

VOLUME II OF II CONCEPT DESIGN REPORT DRAINAGE IMPROVEMENTS ALTERNATIVE ANALYSIS

84TH STREET AND CHOLLA ROAD ROADWAY IMPROVEMENTS AND 83RD PLACE & SHEA BOULEVARD NEIGHBORHOOD DRAINAGE IMPROVEMENTS

Prepared For:

CITY OF SCOTTSDALE
TRANSPORTATION DEPARTMENT

PROJECT NUMBERS
S-2709 & F-2708

October 8, 1993

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I. DESCRIPTION OF PROJECT

A. HYDROLOGY

The hydrology for existing conditions is presented in "Volume I of II - EXISTING CONDITIONS HYDROLOGY REPORT" for this project. Volume I describes the drainage basins and existing drainage facilities in the study area; the study area is defined; drainage patterns are described; and the source of data, criteria, and methodology is described. Runoff discharge values were calculated at numerous concentration points for the 2, 5, 10, 25, 50, and 100-year return frequency storms with a 6-hour duration. Concentration point numbers are shown on the Volume I Drainage Area Map and Table 4.6 lists the discharge values in cfs. The map and Table are reproduced here on pages 2 and 3.

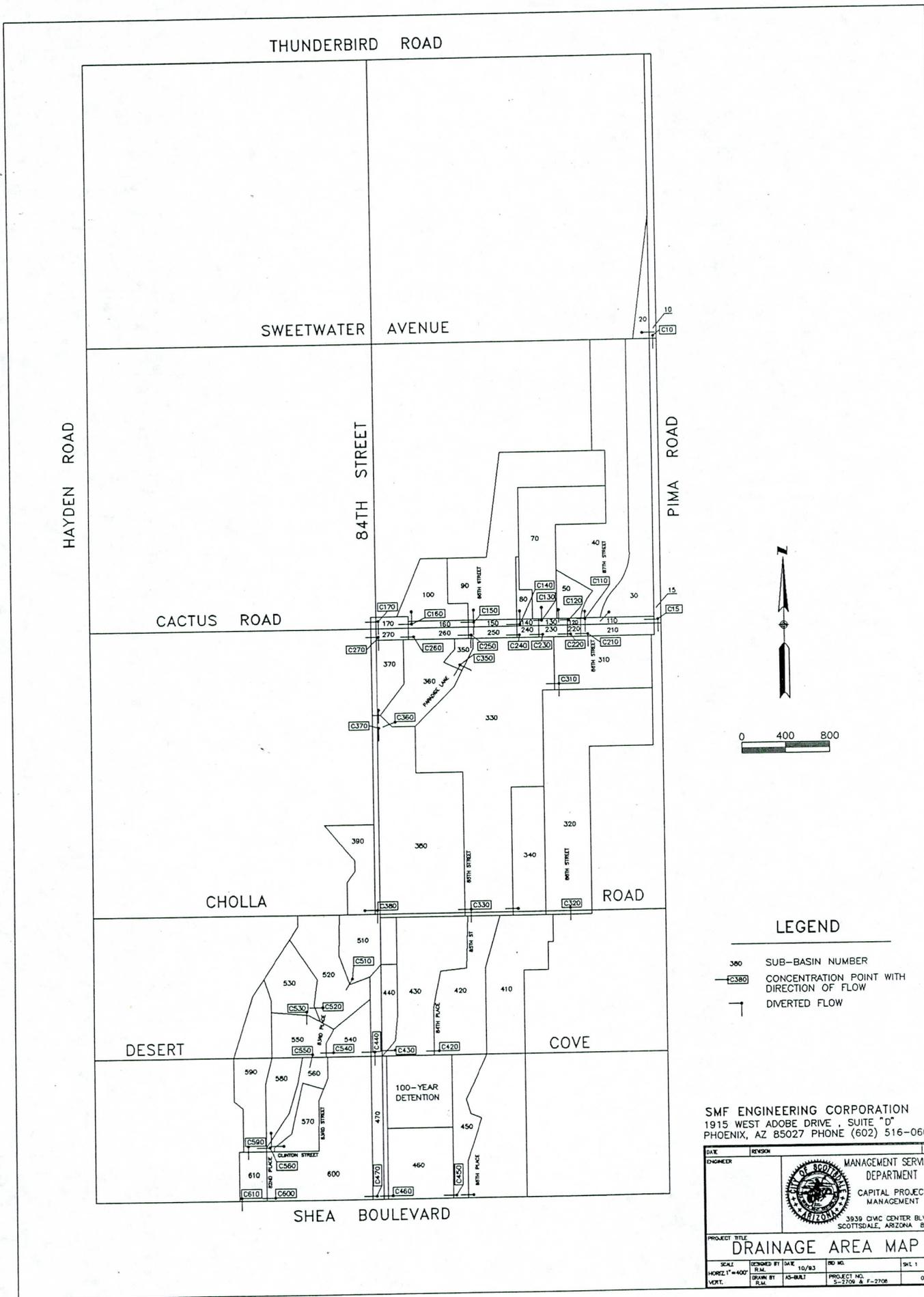
Residential Structure Intrusion Damage... there are no reported incidences on record indicating the floodwaters' surface elevations have exceeded floor elevations and thus, water has entered homes or other buildings, causing damage to them. However, numerous citizen complaints have been received by the City which indicate floodwater has spread through yards and approached floor elevations within inches. The runoff discharge values presented in Volume I and the analysis of this Volume II suggest the citizen complaints are warranted.

