Final DCR

24th Avenue and Camelback Road
Drainage Improvements
PROJECT No. ST83120017

Prepared for:

City of Phoenix
Street Transportation Department
Design and Construction Management
1034 E. Madison Street
Phoenix, Arizona 85034

And

Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Prepared by:

Premier Engineering Corporation
1600 West Broadway Road, Suite 165
Tempe, Arizona 85282

Premier Project No. 2002010
September 23, 2003

LOI (Letter of Intent)
FY 04/05 CIP Prioritization Procedure

City/Agency Proposing Partnership: CITY OF PHOENIX

1. Project Name FEASIBILITY STUDY-LOWER CAVE CREEK WASH (6)

A. Project Description & Limits:

This project is proposed to perform a feasibility study within the Cave Creek Wash floodplain. Cave Creek Wash floodplain has been revised in the past because of the construction of the Arizona Canal Diversion Channel (ACDC). However, downstream of the Grand Canal has never been revised. It is anticipated that one or more available retention areas within the study area may provide some retention of the storm water drainage and hence a revision to the existing Special Flood Hazard Area (SFHA) may be warranted. Under the proposal for this study, it is intended to investigate the feasibility of project(s) to enhance retention/detention capacity of existing facilities within the study area.

B. Estimated Project Cost: $150,000

2. Proposed Lead City/Agency For: (check appropriate column)

	FCD	City/Agency	Other:		N/A
A. Study	☑	☐	☐		☐
B. Design	☑	☐	☐		☐
C. R/W Acquisition	☐	☐	☐		☐
D. Construction	☐	☐	☐		☐
E. Constr. Management	☐	☐	☐		☐
F. Ops & Maintenance	☐	☐	☐		☐

3. Proposed Cost Share:

	FCD	City/Agency	Other:	Total:
A. Percentage - %	100%			
B. Funding - $	$150,000			

4. Availability of City/Agency Funding ($):

FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	Later FYs

5. City/Agency Adoption of ADMS/ADMP/WCMP: (NAME: Metro ADMS)

☐ Yes ☑ Not yet, but willing to ☐ Not associated with Study or Plan

6. Signature: (City Engineer, Public Works Director, or Agency Manager)

Name: Hasan Mushtaq, Ph.D., P.E., C.F.M.

Title: Floodplain Manager 7/18/03 Date

Signature: Russell Miracle, P.E. Planning & Project Management Division Manager Date Flood Control District of Maricopa County

7. Remarks/Comments: (use additional sheet if necessary)

PROPOSAL FOR MARICOPA COUNTY FLOOD CONTROL DISTRICT
FY 04-05 CIP PRIORITIZATION
JULY 2003

PROJECT DESCRIPTION

CANDIDATE ASSESSMENT REPORT

This project is proposed to perform a feasibility study within the Cave Creek Wash floodplain. Cave Creek Wash floodplain has been revised in the past because of the construction of the Arizona Canal Diversion Channel (ACDC). A substantial floodplain area within the Special Flood Hazard Area (SFHA) has been eliminated during these revisions. Currently, floodplain exists from north of Grand Canal to the Salt River in the south. It is anticipated that one or more available retention areas within the study area may provide some retention of the storm water drainage and hence a revision to the existing Special Flood hazard Area (SFHA) may be warranted. Under the proposal for this project, it is intended to investigate the feasibility of a project(s) to enhance retention/detention capacity of existing facilities within the study area.

1.0 Agency Priority

This project is number six (6) priority for the City of Phoenix.

2.0 Master Plan Element

Area Drainage Master Study (ADMS), Metro ADMS, has recently been completed by the Flood Control District of Maricopa County. Under this proposed feasibility study, new topographical mapping will be used to do further hydrologic and hydraulic analysis. The Flood Control District of Maricopa County (FCDMC) has not started an Area Drainage Plan (ADMP) for the area yet.

3.0 Hydrologic/Hydraulic Significance

New hydrology will be developed based on the available topographic mapping. The hydrology will incorporate potential park and other features to investigate if adequate volume retention/detention is available to shave off the peak flow of the storm drainage through the study area. New hydraulic modeling will also be developed for the purposes of the floodplain re-delineation. Appropriate methodology for hydraulic modeling and floodplain delineation through urban watersheds may be applicable for the study. The majority of the north part of the watershed has become urbanized during the past decade or so.

4.0 Level of Protection

The feasibility study recommendation will propose future projects to revise floodplain boundary to identify the hazard area for the 100-year event. Successful implementation of the recommended alternative will protect the property owners from the 100-yr. Special Flood hazard Area (SFHA).

5.0 Area Protected

Existing floodplain boundary as shown in the Flood Insurance Rate Map (FIRM) was developed through a study in 1988. The floodplain has never been updated since that time. Numerous residential, commercial and vacant properties are included in the current floodplain through the study area. It is anticipated that with new topographic mapping, incorporating all new developments and other regional projects within the watershed, a reduced floodplain boundary for the 100-year storm event may be achieved. New hydraulic modeling will also include existing park features and future potential areas of volume retention. Reduction in the floodplain boundary through the watershed will remove many existing residential, commercial and vacant properties from the current floodplain. The study area extends from north of the Grand Canal to Durango curve to the south.

6.0 Environmental Quality/Area-wide Benefits

The recommended alternative would allow removal of properties from within the current floodplain boundary. Elimination from within the floodplain boundary will allow the property owners to not pay flood insurance.

7.0 Total Project Costs

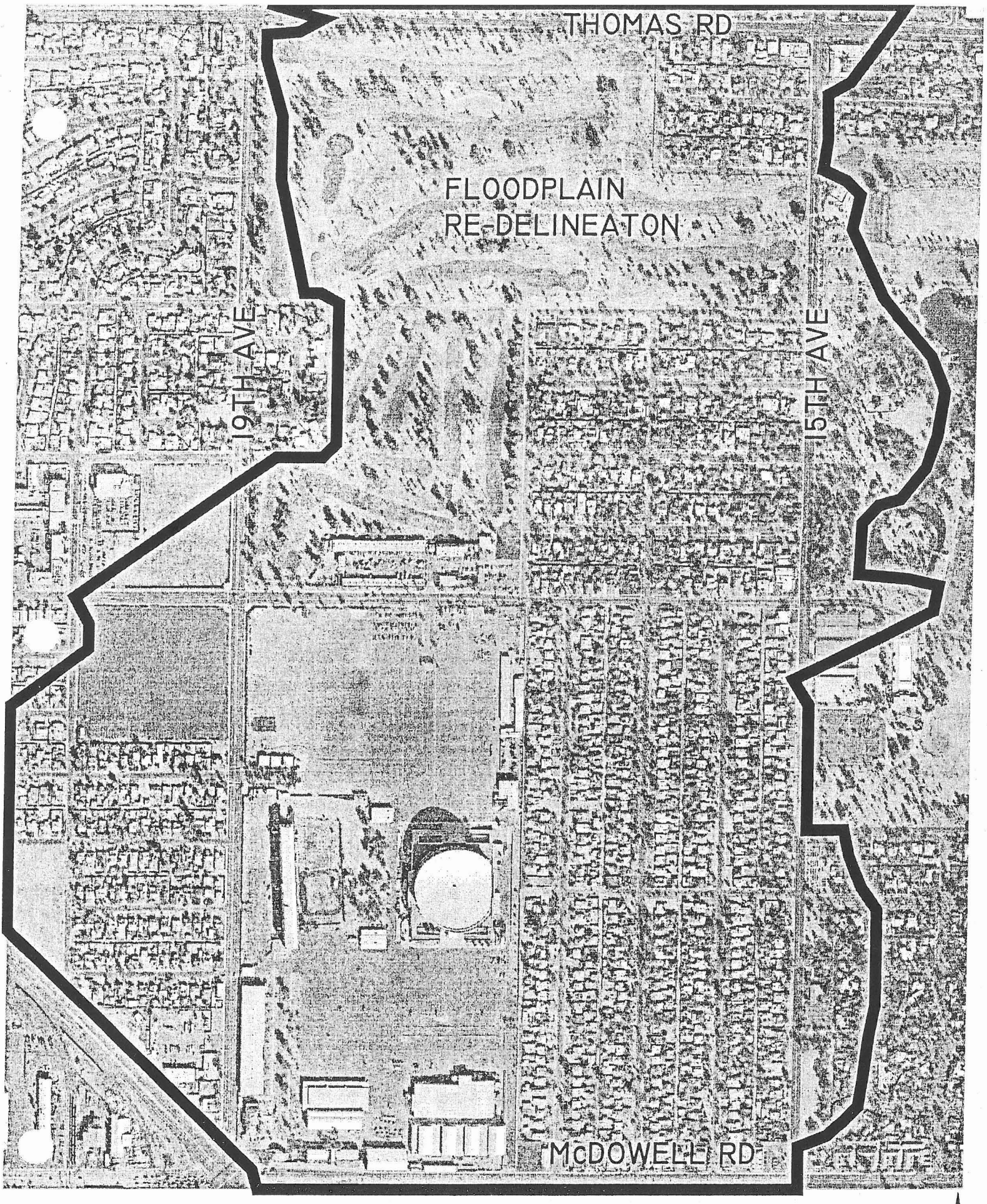
The estimated cost for the feasibility study is approximately $150,000.00. This includes data collection, survey, analyses of existing hydrology/hydraulics, alternative analysis and final recommendation.

8.0 Level of Partner Participation

The study is proposed to be funded in its entirety by the Flood Control District of Maricopa County. The City of Phoenix would propose to contribute staff hours to review the study and finalize recommended alternative.

9.0 Operation and Maintenance Costs and Operation and Maintenance Responsibility

The feasibility study will make final recommendation for future projects. Therefore, no maintenance responsibilities required at this time.



THOMAS RD - McDOWELL RD
19TH AVE - 15TH AVE

QS #14/13-25

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SCALE:
NOT TO SCALE

LOI (Letter of Intent)
FY 03/04 CIP Prioritization Procedure

ity/Agency Proposing Partnership: CITY OF PHOENIX

1. **Project Name** CAVE CREEK WASH FLOODPLAIN RE-DELINEATION (6)

A. Project Description & Limits: This study is proposed to re-delineate the existing Cave Creek Wash floodplain from north of the Grand Canal to the Salt River to the south. Cave Creek Wash flows through the middle part of the City of Phoenix. It is also proposed that the floodplain re-delineation be performed with the available new topographic mapping to revise the existing floodplain through the area. This portion of the floodplain delineation was completed in 1988 and has not been updated since.

B. Estimated Project Cost: $300,000.00

2. **Proposed Lead City/Agency For: (check appropriate column)**

	FCD	City/Agency	Other:		N/A
A. Study	[X]	[ ]	[ ]		[ ]
B. Design	[X]	[ ]	[ ]		[ ]
C. R/W Acquisition	[ ]	[ ]	[ ]		[ ]
D. Construction	[ ]	[ ]	[ ]		[ ]
E. Constr. Management	[ ]	[ ]	[ ]		[ ]
F. Ops & Maintenance	[ ]	[X]	[ ]		[ ]

3. **Proposed Cost Share:**

	FCD	City/Agency	Other:	Total:
A. Percentage - %	100%			
B. Funding - $	$300,000	N/A		

4. **Availability of City/Agency Funding ($):**

FY 03/04	FY 04/05	FY 05/06	FY 06/07	FY 07/08	Later FYs

5. **City/Agency Adoption of ADMS/ADMP/WCMP: (Name:** Metro ADMS **)**

[ ] Yes [X] Not yet, but willing to [ ] Not associated with Study or Plan

6. **Signature:** (City Engineer, Public Works Director, or Agency Manager)

Name: Hasan Mushtaq, Ph. D., P.E., C.F.M.

Title: Floodplain Manager Date: 7/19/02

7. **Remarks/Comments: (use additional sheet if necessary)**

Flood Control District of Maricopa County

Signature:
Thomas D. Johnson P.E., R.L.S.
Deputy Chief Engineer
Date
Flood Control District of Maricopa County

PROPOSAL FOR MARICOPA COUNTY FLOOD CONTROL DISTRICT
FY 03-04 CIP PRIORITIZATION
JULY 2002

PROJECT DESCRIPTION

CAVE CREEK WASH FLOODPLAIN RE-DELINEATION

This study is proposed to re-delineate the existing Cave Creek Wash floodplain from north of the Grand Canal to the Salt River to the south. Cave Creek Wash flows through the middle part of the City of Phoenix. Due to construction of the Arizona Canal Diversion Channel (ACDC), a floodplain re-delineation was submitted to the Federal Emergency Management Agency to remove a large portion of the floodplain. Currently, floodplain exists from north of Grand Canal to the Salt River in the south. It is also proposed that the floodplain re-delineation be performed with the available new topographic mapping to revise the existing floodplain through the area. This portion of the floodplain delineation was completed in 1988 and has not been updated since.

1.0 Agency Priority

This project is number six (6) priority for the City of Phoenix.

2.0 Master Plan Element

A recent Area Drainage Master Study (ADMS), Metro ADMS, has recently been completed by the Flood Control District of Maricopa County. Under the study, new topographical mapping is available for further use. This new mapping will be used for new hydrology/hydraulics for the purposes of the floodplain re-delineation.

3.0 Hydrologic/Hydraulic Significance

New hydrology will be developed based on the available topographic mapping. The hydrology will incorporate all new developments within the watershed area to account for an accurate hydrologic analysis. New hydraulic modeling will be developed for the purposes of the floodplain re-delineation. Appropriate methodology for hydraulic modeling and floodplain delineation through urban watersheds may be applicable for the study. The majority of the north part of the watershed has become urbanized during the past decade or so.

4.0 Level of Protection

The revised floodplain boundary will identify the hazard area for the 100-year event. The standard requirement for floodplain delineation by the Federal Emergency Management Agency (FEMA) is a 100-year design storm.

5.0 Area Protected

Existing floodplain boundary as shown in the Flood Insurance Rate Map (FIRM) was developed through a study in 1988. The floodplain has never been updated since that time. Numerous residential, commercial and vacant properties are included in the current floodplain through the study area. It is anticipated that with new topographic mapping, incorporating all new developments and other regional projects within the watershed, a reduced floodplain boundary for the 100-year storm event may be achieved. Reduction in the floodplain boundary through the watershed will remove many existing residential, commercial and vacant properties from the current floodplain. The study area extends from north of the Grand Canal to the Salt River to the south.

6.0 Environmental Quality/Area-wide Benefits

The benefit to the property owners within the area would be reduction of the floodplain boundary an removal of properties from the current FEMA delineated 100-year floodplain.

7.0 Total Project Costs

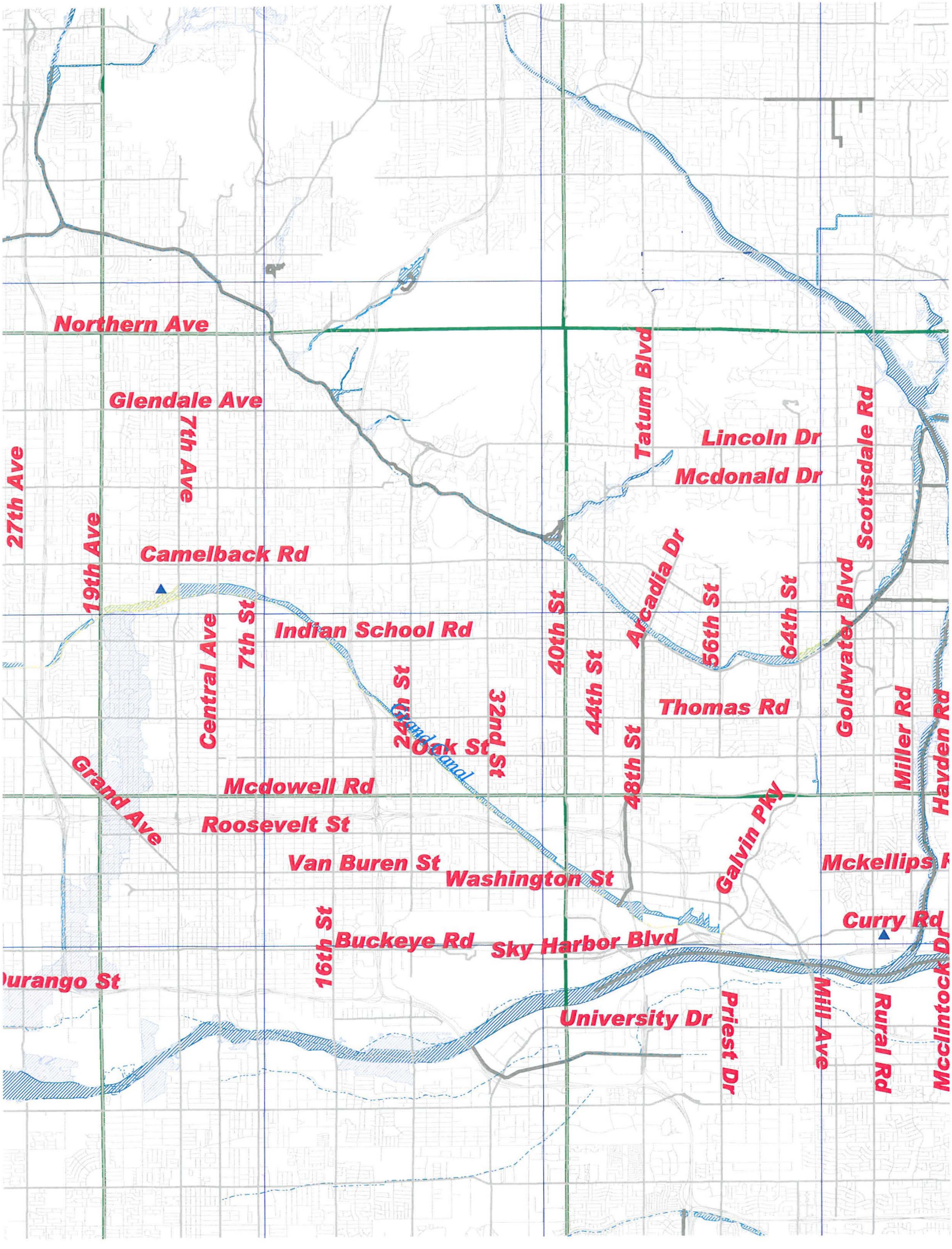
The estimated cost for the re-delineation effort is approximately $300,000.00. This includes survey, hydrology, hydraulics, floodplain delineation, and FEMA submittal for a Letter of Map Revision (LOMR).

8.0 Level of Partner Participation

The study is proposed to be carried out in its entirety by the Flood Control District of Maricopa County. The City of Phoenix would propose contribute staff hours with review of the study and FEMA submittal process.

9.0 Operation and Maintenance Costs and Operation and Maintenance Responsibility

The City of Phoenix will adopt and maintain the revised floodplain through the Cave Creek Wash from north of Grand Canal to the Salt River to the south.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Grand Canal
Grand Ave
Mcdowell Rd
Roosevelt St
Van Buren St
Washington St
16th St
Buckeye Rd
Sky Harbor Blvd
Durango St
University Dr
Priest Dr
Mill Ave
Rural Rd
Mcclintock Dr
Curry Rd
Mckellips R
Galvin Pky
Thomas Rd
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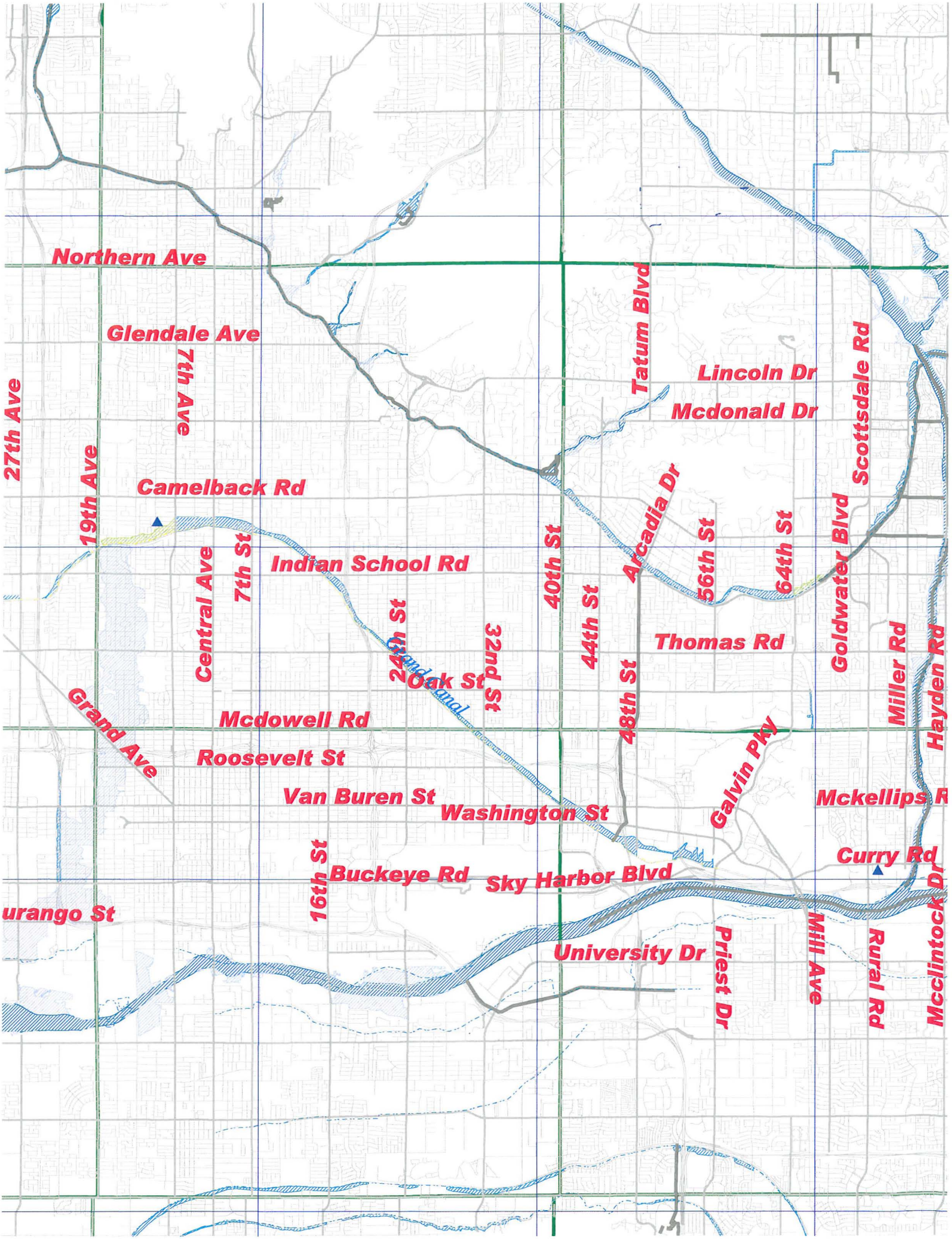
Miller Rd
Hayden Rd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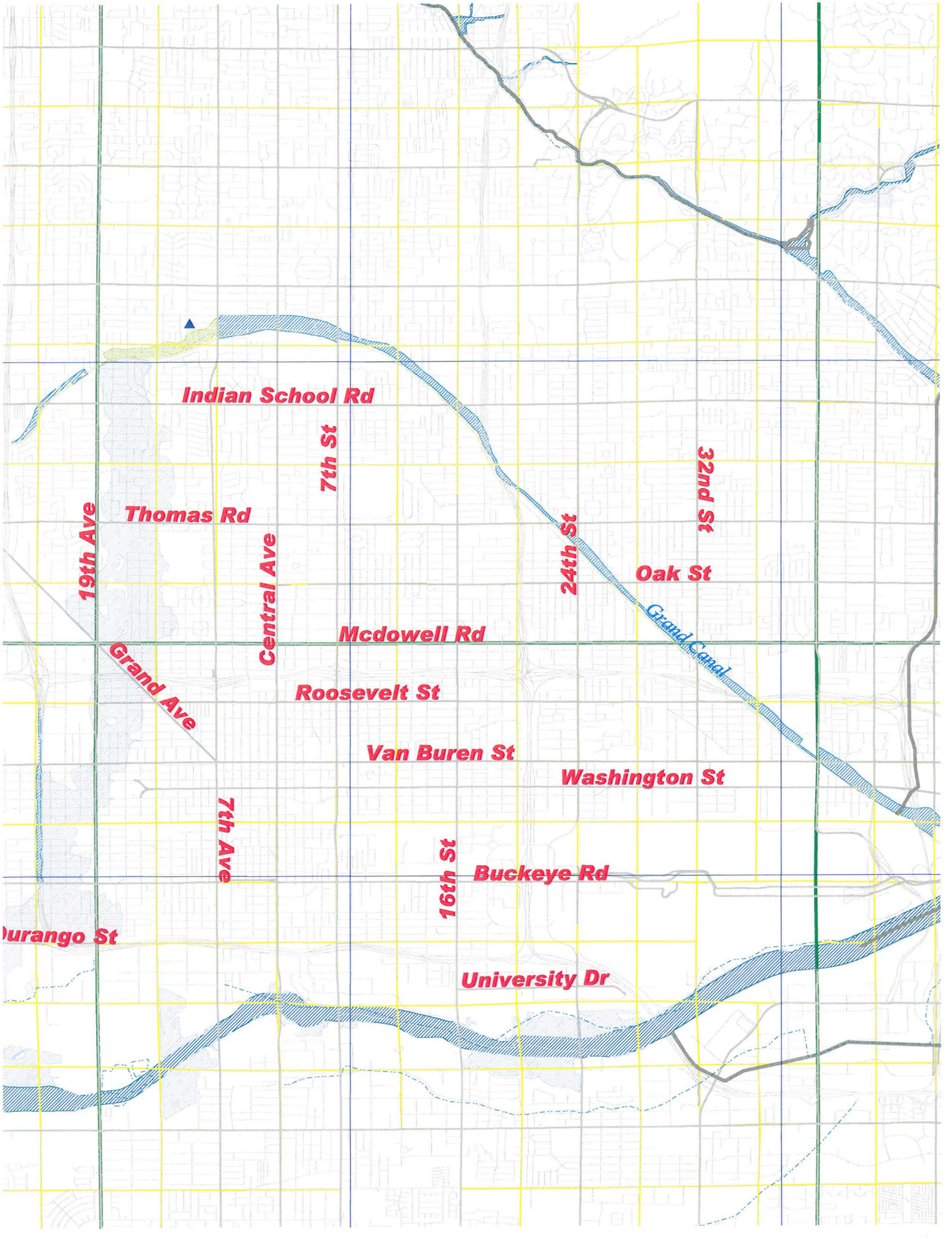
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Final DCR

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Prepared by:

Premier Engineering Corporation
1600 West Broadway Road, Suite 165
Tempe, Arizona 85282

Premier Project No. 2002010
September 23, 2003

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Appendix N	Phase 2: 10-Year, 6 Hour Storm
Appendix O	Phase 2: 2-Year, 6 Hour Storm
Appendix P	Phase 3: 100-Year, 6 Hour Storm
Appendix Q	Phase 3: Alternate. 100Year Storm
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1 INTRODUCTION

1.1 Purpose

This Final Design Concept Report is prepared to present the result of the Phased Construction Concept, which was proposed by the City of Phoenix staff in the coordination meeting on July 1st, 2003 and subsequent to the review of the recommendations offered in the Executive Summary, dated April 02, 2003. The proposed Phased Construction Concept was driven by two main objectives:

1. Preference of having one regional basin along the north side of Camelback Road
2. Limiting the regional basin's (Phase I) construction cost to the current available funds.

This Phased Construction Concept was presented in the Revise Executive Summary format to City of Phoenix staff and was approved in concept. This report identifies four distinct construction phases at four different locations throughout the study area. These phases are described in detail in Section 4.

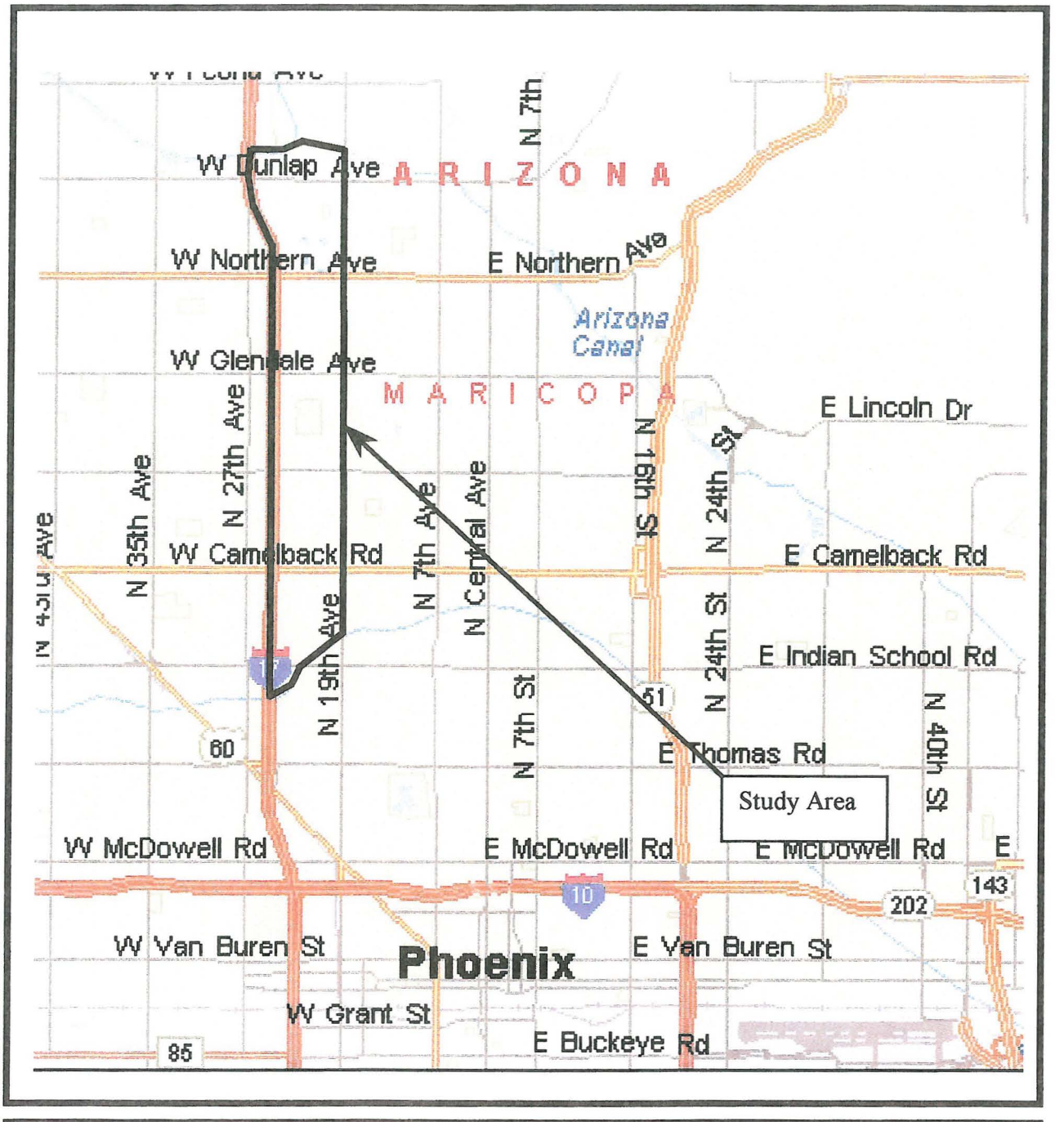
1.2 Background and Scope

The City of Phoenix (COP) retained Premier Engineering Corporation (Premier) to identify the extent of the flooding problems in the vicinity of 24th Avenue and Camelback Road and to develop possible flood protection alternatives in order to enhance public safety for local residents and adjacent businesses. Flooding occurs on Camelback Road and the inundation extends onto properties to the north of Camelback Road. The Bill Luke automobile dealership to the south of Camelback Road has also experienced flooding. Many homes in this area experience flooding (up to one foot in depth) on a semi-annual or annual basis. Many residents use boards and/or sandbags to block flow of storm water to their homes.

During the course of the study and input received from the public two additional flooding locations were identified within the project study area. One in the vicinity of the 21st and Turney Avenues intersection (south of Camelback Road) and the other in the vicinity of the 23rd and Northern Avenues intersection. Premier was further tasked to investigate and determine possible mitigation measures for these areas as well.

The study area is bounded by the Arizona Canal to the north, Grand Canal to the south, I-17 to the west and 19th Avenue to the east. Since some areas west of I-17 drain to the study area through storm drains under the freeway, these areas were included in the hydrology. Figures 1 and 2 show this project area.

The topography of the watershed tends to route storm water toward an area between 19th Avenue and 15th Avenue at Camelback Road. This study did not focus on flows east of 19th Avenue.



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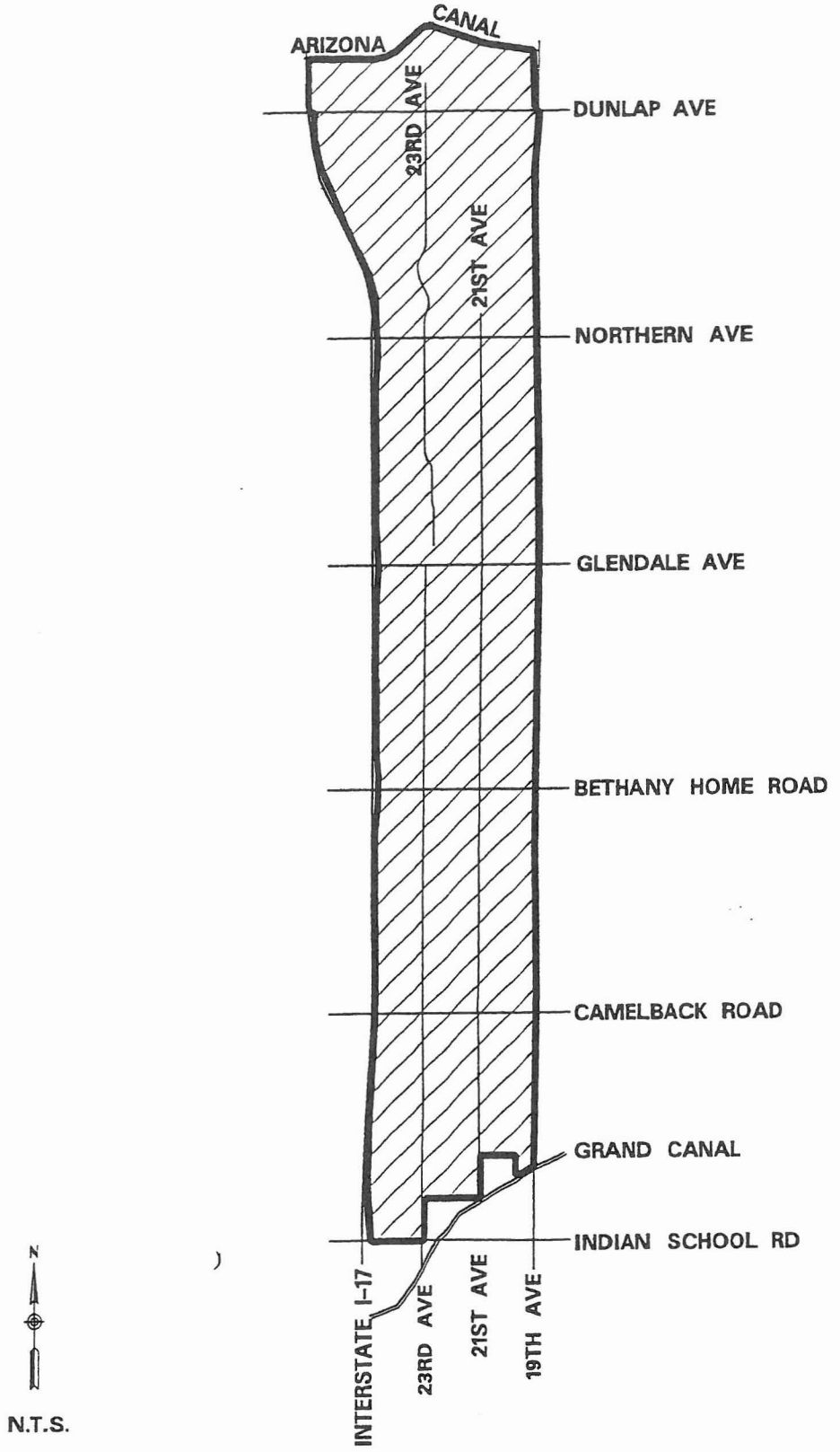
Not to Scale

Location Map

Figure 1

PREMIER



PREMIER ENGINEERING CORPORATION		STUDY AREA MAP	FIGURE 2
PROJECT NO. 2002010	DRAWN BY KL		
DATE 7/02	DESIGNED BY KD		

Plotted By: KD 0908/02 04:26:28 PM P:\2002010\Cadd\Premier\vicmap3d.dgn

1.3 Previous Reports and Studies

The Maryvale Area Drainage Master Study and the Christown Mall Area Drainage Master Study were utilized in the preparation of the hydrologic analysis. Topographic mapping was provided by the City of Phoenix and Flood Control District of Maricopa County. A drainage report by Primatech Engineers, "*Drainage Recommendations of Local Drainage Problems North and Central Service Centers* (Index No. ST-955237)", was prepared for the City of Phoenix in 1997. The report titled *"Route Study Report – 23rd Ave. Storm Drain"* written in 1976 by Henningson, Durham and Richardson outlined a 23rd Avenue storm drain concept. The proposed storm drain was designed to intercept and convey the 2-year flows. A secondary report titled "*23rd Avenue Storm Drain Study Arizona Canal to McDowell Road"* was prepared in August 1984 by Anderson-Nichols & Company. It re-evaluated the 1976 study hydrology and proposed utilizing the I-17 storm drain system. Excerpts from these reports are contained in Appendix W. The Initial Design Concept Report for Interstate 17 Traffic Interchange at Camelback Road was prepared by Entranco and is dated November 1997. Excerpts are not included in this report.

1.4 Floodplain Considerations

The majority of the watershed lies in Flood Zone X. This flood zone is defined as:

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

This study area is contained in the Flood Insurance Rate Maps, Panels 1665, 1655, 2130.

North of the Grand Canal, there are areas lying in Flood Zone A. These areas are defined as:

Special flood hazard areas inundated by the 100-Year Flood – No base flood elevations determined.

2 Existing Condition

The watershed contributing to the subject study area is approximately 3.6 square miles and is completely within the City of Phoenix. The surface gradients range from 1 to 5 percent with a general direction of flow from the northwest to the southeast. The average slope within the watershed is approximately 3 percent. The land use is primarily urban consisting of single-family residential housing developments, apartment complexes, parks and commercial/industrial areas. Before development the area was primarily agricultural. Salt River Project (SRP) provides irrigation via numerous channels and pipe systems to the area. The portion of the watershed between Dunlap Avenue and Northern Avenue, east of 23rd Avenue contains a golf course with lakes and retention basins that receive runoff from the developments within this area.

In the remainder of the watershed, storm water flows are primarily concentrated in the north-south arterial/collector streets, 23rd Avenue, 21st Avenue and 19th Avenue. In general, the storm water flows are split to the south and east at the mile streets (Dunlap Avenue, Northern

Avenue, Glendale Avenue and Bethany Home Road). A small rise to the west of 21st Avenue subdivides the drainage basin.

The primary flooding locations have been identified to be at 24th Avenue and Camelback Road. Runoff impacting the site is generated in the neighborhoods to the north and east. Runoff is routed south via 23rd and 24th Avenues and concentrates at Camelback Road. The storm drains in the immediate area are surcharged or do not function to prevent flooding. The Arizona Department of Transportation (ADOT) constructed detention basins on the northwest and northeast quadrants of 24th Avenue and Camelback. These basins have limited capacity to store the runoff at this location. Each basin is drained to the storm drain system at Camelback Road. The basins alleviate flooding for only the smallest storm events. Several residents have constructed block walls or berms in their front yards to mitigate flooding. Figures 3 and 4 show the 24th Avenue and Camelback Road site.

Residents have also indicated that flooding occurs south of Camelback Road along 21st Avenue. The residents indicated that the 21st Avenue alignment follows the historic corridor of Cave Creek Wash. Homes at Roma Avenue and Turney Avenue have also experienced frequent flooding. A small rise to the west of 21st Avenue concentrates flows east onto these streets. It is apparent that the slope of 21st Avenue is minimal at these locations and has resulted in flooding. Figures 5 and 6 show examples of the flooding experienced along 21st Avenue.

There are numerous storm drain systems within the limits of the watershed. Significant storm drain systems are located along the east-west arterials:

- Dunlap Avenue (24" to 40" diameter mains) – outfall to a 60" storm drain in 23rd Avenue
- Northern Avenue (18" to 24" diameter mains)
- Glendale Avenue (18" to 36" diameter mains)
- Bethany Home Road (24" to 42" diameter mains)
- Camelback Road (30" diameter main)
- Indian School Road (24" diameter main)

A regional storm drain exists along 19th Avenue. The main varies from a 30" diameter main south of the Arizona Canal to a 54" diameter main at the Grand Canal. A large diameter storm drain has been identified in 23rd Avenue between Dunlap Avenue and Northern Avenue. This main varies in size from 54" diameter to 60" diameter. The storm drain appears to end just south of Northern Avenue. It is not apparent whether storm water remains in the pipe after a storm event or is metered out through a smaller storm drain. City of Phoenix storm drain maps I-7, J-7, H-7 and G7 can be referenced for additional iformation.

The points of inflow from the west side of I-17 are at the following locations:

- Ocotillo Road
- Missouri Avenue (24" diameter pipe)
- Colter Street (18" diameter pipe)

In several locations, storm water ponds adjacent to I-17 (west side). The water then flows under I-17 via small diameter pipes. The peak discharge generated by the pipes is governed by the pipe size under I-17.

Figure 3: ***Typical berms at 24th Avenue and Camelback Road***

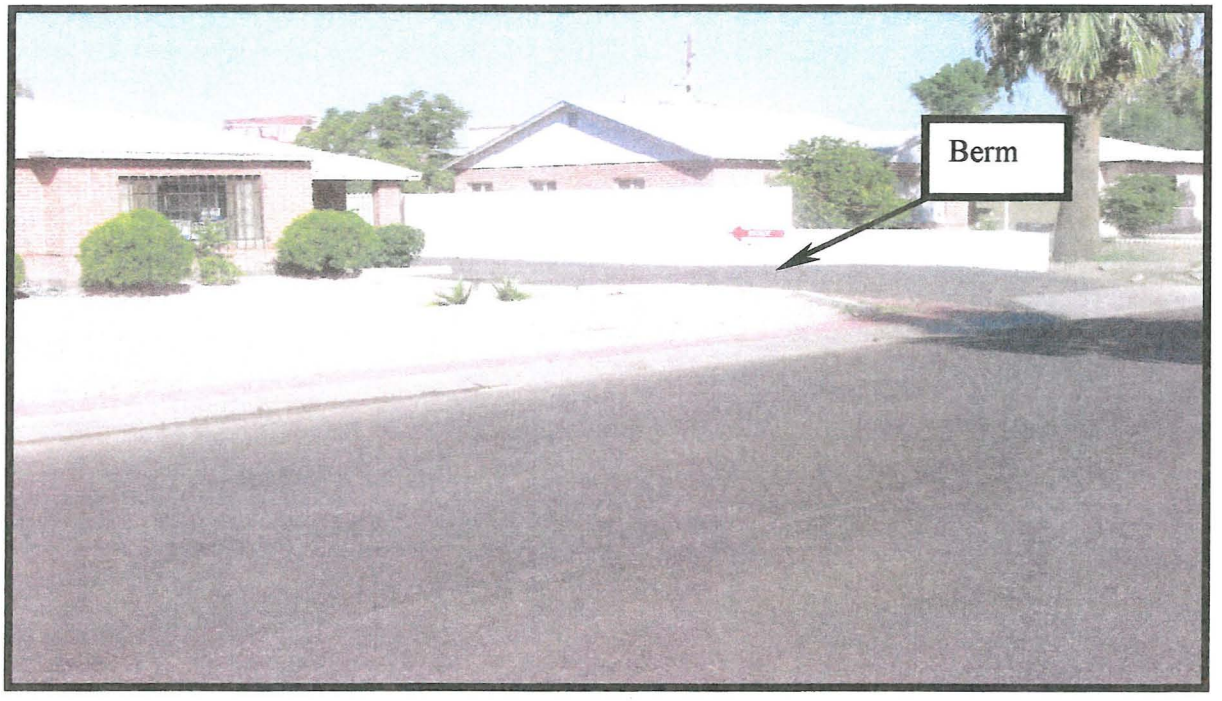


Figure 4: ***24th Avenue and Camelback Road Northwest Detention Basin***

Figure 5: ***Flooding Along Roma Avenue Near 21st Avenue***

This photo was taken on Roma Avenue looking west towards 21st Avenue.

Figure 6: ***Ponding along Roma Avenue***

This photo was taken after the storm event had passed.

3 PROJECT PROGRESS HISTORY

The following section summarizes the results and recommendations that were offered in the Draft DCR and the Executive Summary.

3.1 Draft DCR Report

A Draft DCR Report, dated September 2002, was submitted for review to City of Phoenix and Flood Control District of Maricopa County (FCDMC). This Draft DCR had developed four alternatives for flood protection with primary focus on the area around 24th Avenue and Camelback Road. The Alternative 1 (the "Do Nothing" option) and Alternative "4" (the "23rd Avenue Storm Drain System" option) were determined to be unacceptable and were eliminated from further analysis and discussion.

The concept of Alternative 2 was to capture the 100-year storm-water runoff in a large regional basin located north of Camelback Road in the vicinity of 21st Avenue.

Alternative 3 proposed the construction of a series of retention basins throughout the length of the watershed, by effectively utilizing any existing vacant parcels for storm water retention facilities.

Alternatives 2 and 3 were determined to be feasible concepts, but due to rather high construction cost of regional and multi-basin concepts, Premier was tasked with the development of a concept that is further focused in solving the known and localized flooding problem (i.e., 24th Avenue and Camelback Road area) and not the entire study area.

At this time the Draft DCR was closely examined with the changed and present staff of Premier, which resulted in a significant revisions and corrections to the HEC-1 models, cost estimates and recommendations. Premier was also tasked to perform the 100-year event Flood Damage Analysis and determine whether any of the alternatives would be economically feasible based on the Benefit:Cost analysis. It was agreed that the results be presented in the form of an executive summary for further discussion and possible acceptance.

3.2 Executive Summary, dated April 02, 2003

The Executive Summary was prepared as an interim to the Final DCR report and was presented to the City of Phoenix and FCDMC staff during a review meeting on April 2, 2003. The Executive Summary provided the results of Premier's further analysis of Alternatives 2 (Regional Basin) and 3 (Multi-Basin) as was described in the Draft DCR. Appendix ZZ contains a complete copy of the Executive Summary for reference. Following is a summary of the results presented in the Executive Summary:

Alternative 2 - Further analysis of Alternative 2 determined that this option would require acquiring a significant amount of developed property for the construction of one single retention basin. Considering the available construction funds the concept of constructing one regional basin for 100-year storm event was clearly an impossible task. A further investigation of the area local to 24th Avenue and Camelback Road intersection indicated that there are several vacant or abandoned parcels in the vicinity that could be utilized for retention facilities and reduce the number of developed properties needed for the construction of a regional retention basin and therefore reduce the initial construction cost. Furthermore, these vacant

parcels were adequate in size to provide retention for the 100-year runoff contributing to 24th Avenue independent of the remaining portions of the watershed. These basins were identified as Basins C.1 and C.2. There were two compelling reasons for addressing the retention at 24th Avenue independently by including the Basins C.1 and C.2 as part of the Regional Basin Concept. 1) Reduces the amount of developed property required to construct a regional retention basin, and 2) these basins can be constructed as a standalone initial phase and provide an immediate solution to the known flooding area. The 100-year runoff from the remaining portion of the watershed would be collected in a regional retention basin located between 23rd Avenue and 21st Avenue just north of Camelback. Alternative 2 also included the construction of a retention basin located at the southeast corner of 20th Avenue and Turney (Basin "X"). Basin "X" will provide retention storage for the 100-year storm water runoff for the contributing watershed south of Camelback Road.

Alternative 3 - This concept reduced the need to acquire developed properties along the north side of Camelback Road for the construction of a single regional retention basin by utilizing additional retention basins upstream. Alternative 3 was further broken into two scenarios referred to as Alternative 3a and Alternative 3b.

> Alternative 3a - It proposed the construction of six retention basins, Basin J, Basin I (Washington Park), Basin C.1, Basin C.2, Basin A and Basin X. Alternative 3a utilized Basins J and I to collect the 100-year upstream runoff reducing the amount of runoff contributing to 21st Avenue and Camelback. Basins C.1 and C.2 were proposed to collect the 100-year runoff contributing to 24th Avenue and Camelback. Basin A would collect the reduced 100-year runoff north of Camelback Road. Basin X would collect the 100-year runoff south of Camelback Road. A combination of storm drain systems, roadway re-construction, and spillways would be required to convey the runoff into the proposed basins.
>
> Alternative 3b – This was identical to Alternative 3a except it eliminated Basin J reducing the number of retention basins to five. Basin I (Washington Park) was found to be capable of provide the contributing 100-year runoff retention upstream with lesser cost than having Basin J. including the excess flows caused by the elimination Basin J.

The Executive Summary recommended the Alternative 3b as the preferred alternative because of the least cost and conformance with the possible phased construction.

For the basis of design refer to the Executive Summary included in Appendix ZZ.

A flood damage assessment was performed to determine whether any of the proposed drainage plans would be economically feasible when analyzed through a benefit: cost analysis. All variations of the project financial analysis yielded a positive benefit: cost ratio, which indicates that the project is economically justified, given the assumptions that were used for the analysis.

A detailed cost estimate was prepared for each storm event under each alternative. Also presented were the results of a detailed flood damage assessment that was performed to determine whether any of the proposed alternatives would be economically feasible using a benefit: cost analysis.

See Appendix ZZ, Table 2 for a copy of the summary of the project costs and benefits that were computed for the 100-, 25-, 10-, and 2-year storms for Alternative 3b as presented in the Executive Summary.

4 PHASED CONSTRUCTION CONCEPT

Subsequent to the review of the Executive Summary results and recommendations and coordination meetings with the staff from City of Phoenix and FCDMC, the Phased Construction Concept was proposed. Following four phases were identified:

1) Phase I – Camelback Road Regional Basin sized for 25-year storm event
2) Phase II – Washington Park Basin sized for 50-year storm (minimum). Optimize the basin size for 100-year storm event, if possible.
3) Phase III – Northern Avenue Basin to eliminate local flooding and if needed, supplement phase I and II measures to provide 100-year protection,
4) Phase IV – Basin X at the Grand Canal sized for 100-year storm event for the southern portion of the study area, south of Camelback Road.

These phases are described in detail below and are depicted on the Phased Retention/Detention Basins Map. See figure 7.

Section 5 provides a detailed hydrological description for each phase.

4.1 Phase I –Regional Retention Basin – Basin "A"

Phase I will include the construction of a single regional retention basin located north of Camelback Road between 24th Avenue and 21st Avenue. This basin is separated only with the existing alignments of 22nd and 23rd Avenues assuming that they will remain in service. The majority of the storm water runoff reaches Camelback Road at two dip sections 1) at 24th Avenue, which is trapped without any outlet, 2) at 21st Avenue, known as the old Cave Creek Wash, which flows across the Camelback Road continuing south. The 21st Avenue alignment, expectedly, conveys a significant portion of the runoff generated in upstream portion of the project watershed. To capture the flows approaching these two dip sections, the configuration of Basin "A" was stretched from 24th Avenue to 21st Avenue utilizing currently developed and undeveloped properties.

The proposed basin layout includes three sections; the first will utilize a portion of the residential neighborhood located on the north side of Camelback Road at 24th Avenue. It extends north turning and extending east to 23rd Avenue. The second section of the basin is located between 23rd and 22nd Avenues along the south side of Windsor Boulevard. The third section is located between 22nd and 21st Avenues along the south side of Windsor Boulevard. These basin sections will be connected across 23rd Avenue and 22nd Avenue with equalizing storm-drain pipes. Minor street reconstruction and storm-drain pipes will be required to convey the contributing runoffs into the basin. Concrete spillways will be constructed to convey the storm-water from the streets into the basins at each section.

Basin "A" is sized to handle the 25-year storm event for the entire contributing watershed north of Camelback Road. The 25-year required volume is 83 acre-feet. In the Executive Summary dated April, 2003, Basin "A" was sized for the 100-year storm with a resulting required volume of 113 acre-feet. The City records indicates that there is an existing 27-inch to 30-inch storm-drain pipe running east-west in Camelback Road, approximately 10-feet deep. This storm drain pipe is connected to the regional storm drain system in 19th Avenue and can be utilized to bleed-off the stored volume of storm water in Basin A.

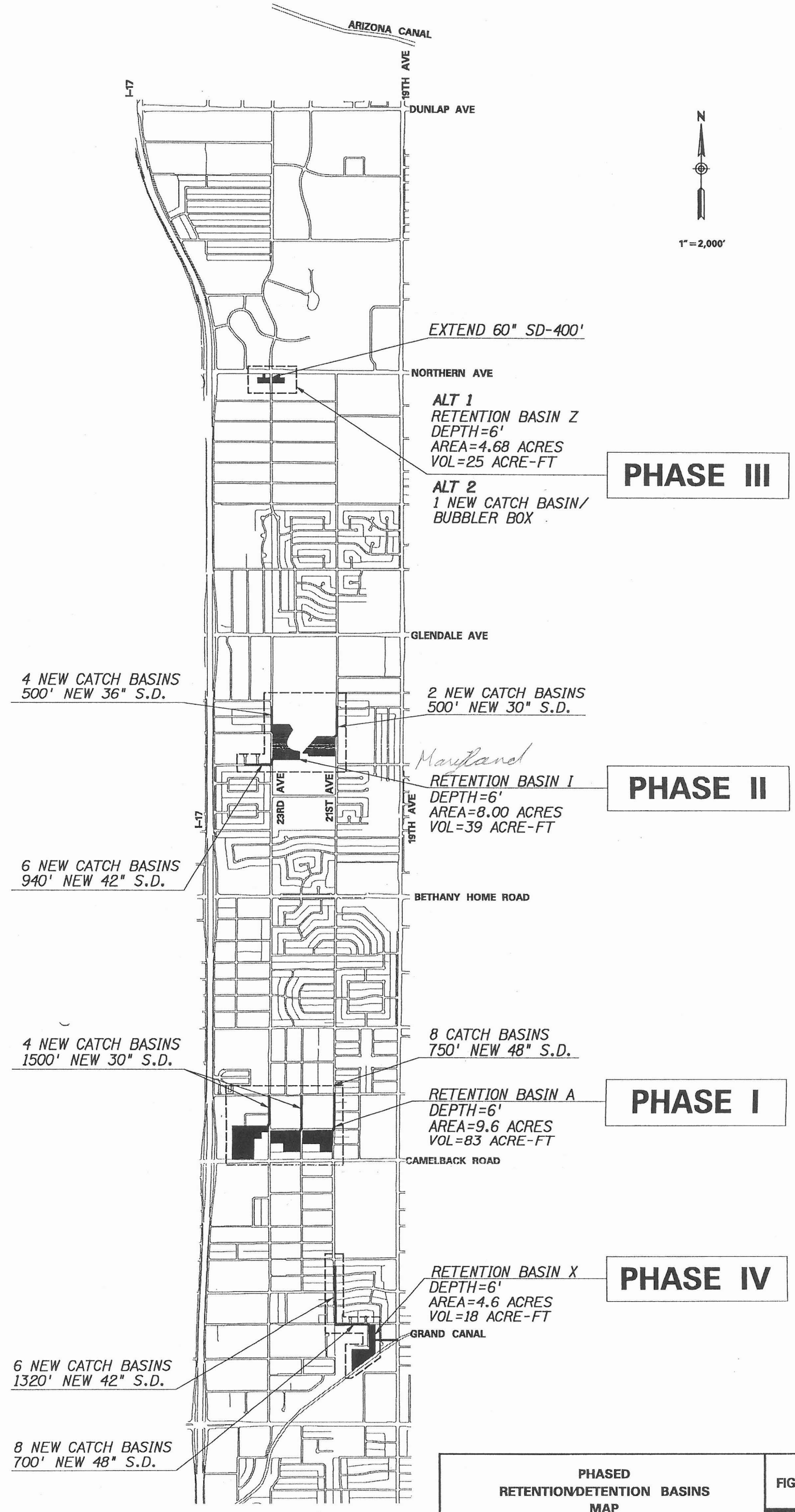
Figure 8 depicts a graphical exhibit of the proposed layout for Basin "A" including a detailed cost estimate.

4.2 Phase II – Washington Park Retention Basin – Basin "I"

Phase II will include reconstructing a portion of Washington Park located north of Maryland between 23rd and 21st Avenues as a retention basin. As a first trial, Basin "I" was sized to handle the 50-year storm event runoff from the portion of the watershed north of Maryland, which resulted in a required retention volume of 43 acre-feet. Under this scenario, Basin "A" was not utilized fully, which was an indication that potentially a 100-year Storm event level of protection may be provided with completion of this phase. Therefore, it was decided to optimize the available volume in Basin "A" to 81 acre-feet allowing 2 acre-feet of freeboard, and sizing Basin "I" for 100-year storm for the portion of the watershed north of Camelback Road. This resulted in a required retention volume for Basin "I" of 39 acre-feet. Excess runoff exceeding the capacity at the Washington Park retention basin will overflow and surface drain eventually contributing to the Camelback/24th Avenue retention basin. In the Executive Summary, Alternative 3b, Basin "I" was sized to handle the 100-year contributing runoff north of Washington Park which resulting in a required retention volume of 42 acre-feet. Minor street reconstruction and storm-drain pipes will be required to convey the contributing runoffs into the Basin "I". Concrete spillways will be constructed to convey the storm-water from the adjacent streets into the basin. Appendix A includes a graphical exhibit of the proposed layout for Basin "I" including a detailed cost estimate.

4.3 Phase III – Northern & 23rd Avenues Drainage Improvements

The concept for Phase III addresses local flooding problems occurring in the vicinity of 23rd Avenue and Northern Avenue. The site investigation and study of the record drawings indicates that the portion of the north half of Northern Avenue west of 23rd Avenue intersection experiences some minor flooding. This is caused mainly due to shallow gradient of the street



PHASED RETENTION/DETENTION BASINS MAP

FIGURE 7

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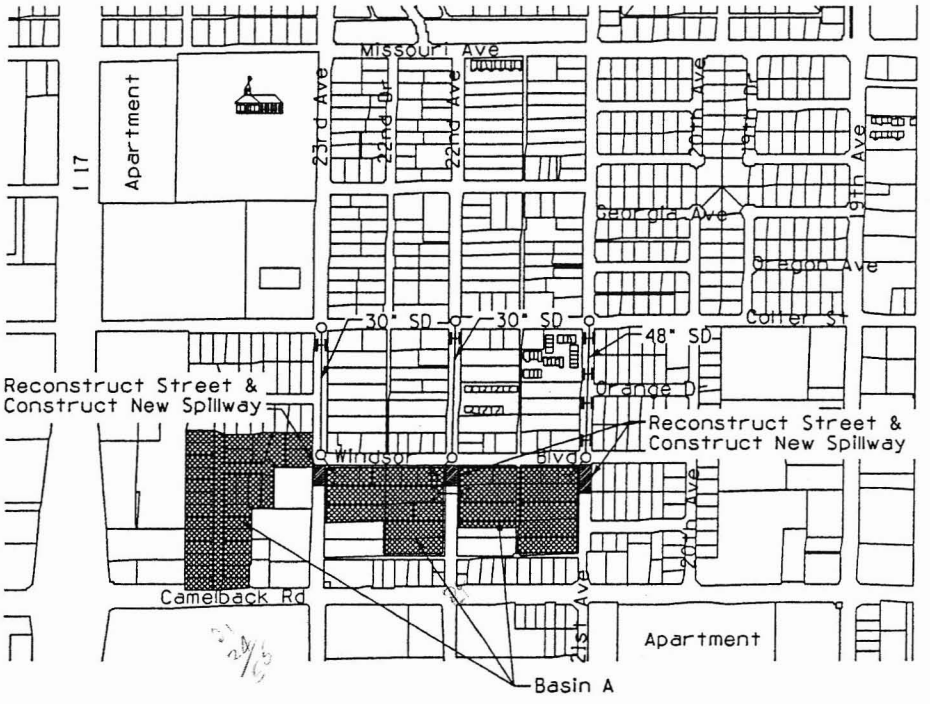

Basin "A"				
Description	Units	Total	Unit Price	Amount
Demolition	ac	15.5	$12,000.00	$186,000.00
Excavation	cy	135000	$5.00	$675,000.00
Catch Basins	ea	12	$10,000.00	$120,000.00
48" HDPE Storm Drain	lf	750	$60.00	$45,000.00
30" HDPE Storm Drain	lf	1500	$45.00	$67,500.00
Equalizer Pipes	lf	400	$60.00	$24,000.00
Manholes	ea	9	$3,500.00	$31,500.00
Bleed-off System	ls	1	$20,000.00	$20,000.00
Remove & Replace Asphalt Pavement	sy	1500	$30.00	$45,000.00
Street Reconstruction (21st Ave.)	lf	350	$110.00	$38,500.00
Street Reconstruction (22nd Ave.)	lf	250	$110.00	$27,500.00
Street Reconstruction (23rd Ave.)	lf	250	$110.00	$27,500.00
Spillway	ls	3	$20,000.00	$60,000.00
Landscape/Irrigation	ac	15.5	$32,670.00	$506,385.00
Survey/Testing (4%)	ls	1	$75,000.00	$75,000.00
			Sub-Total =	*$1,948,885.00*
			Contingency (20%) =	*$389,777.00*
			Construction Cost =	*$2,338,662.00*
			Engineering Fees (12%) =	*$280,639.44*
			Land Acquisition =	*$4,459,341.00*
			Administrative Fees (5%) =	*$116,933.10*
			Total =	*$7,195,575.54*

N

Not to Scale

Phase I - Camelback/24th Ave.
24th Ave and Camelback Rd
Drainage Improvement

FIGURE 8
Basin A

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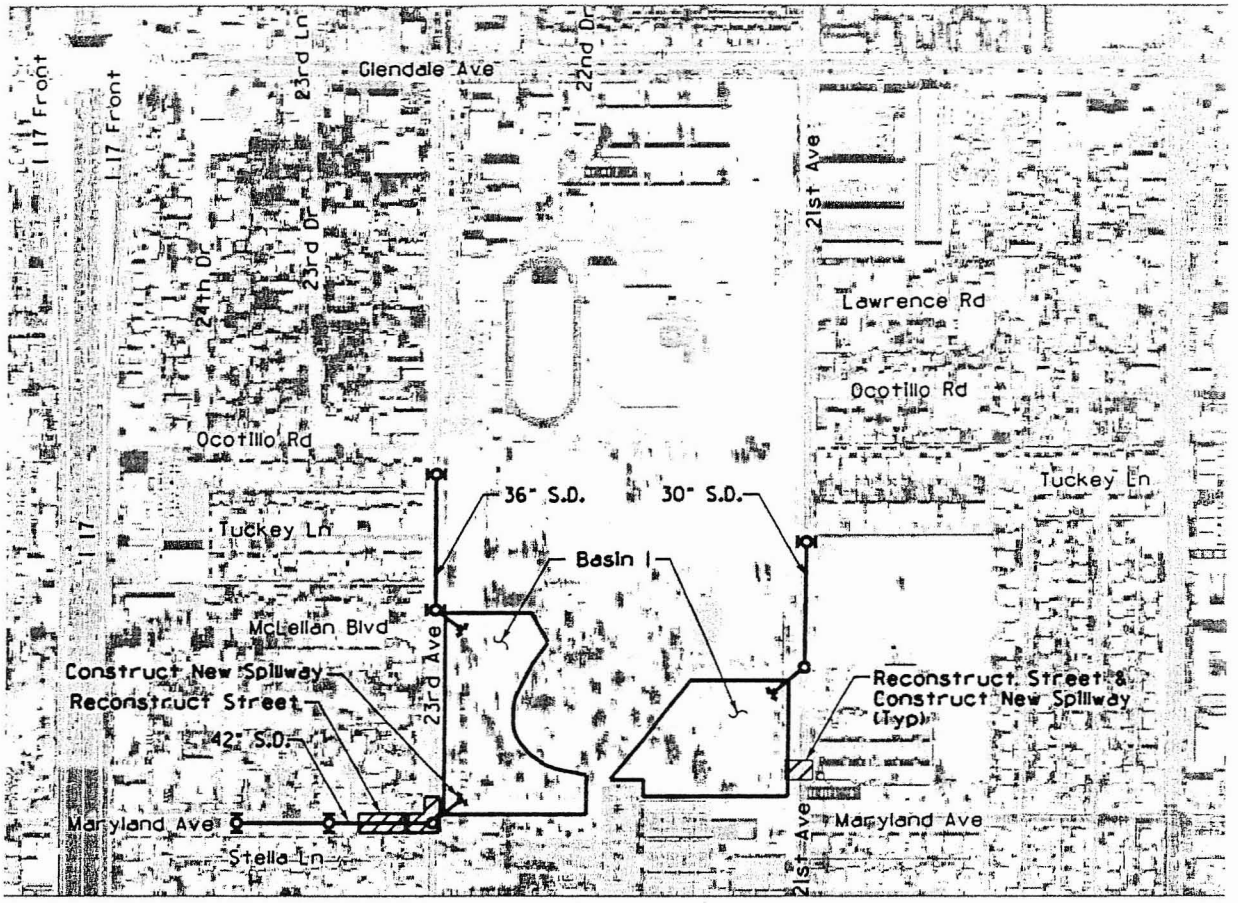

Basin "I" (Washington Park)				
Description	Units	Total	Unit Price	Amount
Demolition	ac	11.3	$2,000.00	$22,600.00
Excavation	cy	68000	$5.00	$340,000.00
Catch Basins	ea	12	$10,000.00	$120,000.00
42" HDPE Storm Drain	lf	950	$50.00	$47,500.00
36" HDPE Storm Drain	lf	500	$50.00	$25,000.00
30" HDPE Storm Drain	lf	500	$45.00	$22,500.00
Manholes	ea	7	$3,500.00	$24,500.00
Drywells	ea	52	$5,000.00	$260,000.00
Remove & Replace Asphalt Pavement	sy	2000	$30.00	$60,000.00
Street Reconstruction (23rd Ave.)	lf	300	$110.00	$33,000.00
Street Reconstruction (21st Ave.)	lf	250	$110.00	$27,500.00
Street Reconstruction (Maryland)	lf	200	$110.00	$22,000.00
Spillway	ls	2	$20,000.00	$40,000.00
Landscape/Irrigation	ac	11.3	$32,670.00	$369,171.00
Survey/Testing (4%)	ls	1	$56,550.00	$56,550.00
			Sub-Total =	*$1,470,321.00*
			Contingency (20%) =	*$294,064.20*
			Construction Cost =	*$1,764,385.20*
			Engineering Fees (12%) =	*$211,726.22*
			Land Acquisition =	*$0.00*
			Administrative Fees (5%) =	*$88,219.26*
			Total =	*$2,064,330.68*

Not to Scale

Phase II – Washington Park
24th Ave and Camelback Rd
Drainage Improvement

FIGURE 9
Basin I

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curb and gutter and lack of an outfall for the existing storm drain system in the area. A 60" storm drain pipe exists in 23rd Avenue, which begins at Dunlap Avenue (54") and ends just south of Northern (60") without any outlet.

Since the project watershed is protected from the 100-year storm with the installation of Basin "A" (phase I) and Basin "I" (Phase II), there was no need to provide a retention basin in this area unless it was necessitated locally. This report provides two alternatives for solving the flooding problems at 23rd Avenue and Northern Avenue. Alternative 1 would provide a retention basin located on either side of 23rd Avenue just south of Northern Avenue. This option is the more expensive solution since it will require acquiring approximately 4.7 acres of developed property for the construction of the basin. Alternative 2 provides a less expensive solution by constructing a catch basin/bubbler box structure downstream from the intersection. The proposed catch basin/bubbler box system will provide an outlet for the storm-water ponding at the intersection. Following is a detailed description of each alternative for Phase III.

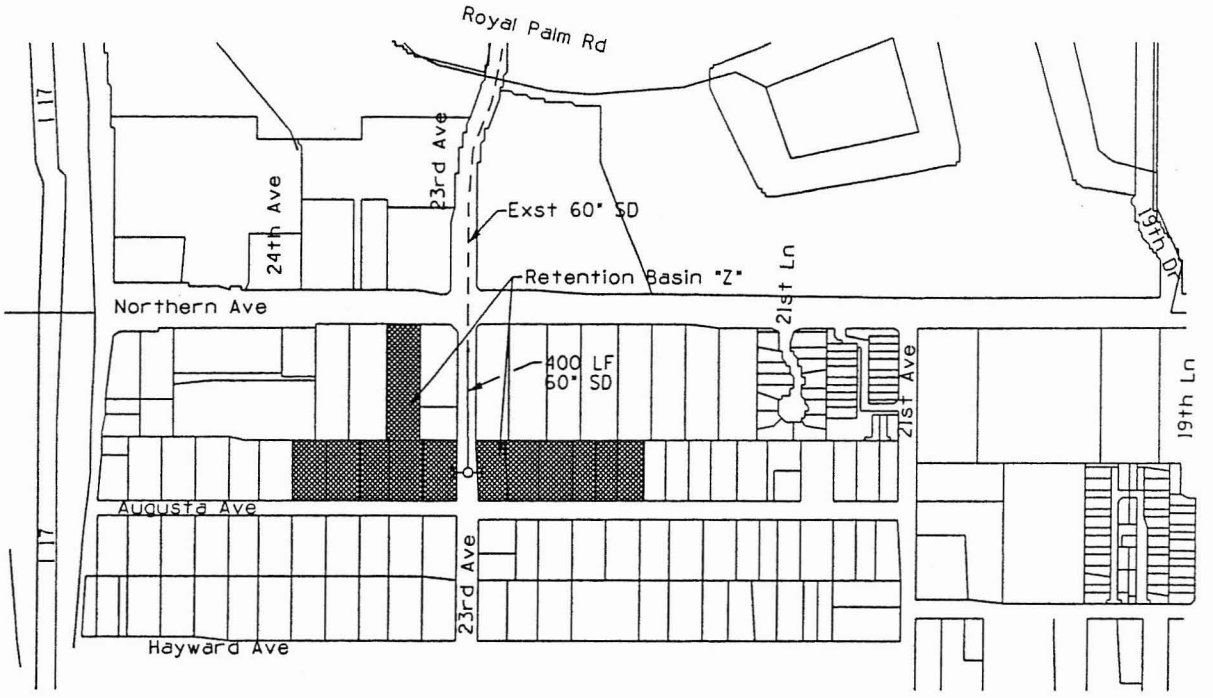
- Alternative 1 – Basin "Z":

  Phase III, Alternative 1 would include the construction of a retention basin located near the intersection of 23rd Avenue and Northern Avenue. Alternative 1 would require acquiring approximately 4.7 acres of currently developed property just south of the intersection for the construction of a retention basin. Figure 10 depicts a graphical exhibit of the proposed layout for Basin "Z" including a detailed cost estimate.

  This retention basin will be sized to handle the contributing runoff from the existing 60-inch storm-drain pipe for approximately 25 acre-feet. The existing 60-inch storm-drain pipe will be extended approximately 400-feet and connected to the proposed Basin "Z". According to the City records, the existing 60-inch storm-drain pipe is approximately 18-feet below the street grade, invert = 1181.2+/-. Therefore the 60-inch storm-drain pipe would need to be connected to two drywells and bubble up into Basin "Z". It will require two drywells to drain the residual storm-water runoff currently being stored in the existing storm-drain system (see below). This retention basin will eliminate the local flooding, which occurs in this area. Excess runoff will overflow and surface drain eventually contributing to the Washington Park retention basin. See Appendix A for an exhibit of Phase III, Alternative 1 including a detailed cost estimate.

- Alternative 2 – Catch Basin/Drywell:

  This Alternative offers a less expensive solution for solving the local flooding problems at 23rd Avenue and Northern Avenue by eliminating the retention basin and subsequent land acquisition. As-Built records indicate that this 60-inch storm-drain pipe is approximately 18-feet deep and terminates just south of the intersection of 23rd Avenue and Northern Avenue. Using Manning's equation, the full flow capacity of this 60-inch storm-drain pipe is 114 CFS (n=0.012, S=0.40%). Also, an existing 18-inch storm-drain pipe running east west in Northern Avenue exists, which connects to the 60-inch storm-drain pipe and continues east eventually connecting to the storm-drain system in 19th Avenue. The 18-inch storm-drain pipe has a high point located between its connection to the 60-inch storm-drain pipe and the connection at 19th Avenue. The invert elevation of the 18-inch pipe at this high point is 1189.00. This 18-inch pipe bleeds-off some of the runoff contributing to the 60-inch storm-drain pipe in 23rd Avenue to the storm-drain system in 19th Avenue. That portion of the 60-inch storm-



Basin "Z"				
Description	**Units**	**Total**	**Unit Price**	**Amount**
Demolition	ac	4.68	$10,000.00	$46,800.00
Excavation	cy	41000	$5.00	$205,000.00
Catch Basins	ea	2	$10,000.00	$20,000.00
60" RGRCP Storm Drain	lf	400	$200.00	$80,000.00
Manholes	ea	1	$3,500.00	$3,500.00
Drywells	ea	2	$5,000.00	$10,000.00
Remove & Replace Asphalt Pavement	sy	300	$30.00	$9,000.00
Landscape/Irrigation	ac	4.68	$32,670.00	$152,895.60
Survey/Testing (4%)	ls	1	$22,615.00	$22,615.00
			Sub-Total =	***$549,810.60***
			Contingency (20%) =	***$109,962.12***
			Construction Cost =	***$659,772.72***
			Engineering Fees (12%) =	***$79,172.73***
			Land Acquisition =	***$1,273,500.00***
			Administrative Fees (5%) =	***$32,988.64***
			Total =	***$2,045,434.08***

N

Not to Scale

Phase III Alternative 1 – Northern/23rd Ave. 24th Ave and Camelback Rd

Drainage Improvement

FIGURE 10
Basin Z

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drain pipe, which is below the high-point elevation of 1189.00 will store storm-water with no existing outlet for disposal. The residual volume being stored in the 60-inch pipe is approximately 41,600 cubic feet. Using an assumed percolation rate of 0.25 cfs, two drywells will be required to drain this residual runoff within 36-hours. Visual inspection of the area indicates that the street crowns in Northern Avenue and 23rd Avenue are higher than the gutter elevation at the catch basins described above; therefore, runoff exceeding the storage capacity of the existing storm-drain system bubbles up through these catch basins and is trapped by the street crowns causing the street flooding and some flooding of the private properties. This flooding is temporary due to the bleed-off function provided by the existing 18" pipe.

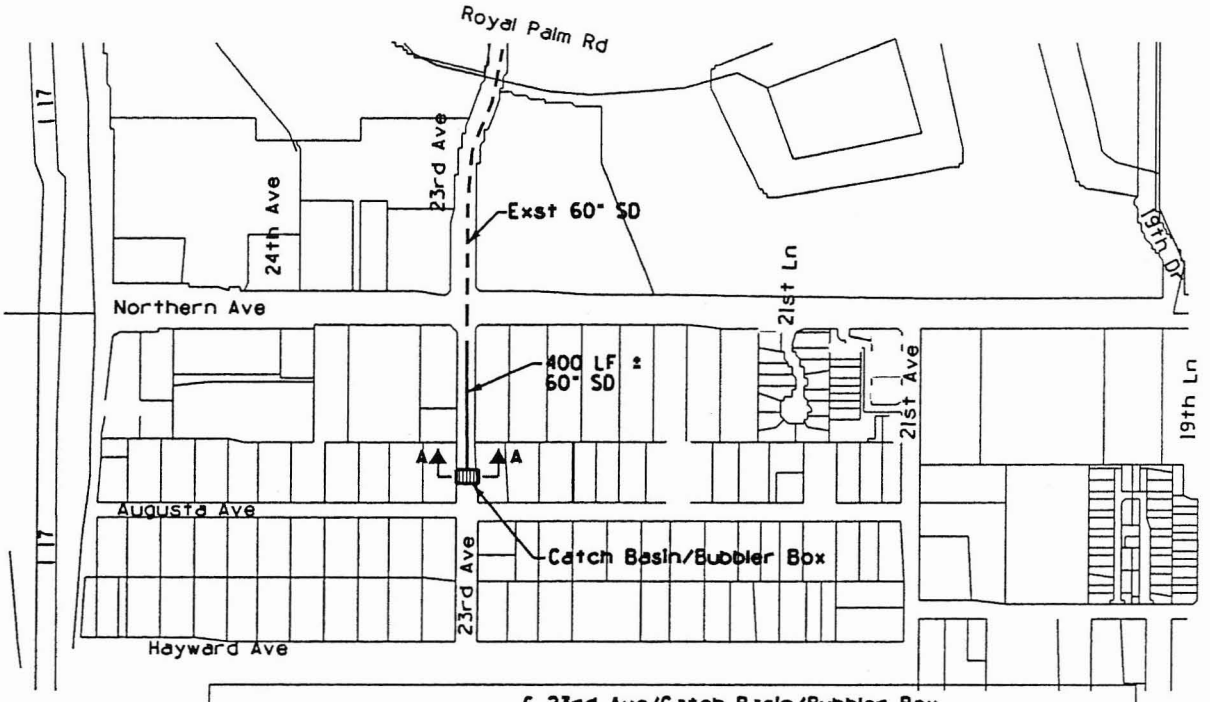
Phase III, Alternative 2 offers a solution which would provide an outfall for the runoff being trapped at the intersection of 23rd and Northern Avenues as well as provide a method for draining the storm-water runoff currently being stored in the 60-inch storm-drain pipe. Alternative 2 would include the construction of a large catch basin structure in 23rd Avenue south of Northern Avenue. The existing 60-inch storm-drain pipe would be extended south and connected to this catch basin structure. The catch basin structure would be located as far south as needed so that the grate would be at a lower elevation than the existing gutter elevation at the catch basins north and west of the intersection of 23rd Avenue and Northern Avenue. This catch basin structure will provide an outlet for the storm-water runoff currently being trapped and flooding this area. Excess runoff exceeding the capacity of the 60-inch storm-drain pipe would bubble up through this catch basin and continue south to the Washington Park retention basin. The proposed catch basin would also be connected to a drywell system utilized for draining the runoff collected in the 60-inch storm-water pipe. See Figure 11 for an exhibit of Phase III, Alternative 2 including a detailed cost estimate.

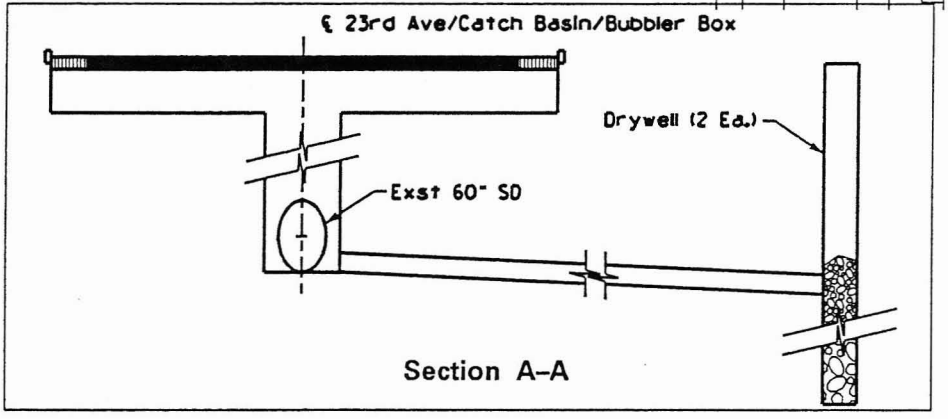
4.4 Phase IV – Turney/20th Avenue Retention Basin "X"

As described in the Executive Summary, Alternative 2 included the construction of a retention basin located at the southeast corner of 20th Avenue and Turney (Basin "X"). Basin "X" will provide retention storage for the 100-year storm water runoff for the contributing watershed south of Camelback Road. A storm-drain system located in 21st Avenue and Turney will be provided to convey the storm-water runoff into Basin "X". Basin "X" design concept remains unchanged as presented in the Executive Summary, except some minor adjustment to the cost estimate. See Figure 12 for an exhibit of Phase IV including a detailed cost estimate.

5 HYDROLOGIC MODELING

The original hydrologic modeling for this project was presented in the Phase 1 Draft DCR which was published in September 2002. All modeling was performed with the Corps of Engineers HEC-1 Program (Flood Hydrograph Package) using hydrologic procedures published by the Flood Control District of Maricopa County (Clark unit hydrograph and Green-Ampt)





Catch Basin/Bubbler Box				
Description	Units	Total	Unit Price	Amount
Catch Basin/Bubbler Box	ea	1	$25,000.00	$25,000.00
60" RGRCP Storm Drain	lf	400	$200.00	$80,000.00
Drywells	ea	2	$18,000.00	$36,000.00
Remove & Replace Asphalt Pavement	sy	300	$30.00	$9,000.00
Survey/Testing (4%)	ls	1	$6,000.00	$6,000.00
			Sub-Total =	*$156,000.00*
			Contingency (20%) =	*$31,200.00*
			Construction Cost =	*$187,200.00*
			Engineering Fees (12%) =	*$22,464.00*
			Land Acquisition =	*$0.00*
			Administrative Fees (5%) =	*$9,360.00*
			Total =	*$219,024.00*

Not to Scale

Phase III Alternative 2 – Northern/23rd Ave.
24th Ave and Camelback Rd
Drainage Improvement

FIGURE 11
Catch Basin/Bubbler Box

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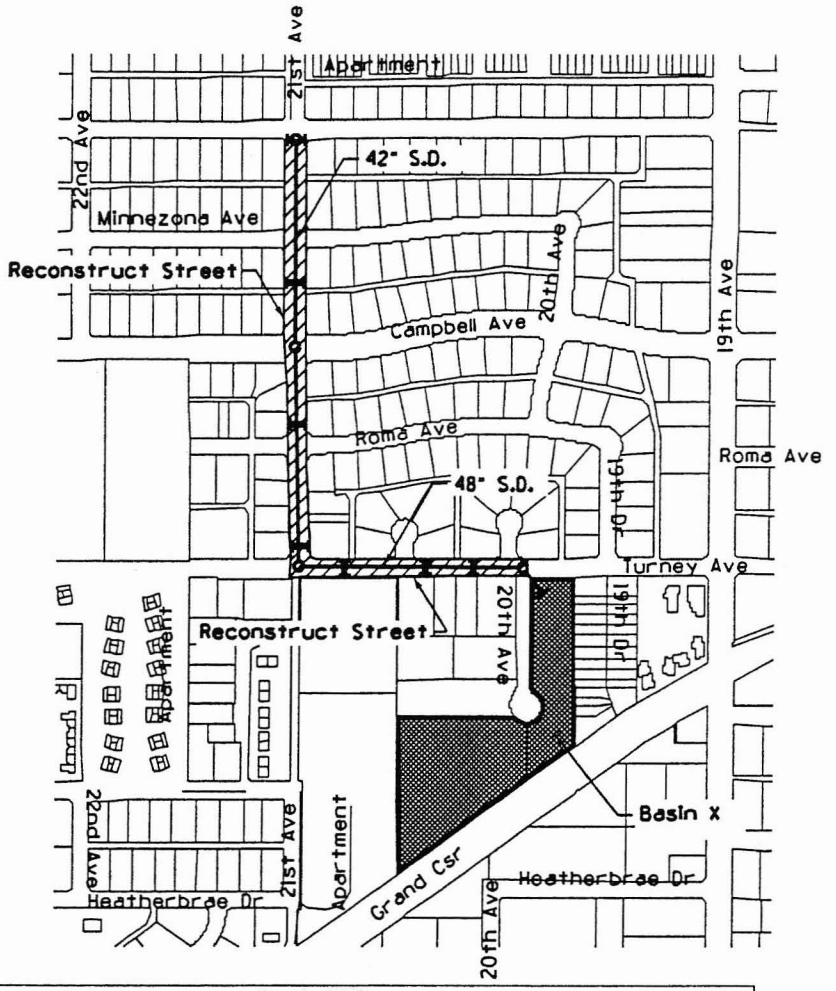

Basin "X"				
Description	Units	Total	Unit Price	Amount
Clear & Grubb	ac	4.6	$1,000.00	$4,600.00
Excavation	cy	29050	$5.00	$145,250.00
Catch Basins	ea	14	$10,000.00	$140,000.00
42" HDPE Storm Drain	lf	1320	$55.00	$72,600.00
48" HDPE Storm Drain	lf	700	$60.00	$42,000.00
Manholes	ea	5	$3,500.00	$17,500.00
Drywells	ea	24	$5,000.00	$120,000.00
Remove & Replace Asphalt Pavement	sy	900	$30.00	$27,000.00
[1&2]Street Reconstruction (Turney) - 88 cfs	lf	700	$110.00	$77,000.00
[2]Street Reconstruction (21st Ave) - 88 cfs	lf	1320	$110.00	$145,200.00
Spillway	ls	1	$20,000.00	$20,000.00
Landscape/Irrigation	ac	4.6	$32,670.00	$150,282.00
Survey/Testing (4%)	ls	1	$38,500.00	$38,500.00
			Sub-Total =	*$999,932.00*
			Contingency (20%) =	*$199,986.40*
			Construction Cost =	*$1,199,918.40*
			Engineering Fees (12%) =	*$143,990.21*
			Land Acquisition (Pro-Rated) =	*$505,500.00*
			Administrative Fees (5%) =	*$59,995.92*
			Total =	*$1,909,404.53*

N

Not to Scale

Phase IV – Turner/20th Avenue
24th Ave and Camelback Rd
Drainage Improvement

FIGURE 12
Basin X

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February 2003. The results of this review were published in a technical memorandum that was provided to the City of Phoenix and to the Flood Control District of Maricopa County.

As a result of this review, numerous changes were made to the HEC-1 models for both existing and proposed conditions. The results of the revised hydrologic modeling, along with updated drainage plans, cost estimates, and benefit analyses were presented to the City of Phoenix and to the Flood Control District of Maricopa County in a Final DCR Executive Summary dated April 2, 2003.

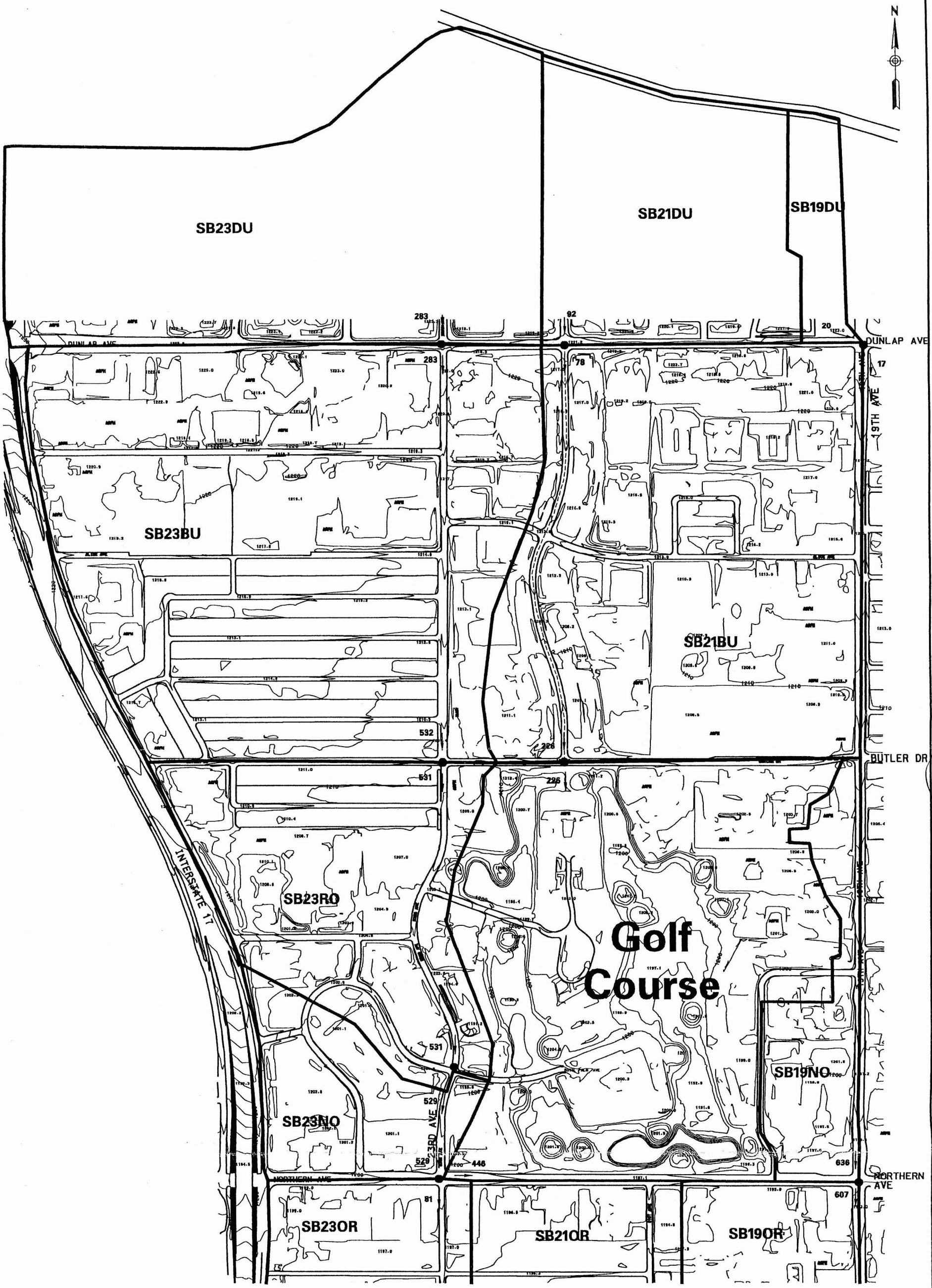
Subsequent coordination meetings with the City of Phoenix (since April 2003) have resulted in a request by the City to make some modifications to the drainage plans that were published in the April 2, 2003 Final DCR Executive Summary. Accordingly, the purpose of this report is to discuss the hydrologic modeling that was undertaken to simulate these modifications, and, to update the benefit:cost analysis associated with such modifications. These modifications were previously discussed in the Revised Executive Summary published on August 26, 2003.

The HEC-1 modeling that was performed for this update was implemented in phases that added additional drainage improvements as work progressed from one phase to the next. A brief discussion of each phase, as well as its hydrologic performance, is presented in the following sections.

It should be noted that the drainage plans previously presented in the original Phase 1 Draft DCR (September 2002) and in the April 2, 2003 Final DCR Executive Summary are not included in this updated report, except a brief description of each in Section 3, Project Progress History. The only drainage plans included in this updated report are those previously published in the August 26, 2003 Revised Executive Summary.

As a matter of technical interest, it should be noted that the HEC-1 models used in this updated analysis include a revised street diversion routine at the intersection of 23rd Avenue and Northern Avenue (CP23NO/DV23NO). This modification was made to provide a more realistic distribution of flow to the east and to the south from this intersection. All storm drain diverts have also been deleted from the contributing drainage area to this intersection since there is no reliable data to presently indicate that the storm drains have a known outfall that will accept a specific rate of flow.

This report also includes copies of the revised HEC-1 models that were prepared for existing watershed conditions. Plates 1 and 2 (see inside back cover) show the HEC-1 routing schematics for existing conditions. Models were prepared for the 100-, 25-, 10-, and 2-year, 6-hour storms. Figures 13(a-d) shows the watershed delineation for the existing conditions. A complete printout of all input and output data for the 100-year storm is contained in Appendix A. Appendices B, C, and D present the output summaries for the 25-, 10-, and 2-year storms. Complete input and output files for both existing conditions, and for proposed drainage plans, are provided on the enclosed compact disk.

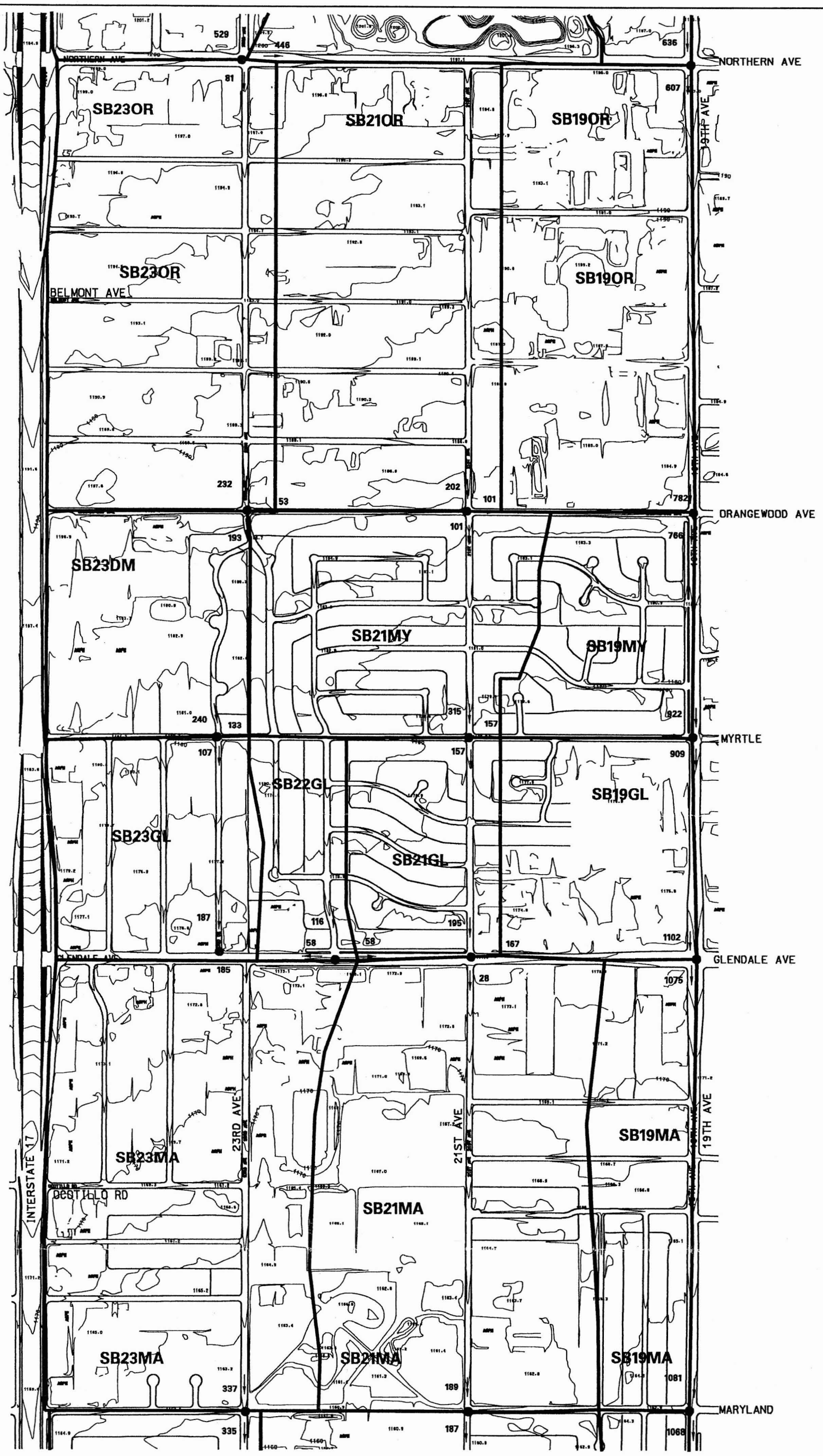


600' 300' 0' 600' 1200'

SCALE: 1" = 600'

PREMIER		EXISTING CONDITION 100-YR PEAK FLOW MAP	FIGURE 13a
ENGINEERING CORPORATION			
PROJECT NO. 2002010	DRAWN BY MR		
DATE 6/1402	CHECKED BY KD		

Plotted By: SG 09/24/2003 12:47:41 PM P:\2002010\Cadd\Premier\100_YR_Fig_(1)v7.dgn

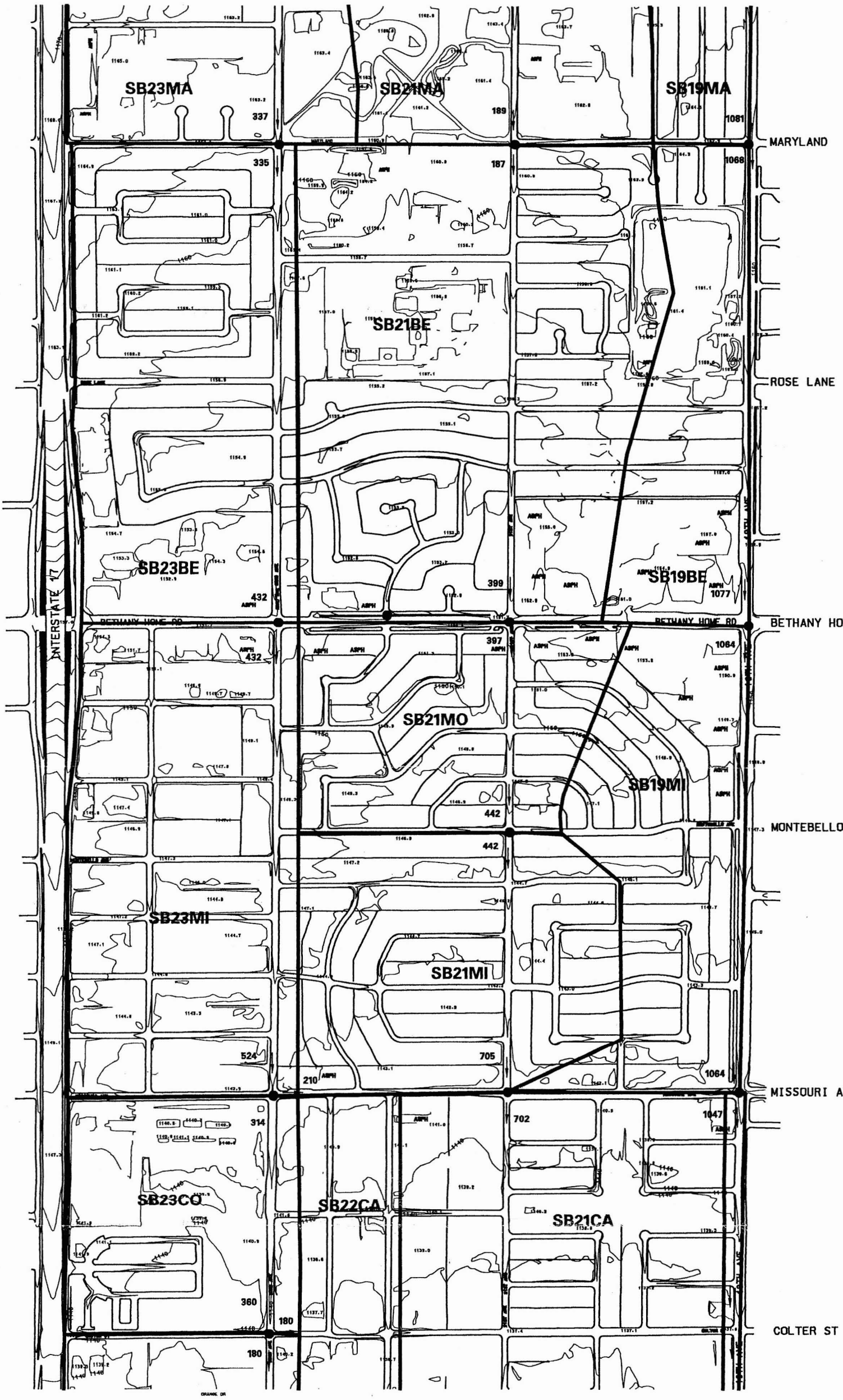


PREMIER ENGINEERING CORPORATION	
PROJECT NO. 2002010	DRAWN BY MR
DATE 6/1402	CHECKED BY KD

EXISTING CONDITION 100-YR PEAK FLOW MAP

FIGURE 13b

Plotted By: SG 09/24/2003 12:48:21 PM P:\2002010\Cadd\Premier\100_YR_Fig_(2).dgn



PREMIER ENGINEERING CORPORATION		EXISTING CONDITION 100-YR PEAK FLOW MAP	FIGURE 13c
PROJECT NO. 2002010	DRAWN BY MR		
DATE 6/1402	CHECKED BY KD		

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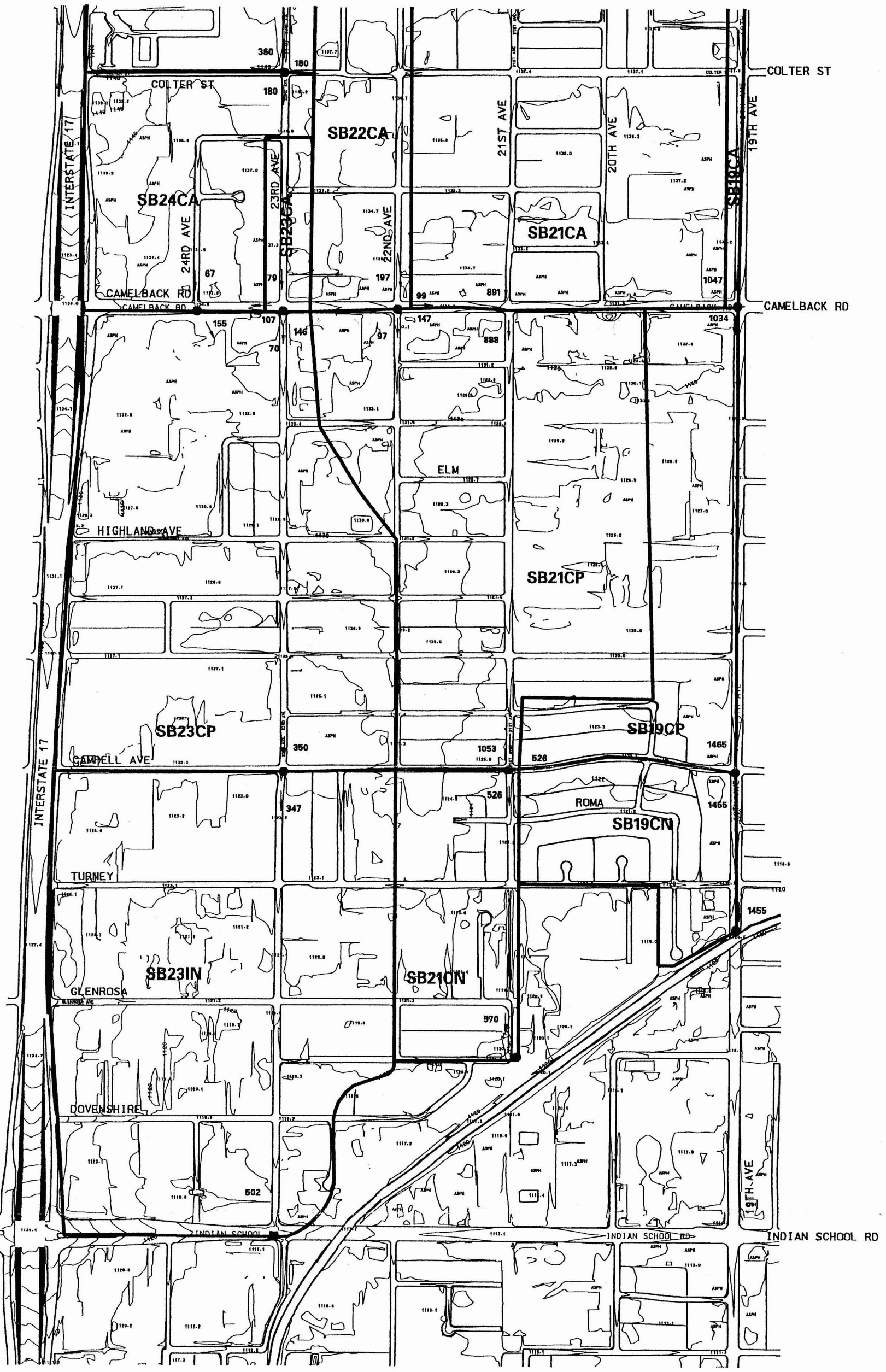


PREMIER		EXISTING CONDITION 100-YR PEAK FLOW MAP	FIGURE 13d
ENGINEERING CORPORATION			
PROJECT NO. 2002010	DRAWN BY MR		
DATE 6/1402	CHECKED BY KD		

Plotted By: SG 09/24/2003 12:49:02 PM P:\2002010\Cadd\Premier\100_YR_Fig_(4).dgn

5.1 Phase I

Phase I consists of constructing a regional retention basin along the north side of Camelback Road, between 21st Avenue and 24th Avenue.. This basin would consist of three separate compartments connected by pipes to equalize the water levels in each compartment.

Some minor street re-grading and storm drain construction would be required south of Colter Street to insure that all upstream flows are captured by the retention basin. No additional upstream drainage improvements are proposed as part of Phase I.

The Phase I retention basin has been initially sized to capture 100-percent of the runoff that will naturally reach this basin during the 25-year, 6-hour storm. As will be discussed in subsequent Phases, this basin may be downsized as additional upstream drainage improvements are installed.

Table 1.1 summarizes the inflow volumes to the Camelback Road retention basin for the 2-, 10-, 25-, 50-, and 100-year, 6-hour storms. As stated in the preceding paragraph, the design storm for Phase I is the 25-year event, which introduces 83 AF of runoff into this retention basin. The complete HEC-1 input and output file for the 25-year event is enclosed in Appendix E. The HEC-1 output summaries for the 100-, 50-, 10-, and 2-year storms are included in Appendices F, G, H, and I, respectively.

The HEC-1 routing schematics for Phase I are shown on Plates 3 and 4 (see inside back cover). Plate 9 (page 27) presents an enlarged view of the routing schematic and concentration points in the vicinity of the proposed detention basin that is located just north of Camelback Road.

Table 1.2 summarizes the estimated street flows that might occur south of Colter Street along 23rd, 22nd, and 21st Avenues. This information, which was used for a preliminary storm drain system analysis, is considered approximate and should be updated as part of any final design effort for this project. These flows are considered approximate because the HEC-1 models are not presently configured in sufficient detail to accommodate a rigorous storm drain design analysis.

5.2 Phase II

Phase II includes the Camelback Road retention basin discussed in Phase I, and, adds a second retention basin in Washington Park, which is located north of Maryland Avenue, between 21st and 23rd Avenues.

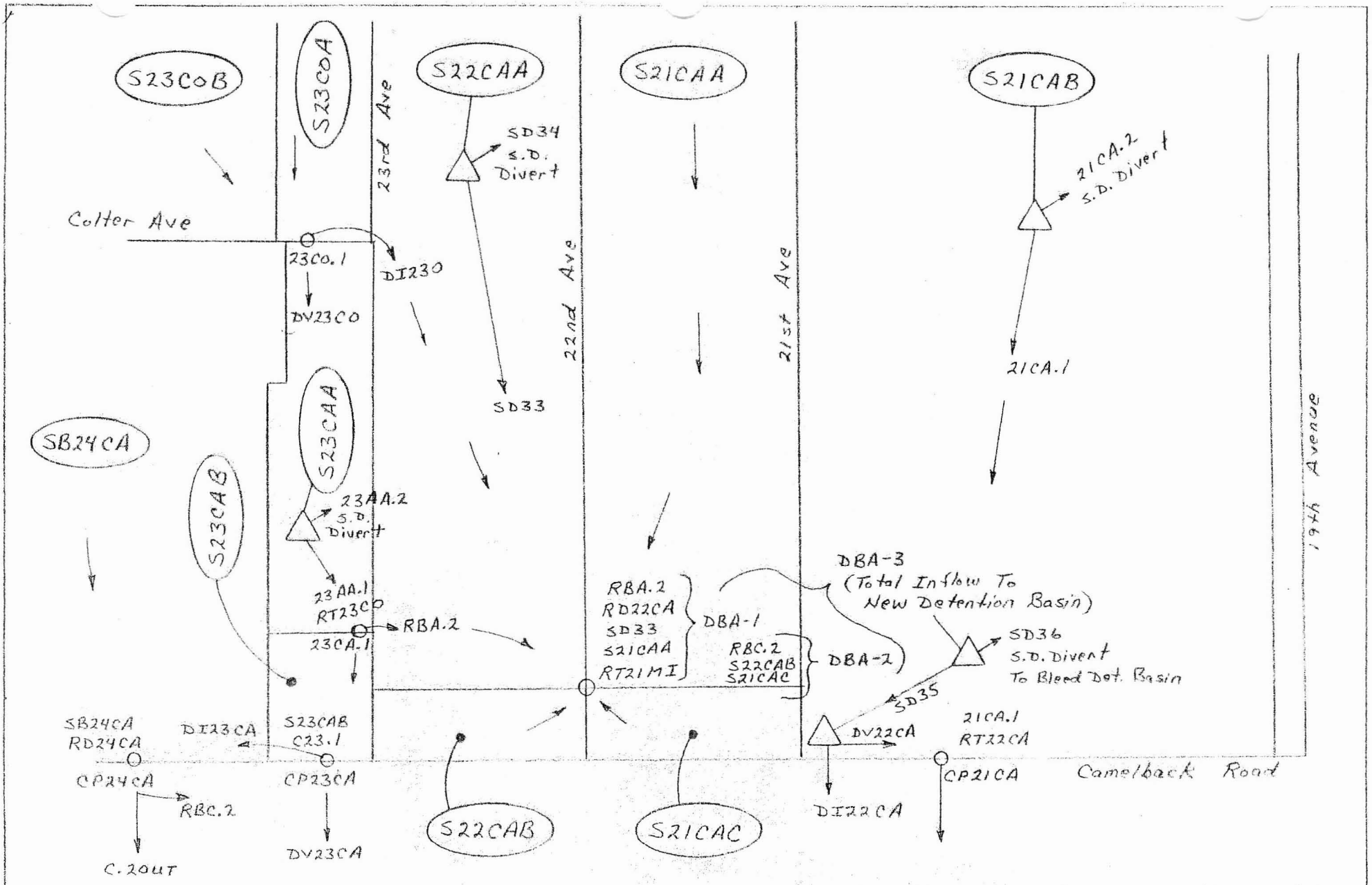
Phase II was evaluated in two parts. The initial analysis was based on designing the Washington Park retention basin to hold 100-percent of the naturally intercepted, upstream runoff from a 50-year, 6-hour storm. This storage volume was computed as 43 AF (from HEC-1).

A reservoir routing operation was inserted at the Washington Park location and a spillway geometry (SS record) was coded with a 50-foot bottom width to discharge any retention basin inflows that exceed 43 AF. The modified HEC-1 model was then run for the 2-, 10-, 25-, 50-,

Table 1.1
Phase 1
Retention Basin "A" Inflow Volumes
24th Avenue & Camelback Road Drainage Project

Basin Location	HEC-1 CP	Inflow Volume (AF)				
		2-Year	10-Year	25-Year	50-Year	100-Year
Camelback Road 21st Ave to 24th Ave	DBA-3	25	59	83	101	120
	HEC-1 File	P1-2-1	P1-10-1	P1-25-2	P1-50-1	P1-100-1

File: 24th & Camelback, Retention Basin Summary, Aug 2003.xls



HEC-1 Routing Schematic	
Enlargement Of Phase 1 Detention Basin Area	
24th Avenue & Camelback Road Drainage Study	
Phoenix, Arizona	
September 2003	PLATE 9

Table 1.2

Phase 1

Storm Drain Design Flows

24th Avenue & Camelback Road Drainage Project

Location	HEC-1 CP	Peak Discharge (cfs)				
		2-Year	10-Year	25-Year	50-Year	100-Year
23rd Ave, South of Colter	RT23CO	19	71	112	147	182
22nd Ave, South of Colter	RE22CA	19	71	113	148	183
21st Ave, South of Colter	RT21MI	72	249	396	512	635
	HEC-1 File	P1-2-1	P1-10-1	P1-25-2	P1-50-1	P1-100-1

File: 24th & Camelback, Discharges For Storm Design, Aug 2003.xls

and 100-year, 6-hour storms. Table 2.1 summarizes the retention basin inflow volumes for this scenario for both the Washington Park basin and the Camelback Road basin.

As expected, the introduction of the Washington Park basin reduces the inflows to the Camelback Road basin, as originally computed in Phase I. Accordingly, the second scenario for Phase II consisted of a 100-year storm analysis that would decrease the storage volume at Washington Park to a level that would provide 81 AF at the Camelback Road retention basin. This is 2 AF less than the original Phase 1, 25-year storage volume of 83 AF at the Camelback Road site. The 2 AF reduction was made to provide a freeboard allowance, while still maintaining the original 83 AF of excavation volume at this location.

In order to analyze this second scenario, the storage volume at Washington Park was incrementally reduced until the inflow volume to the Camelback Road basin reached 81 AF during the 100-year, 6-hour storm. It was found that a non-spill, storage volume of 39 AF at Washington Park would produce the desired 81 AF inflow volume at Camelback Road. As with Scenario 1, this volume analysis is based on a 50-foot wide spillway being in-place at Washington Park to spill any inflows that exceed 39 AF.

The results of the 100-year storm analysis for Scenario 2 (of Phase II) is listed in the right hand column of Table 2.1. The footnotes at the bottom of this table explain which data columns belong to which Phase II scenario. Appendix J contains the complete HEC-1 input and output summary for file P2-100-D for the 100-year event. HEC-1 output summary files for the remaining Phase II storm events are presented in Appendices K, L, M, N, and O. The HEC-1 routing schematics are shown on Plates 5 and 6 (see inside back cover).

Table 2.2 summarizes the estimated Phase II street flows that could be used for the storm drain systems that would be constructed to assist in delivering surface flows to both the Washington Park and Camelback Road retention basins. Results for both Scenario 1 and 2, for the 100-year storm, are included in Table 2.2.

5.3 Phase III

Phase III builds upon the Phase I and II plans through the inclusion of an additional retention basin at the southwest corner of 23rd Avenue and Northern Avenue. At the present time, there is a 60" storm drain in 23rd Avenue, north of Northern Avenue, that has a small bleed-off connection to a storm drain in 19th Avenue. Phase III will divert this 60" storm drain to the proposed retention basin at the southwest corner of 23rd Avenue and Northern Avenue.

The Phase III retention basin was modeled by inserting a new divert routine immediately after CP23NO (intersection of 23rd and Northern Avenues). This diversion (N23RB/N23IN) directs a maximum of 114 cfs from the upstream watershed to the new retention basin. This diversion is based on the capacity of the 60" storm drain that is being re-routed to the retention basin.

Table 3.1 summarizes the runoff volumes to the three retention basins that are included in Phase III. The two 100-year storm scenarios that were previously discussed for Phase II are included in Table 3.1. Table 3.2 provides a summary of the revised downstream street flows that are used for the storm drain systems being evaluated for the Washington Park and Camelback Road retention basins.

Table 2.1
Phase 2
Retention Basin "A" & Washington Park Inflow Volumes
24th Avenue & Camelback Road Drainage Project

Retention Basin Location	HEC-1 CP	Inflow Volume (AF)					
		2-Year*	10-Year*	25-Year*	50-Year*	100-Year*	100-Year**
Camelback Road 21st Ave to 24th Ave	DBA-3	15	34	48	58	77	81
Washington Park 21st Ave to 23rd Ave See Footnotes For Storage	BSN_I	10	25	35	43	51	51
Spillway Discharge (cfs) At Washington Park	WASHPK	0	0	0	0	35	61
	HEC-1 File	P2-2-1	P2-10-1	P2-25-1	P2-50-B	P2-100-C	P2-100-D

* Washington Park retention basin is in-place with a 50-year storage volume of 43 AF.

** Washington Park retention basin is in-place with a storage volume of 39 AF.

File: 24th & Camelback, Retention Basin Summary, Aug 2003.xls

Table 2.2

Phase 2

Storm Drain Design Flows

24th Avenue & Camelback Road Drainage Project

Location	HEC-1 CP	Peak Discharge (cfs)					
		2-Year*	10-Year*	25-Year*	50-Year*	100-Year*	100-Year**
23rd Ave, South of Colter	RT23CO	8	26	44	59	73	73
22nd Ave, South of Colter	RE22CA	8	26	45	59	74	74
21st Ave, South of Colter	RT21MI	44	133	212	280	347	347
Maryland Avenue, West of 23rd Ave	S23MAA	18	51	74	92	111	111
23rd Ave, South of Glendale Ave	CP23GL	31	109	169	215	261	261
21st Ave, South of Glendale Ave	50% of S21MAA	16	39	54	65	76	76
	HEC-1 File	P2-2-1	P2-10-1	P2-25-1	P2-50-B	P2-100-C	P2-100-D

* Washington Park retention basin is in-place with a 50-year storage volume of 43 AF.

** Washington Park retention basin is in-place with a storage volume of 39 AF.

File: 24th & Camelback, Discharges For Storm Design, Aug 2003.xls

Table 3.1
Phase 3
Retention Basin "A" & Washington Park Inflow Volumes
24th Avenue & Camelback Road Drainage Project

Retention Basin Location	HEC-1 CP	Inflow Volume (AF)					
		2-Year*	10-Year*	25-Year*	50-Year*	100-Yr*	100-Year**
Camelback Road 21st Ave to 24th Ave	DBA-3	15	34	48	58	74	78
Washington Park 21st Ave to 23rd Ave See Footnotes For Storage	BSN_I	9	23	33	40	48	48
Northern & 23rd Ave 25 AF Volume Based On 60" S.D. Capacity Of 114 cfs	N23IN	15	21	23	24	25	25
Spillway Discharge (cfs) At Washington Park	WASHPK	0	0	0	0	22	45
	HEC-1 File	P3-2-1	P3-10-1	P3-25-1	P3-50-1	P3-100-1	P3-100-D

* Washington Park retention basin is in-place with a 50-year storage volume of 43 AF.

** Washington Park retention basin is in-place with a storage volume of 39 AF.

File: 24th & Camelback, Retention Basin Summary, Aug 2003.xls

Table 3.2

Phase 3

Storm Drain Design Flows

24th Avenue & Camelback Road Drainage Project

Location	HEC-1 CP	Peak Discharge (cfs)					
		2-Year*	10-Year*	25-Year*	50-Year*	100-Year*	100-Year**
23rd Ave, South of Colter	RT23CO	8	26	44	59	73	73
22nd Ave, South of Colter	RE22CA	8	26	45	59	74	74
21st Ave, South of Colter	RT21MI	44	133	212	280	347	347
Maryland Avenue, West of 23rd Ave	S23MAA	18	51	74	92	111	111
23rd Ave, South of Glendale Ave	CP23GL	26	84	145	195	241	241
21st Ave, South of Glendale Ave	50% of S21MAA	16	39	54	65	76	76
	HEC-1 File	P3-2-1	P3-10-1	P3-25-1	P3-50-1	P3-100-1	P3-100-D

* Washington Park retention basin is in-place with a 50-year storage volume of 43 AF.

** Washington Park retention basin is in-place with a storage volume of 39 AF.

New retention basin is in-place at 23rd Ave & Northern Ave to receive 25 AF from 60" storm drain diversion.

File: 24th & Camelback, Discharges For Storm Design, Aug 2003.xls

Appendix P contains the complete HEC-1 input and output summary for file P3-100-D for the 100-year event. Appendices Q, R, S, T, and U contain output summary files for the remaining Phase III storm events. The HEC-1 routing schematics for Phase III are shown on Plates 7 and 8 (see inside back cover).

6 BASIS OF DESIGN

The basis of design for the proposed drainage improvements, Phases I - IV are as follows:

- Retention Basins:
  - Depth = 6 feet
  - Maximum side slope = 4:1
  - Disposal system =Bleed-Off system (where possible)/Drywells
  - 100-year capacity (except Phase I – 25-year capacity)
- Storm-Drain System:
  - 2-year capacity (except Maryland Avenue – 50-year capacity)
  - Minimum slope = 0.30%
  - Manning's "n" = 0.012
  - 24-inch – 48-inch pipe = HDPE
  - 54-inch – 78-inch pipe = RGRCP
  - Maximum catch basin capacity = 10 cfs
- Street Reconstruction:
  - Minimum longitudinal slope = 0.20%
  - Manning's "n" = 0.016
  - 6-inch Vertical Curb & Gutter

7 COST ANALYSIS

A detailed cost estimate was also prepared for each phase as described above. The cost for each phase included a list of preliminary construction items with associated unit prices. In addition, each cost estimate included a 20% contingency fee, a 12% Engineering fees, and 5% Administrative fees. The cost of land acquisition was determined using the Maricopa County web page listings for full cash values for the year 2004. See Appendix A for the detailed cost estimate for each phase. Following is a summary of the cost estimates to the nearest $1000:

Cost Summary				
Phase I	**Phase II**	**Phase III**		**Phase IV**
		Alternative 1	Alternative 2	
$7,196,000	$2,064,000	$2,045,000	$219,000	$1,909,000

8 FLOOD DAMAGE ANALYSIS

A benefit:cost analysis was previously performed for Drainage Alternative 3b in the April 2, 2003 Executive Summary for this project. Since that time, some modifications have been made to the drainage improvements that were previously evaluated north of Camelback Road. These modifications are discussed as part of the Phase I, II, and III drainage plans that are presented in the preceding sections of this report.

The flood damage assessment described in the following paragraphs is a replication of the text that was published in the April 2, 2003 Executive Summary. Due to the intensive man-hour effort required to prepare the flood damage estimate, as well as the very close similarities between the previous Alternative 3b plan versus the updated Phase I and II plans (i.e., both plans provide essentially the same level of flood damage reduction), a new damage analysis was not prepared for this updated drainage plan. Accordingly, the updated Benefit:Cost analysis was based on the previously computed flood damage reduction (for a 100-year storm) and new installation costs that were developed specifically for Phases I, II, and III.

Phase IV installation costs are for retention basin "X" which is located south of Camelback Road. No significant changes were made to basin "X" as a result of the updated Phase I, II, and III drainage plans north of Camelback Road. As a result, the previous basin "X" installation costs, and damage reductions south of Camelback Road, were retained for this benefit:cost analysis update.

Table 4 summarizes the Benefit:Cost analysis for the installation of Phases I, II, and IV (Camelback Road basin, Washington Park basin, and basin "X"). Table 5 presents the same information when the Phase III retention basin is added near the intersection of 23rd Avenue and Northern Avenue. It should be noted that no additional flood damage reduction benefits are reflected in Table 5 to acknowledge the decrease in flooding that will occur immediately downstream from the 23rd Avenue and Northern Avenue retention basin. As a result, the benefit:cost ratios in Table 2 are actually lower that what they would be if these additional damage reductions were included in the table.

A review of the data in Tables 4 and 5 indicates that all plans have Benefit:Cost ratios that are greater than 1.0, thus indicating that the drainage plans are economically justified, given the assumptions that were used for the analysis.

The following paragraphs are text from the April 2, 2003 Executive Summary.

A flood damage assessment was performed to determine whether any of the proposed drainage plans would be economically feasible when analyzed through a benefit:cost analysis. A benefit:cost analysis reduces project installation costs and flood damage reduction costs to average annual values that can be directly compared to compute a benefit:cost ratio. If this ratio is greater than 1.0, then the proposed project is normally considered to be economically justified, i.e., the project benefits exceed the project cost.

Numerous assumptions were required to perform the benefit:cost analysis. It should be understood that this analysis was performed for a large drainage area in a relatively short period of time. Accordingly, some simplifications were required to complete the analysis.

Table 4
Benefit:Cost Summary
Phases 1, 2, & 4 Drainage improvements

24th Avenue & Camelback Road Drainage Project
(Updated August 22, 2003)

Installation Cost	Annual Interest Rate (%)	Amortization Period (years)	Annual Payment	Annual O & M Cost	Total Annual Cost	Annual Existing Conditio Damage	Annual Damage With Project In-Place	Annual Damage Reduction	**Benefit:Cost Ratio**
100-Year Level of Protection									
$13,625,301	3.00	100	$431,195	$125,000	$556,195	$2,046,883	$536,982	$1,509,901	**2.71**
$13,625,301	4.00	100	$556,021	$125,000	$681,021	$2,046,883	$536,982	$1,509,901	**2.22**
$13,625,301	5.00	100	$686,485	$125,000	$811,485	$2,046,883	$536,982	$1,509,901	**1.86**
$13,625,301	3.00	75	$458,736	$125,000	$583,736	$2,046,883	$536,982	$1,509,901	**2.59**
$13,625,301	4.00	75	$575,383	$125,000	$700,383	$2,046,883	$536,982	$1,509,901	**2.16**
$13,625,301	5.00	75	$699,272	$125,000	$824,272	$2,046,883	$536,982	$1,509,901	**1.83**
$13,625,301	3.00	50	$529,554	$125,000	$654,554	$2,046,883	$536,982	$1,509,901	**2.31**
$13,625,301	4.00	50	$634,260	$125,000	$759,260	$2,046,883	$536,982	$1,509,901	**1.99**
$13,625,301	5.00	50	$746,350	$125,000	$871,350	$2,046,883	$536,982	$1,509,901	**1.73**
$13,625,301	3.00	25	$782,472	$125,000	$907,472	$2,046,883	$536,982	$1,509,901	**1.66**
$13,625,301	4.00	25	$872,182	$125,000	$997,182	$2,046,883	$536,982	$1,509,901	**1.51**
$13,625,301	5.00	25	$966,749	$125,000	$1,091,749	$2,046,883	$536,982	$1,509,901	**1.38**

File: 24Camel, Benefit-Cost Analysis, Aug 2003 Update.xls

Table 5
Benefit:Cost Summary
Phases 1, 2, 3, & 4 Drainage improvements

24th Avenue & Camelback Road Drainage Project
(Updated August 22, 2003)

Installation Cost	Annual Interest Rate (%)	Amortization Period (years)	Annual Payment	Annual O & M Cost	Total Annual Cost	Annual Existing Conditio Damage	Annual Damage With Project In-Place	Annual Damage Reduction	**Benefit:Cost Ratio**
100-Year Level of Protection									
$16,032,412	3.00	100	$507,372	$125,000	$632,372	$2,046,883	$536,982	$1,509,901	**2.39**
$16,032,412	4.00	100	$654,251	$125,000	$779,251	$2,046,883	$536,982	$1,509,901	**1.94**
$16,032,412	5.00	100	$807,763	$125,000	$932,763	$2,046,883	$536,982	$1,509,901	**1.62**
$16,032,412	3.00	75	$539,779	$125,000	$664,779	$2,046,883	$536,982	$1,509,901	**2.27**
$16,032,412	4.00	75	$677,033	$125,000	$802,033	$2,046,883	$536,982	$1,509,901	**1.88**
$16,032,412	5.00	75	$822,809	$125,000	$947,809	$2,046,883	$536,982	$1,509,901	**1.59**
$16,032,412	3.00	50	$623,108	$125,000	$748,108	$2,046,883	$536,982	$1,509,901	**2.02**
$16,032,412	4.00	50	$746,312	$125,000	$871,312	$2,046,883	$536,982	$1,509,901	**1.73**
$16,032,412	5.00	50	$878,203	$125,000	$1,003,203	$2,046,883	$536,982	$1,509,901	**1.51**
$16,032,412	3.00	25	$920,707	$125,000	$1,045,707	$2,046,883	$536,982	$1,509,901	**1.44**
$16,032,412	4.00	25	$1,026,266	$125,000	$1,151,266	$2,046,883	$536,982	$1,509,901	**1.31**
$16,032,412	5.00	25	$1,137,539	$125,000	$1,262,539	$2,046,883	$536,982	$1,509,901	**1.20**

File: 24Camel, Benefit-Cost Analysis, Aug 2003 Update.xls

Actual flooding through the project watershed would probably take the form of widespread sheet flooding, especially during larger flood events. In order to confine the damage assessment to a reasonable scope and time frame, the analysis was limited to an assessment of flood damage along prominent streets. Known flooding areas were included in this assessment. This approach is considered to present a reliable indicator of potential flood damage and flood damage reduction benefits. However, it is not to be interpreted as a complete assessment of total flood damage in the watershed.

This analysis is considered to be in a preliminary format for this DCR Phase and subject to refinement prior to publication of a final construction phase drainage report for this project, when additional detailed survey of the watershed is available.

Key assumptions used in the Benefit:Cost analysis are listed as follows:

1. Flood damage calculations were confined to a single row of properties along each side of major streets that convey the majority of water through the watershed. The street segments used for the damage analysis were:
    - 21st Avenue from Maryland Avenue to the Grand Canal
    - Campbell Avenue, east of 21st Avenue
    - Roma Avenue, east of 21st Avenue
    - Turney Avenue, east of 21st Avenue
    - 20th Avenue, south of Turney Avenue
    - 23rd Avenue from Maryland Avenue to Camelback Road
    - 24th Avenue from Orange Drive to Camelback Road
2. Flooding depths were based on typical street cross-sections and slopes that were measured in the field and scaled from topographic maps and aerial photos. Curb heights of 6" were used with a raised crown centerline that was assumed equal to the curb height. A 20-ft effective flow area was extended beyond both the left and right curbs.

    HEC-2 models were created for each street cross-section and run for a wide range of discharges that would encompass the 2-year through 100-year peak flows. These models were used as discharge-depth rating tables to determine flood depths for a given discharge.

    Table 3 provides a description of the HEC-2 files that were applied to each street that was used in the damage analysis. Figure 1 illustrates the typical cross-section that was used for the street flooding geometry. A complete set of HEC-2 input and output summaries used in this analysis are provided in Appendix V. The HEC-2 files are also included on the enclosed compact disk.
3. All finished floor elevations were assumed to be equal to the street curb height. Field inspections of the watershed indicate that some homes are at or below the curb elevation, while others are above the curb elevation. For comparison purposes, the same assumption was used for both the existing condition and proposed drainage plan

analyses. Accordingly, any errors attributed to this assumption should be cancelled when comparing existing damage to post-project damages.

4. Flood damage estimates were based on depth-damage relationships published in **Benefit:Cost Analysis Of Hazard Mitigation Projects, Appendix 1 to the Riverine Flood – Full Data Module, Users Guide For Software Version 5.2.3**, Federal Emergency Management Agency (FEMA).

   Damages were only computed for Building Damage and Building Contents. Damage assessments were based on Full Cash Value (FCV) from the Maricopa County Assessor records. The residential FCV numbers were reduced by 20-percent to remove the land value from the building value. The resulting building value was then applied to the FEMA depth-damage tables to compute flood damage.

5. Average annual damages and damage reductions were computed as the area under a curve defined by the damage amount (dollars) for each storm return interval (expressed as an annual probability of occurrence). This calculation yields dollars per year.

The annual cost of the proposed project was based on an amortization of the estimated installation cost, plus an annual operation and maintenance cost. Amortization schedules for computing average annual costs were based on annual interest rates of 3, 4, and 5-percent, and amortization periods of 100, 75, 50, and 25-year periods. This approach provides a wide range of financial conditions that can be used to evaluate the financial feasibility of the project.

9 CONCLUSION

This Revised Executive Summary presents the recommended phased construction of the flood control structures, which provides different levels of protection for the entire watershed. The Table below summarizes the recommended phased construction.

Proposed Phase	Recommended construction
I	Construct 83 acre-feet regional retention basin at 24th Ave./Camelback Rd. providing 25-year storm protection.
II	Construct 39 acre-feet retention basin at Washington Park combined with Phase I providing 100-year storm protection.
III	Construct catch basin/bubbler box system mainly eliminating local flooding at 23rd Ave. & Northern Ave.
IV	Construct 18 acre-feet retention basin at 20th Ave. & Turney providing 100-year storm protection for watershed south of Camelback Rd.

10 REFERENCES

1. Arizona Department of Transportation. *Final Design Concept Report Interstate 17 Traffic Interchange At Glendale Avenue* prepared by Entranco, November 1997.
2. City of Phoenix. *23rd Avenue Storm Drain Arizona Canal to McDowell Road*, Prepared by Anderson-Nichols & Company, August 1984.
3. City of Phoenix. *Route Study Report 23rd Ave. Storm Drain*, Prepared by Henningson, Durham & Richardson, 1976.
4. Flood Control District of Maricopa County, Arizona. *Maryvale ADMS Hydrologic Analyses FCD # 93-29* prepared by Wood Patel and Associates and CH2Mhill.
5. Landiscor Aerial Information, *Phoenix Ownwership,2000 Aerial Atlas*. January 2000.
6. Maricopa County, Arizona. *Drainage Design Manual, Volume I, Hydrology*, January 28, 1996.
7. U.S. Army Corps of Engineers. *HEC-1 Flood Hydrograph Package*. Hydrologic Engineering Center, Davis California, September 1990
8. U.S. Department of Agriculture, Natural Resources Conservation Service, *Soil Survey of Maricopa County, Arizona Central Part.* prepared by the United States Department of Agriculture (USDA), Issued September 1977.

APPENDIX A

100-YEAR, 6-HOUR STORM
EXISTING CONDITIONS
FILE: EXIST100

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   DRAFT MODEL
  4       ID   MODELED BY PREMIER ENGINEERING
  5       ID   JULY 2002
  6       ID   ORIGINAL MODEL PREPARED BY: KBD
  7       ID   ORIGINAL FILE NAME: 100CMLBK.DAT
  8       ID
  9       ID   MODELING HAS BEEN REVISED BY PREMIER ENGR IN JANUARY - MARCH 2003
 10       ID   TO CORRECT NUMEROUS MODELING ERRORS IN ORIGINAL KBD CODING.
 11       ID   ****************************************************
 12       ID    REVISED FILE NAME: EXIST100.DAT - MARCH 2003
 13       ID   100-YEAR 6-HOUR MODEL, EXISTING CONDITIONS
 14       ID   ****************************************************
 15       ID
 16       ID   Project ID: 24TH & CAMELBACK - 100 Year, 6-hour Storm
 17       IT       2                    2000
 18       IO       5
          *DIAGRAM
          *
 19       ID   ****************************************************
 20       ID   FLOWS ALONG 23RD AVE
 21       ID   ****************************************************
 22       ID

 23       KK  SB23DU
 24       KM   SUB-BASIN SB23DU
 25       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 26       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 27       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 28       BA    .179
 29       IN      15
 30       KM   RAINFALL DEPTH OF 3.00 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 31       PB   2.900
 32       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 33       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 34       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 35       PC    .949    .962    .975    .988   1.000
 36       LG    .100    .250   4.300    .366  80.000
 37       UC    .346    .137
 38       UA       0       5      16      30      65      77      84      90      94      97
 39       UA     100
          *

 40       KK  23DU.1
 41       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 42       KM   SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
 43       KM   REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
 44       KM   SO=0.001 AND N = 0.013
 45       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 46       DT  23DU.2
 47       DI       0      13   10000
 48       DQ       0      13      13
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 49       KK  RT23DU
 50       KM   ROUTE 23DU
 51       KM   ROUTE FROM BASIN 23DU TO 23BU
 52       KM   23RD AVE - DUNLAP TO BUTLER
 53       RS      6    FLOW       0
 54       RC   .016    .016    .016    2640    .005     4.3
 55       RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 56       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 57       KK  SB23BU
 58       KM   SUB-BASIN SB23BU
 59       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND BUTLER
 60       KM   BASIN AREA REDUCED BY 27.2 ACRES TO ACCOUNT FOR 100 YEAR 2 HOUR RETENTION &
 61       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 62       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 63       KM     L =  .50  Kb = .050  Adj. Slope =   25.0
 64       BA    .222
 65       LG    .200    .250   5.300    .282  46.000
 66       UC    .475    .219
 67       UA       0       5      16      30      65      77      84      90      94      97
 68       UA     100
          *

 69       KK  23BU.1
 70       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 71       KM   SB23BU, 7 CBs IN SUBBASIN, 1-54" SD ALONG 23RD AVE
 72       KM   REMOVE CAPACITY OF CATCH BASINS. ASSUME INLET CAPACITY OF 5 CFS EACH
 73       KM   Qtotal = 7(5) = 35 cfs
 74       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 75       DT  23BU.2
 76       DI       0      35   10000
 77       DQ       0      35      35
          *

 78       KK  CP23BU
 79       KM   COMBINE FLOWS AT 23RD AND BUTLER
 80       HC       2
          *

 81       KK  RT23BU
 82       KM   ROUTE BASIN 23BU TO 23RD AND ROYAL PALM
 83       KM   ROUTE 23BU
 84       KM   ROUTE FROM BASIN 23BU TO 23RO
 85       RS       5    FLOW       0
 86       RC    .016    .016    .016    2036    .004     4.3
 87       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 88       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  89      KK  SB23RO
  90      KM   SUB-BASIN SB23RO
  91      KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND ROYAL PALM
  92      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  93      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  94      KM     L =  .39  Kb = .055  Adj. Slope =   23.0
  95      BA    .101
  96      LG    .150    .160   7.000    .127  66.000
  97      UC    .429    .252
  98      UA       0       5      16      30      65      77      84      90      94      97
  99      UA     100
          *

 100      KK  RN23RO
 101      KM   RETENTION VOLUME IN SB23RO, 23RD AND ROYAL PALM
 102      KM   100-YEAR 2 HOUR RETENTION ESTIMATED BY FIELD VISIT AND STORM DRAIN MAP J-7
 103      KM   VOL = C*(P/12)*A, 50% OF REQUIRED VOLUME IS DIVERTED
 104      KM   C = 0.70, P = 100 YEAR 2 HOUR RAINFALL DEPTH = 2.54 INCHES
 105      KM   AREA A, IN ACRES MEASURED FROM MAPPING
 106      KO       3
 107      DT  DV23RO     4.8
 108      DI       0    4000
 109      DQ       0    4000
          *

 110      KK  23RO.1
 111      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM REMAINING SUBBASIN RUNOFF
 112      KM   SB23RO, 10 CBs IN SUBBASIN, 1-60" SD ALONG 23RD AVE
 113      KM   REMOVE CAPACITY OF CATCH BASINS. ASSUME INLET CAPACITY OF 5 CFS EACH
 114      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 115      DT  23RO.2
 116      DI       0      50   10000
 117      DQ       0      50      50
          *

 118      KK  CP23RO
 119      KM   COMBINE FLOWS AT 23RD AND ROYAL PALM
 120      HC       2
          *

 121      KK  RT23RO
 122      KM   ROUTE 23RO
 123      KM   ROUTE FROM BASIN 23RO TO 23NO
 124      KM   23RD AVE -Royal Palm to Northern
 125      RS       2    FLOW       0
 126      RC    .016    .016    .016     702    .001     4.3
 127      RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 128      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  129     KK  SB23NO
  130     KM   SUB-BASIN SB23NO
  131     KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND NORTHERN BASIN
  132     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  133     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  134     KM     L =  .13  Kb = .060  Adj. Slope =    7.0
  135     BA    .043
  136     LG    .100    .150   9.100    .053  80.000
  137     UC    .367    .143
  138     UA       0       5      16      30      65      77      84      90      94      97
  139     UA     100
          *

  140     KK  RN23NO
  141     KM   RETENTION VOLUME IN SB23NO, 23RD AND NORTHERN
  142     KM   100-YEAR 2 HOUR RETENTION ESTIMATED BY FIELD VISIT AND STORM DRAIN MAP J-7
  143     KM   VOL = C*(P/12)*A, 50% OF REQUIRED VOLUME IS DIVERTED
  144     KM   C = 0.70, P = 100 YEAR 2 HOUR RAINFALL DEPTH = 2.54 INCHES
  145     KM   AREA A, IN ACRES MEASURED FROM MAPPING
  146     DT  RB23NO     2.1
  147     DI       0    4000
  148     DQ       0    4000
          *

  149     KK  CP23NO
  150     KM   COMBINE AT 23RD AVE AND NORTHERN
  151     KO       3
  152     HC       2
          *

  153     KK  DV23NO
  154     KM   DQ FLOWS GO TO EAST TO 21ST AVE AND NORTHERN
  155     DT  DI23NO
  156     DI      74     127    1404    2369
  157     DQ      74     113    1170    1973
          *

  158     KK  RT23NO
  159     KM   ROUTE TO 23RD AND ORANGEWOOD
  160     KM   23RD AVE AND NORTHERN TO 23RD AND ORANGEWOOD
  161     RS       6    FLOW       0
  162     RC    .016    .016    .016    2633    .005     4.3
  163     RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  164     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  165     KK  SB23OR
  166     KM   SUB-BASIN SB23OR
  167     KM   23RD AVE AND ORANGEWOOD BASIN
  168     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  169     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  170     KM     L =  .50  Kb = .054  Adj. Slope =   24.0
  171     BA    .124
  172     LG    .220    .170   6.800    .155  51.000
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 173      UC    .483    .312
 174      UA       0       5      16      30      65      77      84      90      94      97
 175      UA     100
          *

 176      KK  CP23OR
 177      KM   COMBINE AT 23RD AVE AND ORANGEWOOD
 178      HC       2
          *

 179      KK  DV23OR
 180      KM   DIVERT FLOWS AT ORANGEWOOD 75% SOUTH 25% EAST
 181      KM   DQ FLOWS GO TO EAST TO 21ST AVE AND ORANGEWOOD
 182      DT  DI23OR
 183      DI       0     500   10000
 184      DQ       0     125    2500
          *

 185      KK  RT23OR
 186      KM   ROUTE TO 23RD DRIVE AND MYRTLE
 187      KM   ROUTE RUNOFF FROM 23RD AVE AND ORANGEWOOD
 188      RS       3    FLOW       0
 189      RC    .016    .016    .016    1460    .005     4.3
 190      RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 191      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 192      KK  SB23DM
 193      KM   SUB-BASIN SB23DM
 194      KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND MYRTLE
 195      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 196      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 197      KM     L =  .28  Kb = .059  Adj. Slope =   29.0
 198      BA    .056
 199      LG    .250    .150   8.100    .097  40.000
 200      UC    .350    .215
 201      UA       0       5      16      30      65      77      84      90      94      97
 202      UA     100
          *

 203      KK  CP23DM
 204      KM   COMBINE AT 23RD DRIVE AND MYRTLE
 205      HC       2
          *

 206      KK  DV23DM
 207      KM   DIVERT FLOWS AT 23RD DRIVE 50% SOUTH AND 50% EAST
 208      KM   DQ FLOWS GO TO EAST TO 21ST AVE AND MYRTLE
 209      DT  DI23DM
 210      DI       0      16      32     412     701
 211      DQ       0       8      16     206     351
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 212      KK  RT23DM
 213      KM   ROUTE 23DM
 214      KM   ROUTE FROM BASIN 23DM TO 23GL
 215      KM   23RD AVE - 23RD DRIVE AND MYRTLE TO 23RD AVE AND GLENDALE
 216      RS      3    FLOW       0
 217      RC   .016    .016    .016    1324    .003     4.3
 218      RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 219      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 220      KK  SB22GL
 221      KM   SUB-BASIN SB22GL
 222      KM   SUBBASIN CONTRIBUTING TO 22ND AVE AND GLENDALE
 223      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 224      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 225      KM    L =  .30  Kb = .063  Adj. Slope =   16.0
 226      BA   .025
 227      LG   .250    .250   5.900    .235  32.000
 228      UC   .483    .516
 229      UA      0       5      16      30      65      77      84      90      94      97
 230      UA    100
          *

 231      KK  RT22GL
 232      KM   ROUTE FROM BASIN 22GL TO 23GL
 233      RS      5    FLOW       0
 234      RC   .016    .016    .016     830    .001     4.3
 235      RX   44.9      45      66    66.1     134   134.1     155   155.1
 236      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 237      KK  SB23GL
 238      KM   SUB-BASIN SB23GL
 239      KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND GLENDALE
 240      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 241      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 242      KM    L =  .25  Kb = .058  Adj. Slope =   18.0
 243      BA   .057
 244      LG   .240    .150   7.400    .126  36.000
 245      UC   .387    .218
 246      UA      0       5      16      30      65      77      84      90      94      97
 247      UA    100
          *

 248      KK  23GL.1
 249      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 250      KM   SB23GL, 5 CBs IN SUBBASIN, 1-21" SD ALONG GLENDALE AVE
 251      KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL=8.6 CFS
 252      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 253      DT  23GL.2
 254      DI      0     8.6   10000
 255      DQ      0     8.6     8.6
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  256     KK  CP23GL
  257     KM   COMBINE AT 23RD DRIVE AND GLENDALE
  258     HC       3
          *

  259     KK  RT23GL
  260     KM   ROUTE CP23GL TO 23RD AND MARYLAND
  261     KM   ROUTE FROM BASIN 23GL TO 23MA
  262     KM   23RD AVE - GLENDALE TO MARYLAND
  263     RS       5    FLOW       0
  264     RC    .016    .016    .016    2796    .005     4.3
  265     RX    44.9      45      66    66.1     134   134.1     155   155.1
  266     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  267     KK  SB23MA
  268     KM   SUB-BASIN SB23MA
  269     KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND MARYLAND
  270     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  271     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  272     KM    L =  .53  Kb = .053  Adj. Slope =   25.0
  273     BA    .151
  274     LG    .230    .250   3.500    .349  45.000
  275     UC    .508    .309
  276     UA       0       5      16      30      65      77      84      90      94      97
  277     UA     100
          *

  278     KK  23MA.1
  279     KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
  280     KM   SB23MA, 2 CBs IN SUBBASIN, 1-24" SD ALONG 23RD AVE
  281     KM   ASSUME CAPACITY EQUAL TO 5 CFS PER INLET
  282     KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
  283     DT  23MA.2
  284     DI       0      10   10000
  285     DQ       0      10      10
          *

  286     KK  CP23MA
  287     KM   COMBINE AT 23RD AVE AND MARYLAND
  288     HC       2
          *

  289     KK  RT23MA
  290     KM   ROUTE FLOWS TO 23RD AND BETHANY HOME RD
  291     KM   NO FLOWS ARE DIVERTED EAST. ALL FLOWS PROCEED SOUTH
  292     KM   23RD AVE - MARYLAND TO BETHANY HOME
  293     RS       4    FLOW       0
  294     RC    .016    .016    .016    2623    .004     4.3
  295     RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  296     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

297       KK  SB23BE
298       KM   SUB-BASIN SB23BE
299       KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND BETHANY HOME ROAD
300       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
301       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
302       KM     L =  .50  Kb = .054  Adj. Slope =   20.0
303       BA    .115
304       LG    .210    .250   4.900    .338  43.000
305       UC    .546    .372
306       UA       0       5      16      30      65      77      84      90      94      97
307       UA     100
          *

308       KK  23BE.1
309       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
310       KM   SB23BE, 10 CBs IN SUBBASIN, 1-30" SD (LOWER REACH WHERE THE CBs ARE LOCATED)
311       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL= 22.38 CFS
312       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
313       DT  23BE.2
314       DI       0      22   10000
315       DQ       0      22      22
          *

316       KK  CP23BE
317       KM   COMBINE AT 23RD AND BETHANY HOME
318       HC       2
          *

319       KK  RT23BE
320       KM   ROUTE 23BE
321       KM   ROUTE FROM BASIN 23BE TO 23MI (23RD AVE AND MISSOURI)
322       KM   ALL FLOW GOES TO THE SOUTH
323       RS       6    FLOW       0
324       RC    .016    .016    .016    2640    .002     4.3
325       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
326       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

327       KK  SB23MI
328       KM   SUB-BASIN SB23MI
329       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
330       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
331       KM     L =  .65  Kb = .054  Adj. Slope =   12.0
332       BA    .119
333       LG    .240    .250   4.900    .355  37.000
334       UC    .783    .673
335       UA       0       5      16      30      65      77      84      90      94      97
336       UA     100
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  337     KK  CP23MI
  338     KM   COMBINE AT 23RD AND MISSOURI
  339     HC       2
          *

  340     KK  DV23MI
  341     KM   DIVERT FLOWS GENERATED AT 23RD AND MISSOURI
  342     KM   DQ FLOWS GO TO EAST TO 21ST AND MISSOURI
  343     DT  DI23MI
  344     DI       0     500   10000
  345     DQ       0     200    4000
          *

  346     KK  RT23MI
  347     KM   ROUTE 23MI
  348     KM   ROUTE SOUTH FROM BASIN 23MI TO 23CO (23RD AVE AND COLTER)
  349     RS       2    FLOW       0
  350     RC    .016    .016    .016    1314    .003     4.3
  351     RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  352     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  353     KK  SB23CO
  354     KM   SUB-BASIN SB23CO
  355     KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND COLTER
  356     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  357     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  358     KM     L =  .25  Kb = .058  Adj. Slope =   16.0
  359     BA    .061
  360     LG    .210    .250   3.500    .341  52.000
  361     UC    .408    .222
  362     UA       0       5      16      30      65      77      84      90      94      97
  363     UA     100
          *

  364     KK  CP23CO
  365     KM   COMBINE AT 23RD AVE AND COLTER
  366     HC       2
          *

  367     KK  DV23CO
  368     KM   DIVERT FLOWS GENERATED AT 23RD AVE AND COLTER
  369     KM   SPLIT IS APPROXIMATELY 50% EAST AND 50% SOUTH
  370     KM   DQ FLOWS GO SOUTHEAST TO 22ND AND CAMELBACK
  371     KO       3
  372     DT  DI23CO
  373     DI       0     500   10000
  374     DQ       0     250    5000
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  375     KK  RT23CO
  376     KM   FLOW ROUTED SOUTH TO 23RD AND CAMELBACK
  377     KO       3
  378     RS       2    FLOW       0
  379     RC    .016    .016    .016    1348    .003     4.3
  380     RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  381     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  382     KK  SB23CA
  383     KM   SUB-BASIN SB23CA
  384     KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND CAMELBACK
  385     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  386     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  387     KM     L =  .25  Kb = .068  Adj. Slope =   16.0
  388     BA    .012
  389     LG    .180    .150   7.000    .130  56.000
  390     UC    .429    .594
  391     UA       0       5      16      30      65      77      84      90      94      97
  392     UA     100
          *

  393     KK  23CA.1
  394     KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
  395     KM   SB23CA, 2 CBS CONTRIBUTING TO 18" SD ALONG 23RD AVE AFFECTING FLOWS AT CP
  396     KM   REMOVE CAPACITY OF CBs. ASSUME CAPCITY OF 5 CFS PER BASIN
  397     KM   TOTAL Q TAKEN OUT = 2(5) =10 CFS
  398     KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
  399     KO       3
  400     DT  23CA.2
  401     DI       0      10   10000
  402     DQ       0      10      10
          *

  403     KK  CP23CA
  404     KM   COMBINE AT 23RD AND CAMELBACK
  405     KO       3
  406     HC       2
          *

  407     KK  DV23CA
  408     KM   DIVERT FLOWS AT 23RD AVE AND CAMELBACK 60% WEST AND 40% SOUTH
  409     KM   DQ FLOWS GO WEST TO CAMELBACK AND 24th AVENUE
  410     KO       3
  411     DT  DI23CA
  412     DI       0     500   10000
  413     DQ       0     300    6000
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

414       KK  RT23CA
415       KM   ROUTE 23CA
416       KM   ROUTE FROM BASIN 23CA TO 23CP (23RD AND CAMPBELL)
417       RS       5    FLOW       0
418       RC    .016    .016    .016    2673    .004     4.3
419       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
420       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

421       KK  RE24CA
422       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
423       KM   FROM OVERFLOWS AT 23RD AVE AND CAMELBACK
424       DR  DI23CA
          *

425       KK  RD24CA
426       KM   ROUTE DIVERT FROM 23RD AND CAMELBACK TO 24TH DRIVE AND CAMELBACK
427       RS       1    FLOW       0
428       RC    .016    .016    .016     504    .001     4.3
429       RX    44.9      45      66    66.1     134   134.1     155   155.1
430       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

431       KK  SB24CA
432       KM   SUBBASIN CONTRIBUTING TO 24TH AVE AND CAMELBACK
433       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
434       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
435       KM    L =  .34  Kb = .059  Adj. Slope =   14.0
436       BA    .050
437       LG    .150    .250   4.900    .293  63.000
438       UC    .500    .399
439       UA       0       5      16      30      65      77      84      90      94      97
440       UA     100
          *

441       KK  CP24CA
442       KM   COMBINE AT 24TH AND CAMELBACK
443       KO       3
444       HC       2
          *

445       KK  RT24CA
446       KM   FLOWS ACCUMULATE AT 24th AND CAMELBACK UNTIL BREAKING OUT SOUTH TO BILL LUKE
447       KM   FLOWS EVENTUALLY ARRIVE AT 23RD AND CAMPBELL
448       RS       5    FLOW       0
449       RC    .016    .016    .016    2578    .005     4.3
450       RX    44.9      45      66    66.1     134   134.1     155   155.1
451       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

452       KK  SB23CP
453       KM   SUB-BASIN SB23CP
454       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND CAMPBELL
455       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
456       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
457       KM     L =  .51  Kb = .052  Adj. Slope =   24.0
458       BA    .158
459       LG    .210    .150   9.300    .061  51.000
460       UC    .471    .268
461       UA       0       5      16      30      65      77      84      90      94      97
462       UA     100
          *

463       KK  23CP.1
464       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
465       KM   SB23CP, 6 CBs IN SUBBASIN, 1-15" SD ALONG 23RD AVE
466       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL= 3.52 CFS
467       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
468       DT  23CP.2
469       DI       0       4   10000
470       DQ       0       4       4
          *

471       KK  CP23CP
472       KM   COMBINE AT 23RD AND CAMPBELL
473       HC       3
          *

474       KK  RT23CP
475       KM   ROUTE 23CP
476       KM   ROUTE FROM BASIN 23CP TO 23IN
477       RS       4    FLOW       0
478       RC    .016    .016    .016    2578    .003     4.3
479       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
480       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

481       KK  SB23IN
482       KM   SUB-BASIN SB23IN
483       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND INDIAN SCHOOL ROAD
484       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
485       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
486       KM     L =  .49  Kb = .052  Adj. Slope =   16.0
487       BA    .171
488       LG    .220    .150   8.600    .077  52.000
489       UC    .529    .282
490       UA       0       5      16      30      65      77      84      90      94      97
491       UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

492       KK  23IN.1
493       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
494       KM   SB23IN, 8 CBs IN SUBBASIN, 1-15" SD ALONG 23RD AVE
495       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL=3.52 CFS
496       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
497       DT  23IN.2
498       DI       0       4   10000
499       DQ       0       4       4
          *

500       KK  CP23IN
501       KM   COMBINE AT 23RD AND INDIAN SCHOOL ROAD
502       HC       2
          *
503       KM   ********************************************************************************
504       KM   FLOWS ALONG 21ST AVENUE
505       KM   ********************************************************************************
          *

506       KK  SB21DU
507       KM   SUB-BASIN SB21DU
508       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND DUNLAP
509       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
510       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
511       KM     L =  .50  Kb = .056  Adj. Slope =   14.0
512       BA    .091
513       LG    .230    .250   4.650    .389  50.000
514       UC    .633    .502
515       UA       0       5      16      30      65      77      84      90      94      97
516       UA     100
          *

517       KK  21DU.1
518       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
519       KM   SB21DU, 5 CBS CONTRIBUTING TO 30" SD ALONG DUNLAP AVE AFFECTING FLOWS AT CP
520       KM   REMOVE CAPACITY SD
521       KM   QFULL = 12.92
522       KM   SO = 0.001, N = 0.013
523       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
524       DT  21DU.2
525       DI       0      13   10000
526       DQ       0      13      13
          *

527       KK  RT21DU
528       KM   ROUTE 21DU
529       KM   ROUTE FROM BASIN 21DU TO 21BU
530       KM   21ST AVE - DUNLAP TO BUTLER
531       RS       6    FLOW       0
532       RC    .016    .016    .016    2731    .005     4.3
533       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
534       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

535       KK  SB21BU
536       KM   SUB-BASIN SB21BU
537       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND BUTLER
538       KM   BASIN AREA REDUCED BY 49.2 ACRES TO ACCOUNT FOR 100 YEAR 2 HOUR RETENTION &
539       KM   THE FINAL OUTFALL POINT IS AT A GOLF COURSE. RUNOFF IS INTERCEPTED BY LAKES
540       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
541       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
542       KM     L =  .52  Kb = .054  Adj. Slope =   28.0
543       BA    .128
544       LG    .220    .250   6.000    .206  44.000
545       UC    .483    .316
546       UA       0       5      16      30      65      77      84      90      94      97
547       UA     100
          *

548       KK  CP21BU
549       KM   COMBINE AT 21ST AVE AND BUTLER
550       HC       2
          *

551       KK  DV21BU
552       KM   DIVERT ROUTED FLOW THROUGH GOLF COURSE (SB19NO)
553       KM   DIVERT NOT RETRIEVED BACK INTO MODEL. FLOWS ENTER GOLF COURSE LAKES IN SB19NO
554       KM   LAKE STORAGE IS SUFFICIENT TO RETAIN 100% OF 100-YR INFLOWS
555       DT  DI21BU
556       DI       0   10000
557       DQ       0   10000
          *

558       KK  SB21OR
559       KM   SUB-BASIN SB21OR
560       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND ORANGEWOOD
561       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
562       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
563       KM     L =  .50  Kb = .054  Adj. Slope =   22.0
564       BA    .126
565       LG    .250    .200   6.400    .186  45.000
566       UC    .508    .327
567       UA       0       5      16      30      65      77      84      90      94      97
568       UA     100
          *

569       KK  RE21OR
570       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
571       KM   FROM 23RD AND ORANGEWOOD
572       DR  DI23OR
          *

573       KK  RD21OR
574       KM   ROUTE RETRIEVED DIVERT ALONG ORANGEWOOD
575       KM   ROUTE DIVERT FROM 23RD AND ORANGEWOOD TO 21ST AVE AND ORANGEWOOD
576       RS       3    FLOW       0
577       RC    .016    .016    .016    1321    .002     4.3
578       RX    44.9      45      66    66.1     134   134.1     155   155.1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 579      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 580      KK  CP21OR
 581      KM   COMBINE AT 21ST AVE AND ORANGEWOOD
 582      HC       2
          *

 583      KK  DV21OR
 584      KM   DIVERT FLOWS AT 21ST AND ORNAGEWOOD 50% SOUTH AND 50% WEST
 585      KM   DQ FLOWS GO TO EAST TO 19TH AVE AND ORANGEWOOD
 586      DT  DI21OR
 587      DI       0     500   10000
 588      DQ       0     250    5000
          *

 589      KK  RT21OR
 590      KM   ROUTE 21OR
 591      KM   ROUTE FROM BASIN 21OR TO 21MY
 592      RS       6    FLOW       0
 593      RC    .016    .016    .016    1320    .003     4.3
 594      RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
 595      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 596      KK  SB21MY
 597      KM   SUB-BASIN SB21MY
 598      KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND MYRTLE
 599      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 600      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 601      KM     L =  .49  Kb = .057  Adj. Slope =   17.0
 602      BA    .078
 603      LG    .250    .150   7.300    .135  30.000
 604      UC    .567    .476
 605      UA       0       5      16      30      65      77      84      90      94      97
 606      UA     100
          *

 607      KK  RE21MY
 608      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
 609      KM   FROM 23RD DRIVE AND MYRTLE
 610      DR  DI23DM
          *

 611      KK  RD21MY
 612      KM   ROUTE RETRIEVED DIVERT ALONG MYRTLE
 613      KM   ROUTE DIVERT FROM 23RD AND MYRTLE TO 21ST AVE AND MYRTLE
 614      RS       8    FLOW       0
 615      RC    .016    .016    .016    1490    .001     4.3
 616      RX    44.9      45      66    66.1     134   134.1     155   155.1
 617      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

618       KK  CP21MY
619       KM   COMBINE AT 21ST AVE AND MYRTLE
620       HC       3
          *

621       KK  DV21MY
622       KM   DIVERT FLOWS AT MYTRLE 50% SOUTH AND 50% EAST
623       KM   DQ FLOWS GO TO EAST TO 19TH AVE AND MYTRLE
624       DT  DI21MY
625       DI       0     500   10000
626       DQ       0     250    5000
          *

627       KK  RT21MY
628       KM   ROUTE 21MY
629       KM   ROUTE FROM BASIN 21MY TO 21GL
630       KM   MYRTLE TO GLENDALE
631       RS       3    FLOW       0
632       RC    .016    .016    .016    1300    .004     4.3
633       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
634       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

635       KK  SB21GL
636       KM   SUB-BASIN SB21GL
637       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND GLENDALE
638       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
639       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
640       KM     L =  .32  Kb = .060  Adj. Slope =   17.0
641       BA    .043
642       LG    .230    .250   3.500    .349  37.000
643       UC    .475    .391
644       UA       0       5      16      30      65      77      84      90      94      97
645       UA     100
          *

646       KK  CP21GL
647       KM   COMBINE AT 21ST AVE AND GLENDALE
648       HC       2
          *

649       KK  DV21GL
650       KM   DIVERT FLOWS AT 21ST AND GLENDALE SOUTH AND EAST
651       KM   DQ FLOWS GO TO EAST TO 19TH AVE AND GLENDALE
652       DT  DI21GL
653       DI      74     122    1242    2083
654       DQ      74     108    1008    1687
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  655     KK  RT21GL
  656     KM   ROUTE 21GL
  657     KM   ROUTE FROM BASIN 21GL TO 21MA
  658     KM   GLENDALE TO MARYLAND
  659     RS      5    FLOW       0
  660     RC   .016    .016    .016    2666    .005     4.3
  661     RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
  662     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  663     KK  SB21MA
  664     KM   SUB-BASIN SB21MA
  665     KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND MARYLAND
  666     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  667     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  668     KM     L =  .50  Kb = .052  Adj. Slope =   27.0
  669     BA    .155
  670     LG    .230    .250   3.500    .346  41.000
  671     UC    .475    .269
  672     UA       0       5      16      30      65      77      84      90      94      97
  673     UA     100
          *

  674     KK  CP21MA
  675     KM   COMBINE AT 21ST AVE AND MARYLAND
  676     HC       2
          *

  677     KK  RT21MA
  678     KM   ROUTE 21MA
  679     KM   ALL FLOWS ALONG 21ST AVE AT MARYLAND ARE ROUTED TO THE SOUTH
  680     KM   ROUTE FROM BASIN 21MA TO 21BE
  681     RS      5    FLOW       0
  682     RC   .016    .016    .016    2630    .004     4.3
  683     RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
  684     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  685     KK  SB21BE
  686     KM   SUB-BASIN SB21BE
  687     KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND BETHANY HOME
  688     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  689     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  690     KM     L =  .50  Kb = .052  Adj. Slope =   20.0
  691     BA    .182
  692     LG    .210    .250   3.500    .338  47.000
  693     UC    .521    .272
  694     UA       0       5      16      30      65      77      84      90      94      97
  695     UA     100
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

696       KK  21BE.1
697       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
698       KM   SB21BE, 8 CBS CONTRIBUTING TO 18" SD ALONG 21ST AVE AFFECTING FLOWS AT CP
699       KM   REMOVE CAPACITY OF SD. ASSUME QFULL CONDITIONS. QFULL =5.72 CFS
700       KM   SO = 0.003 AND N = 0.013
701       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
702       DT  21BE.2
703       DI       0       6   10000
704       DQ       0       6       6
          *

705       KK  CP21BE
706       KM   COMBINE AT 21ST AVE AND BETHANY HOME
707       HC       2
          *

708       KK  RT21BE
709       KM   ROUTE 21BE
710       KM   ALL FLOW GOES SOUTH
711       KM   ROUTE FROM BASIN 21BE TO 21MO
712       RS       1    FLOW       0
713       RC    .016    .016    .016    1178    .005     4.3
714       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
715       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

716       KK  SB21MO
717       KM   SUB-BASIN SB21MO
718       KM   SUBBASIN CONTRIBUTING TO 21st AVE AND MONTEBELLO
719       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
720       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
721       KM     L =  .58  Kb = .057  Adj. Slope =   10.0
722       BA    .069
723       LG    .240    .250   4.900    .352  35.000
724       UC    .817    .877
725       UA       0       5      16      30      65      77      84      90      94      97
726       UA     100
          *

727       KK  CP21MO
728       KM   COMBINE AT 21ST AVE AND MONTEBELLO
729       HC       2
          *

730       KK  RT21MO
731       KM   ROUTE 21MO
732       KM   ROUTE FROM BASIN 21MO TO 21MI
733       RS       2    FLOW       0
734       RC    .016    .016    .016    1450    .003     4.3
735       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
736       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

737       KK  SB21MI
738       KM   SUB-BASIN SB21MI
739       KM   SUBBASIN CONTRIBUTING TO 21st AVE AND MISSOURI
740       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
741       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
742       KM     L =  .48  Kb = .056  Adj. Slope =   14.0
743       BA    .089
744       LG    .250    .250   4.900    .360  31.000
745       UC    .642    .499
746       UA       0       5      16      30      65      77      84      90      94      97
747       UA     100
          *

748       KK  RE21MI
749       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
750       KM   FROM 23RD AND MISSOURI
751       DR  DI23MI
          *

752       KK  RD21MI
753       KM   ROUTE DIVERT FROM CP23MI TO CP21MI
754       KM   ROUTE DIVERTED FLOW ALONG MISSOURI TO 21st AVENUE
755       RS       4    FLOW       0
756       RC    .016    .016    .016    1296    .002     4.3
757       RX   44.9      45      66    66.1     134   134.1     155   155.1
758       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

759       KK  CP21MI
760       KM   COMBINE AT 21ST AVE AND MISSOURI
761       KO       3
762       HC       3
          *

763       KK  RT21MI
764       KM   ROUTE 21MI
765       KM   ROUTE FROM BASIN 21MI TO 21CA
766       KM   ROUTE FLOW THROUGH 21ST AND MISSOURI BASIN TO 21ST AVE AND CAMELBACK
767       KM   ALL FLOWS GO TO SOUTH
768       KO       3
769       RS       4    FLOW       0
770       RC    .016    .016    .016    2663    .003     4.3
771       RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
772       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          *
          *

773       KK  SB22CA
774       KM   SUB-BASIN SB22CA
775       KM   SUBBASIN CONTRIBUTING TO 22ND AVE AND CAMELBACK
776       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
777       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
778       KM     L =  .50  Kb = .059  Adj. Slope =   16.0
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 779      KO       3
 780      BA    .054
 781      LG    .220    .210   6.400    .180  45.000
 782      UC    .600    .636
 783      UA       0       5      16      30      65      77      84      90      94      97
 784      UA     100
          *

 785      KK  22CA.1
 786      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 787      KM   SB22CA, 2 CBS CONTRIBUTING TO 18" SD ALONG 22ND AVE AFFECTING FLOWS AT CP
 788      KM   REMOVE CAPACITY OF CBs. ASSUME CAPCITY OF 5 CFS PER BASIN
 789      KM   TOTAL Q TAKEN OUT = 2(5) = 10 CFS
 790      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 791      KO       3
 792      DT  22CA.2
 793      DI       0      10   10000
 794      DQ       0      10      10
          *

 795      KK  RE22CA
 796      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
 797      KM   FROM 23RD DRIVE AND COLTER
 798      DR  DI23CO
          *

 799      KK  RD22CA
 800      KM   ROUTE DIVERTED FLOWS FROM BASIN 23CO TO 22CA
 801      KO       3
 802      RS       3    FLOW       0
 803      RC    .016    .016    .016    2150    .002     4.3
 804      RX   44.9      45      66    66.1     134   134.1     155   155.1
 805      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 806      KK  CP22CA
 807      KM   COMBINE AT 22ND AVE AND CAMELBACK
 808      KO       3
 809      HC       2
          *

 810      KK  DV22CA
 811      KM   DIVERT FLOWS TO 21ST AND CAMPBELL 50% SOUTH AND 50% EAST
 812      KM   DQ FLOWS GO TO SOUTH TO 21ST AVE AND CAMPBELL
 813      KO       3
 814      DT  DI22CA
 815      DI       0     500   10000
 816      DQ       0     250    5000
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  817     KK  RT22CA
  818     KM   ROUTE 22CA
  819     KM   ROUTE FROM BASIN 22CA TO 21CA (CAMELBACK)
  820     RS       6    FLOW       0
  821     RC    .016    .016    .016     925    .004     4.3
  822     RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
  823     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  824     KK  SB21CA
  825     KM   SUB-BASIN SB21CA
  826     KM   SUBBASIN CONTRIBUTING TO 21st AVE AND NORTHERN
  827     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  828     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  829     KM     L =  .50  Kb = .052  Adj. Slope =   19.0
  830     KO       3
  831     BA    .172
  832     LG    .210    .250   5.600    .147  45.000
  833     UC    .517    .278
  834     UA       0       5      16      30      65      77      84      90      94      97
  835     UA     100
          *

  836     KK  21CA.1
  837     KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
  838     KM   SB21CA, 2 CBS CONTRIBUTING TO 18" SD ALONG VERMONT AND
  839     KM   12 CBS CONTRIBUTING TO 24" SD ALONG 21ST AVE AFFECTING FLOWS AT CP
  840     KM   REMOVE CAPACITY OF 18 " SD AND 24" SD. 18" QFULL = 5.72 AND 24" = 12.33 CFS
  841     KM   SO = 0.003 '/FT AND N = 0.013
  842     KM   TOTAL Q TAKEN OUT = 12.33+5.72 = 18.05
  843     KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
  844     KO       3
  845     DT  21CA.2
  846     DI       0      18   10000
  847     DQ       0      18      18
          *

  848     KK  CP21CA
  849     KM   COMBINE AT 21ST AVE AND CAMELBACK
  850     KO       3
  851     HC       3
          *

  852     KK  RT21CA
  853     KM   ROUTE 21CA
  854     KM   ALL FLOWS ROUTED SOUTH ALONG 21ST AVE
  855     KM   ROUTE FROM BASIN 21CA TO 21CP
  856     RS       4    FLOW       0
  857     RC    .016    .016    .016    2640    .003     4.3
  858     RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
  859     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  860     KK  SB21CP
  861     KM   SUB-BASIN SB21CP
  862     KM   SUBBASIN CONTRIBUTING TO 21st AVE AND CAMPBELL
  863     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  864     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  865     KM     L =  .62  Kb = .053  Adj. Slope =   16.0
  866     BA    .144
  867     LG    .240    .150   9.100    .067  40.000
  868     UC    .617    .445
  869     UA       0       5      16      30      65      77      84      90      94      97
  870     UA     100
          *

  871     KK  21CP.1
  872     KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
  873     KM   SB21CP, 3 CBs IN SUBBASIN,CONTRIBUTING TO 24" SD ALONG 21ST AVE
  874     KM   REMOVE CAPACITY OF CATCH BASINS ALONG 24" LINE. ASSUME 5 CFS PER CATCH BASIN.
  875     KM   TOTAL Q TAKEN OUT = 3(5) = 15
  876     KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
  877     DT  21CP.2
  878     DI       0      15   10000
  879     DQ       0      15      15
          *

  880     KK  RE22CA
  881     KM   RETRIEVAL OF 22ND AND CAMELBACK FLOWS
  882     DR  DI22CA
          *

  883     KK  RD22CA
  884     KM   ROUTE DIVERTED FLOWS FROM BASIN 22CA TO 21CP
  885     KM   ROUTE FLOW FROM 22nd AVENUE AND CAMELBACK BASIN TO 21ST AVE AND CAMPBELL
  886     RS       2    FLOW       0
  887     RC    .016    .016    .016    3287    .003     4.3
  888     RX   44.9      45      66    66.1     134   134.1     155   155.1
  889     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  890     KK  CP21CP
  891     KM   COMBINE AT 21ST AVE AND CAMPBELL
  892     HC       3
          *

  893     KK  DV21CP
  894     KM   DIVERT FLOWS AT 21ST AND CAMPBELL 50% SOUTH AND 50% EAST
  895     KM   DQ FLOWS GO TO EAST TO 19TH AVE AND CAMPBELL
  896     DT  DI21CP
  897     DI       0     500   10000
  898     DQ       0     250    5000
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

899       KK  RT21CP
900       KM   ROUTE 21CP
901       KM   ROUTE FROM BASIN 21CP TO 21CN (21ST AVE AND THE GRAND CANAL)
902       RS      4    FLOW       0
903       RC   .016    .016    .016    1610    .002     4.3
904       RX    0.0     0.1    15.0    25.0    55.0    65.0    80.0    80.1
905       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

906       KK  SB21CN
907       KM   SUB-BASIN SB21CN
908       KM   SUBBASIN CONTRIBUTING TO 21st AVE AND GRAND CANAL
909       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
910       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
911       KM    L =  .30  Kb = .060  Adj. Slope =   12.0
912       BA   .042
913       LG   .250    .150   7.950    .104  45.000
914       UC   .488    .388
915       UA      0       5      16      30      65      77      84      90      94      97
916       UA    100
          *

917       KK  CP21CN
918       KM   COMBINE AT 21ST AVE AND CANAL
919       HC      2
          *
920       KM   ********************************************************************************
921       KM   19TH AVENUE BASINS
922       KM   ********************************************************************************
          *

923       KK  SB19DU   BASIN
924       KM   SUB-BASIN SB19DU
925       KM   SUBBASIN CONTRIBUING TO 19TH AVE AND DUNLAP
926       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
927       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
928       KM    L =  .33  Kb = .066  Adj. Slope =   26.0
929       BA   .017
930       LG   .100    .250   3.500    .278  80.000
931       UC   .417    .588
932       UA      0       5      16      30      65      77      84      90      94      97
933       UA    100
          *

934       KK  RT19DU
935       KM   ROUTE FROM BASIN 19DU TO 19NO (19TH AVE AND NORTHERN)
936       KM   19TH AVE - DUNLAP TO NORTHERN
937       RS      6    FLOW       0
938       RC   .016    .016    .016    5296    .005     4.3
939       RX   44.9      45      66    66.1     134   134.1     155   155.1
940       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

941       KK  SB19NO
942       KM   SUB-BASIN SB19NO
943       KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND NORTHERN
944       KM   GOLF COURSE AND ITS LAKES RETAINS MOST RUNOFF GENERATED IN THIS BASIN
945       KM   APPROXIMATELY 23 ACRES ALONG THE EAST SIDE DIRECTLY CONTRIBUTES TO
946       KM   19TH AVE AND NORTHERN
947       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
948       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
949       KM     L =  .50  Kb = .032  Adj. Slope =   26.4
950       BA    .036
951       LG    .250    .150   9.600    .056  60.000
952       UC    .346    .435
953       UA       0       5      16      30      65      77      84      90      94      97
954       UA     100
          *

955       KK  19NO.1
956       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
957       KM   SB19NO, 6 CBS CONTRIBUTING TO 36" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
958       KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
959       KM   QTOTAL = 36" SD QFULL = 36.42
960       KM   SO = 0.003 AND N = 0.013
961       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
962       DT  19NO.2
963       DI       0      36   10000
964       DQ       0      36      36
          *

965       KK  RE19NO
966       KM   RETRIEVAL OF FLOW FROM 23RD AVE AND NORTHERN
967       DR  DI23NO
          *

968       KK  RD19NO
969       KM   ROUTE RETRIEVED DIVERT ALONG NORTHERN
970       KM   ROUTE DIVERT FROM 23RD AND NORTHERN TO 19TH AVE AND NORTHERN
971       RS       5    FLOW       0
972       RC    .016    .016    .016    2642    .002     4.3
973       RX    44.9      45      66    66.1     134   134.1     155   155.1
974       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

975       KK  CP19NO
976       KM   COMBINE AT 19TH AVE AND NORTHERN
977       HC       3
          *

978       KK  RT19NO
979       KM   ROUTE 19NO
980       KM   ROUTE FROM BASIN 19NO TO 19OR
981       KM   19TH AVE - NORTHERN TO ORANGEWOOD
982       RS       2    FLOW       0
983       RC    .016    .016    .016    2640    .004     4.3
984       RX    44.9      45      66    66.1     134   134.1     155   155.1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 985      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 986      KK  SB19OR
 987      KM   SUB-BASIN SB19OR
 988      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND ORANGEWOOD
 989      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 990      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 991      KM     L =  .70  Kb = .055  Adj. Slope =   20.0
 992      BA    .105
 993      LG    .100    .200   6.400    .142  80.000
 994      UC    .613    .583
 995      UA       0       5      16      30      65      77      84      90      94      97
 996      UA     100
          *

 997      KK  19OR.1
 998      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 999      KM   SB19OR, 10 CBS CONTRIBUTING TO 48" SD AND 42" SD ALONG 19TH AVE AFFECTING FLO
1000      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1001      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1002      KM   QTOTAL = 6(5) = 30
1003      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1004      DT  19OR.2
1005      DI       0      30   10000
1006      DQ       0      30      30
          *

1007      KK  RE19OR
1008      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1009      KM   FROM 21ST AND ORANGWOOD
1010      DR  DI21OR
          *

1011      KK  RD19OR
1012      KM   ROUTE RETRIEVED DIVERT ALONG ORANGEWOOD
1013      KM   ROUTE DIVERT FROM 21ST AND ORANGEWOOD TO 19TH AVE AND ORANGEWOOD
1014      RS       2    FLOW       0
1015      RC    .016    .016    .016    1346    .003     4.3
1016      RX   44.9      45      66    66.1     134   134.1     155   155.1
1017      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1018      KK  CP19OR
1019      KM   COMBINE AT 19TH AVE AND ORANGEWOOD
1020      HC       3
          *

1021      KK  RT19OR
1022      KM   ROUTE 19OR
1023      KM   ROUTE FROM BASIN 19OR TO 19MY
1024      KM   19TH AVE - ORANGEWOOD TO MYRTLE
1025      RS       1    FLOW       0
1026      RC    .016    .016    .016    1340    .004     4.3
1027      RX   44.9      45      66    66.1     134   134.1     155   155.1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1028      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1029      KK  SB19MY
1030      KM   SUB-BASIN SB19MY
1031      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MYRTLE
1032      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1033      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1034      KM     L =  .37  Kb = .060  Adj. Slope =   16.0
1035      BA    .046
1036      LG    .250    .250   3.500    .360  36.000
1037      UC    .529    .477
1038      UA       0       5      16      30      65      77      84      90      94      97
1039      UA     100
          *

1040      KK  19MY.1
1041      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1042      KM   SB19MY, 7 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1043      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1044      KM   QTOTAL = 7(5) = 35
1045      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1046      DT  19MY.2
1047      DI       0      35   10000
1048      DQ       0      35      35
          *

1049      KK  RE19MY
1050      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1051      KM   FROM 21ST AND MYRTLE
1052      DR  DI21MY
          *

1053      KK  RD19MY
1054      KM   ROUTE RETRIEVED DIVERT ALONG MYRTLE
1055      KM   ROUTE DIVERT FROM 21ST AND MYRTLE TO 19TH AVE AND MYRTLE
1056      RS       3    FLOW       0
1057      RC    .016    .016    .016    1318    .001     4.3
1058      RX    44.9      45      66    66.1     134   134.1     155   155.1
1059      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1060      KK  CP19MY
1061      KM   COMBINE AT 19TH AVE AND MYRTLE
1062      HC       3
          *

1063      KK  RT19MY
1064      KM   ROUTE 19MY
1065      KM   ROUTE FROM BASIN 19MY TO 19GL
1066      KM   19TH AVE - MYRTLE TO GLENDALE
1067      RS       2    FLOW       0
1068      RC    .016    .016    .016    1320    .002     4.3
1069      RX    44.9      45      66    66.1     134   134.1     155   155.1
1070      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1071      KK  SB19GL
1072      KM   SUB-BASIN SB19GL
1073      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND GLENDALE
1074      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1075      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1076      KM     L =  .40  Kb = .059  Adj. Slope =   10.0
1077      BA    .054
1078      LG    .170    .250   3.500    .316  61.000
1079      UC    .617    .549
1080      UA       0       5      16      30      65      77      84      90      94      97
1081      UA     100
          *

1082      KK  19GL.1
1083      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1084      KM   SB19GL, 3 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1085      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1086      KM   QTOTAL = 3(5) = 15
1087      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1088      DT  19GL.2
1089      DI       0      15   10000
1090      DQ       0      15      15
          *

1091      KK  RE19GL
1092      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1093      KM   FROM 21ST AND GLENDALE
1094      DR  DI21GL
          *

1095      KK  RD19GL
1096      KM   ROUTE RETRIEVED DIVERT ALONG GLENDALE
1097      KM   ROUTE DIVERT FROM 21ST AND GLENDALE TO 19TH AVE AND GLENDALE
1098      RS       3    FLOW       0
1099      RC    .016    .016    .016    1318    .001     4.3
1100      RX    44.9      45      66    66.1     134   134.1     155   155.1
1101      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1102      KK  CP19GL
1103      KM   COMBINE AT 19TH AVE AND GLENDALE
1104      HC       3
          *

1105      KK  RT19GL
1106      KM   ROUTE 19GL
1107      KM   ROUTE FROM BASIN 19GL TO 19MA
1108      KM   19TH AVE - GLENDALE TO MARYLAND
1109      RS       1    FLOW       0
1110      RC    .016    .016    .016    2639    .005     4.3
1111      RX    44.9      45      66    66.1     134   134.1     155   155.1
1112      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1113      KK  SB19MA
1114      KM   SUB-BASIN SB19MA
1115      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MARYLAND
1116      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1117      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1118      KM     L =  .50  Kb = .059  Adj. Slope =   28.0
1119      BA    .054
1120      LG    .190    .250   4.900    .324  60.000
1121      UC    .492    .510
1122      UA       0       5      16      30      65      77      84      90      94      97
1123      UA     100
          *

1124      KK  19MA.1
1125      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1126      KM   SB19MA, 7 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1127      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1128      KM   QTOTAL = 7(5) = 35
1129      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1130      DT  19MA.2
1131      DI       0      35   10000
1132      DQ       0      35      35
          *

1133      KK  CP19MA
1134      KM   COMBINE AT 19TH AVE AND MARYLAND
1135      HC       2
          *

1136      KK  RT19MA
1137      KM   ROUTE 19MA
1138      KM   ROUTE FROM BASIN 19MA TO 19BE
1139      KM   19TH AVE - MARYLAND TO BETHANY HOME
1140      RS       2    FLOW       0
1141      RC    .016    .016    .016    2659    .004     4.3
1142      RX   44.9      45      66    66.1     134   134.1     155   155.1
1143      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1144      KK  SB19BE
1145      KM   SUB-BASIN SB19BE
1146      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND BETHANY HOME
1147      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1148      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1149      KM     L =  .50  Kb = .058  Adj. Slope =   20.0
1150      BA    .057
1151      LG    .190    .250   4.900    .324  56.000
1152      UC    .554    .565
1153      UA       0       5      16      30      65      77      84      90      94      97
1154      UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1155      KK  19BE.1
1156      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1157      KM   SB19BE, 6 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1158      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1159      KM   QTOTAL = 6(5) = 30
1160      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1161      DT  19BE.2
1162      DI       0      30   10000
1163      DQ       0      30      30
          *

1164      KK  CP19BE
1165      KM   COMBINE AT 19TH AVE AND BETHANY HOME
1166      HC       2
          *

1167      KK  RT19BE
1168      KM   ROUTE 19BE
1169      KM   ROUTE FROM BASIN 19BE TO 19MI
1170      KM   19TH AVE - BETHANY HOME TO MISSOURI
1171      RS       2    FLOW       0
1172      RC    .016    .016    .016    2623    .004     4.3
1173      RX   44.9      45      66    66.1     134   134.1     155   155.1
1174      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1175      KK  SB19MI
1176      KM   SUB-BASIN SB19MI
1177      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MISSOURI
1178      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1179      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1180      KM     L =  .50  Kb = .057  Adj. Slope =   20.0
1181      BA    .076
1182      LG    .220    .250   4.900    .344  41.000
1183      UC    .567    .491
1184      UA       0       5      16      30      65      77      84      90      94      97
1185      UA     100
          *

