVATION	DISCHARGE (CFS)
13.55	26.02	13.70	52.97
13.56	27.54	13.71	55.52
13.57	29.08	13.72	58.25
13.58	30.66	13.73	61.16
13.59	32.26	13.74	64.26
13.60	33.89	13.75	67.58
13.61	35.54	13.76	71.11
13.62	37.23	13.77	74.86
13.63	38.94	13.78	78.82
13.64	40.67	13.79	82.98
13.65	42.45	13.80	87.29
13.66	44.31	13.81	91.76
13.67	46.27	13.82	96.38
13.68	48.36	13.83	101.13
13.69	50.59	13.84	106.02

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   2/11/1997
    TIME:  13:50.40
*********************************************
```

ELEVATION	DISCHARGE (CFS)	ELEVATION	DISCHARGE (CFS)
13.85	111.03	14.00	199.73
13.86	116.17	14.01	206.53
13.87	121.43	14.02	213.44
13.88	126.80	14.03	220.47
13.89	132.29	14.04	227.62
13.90	137.89	14.05	234.89
13.91	143.60	14.06	242.27
13.92	149.41	14.07	249.76
13.93	155.33	14.08	257.36
13.94	161.35	14.09	265.07
13.95	167.47	14.10	272.87
13.96	173.70	14.11	280.78
13.97	180.04	14.12	288.79
13.98	186.49	14.13	296.89
13.99	193.05	14.14	305.10

```
*******************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   2/11/1997
    TIME:  13:50.40
*******************************************
```

ELEVATION	DISCHARGE (CFS)	ELEVATION	DISCHARGE (CFS)
14.15	313.39	14.30	448.72
14.16	321.79	14.31	458.43
14.17	330.27	14.32	468.23
14.18	338.85	14.33	478.11
14.19	347.52	14.34	488.07
14.20	356.28	14.35	498.11
14.21	365.13	14.36	508.24
14.22	374.07	14.37	518.44
14.23	383.10	14.38	528.73
14.24	392.21	14.39	539.09
14.25	401.41		
14.26	410.70		
14.27	420.08		
14.28	429.54		
14.29	439.09		

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
*********************************************
```

EAPFL 46

PROJECT: Fountain Hills ADMP @ East back of Sidewalk
ENGINEER: mcg
DATE: 2/11/1997
TIME: 14: 7.21

INPUT PARAMETERS

STARTING WSEL:	12.45
MAXIMUM WSEL:	14.00
STEP SIZE:	0.10
BREADTH OF WEIR:	40.00

```
*********************************************
    INPUT ELEVATION/STATION TABLE.
    PROJECT:  Fountain Hills ADMP
    DATE:   2/11/1997
    TIME:  14: 7.21
*********************************************
```

POINT	ELEVATION	STATION
1	13.94	1000.00
2	13.55	1063.00
3	13.31	1163.00
4	13.05	1263.00
5	12.45	1263.10
6	12.50	1299.90
7	13.10	1300.00
8	13.24	1400.00
9	14.00	1402.00

```
*********************************************
    WEIR COEFFICIENT TABLE
    PROJECT:  Fountain Hills ADMP
    DATE:   2/11/1997
    TIME:  14: 7.21
*********************************************
```

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT	POINT	HEAD	COEFFICIENT
1	0.00	2.5000	16	1.50	2.6250
2	0.10	2.5083			
3	0.20	2.5167			
4	0.30	2.5250			
5	0.40	2.5333			
6	0.50	2.5417			
7	0.60	2.5500			
8	0.70	2.5583			
9	0.80	2.5667			
10	0.90	2.5750			
11	1.00	2.5833			
12	1.10	2.5917			
13	1.20	2.6000			
14	1.30	2.6083			
15	1.40	2.6167			

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   2/11/1997
    TIME:  14: 7.21
*********************************************
```

ELEVATION	DISCHARGE (CFS)	ELEVATION	DISCHARGE (CFS)
12.45	0.00	13.95	637.93
12.55	1.92		
12.65	6.80		
12.75	13.42		
12.85	21.43		
12.95	30.66		
13.05	40.98		
13.15	53.92		
13.25	77.71		
13.35	116.40		
13.45	168.97		
13.55	235.93		
13.65	317.26		
13.75	411.64		
13.85	518.59		

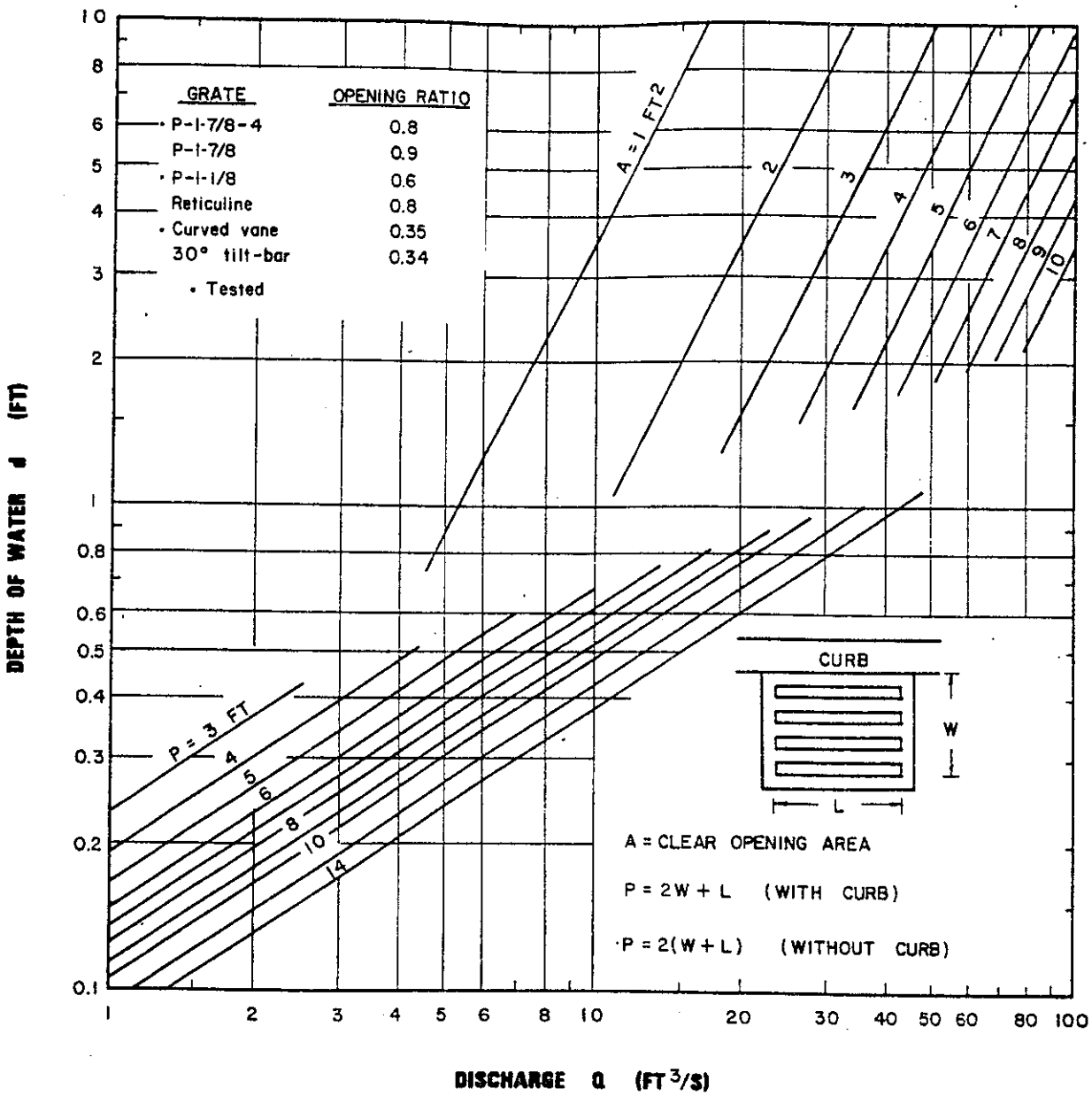


CHART 11. Grate inlet capacity in sump conditions.

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Feb 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 47 (North Bound Lane)

Location to nearest Quarter Section: SW 1/4 of Section 14

Roadway Name: Saguaro Blvd (S of Ave. of the Fountains)

Roadway Classification: Arterial

Wash Name (if applicable): Fountain Channel

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 60" x 170' cmp

Culvert Description: Corrugated metal pipe w/ drop inlet

Future Condition 100-year Discharge: 301 cfs (HEC-1 operation FC38) (6 hr)

Maximum Depth of Flow: 0.5'

Duration of Impassable Flow: 1 hr

Scour/Wash-out Potential: Low X * *Notes:

Medium ____ *

High ____ *

Comments: Estimated passable Q = 47 cfs

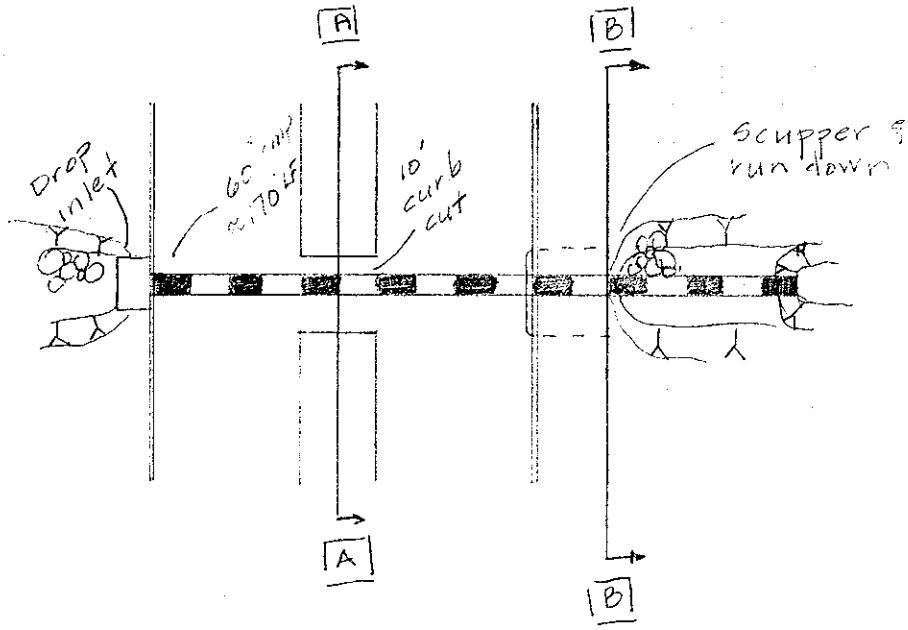
Assume 12' drive one-lane passable depth is 0.3'

PROJECT:
F. Hills ADMP

PROJECT No.: 12 041 01 DATE: 12 Feb 97

PAGE: 1 of SCALE:

EAPFL 47



SECTION A

PT#	Distance	Elevation
1	10+00	14.83
2	10+84	14.31
3	10+84.1	13.71
4	10+93.9	13.71
5	10+94	14.29
6	11+84	15.39

SECTION B

PT#	Distance	Elevation
1	10+00	14.20
2	10+85	13.70
3	10+85.1	13.10
4	10+94.9	13.10
5	10+95	13.64
6	11+94	14.12

Pipe Inverts:

Inlet = 5.87
Outlet = 4.28

Assume drop inlet capacity does not control.

DESIGNED BY: CHECKED BY:

CURRENT DATE: 02-12-1997 FILE DATE: 02-12-1997
CURRENT TIME: 08:58:15 FILE NAME: EAPFL_47

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	5.87	4.28	170.01	1 CSP	5.00	5.00	.024	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (cfs) FILE: EAPFL_47 DATE: 02-12-1997

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
6.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
8.18	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.00	1
9.24	60.0	60.0	0.0	0.0	0.0	0.0	0.0	0.00	1
10.12	90.0	90.0	0.0	0.0	0.0	0.0	0.0	0.00	1
10.94	120.0	120.0	0.0	0.0	0.0	0.0	0.0	0.00	1
11.83	150.0	150.0	0.0	0.0	0.0	0.0	0.0	0.00	1
12.63	180.0	180.0	0.0	0.0	0.0	0.0	0.0	0.00	1
14.21	210.0	199.0	0.0	0.0	0.0	0.0	0.0	10.50	7
14.57	240.0	204.0	0.0	0.0	0.0	0.0	0.0	33.74	8
14.73	270.0	206.3	0.0	0.0	0.0	0.0	0.0	61.20	6
14.84	300.0	207.8	0.0	0.0	0.0	0.0	0.0	89.91	5
13.71	193.3	193.3	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: EAPFL_47 DATE: 02-12-1997

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
6.00	0.000	0.00	0.00	0.00
8.18	0.000	30.00	0.00	0.00
9.24	0.000	60.00	0.00	0.00
10.12	0.000	90.00	0.00	0.00
10.94	0.000	120.00	0.00	0.00
11.83	0.000	150.00	0.00	0.00
12.63	0.000	180.00	0.00	0.00
14.21	-0.006	210.00	0.50	0.24
14.57	-0.006	240.00	2.27	0.95
14.73	-0.008	270.00	2.52	0.93
14.84	-0.008	300.00	2.32	0.77

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

****

CURRENT DATE: 02-12-1997 FILE DATE: 02-12-1997
CURRENT TIME: 08:58:15 FILE NAME: EAPFL_47

****

PERFORMANCE CURVE FOR CULVERT 1 - 1(5.00 (ft) BY 5.00 (ft)) CSP

****

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	6.00	0.00	0.13	0-NF	0.00	0.00	0.00	1.72	0.00	0.00
30.00	8.18	2.07	2.31	3-M1t	1.58	1.52	1.72	1.72	5.00	0.00
60.00	9.24	3.06	3.37	2-M2c	2.31	2.17	2.17	1.72	7.35	0.00
90.00	10.12	3.92	4.25	2-M2c	2.96	2.68	2.68	1.72	8.39	0.00
120.00	10.94	4.75	5.07	2-M2c	3.64	3.12	3.12	1.72	9.32	0.00
150.00	11.83	5.63	5.96	2-M2c	5.00	3.51	3.51	1.72	10.19	0.00
180.00	12.63	6.63	6.76	2-M2c	5.00	3.83	3.83	1.72	11.18	0.00
199.00	14.21	7.34	8.34	2-M2c	5.00	4.02	4.02	1.72	11.75	0.00
203.99	14.57	7.53	8.70	2-M2c	5.00	4.06	4.06	1.72	11.96	0.00
206.27	14.73	7.63	8.86	2-M2c	5.00	4.08	4.08	1.72	12.06	0.00
207.77	14.83	7.69	8.96	2-M2c	5.00	4.09	4.09	1.72	12.12	0.00

****

El. inlet face invert 5.87 ft El. outlet invert 4.28 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	5.87 ft
OUTLET STATION	170.00 ft
OUTLET ELEVATION	4.28 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0094
CULVERT LENGTH ALONG SLOPE	170.01 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	5.00 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

****

CURRENT DATE: 02-12-1997
CURRENT TIME: 08:58:15

FILE DATE: 02-12-1997
FILE NAME: EAPFL_47

****
********** TAILWATER **********
****
****

CONSTANT WATER SURFACE ELEVATION
6.00

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE PAVED
EMBANKMENT TOP WIDTH 70.00 ft
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	1000.00	14.83
2	1084.00	14.31
3	1084.10	13.71
4	1093.90	13.71
5	1094.00	14.29
6	1184.00	15.39

****

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
*********************************************
```

PROJECT: Fountain Hills ADMP
ENGINEER: mcg
DATE: 2/12/1997
TIME: 9:14.29

INPUT PARAMETERS

STARTING WSEL:	13.10
MAXIMUM WSEL:	15.00
STEP SIZE:	0.10
BREADTH OF WEIR:	20.00

```
*******************************************
    INPUT ELEVATION/STATION TABLE.
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:   9:14.29
*******************************************
```

POINT	ELEVATION	STATION
1	15.00	999.00
2	14.20	1000.00
3	13.70	1085.00
4	13.10	1085.10
5	13.10	1094.90
6	13.64	1095.00
7	14.12	1194.00
8	15.00	1195.00

****
WEIR COEFFICIENT TABLE
PROJECT: Fountain Hills ADMP
DATE: 2/12/1997
TIME: 9:14.29
****

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT	POINT	HEAD	COEFFICIENT
1	0.00	2.5000	16	1.50	2.7500
2	0.10	2.5167	17	1.60	2.7667
3	0.20	2.5333	18	1.70	2.7833
4	0.30	2.5500	19	1.80	2.8000
5	0.40	2.5667			
6	0.50	2.5833			
7	0.60	2.6000			
8	0.70	2.6167			
9	0.80	2.6333			
10	0.90	2.6500			
11	1.00	2.6667			
12	1.10	2.6833			
13	1.20	2.7000			
14	1.30	2.7167			
15	1.40	2.7333			

```
*******************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:   9:14.29
*******************************************
```

ELEVATION	DISCHARGE (CFS)	ELEVATION	DISCHARGE (CFS)
13.10	0.00	14.60	329.58
13.20	0.78	14.70	399.08
13.30	2.23	14.80	473.84
13.40	4.12	14.90	553.68
13.50	6.40		
13.60	9.01		
13.70	12.12		
13.80	17.83		
13.90	28.90		
14.00	47.13		
14.10	73.94		
14.20	110.34		
14.30	155.35		
14.40	207.34		
14.50	265.56		

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 11 Feb 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 47 (South bound lane)

Location to nearest Quarter Section: SW 1/4 of Section 14

Roadway Name: Saguaro Blvd (S. of Ave of the Fountains)

Roadway Classification: Arterial

Wash Name (if applicable): Fountain Channel

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 60" x 170' cmp

Culvert Description: Corrugated metal pipe w/ drop inlet

Future Condition 100-year Discharge: 301 cfs (HEC-1 operation FC3P5)(6 hr)

Maximum Depth of Flow: 1.1'

Duration of Impassable Flow: ____

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium ____ *

High ____ *

Comments: Estimated passable Q = 199 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Feb. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 49

Location to nearest Quarter Section: SW 1/4 of Section 14

Roadway Name: Saguaro Blvd and El Lago Blvd.

Roadway Classification:

Wash Name (if applicable): Tributary of Fountain Channel

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 60" x 500' RCP

Culvert Description: Concrete lined corrugated metal pipe - inlet is 2 catch basins in sump.

Future Condition 100-year Discharge: 451 cfs (+) (HEC-1 operation LC2)(6 hr)

Maximum Depth of Flow: ≅ 1.1'

Duration of Impassable Flow: 0.6 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

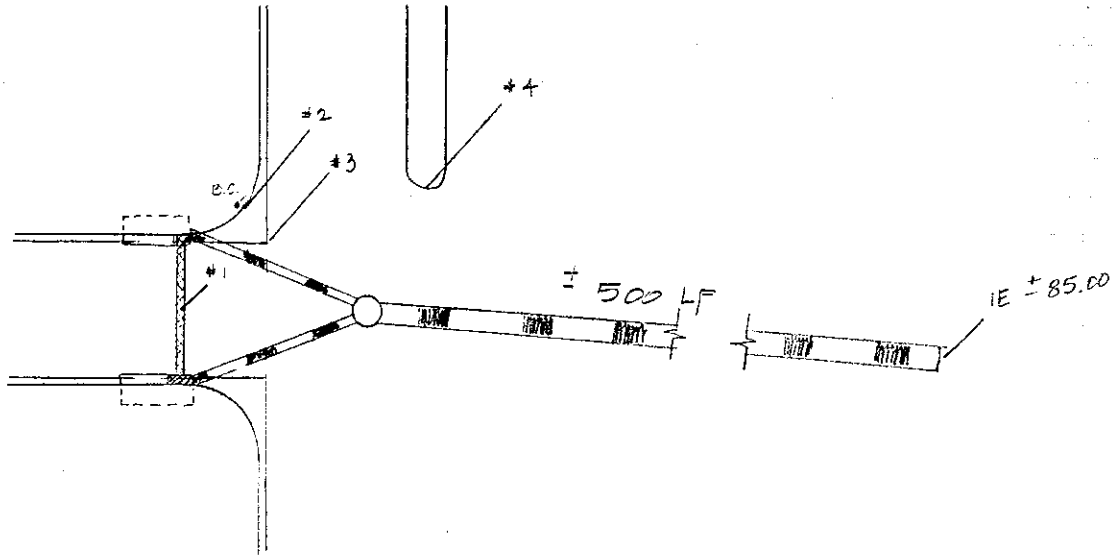
Comments: Estimated passable Q = 236 cfs

PROJECT:
F Hills ADMP

PROJECT No.: 12 041 01 DATE: 12 Feb. 97

PAGE: 1 of SCALE:

EAPFL 49



B.C. ELEV = 1597.72 (4.40)

PT#	Elev		
1	3.00	=>	1598.52
2	3.95	=>	1599.47
3	3.49	=>	1599.01
4	4.15	=>	1599.67

Assume pipe slope = 1.0%

inlet invert = 90.0
Outlet invert 85.0

Passable @ 0.5' + Grate Elev (1599.02)

DESIGNED BY: CHECKED BY:

```
*******************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
*******************************************
```

PROJECT: Fountain Hills ADMP
ENGINEER: mcg
DATE: 2/12/1997
TIME: 10:43.48

INPUT PARAMETERS

STARTING WSEL:	1599.01
MAXIMUM WSEL:	1601.00
STEP SIZE:	0.10
BREADTH OF WEIR:	60.00

```
*********************************************
    INPUT ELEVATION/STATION TABLE.
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:  10:43.48
*********************************************
```

POINT	ELEVATION	STATION
1	1601.00	999.00
2	1599.92	1000.00
3	1599.47	1000.10
4	1599.01	1010.00
5	1599.67	1040.00
6	1601.00	1040.10

****
WEIR COEFFICIENT TABLE
PROJECT: Fountain Hills ADMP
DATE: 2/12/1997
TIME: 10:43.48
****

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT	POINT	HEAD	COEFFICIENT
1	0.00	2.5000	16	1.50	2.5833
2	0.10	2.5056	17	1.60	2.5889
3	0.20	2.5111	18	1.70	2.5944
4	0.30	2.5167	19	1.80	2.6000
5	0.40	2.5222	20	1.90	2.6056
6	0.50	2.5278			
7	0.60	2.5333			
8	0.70	2.5389			
9	0.80	2.5444			
10	0.90	2.5500			
11	1.00	2.5556			
12	1.10	2.5611			
13	1.20	2.5667			
14	1.30	2.5722			
15	1.40	2.5778			

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:  10:43.48
*********************************************
```

ELEVATION	DISCHARGE (CFS)	ELEVATION	DISCHARGE (CFS)
1599.01	0.00	1600.51	135.35
1599.11	0.21	1600.61	152.93
1599.21	1.20	1600.71	171.31
1599.31	3.31	1600.81	190.45
1599.41	6.80	1600.91	210.35
1599.51	11.89		
1599.61	18.64		
1599.71	27.06		
1599.81	36.96		
1599.91	48.06		
1600.01	60.24		
1600.11	73.44		
1600.21	87.59		
1600.31	102.65		
1600.41	118.58		

CURRENT DATE: 02-12-1997 FILE DATE: 02-12-1997
CURRENT TIME: 10:42:12 FILE NAME: EAPFL_49

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	90.00	85.00	500.02	1 RCP	5.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (cfs) FILE: EAPFL_49 DATE: 02-12-1997

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
90.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
92.60	45.0	45.0	0.0	0.0	0.0	0.0	0.0	0.00	1
94.00	90.0	90.0	0.0	0.0	0.0	0.0	0.0	0.00	1
95.23	135.0	135.0	0.0	0.0	0.0	0.0	0.0	0.00	1
96.67	180.0	180.0	0.0	0.0	0.0	0.0	0.0	0.00	1
98.50	225.0	225.0	0.0	0.0	0.0	0.0	0.0	0.00	1
100.80	270.0	270.0	0.0	0.0	0.0	0.0	0.0	0.00	1
102.23	315.0	294.3	0.0	0.0	0.0	0.0	0.0	19.10	6
102.48	360.0	298.4	0.0	0.0	0.0	0.0	0.0	60.78	4
102.68	405.0	301.5	0.0	0.0	0.0	0.0	0.0	101.42	3
102.86	450.0	304.4	0.0	0.0	0.0	0.0	0.0	143.95	3
102.00	290.5	290.5	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: EAPFL_49 DATE: 02-12-1997

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
90.00	0.000	0.00	0.00	0.00
92.60	0.000	45.00	0.00	0.00
94.00	0.000	90.00	0.00	0.00
95.23	0.000	135.00	0.00	0.00
96.67	0.000	180.00	0.00	0.00
98.50	0.000	225.00	0.00	0.00
100.80	0.000	270.00	0.00	0.00
102.23	-0.008	315.00	1.65	0.52
102.48	-0.003	360.00	0.81	0.22
102.68	-0.007	405.00	2.04	0.50
102.86	-0.005	450.00	1.69	0.38

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

****

RRENT DATE: 02-12-1997 FILE DATE: 02-12-1997
RRENT TIME: 10:42:12 FILE NAME: EAPFL_49

****

PERFORMANCE CURVE FOR CULVERT 1 - 1(5.00 (ft) BY 5.00 (ft)) RCP

****

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	90.00	0.00	0.00	0-NF	0.00	0.00	0.00	5.00	0.00	0.00
45.00	92.60	2.60	2.60	1-S1f	1.33	1.86	2.00	5.00	6.14	0.00
90.00	94.00	4.00	4.00	1-S1f	1.93	2.68	2.80	5.00	7.96	0.00
135.00	95.23	5.23	5.23	1-S1f	2.43	3.32	3.50	5.00	9.20	0.00
180.00	96.67	6.67	6.67	1-S1f	2.90	3.83	4.00	5.00	10.69	0.00
225.00	98.50	8.50	6.22	4-FFt	3.37	4.22	3.37	5.00	15.97	0.00
270.00	100.80	10.80	8.96	4-FFt	3.92	4.55	3.92	5.00	16.37	0.00
294.25	102.22	12.22	10.64	4-FFt	4.36	4.73	4.36	5.00	16.25	0.00
298.42	102.48	12.48	10.94	4-FFt	4.44	4.76	4.44	5.00	16.21	0.00
301.54	102.68	12.68	10.49	3-M1f	5.00	4.79	5.00	5.00	15.36	0.00
304.36	102.86	12.86	10.60	3-M1f	5.00	4.81	5.00	5.00	15.50	0.00

****

El. inlet face invert 90.00 ft El. outlet invert 85.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****

** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	90.00 ft
OUTLET STATION	500.00 ft
OUTLET ELEVATION	85.00 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0100
CULVERT LENGTH ALONG SLOPE	500.02 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	5.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

****

CURRENT DATE: 02-12-1997 FILE DATE: 02-12-1997
CURRENT TIME: 10:42:12 FILE NAME: EAPFL_49

****
********** TAILWATER **********
****
****

CONSTANT WATER SURFACE ELEVATION
90.00

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	100.00 ft
CREST LENGTH	60.00 ft
OVERTOPPING CREST ELEVATION	102.00 ft

****

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 50

Location to nearest Quarter Section: NW 1/4 of Section 13

Roadway Name: Mimosa Dr (S. of Lantana Ln)

Roadway Classification: Local

Wash Name (if applicable): Tributary of N. Colony Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dozed road crossing

Future Condition 100-year Discharge: 133 cfs (HEC-1 operation 153A)(6-hr)

Maximum Depth of Flow: 1.0'

Duration of Impassable Flow: 0 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium ____ *

High X *

Comments: Fo[illegible] unscaled Q = 38 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_~~54~~ 50
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

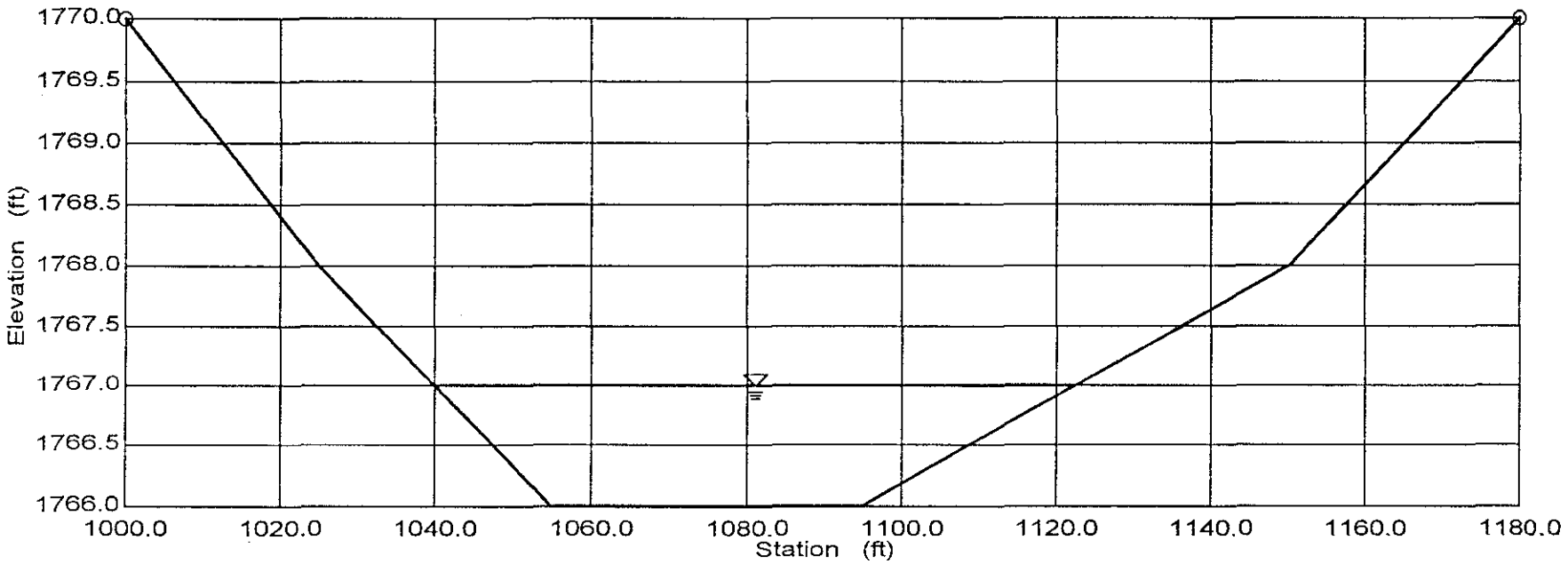
Input Data					
Channel Slope	0.010000 ft/ft				
Elevation range: 1,766.00 ft to 1,770.00 ft.					
Station (ft)	Elevation (ft)		Start Station	End Station	Roughness
1,000.00	1,770.00		1,000.00	1,180.00	0.055
1,025.00	1,768.00				
1,055.00	1,766.00				
1,068.00	1,766.00				
1,095.00	1,766.00				
1,150.00	1,768.00				
1,180.00	1,770.00				
Discharge	133.00	cfs			

Results		
Wtd. Mannings Coefficient	0.055	
Water Surface Elevation	1,766.99	ft
Flow Area	60.41	ft²
Wetted Perimeter	82.12	ft
Top Width	82.07	ft
Height	0.99	ft
Critical Depth	1,766.62	ft
Critical Slope	0.055606	ft/ft
Velocity	2.20	ft/s
Velocity Head	0.08	ft
Specific Energy	1,767.07	ft
Froude Number	0.45	
Flow is subcritical.		

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_50
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.055	
Channel Slope	0.010000	ft/ft
Water Surface Elevation	1,766.99	ft
Discharge	133.00	cfs



George V. Sabol Consulting Engineers, Inc.

SHEET _____ OF _____

CLIENT FCD MC

DATE _____

PROJECT F. HILLS ADMP

BY _____

SUBJECT EAPFL #5D

PROJECT NO. _____

Geometry and manning's estimate for normal depth cross section at overflow crossing:

STATION	DESCRIPTION	ELEVATION	n
10+00	℄ Mimosa Dr.	1770	0.055
10+25	" "	1768	"
10+55	" "	1766	"
10+68	℄ Mimosa @ Flow line	1766	"
10+95	℄ Mimosa Dr.	1766	"
11+50	" "	1768	"
11+80	" "	1770	"

SLOPE = 0.01 ft/ft

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Feb 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 51

Location to nearest Quarter Section: SW 1/4 of Section 15

Roadway Name: Mountainside Dr (S. of El Lago Blvd.)

Roadway Classification: Collector

Wash Name (if applicable): Tributary of Fountain Channel

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 30" cmp ≈ 100 LF

Culvert Description: Corrugated metal pipe w/ projecting inlet

Future Condition 100-year Discharge: 133 cfs (HEC-1 operation 183A)(6 hr)

Maximum Depth of Flow: 1.5'

Duration of Impassable Flow: 1.2 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium X * ____

High ____ * ____

Comments: Estimated passable Q = 7 cfs

SFC

PROJECT: F. Hills ADMP

PROJECT No.: 12 041 01 DATE: 12 Feb 97

PAGE: 1 of 1 SCALE:

EAPFL 51

Culvert overtopping section

Pt #	Station	Elev
1	10+00	17.70
2	10+13	15.98
3	10+30	15.35
4	10+55	18.00

Pipe inverts:

Inlet = 11.19
Outlet = 8.30

Weir overflow section

Pt #	Station	Elev.
1	10+00	14.14
2	10+47	13.13
3	10+49	12.57
4	10+56	12.65
5	10+64	13.72
6	11+00	14.13

Culvert capacity = 43 cfs, HW = 16.87 ⇒ 90 cfs crosses road

DESIGNED BY: CHECKED BY:

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
*********************************************


    PROJECT:  Fountain Hills ADMP
    ENGINEER:  mcg
    DATE:   2/12/1997
    TIME:  11:15.11




-----------------------------------------------
    INPUT PARAMETERS
-----------------------------------------------


    STARTING WSEL:        12.57
    MAXIMUM WSEL:         16.87
    STEP SIZE:             0.10
    BREADTH OF WEIR:      40.00
```

```
*********************************************
    INPUT ELEVATION/STATION TABLE.
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:  11:15.11
*********************************************
```