Erosion and Landscape Damage... during past flooding events, damage to landscaped areas and yards occurred at numerous locations throughout the study area. Some damage and erosion occurred on those properties adjacent to or near the Cholla wash channel, and to properties along Shea Boulevard, along 85th Street and 84th Place between Desert Cove and Cholla Road, along 84th Street between Shea Boulevard and Cactus Road, and along the north side of Shea Boulevard between 84th Street and Cholla channel. Again, the runoff discharge values presented in Volume I suggest this potential.

Road Closures... during larger flooding events, road closures have occurred in the Cactus Road / 84th Street intersection, at Cholla wash in the Cholla Road / 84th Street intersection, and the 83rd Place / Desert Cove intersection.

Suggested Improvements... those runoff discharges presented in Volume I suggest that drainage improvements should be constructed which will reduce existing surface flows to a manageable level at the following locations:

- 1) Cactus Road from Pima Road to 84th Street
- 2) 84th Street from Cactus Road to Cortez Street
- 3) Cholla wash from Cortez Street to Shea Boulevard
- 4) Shea Boulevard from 85th Place to the existing point of outfall (2-barrel 12' x 3' box culvert) located just west of 82nd Place in Cholla wash.
- 5) 84th Place and 85th Street between Desert Cove and Cholla Road



LEGEND

- 380 SUB-BASIN NUMBER
- C380 CONCENTRATION POINT WITH DIRECTION OF FLOW
- └ DIVERTED FLOW

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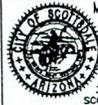
DATE	REVISION	BY
ENGINEER		
		MANAGEMENT SERVICES DEPARTMENT
		CAPITAL PROJECT MANAGEMENT
3639 CIVIC CENTER BLVD. SCOTTSDALE, ARIZONA 85251		
PROJECT TITLE		
DRAINAGE AREA MAP		
SCALE	DESIGNED BY	DATE
HORIZ. 1"=400'	P.L.M.	10/83
VERT.	DRAWN BY	PROJECT NO.
	P.L.M.	S-2709 & F-2708
		SHEET NO.
		1 OF 1

Table 4.6

HEC-1 RUNOFF DISCHARGE SUMMARY

LOCATION CONCENTRATION POINT NUMBER	RETURN FREQUENCY - 6-HOUR DURATION					
	2-YEAR	5-YEAR	10-YEAR	25-YEAR	50-YEAR	100-YEAR
C-110	14	26	34	48	66	85
C-150	27	51	64	84	102	124
C-160	27	41	44	56	66	80
C-170	28	42	45	56	67	82
C-210	4	10	16	23	31	39
C-250	9	27	41	55	70	85
C-260	8	21	31	41	51	56
C-270	28	53	66	86	104	122
C-310	5	11	15	23	29	37
C-320	12	25	35	50	63	80
C-330	18	39	52	77	98	127
C-350	3	8	13	18	23	34
C-370	32	62	81	110	136	160
C-380	44	91	120	173	222	270
410	11	22	29	41	53	65
C-420	17	37	50	73	96	121
C-430	21	44	60	88	117	148
C-440	23	47	63	92	122	155
C-450	13	26	34	49	63	78
C-460	14	29	39	57	74	92
C-470	32	66	89	130	167	206
C-510	46	94	124	178	226	277
C-520	47	98	128	185	238	295
C-530	49	100	133	191	246	306
C-540	8	16	21	31	40	51
C-550	57	117	157	224	288	360
C-560	58	122	165	237	301	372
C-590	61	129	176	254	323	401
C-600	38	79	106	155	201	248
C-610	96	209	283	408	526	655

For concentration point numbers and location, see Drainage Area Map.