1186      KK  19MI.1
1187      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1188      KM   SB19MI, 14 CBS CONTRIBUTING TO 48" SD ALONG19TH AVE AFFECTING FLOWS AT CP
1189      KM   REMOVE CAPACITY OF SD. ASSUME QFULL CONDITIONS. QFULL = 78.5 CFS
1190      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1191      DT  19MI.2
1192      DI       0      79   10000
1193      DQ       0      79      79
          *
```
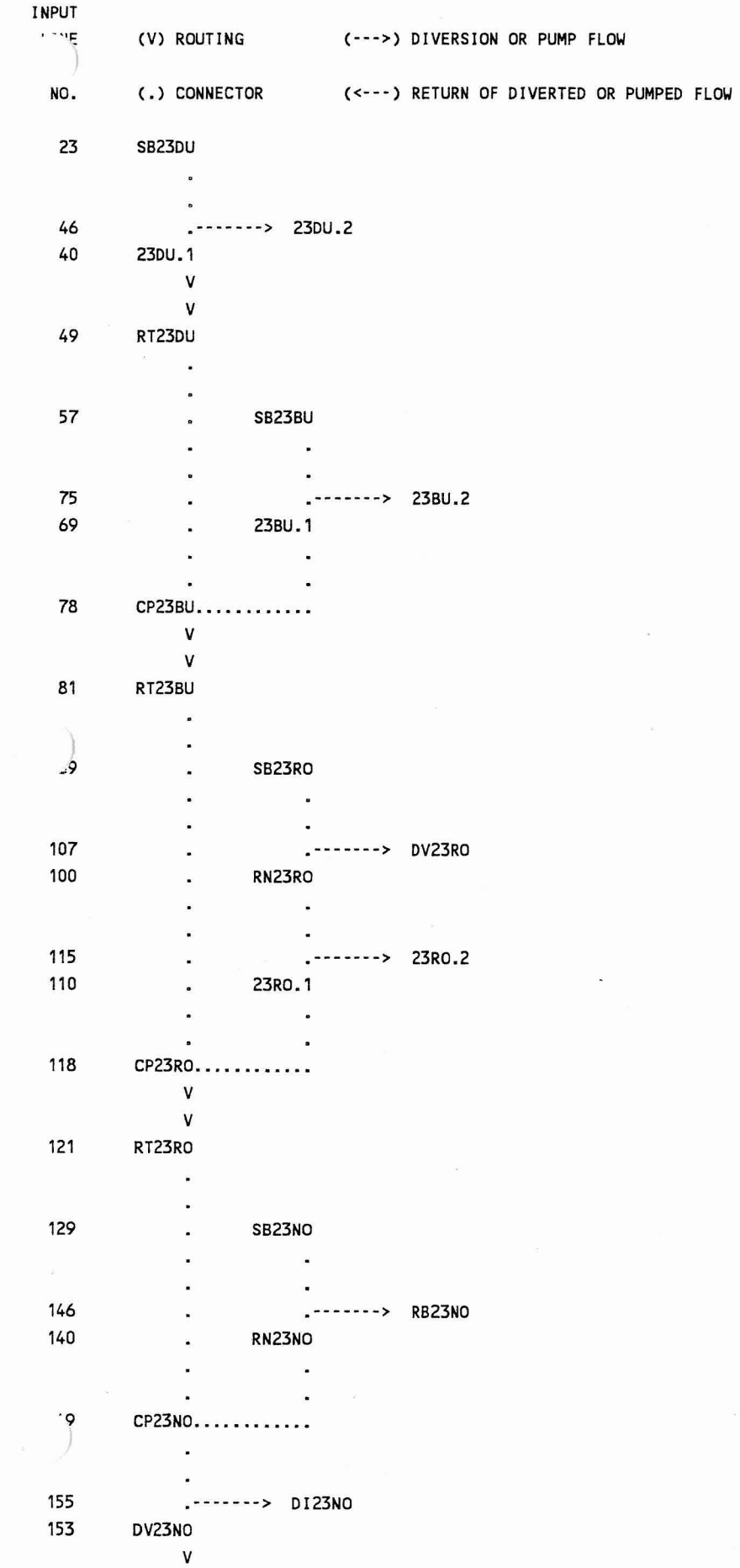
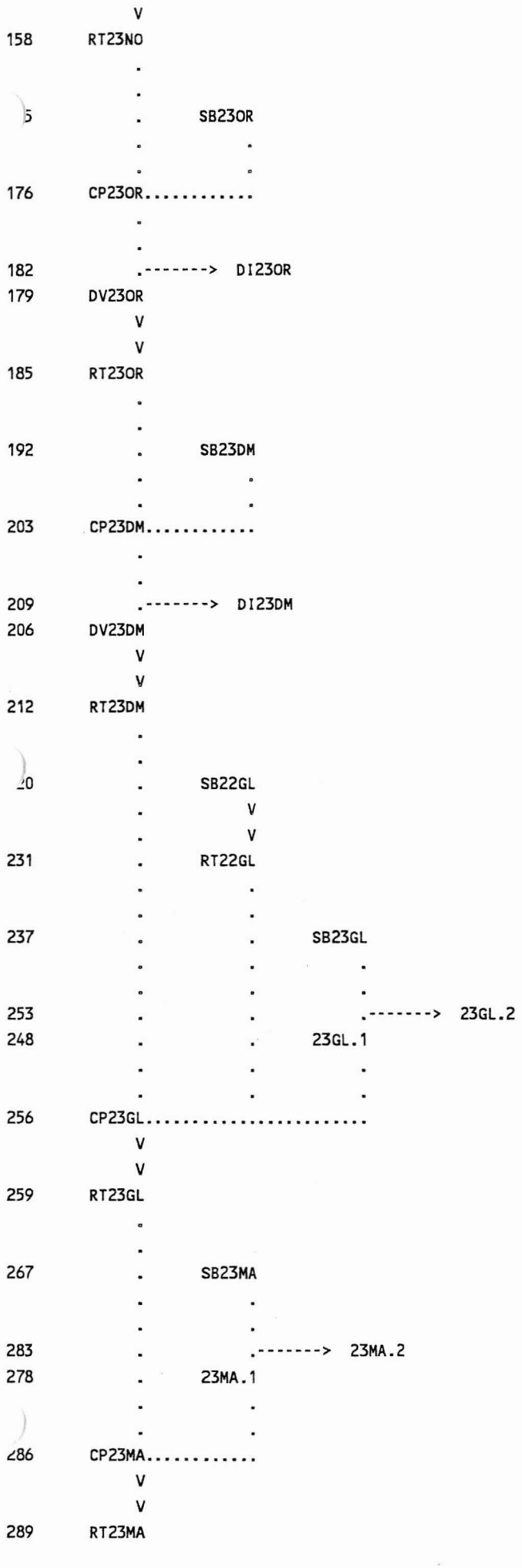

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1194      KK  CP19MI
1195      KM   COMBINE AT 19TH AVE AND MISSOURI
1196      HC       2
          *

1197      KK  RT19MI
1198      KM   19TH AVE - MISSOURI TO CAMELBACK
1199      KM   ROUTE 19MI
1200      KM   ROUTE FROM BASIN 19MI TO 19CA
1201      RS       2    FLOW       0
1202      RC    .016    .016    .016    2639    .003     4.3
1203      RX    44.9      45      66    66.1     134   134.1     155   155.1
1204      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1205      KK  SB19CA
1206      KM   SUB-BASIN SB19CA
1207      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND CAMELBACK
1208      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1209      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1210      KM    L =  .50  Kb = .070  Adj. Slope =   16.0
1211      BA    .009
1212      LG    .100    .150   8.100    .075  80.000
1213      UC    .629   1.862
1214      UA       0       5      16      30      65      77      84      90      94      97
1215      UA     100
          *

1216      KK  19CA.1
1217      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1218      KM   SB19CA, 5 CBS CONTRIBUTING TO 18" SD ALONG VERMONT AND
1219      KM   12 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1220      KM   REMOVE CAPACITY OF CBs. ASSUME CAPCITY OF 5 CFS PER BASIN
1221      KM   TOTAL Q TAKEN OUT = 5(5) = 25 CFS
1222      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1223      DT  19CA.2
1224      DI       0      25   10000
1225      DQ       0      25      25
          *

1226      KK  CP19CA
1227      KM   COMBINE AT 19TH AVE AND CAMELBACK
1228      HC       2
          *

1229      KK  RT19CA
1230      KM   ROUTE 19CA
1231      KM   ROUTE FROM BASIN 19CA TO 19CP
1232      KM   19TH AVE - CAMELBACK TO CAMPBELL
1233      RS       2    FLOW       0
1234      RC    .016    .016    .016    2670    .005     4.3
1235      RX    44.9      45      66    66.1     134   134.1     155   155.1
1236      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1237      KK  SB19CP
1238      KM   SUB-BASIN SB19CP
1239      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND CAMPBELL
1240      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1241      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1242      KM     L =  .51  Kb = .058  Adj. Slope =   25.0
1243      BA    .057
1244      LG    .210    .150   7.900    .100  50.000
1245      UC    .496    .507
1246      UA       0       5      16      30      65      77      84      90      94      97
1247      UA     100
          *

1248      KK  19CP.1
1249      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1250      KM   SB19CP, 6 CBs IN SUBBASIN,CONTRIBUTING TO 54" SD ALONG 19TH AVE
1251      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 54" LINE. ASSUME 5 CFS PER CATCH BASIN.
1252      KM   TOTAL Q TAKEN OUT = 6(5) = 30
1253      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1254      DT  19CP.2
1255      DI       0      30   10000
1256      DQ       0      30      30
          *

1257      KK  RE19CP
1258      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1259      KM   FROM 21ST AND CAMPBELL
1260      DR  DI21CP
          *

1261      KK  RD19CP
1262      KM   ROUTE DIVERT FROM CP21CP TO CP19CP ALONG CAMPBELL
1263      KM   ROUTE FROM 21st AVE AND CAMPBELL TO 19TH AVE AND CAMPBELL
1264      RS       4    FLOW       0
1265      RC    .016    .016    .016    1310    .002     4.3
1266      RX    44.9      45      66    66.1     134   134.1     155   155.1
1267      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1268      KK  CP19CP
1269      KM   COMBINE AT 19TH AVE AND CAMPBELL
1270      HC       3
          *

1271      KK  RT19CP
1272      KM   19TH AVE - CAMPBELL TO GRAND CANAL
1273      KM   ROUTE 19CP
1274      KM   ROUTE FROM BASIN 19CP TO 19CN
1275      RS       3    FLOW       0
1276      RC    .016    .016    .016     900    .001     4.3
1277      RX    44.9      45      66    66.1     134   134.1     155   155.1
1278      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1279      KK  SB19CN
1280      KM   SUB-BASIN SB19CN
1281      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND GRAND CANAL
1282      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1283      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1284      KM     L =  .37  Kb = .061  Adj. Slope =    5.0
1285      BA    .037
1286      LG    .250    .150   8.200    .071  41.000
1287      UC    .750    .795
1288      UA       0       5      16      30      65      77      84      90      94      97
1289      UA     100
          *

1290      KK  19CN.1
1291      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1292      KM   SB19CN, 7 CBs IN SUBBASIN, 1-15" SD ALONG S. TURNEY, 1-18" ALONG N. TURNEY
1293      KM   AND 1-54" ALONG 19TH AVE. 24"QFULL = 12.33 AND 18"QFULL = 5.72 CFS
1294      KM   SO = 0.003 AND N =0.13
1295      KM   3 CBs CONTRIBUTE TO 24" SD AND 2 TO THE 18" SD AND 54" SD AFFECTING FLOW AT C
1296      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 54" LINE. ASSUME 5 CFS PER CATCH BASIN.
1297      KM   REMOVE PIPE CAPACITY OF STORM DRAINS.
1298      KM   TOTAL Q TAKEN OUT = 12.33+5.72+3(5) = 33.05
1299      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1300      DT  19CN.2
1301      DI       0      33   10000
1302      DQ       0      33      33
          *

1303      KK  CP19CN
1304      KM   COMBINE AT 19TH AVE AND GRAND CANAL
1305      HC       2
1306      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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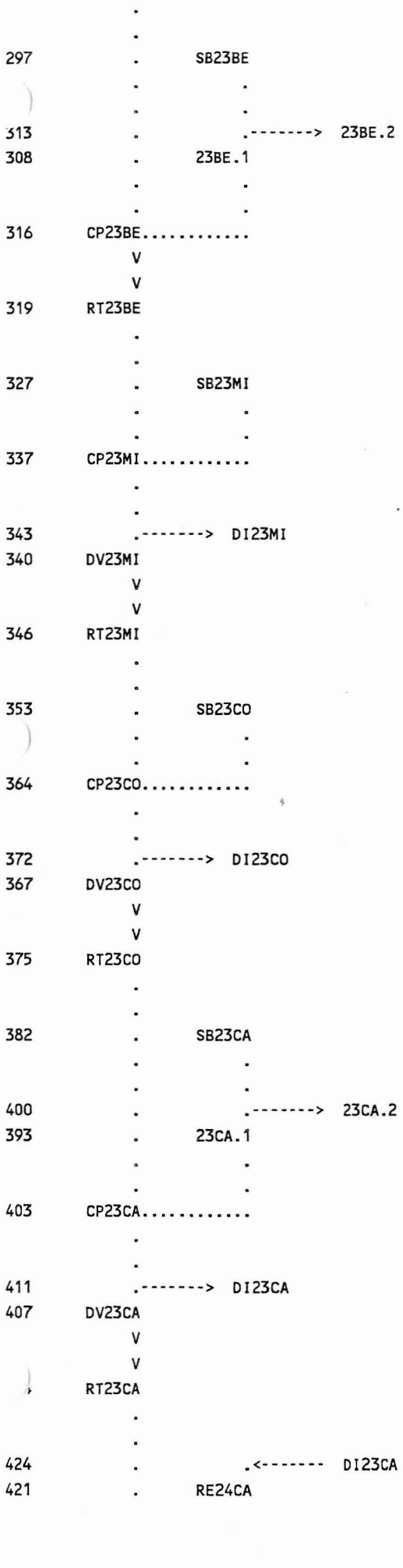
158 RT23NO
SB23OR
176 CP23OR
182 DI23OR
179 DV23OR
185 RT23OR
192 SB23DM
203 CP23DM
209 DI23DM
206 DV23DM
212 RT23DM
SB22GL
231 RT22GL
237 SB23GL
253 23GL.2
248 23GL.1
256 CP23GL
259 RT23GL
267 SB23MA
283 23MA.2
278 23MA.1
286 CP23MA
289 RT23MA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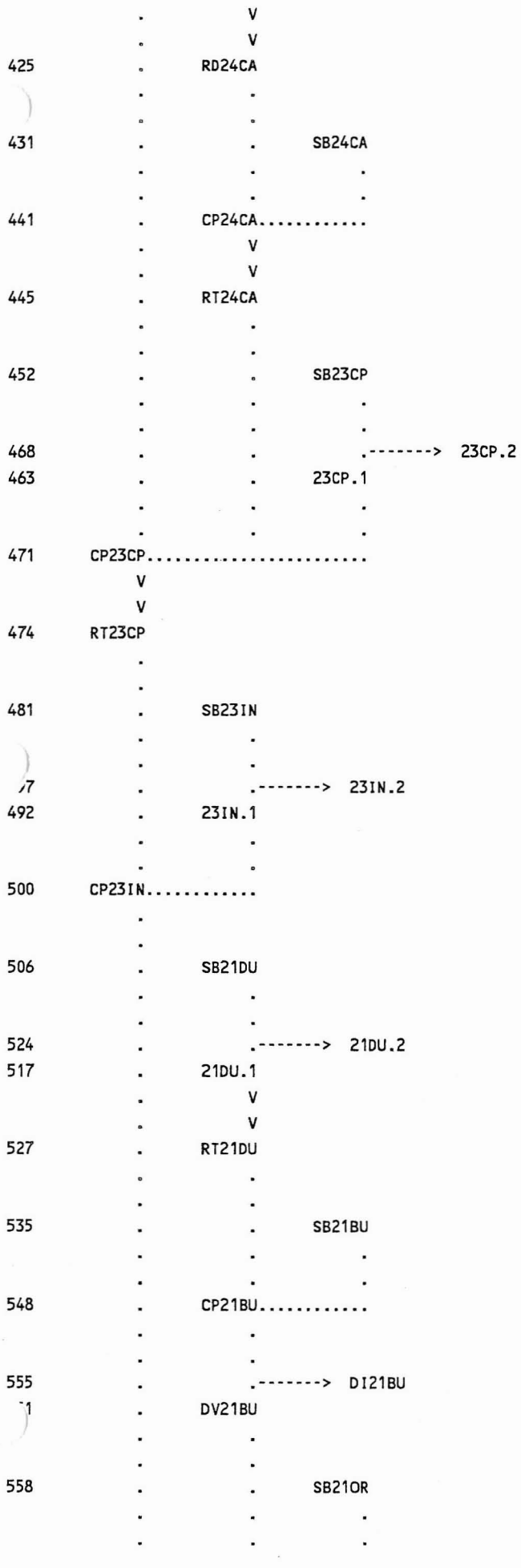
313 23BE.2
308 23BE.1
316 CP23BE
319 RT23BE
327 SB23MI
337 CP23MI
343 DI23MI
340 DV23MI
346 RT23MI
353 SB23CO
364 CP23CO
372 DI23CO
367 DV23CO
375 RT23CO
382 SB23CA
400 23CA.2
393 23CA.1
403 CP23CA
411 DI23CA
407 DV23CA
RT23CA
424 DI23CA
421 RE24CA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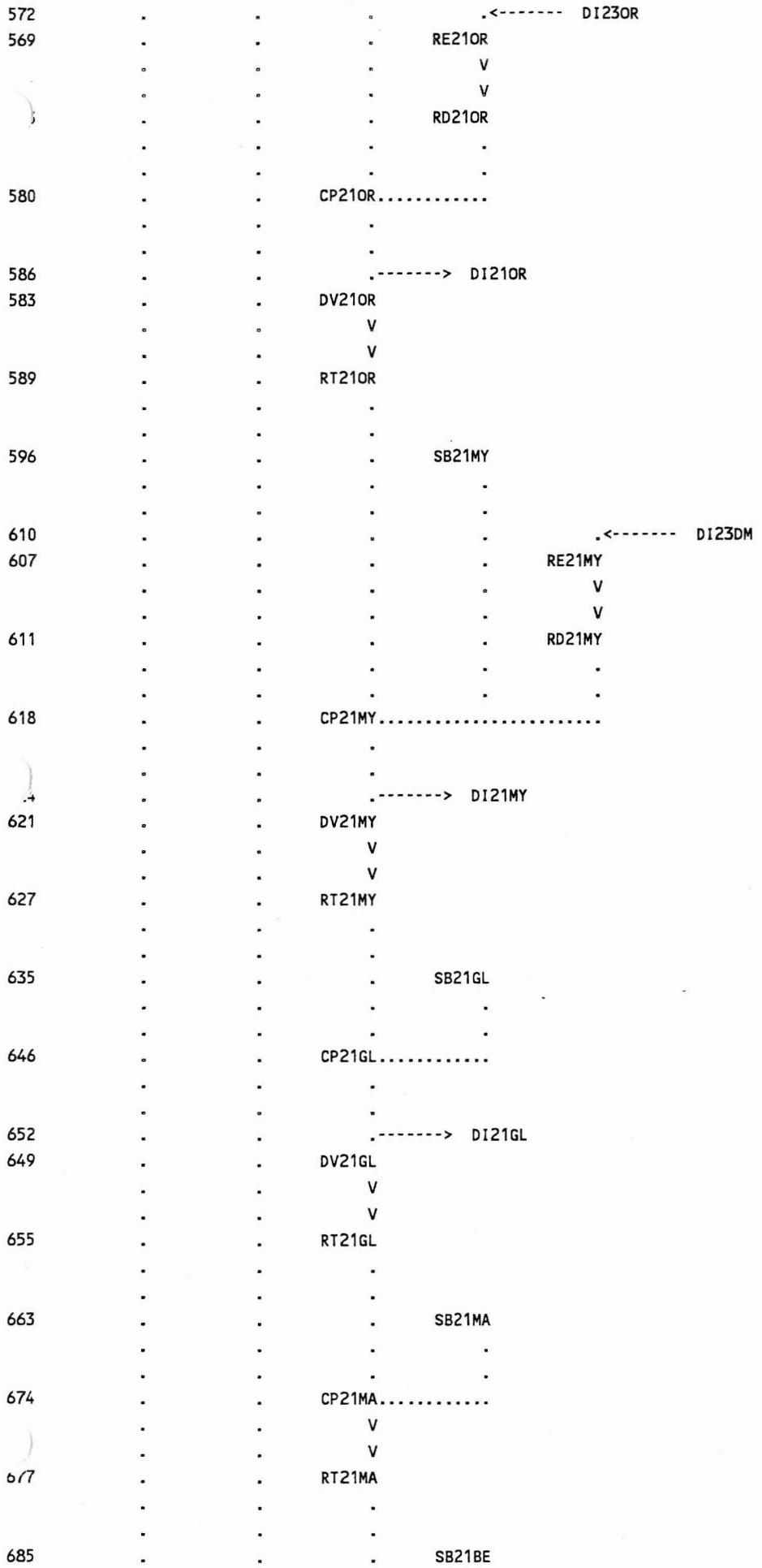
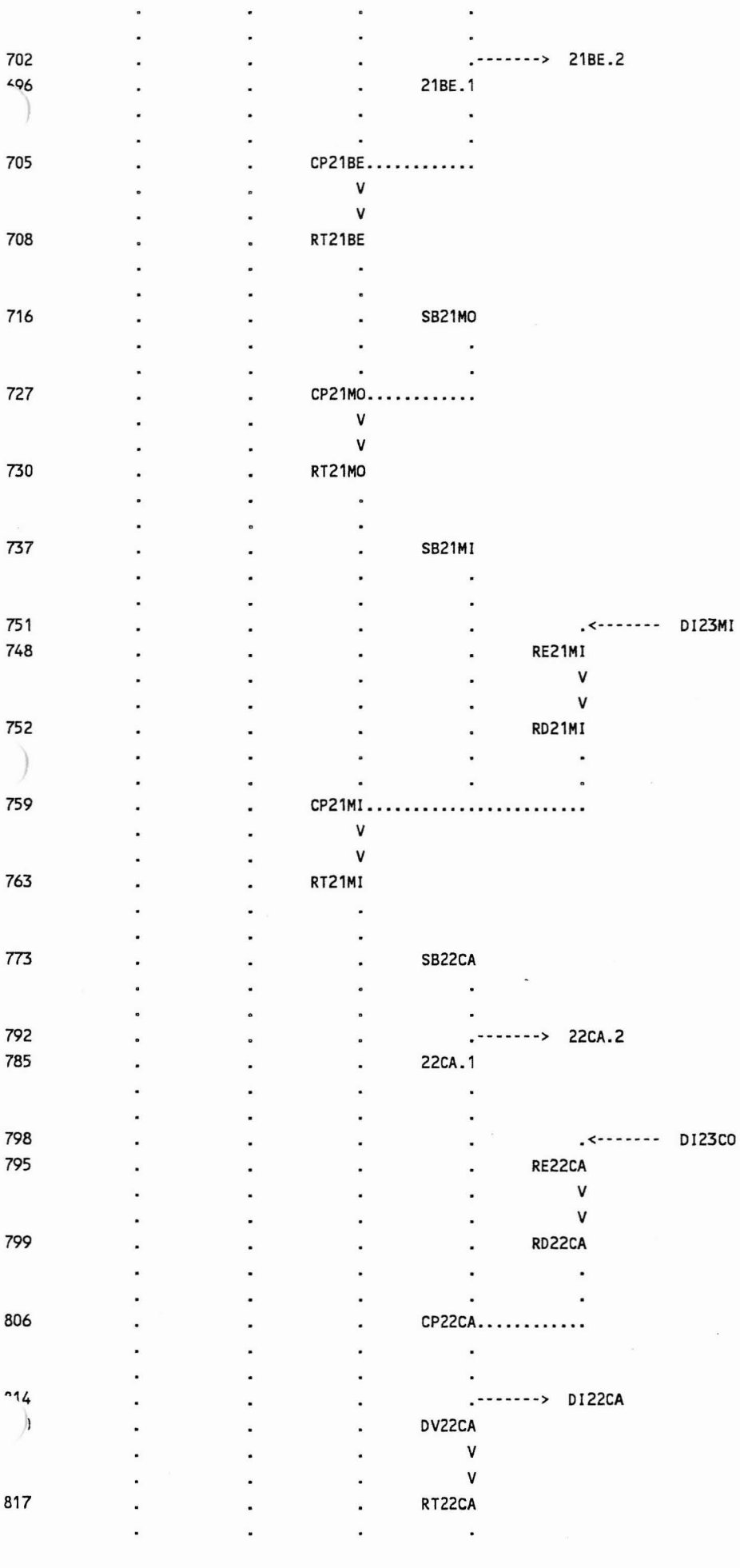
431 SB24CA
441 CP24CA
445 RT24CA
452 SB23CP
468 23CP.2
463 23CP.1
471 CP23CP
474 RT23CP
481 SB23IN
492 23IN.1
500 CP23IN
506 SB21DU
524 21DU.2
517 21DU.1
527 RT21DU
535 SB21BU
548 CP21BU
555 DI21BU
558 SB21OR


572
569
RE21OR
RD21OR
580
CP21OR
586
DI21OR
583
DV21OR
589
RT21OR
596
SB21MY
610
DI23DM
607
RE21MY
611
RD21MY
618
CP21MY
DI21MY
621
DV21MY
627
RT21MY
635
SB21GL
646
CP21GL
652
DI21GL
649
DV21GL
655
RT21GL
663
SB21MA
674
CP21MA
677
RT21MA
685
SB21BE


702
496
21BE.1
21BE.2
705
CP21BE
708
RT21BE
716
SB21MO
727
CP21MO
730
RT21MO
737
SB21MI
751
DI23MI
748
RE21MI
752
RD21MI
759
CP21MI
763
RT21MI
773
SB22CA
792
22CA.2
785
22CA.1
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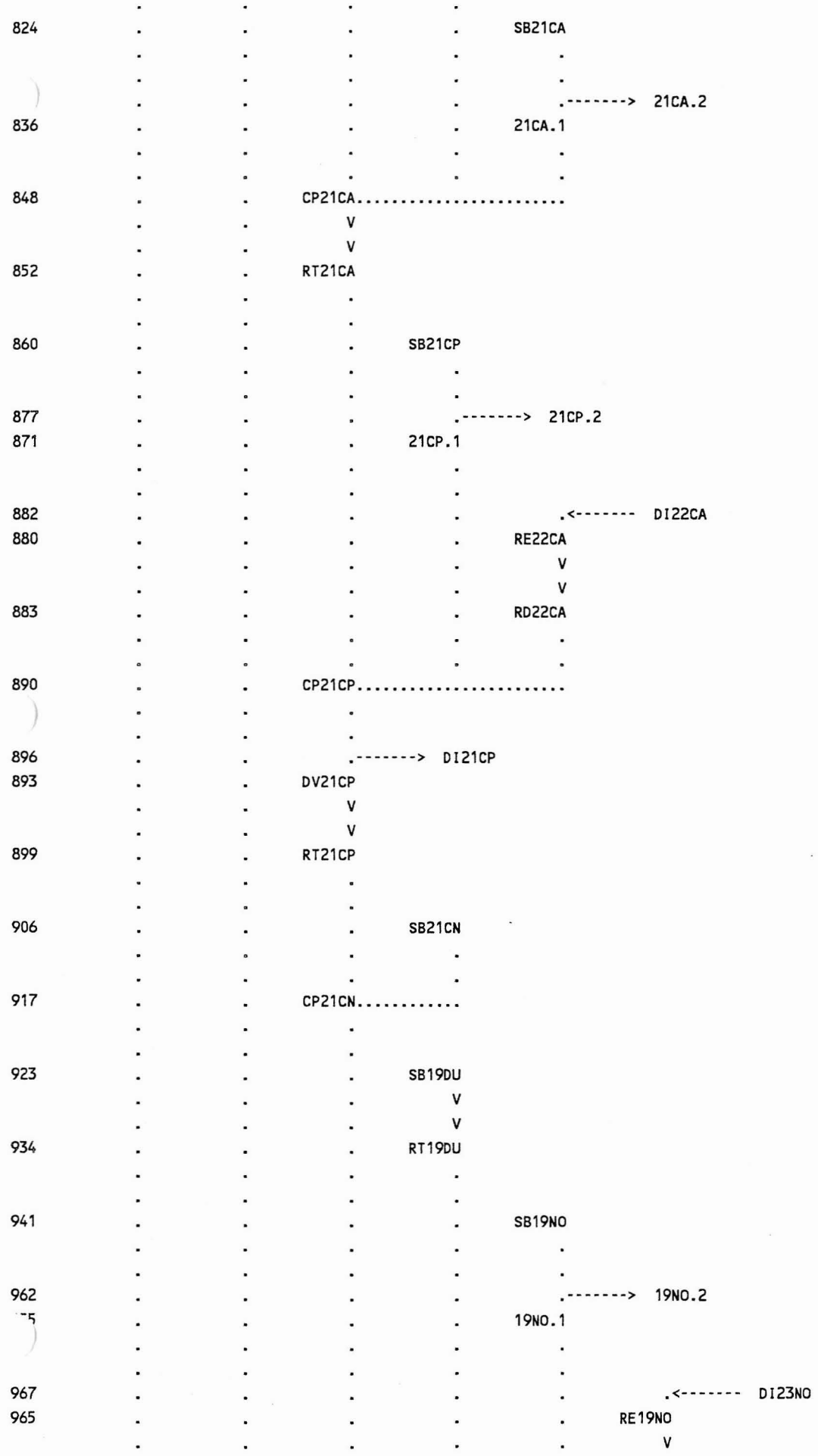
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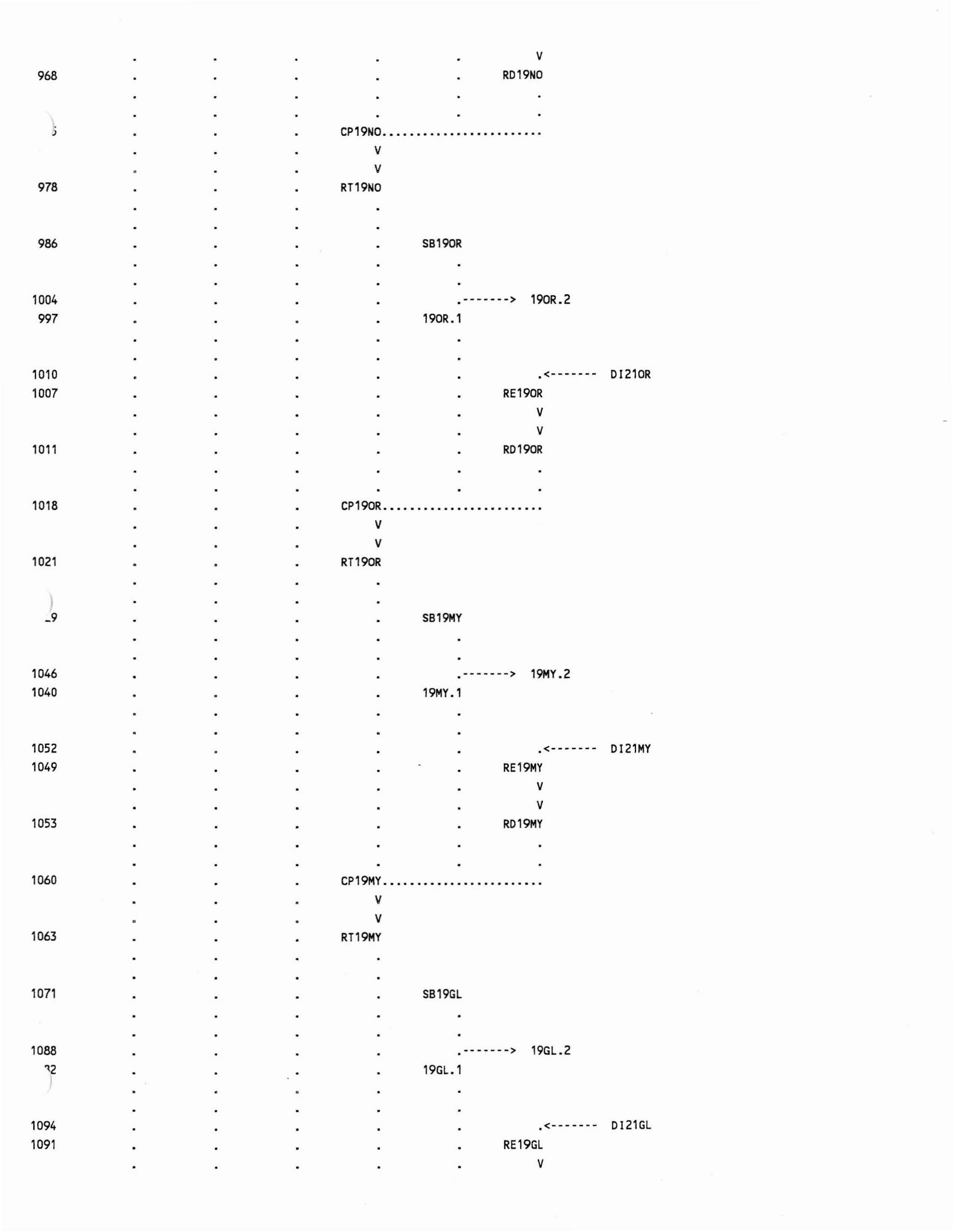
.-------> 21CA.2
836 21CA.1
848 CP21CA.....
852 RT21CA
860 SB21CP
877 .-------> 21CP.2
871 21CP.1
882 .<------- DI22CA
880 RE22CA
883 RD22CA
890 CP21CP.....
896 .-------> DI21CP
893 DV21CP
899 RT21CP
906 SB21CN
917 CP21CN.....
923 SB19DU
934 RT19DU
941 SB19NO
962 .-------> 19NO.2
19NO.1
967 .<------- DI23NO
965 RE19NO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978
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986
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997
19OR.1
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DI21OR
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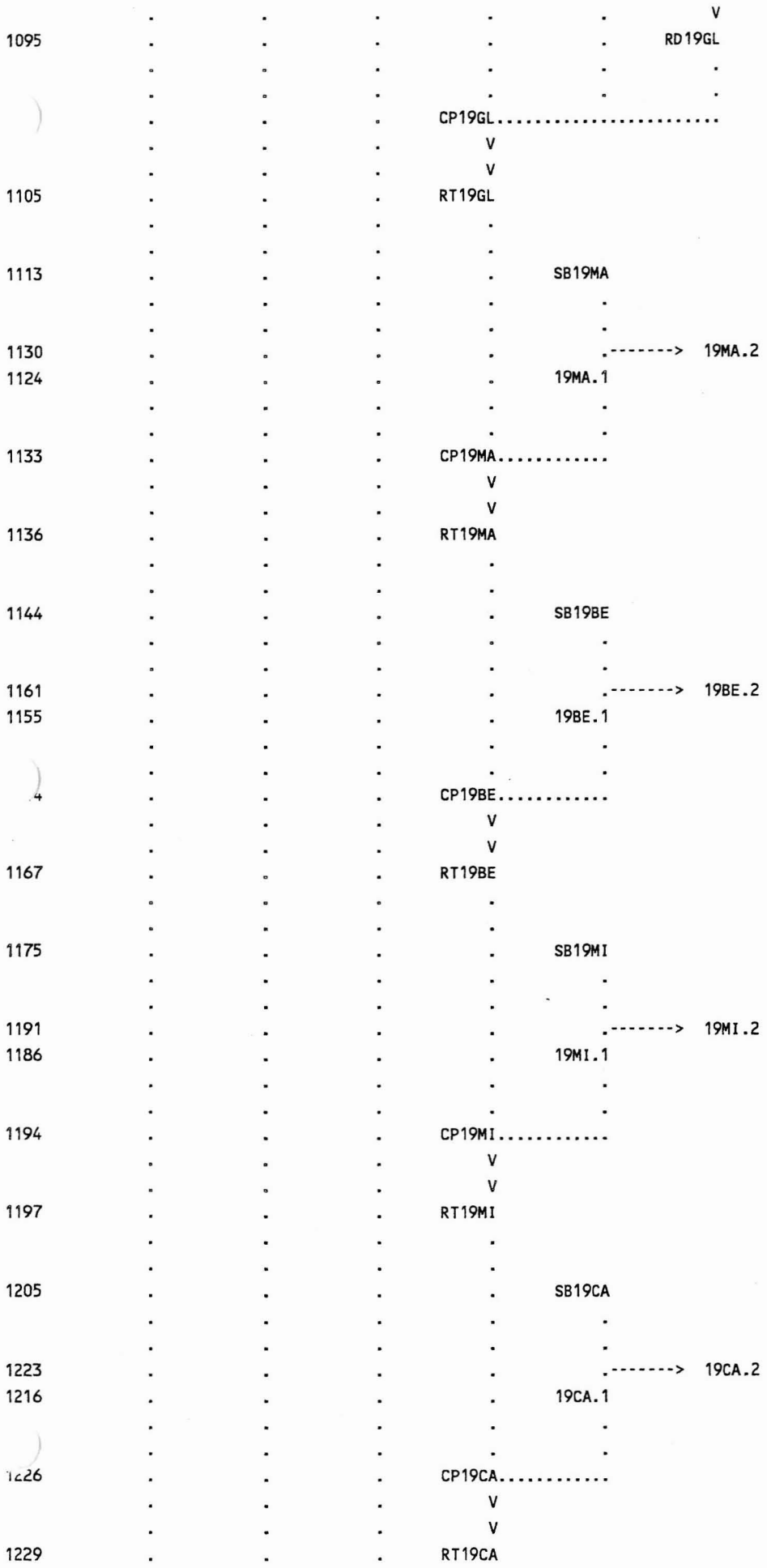
RE19OR
1011
RD19OR
1018
CP19OR
1021
RT19OR
SB19MY
1046
19MY.2
1040
19MY.1
1052
DI21MY
1049
RE19MY
1053
RD19MY
1060
CP19MY
1063
RT19MY
1071
SB19GL
1088
19GL.2
19GL.1
1094
DI21GL
1091
RE19GL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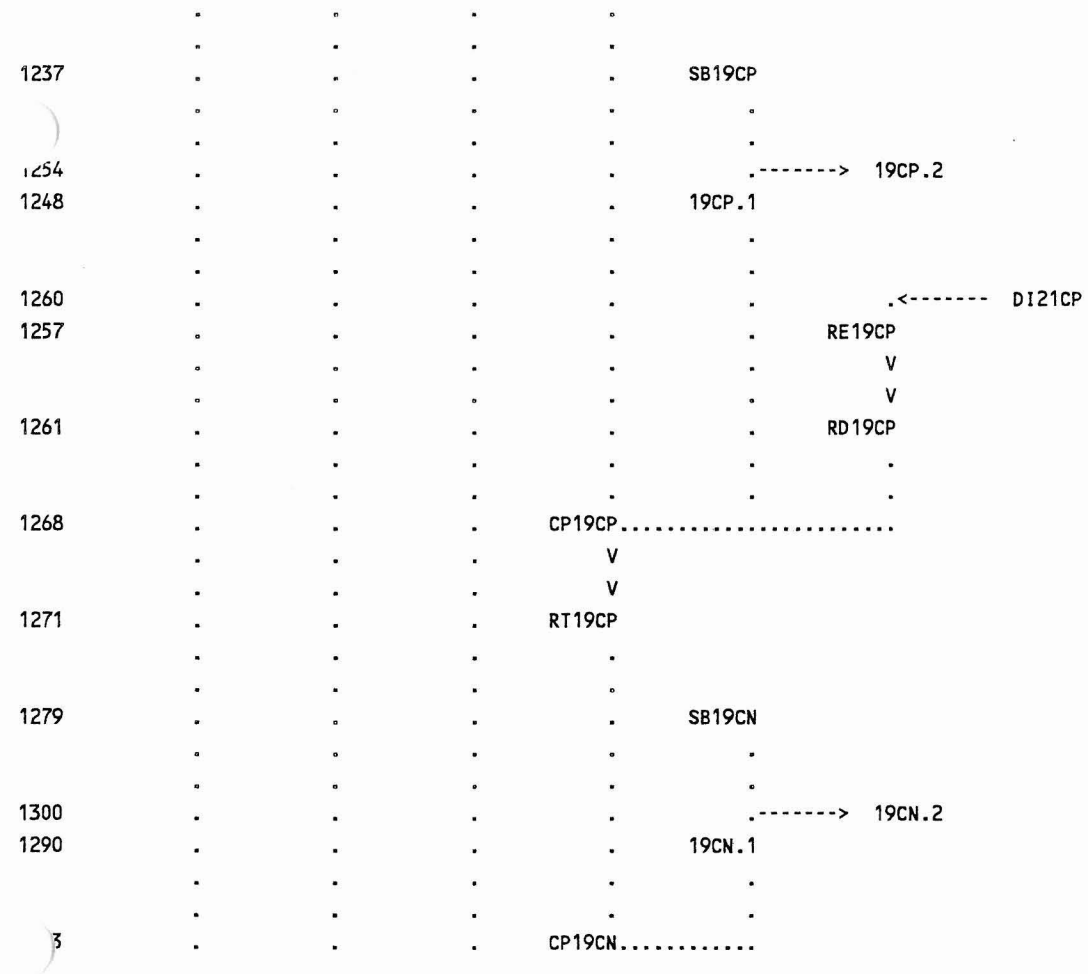
CP19GL
RT19GL
1113 SB19MA
1130 19MA.2
1124 19MA.1
1133 CP19MA
1136 RT19MA
1144 SB19BE
1161 19BE.2
1155 19BE.1
CP19BE
1167 RT19BE
1175 SB19MI
1191 19MI.2
1186 19MI.1
1194 CP19MI
1197 RT19MI
1205 SB19CA
1223 19CA.2
1216 19CA.1
1226 CP19CA
1229 RT19CA



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN 09 1992               *
*           VERSION 4.0.3E              *
*                                       *
*  RUN DATE  09/17/03  TIME  17:35:49   *
*                                       *
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 551-1748               *
*                                       *
*****************************************
```


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     ****************************************************
     DRAFT MODEL
     MODELED BY PREMIER ENGINEERING
     JULY 2002
     ORIGINAL MODEL PREPARED BY: KBD
     ORIGINAL FILE NAME: 100CMLBK.DAT

     MODELING HAS BEEN REVISED BY PREMIER ENGR IN JANUARY - MARCH 2003
     TO CORRECT NUMEROUS MODELING ERRORS IN ORIGINAL KBD CODING.
     ****************************************************
      REVISED FILE NAME: EXIST100.DAT - MARCH 2003
     100-YEAR 6-HOUR MODEL, EXISTING CONDITIONS
     ****************************************************

     Project ID: 24TH & CAMELBACK - 100 Year, 6-hour Storm

18 IO        OUTPUT CONTROL VARIABLES
          IPRNT          5  PRINT CONTROL
          IPLOT          0  PLOT CONTROL
          QSCAL         0.  HYDROGRAPH PLOT SCALE
     ****************************************************
     FLOWS ALONG 23RD AVE
     ****************************************************


  IT         HYDROGRAPH TIME DATA
           NMIN           2  MINUTES IN COMPUTATION INTERVAL
          IDATE      1    0  STARTING DATE
          ITIME         0000  STARTING TIME
             NQ         2000  NUMBER OF HYDROGRAPH ORDINATES
         NDDATE      3    0  ENDING DATE
         NDTIME         1838  ENDING TIME
          ICENT           19  CENTURY MARK

       COMPUTATION INTERVAL     0.03 HOURS
            TOTAL TIME BASE    66.63 HOURS

    ENGLISH UNITS
         DRAINAGE AREA         SQUARE MILES
         PRECIPITATION DEPTH   INCHES
         LENGTH, ELEVATION     FEET
         FLOW                  CUBIC FEET PER SECOND
         STORAGE VOLUME        ACRE-FEET
         SURFACE AREA          ACRES
         TEMPERATURE           DEGREES FAHRENHEIT
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	267.	4.10	48.	12.	4.	0.18		
DIVERSION TO	23DU.2	13.	4.10	12.	3.	1.	0.18		
HYDROGRAPH AT	23DU.1	254.	4.10	37.	9.	3.	0.18		
ROUTED TO	RT23DU	252.	4.17	37.	9.	3.	0.18	0.91	4.17
HYDROGRAPH AT	SB23BU	263.	4.17	46.	12.	4.	0.22		
DIVERSION TO	23BU.2	35.	4.17	17.	4.	2.	0.22		
HYDROGRAPH AT	23BU.1	228.	4.17	29.	7.	3.	0.22		
2 COMBINED AT	CP23BU	480.	4.17	66.	16.	6.	0.40		
ROUTED TO	RT23BU	476.	4.23	66.	16.	6.	0.40	1.36	4.23
HYDROGRAPH AT	SB23RO	134.	4.17	27.	7.	2.	0.10		
DIVERSION TO	DV23RO	119.	4.17	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	134.	4.17	17.	4.	2.	0.10		
DIVERSION TO	23RO.2	50.	4.17	10.	3.	1.	0.10		
HYDROGRAPH AT	23RO.1	84.	4.17	7.	2.	1.	0.10		
2 COMBINED AT	CP23RO	558.	4.20	72.	18.	7.	0.50		
ROUTED TO	RT23RO	557.	4.23	72.	18.	7.	0.50	2.18	4.23
HYDROGRAPH AT	SB23NO	67.	4.10	12.	3.	1.	0.04		
DIVERSION TO	RB23NO	53.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	67.	4.10	8.	2.	1.	0.04		
2 COMBINED AT	CP23NO	615.	4.23	81.	20.	7.	0.55		
DIVERSION TO	DI23NO	517.	4.23	69.	17.	6.	0.55		
HYDROGRAPH AT	DV23NO	98.	4.23	11.	3.	1.	0.55		
ROUTED TO	RT23NO	97.	4.37	11.	3.	1.	0.55	0.56	4.37
HYDROGRAPH AT	SB23OR	146.	4.20	29.	7.	3.	0.12		
2 COMBINED AT	CP23OR	237.	4.30	40.	10.	4.	0.67		
DIVERSION TO	DI23OR	59.	4.30	10.	3.	1.	0.67		

HYDROGRAPH AT	DV23OR	177.	4.30	30.	8.	3.	0.67		
ROUTED TO	RT23OR	177.	4.37	30.	8.	3.	0.67	0.76	4.37
HYDROGRAPH AT	SB23DM	75.	4.10	13.	3.	1.	0.06		
2 COMBINED AT	CP23DM	239.	4.33	43.	11.	4.	0.73		
DIVERSION TO	DI23DM	120.	4.33	22.	5.	2.	0.73		
HYDROGRAPH AT	DV23DM	120.	4.33	22.	5.	2.	0.73		
ROUTED TO	RT23DM	119.	4.40	22.	5.	2.	0.73	0.71	4.40
HYDROGRAPH AT	SB22GL	21.	4.30	5.	1.	0.	0.03		
ROUTED TO	RT22GL	21.	4.43	5.	1.	0.	0.03	0.25	4.43
HYDROGRAPH AT	SB23GL	74.	4.13	13.	3.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.13	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	66.	4.13	9.	2.	1.	0.06		
3 COMBINED AT	CP23GL	191.	4.37	35.	9.	3.	0.81		
ROUTED TO	RT23GL	187.	4.47	35.	9.	3.	0.81	0.53	4.47
HYDROGRAPH AT	SB23MA	160.	4.20	31.	8.	3.	0.15		
DIVERSION TO	23MA.2	10.	4.20	7.	2.	1.	0.15		
HYDROGRAPH AT	23MA.1	150.	4.20	24.	6.	2.	0.15		
2 COMBINED AT	CP23MA	318.	4.40	58.	15.	5.	0.96		
ROUTED TO	RT23MA	316.	4.47	58.	15.	5.	0.96	1.09	4.47
HYDROGRAPH AT	SB23BE	109.	4.27	22.	6.	2.	0.12		
DIVERSION TO	23BE.2	22.	4.27	10.	3.	1.	0.12		
HYDROGRAPH AT	23BE.1	87.	4.27	12.	3.	1.	0.12		
2 COMBINED AT	CP23BE	395.	4.43	71.	18.	6.	1.07		
ROUTED TO	RT23BE	393.	4.50	71.	18.	6.	1.07	1.47	4.50
HYDROGRAPH AT	SB23MI	80.	4.47	21.	5.	2.	0.12		
2 COMBINED AT	CP23MI	474.	4.50	92.	23.	8.	1.19		
DIVERSION TO	DI23MI	189.	4.50	37.	9.	3.	1.19		
HYDROGRAPH AT	DV23MI	284.	4.50	55.	14.	5.	1.19		
ROUTED TO	RT23MI	283.	4.57	55.	14.	5.	1.19	1.11	4.57
HYDROGRAPH AT	SB23CO	75.	4.13	13.	3.	1.	0.06		

2 COMBINED AT	CP23CO	328.	4.50	68.	17.	6.	1.25		
DIVERSION TO	DI23CO	164.	4.50	34.	9.	3.	1.25		
HYDROGRAPH AT	DV23CO	164.	4.50	34.	9.	3.	1.25		
ROUTED TO	RT23CO	163.	4.57	34.	9.	3.	1.25	0.83	4.57
HYDROGRAPH AT	SB23CA	12.	4.30	3.	1.	0.	0.01		
DIVERSION TO	23CA.2	10.	4.30	3.	1.	0.	0.01		
HYDROGRAPH AT	23CA.1	2.	4.30	0.	0.	0.	0.01		
2 COMBINED AT	CP23CA	163.	4.53	34.	9.	3.	1.26		
DIVERSION TO	DI23CA	98.	4.53	20.	5.	2.	1.26		
HYDROGRAPH AT	DV23CA	65.	4.53	14.	3.	1.	1.26		
ROUTED TO	RT23CA	65.	4.70	14.	3.	1.	1.26	0.49	4.70
HYDROGRAPH AT	RE24CA	98.	4.53	20.	5.	2.	0.00		
ROUTED TO	RD24CA	97.	4.60	20.	5.	2.	0.00	0.58	4.60
HYDROGRAPH AT	SB24CA	53.	4.27	12.	3.	1.	0.05		
2 COMBINED AT	CP24CA	139.	4.53	32.	8.	3.	0.05		
ROUTED TO	RT24CA	138.	4.67	32.	8.	3.	0.05	0.46	4.67
HYDROGRAPH AT	SB23CP	205.	4.17	40.	10.	4.	0.16		
DIVERSION TO	23CP.2	4.	4.17	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	201.	4.17	36.	9.	3.	0.16		
3 COMBINED AT	CP23CP	319.	4.60	81.	21.	7.	1.47		
ROUTED TO	RT23CP	316.	4.70	81.	21.	7.	1.47	1.17	4.70
HYDROGRAPH AT	SB23IN	215.	4.20	43.	11.	4.	0.17		
DIVERSION TO	23IN.2	4.	4.20	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	211.	4.20	39.	10.	4.	0.17		
2 COMBINED AT	CP23IN	473.	4.37	120.	30.	11.	1.64		
HYDROGRAPH AT	SB21DU	77.	4.37	19.	5.	2.	0.09		
DIVERSION TO	21DU.2	13.	4.37	8.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	64.	4.37	11.	3.	1.	0.09		
ROUTED TO	RT21DU	64.	4.50	11.	3.	1.	0.09	0.47	4.50
HYDROGRAPH AT	SB21BU	139.	4.20	27.	7.	2.	0.13		

2 COMBINED AT	CP21BU	188.	4.40	38.	9.	3.	0.22		
DIVERSION TO	DI21BU	188.	0.00	38.	9.	3.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	138.	4.20	28.	7.	2.	0.13		
HYDROGRAPH AT	RE21OR	59.	4.30	10.	3.	1.	0.00		
ROUTED TO	RD21OR	57.	4.47	10.	3.	1.	0.00	0.35	4.47
2 COMBINED AT	CP21OR	187.	4.33	38.	9.	3.	0.13		
DIVERSION TO	DI21OR	93.	4.33	19.	5.	2.	0.13		
HYDROGRAPH AT	DV21OR	93.	4.33	19.	5.	2.	0.13		
ROUTED TO	RT21OR	93.	4.40	19.	5.	2.	0.13	0.69	4.40
HYDROGRAPH AT	SB21MY	74.	4.33	16.	4.	1.	0.08		
HYDROGRAPH AT	RE21MY	120.	4.33	22.	5.	2.	0.00		
ROUTED TO	RD21MY	118.	4.47	22.	5.	2.	0.00	0.64	4.47
3 COMBINED AT	CP21MY	282.	4.43	57.	14.	5.	0.20		
DIVERSION TO	DI21MY	141.	4.43	28.	7.	3.	0.20		
HYDROGRAPH AT	DV21MY	141.	4.43	28.	7.	3.	0.20		
ROUTED TO	RT21MY	140.	4.50	28.	7.	3.	0.20	0.78	4.50
HYDROGRAPH AT	SB21GL	40.	4.23	8.	2.	1.	0.04		
2 COMBINED AT	CP21GL	175.	4.47	37.	9.	3.	0.25		
DIVERSION TO	DI21GL	151.	4.47	34.	8.	3.	0.25		
HYDROGRAPH AT	DV21GL	25.	4.47	3.	1.	0.	0.25		
ROUTED TO	RT21GL	24.	4.63	3.	1.	0.	0.25	0.30	4.63
HYDROGRAPH AT	SB21MA	170.	4.17	31.	8.	3.	0.16		
2 COMBINED AT	CP21MA	171.	4.20	34.	8.	3.	0.40		
ROUTED TO	RT21MA	169.	4.30	33.	8.	3.	0.40	0.86	4.30
HYDROGRAPH AT	SB21BE	203.	4.20	38.	10.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.20	6.	2.	1.	0.18		
HYDROGRAPH AT	21BE.1	197.	4.20	32.	8.	3.	0.18		
2 COMBINED AT	CP21BE	362.	4.27	66.	17.	6.	0.58		
ROUTED TO	RT21BE	361.	4.30	66.	17.	6.	0.58	1.21	4.30

HYDROGRAPH AT	SB21MO	40.	4.53	12.	3.	1.	0.07		
2 COMBINED AT	CP21MO	397.	4.30	78.	20.	7.	0.65		
ROUTED TO	RT21MO	396.	4.33	78.	20.	7.	0.65	1.46	4.33
HYDROGRAPH AT	SB21MI	67.	4.37	15.	4.	1.	0.09		
HYDROGRAPH AT	RE21MI	189.	4.50	37.	9.	3.	0.00		
ROUTED TO	RD21MI	189.	4.57	37.	9.	3.	0.00	0.69	4.57
3 COMBINED AT	CP21MI	625.	4.43	129.	33.	12.	0.74		
ROUTED TO	RT21MI	624.	4.50	129.	33.	12.	0.74	1.88	4.50
HYDROGRAPH AT	SB22CA	45.	4.40	12.	3.	1.	0.05		
DIVERSION TO	22CA.2	10.	4.40	6.	1.	1.	0.05		
HYDROGRAPH AT	22CA.1	35.	4.40	6.	2.	1.	0.05		
HYDROGRAPH AT	RE22CA	164.	4.50	34.	9.	3.	0.00		
ROUTED TO	RD22CA	160.	4.67	34.	9.	3.	0.00	0.63	4.67
2 COMBINED AT	CP22CA	190.	4.63	40.	10.	4.	0.05		
DIVERSION TO	DI22CA	95.	4.63	20.	5.	2.	0.05		
HYDROGRAPH AT	DV22CA	95.	4.63	20.	5.	2.	0.05		
ROUTED TO	RT22CA	95.	4.67	20.	5.	2.	0.05	0.64	4.67
HYDROGRAPH AT	SB21CA	204.	4.20	39.	10.	4.	0.17		
DIVERSION TO	21CA.2	18.	4.20	11.	3.	1.	0.17		
HYDROGRAPH AT	21CA.1	186.	4.20	28.	7.	3.	0.17		
3 COMBINED AT	CP21CA	850.	4.47	177.	45.	16.	0.97		
ROUTED TO	RT21CA	848.	4.53	177.	45.	16.	0.97	2.25	4.53
HYDROGRAPH AT	SB21CP	151.	4.33	34.	9.	3.	0.14		
DIVERSION TO	21CP.2	15.	4.33	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	136.	4.33	25.	6.	2.	0.14		
HYDROGRAPH AT	RE22CA	95.	4.63	20.	5.	2.	0.00		
ROUTED TO	RD22CA	85.	4.93	20.	5.	2.	0.00	0.40	4.93
3 COMBINED AT	CP21CP	1016.	4.57	222.	56.	20.	1.11		
DIVERSION TO	DI21CP	508.	4.57	111.	28.	10.	1.11		
HYDROGRAPH AT	DV21CP	508.	4.57	111.	28.	10.	1.11		

ROUTED TO	RT21CP	507.	4.60	111.	28.	10.	1.11	1.44	4.60
HYDROGRAPH AT	SB21CN	46.	4.23	10.	3.	1.	0.04		
2 COMBINED AT	CP21CN	542.	4.60	120.	31.	11.	1.15		
HYDROGRAPH AT	SB19DU	17.	4.30	5.	1.	0.	0.02		
ROUTED TO	RT19DU	15.	4.90	5.	1.	0.	0.02	0.09	4.90
HYDROGRAPH AT	SB19NO	41.	4.20	9.	2.	1.	0.04		
DIVERSION TO	19NO.2	36.	4.20	9.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	5.	4.20	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	517.	4.23	69.	17.	6.	0.00		
ROUTED TO	RD19NO	511.	4.33	69.	17.	6.	0.00	1.18	4.33
3 COMBINED AT	CP19NO	523.	4.33	74.	19.	7.	0.05		
ROUTED TO	RT19NO	507.	4.43	74.	19.	7.	0.05	0.97	4.43
HYDROGRAPH AT	SB19OR	105.	4.37	29.	7.	3.	0.10		
DIVERSION TO	19OR.2	30.	4.37	16.	4.	2.	0.10		
HYDROGRAPH AT	19OR.1	75.	4.37	13.	3.	1.	0.10		
HYDROGRAPH AT	RE19OR	93.	4.33	19.	5.	2.	0.00		
ROUTED TO	RD19OR	91.	4.47	19.	5.	2.	0.00	0.42	4.47
3 COMBINED AT	CP19OR	673.	4.43	105.	26.	10.	0.16		
ROUTED TO	RT19OR	663.	4.50	105.	26.	10.	0.16	1.13	4.50
HYDROGRAPH AT	SB19MY	39.	4.30	9.	2.	1.	0.05		
DIVERSION TO	19MY.2	35.	4.30	8.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	4.	4.30	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	141.	4.43	28.	7.	3.	0.00		
ROUTED TO	RD19MY	139.	4.53	28.	7.	3.	0.00	0.70	4.53
3 COMBINED AT	CP19MY	801.	4.50	134.	34.	12.	0.20		
ROUTED TO	RT19MY	797.	4.53	134.	34.	12.	0.20	1.51	4.53
HYDROGRAPH AT	SB19GL	50.	4.37	13.	3.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.37	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	35.	4.37	5.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	151.	4.47	34.	8.	3.	0.00		

ROUTED TO	RD19GL	149.	4.57	34.	8.	3.	0.00	0.73	4.57
3 COMBINED AT	CP19GL	978.	4.53	173.	43.	16.	0.26		
ROUTED TO	RT19GL	951.	4.63	172.	43.	16.	0.26	1.29	4.63
HYDROGRAPH AT	SB19MA	50.	4.30	12.	3.	1.	0.05		
DIVERSION TO	19MA.2	35.	4.30	11.	3.	1.	0.05		
HYDROGRAPH AT	19MA.1	15.	4.30	1.	0.	0.	0.05		
2 COMBINED AT	CP19MA	957.	4.60	174.	44.	16.	0.31		
ROUTED TO	RT19MA	944.	4.70	173.	44.	16.	0.31	1.37	4.70
HYDROGRAPH AT	SB19BE	50.	4.37	13.	3.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.37	11.	3.	1.	0.06		
HYDROGRAPH AT	19BE.1	20.	4.37	2.	0.	0.	0.06		
2 COMBINED AT	CP19BE	953.	4.70	175.	44.	16.	0.37		
ROUTED TO	RT19BE	940.	4.77	175.	44.	16.	0.37	1.37	4.77
HYDROGRAPH AT	SB19MI	63.	4.33	14.	4.	1.	0.08		
DIVERSION TO	19MI.2	63.	0.00	14.	4.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	940.	4.77	175.	44.	16.	0.44		
ROUTED TO	RT19MI	922.	4.87	175.	44.	16.	0.44	1.46	4.87
HYDROGRAPH AT	SB19CA	5.	4.60	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	5.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	922.	4.87	175.	44.	16.	0.45		
ROUTED TO	RT19CA	910.	4.93	175.	44.	16.	0.45	1.26	4.93
HYDROGRAPH AT	SB19CP	58.	4.30	14.	4.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.30	11.	3.	1.	0.06		
HYDROGRAPH AT	19CP.1	28.	4.30	3.	1.	0.	0.06		
HYDROGRAPH AT	RE19CP	508.	4.57	111.	28.	10.	0.00		
ROUTED TO	RD19CP	508.	4.60	111.	28.	10.	0.00	1.18	4.60
3 COMBINED AT	CP19CP	1334.	4.90	289.	73.	26.	0.51		
ROUTED TO	RT19CP	1331.	4.93	289.	73.	26.	0.51	2.48	4.93

HYDROGRAPH AT	SB19CN	30.	4.50	9.	2.	1.	0.04
DIVERSION TO	19CN.2	30.	0.00	9.	2.	1.	0.04
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.04
2 COMBINED AT	CP19CN	1331.	4.93	289.	73.	26.	0.55

*** NORMAL END OF HEC-1 ***

APPENDIX B

25-YEAR, 6-HOUR STORM
EXISTING CONDITIONS
FILE: EXIST25

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 1        ID
 2        ID   ****************************************************
 3        ID   DRAFT MODEL
 4        ID   MODELED BY PREMIER ENGINEERING
 5        ID   JULY 2002
 6        ID   ORIGINAL MODEL PREPARED BY: KBD
 7        ID
 8        ID   MODELING HAS BEEN REVISED BY PREMIER ENGR IN JANUARY - MARCH 2003
 9        ID   TO CORRECT NUMEROUS MODELING ERRORS IN ORIGINAL KBD CODING.
10        ID   ****************************************************
11        ID   REVISED FILE NAME: EXIST25.DAT - MARCH 2003
12        ID   25-YEAR 6-HOUR MODEL, EXISTING CONDITIONS
13        ID   ****************************************************
14        ID
15        ID   Project ID: 24TH & CAMELBACK  -  25-Year, 6-hour Storm
16        IT       2                   2000
17        IO       5
          *DIAGRAM
          *
18        ID   ****************************************************
19        ID   FLOWS ALONG 23RD AVE
20        ID   ****************************************************
21        ID

22        KK  SB23DU
23        KM   SUB-BASIN SB23DU
24        KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
25        KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
26        KM     L =  .37  Kb = .052  Adj. Slope =   38.0
27        BA    .179
28        IN      15
29        KM   RAINFALL DEPTH OF 2.36 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
30        PB   2.282
31        KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
32        PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
33        PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
34        PC    .949    .962    .975    .988   1.000
35        LG    .100    .250   4.300    .366  80.000
36        UC    .383    .154
37        UA       0       5      16      30      65      77      84      90      94      97
38        UA     100
          *

39        KK  23DU.1
40        KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
41        KM   SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
42        KM   REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
43        KM   SO=0.001 AND N = 0.013
44        KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
45        DT  23DU.2
46        DI       0      13   10000
47        DQ       0      13      13
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	200.	4.10	37.	9.	3.	0.18		
DIVERSION TO	23DU.2	13.	4.10	10.	3.	1.	0.18		
HYDROGRAPH AT	23DU.1	187.	4.10	27.	7.	2.	0.18		
ROUTED TO	RT23DU	185.	4.20	27.	7.	2.	0.18	0.77	4.20
HYDROGRAPH AT	SB23BU	179.	4.20	33.	8.	3.	0.22		
DIVERSION TO	23BU.2	35.	4.20	16.	4.	1.	0.22		
HYDROGRAPH AT	23BU.1	144.	4.20	18.	4.	2.	0.22		
2 COMBINED AT	CP23BU	329.	4.20	45.	11.	4.	0.40		
ROUTED TO	RT23BU	327.	4.27	45.	11.	4.	0.40	1.11	4.27
HYDROGRAPH AT	SB23RO	99.	4.17	20.	5.	2.	0.10		
DIVERSION TO	DV23RO	99.	4.23	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	98.	4.23	11.	3.	1.	0.10		
DIVERSION TO	23RO.2	50.	4.23	8.	2.	1.	0.10		
HYDROGRAPH AT	23RO.1	48.	4.23	2.	1.	0.	0.10		
2 COMBINED AT	CP23RO	374.	4.27	47.	12.	4.	0.50		
ROUTED TO	RT23RO	373.	4.30	47.	12.	4.	0.50	1.74	4.30
HYDROGRAPH AT	SB23NO	52.	4.10	10.	2.	1.	0.04		
DIVERSION TO	RB23NO	48.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	52.	4.10	5.	1.	0.	0.04		
2 COMBINED AT	CP23NO	415.	4.30	53.	13.	5.	0.55		
DIVERSION TO	DI23NO	351.	4.30	46.	11.	4.	0.55		
HYDROGRAPH AT	DV23NO	64.	4.30	7.	2.	1.	0.55		
ROUTED TO	RT23NO	60.	4.47	7.	2.	1.	0.55	0.46	4.47
HYDROGRAPH AT	SB23OR	103.	4.23	22.	5.	2.	0.12		
2 COMBINED AT	CP23OR	154.	4.43	28.	7.	3.	0.67		
DIVERSION TO	DI23OR	39.	4.43	7.	2.	1.	0.67		

HYDROGRAPH AT	DV23OR	116.	4.43	21.	5.	2.	0.67		
ROUTED TO	RT23OR	115.	4.50	21.	5.	2.	0.67	0.61	4.50
HYDROGRAPH AT	SB23DM	55.	4.13	10.	2.	1.	0.06		
2 COMBINED AT	CP23DM	154.	4.43	31.	8.	3.	0.73		
DIVERSION TO	DI23DM	77.	4.43	15.	4.	1.	0.73		
HYDROGRAPH AT	DV23DM	77.	4.43	15.	4.	1.	0.73		
ROUTED TO	RT23DM	76.	4.50	15.	4.	1.	0.73	0.57	4.50
HYDROGRAPH AT	SB22GL	13.	4.37	3.	1.	0.	0.03		
ROUTED TO	RT22GL	13.	4.57	3.	1.	0.	0.03	0.17	4.57
HYDROGRAPH AT	SB23GL	53.	4.17	9.	2.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.17	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	45.	4.17	6.	1.	1.	0.06		
3 COMBINED AT	CP23GL	121.	4.40	24.	6.	2.	0.81		
ROUTED TO	RT23GL	119.	4.57	24.	6.	2.	0.81	0.42	4.57
HYDROGRAPH AT	SB23MA	108.	4.27	22.	6.	2.	0.15		
DIVERSION TO	23MA.2	10.	4.27	7.	2.	1.	0.15		
HYDROGRAPH AT	23MA.1	98.	4.27	16.	4.	1.	0.15		
2 COMBINED AT	CP23MA	204.	4.43	40.	10.	4.	0.96		
ROUTED TO	RT23MA	203.	4.53	40.	10.	4.	0.96	0.86	4.53
HYDROGRAPH AT	SB23BE	71.	4.33	16.	4.	1.	0.12		
DIVERSION TO	23BE.2	22.	4.33	10.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	49.	4.33	7.	2.	1.	0.12		
2 COMBINED AT	CP23BE	247.	4.50	46.	12.	4.	1.07		
ROUTED TO	RT23BE	245.	4.60	46.	12.	4.	1.07	1.14	4.60
HYDROGRAPH AT	SB23MI	48.	4.57	15.	4.	1.	0.12		
2 COMBINED AT	CP23MI	294.	4.60	61.	15.	6.	1.19		
DIVERSION TO	DI23MI	117.	4.60	24.	6.	2.	1.19		
HYDROGRAPH AT	DV23MI	176.	4.60	37.	9.	3.	1.19		
ROUTED TO	RT23MI	175.	4.67	37.	9.	3.	1.19	0.86	4.67
HYDROGRAPH AT	SB23CO	53.	4.17	10.	2.	1.	0.06		

2 COMBINED AT	CP23CO	203.	4.60	46.	12.	4.	1.25		
DIVERSION TO	DI23CO	102.	4.60	23.	6.	2.	1.25		
HYDROGRAPH AT	DV23CO	102.	4.60	23.	6.	2.	1.25		
ROUTED TO	RT23CO	101.	4.70	23.	6.	2.	1.25	0.65	4.70
HYDROGRAPH AT	SB23CA	8.	4.37	2.	1.	0.	0.01		
DIVERSION TO	23CA.2	8.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	23CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP23CA	101.	4.70	23.	6.	2.	1.26		
DIVERSION TO	DI23CA	60.	4.70	14.	4.	1.	1.26		
HYDROGRAPH AT	DV23CA	40.	4.70	9.	2.	1.	1.26		
ROUTED TO	RT23CA	39.	4.93	9.	2.	1.	1.26	0.38	4.93
HYDROGRAPH AT	RE24CA	60.	4.70	14.	4.	1.	0.00		
ROUTED TO	RD24CA	59.	4.77	14.	4.	1.	0.00	0.46	4.77
HYDROGRAPH AT	SB24CA	37.	4.30	9.	2.	1.	0.05		
2 COMBINED AT	CP24CA	85.	4.70	23.	6.	2.	0.05		
ROUTED TO	RT24CA	84.	4.87	22.	6.	2.	0.05	0.34	4.87
HYDROGRAPH AT	SB23CP	150.	4.20	30.	8.	3.	0.16		
DIVERSION TO	23CP.2	4.	4.20	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	146.	4.20	26.	7.	2.	0.16		
3 COMBINED AT	CP23CP	194.	4.67	58.	15.	5.	1.47		
ROUTED TO	RT23CP	194.	4.77	58.	15.	5.	1.47	0.91	4.77
HYDROGRAPH AT	SB23IN	156.	4.23	32.	8.	3.	0.17		
DIVERSION TO	23IN.2	4.	4.23	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	152.	4.23	28.	7.	3.	0.17		
2 COMBINED AT	CP23IN	332.	4.40	86.	22.	8.	1.64		
HYDROGRAPH AT	SB21DU	50.	4.43	13.	3.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.43	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	37.	4.43	6.	2.	1.	0.09		
ROUTED TO	RT21DU	37.	4.63	6.	2.	1.	0.09	0.35	4.63
HYDROGRAPH AT	SB21BU	95.	4.27	20.	5.	2.	0.13		

2 COMBINED AT	CP21BU	121.	4.40	26.	7.	2.	0.22		
DIVERSION TO	DI21BU	121.	0.00	26.	7.	2.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	96.	4.27	20.	5.	2.	0.13		
HYDROGRAPH AT	RE21OR	39.	4.43	7.	2.	1.	0.00		
ROUTED TO	RD21OR	37.	4.57	7.	2.	1.	0.00	0.28	4.57
2 COMBINED AT	CP21OR	125.	4.40	27.	7.	2.	0.13		
DIVERSION TO	DI21OR	63.	4.40	14.	3.	1.	0.13		
HYDROGRAPH AT	DV21OR	63.	4.40	14.	3.	1.	0.13		
ROUTED TO	RT21OR	63.	4.50	14.	3.	1.	0.13	0.56	4.50
HYDROGRAPH AT	SB21MY	51.	4.40	12.	3.	1.	0.08		
HYDROGRAPH AT	RE21MY	77.	4.43	15.	4.	1.	0.00		
ROUTED TO	RD21MY	76.	4.57	15.	4.	1.	0.00	0.51	4.57
3 COMBINED AT	CP21MY	187.	4.50	41.	10.	4.	0.20		
DIVERSION TO	DI21MY	93.	4.50	20.	5.	2.	0.20		
HYDROGRAPH AT	DV21MY	93.	4.50	20.	5.	2.	0.20		
ROUTED TO	RT21MY	93.	4.57	20.	5.	2.	0.20	0.63	4.57
HYDROGRAPH AT	SB21GL	26.	4.30	6.	1.	1.	0.04		
2 COMBINED AT	CP21GL	116.	4.53	26.	7.	2.	0.25		
DIVERSION TO	DI21GL	103.	4.53	25.	6.	2.	0.25		
HYDROGRAPH AT	DV21GL	12.	4.53	1.	0.	0.	0.25		
ROUTED TO	RT21GL	10.	4.87	1.	0.	0.	0.25	0.21	4.87
HYDROGRAPH AT	SB21MA	114.	4.23	22.	6.	2.	0.16		
2 COMBINED AT	CP21MA	114.	4.23	23.	6.	2.	0.40		
ROUTED TO	RT21MA	113.	4.33	23.	6.	2.	0.40	0.70	4.33
HYDROGRAPH AT	SB21BE	139.	4.23	28.	7.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.23	5.	1.	1.	0.18		
HYDROGRAPH AT	21BE.1	133.	4.23	23.	6.	2.	0.18		
2 COMBINED AT	CP21BE	243.	4.30	46.	11.	4.	0.58		
ROUTED TO	RT21BE	242.	4.37	46.	11.	4.	0.58	0.97	4.37

HYDROGRAPH AT	SB21MO	23.	4.63	8.	2.	1.	0.07		
2 COMBINED AT	CP21MO	263.	4.37	54.	14.	5.	0.65		
ROUTED TO	RT21MO	262.	4.40	54.	14.	5.	0.65	1.16	4.40
HYDROGRAPH AT	SB21MI	40.	4.47	10.	3.	1.	0.09		
HYDROGRAPH AT	RE21MI	117.	4.60	24.	6.	2.	0.00		
ROUTED TO	RD21MI	117.	4.70	24.	6.	2.	0.00	0.53	4.70
3 COMBINED AT	CP21MI	396.	4.53	88.	22.	8.	0.74		
ROUTED TO	RT21MI	394.	4.60	88.	22.	8.	0.74	1.45	4.60
HYDROGRAPH AT	SB22CA	31.	4.47	9.	2.	1.	0.05		
DIVERSION TO	22CA.2	10.	4.47	5.	1.	0.	0.05		
HYDROGRAPH AT	22CA.1	21.	4.47	3.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	102.	4.60	23.	6.	2.	0.00		
ROUTED TO	RD22CA	98.	4.80	23.	6.	2.	0.00	0.49	4.80
2 COMBINED AT	CP22CA	114.	4.77	26.	7.	2.	0.05		
DIVERSION TO	DI22CA	57.	4.77	13.	3.	1.	0.05		
HYDROGRAPH AT	DV22CA	57.	4.77	13.	3.	1.	0.05		
ROUTED TO	RT22CA	57.	4.80	13.	3.	1.	0.05	0.50	4.80
HYDROGRAPH AT	SB21CA	143.	4.23	28.	7.	3.	0.17		
DIVERSION TO	21CA.2	18.	4.23	10.	3.	1.	0.17		
HYDROGRAPH AT	21CA.1	125.	4.23	19.	5.	2.	0.17		
3 COMBINED AT	CP21CA	523.	4.60	120.	30.	11.	0.97		
ROUTED TO	RT21CA	522.	4.67	120.	30.	11.	0.97	1.70	4.67
HYDROGRAPH AT	SB21CP	107.	4.40	25.	6.	2.	0.14		
DIVERSION TO	21CP.2	15.	4.40	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	92.	4.40	17.	4.	2.	0.14		
HYDROGRAPH AT	RE22CA	57.	4.77	13.	3.	1.	0.00		
ROUTED TO	RD22CA	50.	5.10	13.	3.	1.	0.00	0.29	5.10
3 COMBINED AT	CP21CP	622.	4.67	150.	38.	14.	1.11		
DIVERSION TO	DI21CP	311.	4.67	75.	19.	7.	1.11		
HYDROGRAPH AT	DV21CP	311.	4.67	75.	19.	7.	1.11		

ROUTED TO	RT21CP	310.	4.73	75.	19.	7.	1.11	1.11	4.73
HYDROGRAPH AT	SB21CN	33.	4.30	7.	2.	1.	0.04		
2 COMBINED AT	CP21CN	333.	4.70	82.	21.	8.	1.15		
HYDROGRAPH AT	SB19DU	12.	4.33	4.	1.	0.	0.02		
ROUTED TO	RT19DU	11.	4.97	4.	1.	0.	0.02	0.07	4.97
HYDROGRAPH AT	SB19NO	29.	4.27	7.	2.	1.	0.04		
DIVERSION TO	19NO.2	29.	0.00	7.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	351.	4.30	46.	11.	4.	0.00		
ROUTED TO	RD19NO	339.	4.43	46.	11.	4.	0.00	0.94	4.43
3 COMBINED AT	CP19NO	346.	4.43	50.	12.	4.	0.05		
ROUTED TO	RT19NO	327.	4.57	49.	12.	4.	0.05	0.76	4.57
HYDROGRAPH AT	SB19OR	76.	4.43	22.	6.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.43	15.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	46.	4.43	7.	2.	1.	0.10		
HYDROGRAPH AT	RE19OR	63.	4.40	14.	3.	1.	0.00		
ROUTED TO	RD19OR	61.	4.53	14.	3.	1.	0.00	0.33	4.53
3 COMBINED AT	CP19OR	432.	4.57	70.	18.	6.	0.16		
ROUTED TO	RT19OR	423.	4.60	70.	18.	6.	0.16	0.88	4.63
HYDROGRAPH AT	SB19MY	25.	4.37	6.	2.	1.	0.05		
DIVERSION TO	19MY.2	25.	0.00	6.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	93.	4.50	20.	5.	2.	0.00		
ROUTED TO	RD19MY	92.	4.63	20.	5.	2.	0.00	0.56	4.63
3 COMBINED AT	CP19MY	515.	4.63	90.	23.	8.	0.20		
ROUTED TO	RT19MY	511.	4.67	90.	23.	8.	0.20	1.18	4.67
HYDROGRAPH AT	SB19GL	35.	4.43	10.	2.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.43	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	20.	4.43	3.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	103.	4.53	25.	6.	2.	0.00		

ROUTED TO	RD19GL	102.	4.67	25.	6.	2.	0.00	0.59	4.67
3 COMBINED AT	CP19GL	629.	4.67	118.	30.	11.	0.26		
ROUTED TO	RT19GL	606.	4.77	118.	30.	11.	0.26	1.01	4.77
HYDROGRAPH AT	SB19MA	35.	4.37	9.	2.	1.	0.05		
DIVERSION TO	19MA.2	35.	0.00	9.	2.	1.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	606.	4.77	118.	30.	11.	0.31		
ROUTED TO	RT19MA	594.	4.87	118.	30.	11.	0.31	1.06	4.87
HYDROGRAPH AT	SB19BE	34.	4.40	9.	2.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.40	9.	2.	1.	0.06		
HYDROGRAPH AT	19BE.1	4.	4.40	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	594.	4.87	118.	30.	11.	0.37		
ROUTED TO	RT19BE	583.	4.97	118.	30.	11.	0.37	1.05	4.97
HYDROGRAPH AT	SB19MI	41.	4.40	10.	3.	1.	0.08		
DIVERSION TO	19MI.2	41.	0.00	10.	3.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	583.	4.97	118.	30.	11.	0.44		
ROUTED TO	RT19MI	568.	5.07	118.	30.	11.	0.44	1.12	5.07
HYDROGRAPH AT	SB19CA	3.	4.67	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	3.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	568.	5.07	118.	30.	11.	0.45		
ROUTED TO	RT19CA	557.	5.17	118.	30.	11.	0.45	0.96	5.17
HYDROGRAPH AT	SB19CP	41.	4.37	10.	3.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.37	9.	2.	1.	0.06		
HYDROGRAPH AT	19CP.1	11.	4.37	1.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	311.	4.67	75.	19.	7.	0.00		
ROUTED TO	RD19CP	310.	4.73	75.	19.	7.	0.00	0.90	4.73
3 COMBINED AT	CP19CP	789.	5.13	193.	49.	18.	0.51		
ROUTED TO	RT19CP	787.	5.17	193.	49.	18.	0.51	1.83	5.17

HYDROGRAPH AT	SB19CN	20.	4.57	6.	2.	1.	0.04
DIVERSION TO	19CN.2	20.	0.00	6.	2.	1.	0.04
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.04
2 COMBINED AT	CP19CN	787.	5.17	193.	49.	18.	0.55

*** NORMAL END OF HEC-1 ***

APPENDIX C

10-YEAR, 6-HOUR STORM
EXISTING CONDITIONS
FILE: EXIST10

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   DRAFT MODEL
  4       ID   MODELED BY PREMIER ENGINEERING
  5       ID   JULY 2002
  6       ID   ORIGINAL MODEL PREPARED BY: KBD
  7       ID
  8       ID   MODELING HAS BEEN REVISED BY PREMIER ENGR IN JANUARY - MARCH 2003
  9       ID   TO CORRECT NUMEROUS MODELING ERRORS IN ORIGINAL KBD CODING.
 10       ID   ****************************************************
 11       ID   REVISED FILE NAME: EXIST10.DAT - MARCH 2003
 12       ID   10-YEAR 6-HOUR MODEL, EXISTING CONDITIONS
 13       ID   ****************************************************
 14       ID
 15       ID   Project ID: 24TH & CAMELBACK  -  10-Year, 6-hour Storm
 16       IT       2                   2000
 17       IO       5
          *DIAGRAM
          *
 18       ID   ****************************************************
 19       ID   FLOWS ALONG 23RD AVE
 20       ID   ****************************************************
 21       ID

 22       KK  SB23DU
 23       KM   SUB-BASIN SB23DU
 24       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 25       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 26       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 27       BA    .179
 28       IN      15
 29       KM   RAINFALL DEPTH OF 1.94 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 30       PB   1.875
 31       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 32       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 33       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 34       PC    .949    .962    .975    .988   1.000
 35       LG    .100    .250   4.300    .366  80.000
 36       UC    .421    .170
 37       UA       0       5      16      30      65      77      84      90      94      97
 38       UA     100
          *

 39       KK  23DU.1
 40       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 41       KM   SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
 42       KM   REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
 43       KM   SO=0.001 AND N = 0.013
 44       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 45       DT  23DU.2
 46       DI       0      13   10000
 47       DQ       0      13      13
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	156.	4.13	30.	8.	3.	0.18		
DIVERSION TO	23DU.2	13.	4.13	9.	2.	1.	0.18		
HYDROGRAPH AT	23DU.1	143.	4.13	21.	5.	2.	0.18		
ROUTED TO	RT23DU	141.	4.23	21.	5.	2.	0.18	0.68	4.23
HYDROGRAPH AT	SB23BU	125.	4.27	25.	6.	2.	0.22		
DIVERSION TO	23BU.2	35.	4.27	14.	4.	1.	0.22		
HYDROGRAPH AT	23BU.1	90.	4.27	11.	3.	1.	0.22		
2 COMBINED AT	CP23BU	230.	4.23	31.	8.	3.	0.40		
ROUTED TO	RT23BU	229.	4.30	31.	8.	3.	0.40	0.92	4.30
HYDROGRAPH AT	SB23RO	76.	4.20	16.	4.	1.	0.10		
DIVERSION TO	DV23RO	76.	4.43	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	68.	4.43	7.	2.	1.	0.10		
DIVERSION TO	23RO.2	50.	4.43	6.	2.	1.	0.10		
HYDROGRAPH AT	23RO.1	18.	4.43	0.	0.	0.	0.10		
2 COMBINED AT	CP23RO	234.	4.43	32.	8.	3.	0.50		
ROUTED TO	RT23RO	228.	4.47	32.	8.	3.	0.50	1.32	4.47
HYDROGRAPH AT	SB23NO	43.	4.10	8.	2.	1.	0.04		
DIVERSION TO	RB23NO	43.	4.17	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	41.	4.17	4.	1.	0.	0.04		
2 COMBINED AT	CP23NO	259.	4.33	35.	9.	3.	0.55		
DIVERSION TO	DI23NO	223.	4.33	32.	8.	3.	0.55		
HYDROGRAPH AT	DV23NO	37.	4.33	4.	1.	0.	0.55		
ROUTED TO	RT23NO	35.	4.57	4.	1.	0.	0.55	0.34	4.57
HYDROGRAPH AT	SB23OR	76.	4.30	17.	4.	2.	0.12		
2 COMBINED AT	CP23OR	105.	4.47	21.	5.	2.	0.67		
DIVERSION TO	DI23OR	26.	4.47	5.	1.	0.	0.67		

HYDROGRAPH AT	DV23OR	79.	4.47	16.	4.	1.	0.67		
ROUTED TO	RT23OR	78.	4.53	16.	4.	1.	0.67	0.51	4.53
HYDROGRAPH AT	SB23DM	41.	4.17	7.	2.	1.	0.06		
2 COMBINED AT	CP23DM	106.	4.50	23.	6.	2.	0.73		
DIVERSION TO	DI23DM	53.	4.50	11.	3.	1.	0.73		
HYDROGRAPH AT	DV23DM	53.	4.50	11.	3.	1.	0.73		
ROUTED TO	RT23DM	53.	4.57	11.	3.	1.	0.73	0.48	4.57
HYDROGRAPH AT	SB22GL	9.	4.43	2.	1.	0.	0.03		
ROUTED TO	RT22GL	8.	4.67	2.	1.	0.	0.03	0.11	4.67
HYDROGRAPH AT	SB23GL	39.	4.20	7.	2.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.20	3.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	31.	4.20	4.	1.	0.	0.06		
3 COMBINED AT	CP23GL	81.	4.43	17.	4.	2.	0.81		
ROUTED TO	RT23GL	80.	4.60	17.	4.	2.	0.81	0.33	4.60
HYDROGRAPH AT	SB23MA	74.	4.33	17.	4.	2.	0.15		
DIVERSION TO	23MA.2	10.	4.33	6.	2.	1.	0.15		
HYDROGRAPH AT	23MA.1	64.	4.33	11.	3.	1.	0.15		
2 COMBINED AT	CP23MA	138.	4.47	28.	7.	3.	0.96		
ROUTED TO	RT23MA	137.	4.57	28.	7.	3.	0.96	0.71	4.57
HYDROGRAPH AT	SB23BE	47.	4.40	12.	3.	1.	0.12		
DIVERSION TO	23BE.2	22.	4.40	9.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	25.	4.40	3.	1.	0.	0.12		
2 COMBINED AT	CP23BE	160.	4.53	31.	8.	3.	1.07		
ROUTED TO	RT23BE	158.	4.70	31.	8.	3.	1.07	0.91	4.70
HYDROGRAPH AT	SB23MI	29.	4.70	11.	3.	1.	0.12		
2 COMBINED AT	CP23MI	187.	4.70	42.	11.	4.	1.19		
DIVERSION TO	DI23MI	75.	4.70	17.	4.	2.	1.19		
HYDROGRAPH AT	DV23MI	112.	4.70	25.	6.	2.	1.19		
ROUTED TO	RT23MI	111.	4.77	25.	6.	2.	1.19	0.69	4.77
HYDROGRAPH AT	SB23CO	38.	4.20	8.	2.	1.	0.06		

2 COMBINED AT	CP23CO	130.	4.73	32.	8.	3.	1.25		
DIVERSION TO	DI23CO	65.	4.73	16.	4.	1.	1.25		
HYDROGRAPH AT	DV23CO	65.	4.73	16.	4.	1.	1.25		
ROUTED TO	RT23CO	64.	4.83	16.	4.	1.	1.25	0.52	4.83
HYDROGRAPH AT	SB23CA	6.	4.40	2.	0.	0.	0.01		
DIVERSION TO	23CA.2	6.	0.00	2.	0.	0.	0.01		
HYDROGRAPH AT	23CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP23CA	64.	4.83	16.	4.	1.	1.26		
DIVERSION TO	DI23CA	38.	4.83	10.	2.	1.	1.26		
HYDROGRAPH AT	DV23CA	26.	4.83	6.	2.	1.	1.26		
ROUTED TO	RT23CA	25.	5.07	6.	2.	1.	1.26	0.30	5.07
HYDROGRAPH AT	RE24CA	38.	4.83	10.	2.	1.	0.00		
ROUTED TO	RD24CA	37.	4.90	10.	2.	1.	0.00	0.34	4.93
HYDROGRAPH AT	SB24CA	27.	4.37	7.	2.	1.	0.05		
2 COMBINED AT	CP24CA	55.	4.83	16.	4.	2.	0.05		
ROUTED TO	RT24CA	54.	5.00	16.	4.	2.	0.05	0.27	5.00
HYDROGRAPH AT	SB23CP	114.	4.27	24.	6.	2.	0.16		
DIVERSION TO	23CP.2	4.	4.27	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	110.	4.27	20.	5.	2.	0.16		
3 COMBINED AT	CP23CP	139.	4.40	43.	11.	4.	1.47		
ROUTED TO	RT23CP	139.	4.50	43.	11.	4.	1.47	0.76	4.50
HYDROGRAPH AT	SB23IN	118.	4.30	25.	6.	2.	0.17		
DIVERSION TO	23IN.2	4.	4.30	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	114.	4.30	22.	5.	2.	0.17		
2 COMBINED AT	CP23IN	247.	4.40	65.	16.	6.	1.64		
HYDROGRAPH AT	SB21DU	34.	4.53	10.	3.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.53	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	21.	4.53	3.	1.	0.	0.09		
ROUTED TO	RT21DU	20.	4.73	3.	1.	0.	0.09	0.26	4.73
HYDROGRAPH AT	SB21BU	66.	4.33	15.	4.	1.	0.13		

2 COMBINED AT	CP21BU	76.	4.53	18.	5.	2.	0.22		
DIVERSION TO	DI21BU	76.	0.00	18.	5.	2.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	68.	4.33	15.	4.	1.	0.13		
HYDROGRAPH AT	RE21OR	26.	4.47	5.	1.	0.	0.00		
ROUTED TO	RD21OR	24.	4.67	5.	1.	0.	0.00	0.23	4.67
2 COMBINED AT	CP21OR	85.	4.43	20.	5.	2.	0.13		
DIVERSION TO	DI21OR	43.	4.43	10.	3.	1.	0.13		
HYDROGRAPH AT	DV21OR	43.	4.43	10.	3.	1.	0.13		
ROUTED TO	RT21OR	43.	4.50	10.	3.	1.	0.13	0.47	4.50
HYDROGRAPH AT	SB21MY	36.	4.47	9.	2.	1.	0.08		
HYDROGRAPH AT	RE21MY	53.	4.50	11.	3.	1.	0.00		
ROUTED TO	RD21MY	52.	4.70	11.	3.	1.	0.00	0.42	4.70
3 COMBINED AT	CP21MY	126.	4.57	30.	8.	3.	0.20		
DIVERSION TO	DI21MY	63.	4.57	15.	4.	1.	0.20		
HYDROGRAPH AT	DV21MY	63.	4.57	15.	4.	1.	0.20		
ROUTED TO	RT21MY	63.	4.63	15.	4.	1.	0.20	0.52	4.63
HYDROGRAPH AT	SB21GL	18.	4.37	4.	1.	0.	0.04		
2 COMBINED AT	CP21GL	78.	4.57	19.	5.	2.	0.25		
DIVERSION TO	DI21GL	77.	4.57	19.	5.	2.	0.25		
HYDROGRAPH AT	DV21GL	1.	4.57	0.	0.	0.	0.25		
ROUTED TO	RT21GL	1.	4.90	0.	0.	0.	0.25	0.02	4.90
HYDROGRAPH AT	SB21MA	77.	4.30	16.	4.	1.	0.16		
2 COMBINED AT	CP21MA	77.	4.30	17.	4.	2.	0.40		
ROUTED TO	RT21MA	77.	4.43	17.	4.	2.	0.40	0.57	4.43
HYDROGRAPH AT	SB21BE	97.	4.30	21.	5.	2.	0.18		
DIVERSION TO	21BE.2	6.	4.30	5.	1.	0.	0.18		
HYDROGRAPH AT	21BE.1	91.	4.30	16.	4.	1.	0.18		
2 COMBINED AT	CP21BE	166.	4.40	33.	8.	3.	0.58		
ROUTED TO	RT21BE	165.	4.43	33.	8.	3.	0.58	0.80	4.43

HYDROGRAPH AT	SB21MO	14.	4.80	6.	2.	1.	0.07		
2 COMBINED AT	CP21MO	177.	4.43	38.	10.	4.	0.65		
ROUTED TO	RT21MO	176.	4.50	38.	10.	4.	0.65	0.94	4.50
HYDROGRAPH AT	SB21MI	24.	4.57	7.	2.	1.	0.09		
HYDROGRAPH AT	RE21MI	75.	4.70	17.	4.	2.	0.00		
ROUTED TO	RD21MI	74.	4.87	17.	4.	2.	0.00	0.42	4.87
3 COMBINED AT	CP21MI	249.	4.67	62.	16.	6.	0.74		
ROUTED TO	RT21MI	248.	4.77	62.	16.	6.	0.74	1.13	4.77
HYDROGRAPH AT	SB22CA	21.	4.50	6.	2.	1.	0.05		
DIVERSION TO	22CA.2	10.	4.50	5.	1.	0.	0.05		
HYDROGRAPH AT	22CA.1	11.	4.50	2.	0.	0.	0.05		
HYDROGRAPH AT	RE22CA	65.	4.73	16.	4.	1.	0.00		
ROUTED TO	RD22CA	61.	5.00	16.	4.	1.	0.00	0.37	5.00
2 COMBINED AT	CP22CA	68.	4.97	18.	5.	2.	0.05		
DIVERSION TO	DI22CA	34.	4.93	9.	2.	1.	0.05		
HYDROGRAPH AT	DV22CA	34.	4.93	9.	2.	1.	0.05		
ROUTED TO	RT22CA	34.	5.03	9.	2.	1.	0.05	0.39	5.03
HYDROGRAPH AT	SB21CA	104.	4.30	22.	6.	2.	0.17		
DIVERSION TO	21CA.2	18.	4.30	9.	2.	1.	0.17		
HYDROGRAPH AT	21CA.1	86.	4.30	13.	3.	1.	0.17		
3 COMBINED AT	CP21CA	323.	4.73	83.	21.	8.	0.97		
ROUTED TO	RT21CA	322.	4.80	83.	21.	8.	0.97	1.30	4.80
HYDROGRAPH AT	SB21CP	79.	4.47	20.	5.	2.	0.14		
DIVERSION TO	21CP.2	15.	4.47	8.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	64.	4.47	11.	3.	1.	0.14		
HYDROGRAPH AT	RE22CA	34.	4.93	9.	2.	1.	0.00		
ROUTED TO	RD22CA	28.	5.40	9.	2.	1.	0.00	0.22	5.40
3 COMBINED AT	CP21CP	385.	4.80	104.	26.	10.	1.11		
DIVERSION TO	DI21CP	192.	4.80	52.	13.	5.	1.11		
HYDROGRAPH AT	DV21CP	192.	4.80	52.	13.	5.	1.11		

ROUTED TO	RT21CP	192.	4.87	52.	13.	5.	1.11	0.86	4.87
HYDROGRAPH AT	SB21CN	24.	4.37	6.	1.	1.	0.04		
2 COMBINED AT	CP21CN	207.	4.83	57.	15.	5.	1.15		
HYDROGRAPH AT	SB19DU	9.	4.37	3.	1.	0.	0.02		
ROUTED TO	RT19DU	9.	5.00	3.	1.	0.	0.02	0.05	5.00
HYDROGRAPH AT	SB19NO	23.	4.30	6.	1.	1.	0.04		
DIVERSION TO	19NO.2	23.	0.00	6.	1.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	223.	4.33	32.	8.	3.	0.00		
ROUTED TO	RD19NO	218.	4.50	32.	8.	3.	0.00	0.74	4.50
3 COMBINED AT	CP19NO	224.	4.53	34.	9.	3.	0.05		
ROUTED TO	RT19NO	210.	4.70	34.	9.	3.	0.05	0.60	4.70
HYDROGRAPH AT	SB19OR	58.	4.47	18.	5.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.47	14.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	28.	4.47	4.	1.	0.	0.10		
HYDROGRAPH AT	RE19OR	43.	4.43	10.	3.	1.	0.00		
ROUTED TO	RD19OR	42.	4.53	10.	3.	1.	0.00	0.27	4.53
3 COMBINED AT	CP19OR	275.	4.67	48.	12.	4.	0.16		
ROUTED TO	RT19OR	269.	4.77	48.	12.	4.	0.16	0.69	4.77
HYDROGRAPH AT	SB19MY	16.	4.47	4.	1.	0.	0.05		
DIVERSION TO	19MY.2	16.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	63.	4.57	15.	4.	1.	0.00		
ROUTED TO	RD19MY	62.	4.73	15.	4.	1.	0.00	0.46	4.73
3 COMBINED AT	CP19MY	331.	4.73	64.	16.	6.	0.20		
ROUTED TO	RT19MY	327.	4.83	64.	16.	6.	0.20	0.93	4.83
HYDROGRAPH AT	SB19GL	25.	4.50	7.	2.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.50	6.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	10.	4.50	1.	0.	0.	0.05		
HYDROGRAPH AT	RE19GL	77.	4.57	19.	5.	2.	0.00		

ROUTED TO	RD19GL	76.	4.70	19.	5.	2.	0.00	0.51	4.70
3 COMBINED AT	CP19GL	410.	4.80	84.	21.	8.	0.26		
ROUTED TO	RT19GL	391.	4.93	84.	21.	8.	0.26	0.79	4.93
HYDROGRAPH AT	SB19MA	25.	4.43	7.	2.	1.	0.05		
DIVERSION TO	19MA.2	25.	0.00	7.	2.	1.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	391.	4.93	84.	21.	8.	0.31		
ROUTED TO	RT19MA	383.	5.03	84.	21.	8.	0.31	0.83	5.03
HYDROGRAPH AT	SB19BE	24.	4.47	7.	2.	1.	0.06		
DIVERSION TO	19BE.2	24.	0.00	7.	2.	1.	0.06		
HYDROGRAPH AT	19BE.1	0.	0.00	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	383.	5.03	84.	21.	8.	0.37		
ROUTED TO	RT19BE	374.	5.13	84.	21.	8.	0.37	0.82	5.13
HYDROGRAPH AT	SB19MI	26.	4.50	7.	2.	1.	0.08		
DIVERSION TO	19MI.2	26.	0.00	7.	2.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	374.	5.13	84.	21.	8.	0.44		
ROUTED TO	RT19MI	362.	5.30	84.	21.	8.	0.44	0.88	5.30
HYDROGRAPH AT	SB19CA	3.	4.73	1.	0.	0.	0.01		
DIVERSION TO	19CA.2	3.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	362.	5.30	84.	21.	8.	0.45		
ROUTED TO	RT19CA	355.	5.40	84.	21.	8.	0.45	0.75	5.40
HYDROGRAPH AT	SB19CP	31.	4.40	8.	2.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.40	8.	2.	1.	0.06		
HYDROGRAPH AT	19CP.1	1.	4.40	0.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	192.	4.80	52.	13.	5.	0.00		
ROUTED TO	RD19CP	192.	4.87	52.	13.	5.	0.00	0.70	4.87
3 COMBINED AT	CP19CP	489.	5.37	135.	34.	12.	0.51		
ROUTED TO	RT19CP	488.	5.40	135.	34.	12.	0.51	1.39	5.40

HYDROGRAPH AT	SB19CN	14.	4.63	5.	1.	0.	0.04
DIVERSION TO	19CN.2	14.	0.00	5.	1.	0.	0.04
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.04
2 COMBINED AT	CP19CN	488.	5.40	135.	34.	12.	0.55

*** NORMAL END OF HEC-1 ***

APPENDIX D

2-YEAR, 6-HOUR STORM
EXISITNG CONDITIONS
FILE: EXIST2

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   DRAFT MODEL
  4       ID   MODELED BY PREMIER ENGINEERING
  5       ID   JULY 2002
  6       ID   ORIGINAL MODEL PREPARED BY: KBD
  7       ID
  8       ID   MODELING HAS BEEN REVISED BY PREMIER ENGR IN JANUARY - MARCH 2003
  9       ID   TO CORRECT NUMEROUS MODELING ERRORS IN ORIGINAL KBD CODING.
 10       ID   ****************************************************
 11       ID   REVISED FILE NAME: EXIST2.DAT - MARCH 2003
 12       ID   2-YEAR 6-HOUR MODEL, EXISTING CONDITIONS
 13       ID   ****************************************************
 14       ID
 15       ID   Project ID: 24TH & CAMELBACK  -  2-Year, 6-hour Storm
 16       IT       2                   2000
 17       IO       5
          *DIAGRAM
          *
 18       ID   ****************************************************
 19       ID   FLOWS ALONG 23RD AVE
 20       ID   ****************************************************
 21       ID

 22       KK  SB23DU
 23       KM   SUB-BASIN SB23DU
 24       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 25       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 26       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 27       BA    .179
 28       IN      15
 29       KM   RAINFALL DEPTH OF 1.20 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 30       PB   1.160
 31       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 32       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 33       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 34       PC    .949    .962    .975    .988   1.000
 35       LG    .100    .250   4.300    .366  80.000
 36       UC    .529    .220
 37       UA       0       5      16      30      65      77      84      90      94      97
 38       UA     100
          *

 39       KK  23DU.1
 40       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 41       KM   SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
 42       KM   REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
 43       KM   SO=0.001 AND N = 0.013
 44       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 45       DT  23DU.2
 46       DI       0      13   10000
 47       DQ       0      13      13
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	82.	4.17	18.	4.	2.	0.18		
DIVERSION TO	23DU.2	13.	4.17	8.	2.	1.	0.18		
HYDROGRAPH AT	23DU.1	69.	4.17	10.	3.	1.	0.18		
ROUTED TO	RT23DU	68.	4.30	10.	3.	1.	0.18	0.48	4.30
HYDROGRAPH AT	SB23BU	46.	4.43	13.	3.	1.	0.22		
DIVERSION TO	23BU.2	35.	4.43	12.	3.	1.	0.22		
HYDROGRAPH AT	23BU.1	11.	4.43	1.	0.	0.	0.22		
2 COMBINED AT	CP23BU	78.	4.33	11.	3.	1.	0.40		
ROUTED TO	RT23BU	77.	4.43	11.	3.	1.	0.40	0.53	4.43
HYDROGRAPH AT	SB23RO	37.	4.33	9.	2.	1.	0.10		
DIVERSION TO	DV23RO	37.	0.00	9.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	0.	0.00	0.	0.	0.	0.10		
DIVERSION TO	23RO.2	0.	0.00	0.	0.	0.	0.10		
HYDROGRAPH AT	23RO.1	0.	0.00	0.	0.	0.	0.10		
2 COMBINED AT	CP23RO	77.	4.43	11.	3.	1.	0.50		
ROUTED TO	RT23RO	77.	4.50	11.	3.	1.	0.50	0.75	4.50
HYDROGRAPH AT	SB23NO	26.	4.10	5.	1.	0.	0.04		
DIVERSION TO	RB23NO	26.	4.87	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	5.	4.87	0.	0.	0.	0.04		
2 COMBINED AT	CP23NO	77.	4.50	11.	3.	1.	0.55		
DIVERSION TO	DI23NO	76.	4.50	11.	3.	1.	0.55		
HYDROGRAPH AT	DV23NO	1.	4.50	0.	0.	0.	0.55		
ROUTED TO	RT23NO	0.	4.80	0.	0.	0.	0.55	0.00	4.83
HYDROGRAPH AT	SB23OR	31.	4.50	9.	2.	1.	0.12		
2 COMBINED AT	CP23OR	31.	4.50	9.	2.	1.	0.67		
DIVERSION TO	DI23OR	8.	4.50	2.	1.	0.	0.67		

HYDROGRAPH AT	DV23OR	23.	4.50	7.	2.	1.	0.67		
ROUTED TO	RT23OR	23.	4.60	7.	2.	1.	0.67	0.28	4.60
HYDROGRAPH AT	SB23DM	17.	4.33	4.	1.	0.	0.06		
2 COMBINED AT	CP23DM	39.	4.47	10.	3.	1.	0.73		
DIVERSION TO	DI23DM	19.	4.47	5.	1.	0.	0.73		
HYDROGRAPH AT	DV23DM	19.	4.47	5.	1.	0.	0.73		
ROUTED TO	RT23DM	19.	4.60	5.	1.	0.	0.73	0.29	4.60
HYDROGRAPH AT	SB22GL	2.	4.70	1.	0.	0.	0.03		
ROUTED TO	RT22GL	2.	4.93	1.	0.	0.	0.03	0.03	4.97
HYDROGRAPH AT	SB23GL	15.	4.37	3.	1.	0.	0.06		
DIVERSION TO	23GL.2	9.	4.37	3.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	7.	4.37	1.	0.	0.	0.06		
3 COMBINED AT	CP23GL	26.	4.50	7.	2.	1.	0.81		
ROUTED TO	RT23GL	24.	4.83	7.	2.	1.	0.81	0.15	4.83
HYDROGRAPH AT	SB23MA	27.	4.57	8.	2.	1.	0.15		
DIVERSION TO	23MA.2	10.	4.57	5.	1.	1.	0.15		
HYDROGRAPH AT	23MA.1	17.	4.57	3.	1.	0.	0.15		
2 COMBINED AT	CP23MA	39.	4.77	9.	2.	1.	0.96		
ROUTED TO	RT23MA	38.	4.97	9.	2.	1.	0.96	0.37	4.97
HYDROGRAPH AT	SB23BE	17.	4.63	6.	2.	1.	0.12		
DIVERSION TO	23BE.2	17.	0.00	6.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	0.	0.00	0.	0.	0.	0.12		
2 COMBINED AT	CP23BE	38.	4.97	9.	2.	1.	1.07		
ROUTED TO	RT23BE	36.	5.27	9.	2.	1.	1.07	0.45	5.27
HYDROGRAPH AT	SB23MI	11.	4.97	5.	1.	0.	0.12		
2 COMBINED AT	CP23MI	47.	5.27	14.	4.	1.	1.19		
DIVERSION TO	DI23MI	19.	5.27	6.	2.	1.	1.19		
HYDROGRAPH AT	DV23MI	28.	5.27	9.	2.	1.	1.19		
ROUTED TO	RT23MI	28.	5.40	9.	2.	1.	1.19	0.34	5.40
HYDROGRAPH AT	SB23CO	15.	4.33	4.	1.	0.	0.06		

2 COMBINED AT	CP23CO	32.	5.33	12.	3.	1.	1.25		
DIVERSION TO	DI23CO	16.	5.30	6.	2.	1.	1.25		
HYDROGRAPH AT	DV23CO	16.	5.30	6.	2.	1.	1.25		
ROUTED TO	RT23CO	16.	5.43	6.	2.	1.	1.25	0.27	5.43
HYDROGRAPH AT	SB23CA	3.	4.50	1.	0.	0.	0.01		
DIVERSION TO	23CA.2	3.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	23CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP23CA	16.	5.43	6.	2.	1.	1.26		
DIVERSION TO	DI23CA	10.	5.43	4.	1.	0.	1.26		
HYDROGRAPH AT	DV23CA	6.	5.43	2.	1.	0.	1.26		
ROUTED TO	RT23CA	6.	5.87	2.	1.	0.	1.26	0.12	5.87
HYDROGRAPH AT	RE24CA	10.	5.43	4.	1.	0.	0.00		
ROUTED TO	RD24CA	9.	5.57	4.	1.	0.	0.00	0.13	5.57
HYDROGRAPH AT	SB24CA	12.	4.53	4.	1.	0.	0.05		
2 COMBINED AT	CP24CA	17.	4.60	7.	2.	1.	0.05		
ROUTED TO	RT24CA	17.	4.93	7.	2.	1.	0.05	0.10	4.93
HYDROGRAPH AT	SB23CP	53.	4.40	13.	3.	1.	0.16		
DIVERSION TO	23CP.2	4.	4.40	3.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	49.	4.40	10.	2.	1.	0.16		
3 COMBINED AT	CP23CP	63.	4.50	19.	5.	2.	1.47		
ROUTED TO	RT23CP	63.	4.63	19.	5.	2.	1.47	0.52	4.63
HYDROGRAPH AT	SB23IN	53.	4.47	14.	3.	1.	0.17		
DIVERSION TO	23IN.2	4.	4.47	3.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	49.	4.47	10.	3.	1.	0.17		
2 COMBINED AT	CP23IN	110.	4.57	30.	8.	3.	1.64		
HYDROGRAPH AT	SB21DU	14.	4.73	5.	1.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.73	5.	1.	1.	0.09		
HYDROGRAPH AT	21DU.1	1.	4.73	0.	0.	0.	0.09		
ROUTED TO	RT21DU	1.	5.10	0.	0.	0.	0.09	0.01	5.10
HYDROGRAPH AT	SB21BU	23.	4.53	7.	2.	1.	0.13		

2 COMBINED AT	CP21BU	23.	4.53	7.	2.	1.	0.22		
DIVERSION TO	DI21BU	23.	0.00	7.	2.	1.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	24.	4.57	7.	2.	1.	0.13		
HYDROGRAPH AT	RE21OR	8.	4.50	2.	1.	0.	0.00		
ROUTED TO	RD21OR	8.	4.73	2.	1.	0.	0.00	0.07	4.73
2 COMBINED AT	CP21OR	31.	4.60	10.	2.	1.	0.13		
DIVERSION TO	DI21OR	16.	4.60	5.	1.	0.	0.13		
HYDROGRAPH AT	DV21OR	16.	4.60	5.	1.	0.	0.13		
ROUTED TO	RT21OR	16.	4.73	5.	1.	0.	0.13	0.28	4.73
HYDROGRAPH AT	SB21MY	11.	4.70	4.	1.	0.	0.08		
HYDROGRAPH AT	RE21MY	19.	4.47	5.	1.	0.	0.00		
ROUTED TO	RD21MY	19.	4.70	5.	1.	0.	0.00	0.24	4.70
3 COMBINED AT	CP21MY	45.	4.70	14.	4.	1.	0.20		
DIVERSION TO	DI21MY	23.	4.70	7.	2.	1.	0.20		
HYDROGRAPH AT	DV21MY	23.	4.70	7.	2.	1.	0.20		
ROUTED TO	RT21MY	22.	4.83	7.	2.	1.	0.20	0.31	4.83
HYDROGRAPH AT	SB21GL	5.	4.60	2.	1.	0.	0.04		
2 COMBINED AT	CP21GL	28.	4.83	9.	2.	1.	0.25		
DIVERSION TO	DI21GL	28.	0.00	9.	2.	1.	0.25		
HYDROGRAPH AT	DV21GL	0.	0.00	0.	0.	0.	0.25		
ROUTED TO	RT21GL	0.	0.00	0.	0.	0.	0.25		
HYDROGRAPH AT	SB21MA	26.	4.50	8.	2.	1.	0.16		
2 COMBINED AT	CP21MA	26.	4.50	8.	2.	1.	0.40		
ROUTED TO	RT21MA	26.	4.73	8.	2.	1.	0.40	0.33	4.73
HYDROGRAPH AT	SB21BE	36.	4.53	11.	3.	1.	0.18		
DIVERSION TO	21BE.2	6.	4.53	4.	1.	0.	0.18		
HYDROGRAPH AT	21BE.1	30.	4.53	6.	2.	1.	0.18		
2 COMBINED AT	CP21BE	55.	4.60	14.	4.	1.	0.58		
ROUTED TO	RT21BE	54.	4.67	14.	4.	1.	0.58	0.47	4.67

HYDROGRAPH AT	SB21MO	5.	5.03	3.	1.	0.	0.07		
2 COMBINED AT	CP21MO	59.	4.70	17.	4.	2.	0.65		
ROUTED TO	RT21MO	59.	4.77	17.	4.	2.	0.65	0.54	4.77
HYDROGRAPH AT	SB21MI	7.	4.90	3.	1.	0.	0.09		
HYDROGRAPH AT	RE21MI	19.	5.27	6.	2.	1.	0.00		
ROUTED TO	RD21MI	18.	5.50	6.	2.	1.	0.00	0.17	5.50
3 COMBINED AT	CP21MI	72.	5.00	26.	7.	2.	0.74		
ROUTED TO	RT21MI	72.	5.13	26.	7.	2.	0.74	0.60	5.13
HYDROGRAPH AT	SB22CA	7.	4.77	3.	1.	0.	0.05		
DIVERSION TO	22CA.2	7.	0.00	3.	1.	0.	0.05		
HYDROGRAPH AT	22CA.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE22CA	16.	5.30	6.	2.	1.	0.00		
ROUTED TO	RD22CA	15.	5.70	6.	2.	1.	0.00	0.15	5.70
2 COMBINED AT	CP22CA	15.	5.70	6.	2.	1.	0.05		
DIVERSION TO	DI22CA	8.	5.70	3.	1.	0.	0.05		
HYDROGRAPH AT	DV22CA	8.	5.70	3.	1.	0.	0.05		
ROUTED TO	RT22CA	8.	5.83	3.	1.	0.	0.05	0.18	5.83
HYDROGRAPH AT	SB21CA	39.	4.53	11.	3.	1.	0.17		
DIVERSION TO	21CA.2	18.	4.53	8.	2.	1.	0.17		
HYDROGRAPH AT	21CA.1	21.	4.53	3.	1.	0.	0.17		
3 COMBINED AT	CP21CA	88.	4.87	32.	8.	3.	0.97		
ROUTED TO	RT21CA	87.	5.03	31.	8.	3.	0.97	0.66	5.03
HYDROGRAPH AT	SB21CP	31.	4.67	10.	3.	1.	0.14		
DIVERSION TO	21CP.2	15.	4.67	7.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	16.	4.67	2.	1.	0.	0.14		
HYDROGRAPH AT	RE22CA	8.	5.70	3.	1.	0.	0.00		
ROUTED TO	RD22CA	7.	6.13	3.	1.	0.	0.00	0.05	6.13
3 COMBINED AT	CP21CP	103.	5.00	37.	10.	3.	1.11		
DIVERSION TO	DI21CP	51.	5.00	18.	5.	2.	1.11		
HYDROGRAPH AT	DV21CP	51.	5.00	18.	5.	2.	1.11		

ROUTED TO	RT21CP	51.	5.13	18.	5.	2.	1.11	0.46	5.13
HYDROGRAPH AT	SB21CN	10.	4.53	3.	1.	0.	0.04		
2 COMBINED AT	CP21CN	57.	5.13	21.	6.	2.	1.15		
HYDROGRAPH AT	SB19DU	5.	4.47	2.	0.	0.	0.02		
ROUTED TO	RT19DU	4.	5.13	2.	0.	0.	0.02	0.03	5.13
HYDROGRAPH AT	SB19NO	11.	4.40	3.	1.	0.	0.04		
DIVERSION TO	19NO.2	11.	0.00	3.	1.	0.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	76.	4.50	11.	3.	1.	0.00		
ROUTED TO	RD19NO	69.	4.83	11.	3.	1.	0.00	0.40	4.83
3 COMBINED AT	CP19NO	73.	4.87	13.	3.	1.	0.05		
ROUTED TO	RT19NO	67.	5.13	13.	3.	1.	0.05	0.32	5.13
HYDROGRAPH AT	SB19OR	29.	4.63	10.	3.	1.	0.10		
DIVERSION TO	19OR.2	29.	0.00	10.	3.	1.	0.10		
HYDROGRAPH AT	19OR.1	0.	0.00	0.	0.	0.	0.10		
HYDROGRAPH AT	RE19OR	16.	4.60	5.	1.	0.	0.00		
ROUTED TO	RD19OR	15.	4.80	5.	1.	0.	0.00	0.12	4.80
3 COMBINED AT	CP19OR	80.	5.10	18.	5.	2.	0.16		
ROUTED TO	RT19OR	77.	5.23	18.	5.	2.	0.16	0.35	5.23
HYDROGRAPH AT	SB19MY	5.	4.70	2.	1.	0.	0.05		
DIVERSION TO	19MY.2	5.	0.00	2.	1.	0.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	23.	4.70	7.	2.	1.	0.00		
ROUTED TO	RD19MY	22.	4.97	7.	2.	1.	0.00	0.25	4.97
3 COMBINED AT	CP19MY	98.	5.20	25.	6.	2.	0.20		
ROUTED TO	RT19MY	96.	5.30	25.	6.	2.	0.20	0.48	5.30
HYDROGRAPH AT	SB19GL	10.	4.67	4.	1.	0.	0.05		
DIVERSION TO	19GL.2	10.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19GL.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19GL	28.	4.83	9.	2.	1.	0.00		

ROUTED TO	RD19GL	27.	5.03	9.	2.	1.	0.00	0.28	5.03
3 COMBINED AT	CP19GL	121.	5.30	33.	9.	3.	0.26		
ROUTED TO	RT19GL	112.	5.47	33.	9.	3.	0.26	0.41	5.47
HYDROGRAPH AT	SB19MA	11.	4.57	4.	1.	0.	0.05		
DIVERSION TO	19MA.2	11.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	112.	5.47	33.	9.	3.	0.31		
ROUTED TO	RT19MA	108.	5.70	33.	9.	3.	0.31	0.43	5.70
HYDROGRAPH AT	SB19BE	10.	4.67	4.	1.	0.	0.06		
DIVERSION TO	19BE.2	10.	0.00	4.	1.	0.	0.06		
HYDROGRAPH AT	19BE.1	0.	0.00	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	108.	5.70	33.	9.	3.	0.37		
ROUTED TO	RT19BE	104.	5.90	33.	9.	3.	0.37	0.42	5.90
HYDROGRAPH AT	SB19MI	9.	4.73	4.	1.	0.	0.08		
DIVERSION TO	19MI.2	9.	0.00	4.	1.	0.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	104.	5.90	33.	9.	3.	0.44		
ROUTED TO	RT19MI	100.	6.13	33.	9.	3.	0.44	0.45	6.13
HYDROGRAPH AT	SB19CA	1.	5.33	1.	0.	0.	0.01		
DIVERSION TO	19CA.2	1.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	100.	6.13	33.	9.	3.	0.45		
ROUTED TO	RT19CA	97.	6.33	33.	9.	3.	0.45	0.37	6.33
HYDROGRAPH AT	SB19CP	13.	4.57	4.	1.	0.	0.06		
DIVERSION TO	19CP.2	13.	0.00	4.	1.	0.	0.06		
HYDROGRAPH AT	19CP.1	0.	0.00	0.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	51.	5.00	18.	5.	2.	0.00		
ROUTED TO	RD19CP	51.	5.13	18.	5.	2.	0.00	0.33	5.13
3 COMBINED AT	CP19CP	127.	6.23	52.	13.	5.	0.51		
ROUTED TO	RT19CP	127.	6.33	52.	13.	5.	0.51	0.67	6.33

HYDROGRAPH AT	SB19CN	5.	4.93	2.	1.	0.	0.04
DIVERSION TO	19CN.2	5.	0.00	2.	1.	0.	0.04
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.04
2 COMBINED AT	CP19CN	127.	6.33	52.	13.	5.	0.55

*** NORMAL END OF HEC-1 ***

APPENDIX E

PHASE 1 DRAINAGE SYSTEM
25-YEAR, 6-HOUR STORM
FILE: P1-25-2

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 1, SINGLE RETENTION BASIN AT CAMELBACK ROAD
  9       ID   25-YEAR 6 HOUR STORM
 10       ID
 11       ID   THIS IS BASELINE FILE 25ATL2 MODIFIED FOR AUGUST 2003 PHASE I ANALYSIS
 12       ID
 13       ID   FILE NAME: P1-25-2.6I
 14       ID   ****************************************************
 15       ID
 16       ID   Project ID: 24TH & CAMELBACK
 17       IT       2                   2000
 18       IO       5
          *DIAGRAM
          *
 19       ID   ****************************************************
 20       ID   FLOWS ALONG 23RD AVE
 21       ID   ****************************************************
 22       ID

 23       KK  SB23DU
 24       KM   SUB-BASIN SB23DU
 25       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 26       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 27       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 28       BA    .179
 29       IN      15
 30       KM   RAINFALL DEPTH OF 2.36 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 31       PB   2.282
 32       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 33       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 34       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 35       PC    .949    .962    .975    .988   1.000
 36       LG    .100    .250   4.300    .366  80.000
 37       UC    .383    .154
 38       UA       0       5      16      30      65      77      84      90      94      97
 39       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 40       KK  RT23DU
 41       KM   ROUTE 23DU
 42       KM   ROUTE FROM BASIN 23DU TO 23BU
 43       KM   23RD AVE - DUNLAP TO BUTLER
 44       RS       6    FLOW       0
 45       RC    .016    .016    .016    2640    .005     4.3
 46       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 47       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 48       KK  SB23BU
 49       KM   SUB-BASIN SB23BU
 50       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND BUTLER
 51       KM   BASIN AREA REDUCED BY 27.2 ACRES TO ACCOUNT FOR 100 YEAR 2 HOUR RETENTION &
 52       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 53       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 54       KM     L =  .50  Kb = .050  Adj. Slope =   25.0
 55       BA    .222
 56       LG    .200    .250   5.300    .282  46.000
 57       UC    .550    .258
 58       UA       0       5      16      30      65      77      84      90      94      97
 59       UA     100
          *
          *  KK23BU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23BU, 7 CBs IN SUBBASIN, 1-54" SD ALONG 23RD AVE
          *  KM REMOVE CAPACITY OF CATCH BASINS. ASSUME INLET CAPACITY OF 5 CFS EACH
          *  KM Qtotal = 7(5) = 35 cfs
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23BU.2
          *  DI      0      35   10000
          *  DQ      0      35      35
          *

 60       KK  CP23BU
 61       KM   COMBINE FLOWS AT 23RD AND BUTLER
 62       HC       2
          *

 63       KK  RT23BU
 64       KM   ROUTE BASIN 23BU TO 23RD AND ROYAL PALM
 65       KM   ROUTE 23BU
 66       KM   ROUTE FROM BASIN 23BU TO 23RO
 67       RS       5    FLOW       0
 68       RC    .016    .016    .016    2036    .004     4.3
 69       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 70       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  71      KK  SB23RO
  72      KM   SUB-BASIN SB23RO
  73      KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND ROYAL PALM
  74      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  75      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  76      KM     L =  .39  Kb = .055  Adj. Slope =   23.0
  77      BA    .101
  78      LG    .150    .160   7.000    .127  66.000
  79      UC    .475    .282
  80      UA       0       5      16      30      65      77      84      90      94      97
  81      UA     100
          *

  82      KK  RN23RO
  83      KM   RETENTION VOLUME IN SB23RO, 23RD AND ROYAL PALM
  84      KM   100-YEAR 2 HOUR RETENTION ESTIMATED BY FIELD VISIT AND STORM DRAIN MAP J-7
  85      KM   VOL = C*(P/12)*A, 50% OF REQUIRED VOLUME IS DIVERTED
  86      KM   C = 0.70, P = 100 YEAR 2 HOUR RAINFALL DEPTH = 2.54 INCHES
  87      KM   AREA A, IN ACRES MEASURED FROM MAPPING
  88      KO       3
  89      DT  DV23RO     4.8
  90      DI       0    4000
  91      DQ       0    4000
          *
          *  KK23RO.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM REMAINING SUBBASIN RUNOFF
          *  KM SB23RO, 10 CBs IN SUBBASIN, 1-60" SD ALONG 23RD AVE
          *  KM REMOVE CAPACITY OF CATCH BASINS. ASSUME INLET CAPACITY OF 5 CFS EACH
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23RO.2
          *  DI      0      50   10000
          *  DQ      0      50      50
          *

  92      KK  CP23RO
  93      KM   COMBINE FLOWS AT 23RD AND ROYAL PALM
  94      HC       2
          *

  95      KK  RT23RO
  96      KM   ROUTE 23RO
  97      KM   ROUTE FROM BASIN 23RO TO 23NO
  98      KM   23RD AVE -Royal Palm to Northern
  99      RS       2    FLOW       0
 100      RC    .016    .016    .016     702    .001     4.3
 101      RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 102      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  103     KK  SB23NO
  104     KM   SUB-BASIN SB23NO
  105     KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND NORTHERN BASIN
  106     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  107     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  108     KM     L =  .13  Kb = .060  Adj. Slope =    7.0
  109     BA    .043
  110     LG    .100    .150   9.100    .053  80.000
  111     UC    .404    .159
  112     UA       0       5      16      30      65      77      84      90      94      97
  113     UA     100
          *

  114     KK  RN23NO
  115     KM   RETENTION VOLUME IN SB23NO, 23RD AND NORTHERN
  116     KM   100-YEAR 2 HOUR RETENTION ESTIMATED BY FIELD VISIT AND STORM DRAIN MAP J-7
  117     KM   VOL = C*(P/12)*A, 50% OF REQUIRED VOLUME IS DIVERTED
  118     KM   C = 0.70, P = 100 YEAR 2 HOUR RAINFALL DEPTH = 2.54 INCHES
  119     KM   AREA A, IN ACRES MEASURED FROM MAPPING
  120     DT  RB23NO     2.1
  121     DI       0    4000
  122     DQ       0    4000
          *

  123     KK  CP23NO
  124     KM   COMBINE AT 23RD AVE AND NORTHERN
  125     HC       2
          *

  126     KK  DV23NO
  127     KM   DQ FLOWS GO TO EAST TO 21ST AVE AND NORTHERN
  128     DT  DI23NO
  129     DI      74     127    1404    2369
  130     DQ      56      95     842    1421
          *

  131     KK  RT23NO
  132     KM   ROUTE TO 23RD AND ORANGEWOOD
  133     KM   23RD AVE AND NORTHERN TO 23RD AND ORANGEWOOD
  134     RS       6    FLOW       0
  135     RC    .016    .016    .016    2633    .005     4.3
  136     RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  137     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  138     KK  SB23OR
  139     KM   SUB-BASIN SB23OR
  140     KM   23RD AVE AND ORANGEWOOD BASIN
  141     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  142     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  143     KM     L =  .50  Kb = .054  Adj. Slope =   24.0
  144     BA    .124
  145     LG    .220    .170   6.800    .155  51.000
  146     UC    .546    .357
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  147     UA       0       5      16      30      65      77      84      90      94      97
  148     UA     100
          *

  149     KK  CP23OR
  150     KM   COMBINE AT 23RD AVE AND ORANGEWOOD
  151     HC       2
          *

  152     KK  DV23OR
  153     KM   DIVERT FLOWS AT ORANGEWOOD 75% SOUTH 25% EAST
  154     KM   DQ FLOWS GO TO EAST TO 21ST AVE AND ORANGEWOOD
  155     DT  DI23OR
  156     DI       0     500   10000
  157     DQ       0     125    2500
          *

  158     KK  RT23OR
  159     KM   ROUTE TO 23RD DRIVE AND MYRTLE
  160     KM   ROUTE RUNOFF FROM 23RD AVE AND ORANGEWOOD
  161     RS       3    FLOW       0
  162     RC    .016    .016    .016    1460    .005     4.3
  163     RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  164     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  165     KK  SB23DM
  166     KM   SUB-BASIN SB23DM
  167     KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND MYRTLE
  168     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  169     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  170     KM     L =  .28  Kb = .059  Adj. Slope =   29.0
  171     BA    .056
  172     LG    .250    .150   8.100    .097  40.000
  173     UC    .392    .244
  174     UA       0       5      16      30      65      77      84      90      94      97
  175     UA     100
          *

  176     KK  CP23DM
  177     KM   COMBINE AT 23RD DRIVE AND MYRTLE
  178     HC       2
          *

  179     KK  DV23DM
  180     KM   DIVERT FLOWS AT 23RD DRIVE 50% SOUTH AND 50% EAST
  181     KM   DQ FLOWS GO TO EAST TO 21ST AVE AND MYRTLE
  182     DT  DI23DM
  183     DI       0      16      32     412     701
  184     DQ       0       8      16     206     351
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  185     KK  RT23DM
  186     KM   ROUTE 23M.3 SOUTH ON 23rd AVENUE TO GLENDALE AVENUE
  187     RS      3    FLOW       0
  188     RC   .016    .016    .016    1324    .003     4.3
  189     RX  0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  190     RY   4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  191     KK  SB22GL
  192     KM   SUB-BASIN SB22GL
  193     KM   SUBBASIN CONTRIBUTING TO 22ND AVE AND GLENDALE
  194     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  195     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  196     KM     L =  .30  Kb = .063  Adj. Slope =   16.0
  197     BA   .025
  198     LG   .250    .250   5.900    .235  32.000
  199     UC   .567    .616
  200     UA      0       5      16      30      65      77      84      90      94      97
  201     UA    100
          *

  202     KK  RT22GL
  203     KM   ROUTE FROM BASIN 22GL TO 23GL
  204     RS      5    FLOW       0
  205     RC   .016    .016    .016     830    .001     4.3
  206     RX  44.9      45      66    66.1     134   134.1     155   155.1
  207     RY   4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  208     KK  SB23GL
  209     KM   SUB-BASIN SB23GL
  210     KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND GLENDALE
  211     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  212     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  213     KM     L =  .25  Kb = .058  Adj. Slope =   18.0
  214     BA   .057
  215     LG   .240    .150   7.400    .126  36.000
  216     UC   .433    .247
  217     UA      0       5      16      30      65      77      84      90      94      97
  218     UA    100
          *

  219     KK  23GL.1
  220     KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
  221     KM   SB23GL, 5 CBs IN SUBBASIN, 1-21" SD ALONG GLENDALE AVE
  222     KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL=8.6 CFS
  223     KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
  224     DT  23GL.2
  225     DI      0     8.6   10000
  226     DQ      0     8.6     8.6
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

227       KK  CP23GL
228       KM   COMBINE AT 23RD DRIVE AND GLENDALE
229       HC       3
          *

230       KK  RT23GL
231       KM   ROUTE CP23GL TO 23RD AND MARYLAND
232       KM   ROUTE FROM BASIN 23GL TO 23MA
233       KM   23RD AVE - GLENDALE TO MARYLAND
234       RS       5    FLOW       0
235       RC    .016    .016    .016    2796    .005     4.3
236       RX    44.9      45      66    66.1     134   134.1     155   155.1
237       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          *

238       KK  SB23MA
239       KM   SUB-BASIN SB23MA
240       KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND MARYLAND
241       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
242       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
243       KM     L =  .53  Kb = .053  Adj. Slope =   25.0
244       BA    .151
245       LG    .230    .250   3.500    .349  45.000
246       UC    .587    .362
247       UA       0       5      16      30      65      77      84      90      94      97
248       UA     100
          *

249       KK  23MA.1
250       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
251       KM   SB23MA, 2 CBs IN SUBBASIN, 1-24" SD ALONG 23RD AVE
252       KM   ASSUME CAPACITY EQUAL TO 5 CFS PER INLET
253       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
254       DT  23MA.2
255       DI       0      10   10000
256       DQ       0      10      10
          *

257       KK  CP23MA
258       KM   COMBINE AT 23RD AVE AND MARYLAND
259       HC       2
          *

260       KK  RT23MA
261       KM   ROUTE FLOWS TO 23RD AND BETHANY HOME RD
262       KM   NO FLOWS ARE DIVERTED EAST. ALL FLOWS PROCEED SOUTH
263       KM   23RD AVE - MARYLAND TO BETHANY HOME
264       RS       4    FLOW       0
265       RC    .016    .016    .016    2623    .004     4.3
266       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
267       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  268     KK  SB23BE
  269     KM   SUB-BASIN SB23BE
  270     KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND BETHANY HOME ROAD
  271     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  272     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  273     KM     L =  .50  Kb = .054  Adj. Slope =   20.0
  274     BA    .115
  275     LG    .210    .250   4.900    .338  43.000
  276     UC    .637    .442
  277     UA       0       5      16      30      65      77      84      90      94      97
  278     UA     100
          *

  279     KK  23BE.1
  280     KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
  281     KM   SB23BE, 10 CBs IN SUBBASIN, 1-30" SD (LOWER REACH WHERE THE CBs ARE LOCATED)
  282     KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL= 22.38 CFS
  283     KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
  284     DT  23BE.2
  285     DI       0      22   10000
  286     DQ       0      22      22
          *

  287     KK  CP23BE
  288     KM   COMBINE AT 23RD AND BETHANY HOME
  289     HC       2
          *

  290     KK  RT23BE
  291     KM   ROUTE 23BE
  292     KM   ROUTE FROM BASIN 23BE TO 23MI (23RD AVE AND MISSOURI)
  293     KM   ALL FLOW GOES TO THE SOUTH
  294     RS       6    FLOW       0
  295     RC    .016    .016    .016    2640    .002     4.3
  296     RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  297     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  298     KK  SB23MI
  299     KM   SUB-BASIN SB23MI
  300     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  301     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  302     KM     L =  .65  Kb = .054  Adj. Slope =   12.0
  303     BA    .119
  304     LG    .240    .250   4.900    .355  37.000
  305     UC    .958    .841
  306     UA       0       5      16      30      65      77      84      90      94      97
  307     UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  308     KK  CP23MI
  309     KM   COMBINE AT 23RD AND MISSOURI
  310     HC       2
          *

  311     KK  DV23MI
  312     KM   DIVERT FLOWS GENERATED AT 23RD AND MISSOURI
  313     KM   DQ FLOWS GO TO EAST TO 21ST AND MISSOURI
  314     DT  DI23MI
  315     DI       0     500   10000
  316     DQ       0     200    4000
          *

  317     KK  RT23MI
  318     KM   ROUTE 23MI
  319     KM   ROUTE SOUTH FROM BASIN 23MI TO 23CO (23RD AVE AND COLTER)
  320     RS       2    FLOW       0
  321     RC    .016    .016    .016    1314    .003     4.3
  322     RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  323     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ================================================
          * ADD DETENTION BASIN C
          * ================================================
          *

  324     KK  S23COA
  325     KM   SUB-BASIN S23COA
  326     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  327     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  328     KM     L =  .25  Kb = .068  Adj. Slope =   16.0
  329     BA    .012
  330     LG    .180    .250   3.500    .360  40.000
  331     UC    .525    .743
  332     UA       0       5      16      30      65      77      84      90      94      97
  333     UA     100
          *

  334     KK  S23COB
  335     KM   SUB-BASIN S23COB
  336     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  337     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  338     KM     L =  .44  Kb = .059  Adj. Slope =   11.0
  339     BA    .049
  340     LG    .210    .250   3.500    .305  60.000
  341     UC    .717    .740
  342     UA       0       5      16      30      65      77      84      90      94      97
  343     UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 344      KK  23CO.1
 345      KM    COMBINE S23COA, S23COB & RT23MI AT COLTER & 23rd AVENUE
 346      KO       3
 347      HC       3
          *
          *  KK23CO.3     DIV
          *  KM CAPTURE FLOWS FROM 23CO.1 WITH NEW STORM DRAIN
          *  KM THIS STORM DRAIN COLLECTION SYSTEM WILL BE DESIGNED TO INTERCEPT A MAXIMUM
          *  KM 9.0 AF OF WATER AND DIRECT IT TO RET BASIN C.1 AT I-17 & COLTER STREET.
          *  KM THE DIVERTED FLOW GOES TO RETENTION BASIN C.1.
          *  KM NON-DIVERTED FLOW GOES EAST ON COLTER AND SOUTH ON 23rd AVENUE
          *  KO     3
          *  DT23CO.2
          *  DI     0      34   10000
          *  DQ     0      34      34
          *

 348      KK  DV23CO
 349      KM   DIVERT FLOWS GENERATED AT 23RD AVE AND COLTER
 350      KM   SPLIT IS APPROXIMATELY 50% EAST AND 50% SOUTH
 351      KM   DQ FLOWS GO TO EAST TO 22ND AND CAMELBACK
 352      DT  DI23CO
 353      DI       0     500   10000
 354      DQ       0     250    5000
          *

 355      KK  RT23CO
 356      KM   FLOW ROUTED SOUTH ON 23RD AVE TO BOTTOM OF SUB S23CAA
 357      RS       2    FLOW       0
 358      RC    .016    .016    .016     960    .003     4.3
 359      RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 360      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 361      KK  S23CAA
 362      KM   SUB-BASIN S23CAA
 363      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 364      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 365      KM     L =  .18  Kb = .070  Adj. Slope =   16.0
 366      BA    .009
 367      LG    .180    .230   6.200    .187  56.000
 368      UC    .421    .526
 369      UA       0       5      16      30      65      77      84      90      94      97
 370      UA     100
          *

 371      KK  23AA.1
 372      KM   REMOVE FLOW FROM S23CAA INTO AN EXISTING STORM ON 23rd AVENUE
 373      KM   2 CATCH BASINS CONTRIBUTE TO AN 18" STORM DRAIN IN 23rd AVENUE
 374      KM   THROUGH SUB-BASIN S23CAA.
 375      KM   ASSUME CATCH BASIN CAPACITY OF 5 cfs EACH
 376      KM   TOTAL Q TAKEN OUT = 2(5) =10 CFS
 377      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 378      DT  23AA.2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 379      DI       0      10    1000
 380      DQ       0      10      10
          *

 381      KK  23CA.1
 382      KM   COMBINE RT23CO & S23CAA
 383      HC       2
          *

 384      KK   RBA.1
 385      KM   INSTALL NEW STORM DRAIN TO COLLECT FLOW AT 23CA.1 AND PIPE TO RET BASIN A.
 386      KO       3
 387      DT   RBA.2
 388      DI       0    1000
 389      DQ       0    1000
          * ===============================================================
          * COLLECT FLOWS WITH STORM DRAIN IN 23RD AVE AND CONVEY TO BASIN C.2
          * ===============================================================
          *

 390      KK   C23.1
 391      KM   ROUTE ANY EXCESS FLOW FROM RBA.1 DOWN 23rd AVE TO CAMELBACK ROAD
 392      RS       2    FLOW      0
 393      RC    .016    .016    .016     350    .003     4.3
 394      RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 395      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 396      KK  S23CAB
 397      KM   SUB-BASIN S23CAB
 398      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 399      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 400      KM     L =  .07  Kb = .076  Adj. Slope =   15.8
 401      BA    .003
 402      LG    .180    .150   8.200    .052  56.000
 403      UC    .254    .264
 404      UA       0       5      16      30      65      77      84      90      94      97
 405      UA     100
          *

 406      KK  CP23CA
 407      KM   COMBINE AT 23RD AND CAMELBACK
 408      KO       3
 409      HC       2
          *

 410      KK  DV23CA
          *  KM DIVERT FLOWS AT 23RD AVE AND CAMELBACK TO RET BASIN C.2
 411      KM     DETENTION BASIN C.2 IS ELIMINATED.
 412      KM     ALL FLOWS AT THIS POINT GO TO DETENTION BASIN "A"
 413      KM   100% OF THE FLOW IS DIVERTED WEST ALONG THE NORTH SIDE OF CAMELBACK
 414      DT  DI23CA
 415      DI       0   10000
 416      DQ       0   10000
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

417       KK  RT23CA
418       KM   ROUTE 23CA
419       KM   ROUTE FROM BASIN 23CA TO 23CP (23RD AND CAMPBELL)
420       RS      5    FLOW       0
421       RC   .016    .016    .016    2673    .004     4.3
422       RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
423       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

424       KK  RE24CA
425       KM   RETRIEVAL OF RET BASIN C.2 DIVERSION FROM 23rd AVE & CAMELBACK
426       DR  DI23CA
          *

427       KK  RD24CA
428       KM   ROUTE DIVERT FROM 23RD AND CAMELBACK TO 24TH DRIVE AND CAMELBACK
429       RS      1    FLOW       0
430       RC   .016    .016    .016     504    .001     4.3
431       RX   44.9      45      66    66.1     134   134.1     155   155.1
432       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

433       KK  SB24CA
434       KM   SUB-BASIN SB24CA
435       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
436       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
437       KM     L =  .34  Kb = .059  Adj. Slope =   14.0
438       KO      3
439       BA   .050
440       LG   .150    .250   4.900    .293  63.000
441       UC   .567    .458
442       UA      0       5      16      30      65      77      84      90      94      97
443       UA    100
          *

444       KK  CP24CA
445       KM   COMBINE AT 24TH AND CAMELBACK
446       KO      3
447       HC      2
          *

448       KK  C.2OUT
449       KM       ROUTE CP24CA THROUGH NEW RET BASIN C.2
450       KM       THIS DETENTION BASIN HAS BEEN REMOVED.
451       KM       ALL FLOWS ARE ROUTED TO DETENTION BASIN "A" THROUGH RETRIEVAL OF RBC.2
452       KO      3
453       DT   RBC.2
454       DI      0   10000
455       DQ      0   10000
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

456       KK  RT24CA
457       KM   FLOWS ACCUMULATE AT 24th AND CAMELBACK UNTIL BREAKING OUT SOUTH TO BILL LUKE
458       KM   FLOWS EVENTUALLY ARRIVE AT 23RD AND CAMPBELL
459       RS      5    FLOW      0
460       RC   .016    .016    .016    2578    .005     4.3
461       RX   44.9      45     66     66.1     134   134.1     155   155.1
462       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

463       KK  SB23CP
464       KM   SUB-BASIN SB23CP
465       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND CAMPBELL
466       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
467       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
468       KM    L =  .51  Kb = .052  Adj. Slope =   24.0
469       BA   .158
470       LG   .210    .150   9.300    .061  51.000
471       UC   .525    .302
472       UA      0       5      16      30      65      77      84      90      94      97
473       UA    100
          *

474       KK  23CP.1
475       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
476       KM   SB23CP, 6 CBs IN SUBBASIN, 1-15" SD ALONG 23RD AVE
477       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL= 3.52 CFS
478       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
479       DT  23CP.2
480       DI       0       4   10000
481       DQ       0       4       4
          *

482       KK  CP23CP
483       KM   COMBINE AT 23RD AND CAMPBELL
484       HC       3
          *

485       KK  RT23CP
486       KM   ROUTE 23CP
487       KM   ROUTE FROM BASIN 23CP TO 23IN
488       RS       4    FLOW      0
489       RC    .016    .016    .016    2578    .003     4.3
490       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
491       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

492       KK  SB23IN
493       KM   SUB-BASIN SB23IN
494       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND INDIAN SCHOOL ROAD
495       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
496       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
497       KM    L =  .49  Kb = .052  Adj. Slope =   16.0
498       BA   .171
499       LG   .220    .150   8.600    .077  52.000
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

500       UC    .596    .322
501       UA       0       5      16      30      65      77      84      90      94      97
502       UA     100
          *

503       KK  23IN.1
504       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
505       KM   SB23IN, 8 CBs IN SUBBASIN, 1-15" SD ALONG 23RD AVE
506       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL=3.52 CFS
507       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
508       DT  23IN.2
509       DI       0       4   10000
510       DQ       0       4       4
          *

511       KK  CP23IN
512       KM   COMBINE AT 23RD AND INDIAN SCHOOL ROAD
513       HC       2
          *
514       KM   ********************************************************************************
515       KM   FLOWS ALONG 21ST AVENUE
516       KM   ********************************************************************************
          *

517       KK  SB21DU
518       KM   SUB-BASIN SB21DU
519       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND DUNLAP
520       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
521       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
522       KM     L =  .50  Kb = .056  Adj. Slope =   14.0
523       BA    .091
524       LG    .230    .250   4.650    .389  50.000
525       UC    .738    .594
526       UA       0       5      16      30      65      77      84      90      94      97
527       UA     100
          *

528       KK  21DU.1
529       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
530       KM   SB21DU, 5 CBS CONTRIBUTING TO 30" SD ALONG DUNLAP AVE AFFECTING FLOWS AT CP
531       KM   REMOVE CAPACITY SD
532       KM   QFULL = 12.92
533       KM   SO = 0.001, N = 0.013
534       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
535       DT  21DU.2
536       DI       0      13   10000
537       DQ       0      13      13
          *

538       KK  RT21DU
539       KM   ROUTE 21DU
540       KM   ROUTE FROM BASIN 21DU TO 21BU
541       KM   21ST AVE - DUNLAP TO BUTLER
542       RS       6    FLOW       0
543       RC    .016    .016    .016    2731    .005     4.3
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 544      RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 545      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 546      KK  SB21BU
 547      KM   SUB-BASIN SB21BU
 548      KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND BUTLER
 549      KM   BASIN AREA REDUCED BY 49.2 ACRES TO ACCOUNT FOR 100 YEAR 2 HOUR RETENTION &
 550      KM   THE FINAL OUTFALL POINT IS AT A GOLF COURSE. RUNOFF IS INTERCEPTED BY LAKES
 551      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 552      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 553      KM     L =  .52  Kb = .054  Adj. Slope =   28.0
 554      BA    .128
 555      LG    .220    .250   6.000    .206  44.000
 556      UC    .554    .368
 557      UA       0       5      16      30      65      77      84      90      94      97
 558      UA     100
          *

 559      KK  CP21BU
 560      KM   COMBINE AT 21ST AVE AND BUTLER
 561      HC       2
          *

 562      KK  DV21BU
 563      KM   DIVERT ROUTED FLOW THROUGH GOLF COURSE (SB19NO)
 564      KM   DIVERT NOT RETRIEVED BACK INTO MODEL. FLOWS ENTER GOLF COURSE LAKES IN SB19NO
 565      KM   LAKE STORAGE IS SUFFICIENT TO RETAIN 100% OF 100-YR INFLOWS
 566      DT  DI21BU
 567      DI       0   10000
 568      DQ       0   10000
          *

 569      KK  SB21OR
 570      KM   SUB-BASIN SB21OR
 571      KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND ORANGEWOOD
 572      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 573      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 574      KM     L =  .50  Kb = .054  Adj. Slope =   22.0
 575      BA    .126
 576      LG    .250    .200   6.400    .186  45.000
 577      UC    .579    .377
 578      UA       0       5      16      30      65      77      84      90      94      97
 579      UA     100
          *

 580      KK  RE21OR
 581      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
 582      KM   FROM 23RD AND ORANGEWOOD
 583      DR  DI23OR
          *
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

584       KK  RD21OR
585       KM   ROUTE RETRIEVED DIVERT ALONG ORANGEWOOD
586       KM   ROUTE DIVERT FROM 23RD AND ORANGEWOOD TO 21ST AVE AND ORANGEWOOD
587       RS      3    FLOW       0
588       RC   .016    .016    .016    1321    .002     4.3
589       RX   44.9      45      66    66.1     134   134.1     155   155.1
590       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

591       KK  CP21OR
592       KM   COMBINE AT 21ST AVE AND ORANGEWOOD
593       HC      2
          *

594       KK  DV21OR
595       KM   DIVERT FLOWS AT 21ST AND ORNAGEWOOD 50% SOUTH AND 50% WEST
596       KM   DQ FLOWS GO TO EAST TO 19TH AVE AND ORANGEWOOD
597       DT  DI21OR
598       DI      0     500   10000
599       DQ      0     250    5000
          *

600       KK  RT21OR
601       KM   ROUTE 21OR
602       KM   ROUTE FROM BASIN 21OR TO 21MY
603       RS      6    FLOW       0
604       RC   .016    .016    .016    1320    .003     4.3
605       RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
606       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

607       KK  SB21MY
608       KM   SUB-BASIN SB21MY (MODIFIED FOR MULTI-BASIN MODEL)
609       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
610       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
611       KM     L =  .49  Kb = .058  Adj. Slope =   17.0
612       BA    .066
613       LG    .250    .160   7.000    .151  30.000
614       UC    .654    .615
615       UA      0       5      16      30      65      77      84      90      94      97
616       UA    100
          *

617       KK  RE21MY
618       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
619       KM   FROM 23RD DRIVE AND MYRTLE
620       DR  DI23DM
          *
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  621     KK  RD21MY
  622     KM   ROUTE RETRIEVED DIVERT ALONG MYRTLE
  623     KM   ROUTE DIVERT FROM 23RD AND MYRTLE TO 21ST AVE AND MYRTLE
  624     RS       8    FLOW       0
  625     RC    .016    .016    .016    1490    .001     4.3
  626     RX   44.9      45      66    66.1     134   134.1     155   155.1
  627     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  628     KK  CP21MY
  629     KM   COMBINE AT 21ST AVE AND MYRTLE
  630     HC       3
          *

  631     KK  DV21MY
  632     KM   DIVERT FLOWS AT MYTRLE 50% SOUTH AND 50% EAST
  633     KM   DQ FLOWS GO TO EAST TO 19TH AVE AND MYTRLE
  634     DT  DI21MY
  635     DI       0     500   10000
  636     DQ       0     250    5000
          *

  637     KK  RT21MY
  638     KM   ROUTE 21MY
  639     KM   ROUTE FROM BASIN 21MY TO 21GL
  640     KM   MYRTLE TO GLENDALE
  641     RS       3    FLOW       0
  642     RC    .016    .016    .016    1300    .004     4.3
  643     RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
  644     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  645     KK  SB21GL
  646     KM   SUB-BASIN SB21GL
  647     KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND GLENDALE
  648     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  649     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  650     KM    L =  .32  Kb = .060  Adj. Slope =   17.0
  651     BA   .043
  652     LG   .230    .250   3.500    .349  37.000
  653     UC   .554    .464
  654     UA      0       5      16      30      65      77      84      90      94      97
  655     UA    100
          *

  656     KK  CP21GL
  657     KM   COMBINE AT 21ST AVE AND GLENDALE
  658     HC       2
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

659       KK  DV21GL
660       KM   DIVERT FLOWS AT 21ST AND GLENDALE SOUTH AND EAST
661       KM   DQ FLOWS GO TO EAST TO 19TH AVE AND GLENDALE
662       DT  DI21GL
663       DI      74     122    1242    2083
664       DQ      74     108    1008    1687
          *

665       KK  RT21GL
666       KM   ROUTE 21GL
667       KM   ROUTE FROM BASIN 21GL TO 21MA
668       KM   GLENDALE TO MARYLAND
669       RS       5    FLOW       0
670       RC    .016    .016    .016    2666    .005     4.3
671       RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
672       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

673       KK  SB21MA
674       KM   SUB-BASIN SB21MA
675       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND MARYLAND
676       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
677       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
678       KM     L =  .50  Kb = .052  Adj. Slope =   27.0
679       BA    .155
680       LG    .230    .250   3.500    .346  41.000
681       UC    .550    .317
682       UA       0       5      16      30      65      77      84      90      94      97
683       UA     100
          *

684       KK  CP21MA
685       KM   COMBINE AT 21ST AVE AND MARYLAND
686       HC       2
          *

687       KK  RT21MA
688       KM   ROUTE 21MA
689       KM   ALL FLOWS ALONG 21ST AVE AT MARYLAND ARE ROUTED TO THE SOUTH
690       KM   ROUTE FROM BASIN 21MA TO 21BE
691       RS       5    FLOW       0
692       RC    .016    .016    .016    2630    .004     4.3
693       RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
694       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

695       KK  SB21BE
696       KM   SUB-BASIN SB21BE
697       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND BETHANY HOME
698       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
699       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
700       KM     L =  .50  Kb = .052  Adj. Slope =   20.0
701       BA    .182
702       LG    .210    .250   3.500    .338  47.000
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 703      UC    .600    .318
 704      UA       0       5      16      30      65      77      84      90      94      97
 705      UA     100
          *

 706      KK  21BE.1
 707      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 708      KM   SB21BE, 8 CBS CONTRIBUTING TO 18" SD ALONG 21ST AVE AFFECTING FLOWS AT CP
 709      KM   REMOVE CAPACITY OF SD. ASSUME QFULL CONDITIONS. QFULL =5.72 CFS
 710      KM   SO = 0.003 AND N = 0.013
 711      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 712      DT  21BE.2
 713      DI       0       6   10000
 714      DQ       0       6       6
          *

 715      KK  CP21BE
 716      KM   COMBINE AT 21ST AVE AND BETHANY HOME
 717      HC       2
          *

 718      KK  RT21BE
 719      KM   ROUTE 21BE
 720      KM   ALL FLOW GOES SOUTH
 721      KM   ROUTE FROM BASIN 21BE TO 21MO
 722      RS       1    FLOW       0
 723      RC    .016    .016    .016    1178    .005     4.3
 724      RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
 725      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 726      KK  SB21MO
 727      KM   SUB-BASIN SB21MO
 728      KM   SUBBASIN CONTRIBUTING TO 21st AVE AND MONTEBELLO
 729      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 730      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 731      KM     L =  .58  Kb = .057  Adj. Slope =   10.0
 732      BA    .069
 733      LG    .240    .250   4.900    .352  35.000
 734      UC   1.004   1.104
 735      UA       0       5      16      30      65      77      84      90      94      97
 736      UA     100
          *

 737      KK  CP21MO
 738      KM   COMBINE AT 21ST AVE AND MONTEBELLO
 739      HC       2
          *

 740      KK  RT21MO
 741      KM   ROUTE 21MO
 742      KM   ROUTE FROM BASIN 21MO TO 21MI
 743      RS       2    FLOW       0
 744      RC    .016    .016    .016    1450    .003     4.3
 745      RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

746       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

747       KK  SB21MI
748       KM   SUB-BASIN SB21MI
749       KM   SUBBASIN CONTRIBUTING TO 21st AVE AND MISSOURI
750       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
751       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
752       KM     L =  .48  Kb = .056  Adj. Slope =   14.0
753       BA    .089
754       LG    .250    .250   4.900    .360  31.000
755       UC    .775    .615
756       UA       0       5      16      30      65      77      84      90      94      97
757       UA     100
          *

758       KK  RE21MI
759       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
760       KM   FROM 23RD AND MISSOURI
761       DR  DI23MI
          *

762       KK  RD21MI
763       KM   ROUTE DIVERT FROM CP23MI TO CP21MI
764       KM   ROUTE DIVERTED FLOW ALONG MISSOURI TO 21st AVENUE
765       RS       4    FLOW       0
766       RC    .016    .016    .016    1296    .002     4.3
767       RX    44.9      45      66    66.1     134   134.1     155   155.1
768       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

769       KK  CP21MI
770       KM   COMBINE AT 21ST AVE AND MISSOURI
771       HC       3
          *

772       KK  RT21MI
773       KM   ROUTE 21MI
774       KM   ROUTE FROM BASIN 21MI TO 21CA
775       KM   ROUTE FLOW THROUGH 21ST AND MISSOURI BASIN TO 21ST AVE AND CAMELBACK
776       KM   ALL FLOWS GO TO SOUTH
777       RS       4    FLOW       0
778       RC    .016    .016    .016    2663    .003     4.3
779       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
780       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ================================================
          * ADD DETENTION BASIN A
          * ================================================
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

781       KK  S21CAA
782       KM   SUB-BASIN S21CAA
783       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
784       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
785       KM     L =  .46  Kb = .059  Adj. Slope =   16.0
786       BA    .049
787       LG    .210    .220   6.400    .179  45.000
788       UC    .650    .688
789       UA       0       5      16      30      65      77      84      90      94      97
790       UA     100
          *

791       KK  S22CAA
792       KM   SUB-BASIN S22CAA
793       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
794       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
795       KM     L =  .44  Kb = .060  Adj. Slope =   21.0
796       BA    .047
797       LG    .220    .250   5.900    .219  45.000
798       UC    .596    .617
799       UA       0       5      16      30      65      77      84      90      94      97
800       UA     100
          *

801       KK    SD33
802       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
803       KM   SB22CA, 2 CBS CONTRIBUTING TO 18" SD ALONG 22ND AVE AFFECTING FLOWS AT CP
804       KM   REMOVE CAPACITY OF CBs. ASSUME CAPCITY OF 5 CFS PER BASIN
805       KM   TOTAL Q TAKEN OUT = 2(5) = 10 CFS
806       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
807       DT    SD34
808       DI       0      10   10000
809       DQ       0      10      10
          *

810       KK  RE22CA
811       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
812       KM   FROM 23RD DRIVE AND COLTER
813       DR  DI23CO
          *

814       KK  RD22CA
815       KM   ROUTE DIVERTED FLOWS TO RETENTION BASIN A
816       RS       3    FLOW       0
817       RC    .016    .016    .016    3290    .002     4.3
818       RX    44.9      45      66    66.1     134   134.1     155   155.1
819       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 820      KK   RBA.2     RET
 821      KM        RETRIEVE STORM DRAIN FLOW FROM 23rd AVE AT SUB-BASIN S23CAA
 822      DR   RBA.2
          *

 823      KK   DBA-1
 824      KM   COMBINE RT21MI, S21CAA, SD33, RD22CA, RBA.2
 825      KM   THIS IS PARTIAL INFLOW TO RET BASIN A
 826      KO       3
 827      HC       5
          *

 828      KK   RBC.2   RETRIEVE
 829      KM        RETRIEVE FLOW FROM FORMER DET BASIN C2 LOCATION
 830      DR   RBC.2
          *

 831      KK  S22CAB
 832      KM   SUB-BASIN S22CAB
 833      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 834      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 835      KM     L =  .04  Kb = .071  Adj. Slope =   10.0
 836      BA    .007
 837      LG    .100    .150   8.200    .040  90.000
 838      UC    .213    .085
 839      UA       0       5      16      30      65      77      84      90      94      97
 840      UA     100
          *
          *  KKCP22CA
          *  KM COMBINE AT 22ND AVE AND CAMELBACK
          *  HC     2
          *

 841      KK  S21CAC
 842      KM   SUB-BASIN S21CAC
 843      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 844      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 845      KM     L =  .04  Kb = .075  Adj. Slope =   15.0
 846      BA    .004
 847      LG    .210    .150   8.200    .040  70.000
 848      UC    .196    .107
 849      UA       0       5      16      30      65      77      84      90      94      97
 850      UA     100
          *

 851      KK   DBA-2
 852      KM   COMBINE RBC.2, S22CAB, & S21CAC AT 21ST AVE AND CAMELBACK
 853      KM   THIS IS PARTIAL INFLOW TO DETENTION BASIN "A"
 854      KO       3
 855      HC       3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 856      KK   DBA-3
 857      KM        COMBINE DBA-1 & DBA-2
 858      KM        THIS IS THE TOTAL INFLOW TO DETENTION BASIN "A"
 859      KO       3
 860      HC       2
          *

 861      KK    SD35
 862      KM   BLEED 100% OF RET BASIN "A" THROUGH EXISTING 18" STORM DRAIN
 863      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 864      DT    SD36
 865      DI       0   20000
 866      DQ       0   20000
          *

 867      KK  DV22CA
 868      KM   DIVERT FLOWS TO 21ST AND CAMPBELL 50% SOUTH AND 50% EAST
 869      KM   DQ FLOWS GO TO SOUTH TO 21ST AVE AND CAMPBELL
 870      DT  DI22CA
 871      DI       0     500   10000
 872      DQ       0       0       0
          *

 873      KK  RT22CA
 874      KM   ROUTE 22CA
 875      KM   ROUTE FROM BASIN 22CA TO 21CA (CAMELBACK)
 876      RS       6    FLOW       0
 877      RC    .016    .016    .016     925    .004     4.3
 878      RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
 879      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 880      KK  S21CAB
 881      KM   SUB-BASIN S21CAB
 882      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 883      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 884      KM     L =  .61  Kb = .054  Adj. Slope =   16.0
 885      BA    .119
 886      LG    .210    .170   6.800    .152  45.000
 887      UC    .712    .575
 888      UA       0       5      16      30      65      77      84      90      94      97
 889      UA     100
          *

 890      KK  21CA.1
 891      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 892      KM   S21CAB, 2 CBS CONTRIBUTING TO 18" SD ALONG VERMONT AND
 893      KM   12 CBS CONTRIBUTING TO 24" SD ALONG 21ST AVE AFFECTING FLOWS AT CP
 894      KM   REMOVE CAPACITY OF 18 " SD AND 24" SD. 18" QFULL = 5.72 AND 24" = 12.33 CFS
 895      KM   SO = 0.003 '/FT AND N = 0.013
 896      KM   TOTAL Q TAKEN OUT = 12.33+5.72 = 18.05
 897      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 898      DT  21CA.2
 899      DI       0      18   10000
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 900      DQ       0      18      18
          *

 901      KK  CP21CA
 902      KM        COMBINE 21CA.1 & RT22CA
 903      HC       2
          *

 904      KK  RT21CA
 905      KM   ROUTE 21CA
 906      KM   ALL FLOWS ROUTED SOUTH ALONG 21ST AVE
 907      KM   ROUTE FROM BASIN 21CA TO 21CP
 908      RS       4    FLOW       0
 909      RC    .016    .016    .016    2640    .003     4.3
 910      RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
 911      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 912      KK  SB21CP
 913      KM   SUB-BASIN SB21CP
 914      KM   SUBBASIN CONTRIBUTING TO 21st AVE AND CAMPBELL
 915      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 916      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 917      KM     L =  .62  Kb = .053  Adj. Slope =   16.0
 918      BA    .144
 919      LG    .240    .150   9.100    .067  40.000
 920      UC    .696    .509
 921      UA       0       5      16      30      65      77      84      90      94      97
 922      UA     100
          *

 923      KK  21CP.1
 924      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 925      KM   SB21CP, 3 CBs IN SUBBASIN,CONTRIBUTING TO 24" SD ALONG 21ST AVE
 926      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 24" LINE. ASSUME 5 CFS PER CATCH BASIN.
 927      KM   TOTAL Q TAKEN OUT = 3(5) = 15
 928      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 929      DT  21CP.2
 930      DI       0      15   10000
 931      DQ       0      15      15
          *

 932      KK  RE22CA
 933      KM   RETRIEVAL OF 22ND AND CAMELBACK FLOWS
 934      DR  DI22CA
          *

 935      KK  RD22CA
 936      KM   ROUTE DIVERTED FLOWS FROM BASIN 22CA TO 21CP
 937      KM   ROUTE FLOW FROM 22nd AVENUE AND CAMELBACK BASIN TO 21ST AVE AND CAMPBELL
 938      RS       2    FLOW       0
 939      RC    .016    .016    .016    3287    .003     4.3
 940      RX    44.9      45      66    66.1     134   134.1     155   155.1
 941      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 942      KK  CP21CP
 943      KM   COMBINE AT 21ST AVE AND CAMPBELL
 944      HC       3
          *

 945      KK  DV21CP
 946      KM   DIVERT FLOWS AT 21ST AND CAMPBELL 50% SOUTH AND 50% EAST
 947      KM   DQ FLOWS GO TO EAST TO 19TH AVE AND CAMPBELL
 948      DT  DI21CP
 949      DI       0     500   10000
 950      DQ       0     250    5000
          *

 951      KK  RT21CP
 952      KM   ROUTE 21CP
 953      KM   ROUTE FROM BASIN 21CP TO 21ST AVE AND TURNEY
 954      RS       4    FLOW       0
 955      RC    .016    .016    .016     665    .002     4.3
 956      RX     0.0     0.1    15.0    25.0    55.0    65.0    80.0    80.1
 957      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ================================================
          * ADD DETENTION BASIN X
          * ================================================
          *

 958      KK  S21CNA
 959      KM   SUB-BASIN S21CNA
 960      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 961      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 962      KM     L =  .19  Kb = .066  Adj. Slope =   27.0
 963      BA    .017
 964      LG    .250    .150   8.800    .078  45.000
 965      UC    .346    .308
 966      UA       0       5      16      30      65      77      84      90      94      97
 967      UA     100
          *

 968      KK   S19.1
 969      KM    COMBINE S21CNA & RT21CP AT 21st AVE & TURNEY
 970      HC       2
          *

 971      KK   S19.2
 972      KM   ROUTE S19.1 EAST ON TURNEY TO RET BASIN X INLET
 973      RK     700   .0020    .016            TRAP      36
          *

 974      KK  S19CNA
 975      KM   SUB-BASIN S19CNA
 976      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 977      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 978      KM     L =  .26  Kb = .065  Adj. Slope =    2.0
 979      BA    .021
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 980      LG    .250    .150   8.200    .071  41.000
 981      UC   1.038   1.186
 982      UA      0       5      16      30      65      77      84      90      94      97
 983      UA    100
          *

 984      KK     SBX
 985      KM   SUB-BASIN SBX.  THIS IS THE RET BASIN X SURFACE AREA + ADJOINING APT COMPLEX
 986      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 987      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 988      KM     L =  .15  Kb = .064  Adj. Slope =    2.0
 989      BA    .021
 990      LG    .250    .150   8.200    .075  45.000
 991      UC    .717    .507
 992      UA      0       5      16      30      65      77      84      90      94      97
 993      UA    100
          *

 994      KK  BASN_X
 995      KM   COMBINE S19CNA, S19.2, AND SBX AT RET BASIN X
 996      KO      3
 997      HC      3
          *

 998      KK    SD41
 999      KM   BLEED 100% OF RET BASIN "X" THROUGH EXISTING 18" STORM DRAIN
1000      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1001      DT    SD42
1002      DI      0   10000
1003      DQ      0   10000
          *

1004      KK  S21CNB
1005      KM   SUB-BASIN S21CNB
1006      KM   S21CNB - SOUTH OF TURNEY AND NORTH OF GRAND CANAL
1007      KM   SUBBASIN CONTRIBUTING TO 21st AVE AND GRAND CANAL
1008      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1009      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1010      KM     L =  .19  Kb = .063  Adj. Slope =   17.0
1011      BA    .025
1012      LG    .250    .170   6.800    .161  45.000
1013      UC    .400    .290
1014      UA      0       5      16      30      65      77      84      90      94      97
1015      UA    100
          *

1016      KK    SD43
1017      KM   REMOVE 18" FLOWS FROM MODEL
1018      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1019      DT    SD44
1020      DI      0     7.4  100000
1021      DQ      0     7.4     7.4
          *
1022      KM   ********************************************************************************
1023      KM   19TH AVENUE BASINS
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1024      KM   ************************************************************************
          *

1025      KK  SB19DU   BASIN
1026      KM   SUB-BASIN SB19DU
1027      KM   SUBBASIN CONTRIBUING TO 19TH AVE AND DUNLAP
1028      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1029      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1030      KM     L =  .33  Kb = .066  Adj. Slope =   26.0
1031      BA    .017
1032      LG    .100    .250   3.500    .278  80.000
1033      UC    .463    .661
1034      UA       0       5      16      30      65      77      84      90      94      97
1035      UA     100
          *

1036      KK  RT19DU
1037      KM   ROUTE FROM BASIN 19DU TO 19NO (19TH AVE AND NORTHERN)
1038      KM   19TH AVE - DUNLAP TO NORTHERN
1039      RS       6    FLOW       0
1040      RC    .016    .016    .016    5296    .005     4.3
1041      RX    44.9      45      66    66.1     134   134.1     155   155.1
1042      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1043      KK  SB19NO
1044      KM   SUB-BASIN SB19NO
1045      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND NORTHERN
1046      KM   GOLF COURSE AND ITS LAKES RETAINS MOST RUNOFF GENERATED IN THIS BASIN
1047      KM   APPROXIMATELY 23 ACRES ALONG THE EAST SIDE DIRECTLY CONTRIBUTES TO
1048      KM   19TH AVE AND NORTHERN
1049      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1050      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1051      KM     L =  .50  Kb = .032  Adj. Slope =   26.4
1052      BA    .036
1053      LG    .250    .150   9.600    .056  60.000
1054      UC    .396    .505
1055      UA       0       5      16      30      65      77      84      90      94      97
1056      UA     100
          *

1057      KK  19NO.1
1058      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1059      KM   SB19NO, 6 CBS CONTRIBUTING TO 36" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1060      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1061      KM   QTOTAL = 36" SD QFULL = 36.42
1062      KM   SO = 0.003 AND N = 0.013
1063      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1064      DT  19NO.2
1065      DI       0      36   10000
1066      DQ       0      36      36
          *
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1067      KK  RE19NO
1068      KM   RETRIEVAL OF FLOW FROM 23RD AVE AND NORTHERN
1069      DR  DI23NO
          *

1070      KK  RD19NO
1071      KM   ROUTE RETRIEVED DIVERT ALONG NORTHERN
1072      KM   ROUTE DIVERT FROM 23RD AND NORTHERN TO 19TH AVE AND NORTHERN
1073      RS       5    FLOW       0
1074      RC    .016    .016    .016    2642    .002     4.3
1075      RX    44.9      45      66    66.1     134   134.1     155   155.1
1076      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1077      KK  CP19NO
1078      KM   COMBINE AT 19TH AVE AND NORTHERN
1079      HC       3
          *

1080      KK  RT19NO
1081      KM   ROUTE 19NO
1082      KM   ROUTE FROM BASIN 19NO TO 19OR
1083      KM   19TH AVE - NORTHERN TO ORANGEWOOD
1084      RS       2    FLOW       0
1085      RC    .016    .016    .016    2640    .004     4.3
1086      RX    44.9      45      66    66.1     134   134.1     155   155.1
1087      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1088      KK  SB19OR
1089      KM   SUB-BASIN SB19OR
1090      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND ORANGEWOOD
1091      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1092      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1093      KM     L =  .70  Kb = .055  Adj. Slope =   20.0
1094      BA    .105
1095      LG    .100    .200   6.400    .142  80.000
1096      UC    .683    .659
1097      UA       0       5      16      30      65      77      84      90      94      97
1098      UA     100
          *

1099      KK  19OR.1
1100      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1101      KM   SB19OR, 10 CBS CONTRIBUTING TO 48" SD AND 42" SD ALONG 19TH AVE AFFECTING FLO
1102      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1103      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1104      KM   QTOTAL = 6(5) = 30
1105      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1106      DT  19OR.2
1107      DI       0      30   10000
1108      DQ       0      30      30
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1109      KK  RE19OR
1110      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1111      KM   FROM 21ST AND ORANGWOOD
1112      DR  DI21OR
          *

1113      KK  RD19OR
1114      KM   ROUTE RETRIEVED DIVERT ALONG ORANGEWOOD
1115      KM   ROUTE DIVERT FROM 21ST AND ORANGEWOOD TO 19TH AVE AND ORANGEWOOD
1116      RS      2    FLOW       0
1117      RC   .016    .016    .016    1346    .003     4.3
1118      RX   44.9      45      66    66.1     134   134.1     155   155.1
1119      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1120      KK  CP19OR
1121      KM   COMBINE AT 19TH AVE AND ORANGEWOOD
1122      HC      3
          *

1123      KK  RT19OR
1124      KM   ROUTE 19OR
1125      KM   ROUTE FROM BASIN 19OR TO 19MY
1126      KM   19TH AVE - ORANGEWOOD TO MYRTLE
1127      RS      1    FLOW       0
1128      RC   .016    .016    .016    1340    .004     4.3
1129      RX   44.9      45      66    66.1     134   134.1     155   155.1
1130      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1131      KK  SB19MY
1132      KM   SUB-BASIN SB19MY
1133      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MYRTLE
1134      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1135      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1136      KM     L =  .37  Kb = .060  Adj. Slope =   16.0
1137      BA    .046
1138      LG    .250    .250   3.500    .360  36.000
1139      UC    .625    .573
1140      UA       0       5      16      30      65      77      84      90      94      97
1141      UA     100
          *

1142      KK  19MY.1
1143      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1144      KM   SB19MY, 7 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1145      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1146      KM   QTOTAL = 7(5) = 35
1147      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1148      DT  19MY.2
1149      DI       0      35   10000
1150      DQ       0      35      35
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1151      KK  RE19MY
1152      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1153      KM   FROM 21ST AND MYRTLE
1154      DR  DI21MY
          *

1155      KK  RD19MY
1156      KM   ROUTE RETRIEVED DIVERT ALONG MYRTLE
1157      KM   ROUTE DIVERT FROM 21ST AND MYRTLE TO 19TH AVE AND MYRTLE
1158      RS       3    FLOW       0
1159      RC    .016    .016    .016    1318    .001     4.3
1160      RX    44.9      45      66    66.1     134   134.1     155   155.1
1161      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1162      KK  CP19MY
1163      KM   COMBINE AT 19TH AVE AND MYRTLE
1164      HC       3
          *

1165      KK  RT19MY
1166      KM   ROUTE 19MY
1167      KM   ROUTE FROM BASIN 19MY TO 19GL
1168      KM   19TH AVE - MYRTLE TO GLENDALE
1169      RS       2    FLOW       0
1170      RC    .016    .016    .016    1320    .002     4.3
1171      RX    44.9      45      66    66.1     134   134.1     155   155.1
1172      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1173      KK  SB19GL
1174      KM   SUB-BASIN SB19GL
1175      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND GLENDALE
1176      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1177      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1178      KM     L =  .40  Kb = .059  Adj. Slope =   10.0
1179      BA    .054
1180      LG    .170    .250   3.500    .316  61.000
1181      UC    .700    .632
1182      UA       0       5      16      30      65      77      84      90      94      97
1183      UA     100
          *

1184      KK  19GL.1
1185      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1186      KM   SB19GL, 3 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1187      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1188      KM   QTOTAL = 3(5) = 15
1189      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1190      DT  19GL.2
1191      DI       0      15   10000
1192      DQ       0      15      15
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1193      KK  RE19GL
1194      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1195      KM   FROM 21ST AND GLENDALE
1196      DR  DI21GL
          *

1197      KK  RD19GL
1198      KM   ROUTE RETRIEVED DIVERT ALONG GLENDALE
1199      KM   ROUTE DIVERT FROM 21ST AND GLENDALE TO 19TH AVE AND GLENDALE
1200      RS      3    FLOW       0
1201      RC   .016    .016    .016    1318    .001     4.3
1202      RX   44.9      45      66    66.1     134   134.1     155   155.1
1203      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1204      KK  CP19GL
1205      KM   COMBINE AT 19TH AVE AND GLENDALE
1206      HC      3
          *

1207      KK  RT19GL
1208      KM   ROUTE 19GL
1209      KM   ROUTE FROM BASIN 19GL TO 19MA
1210      KM   19TH AVE - GLENDALE TO MARYLAND
1211      RS      1    FLOW       0
1212      RC   .016    .016    .016    2639    .005     4.3
1213      RX   44.9      45      66    66.1     134   134.1     155   155.1
1214      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1215      KK  SB19MA
1216      KM   SUB-BASIN SB19MA
1217      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MARYLAND
1218      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1219      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1220      KM    L =  .50  Kb = .059  Adj. Slope =   28.0
1221      BA   .054
1222      LG   .190    .250   4.900    .324  60.000
1223      UC   .563    .592
1224      UA      0       5      16      30      65      77      84      90      94      97
1225      UA    100
          *

1226      KK  19MA.1
1227      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1228      KM   SB19MA, 7 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1229      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1230      KM   QTOTAL = 7(5) = 35
1231      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1232      DT  19MA.2
1233      DI      0      35   10000
1234      DQ      0      35      35
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1235      KK  CP19MA
1236      KM   COMBINE AT 19TH AVE AND MARYLAND
1237      HC       2
          *

1238      KK  RT19MA
1239      KM   ROUTE 19MA
1240      KM   ROUTE FROM BASIN 19MA TO 19BE
1241      KM   19TH AVE - MARYLAND TO BETHANY HOME
1242      RS       2    FLOW       0
1243      RC    .016    .016    .016    2659    .004     4.3
1244      RX    44.9      45      66    66.1     134   134.1     155   155.1
1245      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1246      KK  SB19BE
1247      KM   SUB-BASIN SB19BE
1248      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND BETHANY HOME
1249      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1250      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1251      KM     L =  .50  Kb = .058  Adj. Slope =   20.0
1252      BA    .057
1253      LG    .190    .250   4.900    .324  56.000
1254      UC    .637    .660
1255      UA       0       5      16      30      65      77      84      90      94      97
1256      UA     100
          *

1257      KK  19BE.1
1258      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1259      KM   SB19BE, 6 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1260      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1261      KM   QTOTAL = 6(5) = 30
1262      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1263      DT  19BE.2
1264      DI       0      30   10000
1265      DQ       0      30      30
          *

1266      KK  CP19BE
1267      KM   COMBINE AT 19TH AVE AND BETHANY HOME
1268      HC       2
          *

1269      KK  RT19BE
1270      KM   ROUTE 19BE
1271      KM   ROUTE FROM BASIN 19BE TO 19MI
1272      KM   19TH AVE - BETHANY HOME TO MISSOURI
1273      RS       2    FLOW       0
1274      RC    .016    .016    .016    2623    .004     4.3
1275      RX    44.9      45      66    66.1     134   134.1     155   155.1
1276      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1277      KK  SB19MI
1278      KM   SUB-BASIN SB19MI
1279      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MISSOURI
1280      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1281      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1282      KM     L =  .50  Kb = .057  Adj. Slope =   20.0
1283      BA    .076
1284      LG    .220    .250   4.900    .344  41.000
1285      UC    .667    .589
1286      UA       0       5      16      30      65      77      84      90      94      97
1287      UA     100
          *

1288      KK  19MI.1
1289      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1290      KM   SB19MI, 14 CBS CONTRIBUTING TO 48" SD ALONG19TH AVE AFFECTING FLOWS AT CP
1291      KM   REMOVE CAPACITY OF SD. ASSUME QFULL CONDITIONS. QFULL = 78.5 CFS
1292      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1293      DT  19MI.2
1294      DI       0      79   10000
1295      DQ       0      79      79
          *

1296      KK  CP19MI
1297      KM   COMBINE AT 19TH AVE AND MISSOURI
1298      HC       2
          *

1299      KK  RT19MI
1300      KM   19TH AVE - MISSOURI TO CAMELBACK
1301      KM   ROUTE 19MI
1302      KM   ROUTE FROM BASIN 19MI TO 19CA
1303      RS       2    FLOW       0
1304      RC    .016    .016    .016    2639    .003     4.3
1305      RX    44.9      45      66    66.1     134   134.1     155   155.1
1306      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1307      KK  SB19CA
1308      KM   SUB-BASIN SB19CA
1309      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND CAMELBACK
1310      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1311      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1312      KM     L =  .50  Kb = .070  Adj. Slope =   16.0
1313      BA    .009
1314      LG    .100    .150   8.100    .075  80.000
1315      UC    .700   2.097
1316      UA       0       5      16      30      65      77      84      90      94      97
1317      UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1318      KK  19CA.1
1319      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1320      KM   SB19CA, 5 CBS CONTRIBUTING TO 18" SD ALONG VERMONT AND
1321      KM   12 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1322      KM   REMOVE CAPACITY OF CBs. ASSUME CAPCITY OF 5 CFS PER BASIN
1323      KM   TOTAL Q TAKEN OUT = 5(5) = 25 CFS
1324      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1325      DT  19CA.2
1326      DI       0      25   10000
1327      DQ       0      25      25
          *

1328      KK  CP19CA
1329      KM   COMBINE AT 19TH AVE AND CAMELBACK
1330      HC       2
          *

1331      KK  RT19CA
1332      KM   ROUTE 19CA
1333      KM   ROUTE FROM BASIN 19CA TO 19CP
1334      KM   19TH AVE - CAMELBACK TO CAMPBELL
1335      RS       2    FLOW       0
1336      RC    .016    .016    .016    2670    .005     4.3
1337      RX    44.9      45      66    66.1     134   134.1     155   155.1
1338      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1339      KK  SB19CP
1340      KM   SUB-BASIN SB19CP
1341      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND CAMPBELL
1342      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1343      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1344      KM     L =  .51  Kb = .058  Adj. Slope =   25.0
1345      BA    .057
1346      LG    .210    .150   7.900    .100  50.000
1347      UC    .558    .579
1348      UA       0       5      16      30      65      77      84      90      94      97
1349      UA     100
          *

1350      KK  19CP.1
1351      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1352      KM   SB19CP, 6 CBs IN SUBBASIN,CONTRIBUTING TO 54" SD ALONG 19TH AVE
1353      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 54" LINE. ASSUME 5 CFS PER CATCH BASIN.
1354      KM   TOTAL Q TAKEN OUT = 6(5) = 30
1355      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1356      DT  19CP.2
1357      DI       0      30   10000
1358      DQ       0      30      30
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1359      KK  RE19CP
1360      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1361      KM   FROM 21ST AND CAMPBELL
1362      DR  DI21CP
          *

1363      KK  RD19CP
1364      KM   ROUTE DIVERT FROM CP21CP TO CP19CP ALONG CAMPBELL
1365      KM   ROUTE FROM 21st AVE AND CAMPBELL TO 19TH AVE AND CAMPBELL
1366      RS      4    FLOW       0
1367      RC   .016    .016    .016    1310    .002     4.3
1368      RX   44.9      45      66    66.1     134   134.1     155   155.1
1369      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1370      KK  CP19CP
1371      KM   COMBINE AT 19TH AVE AND CAMPBELL
1372      HC      3
          *

1373      KK  RT19CP
1374      KM   19TH AVE - CAMPBELL TO GRAND CANAL
1375      KM   ROUTE 19CP
1376      KM   ROUTE FROM BASIN 19CP TO 19CN
1377      RS      3    FLOW       0
1378      RC   .016    .016    .016     900    .001     4.3
1379      RX   44.9      45      66    66.1     134   134.1     155   155.1
1380      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1381      KK  S19CNB
1382      KM   SUB-BASIN S19CNB
1383      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1384      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1385      KM    L =  .26  Kb = .066  Adj. Slope =    2.0
1386      BA   .016
1387      LG   .250    .150   8.200    .071  41.000
1388      UC  1.050   1.404
1389      UA      0       5      16      30      65      77      84      90      94      97
1390      UA    100
          *

1391      KK  19CN.1
1392      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1393      KM   S19CNB, 7 CBs IN SUBBASIN, 1-15" SD ALONG S. TURNEY, 1-18" ALONG N. TURNEY
1394      KM   AND 1-54" ALONG 19TH AVE. 24"QFULL = 12.33 AND 18"QFULL = 5.72 CFS
1395      KM   SO = 0.003 AND N =0.13
1396      KM   3 CBs CONTRIBUTE TO 24" SD AND 2 TO THE 18" SD AND 54" SD AFFECTING FLOW AT C
1397      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 54" LINE. ASSUME 5 CFS PER CATCH BASIN.
1398      KM   REMOVE PIPE CAPACITY OF STORM DRAINS.
1399      KM   TOTAL Q TAKEN OUT = 12.33+5.72+3(5) = 33.05
1400      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1401      DT  19CN.2
1402      DI      0      33   10000
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

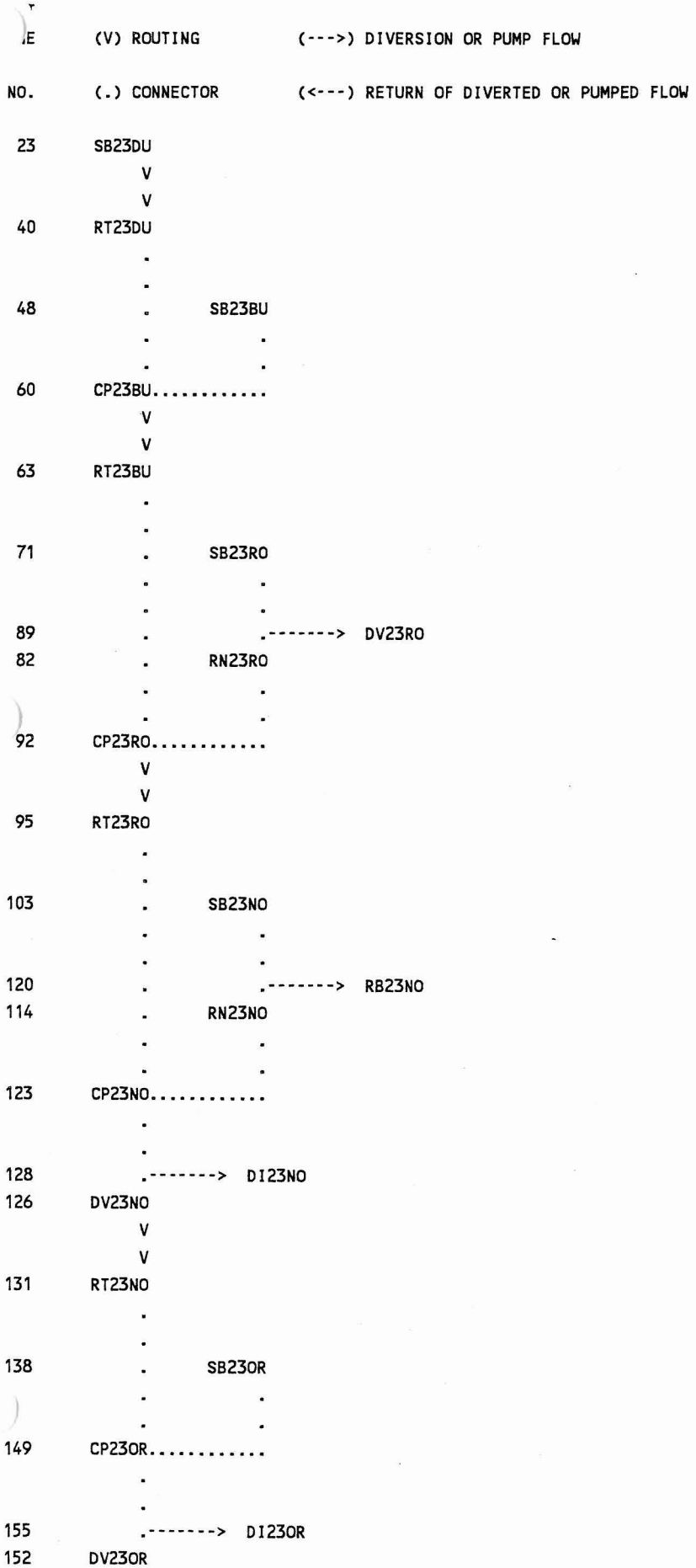
1403          DQ       0      33      33
              *

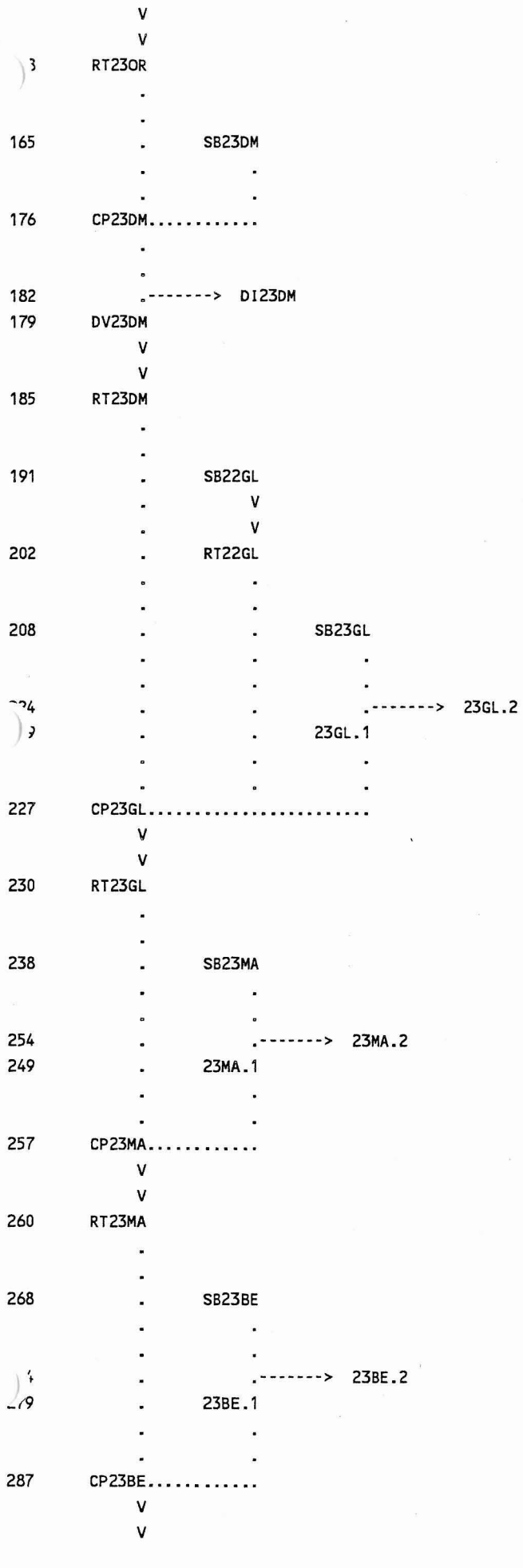
1404          KK  CP19CN
1405          KM   COMBINE AT 19TH AVE AND GRAND CANAL
1406          HC       2
              *
              *
1407          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

(V) ROUTING (---->) DIVERSION OR PUMP FLOW

(.) CONNECTOR (<----) RETURN OF DIVERTED OR PUMPED FLOW

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CP23DM
DI23DM
DV23DM
RT23DM
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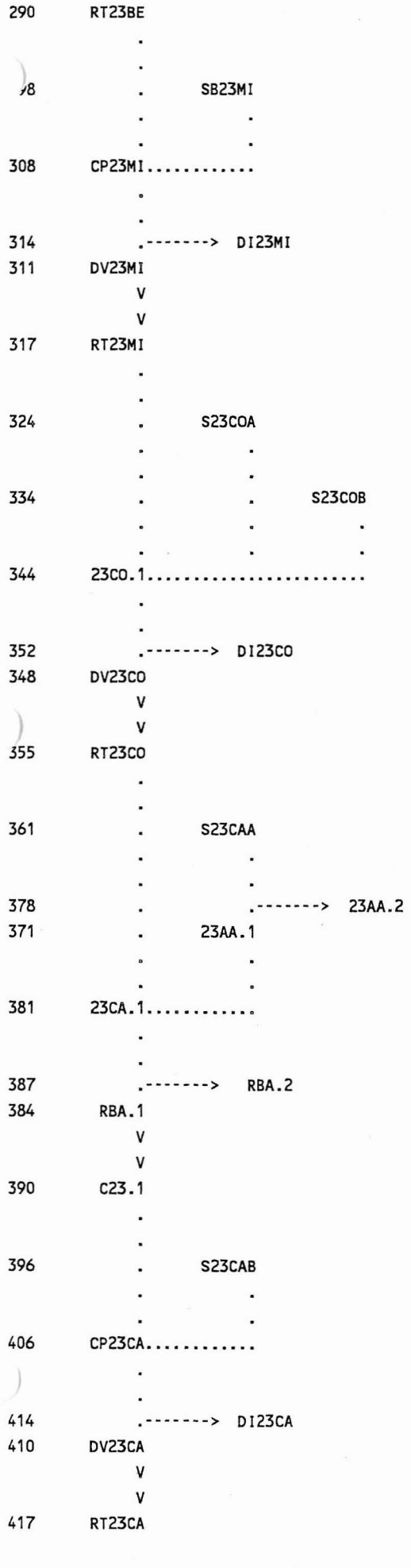
RT22GL
SB23GL
23GL.2
23GL.1
CP23GL
RT23GL
SB23MA
23MA.2
23MA.1
CP23MA
RT23MA
SB23BE
23BE.2
23BE.1
CP23BE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314 DI23MI
311 DV23MI
317 RT23MI
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334 S23COB
344 23CO.1
352 DI23CO
348 DV23CO
355 RT23CO
361 S23CAA
378 23AA.2
371 23AA.1
381 23CA.1
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384 RBA.1
390 C23.1
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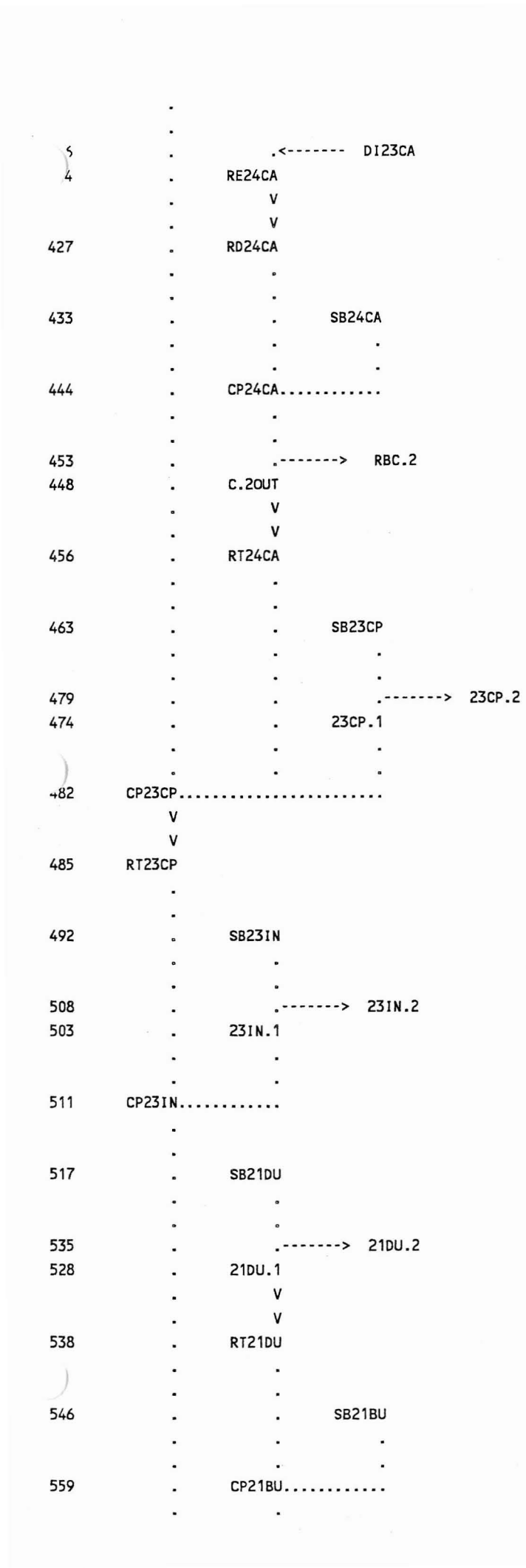
417 RT23CA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CP23CP
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23IN.1
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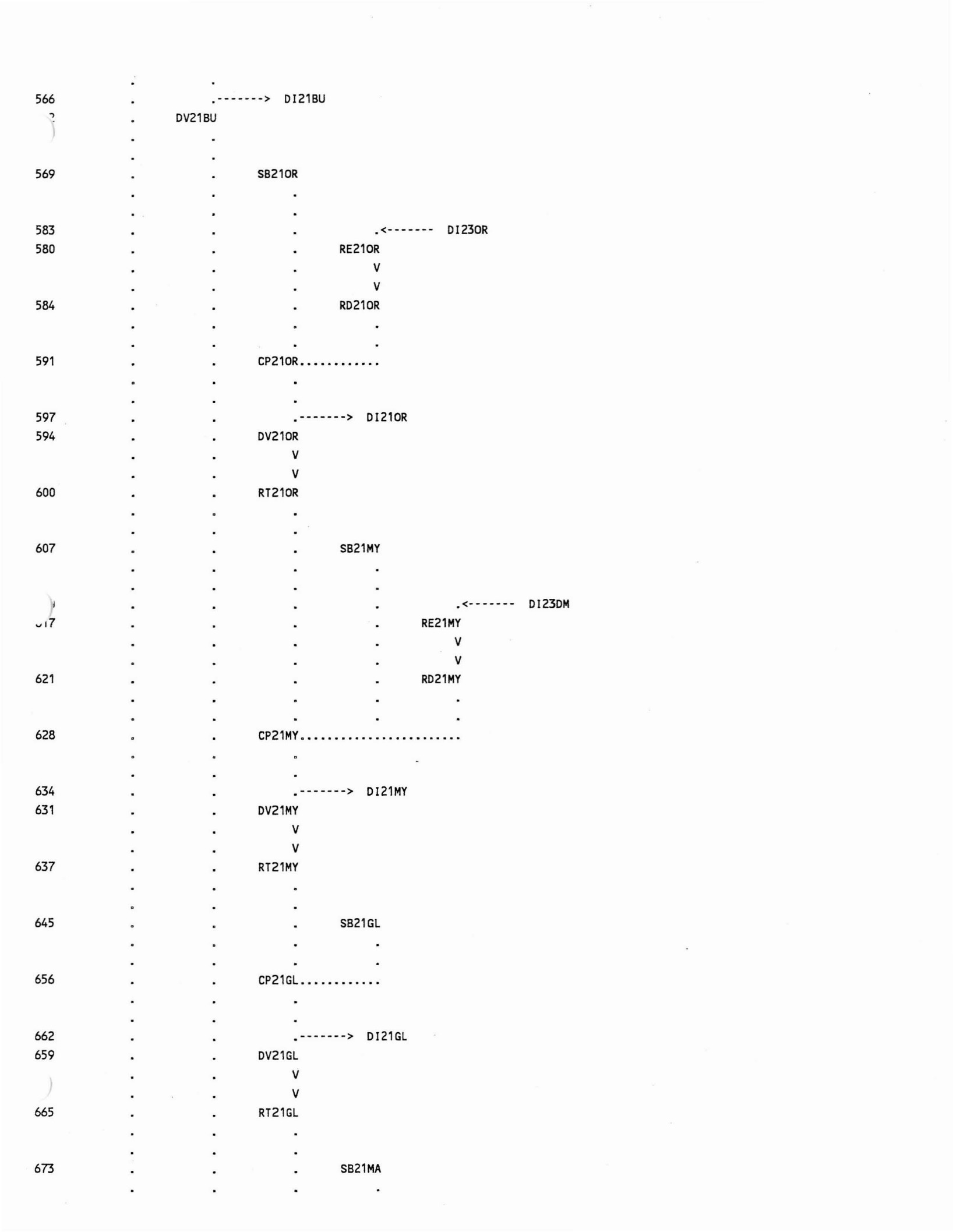
21DU.2
21DU.1
RT21DU
SB21BU
CP21BU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DI21BU
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SB21OR
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DI23OR
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RE21OR
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591
CP21OR
597
DI21OR
594
DV21OR
600
RT21OR
607
SB21MY
DI23DM
RE21MY
621
RD21MY
628
CP21MY
634
DI21MY
631
DV21MY
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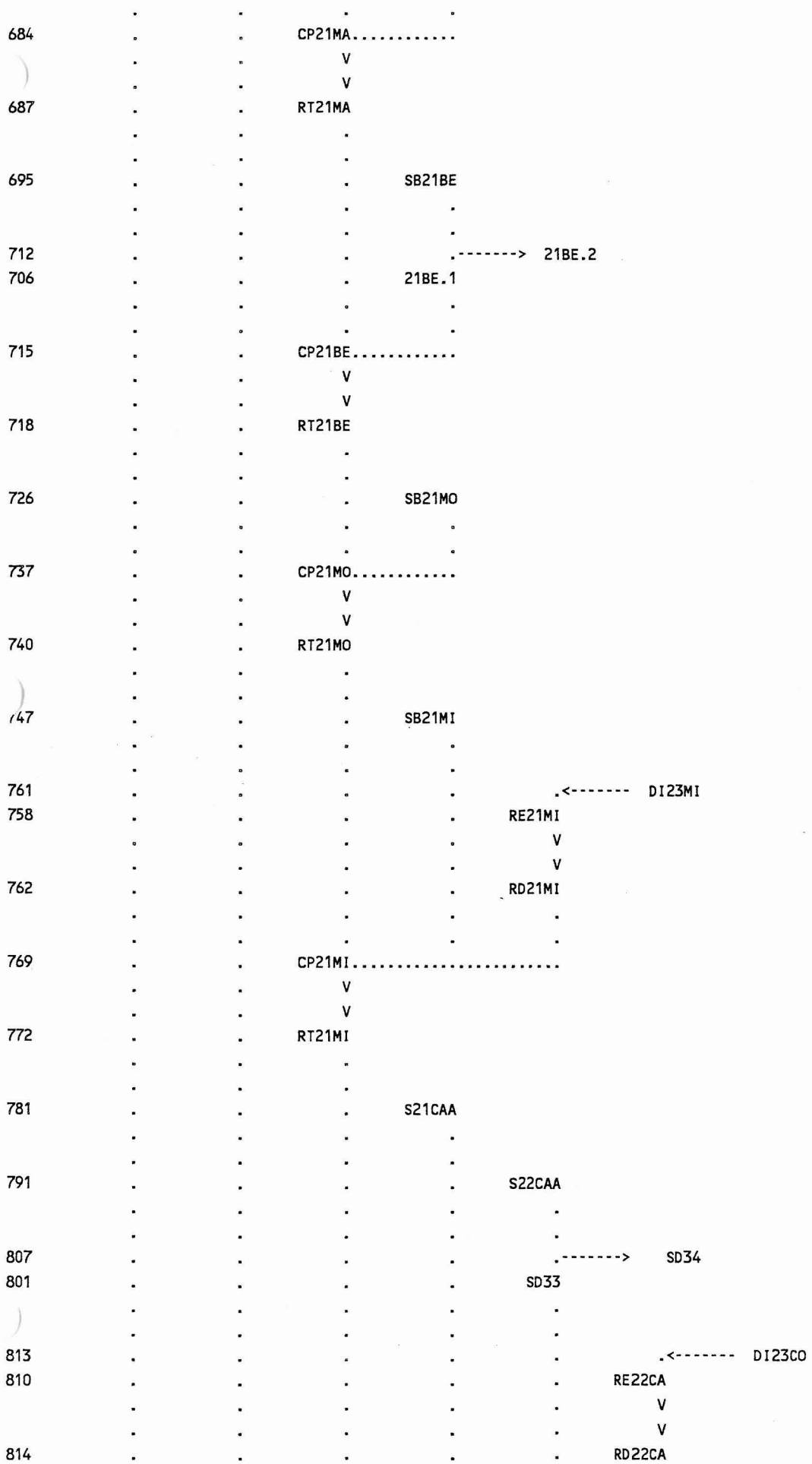
RT21GL
673
SB21MA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726 SB21MO
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747 SB21MI
761 DI23MI
758 RE21MI
762 RD21MI
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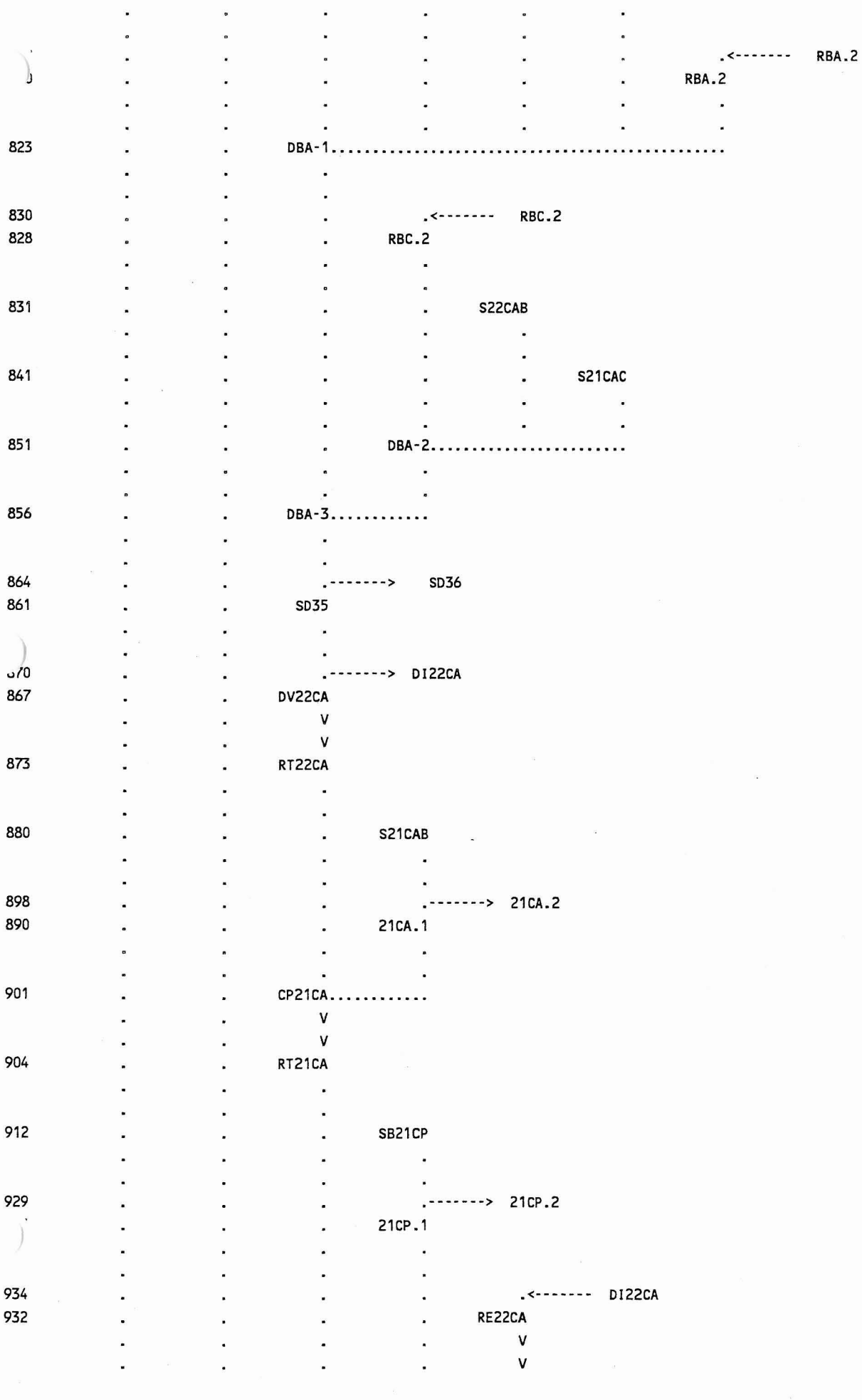
772 RT21MI
781 S21CAA
791 S22CAA
807 SD34
801 SD33
813 DI23CO
810 RE22CA
814 RD22CA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841 S21CAC
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856 DBA-3
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861 SD35
.-------> DI22CA
867 DV22CA
V
V
873 RT22CA
880 S21CAB
.-------> 21CA.2
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V
V
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912 SB21CP
.-------> 21CP.2
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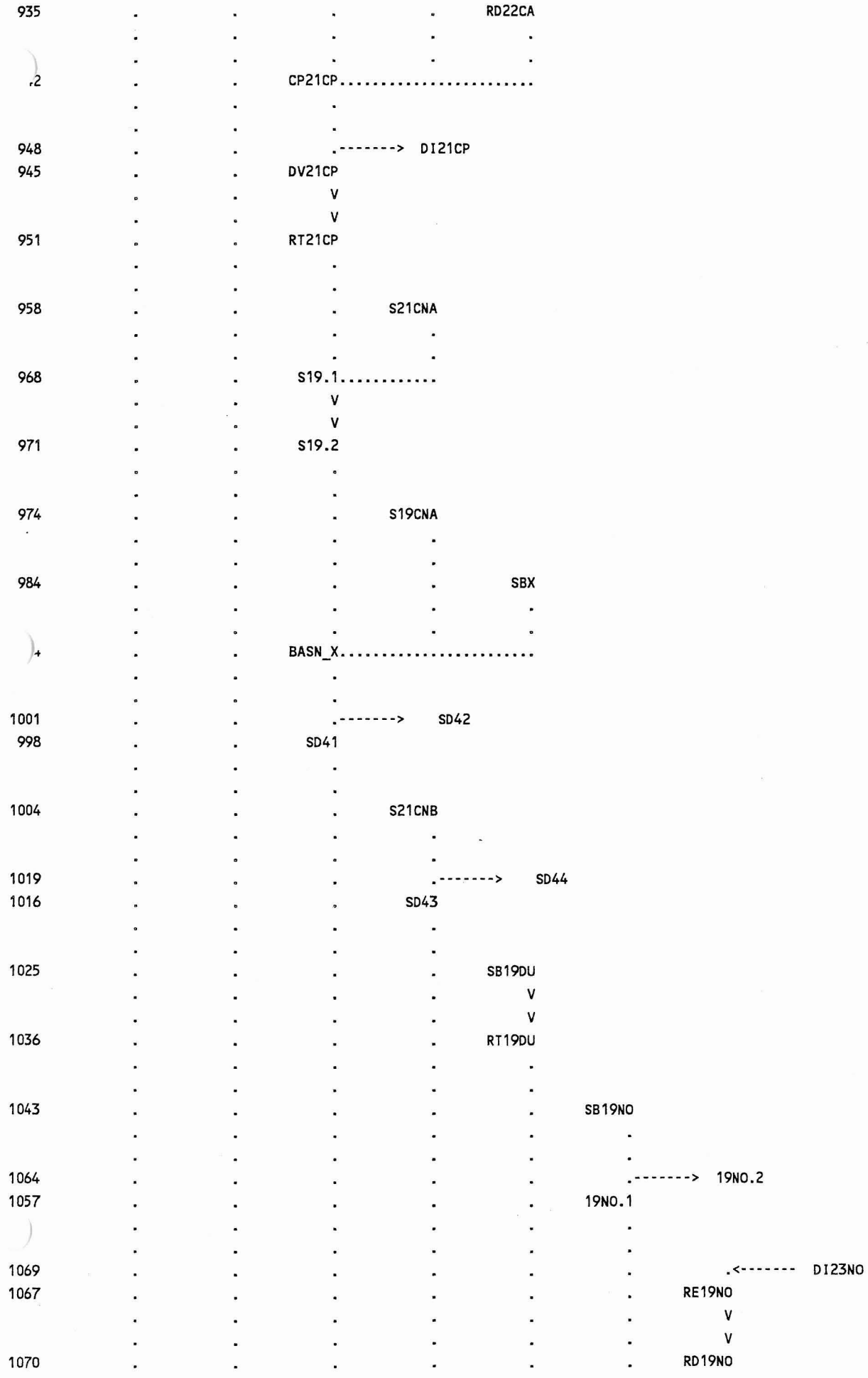
V
V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984 SBX
BASN_X
1001 SD42
998 SD41
1004 S21CNB
1019 SD44
1016 SD43
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1057 19NO.1
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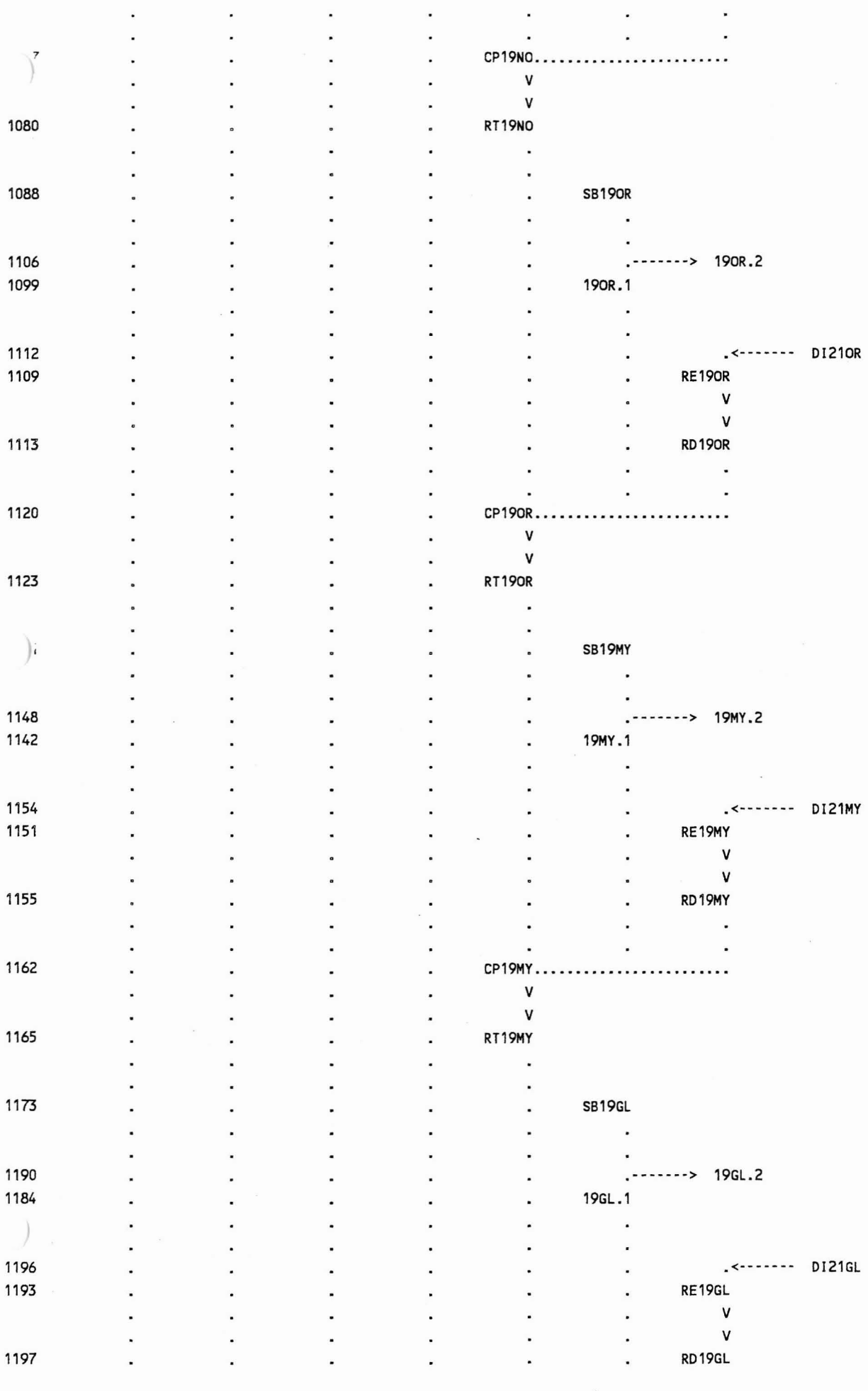
1067 RE19NO
1070 RD19NO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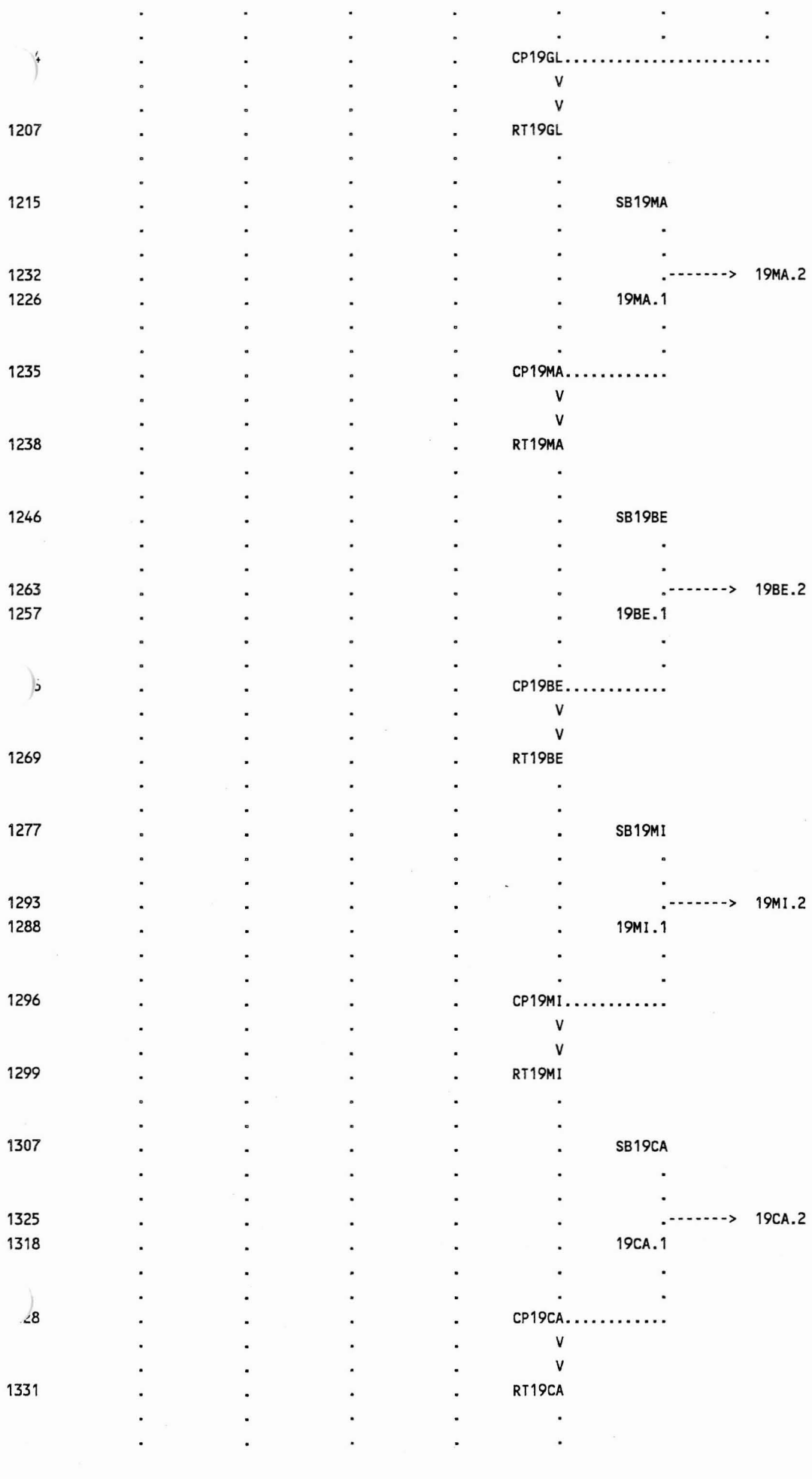
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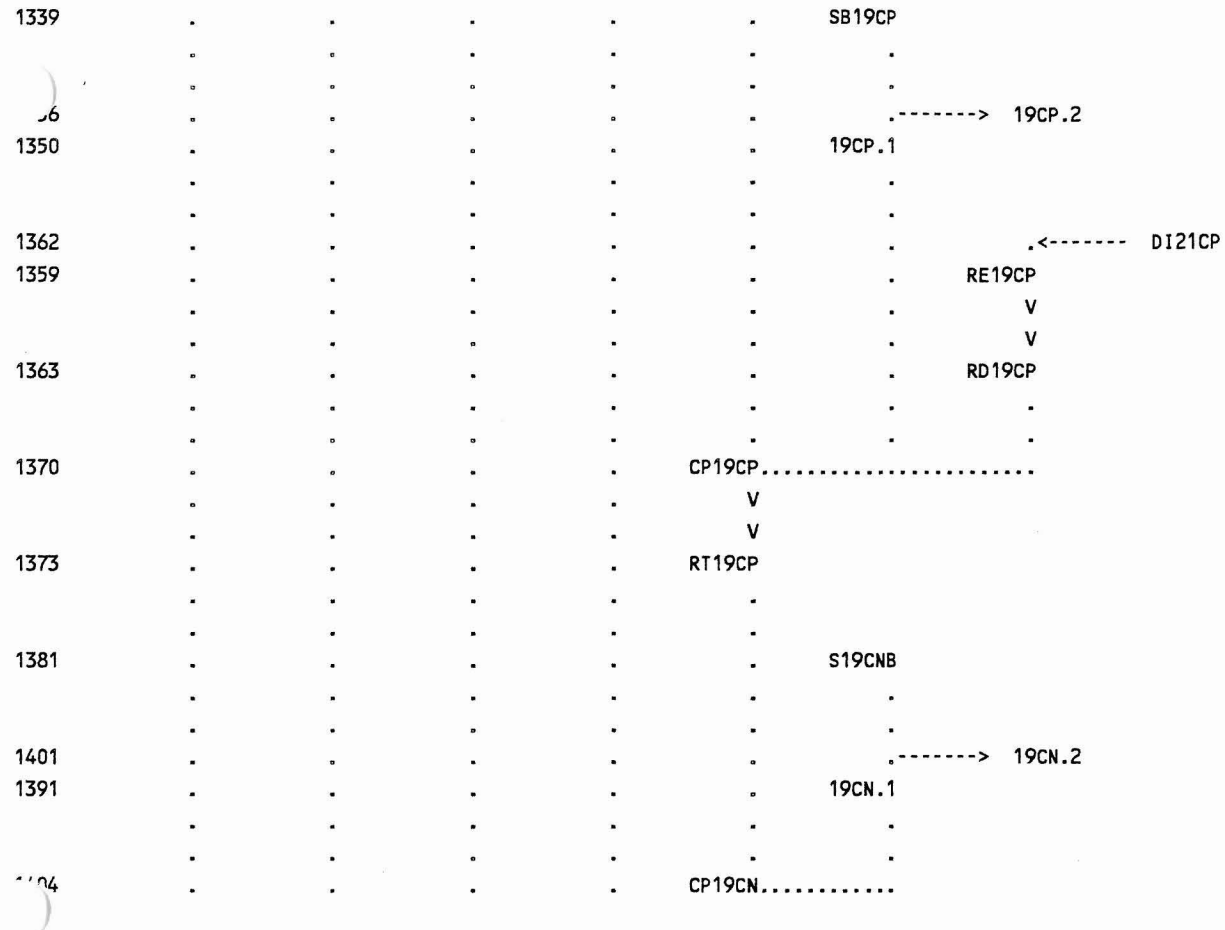