POINT	ELEVATION	STATION
1	14.14	1000.00
2	13.13	1047.00
3	12.57	1049.00
4	12.65	1056.00
5	13.72	1064.00
6	14.13	1100.00

```
*******************************************
    WEIR COEFFICIENT TABLE
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:  11:15.11
*******************************************
```

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT	POINT	HEAD	COEFFICIENT
1	0.00	2.5000	16	1.50	2.6250
2	0.10	2.5083	17	1.60	2.6333
3	0.20	2.5167	18	1.70	2.6417
4	0.30	2.5250	19	1.80	2.6500
5	0.40	2.5333	20	1.90	2.6583
6	0.50	2.5417	21	2.00	2.6667
7	0.60	2.5500	22	2.10	2.6750
8	0.70	2.5583	23	2.20	2.6833
9	0.80	2.5667	24	2.30	2.6917
10	0.90	2.5750	25	2.40	2.7000
11	1.00	2.5833	26	2.50	2.7083
12	1.10	2.5917	27	2.60	2.7167
13	1.20	2.6000	28	2.70	2.7250
14	1.30	2.6083	29	2.80	2.7333
15	1.40	2.6167	30	2.90	2.7417

```
*******************************************
    WEIR COEFFICIENT TABLE
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:  11:15.11
*******************************************
```

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT
31	3.00	2.7500
32	3.10	2.7583
33	3.20	2.7667
34	3.30	2.7750
35	3.40	2.7833
36	3.50	2.7917
37	3.60	2.8000
38	3.70	2.8083
39	3.80	2.8167
40	3.90	2.8250
41	4.00	2.8333
42	4.10	2.8417
43	4.20	2.8500
44	4.30	2.8583

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:  11:15.11
*********************************************
```

ELEVATION	DISCHARGE (CFS)	ELEVATION	DISCHARGE (CFS)
12.57	0.00	14.07	104.26
12.67	0.28	14.17	129.02
12.77	1.24	14.27	157.47
12.87	2.69	14.37	188.91
12.97	4.63	14.47	223.05
13.07	7.05	14.57	259.68
13.17	9.97	14.67	298.67
13.27	13.68	14.77	339.91
13.37	18.52	14.87	383.31
13.47	24.69	14.97	428.79
13.57	32.36	15.07	476.30
13.67	41.70	15.17	525.79
13.77	52.89	15.27	577.21
13.87	66.63	15.37	630.52
13.97	83.60	15.47	685.68

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:  11:15.11
*********************************************
```

ELEVATION	DISCHARGE (CFS)
15.57	742.67
15.67	801.46
15.77	862.02
15.87	924.34
15.97	988.38
16.07	1054.14
16.17	1121.60
16.27	1190.74
16.37	1261.56
16.47	1334.02
16.57	1408.14
16.67	1483.88
16.77	1561.26
16.87	1640.25

CURRENT DATE: 02-12-1997 FILE DATE: 02-12-1997
CURRENT TIME: 11:12:14 FILE NAME: EAPFL_50.S1

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	11.19	8.30	100.04	1 CSP	2.50	2.50	.024	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (cfs) FILE: EAPFL_50 DATE: 02-12-1997

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
11.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
13.13	14.0	14.0	0.0	0.0	0.0	0.0	0.0	0.00	1
14.53	28.0	28.0	0.0	0.0	0.0	0.0	0.0	0.00	1
15.80	42.0	37.0	0.0	0.0	0.0	0.0	0.0	4.63	8
16.09	56.0	38.8	0.0	0.0	0.0	0.0	0.0	16.82	5
16.28	70.0	39.8	0.0	0.0	0.0	0.0	0.0	29.93	5
16.42	84.0	40.7	0.0	0.0	0.0	0.0	0.0	42.78	4
16.55	98.0	41.4	0.0	0.0	0.0	0.0	0.0	56.15	4
16.67	112.0	42.0	0.0	0.0	0.0	0.0	0.0	69.60	4
16.78	126.0	42.5	0.0	0.0	0.0	0.0	0.0	83.11	4
16.87	140.0	43.0	0.0	0.0	0.0	0.0	0.0	95.81	3
15.35	34.1	34.1	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: EAPFL_50 DATE: 02-12-1997

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
11.19	0.000	0.00	0.00	0.00
13.13	0.000	14.00	0.00	0.00
14.53	0.000	28.00	0.00	0.00
15.80	-0.009	42.00	0.37	0.88
16.09	-0.004	56.00	0.43	0.77
16.28	-0.006	70.00	0.24	0.34
16.42	-0.004	84.00	0.56	0.67
16.55	-0.010	98.00	0.48	0.49
16.67	-0.008	112.00	0.41	0.37
16.78	-0.007	126.00	0.37	0.29
16.87	-0.006	140.00	1.19	0.85

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

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CURRENT DATE: 02-12-1997 FILE DATE: 02-12-1997
CURRENT TIME: 11:12:14 FILE NAME: EAPFL_50

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PERFORMANCE CURVE FOR CULVERT 1 - 1(2.50 (ft) BY 2.50 (ft)) CSP

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DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	11.19	0.00	-1.19	0-NF	0.00	0.00	0.00	1.70	0.00	0.00
14.00	13.13	1.94	-0.38	1-S2n	1.05	1.26	0.96	1.70	8.07	0.00
28.00	14.53	3.34	1.80	1-S2n	1.60	1.80	1.50	1.70	9.11	0.00
37.00	15.79	4.60	3.82	5-S2n	2.00	2.05	1.95	1.70	9.02	0.00
38.75	16.09	4.90	4.41	2-M2c	2.13	2.09	2.09	1.70	8.88	0.00
39.83	16.27	5.08	4.43	2-M2c	2.21	2.11	2.11	1.70	9.05	0.00
40.66	16.42	5.23	3.18	2-M2c	2.50	2.13	2.13	1.70	9.17	0.00
41.37	16.55	5.36	4.03	2-M2c	2.50	2.14	2.14	1.70	9.27	0.00
41.99	16.67	5.48	4.45	2-M2c	2.50	2.15	2.15	1.70	9.36	0.00
42.52	16.77	5.58	4.72	2-M2c	2.50	2.17	2.17	1.70	9.44	0.00
43.00	16.87	5.68	4.94	2-M2c	2.50	2.18	2.18	1.70	9.51	0.00

****

El. inlet face invert 11.19 ft El. outlet invert 8.30 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	11.19 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	8.30 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0289
CULVERT LENGTH ALONG SLOPE	100.04 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	2.50 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	THIN EDGE PROJECTING
INLET DEPRESSION	NONE

****

CURRENT DATE: 02-12-1997 FILE DATE: 02-12-1997
CURRENT TIME: 11:12:14 FILE NAME: EAPFL_50

****
********** TAILWATER **********
****
****

CONSTANT WATER SURFACE ELEVATION
10.00

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE GRAVEL
EMBANKMENT TOP WIDTH 10.00 ft
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	1000.00	17.70
2	1013.00	15.98
3	1030.00	15.35
4	1055.00	18.00

****

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: _____

Project: Fountain Hills ADMP, FCD 94-16 By: _____

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 52 (ADMP 17)

Location to nearest Quarter Section: SW 1/4 of Section 14

Roadway Name: Kiwanis Dr. (E. of Saguaro Blvd.)

Roadway Classification: Local

Wash Name (if applicable): Fountain Channel

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped road crossing

Future Condition 100-year Discharge: 982 cfs (HEC-1 operation FC6)(6-hr)

Maximum Depth of Flow: 3.1' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 2 hrs

Scour/Wash-out Potential: Low ____ * *Notes: _____

Medium X *

High ____ *

Comments: Estimated passable Q = 100 cfs

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: Impo rted Pla Reach: 1 1/13/97

Hydraulic Reaches = 1
River Sta tions = 15
Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.5	451	1584.8	1586.96	1586.96	1587.62	0.009769	7	71.48	55.56	0.99
0.5	460	1584.8	1587.01	1587.01	1587.64	0.009103	6.89	73.99	55.5	0.96
0.5	20	1584.8	1585.6	1585.6	1585.71	0.013117	1.97	8.4	37.34	0.81
0.5	40	1584.8	1585.72	1585.72	1585.88	0.014404	2.88	12.93	38.93	0.92
0.5	60	1584.8	1585.82	1585.82	1586.02	0.014687	3.49	16.72	40.21	0.97
0.5	80	1584.8	1585.9	1585.9	1586.15	0.014537	3.95	20.19	41.36	1
0.5	100	1584.8	1585.98	1585.98	1586.27	0.014118	4.3	23.53	42.43	1.01
0.5	120	1584.8	1586.05	1586.05	1586.37	0.013944	4.63	26.57	43.38	1.02
0.5	150	1584.8	1586.17	1586.17	1586.52	0.012581	4.92	31.74	44.95	1
0.5	180	1584.8	1586.26	1586.26	1586.66	0.012337	5.27	35.97	46.19	1.01
0.5	200	1584.8	1586.32	1586.32	1586.75	0.012072	5.46	38.81	47.01	1.01
0.5	250	1584.8	1586.47	1586.47	1586.95	0.011409	5.86	45.78	48.96	1.01
0.41	451	1582.6	1585.84	1584.21	1585.92	0.00052	2.45	202.43	82.76	0.25
0.41	460	1582.6	1585.91	1584.22	1585.99	0.000491	2.43	208.65	82.8	0.25
0.41	20	1582.6	1583.4	1582.99	1583.41	0.000665	0.81	25.27	57.65	0.21
0.41	40	1582.6	1583.63	1582.99	1583.64	0.00069	1.08	38.55	60.74	0.23
0.41	60	1582.6	1583.81	1582.99	1583.83	0.000683	1.26	50.01	63.29	0.24
0.41	80	1582.6	1583.96	1582.99	1583.99	0.000698	1.41	59.68	65.36	0.25
0.41	100	1582.6	1584.1	1583.42	1584.13	0.000701	1.54	68.83	67.26	0.25
0.41	120	1582.6	1584.22	1583.48	1584.26	0.000708	1.66	77.24	68.96	0.26
0.41	150	1582.6	1584.38	1583.56	1584.43	0.000729	1.82	88.48	71.17	0.27
0.41	180	1582.6	1584.53	1583.64	1584.58	0.000754	1.97	98.68	73.12	0.28
0.41	200	1582.6	1584.61	1583.7	1584.67	0.000768	2.06	105.15	74.33	0.28
0.41	250	1582.6	1584.78	1583.81	1584.86	0.00085	2.32	117.87	76.65	0.3
0.32	713	1581.6	1584.23	1584.23	1584.9	0.007392	7.19	117.5	83.96	0.9
0.32	755	1581.6	1584.28	1584.28	1584.97	0.007444	7.34	121.71	83.8	0.91

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HEC-RAS Plan: Impo rted Pla Reach: 1 1/13/97

Hydraulic Reaches = 1
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Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.23	60	1577.3	1578.33	1577.95	1578.46	0.002902	2.91	20.59	24.81	0.53
0.23	80	1577.3	1578.53	1578.09	1578.7	0.002829	3.24	24.65	25.76	0.59
0.23	100	1577.3	1578.72	1578.22	1578.91	0.002762	3.52	28.39	26.63	0.65
0.23	120	1577.3	1578.89	1578.34	1579.11	0.002702	3.76	31.88	27.45	0.71
0.23	150	1577.3	1579.14	1578.51	1579.4	0.002624	4.08	36.77	28.59	0.77
0.23	180	1577.3	1579.37	1578.66	1579.66	0.002557	4.35	41.34	29.66	0.83
0.23	200	1577.3	1579.51	1578.75	1579.83	0.002517	4.52	44.25	30.34	0.87
0.23	250	1577.3	1579.86	1578.99	1580.23	0.00243	4.89	51.12	31.95	0.96
0.22 Culvert										
0.21	857	1576.5	1580.4	1580.4	1582.33	0.007306	11.14	76.95	25.92	1
0.21	954	1576.5	1580.69	1580.69	1582.75	0.007125	11.54	82.68	25.76	1
0.21	20	1576.5	1577.15	1576.87	1577.2	0.001924	1.66	12.05	20.97	0.38
0.21	40	1576.5	1577.39	1577.05	1577.48	0.0026	2.4	16.68	21.32	0.46
0.21	60	1576.5	1577.55	1577.2	1577.69	0.003255	3.02	19.89	21.57	0.53
0.21	80	1576.5	1577.67	1577.34	1577.87	0.003868	3.56	22.44	21.76	0.59
0.21	100	1576.5	1577.78	1577.47	1578.04	0.004509	4.08	24.51	21.92	0.65
0.21	120	1576.5	1577.86	1577.59	1578.19	0.005226	4.59	26.16	22.04	0.71
0.21	150	1576.5	1577.98	1577.75	1578.41	0.006036	5.24	28.64	22.23	0.77
0.21	180	1576.5	1578.09	1577.91	1578.62	0.006849	5.85	30.76	22.4	0.83
0.21	200	1576.5	1578.15	1578.02	1578.76	0.007453	6.26	31.95	22.49	0.87
0.21	250	1576.5	1578.29	1578.24	1579.09	0.008834	7.2	34.71	22.7	0.96
0.2	880	1576.3	1579.02	1579.02	1579.97	0.009335	8.39	135.11	74.85	0.95
0.2	982	1576.3	1579.18	1579.18	1580.18	0.009113	8.65	147.08	74.39	0.95
0.2	20	1576.3	1576.72	1576.72	1576.85	0.021923	2.9	7.18	27.94	1
0.2	40	1576.3	1576.88	1576.88	1577.06	0.020083	3.39	12.34	35.58	1.01

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0.2	60	1576.3	1577	1577	1577.21	0.01906	3.71	16.96	41.14	1.01
0.2	80	1576.3	1577.09	1577.09	1577.34	0.017859	4.08	20.67	42.28	1.01
0.2	100	1576.3	1577.17	1577.17	1577.46	0.017281	4.42	24.02	43.28	1.02
0.2	120	1576.3	1577.24	1577.24	1577.57	0.016614	4.69	27.3	44.24	1.02
0.2	150	1576.3	1577.35	1577.35	1577.73	0.015483	5.01	32.22	45.65	1.01
0.2	180	1576.3	1577.45	1577.45	1577.87	0.01484	5.32	36.77	46.91	1.01
0.2	200	1576.3	1577.52	1577.52	1577.96	0.014019	5.45	40.14	47.82	0.99
0.2	250	1576.3	1577.67	1577.67	1578.18	0.013351	5.86	47.3	49.7	0.99
0.14	880	1574.2	1577.57	1576.58	1577.83	0.001296	4.55	229.03	101.69	0.46
0.14	982	1574.2	1577.8	1576.71	1578.05	0.0012	4.58	251.37	101	0.44
0.14	20	1574.2	1575.14	1574.66	1575.15	0.000277	0.75	28.02	51.81	0.16
0.14	40	1574.2	1575.28	1574.8	1575.3	0.000556	1.21	35.57	56.8	0.24
0.14	60	1574.2	1575.39	1574.9	1575.42	0.00079	1.57	41.82	60.62	0.29
0.14	80	1574.2	1575.47	1575	1575.52	0.001011	1.88	46.99	63.6	0.33
0.14	100	1574.2	1575.54	1575.08	1575.61	0.001211	2.16	51.68	66.19	0.37
0.14	120	1574.2	1575.61	1575.16	1575.69	0.001404	2.41	55.87	68.42	0.4
0.14	150	1574.2	1575.68	1575.27	1575.79	0.001717	2.79	61.03	71.08	0.45
0.14	180	1574.2	1575.74	1575.35	1575.87	0.002047	3.14	65.37	73.23	0.49
0.14	200	1574.2	1575.76	1575.4	1575.92	0.002365	3.41	66.96	74.01	0.53
0.14	250	1574.2	1575.86	1575.55	1576.06	0.00277	3.88	74.23	76.6	0.58
0.13	880	1574.8	1577.65	1576.26	1577.69	0.000338	2.17	557.87	339.23	0.23
0.13	982	1574.8	1577.88	1576.34	1577.92	0.000275	2.07	634.8	335.5	0.21
0.13	20	1574.8	1575.02	1575.02	1575.1	0.014407	2.3	9.75	70.76	0.95
0.13	40	1574.8	1575.11	1575.11	1575.21	0.011896	2.75	16.73	80.7	0.92
0.13	60	1574.8	1575.18	1575.18	1575.31	0.011947	3.16	22.05	87.54	0.96
0.13	80	1574.8	1575.24	1575.24	1575.38	0.01105	3.39	27.65	94.19	0.95

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0.13	100	1574.8	1575.29	1575.29	1575.45	0.010904	3.64	32.45	99.54	0.96
0.13	120	1574.8	1575.33	1575.33	1575.52	0.01072	3.85	37.09	104.46	0.96
0.13	150	1574.8	1575.41	1575.41	1575.6	0.009785	4.03	44.83	112.07	0.94
0.13	180	1574.8	1575.47	1575.46	1575.68	0.009025	4.16	52.35	118.07	0.92
0.13	200	1574.8	1575.54	1575.49	1575.73	0.007368	4.02	60.52	124.25	0.85
0.13	250	1574.8	1575.71	1575.57	1575.86	0.004778	3.74	82.58	139.58	0.71
0.12	885	1573.4	1576.21	1576.21	1577.31	0.010604	9.46	130.52	63.64	1.02
0.12	987	1573.4	1576.42	1576.42	1577.54	0.009849	9.59	143.95	63.4	1
0.12	20	1573.4	1573.81	1573.81	1573.94	0.02457	2.97	6.97	30.43	1.05
0.12	40	1573.4	1573.96	1573.96	1574.15	0.018422	3.57	12.12	34.92	0.99
0.12	60	1573.4	1574.08	1574.08	1574.33	0.016745	4.05	16.57	38.37	0.98
0.12	80	1573.4	1574.2	1574.2	1574.48	0.014488	4.32	21.39	41.79	0.95
0.12	100	1573.4	1574.29	1574.29	1574.61	0.014382	4.69	25.2	44.31	0.96
0.12	120	1573.4	1574.38	1574.38	1574.73	0.013882	4.96	29.18	46.79	0.96
0.12	150	1573.4	1574.51	1574.51	1574.89	0.012937	5.26	35.13	48.29	0.95
0.12	180	1573.4	1574.61	1574.61	1575.04	0.012851	5.61	40.05	49.2	0.97
0.12	200	1573.4	1574.67	1574.67	1575.13	0.012635	5.8	43.38	49.8	0.97
0.12	250	1573.4	1574.82	1574.82	1575.35	0.012509	6.27	50.87	51.14	0.98
0.11	885	1572.8	1575.41	1575.35	1576.45	0.009239	8.45	120.11	58.24	0.94
0.11	987	1572.8	1575.55	1575.55	1576.69	0.00953	8.88	127.87	58	0.97
0.11	20	1572.8	1573.22	1573.13	1573.27	0.006912	1.75	11.56	40.81	0.57
0.11	40	1572.8	1573.36	1573.25	1573.44	0.007683	2.38	17.14	41.88	0.64
0.11	60	1572.8	1573.47	1573.35	1573.59	0.007633	2.78	22.1	42.82	0.67
0.11	80	1572.8	1573.57	1573.43	1573.72	0.007864	3.15	26.22	43.57	0.69
0.11	100	1572.8	1573.66	1573.51	1573.84	0.007906	3.44	30.13	44.28	0.71
0.11	120	1572.8	1573.75	1573.59	1573.95	0.007675	3.67	34.14	45	0.72

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: Impo rted Pla Reach: 1 1/13/97

Hydraulic Reaches = 1
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Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.11	150	1572.8	1573.86	1573.69	1574.1	0.007823	4.03	39.12	45.87	0.74
0.11	180	1572.8	1573.95	1573.79	1574.24	0.008157	4.38	43.4	46.6	0.77
0.11	200	1572.8	1574.01	1573.86	1574.33	0.008174	4.57	46.42	47.11	0.77
0.11	250	1572.8	1574.17	1574	1574.54	0.008097	4.97	53.82	48.35	0.79
0.08	885	1570.8	1573.45	1573.45	1574.5	0.013818	10.52	137.69	67.33	1.16
0.08	987	1570.8	1573.64	1573.64	1574.72	0.013123	10.75	150.16	67.17	1.14
0.08	20	1570.8	1571.21	1571.21	1571.35	0.020492	3.16	8.23	36.14	1
0.08	40	1570.8	1571.38	1571.38	1571.56	0.016265	3.75	15.17	44.23	0.95
0.08	60	1570.8	1571.49	1571.49	1571.72	0.016413	4.33	20.28	46.93	0.99
0.08	80	1570.8	1571.59	1571.59	1571.85	0.016145	4.77	25.06	49.33	1.01
0.08	100	1570.8	1571.68	1571.68	1571.98	0.015685	5.11	29.69	51.54	1.02
0.08	120	1570.8	1571.76	1571.76	1572.09	0.015783	5.45	33.76	53.41	1.04
0.08	150	1570.8	1571.88	1571.88	1572.25	0.015262	5.83	40.1	56.2	1.04
0.08	180	1570.8	1571.99	1571.99	1572.38	0.014553	6.11	46.25	57.33	1.03
0.08	200	1570.8	1572.05	1572.05	1572.47	0.014494	6.32	49.77	57.75	1.04
0.08	250	1570.8	1572.18	1572.18	1572.67	0.014716	6.86	57.59	58.66	1.07
0	885	1558.4	1560.57	1560.57	1561.47	0.019293	8.49	122.83	74.05	1.07
0	987	1558.4	1560.77	1560.77	1561.66	0.01696	8.49	137.74	75.5	1.02
0	20	1558.4	1558.8	1558.8	1558.93	0.031932	2.92	6.94	26.08	0.99
0	40	1558.4	1558.98	1558.98	1559.12	0.023028	3.07	14.72	58.66	0.89
0	60	1558.4	1559.08	1559.08	1559.24	0.021242	3.39	20.65	62.57	0.88
0	80	1558.4	1559.15	1559.15	1559.34	0.021721	3.76	24.96	63.1	0.91
0	100	1558.4	1559.21	1559.21	1559.43	0.021949	4.07	28.87	63.57	0.93
0	120	1558.4	1559.27	1559.27	1559.51	0.021268	4.29	32.89	64.06	0.94
0	150	1558.4	1559.35	1559.35	1559.63	0.021699	4.66	37.78	64.64	0.96
0	180	1558.4	1559.42	1559.42	1559.74	0.022148	5	42.23	65.16	0.99

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: Impo rted Pla Reach: 1 1/13/97

Hydraulic Reaches = 1
River Sta tions = 15
Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0	200	1558.4	1559.46	1559.46	1559.81	0.022118	5.19	45.21	65.51	1
0	250	1558.4	1559.57	1559.57	1559.97	0.021427	5.55	52.7	66.39	1
2.99	885	1551	1554.45	1554.35	1555	0.01001	6.95	181.5	158.89	0.79
2.99	987	1551	1554.56	1554.5	1555.14	0.010007	7.16	200.18	170.19	0.79
2.99	20	1551	1551.82	1551.67	1551.9	0.010009	2.28	8.77	19.55	0.6
2.99	40	1551	1552.07	1551.88	1552.2	0.009999	2.89	13.85	21.61	0.64
2.99	60	1551	1552.26	1552.05	1552.43	0.010006	3.3	18.19	23.23	0.66
2.99	80	1551	1552.42	1552.18	1552.63	0.009999	3.61	22.13	24.6	0.67
2.99	100	1551	1552.57	1552.31	1552.8	0.010017	3.88	25.89	28.92	0.68
2.99	120	1551	1552.7	1552.43	1552.96	0.010019	4.09	30.03	35.71	0.69
2.99	150	1551	1552.86	1552.6	1553.15	0.010016	4.36	36.63	44.44	0.7
2.99	180	1551	1553	1552.78	1553.32	0.010019	4.57	43.38	52.04	0.71
2.99	200	1551	1553.09	1552.88	1553.41	0.010018	4.7	47.9	56.59	0.72
2.99	250	1551	1553.27	1553.1	1553.62	0.010015	4.96	59.07	66.53	0.73

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 55 (ADMP 15)

Location to nearest Quarter Section: SW 1/4 of Section 14

Roadway Name: Saguaro Blvd. (S. of Kiwanis Dr.)