B. DESIGN STANDARDS AND CRITERIA

The design standards used for this project are City of Scottsdale Design Procedures and Criteria, Section 2 - Drainage Report Presentation; Section 2.2 - Hydrology (Revised September 21, 1992); and Section 3 - Design of Facilities to Manage Storm Water Runoff.

C. EXCEPTIONS TO THE STANDARDS

City of Scottsdale Design Procedures and Criteria, Section 3 says "...Abrupt, 90-degree channel bends, steep side slopes, and channel lining consisting of soil cement, hydraulically applied cement or concrete are to be avoided. ..." ¹. For the various alternates studied which include improvements to Cholla wash, those improvements consist of widening and concrete lining of the existing Cholla wash.

D. DRAINAGE BASINS AND DIVERSION CONCEPTS

Planned Diversions... when a diversion is required, sufficient design / modeling must be performed to demonstrate that the affected areas are provided with at least the same level of flood protection as existed prior to the diversion. In the event that level of protection which existed prior to the diversion improvement was considered undesirable or unacceptable, then a serious uncertainty would exist as to the validity or acceptability of the proposed diversion concept. In that event, a total solution is necessary, including the area downstream of the diversion and that facility should be improved to City Standards.

Drainage Area Parameters... as described in Volume I, Section 3, the drainage basin of this study area is bound on the east by Pima Road and bound on the west and northwest side by Thunderbird wash channel. However, in order to prevent overspillage from the adjacent basins, two improvements are necessary; one, Thunderbird channel from Sweetwater Avenue to Thunderbird Road, including the Pima Road box culvert, and two, the box culverts under 84th Street and Cactus Road in Thunderbird wash.

Pima Road Diversion... the Pima Road channel improvement and culvert improvement at Thunderbird Road is a City planned diversion. A part of the runoff discharge from areas A10 and A20 ² will be diverted south in the Pima Road channel.

Areas A10 and A20 are relatively large areas and they are expected to contribute a significant discharge to the downstream Scottsdale Country Club East Nine

¹ City of Scottsdale, Design Procedures and Criteria, Section 3 - Design of Facilities to Manage Stormwater Runoff, p. 3.

² Boyle Engineering Corporation. Hayden / Shea Area Master Drainage Plan, Pima/Doubletree Area Master Drainage Plan, Addendum No. 2, January 25, 1991, Exhibit 1.

drainage facilities. Therefore, the peak discharges and total volume of flow which reach those facilities will be reduced by the Pima Road diversion channel improvements. A capacity analysis has not been performed for the Pima channel.

The City of Scottsdale recognizes that the Pima Road channel has some deficiencies and some overspillage is expected during larger storm events; however, during the interim period (until the Outer Loop Freeway is constructed) the consequences of these deficiencies appear to be less severe than that which would occur in the Thunderbird wash basin. Consequently, the City has planned this diversion component which will increase the discharge into the Pima Road channel and they are amenable to allowing greater deficiencies until the Outer Loop drainage facilities are constructed.

The Hayden / Shea Master Drainage Plan in the discussion of future detention of undeveloped areas says... "Drainage areas A10, A30 and A40 are presently undeveloped." It also says... "Detention of these areas has no effect on the flooding that occurs at the Scottsdale Country Club..."³. This statement is believed to be in error. It will be confirmed in the final HEC-1 analysis.

Cactus Road Diversion Component... as stated in Volume I, the existing Cactus Road from 84th Street to Pima Road collects flows from those areas north of Cactus Road and diverts those flows to 84th Street where it turns south and continues in 84th Street to Cholla wash at Cortez Street. The hydraulic capacity of Cholla wash is considerably less than the runoff flows which will enter into it. Also, the surface runoff flows experienced in Cactus Road and 84th Street are considerably greater than the street's water conveyance capacity.