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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*                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*            JUN 09 1992                *
*           VERSION 4.0.3E              *
*                                       *
*  RUN DATE  09/17/03  TIME  17:28:35   *
*                                       *
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
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**********************************************************
24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
PHOENIX, ARIZONA
MODELED BY PREMIER ENGINEERING
MARCH 2003, REVISED AUGUST 2003

PHASE 1, SINGLE RETENTION BASIN AT CAMELBACK ROAD
25-YEAR 6 HOUR STORM

THIS IS BASELINE FILE 25ATL2 MODIFIED FOR AUGUST 2003 PHASE I ANALYSIS

FILE NAME: P1-25-2.6I
**********************************************************

Project ID: 24TH & CAMELBACK

18 IO          OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE
                    **********************************************************
                    FLOWS ALONG 23RD AVE
                    **********************************************************


   IT          HYDROGRAPH TIME DATA
                     NMIN          2  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1    0  STARTING DATE
                    ITIME         0000  STARTING TIME
                       NQ         2000  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      3    0  ENDING DATE
                   NDTIME         1838  ENDING TIME
                    ICENT           19  CENTURY MARK

                 COMPUTATION INTERVAL     0.03 HOURS
                      TOTAL TIME BASE    66.63 HOURS

      ENGLISH UNITS
           DRAINAGE AREA         SQUARE MILES
           PRECIPITATION DEPTH   INCHES
           LENGTH, ELEVATION     FEET
           FLOW                  CUBIC FEET PER SECOND
           STORAGE VOLUME        ACRE-FEET
           SURFACE AREA          ACRES
           TEMPERATURE           DEGREES FAHRENHEIT
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	200.	4.10	37.	9.	3.	0.18		
ROUTED TO	RT23DU	198.	4.20	37.	9.	3.	0.18	0.80	4.20
HYDROGRAPH AT	SB23BU	179.	4.20	33.	8.	3.	0.22		
2 COMBINED AT	CP23BU	377.	4.20	71.	18.	6.	0.40		
ROUTED TO	RT23BU	375.	4.27	70.	18.	6.	0.40	1.19	4.27
HYDROGRAPH AT	SB23RO	99.	4.17	20.	5.	2.	0.10		
DIVERSION TO	DV23RO	99.	4.23	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	98.	4.23	11.	3.	1.	0.10		
2 COMBINED AT	CP23RO	472.	4.23	81.	20.	7.	0.50		
ROUTED TO	RT23RO	473.	4.30	81.	20.	7.	0.50	1.98	4.30
HYDROGRAPH AT	SB23NO	51.	4.10	10.	2.	1.	0.04		
DIVERSION TO	RB23NO	48.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	51.	4.10	5.	1.	0.	0.04		
2 COMBINED AT	CP23NO	516.	4.30	87.	22.	8.	0.55		
DIVERSION TO	DI23NO	322.	4.30	62.	16.	6.	0.55		
HYDROGRAPH AT	DV23NO	193.	4.30	24.	6.	2.	0.55		
ROUTED TO	RT23NO	188.	4.40	24.	6.	2.	0.55	0.78	4.40
HYDROGRAPH AT	SB23OR	103.	4.23	22.	5.	2.	0.12		
2 COMBINED AT	CP23OR	287.	4.40	46.	12.	4.	0.67		
DIVERSION TO	DI23OR	72.	4.40	12.	3.	1.	0.67		
HYDROGRAPH AT	DV23OR	215.	4.40	35.	9.	3.	0.67		
ROUTED TO	RT23OR	213.	4.47	35.	9.	3.	0.67	0.83	4.47
HYDROGRAPH AT	SB23DM	55.	4.13	10.	2.	1.	0.06		
2 COMBINED AT	CP23DM	254.	4.43	44.	11.	4.	0.73		
DIVERSION TO	DI23DM	127.	4.43	22.	6.	2.	0.73		
HYDROGRAPH AT	DV23DM	127.	4.43	22.	6.	2.	0.73		

ROUTED TO	RT23DM	126.	4.50	22.	6.	2.	0.73	0.73	4.50
HYDROGRAPH AT	SB22GL	13.	4.37	3.	1.	0.	0.03		
ROUTED TO	RT22GL	13.	4.57	3.	1.	0.	0.03	0.17	4.57
HYDROGRAPH AT	SB23GL	53.	4.17	9.	2.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.17	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	45.	4.17	6.	1.	1.	0.06		
3 COMBINED AT	CP23GL	169.	4.47	31.	8.	3.	0.81		
ROUTED TO	RT23GL	166.	4.57	31.	8.	3.	0.81	0.50	4.57
HYDROGRAPH AT	SB23MA	108.	4.27	22.	6.	2.	0.15		
DIVERSION TO	23MA.2	10.	4.27	7.	2.	1.	0.15		
HYDROGRAPH AT	23MA.1	98.	4.27	16.	4.	1.	0.15		
2 COMBINED AT	CP23MA	245.	4.50	47.	12.	4.	0.96		
ROUTED TO	RT23MA	243.	4.60	47.	12.	4.	0.96	0.95	4.60
HYDROGRAPH AT	SB23BE	71.	4.33	16.	4.	1.	0.12		
DIVERSION TO	23BE.2	22.	4.33	10.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	49.	4.33	7.	2.	1.	0.12		
2 COMBINED AT	CP23BE	282.	4.57	53.	13.	5.	1.07		
ROUTED TO	RT23BE	279.	4.67	53.	13.	5.	1.07	1.22	4.67
HYDROGRAPH AT	SB23MI	48.	4.57	15.	4.	1.	0.12		
2 COMBINED AT	CP23MI	327.	4.67	68.	17.	6.	1.19		
DIVERSION TO	DI23MI	131.	4.67	27.	7.	2.	1.19		
HYDROGRAPH AT	DV23MI	196.	4.67	41.	10.	4.	1.19		
ROUTED TO	RT23MI	195.	4.73	41.	10.	4.	1.19	0.91	4.73
HYDROGRAPH AT	S23COA	6.	4.37	2.	0.	0.	0.01		
HYDROGRAPH AT	S23COB	29.	4.47	9.	2.	1.	0.05		
3 COMBINED AT	23CO.1	226.	4.70	51.	13.	5.	1.25		
DIVERSION TO	DI23CO	113.	4.70	25.	6.	2.	1.25		
HYDROGRAPH AT	DV23CO	113.	4.70	25.	6.	2.	1.25		
ROUTED TO	RT23CO	112.	4.77	25.	6.	2.	1.25	0.69	4.77
HYDROGRAPH AT	S23CAA	6.	4.27	2.	0.	0.	0.01		

DIVERSION TO	23AA.2	6.	0.00	2.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	112.	4.77	25.	6.	2.	1.26		
DIVERSION TO	RBA.2	112.	0.00	25.	6.	2.	1.26		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.26		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.26	0.00	5.87
HYDROGRAPH AT	S23CAB	3.	4.10	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	3.	4.10	1.	0.	0.	1.26		
DIVERSION TO	DI23CA	3.	0.00	1.	0.	0.	1.26		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.26		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.26	0.00	4.47
HYDROGRAPH AT	RE24CA	3.	4.10	1.	0.	0.	0.00		
ROUTED TO	RD24CA	3.	4.20	1.	0.	0.	0.00	0.04	4.20
HYDROGRAPH AT	SB24CA	37.	4.30	9.	2.	1.	0.05		
2 COMBINED AT	CP24CA	40.	4.30	10.	2.	1.	0.05		
DIVERSION TO	RBC.2	40.	0.00	10.	2.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.63
HYDROGRAPH AT	SB23CP	150.	4.20	30.	8.	3.	0.16		
DIVERSION TO	23CP.2	4.	4.20	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	146.	4.20	26.	7.	2.	0.16		
3 COMBINED AT	CP23CP	146.	4.20	26.	7.	2.	1.47		
ROUTED TO	RT23CP	144.	4.33	26.	7.	2.	1.47	0.78	4.33
HYDROGRAPH AT	SB23IN	156.	4.23	32.	8.	3.	0.17		
DIVERSION TO	23IN.2	4.	4.23	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	152.	4.23	28.	7.	3.	0.17		
2 COMBINED AT	CP23IN	294.	4.30	55.	14.	5.	1.64		
HYDROGRAPH AT	SB21DU	50.	4.43	13.	3.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.43	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	37.	4.43	6.	2.	1.	0.09		

ROUTED TO	RT21DU	37.	4.63	6.	2.	1.	0.09	0.35	4.63
HYDROGRAPH AT	SB21BU	95.	4.27	20.	5.	2.	0.13		
2 COMBINED AT	CP21BU	121.	4.40	26.	7.	2.	0.22		
DIVERSION TO	DI21BU	121.	0.00	26.	7.	2.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	96.	4.27	20.	5.	2.	0.13		
HYDROGRAPH AT	RE21OR	72.	4.40	12.	3.	1.	0.00		
ROUTED TO	RD21OR	68.	4.53	12.	3.	1.	0.00	0.40	4.53
2 COMBINED AT	CP21OR	155.	4.47	32.	8.	3.	0.13		
DIVERSION TO	DI21OR	77.	4.47	16.	4.	1.	0.13		
HYDROGRAPH AT	DV21OR	77.	4.47	16.	4.	1.	0.13		
ROUTED TO	RT21OR	77.	4.53	16.	4.	1.	0.13	0.62	4.53
HYDROGRAPH AT	SB21MY	40.	4.43	10.	2.	1.	0.07		
HYDROGRAPH AT	RE21MY	127.	4.43	22.	6.	2.	0.00		
ROUTED TO	RD21MY	124.	4.57	22.	6.	2.	0.00	0.66	4.57
3 COMBINED AT	CP21MY	239.	4.57	47.	12.	4.	0.19		
DIVERSION TO	DI21MY	119.	4.57	24.	6.	2.	0.19		
HYDROGRAPH AT	DV21MY	119.	4.57	24.	6.	2.	0.19		
ROUTED TO	RT21MY	119.	4.60	24.	6.	2.	0.19	0.72	4.60
HYDROGRAPH AT	SB21GL	26.	4.30	6.	1.	1.	0.04		
2 COMBINED AT	CP21GL	140.	4.57	29.	7.	3.	0.23		
DIVERSION TO	DI21GL	123.	4.57	28.	7.	3.	0.23		
HYDROGRAPH AT	DV21GL	18.	4.57	2.	0.	0.	0.23		
ROUTED TO	RT21GL	16.	4.80	2.	0.	0.	0.23	0.26	4.80
HYDROGRAPH AT	SB21MA	114.	4.23	22.	6.	2.	0.16		
2 COMBINED AT	CP21MA	114.	4.23	24.	6.	2.	0.39		
ROUTED TO	RT21MA	113.	4.33	24.	6.	2.	0.39	0.70	4.33
HYDROGRAPH AT	SB21BE	139.	4.23	28.	7.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.23	5.	1.	1.	0.18		
HYDROGRAPH AT	21BE.1	133.	4.23	23.	6.	2.	0.18		

2 COMBINED AT	CP21BE	243.	4.30	46.	12.	4.	0.57		
ROUTED TO	RT21BE	242.	4.37	46.	12.	4.	0.57	0.97	4.37
HYDROGRAPH AT	SB21MO	23.	4.63	8.	2.	1.	0.07		
2 COMBINED AT	CP21MO	263.	4.37	54.	14.	5.	0.64		
ROUTED TO	RT21MO	262.	4.40	54.	14.	5.	0.64	1.16	4.40
HYDROGRAPH AT	SB21MI	40.	4.47	10.	3.	1.	0.09		
HYDROGRAPH AT	RE21MI	131.	4.67	27.	7.	2.	0.00		
ROUTED TO	RD21MI	130.	4.77	27.	7.	2.	0.00	0.56	4.77
3 COMBINED AT	CP21MI	398.	4.53	91.	23.	8.	0.73		
ROUTED TO	RT21MI	396.	4.63	91.	23.	8.	0.73	1.46	4.63
HYDROGRAPH AT	S21CAA	29.	4.43	8.	2.	1.	0.05		
HYDROGRAPH AT	S22CAA	28.	4.40	7.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.40	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	18.	4.40	3.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	113.	4.70	25.	6.	2.	0.00		
ROUTED TO	RD22CA	105.	4.97	25.	6.	2.	0.00	0.50	4.97
HYDROGRAPH AT	RBA.2	112.	4.77	25.	6.	2.	0.00		
5 COMBINED AT	DBA-1	609.	4.73	152.	39.	14.	0.83		
HYDROGRAPH AT	RBC.2	40.	4.30	10.	2.	1.	0.00		
HYDROGRAPH AT	S22CAB	9.	4.03	2.	0.	0.	0.01		
HYDROGRAPH AT	S21CAC	5.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	50.	4.20	12.	3.	1.	0.01		
2 COMBINED AT	DBA-3	639.	4.73	163.	42.	15.	0.84		
DIVERSION TO	SD36	639.	0.00	163.	42.	15.	0.84		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.84		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.84		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.84		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.84	0.00	4.37
HYDROGRAPH AT	S21CAB	79.	4.43	20.	5.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.43	10.	2.	1.	0.12		

HYDROGRAPH AT	21CA.1	61.	4.43	10.	3.	1.	0.12		
2 COMBINED AT	CP21CA	61.	4.43	10.	3.	1.	0.96		
ROUTED TO	RT21CA	60.	4.57	10.	3.	1.	0.96	0.55	4.57
HYDROGRAPH AT	SB21CP	107.	4.40	25.	6.	2.	0.14		
DIVERSION TO	21CP.2	15.	4.40	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	92.	4.40	17.	4.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	148.	4.47	27.	7.	2.	1.10		
DIVERSION TO	DI21CP	74.	4.47	13.	3.	1.	1.10		
HYDROGRAPH AT	DV21CP	74.	4.47	13.	3.	1.	1.10		
ROUTED TO	RT21CP	74.	4.53	13.	3.	1.	1.10	0.53	4.53
HYDROGRAPH AT	S21CNA	16.	4.13	3.	1.	0.	0.02		
2 COMBINED AT	S19.1	85.	4.50	17.	4.	1.	1.12		
ROUTED TO	S19.2	85.	4.50	17.	4.	1.	1.12		
HYDROGRAPH AT	S19CNA	10.	4.70	4.	1.	0.	0.02		
HYDROGRAPH AT	SBX	16.	4.40	4.	1.	0.	0.02		
3 COMBINED AT	BASN_X	110.	4.50	24.	6.	2.	1.16		
DIVERSION TO	SD42	110.	0.00	24.	6.	2.	1.16		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.16		
HYDROGRAPH AT	S21CNB	22.	4.17	4.	1.	0.	0.03		
DIVERSION TO	SD44	7.	4.17	3.	1.	0.	0.03		
HYDROGRAPH AT	SD43	15.	4.17	2.	0.	0.	0.03		
HYDROGRAPH AT	SB19DU	12.	4.33	4.	1.	0.	0.02		
ROUTED TO	RT19DU	11.	4.97	4.	1.	0.	0.02	0.07	4.97
HYDROGRAPH AT	SB19NO	29.	4.27	7.	2.	1.	0.04		
DIVERSION TO	19NO.2	29.	0.00	7.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	322.	4.30	62.	16.	6.	0.00		
ROUTED TO	RD19NO	307.	4.47	62.	16.	6.	0.00	0.90	4.47

3 COMBINED AT	CP19NO	315.	4.47	66.	17.	6.	0.05		
ROUTED TO	RT19NO	303.	4.60	66.	17.	6.	0.05	0.73	4.60
HYDROGRAPH AT	SB19OR	76.	4.43	22.	6.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.43	15.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	46.	4.43	7.	2.	1.	0.10		
HYDROGRAPH AT	RE19OR	77.	4.47	16.	4.	1.	0.00		
ROUTED TO	RD19OR	75.	4.57	16.	4.	1.	0.00	0.37	4.57
3 COMBINED AT	CP19OR	422.	4.57	88.	22.	8.	0.16		
ROUTED TO	RT19OR	416.	4.63	88.	22.	8.	0.16	0.87	4.63
HYDROGRAPH AT	SB19MY	25.	4.37	6.	2.	1.	0.05		
DIVERSION TO	19MY.2	25.	0.00	6.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	119.	4.57	24.	6.	2.	0.00		
ROUTED TO	RD19MY	116.	4.67	24.	6.	2.	0.00	0.64	4.67
3 COMBINED AT	CP19MY	532.	4.63	112.	28.	10.	0.20		
ROUTED TO	RT19MY	528.	4.70	112.	28.	10.	0.20	1.20	4.70
HYDROGRAPH AT	SB19GL	35.	4.43	10.	2.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.43	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	20.	4.43	3.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	123.	4.57	28.	7.	3.	0.00		
ROUTED TO	RD19GL	120.	4.70	28.	7.	3.	0.00	0.65	4.70
3 COMBINED AT	CP19GL	664.	4.70	142.	36.	13.	0.26		
ROUTED TO	RT19GL	647.	4.77	142.	36.	13.	0.26	1.04	4.77
HYDROGRAPH AT	SB19MA	35.	4.37	9.	2.	1.	0.05		
DIVERSION TO	19MA.2	35.	0.00	9.	2.	1.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	647.	4.77	142.	36.	13.	0.31		
ROUTED TO	RT19MA	637.	4.87	142.	36.	13.	0.31	1.10	4.87
HYDROGRAPH AT	SB19BE	34.	4.40	9.	2.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.40	9.	2.	1.	0.06		

HYDROGRAPH AT	19BE.1	4.	4.40	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	637.	4.87	142.	36.	13.	0.37		
ROUTED TO	RT19BE	627.	4.97	142.	36.	13.	0.37	1.09	4.97
HYDROGRAPH AT	SB19MI	41.	4.40	10.	3.	1.	0.08		
DIVERSION TO	19MI.2	41.	0.00	10.	3.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	627.	4.97	142.	36.	13.	0.44		
ROUTED TO	RT19MI	617.	5.03	142.	36.	13.	0.44	1.17	5.03
HYDROGRAPH AT	SB19CA	3.	4.67	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	3.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	617.	5.03	142.	36.	13.	0.45		
ROUTED TO	RT19CA	609.	5.13	141.	36.	13.	0.45	1.01	5.13
HYDROGRAPH AT	SB19CP	41.	4.37	10.	3.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.37	9.	2.	1.	0.06		
HYDROGRAPH AT	19CP.1	11.	4.37	1.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	74.	4.47	13.	3.	1.	0.00		
ROUTED TO	RD19CP	73.	4.63	13.	3.	1.	0.00	0.41	4.63
3 COMBINED AT	CP19CP	653.	5.13	156.	40.	14.	0.51		
ROUTED TO	RT19CP	652.	5.17	156.	40.	14.	0.51	1.64	5.17
HYDROGRAPH AT	S19CNB	7.	4.73	3.	1.	0.	0.02		
DIVERSION TO	19CN.2	7.	0.00	3.	1.	0.	0.02		
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02		
2 COMBINED AT	CP19CN	652.	5.17	156.	40.	14.	0.53		

*** NORMAL END OF HEC-1 ***

APPENDIX F

PHASE 1 DRAINAGE SYSTEM
100-YEAR, 6-HOUR STORM
FILE: P1-100-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 1, SINGLE RETENTION BASIN AT CAMELBACK ROAD
  9       ID   100-YEAR 6 HOUR STORM
 10       ID
 11       ID   THIS IS BASELINE FILE 25ATL2 MODIFIED FOR AUGUST 2003 PHASE I ANALYSIS
 12       ID
 13       ID   FILE NAME: P1-100-1.6I
 14       ID   ****************************************************
 15       ID
 16       ID   Project ID: 24TH & CAMELBACK
 17       IT      2                   2000
 18       IO      5
          *DIAGRAM
          *
 19       ID   ****************************************************
 20       ID   FLOWS ALONG 23RD AVE
 21       ID   ****************************************************
 22       ID

 23       KK  SB23DU
 24       KM   SUB-BASIN SB23DU
 25       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 26       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 27       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 28       BA    .179
 29       IN      15
 30       KM   RAINFALL DEPTH OF 3.00 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 31       PB   2.900
 32       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 33       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 34       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 35       PC    .949    .962    .975    .988   1.000
 36       LG    .100    .250   4.300    .366  80.000
 37       UC    .346    .137
 38       UA       0       5      16      30      65      77      84      90      94      97
 39       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0       13   10000
          *  DQ      0       13      13
          *
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	267.	4.10	48.	12.	4.	0.18		
ROUTED TO	RT23DU	265.	4.17	48.	12.	4.	0.18	0.93	4.17
HYDROGRAPH AT	SB23BU	263.	4.17	46.	12.	4.	0.22		
2 COMBINED AT	CP23BU	528.	4.17	94.	24.	9.	0.40		
ROUTED TO	RT23BU	526.	4.20	94.	24.	9.	0.40	1.43	4.20
HYDROGRAPH AT	SB23RO	134.	4.17	27.	7.	2.	0.10		
DIVERSION TO	DV23RO	119.	4.17	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	134.	4.17	17.	4.	2.	0.10		
2 COMBINED AT	CP23RO	658.	4.20	111.	28.	10.	0.50		
ROUTED TO	RT23RO	657.	4.23	111.	28.	10.	0.50	2.39	4.23
HYDROGRAPH AT	SB23NO	67.	4.10	12.	3.	1.	0.04		
DIVERSION TO	RB23NO	53.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	67.	4.10	8.	2.	1.	0.04		
2 COMBINED AT	CP23NO	715.	4.20	119.	30.	11.	0.55		
DIVERSION TO	DI23NO	439.	4.20	83.	21.	8.	0.55		
HYDROGRAPH AT	DV23NO	276.	4.20	37.	9.	3.	0.55		
ROUTED TO	RT23NO	275.	4.30	37.	9.	3.	0.55	0.95	4.30
HYDROGRAPH AT	SB23OR	146.	4.20	29.	7.	3.	0.12		
2 COMBINED AT	CP23OR	418.	4.27	66.	17.	6.	0.67		
DIVERSION TO	DI23OR	105.	4.27	16.	4.	1.	0.67		
HYDROGRAPH AT	DV23OR	314.	4.27	49.	12.	4.	0.67		
ROUTED TO	RT23OR	312.	4.33	49.	12.	4.	0.67	1.02	4.33
HYDROGRAPH AT	SB23DM	75.	4.10	13.	3.	1.	0.06		
2 COMBINED AT	CP23DM	378.	4.30	62.	16.	6.	0.73		
DIVERSION TO	DI23DM	189.	4.30	31.	8.	3.	0.73		
HYDROGRAPH AT	DV23DM	189.	4.30	31.	8.	3.	0.73		

ROUTED TO	RT23DM	187.	4.37	31.	8.	3.	0.73	0.89	4.37
HYDROGRAPH AT	SB22GL	21.	4.30	5.	1.	0.	0.03		
ROUTED TO	RT22GL	21.	4.43	5.	1.	0.	0.03	0.25	4.43
HYDROGRAPH AT	SB23GL	74.	4.13	13.	3.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.13	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	66.	4.13	9.	2.	1.	0.06		
3 COMBINED AT	CP23GL	261.	4.33	44.	11.	4.	0.81		
ROUTED TO	RT23GL	256.	4.47	44.	11.	4.	0.81	0.63	4.47
HYDROGRAPH AT	SB23MA	160.	4.20	31.	8.	3.	0.15		
DIVERSION TO	23MA.2	10.	4.20	7.	2.	1.	0.15		
HYDROGRAPH AT	23MA.1	150.	4.20	24.	6.	2.	0.15		
2 COMBINED AT	CP23MA	384.	4.43	68.	17.	6.	0.96		
ROUTED TO	RT23MA	382.	4.50	68.	17.	6.	0.96	1.20	4.50
HYDROGRAPH AT	SB23BE	109.	4.27	22.	6.	2.	0.12		
DIVERSION TO	23BE.2	22.	4.27	10.	3.	1.	0.12		
HYDROGRAPH AT	23BE.1	87.	4.27	12.	3.	1.	0.12		
2 COMBINED AT	CP23BE	457.	4.47	80.	20.	7.	1.07		
ROUTED TO	RT23BE	454.	4.53	80.	20.	7.	1.07	1.60	4.53
HYDROGRAPH AT	SB23MI	80.	4.47	21.	5.	2.	0.12		
2 COMBINED AT	CP23MI	534.	4.53	101.	26.	9.	1.19		
DIVERSION TO	DI23MI	214.	4.53	40.	10.	4.	1.19		
HYDROGRAPH AT	DV23MI	320.	4.53	61.	15.	6.	1.19		
ROUTED TO	RT23MI	319.	4.60	61.	15.	6.	1.19	1.18	4.60
HYDROGRAPH AT	S23COA	9.	4.33	2.	1.	0.	0.01		
HYDROGRAPH AT	S23COB	42.	4.40	11.	3.	1.	0.05		
3 COMBINED AT	23CO.1	366.	4.57	74.	19.	7.	1.25		
DIVERSION TO	DI23CO	183.	4.57	37.	9.	3.	1.25		
HYDROGRAPH AT	DV23CO	183.	4.57	37.	9.	3.	1.25		
ROUTED TO	RT23CO	182.	4.63	37.	9.	3.	1.25	0.88	4.63
HYDROGRAPH AT	S23CAA	9.	4.23	2.	1.	0.	0.01		

DIVERSION TO	23AA.2	9.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	182.	4.63	37.	9.	3.	1.26		
DIVERSION TO	RBA.2	182.	0.00	37.	9.	3.	1.26		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.26		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.26	0.00	7.70
HYDROGRAPH AT	S23CAB	4.	4.07	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	4.	4.07	1.	0.	0.	1.26		
DIVERSION TO	DI23CA	4.	0.00	1.	0.	0.	1.26		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.26		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.26	0.00	4.97
HYDROGRAPH AT	RE24CA	4.	4.07	1.	0.	0.	0.00		
ROUTED TO	RD24CA	4.	4.20	1.	0.	0.	0.00	0.05	4.20
HYDROGRAPH AT	SB24CA	53.	4.27	12.	3.	1.	0.05		
2 COMBINED AT	CP24CA	57.	4.23	13.	3.	1.	0.05		
DIVERSION TO	RBC.2	57.	0.00	13.	3.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.30
HYDROGRAPH AT	SB23CP	205.	4.17	40.	10.	4.	0.16		
DIVERSION TO	23CP.2	4.	4.17	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	201.	4.17	36.	9.	3.	0.16		
3 COMBINED AT	CP23CP	201.	4.17	36.	9.	3.	1.47		
ROUTED TO	RT23CP	198.	4.27	36.	9.	3.	1.47	0.92	4.27
HYDROGRAPH AT	SB23IN	215.	4.20	43.	11.	4.	0.17		
DIVERSION TO	23IN.2	4.	4.20	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	211.	4.20	39.	10.	4.	0.17		
2 COMBINED AT	CP23IN	406.	4.27	75.	19.	7.	1.64		
HYDROGRAPH AT	SB21DU	77.	4.37	19.	5.	2.	0.09		
DIVERSION TO	21DU.2	13.	4.37	8.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	64.	4.37	11.	3.	1.	0.09		

ROUTED TO	RT21DU	64.	4.50	11.	3.	1.	0.09	0.47	4.50
HYDROGRAPH AT	SB21BU	139.	4.20	27.	7.	2.	0.13		
2 COMBINED AT	CP21BU	188.	4.40	38.	9.	3.	0.22		
DIVERSION TO	DI21BU	188.	0.00	38.	9.	3.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	138.	4.20	28.	7.	2.	0.13		
HYDROGRAPH AT	RE21OR	105.	4.27	16.	4.	1.	0.00		
ROUTED TO	RD21OR	102.	4.40	16.	4.	1.	0.00	0.50	4.40
2 COMBINED AT	CP21OR	234.	4.33	44.	11.	4.	0.13		
DIVERSION TO	DI21OR	117.	4.33	22.	6.	2.	0.13		
HYDROGRAPH AT	DV21OR	117.	4.33	22.	6.	2.	0.13		
ROUTED TO	RT21OR	117.	4.40	22.	6.	2.	0.13	0.76	4.40
HYDROGRAPH AT	SB21MY	59.	4.37	14.	3.	1.	0.07		
HYDROGRAPH AT	RE21MY	189.	4.30	31.	8.	3.	0.00		
ROUTED TO	RD21MY	187.	4.43	31.	8.	3.	0.00	0.82	4.43
3 COMBINED AT	CP21MY	362.	4.40	67.	17.	6.	0.19		
DIVERSION TO	DI21MY	181.	4.40	33.	8.	3.	0.19		
HYDROGRAPH AT	DV21MY	181.	4.40	33.	8.	3.	0.19		
ROUTED TO	RT21MY	180.	4.47	33.	8.	3.	0.19	0.89	4.47
HYDROGRAPH AT	SB21GL	40.	4.23	8.	2.	1.	0.04		
2 COMBINED AT	CP21GL	216.	4.43	41.	10.	4.	0.23		
DIVERSION TO	DI21GL	184.	4.43	38.	10.	3.	0.23		
HYDROGRAPH AT	DV21GL	32.	4.43	4.	1.	0.	0.23		
ROUTED TO	RT21GL	31.	4.67	4.	1.	0.	0.23	0.34	4.67
HYDROGRAPH AT	SB21MA	170.	4.17	31.	8.	3.	0.16		
2 COMBINED AT	CP21MA	170.	4.20	34.	9.	3.	0.39		
ROUTED TO	RT21MA	169.	4.30	34.	9.	3.	0.39	0.86	4.30
HYDROGRAPH AT	SB21BE	203.	4.20	38.	10.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.20	6.	2.	1.	0.18		
HYDROGRAPH AT	21BE.1	197.	4.20	32.	8.	3.	0.18		

2 COMBINED AT	CP21BE	362.	4.27	67.	17.	6.	0.57		
ROUTED TO	RT21BE	361.	4.30	67.	17.	6.	0.57	1.21	4.30
HYDROGRAPH AT	SB21MO	40.	4.53	12.	3.	1.	0.07		
2 COMBINED AT	CP21MO	397.	4.30	79.	20.	7.	0.64		
ROUTED TO	RT21MO	396.	4.33	78.	20.	7.	0.64	1.46	4.33
HYDROGRAPH AT	SB21MI	67.	4.37	15.	4.	1.	0.09		
HYDROGRAPH AT	RE21MI	214.	4.53	40.	10.	4.	0.00		
ROUTED TO	RD21MI	212.	4.60	40.	10.	4.	0.00	0.73	4.60
3 COMBINED AT	CP21MI	637.	4.47	133.	34.	12.	0.73		
ROUTED TO	RT21MI	635.	4.53	133.	34.	12.	0.73	1.90	4.53
HYDROGRAPH AT	S21CAA	42.	4.37	11.	3.	1.	0.05		
HYDROGRAPH AT	S22CAA	42.	4.33	10.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.33	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	32.	4.33	5.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	183.	4.57	37.	9.	3.	0.00		
ROUTED TO	RD22CA	171.	4.83	37.	9.	3.	0.00	0.65	4.83
HYDROGRAPH AT	RBA.2	182.	4.63	37.	9.	3.	0.00		
5 COMBINED AT	DBA-1	1012.	4.60	223.	57.	20.	0.83		
HYDROGRAPH AT	RBC.2	57.	4.23	13.	3.	1.	0.00		
HYDROGRAPH AT	S22CAB	12.	4.00	2.	1.	0.	0.01		
HYDROGRAPH AT	S21CAC	7.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	70.	4.17	16.	4.	1.	0.01		
2 COMBINED AT	DBA-3	1060.	4.60	238.	61.	22.	0.84		
DIVERSION TO	SD36	1060.	0.00	238.	61.	22.	0.84		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.84		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.84		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.84		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.84	0.00	4.50
HYDROGRAPH AT	S21CAB	114.	4.37	27.	7.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.37	10.	3.	1.	0.12		

HYDROGRAPH AT	21CA.1	96.	4.37	17.	4.	2.	0.12		
2 COMBINED AT	CP21CA	96.	4.37	17.	4.	2.	0.96		
ROUTED TO	RT21CA	95.	4.50	17.	4.	2.	0.96	0.69	4.50
HYDROGRAPH AT	SB21CP	151.	4.33	34.	9.	3.	0.14		
DIVERSION TO	21CP.2	15.	4.33	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	136.	4.33	25.	6.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	227.	4.43	42.	10.	4.	1.10		
DIVERSION TO	DI21CP	113.	4.43	21.	5.	2.	1.10		
HYDROGRAPH AT	DV21CP	113.	4.43	21.	5.	2.	1.10		
ROUTED TO	RT21CP	113.	4.47	21.	5.	2.	1.10	0.66	4.47
HYDROGRAPH AT	S21CNA	22.	4.10	4.	1.	0.	0.02		
2 COMBINED AT	S19.1	129.	4.43	25.	6.	2.	1.12		
ROUTED TO	S19.2	129.	4.43	25.	6.	2.	1.12		
HYDROGRAPH AT	S19CNA	15.	4.60	5.	1.	0.	0.02		
HYDROGRAPH AT	SBX	22.	4.33	5.	1.	0.	0.02		
3 COMBINED AT	BASN_X	164.	4.43	35.	9.	3.	1.16		
DIVERSION TO	SD42	164.	0.00	35.	9.	3.	1.16		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.16		
HYDROGRAPH AT	S21CNB	31.	4.13	6.	1.	1.	0.03		
DIVERSION TO	SD44	7.	4.13	3.	1.	0.	0.03		
HYDROGRAPH AT	SD43	24.	4.13	3.	1.	0.	0.03		
HYDROGRAPH AT	SB19DU	17.	4.30	5.	1.	0.	0.02		
ROUTED TO	RT19DU	15.	4.90	5.	1.	0.	0.02	0.09	4.90
HYDROGRAPH AT	SB19NO	41.	4.20	9.	2.	1.	0.04		
DIVERSION TO	19NO.2	36.	4.20	9.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	5.	4.20	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	439.	4.20	83.	21.	8.	0.00		
ROUTED TO	RD19NO	433.	4.33	83.	21.	8.	0.00	1.08	4.33

3 COMBINED AT	CP19NO	445.	4.33	87.	22.	8.	0.05		
ROUTED TO	RT19NO	431.	4.47	87.	22.	8.	0.05	0.89	4.47
HYDROGRAPH AT	SB19OR	105.	4.37	29.	7.	3.	0.10		
DIVERSION TO	19OR.2	30.	4.37	16.	4.	2.	0.10		
HYDROGRAPH AT	19OR.1	75.	4.37	13.	3.	1.	0.10		
HYDROGRAPH AT	RE19OR	117.	4.33	22.	6.	2.	0.00		
ROUTED TO	RD19OR	115.	4.43	22.	6.	2.	0.00	0.48	4.43
3 COMBINED AT	CP19OR	619.	4.43	122.	31.	11.	0.16		
ROUTED TO	RT19OR	613.	4.50	121.	31.	11.	0.16	1.08	4.50
HYDROGRAPH AT	SB19MY	39.	4.30	9.	2.	1.	0.05		
DIVERSION TO	19MY.2	35.	4.30	8.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	4.	4.30	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	181.	4.40	33.	8.	3.	0.00		
ROUTED TO	RD19MY	178.	4.53	33.	8.	3.	0.00	0.80	4.53
3 COMBINED AT	CP19MY	791.	4.50	155.	39.	14.	0.20		
ROUTED TO	RT19MY	787.	4.53	155.	39.	14.	0.20	1.50	4.53
HYDROGRAPH AT	SB19GL	50.	4.37	13.	3.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.37	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	35.	4.37	5.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	184.	4.43	38.	10.	3.	0.00		
ROUTED TO	RD19GL	180.	4.57	38.	10.	3.	0.00	0.80	4.57
3 COMBINED AT	CP19GL	999.	4.53	197.	50.	18.	0.26		
ROUTED TO	RT19GL	975.	4.63	197.	50.	18.	0.26	1.31	4.63
HYDROGRAPH AT	SB19MA	50.	4.30	12.	3.	1.	0.05		
DIVERSION TO	19MA.2	35.	4.30	11.	3.	1.	0.05		
HYDROGRAPH AT	19MA.1	15.	4.30	1.	0.	0.	0.05		
2 COMBINED AT	CP19MA	981.	4.60	198.	50.	18.	0.31		
ROUTED TO	RT19MA	970.	4.70	198.	50.	18.	0.31	1.39	4.70
HYDROGRAPH AT	SB19BE	50.	4.37	13.	3.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.37	11.	3.	1.	0.06		

HYDROGRAPH AT	19BE.1	20.	4.37	2.	0.	0.	0.06		
2 COMBINED AT	CP19BE	980.	4.67	200.	51.	18.	0.37		
ROUTED TO	RT19BE	968.	4.77	200.	51.	18.	0.37	1.39	4.77
HYDROGRAPH AT	SB19MI	63.	4.33	14.	4.	1.	0.08		
DIVERSION TO	19MI.2	63.	0.00	14.	4.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	968.	4.77	200.	51.	18.	0.44		
ROUTED TO	RT19MI	953.	4.83	200.	51.	18.	0.44	1.49	4.83
HYDROGRAPH AT	SB19CA	5.	4.60	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	5.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	953.	4.83	200.	51.	18.	0.45		
ROUTED TO	RT19CA	941.	4.90	200.	51.	18.	0.45	1.28	4.90
HYDROGRAPH AT	SB19CP	58.	4.30	14.	4.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.30	11.	3.	1.	0.06		
HYDROGRAPH AT	19CP.1	28.	4.30	3.	1.	0.	0.06		
HYDROGRAPH AT	RE19CP	113.	4.43	21.	5.	2.	0.00		
ROUTED TO	RD19CP	112.	4.50	21.	5.	2.	0.00	0.52	4.50
3 COMBINED AT	CP19CP	1027.	4.90	224.	57.	20.	0.51		
ROUTED TO	RT19CP	1025.	4.93	224.	57.	20.	0.51	2.13	4.93
HYDROGRAPH AT	S19CNB	10.	4.63	4.	1.	0.	0.02		
DIVERSION TO	19CN.2	10.	0.00	4.	1.	0.	0.02		
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02		
2 COMBINED AT	CP19CN	1025.	4.93	224.	57.	20.	0.53		

*** NORMAL END OF HEC-1 ***

APPENDIX G

PHASE 1 DRAINAGE SYSTEM
50-YEAR, 6-HOUR STORM
FILE: P1-50-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 1, SINGLE RETENTION BASIN AT CAMELBACK ROAD
  9       ID   50-YEAR 6 HOUR STORM
 10       ID
 11       ID   THIS IS BASELINE FILE 25ATL2 MODIFIED FOR AUGUST 2003 PHASE I ANALYSIS
 12       ID
 13       ID   FILE NAME: P1-50-1.6I
 14       ID   ****************************************************
 15       ID
 16       ID   Project ID: 24TH & CAMELBACK
 17       IT       2                   2000
 18       IO       5
          *DIAGRAM
          *
 19       ID   ****************************************************
 20       ID   FLOWS ALONG 23RD AVE
 21       ID   ****************************************************
 22       ID

 23       KK  SB23DU
 24       KM   SUB-BASIN SB23DU
 25       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 26       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 27       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 28       BA    .179
 29       IN      15
 30       KM   RAINFALL DEPTH OF 2.68 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 31       PB   2.591
 32       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 33       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 34       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 35       PC    .949    .962    .975    .988   1.000
 36       LG    .100    .250   4.300    .366  80.000
 37       UC    .363    .144
 38       UA       0       5      16      30      65      77      84      90      94      97
 39       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0       13   10000
          *  DQ      0       13      13
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	234.	4.10	43.	11.	4.	0.18		
ROUTED TO	RT23DU	231.	4.17	43.	11.	4.	0.18	0.87	4.17
HYDROGRAPH AT	SB23BU	221.	4.17	40.	10.	4.	0.22		
2 COMBINED AT	CP23BU	452.	4.17	82.	21.	7.	0.40		
ROUTED TO	RT23BU	451.	4.23	82.	21.	7.	0.40	1.31	4.23
HYDROGRAPH AT	SB23RO	117.	4.17	23.	6.	2.	0.10		
DIVERSION TO	DV23RO	110.	4.17	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	117.	4.17	14.	3.	1.	0.10		
2 COMBINED AT	CP23RO	565.	4.23	96.	24.	9.	0.50		
ROUTED TO	RT23RO	564.	4.27	96.	24.	9.	0.50	2.19	4.27
HYDROGRAPH AT	SB23NO	59.	4.10	11.	3.	1.	0.04		
DIVERSION TO	RB23NO	51.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	59.	4.10	7.	2.	1.	0.04		
2 COMBINED AT	CP23NO	615.	4.23	103.	26.	9.	0.55		
DIVERSION TO	DI23NO	380.	4.23	72.	18.	7.	0.55		
HYDROGRAPH AT	DV23NO	234.	4.23	30.	8.	3.	0.55		
ROUTED TO	RT23NO	233.	4.33	30.	8.	3.	0.55	0.87	4.33
HYDROGRAPH AT	SB23OR	124.	4.23	25.	6.	2.	0.12		
2 COMBINED AT	CP23OR	354.	4.33	56.	14.	5.	0.67		
DIVERSION TO	DI23OR	89.	4.33	14.	4.	1.	0.67		
HYDROGRAPH AT	DV23OR	266.	4.33	42.	11.	4.	0.67		
ROUTED TO	RT23OR	265.	4.37	42.	11.	4.	0.67	0.93	4.37
HYDROGRAPH AT	SB23DM	65.	4.13	11.	3.	1.	0.06		
2 COMBINED AT	CP23DM	318.	4.37	53.	13.	5.	0.73		
DIVERSION TO	DI23DM	159.	4.37	27.	7.	2.	0.73		
HYDROGRAPH AT	DV23DM	159.	4.37	27.	7.	2.	0.73		

ROUTED TO	RT23DM	157.	4.43	27.	7.	2.	0.73	0.81	4.43
HYDROGRAPH AT	SB22GL	17.	4.33	4.	1.	0.	0.03		
ROUTED TO	RT22GL	17.	4.53	4.	1.	0.	0.03	0.22	4.53
HYDROGRAPH AT	SB23GL	64.	4.13	11.	3.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.13	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	55.	4.13	7.	2.	1.	0.06		
3 COMBINED AT	CP23GL	215.	4.40	38.	9.	3.	0.81		
ROUTED TO	RT23GL	211.	4.53	38.	9.	3.	0.81	0.57	4.53
HYDROGRAPH AT	SB23MA	134.	4.23	27.	7.	2.	0.15		
DIVERSION TO	23MA.2	10.	4.23	7.	2.	1.	0.15		
HYDROGRAPH AT	23MA.1	124.	4.23	20.	5.	2.	0.15		
2 COMBINED AT	CP23MA	314.	4.47	57.	14.	5.	0.96		
ROUTED TO	RT23MA	312.	4.53	57.	14.	5.	0.96	1.08	4.53
HYDROGRAPH AT	SB23BE	90.	4.30	19.	5.	2.	0.12		
DIVERSION TO	23BE.2	22.	4.30	10.	3.	1.	0.12		
HYDROGRAPH AT	23BE.1	68.	4.30	9.	2.	1.	0.12		
2 COMBINED AT	CP23BE	368.	4.50	67.	17.	6.	1.07		
ROUTED TO	RT23BE	366.	4.60	66.	17.	6.	1.07	1.42	4.60
HYDROGRAPH AT	SB23MI	64.	4.53	18.	5.	2.	0.12		
2 COMBINED AT	CP23MI	429.	4.60	84.	21.	8.	1.19		
DIVERSION TO	DI23MI	172.	4.60	34.	9.	3.	1.19		
HYDROGRAPH AT	DV23MI	257.	4.60	51.	13.	5.	1.19		
ROUTED TO	RT23MI	256.	4.63	51.	13.	5.	1.19	1.05	4.63
HYDROGRAPH AT	S23COA	8.	4.33	2.	1.	0.	0.01		
HYDROGRAPH AT	S23COB	35.	4.43	10.	3.	1.	0.05		
3 COMBINED AT	23CO.1	295.	4.63	62.	16.	6.	1.25		
DIVERSION TO	DI23CO	148.	4.63	31.	8.	3.	1.25		
HYDROGRAPH AT	DV23CO	148.	4.63	31.	8.	3.	1.25		
ROUTED TO	RT23CO	147.	4.67	31.	8.	3.	1.25	0.78	4.67
HYDROGRAPH AT	S23CAA	8.	4.27	2.	0.	0.	0.01		

DIVERSION TO	23AA.2	8.	0.00	2.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	147.	4.67	31.	8.	3.	1.26		
DIVERSION TO	RBA.2	147.	0.00	31.	8.	3.	1.26		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.26		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.26	0.00	6.53
HYDROGRAPH AT	S23CAB	4.	4.07	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	4.	4.07	1.	0.	0.	1.26		
DIVERSION TO	DI23CA	4.	0.00	1.	0.	0.	1.26		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.26		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.26	0.00	4.23
HYDROGRAPH AT	RE24CA	4.	4.07	1.	0.	0.	0.00		
ROUTED TO	RD24CA	3.	4.20	1.	0.	0.	0.00	0.05	4.20
HYDROGRAPH AT	SB24CA	45.	4.27	10.	3.	1.	0.05		
2 COMBINED AT	CP24CA	48.	4.27	11.	3.	1.	0.05		
DIVERSION TO	RBC.2	48.	0.00	11.	3.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.37
HYDROGRAPH AT	SB23CP	177.	4.20	35.	9.	3.	0.16		
DIVERSION TO	23CP.2	4.	4.20	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	173.	4.20	31.	8.	3.	0.16		
3 COMBINED AT	CP23CP	173.	4.20	31.	8.	3.	1.47		
ROUTED TO	RT23CP	171.	4.33	31.	8.	3.	1.47	0.85	4.33
HYDROGRAPH AT	SB23IN	185.	4.23	38.	9.	3.	0.17		
DIVERSION TO	23IN.2	4.	4.23	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	181.	4.23	34.	8.	3.	0.17		
2 COMBINED AT	CP23IN	349.	4.27	65.	16.	6.	1.64		
HYDROGRAPH AT	SB21DU	64.	4.40	16.	4.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.40	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	51.	4.40	9.	2.	1.	0.09		

ROUTED TO	RT21DU	50.	4.60	9.	2.	1.	0.09	0.41	4.60
HYDROGRAPH AT	SB21BU	117.	4.23	23.	6.	2.	0.13		
2 COMBINED AT	CP21BU	154.	4.37	32.	8.	3.	0.22		
DIVERSION TO	DI21BU	154.	0.00	32.	8.	3.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	117.	4.23	24.	6.	2.	0.13		
HYDROGRAPH AT	RE21OR	89.	4.33	14.	4.	1.	0.00		
ROUTED TO	RD21OR	86.	4.47	14.	4.	1.	0.00	0.46	4.47
2 COMBINED AT	CP21OR	193.	4.40	38.	9.	3.	0.13		
DIVERSION TO	DI21OR	97.	4.40	19.	5.	2.	0.13		
HYDROGRAPH AT	DV21OR	97.	4.40	19.	5.	2.	0.13		
ROUTED TO	RT21OR	97.	4.47	19.	5.	2.	0.13	0.70	4.47
HYDROGRAPH AT	SB21MY	49.	4.40	12.	3.	1.	0.07		
HYDROGRAPH AT	RE21MY	159.	4.37	27.	7.	2.	0.00		
ROUTED TO	RD21MY	157.	4.47	27.	7.	2.	0.00	0.75	4.47
3 COMBINED AT	CP21MY	302.	4.47	57.	14.	5.	0.19		
DIVERSION TO	DI21MY	151.	4.47	29.	7.	3.	0.19		
HYDROGRAPH AT	DV21MY	151.	4.47	29.	7.	3.	0.19		
ROUTED TO	RT21MY	150.	4.53	29.	7.	3.	0.19	0.80	4.53
HYDROGRAPH AT	SB21GL	32.	4.30	7.	2.	1.	0.04		
2 COMBINED AT	CP21GL	179.	4.50	35.	9.	3.	0.23		
DIVERSION TO	DI21GL	154.	4.50	33.	8.	3.	0.23		
HYDROGRAPH AT	DV21GL	25.	4.50	3.	1.	0.	0.23		
ROUTED TO	RT21GL	24.	4.70	3.	1.	0.	0.23	0.30	4.70
HYDROGRAPH AT	SB21MA	142.	4.20	26.	7.	2.	0.16		
2 COMBINED AT	CP21MA	142.	4.20	29.	7.	3.	0.39		
ROUTED TO	RT21MA	140.	4.33	29.	7.	3.	0.39	0.78	4.33
HYDROGRAPH AT	SB21BE	170.	4.23	33.	8.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.23	6.	1.	1.	0.18		
HYDROGRAPH AT	21BE.1	164.	4.23	27.	7.	2.	0.18		

2 COMBINED AT	CP21BE	302.	4.27	56.	14.	5.	0.57		
ROUTED TO	RT21BE	301.	4.30	56.	14.	5.	0.57	1.09	4.30
HYDROGRAPH AT	SB21MO	31.	4.57	10.	3.	1.	0.07		
2 COMBINED AT	CP21MO	329.	4.33	66.	17.	6.	0.64		
ROUTED TO	RT21MO	328.	4.37	66.	17.	6.	0.64	1.32	4.37
HYDROGRAPH AT	SB21MI	54.	4.40	12.	3.	1.	0.09		
HYDROGRAPH AT	RE21MI	172.	4.60	34.	9.	3.	0.00		
ROUTED TO	RD21MI	170.	4.70	34.	9.	3.	0.00	0.65	4.70
3 COMBINED AT	CP21MI	513.	4.50	112.	28.	10.	0.73		
ROUTED TO	RT21MI	512.	4.57	112.	28.	10.	0.73	1.68	4.57
HYDROGRAPH AT	S21CAA	36.	4.40	9.	2.	1.	0.05		
HYDROGRAPH AT	S22CAA	35.	4.37	8.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.37	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	25.	4.37	4.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	148.	4.63	31.	8.	3.	0.00		
ROUTED TO	RD22CA	138.	4.87	31.	8.	3.	0.00	0.58	4.87
HYDROGRAPH AT	RBA.2	147.	4.67	31.	8.	3.	0.00		
5 COMBINED AT	DBA-1	806.	4.67	187.	48.	17.	0.83		
HYDROGRAPH AT	RBC.2	48.	4.27	11.	3.	1.	0.00		
HYDROGRAPH AT	S22CAB	11.	4.03	2.	0.	0.	0.01		
HYDROGRAPH AT	S21CAC	6.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	60.	4.20	14.	4.	1.	0.01		
2 COMBINED AT	DBA-3	844.	4.67	200.	51.	18.	0.84		
DIVERSION TO	SD36	844.	0.00	200.	51.	18.	0.84		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.84		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.84		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.84		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.84	0.00	5.10
HYDROGRAPH AT	S21CAB	96.	4.40	23.	6.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.40	10.	3.	1.	0.12		

HYDROGRAPH AT	21CA.1	78.	4.40	13.	3.	1.	0.12		
2 COMBINED AT	CP21CA	78.	4.40	13.	3.	1.	0.96		
ROUTED TO	RT21CA	77.	4.53	13.	3.	1.	0.96	0.62	4.53
HYDROGRAPH AT	SB21CP	129.	4.37	30.	8.	3.	0.14		
DIVERSION TO	21CP.2	15.	4.37	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	114.	4.37	21.	5.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	187.	4.43	34.	9.	3.	1.10		
DIVERSION TO	DI21CP	93.	4.43	17.	4.	2.	1.10		
HYDROGRAPH AT	DV21CP	93.	4.43	17.	4.	2.	1.10		
ROUTED TO	RT21CP	93.	4.50	17.	4.	2.	1.10	0.60	4.50
HYDROGRAPH AT	S21CNA	19.	4.13	4.	1.	0.	0.02		
2 COMBINED AT	S19.1	107.	4.43	21.	5.	2.	1.12		
ROUTED TO	S19.2	107.	4.47	21.	5.	2.	1.12		
HYDROGRAPH AT	S19CNA	12.	4.63	4.	1.	0.	0.02		
HYDROGRAPH AT	SBX	19.	4.37	4.	1.	0.	0.02		
3 COMBINED AT	BASN_X	137.	4.47	29.	7.	3.	1.16		
DIVERSION TO	SD42	137.	0.00	29.	7.	3.	1.16		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.16		
HYDROGRAPH AT	S21CNB	27.	4.13	5.	1.	0.	0.03		
DIVERSION TO	SD44	7.	4.13	3.	1.	0.	0.03		
HYDROGRAPH AT	SD43	19.	4.13	2.	1.	0.	0.03		
HYDROGRAPH AT	SB19DU	15.	4.33	4.	1.	0.	0.02		
ROUTED TO	RT19DU	13.	4.93	4.	1.	0.	0.02	0.08	4.93
HYDROGRAPH AT	SB19NO	35.	4.23	8.	2.	1.	0.04		
DIVERSION TO	19NO.2	35.	0.00	8.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	380.	4.23	72.	18.	7.	0.00		
ROUTED TO	RD19NO	374.	4.37	72.	18.	7.	0.00	0.99	4.37

3 COMBINED AT	CP19NO	381.	4.37	76.	19.	7.	0.05		
ROUTED TO	RT19NO	368.	4.50	76.	19.	7.	0.05	0.81	4.50
HYDROGRAPH AT	SB19OR	90.	4.40	26.	7.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.40	16.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	60.	4.40	10.	2.	1.	0.10		
HYDROGRAPH AT	RE19OR	97.	4.40	19.	5.	2.	0.00		
ROUTED TO	RD19OR	94.	4.50	19.	5.	2.	0.00	0.43	4.50
3 COMBINED AT	CP19OR	521.	4.50	105.	27.	10.	0.16		
ROUTED TO	RT19OR	515.	4.53	105.	27.	10.	0.16	0.98	4.53
HYDROGRAPH AT	SB19MY	32.	4.33	7.	2.	1.	0.05		
DIVERSION TO	19MY.2	32.	0.00	7.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	151.	4.47	29.	7.	3.	0.00		
ROUTED TO	RD19MY	148.	4.57	28.	7.	3.	0.00	0.73	4.57
3 COMBINED AT	CP19MY	662.	4.57	133.	34.	12.	0.20		
ROUTED TO	RT19MY	658.	4.60	133.	34.	12.	0.20	1.36	4.60
HYDROGRAPH AT	SB19GL	42.	4.40	11.	3.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.40	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	27.	4.40	4.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	154.	4.50	33.	8.	3.	0.00		
ROUTED TO	RD19GL	151.	4.60	33.	8.	3.	0.00	0.73	4.60
3 COMBINED AT	CP19GL	833.	4.60	169.	43.	15.	0.26		
ROUTED TO	RT19GL	810.	4.67	169.	43.	15.	0.26	1.18	4.67
HYDROGRAPH AT	SB19MA	42.	4.33	11.	3.	1.	0.05		
DIVERSION TO	19MA.2	35.	4.33	10.	3.	1.	0.05		
HYDROGRAPH AT	19MA.1	7.	4.33	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	810.	4.67	170.	43.	16.	0.31		
ROUTED TO	RT19MA	800.	4.77	169.	43.	16.	0.31	1.25	4.77
HYDROGRAPH AT	SB19BE	41.	4.37	11.	3.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.37	10.	3.	1.	0.06		

HYDROGRAPH AT	19BE.1	11.	4.37	1.	0.	0.	0.06		
2 COMBINED AT	CP19BE	801.	4.77	170.	43.	16.	0.37		
ROUTED TO	RT19BE	791.	4.83	170.	43.	16.	0.37	1.24	4.83
HYDROGRAPH AT	SB19MI	52.	4.37	12.	3.	1.	0.08		
DIVERSION TO	19MI.2	52.	0.00	12.	3.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	791.	4.83	170.	43.	16.	0.44		
ROUTED TO	RT19MI	777.	4.93	170.	43.	16.	0.44	1.33	4.93
HYDROGRAPH AT	SB19CA	4.	4.63	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	4.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	777.	4.93	170.	43.	16.	0.45		
ROUTED TO	RT19CA	767.	5.00	170.	43.	16.	0.45	1.15	5.00
HYDROGRAPH AT	SB19CP	49.	4.33	12.	3.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.33	10.	3.	1.	0.06		
HYDROGRAPH AT	19CP.1	19.	4.33	2.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	93.	4.43	17.	4.	2.	0.00		
ROUTED TO	RD19CP	93.	4.53	17.	4.	2.	0.00	0.48	4.53
3 COMBINED AT	CP19CP	831.	5.00	189.	48.	17.	0.51		
ROUTED TO	RT19CP	829.	5.03	189.	48.	17.	0.51	1.88	5.03
HYDROGRAPH AT	S19CNB	8.	4.67	3.	1.	0.	0.02		
DIVERSION TO	19CN.2	8.	0.00	3.	1.	0.	0.02		
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02		
2 COMBINED AT	CP19CN	829.	5.03	189.	48.	17.	0.53		

*** NORMAL END OF HEC-1 ***

APPENDIX H

PHASE 1 DRAINAGE SYSTEM
10-YEAR, 6-HOUR STORM
FILE: P1-10-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 1, SINGLE RETENTION BASIN AT CAMELBACK ROAD
  9       ID   2-YEAR 6 HOUR STORM
 10       ID
 11       ID   THIS IS BASELINE FILE 25ATL2 MODIFIED FOR AUGUST 2003 PHASE I ANALYSIS
 12       ID
 13       ID   FILE NAME: P1-2-1.6I
 14       ID   ****************************************************
 15       ID
 16       ID   Project ID: 24TH & CAMELBACK
 17       IT       2                   2000
 18       IO       5
          *DIAGRAM
          *
 19       ID   ****************************************************
 20       ID   FLOWS ALONG 23RD AVE
 21       ID   ****************************************************
 22       ID

 23       KK  SB23DU
 24       KM   SUB-BASIN SB23DU
 25       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 26       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 27       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 28       BA    .179
 29       IN      15
 30       KM   RAINFALL DEPTH OF 1.20 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 31       PB   1.160
 32       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 33       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 34       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 35       PC    .949    .962    .975    .988   1.000
 36       LG    .100    .250   4.300    .366  80.000
 37       UC    .529    .220
 38       UA       0       5      16      30      65      77      84      90      94      97
 39       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	82.	4.17	18.	4.	2.	0.18		
ROUTED TO	RT23DU	81.	4.30	18.	4.	2.	0.18	0.52	4.30
HYDROGRAPH AT	SB23BU	46.	4.43	13.	3.	1.	0.22		
2 COMBINED AT	CP23BU	126.	4.33	30.	8.	3.	0.40		
ROUTED TO	RT23BU	126.	4.43	30.	8.	3.	0.40	0.68	4.43
HYDROGRAPH AT	SB23RO	37.	4.33	9.	2.	1.	0.10		
DIVERSION TO	DV23RO	37.	0.00	9.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	0.	0.00	0.	0.	0.	0.10		
2 COMBINED AT	CP23RO	126.	4.43	30.	8.	3.	0.50		
ROUTED TO	RT23RO	125.	4.50	30.	8.	3.	0.50	0.96	4.50
HYDROGRAPH AT	SB23NO	23.	4.20	5.	1.	0.	0.04		
DIVERSION TO	RB23NO	23.	5.07	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	5.	5.07	0.	0.	0.	0.04		
2 COMBINED AT	CP23NO	125.	4.50	31.	8.	3.	0.55		
DIVERSION TO	DI23NO	93.	4.50	26.	7.	2.	0.55		
HYDROGRAPH AT	DV23NO	31.	4.50	5.	1.	0.	0.55		
ROUTED TO	RT23NO	31.	4.70	5.	1.	0.	0.55	0.32	4.70
HYDROGRAPH AT	SB23OR	31.	4.50	9.	2.	1.	0.12		
2 COMBINED AT	CP23OR	60.	4.63	13.	3.	1.	0.67		
DIVERSION TO	DI23OR	15.	4.63	3.	1.	0.	0.67		
HYDROGRAPH AT	DV23OR	45.	4.63	10.	3.	1.	0.67		
ROUTED TO	RT23OR	44.	4.77	10.	3.	1.	0.67	0.39	4.77
HYDROGRAPH AT	SB23DM	17.	4.33	4.	1.	0.	0.06		
2 COMBINED AT	CP23DM	56.	4.70	14.	3.	1.	0.73		
DIVERSION TO	DI23DM	28.	4.70	7.	2.	1.	0.73		
HYDROGRAPH AT	DV23DM	28.	4.70	7.	2.	1.	0.73		

ROUTED TO	RT23DM	27.	4.83	7.	2.	1.	0.73	0.34	4.83
HYDROGRAPH AT	SB22GL	2.	4.70	1.	0.	0.	0.03		
ROUTED TO	RT22GL	2.	4.93	1.	0.	0.	0.03	0.03	4.97
HYDROGRAPH AT	SB23GL	15.	4.37	3.	1.	0.	0.06		
DIVERSION TO	23GL.2	9.	4.37	3.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	7.	4.37	1.	0.	0.	0.06		
3 COMBINED AT	CP23GL	31.	4.77	8.	2.	1.	0.81		
ROUTED TO	RT23GL	30.	5.07	8.	2.	1.	0.81	0.18	5.07
HYDROGRAPH AT	SB23MA	27.	4.57	8.	2.	1.	0.15		
DIVERSION TO	23MA.2	10.	4.57	5.	1.	1.	0.15		
HYDROGRAPH AT	23MA.1	17.	4.57	3.	1.	0.	0.15		
2 COMBINED AT	CP23MA	41.	4.90	11.	3.	1.	0.96		
ROUTED TO	RT23MA	41.	5.10	11.	3.	1.	0.96	0.39	5.10
HYDROGRAPH AT	SB23BE	17.	4.63	6.	2.	1.	0.12		
DIVERSION TO	23BE.2	17.	0.00	6.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	0.	0.00	0.	0.	0.	0.12		
2 COMBINED AT	CP23BE	41.	5.10	11.	3.	1.	1.07		
ROUTED TO	RT23BE	40.	5.30	11.	3.	1.	1.07	0.47	5.30
HYDROGRAPH AT	SB23MI	11.	4.97	5.	1.	0.	0.12		
2 COMBINED AT	CP23MI	51.	5.30	16.	4.	2.	1.19		
DIVERSION TO	DI23MI	20.	5.30	6.	2.	1.	1.19		
HYDROGRAPH AT	DV23MI	30.	5.30	10.	3.	1.	1.19		
ROUTED TO	RT23MI	30.	5.43	10.	3.	1.	1.19	0.36	5.43
HYDROGRAPH AT	S23COA	1.	4.63	1.	0.	0.	0.01		
HYDROGRAPH AT	S23COB	8.	4.73	3.	1.	0.	0.05		
3 COMBINED AT	23CO.1	37.	5.40	14.	4.	1.	1.25		
DIVERSION TO	DI23CO	19.	5.40	7.	2.	1.	1.25		
HYDROGRAPH AT	DV23CO	19.	5.40	7.	2.	1.	1.25		
ROUTED TO	RT23CO	19.	5.50	7.	2.	1.	1.25	0.28	5.50
HYDROGRAPH AT	S23CAA	2.	4.43	1.	0.	0.	0.01		

DIVERSION TO	23AA.2	2.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	19.	5.50	7.	2.	1.	1.26		
DIVERSION TO	RBA.2	19.	0.00	7.	2.	1.	1.26		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.26		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.26	0.00	5.97
HYDROGRAPH AT	S23CAB	1.	4.17	0.	0.	0.	0.00		
2 COMBINED AT	CP23CA	1.	4.17	0.	0.	0.	1.26		
DIVERSION TO	DI23CA	1.	0.00	0.	0.	0.	1.26		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.26		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.26	0.00	5.07
HYDROGRAPH AT	RE24CA	1.	4.17	0.	0.	0.	0.00		
ROUTED TO	RD24CA	1.	4.33	0.	0.	0.	0.00	0.02	4.33
HYDROGRAPH AT	SB24CA	12.	4.53	4.	1.	0.	0.05		
2 COMBINED AT	CP24CA	13.	4.50	4.	1.	0.	0.05		
DIVERSION TO	RBC.2	13.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.90
HYDROGRAPH AT	SB23CP	53.	4.40	13.	3.	1.	0.16		
DIVERSION TO	23CP.2	4.	4.40	3.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	49.	4.40	10.	2.	1.	0.16		
3 COMBINED AT	CP23CP	49.	4.40	10.	2.	1.	1.47		
ROUTED TO	RT23CP	48.	4.60	10.	2.	1.	1.47	0.47	4.60
HYDROGRAPH AT	SB23IN	53.	4.47	14.	3.	1.	0.17		
DIVERSION TO	23IN.2	4.	4.47	3.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	49.	4.47	10.	3.	1.	0.17		
2 COMBINED AT	CP23IN	96.	4.57	20.	5.	2.	1.64		
HYDROGRAPH AT	SB21DU	14.	4.73	5.	1.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.73	5.	1.	1.	0.09		
HYDROGRAPH AT	21DU.1	1.	4.73	0.	0.	0.	0.09		

ROUTED TO	RT21DU	1.	5.10	0.	0.	0.	0.09	0.01	5.10
HYDROGRAPH AT	SB21BU	23.	4.53	7.	2.	1.	0.13		
2 COMBINED AT	CP21BU	23.	4.53	7.	2.	1.	0.22		
DIVERSION TO	DI21BU	23.	0.00	7.	2.	1.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	24.	4.57	7.	2.	1.	0.13		
HYDROGRAPH AT	RE21OR	15.	4.63	3.	1.	0.	0.00		
ROUTED TO	RD21OR	14.	4.90	3.	1.	0.	0.00	0.13	4.90
2 COMBINED AT	CP21OR	36.	4.77	11.	3.	1.	0.13		
DIVERSION TO	DI21OR	18.	4.77	5.	1.	0.	0.13		
HYDROGRAPH AT	DV21OR	18.	4.77	5.	1.	0.	0.13		
ROUTED TO	RT21OR	18.	4.90	5.	1.	0.	0.13	0.30	4.90
HYDROGRAPH AT	SB21MY	8.	4.73	3.	1.	0.	0.07		
HYDROGRAPH AT	RE21MY	28.	4.70	7.	2.	1.	0.00		
ROUTED TO	RD21MY	27.	4.93	7.	2.	1.	0.00	0.28	4.93
3 COMBINED AT	CP21MY	53.	4.90	15.	4.	1.	0.19		
DIVERSION TO	DI21MY	26.	4.90	8.	2.	1.	0.19		
HYDROGRAPH AT	DV21MY	26.	4.90	8.	2.	1.	0.19		
ROUTED TO	RT21MY	26.	5.03	8.	2.	1.	0.19	0.34	5.03
HYDROGRAPH AT	SB21GL	5.	4.60	2.	1.	0.	0.04		
2 COMBINED AT	CP21GL	31.	5.00	9.	2.	1.	0.23		
DIVERSION TO	DI21GL	31.	0.00	9.	2.	1.	0.23		
HYDROGRAPH AT	DV21GL	0.	0.00	0.	0.	0.	0.23		
ROUTED TO	RT21GL	0.	0.00	0.	0.	0.	0.23		
HYDROGRAPH AT	SB21MA	26.	4.50	8.	2.	1.	0.16		
2 COMBINED AT	CP21MA	26.	4.50	8.	2.	1.	0.39		
ROUTED TO	RT21MA	26.	4.73	8.	2.	1.	0.39	0.33	4.73
HYDROGRAPH AT	SB21BE	36.	4.53	11.	3.	1.	0.18		
DIVERSION TO	21BE.2	6.	4.53	4.	1.	0.	0.18		
HYDROGRAPH AT	21BE.1	30.	4.53	6.	2.	1.	0.18		

2 COMBINED AT	CP21BE	55.	4.60	14.	4.	1.	0.57		
ROUTED TO	RT21BE	54.	4.67	14.	4.	1.	0.57	0.47	4.67
HYDROGRAPH AT	SB21MO	5.	5.03	3.	1.	0.	0.07		
2 COMBINED AT	CP21MO	59.	4.70	17.	4.	2.	0.64		
ROUTED TO	RT21MO	59.	4.77	17.	4.	2.	0.64	0.54	4.77
HYDROGRAPH AT	SB21MI	7.	4.90	3.	1.	0.	0.09		
HYDROGRAPH AT	RE21MI	20.	5.30	6.	2.	1.	0.00		
ROUTED TO	RD21MI	20.	5.57	6.	2.	1.	0.00	0.19	5.57
3 COMBINED AT	CP21MI	72.	5.00	26.	7.	2.	0.73		
ROUTED TO	RT21MI	72.	5.13	26.	7.	2.	0.73	0.60	5.13
HYDROGRAPH AT	S21CAA	7.	4.73	3.	1.	0.	0.05		
HYDROGRAPH AT	S22CAA	7.	4.67	3.	1.	0.	0.05		
DIVERSION TO	SD34	7.	0.00	3.	1.	0.	0.05		
HYDROGRAPH AT	SD33	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE22CA	19.	5.40	7.	2.	1.	0.00		
ROUTED TO	RD22CA	17.	6.03	7.	2.	1.	0.00	0.16	6.03
HYDROGRAPH AT	RBA.2	19.	5.50	7.	2.	1.	0.00		
5 COMBINED AT	DBA-1	104.	5.37	43.	11.	4.	0.83		
HYDROGRAPH AT	RBC.2	13.	4.50	4.	1.	0.	0.00		
HYDROGRAPH AT	S22CAB	4.	4.07	1.	0.	0.	0.01		
HYDROGRAPH AT	S21CAC	2.	4.07	0.	0.	0.	0.00		
3 COMBINED AT	DBA-2	17.	4.30	5.	1.	0.	0.01		
2 COMBINED AT	DBA-3	112.	5.30	48.	13.	5.	0.84		
DIVERSION TO	SD36	112.	0.00	48.	13.	5.	0.84		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.84		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.84		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.84		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.84	0.00	5.93
HYDROGRAPH AT	S21CAB	20.	4.70	7.	2.	1.	0.12		
DIVERSION TO	21CA.2	18.	4.70	7.	2.	1.	0.12		

HYDROGRAPH AT	21CA.1	2.	4.70	0.	0.	0.	0.12		
2 COMBINED AT	CP21CA	2.	4.70	0.	0.	0.	0.96		
ROUTED TO	RT21CA	2.	5.17	0.	0.	0.	0.96	0.04	5.17
HYDROGRAPH AT	SB21CP	31.	4.67	10.	3.	1.	0.14		
DIVERSION TO	21CP.2	15.	4.67	7.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	16.	4.67	2.	1.	0.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	16.	4.67	3.	1.	0.	1.10		
DIVERSION TO	DI21CP	8.	4.67	1.	0.	0.	1.10		
HYDROGRAPH AT	DV21CP	8.	4.67	1.	0.	0.	1.10		
ROUTED TO	RT21CP	8.	4.83	1.	0.	0.	1.10	0.15	4.83
HYDROGRAPH AT	S21CNA	5.	4.33	1.	0.	0.	0.02		
2 COMBINED AT	S19.1	11.	4.70	3.	1.	0.	1.12		
ROUTED TO	S19.2	11.	4.77	3.	1.	0.	1.12		
HYDROGRAPH AT	S19CNA	3.	5.00	1.	0.	0.	0.02		
HYDROGRAPH AT	SBX	5.	4.67	1.	0.	0.	0.02		
3 COMBINED AT	BASN_X	19.	4.77	5.	1.	1.	1.16		
DIVERSION TO	SD42	19.	0.00	5.	1.	1.	1.16		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.16		
HYDROGRAPH AT	S21CNB	6.	4.37	2.	0.	0.	0.03		
DIVERSION TO	SD44	6.	0.00	2.	0.	0.	0.03		
HYDROGRAPH AT	SD43	0.	0.00	0.	0.	0.	0.03		
HYDROGRAPH AT	SB19DU	5.	4.47	2.	0.	0.	0.02		
ROUTED TO	RT19DU	4.	5.13	2.	0.	0.	0.02	0.03	5.13
HYDROGRAPH AT	SB19NO	11.	4.40	3.	1.	0.	0.04		
DIVERSION TO	19NO.2	11.	0.00	3.	1.	0.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	93.	4.50	26.	7.	2.	0.00		
ROUTED TO	RD19NO	91.	4.70	26.	7.	2.	0.00	0.47	4.70

3 COMBINED AT	CP19NO	94.	4.73	28.	7.	3.	0.05		
ROUTED TO	RT19NO	89.	4.97	28.	7.	3.	0.05	0.38	4.97
HYDROGRAPH AT	SB19OR	29.	4.63	10.	3.	1.	0.10		
DIVERSION TO	19OR.2	29.	0.00	10.	3.	1.	0.10		
HYDROGRAPH AT	19OR.1	0.	0.00	0.	0.	0.	0.10		
HYDROGRAPH AT	RE19OR	18.	4.77	5.	1.	0.	0.00		
ROUTED TO	RD19OR	17.	4.97	5.	1.	0.	0.00	0.14	4.97
3 COMBINED AT	CP19OR	106.	4.97	33.	8.	3.	0.16		
ROUTED TO	RT19OR	104.	5.07	33.	8.	3.	0.16	0.42	5.07
HYDROGRAPH AT	SB19MY	5.	4.70	2.	1.	0.	0.05		
DIVERSION TO	19MY.2	5.	0.00	2.	1.	0.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	26.	4.90	8.	2.	1.	0.00		
ROUTED TO	RD19MY	26.	5.10	8.	2.	1.	0.00	0.27	5.10
3 COMBINED AT	CP19MY	130.	5.10	40.	10.	4.	0.20		
ROUTED TO	RT19MY	129.	5.20	40.	10.	4.	0.20	0.56	5.20
HYDROGRAPH AT	SB19GL	10.	4.67	4.	1.	0.	0.05		
DIVERSION TO	19GL.2	10.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19GL.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19GL	31.	5.00	9.	2.	1.	0.00		
ROUTED TO	RD19GL	30.	5.20	9.	2.	1.	0.00	0.30	5.20
3 COMBINED AT	CP19GL	159.	5.20	50.	13.	5.	0.26		
ROUTED TO	RT19GL	153.	5.33	50.	13.	5.	0.26	0.48	5.33
HYDROGRAPH AT	SB19MA	11.	4.57	4.	1.	0.	0.05		
DIVERSION TO	19MA.2	11.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	153.	5.33	50.	13.	5.	0.31		
ROUTED TO	RT19MA	150.	5.50	50.	13.	5.	0.31	0.51	5.50
HYDROGRAPH AT	SB19BE	10.	4.67	4.	1.	0.	0.06		
DIVERSION TO	19BE.2	10.	0.00	4.	1.	0.	0.06		

HYDROGRAPH AT	19BE.1	0.	0.00	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	150.	5.50	50.	13.	5.	0.37		
ROUTED TO	RT19BE	147.	5.67	50.	13.	5.	0.37	0.50	5.67
HYDROGRAPH AT	SB19MI	9.	4.73	4.	1.	0.	0.08		
DIVERSION TO	19MI.2	9.	0.00	4.	1.	0.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	147.	5.67	50.	13.	5.	0.44		
ROUTED TO	RT19MI	142.	5.87	49.	13.	5.	0.44	0.53	5.87
HYDROGRAPH AT	SB19CA	1.	5.33	1.	0.	0.	0.01		
DIVERSION TO	19CA.2	1.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	142.	5.87	49.	13.	5.	0.45		
ROUTED TO	RT19CA	139.	6.03	49.	13.	5.	0.45	0.46	6.03
HYDROGRAPH AT	SB19CP	13.	4.57	4.	1.	0.	0.06		
DIVERSION TO	19CP.2	13.	0.00	4.	1.	0.	0.06		
HYDROGRAPH AT	19CP.1	0.	0.00	0.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	8.	4.67	1.	0.	0.	0.00		
ROUTED TO	RD19CP	8.	4.93	1.	0.	0.	0.00	0.07	4.93
3 COMBINED AT	CP19CP	139.	6.03	51.	13.	5.	0.51		
ROUTED TO	RT19CP	138.	6.10	51.	13.	5.	0.51	0.70	6.10
HYDROGRAPH AT	S19CNB	2.	5.03	1.	0.	0.	0.02		
DIVERSION TO	19CN.2	2.	0.00	1.	0.	0.	0.02		
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02		
2 COMBINED AT	CP19CN	138.	6.10	51.	13.	5.	0.53		

*** NORMAL END OF HEC-1 ***

APPENDIX I

PHASE 1 DRAINAGE SYSTEM
2-YEAR, 6-HOUR STORM
FILE: P1-2-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 1, SINGLE RETENTION BASIN AT CAMELBACK ROAD
  9       ID   10-YEAR 6 HOUR STORM
 10       ID
 11       ID   THIS IS BASELINE FILE 25ATL2 MODIFIED FOR AUGUST 2003 PHASE I ANALYSIS
 12       ID
 13       ID   FILE NAME: P1-10-1.6I
 14       ID   ****************************************************
 15       ID
 16       ID   Project ID: 24TH & CAMELBACK
 17       IT       2                   2000
 18       IO       5
          *DIAGRAM
          *
 19       ID   ****************************************************
 20       ID   FLOWS ALONG 23RD AVE
 21       ID   ****************************************************
 22       ID

 23       KK  SB23DU
 24       KM   SUB-BASIN SB23DU
 25       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 26       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 27       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 28       BA    .179
 29       IN      15
 30       KM   RAINFALL DEPTH OF 1.94 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 31       PB   1.875
 32       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 33       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 34       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 35       PC    .949    .962    .975    .988   1.000
 36       LG    .100    .250   4.300    .366  80.000
 37       UC    .421    .170
 38       UA       0       5      16      30      65      77      84      90      94      97
 39       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	156.	4.13	30.	8.	3.	0.18		
ROUTED TO	RT23DU	154.	4.20	30.	8.	3.	0.18	0.71	4.20
HYDROGRAPH AT	SB23BU	125.	4.27	25.	6.	2.	0.22		
2 COMBINED AT	CP23BU	278.	4.23	55.	14.	5.	0.40		
ROUTED TO	RT23BU	277.	4.30	55.	14.	5.	0.40	1.01	4.30
HYDROGRAPH AT	SB23RO	76.	4.20	16.	4.	1.	0.10		
DIVERSION TO	DV23RO	76.	4.43	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	68.	4.43	7.	2.	1.	0.10		
2 COMBINED AT	CP23RO	328.	4.43	62.	16.	6.	0.50		
ROUTED TO	RT23RO	318.	4.50	62.	16.	6.	0.50	1.59	4.50
HYDROGRAPH AT	SB23NO	43.	4.10	8.	2.	1.	0.04		
DIVERSION TO	RB23NO	43.	4.17	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	41.	4.17	4.	1.	0.	0.04		
2 COMBINED AT	CP23NO	340.	4.50	65.	16.	6.	0.55		
DIVERSION TO	DI23NO	219.	4.50	49.	12.	4.	0.55		
HYDROGRAPH AT	DV23NO	120.	4.50	16.	4.	1.	0.55		
ROUTED TO	RT23NO	115.	4.60	16.	4.	1.	0.55	0.61	4.60
HYDROGRAPH AT	SB23OR	76.	4.30	17.	4.	2.	0.12		
2 COMBINED AT	CP23OR	180.	4.43	33.	8.	3.	0.67		
DIVERSION TO	DI23OR	45.	4.43	8.	2.	1.	0.67		
HYDROGRAPH AT	DV23OR	135.	4.43	25.	6.	2.	0.67		
ROUTED TO	RT23OR	134.	4.50	25.	6.	2.	0.67	0.67	4.50
HYDROGRAPH AT	SB23DM	41.	4.17	7.	2.	1.	0.06		
2 COMBINED AT	CP23DM	165.	4.47	32.	8.	3.	0.73		
DIVERSION TO	DI23DM	83.	4.47	16.	4.	1.	0.73		
HYDROGRAPH AT	DV23DM	83.	4.47	16.	4.	1.	0.73		

ROUTED TO	RT23DM	82.	4.53	16.	4.	1.	0.73	0.59	4.53
HYDROGRAPH AT	SB22GL	9.	4.43	2.	1.	0.	0.03		
ROUTED TO	RT22GL	8.	4.67	2.	1.	0.	0.03	0.11	4.67
HYDROGRAPH AT	SB23GL	39.	4.20	7.	2.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.20	3.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	31.	4.20	4.	1.	0.	0.06		
3 COMBINED AT	CP23GL	110.	4.50	22.	6.	2.	0.81		
ROUTED TO	RT23GL	107.	4.70	22.	6.	2.	0.81	0.39	4.70
HYDROGRAPH AT	SB23MA	74.	4.33	17.	4.	2.	0.15		
DIVERSION TO	23MA.2	10.	4.33	6.	2.	1.	0.15		
HYDROGRAPH AT	23MA.1	64.	4.33	11.	3.	1.	0.15		
2 COMBINED AT	CP23MA	157.	4.60	33.	8.	3.	0.96		
ROUTED TO	RT23MA	155.	4.70	33.	8.	3.	0.96	0.75	4.70
HYDROGRAPH AT	SB23BE	47.	4.40	12.	3.	1.	0.12		
DIVERSION TO	23BE.2	22.	4.40	9.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	25.	4.40	3.	1.	0.	0.12		
2 COMBINED AT	CP23BE	174.	4.67	36.	9.	3.	1.07		
ROUTED TO	RT23BE	173.	4.77	36.	9.	3.	1.07	0.95	4.77
HYDROGRAPH AT	SB23MI	29.	4.70	11.	3.	1.	0.12		
2 COMBINED AT	CP23MI	202.	4.77	46.	12.	4.	1.19		
DIVERSION TO	DI23MI	81.	4.77	19.	5.	2.	1.19		
HYDROGRAPH AT	DV23MI	121.	4.77	28.	7.	3.	1.19		
ROUTED TO	RT23MI	121.	4.83	28.	7.	3.	1.19	0.71	4.83
HYDROGRAPH AT	S23COA	4.	4.43	1.	0.	0.	0.01		
HYDROGRAPH AT	S23COB	21.	4.53	7.	2.	1.	0.05		
3 COMBINED AT	23CO.1	143.	4.80	36.	9.	3.	1.25		
DIVERSION TO	DI23CO	71.	4.80	18.	5.	2.	1.25		
HYDROGRAPH AT	DV23CO	71.	4.80	18.	5.	2.	1.25		
ROUTED TO	RT23CO	71.	4.87	18.	5.	2.	1.25	0.55	4.87
HYDROGRAPH AT	S23CAA	5.	4.33	1.	0.	0.	0.01		

DIVERSION TO	23AA.2	5.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	71.	4.87	18.	5.	2.	1.26		
DIVERSION TO	RBA.2	71.	0.00	18.	5.	2.	1.26		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.26		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.26	0.00	4.73
HYDROGRAPH AT	S23CAB	2.	4.10	0.	0.	0.	0.00		
2 COMBINED AT	CP23CA	2.	4.10	0.	0.	0.	1.26		
DIVERSION TO	DI23CA	2.	0.00	0.	0.	0.	1.26		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.26		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.26	0.00	4.77
HYDROGRAPH AT	RE24CA	2.	4.10	0.	0.	0.	0.00		
ROUTED TO	RD24CA	2.	4.23	0.	0.	0.	0.00	0.03	4.23
HYDROGRAPH AT	SB24CA	27.	4.37	7.	2.	1.	0.05		
2 COMBINED AT	CP24CA	29.	4.37	8.	2.	1.	0.05		
DIVERSION TO	RBC.2	29.	0.00	8.	2.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	5.37
HYDROGRAPH AT	SB23CP	114.	4.27	24.	6.	2.	0.16		
DIVERSION TO	23CP.2	4.	4.27	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	110.	4.27	20.	5.	2.	0.16		
3 COMBINED AT	CP23CP	110.	4.27	20.	5.	2.	1.47		
ROUTED TO	RT23CP	108.	4.40	20.	5.	2.	1.47	0.68	4.40
HYDROGRAPH AT	SB23IN	118.	4.30	25.	6.	2.	0.17		
DIVERSION TO	23IN.2	4.	4.30	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	114.	4.30	22.	5.	2.	0.17		
2 COMBINED AT	CP23IN	220.	4.37	42.	10.	4.	1.64		
HYDROGRAPH AT	SB21DU	34.	4.53	10.	3.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.53	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	21.	4.53	3.	1.	0.	0.09		

ROUTED TO	RT21DU	20.	4.73	3.	1.	0.	0.09	0.26	4.73
HYDROGRAPH AT	SB21BU	66.	4.33	15.	4.	1.	0.13		
2 COMBINED AT	CP21BU	76.	4.53	18.	5.	2.	0.22		
DIVERSION TO	DI21BU	76.	0.00	18.	5.	2.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	68.	4.33	15.	4.	1.	0.13		
HYDROGRAPH AT	RE21OR	45.	4.43	8.	2.	1.	0.00		
ROUTED TO	RD21OR	44.	4.63	8.	2.	1.	0.00	0.30	4.63
2 COMBINED AT	CP21OR	106.	4.50	24.	6.	2.	0.13		
DIVERSION TO	DI21OR	53.	4.50	12.	3.	1.	0.13		
HYDROGRAPH AT	DV21OR	53.	4.50	12.	3.	1.	0.13		
ROUTED TO	RT21OR	53.	4.57	12.	3.	1.	0.13	0.52	4.57
HYDROGRAPH AT	SB21MY	27.	4.47	7.	2.	1.	0.07		
HYDROGRAPH AT	RE21MY	83.	4.47	16.	4.	1.	0.00		
ROUTED TO	RD21MY	82.	4.63	16.	4.	1.	0.00	0.53	4.63
3 COMBINED AT	CP21MY	161.	4.60	35.	9.	3.	0.19		
DIVERSION TO	DI21MY	80.	4.60	18.	4.	2.	0.19		
HYDROGRAPH AT	DV21MY	80.	4.60	18.	4.	2.	0.19		
ROUTED TO	RT21MY	80.	4.67	18.	4.	2.	0.19	0.59	4.67
HYDROGRAPH AT	SB21GL	18.	4.37	4.	1.	0.	0.04		
2 COMBINED AT	CP21GL	95.	4.63	22.	6.	2.	0.23		
DIVERSION TO	DI21GL	89.	4.63	21.	5.	2.	0.23		
HYDROGRAPH AT	DV21GL	6.	4.63	0.	0.	0.	0.23		
ROUTED TO	RT21GL	4.	5.00	0.	0.	0.	0.23	0.09	5.00
HYDROGRAPH AT	SB21MA	77.	4.30	16.	4.	1.	0.16		
2 COMBINED AT	CP21MA	77.	4.30	17.	4.	2.	0.39		
ROUTED TO	RT21MA	77.	4.43	17.	4.	2.	0.39	0.57	4.43
HYDROGRAPH AT	SB21BE	97.	4.30	21.	5.	2.	0.18		
DIVERSION TO	21BE.2	6.	4.30	5.	1.	0.	0.18		
HYDROGRAPH AT	21BE.1	91.	4.30	16.	4.	1.	0.18		

2 COMBINED AT	CP21BE	166.	4.40	33.	8.	3.	0.57		
ROUTED TO	RT21BE	165.	4.43	33.	8.	3.	0.57	0.80	4.43
HYDROGRAPH AT	SB21MO	14.	4.80	6.	2.	1.	0.07		
2 COMBINED AT	CP21MO	177.	4.43	39.	10.	4.	0.64		
ROUTED TO	RT21MO	176.	4.50	39.	10.	4.	0.64	0.94	4.50
HYDROGRAPH AT	SB21MI	24.	4.57	7.	2.	1.	0.09		
HYDROGRAPH AT	RE21MI	81.	4.77	19.	5.	2.	0.00		
ROUTED TO	RD21MI	80.	4.90	19.	5.	2.	0.00	0.44	4.90
3 COMBINED AT	CP21MI	250.	4.67	64.	16.	6.	0.73		
ROUTED TO	RT21MI	249.	4.77	64.	16.	6.	0.73	1.14	4.77
HYDROGRAPH AT	S21CAA	20.	4.50	6.	2.	1.	0.05		
HYDROGRAPH AT	S22CAA	19.	4.43	5.	1.	0.	0.05		
DIVERSION TO	SD34	10.	4.43	4.	1.	0.	0.05		
HYDROGRAPH AT	SD33	9.	4.43	1.	0.	0.	0.05		
HYDROGRAPH AT	RE22CA	71.	4.80	18.	5.	2.	0.00		
ROUTED TO	RD22CA	64.	5.20	18.	5.	2.	0.00	0.38	5.20
HYDROGRAPH AT	RBA.2	71.	4.87	18.	5.	2.	0.00		
5 COMBINED AT	DBA-1	379.	4.87	106.	27.	10.	0.83		
HYDROGRAPH AT	RBC.2	29.	4.37	8.	2.	1.	0.00		
HYDROGRAPH AT	S22CAB	8.	4.03	1.	0.	0.	0.01		
HYDROGRAPH AT	S21CAC	4.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	37.	4.27	10.	2.	1.	0.01		
2 COMBINED AT	DBA-3	400.	4.87	116.	30.	11.	0.84		
DIVERSION TO	SD36	400.	0.00	116.	30.	11.	0.84		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.84		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.84		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.84		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.84	0.00	5.83
HYDROGRAPH AT	S21CAB	56.	4.50	15.	4.	1.	0.12		
DIVERSION TO	21CA.2	18.	4.50	9.	2.	1.	0.12		

HYDROGRAPH AT	21CA.1	38.	4.50	6.	2.	1.	0.12		
2 COMBINED AT	CP21CA	38.	4.50	6.	2.	1.	0.96		
ROUTED TO	RT21CA	37.	4.73	6.	2.	1.	0.96	0.44	4.73
HYDROGRAPH AT	SB21CP	79.	4.47	20.	5.	2.	0.14		
DIVERSION TO	21CP.2	15.	4.47	8.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	64.	4.47	11.	3.	1.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	95.	4.57	18.	4.	2.	1.10		
DIVERSION TO	DI21CP	47.	4.57	9.	2.	1.	1.10		
HYDROGRAPH AT	DV21CP	47.	4.57	9.	2.	1.	1.10		
ROUTED TO	RT21CP	47.	4.63	9.	2.	1.	1.10	0.44	4.63
HYDROGRAPH AT	S21CNA	12.	4.17	2.	1.	0.	0.02		
2 COMBINED AT	S19.1	55.	4.60	11.	3.	1.	1.12		
ROUTED TO	S19.2	55.	4.63	11.	3.	1.	1.12		
HYDROGRAPH AT	S19CNA	7.	4.80	3.	1.	0.	0.02		
HYDROGRAPH AT	SBX	12.	4.47	3.	1.	0.	0.02		
3 COMBINED AT	BASN_X	72.	4.63	17.	4.	2.	1.16		
DIVERSION TO	SD42	72.	0.00	17.	4.	2.	1.16		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.16		
HYDROGRAPH AT	S21CNB	16.	4.20	3.	1.	0.	0.03		
DIVERSION TO	SD44	7.	4.20	2.	1.	0.	0.03		
HYDROGRAPH AT	SD43	9.	4.20	1.	0.	0.	0.03		
HYDROGRAPH AT	SB19DU	9.	4.37	3.	1.	0.	0.02		
ROUTED TO	RT19DU	9.	5.00	3.	1.	0.	0.02	0.05	5.00
HYDROGRAPH AT	SB19NO	23.	4.30	6.	1.	1.	0.04		
DIVERSION TO	19NO.2	23.	0.00	6.	1.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	219.	4.50	49.	12.	4.	0.00		
ROUTED TO	RD19NO	210.	4.63	49.	12.	4.	0.00	0.73	4.63

3 COMBINED AT	CP19NO	217.	4.63	52.	13.	5.	0.05		
ROUTED TO	RT19NO	211.	4.73	52.	13.	5.	0.05	0.60	4.73
HYDROGRAPH AT	SB19OR	58.	4.47	18.	5.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.47	14.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	28.	4.47	4.	1.	0.	0.10		
HYDROGRAPH AT	RE19OR	53.	4.50	12.	3.	1.	0.00		
ROUTED TO	RD19OR	52.	4.60	12.	3.	1.	0.00	0.30	4.60
3 COMBINED AT	CP19OR	284.	4.70	67.	17.	6.	0.16		
ROUTED TO	RT19OR	281.	4.77	67.	17.	6.	0.16	0.71	4.77
HYDROGRAPH AT	SB19MY	16.	4.47	4.	1.	0.	0.05		
DIVERSION TO	19MY.2	16.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	80.	4.60	18.	4.	2.	0.00		
ROUTED TO	RD19MY	78.	4.73	18.	4.	2.	0.00	0.52	4.73
3 COMBINED AT	CP19MY	360.	4.77	85.	22.	8.	0.20		
ROUTED TO	RT19MY	357.	4.80	85.	22.	8.	0.20	0.97	4.80
HYDROGRAPH AT	SB19GL	25.	4.50	7.	2.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.50	6.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	10.	4.50	1.	0.	0.	0.05		
HYDROGRAPH AT	RE19GL	89.	4.63	21.	5.	2.	0.00		
ROUTED TO	RD19GL	87.	4.80	21.	5.	2.	0.00	0.54	4.80
3 COMBINED AT	CP19GL	451.	4.80	107.	27.	10.	0.26		
ROUTED TO	RT19GL	437.	4.90	107.	27.	10.	0.26	0.84	4.90
HYDROGRAPH AT	SB19MA	25.	4.43	7.	2.	1.	0.05		
DIVERSION TO	19MA.2	25.	0.00	7.	2.	1.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	437.	4.90	107.	27.	10.	0.31		
ROUTED TO	RT19MA	430.	5.03	107.	27.	10.	0.31	0.89	5.03
HYDROGRAPH AT	SB19BE	24.	4.47	7.	2.	1.	0.06		
DIVERSION TO	19BE.2	24.	0.00	7.	2.	1.	0.06		

HYDROGRAPH AT	19BE.1	0.	0.00	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	430.	5.03	107.	27.	10.	0.37		
ROUTED TO	RT19BE	423.	5.13	107.	27.	10.	0.37	0.88	5.13
HYDROGRAPH AT	SB19MI	26.	4.50	7.	2.	1.	0.08		
DIVERSION TO	19MI.2	26.	0.00	7.	2.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	423.	5.13	107.	27.	10.	0.44		
ROUTED TO	RT19MI	416.	5.23	106.	27.	10.	0.44	0.94	5.23
HYDROGRAPH AT	SB19CA	3.	4.73	1.	0.	0.	0.01		
DIVERSION TO	19CA.2	3.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	416.	5.23	106.	27.	10.	0.45		
ROUTED TO	RT19CA	409.	5.33	106.	27.	10.	0.45	0.81	5.33
HYDROGRAPH AT	SB19CP	31.	4.40	8.	2.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.40	8.	2.	1.	0.06		
HYDROGRAPH AT	19CP.1	1.	4.40	0.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	47.	4.57	9.	2.	1.	0.00		
ROUTED TO	RD19CP	47.	4.70	9.	2.	1.	0.00	0.31	4.70
3 COMBINED AT	CP19CP	433.	5.33	115.	29.	11.	0.51		
ROUTED TO	RT19CP	432.	5.40	115.	29.	11.	0.51	1.30	5.40
HYDROGRAPH AT	S19CNB	5.	4.87	2.	1.	0.	0.02		
DIVERSION TO	19CN.2	5.	0.00	2.	1.	0.	0.02		
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02		
2 COMBINED AT	CP19CN	432.	5.40	115.	29.	11.	0.53		

*** NORMAL END OF HEC-1 ***

APPENDIX J

PHASE 2 DRAINAGE SYSTEM
100-YEAR, 6-HOUR STORM
FILE: P2-100-D

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*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN 09 1992              *
*            VERSION 4.0.3E             *
*                                       *
*  RUN DATE  09/17/03  TIME  17:32:12   *
*                                       *
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*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*            (916) 551-1748             *
*                                       *
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24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
PHOENIX, ARIZONA
MODELED BY PREMIER ENGINEERING
MARCH 2003, REVISED AUGUST 2003

PHASE 2, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
         NEW RETENTION BASIN AT WASHINGTON PARK FOR OPTIMAL INFLOW VOLUME
100-YEAR 6 HOUR STORM


FILE NAME: P2-100-D.6I
**********************************************************

Project ID: 24TH & CAMELBACK

IO          OUTPUT CONTROL VARIABLES
                IPRNT          5  PRINT CONTROL
                IPLOT          0  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE
            **********************************************************
            FLOWS ALONG 23RD AVE
            **********************************************************


IT          HYDROGRAPH TIME DATA
                 NMIN          2  MINUTES IN COMPUTATION INTERVAL
                IDATE      1   0  STARTING DATE
                ITIME       0000  STARTING TIME
                   NQ       2000  NUMBER OF HYDROGRAPH ORDINATES
               NDDATE      3   0  ENDING DATE
               NDTIME       1838  ENDING TIME
               ICENT         19  CENTURY MARK

          COMPUTATION INTERVAL     0.03 HOURS
              TOTAL TIME BASE    66.63 HOURS

     ENGLISH UNITS
          DRAINAGE AREA         SQUARE MILES
          PRECIPITATION DEPTH   INCHES
          LENGTH, ELEVATION     FEET
          FLOW                  CUBIC FEET PER SECOND
          STORAGE VOLUME        ACRE-FEET
          SURFACE AREA          ACRES
          TEMPERATURE           DEGREES FAHRENHEIT
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	267.	4.10	48.	12.	4.	0.18		
ROUTED TO	RT23DU	265.	4.17	48.	12.	4.	0.18	0.93	4.17
HYDROGRAPH AT	SB23BU	263.	4.17	46.	12.	4.	0.22		
2 COMBINED AT	CP23BU	528.	4.17	94.	24.	9.	0.40		
ROUTED TO	RT23BU	526.	4.20	94.	24.	9.	0.40	1.43	4.20
HYDROGRAPH AT	SB23RO	134.	4.17	27.	7.	2.	0.10		
DIVERSION TO	DV23RO	119.	4.17	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	134.	4.17	17.	4.	2.	0.10		
2 COMBINED AT	CP23RO	658.	4.20	111.	28.	10.	0.50		
ROUTED TO	RT23RO	657.	4.23	111.	28.	10.	0.50	2.39	4.23
HYDROGRAPH AT	SB23NO	67.	4.10	12.	3.	1.	0.04		
DIVERSION TO	RB23NO	53.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	67.	4.10	8.	2.	1.	0.04		
2 COMBINED AT	CP23NO	715.	4.20	119.	30.	11.	0.55		
DIVERSION TO	DI23NO	439.	4.20	83.	21.	8.	0.55		
HYDROGRAPH AT	DV23NO	276.	4.20	37.	9.	3.	0.55		
ROUTED TO	RT23NO	275.	4.30	37.	9.	3.	0.55	0.95	4.30
HYDROGRAPH AT	SB23OR	146.	4.20	29.	7.	3.	0.12		
2 COMBINED AT	CP23OR	418.	4.27	66.	17.	6.	0.67		
DIVERSION TO	DI23OR	105.	4.27	16.	4.	1.	0.67		
HYDROGRAPH AT	DV23OR	314.	4.27	49.	12.	4.	0.67		
ROUTED TO	RT23OR	312.	4.33	49.	12.	4.	0.67	1.02	4.33
HYDROGRAPH AT	SB23DM	75.	4.10	13.	3.	1.	0.06		
2 COMBINED AT	CP23DM	378.	4.30	62.	16.	6.	0.73		
DIVERSION TO	DI23DM	189.	4.30	31.	8.	3.	0.73		
HYDROGRAPH AT	DV23DM	189.	4.30	31.	8.	3.	0.73		

ROUTED TO	RT23DM	187.	4.37	31.	8.	3.	0.73	0.89	4.37
HYDROGRAPH AT	SB22GL	21.	4.30	5.	1.	0.	0.03		
ROUTED TO	RT22GL	21.	4.43	5.	1.	0.	0.03	0.25	4.43
HYDROGRAPH AT	SB23GL	74.	4.13	13.	3.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.13	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	66.	4.13	9.	2.	1.	0.06		
3 COMBINED AT	CP23GL	261.	4.33	44.	11.	4.	0.81		
ROUTED TO	RT23GL	256.	4.47	44.	11.	4.	0.81	0.63	4.47
HYDROGRAPH AT	S23MAA	111.	4.23	22.	6.	2.	0.11		
DIVERSION TO	SD12	10.	4.23	6.	2.	1.	0.11		
HYDROGRAPH AT	SD11	101.	4.23	16.	4.	1.	0.11		
HYDROGRAPH AT	S23MAB	26.	4.27	6.	1.	1.	0.03		
HYDROGRAPH AT	S21MAC	12.	4.20	1.	0.	0.	0.02		
4 COMBINED AT	CP23MA	378.	4.43	68.	17.	6.	0.96		
DIVERSION TO	DI_I	378.	0.00	68.	17.	6.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	6.23
HYDROGRAPH AT	SB23BE	109.	4.27	22.	6.	2.	0.12		
DIVERSION TO	23BE.2	22.	4.27	10.	3.	1.	0.12		
HYDROGRAPH AT	23BE.1	87.	4.27	12.	3.	1.	0.12		
2 COMBINED AT	CP23BE	87.	4.27	12.	3.	1.	1.08		
ROUTED TO	RT23BE	85.	4.47	12.	3.	1.	1.08	0.67	4.47
HYDROGRAPH AT	SB23MI	80.	4.47	21.	5.	2.	0.12		
2 COMBINED AT	CP23MI	166.	4.47	33.	8.	3.	1.20		
DIVERSION TO	DI23MI	66.	4.47	13.	3.	1.	1.20		
HYDROGRAPH AT	DV23MI	99.	4.47	20.	5.	2.	1.20		
ROUTED TO	RT23MI	98.	4.57	20.	5.	2.	1.20	0.65	4.57
HYDROGRAPH AT	S23COA	9.	4.33	2.	1.	0.	0.01		
HYDROGRAPH AT	S23COB	42.	4.40	11.	3.	1.	0.05		
3 COMBINED AT	23CO.1	147.	4.50	34.	9.	3.	1.26		

DIVERSION TO	DI23CO	74.	4.50	17.	4.	2.	1.26		
HYDROGRAPH AT	DV23CO	74.	4.50	17.	4.	2.	1.26		
ROUTED TO	RT23CO	73.	4.57	17.	4.	2.	1.26	0.56	4.57
HYDROGRAPH AT	S23CAA	9.	4.23	2.	1.	0.	0.01		
DIVERSION TO	23AA.2	9.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	73.	4.57	17.	4.	2.	1.27		
DIVERSION TO	RBA.2	73.	0.00	17.	4.	2.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	2.27
HYDROGRAPH AT	S23CAB	4.	4.07	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	4.	4.07	1.	0.	0.	1.27		
DIVERSION TO	DI23CA	4.	0.00	1.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	4.97
HYDROGRAPH AT	RE24CA	4.	4.07	1.	0.	0.	0.00		
ROUTED TO	RD24CA	4.	4.20	1.	0.	0.	0.00	0.05	4.20
HYDROGRAPH AT	SB24CA	53.	4.27	12.	3.	1.	0.05		
2 COMBINED AT	CP24CA	57.	4.23	13.	3.	1.	0.05		
DIVERSION TO	RBC.2	57.	0.00	13.	3.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.30
HYDROGRAPH AT	SB23CP	205.	4.17	40.	10.	4.	0.16		
DIVERSION TO	23CP.2	4.	4.17	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	201.	4.17	36.	9.	3.	0.16		
3 COMBINED AT	CP23CP	201.	4.17	36.	9.	3.	1.48		
ROUTED TO	RT23CP	198.	4.27	36.	9.	3.	1.48	0.92	4.27
HYDROGRAPH AT	SB23IN	215.	4.20	43.	11.	4.	0.17		
DIVERSION TO	23IN.2	4.	4.20	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	211.	4.20	39.	10.	4.	0.17		

2 COMBINED AT	CP23IN	406.	4.27	75.	19.	7.	1.65		
HYDROGRAPH AT	SB21DU	77.	4.37	19.	5.	2.	0.09		
DIVERSION TO	21DU.2	13.	4.37	8.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	64.	4.37	11.	3.	1.	0.09		
ROUTED TO	RT21DU	64.	4.50	11.	3.	1.	0.09	0.47	4.50
HYDROGRAPH AT	SB21BU	139.	4.20	27.	7.	2.	0.13		
2 COMBINED AT	CP21BU	188.	4.40	38.	9.	3.	0.22		
DIVERSION TO	DI21BU	188.	0.00	38.	9.	3.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	138.	4.20	28.	7.	2.	0.13		
HYDROGRAPH AT	RE21OR	105.	4.27	16.	4.	1.	0.00		
ROUTED TO	RD21OR	102.	4.40	16.	4.	1.	0.00	0.50	4.40
2 COMBINED AT	CP21OR	234.	4.33	44.	11.	4.	0.13		
DIVERSION TO	DI21OR	117.	4.33	22.	6.	2.	0.13		
HYDROGRAPH AT	DV21OR	117.	4.33	22.	6.	2.	0.13		
ROUTED TO	RT21OR	117.	4.40	22.	6.	2.	0.13	0.76	4.40
HYDROGRAPH AT	SB21MY	59.	4.37	14.	3.	1.	0.07		
HYDROGRAPH AT	RE21MY	189.	4.30	31.	8.	3.	0.00		
ROUTED TO	RD21MY	187.	4.43	31.	8.	3.	0.00	0.82	4.43
3 COMBINED AT	CP21MY	362.	4.40	67.	17.	6.	0.19		
DIVERSION TO	DI21MY	181.	4.40	33.	8.	3.	0.19		
HYDROGRAPH AT	DV21MY	181.	4.40	33.	8.	3.	0.19		
ROUTED TO	RT21MY	180.	4.47	33.	8.	3.	0.19	0.89	4.47
HYDROGRAPH AT	SB21GL	40.	4.23	8.	2.	1.	0.04		
2 COMBINED AT	CP21GL	216.	4.43	41.	10.	4.	0.23		
DIVERSION TO	DI21GL	184.	4.43	38.	10.	3.	0.23		
HYDROGRAPH AT	DV21GL	32.	4.43	4.	1.	0.	0.23		
ROUTED TO	RT21GL	31.	4.67	4.	1.	0.	0.23	0.34	4.67
HYDROGRAPH AT	S21MAA	151.	4.07	24.	6.	2.	0.11		
HYDROGRAPH AT	DI_I	378.	4.43	68.	17.	6.	0.00		

HYDROGRAPH AT	S21MAB	50.	4.07	7.	2.	1.	0.04		
4 COMBINED AT	BSN_I	502.	4.37	101.	26.	9.	0.38		
ROUTED TO	WASHPK	61.	5.53	22.	6.	2.	0.38	4.13	5.53
ROUTED TO	M21.1	60.	5.57	22.	6.	2.	0.38	0.49	5.57
ROUTED TO	RT21MA	60.	5.70	22.	6.	2.	0.38	0.51	5.70
HYDROGRAPH AT	SB21BE	203.	4.20	38.	10.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.20	6.	2.	1.	0.18		
HYDROGRAPH AT	21BE.1	197.	4.20	32.	8.	3.	0.18		
2 COMBINED AT	CP21BE	197.	4.20	52.	14.	5.	0.57		
ROUTED TO	RT21BE	196.	4.23	52.	14.	5.	0.57	0.87	4.23
HYDROGRAPH AT	SB21MO	40.	4.53	12.	3.	1.	0.07		
2 COMBINED AT	CP21MO	230.	4.27	64.	17.	6.	0.64		
ROUTED TO	RT21MO	229.	4.33	64.	17.	6.	0.64	1.08	4.33
HYDROGRAPH AT	SB21MI	67.	4.37	15.	4.	1.	0.09		
HYDROGRAPH AT	RE21MI	66.	4.47	13.	3.	1.	0.00		
ROUTED TO	RD21MI	65.	4.60	13.	3.	1.	0.00	0.39	4.60
3 COMBINED AT	CP21MI	349.	4.40	91.	24.	9.	0.72		
ROUTED TO	RT21MI	347.	4.50	91.	24.	9.	0.72	1.36	4.50
HYDROGRAPH AT	S21CAA	42.	4.37	11.	3.	1.	0.05		
HYDROGRAPH AT	S22CAA	42.	4.33	10.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.33	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	32.	4.33	5.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	74.	4.50	17.	4.	2.	0.00		
ROUTED TO	RD22CA	66.	4.87	17.	4.	2.	0.00	0.39	4.87
HYDROGRAPH AT	RBA.2	73.	4.57	17.	4.	2.	0.00		
5 COMBINED AT	DBA-1	530.	4.53	139.	37.	13.	0.82		
HYDROGRAPH AT	RBC.2	57.	4.23	13.	3.	1.	0.00		
HYDROGRAPH AT	S22CAB	12.	4.00	2.	1.	0.	0.01		
HYDROGRAPH AT	S21CAC	7.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	70.	4.17	16.	4.	1.	0.01		

2 COMBINED AT	DBA-3	583.	4.50	154.	41.	15.	0.83		
DIVERSION TO	SD36	583.	0.00	154.	41.	15.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	4.23
HYDROGRAPH AT	S21CAB	114.	4.37	27.	7.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.37	10.	3.	1.	0.12		
HYDROGRAPH AT	21CA.1	96.	4.37	17.	4.	2.	0.12		
2 COMBINED AT	CP21CA	96.	4.37	17.	4.	2.	0.95		
ROUTED TO	RT21CA	95.	4.50	17.	4.	2.	0.95	0.69	4.50
HYDROGRAPH AT	SB21CP	151.	4.33	34.	9.	3.	0.14		
DIVERSION TO	21CP.2	15.	4.33	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	136.	4.33	25.	6.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	227.	4.43	42.	10.	4.	1.10		
DIVERSION TO	DI21CP	113.	4.43	21.	5.	2.	1.10		
HYDROGRAPH AT	DV21CP	113.	4.43	21.	5.	2.	1.10		
ROUTED TO	RT21CP	113.	4.47	21.	5.	2.	1.10	0.66	4.47
HYDROGRAPH AT	S21CNA	22.	4.10	4.	1.	0.	0.02		
2 COMBINED AT	S19.1	129.	4.43	25.	6.	2.	1.11		
ROUTED TO	S19.2	129.	4.43	25.	6.	2.	1.11		
HYDROGRAPH AT	S19CNA	15.	4.60	5.	1.	0.	0.02		
HYDROGRAPH AT	SBX	22.	4.33	5.	1.	0.	0.02		
3 COMBINED AT	BASN_X	164.	4.43	35.	9.	3.	1.15		
DIVERSION TO	SD42	164.	0.00	35.	9.	3.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		
HYDROGRAPH AT	S21CNB	31.	4.13	6.	1.	1.	0.03		
DIVERSION TO	SD44	7.	4.13	3.	1.	0.	0.03		

HYDROGRAPH AT	SD43	24.	4.13	3.	1.	0.	0.03		
HYDROGRAPH AT	SB19DU	17.	4.30	5.	1.	0.	0.02		
ROUTED TO	RT19DU	15.	4.90	5.	1.	0.	0.02	0.09	4.90
HYDROGRAPH AT	SB19NO	41.	4.20	9.	2.	1.	0.04		
DIVERSION TO	19NO.2	36.	4.20	9.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	5.	4.20	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	439.	4.20	83.	21.	8.	0.00		
ROUTED TO	RD19NO	433.	4.33	83.	21.	8.	0.00	1.08	4.33
3 COMBINED AT	CP19NO	445.	4.33	87.	22.	8.	0.05		
ROUTED TO	RT19NO	431.	4.47	87.	22.	8.	0.05	0.89	4.47
HYDROGRAPH AT	SB19OR	105.	4.37	29.	7.	3.	0.10		
DIVERSION TO	19OR.2	30.	4.37	16.	4.	2.	0.10		
HYDROGRAPH AT	19OR.1	75.	4.37	13.	3.	1.	0.10		
HYDROGRAPH AT	RE19OR	117.	4.33	22.	6.	2.	0.00		
ROUTED TO	RD19OR	115.	4.43	22.	6.	2.	0.00	0.48	4.43
3 COMBINED AT	CP19OR	619.	4.43	122.	31.	11.	0.16		
ROUTED TO	RT19OR	613.	4.50	121.	31.	11.	0.16	1.08	4.50
HYDROGRAPH AT	SB19MY	39.	4.30	9.	2.	1.	0.05		
DIVERSION TO	19MY.2	35.	4.30	8.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	4.	4.30	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	181.	4.40	33.	8.	3.	0.00		
ROUTED TO	RD19MY	178.	4.53	33.	8.	3.	0.00	0.80	4.53
3 COMBINED AT	CP19MY	791.	4.50	155.	39.	14.	0.20		
ROUTED TO	RT19MY	787.	4.53	155.	39.	14.	0.20	1.50	4.53
HYDROGRAPH AT	SB19GL	50.	4.37	13.	3.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.37	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	35.	4.37	5.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	184.	4.43	38.	10.	3.	0.00		
ROUTED TO	RD19GL	180.	4.57	38.	10.	3.	0.00	0.80	4.57
3 COMBINED AT	CP19GL	999.	4.53	197.	50.	18.	0.26		

ROUTED TO	RT19GL	975.	4.63	197.	50.	18.	0.26	1.31	4.63
HYDROGRAPH AT	SB19MA	50.	4.30	12.	3.	1.	0.05		
DIVERSION TO	19MA.2	35.	4.30	11.	3.	1.	0.05		
HYDROGRAPH AT	19MA.1	15.	4.30	1.	0.	0.	0.05		
2 COMBINED AT	CP19MA	981.	4.60	198.	50.	18.	0.31		
ROUTED TO	RT19MA	970.	4.70	198.	50.	18.	0.31	1.39	4.70
HYDROGRAPH AT	SB19BE	50.	4.37	13.	3.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.37	11.	3.	1.	0.06		
HYDROGRAPH AT	19BE.1	20.	4.37	2.	0.	0.	0.06		
2 COMBINED AT	CP19BE	980.	4.67	200.	51.	18.	0.37		
ROUTED TO	RT19BE	968.	4.77	200.	51.	18.	0.37	1.39	4.77
HYDROGRAPH AT	SB19MI	63.	4.33	14.	4.	1.	0.08		
DIVERSION TO	19MI.2	63.	0.00	14.	4.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	968.	4.77	200.	51.	18.	0.44		
ROUTED TO	RT19MI	953.	4.83	200.	51.	18.	0.44	1.49	4.83
HYDROGRAPH AT	SB19CA	5.	4.60	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	5.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	953.	4.83	200.	51.	18.	0.45		
ROUTED TO	RT19CA	941.	4.90	200.	51.	18.	0.45	1.28	4.90
HYDROGRAPH AT	SB19CP	58.	4.30	14.	4.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.30	11.	3.	1.	0.06		
HYDROGRAPH AT	19CP.1	28.	4.30	3.	1.	0.	0.06		
HYDROGRAPH AT	RE19CP	113.	4.43	21.	5.	2.	0.00		
ROUTED TO	RD19CP	112.	4.50	21.	5.	2.	0.00	0.52	4.50
3 COMBINED AT	CP19CP	1027.	4.90	224.	57.	20.	0.51		
ROUTED TO	RT19CP	1025.	4.93	224.	57.	20.	0.51	2.13	4.93
HYDROGRAPH AT	S19CNB	10.	4.63	4.	1.	0.	0.02		
DIVERSION TO	19CN.2	10.	0.00	4.	1.	0.	0.02		

HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	1025.	4.93	224.	57.	20.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

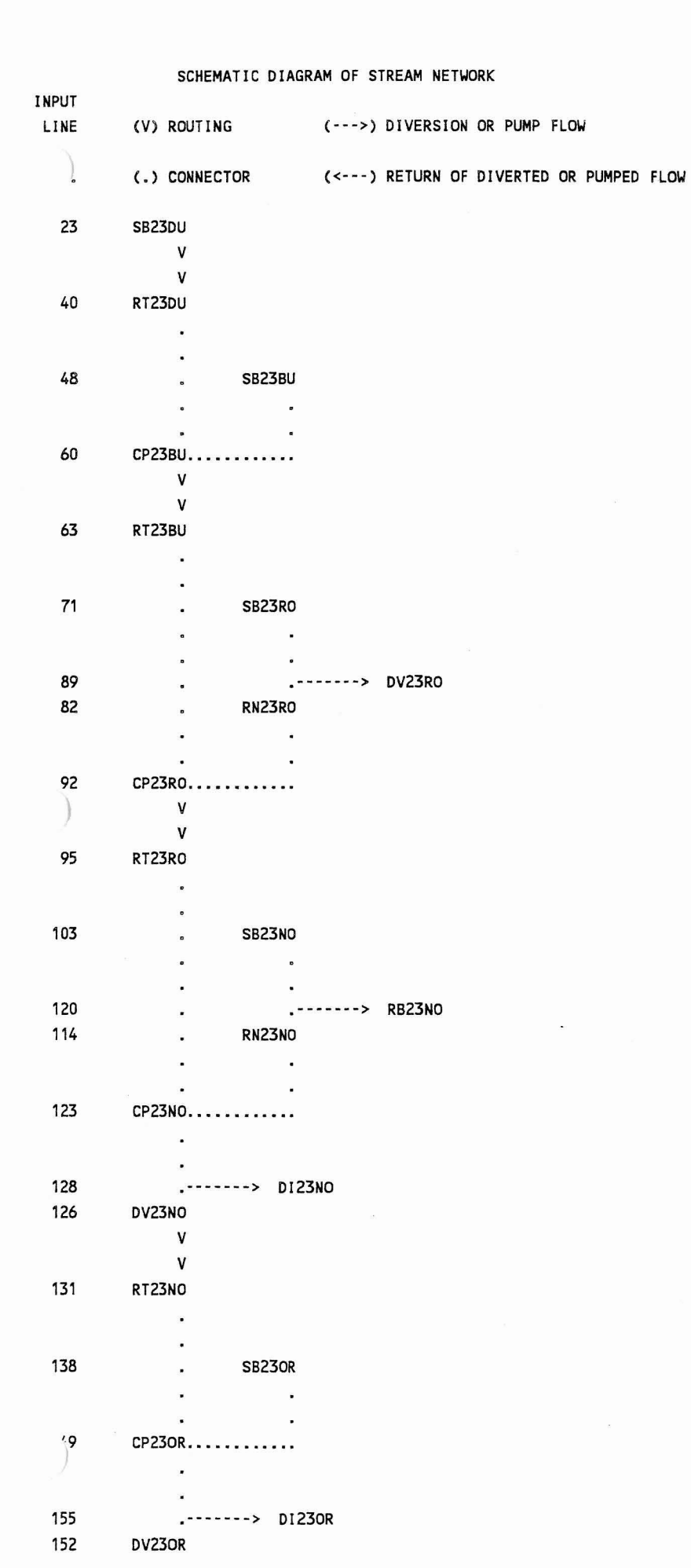
PLAN 1 .....

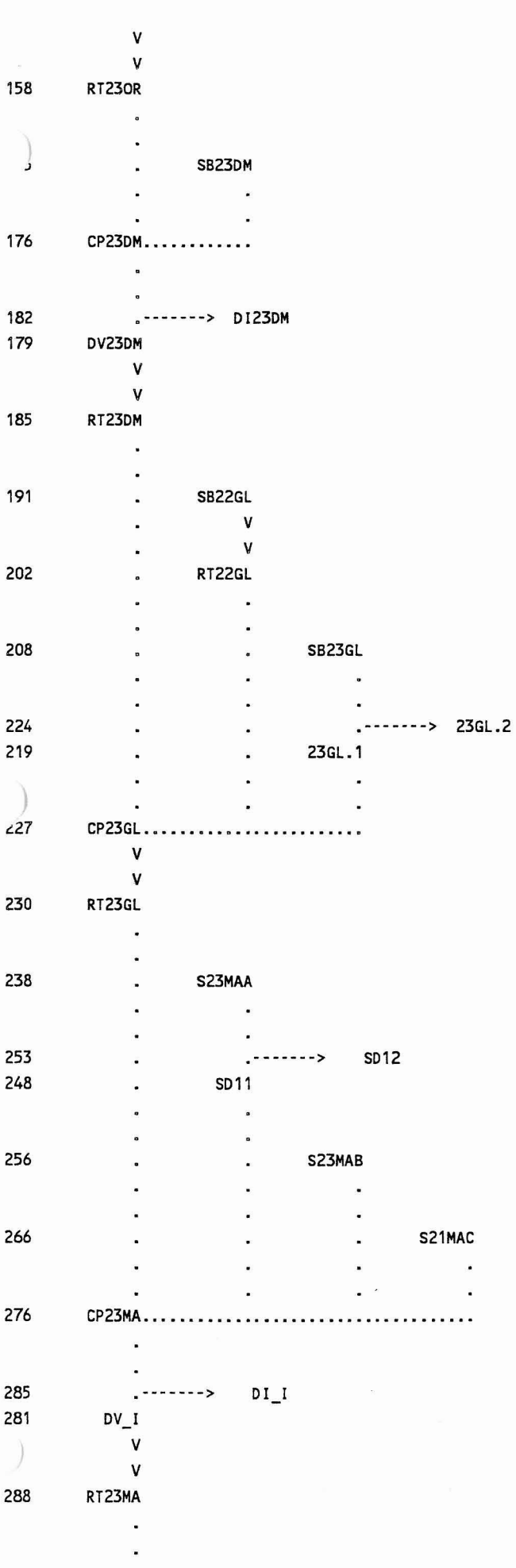
	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	3.54	11.00
STORAGE	0.	39.	121.
OUTFLOW	0.	0.	2751.

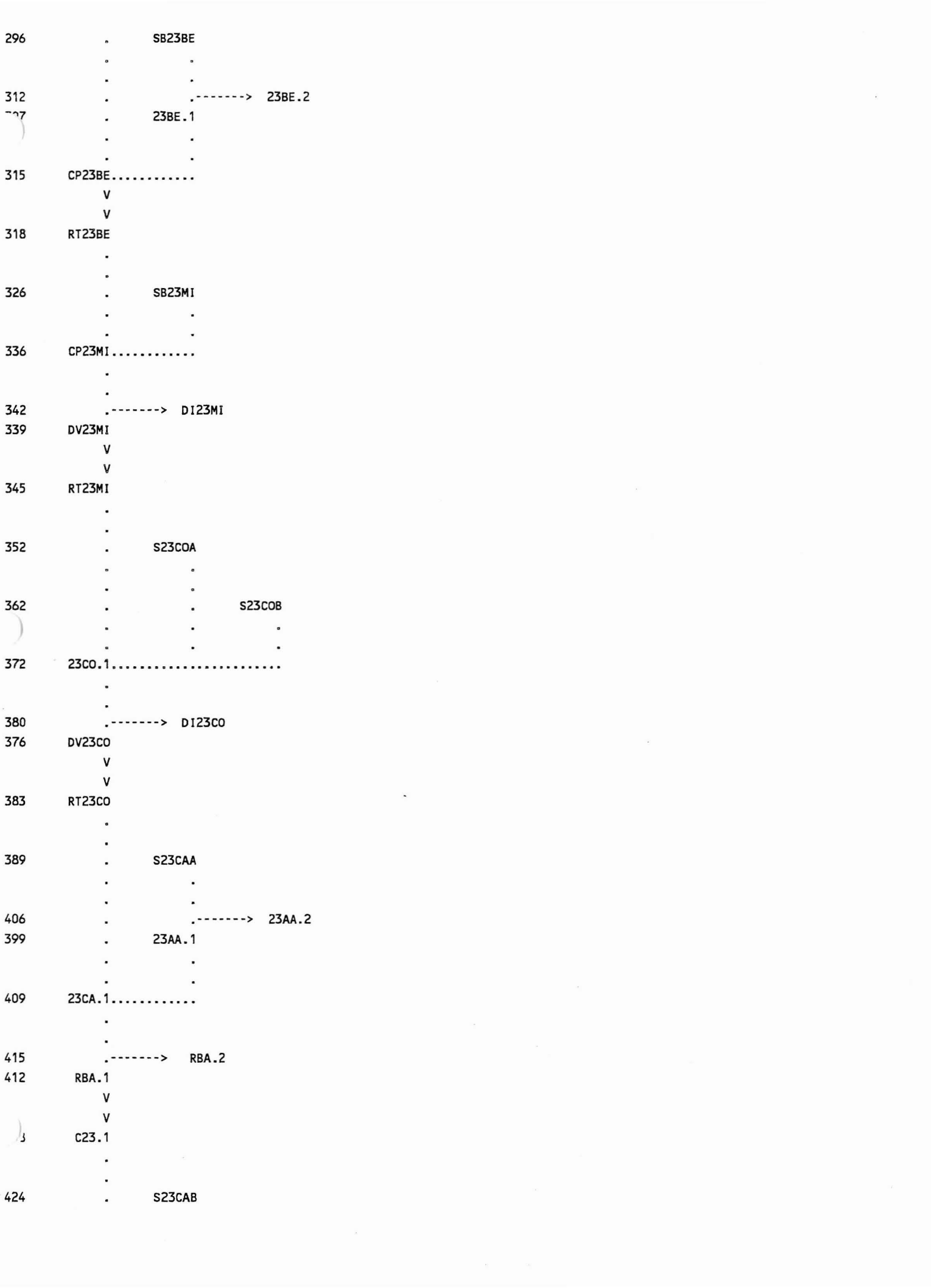
RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	4.13	0.00	45.	61.	0.00	5.53	0.00

*** NORMAL END OF HEC-1 ***

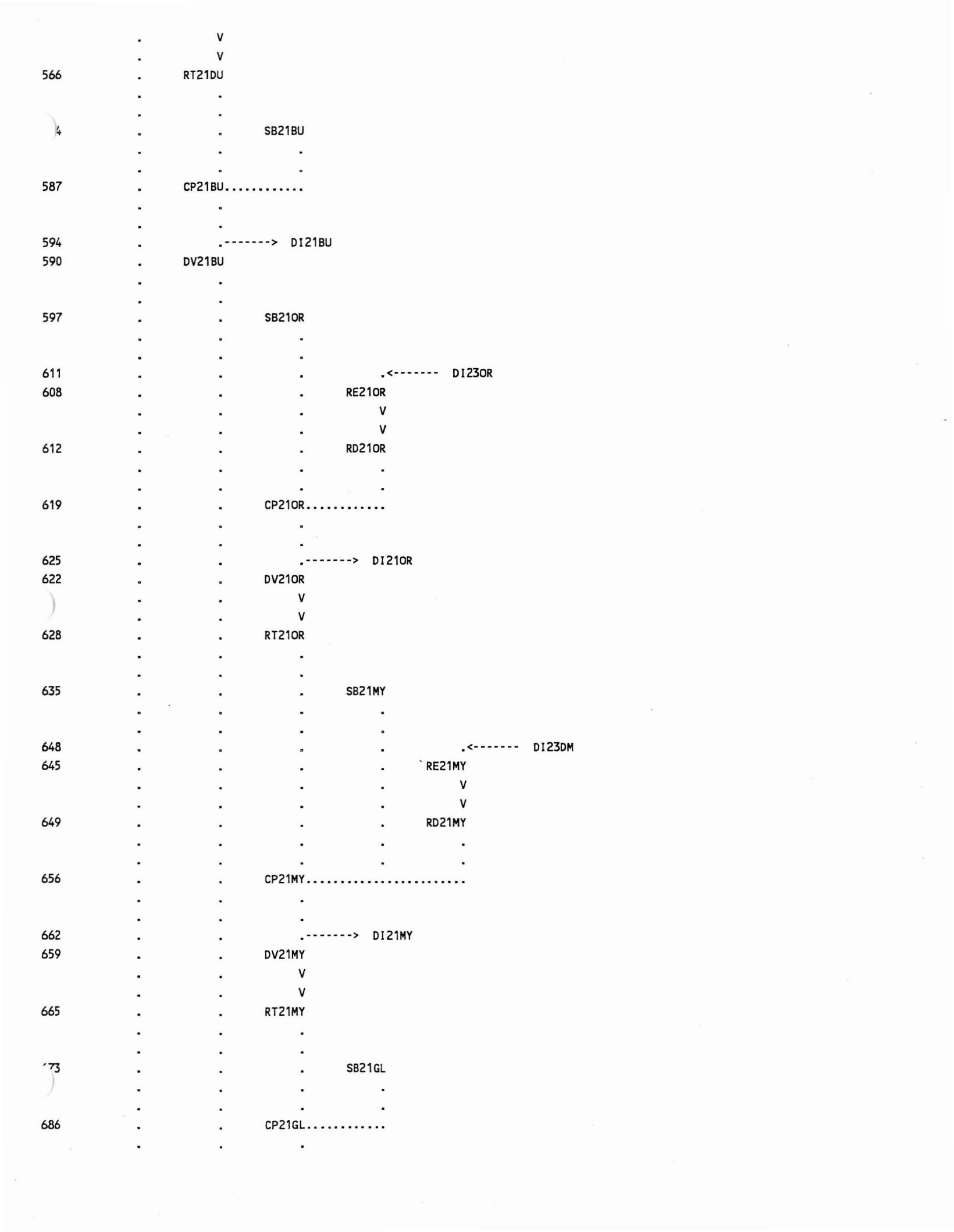
SCHEMATIC DIAGRAM OF STREAM NETWORK

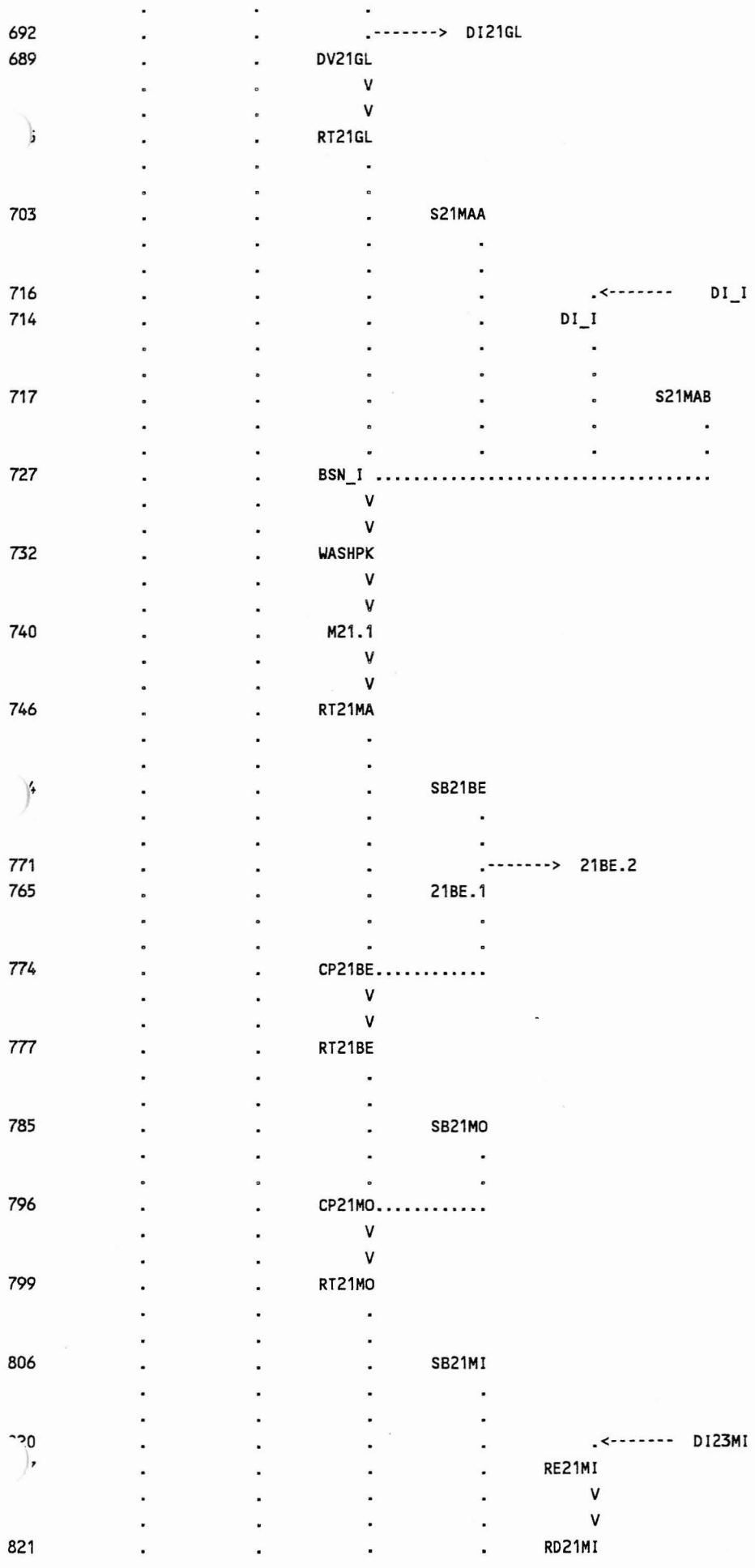


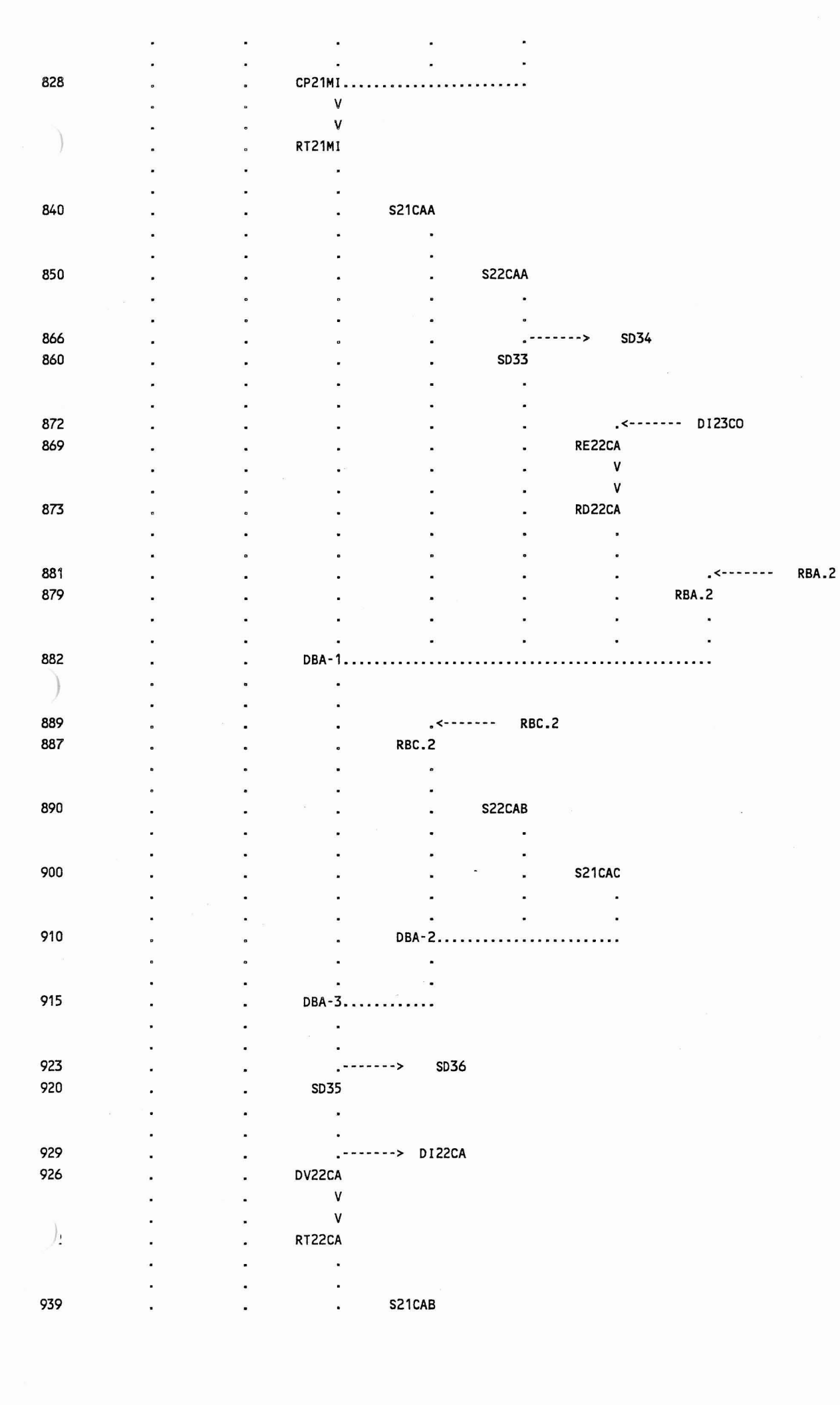

V
V
158 RT23OR
SB23DM
176 CP23DM
182 DI23DM
179 DV23DM
V
V
185 RT23DM
191 SB22GL
V
V
202 RT22GL
208 SB23GL
224 23GL.2
219 23GL.1
227 CP23GL
V
V
230 RT23GL
238 S23MAA
253 SD12
248 SD11
256 S23MAB
266 S21MAC
276 CP23MA
285 DI_I
281 DV_I
V
V
288 RT23MA

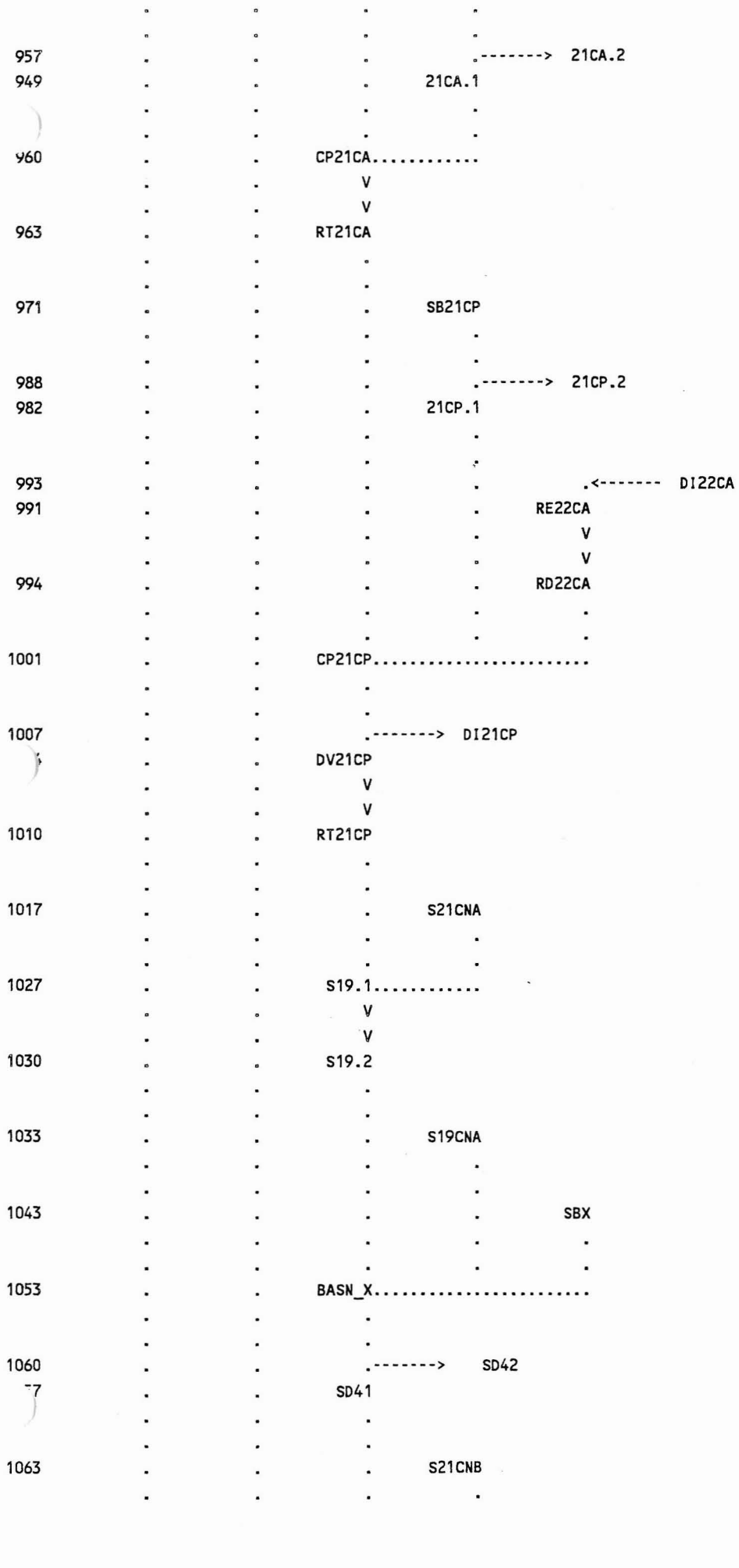

296 SB23BE
312 23BE.2
307 23BE.1
315 CP23BE
318 RT23BE
326 SB23MI
336 CP23MI
342 DI23MI
339 DV23MI
345 RT23MI
352 S23COA
362 S23COB
372 23CO.1
380 DI23CO
376 DV23CO
383 RT23CO
389 S23CAA
406 23AA.2
399 23AA.1
409 23CA.1
415 RBA.2
412 RBA.1
C23.1
424 S23CAB

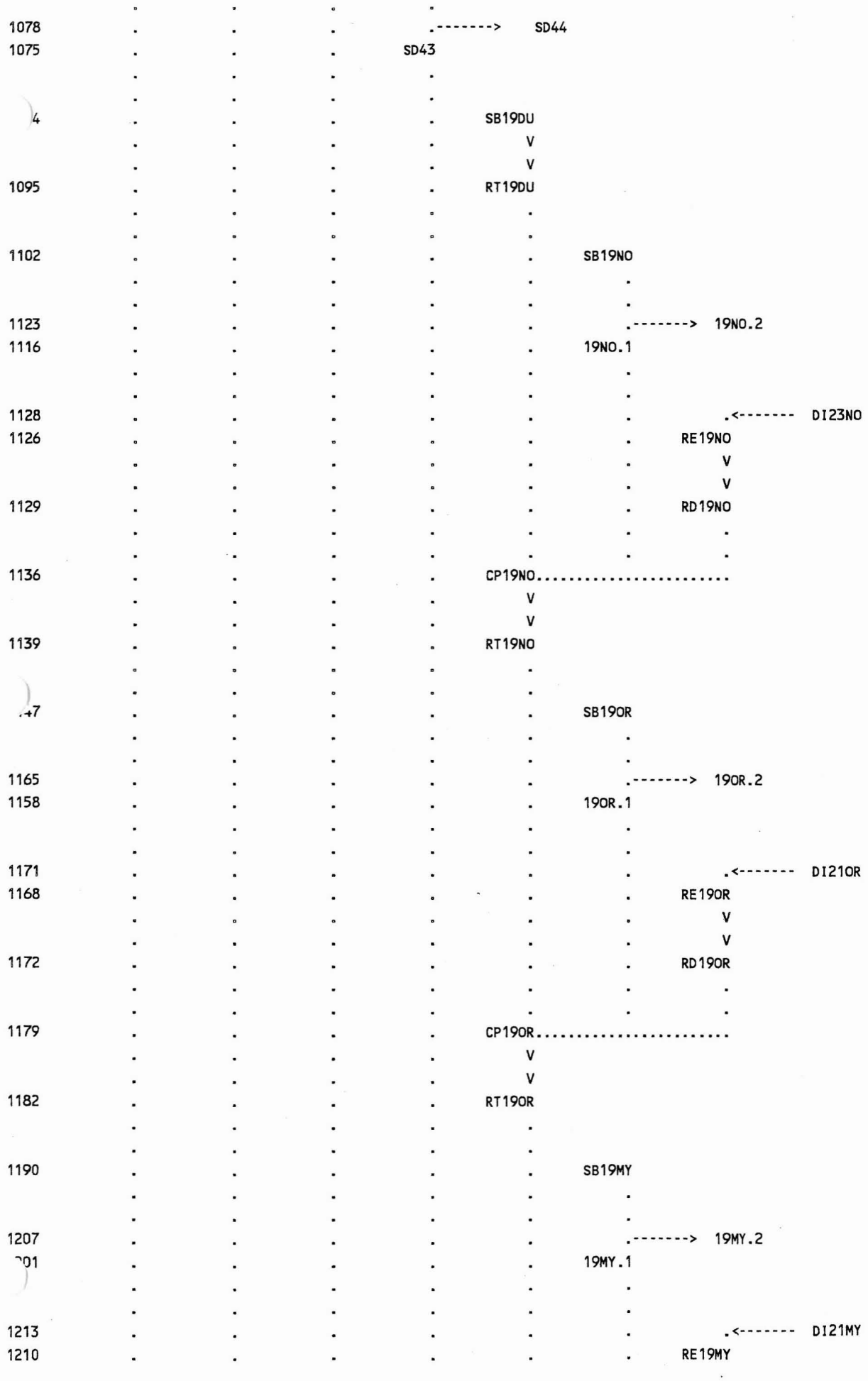
```
                .           .
                .           .
434     CP23CA.............
                .
                .
                .-------->  DI23CA
438     DV23CA
                V
                V
445     RT23CA
                .
                .
454             .           .<-------  DI23CA
452             .       RE24CA
                .           V
                .           V
455             .       RD24CA
                .           .
                .           .
461             .           .       SB24CA
                .           .           .
                .           .           .
472             .       CP24CA.............
                .           .
                .           .
481             .           .-------->   RBC.2
476             .       C.2OUT
                .           V
                .           V
484             .       RT24CA
                .           .
                .           .
491             .           .       SB23CP
                .           .           .
                .           .           .
507             .           .           .--------> 23CP.2
502             .           .       23CP.1
                .           .           .
                .           .           .
510     CP23CP.........................
                V
                V
513     RT23CP
                .
                .
520             .       SB23IN
                .           .
                .           .
536             .           .-------->  23IN.2
531             .       23IN.1
                .           .
                .           .
539     CP23IN.............
                .
                .
5               .       SB21DU
                .           .
                .           .
563             .           .-------->  21DU.2
556             .       21DU.1
```

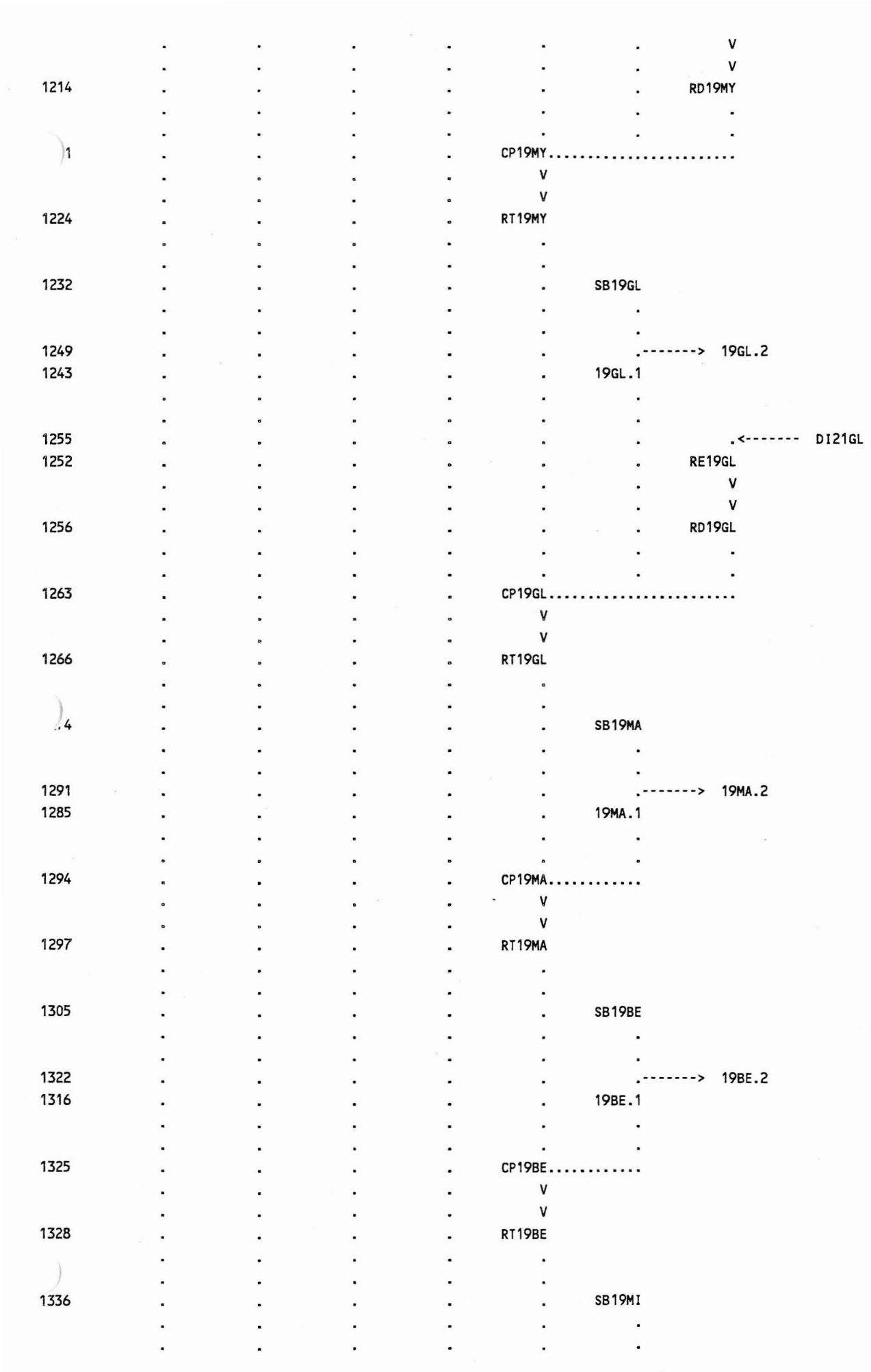

V
V
566 RT21DU
SB21BU
587 CP21BU.....
594 .-------> DI21BU
590 DV21BU
597 SB21OR
611 .<------- DI23OR
608 RE21OR
V
V
612 RD21OR
619 CP21OR.....
625 .-------> DI21OR
622 DV21OR
V
V
628 RT21OR
635 SB21MY
648 .<------- DI23DM
645 RE21MY
V
V
649 RD21MY
656 CP21MY.....
662 .-------> DI21MY
659 DV21MY
V
V
665 RT21MY
673 SB21GL
686 CP21GL.....

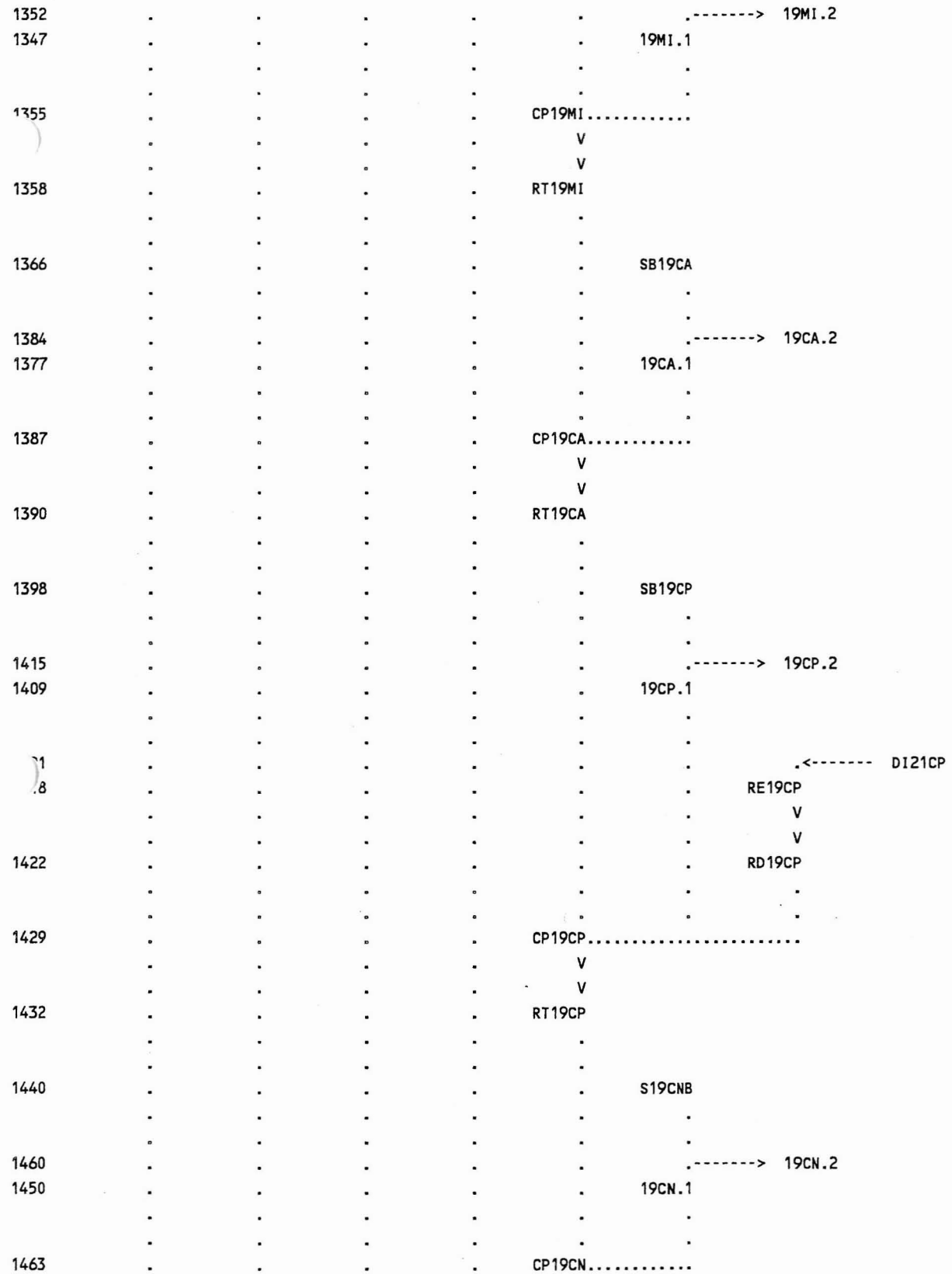

692 .-------> DI21GL
689 DV21GL
V
V
RT21GL
703 S21MAA
716 .<------- DI_I
714 DI_I
717 S21MAB
727 BSN_I .....
V
V
732 WASHPK
V
V
740 M21.1
V
V
746 RT21MA
SB21BE
771 .-------> 21BE.2
765 21BE.1
774 CP21BE.....
V
V
777 RT21BE
785 SB21MO
796 CP21MO.....
V
V
799 RT21MO
806 SB21MI
.<------- DI23MI
RE21MI
V
V
821 RD21MI


828 CP21MI
RT21MI
840 S21CAA
850 S22CAA
866 SD34
860 SD33
872 DI23CO
869 RE22CA
873 RD22CA
881 RBA.2
879 RBA.2
882 DBA-1
889 RBC.2
887 RBC.2
890 S22CAB
900 S21CAC
910 DBA-2
915 DBA-3
923 SD36
920 SD35
929 DI22CA
926 DV22CA
RT22CA
939 S21CAB


957
949 21CA.1
960 CP21CA
963 RT21CA
971 SB21CP
988 21CP.2
982 21CP.1
993 DI22CA
991 RE22CA
994 RD22CA
1001 CP21CP
1007 DI21CP
DV21CP
1010 RT21CP
1017 S21CNA
1027 S19.1
1030 S19.2
1033 S19CNA
1043 SBX
1053 BASN_X
1060 SD42
SD41
1063 S21CNB


1078
SD44
1075
SD43
SB19DU
V
V
1095
RT19DU
1102
SB19NO
1123
19NO.2
1116
19NO.1
1128
DI23NO
1126
RE19NO
V
V
1129
RD19NO
1136
CP19NO
V
V
1139
RT19NO
SB19OR
1165
19OR.2
1158
19OR.1
1171
DI21OR
1168
RE19OR
V
V
1172
RD19OR
1179
CP19OR
V
V
1182
RT19OR
1190
SB19MY
1207
19MY.2
19MY.1
1213
DI21MY
1210
RE19MY


1214
RD19MY
CP19MY
1224
RT19MY
1232
SB19GL
1249
19GL.2
1243
19GL.1
1255
DI21GL
1252
RE19GL
1256
RD19GL
1263
CP19GL
1266
RT19GL
SB19MA
1291
19MA.2
1285
19MA.1
1294
CP19MA
1297
RT19MA
1305
SB19BE
1322
19BE.2
1316
19BE.1
1325
CP19BE
1328
RT19BE
1336
SB19MI



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 2, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
  9       ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR OPTIMAL INFLOW VOLUME
 10       ID   100-YEAR 6 HOUR STORM
 11       ID
 12       ID
 13       ID   FILE NAME: P2-100-D.6I
 14       ID   ****************************************************
 15       ID
 16       ID   Project ID: 24TH & CAMELBACK
 17       IT       2                    2000
 18       IO       5
          *DIAGRAM
          *
 19       ID   ****************************************************
 20       ID   FLOWS ALONG 23RD AVE
 21       ID   ****************************************************
 22       ID

 23       KK  SB23DU
 24       KM   SUB-BASIN SB23DU
 25       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 26       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 27       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 28       BA    .179
 29       IN      15
 30       KM   RAINFALL DEPTH OF 3.00 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 31       PB   2.900
 32       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 33       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 34       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 35       PC    .949    .962    .975    .988   1.000
 36       LG    .100    .250   4.300    .366  80.000
 37       UC    .346    .137
 38       UA       0       5      16      30      65      77      84      90      94      97
 39       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  40      KK  RT23DU
  41      KM   ROUTE 23DU
  42      KM   ROUTE FROM BASIN 23DU TO 23BU
  43      KM   23RD AVE - DUNLAP TO BUTLER
  44      RS      6    FLOW       0
  45      RC   .016    .016    .016    2640    .005     4.3
  46      RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  47      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  48      KK  SB23BU
  49      KM   SUB-BASIN SB23BU
  50      KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND BUTLER
  51      KM   BASIN AREA REDUCED BY 27.2 ACRES TO ACCOUNT FOR 100 YEAR 2 HOUR RETENTION &
  52      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  53      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  54      KM    L =  .50  Kb = .050  Adj. Slope =   25.0
  55      BA   .222
  56      LG   .200    .250   5.300    .282  46.000
  57      UC   .475    .219
  58      UA     0       5      16      30      65      77      84      90      94      97
  59      UA   100
          *
          *  KK23BU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23BU, 7 CBs IN SUBBASIN, 1-54" SD ALONG 23RD AVE
          *  KM REMOVE CAPACITY OF CATCH BASINS. ASSUME INLET CAPACITY OF 5 CFS EACH
          *  KM Qtotal = 7(5) = 35 cfs
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23BU.2
          *  DI     0      35   10000
          *  DQ     0      35      35
          *

  60      KK  CP23BU
  61      KM   COMBINE FLOWS AT 23RD AND BUTLER
  62      HC      2
          *

  63      KK  RT23BU
  64      KM   ROUTE BASIN 23BU TO 23RD AND ROYAL PALM
  65      KM   ROUTE 23BU
  66      KM   ROUTE FROM BASIN 23BU TO 23RO
  67      RS      5    FLOW       0
  68      RC   .016    .016    .016    2036    .004     4.3
  69      RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  70      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  71      KK  SB23RO
  72      KM   SUB-BASIN SB23RO
  73      KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND ROYAL PALM
  74      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  75      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  76      KM     L =  .39  Kb = .055  Adj. Slope =   23.0
  77      BA    .101
  78      LG    .150    .160   7.000    .127  66.000
  79      UC    .429    .252
  80      UA       0       5      16      30      65      77      84      90      94      97
  81      UA     100
          *

  82      KK  RN23RO
  83      KM   RETENTION VOLUME IN SB23RO, 23RD AND ROYAL PALM
  84      KM   100-YEAR 2 HOUR RETENTION ESTIMATED BY FIELD VISIT AND STORM DRAIN MAP J-7
  85      KM   VOL = C*(P/12)*A, 50% OF REQUIRED VOLUME IS DIVERTED
  86      KM   C = 0.70, P = 100 YEAR 2 HOUR RAINFALL DEPTH = 2.54 INCHES
  87      KM   AREA A, IN ACRES MEASURED FROM MAPPING
  88      KO       3
  89      DT  DV23RO     4.8
  90      DI       0    4000
  91      DQ       0    4000
          *
          *  KK23RO.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM REMAINING SUBBASIN RUNOFF
          *  KM SB23RO, 10 CBs IN SUBBASIN, 1-60" SD ALONG 23RD AVE
          *  KM REMOVE CAPACITY OF CATCH BASINS. ASSUME INLET CAPACITY OF 5 CFS EACH
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23RO.2
          *  DI     0      50   10000
          *  DQ     0      50      50
          *

  92      KK  CP23RO
  93      KM   COMBINE FLOWS AT 23RD AND ROYAL PALM
  94      HC       2
          *

  95      KK  RT23RO
  96      KM   ROUTE 23RO
  97      KM   ROUTE FROM BASIN 23RO TO 23NO
  98      KM   23RD AVE -Royal Palm to Northern
  99      RS       2    FLOW       0
 100      RC    .016    .016    .016     702    .001     4.3
 101      RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 102      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  103     KK  SB23NO
  104     KM   SUB-BASIN SB23NO
  105     KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND NORTHERN BASIN
  106     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  107     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  108     KM     L =  .13  Kb = .060  Adj. Slope =    7.0
  109     BA    .043
  110     LG    .100    .150   9.100    .053  80.000
  111     UC    .367    .143
  112     UA       0       5      16      30      65      77      84      90      94      97
  113     UA     100
          *

  114     KK  RN23NO
  115     KM   RETENTION VOLUME IN SB23NO, 23RD AND NORTHERN
  116     KM   100-YEAR 2 HOUR RETENTION ESTIMATED BY FIELD VISIT AND STORM DRAIN MAP J-7
  117     KM   VOL = C*(P/12)*A, 50% OF REQUIRED VOLUME IS DIVERTED
  118     KM   C = 0.70, P = 100 YEAR 2 HOUR RAINFALL DEPTH = 2.54 INCHES
  119     KM   AREA A, IN ACRES MEASURED FROM MAPPING
  120     DT  RB23NO     2.1
  121     DI       0    4000
  122     DQ       0    4000
          *

  123     KK  CP23NO
  124     KM   COMBINE AT 23RD AVE AND NORTHERN
  125     HC       2
          *

  126     KK  DV23NO
  127     KM   DQ FLOWS GO TO EAST TO 21ST AVE AND NORTHERN
  128     DT  DI23NO
  129     DI      74     127    1404    2369
  130     DQ      56      95     842    1421
          *

  131     KK  RT23NO
  132     KM   ROUTE TO 23RD AND ORANGEWOOD
  133     KM   23RD AVE AND NORTHERN TO 23RD AND ORANGEWOOD
  134     RS       6    FLOW       0
  135     RC    .016    .016    .016    2633    .005     4.3
  136     RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  137     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  138     KK  SB23OR
  139     KM   SUB-BASIN SB23OR
  140     KM   23RD AVE AND ORANGEWOOD BASIN
  141     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  142     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  143     KM     L =  .50  Kb = .054  Adj. Slope =   24.0
  144     BA    .124
  145     LG    .220    .170   6.800    .155  51.000
  146     UC    .483    .312
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  147     UA       0       5      16      30      65      77      84      90      94      97
  148     UA     100
          *

  149     KK  CP23OR
  150     KM   COMBINE AT 23RD AVE AND ORANGEWOOD
  151     HC       2
          *

  152     KK  DV23OR
  153     KM   DIVERT FLOWS AT ORANGEWOOD 75% SOUTH 25% EAST
  154     KM   DQ FLOWS GO TO EAST TO 21ST AVE AND ORANGEWOOD
  155     DT  DI23OR
  156     DI       0     500   10000
  157     DQ       0     125    2500
          *

  158     KK  RT23OR
  159     KM   ROUTE TO 23RD DRIVE AND MYRTLE
  160     KM   ROUTE RUNOFF FROM 23RD AVE AND ORANGEWOOD
  161     RS       3    FLOW       0
  162     RC    .016    .016    .016    1460    .005     4.3
  163     RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  164     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  165     KK  SB23DM
  166     KM   SUB-BASIN SB23DM
  167     KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND MYRTLE
  168     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  169     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  170     KM     L =  .28  Kb = .059  Adj. Slope =   29.0
  171     BA    .056
  172     LG    .250    .150   8.100    .097  40.000
  173     UC    .350    .215
  174     UA       0       5      16      30      65      77      84      90      94      97
  175     UA     100
          *

  176     KK  CP23DM
  177     KM   COMBINE AT 23RD DRIVE AND MYRTLE
  178     HC       2
          *

  179     KK  DV23DM
  180     KM   DIVERT FLOWS AT 23RD DRIVE 50% SOUTH AND 50% EAST
  181     KM   DQ FLOWS GO TO EAST TO 21ST AVE AND MYRTLE
  182     DT  DI23DM
  183     DI       0      16      32     412     701
  184     DQ       0       8      16     206     351
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  185     KK  RT23DM
  186     KM   ROUTE 23M.3 SOUTH ON 23rd AVENUE TO GLENDALE AVENUE
  187     RS      3    FLOW       0
  188     RC   .016    .016    .016    1324    .003     4.3
  189     RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  190     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  191     KK  SB22GL
  192     KM   SUB-BASIN SB22GL
  193     KM   SUBBASIN CONTRIBUTING TO 22ND AVE AND GLENDALE
  194     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  195     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  196     KM    L =  .30  Kb = .063  Adj. Slope =   16.0
  197     BA   .025
  198     LG   .250    .250   5.900    .235  32.000
  199     UC   .483    .516
  200     UA      0       5      16      30      65      77      84      90      94      97
  201     UA    100
          *

  202     KK  RT22GL
  203     KM   ROUTE FROM BASIN 22GL TO 23GL
  204     RS      5    FLOW       0
  205     RC   .016    .016    .016     830    .001     4.3
  206     RX   44.9      45      66    66.1     134   134.1     155   155.1
  207     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  208     KK  SB23GL
  209     KM   SUB-BASIN SB23GL
  210     KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND GLENDALE
  211     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  212     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  213     KM    L =  .25  Kb = .058  Adj. Slope =   18.0
  214     BA   .057
  215     LG   .240    .150   7.400    .126  36.000
  216     UC   .387    .218
  217     UA      0       5      16      30      65      77      84      90      94      97
  218     UA    100
          *

  219     KK  23GL.1
  220     KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
  221     KM   SB23GL, 5 CBs IN SUBBASIN, 1-21" SD ALONG GLENDALE AVE
  222     KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL=8.6 CFS
  223     KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
  224     DT  23GL.2
  225     DI      0     8.6   10000
  226     DQ      0     8.6     8.6
          *
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  227     KK  CP23GL
  228     KM   COMBINE AT 23RD DRIVE AND GLENDALE
  229     HC       3
          *

  230     KK  RT23GL
  231     KM   ROUTE CP23GL TO 23RD AND MARYLAND
  232     KM   ROUTE FROM BASIN 23GL TO 23MA
  233     KM   23RD AVE - GLENDALE TO MARYLAND
  234     RS       5    FLOW       0
  235     RC    .016    .016    .016    2796    .005     4.3
  236     RX   44.9      45      66    66.1     134   134.1     155   155.1
  237     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * =====================================================
          * FLOW INTERCEPTED BY STORM DRAIN AND ROUTED TO BASIN I
          * =====================================================
          *

  238     KK  S23MAA
  239     KM   SUB-BASIN S23MAA
  240     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  241     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  242     KM    L =  .51  Kb = .055  Adj. Slope =   25.0
  243     BA   .110
  244     LG   .230    .250   3.500    .349  45.000
  245     UC   .508    .358
  246     UA     0       5      16      30      65      77      84      90      94      97
  247     UA   100
          *

  248     KK    SD11
  249     KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
  250     KM   S23MAA, 2 CBs IN SUBBASIN, 1-24" SD ALONG 23RD AVE
  251     KM   ASSUME CAPACITY EQUAL TO 5 CFS PER INLET
  252     KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
  253     DT    SD12
  254     DI       0      10   10000
  255     DQ       0      10      10
          *

  256     KK  S23MAB
  257     KM   SUB-BASIN S23MAB
  258     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  259     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  260     KM    L =  .35  Kb = .063  Adj. Slope =   25.0
  261     BA   .029
  262     LG   .230    .250   3.500    .349  45.000
  263     UC   .446    .490
  264     UA     0       5      16      30      65      77      84      90      94      97
  265     UA   100
          *
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  266     KK  S21MAC
  267     KM   SUB-BASIN S21MAC
  268     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  269     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  270     KM     L =  .08  Kb = .033  Adj. Slope =    1.0
  271     BA    .017
  272     LG    .500    .250   3.500    .498    .000
  273     UC    .504    .234
  274     UA       0       5      16      30      65      77      84      90      94      97
  275     UA     100
          *

  276     KK  CP23MA
  277     KM   COMBINE RT23GL, SD11, S23MAB, & S21MAC
  278     KM   THIS IS THE TOTAL INFLOW TO RET BASIN I ALONG 23rd AVENUE
  279     KO       3
  280     HC       4
          *

  281     KK    DV_I
  282     KM   DIVERT ROUTINE FOR ANY EXCESS FLOW THAT CANNOT ENTER RET BASIN I
  283     KM   ALONG 23rd AVENUE.
  284     KM   100% RETENTION FOR DI_I FLOW IS ASSUMED FOR RET BASIN I
  285     DT    DI_I
  286     DI       0  100000
  287     DQ       0  100000
          *

  288     KK  RT23MA
  289     KM   ROUTE FLOWS TO 23RD AND BETHANY HOME RD
  290     KM   NO FLOWS ARE DIVERTED EAST. ALL FLOWS PROCEED SOUTH
  291     KM   23RD AVE - MARYLAND TO BETHANY HOME
  292     RS       4    FLOW       0
  293     RC    .016    .016    .016    2623    .004     4.3
  294     RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  295     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  296     KK  SB23BE
  297     KM   SUB-BASIN SB23BE
  298     KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND BETHANY HOME ROAD
  299     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  300     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  301     KM     L =  .50  Kb = .054  Adj. Slope =   20.0
  302     BA    .115
  303     LG    .210    .250   4.900    .338  43.000
  304     UC    .546    .372
  305     UA       0       5      16      30      65      77      84      90      94      97
  306     UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  307     KK  23BE.1
  308     KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
  309     KM   SB23BE, 10 CBs IN SUBBASIN, 1-30" SD (LOWER REACH WHERE THE CBs ARE LOCATED)
  310     KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL= 22.38 CFS
  311     KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
  312     DT  23BE.2
  313     DI       0      22   10000
  314     DQ       0      22      22
          *

  315     KK  CP23BE
  316     KM   COMBINE AT 23RD AND BETHANY HOME
  317     HC       2
          *

  318     KK  RT23BE
  319     KM   ROUTE 23BE
  320     KM   ROUTE FROM BASIN 23BE TO 23MI (23RD AVE AND MISSOURI)
  321     KM   ALL FLOW GOES TO THE SOUTH
  322     RS       6    FLOW       0
  323     RC    .016    .016    .016    2640    .002     4.3
  324     RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  325     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  326     KK  SB23MI
  327     KM   SUB-BASIN SB23MI
  328     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  329     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  330     KM    L =  .65  Kb = .054  Adj. Slope =   12.0
  331     BA    .119
  332     LG    .240    .250   4.900    .355  37.000
  333     UC    .783    .673
  334     UA       0       5      16      30      65      77      84      90      94      97
  335     UA     100
          *

  336     KK  CP23MI
  337     KM   COMBINE AT 23RD AND MISSOURI
  338     HC       2
          *

  339     KK  DV23MI
  340     KM   DIVERT FLOWS GENERATED AT 23RD AND MISSOURI
  341     KM   DQ FLOWS GO TO EAST TO 21ST AND MISSOURI
  342     DT  DI23MI
  343     DI       0     500   10000
  344     DQ       0     200    4000
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

345       KK  RT23MI
346       KM   ROUTE 23MI
347       KM   ROUTE SOUTH FROM BASIN 23MI TO 23CO (23RD AVE AND COLTER)
348       RS       2    FLOW       0
349       RC    .016    .016    .016    1314    .003     4.3
350       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
351       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ================================================
          * ADD DETENTION BASIN C
          * ================================================
          *

352       KK  S23COA
353       KM   SUB-BASIN S23COA
354       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
355       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
356       KM    L =  .25  Kb = .068  Adj. Slope =   16.0
357       BA    .012
358       LG    .180    .250   3.500    .360  40.000
359       UC    .454    .632
360       UA       0       5      16      30      65      77      84      90      94      97
361       UA     100
          *

362       KK  S23COB
363       KM   SUB-BASIN S23COB
364       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
365       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
366       KM    L =  .44  Kb = .059  Adj. Slope =   11.0
367       BA    .049
368       LG    .210    .250   3.500    .305  60.000
369       UC    .629    .640
370       UA       0       5      16      30      65      77      84      90      94      97
371       UA     100
          *

372       KK  23CO.1
373       KM    COMBINE S23COA, S23COB & RT23MI AT COLTER & 23rd AVENUE
374       KO       3
375       HC       3
          *
          *  KK23CO.3     DIV
          *  KM CAPTURE FLOWS FROM 23CO.1 WITH NEW STORM DRAIN
          *  KM THIS STORM DRAIN COLLECTION SYSTEM WILL BE DESIGNED TO INTERCEPT A MAXIMUM
          *  KM 9.0 AF OF WATER AND DIRECT IT TO RET BASIN C.1 AT I-17 & COLTER STREET.
          *  KM THE DIVERTED FLOW GOES TO RETENTION BASIN C.1.
          *  KM NON-DIVERTED FLOW GOES EAST ON COLTER AND SOUTH ON 23rd AVENUE
          *  KO     3
          *  DT23CO.2
          *  DI     0       34   10000
          *  DQ     0       34      34
          *
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

376       KK  DV23CO
377       KM   DIVERT FLOWS GENERATED AT 23RD AVE AND COLTER
378       KM   SPLIT IS APPROXIMATELY 50% EAST AND 50% SOUTH
379       KM   DQ FLOWS GO TO EAST TO 22ND AND CAMELBACK
380       DT  DI23CO
381       DI       0     500   10000
382       DQ       0     250    5000
          *

383       KK  RT23CO
384       KM   FLOW ROUTED SOUTH ON 23RD AVE TO BOTTOM OF SUB S23CAA
385       RS       2    FLOW       0
386       RC    .016    .016    .016     960    .003     4.3
387       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
388       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

389       KK  S23CAA
390       KM   SUB-BASIN S23CAA
391       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
392       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
393       KM    L =  .18  Kb = .070  Adj. Slope =   16.0
394       BA    .009
395       LG    .180    .230   6.200    .187  56.000
396       UC    .375    .463
397       UA       0       5      16      30      65      77      84      90      94      97
398       UA     100
          *

399       KK  23AA.1
400       KM   REMOVE FLOW FROM S23CAA INTO AN EXISTING STORM ON 23rd AVENUE
401       KM   2 CATCH BASINS CONTRIBUTE TO AN 18" STORM DRAIN IN 23rd AVENUE
402       KM   THROUGH SUB-BASIN S23CAA.
403       KM   ASSUME CATCH BASIN CAPACITY OF 5 cfs EACH
404       KM   TOTAL Q TAKEN OUT = 2(5) =10 CFS
405       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
406       DT  23AA.2
407       DI       0      10    1000
408       DQ       0      10      10
          *

409       KK  23CA.1
410       KM   COMBINE RT23CO & S23CAA
411       HC       2
          *

412       KK   RBA.1
413       KM   INSTALL NEW STORM DRAIN TO COLLECT FLOW AT 23CA.1 AND PIPE TO RET BASIN A.
414       KO       3
415       DT   RBA.2
416       DI       0    1000
417       DQ       0    1000
          * ==============================================================
          * COLLECT FLOWS WITH STORM DRAIN IN 23RD AVE AND CONVEY TO BASIN C.2
          * ==============================================================
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

418       KK   C23.1
419       KM   ROUTE ANY EXCESS FLOW FROM RBA.1 DOWN 23rd AVE TO CAMELBACK ROAD
420       RS      2    FLOW       0
421       RC   .016    .016    .016     350    .003     4.3
422       RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
423       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

424       KK  S23CAB
425       KM   SUB-BASIN S23CAB
426       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
427       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
428       KM    L =  .07  Kb = .076  Adj. Slope =   15.8
429       BA   .003
430       LG   .180    .150   8.200    .052  56.000
431       UC   .233    .240
432       UA      0       5      16      30      65      77      84      90      94      97
433       UA    100
          *

434       KK  CP23CA
435       KM   COMBINE AT 23RD AND CAMELBACK
436       KO      3
437       HC      2
          *

438       KK  DV23CA
          *  KM DIVERT FLOWS AT 23RD AVE AND CAMELBACK TO RET BASIN C.2
439       KM    DETENTION BASIN C.2 IS ELIMINATED.
440       KM    ALL FLOWS AT THIS POINT GO TO DETENTION BASIN "A"
441       KM   100% OF THE FLOW IS DIVERTED WEST ALONG THE NORTH SIDE OF CAMELBACK
442       DT  DI23CA
443       DI      0   10000
444       DQ      0   10000
          *

445       KK  RT23CA
446       KM   ROUTE 23CA
447       KM   ROUTE FROM BASIN 23CA TO 23CP (23RD AND CAMPBELL)
448       RS      5    FLOW       0
449       RC   .016    .016    .016    2673    .004     4.3
450       RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
451       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

452       KK  RE24CA
453       KM   RETRIEVAL OF RET BASIN C.2 DIVERSION FROM 23rd AVE & CAMELBACK
454       DR  DI23CA
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 455      KK  RD24CA
 456      KM   ROUTE DIVERT FROM 23RD AND CAMELBACK TO 24TH DRIVE AND CAMELBACK
 457      RS      1    FLOW       0
 458      RC   .016    .016    .016     504    .001     4.3
 459      RX   44.9      45      66    66.1     134   134.1     155   155.1
 460      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 461      KK  SB24CA
 462      KM   SUB-BASIN SB24CA
 463      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 464      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 465      KM    L =  .34  Kb = .059  Adj. Slope =   14.0
 466      KO      3
 467      BA   .050
 468      LG   .150    .250   4.900    .293  63.000
 469      UC   .500    .399
 470      UA      0       5      16      30      65      77      84      90      94      97
 471      UA    100
          *

 472      KK  CP24CA
 473      KM   COMBINE AT 24TH AND CAMELBACK
 474      KO      3
 475      HC      2
          *

 476      KK  C.2OUT
 477      KM       ROUTE CP24CA THROUGH NEW RET BASIN C.2
 478      KM       THIS DETENTION BASIN HAS BEEN REMOVED.
 479      KM       ALL FLOWS ARE ROUTED TO DETENTION BASIN "A" THROUGH RETRIEVAL OF RBC.2
 480      KO      3
 481      DT   RBC.2
 482      DI      0   10000
 483      DQ      0   10000
          *

 484      KK  RT24CA
 485      KM   FLOWS ACCUMULATE AT 24th AND CAMELBACK UNTIL BREAKING OUT SOUTH TO BILL LUKE
 486      KM   FLOWS EVENTUALLY ARRIVE AT 23RD AND CAMPBELL
 487      RS      5    FLOW       0
 488      RC   .016    .016    .016    2578    .005     4.3
 489      RX   44.9      45      66    66.1     134   134.1     155   155.1
 490      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 491      KK  SB23CP
 492      KM   SUB-BASIN SB23CP
 493      KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND CAMPBELL
 494      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 495      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 496      KM    L =  .51  Kb = .052  Adj. Slope =   24.0
 497      BA   .158
 498      LG   .210    .150   9.300    .061  51.000
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

499       UC    .471    .268
500       UA       0       5      16      30      65      77      84      90      94      97
501       UA     100
          *

502       KK  23CP.1
503       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
504       KM   SB23CP, 6 CBs IN SUBBASIN, 1-15" SD ALONG 23RD AVE
505       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL= 3.52 CFS
506       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
507       DT  23CP.2
508       DI       0       4   10000
509       DQ       0       4       4
          *

510       KK  CP23CP
511       KM   COMBINE AT 23RD AND CAMPBELL
512       HC       3
          *

513       KK  RT23CP
514       KM   ROUTE 23CP
515       KM   ROUTE FROM BASIN 23CP TO 23IN
516       RS       4    FLOW       0
517       RC    .016    .016    .016    2578    .003     4.3
518       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
519       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

520       KK  SB23IN
521       KM   SUB-BASIN SB23IN
522       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND INDIAN SCHOOL ROAD
523       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
524       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
525       KM     L =  .49  Kb = .052  Adj. Slope =   16.0
526       BA    .171
527       LG    .220    .150   8.600    .077  52.000
528       UC    .529    .282
529       UA       0       5      16      30      65      77      84      90      94      97
530       UA     100
          *

531       KK  23IN.1
532       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
533       KM   SB23IN, 8 CBs IN SUBBASIN, 1-15" SD ALONG 23RD AVE
534       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL=3.52 CFS
535       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
536       DT  23IN.2
537       DI       0       4   10000
538       DQ       0       4       4
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

539       KK  CP23IN
540       KM   COMBINE AT 23RD AND INDIAN SCHOOL ROAD
541       HC       2
          *
542       KM   ********************************************************************************
543       KM   FLOWS ALONG 21ST AVENUE
544       KM   ********************************************************************************
          *

545       KK  SB21DU
546       KM   SUB-BASIN SB21DU
547       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND DUNLAP
548       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
549       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
550       KM     L =  .50  Kb = .056  Adj. Slope =   14.0
551       BA    .091
552       LG    .230    .250   4.650    .389  50.000
553       UC    .633    .502
554       UA       0       5      16      30      65      77      84      90      94      97
555       UA     100
          *

556       KK  21DU.1
557       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
558       KM   SB21DU, 5 CBS CONTRIBUTING TO 30" SD ALONG DUNLAP AVE AFFECTING FLOWS AT CP
559       KM   REMOVE CAPACITY SD
560       KM   QFULL = 12.92
561       KM   SO = 0.001, N = 0.013
562       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
563       DT  21DU.2
564       DI       0      13   10000
565       DQ       0      13      13
          *

566       KK  RT21DU
567       KM   ROUTE 21DU
568       KM   ROUTE FROM BASIN 21DU TO 21BU
569       KM   21ST AVE - DUNLAP TO BUTLER
570       RS       6    FLOW       0
571       RC    .016    .016    .016    2731    .005     4.3
572       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
573       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

574       KK  SB21BU
575       KM   SUB-BASIN SB21BU
576       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND BUTLER
577       KM   BASIN AREA REDUCED BY 49.2 ACRES TO ACCOUNT FOR 100 YEAR 2 HOUR RETENTION &
578       KM   THE FINAL OUTFALL POINT IS AT A GOLF COURSE. RUNOFF IS INTERCEPTED BY LAKES
579       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
580       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
581       KM     L =  .52  Kb = .054  Adj. Slope =   28.0
582       BA    .128
583       LG    .220    .250   6.000    .206  44.000
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 584      UC    .483    .316
 585      UA       0       5      16      30      65      77      84      90      94      97
 586      UA     100
          *

 587      KK  CP21BU
 588      KM   COMBINE AT 21ST AVE AND BUTLER
 589      HC       2
          *

 590      KK  DV21BU
 591      KM   DIVERT ROUTED FLOW THROUGH GOLF COURSE (SB19NO)
 592      KM   DIVERT NOT RETRIEVED BACK INTO MODEL. FLOWS ENTER GOLF COURSE LAKES IN SB19NO
 593      KM   LAKE STORAGE IS SUFFICIENT TO RETAIN 100% OF 100-YR INFLOWS
 594      DT  DI21BU
 595      DI       0   10000
 596      DQ       0   10000
          *

 597      KK  SB21OR
 598      KM   SUB-BASIN SB21OR
 599      KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND ORANGEWOOD
 600      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 601      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 602      KM     L =  .50  Kb = .054  Adj. Slope =   22.0
 603      BA    .126
 604      LG    .250    .200   6.400    .186  45.000
 605      UC    .508    .327
 606      UA       0       5      16      30      65      77      84      90      94      97
 607      UA     100
          *

 608      KK  RE21OR
 609      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
 610      KM   FROM 23RD AND ORANGEWOOD
 611      DR  DI23OR
          *

 612      KK  RD21OR
 613      KM   ROUTE RETRIEVED DIVERT ALONG ORANGEWOOD
 614      KM   ROUTE DIVERT FROM 23RD AND ORANGEWOOD TO 21ST AVE AND ORANGEWOOD
 615      RS       3    FLOW       0
 616      RC    .016    .016    .016    1321    .002     4.3
 617      RX    44.9      45      66    66.1     134   134.1     155   155.1
 618      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 619      KK  CP21OR
 620      KM   COMBINE AT 21ST AVE AND ORANGEWOOD
 621      HC       2
          *
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

622       KK  DV21OR
623       KM   DIVERT FLOWS AT 21ST AND ORNAGEWOOD 50% SOUTH AND 50% WEST
624       KM   DQ FLOWS GO TO EAST TO 19TH AVE AND ORANGEWOOD
625       DT  DI21OR
626       DI       0     500   10000
627       DQ       0     250    5000
          *

628       KK  RT21OR
629       KM   ROUTE 21OR
630       KM   ROUTE FROM BASIN 21OR TO 21MY
631       RS       6    FLOW       0
632       RC    .016    .016    .016    1320    .003     4.3
633       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
634       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

635       KK  SB21MY
636       KM   SUB-BASIN SB21MY (MODIFIED FOR MULTI-BASIN MODEL)
637       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
638       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
639       KM     L =  .49  Kb = .058  Adj. Slope =   17.0
640       BA    .066
641       LG    .250    .160   7.000    .151  30.000
642       UC    .575    .533
643       UA       0       5      16      30      65      77      84      90      94      97
644       UA     100
          *

645       KK  RE21MY
646       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
647       KM   FROM 23RD DRIVE AND MYRTLE
648       DR  DI23DM
          *

649       KK  RD21MY
650       KM   ROUTE RETRIEVED DIVERT ALONG MYRTLE
651       KM   ROUTE DIVERT FROM 23RD AND MYRTLE TO 21ST AVE AND MYRTLE
652       RS       8    FLOW       0
653       RC    .016    .016    .016    1490    .001     4.3
654       RX    44.9      45      66    66.1     134   134.1     155   155.1
655       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

656       KK  CP21MY
657       KM   COMBINE AT 21ST AVE AND MYRTLE
658       HC       3
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

659       KK  DV21MY
660       KM   DIVERT FLOWS AT MYTRLE 50% SOUTH AND 50% EAST
661       KM   DQ FLOWS GO TO EAST TO 19TH AVE AND MYTRLE
662       DT  DI21MY
663       DI       0     500   10000
664       DQ       0     250    5000
          *

665       KK  RT21MY
666       KM   ROUTE 21MY
667       KM   ROUTE FROM BASIN 21MY TO 21GL
668       KM   MYRTLE TO GLENDALE
669       RS       3    FLOW       0
670       RC    .016    .016    .016    1300    .004     4.3
671       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
672       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

673       KK  SB21GL
674       KM   SUB-BASIN SB21GL
675       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND GLENDALE
676       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
677       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
678       KM   THE 50-YR UC DATA FOR THIS BASIN WAS LARGER THAN THE 25-YR DATA.
679       KM   ACCORDINGLY, THE 25-YR UC RECORD WAS RETAINED FOR THE 50-YR STORM.
680       KM     L =  .32  Kb = .060  Adj. Slope =   17.0
681       BA    .043
682       LG    .230    .250   3.500    .349  37.000
683       UC    .475    .391
684       UA       0       5      16      30      65      77      84      90      94      97
685       UA     100
          *