Roadway Classification: Arterial

Wash Name (if applicable): Colony Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 1 - 72" x 166' cmp

Culvert Description: ____

Future Condition 100-year Discharge: 662 cfs (HEC-1 operation SCLN5)(6-hr

Maximum Depth of Flow: 2.81' (From HEC-RAS model using future Q's

Duration of Impassable Flow: 0.7 hrs

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ___ *

High ___ *

Comments: Estimated passable Q = 400 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 14 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 58

Location to nearest Quarter Section: NE 1/4 of Section 21

Roadway Name: Burro Dr. (E. of Palomino Dr)

Roadway Classification: Local

Wash Name (if applicable): Emerald Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped road crossing

Future Condition 100-year Discharge: 1.3 cfs (HEC-1 operation EITR2)(6-hr)

Maximum Depth of Flow: 0.94'

Duration of Impassable Flow: 1.2 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium ____ *

High X *

Comments: Estimated passage Q = 21 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_58
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

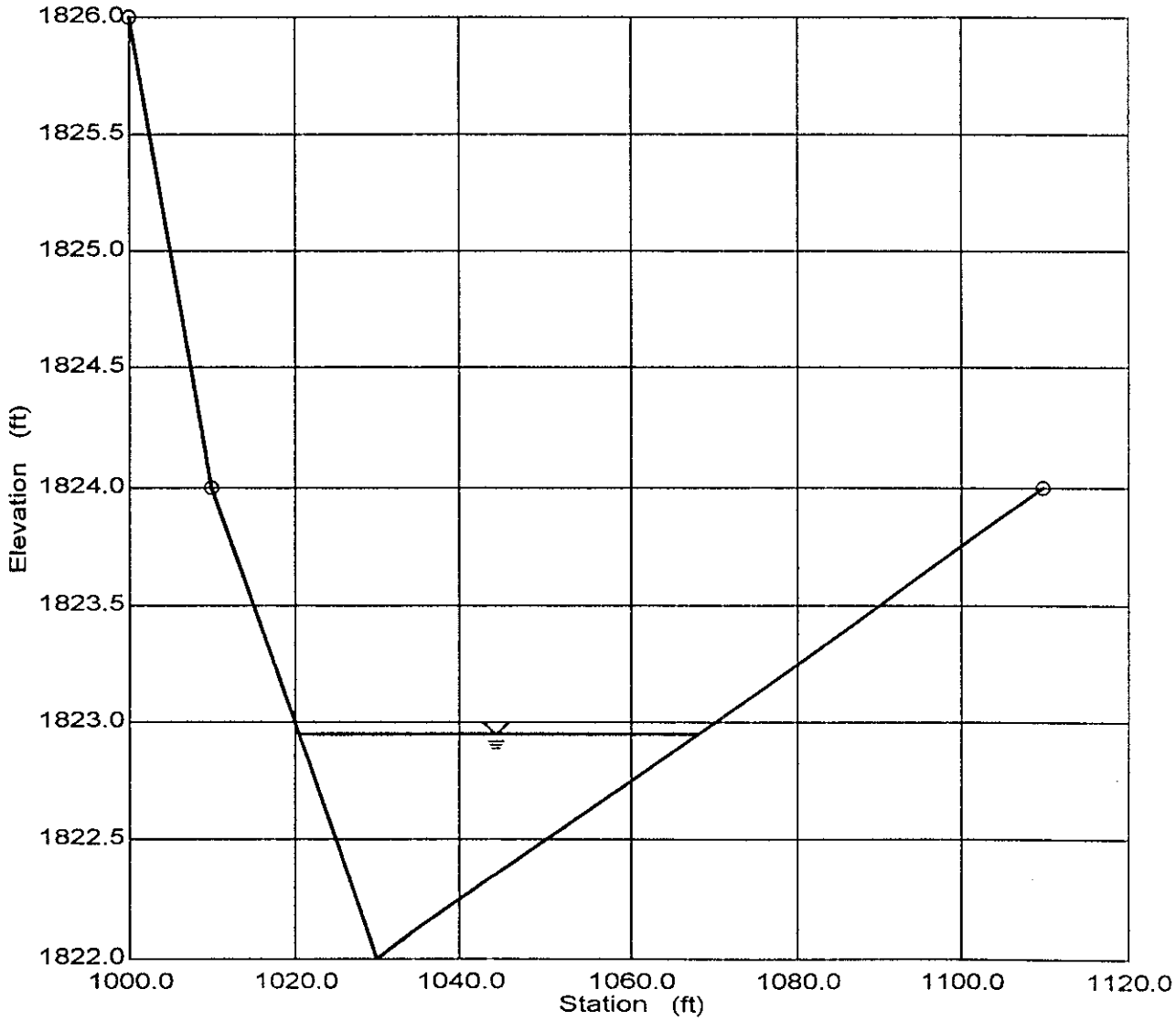
Input Data				
Channel Slope	0.020000 ft/ft			
Elevation range: 1,822.00 ft to 1,826.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
1,000.00	1,826.00	1,000.00	1,010.00	0.050
1,010.00	1,824.00	1,010.00	1,110.00	0.025
1,030.00	1,822.00			
1,110.00	1,824.00			
Discharge	113.00 cfs			

Results		
Wtd. Mannings Coefficient	0.025	
Water Surface Elevation	1,822.94	ft
Flow Area	22.22	ft^2
Wetted Perimeter	47.19	ft
Top Width	47.13	ft
Height	0.94	ft
Critical Depth	1,823.05	ft
Critical Slope	0.011312	ft/ft
Velocity	5.09	ft/s
Velocity Head	0.40	ft
Specific Energy	1,823.34	ft
Froude Number	1.31	
Flow is supercritical.		

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_58
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.025	
Channel Slope	0.020000	ft/ft
Water Surface Elevation	1,822.94	ft
Discharge	113.00	cfs



George V. Sabol Consulting Engineers, Inc.

SHEET ____ OF ____

CLIENT FCD MC

DATE

PROJECT F. HILLS ADMP

BY

SUBJECT EAPFL ES

PROJECT NO.

Geometry and manning's estimate for normal depth cross section for overflow crossing:

Station	Description	Elevation	n
10+00	n/a	1826	0.05
10+10	Eof Burro Dr	1824	0.025
10+30	℄ Burro Dr @ Flow line	1822	"
11+10	℄ Burro Dr	1824	"

Slope = 0.02%

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 14 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 59

Location to nearest Quarter Section: NE 1/4 of Section 22

Roadway Name: Baron Dr (N. of Emerald Dr)

Roadway Classification: Local

Wash Name (if applicable): Emerald Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 66" x 140' cmp

Culvert Description: ____

Future Condition 100-year Discharge: 217 cfs (HEC-1 operation SEMR7)(6 hr

Maximum Depth of Flow: 0.81' (From HEC-2 model using future Q's)

Duration of Impassable Flow: 2.2 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium X *

High ____ *

Comments: Estimated overbank Q = 150 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Feb 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 53

Location to nearest Quarter Section: NE 1/4 of Section 22

Roadway Name: Cromwell Drive (N. of Inca Ave.)

Roadway Classification: Local

Wash Name (if applicable): Malta Drain

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped road crossing. One foot berm on downstream side w/ 18" culvert for a drain

Future Condition 100-year Discharge: 88 cfs (HEC-1 operation MLT1)(6 hr)

Maximum Depth of Flow: 1.8'

Duration of Impassable Flow: 1.1 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium X *

High ____ *

Comments: Estimated passable Q = 4 cfs

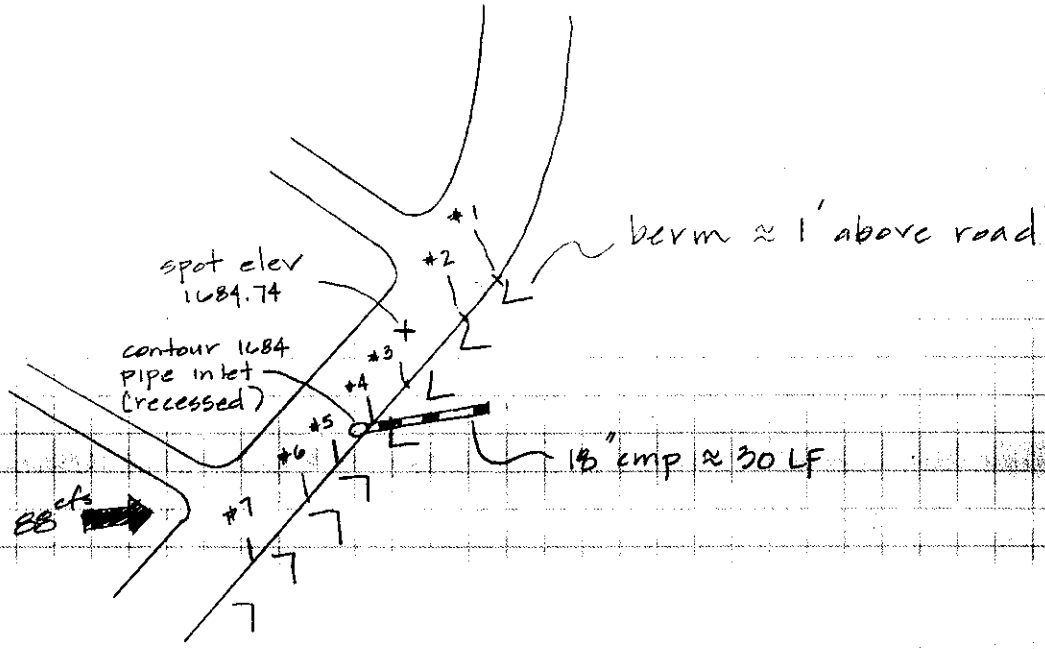
SFC

PROJECT: F. Hills ADMP

PROJECT No.: 12 041 01 DATE: 12 Feb 97

PAGE: 1 OF 1 SCALE:

EAPFL 53



Berm profile estimated by adding 1' to EOP elevations (Pavement elevation taken for digital topo file).

PT#	Station	Pavement Elevation	Berm Elevation
1	10+00	1686.00	1687.0
2	10+10.6	1685.60	1686.6
3	10+55.5	1684.63	1685.6
4	10+81.4	1685.17	1686.2
5	10+97.0	1685.28	1686.3
6	11+15.6	1685.31	1686.3
7	11+69.5	1685.82	1686.8

Pipe inverts: Assume L = 30' & S = 3%

Inlet = 1684
Outlet = 1683.1

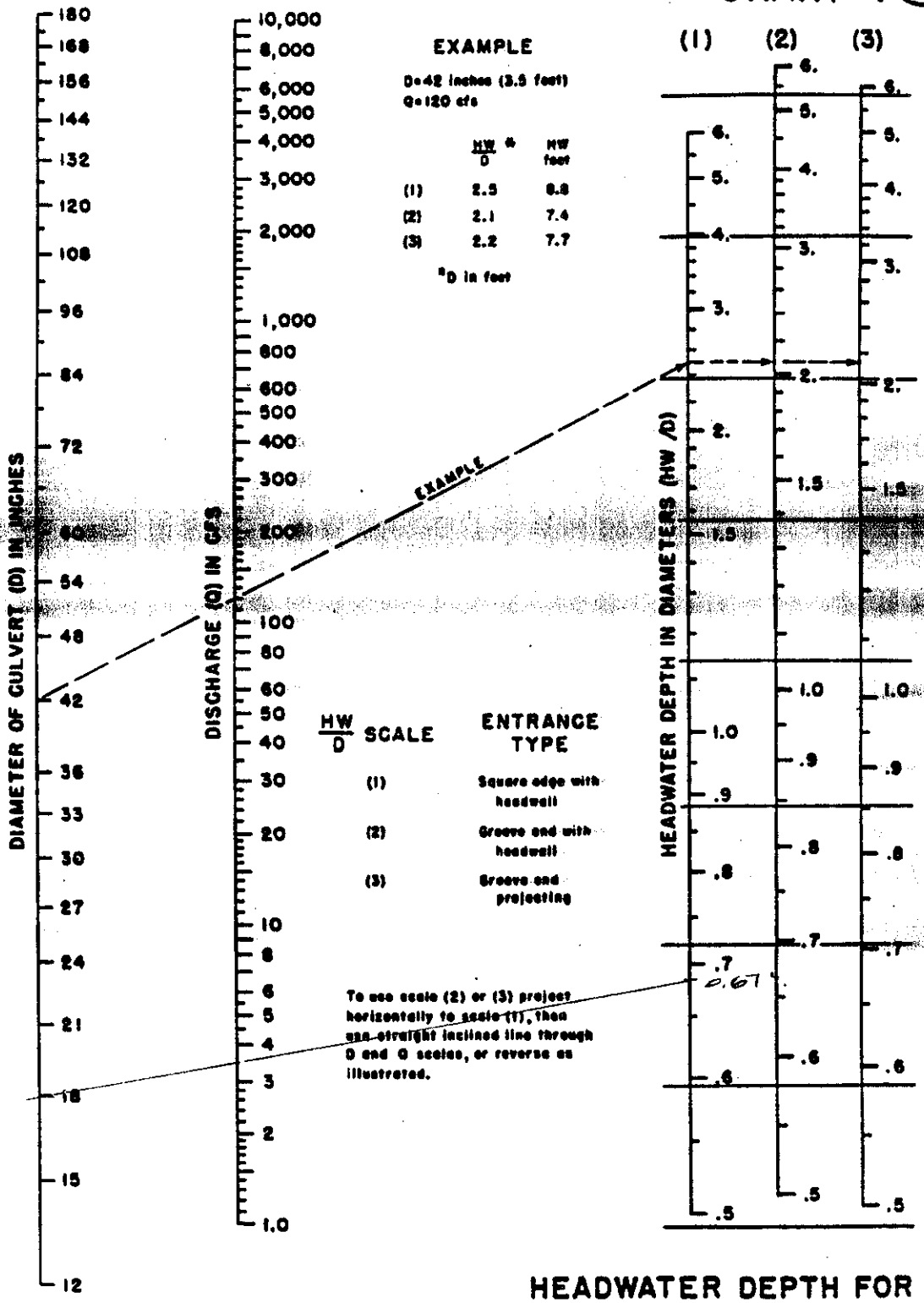
passable Q @ 1' of depth in pipe

DESIGNED BY: CHECKED BY:

HW/D = 0.67 0.67 * 1.5' = 1.0'

Q = 3.5 → 4 cfs

CHART 1



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 2&3
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

```
*******************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
*******************************************
```

PROJECT: Fountain Hills ADMP
ENGINEER: mcg
DATE: 2/12/1997
TIME: 13:54.33

INPUT PARAMETERS

STARTING WSEL:	1685.60
MAXIMUM WSEL:	1686.80
STEP SIZE:	0.10
BREADTH OF WEIR:	5.00

```
*********************************************
    INPUT ELEVATION/STATION TABLE.
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:  13:54.33
*********************************************
```

POINT	ELEVATION	STATION
1	1687.00	1000.00
2	1686.60	1010.60
3	1685.60	1055.50
4	1686.20	1081.40
5	1686.30	1097.00
6	1686.30	1115.60
7	1686.80	1169.50

```
*********************************************
    WEIR COEFFICIENT TABLE
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:  13:54.33
*********************************************
```

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT
1	0.00	2.5000
2	0.10	2.5667
3	0.20	2.6333
4	0.30	2.7000
5	0.40	2.7667
6	0.50	2.8333
7	0.60	2.9000
8	0.70	2.9667
9	0.80	3.0022
10	0.90	3.0067
11	1.00	3.0111
12	1.10	3.0156
13	1.20	3.0200

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   2/12/1997
    TIME:  13:54.33
*********************************************
```

ELEVATION	DISCHARGE (CFS)
1685.60	0.00
1685.70	0.28
1685.80	1.62
1685.90	4.51
1686.00	9.38
1686.10	16.60
1686.20	26.51
1686.30	40.03
1686.40	59.77
1686.50	86.17
1686.60	119.46
1686.70	160.23
1686.80	208.05

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 12 Feb 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 54

Location to nearest Quarter Section: NE 1/4 of Section 22

Roadway Name: Hawk Dr and Arroyo Vista Dr

Roadway Classification: Local

Wash Name (if applicable): Malta Drain

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ___

Culvert Size: N/A

Culvert Description: Hawk Dr. becomes Malta Drain at the intersection w/ Arroyo Vista Dr until intersection w/ Malta Dr.

Future Condition 100-year Discharge: 187 cfs (HEC-1 operation MLT3)(6 hr)

Maximum Depth of Flow: 0.7'

Duration of Impassable Flow: 0.3 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

Comments: Estimated passable Q = 126 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_54
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.016700	ft/ft

Elevation range: 99.80 ft to 102.13 ft.

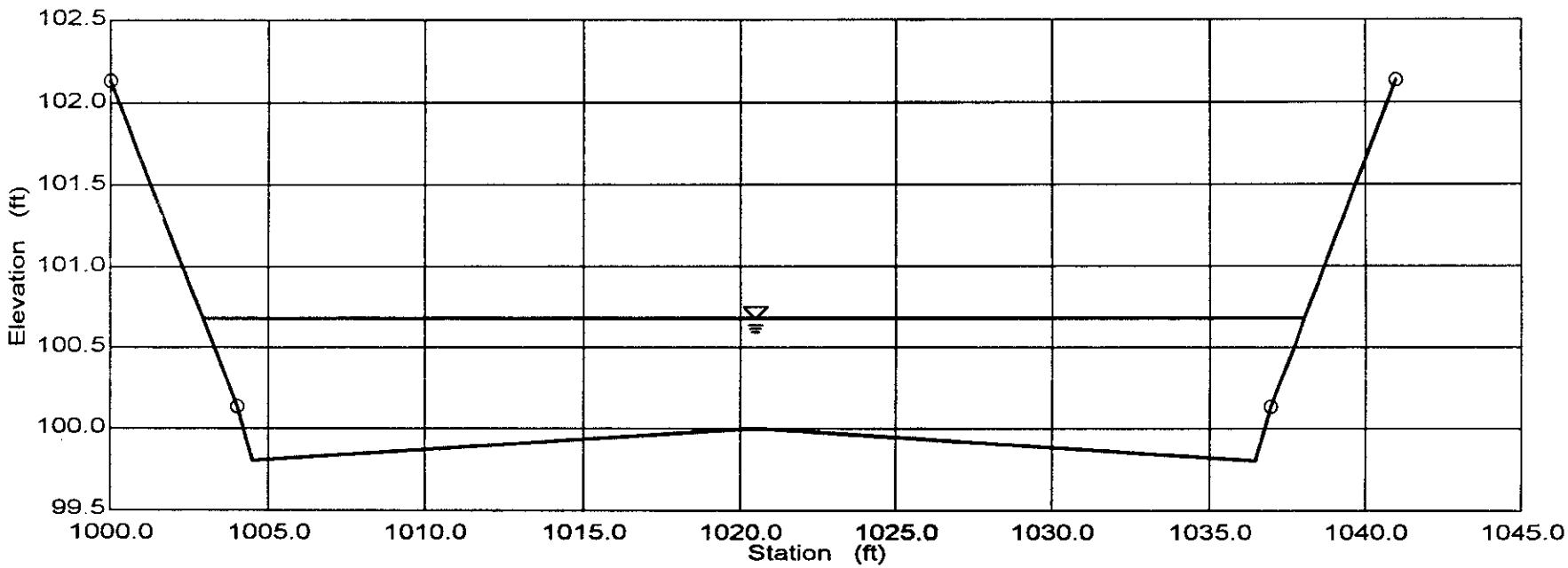
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
1,000.00	102.13	1,000.00	1,004.00	0.040
1,004.00	100.13	1,004.00	1,037.00	0.020
1,004.50	99.80	1,037.00	1,041.00	0.040
1,020.50	100.00			
1,036.50	99.80			
1,037.00	100.13			
1,041.00	102.13			
Discharge	187.00	cfs		

Results		
Wtd. Mannings Coefficient	0.022	
Water Surface Elevation	100.67	ft
Flow Area	25.99	ft^2
Wetted Perimeter	35.62	ft
Top Width	35.17	ft
Height	0.87	ft
Critical Depth	100.90	ft
Critical Slope	0.007492	ft/ft
Velocity	7.20	ft/s
Velocity Head	0.80	ft
Specific Energy	101.48	ft
Froude Number	1.48	
Flow is supercritical.		

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_54
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.022	
Channel Slope	0.016700	ft/ft
Water Surface Elevation	100.67	ft
Discharge	187.00	cfs



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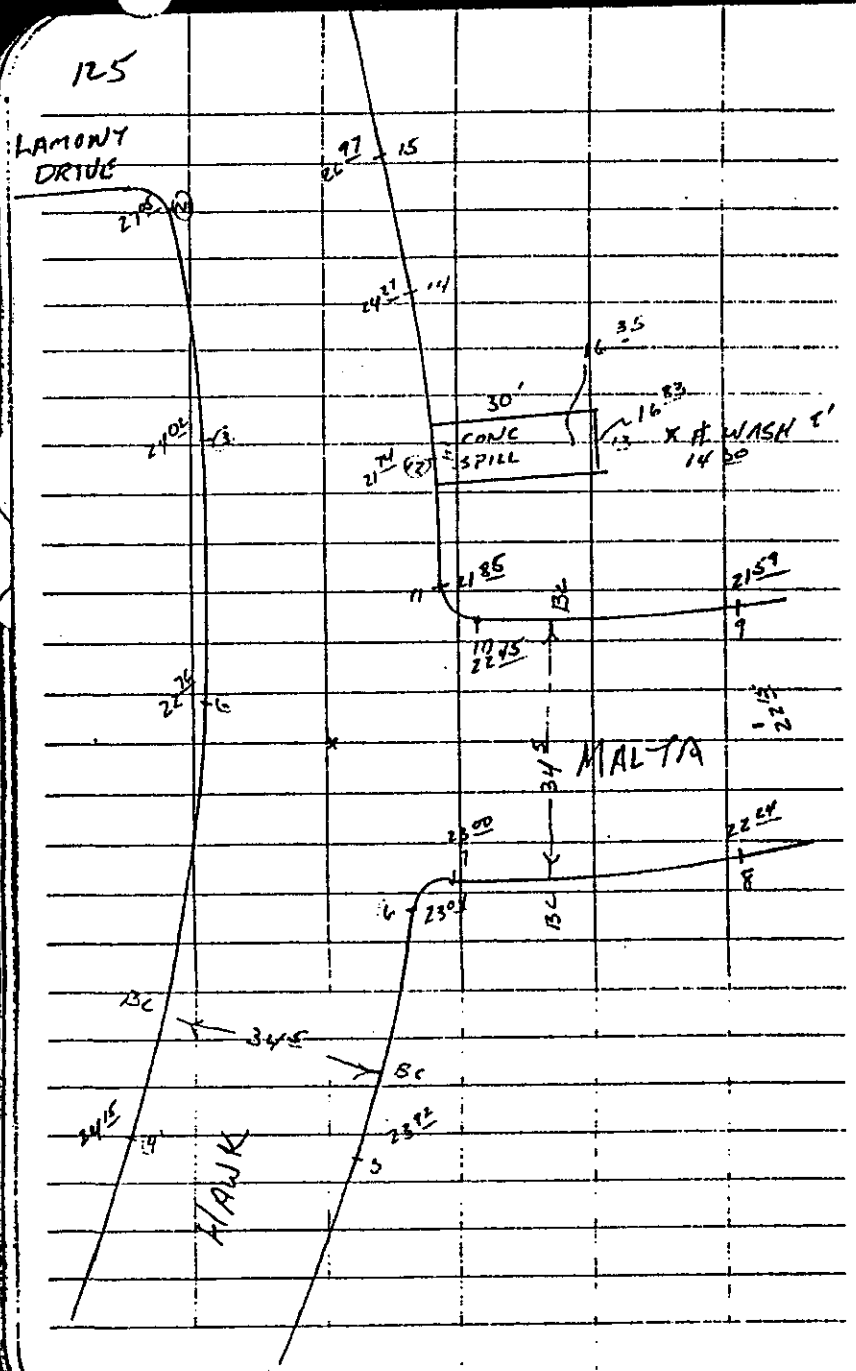
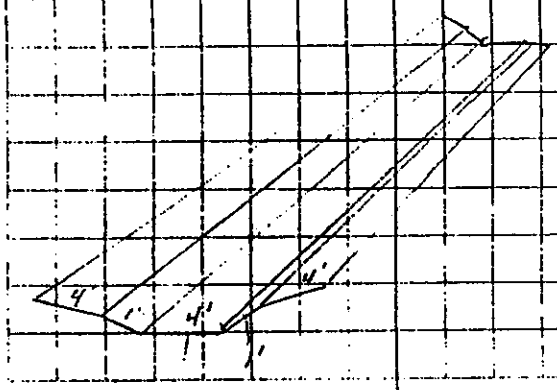


JNT MALTA & HAWK

1	E	0-00-00	155	45
3		4-48-00	85	65
4		198-03-00	54	90
5		179-50-00	102	40
6		149-52-00	46	70
7		118-12-00	53	70
8		110-52-00	93	45
9		91-06-00	92	00
10		82-55-00	54	55
11		51-14-00	47	55
12		40-58-00	60	25
13		59-20-00	80	90
14		70-03-00	115	40
15		18-58-00	166	00



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 14 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 60 (ADMP 25)

Location to nearest Quarter Section: NW 1/4 Section 23

Roadway Name: Nightingale Cir (N. of Malta Dr)

Roadway Classification: Local

Wash Name (if applicable): Malta Drain

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding X

Culvert Size: 18" x 28" x 48' cmpe

Culvert Description: Corrugated metal pipe ellipse – assumed ineffective

Future Condition 100-year Discharge: 378 cfs (HEC-1 operation MLT4)(6-hr)

Maximum Depth of Flow: 1.0' (From HEC-RAS model using Future Q's

Duration of Impassable Flow: 1.25 hrs

Scour/Wash-out Potential: Low ___ * *Notes:

Medium X *

High ___ *

Comments: Estimated passable Q = 40 cfs

* Floodplain inundates Malta Dr

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 14 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 61 (ADMP 25)

Location to nearest Quarter Section: NW 1/4 of Section 23

Roadway Name: Oasis Dr (N. of Malta Dr.)

Roadway Classification: Local

Wash Name (if applicable): Malta Drain

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding X

Culvert Size: 18" x 28" x 48' cmpe

Culvert Description: Corrugated metal pipe ellipse – assumed ineffective.

Future Condition 100-year Discharge: 378 cfs (HEC-1 operation MLT4)(6-hr)

Maximum Depth of Flow: 1.2' (From HEC-RAS model using Future Q's)

Duration of Impassable Flow: 1.25 hrs

Scour/Wash-out Potential: Low ___ * *Notes:

Medium X *

High ___ *

Comments: Estimated passable Q = 40 cfs

* Floodplain inundates Malta Dr.

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 14 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 62 (ADMP 25)

Location to nearest Quarter Section: NW ¼ of Section 23

Roadway Name: Dawn Ridge Cir (N. of Malta Dr.)

Roadway Classification: Local

Wash Name (if applicable): Malta Drain

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding X

Culvert Size: 18" x 28" x 48' cmpe

Culvert Description: Corrugated metal pipe ellipse – assumed ineffective

Future Condition 100-year Discharge: 278 cfs (HEC-1 operation MLT4)(6 hr)

Maximum Depth of Flow: 0.86' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 0.6 hrs

Scour/Wash-out Potential: Low ___ * *Notes:

Medium X *

High ___ *

Comments: Estimated passable Q = 155 cfs

* Floodplain inundates Malta Drive

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County — Date: 14 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 — By: MCG

Subject: Emergency Access Plan — Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 63 (ADMP 25)

Location to nearest Quarter Section: NW 1/4 of Section 23

Roadway Name: Mission Bell Cir (N. of Malta Dr.)

Roadway Classification: Local

Wash Name (if applicable): Malta Drain

EAPFL Type and Description

Type of Flooding: Cross Street X — Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding X

Culvert Size: 18" x 28" x 48' cmpe

Culvert Description: Corrugated metal pipe ellipse — assumed ineffective

Future Condition 100-year Discharge: 378 cfs (HEC-1 operation MLT4)(6 hr)

Maximum Depth of Flow: 0.98' (From HEC-RAS model using future Q)

Duration of Impassable Flow: 0.6 hrs

Scour/Wash-out Potential: Low ___ * — *Notes:

Medium X *

High ___ *

Comments: Estimated passable Q = 145 cfs

* Floodplain inundates Malta Dr.

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 14 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 64 (ADMP 25)

Location to nearest Quarter Section: NW 1/4 of Section 23

Roadway Name: Quinto Drive (N. of Malta Dr.)

Roadway Classification: Local

Wash Name (if applicable): Malta Drain

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding X

Culvert Size: 1 - 24" x 49' cmp, 1 - 18" x 28" x 48' cmpe

Culvert Description: Corrugated metal pipes - assumed ineffective

Future Condition 100-year Discharge: 378 cfs (HEC-1 operation MLT4)(6'

Maximum Depth of Flow: 1.59' (From HEC-RAS model using Future Q:

Duration of Impassable Flow: 1.25 hrs

Scour/Wash-out Potential: Low ___ * *Notes:

Medium X *

High ___ *

Comments: Estimated passable Q = 40 cfs

* Floodplain inundates Malta Dr

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 14 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 65 (ADMP 21)

Location to nearest Quarter Section: NW 1/4 of Section 23

Roadway Name: Rand Drive (N. of Malta Dr)

Roadway Classification: Local

Wash Name (if applicable): Malta Drain

EAPFL Type and Description:

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped road crossing

Future Condition 100-year Discharge: 448 cfs (HEC-1 operation MLT4A)(6 hr

Maximum Depth of Flow: 2.9' (From HEC-RAS model using future Q

Duration of Impassable Flow: 2 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

Medium ____ *

High X *

Comments: Estimated passable Q = 10 cfs

* Floodplain inundates Malta Dr

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 14 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 66 (ADMP 20 & 22)

Location to nearest Quarter Section: NE 1/4 of Section 23

Roadway Name: Saguaro Blvd. and Malta Dr.

Roadway Classification: Arterial

Wash Name (if applicable): Confluence of Malta Drain & Emerald Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding X

Culvert Size: Malta Drain: 2-48" cmp's Emerald Wash: 2-60" cm

Culvert Description: ___

Future Condition 100-year Discharge: 907 cfs (HEC-1 operation EMRMLT*)(6-hr)

Maximum Depth of Flow: 1.2'

Duration of Impassable Flow: 3.3 hrs

Scour/Wash-out Potential: Low X * *Notes: ___

Medium ___ *

High ___ *

Comments: Estimated passable Q = 32 cfs

* See attached worksheets for estimation of max. depth of flow & passable Q.

4: THE Q @ CP EMRMLT IS TAKEN FROM HEC-1 MODEL (FILE 160-170.IHI) A MERGING OF EMERALD & MALTA FILES WHICH WAS PROVIDED BY ENTELLUS.

CURRENT DATE: 01-15-1997 FILE DATE: 01-15-1997
CURRENT TIME: 09:18:48 FILE NAME: MALTA

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	16.24	14.08	132.02	2 CSP	4.00	4.00	.024	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (cfs) FILE: MALTA DATE: 01-15-1997

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
16.24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
18.23	48.3	48.3	0.0	0.0	0.0	0.0	0.0	0.00	1
19.24	96.6	96.6	0.0	0.0	0.0	0.0	0.0	0.00	1
20.18	144.9	144.9	0.0	0.0	0.0	0.0	0.0	0.00	1
21.32	193.2	193.2	0.0	0.0	0.0	0.0	0.0	0.00	1
22.46	241.5	240.8	0.0	0.0	0.0	0.0	0.0	0.72	4
22.73	250.0	245.3	0.0	0.0	0.0	0.0	0.0	4.35	5
23.81	338.1	262.8	0.0	0.0	0.0	0.0	0.0	73.63	4
24.13	386.4	267.1	0.0	0.0	0.0	0.0	0.0	118.60	4
24.38	434.7	271.8	0.0	0.0	0.0	0.0	0.0	162.09	4
24.59	483.0	275.6	0.0	0.0	0.0	0.0	0.0	206.36	4
22.20	231.6	231.6	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: MALTA DATE: 01-15-1997

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
16.24	0.000	0.00	0.00	0.00
18.23	0.000	48.30	0.00	0.00
19.24	0.000	96.60	0.00	0.00
20.18	0.000	144.90	0.00	0.00
21.32	0.000	193.20	0.00	0.00
22.46	-0.001	241.50	0.03	0.01
22.73	-0.006	250.00	0.40	0.16
23.81	-0.008	338.10	1.64	0.49
24.13	-0.003	386.40	0.67	0.17
24.38	-0.003	434.70	0.85	0.20
24.59	-0.003	483.00	1.08	0.22

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

****

RENT DATE: 01-15-1997 FILE DATE: 01-15-1997
RENT TIME: 09:18:48 FILE NAME: MALTA

****

PERFORMANCE CURVE FOR CULVERT 1 - 2(4.00 (ft) BY 4.00 (ft)) CSP

****

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	16.24	0.00	-1.54	0-NF	0.00	0.00	0.00	0.62	0.00	0.00
48.30	18.23	1.99	0.77	1-S2n	1.33	1.44	1.24	0.62	7.31	0.00
96.60	19.24	3.00	1.73	1-S2n	1.96	2.08	1.88	0.62	8.33	0.00
144.90	20.18	3.94	3.04	1-S2n	2.53	2.57	2.47	0.62	8.92	0.00
193.20	21.32	4.98	5.08	2-M2c	3.17	2.97	2.97	0.62	9.69	0.00
240.75	22.46	6.22	5.99	2-M2c	4.00	3.28	3.28	0.62	10.93	0.00
245.25	22.73	6.35	6.49	2-M2c	4.00	3.31	3.31	0.62	11.06	0.00
262.83	23.77	6.88	7.53	2-M2c	4.00	3.40	3.40	0.62	11.58	0.00
267.13	24.14	7.02	7.90	2-M2c	4.00	3.42	3.42	0.62	11.71	0.00
271.76	24.38	7.17	8.14	2-M2c	4.00	3.45	3.45	0.62	11.84	0.00
275.56	24.59	7.29	8.35	2-M2c	4.00	3.47	3.47	0.62	11.95	0.00

****

El. inlet face invert 16.24 ft El. outlet invert 14.08 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****

** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	16.24 ft
OUTLET STATION	132.00 ft
OUTLET ELEVATION	14.08 ft
NUMBER OF BARRELS	2
SLOPE (V/H)	0.0164
CULVERT LENGTH ALONG SLOPE	132.02 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	4.00 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

****

RENT DATE: 01-15-1997 FILE DATE: 01-15-1997
ENT TIME: 09:18:48 FILE NAME: MALTA

****
********** TAILWATER **********
****
****

CONSTANT WATER SURFACE ELEVATION
14.70

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE GRAVEL
EMBANKMENT TOP WIDTH 100.00 ft
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	1000.00	26.00
2	1025.00	24.82
3	1070.00	22.20
4	1080.00	24.00
5	1090.00	26.00

****

CURRENT DATE: 01-15-1997 FILE DATE: 01-15-1997
CURRENT TIME: 09:20:02 FILE NAME: EMERALD

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	14.86	10.87	192.04	2 CSP	5.00	5.00	.024	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (cfs) FILE: EMERALD DATE: 01-15-1997

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
14.86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
16.82	55.5	55.5	0.0	0.0	0.0	0.0	0.0	0.00	1
17.76	111.0	111.0	0.0	0.0	0.0	0.0	0.0	0.00	1
18.57	166.5	166.5	0.0	0.0	0.0	0.0	0.0	0.00	1
19.33	222.0	222.0	0.0	0.0	0.0	0.0	0.0	0.00	1
20.12	277.5	277.5	0.0	0.0	0.0	0.0	0.0	0.00	1
20.46	300.0	300.0	0.0	0.0	0.0	0.0	0.0	0.00	1
21.98	388.5	388.5	0.0	0.0	0.0	0.0	0.0	0.00	1
23.12	444.0	444.0	0.0	0.0	0.0	0.0	0.0	0.00	1
23.77	499.5	472.7	0.0	0.0	0.0	0.0	0.0	24.94	6
23.95	555.0	480.6	0.0	0.0	0.0	0.0	0.0	69.98	4
23.38	455.7	455.7	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: EMERALD DATE: 01-15-1997

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
14.86	0.000	0.00	0.00	0.00
16.82	0.000	55.50	0.00	0.00
17.76	0.000	111.00	0.00	0.00
18.57	0.000	166.50	0.00	0.00
19.33	0.000	222.00	0.00	0.00
20.12	0.000	277.50	0.00	0.00
20.46	0.000	300.00	0.00	0.00
21.98	0.000	388.50	0.00	0.00
23.12	0.000	444.00	0.00	0.00
23.77	-0.006	499.50	1.82	0.36
23.95	-0.008	555.00	4.46	0.80

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

****

RENT DATE: 01-15-1997 FILE DATE: 01-15-1997
ENT TIME: 09:20:02 FILE NAME: EMERALD

****

PERFORMANCE CURVE FOR CULVERT 1 - 2(5.00 (ft) BY 5.00 (ft)) CSP

****

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	14.86	0.00	-0.66	0-NF	0.00	0.00	0.00	3.33	0.00	0.00
55.50	16.82	1.96	-0.54	1-S2n	1.22	1.45	1.15	3.33	8.02	0.00
111.00	17.76	2.90	0.03	1-S2n	1.77	2.08	1.68	3.33	9.52	0.00
166.50	18.57	3.71	0.88	1-S2n	2.22	2.58	2.22	3.33	9.88	0.00
222.00	19.33	4.47	1.94	1-S2n	2.63	3.01	2.51	3.33	11.28	0.00
277.50	20.12	5.26	3.20	1-S2n	3.03	3.37	2.97	3.33	11.44	0.00
300.00	20.46	5.60	3.78	1-S2n	3.19	3.51	3.11	3.33	11.70	0.00
388.50	21.98	7.12	6.40	5-S2n	3.91	3.98	3.78	3.33	12.22	0.00
444.00	23.12	8.26	5.10	2-M2c	5.00	4.19	4.19	3.33	12.67	0.00
472.74	23.76	8.90	8.68	2-M2c	5.00	4.30	4.30	3.33	13.20	0.00
480.56	23.95	9.09	9.09	2-M2c	5.00	4.33	4.33	3.33	13.34	0.00

****

El. inlet face invert 14.86 ft El. outlet invert 10.87 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****

** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	14.86 ft
OUTLET STATION	192.00 ft
OUTLET ELEVATION	10.87 ft
NUMBER OF BARRELS	2
SLOPE (V/H)	0.0208
CULVERT LENGTH ALONG SLOPE	192.04 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	5.00 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

****

RENT DATE: 01-15-1997 FILE DATE: 01-15-1997
ENT TIME: 09:20:02 FILE NAME: EMERALD

****
********** TAILWATER **********
****
****

CONSTANT WATER SURFACE ELEVATION
14.20

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE GRAVEL
EMBANKMENT TOP WIDTH 150.00 ft
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	1000.00	26.00
2	1040.00	24.00
3	1070.00	23.38
4	1170.00	23.80
5	1220.00	25.07

****

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
*********************************************
```