Therefore, a new storm sewer pipe alternative is proposed for study in Cactus Road from about 87th Street to 84th Street. For some of the alternative plans studied, the storm sewer pipe design concept outfalls into the Scottsdale Country Club East Nine drainage facilities along 84th Street just south of Cactus Road. The Pima Road diversion channel will reduce the flows reaching the outfall facilities at the East Nine from Thunderbird wash, and the Cactus Road storm sewer will increase those flows. Final design of the Cactus Road Storm Sewer must include modeling the Scottsdale Country Club East Nine drainage facilities to ensure a proper balance with the Pima Road diversion channel.

In Volume I, Section II, 2.1 Base Data, uncertainties associated with the initial HEC-1 model of the East Nine drainage facilities and basins are discussed.

Cholla Road Diversion Component... drainage improvements are needed at the Cholla Road / 85th Street intersection, and in 85th Place, 85th Street, and Desert Cove south of that intersection. Therefore, the Cholla Road storm sewer

³ Boyle Engineering Corporation. Hayden / Shea Area Master Drainage Plan, Pima/Doubletree Area Master Drainage Plan, Addendum No. 2, January 25, 1991, p. 9.

alternative is proposed for study from 85th Street to Cholla wash. The proposed Cactus Road storm sewer will reduce those runoff flows that reach Cholla wash, thus excess capacity is available in Cholla wash to receive these diverted flows from the Cholla Road storm sewer.

E. BENEFITTING COMMUNITY

Residential Area... the primary benefitting area of the proposed improvements of this project is that area bounded by Shea Boulevard on the south, Cholla Road on the north, 82nd Street on the west and 86th Street on the east; and, the area bounded by Cholla Road on the south, Cactus Road on the north, 84th Street on the west and 86th Street on the east. The primary beneficial impacts will be to those properties near and adjacent to Cholla wash, 84th Street, Cactus Road, and 85th Street.

Scottsdale Country Club East Nine... For most of the alternates studied, post-construction impacts to this area will be little or none. Essentially, runoff discharges flowing into the East Nine drainage facilities will remain unchanged or will be reduced. However, the objectives of one of the alternates studied include improving conditions outside the study area of this project, which will impact the Scottsdale Country Club East Nine and the communities downstream of its outfall from Lake 2.

F. CAPITAL IMPROVEMENT PROGRAM (CIP), LEVEL OF PROTECTION AND NEEDED IMPROVEMENTS

Level of Protection and Budget... construction is planned for mid 1994. The total funds available for this project (Project Number F2708), including engineering, construction and inspection is \$838,900. Total funds available for the related street improvement project (Project Number S2709) is \$925,000.

The Concept Design Report for the companion street improvement project of Cholla Road and 84th Street is a separate bound report.⁴

For each of the preferred drainage alternates studied, runoff discharges were calculated for selected return frequency storms and alternative designs were prepared for various levels of protection while considering the construction cost and budget.

The nature of a concept study is that proposed improvements are not known beforehand; therefore, it is rare if pre-programmed available funds and cost to meet the community needs match.

The alternative chosen for construction must meet the long range needs of the

⁴ SMF Engineering Corporation. 84th Street and Cholla Road Roadway Improvements, Concept Design Report, August 4, 1993, Sections 3 and 4.

community and maximize benefit to the community.

Much of this project area is an older community and was developed under older drainage standards (Maricopa County). As newer subdivisions developed in the surrounding areas, the drainage problems were exacerbated in this study area. Many of the local citizens whom attended the public information meetings perceive their community as a victim of surrounding growth and changing standards.

As the engineer progressed with this study, it became apparent that the drainage issues are more severe than initially described and that alternative solutions are limited by surrounding development and adjacent drainage system's capacity constraints. Therefore, the long range, overall solution reaches beyond the study area of this project. The study area of this project is described in Volume I.

Cholla Wash Channel... initially, this study was centered around the Cholla wash channel. The initial brief description of the project is... "The drainage project will address deficiencies and problems in the existing drainage channel from the 84th Street and Cholla Road intersection south to the existing lined channel at 82nd Place and Clinton Street (400 feet north of Shea Boulevard). Should channel improvements be necessary along the existing channel alignment, the required drainage easements for this portion of the project are assumed to be dedicated to the City at no cost."⁵. However, the future runoff discharges which contribute to Cholla wash are dependent upon several surrounding drainage features which require consideration and they are reiterated here:

- 1) Cactus Road storm sewer
- 2) Thunderbird wash and box culvert at 84th Street
- 3) Pima Road channel
- 4) Box Culvert at Pima / Thunderbird intersection
- 5) Scottsdale Country Club East Nine drainage facilities
- 6) Outfall drainage culvert and channel at Shea Boulevard

Several of the alternative improvement plans studied require detention. The cost of a detention basin site is a substantial part of the project budget. Suitable sites are scarce, therefore, site selection has been given an inordinate amount of study.