686       KK  CP21GL
687       KM   COMBINE AT 21ST AVE AND GLENDALE
688       HC       2
          *

689       KK  DV21GL
690       KM   DIVERT FLOWS AT 21ST AND GLENDALE SOUTH AND EAST
691       KM   DQ FLOWS GO TO EAST TO 19TH AVE AND GLENDALE
692       DT  DI21GL
693       DI      74     122    1242    2083
694       DQ      74     108    1008    1687
          *

695       KK  RT21GL
696       KM   ROUTE 21GL
697       KM   ROUTE FROM BASIN 21GL TO 21MA
698       KM   GLENDALE TO MARYLAND
699       RS       5    FLOW       0
700       RC    .016    .016    .016    2666    .005     4.3
701       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
702       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```

```
* ================================================
* ADD RETENTION BASIN I
* ================================================
*
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

703       KK  S21MAA
704       KM   SUB-BASIN S21MAA
705       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
706       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
707       KM     L =  .35  Kb = .028  Adj. Slope =   26.0
708       KO       3
709       BA    .110
710       LG    .230    .250   3.500    .360  50.000
711       UC    .279    .136
712       UA       0       5      16      30      65      77      84      90      94      97
713       UA     100
          *

714       KK    DI_I
715       KM   RETRIEVE FLOW INTERCEPTED IN SB23MA AND ROUTED TO BASIN I
716       DR    DI_I
          *

717       KK  S21MAB
718       KM   SUB-BASIN S21MAB
719       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
720       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
721       KM     L =  .16  Kb = .061  Adj. Slope =   26.0
722       BA    .040
723       LG    .230    .250   3.500    .388  30.000
724       UC    .292    .136
725       UA       0       5      16      30      65      77      84      90      94      97
726       UA     100
          *

727       KK  BSN_I
728       KM   COMBINE RT21GL,S21MAA, S21MAB, & DI_I
729       KM   THIS IS THE TOTAL INFLOW TO RETENTION BASIN I (WASHINGTON PARK)
730       KO       3
731       HC       4
          *

732       KK  WASHPK     DAM
733       KM        ROUTE FLOW THROUGH PROPOSED WASHINGTON PARK RETENTION BASIN
734       KM        SPILLWAY ELEV IS SET TO PROVIDE 39 AF
735       RS       1    ELEV       0
736       SV       0   22.03   44.07   66.12   88.15  110.19  121.21
737       SE       0       2       4       6       8      10      11
738       SS    3.54      50     2.7     1.5
739       ST      11       0     2.7     1.5
          *
          *

740       KK   M21.1
741       KM   ROUTE ANY EXCESS FLOW FROM DET BASIN DOWN 21st AVE TO MARYLAND
742       RS       5    FLOW       0
743       RC    .016    .016    .016     650    .005     4.3
744       RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
745       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```

```
*  OPERATION CP21MA IS NOT NEEDED FOR THIS MODEL (8/8/03)
*
*  KKCP21MA
*  KM COMBINE AT 21ST AVE AND MARYLAND
*  HC     2
*
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

746       KK  RT21MA
747       KM   ROUTE 21MA
748       KM   ALL FLOWS ALONG 21ST AVE AT MARYLAND ARE ROUTED TO THE SOUTH
749       KM   ROUTE FROM BASIN 21MA TO 21BE
750       RS      5    FLOW       0
751       RC    .016    .016    .016    2630    .004     4.3
752       RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
753       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

754       KK  SB21BE
755       KM   SUB-BASIN SB21BE
756       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND BETHANY HOME
757       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
758       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
759       KM    L =  .50  Kb = .052  Adj. Slope =   20.0
760       BA    .182
761       LG    .210    .250   3.500    .338  47.000
762       UC    .521    .272
763       UA       0       5      16      30      65      77      84      90      94      97
764       UA     100
          *

765       KK  21BE.1
766       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
767       KM   SB21BE, 8 CBS CONTRIBUTING TO 18" SD ALONG 21ST AVE AFFECTING FLOWS AT CP
768       KM   REMOVE CAPACITY OF SD. ASSUME QFULL CONDITIONS. QFULL =5.72 CFS
769       KM   SO = 0.003 AND N = 0.013
770       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
771       DT  21BE.2
772       DI       0       6   10000
773       DQ       0       6       6
          *

774       KK  CP21BE
775       KM   COMBINE AT 21ST AVE AND BETHANY HOME
776       HC       2
          *

777       KK  RT21BE
778       KM   ROUTE 21BE
779       KM   ALL FLOW GOES SOUTH
780       KM   ROUTE FROM BASIN 21BE TO 21MO
781       RS       1    FLOW       0
782       RC    .016    .016    .016    1178    .005     4.3
783       RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
784       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 785      KK  SB21MO
 786      KM   SUB-BASIN SB21MO
 787      KM   SUBBASIN CONTRIBUTING TO 21st AVE AND MONTEBELLO
 788      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 789      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 790      KM     L =  .58  Kb = .057  Adj. Slope =   10.0
 791      BA    .069
 792      LG    .240    .250   4.900    .352  35.000
 793      UC    .817    .877
 794      UA       0       5      16      30      65      77      84      90      94      97
 795      UA     100
          *

 796      KK  CP21MO
 797      KM   COMBINE AT 21ST AVE AND MONTEBELLO
 798      HC       2
          *

 799      KK  RT21MO
 800      KM   ROUTE 21MO
 801      KM   ROUTE FROM BASIN 21MO TO 21MI
 802      RS       2    FLOW       0
 803      RC    .016    .016    .016    1450    .003     4.3
 804      RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
 805      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 806      KK  SB21MI
 807      KM   SUB-BASIN SB21MI
 808      KM   SUBBASIN CONTRIBUTING TO 21st AVE AND MISSOURI
 809      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 810      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 811      KM     L =  .48  Kb = .056  Adj. Slope =   14.0
 812      BA    .089
 813      LG    .250    .250   4.900    .360  31.000
 814      UC    .642    .499
 815      UA       0       5      16      30      65      77      84      90      94      97
 816      UA     100
          *

 817      KK  RE21MI
 818      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
 819      KM   FROM 23RD AND MISSOURI
 820      DR  DI23MI
          *

 821      KK  RD21MI
 822      KM   ROUTE DIVERT FROM CP23MI TO CP21MI
 823      KM   ROUTE DIVERTED FLOW ALONG MISSOURI TO 21st AVENUE
 824      RS       4    FLOW       0
 825      RC    .016    .016    .016    1296    .002     4.3
 826      RX    44.9      45      66    66.1     134   134.1     155   155.1
 827      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

828       KK  CP21MI
829       KM   COMBINE AT 21ST AVE AND MISSOURI
830       HC       3
          *

831       KK  RT21MI
832       KM   ROUTE 21MI
833       KM   ROUTE FROM BASIN 21MI TO 21CA
834       KM   ROUTE FLOW THROUGH 21ST AND MISSOURI BASIN TO 21ST AVE AND CAMELBACK
835       KM   ALL FLOWS GO TO SOUTH
836       RS       4    FLOW       0
837       RC    .016    .016    .016    2663    .003     4.3
838       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
839       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ================================================
          * ADD DETENTION BASIN A
          * ================================================
          *

840       KK  S21CAA
841       KM   SUB-BASIN S21CAA
842       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
843       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
844       KM     L =  .46  Kb = .059  Adj. Slope =   16.0
845       BA    .049
846       LG    .210    .220   6.400    .179  45.000
847       UC    .571    .595
848       UA       0       5      16      30      65      77      84      90      94      97
849       UA     100
          *

850       KK  S22CAA
851       KM   SUB-BASIN S22CAA
852       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
853       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
854       KM     L =  .44  Kb = .060  Adj. Slope =   21.0
855       BA    .047
856       LG    .220    .250   5.900    .219  45.000
857       UC    .517    .527
858       UA       0       5      16      30      65      77      84      90      94      97
859       UA     100
          *

860       KK    SD33
861       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
862       KM   SB22CA, 2 CBS CONTRIBUTING TO 18" SD ALONG 22ND AVE AFFECTING FLOWS AT CP
863       KM   REMOVE CAPACITY OF CBs. ASSUME CAPCITY OF 5 CFS PER BASIN
864       KM   TOTAL Q TAKEN OUT = 2(5) = 10 CFS
865       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
866       DT    SD34
867       DI       0      10   10000
868       DQ       0      10      10
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

869       KK  RE22CA
870       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
871       KM   FROM 23RD DRIVE AND COLTER
872       DR  DI23CO
          *

873       KK  RD22CA
874       KM   ROUTE DIVERTED FLOWS TO RETENTION BASIN A
875       RS      3    FLOW       0
876       RC    .016    .016    .016    3290    .002     4.3
877       RX   44.9      45      66    66.1     134   134.1     155   155.1
878       RY    4.3     0.3     0.3      00      00     0.3      .3    4.3
          *

879       KK   RBA.2     RET
880       KM        RETRIEVE STORM DRAIN FLOW FROM 23rd AVE AT SUB-BASIN S23CAA
881       DR   RBA.2
          *

882       KK   DBA-1
883       KM   COMBINE RT21MI, S21CAA, SD33, RD22CA, RBA.2
884       KM   THIS IS PARTIAL INFLOW TO RET BASIN A
885       KO      3
886       HC      5
          *

887       KK   RBC.2   RETRIEVE
888       KM        RETRIEVE FLOW FROM FORMER DET BASIN C2 LOCATION
889       DR   RBC.2
          *

890       KK  S22CAB
891       KM   SUB-BASIN S22CAB
892       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
893       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
894       KM     L =  .04  Kb = .071  Adj. Slope =   10.0
895       BA    .007
896       LG    .100    .150   8.200    .040  90.000
897       UC    .192    .076
898       UA       0       5      16      30      65      77      84      90      94      97
899       UA     100
          *
          *  KKCP22CA
          *  KM COMBINE AT 22ND AVE AND CAMELBACK
          *  HC     2
          *

900       KK  S21CAC
901       KM   SUB-BASIN S21CAC
902       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
903       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
904       KM     L =  .04  Kb = .075  Adj. Slope =   15.0
905       BA    .004
906       LG    .210    .150   8.200    .040  70.000
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

907       UC    .175    .095
908       UA       0       5      16      30      65      77      84      90      94      97
909       UA     100
          *

910       KK   DBA-2
911       KM   COMBINE RBC.2, S22CAB, & S21CAC AT 21ST AVE AND CAMELBACK
912       KM   THIS IS PARTIAL INFLOW TO DETENTION BASIN "A"
913       KO       3
914       HC       3
          *

915       KK   DBA-3
916       KM        COMBINE DBA-1 & DBA-2
917       KM        THIS IS THE TOTAL INFLOW TO DETENTION BASIN "A"
918       KO       3
919       HC       2
          *

920       KK    SD35
921       KM   BLEED 100% OF RET BASIN "A" THROUGH EXISTING 18" STORM DRAIN
922       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
923       DT    SD36
924       DI       0   20000
925       DQ       0   20000
          *

926       KK  DV22CA
927       KM   DIVERT FLOWS TO 21ST AND CAMPBELL 50% SOUTH AND 50% EAST
928       KM   DQ FLOWS GO TO SOUTH TO 21ST AVE AND CAMPBELL
929       DT  DI22CA
930       DI       0     500   10000
931       DQ       0       0       0
          *

932       KK  RT22CA
933       KM   ROUTE 22CA
934       KM   ROUTE FROM BASIN 22CA TO 21CA (CAMELBACK)
935       RS       6    FLOW       0
936       RC    .016    .016    .016     925    .004     4.3
937       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
938       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

939       KK  S21CAB
940       KM   SUB-BASIN S21CAB
941       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
942       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
943       KM     L =  .61  Kb = .054  Adj. Slope =   16.0
944       BA    .119
945       LG    .210    .170   6.800    .152  45.000
946       UC    .629    .501
947       UA       0       5      16      30      65      77      84      90      94      97
948       UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 949      KK  21CA.1
 950      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 951      KM   S21CAB, 2 CBS CONTRIBUTING TO 18" SD ALONG VERMONT AND
 952      KM   12 CBS CONTRIBUTING TO 24" SD ALONG 21ST AVE AFFECTING FLOWS AT CP
 953      KM   REMOVE CAPACITY OF 18 " SD AND 24" SD. 18" QFULL = 5.72 AND 24" = 12.33 CFS
 954      KM   SO = 0.003 '/FT AND N = 0.013
 955      KM   TOTAL Q TAKEN OUT = 12.33+5.72 = 18.05
 956      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 957      DT  21CA.2
 958      DI       0      18   10000
 959      DQ       0      18      18
          *

 960      KK  CP21CA
 961      KM        COMBINE 21CA.1 & RT22CA
 962      HC       2
          *

 963      KK  RT21CA
 964      KM   ROUTE 21CA
 965      KM   ALL FLOWS ROUTED SOUTH ALONG 21ST AVE
 966      KM   ROUTE FROM BASIN 21CA TO 21CP
 967      RS       4    FLOW       0
 968      RC    .016    .016    .016    2640    .003     4.3
 969      RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
 970      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 971      KK  SB21CP
 972      KM   SUB-BASIN SB21CP
 973      KM   SUBBASIN CONTRIBUTING TO 21st AVE AND CAMPBELL
 974      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 975      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 976      KM     L =  .62  Kb = .053  Adj. Slope =   16.0
 977      BA    .144
 978      LG    .240    .150   9.100    .067  40.000
 979      UC    .617    .445
 980      UA       0       5      16      30      65      77      84      90      94      97
 981      UA     100
          *

 982      KK  21CP.1
 983      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 984      KM   SB21CP, 3 CBs IN SUBBASIN,CONTRIBUTING TO 24" SD ALONG 21ST AVE
 985      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 24" LINE. ASSUME 5 CFS PER CATCH BASIN.
 986      KM   TOTAL Q TAKEN OUT = 3(5) = 15
 987      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 988      DT  21CP.2
 989      DI       0      15   10000
 990      DQ       0      15      15
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 991      KK  RE22CA
 992      KM   RETRIEVAL OF 22ND AND CAMELBACK FLOWS
 993      DR  DI22CA
          *

 994      KK  RD22CA
 995      KM   ROUTE DIVERTED FLOWS FROM BASIN 22CA TO 21CP
 996      KM   ROUTE FLOW FROM 22nd AVENUE AND CAMELBACK BASIN TO 21ST AVE AND CAMPBELL
 997      RS       2    FLOW       0
 998      RC    .016    .016    .016    3287    .003     4.3
 999      RX    44.9      45      66    66.1     134   134.1     155   155.1
1000      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1001      KK  CP21CP
1002      KM   COMBINE AT 21ST AVE AND CAMPBELL
1003      HC       3
          *

1004      KK  DV21CP
1005      KM   DIVERT FLOWS AT 21ST AND CAMPBELL 50% SOUTH AND 50% EAST
1006      KM   DQ FLOWS GO TO EAST TO 19TH AVE AND CAMPBELL
1007      DT  DI21CP
1008      DI       0     500   10000
1009      DQ       0     250    5000
          *

1010      KK  RT21CP
1011      KM   ROUTE 21CP
1012      KM   ROUTE FROM BASIN 21CP TO 21ST AVE AND TURNEY
1013      RS       4    FLOW       0
1014      RC    .016    .016    .016     665    .002     4.3
1015      RX     0.0     0.1    15.0    25.0    55.0    65.0    80.0    80.1
1016      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ================================================
          * ADD DETENTION BASIN X
          * ================================================
          *

1017      KK  S21CNA
1018      KM   SUB-BASIN S21CNA
1019      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1020      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1021      KM    L =  .19  Kb = .066  Adj. Slope =   27.0
1022      BA    .017
1023      LG    .250    .150   8.800    .078  45.000
1024      UC    .308    .271
1025      UA       0       5      16      30      65      77      84      90      94      97
1026      UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1027      KK   S19.1
1028      KM    COMBINE S21CNA & RT21CP AT 21st AVE & TURNEY
1029      HC      2
          *

1030      KK   S19.2
1031      KM   ROUTE S19.1 EAST ON TURNEY TO RET BASIN X INLET
1032      RK    700   .0020    .016           TRAP      36
          *

1033      KK  S19CNA
1034      KM   SUB-BASIN S19CNA
1035      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1036      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1037      KM    L =  .26  Kb = .065  Adj. Slope =    2.0
1038      BA   .021
1039      LG   .250    .150   8.200    .071  41.000
1040      UC   .900   1.013
1041      UA      0       5      16      30      65      77      84      90      94      97
1042      UA    100
          *

1043      KK    SBX
1044      KM   SUB-BASIN SBX.  THIS IS THE RET BASIN X SURFACE AREA + ADJOINING APT COMPLEX
1045      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1046      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1047      KM    L =  .15  Kb = .064  Adj. Slope =    2.0
1048      BA   .021
1049      LG   .250    .150   8.200    .075  45.000
1050      UC   .637    .445
1051      UA      0       5      16      30      65      77      84      90      94      97
1052      UA    100
          *

1053      KK  BASN_X
1054      KM   COMBINE S19CNA, S19.2, AND SBX AT RET BASIN X
1055      KO      3
1056      HC      3
          *

1057      KK    SD41
1058      KM   BLEED 100% OF RET BASIN "X" THROUGH EXISTING 18" STORM DRAIN
1059      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1060      DT    SD42
1061      DI      0   10000
1062      DQ      0   10000
          *

1063      KK  S21CNB
1064      KM   SUB-BASIN S21CNB
1065      KM   S21CNB - SOUTH OF TURNEY AND NORTH OF GRAND CANAL
1066      KM   SUBBASIN CONTRIBUTING TO 21st AVE AND GRAND CANAL
1067      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1068      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1069      KM     L =  .19  Kb = .063  Adj. Slope =   17.0
1070      BA    .025
1071      LG    .250    .170   6.800    .161  45.000
1072      UC    .358    .257
1073      UA       0       5      16      30      65      77      84      90      94      97
1074      UA     100
          *

1075      KK    SD43
1076      KM   REMOVE 18" FLOWS FROM MODEL
1077      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1078      DT    SD44
1079      DI       0     7.4  100000
1080      DQ       0     7.4     7.4
          *
1081      KM   ************************************************************************
1082      KM   19TH AVENUE BASINS
1083      KM   ************************************************************************
          *

1084      KK  SB19DU   BASIN
1085      KM   SUB-BASIN SB19DU
1086      KM   SUBBASIN CONTRIBUING TO 19TH AVE AND DUNLAP
1087      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1088      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1089      KM     L =  .33  Kb = .066  Adj. Slope =   26.0
1090      BA    .017
1091      LG    .100    .250   3.500    .278  80.000
1092      UC    .417    .588
1093      UA       0       5      16      30      65      77      84      90      94      97
1094      UA     100
          *

1095      KK  RT19DU
1096      KM   ROUTE FROM BASIN 19DU TO 19NO (19TH AVE AND NORTHERN)
1097      KM   19TH AVE - DUNLAP TO NORTHERN
1098      RS       6    FLOW       0
1099      RC    .016    .016    .016    5296    .005     4.3
1100      RX   44.9      45      66    66.1     134   134.1     155   155.1
1101      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1102      KK  SB19NO
1103      KM   SUB-BASIN SB19NO
1104      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND NORTHERN
1105      KM   GOLF COURSE AND ITS LAKES RETAINS MOST RUNOFF GENERATED IN THIS BASIN
1106      KM   APPROXIMATELY 23 ACRES ALONG THE EAST SIDE DIRECTLY CONTRIBUTES TO
1107      KM   19TH AVE AND NORTHERN
1108      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1109      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1110      KM     L =  .50  Kb = .032  Adj. Slope =   26.4
1111      BA    .036
1112      LG    .250    .150   9.600    .056  60.000
1113      UC    .346    .435
1114      UA       0       5      16      30      65      77      84      90      94      97
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1115      UA     100
          *

1116      KK  19NO.1
1117      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1118      KM   SB19NO, 6 CBS CONTRIBUTING TO 36" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1119      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1120      KM   QTOTAL = 36" SD QFULL = 36.42
1121      KM   SO = 0.003 AND N = 0.013
1122      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1123      DT  19NO.2
1124      DI       0      36   10000
1125      DQ       0      36      36
          *

1126      KK  RE19NO
1127      KM   RETRIEVAL OF FLOW FROM 23RD AVE AND NORTHERN
1128      DR  DI23NO
          *

1129      KK  RD19NO
1130      KM   ROUTE RETRIEVED DIVERT ALONG NORTHERN
1131      KM   ROUTE DIVERT FROM 23RD AND NORTHERN TO 19TH AVE AND NORTHERN
1132      RS       5    FLOW       0
1133      RC    .016    .016    .016    2642    .002     4.3
1134      RX    44.9      45      66    66.1     134   134.1     155   155.1
1135      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1136      KK  CP19NO
1137      KM   COMBINE AT 19TH AVE AND NORTHERN
1138      HC       3
          *

1139      KK  RT19NO
1140      KM   ROUTE 19NO
1141      KM   ROUTE FROM BASIN 19NO TO 19OR
1142      KM   19TH AVE - NORTHERN TO ORANGEWOOD
1143      RS       2    FLOW       0
1144      RC    .016    .016    .016    2640    .004     4.3
1145      RX    44.9      45      66    66.1     134   134.1     155   155.1
1146      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1147      KK  SB19OR
1148      KM   SUB-BASIN SB19OR
1149      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND ORANGEWOOD
1150      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1151      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1152      KM     L =  .70  Kb = .055  Adj. Slope =   20.0
1153      BA    .105
1154      LG    .100    .200   6.400    .142  80.000
1155      UC    .613    .583
1156      UA       0       5      16      30      65      77      84      90      94      97
1157      UA     100
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1158      KK  19OR.1
1159      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1160      KM   SB19OR, 10 CBS CONTRIBUTING TO 48" SD AND 42" SD ALONG 19TH AVE AFFECTING FLO
1161      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1162      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1163      KM   QTOTAL = 6(5) = 30
1164      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1165      DT  19OR.2
1166      DI       0      30   10000
1167      DQ       0      30      30
          *

1168      KK  RE19OR
1169      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1170      KM   FROM 21ST AND ORANGWOOD
1171      DR  DI21OR
          *

1172      KK  RD19OR
1173      KM   ROUTE RETRIEVED DIVERT ALONG ORANGEWOOD
1174      KM   ROUTE DIVERT FROM 21ST AND ORANGEWOOD TO 19TH AVE AND ORANGEWOOD
1175      RS       2    FLOW       0
1176      RC    .016    .016    .016    1346    .003     4.3
1177      RX    44.9      45      66    66.1     134   134.1     155   155.1
1178      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1179      KK  CP19OR
1180      KM   COMBINE AT 19TH AVE AND ORANGEWOOD
1181      HC       3
          *

1182      KK  RT19OR
1183      KM   ROUTE 19OR
1184      KM   ROUTE FROM BASIN 19OR TO 19MY
1185      KM   19TH AVE - ORANGEWOOD TO MYRTLE
1186      RS       1    FLOW       0
1187      RC    .016    .016    .016    1340    .004     4.3
1188      RX    44.9      45      66    66.1     134   134.1     155   155.1
1189      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1190      KK  SB19MY
1191      KM   SUB-BASIN SB19MY
1192      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MYRTLE
1193      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1194      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1195      KM     L =  .37  Kb = .060  Adj. Slope =   16.0
1196      BA    .046
1197      LG    .250    .250   3.500    .360  36.000
1198      UC    .529    .477
1199      UA       0       5      16      30      65      77      84      90      94      97
1200      UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1201      KK  19MY.1
1202      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1203      KM   SB19MY, 7 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1204      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1205      KM   QTOTAL = 7(5) = 35
1206      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1207      DT  19MY.2
1208      DI       0      35   10000
1209      DQ       0      35      35
          *

1210      KK  RE19MY
1211      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1212      KM   FROM 21ST AND MYRTLE
1213      DR  DI21MY
          *

1214      KK  RD19MY
1215      KM   ROUTE RETRIEVED DIVERT ALONG MYRTLE
1216      KM   ROUTE DIVERT FROM 21ST AND MYRTLE TO 19TH AVE AND MYRTLE
1217      RS       3    FLOW       0
1218      RC    .016    .016    .016    1318    .001     4.3
1219      RX    44.9      45      66    66.1     134   134.1     155   155.1
1220      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1221      KK  CP19MY
1222      KM   COMBINE AT 19TH AVE AND MYRTLE
1223      HC       3
          *

1224      KK  RT19MY
1225      KM   ROUTE 19MY
1226      KM   ROUTE FROM BASIN 19MY TO 19GL
1227      KM   19TH AVE - MYRTLE TO GLENDALE
1228      RS       2    FLOW       0
1229      RC    .016    .016    .016    1320    .002     4.3
1230      RX    44.9      45      66    66.1     134   134.1     155   155.1
1231      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1232      KK  SB19GL
1233      KM   SUB-BASIN SB19GL
1234      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND GLENDALE
1235      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1236      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1237      KM     L =  .40  Kb = .059  Adj. Slope =   10.0
1238      BA    .054
1239      LG    .170    .250   3.500    .316  61.000
1240      UC    .617    .549
1241      UA       0       5      16      30      65      77      84      90      94      97
1242      UA     100
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1243      KK  19GL.1
1244      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1245      KM   SB19GL, 3 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1246      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1247      KM   QTOTAL = 3(5) = 15
1248      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1249      DT  19GL.2
1250      DI       0      15   10000
1251      DQ       0      15      15
          *

1252      KK  RE19GL
1253      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1254      KM   FROM 21ST AND GLENDALE
1255      DR  DI21GL
          *

1256      KK  RD19GL
1257      KM   ROUTE RETRIEVED DIVERT ALONG GLENDALE
1258      KM   ROUTE DIVERT FROM 21ST AND GLENDALE TO 19TH AVE AND GLENDALE
1259      RS       3    FLOW       0
1260      RC    .016    .016    .016    1318    .001     4.3
1261      RX    44.9      45      66    66.1     134   134.1     155   155.1
1262      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1263      KK  CP19GL
1264      KM   COMBINE AT 19TH AVE AND GLENDALE
1265      HC       3
          *

1266      KK  RT19GL
1267      KM   ROUTE 19GL
1268      KM   ROUTE FROM BASIN 19GL TO 19MA
1269      KM   19TH AVE - GLENDALE TO MARYLAND
1270      RS       1    FLOW       0
1271      RC    .016    .016    .016    2639    .005     4.3
1272      RX    44.9      45      66    66.1     134   134.1     155   155.1
1273      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1274      KK  SB19MA
1275      KM   SUB-BASIN SB19MA
1276      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MARYLAND
1277      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1278      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1279      KM     L =  .50  Kb = .059  Adj. Slope =   28.0
1280      BA    .054
1281      LG    .190    .250   4.900    .324  60.000
1282      UC    .492    .510
1283      UA       0       5      16      30      65      77      84      90      94      97
1284      UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1285      KK  19MA.1
1286      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1287      KM   SB19MA, 7 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1288      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1289      KM   QTOTAL = 7(5) = 35
1290      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1291      DT  19MA.2
1292      DI       0      35   10000
1293      DQ       0      35      35
          *

1294      KK  CP19MA
1295      KM   COMBINE AT 19TH AVE AND MARYLAND
1296      HC       2
          *

1297      KK  RT19MA
1298      KM   ROUTE 19MA
1299      KM   ROUTE FROM BASIN 19MA TO 19BE
1300      KM   19TH AVE - MARYLAND TO BETHANY HOME
1301      RS       2    FLOW       0
1302      RC    .016    .016    .016    2659    .004     4.3
1303      RX    44.9      45      66    66.1     134   134.1     155   155.1
1304      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1305      KK  SB19BE
1306      KM   SUB-BASIN SB19BE
1307      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND BETHANY HOME
1308      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1309      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1310      KM     L =  .50  Kb = .058  Adj. Slope =   20.0
1311      BA    .057
1312      LG    .190    .250   4.900    .324  56.000
1313      UC    .554    .565
1314      UA       0       5      16      30      65      77      84      90      94      97
1315      UA     100
          *

1316      KK  19BE.1
1317      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1318      KM   SB19BE, 6 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1319      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1320      KM   QTOTAL = 6(5) = 30
1321      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1322      DT  19BE.2
1323      DI       0      30   10000
1324      DQ       0      30      30
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1325      KK  CP19BE
1326      KM   COMBINE AT 19TH AVE AND BETHANY HOME
1327      HC       2
          *

1328      KK  RT19BE
1329      KM   ROUTE 19BE
1330      KM   ROUTE FROM BASIN 19BE TO 19MI
1331      KM   19TH AVE - BETHANY HOME TO MISSOURI
1332      RS       2    FLOW       0
1333      RC    .016    .016    .016    2623    .004     4.3
1334      RX    44.9      45      66    66.1     134   134.1     155   155.1
1335      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1336      KK  SB19MI
1337      KM   SUB-BASIN SB19MI
1338      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MISSOURI
1339      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1340      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1341      KM     L =  .50  Kb = .057  Adj. Slope =   20.0
1342      BA    .076
1343      LG    .220    .250   4.900    .344  41.000
1344      UC    .567    .491
1345      UA       0       5      16      30      65      77      84      90      94      97
1346      UA     100
          *

1347      KK  19MI.1
1348      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1349      KM   SB19MI, 14 CBS CONTRIBUTING TO 48" SD ALONG19TH AVE AFFECTING FLOWS AT CP
1350      KM   REMOVE CAPACITY OF SD. ASSUME QFULL CONDITIONS. QFULL = 78.5 CFS
1351      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1352      DT  19MI.2
1353      DI       0      79   10000
1354      DQ       0      79      79
          *

1355      KK  CP19MI
1356      KM   COMBINE AT 19TH AVE AND MISSOURI
1357      HC       2
          *

1358      KK  RT19MI
1359      KM   19TH AVE - MISSOURI TO CAMELBACK
1360      KM   ROUTE 19MI
1361      KM   ROUTE FROM BASIN 19MI TO 19CA
1362      RS       2    FLOW       0
1363      RC    .016    .016    .016    2639    .003     4.3
1364      RX    44.9      45      66    66.1     134   134.1     155   155.1
1365      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1366      KK  SB19CA
1367      KM   SUB-BASIN SB19CA
1368      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND CAMELBACK
1369      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1370      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1371      KM     L =  .50  Kb = .070  Adj. Slope =   16.0
1372      BA    .009
1373      LG    .100    .150   8.100    .075  80.000
1374      UC    .629   1.862
1375      UA       0       5      16      30      65      77      84      90      94      97
1376      UA     100
          *

1377      KK  19CA.1
1378      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1379      KM   SB19CA, 5 CBS CONTRIBUTING TO 18" SD ALONG VERMONT AND
1380      KM   12 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1381      KM   REMOVE CAPACITY OF CBs. ASSUME CAPCITY OF 5 CFS PER BASIN
1382      KM   TOTAL Q TAKEN OUT = 5(5) = 25 CFS
1383      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1384      DT  19CA.2
1385      DI       0      25   10000
1386      DQ       0      25      25
          *

1387      KK  CP19CA
1388      KM   COMBINE AT 19TH AVE AND CAMELBACK
1389      HC       2
          *

1390      KK  RT19CA
1391      KM   ROUTE 19CA
1392      KM   ROUTE FROM BASIN 19CA TO 19CP
1393      KM   19TH AVE - CAMELBACK TO CAMPBELL
1394      RS       2    FLOW       0
1395      RC    .016    .016    .016    2670    .005     4.3
1396      RX   44.9      45      66    66.1     134   134.1     155   155.1
1397      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1398      KK  SB19CP
1399      KM   SUB-BASIN SB19CP
1400      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND CAMPBELL
1401      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1402      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1403      KM     L =  .51  Kb = .058  Adj. Slope =   25.0
1404      BA    .057
1405      LG    .210    .150   7.900    .100  50.000
1406      UC    .496    .507
1407      UA       0       5      16      30      65      77      84      90      94      97
1408      UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1409      KK  19CP.1
1410      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1411      KM   SB19CP, 6 CBs IN SUBBASIN,CONTRIBUTING TO 54" SD ALONG 19TH AVE
1412      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 54" LINE. ASSUME 5 CFS PER CATCH BASIN.
1413      KM   TOTAL Q TAKEN OUT = 6(5) = 30
1414      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1415      DT  19CP.2
1416      DI       0      30   10000
1417      DQ       0      30      30
          *

1418      KK  RE19CP
1419      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1420      KM   FROM 21ST AND CAMPBELL
1421      DR  DI21CP
          *

1422      KK  RD19CP
1423      KM   ROUTE DIVERT FROM CP21CP TO CP19CP ALONG CAMPBELL
1424      KM   ROUTE FROM 21st AVE AND CAMPBELL TO 19TH AVE AND CAMPBELL
1425      RS       4    FLOW       0
1426      RC    .016    .016    .016    1310    .002     4.3
1427      RX    44.9      45      66    66.1     134   134.1     155   155.1
1428      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1429      KK  CP19CP
1430      KM   COMBINE AT 19TH AVE AND CAMPBELL
1431      HC       3
          *

1432      KK  RT19CP
1433      KM   19TH AVE - CAMPBELL TO GRAND CANAL
1434      KM   ROUTE 19CP
1435      KM   ROUTE FROM BASIN 19CP TO 19CN
1436      RS       3    FLOW       0
1437      RC    .016    .016    .016     900    .001     4.3
1438      RX    44.9      45      66    66.1     134   134.1     155   155.1
1439      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1440      KK  S19CNB
1441      KM   SUB-BASIN S19CNB
1442      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1443      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1444      KM    L =  .26  Kb = .066  Adj. Slope =    2.0
1445      BA    .016
1446      LG    .250    .150   8.200    .071  41.000
1447      UC    .908   1.195
1448      UA       0       5      16      30      65      77      84      90      94      97
1449      UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1450      KK  19CN.1
1451      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1452      KM   S19CNB, 7 CBs IN SUBBASIN, 1-15" SD ALONG S. TURNEY, 1-18" ALONG N. TURNEY
1453      KM   AND 1-54" ALONG 19TH AVE. 24"QFULL = 12.33 AND 18"QFULL = 5.72 CFS
1454      KM   SO = 0.003 AND N =0.13
1455      KM   3 CBs CONTRIBUTE TO 24" SD AND 2 TO THE 18" SD AND 54" SD AFFECTING FLOW AT C
1456      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 54" LINE. ASSUME 5 CFS PER CATCH BASIN.
1457      KM   REMOVE PIPE CAPACITY OF STORM DRAINS.
1458      KM   TOTAL Q TAKEN OUT = 12.33+5.72+3(5) = 33.05
1459      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1460      DT  19CN.2
1461      DI       0      33   10000
1462      DQ       0      33      33
          *

1463      KK  CP19CN
1464      KM   COMBINE AT 19TH AVE AND GRAND CANAL
1465      HC       2
          *
          *
1466      ZZ
```

APPENDIX K

PHASE 2 DRAINAGE SYSTEM
ALTERNATE 100-YEAR, 6-HOUR STORM
FILE: P2-100-C

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 2, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
  9       ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR 50-YR INFLOW VOLUME
 10       ID   100-YEAR 6 HOUR STORM
 11       ID
 12       ID   THIS IS BASELINE FILE P1-25-1 MODIFIED FOR AUGUST 2003 FOR PHASE 2 ANALYSIS
 13       ID
 14       ID   FILE NAME: P2-100-C.6I
 15       ID   ****************************************************
 16       ID
 17       ID   Project ID: 24TH & CAMELBACK
 18       IT      2                   2000
 19       IO      5
          *DIAGRAM
          *
 20       ID   ****************************************************
 21       ID   FLOWS ALONG 23RD AVE
 22       ID   ****************************************************
 23       ID

 24       KK  SB23DU
 25       KM   SUB-BASIN SB23DU
 26       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 27       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 28       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 29       BA    .179
 30       IN      15
 31       KM   RAINFALL DEPTH OF 3.00 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 32       PB   2.900
 33       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 34       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 35       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 36       PC    .949    .962    .975    .988   1.000
 37       LG    .100    .250   4.300    .366  80.000
 38       UC    .346    .137
 39       UA       0       5      16      30      65      77      84      90      94      97
 40       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0       13   10000
          *  DQ      0       13      13
          *
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	267.	4.10	48.	12.	4.	0.18		
ROUTED TO	RT23DU	265.	4.17	48.	12.	4.	0.18	0.93	4.17
HYDROGRAPH AT	SB23BU	263.	4.17	46.	12.	4.	0.22		
2 COMBINED AT	CP23BU	528.	4.17	94.	24.	9.	0.40		
ROUTED TO	RT23BU	526.	4.20	94.	24.	9.	0.40	1.43	4.20
HYDROGRAPH AT	SB23RO	134.	4.17	27.	7.	2.	0.10		
DIVERSION TO	DV23RO	119.	4.17	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	134.	4.17	17.	4.	2.	0.10		
2 COMBINED AT	CP23RO	658.	4.20	111.	28.	10.	0.50		
ROUTED TO	RT23RO	657.	4.23	111.	28.	10.	0.50	2.39	4.23
HYDROGRAPH AT	SB23NO	67.	4.10	12.	3.	1.	0.04		
DIVERSION TO	RB23NO	53.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	67.	4.10	8.	2.	1.	0.04		
2 COMBINED AT	CP23NO	715.	4.20	119.	30.	11.	0.55		
DIVERSION TO	DI23NO	439.	4.20	83.	21.	8.	0.55		
HYDROGRAPH AT	DV23NO	276.	4.20	37.	9.	3.	0.55		
ROUTED TO	RT23NO	275.	4.30	37.	9.	3.	0.55	0.95	4.30
HYDROGRAPH AT	SB23OR	146.	4.20	29.	7.	3.	0.12		
2 COMBINED AT	CP23OR	418.	4.27	66.	17.	6.	0.67		
DIVERSION TO	DI23OR	105.	4.27	16.	4.	1.	0.67		
HYDROGRAPH AT	DV23OR	314.	4.27	49.	12.	4.	0.67		
ROUTED TO	RT23OR	312.	4.33	49.	12.	4.	0.67	1.02	4.33
HYDROGRAPH AT	SB23DM	75.	4.10	13.	3.	1.	0.06		
2 COMBINED AT	CP23DM	378.	4.30	62.	16.	6.	0.73		
DIVERSION TO	DI23DM	189.	4.30	31.	8.	3.	0.73		
HYDROGRAPH AT	DV23DM	189.	4.30	31.	8.	3.	0.73		

ROUTED TO	RT23DM	187.	4.37	31.	8.	3.	0.73	0.89	4.37
HYDROGRAPH AT	SB22GL	21.	4.30	5.	1.	0.	0.03		
ROUTED TO	RT22GL	21.	4.43	5.	1.	0.	0.03	0.25	4.43
HYDROGRAPH AT	SB23GL	74.	4.13	13.	3.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.13	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	66.	4.13	9.	2.	1.	0.06		
3 COMBINED AT	CP23GL	261.	4.33	44.	11.	4.	0.81		
ROUTED TO	RT23GL	256.	4.47	44.	11.	4.	0.81	0.63	4.47
HYDROGRAPH AT	S23MAA	111.	4.23	22.	6.	2.	0.11		
DIVERSION TO	SD12	10.	4.23	6.	2.	1.	0.11		
HYDROGRAPH AT	SD11	101.	4.23	16.	4.	1.	0.11		
HYDROGRAPH AT	S23MAB	26.	4.27	6.	1.	1.	0.03		
HYDROGRAPH AT	S21MAC	12.	4.20	1.	0.	0.	0.02		
4 COMBINED AT	CP23MA	378.	4.43	68.	17.	6.	0.96		
DIVERSION TO	DI_I	378.	0.00	68.	17.	6.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	6.23
HYDROGRAPH AT	SB23BE	109.	4.27	22.	6.	2.	0.12		
DIVERSION TO	23BE.2	22.	4.27	10.	3.	1.	0.12		
HYDROGRAPH AT	23BE.1	87.	4.27	12.	3.	1.	0.12		
2 COMBINED AT	CP23BE	87.	4.27	12.	3.	1.	1.08		
ROUTED TO	RT23BE	85.	4.47	12.	3.	1.	1.08	0.67	4.47
HYDROGRAPH AT	SB23MI	80.	4.47	21.	5.	2.	0.12		
2 COMBINED AT	CP23MI	166.	4.47	33.	8.	3.	1.20		
DIVERSION TO	DI23MI	66.	4.47	13.	3.	1.	1.20		
HYDROGRAPH AT	DV23MI	99.	4.47	20.	5.	2.	1.20		
ROUTED TO	RT23MI	98.	4.57	20.	5.	2.	1.20	0.65	4.57
HYDROGRAPH AT	S23COA	9.	4.33	2.	1.	0.	0.01		
HYDROGRAPH AT	S23COB	42.	4.40	11.	3.	1.	0.05		
3 COMBINED AT	23CO.1	147.	4.50	34.	9.	3.	1.26		

DIVERSION TO	DI23CO	74.	4.50	17.	4.	2.	1.26		
HYDROGRAPH AT	DV23CO	74.	4.50	17.	4.	2.	1.26		
ROUTED TO	RT23CO	73.	4.57	17.	4.	2.	1.26	0.56	4.57
HYDROGRAPH AT	S23CAA	9.	4.23	2.	1.	0.	0.01		
DIVERSION TO	23AA.2	9.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	73.	4.57	17.	4.	2.	1.27		
DIVERSION TO	RBA.2	73.	0.00	17.	4.	2.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	2.27
HYDROGRAPH AT	S23CAB	4.	4.07	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	4.	4.07	1.	0.	0.	1.27		
DIVERSION TO	DI23CA	4.	0.00	1.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	4.97
HYDROGRAPH AT	RE24CA	4.	4.07	1.	0.	0.	0.00		
ROUTED TO	RD24CA	4.	4.20	1.	0.	0.	0.00	0.05	4.20
HYDROGRAPH AT	SB24CA	53.	4.27	12.	3.	1.	0.05		
2 COMBINED AT	CP24CA	57.	4.23	13.	3.	1.	0.05		
DIVERSION TO	RBC.2	57.	0.00	13.	3.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.30
HYDROGRAPH AT	SB23CP	205.	4.17	40.	10.	4.	0.16		
DIVERSION TO	23CP.2	4.	4.17	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	201.	4.17	36.	9.	3.	0.16		
3 COMBINED AT	CP23CP	201.	4.17	36.	9.	3.	1.48		
ROUTED TO	RT23CP	198.	4.27	36.	9.	3.	1.48	0.92	4.27
HYDROGRAPH AT	SB23IN	215.	4.20	43.	11.	4.	0.17		
DIVERSION TO	23IN.2	4.	4.20	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	211.	4.20	39.	10.	4.	0.17		

2 COMBINED AT	CP23IN	406.	4.27	75.	19.	7.	1.65		
HYDROGRAPH AT	SB21DU	77.	4.37	19.	5.	2.	0.09		
DIVERSION TO	21DU.2	13.	4.37	8.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	64.	4.37	11.	3.	1.	0.09		
ROUTED TO	RT21DU	64.	4.50	11.	3.	1.	0.09	0.47	4.50
HYDROGRAPH AT	SB21BU	139.	4.20	27.	7.	2.	0.13		
2 COMBINED AT	CP21BU	188.	4.40	38.	9.	3.	0.22		
DIVERSION TO	DI21BU	188.	0.00	38.	9.	3.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	138.	4.20	28.	7.	2.	0.13		
HYDROGRAPH AT	RE21OR	105.	4.27	16.	4.	1.	0.00		
ROUTED TO	RD21OR	102.	4.40	16.	4.	1.	0.00	0.50	4.40
2 COMBINED AT	CP21OR	234.	4.33	44.	11.	4.	0.13		
DIVERSION TO	DI21OR	117.	4.33	22.	6.	2.	0.13		
HYDROGRAPH AT	DV21OR	117.	4.33	22.	6.	2.	0.13		
ROUTED TO	RT21OR	117.	4.40	22.	6.	2.	0.13	0.76	4.40
HYDROGRAPH AT	SB21MY	59.	4.37	14.	3.	1.	0.07		
HYDROGRAPH AT	RE21MY	189.	4.30	31.	8.	3.	0.00		
ROUTED TO	RD21MY	187.	4.43	31.	8.	3.	0.00	0.82	4.43
3 COMBINED AT	CP21MY	362.	4.40	67.	17.	6.	0.19		
DIVERSION TO	DI21MY	181.	4.40	33.	8.	3.	0.19		
HYDROGRAPH AT	DV21MY	181.	4.40	33.	8.	3.	0.19		
ROUTED TO	RT21MY	180.	4.47	33.	8.	3.	0.19	0.89	4.47
HYDROGRAPH AT	SB21GL	40.	4.23	8.	2.	1.	0.04		
2 COMBINED AT	CP21GL	216.	4.43	41.	10.	4.	0.23		
DIVERSION TO	DI21GL	184.	4.43	38.	10.	3.	0.23		
HYDROGRAPH AT	DV21GL	32.	4.43	4.	1.	0.	0.23		
ROUTED TO	RT21GL	31.	4.67	4.	1.	0.	0.23	0.34	4.67
HYDROGRAPH AT	S21MAA	151.	4.07	24.	6.	2.	0.11		
HYDROGRAPH AT	DI_I	378.	4.43	68.	17.	6.	0.00		

HYDROGRAPH AT	S21MAB	50.	4.07	7.	2.	1.	0.04		
4 COMBINED AT	BSN_I	502.	4.37	101.	26.	9.	0.38		
ROUTED TO	WASHPK	35.	5.93	14.	4.	1.	0.38	4.31	5.93
ROUTED TO	M21.1	35.	5.97	14.	4.	1.	0.38	0.37	5.97
ROUTED TO	RT21MA	35.	6.20	14.	4.	1.	0.38	0.39	6.20
HYDROGRAPH AT	SB21BE	203.	4.20	38.	10.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.20	6.	2.	1.	0.18		
HYDROGRAPH AT	21BE.1	197.	4.20	32.	8.	3.	0.18		
2 COMBINED AT	CP21BE	197.	4.20	45.	12.	4.	0.57		
ROUTED TO	RT21BE	196.	4.23	45.	12.	4.	0.57	0.87	4.23
HYDROGRAPH AT	SB21MO	40.	4.53	12.	3.	1.	0.07		
2 COMBINED AT	CP21MO	230.	4.27	56.	15.	5.	0.64		
ROUTED TO	RT21MO	229.	4.33	56.	15.	5.	0.64	1.08	4.33
HYDROGRAPH AT	SB21MI	67.	4.37	15.	4.	1.	0.09		
HYDROGRAPH AT	RE21MI	66.	4.47	13.	3.	1.	0.00		
ROUTED TO	RD21MI	65.	4.60	13.	3.	1.	0.00	0.39	4.60
3 COMBINED AT	CP21MI	349.	4.40	83.	22.	8.	0.72		
ROUTED TO	RT21MI	347.	4.50	83.	22.	8.	0.72	1.36	4.50
HYDROGRAPH AT	S21CAA	42.	4.37	11.	3.	1.	0.05		
HYDROGRAPH AT	S22CAA	42.	4.33	10.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.33	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	32.	4.33	5.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	74.	4.50	17.	4.	2.	0.00		
ROUTED TO	RD22CA	66.	4.87	17.	4.	2.	0.00	0.39	4.87
HYDROGRAPH AT	RBA.2	73.	4.57	17.	4.	2.	0.00		
5 COMBINED AT	DBA-1	530.	4.53	131.	35.	13.	0.82		
HYDROGRAPH AT	RBC.2	57.	4.23	13.	3.	1.	0.00		
HYDROGRAPH AT	S22CAB	12.	4.00	2.	1.	0.	0.01		
HYDROGRAPH AT	S21CAC	7.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	70.	4.17	16.	4.	1.	0.01		

2 COMBINED AT	DBA-3	583.	4.50	146.	39.	14.	0.83		
DIVERSION TO	SD36	583.	0.00	146.	39.	14.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	4.23
HYDROGRAPH AT	S21CAB	114.	4.37	27.	7.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.37	10.	3.	1.	0.12		
HYDROGRAPH AT	21CA.1	96.	4.37	17.	4.	2.	0.12		
2 COMBINED AT	CP21CA	96.	4.37	17.	4.	2.	0.95		
ROUTED TO	RT21CA	95.	4.50	17.	4.	2.	0.95	0.69	4.50
HYDROGRAPH AT	SB21CP	151.	4.33	34.	9.	3.	0.14		
DIVERSION TO	21CP.2	15.	4.33	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	136.	4.33	25.	6.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	227.	4.43	42.	10.	4.	1.10		
DIVERSION TO	DI21CP	113.	4.43	21.	5.	2.	1.10		
HYDROGRAPH AT	DV21CP	113.	4.43	21.	5.	2.	1.10		
ROUTED TO	RT21CP	113.	4.47	21.	5.	2.	1.10	0.66	4.47
HYDROGRAPH AT	S21CNA	22.	4.10	4.	1.	0.	0.02		
2 COMBINED AT	S19.1	129.	4.43	25.	6.	2.	1.11		
ROUTED TO	S19.2	129.	4.43	25.	6.	2.	1.11		
HYDROGRAPH AT	S19CNA	15.	4.60	5.	1.	0.	0.02		
HYDROGRAPH AT	SBX	22.	4.33	5.	1.	0.	0.02		
3 COMBINED AT	BASN_X	164.	4.43	35.	9.	3.	1.15		
DIVERSION TO	SD42	164.	0.00	35.	9.	3.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		
HYDROGRAPH AT	S21CNB	31.	4.13	6.	1.	1.	0.03		
DIVERSION TO	SD44	7.	4.13	3.	1.	0.	0.03		

HYDROGRAPH AT	SD43	24.	4.13	3.	1.	0.	0.03		
HYDROGRAPH AT	SB19DU	17.	4.30	5.	1.	0.	0.02		
ROUTED TO	RT19DU	15.	4.90	5.	1.	0.	0.02	0.09	4.90
HYDROGRAPH AT	SB19NO	41.	4.20	9.	2.	1.	0.04		
DIVERSION TO	19NO.2	36.	4.20	9.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	5.	4.20	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	439.	4.20	83.	21.	8.	0.00		
ROUTED TO	RD19NO	433.	4.33	83.	21.	8.	0.00	1.08	4.33
3 COMBINED AT	CP19NO	445.	4.33	87.	22.	8.	0.05		
ROUTED TO	RT19NO	431.	4.47	87.	22.	8.	0.05	0.89	4.47
HYDROGRAPH AT	SB19OR	105.	4.37	29.	7.	3.	0.10		
DIVERSION TO	19OR.2	30.	4.37	16.	4.	2.	0.10		
HYDROGRAPH AT	19OR.1	75.	4.37	13.	3.	1.	0.10		
HYDROGRAPH AT	RE19OR	117.	4.33	22.	6.	2.	0.00		
ROUTED TO	RD19OR	115.	4.43	22.	6.	2.	0.00	0.48	4.43
3 COMBINED AT	CP19OR	619.	4.43	122.	31.	11.	0.16		
ROUTED TO	RT19OR	613.	4.50	121.	31.	11.	0.16	1.08	4.50
HYDROGRAPH AT	SB19MY	39.	4.30	9.	2.	1.	0.05		
DIVERSION TO	19MY.2	35.	4.30	8.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	4.	4.30	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	181.	4.40	33.	8.	3.	0.00		
ROUTED TO	RD19MY	178.	4.53	33.	8.	3.	0.00	0.80	4.53
3 COMBINED AT	CP19MY	791.	4.50	155.	39.	14.	0.20		
ROUTED TO	RT19MY	787.	4.53	155.	39.	14.	0.20	1.50	4.53
HYDROGRAPH AT	SB19GL	50.	4.37	13.	3.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.37	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	35.	4.37	5.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	184.	4.43	38.	10.	3.	0.00		
ROUTED TO	RD19GL	180.	4.57	38.	10.	3.	0.00	0.80	4.57
3 COMBINED AT	CP19GL	999.	4.53	197.	50.	18.	0.26		

ROUTED TO	RT19GL	975.	4.63	197.	50.	18.	0.26	1.31	4.63
HYDROGRAPH AT	SB19MA	50.	4.30	12.	3.	1.	0.05		
DIVERSION TO	19MA.2	35.	4.30	11.	3.	1.	0.05		
HYDROGRAPH AT	19MA.1	15.	4.30	1.	0.	0.	0.05		
2 COMBINED AT	CP19MA	981.	4.60	198.	50.	18.	0.31		
ROUTED TO	RT19MA	970.	4.70	198.	50.	18.	0.31	1.39	4.70
HYDROGRAPH AT	SB19BE	50.	4.37	13.	3.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.37	11.	3.	1.	0.06		
HYDROGRAPH AT	19BE.1	20.	4.37	2.	0.	0.	0.06		
2 COMBINED AT	CP19BE	980.	4.67	200.	51.	18.	0.37		
ROUTED TO	RT19BE	968.	4.77	200.	51.	18.	0.37	1.39	4.77
HYDROGRAPH AT	SB19MI	63.	4.33	14.	4.	1.	0.08		
DIVERSION TO	19MI.2	63.	0.00	14.	4.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	968.	4.77	200.	51.	18.	0.44		
ROUTED TO	RT19MI	953.	4.83	200.	51.	18.	0.44	1.49	4.83
HYDROGRAPH AT	SB19CA	5.	4.60	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	5.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	953.	4.83	200.	51.	18.	0.45		
ROUTED TO	RT19CA	941.	4.90	200.	51.	18.	0.45	1.28	4.90
HYDROGRAPH AT	SB19CP	58.	4.30	14.	4.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.30	11.	3.	1.	0.06		
HYDROGRAPH AT	19CP.1	28.	4.30	3.	1.	0.	0.06		
HYDROGRAPH AT	RE19CP	113.	4.43	21.	5.	2.	0.00		
ROUTED TO	RD19CP	112.	4.50	21.	5.	2.	0.00	0.52	4.50
3 COMBINED AT	CP19CP	1027.	4.90	224.	57.	20.	0.51		
ROUTED TO	RT19CP	1025.	4.93	224.	57.	20.	0.51	2.13	4.93
HYDROGRAPH AT	S19CNB	10.	4.63	4.	1.	0.	0.02		
DIVERSION TO	19CN.2	10.	0.00	4.	1.	0.	0.02		

HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	1025.	4.93	224.	57.	20.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	3.90	11.00
STORAGE	0.	43.	121.
OUTFLOW	0.	0.	2554.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	4.31	0.00	47.	35.	0.00	5.93	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX L

PHASE 2 DRAINAGE SYSTEM
50-YEAR, 6-HOUR STORM
FILE: P2-50-B

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

    1     ID
    2     ID   ****************************************************
    3     ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
    4     ID   PHOENIX, ARIZONA
    5     ID   MODELED BY PREMIER ENGINEERING
    6     ID   MARCH 2003, REVISED AUGUST 2003
    7     ID
    8     ID   PHASE 2, SINGLE RETENTION BASIN AT CAMELBACK ROAD
    9     ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR 50-YR INFLOW VOLUME
   10     ID   50-YEAR 6 HOUR STORM
   11     ID
   12     ID   THIS IS BASELINE FILE P1-25-1 MODIFIED FOR AUGUST 2003 FOR PHASE 2 ANALYSIS
   13     ID
   14     ID   FILE NAME: P2-50-B.6I
   15     ID   ****************************************************
   16     ID
   17     ID   Project ID: 24TH & CAMELBACK
   18     IT       2                   2000
   19     IO       5
          *DIAGRAM
          *
   20     ID   ****************************************************
   21     ID   FLOWS ALONG 23RD AVE
   22     ID   ****************************************************
   23     ID

   24     KK  SB23DU
   25     KM   SUB-BASIN SB23DU
   26     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
   27     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
   28     KM     L =  .37  Kb = .052  Adj. Slope =   38.0
   29     BA    .179
   30     IN      15
   31     KM   RAINFALL DEPTH OF 2.68 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
   32     PB   2.591
   33     KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
   34     PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
   35     PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
   36     PC    .949    .962    .975    .988   1.000
   37     LG    .100    .250   4.300    .366  80.000
   38     UC    .363    .144
   39     UA       0       5      16      30      65      77      84      90      94      97
   40     UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0       13   10000
          *  DQ      0       13      13
          *
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	234.	4.10	43.	11.	4.	0.18		
ROUTED TO	RT23DU	231.	4.17	43.	11.	4.	0.18	0.87	4.17
HYDROGRAPH AT	SB23BU	221.	4.17	40.	10.	4.	0.22		
2 COMBINED AT	CP23BU	452.	4.17	82.	21.	7.	0.40		
ROUTED TO	RT23BU	451.	4.23	82.	21.	7.	0.40	1.31	4.23
HYDROGRAPH AT	SB23RO	117.	4.17	23.	6.	2.	0.10		
DIVERSION TO	DV23RO	110.	4.17	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	117.	4.17	14.	3.	1.	0.10		
2 COMBINED AT	CP23RO	565.	4.23	96.	24.	9.	0.50		
ROUTED TO	RT23RO	564.	4.27	96.	24.	9.	0.50	2.19	4.27
HYDROGRAPH AT	SB23NO	59.	4.10	11.	3.	1.	0.04		
DIVERSION TO	RB23NO	51.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	59.	4.10	7.	2.	1.	0.04		
2 COMBINED AT	CP23NO	615.	4.23	103.	26.	9.	0.55		
DIVERSION TO	DI23NO	380.	4.23	72.	18.	7.	0.55		
HYDROGRAPH AT	DV23NO	234.	4.23	30.	8.	3.	0.55		
ROUTED TO	RT23NO	233.	4.33	30.	8.	3.	0.55	0.87	4.33
HYDROGRAPH AT	SB23OR	124.	4.23	25.	6.	2.	0.12		
2 COMBINED AT	CP23OR	354.	4.33	56.	14.	5.	0.67		
DIVERSION TO	DI23OR	89.	4.33	14.	4.	1.	0.67		
HYDROGRAPH AT	DV23OR	266.	4.33	42.	11.	4.	0.67		
ROUTED TO	RT23OR	265.	4.37	42.	11.	4.	0.67	0.93	4.37
HYDROGRAPH AT	SB23DM	65.	4.13	11.	3.	1.	0.06		
2 COMBINED AT	CP23DM	318.	4.37	53.	13.	5.	0.73		
DIVERSION TO	DI23DM	159.	4.37	27.	7.	2.	0.73		
HYDROGRAPH AT	DV23DM	159.	4.37	27.	7.	2.	0.73		

ROUTED TO	RT23DM	157.	4.43	27.	7.	2.	0.73	0.81	4.43
HYDROGRAPH AT	SB22GL	17.	4.33	4.	1.	0.	0.03		
ROUTED TO	RT22GL	17.	4.53	4.	1.	0.	0.03	0.22	4.53
HYDROGRAPH AT	SB23GL	64.	4.13	11.	3.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.13	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	55.	4.13	7.	2.	1.	0.06		
3 COMBINED AT	CP23GL	215.	4.40	38.	9.	3.	0.81		
ROUTED TO	RT23GL	211.	4.53	38.	9.	3.	0.81	0.57	4.53
HYDROGRAPH AT	S23MAA	92.	4.27	19.	5.	2.	0.11		
DIVERSION TO	SD12	10.	4.27	6.	2.	1.	0.11		
HYDROGRAPH AT	SD11	82.	4.27	13.	3.	1.	0.11		
HYDROGRAPH AT	S23MAB	22.	4.30	5.	1.	0.	0.03		
HYDROGRAPH AT	S21MAC	8.	4.23	1.	0.	0.	0.02		
4 COMBINED AT	CP23MA	308.	4.47	57.	14.	5.	0.96		
DIVERSION TO	DI_I	308.	0.00	57.	14.	5.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	5.10
HYDROGRAPH AT	SB23BE	90.	4.30	19.	5.	2.	0.12		
DIVERSION TO	23BE.2	22.	4.30	10.	3.	1.	0.12		
HYDROGRAPH AT	23BE.1	68.	4.30	9.	2.	1.	0.12		
2 COMBINED AT	CP23BE	68.	4.30	9.	2.	1.	1.08		
ROUTED TO	RT23BE	66.	4.50	9.	2.	1.	1.08	0.58	4.50
HYDROGRAPH AT	SB23MI	64.	4.53	18.	5.	2.	0.12		
2 COMBINED AT	CP23MI	130.	4.50	27.	7.	2.	1.20		
DIVERSION TO	DI23MI	52.	4.50	11.	3.	1.	1.20		
HYDROGRAPH AT	DV23MI	78.	4.50	16.	4.	1.	1.20		
ROUTED TO	RT23MI	77.	4.60	16.	4.	1.	1.20	0.57	4.60
HYDROGRAPH AT	S23COA	8.	4.33	2.	1.	0.	0.01		
HYDROGRAPH AT	S23COB	35.	4.43	10.	3.	1.	0.05		
3 COMBINED AT	23CO.1	118.	4.53	28.	7.	3.	1.26		

DIVERSION TO	DI23CO	59.	4.53	14.	4.	1.	1.26		
HYDROGRAPH AT	DV23CO	59.	4.53	14.	4.	1.	1.26		
ROUTED TO	RT23CO	59.	4.60	14.	4.	1.	1.26	0.50	4.60
HYDROGRAPH AT	S23CAA	8.	4.27	2.	0.	0.	0.01		
DIVERSION TO	23AA.2	8.	0.00	2.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	59.	4.60	14.	4.	1.	1.27		
DIVERSION TO	RBA.2	59.	0.00	14.	4.	1.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	16.00
HYDROGRAPH AT	S23CAB	4.	4.07	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	4.	4.07	1.	0.	0.	1.27		
DIVERSION TO	DI23CA	4.	0.00	1.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	4.20
HYDROGRAPH AT	RE24CA	4.	4.07	1.	0.	0.	0.00		
ROUTED TO	RD24CA	3.	4.20	1.	0.	0.	0.00	0.05	4.20
HYDROGRAPH AT	SB24CA	45.	4.27	10.	3.	1.	0.05		
2 COMBINED AT	CP24CA	48.	4.27	11.	3.	1.	0.05		
DIVERSION TO	RBC.2	48.	0.00	11.	3.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.37
HYDROGRAPH AT	SB23CP	177.	4.20	35.	9.	3.	0.16		
DIVERSION TO	23CP.2	4.	4.20	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	173.	4.20	31.	8.	3.	0.16		
3 COMBINED AT	CP23CP	173.	4.20	31.	8.	3.	1.48		
ROUTED TO	RT23CP	171.	4.33	31.	8.	3.	1.48	0.85	4.33
HYDROGRAPH AT	SB23IN	185.	4.23	38.	9.	3.	0.17		
DIVERSION TO	23IN.2	4.	4.23	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	181.	4.23	34.	8.	3.	0.17		

2 COMBINED AT	CP23IN	349.	4.27	65.	16.	6.	1.65		
HYDROGRAPH AT	SB21DU	64.	4.40	16.	4.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.40	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	51.	4.40	9.	2.	1.	0.09		
ROUTED TO	RT21DU	50.	4.60	9.	2.	1.	0.09	0.41	4.60
HYDROGRAPH AT	SB21BU	117.	4.23	23.	6.	2.	0.13		
2 COMBINED AT	CP21BU	154.	4.37	32.	8.	3.	0.22		
DIVERSION TO	DI21BU	154.	0.00	32.	8.	3.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	117.	4.23	24.	6.	2.	0.13		
HYDROGRAPH AT	RE21OR	89.	4.33	14.	4.	1.	0.00		
ROUTED TO	RD21OR	86.	4.47	14.	4.	1.	0.00	0.46	4.47
2 COMBINED AT	CP21OR	193.	4.40	38.	9.	3.	0.13		
DIVERSION TO	DI21OR	97.	4.40	19.	5.	2.	0.13		
HYDROGRAPH AT	DV21OR	97.	4.40	19.	5.	2.	0.13		
ROUTED TO	RT21OR	97.	4.47	19.	5.	2.	0.13	0.70	4.47
HYDROGRAPH AT	SB21MY	49.	4.40	12.	3.	1.	0.07		
HYDROGRAPH AT	RE21MY	159.	4.37	27.	7.	2.	0.00		
ROUTED TO	RD21MY	157.	4.47	27.	7.	2.	0.00	0.75	4.47
3 COMBINED AT	CP21MY	302.	4.47	57.	14.	5.	0.19		
DIVERSION TO	DI21MY	151.	4.47	29.	7.	3.	0.19		
HYDROGRAPH AT	DV21MY	151.	4.47	29.	7.	3.	0.19		
ROUTED TO	RT21MY	150.	4.53	29.	7.	3.	0.19	0.80	4.53
HYDROGRAPH AT	SB21GL	32.	4.30	7.	2.	1.	0.04		
2 COMBINED AT	CP21GL	179.	4.50	35.	9.	3.	0.23		
DIVERSION TO	DI21GL	154.	4.50	33.	8.	3.	0.23		
HYDROGRAPH AT	DV21GL	25.	4.50	3.	1.	0.	0.23		
ROUTED TO	RT21GL	24.	4.70	3.	1.	0.	0.23	0.30	4.70
HYDROGRAPH AT	S21MAA	129.	4.07	20.	5.	2.	0.11		
HYDROGRAPH AT	DI_I	308.	4.47	57.	14.	5.	0.00		

HYDROGRAPH AT	S21MAB	42.	4.10	6.	1.	1.	0.04		
4 COMBINED AT	BSN_I	405.	4.37	85.	22.	8.	0.38		
ROUTED TO	WASHPK	0.	0.00	0.	0.	0.	0.38	3.87	9.73
ROUTED TO	M21.1	0.	0.00	0.	0.	0.	0.38		
ROUTED TO	RT21MA	0.	0.00	0.	0.	0.	0.38		
HYDROGRAPH AT	SB21BE	170.	4.23	33.	8.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.23	6.	1.	1.	0.18		
HYDROGRAPH AT	21BE.1	164.	4.23	27.	7.	2.	0.18		
2 COMBINED AT	CP21BE	164.	4.23	27.	7.	2.	0.57		
ROUTED TO	RT21BE	163.	4.27	27.	7.	2.	0.57	0.79	4.27
HYDROGRAPH AT	SB21MO	31.	4.57	10.	3.	1.	0.07		
2 COMBINED AT	CP21MO	190.	4.30	37.	9.	3.	0.64		
ROUTED TO	RT21MO	189.	4.37	37.	9.	3.	0.64	0.98	4.37
HYDROGRAPH AT	SB21MI	54.	4.40	12.	3.	1.	0.09		
HYDROGRAPH AT	RE21MI	52.	4.50	11.	3.	1.	0.00		
ROUTED TO	RD21MI	51.	4.63	11.	3.	1.	0.00	0.33	4.63
3 COMBINED AT	CP21MI	282.	4.43	61.	15.	6.	0.72		
ROUTED TO	RT21MI	280.	4.53	61.	15.	6.	0.72	1.21	4.53
HYDROGRAPH AT	S21CAA	36.	4.40	9.	2.	1.	0.05		
HYDROGRAPH AT	S22CAA	35.	4.37	8.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.37	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	25.	4.37	4.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	59.	4.53	14.	4.	1.	0.00		
ROUTED TO	RD22CA	53.	4.93	14.	4.	1.	0.00	0.34	4.93
HYDROGRAPH AT	RBA.2	59.	4.60	14.	4.	1.	0.00		
5 COMBINED AT	DBA-1	424.	4.57	101.	26.	9.	0.82		
HYDROGRAPH AT	RBC.2	48.	4.27	11.	3.	1.	0.00		
HYDROGRAPH AT	S22CAB	11.	4.03	2.	0.	0.	0.01		
HYDROGRAPH AT	S21CAC	6.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	60.	4.20	14.	4.	1.	0.01		

2 COMBINED AT	DBA-3	468.	4.57	115.	29.	11.	0.83		
DIVERSION TO	SD36	468.	0.00	115.	29.	11.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	5.00
HYDROGRAPH AT	S21CAB	96.	4.40	23.	6.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.40	10.	3.	1.	0.12		
HYDROGRAPH AT	21CA.1	78.	4.40	13.	3.	1.	0.12		
2 COMBINED AT	CP21CA	78.	4.40	13.	3.	1.	0.95		
ROUTED TO	RT21CA	77.	4.53	13.	3.	1.	0.95	0.62	4.53
HYDROGRAPH AT	SB21CP	129.	4.37	30.	8.	3.	0.14		
DIVERSION TO	21CP.2	15.	4.37	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	114.	4.37	21.	5.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	187.	4.43	34.	9.	3.	1.10		
DIVERSION TO	DI21CP	93.	4.43	17.	4.	2.	1.10		
HYDROGRAPH AT	DV21CP	93.	4.43	17.	4.	2.	1.10		
ROUTED TO	RT21CP	93.	4.50	17.	4.	2.	1.10	0.60	4.50
HYDROGRAPH AT	S21CNA	19.	4.13	4.	1.	0.	0.02		
2 COMBINED AT	S19.1	107.	4.43	21.	5.	2.	1.11		
ROUTED TO	S19.2	107.	4.47	21.	5.	2.	1.11		
HYDROGRAPH AT	S19CNA	12.	4.63	4.	1.	0.	0.02		
HYDROGRAPH AT	SBX	19.	4.37	4.	1.	0.	0.02		
3 COMBINED AT	BASN_X	137.	4.47	29.	7.	3.	1.15		
DIVERSION TO	SD42	137.	0.00	29.	7.	3.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		
HYDROGRAPH AT	S21CNB	27.	4.13	5.	1.	0.	0.03		
DIVERSION TO	SD44	7.	4.13	3.	1.	0.	0.03		

HYDROGRAPH AT	SD43	19.	4.13	2.	1.	0.	0.03		
HYDROGRAPH AT	SB19DU	15.	4.33	4.	1.	0.	0.02		
ROUTED TO	RT19DU	13.	4.93	4.	1.	0.	0.02	0.08	4.93
HYDROGRAPH AT	SB19NO	35.	4.23	8.	2.	1.	0.04		
DIVERSION TO	19NO.2	35.	0.00	8.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	380.	4.23	72.	18.	7.	0.00		
ROUTED TO	RD19NO	374.	4.37	72.	18.	7.	0.00	0.99	4.37
3 COMBINED AT	CP19NO	381.	4.37	76.	19.	7.	0.05		
ROUTED TO	RT19NO	368.	4.50	76.	19.	7.	0.05	0.81	4.50
HYDROGRAPH AT	SB19OR	90.	4.40	26.	7.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.40	16.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	60.	4.40	10.	2.	1.	0.10		
HYDROGRAPH AT	RE19OR	97.	4.40	19.	5.	2.	0.00		
ROUTED TO	RD19OR	94.	4.50	19.	5.	2.	0.00	0.43	4.50
3 COMBINED AT	CP19OR	521.	4.50	105.	27.	10.	0.16		
ROUTED TO	RT19OR	515.	4.53	105.	27.	10.	0.16	0.98	4.53
HYDROGRAPH AT	SB19MY	32.	4.33	7.	2.	1.	0.05		
DIVERSION TO	19MY.2	32.	0.00	7.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	151.	4.47	29.	7.	3.	0.00		
ROUTED TO	RD19MY	148.	4.57	28.	7.	3.	0.00	0.73	4.57
3 COMBINED AT	CP19MY	662.	4.57	133.	34.	12.	0.20		
ROUTED TO	RT19MY	658.	4.60	133.	34.	12.	0.20	1.36	4.60
HYDROGRAPH AT	SB19GL	42.	4.40	11.	3.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.40	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	27.	4.40	4.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	154.	4.50	33.	8.	3.	0.00		
ROUTED TO	RD19GL	151.	4.60	33.	8.	3.	0.00	0.73	4.60
3 COMBINED AT	CP19GL	833.	4.60	169.	43.	15.	0.26		

ROUTED TO	RT19GL	810.	4.67	169.	43.	15.	0.26	1.18	4.67
HYDROGRAPH AT	SB19MA	42.	4.33	11.	3.	1.	0.05		
DIVERSION TO	19MA.2	35.	4.33	10.	3.	1.	0.05		
HYDROGRAPH AT	19MA.1	7.	4.33	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	810.	4.67	170.	43.	16.	0.31		
ROUTED TO	RT19MA	800.	4.77	169.	43.	16.	0.31	1.25	4.77
HYDROGRAPH AT	SB19BE	41.	4.37	11.	3.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.37	10.	3.	1.	0.06		
HYDROGRAPH AT	19BE.1	11.	4.37	1.	0.	0.	0.06		
2 COMBINED AT	CP19BE	801.	4.77	170.	43.	16.	0.37		
ROUTED TO	RT19BE	791.	4.83	170.	43.	16.	0.37	1.24	4.83
HYDROGRAPH AT	SB19MI	52.	4.37	12.	3.	1.	0.08		
DIVERSION TO	19MI.2	52.	0.00	12.	3.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	791.	4.83	170.	43.	16.	0.44		
ROUTED TO	RT19MI	777.	4.93	170.	43.	16.	0.44	1.33	4.93
HYDROGRAPH AT	SB19CA	4.	4.63	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	4.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	777.	4.93	170.	43.	16.	0.45		
ROUTED TO	RT19CA	767.	5.00	170.	43.	16.	0.45	1.15	5.00
HYDROGRAPH AT	SB19CP	49.	4.33	12.	3.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.33	10.	3.	1.	0.06		
HYDROGRAPH AT	19CP.1	19.	4.33	2.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	93.	4.43	17.	4.	2.	0.00		
ROUTED TO	RD19CP	93.	4.53	17.	4.	2.	0.00	0.48	4.53
3 COMBINED AT	CP19CP	831.	5.00	189.	48.	17.	0.51		
ROUTED TO	RT19CP	829.	5.03	189.	48.	17.	0.51	1.88	5.03
HYDROGRAPH AT	S19CNB	8.	4.67	3.	1.	0.	0.02		
DIVERSION TO	19CN.2	8.	0.00	3.	1.	0.	0.02		

HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	829.	5.03	189.	48.	17.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1		INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
	ELEVATION	0.00	9.00	11.00
	STORAGE	0.	99.	121.
	OUTFLOW	0.	0.	382.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	3.87	0.00	43.	0.	0.00	0.00	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX M

PHASE 2 DRAINAGE SYSTEM
25-YEAR, 6-HOUR STORM
FILE: P2-25-1

APPENDIX M

PHASE 2 DRAINAGE SYSTEM
25-YEAR, 6-HOUR STORM
FILE: P2-25-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 2, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
  9       ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR 50-YR INFLOW VOLUME
 10       ID   25-YEAR 6 HOUR STORM
 11       ID
 12       ID
 13       ID   FILE NAME: P2-25-1.6I
 14       ID   ****************************************************
 15       ID
 16       ID   Project ID: 24TH & CAMELBACK
 17       IT       2                    2000
 18       IO       5
          *DIAGRAM
          *
 19       ID   ****************************************************
 20       ID   FLOWS ALONG 23RD AVE
 21       ID   ****************************************************
 22       ID

 23       KK  SB23DU
 24       KM   SUB-BASIN SB23DU
 25       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 26       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 27       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 28       BA    .179
 29       IN      15
 30       KM   RAINFALL DEPTH OF 2.36 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 31       PB   2.282
 32       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 33       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 34       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 35       PC    .949    .962    .975    .988   1.000
 36       LG    .100    .250   4.300    .366  80.000
 37       UC    .383    .154
 38       UA       0       5      16      30      65      77      84      90      94      97
 39       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0       13   10000
          *  DQ      0       13      13
          *
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	200.	4.10	37.	9.	3.	0.18		
ROUTED TO	RT23DU	198.	4.20	37.	9.	3.	0.18	0.80	4.20
HYDROGRAPH AT	SB23BU	179.	4.20	33.	8.	3.	0.22		
2 COMBINED AT	CP23BU	377.	4.20	71.	18.	6.	0.40		
ROUTED TO	RT23BU	375.	4.27	70.	18.	6.	0.40	1.19	4.27
HYDROGRAPH AT	SB23RO	99.	4.17	20.	5.	2.	0.10		
DIVERSION TO	DV23RO	99.	4.23	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	98.	4.23	11.	3.	1.	0.10		
2 COMBINED AT	CP23RO	472.	4.23	81.	20.	7.	0.50		
ROUTED TO	RT23RO	473.	4.30	81.	20.	7.	0.50	1.98	4.30
HYDROGRAPH AT	SB23NO	51.	4.10	10.	2.	1.	0.04		
DIVERSION TO	RB23NO	48.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	51.	4.10	5.	1.	0.	0.04		
2 COMBINED AT	CP23NO	516.	4.30	87.	22.	8.	0.55		
DIVERSION TO	DI23NO	322.	4.30	62.	16.	6.	0.55		
HYDROGRAPH AT	DV23NO	193.	4.30	24.	6.	2.	0.55		
ROUTED TO	RT23NO	188.	4.40	24.	6.	2.	0.55	0.78	4.40
HYDROGRAPH AT	SB23OR	103.	4.23	22.	5.	2.	0.12		
2 COMBINED AT	CP23OR	287.	4.40	46.	12.	4.	0.67		
DIVERSION TO	DI23OR	72.	4.40	12.	3.	1.	0.67		
HYDROGRAPH AT	DV23OR	215.	4.40	35.	9.	3.	0.67		
ROUTED TO	RT23OR	213.	4.47	35.	9.	3.	0.67	0.83	4.47
HYDROGRAPH AT	SB23DM	55.	4.13	10.	2.	1.	0.06		
2 COMBINED AT	CP23DM	254.	4.43	44.	11.	4.	0.73		
DIVERSION TO	DI23DM	127.	4.43	22.	6.	2.	0.73		
HYDROGRAPH AT	DV23DM	127.	4.43	22.	6.	2.	0.73		

ROUTED TO	RT23DM	126.	4.50	22.	6.	2.	0.73	0.73	4.50
HYDROGRAPH AT	SB22GL	13.	4.37	3.	1.	0.	0.03		
ROUTED TO	RT22GL	13.	4.57	3.	1.	0.	0.03	0.17	4.57
HYDROGRAPH AT	SB23GL	53.	4.17	9.	2.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.17	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	45.	4.17	6.	1.	1.	0.06		
3 COMBINED AT	CP23GL	169.	4.47	31.	8.	3.	0.81		
ROUTED TO	RT23GL	166.	4.57	31.	8.	3.	0.81	0.50	4.57
HYDROGRAPH AT	S23MAA	74.	4.30	16.	4.	1.	0.11		
DIVERSION TO	SD12	10.	4.30	6.	2.	1.	0.11		
HYDROGRAPH AT	SD11	64.	4.30	10.	3.	1.	0.11		
HYDROGRAPH AT	S23MAB	17.	4.33	4.	1.	0.	0.03		
HYDROGRAPH AT	S21MAC	5.	4.33	1.	0.	0.	0.02		
4 COMBINED AT	CP23MA	239.	4.53	46.	12.	4.	0.96		
DIVERSION TO	DI_I	239.	0.00	46.	12.	4.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	4.70
HYDROGRAPH AT	SB23BE	71.	4.33	16.	4.	1.	0.12		
DIVERSION TO	23BE.2	22.	4.33	10.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	49.	4.33	7.	2.	1.	0.12		
2 COMBINED AT	CP23BE	49.	4.33	7.	2.	1.	1.08		
ROUTED TO	RT23BE	48.	4.53	7.	2.	1.	1.08	0.50	4.53
HYDROGRAPH AT	SB23MI	48.	4.57	15.	4.	1.	0.12		
2 COMBINED AT	CP23MI	96.	4.57	21.	5.	2.	1.20		
DIVERSION TO	DI23MI	38.	4.57	9.	2.	1.	1.20		
HYDROGRAPH AT	DV23MI	58.	4.57	13.	3.	1.	1.20		
ROUTED TO	RT23MI	57.	4.63	13.	3.	1.	1.20	0.50	4.63
HYDROGRAPH AT	S23COA	6.	4.37	2.	0.	0.	0.01		
HYDROGRAPH AT	S23COB	29.	4.47	9.	2.	1.	0.05		
3 COMBINED AT	23CO.1	90.	4.60	23.	6.	2.	1.26		

DIVERSION TO	DI23CO	45.	4.60	11.	3.	1.	1.26		
HYDROGRAPH AT	DV23CO	45.	4.60	11.	3.	1.	1.26		
ROUTED TO	RT23CO	44.	4.73	11.	3.	1.	1.26	0.45	4.73
HYDROGRAPH AT	S23CAA	6.	4.27	2.	0.	0.	0.01		
DIVERSION TO	23AA.2	6.	0.00	2.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	44.	4.73	11.	3.	1.	1.27		
DIVERSION TO	RBA.2	44.	0.00	11.	3.	1.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	4.47
HYDROGRAPH AT	S23CAB	3.	4.10	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	3.	4.10	1.	0.	0.	1.27		
DIVERSION TO	DI23CA	3.	0.00	1.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	4.47
HYDROGRAPH AT	RE24CA	3.	4.10	1.	0.	0.	0.00		
ROUTED TO	RD24CA	3.	4.20	1.	0.	0.	0.00	0.04	4.20
HYDROGRAPH AT	SB24CA	37.	4.30	9.	2.	1.	0.05		
2 COMBINED AT	CP24CA	40.	4.30	10.	2.	1.	0.05		
DIVERSION TO	RBC.2	40.	0.00	10.	2.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.63
HYDROGRAPH AT	SB23CP	150.	4.20	30.	8.	3.	0.16		
DIVERSION TO	23CP.2	4.	4.20	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	146.	4.20	26.	7.	2.	0.16		
3 COMBINED AT	CP23CP	146.	4.20	26.	7.	2.	1.48		
ROUTED TO	RT23CP	144.	4.33	26.	7.	2.	1.48	0.78	4.33
HYDROGRAPH AT	SB23IN	156.	4.23	32.	8.	3.	0.17		
DIVERSION TO	23IN.2	4.	4.23	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	152.	4.23	28.	7.	3.	0.17		

2 COMBINED AT	CP23IN	294.	4.30	55.	14.	5.	1.65		
HYDROGRAPH AT	SB21DU	50.	4.43	13.	3.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.43	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	37.	4.43	6.	2.	1.	0.09		
ROUTED TO	RT21DU	37.	4.63	6.	2.	1.	0.09	0.35	4.63
HYDROGRAPH AT	SB21BU	95.	4.27	20.	5.	2.	0.13		
2 COMBINED AT	CP21BU	121.	4.40	26.	7.	2.	0.22		
DIVERSION TO	DI21BU	121.	0.00	26.	7.	2.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	96.	4.27	20.	5.	2.	0.13		
HYDROGRAPH AT	RE21OR	72.	4.40	12.	3.	1.	0.00		
ROUTED TO	RD21OR	68.	4.53	12.	3.	1.	0.00	0.40	4.53
2 COMBINED AT	CP21OR	155.	4.47	32.	8.	3.	0.13		
DIVERSION TO	DI21OR	77.	4.47	16.	4.	1.	0.13		
HYDROGRAPH AT	DV21OR	77.	4.47	16.	4.	1.	0.13		
ROUTED TO	RT21OR	77.	4.53	16.	4.	1.	0.13	0.62	4.53
HYDROGRAPH AT	SB21MY	40.	4.43	10.	2.	1.	0.07		
HYDROGRAPH AT	RE21MY	127.	4.43	22.	6.	2.	0.00		
ROUTED TO	RD21MY	124.	4.57	22.	6.	2.	0.00	0.66	4.57
3 COMBINED AT	CP21MY	239.	4.57	47.	12.	4.	0.19		
DIVERSION TO	DI21MY	119.	4.57	24.	6.	2.	0.19		
HYDROGRAPH AT	DV21MY	119.	4.57	24.	6.	2.	0.19		
ROUTED TO	RT21MY	119.	4.60	24.	6.	2.	0.19	0.72	4.60
HYDROGRAPH AT	SB21GL	26.	4.30	6.	1.	1.	0.04		
2 COMBINED AT	CP21GL	140.	4.57	29.	7.	3.	0.23		
DIVERSION TO	DI21GL	123.	4.57	28.	7.	3.	0.23		
HYDROGRAPH AT	DV21GL	18.	4.57	2.	0.	0.	0.23		
ROUTED TO	RT21GL	16.	4.80	2.	0.	0.	0.23	0.26	4.80
HYDROGRAPH AT	S21MAA	107.	4.10	17.	4.	2.	0.11		
HYDROGRAPH AT	DI_I	239.	4.53	46.	12.	4.	0.00		

HYDROGRAPH AT	S21MAB	34.	4.10	5.	1.	0.	0.04		
4 COMBINED AT	BSN_I	307.	4.43	69.	18.	6.	0.38		
ROUTED TO	WASHPK	0.	0.00	0.	0.	0.	0.38	3.16	10.00
ROUTED TO	M21.1	0.	0.00	0.	0.	0.	0.38		
ROUTED TO	RT21MA	0.	0.00	0.	0.	0.	0.38		
HYDROGRAPH AT	SB21BE	139.	4.23	28.	7.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.23	5.	1.	1.	0.18		
HYDROGRAPH AT	21BE.1	133.	4.23	23.	6.	2.	0.18		
2 COMBINED AT	CP21BE	133.	4.23	23.	6.	2.	0.57		
ROUTED TO	RT21BE	132.	4.30	23.	6.	2.	0.57	0.71	4.30
HYDROGRAPH AT	SB21MO	23.	4.63	8.	2.	1.	0.07		
2 COMBINED AT	CP21MO	151.	4.33	31.	8.	3.	0.64		
ROUTED TO	RT21MO	150.	4.40	31.	8.	3.	0.64	0.87	4.40
HYDROGRAPH AT	SB21MI	40.	4.47	10.	3.	1.	0.09		
HYDROGRAPH AT	RE21MI	38.	4.57	9.	2.	1.	0.00		
ROUTED TO	RD21MI	38.	4.70	9.	2.	1.	0.00	0.28	4.70
3 COMBINED AT	CP21MI	214.	4.53	49.	13.	5.	0.72		
ROUTED TO	RT21MI	212.	4.63	49.	13.	5.	0.72	1.04	4.63
HYDROGRAPH AT	S21CAA	29.	4.43	8.	2.	1.	0.05		
HYDROGRAPH AT	S22CAA	28.	4.40	7.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.40	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	18.	4.40	3.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	45.	4.60	11.	3.	1.	0.00		
ROUTED TO	RD22CA	39.	5.03	11.	3.	1.	0.00	0.29	5.03
HYDROGRAPH AT	RBA.2	44.	4.73	11.	3.	1.	0.00		
5 COMBINED AT	DBA-1	317.	4.67	82.	21.	8.	0.82		
HYDROGRAPH AT	RBC.2	40.	4.30	10.	2.	1.	0.00		
HYDROGRAPH AT	S22CAB	9.	4.03	2.	0.	0.	0.01		
HYDROGRAPH AT	S21CAC	5.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	50.	4.20	12.	3.	1.	0.01		

2 COMBINED AT	DBA-3	352.	4.63	94.	24.	9.	0.83		
DIVERSION TO	SD36	352.	0.00	94.	24.	9.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	4.83
HYDROGRAPH AT	S21CAB	79.	4.43	20.	5.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.43	10.	2.	1.	0.12		
HYDROGRAPH AT	21CA.1	61.	4.43	10.	3.	1.	0.12		
2 COMBINED AT	CP21CA	61.	4.43	10.	3.	1.	0.95		
ROUTED TO	RT21CA	60.	4.57	10.	3.	1.	0.95	0.55	4.57
HYDROGRAPH AT	SB21CP	107.	4.40	25.	6.	2.	0.14		
DIVERSION TO	21CP.2	15.	4.40	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	92.	4.40	17.	4.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	148.	4.47	27.	7.	2.	1.10		
DIVERSION TO	DI21CP	74.	4.47	13.	3.	1.	1.10		
HYDROGRAPH AT	DV21CP	74.	4.47	13.	3.	1.	1.10		
ROUTED TO	RT21CP	74.	4.53	13.	3.	1.	1.10	0.53	4.53
HYDROGRAPH AT	S21CNA	16.	4.13	3.	1.	0.	0.02		
2 COMBINED AT	S19.1	85.	4.50	17.	4.	1.	1.11		
ROUTED TO	S19.2	85.	4.50	17.	4.	1.	1.11		
HYDROGRAPH AT	S19CNA	10.	4.70	4.	1.	0.	0.02		
HYDROGRAPH AT	SBX	16.	4.40	4.	1.	0.	0.02		
3 COMBINED AT	BASN_X	110.	4.50	24.	6.	2.	1.15		
DIVERSION TO	SD42	110.	0.00	24.	6.	2.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		
HYDROGRAPH AT	S21CNB	22.	4.17	4.	1.	0.	0.03		
DIVERSION TO	SD44	7.	4.17	3.	1.	0.	0.03		

HYDROGRAPH AT	SD43	15.	4.17	2.	0.	0.	0.03		
HYDROGRAPH AT	SB19DU	12.	4.33	4.	1.	0.	0.02		
ROUTED TO	RT19DU	11.	4.97	4.	1.	0.	0.02	0.07	4.97
HYDROGRAPH AT	SB19NO	29.	4.27	7.	2.	1.	0.04		
DIVERSION TO	19NO.2	29.	0.00	7.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	322.	4.30	62.	16.	6.	0.00		
ROUTED TO	RD19NO	307.	4.47	62.	16.	6.	0.00	0.90	4.47
3 COMBINED AT	CP19NO	315.	4.47	66.	17.	6.	0.05		
ROUTED TO	RT19NO	303.	4.60	66.	17.	6.	0.05	0.73	4.60
HYDROGRAPH AT	SB19OR	76.	4.43	22.	6.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.43	15.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	46.	4.43	7.	2.	1.	0.10		
HYDROGRAPH AT	RE19OR	77.	4.47	16.	4.	1.	0.00		
ROUTED TO	RD19OR	75.	4.57	16.	4.	1.	0.00	0.37	4.57
3 COMBINED AT	CP19OR	422.	4.57	88.	22.	8.	0.16		
ROUTED TO	RT19OR	416.	4.63	88.	22.	8.	0.16	0.87	4.63
HYDROGRAPH AT	SB19MY	25.	4.37	6.	2.	1.	0.05		
DIVERSION TO	19MY.2	25.	0.00	6.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	119.	4.57	24.	6.	2.	0.00		
ROUTED TO	RD19MY	116.	4.67	24.	6.	2.	0.00	0.64	4.67
3 COMBINED AT	CP19MY	532.	4.63	112.	28.	10.	0.20		
ROUTED TO	RT19MY	528.	4.70	112.	28.	10.	0.20	1.20	4.70
HYDROGRAPH AT	SB19GL	35.	4.43	10.	2.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.43	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	20.	4.43	3.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	123.	4.57	28.	7.	3.	0.00		
ROUTED TO	RD19GL	120.	4.70	28.	7.	3.	0.00	0.65	4.70
3 COMBINED AT	CP19GL	664.	4.70	142.	36.	13.	0.26		

ROUTED TO	RT19GL	647.	4.77	142.	36.	13.	0.26	1.04	4.77
HYDROGRAPH AT	SB19MA	35.	4.37	9.	2.	1.	0.05		
DIVERSION TO	19MA.2	35.	0.00	9.	2.	1.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	647.	4.77	142.	36.	13.	0.31		
ROUTED TO	RT19MA	637.	4.87	142.	36.	13.	0.31	1.10	4.87
HYDROGRAPH AT	SB19BE	34.	4.40	9.	2.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.40	9.	2.	1.	0.06		
HYDROGRAPH AT	19BE.1	4.	4.40	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	637.	4.87	142.	36.	13.	0.37		
ROUTED TO	RT19BE	627.	4.97	142.	36.	13.	0.37	1.09	4.97
HYDROGRAPH AT	SB19MI	41.	4.40	10.	3.	1.	0.08		
DIVERSION TO	19MI.2	41.	0.00	10.	3.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	627.	4.97	142.	36.	13.	0.44		
ROUTED TO	RT19MI	617.	5.03	142.	36.	13.	0.44	1.17	5.03
HYDROGRAPH AT	SB19CA	3.	4.67	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	3.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	617.	5.03	142.	36.	13.	0.45		
ROUTED TO	RT19CA	609.	5.13	141.	36.	13.	0.45	1.01	5.13
HYDROGRAPH AT	SB19CP	41.	4.37	10.	3.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.37	9.	2.	1.	0.06		
HYDROGRAPH AT	19CP.1	11.	4.37	1.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	74.	4.47	13.	3.	1.	0.00		
ROUTED TO	RD19CP	73.	4.63	13.	3.	1.	0.00	0.41	4.63
3 COMBINED AT	CP19CP	653.	5.13	156.	40.	14.	0.51		
ROUTED TO	RT19CP	652.	5.17	156.	40.	14.	0.51	1.64	5.17
HYDROGRAPH AT	S19CNB	7.	4.73	3.	1.	0.	0.02		
DIVERSION TO	19CN.2	7.	0.00	3.	1.	0.	0.02		

HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	652.	5.17	156.	40.	14.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	3.90	11.00
STORAGE	0.	43.	121.
OUTFLOW	0.	0.	2554.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	3.16	0.00	35.	0.	0.00	0.00	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX N

PHASE 2 DRAINAGE SYSTEM
10-YEAR, 6-HOUR STORM
FILE: P2-10-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 2, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
  9       ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR 50-YR INFLOW VOLUME
 10       ID   10-YEAR 6 HOUR STORM
 11       ID
 12       ID
 13       ID   FILE NAME: P2-10-1.6I
 14       ID   ****************************************************
 15       ID
 16       ID   Project ID: 24TH & CAMELBACK
 17       IT       2                   2000
 18       IO       5
          *DIAGRAM
          *
 19       ID   ****************************************************
 20       ID   FLOWS ALONG 23RD AVE
 21       ID   ****************************************************
 22       ID

 23       KK  SB23DU
 24       KM   SUB-BASIN SB23DU
 25       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 26       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 27       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 28       BA    .179
 29       IN      15
 30       KM   RAINFALL DEPTH OF 1.94 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 31       PB   1.875
 32       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 33       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 34       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 35       PC    .949    .962    .975    .988   1.000
 36       LG    .100    .250   4.300    .366  80.000
 37       UC    .421    .170
 38       UA       0       5      16      30      65      77      84      90      94      97
 39       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0       13   10000
          *  DQ      0       13      13
          *
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	156.	4.13	30.	8.	3.	0.18		
ROUTED TO	RT23DU	154.	4.20	30.	8.	3.	0.18	0.71	4.20
HYDROGRAPH AT	SB23BU	125.	4.27	25.	6.	2.	0.22		
2 COMBINED AT	CP23BU	278.	4.23	55.	14.	5.	0.40		
ROUTED TO	RT23BU	277.	4.30	55.	14.	5.	0.40	1.01	4.30
HYDROGRAPH AT	SB23RO	76.	4.20	16.	4.	1.	0.10		
DIVERSION TO	DV23RO	76.	4.43	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	68.	4.43	7.	2.	1.	0.10		
2 COMBINED AT	CP23RO	328.	4.43	62.	16.	6.	0.50		
ROUTED TO	RT23RO	318.	4.50	62.	16.	6.	0.50	1.59	4.50
HYDROGRAPH AT	SB23NO	41.	4.13	8.	2.	1.	0.04		
DIVERSION TO	RB23NO	41.	4.20	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	39.	4.20	4.	1.	0.	0.04		
2 COMBINED AT	CP23NO	343.	4.50	65.	16.	6.	0.55		
DIVERSION TO	DI23NO	221.	4.50	49.	12.	4.	0.55		
HYDROGRAPH AT	DV23NO	122.	4.50	16.	4.	1.	0.55		
ROUTED TO	RT23NO	116.	4.60	16.	4.	1.	0.55	0.62	4.60
HYDROGRAPH AT	SB23OR	76.	4.30	17.	4.	2.	0.12		
2 COMBINED AT	CP23OR	180.	4.43	33.	8.	3.	0.67		
DIVERSION TO	DI23OR	45.	4.43	8.	2.	1.	0.67		
HYDROGRAPH AT	DV23OR	135.	4.43	25.	6.	2.	0.67		
ROUTED TO	RT23OR	134.	4.53	25.	6.	2.	0.67	0.67	4.53
HYDROGRAPH AT	SB23DM	41.	4.17	7.	2.	1.	0.06		
2 COMBINED AT	CP23DM	165.	4.47	32.	8.	3.	0.73		
DIVERSION TO	DI23DM	82.	4.47	16.	4.	1.	0.73		
HYDROGRAPH AT	DV23DM	82.	4.47	16.	4.	1.	0.73		

ROUTED TO	RT23DM	82.	4.57	16.	4.	1.	0.73	0.59	4.57
HYDROGRAPH AT	SB22GL	9.	4.43	2.	1.	0.	0.03		
ROUTED TO	RT22GL	8.	4.67	2.	1.	0.	0.03	0.11	4.67
HYDROGRAPH AT	SB23GL	39.	4.20	7.	2.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.20	3.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	31.	4.20	4.	1.	0.	0.06		
3 COMBINED AT	CP23GL	109.	4.50	22.	6.	2.	0.81		
ROUTED TO	RT23GL	106.	4.70	22.	6.	2.	0.81	0.39	4.70
HYDROGRAPH AT	S23MAA	51.	4.37	12.	3.	1.	0.11		
DIVERSION TO	SD12	10.	4.37	6.	1.	1.	0.11		
HYDROGRAPH AT	SD11	41.	4.37	7.	2.	1.	0.11		
HYDROGRAPH AT	S23MAB	12.	4.40	3.	1.	0.	0.03		
HYDROGRAPH AT	S21MAC	1.	4.67	0.	0.	0.	0.02		
4 COMBINED AT	CP23MA	149.	4.63	32.	8.	3.	0.96		
DIVERSION TO	DI_I	149.	0.00	32.	8.	3.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	5.17
HYDROGRAPH AT	SB23BE	47.	4.40	12.	3.	1.	0.12		
DIVERSION TO	23BE.2	22.	4.40	9.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	25.	4.40	3.	1.	0.	0.12		
2 COMBINED AT	CP23BE	25.	4.40	3.	1.	0.	1.08		
ROUTED TO	RT23BE	24.	4.73	3.	1.	0.	1.08	0.35	4.73
HYDROGRAPH AT	SB23MI	29.	4.70	11.	3.	1.	0.12		
2 COMBINED AT	CP23MI	53.	4.73	14.	4.	1.	1.20		
DIVERSION TO	DI23MI	21.	4.73	5.	1.	1.	1.20		
HYDROGRAPH AT	DV23MI	32.	4.73	8.	2.	1.	1.20		
ROUTED TO	RT23MI	31.	4.87	8.	2.	1.	1.20	0.36	4.87
HYDROGRAPH AT	S23COA	4.	4.43	1.	0.	0.	0.01		
HYDROGRAPH AT	S23COB	21.	4.53	7.	2.	1.	0.05		
3 COMBINED AT	23CO.1	53.	4.80	16.	4.	1.	1.26		

DIVERSION TO	DI23CO	26.	4.80	8.	2.	1.	1.26		
HYDROGRAPH AT	DV23CO	26.	4.80	8.	2.	1.	1.26		
ROUTED TO	RT23CO	26.	4.90	8.	2.	1.	1.26	0.33	4.90
HYDROGRAPH AT	S23CAA	5.	4.33	1.	0.	0.	0.01		
DIVERSION TO	23AA.2	5.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	26.	4.90	8.	2.	1.	1.27		
DIVERSION TO	RBA.2	26.	0.00	8.	2.	1.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	7.07
HYDROGRAPH AT	S23CAB	2.	4.10	0.	0.	0.	0.00		
2 COMBINED AT	CP23CA	2.	4.10	0.	0.	0.	1.27		
DIVERSION TO	DI23CA	2.	0.00	0.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	4.77
HYDROGRAPH AT	RE24CA	2.	4.10	0.	0.	0.	0.00		
ROUTED TO	RD24CA	2.	4.23	0.	0.	0.	0.00	0.03	4.23
HYDROGRAPH AT	SB24CA	27.	4.37	7.	2.	1.	0.05		
2 COMBINED AT	CP24CA	29.	4.37	8.	2.	1.	0.05		
DIVERSION TO	RBC.2	29.	0.00	8.	2.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	5.37
HYDROGRAPH AT	SB23CP	114.	4.27	24.	6.	2.	0.16		
DIVERSION TO	23CP.2	4.	4.27	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	110.	4.27	20.	5.	2.	0.16		
3 COMBINED AT	CP23CP	110.	4.27	20.	5.	2.	1.48		
ROUTED TO	RT23CP	108.	4.40	20.	5.	2.	1.48	0.68	4.40
HYDROGRAPH AT	SB23IN	118.	4.30	25.	6.	2.	0.17		
DIVERSION TO	23IN.2	4.	4.30	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	114.	4.30	22.	5.	2.	0.17		

2 COMBINED AT	CP23IN	220.	4.37	42.	10.	4.	1.65		
HYDROGRAPH AT	SB21DU	34.	4.53	10.	3.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.53	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	21.	4.53	3.	1.	0.	0.09		
ROUTED TO	RT21DU	20.	4.73	3.	1.	0.	0.09	0.26	4.73
HYDROGRAPH AT	SB21BU	66.	4.33	15.	4.	1.	0.13		
2 COMBINED AT	CP21BU	76.	4.53	18.	5.	2.	0.22		
DIVERSION TO	DI21BU	76.	0.00	18.	5.	2.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	68.	4.33	15.	4.	1.	0.13		
HYDROGRAPH AT	RE21OR	45.	4.43	8.	2.	1.	0.00		
ROUTED TO	RD21OR	44.	4.67	8.	2.	1.	0.00	0.31	4.67
2 COMBINED AT	CP21OR	106.	4.50	24.	6.	2.	0.13		
DIVERSION TO	DI21OR	53.	4.50	12.	3.	1.	0.13		
HYDROGRAPH AT	DV21OR	53.	4.50	12.	3.	1.	0.13		
ROUTED TO	RT21OR	53.	4.57	12.	3.	1.	0.13	0.52	4.57
HYDROGRAPH AT	SB21MY	27.	4.47	7.	2.	1.	0.07		
HYDROGRAPH AT	RE21MY	82.	4.47	16.	4.	1.	0.00		
ROUTED TO	RD21MY	81.	4.63	16.	4.	1.	0.00	0.53	4.63
3 COMBINED AT	CP21MY	160.	4.60	35.	9.	3.	0.19		
DIVERSION TO	DI21MY	80.	4.60	18.	4.	2.	0.19		
HYDROGRAPH AT	DV21MY	80.	4.60	18.	4.	2.	0.19		
ROUTED TO	RT21MY	80.	4.67	18.	4.	2.	0.19	0.58	4.67
HYDROGRAPH AT	SB21GL	18.	4.37	4.	1.	0.	0.04		
2 COMBINED AT	CP21GL	94.	4.67	22.	6.	2.	0.23		
DIVERSION TO	DI21GL	88.	4.67	21.	5.	2.	0.23		
HYDROGRAPH AT	DV21GL	6.	4.67	0.	0.	0.	0.23		
ROUTED TO	RT21GL	4.	5.00	0.	0.	0.	0.23	0.09	5.03
HYDROGRAPH AT	S21MAA	78.	4.10	13.	3.	1.	0.11		
HYDROGRAPH AT	DI_I	149.	4.63	32.	8.	3.	0.00		

HYDROGRAPH AT	S21MAB	22.	4.13	3.	1.	0.	0.04		
4 COMBINED AT	BSN_I	199.	4.37	49.	12.	4.	0.38		
ROUTED TO	WASHPK	0.	0.00	0.	0.	0.	0.38	2.23	10.60
ROUTED TO	M21.1	0.	0.00	0.	0.	0.	0.38		
ROUTED TO	RT21MA	0.	0.00	0.	0.	0.	0.38		
HYDROGRAPH AT	SB21BE	97.	4.30	21.	5.	2.	0.18		
DIVERSION TO	21BE.2	6.	4.30	5.	1.	0.	0.18		
HYDROGRAPH AT	21BE.1	91.	4.30	16.	4.	1.	0.18		
2 COMBINED AT	CP21BE	91.	4.30	16.	4.	1.	0.57		
ROUTED TO	RT21BE	90.	4.37	16.	4.	1.	0.57	0.59	4.37
HYDROGRAPH AT	SB21MO	14.	4.80	6.	2.	1.	0.07		
2 COMBINED AT	CP21MO	102.	4.40	22.	6.	2.	0.64		
ROUTED TO	RT21MO	101.	4.47	22.	6.	2.	0.64	0.71	4.47
HYDROGRAPH AT	SB21MI	24.	4.57	7.	2.	1.	0.09		
HYDROGRAPH AT	RE21MI	21.	4.73	5.	1.	1.	0.00		
ROUTED TO	RD21MI	20.	4.97	5.	1.	1.	0.00	0.19	4.97
3 COMBINED AT	CP21MI	134.	4.53	34.	9.	3.	0.72		
ROUTED TO	RT21MI	133.	4.67	34.	9.	3.	0.72	0.81	4.67
HYDROGRAPH AT	S21CAA	20.	4.50	6.	2.	1.	0.05		
HYDROGRAPH AT	S22CAA	19.	4.43	5.	1.	0.	0.05		
DIVERSION TO	SD34	10.	4.43	4.	1.	0.	0.05		
HYDROGRAPH AT	SD33	9.	4.43	1.	0.	0.	0.05		
HYDROGRAPH AT	RE22CA	26.	4.80	8.	2.	1.	0.00		
ROUTED TO	RD22CA	22.	5.37	8.	2.	1.	0.00	0.21	5.37
HYDROGRAPH AT	RBA.2	26.	4.90	8.	2.	1.	0.00		
5 COMBINED AT	DBA-1	194.	4.70	57.	15.	5.	0.82		
HYDROGRAPH AT	RBC.2	29.	4.37	8.	2.	1.	0.00		
HYDROGRAPH AT	S22CAB	8.	4.03	1.	0.	0.	0.01		
HYDROGRAPH AT	S21CAC	4.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	37.	4.27	10.	2.	1.	0.01		

2 COMBINED AT	DBA-3	221.	4.63	66.	17.	6.	0.83		
DIVERSION TO	SD36	221.	0.00	66.	17.	6.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	4.83
HYDROGRAPH AT	S21CAB	56.	4.50	15.	4.	1.	0.12		
DIVERSION TO	21CA.2	18.	4.50	9.	2.	1.	0.12		
HYDROGRAPH AT	21CA.1	38.	4.50	6.	2.	1.	0.12		
2 COMBINED AT	CP21CA	38.	4.50	6.	2.	1.	0.95		
ROUTED TO	RT21CA	37.	4.73	6.	2.	1.	0.95	0.44	4.73
HYDROGRAPH AT	SB21CP	79.	4.47	20.	5.	2.	0.14		
DIVERSION TO	21CP.2	15.	4.47	8.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	64.	4.47	11.	3.	1.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	95.	4.57	18.	4.	2.	1.10		
DIVERSION TO	DI21CP	47.	4.57	9.	2.	1.	1.10		
HYDROGRAPH AT	DV21CP	47.	4.57	9.	2.	1.	1.10		
ROUTED TO	RT21CP	47.	4.63	9.	2.	1.	1.10	0.44	4.63
HYDROGRAPH AT	S21CNA	12.	4.17	2.	1.	0.	0.02		
2 COMBINED AT	S19.1	55.	4.60	11.	3.	1.	1.11		
ROUTED TO	S19.2	55.	4.63	11.	3.	1.	1.11		
HYDROGRAPH AT	S19CNA	7.	4.80	3.	1.	0.	0.02		
HYDROGRAPH AT	SBX	12.	4.47	3.	1.	0.	0.02		
3 COMBINED AT	BASN_X	72.	4.63	17.	4.	2.	1.15		
DIVERSION TO	SD42	72.	0.00	17.	4.	2.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		
HYDROGRAPH AT	S21CNB	16.	4.20	3.	1.	0.	0.03		
DIVERSION TO	SD44	7.	4.20	2.	1.	0.	0.03		

HYDROGRAPH AT	SD43	9.	4.20	1.	0.	0.	0.03		
HYDROGRAPH AT	SB19DU	9.	4.37	3.	1.	0.	0.02		
ROUTED TO	RT19DU	9.	5.00	3.	1.	0.	0.02	0.05	5.00
HYDROGRAPH AT	SB19NO	23.	4.30	6.	1.	1.	0.04		
DIVERSION TO	19NO.2	23.	0.00	6.	1.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	221.	4.50	49.	12.	4.	0.00		
ROUTED TO	RD19NO	212.	4.63	49.	12.	4.	0.00	0.73	4.63
3 COMBINED AT	CP19NO	219.	4.63	52.	13.	5.	0.05		
ROUTED TO	RT19NO	212.	4.73	52.	13.	5.	0.05	0.61	4.73
HYDROGRAPH AT	SB19OR	58.	4.47	18.	5.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.47	14.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	28.	4.47	4.	1.	0.	0.10		
HYDROGRAPH AT	RE19OR	53.	4.50	12.	3.	1.	0.00		
ROUTED TO	RD19OR	51.	4.63	12.	3.	1.	0.00	0.30	4.63
3 COMBINED AT	CP19OR	285.	4.70	67.	17.	6.	0.16		
ROUTED TO	RT19OR	282.	4.77	67.	17.	6.	0.16	0.71	4.77
HYDROGRAPH AT	SB19MY	16.	4.47	4.	1.	0.	0.05		
DIVERSION TO	19MY.2	16.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	80.	4.60	18.	4.	2.	0.00		
ROUTED TO	RD19MY	78.	4.77	18.	4.	2.	0.00	0.52	4.77
3 COMBINED AT	CP19MY	360.	4.77	85.	22.	8.	0.20		
ROUTED TO	RT19MY	358.	4.83	85.	22.	8.	0.20	0.97	4.83
HYDROGRAPH AT	SB19GL	25.	4.50	7.	2.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.50	6.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	10.	4.50	1.	0.	0.	0.05		
HYDROGRAPH AT	RE19GL	88.	4.67	21.	5.	2.	0.00		
ROUTED TO	RD19GL	87.	4.80	21.	5.	2.	0.00	0.54	4.80
3 COMBINED AT	CP19GL	451.	4.80	107.	27.	10.	0.26		

ROUTED TO	RT19GL	437.	4.90	107.	27.	10.	0.26	0.84	4.90
HYDROGRAPH AT	SB19MA	25.	4.43	7.	2.	1.	0.05		
DIVERSION TO	19MA.2	25.	0.00	7.	2.	1.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	437.	4.90	107.	27.	10.	0.31		
ROUTED TO	RT19MA	430.	5.03	107.	27.	10.	0.31	0.89	5.03
HYDROGRAPH AT	SB19BE	24.	4.47	7.	2.	1.	0.06		
DIVERSION TO	19BE.2	24.	0.00	7.	2.	1.	0.06		
HYDROGRAPH AT	19BE.1	0.	0.00	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	430.	5.03	107.	27.	10.	0.37		
ROUTED TO	RT19BE	423.	5.13	107.	27.	10.	0.37	0.88	5.13
HYDROGRAPH AT	SB19MI	26.	4.50	7.	2.	1.	0.08		
DIVERSION TO	19MI.2	26.	0.00	7.	2.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	423.	5.13	107.	27.	10.	0.44		
ROUTED TO	RT19MI	416.	5.23	106.	27.	10.	0.44	0.94	5.23
HYDROGRAPH AT	SB19CA	3.	4.73	1.	0.	0.	0.01		
DIVERSION TO	19CA.2	3.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	416.	5.23	106.	27.	10.	0.45		
ROUTED TO	RT19CA	409.	5.37	106.	27.	10.	0.45	0.81	5.37
HYDROGRAPH AT	SB19CP	31.	4.40	8.	2.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.40	8.	2.	1.	0.06		
HYDROGRAPH AT	19CP.1	1.	4.40	0.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	47.	4.57	9.	2.	1.	0.00		
ROUTED TO	RD19CP	47.	4.70	9.	2.	1.	0.00	0.31	4.70
3 COMBINED AT	CP19CP	433.	5.33	115.	29.	11.	0.51		
ROUTED TO	RT19CP	432.	5.40	115.	29.	11.	0.51	1.30	5.40
HYDROGRAPH AT	S19CNB	5.	4.87	2.	1.	0.	0.02		
DIVERSION TO	19CN.2	5.	0.00	2.	1.	0.	0.02		

HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	432.	5.40	115.	29.	11.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	3.90	11.00
STORAGE	0.	43.	121.
OUTFLOW	0.	0.	2554.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.23	0.00	25.	0.	0.00	0.00	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX O

PHASE 2 DRAINAGE SYSTEM
2-YEAR, 6-HOUR STROM
FILE: P2-2-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

    1     ID
    2     ID   ****************************************************
    3     ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
    4     ID   PHOENIX, ARIZONA
    5     ID   MODELED BY PREMIER ENGINEERING
    6     ID   MARCH 2003, REVISED AUGUST 2003
    7     ID
    8     ID   PHASE 2, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
    9     ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR 50-YR INFLOW VOLUME
   10     ID   2-YEAR 6 HOUR STORM
   11     ID
   12     ID
   13     ID   FILE NAME: P2-2-1.6I
   14     ID   ****************************************************
   15     ID
   16     ID   Project ID: 24TH & CAMELBACK
   17     IT       2                   2000
   18     IO       5
          *DIAGRAM
          *
   19     ID   ****************************************************
   20     ID   FLOWS ALONG 23RD AVE
   21     ID   ****************************************************
   22     ID

   23     KK  SB23DU
   24     KM   SUB-BASIN SB23DU
   25     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
   26     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
   27     KM     L =  .37  Kb = .052  Adj. Slope =   38.0
   28     BA    .179
   29     IN      15
   30     KM   RAINFALL DEPTH OF 1.20 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
   31     PB   1.160
   32     KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
   33     PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
   34     PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
   35     PC    .949    .962    .975    .988   1.000
   36     LG    .100    .250   4.300    .366  80.000
   37     UC    .529    .220
   38     UA       0       5      16      30      65      77      84      90      94      97
   39     UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	82.	4.17	18.	4.	2.	0.18		
ROUTED TO	RT23DU	81.	4.30	18.	4.	2.	0.18	0.52	4.30
HYDROGRAPH AT	SB23BU	46.	4.43	13.	3.	1.	0.22		
2 COMBINED AT	CP23BU	126.	4.33	30.	8.	3.	0.40		
ROUTED TO	RT23BU	126.	4.43	30.	8.	3.	0.40	0.68	4.43
HYDROGRAPH AT	SB23RO	37.	4.33	9.	2.	1.	0.10		
DIVERSION TO	DV23RO	37.	0.00	9.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	0.	0.00	0.	0.	0.	0.10		
2 COMBINED AT	CP23RO	126.	4.43	30.	8.	3.	0.50		
ROUTED TO	RT23RO	125.	4.50	30.	8.	3.	0.50	0.96	4.50
HYDROGRAPH AT	SB23NO	23.	4.20	5.	1.	0.	0.04		
DIVERSION TO	RB23NO	23.	5.07	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	5.	5.07	0.	0.	0.	0.04		
2 COMBINED AT	CP23NO	125.	4.50	31.	8.	3.	0.55		
DIVERSION TO	DI23NO	93.	4.50	26.	7.	2.	0.55		
HYDROGRAPH AT	DV23NO	31.	4.50	5.	1.	0.	0.55		
ROUTED TO	RT23NO	31.	4.70	5.	1.	0.	0.55	0.32	4.70
HYDROGRAPH AT	SB23OR	31.	4.50	9.	2.	1.	0.12		
2 COMBINED AT	CP23OR	60.	4.63	13.	3.	1.	0.67		
DIVERSION TO	DI23OR	15.	4.63	3.	1.	0.	0.67		
HYDROGRAPH AT	DV23OR	45.	4.63	10.	3.	1.	0.67		
ROUTED TO	RT23OR	44.	4.77	10.	3.	1.	0.67	0.39	4.77
HYDROGRAPH AT	SB23DM	17.	4.33	4.	1.	0.	0.06		
2 COMBINED AT	CP23DM	56.	4.70	14.	3.	1.	0.73		
DIVERSION TO	DI23DM	28.	4.70	7.	2.	1.	0.73		
HYDROGRAPH AT	DV23DM	28.	4.70	7.	2.	1.	0.73		

ROUTED TO	RT23DM	27.	4.83	7.	2.	1.	0.73	0.34	4.83
HYDROGRAPH AT	SB22GL	2.	4.70	1.	0.	0.	0.03		
ROUTED TO	RT22GL	2.	4.93	1.	0.	0.	0.03	0.03	4.97
HYDROGRAPH AT	SB23GL	15.	4.37	3.	1.	0.	0.06		
DIVERSION TO	23GL.2	9.	4.37	3.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	7.	4.37	1.	0.	0.	0.06		
3 COMBINED AT	CP23GL	31.	4.77	8.	2.	1.	0.81		
ROUTED TO	RT23GL	30.	5.07	8.	2.	1.	0.81	0.18	5.07
HYDROGRAPH AT	S23MAA	18.	4.57	6.	2.	1.	0.11		
DIVERSION TO	SD12	10.	4.57	5.	1.	0.	0.11		
HYDROGRAPH AT	SD11	8.	4.57	1.	0.	0.	0.11		
HYDROGRAPH AT	S23MAB	4.	4.57	2.	0.	0.	0.03		
HYDROGRAPH AT	S21MAC	0.	0.00	0.	0.	0.	0.02		
4 COMBINED AT	CP23MA	38.	4.93	11.	3.	1.	0.96		
DIVERSION TO	DI_I	38.	0.00	11.	3.	1.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	7.30
HYDROGRAPH AT	SB23BE	17.	4.63	6.	2.	1.	0.12		
DIVERSION TO	23BE.2	17.	0.00	6.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	0.	0.00	0.	0.	0.	0.12		
2 COMBINED AT	CP23BE	0.	0.00	0.	0.	0.	1.08		
ROUTED TO	RT23BE	0.	0.00	0.	0.	0.	1.08	0.00	4.73
HYDROGRAPH AT	SB23MI	11.	4.97	5.	1.	0.	0.12		
2 COMBINED AT	CP23MI	11.	4.97	5.	1.	0.	1.20		
DIVERSION TO	DI23MI	4.	4.97	2.	1.	0.	1.20		
HYDROGRAPH AT	DV23MI	7.	4.97	3.	1.	0.	1.20		
ROUTED TO	RT23MI	7.	5.20	3.	1.	0.	1.20	0.15	5.20
HYDROGRAPH AT	S23COA	1.	4.63	1.	0.	0.	0.01		
HYDROGRAPH AT	S23COB	8.	4.73	3.	1.	0.	0.05		
3 COMBINED AT	23CO.1	16.	4.93	7.	2.	1.	1.26		

DIVERSION TO	DI23CO	8.	4.93	4.	1.	0.	1.26		
HYDROGRAPH AT	DV23CO	8.	4.93	4.	1.	0.	1.26		
ROUTED TO	RT23CO	8.	5.10	4.	1.	0.	1.26	0.18	5.10
HYDROGRAPH AT	S23CAA	2.	4.43	1.	0.	0.	0.01		
DIVERSION TO	23AA.2	2.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	8.	5.10	4.	1.	0.	1.27		
DIVERSION TO	RBA.2	8.	0.00	4.	1.	0.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	2.00
HYDROGRAPH AT	S23CAB	1.	4.17	0.	0.	0.	0.00		
2 COMBINED AT	CP23CA	1.	4.17	0.	0.	0.	1.27		
DIVERSION TO	DI23CA	1.	0.00	0.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	5.07
HYDROGRAPH AT	RE24CA	1.	4.17	0.	0.	0.	0.00		
ROUTED TO	RD24CA	1.	4.33	0.	0.	0.	0.00	0.02	4.33
HYDROGRAPH AT	SB24CA	12.	4.53	4.	1.	0.	0.05		
2 COMBINED AT	CP24CA	13.	4.50	4.	1.	0.	0.05		
DIVERSION TO	RBC.2	13.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.90
HYDROGRAPH AT	SB23CP	53.	4.40	13.	3.	1.	0.16		
DIVERSION TO	23CP.2	4.	4.40	3.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	49.	4.40	10.	2.	1.	0.16		
3 COMBINED AT	CP23CP	49.	4.40	10.	2.	1.	1.48		
ROUTED TO	RT23CP	48.	4.60	10.	2.	1.	1.48	0.47	4.60
HYDROGRAPH AT	SB23IN	53.	4.47	14.	3.	1.	0.17		
DIVERSION TO	23IN.2	4.	4.47	3.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	49.	4.47	10.	3.	1.	0.17		

2 COMBINED AT	CP23IN	96.	4.57	20.	5.	2.	1.65		
HYDROGRAPH AT	SB21DU	14.	4.73	5.	1.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.73	5.	1.	1.	0.09		
HYDROGRAPH AT	21DU.1	1.	4.73	0.	0.	0.	0.09		
ROUTED TO	RT21DU	1.	5.10	0.	0.	0.	0.09	0.01	5.10
HYDROGRAPH AT	SB21BU	23.	4.53	7.	2.	1.	0.13		
2 COMBINED AT	CP21BU	23.	4.53	7.	2.	1.	0.22		
DIVERSION TO	DI21BU	23.	0.00	7.	2.	1.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	24.	4.57	7.	2.	1.	0.13		
HYDROGRAPH AT	RE21OR	15.	4.63	3.	1.	0.	0.00		
ROUTED TO	RD21OR	14.	4.90	3.	1.	0.	0.00	0.13	4.90
2 COMBINED AT	CP21OR	36.	4.77	11.	3.	1.	0.13		
DIVERSION TO	DI21OR	18.	4.77	5.	1.	0.	0.13		
HYDROGRAPH AT	DV21OR	18.	4.77	5.	1.	0.	0.13		
ROUTED TO	RT21OR	18.	4.90	5.	1.	0.	0.13	0.30	4.90
HYDROGRAPH AT	SB21MY	8.	4.73	3.	1.	0.	0.07		
HYDROGRAPH AT	RE21MY	28.	4.70	7.	2.	1.	0.00		
ROUTED TO	RD21MY	27.	4.93	7.	2.	1.	0.00	0.28	4.93
3 COMBINED AT	CP21MY	53.	4.90	15.	4.	1.	0.19		
DIVERSION TO	DI21MY	26.	4.90	8.	2.	1.	0.19		
HYDROGRAPH AT	DV21MY	26.	4.90	8.	2.	1.	0.19		
ROUTED TO	RT21MY	26.	5.03	8.	2.	1.	0.19	0.34	5.03
HYDROGRAPH AT	SB21GL	5.	4.60	2.	1.	0.	0.04		
2 COMBINED AT	CP21GL	31.	5.00	9.	2.	1.	0.23		
DIVERSION TO	DI21GL	31.	0.00	9.	2.	1.	0.23		
HYDROGRAPH AT	DV21GL	0.	0.00	0.	0.	0.	0.23		
ROUTED TO	RT21GL	0.	0.00	0.	0.	0.	0.23		
HYDROGRAPH AT	S21MAA	31.	4.17	7.	2.	1.	0.11		
HYDROGRAPH AT	DI_I	38.	4.93	11.	3.	1.	0.00		

HYDROGRAPH AT	S21MAB	6.	4.27	1.	0.	0.	0.04		
4 COMBINED AT	BSN_I	57.	4.57	19.	5.	2.	0.38		
ROUTED TO	WASHPK	0.	0.00	0.	0.	0.	0.38	0.89	13.60
ROUTED TO	M21.1	0.	0.00	0.	0.	0.	0.38		
ROUTED TO	RT21MA	0.	0.00	0.	0.	0.	0.38		
HYDROGRAPH AT	SB21BE	36.	4.53	11.	3.	1.	0.18		
DIVERSION TO	21BE.2	6.	4.53	4.	1.	0.	0.18		
HYDROGRAPH AT	21BE.1	30.	4.53	6.	2.	1.	0.18		
2 COMBINED AT	CP21BE	30.	4.53	6.	2.	1.	0.57		
ROUTED TO	RT21BE	29.	4.60	6.	2.	1.	0.57	0.34	4.60
HYDROGRAPH AT	SB21MO	5.	5.03	3.	1.	0.	0.07		
2 COMBINED AT	CP21MO	34.	4.63	9.	2.	1.	0.64		
ROUTED TO	RT21MO	34.	4.77	9.	2.	1.	0.64	0.42	4.77
HYDROGRAPH AT	SB21MI	7.	4.90	3.	1.	0.	0.09		
HYDROGRAPH AT	RE21MI	4.	4.93	2.	1.	0.	0.00		
ROUTED TO	RD21MI	4.	5.20	2.	1.	0.	0.00	0.04	5.20
3 COMBINED AT	CP21MI	45.	4.80	14.	4.	1.	0.72		
ROUTED TO	RT21MI	44.	4.97	14.	4.	1.	0.72	0.48	4.97
HYDROGRAPH AT	S21CAA	7.	4.73	3.	1.	0.	0.05		
HYDROGRAPH AT	S22CAA	7.	4.67	3.	1.	0.	0.05		
DIVERSION TO	SD34	7.	0.00	3.	1.	0.	0.05		
HYDROGRAPH AT	SD33	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE22CA	8.	4.93	4.	1.	0.	0.00		
ROUTED TO	RD22CA	7.	5.57	4.	1.	0.	0.00	0.07	5.57
HYDROGRAPH AT	RBA.2	8.	5.10	4.	1.	0.	0.00		
5 COMBINED AT	DBA-1	65.	5.00	24.	6.	2.	0.82		
HYDROGRAPH AT	RBC.2	13.	4.50	4.	1.	0.	0.00		
HYDROGRAPH AT	S22CAB	4.	4.07	1.	0.	0.	0.01		
HYDROGRAPH AT	S21CAC	2.	4.07	0.	0.	0.	0.00		
3 COMBINED AT	DBA-2	17.	4.30	5.	1.	0.	0.01		

2 COMBINED AT	DBA-3	75.	4.93	29.	8.	3.	0.83		
DIVERSION TO	SD36	75.	0.00	29.	8.	3.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	5.90
HYDROGRAPH AT	S21CAB	20.	4.70	7.	2.	1.	0.12		
DIVERSION TO	21CA.2	18.	4.70	7.	2.	1.	0.12		
HYDROGRAPH AT	21CA.1	2.	4.70	0.	0.	0.	0.12		
2 COMBINED AT	CP21CA	2.	4.70	0.	0.	0.	0.95		
ROUTED TO	RT21CA	2.	5.17	0.	0.	0.	0.95	0.04	5.17
HYDROGRAPH AT	SB21CP	31.	4.67	10.	3.	1.	0.14		
DIVERSION TO	21CP.2	15.	4.67	7.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	16.	4.67	2.	1.	0.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	16.	4.67	3.	1.	0.	1.10		
DIVERSION TO	DI21CP	8.	4.67	1.	0.	0.	1.10		
HYDROGRAPH AT	DV21CP	8.	4.67	1.	0.	0.	1.10		
ROUTED TO	RT21CP	8.	4.83	1.	0.	0.	1.10	0.15	4.83
HYDROGRAPH AT	S21CNA	5.	4.33	1.	0.	0.	0.02		
2 COMBINED AT	S19.1	11.	4.70	3.	1.	0.	1.11		
ROUTED TO	S19.2	11.	4.77	3.	1.	0.	1.11		
HYDROGRAPH AT	S19CNA	3.	5.00	1.	0.	0.	0.02		
HYDROGRAPH AT	SBX	5.	4.67	1.	0.	0.	0.02		
3 COMBINED AT	BASN_X	19.	4.77	5.	1.	1.	1.15		
DIVERSION TO	SD42	19.	0.00	5.	1.	1.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		
HYDROGRAPH AT	S21CNB	6.	4.37	2.	0.	0.	0.03		
DIVERSION TO	SD44	6.	0.00	2.	0.	0.	0.03		

HYDROGRAPH AT	SD43	0.	0.00	0.	0.	0.	0.03		
HYDROGRAPH AT	SB19DU	5.	4.47	2.	0.	0.	0.02		
ROUTED TO	RT19DU	4.	5.13	2.	0.	0.	0.02	0.03	5.13
HYDROGRAPH AT	SB19NO	11.	4.40	3.	1.	0.	0.04		
DIVERSION TO	19NO.2	11.	0.00	3.	1.	0.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	93.	4.50	26.	7.	2.	0.00		
ROUTED TO	RD19NO	91.	4.70	26.	7.	2.	0.00	0.47	4.70
3 COMBINED AT	CP19NO	94.	4.73	28.	7.	3.	0.05		
ROUTED TO	RT19NO	89.	4.97	28.	7.	3.	0.05	0.38	4.97
HYDROGRAPH AT	SB19OR	29.	4.63	10.	3.	1.	0.10		
DIVERSION TO	19OR.2	29.	0.00	10.	3.	1.	0.10		
HYDROGRAPH AT	19OR.1	0.	0.00	0.	0.	0.	0.10		
HYDROGRAPH AT	RE19OR	18.	4.77	5.	1.	0.	0.00		
ROUTED TO	RD19OR	17.	4.97	5.	1.	0.	0.00	0.14	4.97
3 COMBINED AT	CP19OR	106.	4.97	33.	8.	3.	0.16		
ROUTED TO	RT19OR	104.	5.07	33.	8.	3.	0.16	0.42	5.07
HYDROGRAPH AT	SB19MY	5.	4.70	2.	1.	0.	0.05		
DIVERSION TO	19MY.2	5.	0.00	2.	1.	0.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	26.	4.90	8.	2.	1.	0.00		
ROUTED TO	RD19MY	26.	5.10	8.	2.	1.	0.00	0.27	5.10
3 COMBINED AT	CP19MY	130.	5.10	40.	10.	4.	0.20		
ROUTED TO	RT19MY	129.	5.20	40.	10.	4.	0.20	0.56	5.20
HYDROGRAPH AT	SB19GL	10.	4.67	4.	1.	0.	0.05		
DIVERSION TO	19GL.2	10.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19GL.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19GL	31.	5.00	9.	2.	1.	0.00		
ROUTED TO	RD19GL	30.	5.20	9.	2.	1.	0.00	0.30	5.20
3 COMBINED AT	CP19GL	159.	5.20	50.	13.	5.	0.26		

ROUTED TO	RT19GL	153.	5.33	50.	13.	5.	0.26	0.48	5.33
HYDROGRAPH AT	SB19MA	11.	4.57	4.	1.	0.	0.05		
DIVERSION TO	19MA.2	11.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	153.	5.33	50.	13.	5.	0.31		
ROUTED TO	RT19MA	150.	5.50	50.	13.	5.	0.31	0.51	5.50
HYDROGRAPH AT	SB19BE	10.	4.67	4.	1.	0.	0.06		
DIVERSION TO	19BE.2	10.	0.00	4.	1.	0.	0.06		
HYDROGRAPH AT	19BE.1	0.	0.00	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	150.	5.50	50.	13.	5.	0.37		
ROUTED TO	RT19BE	147.	5.67	50.	13.	5.	0.37	0.50	5.67
HYDROGRAPH AT	SB19MI	9.	4.73	4.	1.	0.	0.08		
DIVERSION TO	19MI.2	9.	0.00	4.	1.	0.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	147.	5.67	50.	13.	5.	0.44		
ROUTED TO	RT19MI	142.	5.87	49.	13.	5.	0.44	0.53	5.87
HYDROGRAPH AT	SB19CA	1.	5.33	1.	0.	0.	0.01		
DIVERSION TO	19CA.2	1.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	142.	5.87	49.	13.	5.	0.45		
ROUTED TO	RT19CA	139.	6.03	49.	13.	5.	0.45	0.46	6.03
HYDROGRAPH AT	SB19CP	13.	4.57	4.	1.	0.	0.06		
DIVERSION TO	19CP.2	13.	0.00	4.	1.	0.	0.06		
HYDROGRAPH AT	19CP.1	0.	0.00	0.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	8.	4.67	1.	0.	0.	0.00		
ROUTED TO	RD19CP	8.	4.93	1.	0.	0.	0.00	0.07	4.93
3 COMBINED AT	CP19CP	139.	6.03	51.	13.	5.	0.51		
ROUTED TO	RT19CP	138.	6.10	51.	13.	5.	0.51	0.70	6.10
HYDROGRAPH AT	S19CNB	2.	5.03	1.	0.	0.	0.02		
DIVERSION TO	19CN.2	2.	0.00	1.	0.	0.	0.02		

HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	138.	6.10	51.	13.	5.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	3.90	11.00
STORAGE	0.	43.	121.
OUTFLOW	0.	0.	2554.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	0.89	0.00	10.	0.	0.00	0.00	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX P

PHASE 3 DRAINAGE SYSTEM
100-YEAR, 6-HOUR STORM
FILE: P3-100-D

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ********************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 3, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
  9       ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR OPTIMAL INFLOW VOLUME
 10       ID            NEW RETENTION BASIN AT 23rd AVE & NORTHERN AVE
 11       ID   100-YEAR 6 HOUR STORM
 12       ID
 13       ID
 14       ID   FILE NAME: P3-100-D.6I
 15       ID   ********************************************************
 16       ID
 17       ID   Project ID: 24TH & CAMELBACK
 18       IT       2                   2000
 19       IO       5
          *DIAGRAM
          *
 20       ID   ********************************************************
 21       ID   FLOWS ALONG 23RD AVE
 22       ID   ********************************************************
 23       ID

 24       KK  SB23DU
 25       KM   SUB-BASIN SB23DU
 26       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 27       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 28       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 29       BA    .179
 30       IN      15
 31       KM   RAINFALL DEPTH OF 3.00 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 32       PB   2.900
 33       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 34       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 35       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 36       PC    .949    .962    .975    .988   1.000
 37       LG    .100    .250   4.300    .366  80.000
 38       UC    .346    .137
 39       UA       0       5      16      30      65      77      84      90      94      97
 40       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  41      KK  RT23DU
  42      KM   ROUTE 23DU
  43      KM   ROUTE FROM BASIN 23DU TO 23BU
  44      KM   23RD AVE - DUNLAP TO BUTLER
  45      RS      6    FLOW       0
  46      RC   .016    .016    .016    2640    .005     4.3
  47      RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  48      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  49      KK  SB23BU
  50      KM   SUB-BASIN SB23BU
  51      KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND BUTLER
  52      KM   BASIN AREA REDUCED BY 27.2 ACRES TO ACCOUNT FOR 100 YEAR 2 HOUR RETENTION &
  53      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  54      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  55      KM     L =  .50  Kb = .050  Adj. Slope =   25.0
  56      BA    .222
  57      LG    .200    .250   5.300    .282  46.000
  58      UC    .475    .219
  59      UA       0       5      16      30      65      77      84      90      94      97
  60      UA     100
          *
          *  KK23BU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23BU, 7 CBs IN SUBBASIN, 1-54" SD ALONG 23RD AVE
          *  KM REMOVE CAPACITY OF CATCH BASINS. ASSUME INLET CAPACITY OF 5 CFS EACH
          *  KM Qtotal = 7(5) = 35 cfs
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23BU.2
          *  DI      0      35   10000
          *  DQ      0      35      35
          *

  61      KK  CP23BU
  62      KM   COMBINE FLOWS AT 23RD AND BUTLER
  63      HC       2
          *

  64      KK  RT23BU
  65      KM   ROUTE BASIN 23BU TO 23RD AND ROYAL PALM
  66      KM   ROUTE 23BU
  67      KM   ROUTE FROM BASIN 23BU TO 23RO
  68      RS       5    FLOW       0
  69      RC    .016    .016    .016    2036    .004     4.3
  70      RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  71      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 72       KK  SB23RO
 73       KM   SUB-BASIN SB23RO
 74       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND ROYAL PALM
 75       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 76       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 77       KM     L =  .39  Kb = .055  Adj. Slope =   23.0
 78       BA    .101
 79       LG    .150    .160   7.000    .127  66.000
 80       UC    .429    .252
 81       UA       0       5      16      30      65      77      84      90      94      97
 82       UA     100
          *

 83       KK  RN23RO
 84       KM   RETENTION VOLUME IN SB23RO, 23RD AND ROYAL PALM
 85       KM   100-YEAR 2 HOUR RETENTION ESTIMATED BY FIELD VISIT AND STORM DRAIN MAP J-7
 86       KM   VOL = C*(P/12)*A, 50% OF REQUIRED VOLUME IS DIVERTED
 87       KM   C = 0.70, P = 100 YEAR 2 HOUR RAINFALL DEPTH = 2.54 INCHES
 88       KM   AREA A, IN ACRES MEASURED FROM MAPPING
 89       KO       3
 90       DT  DV23RO     4.8
 91       DI       0    4000
 92       DQ       0    4000
          *
          *  KK23RO.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM REMAINING SUBBASIN RUNOFF
          *  KM SB23RO, 10 CBs IN SUBBASIN, 1-60" SD ALONG 23RD AVE
          *  KM REMOVE CAPACITY OF CATCH BASINS. ASSUME INLET CAPACITY OF 5 CFS EACH
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23RO.2
          *  DI     0      50   10000
          *  DQ     0      50      50
          *

 93       KK  CP23RO
 94       KM   COMBINE FLOWS AT 23RD AND ROYAL PALM
 95       HC       2
          *

 96       KK  RT23RO
 97       KM   ROUTE 23RO
 98       KM   ROUTE FROM BASIN 23RO TO 23NO
 99       KM   23RD AVE -Royal Palm to Northern
100       RS       2    FLOW       0
101       RC    .016    .016    .016     702    .001     4.3
102       RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
103       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

104       KK  SB23NO
105       KM   SUB-BASIN SB23NO
106       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND NORTHERN BASIN
107       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
108       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
109       KM     L =  .13  Kb = .060  Adj. Slope =    7.0
110       BA    .043
111       LG    .100    .150   9.100    .053  80.000
112       UC    .367    .143
113       UA       0       5      16      30      65      77      84      90      94      97
114       UA     100
          *

115       KK  RN23NO
116       KM   RETENTION VOLUME IN SB23NO, 23RD AND NORTHERN
117       KM   100-YEAR 2 HOUR RETENTION ESTIMATED BY FIELD VISIT AND STORM DRAIN MAP J-7
118       KM   VOL = C*(P/12)*A, 50% OF REQUIRED VOLUME IS DIVERTED
119       KM   C = 0.70, P = 100 YEAR 2 HOUR RAINFALL DEPTH = 2.54 INCHES
120       KM   AREA A, IN ACRES MEASURED FROM MAPPING
121       DT  RB23NO     2.1
122       DI       0    4000
123       DQ       0    4000
          *

124       KK  CP23NO
125       KM   COMBINE AT 23RD AVE AND NORTHERN
126       KO       3
127       HC       2
          *

128       KK   N23RB
129       KM        ADD PROPOSED RETENTION BASIN AT SW CORNER OF 23rd & NORTHERN AVE
130       KM        DIVERT 60" SD FLOWS INTO NEW BASIN AT A MAX RATE OF 114 cfs
131       KM        ANY FLOWS IN EXCESS OF 114 cfs WILL CONTINUE AS SURFACE FLOW
132       KO       3
133       DT   N23IN
134       DI       0     114    4000
135       DQ       0     114     114
          *

136       KK  DV23NO
137       KM        STREET INTERSECTION DIVERSION AT 23rd AVE & NORTHERN AVE
138       KM        DQ FLOWS GO TO EAST TO 21ST AVE AND NORTHERN
139       DT  DI23NO
140       DI      74     127    1404    2369
141       DQ      56      95     842    1421
          *

142       KK  RT23NO
143       KM   ROUTE TO 23RD AND ORANGEWOOD
144       KM   23RD AVE AND NORTHERN TO 23RD AND ORANGEWOOD
145       RS       6    FLOW       0
146       RC    .016    .016    .016    2633    .005     4.3
147       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 148      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 149      KK  SB23OR
 150      KM   SUB-BASIN SB23OR
 151      KM   23RD AVE AND ORANGEWOOD BASIN
 152      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 153      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 154      KM     L =  .50  Kb = .054  Adj. Slope =   24.0
 155      BA    .124
 156      LG    .220    .170   6.800    .155  51.000
 157      UC    .483    .312
 158      UA       0       5      16      30      65      77      84      90      94      97
 159      UA     100
          *

 160      KK  CP23OR
 161      KM   COMBINE AT 23RD AVE AND ORANGEWOOD
 162      HC       2
          *

 163      KK  DV23OR
 164      KM   DIVERT FLOWS AT ORANGEWOOD 75% SOUTH 25% EAST
 165      KM   DQ FLOWS GO TO EAST TO 21ST AVE AND ORANGEWOOD
 166      DT  DI23OR
 167      DI       0     500   10000
 168      DQ       0     125    2500
          *

 169      KK  RT23OR
 170      KM   ROUTE TO 23RD DRIVE AND MYRTLE
 171      KM   ROUTE RUNOFF FROM 23RD AVE AND ORANGEWOOD
 172      RS       3    FLOW       0
 173      RC    .016    .016    .016    1460    .005     4.3
 174      RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 175      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 176      KK  SB23DM
 177      KM   SUB-BASIN SB23DM
 178      KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND MYRTLE
 179      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 180      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 181      KM     L =  .28  Kb = .059  Adj. Slope =   29.0
 182      BA    .056
 183      LG    .250    .150   8.100    .097  40.000
 184      UC    .350    .215
 185      UA       0       5      16      30      65      77      84      90      94      97
 186      UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  187     KK  CP23DM
  188     KM   COMBINE AT 23RD DRIVE AND MYRTLE
  189     HC       2
          *

  190     KK  DV23DM
  191     KM   DIVERT FLOWS AT 23RD DRIVE 50% SOUTH AND 50% EAST
  192     KM   DQ FLOWS GO TO EAST TO 21ST AVE AND MYRTLE
  193     DT  DI23DM
  194     DI       0      16      32     412     701
  195     DQ       0       8      16     206     351
          *

  196     KK  RT23DM
  197     KM   ROUTE 23M.3 SOUTH ON 23rd AVENUE TO GLENDALE AVENUE
  198     RS       3    FLOW       0
  199     RC    .016    .016    .016    1324    .003     4.3
  200     RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
  201     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  202     KK  SB22GL
  203     KM   SUB-BASIN SB22GL
  204     KM   SUBBASIN CONTRIBUTING TO 22ND AVE AND GLENDALE
  205     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  206     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  207     KM     L =  .30  Kb = .063  Adj. Slope =   16.0
  208     BA    .025
  209     LG    .250    .250   5.900    .235  32.000
  210     UC    .483    .516
  211     UA       0       5      16      30      65      77      84      90      94      97
  212     UA     100
          *

  213     KK  RT22GL
  214     KM   ROUTE FROM BASIN 22GL TO 23GL
  215     RS       5    FLOW       0
  216     RC    .016    .016    .016     830    .001     4.3
  217     RX    44.9      45      66    66.1     134   134.1     155   155.1
  218     RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  219     KK  SB23GL
  220     KM   SUB-BASIN SB23GL
  221     KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND GLENDALE
  222     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  223     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  224     KM     L =  .25  Kb = .058  Adj. Slope =   18.0
  225     BA    .057
  226     LG    .240    .150   7.400    .126  36.000
  227     UC    .387    .218
  228     UA       0       5      16      30      65      77      84      90      94      97
  229     UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

230       KK  23GL.1
231       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
232       KM   SB23GL, 5 CBs IN SUBBASIN, 1-21" SD ALONG GLENDALE AVE
233       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL=8.6 CFS
234       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
235       DT  23GL.2
236       DI       0     8.6   10000
237       DQ       0     8.6     8.6
          *

238       KK  CP23GL
239       KM   COMBINE AT 23RD DRIVE AND GLENDALE
240       HC       3
          *

241       KK  RT23GL
242       KM   ROUTE CP23GL TO 23RD AND MARYLAND
243       KM   ROUTE FROM BASIN 23GL TO 23MA
244       KM   23RD AVE - GLENDALE TO MARYLAND
245       RS       5    FLOW       0
246       RC    .016    .016    .016    2796    .005     4.3
247       RX    44.9      45      66    66.1     134   134.1     155   155.1
248       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ====================================================
          * FLOW INTERCEPTED BY STORM DRAIN AND ROUTED TO BASIN I
          * ====================================================
          *

249       KK  S23MAA
250       KM   SUB-BASIN S23MAA
251       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
252       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
253       KM     L =  .51  Kb = .055  Adj. Slope =   25.0
254       BA    .110
255       LG    .230    .250   3.500    .349  45.000
256       UC    .508    .358
257       UA       0       5      16      30      65      77      84      90      94      97
258       UA     100
          *

259       KK    SD11
260       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
261       KM   S23MAA, 2 CBs IN SUBBASIN, 1-24" SD ALONG 23RD AVE
262       KM   ASSUME CAPACITY EQUAL TO 5 CFS PER INLET
263       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
264       DT    SD12
265       DI       0      10   10000
266       DQ       0      10      10
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 267      KK  S23MAB
 268      KM   SUB-BASIN S23MAB
 269      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 270      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 271      KM     L =  .35  Kb = .063  Adj. Slope =   25.0
 272      BA    .029
 273      LG    .230    .250   3.500    .349  45.000
 274      UC    .446    .490
 275      UA       0       5      16      30      65      77      84      90      94      97
 276      UA     100
          *

 277      KK  S21MAC
 278      KM   SUB-BASIN S21MAC
 279      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 280      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 281      KM     L =  .08  Kb = .033  Adj. Slope =    1.0
 282      BA    .017
 283      LG    .500    .250   3.500    .498    .000
 284      UC    .504    .234
 285      UA       0       5      16      30      65      77      84      90      94      97
 286      UA     100
          *

 287      KK  CP23MA
 288      KM   COMBINE RT23GL, SD11, S23MAB, & S21MAC
 289      KM   THIS IS THE TOTAL INFLOW TO RET BASIN I ALONG 23rd AVENUE
 290      KO       3
 291      HC       4
          *

 292      KK   DV_I
 293      KM   DIVERT ROUTINE FOR ANY EXCESS FLOW THAT CANNOT ENTER RET BASIN I
 294      KM   ALONG 23rd AVENUE.
 295      KM   100% RETENTION FOR DI_I FLOW IS ASSUMED FOR RET BASIN I
 296      DT    DI_I
 297      DI       0  100000
 298      DQ       0  100000
          *

 299      KK  RT23MA
 300      KM   ROUTE FLOWS TO 23RD AND BETHANY HOME RD
 301      KM   NO FLOWS ARE DIVERTED EAST. ALL FLOWS PROCEED SOUTH
 302      KM   23RD AVE - MARYLAND TO BETHANY HOME
 303      RS       4    FLOW       0
 304      RC    .016    .016    .016    2623    .004     4.3
 305      RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
 306      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

307       KK  SB23BE
308       KM   SUB-BASIN SB23BE
309       KM   SUBBASIN CONTRIBUTING TO 23RD DRIVE AND BETHANY HOME ROAD
310       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
311       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
312       KM    L =  .50  Kb = .054  Adj. Slope =   20.0
313       BA   .115
314       LG   .210    .250   4.900    .338  43.000
315       UC   .546    .372
316       UA     0       5      16      30      65      77      84      90      94      97
317       UA   100
          *

318       KK  23BE.1
319       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
320       KM   SB23BE, 10 CBs IN SUBBASIN, 1-30" SD (LOWER REACH WHERE THE CBs ARE LOCATED)
321       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL= 22.38 CFS
322       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
323       DT  23BE.2
324       DI       0      22   10000
325       DQ       0      22      22
          *

326       KK  CP23BE
327       KM   COMBINE AT 23RD AND BETHANY HOME
328       HC       2
          *

329       KK  RT23BE
330       KM   ROUTE 23BE
331       KM   ROUTE FROM BASIN 23BE TO 23MI (23RD AVE AND MISSOURI)
332       KM   ALL FLOW GOES TO THE SOUTH
333       RS       6    FLOW       0
334       RC    .016    .016    .016    2640    .002     4.3
335       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
336       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

337       KK  SB23MI
338       KM   SUB-BASIN SB23MI
339       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
340       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
341       KM    L =  .65  Kb = .054  Adj. Slope =   12.0
342       BA   .119
343       LG   .240    .250   4.900    .355  37.000
344       UC   .783    .673
345       UA     0       5      16      30      65      77      84      90      94      97
346       UA   100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

347       KK  CP23MI
348       KM   COMBINE AT 23RD AND MISSOURI
349       HC       2
          *

350       KK  DV23MI
351       KM   DIVERT FLOWS GENERATED AT 23RD AND MISSOURI
352       KM   DQ FLOWS GO TO EAST TO 21ST AND MISSOURI
353       DT  DI23MI
354       DI       0     500   10000
355       DQ       0     200    4000
          *

356       KK  RT23MI
357       KM   ROUTE 23MI
358       KM   ROUTE SOUTH FROM BASIN 23MI TO 23CO (23RD AVE AND COLTER)
359       RS       2    FLOW       0
360       RC    .016    .016    .016    1314    .003     4.3
361       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
362       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ================================================
          * ADD DETENTION BASIN C
          * ================================================
          *

363       KK  S23COA
364       KM   SUB-BASIN S23COA
365       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
366       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
367       KM     L =  .25  Kb = .068  Adj. Slope =   16.0
368       BA    .012
369       LG    .180    .250   3.500    .360  40.000
370       UC    .454    .632
371       UA       0       5      16      30      65      77      84      90      94      97
372       UA     100
          *

373       KK  S23COB
374       KM   SUB-BASIN S23COB
375       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
376       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
377       KM     L =  .44  Kb = .059  Adj. Slope =   11.0
378       BA    .049
379       LG    .210    .250   3.500    .305  60.000
380       UC    .629    .640
381       UA       0       5      16      30      65      77      84      90      94      97
382       UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

383       KK  23CO.1
384       KM    COMBINE S23COA, S23COB & RT23MI AT COLTER & 23rd AVENUE
385       KO       3
386       HC       3
          *
          *  KK23CO.3     DIV
          *  KM CAPTURE FLOWS FROM 23CO.1 WITH NEW STORM DRAIN
          *  KM THIS STORM DRAIN COLLECTION SYSTEM WILL BE DESIGNED TO INTERCEPT A MAXIMUM
          *  KM 9.0 AF OF WATER AND DIRECT IT TO RET BASIN C.1 AT I-17 & COLTER STREET.
          *  KM THE DIVERTED FLOW GOES TO RETENTION BASIN C.1.
          *  KM NON-DIVERTED FLOW GOES EAST ON COLTER AND SOUTH ON 23rd AVENUE
          *  KO     3
          *  DT23CO.2
          *  DI     0      34   10000
          *  DQ     0      34      34
          *

387       KK  DV23CO
388       KM   DIVERT FLOWS GENERATED AT 23RD AVE AND COLTER
389       KM   SPLIT IS APPROXIMATELY 50% EAST AND 50% SOUTH
390       KM   DQ FLOWS GO TO EAST TO 22ND AND CAMELBACK
391       DT  DI23CO
392       DI       0     500   10000
393       DQ       0     250    5000
          *

394       KK  RT23CO
395       KM   FLOW ROUTED SOUTH ON 23RD AVE TO BOTTOM OF SUB S23CAA
396       RS       2    FLOW       0
397       RC    .016    .016    .016     960    .003     4.3
398       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
399       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

400       KK  S23CAA
401       KM   SUB-BASIN S23CAA
402       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
403       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
404       KM    L =  .18  Kb = .070  Adj. Slope =   16.0
405       BA    .009
406       LG    .180    .230   6.200    .187  56.000
407       UC    .375    .463
408       UA       0       5      16      30      65      77      84      90      94      97
409       UA     100
          *

410       KK  23AA.1
411       KM   REMOVE FLOW FROM S23CAA INTO AN EXISTING STORM ON 23rd AVENUE
412       KM   2 CATCH BASINS CONTRIBUTE TO AN 18" STORM DRAIN IN 23rd AVENUE
413       KM   THROUGH SUB-BASIN S23CAA.
414       KM   ASSUME CATCH BASIN CAPACITY OF 5 cfs EACH
415       KM   TOTAL Q TAKEN OUT = 2(5) =10 CFS
416       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
417       DT  23AA.2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

418       DI       0      10    1000
419       DQ       0      10      10
          *

420       KK  23CA.1
421       KM   COMBINE RT23CO & S23CAA
422       HC       2
          *

423       KK   RBA.1
424       KM   INSTALL NEW STORM DRAIN TO COLLECT FLOW AT 23CA.1 AND PIPE TO RET BASIN A.
425       KO       3
426       DT   RBA.2
427       DI       0    1000
428       DQ       0    1000
          * ===============================================================
          * COLLECT FLOWS WITH STORM DRAIN IN 23RD AVE AND CONVEY TO BASIN C.2
          * ===============================================================
          *

429       KK   C23.1
430       KM   ROUTE ANY EXCESS FLOW FROM RBA.1 DOWN 23rd AVE TO CAMELBACK ROAD
431       RS       2    FLOW       0
432       RC    .016    .016    .016     350    .003     4.3
433       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
434       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

435       KK  S23CAB
436       KM   SUB-BASIN S23CAB
437       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
438       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
439       KM     L =  .07  Kb = .076  Adj. Slope =   15.8
440       BA    .003
441       LG    .180    .150   8.200    .052  56.000
442       UC    .233    .240
443       UA       0       5      16      30      65      77      84      90      94      97
444       UA     100
          *

445       KK  CP23CA
446       KM   COMBINE AT 23RD AND CAMELBACK
447       KO       3
448       HC       2
          *

449       KK  DV23CA
          *  KM DIVERT FLOWS AT 23RD AVE AND CAMELBACK TO RET BASIN C.2
450       KM     DETENTION BASIN C.2 IS ELIMINATED.
451       KM     ALL FLOWS AT THIS POINT GO TO DETENTION BASIN "A"
452       KM   100% OF THE FLOW IS DIVERTED WEST ALONG THE NORTH SIDE OF CAMELBACK
453       DT  DI23CA
454       DI       0   10000
455       DQ       0   10000
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

456       KK  RT23CA
457       KM   ROUTE 23CA
458       KM   ROUTE FROM BASIN 23CA TO 23CP (23RD AND CAMPBELL)
459       RS      5    FLOW       0
460       RC   .016    .016    .016    2673    .004     4.3
461       RX   0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
462       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

463       KK  RE24CA
464       KM   RETRIEVAL OF RET BASIN C.2 DIVERSION FROM 23rd AVE & CAMELBACK
465       DR  DI23CA
          *

466       KK  RD24CA
467       KM   ROUTE DIVERT FROM 23RD AND CAMELBACK TO 24TH DRIVE AND CAMELBACK
468       RS      1    FLOW       0
469       RC   .016    .016    .016     504    .001     4.3
470       RX   44.9      45      66    66.1     134   134.1     155   155.1
471       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

472       KK  SB24CA
473       KM   SUB-BASIN SB24CA
474       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
475       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
476       KM    L =  .34  Kb = .059  Adj. Slope =   14.0
477       KO      3
478       BA   .050
479       LG   .150    .250   4.900    .293  63.000
480       UC   .500    .399
481       UA      0       5      16      30      65      77      84      90      94      97
482       UA    100
          *

483       KK  CP24CA
484       KM   COMBINE AT 24TH AND CAMELBACK
485       KO      3
486       HC      2
          *

487       KK  C.2OUT
488       KM       ROUTE CP24CA THROUGH NEW RET BASIN C.2
489       KM       THIS DETENTION BASIN HAS BEEN REMOVED.
490       KM       ALL FLOWS ARE ROUTED TO DETENTION BASIN "A" THROUGH RETRIEVAL OF RBC.2
491       KO      3
492       DT   RBC.2
493       DI      0   10000
494       DQ      0   10000
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

495       KK  RT24CA
496       KM   FLOWS ACCUMULATE AT 24th AND CAMELBACK UNTIL BREAKING OUT SOUTH TO BILL LUKE
497       KM   FLOWS EVENTUALLY ARRIVE AT 23RD AND CAMPBELL
498       RS      5    FLOW       0
499       RC   .016    .016    .016    2578    .005     4.3
500       RX   44.9      45      66    66.1     134   134.1     155   155.1
501       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

502       KK  SB23CP
503       KM   SUB-BASIN SB23CP
504       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND CAMPBELL
505       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
506       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
507       KM    L =  .51  Kb = .052  Adj. Slope =   24.0
508       BA   .158
509       LG   .210    .150   9.300    .061  51.000
510       UC   .471    .268
511       UA      0       5      16      30      65      77      84      90      94      97
512       UA    100
          *

513       KK  23CP.1
514       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
515       KM   SB23CP, 6 CBs IN SUBBASIN, 1-15" SD ALONG 23RD AVE
516       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL= 3.52 CFS
517       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
518       DT  23CP.2
519       DI       0       4   10000
520       DQ       0       4       4
          *

521       KK  CP23CP
522       KM   COMBINE AT 23RD AND CAMPBELL
523       HC       3
          *

524       KK  RT23CP
525       KM   ROUTE 23CP
526       KM   ROUTE FROM BASIN 23CP TO 23IN
527       RS       4    FLOW       0
528       RC    .016    .016    .016    2578    .003     4.3
529       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
530       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

531       KK  SB23IN
532       KM   SUB-BASIN SB23IN
533       KM   SUBBASIN CONTRIBUTING TO 23RD AVE AND INDIAN SCHOOL ROAD
534       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
535       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
536       KM    L =  .49  Kb = .052  Adj. Slope =   16.0
537       BA   .171
538       LG   .220    .150   8.600    .077  52.000
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

539       UC    .529    .282
540       UA       0       5      16      30      65      77      84      90      94      97
541       UA     100
          *

542       KK  23IN.1
543       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
544       KM   SB23IN, 8 CBs IN SUBBASIN, 1-15" SD ALONG 23RD AVE
545       KM   REMOVE CAPACITY SD ASSUME FULL FLOW (So = 0.003 '/FT) QFULL=3.52 CFS
546       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
547       DT  23IN.2
548       DI       0       4   10000
549       DQ       0       4       4
          *

550       KK  CP23IN
551       KM   COMBINE AT 23RD AND INDIAN SCHOOL ROAD
552       HC       2
          *
553       KM   ********************************************************************************
554       KM   FLOWS ALONG 21ST AVENUE
555       KM   ********************************************************************************
          *

556       KK  SB21DU
557       KM   SUB-BASIN SB21DU
558       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND DUNLAP
559       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
560       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
561       KM     L =  .50  Kb = .056  Adj. Slope =   14.0
562       BA    .091
563       LG    .230    .250   4.650    .389  50.000
564       UC    .633    .502
565       UA       0       5      16      30      65      77      84      90      94      97
566       UA     100
          *

567       KK  21DU.1
568       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
569       KM   SB21DU, 5 CBS CONTRIBUTING TO 30" SD ALONG DUNLAP AVE AFFECTING FLOWS AT CP
570       KM   REMOVE CAPACITY SD
571       KM   QFULL = 12.92
572       KM   SO = 0.001, N = 0.013
573       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
574       DT  21DU.2
575       DI       0      13   10000
576       DQ       0      13      13
          *

577       KK  RT21DU
578       KM   ROUTE 21DU
579       KM   ROUTE FROM BASIN 21DU TO 21BU
580       KM   21ST AVE - DUNLAP TO BUTLER
581       RS       6    FLOW       0
582       RC    .016    .016    .016    2731    .005     4.3
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

583       RX    0.00     0.1    10.0    20.0    40.0    50.0    60.0    60.1
584       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

585       KK  SB21BU
586       KM   SUB-BASIN SB21BU
587       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND BUTLER
588       KM   BASIN AREA REDUCED BY 49.2 ACRES TO ACCOUNT FOR 100 YEAR 2 HOUR RETENTION &
589       KM   THE FINAL OUTFALL POINT IS AT A GOLF COURSE. RUNOFF IS INTERCEPTED BY LAKES
590       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
591       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
592       KM     L =  .52  Kb = .054  Adj. Slope =   28.0
593       BA    .128
594       LG    .220    .250   6.000    .206  44.000
595       UC    .483    .316
596       UA       0       5      16      30      65      77      84      90      94      97
597       UA     100
          *

598       KK  CP21BU
599       KM   COMBINE AT 21ST AVE AND BUTLER
600       HC       2
          *

601       KK  DV21BU
602       KM   DIVERT ROUTED FLOW THROUGH GOLF COURSE (SB19NO)
603       KM   DIVERT NOT RETRIEVED BACK INTO MODEL. FLOWS ENTER GOLF COURSE LAKES IN SB19NO
604       KM   LAKE STORAGE IS SUFFICIENT TO RETAIN 100% OF 100-YR INFLOWS
605       DT  DI21BU
606       DI       0   10000
607       DQ       0   10000
          *

608       KK  SB21OR
609       KM   SUB-BASIN SB21OR
610       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND ORANGEWOOD
611       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
612       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
613       KM     L =  .50  Kb = .054  Adj. Slope =   22.0
614       BA    .126
615       LG    .250    .200   6.400    .186  45.000
616       UC    .508    .327
617       UA       0       5      16      30      65      77      84      90      94      97
618       UA     100
          *

619       KK  RE21OR
620       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
621       KM   FROM 23RD AND ORANGEWOOD
622       DR  DI23OR
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

623       KK  RD21OR
624       KM   ROUTE RETRIEVED DIVERT ALONG ORANGEWOOD
625       KM   ROUTE DIVERT FROM 23RD AND ORANGEWOOD TO 21ST AVE AND ORANGEWOOD
626       RS      3    FLOW       0
627       RC   .016    .016    .016    1321    .002     4.3
628       RX   44.9      45      66    66.1     134   134.1     155   155.1
629       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

630       KK  CP21OR
631       KM   COMBINE AT 21ST AVE AND ORANGEWOOD
632       HC      2
          *

633       KK  DV21OR
634       KM   DIVERT FLOWS AT 21ST AND ORNAGEWOOD 50% SOUTH AND 50% WEST
635       KM   DQ FLOWS GO TO EAST TO 19TH AVE AND ORANGEWOOD
636       DT  DI21OR
637       DI      0     500   10000
638       DQ      0     250    5000
          *

639       KK  RT21OR
640       KM   ROUTE 21OR
641       KM   ROUTE FROM BASIN 21OR TO 21MY
642       RS      6    FLOW       0
643       RC   .016    .016    .016    1320    .003     4.3
644       RX   0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
645       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

646       KK  SB21MY
647       KM   SUB-BASIN SB21MY (MODIFIED FOR MULTI-BASIN MODEL)
648       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
649       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
650       KM     L =  .49  Kb = .058  Adj. Slope =   17.0
651       BA    .066
652       LG    .250    .160   7.000    .151  30.000
653       UC    .575    .533
654       UA       0       5      16      30      65      77      84      90      94      97
655       UA     100
          *

656       KK  RE21MY
657       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
658       KM   FROM 23RD DRIVE AND MYRTLE
659       DR  DI23DM
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

660       KK  RD21MY
661       KM   ROUTE RETRIEVED DIVERT ALONG MYRTLE
662       KM   ROUTE DIVERT FROM 23RD AND MYRTLE TO 21ST AVE AND MYRTLE
663       RS      8    FLOW       0
664       RC   .016    .016    .016    1490    .001     4.3
665       RX   44.9      45      66    66.1     134   134.1     155   155.1
666       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

667       KK  CP21MY
668       KM   COMBINE AT 21ST AVE AND MYRTLE
669       HC      3
          *

670       KK  DV21MY
671       KM   DIVERT FLOWS AT MYTRLE 50% SOUTH AND 50% EAST
672       KM   DQ FLOWS GO TO EAST TO 19TH AVE AND MYTRLE
673       DT  DI21MY
674       DI      0     500   10000
675       DQ      0     250    5000
          *

676       KK  RT21MY
677       KM   ROUTE 21MY
678       KM   ROUTE FROM BASIN 21MY TO 21GL
679       KM   MYRTLE TO GLENDALE
680       RS      3    FLOW       0
681       RC   .016    .016    .016    1300    .004     4.3
682       RX  0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
683       RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

684       KK  SB21GL
685       KM   SUB-BASIN SB21GL
686       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND GLENDALE
687       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
688       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
689       KM   THE 50-YR UC DATA FOR THIS BASIN WAS LARGER THAN THE 25-YR DATA.
690       KM   ACCORDINGLY, THE 25-YR UC RECORD WAS RETAINED FOR THE 50-YR STORM.
691       KM     L =  .32  Kb = .060  Adj. Slope =   17.0
692       BA   .043
693       LG   .230    .250   3.500    .349  37.000
694       UC   .475    .391
695       UA      0       5      16      30      65      77      84      90      94      97
696       UA    100
          *

697       KK  CP21GL
698       KM   COMBINE AT 21ST AVE AND GLENDALE
699       HC      2
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 700      KK  DV21GL
 701      KM   DIVERT FLOWS AT 21ST AND GLENDALE SOUTH AND EAST
 702      KM   DQ FLOWS GO TO EAST TO 19TH AVE AND GLENDALE
 703      DT  DI21GL
 704      DI      74     122    1242    2083
 705      DQ      74     108    1008    1687
          *

 706      KK  RT21GL
 707      KM   ROUTE 21GL
 708      KM   ROUTE FROM BASIN 21GL TO 21MA
 709      KM   GLENDALE TO MARYLAND
 710      RS       5    FLOW       0
 711      RC    .016    .016    .016    2666    .005     4.3
 712      RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
 713      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ================================================
          * ADD RETENTION BASIN I
          * ================================================
          *

 714      KK  S21MAA
 715      KM   SUB-BASIN S21MAA
 716      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 717      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 718      KM     L =  .35  Kb = .028  Adj. Slope =   26.0
 719      KO       3
 720      BA    .110
 721      LG    .230    .250   3.500    .360  50.000
 722      UC    .279    .136
 723      UA       0       5      16      30      65      77      84      90      94      97
 724      UA     100
          *

 725      KK    DI_I
 726      KM   RETRIEVE FLOW INTERCEPTED IN SB23MA AND ROUTED TO BASIN I
 727      DR    DI_I
          *

 728      KK  S21MAB
 729      KM   SUB-BASIN S21MAB
 730      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 731      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 732      KM     L =  .16  Kb = .061  Adj. Slope =   26.0
 733      BA    .040
 734      LG    .230    .250   3.500    .388  30.000
 735      UC    .292    .136
 736      UA       0       5      16      30      65      77      84      90      94      97
 737      UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

738       KK  BSN_I
739       KM   COMBINE RT21GL,S21MAA, S21MAB, & DI_I
740       KM   THIS IS THE TOTAL INFLOW TO RETENTION BASIN I (WASHINGTON PARK)
741       KO       3
742       HC       4
          *

743       KK  WASHPK     DAM
744       KM        ROUTE FLOW THROUGH PROPOSED WASHINGTON PARK RETENTION BASIN
745       KM        SPILLWAY ELEV IS SET TO PROVIDE 39 AF
746       RS       1    ELEV       0
747       SV       0   22.03   44.07   66.12   88.15  110.19  121.21
748       SE       0       2       4       6       8      10      11
749       SS    3.54      50     2.7     1.5
750       ST      11       0     2.7     1.5
          *
          *

751       KK   M21.1
752       KM   ROUTE ANY EXCESS FLOW FROM DET BASIN DOWN 21st AVE TO MARYLAND
753       RS       5    FLOW       0
754       RC    .016    .016    .016     650    .005     4.3
755       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
756       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          *  OPERATION CP21MA IS NOT NEEDED FOR THIS MODEL (8/8/03)
          *
          *  KKCP21MA
          *  KM COMBINE AT 21ST AVE AND MARYLAND
          *  HC     2
          *

757       KK  RT21MA
758       KM   ROUTE 21MA
759       KM   ALL FLOWS ALONG 21ST AVE AT MARYLAND ARE ROUTED TO THE SOUTH
760       KM   ROUTE FROM BASIN 21MA TO 21BE
761       RS       5    FLOW       0
762       RC    .016    .016    .016    2630    .004     4.3
763       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
764       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

765       KK  SB21BE
766       KM   SUB-BASIN SB21BE
767       KM   SUBBASIN CONTRIBUTING TO 21ST AVE AND BETHANY HOME
768       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
769       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
770       KM     L =  .50  Kb = .052  Adj. Slope =   20.0
771       BA    .182
772       LG    .210    .250   3.500    .338  47.000
773       UC    .521    .272
774       UA       0       5      16      30      65      77      84      90      94      97
775       UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 776      KK  21BE.1
 777      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 778      KM   SB21BE, 8 CBS CONTRIBUTING TO 18" SD ALONG 21ST AVE AFFECTING FLOWS AT CP
 779      KM   REMOVE CAPACITY OF SD. ASSUME QFULL CONDITIONS. QFULL =5.72 CFS
 780      KM   SO = 0.003 AND N = 0.013
 781      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 782      DT  21BE.2
 783      DI       0       6   10000
 784      DQ       0       6       6
          *

 785      KK  CP21BE
 786      KM   COMBINE AT 21ST AVE AND BETHANY HOME
 787      HC       2
          *

 788      KK  RT21BE
 789      KM   ROUTE 21BE
 790      KM   ALL FLOW GOES SOUTH
 791      KM   ROUTE FROM BASIN 21BE TO 21MO
 792      RS       1    FLOW       0
 793      RC    .016    .016    .016    1178    .005     4.3
 794      RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
 795      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 796      KK  SB21MO
 797      KM   SUB-BASIN SB21MO
 798      KM   SUBBASIN CONTRIBUTING TO 21st AVE AND MONTEBELLO
 799      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 800      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 801      KM    L =  .58  Kb = .057  Adj. Slope =   10.0
 802      BA    .069
 803      LG    .240    .250   4.900    .352  35.000
 804      UC    .817    .877
 805      UA       0       5      16      30      65      77      84      90      94      97
 806      UA     100
          *

 807      KK  CP21MO
 808      KM   COMBINE AT 21ST AVE AND MONTEBELLO
 809      HC       2
          *

 810      KK  RT21MO
 811      KM   ROUTE 21MO
 812      KM   ROUTE FROM BASIN 21MO TO 21MI
 813      RS       2    FLOW       0
 814      RC    .016    .016    .016    1450    .003     4.3
 815      RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
 816      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

817       KK  SB21MI
818       KM   SUB-BASIN SB21MI
819       KM   SUBBASIN CONTRIBUTING TO 21st AVE AND MISSOURI
820       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
821       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
822       KM     L =  .48  Kb = .056  Adj. Slope =   14.0
823       BA    .089
824       LG    .250    .250   4.900    .360  31.000
825       UC    .642    .499
826       UA       0       5      16      30      65      77      84      90      94      97
827       UA     100
          *

828       KK  RE21MI
829       KM   RETRIEVAL OF STREET CAPACITY DIVERSION
830       KM   FROM 23RD AND MISSOURI
831       DR  DI23MI
          *

832       KK  RD21MI
833       KM   ROUTE DIVERT FROM CP23MI TO CP21MI
834       KM   ROUTE DIVERTED FLOW ALONG MISSOURI TO 21st AVENUE
835       RS       4    FLOW       0
836       RC    .016    .016    .016    1296    .002     4.3
837       RX    44.9      45      66    66.1     134   134.1     155   155.1
838       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

839       KK  CP21MI
840       KM   COMBINE AT 21ST AVE AND MISSOURI
841       HC       3
          *

842       KK  RT21MI
843       KM   ROUTE 21MI
844       KM   ROUTE FROM BASIN 21MI TO 21CA
845       KM   ROUTE FLOW THROUGH 21ST AND MISSOURI BASIN TO 21ST AVE AND CAMELBACK
846       KM   ALL FLOWS GO TO SOUTH
847       RS       4    FLOW       0
848       RC    .016    .016    .016    2663    .003     4.3
849       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
850       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ================================================
          * ADD DETENTION BASIN A
          * ================================================
          *

851       KK  S21CAA
852       KM   SUB-BASIN S21CAA
853       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
854       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
855       KM     L =  .46  Kb = .059  Adj. Slope =   16.0
856       BA    .049
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  857     LG    .210    .220   6.400    .179  45.000
  858     UC    .571    .595
  859     UA       0       5      16      30      65      77      84      90      94      97
  860     UA     100
          *

  861     KK  S22CAA
  862     KM   SUB-BASIN S22CAA
  863     KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
  864     KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
  865     KM     L =  .44  Kb = .060  Adj. Slope =   21.0
  866     BA    .047
  867     LG    .220    .250   5.900    .219  45.000
  868     UC    .517    .527
  869     UA       0       5      16      30      65      77      84      90      94      97
  870     UA     100
          *

  871     KK    SD33
  872     KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
  873     KM   SB22CA, 2 CBS CONTRIBUTING TO 18" SD ALONG 22ND AVE AFFECTING FLOWS AT CP
  874     KM   REMOVE CAPACITY OF CBs. ASSUME CAPCITY OF 5 CFS PER BASIN
  875     KM   TOTAL Q TAKEN OUT = 2(5) = 10 CFS
  876     KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
  877     DT    SD34
  878     DI       0      10   10000
  879     DQ       0      10      10
          *

  880     KK  RE22CA
  881     KM   RETRIEVAL OF STREET CAPACITY DIVERSION
  882     KM   FROM 23RD DRIVE AND COLTER
  883     DR  DI23CO
          *

  884     KK  RD22CA
  885     KM   ROUTE DIVERTED FLOWS TO RETENTION BASIN A
  886     RS       3    FLOW       0
  887     RC    .016    .016    .016    3290    .002     4.3
  888     RX   44.9      45      66    66.1     134   134.1     155   155.1
  889     RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

  890     KK   RBA.2     RET
  891     KM        RETRIEVE STORM DRAIN FLOW FROM 23rd AVE AT SUB-BASIN S23CAA
  892     DR   RBA.2
          *

  893     KK   DBA-1
  894     KM   COMBINE RT21MI, S21CAA, SD33, RD22CA, RBA.2
  895     KM   THIS IS PARTIAL INFLOW TO RET BASIN A
  896     KO       3
  897     HC       5
          *
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

898       KK   RBC.2   RETRIEVE
899       KM        RETRIEVE FLOW FROM FORMER DET BASIN C2 LOCATION
900       DR   RBC.2
          *

901       KK  S22CAB
902       KM   SUB-BASIN S22CAB
903       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
904       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
905       KM     L =  .04  Kb = .071  Adj. Slope =   10.0
906       BA    .007
907       LG    .100    .150   8.200    .040  90.000
908       UC    .192    .076
909       UA       0       5      16      30      65      77      84      90      94      97
910       UA     100
          *
          *  KKCP22CA
          *  KM COMBINE AT 22ND AVE AND CAMELBACK
          *  HC     2
          *

911       KK  S21CAC
912       KM   SUB-BASIN S21CAC
913       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
914       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
915       KM     L =  .04  Kb = .075  Adj. Slope =   15.0
916       BA    .004
917       LG    .210    .150   8.200    .040  70.000
918       UC    .175    .095
919       UA       0       5      16      30      65      77      84      90      94      97
920       UA     100
          *

921       KK   DBA-2
922       KM   COMBINE RBC.2, S22CAB, & S21CAC AT 21ST AVE AND CAMELBACK
923       KM   THIS IS PARTIAL INFLOW TO DETENTION BASIN "A"
924       KO       3
925       HC       3
          *

926       KK   DBA-3
927       KM        COMBINE DBA-1 & DBA-2
928       KM        THIS IS THE TOTAL INFLOW TO DETENTION BASIN "A"
929       KO       3
930       HC       2
          *

931       KK    SD35
932       KM   BLEED 100% OF RET BASIN "A" THROUGH EXISTING 18" STORM DRAIN
933       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
934       DT    SD36
935       DI       0   20000
936       DQ       0   20000
          *
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

937       KK  DV22CA
938       KM   DIVERT FLOWS TO 21ST AND CAMPBELL 50% SOUTH AND 50% EAST
939       KM   DQ FLOWS GO TO SOUTH TO 21ST AVE AND CAMPBELL
940       DT  DI22CA
941       DI       0     500   10000
942       DQ       0       0       0
          *

943       KK  RT22CA
944       KM   ROUTE 22CA
945       KM   ROUTE FROM BASIN 22CA TO 21CA (CAMELBACK)
946       RS       6    FLOW       0
947       RC    .016    .016    .016     925    .004     4.3
948       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
949       RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

950       KK  S21CAB
951       KM   SUB-BASIN S21CAB
952       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
953       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
954       KM     L =  .61  Kb = .054  Adj. Slope =   16.0
955       BA    .119
956       LG    .210    .170   6.800    .152  45.000
957       UC    .629    .501
958       UA       0       5      16      30      65      77      84      90      94      97
959       UA     100
          *

960       KK  21CA.1
961       KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
962       KM   S21CAB, 2 CBS CONTRIBUTING TO 18" SD ALONG VERMONT AND
963       KM   12 CBS CONTRIBUTING TO 24" SD ALONG 21ST AVE AFFECTING FLOWS AT CP
964       KM   REMOVE CAPACITY OF 18 " SD AND 24" SD. 18" QFULL = 5.72 AND 24" = 12.33 CFS
965       KM   SO = 0.003 '/FT AND N = 0.013
966       KM   TOTAL Q TAKEN OUT = 12.33+5.72 = 18.05
967       KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
968       DT  21CA.2
969       DI       0      18   10000
970       DQ       0      18      18
          *

971       KK  CP21CA
972       KM        COMBINE 21CA.1 & RT22CA
973       HC       2
          *

974       KK  RT21CA
975       KM   ROUTE 21CA
976       KM   ALL FLOWS ROUTED SOUTH ALONG 21ST AVE
977       KM   ROUTE FROM BASIN 21CA TO 21CP
978       RS       4    FLOW       0
979       RC    .016    .016    .016    2640    .003     4.3
980       RX    0.00     0.1     7.0    17.0    33.0    43.0    50.0    50.1
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 981      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

 982      KK  SB21CP
 983      KM   SUB-BASIN SB21CP
 984      KM   SUBBASIN CONTRIBUTING TO 21st AVE AND CAMPBELL
 985      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 986      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 987      KM    L =  .62  Kb = .053  Adj. Slope =   16.0
 988      BA    .144
 989      LG    .240    .150   9.100    .067  40.000
 990      UC    .617    .445
 991      UA       0       5      16      30      65      77      84      90      94      97
 992      UA     100
          *

 993      KK  21CP.1
 994      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
 995      KM   SB21CP, 3 CBs IN SUBBASIN,CONTRIBUTING TO 24" SD ALONG 21ST AVE
 996      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 24" LINE. ASSUME 5 CFS PER CATCH BASIN.
 997      KM   TOTAL Q TAKEN OUT = 3(5) = 15
 998      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
 999      DT  21CP.2
1000      DI       0      15   10000
1001      DQ       0      15      15
          *

1002      KK  RE22CA
1003      KM   RETRIEVAL OF 22ND AND CAMELBACK FLOWS
1004      DR  DI22CA
          *

1005      KK  RD22CA
1006      KM   ROUTE DIVERTED FLOWS FROM BASIN 22CA TO 21CP
1007      KM   ROUTE FLOW FROM 22nd AVENUE AND CAMELBACK BASIN TO 21ST AVE AND CAMPBELL
1008      RS       2    FLOW       0
1009      RC    .016    .016    .016    3287    .003     4.3
1010      RX   44.9      45      66    66.1     134   134.1     155   155.1
1011      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1012      KK  CP21CP
1013      KM   COMBINE AT 21ST AVE AND CAMPBELL
1014      HC       3
          *

1015      KK  DV21CP
1016      KM   DIVERT FLOWS AT 21ST AND CAMPBELL 50% SOUTH AND 50% EAST
1017      KM   DQ FLOWS GO TO EAST TO 19TH AVE AND CAMPBELL
1018      DT  DI21CP
1019      DI       0     500   10000
1020      DQ       0     250    5000
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1021      KK  RT21CP
1022      KM   ROUTE 21CP
1023      KM   ROUTE FROM BASIN 21CP TO 21ST AVE AND TURNEY
1024      RS      4    FLOW       0
1025      RC   .016    .016    .016     665    .002     4.3
1026      RX    0.0     0.1    15.0    25.0    55.0    65.0    80.0    80.1
1027      RY    4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
          * ================================================
          * ADD DETENTION BASIN X
          * ================================================
          *

1028      KK  S21CNA
1029      KM   SUB-BASIN S21CNA
1030      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1031      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1032      KM    L =  .19  Kb = .066  Adj. Slope =   27.0
1033      BA   .017
1034      LG   .250    .150   8.800    .078  45.000
1035      UC   .308    .271
1036      UA      0       5      16      30      65      77      84      90      94      97
1037      UA    100
          *

1038      KK   S19.1
1039      KM    COMBINE S21CNA & RT21CP AT 21st AVE & TURNEY
1040      HC      2
          *

1041      KK   S19.2
1042      KM   ROUTE S19.1 EAST ON TURNEY TO RET BASIN X INLET
1043      RK    700   .0020    .016            TRAP      36
          *

1044      KK  S19CNA
1045      KM   SUB-BASIN S19CNA
1046      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1047      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1048      KM    L =  .26  Kb = .065  Adj. Slope =    2.0
1049      BA   .021
1050      LG   .250    .150   8.200    .071  41.000
1051      UC   .900   1.013
1052      UA      0       5      16      30      65      77      84      90      94      97
1053      UA    100
          *

1054      KK    SBX
1055      KM   SUB-BASIN SBX.  THIS IS THE RET BASIN X SURFACE AREA + ADJOINING APT COMPLEX
1056      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1057      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1058      KM    L =  .15  Kb = .064  Adj. Slope =    2.0
1059      BA   .021
1060      LG   .250    .150   8.200    .075  45.000
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1061      UC    .637    .445
1062      UA      0       5      16      30      65      77      84      90      94      97
1063      UA     100
          *

1064      KK  BASN_X
1065      KM   COMBINE S19CNA, S19.2, AND SBX AT RET BASIN X
1066      KO       3
1067      HC       3
          *

1068      KK    SD41
1069      KM   BLEED 100% OF RET BASIN "X" THROUGH EXISTING 18" STORM DRAIN
1070      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1071      DT    SD42
1072      DI       0   10000
1073      DQ       0   10000
          *

1074      KK  S21CNB
1075      KM   SUB-BASIN S21CNB
1076      KM   S21CNB - SOUTH OF TURNEY AND NORTH OF GRAND CANAL
1077      KM   SUBBASIN CONTRIBUTING TO 21st AVE AND GRAND CANAL
1078      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1079      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1080      KM    L =  .19  Kb = .063  Adj. Slope =   17.0
1081      BA   .025
1082      LG   .250    .170   6.800    .161  45.000
1083      UC   .358    .257
1084      UA      0       5      16      30      65      77      84      90      94      97
1085      UA     100
          *

1086      KK    SD43
1087      KM   REMOVE 18" FLOWS FROM MODEL
1088      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1089      DT    SD44
1090      DI       0     7.4  100000
1091      DQ       0     7.4     7.4
          *
1092      KM   ********************************************************************************
1093      KM   19TH AVENUE BASINS
1094      KM   ********************************************************************************
          *

1095      KK  SB19DU   BASIN
1096      KM   SUB-BASIN SB19DU
1097      KM   SUBBASIN CONTRIBUING TO 19TH AVE AND DUNLAP
1098      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1099      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1100      KM    L =  .33  Kb = .066  Adj. Slope =   26.0
1101      BA   .017
1102      LG   .100    .250   3.500    .278  80.000
1103      UC   .417    .588
1104      UA      0       5      16      30      65      77      84      90      94      97
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1105      UA     100
          *

1106      KK  RT19DU
1107      KM   ROUTE FROM BASIN 19DU TO 19NO (19TH AVE AND NORTHERN)
1108      KM   19TH AVE - DUNLAP TO NORTHERN
1109      RS       6    FLOW       0
1110      RC    .016    .016    .016    5296    .005     4.3
1111      RX    44.9      45      66    66.1     134   134.1     155   155.1
1112      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1113      KK  SB19NO
1114      KM   SUB-BASIN SB19NO
1115      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND NORTHERN
1116      KM   GOLF COURSE AND ITS LAKES RETAINS MOST RUNOFF GENERATED IN THIS BASIN
1117      KM   APPROXIMATELY 23 ACRES ALONG THE EAST SIDE DIRECTLY CONTRIBUTES TO
1118      KM   19TH AVE AND NORTHERN
1119      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1120      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1121      KM     L =  .50  Kb = .032  Adj. Slope =   26.4
1122      BA    .036
1123      LG    .250    .150   9.600    .056  60.000
1124      UC    .346    .435
1125      UA       0       5      16      30      65      77      84      90      94      97
1126      UA     100
          *

1127      KK  19NO.1
1128      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1129      KM   SB19NO, 6 CBS CONTRIBUTING TO 36" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1130      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1131      KM   QTOTAL = 36" SD QFULL = 36.42
1132      KM   SO = 0.003 AND N = 0.013
1133      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1134      DT  19NO.2
1135      DI       0      36   10000
1136      DQ       0      36      36
          *

1137      KK  RE19NO
1138      KM   RETRIEVAL OF FLOW FROM 23RD AVE AND NORTHERN
1139      DR  DI23NO
          *

1140      KK  RD19NO
1141      KM   ROUTE RETRIEVED DIVERT ALONG NORTHERN
1142      KM   ROUTE DIVERT FROM 23RD AND NORTHERN TO 19TH AVE AND NORTHERN
1143      RS       5    FLOW       0
1144      RC    .016    .016    .016    2642    .002     4.3
1145      RX    44.9      45      66    66.1     134   134.1     155   155.1
1146      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1147      KK  CP19NO
1148      KM   COMBINE AT 19TH AVE AND NORTHERN
1149      HC       3
          *

1150      KK  RT19NO
1151      KM   ROUTE 19NO
1152      KM   ROUTE FROM BASIN 19NO TO 19OR
1153      KM   19TH AVE - NORTHERN TO ORANGEWOOD
1154      RS       2    FLOW       0
1155      RC    .016    .016    .016    2640    .004     4.3
1156      RX    44.9      45      66    66.1     134   134.1     155   155.1
1157      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1158      KK  SB19OR
1159      KM   SUB-BASIN SB19OR
1160      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND ORANGEWOOD
1161      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1162      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1163      KM    L =  .70  Kb = .055  Adj. Slope =   20.0
1164      BA    .105
1165      LG    .100    .200   6.400    .142  80.000
1166      UC    .613    .583
1167      UA       0       5      16      30      65      77      84      90      94      97
1168      UA     100
          *

1169      KK  19OR.1
1170      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1171      KM   SB19OR, 10 CBS CONTRIBUTING TO 48" SD AND 42" SD ALONG 19TH AVE AFFECTING FLO
1172      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1173      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1174      KM   QTOTAL = 6(5) = 30
1175      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1176      DT  19OR.2
1177      DI       0      30   10000
1178      DQ       0      30      30
          *

1179      KK  RE19OR
1180      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1181      KM   FROM 21ST AND ORANGWOOD
1182      DR  DI21OR
          *

1183      KK  RD19OR
1184      KM   ROUTE RETRIEVED DIVERT ALONG ORANGEWOOD
1185      KM   ROUTE DIVERT FROM 21ST AND ORANGEWOOD TO 19TH AVE AND ORANGEWOOD
1186      RS       2    FLOW       0
1187      RC    .016    .016    .016    1346    .003     4.3
1188      RX    44.9      45      66    66.1     134   134.1     155   155.1
1189      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1190      KK  CP19OR
1191      KM   COMBINE AT 19TH AVE AND ORANGEWOOD
1192      HC       3
          *

1193      KK  RT19OR
1194      KM   ROUTE 19OR
1195      KM   ROUTE FROM BASIN 19OR TO 19MY
1196      KM   19TH AVE - ORANGEWOOD TO MYRTLE
1197      RS       1    FLOW       0
1198      RC    .016    .016    .016    1340    .004     4.3
1199      RX    44.9      45      66    66.1     134   134.1     155   155.1
1200      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1201      KK  SB19MY
1202      KM   SUB-BASIN SB19MY
1203      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MYRTLE
1204      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1205      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1206      KM     L =  .37  Kb = .060  Adj. Slope =   16.0
1207      BA    .046
1208      LG    .250    .250   3.500    .360  36.000
1209      UC    .529    .477
1210      UA       0       5      16      30      65      77      84      90      94      97
1211      UA     100
          *

1212      KK  19MY.1
1213      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1214      KM   SB19MY, 7 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1215      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1216      KM   QTOTAL = 7(5) = 35
1217      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1218      DT  19MY.2
1219      DI       0      35   10000
1220      DQ       0      35      35
          *

1221      KK  RE19MY
1222      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1223      KM   FROM 21ST AND MYRTLE
1224      DR  DI21MY
          *

1225      KK  RD19MY
1226      KM   ROUTE RETRIEVED DIVERT ALONG MYRTLE
1227      KM   ROUTE DIVERT FROM 21ST AND MYRTLE TO 19TH AVE AND MYRTLE
1228      RS       3    FLOW       0
1229      RC    .016    .016    .016    1318    .001     4.3
1230      RX    44.9      45      66    66.1     134   134.1     155   155.1
1231      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1232      KK  CP19MY
1233      KM   COMBINE AT 19TH AVE AND MYRTLE
1234      HC       3
          *

1235      KK  RT19MY
1236      KM   ROUTE 19MY
1237      KM   ROUTE FROM BASIN 19MY TO 19GL
1238      KM   19TH AVE - MYRTLE TO GLENDALE
1239      RS       2    FLOW       0
1240      RC    .016    .016    .016    1320    .002     4.3
1241      RX    44.9      45      66    66.1     134   134.1     155   155.1
1242      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1243      KK  SB19GL
1244      KM   SUB-BASIN SB19GL
1245      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND GLENDALE
1246      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1247      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1248      KM     L =  .40  Kb = .059  Adj. Slope =   10.0
1249      BA    .054
1250      LG    .170    .250   3.500    .316  61.000
1251      UC    .617    .549
1252      UA       0       5      16      30      65      77      84      90      94      97
1253      UA     100
          *

1254      KK  19GL.1
1255      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1256      KM   SB19GL, 3 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1257      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1258      KM   QTOTAL = 3(5) = 15
1259      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1260      DT  19GL.2
1261      DI       0      15   10000
1262      DQ       0      15      15
          *

1263      KK  RE19GL
1264      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1265      KM   FROM 21ST AND GLENDALE
1266      DR  DI21GL
          *

1267      KK  RD19GL
1268      KM   ROUTE RETRIEVED DIVERT ALONG GLENDALE
1269      KM   ROUTE DIVERT FROM 21ST AND GLENDALE TO 19TH AVE AND GLENDALE
1270      RS       3    FLOW       0
1271      RC    .016    .016    .016    1318    .001     4.3
1272      RX    44.9      45      66    66.1     134   134.1     155   155.1
1273      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1274      KK  CP19GL
1275      KM   COMBINE AT 19TH AVE AND GLENDALE
1276      HC       3
          *

1277      KK  RT19GL
1278      KM   ROUTE 19GL
1279      KM   ROUTE FROM BASIN 19GL TO 19MA
1280      KM   19TH AVE - GLENDALE TO MARYLAND
1281      RS       1    FLOW       0
1282      RC    .016    .016    .016    2639    .005     4.3
1283      RX    44.9      45      66    66.1     134   134.1     155   155.1
1284      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1285      KK  SB19MA
1286      KM   SUB-BASIN SB19MA
1287      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MARYLAND
1288      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1289      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1290      KM     L =  .50  Kb = .059  Adj. Slope =   28.0
1291      BA    .054
1292      LG    .190    .250   4.900    .324  60.000
1293      UC    .492    .510
1294      UA       0       5      16      30      65      77      84      90      94      97
1295      UA     100
          *

1296      KK  19MA.1
1297      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1298      KM   SB19MA, 7 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1299      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1300      KM   QTOTAL = 7(5) = 35
1301      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1302      DT  19MA.2
1303      DI       0      35   10000
1304      DQ       0      35      35
          *

1305      KK  CP19MA
1306      KM   COMBINE AT 19TH AVE AND MARYLAND
1307      HC       2
          *

1308      KK  RT19MA
1309      KM   ROUTE 19MA
1310      KM   ROUTE FROM BASIN 19MA TO 19BE
1311      KM   19TH AVE - MARYLAND TO BETHANY HOME
1312      RS       2    FLOW       0
1313      RC    .016    .016    .016    2659    .004     4.3
1314      RX    44.9      45      66    66.1     134   134.1     155   155.1
1315      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1316      KK  SB19BE
1317      KM   SUB-BASIN SB19BE
1318      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND BETHANY HOME
1319      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1320      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1321      KM     L =  .50  Kb = .058  Adj. Slope =   20.0
1322      BA    .057
1323      LG    .190    .250   4.900    .324  56.000
1324      UC    .554    .565
1325      UA       0       5      16      30      65      77      84      90      94      97
1326      UA     100
          *

1327      KK  19BE.1
1328      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1329      KM   SB19BE, 6 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1330      KM   REMOVE CAPACITY OF CBs. ASSUME CAPACITY EQUAL TO 5 CFS PER BASIN
1331      KM   QTOTAL = 6(5) = 30
1332      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1333      DT  19BE.2
1334      DI       0      30   10000
1335      DQ       0      30      30
          *

1336      KK  CP19BE
1337      KM   COMBINE AT 19TH AVE AND BETHANY HOME
1338      HC       2
          *

1339      KK  RT19BE
1340      KM   ROUTE 19BE
1341      KM   ROUTE FROM BASIN 19BE TO 19MI
1342      KM   19TH AVE - BETHANY HOME TO MISSOURI
1343      RS       2    FLOW       0
1344      RC    .016    .016    .016    2623    .004     4.3
1345      RX    44.9      45      66    66.1     134   134.1     155   155.1
1346      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1347      KK  SB19MI
1348      KM   SUB-BASIN SB19MI
1349      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND MISSOURI
1350      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1351      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1352      KM     L =  .50  Kb = .057  Adj. Slope =   20.0
1353      BA    .076
1354      LG    .220    .250   4.900    .344  41.000
1355      UC    .567    .491
1356      UA       0       5      16      30      65      77      84      90      94      97
1357      UA     100
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1358      KK  19MI.1
1359      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1360      KM   SB19MI, 14 CBS CONTRIBUTING TO 48" SD ALONG19TH AVE AFFECTING FLOWS AT CP
1361      KM   REMOVE CAPACITY OF SD. ASSUME QFULL CONDITIONS. QFULL = 78.5 CFS
1362      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1363      DT  19MI.2
1364      DI       0      79   10000
1365      DQ       0      79      79
          *

1366      KK  CP19MI
1367      KM   COMBINE AT 19TH AVE AND MISSOURI
1368      HC       2
          *

1369      KK  RT19MI
1370      KM   19TH AVE - MISSOURI TO CAMELBACK
1371      KM   ROUTE 19MI
1372      KM   ROUTE FROM BASIN 19MI TO 19CA
1373      RS       2    FLOW       0
1374      RC    .016    .016    .016    2639    .003     4.3
1375      RX    44.9      45      66    66.1     134   134.1     155   155.1
1376      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1377      KK  SB19CA
1378      KM   SUB-BASIN SB19CA
1379      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND CAMELBACK
1380      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1381      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1382      KM     L =  .50  Kb = .070  Adj. Slope =   16.0
1383      BA    .009
1384      LG    .100    .150   8.100    .075  80.000
1385      UC    .629   1.862
1386      UA       0       5      16      30      65      77      84      90      94      97
1387      UA     100
          *

1388      KK  19CA.1
1389      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1390      KM   SB19CA, 5 CBS CONTRIBUTING TO 18" SD ALONG VERMONT AND
1391      KM   12 CBS CONTRIBUTING TO 48" SD ALONG 19TH AVE AFFECTING FLOWS AT CP
1392      KM   REMOVE CAPACITY OF CBs. ASSUME CAPCITY OF 5 CFS PER BASIN
1393      KM   TOTAL Q TAKEN OUT = 5(5) = 25 CFS
1394      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1395      DT  19CA.2
1396      DI       0      25   10000
1397      DQ       0      25      25
          *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1398      KK  CP19CA
1399      KM   COMBINE AT 19TH AVE AND CAMELBACK
1400      HC       2
          *

1401      KK  RT19CA
1402      KM   ROUTE 19CA
1403      KM   ROUTE FROM BASIN 19CA TO 19CP
1404      KM   19TH AVE - CAMELBACK TO CAMPBELL
1405      RS       2    FLOW       0
1406      RC    .016    .016    .016    2670    .005     4.3
1407      RX    44.9      45      66    66.1     134   134.1     155   155.1
1408      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1409      KK  SB19CP
1410      KM   SUB-BASIN SB19CP
1411      KM   SUBBASIN CONTRIBUTING TO 19TH AVE AND CAMPBELL
1412      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1413      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1414      KM    L =  .51  Kb = .058  Adj. Slope =   25.0
1415      BA    .057
1416      LG    .210    .150   7.900    .100  50.000
1417      UC    .496    .507
1418      UA       0       5      16      30      65      77      84      90      94      97
1419      UA     100
          *

1420      KK  19CP.1
1421      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1422      KM   SB19CP, 6 CBs IN SUBBASIN,CONTRIBUTING TO 54" SD ALONG 19TH AVE
1423      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 54" LINE. ASSUME 5 CFS PER CATCH BASIN.
1424      KM   TOTAL Q TAKEN OUT = 6(5) = 30
1425      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1426      DT  19CP.2
1427      DI       0      30   10000
1428      DQ       0      30      30
          *

1429      KK  RE19CP
1430      KM   RETRIEVAL OF STREET CAPACITY DIVERSION
1431      KM   FROM 21ST AND CAMPBELL
1432      DR  DI21CP
          *

1433      KK  RD19CP
1434      KM   ROUTE DIVERT FROM CP21CP TO CP19CP ALONG CAMPBELL
1435      KM   ROUTE FROM 21st AVE AND CAMPBELL TO 19TH AVE AND CAMPBELL
1436      RS       4    FLOW       0
1437      RC    .016    .016    .016    1310    .002     4.3
1438      RX    44.9      45      66    66.1     134   134.1     155   155.1
1439      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *
```
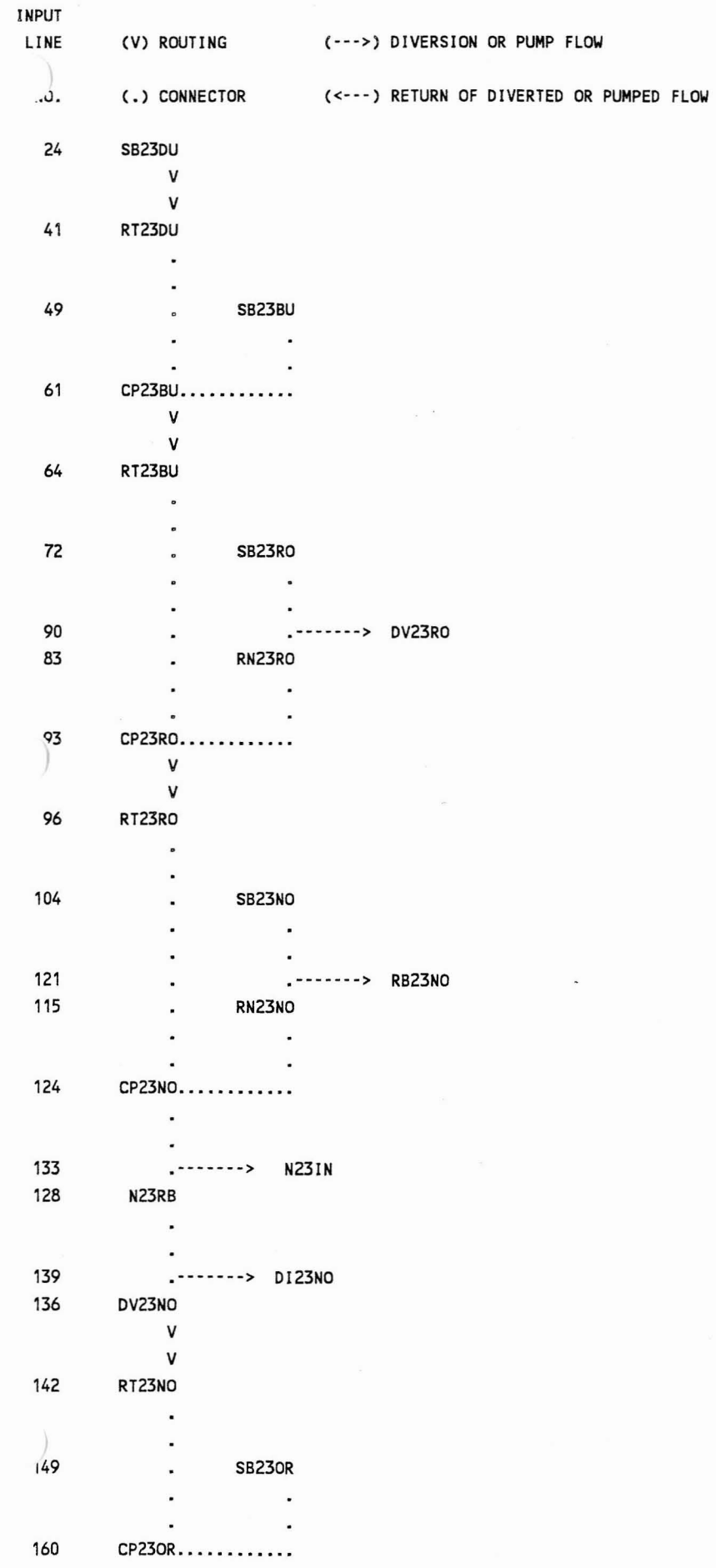
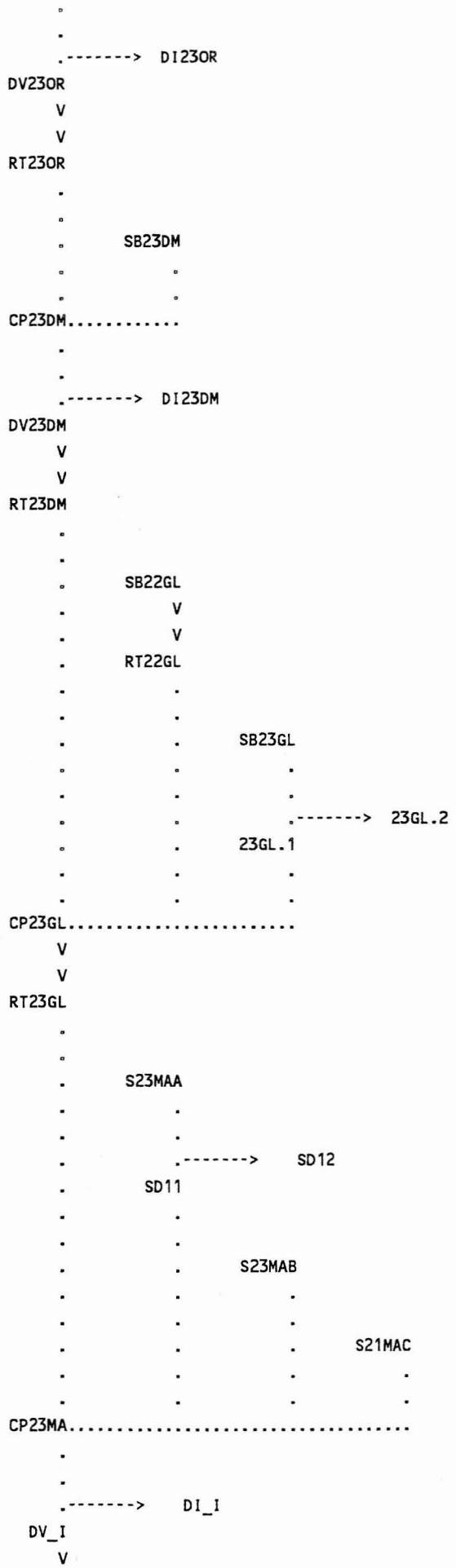