PROJECT: Fountain Hills ADMP
ENGINEER: mcg
DATE: 1/15/1997
TIME: 9:26.48

INPUT PARAMETERS

STARTING WSEL:	22.17
MAXIMUM WSEL:	24.00
STEP SIZE:	0.10
BREADTH OF WEIR:	100.00

```
*********************************************
    INPUT ELEVATION/STATION TABLE.
    PROJECT:  Fountain Hills ADMP
    DATE:   1/15/1997
    TIME:   9:26.48
*********************************************
```

POINT	ELEVATION	STATION
1	28.00	1000.00
2	26.00	1045.00
3	25.57	1048.00
4	25.07	1048.10
5	22.17	1285.00
6	23.97	1465.00
7	24.47	1465.10
8	26.00	1545.00

****

WEIR COEFFICIENT TABLE

PROJECT: Fountain Hills ADMP

DATE: 1/15/1997

TIME: 9:26.48

****

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT
1	0.00	2.5000
2	0.10	2.5033
3	0.20	2.5067
4	0.30	2.5100
5	0.40	2.5133
6	0.50	2.5167
7	0.60	2.5200
8	0.70	2.5233
9	0.80	2.5267
10	0.90	2.5300
11	1.00	2.5333
12	1.10	2.5367
13	1.20	2.5400
14	1.30	2.5433
15	1.40	2.5467
16	1.50	2.5500
17	1.60	2.5533
18	1.70	2.5567
19	1.80	2.5600

****

UNEVEN WEIR FLOW PROGRAM
FORTRAN VERSION 1.0
PROJECT: Fountain Hills ADMP
DATE: 1/15/1997
TIME: 9:26.48

****

ELEVATION	DISCHARGE (CFS)
22.17	0.00
22.27	0.57
22.37	3.25
22.47	8.97
22.57	18.43
22.67	32.23
22.77	50.87
22.87	74.83
22.97	104.56
23.07	140.46
23.17	182.90
23.27	232.27
23.37	[illegible]
23.47	353.13
23.57	425.29
23.67	505.69
23.77	594.62
23.87	692.39
23.97	799.28

- Total Q overtopping Saguaro Blvd = 276 cfs
  (70 cfs from Emerald Wash
  206 cfs from Malta Drain)

- Minimum ℄ Elev = 22.17
- Estimated passable Q = 32 cfs
- Max. depth of flow = 1.18'

George V. Sabol Consulting Engineers, Inc.

SHEET ____ OF ____

CLIENT FCD MC

DATE ____

PROJECT F HILLS ADMP

BY ____

SUBJECT EAPFL 66

PROJECT NO. ____

Geometry for Saguaro Blvd crossing of Emerald Wash and Malta Drain:

- Emerald Wash Culvert
  - 2 - 60" x 192' cmp's
  - Inlet invert : 14.86 & 14.86
  - Outlet invert : 10.87 & 10.87
  - Q : 555 cfs
  - Tailwater : 14.2 (constant water surface elev.)
  - Overtopping control section

Station	Elev	Description
10+00	26	n/g
10+40	24	"
10+70	23.38	E. toc
11+70	23.8	" "
12+20	25.07	" "

- Malta Drain Culvert
  - 2-48" x 132' cmp's
  - Inlet invert : 16.23 & 16.24
  - Outlet invert : 13.97 & 14.08
  - Q : 483 cfs
  - Tailwater : 14.7 (constant water surface elev.)
  - Overtopping control section

Station	Elev	Description
10+00	26	n/g
10+25	24.82	E. toc
10+70	22.2	" "
10+80	24	n/g
10+90	26	n/g

George V. Sabol Consulting Engineers, Inc.

SHEET _____ OF _____

CLIENT _____ DATE _____

PROJECT _____ BY _____

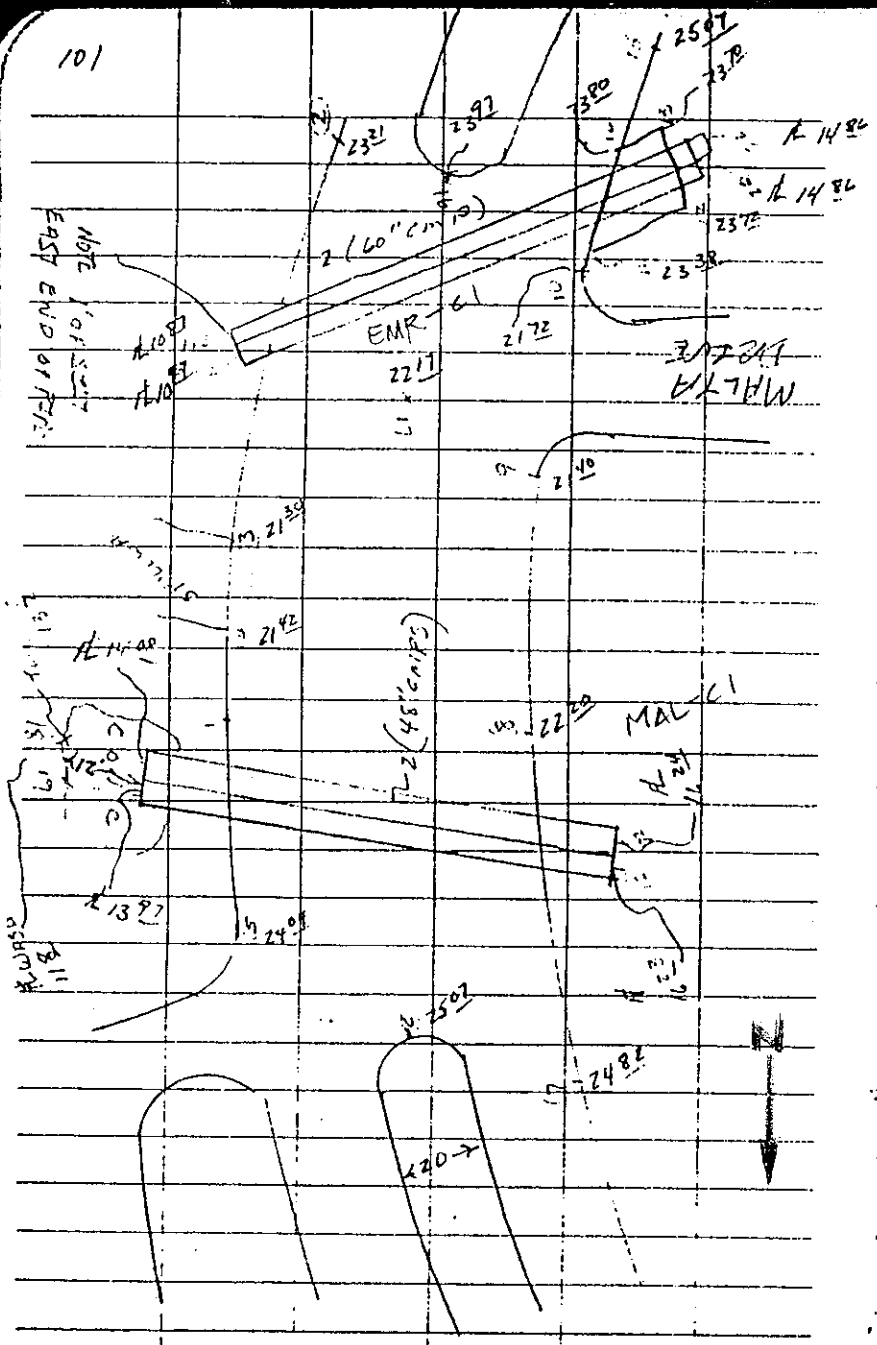
SUBJECT _____ PROJECT NO. _____

- Weir Section

Station	Elevation	Description
10+00	28	℄ median (contours)
10+45	26	" " "
10+48	25.57	Toc @ nose of median
10+48.1	25.07	Pav " "
12+85	22.17	℄ Saguaro & Malta
14+65	23.97	Pav @ nose of median
14+65.1	24.47	Toc " "
15+45	26	℄ median (contours)

* Q's for the culverts are the Q from operation EMR13 & MLT6 (Emerald Wash & Malta Drain respectively) at the time to peak for the combine operation of the two washes.

101



"SAGUARO & MALTA

342		0-00-00	270 10	89-33-00
343	3	354-07-00	55 10	89-48-00
344	4	354-10-00	10 80	88-22-00
345	5	169-52-00	89 10	88-06-00
346	6	146-54-00	116 30	88-02-00
347	7	132-08-00	147 00	88-34-00
348	8	98-51-00	93 00	89-20-00
349	9	48-31-00	109 70	89-51-00
350	10	28-34-00	167 10	89-48-00
351	11	18-26-00	284 40	89-34-00
352	12	22-35-00	304 50	89-30-00
353	13	19-20-00	317 50	89-32-00
354	14	17-40-00	311 60	89-32-00
355	15	16-49-00	357 40	89-23-00
356	16	9-42-00	279 95	89-25-00
357	17	17-59-00	114 70	89-28-00
358	18	190-56-00	84 25	88-48-00
359	19	159-56-00	89 20	87-32-00
360	20	144-08-00	135 90	88-23-00
361	21	145-44-00	139 30	88-21-00
362	22	21-42-00	319 50	89-38-00
363	23	21-10-00	326 20	89-39-00
364	24	349-41-00	190 10	89-07-00
365	25	349-34-00	183 30	89-05-00

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: Impo rted Pla Reach: 1 1/14/97

Hydraulic Reaches = 1
River Sta tions = 27
Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.78	366	1612.1	1616.22	1616.22	1617.27	0.015525	8.19	44.71	21.68	1
0.78	378	1612.1	1616.26	1616.26	1617.33	0.015606	8.3	45.53	21.59	1.01
0.78	20	1612.1	1613.39	1613.39	1613.71	0.022836	4.57	4.37	6.78	1
0.78	40	1612.1	1613.8	1613.8	1614.23	0.021153	5.29	7.57	8.92	1.01
0.78	60	1612.1	1614.09	1614.09	1614.61	0.02013	5.74	10.45	10.48	1.01
0.78	80	1612.1	1614.34	1614.34	1614.91	0.019318	6.07	13.17	11.77	1.01
0.78	100	1612.1	1614.55	1614.55	1615.17	0.018461	6.32	15.84	12.9	1
0.78	150	1612.1	1614.98	1614.98	1615.72	0.017622	6.87	21.84	15.15	1.01
0.78	200	1612.1	1615.33	1615.33	1616.16	0.017055	7.29	27.43	16.98	1.01
0.78	250	1612.1	1615.64	1615.64	1616.53	0.016322	7.58	32.97	18.62	1
0.78	350	1612.1	1616.16	1616.16	1617.17	0.015514	8.09	43.25	21.32	1
0.78	360	1612.1	1616.2	1616.2	1617.23	0.015444	8.14	44.25	21.57	1
0.73	366	1607.3	1612.84	1610.03	1612.88	0.000325	1.96	305.34	124.81	0.17
0.73	378	1607.3	1612.86	1610.07	1612.9	0.000337	2.01	308.4	124.89	0.17
0.73	20	1607.3	1611.63	1608.08	1611.63	0.000004	0.18	164.47	105.29	0.02
0.73	40	1607.3	1611.8	1608.32	1611.8	0.000014	0.34	182.7	110.53	0.03
0.73	60	1607.3	1611.92	1608.5	1611.92	0.000027	0.48	196.33	112.28	0.05
0.73	80	1607.3	1612.02	1608.64	1612.02	0.000041	0.61	207.37	113.61	0.06
0.73	100	1607.3	1612.1	1608.77	1612.11	0.000058	0.73	217.24	114.79	0.07
0.73	150	1607.3	1612.28	1609.06	1612.29	0.000104	1.01	237.5	117.17	0.09
0.73	200	1607.3	1612.43	1609.32	1612.44	0.000154	1.26	255.19	119.21	0.11
0.73	250	1607.3	1612.56	1609.56	1612.59	0.000205	1.49	271.65	121.07	0.13
0.73	350	1607.3	1612.8	1609.96	1612.84	0.000309	1.9	300.93	124.33	0.16
0.73	360	1607.3	1612.82	1610	1612.86	0.000319	1.94	303.59	124.62	0.17
0.72	366	1611.1	1612.35	1612.35	1612.74	0.018794	5.02	74.98	105.44	0.99
0.72	378	1611.1	1612.37	1612.37	1612.76	0.01841	5.05	77.1	105.4	0.98

Profile Output Table #NAME? Table 1
HEC-RAS Plan: Imported Pla Reach: 1 1/14/97

Hydraulic Reaches = 1
River Stations = 27
Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.72	20	1611.1	1611.5	1611.5	1611.6	0.03021	2.52	7.95	39.92	0.99
0.72	40	1611.1	1611.62	1611.62	1611.76	0.028396	2.92	13.68	52.37	1.01
0.72	60	1611.1	1611.71	1611.71	1611.87	0.027067	3.18	18.88	61.52	1.01
0.72	80	1611.1	1611.79	1611.79	1611.96	0.024976	3.31	24.15	69.57	0.99
0.72	100	1611.1	1611.85	1611.85	1612.05	0.025005	3.5	28.54	75.63	1.01
0.72	150	1611.1	1611.99	1611.99	1612.21	0.02375	3.8	39.43	88.9	1.01
0.72	200	1611.1	1612.08	1612.08	1612.35	0.021995	4.15	48.38	93.87	1
0.72	250	1611.1	1612.17	1612.17	1612.48	0.02114	4.48	56.35	97.48	1
0.72	350	1611.1	1612.33	1612.33	1612.71	0.018982	4.95	72.56	104.44	0.99
0.72	360	1611.1	1612.35	1612.35	1612.73	0.018682	4.98	74.31	105.17	0.98
0.71	366	1604.7	1608.22	1608.22	1609.13	0.015854	7.63	47.99	27.24	1.01
0.71	378	1604.7	1608.27	1608.27	1609.18	0.015652	7.69	49.14	27.16	1.01
0.71	20	1604.7	1605.8	1605.8	1606.08	0.023538	4.28	4.68	8.5	1.02
0.71	40	1604.7	1606.15	1606.15	1606.53	0.021327	4.9	8.16	11.23	1.01
0.71	60	1604.7	1606.41	1606.41	1606.85	0.020168	5.31	11.3	13.22	1.01
0.71	80	1604.7	1606.62	1606.62	1607.11	0.019404	5.62	14.22	14.83	1.01
0.71	100	1604.7	1606.8	1606.8	1607.33	0.018778	5.87	17.02	16.22	1.01
0.71	150	1604.7	1607.17	1607.17	1607.8	0.017833	6.38	23.52	19.07	1.01
0.71	200	1604.7	1607.47	1607.47	1608.18	0.017172	6.76	29.6	21.39	1.01
0.71	250	1604.7	1607.74	1607.74	1608.5	0.016381	7.02	35.62	23.47	1
0.71	350	1604.7	1608.17	1608.17	1609.05	0.015728	7.52	46.55	26.83	1.01
0.71	360	1604.7	1608.19	1608.19	1609.1	0.016075	7.63	47.16	27	1.02
0.66	366	1596.9	1602.66	1600.17	1602.69	0.000269	1.62	316.52	110.92	0.15
0.66	378	1596.9	1602.7	1600.2	1602.73	0.000277	1.65	320.3	111.07	0.15
0.66	20	1596.9	1601.51	1597.88	1601.51	0.000003	0.14	194.84	99.24	0.02
0.66	40	1596.9	1601.67	1598.19	1601.67	0.00001	0.26	211.1	100.88	0.03

Profile Output Table #NAME? Table 1
HEC-RAS Plan: Imported Pla Reach: 1 1/14/97

Hydraulic Reaches = 1
River Stations = 27
Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.66	60	1596.9	1601.78	1598.42	1601.79	0.000019	0.38	222.94	102.05	0.04
0.66	80	1596.9	1601.88	1598.6	1601.88	0.00003	0.48	232.85	103.03	0.05
0.66	100	1596.9	1601.97	1598.77	1601.97	0.000042	0.58	241.77	103.9	0.06
0.66	150	1596.9	1602.14	1599.09	1602.15	0.000078	0.81	259.57	105.61	0.08
0.66	200	1596.9	1602.28	1599.36	1602.29	0.000119	1.02	274.66	107.05	0.1
0.66	250	1596.9	1602.41	1599.61	1602.42	0.000162	1.21	288.27	108.32	0.12
0.66	350	1596.9	1602.63	1600.13	1602.66	0.000254	1.56	312.88	110.59	0.15
0.66	360	1596.9	1602.65	1600.14	1602.68	0.000264	1.6	315.11	110.79	0.15
0.65	366	1601	1602.2	1602.2	1602.54	0.019671	4.69	78.36	115.9	0.99
0.65	378	1601	1602.21	1602.21	1602.57	0.020287	4.83	78.44	111.6	1.01
0.65	20	1601	1601.38	1601.38	1601.48	0.031741	2.5	8.01	42.23	1.01
0.65	40	1601	1601.5	1601.5	1601.63	0.029054	2.87	13.93	55.68	1.01
0.65	60	1601	1601.59	1601.59	1601.74	0.025981	3.05	19.68	66.19	0.99
0.65	80	1601	1601.67	1601.67	1601.83	0.024959	3.23	24.79	74.29	0.98
0.65	100	1601	1601.72	1601.72	1601.91	0.025926	3.46	28.9	80.2	1.02
0.65	150	1601	1601.86	1601.86	1602.07	0.023113	3.67	40.89	95.4	0.99
0.65	200	1601	1601.96	1601.96	1602.2	0.022644	3.91	51.13	106.68	1
0.65	250	1601	1602.04	1602.04	1602.31	0.022519	4.2	59.56	112.11	1.01
0.65	350	1601	1602.18	1602.18	1602.51	0.020173	4.65	75.64	115.36	1
0.65	360	1601	1602.19	1602.19	1602.53	0.019679	4.66	77.56	115.74	0.99
0.64	366	1594.3	1596.78	1596.78	1597.65	0.014852	7.57	50.34	29.87	1
0.64	378	1594.3	1596.83	1596.83	1597.71	0.014556	7.62	51.69	29.78	0.99
0.64	20	1594.3	1594.97	1594.97	1595.13	0.025749	3.27	6.12	18.29	1
0.64	40	1594.3	1595.17	1595.17	1595.42	0.022659	4.02	9.98	20.16	1
0.64	60	1594.3	1595.33	1595.33	1595.65	0.020927	4.55	13.26	21.11	1
0.64	80	1594.3	1595.47	1595.47	1595.85	0.019444	4.93	16.37	21.98	0.99