⁵ City of Scottsdale, Engineering Contract Number 920106 - Exhibit "A", Project No. S-2709 & F-2708, 84th Street and Cholla Road Roadway Improvements and 83rd Place and Shea Boulevard Neighborhood Drainage Improvements, Scope of Work, p. 1.



II MAJOR DESIGN COMPONENTS

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II MAJOR DESIGN COMPONENTS

A. PIMA ROAD DIVERSION COMPONENT (See Map on Page 2)

Design Period... "ADOT's future depressed Outer Loop Highway will follow the Pima Road alignment. Construction is planned for the year 2001. ADOT's General Plan includes a channel to be constructed on the east side of the Outer Loop Highway."...⁶ The facility is expected to be in service by the year 2005. The Pima Road channel planned for the interim period by the City of Scottsdale will be replaced by ADOT's Outer Loop Highway channel. Scottsdale's interim channel is planned for a ten (10) year life.

Drainage Basin... at the intersection of Thunderbird Road and Pima Road the tributary area (.67 sq. mi.) to the Pima channel is shown in the Hayden / Shea Area Master Drainage Plan as areas A10 and A20.⁷ As the channel continues south additional tributary area accumulates on the east side of Pima Road. The size of that area was not determined in this study.

Design Discharge... the tributary drainage basin to the intersection of Thunderbird and Pima Roads is outside the study area of this report; therefore, the runoff discharges were not determined. However, the Hayden / Shea Master Drainage Plan (HEC-1) model shows the runoff discharges at this intersection to be:

Return Frequency	Runoff (cfs)
10	192
50	450
100	587

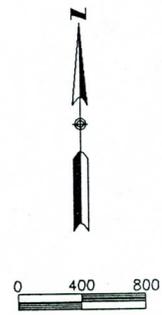
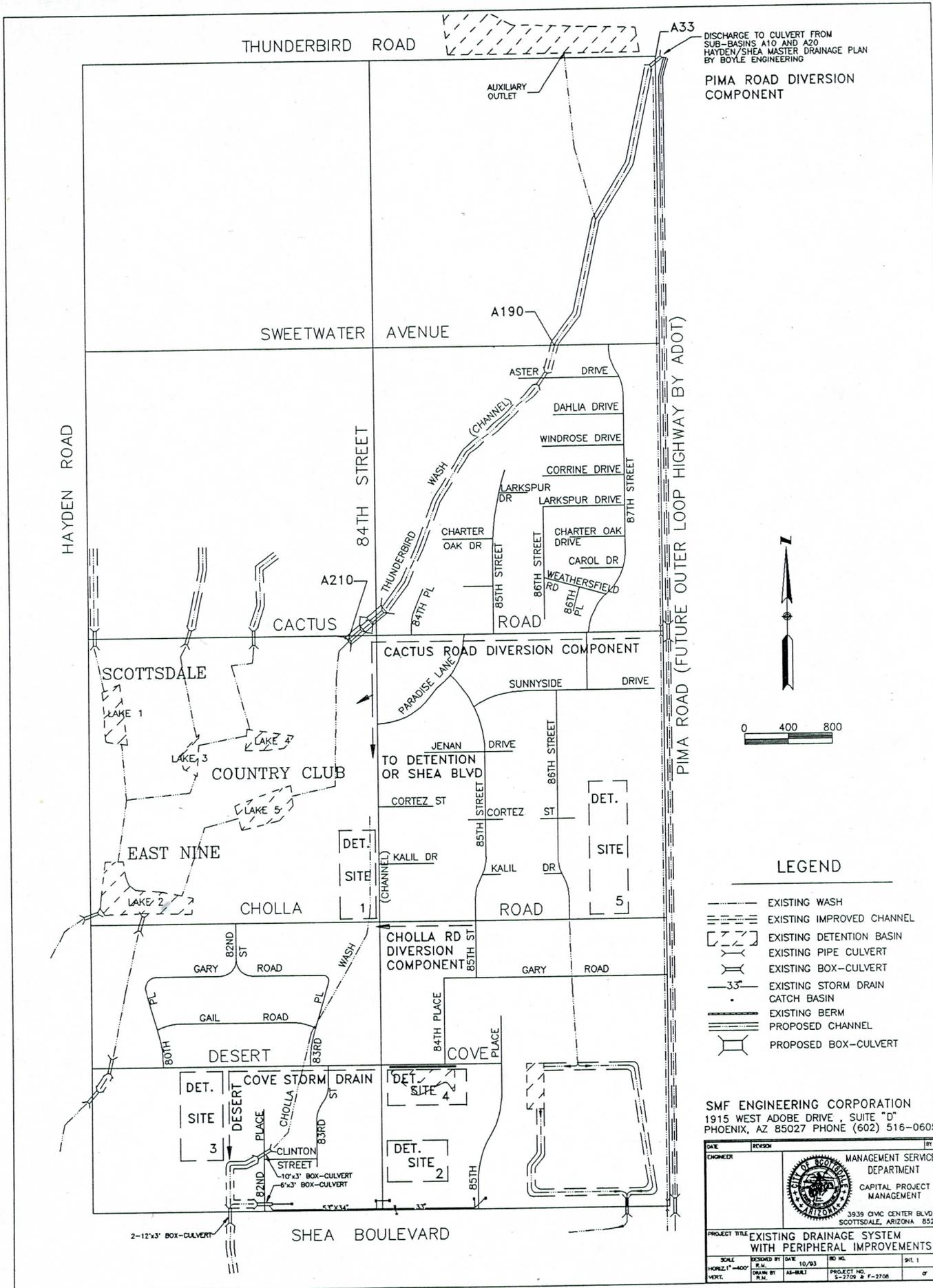
In the final design process, the Scottsdale Country Club East Nine drainage facilities and basins will be modeled using HEC-1 and from that analysis the magnitude of flow which must be diverted into the Pima Road channel will be determined.