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1440      KK  CP19CP
1441      KM   COMBINE AT 19TH AVE AND CAMPBELL
1442      HC       3
          *

1443      KK  RT19CP
1444      KM   19TH AVE - CAMPBELL TO GRAND CANAL
1445      KM   ROUTE 19CP
1446      KM   ROUTE FROM BASIN 19CP TO 19CN
1447      RS       3    FLOW       0
1448      RC    .016    .016    .016     900    .001     4.3
1449      RX    44.9      45      66    66.1     134   134.1     155   155.1
1450      RY     4.3     0.3     0.3      00      00     0.3      .3     4.3
          *

1451      KK  S19CNB
1452      KM   SUB-BASIN S19CNB
1453      KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
1454      KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
1455      KM     L =  .26  Kb = .066  Adj. Slope =    2.0
1456      BA    .016
1457      LG    .250    .150   8.200    .071  41.000
1458      UC    .908   1.195
1459      UA       0       5      16      30      65      77      84      90      94      97
1460      UA     100
          *

1461      KK  19CN.1
1462      KM   REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
1463      KM   S19CNB, 7 CBs IN SUBBASIN, 1-15" SD ALONG S. TURNEY, 1-18" ALONG N. TURNEY
1464      KM   AND 1-54" ALONG 19TH AVE. 24"QFULL = 12.33 AND 18"QFULL = 5.72 CFS
1465      KM   SO = 0.003 AND N =0.13
1466      KM   3 CBs CONTRIBUTE TO 24" SD AND 2 TO THE 18" SD AND 54" SD AFFECTING FLOW AT C
1467      KM   REMOVE CAPACITY OF CATCH BASINS ALONG 54" LINE. ASSUME 5 CFS PER CATCH BASIN.
1468      KM   REMOVE PIPE CAPACITY OF STORM DRAINS.
1469      KM   TOTAL Q TAKEN OUT = 12.33+5.72+3(5) = 33.05
1470      KM   THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
1471      DT  19CN.2
1472      DI       0      33   10000
1473      DQ       0      33      33
          *

1474      KK  CP19CN
1475      KM   COMBINE AT 19TH AVE AND GRAND CANAL
1476      HC       2
          *
          *
1477      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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202
SB22GL
213
RT22GL
219
SB23GL
235
23GL.2
230
23GL.1
238
CP23GL
241
RT23GL
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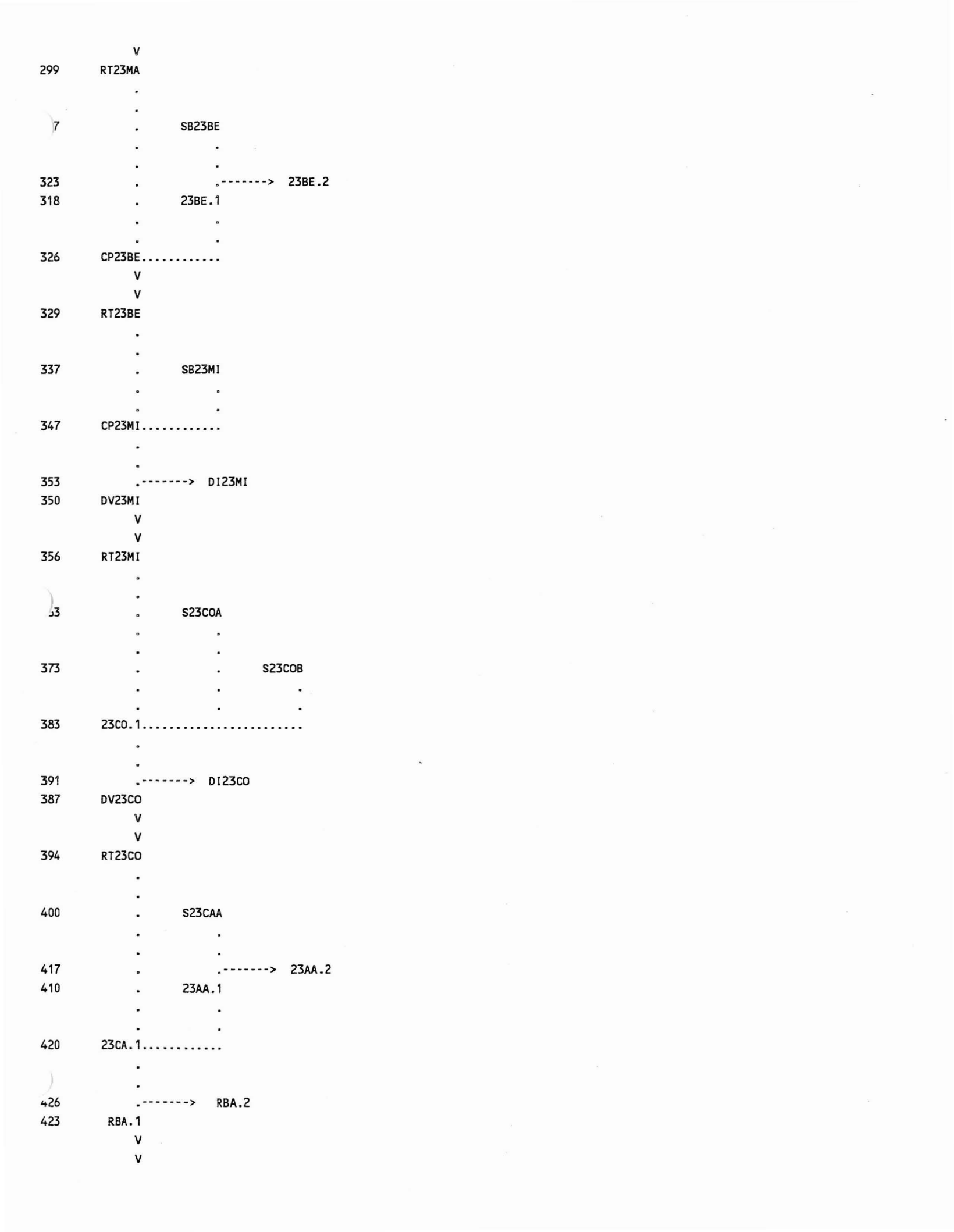
DV_I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350 DV23MI
V
V
356 RT23MI
S23COA
373 S23COB
383 23CO.1
391 DI23CO
387 DV23CO
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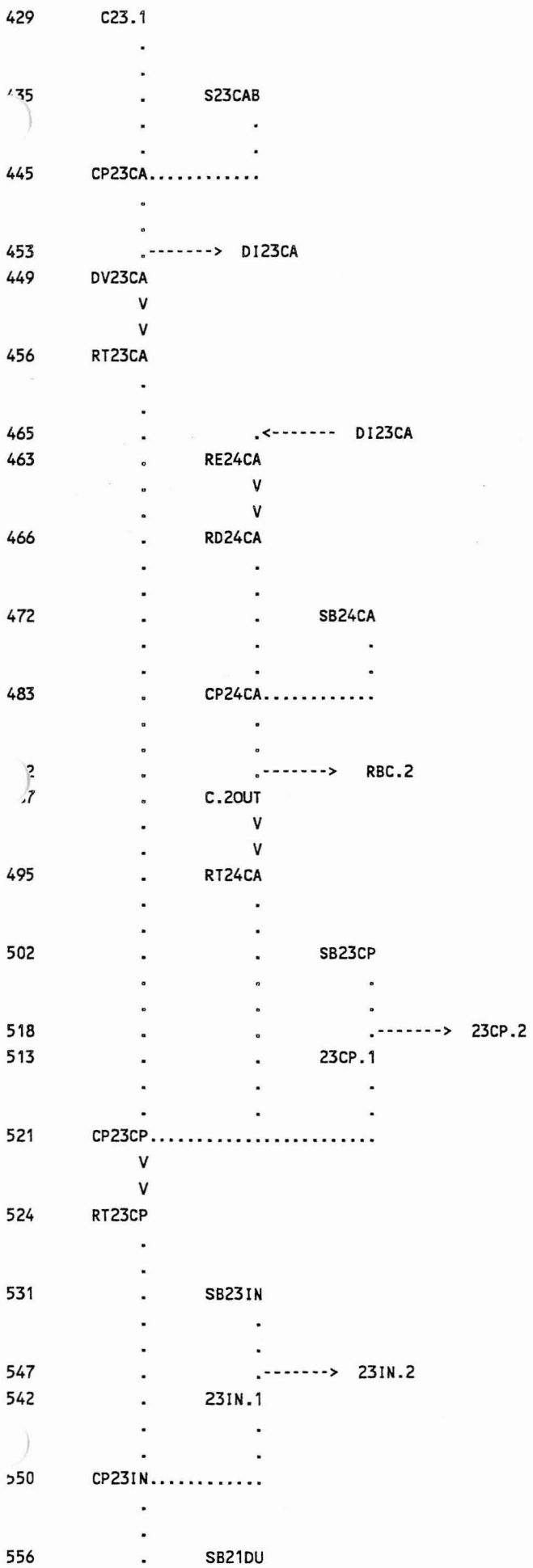
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C.2OUT
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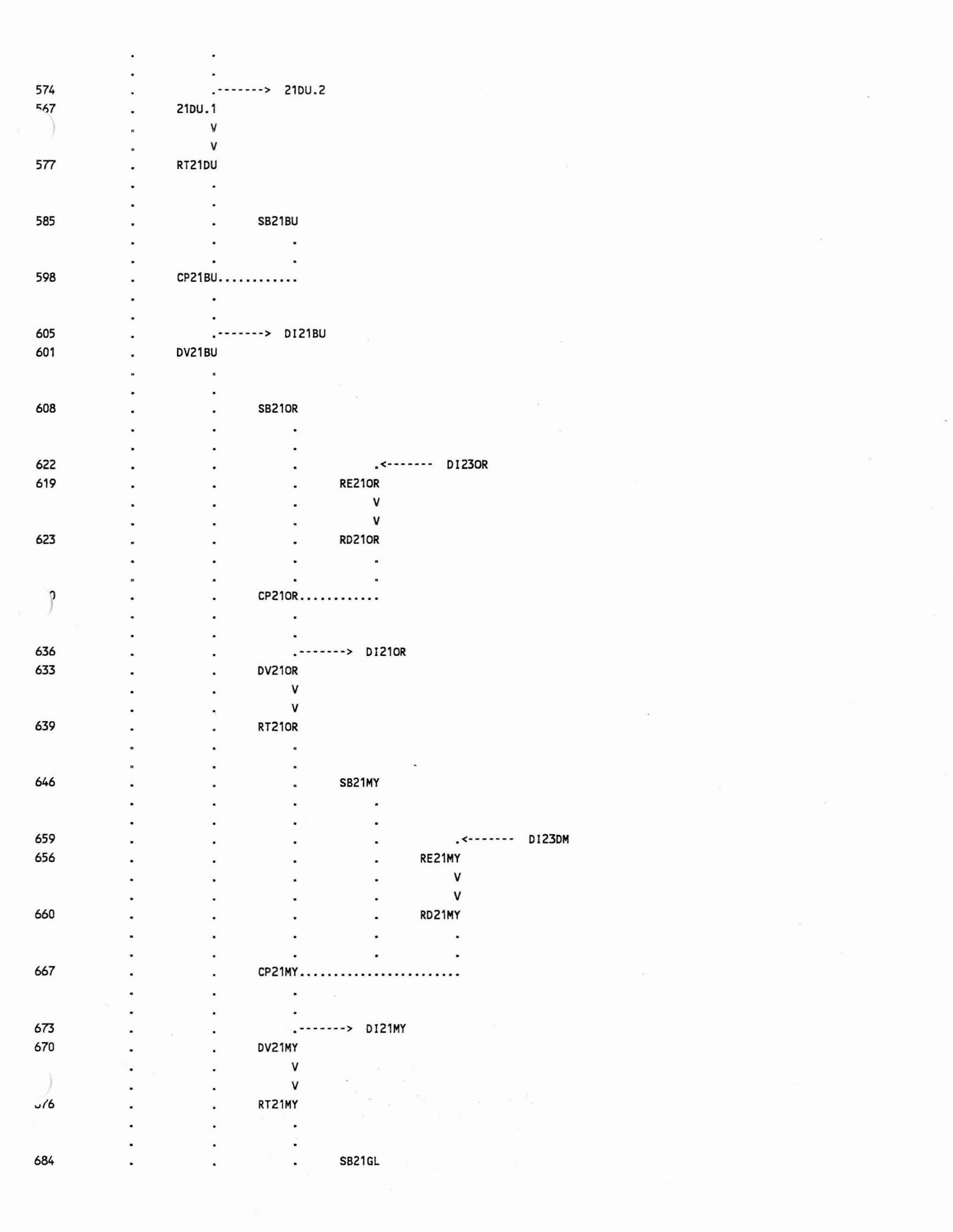
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622
DI23OR
619
RE21OR
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RD21OR
CP21OR
636
DI21OR
633
DV21OR
639
RT21OR
646
SB21MY
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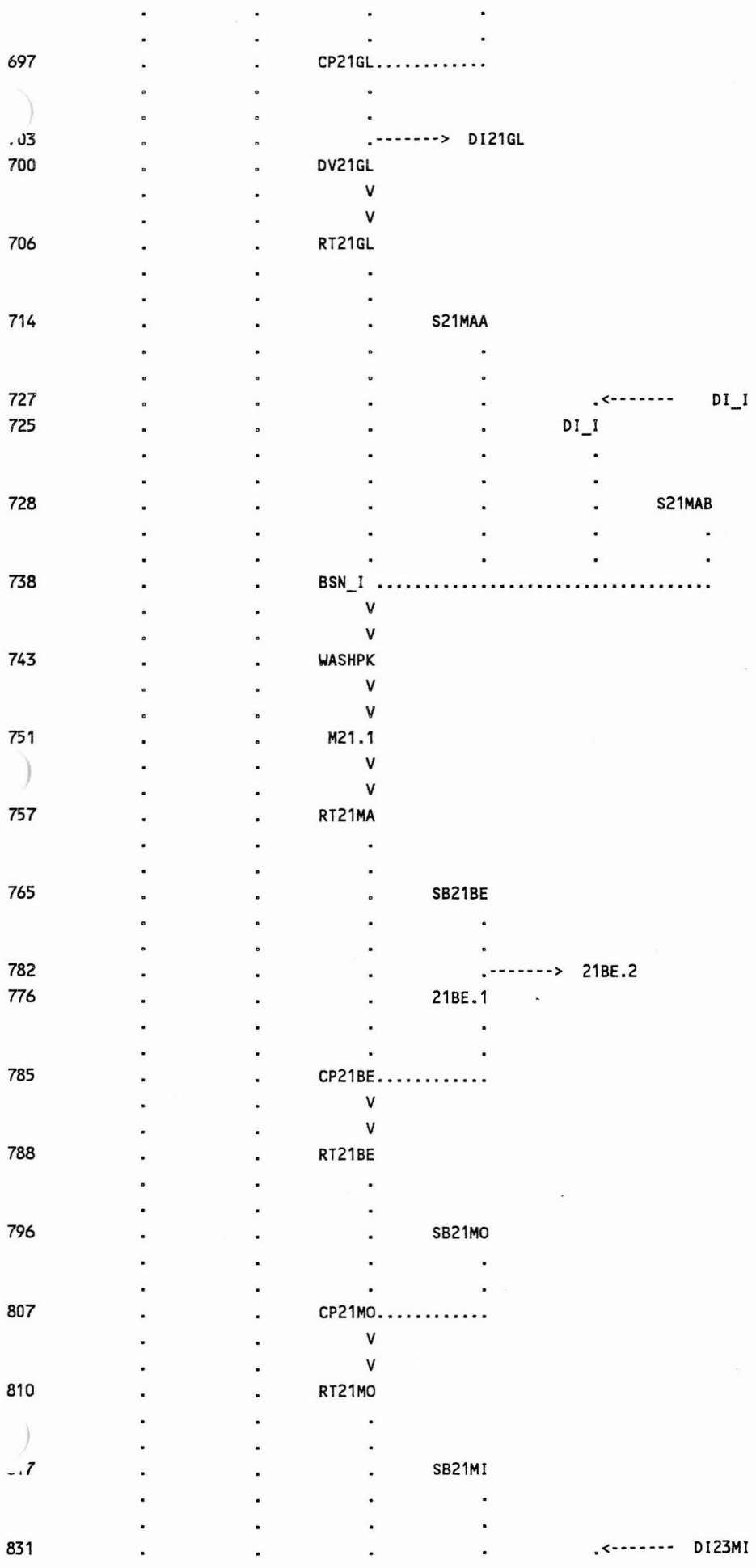
SB21GL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751 M21.1
757 RT21MA
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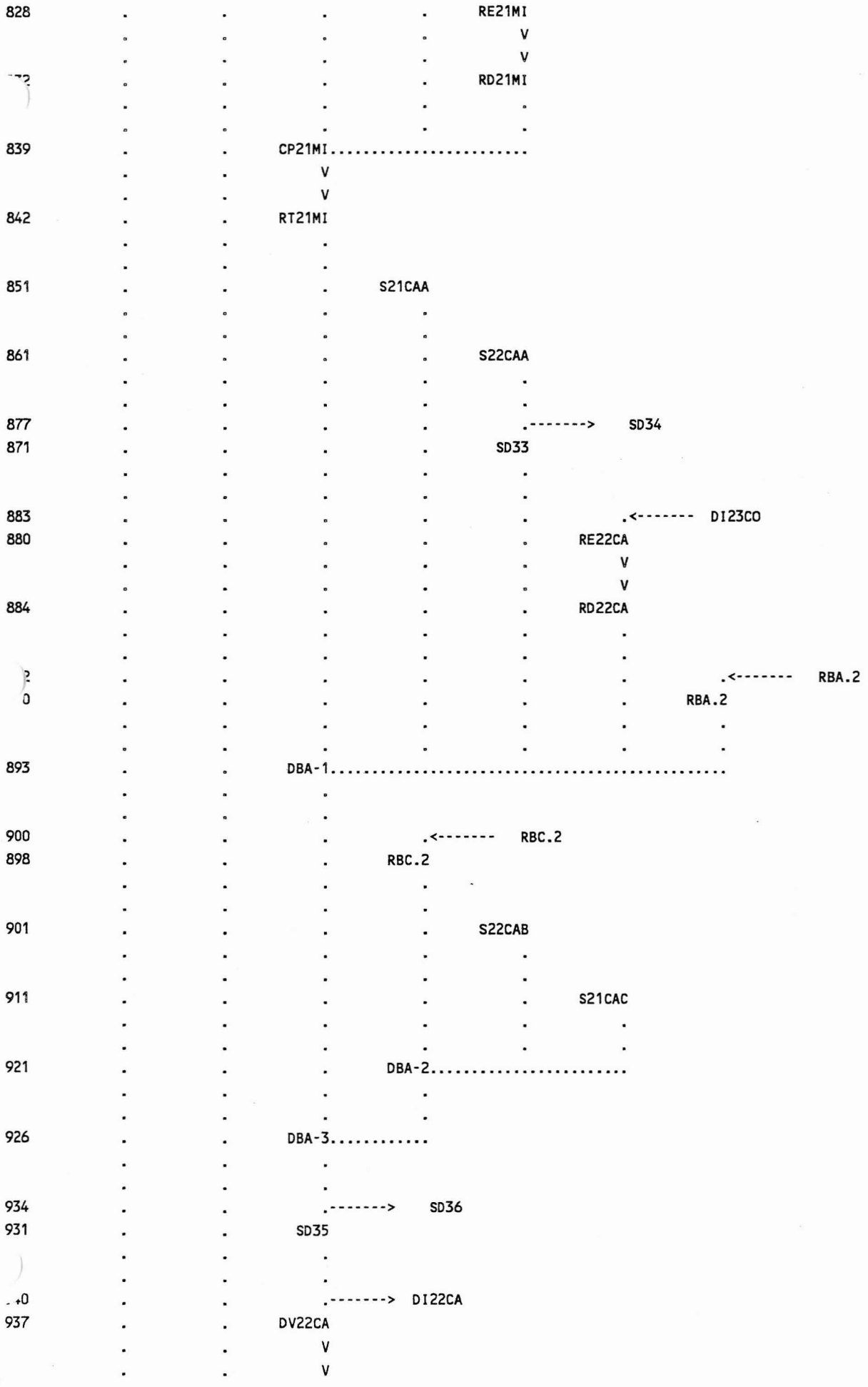
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884 RD22CA
RBA.2
RBA.2
893 DBA-1
900 RBC.2
898 RBC.2
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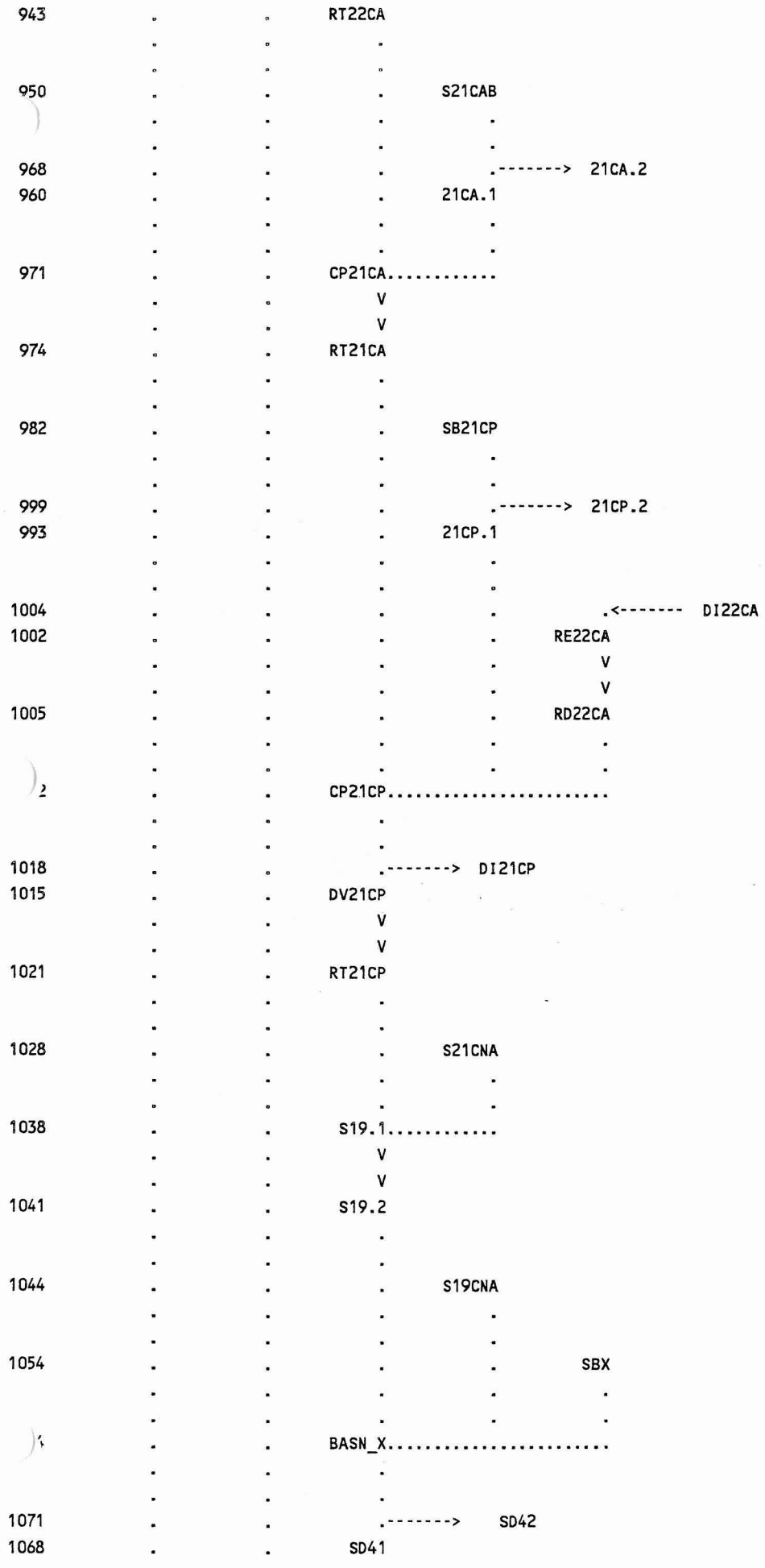
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1005 RD22CA
CP21CP
1018 DI21CP
1015 DV21CP
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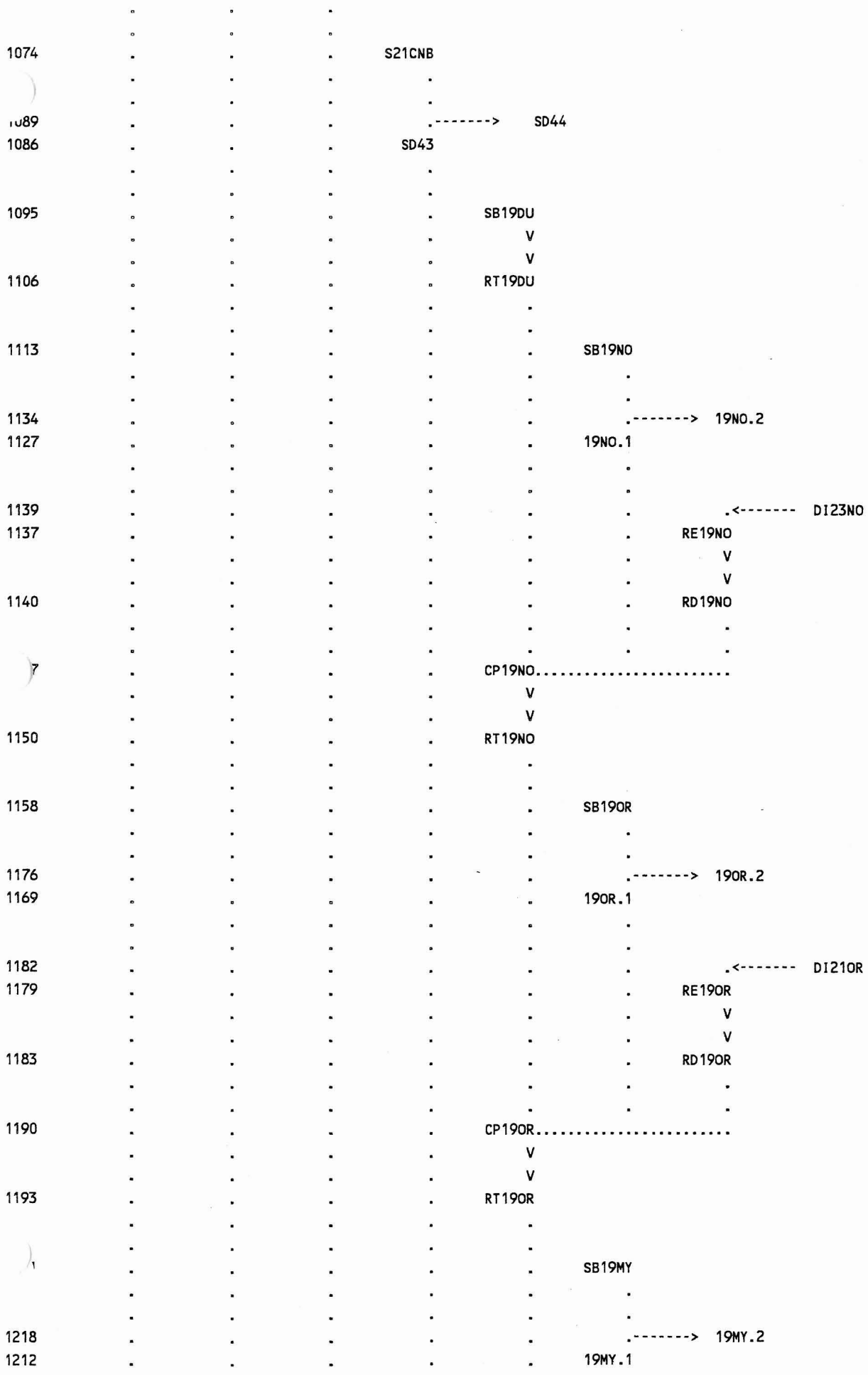
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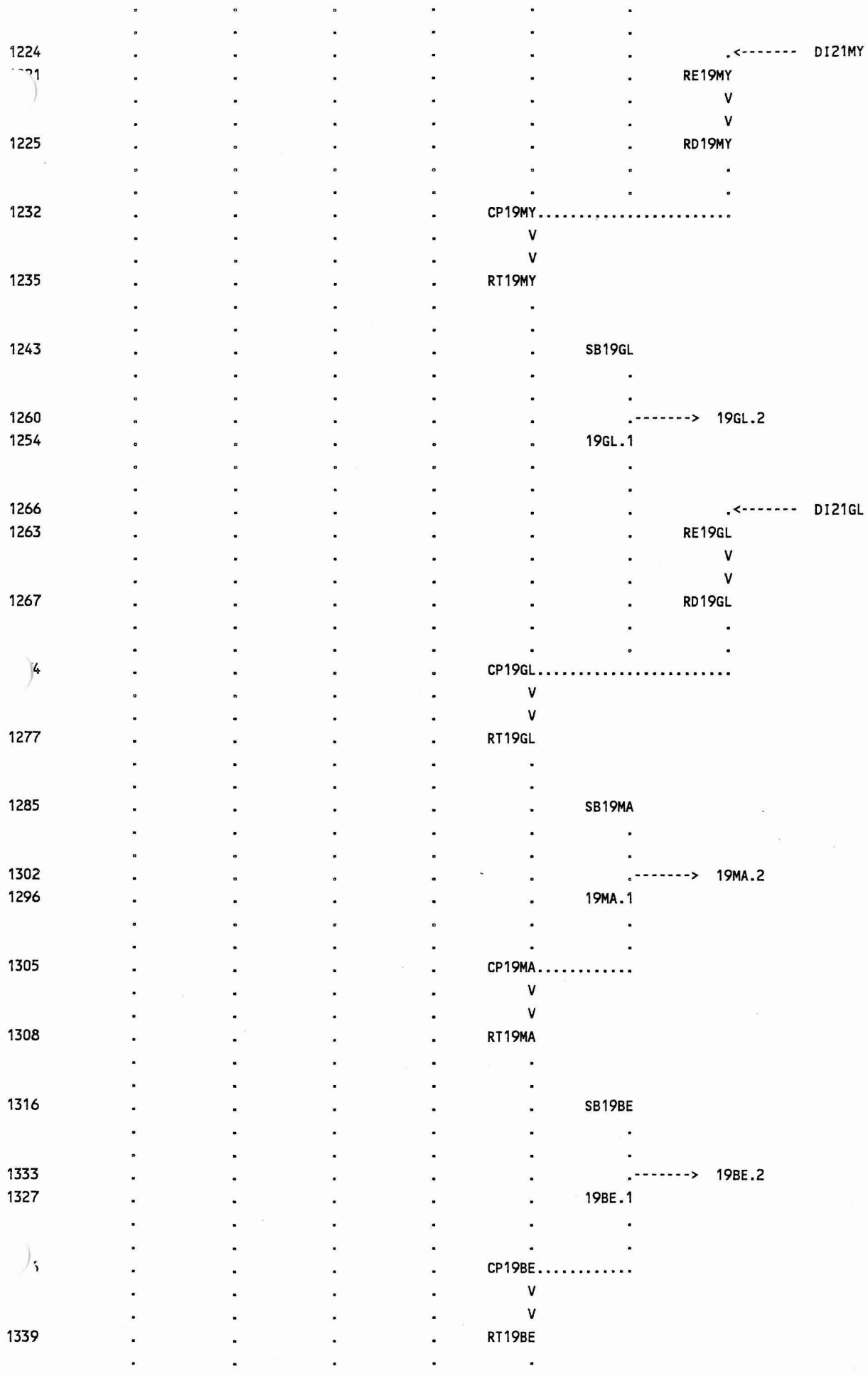
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1327
1339
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RE19MY
V
V
RD19MY
CP19MY.....
V
V
RT19MY
SB19GL
.-------> 19GL.2
19GL.1
.<------- DI21GL
RE19GL
V
V
RD19GL
CP19GL.....
V
V
RT19GL
SB19MA
.-------> 19MA.2
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RT19MA
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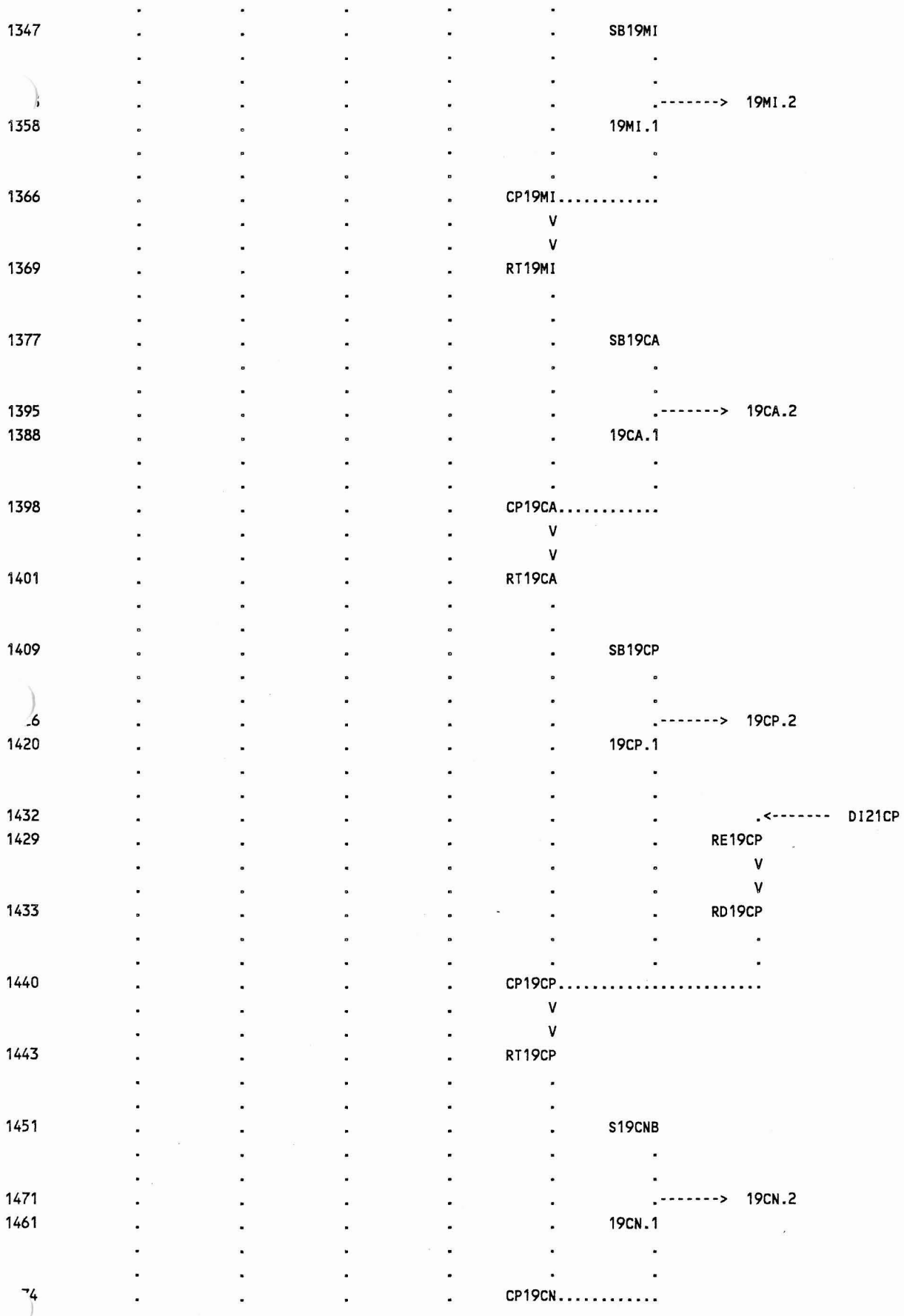
V
RT19BE



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN 09 1992               *
*           VERSION 4.0.3E              *
*                                       *
*  RUN DATE  09/17/03  TIME  17:34:31   *
*                                       *
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*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
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     24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
     PHOENIX, ARIZONA
     MODELED BY PREMIER ENGINEERING
     MARCH 2003, REVISED AUGUST 2003

     PHASE 3, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
              NEW RETENTION BASIN AT WASHINGTON PARK FOR OPTIMAL INFLOW VOLUME
              NEW RETENTION BASIN AT 23rd AVE & NORTHERN AVE
     100-YEAR 6 HOUR STORM


     FILE NAME: P3-100-D.6I
     ************************************************************

     Project ID: 24TH & CAMELBACK

19 IO        OUTPUT CONTROL VARIABLES
               IPRNT          5  PRINT CONTROL
               IPLOT          0  PLOT CONTROL
               QSCAL         0.  HYDROGRAPH PLOT SCALE
                  ************************************************
                  FLOWS ALONG 23RD AVE
                  ************************************************


  IT         HYDROGRAPH TIME DATA
               NMIN           2  MINUTES IN COMPUTATION INTERVAL
               IDATE      1   0  STARTING DATE
               ITIME        0000  STARTING TIME
                  NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
              NDDATE      3   0  ENDING DATE
              NDTIME        1838  ENDING TIME
              ICENT           19  CENTURY MARK

        COMPUTATION INTERVAL    0.03 HOURS
             TOTAL TIME BASE   66.63 HOURS

   ENGLISH UNITS
        DRAINAGE AREA         SQUARE MILES
        PRECIPITATION DEPTH   INCHES
        LENGTH, ELEVATION     FEET
        FLOW                  CUBIC FEET PER SECOND
        STORAGE VOLUME        ACRE-FEET
        SURFACE AREA          ACRES
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	267.	4.10	48.	12.	4.	0.18		
ROUTED TO	RT23DU	265.	4.17	48.	12.	4.	0.18	0.93	4.17
HYDROGRAPH AT	SB23BU	263.	4.17	46.	12.	4.	0.22		
2 COMBINED AT	CP23BU	528.	4.17	94.	24.	9.	0.40		
ROUTED TO	RT23BU	526.	4.20	94.	24.	9.	0.40	1.43	4.20
HYDROGRAPH AT	SB23RO	134.	4.17	27.	7.	2.	0.10		
DIVERSION TO	DV23RO	119.	4.17	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	134.	4.17	17.	4.	2.	0.10		
2 COMBINED AT	CP23RO	658.	4.20	111.	28.	10.	0.50		
ROUTED TO	RT23RO	657.	4.23	111.	28.	10.	0.50	2.39	4.23
HYDROGRAPH AT	SB23NO	67.	4.10	12.	3.	1.	0.04		
DIVERSION TO	RB23NO	53.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	67.	4.10	8.	2.	1.	0.04		
2 COMBINED AT	CP23NO	715.	4.20	119.	30.	11.	0.55		
DIVERSION TO	N23IN	114.	4.20	50.	13.	5.	0.55		
HYDROGRAPH AT	N23RB	601.	4.20	69.	17.	6.	0.55		
DIVERSION TO	DI23NO	373.	4.20	45.	11.	4.	0.55		
HYDROGRAPH AT	DV23NO	229.	4.20	24.	6.	2.	0.55		
ROUTED TO	RT23NO	227.	4.30	24.	6.	2.	0.55	0.86	4.30
HYDROGRAPH AT	SB23OR	146.	4.20	29.	7.	3.	0.12		
2 COMBINED AT	CP23OR	369.	4.30	54.	13.	5.	0.67		
DIVERSION TO	DI23OR	92.	4.30	13.	3.	1.	0.67		
HYDROGRAPH AT	DV23OR	277.	4.30	40.	10.	4.	0.67		
ROUTED TO	RT23OR	276.	4.33	40.	10.	4.	0.67	0.95	4.33
HYDROGRAPH AT	SB23DM	75.	4.10	13.	3.	1.	0.06		
2 COMBINED AT	CP23DM	340.	4.30	53.	13.	5.	0.73		

DIVERSION TO	DI23DM	170.	4.30	27.	7.	2.	0.73		
HYDROGRAPH AT	DV23DM	170.	4.30	27.	7.	2.	0.73		
ROUTED TO	RT23DM	168.	4.37	27.	7.	2.	0.73	0.84	4.37
HYDROGRAPH AT	SB22GL	21.	4.30	5.	1.	0.	0.03		
ROUTED TO	RT22GL	21.	4.43	5.	1.	0.	0.03	0.25	4.43
HYDROGRAPH AT	SB23GL	74.	4.13	13.	3.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.13	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	66.	4.13	9.	2.	1.	0.06		
3 COMBINED AT	CP23GL	241.	4.37	40.	10.	4.	0.81		
ROUTED TO	RT23GL	235.	4.50	40.	10.	4.	0.81	0.60	4.50
HYDROGRAPH AT	S23MAA	111.	4.23	22.	6.	2.	0.11		
DIVERSION TO	SD12	10.	4.23	6.	2.	1.	0.11		
HYDROGRAPH AT	SD11	101.	4.23	16.	4.	1.	0.11		
HYDROGRAPH AT	S23MAB	26.	4.27	6.	1.	1.	0.03		
HYDROGRAPH AT	S21MAC	12.	4.20	1.	0.	0.	0.02		
4 COMBINED AT	CP23MA	355.	4.43	63.	16.	6.	0.96		
DIVERSION TO	DI_I	355.	0.00	63.	16.	6.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	5.67
HYDROGRAPH AT	SB23BE	109.	4.27	22.	6.	2.	0.12		
DIVERSION TO	23BE.2	22.	4.27	10.	3.	1.	0.12		
HYDROGRAPH AT	23BE.1	87.	4.27	12.	3.	1.	0.12		
2 COMBINED AT	CP23BE	87.	4.27	12.	3.	1.	1.08		
ROUTED TO	RT23BE	85.	4.47	12.	3.	1.	1.08	0.67	4.47
HYDROGRAPH AT	SB23MI	80.	4.47	21.	5.	2.	0.12		
2 COMBINED AT	CP23MI	166.	4.47	33.	8.	3.	1.20		
DIVERSION TO	DI23MI	66.	4.47	13.	3.	1.	1.20		
HYDROGRAPH AT	DV23MI	99.	4.47	20.	5.	2.	1.20		
ROUTED TO	RT23MI	98.	4.57	20.	5.	2.	1.20	0.65	4.57
HYDROGRAPH AT	S23COA	9.	4.33	2.	1.	0.	0.01		

HYDROGRAPH AT	S23COB	42.	4.40	11.	3.	1.	0.05		
3 COMBINED AT	23CO.1	147.	4.50	34.	9.	3.	1.26		
DIVERSION TO	DI23CO	74.	4.50	17.	4.	2.	1.26		
HYDROGRAPH AT	DV23CO	74.	4.50	17.	4.	2.	1.26		
ROUTED TO	RT23CO	73.	4.57	17.	4.	2.	1.26	0.56	4.57
HYDROGRAPH AT	S23CAA	9.	4.23	2.	1.	0.	0.01		
DIVERSION TO	23AA.2	9.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	73.	4.57	17.	4.	2.	1.27		
DIVERSION TO	RBA.2	73.	0.00	17.	4.	2.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	2.27
HYDROGRAPH AT	S23CAB	4.	4.07	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	4.	4.07	1.	0.	0.	1.27		
DIVERSION TO	DI23CA	4.	0.00	1.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	4.97
HYDROGRAPH AT	RE24CA	4.	4.07	1.	0.	0.	0.00		
ROUTED TO	RD24CA	4.	4.20	1.	0.	0.	0.00	0.05	4.20
HYDROGRAPH AT	SB24CA	53.	4.27	12.	3.	1.	0.05		
2 COMBINED AT	CP24CA	57.	4.23	13.	3.	1.	0.05		
DIVERSION TO	RBC.2	57.	0.00	13.	3.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.30
HYDROGRAPH AT	SB23CP	205.	4.17	40.	10.	4.	0.16		
DIVERSION TO	23CP.2	4.	4.17	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	201.	4.17	36.	9.	3.	0.16		
3 COMBINED AT	CP23CP	201.	4.17	36.	9.	3.	1.48		
ROUTED TO	RT23CP	198.	4.27	36.	9.	3.	1.48	0.92	4.27
HYDROGRAPH AT	SB23IN	215.	4.20	43.	11.	4.	0.17		

DIVERSION TO	23IN.2	4.	4.20	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	211.	4.20	39.	10.	4.	0.17		
2 COMBINED AT	CP23IN	406.	4.27	75.	19.	7.	1.65		
HYDROGRAPH AT	SB21DU	77.	4.37	19.	5.	2.	0.09		
DIVERSION TO	21DU.2	13.	4.37	8.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	64.	4.37	11.	3.	1.	0.09		
ROUTED TO	RT21DU	64.	4.50	11.	3.	1.	0.09	0.47	4.50
HYDROGRAPH AT	SB21BU	139.	4.20	27.	7.	2.	0.13		
2 COMBINED AT	CP21BU	188.	4.40	38.	9.	3.	0.22		
DIVERSION TO	DI21BU	188.	0.00	38.	9.	3.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	138.	4.20	28.	7.	2.	0.13		
HYDROGRAPH AT	RE21OR	92.	4.30	13.	3.	1.	0.00		
ROUTED TO	RD21OR	89.	4.43	13.	3.	1.	0.00	0.47	4.43
2 COMBINED AT	CP21OR	219.	4.37	41.	10.	4.	0.13		
DIVERSION TO	DI21OR	109.	4.37	20.	5.	2.	0.13		
HYDROGRAPH AT	DV21OR	109.	4.37	20.	5.	2.	0.13		
ROUTED TO	RT21OR	109.	4.43	20.	5.	2.	0.13	0.74	4.43
HYDROGRAPH AT	SB21MY	59.	4.37	14.	3.	1.	0.07		
HYDROGRAPH AT	RE21MY	170.	4.30	27.	7.	2.	0.00		
ROUTED TO	RD21MY	168.	4.43	27.	7.	2.	0.00	0.78	4.43
3 COMBINED AT	CP21MY	335.	4.43	61.	15.	5.	0.19		
DIVERSION TO	DI21MY	168.	4.43	30.	8.	3.	0.19		
HYDROGRAPH AT	DV21MY	168.	4.43	30.	8.	3.	0.19		
ROUTED TO	RT21MY	167.	4.47	30.	8.	3.	0.19	0.85	4.47
HYDROGRAPH AT	SB21GL	40.	4.23	8.	2.	1.	0.04		
2 COMBINED AT	CP21GL	202.	4.47	38.	10.	3.	0.23		
DIVERSION TO	DI21GL	172.	4.47	35.	9.	3.	0.23		
HYDROGRAPH AT	DV21GL	30.	4.47	3.	1.	0.	0.23		
ROUTED TO	RT21GL	28.	4.67	3.	1.	0.	0.23	0.33	4.67

HYDROGRAPH AT	S21MAA	151.	4.07	24.	6.	2.	0.11		
HYDROGRAPH AT	DI_I	355.	4.43	63.	16.	6.	0.00		
HYDROGRAPH AT	S21MAB	50.	4.07	7.	2.	1.	0.04		
4 COMBINED AT	BSN_I	472.	4.37	96.	24.	9.	0.38		
ROUTED TO	WASHPK	45.	5.63	17.	5.	2.	0.38	4.02	5.63
ROUTED TO	M21.1	45.	5.67	17.	5.	2.	0.38	0.43	5.67
ROUTED TO	RT21MA	45.	5.83	17.	5.	2.	0.38	0.46	5.83
HYDROGRAPH AT	SB21BE	203.	4.20	38.	10.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.20	6.	2.	1.	0.18		
HYDROGRAPH AT	21BE.1	197.	4.20	32.	8.	3.	0.18		
2 COMBINED AT	CP21BE	197.	4.20	47.	13.	5.	0.57		
ROUTED TO	RT21BE	196.	4.23	47.	13.	5.	0.57	0.87	4.23
HYDROGRAPH AT	SB21MO	40.	4.53	12.	3.	1.	0.07		
2 COMBINED AT	CP21MO	230.	4.27	59.	16.	6.	0.64		
ROUTED TO	RT21MO	229.	4.33	59.	16.	6.	0.64	1.08	4.33
HYDROGRAPH AT	SB21MI	67.	4.37	15.	4.	1.	0.09		
HYDROGRAPH AT	RE21MI	66.	4.47	13.	3.	1.	0.00		
ROUTED TO	RD21MI	65.	4.60	13.	3.	1.	0.00	0.39	4.60
3 COMBINED AT	CP21MI	349.	4.40	86.	23.	8.	0.72		
ROUTED TO	RT21MI	347.	4.50	86.	23.	8.	0.72	1.36	4.50
HYDROGRAPH AT	S21CAA	42.	4.37	11.	3.	1.	0.05		
HYDROGRAPH AT	S22CAA	42.	4.33	10.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.33	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	32.	4.33	5.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	74.	4.50	17.	4.	2.	0.00		
ROUTED TO	RD22CA	66.	4.87	17.	4.	2.	0.00	0.39	4.87
HYDROGRAPH AT	RBA.2	73.	4.57	17.	4.	2.	0.00		
5 COMBINED AT	DBA-1	530.	4.53	134.	35.	13.	0.82		
HYDROGRAPH AT	RBC.2	57.	4.23	13.	3.	1.	0.00		
HYDROGRAPH AT	S22CAB	12.	4.00	2.	1.	0.	0.01		

HYDROGRAPH AT	S21CAC	7.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	70.	4.17	16.	4.	1.	0.01		
2 COMBINED AT	DBA-3	583.	4.50	149.	39.	14.	0.83		
DIVERSION TO	SD36	583.	0.00	149.	39.	14.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	4.23
HYDROGRAPH AT	S21CAB	114.	4.37	27.	7.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.37	10.	3.	1.	0.12		
HYDROGRAPH AT	21CA.1	96.	4.37	17.	4.	2.	0.12		
2 COMBINED AT	CP21CA	96.	4.37	17.	4.	2.	0.95		
ROUTED TO	RT21CA	95.	4.50	17.	4.	2.	0.95	0.69	4.50
HYDROGRAPH AT	SB21CP	151.	4.33	34.	9.	3.	0.14		
DIVERSION TO	21CP.2	15.	4.33	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	136.	4.33	25.	6.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	227.	4.43	42.	10.	4.	1.10		
DIVERSION TO	DI21CP	113.	4.43	21.	5.	2.	1.10		
HYDROGRAPH AT	DV21CP	113.	4.43	21.	5.	2.	1.10		
ROUTED TO	RT21CP	113.	4.47	21.	5.	2.	1.10	0.66	4.47
HYDROGRAPH AT	S21CNA	22.	4.10	4.	1.	0.	0.02		
2 COMBINED AT	S19.1	129.	4.43	25.	6.	2.	1.11		
ROUTED TO	S19.2	129.	4.43	25.	6.	2.	1.11		
HYDROGRAPH AT	S19CNA	15.	4.60	5.	1.	0.	0.02		
HYDROGRAPH AT	SBX	22.	4.33	5.	1.	0.	0.02		
3 COMBINED AT	BASN_X	164.	4.43	35.	9.	3.	1.15		
DIVERSION TO	SD42	164.	0.00	35.	9.	3.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		

HYDROGRAPH AT	S21CNB	31.	4.13	6.	1.	1.	0.03		
DIVERSION TO	SD44	7.	4.13	3.	1.	0.	0.03		
HYDROGRAPH AT	SD43	24.	4.13	3.	1.	0.	0.03		
HYDROGRAPH AT	SB19DU	17.	4.30	5.	1.	0.	0.02		
ROUTED TO	RT19DU	15.	4.90	5.	1.	0.	0.02	0.09	4.90
HYDROGRAPH AT	SB19NO	41.	4.20	9.	2.	1.	0.04		
DIVERSION TO	19NO.2	36.	4.20	9.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	5.	4.20	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	373.	4.20	45.	11.	4.	0.00		
ROUTED TO	RD19NO	366.	4.33	45.	11.	4.	0.00	0.98	4.33
3 COMBINED AT	CP19NO	378.	4.33	50.	12.	5.	0.05		
ROUTED TO	RT19NO	358.	4.47	50.	12.	5.	0.05	0.80	4.47
HYDROGRAPH AT	SB19OR	105.	4.37	29.	7.	3.	0.10		
DIVERSION TO	19OR.2	30.	4.37	16.	4.	2.	0.10		
HYDROGRAPH AT	19OR.1	75.	4.37	13.	3.	1.	0.10		
HYDROGRAPH AT	RE19OR	109.	4.37	20.	5.	2.	0.00		
ROUTED TO	RD19OR	107.	4.47	20.	5.	2.	0.00	0.46	4.47
3 COMBINED AT	CP19OR	538.	4.47	83.	21.	7.	0.16		
ROUTED TO	RT19OR	529.	4.53	83.	21.	7.	0.16	0.99	4.53
HYDROGRAPH AT	SB19MY	39.	4.30	9.	2.	1.	0.05		
DIVERSION TO	19MY.2	35.	4.30	8.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	4.	4.30	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	168.	4.43	30.	8.	3.	0.00		
ROUTED TO	RD19MY	164.	4.53	30.	8.	3.	0.00	0.76	4.53
3 COMBINED AT	CP19MY	693.	4.53	113.	28.	10.	0.20		
ROUTED TO	RT19MY	688.	4.57	113.	28.	10.	0.20	1.39	4.57
HYDROGRAPH AT	SB19GL	50.	4.37	13.	3.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.37	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	35.	4.37	5.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	172.	4.47	35.	9.	3.	0.00		

ROUTED TO	RD19GL	169.	4.57	35.	9.	3.	0.00	0.78	4.57
3 COMBINED AT	CP19GL	887.	4.57	153.	39.	14.	0.26		
ROUTED TO	RT19GL	858.	4.67	153.	39.	14.	0.26	1.22	4.67
HYDROGRAPH AT	SB19MA	50.	4.30	12.	3.	1.	0.05		
DIVERSION TO	19MA.2	35.	4.30	11.	3.	1.	0.05		
HYDROGRAPH AT	19MA.1	15.	4.30	1.	0.	0.	0.05		
2 COMBINED AT	CP19MA	861.	4.63	155.	39.	14.	0.31		
ROUTED TO	RT19MA	848.	4.73	154.	39.	14.	0.31	1.29	4.73
HYDROGRAPH AT	SB19BE	50.	4.37	13.	3.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.37	11.	3.	1.	0.06		
HYDROGRAPH AT	19BE.1	20.	4.37	2.	0.	0.	0.06		
2 COMBINED AT	CP19BE	856.	4.73	156.	39.	14.	0.37		
ROUTED TO	RT19BE	842.	4.80	156.	39.	14.	0.37	1.28	4.80
HYDROGRAPH AT	SB19MI	63.	4.33	14.	4.	1.	0.08		
DIVERSION TO	19MI.2	63.	0.00	14.	4.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	842.	4.80	156.	39.	14.	0.44		
ROUTED TO	RT19MI	826.	4.90	156.	39.	14.	0.44	1.38	4.90
HYDROGRAPH AT	SB19CA	5.	4.60	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	5.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	826.	4.90	156.	39.	14.	0.45		
ROUTED TO	RT19CA	813.	4.97	156.	39.	14.	0.45	1.18	4.97
HYDROGRAPH AT	SB19CP	58.	4.30	14.	4.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.30	11.	3.	1.	0.06		
HYDROGRAPH AT	19CP.1	28.	4.30	3.	1.	0.	0.06		
HYDROGRAPH AT	RE19CP	113.	4.43	21.	5.	2.	0.00		
ROUTED TO	RD19CP	112.	4.50	21.	5.	2.	0.00	0.52	4.50
3 COMBINED AT	CP19CP	890.	4.97	180.	45.	16.	0.51		
ROUTED TO	RT19CP	888.	5.00	180.	45.	16.	0.51	1.96	5.00

HYDROGRAPH AT	S19CNB	10.	4.63	4.	1.	0.	0.02
DIVERSION TO	19CN.2	10.	0.00	4.	1.	0.	0.02
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	888.	5.00	180.	45.	16.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	3.54	11.00
STORAGE	0.	39.	121.
OUTFLOW	0.	0.	2751.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	4.02	0.00	44.	45.	0.00	5.63	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX Q

PHASE 3 DRAINAGE SYSTEM
ALTERNATE 100-YEAR, 6-HOUR STORM
FILE: P3-100-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 3, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
  9       ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR 50-YR INFLOW VOLUME
 10       ID            NEW RETENTION BASIN AT 23rd AVE & NORTHERN AVE
 11       ID   100-YEAR 6 HOUR STORM
 12       ID
 13       ID
 14       ID   FILE NAME: P3-100-1.6I
 15       ID   ****************************************************
 16       ID
 17       ID   Project ID: 24TH & CAMELBACK
 18       IT       2                   2000
 19       IO       5
          *DIAGRAM
          *
 20       ID   ****************************************************
 21       ID   FLOWS ALONG 23RD AVE
 22       ID   ****************************************************
 23       ID

 24       KK  SB23DU
 25       KM   SUB-BASIN SB23DU
 26       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 27       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 28       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 29       BA    .179
 30       IN      15
 31       KM   RAINFALL DEPTH OF 3.00 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 32       PB   2.900
 33       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 34       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 35       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 36       PC    .949    .962    .975    .988   1.000
 37       LG    .100    .250   4.300    .366  80.000
 38       UC    .346    .137
 39       UA       0       5      16      30      65      77      84      90      94      97
 40       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
          *
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	267.	4.10	48.	12.	4.	0.18		
ROUTED TO	RT23DU	265.	4.17	48.	12.	4.	0.18	0.93	4.17
HYDROGRAPH AT	SB23BU	263.	4.17	46.	12.	4.	0.22		
2 COMBINED AT	CP23BU	528.	4.17	94.	24.	9.	0.40		
ROUTED TO	RT23BU	526.	4.20	94.	24.	9.	0.40	1.43	4.20
HYDROGRAPH AT	SB23RO	134.	4.17	27.	7.	2.	0.10		
DIVERSION TO	DV23RO	119.	4.17	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	134.	4.17	17.	4.	2.	0.10		
2 COMBINED AT	CP23RO	658.	4.20	111.	28.	10.	0.50		
ROUTED TO	RT23RO	657.	4.23	111.	28.	10.	0.50	2.39	4.23
HYDROGRAPH AT	SB23NO	67.	4.10	12.	3.	1.	0.04		
DIVERSION TO	RB23NO	53.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	67.	4.10	8.	2.	1.	0.04		
2 COMBINED AT	CP23NO	715.	4.20	119.	30.	11.	0.55		
DIVERSION TO	N23IN	114.	4.20	50.	13.	5.	0.55		
HYDROGRAPH AT	N23RB	601.	4.20	69.	17.	6.	0.55		
DIVERSION TO	DI23NO	373.	4.20	45.	11.	4.	0.55		
HYDROGRAPH AT	DV23NO	229.	4.20	24.	6.	2.	0.55		
ROUTED TO	RT23NO	227.	4.30	24.	6.	2.	0.55	0.86	4.30
HYDROGRAPH AT	SB23OR	146.	4.20	29.	7.	3.	0.12		
2 COMBINED AT	CP23OR	369.	4.30	54.	13.	5.	0.67		
DIVERSION TO	DI23OR	92.	4.30	13.	3.	1.	0.67		
HYDROGRAPH AT	DV23OR	277.	4.30	40.	10.	4.	0.67		
ROUTED TO	RT23OR	276.	4.33	40.	10.	4.	0.67	0.95	4.33
HYDROGRAPH AT	SB23DM	75.	4.10	13.	3.	1.	0.06		
2 COMBINED AT	CP23DM	340.	4.30	53.	13.	5.	0.73		

DIVERSION TO	DI23DM	170.	4.30	27.	7.	2.	0.73		
HYDROGRAPH AT	DV23DM	170.	4.30	27.	7.	2.	0.73		
ROUTED TO	RT23DM	168.	4.37	27.	7.	2.	0.73	0.84	4.37
HYDROGRAPH AT	SB22GL	21.	4.30	5.	1.	0.	0.03		
ROUTED TO	RT22GL	21.	4.43	5.	1.	0.	0.03	0.25	4.43
HYDROGRAPH AT	SB23GL	74.	4.13	13.	3.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.13	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	66.	4.13	9.	2.	1.	0.06		
3 COMBINED AT	CP23GL	241.	4.37	40.	10.	4.	0.81		
ROUTED TO	RT23GL	235.	4.50	40.	10.	4.	0.81	0.60	4.50
HYDROGRAPH AT	S23MAA	111.	4.23	22.	6.	2.	0.11		
DIVERSION TO	SD12	10.	4.23	6.	2.	1.	0.11		
HYDROGRAPH AT	SD11	101.	4.23	16.	4.	1.	0.11		
HYDROGRAPH AT	S23MAB	26.	4.27	6.	1.	1.	0.03		
HYDROGRAPH AT	S21MAC	12.	4.20	1.	0.	0.	0.02		
4 COMBINED AT	CP23MA	355.	4.43	63.	16.	6.	0.96		
DIVERSION TO	DI_I	355.	0.00	63.	16.	6.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	5.67
HYDROGRAPH AT	SB23BE	109.	4.27	22.	6.	2.	0.12		
DIVERSION TO	23BE.2	22.	4.27	10.	3.	1.	0.12		
HYDROGRAPH AT	23BE.1	87.	4.27	12.	3.	1.	0.12		
2 COMBINED AT	CP23BE	87.	4.27	12.	3.	1.	1.08		
ROUTED TO	RT23BE	85.	4.47	12.	3.	1.	1.08	0.67	4.47
HYDROGRAPH AT	SB23MI	80.	4.47	21.	5.	2.	0.12		
2 COMBINED AT	CP23MI	166.	4.47	33.	8.	3.	1.20		
DIVERSION TO	DI23MI	66.	4.47	13.	3.	1.	1.20		
HYDROGRAPH AT	DV23MI	99.	4.47	20.	5.	2.	1.20		
ROUTED TO	RT23MI	98.	4.57	20.	5.	2.	1.20	0.65	4.57
HYDROGRAPH AT	S23COA	9.	4.33	2.	1.	0.	0.01		

HYDROGRAPH AT	S23COB	42.	4.40	11.	3.	1.	0.05		
3 COMBINED AT	23CO.1	147.	4.50	34.	9.	3.	1.26		
DIVERSION TO	DI23CO	74.	4.50	17.	4.	2.	1.26		
HYDROGRAPH AT	DV23CO	74.	4.50	17.	4.	2.	1.26		
ROUTED TO	RT23CO	73.	4.57	17.	4.	2.	1.26	0.56	4.57
HYDROGRAPH AT	S23CAA	9.	4.23	2.	1.	0.	0.01		
DIVERSION TO	23AA.2	9.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	73.	4.57	17.	4.	2.	1.27		
DIVERSION TO	RBA.2	73.	0.00	17.	4.	2.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	2.27
HYDROGRAPH AT	S23CAB	4.	4.07	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	4.	4.07	1.	0.	0.	1.27		
DIVERSION TO	DI23CA	4.	0.00	1.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	4.97
HYDROGRAPH AT	RE24CA	4.	4.07	1.	0.	0.	0.00		
ROUTED TO	RD24CA	4.	4.20	1.	0.	0.	0.00	0.05	4.20
HYDROGRAPH AT	SB24CA	53.	4.27	12.	3.	1.	0.05		
2 COMBINED AT	CP24CA	57.	4.23	13.	3.	1.	0.05		
DIVERSION TO	RBC.2	57.	0.00	13.	3.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.30
HYDROGRAPH AT	SB23CP	205.	4.17	40.	10.	4.	0.16		
DIVERSION TO	23CP.2	4.	4.17	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	201.	4.17	36.	9.	3.	0.16		
3 COMBINED AT	CP23CP	201.	4.17	36.	9.	3.	1.48		
ROUTED TO	RT23CP	198.	4.27	36.	9.	3.	1.48	0.92	4.27
HYDROGRAPH AT	SB23IN	215.	4.20	43.	11.	4.	0.17		

DIVERSION TO	23IN.2	4.	4.20	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	211.	4.20	39.	10.	4.	0.17		
2 COMBINED AT	CP23IN	406.	4.27	75.	19.	7.	1.65		
HYDROGRAPH AT	SB21DU	77.	4.37	19.	5.	2.	0.09		
DIVERSION TO	21DU.2	13.	4.37	8.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	64.	4.37	11.	3.	1.	0.09		
ROUTED TO	RT21DU	64.	4.50	11.	3.	1.	0.09	0.47	4.50
HYDROGRAPH AT	SB21BU	139.	4.20	27.	7.	2.	0.13		
2 COMBINED AT	CP21BU	188.	4.40	38.	9.	3.	0.22		
DIVERSION TO	DI21BU	188.	0.00	38.	9.	3.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	138.	4.20	28.	7.	2.	0.13		
HYDROGRAPH AT	RE21OR	92.	4.30	13.	3.	1.	0.00		
ROUTED TO	RD21OR	89.	4.43	13.	3.	1.	0.00	0.47	4.43
2 COMBINED AT	CP21OR	219.	4.37	41.	10.	4.	0.13		
DIVERSION TO	DI21OR	109.	4.37	20.	5.	2.	0.13		
HYDROGRAPH AT	DV21OR	109.	4.37	20.	5.	2.	0.13		
ROUTED TO	RT21OR	109.	4.43	20.	5.	2.	0.13	0.74	4.43
HYDROGRAPH AT	SB21MY	59.	4.37	14.	3.	1.	0.07		
HYDROGRAPH AT	RE21MY	170.	4.30	27.	7.	2.	0.00		
ROUTED TO	RD21MY	168.	4.43	27.	7.	2.	0.00	0.78	4.43
3 COMBINED AT	CP21MY	335.	4.43	61.	15.	5.	0.19		
DIVERSION TO	DI21MY	168.	4.43	30.	8.	3.	0.19		
HYDROGRAPH AT	DV21MY	168.	4.43	30.	8.	3.	0.19		
ROUTED TO	RT21MY	167.	4.47	30.	8.	3.	0.19	0.85	4.47
HYDROGRAPH AT	SB21GL	40.	4.23	8.	2.	1.	0.04		
2 COMBINED AT	CP21GL	202.	4.47	38.	10.	3.	0.23		
DIVERSION TO	DI21GL	172.	4.47	35.	9.	3.	0.23		
HYDROGRAPH AT	DV21GL	30.	4.47	3.	1.	0.	0.23		
ROUTED TO	RT21GL	28.	4.67	3.	1.	0.	0.23	0.33	4.67

HYDROGRAPH AT	S21MAA	151.	4.07	24.	6.	2.	0.11		
HYDROGRAPH AT	DI_I	355.	4.43	63.	16.	6.	0.00		
HYDROGRAPH AT	S21MAB	50.	4.07	7.	2.	1.	0.04		
4 COMBINED AT	BSN_I	472.	4.37	96.	24.	9.	0.38		
ROUTED TO	WASHPK	22.	6.07	9.	3.	1.	0.38	4.19	6.07
ROUTED TO	M21.1	22.	6.13	9.	3.	1.	0.38	0.29	6.13
ROUTED TO	RT21MA	21.	6.33	9.	3.	1.	0.38	0.30	6.33
HYDROGRAPH AT	SB21BE	203.	4.20	38.	10.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.20	6.	2.	1.	0.18		
HYDROGRAPH AT	21BE.1	197.	4.20	32.	8.	3.	0.18		
2 COMBINED AT	CP21BE	197.	4.20	40.	11.	4.	0.57		
ROUTED TO	RT21BE	196.	4.23	40.	11.	4.	0.57	0.87	4.23
HYDROGRAPH AT	SB21MO	40.	4.53	12.	3.	1.	0.07		
2 COMBINED AT	CP21MO	230.	4.27	52.	14.	5.	0.64		
ROUTED TO	RT21MO	229.	4.33	52.	14.	5.	0.64	1.08	4.33
HYDROGRAPH AT	SB21MI	67.	4.37	15.	4.	1.	0.09		
HYDROGRAPH AT	RE21MI	66.	4.47	13.	3.	1.	0.00		
ROUTED TO	RD21MI	65.	4.60	13.	3.	1.	0.00	0.39	4.60
3 COMBINED AT	CP21MI	349.	4.40	79.	21.	8.	0.72		
ROUTED TO	RT21MI	347.	4.50	79.	21.	8.	0.72	1.36	4.50
HYDROGRAPH AT	S21CAA	42.	4.37	11.	3.	1.	0.05		
HYDROGRAPH AT	S22CAA	42.	4.33	10.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.33	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	32.	4.33	5.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	74.	4.50	17.	4.	2.	0.00		
ROUTED TO	RD22CA	66.	4.87	17.	4.	2.	0.00	0.39	4.87
HYDROGRAPH AT	RBA.2	73.	4.57	17.	4.	2.	0.00		
5 COMBINED AT	DBA-1	530.	4.53	127.	33.	12.	0.82		
HYDROGRAPH AT	RBC.2	57.	4.23	13.	3.	1.	0.00		
HYDROGRAPH AT	S22CAB	12.	4.00	2.	1.	0.	0.01		

HYDROGRAPH AT	S21CAC	7.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	70.	4.17	16.	4.	1.	0.01		
2 COMBINED AT	DBA-3	583.	4.50	142.	37.	13.	0.83		
DIVERSION TO	SD36	583.	0.00	142.	37.	13.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	4.23
HYDROGRAPH AT	S21CAB	114.	4.37	27.	7.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.37	10.	3.	1.	0.12		
HYDROGRAPH AT	21CA.1	96.	4.37	17.	4.	2.	0.12		
2 COMBINED AT	CP21CA	96.	4.37	17.	4.	2.	0.95		
ROUTED TO	RT21CA	95.	4.50	17.	4.	2.	0.95	0.69	4.50
HYDROGRAPH AT	SB21CP	151.	4.33	34.	9.	3.	0.14		
DIVERSION TO	21CP.2	15.	4.33	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	136.	4.33	25.	6.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	227.	4.43	42.	10.	4.	1.10		
DIVERSION TO	DI21CP	113.	4.43	21.	5.	2.	1.10		
HYDROGRAPH AT	DV21CP	113.	4.43	21.	5.	2.	1.10		
ROUTED TO	RT21CP	113.	4.47	21.	5.	2.	1.10	0.66	4.47
HYDROGRAPH AT	S21CNA	22.	4.10	4.	1.	0.	0.02		
2 COMBINED AT	S19.1	129.	4.43	25.	6.	2.	1.11		
ROUTED TO	S19.2	129.	4.43	25.	6.	2.	1.11		
HYDROGRAPH AT	S19CNA	15.	4.60	5.	1.	0.	0.02		
HYDROGRAPH AT	SBX	22.	4.33	5.	1.	0.	0.02		
3 COMBINED AT	BASN_X	164.	4.43	35.	9.	3.	1.15		
DIVERSION TO	SD42	164.	0.00	35.	9.	3.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		

HYDROGRAPH AT	S21CNB	31.	4.13	6.	1.	1.	0.03		
DIVERSION TO	SD44	7.	4.13	3.	1.	0.	0.03		
HYDROGRAPH AT	SD43	24.	4.13	3.	1.	0.	0.03		
HYDROGRAPH AT	SB19DU	17.	4.30	5.	1.	0.	0.02		
ROUTED TO	RT19DU	15.	4.90	5.	1.	0.	0.02	0.09	4.90
HYDROGRAPH AT	SB19NO	41.	4.20	9.	2.	1.	0.04		
DIVERSION TO	19NO.2	36.	4.20	9.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	5.	4.20	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	373.	4.20	45.	11.	4.	0.00		
ROUTED TO	RD19NO	366.	4.33	45.	11.	4.	0.00	0.98	4.33
3 COMBINED AT	CP19NO	378.	4.33	50.	12.	5.	0.05		
ROUTED TO	RT19NO	358.	4.47	50.	12.	5.	0.05	0.80	4.47
HYDROGRAPH AT	SB19OR	105.	4.37	29.	7.	3.	0.10		
DIVERSION TO	19OR.2	30.	4.37	16.	4.	2.	0.10		
HYDROGRAPH AT	19OR.1	75.	4.37	13.	3.	1.	0.10		
HYDROGRAPH AT	RE19OR	109.	4.37	20.	5.	2.	0.00		
ROUTED TO	RD19OR	107.	4.47	20.	5.	2.	0.00	0.46	4.47
3 COMBINED AT	CP19OR	538.	4.47	83.	21.	7.	0.16		
ROUTED TO	RT19OR	529.	4.53	83.	21.	7.	0.16	0.99	4.53
HYDROGRAPH AT	SB19MY	39.	4.30	9.	2.	1.	0.05		
DIVERSION TO	19MY.2	35.	4.30	8.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	4.	4.30	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	168.	4.43	30.	8.	3.	0.00		
ROUTED TO	RD19MY	164.	4.53	30.	8.	3.	0.00	0.76	4.53
3 COMBINED AT	CP19MY	693.	4.53	113.	28.	10.	0.20		
ROUTED TO	RT19MY	688.	4.57	113.	28.	10.	0.20	1.39	4.57
HYDROGRAPH AT	SB19GL	50.	4.37	13.	3.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.37	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	35.	4.37	5.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	172.	4.47	35.	9.	3.	0.00		

ROUTED TO	RD19GL	169.	4.57	35.	9.	3.	0.00	0.78	4.57
3 COMBINED AT	CP19GL	887.	4.57	153.	39.	14.	0.26		
ROUTED TO	RT19GL	858.	4.67	153.	39.	14.	0.26	1.22	4.67
HYDROGRAPH AT	SB19MA	50.	4.30	12.	3.	1.	0.05		
DIVERSION TO	19MA.2	35.	4.30	11.	3.	1.	0.05		
HYDROGRAPH AT	19MA.1	15.	4.30	1.	0.	0.	0.05		
2 COMBINED AT	CP19MA	861.	4.63	155.	39.	14.	0.31		
ROUTED TO	RT19MA	848.	4.73	154.	39.	14.	0.31	1.29	4.73
HYDROGRAPH AT	SB19BE	50.	4.37	13.	3.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.37	11.	3.	1.	0.06		
HYDROGRAPH AT	19BE.1	20.	4.37	2.	0.	0.	0.06		
2 COMBINED AT	CP19BE	856.	4.73	156.	39.	14.	0.37		
ROUTED TO	RT19BE	842.	4.80	156.	39.	14.	0.37	1.28	4.80
HYDROGRAPH AT	SB19MI	63.	4.33	14.	4.	1.	0.08		
DIVERSION TO	19MI.2	63.	0.00	14.	4.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	842.	4.80	156.	39.	14.	0.44		
ROUTED TO	RT19MI	826.	4.90	156.	39.	14.	0.44	1.38	4.90
HYDROGRAPH AT	SB19CA	5.	4.60	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	5.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	826.	4.90	156.	39.	14.	0.45		
ROUTED TO	RT19CA	813.	4.97	156.	39.	14.	0.45	1.18	4.97
HYDROGRAPH AT	SB19CP	58.	4.30	14.	4.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.30	11.	3.	1.	0.06		
HYDROGRAPH AT	19CP.1	28.	4.30	3.	1.	0.	0.06		
HYDROGRAPH AT	RE19CP	113.	4.43	21.	5.	2.	0.00		
ROUTED TO	RD19CP	112.	4.50	21.	5.	2.	0.00	0.52	4.50
3 COMBINED AT	CP19CP	890.	4.97	180.	45.	16.	0.51		
ROUTED TO	RT19CP	888.	5.00	180.	45.	16.	0.51	1.96	5.00

HYDROGRAPH AT	S19CNB	10.	4.63	4.	1.	0.	0.02
DIVERSION TO	19CN.2	10.	0.00	4.	1.	0.	0.02
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	888.	5.00	180.	45.	16.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	3.90	11.00
STORAGE	0.	43.	121.
OUTFLOW	0.	0.	2554.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	4.19	0.00	46.	22.	0.00	6.07	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX R

PHASE 3 DRAINAGE SYSTEM
50-YEAR, 6-HOUR STORM
FILE: P3-50-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 3, SINGLE RETENTION BASIN AT CAMELBACK ROAD
  9       ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR 50-YR INFLOW VOLUME
 10       ID            NEW RETENTION BASIN AT 23rd AVE & NORTHERN AVE
 11       ID   50-YEAR 6 HOUR STORM
 12       ID
 13       ID
 14       ID   FILE NAME: P3-50-1.6I
 15       ID   ****************************************************
 16       ID
 17       ID   Project ID: 24TH & CAMELBACK
 18       IT       2                    2000
 19       IO       5
          *DIAGRAM
          *
 20       ID   ****************************************************
 21       ID   FLOWS ALONG 23RD AVE
 22       ID   ****************************************************
 23       ID

 24       KK  SB23DU
 25       KM   SUB-BASIN SB23DU
 26       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 27       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 28       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 29       BA    .179
 30       IN      15
 31       KM   RAINFALL DEPTH OF 2.68 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 32       PB   2.591
 33       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 34       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 35       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 36       PC    .949    .962    .975    .988   1.000
 37       LG    .100    .250   4.300    .366  80.000
 38       UC    .363    .144
 39       UA       0       5      16      30      65      77      84      90      94      97
 40       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
          *
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	234.	4.10	43.	11.	4.	0.18		
ROUTED TO	RT23DU	231.	4.17	43.	11.	4.	0.18	0.87	4.17
HYDROGRAPH AT	SB23BU	221.	4.17	40.	10.	4.	0.22		
2 COMBINED AT	CP23BU	452.	4.17	82.	21.	7.	0.40		
ROUTED TO	RT23BU	451.	4.23	82.	21.	7.	0.40	1.31	4.23
HYDROGRAPH AT	SB23RO	117.	4.17	23.	6.	2.	0.10		
DIVERSION TO	DV23RO	110.	4.17	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	117.	4.17	14.	3.	1.	0.10		
2 COMBINED AT	CP23RO	565.	4.23	96.	24.	9.	0.50		
ROUTED TO	RT23RO	564.	4.27	96.	24.	9.	0.50	2.19	4.27
HYDROGRAPH AT	SB23NO	59.	4.10	11.	3.	1.	0.04		
DIVERSION TO	RB23NO	51.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	59.	4.10	7.	2.	1.	0.04		
2 COMBINED AT	CP23NO	615.	4.23	103.	26.	9.	0.55		
DIVERSION TO	N23IN	114.	4.23	48.	12.	4.	0.55		
HYDROGRAPH AT	N23RB	501.	4.23	55.	14.	5.	0.55		
DIVERSION TO	DI23NO	314.	4.23	37.	9.	3.	0.55		
HYDROGRAPH AT	DV23NO	187.	4.23	19.	5.	2.	0.55		
ROUTED TO	RT23NO	186.	4.33	19.	5.	2.	0.55	0.78	4.33
HYDROGRAPH AT	SB23OR	124.	4.23	25.	6.	2.	0.12		
2 COMBINED AT	CP23OR	307.	4.33	44.	11.	4.	0.67		
DIVERSION TO	DI23OR	77.	4.33	11.	3.	1.	0.67		
HYDROGRAPH AT	DV23OR	230.	4.33	33.	8.	3.	0.67		
ROUTED TO	RT23OR	228.	4.40	33.	8.	3.	0.67	0.86	4.40
HYDROGRAPH AT	SB23DM	65.	4.13	11.	3.	1.	0.06		
2 COMBINED AT	CP23DM	281.	4.37	44.	11.	4.	0.73		

DIVERSION TO	DI23DM	140.	4.37	22.	6.	2.	0.73		
HYDROGRAPH AT	DV23DM	140.	4.37	22.	6.	2.	0.73		
ROUTED TO	RT23DM	139.	4.43	22.	6.	2.	0.73	0.76	4.43
HYDROGRAPH AT	SB22GL	17.	4.33	4.	1.	0.	0.03		
ROUTED TO	RT22GL	17.	4.53	4.	1.	0.	0.03	0.22	4.53
HYDROGRAPH AT	SB23GL	64.	4.13	11.	3.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.13	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	55.	4.13	7.	2.	1.	0.06		
3 COMBINED AT	CP23GL	195.	4.40	33.	8.	3.	0.81		
ROUTED TO	RT23GL	190.	4.53	33.	8.	3.	0.81	0.54	4.53
HYDROGRAPH AT	S23MAA	92.	4.27	19.	5.	2.	0.11		
DIVERSION TO	SD12	10.	4.27	6.	2.	1.	0.11		
HYDROGRAPH AT	SD11	82.	4.27	13.	3.	1.	0.11		
HYDROGRAPH AT	S23MAB	22.	4.30	5.	1.	0.	0.03		
HYDROGRAPH AT	S21MAC	8.	4.23	1.	0.	0.	0.02		
4 COMBINED AT	CP23MA	284.	4.50	52.	13.	5.	0.96		
DIVERSION TO	DI_I	284.	0.00	52.	13.	5.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	5.03
HYDROGRAPH AT	SB23BE	90.	4.30	19.	5.	2.	0.12		
DIVERSION TO	23BE.2	22.	4.30	10.	3.	1.	0.12		
HYDROGRAPH AT	23BE.1	68.	4.30	9.	2.	1.	0.12		
2 COMBINED AT	CP23BE	68.	4.30	9.	2.	1.	1.08		
ROUTED TO	RT23BE	66.	4.50	9.	2.	1.	1.08	0.58	4.50
HYDROGRAPH AT	SB23MI	64.	4.53	18.	5.	2.	0.12		
2 COMBINED AT	CP23MI	130.	4.50	27.	7.	2.	1.20		
DIVERSION TO	DI23MI	52.	4.50	11.	3.	1.	1.20		
HYDROGRAPH AT	DV23MI	78.	4.50	16.	4.	1.	1.20		
ROUTED TO	RT23MI	77.	4.60	16.	4.	1.	1.20	0.57	4.60
HYDROGRAPH AT	S23COA	8.	4.33	2.	1.	0.	0.01		

HYDROGRAPH AT	S23COB	35.	4.43	10.	3.	1.	0.05		
3 COMBINED AT	23CO.1	118.	4.53	28.	7.	3.	1.26		
DIVERSION TO	DI23CO	59.	4.53	14.	4.	1.	1.26		
HYDROGRAPH AT	DV23CO	59.	4.53	14.	4.	1.	1.26		
ROUTED TO	RT23CO	59.	4.60	14.	4.	1.	1.26	0.50	4.60
HYDROGRAPH AT	S23CAA	8.	4.27	2.	0.	0.	0.01		
DIVERSION TO	23AA.2	8.	0.00	2.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	59.	4.60	14.	4.	1.	1.27		
DIVERSION TO	RBA.2	59.	0.00	14.	4.	1.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	14.80
HYDROGRAPH AT	S23CAB	4.	4.07	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	4.	4.07	1.	0.	0.	1.27		
DIVERSION TO	DI23CA	4.	0.00	1.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	4.20
HYDROGRAPH AT	RE24CA	4.	4.07	1.	0.	0.	0.00		
ROUTED TO	RD24CA	3.	4.20	1.	0.	0.	0.00	0.05	4.20
HYDROGRAPH AT	SB24CA	45.	4.27	10.	3.	1.	0.05		
2 COMBINED AT	CP24CA	48.	4.27	11.	3.	1.	0.05		
DIVERSION TO	RBC.2	48.	0.00	11.	3.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.37
HYDROGRAPH AT	SB23CP	177.	4.20	35.	9.	3.	0.16		
DIVERSION TO	23CP.2	4.	4.20	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	173.	4.20	31.	8.	3.	0.16		
3 COMBINED AT	CP23CP	173.	4.20	31.	8.	3.	1.48		
ROUTED TO	RT23CP	171.	4.33	31.	8.	3.	1.48	0.85	4.33
HYDROGRAPH AT	SB23IN	185.	4.23	38.	9.	3.	0.17		

DIVERSION TO	23IN.2	4.	4.23	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	181.	4.23	34.	8.	3.	0.17		
2 COMBINED AT	CP23IN	349.	4.27	65.	16.	6.	1.65		
HYDROGRAPH AT	SB21DU	64.	4.40	16.	4.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.40	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	51.	4.40	9.	2.	1.	0.09		
ROUTED TO	RT21DU	50.	4.60	9.	2.	1.	0.09	0.41	4.60
HYDROGRAPH AT	SB21BU	117.	4.23	23.	6.	2.	0.13		
2 COMBINED AT	CP21BU	154.	4.37	32.	8.	3.	0.22		
DIVERSION TO	DI21BU	154.	0.00	32.	8.	3.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	117.	4.23	24.	6.	2.	0.13		
HYDROGRAPH AT	RE21OR	77.	4.33	11.	3.	1.	0.00		
ROUTED TO	RD21OR	72.	4.50	11.	3.	1.	0.00	0.41	4.50
2 COMBINED AT	CP21OR	179.	4.43	35.	9.	3.	0.13		
DIVERSION TO	DI21OR	90.	4.43	17.	4.	2.	0.13		
HYDROGRAPH AT	DV21OR	90.	4.43	17.	4.	2.	0.13		
ROUTED TO	RT21OR	89.	4.50	17.	4.	2.	0.13	0.67	4.50
HYDROGRAPH AT	SB21MY	49.	4.40	12.	3.	1.	0.07		
HYDROGRAPH AT	RE21MY	140.	4.37	22.	6.	2.	0.00		
ROUTED TO	RD21MY	138.	4.50	22.	6.	2.	0.00	0.70	4.50
3 COMBINED AT	CP21MY	275.	4.50	51.	13.	5.	0.19		
DIVERSION TO	DI21MY	138.	4.50	26.	6.	2.	0.19		
HYDROGRAPH AT	DV21MY	138.	4.50	26.	6.	2.	0.19		
ROUTED TO	RT21MY	136.	4.53	26.	6.	2.	0.19	0.77	4.53
HYDROGRAPH AT	SB21GL	32.	4.30	7.	2.	1.	0.04		
2 COMBINED AT	CP21GL	164.	4.53	32.	8.	3.	0.23		
DIVERSION TO	DI21GL	142.	4.53	30.	8.	3.	0.23		
HYDROGRAPH AT	DV21GL	22.	4.53	2.	1.	0.	0.23		
ROUTED TO	RT21GL	21.	4.73	2.	1.	0.	0.23	0.29	4.73

HYDROGRAPH AT	S21MAA	129.	4.07	20.	5.	2.	0.11		
HYDROGRAPH AT	DI_I	284.	4.50	52.	13.	5.	0.00		
HYDROGRAPH AT	S21MAB	42.	4.10	6.	1.	1.	0.04		
4 COMBINED AT	BSN_I	374.	4.37	80.	20.	7.	0.38		
ROUTED TO	WASHPK	0.	0.00	0.	0.	0.	0.38	3.65	9.73
ROUTED TO	M21.1	0.	0.00	0.	0.	0.	0.38		
ROUTED TO	RT21MA	0.	0.00	0.	0.	0.	0.38		
HYDROGRAPH AT	SB21BE	170.	4.23	33.	8.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.23	6.	1.	1.	0.18		
HYDROGRAPH AT	21BE.1	164.	4.23	27.	7.	2.	0.18		
2 COMBINED AT	CP21BE	164.	4.23	27.	7.	2.	0.57		
ROUTED TO	RT21BE	163.	4.27	27.	7.	2.	0.57	0.79	4.27
HYDROGRAPH AT	SB21MO	31.	4.57	10.	3.	1.	0.07		
2 COMBINED AT	CP21MO	190.	4.30	37.	9.	3.	0.64		
ROUTED TO	RT21MO	189.	4.37	37.	9.	3.	0.64	0.98	4.37
HYDROGRAPH AT	SB21MI	54.	4.40	12.	3.	1.	0.09		
HYDROGRAPH AT	RE21MI	52.	4.50	11.	3.	1.	0.00		
ROUTED TO	RD21MI	51.	4.63	11.	3.	1.	0.00	0.33	4.63
3 COMBINED AT	CP21MI	282.	4.43	61.	15.	6.	0.72		
ROUTED TO	RT21MI	280.	4.53	61.	15.	6.	0.72	1.21	4.53
HYDROGRAPH AT	S21CAA	36.	4.40	9.	2.	1.	0.05		
HYDROGRAPH AT	S22CAA	35.	4.37	8.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.37	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	25.	4.37	4.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	59.	4.53	14.	4.	1.	0.00		
ROUTED TO	RD22CA	53.	4.93	14.	4.	1.	0.00	0.34	4.93
HYDROGRAPH AT	RBA.2	59.	4.60	14.	4.	1.	0.00		
5 COMBINED AT	DBA-1	424.	4.57	101.	26.	9.	0.82		
HYDROGRAPH AT	RBC.2	48.	4.27	11.	3.	1.	0.00		
HYDROGRAPH AT	S22CAB	11.	4.03	2.	0.	0.	0.01		

HYDROGRAPH AT	S21CAC	6.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	60.	4.20	14.	4.	1.	0.01		
2 COMBINED AT	DBA-3	468.	4.57	115.	29.	11.	0.83		
DIVERSION TO	SD36	468.	0.00	115.	29.	11.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	5.00
HYDROGRAPH AT	S21CAB	96.	4.40	23.	6.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.40	10.	3.	1.	0.12		
HYDROGRAPH AT	21CA.1	78.	4.40	13.	3.	1.	0.12		
2 COMBINED AT	CP21CA	78.	4.40	13.	3.	1.	0.95		
ROUTED TO	RT21CA	77.	4.53	13.	3.	1.	0.95	0.62	4.53
HYDROGRAPH AT	SB21CP	129.	4.37	30.	8.	3.	0.14		
DIVERSION TO	21CP.2	15.	4.37	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	114.	4.37	21.	5.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	187.	4.43	34.	9.	3.	1.10		
DIVERSION TO	DI21CP	93.	4.43	17.	4.	2.	1.10		
HYDROGRAPH AT	DV21CP	93.	4.43	17.	4.	2.	1.10		
ROUTED TO	RT21CP	93.	4.50	17.	4.	2.	1.10	0.60	4.50
HYDROGRAPH AT	S21CNA	19.	4.13	4.	1.	0.	0.02		
2 COMBINED AT	S19.1	107.	4.43	21.	5.	2.	1.11		
ROUTED TO	S19.2	107.	4.47	21.	5.	2.	1.11		
HYDROGRAPH AT	S19CNA	12.	4.63	4.	1.	0.	0.02		
HYDROGRAPH AT	SBX	19.	4.37	4.	1.	0.	0.02		
3 COMBINED AT	BASN_X	137.	4.47	29.	7.	3.	1.15		
DIVERSION TO	SD42	137.	0.00	29.	7.	3.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		

HYDROGRAPH AT	S21CNB	27.	4.13	5.	1.	0.	0.03		
DIVERSION TO	SD44	7.	4.13	3.	1.	0.	0.03		
HYDROGRAPH AT	SD43	19.	4.13	2.	1.	0.	0.03		
HYDROGRAPH AT	SB19DU	15.	4.33	4.	1.	0.	0.02		
ROUTED TO	RT19DU	13.	4.93	4.	1.	0.	0.02	0.08	4.93
HYDROGRAPH AT	SB19NO	35.	4.23	8.	2.	1.	0.04		
DIVERSION TO	19NO.2	35.	0.00	8.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	314.	4.23	37.	9.	3.	0.00		
ROUTED TO	RD19NO	304.	4.40	37.	9.	3.	0.00	0.89	4.40
3 COMBINED AT	CP19NO	312.	4.40	41.	10.	4.	0.05		
ROUTED TO	RT19NO	294.	4.57	41.	10.	4.	0.05	0.72	4.57
HYDROGRAPH AT	SB19OR	90.	4.40	26.	7.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.40	16.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	60.	4.40	10.	2.	1.	0.10		
HYDROGRAPH AT	RE19OR	90.	4.43	17.	4.	2.	0.00		
ROUTED TO	RD19OR	87.	4.53	17.	4.	2.	0.00	0.41	4.53
3 COMBINED AT	CP19OR	438.	4.53	68.	17.	6.	0.16		
ROUTED TO	RT19OR	429.	4.60	68.	17.	6.	0.16	0.89	4.60
HYDROGRAPH AT	SB19MY	32.	4.33	7.	2.	1.	0.05		
DIVERSION TO	19MY.2	32.	0.00	7.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	138.	4.50	26.	6.	2.	0.00		
ROUTED TO	RD19MY	133.	4.60	26.	6.	2.	0.00	0.69	4.60
3 COMBINED AT	CP19MY	562.	4.60	93.	23.	8.	0.20		
ROUTED TO	RT19MY	556.	4.67	93.	23.	8.	0.20	1.24	4.67
HYDROGRAPH AT	SB19GL	42.	4.40	11.	3.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.40	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	27.	4.40	4.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	142.	4.53	30.	8.	3.	0.00		

ROUTED TO	RD19GL	139.	4.63	30.	8.	3.	0.00	0.70	4.63
3 COMBINED AT	CP19GL	716.	4.67	127.	32.	12.	0.26		
ROUTED TO	RT19GL	690.	4.73	127.	32.	12.	0.26	1.08	4.73
HYDROGRAPH AT	SB19MA	42.	4.33	11.	3.	1.	0.05		
DIVERSION TO	19MA.2	35.	4.33	10.	3.	1.	0.05		
HYDROGRAPH AT	19MA.1	7.	4.33	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	690.	4.73	128.	32.	12.	0.31		
ROUTED TO	RT19MA	678.	4.83	128.	32.	12.	0.31	1.14	4.83
HYDROGRAPH AT	SB19BE	41.	4.37	11.	3.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.37	10.	3.	1.	0.06		
HYDROGRAPH AT	19BE.1	11.	4.37	1.	0.	0.	0.06		
2 COMBINED AT	CP19BE	678.	4.83	128.	32.	12.	0.37		
ROUTED TO	RT19BE	665.	4.90	128.	32.	12.	0.37	1.13	4.90
HYDROGRAPH AT	SB19MI	52.	4.37	12.	3.	1.	0.08		
DIVERSION TO	19MI.2	52.	0.00	12.	3.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	665.	4.90	128.	32.	12.	0.44		
ROUTED TO	RT19MI	653.	5.00	128.	32.	12.	0.44	1.21	5.00
HYDROGRAPH AT	SB19CA	4.	4.63	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	4.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	653.	5.00	128.	32.	12.	0.45		
ROUTED TO	RT19CA	643.	5.10	128.	32.	12.	0.45	1.04	5.10
HYDROGRAPH AT	SB19CP	49.	4.33	12.	3.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.33	10.	3.	1.	0.06		
HYDROGRAPH AT	19CP.1	19.	4.33	2.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	93.	4.43	17.	4.	2.	0.00		
ROUTED TO	RD19CP	93.	4.53	17.	4.	2.	0.00	0.48	4.53
3 COMBINED AT	CP19CP	698.	5.10	147.	37.	13.	0.51		
ROUTED TO	RT19CP	696.	5.13	147.	37.	13.	0.51	1.71	5.13

HYDROGRAPH AT	S19CNB	8.	4.67	3.	1.	0.	0.02
DIVERSION TO	19CN.2	8.	0.00	3.	1.	0.	0.02
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	696.	5.13	147.	37.	13.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	9.00	11.00
STORAGE	0.	99.	121.
OUTFLOW	0.	0.	382.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	3.65	0.00	40.	0.	0.00	0.00	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX S

PHASE 3 DRAINAGE SYSTEM
25-YEAR, 6-HOUR STORM
FILE: P3-25-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 3, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
  9       ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR 50-YR INFLOW VOLUME
 10       ID            NEW RETENTION BASIN AT 23rd AVE & NORTHERN AVE
 11       ID   25-YEAR 6 HOUR STORM
 12       ID
 13       ID
 14       ID   FILE NAME: P3-25-1.6I
 15       ID   ****************************************************
 16       ID
 17       ID   Project ID: 24TH & CAMELBACK
 18       IT       2                   2000
 19       IO       5
          *DIAGRAM
          *
 20       ID   ****************************************************
 21       ID   FLOWS ALONG 23RD AVE
 22       ID   ****************************************************
 23       ID

 24       KK  SB23DU
 25       KM   SUB-BASIN SB23DU
 26       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 27       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 28       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 29       BA    .179
 30       IN      15
 31       KM   RAINFALL DEPTH OF 2.36 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 32       PB   2.282
 33       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 34       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 35       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 36       PC    .949    .962    .975    .988   1.000
 37       LG    .100    .250   4.300    .366  80.000
 38       UC    .383    .154
 39       UA       0       5      16      30      65      77      84      90      94      97
 40       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
          *
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	200.	4.10	37.	9.	3.	0.18		
ROUTED TO	RT23DU	198.	4.20	37.	9.	3.	0.18	0.80	4.20
HYDROGRAPH AT	SB23BU	179.	4.20	33.	8.	3.	0.22		
2 COMBINED AT	CP23BU	377.	4.20	71.	18.	6.	0.40		
ROUTED TO	RT23BU	375.	4.27	70.	18.	6.	0.40	1.19	4.27
HYDROGRAPH AT	SB23RO	99.	4.17	20.	5.	2.	0.10		
DIVERSION TO	DV23RO	99.	4.23	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	98.	4.23	11.	3.	1.	0.10		
2 COMBINED AT	CP23RO	472.	4.23	81.	20.	7.	0.50		
ROUTED TO	RT23RO	473.	4.30	81.	20.	7.	0.50	1.98	4.30
HYDROGRAPH AT	SB23NO	51.	4.10	10.	2.	1.	0.04		
DIVERSION TO	RB23NO	48.	4.10	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	51.	4.10	5.	1.	0.	0.04		
2 COMBINED AT	CP23NO	516.	4.30	87.	22.	8.	0.55		
DIVERSION TO	N23IN	114.	4.30	45.	11.	4.	0.55		
HYDROGRAPH AT	N23RB	402.	4.30	41.	10.	4.	0.55		
DIVERSION TO	DI23NO	256.	4.30	28.	7.	3.	0.55		
HYDROGRAPH AT	DV23NO	146.	4.30	13.	3.	1.	0.55		
ROUTED TO	RT23NO	138.	4.43	13.	3.	1.	0.55	0.68	4.43
HYDROGRAPH AT	SB23OR	103.	4.23	22.	5.	2.	0.12		
2 COMBINED AT	CP23OR	235.	4.43	35.	9.	3.	0.67		
DIVERSION TO	DI23OR	59.	4.43	9.	2.	1.	0.67		
HYDROGRAPH AT	DV23OR	176.	4.43	26.	7.	2.	0.67		
ROUTED TO	RT23OR	174.	4.47	26.	7.	2.	0.67	0.75	4.47
HYDROGRAPH AT	SB23DM	55.	4.13	10.	2.	1.	0.06		
2 COMBINED AT	CP23DM	213.	4.47	36.	9.	3.	0.73		

DIVERSION TO	DI23DM	107.	4.47	18.	4.	2.	0.73		
HYDROGRAPH AT	DV23DM	107.	4.47	18.	4.	2.	0.73		
ROUTED TO	RT23DM	105.	4.53	18.	4.	2.	0.73	0.67	4.53
HYDROGRAPH AT	SB22GL	13.	4.37	3.	1.	0.	0.03		
ROUTED TO	RT22GL	13.	4.57	3.	1.	0.	0.03	0.17	4.57
HYDROGRAPH AT	SB23GL	53.	4.17	9.	2.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.17	4.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	45.	4.17	6.	1.	1.	0.06		
3 COMBINED AT	CP23GL	145.	4.50	27.	7.	2.	0.81		
ROUTED TO	RT23GL	142.	4.63	27.	7.	2.	0.81	0.47	4.63
HYDROGRAPH AT	S23MAA	74.	4.30	16.	4.	1.	0.11		
DIVERSION TO	SD12	10.	4.30	6.	2.	1.	0.11		
HYDROGRAPH AT	SD11	64.	4.30	10.	3.	1.	0.11		
HYDROGRAPH AT	S23MAB	17.	4.33	4.	1.	0.	0.03		
HYDROGRAPH AT	S21MAC	5.	4.33	1.	0.	0.	0.02		
4 COMBINED AT	CP23MA	210.	4.57	42.	11.	4.	0.96		
DIVERSION TO	DI_I	210.	0.00	42.	11.	4.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	4.67
HYDROGRAPH AT	SB23BE	71.	4.33	16.	4.	1.	0.12		
DIVERSION TO	23BE.2	22.	4.33	10.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	49.	4.33	7.	2.	1.	0.12		
2 COMBINED AT	CP23BE	49.	4.33	7.	2.	1.	1.08		
ROUTED TO	RT23BE	48.	4.53	7.	2.	1.	1.08	0.50	4.53
HYDROGRAPH AT	SB23MI	48.	4.57	15.	4.	1.	0.12		
2 COMBINED AT	CP23MI	96.	4.57	21.	5.	2.	1.20		
DIVERSION TO	DI23MI	38.	4.57	9.	2.	1.	1.20		
HYDROGRAPH AT	DV23MI	58.	4.57	13.	3.	1.	1.20		
ROUTED TO	RT23MI	57.	4.63	13.	3.	1.	1.20	0.50	4.63
HYDROGRAPH AT	S23COA	6.	4.37	2.	0.	0.	0.01		

HYDROGRAPH AT	S23COB	29.	4.47	9.	2.	1.	0.05		
3 COMBINED AT	23CO.1	90.	4.60	23.	6.	2.	1.26		
DIVERSION TO	DI23CO	45.	4.60	11.	3.	1.	1.26		
HYDROGRAPH AT	DV23CO	45.	4.60	11.	3.	1.	1.26		
ROUTED TO	RT23CO	44.	4.73	11.	3.	1.	1.26	0.45	4.73
HYDROGRAPH AT	S23CAA	6.	4.27	2.	0.	0.	0.01		
DIVERSION TO	23AA.2	6.	0.00	2.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	44.	4.73	11.	3.	1.	1.27		
DIVERSION TO	RBA.2	44.	0.00	11.	3.	1.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	4.47
HYDROGRAPH AT	S23CAB	3.	4.10	1.	0.	0.	0.00		
2 COMBINED AT	CP23CA	3.	4.10	1.	0.	0.	1.27		
DIVERSION TO	DI23CA	3.	0.00	1.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	4.47
HYDROGRAPH AT	RE24CA	3.	4.10	1.	0.	0.	0.00		
ROUTED TO	RD24CA	3.	4.20	1.	0.	0.	0.00	0.04	4.20
HYDROGRAPH AT	SB24CA	37.	4.30	9.	2.	1.	0.05		
2 COMBINED AT	CP24CA	40.	4.30	10.	2.	1.	0.05		
DIVERSION TO	RBC.2	40.	0.00	10.	2.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.63
HYDROGRAPH AT	SB23CP	150.	4.20	30.	8.	3.	0.16		
DIVERSION TO	23CP.2	4.	4.20	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	146.	4.20	26.	7.	2.	0.16		
3 COMBINED AT	CP23CP	146.	4.20	26.	7.	2.	1.48		
ROUTED TO	RT23CP	144.	4.33	26.	7.	2.	1.48	0.78	4.33
HYDROGRAPH AT	SB23IN	156.	4.23	32.	8.	3.	0.17		

DIVERSION TO	23IN.2	4.	4.23	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	152.	4.23	28.	7.	3.	0.17		
2 COMBINED AT	CP23IN	294.	4.30	55.	14.	5.	1.65		
HYDROGRAPH AT	SB21DU	50.	4.43	13.	3.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.43	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	37.	4.43	6.	2.	1.	0.09		
ROUTED TO	RT21DU	37.	4.63	6.	2.	1.	0.09	0.35	4.63
HYDROGRAPH AT	SB21BU	95.	4.27	20.	5.	2.	0.13		
2 COMBINED AT	CP21BU	121.	4.40	26.	7.	2.	0.22		
DIVERSION TO	DI21BU	121.	0.00	26.	7.	2.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	96.	4.27	20.	5.	2.	0.13		
HYDROGRAPH AT	RE21OR	59.	4.43	9.	2.	1.	0.00		
ROUTED TO	RD21OR	56.	4.57	9.	2.	1.	0.00	0.35	4.57
2 COMBINED AT	CP21OR	140.	4.47	29.	7.	3.	0.13		
DIVERSION TO	DI21OR	70.	4.47	14.	4.	1.	0.13		
HYDROGRAPH AT	DV21OR	70.	4.47	14.	4.	1.	0.13		
ROUTED TO	RT21OR	70.	4.53	14.	4.	1.	0.13	0.59	4.53
HYDROGRAPH AT	SB21MY	40.	4.43	10.	2.	1.	0.07		
HYDROGRAPH AT	RE21MY	107.	4.47	18.	4.	2.	0.00		
ROUTED TO	RD21MY	104.	4.60	18.	4.	2.	0.00	0.60	4.60
3 COMBINED AT	CP21MY	210.	4.57	42.	11.	4.	0.19		
DIVERSION TO	DI21MY	105.	4.57	21.	5.	2.	0.19		
HYDROGRAPH AT	DV21MY	105.	4.57	21.	5.	2.	0.19		
ROUTED TO	RT21MY	104.	4.63	21.	5.	2.	0.19	0.68	4.63
HYDROGRAPH AT	SB21GL	26.	4.30	6.	1.	1.	0.04		
2 COMBINED AT	CP21GL	125.	4.63	27.	7.	2.	0.23		
DIVERSION TO	DI21GL	110.	4.63	25.	6.	2.	0.23		
HYDROGRAPH AT	DV21GL	15.	4.63	1.	0.	0.	0.23		
ROUTED TO	RT21GL	13.	4.87	1.	0.	0.	0.23	0.24	4.87

HYDROGRAPH AT	S21MAA	107.	4.10	17.	4.	2.	0.11		
HYDROGRAPH AT	DI_I	210.	4.57	42.	11.	4.	0.00		
HYDROGRAPH AT	S21MAB	34.	4.10	5.	1.	0.	0.04		
4 COMBINED AT	BSN_I	291.	4.30	65.	16.	6.	0.38		
ROUTED TO	WASHPK	0.	0.00	0.	0.	0.	0.38	2.95	10.00
ROUTED TO	M21.1	0.	0.00	0.	0.	0.	0.38		
ROUTED TO	RT21MA	0.	0.00	0.	0.	0.	0.38		
HYDROGRAPH AT	SB21BE	139.	4.23	28.	7.	3.	0.18		
DIVERSION TO	21BE.2	6.	4.23	5.	1.	1.	0.18		
HYDROGRAPH AT	21BE.1	133.	4.23	23.	6.	2.	0.18		
2 COMBINED AT	CP21BE	133.	4.23	23.	6.	2.	0.57		
ROUTED TO	RT21BE	132.	4.30	23.	6.	2.	0.57	0.71	4.30
HYDROGRAPH AT	SB21MO	23.	4.63	8.	2.	1.	0.07		
2 COMBINED AT	CP21MO	151.	4.33	31.	8.	3.	0.64		
ROUTED TO	RT21MO	150.	4.40	31.	8.	3.	0.64	0.87	4.40
HYDROGRAPH AT	SB21MI	40.	4.47	10.	3.	1.	0.09		
HYDROGRAPH AT	RE21MI	38.	4.57	9.	2.	1.	0.00		
ROUTED TO	RD21MI	38.	4.70	9.	2.	1.	0.00	0.28	4.70
3 COMBINED AT	CP21MI	214.	4.53	49.	13.	5.	0.72		
ROUTED TO	RT21MI	212.	4.63	49.	13.	5.	0.72	1.04	4.63
HYDROGRAPH AT	S21CAA	29.	4.43	8.	2.	1.	0.05		
HYDROGRAPH AT	S22CAA	28.	4.40	7.	2.	1.	0.05		
DIVERSION TO	SD34	10.	4.40	5.	1.	0.	0.05		
HYDROGRAPH AT	SD33	18.	4.40	3.	1.	0.	0.05		
HYDROGRAPH AT	RE22CA	45.	4.60	11.	3.	1.	0.00		
ROUTED TO	RD22CA	39.	5.03	11.	3.	1.	0.00	0.29	5.03
HYDROGRAPH AT	RBA.2	44.	4.73	11.	3.	1.	0.00		
5 COMBINED AT	DBA-1	317.	4.67	82.	21.	8.	0.82		
HYDROGRAPH AT	RBC.2	40.	4.30	10.	2.	1.	0.00		
HYDROGRAPH AT	S22CAB	9.	4.03	2.	0.	0.	0.01		

HYDROGRAPH AT	S21CAC	5.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	50.	4.20	12.	3.	1.	0.01		
2 COMBINED AT	DBA-3	352.	4.63	94.	24.	9.	0.83		
DIVERSION TO	SD36	352.	0.00	94.	24.	9.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	4.83
HYDROGRAPH AT	S21CAB	79.	4.43	20.	5.	2.	0.12		
DIVERSION TO	21CA.2	18.	4.43	10.	2.	1.	0.12		
HYDROGRAPH AT	21CA.1	61.	4.43	10.	3.	1.	0.12		
2 COMBINED AT	CP21CA	61.	4.43	10.	3.	1.	0.95		
ROUTED TO	RT21CA	60.	4.57	10.	3.	1.	0.95	0.55	4.57
HYDROGRAPH AT	SB21CP	107.	4.40	25.	6.	2.	0.14		
DIVERSION TO	21CP.2	15.	4.40	9.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	92.	4.40	17.	4.	2.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	148.	4.47	27.	7.	2.	1.10		
DIVERSION TO	DI21CP	74.	4.47	13.	3.	1.	1.10		
HYDROGRAPH AT	DV21CP	74.	4.47	13.	3.	1.	1.10		
ROUTED TO	RT21CP	74.	4.53	13.	3.	1.	1.10	0.53	4.53
HYDROGRAPH AT	S21CNA	16.	4.13	3.	1.	0.	0.02		
2 COMBINED AT	S19.1	85.	4.50	17.	4.	1.	1.11		
ROUTED TO	S19.2	85.	4.50	17.	4.	1.	1.11		
HYDROGRAPH AT	S19CNA	10.	4.70	4.	1.	0.	0.02		
HYDROGRAPH AT	SBX	16.	4.40	4.	1.	0.	0.02		
3 COMBINED AT	BASN_X	110.	4.50	24.	6.	2.	1.15		
DIVERSION TO	SD42	110.	0.00	24.	6.	2.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		

HYDROGRAPH AT	S21CNB	22.	4.17	4.	1.	0.	0.03		
DIVERSION TO	SD44	7.	4.17	3.	1.	0.	0.03		
HYDROGRAPH AT	SD43	15.	4.17	2.	0.	0.	0.03		
HYDROGRAPH AT	SB19DU	12.	4.33	4.	1.	0.	0.02		
ROUTED TO	RT19DU	11.	4.97	4.	1.	0.	0.02	0.07	4.97
HYDROGRAPH AT	SB19NO	29.	4.27	7.	2.	1.	0.04		
DIVERSION TO	19NO.2	29.	0.00	7.	2.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	256.	4.30	28.	7.	3.	0.00		
ROUTED TO	RD19NO	240.	4.47	28.	7.	3.	0.00	0.78	4.47
3 COMBINED AT	CP19NO	248.	4.47	32.	8.	3.	0.05		
ROUTED TO	RT19NO	226.	4.63	32.	8.	3.	0.05	0.63	4.63
HYDROGRAPH AT	SB19OR	76.	4.43	22.	6.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.43	15.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	46.	4.43	7.	2.	1.	0.10		
HYDROGRAPH AT	RE19OR	70.	4.47	14.	4.	1.	0.00		
ROUTED TO	RD19OR	68.	4.57	14.	4.	1.	0.00	0.35	4.57
3 COMBINED AT	CP19OR	334.	4.63	53.	13.	5.	0.16		
ROUTED TO	RT19OR	327.	4.67	53.	13.	5.	0.16	0.76	4.67
HYDROGRAPH AT	SB19MY	25.	4.37	6.	2.	1.	0.05		
DIVERSION TO	19MY.2	25.	0.00	6.	2.	1.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	105.	4.57	21.	5.	2.	0.00		
ROUTED TO	RD19MY	102.	4.70	21.	5.	2.	0.00	0.59	4.70
3 COMBINED AT	CP19MY	429.	4.70	74.	19.	7.	0.20		
ROUTED TO	RT19MY	425.	4.73	74.	19.	7.	0.20	1.06	4.73
HYDROGRAPH AT	SB19GL	35.	4.43	10.	2.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.43	7.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	20.	4.43	3.	1.	0.	0.05		
HYDROGRAPH AT	RE19GL	110.	4.63	25.	6.	2.	0.00		

ROUTED TO	RD19GL	108.	4.73	25.	6.	2.	0.00	0.61	4.73
3 COMBINED AT	CP19GL	547.	4.73	102.	26.	9.	0.26		
ROUTED TO	RT19GL	528.	4.83	102.	26.	9.	0.26	0.93	4.83
HYDROGRAPH AT	SB19MA	35.	4.37	9.	2.	1.	0.05		
DIVERSION TO	19MA.2	35.	0.00	9.	2.	1.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	528.	4.83	102.	26.	9.	0.31		
ROUTED TO	RT19MA	517.	4.93	102.	26.	9.	0.31	0.98	4.93
HYDROGRAPH AT	SB19BE	34.	4.40	9.	2.	1.	0.06		
DIVERSION TO	19BE.2	30.	4.40	9.	2.	1.	0.06		
HYDROGRAPH AT	19BE.1	4.	4.40	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	517.	4.93	102.	26.	9.	0.37		
ROUTED TO	RT19BE	507.	5.03	102.	26.	9.	0.37	0.97	5.03
HYDROGRAPH AT	SB19MI	41.	4.40	10.	3.	1.	0.08		
DIVERSION TO	19MI.2	41.	0.00	10.	3.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	507.	5.03	102.	26.	9.	0.44		
ROUTED TO	RT19MI	494.	5.13	102.	26.	9.	0.44	1.03	5.13
HYDROGRAPH AT	SB19CA	3.	4.67	2.	1.	0.	0.01		
DIVERSION TO	19CA.2	3.	0.00	2.	1.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	494.	5.13	102.	26.	9.	0.45		
ROUTED TO	RT19CA	482.	5.23	102.	26.	9.	0.45	0.89	5.23
HYDROGRAPH AT	SB19CP	41.	4.37	10.	3.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.37	9.	2.	1.	0.06		
HYDROGRAPH AT	19CP.1	11.	4.37	1.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	74.	4.47	13.	3.	1.	0.00		
ROUTED TO	RD19CP	73.	4.63	13.	3.	1.	0.00	0.41	4.63
3 COMBINED AT	CP19CP	520.	5.23	116.	29.	11.	0.51		
ROUTED TO	RT19CP	518.	5.27	116.	29.	11.	0.51	1.44	5.27

HYDROGRAPH AT	S19CNB	7.	4.73	3.	1.	0.	0.02
DIVERSION TO	19CN.2	7.	0.00	3.	1.	0.	0.02
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	518.	5.27	116.	29.	11.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	3.90	11.00
STORAGE	0.	43.	121.
OUTFLOW	0.	0.	2554.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.95	0.00	33.	0.	0.00	0.00	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX T

PHASE 3 DRAINAGE SYSTEM
10-YEAR, 6-HOUR STORM
FILE: P3-10-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 3, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
  9       ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR 50-YR INFLOW VOLUME
 10       ID            NEW RETENTION BASIN AT 23rd AVE & NORTHERN AVE
 11       ID   10-YEAR 6 HOUR STORM
 12       ID
 13       ID
 14       ID   FILE NAME: P3-10-1.6I
 15       ID   ****************************************************
 16       ID
 17       ID   Project ID: 24TH & CAMELBACK
 18       IT       2                   2000
 19       IO       5
          *DIAGRAM
          *
 20       ID   ****************************************************
 21       ID   FLOWS ALONG 23RD AVE
 22       ID   ****************************************************
 23       ID

 24       KK  SB23DU
 25       KM   SUB-BASIN SB23DU
 26       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 27       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 28       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 29       BA    .179
 30       IN      15
 31       KM   RAINFALL DEPTH OF 1.94 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 32       PB   1.875
 33       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 34       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 35       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 36       PC    .949    .962    .975    .988   1.000
 37       LG    .100    .250   4.300    .366  80.000
 38       UC    .421    .170
 39       UA       0       5      16      30      65      77      84      90      94      97
 40       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
          *
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	156.	4.13	30.	8.	3.	0.18		
ROUTED TO	RT23DU	154.	4.20	30.	8.	3.	0.18	0.71	4.20
HYDROGRAPH AT	SB23BU	125.	4.27	25.	6.	2.	0.22		
2 COMBINED AT	CP23BU	278.	4.23	55.	14.	5.	0.40		
ROUTED TO	RT23BU	277.	4.30	55.	14.	5.	0.40	1.01	4.30
HYDROGRAPH AT	SB23RO	76.	4.20	16.	4.	1.	0.10		
DIVERSION TO	DV23RO	76.	4.43	10.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	68.	4.43	7.	2.	1.	0.10		
2 COMBINED AT	CP23RO	328.	4.43	62.	16.	6.	0.50		
ROUTED TO	RT23RO	318.	4.50	62.	16.	6.	0.50	1.59	4.50
HYDROGRAPH AT	SB23NO	41.	4.13	8.	2.	1.	0.04		
DIVERSION TO	RB23NO	41.	4.20	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	39.	4.20	4.	1.	0.	0.04		
2 COMBINED AT	CP23NO	343.	4.50	65.	16.	6.	0.55		
DIVERSION TO	N23IN	114.	4.50	42.	11.	4.	0.55		
HYDROGRAPH AT	N23RB	229.	4.50	23.	6.	2.	0.55		
DIVERSION TO	DI23NO	155.	4.50	17.	4.	2.	0.55		
HYDROGRAPH AT	DV23NO	74.	4.50	6.	2.	1.	0.55		
ROUTED TO	RT23NO	69.	4.60	6.	2.	1.	0.55	0.48	4.60
HYDROGRAPH AT	SB23OR	76.	4.30	17.	4.	2.	0.12		
2 COMBINED AT	CP23OR	132.	4.57	23.	6.	2.	0.67		
DIVERSION TO	DI23OR	33.	4.57	6.	1.	1.	0.67		
HYDROGRAPH AT	DV23OR	99.	4.57	17.	4.	2.	0.67		
ROUTED TO	RT23OR	98.	4.63	17.	4.	2.	0.67	0.56	4.63
HYDROGRAPH AT	SB23DM	41.	4.17	7.	2.	1.	0.06		
2 COMBINED AT	CP23DM	122.	4.57	25.	6.	2.	0.73		

DIVERSION TO	DI23DM	61.	4.57	12.	3.	1.	0.73		
HYDROGRAPH AT	DV23DM	61.	4.57	12.	3.	1.	0.73		
ROUTED TO	RT23DM	61.	4.67	12.	3.	1.	0.73	0.51	4.67
HYDROGRAPH AT	SB22GL	9.	4.43	2.	1.	0.	0.03		
ROUTED TO	RT22GL	8.	4.67	2.	1.	0.	0.03	0.11	4.67
HYDROGRAPH AT	SB23GL	39.	4.20	7.	2.	1.	0.06		
DIVERSION TO	23GL.2	9.	4.20	3.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	31.	4.20	4.	1.	0.	0.06		
3 COMBINED AT	CP23GL	84.	4.57	18.	5.	2.	0.81		
ROUTED TO	RT23GL	83.	4.70	18.	5.	2.	0.81	0.34	4.70
HYDROGRAPH AT	S23MAA	51.	4.37	12.	3.	1.	0.11		
DIVERSION TO	SD12	10.	4.37	6.	1.	1.	0.11		
HYDROGRAPH AT	SD11	41.	4.37	7.	2.	1.	0.11		
HYDROGRAPH AT	S23MAB	12.	4.40	3.	1.	0.	0.03		
HYDROGRAPH AT	S21MAC	1.	4.67	0.	0.	0.	0.02		
4 COMBINED AT	CP23MA	129.	4.50	28.	7.	3.	0.96		
DIVERSION TO	DI_I	129.	0.00	28.	7.	3.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	5.53
HYDROGRAPH AT	SB23BE	47.	4.40	12.	3.	1.	0.12		
DIVERSION TO	23BE.2	22.	4.40	9.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	25.	4.40	3.	1.	0.	0.12		
2 COMBINED AT	CP23BE	25.	4.40	3.	1.	0.	1.08		
ROUTED TO	RT23BE	24.	4.73	3.	1.	0.	1.08	0.35	4.73
HYDROGRAPH AT	SB23MI	29.	4.70	11.	3.	1.	0.12		
2 COMBINED AT	CP23MI	53.	4.73	14.	4.	1.	1.20		
DIVERSION TO	DI23MI	21.	4.73	5.	1.	1.	1.20		
HYDROGRAPH AT	DV23MI	32.	4.73	8.	2.	1.	1.20		
ROUTED TO	RT23MI	31.	4.87	8.	2.	1.	1.20	0.36	4.87
HYDROGRAPH AT	S23COA	4.	4.43	1.	0.	0.	0.01		

HYDROGRAPH AT	S23COB	21.	4.53	7.	2.	1.	0.05		
3 COMBINED AT	23CO.1	53.	4.80	16.	4.	1.	1.26		
DIVERSION TO	DI23CO	26.	4.80	8.	2.	1.	1.26		
HYDROGRAPH AT	DV23CO	26.	4.80	8.	2.	1.	1.26		
ROUTED TO	RT23CO	26.	4.90	8.	2.	1.	1.26	0.33	4.90
HYDROGRAPH AT	S23CAA	5.	4.33	1.	0.	0.	0.01		
DIVERSION TO	23AA.2	5.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	26.	4.90	8.	2.	1.	1.27		
DIVERSION TO	RBA.2	26.	0.00	8.	2.	1.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	7.07
HYDROGRAPH AT	S23CAB	2.	4.10	0.	0.	0.	0.00		
2 COMBINED AT	CP23CA	2.	4.10	0.	0.	0.	1.27		
DIVERSION TO	DI23CA	2.	0.00	0.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	4.77
HYDROGRAPH AT	RE24CA	2.	4.10	0.	0.	0.	0.00		
ROUTED TO	RD24CA	2.	4.23	0.	0.	0.	0.00	0.03	4.23
HYDROGRAPH AT	SB24CA	27.	4.37	7.	2.	1.	0.05		
2 COMBINED AT	CP24CA	29.	4.37	8.	2.	1.	0.05		
DIVERSION TO	RBC.2	29.	0.00	8.	2.	1.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	5.37
HYDROGRAPH AT	SB23CP	114.	4.27	24.	6.	2.	0.16		
DIVERSION TO	23CP.2	4.	4.27	4.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	110.	4.27	20.	5.	2.	0.16		
3 COMBINED AT	CP23CP	110.	4.27	20.	5.	2.	1.48		
ROUTED TO	RT23CP	108.	4.40	20.	5.	2.	1.48	0.68	4.40
HYDROGRAPH AT	SB23IN	118.	4.30	25.	6.	2.	0.17		

DIVERSION TO	23IN.2	4.	4.30	4.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	114.	4.30	22.	5.	2.	0.17		
2 COMBINED AT	CP23IN	220.	4.37	42.	10.	4.	1.65		
HYDROGRAPH AT	SB21DU	34.	4.53	10.	3.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.53	7.	2.	1.	0.09		
HYDROGRAPH AT	21DU.1	21.	4.53	3.	1.	0.	0.09		
ROUTED TO	RT21DU	20.	4.73	3.	1.	0.	0.09	0.26	4.73
HYDROGRAPH AT	SB21BU	66.	4.33	15.	4.	1.	0.13		
2 COMBINED AT	CP21BU	76.	4.53	18.	5.	2.	0.22		
DIVERSION TO	DI21BU	76.	0.00	18.	5.	2.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	68.	4.33	15.	4.	1.	0.13		
HYDROGRAPH AT	RE21OR	33.	4.57	6.	1.	1.	0.00		
ROUTED TO	RD21OR	32.	4.70	6.	1.	1.	0.00	0.26	4.70
2 COMBINED AT	CP21OR	88.	4.57	21.	5.	2.	0.13		
DIVERSION TO	DI21OR	44.	4.57	11.	3.	1.	0.13		
HYDROGRAPH AT	DV21OR	44.	4.57	11.	3.	1.	0.13		
ROUTED TO	RT21OR	44.	4.63	11.	3.	1.	0.13	0.48	4.63
HYDROGRAPH AT	SB21MY	27.	4.47	7.	2.	1.	0.07		
HYDROGRAPH AT	RE21MY	61.	4.57	12.	3.	1.	0.00		
ROUTED TO	RD21MY	60.	4.73	12.	3.	1.	0.00	0.46	4.73
3 COMBINED AT	CP21MY	127.	4.73	30.	8.	3.	0.19		
DIVERSION TO	DI21MY	63.	4.73	15.	4.	1.	0.19		
HYDROGRAPH AT	DV21MY	63.	4.73	15.	4.	1.	0.19		
ROUTED TO	RT21MY	63.	4.77	15.	4.	1.	0.19	0.52	4.77
HYDROGRAPH AT	SB21GL	18.	4.37	4.	1.	0.	0.04		
2 COMBINED AT	CP21GL	76.	4.73	19.	5.	2.	0.23		
DIVERSION TO	DI21GL	76.	4.73	19.	5.	2.	0.23		
HYDROGRAPH AT	DV21GL	1.	4.73	0.	0.	0.	0.23		
ROUTED TO	RT21GL	0.	5.00	0.	0.	0.	0.23	0.01	5.00

HYDROGRAPH AT	S21MAA	78.	4.10	13.	3.	1.	0.11		
HYDROGRAPH AT	DI_I	129.	4.50	28.	7.	3.	0.00		
HYDROGRAPH AT	S21MAB	22.	4.13	3.	1.	0.	0.04		
4 COMBINED AT	BSN_I	197.	4.33	45.	11.	4.	0.38		
ROUTED TO	WASHPK	0.	0.00	0.	0.	0.	0.38	2.04	10.60
ROUTED TO	M21.1	0.	0.00	0.	0.	0.	0.38		
ROUTED TO	RT21MA	0.	0.00	0.	0.	0.	0.38		
HYDROGRAPH AT	SB21BE	97.	4.30	21.	5.	2.	0.18		
DIVERSION TO	21BE.2	6.	4.30	5.	1.	0.	0.18		
HYDROGRAPH AT	21BE.1	91.	4.30	16.	4.	1.	0.18		
2 COMBINED AT	CP21BE	91.	4.30	16.	4.	1.	0.57		
ROUTED TO	RT21BE	90.	4.37	16.	4.	1.	0.57	0.59	4.37
HYDROGRAPH AT	SB21MO	14.	4.80	6.	2.	1.	0.07		
2 COMBINED AT	CP21MO	102.	4.40	22.	6.	2.	0.64		
ROUTED TO	RT21MO	101.	4.47	22.	6.	2.	0.64	0.71	4.47
HYDROGRAPH AT	SB21MI	24.	4.57	7.	2.	1.	0.09		
HYDROGRAPH AT	RE21MI	21.	4.73	5.	1.	1.	0.00		
ROUTED TO	RD21MI	20.	4.97	5.	1.	1.	0.00	0.19	4.97
3 COMBINED AT	CP21MI	134.	4.53	34.	9.	3.	0.72		
ROUTED TO	RT21MI	133.	4.67	34.	9.	3.	0.72	0.81	4.67
HYDROGRAPH AT	S21CAA	20.	4.50	6.	2.	1.	0.05		
HYDROGRAPH AT	S22CAA	19.	4.43	5.	1.	0.	0.05		
DIVERSION TO	SD34	10.	4.43	4.	1.	0.	0.05		
HYDROGRAPH AT	SD33	9.	4.43	1.	0.	0.	0.05		
HYDROGRAPH AT	RE22CA	26.	4.80	8.	2.	1.	0.00		
ROUTED TO	RD22CA	22.	5.37	8.	2.	1.	0.00	0.21	5.37
HYDROGRAPH AT	RBA.2	26.	4.90	8.	2.	1.	0.00		
5 COMBINED AT	DBA-1	194.	4.70	57.	15.	5.	0.82		
HYDROGRAPH AT	RBC.2	29.	4.37	8.	2.	1.	0.00		
HYDROGRAPH AT	S22CAB	8.	4.03	1.	0.	0.	0.01		

HYDROGRAPH AT	S21CAC	4.	4.03	1.	0.	0.	0.00		
3 COMBINED AT	DBA-2	37.	4.27	10.	2.	1.	0.01		
2 COMBINED AT	DBA-3	221.	4.63	66.	17.	6.	0.83		
DIVERSION TO	SD36	221.	0.00	66.	17.	6.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	4.83
HYDROGRAPH AT	S21CAB	56.	4.50	15.	4.	1.	0.12		
DIVERSION TO	21CA.2	18.	4.50	9.	2.	1.	0.12		
HYDROGRAPH AT	21CA.1	38.	4.50	6.	2.	1.	0.12		
2 COMBINED AT	CP21CA	38.	4.50	6.	2.	1.	0.95		
ROUTED TO	RT21CA	37.	4.73	6.	2.	1.	0.95	0.44	4.73
HYDROGRAPH AT	SB21CP	79.	4.47	20.	5.	2.	0.14		
DIVERSION TO	21CP.2	15.	4.47	8.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	64.	4.47	11.	3.	1.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	95.	4.57	18.	4.	2.	1.10		
DIVERSION TO	DI21CP	47.	4.57	9.	2.	1.	1.10		
HYDROGRAPH AT	DV21CP	47.	4.57	9.	2.	1.	1.10		
ROUTED TO	RT21CP	47.	4.63	9.	2.	1.	1.10	0.44	4.63
HYDROGRAPH AT	S21CNA	12.	4.17	2.	1.	0.	0.02		
2 COMBINED AT	S19.1	55.	4.60	11.	3.	1.	1.11		
ROUTED TO	S19.2	55.	4.63	11.	3.	1.	1.11		
HYDROGRAPH AT	S19CNA	7.	4.80	3.	1.	0.	0.02		
HYDROGRAPH AT	SBX	12.	4.47	3.	1.	0.	0.02		
3 COMBINED AT	BASN_X	72.	4.63	17.	4.	2.	1.15		
DIVERSION TO	SD42	72.	0.00	17.	4.	2.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		

HYDROGRAPH AT	S21CNB	16.	4.20	3.	1.	0.	0.03		
DIVERSION TO	SD44	7.	4.20	2.	1.	0.	0.03		
HYDROGRAPH AT	SD43	9.	4.20	1.	0.	0.	0.03		
HYDROGRAPH AT	SB19DU	9.	4.37	3.	1.	0.	0.02		
ROUTED TO	RT19DU	9.	5.00	3.	1.	0.	0.02	0.05	5.00
HYDROGRAPH AT	SB19NO	23.	4.30	6.	1.	1.	0.04		
DIVERSION TO	19NO.2	23.	0.00	6.	1.	1.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	155.	4.50	17.	4.	2.	0.00		
ROUTED TO	RD19NO	143.	4.67	17.	4.	2.	0.00	0.59	4.67
3 COMBINED AT	CP19NO	150.	4.67	20.	5.	2.	0.05		
ROUTED TO	RT19NO	138.	4.80	20.	5.	2.	0.05	0.49	4.80
HYDROGRAPH AT	SB19OR	58.	4.47	18.	5.	2.	0.10		
DIVERSION TO	19OR.2	30.	4.47	14.	4.	1.	0.10		
HYDROGRAPH AT	19OR.1	28.	4.47	4.	1.	0.	0.10		
HYDROGRAPH AT	RE19OR	44.	4.57	11.	3.	1.	0.00		
ROUTED TO	RD19OR	43.	4.63	11.	3.	1.	0.00	0.27	4.63
3 COMBINED AT	CP19OR	200.	4.80	34.	9.	3.	0.16		
ROUTED TO	RT19OR	194.	4.87	34.	9.	3.	0.16	0.58	4.87
HYDROGRAPH AT	SB19MY	16.	4.47	4.	1.	0.	0.05		
DIVERSION TO	19MY.2	16.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	63.	4.73	15.	4.	1.	0.00		
ROUTED TO	RD19MY	62.	4.83	15.	4.	1.	0.00	0.46	4.83
3 COMBINED AT	CP19MY	256.	4.87	49.	12.	4.	0.20		
ROUTED TO	RT19MY	253.	4.93	49.	12.	4.	0.20	0.80	4.93
HYDROGRAPH AT	SB19GL	25.	4.50	7.	2.	1.	0.05		
DIVERSION TO	19GL.2	15.	4.50	6.	2.	1.	0.05		
HYDROGRAPH AT	19GL.1	10.	4.50	1.	0.	0.	0.05		
HYDROGRAPH AT	RE19GL	76.	4.73	19.	5.	2.	0.00		

ROUTED TO	RD19GL	75.	4.83	19.	5.	2.	0.00	0.51	4.83
3 COMBINED AT	CP19GL	332.	4.90	70.	18.	6.	0.26		
ROUTED TO	RT19GL	318.	5.00	70.	18.	6.	0.26	0.71	5.00
HYDROGRAPH AT	SB19MA	25.	4.43	7.	2.	1.	0.05		
DIVERSION TO	19MA.2	25.	0.00	7.	2.	1.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	318.	5.00	70.	18.	6.	0.31		
ROUTED TO	RT19MA	311.	5.13	70.	18.	6.	0.31	0.74	5.13
HYDROGRAPH AT	SB19BE	24.	4.47	7.	2.	1.	0.06		
DIVERSION TO	19BE.2	24.	0.00	7.	2.	1.	0.06		
HYDROGRAPH AT	19BE.1	0.	0.00	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	311.	5.13	70.	18.	6.	0.37		
ROUTED TO	RT19BE	304.	5.23	70.	18.	6.	0.37	0.74	5.23
HYDROGRAPH AT	SB19MI	26.	4.50	7.	2.	1.	0.08		
DIVERSION TO	19MI.2	26.	0.00	7.	2.	1.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	304.	5.23	70.	18.	6.	0.44		
ROUTED TO	RT19MI	295.	5.37	69.	18.	6.	0.44	0.78	5.37
HYDROGRAPH AT	SB19CA	3.	4.73	1.	0.	0.	0.01		
DIVERSION TO	19CA.2	3.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	295.	5.37	69.	18.	6.	0.45		
ROUTED TO	RT19CA	286.	5.50	69.	18.	6.	0.45	0.68	5.50
HYDROGRAPH AT	SB19CP	31.	4.40	8.	2.	1.	0.06		
DIVERSION TO	19CP.2	30.	4.40	8.	2.	1.	0.06		
HYDROGRAPH AT	19CP.1	1.	4.40	0.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	47.	4.57	9.	2.	1.	0.00		
ROUTED TO	RD19CP	47.	4.70	9.	2.	1.	0.00	0.31	4.70
3 COMBINED AT	CP19CP	305.	5.50	78.	20.	7.	0.51		
ROUTED TO	RT19CP	304.	5.57	78.	20.	7.	0.51	1.07	5.57

HYDROGRAPH AT	S19CNB	5.	4.87	2.	1.	0.	0.02
DIVERSION TO	19CN.2	5.	0.00	2.	1.	0.	0.02
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	304.	5.57	78.	20.	7.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	3.90	11.00
STORAGE	0.	43.	121.
OUTFLOW	0.	0.	2554.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.04	0.00	23.	0.	0.00	0.00	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX U

PHASE 3 DRAINAGE SYSTEM
2-YEAR, 6-HOUR STORM
FILE: P3-2-1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID
  2       ID   ****************************************************
  3       ID   24TH AVENUE & CAMELBACK ROAD DRAINAGE STUDY
  4       ID   PHOENIX, ARIZONA
  5       ID   MODELED BY PREMIER ENGINEERING
  6       ID   MARCH 2003, REVISED AUGUST 2003
  7       ID
  8       ID   PHASE 3, SINGLE RETENTION BASIN AT CAMELBACK ROAD, 25-YEAR VOLUME
  9       ID            NEW RETENTION BASIN AT WASHINGTON PARK FOR 50-YR INFLOW VOLUME
 10       ID            NEW RETENTION BASIN AT 23rd AVE & NORTHERN AVE
 11       ID   2-YEAR 6 HOUR STORM
 12       ID
 13       ID
 14       ID   FILE NAME: P3-2-1.6I
 15       ID   ****************************************************
 16       ID
 17       ID   Project ID: 24TH & CAMELBACK
 18       IT       2                    2000
 19       IO       5
          *DIAGRAM
          *
 20       ID   ****************************************************
 21       ID   FLOWS ALONG 23RD AVE
 22       ID   ****************************************************
 23       ID

 24       KK  SB23DU
 25       KM   SUB-BASIN SB23DU
 26       KM   6-HOUR RAINFALL, PATTERN NO. 2.20 WAS USED TO FIND TC & R FOR THIS BASIN
 27       KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .967
 28       KM     L =  .37  Kb = .052  Adj. Slope =   38.0
 29       BA    .179
 30       IN      15
 31       KM   RAINFALL DEPTH OF 1.20 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 32       PB   1.160
 33       KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.20
 34       PC    .000    .010    .017    .026    .037    .046    .056    .065    .075    .085
 35       PC    .097    .111    .131    .175    .263    .455    .689    .829    .893    .933
 36       PC    .949    .962    .975    .988   1.000
 37       LG    .100    .250   4.300    .366  80.000
 38       UC    .529    .220
 39       UA       0       5      16      30      65      77      84      90      94      97
 40       UA     100
          *
          *  KK23DU.1
          *  KM REMOVE INTERCEPTED STORM DRAIN FLOWS FROM TOTAL SUBBASIN RUNOFF
          *  KM SB23DU, 9 CBs IN SUBBASIN, 27", 30" and 36" SD ALONG NORTH SIDE OF DUNLAP
          *  KM REMOVE CAPACITY OF 30" SD. ASSUME QFULL = 12.92
          *  KM SO=0.001 AND N = 0.013
          *  KM THIS DIVERT IS NOT RETRIEVED BACK INTO THE MODEL
          *  DT23DU.2
          *  DI      0      13   10000
          *  DQ      0      13      13
          *
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB23DU	82.	4.17	18.	4.	2.	0.18		
ROUTED TO	RT23DU	81.	4.30	18.	4.	2.	0.18	0.52	4.30
HYDROGRAPH AT	SB23BU	46.	4.43	13.	3.	1.	0.22		
2 COMBINED AT	CP23BU	126.	4.33	30.	8.	3.	0.40		
ROUTED TO	RT23BU	126.	4.43	30.	8.	3.	0.40	0.68	4.43
HYDROGRAPH AT	SB23RO	37.	4.33	9.	2.	1.	0.10		
DIVERSION TO	DV23RO	37.	0.00	9.	2.	1.	0.10		
HYDROGRAPH AT	RN23RO	0.	0.00	0.	0.	0.	0.10		
2 COMBINED AT	CP23RO	126.	4.43	30.	8.	3.	0.50		
ROUTED TO	RT23RO	125.	4.50	30.	8.	3.	0.50	0.96	4.50
HYDROGRAPH AT	SB23NO	23.	4.20	5.	1.	0.	0.04		
DIVERSION TO	RB23NO	23.	5.07	4.	1.	0.	0.04		
HYDROGRAPH AT	RN23NO	5.	5.07	0.	0.	0.	0.04		
2 COMBINED AT	CP23NO	125.	4.50	31.	8.	3.	0.55		
DIVERSION TO	N23IN	114.	4.50	30.	8.	3.	0.55		
HYDROGRAPH AT	N23RB	11.	4.50	0.	0.	0.	0.55		
DIVERSION TO	DI23NO	11.	0.00	0.	0.	0.	0.55		
HYDROGRAPH AT	DV23NO	0.	0.00	0.	0.	0.	0.55		
ROUTED TO	RT23NO	0.	0.00	0.	0.	0.	0.55		
HYDROGRAPH AT	SB23OR	31.	4.50	9.	2.	1.	0.12		
2 COMBINED AT	CP23OR	31.	4.50	9.	2.	1.	0.67		
DIVERSION TO	DI23OR	8.	4.50	2.	1.	0.	0.67		
HYDROGRAPH AT	DV23OR	23.	4.50	7.	2.	1.	0.67		
ROUTED TO	RT23OR	23.	4.60	7.	2.	1.	0.67	0.28	4.60
HYDROGRAPH AT	SB23DM	17.	4.33	4.	1.	0.	0.06		
2 COMBINED AT	CP23DM	39.	4.47	10.	3.	1.	0.73		

DIVERSION TO	DI23DM	19.	4.47	5.	1.	0.	0.73		
HYDROGRAPH AT	DV23DM	19.	4.47	5.	1.	0.	0.73		
ROUTED TO	RT23DM	19.	4.60	5.	1.	0.	0.73	0.29	4.60
HYDROGRAPH AT	SB22GL	2.	4.70	1.	0.	0.	0.03		
ROUTED TO	RT22GL	2.	4.93	1.	0.	0.	0.03	0.03	4.97
HYDROGRAPH AT	SB23GL	15.	4.37	3.	1.	0.	0.06		
DIVERSION TO	23GL.2	9.	4.37	3.	1.	0.	0.06		
HYDROGRAPH AT	23GL.1	7.	4.37	1.	0.	0.	0.06		
3 COMBINED AT	CP23GL	26.	4.50	7.	2.	1.	0.81		
ROUTED TO	RT23GL	24.	4.83	7.	2.	1.	0.81	0.15	4.83
HYDROGRAPH AT	S23MAA	18.	4.57	6.	2.	1.	0.11		
DIVERSION TO	SD12	10.	4.57	5.	1.	0.	0.11		
HYDROGRAPH AT	SD11	8.	4.57	1.	0.	0.	0.11		
HYDROGRAPH AT	S23MAB	4.	4.57	2.	0.	0.	0.03		
HYDROGRAPH AT	S21MAC	0.	0.00	0.	0.	0.	0.02		
4 COMBINED AT	CP23MA	36.	4.80	9.	2.	1.	0.96		
DIVERSION TO	DI_I	36.	0.00	9.	2.	1.	0.96		
HYDROGRAPH AT	DV_I	0.	0.00	0.	0.	0.	0.96		
ROUTED TO	RT23MA	0.	0.00	0.	0.	0.	0.96	0.00	5.33
HYDROGRAPH AT	SB23BE	17.	4.63	6.	2.	1.	0.12		
DIVERSION TO	23BE.2	17.	0.00	6.	2.	1.	0.12		
HYDROGRAPH AT	23BE.1	0.	0.00	0.	0.	0.	0.12		
2 COMBINED AT	CP23BE	0.	0.00	0.	0.	0.	1.08		
ROUTED TO	RT23BE	0.	0.00	0.	0.	0.	1.08	0.00	5.80
HYDROGRAPH AT	SB23MI	11.	4.97	5.	1.	0.	0.12		
2 COMBINED AT	CP23MI	11.	4.97	5.	1.	0.	1.20		
DIVERSION TO	DI23MI	4.	4.97	2.	1.	0.	1.20		
HYDROGRAPH AT	DV23MI	7.	4.97	3.	1.	0.	1.20		
ROUTED TO	RT23MI	7.	5.20	3.	1.	0.	1.20	0.15	5.20
HYDROGRAPH AT	S23COA	1.	4.63	1.	0.	0.	0.01		

HYDROGRAPH AT	S23COB	8.	4.73	3.	1.	0.	0.05		
3 COMBINED AT	23CO.1	16.	4.93	7.	2.	1.	1.26		
DIVERSION TO	DI23CO	8.	4.93	4.	1.	0.	1.26		
HYDROGRAPH AT	DV23CO	8.	4.93	4.	1.	0.	1.26		
ROUTED TO	RT23CO	8.	5.10	4.	1.	0.	1.26	0.18	5.10
HYDROGRAPH AT	S23CAA	2.	4.43	1.	0.	0.	0.01		
DIVERSION TO	23AA.2	2.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	23AA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	23CA.1	8.	5.10	4.	1.	0.	1.27		
DIVERSION TO	RBA.2	8.	0.00	4.	1.	0.	1.27		
HYDROGRAPH AT	RBA.1	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	C23.1	0.	0.00	0.	0.	0.	1.27	0.00	2.00
HYDROGRAPH AT	S23CAB	1.	4.17	0.	0.	0.	0.00		
2 COMBINED AT	CP23CA	1.	4.17	0.	0.	0.	1.27		
DIVERSION TO	DI23CA	1.	0.00	0.	0.	0.	1.27		
HYDROGRAPH AT	DV23CA	0.	0.00	0.	0.	0.	1.27		
ROUTED TO	RT23CA	0.	0.00	0.	0.	0.	1.27	0.00	5.07
HYDROGRAPH AT	RE24CA	1.	4.17	0.	0.	0.	0.00		
ROUTED TO	RD24CA	1.	4.33	0.	0.	0.	0.00	0.02	4.33
HYDROGRAPH AT	SB24CA	12.	4.53	4.	1.	0.	0.05		
2 COMBINED AT	CP24CA	13.	4.50	4.	1.	0.	0.05		
DIVERSION TO	RBC.2	13.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	C.2OUT	0.	0.00	0.	0.	0.	0.05		
ROUTED TO	RT24CA	0.	0.00	0.	0.	0.	0.05	0.00	4.90
HYDROGRAPH AT	SB23CP	53.	4.40	13.	3.	1.	0.16		
DIVERSION TO	23CP.2	4.	4.40	3.	1.	0.	0.16		
HYDROGRAPH AT	23CP.1	49.	4.40	10.	2.	1.	0.16		
3 COMBINED AT	CP23CP	49.	4.40	10.	2.	1.	1.48		
ROUTED TO	RT23CP	48.	4.60	10.	2.	1.	1.48	0.47	4.60
HYDROGRAPH AT	SB23IN	53.	4.47	14.	3.	1.	0.17		

DIVERSION TO	23IN.2	4.	4.47	3.	1.	0.	0.17		
HYDROGRAPH AT	23IN.1	49.	4.47	10.	3.	1.	0.17		
2 COMBINED AT	CP23IN	96.	4.57	20.	5.	2.	1.65		
HYDROGRAPH AT	SB21DU	14.	4.73	5.	1.	1.	0.09		
DIVERSION TO	21DU.2	13.	4.73	5.	1.	1.	0.09		
HYDROGRAPH AT	21DU.1	1.	4.73	0.	0.	0.	0.09		
ROUTED TO	RT21DU	1.	5.10	0.	0.	0.	0.09	0.01	5.10
HYDROGRAPH AT	SB21BU	23.	4.53	7.	2.	1.	0.13		
2 COMBINED AT	CP21BU	23.	4.53	7.	2.	1.	0.22		
DIVERSION TO	DI21BU	23.	0.00	7.	2.	1.	0.22		
HYDROGRAPH AT	DV21BU	0.	0.00	0.	0.	0.	0.22		
HYDROGRAPH AT	SB21OR	24.	4.57	7.	2.	1.	0.13		
HYDROGRAPH AT	RE21OR	8.	4.50	2.	1.	0.	0.00		
ROUTED TO	RD21OR	7.	4.73	2.	1.	0.	0.00	0.07	4.73
2 COMBINED AT	CP21OR	31.	4.60	10.	2.	1.	0.13		
DIVERSION TO	DI21OR	16.	4.60	5.	1.	0.	0.13		
HYDROGRAPH AT	DV21OR	16.	4.60	5.	1.	0.	0.13		
ROUTED TO	RT21OR	16.	4.73	5.	1.	0.	0.13	0.28	4.73
HYDROGRAPH AT	SB21MY	8.	4.73	3.	1.	0.	0.07		
HYDROGRAPH AT	RE21MY	19.	4.47	5.	1.	0.	0.00		
ROUTED TO	RD21MY	19.	4.70	5.	1.	0.	0.00	0.24	4.70
3 COMBINED AT	CP21MY	42.	4.73	13.	3.	1.	0.19		
DIVERSION TO	DI21MY	21.	4.73	6.	2.	1.	0.19		
HYDROGRAPH AT	DV21MY	21.	4.73	6.	2.	1.	0.19		
ROUTED TO	RT21MY	21.	4.83	6.	2.	1.	0.19	0.30	4.83
HYDROGRAPH AT	SB21GL	5.	4.60	2.	1.	0.	0.04		
2 COMBINED AT	CP21GL	26.	4.83	8.	2.	1.	0.23		
DIVERSION TO	DI21GL	26.	0.00	8.	2.	1.	0.23		
HYDROGRAPH AT	DV21GL	0.	0.00	0.	0.	0.	0.23		
ROUTED TO	RT21GL	0.	0.00	0.	0.	0.	0.23		

HYDROGRAPH AT	S21MAA	31.	4.17	7.	2.	1.	0.11		
HYDROGRAPH AT	DI_I	36.	4.80	9.	2.	1.	0.00		
HYDROGRAPH AT	S21MAB	6.	4.27	1.	0.	0.	0.04		
4 COMBINED AT	BSN_I	57.	4.57	17.	5.	2.	0.38		
ROUTED TO	WASHPK	0.	0.00	0.	0.	0.	0.38	0.81	13.60
ROUTED TO	M21.1	0.	0.00	0.	0.	0.	0.38		
ROUTED TO	RT21MA	0.	0.00	0.	0.	0.	0.38		
HYDROGRAPH AT	SB21BE	36.	4.53	11.	3.	1.	0.18		
DIVERSION TO	21BE.2	6.	4.53	4.	1.	0.	0.18		
HYDROGRAPH AT	21BE.1	30.	4.53	6.	2.	1.	0.18		
2 COMBINED AT	CP21BE	30.	4.53	6.	2.	1.	0.57		
ROUTED TO	RT21BE	29.	4.60	6.	2.	1.	0.57	0.34	4.60
HYDROGRAPH AT	SB21MO	5.	5.03	3.	1.	0.	0.07		
2 COMBINED AT	CP21MO	34.	4.63	9.	2.	1.	0.64		
ROUTED TO	RT21MO	34.	4.77	9.	2.	1.	0.64	0.42	4.77
HYDROGRAPH AT	SB21MI	7.	4.90	3.	1.	0.	0.09		
HYDROGRAPH AT	RE21MI	4.	4.93	2.	1.	0.	0.00		
ROUTED TO	RD21MI	4.	5.20	2.	1.	0.	0.00	0.04	5.20
3 COMBINED AT	CP21MI	45.	4.80	14.	4.	1.	0.72		
ROUTED TO	RT21MI	44.	4.97	14.	4.	1.	0.72	0.48	4.97
HYDROGRAPH AT	S21CAA	7.	4.73	3.	1.	0.	0.05		
HYDROGRAPH AT	S22CAA	7.	4.67	3.	1.	0.	0.05		
DIVERSION TO	SD34	7.	0.00	3.	1.	0.	0.05		
HYDROGRAPH AT	SD33	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE22CA	8.	4.93	4.	1.	0.	0.00		
ROUTED TO	RD22CA	7.	5.57	4.	1.	0.	0.00	0.07	5.57
HYDROGRAPH AT	RBA.2	8.	5.10	4.	1.	0.	0.00		
5 COMBINED AT	DBA-1	65.	5.00	24.	6.	2.	0.82		
HYDROGRAPH AT	RBC.2	13.	4.50	4.	1.	0.	0.00		
HYDROGRAPH AT	S22CAB	4.	4.07	1.	0.	0.	0.01		

HYDROGRAPH AT	S21CAC	2.	4.07	0.	0.	0.	0.00		
3 COMBINED AT	DBA-2	17.	4.30	5.	1.	0.	0.01		
2 COMBINED AT	DBA-3	75.	4.93	29.	8.	3.	0.83		
DIVERSION TO	SD36	75.	0.00	29.	8.	3.	0.83		
HYDROGRAPH AT	SD35	0.	0.00	0.	0.	0.	0.83		
DIVERSION TO	DI22CA	0.	0.00	0.	0.	0.	0.83		
HYDROGRAPH AT	DV22CA	0.	0.00	0.	0.	0.	0.83		
ROUTED TO	RT22CA	0.	0.00	0.	0.	0.	0.83	0.00	5.90
HYDROGRAPH AT	S21CAB	20.	4.70	7.	2.	1.	0.12		
DIVERSION TO	21CA.2	18.	4.70	7.	2.	1.	0.12		
HYDROGRAPH AT	21CA.1	2.	4.70	0.	0.	0.	0.12		
2 COMBINED AT	CP21CA	2.	4.70	0.	0.	0.	0.95		
ROUTED TO	RT21CA	2.	5.17	0.	0.	0.	0.95	0.04	5.17
HYDROGRAPH AT	SB21CP	31.	4.67	10.	3.	1.	0.14		
DIVERSION TO	21CP.2	15.	4.67	7.	2.	1.	0.14		
HYDROGRAPH AT	21CP.1	16.	4.67	2.	1.	0.	0.14		
HYDROGRAPH AT	RE22CA	0.	0.00	0.	0.	0.	0.00		
ROUTED TO	RD22CA	0.	0.00	0.	0.	0.	0.00		
3 COMBINED AT	CP21CP	16.	4.67	3.	1.	0.	1.10		
DIVERSION TO	DI21CP	8.	4.67	1.	0.	0.	1.10		
HYDROGRAPH AT	DV21CP	8.	4.67	1.	0.	0.	1.10		
ROUTED TO	RT21CP	8.	4.83	1.	0.	0.	1.10	0.15	4.83
HYDROGRAPH AT	S21CNA	5.	4.33	1.	0.	0.	0.02		
2 COMBINED AT	S19.1	11.	4.70	3.	1.	0.	1.11		
ROUTED TO	S19.2	11.	4.77	3.	1.	0.	1.11		
HYDROGRAPH AT	S19CNA	3.	5.00	1.	0.	0.	0.02		
HYDROGRAPH AT	SBX	5.	4.67	1.	0.	0.	0.02		
3 COMBINED AT	BASN_X	19.	4.77	5.	1.	1.	1.15		
DIVERSION TO	SD42	19.	0.00	5.	1.	1.	1.15		
HYDROGRAPH AT	SD41	0.	0.00	0.	0.	0.	1.15		

HYDROGRAPH AT	S21CNB	6.	4.37	2.	0.	0.	0.03		
DIVERSION TO	SD44	6.	0.00	2.	0.	0.	0.03		
HYDROGRAPH AT	SD43	0.	0.00	0.	0.	0.	0.03		
HYDROGRAPH AT	SB19DU	5.	4.47	2.	0.	0.	0.02		
ROUTED TO	RT19DU	4.	5.13	2.	0.	0.	0.02	0.03	5.13
HYDROGRAPH AT	SB19NO	11.	4.40	3.	1.	0.	0.04		
DIVERSION TO	19NO.2	11.	0.00	3.	1.	0.	0.04		
HYDROGRAPH AT	19NO.1	0.	0.00	0.	0.	0.	0.04		
HYDROGRAPH AT	RE19NO	11.	4.50	0.	0.	0.	0.00		
ROUTED TO	RD19NO	5.	4.90	0.	0.	0.	0.00	0.05	4.90
3 COMBINED AT	CP19NO	9.	4.93	2.	1.	0.	0.05		
ROUTED TO	RT19NO	7.	5.23	2.	1.	0.	0.05	0.05	5.23
HYDROGRAPH AT	SB19OR	29.	4.63	10.	3.	1.	0.10		
DIVERSION TO	19OR.2	29.	0.00	10.	3.	1.	0.10		
HYDROGRAPH AT	19OR.1	0.	0.00	0.	0.	0.	0.10		
HYDROGRAPH AT	RE19OR	16.	4.60	5.	1.	0.	0.00		
ROUTED TO	RD19OR	15.	4.80	5.	1.	0.	0.00	0.12	4.80
3 COMBINED AT	CP19OR	20.	5.07	7.	2.	1.	0.16		
ROUTED TO	RT19OR	20.	5.23	7.	2.	1.	0.16	0.13	5.23
HYDROGRAPH AT	SB19MY	5.	4.70	2.	1.	0.	0.05		
DIVERSION TO	19MY.2	5.	0.00	2.	1.	0.	0.05		
HYDROGRAPH AT	19MY.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19MY	21.	4.73	6.	2.	1.	0.00		
ROUTED TO	RD19MY	20.	5.00	6.	2.	1.	0.00	0.25	5.00
3 COMBINED AT	CP19MY	39.	5.10	13.	3.	1.	0.20		
ROUTED TO	RT19MY	39.	5.23	13.	3.	1.	0.20	0.28	5.23
HYDROGRAPH AT	SB19GL	10.	4.67	4.	1.	0.	0.05		
DIVERSION TO	19GL.2	10.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19GL.1	0.	0.00	0.	0.	0.	0.05		
HYDROGRAPH AT	RE19GL	26.	4.83	8.	2.	1.	0.00		

ROUTED TO	RD19GL	25.	5.03	8.	2.	1.	0.00	0.27	5.03
3 COMBINED AT	CP19GL	63.	5.17	21.	6.	2.	0.26		
ROUTED TO	RT19GL	60.	5.40	21.	6.	2.	0.26	0.28	5.40
HYDROGRAPH AT	SB19MA	11.	4.57	4.	1.	0.	0.05		
DIVERSION TO	19MA.2	11.	0.00	4.	1.	0.	0.05		
HYDROGRAPH AT	19MA.1	0.	0.00	0.	0.	0.	0.05		
2 COMBINED AT	CP19MA	60.	5.40	21.	6.	2.	0.31		
ROUTED TO	RT19MA	58.	5.63	21.	6.	2.	0.31	0.29	5.63
HYDROGRAPH AT	SB19BE	10.	4.67	4.	1.	0.	0.06		
DIVERSION TO	19BE.2	10.	0.00	4.	1.	0.	0.06		
HYDROGRAPH AT	19BE.1	0.	0.00	0.	0.	0.	0.06		
2 COMBINED AT	CP19BE	58.	5.63	21.	6.	2.	0.37		
ROUTED TO	RT19BE	57.	5.87	21.	6.	2.	0.37	0.29	5.87
HYDROGRAPH AT	SB19MI	9.	4.73	4.	1.	0.	0.08		
DIVERSION TO	19MI.2	9.	0.00	4.	1.	0.	0.08		
HYDROGRAPH AT	19MI.1	0.	0.00	0.	0.	0.	0.08		
2 COMBINED AT	CP19MI	57.	5.87	21.	6.	2.	0.44		
ROUTED TO	RT19MI	54.	6.13	21.	6.	2.	0.44	0.31	6.13
HYDROGRAPH AT	SB19CA	1.	5.33	1.	0.	0.	0.01		
DIVERSION TO	19CA.2	1.	0.00	1.	0.	0.	0.01		
HYDROGRAPH AT	19CA.1	0.	0.00	0.	0.	0.	0.01		
2 COMBINED AT	CP19CA	54.	6.13	21.	6.	2.	0.45		
ROUTED TO	RT19CA	53.	6.33	21.	6.	2.	0.45	0.26	6.33
HYDROGRAPH AT	SB19CP	13.	4.57	4.	1.	0.	0.06		
DIVERSION TO	19CP.2	13.	0.00	4.	1.	0.	0.06		
HYDROGRAPH AT	19CP.1	0.	0.00	0.	0.	0.	0.06		
HYDROGRAPH AT	RE19CP	8.	4.67	1.	0.	0.	0.00		
ROUTED TO	RD19CP	8.	4.93	1.	0.	0.	0.00	0.07	4.93
3 COMBINED AT	CP19CP	53.	6.33	23.	6.	2.	0.51		
ROUTED TO	RT19CP	52.	6.50	23.	6.	2.	0.51	0.42	6.50

HYDROGRAPH AT	S19CNB	2.	5.03	1.	0.	0.	0.02
DIVERSION TO	19CN.2	2.	0.00	1.	0.	0.	0.02
HYDROGRAPH AT	19CN.1	0.	0.00	0.	0.	0.	0.02
2 COMBINED AT	CP19CN	52.	6.50	23.	6.	2.	0.53

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION WASHPK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	3.90	11.00
STORAGE	0.	43.	121.
OUTFLOW	0.	0.	2554.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	0.81	0.00	9.	0.	0.00	0.00	0.00

*** NORMAL END OF HEC-1 ***

APPENDIX V

HEC-2 FILES
STREET FLOODING/DAMAGE ANALYSIS

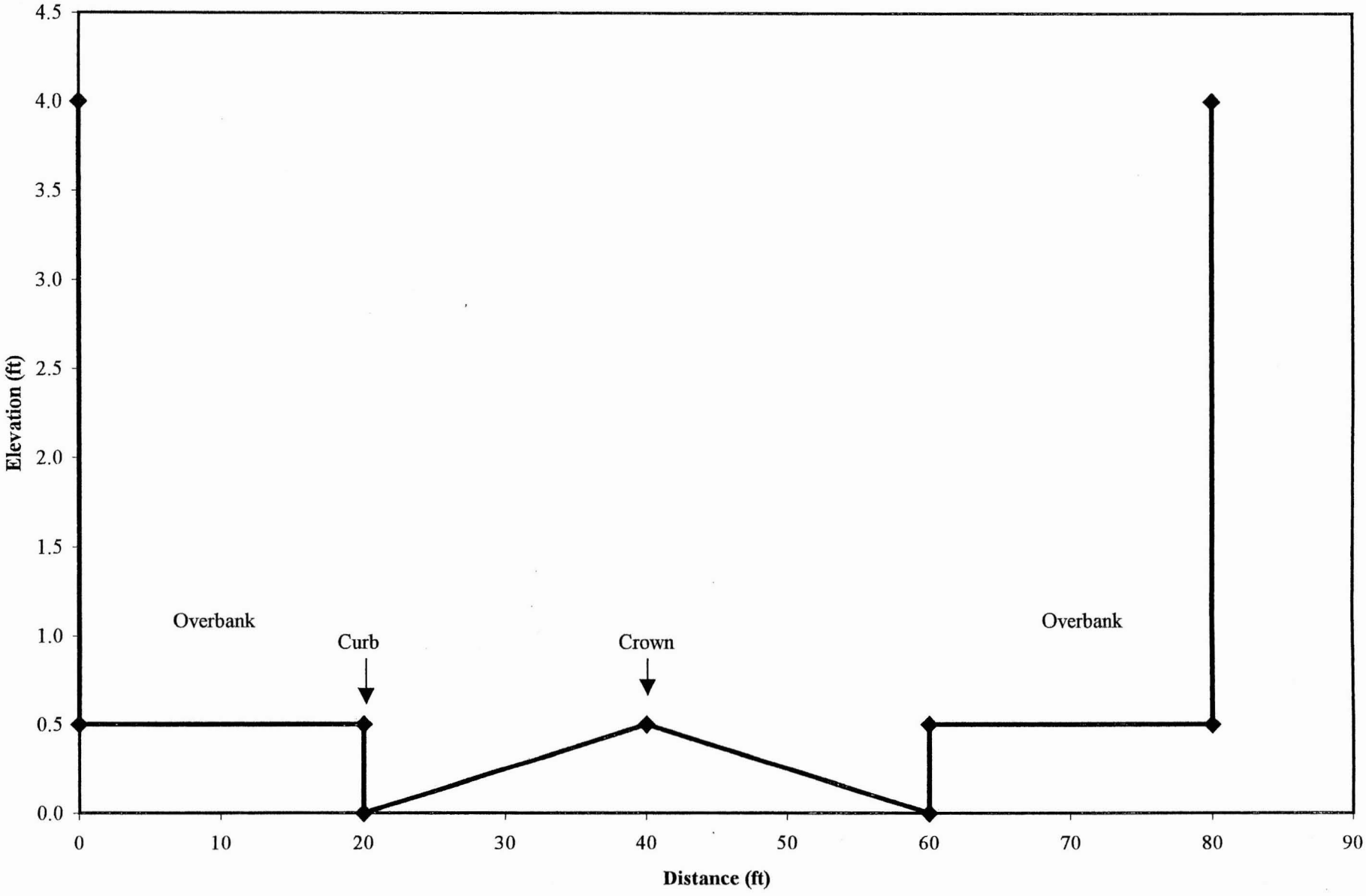
HEC-2 ANALYSIS

Table 3
Summary Of HEC-2 Files Used For Flood Damage Assessment
24th Avenue & Camelback Road Drainage Improvements
March 2003

HEC-2 Input File Name	Applicable Location	Pavement Width (ft)	Overbank Width Each Side (ft)	Slope (ft/ft)
CAMEL1.IN	Not Used	68	20	0.00280
CAMEL2.IN	Not Used	40	20	0.00670
CAMEL3.IN	21st Avenue, Camelback Road to Heatherbrae Drive	48	20	0.00330
CAMEL4.IN	Roma, East of 21st Avenue & 21st Avenue, Camelback Road to Heatherbrae Drive	32	20	0.00050
CAMEL5.IN	Campbell, East of 21st Avenue	46	20	0.00050
CAMEL6.IN	Turney, East of 21st Avenue	36	20	0.00200
CAMEL7.IN	Not Used	32	20	0.00060
CAMEL8.IN	21st Avenue, Camelback Road to Heatherbrae Drive	40	20	0.00340
CAMEL9.IN	Not Used	32	20	0.00220
CAMEL10.IN	20th Avenue, South of Turney	48	20	0.00050
CAMEL11.IN	21st Avenue, Maryland Avenue to Camelback Road	36	20	0.00350
CAMEL12.IN	21st Avenue, Maryland Avenue to Camelback Road	40	20	0.00350
CAMEL13.IN	23rd Avenue, Maryland Avenue to Camelback Road	40	20	0.00400
CAMEL14.IN	23rd Avenue, Maryland Avenue to Camelback Road	40	20	0.00320
CAMEL15.IN	23rd Avenue, Maryland Avenue to Camelback Road	40	20	0.00245
CAMEL16.IN	24th Avenue, Orange Drive To Camelback Road	28	20	0.00270

File: 24th & Camelback, HEC-2 File Summary For Damage Analysis.xls

Figure 1
Geomtric Shape Of Typical Street Cross-Section
Individual Street Cross-Sections Will Vary
24th Avenue & Camelback Road Drainage Study



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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

T1 24th Avenue & Camelback Road Drainage Study
T2 Street Capacity Analysis For Flood Damage Assesment
T3 Camelback Rd @ 24th MODEL CAMEL1.in

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.000198			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	14	10	25	50	100	150	200	250	300	350
QT	400	450	500	550	600					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	88						
GR	4	0	.5	0	.5	20	0	20	.5	54
GR	0	88	.5	88	.5	108	4	108		

lback Rd @ 24th

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.52	.52	.08	.54	.08	.03	9.93	.03	108.00	1.97
1.000	25.00	.69	.69	.36	.75	.36	1.35	22.30	1.35	108.00	1.99
1.000	50.00	.88	.88	.57	.96	.57	4.40	41.19	4.40	108.00	1.99
1.000	100.00	1.18	1.18	.83	1.23	.83	11.23	77.54	11.23	108.00	1.98
1.000	150.00	1.41	1.41	1.01	1.43	1.01	18.37	113.26	18.37	108.00	1.98
1.000	200.00	1.62	1.62	1.14	1.59	1.14	25.66	148.68	25.66	108.00	1.96
1.000	250.00	1.81	1.81	1.26	1.74	1.26	32.98	184.04	32.98	108.00	1.97
1.000	300.00	1.98	1.98	1.36	1.86	1.36	40.33	219.34	40.33	108.00	1.98
1.000	350.00	2.13	2.13	1.46	1.99	1.46	47.67	254.67	47.67	108.00	2.02
1.000	400.00	2.29	2.29	1.54	2.09	1.54	55.07	289.86	55.07	108.00	1.99
1.000	450.00	2.44	2.44	1.61	2.18	1.61	62.46	325.08	62.46	108.00	1.98
1.000	500.00	2.58	2.58	1.68	2.27	1.68	69.83	360.34	69.83	108.00	1.98
1.000	550.00	2.71	2.71	1.75	2.36	1.75	77.18	395.63	77.18	108.00	1.99
1.000	600.00	2.83	2.83	1.81	2.45	1.81	84.52	430.96	84.52	108.00	2.00

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 13SEP03 19:35:16

T1 24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
23rd AVENUE & HIGHLAND MODEL CAMEL2.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0067			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	43	1	8	55	26	56	13	14	15
4	5								

QT	14	10	25	50	100	150	200	250	300	350
QT	400	450	500	550	600					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	60						
GR	4	0	.5	0	.5	20	0	20	.5	40
GR	0	60	.5	60	.5	80	4	80		

J AVENUE & HIGHLAND

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
	1.000	10.00	.33	.33	.00	2.26	.00	.00	10.00	.00	26.62	66.77
*	1.000	25.00	.47	.47	.00	2.82	.00	.00	25.00	.00	37.66	65.57
*	1.000	50.00	.62	.62	1.20	2.97	1.20	2.93	44.13	2.93	80.00	39.44
*	1.000	100.00	.76	.76	2.07	3.82	2.07	10.88	78.23	10.88	80.00	42.59
*	1.000	150.00	.88	.88	2.62	4.32	2.62	20.14	109.73	20.14	80.00	41.05
*	1.000	200.00	.98	.98	3.07	4.82	3.07	29.56	140.89	29.56	80.00	42.25
*	1.000	250.00	1.08	1.08	3.41	5.15	3.41	39.52	170.95	39.52	80.00	40.71
*	1.000	300.00	1.16	1.16	3.74	5.53	3.74	49.38	201.25	49.38	80.00	41.48
*	1.000	350.00	1.25	1.25	4.00	5.80	4.00	59.56	230.89	59.56	80.00	40.61
*	1.000	400.00	1.33	1.33	4.22	6.04	4.22	69.86	260.28	69.86	80.00	39.55
*	1.000	450.00	1.40	1.40	4.46	6.32	4.46	80.02	289.96	80.02	80.00	39.91
*	1.000	500.00	1.47	1.47	4.66	6.55	4.66	90.35	319.29	90.35	80.00	39.45
*	1.000	550.00	1.54	1.54	4.84	6.75	4.84	100.75	348.50	100.75	80.00	38.88
*	1.000	600.00	1.61	1.61	5.00	6.94	5.00	111.19	377.62	111.19	80.00	38.22

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HEC-2 WATER SURFACE PROFILES

sion 4.6.2; May 1991

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T1 24th Avenue & Camelback Road Drainage Study
T2 Street Capacity Analysis For Flood Damage Assesment
T3 21st AVENUE & ELM MODEL CAMEL3.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0033			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	14	10	25	50	100	300	400	500	600	700
QT	800	900	1000	1100	1200					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	68						
GR	4	0	.5	0	.5	20	0	20	.5	44
GR	0	68	.5	68	.5	88	4	88		

21st AVENUE & ELM

ARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.35	.35	.00	1.66	.00	.00	10.00	.00	34.02	32.96
1.000	25.00	.50	.50	.00	2.08	.00	.00	25.00	.00	48.00	32.85
1.000	50.00	.61	.61	1.02	2.66	1.02	2.18	45.63	2.18	88.00	33.22
1.000	100.00	.76	.76	1.80	3.36	1.80	9.23	81.53	9.23	88.00	33.36
1.000	300.00	1.15	1.15	3.31	4.92	3.31	43.30	213.40	43.30	88.00	33.09
1.000	400.00	1.31	1.31	3.80	5.46	3.80	61.31	277.37	61.31	88.00	33.04
1.000	500.00	1.45	1.45	4.20	5.93	4.20	79.57	340.85	79.57	88.00	33.02
1.000	600.00	1.58	1.58	4.54	6.32	4.54	98.08	403.84	98.08	88.00	32.51
1.000	700.00	1.70	1.70	4.86	6.71	4.86	116.55	466.89	116.55	88.00	32.70
1.000	800.00	1.81	1.81	5.15	7.07	5.15	135.10	529.80	135.10	88.00	32.83
1.000	900.00	1.92	1.92	5.41	7.39	5.41	153.70	592.60	153.70	88.00	32.90
1.000	1000.00	2.02	2.02	5.66	7.70	5.66	172.33	655.33	172.33	88.00	32.95
1.000	1100.00	2.12	2.12	5.89	7.99	5.89	190.99	718.03	190.99	88.00	32.98
1.000	1200.00	2.21	2.21	6.12	8.29	6.12	209.56	780.87	209.56	88.00	33.37

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 13SEP03 19:35:40

24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
T3 ROMA, EAST OF 21st AVENUE MODEL CAMEL4.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0005			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	14	10	25	50	100	150	200	250	300	350
QT	400	450	500	550	600					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	52						
GR	4	0	.5	0	.5	20	0	20	.5	36
GR	0	52	.5	52	.5	72	4	72		

ROMA, EAST OF 21st AVENU

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.56	.56	.27	.94	.27	.33	9.33	.33	72.00	5.03
1.000	25.00	.73	.73	.65	1.25	.65	2.95	19.10	2.95	72.00	5.08
1.000	50.00	.92	.92	.97	1.57	.97	8.19	33.62	8.19	72.00	5.05
1.000	100.00	1.21	1.21	1.36	1.98	1.36	19.44	61.13	19.44	72.00	5.01
1.000	150.00	1.45	1.45	1.64	2.29	1.64	31.02	87.95	31.02	72.00	5.00
1.000	200.00	1.66	1.66	1.85	2.54	1.85	42.77	114.46	42.77	72.00	4.94
1.000	250.00	1.84	1.84	2.03	2.77	2.03	54.55	140.91	54.55	72.00	4.98
1.000	300.00	2.01	2.01	2.19	2.97	2.19	66.36	167.28	66.36	72.00	4.99
1.000	350.00	2.16	2.16	2.35	3.16	2.35	78.16	193.69	78.16	72.00	5.08
1.000	400.00	2.32	2.32	2.47	3.31	2.47	90.02	219.95	90.02	72.00	5.02
1.000	450.00	2.47	2.47	2.58	3.46	2.58	101.87	246.26	101.87	72.00	5.00
1.000	500.00	2.61	2.61	2.69	3.61	2.69	113.70	272.61	113.70	72.00	5.01
1.000	550.00	2.74	2.74	2.80	3.75	2.80	125.50	298.99	125.50	72.00	5.03
1.000	600.00	2.86	2.86	2.90	3.89	2.90	137.29	325.42	137.29	72.00	5.08

THIS RUN EXECUTED 13SEP03 19:36:05

T1 24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
CAMPBELL AVE EAST OF 21sT AVE MODEL CAMEL5.IN

	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
J1		2			.0005			0	.5	

	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
J2	1	0	-1				-1			

QT	14	10	25	50	100	150	200	250	300	350
QT	400	450	500	550	600					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	66						
GR	4	0	.5	0	.5	20	0	20	.5	43
GR	0	66	.5	66	.5	86	4	86		

CAMPBELL AVE EAST OF 21s

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.51	.51	.08	.83	.08	.02	9.97	.02	86.00	4.97
1.000	25.00	.66	.66	.52	1.14	.52	1.69	21.62	1.69	86.00	5.05
1.000	50.00	.84	.84	.84	1.44	.84	5.63	38.75	5.63	86.00	5.05
1.000	100.00	1.09	1.09	1.21	1.83	1.21	14.43	71.13	14.43	86.00	5.02
1.000	150.00	1.30	1.30	1.47	2.12	1.47	23.65	102.69	23.65	86.00	5.01
1.000	200.00	1.49	1.49	1.68	2.36	1.68	33.05	133.91	33.05	86.00	5.00
1.000	250.00	1.65	1.65	1.84	2.55	1.84	42.56	164.89	42.56	86.00	4.94
1.000	300.00	1.80	1.80	2.00	2.74	2.00	52.08	195.85	52.08	86.00	4.97
1.000	350.00	1.95	1.95	2.13	2.91	2.13	61.63	226.74	61.63	86.00	4.99
1.000	400.00	2.08	2.08	2.25	3.06	2.25	71.20	257.59	71.20	86.00	5.00
1.000	450.00	2.20	2.20	2.37	3.22	2.37	80.75	288.49	80.75	86.00	5.06
1.000	500.00	2.33	2.33	2.47	3.34	2.47	90.36	319.27	90.36	86.00	5.02
1.000	550.00	2.45	2.45	2.56	3.46	2.56	99.96	350.09	99.96	86.00	5.00
1.000	600.00	2.56	2.56	2.66	3.58	2.66	109.53	380.93	109.53	86.00	5.00

THIS RUN EXECUTED 13SEP03 19:36:28

T1 24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
TURNEY AVE AT 20th AVE MODEL CAMEL6.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0020			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	14	10	25	50	100	150	200	250	300	350
QT	400	450	500	550	600					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	56						
GR	4	0	.5	0	.5	20	0	20	.5	38
GR	0	56	.5	56	.5	76	4	76		

TURNEY AVE AT 20th AVE

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.43	.43	.00	1.47	.00	.00	10.00	.00	31.28	19.96
1.000	25.00	.58	.58	.64	1.95	.64	1.00	23.00	1.00	76.00	20.14
1.000	50.00	.71	.71	1.22	2.43	1.22	5.03	39.94	5.03	76.00	20.29
1.000	100.00	.89	.89	1.86	3.05	1.86	14.65	70.70	14.65	76.00	20.20
1.000	150.00	1.04	1.04	2.29	3.50	2.29	24.94	100.11	24.94	76.00	20.11
1.000	200.00	1.17	1.17	2.63	3.87	2.63	35.53	128.93	35.53	76.00	20.06
1.000	250.00	1.29	1.29	2.92	4.19	2.92	46.29	157.42	46.29	76.00	20.03
1.000	300.00	1.40	1.40	3.17	4.48	3.17	57.15	185.71	57.15	76.00	20.02
1.000	350.00	1.50	1.50	3.39	4.74	3.39	68.08	213.85	68.08	76.00	20.01
1.000	400.00	1.60	1.60	3.58	4.96	3.58	79.12	241.75	79.12	76.00	19.71
1.000	450.00	1.69	1.69	3.77	5.19	3.77	90.12	269.76	90.12	76.00	19.81
1.000	500.00	1.78	1.78	3.95	5.40	3.95	101.15	297.71	101.15	76.00	19.87
1.000	550.00	1.86	1.86	4.11	5.60	4.11	112.20	325.61	112.20	76.00	19.92
1.000	600.00	1.95	1.95	4.26	5.79	4.26	123.26	353.47	123.26	76.00	19.95

THIS RUN EXECUTED 13SEP03 19:36:56

T1 24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
22nd AVE & CAMPBELL AVENUE MODEL CAMEL7.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0006			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	14	10	25	50	100	150	200	250	300	350
QT	400	450	500	550	600					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	52						
GR	4	0	.5	0	.5	20	0	20	.5	36
GR	0	52	.5	52	.5	72	4	72		

22nd AVE & CAMPBELL AVEN

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.55	.55	.25	1.00	.25	.24	9.51	.24	72.00	6.02
1.000	25.00	.71	.71	.67	1.33	.67	2.77	19.46	2.77	72.00	6.10
1.000	50.00	.89	.89	1.02	1.66	1.02	7.94	34.13	7.94	72.00	6.07
1.000	100.00	1.17	1.17	1.43	2.11	1.43	19.11	61.78	19.11	72.00	6.02
1.000	150.00	1.39	1.39	1.72	2.43	1.72	30.65	88.70	30.65	72.00	6.01
1.000	200.00	1.59	1.59	1.94	2.69	1.94	42.38	115.25	42.38	72.00	5.91
1.000	250.00	1.76	1.76	2.14	2.93	2.14	54.13	141.75	54.13	72.00	5.96
1.000	300.00	1.92	1.92	2.31	3.14	2.31	65.92	168.15	65.92	72.00	5.98
1.000	350.00	2.08	2.08	2.47	3.33	2.47	77.75	194.50	77.75	72.00	5.99
1.000	400.00	2.21	2.21	2.61	3.51	2.61	89.56	220.88	89.56	72.00	6.07
1.000	450.00	2.36	2.36	2.73	3.67	2.73	101.42	247.16	101.42	72.00	6.02
1.000	500.00	2.50	2.50	2.83	3.80	2.83	113.30	273.40	113.30	72.00	5.91
1.000	550.00	2.62	2.62	2.96	3.96	2.96	125.09	299.83	125.09	72.00	6.01
1.000	600.00	2.74	2.74	3.06	4.10	3.06	136.89	326.21	136.89	72.00	6.04

24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
T3 21st AVENUE & ROMA MODEL CAMEL8.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0034			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	15	10	25	50	100	200	300	400	500	600
QT	700	800	900	1000	1100	1200				
NC	.019	.019	.016	.1	.3					
X1	1	9	20	60						
GR	4	0	.5	0	.5	20	0	20	.5	40
GR	0	60	.5	60	.5	80	4	80		

21st AVENUE & ROMA

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.38	.38	.00	1.74	.00	.00	10.00	.00	30.32	33.37
1.000	25.00	.53	.53	.39	2.24	.39	.19	24.61	.19	80.00	33.52
1.000	50.00	.63	.63	1.20	2.83	1.20	3.22	43.55	3.22	80.00	34.36
1.000	100.00	.79	.79	1.99	3.56	1.99	11.58	76.85	11.58	80.00	34.41
1.000	200.00	1.02	1.02	2.92	4.50	2.92	30.50	139.01	30.50	80.00	34.19
1.000	300.00	1.21	1.21	3.55	5.19	3.55	50.40	199.21	50.40	80.00	34.08
1.000	400.00	1.37	1.37	4.05	5.76	4.05	70.71	258.57	70.71	80.00	34.03
1.000	500.00	1.53	1.53	4.45	6.21	4.45	91.37	317.25	91.37	80.00	33.35
1.000	600.00	1.66	1.66	4.82	6.66	4.82	112.00	375.99	112.00	80.00	33.62
1.000	700.00	1.79	1.79	5.16	7.07	5.16	132.74	434.52	132.74	80.00	33.79
1.000	800.00	1.91	1.91	5.46	7.44	5.46	153.54	492.93	153.54	80.00	33.89
1.000	900.00	2.02	2.02	5.74	7.79	5.74	174.38	551.25	174.38	80.00	33.95
1.000	1000.00	2.13	2.13	5.99	8.11	5.99	195.24	609.52	195.24	80.00	33.98
1.000	1100.00	2.23	2.23	6.25	8.44	6.25	216.04	667.92	216.04	80.00	34.34

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 13SEP03 19:37:29

T1 24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
24th AVE NORTH OF CAMELBACK MODEL CAMEL9.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0022			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	14	10	25	50	100	150	200	250	300	350
QT	400	450	500	550	600					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	52						
GR	4	0	.5	0	.5	20	0	20	.5	36
GR	0	52	.5	52	.5	72	4	72		

24th AVE NORTH OF CAMELB

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.45	.45	.00	1.57	.00	.00	10.00	.00	28.56	21.98
1.000	25.00	.59	.59	.73	2.08	.73	1.27	22.46	1.27	72.00	22.21
1.000	50.00	.72	.72	1.32	2.59	1.32	5.71	38.57	5.71	72.00	22.37
1.000	100.00	.90	.90	1.99	3.23	1.99	16.12	67.76	16.12	72.00	22.23
1.000	150.00	1.06	1.06	2.44	3.71	2.44	27.18	95.63	27.18	72.00	22.12
1.000	200.00	1.19	1.19	2.80	4.09	2.80	38.53	122.93	38.53	72.00	22.06
1.000	250.00	1.31	1.31	3.10	4.43	3.10	50.05	149.91	50.05	72.00	22.03
1.000	300.00	1.42	1.42	3.36	4.73	3.36	61.66	176.68	61.66	72.00	22.02
1.000	350.00	1.52	1.52	3.60	5.00	3.60	73.34	203.32	73.34	72.00	22.01
1.000	400.00	1.62	1.62	3.79	5.23	3.79	85.14	229.73	85.14	72.00	21.70
1.000	450.00	1.71	1.71	3.99	5.47	3.99	96.88	256.24	96.88	72.00	21.80
1.000	500.00	1.80	1.80	4.18	5.70	4.18	108.66	282.68	108.66	72.00	21.87
1.000	550.00	1.88	1.88	4.35	5.91	4.35	120.46	309.08	120.46	72.00	21.92
1.000	600.00	1.97	1.97	4.51	6.11	4.51	132.27	335.45	132.27	72.00	21.95

THIS RUN EXECUTED 29MAR03 11:18:41

24th Avenue & Camelback Road Drainage Study
T2 Street Capacity Analysis For Flood Damage Assesment
T3 20TH AVE SOUTH OF TURNEY MODEL CAMEL10.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0005			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	14	10	25	50	100	300	400	500	600	700
QT	800	900	1000	1100	1200					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	68						
GR	4	0	.5	0	.5	20	0	20	.5	44
GR	0	68	.5	68	.5	88	4	88		

20TH AVE SOUTH OF TURNEY

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.50	.50	.02	.82	.02	.00	10.00	.00	88.00	5.00
1.000	25.00	.65	.65	.50	1.13	.50	1.56	21.88	1.56	88.00	5.05
1.000	50.00	.83	.83	.82	1.42	.82	5.35	39.30	5.35	88.00	5.05
1.000	100.00	1.08	1.08	1.20	1.81	1.20	13.88	72.24	13.88	88.00	5.02
1.000	300.00	1.78	1.78	1.97	2.71	1.97	50.47	199.06	50.47	88.00	4.97
1.000	400.00	2.05	2.05	2.23	3.03	2.23	69.09	261.83	69.09	88.00	4.99
1.000	500.00	2.29	2.29	2.45	3.31	2.45	87.73	324.54	87.73	88.00	5.03
1.000	600.00	2.53	2.53	2.63	3.54	2.63	106.40	387.19	106.40	88.00	5.00
1.000	700.00	2.74	2.74	2.80	3.77	2.80	125.02	449.97	125.02	88.00	5.03
1.000	800.00	2.93	2.93	2.96	3.99	2.96	143.57	512.86	143.57	88.00	5.10
1.000	900.00	3.14	3.14	3.08	4.16	3.08	162.16	575.68	162.16	88.00	5.01
1.000	1000.00	3.32	3.32	3.20	4.33	3.20	180.64	638.71	180.64	88.00	5.02
1.000	1100.00	3.50	3.50	3.32	4.50	3.32	199.07	701.86	199.07	88.00	5.03
1.000	1200.00	3.66	3.66	3.44	4.67	3.44	217.44	765.12	217.44	88.00	5.05

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 30MAR03 10:18:49

T* 24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
21st Avenue, Maryland to Missouri MODEL CAMEL11.IN

	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
J1		2			.0035			0	.5	

	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
J2	1	0	-1				-1			

QT	14	10	25	50	100	200	300	400	500	600
QT	700	800	900	1000	1100					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	56						
GR	4	0	.5	0	.5	20	0	20	.5	38
GR	0	56	.5	56	.5	76	4	76		

21st Avenue, Maryland to

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.39	.39	.00	1.81	.00	.00	10.00	.00	28.22	34.56
1.000	25.00	.54	.54	.51	2.35	.51	.38	24.25	.38	76.00	35.07
1.000	50.00	.65	.65	1.30	2.94	1.30	3.88	42.25	3.88	76.00	35.46
1.000	100.00	.81	.81	2.10	3.68	2.10	12.99	74.03	12.99	76.00	35.45
1.000	200.00	1.05	1.05	3.05	4.65	3.05	33.33	133.35	33.33	76.00	35.19
1.000	300.00	1.24	1.24	3.70	5.36	3.70	54.61	190.79	54.61	76.00	35.07
1.000	400.00	1.41	1.41	4.21	5.94	4.21	76.28	247.43	76.28	76.00	35.03
1.000	500.00	1.56	1.56	4.62	6.42	4.62	98.28	303.45	98.28	76.00	34.40
1.000	600.00	1.70	1.70	5.01	6.88	5.01	120.25	359.50	120.25	76.00	34.67
1.000	700.00	1.83	1.83	5.35	7.30	5.35	142.32	415.36	142.32	76.00	34.82
1.000	800.00	1.95	1.95	5.66	7.68	5.66	164.45	471.10	164.45	76.00	34.91
1.000	900.00	2.07	2.07	5.94	8.04	5.94	186.61	526.77	186.61	76.00	34.96
1.000	1000.00	2.17	2.17	6.23	8.41	6.23	208.70	582.60	208.70	76.00	35.52
1.000	1100.00	2.29	2.29	6.46	8.70	6.46	230.95	638.11	230.95	76.00	35.21

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 31MAR03 08:39:03

T1 24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
21st Avenue, Missouri To Camelback MODEL CAMEL12.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0035			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	14	10	25	50	100	200	300	400	500	600
QT	700	800	900	1000	1100					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	60						
GR	4	0	.5	0	.5	20	0	20	.5	40
GR	0	60	.5	60	.5	80	4	80		

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
	1.000	10.00	.38	.38	.00	1.76	.00	.00	10.00	.00	30.16	34.31
	1.000	25.00	.52	.52	.37	2.26	.37	.17	24.66	.17	80.00	34.57
	1.000	50.00	.63	.63	1.20	2.86	1.20	3.16	43.67	3.16	80.00	35.37
	1.000	100.00	.79	.79	2.00	3.59	2.00	11.48	77.03	11.48	80.00	35.43
	1.000	200.00	1.02	1.02	2.94	4.54	2.94	30.37	139.26	30.37	80.00	35.20
	1.000	300.00	1.20	1.20	3.58	5.24	3.58	50.25	199.50	50.25	80.00	35.08
	1.000	400.00	1.36	1.36	4.08	5.81	4.08	70.55	258.90	70.55	80.00	35.03
	1.000	500.00	1.51	1.51	4.51	6.31	4.51	91.08	317.83	91.08	80.00	35.01
	1.000	600.00	1.65	1.65	4.86	6.72	4.86	111.83	376.34	111.83	80.00	34.59
	1.000	700.00	1.77	1.77	5.20	7.13	5.20	132.55	434.89	132.55	80.00	34.77
	1.000	800.00	1.89	1.89	5.51	7.51	5.51	153.35	493.31	153.35	80.00	34.88
	1.000	900.00	2.01	2.01	5.79	7.86	5.79	174.18	551.64	174.18	80.00	34.94
	1.000	1000.00	2.11	2.11	6.04	8.18	6.04	195.04	609.92	195.04	80.00	34.97
*	1.000	1100.00	2.22	2.22	6.28	8.48	6.28	215.93	668.14	215.93	80.00	34.91

SUMMARY OF ERRORS AND SPECIAL NOTES
CAUTION SECNO= 1.000 PROFILE= 14 CRITICAL DEPTH ASSUMED

THIS RUN EXECUTED 30MAR03 19:25:37

T1 24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
23rd Ave, Maryland to Bethany Home MODEL CAMEL13.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0040			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	15	10	25	50	100	200	300	400	500	600
QT	700	800	900	1000	1100	1200				
NC	.019	.019	.016	.1	.3					
X1	1	9	20	60						
GR	4	0	.5	0	.5	20	0	20	.5	40
GR	0	60	.5	60	.5	80	4	80		

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
	1.000	10.00	.37	.37	.00	1.86	.00	.00	10.00	.00	29.31	39.97
	1.000	25.00	.51	.51	.27	2.37	.27	.07	24.86	.07	80.00	39.87
*	1.000	50.00	.62	.62	1.20	2.97	1.20	2.93	44.13	2.93	80.00	39.44
	1.000	100.00	.77	.77	2.05	3.75	2.05	11.05	77.90	11.05	80.00	40.50
	1.000	200.00	.99	.99	3.04	4.74	3.04	29.78	140.45	29.78	80.00	40.25
	1.000	300.00	1.17	1.17	3.71	5.47	3.71	49.56	200.89	49.56	80.00	40.11
*	1.000	400.00	1.33	1.33	4.22	6.04	4.22	69.86	260.28	69.86	80.00	39.55
*	1.000	500.00	1.47	1.47	4.66	6.55	4.66	90.35	319.29	90.35	80.00	39.45
*	1.000	600.00	1.61	1.61	5.00	6.94	5.00	111.19	377.62	111.19	80.00	38.22
*	1.000	700.00	1.74	1.74	5.33	7.32	5.33	132.01	435.98	132.01	80.00	37.77
*	1.000	800.00	1.86	1.86	5.61	7.66	5.61	152.92	494.16	152.92	80.00	37.15
*	1.000	900.00	1.98	1.98	5.86	7.96	5.86	173.89	552.21	173.89	80.00	36.44
*	1.000	1000.00	2.10	2.10	6.08	8.23	6.08	194.91	610.19	194.91	80.00	35.67
*	1.000	1100.00	2.22	2.22	6.28	8.48	6.28	215.93	668.14	215.93	80.00	34.91