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: Impo rted Pla Reach: 1 1/14/97

Hydraulic Reaches = 1
River Sta tions = 27
Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.64	100	1594.3	1595.6	1595.6	1596.03	0.018325	5.24	19.33	22.78	0.99
0.64	150	1594.3	1595.88	1595.88	1596.42	0.017347	5.93	25.8	24.43	1
0.64	200	1594.3	1596.12	1596.12	1596.75	0.016507	6.43	31.9	25.89	1
0.64	250	1594.3	1596.34	1596.34	1597.05	0.015834	6.83	37.73	27.21	1
0.64	350	1594.3	1596.72	1596.72	1597.58	0.015006	7.49	48.61	29.51	1
0.64	360	1594.3	1596.76	1596.76	1597.62	0.014927	7.54	49.67	29.73	1
0.57	366	1585.9	1591.27	1588.08	1591.29	0.000195	1.48	347.75	161.96	0.13
0.57	378	1585.9	1591.29	1588.12	1591.31	0.000203	1.52	351.01	162.14	0.13
0.57	20	1585.9	1590.23	1586.3	1590.23	0.000002	0.12	203.07	97.4	0.01
0.57	40	1585.9	1590.34	1586.5	1590.34	0.000007	0.24	213.48	105.05	0.02
0.57	60	1585.9	1590.51	1586.67	1590.51	0.000013	0.33	232.4	116.52	0.03
0.57	80	1585.9	1590.52	1586.8	1590.52	0.000023	0.44	233.37	117.08	0.04
0.57	100	1585.9	1590.59	1586.94	1590.6	0.000033	0.53	242.53	122.22	0.05
0.57	150	1585.9	1590.76	1587.2	1590.76	0.00006	0.75	267.15	153.43	0.07
0.57	200	1585.9	1590.9	1587.44	1590.91	0.00009	0.94	288.89	155.78	0.09
0.57	250	1585.9	1591.02	1587.66	1591.03	0.000121	1.12	307.99	157.81	0.1
0.57	350	1585.9	1591.24	1588.02	1591.26	0.000184	1.43	342.83	161.45	0.13
0.57	360	1585.9	1591.25	1588.06	1591.28	0.000191	1.46	345.53	161.73	0.13
0.56	366	1590	1590.84	1590.84	1591.17	0.01783	5.03	87.38	137.49	0.97
0.56	378	1590	1590.86	1590.86	1591.2	0.017016	5.01	90.92	139.42	0.95
0.56	20	1590	1590.2	1590.2	1590.23	0.008353	1.33	15.91	87.45	0.52
0.56	40	1590	1590.2	1590.2	1590.31	0.033411	2.65	15.91	87.45	1.05
0.56	60	1590	1590.2	1590.2	1590.44	0.075175	3.98	15.91	87.45	1.57
0.56	80	1590	1590.32	1590.32	1590.47	0.02533	3.18	27.31	97.17	0.99
0.56	100	1590	1590.37	1590.37	1590.54	0.024543	3.43	32	100.9	0.99
0.56	150	1590	1590.48	1590.48	1590.69	0.021626	3.85	43.89	109.79	0.97

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: Impo rted Pla Reach: 1 1/14/97

Hydraulic Reaches = 1
River Sta tions = 27
Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.56	200	1590	1590.58	1590.58	1590.82	0.020351	4.2	54.58	117.21	0.97
0.56	250	1590	1590.67	1590.67	1590.94	0.018505	4.43	65.89	124.57	0.95
0.56	350	1590	1590.81	1590.81	1591.14	0.018207	4.98	84.02	135.55	0.97
0.56	360	1590	1590.83	1590.83	1591.16	0.01739	4.96	87.13	137.35	0.96
0.55	366	1582.5	1585.42	1585.42	1586.28	0.014302	7.5	50.2	29.31	0.98
0.55	378	1582.5	1585.46	1585.46	1586.34	0.014252	7.6	51.21	29.12	0.98
0.55	20	1582.5	1583.38	1583.38	1583.6	0.024254	3.79	5.27	12	1.01
0.55	40	1582.5	1583.67	1583.67	1583.95	0.020953	4.27	9.37	15.99	0.98
0.55	60	1582.5	1583.86	1583.86	1584.21	0.021017	4.73	12.68	18.61	1.01
0.55	80	1582.5	1584.02	1584.02	1584.42	0.019451	5.07	15.8	19.94	1
0.55	100	1582.5	1584.17	1584.17	1584.61	0.018332	5.37	18.68	20.89	0.99
0.55	150	1582.5	1584.45	1584.45	1585.02	0.017573	6.07	24.94	22.81	1
0.55	200	1582.5	1584.72	1584.72	1585.37	0.016256	6.49	31.26	24.6	0.99
0.55	250	1582.5	1584.95	1584.95	1585.67	0.01554	6.86	37.14	26.15	0.99
0.55	350	1582.5	1585.36	1585.36	1586.2	0.014396	7.42	48.49	28.92	0.98
0.55	360	1582.5	1585.39	1585.39	1586.25	0.014575	7.51	49.27	29.1	0.99
0.48	366	1572.7	1577.48	1574.32	1577.53	0.000246	1.88	270.64	100.7	0.15
0.48	378	1572.7	1577.51	1574.36	1577.56	0.000255	1.92	273.51	100.77	0.16
0.48	20	1572.7	1576.24	1572.98	1576.24	0.000003	0.17	149.85	93.84	0.02
0.48	40	1572.7	1576.37	1573.12	1576.37	0.00001	0.31	162.32	94.57	0.03
0.48	60	1572.7	1576.48	1573.23	1576.49	0.000019	0.45	172.84	95.18	0.04
0.48	80	1572.7	1576.58	1573.33	1576.58	0.000031	0.58	182.06	95.72	0.05
0.48	100	1572.7	1576.67	1573.42	1576.68	0.000043	0.69	190.77	96.22	0.06
0.48	150	1572.7	1576.86	1573.63	1576.87	0.000078	0.96	209.27	97.27	0.08
0.48	200	1572.7	1577.03	1573.81	1577.05	0.000116	1.2	225.9	98.21	0.1
0.48	250	1572.7	1577.18	1573.98	1577.21	0.000154	1.42	240.67	99.04	0.12

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: Impo rted Pla Reach: 1 1/14/97

Hydraulic Reaches = 1
River Sta tions = 27
Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.48	350	1572.7	1577.44	1574.28	1577.49	0.000233	1.82	266.9	100.49	0.15
0.48	360	1572.7	1577.47	1574.31	1577.51	0.000241	1.85	269.42	100.63	0.15
0.47	366	1576	1576.96	1576.96	1577.37	0.030217	4.62	70.99	84.55	1.16
0.47	378	1576	1576.98	1576.98	1577.4	0.030006	4.73	72.53	84.4	1.16
0.47	20	1576	1576.14	1576.14	1576.22	0.070605	1.9	8.95	66.22	1.27
0.47	40	1576	1576.23	1576.23	1576.34	0.051139	2.27	15.08	68.46	1.18
0.47	60	1576	1576.3	1576.3	1576.44	0.046316	2.58	19.95	70.19	1.17
0.47	80	1576	1576.36	1576.36	1576.53	0.042477	2.85	24.48	71.58	1.16
0.47	100	1576	1576.41	1576.41	1576.61	0.043162	3.13	27.97	72.64	1.2
0.47	150	1576	1576.55	1576.55	1576.79	0.036998	3.51	37.8	75.52	1.16
0.47	200	1576	1576.65	1576.65	1576.95	0.036059	3.89	45.67	77.76	1.18
0.47	250	1576	1576.75	1576.75	1577.09	0.033956	4.16	53.61	79.95	1.18
0.47	350	1576	1576.93	1576.93	1577.34	0.031024	4.58	68.4	83.88	1.17
0.47	360	1576	1576.94	1576.94	1577.36	0.031134	4.63	69.57	84.18	1.17
0.46	366	1568.2	1571.39	1571.39	1572.37	0.012594	9.1	53.51	27.87	0.98
0.46	378	1568.2	1571.45	1571.45	1572.42	0.012166	9.09	55.24	27.45	0.97
0.46	20	1568.2	1569.04	1569.04	1569.31	0.021642	4.31	4.93	8.94	1
0.46	40	1568.2	1569.39	1569.39	1569.76	0.020037	5.03	8.51	11.5	1.01
0.46	60	1568.2	1569.62	1569.62	1570.09	0.020811	5.69	11.33	13.49	1.05
0.46	80	1568.2	1569.87	1569.87	1570.36	0.015932	5.86	15.5	19.74	0.96
0.46	100	1568.2	1570.09	1570.09	1570.57	0.012909	5.93	20.4	23.31	0.89
0.46	150	1568.2	1570.42	1570.42	1571.01	0.012539	6.73	28.2	24.46	0.91
0.46	200	1568.2	1570.69	1570.69	1571.38	0.012302	7.37	35.05	25.43	0.92
0.46	250	1568.2	1570.92	1570.92	1571.7	0.012388	7.96	41.05	26.25	0.94
0.46	350	1568.2	1571.34	1571.34	1572.28	0.012328	8.9	52.23	27.71	0.97
0.46	360	1568.2	1571.37	1571.37	1572.34	0.012534	9.04	52.97	27.8	0.98

Profile Output Table #NAME? Table 1
HEC-RAS Plan: Imported Pla Reach: 1 1/14/97

Hydraulic Reaches = 1
River Stations = 27
Plans = 1
Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.42	366	1563.7	1568.08	1565.83	1568.16	0.000547	2.6	215.41	95.45	0.22
0.42	378	1563.7	1568.09	1565.87	1568.17	0.000577	2.68	216.12	95.17	0.23
0.42	20	1563.7	1566.52	1564.12	1566.52	0.000012	0.28	90.65	52.5	0.03
0.42	40	1563.7	1566.74	1564.3	1566.74	0.000035	0.51	102.83	59.47	0.05
0.42	60	1563.7	1566.9	1564.45	1566.91	0.000066	0.73	113.93	76.12	0.07
0.42	80	1563.7	1567.04	1564.57	1567.05	0.000096	0.9	124.46	78.46	0.09
0.42	100	1563.7	1567.16	1564.69	1567.17	0.000127	1.07	133.7	80.46	0.1
0.42	150	1563.7	1567.4	1564.97	1567.42	0.000208	1.43	153.53	84.6	0.13
0.42	200	1563.7	1567.6	1565.21	1567.64	0.000285	1.74	171.22	88.12	0.16
0.42	250	1563.7	1567.77	1565.42	1567.82	0.000363	2.02	186.56	91.07	0.18
0.42	350	1563.7	1568.04	1565.78	1568.11	0.000523	2.53	211.75	95.23	0.22
0.42	360	1563.7	1568.07	1565.82	1568.14	0.000538	2.58	214.03	95.37	0.22
0.41	366	1566	1567.54	1567.54	1567.99	0.028317	5.91	79.3	104.17	0.95
0.41	378	1566	1567.59	1567.59	1568.01	0.025344	5.74	84.2	100.72	0.9
0.41	20	1566	1566.35	1566.35	1566.48	0.05067	2.97	7.27	28.61	0.99
0.41	40	1566	1566.51	1566.51	1566.69	0.04669	3.52	12.45	35.82	1
0.41	60	1566	1566.64	1566.64	1566.84	0.042991	3.82	17.35	41.5	0.99
0.41	80	1566	1566.73	1566.73	1566.97	0.042914	4.12	21.52	45.79	1.01
0.41	100	1566	1566.82	1566.82	1567.08	0.042098	4.34	25.63	49.65	1.02
0.41	150	1566	1566.99	1566.99	1567.31	0.041301	4.79	35.03	57.52	1.04
0.41	200	1566	1567.14	1567.14	1567.51	0.037485	5.19	44.21	69.67	1.02
0.41	250	1566	1567.27	1567.27	1567.67	0.034023	5.48	54.27	81.07	1
0.41	350	1566	1567.51	1567.51	1567.95	0.028601	5.84	76.14	101.54	0.95
0.41	360	1566	1567.53	1567.53	1567.97	0.028391	5.88	78.15	103.22	0.95
0.4	366	1562.2	1564.24	1564.19	1564.82	0.019829	6.63	72.12	72.89	0.85

Profile Out put Table #NAME? Table 1
HEC-RAS Plan: Impo rted Pla Reach: 1 1/14/97

Hydraulic Reaches = 1
River Sta tions = 27
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Profiles = 12

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #
0.4	378	1562.2	1564.27	1564.28	1564.86	0.019646	6.67	74.51	73.62	0.85
0.4	20	1562.2	1562.73	1562.63	1562.8	0.018248	2.14	9.63	27.25	0.62
0.4	40	1562.2	1562.9	1562.79	1563.03	0.019818	2.89	14.44	28.34	0.69
0.4	60	1562.2	1563.06	1562.92	1563.22	0.018966	3.34	18.9	29.32	0.71
0.4	80	1562.2	1563.21	1563.03	1563.41	0.016775	3.6	23.61	30.59	0.69
0.4	100	1562.2	1563.33	1563.13	1563.56	0.016975	3.94	27.28	33.49	0.71
0.4	150	1562.2	1563.56	1563.38	1563.88	0.01821	4.7	35.54	39.23	0.76
0.4	200	1562.2	1563.76	1563.6	1564.15	0.018523	5.25	43.85	44.26	0.78
0.4	250	1562.2	1563.94	1563.79	1564.38	0.018413	5.68	52.61	54.42	0.8
0.4	350	1562.2	1564.21	1564.16	1564.77	0.019405	6.49	69.98	72.23	0.84
0.4	360	1562.2	1564.23	1564.18	1564.8	0.019722	6.58	71.24	72.62	0.85
0.36	366	1557.9	1560.19	1560.19	1561.01	0.024155	7.58	54.66	37.52	0.95
0.36	378	1557.9	1560.23	1560.23	1561.07	0.023983	7.65	56.15	37.94	0.95
0.36	20	1557.9	1558.49	1558.44	1558.62	0.031923	2.89	7.02	19.29	0.83
0.36	40	1557.9	1558.72	1558.66	1558.9	0.028588	3.45	11.88	23.19	0.83
0.36	60	1557.9	1558.86	1558.82	1559.11	0.030292	4.04	15.32	24.92	0.88
0.36	80	1557.9	1558.94	1558.93	1559.29	0.035584	4.75	17.45	25.4	0.98
0.36	100	1557.9	1559.05	1559.05	1559.45	0.03497	5.16	20.21	26	0.99
0.36	150	1557.9	1559.31	1559.31	1559.82	0.031144	5.83	27.22	27.48	0.98
0.36	200	1557.9	1559.54	1559.54	1560.15	0.029267	6.4	33.52	28.74	0.98
0.36	250	1557.9	1559.74	1559.74	1560.44	0.028287	6.89	39.31	30.23	0.98
0.36	350	1557.9	1560.13	1560.13	1560.94	0.024875	7.52	52.28	36.49	0.96
0.36	360	1557.9	1560.17	1560.17	1560.99	0.024325	7.55	53.84	37.17	0.95
0.27	366	1545.7	1549.39	1549.09	1550.1	0.015076	7.49	61.7	30.61	0.78
0.27	378	1545.7	1549.43	1549.13	1550.16	0.015258	7.61	62.91	30.84	0.79
0.27	20	1545.7	1547	1546.79	1547.14	0.017127	2.98	6.72	10.34	0.65

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0.27	40	1545.7	1547.36	1547.14	1547.56	0.017769	3.61	11.61	18.83	0.69
0.27	60	1545.7	1547.59	1547.43	1547.84	0.0171	4.11	15.98	20.17	0.7
0.27	80	1545.7	1547.79	1547.6	1548.08	0.015729	4.44	20.25	21.36	0.7
0.27	100	1545.7	1547.96	1547.75	1548.28	0.015471	4.78	23.9	22.33	0.71
0.27	150	1545.7	1548.35	1548.07	1548.74	0.01404	5.35	33.08	24.6	0.7
0.27	200	1545.7	1548.66	1548.34	1549.13	0.013723	5.88	41.05	26.41	0.71
0.27	250	1545.7	1548.92	1548.59	1549.46	0.013983	6.4	47.95	27.89	0.73
0.27	350	1545.7	1549.31	1549.02	1550.02	0.015224	7.4	59.48	30.19	0.78
0.27	360	1545.7	1549.35	1549.06	1550.07	0.015225	7.47	60.73	30.43	0.78
0.19	366	1538.6	1540.74	1540.74	1541.58	0.026975	7.63	52.87	33.15	0.99
0.19	378	1538.6	1540.78	1540.78	1541.64	0.02661	7.69	54.26	33.36	0.99
0.19	20	1538.6	1539.26	1539.17	1539.34	0.01983	2.22	9.24	25.98	0.65
0.19	40	1538.6	1539.46	1539.33	1539.58	0.019337	2.9	14.28	26.9	0.69
0.19	60	1538.6	1539.59	1539.47	1539.77	0.021147	3.5	17.88	27.55	0.74
0.19	80	1538.6	1539.69	1539.59	1539.93	0.02365	4.06	20.68	28.04	0.81
0.19	100	1538.6	1539.79	1539.7	1540.09	0.02461	4.48	23.52	28.53	0.84
0.19	150	1538.6	1539.98	1539.93	1540.43	0.028131	5.47	29.18	29.48	0.93
0.19	200	1538.6	1540.16	1540.14	1540.73	0.029671	6.22	34.51	30.34	0.98
0.19	250	1538.6	1540.34	1540.34	1541.01	0.029227	6.75	40.09	31.22	0.99
0.19	350	1538.6	1540.7	1540.7	1541.51	0.026845	7.49	51.41	32.94	0.99
0.19	360	1538.6	1540.72	1540.72	1541.56	0.026972	7.58	52.3	33.07	0.99
0.18	366	1537.2	1539.55	1539.55	1540.3	0.028302	7.36	55.92	38.53	1
0.18	378	1537.2	1539.58	1539.58	1540.35	0.02811	7.43	57.26	38.78	1
0.18	20	1537.2	1537.99	1537.99	1538.17	0.050017	3.51	5.97	16.28	1.03
0.18	40	1537.2	1538.23	1538.23	1538.43	0.052604	3.62	11.23	29.34	1.06
0.18	60	1537.2	1538.35	1538.35	1538.61	0.047594	4.18	14.86	30.2	1.05

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0.18	80	1537.2	1538.47	1538.47	1538.77	0.042436	4.55	18.42	31.01	1.03
0.18	100	1537.2	1538.57	1538.57	1538.92	0.040347	4.91	21.52	31.7	1.03
0.18	150	1537.2	1538.79	1538.79	1539.24	0.035864	5.58	28.9	33.28	1.02
0.18	200	1537.2	1538.98	1538.98	1539.53	0.034262	6.17	35.29	34.6	1.03
0.18	250	1537.2	1539.17	1539.17	1539.78	0.031639	6.57	41.88	35.9	1.01
0.18	350	1537.2	1539.5	1539.5	1540.24	0.028568	7.25	54.1	38.2	1
0.18	360	1537.2	1539.53	1539.53	1540.28	0.028405	7.32	55.23	38.41	1
0.17	431	1533.2	1536.59	1536.59	1537.91	0.02109	10.15	54.79	22.5	0.97
0.17	448	1533.2	1536.71	1536.71	1538	0.019954	10.1	57.4	22.42	0.95
0.17	20	1533.2	1533.85	1533.7	1533.98	0.016773	3	7.12	12.22	0.66
0.17	40	1533.2	1534.12	1533.98	1534.37	0.019547	4.11	10.66	13.26	0.75
0.17	60	1533.2	1534.33	1534.22	1534.69	0.021691	4.95	13.49	14.04	0.82
0.17	80	1533.2	1534.51	1534.41	1534.96	0.023232	5.64	16.01	14.69	0.87
0.17	100	1533.2	1534.7	1534.59	1535.22	0.022088	6.04	18.98	15.43	0.87
0.17	150	1533.2	1534.99	1534.99	1535.76	0.026536	7.44	23.6	16.51	0.98
0.17	200	1533.2	1535.35	1535.35	1536.24	0.024554	8.08	29.7	17.84	0.97
0.17	250	1533.2	1535.65	1535.65	1536.66	0.023665	8.66	35.31	18.98	0.97
0.17	350	1533.2	1536.2	1536.2	1537.39	0.022008	9.56	46.28	21.04	0.97
0.17	360	1533.2	1536.25	1536.25	1537.46	0.021823	9.63	47.39	21.23	0.97
0.16	431	1532.3	1534.51	1534.51	1535.48	0.02536	8.18	58.33	31.89	0.99
0.16	448	1532.3	1534.59	1534.59	1535.55	0.024074	8.16	60.83	31.72	0.97
0.16	20	1532.3	1532.73	1532.66	1532.82	0.023273	2.4	8.51	24.26	0.7
0.16	40	1532.3	1532.91	1532.82	1533.07	0.024294	3.2	12.88	25.02	0.77
0.16	60	1532.3	1533.05	1532.97	1533.27	0.025332	3.8	16.37	25.62	0.81
0.16	80	1532.3	1533.16	1533.09	1533.44	0.026602	4.32	19.31	26.1	0.86
0.16	100	1532.3	1533.22	1533.2	1533.6	0.033382	5.05	20.7	26.33	0.97

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0.16	150	1532.3	1533.46	1533.46	1533.97	0.03149	5.81	27.28	27.39	0.98
0.16	200	1532.3	1533.67	1533.67	1534.29	0.030966	6.47	33	28.27	1
0.16	250	1532.3	1533.88	1533.88	1534.58	0.028808	6.9	39.04	29.18	0.99
0.16	350	1532.3	1534.24	1534.24	1535.1	0.02671	7.67	49.92	30.74	0.99
0.16	360	1532.3	1534.28	1534.28	1535.15	0.026057	7.7	51.28	30.93	0.98
0.07	431	1519	1525.12	1521.65	1525.23	0.000893	3.04	193.09	44.43	0.22
0.07	448	1519	1525.13	1521.71	1525.25	0.000944	3.13	192.3	41.23	0.22
0.07	20	1519	1519.42	1519.42	1519.62	0.046217	3.61	5.62	14.33	1
0.07	40	1519	1519.66	1519.66	1519.96	0.039609	4.43	9.22	15.49	1
0.07	60	1519	1519.86	1519.86	1520.24	0.036923	5.01	12.31	16.42	1
0.07	80	1519	1520.03	1520.03	1520.48	0.034601	5.43	15.21	18.42	1
0.07	100	1519	1520.23	1520.23	1520.68	0.027414	5.51	19.77	26.43	0.92
0.07	150	1519	1520.96	1520.54	1521.23	0.00929	4.48	40.08	29.12	0.58
0.07	200	1519	1521.99	1520.79	1522.15	0.003072	3.46	72.22	32.93	0.36
0.07	250	1519	1523.08	1521	1523.19	0.001438	2.93	110.26	36.94	0.26
0.07	350	1519	1524.67	1521.38	1524.75	0.000793	2.72	173.37	42.77	0.2
0.07	360	1519	1524.73	1521.41	1524.82	0.000805	2.76	175.97	42.99	0.21
0.06	440	1516.2	1525.09	1520.42	1525.16	0.000422	2.73	272.23	55.61	0.96
0.06	447	1516.2	1525.09	1520.46	1525.18	0.000557	3.13	225.52	36.88	1.01
0.06	20	1516.2	1517.7	1516.76	1517.74	0.001403	1.5	13.3	15.52	0.65
0.06	40	1516.2	1518.34	1517.07	1518.41	0.001695	2.1	19.04	18.32	0.68
0.06	60	1516.2	1518.85	1517.34	1518.95	0.001855	2.54	23.64	20.55	0.75
0.06	80	1516.2	1519.3	1517.57	1519.43	0.001947	2.89	27.69	22.53	0.83
0.06	100	1516.2	1519.72	1517.78	1519.87	0.001992	3.18	31.44	24.35	0.85
0.06	150	1516.2	1520.69	1518.28	1520.91	0.001968	3.73	40.24	29.66	0.94
0.06	200	1516.2	1521.67	1518.7	1521.93	0.001807	4.08	49.07	35.4	0.99

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0.06	250	1516.2	1522.73	1519.1	1523.02	0.001562	4.27	58.6	41.7	1
0.06	350	1516.2	1524.65	1519.83	1524.7	0.000338	2.35	247.97	53.03	0.96
0.06	360	1516.2	1524.71	1519.9	1524.76	0.000346	2.39	251.17	53.38	0.96
4.49999 Culvert										
0.03	466	1512.2	1514.69	1514.69	1515.6	0.024379	7.81	64.5	39.1	0.96
0.03	483	1512.2	1514.73	1514.73	1515.79	0.030937	8.28	58.36	27.8	1.01
0.03	20	1512.2	1512.83	1512.72	1512.92	0.019354	2.38	8.43	20.69	0.65
0.03	40	1512.2	1513.06	1512.92	1513.2	0.018515	2.97	13.56	23.16	0.68
0.03	60	1512.2	1513.21	1513.07	1513.4	0.021347	3.55	17	24.69	0.75
0.03	80	1512.2	1513.31	1513.2	1513.57	0.025154	4.12	19.58	25.77	0.83
0.03	100	1512.2	1513.43	1513.33	1513.73	0.025864	4.46	22.62	26.99	0.85
0.03	150	1512.2	1513.63	1513.59	1514.07	0.029876	5.34	28.4	29.13	0.94
0.03	200	1512.2	1513.8	1513.8	1514.37	0.031334	6.07	33.5	30.73	0.99
0.03	250	1512.2	1513.98	1513.98	1514.64	0.030254	6.56	39.15	32.42	1
0.03	350	1512.2	1514.34	1514.34	1515.12	0.026147	7.15	51.56	35.84	0.96
0.03	360	1512.2	1514.38	1514.38	1515.17	0.025879	7.21	52.76	36.16	0.96
0	466	1507.2	1510.13	1510.13	1510.47	0.018876	6.65	136.48	169.71	0.82
0	483	1507.2	1510.16	1510.16	1510.5	0.018574	6.66	140.76	168.77	0.82
0	20	1507.2	1508.38	1508.3	1508.59	0.030014	3.68	5.46	10.12	0.85
0	40	1507.2	1508.7	1508.67	1508.99	0.030021	4.35	9.87	16.92	0.88
0	60	1507.2	1508.95	1508.95	1509.24	0.024628	4.55	16.43	37.22	0.83
0	80	1507.2	1509.13	1509.13	1509.4	0.021039	4.59	24.51	52.34	0.78
0	100	1507.2	1509.24	1509.24	1509.53	0.020888	4.81	31.15	63.07	0.79
0	150	1507.2	1509.47	1509.47	1509.76	0.018995	5.14	49.32	95.77	0.77
0	200	1507.2	1509.67	1509.67	1509.94	0.017013	5.3	70.24	121.36	0.75

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0	250	1507.2	1509.78	1509.78	1510.06	0.017179	5.59	84.51	129.24	0.76
0	350	1507.2	1509.93	1509.93	1510.26	0.019866	6.36	104.25	140.51	0.83
0	360	1507.2	1509.94	1509.94	1510.28	0.019783	6.38	106.8	143.52	0.83

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 14 Feb 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 56

Location to nearest Quarter Section: SW 1/4 of Section 22

Roadway Name: Frisco Drive (N. of Kingsrtree Blvd.)