Channel Capacity... the necessary capacity of the future Pima Road channel will be matched to that flow to be diverted into the channel at the Thunderbird / Pima intersection. Progressing to the south, the capacity must be increased to match the additional accumulative runoff from the adjacent area east of Pima Road.

The combined capacity of the Pima Road channel and Thunderbird wash channel should match the 100-year runoff discharge of 587 cfs and prevent overspillage into the basin of this project.

⁶ SMF Engineering Corporation, Hydrology Report 84th Street and Cholla Road Roadway Improvements and 83rd Place and Shea Boulevard Neighborhood Drainage Improvements, Volume I - Existing Conditions (June 21, 1993), section 3, p. 2.

⁷ Boyle Engineering Corporation, Hayden / Shea Area Master Drainage Plan, Pima/Doubletree Area Master Drainage Plan, Addendum No. 2, January 25, 1991, p. 9.



LEGEND

- EXISTING WASH
- ==== EXISTING IMPROVED CHANNEL
- [---] EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING BOX-CULVERT
- 33" EXISTING STORM DRAIN
- CATCH BASIN
- EXISTING BERM
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT

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DATE	REVISION	BY
ENGINEER		
		MANAGEMENT SERVICES DEPARTMENT
		CAPITAL PROJECT MANAGEMENT
3939 CIVIC CENTER BLVD. SCOTTSDALE, ARIZONA 85251		
PROJECT TITLE: EXISTING DRAINAGE SYSTEM WITH PERIPHERAL IMPROVEMENTS		
SCALE	DESIGNED BY DATE	RD NO.
HORIZ. 1"=400'	R.M. 10/93	
VERT.	DRAWN BY	PROJECT NO.
	A.S.-B&E	2-2706 & F-2706
		SHT. 1 OF 1

Diversion Structure... at the box culvert located near the Pima / Thunderbird intersection, a new diversion structure will be necessary to split the flow, into the Thunderbird wash channel and the Pima Road channel. The percent split to each channel will be determined in the SCC East Nine HEC-1 model analysis.

Improvement Limits and Outfall... this Pima Road channel improvement will begin at the diversion structure (Pima / Thunderbird intersection) and extend south along the east side of Pima Road .25 miles to the existing unlined Pima Road channel. The existing channel continues south 2.5 miles, then crosses Pima Road (northeast to southwest) and enters the McCormick Ranch area just south of Paradise Park.

B. THUNDERBIRD WASH CHANNEL (See Map on Page 2)

Channel Limits... as stated in Volume I, Thunderbird wash is unimproved from Sweetwater Avenue to the Pima / Thunderbird intersection; in the past overspillage into the study area of this project has occurred. This segment needs improvement.