THIS RUN EXECUTED 30MAR03 19:25:54

T1 24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
23rd Ave, Bethany Home To Missouri MODEL CAMEL14.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0032			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	15	10	25	50	100	200	300	400	500	600
QT	700	800	900	1000	1100	1200				
NC	.019	.019	.016	.1	.3					
X1	1	9	20	60						
GR	4	0	.5	0	.5	20	0	20	.5	40
GR	0	60	.5	60	.5	80	4	80		

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.38	.38	.00	1.70	.00	.00	10.00	.00	30.65	31.49
1.000	25.00	.53	.53	.42	2.19	.42	.25	24.50	.25	80.00	31.42
1.000	50.00	.64	.64	1.19	2.77	1.19	3.35	43.30	3.35	80.00	32.35
1.000	100.00	.80	.80	1.97	3.48	1.97	11.77	76.47	11.77	80.00	32.38
1.000	200.00	1.04	1.04	2.87	4.41	2.87	30.75	138.49	30.75	80.00	32.17
1.000	300.00	1.23	1.23	3.49	5.09	3.49	50.70	198.60	50.70	80.00	32.07
1.000	400.00	1.39	1.39	3.98	5.65	3.98	71.05	257.91	71.05	80.00	32.03
1.000	500.00	1.55	1.55	4.37	6.10	4.37	91.72	316.57	91.72	80.00	31.43
1.000	600.00	1.68	1.68	4.74	6.54	4.74	112.37	375.26	112.37	80.00	31.68
1.000	700.00	1.81	1.81	5.07	6.94	5.07	133.12	433.76	133.12	80.00	31.83
1.000	800.00	1.93	1.93	5.37	7.30	5.37	153.93	492.15	153.93	80.00	31.91
1.000	900.00	2.05	2.05	5.64	7.64	5.64	174.77	550.45	174.77	80.00	31.96
1.000	1000.00	2.15	2.15	5.92	8.00	5.92	195.53	608.95	195.53	80.00	32.54
1.000	1100.00	2.27	2.27	6.13	8.27	6.13	216.46	667.07	216.46	80.00	32.24

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 30MAR03 19:21:43

T1 24th Avenue & Camelback Road Drainage Study
Street Capacity Analysis For Flood Damage Assesment
23rd Ave, Missouri To Camelback MODEL CAMEL15.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.00245			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	15	10	25	50	100	200	300	400	500	600
QT	700	800	900	1000	1100	1200				
NC	.019	.019	.016	.1	.3					
X1	1	9	20	60						
GR	4	0	.5	0	.5	20	0	20	.5	40
GR	0	60	.5	60	.5	80	4	80		

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.40	.40	.00	1.55	.00	.00	10.00	.00	32.17	24.30
1.000	25.00	.55	.55	.51	2.02	.51	.49	24.03	.49	80.00	24.56
1.000	50.00	.67	.67	1.17	2.54	1.17	3.89	42.21	3.89	80.00	24.80
1.000	100.00	.84	.84	1.86	3.19	1.86	12.57	74.86	12.57	80.00	24.77
1.000	200.00	1.09	1.09	2.69	4.04	2.69	31.84	136.31	31.84	80.00	24.60
1.000	300.00	1.30	1.30	3.25	4.67	3.25	51.96	196.08	51.96	80.00	24.53
1.000	400.00	1.48	1.48	3.70	5.19	3.70	72.43	255.14	72.43	80.00	24.51
1.000	500.00	1.65	1.65	4.06	5.62	4.06	93.15	313.70	93.15	80.00	24.21
1.000	600.00	1.79	1.79	4.40	6.02	4.40	113.88	372.24	113.88	80.00	24.36
1.000	700.00	1.93	1.93	4.70	6.39	4.70	134.69	430.63	134.69	80.00	24.43
1.000	800.00	2.07	2.07	4.96	6.73	4.96	155.53	488.93	155.53	80.00	24.47
1.000	900.00	2.19	2.19	5.23	7.07	5.23	176.32	547.35	176.32	80.00	24.83
1.000	1000.00	2.31	2.31	5.44	7.34	5.44	197.25	605.50	197.25	80.00	24.61
1.000	1100.00	2.43	2.43	5.65	7.61	5.65	218.15	663.71	218.15	80.00	24.51

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 31MAR03 08:39:21

T1 24th Avenue & Camelback Road Drainage Study
T2 Street Capacity Analysis For Flood Damage Assesment
24th Avenue, Orange Dr To Camelback MODEL CAMEL16.IN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			.0027			0	.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1				-1			

QT	14	10	25	50	100	200	300	400	500	600
QT	700	800	900	1000	1100					
NC	.019	.019	.016	.1	.3					
X1	1	9	20	48						
GR	4	0	.5	0	.5	20	0	20	.5	34
GR	0	48	.5	48	.5	68	4	68		

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	10*KS
1.000	10.00	.45	.45	.00	1.74	.00	.00	10.00	.00	25.40	26.52
1.000	25.00	.59	.59	.82	2.31	.82	1.48	22.03	1.48	68.00	27.33
1.000	50.00	.72	.72	1.47	2.86	1.47	6.34	37.32	6.34	68.00	27.53
1.000	100.00	.90	.90	2.19	3.56	2.19	17.57	64.85	17.57	68.00	27.32
1.000	200.00	1.18	1.18	3.07	4.49	3.07	41.66	116.68	41.66	68.00	27.09
1.000	300.00	1.40	1.40	3.69	5.18	3.69	66.46	167.07	66.46	68.00	27.02
1.000	400.00	1.60	1.60	4.15	5.72	4.15	91.64	216.72	91.64	68.00	26.58
1.000	500.00	1.78	1.78	4.57	6.23	4.57	116.85	266.30	116.85	68.00	26.81
1.000	600.00	1.94	1.94	4.94	6.67	4.94	142.16	315.68	142.16	68.00	26.92
1.000	700.00	2.09	2.09	5.26	7.08	5.26	167.52	364.96	167.52	68.00	26.97
1.000	800.00	2.23	2.23	5.57	7.47	5.57	192.85	414.31	192.85	68.00	27.27
1.000	900.00	2.37	2.37	5.82	7.79	5.82	218.27	463.46	218.27	68.00	27.06
1.000	1000.00	2.50	2.50	6.09	8.14	6.09	243.60	512.80	243.60	68.00	27.32
1.000	1100.00	2.63	2.63	6.30	8.42	6.30	269.01	561.99	269.01	68.00	27.06

SUMMARY OF ERRORS AND SPECIAL NOTES

FULL CASH VALUES

From	To	Parcel #			FCV Cost	Owner	Building Cost	% Improvements
Orange	Camelback	153	26	65	$61,000	residential	$48,800	80%
		153	26	20	$59,500	residential	$47,600	80%
		153	26	21	$65,500	residential	$52,400	80%
		153	26	22	$67,000	residential	$53,600	80%
		153	26	23	$75,500	residential	$60,400	80%
		153	26	24	$66,500	residential	$53,200	80%
		153	26	25	$62,500	residential	$50,000	80%
		153	26	26	$57,000	residential	$45,600	80%
		153	26	27	$77,000	residential	$61,600	80%
		153	26	28	$63,000	residential	$50,400	80%
		153	26	29	$66,500	residential	$53,200	80%
		153	26	30	$80,500	residential	$64,400	80%
		153	26	31	$61,000	residential	$48,800	80%
		153	26	32	$62,000	residential	$49,600	80%
		153	26	33	$64,000	residential	$51,200	80%
		153	26	034-A	$89,000		$71,200	80%
		153	26	035-A	$59,000		$47,200	80%
		153	26	36	$60,000	residential	$48,000	80%
		153	26	37	$62,000	residential	$49,600	80%
		153	26	38	$65,500	residential	$52,400	80%
		153	26	39	$61,000	residential	$48,800	80%
		153	26	40	$61,000	residential	$48,800	80%
		153	26	41	$56,500	residential	$45,200	80%
		153	26	42	$61,500	residential	$49,200	80%
		153	26	50	$61,000	residential	$48,800	80%
		153	26	51	$66,000	residential	$52,800	80%
		153	26	52	$73,000	residential	$58,400	80%
Dunlap	Butler Ave.	158	2	006A	$880,869	Presso Advisory LLC	$671,369	76%
				006D	$575,606	Presso Advisory LLC	$438,708	76%
				006C	$311,020	company	$219,580	71%
				16	$6,899,402	Transwestern Koll Townley LLC	$5,259,402	76%
		158	36	17	$22,500	City of Phoenix	$15,885	71%
				18	$84,500	residential	$67,600	80%
				52	$72,000	residential	$57,600	80%
				53	$78,000	residential	$62,400	80%
				88	$93,000	residential	$74,400	80%
				89	$79,500	residential	$63,600	80%
				123	$83,500	residential	$66,800	80%
				124	$75,500	residential	$60,400	80%
				159	$74,000	residential	$59,200	80%
				160	$96,500	residential	$77,200	80%
		158	5	37	$10,615,848	Carramerica U.S. West LLC	$9,500,848	89%
				30	$13,784,054	Carramerica U.S. West LLC	$12,336,292	89%
				7	$898,892	residential	$719,114	80%
				6	$900,000	company	$635,400	71%
				16	$860,547	Great Scott Holdings LLC	$576,047	67%
				082A	$6,104,276	company	$4,309,619	71%
				20	$3,106,412	company	$2,193,127	71%
				21	$3,388,896	company	$2,392,561	71%
Butler	Northern	158	40	16	$22,000	residential	$17,600	80%
				17	$84,000	residential	$67,200	80%
				50	$83,000	residential	$66,400	80%
		158	6	15	$9,407,223	Blue Cross & Blue Shield	$8,410,223	89%
		158	4	80	$3,702,285	company	$2,613,813	71%
				081A	$3,339,721	Black Canyon Associates II	$2,492,221	75%
				006V	$1,494,203	Northern Village LTD Partnership	$967,703	65%
				006Q	$558,745	company	$394,474	71%
		158	6	16	$4,078,500	company	$2,879,421	71%
				021A	$1,109,463	company	$783,281	71%
				17	$3,137,884	company	$2,215,346	71%
				021B	$5,574,325	Bedford Property Investors Inc	$5,074,825	91%
				18	$6,313,097	company	$4,457,046	71%
Northern	Orangewood	157	28	012C	$193,000	company	$136,258	71%
				012A	$267,526	company	$188,873	71%
				13	$96,000	company	$67,776	71%
				34	$85,000	company	$60,010	71%
				35	$78,000	residential	$62,400	80%
				060A	$127,500	company	$90,015	71%
				61	$112,000	residential	$89,600	80%
		157	27	13	$75,500	residential	$60,400	80%
				930	$62,500	residential	$50,000	80%
				40	$101,000	residential	$80,800	80%
				41	$83,500	residential	$66,800	80%
				065A	$51,500	company	$36,359	71%
				065B	$81,500	residential	$65,200	80%
				66	$319,000	residential	$255,200	80%
		157	21	1	$1,194,894	Kay-Kay 941 Limited Partnership	$1,080,394	90%
				28	$104,500	residential	$83,600	80%
				030A	$83,000	residential	$66,400	80%
				029A	$29,500	residential	$23,600	80%
				58	$168,000	company	$118,608	71%
				59	$102,454	residential	$81,963	80%
				087A	$102,500	residential	$82,000	80%
		157	22	1	$57,500	residential	$46,000	80%
				26	$226,000	company	$159,556	71%

				27	$112,500	company	$79,425	71%
				81	$35,000	residential	$28,000	80%
				88	$33,000	company	$23,298	71%
				54	$118,000	company	$83,308	71%
				53	$53,000	residential	$42,400	80%
				80	$188,500	company	$133,081	71%
Orangewood	Myrtle	157	26	38	$104,500	residential	$83,600	80%
				39	$83,500	residential	$66,800	80%
		157	23	112	$94,500	residential	$75,600	80%
				111	$76,000	residential	$60,800	80%
				110	$75,500	residential	$60,400	80%
				109	$76,500	residential	$61,200	80%
				108	$95,500	residential	$76,400	80%
				59	$89,500	residential	$71,600	80%
				58	$90,000	residential	$72,000	80%
				57	$90,500	residential	$72,400	80%
				56	$79,000	residential	$63,200	80%
				55	$87,500	residential	$70,000	80%
				54	$78,001	residential	$62,401	80%
				53	$92,500	residential	$74,000	80%
				52	$90,500	residential	$72,400	80%
				51	$74,000	residential	$59,200	80%
				50	$91,500	company	$64,599	71%
				180	$80,000	residential	$64,000	80%
				113	$82,500	residential	$66,000	80%
				114	$84,000	residential	$67,200	80%
				115	$85,000	residential	$68,000	80%
				116	$91,000	residential	$72,800	80%
				117	$81,000	residential	$64,800	80%
				118	$80,500	residential	$64,400	80%
				62	$81,000	residential	$64,800	80%
				63	$88,500	residential	$70,800	80%
				64	$75,000	residential	$60,000	80%
				65	$79,000	residential	$63,200	80%
				66	$81,500	residential	$65,200	80%
				67	$73,000	residential	$58,400	80%
				68	$82,000	residential	$65,600	80%
				69	$82,000	residential	$65,600	80%
				70	$123,000	residential	$98,400	80%
Orangewood	Myrtle	157	26	39	$83,500	residential	$66,800	80%
				40	$82,500	residential	$66,000	80%
				41	$105,000	residential	$84,000	80%
				42	$109,000	residential	$87,200	80%
				043A	$91,000	residential	$72,800	80%
				044A	$92,500	residential	$74,000	80%
				45	$115,000	residential	$92,000	80%
				46	$112,000	residential	$89,600	80%
				47	$102,000	residential	$81,600	80%
				048A	$131,500	residential	$105,200	80%
				050A	$125,500	company	$88,603	71%
				51	$80,000	residential	$64,000	80%
				52	$133,500	residential	$106,800	80%
				53	$16,000	residential	$12,800	80%
				55	$90,000	residential	$72,000	80%
				70	$92,000	residential	$73,600	80%
				69	$93,500	residential	$74,800	80%
				068A	$99,500	residential	$79,600	80%
				067B	$96,500	residential	$77,200	80%
				066A	$98,000	residential	$78,400	80%
				064B	$95,000	residential	$76,000	80%
				063B	$131,000	residential	$104,800	80%
				062A	$130,000	residential	$104,000	80%
				61	$92,500	residential	$74,000	80%
				60	$94,000	residential	$75,200	80%
				59	$101,000	residential	$80,800	80%
				58	$99,000	residential	$79,200	80%
				56	$96,500	residential	$77,200	80%
Myrtle	Glendale	157	25	118	$77,000	residential	$61,600	80%
				117	$60,500	residential	$48,400	80%
				116	$61,500	residential	$49,200	80%
				115	$61,000	residential	$48,800	80%
				114	$85,000	residential	$68,000	80%
				113	$54,500	residential	$43,600	80%
				112	$63,000	residential	$50,400	80%
				111	$64,500	residential	$51,600	80%
				110	$82,500	residential	$66,000	80%
				109	$66,000	residential	$52,800	80%
				108	$77,500	residential	$62,000	80%
				107	$71,500	residential	$57,200	80%
				106	$68,000	company	$48,008	71%
				105	$98,000	company	$69,188	71%
				104	$71,500	residential	$57,200	80%
				103	$141,087	company	$99,607	71%
				87	$111,000	residential	$88,800	80%
				88	$70,500	residential	$56,400	80%
				89	$64,000	residential	$51,200	80%

				90	$68,000	residential	$54,400	80%
				91	$79,000	residential	$63,200	80%
				92	$89,000	residential	$71,200	80%
				93	$70,000	residential	$56,000	80%
				94	$61,000	residential	$48,800	80%
				95	$66,500	residential	$53,200	80%
				96	$85,000	residential	$68,000	80%
				97	$75,500	residential	$60,400	80%
				98	$89,000	residential	$71,200	80%
				99	$69,500	residential	$55,600	80%
				100	$65,500	residential	$52,400	80%
				101	$44,000	company	$31,064	71%
				102A	$545,112	Emergency animal Clinic	$497,612	91%
Glendale	Maryland	156	8	97	$410,622	company	$289,899	71%
				98	$210,493	company	$148,608	71%
				40	$118,000	company	$83,308	71%
				42	$111,407	company	$78,653	71%
				44	$158,290	company	$111,753	71%
				048A	$136,100	company	$96,087	71%
				49	$79,500	company	$56,127	71%
				51	$99,500	company	$70,247	71%
				53	$67,977	company	$47,992	71%
				55	$153,968	company	$108,701	71%
				57	$138,500	company	$97,781	71%
				59	$169,000	residential	$135,200	80%
		156	7	014F	$110,500	residential	$88,400	80%
				014D	$128,000	residential	$102,400	80%
				015C	$87,500	company	$61,775	71%
				015E	$92,000	residential	$73,600	80%
				1	$92,000	residential	$73,600	80%
				2	$93,500	residential	$74,800	80%
				21	$120,500	residential	$96,400	80%
				64	$82,500	residential	$66,000	80%
				65	$89,000	residential	$71,200	80%
				66	$76,000	residential	$60,800	80%
				67	$68,500	residential	$54,800	80%
		156	9	1	$8,384,075	School Dist. Glendale Union	$3,948,575	47%
		156	10	001A	$4,531,608	City of Phoenix	$112,608	2%
Maryland	Bethany Home	156	6	130	$79,000	residential	$63,200	80%
				129	$95,000	residential	$76,000	80%
				128	$80,500	residential	$64,400	80%
				127	$79,000	residential	$63,200	80%
		156	6	80	$78,500	residential	$62,800	80%
				79	$69,000	residential	$55,200	80%
				78	$69,500	residential	$55,600	80%
				77	$68,500	residential	$54,800	80%
				76	$85,000	company	$60,010	71%
				75	$78,000	residential	$62,400	80%
				74	$74,000	residential	$59,200	80%
				73	$92,000	residential	$73,600	80%
				23	$91,000	residential	$72,800	80%
				22	$54,000	residential	$43,200	80%
				21	$73,500	residential	$58,800	80%
				20	$71,000	residential	$56,800	80%
				19	$77,000	company	$54,362	71%
		156	5	14	$109,000	residential	$87,200	80%
				15	$118,500	residential	$94,800	80%
				55	$98,500	residential	$78,800	80%
				38	$109,000	residential	$87,200	80%
				37	$107,000	residential	$85,600	80%
				001S	$144,591	company	$102,081	71%
				001T	$139,241	Bethany Marketplace II LLC	$65,741	47%
				001C	$441,329	The Kasie CO	$279,829	63%
		156	11	003A	$122,500	company	$86,485	71%
				001B	$2,852,462	company	$2,013,838	71%
				009C	$79,000	company	$55,774	71%
				009E	$113,000	company	$79,778	71%
				011A	$91,000	company	$64,246	71%
				013D	$108,000	company	$76,248	71%
				013C	$135,000	company	$95,310	71%
				015A	$235,760	company	$166,447	71%
		156	12	59	$105,500	company	$74,483	71%
				58	$109,000	company	$76,954	71%
				57	$107,500	residential	$86,000	80%
				60	$94,000	residential	$75,200	80%
				92	$97,000	residential	$77,600	80%
				93	$101,000	residential	$80,800	80%
				138C	$169,827	company	$119,898	71%
				138D	$102,153	company	$72,120	71%
				139	$114,660	company	$80,950	71%
				140	$114,660	company	$80,950	71%
				141A	$217,274	company	$153,395	71%
				142A	$49,500	company	$34,947	71%
				138A	$402,640	company	$284,264	71%
Bethany Home	Missouri	153	6	72	$478,463	McDonalds Corp.	$384,963	80%
				3	$69,000	residential	$55,200	80%

			4	$56,000	company	$39,536	71%
			5	$124,734	company	$88,062	71%
			23	$62,500	residential	$50,000	80%
			24	$59,000	company	$41,654	71%
			25	$75,000	residential	$60,000	80%
			26	$58,000	residential	$46,400	80%
			27	$65,000	residential	$52,000	80%
			28	$55,000	residential	$44,000	80%
			47	$65,000	residential	$52,000	80%
			48	$63,000	residential	$50,400	80%
			49	$67,500	residential	$54,000	80%
			50	$83,000	residential	$66,400	80%
			51	$79,500	residential	$63,600	80%
			52	$69,500	residential	$55,600	80%
		153	11	1	$60,000	residential	$48,000	80%
			2	$69,000	company	$48,714	71%
			27	$78,000	residential	$62,400	80%
			28	$98,000	residential	$78,400	80%
			53	$73,500	residential	$58,800	80%
			54	$76,500	residential	$61,200	80%
			79	$67,500	company	$47,655	71%
			080A	$89,000	company	$62,834	71%
		153	7	112	$80,500	company	$56,833	71%
			111	$79,500	residential	$63,600	80%
			110	$79,500	residential	$63,600	80%
			109	$83,000	residential	$66,400	80%
			108	$91,500	residential	$73,200	80%
			107	$85,000	residential	$68,000	80%
			78	$79,500	residential	$63,600	80%
			77	$103,500	residential	$82,800	80%
			76	$82,500	residential	$66,000	80%
			75	$79,000	residential	$63,200	80%
			74	$83,500	residential	$66,800	80%
			73	$92,000	residential	$73,600	80%
			72	$85,000	residential	$68,000	80%
			1	$98,500	residential	$78,800	80%
		153	10	31	$93,000	residential	$74,400	80%
			30	$83,000	residential	$66,400	80%
			1	$92,000	residential	$73,600	80%
			2	$125,500	residential	$100,400	80%
			3	$87,000	residential	$69,600	80%
			4	$76,000	company	$53,656	71%
			5	$86,500	residential	$69,200	80%
			6	$82,000	residential	$65,600	80%
			7	$81,500	residential	$65,200	80%
			8	$83,000	residential	$66,400	80%
			9	$93,500	residential	$74,800	80%
			10	$83,500	residential	$66,800	80%
			015A	$597,026	Boys Club of North Phoenix	$428,026	72%
Missouri	Camelback	153	21	2	$7,345,420	School Dist. 68	$5,655,920	77%
			003B	$362,229	Homeward Bound	$310,429	86%
		153	26	10	$62,500	company	$44,125	71%
			11	$63,500	residential	$50,800	80%
			58	$124,419	company	$87,840	71%
			47	$65,500	company	$46,243	71%
			46	$76,000	residential	$60,800	80%
			60	$25,000	company	$17,650	71%
			063A	$1,357,616	company	$958,477	71%
			062A	$374,884	company	$264,668	71%
		153	22	025A	$45,000	company	$31,770	71%
			33	$70,500	company	$49,773	71%
			35	$16,500	company	$11,649	71%
			38	$80,000	residential	$64,000	80%
			041A	$75,500	company	$53,303	71%
			043E	$45,000	company	$31,770	71%
			043F	$54,000	company	$38,124	71%
			118	$75,000	company	$52,950	71%
			53	$58,500	residential	$46,800	80%
			57	$13,000	company	$9,178	71%
			61	$14,500	company	$10,237	71%
			64	$56,000	company	$39,536	71%
			67	$69,048	residential	$55,238	80%
			70	$108,716	company	$76,753	71%
			73	$13,000	company	$9,178	71%
			102	$12,500	company	$8,825	71%
			100	$77,000	company	$54,362	71%
			106E	$75,000	residential	$60,000	80%
		153	25	24	$341,932	company	$241,404	71%
			28	$148,085	company	$104,548	71%
			31	$218,386	company	$154,181	71%
			34	$62,500	company	$44,125	71%
			36	$177,579	company	$125,371	71%
			38	$71,000	residential	$56,800	80%
			043A	$155,500	company	$109,783	71%
			50	$73,000	company	$51,538	71%
			53	$173,011	company	$122,146	71%

				55	$176,137	residential	$140,910	80%
				57	$64,500	company	$45,537	71%
				59	$65,500	company	$46,243	71%
		153	25	067C	$276,920	commercial	$195,506	71%
				067B	$289,592	company	$204,452	71%
Camelback	Campbell	154	3	23	$5,786,675	Luke Camelback LLC	$2,665,675	46%
				022A	$154,082	company	$108,782	71%
				16	$79,000	residential	$63,200	80%
				15	$63,500	company	$44,831	71%
				14	$63,000	company	$44,478	71%
				13	$69,500	residential	$55,600	80%
				12	$62,500	residential	$50,000	80%
				11	$57,500	residential	$46,000	80%
				10	$69,500	residential	$55,600	80%
				009A	$71,788	residential	$57,430	80%
		154	13	037A	$81,000	residential	$64,800	80%
				36	$272,632	company	$192,478	71%
				2	$70,000	residential	$56,000	80%
				1	$71,500	company	$50,479	71%
		154	2	007B	$1,440,760	Childress Buick LLLP	$1,084,760	75%
				008A	$532,500	Childress Buick LLLP	$400,924	75%
				1	$27,500	Childress Buick LLLP	$20,705	75%
				2	$26,500	Childress Buick LLLP	$19,952	75%
				3	$26,500	Childress Buick LLLP	$19,952	75%
				4	$26,500	Childress Buick LLLP	$19,952	75%
				006A	$26,000	Childress Buick LLLP	$19,576	75%
				5	$1,430,517	company	$1,009,945	71%
		154	14	70	$55,000	residential	$44,000	80%
				69	$61,500	residential	$49,200	80%
				71	$79,000	residential	$63,200	80%
				82	$110,500	company	$78,013	71%
				131	$507,000	company	$357,942	71%
				128	$378,770	company	$267,412	71%
				130	$78,000	residential	$62,400	80%
				124	$98,000	residential	$78,400	80%
				119	$74,263	company	$52,430	71%
Missouri	Camelback	153	25	24	$329,222	company	$232,102	71%
				28	$128,392	company	$90,516	71%
				31	$218,386	residential	$174,709	80%
				34	$68,000	residential	$54,400	80%
				36	$177,579	residential	$142,063	80%
				38	$71,000	residential	$56,800	80%
				043A	$155,500	residential	$124,400	80%
		153	25	53	$173,011	company	$121,973	71%
				55	$176,137	residential	$140,910	80%
Campbell	Indian School	154	17	002L	$69,115	company	$48,795	71%
				002M	$120,900	company	$85,355	71%
				002G	$90,405	company	$63,826	71%
				002F	$90,433	company	$63,846	71%
				002E	$90,462	company	$63,866	71%
				002J	$90,462	company	$63,866	71%
				002H	$161,122	company	$113,752	71%
				007G	$102,000	company	$72,012	71%
				007H	$96,333	company	$68,011	71%
				007F	$97,677	company	$68,960	71%
				007E	$101,500	company	$71,659	71%
				007D	$83,500	residential	$66,800	80%
				007J	$108,843	company	$76,843	71%
				007M	$110,843	residential	$88,674	80%
				007L	$61,500	residential	$49,200	80%
		154	28	3	$43,192	company	$30,494	71%
				6	$54,500	residential	$43,600	80%
				8	$71,500	residential	$57,200	80%
				2	$59,000	residential	$47,200	80%
				7	$63,500	residential	$50,800	80%
				004B	$258,385	residential	$206,708	80%
				004A	$128,538	Mason Family Partnership the Etal	$106,238	83%
				014A	$8,500	company	$6,001	71%
				10	$5,500	company	$3,883	71%
				009B	$4,100	company	$2,895	71%
				13	$63,000	residential	$50,400	80%
				11	$82,500	company	$58,245	71%
				15	$41,500	company	$29,299	71%
				17	$93,898	company	$66,292	71%
		154	16	002A	$108,492	company	$76,595	71%
				001A	$47,000	residential	$37,600	80%
				003A	$57,346	residential	$45,877	80%
				004B	$81,072	company	$57,237	71%
				004D	$81,090	company	$57,250	71%
				005B	$103,500	company	$73,071	71%
				005C	$103,500	company	$73,071	71%
				006A	$105,500	company	$74,483	71%
				025D	$65,000	residential	$52,000	80%
				031A	$64,500	residential	$51,600	80%
				17	$1,124,795	company	$794,105	71%
				15	$456,631	company	$322,381	71%

				16	$164,074	company	$115,836	71%
		154	29	013B	$85,800	company	$60,575	71%
				013A	$86,200	company	$60,857	71%
				017B	$66,000	residential	$52,800	80%
				017A	$87,500	company	$61,775	71%
				14	$65,000	residential	$52,000	80%
				018B	$125,596	residential	$100,477	80%
				003A	$142,303	company	$100,466	71%
				19	$55,624	company	$39,271	71%
				008A	$69,500	residential	$55,600	80%
				011A	$87,500	company	$61,775	71%
				16	$194,400	company	$137,246	71%
				015B	$67,500	company	$47,655	71%
				015C	$77,500	company	$54,715	71%
				5	$54,885	company	$38,749	71%
				4	$440,888	company	$311,267	71%
Missouri Ave	Camelback Rd.	153	25	3	$36,500	residential	$29,200	80%
				7	$216,004	company	$152,283	71%
				9	$134,000	residential	$107,200	80%
				15	$68,500	residential	$54,800	80%
				19	$53,000	residential	$42,400	80%
				21	$35,000	residential	$28,000	80%
				23B	$157,045	company	$110,717	71%
				027B	$56,500	company	$39,833	71%
				027C	$47,000	residential	$37,600	80%
				29	$135,165	residential	$108,132	80%
				030B	$97,412	residential	$77,930	80%
				030C	$10,959	residential	$8,767	80%
				32	$281,094	residential	$224,875	80%
				35	$34,406	residential	$27,525	80%
				37	$67,000	residential	$53,600	80%
				48	$61,500	residential	$49,200	80%
				52	$81,500	residential	$65,200	80%
				54A	$146,500	residential	$117,200	80%
				54B	$140,269	residential	$112,215	80%
				56	$38,000	residential	$30,400	80%
				58	$39,000	residential	$31,200	80%
				60	$24,000	residential	$19,200	80%
				77	$65,000	residential	$52,000	80%
				79	$59,500	residential	$47,600	80%
				81	$294,000	residential	$235,200	80%
				83	$97,500	residential	$78,000	80%
				94	$98,492	residential	$78,794	80%
Northern	Orangewood	157	21	98	$81,000	residential	$64,800	80%
				97	$81,000	residential	$64,800	80%
				96	$73,000	residential	$58,400	80%
				95	$81,000	residential	$64,800	80%
				94	$81,000	residential	$64,800	80%
				93	$81,000	residential	$64,800	80%
				92	$81,000	residential	$64,800	80%
				91	$73,000	residential	$58,400	80%
				90	$81,000	residential	$64,800	80%
				12	$139,500	company	$98,487	71%
				44	$130,790	residential	$104,632	80%
				046A	$81,000	residential	$64,800	80%
				045A	$95,000	residential	$76,000	80%
				072A	$110,500	company	$78,013	71%
				73	$65,500	residential	$52,400	80%
		157	22	13	$63,000	residential	$50,400	80%
				14	$130,238	residential	$104,190	80%
				39	$30,954	company	$21,854	71%
				040B	$84,750	company	$59,834	71%
				041D	$26,000	company	$18,356	71%
				040A	$6,055	company	$4,275	71%
				067A	$165,680	company	$116,970	71%
				067B	$76,160	residential	$60,928	80%
				068B	$76,160	company	$53,769	71%
				068C	$107,000	company	$75,542	71%
		157	20	1	$3,091,692	company	$2,182,735	71%
				013B	$480,209	Mini Me LLC	$365,709	76%
				013C	$219,450	company	$154,932	71%
				013D	$88,500	company	$62,481	71%
				014E	$467,988	company	$330,400	71%
				014F	$16,212	company	$11,446	71%
				16	$1,500	company	$1,059	71%
		157	19	032A	$500	company	$353	71%
				032B	$500	company	$353	71%
				8	$720,174	company	$508,443	71%
				009H	$211,500	company	$149,319	71%
				009E	$305,000	company	$215,330	71%
				11	$68,000	company	$48,008	71%
				31	$710,000	company	$501,260	71%
Orangewood	Myrtle	157	23	163	$79,000	residential	$63,200	80%
				162	$79,500	residential	$63,600	80%
				161	$79,000	residential	$63,200	80%
				160	$90,000	residential	$72,000	80%

				159	$77,500	residential	$62,000	80%
				158	$78,500	residential	$62,800	80%
				95	$91,500	residential	$73,200	80%
				93	$87,500	residential	$70,000	80%
				42	$79,500	residential	$63,600	80%
				43	$75,500	residential	$60,400	80%
				44	$78,000	residential	$62,400	80%
				45	$78,000	residential	$62,400	80%
				46	$85,000	residential	$68,000	80%
				47	$79,000	residential	$63,200	80%
			157	18	19	$82,000	residential	$65,600	80%
					18	$78,500	residential	$62,800	80%
					17	$56,500	residential	$45,200	80%
					16	$68,500	residential	$54,800	80%
					15	$81,000	residential	$64,800	80%
					014A	$79,000	residential	$63,200	80%
					2	$80,500	residential	$64,400	80%
					109	$90,000	residential	$72,000	80%
					124	$90,000	residential	$72,000	80%
					125	$88,500	residential	$70,800	80%
					126	$93,000	residential	$74,400	80%
					127	$91,000	residential	$72,800	80%
					128	$94,500	company	$66,717	71%
Myrtle	Glendale		157	24	117	$70,500	company	$49,773	71%
					118	$84,000	residential	$67,200	80%
					119	$78,000	residential	$62,400	80%
					120	$69,000	residential	$55,200	80%
					121	$76,500	residential	$61,200	80%
					92	$87,000	residential	$69,600	80%
					91	$83,500	residential	$66,800	80%
					68	$81,000	residential	$64,800	80%
					67	$86,000	residential	$68,800	80%
					44	$80,000	residential	$64,000	80%
					12	$78,500	residential	$62,800	80%
					11	$73,500	company	$51,891	71%
			157	17	020A	$100,500	residential	$80,400	80%
					019A	$100,000	residential	$80,000	80%
					018A	$95,500	residential	$76,400	80%
					017A	$100,000	residential	$80,000	80%
					016A	$101,500	residential	$81,200	80%
					015B	$147,000	residential	$117,600	80%
					001A	$107,500	residential	$86,000	80%
					212	$38,250	company	$27,005	71%
					213	$38,250	company	$27,005	71%
					236	$38,250	company	$27,005	71%
					237	$38,250	company	$27,005	71%
					238	$38,250	company	$27,005	71%
					239	$38,250	company	$27,005	71%
					240	$38,250	company	$27,005	71%
					241	$57,500	company	$40,595	71%
Glendale	Maryland		156	9	1	$8,384,075	School Dist. Glendale Union	$3,948,575	47%
			156	10	001A	$4,531,608	company	$3,199,315	71%
			156	16	002B	$311,688	company	$220,052	71%
					001F	$925,983	company	$653,744	71%
					001E	$312,329	company	$220,504	71%
					92	$88,500	residential	$70,800	80%
					93	$85,500	residential	$68,400	80%
					116	$81,000	residential	$64,800	80%
					117	$115,582	company	$81,601	71%
			156	15	130	$156,501	North Palms PN	$131,526	84%
					131	$500	North Palms PN	$420	84%
					073A	$3,799,960	company	$2,682,772	71%
					132	$500	North Palms PN	$420	84%
					133	$500	North Palms PN	$420	84%
					134	$500	North Palms PN	$420	84%
Maryland	Bethany Home		156	11	002D	$82,500	residential	$66,000	80%
			156	11	001B	$2,852,462	City of Phoenix	$713,462	25%
			156	11	130	$500	company	$353	71%
			156	11	26	$104,000	apartment	$83,200	80%
			156	11	27	$104,000	apartment	$83,200	80%
			156	11	28	$82,000	apartment	$65,600	80%
			156	11	29	$96,000	apartment	$76,800	80%
			156	11	30	$104,000	apartment	$83,200	80%
			156	11	42	$95,500	apartment	$76,400	80%
			156	11	43	$98,500	apartment	$78,800	80%
			156	11	44	$82,000	apartment	$65,600	80%
			156	11	45	$82,000	apartment	$65,600	80%
			156	11	46	$82,000	apartment	$65,600	80%
			156	11	47	$104,000	apartment	$83,200	80%
			156	11	48	$104,000	apartment	$83,200	80%
			156	12	41	$98,500	residential	$78,800	80%
			156	12	76	$103,500	residential	$82,800	80%
			156	12	77	$106,000	residential	$84,800	80%
			156	12	40	$90,500	residential	$72,400	80%
			156	12	136B	$157,849	company	$111,441	71%
			156	12	136H	$137,500	company	$97,075	71%

		156	12	136J	$120,920	company	$85,370	71%
		156	12	136K	$137,467	company	$97,052	71%
		156	12	136L	$131,742	company	$93,010	71%
		156	12	136M	$132,203	company	$93,335	71%
		156	12	17	$94,000	company	$66,364	71%
		156	14	29	$83,500	residential	$66,800	80%
		156	14	30	$86,500	residential	$69,200	80%
		156	14	47	$87,000	residential	$69,600	80%
		156	14	48	$79,000	residential	$63,200	80%
		156	14	65	$97,000	residential	$77,600	80%
		156	14	76	$96,500	residential	$77,200	80%
		156	14	96	$82,000	residential	$65,600	80%
		156	14	97	$97,000	residential	$77,600	80%
		156	14	98	$77,500	residential	$62,000	80%
		156	14	99	$80,000	residential	$64,000	80%
		156	14	117	$88,000	residential	$70,400	80%
		156	13	59	$73,000	residential	$58,400	80%
		156	13	60	$93,000	residential	$74,400	80%
		156	13	091A	$1,206,614	Oliverio Investment Co	$1,114,454	92%
		156	13	094A	$450,000	Oliverio Investment Co	$415,629	92%
		156	13	113A	$2,013,864	company	$1,421,788	71%
		156	13	114	$764,033	company	$539,407	71%
Bethany Home	Missouri	153	7	138	$79,055	residential	$63,244	80%
		153	7	94	$83,500	company	$58,951	71%
		153	7	93	$66,000	residential	$52,800	80%
		153	7	92	$93,000	company	$65,658	71%
		153	7	54	$103,500	residential	$82,800	80%
		153	7	53	$86,500	residential	$69,200	80%
		153	7	52	$79,500	residential	$63,600	80%
		153	7	25	$84,500	residential	$67,600	80%
		153	7	24	$95,000	residential	$76,000	80%
		153	7	17	$84,500	residential	$67,600	80%
		153	7	16	$83,500	residential	$66,800	80%
		153	10	46	$89,000	residential	$71,200	80%
		153	10	47	$91,500	residential	$73,200	80%
		153	10	73	$88,000	residential	$70,400	80%
		153	10	74	$96,000	company	$67,776	71%
		153	10	88	$90,000	residential	$72,000	80%
		153	10	89	$86,500	residential	$69,200	80%
		153	10	103	$89,500	residential	$71,600	80%
		153	10	104	$90,000	residential	$72,000	80%
		153	10	122A	$884,500	company	$624,457	71%
		153	8	121	$99,000	residential	$79,200	80%
		153	8	120	$83,500	residential	$66,800	80%
		153	8	119	$89,000	residential	$71,200	80%
		153	8	92	$80,500	residential	$64,400	80%
		153	8	91	$96,000	residential	$76,800	80%
		153	8	90	$85,500	residential	$68,400	80%
		153	8	52	$100,000	company	$70,600	71%
		153	8	30	$83,500	residential	$66,800	80%
		153	8	29	$93,500	residential	$74,800	80%
		153	8	19	$90,000	residential	$72,000	80%
		153	8	18	$90,000	residential	$72,000	80%
		153	9	142	$85,000	residential	$68,000	80%
		153	9	29	$88,500	residential	$70,800	80%
		153	9	28	$85,000	residential	$68,000	80%
		153	9	27	$82,500	residential	$66,000	80%
		153	9	26	$97,500	residential	$78,000	80%
		153	9	25	$82,500	residential	$66,000	80%
		153	9	24	$96,500	residential	$77,200	80%
		153	9	23	$84,000	residential	$67,200	80%
		153	9	1	$82,500	residential	$66,000	80%
		153	9	2	$81,000	residential	$64,800	80%
		153	9	3	$92,000	residential	$73,600	80%
		153	9	4	$80,500	residential	$64,400	80%
		153	9	5	$97,500	residential	$78,000	80%
		153	9	6	$82,000	residential	$65,600	80%
		153	9	7	$91,500	company	$64,599	71%
Missouri	Camelback	153	22	001B	$70,000	residential	$56,000	80%
		153	22	001A	$50,000	company	$35,300	71%
		153	22	5	$64,000	company	$45,184	71%
		153	22	7	$70,500	company	$49,773	71%
		153	22	9	$70,500	company	$49,773	71%
		153	22	11	$10,000	company	$7,060	71%
		153	22	13	$100,500	company	$70,953	71%
		153	22	15	$62,500	company	$44,125	71%
		153	22	019B	$60,000	residential	$48,000	80%
		153	22	019A	$72,000	company	$50,832	71%
		153	22	76	$77,000	company	$54,362	71%
		153	22	080A	$58,500	residential	$46,800	80%
		153	22	082A	$219,000	company	$154,614	71%
		153	22	84	$60,500	residential	$48,400	80%
		153	22	087A	$11,000	company	$7,766	71%
		153	22	087B	$15,500	company	$10,943	71%
		153	22	089B	$15,500	company	$10,943	71%
		153	22	089A	$0	company	$0	

		153	22	092A	$69,000	company	$48,714	71%
		153	22	094A	$82,000	residential	$65,600	80%
		153	25	10	$255,500	company	$180,383	71%
		153	25	12	$461,919	company	$326,115	71%
		153	25	14	$34,581	residential	$27,665	80%
		153	25	16	$31,000	company	$21,886	71%
		153	25	71	$34,500	company	$24,357	71%
		153	25	076C	$194,500	company	$137,317	71%
		153	25	78	$73,500	company	$51,891	71%
		153	25	80	$131,485	company	$92,828	71%
		153	25	82	$75,000	company	$52,950	71%
		153	25	084A	$31,786	company	$22,441	71%
		153	23	169	$87,500	residential	$70,000	80%
		153	23	170	$71,500	company	$50,479	71%
		153	23	155	$70,000	residential	$56,000	80%
		153	23	156	$74,500	residential	$59,600	80%
		153	23	148	$73,000	company	$51,538	71%
		153	23	117	$76,000	residential	$60,800	80%
		153	23	109	$76,000	residential	$60,800	80%
		153	23	110	$73,000	residential	$58,400	80%
		153	23	95	$72,000	residential	$57,600	80%
		153	23	96	$69,500	residential	$55,600	80%
		153	24	62	$65,000	residential	$52,000	80%
		153	24	63	$67,000	residential	$53,600	80%
		153	24	72	$66,000	residential	$52,800	80%
		153	24	73	$89,000	residential	$71,200	80%
		153	24	82	$70,500	residential	$56,400	80%
		153	24	83	$67,500	residential	$54,000	80%
		153	24	085A	$62,153	company	$43,880	71%
		153	24	091B	$379,661	Dollar Store LLC	$240,661	63%
Camelback	Heatherbrae	154	2	009B	$57,347	company	$40,487	71%
				10	$248,500	company	$175,441	71%
				33	$29,000	company	$20,474	71%
				036A	$52,000	company	$36,712	71%
				034A	$73,000	residential	$58,400	80%
				57	$56,500	residential	$45,200	80%
				58	$52,500	residential	$42,000	80%
				59	$46,500	residential	$37,200	80%
				60	$48,000	residential	$38,400	80%
				83	$6,500	residential	$5,200	80%
				84	$3,500	residential	$2,800	80%
				085B	$50,500	company	$35,653	71%
				088B	$58,000	company	$40,948	71%
		154	14	92	$72,215	residential	$57,772	80%
				095A	$49,000	residential	$39,200	80%
				1	$105,500	residential	$84,400	80%
				18	$64,000	residential	$51,200	80%
				19	$73,000	residential	$58,400	80%
				36	$85,000	residential	$68,000	80%
				37	$8,200	company	$5,789	71%
				54	$96,500	residential	$77,200	80%
		154	16	46	$93,000	company	$65,658	71%
				47	$86,500	residential	$69,200	80%
				48	$79,000	residential	$63,200	80%
				49	$84,000	residential	$67,200	80%
				50	$93,500	residential	$74,800	80%
				51	$86,000	company	$60,716	71%
				52	$98,000	company	$69,188	71%
		154	29	001B	$64,838	A-1 Direct Services LLC	$51,538	79%
				35	$70,000	company	$49,420	71%
		154	1	003F	$688,119	company	$485,812	71%
		154	1	003J	$4,687,976	company	$3,309,711	71%
		154	1	240	$63,500	residential	$50,800	80%
		154	1	239	$54,000	residential	$43,200	80%
		154	1	209	$54,000	residential	$43,200	80%
		154	1	208	$63,500	residential	$50,800	80%
		154	1	190	$63,500	residential	$50,800	80%
		154	1	189	$54,000	residential	$43,200	80%
		154	1	253	$500	company	$353	71%
		154	1	175	$500	company	$353	71%
		154	1	21	$60,000	residential	$48,000	80%
		154	1	174	$60,000	residential	$48,000	80%
		154	1	132	$60,000	residential	$48,000	80%
		154	1	131	$60,000	residential	$48,000	80%
				4	$102,500	residential	$82,000	80%
		154	15	016A	$93,500	residential	$74,800	80%
				17	$98,500	residential	$78,800	80%
				40	$94,000	residential	$75,200	80%
				41	$92,500	residential	$74,000	80%
				64	$96,500	residential	$77,200	80%
				65	$93,000	residential	$74,400	80%
				96	$98,500	residential	$78,800	80%
		154	15	97	$95,000	residential	$76,000	80%
				098A	$5,300	residential	$4,240	80%
				099A	$95,000	residential	$76,000	80%

		154	30	009B	$1,719,228	company	$1,213,775	71%
Campbell Ave.	Indian School Rd.	154	16	52	$98,000	residential	$78,400	80%
			30	006B	$318,500	company	$224,543	71%
				009B	$1,719,228	residential	$1,375,382	80%
Campbell Ave.	Indian School Rd.	154	30	7	$252,743	company	$178,184	71%
				8	$133,728	company	$94,278	71%
Missouri	Camelback	153	24	25	$82,500	residential	$66,000	80%
				26	$88,500	residential	$70,800	80%
				27	$76,500	residential	$61,200	80%
				28	$88,000	residential	$70,400	80%
				29	$77,000	residential	$61,600	80%
				30	$80,500	residential	$64,400	80%
				31	$79,500	residential	$63,600	80%
				32	$84,000	residential	$67,200	80%
Maryland Ave.	Bethany Home Rd.	156	26	56	$66,500	residential	$53,200	80%
				57	$66,500	residential	$53,200	80%
23rd Ave.	19th Ave.	158	6	18	$6,313,097	company	$4,457,046	71%
				021A	$1,109,463	company	$783,281	71%
				5	$3,642,139	company	$2,571,350	71%
				001B	$233,246	company	$164,672	71%
		157	21	1	$1,194,894	Kay-Kay 941 Limited Partnership	$1,080,394	90%
				2	$121,500	Kay-Kay 941 Limited Partnership	$109,857	90%
				3	$168,255	residential	$134,604	80%
				4	$305,000	company	$215,330	71%
				5	$159,750	company	$112,784	71%
				6	$280,800	company	$198,245	71%
				7	$141,173	company	$99,668	71%
				8	$126,000	residential	$100,800	80%
				108	$100,500	residential	$80,400	80%
				12	$139,500	company	$98,487	71%
				99	$81,000	residential	$64,800	80%
				98	$81,000	residential	$64,800	80%
		157	20	1	$3,091,692	company	$2,182,735	71%
				110	$1,604,067	residential	$1,283,254	80%
				4	$775,002	company	$547,151	71%
				005A	$163,215	company	$115,230	71%
				005B	$375,431	company	$265,054	71%
				006A	$449,429	company	$317,297	71%
				007A	$235,390	company	$166,185	71%
23rd Ave.	19th Ave.	157	22	80	$188,500	company	$133,081	71%
				79	$70,500	company	$49,773	71%
				78	$78,000	residential	$62,400	80%
				77	$71,500	residential	$57,200	80%
				76	$78,000	residential	$62,400	80%
				75	$228,000	company	$160,968	71%
				74	$57,500	residential	$46,000	80%
				73	$45,000	residential	$36,000	80%
				72	$59,000	residential	$47,200	80%
				71	$146,651	company	$103,536	71%
				70	$55,500	company	$39,183	71%
				69	$53,000	company	$37,418	71%
				068C	$107,000	company	$75,542	71%
		157	19	31	$1,175,748	Bougainvillea Garden Apartments LLC	$1,072,914	91%
				29	$579,446	company	$409,089	71%
				30	$33,554	residential	$26,843	80%
				28	$89,000	residential	$71,200	80%
				027B	$491,479	company	$346,984	71%
				027A	$130,000	company	$91,780	71%
				25	$411,337	company	$290,404	71%
				26	$411,337	company	$290,404	71%
				024A	$363,098	company	$256,347	71%
		157	23	180	$80,000	residential	$64,000	80%
				179	$87,500	residential	$70,000	80%
				178	$82,500	residential	$66,000	80%
				177	$79,000	residential	$63,200	80%
				176	$81,500	residential	$65,200	80%
				175	$73,500	residential	$58,800	80%
				174	$81,500	residential	$65,200	80%
				173	$80,500	residential	$64,400	80%
				172	$87,500	residential	$70,000	80%
				171	$86,500	residential	$69,200	80%
				90	$77,500	residential	$62,000	80%
				170	$82,500	residential	$66,000	80%
				169	$81,500	residential	$65,200	80%
				168	$77,000	residential	$61,600	80%
				167	$93,000	residential	$74,400	80%
				166	$87,000	residential	$69,600	80%
				165	$79,500	residential	$63,600	80%
				164	$94,000	residential	$75,200	80%
				163	$79,000	residential	$63,200	80%
		157	18	19	$82,000	residential	$65,600	80%
				20	$77,500	residential	$62,000	80%
				21	$76,500	residential	$61,200	80%
				22	$74,000	residential	$59,200	80%
				23	$77,000	residential	$61,600	80%
				24	$92,500	residential	$74,000	80%

				25	$80,000	residential	$64,000	80%
				26	$77,500	residential	$62,000	80%
				27	$85,500	residential	$68,400	80%
				28	$74,500	residential	$59,600	80%
				29	$84,000	residential	$67,200	80%
				30	$86,500	residential	$69,200	80%
				31	$77,000	residential	$61,600	80%
				32	$71,000	residential	$56,800	80%
				33	$81,000	residential	$64,800	80%
				34	$76,000	residential	$60,800	80%
				35	$83,000	residential	$66,400	80%
				36	$67,000	residential	$53,600	80%
23rd Dr.	19th Ave.	157	26	56	$95,500	residential	$76,400	80%
				57	$87,000	company	$61,422	71%
		157	23	50	$91,500	company	$64,599	71%
				70	$123,000	residential	$98,400	80%
				71	$82,500	residential	$66,000	80%
				8	$79,000	residential	$63,200	80%
				7	$83,500	residential	$66,800	80%
				6	$83,000	residential	$66,400	80%
				5	$76,000	residential	$60,800	80%
				4	$85,000	residential	$68,000	80%
				3	$84,500	residential	$67,600	80%
				2	$76,000	residential	$60,800	80%
				1	$79,500	residential	$63,600	80%
				49	$87,000	residential	$69,600	80%
				48	$83,000	residential	$66,400	80%
				47	$79,000	residential	$63,200	80%
		157	18	128	$94,500	company	$66,717	71%
				129	$92,500	residential	$74,000	80%
				130	$62,000	residential	$49,600	80%
				136	$90,500	residential	$72,400	80%
				137	$82,000	residential	$65,600	80%
				138	$84,500	company	$59,657	71%
				139	$89,500	residential	$71,600	80%
				144A	$614,349	company	$433,730	71%
				145A	$411,691	company	$290,654	71%
		157	25	87	$111,000	residential	$88,800	80%
		157	24	140A	$98,500	residential	$78,800	80%
				141	$102,000	company	$72,012	71%
				43	$79,000	residential	$63,200	80%
				107	$78,000	company	$55,068	71%
				108	$70,000	residential	$56,000	80%
				109	$77,500	residential	$62,000	80%
				110	$82,500	residential	$66,000	80%
				111	$87,000	residential	$69,600	80%
				112	$75,500	residential	$60,400	80%
				113	$82,000	residential	$65,600	80%
				114	$81,500	residential	$65,200	80%
				115	$76,000	residential	$60,800	80%
				116	$75,000	residential	$60,000	80%
				117	$70,500	company	$49,773	71%
		157	17	020A	$100,500	company	$70,953	71%
				021A	$99,500	residential	$79,600	80%
				022A	$101,500	residential	$81,200	80%
				023A	$100,500	residential	$80,400	80%
				024A	$100,500	residential	$80,400	80%
				025A	$101,500	residential	$81,200	80%
				037B	$102,000	residential	$81,600	80%
				41	$33,000	residential	$26,400	80%
				42	$33,000	residential	$26,400	80%
				66	$33,000	company	$23,298	71%
				67	$33,000	residential	$26,400	80%
				68	$52,000	company	$36,712	71%
				69	$38,000	residential	$30,400	80%
				70	$38,000	residential	$30,400	80%
				71	$52,000	residential	$41,600	80%
				72	$45,500	residential	$36,400	80%
				73	$38,000	residential	$30,400	80%
				74	$38,000	residential	$30,400	80%
				75	$45,500	residential	$36,400	80%
				76	$33,000	residential	$26,400	80%
				89	$33,000	residential	$26,400	80%
				91	$45,500	residential	$36,400	80%
				92	$38,000	residential	$30,400	80%
				93	$38,000	residential	$30,400	80%
				94	$45,500	residential	$36,400	80%
				95	$52,000	residential	$41,600	80%
				96	$38,000	residential	$30,400	80%
				97	$52,000	residential	$41,600	80%
23rd Ave.	21st Ave.	153	10	015A	$597,026	company	$421,500	71%
				122A	$884,500	company	$624,457	71%
		153	9	7	$91,500	company	$64,599	71%
				8	$83,500	residential	$66,800	80%
				9	$85,500	residential	$68,400	80%
				10	$95,500	company	$67,423	71%

				11	$83,000	residential	$66,400	80%
				12	$86,000	residential	$68,800	80%
				13	$87,500	residential	$70,000	80%
				101	$92,000	residential	$73,600	80%
				102	$99,000	residential	$79,200	80%
				103	$83,500	residential	$66,800	80%
				104	$87,500	residential	$70,000	80%
				105	$86,500	residential	$69,200	80%
				106	$83,000	residential	$66,400	80%
				107	$85,500	company	$60,363	71%
			153	22	025A	$45,000	company	$31,770	71%
				24	$32,000	residential	$25,600	80%
				23	$55,500	residential	$44,400	80%
				108	$50,500	company	$35,653	71%
				109	$50,500	company	$35,653	71%
				110	$50,500	company	$35,653	71%
				111	$50,500	company	$35,653	71%
				112	$50,500	company	$35,653	71%
				113	$50,500	company	$35,653	71%
				114	$50,500	company	$35,653	71%
				115	$50,500	company	$35,653	71%
				116	$50,500	company	$35,653	71%
				117	$50,500	company	$35,653	71%
				2	$63,500	company	$44,831	71%
				001B	$70,000	residential	$56,000	80%
			153	23	169	$87,500	residential	$70,000	80%
				168	$75,000	residential	$60,000	80%
				167	$83,500	residential	$66,800	80%
				166	$72,500	company	$51,185	71%
				165	$71,000	residential	$56,800	80%
				164	$81,000	company	$57,186	71%
				163	$90,000	residential	$72,000	80%
				133	$76,000	residential	$60,800	80%
				29	$81,000	residential	$64,800	80%
				7	$80,500	residential	$64,400	80%
				6	$82,000	residential	$65,600	80%
				5	$71,000	residential	$56,800	80%
				4	$69,500	residential	$55,600	80%
				3	$79,000	residential	$63,200	80%
				177	$650,077	residential	$520,062	80%
25th Ave.	20th Ave.		153	25	2	$176,720	company	$124,588	71%
					4	$25,000	company	$17,625	71%
					5	$59,000	residential	$47,200	80%
					023A	$44,000	company	$31,020	71%
					25	$53,195	company	$37,502	71%
			153	26	061D	$552,500	company	$389,513	71%
24th Ave.	20th Ave.		153	24	42	$77,000	residential	$61,600	80%
					64	$68,500	residential	$54,800	80%
					66	$64,500	residential	$51,600	80%
					68	$66,000	residential	$52,800	80%
					70	$63,000	residential	$50,400	80%
					72	$66,000	residential	$52,800	80%
			153	26	12	$65,500	residential	$52,400	80%
					13	$62,500	residential	$50,000	80%
					14	$71,500	residential	$57,200	80%
					15	$68,500	residential	$54,800	80%
					16	$65,500	residential	$52,400	80%
					17	$64,500	residential	$51,600	80%
					52	$73,000	residential	$58,400	80%
					53	$69,000	residential	$55,200	80%
					54	$68,500	residential	$54,800	80%
					55	$61,000	residential	$48,800	80%
					64	$75,500	residential	$60,400	80%
24th Ave.	20th Ave.		153	24	40	$82,500	residential	$66,000	80%
					41	$102,000	residential	$81,600	80%
					65	$90,000	residential	$72,000	80%
					67	$83,500	residential	$66,800	80%
					69	$66,500	residential	$53,200	80%
					71	$65,500	residential	$52,400	80%
					73	$89,000	residential	$71,200	80%
					74	$68,000	residential	$54,400	80%
					76	$66,000	residential	$52,800	80%
					78	$79,000	residential	$63,200	80%
					80	$65,000	residential	$52,000	80%
					82	$70,500	residential	$56,400	80%
			153	25	17	$52,500	company		
					18	$59,284	residential	$47,427	80%
					20	$50,000	residential	$40,000	80%
					22	$51,500	residential	$41,200	80%
					39	$52,500	residential	$42,000	80%
					040A	$47,500	residential	$38,000	80%
					040B	$48,500	residential	$38,800	80%
					41	$49,500	residential	$39,600	80%
					42	$52,000	residential	$41,600	80%

				043B	$69,000	residential	$55,200	80%
				44	$75,187	residential	$60,150	80%
				45	$38,500	residential	$30,800	80%
				47	$51,000	residential	$40,800	80%
				49	$65,500	residential	$52,400	80%
				50	$73,000	residential	$58,400	80%
				51A	$68,500	residential	$54,800	80%
				51B	$82,000	residential	$65,600	80%
				72	$71,500	residential	$57,200	80%
				73	$80,000	residential	$64,000	80%
				74	$283,500	residential	$226,800	80%
				75	$179,908	residential	$143,926	80%
			153	26	42	$61,500	residential	$49,200	80%
					43	$69,000	residential	$55,200	80%
					44	$63,500	residential	$50,800	80%
					45	$63,000	residential	$50,400	80%
					48	$64,500	residential	$51,600	80%
					49	$63,000	residential	$50,400	80%
24th Ave	20th Ave.		153	24	39	$79,500	residential	$63,600	80%
					75	$75,500	residential	$60,400	80%
					77	$66,500	residential	$53,200	80%
					79	$80,500	residential	$64,400	80%
					81	$63,500	residential	$50,800	80%
					83	$67,500	residential	$54,000	80%
25th Ave.	21st Ave.		153	25	095A	$500	company	$353	71%
					067B	$289,592	company	$204,452	71%
					066C	$39,000	company	$27,534	71%
					065A	$111,998	company	$79,071	71%
					064B	$172,540	company	$121,813	71%
					063B	$37,115	company	$26,203	71%
					062B	$217,663	company	$153,670	71%
					061A	$20,500	company	$14,473	71%
					093A	$41,871	company	$29,561	71%
					92	$200,355	company	$141,451	71%
					091B	$33,500	company	$23,651	71%
					090D	$39,000	company	$27,534	71%
					089A	$73,608	company	$51,967	71%
					088B	$64,500	company	$45,537	71%
					087A	$35,800	company	$25,275	71%
					086A	$42,500	company	$30,005	71%
					085A	$174,738	company	$123,365	71%
					084A	$31,786	company	$22,441	71%
			153	24	091B	$379,661	Dollar Store LLC	$240,661	63%
					085E	$27,183	company	$19,191	71%
					089A	$245,116	company	$173,052	71%
					037A	$77,142	company	$54,462	71%
					036A	$69,161	company	$48,828	71%
					092A	$6,800,000	company	$4,800,800	71%
					049C	$536,656	company	$378,879	71%
					045A	$300,000	company	$211,800	71%
			153	26	059C	$43,000	company	$30,315	71%
					059D	$260,951	company	$184,231	71%
					061C	$115,965	company	$81,755	71%
			154	2	007B	$1,440,760	company	$1,017,177	71%
					007C	$148,500	company	$104,841	71%
					032E	$916,008	company	$646,702	71%
					019B	$35,259	company	$24,893	71%
					017A	$86,263	company	$60,902	71%
					015A	$61,817	company	$43,643	71%
					013A	$112,225	company	$79,231	71%
					011B	$87,088	company	$61,484	71%
					009B	$57,347	company	$40,487	71%
			154	1	003F	$688,119	company	$485,812	71%
					003L	$14,566,648	company	$10,284,053	71%
					001B	$1,138,865	company	$804,039	71%
21st Ave.	20th Ave.		154	1	189	$54,000	residential	$43,200	80%
21st Ave.	20th Ave.		154	15	18	$100,000	residential	$80,000	80%
					39	$92,500	residential	$74,000	80%
23rd Ave.	19th Ave.		154	14	119	$74,263	company	$52,430	71%
					120	$74,500	company	$52,597	71%
					125C	$181,515	company	$128,150	71%
					127	$109,500	company	$77,307	71%
					122B	$120,788	residential	$96,630	80%
					121	$77,000	residential	$61,600	80%
					46	$70,000	residential	$56,000	80%
					47	$76,000	residential	$60,800	80%
					48	$83,500	residential	$66,800	80%
					49	$76,000	residential	$60,800	80%
					50	$70,000	residential	$56,000	80%
					51	$73,500	residential	$58,800	80%
					52	$79,500	residential	$63,600	80%
					53	$69,500	residential	$55,600	80%
					54	$96,500	residential	$77,200	80%
			154	15	41	$92,500	residential	$74,000	80%
					42	$97,500	residential	$78,000	80%
					43	$101,500	residential	$81,200	80%

				44	$91,000	residential	$72,800	80%
				45	$106,000	residential	$84,800	80%
				46	$111,500	company	$78,719	71%
				47	$93,000	residential	$74,400	80%
				48	$94,500	residential	$75,600	80%
				49	$92,000	residential	$73,600	80%
				50	$96,500	residential	$77,200	80%
				51	$105,500	residential	$84,400	80%
				52	$92,000	residential	$73,600	80%
				63	$90,000	residential	$72,000	80%
				111G	$141,590	Superior Tattoo Equipment Co Inc	$108,056	76%
				111D	$183,254	company	$129,377	71%
			154	16	002A	$108,492	company	$76,595	71%
					007A	$121,823	residential	$97,458	80%
					007B	$106,500	company	$75,189	71%
					139B	$0	company	$0	
					023D	$1,165,423	Cyruss Woods Apartment Partners Inc	$932,029	80%
					40	$93,500	residential	$74,800	80%
					41	$85,000	residential	$68,000	80%
					42	$82,000	residential	$65,600	80%
					46	$93,000	company	$65,658	71%
			154	15	64	$96,500	residential	$77,200	80%
					63	$90,000	residential	$72,000	80%
					62	$92,500	residential	$74,000	80%
					61	$92,500	residential	$74,000	80%
					60	$91,500	residential	$73,200	80%
					59	$108,500	residential	$86,800	80%
					58	$95,000	residential	$76,000	80%
					57	$95,000	residential	$76,000	80%
					56	$99,000	residential	$79,200	80%
					55	$94,000	residential	$75,200	80%
					54	$91,500	residential	$73,200	80%
					53	$98,000	company	$69,188	71%
					113A	$42,610	United Auto Insurance Inc	$17,743	42%
					113C	$86,277	company	$60,912	71%
22nd Ave.	20th Ave.		154	15	65	$93,000	residential	$74,400	80%
			154	15	66	$74,500	residential	$59,600	80%
			154	15	67	$96,000	residential	$76,800	80%
			154	15	68	$92,500	residential	$74,000	80%
			154	15	69	$92,000	residential	$73,600	80%
			154	15	92	$93,000	residential	$74,400	80%
			154	15	93	$93,000	residential	$74,400	80%
			154	15	94	$101,500	residential	$81,200	80%
			154	15	95	$98,500	residential	$78,800	80%
			154	16	043A	$84,500	residential	$67,600	80%
			154	16	044A	$102,500	residential	$82,000	80%
			154	16	45	$12,900	residential	$10,320	80%
			154	16	054A	$97,500	residential	$78,000	80%
East of 21st Ave			154	15	91	$97,500	residential	$78,000	80%
			154	15	90	$98,500	residential	$78,800	80%
			154	15	89	$96,000	residential	$76,800	80%
			154	15	88	$93,500	residential	$74,800	80%
			154	15	87	$93,000	residential	$74,400	80%
			154	15	86	$92,000	residential	$73,600	80%
			154	15	85	$97,000	residential	$77,600	80%
			154	15	84	$97,500	residential	$78,000	80%
			154	15	83	$94,500	residential	$75,600	80%
			154	15	82	$94,500	residential	$75,600	80%
			154	15	70	$92,500	residential	$74,000	80%
			154	15	71	$93,000	residential	$74,400	80%
			154	15	72	$91,500	residential	$73,200	80%
			154	15	73	$108,500	residential	$86,800	80%
			154	15	74	$114,000	residential	$91,200	80%
			154	15	75	$96,000	residential	$76,800	80%
			154	15	76	$86,000	residential	$68,800	80%
			154	15	77	$107,500	residential	$86,000	80%
			154	15	78	$95,000	residential	$76,000	80%
			154	15	79	$102,000	residential	$81,600	80%
			154	15	80	$95,500	residential	$76,400	80%
			154	15	81	$109,500	residential	$87,600	80%
			154	15	110	$89,000	residential	$71,200	80%
ıth of Turney			154	30	8	$133,728	apartments	$106,982	80%
			154	30	7	$252,743	apartments	$202,194	80%
			154	16	054B	$103,000	residential	$82,400	80%
22nd Ave	19th Ave.		154	15	099A	$95,000	residential	$76,000	80%

		154	15	100	$111,500	residential	$89,200	80%
		154	15	104	$95,500	residential	$76,400	80%
		154	15	105	$107,000	residential	$85,600	80%
		154	16	53	$151,500	residential	$121,200	80%
		154	30	001B	$187,000	company	$131,835	71%
		154	30	004B	$25,000	residential	$20,000	80%
		154	30	004C	$92,300	residential	$73,840	80%
		154	30	004D	$113,600	residential	$90,880	80%
		154	30	004E	$167,000	residential	$133,600	80%
		154	30	5	$19,000	residential	$15,200	80%
		154	30	009C	$1,436,772	residential	$1,149,418	80%
22nd Ave.	21st. Ave.	154	30		$32,000	residential	$25,600	80%
Camelback Rd.	Missouri Ave.	153	26	061M	$391,686	company	$276,139	71%
		153	26	061S	$739,924	company	$521,646	71%
						Total Building Value	$226,581,132	

AVERAGE ANNUAL FLOOD DAMAGE

Average Annual Flood Damage
24th Avenue & Camelback Road Drainage Project

Existing Conditions, 2-Year Storm

Location	Flood Damage ($) By Storm Return Interval			
	2-Year	10-Year	25-Year	100-Year
21st Avenue, Camelback Road to Heatherbrae	$288,392			
21st Avenue, Maryland Avenue to Camelback Road	$561,137			
East of 21st Avenue, Campbell, Roma, Turney, 20th Avenue	$326,940			
23rd Avenue, Maryland Avenue to Camelback Road	$256,561			
24th Avenue, Orange Drive to Camelback Road	$73,150			
Total:	**$1,506,180**	**$0**	**$0**	**$0**

Average Annual Damage: **$753,089.80**

Average Annual Flood Damage
24th Avenue & Camelback Road Drainage Project

Existing Conditions, 2-Year Through 10-Year Storm

Location	Flood Damage ($) By Storm Return Interval			
	2-Year	10-Year	25-Year	100-Year
21st Avenue, Camelback Road to Heatherbrae	$288,392	$948,070		
21st Avenue, Maryland Avenue to Camelback Road	$561,137	$1,606,771		
East of 21st Avenue, Campbell, Roma, Turney, 20th Avenue	$326,940	$1,134,965		
23rd Avenue, Maryland Avenue to Camelback Road	$256,561	$1,467,365		
24th Avenue, Orange Drive to Camelback Road	$73,150	$298,995		
Total:	**$1,506,180**	**$5,456,167**	**$0**	**$0**

Average Annual Damage: **$1,392,469.23**

Average Annual Flood Damage
24th Avenue & Camelback Road Drainage Project

Existing Conditions, 2-Year Through 25-Year Storm

Location	Flood Damage ($) By Storm Return Interval			
	2-Year	10-Year	25-Year	100-Year
21st Avenue, Camelback Road to Heatherbrae	$288,392	$948,070	$1,342,065	
21st Avenue, Maryland Avenue to Camelback Road	$561,137	$1,606,771	$2,202,949	
East of 21st Avenue, Campbell, Roma, Turney, 20th Avenue	$326,940	$1,134,965	$1,554,395	
23rd Avenue, Maryland Avenue to Camelback Road	$256,561	$1,467,365	$2,126,106	
24th Avenue, Orange Drive to Camelback Road	$73,150	$298,995	$328,744	
Total:	**$1,506,180**	**$5,456,167**	**$7,554,260**	**$0**

Average Annual Damage: **$1,782,782.01**

Average Annual Flood Damage
24th Avenue & Camelback Road Drainage Project

Existing Conditions, 2-Year Through 100-Year Storm

Location	Flood Damage ($) By Storm Return Interval			
	2-Year	10-Year	25-Year	100-Year
21st Avenue, Camelback Road to Heatherbrae	$288,392	$948,070	$1,342,065	$1,741,570
21st Avenue, Maryland Avenue to Camelback Road	$561,137	$1,606,771	$2,202,949	$2,885,027
East of 21st Avenue, Campbell, Roma, Turney, 20th Avenue	$326,940	$1,134,965	$1,554,395	$2,049,071
23rd Avenue, Maryland Avenue to Camelback Road	$256,561	$1,467,365	$2,126,106	$3,008,410
24th Avenue, Orange Drive to Camelback Road	$73,150	$298,995	$328,744	$368,409
Total:	**$1,506,180**	**$5,456,167**	**$7,554,260**	**$10,052,486**

Average Annual Damage: **$2,046,883**

Average Annual Flood Damage
24th Avenue & Camelback Road Drainage Project

100-Yr Level Flood Protection
2-Year Storm

Location	Flood Damage ($) By Storm Return Interval			
	2-Year	10-Year	25-Year	100-Year
21st Avenue, Camelback Road to Heatherbrae	$0			
21st Avenue, Maryland Avenue to Camelback Road	$283,420			
East of 21st Avenue, Campbell, Roma, Turney, 20th Avenue	$0			
23rd Avenue, Maryland Avenue to Camelback Road	$0			
24th Avenue, Orange Drive to Camelback Road	$0			
Total:	**$283,420**	**$0**	**$0**	**$0**

Average Annual Damage: **$141,710.20**

Average Annual Flood Damage
24th Avenue & Camelback Road Drainage Project

100-yr Level Flood Protection
2-Year Through 10-Year Storm

Location	Flood Damage ($) By Storm Return Interval			
	2-Year	10-Year	25-Year	100-Year
21st Avenue, Camelback Road to Heatherbrae	$0	$64,834		
21st Avenue, Maryland Avenue to Camelback Road	$283,420	$960,682		
East of 21st Avenue, Campbell, Roma, Turney, 20th Avenue	$0	$170,974		
23rd Avenue, Maryland Avenue to Camelback Road	$0	$207,339		
24th Avenue, Orange Drive to Camelback Road	$0	$16,852		
Total:	**$283,420**	**$1,420,680**	**$0**	**$0**

Average Annual Damage: **$340,820.04**

Average Annual Flood Damage
24th Avenue & Camelback Road Drainage Project

100-Yr Level Flood Protection
2-Year Through 25-Year Storm

Location	Flood Damage ($) By Storm Return Interval			
	2-Year	10-Year	25-Year	100-Year
21st Avenue, Camelback Road to Heatherbrae	$0	$64,834	$136,089	
21st Avenue, Maryland Avenue to Camelback Road	$283,420	$960,682	$1,376,858	
East of 21st Avenue, Campbell, Roma, Turney, 20th Avenue	$0	$170,974	$282,455	
23rd Avenue, Maryland Avenue to Camelback Road	$0	$207,339	$443,175	
24th Avenue, Orange Drive to Camelback Road	$0	$16,852	$45,462	
Total:	**$283,420**	**$1,420,680**	**$2,284,039**	**$0**

Average Annual Damage: **$451,961.61**

Average Annual Flood Damage
24th Avenue & Camelback Road Drainage Project

100-Yr Level Flood Protection
2-Year Through 100-Year Storm

Location	Flood Damage ($) By Storm Return Interval			
	2-Year	10-Year	25-Year	100-Year
21st Avenue, Camelback Road to Heatherbrae	$0	$64,834	$136,089	$184,124
21st Avenue, Maryland Avenue to Camelback Road	$283,420	$960,682	$1,376,858	$1,939,869
East of 21st Avenue, Campbell, Roma, Turney, 20th Avenue	$0	$170,974	$282,455	$419,251
23rd Avenue, Maryland Avenue to Camelback Road	$0	$207,339	$443,175	$765,241
24th Avenue, Orange Drive to Camelback Road	$0	$16,852	$45,462	$75,536
Total:	**$283,420**	**$1,420,680**	**$2,284,039**	**$3,384,020**

Average Annual Damage: **$536,982**

APPENDIX W

EXCERPTS FROM DRAINAGE STUDIES

DRAINAGE RECOMMENDATIONS
OF
LOCAL DRAINAGE PROBLEMS
NORTH AND CENTRAL SERVICE CENTERS

INDEX NO. ST-955237

Prepared

for

City of Phoenix

by

PRIMATECH ENGINEERS
2929 N. 44th Street, Suite 228
Phoenix, Arizona, 85018

February 28, 1997

16. *Site 43 — 24th Avenue and Camelback Road*

16.1 Location and Site Description

This site is located on the north side of Camelback Road at 24th Avenue in Township 2 North, Range 2 East, Section 13 of the Gila and Salt River Base and Meridian (see Site 43 - Vicinity Map, Figure 1).

The area is developed as medium density, single-family residents. Existing roadway geometry consists of a normal crown with rolled curb and gutter. Curb opening catch basins are located at the curb returns at the northeast and northwest corners of 24th Avenue.

16.2 Problem Identification

The houses and properties beginning at Camelback Road and extending north on both sides of 24th Avenue regularly flood during storm events. Some of the property owners have constructed humps in their front yards in an attempt to prevent flood waters which overtop the curb from flooding their homes.

Flooding may be caused by three situations at this location. First, the flows generated within the drainage area exceed the interception capacity of the existing catch basins. Second, the hydraulic grade line of the main line storm drain in Camelback Road is higher than the ground at the existing catch basins and flows bubble out.

Camelback Road may be in a sag condition, causing flows to drain back into 24th Avenue where they pond. Humps have been built around several of the front yards of the properties to protect them from flooding (see Site 43 - Problem Identification, Figure 2).

16.3 History

The catch basins (each a single COP P1572 Type Q catch basin) which are located at the curb return of 24th Avenue connect to the Camelback Road trunk line. These storm drain plans are not available from Central Records.

16.4 Site Specific Data Acquisition

The following documentation was acquired from various sources for use in evaluating this site:

- City of Phoenix Right-of-Way Quarter Section Map Numbers: 19-23, Plotted 10-11-94;19-24, Revised 9-12-91; 20-23, Revised 10-22-92; and 20-24 Revised 9-12-91.
- City of Phoenix Aerial Photo Quarter Section Map Numbers: 19-23, Flown 6-12-95; 19-24, Flown 6-12-95; 20-23, Flown 6-12-95; and 20-24, Flown 6-12-95.
- City of Phoenix Wastewater Quarter Section Map Numbers: 19-23, Revised 11-6-95; 19-24, Revised 4-6-94; 20-23, Plotted 11-6-95; and 20-24, Revised 9-22-94.

- City of Phoenix Water Quarter Section Map Numbers: 19-23, Plotted 11-6-95; 19-24, Revised 10-31-94; 20-23, Plotted 11-6-95; and 20-24, Revised 5-16-95.
- City of Phoenix Engineering Storm Drain Map H7 (not dated).
- USGS 7.5-minute quadrangle map for Sunnyslope Arizona which contains Site 43, its upstream drainage area, and downstream flow path, Photo Revised 1982.

16.5 Hydrology

Flood waters intercepted by the catch basins located at the curb return of 24th Avenue and Camelback Road originate from the northwest. City quarter section topographic maps are not available for this area; therefore, the drainage area was delineated on a USGS 7.5-Minute Quadrangle Map. The Rational Method was used to calculate the discharges at this location and are listed in the following table. The roadway geometry has a normal crown section, with rolled curb and gutter. The cross slope was assumed to be 2.0 percent. The subdivision does not have sidewalks. Refer to the following table for frequency, discharge, flow depths, and flow velocity at the catch basins.

Frequency (yr)	Discharge (cfs)	Runoff Volume (ac-ft)	Flow Depth (ft)	Flow Velocity (fps)
100	22	3	*	*
50	20	3	*	*
10	15	2	.4	1.7
2	7	1	.3	4.0

*Flow exceeds the roadway right-of-way.

16.6 Future Projects

City of Phoenix Freeway Corridor Information Report, Summer 1993

Improvements to the Camelback Road traffic interchange with I-17 are currently in the planning stage.

City of Phoenix Five-Year Arterial Street and Storm Drain Program

The City of Phoenix Street Transportation Department instituted a 5-year arterial street and storm drain improvement program beginning in 1995. There are no plans to improve any of the streets, nor are there any plans to construct any storm drain systems in the area of this site.

16.7 Federal Emergency Management Agency

FEMA data for this site can be found on FIRM Panel Number 04013C1665F, dated September 30, 1995. The site is located in Zone X (shaded), which denotes areas of 500-year flood; areas

of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 100-year flood. A LOMR dated April 19, 1995 has been submitted and approved by FEMA, and the new Panel Number is 04013C1665G. The LOMR does not modify the flooding zone for this site.

16.8 Alternative Solutions

The roadway has the capacity to convey the 2-year storm. The existing catch basins (COP P1569 Type M catch basin M1, L=0) located at the curb returns of 24th Avenue at the intersection of 24th Avenue with Camelback Road are in a sag condition. They can intercept 2.2 cfs of the total 7.0 cfs generated in the 2-year storm.

Alternative 1 - 2-year Storm Drain Lateral Beginning at the Manhole in 24th Avenue and Extending North

An existing storm drain lateral extends north into 24th Avenue from the trunk line in Camelback Road. It consists of a manhole in the center of 24th Avenue with catch basins located at the curb returns of 24th Avenue directly opposite the manhole. The roadway section has a normal crown. A 24-inch pipe will be extended north in 24th Avenue from the existing manhole for about 110 feet to a new City of Phoenix P1520 manhole. From the manhole, a 24-inch pipe will branch due west to join to a new City of Phoenix P1569 M2, L=10 catch basin installed in the curb on the west side of 24th Avenue. A 24-inch pipe will be extended to the northeast beginning at the proposed manhole previously mentioned and join a new City of Phoenix P1569 M2, L=10 catch basin. These catch basins will intercept 6.6 cfs of the 7.0 cfs generated in the 2-year storm. The existing catch basins will intercept the remaining flow.

Alternative 2 - Increase the Capacity of the Mainline in Camelback Road

Residents have complained that drain times for the existing catch basins are excessive. The existing ponding may be a result of the conveyance capacity of the mainline being exceeded. As the storm drain is filled during a flooding event, the hydraulic grade line may exceed the top of ground at the existing catch basins and water may discharge from the mainline through these catch basins, causing the local flooding at this site. A detailed storm drain analysis of the Camelback Road Storm Drain will have to be performed to evaluate this possibility.

Alternative 3 - Build a Hump Around the Properties

This alternative involves building berms around the houses if the flooding is the result of two conditions: 1) Camelback Road is in a sag condition at 24th Avenue, and 2) the houses are lower than the intersection.

16.9 Recommended Alternative

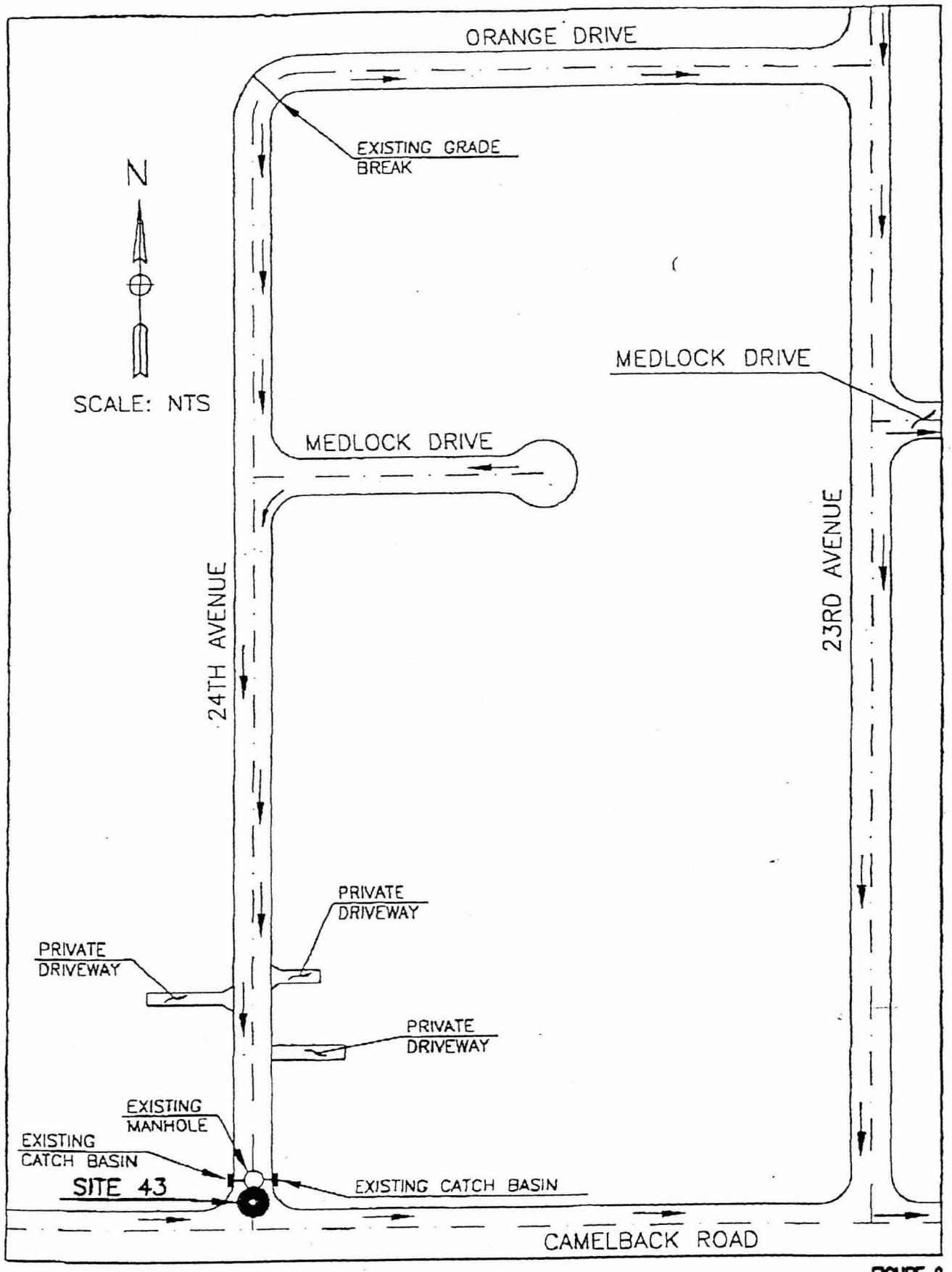
The City of Phoenix has decided to take no action at this time at this site, as improvements to the Camelback Road traffic interchange may address the problem. It is recommended that the

City discuss this possibility with ADOT and their design engineers, Wood/Patel. Jeff Holzmeister of Wood/Patel, 234-1344, has expressed a willingness to discuss this issue with the City (see Site 43 - Preferred Alternative, Figure 3).

16.10 Cost Estimate

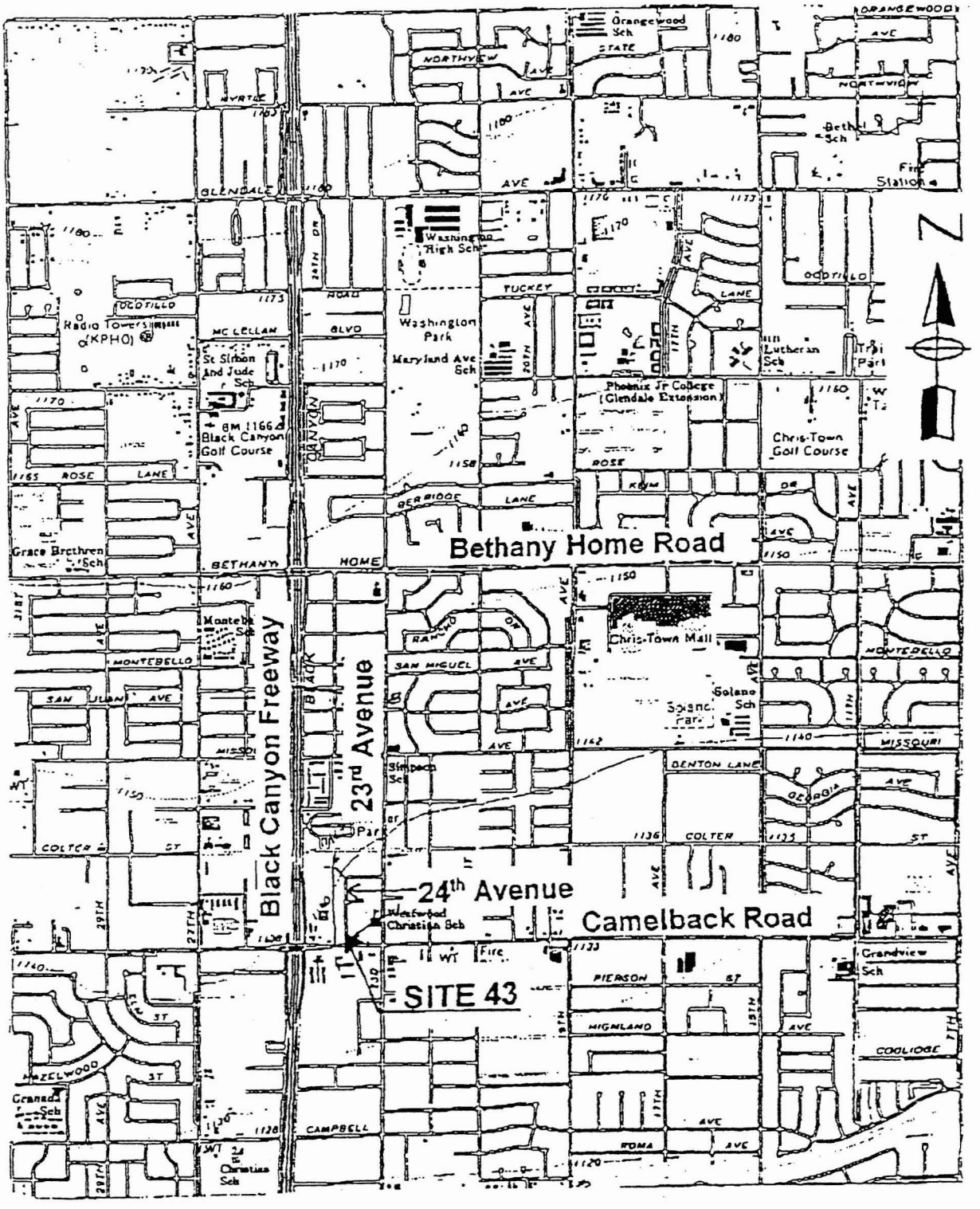
Alternative 1

Description	Quantity	Unit Cost	Cost
Remove Rolled Curb & Gutter	61 LF	$2.00/LF	$ 100
Remove Asphalt	74 YD^2	$1.80/$YD^2$	100
Excavation	139 YD^3	$3.00/$YD^3$	400
Fill	123 YD^3	$8.00/$YD^3$	1,000
Asphalt, 2" Lift	9 Tons	$60.00/Ton	500
ABC, 6" Lift	13 YD^3	$21.00/$YD^3$	300
24" RGRCP	132 LF	$100.00/LF	13,200
COP P1569 M2, L=10 Catch Basin	2 Each	$2,700/Each	5,400
COP P1520 Manhole	1 Each	$2,300/Each	2,300
Subtotal			$23,300
20% Contingency			4,700
Total			$28,000



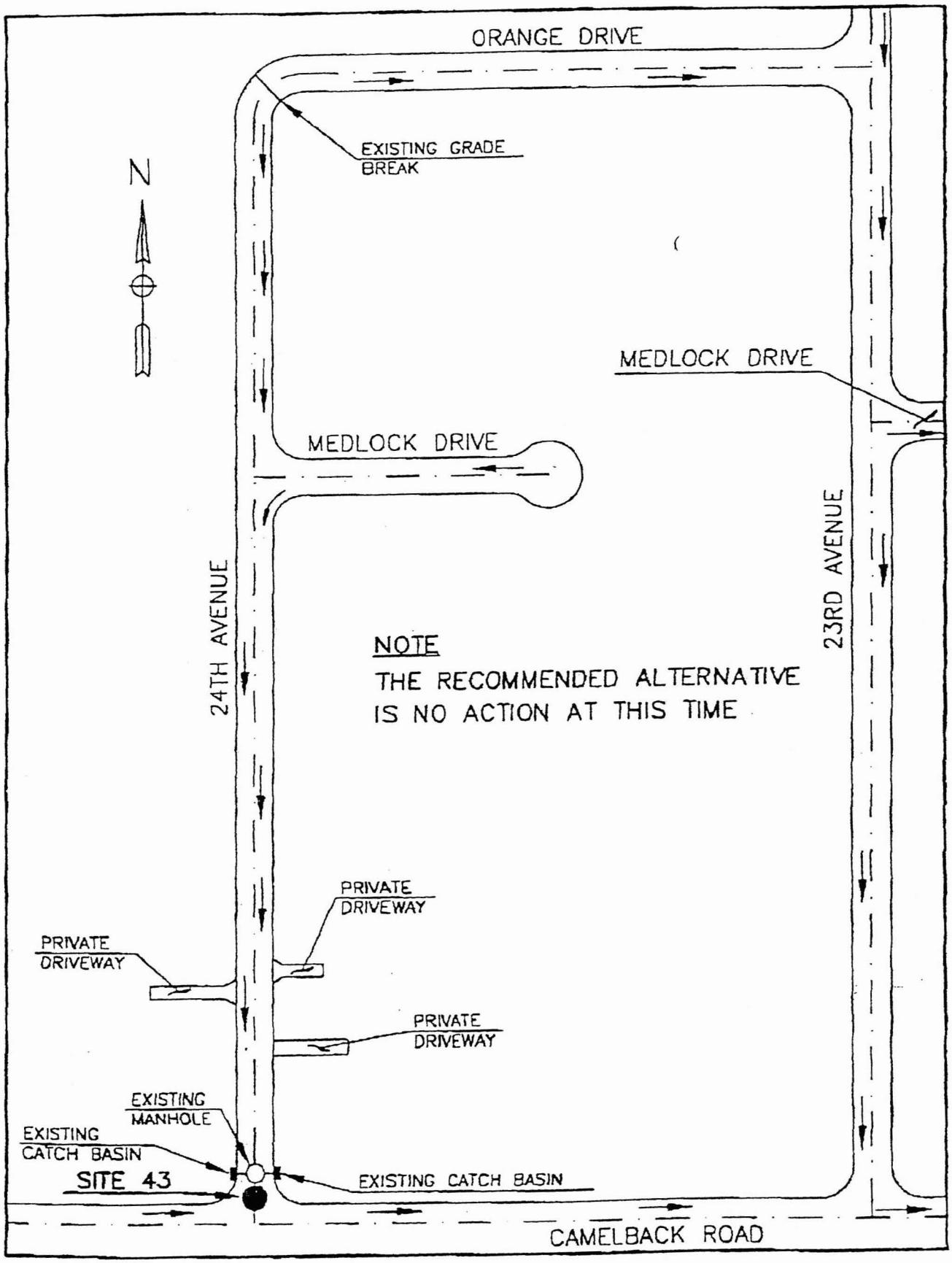
SITE 43 – PROBLEM IDENTIFICATION

FIGURE 2



SITE 43 – VICINITY MAP

FIGURE 1



SITE 43 - PREFERRED ALTERNATIVE

FIGURE 3

HP Fax Series 900
Plain Paper Fax/Copier

Fax History Report for
FCD-PPM
602-506-8561
Feb 09 2001 12:21pm

Last Fax

Date	Time	Type	Identification	Duration	Pages	Result
Feb 9	12:17pm	Received	6026859015	2:38	9	OK

Result:
OK - black and white fax

23RD AVENUE STORM DRAIN STUDY
ARIZONA CANAL TO McDOWELL ROAD

CONTRACT NO. 35502
INDEX NO. ST-824409

August, 1984

Prepared for:

City of Phoenix
Engineering Department
Hydraulics Section

Prepared by:

Anderson-Nichols & Company, Inc.
4120 North 20th Street
Phoenix, Arizona 85016

ANCo Job No. 4503

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Table II, Hydrologic Parameters, Times of Concentration
Table III, 23rd Avenue Storm Sewer Pipe Data
Table IV, Summary of TR-20 Discharge Calculations

FIGURES

Figure 1 - 23rd Avenue Storm Sewer, TR-20 Outflow Hydrograph at McDowell Road

APPENDIX

Plate A, Hydrologic Soils Map
Plate B, TR-20 Base Data and Land Use Zoning Basin Map

TR-20 Input and Output
City of Phoenix Supplements:

1. Rainfall Table
2. Precipitation Values
3. Curve Number - Soil Land Use with Curve Number Adjustment Calculation

23RD AVENUE STORM DRAIN STUDY
ARIZONA CANAL TO McDOWELL ROAD

SUMMARY AND RESULTS

This study represents a hydrologic analysis of a 2.8 square mile drainage area located between McDowell Road and the Arizona Canal and between the I-17 Highway and approximately 19th Avenue.

A previous storm drain study for this area was completed in 1976 (Reference 2) establishing a trunk line design along the 23rd Avenue alignment. The 1976 study used the City of Phoenix modified rational method to generate design discharges. At McDowell Road, the previous study proposed several alternate alignments for conveying storm runoff to the Salt River. One of the alternatives proposed routing the storm drain west at McDowell Road and then south to the Salt River along the I-17 frontage road paralleling an existing I-17 storm drain.

Recent design plans for the I-10 and I-17 Highway Interchange south of McDowell Road will necessitate the relocation of the section of the existing I-17 storm drain from approximately McDowell Road to Van Buren Street. This relocation has presented the possibility of combining the proposed 23rd Avenue and I-17 storm drains at McDowell Road. Several alternate plans are possible for combining the storm drains from McDowell Road to Van Buren Street or to the Salt River. These plans are discussed briefly in this report.

To evaluate the storm drain combination plans, a runoff hydrograph of the 23rd Avenue storm drain at McDowell Road was necessary to compare with hydrographs generated as part of the I-17 system evaluation. A runoff hydrograph for the 2-year, 24-hour event was generated by the TR-20 computer model method using the 1976 study of the 23rd Avenue storm drain (Reference 2) as a guide.

Results of modeling the drainage areas using SCS's TR-20 computer model is a peak discharge of 405 cfs at McDowell Road for the 2-year, 24-hour storm. The 1976 study, using the Rational Method as modified by the City of Phoenix, calculated a peak of 286 cfs. The difference in peaks can primarily be attributed to the means by which the two methods treat rainfall intensity over the drainage area and the manner in which times of concentration are determined.

HYDROLOGY

METHODOLOGY, FIELD OBSERVATIONS AND ASSUMPTIONS

The Soil Conservation Service (SCS) TR-20 computer hydrology program (Reference 1) was used to compute peak discharges at selected concentration points and a basin outflow hydrograph at McDowell Road. The 2-year, 24-hour precipitation volume (City of Phoenix Supplement 2, Appendix) and rainfall distribution (City of Phoenix Supplement 1, Appendix) were obtained from the City of Phoenix and used as the input to the TR-20 model.

Runoff curve numbers (CN) for use in the TR-20 model were dependent upon the land use and soil types in the study area. Land uses were obtained from the 1976 study (Reference 2) and were updated by current City of Phoenix zoning maps (Reference 6). The hydrologic soil types for the study area were obtained from the City of Phoenix Storm Drain Design Manual (Reference 3).

As per City of Phoenix design criteria, for drainage subareas zoned commercial or industrial and developed with the 10-year, 2-hour retention requirement, a curve number of 98 was assigned and only fifteen percent of the drainage subarea was considered to contribute runoff. This represents only the street system of the subarea contributing to the runoff. Any significant portion of the drainage area that was bermed (i.e. parks, schools, etc.) or had similar features preventing runoff from contributing was not considered to contribute. About half the residential areas (zoned R1-6) observed during field investigations had irrigated lots. Rather than survey all residential areas in detail to quantify the number of irrigated lots, the conservative assumption was made that all R1-6 areas are non-irrigated and will contribute except as noted in Table 1. The weighted curve number for areas zoned R1-6 was evaluated by Storm Drain Design Manual procedures. The curve number was lowered from 88 (see City of Phoenix Supplement 3, Appendix) to 80 for a type C soil (see calculations in Appendix) because it was assumed that roof runoff would flow over yard areas before contributing to street flows.

Field investigations indicated that existing commercial and industrial properties in the southern half of the study area had no retention facilities. Therefore, their total drainage area was considered to contribute and the curve number specified for the subarea zoning was used without adjustment.

A summary of weighted curve number (CN) calculations is provided in Table 1, Hydrologic Parameters. A City of Phoenix table (See City of Phoenix Supplement 3, Appendix) was used as the basis for computing subarea curve numbers.

A summary of the Time of Concentration (Tc) calculations is shown in Table II, Hydrologic Parameters. Velocities for computing the

Time of Concentration in Table II were obtained from the gutter velocity graph on page 26 of the City of Phoenix Storm Drain Design Manual (Reference 3), except as otherwise noted.

The routing coefficients used in the TR-20 model were based on the pipe full velocity (see Table III) of the proposed storm drain (1976 study).

The drainage area maps from the 1976 storm drain study were updated to reflect current conditions (Reference 2) before they were used for this study. The TR-20 concentration points and routing paths are shown on Plate B in the Appendix.

The results of the TR-20 analysis are summarized on Table IV, Summary of Discharges, for each concentration point.

The outflow hydrograph from the 23rd Avenue storm drain basin at McDowell Road is plotted in Figure 1. The peak of 405 cfs occurred approximately 12.7 hours after the beginning of the design storm.

The recommended alternative for modifying the I-17 storm drain to accommodate the construction of the I-10, I-17 interchange is to relocate the section of storm drain from McDowell Road to Van Buren Street. This section of the storm drain could be sized to integrate both the I-17 and 23rd Avenue systems. However, there is only 100 cfs available capacity (for the 50-year event) in the existing storm drain below Van Buren Street. Therefore, only 100 cfs from the 23rd Avenue storm drain can be conveyed all the way to the Salt River by the I-17 system. The volume of the 23rd Avenue outflow hydrograph (Figure 1) above this 100 cfs limit is about 25.5 acre-feet. This is the storage volume required if all the 23rd Avenue storm drain discharge is to be conveyed by the I-17 system to the Salt River.

TABLE I - HYDROLOGIC PARAMETERS - CURVE NUMBERS
23RD AVENUE STORM SEWER

DRAINAGE AREA I.D.	AREA (AC/SQ MI)	LAND USE ZONING	SOIL TYPE	CURVE NUMBER (CN)	SUBAREA (AC)	CN X SUBAREA	WEIGHTED CN	REMARKS
2	165.00/.26	SP						
		(USE R-4)	C	89	27.80	2469.80		* Only 15% of C-2 and Industrial Park Zone contributes
	*96.90/.15	R1-6	C	80	57.10	4568.00	84.8	
		*Industrial Park	C	98	9.40	919.50		
		*C-2	C	98	2.70	260.40		
4	221.30/.35	PAD-14						
		(USE R-3)	C	88	13.70	1209.70		
	*138.60/.22	P-1	C	98	3.70	358.50		
		*Industrial Park	C	98	10.80	1060.40		
		C-0	C	91	11.10	1011.30		* Only 15% of C-1, C-2, and Industrial Park Zone contributes
		R-4	C	89	7.20	643.50	84.7	
		R1-6	C	80	85.30	6824.00		
		S-1	C	83	1.20	103.60		
		*C-2	C	98	2.70	264.50		
		*C-1	C	98	1.10	103.60		
		R-5	C	89	1.80	160.41		
7	74.70/.12	R1-6	C	80	12.20	976.00		* Only 15% of C-2, PSC, and Industrial Park Zone contributes
	*41.70/.065	C-0	C	91	23.60	2146.80		
		*PSC	C	98	1.20	115.50	88.6	
		*Industrial Park	C	98	2.60	258.20		
		*C-2	C	98	2.00	197.40		
11	79.10/.12	R-5	C	89	5.80	519.20		
	*77.00/.12	R-3	C	88	69.30	6095.70		* Only 15% of C-2 Zone contributes
		C-0	C	91	1.60	142.70	88.2	
		*C-2	C	98	0.40	35.90		

TABLE I - HYDROLOGIC PARAMETERS - CURVE NUMBERS
23RD AVENUE STORM SEWER (cont'd)

DRAINAGE AREA I.D.	AREA (AC/SQ MI)	LAND USE ZONING	SOIL TYPE	CURVE NUMBER (CN)	SUBAREA (AC)	CN X SUBAREA	WEIGHTED CN	REMARKS
14	166.80/.26	R1-6	C	80	136.20	10896.00		
	*163.30/.26	R-3	C	88	14.70	1289.50		
		R-4	C	89	9.40	839.10	81.1	* Only 15% of C-2 Zone contribute
		P-1	C	98	.20	19.90		
		C-0	C	91	2.20	199.90		
		*C-2	C	98	.60	61.10		
20	113.10/.18	R1-6	C	80	47.40	3792.00		
	*73.28/.11	R-3	C	88	5.19	457.10		
		R-5	C	89	7.30	649.20		* Only 15% of C- and R1-6 (Scho
		PAD-8						
		(USE R-3)	C	88	1.53	135.10	82.4	Zone contribut
		PAD-11						
		(USE R-5)	C	89	4.80	430.90		
		*C-2	C	98	.99	96.90		
		*R1-6						
		(High School)	C	80	6.00	480.00		
25	212.20/.33	R1-6	C	80	112.20	8976.00		
	*195.90/.31	R-3	C	88	18.81	1655.50		
		R-4	C	89	4.80	423.30		
		R-5	C	89	4.00	355.90		* Only 15% of C-
		P-1	C	98	2.40	233.10	84.6	and R1-6 (Tenn Courts) Zone
		PAD-10						
		(USE R-4)	C	89	16.30	1455.10		contributes
		C-0	C	91	.9	78.60		
		*C-2	C	94	33.56	3154.90		
		*R1-6						
		(Tennis Courts)	C	80	2.90	232.00		

TABLE I - HYDROLOGIC PARAMETERS - CURVE NUMBERS
23RD AVENUE STORM SEWER (cont'd)

DRAINAGE AREA I.D.	AREA (AC/SQ MI)	LAND USE ZONING	SOIL TYPE	CURVE NUMBER (CN)	SUBAREA (AC)	CN X SUBAREA	WEIGHTED CN	REMARKS
31	62.30/.097	R1-6	C	80	59.40	4752.00		
	*62.00/.097	R-4	C	89	.80	73.10	80.5	* Only 15% of
		R-5	C	89	1.00	87.30		C-2 Zone
		*C-2	C	98	.80	76.80		contributes
34	67.20/.105	R1-6	C	80	29.30	2344.00		
		R-3	C	88	3.40	299.40		
		R-5	C	89	20.60	1830.00	86.1	
		C-2	C	94	11.40	1070.70		
		C-3	C	94	2.50	238.60		
41	103.90/.16	R1-6	C	80	29.60	2368.00		
	*83.60/.14	R-3	C	88	13.10	1154.40		
		R-4	C	89	15.30	1363.00		
		R-5	C	89	6.00	538.20	87.0	* Only 15% of
		C-2	C	94	14.20	1337.30		C-2 Zone
		*C-2	C	98	3.50	342.40		contributes
		C-3	C	94	1.40	127.30		
		C-1	C	94	.50	46.10		
44	118.21/.18	R-3	C	88	89.50	7875.10		
		R-4	C	89	5.60	495.50		
		R-5	C	89	13.80	1230.10		
		P-1	C	98	.80	80.50	94.7	
		PAD-14						
		(USE R-3)	C	88	4.90	431.70		
		C-0	C	91	.40	35.90		
		C-3	C	94	11.10	1040.60		

TABLE I - HYDROLOGIC PARAMETERS - CURVE NUMBERS
23RD AVENUE STORM SEWER (cont'd)

DRAINAGE AREA I.D.	AREA (AC/SQ MI)	LAND USE ZONING	SOIL TYPE	CURVE NUMBER (CN)	SUBAREA (AC)	CN X SUBAREA	WEIGHTED CN	REMARKS
51	170.00/.26	R1-6	C	80	119.10	9528.00		
		R-3	C	88	10.10	887.80		
		R-4	C	89	1.50	137.60		
		R-5	C	89	25.20	2246.70	83.0	
		PAD-14 (USE R-3)	C	88	2.60	225.20		
		P-1	C	98	1.50	144.20		
		C-3	C	94	10.00	937.30		
54	76.80/.12	R1-6	C	80	38.90	3112.00		
		R-5	C	89	23.90	2131.90	84.5	
		PAD-14 (USE R-3)	C	88	6.10	539.60		
		PAD-12 (USE R-5)	C	89	5.10	455.60		
		C-2	C	94	2.70	249.60		
61	93.10/.15	R1-6	C	80	12.60	1008.00		
	84.10/.13	R-3	C	88	4.70	412.90		
		R-4	C	89	9.40	839.10		
		R-5	C	89	2.30	207.90	89.4	
		A-2	C	91	12.10	1102.50		
		C-2	C	94	.90	83.20		
		C-3	C	94	41.50	3901.80		
64	93.90/.15	A-2	B	88	93.90	8263.20	88.0	

TABLE II - HYDROLOGIC PARAMETERS
TIMES OF CONCENTRATION

DRAINAGE AREA I.D.	FLOWPATH LENGTH (ft)	DIFF. ELEV. (FT)	AVERAGE SLOPE ALONG FLOWPATH (PERCENT)	VELOCITY (FPS) FOR Q = 3 CFS	TIME OF CONCENTRATION (Tc) MINUTES	HOURS
2 Total	3075				15.49	.258
Reach 1	1005	3.3	.33	1.95	8.59	.143
Reach 2	2070	3.9	.19	Assume pipe flow @ 5.00	6.90	.115
4 Total	4385				30.99	.517
Reach 1	2450	4.2	.17	1.50	27.22	.454
Reach 2	1935	7.8	.40	Flow in 23rd Ave. Storm Drain 8.50	3.79	.063
7 Total	3850				24.58	.410
Reach 1	1450	1.3	.09	1.20	20.14	.336
Reach 2	2400	10.0	.42	Flow in 23rd Ave. Storm Drain 9.00	4.44	.074
11 Total	3200				13.69	.228
Reach 1	960	1.9	.20	1.62	9.88	.165
Reach 2	2240	6.5	.29	Flow in 23rd Ave. Storm Drain 9.80	3.81	.063
14 Total					25.16	.420
Reach 1	2600	9.9	.38	2.07	20.93	.349
Reach 2	1270			Assume pipe flow @ 5.00	4.23	.071
20 Total	3345				18.28	.304
Reach 1	1295	8.0	.62	2.45	8.81	.147
Reach 2	750	1.7	.23	1.73	7.26	.120
Reach 3	1300	5.4	.42	Flow in 23rd Ave. Storm Drain 9.80	2.21	.037
25 Total	6490				44.64	.744
Reach 1	5250	22.1	.42	2.16	40.51	.675
Reach 2	1240			Assume pipe flow @ 5.00	4.13	.069
31 Total					30.95	.516
Reach 1	2285	8.0	.35	1.98	19.23	.321
Reach 2	670	0.3	.04	1.00	11.17	.186
Reach 3	330	1.1	.33	Flow in 23rd Ave. Storm Drain 10.00	0.55	.009

TABLE II - HYDROLOGIC PARAMETERS
TIMES OF CONCENTRATION (cont'd)

DRAINAGE AREA I.D.		FLOWPATH LENGTH (ft)	DIFF. ELEV. (FT)	AVERAGE SLOPE ALONG FLOWPATH (PERCENT)	VELOCITY (FPS) FOR Q = 3 CFS	TIME OF CONCENTRATION (Tc) MINUTES	HOURS
34	Total	3275				16.58	.276
	Reach 1	640	1.7	.27	1.79	5.96	.099
	Reach 2	685	1.3	.19	1.55	7.37	.123
	Reach 3	1950	4.3	.22	Flow in 23rd Ave. Storm Drain 10.00	3.25	.054
41	Total	3250				20.40	.340
	Reach 1	1260	4.5	.36	2.00	10.50	.175
	Reach 2	670	1.1	.16	1.46	7.65	.128
	Reach 3	1320	2.8	.21	Flow in 23rd Ave. Storm Drain 9.80	2.25	.037
44	Total	3210				18.33	.306
	Reach 1	1230	1.8	.14	1.37	14.96	.250
	Reach 2	1980	5.1	.26	Flow in 23rd Ave. Storm Drain 9.80	3.37	.056
51	Total	4060					.559
	Reach 1	750	2.2	.29	1.82	6.87	.115
	Reach 2	470	0.3	.06	1.04	7.53	.126
	Reach 3	1790	5.8	.32	1.91	15.62	.260
	Reach 4	1050			Assume pipe flow @ 5.00	3.50	.058
54	Total	3080				16.69	.278
	Reach 1	850	0.7	.08	1.15	12.32	.205
	Reach 2	2230	9.3	.42	Flow in 23rd Ave. Storm Drain 8.50	4.37	.073
61	Total	2160				14.29	.238
	Reach 1	1040	2.7	.26	1.77	9.79	.163
	Reach 2	330	0.8	.23	1.73	3.18	.053
	Reach 3	790	1.1	.15	Flow in 23rd Ave. Storm Drain 10.00	1.32	.022
64	Total	4480				37.17	.619
	Reach 1	1650	0.5	.03	0.93	29.57	.493
	Reach 2	440	4.0	.91	2.80	2.62	.044
	Reach 3	2390	8.6	.36	Flow in 23rd Ave. Storm Drain 8.00	4.98	.083

TABLE III

23RD AVENUE
STORM SEWER PIPE DATA

STORM SEWER REACH FROM - TO	TR-20 ROUTING I.D. NO.	PIPE DIA. INCHES	PIPE SLOPE FT/FT	LENGTH FT	VELOCITY FPS
Dunlap - Butler	3	54	0.0041	2570	8.5
Bulter - Northern	6	60	0.0040	2710	9.0
Northern - Orangewood	10	66	0.0041	2630	9.8
Orangewood - Glendale	13	66	0.0041	2780	9.8
Glendale - Maryland	19	66	0.0042	2810	9.8
Maryland - Bethany Home	24	66	0.0040	2645	9.8
Bethany Home - Missouri	30	72	0.0040	2650	10.0
Missouri - Camelback	33	72	0.0037	2645	10.0
Camelback - Campbell	40	72	0.0035	2650	9.8
Campbell - Indian School	43	72	0.0035	2635	9.8
Indian School - Osborn	50	78	0.0027	2710	8.4
Osborn - Thomas	53	78	0.0028	2570	8.5
Thomas - Encanto	60	78	0.00335	2670	10.0
Encanto - McDowell	63	84	0.002	2650	8.0

TABLE IV

SUMMARY OF
TR-20 DISCHARGE CALCULATIONS

TR-20 CONCENTRATION POINT *	LOCATION	ACCUMULATED CONTRIBUTING DRAINAGE AREA SQ. MI. **	TR-20 2-YEAR 24 HOUR PEAK DISCHARGE CFS
2	Dunlap	0.15	34
5	Bulter	0.22	48
8	Northern	0.44	100
12	Orangewood	0.55	130
15	Glendale	0.82	170
21	Maryland	0.93	185
26	Bethany Home	1.23	236
32	Missouri	1.33	243
35	Camelback	1.44	256
42	Campbell	1.57	275
45	Indian School	1.75	325
52	Osborn	2.01	356
55	Thomas	2.13	364
62	Encanto	2.26	381
65	McDowell	2.41	405

Maximum discharge for entire drainage basin = 405 cfs

* See Plate B 1 and 2
** Excluding non-contributing subarea

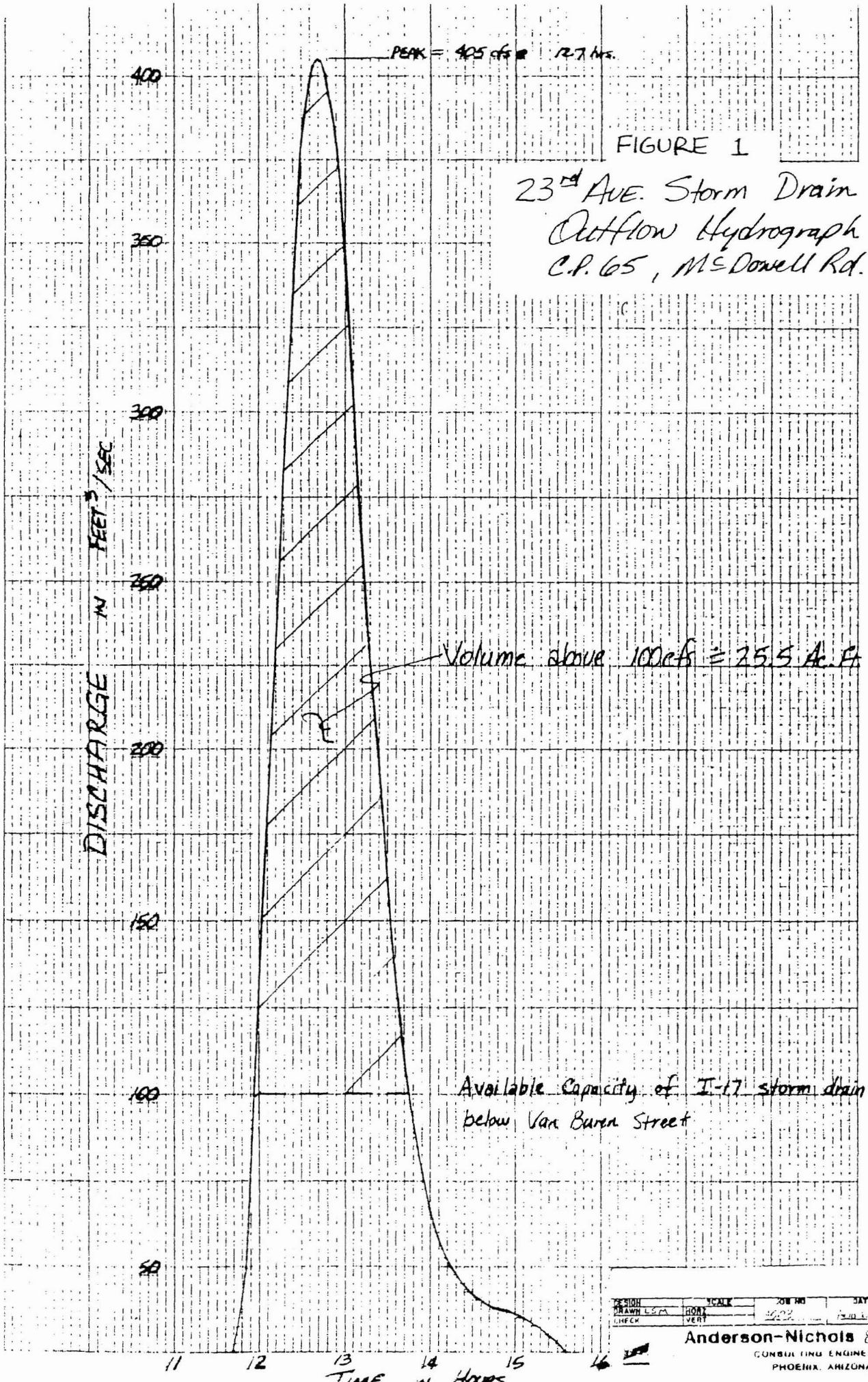


FIGURE 1

23rd AVE. Storm Drain
Outflow Hydrograph
C.P. 65, McDowell Rd.

DESIGN	SCALE	JOB NO	DATE	SHEET
DRAWN LSM	HORZ	5202	[illegible]	OF
CHECK	VERT			

Anderson-Nichols & Co., Inc.
CONSULTING ENGINEERS
PHOENIX, ARIZONA

STORM DRAIN COMBINATION ALTERNATIVES

Background on I-17 System

The recommended alternative for modifying the I-17 storm drain system results in 50-year discharges below Van Buren Street and Buckeye Road of 276 cfs and 335 cfs, respectively. The full flow capacity of the existing storm drain system below Van Buren is approximately 430 cfs. There is about 100 cfs available capacity in the I-17 storm drain system below Van Buren Street that could be used as part of the 23rd Avenue storm drain system. However, the segment between McDowell and Van Buren will have to be relocated for the construction of the I-10 interchange and could be upsized to convey some or perhaps all the 405 cfs from the 23rd Avenue storm drain system (see Figure 2).

Alternatives

Considering the above analysis, alternatives for combining the 23rd Avenue storm drain with the I-17 system are:

1. Route the 23rd Avenue hydrograph (see TR-20 Hydrograph Plot, Figure 1) through a retention basin allowing no more than 100 cfs into the I-17 system. When the inflow into the retention basin is less than 100 cfs, the retention basin could be emptied into the I-17 system. As shown on the hydrograph, this would require a retention basin of 25.5 acre-feet capacity. The storm drain system on 23rd Avenue below Van Buren could then be sized to convey only the flow from the area below (south of) Van Buren Street, a reduction of 405 cfs.

2. Route the 23rd Avenue hydrograph directly into the I-17 system, increase the size of the relocated I-17 storm drain pipe to carry the combined total discharge to Van Buren Street, then divert at least 300 cfs back out of the I-17 pipe to a City of Phoenix storm drain pipe. This would prevent overloading the I-17 system below Van Buren Street and allow a reduction of 100 cfs to be conveyed by the 23rd Avenue Storm Drain system below Van Buren Street. No retention basin is required with this option.

3. Route the 23rd Avenue hydrograph through a retention basin, divert 200 to 300 cfs into the I-17 system, and upsize the relocated pipe to handle this combined discharge. At Van Buren Street, divert all the 23rd Avenue Storm Drain discharge, except 100 cfs, into a City of Phoenix storm drain. This would allow a reduction in the needed capacity of the 23rd Avenue Storm Drain below Van Buren by 100 cfs. The amount diverted at McDowell into the I-17 system would depend upon the economics of reducing the detention basin size and upsizing the I-17 pipe between McDowell and Van Buren.

Further analysis of these alternatives and consideration of others should be made before a decision is made. Additional information is needed including land availability for a retention basin, pipe grades and potential for connection, etc. to determine the feasibility of any of the alternatives described.

REFERENCES

1. U.S. Department of Agriculture, Soil Conservation Service (SCS), Engineering Division, "Technical Release No. 20 (TR-20), Computer Program for Project Formulation, Hydrology", 1965.

2. City of Phoenix, Arizona, Route Study Report, 23rd Avenue Storm Drain, Dunlap Avenue to Salt River, 1976, Project No. ST-74205.00 by Henningson, Durham and Richardson, Inc., Phoenix, Arizona.

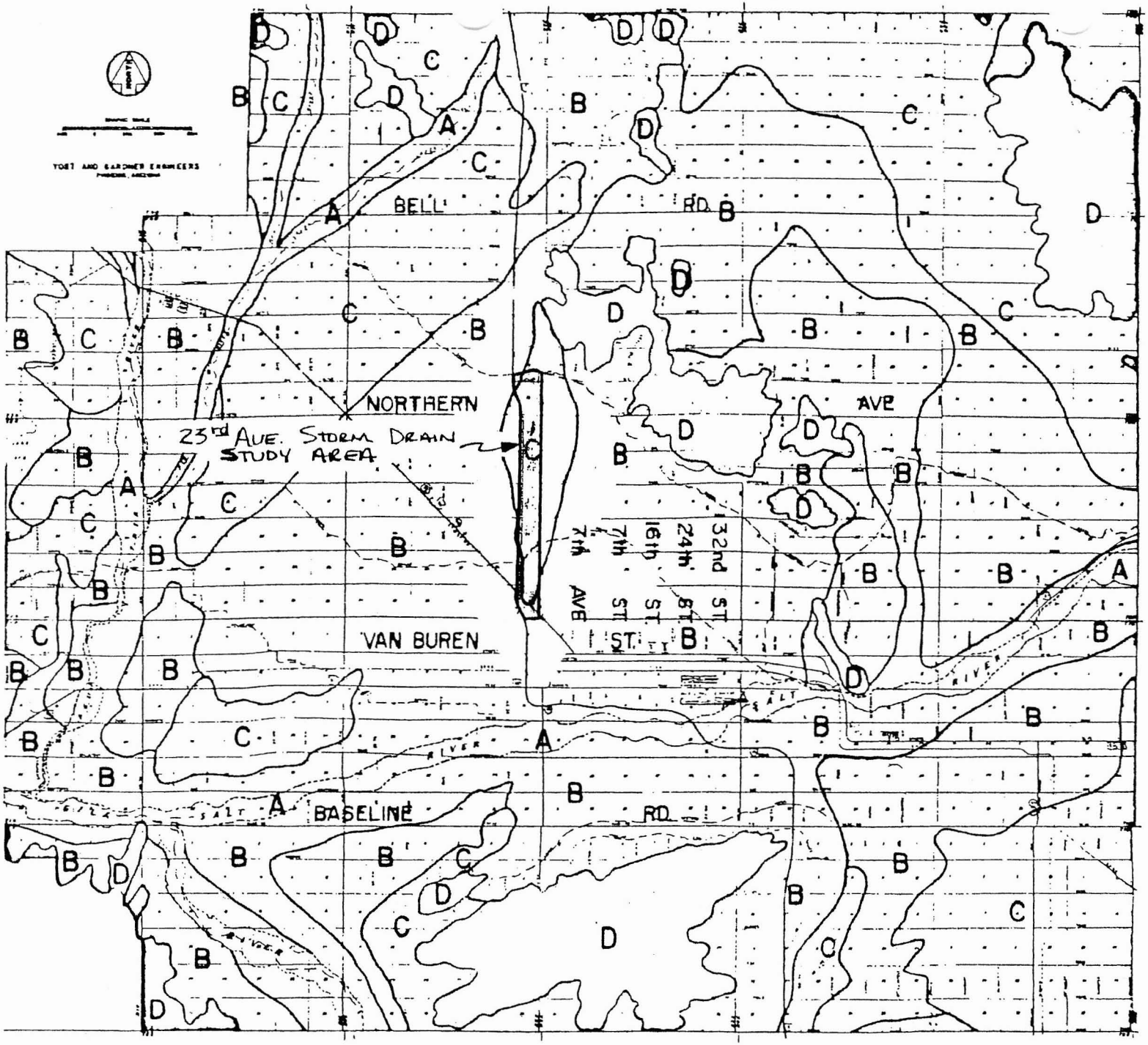
3. City of Phoenix, Arizona, Engineering Department, Storm Drain Design Manual, Storm Drains with Paving of Major Streets, August, 1975.

4. U.S. Department of Agriculture, Soil Conservation Service (SCS), Engineering Division, "Technical Release No. 55 (TR-55) Urban Hydrology for Small Watersheds", 1975.

5. Topographic Mapping, City of Phoenix, Engineering Department, Project No. ST-74205.00.

6. Current City of Phoenix zoning maps, Nos. F5 to I5, obtained August 7, 1984.

7. Arizona Department of Transportation and HNTB, Management Consultant, "TR-20 Drainage Report and Comparison of Storm Drain Improvement Plans", Contract No. 83-22, Project No. I-10-2(202)PE, May 10, 1984, Revised July 10, 1984, by Anderson-Nichols & Company, Inc.



SOIL TYPES

FROM "GENERAL SOIL MAP OF MARICOPA COUNTY"
U.S. Department of Agriculture, Soil Conservation Service

PLATE A

STORM DRAIN ROUTE STUDY
Project No. ST-74205.00

PHOENIX AREA
23rd Avenue

DUNLAP AVENUE TO SALT RIVER

1976

HENNINGSON, DURHAM & RICHARDSON, INC. OF ARIZONA
PHOENIX, ARIZONA

HENNINGSON, DURHAM & RICHARDSON

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Exhibit A-	Drainage Areas & Zoning
Exhibit B-	Plan and Profile- All Alternates
Exhibit C-	Plan and Profile- Critical Areas

TOPICAL SUMMARY

The purpose of this report was to study an area in the City of Phoenix generally bounded by the Arizona Canal, the Salt River, 19th Avenue and the Black Canyon Freeway to analyze the storm drain requirements with recommendations for an alignment and necessary facilities to meet those requirements.

The area under study shall be considered as fully developed, using the current zoning proposed development. As projected development occurs, flooding problems will increase, if no storm drainage facilities are provided.

Recommendations for the alignment and necessary facilities are detailed in Section V. Estimated construction costs are detailed in Section VI and are based on current prices. Based on the present inflationary trend, prices are expected to increase approximately 10 percent per annum, therefore, estimated costs should be updated periodically to reflect the upward trend.

I INTRODUCTION

1. Background

The City of Phoenix design policies are general in nature and are applicable to areas where no recognizable natural water courses exist and urbanization is probable. Due to the rapid growth within the City of Phoenix, urbanization has obliterated most natural washes and provided a new set of artificial channels in the streets and drains.

Large areas have been rendered impervious with buildings and pavements thus adding to the amount of run off. Due to these factors, the City of Phoenix long range design policies call for a system of primary laterals spaced at one mile intervals on section line streets, supplemented by secondary laterals to be added at one-half mile intervals. This report will deal with a system planned as a part of the secondary lateral network.

2. Purpose

The purpose of this report is to study the existing conditions and problems and to formulate a sound, realistic and feasible storm water disposal system route within the corridor specified in the City of Phoenix general criteria.

It should be noted that while the material contained herein is the result of considerable research and investigation, detailed examination of the various areas involved in producing construction plans for this project may reveal problems of limited scope which must be solved in a manner not included in the recommendations listed within this report.

3. Scope

The scope of this report includes:

a. Evaluation of all existing areas of contribution to determine the quantity of storm water run off.

b. Calculation of run off quantities as determined from a.

c. Evaluation of all existing utilities, etc. on record, necessary to select a probable and feasible route.

d. Preparation of estimated construction costs for the main line storm drain lateral.

e. Presentation of recommended storm drain route alternates with estimates of Construction Costs.

II STUDY AREA

1. Location and Boundaries

The study area is located within the City of Phoenix and is bounded by the Arizona Canal on the north, the Salt River on the south, 19th Avenue on the east and the Black Canyon Freeway on the west. The total area encompasses approximately 8.0 square miles. (Refer to Plate No. 1 entitled "Location Map")

2. Natural Features

Most of the natural features, including Cave Creek Wash, have been obliterated south of the Arizona Canal due to urbanization. This area is still subject to flooding during intense summer storms thus demonstrating the fact that additional storm drain systems are needed to adequately serve the area.

3. Areas of Consideration

The study area can be divided into two separate sub-areas when considering the alignment and profile grade of the proposed lateral. These sub-areas consist primarily of the area north of Thomas Road and the area south of Thomas Road. Also, it was necessary to consider the different nature of development in these areas when planning a major utility location.

a. North of Thomas Road- This area is mostly residential with some commercial sites around the major intersections. Twenty-third Avenue is reasonably well defined with very few breaks in alignment. Local streets with curb and gutter are used as water carriers but many areas are still subject to flooding.

b. South of Thomas Road- This area is highly industrialized with the local streets providing no systematic drainage pattern. Local flooding is a problem because of the large areas made impervious with building and pavements. Twenty-third Avenue is not a suitable location for the route south of McDowell because of the proximity of the Black Canyon Freeway. Many other obstructions in this area will necessitate an alignment not as well defined as the alignment north of Thomas Road. This will be discussed in detail in Section V to follow.

4. Design Criteria

For the purpose of this report, the criteria contained in the City of Phoenix Storm Drain Design Manual, "Lateral Storm Drains on Major Streets" was used as a guide. The design storm selected was of the two-year recurrence interval.

The drainage area was considered as being fully developed, using the current zoning for proposed development. The 27th Avenue, 19th Avenue and 15th Avenue storm drains were considered as being built up to the Arizona Canal. Also, the Arizona Diversion Channel was considered fully completed, thus allowing no water from Cave Creek to by pass the Arizona Canal. All undeveloped land was assumed to be developed under the current Grading and Drainage Ordinance, which requires retention of a storm of ten-year frequency.

III EXISTING CONDITIONS

1. Land Use

The upper portion of the study area originally contained a drainage swale which was a characteristic of the lower reach of Cave Creek. Advanced urbanization in the area has almost completely obliterated any natural land marks. As mentioned previously, the area was assumed fully developed for this study, therefore theoretically no undeveloped land exists.

The lower portion of the study area south of McDowell has a somewhat irregular type of drainage pattern. This industrialized area does have a slight swale paralleling Black Canyon Freeway along 22nd Avenue which dictates to some extent the location of the storm drain lateral.

2. Streets

Assuming the study area as being fully developed, all streets will be considered paved and with curb and gutter. It is further assumed that the streets will be used in conveying run off water when implementing a storm drain system.

3. Utilities

The study area is well served by all utilities. There are no major conflicts with the proposed storm drain alignment north of McDowell, although there will be need for the usual minor relocation of small lines and service connections.

South of McDowell there are several large underground utilities that could possibly pose conflicts. Detailed investigation of the points in question indicates

that with proper planning, relocation of these major utilities will probably not be necessary. These areas are located for the most part south of Buckeye Road along 22nd Avenue.

IV HYDROLOGY

1. Storm Design Frequency

As has been discussed previously, the storm design frequency for this report has been established at the 2 year level. This is consistent with the City of Phoenix design policies for laterals added at the 1/2 mile intervals.

2. Existing Storm Drainage System

Almost all of the major streets north of Thomas and crossing 23rd Avenue have some type of storm drain and /or irrigation system in service.

There appears to be nothing in place that is larger than 30" in diameter. Also, the existing systems seem shallow enough to allow the main lateral to be placed under them.

Most of the smaller storm drain systems within the intersections are indicated to tie into existing irrigation structures, thus presenting problems during times of rain storm activity.

The only storm drain system south of Thomas of any consequence is the 78" diameter 19th Avenue outfall. This system crosses under the Maricopa Freeway at 19th Avenue, continuing south to Hilton Avenue, then west of 22nd Avenue and again south to the outfall channel.

Another system that may need to be considered, if an alternate route is selected, is the Arizona Highway Department storm drain outfall located in the North Bound Frontage Road of the Black Canyon Freeway. This system enters

the frontage road alignment at a point north of Encanto and continues south along the west edge of the north bound frontage road to a point approximately in line with Cocopah Street. At this point the storm drain angles to the south-west where it by passes the City of Phoenix 23rd Avenue sewage treatment plant and sludge beds. The line then continues south to the outfall channel. The line varies in size from 78" diamter at Encanto to 102" diameter at the outfall.

3. Drainage Calculations

Calculations of flood flows for the study area are dependent upon the assumption of various factors and the use of these factors in accepted formulas.

The general method for estimating run off for the purpose of this report was the Rational Method. Basically this method relates rainfall intensity, a run off coefficient based on the type and condition of run off surfaces, and the total area involved. (Refer to Appendix- Figures 1 and 2, Tables I and II and Exhibit A.)

Each section was considered separately in the development of the run off data. The calculated run off from each section varies due to the different run off coefficient assigned. These coefficients were assigned in accordance with the current City of Phoenix zoning proposed development. The calculated flows are computed by use of the following formula: (The Rational Method)

$$Q = CiA, \quad \text{Modified to } Q = C\,(Ia - .2)\,Ai$$

in which Q is the total run off in cubic feet per second, A is the area in acres, i is the rainfall intensity, and C is the runoff coefficient. The impervious values

used in this report for the various zoning types are as shown in Table I.

The modified formula of Q= .9 (Ia-.2) Ai is expressing run off- rainfal relationship where:

Q= design run off rate in cubic feet per second

Ai= impervious portion of drainage area in acres

Ia= average rainfall intensity over the area in inches per hour

The expression (Ia-.2) represents the intensity (Ia) minus the loss rate (.2) for impervious areas such as street paving.

The value of C is set at 0.9 for that run off originating from impervious areas.

Using the run off data developed for the study area, flows at points of concentration (every 1/2 mile) were calculated. These flows are shown in Table II.

V PROPOSED STORM DRAINAGE OUTFALL SYSTEM

Although the scope of this report does not include development of an overall detailed drainage system, for the purposes of this report, it has been assumed that such a system, in addition to the existing streets, will be developed and will provide drainage input for the major outfall facility.

The route of the main storm drain from Dunlap Road to Thomas Road does not present many alternate choices, and the route described is essentially the only logical selection; however, from Thomas Road south to the termination, a number of choices had to be investigated. Under Alternative No. 1, the recommended route has been described. Alternatives 2, 3 and 4 describe other routes investigated, and which could be utilized if necessary. (Plate 2 and Exhibit B)

1. Dunlap Road to Thomas Road- Alternate 1 (Refer to Plate 2 and Exhibit B)

As mentioned before, this area will be assumed fully developed, thus having paved streets with curb and gutter to be utilized as storm water conveyance channels, in conjunction with general underground collection systems.

The design basis for the beginning of the drain at 23rd Avenue and Dunlap was the storm drain size and invert elevation provided by the City of Phoenix, which was obtained from prior approved projects.

The proposed storm drain alignment for this area follows 23rd Avenue exclusively with the exception of the run between Orangewood and Glendale Avenue.

A jog occurs in 23rd Avenue through this stretch and it is not practical to locate the storm drain in the alley easement, which would be necessary in order to keep a true mid-section alignment. It is therefore recommended as shown in Exhibit B , that from the junction of 23rd Avenue and 23rd Drive, the alignment follow 23rd Drive to the west and south to Glendale Avenue where the storm drain would be routed east along Glendale back to the original 23rd Avenue alignment.

Although there will be relocation of normal service utilities required throughout the project, the major areas of difficulty will be the major intersections, with some crossings of intermediate size utilities, and the Grand Canal crossing just south of Indian School Road. As shown on plan-profile Sheet 12 , Exhibit B it is recommended that the alignment parallel the canal for a distance to a point where a shorter and more practical right angle crossing can be made.

Various lateral shifts in alignment within the proposed 23rd Avenue right of way may be needed after detail construction plans are assembled at some future date.

The size of the proposed outfall at the Dunlap connection is set at 54" in diameter. As the line progresses south, the size increases as the calculated run off is accumulated at the one-half mile concentration points as shown on the Pipe Tabulation Chart, Table II.

2. Thomas Road to Salt River- Alternate 1 (Plate 2 and Exhibit B)

The alignment in this area is not as definite and straight forward as the proposed alignment north of Thomas Road. Because of the greater density of larger underground utilities and the prominence of industrial facilities, changes in alignment are necessitated at several locations. Also, since the Black Canyon Freeway swings to the east at Encanto Blvd., several streets are eliminated as possible routes, including 23rd Avenue South of McDowell.

It appears that the utility conflicts in this area will become more of a problem, especially with existing sanitary sewers as the Salt River and the City of Phoenix 23rd Avenue Sewage Treatment Plant are approached to the south.

From Thomas Road south to Granada, the 23rd Avenue alignment can be continued with the only apparent surface conflict being the Grand Avenue and A.T. & S.F. Railroad crossing. For approximately 400' south of the A.T. & S.F. R/W and east along 23rd Avenue, twenty (20) feet of new right-of-way will be required to locate the proposed 78" storm drain east of the existing 10" sanitary sewer and 6" water lines. A permit will be required to cross the A.T. & S.F. Railroad property.

In order to keep construction on McDowell Road at a minimum and to cause the least amount of disruption to services and traffic, the alignment will need to be shifted at Granada to 22nd Avenue. The 22nd Avenue alignment should be continued south to Culver Street then east along Culver to 21st Avenue and again south along 21st Avenue to Monroe Street.

To keep from interrupting services on a major street, it is recommended the line again be shifted west along Monroe Street to 22nd Avenue and then south along 22nd Avenue to the existing 19th Avenue storm drain outfall channel. Several obstructions will have to be dealt with along this route and they will be discussed in the following paragraphs.

From Van Buren south to Buckeye Road there are several 8" sanitary sewer lines crossing the proposed storm drain and a 36" sanitary sewer parallel to the proposed alignment. A 42" water line crosses 22nd Avenue at Madison Street. The aforementioned utilities all seem to be situated well above the proposed alignment profile elevation.

Between Harrison Street and Lincoln Street an easement will need to be acquired to allow access across private property. The 22nd Avenue route from Monroe Street to the outfall channel would then be uninterrupted in alignment. Three railroad switching spur tracks cross 22nd Avenue just south of Harrison therefore, construction of this section will necessitate coordination with the Southern Pacific Railroad.

Approximately 850' south of Buckeye Road, the existing 36" sanitary sewer branches into two 27" sewers and continues south along 22nd Avenue to the Black Canyon Freeway and then reverts back to a single 36" line and turns east along the Freeway. Preliminary investigation indicates that an existing 6" water line from Buckeye Road south to the Freeway will need to be relocated in order to accommodate the proposed storm drain. Additional right-of-way will need to be acquired along

the east side of 23rd Avenue so that the minimum east right-of-way width is 25 feet from McDowell to the Northbound Frontage Road junction.

As mentioned before, a major obstacle in this area is the Black Canyon Freeway. At the 22nd Avenue alignment crossing, the freeway is elevated on earth embankment at a height of approximately 30'. This will probably have to be negotiated by tunnelling with liner plate encasement. This will be a very expensive operation as will any other type of crossing of the freeway. A more detailed study during the preparation of construction plans should be made to determine other types of construction methods open to the Contractor for crossing in this area.

FromDurango Street south to the Salt River several large sanitary sewer lines cross 22nd Avenue at Hilton and Lower Buckeye Road. The sewer crossings at Hilton Street are above the proposed storm drain top of pipe elevation while the crossings at Lower Buckeye Road are below the invert elevation.

A 10" sanitary sewer, 8" water line and 78" storm sewer parallel the proposed alignment along 22nd Avenue from Hilton Street to Lower Buckeye Road. Preliminary studies indicate that only the 8" water line is in conflict with the proposed 96" storm drain. This water line will have to be relocated approximately 14 feet to the west. A construction easement along the west right-of-way will be required to relocate the 8" water line.

From Lower Buckeye Road to the existing outfall channel for the 19th Avenue system, the only apparent conflicts are the railroad track paralleling

Lower Buckeye Road on the south and the existing 78" storm drain paralleling the proposed alignment. Although there is adequate room, care would have to be exercised in excavating next to the existing system. A construction easement in this area will probably be required.

From this point, it will be necessary to enlarge the existing outfall open channel to accommodate the anticipated additional flow from the proposed system.

For more detail in questionable areas, refer to cross-sections provided in Exhibit B and large scale drawings in Exhibit C of the Appendix.

One possible alternate route (1A) would be to continue the alignment south along 21st Avenue past Monroe Street to Harrison Street then west on Harrison to 22nd Avenue to the original Alternate 1 alignment. (See Exhibit B, Sheet No. 9).

Advantages- From Dunlap Avenue to Encanto Blvd. the alignment follows the 1/2 mile grid of 23rd Avenue, thus conforming to the City of Phoenix long range design policy for secondary systems (laterals). This alignment is relatively free from any major utility conflicts and only a limited amount of R/W is needed.

From Encanto Blvd. south to the outfall channel the alignment meanders somewhat but never the less follows the natural ground swale between 19th Avenue and the freeway thus allowing for mostly surface flow to concentrate near the proposed storm drain.

Disadvantages- From Dunlap Avenue to Encanto Blvd. the 23rd Avenue alignment will necessitate construction at the major intersections which will disrupt some services and traffic. This would be equally true for any other alignment.

Also, construction across the Grand Canal will have to be done during the annual dry-up period which might pose a problem in scheduling the projects.

From Encanto south to the outfall channel, this alignment could present several problems because of the many turns, junctions, utility conflicts, etc. Another possible major drawback is the need to cross private property between Harrison Street and Lincoln Street along 22nd Avenue. The accessibility of an easement across this property will determine whether this alternate can be used Another major disadvantage is the need to negotiate through the Freeway embank ment at 22nd Avenue. Construction through this area will be very expensive and require additional study, as previously mentioned.

3. Alternates #2, #3, and #4. (Plate 2 and Exhibit B)

a. Alternate #2- (See Plan Sheet #19) This alternate route is a takeoff of the Alternate 1 alignment at the junction of 22nd Avenue and Black Canyon Freeway Northbound Frontage Road. At this point, the Alternate 2 route would proceed in a southwesterly direction to the vicinity of Durango Street and the 23rd Avenue junction. From here, the system would become parallel to the existing Arizona Highway Department I-17 outfall that borders the City of Phoenix Sewage Treatment Plant. The I-17 outfall continues around the treatment plant and eventually discharges into an open channel that leads to the Salt River. Alternate 2 would follow the same alignment and discharge into the same channel as just described. If used for both systems, this channel would also need to be enlarged.

b. Alternate #3 (See Plan Sheet 21 Exhibit B).

This alternate route is more involved than the one just discussed, because of the proximity to Black Canyon Freeway. This alternate departs from the Alternate 1 route at 23rd Avenue and Granada Road and continues south along 23rd Avenue to McDowell Road.

At this point the alignment would need to shift approximately 150' east along McDowell to the first property line. By remaining on the west side of this property line a route south might be possible through to Willetta Street. From this location, the alignment could go either of two ways to the frontage road. One possibility would be to route the project west along Willetta to the frontage road, then continue south along the east edge of the frontage road. The major drawback for this route would be the almost prohibitive angle needed at the intersection of Willetta and the frontage road. The other possibility would be to secure an easement across the northwest corner of the Central Industrial Lots P.T. 25 and P.T. 26, both of which are now vacant. This route would provide a better alignment between Willetta and the frontage road. Of course, this plan would be contingent upon the ability of the City to secure the proper easements. Once the route is established to the frontage road, the alignment would then continue south along the east side of the frontage road to the point where the existing AHD storm drain changes direction

to the southwest and continues to another alignment change near the junction of 23rd Avenue and Durango. From this point the alignment is the same as described for Alternate #2.

There is an existing 90" storm drain under the west edge of the Northbound Frontage Road. Investigation shows there is sufficient room to locate a new 84" storm drain under the east half of the frontage road. The only conflict noted is a 6" water line paralleling the proposed alignment between Harrison Street and Lincoln Street. The water line would need to be relocated several feet to the east to allow sufficient clearance for the proposed storm drain. A 36" sanitary sewer in the same area appears to be located sufficiently to the east to allow clearance. Refer to the cross-section on Sheet 20 for further detail.

Traffic along the Frontage Road will be somewhat curtailed during construction but the west half of the road would be open to traffic continuously while the east half the road could possibly be open at various intervals during construction. The PM rush hour traffic will be the only time of the day that traffic control would be a problem. Construction activity at this time would have to be at a minimum.

Access to adjacent properties from the frontage road will be severed at the location where actual construction is underway. However, investigation of aerial photographs and an onsite inspection reveals that very few, if any, properties will be totally inaccessible. Most all properties

south of Van Buren Street can be served from east-west streets via 22nd Avenue. Properties north of Van Buren to McDowell can be served from east-west streets via either 21st Avenue or 27th Avenue. Traffic control and accessibility to adjacent properties does not appear to present problems that cannot be resolved.

A modification to Alternate #3 might be to depart from the Alternate 1 route at the junction of 22nd Avenue and Culver Street and continue south along 22nd Avenue to Portland Street, then west to the frontage road. At this point the route and alignment south would be identical to that previously discussed. (See Alternate 3A, Plan Sheet 21)

c. Alternate #4- This alternate is a combination of Alternate 3 and Alternate 1 routes. At the location south of Buckeye Road along the frontage road where the Alternate 3 alignment coincides with the existing AHD storm drain, this alternate alignment would continue along the frontage road to a point in line with the Alternate 1 route at 22nd Avenue. At this location the alignment would revert to the Alternate 1 route. In essence, Alternate 4 involves only approximately 700' of additional alignment in the frontage road connecting a segment of Alternate 3 to a part of Alternate 1. (See Alternate 4, Plan Sheet 1

4. Papago Freeway Effect

At the time of this report, it was assumed that the Papago Freeway would be located along the original corridor approximately one-fourth mile south of McDowell. Preliminary plans call for the freeway to be elevated across the study area of this report.

Preliminary plans indicate that the crest of the elevated freeway occurs approximately over what normally would be 20th Avenue. Freeway pavement drainage west of the crest would be collected and discharged into the Arizona Highway Department system now located in the Northbound Frontage Road. This system would be enlarged and the frontage road relocated as necessary to be compatible with the interchange geometrics. If this plan is carried out the location of Alternate 3 in this area would also shift according to the relocation of the frontage road but Alternate 3 would still remain as a possible route.

The plan for freeway pavement drainage east of the crest would be collection and discharge of the run off down the columns to the City streets and bermed retention sites.

Until final plans are available final distribution of storm water run off from the freeway can only be assumed based on preliminary studies.

Advantages-Disadvantages-

Discussion will be limited to alternates south of Granada since Alternate 1 north of Granada is common to all alternates and has previously been discussed.

Advantages

Alternate 2. The only real advantage to this alternate would be would be the ability to cross under the freeway on a line radial to the curve thus decreasing the length of tunneling required. Also, the outfall from Durango south would parallel an already established route.

Alternate 3. This route will involve the least amount of conflict with existing utilities. Also, the only through intersections involving interruption of traffic will be the major streets crossing Black Canyon Freeway between McDowell and the freeway curve at Durango. Additional right-of-way will not be required for this alternate although several easements will be needed. Since a greater hydraulic slope is possible, the pipe sizes will be less thus resulting in reduced costs.

Alternate 3A. This would allow the use of most of Alternate 3 in the event complications arise in obtaining easements across private property south of McDowell and near the Northbound Frontage Road south of Willetta.

Alternate 4. This would allow using Alternate 3 even though the crossing at the curve might be prohibited. Also, preliminary estimates show this route to be less costly than other alternates.

Disadvantages

Alternate 2. Possible conflict with normal operations of City of Phoenix Sewage Treatment Plant.

Alternate 3. The need for easements across industrialized property, construction permits for work in Arizona Highway Department R.O.W., and possible conflict with City of Phoenix Sewage Treatment Plant Operations.

Alternate 3A. If this alternate is chosen, the hydraulic grade of Alternates 1 and 3 would need revision because of the difference in the datum of the two alternates.

Alternate 4. Refer to Alternate 1 and 3.

5. Recommendations

The following recommendations were based on several criteria including cost, projected route availability and basic information derived from the investigations necessary to complete this study. The alternates recommended in order of preference are as follows:

1. Alternate 1-

This alignment as discussed in Section V-1 and shown in Exhibit B, is the most direct route, and probably the most workable one, although not necessarily the one most free of obstructions or the least expensive.

2. Alternate 3-

This route as discussed in Section V-3 and shown in Exhibit B is a take off of Alternate 1 at 23rd Avenue and Granada Road. The most significant

elements to be considered in evaluating this alternate are (a) the location of 2.2 miles of alignment in the Arizona Highway Department R/W, and (b) location of 0.33 miles of alignment adjacent to City of Phoenix Wastewater Treatment Plant.

3. Alternate 4.

This route as discussed inSection V-4 and shown in Exhibit B incorporates the strong points of both alternates 1 and 3, thus allowing the frontage road alignment to be used even though problems might arise that would prevent the crossing at the Freeway curve. The estimated cost is less than the other alternates.

4. Alternate 2.

This route departs Alternate 1 at the Northbound Frontage Road junction and utilizes the Alternate 3 alignment from Durango to the outfall channel. Refer to section V-2 and Exhibit B for more information and details.

5. Alternate Combinations 1-A, 1-3A-3

These are various combinations of routes that could be used in the event unforeseen circumstances prohibit the use of the aforementioned recommendations.

VI-ESTIMATED CONSTRUCTION COSTS

The following are estimated current construction costs to install the storm drainage system detailed by alternates:

A. ALTERNATE NO. 1

Item	Description	Quantity	Unit	Unit Price	Amount
1.	54"RCP	2570	LF	$64.00	$164,480
2.	60"RCP	2710	LF	68.00	184,280
3.	66"RCP	10865	LF	72.00	782,280
4.	72"RCP	10580	LF	76.00	804,080
5.	78"RCP	13520	LF	88.00	1,189,760
6.	84"RCP	4850	LF	98.00	475,300
7.	90"RCP	4910	LF	120.00	589,200
8.	96"RCP	6495	LF	146.00	948,270
9.	Manhole	91	Ea.	2,200.00	200,200
10.	Concrete Catch Basin	76	Ea.	1,000.00	76,000
11.	C.B. Connector Pipe	6000	LF	30.00	180,000
12.	Pavement Replacement	66,245	SY	8.00	529,960
13.	Tunnel w / Liner (84"-96")	850	LF	1,000.00	850,000
14.	Outfall Structure	1	Ea.	1,500.00	1,500
15.	Misc. Items (Rem, Reloc. etc.)		LS		100,000
		Subtotal			$7,075,310
	Contingencies- 15%				1,061,297
	R/W Costs				
	New R/W	$1600			
	Constr. Easement	1100			
	Perm. Easement	25,000			
	R/W Total				27,700
	GRAND TOTAL-ALTERNATE NO. 1				$8,164,307

B. ALTERNATE NO. 2

Item	Description	Quantity	Unit	Unit Price	Amount
1.	54"RCP	2570	LF	$64.00	$164,480
2.	60"RCP	2710	LF	68.00	184,280
3.	66"RCP	10865	LF	72.00	782,280
4.	72"RCP	10580	LF	76.00	804,080
5.	78"RCP	13520	LF	88.00	1,189,760
6.	84"RCP	4850	LF	98.00	475,300
7.	90"RCP	11460	LF	120.00	1,375,200
8.	96"RCP	1960	LF	146.00	286,160
9.	Manhole	94	Ea.	2200.00	206,800
10.	Concrete Catch Basin	76	Ea.	1000.00	76,000
11.	C.B. Connector Pipe	6000	LF	30.00	180,000
12.	Pavement Replacement	68996	SY	8.00	551,968
13.	Tunnel w/ Liner (84" -96")	700	LF	1000.00	700,000
14.	Outfall Structure	1	Ea.	2000.00	2,000
15.	Misc. Items (Rem. Reloc. etc.)	____	LS	_____	100,000
		Subtotal			$7,078,308
	Contingencies- 15%				1,061,746
	R/W Costs				
	New R/W		$1,600		
	Construction Easement		2,910		
	Permanent Easement		25,000		
	R/W Total				29,510
	GRAND TOTAL- ALTERNATE NO. 2				$8,169,564

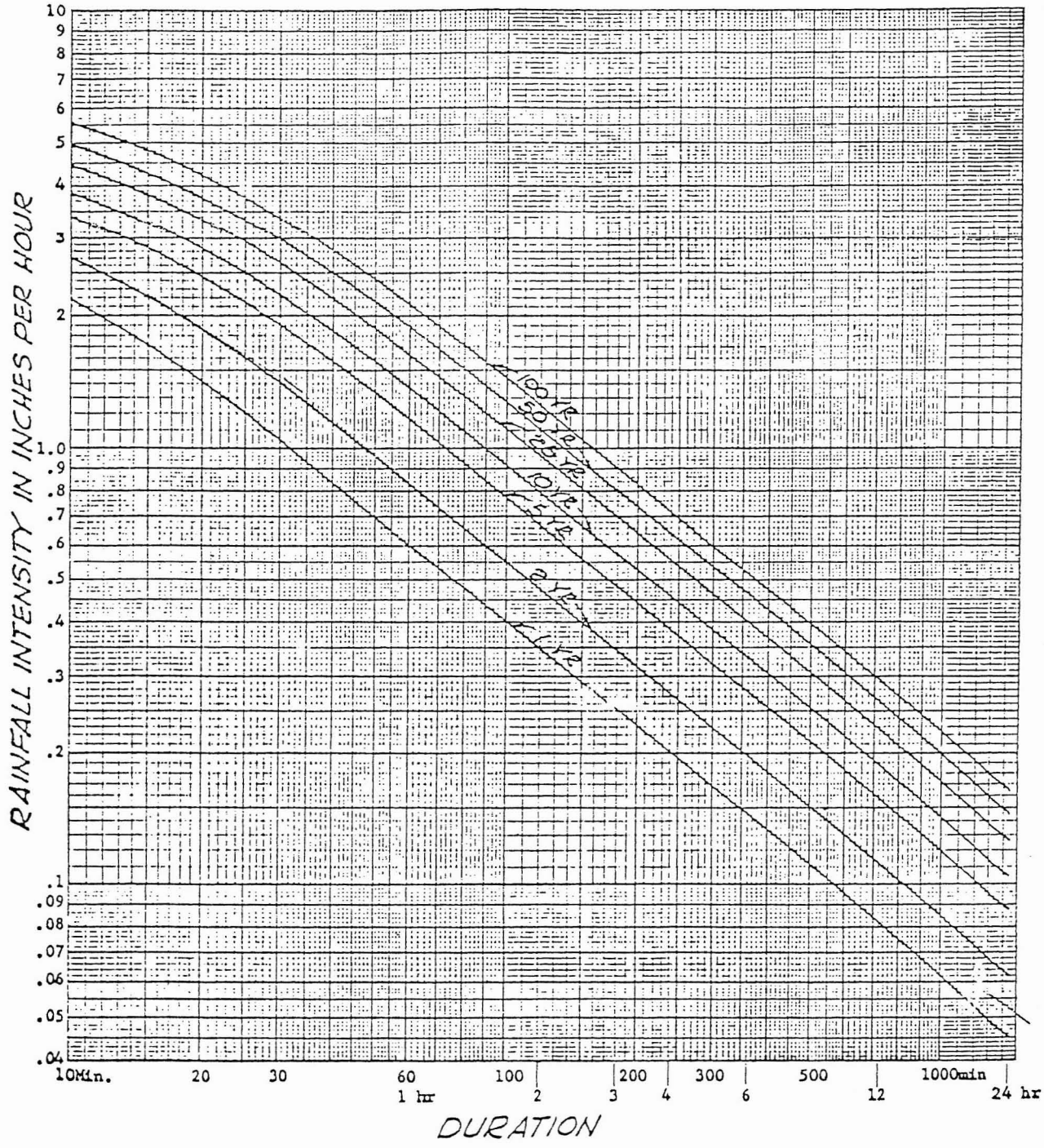
C. ALTERNATE NO. 3

Item	Description	Quantity	Unit	Unit Price	Amount
1.	54"RCP	2570	LF	$64.00	$164,480
2.	60"RCP	2710	LF	68.00	184,280
3.	66"RCP	10865	LF	72.00	782,280
4.	72"RCP	10580	LF	76.00	804,080
5.	78"RCP	9091	LF	88.00	800,008
6.	84"RCP	9103	LF	98.00	892,094
7.	90"RCP	8315	LF	120.00	997,800
8.	Manhole	87	Ea.	2200.00	191,400
9.	Concrete Catch Basin	65	Ea.	1000.00	65,000
10.	C.B. Connector Pipe	8500	LF	30.00	255,000
11.	Pavement Replacement	54546	SY	8.00	436,368
12.	Tunnel w/ Liner (84"-90")	850	LF	1000.00	850,000
13.	Outfall Structure	1	Ea.	2000.00	2,000
14.	Misc. Items (Rem. Reloc. etc.)		LS		100,000
		Subtotal			$6,524,790
	Contingencies- 15%				978,719
	R/W Costs				
	New R/W	$900			
	Construction Easement	3,260			
	Permanent Easement	25,000			
		R/W. Total			29,160
	GRAND TOTAL- ALTERNATE NO. 3				$7,532,669

D. ALTERNATE NO. 4

Item	Description	Quantity	Unit	Unit Price	Amount
1.	54" RCP	2570	LF	$64.00	$164,480
2.	60"RCP	2710	LF	68.00	184,280
3.	66"RCP	10865	LF	72.00	782,280
4.	72"RCP	10580	LF	76.00	804,080
5.	78"RCP	9091	LF	88.00	800,008
6.	84"RCP	9103	LF	98.00	892,094
7.	90"RCP	2150	LF	120.00	258,000
8.	96"RCP	4440	LF	146.00	648,240
9.	Manhole	86	Ea.	2200.00	189,200
10.	Conc. Catch Basin	68	Ea.	1000.00	68,000
11.	C.B. Connector Pipe	10000	LF	30.00	300,000
12.	Pavement Replacement	59408	SY	8.00	475,264
13	Tunnel w/Liner (84"-96")	800	LF	1000.00	800,000
14.	Outfall Structure	1	Ea.	1500.00	1,500
15.	Misc. Items (Rem. Reloc. etc.)	—	LS	—	100,000
		Subtotal			$6,467,426
	Contingencies- 15%				970,114
	R/W. Costs				
	New R/W	$900			
	Construction Easement	1,450			
	Permanent Easement	25,000			
		R/W. Total			27,350
	GRAND TOTAL- ALTERNATE NO. 4				$7,464,890

VII APPENDIX

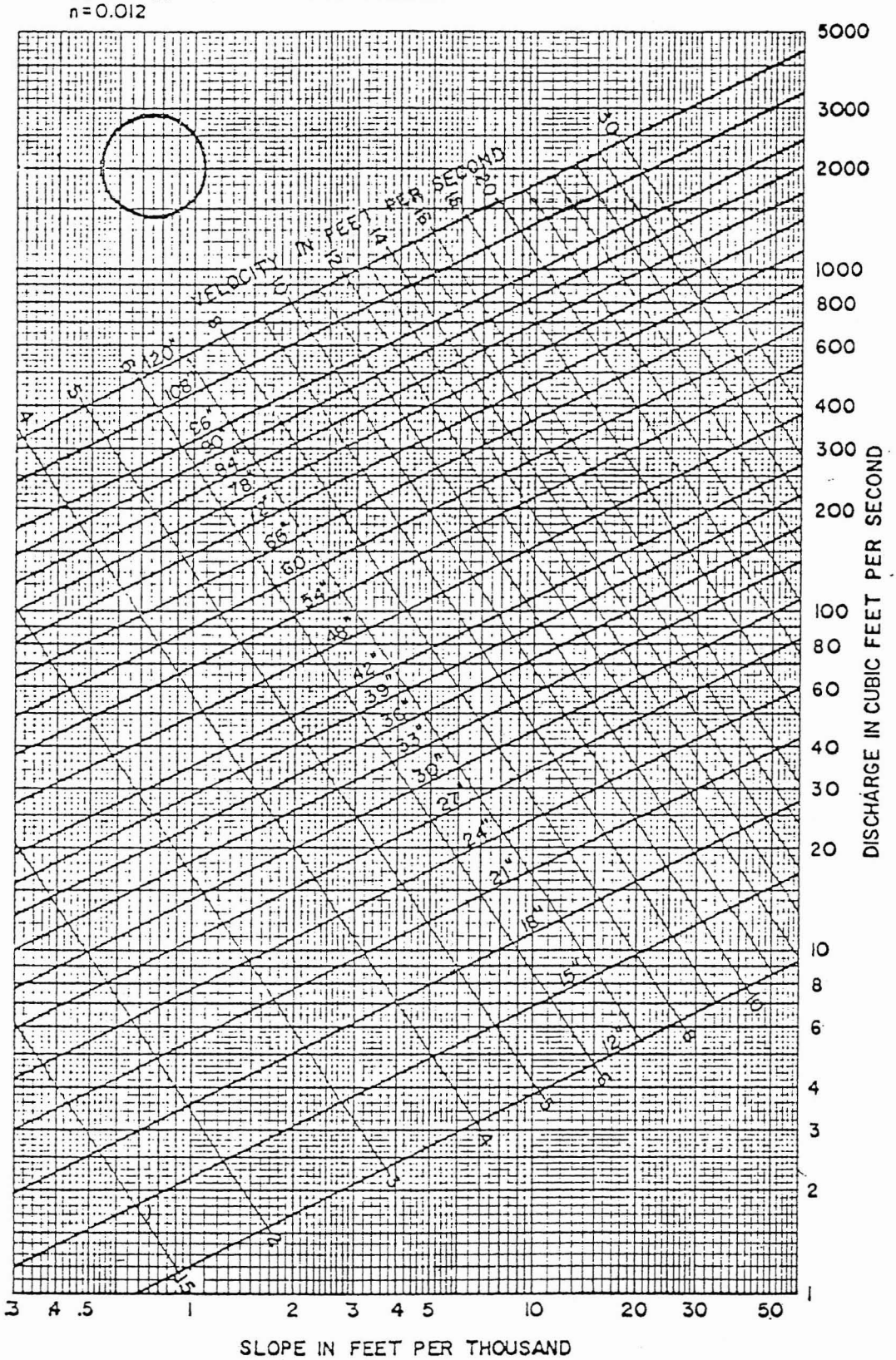


RAINFALL INTENSITY-DURATION-FREQUENCY RELATION
FOR PHOENIX, ARIZONA
(Partial Duration Series)

Curves are based on methods of U.S. Weather Bureau Technical Papers Nos. 28 and 40 and rainfall data prepared by U.S. Weather Bureau Office of Hydrology for the Soil Conservation Service, March 1967

(TIME FOR RUN OFF TO OCCUR)

FIGURE 1.



PIPE CAPACITIES FLOWING FULL

FIGURE 2

TABLE I
IMPERVIOUS VALUES FOR ZONING TYPES

ZONING TYPES	% IMPERVIOUS
RE-43	15.
RE-35	15.
RE-24	18.
RI-18	18.
RI-14	20.
RI-10	25.
RI-8	25.
RI-6	25.
R-3	60.
R-4	65.
R-4A	70.
R-5	70.
C-0	75.
HR	90.
PSC	90.
C-1	85.
C-2	85.
C-3	85.
P-1	85.
P-2	85.
IND. PARK	75.
A-1	75.
A-2	75.
P.A.D.	85.
D.G.	85.
RIGHT OF WAY (R.O.W.)	100.

TABLE II

STORM DRAIN SUMMARY SHEET-Alternate No. 1.

From	To	Contributing Area (Ac)	Total Area	T_c	Calculated Flow (cfs)	Pipe Size	Slope ft/ft	Invert Inlet	Elev. Outlet
Dunlap	Butler	66.17**	66.17	17.02	110.2	**54	0.0041	1204.75	1194.25
Butler	Northern	89.28	155.45	33.3⊛	156.7	60	0.0040	1193.75	1182.83
Northern	Orangewood	60.53	215.98	38.6	192.4	66	0.0041	1182.33	1171.54
Orange-wood	Glendale	53.42	269.40	43.4	213.4	66	0.0041	1171.54	1160.15
Glendale	Maryland	37.79	307.19	48.2	215.6	66	0.0042	1160.15	1148.25
Maryland	Bethany Home	30.27	337.46	53.1	218.7	66	0.0040	1148.25	1137.65
Bethany Home	Missouri	77.94	415.40	57.6	246.7	72	0.0040	1137.15	1126.55
Missouri	Camelback	28.96	444.36	62.1	*246.7	72	0.0037	1126.55	1116.75
Camelback	Campbell	43.84	488.20	66.7	*246.7	72	0.0035	1116.75	1107.45
Campbell	Indian School	60.57	548.77	71.4	261.8	72	0.0035	1107.45	1098.25
Indian Sch	Osborn	90.89	639.66	76.0	282.1	78	0.0027	1097.75	1090.45
Osborn	Thomas	67.48	707.14	81.2	286.4	78	0.0028	1090.45	1083.15
Thomas	Encanto	17.04	724.18	86.0	*286.4	78	0.00335	1083.15	1074.35
Encanto	Granada @ 23rd	64.54	788.72	90.7	*286.4	78	0.00315	1074.35	1068.17

⊛Tributary tc Controls

TABLE II

STORM DRAIN SUMMARY SHEET-Alternate No. 1

From	To	Contributing Area (ac)	Total Area	T_c	Calculated Flow (cfs)	Pipe Size	Slope ft/ft	Invert Inlet	Elev. Outlet
Granada @23rd	Granada @22nd	30.0	818.72	94.0	*286.4	78	0.0027	1068.17	1066.73
Granada @22nd	McDowell (W)	20.0	838.72	95.3	*286.4	78	0.0028	1066.73	1064.25
McDowell (W)	McDowell (E)	10.0	848.72	96.9	*286.4	78	0.0027	1064.25	1063.85
McDowell (E)	Culver @22nd	12.18	860.90	97.2	*286.4	78	0.0025	1063.85	1058.80
Culver @ 22nd	Culver @21st	50.00	910.90	100.2	286.9	78	0.0025	1058.80	1058.30
Culver @21st	Roosevelt	10.00	920.90	101.2	*286.9	84	0.0020	1058.30	1055.70
Roosevelt	Van Buren	55.92	976.82	103.9	294.5	84	0.0020	1055.70	1050.70
Van Buren	Monroe @21st	84.80	1061.62	109.2	301.0	84	0.0019	1050.70	1050.0
Monroe @ 21st	Monroe @ 22nd	10.00	1071.62	110.0	*301.0	84	0.0019	1050.0	1048.7
Monroe @22nd	Harrison	5.00	1076.62	111.4	*301.0	90	0.014	1048.2	1045.0

TABLE II

STORM DRAIN SUMMARY SHEET-Alternate No. 1

From	To	Contributing Area (Ac)	Total Area	T_c	Calculated Flow (cfs)	Pipe Size	Slope ft/ft	Invert Inlet	Elev. Outlet
Harrison	Buckeye	53.08	1129.70	116.8	*301.0	90	0.0014	1045.0	1041.3
Buckeye	Durango	41.23	1170.93	123.1	*301.0	96	0.0012	1040.8	1037.7
Durango	L. Buckeye	102.00	1272.93	129.8	*301.0	96	0.0010	1037.7	1035.1
Lower Buckeye	Outfall Channel	76.94	1349.87	136.9	*301.0	96	0.0016	1035.1	1033.1

* Use previous maximum calculation flow

** Values from Dunlap Avenue Project Consultant

TABLE II

STORM DRAIN SUMMARY SHEET-Alternate No. 2

From	To	Contributing Area (Ac)	Total Area	T_c	Calculated Flow (cfs)	Pipe Size	Slope ft/ft	Invert Inlet	Elev. Outlet
** Monroe @21st	Harrison @21st	10.00	1071.62	110.0	*301.0	90	0.0015	1049.5	1046.1
** Harrison @21st	Harrison @22nd	41.21	1112.83	115.0	*301.0	90	0.0016	1046.1	1045.0
Harrison @22nd	Buckeye	16.87	1129.70	116.8	*301.0	90	0.0015	1045.0	1041.1
Buckeye	Jct. Black Canyon Fr. Road	41.23	1170.93	123.1	*301.0	90	0.0014	1041.1	1038.3
Jct. Frontage Road	Jct. #4	60.00	1230.93	127.9	*301.0	90	0.0014	1038.3	1036.1
Jct. #4	RR Crossing	42.00	1272.93	131.6	*301.0	90	0.0014	1036.1	1031.9
RR Crossing	Outfall Chan.	76.94	1349.87	138.7	*301.0	96	0.0010	1031.4	1029.4

* Use previous maximum calculation flow
** Alt. 1A

TABLE II

STORM DRAIN SUMMARY SHEET-Alternate No. 3

From	To	Contributing Area (Ac)	Total Area	T_c	Calculated Flow (cfs)	Pipe Size	Slope ft /ft	Invert Inlet	Elev. Outlet
Thomas	Encanto	17.04	724.18	86.0	*286.4	78	0.0027	1083.15	1075.95
Encanto	McDowell	64.54	788.72	90.7	*286.4	78	0.0027	1075.95	1068.35
McDowell	JCT NB Frontage Rd.	72.18	860.90	95.8	286.7	78	0.0027	1068.35	1065.50
Jct. NB Frontage Rd.	Roosevelt	35.00	895.90	98.0	290.3	84	0.0020	1065.00	1061.40
Roosevelt	VanBuren	80.92	976.82	100.7	307.7	84	0.0020	1061.40	1056.40
Van Buren	Harrison	84.80	1061.62	106.0	315.3	84	0.0020	1056.40	1051.10
Harrison	Sherman	68.08	1129.70	111.5	*315.3	84	0.0039	1051.10	1046.00
Sherman	Buckeye	25.00	1154.70	113.4	*315.3	84	0.0023	1046.00	1042.80
Buckeye	Durango Jct.#4	16.23	1170.93	116.1	*315.3	90	0.0016	1042.30	1037.30
Durango	L. Buckeye	102.00	1272.93	123.6	*315.3	90	0.0016	1037.30	1032.50
L. Buckeye	Outfall Ch.	76.94	1349.87	130.4	*315.3	90	0.0016	1032.50	1029.10

*Use Previous Maximum calculations flow

TABLE II

STORM DRAIN SUMMARY SHEET-Alternate No. 4

From	To	Contributing Area (Ac)	Total Area	T_c	Calculated Flow (cfs)	Pipe Size	Slope ft /ft	Invert Inlet	Elev. Outlet
Buckeye	Jct. NB Fr. Road	16.23	1170.93	116.1	*315.3	90	0.0018	1042.30	1038.43
Jct. NB Fr. Road	Durango	60.00	1230.93	120.7	*315.3	96	0.0012	1038.43	1037.73
Durango	L. Buckeye	42.00	1272.93	122.2	*315.3	96	0.0010	1037.73	1035.09
L. Buckeye	Channel Outfall	76.94	1349.87	129.2	*315.3	96	0.0016	1035.09	1033.14

TABLE III

UTILITY AND R.O.W. CONFLICTS

ALTERNATE NO. 1

Location	Type of Conflict	Remarks
23rd Ave. and Indian School	48"W and 24" S.D.	S.D. Crossing under
23rd Ave. and Grand Canal	SRVWUA Property	Construction Permit Req'd
23rd Ave. (Clarendon to Grand Canal)	Private Property	5' Construction Easement Req'd
23rd Ave. and Cambridge	2" Gas	Relocate
23rd Ave. (Holly to A.T. & S.F.R.R.)	1/2 street	New R/W. Req'd
22nd Ave. Route (Lincoln to Harrison)	Private Property	New R.O.W. needed to continue alignment along 22nd Avenue
22nd Avenue & Sherman	APS R.O.W.	Construction Permit
22nd Avenue (Buckeye to N.B. Frontage Road)	6" Water	Relocate W. Acquire new R.O.W. east side
22nd Avenue at Freeway	AHD R.O.W.	Construction Permit
22nd Ave. (Hilton to L. Buckeye	8" W	Relocate 8"W . Acquire west side construction easement

ALTERNATE NO. 2

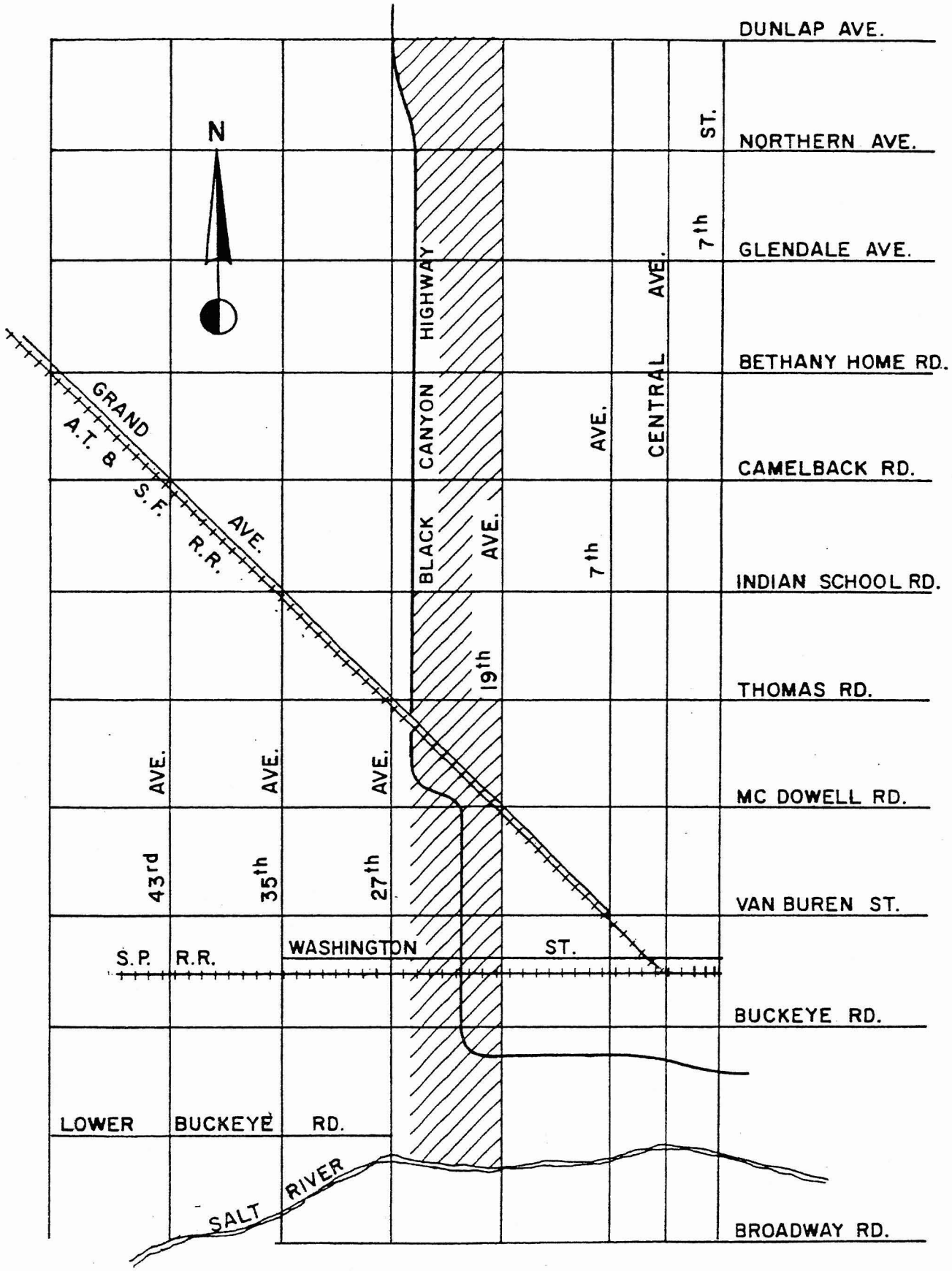
Freeway Crossing	AHD R.O.W.	Construction Permit
23rd Ave. & Durango	36" Sanitary Sewer	Storm Drain crossing under Sanitary Sewer
Durango to Railroad	City of Phoenix Sewage Treatment Plant Sludge Beds	Temporary distruption of sludge beds during construction. Easement req'd
RR and RID Canal	Crossing	Construction Permit

TABLE III

UTILITY AND R.O.W. CONFLICTS

ALTERNATE NO. 3

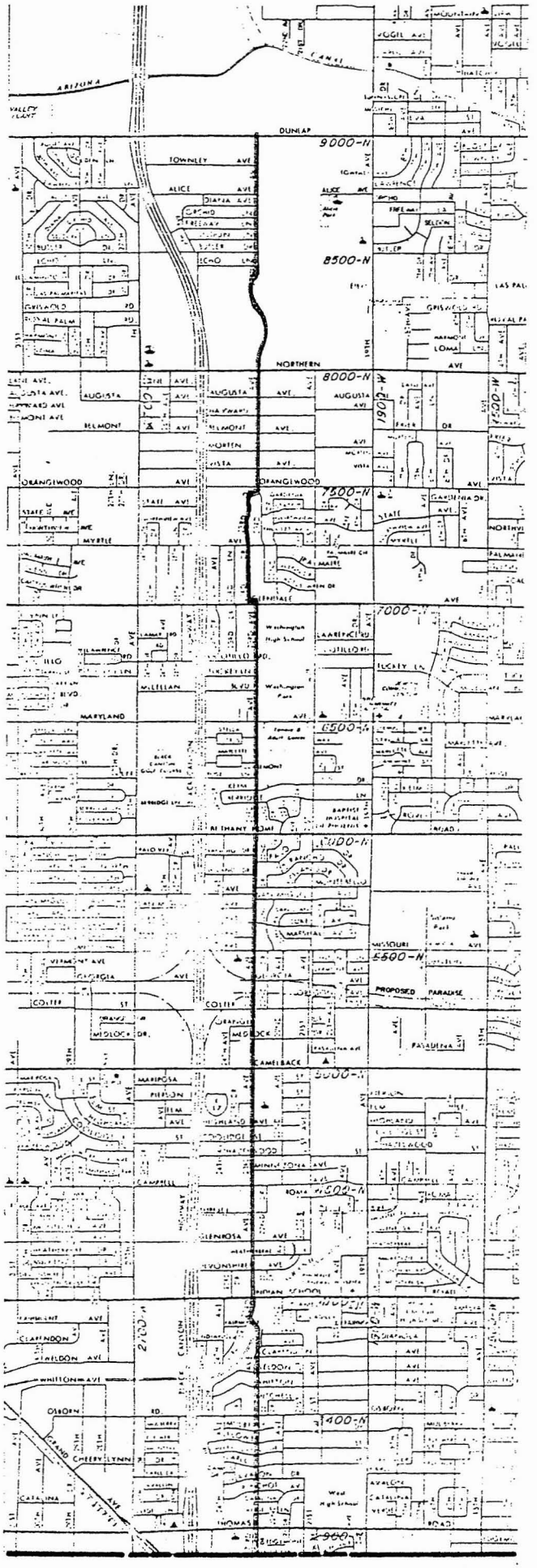
McDowell to Willetta	Private Property	Acquire R.O.W. or Extend existing easement.
Willetta to N.F. Frontage Rd.	Private Property	Acquire R.O.W. or Easement.
NB. Fr. Road (Lincoln to Harrison	6" ACP. W.	Relocate
NB Fr. Road (1300' ± So. Buckeye	10" S.S. w /24" Slv.	Adjust S.S. elevation.
Freeway Crossing	A.H.D. R.O.W.	Construction Permit.
23rd Ave. & Durango	36" Sanitary Sewer & 8" S.S.	Storm Drain Crossing under Sanitary Sewer.
Durango to Railroad	City of Phoenix Sewage Treatment Plant Sludge Beds	Temporary disruption of sludge beds during construction. Easement might be required.
R.R. and RID Canal	Crossing	Construction Permit.



Area of Study

LOCATION MAP
23rd AVE. STORM DRAIN
ROUTE STUDY

Plate 1

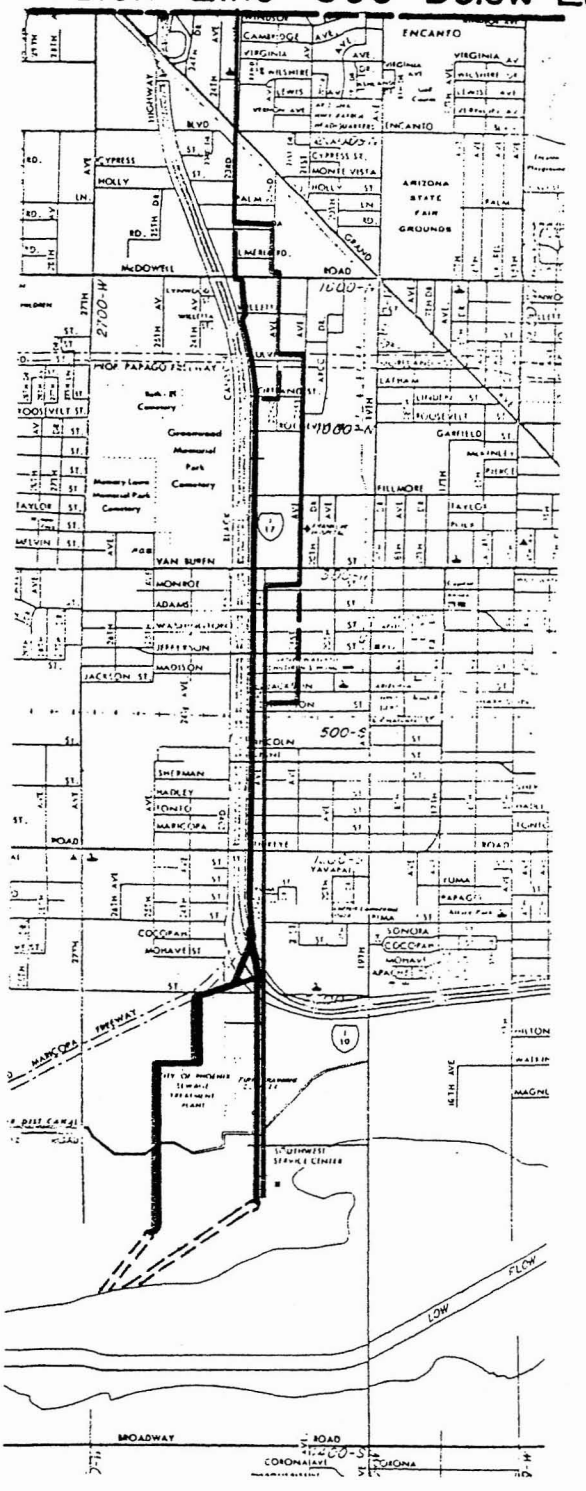


Match Line - See Above Right

N

Alternate 1
" 2
" 3
" 4

Match Line - See Below Left



Match Line - See Below Left

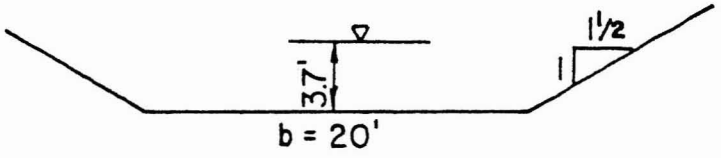
CITY OF PHOENIX
ENGINEERING DEPT.

23rd Ave. Storm Drain Route Study - Alternates

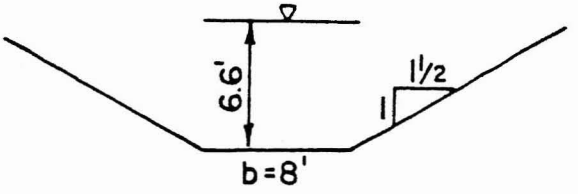
H.D. & R.	Plate No. 2

TYPICAL SECTIONS
OUTFALL CHANNELS

ALTERNATES No. 1 & 4



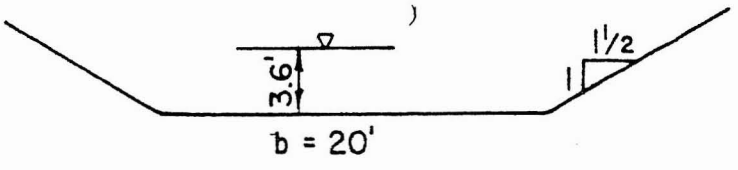
*AT PIPE OUTLET



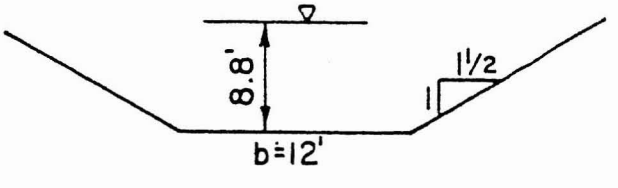
200' ± DOWNSTREAM
(Existing Channel)

* Widening of Existing Channel to Accomodate Existing 78" Pipe & 96" Pipe.

ALTERNATES No. 2 & 3



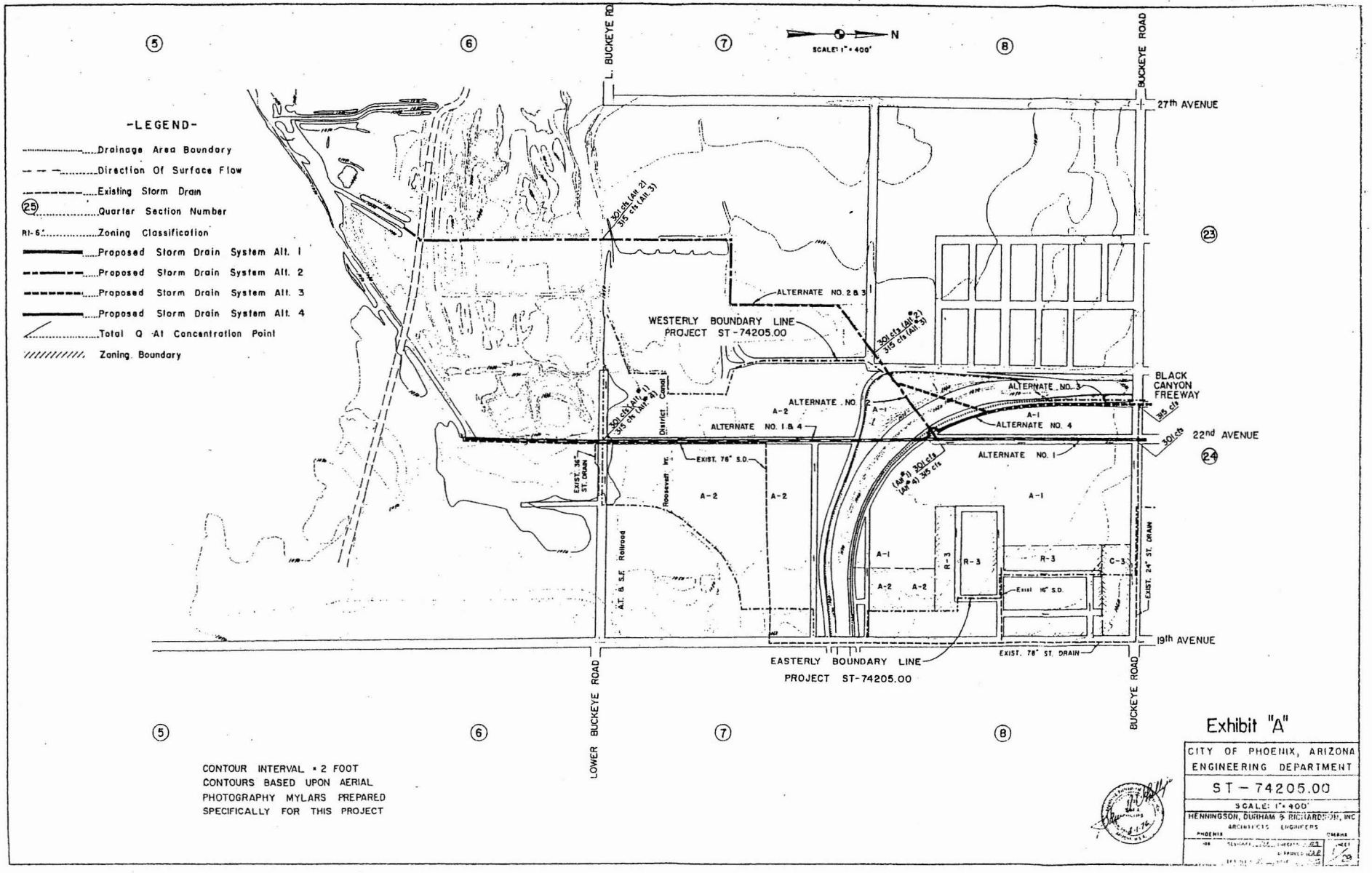
*AT PIPE OUTLET



200' ± DOWNSTREAM
(Existing Channel)

*Widening of Existing Channel to Accomodate Existing 102" Pipe & 96" Pipe.

PLATE No. 3



CONTOUR INTERVAL = 2 FOOT
CONTOURS BASED UPON AERIAL PHOTOGRAPHY MYLARS PREPARED SPECIFICALLY FOR THIS PROJECT

Exhibit "A"

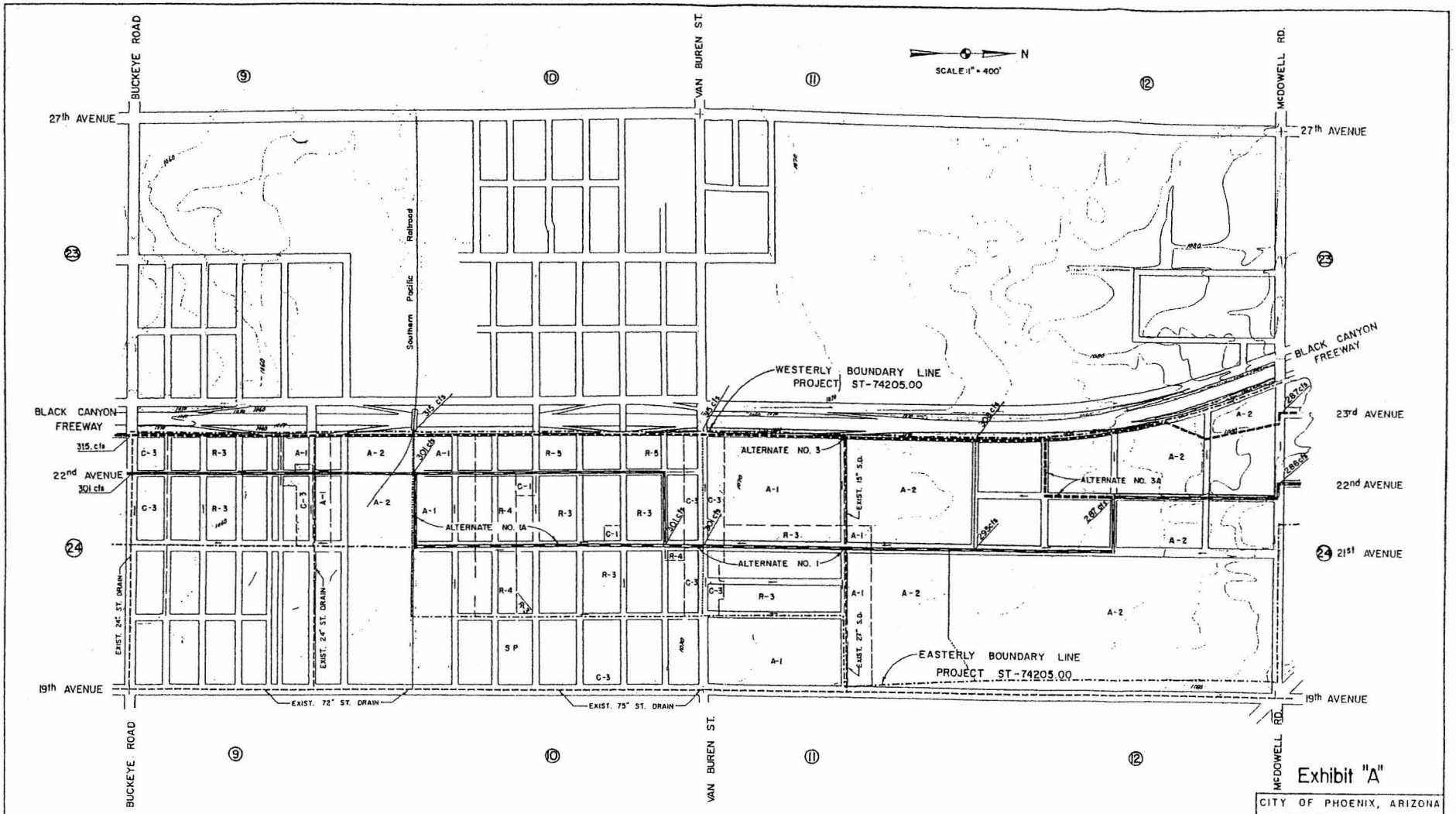
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST - 74205.00

SCALE: 1" = 400'

HENNINGSON, DURHAM & RICHARDSON, INC
ARCHITECTS ENGINEERS
PHOENIX OMAHA

SHEET 1 OF 1



CONTOUR INTERVAL = 2 FOOT
CONTOURS BASED UPON AERIAL PHOTOGRAPHY MYLARS PREPARED SPECIFICALLY FOR THIS PROJECT.