Roadway Classification: Local

Wash Name (if applicable): Kingstree Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ___

Ponding X

Culvert Size: 36" x 100 CMP

Culvert Description: Corrugated metal pipe - inlet obscured by heavy brush - 3' scour hole @ outlet

Future Condition 100-year Discharge: 118 cfs (HEC-1 operation KG70JA)(6 hr)

Maximum Depth of Flow: 1.0'

Duration of Impassable Flow: 1 hr

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

Comments: Estimated passable Q = 10 cfs

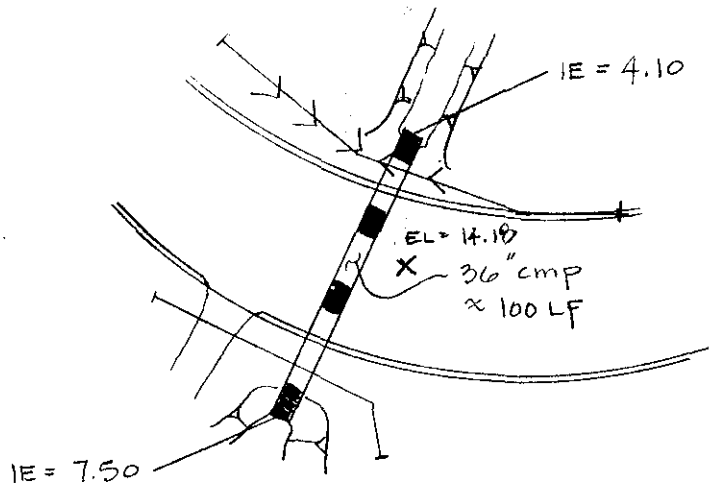
PROJECT:
F. Hills ADMP

PROJECT No.: 12 04 01 DATE: 12 Feb 97

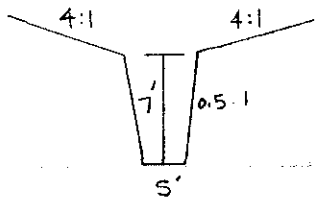
PAGE: 1 of SCALE: -

EAPFL 56

Kingstree Wash crossing at Frisco Drive



TAILWATER SECTION



CULVERT OVERTOPPING

PT#	STA	ELEV
1	10+00	15.86
2	10+15	14.72
3	10+15.5	14.50
4	10+25.5	14.37
5	10+26	14.84
6	10+46	14.71
7	10+65	15.75

ROAD OVERFLOW

PT#	STA	ELEV
1	10+00	16.30
2	10+42	15.91
3	10+43.5	15.41
4	10+50.5	15.34
5	10+51	15.84
6	10+81	15.74
7	11+14	15.70
8	12+24	17.12

DESIGNED BY: CHECKED BY:

CURRENT DATE: 02-14-1997 FILE DATE: 02-14-1997
CURRENT TIME: 08:18:38 FILE NAME: EAPFL ~~36~~ 56

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	7.50	4.10	100.06	1 CSP	3.00	3.00	.024	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (cfs) FILE: EAPFL_36 DATE: 02-14-1997

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
7.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
9.08	12.0	12.0	0.0	0.0	0.0	0.0	0.0	0.00	1
9.85	24.0	24.0	0.0	0.0	0.0	0.0	0.0	0.00	1
10.63	36.0	36.0	0.0	0.0	0.0	0.0	0.0	0.00	1
11.65	48.0	48.0	0.0	0.0	0.0	0.0	0.0	0.00	1
12.98	60.0	60.0	0.0	0.0	0.0	0.0	0.0	0.00	1
14.47	72.0	71.3	0.0	0.0	0.0	0.0	0.0	0.29	13
14.78	84.0	73.4	0.0	0.0	0.0	0.0	0.0	10.02	7
14.92	96.0	74.5	0.0	0.0	0.0	0.0	0.0	20.86	5
15.04	108.0	75.3	0.0	0.0	0.0	0.0	0.0	32.28	5
15.13	120.0	75.9	0.0	0.0	0.0	0.0	0.0	43.21	4
14.37	70.6	70.6	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: EAPFL_36 DATE: 02-14-1997

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
7.50	0.000	0.00	0.00	0.00
9.08	0.000	12.00	0.00	0.00
9.85	0.000	24.00	0.00	0.00
10.63	0.000	36.00	0.00	0.00
11.65	0.000	48.00	0.00	0.00
12.98	0.000	60.00	0.00	0.00
14.47	-0.007	72.00	0.44	0.61
14.78	-0.008	84.00	0.57	0.68
14.92	-0.009	96.00	0.66	0.69
15.04	-0.006	108.00	0.45	0.42
15.13	-0.004	120.00	0.88	0.73

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

****

CURRENT DATE: 02-14-1997 FILE DATE: 02-14-1997
CURRENT TIME: 08:18:38 FILE NAME: EAPFL 36

****

PERFORMANCE CURVE FOR CULVERT 1 - 1(3.00 (ft) BY 3.00 (ft)) CSP

****

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	7.50	0.00	-3.40	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
12.00	9.08	1.58	-1.17	1-S2n	0.86	1.09	0.79	0.33	8.00	7.02
24.00	9.85	2.35	-0.37	1-S2n	1.24	1.57	1.17	0.51	9.36	9.02
36.00	10.63	3.13	0.74	1-S2n	1.57	1.94	1.44	0.65	10.69	10.40
48.00	11.65	4.15	2.20	1-S2n	1.89	2.25	1.89	0.78	10.24	11.47
60.00	12.98	5.48	3.99	5-S2n	2.23	2.49	2.23	0.89	10.69	12.36
71.27	14.47	6.97	4.00	2-M2c	3.00	2.67	2.67	1.00	10.75	13.11
73.41	14.77	7.27	5.75	2-M2c	3.00	2.70	2.70	1.10	10.95	13.78
74.48	14.92	7.42	6.07	2-M2c	3.00	2.72	2.72	1.19	11.05	14.37
75.27	15.04	7.54	6.27	2-M2c	3.00	2.73	2.73	1.28	11.13	14.91
75.91	15.13	7.63	6.43	2-M2c	3.00	2.74	2.74	1.37	11.18	15.40

****

El. inlet face invert 7.50 ft El. outlet invert 4.10 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	7.50 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4.10 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0340
CULVERT LENGTH ALONG SLOPE	100.06 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	3.00 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	MITERED TO CONFORM TO SLOPE
INLET DEPRESSION	NONE

****

CURRENT DATE: 02-14-1997 FILE DATE: 02-14-1997
CURRENT TIME: 08:18:38 FILE NAME: EAPFL_36

****
********** TAILWATER **********
****

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH	5.00 ft
SIDE SLOPE H/V (X:1)	0.5
CHANNEL SLOPE V/H (ft/ft)	0.180
MANNING'S n (.01-0.1)	0.040
CHANNEL INVERT ELEVATION	4.10 ft
CULVERT NO.1 OUTLET INVERT ELEVATION	4.10 ft

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4.10	0.000	0.00	0.00	0.00
12.00	4.43	2.152	0.33	7.02	3.72
24.00	4.61	2.235	0.51	9.02	5.69
36.00	4.75	2.272	0.65	10.40	7.30
48.00	4.88	2.294	0.78	11.47	8.72
60.00	4.99	2.306	0.89	12.36	10.02
72.00	5.10	2.313	1.00	13.11	11.21
84.00	5.20	2.317	1.10	13.78	12.34
96.00	5.29	2.319	1.19	14.37	13.40
108.00	5.38	2.319	1.28	14.91	14.42
120.00	5.47	2.319	1.37	15.40	15.39

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	GRAVEL
EMBANKMENT TOP WIDTH	60.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	1000.00	15.86
2	1015.00	14.72
3	1015.50	14.50
4	1025.50	14.37
5	1026.00	14.84
6	1046.00	14.41
7	1065.00	15.75

****

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County — Date: 15 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 — By: MCG

Subject: Emergency Access Plan — Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 67 (ADMP 23)

Location to nearest Quarter Section: SW 1/4 of Section 23

Roadway Name: Kingstree Blvd and Inca Ave.

Roadway Classification: Collector

Wash Name (if applicable): Kingstree Wash

EAPFL Type and Description

Type of Flooding: Cross Street ____ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ____

Culvert Size: N/A

Culvert Description: Kingstree Blvd. becomes Kingstree Wash just upstream of the intersection w/ Inca Ave.

Future Condition 100-year Discharge: 3608 cfs (HEC-1 operation RATS)(6-hr)

Maximum Depth of Flow: 1.4'

Duration of Impassable Flow: 5 hrs

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ____ *

High ____ *

Comments: [illegible] = 20 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 15 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 68 (ALTP 33)

Location to nearest Quarter Section: SW 1/4 of Section 23

Roadway Name: Kingstree Blvd & Royal Court

Roadway Classification: Collector

Wash Name (if applicable): Kingstree Wash

EAPFL Type and Description

Type of Flooding: Cross Street ____ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ____

Culvert Size: N/A

~~Culvert~~ Description: Kingstree Blvd becomes Kingstree Wash just upstream of the intersection w/ Inca Ave

Future Condition 100-year Discharge: 368 cfs (HEC-1 operation KGT5)/6-hr

Maximum Depth of Flow: 1.5'

Duration of Impassable Flow: 1.5 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ____ *

High ____ *

Comments: [illegible] = 20 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 15 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 69 (ADMP 23)

Location to nearest Quarter Section: SW 1/4 of Section 23

Roadway Name: Kimstree Blvd and Teller Dr

Roadway Classification: Collector

Wash Name (if applicable): Kimstree Wash

EAPFL Type and Description

Type of Flooding: Cross Street ___ Is there a culvert? Y or (N)
Longitudinal Flow X
Ponding ___

Culvert Size: N/A

~~Culvert~~ Description: Kimstree Blvd becomes Kimstree Wash just upstream of intersection of Inca Ave

Future Condition 100-year Discharge: 368 cfs (HEC-1 operation KGT5) (6-hr

Maximum Depth of Flow: 1.4'

Duration of Impassable Flow: 1 1/2 hrs

Scour/Wash-out Potential: Low X * *Notes:
Medium ___ *
High ___ *

Comments: [illegible] = 40 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 15 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 70 (ADMP 23)

Location to nearest Quarter Section: SW 1/4 of Section 23

Roadway Name: Kingstree Blvd. and Mangrum Ct.

Roadway Classification: Collector

Wash Name (if applicable): Kingstree Wash

EAPFL Type and Description

Type of Flooding: Cross Street ____ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ____

Culvert Size: N/A

Culvert Description: Kingstree Blvd. becomes Kingstree Wash just upstream of the intersection w/ Inca Ave

Future Condition 100-year Discharge: 496 cfs (HEC-1 operation 2GT6)(6 hr

Maximum Depth of Flow: 1.5'

Duration of Impassable Flow: [illegible]

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ____ *

High ____ *

Comments: [illegible]

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County — Date: 5 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 — By: MCG

Subject: Emergency Access Plan — Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 71 (ADMP 23)

Location to nearest Quarter Section: SW 1/4 of Section 23

Roadway Name: Kingstree Blvd and Regency Place

Roadway Classification: Collector

Wash Name (if applicable): Kingstree Wash

EAPFL Type and Description

Type of Flooding: Cross Street ___ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ___

Culvert Size: N/A

Culvert Description: Kingstree Blvd. becomes Kingstree Wash just upstream of intersection w/ Inca Ave

Future Condition 100-year Discharge: 476 cfs (LEC operation KGTL) (6-hr)

Maximum Depth of Flow: 1.6'

Duration of Impassable Flow: 6 hrs

Scour/Wash-out Potential: Low X * *Notes: ___

Medium ___ *

High ___ *

Comments: [illegible] = 25 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 5 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : [illegible]

Location to nearest Quarter Section: SW 1/4 of Section 23

Roadway Name: Kingstree Blvd and Walsh Dr

Roadway Classification: Collector

Wash Name (if applicable): Kingstree Wash

EAPFL Type and Description

Type of Flooding: Cross Street ____ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ____

Culvert Size: N/A

Culvert Description: Kingstree Blvd becomes Kingstree Wash just upstream of the intersection w/ Inca Ave

Future Condition 100-year Discharge: [illegible] (total [illegible] KCFS) (6-hr

Maximum Depth of Flow: [illegible] 3'

Duration of Impassable Flow: [illegible] hrs

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ____ *

High ____ *

Comments: [illegible] 15 [illegible]

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 15 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 73 (ADMP 23)

Location to nearest Quarter Section: SW 1/4 of Section 23

Roadway Name: Kingstree Wash and Zephyr Dr.

Roadway Classification: Collector

Wash Name (if applicable): Kingstree Wash

EAPFL Type and Description

Type of Flooding: Cross Street ____ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ____

Culvert Size: N/A

Culvert Description: Kingstree Blvd. becomes Kingstree Wash just upstream of intersection w/ Inca Ave.

Future Condition 100-year Discharge: 496 cfs (HEC-1 operation KGT6)(6 hr)

Maximum Depth of Flow: 1.8'

Duration of Impassable Flow: 1 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ____ *

High ____ *

Comments: [illegible]

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 16 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 14 (ADMP 33)

Location to nearest Quarter Section: SW 1/4 of Section 23

Roadway Name: Kingstree Blvd. and Saguaro Blvd.

Roadway Classification: Arterial

Wash Name (if applicable): Kingstree Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Kingstree Blvd. becomes Kingstree Wash just upstream of intersection w/ Inca Ave. Flow crosses Saguaro Blvd and enters Jacklin Wash

Future Condition 100-year Discharge: 496 cfs (HEC-1 operation KGTC) (6-hr)

Maximum Depth of Flow: 1.9'

Duration of Impassable Flow: 1.4 hrs

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ____ *

High ____ *

Comments: [illegible] 25 [illegible]

```
*********************************************
   UNEVEN WEIR FLOW PROGRAM
   FORTRAN VERSION 1.0
*********************************************

   PROJECT:  Fountain Hills ADMP
   ENGINEER:  mcg
   DATE:   1/16/1997
   TIME:   7:45.54

---------------------------------------------
   INPUT PARAMETERS
---------------------------------------------

   STARTING WSEL:        24.25
   MAXIMUM WSEL:         28.00
   STEP SIZE:             0.10
   BREADTH OF WEIR:      90.00

*********************************************
   INPUT ELEVATION/STATION TABLE.
   PROJECT:  Fountain Hills ADMP
   DATE:   1/16/1997
   TIME:   7:45.54
*********************************************
```

POINT	ELEVATION	STATION
1	28.00	950.00
2	26.00	1000.00
3	25.12	1005.00
4	24.62	1005.10
5	24.52	1042.00
6	24.25	1092.00
7	24.75	1092.10
8	28.00	1092.20

****

WEIR COEFFICIENT TABLE

PROJECT: Fountain Hills ADMP

DATE: 1/16/1997

TIME: 7:45.54

****

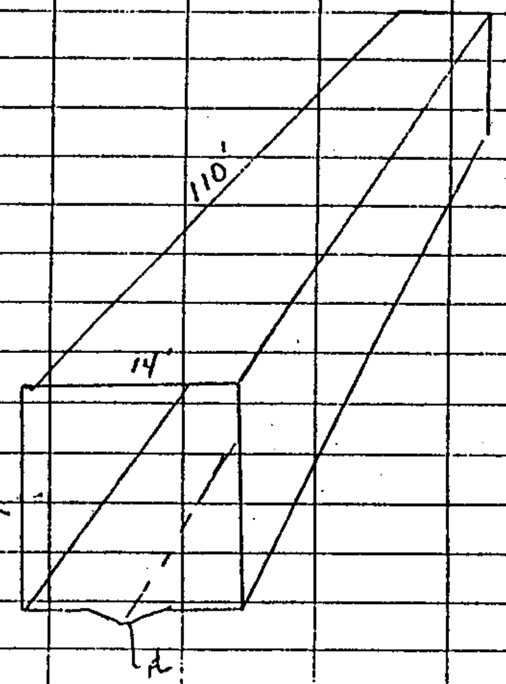
REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT
1	0.00	2.5000
2	0.10	2.5037
3	0.20	2.5074
4	0.30	2.5111
5	0.40	2.5148
6	0.50	2.5185
7	0.60	2.5222
8	0.70	2.5259
9	0.80	2.5296
10	0.90	2.5333
11	1.00	2.5370
12	1.10	2.5407
13	1.20	2.5444
14	1.30	2.5481
15	1.40	2.5519
16	1.50	2.5556
17	1.60	2.5593
18	1.70	2.5630
19	1.80	2.5667
20	1.90	2.5704
21	2.00	2.5741
22	2.10	2.5778
23	2.20	2.5815
24	2.30	2.5852
25	2.40	2.5889
26	2.50	2.5926
27	2.60	2.5963
28	2.70	2.6000
29	2.80	2.6037
30	2.90	2.6074
31	3.00	2.6111
32	3.10	2.6148
33	3.20	2.6185
34	3.30	2.6222
35	3.40	2.6259
36	3.50	2.6296
37	3.60	2.6333
38	3.70	2.6370

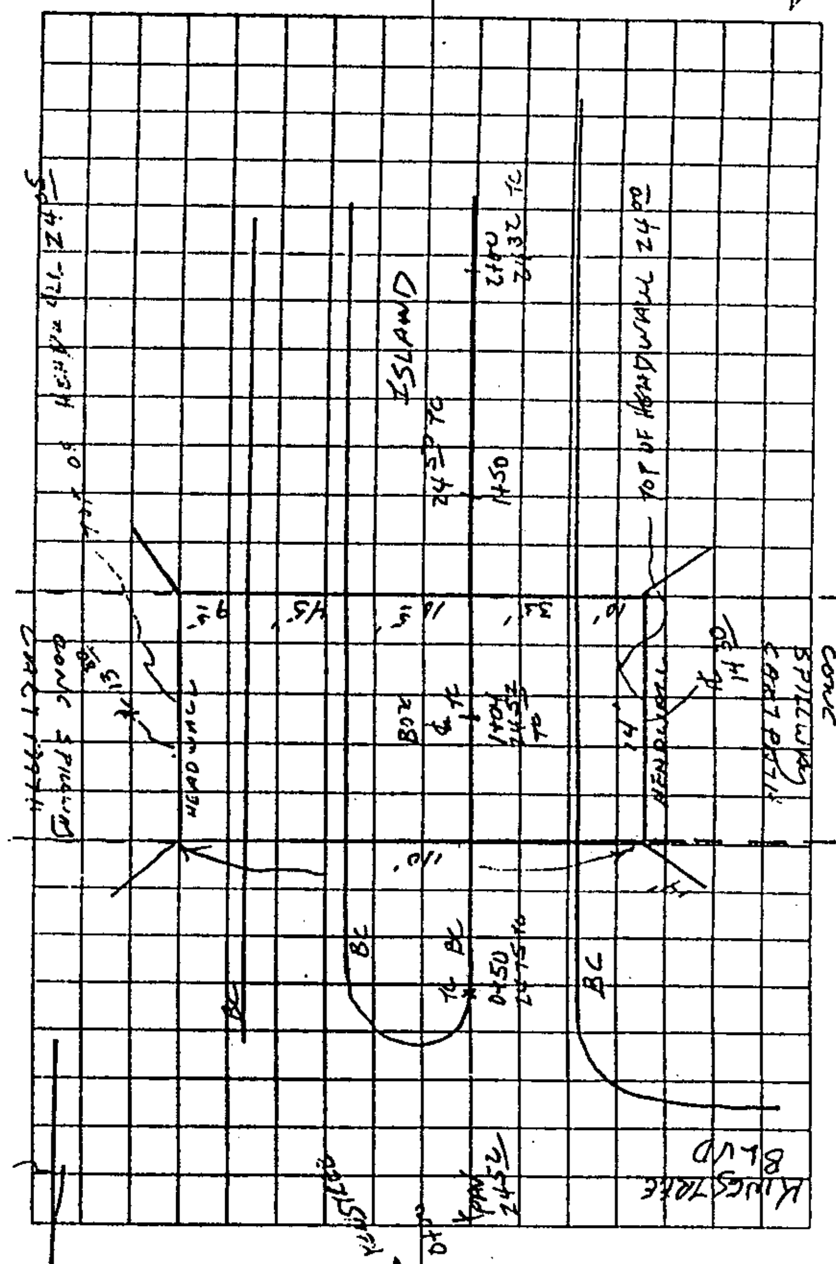
```
*******************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  Fountain Hills ADMP
    DATE:   1/16/1997
    TIME:   7:45.54
*******************************************
```

ELEVATION	DISCHARGE (CFS)
24.25	0.00
24.35	0.59
24.45	3.32
24.55	9.19
24.65	19.89
24.75	35.36
24.85	54.17
24.95	75.78
25.05	99.88
25.15	126.23
25.25	154.72
25.35	185.24
25.45	217.73
25.55	252.12
25.65	288.35
25.75	326.37
25.85	366.14
25.95	407.64
26.05	450.84
26.15	495.84
26.25	542.77
26.35	591.68
26.45	642.62
26.55	695.64
26.65	750.77
26.75	808.05
26.85	867.51
26.95	929.19
27.05	993.11
27.15	1059.31
27.25	1127.82
27.35	1198.66
27.45	1271.87
27.55	1347.47
27.65	1425.49
27.75	1505.95
27.85	1588.89
27.95	1674.33

103



CONC BOX CULVERT SAGUARO BLVD AND KINGSTREE



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 16 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 75

Location to nearest Quarter Section: SW 1/4 of Section 23

Roadway Name: Jacklin Dr. (N. of Indian Wells Dr.)

Roadway Classification: Local

Wash Name (if applicable): Jacklin Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped road crossing

Future Condition 100-year Discharge: 369 cfs (HEC-1 operation JLK 7)(6-hr)

Maximum Depth of Flow: 1.8'

Duration of Impassable Flow: 3.0 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

Comments: [illegible]

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: _____

Project: Fountain Hills ADMP, FCD 94-16 By: _____

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 76

Location to nearest Quarter Section: SE 1/4 of Section 23

Roadway Name: Indian Wells Dr (E of Saguaro Blvd.)

Roadway Classification: Local

Wash Name (if applicable): Jacklin Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: 2 - 60" x 72' cmp's

Culvert Description: _____

Future Condition 100-year Discharge: 1021 cfs (HEC-1 operation JKL10)(6 hr

Maximum Depth of Flow: 2.2'

Duration of Impassable Flow: 0.7 hrs

Scour/Wash-out Potential: Low X * *Notes: _____

Medium ____ *

High ____ *

Comments: Estimated [illegible] Q = 415 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County — Date: 16 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 — By: MCG

Subject: Emergency Access Plan — Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 77

Location to nearest Quarter Section: NW 1/4 of Section 26

Roadway Name: Nicklaus Dr (S. of Indian Wells Dr.)

Roadway Classification: Local

Wash Name (if applicable): Cyprus Point Wash

EAPFL Type and Description

Type of Flooding: Cross Street X — Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped road crossing — flow moves longitudinally for short distance

Future Condition 100-year Discharge: 113 cfs (HEC-1 operation CP1)(6-hr)

Maximum Depth of Flow: 2.31'

Duration of Impassable Flow: 2.2 hr

Scour/Wash-out Potential: Low X * — *Notes:

Medium ____ *

High ____ *

Comments: [illegible]

George V. Sabol Consulting Engineers, Inc.

SHEET _____ OF _____

CLIENT FCD MC

DATE _____

PROJECT E. HILLS ADMP

BY _____

SUBJECT CAPEL 77

PROJECT NO. _____

Geometry and mannings estimate for normal depth cross section for overflow crossing

Station	Description	Elevation	n
10+00	n/g (private drive)	1608	0.025
10+14	"	1606	"
10+16	EOP of Nicklaus Dr.	1605.8	"
10+35	℄ of Nicklaus Dr.	1605.6	"
10+54	EOP of Nicklaus Dr.	1605.6	"
10+62	n/g (private drive)	1606	"
10+82	" " "	1608	"

slope = 0.031'/'

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County — Date: 16 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 — By: MCG

Subject: Emergency Access Plan — Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 18

Location to nearest Quarter Section: NW 1/4 of Section 36

Roadway Name: Lomaraz Dr (S. of Nicklaus Dr)

Roadway Classification: Local

Wash Name (if applicable): Cyprus Point Wash

EAPFL Type and Description

Type of Flooding: Cross Street X — Is there a culvert? Y or (N)

Longitudinal Flow ___

Ponding ___

Culvert Size: N/A

~~Culvert~~ Description: Dipped road crossing

Future Condition 100-year Discharge: 208 cfs (HEC-1 operation CP2)(6 hr

Maximum Depth of Flow: 2.0'

Duration of Impassable Flow: 1.5 hrs

Scour/Wash-out Potential: Low ___ * — *Notes:

Medium Y *

High ___ *

Comments: [illegible]

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 16 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 79

Location to nearest Quarter Section: NW 1/4 of Section 26

Roadway Name: Nicklaus Dr (E. of Demaret Dr)

Roadway Classification: Local

Wash Name (if applicable): Cyprus Point Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped road crossing

Future Condition 100-year Discharge: 315 cfs (local operation cos) (6 hr)

Maximum Depth of Flow: 1.75'

Duration of Impassable Flow: 1.8 hrs

Scour/Wash-out Potential: Low ____ * *Notes: ____

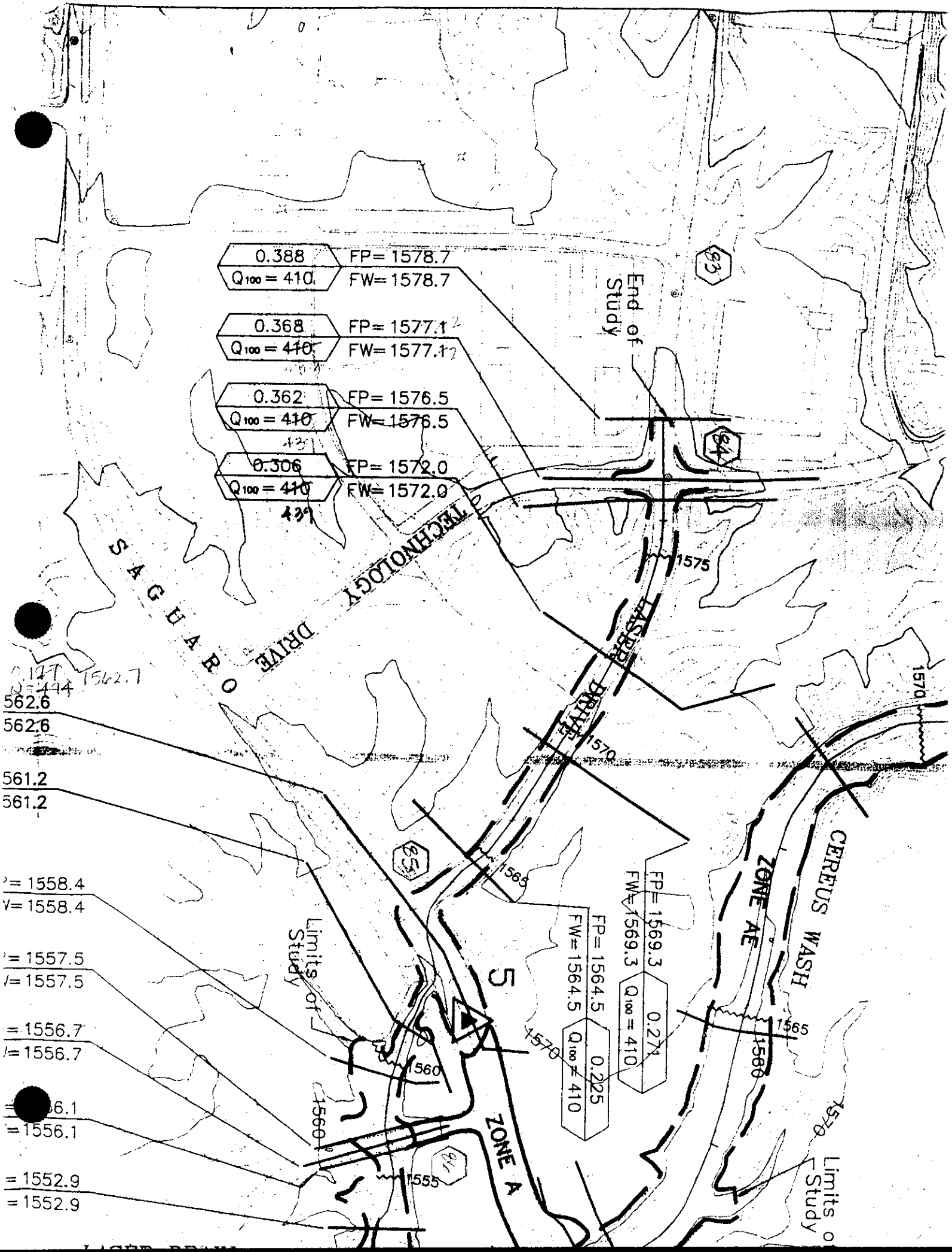
Medium X *

High ____ *

Comments: [illegible]

• [illegible] field [illegible] at wash

[illegible]


0.388
Q100 = 410
FP= 1578.7
FW= 1578.7
0.368
Q100 = 410
FP= 1577.1
FW= 1577.1
0.362
Q100 = 410
FP= 1576.5
FW= 1576.5
0.306
Q100 = 410
FP= 1572.0
FW= 1572.0
End of Study
TECHNOLOGY DRIVE
SAGUARO
PASEO DRIVE
CEREUS WASH
ZONE AE
ZONE A
Limits of Study
FP= 1569.3
FW= 1569.3
0.271
Q100 = 410
FP= 1564.5
FW= 1564.5
0.225
Q100 = 410
1575
1570
1565
1560
1555
5

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 20 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 83

Location to nearest Quarter Section: SE 1/4 of Section 27

Roadway Name: Laser Drive and Alley

Roadway Classification: Local

Wash Name (if applicable): Laser Drain

EAPFL Type and Description

Type of Flooding: Cross Street ____ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ____

Culvert Size: N/A

Culvert Description: Laser Drain is Laser Drive — Longitudinal flow

Future Condition 100-year Discharge: 272 cfs (HEC-1 operation LSR2)(6-hr)

Maximum Depth of Flow: 1.0' (From Laser Drain Addendum HEC-2)

Duration of Impassable Flow: 0.7 hrs

Scour/Wash-out Potential: Low X * *Notes: ____

Medium ____ *

High ____ *

Comments: Estimated passable Q = 65 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 20 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 84

Location to nearest Quarter Section: SE 1/4 of Section 27

Roadway Name: Laser Drive & Technology Drive

Roadway Classification: Local

Wash Name (if applicable): Laser Drain

EAPFL Type and Description

Type of Flooding: Cross Street ___ Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ___

Culvert Size: N/A

Culvert Description: Laser Drain is Laser Drive – Longitudinal flow thru' the intersection

Future Condition 100-year Discharge: 439 cfs (HEC-1 operation LSR3)(6-hr)

Maximum Depth of Flow: 12' (From Laser Drain Addendum HEC-2 model)

Duration of Impassable Flow: 1.0 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

Comments: Estimated passable Q = 79 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_84
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.004000	ft/ft
Water Surface Elevation	1,576.51	ft

Elevation range: 1,575.95 ft to 1,584.00 ft.

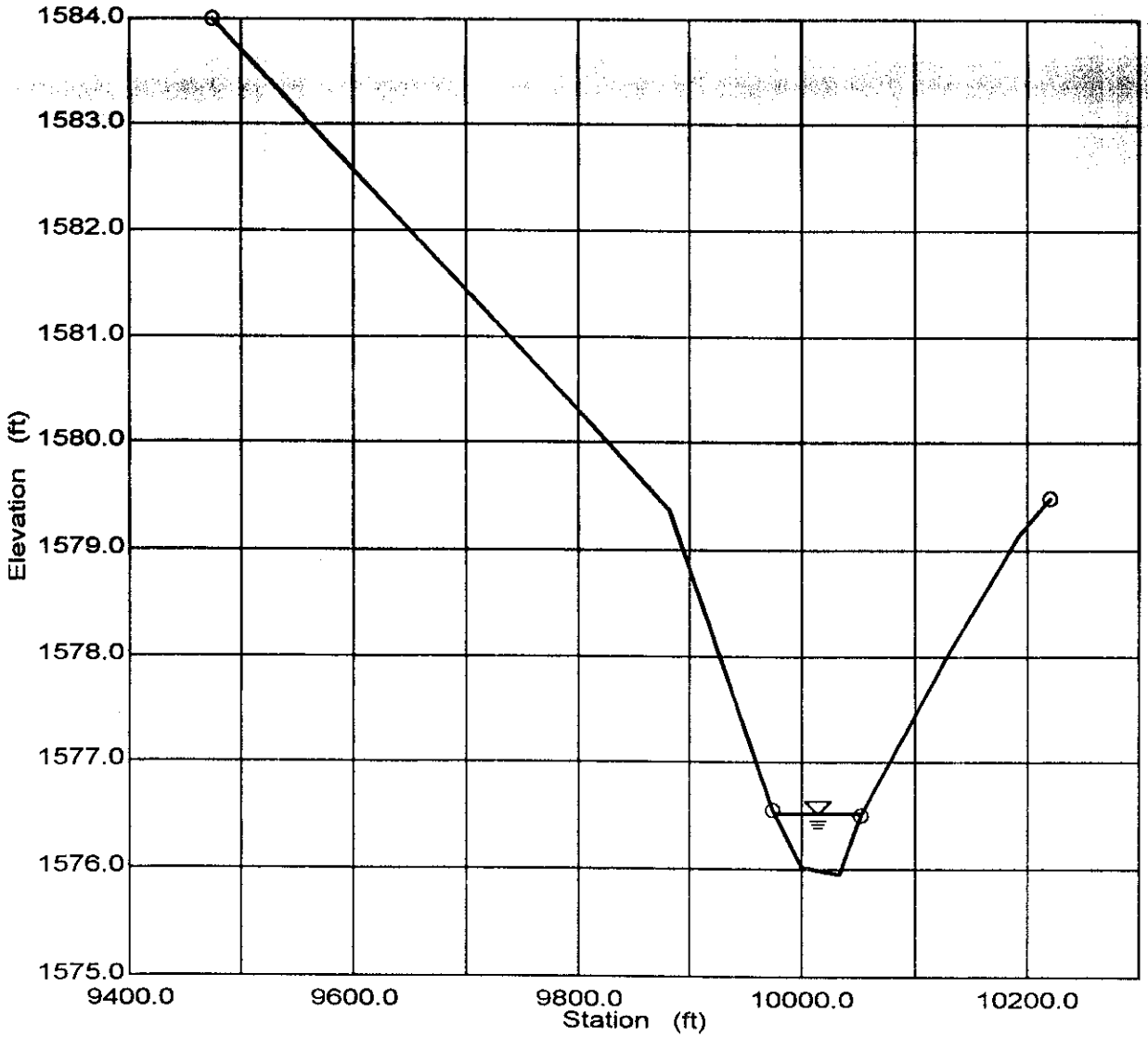
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
9,474.91	1,584.00	9,474.91	9,974.79	0.035
9,883.49	1,579.37	9,974.79	10,053.00	0.018
9,974.79	1,576.55	10,053.00	10,220.80	0.033
10,000.00	1,576.01			
10,033.40	1,575.95			
10,053.00	1,576.50			
10,132.60	1,578.06			
10,193.10	1,579.13			
10,220.80	1,579.48			

Results		
Wtd. Mannings Coefficient	0.018	
Discharge	79.11	cfs
Flow Area	29.13	ft^2
Wetted Perimeter	76.87	ft
Top Width	76.85	ft
Height	0.56	ft
Critical Depth	1,576.44	ft
Critical Slope	0.006779	ft/ft
Velocity	2.72	ft/s
Velocity Head	0.11	ft
Specific Energy	1,576.62	ft
Froude Number	0.78	
Flow is subcritical.		

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_84
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.018	
Channel Slope	0.004000	ft/ft
Water Surface Elevation	1,576.51	ft
Discharge	79.11	cfs



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 20 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 85

Location to nearest Quarter Section: SW 1/4 of Section 26

Roadway Name: Laser Drive and Saguaro Blvd.

Roadway Classification: Collector

Wash Name (if applicable): Laser Drain

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ___

Ponding ___

Culvert Size: N/A

Culvert Description: Longitudinal flow down Laser Drive crosses Saguaro Blvd.

Future Condition 100-year Discharge: 494 cfs (HEC-1 operation LSR4)(6hr)

Maximum Depth of Flow: 3.0' (From Laser Drain Addendum HEC-2)

Duration of Impassable Flow: 5.8 hrs

Scour/Wash-out Potential: Low X * *Notes:

Medium ___ *

High ___ *

Comments: Estimated passable Q = 6 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_85
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.000300	ft/ft
Water Surface Elevation	1,560.20	ft

Elevation range: 1,559.70 ft to 1,567.60 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
9,731.87	1,567.60	9,731.87	9,900.10	0.059
9,751.99	1,562.20	9,900.10	10,000.00	0.018
9,762.09	1,562.30	10,000.00	10,073.51	0.059
9,775.83	1,562.20			
9,780.45	1,562.10			
9,785.87	1,562.00			
9,802.32	1,561.90			
9,807.51	1,561.80			
9,823.93	1,561.90			
9,829.39	1,561.70			
9,834.67	1,561.60			
9,841.34	1,561.30			
9,845.56	1,561.10			
9,851.11	1,561.00			
9,856.21	1,560.90			
9,867.53	1,560.80			
9,872.79	1,560.70			
9,878.34	1,560.60			
9,889.26	1,560.70			
9,893.88	1,560.70			
9,900.10	1,560.80			
9,911.20	1,560.70			
9,927.35	1,559.80			
9,932.63	1,559.70			
9,938.27	1,559.80			
9,943.82	1,559.90			
9,949.10	1,560.00			
9,989.55	1,561.60			
10,000.00	1,561.70			
10,005.11	1,561.80			
10,011.21	1,561.60			
10,014.13	1,561.50			
10,017.55	1,561.30			
10,024.44	1,561.00			
10,030.15	1,560.90			

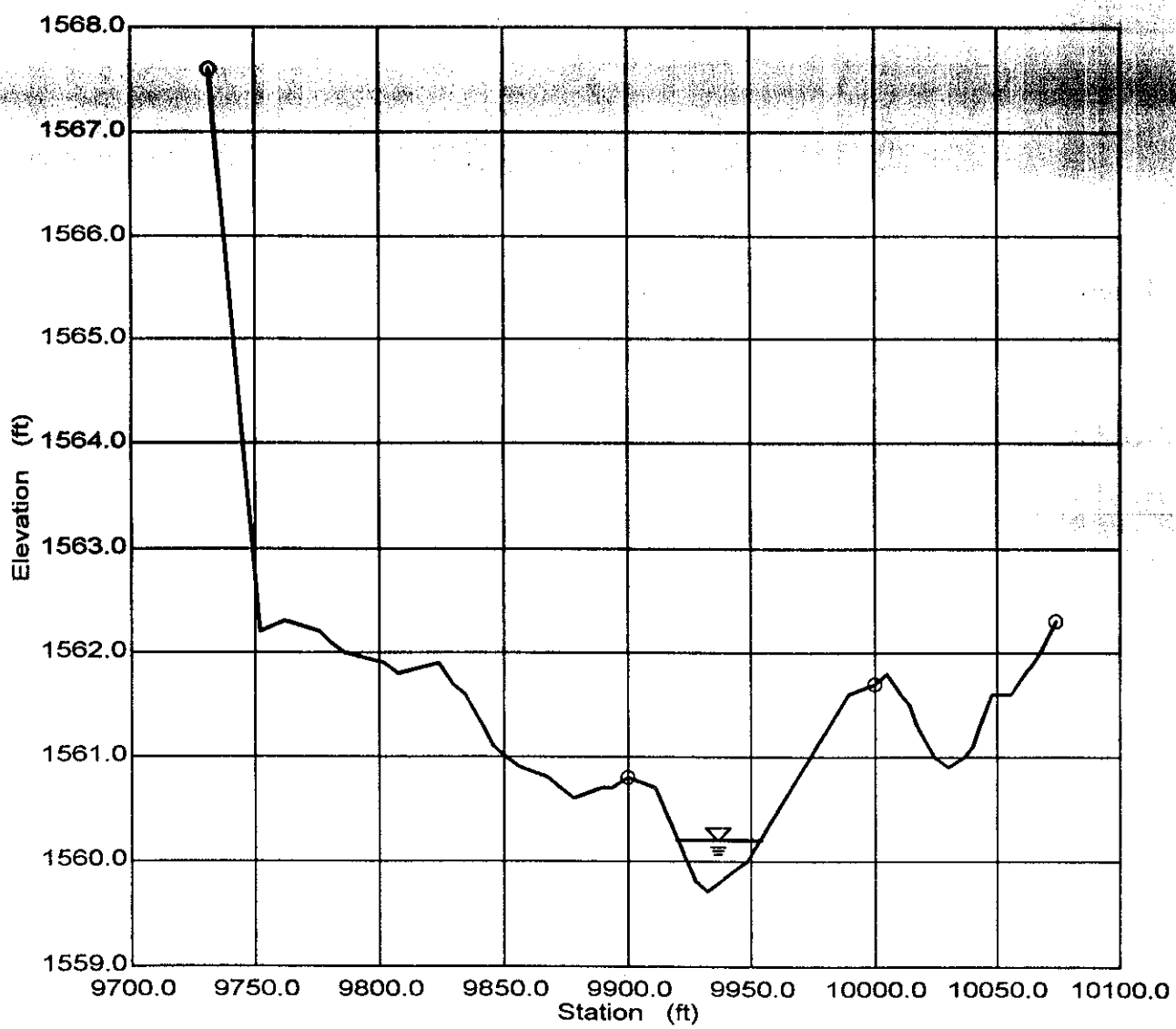
10,036.00	1,561.00
10,039.78	1,561.10
10,042.47	1,561.30
10,047.65	1,561.60
10,055.46	1,561.60
10,061.24	1,561.80
10,064.74	1,561.90
10,067.35	1,562.00
10,073.51	1,562.30

Results		
Wtd. Mannings Coefficient	0.018	
Discharge	6.45	cfs
Flow Area	10.12	ft²
Wetted Perimeter	34.00	ft
Top Width	33.98	ft
Height	0.50	ft
Critical Depth	1,559.95	ft
Critical Slope	0.009118	ft/ft
Velocity	0.64	ft/s
Velocity Head	0.01	ft
Specific Energy	1,560.21	ft
Froude Number	0.21	
Flow is subcritical.		

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_85
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.018	
Channel Slope	0.000300	ft/ft
Water Surface Elevation	1,560.20	ft
Discharge	6.45	cfs



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: _____

Project: Fountain Hills ADMP, FCD 94-16 By: _____

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 86

Location to nearest Quarter Section: SW 1/4 of Section 26

Roadway Name: Firebrick Drive (S. of Saguaro Blvd)

Roadway Classification: Local

Wash Name (if applicable): Laser Drain

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped road crossing

Future Condition 100-year Discharge: 494 cfs (HEC-1 operation LSR4)(6hr)

Maximum Depth of Flow: 2.2' (From Laser Drain Addendum HEC-2)

Duration of Impassable Flow: 2.6 hrs

Scour/Wash-out Potential: Low X * *Notes: _____

Medium ____ * _____

High ____ * _____

Comments: Estimated passable Q = 14 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_86
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data

Channel Slope	0.028000	ft/ft
Water Surface Elevation	1,555.15	ft

Elevation range: 1,554.65 ft to 1,561.24 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
9,894.22	1,561.10	9,894.22	9,962.49	0.089
9,924.12	1,559.85	9,962.49	10,040.00	0.034
9,962.49	1,556.93	10,040.00	10,146.70	0.099
10,000.00	1,554.65			
10,040.00	1,556.52			
10,085.20	1,558.70			
10,146.70	1,561.24			

Results

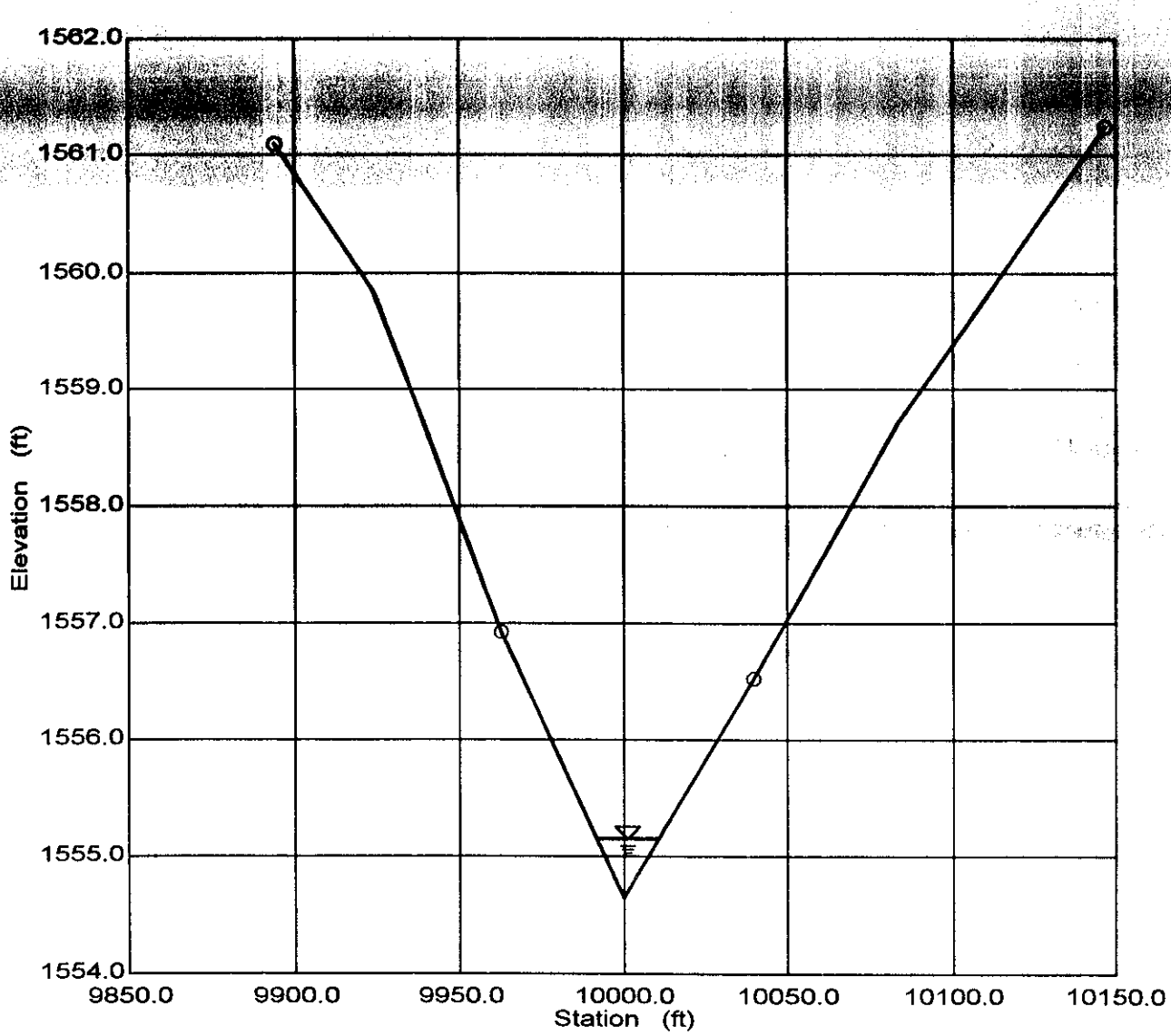
Wtd. Mannings Coefficient	0.034	
Discharge	13.72	cfs
Flow Area	4.73	ft²
Wetted Perimeter	18.95	ft
Top Width	18.92	ft
Height	0.50	ft
Critical Depth	1,555.15	ft
Critical Slope	0.026712	ft/ft
Velocity	2.90	ft/s
Velocity Head	0.13	ft
Specific Energy	1,555.28	ft
Froude Number	1.02	

Flow is supercritical.

Nrml dpth calc for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_86
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.034	
Channel Slope	0.028000	ft/ft
Water Surface Elevation	1,555.15	ft
Discharge	13.72	cfs



George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County — Date: 20 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 — By: MCG

Subject: Emergency Access Plan — Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 88

Location to nearest Quarter Section: SW 1/4 of Section 26

Roadway Name: Firebrick Drive and Lost Trail Drive

Roadway Classification: Local

Wash Name (if applicable): Tributary of Cerens Wash

EAPFL Type and Description

Type of Flooding: Cross Street X — Is there a culvert? Y or (N)

Longitudinal Flow X

Ponding ___

Culvert Size: N/A

Culvert Description: Longitudinal flow down Lost Trail Drive crossing Firebrick Drive

Future Condition 100-year Discharge: 143 cfs (HEC-1 operation LTD1)(6 hr)

Maximum Depth of Flow: 0.9'

Duration of Impassable Flow: 1.0 hrs

Scour/Wash-out Potential: Low X * — *Notes:

Medium ___ *

High ___ *

Comments: [illegible] = 29 cfs

Nrml dpth calc for impass dur
Worksheet for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_88
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

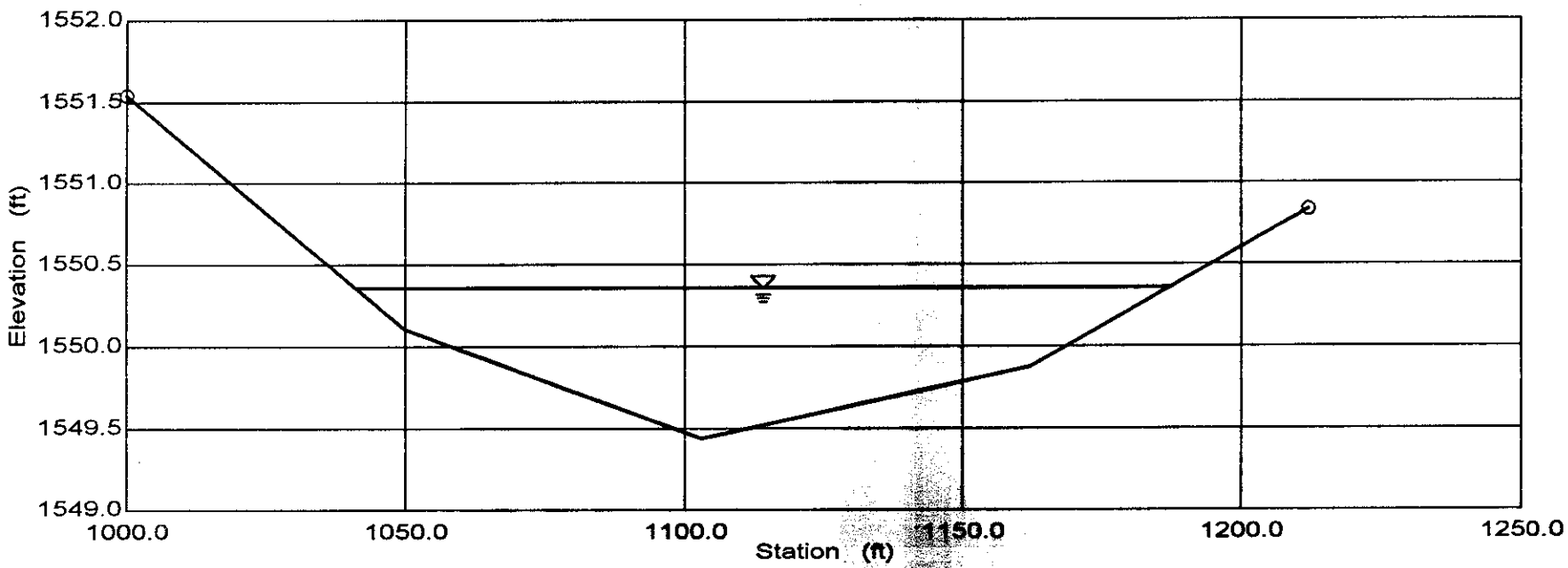
Input Data				
Channel Slope	0.010000 ft/ft			
Elevation range: 1,549.43 ft to 1,551.54 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
1,000.00	1,551.54	1,000.00	1,212.00	0.055
1,050.00	1,550.10			
1,103.00	1,549.43			
1,162.00	1,549.87			
1,212.00	1,550.83			
Discharge	143.00 cfs			

Results		
Wtd. Mannings Coefficient	0.055	
Water Surface Elevation	1,550.35	ft
Flow Area	79.35	ft^2
Wetted Perimeter	145.67	ft
Top Width	145.66	ft
Height	0.92	ft
Critical Depth	1,550.07	ft
Critical Slope	0.062411	ft/ft
Velocity	1.80	ft/s
Velocity Head	0.05	ft
Specific Energy	1,550.40	ft
Froude Number	0.43	
Flow is subcritical.		

Nrml dpth calcl for impass dur
Cross Section for Irregular Channel

Project Description	
Project File	k:\p\1204101\flowmstr\emrgaxsp.fm2
Worksheet	EAPFL_88
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.055	
Channel Slope	0.010000	ft/ft
Water Surface Elevation	1,550.35	ft
Discharge	143.00	cfs



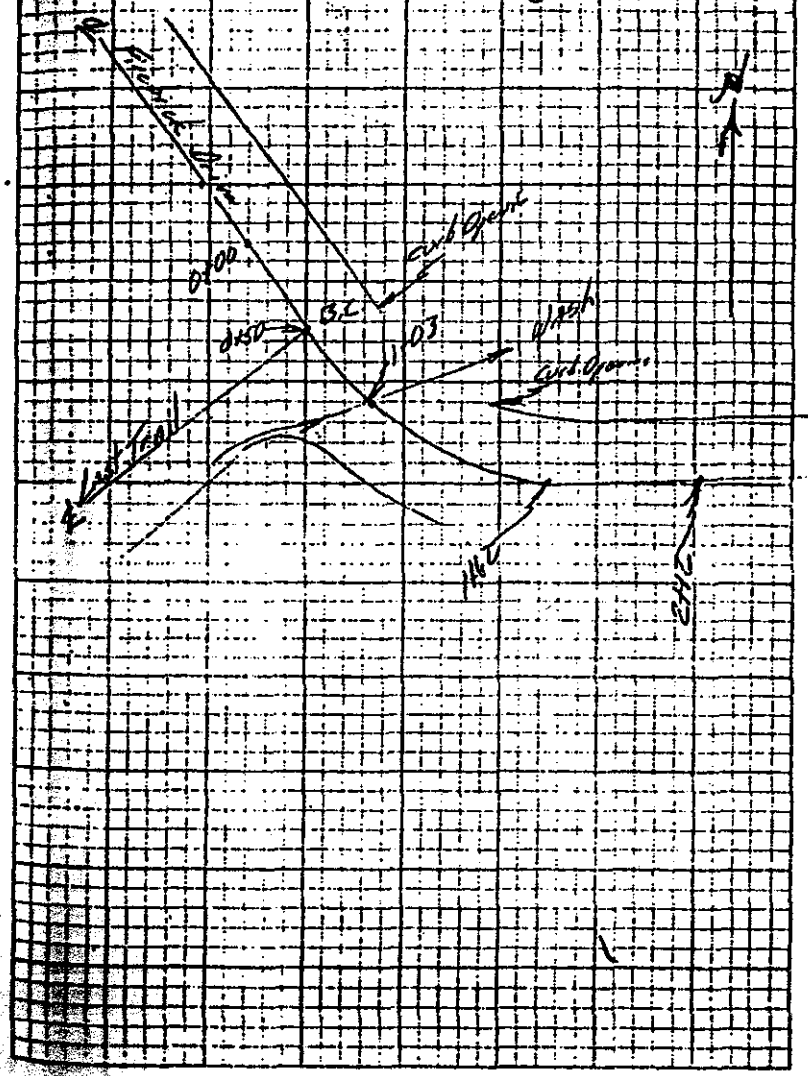
STA	Elev.	Description
0+00	1551.54	℄ Pavement
0+50	1550.10	℄ Brass Cap. Bench Mark
1+03	1549.43	Approximate ℄ Crossing
1+62	1549.87	℄ P.C.
2+12	1550.83	℄ Pavement

Slope = 0.1%

3/15/93 Drainage Structure "As Built"

2

Fine Brook Drive East of
Lost Trail Drive Intersection
Wet Crossing


N
0+00
B.C.
0+50
1+03
Curb Open
Curb Open
1+62
2+12

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 20 Jan. 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 89

Location to nearest Quarter Section: SW 1/4 of Section 27

Roadway Name: Powderhorn Drive (S. of Tombstone Ave)

Roadway Classification: Local

Wash Name (if applicable): Powder Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped road crossing

Future Condition 100-year Discharge: 562 cfs (HEC-1 operation PW4)(6 hr)

Maximum Depth of Flow: 1.7' (From HEC-RAS model using future Q

Duration of Impassable Flow: 1.2 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium X *

High ____ *

Comments: Estimated [illegible] D - 60 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 20 Jan 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 90

Location to nearest Quarter Section: SE ¼ of Section 27

Roadway Name: Leo Drive (S. of Last Trail Drive)

Roadway Classification: Local

Wash Name (if applicable): Powder Wash

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? Y or (N)

Longitudinal Flow ____

Ponding ____

Culvert Size: N/A

Culvert Description: Dipped road crossing

Future Condition 100-year Discharge: 629 cfs (HEC-1 operation PW6)(6hr)

Maximum Depth of Flow: 1.9' (From HEC-RAS model using future Q's)

Duration of Impassable Flow: 1.4 hrs

Scour/Wash-out Potential: Low ____ * *Notes:

Medium X *

High ____ *

Comments: [illegible] 50 cfs

George V. Sabol Consulting Engineers, Inc.