Exhibit "A"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST – 74205.00

SCALE: 1" = 400'

HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX OMAHA

JOB DESIGNED EEJ CHECKED EEJ
APPROVED GAE
DETAILED TR DATE 6-21-78
SHEET 2 OF 29

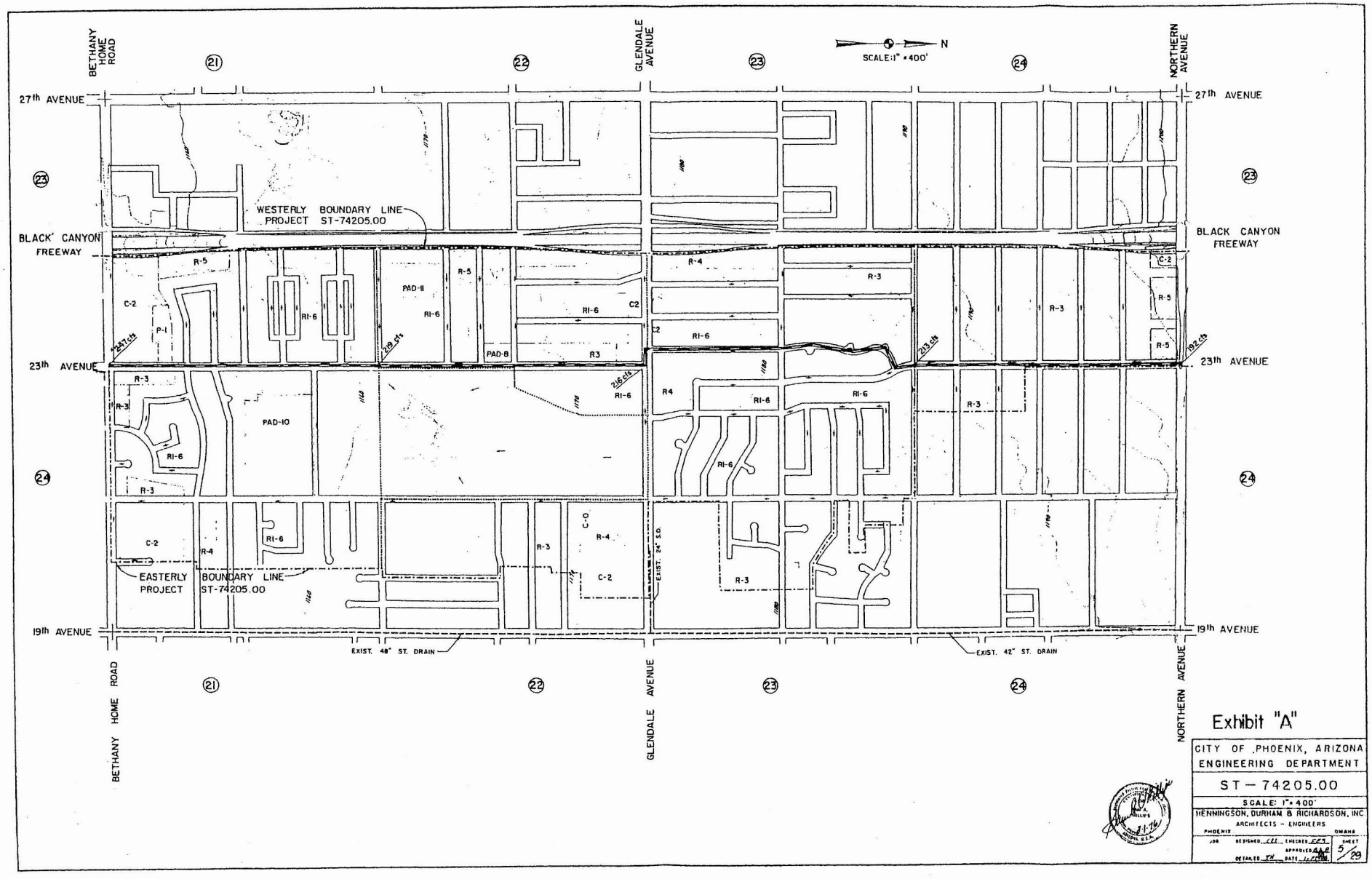


Exhibit "A"

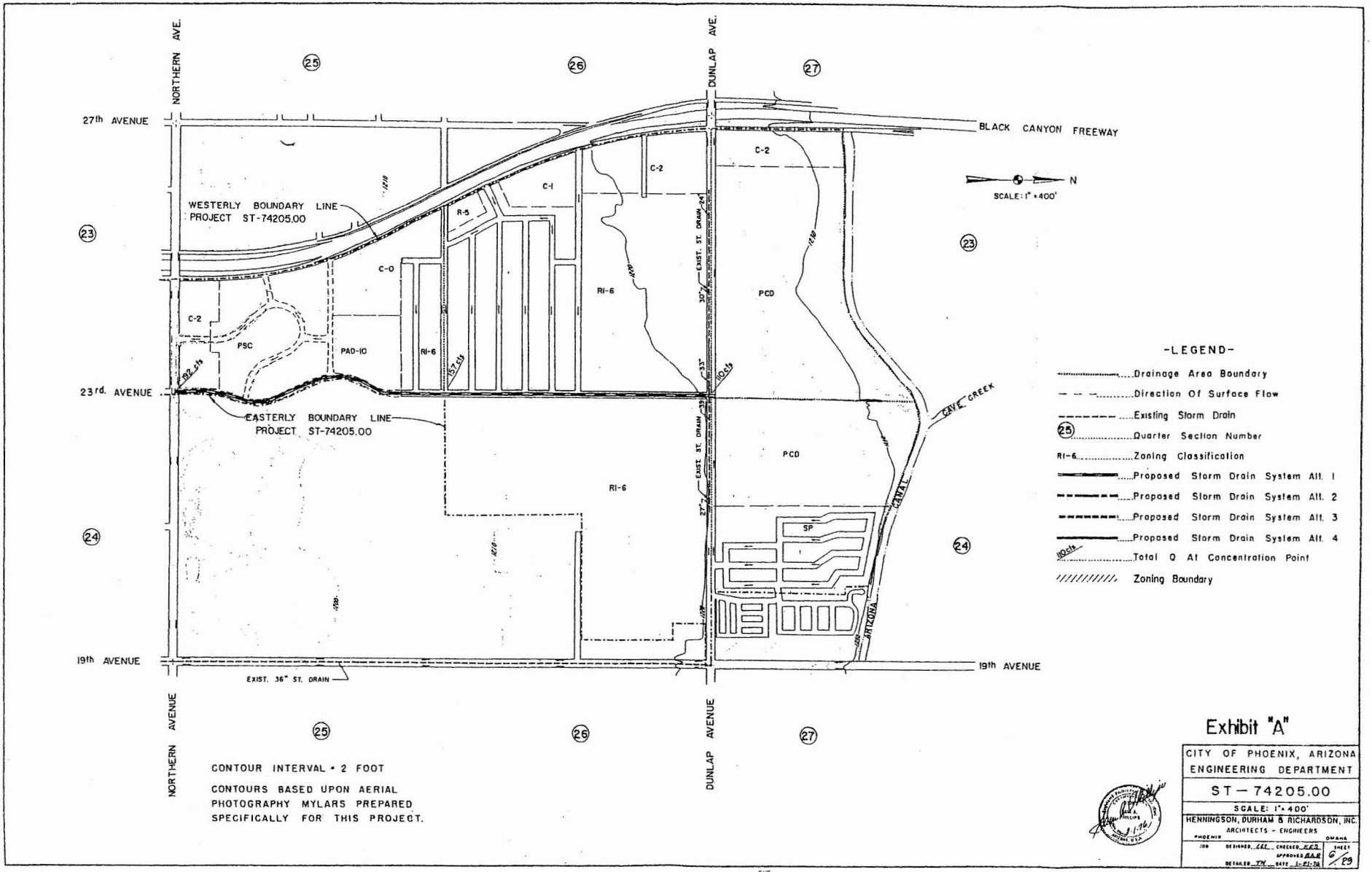
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST – 74205.00

SCALE: 1" = 400'

HENNINGSON, DURHAM & RICHARDSON, INC
ARCHITECTS – ENGINEERS
PHOENIX OMAHA

JOB DESIGNED CLL CHECKED CCS SHEET 5/29
APPROVED
DETAILED TH DATE 11-16-76



CONTOUR INTERVAL = 2 FOOT

CONTOURS BASED UPON AERIAL PHOTOGRAPHY MYLARS PREPARED SPECIFICALLY FOR THIS PROJECT.

Exhibit "A"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST – 74205.00

SCALE: 1" = 400'

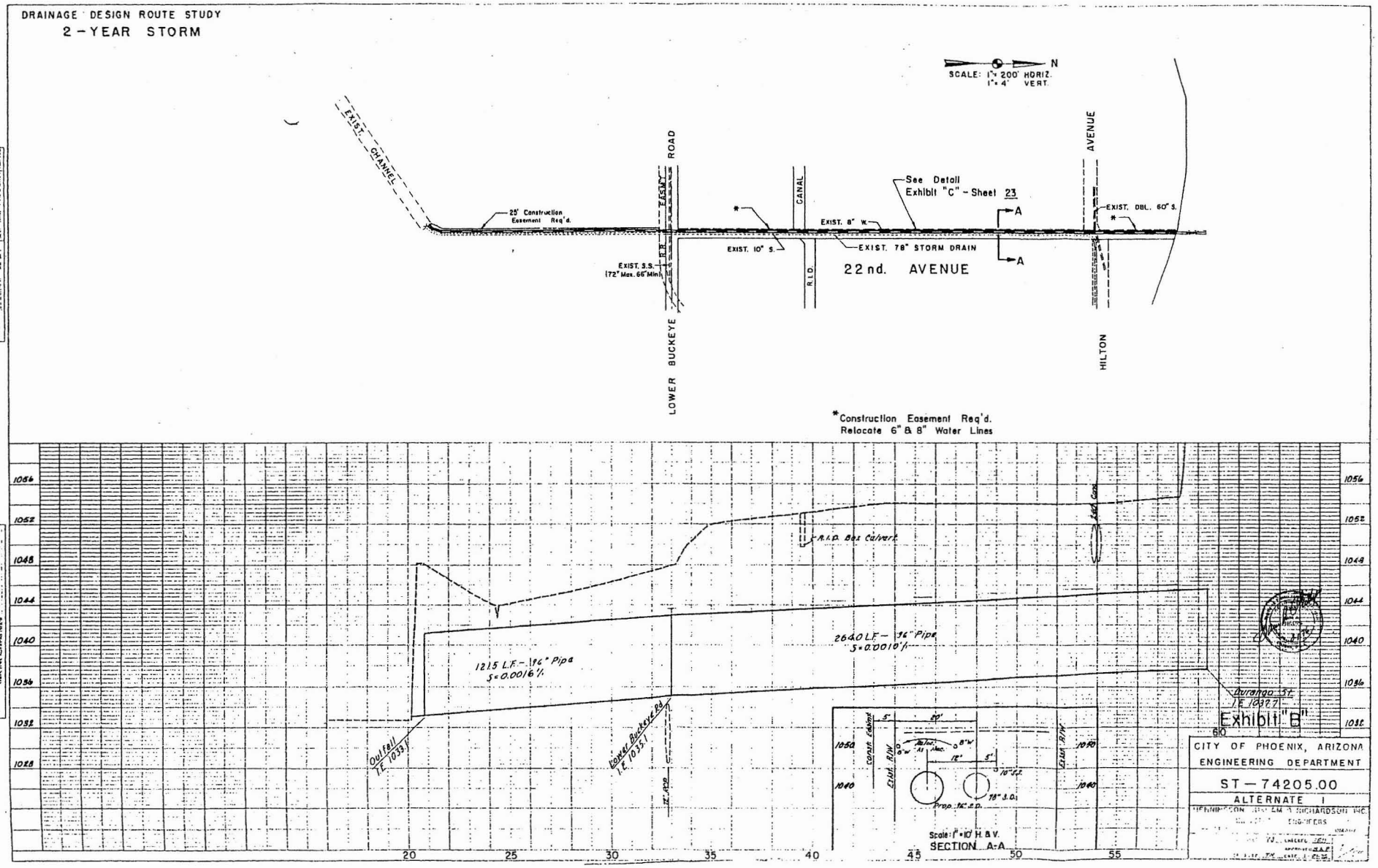
HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS – ENGINEERS
PHOENIX OMAHA

JOB DESIGNED LEE CHECKED K.E.S.
APPROVED R.A.P.
DETAILED TM DATE 1-21-76

SHEET G / 29

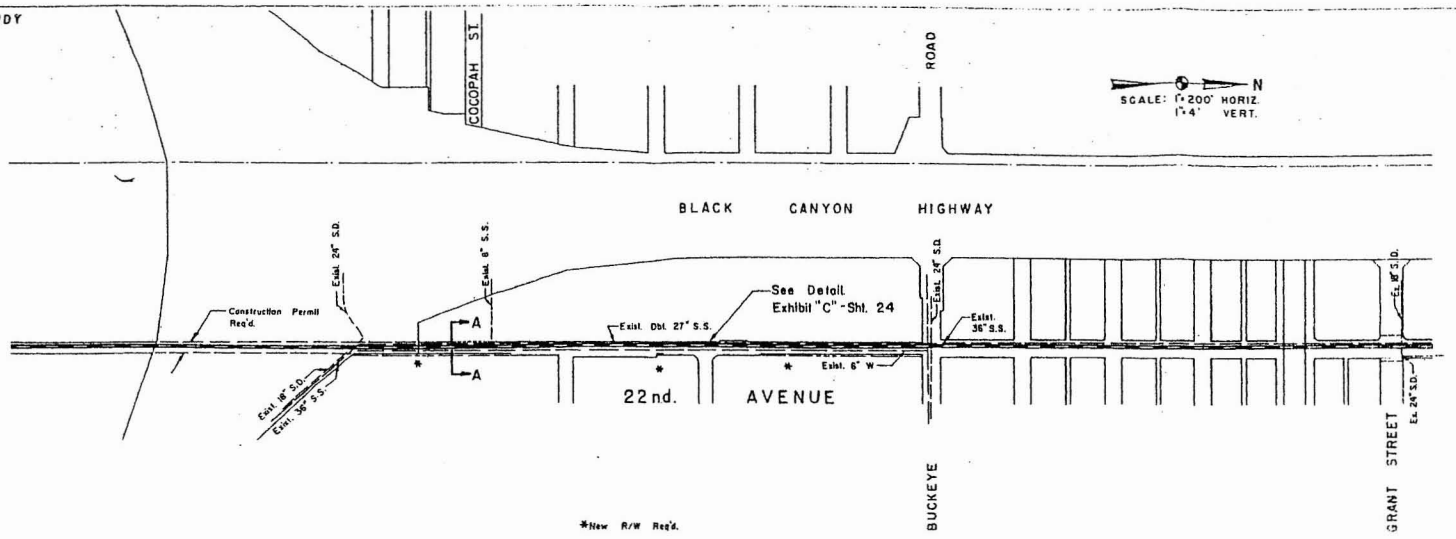
DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



PLAN

PROFILE

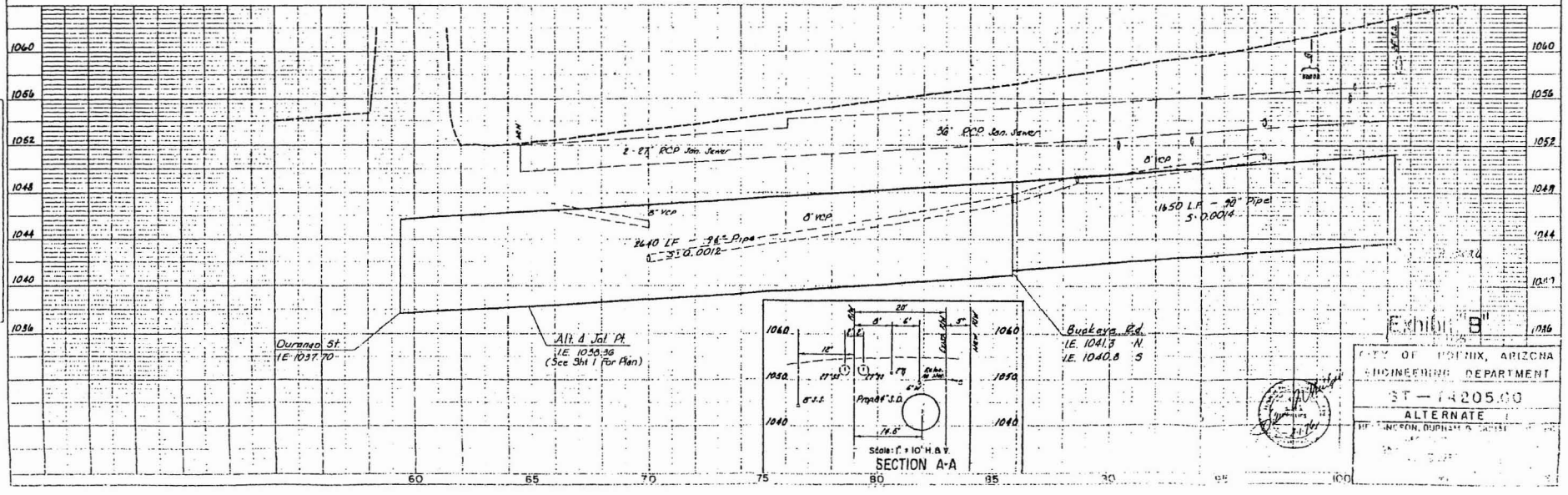
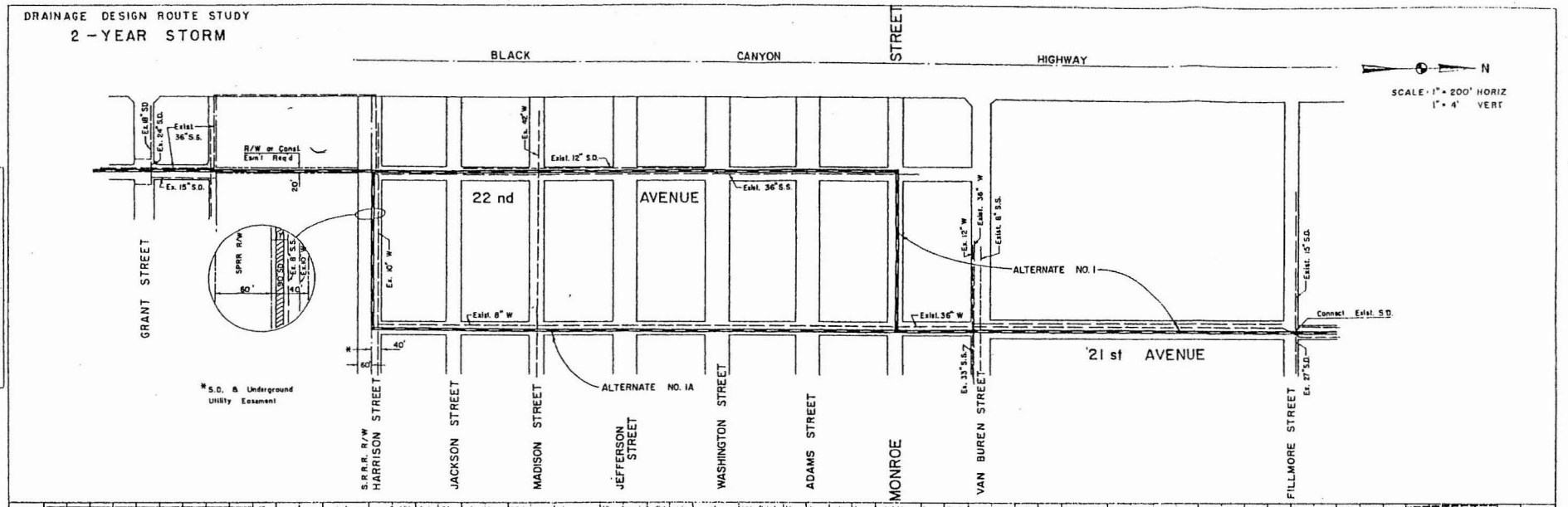


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
ALTERNATE

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



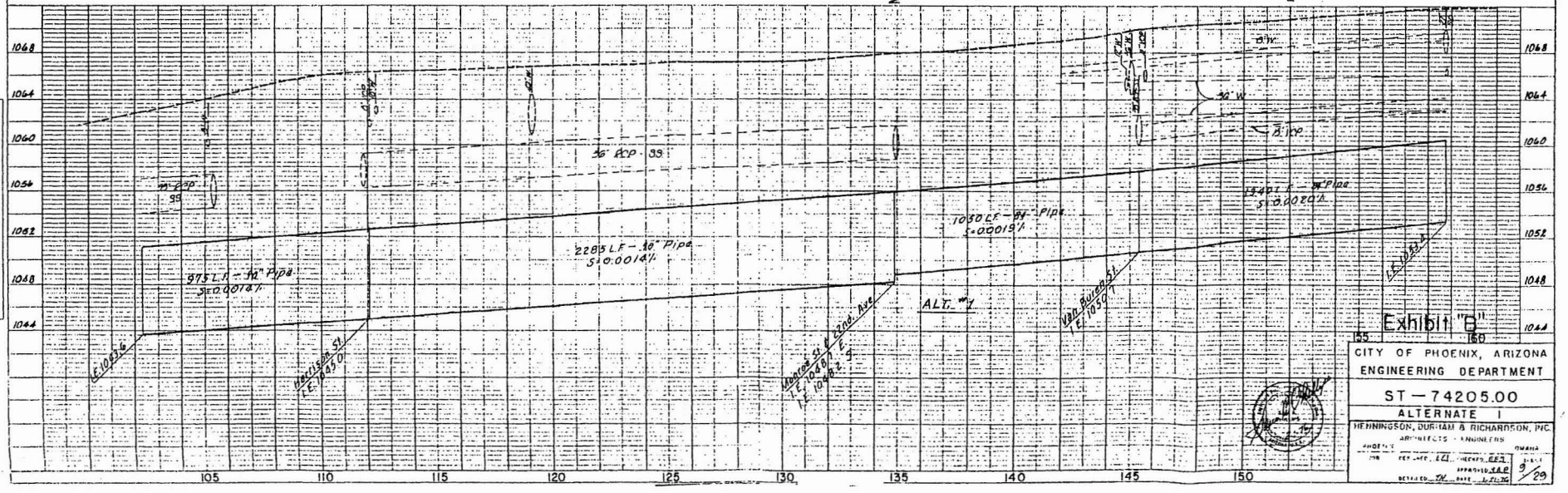


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST - 74205.00

ALTERNATE I

HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS

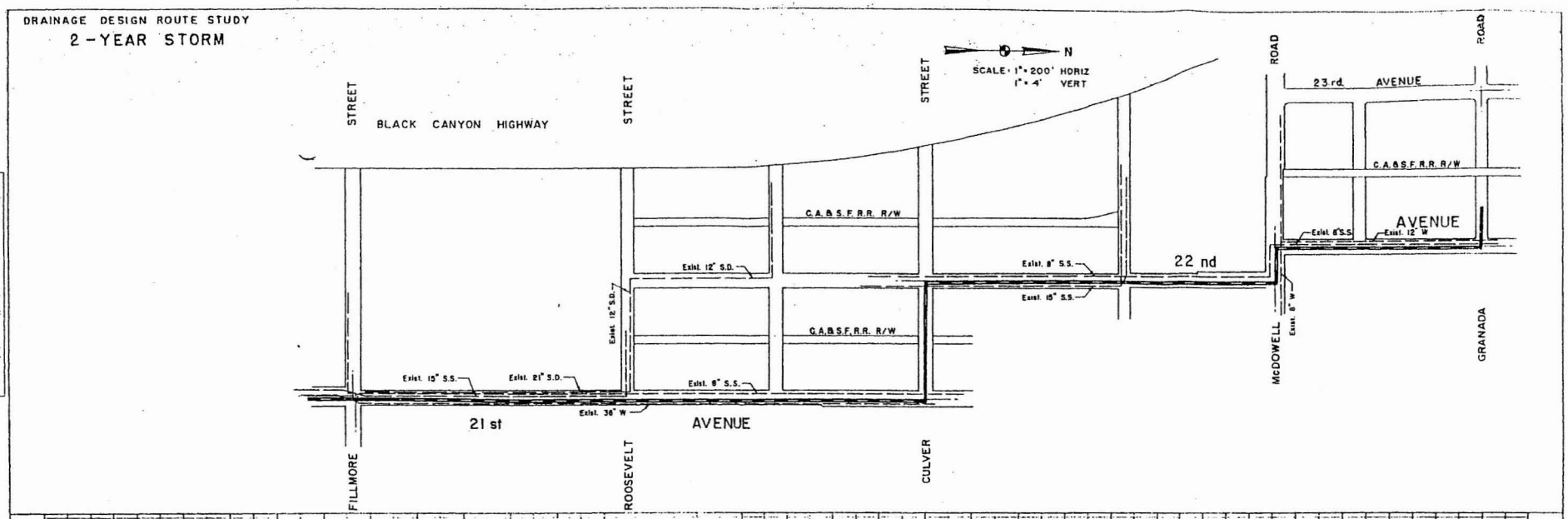
PHOENIX OMAHA

PER APP. E.E.I. CHECKED E.R.S. DATE 9/29

DESIGNED T.N. DRAWN L.F.L.M. APPROVED E.A.E. DATE

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



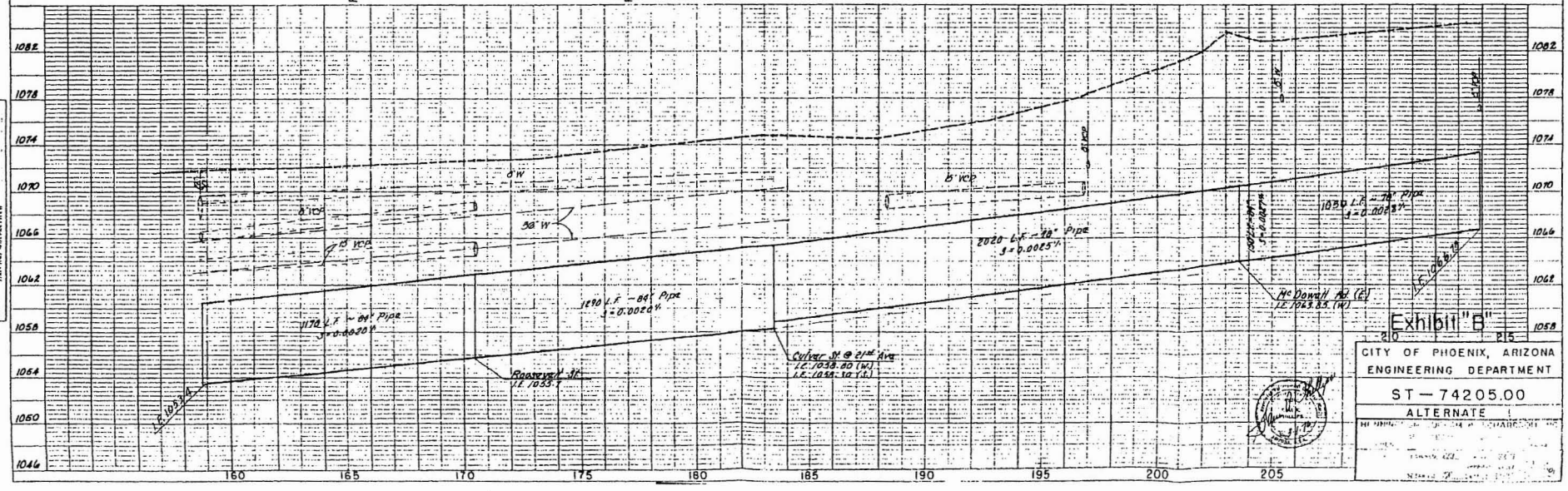


Exhibit "B"

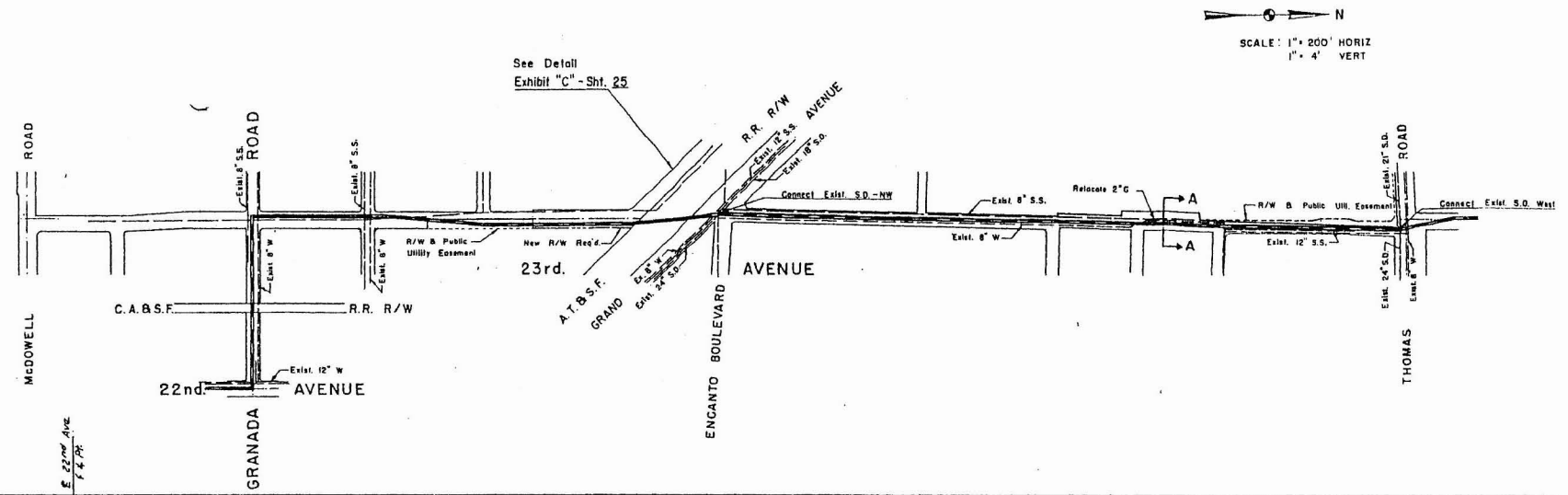
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST - 74205.00

ALTERNATE

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



PLAN

PROFILE

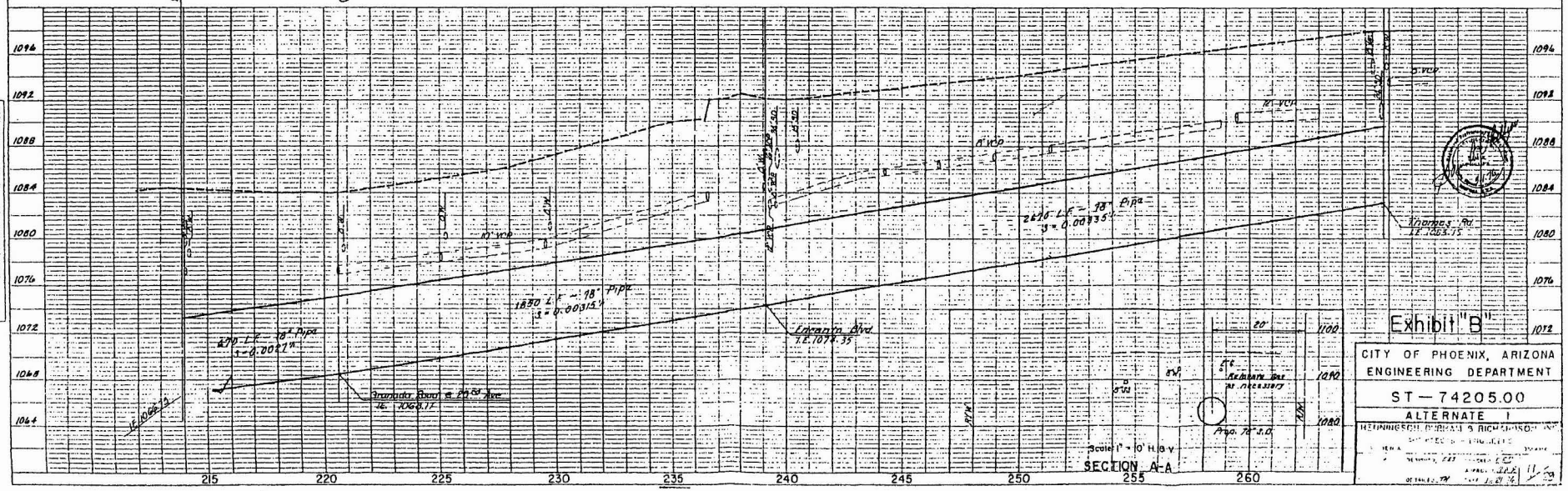


Exhibit "B"

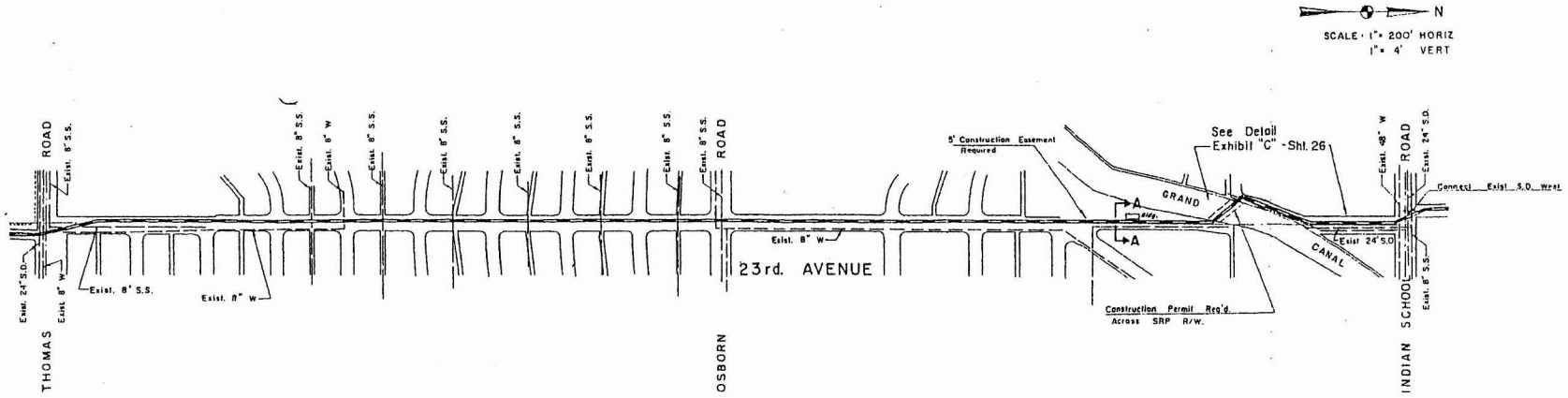
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST - 74205.00

ALTERNATE 1

DRAINAGE DESIGN ROUTE STUDY

2 – YEAR STORM



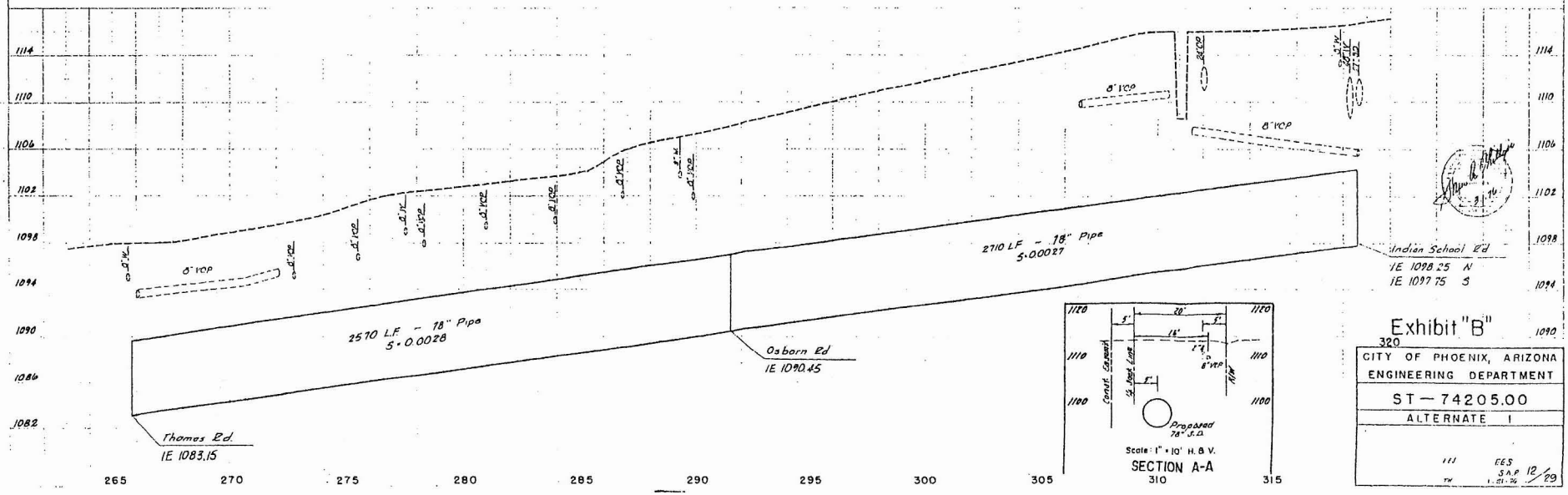


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

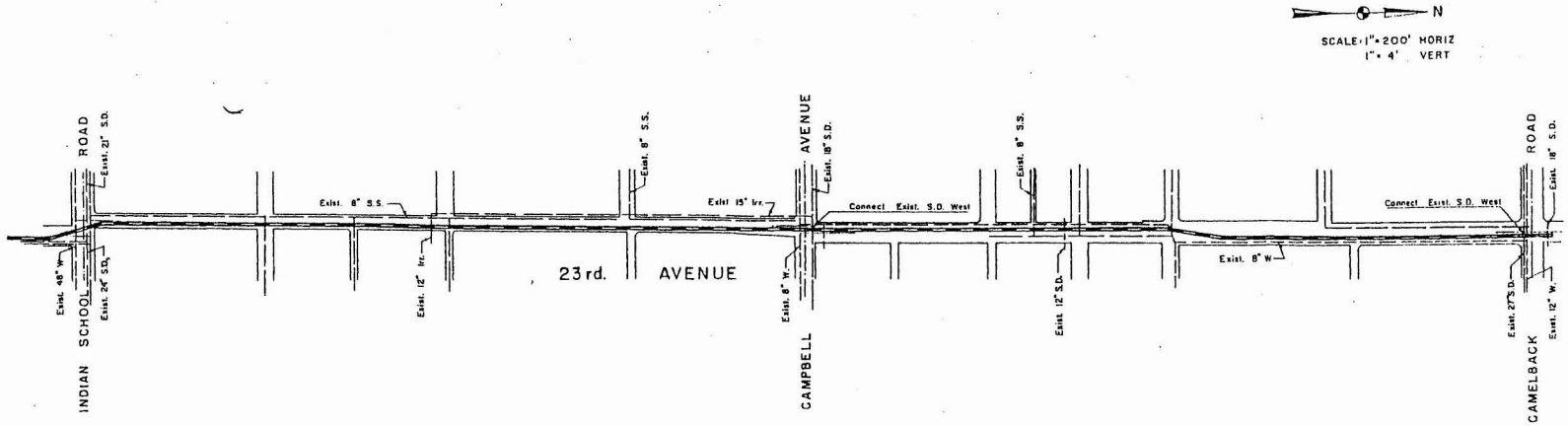
ST – 74205.00

ALTERNATE 1

FES
SAP 12/29
1-21-74

DRAINAGE DESIGN ROUTE STUDY

2 – YEAR STORM



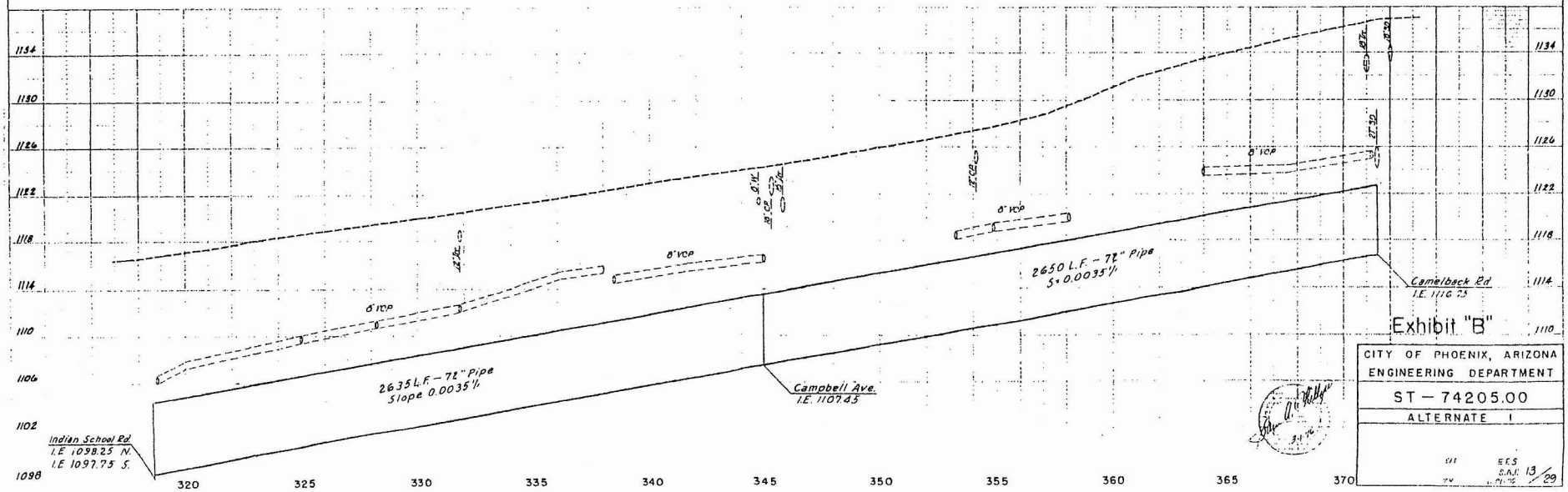


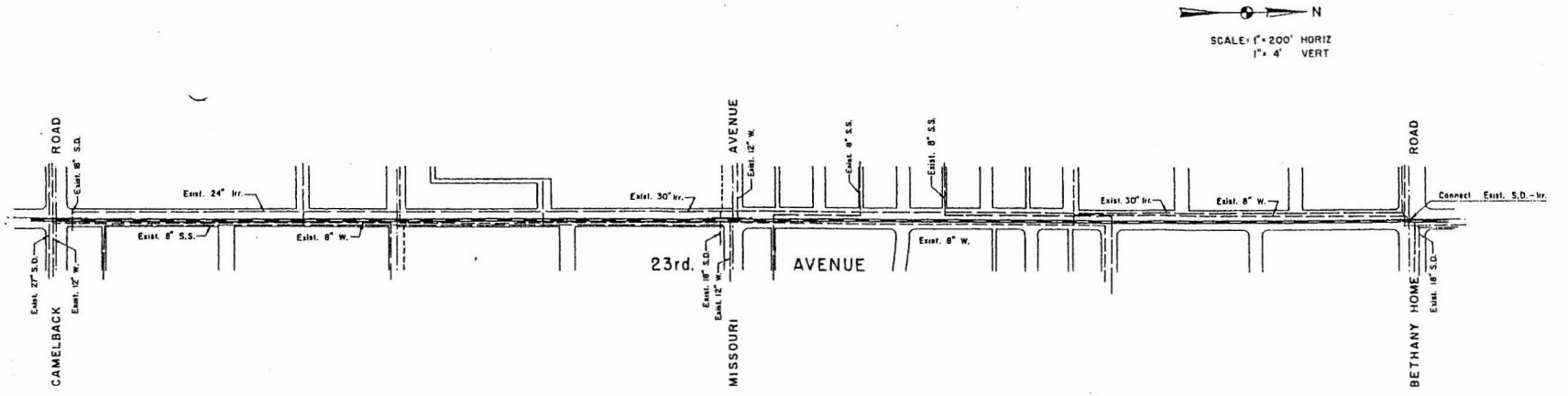
Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST – 74205.00
ALTERNATE 1

EES
D.N.: 13/29

DRAINAGE DESIGN ROUTE STUDY

2 – YEAR STORM



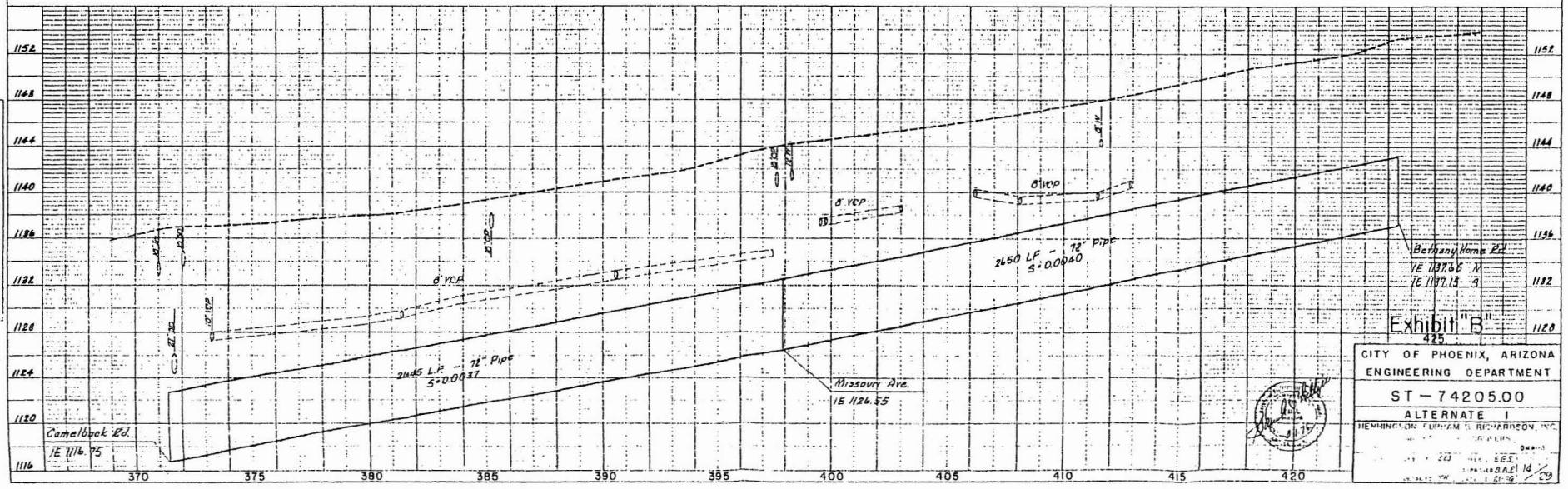


Exhibit "B"

425

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

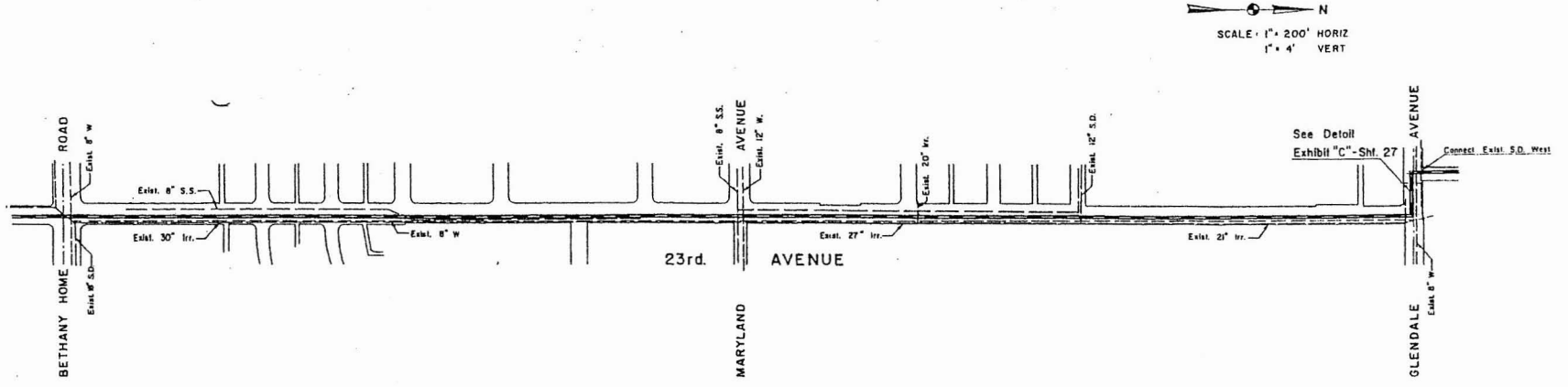
ST – 74205.00

ALTERNATE 1

HEMINGSON, FURNESS & RICHARDSON, INC.

DRAINAGE DESIGN ROUTE STUDY

2-YEAR STORM



PLAN

PROFILE

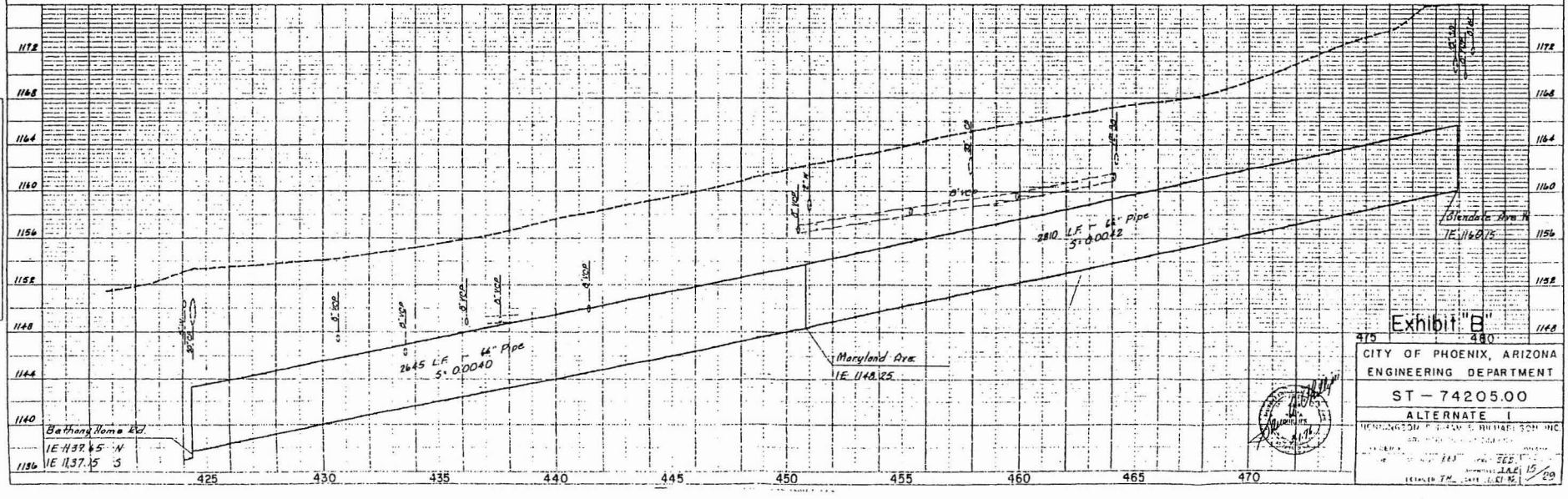


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

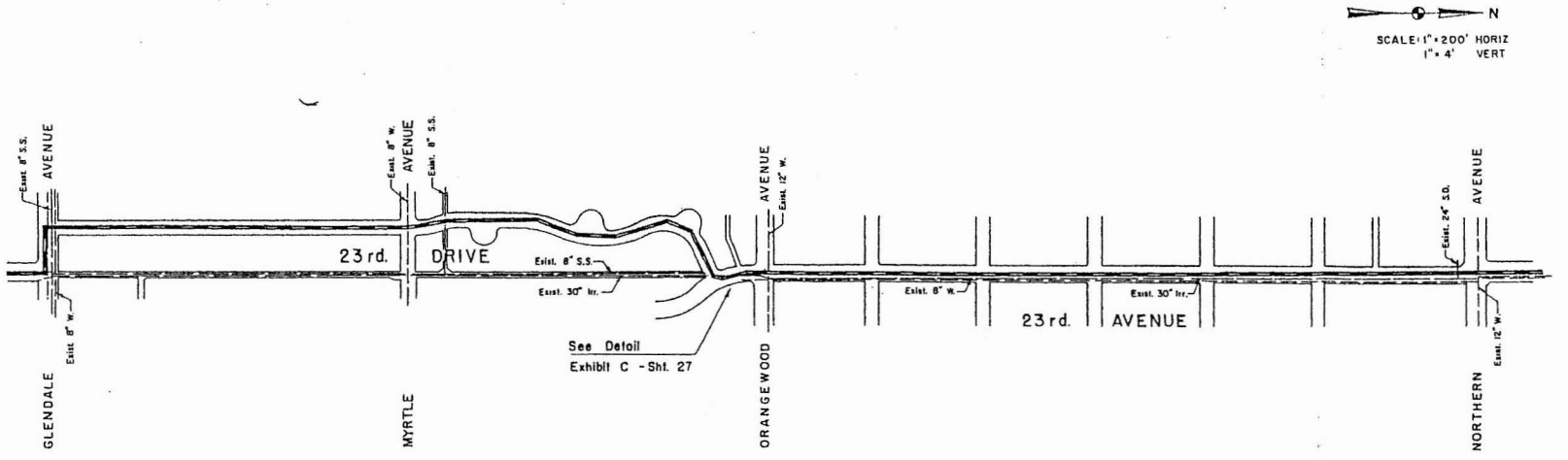
ST - 74205.00

ALTERNATE 1

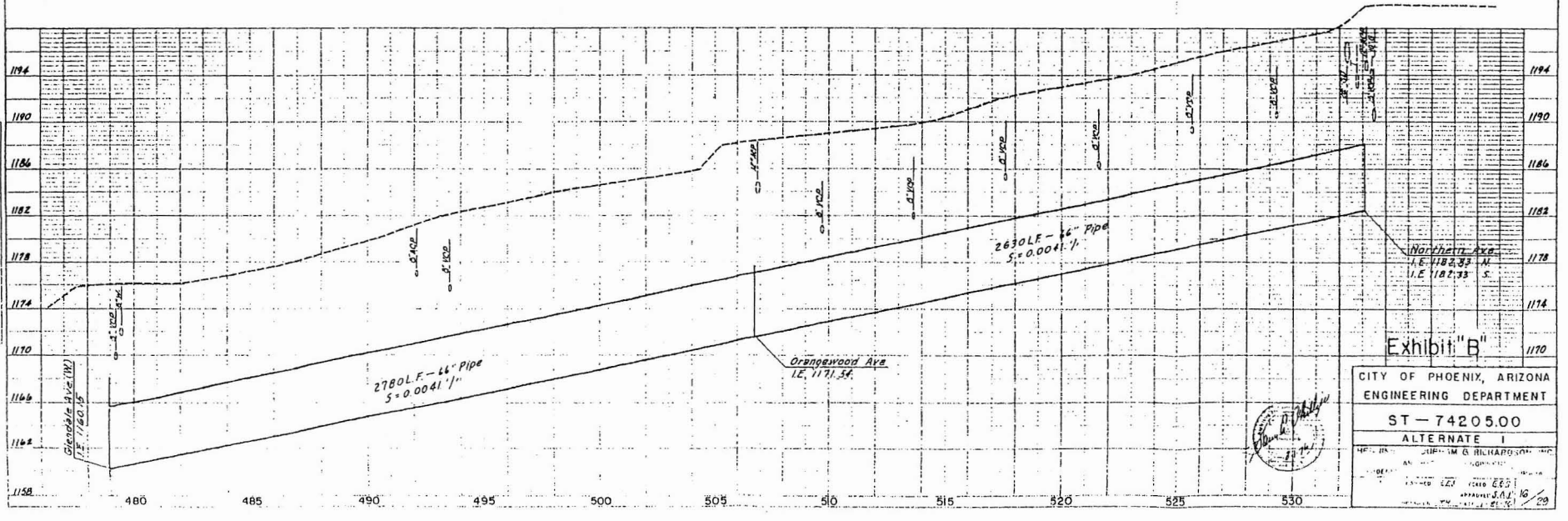
HENNINGSON, DURHAM & RICHARDSON, INC.

DRAINAGE DESIGN ROUTE STUDY

2 – YEAR STORM



PLAN



PROFILE

Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST – 74205.00

ALTERNATE 1

DRAINAGE DESIGN ROUTE STUDY

2 – YEAR STORM

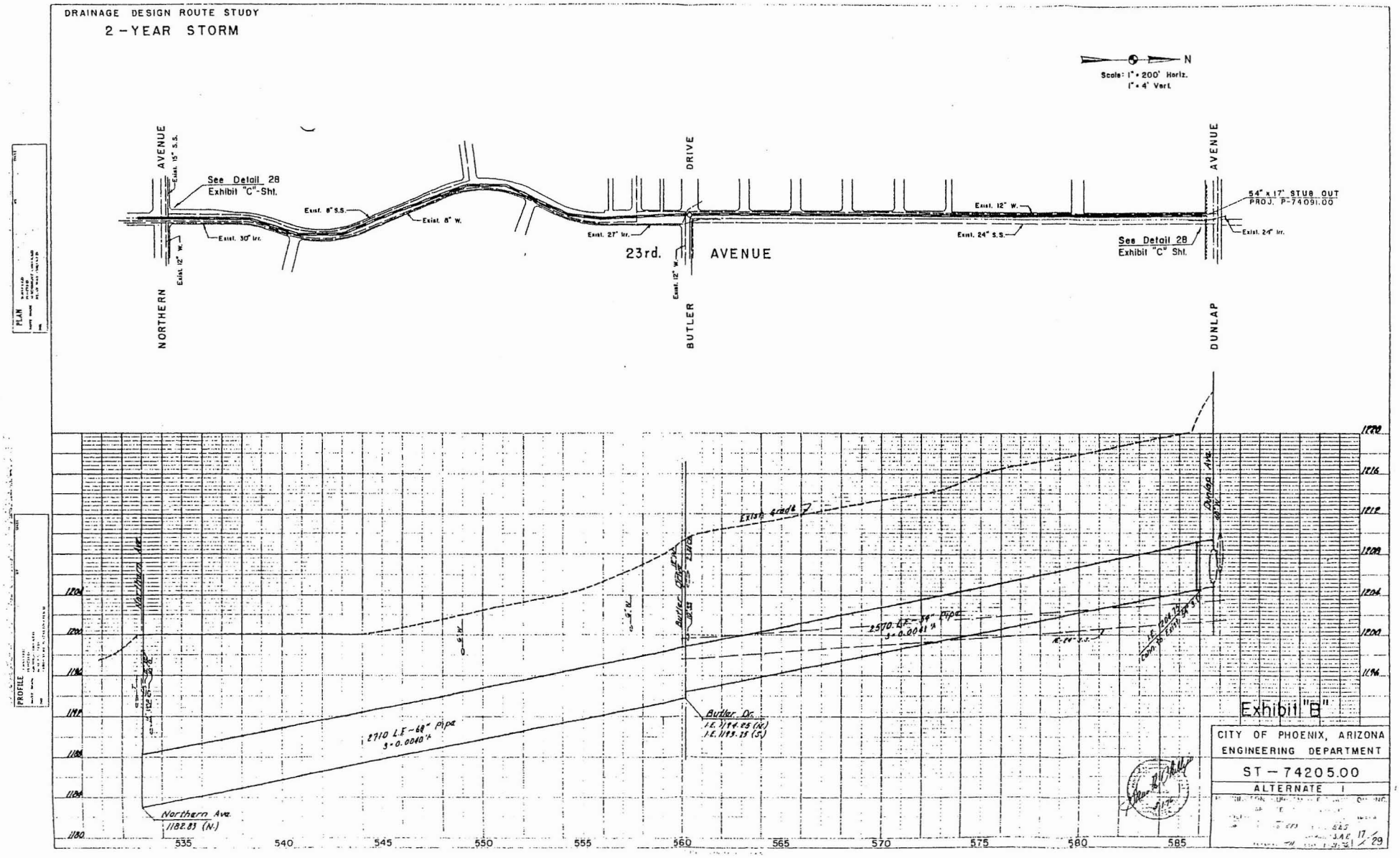


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST – 74205.00

ALTERNATE 1

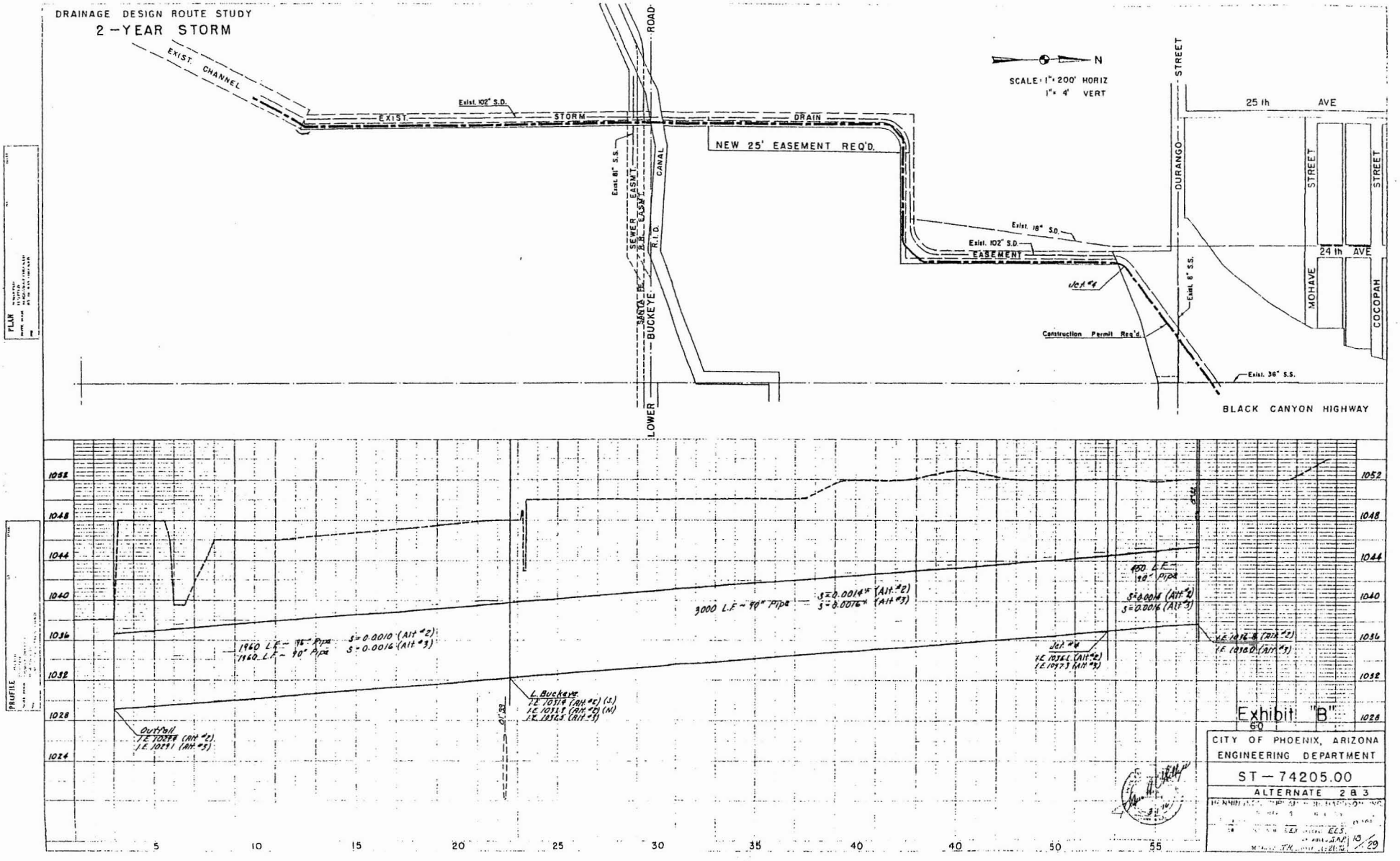


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

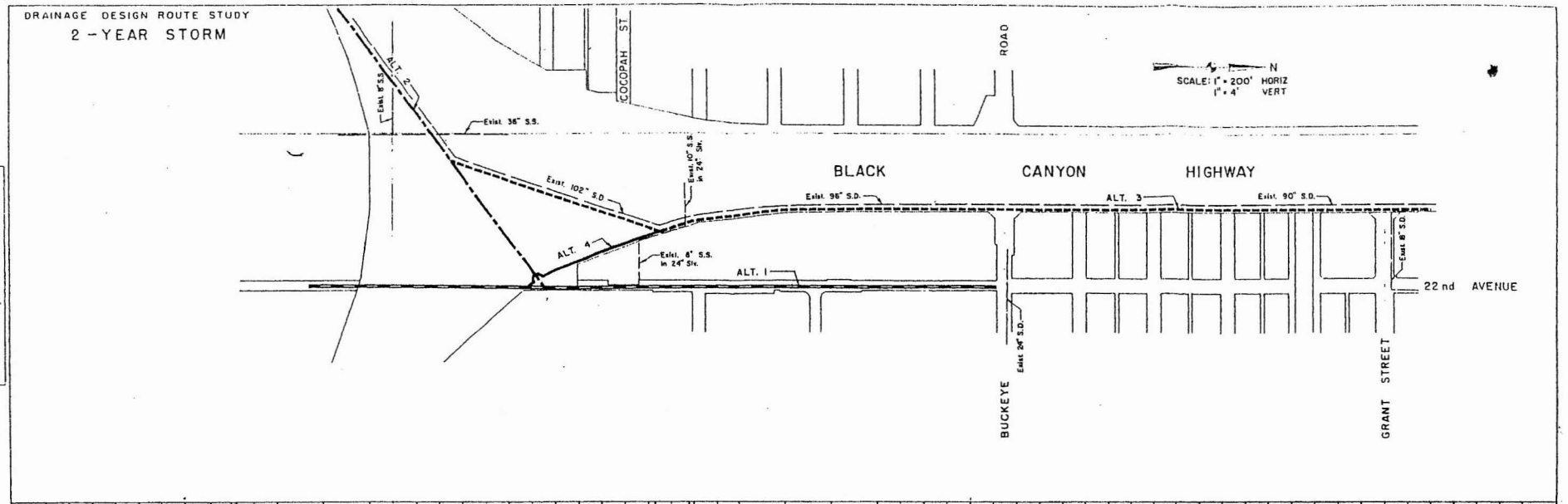
ST - 74205.00

ALTERNATE 2 B 3

13/29

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



PLAN

PROFILE

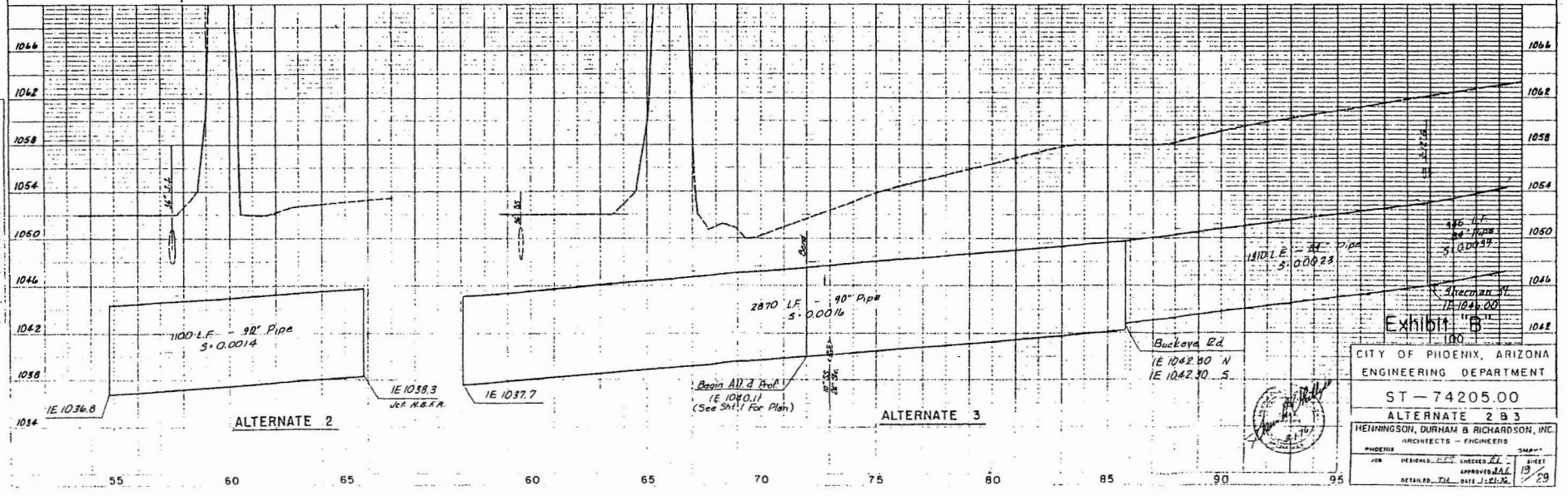


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST - 74205.00

ALTERNATE 2 & 3

HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX

JOB | DESIGNED EFS | CHECKED AL | SHEET 19
DETAILED TH | DATE 1-21-72 | APPROVED DAL | 29

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM

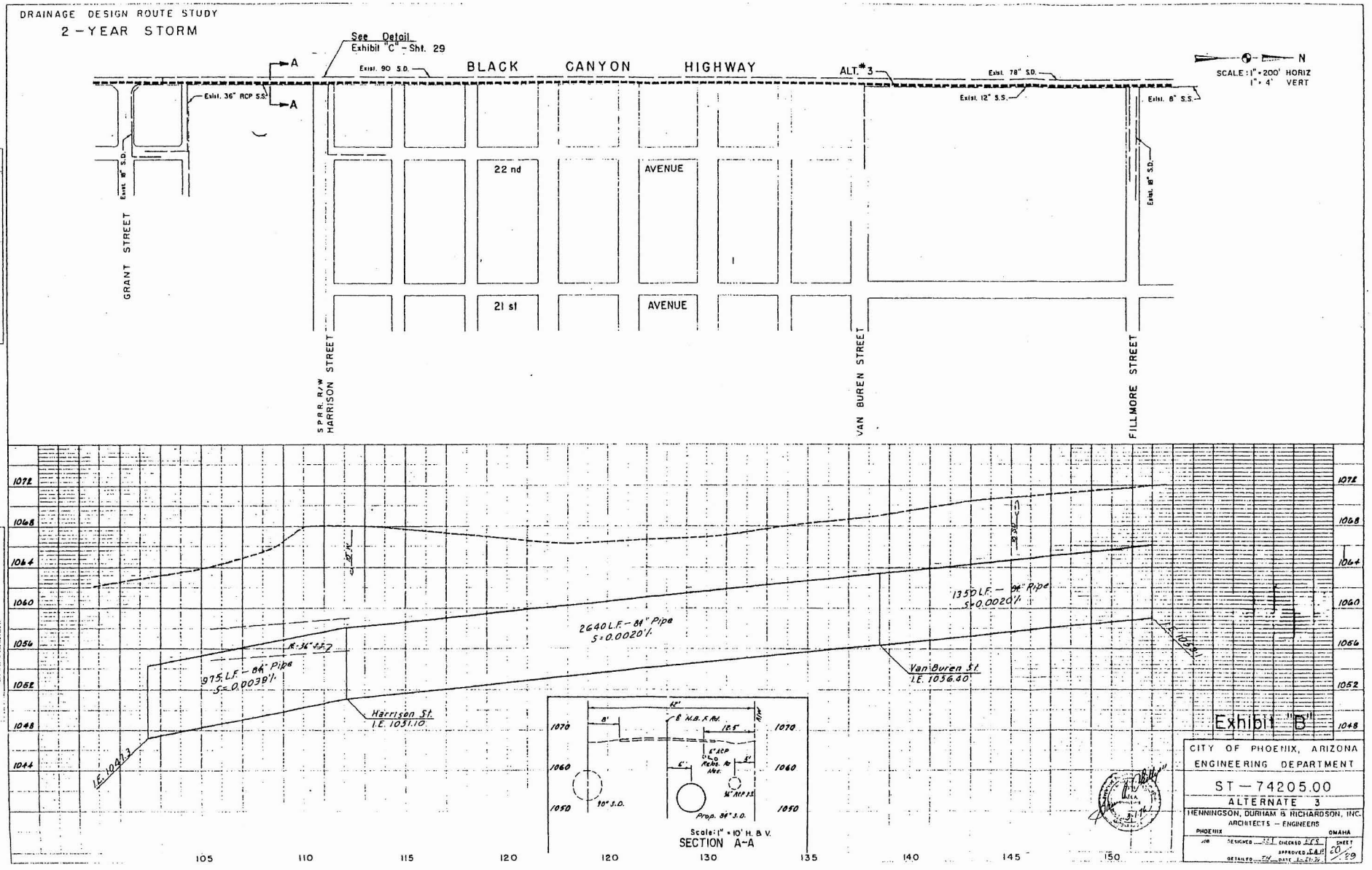


Exhibit "B"

CITY OF PHOENIX, ARIZONA

ENGINEERING DEPARTMENT

ST - 74205.00

ALTERNATE 3

HENNINGSON, DURHAM & RICHARDSON, INC.

ARCHITECTS - ENGINEERS

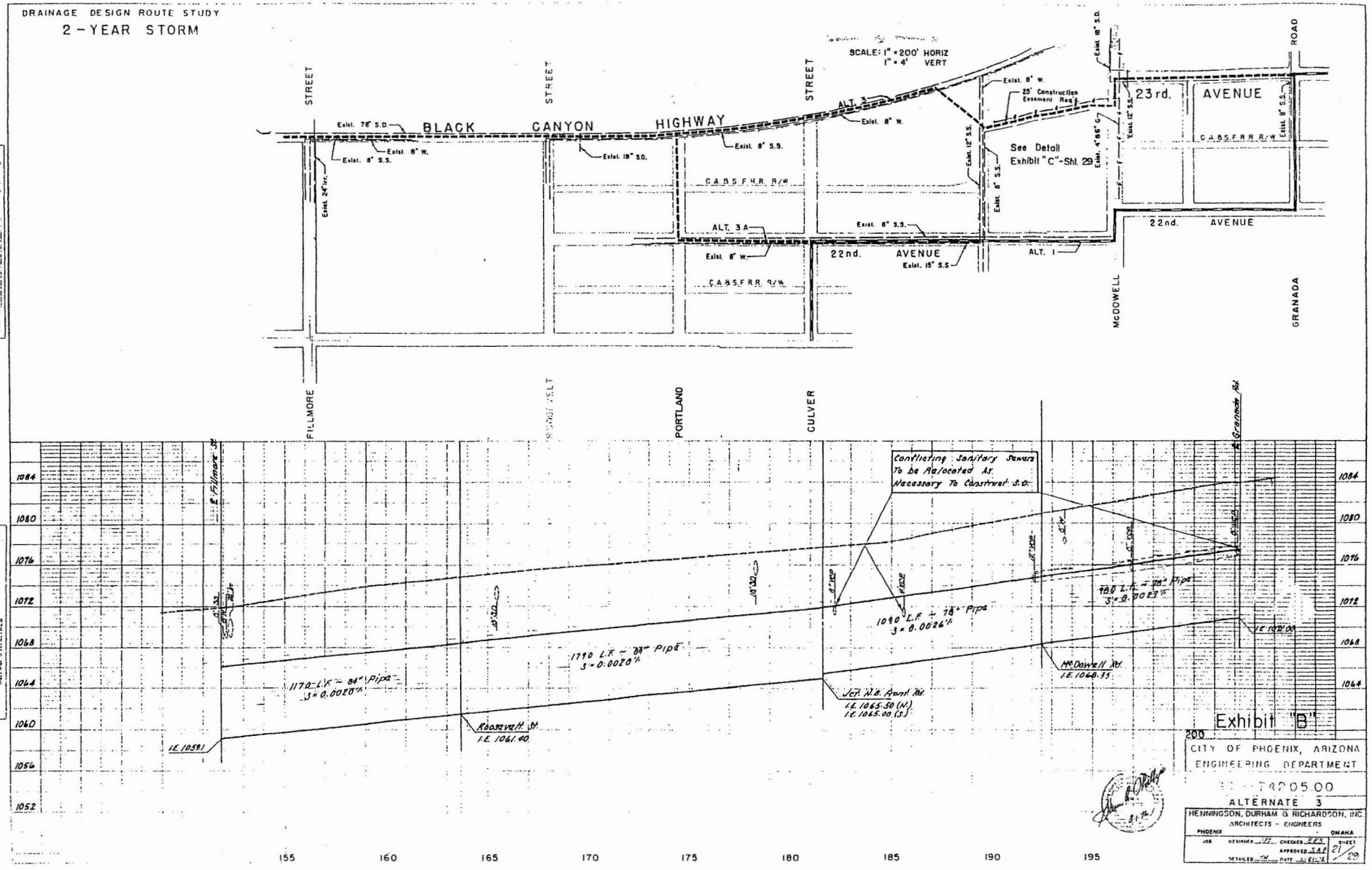
PHOENIX OMAHA

JOB DESIGNED CHECKED APPROVED DETAILED DATE

SHEET 20/29

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



PLAN

PROFILE

Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

T4205.00

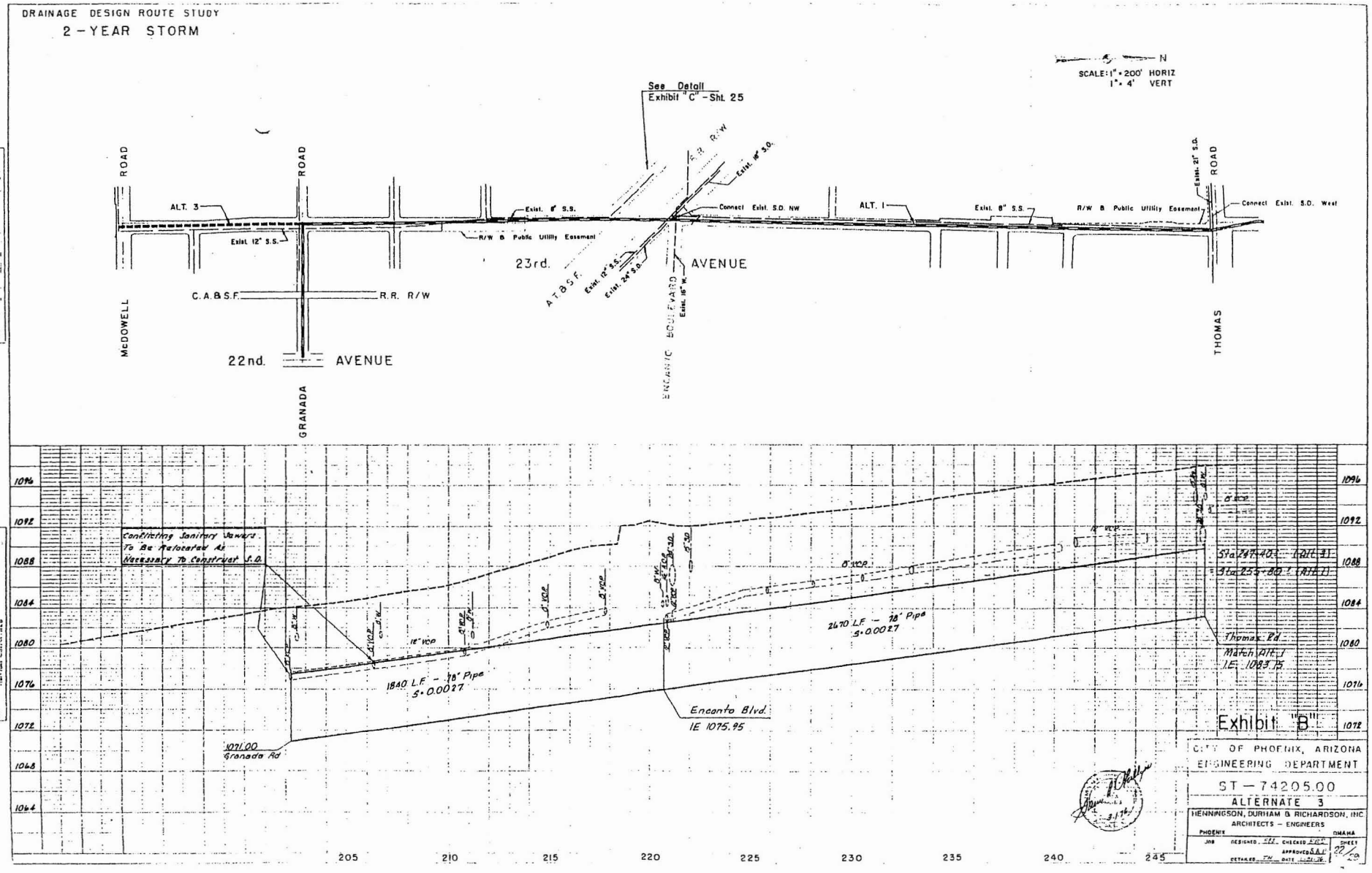
ALTERNATE 3

HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX OMAHA

JOB DESIGNED JJT CHECKED EES SHEET
APPROVED SAP 21
DETAILED TH DATE 1-16-74 / 100

DRAINAGE DESIGN ROUTE STUDY

2 – YEAR STORM



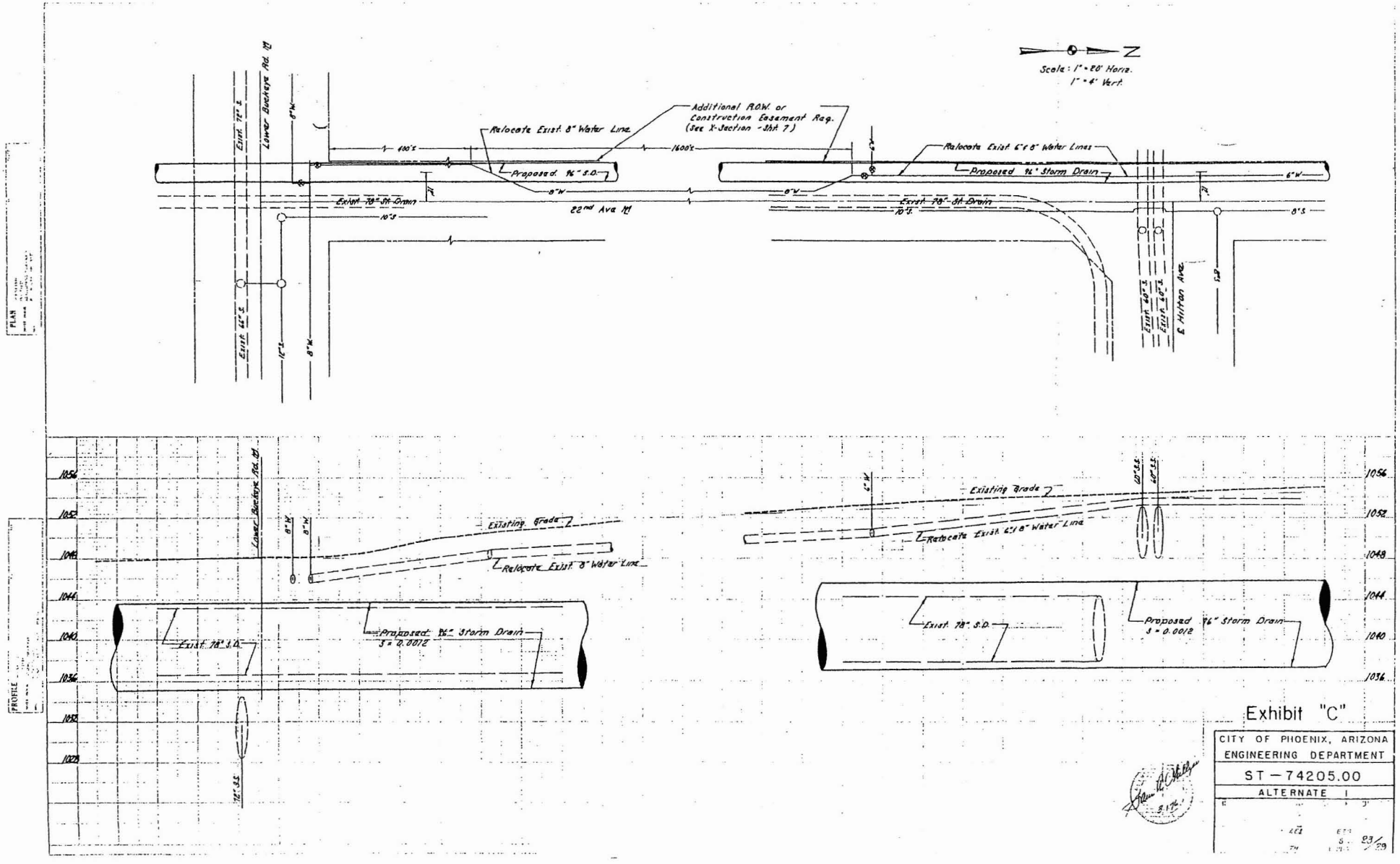


Exhibit "C"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST – 74205.00

ALTERNATE 1

23/29

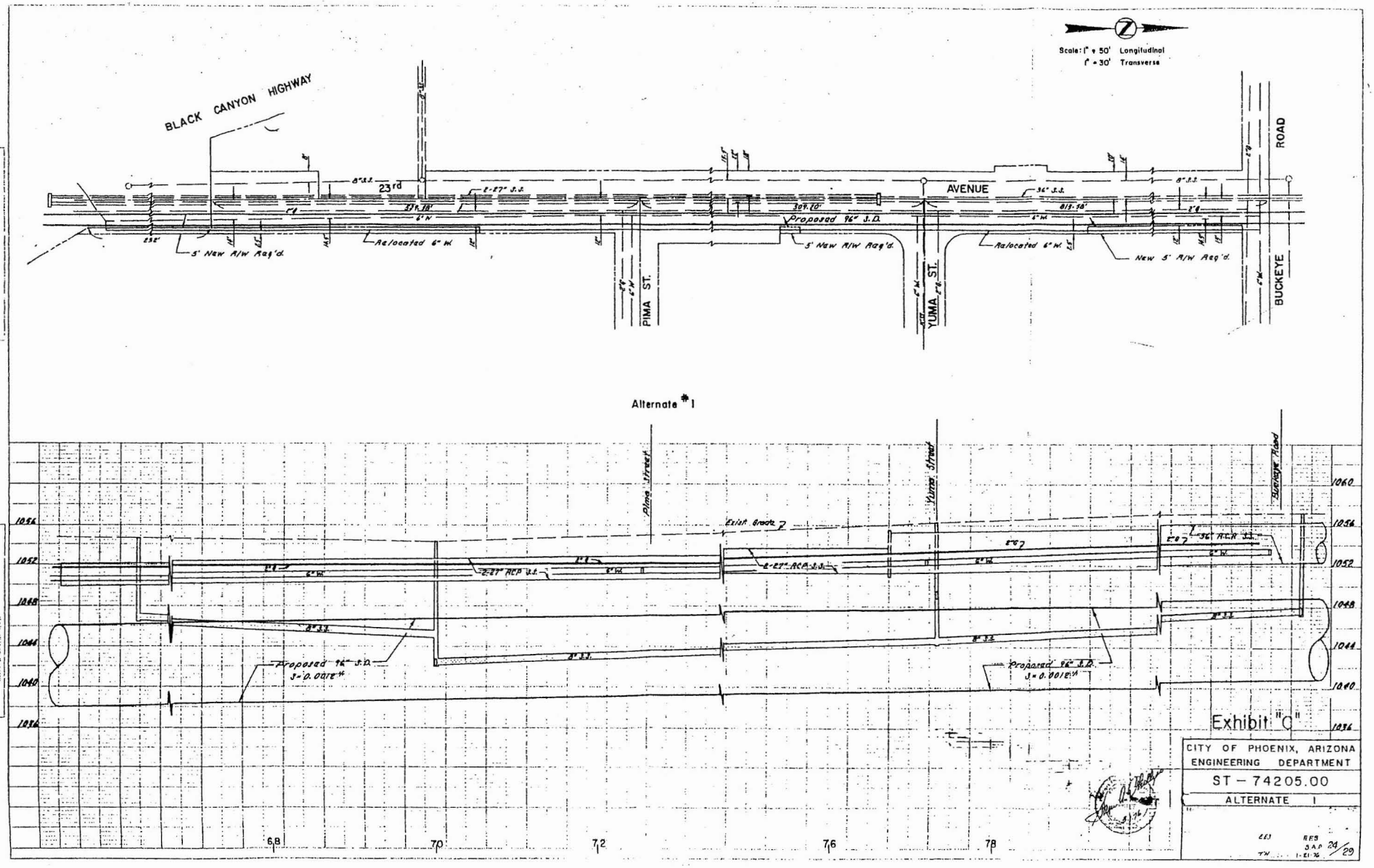
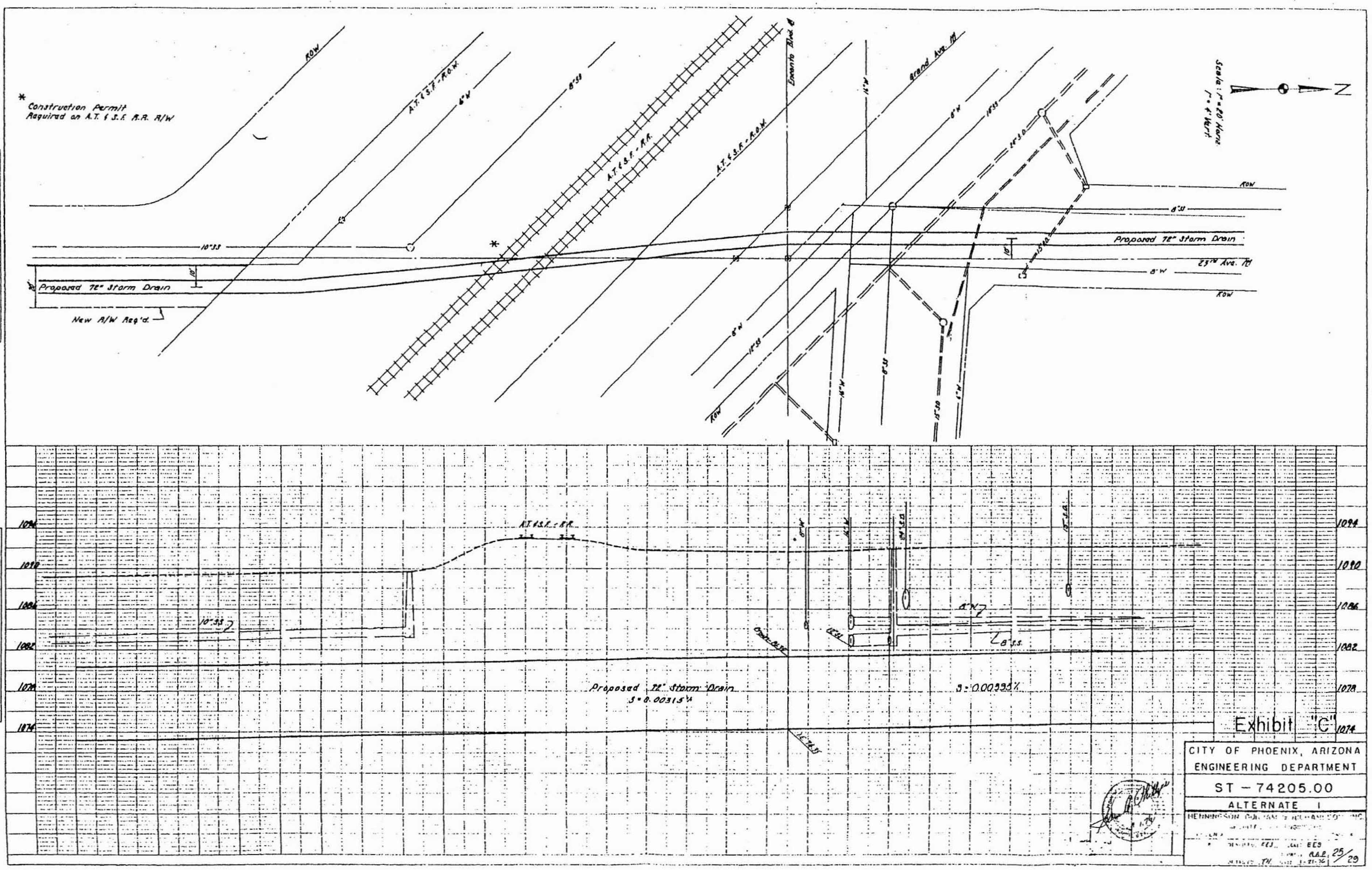
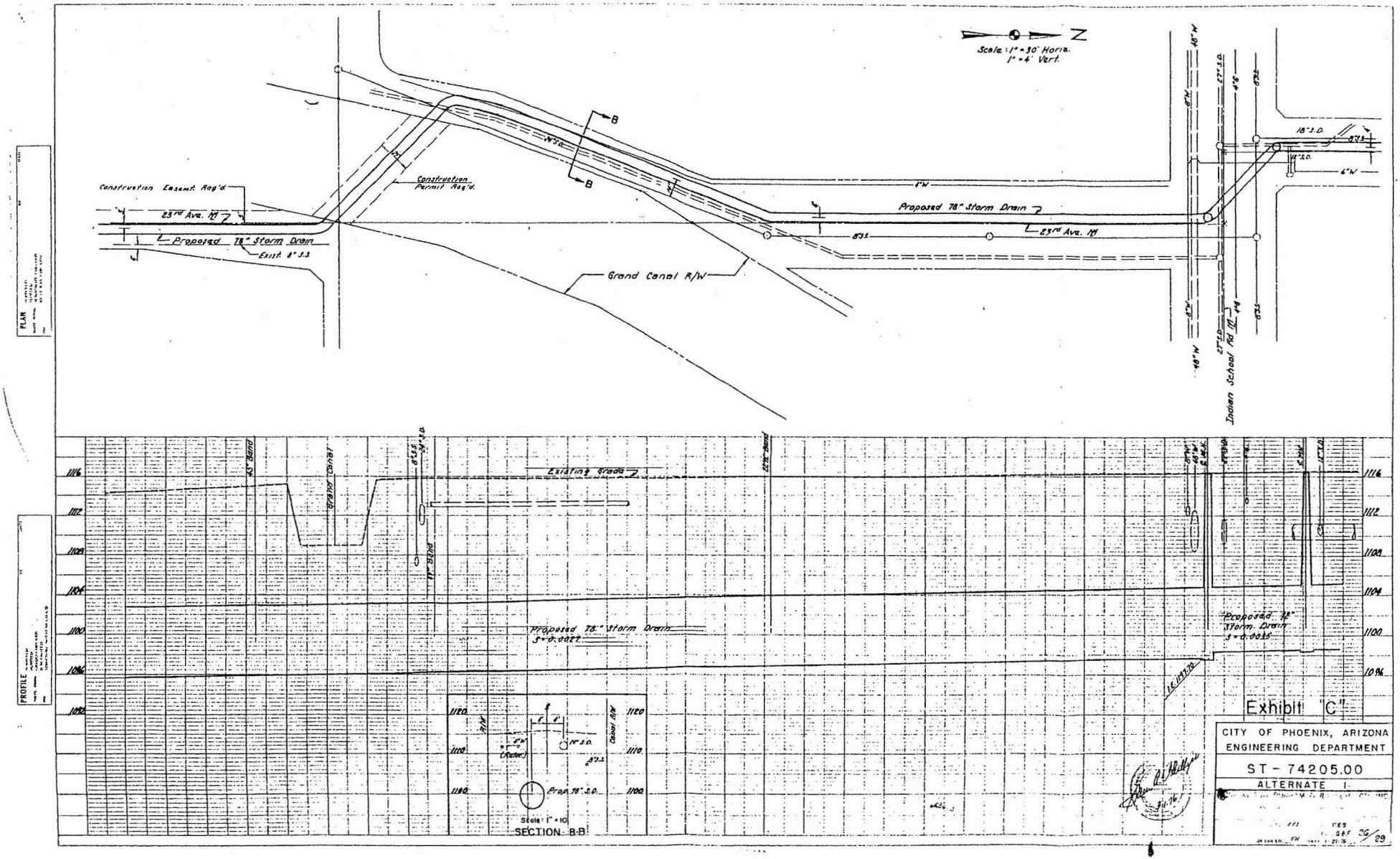


Exhibit "C"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST – 74205.00
ALTERNATE 1

EEI RFS
SAP 29/29
TH 1-21-76


* Construction Permit
Required on A.T. & S.F. R.R. R/W
ROW
A.T.&S.F.-R.O.W.
A.T.&S.F.-R.R.
A.T.&S.F.-R.O.W.
Encanto Blvd.
Grand Ave.
Scale: 1" = 20' Horiz.
1" = 4' Vert.
N
10"SS
Proposed 72" Storm Drain
23rd Ave.
New R/W Req'd.
PLAN
PROFILE
A.T.&S.F.-R.R.
1094
1090
1086
1082
1078
1074
10"SS
Proposed 72" Storm Drain
S = 0.00315%
S = 0.00335%
Exhibit "C"
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
ALTERNATE I
25/29


PLAN
PROFILE
Scale: 1" = 30' Horiz.
1" = 4' Vert.
Construction Easement Req'd
Construction Permit Req'd
23rd Ave. M
Proposed 78" Storm Drain
Exist. 8' S.S.
Grand Canal R/W
Proposed 78" Storm Drain
23rd Ave. M
Indian School Rd. M
Existing Grade
Grand Canal
Proposed 78" Storm Drain
S=0.0027
Proposed 78" Storm Drain
S=0.0025
Scale: 1" = 10'
SECTION B-B
Exhibit "C"
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
ALTERNATE I

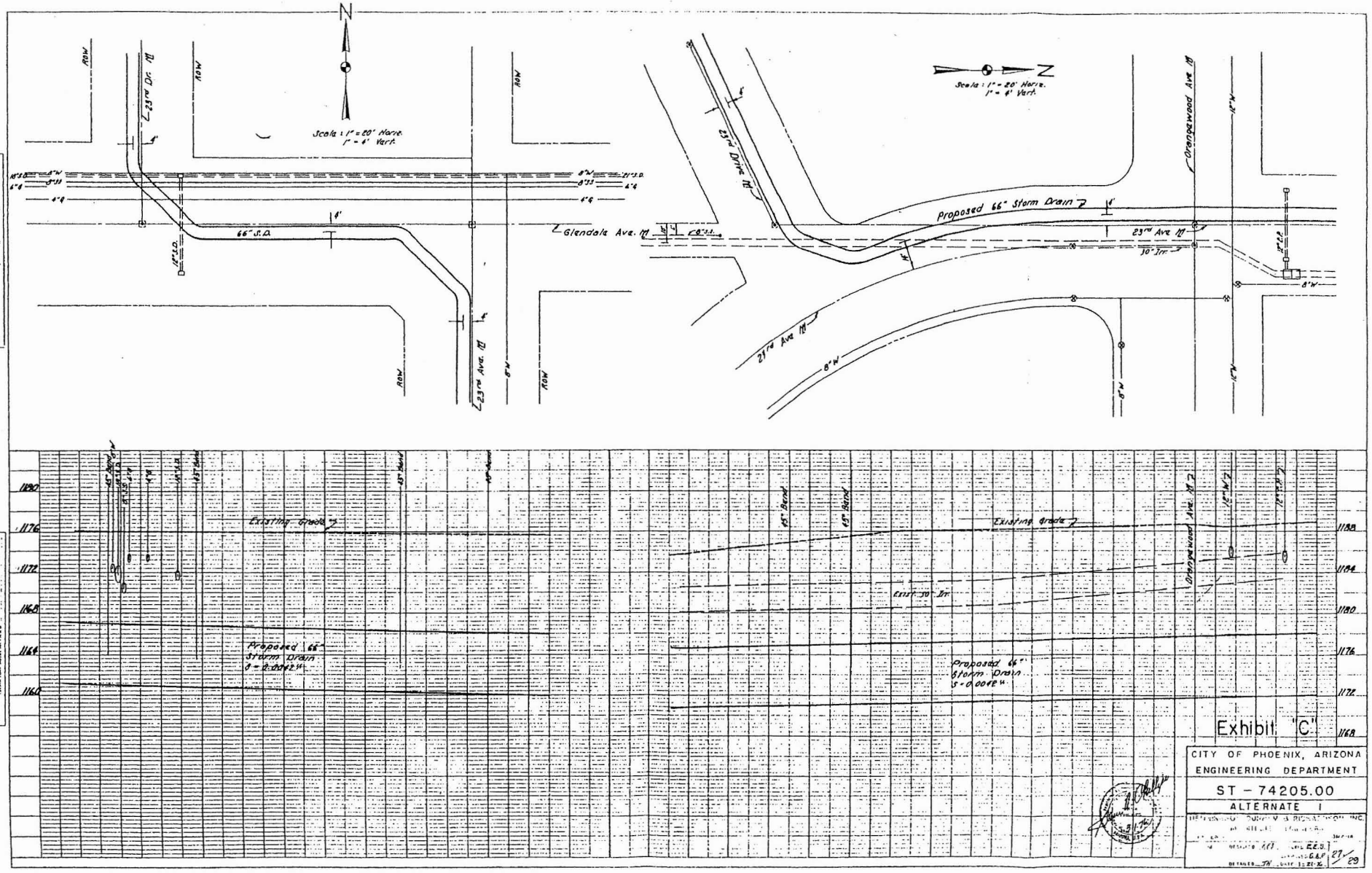


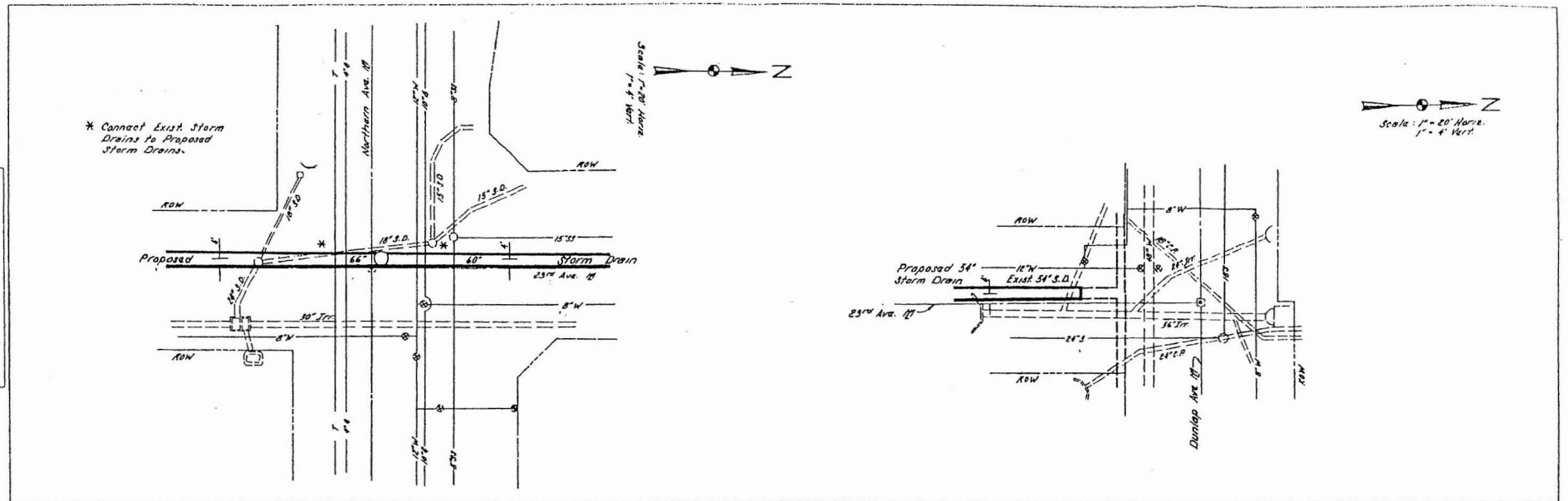
Exhibit "C"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST - 74205.00

ALTERNATE 1

27/29



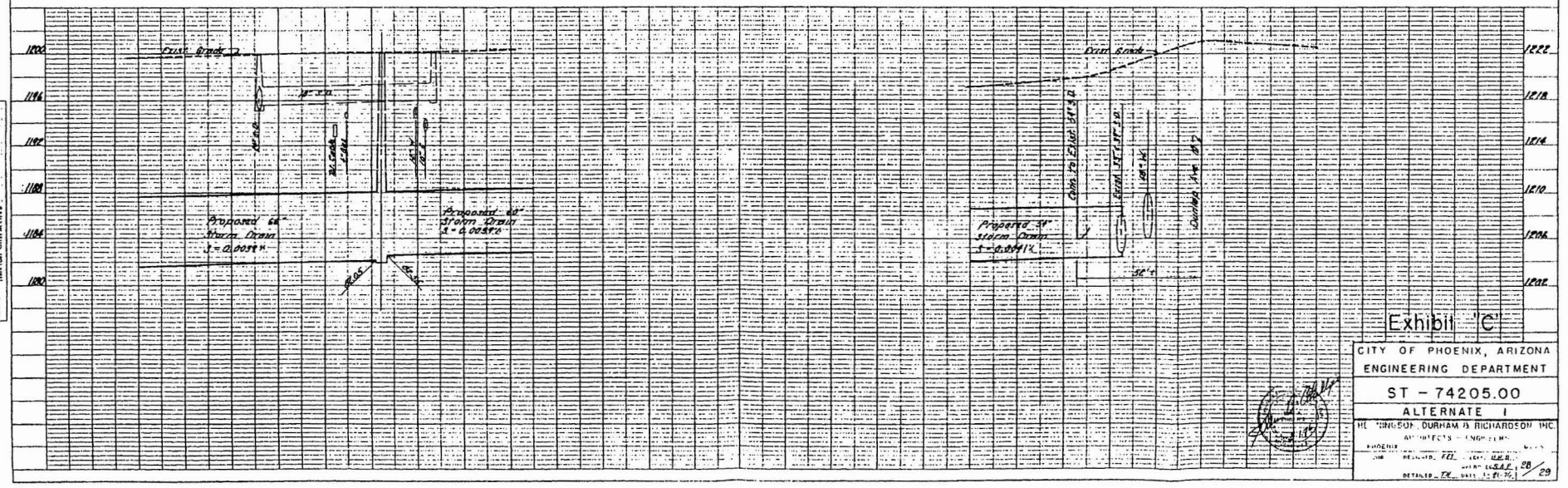


Exhibit "C"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

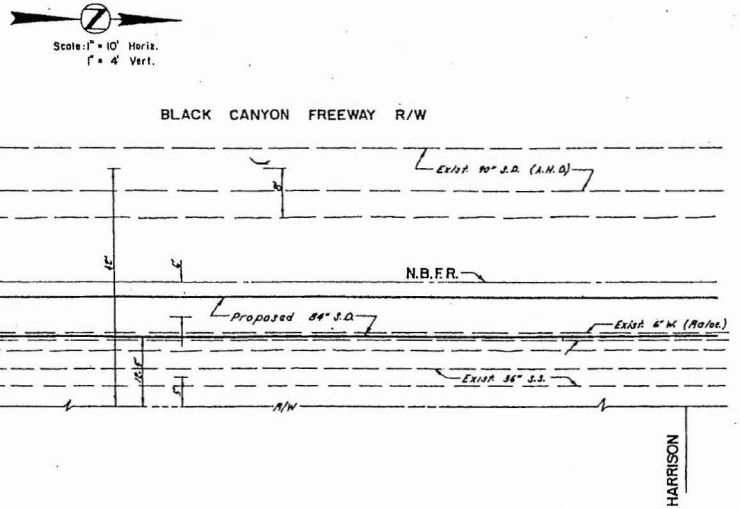
ST - 74205.00

ALTERNATE 1

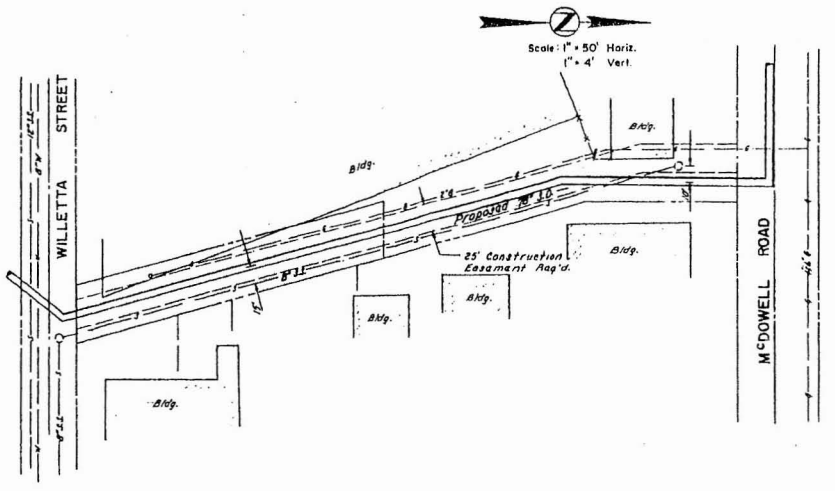
HENRICKSON, DURHAM & RICHARDSON INC.
ARCHITECTS - ENGINEERS
PHOENIX

DESIGNED FDL
DRAWN LCS.A.F.
DETAILED TR
DATE 1-21-76

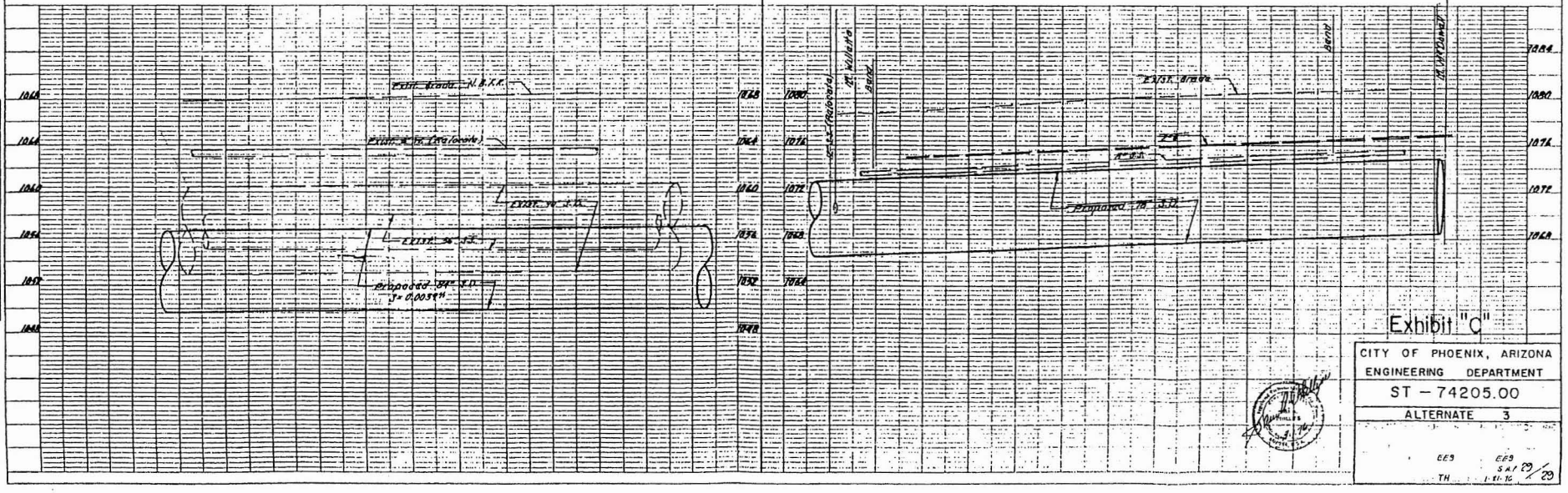
28/29

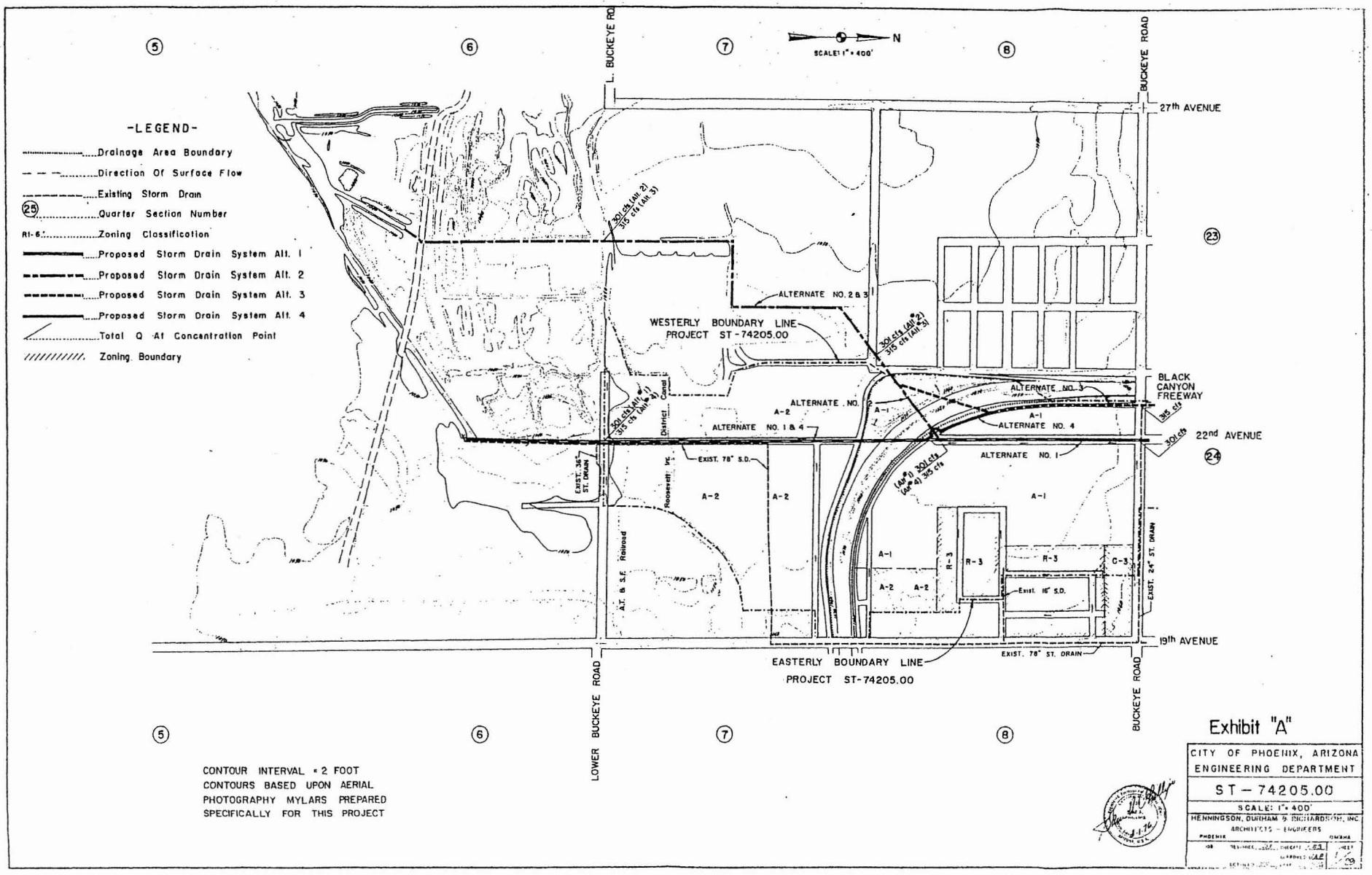


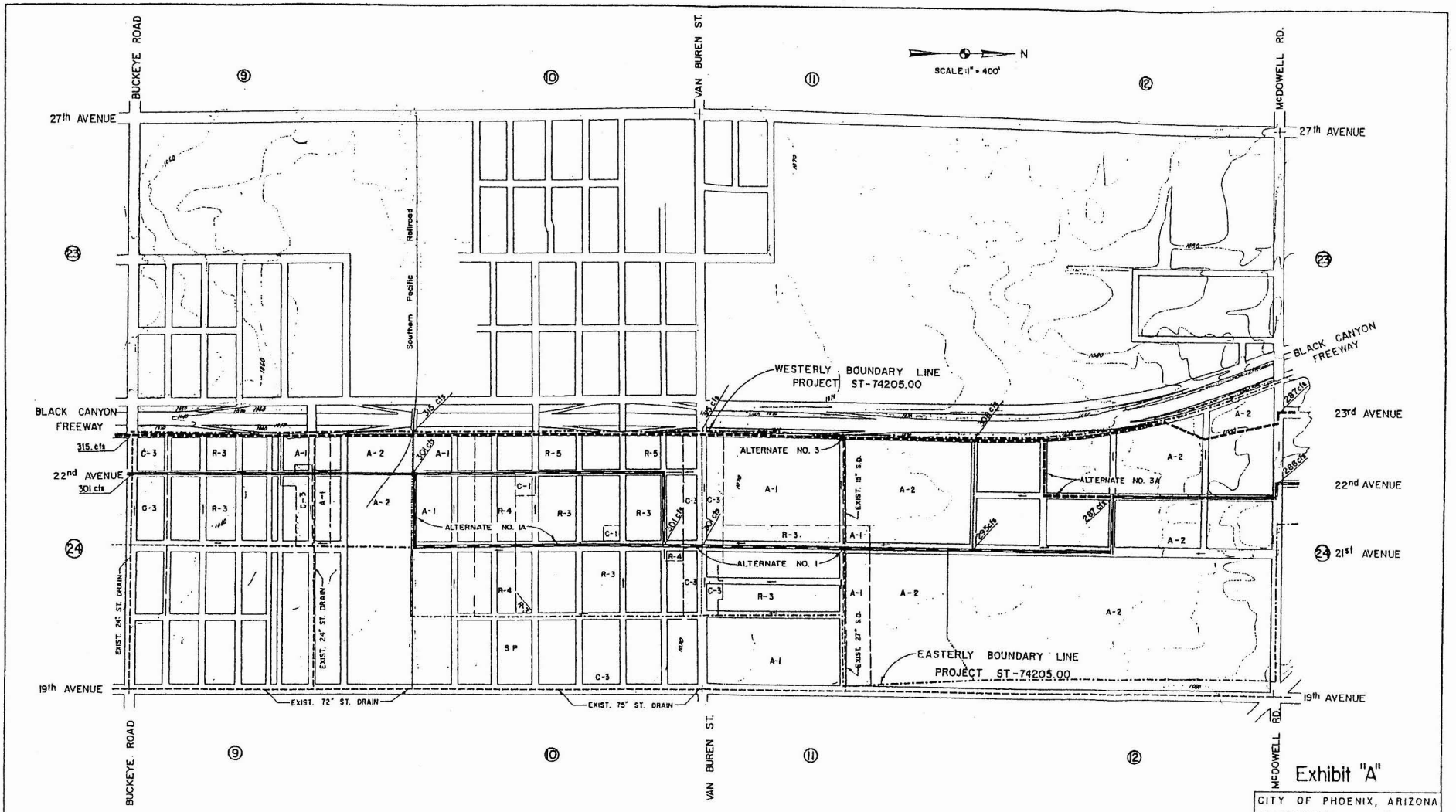
Alternate * 3



Alternate * 3




-LEGEND-
Drainage Area Boundary
Direction Of Surface Flow
Existing Storm Drain
Quarter Section Number
Zoning Classification
Proposed Storm Drain System Alt. 1
Proposed Storm Drain System Alt. 2
Proposed Storm Drain System Alt. 3
Proposed Storm Drain System Alt. 4
Total Q At Concentration Point
Zoning Boundary
SCALE: 1" = 400'
L. BUCKEYE RD
BUCKEYE ROAD
27th AVENUE
WESTERLY BOUNDARY LINE
PROJECT ST-74205.00
ALTERNATE NO. 2 & 3
ALTERNATE NO. 1 & 4
ALTERNATE NO. 2
ALTERNATE NO. 3
ALTERNATE NO. 4
BLACK CANYON FREEWAY
22nd AVENUE
19th AVENUE
EXIST. 78" S.D.
EXIST. 24" ST. DRAIN
EXIST. 15" S.D.
EXIST. 78" ST. DRAIN
EASTERLY BOUNDARY LINE
PROJECT ST-74205.00
LOWER BUCKEYE ROAD
A.T. & S.F. Railroad
Roosevelt I.C.
District Canal
A-1
A-2
R-3
C-3
CONTOUR INTERVAL = 2 FOOT
CONTOURS BASED UPON AERIAL
PHOTOGRAPHY MYLARS PREPARED
SPECIFICALLY FOR THIS PROJECT
Exhibit "A"
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
SCALE: 1" = 400'
HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX
OMAHA



CONTOUR INTERVAL = 2 FOOT
CONTOURS BASED UPON AERIAL PHOTOGRAPHY MYLARS PREPARED SPECIFICALLY FOR THIS PROJECT.

Exhibit "A"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST – 74205.00

SCALE: 1" = 400'

HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX OMAHA

JOB DESIGNED KH CHECKED EEA SHEET
APPROVED CAR
DETAILED TH DATE 2-21-76 2 / 89

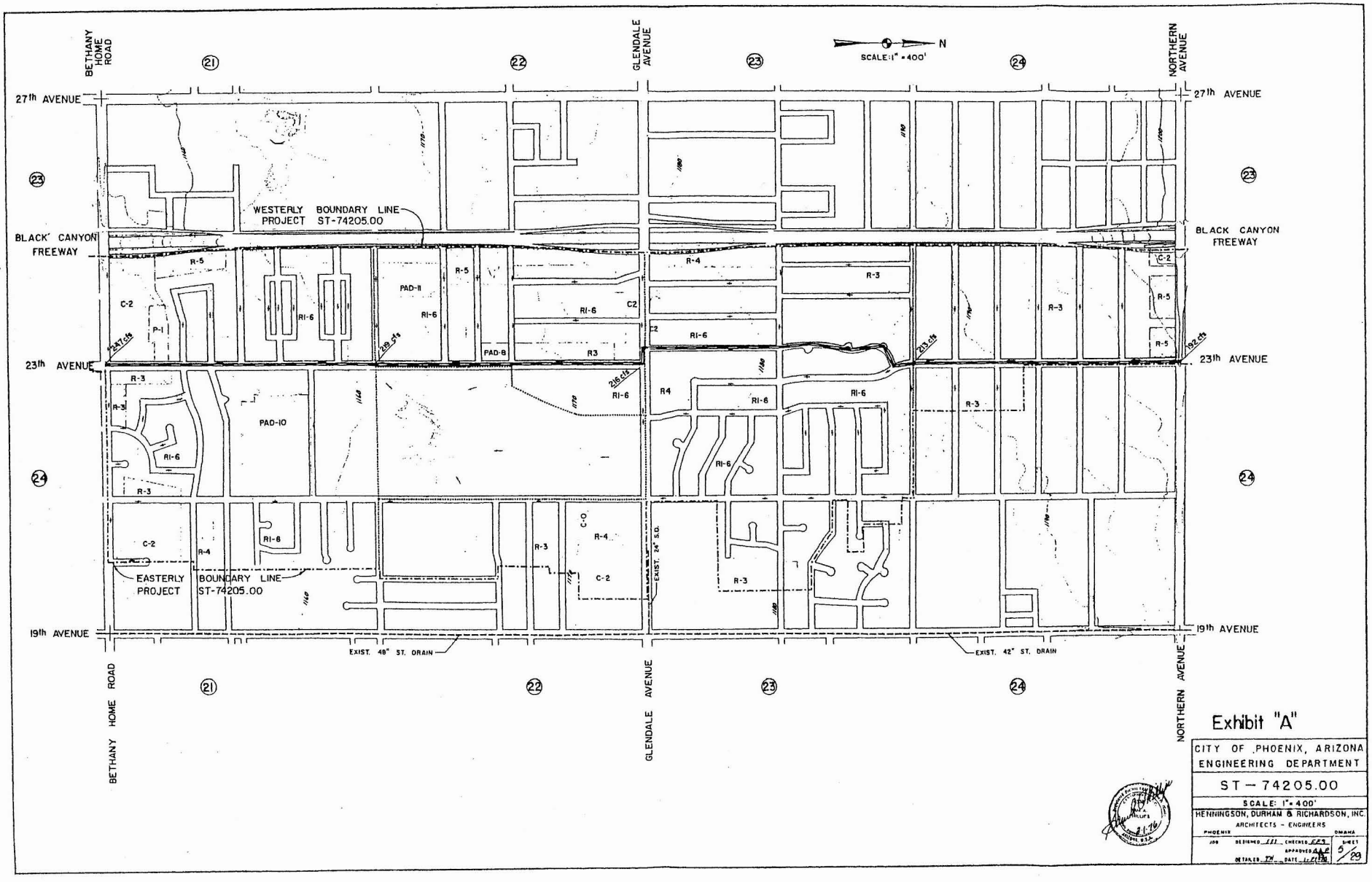


Exhibit "A"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST – 74205.00

SCALE: 1" = 400'

HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX OMAHA

JOB DESIGNED ... CHECKED ...
APPROVED ...
DETAILED ... DATE ...

SHEET 5/29

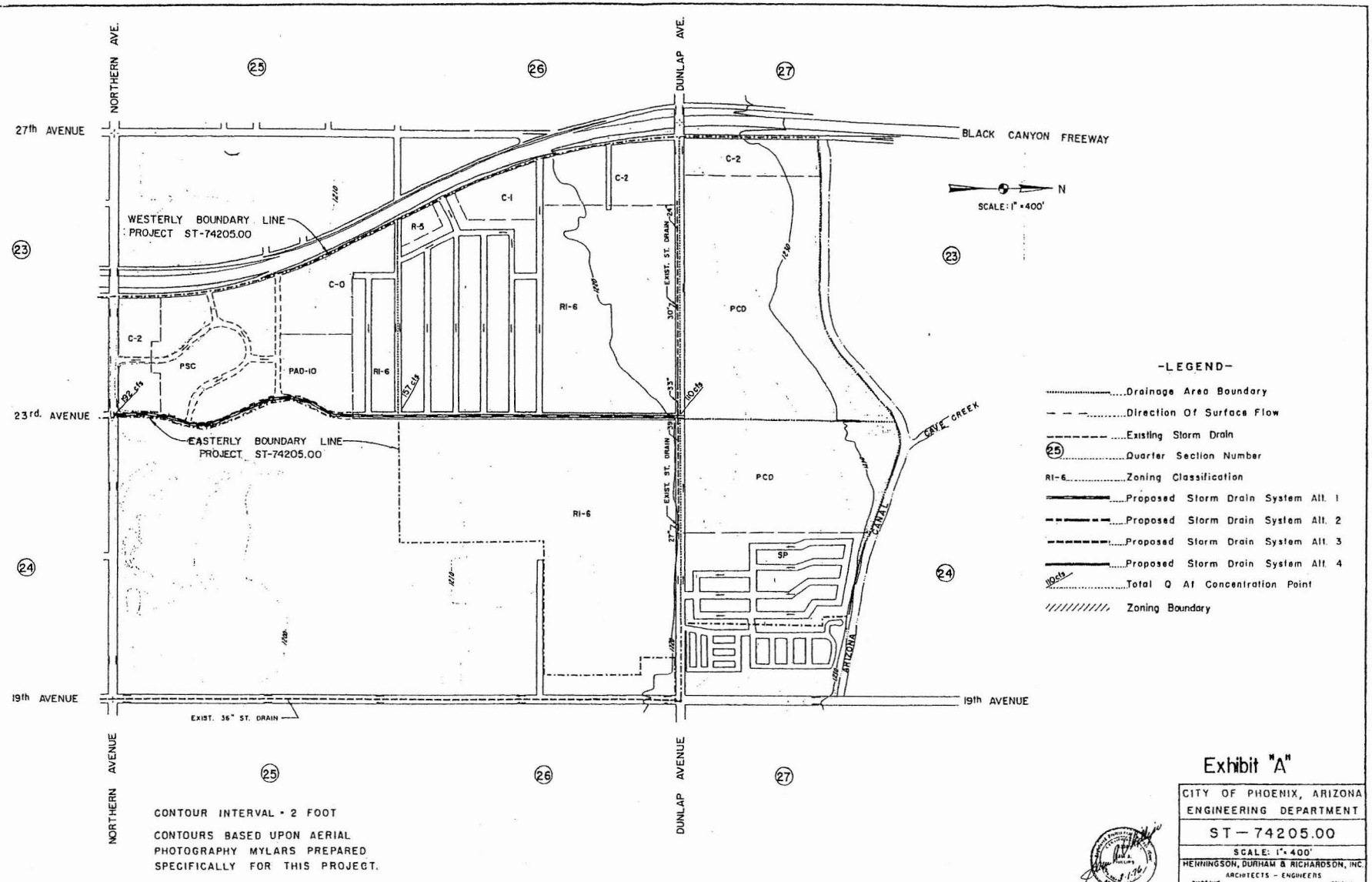


Exhibit "A"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST — 74205.00

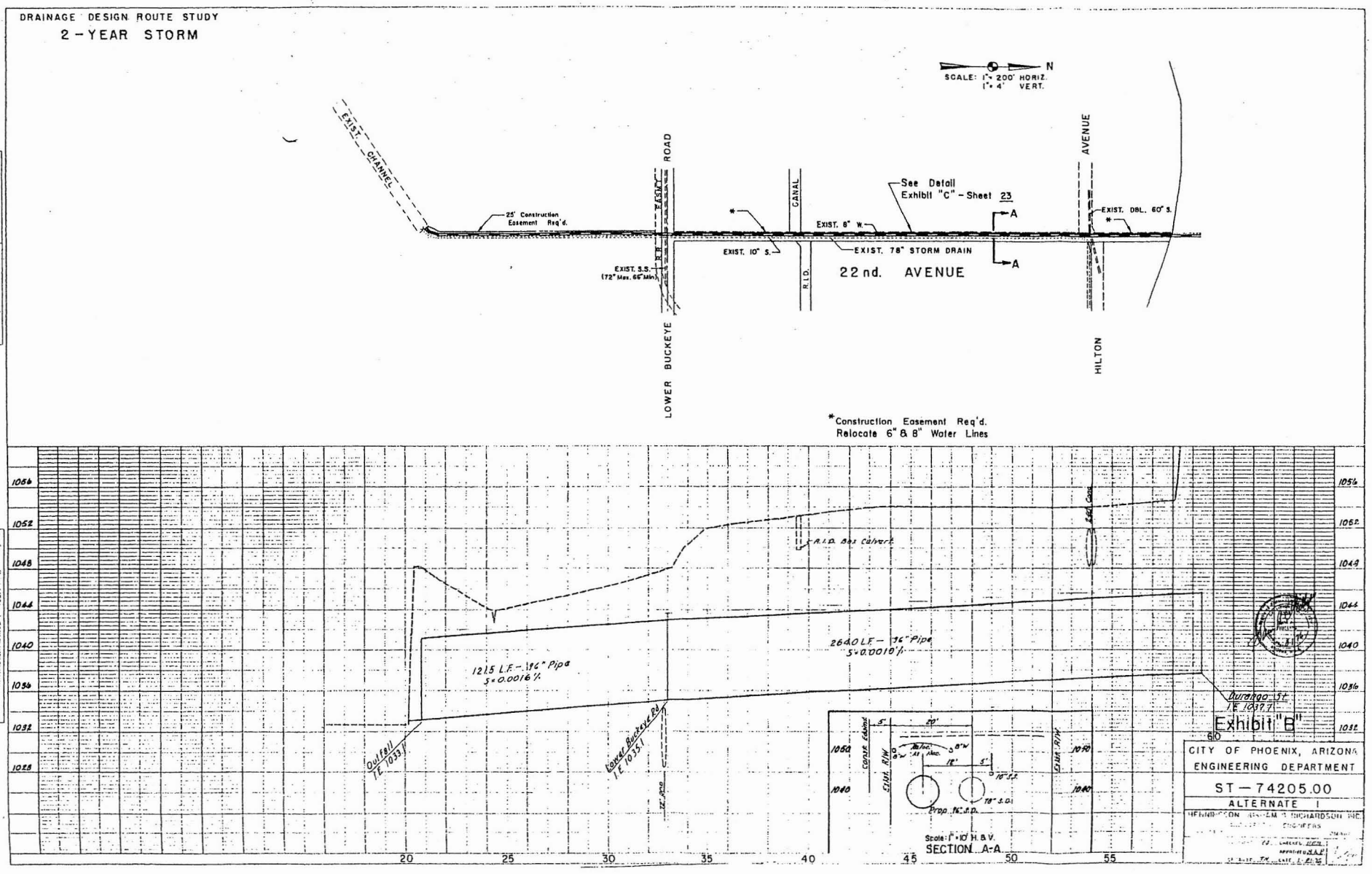
SCALE: 1" = 400'

HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX OMAHA

JOB DESIGNED LLL CHECKED EES SHEET 6/29
APPROVED DAR
DETAILED TK DATE 12-21-76

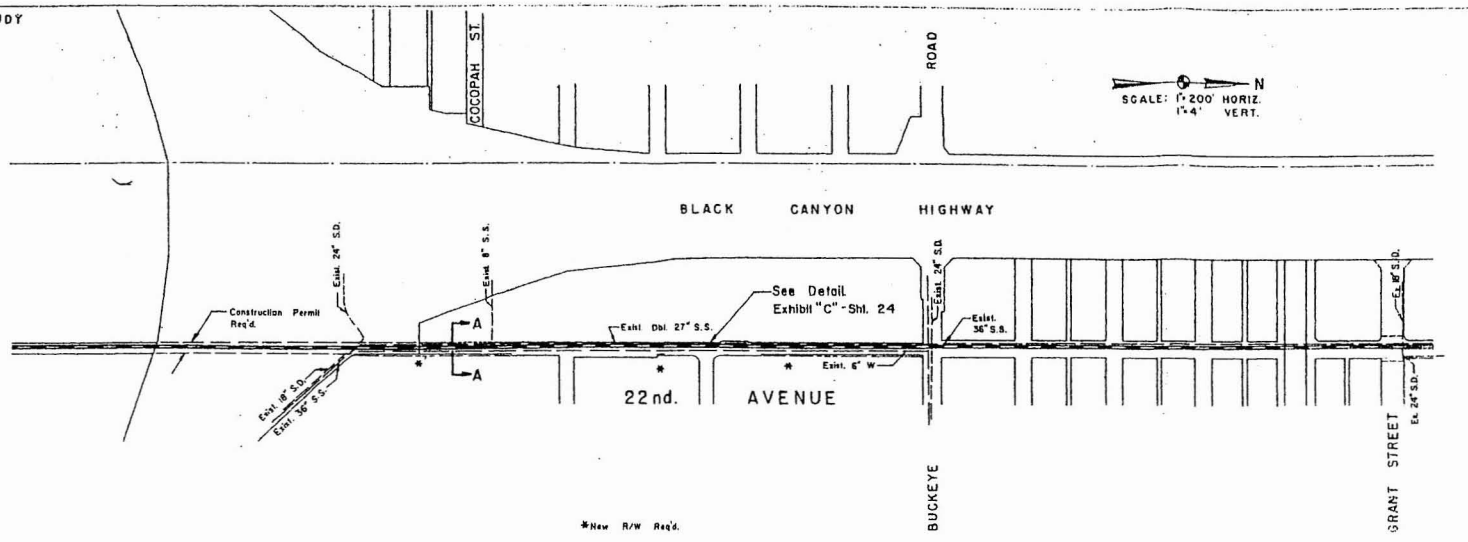
DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



PLAN

PROFILE

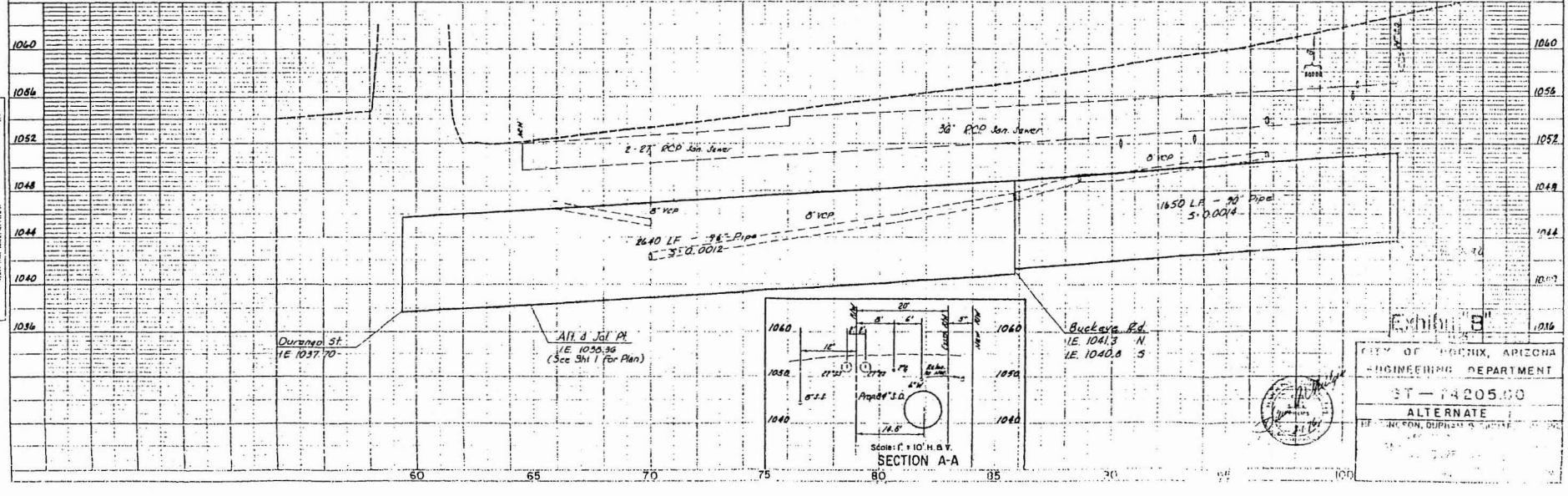
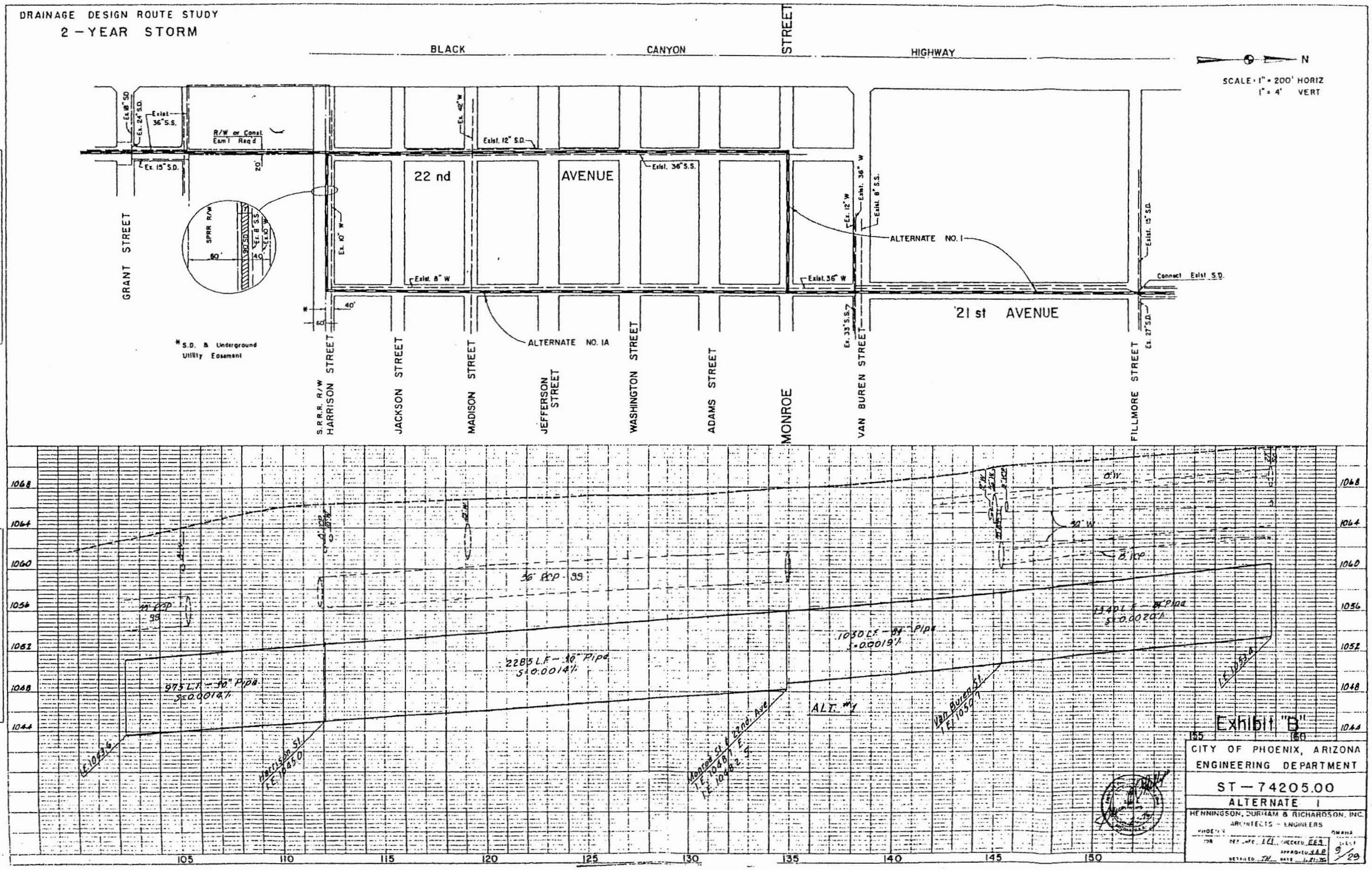


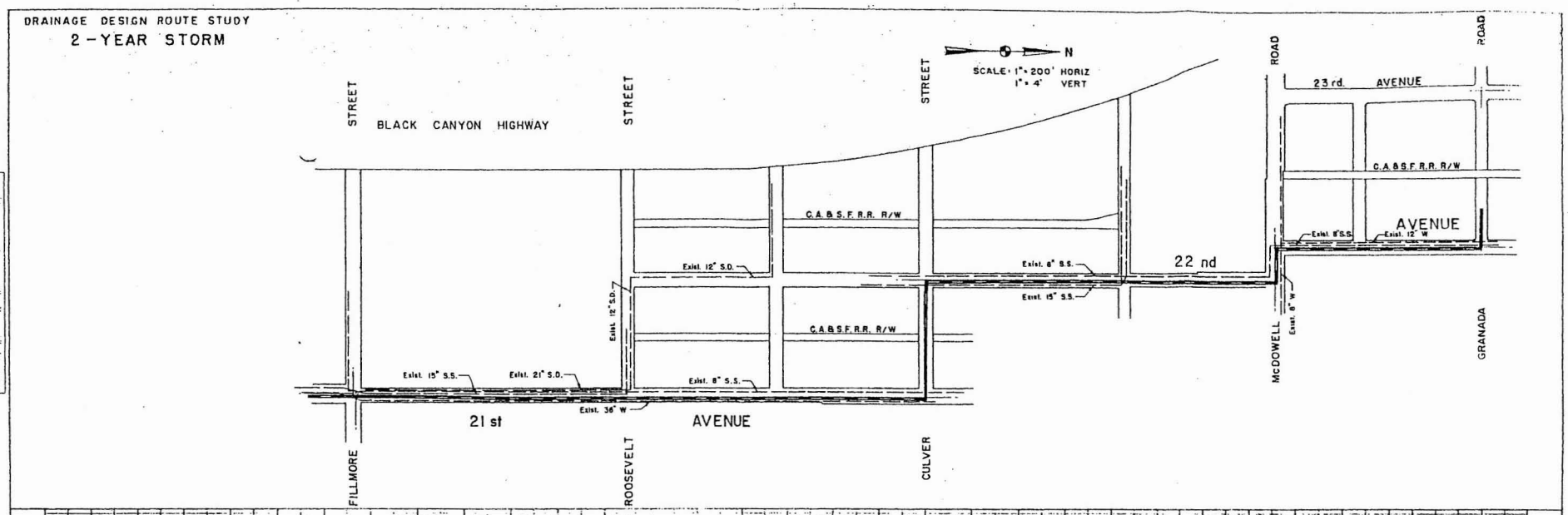
Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST-74205.00
ALTERNATE


DRAINAGE DESIGN ROUTE STUDY
2 - YEAR STORM
BLACK CANYON HIGHWAY
N
SCALE: 1" = 200' HORIZ
1" = 4' VERT
GRANT STREET
22 nd AVENUE
21 st AVENUE
S.R.R.R. R/W
HARRISON STREET
JACKSON STREET
MADISON STREET
JEFFERSON STREET
WASHINGTON STREET
ADAMS STREET
MONROE STREET
VAN BUREN STREET
FILLMORE STREET
R/W or Const. Esm't Req'd
Exist. 36" S.S.
Exist. 12" S.D.
Exist. 8" W
Exist. 36" W
Ex. 15" S.D.
ALTERNATE NO. 1
ALTERNATE NO. 1A
Connect Exist S.D.
SPRR R/W
*S.D. & Underground Utility Easement
36" RCP
975 L.F. - 30" Pipe S=0.0014%
2285 L.F. - 30" Pipe S=0.0014%
1030 L.F. - 33" Pipe S=0.0015%
ALT. #1
Harrison St. I.E. 1045.0
Van Buren St. I.E. 1050.1
Exhibit "B"
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
ALTERNATE 1
HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
9/29
105
110
115
120
125
130
135
140
145
150

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



PLAN

PROFILE

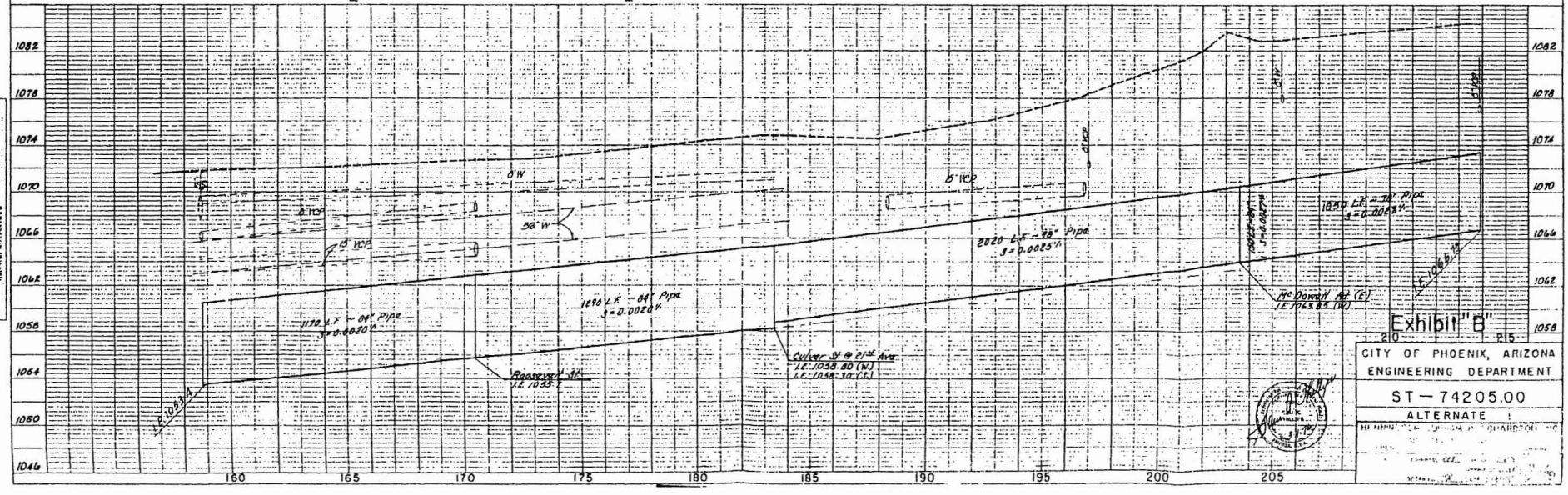


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST - 74205.00

ALTERNATE 1

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM

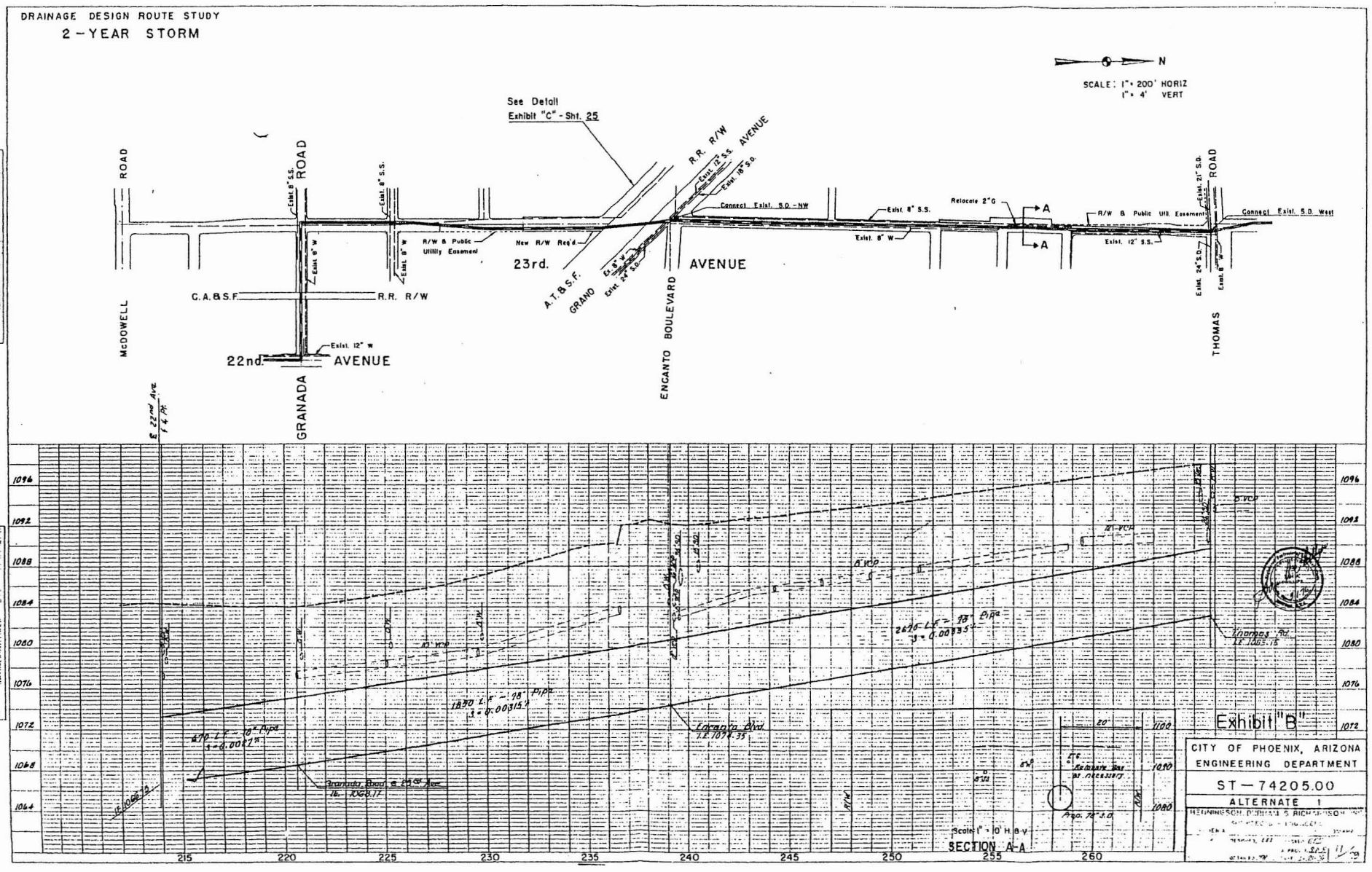


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

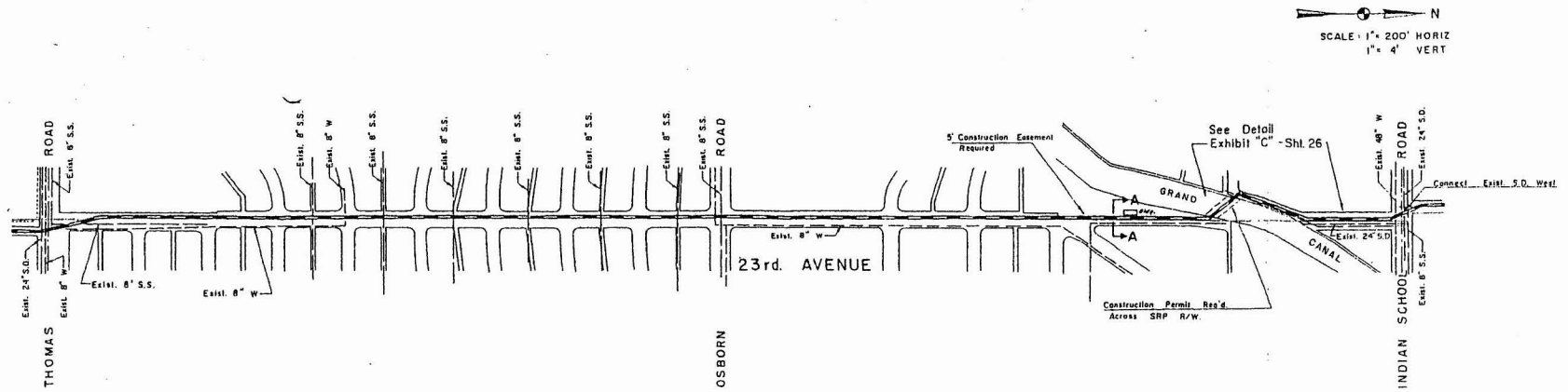
ST - 74205.00

ALTERNATE 1

HENNINGSON, DURHAM & RICHARDSON

DRAINAGE DESIGN ROUTE STUDY

2 – YEAR STORM



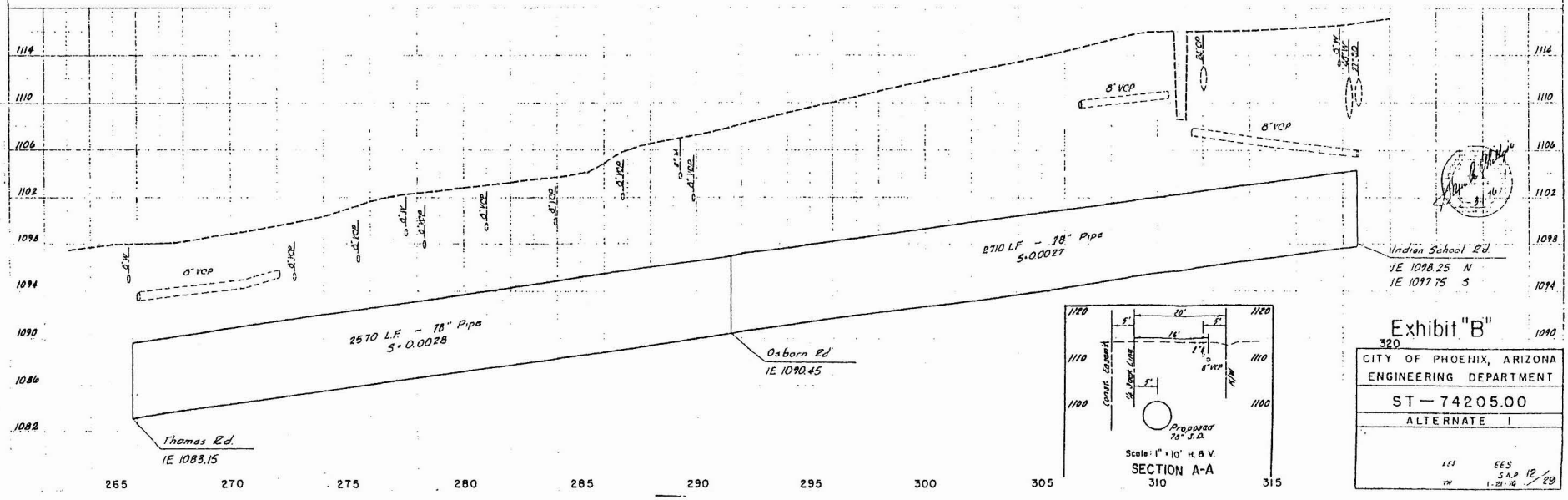


Exhibit "B"

320

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

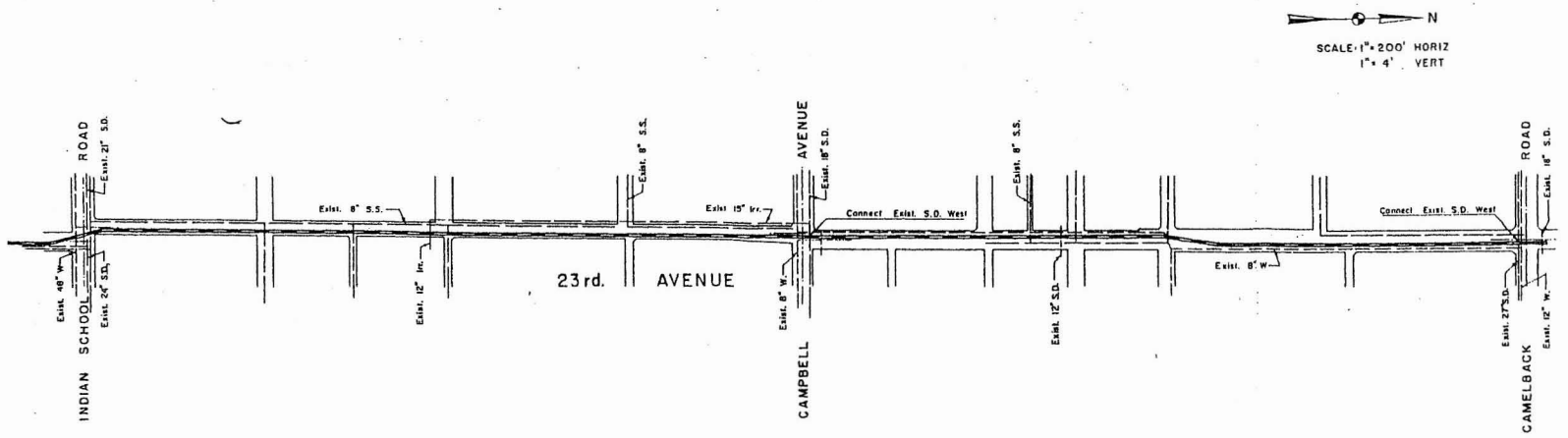
ST – 74205.00

ALTERNATE 1

EES
EES
12/29

DRAINAGE DESIGN ROUTE STUDY

2 – YEAR STORM



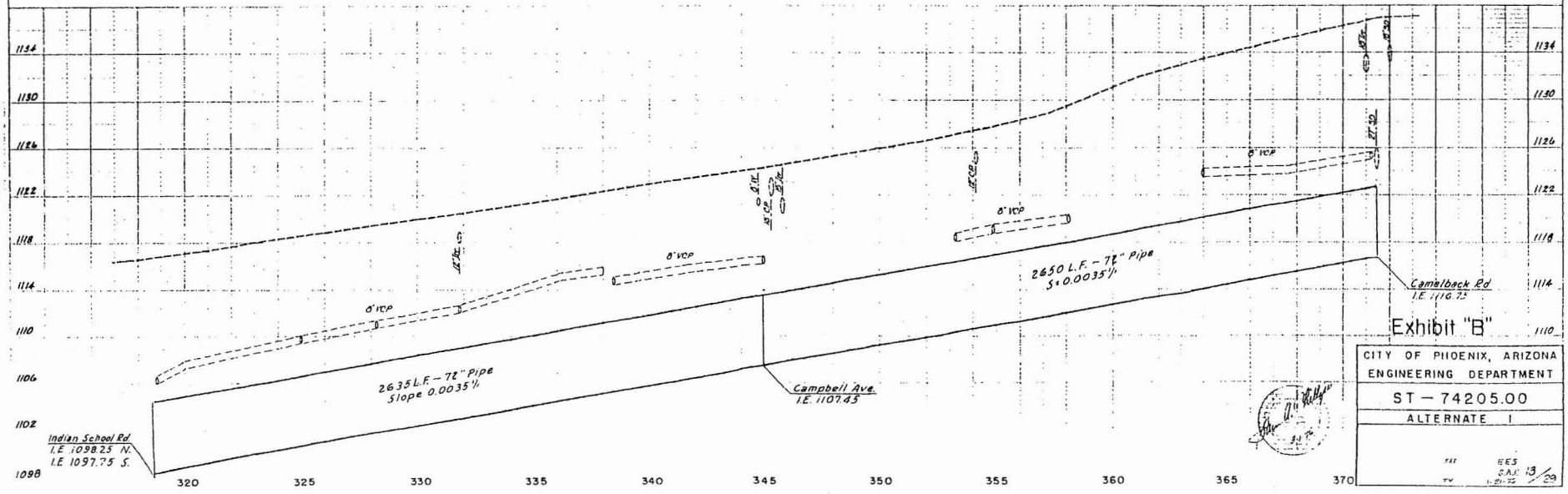
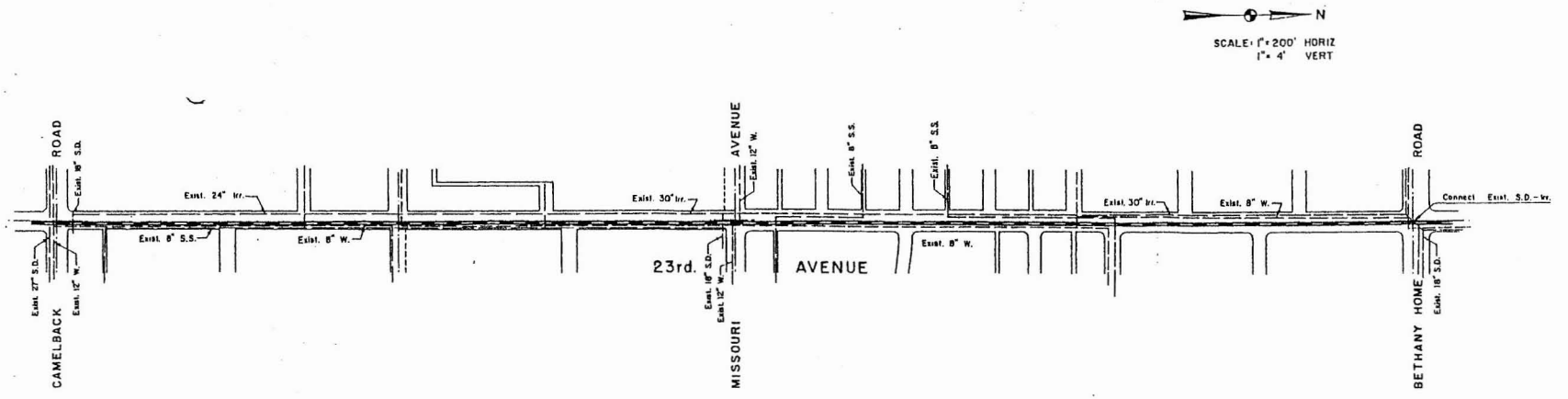


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST – 74205.00
ALTERNATE 1

DRAINAGE DESIGN ROUTE STUDY

2 – YEAR STORM



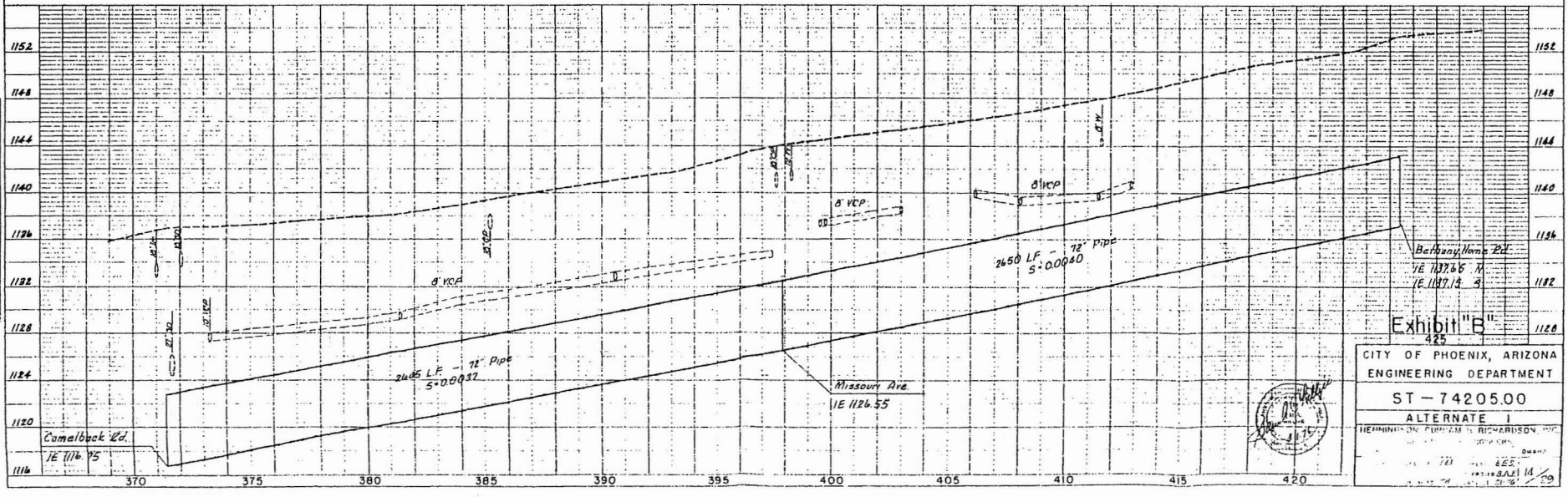


Exhibit "B"

425

CITY OF PHOENIX, ARIZONA

ENGINEERING DEPARTMENT

ST – 74205.00

ALTERNATE 1

HERRINGTON, CURRAN & RICHARDSON, INC.

DRAINAGE DESIGN ROUTE STUDY

2-YEAR STORM

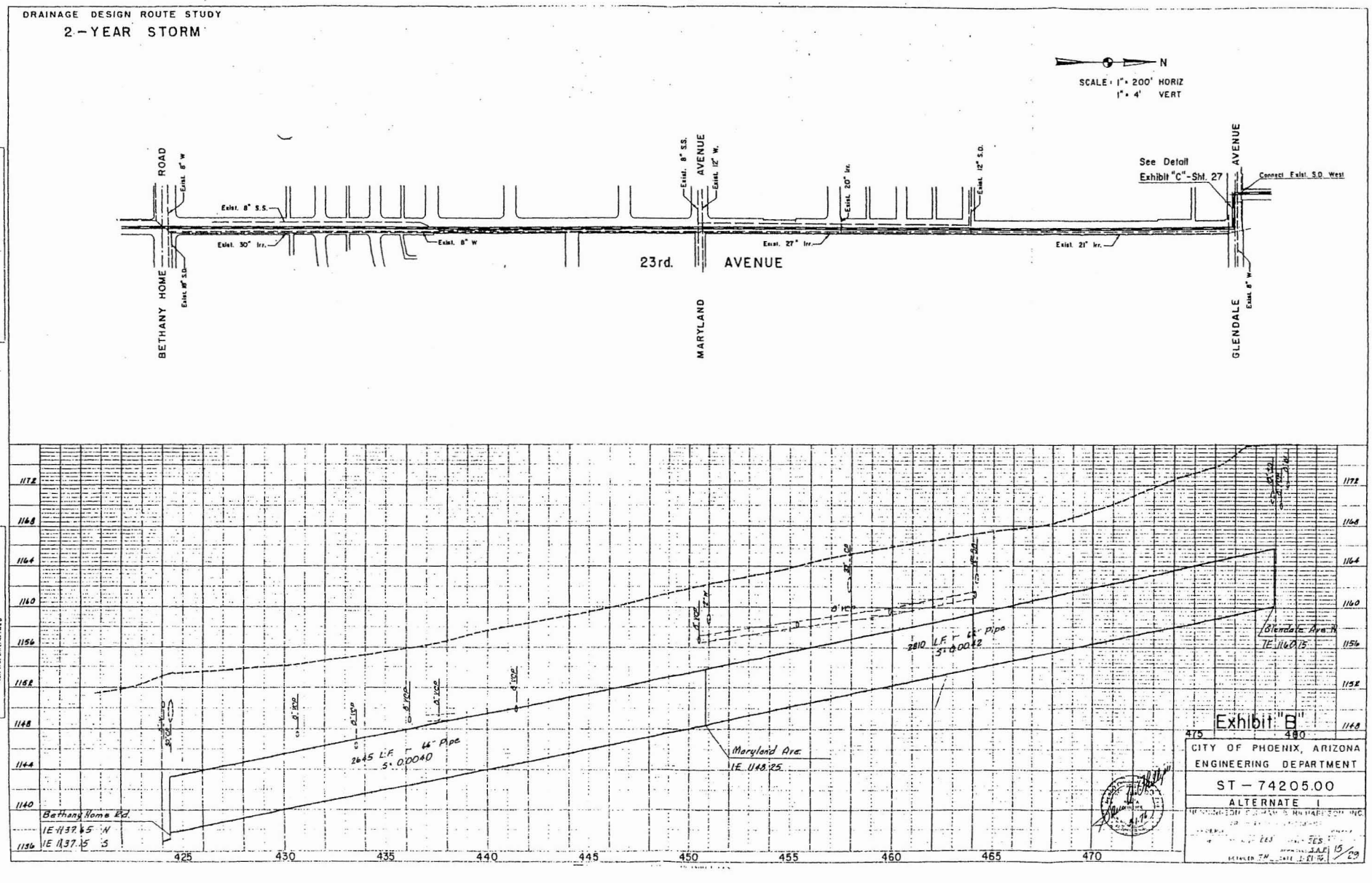


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

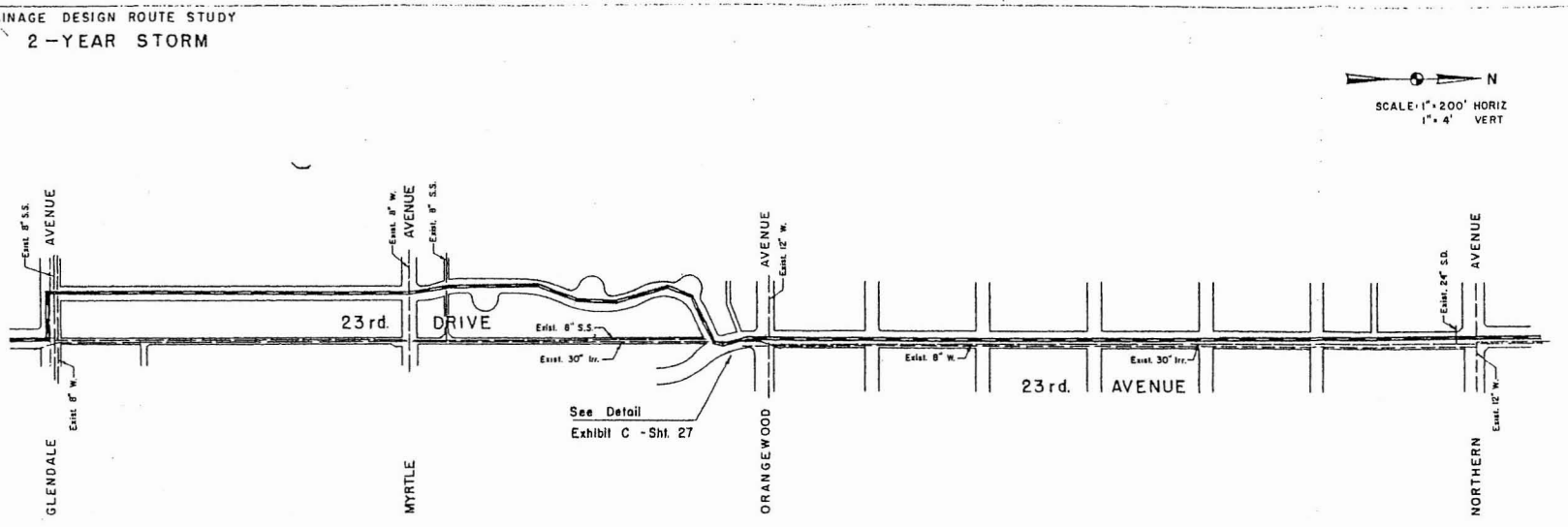
ST - 74205.00

ALTERNATE 1

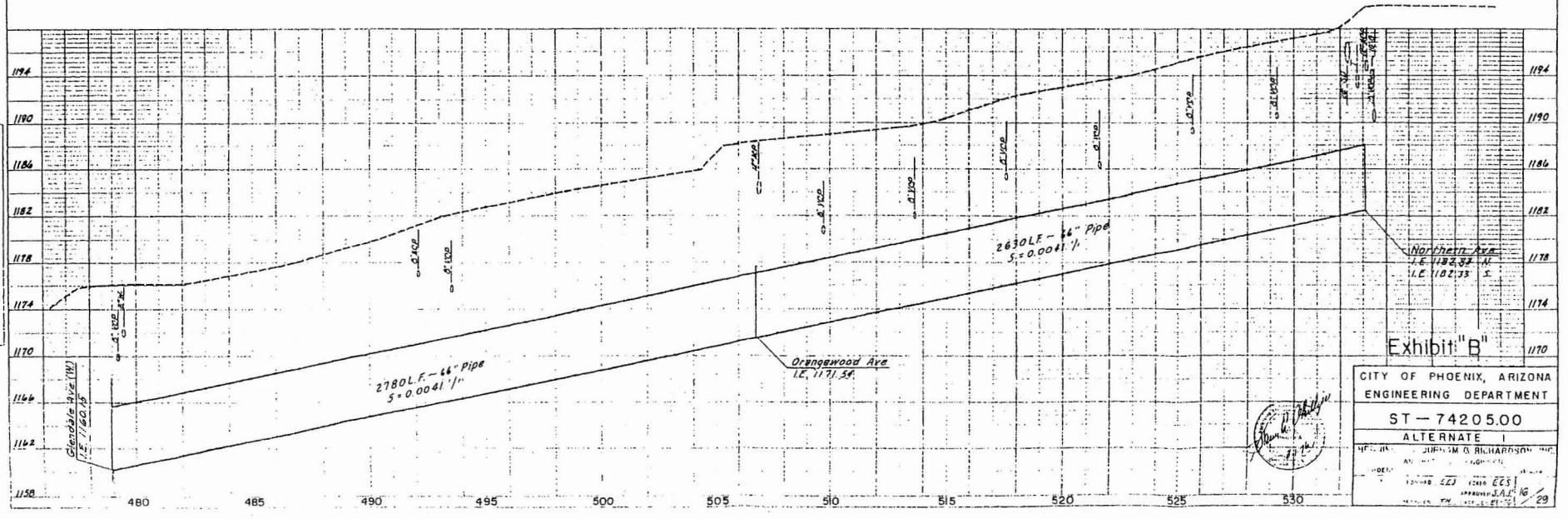
15/29

DRAINAGE DESIGN ROUTE STUDY

2 – YEAR STORM



PLAN



PROFILE

Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST – 74205.00

ALTERNATE 1

JURGEN O. RICHARDSON INC.

DRWN CZJ CHKD ECS APPROVED JAL 10/29

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM

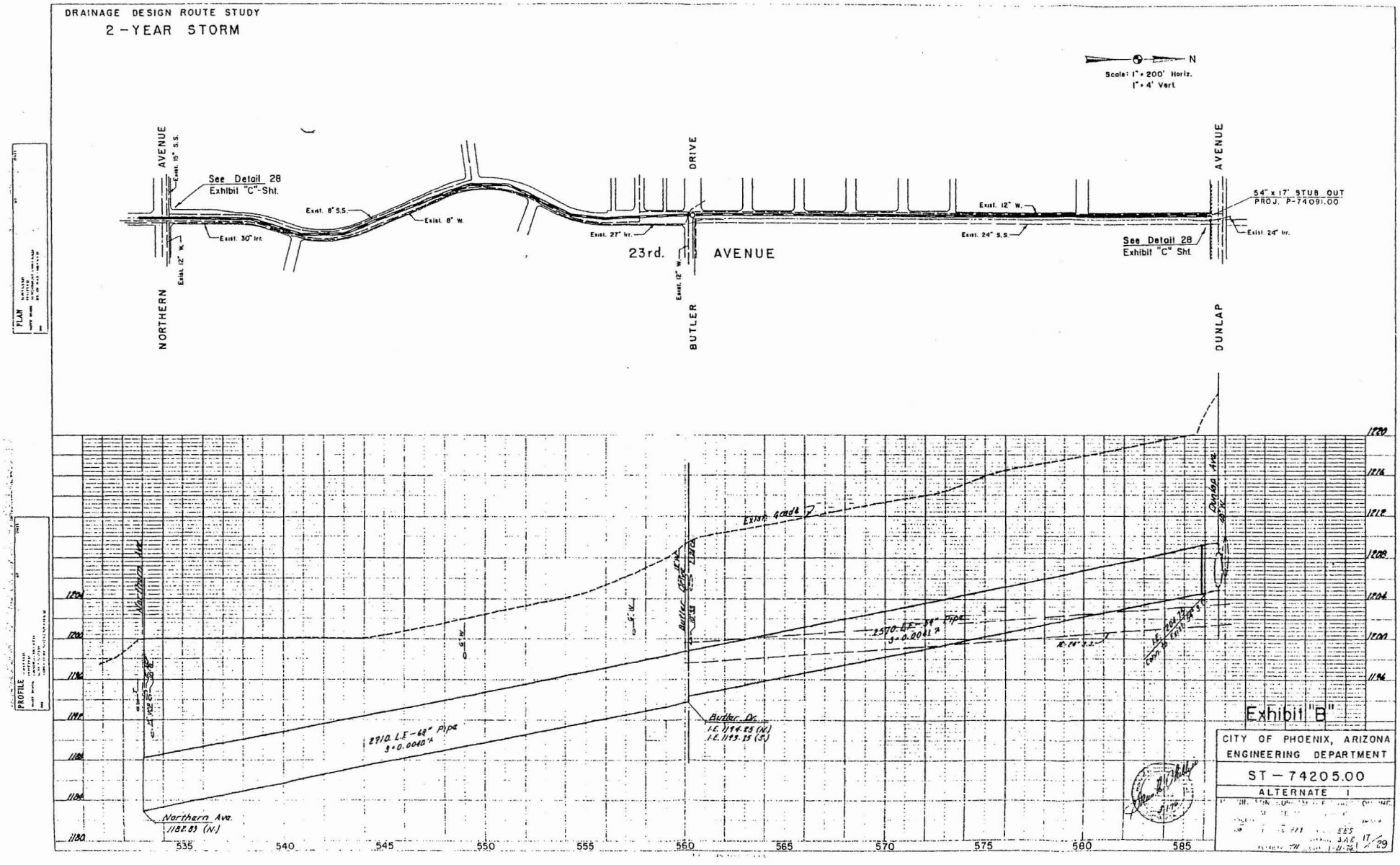
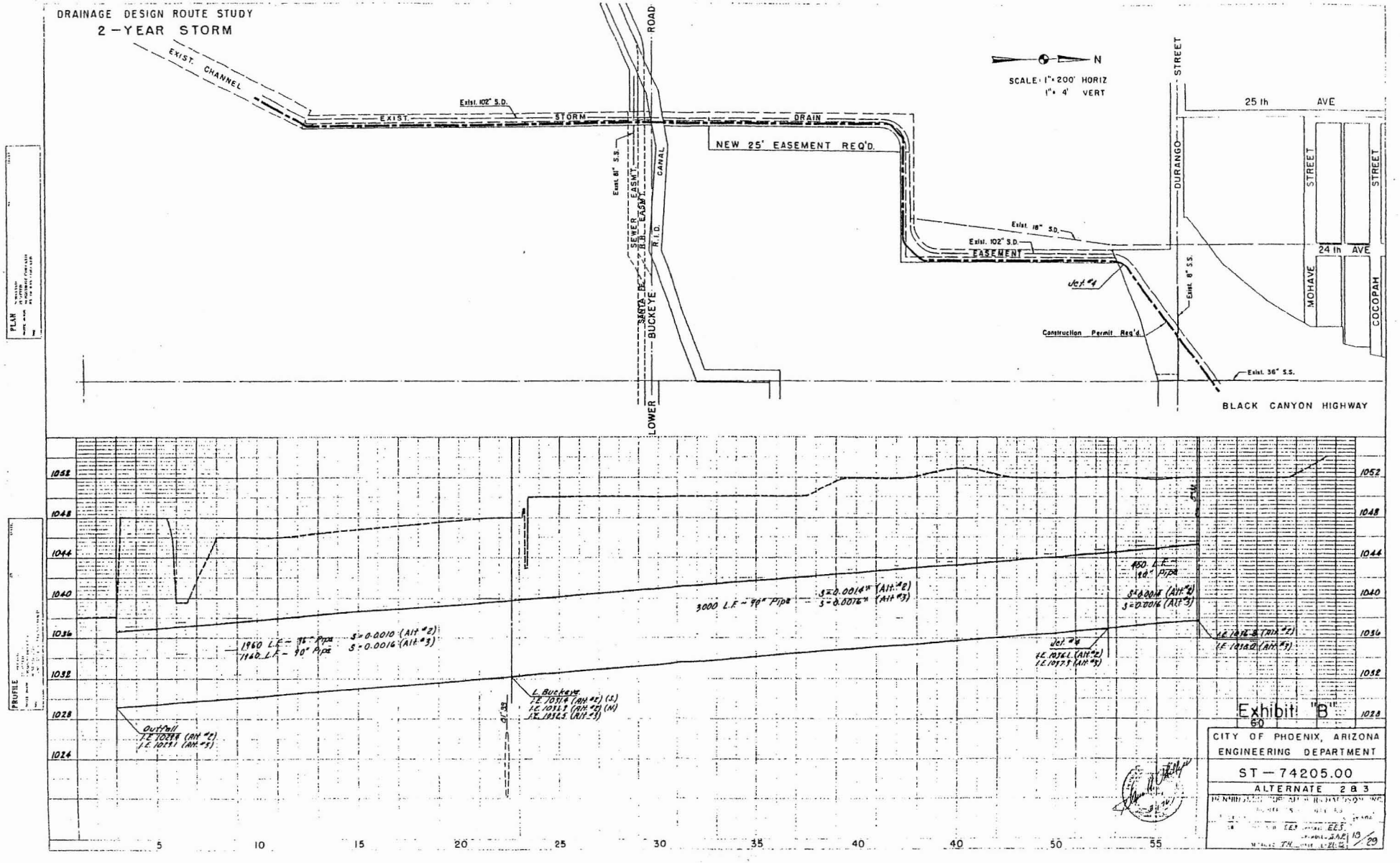


Exhibit "B"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

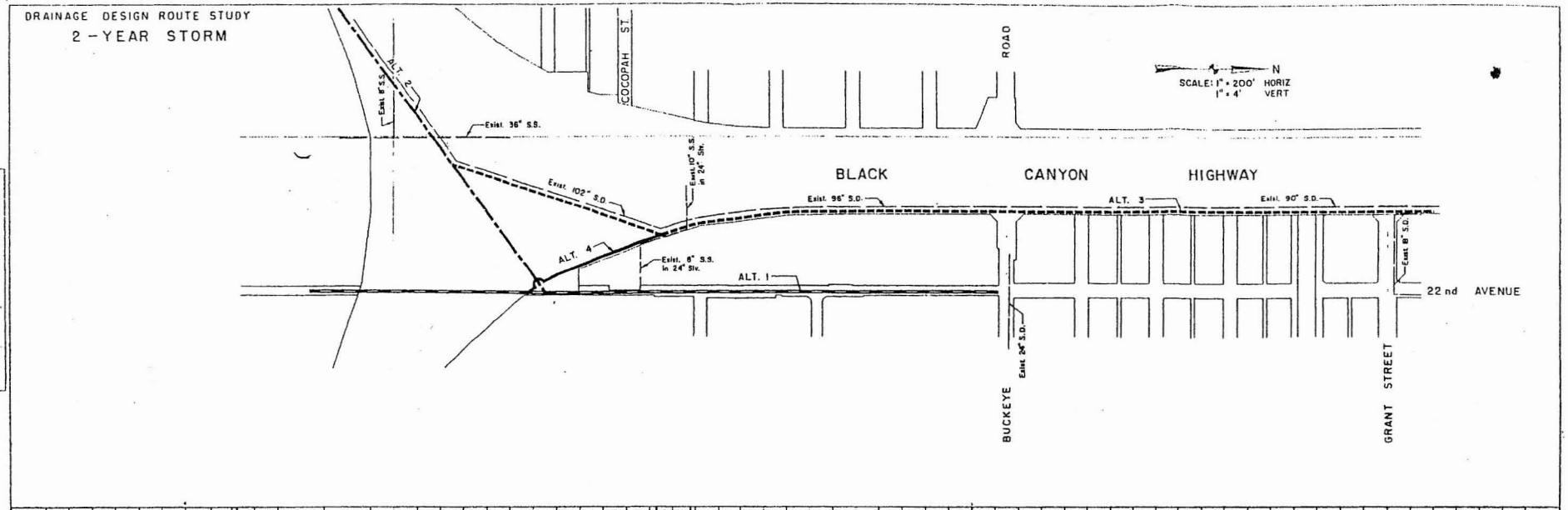
ST - 74205.00

ALTERNATE 1


DRAINAGE DESIGN ROUTE STUDY
2 – YEAR STORM
EXIST. CHANNEL
Exist. 102" S.D.
EXIST. STORM DRAIN
NEW 25' EASEMENT REQ'D.
Exist. 60" S.S.
SEWER EASMT.
R.R. EASMT.
SANTA FE
BUCKEYE ROAD
R.I.D. CANAL
LOWER
N
SCALE: 1" = 200' HORIZ
1" = 4' VERT
DURANGO STREET
25 th AVE
24 th AVE
MOHAVE STREET
COCOPAH STREET
Exist. 18" S.D.
Exist. 102" S.D.
EASEMENT
Jct. #4
Exist. 8' S.S.
Construction Permit Req'd.
Exist. 36" S.S.
BLACK CANYON HIGHWAY
PLAN
PROFILE
1052
1048
1044
1040
1036
1032
1028
1024
1960 L.F. – 75" Pipe S = 0.0010 (Alt. #2)
1140 L.F. – 90" Pipe S = 0.0016 (Alt. #3)
3000 L.F. – 90" Pipe S = 0.0014 (Alt. #2)
S = 0.0016 (Alt. #3)
450 L.F. 90" Pipe
S = 0.0014 (Alt. #2)
S = 0.0016 (Alt. #3)
Jct. #4
I.E. 1036.6 (Alt. #2)
I.E. 1037.8 (Alt. #3)
I.E. 1038.8 (Alt. #2)
I.E. 1039.2 (Alt. #3)
Outfall
I.E. 1026.8 (Alt. #2)
I.E. 1027.1 (Alt. #3)
L. Buckeye
I.E. 1031.4 (Alt. #2) (S.)
I.E. 1031.2 (Alt. #2) (N.)
I.E. 1032.5 (Alt. #3)
5
10
15
20
25
30
35
40
40
50
55
Exhibit "B"
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST – 74205.00
ALTERNATE 2 & 3

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM



PLAN

PROFILE

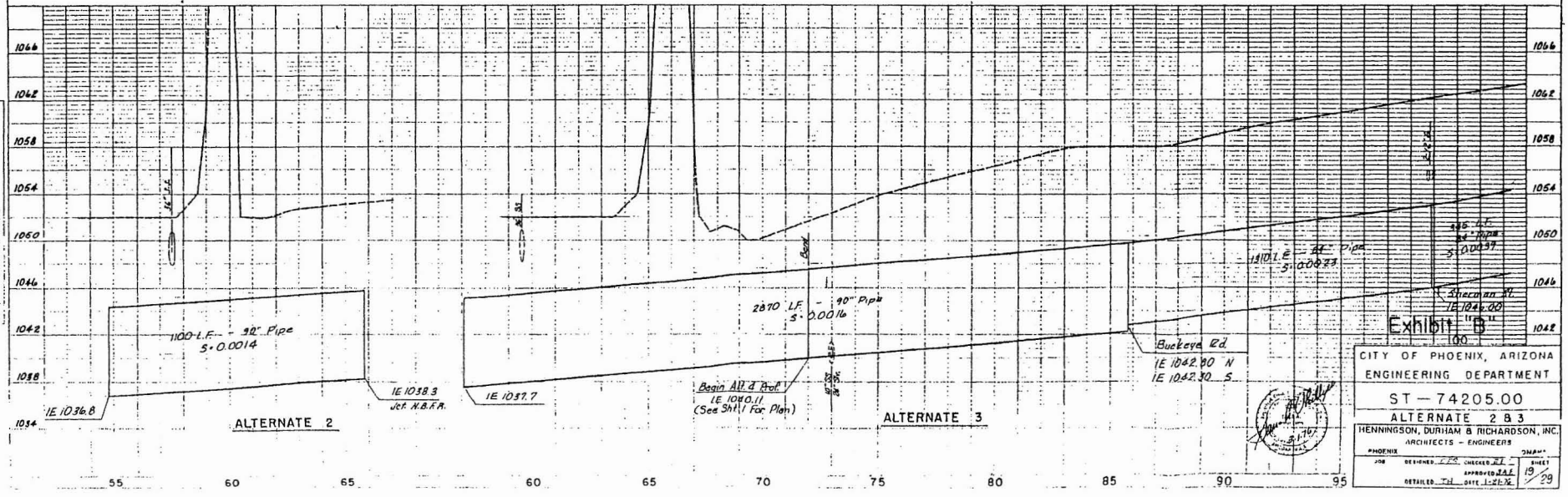


Exhibit "B"

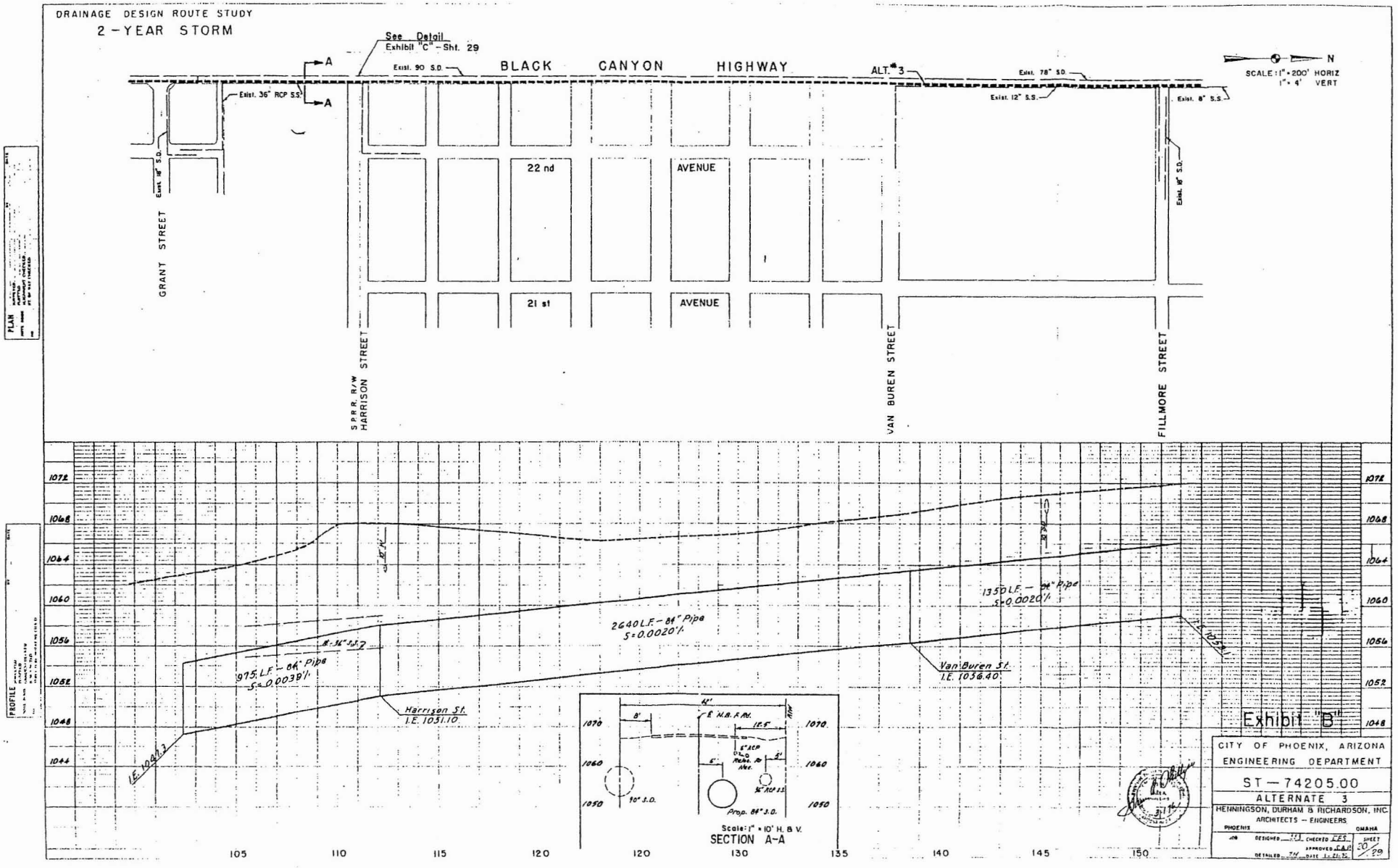
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST - 74205.00

ALTERNATE 2 & 3

HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX

JOB DESIGNED TJB CHECKED RT
APPROVED RAL
DETAILED TJH DATE 1-21-76
DRAWN SHEET 19 / 29


DRAINAGE DESIGN ROUTE STUDY
2 - YEAR STORM
See Detail
Exhibit "C" - Sht. 29
BLACK CANYON HIGHWAY
ALT. 3
Exist. 90 S.D.
Exist. 36" RCP S.S.
Exist. 78" S.D.
Exist. 12" S.S.
Exist. 8" S.S.
Exist. 18" S.D.
Exist. 18" S.D.
N
SCALE: 1" = 200' HORIZ
1" = 4' VERT
GRANT STREET
22 nd
AVENUE
21 st
AVENUE
S.P.R.R. R/W
HARRISON STREET
VAN BUREN STREET
FILLMORE STREET
PLAN
PROFILE
975 L.F. - 84" Pipe
S=0.0039'/.
2640 L.F. - 84" Pipe
S=0.0020'/.
1350 L.F. - 84" Pipe
S=0.0020'/.
Harrison St.
I.E. 1051.10
Van Buren St.
I.E. 1036.40
I.E. 1049.7
Scale: 1" = 10' H. & V.
SECTION A-A
Prop. 84" S.D.
105
110
115
120
120
130
135
140
145
150
Exhibit "B"
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
ALTERNATE 3
HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX
OMAHA
DESIGNED
CHECKED
APPROVED
DETAILED
DATE
SHEET
30
29

DRAINAGE DESIGN ROUTE STUDY

2 - YEAR STORM

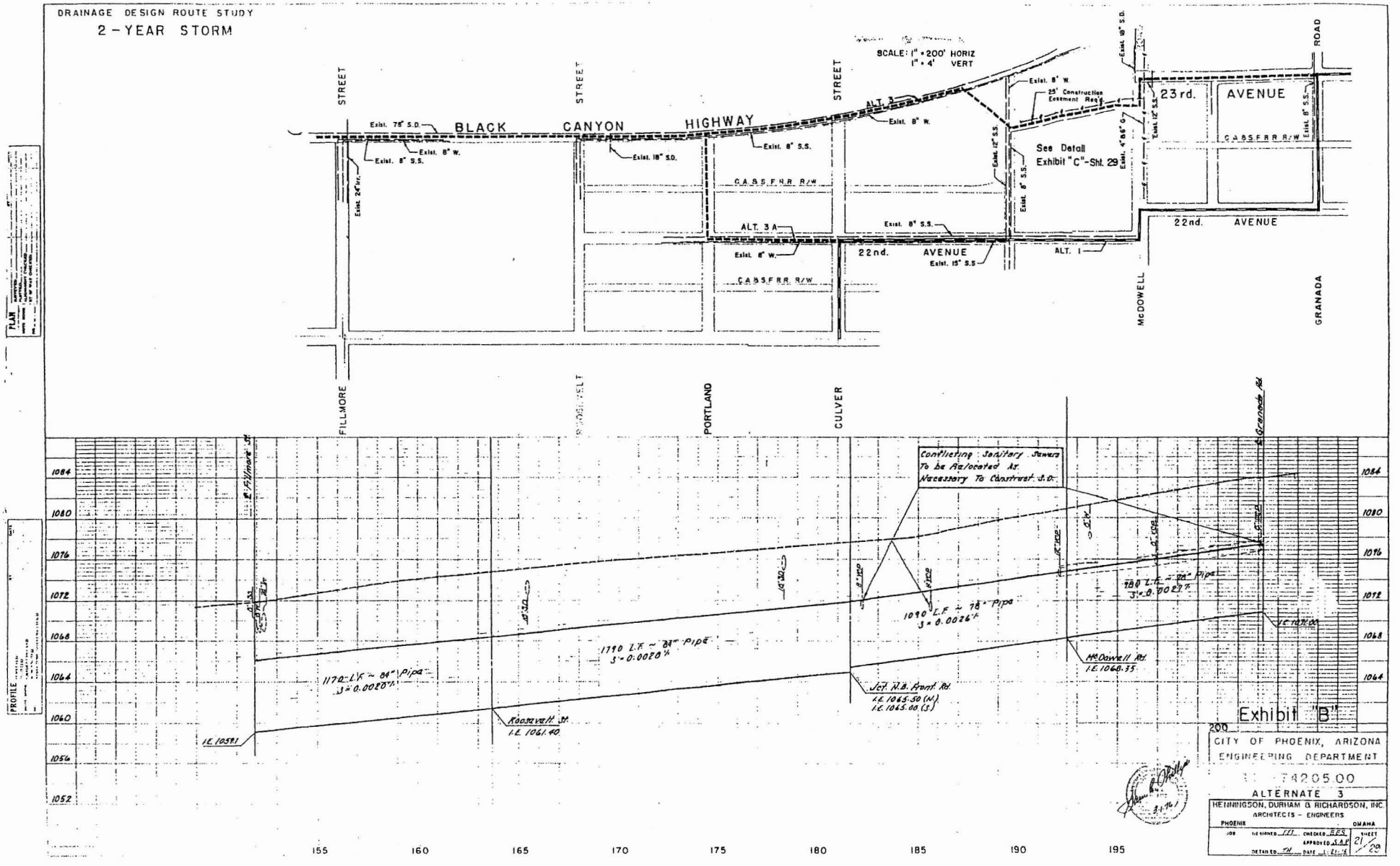


Exhibit "B"

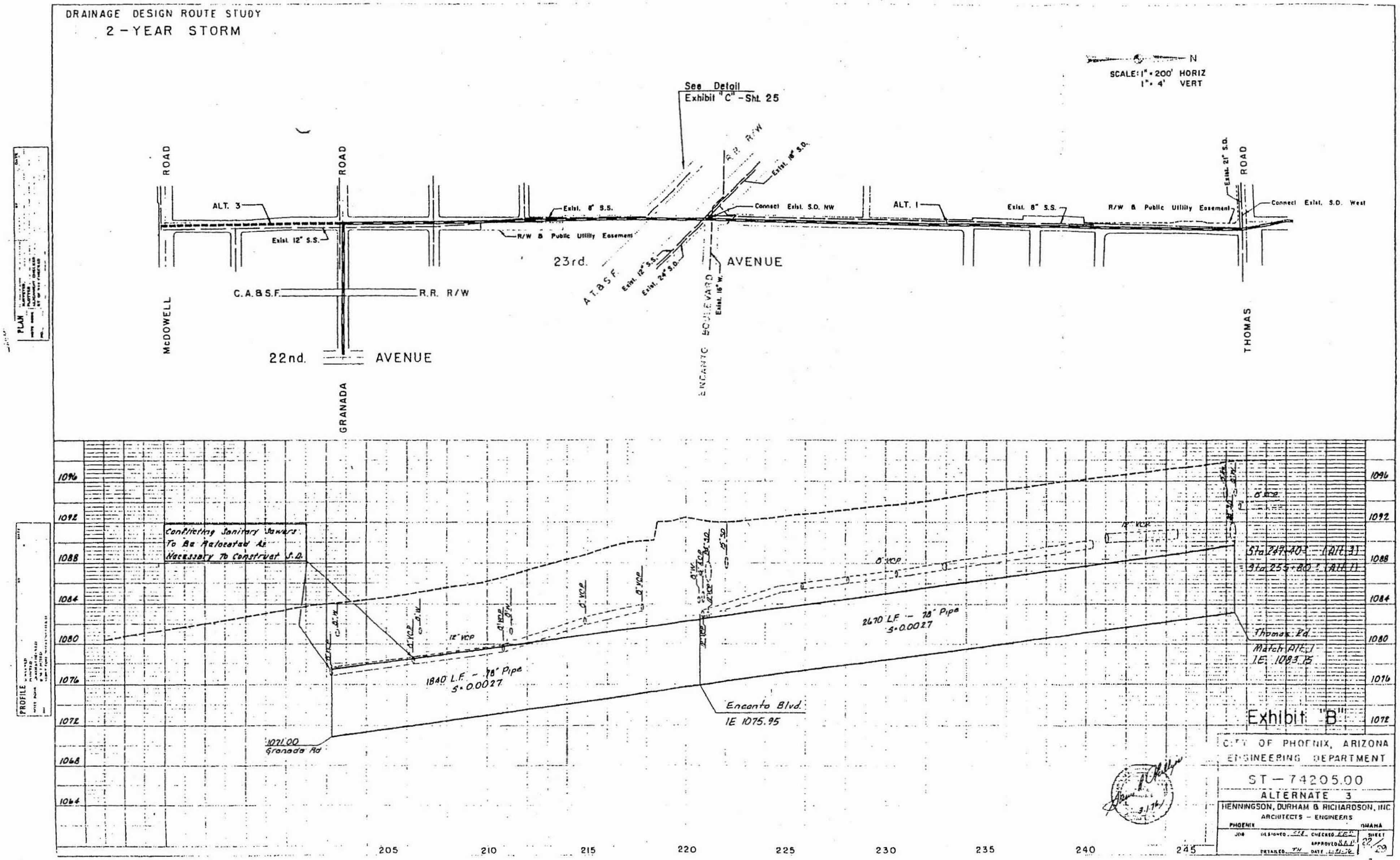
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

74205.00

ALTERNATE 3

HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX OMAHA

JOB DESIGNED ... CHECKED ... SHEET 21/29
APPROVED ...
DETAILED ... DATE ...