Client: Flood Control District of Maricopa County Date: 13 Mar 97

Project: Fountain Hills ADMP, FCD 94-16 By: MCG

Subject: Emergency Access Plan Project Number: 1204101

Emergency Access Plan Flooding Location (EAPFL)
Existing Condition Characteristics

EAFPL Identification # : 91

Location to nearest Quarter Section: NE 1/4 of Section 26

Roadway Name: Saguaro Blvd (N. of Palwer Way)

Roadway Classification: Arterial

Wash Name (if applicable): Hogan and Palmer Washes

EAPFL Type and Description

Type of Flooding: Cross Street X Is there a culvert? (Y) or N

Longitudinal Flow ____

Ponding ____

Culvert Size: Hogan Wash – 36" x 160' cmp Palmer Wash – 36" x 120' cmp

Culvert Description: Hogan Wash – corrugated metal pipe w/ mitered inlet

Palmer Wash – corrugated metal pipe w/ drop inlet

Future Condition 100-year Discharge: 164 cfs (SEE ATTACHED WORKSHEETS)

Maximum Depth of Flow: 0.6'

Duration of Impassable Flow: Less than 1 hr

Scour/Wash-out Potential: Low X * *Notes:

Medium ____ *

High ____ *

Comments:

George V. Sabol Consulting Engineers, Inc.

SHEET _____ OF _____

CLIENT _____ DATE _____

PROJECT _____ BY _____

SUBJECT _____ PROJECT NO. _____

HOGAN & PALMER WASHES AT SAGUARO BLVD.

- NO HYDROLOGY WAS PERFORMED FOR FIS STUDY AT THESE LOCATIONS.
- FOLLOWING FCDMC MANUAL PROCEDURES HYDROLOGIC PARAMETERS WERE ROUGHLY ESTIMATED:

PALMER WASH: $A = 38^{AC}$, $C = 0.55$, $i = 7.0^{IN/HR}$ ($T_c = 10^{MIN}$) } $Q = 146^{cfs}$

HOGAN WASH: $A = 31^{AC}$, $C = 0.55$, $i = 7.0^{IN/HR}$ ($T_c = 10^{MIN}$) } $Q = 119^{cfs}$

PALMER WASH CROSSING

- 36" x 120' cmp, SLOPE ≈ 1.7% w/ DROP INLET
- CULVERT CAPACITY ≈ 97^{cfs}
- APPROX. 49^{cfs} OVERFLOWS TO HOGAN WASH

HOGAN WASH CROSSING

- 36" x 160' cmp, slope ≈ 2.5% w/ MITRED INLET
- TOTAL Q = 119 + 45 = 164^{cfs}
- CULVERT CAPACITY = 56^{cfs} (BEFORE OVERTOPPING)
- OVERFLOW = 103^{cfs}
- WEIR PROFILE:

10+00	14.88
10+50	14.40
10+50.1	13.90
12+25	14.35
12+25.1	14.85
12+50	15.12

FOR $Q = 103^{cfs}$ DEPTH @ CROWN = 0.6'

CURRENT DATE: 03-13-1997 FILE DATE: 03-13-1997
CURRENT TIME: 15:04:51 FILE NAME: PALMER

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS	SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	10.00	8.00	120.02	1	CSP	3.00	3.00	.024	CONVENTIONAL
2									
3									
4									
5									
6									

****

****

SUMMARY OF CULVERT FLOWS (cfs) FILE: PALMER DATE: 03-13-1997

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
11.71	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.00	1
12.63	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.00	1
13.69	45.0	45.0	0.0	0.0	0.0	0.0	0.0	0.00	1
15.38	60.0	60.0	0.0	0.0	0.0	0.0	0.0	0.00	1
18.43	75.0	74.1	0.0	0.0	0.0	0.0	0.0	0.88	5
20.03	90.0	81.1	0.0	0.0	0.0	0.0	0.0	8.95	4
21.31	105.0	86.4	0.0	0.0	0.0	0.0	0.0	18.60	4
22.44	120.0	91.0	0.0	0.0	0.0	0.0	0.0	28.95	3
23.49	135.0	95.1	0.0	0.0	0.0	0.0	0.0	39.86	3
24.49	150.0	98.8	0.0	0.0	0.0	0.0	0.0	51.16	2
18.00	72.2	72.2	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: PALMER DATE: 03-13-1997

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
10.00	0.000	0.00	0.00	0.00
11.71	0.000	15.00	0.00	0.00
12.63	0.000	30.00	0.00	0.00
13.69	0.000	45.00	0.00	0.00
15.38	0.000	60.00	0.00	0.00
18.43	-0.004	75.00	0.04	0.05
20.03	-0.001	90.00	0.01	0.01
21.31	0.000	105.00	0.00	0.00
22.44	-0.002	120.00	0.02	0.02
23.49	-0.001	135.00	0.02	0.01
24.49	0.000	150.00	0.00	0.00

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

****

RENT DATE: 03-13-1997 FILE DATE: 03-13-1997
ENT TIME: 15:04:51 FILE NAME: PALMER

****

PERFORMANCE CURVE FOR CULVERT 1 - 1(3.00 (ft) BY 3.00 (ft)) CSP

****

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	10.00	0.00	-1.00	0-NF	0.00	0.00	0.00	1.00	0.00	0.00
15.00	11.71	1.71	0.43	1-S2n	1.17	1.23	1.03	1.00	6.95	0.00
30.00	12.63	2.63	1.63	1-S2n	1.75	1.77	1.67	1.00	7.41	0.00
45.00	13.69	3.59	3.69	2-M2c	2.37	2.18	2.18	1.00	8.20	0.00
60.00	15.38	4.78	5.38	2-M2c	3.00	2.49	2.49	1.00	9.61	0.00
74.08	18.43	6.22	8.43	2-M2c	3.00	2.71	2.71	1.00	11.02	0.00
81.05	20.03	7.05	10.03	2-M2c	3.00	2.82	2.82	1.00	11.83	0.00
86.40	21.30	7.75	11.30	2-M2c	3.00	2.91	2.91	1.00	12.42	0.00
91.03	22.44	8.38	12.44	2-M2c	3.00	2.98	2.98	1.00	12.91	0.00
95.12	23.49	8.97	13.49	6-FFc	3.00	3.00	3.00	1.00	13.46	0.00
98.84	24.49	9.53	14.49	6-FFc	3.00	3.00	3.00	1.00	13.98	0.00

****

El. inlet face invert 10.00 ft El. outlet invert 8.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****

* SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	10.00 ft
OUTLET STATION	120.00 ft
OUTLET ELEVATION	8.00 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0167
CULVERT LENGTH ALONG SLOPE	120.02 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	3.00 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

****

ENT DATE: 03-13-1997 FILE DATE: 03-13-1997
ENT TIME: 15:04:51 FILE NAME: PALMER

****
********** TAILWATER **********
****
****

CONSTANT WATER SURFACE ELEVATION
9.00

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	1.00 ft
CREST LENGTH	1.00 ft
OVERTOPPING CREST ELEVATION	18.00 ft

****

CURRENT DATE: 03-13-1997 FILE DATE: 03-13-1997
CURRENT TIME: 15:27:03 FILE NAME: HOGAN

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	7.80	3.80	160.05	1 CSP	3.00	3.00	.024	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (cfs) **FILE: HOGAN** **DATE: 03-13-1997**

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
7.80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
9.69	16.4	16.4	0.0	0.0	0.0	0.0	0.0	0.00	1
10.70	32.8	32.8	0.0	0.0	0.0	0.0	0.0	0.00	1
12.07	49.2	49.2	0.0	0.0	0.0	0.0	0.0	0.00	1
12.89	65.6	56.7	0.0	0.0	0.0	0.0	0.0	8.32	8
12.99	82.0	57.5	0.0	0.0	0.0	0.0	0.0	24.07	6
13.06	98.4	58.1	0.0	0.0	0.0	0.0	0.0	39.81	5
13.12	114.8	58.7	0.0	0.0	0.0	0.0	0.0	55.35	4
13.18	131.2	59.2	0.0	0.0	0.0	0.0	0.0	71.43	4
13.24	147.6	59.6	0.0	0.0	0.0	0.0	0.0	87.53	4
13.29	164.0	60.0	0.0	0.0	0.0	0.0	0.0	102.58	3
12.80	55.9	55.9	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: HOGAN DATE: 03-13-1997

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
7.80	0.000	0.00	0.00	0.00
9.69	0.000	16.40	0.00	0.00
10.70	0.000	32.80	0.00	0.00
12.07	0.000	49.20	0.00	0.00
12.89	-0.003	65.60	0.57	0.87
12.99	-0.003	82.00	0.41	0.50
13.06	-0.003	98.40	0.44	0.45
13.12	-0.006	114.80	0.78	0.68
13.18	-0.005	131.20	0.61	0.46
13.24	-0.004	147.60	0.45	0.30
13.29	-0.003	164.00	1.41	0.86

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

****

RENT DATE: 03-13-1997 FILE DATE: 03-13-1997
RENT TIME: 15:27:03 FILE NAME: HOGAN

****

PERFORMANCE CURVE FOR CULVERT 1 - 1(3.00 (ft) BY 3.00 (ft)) CSP

****

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	7.80	0.00	-3.80	0-NF	0.00	0.00	0.00	0.20	0.00	0.00
16.40	9.69	1.89	-1.39	1-S2n	1.09	1.29	0.99	0.20	8.07	0.00
32.80	10.70	2.90	0.31	1-S2n	1.63	1.85	1.55	0.20	8.87	0.00
49.20	12.07	4.27	2.87	1-S2n	2.15	2.27	2.07	0.20	9.44	0.00
56.71	12.89	5.09	4.68	2-M2c	2.45	2.43	2.43	0.20	9.23	0.00
57.52	12.98	5.18	4.73	2-M2c	2.49	2.45	2.45	0.20	9.31	0.00
58.14	13.06	5.26	4.74	2-M2c	2.53	2.46	2.46	0.20	9.41	0.00
58.67	13.12	5.32	4.77	2-M2c	2.56	2.46	2.46	0.20	9.47	0.00
59.16	13.18	5.38	4.81	2-M2c	2.59	2.47	2.47	0.20	9.52	0.00
59.62	13.24	5.44	4.84	2-M2c	2.62	2.48	2.48	0.20	9.57	0.00
60.01	13.28	5.48	4.82	2-M2c	2.64	2.49	2.49	0.20	9.61	0.00

****

El. inlet face invert 7.80 ft El. outlet invert 3.80 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****

** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	7.80 ft
OUTLET STATION	160.00 ft
OUTLET ELEVATION	3.80 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0250
CULVERT LENGTH ALONG SLOPE	160.05 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	3.00 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	MITERED TO CONFORM TO SLOPE
INLET DEPRESSION	NONE

****

RENT DATE: 03-13-1997 FILE DATE: 03-13-1997
RENT TIME: 15:27:03 FILE NAME: HOGAN

****
********** TAILWATER **********
****
****

CONSTANT WATER SURFACE ELEVATION
4.00

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	120.00 ft
CREST LENGTH	100.00 ft
OVERTOPPING CREST ELEVATION	12.80 ft

****

```
*********************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
*********************************************


    PROJECT:  Fountain Hills ADMP
    ENGINEER:  mcg
    DATE:   3/13/1997
    TIME:  15:28.36


---------------------------------------------
    INPUT PARAMETERS
---------------------------------------------


    STARTING WSEL:        13.90
    MAXIMUM WSEL:         15.10
    STEP SIZE:             0.10
    BREADTH OF WEIR:      50.00


*********************************************
    INPUT ELEVATION/STATION TABLE.
    PROJECT:  Fountain Hills ADMP
    DATE:   3/13/1997
    TIME:  15:28.36
*********************************************
```

POINT	ELEVATION	STATION
1	14.88	1000.00
2	14.40	1050.00
3	13.90	1050.10
4	14.35	1225.00
5	14.85	1225.10
6	15.12	1250.00

****

WEIR COEFFICIENT TABLE

PROJECT: Fountain Hills ADMP

DATE: 3/13/1997

TIME: 15:28.36

****

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT
1	0.00	2.5000
2	0.10	2.5067
3	0.20	2.5133
4	0.30	2.5200
5	0.40	2.5267
6	0.50	2.5333
7	0.60	2.5400
8	0.70	2.5467
9	0.80	2.5533
10	0.90	2.5600
11	1.00	2.5667
12	1.10	2.5733
13	1.20	2.5800

****

UNEVEN WEIR FLOW PROGRAM

FORTRAN VERSION 1.0

PROJECT: Fountain Hills ADMP

DATE: 3/13/1997

TIME: 15:28.36

****

ELEVATION	DISCHARGE (CFS)
13.90	0.00
14.00	1.23
14.10	6.97
14.20	19.25
14.30	39.56
14.40	69.03
14.50	106.43
14.60	151.01
14.70	202.58
14.80	261.06
14.90	326.51

APPENDIX B

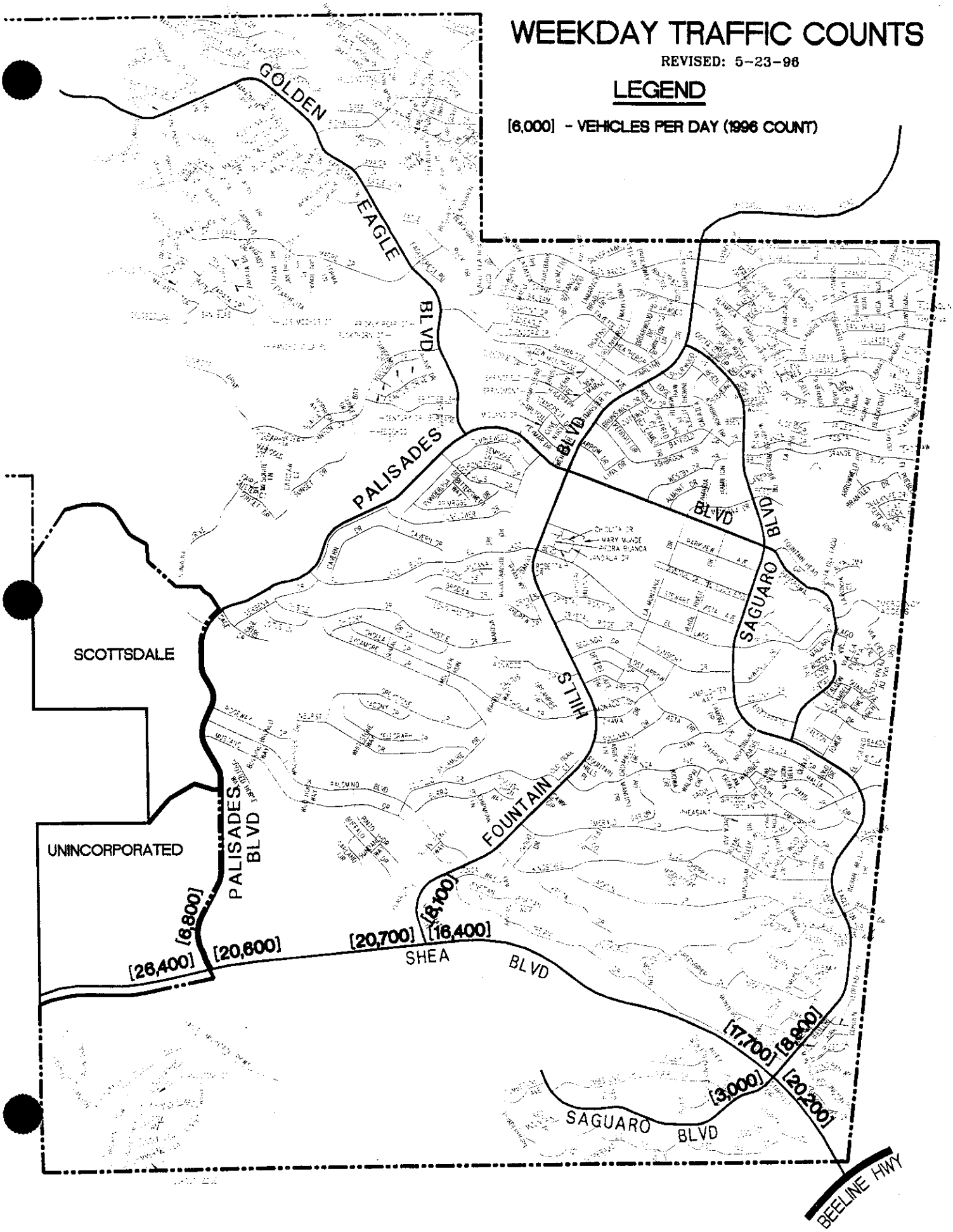
Town of Fountain Hills Traffic Counts

WEEKDAY TRAFFIC COUNTS

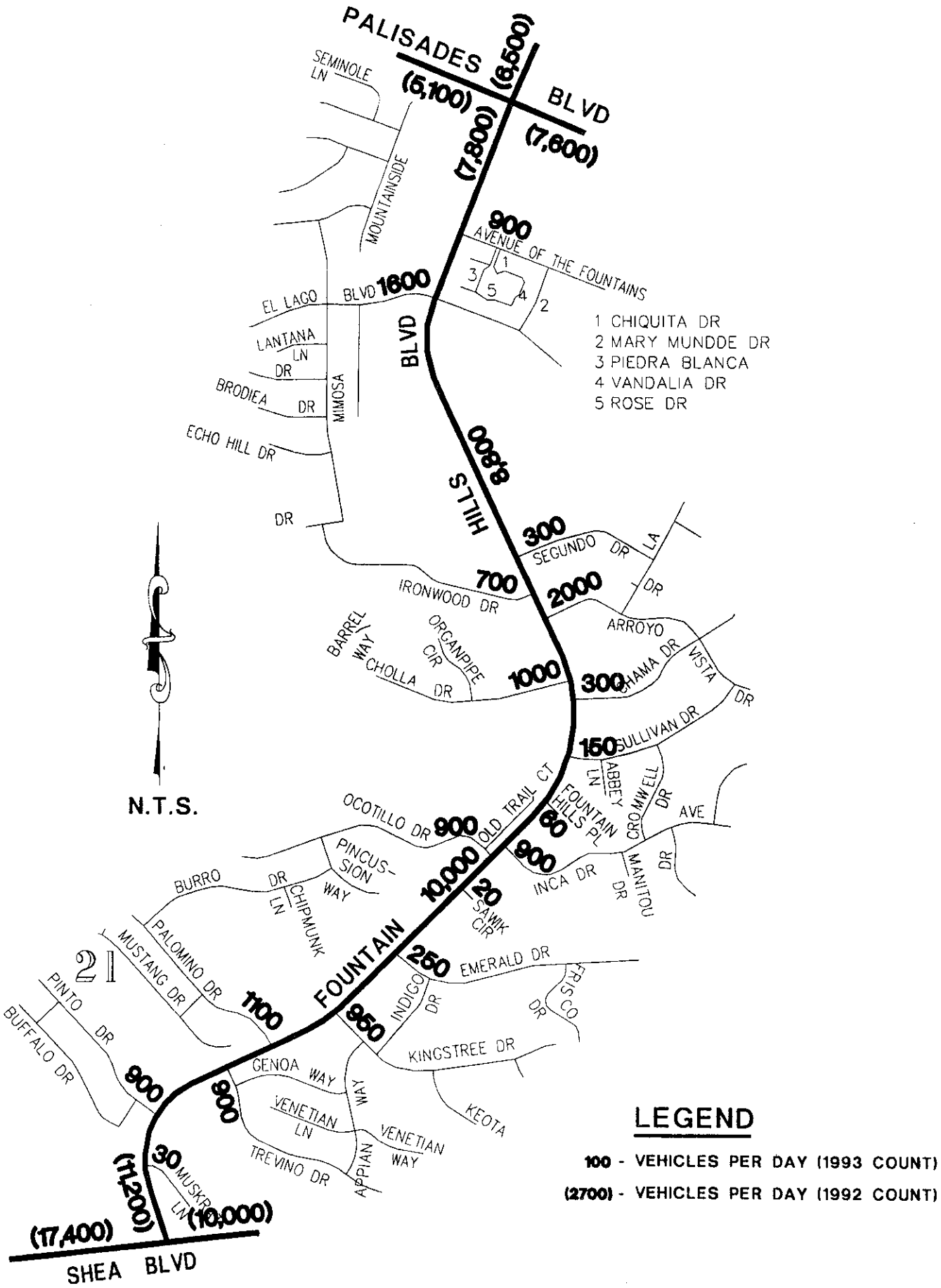
REVISED: 5-23-96

LEGEND

[6,000] - VEHICLES PER DAY (1996 COUNT)



WEEKDAY TRAFFIC COUNTS

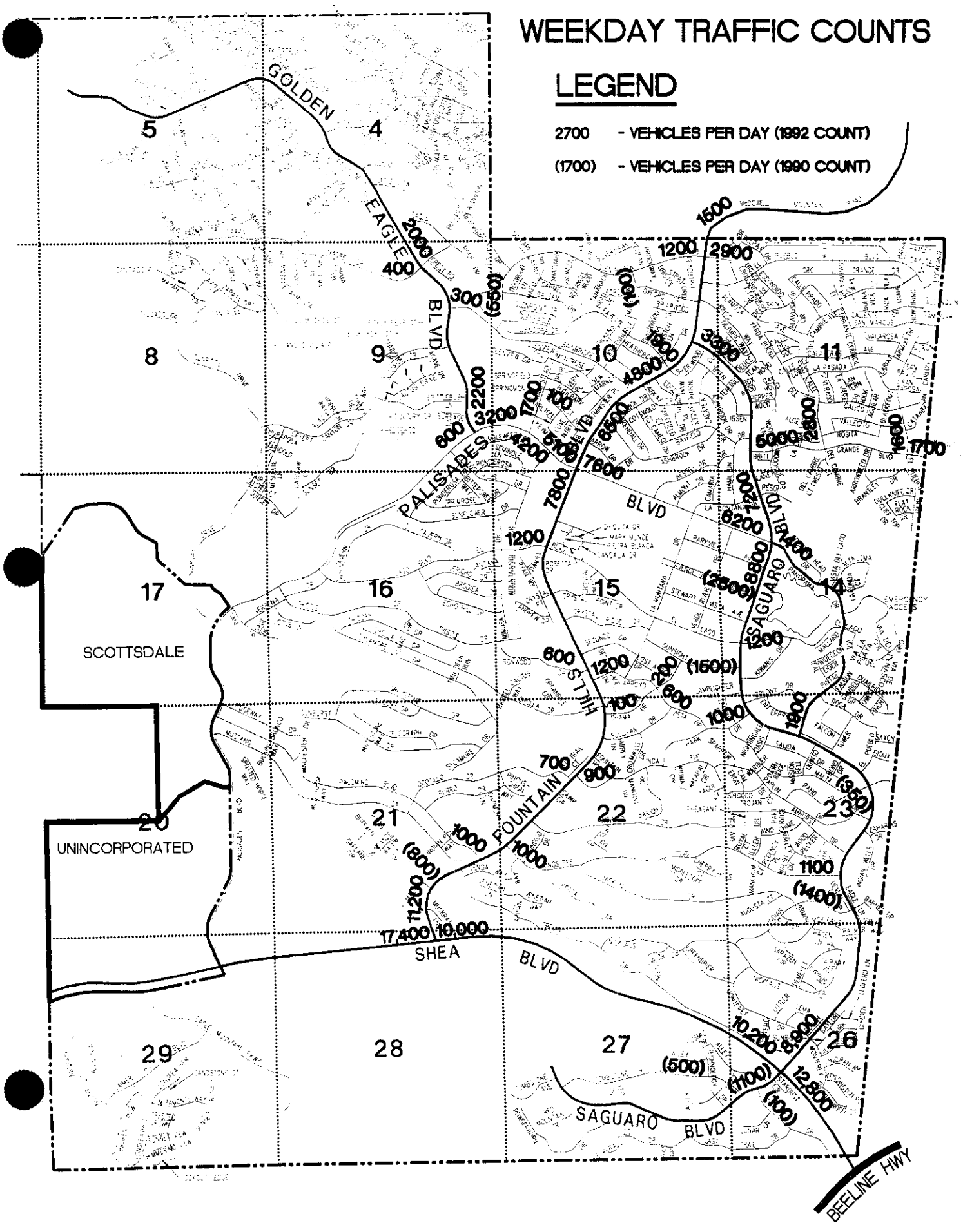


WEEKDAY TRAFFIC COUNTS

LEGEND

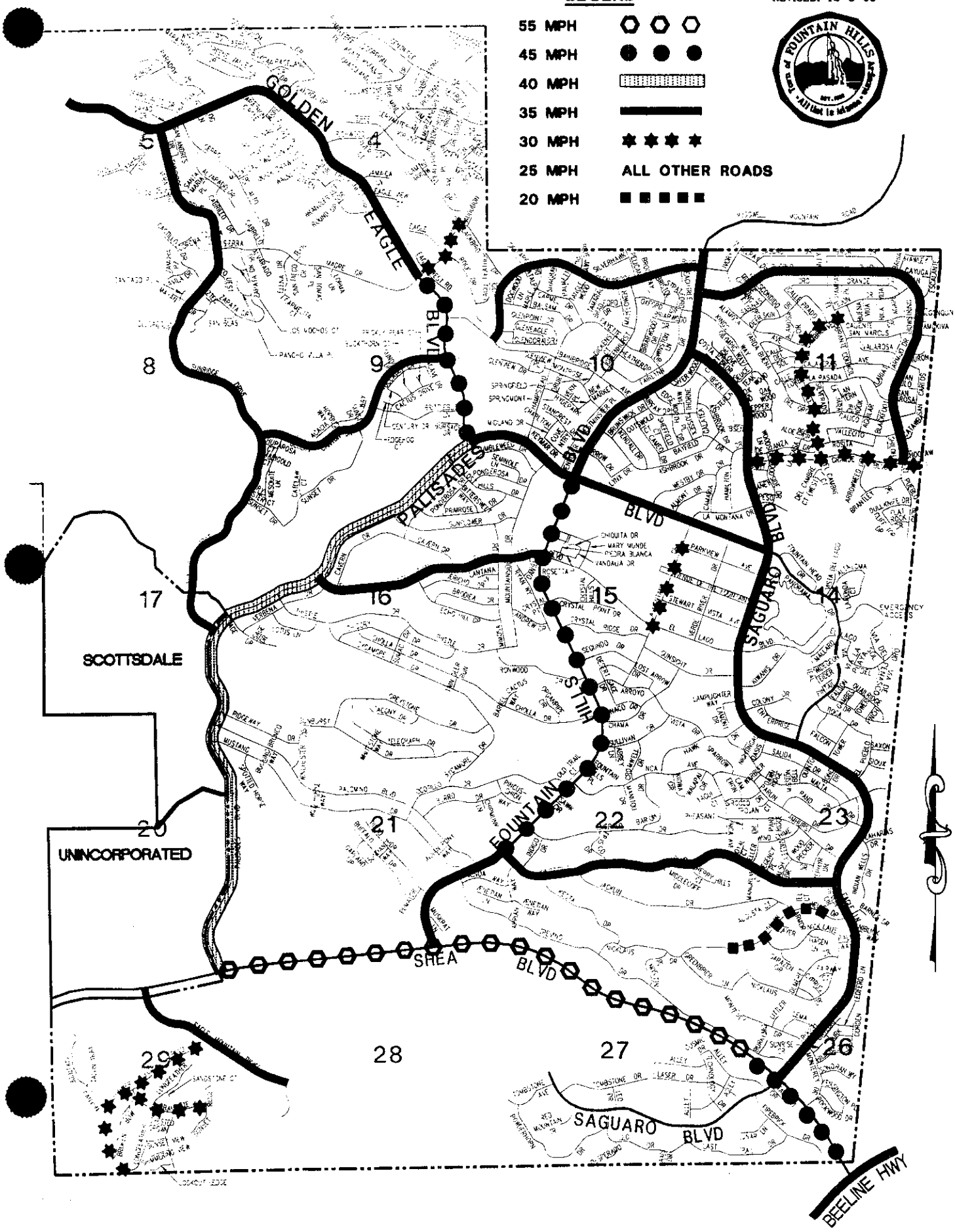
2700 - VEHICLES PER DAY (1992 COUNT)

(1700) - VEHICLES PER DAY (1990 COUNT)



SPEED LIMIT MAP

LEGEND

REVISED: 12-8-95

55 MPH	⬡ ⬡ ⬡
45 MPH	● ● ●
40 MPH	▭
35 MPH	▬
30 MPH	★ ★ ★ ★
25 MPH	ALL OTHER ROADS
20 MPH	■ ■ ■ ■ ■