DRAINAGE DESIGN ROUTE STUDY
2-YEAR STORM
N
SCALE: 1" = 200' HORIZ
1" = 4' VERT
See Detail
Exhibit "C" - Sht. 25
ROAD
McDOWELL
ALT. 3
Exist. 12" S.S.
Exist. 8" S.S.
R/W & Public Utility Easement
C.A.B.S.F.
R.R. R/W
22nd.
AVENUE
GRANADA
23rd.
AVENUE
A.T.&S.F.
Exist. 12" S.S.
Exist. 24" S.D.
Exist. 18" S.D.
Connect Exist. S.D. NW
ENCANTO BOULEVARD
Exist. 18" W.
ALT. 1
Exist. 8" S.S.
R/W & Public Utility Easement
Exist. 21" S.D.
THOMAS
Connect Exist. S.D. West
Conflicting Sanitary Sewers To Be Relocated As Necessary To Construct S.D.
1840 L.F. - 78" Pipe
S = 0.0027
2470 L.F. - 78" Pipe
S = 0.0027
1071.00
Granada Rd
Encanto Blvd.
IE 1075.95
Sta 249+40± (Alt. 3)
Sta 255+80± (Alt. 1)
Thomas Rd.
Match Alt. 1
IE 1083.15
Exhibit "B"
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
ALTERNATE 3
HENNINGSON, DURHAM & RICHARDSON, INC.
ARCHITECTS - ENGINEERS
PHOENIX
OMAHA
PLAN
PROFILE

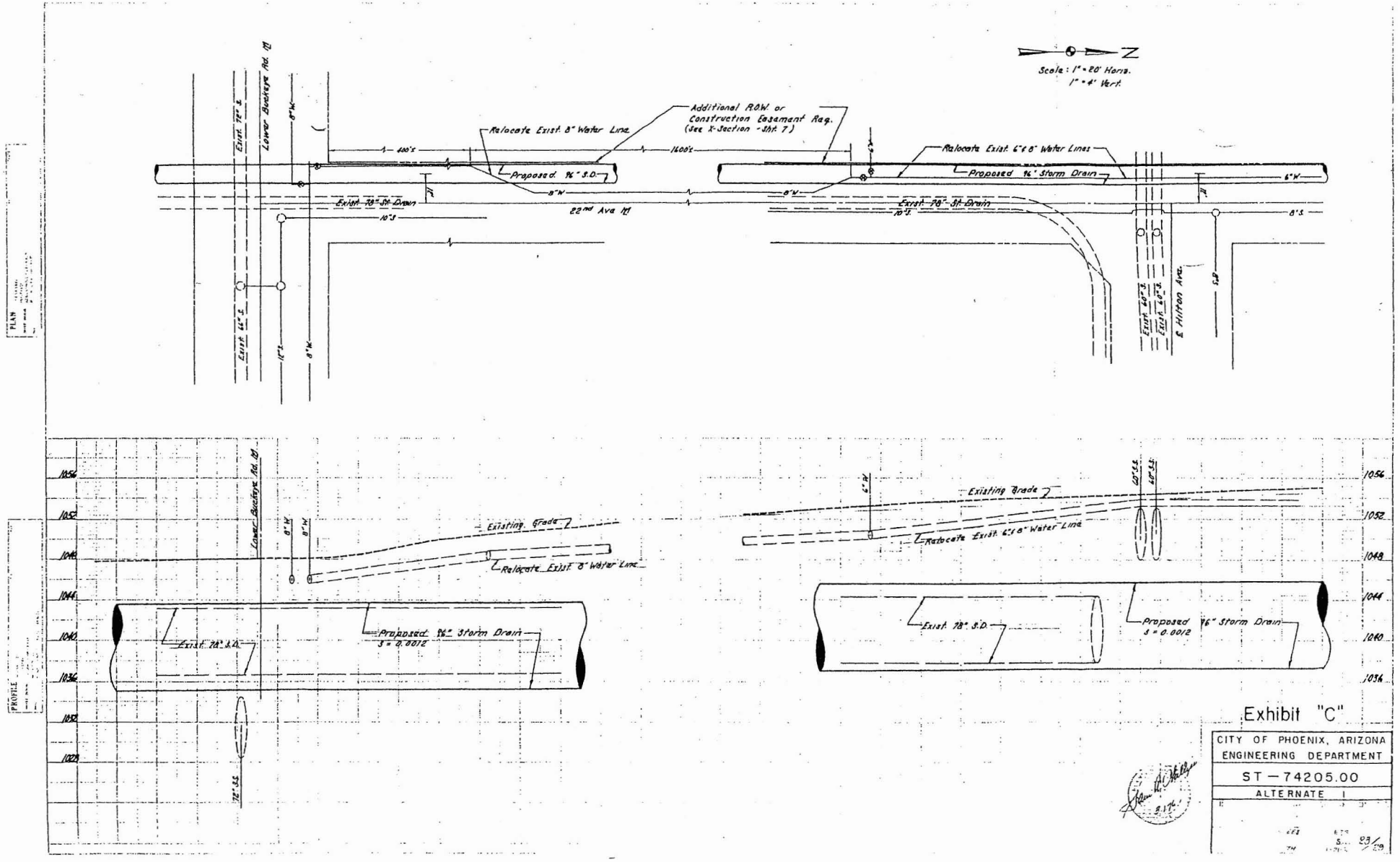


Exhibit "C"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST — 74205.00

ALTERNATE 1

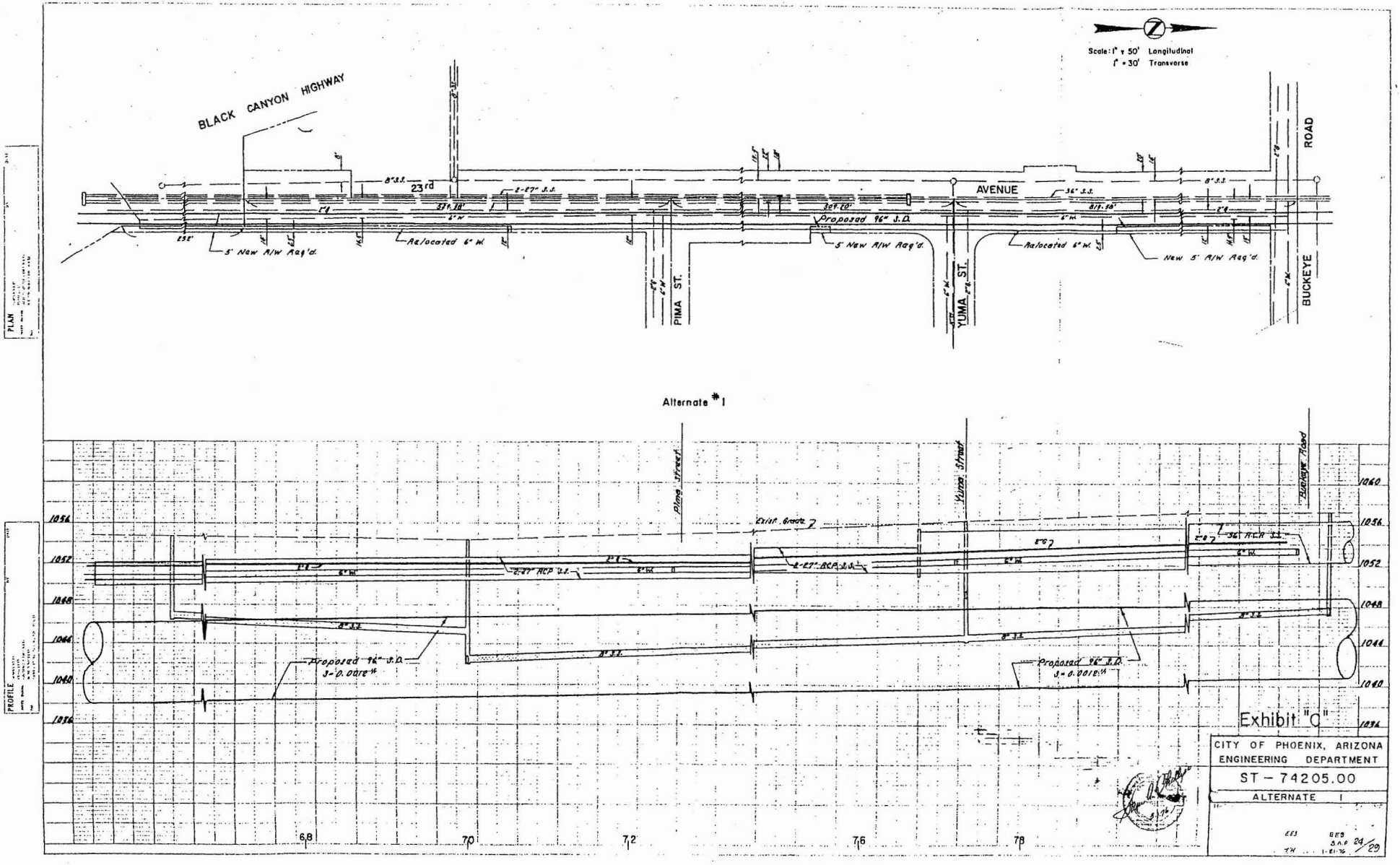
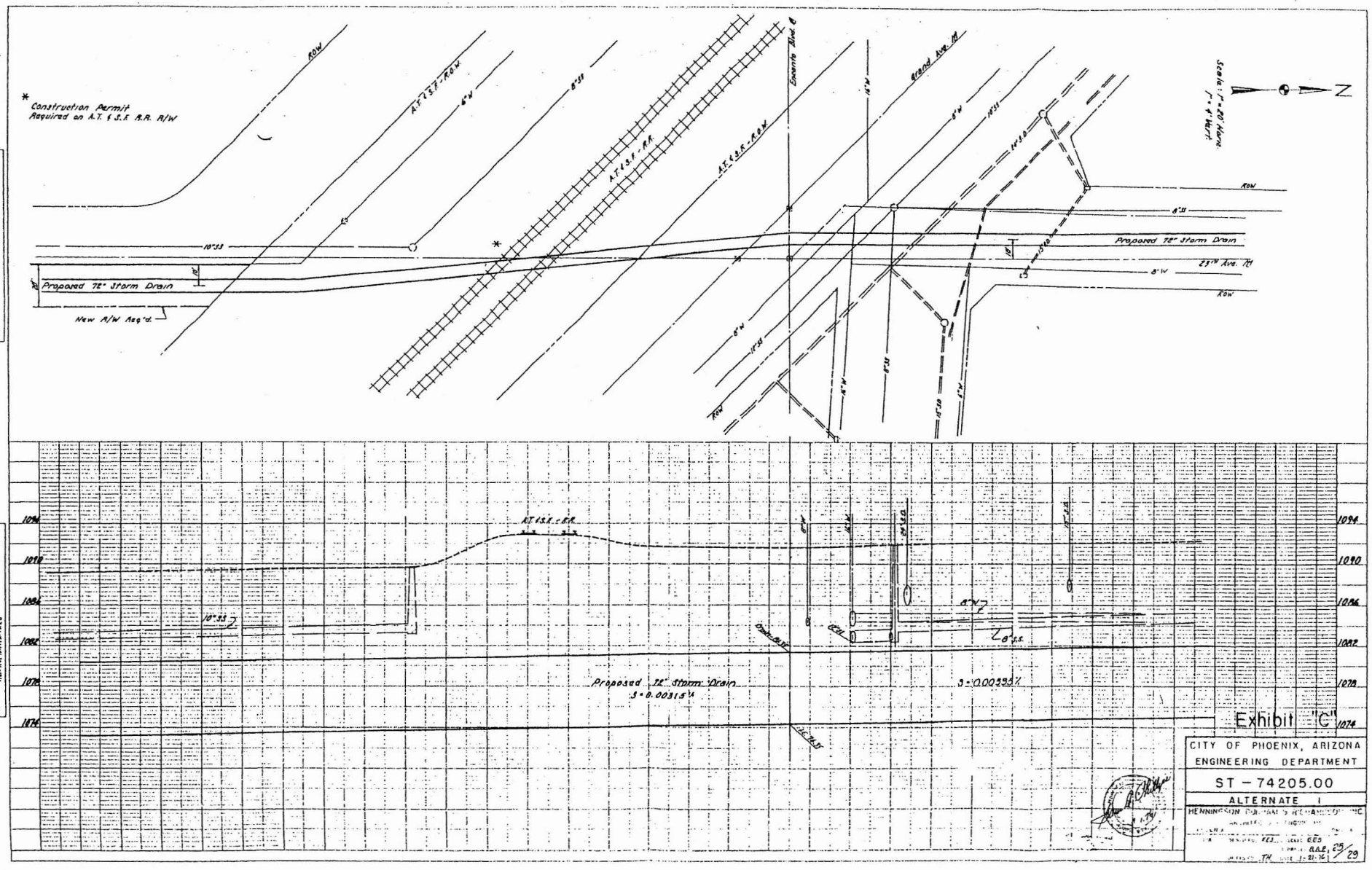
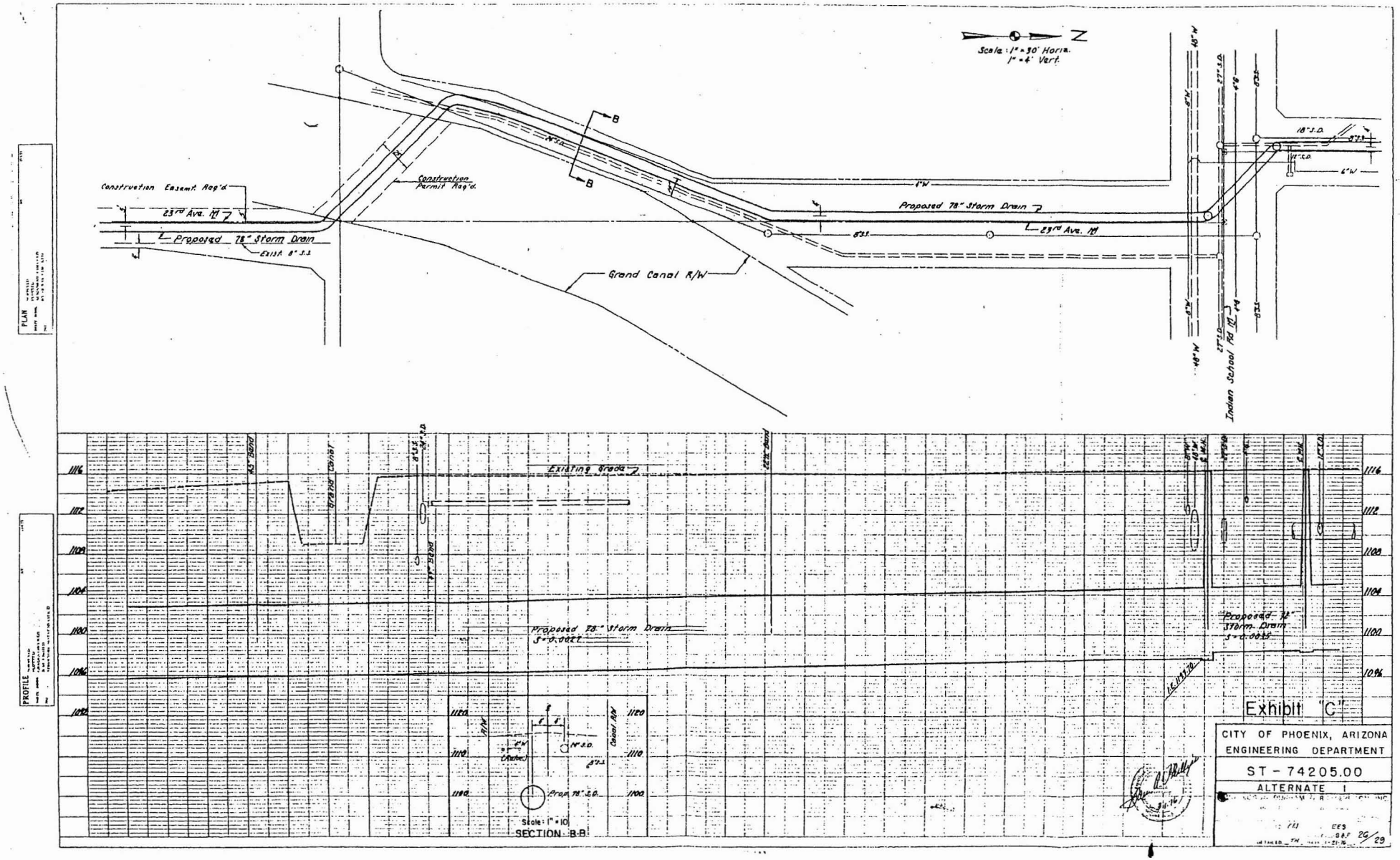


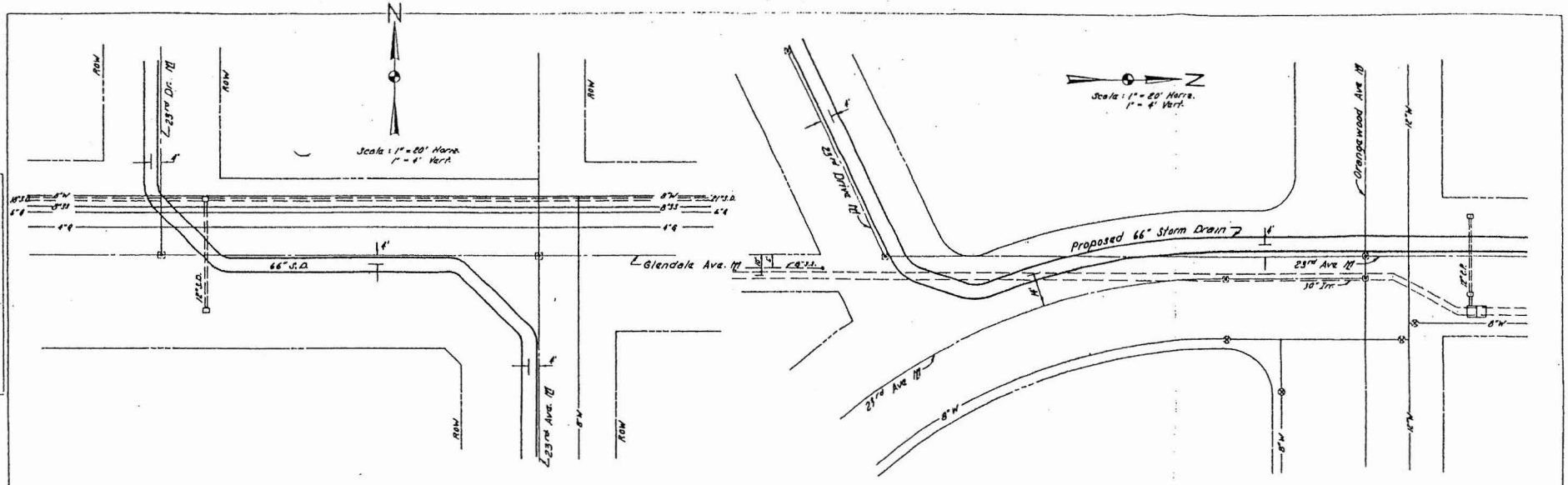
Exhibit "C"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
ALTERNATE 1

EFJ BES
SAP 24/29
TH 1-21-76


PLAN
PROFILE
* Construction Permit Required on A.T. & S.F. R.R. R/W
A.T. & S.F. R.R.
ROW
Seventh Blvd.
Grand Ave. 111
23rd Ave. 111
Proposed 72" Storm Drain
New R/W Req'd.
10°33
8°55
Scale: 1" = 20' Horiz.
1" = 4' Vert.
N
Proposed 72" Storm Drain
S = 0.00315
S = 0.00333
Exhibit "C"
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
ALTERNATE 1
HENNINGSON, DURHAM & RICHARDSON, INC.
25/29


PLAN
PROFILE
Scale: 1" = 30' Horiz.
1" = 4' Vert.
Construction Easement Req'd
23rd Ave. M
Proposed 78" Storm Drain
Exist. 8" S.S.
Construction Permit Req'd.
Grand Canal R/W
Proposed 78" Storm Drain
23rd Ave. M
Indian School Rd M
Existing Grade
Grand Canal
Proposed 78" Storm Drain
S=0.0022
Proposed 72" Storm Drain
S=0.0035
Prop 78" S.D.
Scale: 1" = 10'
SECTION B-B
Exhibit "C"
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
ALTERNATE 1
DRAWN
CHECKED
DATE
SHEET 26/29



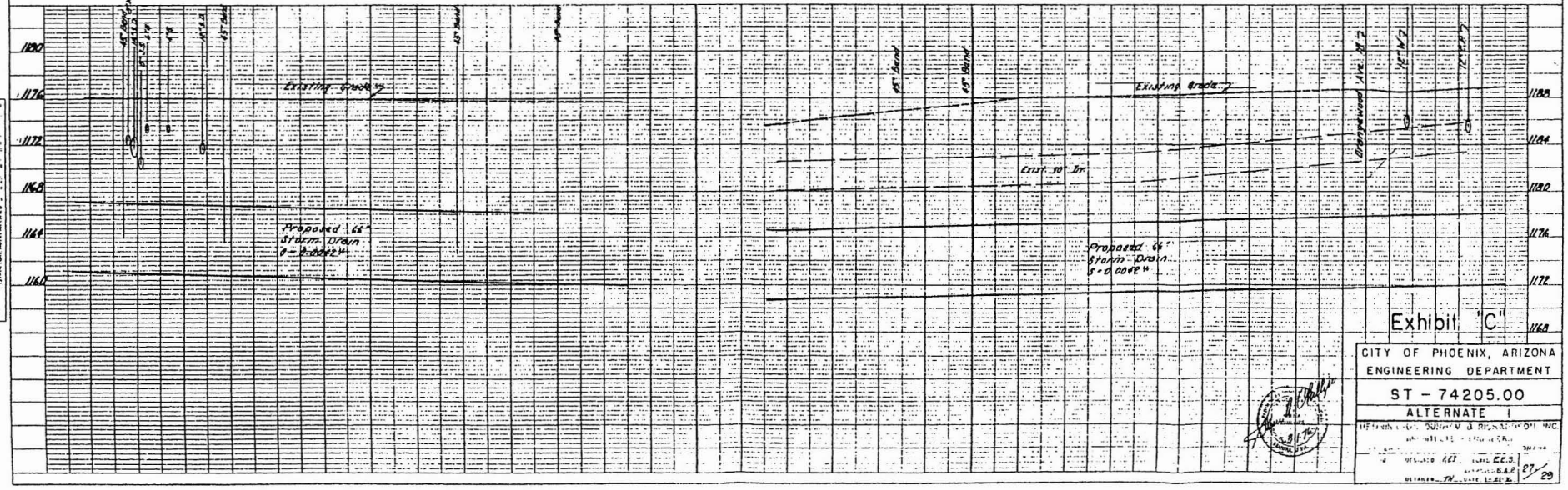


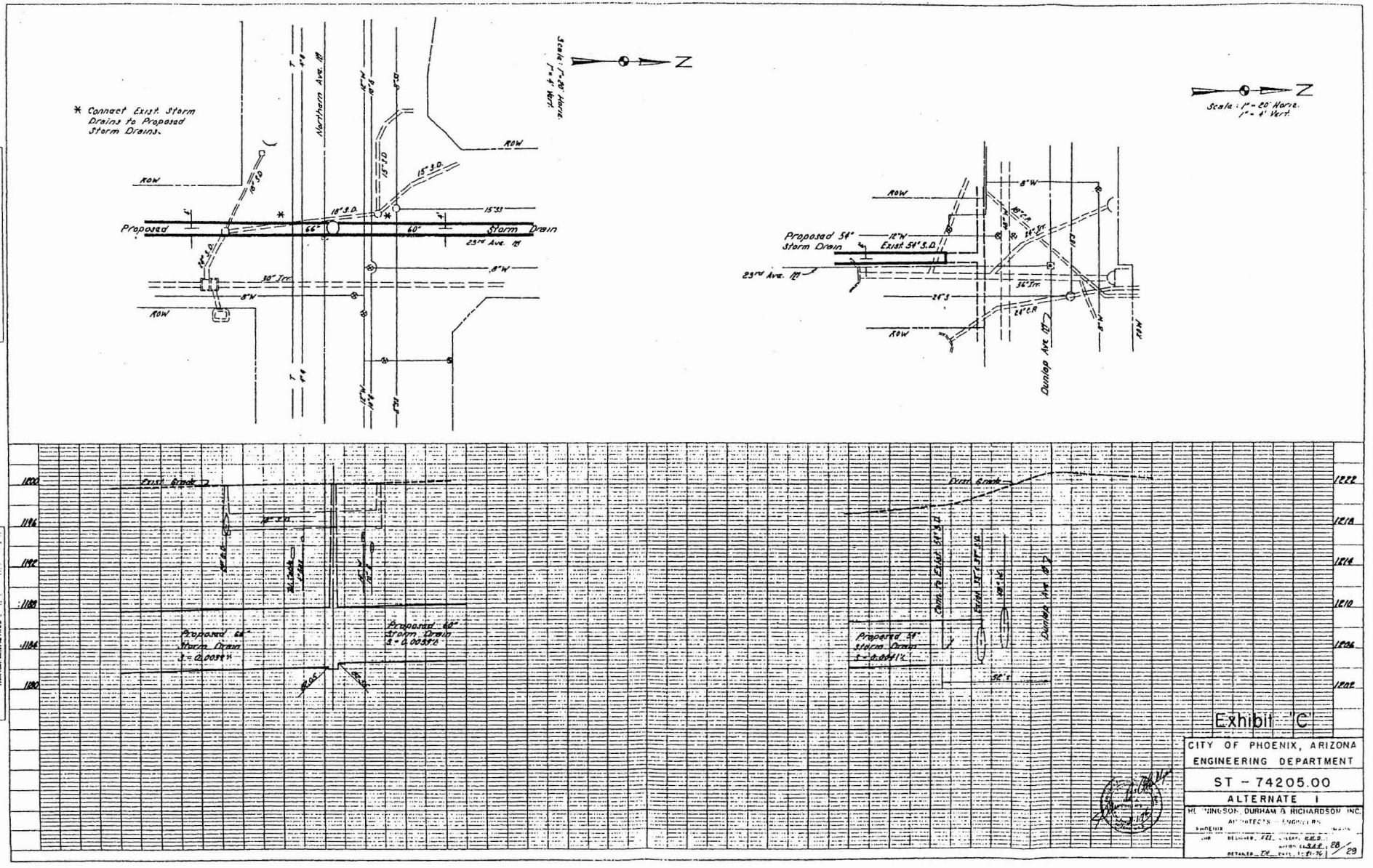
Exhibit "C"

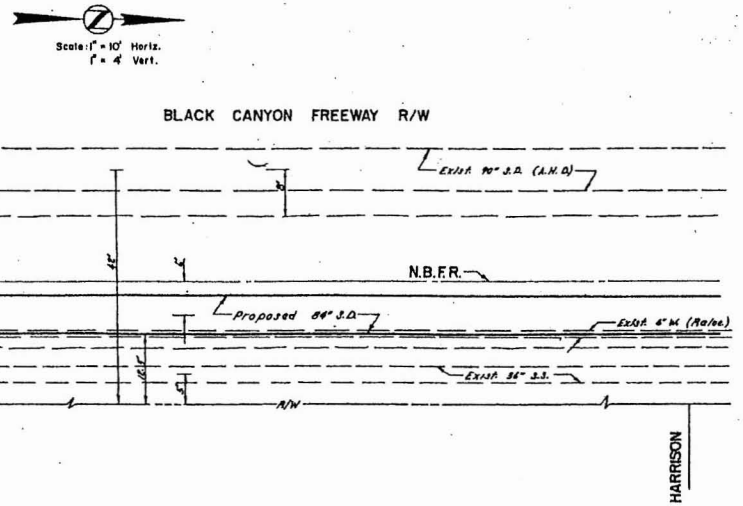
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT

ST - 74205.00

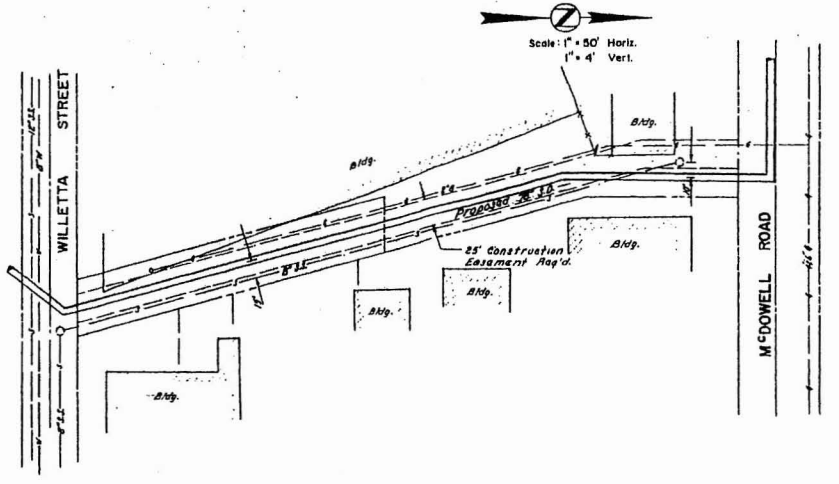
ALTERNATE I

27/29


PLAN
PROFILE
* Connect Exist. Storm Drains to Proposed Storm Drains.
Northern Ave. ℄
25th Ave. ℄
Dunlap Ave. ℄
Proposed 66" Storm Drain
Proposed 54" Storm Drain
Exist 54" S.D.
Proposed 60" Storm Drain
Proposed 54" Storm Drain
Exist Grade
Drain Grade
ROW
Scale: 1"=20' Horiz. 1"=4' Vert.
Exhibit "C"
CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST - 74205.00
ALTERNATE 1
HENNINGSON, DURHAM & RICHARDSON INC.
ARCHITECTS - ENGINEERS
28
29



Alternate * 3



Alternate * 3

Exhibit "C"

CITY OF PHOENIX, ARIZONA
ENGINEERING DEPARTMENT
ST – 74205.00
ALTERNATE 3

EES EES
TH

APPENDIX X

RAINFALL DATA

Appendix D: Rainfall Data

PREMIER
ENGINEERING CORPORATION

Precipitation: ADOT Hydrology Manual

Project:	**24th Ave and Camelback**	By:	**KBD**
Location :		Date:	**Jul-00**
Subject :	**Point Rainfall Depths and Intensities**	Project #:	

RAINFALL DEPTH-DURATION-FREQUENCY (D-D-F) WORKSHEET AND INTENSITY-DURATION-FREQUENCY (I-D-F)CURVES

Determine rainfall depths from the isopluvial maps (Appendix B):

2-year, 6-hour	P2,6' =	1.1
2-year, 24-hour	P2,24' =	1.3
100-year, 6-hour	P100,6' =	3 ✔
100-year, 24-hour	P100,24' =	3.7
Short Duration Frequency Zone	Zone =	8

Depth - Duration - Frequency (DDF)

Rainfall Depth, in inches							
	Frequency, in years						
Duration	**2**	**5**	**10**	**25**	**50**	**100**	**500**
5-min	0.29	0.39	0.46	0.55	0.63	0.70	0.87
10-min	0.44	0.60	0.70	0.85	0.96	1.07	1.33
15-min	0.54	0.74	0.88	1.08	1.23	1.37	1.72
30-min	0.71	1.00	1.19	1.46	1.66	1.86	2.34
1-hour	0.87	1.23	1.48	1.81	2.07	2.33	2.93
2-hour	0.95	1.35	1.62	1.99	2.27	2.56	3.22
3-hour	1.00	1.43	1.71	2.11	2.41	2.71	3.41
6-hour	**1.10**	1.58	**1.89**	2.33	2.67	**3.00**	3.77
12-hour	1.20	1.74	2.10	2.59	2.97	3.35	4.22
24-hour	**1.30**	1.90	**2.31**	2.86	3.28	**3.70**	4.67

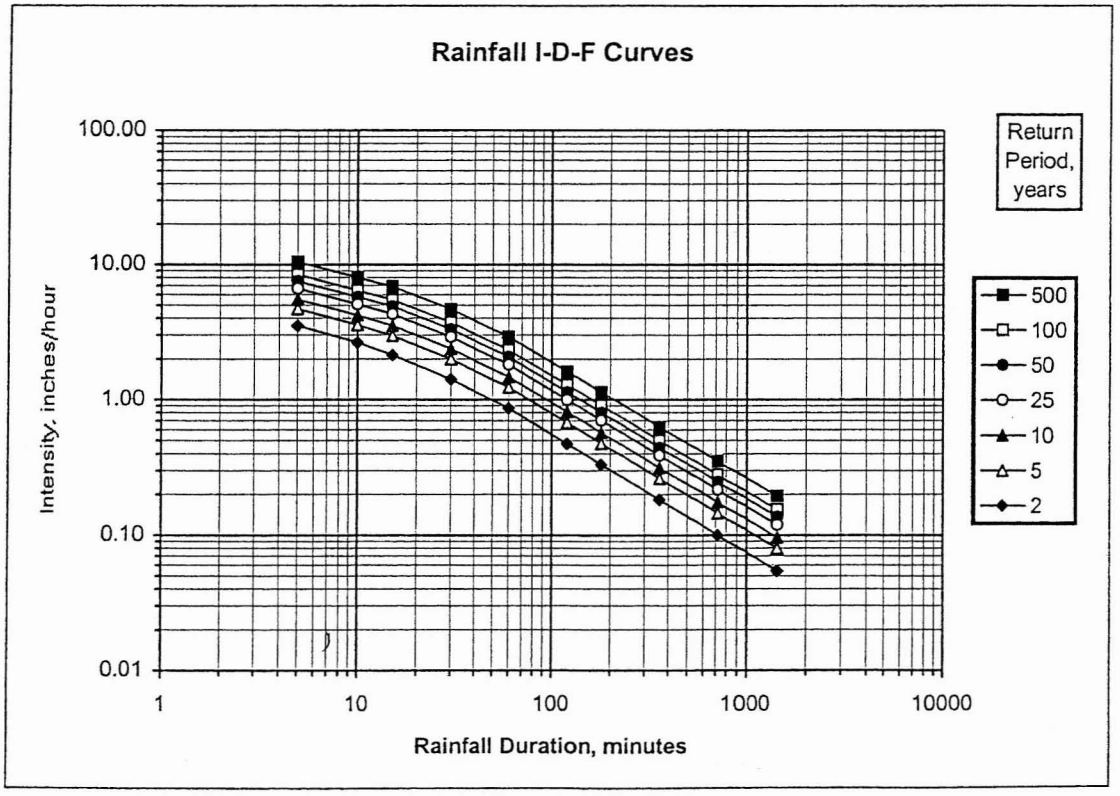
PREMIER
ENGINEERING CORPORATION

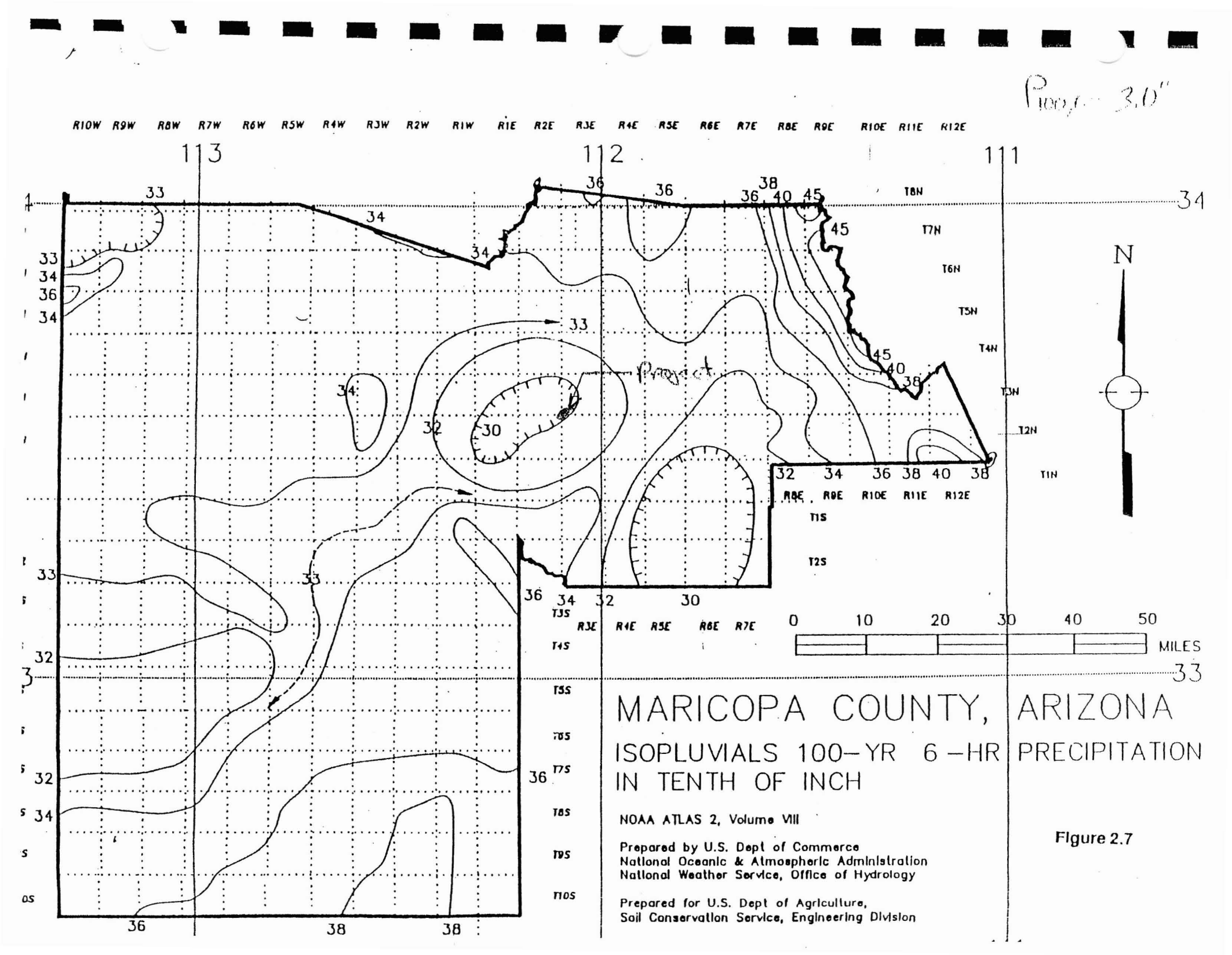
Precipitation: ADOT Hydrology Manual

Project:	**24th Ave and Camelback**	By:	**KBD**
Location :		Date:	**Jul-00**
Subject :	**Point Rainfall Depths and Intensities**	Project #:	

Intensity - Duration - Frequency (IDF)

Rainfall Intensity, in inches per hour								
		Frequency, in years						
Duration	minutes	2	5	10	25	50	100	500
5-min	5	3.53	4.71	5.52	6.65	7.52	8.39	10.40
10-min	10	2.65	3.57	**4.20**	5.08	5.76	6.43	7.99
15-min	15	2.15	2.98	3.53	4.31	4.91	5.50	6.87
30-min	30	1.42	1.99	2.38	2.91	3.32	3.73	4.67
1-hour	60	0.87	1.23	1.48	1.81	2.07	2.33	2.93
2-hour	120	0.47	0.67	0.81	0.99	1.14	1.28	1.61
3-hour	180	0.33	0.48	0.57	0.70	0.80	0.90	1.14
6-hour	360	0.18	0.26	0.32	0.39	0.44	0.50	0.63
12-hour	720	0.10	0.15	0.17	0.22	0.25	0.28	0.35
24-hour	1440	0.05	0.08	0.10	0.12	0.14	0.15	0.19

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113
112
111
T8N
T7N
T6N
T5N
T4N
T3N
T2N
T1N
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T3S
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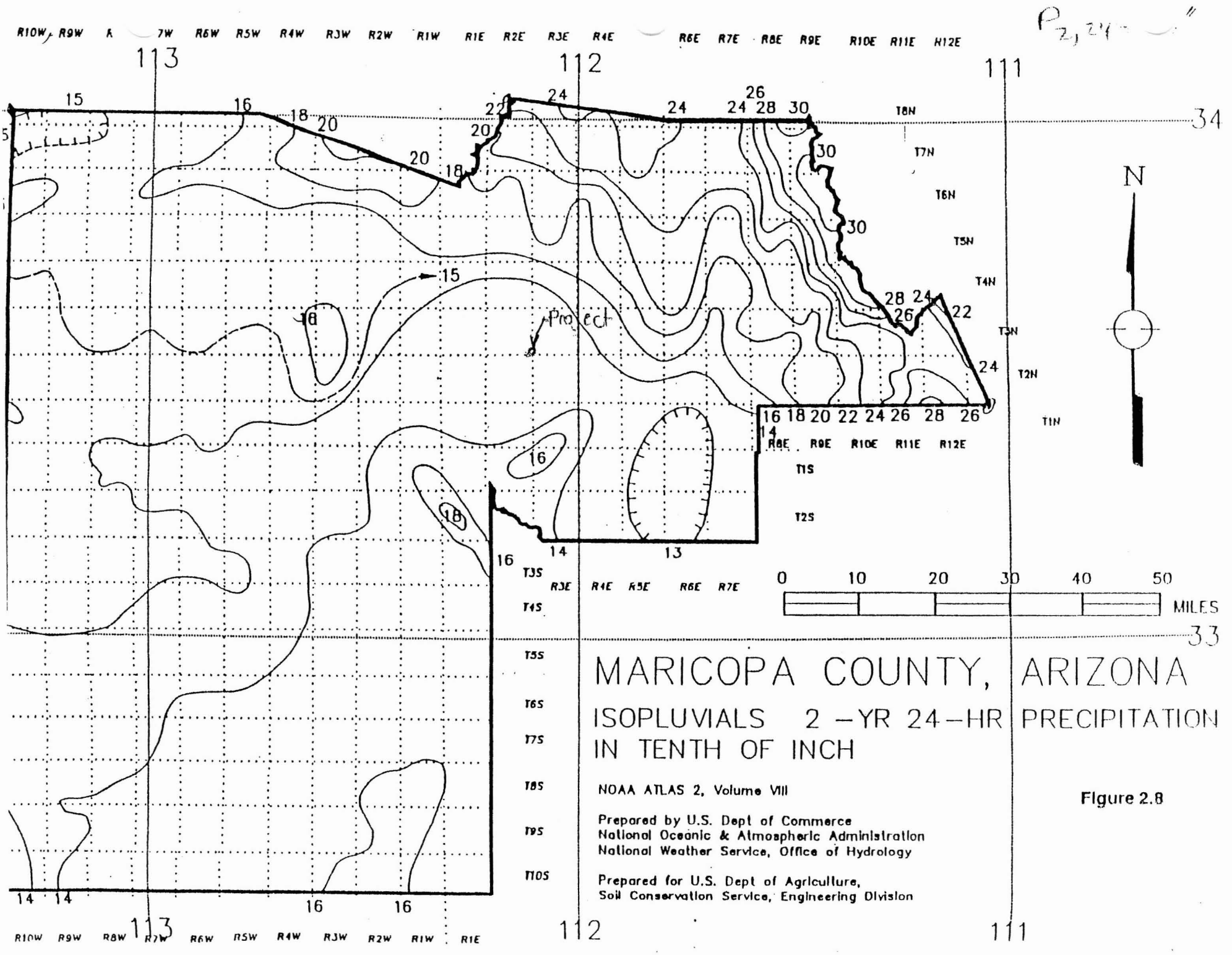
T5S
T6S
T7S
T8S
T9S
T10S
N
Project
0 10 20 30 40 50
MILES
MARICOPA COUNTY, ARIZONA
ISOPLUVIALS 100-YR 6-HR PRECIPITATION
IN TENTH OF INCH
NOAA ATLAS 2, Volume VIII
Prepared by U.S. Dept of Commerce
National Oceanic & Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Dept of Agriculture,
Soil Conservation Service, Engineering Division
Figure 2.7



MARICOPA COUNTY, ARIZONA

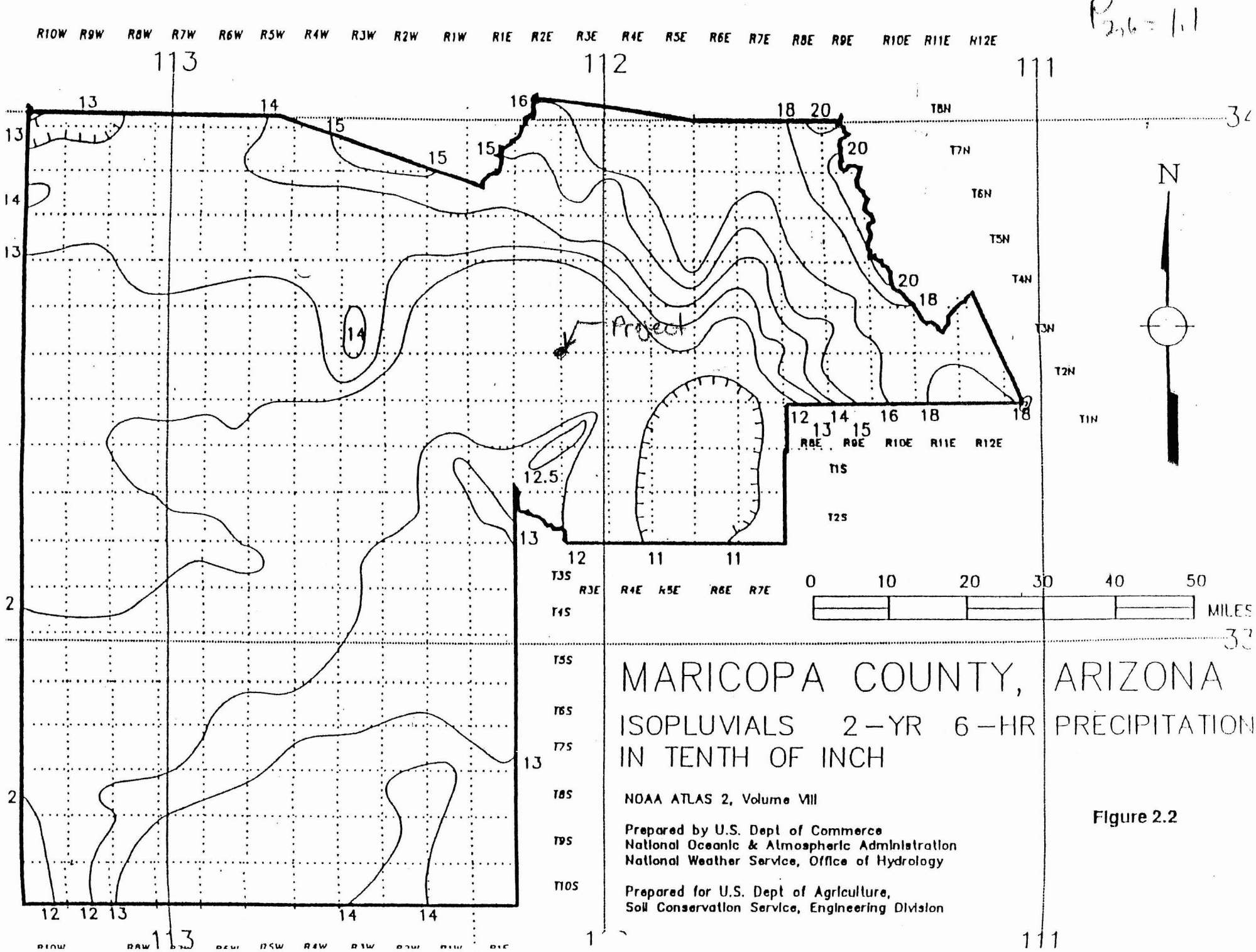
ISOPLUVIALS 2 – YR 24 – HR PRECIPITATION IN TENTH OF INCH

NOAA ATLAS 2, Volume VIII

Prepared by U.S. Dept of Commerce
National Oceanic & Atmospheric Administration
National Weather Service, Office of Hydrology

Prepared for U.S. Dept of Agriculture,
Soil Conservation Service, Engineering Division

Figure 2.8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113
112
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T5S
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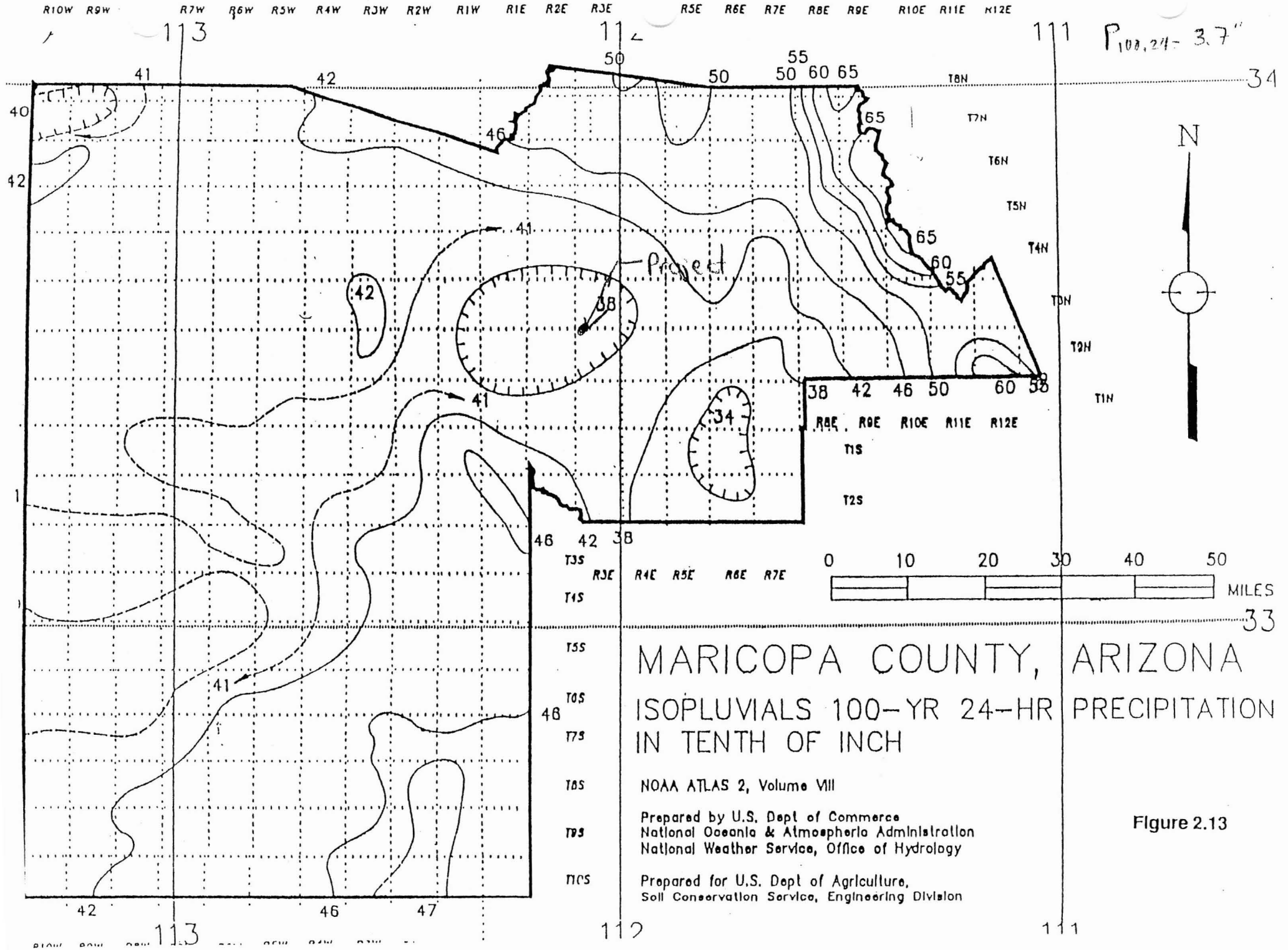
T10S
N
Project
0 10 20 30 40 50
MILES
MARICOPA COUNTY, ARIZONA
ISOPLUVIALS 2-YR 6-HR PRECIPITATION
IN TENTH OF INCH
NOAA ATLAS 2, Volume VIII
Prepared by U.S. Dept of Commerce
National Oceanic & Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Dept of Agriculture,
Soil Conservation Service, Engineering Division

Figure 2.2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N
Project
0 10 20 30 40 50
MILES
MARICOPA COUNTY, ARIZONA
ISOPLUVIALS 100-YR 24-HR PRECIPITATION
IN TENTH OF INCH
NOAA ATLAS 2, Volume VIII
Prepared by U.S. Dept of Commerce
National Oceanic & Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Dept of Agriculture,
Soil Conservation Service, Engineering Division

Figure 2.13

APPENDIX Y

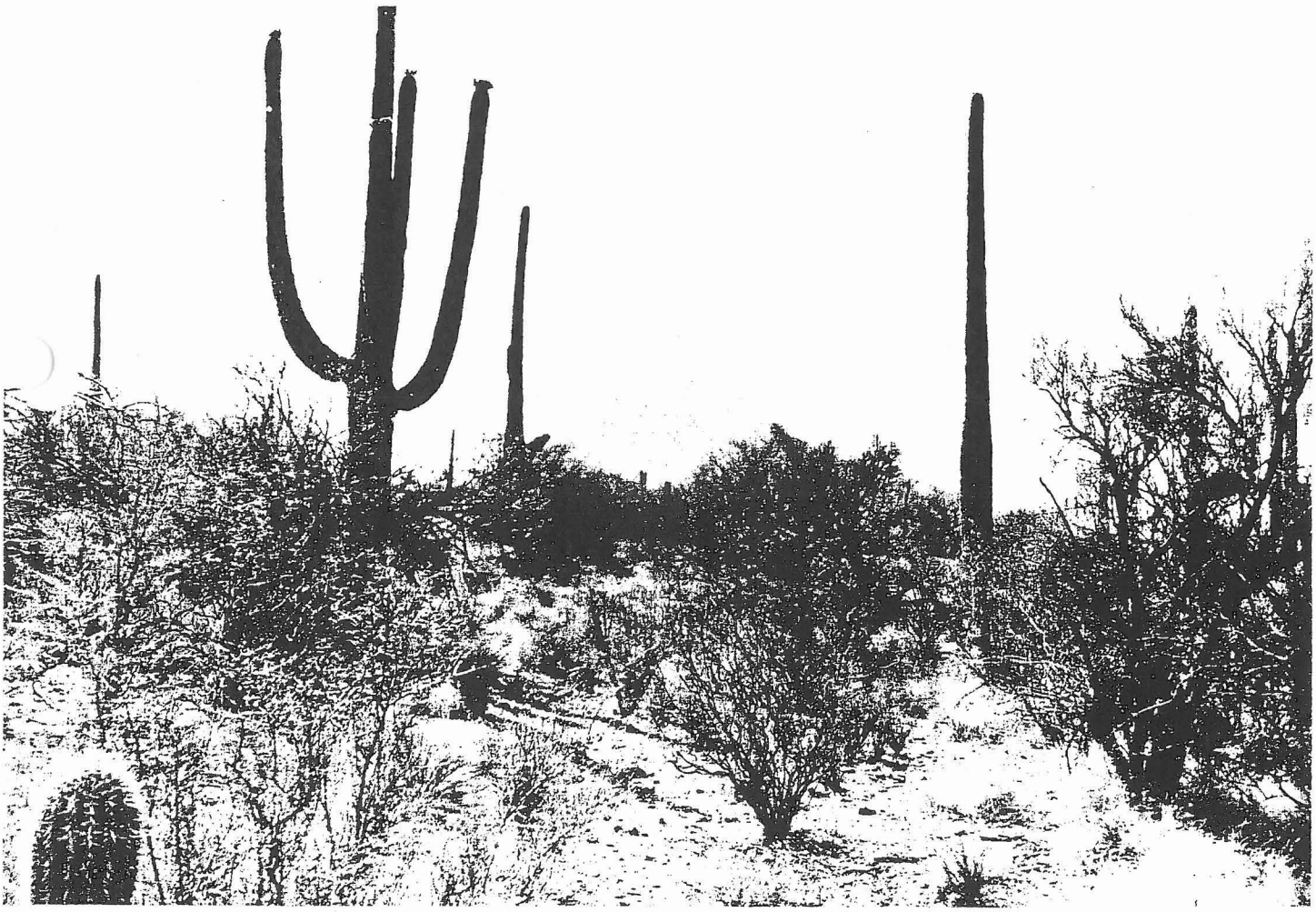
SOIL DATA

Appendix E: Soils Data

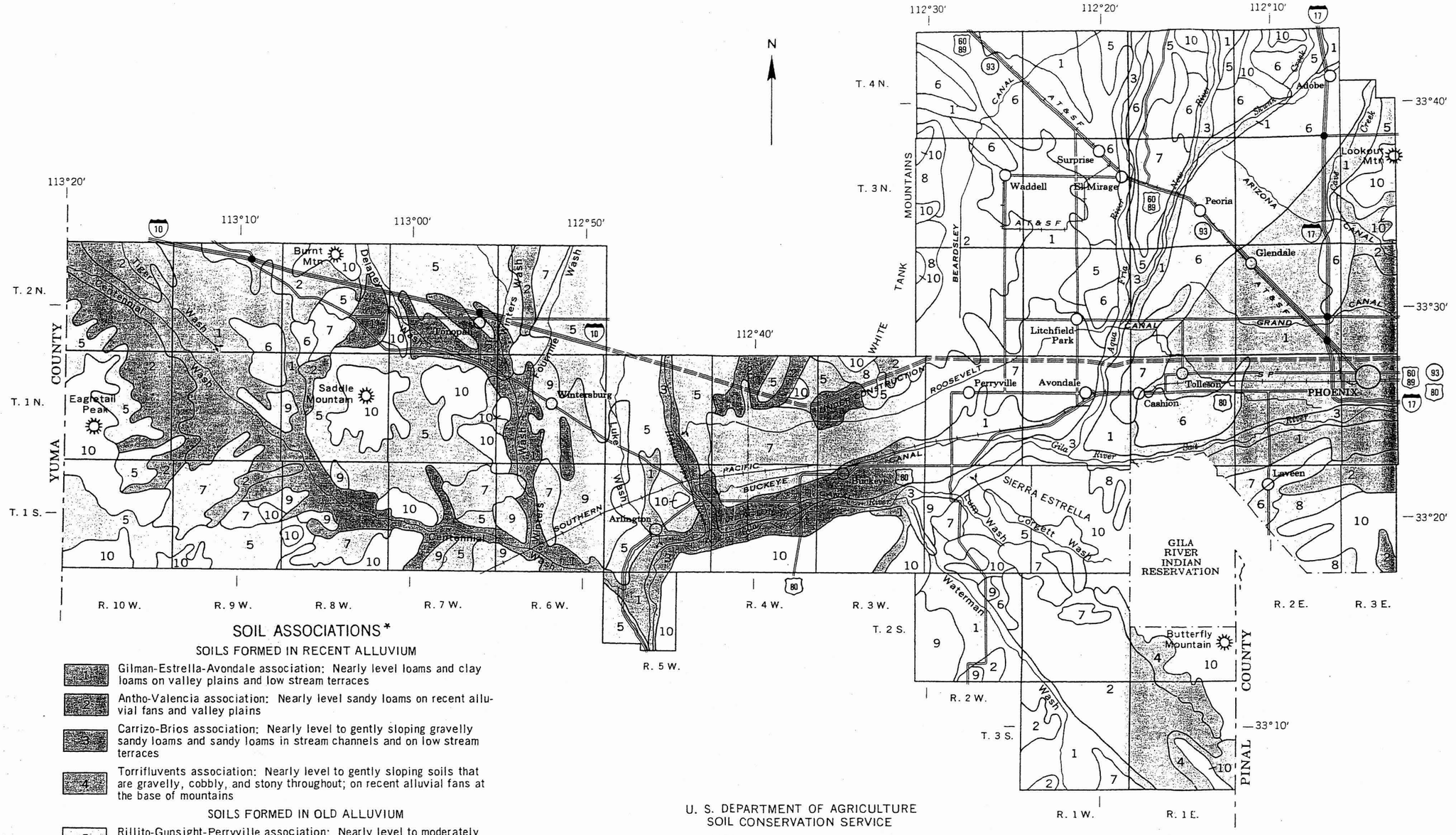
SOIL SURVEY OF

Maricopa County, Arizona

Central Part



United States Department of Agriculture
Soil Conservation Service
in cooperation with
University of Arizona
Agricultural Experiment Station



SOIL ASSOCIATIONS*

SOILS FORMED IN RECENT ALLUVIUM

1. Gilman-Estrella-Avondale association: Nearly level loams and clay loams on valley plains and low stream terraces
2. Antho-Valencia association: Nearly level sandy loams on recent alluvial fans and valley plains
3. Carrizo-Brios association: Nearly level to gently sloping gravelly sandy loams and sandy loams in stream channels and on low stream terraces
4. Torrifluvents association: Nearly level to gently sloping soils that are gravelly, cobbly, and stony throughout; on recent alluvial fans at the base of mountains

SOILS FORMED IN OLD ALLUVIUM

5. Rillito-Gunsight-Perryville association: Nearly level to moderately steep gravelly loams and loams on old alluvial fans and valley plains
6. Mohall-Laveen association: Nearly level loams and clay loams on old alluvial fans and valley plains
7. Laveen-Coolidge association: Nearly level sandy loams, loams, and clay loams on old alluvial fans and valley plains
8. Ebon-Pinamt-Tremant association: Nearly level to gently sloping gravelly loams, very cobbly loams, and gravelly clay loams on old alluvial fans at the base of mountains
9. Casa Grande-Harqua association: Nearly level to sloping, saline-alkali loams, sandy loams, and gravelly clay loams on valley plains

SOILS OF MOUNTAINS AND BUTTES

10. Cherioni-Rock outcrop association: Gently sloping to very steep very gravelly loams and Rock outcrop on mountains, buttes, and low hills

* The texture mentioned in the name of each association refers to the dominant texture of the surface layer of the major soils.

Compiled 1976

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

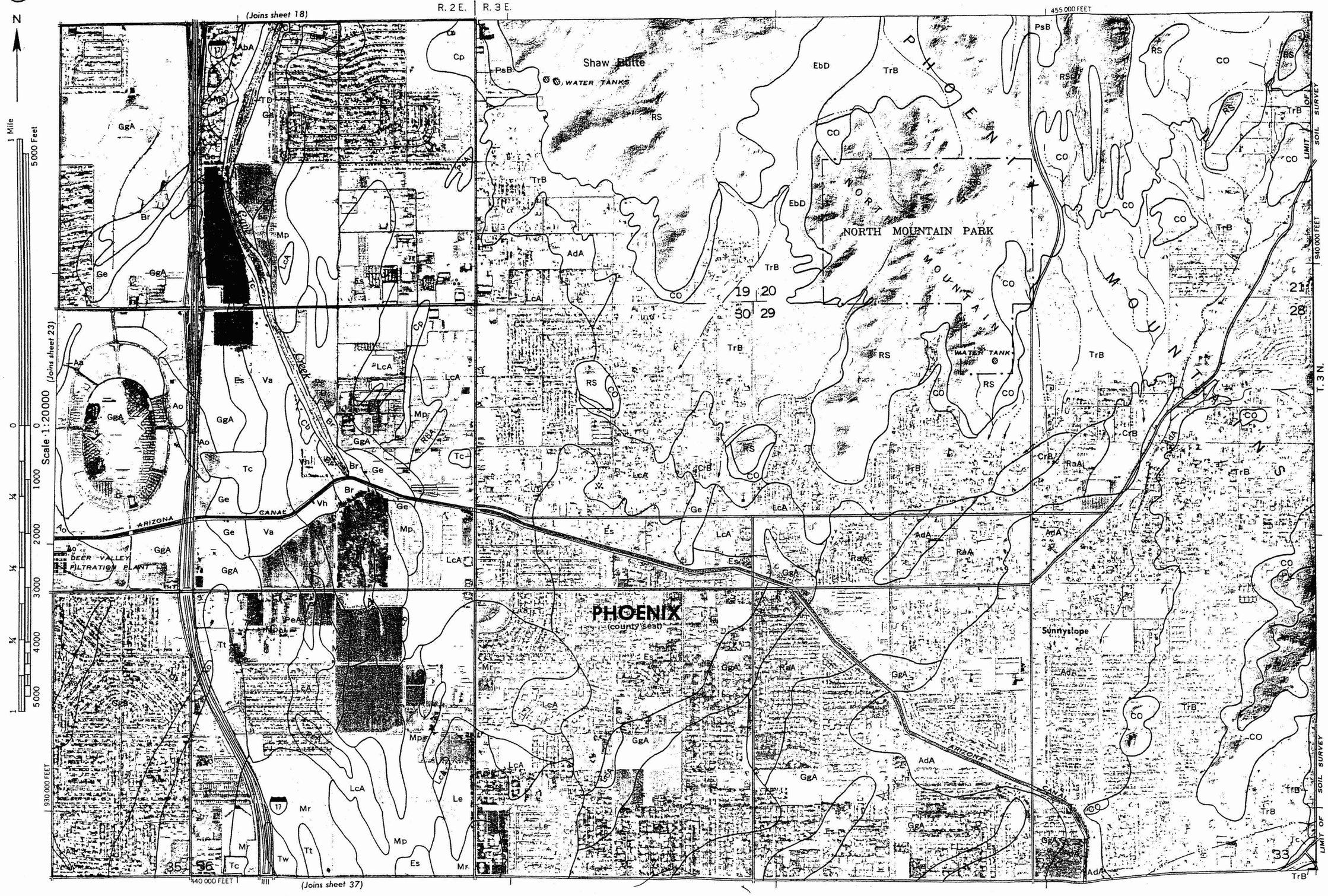
UNIVERSITY OF ARIZONA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

MARICOPA COUNTY, ARIZONA, CENTRAL PART

Scale 1: 380,160
1 0 1 2 3 4 5 6 Miles

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.


N
1 Mile
5000 Feet
Scale 1:20000
R. 2 E.
R. 3 E.
(Joins sheet 18)
(Joins sheet 23)
(Joins sheet 37)
455 000 FEET
940 000 FEET
930 000 FEET
440 000 FEET
T. 3 N.
LIMIT OF SOIL SURVEY
Shaw Butte
WATER TANKS
NORTH MOUNTAIN PARK
MOUNTAIN
WATER TANK
PHOENIX
(county seat)
Sunnyslope
ARIZONA CANAL
DEER VALLEY FILTRATION PLANT
Cave Creek
CANAL
19
20
30
29
21
28
35
36
33
AbA
Ma
TD
GgA
Ge
Cp
PsB
EbD
TrB
RS
CO
AdA
Br
Es
Mp
LcA
Va
Ao
Aa
Tc
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RaA
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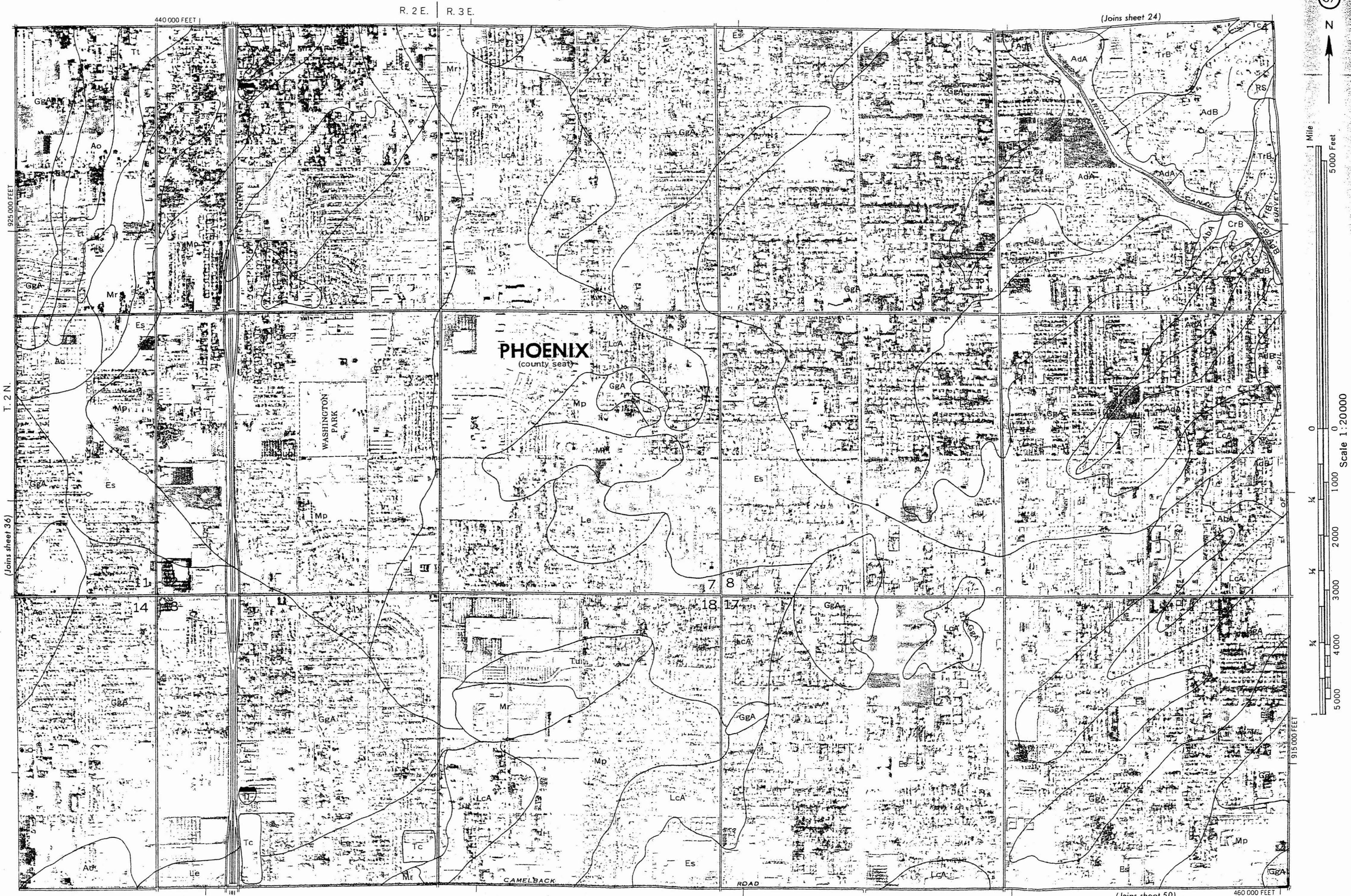
Le
Tt
Tw
PeA
CrB


R. 2 E.
R. 3 E.
440 000 FEET
(Joins sheet 24)
37
N
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
925 000 FEET
915 000 FEET
T. 2 N.
(Joins sheet 36)
(Joins sheet 50)
460 000 FEET
PHOENIX
(county seat)
WASHINGTON PARK
ARIZONA
CANAL
CAMELBACK
ROAD
Tt
GgA
Ao
Mp
Mr
Es
LcA
Le
Tu
Tc
AdA
AdB
TrB
RS
CrB
11
14
7
8
18
17

MARICOPA COUNTY, ARIZONA, CENTRAL PART — SHEET NUMBER 50

(50)

N

R. 2 E. | R. 3 E.

460 000 FEET

910 000 FEET

900 000 FEET

T. 2 N.

(Joins sheet 37)

(Joins sheet 49)

(Joins sheet 67)

440 000 FEET

1 Mile 5000 Feet

Scale 1:20000

0 0

¼ ½ ¾ 1

1000 2000 3000 4000 5000

CAMELBACK ROAD

GRAND CANAL

AVENUE

CENTRAL

LIMIT

GRAND

ATCHISON TOPEKA AND SANTA FE

PHOENIX
(county seat)

Encanto Park And Golf Course

State Fairground

Phoenix Country Club

G.P.

Mp Es LcA Le Mr GbA Ao Gt Tc

31 32

APPENDIX Z

FLOODING RECORDS / PHOTOS

PUBLIC MEETING

Flooding Along Roma Avenue Near 21st Avenue

This photo was taken on Roma Avenue looking west towards 21st Avenue.

Ponding along Roma Avenue

This photo was taken after the storm event had passed.

24th Avenue & Camelback Road Drai. .ge Project - COP Project #ST83120017

Citizen Historical Input Log

Date of Contact	Location/Address	Depth of Water	Cause of Flooding	Name	Phone Number	Contact Time
06/20/02	19th Ave & Turney	ROW / pkg lot	rain	Lisa Hubbard		
06/20/02	23rd Ave Beth Home-Ind Sch	street/over curbs	rain	Lisa Hubbard		
06/25/02	2509 N. 23rd Ave - (home)	driveway	rain from street	Betty Higgins	602-973-7608	
06/26/02	1929 W. Georgia Ave	flooded carport & storage shed-bagged so didn't enter house	heavy rain	Charlie	602-249-3290	Daytime
06/26/02	Georgia & 19th Drive	water flows west and floods this intersection into the houses	heavy rain	Charlie (his neighbors)	602-249-3290	Daytime
06/26/02	5016 N. 24th Ave	no flooding at 24th & Cmlbk since the detention basins were installed	heavy rain	Mary Leonard	602-249-0435	
06/27/02	2222 W. Medlock			Florence Duran	602-433-2925	
06/27/02	5015 N. 24th Ave	None for 4 years installed floorboards for protection. 24th Ave much lower than I-17-she has gone to the council many times & keeps records since 1991-Bill Luke gets most water.	heavy rains - when storm drain has to override the Salt River	Linda Kantor	602-242-7178	After 4:00 pm
07/02/02	**Westwood Citizen Meeting**					
	2059 W. Campbell Ave			Maybelle Huffaker	602-266-1963	
	4638 N. 22nd Ave			Ken & Claire Radich	602-246-4043	
	2146 W. Pierson St			Christel Kurtenback	602-242-8846	
	2040 W. Hazelwood	major flooding @ their home-they brought pictures	heavy rains	Jackie & Louis Fleck	602-246-4559	
	4515 N. 20th Ave			Ralph Breninger	602-246-4026	
	2002 W. Roma	Neighborhood activist-would like to see something done for their neighborhood-like a park that could double as a detention basin		Jerry & Donna Neill	602-266-9382	

Date of Contact	Location/Address	Depth of Water	Cause of Flooding	Name	Phone Number	Contact Time
07/02/02	**Westwood Citizen Meeting - (Con't)**					
	2402 W. Devonshire #18	lots of flooding @ his home	heavy rains	Al Synder	602-246-7486	
	Historical Input: 21st & 23rd Ave seem to flood the most. It floods behind Childress & behind the businesses between 19th Ave & the ally. 21st is the worst area for water spreading out.Last big rain, Campbell was shut down from 20th St to 21st St. The water ran heavily east of I-17 down Camelback Rd. The sewage overflows when heavy rains come (who can they report this to? It's a mess!!) Hazelwood from 23rd Ave to 20th Ave - worst @ 2034. Flooding between Devonshire & Glenrosa - starts @ I-17 to 23rd Ave, 2402 gets hit hard. **Comments from Donna Neill**: each community should benefit from support of the project - they are very interested in a park addition and enhancements.					
07/10/02	1911 W. Denton Lane	Comes down 19th Ave onto Denton & goes into her driveway - has entered utility room & work shop in the back yard	heavy rains	Barbara Deblock	602-246-7975	
07/11/02	4515 N. 23rd Ave	Live between Campbell & Cmlbk - water comes up from road into yard & form a lake - then runs into the house.	heavy rains	Edgar Conrad	Sent Letter	
07/16/02	5326 N. 19th Ave	Did not receive 1st notice; confirmed that he is on our mailing list & sent him second notice		Gary Sammon		
07/16/02	W. Roma - 21st Ave east to 19th Drive south to Turney	Ralph called in on behalf of this neighborhood: 2019, 2025, 2043 W. Roma - the water was up past the footings of these houses - Roma becomes a lake.	pretty much any rain causes flooding in Roma	Ralph Benniger: 4515 N. 20th St	602-246-4026	
07/24/02	Turney - between 19th Ave & 23rd Ave	Floods into her garage	heavy rains	Doris Spillvall	602-279-2007	

08/1[illegible]	2037 W Roma	Flooding caused to her and her neighbors by changes made in Campbell Ave & 21st Ave - the City has proveded them with snad bags in the past - she has lived there since 1971 and even with the 100 year rains in 1980-1980 (?) her house didn't flood - now since changes in Campbell several of them flood.	mod[illegible]e to heavy rains	Joyce Synder	602-241-0444 ext. O 602-274-6175	
08/19/02	2102 W. Marlette	Questions about public meeting		Lois Damashek	602-246-1221	
08/20/02	2031 W. Solano Dr	Questions about basins and public meeting		Ethel Probst	602-242-3095	
08/20/02	2416 W Marshall	Tree died after water meter was relocated		Mary Patricio	602-246-1392	
08/22/02		Left message - how long will project last?		Gary Frederick	602-995-3487	
08/22/02	Myrtle	Wanted more information about the project		Chris Higgins	602-650-8128	
08/22/02	Turney	The basin would be directly behind her house - she is concerned and will fax me a letter about her concerns-she cannot attend mtg-she is concerned about a park where people have unlimited access, etc.		Lisa Richards	602-277-9807	
08/22/02		Wanted more information about the basins		Sue Capp	602-995-4781	

Sign In Sheet for the Public Information Open House held at Westwood Elementary School 4711 North 23rd Avenue

24th Avenue & Camelback Road Drainage Improvement Project

August 29, 2002
6:30 pm – 8:00 pm

	Name	Address	Telephone #
1.	Ralph Broxinger	4515 N. 20th Ave. Phx. 85015	602-246-4026
2.	JAMES NEWMAN	4540 N 18TH DRIVE PHX 85015	279-0441
3.	Donna Ellis	2002 W Roma Phx 85015	266-9882
4.	Renie Matias	2038 W. Campbell 85015	336-0918
5.	Lori Pearce	In Roads	
6.	HASAN MUSHTAQ	200 W. WASHINGTON ST. 85003	262-4026
7.	STEVEN TUCKER		602 506 4872
8.	Paul Driver	1034 E. Madison 85003	495-2045
9.	Paul Ennis	2137 W Ennis	433-9130
10.	JACQUELINE MITCHELL	INROADS	
11.	Pat Fyi	Premier Engr	480-829-6000
12.	Russ Mead	FCDMC	602-506-2961
13.	Gene Gethin	4316 N 20th AVE	602-277-7652
14.	Deborah Coombs	2131 W Hatcher	602-242-6160
15.			

Sign In Sheet for the Public Information Open House held at Westwood Elementary School 4711 North 23rd Avenue

24th Avenue & Camelback Road Drainage Improvement Project

August 29, 2002
6:30 pm – 8:00 pm

	Name	Address	Telephone #
16.	Jerry Neil	2002 W. Roma 85015	602-266-9382
17.	Anita Darling RN	5012 N 24th Ave	unlisted
18.	Marian Holden	City Staff	602-495-2050
19.	Jo Wright	2324 W. Myrtle	602-995-3542
20.	Louis & Jackie Fleck	2040 W. Hazelwood St	602-246-4559
21.	Maria Davis	5011 N 24th Ave	602 242 9166
22.	Linda Kantor	5015 N. 24th Ave	602 242 7178
23.	John Purdon	5008 N 24th Av	602 585-6624
24.	Patrick Morgan	2125 W Augusta Ave	" 995-4533
25.	George & Helen Kapp	2213 W. Cactus Wren Dr.	602-995-4781
26.	Dave Peterson	1034 E Madison	
27.	Keith Duffy.	~~Ho~~ Premier Engineering	480 829 600
28.	Richard Benitez	COP St. Trans. / D.C.M.	602-534-7073
29.	Cynthia L Nord	2022 W Hazelwood st	NOT LISTED
30.	Jeff Holzmeister	2036 E Redfield	480 413-1132

CITY OF PHOENIX
STREET TRANSPORTATION DEPARTMENT
24th Avenue and Camelback Road
ST83120017

Drainage Issues Comment Notes - August 29, 2002

Name _____ Date _____

Address 18th Ave & Turney Telephone No. _____

Address _____

Comments Do not tear up Camelback Road during const.

CITY OF PHOENIX
STREET TRANSPORTATION DEPARTMENT
24th Avenue and Camelback Road
ST83120017

Drainage Issues Comment Form - August 29, 2002

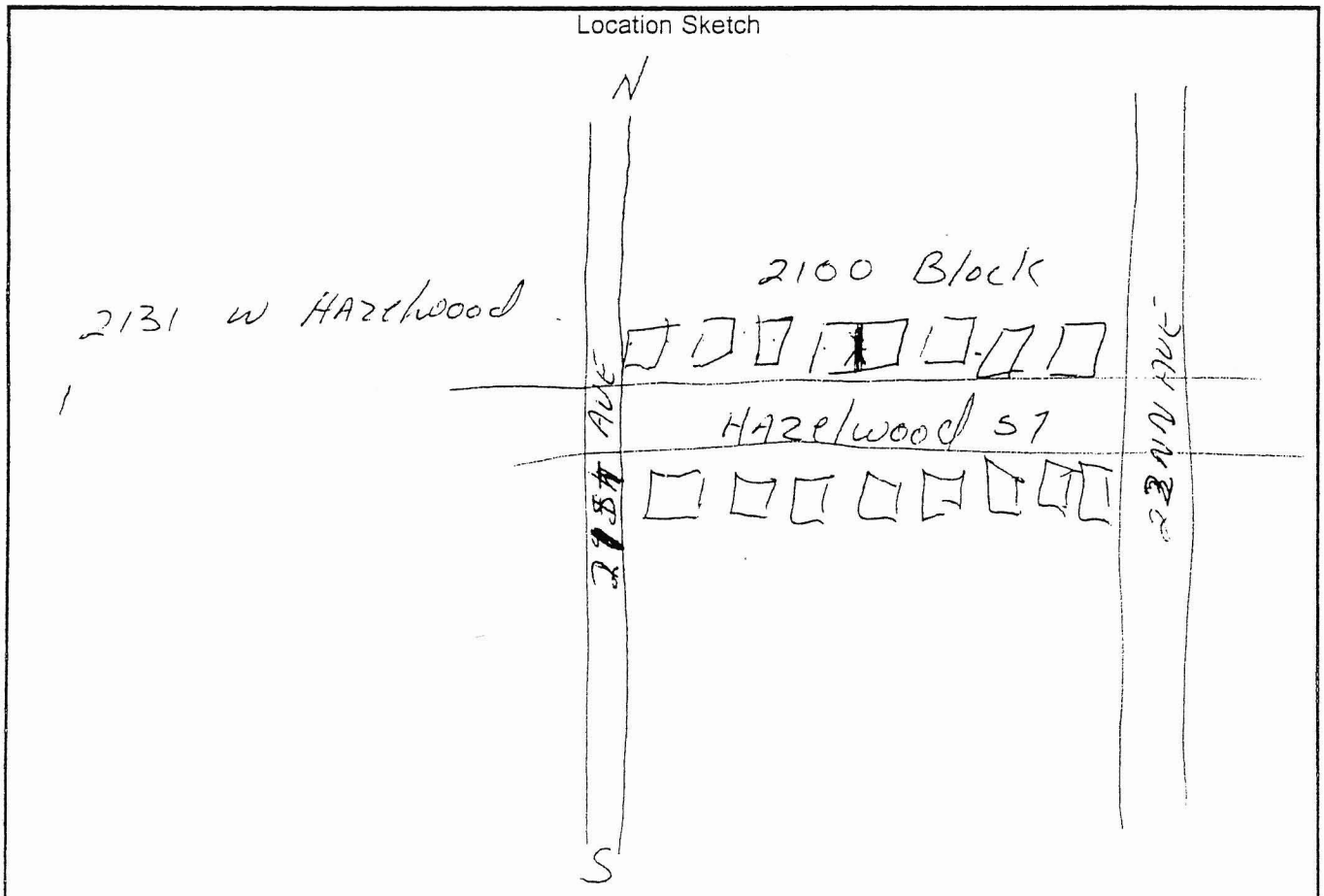
Name Deborah E Coombs Date 8-29-2002
Address 2131 W Hazelwood Telephone No. 602-242-6160
Address

Please identify any flooding or drainage problems that you have experienced or observed. It would be helpful if you could indicate the frequency and the depth of the flooding. Leave this form with the staff at the public meeting or mail to: InRoads, 15849 N. 71st Street, Suite 100, Scottsdale, AZ 85254.

Property Owner Comments

My Family has owned the house since it was built - No one in the neighborhood has ever been flooded
I VOTE for Alternative 4

Location Sketch



Include: North arrow, buildings, fences, pavements, drainage structures and drainage patterns

CITY OF PHOENIX
STREET TRANSPORTATION DEPARTMENT
24th Avenue and Camelback Road
ST83120017

Drainage Issues Comment Form - August 29, 2002

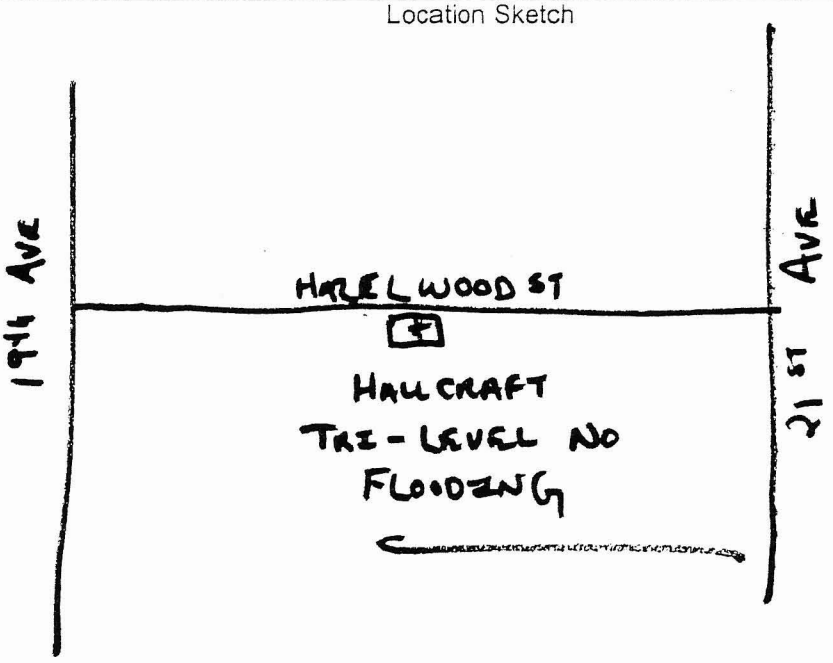
Name CYNTHIA NOEL Date 8-29-02
Address 2022 W HAZELWOOD ST Telephone No. 602 249-9114
Address PHX AZ 85015

Please identify any flooding or drainage problems that you have experienced or observed. It would be helpful if you could indicate the frequency and the depth of the flooding. Leave this form with the staff at the public meeting or mail to: InRoads, 15849 N. 71st Street, Suite 100, Scottsdale, AZ 85254.

Property Owner Comments

I'm IN FAVOR of Alternative #4 STORM DRAIN SYSTEM

Location Sketch



Include: North arrow, buildings, fences, pavements, drainage structures and drainage patterns

6

CITY OF PHOENIX
STREET TRANSPORTATION DEPARTMENT
24th Avenue and Camelback Road
ST83120017

Drainage Issues Comment Notes - August 29, 2002

Name JAMES NEWMAN Date

Address 4540 N 18TH DR Telephone No. 602-279-0444

Address

Comments BASOLT SHOULD BE MOVE ACROSS 21 AV. TO PARK

STUDENT WILL BE AT SCHOOL 5 DAY AWEEK, BETWEEN 1000 AM 1200 STUDENT WILL BE THERE 5 DAY A WEEK A DEPRESSED AREA IN A SCHOOL STUDENT COULD GET HURT ON PLAY GROUND

AT THE PARK PEOPLE WOULD BE THERE 2 DAY A WEEK DOGS COULD GO DOWN THE SLOPE VERY EASY

CITY OF PHOENIX
STREET TRANSPORTATION DEPARTMENT
24th Avenue and Camelback Road
ST83120017

Drainage Issues Comment Notes - August 29, 2002

Name Jo Wright
Address 2324 W. Myrtle Ave
Address Phx. Az 85021

Date 8-29-02
Telephone No. 602-995

Comments Basin J. I would like to be notified when the decision is made. I'm not really in favor of either plan - Basin or Gomes. If it becomes a basin/park what kind of security will the homeowners have from the influx of traffic? Will there be a barrier along the east side of the property?

CITY OF PHOENIX
STREET TRANSPORTATION DEPARTMENT
24th Avenue and Camelback Road
ST83120017

Drainage Issues Comment Form - August 29, 2002

Name Patricia Logan Morgan Date

Address 2125 W. Augusta Ave Telephone No. 602-995-4533

Address 85021

Please identify any flooding or drainage problems that you have experienced or observed. It would be helpful if you could indicate the frequency and the depth of the flooding. Leave this form with the staff at the public meeting or mail to: InRoads, 15849 N. 71st Street, Suite 100, Scottsdale, AZ 85254.

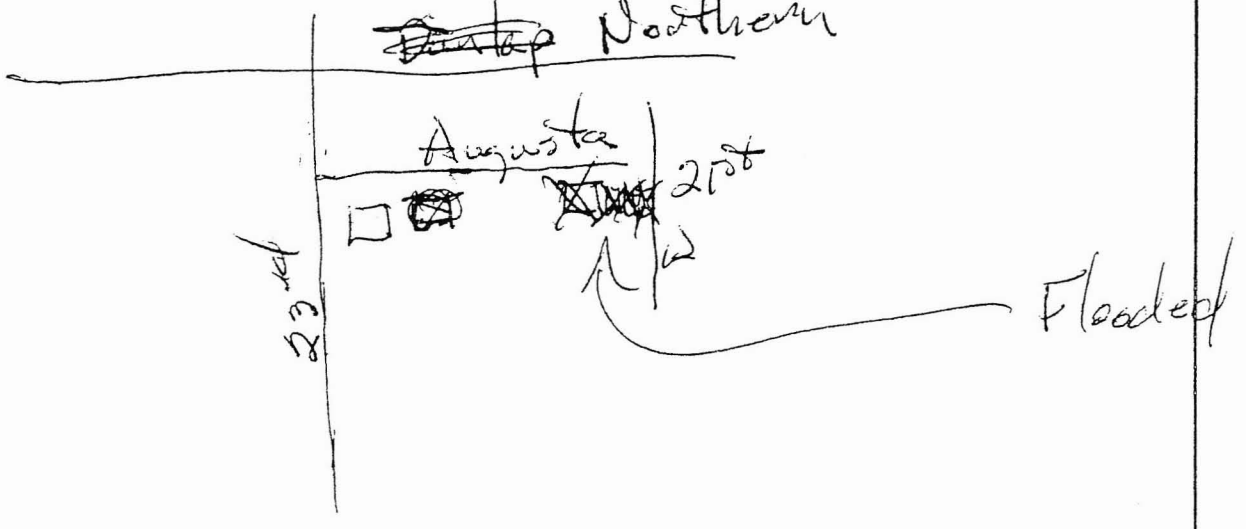
Property Owner Comments

Talked to Paul Driver
& Hassan Mushtaq

Location Sketch

Roger Fyffe 534-0342

Flooding from storm drain ~~but~~ on 23rd Ave between Northern & Dunlap



Include: North arrow, buildings, fences, pavements, drainage structures and drainage patterns

CITY OF PHOENIX
STREET TRANSPORTATION DEPARTMENT
24th Avenue and Camelback Road
ST83120017

Drainage Issues Comment Form - August 29, 2002

Name Donna Neill
Address 2008 W Roma
Address

Date Aug 29, 02
Telephone No. 463-1207

Please identify any flooding or drainage problems that you have experienced or observed. It would be helpful if you could indicate the frequency and the depth of the flooding. Leave this form with the staff at the public meeting or mail to: InRoads, 15849 N. 71st Street, Suite 100, Scottsdale, AZ 85254.

Property Owner Comments

Regional Detention - Yes

Location Sketch

Include: North arrow, buildings, fences, pavements, drainage structures and drainage patterns

CITY OF PHOENIX
STREET TRANSPORTATION DEPARTMENT
24th Avenue and Camelback Road
ST83120017

Drainage Issues Comment Notes - August 29, 2002

Name Anita Martinez
Address 5012 N. 24th Avenue
Address Phoenix, Arizona

Date 8-29-02
Telephone No.

Comments

I live @ 5012 N 24th Ave -
It was the home of my parents.
I am retired. This house is more
than dollars + cents. My father
planted trees etc.
I am a retired VA Nurse, as of 1995.
I like my location because it is
an old neighborhood and believe
it or not a quiet one.

Thanks

CITY OF PHOENIX
STREET TRANSPORTATION DEPARTMENT
24th Avenue and Camelback Road
ST83120017

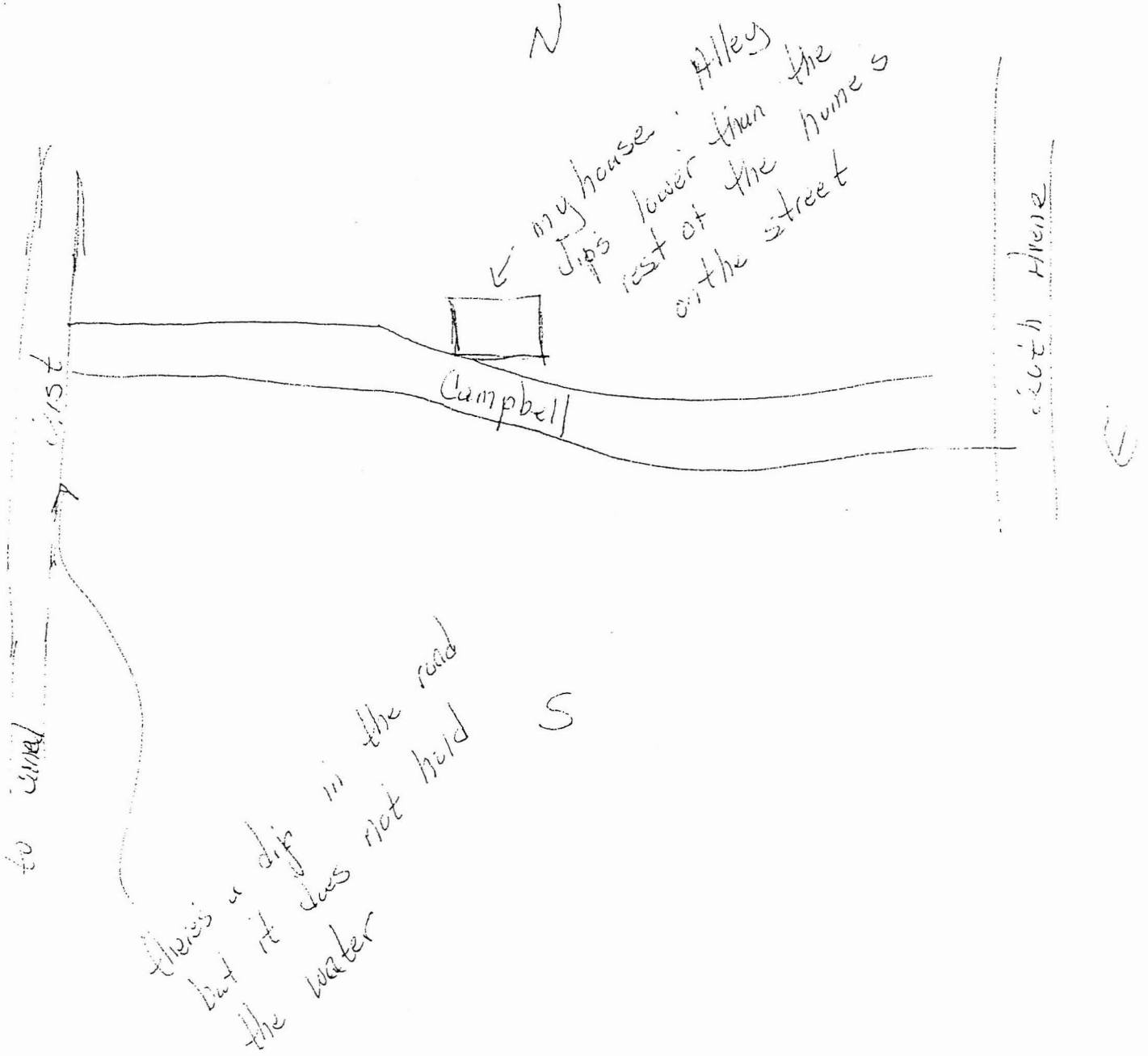
Drainage Issues Comment Notes - August 29, 2002

Name Eugene Geffie
Address 4316 N 20th AVE
Address Phoenix AZ,

Date Aug. 29, 2002
Telephone No. 602-277-7632

Comments We live beside Basin X, & would like to no the elevation of the north side compared to our propertie elevation. I also would like to know where the water will go if the basin X fills up. I don't want it backing up on to my property

have been times when we tried to stop the car traffic on Campbell since the cars force the water back into our properties as we are pushing water to the street.



CITY OF PHOENIX
STREET TRANSPORTATION DEPARTMENT
24th Avenue and Camelback Road
ST83120017

Drainage Issues Comment Form - August 29, 2002

Name Kuby Valenzuela & Irene B. Mucus
Date 08/29/02
Address 2038 W Campbell Ave
Telephone No. (602) 336-0918
Address Phx, AZ 85015

Please identify any flooding or drainage problems that you have experienced or observed. It would be helpful if you could indicate the frequency and the depth of the flooding. Leave this form with the staff at the public meeting or mail to: InRoads, 15849 N. 71st Street, Suite 100, Scottsdale, AZ 85254.

Property Owner Comments

Location Sketch

Recently no problems, since we are experiencing the heavy monsoons we normally get. A few years ago, I had water in my house several times. I live in the middle of Campbell and the street dips to my house. I get water from the alley and it stops @ my house. My neighbors' yards are completely flooded but they dont get water inside. East of my neighbors on the west of me do not have block fences. I do - so I stop the water. I have built a curb on the west side of my house and also a step up to the alley which helped. The city came out one time and added gravel in the dirt alley to try and level the alley. It helped but did not completely solve the problem. The water is a river on 21st avenue - runs into the alley then onto our properties. There is not a straight shot to the canal. There →

Include: North arrow, buildings, fences, pavements, drainage structures and drainage patterns

City of Phoenix
STREET TRANSPORTATION DEPARTMENT

July 3, 1991

Ms. Linda Kanter
5015 North 24th Avenue
Phoenix, Arizona 85015

Dear Ms. Kanter:

RE: STORM FLOODING AT 24TH AVENUE & CAMELBACK ROAD, Q.S. 18/23

Councilman Tribkens' assistant has contacted us and requested that we write to you directly concerning the storm flooding which you have observed at 24th Avenue and Camelback Road.

On June 7, 1991, Donna Weiss of our office contacted you and noted some of your concerns. As you have observed, the flooding extends up 24th Avenue. The flooding results because Interstate 17 to the west and 23rd Avenue to the east are approximately 3 feet higher than Camelback Road at 24th Avenue. Additionally, the car dealerships to the south have raised the land so that water cannot drain to the south. Therefore water ponds to a depth of approximately 3 feet at this location.

We don't believe that the freeway pumps have any influence on this situation. It is a result of the development to the south which began in the 1940's. At the time the City annexed this area in 1958, the drainage had already been cut-off to the south at Highland by the construction of homes on unsubdivided land between the freeway and 23rd Avenue. The car dealerships were constructed about 1971 further obstructing drainage to the south. In 1982 apartments were constructed south of the car dealerships further complicating the situation. As a result of this development and condominiums located along Campbell Avenue between Interstate 17 and 23rd Avenue it is impossible to provide surface drainage to the south from the intersection of 24th Avenue and Camelback Road. While the City of Phoenix has a storm drain system throughout its major streets, the purpose of this system is to drain the two year storm so that the streets are driveable. Whenever a heavier rain falls, flooding does occur and will continue to occur at the intersection.

125 East Washington Street, Phoenix, Arizona 85004 602-262-6284

The Local Flooding Task Force has looked at this problem and estimates that the cost to correct it would be $2,000,000. The solution proposed would be the demolition of homes in the area and the creation of a detention basin. This is one of approximately 120 unfunded projects which are being included in a report to Mayor and Council. If the Mayor and Council desire to fund the project, priorities will be assigned to them and as funds are available solutions will be sought. At this time funds are very limited.

It may be that the neighborhood would not want to have the homes demolished. This would not be done until a engineering study is done to be sure that no other possibilities are feasible and the solution proposed is acceptable to the neighborhood. In the meantime you and your neighbors should construct low flood walls. Berms and/or some form of closures will have to be installed at the driveway entrances. The homeowners in the neighborhood should also purchase flood insurance on their homes and contents. Flood insurance is available at a low cost throughout the City of Phoenix and any insurance agent should be able to provide it.

I regret that this is not the answer that you would liked to have received. However there is no solution to the flooding other than a project of one to two million dollars. I would be happy to come to the neighborhood and speak at a neighborhood meeting should the neighbors wish to discuss this in more depth. Please contact me at 262-4960 if you wish to do this or have any further questions.

Sincerely,

James H. Matteson, P.E.
Street Transportation Director

Paul Kienow

Paul E. Kienow, P.E.
Floodplain Management Engineer

JHM/PEK/aff/910703a

c: MAIDI
Ms. Terry Council Assistant District 5 262-7447
Mr. David A. Moody
Mr. Melvin
Mr. Traines

TUES 7/16 9:00am

****
****

CITY COUNCIL REPORT AGENDA

DATE: September 1, 1992 DATE:

TO: Jack Tevlin ITEM:
Deputy City Manager

FROM: James H. Matteson, P.E.
Street Transportation Director

SUBJECT: STORMWATER FLOODING REPORT - JULY AND AUGUST 1992

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PURPOSE

A severe thunderstorm occurred in the City of Phoenix on the night of July 23 and early morning of Friday, July 24, 1992. This is a brief report describing the size and intensity of the storm and the extent of flooding. Additional storms occurred during August with the most severe occurring on Saturday, August 22, 1992.

This report discusses the impact of the storms, as well as a proposal for projects to mitigate the damages.

DISCUSSION

The July 24 rainstorm was citywide, but the greatest rainfall was centered over the general location of 27th Avenue and Camelback Road. Rain began to fall shortly after 10:00 p.m. on Thursday night, July 23 and continued on through noon on Friday, July 24, 1992. Rainfall was more than six inches at 27th Avenue and Camelback Road and radiated out to a two inch rainfall over most of the City. The statistical frequency of the storm is well over a 100-year rainfall at the storm center and reduces to approximately a two-year rainfall at Papago Park. While not quite as large, this storm is similar to the August 16, 1963 storm which was centered at 59th Avenue and Glendale; the June 22, 1972 storm located at 24th Street and Camelback Road, and the August 14, 1990 storm located in the vicinity of 7th Street and Glendale Avenue. Much larger summer storms were recorded in August 2, 1943 and October 19, 1972. The rain gauge located at Maryvale Municipal Golf Course at 59th Avenue and Indian School Road recorded 3.78 inches in less than eight hours. This was the largest rainfall ever recorded on an official gauge in the City of Phoenix and was the fourth largest storm recorded in approximately 50 years of record keeping. It appears that the City of Phoenix is being subjected to more intense summer thunderstorms on a greater frequency.

The Saturday, August 22 storm was not nearly as intense and was concentrated in the northerly part of the City.

NEIGHBORHOODS REPORTING MAJOR FLOODING

Grand Canal West of 43rd Avenue - Water ponded along the north side of the Grand Canal. This has been recognized as a Special Flood Hazard Area (SFHA) since the beginning of the National Flood Insurance Program in 1979. An exact count is not available, but it is estimated that 100 houses flooded west of 43rd Avenue. These are the homes that received most of the publicity on television and in the newspaper. While the situation is indeed unfortunate, a method of preventing this flooding is difficult. There are three large storm drains in the vicinity: 51st Avenue - 72", 43rd Avenue - 66", and 39th Avenue -78". They were all flowing at their maximum capacity.

In the area near 71st Avenue & Campbell Avenue, four storm drains have been placed: 73rd Avenue & Highland - 24", 71st Avenue & Campbell - 1-42" and 1-24", and 67th Avenue & Turney - 1-60" and all were carrying their maximum flow. During the morning of July 24 several large pumps placed by our staff pumped water into the Grand Canal to help matters.

In the early 1960s flood control planning intended for flood control projects to relieve this area of flooding. They were eliminated from the program many years ago, probably because of a low benefit/cost ratio (less than 1.0). The construction of the Arizona Canal Diversion Channel (ACDC), while greatly reducing the amount of water which can reach this area, does not eliminate the threat of flooding. It is not feasible at this time to construct a channel westerly along the Grand Canal to the Agua Fria River due to the complexity of water transfers.

Therefore, a channel to the west is no longer feasible. While deep tunnels to the Salt River would be a solution, it would be very costly, approaching the cost of the ACDC. It seems that the most reasonable method of preventing this flooding will be the purchase of large numbers of homes and a creation of a "greenbelt" park type detention basin at selected areas along the canal. While detention basins farther up the watershed would help, water will still continue to accumulate and will be a threat to the homes along the canal. Construction of the Paradise Parkway may be a solution.

Indian School Road and 35th Avenue - The large detention basins filled and overflowed to the south. These basins were designed to hold a 50-year flood. They have never been filled before. Water nearly three feet deep over topped Indian School Road just east of the Grand Avenue overpass.

Grand Canal East of 19th Avenue - Late on July 29, 1992 a resident reported that a number of homes were flooded along the Grand Canal in this area. The total number of homes flooded here is estimated to be 50. The comments concerning the area along the Grand Canal above would apply in this case also. One of the residents reported 6 1/4 inches of water in their rain gauge.

24th Avenue and Camelback Road - This is a low area on the north side of Camelback along 24th Avenue. It has a history of flooding, and structures have been flooded many times since the subdivision was constructed. Neighborhood meetings have been held, and the neighbors are well aware of the problem. However, they are tired of repeatedly being flooded and have contacted the City again requesting some form of relief. The spokesperson for this neighborhood reported that at least eight houses had water in them, and more would have had water in them if they had not put up their floodproofing barriers during the storm. They also reported that a large number of cars at the car dealership on the south side of Camelback Road had up to six inches of water in many cars. One of the neighbors reported five inches of rainfall.

It is not possible to drain this neighborhood, and the Local Flooding Mitigation Program recommended the demolition of several homes and the creation of a detention basin. There is no other economically feasible solution to this flooding.

Verde Lane and 27th Avenue - This area which is drained by a 60" and a 24" storm drain flooded again. Some 20 homes were flooded. Flowage easements were purchased here in the mid-1980s.

Northwest Corner of Tatum and Shea Boulevard - There is a large wash which drains the north side of Squaw Peak and crosses Shea Boulevard a few hundred feet west of Tatum Boulevard. Large amounts of debris and mud several feet deep were deposited in the streets early on July 25. Eight homes were flooded in the Morningstar Subdivision. As are most of the other Local Flooding Projects, there is no inexpensive solution to this problem. The City had planned a large detention basin (Detention Basin No. 8) in the mountains which would have reduced the flow, but this would still not solve the problem. A major bridge is required on Shea Boulevard, and a channel must be constructed to Indian Bend Wash. Since there is little or no right-of-way, this will be a difficult and expensive project.

Arizona Canal East of 40th Street (South of Camelback Road) - Since the Arizona Canal Diversion Channel project stops at approximately 40th Street, no protection is provided for those homes located on the north side of the Arizona Canal from 40th Street to the Scottsdale City limits. The only reported flooding was in the Camelback Castille Condominium project. The spokesperson for this project notified the City that 21 first-floor units were flooded. A resident reported lots of mud and damage and was quite upset since they have been flooded several times. Comments concerning the Grand Canal also apply to this part of the Arizona Canal.

We ultimately will provide protection east of 44th Street with the Lafayette interceptor draining into the Old Cross Cut Canal. The area between 40th and 44th Streets still must be addressed.

Arcadia Area - The Arcadia Area north of the Arizona Canal, west of 64th Street, and east of 44th Street has much the same flooding history as the prior areas. The proposed solution is a large interceptor storm drain along Lafayatte bringing stormwater to a detention basin just north of the Arizona Canal at about 49th Street.

As part of the Old Cross Cut Canal project, a large pipe will be placed under the Arizona Canal to drain the basin into the Old Cross Cut Canal. The construction of the pipe is to occur this winter. An IGA with SRP and the Flood Control District has been prepared and will come forward to Council this fall.

Pinnacle Peak Road and Skunk Creek - Skunk Creek stormwater flow has cut off access to the subdivisions west of 35th Avenue several times during the past two years. At least two dramatic rescues have taken place at this location, the last occurring August 22, 1992. A bridge is badly needed, and funds have been allocated for design this year. Funds have not yet been identified for construction. A feasibility study is now under way.

SUMMARY

In summary, it is estimated that approximately 200 structures were flooded in Phoenix this summer. The total cost of damage per structure is estimated to be between $5,000 and $10,000 which is the cost of repairing drywall and removing carpets and other floor coverings. Total cost of damage from this storm is estimated to be at least $2,000,000. A few isolated structures flooded throughout the City. A roof collapsed on one commercial building. A number of cars were flooded. A heavier storm, or a different location of storm, will result in a completely different flooding situation. Considering the severity of this summer's storms, the City storm drain and street drainage system worked well. The only areas flooded were known ponding areas or areas where washes have been filled in by development. Isolated cases of flooding will always occur because of structures built too low with respect to the street.

RECOMMENDATION

Since we have constructed numerous storm drains in Maryvale which handle the typical two-year event with no flooding, the design challenge is to deal with the major events, such as the July 24 storm.

It is recommended that at approximately one-mile intervals along the Grand Canal, detention basins of 10 acres (average) would be constructed. Flood water would be collected in each basin, then slowly released into the existing storm drains in the arterial streets after the storm peak has passed. This solution would eliminate the overload on the storm drains and provide storage for the accumulated storm waters that now flood the homes on the north side of the canal. Since the areas are now fully urbanized, about 40 homes would have to be purchased and removed for each detention basin. Logically, these would be the homes that are now being flooded.

We would recommend that eight basins be constructed along the Grand Canal and one be constructed at 40th Street and Camelback. One basin would also be constructed at 48th Street north of the Arizona Canal to augment the Lafayette Interceptor system which we plan to drain into the Old Cross Cut Canal. This proposal would solve virtually all the remaining known major flooding problems along the canals (including Verde Lane). We estimate that the project would cost $40 million and would require purchase of 350 to 400 homes. The basins, as virtually all of our new basins are now, could double as parks and recreation areas 99 percent of the time. Many of the homes that now flood would be purchased with this proposal, eliminating their problems as well as the criticism that the City is doing nothing. A new roadway crossing of Skunk Creek (35th Avenue and Pinnacle Peak Road) should also be included in our Program. Finally, we suggest that these projects would be included in the next bond program since they have citywide implications. The Flood Control District of Maricopa County (FCDMC) does not have any funds available. An IGA is being prepared with the FCDMC for the Lafayette Interceptor and the new pipe under the Arizona Canal. A cost estimate has not yet been prepared.

It is further recommended that a $45 million bond issue for construction of approximately ten storm water detention basins and a large bridge to mitigate flooding could be included in the next bond program. The project would utilize existing storm drains to carry the water from the basins to the Salt River after major events. The basins would be constructed to be urban parks thereby serving two purposes in our residential areas. The basins/parks could be constructed within two years of authorization to proceed. The Skunk Creek bridge design will be complete so that construction could begin as quickly as funds are available.

JHM:DTM:PEK:mt:1501P(6)

49761

Linda S. Kantor
5015 N. 24th Avenue
Phoenix, Arizona 85015-2727
(602) 242-7178

November 4, 1995

Councilman Craig L. Tribken
251 West Washington
Phoenix, Arizona 85003

RE: Alternative Flood Control Works Program
Flooding Problem - 24th Ave. & Camelback

Dear Councilman Tribken:

As you may remember, our neighborhood has a chronic flooding problem. I have been trying to work through the City since 1991 to try to find a solution to this problem. At that time Paul Kienow, Floodplain Management, was very helpful in explaining our situation and trying to help find a solution. In September of 1992 I was fortunate enough to have a meeting with you regarding this matter. That same year I spoke before a Street Transportation Meeting and the City Council regarding this matter.

The following are several reasons that I know of why we flood:

1. 23rd Ave. and the I-17 access road are both approximately 3' higher than 24th Ave. Also, when Camelback was widened it was made approximately 1' higher that 24th Ave. Therefore, all downhill water comes to our street.

2. The mobile home park on the I-17 access road just north of Missouri Ave. has several sump pumps to remove their flood water onto 23rd Ave., which eventually runs to us.

3. The storm drains are not large enough to handle the amount of water that comes. They become full and the water starts backing up at that point because it has nowhere to go.

4. More storm drains are not feasible because routing to the Salt River is deterred due to development.

5. More development each year eradicates ground for water saturation which causes more runoff, which fills up the storm drains faster, which causes more flooding.

6. A weatherman predicted several years ago that our monsoons would last longer and would have heavier rain in years to come. This appears to be happening.

Mr. Kienow tried finding solutions for our problem but could find none. We have already taken many flood proofing measures to protect our properties. The only practical solution he could find,

without causing the flooding problem to go elsewhere, was to create a retention basin in the form of a small park for the flood waters here in our neighborhood. That would entail the City buying the 8-10 homes that flood. One alternative I personally thought of to handle our problem would be to re-zone our properties to "Commercial" rather than "Residential". Three or four of the houses are already zoned for commercial use. Two of the houses are currently low rent properties that are not well maintained. The other two are currently businesses. Perhaps if the other houses were rezoned, then we could sell our properties, and a developer could then build to accommodate the flood waters. We are currently surrounded on the West, South, and East by commercial business in one form or another. Just a thought.

The first obstacle to overcome was that the City had no funds to do anything about our flooding problem. We were turned over to the Maricopa County Flood Control District, but our flooding problem does not meet the criteria for their projects. In September of this year though, the "Alternative Flood Control Works Program" was passed by the Flood Control District of Maricopa County and our neighborhood flooding problem does appear to fit the criteria.

We are trapped in our own homes. We can't move or sell our homes as they are totally unmarketable. Who in their right mind would knowingly buy or rent a house that floods. There is an extreme amount of stress and worry that goes along with our problem. Even my 8 year old son hates the rain as he worries that we are going to flood again. We are afraid to go anywhere if rain is in the forecast for fear of flooding. I won't even go into the amount of sleep lost because of staying up half the night with the rain, the moving of sandbags, the debris washed up on our property, the smell that lingers, the time lost from work, the structural damage due to standing water, or the amount of cleanup needed to put our properties back in order.

The flooding takes less rain, comes up higher, and stands longer each time it rains. This year it has rained 3 times and we've flooded 3 times! The water stands on our properties for approximately 3 hours before it starts draining. We seem to be cursed by 3's! Streets 3' too high, standing water for 3 hours, 3 rains=3 floods. I've heard 3 times the charm...hopefully that's true in our case. Enough is enough!

The City has inadvertently created this problem, and we want to raise our quality of living from where it has dwindled. As a neighborhood we are willing to do what we can to help solve this problem At this point though, we feel that we need help and direction. If there is something we can do to help solve this problem and keep our homes we will. If selling is the only workable alternative then we will. We are therefore respectfully requesting that you propose our neighborhood to the Maricopa County Flood Control district for consideration in the "Alternative Flood Control Works Program".

We look forward to hearing from you in this matter. Thank you in advance for your caring and consideration in this matter.

Sincerely,

Linda Kantor

Enclosure: Alternative Flood Control Works Program

CITY COUNCIL REPORT AGENDA

DATE: January 6, 1994 DATE:

TO: Jack Tevlin
Deputy City Manager

FROM: James H. Matteson, P.E. ← 262-6136 Carol, sorry
Street Transportation Director

SUBJECT: STATUS OF PHOENIX TOP TWENTY FLOODING AREA - JANUARY 3, 1994

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The City and the Flood Control District of Maricopa County (FCDMC) have been working cooperatively to address drainage concerns in twenty areas within Phoenix. Within the last six months the FCDMC has implemented a program to identify and prioritize potential projects for their Five-Year Capital Improvement Program. The City has submitted nine (9) projects from the top-twenty list for evaluation and prioritization. It is anticipated that the remaining projects will be submitted to the FCDMC for consideration in October, 1994.

DISCUSSION:

No program to eliminate local area flooding within the City presently exist. Heavy rains in recent years have indicated a need for up to $300 million in capital improvements to remedy known problems. The City initiated discussions with FCDMC hoping they would begin to address some of these problems. These discussions lead to a request by FCDMC for the identification of the top 20 locations for their consideration. Since that original submittal, additional and much more detailed information has been submitted for nine of the projects to allow the FCDMC to establish priorities within their Countywide program.

The nine projects submitted and their status are listed below:

		STATUS
1.	64th Drive and Sunset Drive	Engineer Analysis Underway
2.	47th Drive and Crittenden Lane	Engineer Analysis Underway
3.	24th Avenue and Camelback Road ✓	Project Being Evaluated
4.	41st Street and Calle Redondo	Project Being Evaluated
— 5.	26th Avenue and Verde Lane	Project Being Evaluated
6.	43rd Avenue and Burgess Lane	Engineer Analysis Underway
7.	46th Street and Shea Boulevard	Project Being Evaluated
8.	10th Street Wash ✓	Feasibility Study Underway
— 9.	10th Avenue and Mclellan Boulevard	Project Being Evaluated

City of Phoenix
STREET TRANSPORTATION DEPARTMENT

Winner of the Carl Bertelsmann Prize for BEST RUN CITY IN THE WORLD

January 10, 1996

Mr. Stanley L. Smith, Jr., P.E.
Interim Chief Engineer and General Manager
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Dear Mr. Smith:

RE: ALTERNATIVE FLOOD CONTROL WORKS PROGRAM
24TH AVENUE & CAMELBACK ROAD, PHOENIX, ARIZONA

The area in the vicinity of 24th Avenue and Camelback Road has experienced repeated flooding. This location was classified as one of Phoenix's top twenty flooding problems for inclusion in the Flood Control District of Maricopa County (District) Fiscal Year 94-95 CIP Prioritization Procedure. This project was not approved for inclusion in the District's CIP.

Since then the District has developed a policy to address areas like 24th Avenue and Camelback Road. This policy is the "Alternative Flood Control Works Program". We respectfully request reconsideration of this location for inclusion in the District's CIP using the newly developed program.

We suggest that engineering data may become available with the District's Metro ADMS or the Maryvale ADMS to evaluate alternatives to address the flooding problem. If you have any questions, please contact Mr. Ray Acuna at 262-4026.

Sincerely,

James H. Matteson, P.E.
Street Transportation Director

JHM/RUA/aff/960110a

c: Councilman Tribken
Mr. Blakley
Ms. Kantor
Mr. Perreault

Linda S. Kantor
5015 N. 24th Avenue
Phoenix, Arizona 85015
(602) 242-7178

August 17, 1996

Mr. Harold Shanahan
ADOT Project Manager
1739 West Jackson
Mail Drop 050P
Phoenix, Arizona 85007

RE: I-17 & Camelback Road
Traffic Interchange
August 8, 1996 Meeting

Dear Mr. Shanahan:

As requested, enclosed please find a copy of the Camelback Concept Diagram which I have marked in yellow to indicate the homes that have chronically flooded over the years during heavy rain.

For your information, the flooding has occurred up to 5 houses north of Camelback on 24th Avenue. Normally, the flooding occurs 2-4 houses north of Camelback, depending on the severity and duration of the storm.

The 24th Avenue/Camelback area is a manmade flood plain. Part of our biggest problem is that 23rd Ave. & the I-17 access road are both 3 feet higher than 24th Ave. Therefore all south bound water comes down Camelback and pools at 24th Ave. When the storm drains fill up, that's when the water starts "backing up" 24th Ave. and we flood. Depending on how long it takes for the storm drains to start draining again determines how long we have standing water.

Councilman Craig Tribken and our neighborhood association President, Mr. Paul Ennes, are both well aware of our flooding problem and have been working on ways to try and alleviate the problem. The only solution the City Engineers could come up with was to buy the flooding properties and turn the area into a retention basin to hold the flood waters.

In talking with you after the meeting, it appears you had the same thought. Since you have to take property for the I-17 & Camelback overpass anyway, that might just be the time to put in a retention basin in the area. That coupled with larger storm drains just might handle our flooding problem.

My second concern with widening Camelback for the I-17 overpass is the number of accidents that occur at 24th Ave. The accidents mostly occur during rush hour where people traveling eastbound on Camelback try to make a left on 24th Ave. to avert the 23rd Ave. stop light. You can verify through the city records as to how many accidents occur there each year. My concern becomes one that if you widen Camelback, the traffic flow will be heavier, the cars will go faster than they already do, cars will have to cut across at least one additional lane to make a lefthand turn onto 24th Ave. This combination will most likely cause more accidents.

During the meeting, someone brought up the fact that you would be adding about 3' high retention walls along the access road. We would love to see a retention wall go right along Camelback which would also block off 24th Ave.

For years, we as a neighborhood, have tried to get 24th Ave. at Camelback blocked off. We've had no success, due to the fact we've been told its a public access. Our reasons for trying to have the street blocked off are as folllows:

1. During rush hour the traffic on our street increases, the cars are speeding, and it puts the children at risk that play in our neighborhood and also the people that walk on the side of the road. (We don't have sidewalks)

2. During times when we flood we've requested that the city block off 24th Ave. at Camelback because traffic coming down 24th causes wakes which can make the difference between a yard flooding or a house flooding.

3. We feel it would deter vagrants and other non residents of the neighborhood from "cruising". We've noticed an increase in the number of strangers and teens walking up our street. We've had several thefts and taggings this year. We feel that closing off our street at Camelback would help preserve our neighborhood.

Mr. Shanahan, thanks for talking with me after the August 8th meeting. Hopefully, the above gives you a better view of our street and problems associated with it. Should you want to discuss anything further, please feel free to contact me.

Sincerely,

Linda

Linda Kantor

ENTRANCO

2400
W DUNLAP AVENUE
SUITE 100
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ARIZONA
85021-2813

TELEPHONE
264 1228

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602 943 5068

INTERNET
www.entranco.com

ARIZONA
CALIFORNIA
IDAHO
OREGON
UTAH
WASHINGTON

February 6, 1998

Ms. Linda S. Kantor
5015 North 24th Avenue
Phoenix, Arizona 85015

Re: I-17 & Camelback Road
Traffic Interchange Public Meeting

Dear Ms. Kantor:

This is in response to your December 17, 1997, letter to Harold Shanahan regarding the drainage issue on 24th Avenue. I am writing to respond to your written inquiry regarding the affects on drainage of the proposed reconstruction of the I-17 traffic interchange at Camelback Road. I appreciate that you live on 24th Avenue, in an area with historic flooding, and share concerns with your neighbors that this project might impact conditions in your neighborhood.

The proposed interchange reconstruction will be undertaken to provide a better level of service and improved operations. This will increase interchange capacity and reduce traffic congestion in the neighborhood. As we discussed at the public meeting, reconstruction of the interchange bridge over I-17 will require raising the profile of Camelback Road by about three feet. This vertical increase is required to improve the vertical clearance under the bridge (so trucks will not hit it) and because the new bridge will be longer and thicker in order to accommodate the future widening of I-17.

While the limits of this raised profile will be contained within the area between 23rd and 27th Avenues, it will be raised at 24th Avenue. Historically, localized flooding in the area has run in a north to south pattern. We appreciate that raising the street could act as a dam and affect drainage patterns. Our design of the project will be developed to address this problem by improving the street drainage system to handle the increased runoff from additional paving and by providing drains behind the curb, gutter, and sidewalk where the raised profile causes ponding in new locations. The design criteria will focus on not allowing the situation to worsen. While this will not improve the historical flooding, it will not worsen it either.

We encourage you to contact City staff and staff at the Flood Control District of Maricopa County to investigate planning and measures to relieve this flooding problem. These agencies are responsible for this effort and can further update you on the status of work underway and that which is planned. I appreciate your inquiry and if you have any more questions, feel free to call Kevin Nelson at 264-1228.

Sincerely,
ENTRANCO

Kevin P. Nelson, P.E.
Principal

cc: Harold Shanahan (ADOT)

APPENDIX ZZ

EXECUTIVE SUMMARY – APRIL, 2003

Final DCR
24th Avenue and Camelback Road
Drainage Improvements

PROJECT No. ST83120017

EXECUTIVE SUMMARY

Prepared for:

City of Phoenix
Street Transportation Department
Design and Construction Management
1034 E. Madison Street
Phoenix, Arizona 85034

And

Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Prepared by:

Premier Engineering Corporation
1600 West Broadway Road, Suite 165
Tempe, Arizona 85282

Premier Project No. 2002010
April 02, 2003

EXECUTIVE SUMMARY

This Executive summary is prepared as an interim DCR report to address the requested additional scenarios for two of the four alternatives presented in the Draft DCR. A detail cost estimate is prepared for each storm event under each alternatives for easy comparison. Furthermore, this summary presents the results of a detailed flood damage assessment that is performed to determine whether any of the proposed alternatives would be economically feasible using a benefit: cost analysis.

I. ALTERNATIVES

The following four alternatives were described in the Draft DCR.

A. Alternatives 1 & 4

As described in the Draft DCR, Alternative 1 is the "Do Nothing Option" and Alternative "4" is the "23rd Avenue Storm Drain System". These two alternatives were determined to be unacceptable and were eliminated from further analysis and discussion.

B. Alternative 2 –Regional Retention Basin

The concept of Alternative 2 is to captures the 100-year storm-water runoff in a large regional basin located north of Camelback Road in the vicinity of 21st Avenue. This option would require acquiring a significant amount of developed property for the construction of this basin. An investigation of this areas indicated that there are some vacant or abandoned parcels in the vicinity that could be utilized for retention facilities and reduce the number of developed property needed for the construction of a regional retention basin. The proposed basin layout for Alternative #2 utilizes a vacant parcel located at the southeast corner of Colter and the I-17 frontage road (Basin C.1) as well as a vacant site located at the northeast corner of Camelback Road and the I-17 frontage road (Basin C.2). These two parcels were adequate in size to provide retention for the 100-year runoff contributing to 24th Avenue independent of the remaining portions of the watershed. Storm drain systems will be provided in 24th Avenue, 23rd Avenue and Colter to convey the storm-water runoff into these basins. There are two compelling reasons for addressing the retention at 24th Avenue independently 1) reduces the amount of developed property required to construct a regional retention basin, and 2) these basins can be constructed as a standalone initial phase and provide an immediate solution to the known flooding area. The 100-year runoff from the remaining portion of the watershed will be collected in a regional retention basin located between 23rd Avenue and 21st Avenue just north of Camelback. The recommended layout utilizes the most cost effective parcels in the area to reduce the cost of land acquisition for this alternative.

Alternative 2 also includes the construction of a retention basin located at the southeast corner of 20th Avenue and Turney (Basin "X"). Basin "X" will provide retention storage for the 100-year storm water runoff for the contributing watershed south of Camelback Road. A storm-drain system located in 21st Avenue and Turney will be provided to

convey the storm water runoff to Basin "X". See Exhibit 15 for a graphical representation of Alternative 2.

C. Alternative 3 – Multi-Basin

Alternative 3 proposes the construction of a series of retention basins throughout the length of the watershed. The concept of Alternative 3 is to effectively utilize any vacant parcels for retention facilities. This concept reduces the need to acquire developed properties along north side of Camelback Road for the construction of a retention basin. The Draft DCR proposed the construction of seven retention basins (Basins A, C, H, I, J, O and X). Further investigation of Alternative 3 indicated that Washington Park could be utilized to capture significantly more runoff than previously proposed and hence eliminating the need for the smaller basins H, J, and O. It was also discovered that the proposed parcel for Basin O is currently under construction and Basin H is an existing school playground. Therefore, Basin O and Basin H were eliminated from this study. The Alternative 3 is further broken into two scenarios and are referred as Alternative 3a and Alternative 3b and described as follows:

Alternative 3a

Alternative 3a proposes the construction of six retention basins, Basin J, Basin I (Washington Park), Basin C.1, Basin C.2, Basin A and Basin X (See Exhibit 17). Alternative 3a utilizes Basins J and I to collect the 100-year upstream runoff reducing the amount of runoff contributing to 24th Avenue and Camelback. Basins C.1 and C.2 are proposed to collect the 100-year runoff contributing to 24th Avenue and Camelback. Basin A will collect the reduced 100-year runoff north of Camelback Road. Basin X will collect the 100-year runoff south of Camelback Road. Combination of storm drain systems, roadway re-construction, and spillways will be required to convey the runoff into the proposed basins.

Alternative 3b

Alternative 3b is identical to Alternative 3a except it eliminates Basin J reducing the number of retention basins to five (See Exhibit 17.1). Basin I (Washington Park) will provide the contributing 100-year runoff retention including the excess flows caused by eliminating Basin J. The Cost Analysis indicated that it was more cost effective to increase the improvements at Basin I to handle the excess runoff than to construct Basin J.

II. BASIS OF DESIGN

The basis of design for the proposed drainage facilities is as follows:

- Retention Basins:
  - Depth = 6 feet
  - Maximum side slope = 4:1
  - Disposal system = Drywells
  - 100-year capacity

- Storm-Drain System:
  - 10-year capacity
  - Minimum slope = 0.30%
  - Manning's "n" = 0.012
  - 24-inch – 48-inch pipe = HDPE
  - 54-inch – 78-inch pipe = RGRCP
  - Maximum catch basin capacity = 10 cfs
- Street Reconstruction:
  - Minimum longitudinal slope = 0.20%
  - Manning's "n" = 0.016
  - 6-inch Vertical Curb & Gutter

Exceptions to the basis of design assumptions are as follows:

- Alternative 2
  - Basin C.1 storm drain system design capacity = per excess volume available in Basin C.1
  - Basin C.2 storm drain system design capacity = 100-year
- Alternative 3a
  - Basin J storm drain system design capacity = 100-year
  - Basin C.1 storm drain system design capacity = 100-year
  - Basin C.2 storm drain system design capacity = 100-year
- Alternative 3b
  - Basin C.1 storm drain system design capacity = 100-year
  - Basin C.2 storm drain system design capacity = 100-year

III. COST ANALYSIS

The following Table 1 provides a cost for each of the alternatives for each storm event.

Table 1 – Cost Estimate

Storm	Alt. 2	Alt. 3a	Alt. 3b
100-year	$15,012,915	$15,042,435	$14,013,388
25-year	$10,445,562	$10,913,182	$10,068,433
10-year	$7,082,130	$7,845,475	$7,170,155
2-year	$3,719,377	$3,846,041	$3,303,893

IV. FLOOD DAMAGE ANALYSIS

A flood damage assessment was performed to determine whether any of the proposed drainage plans would be economically feasible when analyzed through a benefit: cost analysis. A benefit: cost analysis reduces project installation costs and flood damage reduction costs to average annual values that can be directly compared to compute a benefit: cost ratio. If this ratio is greater than 1.0, then the proposed project is normally considered to be economically justified, i.e., the project benefits exceed the project cost.

Numerous assumptions were required to perform the benefit: cost analysis. It should be understood that this analysis was performed for a large drainage area in a relatively short period of time. Accordingly, some simplifications were required to complete the analysis.

Actual flooding through the project watershed would probably take the form of widespread sheet flooding, especially during larger flood events. In order to confine the damage assessment to a reasonable scope and time frame, the analysis was limited to an assessment of flood damage along prominent streets. Known flooding areas were included in this assessment. This approach is considered to present a reliable indicator of potential flood damage and flood damage reduction benefits. However, it is not to be interpreted as a complete assessment of total flood damage in the watershed.

This analysis is considered to be in a preliminary format at this time and subject to refinement prior to publication of a final drainage report for this project.

Key assumptions used in the benefit: cost analysis are listed as follows:

1. Flood damage calculations were confined to a single row of properties along each side of major streets that convey the majority of water through the watershed. The street segments used for the damage analysis were:

    - 21st Avenue from Maryland Avenue to the Grand Canal
    - Campbell Avenue, east of 21st Avenue
    - Roma Avenue, east of 21st Avenue
    - Turney Avenue, east of 21st Avenue
    - 20th Avenue, south of Turney Avenue
    - 23rd Avenue from Maryland Avenue to Camelback Road
    - 24th Avenue from Orange Drive to Camelback Road

2. Flooding depths were based on typical street cross-sections and slopes that were measured in the field and scaled from topographic maps and aerial photos. Curb heights of 6" were used with a raised crown centerline that was assumed equal to the curb height. A 20-ft effective flow area was extended beyond both the left and right curbs.

    HEC-2 models were created for each street cross-section and run for a wide range of discharges that would encompass the 2-year through 100-year peak flows. These models were used as discharge-depth rating tables to determine flood depths for a given discharge.

3. All finished floor elevations were assumed to be equal to the street curb height. Field inspections of the watershed indicate that some homes are at or below the curb elevation, while others are above the curb elevation. For comparison purposes, the same assumption was used for both the existing condition and proposed drainage plan analyses. Accordingly, any errors attributed to this assumption should be cancelled when comparing existing damage to post-project damages.

4. Flood damage estimates were based on depth-damage relationships published in **Benefit: Cost Analysis Of Hazard Mitigation Projects, Appendix 1 to the Riverine Flood – Full Data Module, Users Guide For Software Version 5.2.3**, Federal Emergency Management Agency (FEMA).

   Damages were only computed for Building Damage and Building Contents. Damage assessments were based on Full Cash Value (FCV) from the Maricopa County Assessor records. The residential FCV numbers were reduced by 20-percent to remove the land value from the building value. The resulting building value was then applied to the FEMA depth-damage tables to compute flood damage.

5. Average annual damages and damage reductions were computed as the area under a curve defined by the damage amount (dollars) for each storm return interval (expressed as an annual probability of occurrence). This calculation yields dollars per year.

6. The annual cost of the proposed project was based on an amortization of the estimated installation cost, plus an annual operation and maintenance cost. Amortization schedules for computing average annual costs were based on annual interest rates of 3, 4, and 5-percent, and amortization periods of 100, 75, 50, and 25-year periods. This approach provides a wide range of financial conditions that can be used to evaluate the financial feasibility of the project.

V. RECOMMENDATIONS

As summarized in Table 1, Alternative 3b is the least expensive alternative for all the storm events considered. This alternative also provides additional benefits by reducing any potential flood damages for the area between Washington Park and Camelback Road. Furthermore Alternative 3b allows for phased construction of the proposed improvements throughout the watershed. We recommend this alternative for 100-year level protection for entire watershed, which can be constructed in phases as the available funds allow. An exhibit of each basin for this recommended alternative is included in the Appendix, which shows the improvements and a detailed cost estimate.

Following Table 2 provides a summary of the project costs and benefits that were computed for the 100-, 25-, 10-, and 2-year storms for Alternative 3b. All variations of the project financial analysis yield a positive benefit: cost ratio, which indicates that the project is economically justified, given the assumptions that were used for the analysis.

Table 2
Benefit:Cost Summary
Alternative 3b

24th Avenue & Camelback Road Drainage Project

Installation Cost	Annual Interest Rate (%)	Amortization Period (years)	Annual Payment	Annual O & M Cost	Total Annual Cost	Annual Existing Conditio Damage	Annual Damage With Project In-Place	Annual Damage Reduction	**Benefit:Cost Ratio**
100-Year Level of Protection									
$14,013,388.00	3.00	100	443,477	$125,000	$568,477	$2,046,883	$536,982	$1,509,901	**2.66**
$14,013,388.00	4.00	100	571,858	$125,000	$696,858	$2,046,883	$536,982	$1,509,901	**2.17**
$14,013,388.00	5.00	100	706,038	$125,000	$831,038	$2,046,883	$536,982	$1,509,901	**1.82**
$14,013,388.00	3.00	75	471,802	$125,000	$596,802	$2,046,883	$536,982	$1,509,901	**2.53**
$14,013,388.00	4.00	75	591,771	$125,000	$716,771	$2,046,883	$536,982	$1,509,901	**2.11**
$14,013,388.00	5.00	75	719,190	$125,000	$844,190	$2,046,883	$536,982	$1,509,901	**1.79**
$14,013,388.00	3.00	50	544,637	$125,000	$669,637	$2,046,883	$536,982	$1,509,901	**2.25**
$14,013,388.00	4.00	50	652,326	$125,000	$777,326	$2,046,883	$536,982	$1,509,901	**1.94**
$14,013,388.00	5.00	50	767,608	$125,000	$892,608	$2,046,883	$536,982	$1,509,901	**1.69**
$14,013,388.00	3.00	25	804,759	$125,000	$929,759	$2,046,883	$536,982	$1,509,901	**1.62**
$14,013,388.00	4.00	25	897,024	$125,000	$1,022,024	$2,046,883	$536,982	$1,509,901	**1.48**
$14,013,388.00	5.00	25	994,284	$125,000	$1,119,284	$2,046,883	$536,982	$1,509,901	**1.35**

Table 2
Benefit:Cost Summary
Alternative 3b

24th Avenue & Camelback Road Drainage Project

Installation Cost	Annual Interest Rate (%)	Amortization Period (years)	Annual Payment	Annual O & M Cost	Total Annual Cost	Annual Existing Conditio Damage	Annual Damage With Project In-Place	Annual Damage Reduction	**Benefit:Cost Ratio**
25-Year Level of Protection									
$10,068,433.00	3.00	100	318,632	$125,000	$443,632	$1,782,782	$451,962	$1,330,820	**3.00**
$10,068,433.00	4.00	100	410,873	$125,000	$535,873	$1,782,782	$451,962	$1,330,820	**2.48**
$10,068,433.00	5.00	100	507,279	$125,000	$632,279	$1,782,782	$451,962	$1,330,820	**2.10**
$10,068,433.00	3.00	75	338,984	$125,000	$463,984	$1,782,782	$451,962	$1,330,820	**2.87**
$10,068,433.00	4.00	75	425,180	$125,000	$550,180	$1,782,782	$451,962	$1,330,820	**2.42**
$10,068,433.00	5.00	75	516,728	$125,000	$641,728	$1,782,782	$451,962	$1,330,820	**2.07**
$10,068,433.00	3.00	50	391,315	$125,000	$516,315	$1,782,782	$451,962	$1,330,820	**2.58**
$10,068,433.00	4.00	50	468,688	$125,000	$593,688	$1,782,782	$451,962	$1,330,820	**2.24**
$10,068,433.00	5.00	50	551,516	$125,000	$676,516	$1,782,782	$451,962	$1,330,820	**1.97**
$10,068,433.00	3.00	25	578,209	$125,000	$703,209	$1,782,782	$451,962	$1,330,820	**1.89**
$10,068,433.00	4.00	25	644,500	$125,000	$769,500	$1,782,782	$451,962	$1,330,820	**1.73**
$10,068,433.00	5.00	25	714,380	$125,000	$839,380	$1,782,782	$451,962	$1,330,820	**1.59**

Table 2
Benefit:Cost Summary
Alternative 3b

24th Avenue & Camelback Road Drainage Project

Installation Cost	Annual Interest Rate (%)	Amortization Period (years)	Annual Payment	Annual O & M Cost	Total Annual Cost	Annual Existing Condition Damage	Annual Damage With Project In-Place	Annual Damage Reduction	**Benefit:Cost Ratio**
10-Year Level of Protection									
$7,170,155.00	3.00	100	226,911	$125,000	$351,911	$1,392,469	$340,820	$1,051,649	**2.99**
$7,170,155.00	4.00	100	292,600	$125,000	$417,600	$1,392,469	$340,820	$1,051,649	**2.52**
$7,170,155.00	5.00	100	361,255	$125,000	$486,255	$1,392,469	$340,820	$1,051,649	**2.16**
$7,170,155.00	3.00	75	241,405	$125,000	$366,405	$1,392,469	$340,820	$1,051,649	**2.87**
$7,170,155.00	4.00	75	302,788	$125,000	$427,788	$1,392,469	$340,820	$1,051,649	**2.46**
$7,170,155.00	5.00	75	367,984	$125,000	$492,984	$1,392,469	$340,820	$1,051,649	**2.13**
$7,170,155.00	3.00	50	278,672	$125,000	$403,672	$1,392,469	$340,820	$1,051,649	**2.61**
$7,170,155.00	4.00	50	333,772	$125,000	$458,772	$1,392,469	$340,820	$1,051,649	**2.29**
$7,170,155.00	5.00	50	392,758	$125,000	$517,758	$1,392,469	$340,820	$1,051,649	**2.03**
$7,170,155.00	3.00	25	411,767	$125,000	$536,767	$1,392,469	$340,820	$1,051,649	**1.96**
$7,170,155.00	4.00	25	458,976	$125,000	$583,976	$1,392,469	$340,820	$1,051,649	**1.80**
$7,170,155.00	5.00	25	508,740	$125,000	$633,740	$1,392,469	$340,820	$1,051,649	**1.66**

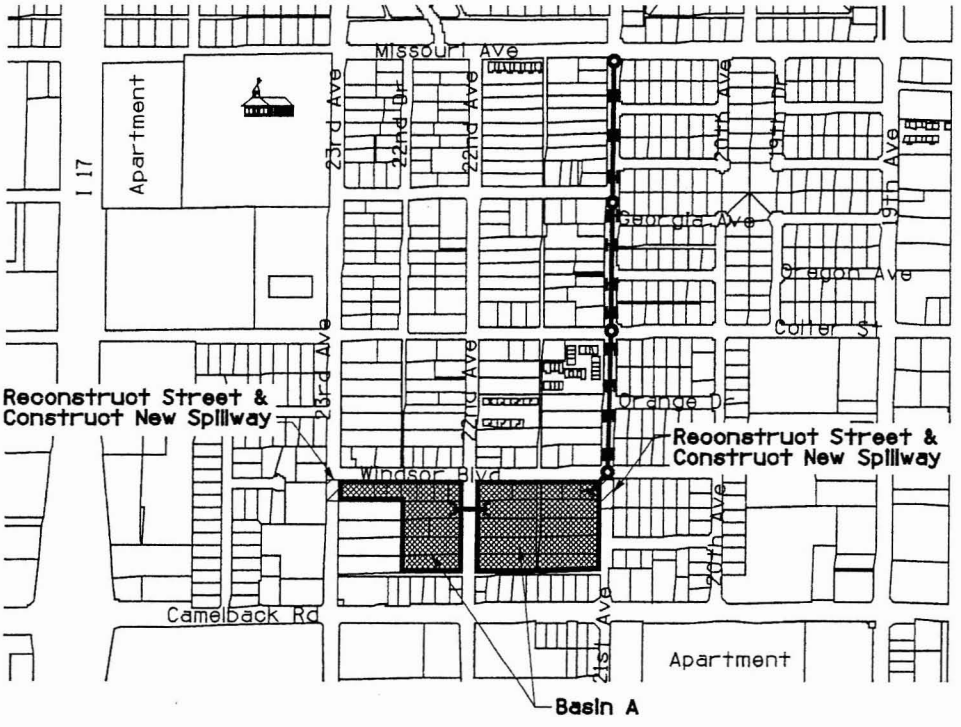
Table 2
Benefit:Cost Summary
Alternative 3b

24th Avenue & Camelback Road Drainage Project

Installation Cost	Annual Interest Rate (%)	Amortization Period (years)	Annual Payment	Annual O & M Cost	Total Annual Cost	Annual Existing Conditio Damage	Annual Damage With Project In-Place	Annual Damage Reduction	**Benefit:Cost Ratio**
2-Year Level of Protection									
$3,303,893.00	3.00	100	104,557	$125,000	$229,557	$753,090	$141,710	$611,380	**2.66**
$3,303,893.00	4.00	100	134,825	$125,000	$259,825	$753,090	$141,710	$611,380	**2.35**
$3,303,893.00	5.00	100	166,460	$125,000	$291,460	$753,090	$141,710	$611,380	**2.10**
$3,303,893.00	3.00	75	111,235	$125,000	$236,235	$753,090	$141,710	$611,380	**2.59**
$3,303,893.00	4.00	75	139,520	$125,000	$264,520	$753,090	$141,710	$611,380	**2.31**
$3,303,893.00	5.00	75	169,561	$125,000	$294,561	$753,090	$141,710	$611,380	**2.08**
$3,303,893.00	3.00	50	128,407	$125,000	$253,407	$753,090	$141,710	$611,380	**2.41**
$3,303,893.00	4.00	50	153,797	$125,000	$278,797	$753,090	$141,710	$611,380	**2.19**
$3,303,893.00	5.00	50	180,976	$125,000	$305,976	$753,090	$141,710	$611,380	**2.00**
$3,303,893.00	3.00	25	189,736	$125,000	$314,736	$753,090	$141,710	$611,380	**1.94**
$3,303,893.00	4.00	25	211,489	$125,000	$336,489	$753,090	$141,710	$611,380	**1.82**
$3,303,893.00	5.00	25	234,419	$125,000	$359,419	$753,090	$141,710	$611,380	**1.70**

File: 24Camel, Amortization Schedule.xls

APPENDIX



Basin "A"				
Description	**Units**	**Total**	**Unit Price**	**Amount**
Demolition	ac	9.6	$25,000.00	$240,000.00
Excavation	cy	80000	$5.00	$400,000.00
Catch Basins	ea	22	$10,000.00	$220,000.00
72" RGRCP Storm Drain	lf	2000	$130.00	$260,000.00
Manholes	ea	4	$3,500.00	$14,000.00
Drywells	ea	122	$5,000.00	$610,000.00
Remove & Replace Asphalt Pavement	sy	900	$30.00	$27,000.00
[1]Street Reconstruction (21st Ave.) - 252 cfs	lf	100	$250.00	$25,000.00
Spillway	ls	1	$20,000.00	$20,000.00
Landscape/Irrigation	ac	9.6	$43,560.00	$418,176.00
Survey/Testing (4%)	ls	1	$89,367.04	$89,367.04
			Sub-Total =	***$2,323,543.04***
			Contingency (20%) =	***$464,708.61***
			Construction Cost =	***$2,788,251.65***
			Engineering Fees (15%) =	***$418,237.75***
			Land Acquisition =	***$2,510,193.00***
			Administrative Fees (5%) =	***$139,412.58***
			Total =	***$5,856,094.98***

N

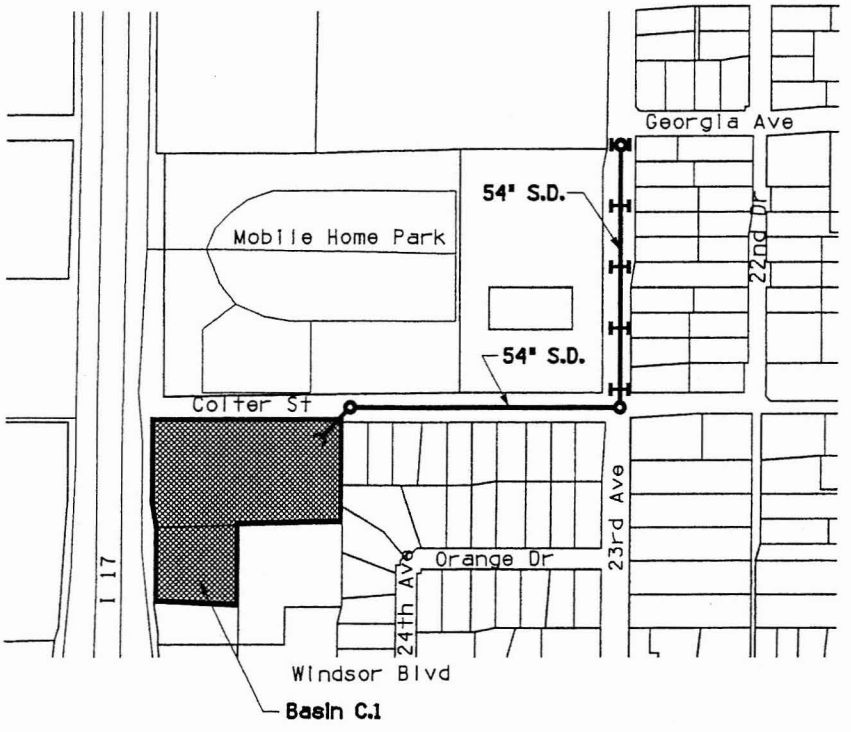
Not to Scale

ALT. 3B (100-YR)

24th Ave and Camelback Rd
Drainage Improvement

Basin A

PREMIER



Basin "C.1"				
Description	**Units**	**Total**	**Unit Price**	**Amount**
Clear & Grubb	ac	3.5	$1,000.00	$3,500.00
Excavation	cy	20000	$5.00	$100,000.00
Catch Basins	ea	12	$10,000.00	$120,000.00
54" RGRCP Storm Drain	lf	1320	$100.00	$132,000.00
Manholes	ea	3	$3,500.00	$10,500.00
Drywells	ea	23	$5,000.00	$115,000.00
Remove & Replace Asphalt Pavement	sy	600	$30.00	$18,000.00
Landscape/Irrigation	ac	3.5	$43,560.00	$152,460.00
Survey/Testing (4%)	ls	1	$26,058.40	$26,058.40
			Sub-Total =	***$677,518.40***
			Contingency (20%) =	***$135,503.68***
			Construction Cost =	***$813,022.08***
			Engineering Fees (15%) =	***$121,953.31***
			Land Acquisition =	***$681,756.00***
			Administrative Fees (5%) =	***$40,651.10***
			Total =	***$1,657,382.50***

N

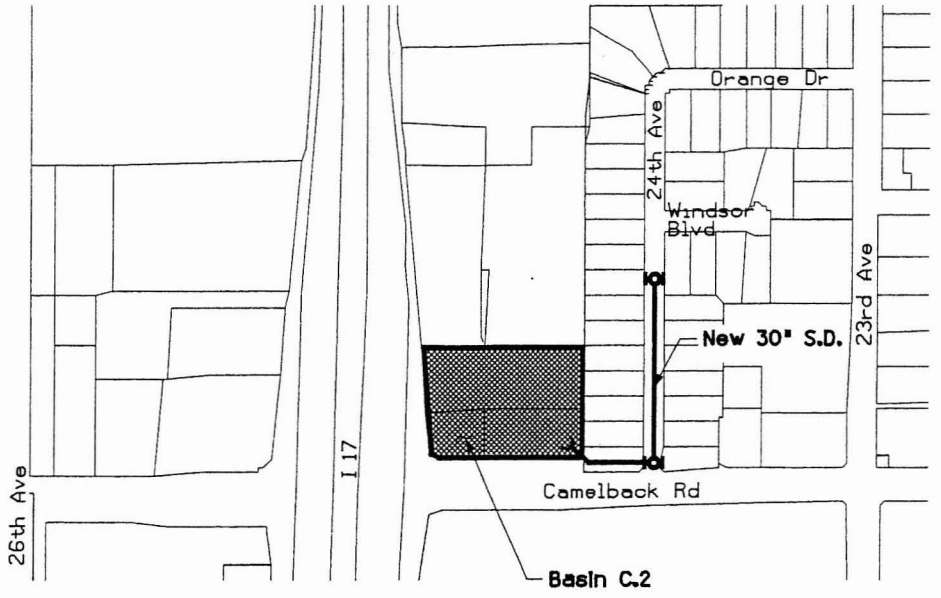
Not to Scale

ALT. 3B (100-YR.)

24th Ave and Camelback Rd
Drainage Improvement

Basin C.1

PREMIER



Basin "C.2"				
Description	**Units**	**Total**	**Unit Price**	**Amount**
Demolition	ac	1.7	$25,000.00	$42,500.00
Excavation	cy	13000	$5.00	$65,000.00
Catch Basins	ea	4	$5,000.00	$20,000.00
30" HDPE Storm Drain	lf	400	$45.00	$18,000.00
Manholes	ea	2	$3,500.00	$7,000.00
Drywells	ea	8	$5,000.00	$40,000.00
Remove & Replace Asphalt Pavement	sy	200	$30.00	$6,000.00
Landscape/Irrigation	ac	1.7	$43,560.00	$74,052.00
Survey/Testing (4%)	ls	1	$10,902.08	$10,902.08
			Sub-Total =	***$283,454.08***
			Contingency (20%) =	***$56,690.82***
			Construction Cost =	***$340,144.90***
			Engineering Fees (15%) =	***$51,021.73***
			Land Acquisition (Pro-Rated) =	***$793,349.00***
			Administrative Fees (5%) =	***$17,007.24***
			Total =	***$1,201,522.88***

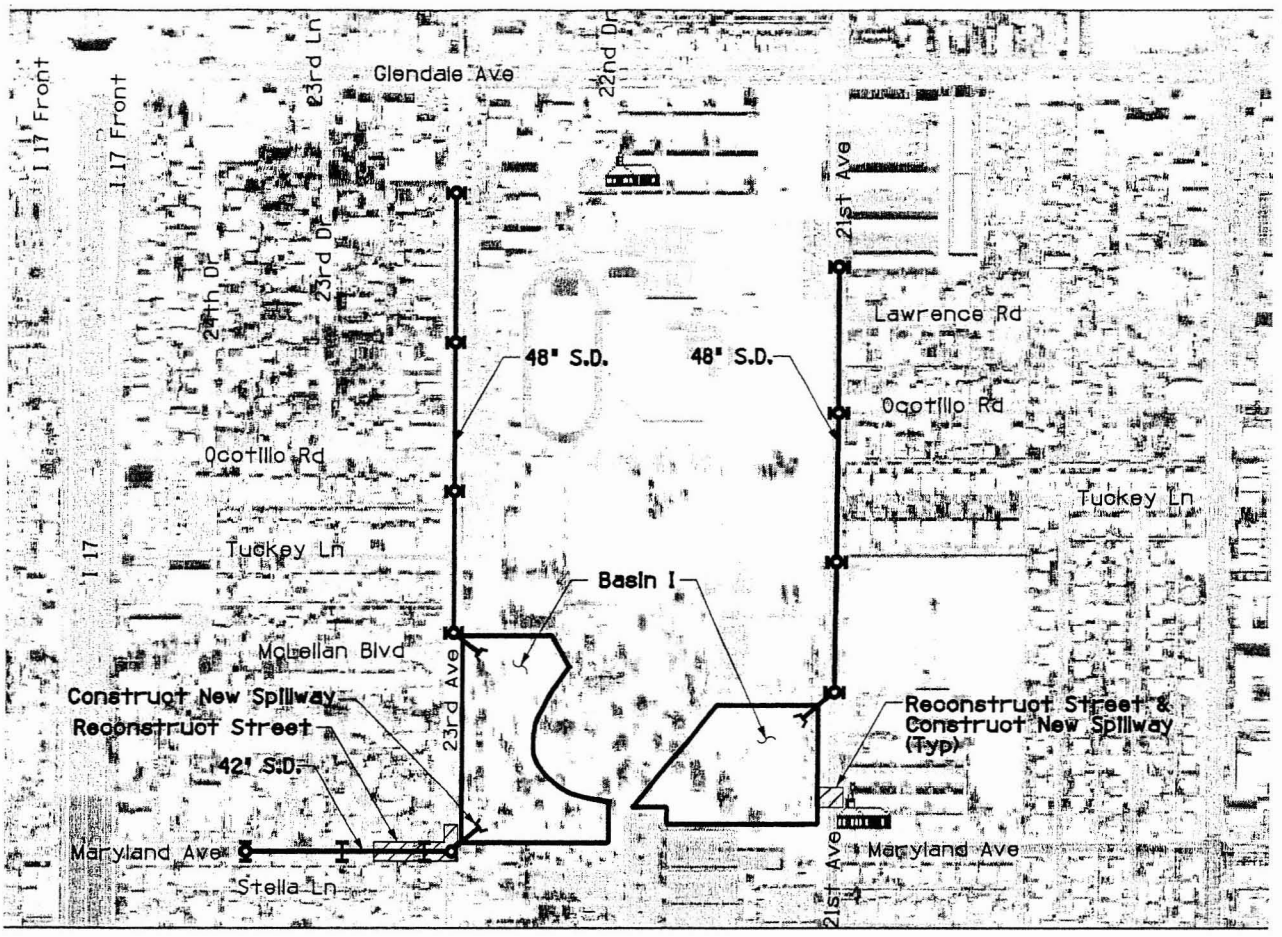
Not to Scale

ALT. 3B (100-YR.)

24th Ave and Camelback Rd
Drainage Improvement

Basin C.2

PREMIER



Basin "I" (Washington Park)				
Description	**Units**	**Total**	**Unit Price**	**Amount**
Demolition	ac	11.3	$10,000.00	$113,000.00
Excavation	cy	68000	$5.00	$340,000.00
Catch Basins	ea	22	$10,000.00	$220,000.00
48" HDPE Storm Drain	lf	3300	$60.00	$198,000.00
42" HDPE Storm Drain	lf	940	$55.00	$51,700.00
Manholes	ea	9	$3,500.00	$31,500.00
Drywells	ea	56	$5,000.00	$280,000.00
Remove & Replace Asphalt Pavement	sy	2000	$30.00	$60,000.00
[1]Street Reconstruction (23rd Ave.) -102 cfs	lf	75	$245.00	$18,375.00
[1]Street Reconstruction (21st Ave.) - 14 cfs	lf	50	$225.00	$11,250.00
[2]Street Reconstruction (Maryland) - 51 cfs	lf	200	$250.00	$50,000.00
Spillway	ls	2	$20,000.00	$40,000.00
Landscape/Irrigation	ac	11.3	$43,560.00	$492,228.00
Survey/Testing (4%)	ls	1	$76,242.12	$76,242.12
			Sub-Total =	***$1,982,295.12***
			Contingency (20%) =	***$396,459.02***
			Construction Cost =	***$2,378,754.14***
			Engineering Fees (15%) =	***$356,813.12***
			Land Acquisition =	***$0.00***
			Administrative Fees (5%) =	***$118,937.71***
			Total =	***$2,854,504.97***

N

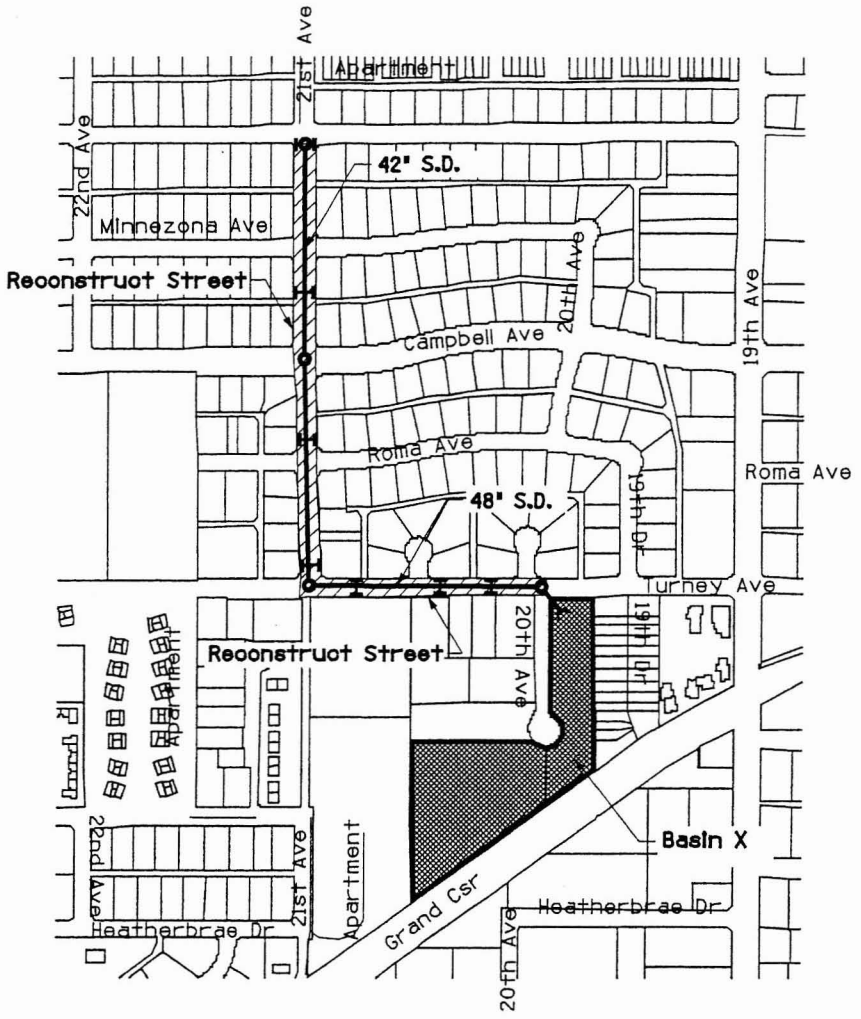
Not to Scale

ALT. 3B (100-YR.)

24th Ave and Camelback Rd
Drainage Improvement

Basin I

PREMIER



Basin "X"				
Description	Units	Total	Unit Price	Amount
Clear & Grubb	ac	4.6	$1,000.00	$4,600.00
Excavation	cy	29050	$5.00	$145,250.00
Catch Basins	ea	14	$10,000.00	$140,000.00
42" HDPE Storm Drain	lf	1320	$55.00	$72,600.00
48" HDPE Storm Drain	lf	700	$60.00	$42,000.00
Manholes	ea	5	$3,500.00	$17,500.00
Drywells	ea	24	$5,000.00	$120,000.00
Remove & Replace Asphalt Pavement	sy	900	$30.00	$27,000.00
[1&2]Street Reconstruction (Turney) - 88 cfs	lf	700	$250.00	$175,000.00
[2]Street Reconstruction (21st Ave) - 88 cfs	lf	1320	$250.00	$330,000.00
Spillway	ls	1	$20,000.00	$20,000.00
Landscape/Irrigation	ac	4.6	$43,560.00	$200,376.00
Survey/Testing (4%)	ls	1	$51,773.04	$51,773.04
			Sub-Total =	*$1,346,099.04*
			Contingency (20%) =	*$269,219.81*
			Construction Cost =	*$1,615,318.85*
			Engineering Fees (15%) =	*$242,297.83*
			Land Acquisition (Pro-Rated) =	*$505,500.00*
			Administrative Fees (5%) =	*$80,765.94*
			Total =	*$2,443,882.62*

N

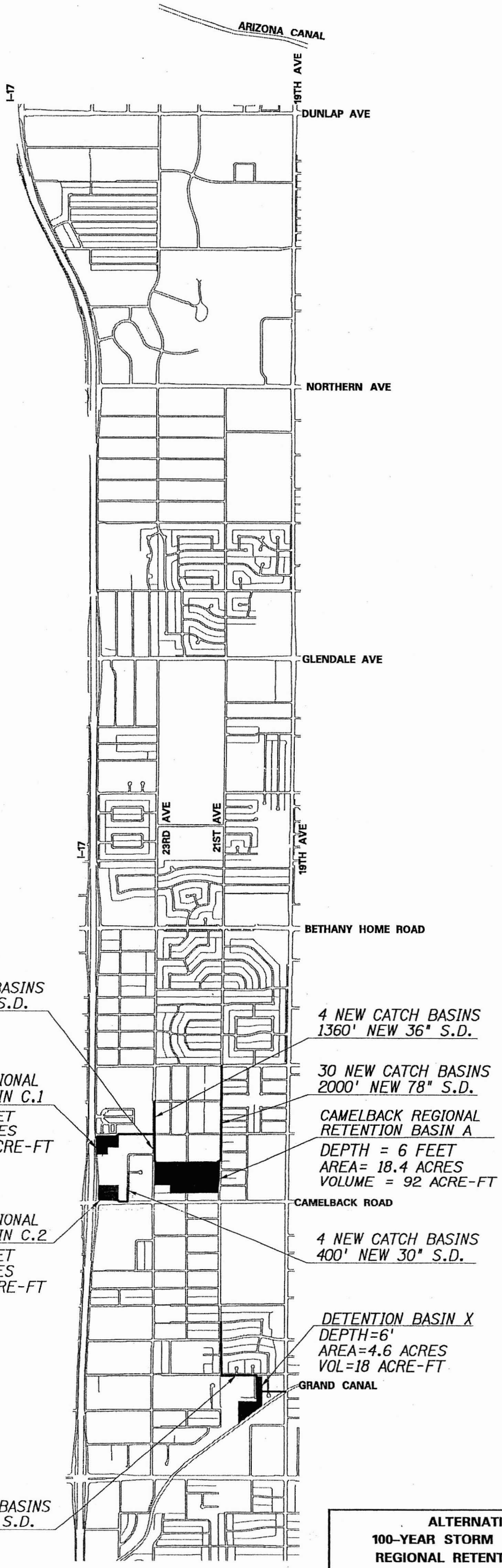
Not to Scale

ALT. 3B (100-YR.)

24th Ave and Camelback Rd
Drainage Improvement

Basin X

PREMIER

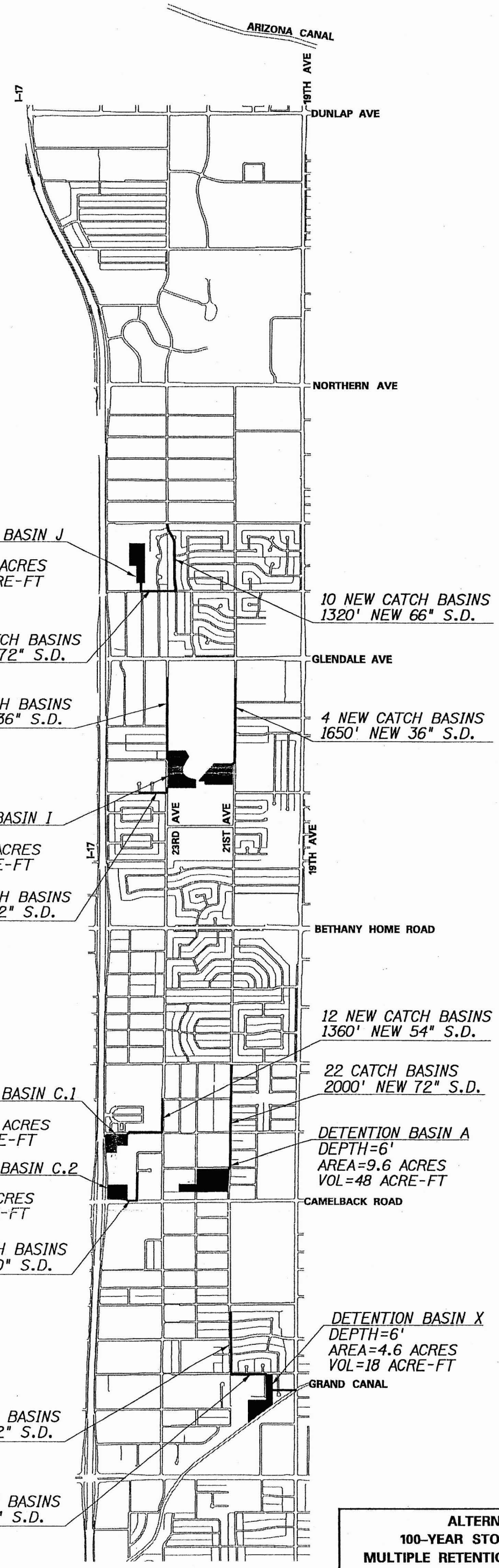


ALTERNATIVE 2
100-YEAR STORM PROTECTION
REGIONAL RETENTION BASIN
MAP

FIGURE 15

PREMIER

Plotted By: KLW 04/01/2003 09:11:00 PM P:\2002010\Cadd\Premier\Alt2_Regional_Basin_V8.dgn

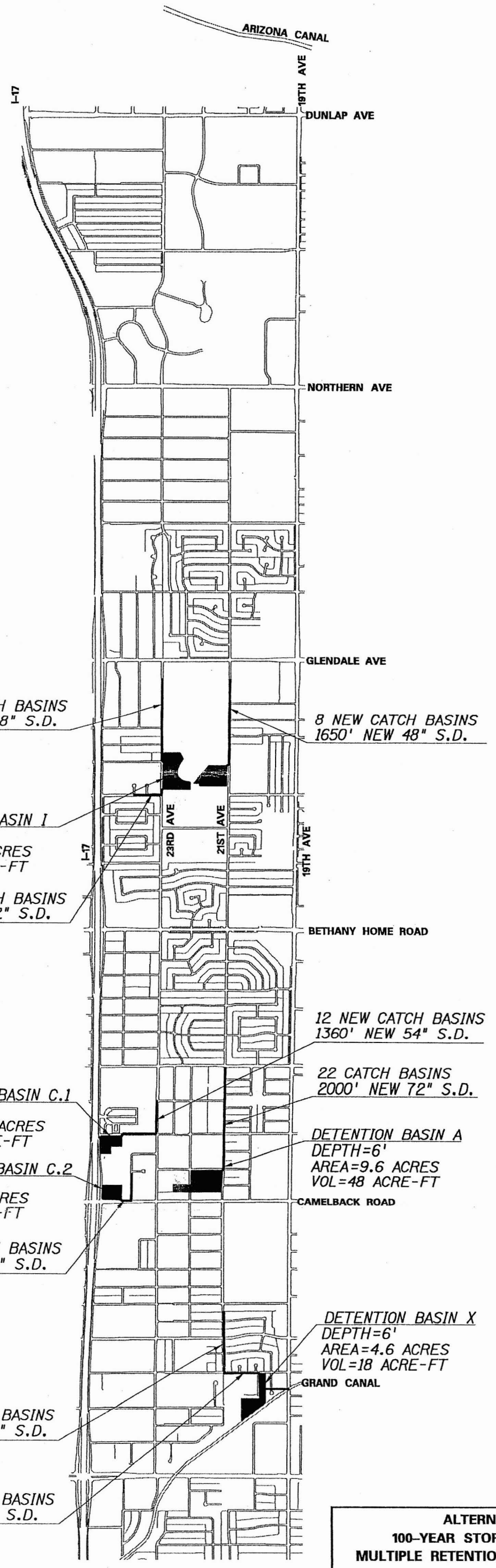


ALTERNATIVE 3A
100-YEAR STORM PROTECTION
MULTIPLE RETENTION/DETENTION BASINS
MAP

FIGURE 17

PREMIER

Plotted By: KLW 04/01/2003 09:37:40 PM P:\2002010\Cadd\Premier\Alt3_Multi-Basin1_v8.dgn

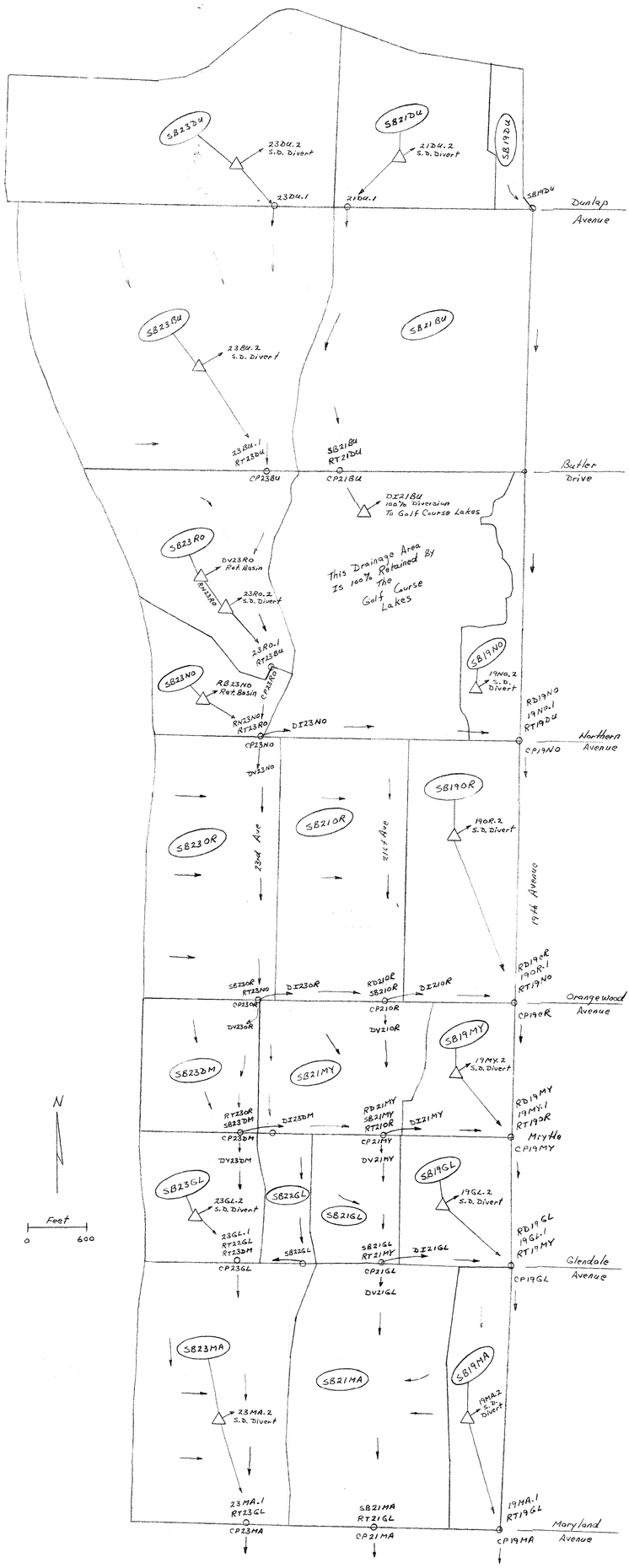


ALTERNATIVE 3B
100-YEAR STORM PROTECTION
MULTIPLE RETENTION/DETENTION BASINS
MAP

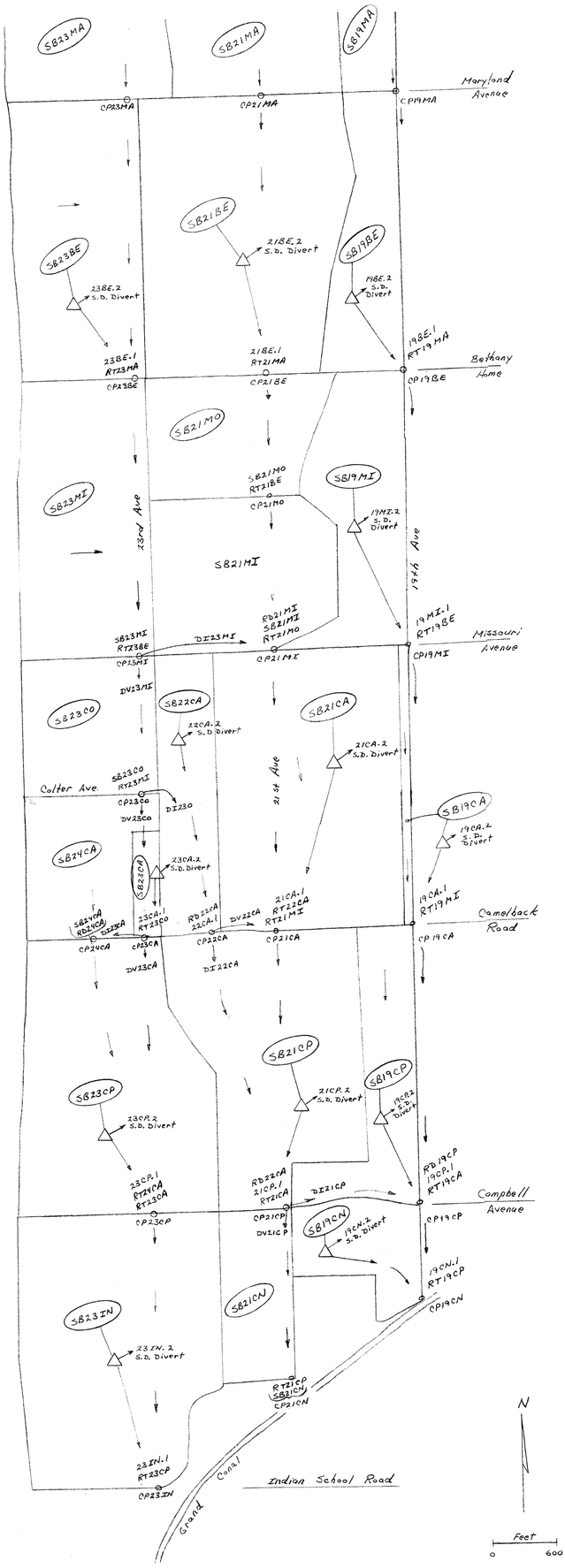
FIGURE 17.1

PREMIER

Plotted By: KLW 04/01/2003 09:43:27 PM P:\2002010\Cadd\Premier\Alt3_Multi-Basin2_v8.dgn



HEC-1 Routing Schematic
Existing Conditions
24th Avenue & Camelback Road Drainage Study
Phoenix, Arizona
Premier Engineering Corporation
September 2003 — PLATE 1



HEC-1 Routing Schematic

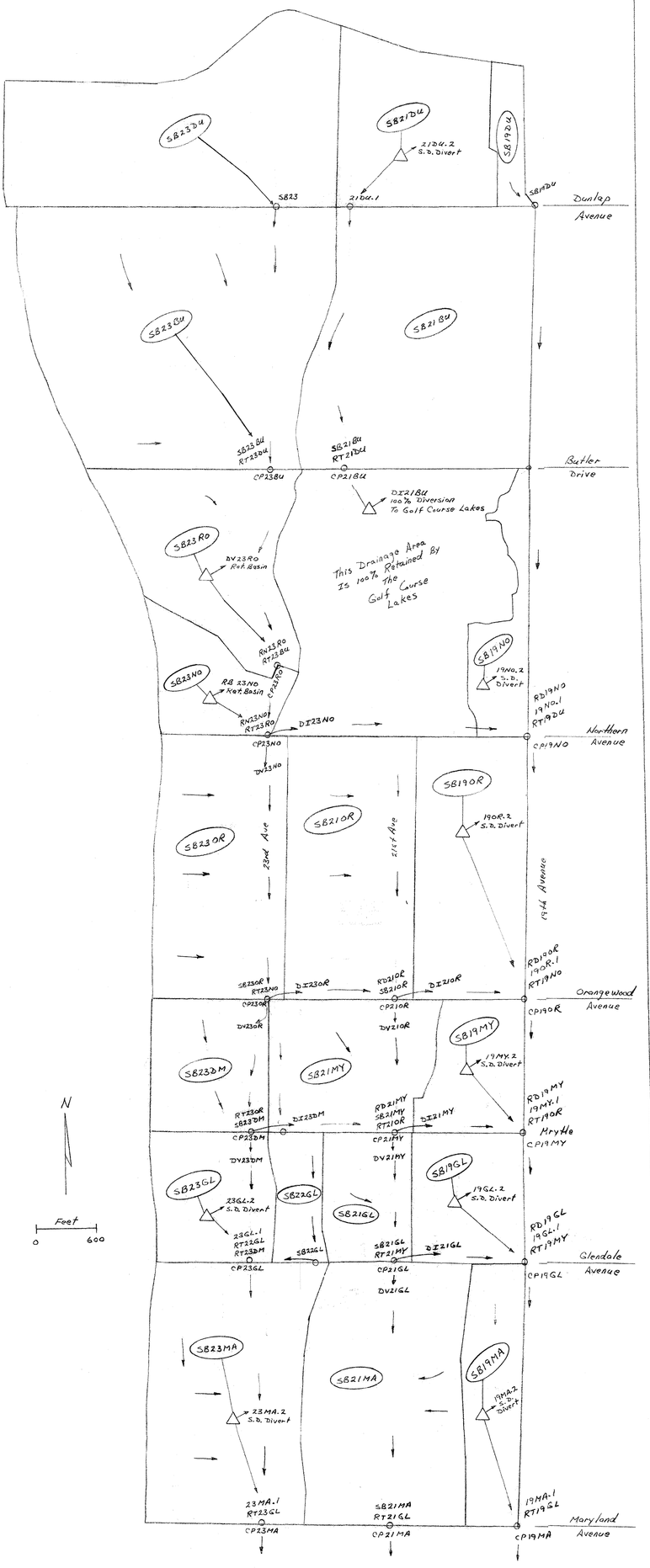
Existing Conditions

24th Avenue & Camelback Road Drainage Study

Phoenix, Arizona

Premier Engineering Corporation

September 2003 **PLATE 2**



HEC-1 Routing Schematic

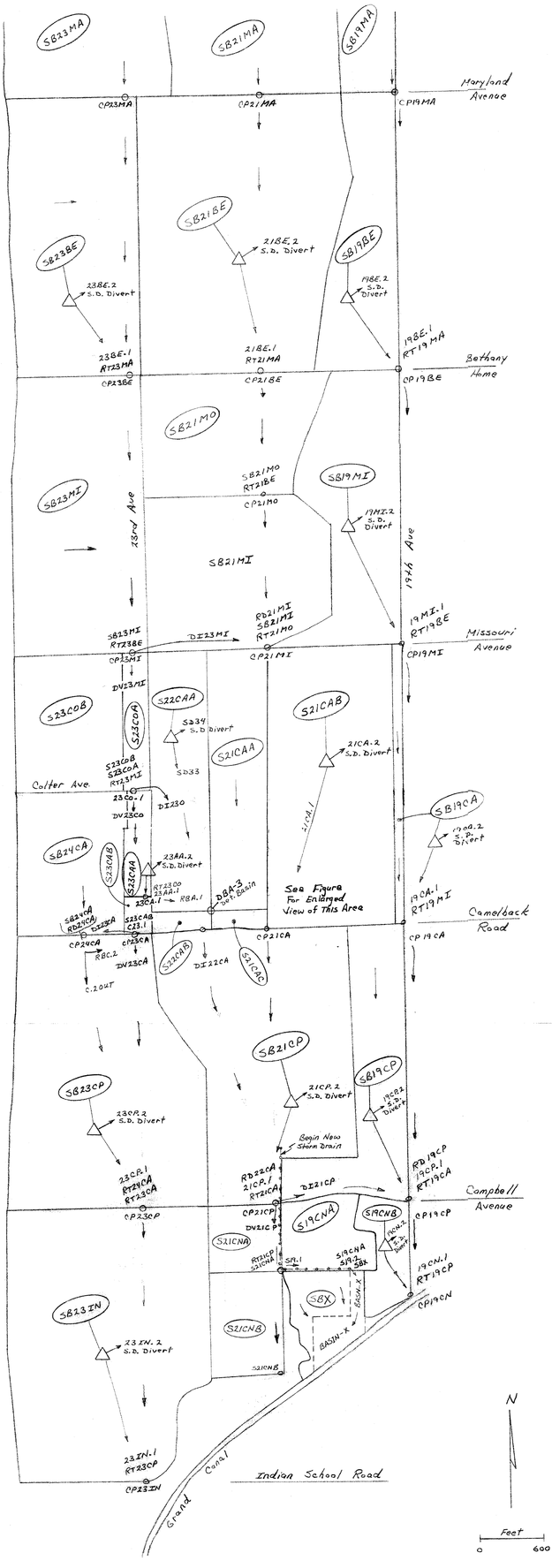
Phase 1 System

24th Avenue & Camelback Road Drainage Study

Phoenix, Arizona

Premier Engineering Corporation

September 2003 **PLATE 3**



HEC-1 Routing Schematic

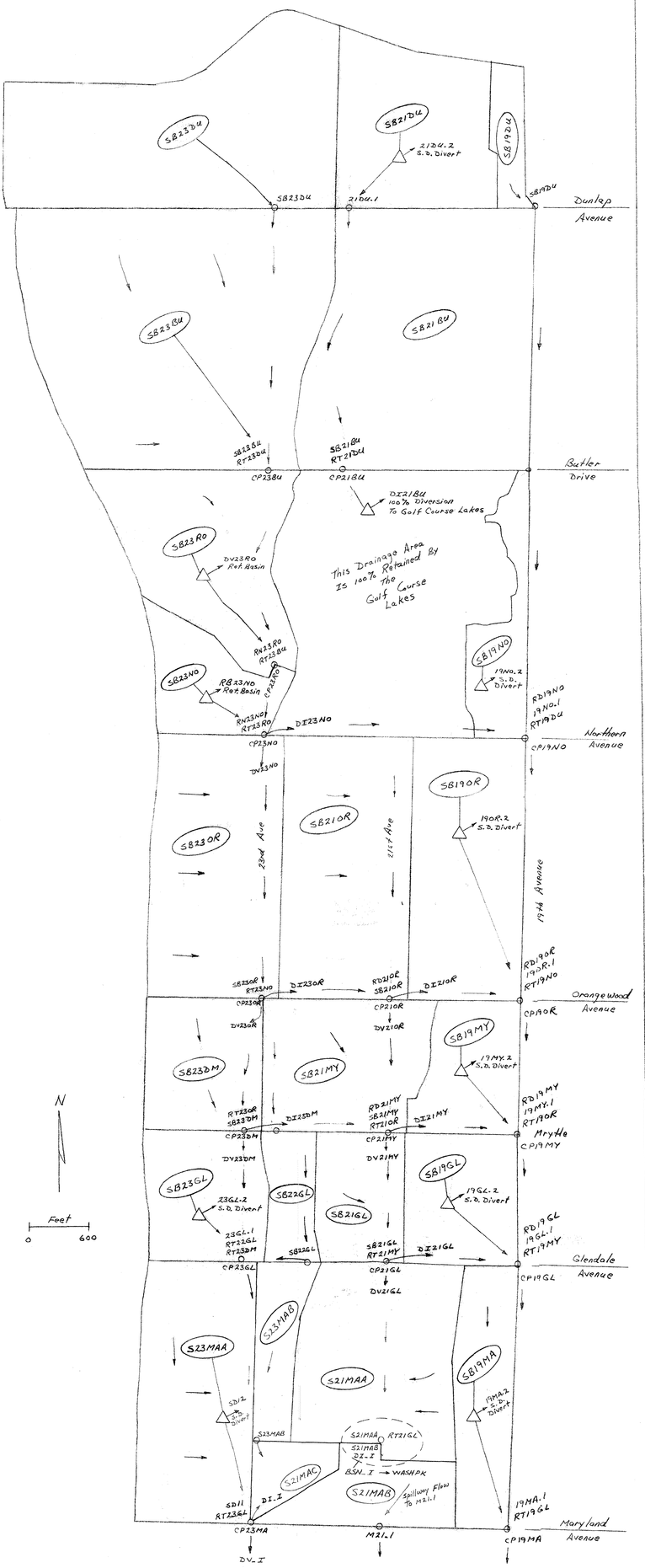
Phase 1 System

24th Avenue & Camelback Road Drainage Study

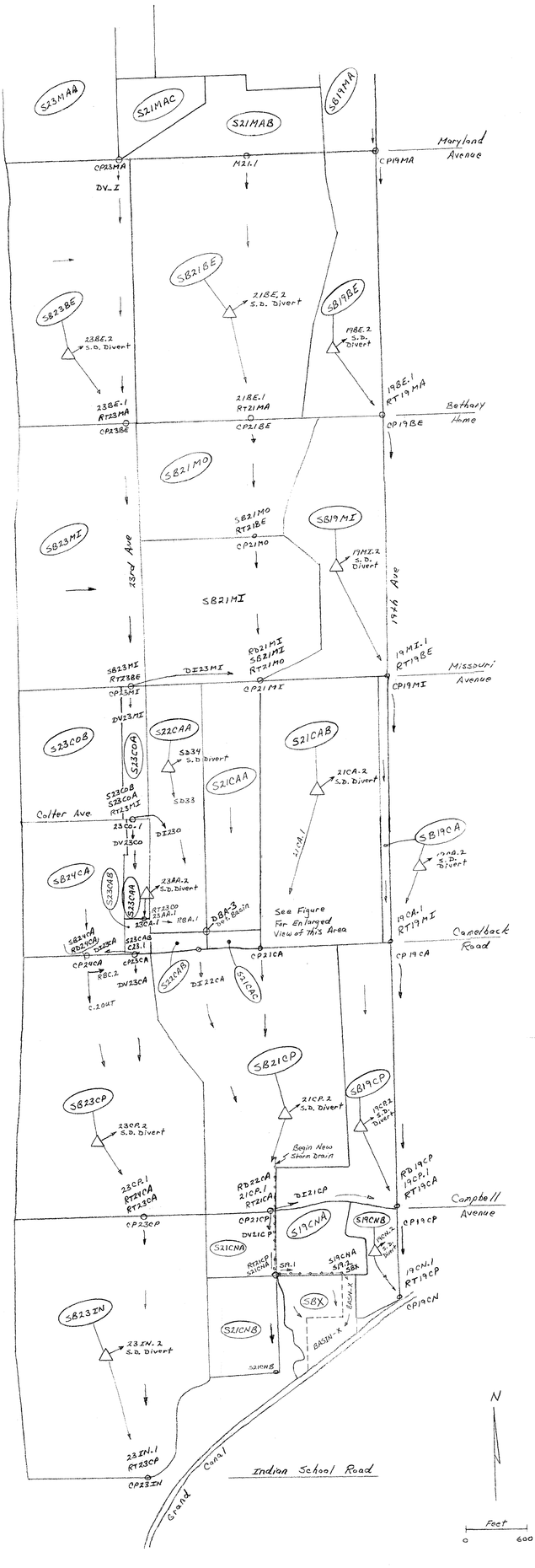
Phoenix, Arizona

Premier Engineering Corporation

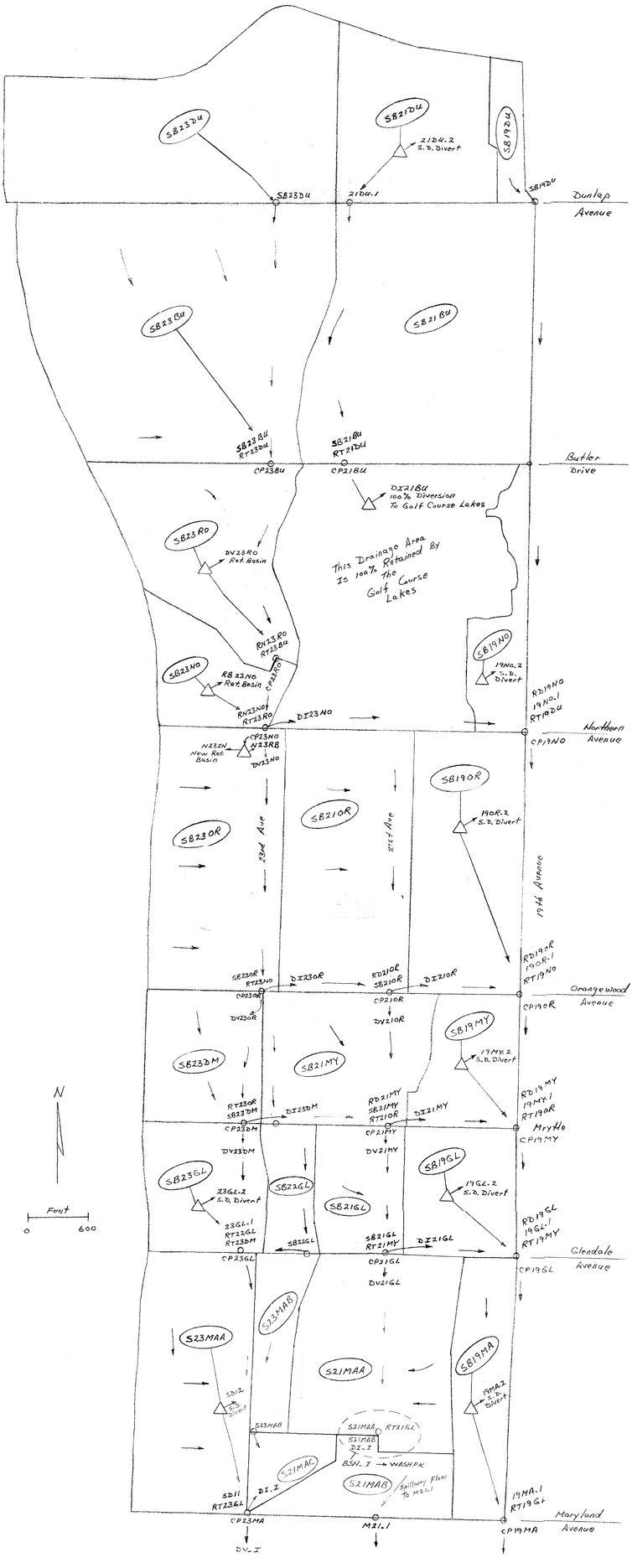
September 2003 **PLATE 4**



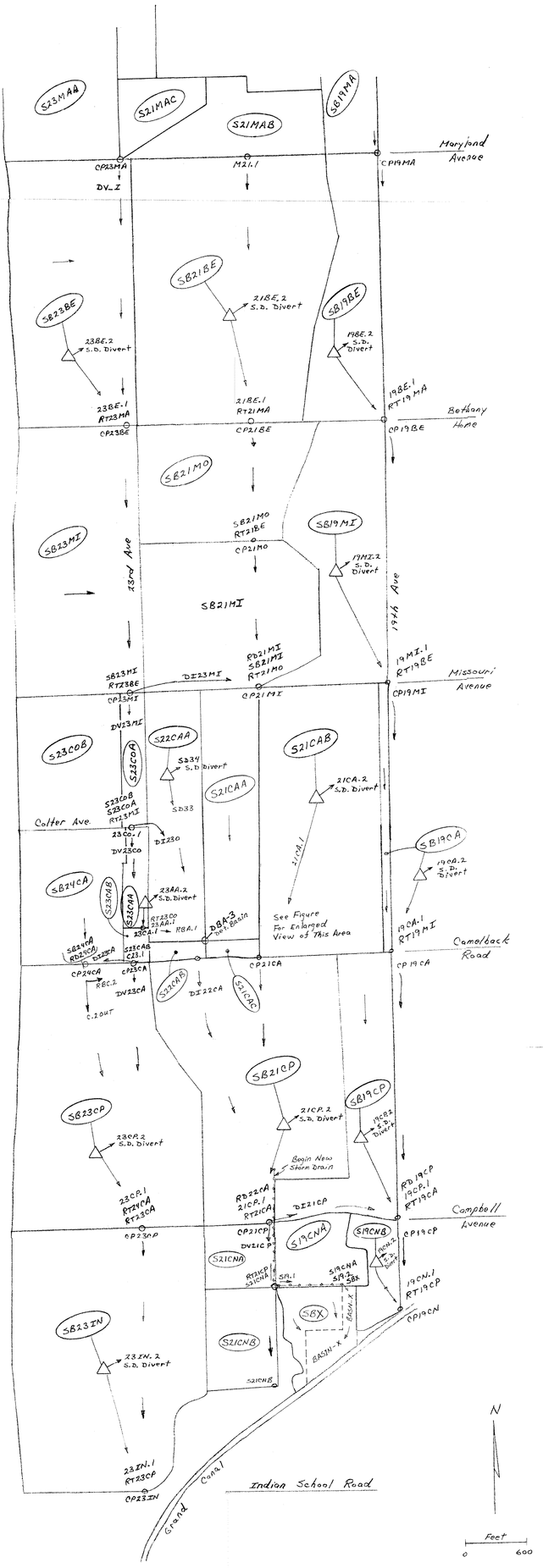
HEC-1 Routing Schematic	
Phase 2 System	
24th Avenue & Camelback Road Drainage Study	
Phoenix, Arizona	
Premier Engineering Corporation	
September 2003	PLATE 5



HEC-1 Routing Schematic	
Phase 2 System	
24th Avenue & Camelback Road Drainage Study	
Phoenix, Arizona	
Premier Engineering Corporation	
September 2003	PLATE 6



HEC-1 Routing Schematic	
Phase 3 System	
24th Avenue & Camelback Road Drainage Study	
Phoenix, Arizona	
Premier Engineering Corporation	
September 2003	PLATE 7



HEC-1 Routing Schematic
Phase 3 System
24th Avenue & Camelback Road Drainage Study
Phoenix, Arizona
Premier Engineering Corporation
September 2003 — PLATE 8