Thunderbird to Sweetwater Design Discharge... again, these drainage basins are outside the limits of this study area; but, the Hayden / Shea master Drainage Plan shows the following in Thunderbird wash:

Return Frequency	@ Sutton (A35)		@ Sweetwater (A190)	
	Runoff	Channel Capacity	Runoff	Channel Capacity
10	222	373*	231	112
50	522	373*	546	112
100	681	373*	715	112

* This value appears to be in error (too high)

Among several other recommendations for Basin "A" improvements the Hayden / Shea Master Drainage Plan says:

- "* Upgrade the channel from Pima and Thunderbird Road to 87th and Sutton (A33 - A35). (Detention of Drainage Areas A10 and A30 eliminates need to upgrade this channel.)
- * Upgrade the channel from 87th and Sutton to 87th and Sweetwater (A35 - A190). (Detention of A10 and A30 reduces required upgrades.)
- * Construct a culvert at 87th and Sweetwater (A190) to convey flows under Sweetwater."⁸

⁸ Boyle Engineering Corporation. Hayden / Shea Area Master Drainage Plan, Pima/Doubletree Area Master Drainage Plan, Addendum No. 2, January 25, 1991, p. 10.

Cactus to Sweetwater Design Discharges... several local citizens were interviewed in this channel reach and there was no indication that overspillage has occurred in this improved channel. Also, no citizen complaints have been filed with the City of Scottsdale which would indicate that overspillage has occurred in the past.

However, the Hayden / Shea Master Drainage Plan lists the following for Thunderbird wash from Cactus Road to Sweetwater Avenue.

Return Frequency	@ Cactus (A200)		84th Street & Cactus (A200)	
	Runoff	Channel Capacity	Runoff	Culvert Capacity
10	311	391	311	330
50	622	391	622	330
100	849	391	849	330

and it says:

- "* Upgrade the channel from 87th and Sweetwater to 84th and Cactus (A190 to A200). (Detention of drainage areas A10 and A30 reduces required upgrade.)
- * Upgrade both sets of culverts at 84th and Cactus (A200-A210). (Detention of drainage areas A10 and A30 reduces required upgrade.)"⁹

During the storm of September 3, 1990, overspillage was observed at these culvert locations.

Land Use... from Cactus Road to Sutton Drive the area is developed residential. From Sutton Drive to Thunderbird Road the channel passed through an undeveloped area at the time the Hayden / Shea Master Drainage Plan was prepared. However, more recently (1992 / 1993), a 25-lot subdivision (McDowell Shadow Estates II) was constructed in a portion of the area. Thunderbird wash is positioned along the east side of that subdivision within ADOT ROW of the future Outer Loop Highway.

C. CACTUS ROAD DIVERSION COMPONENT (See Map on Page 2)

Existing Conditions... The Cactus Road roadway from Pima Road to 84th Street is improved with asphalt pavement, vertical curb, gutter and sidewalk. It carries surface flows from Pima Road to 84th Street. A small culvert is positioned on the west side of the Pima Road intersection to carry flows under Cactus Road; but, a portion of the larger storm flows are diverted west along Cactus Road. Those

⁹ Boyle Engineering Corporation. Hayden / Shea Area Master Drainage Plan, Pima/Doubletree Area Master Drainage Plan, Addendum No. 2, January 25, 1991, p. 9.

runoff discharges north of Cactus Road flow generally south/southwest; Cactus Road intercepts the flow and diverts the discharge to 84th Street where it turns south. The HEC-2 computer model for existing conditions demonstrates that for the 100-year return frequency storm, flows are not retained within the ROW and the depth of flow exceeds eight inches.

Proposed Improvements... for some of the alternatives studied, a new storm sewer is proposed in Cactus Road to intercept flows and carry them to the Scottsdale Country Club East Nine. A selected design storm (25, 50 or 100-year) was modeled in the HEC-1 computer program for each alternate considered. The hydraulic profile is presented on the page 6; it was calculated for the 50-year storm.

HEC-1 Model... during the final design phase of this project, the Scottsdale Country Club East (Second) Nine HEC-1 model must be updated or redone to ensure reliable results; and to ensure that an equal or better condition exists at the East Nine subsequent to construction of drainage improvements.

For those alternative plans studied which include the Cactus Road diversion component with an outfall into the East Nine drainage swale, the effects must be determined prior to considering the plan valid.

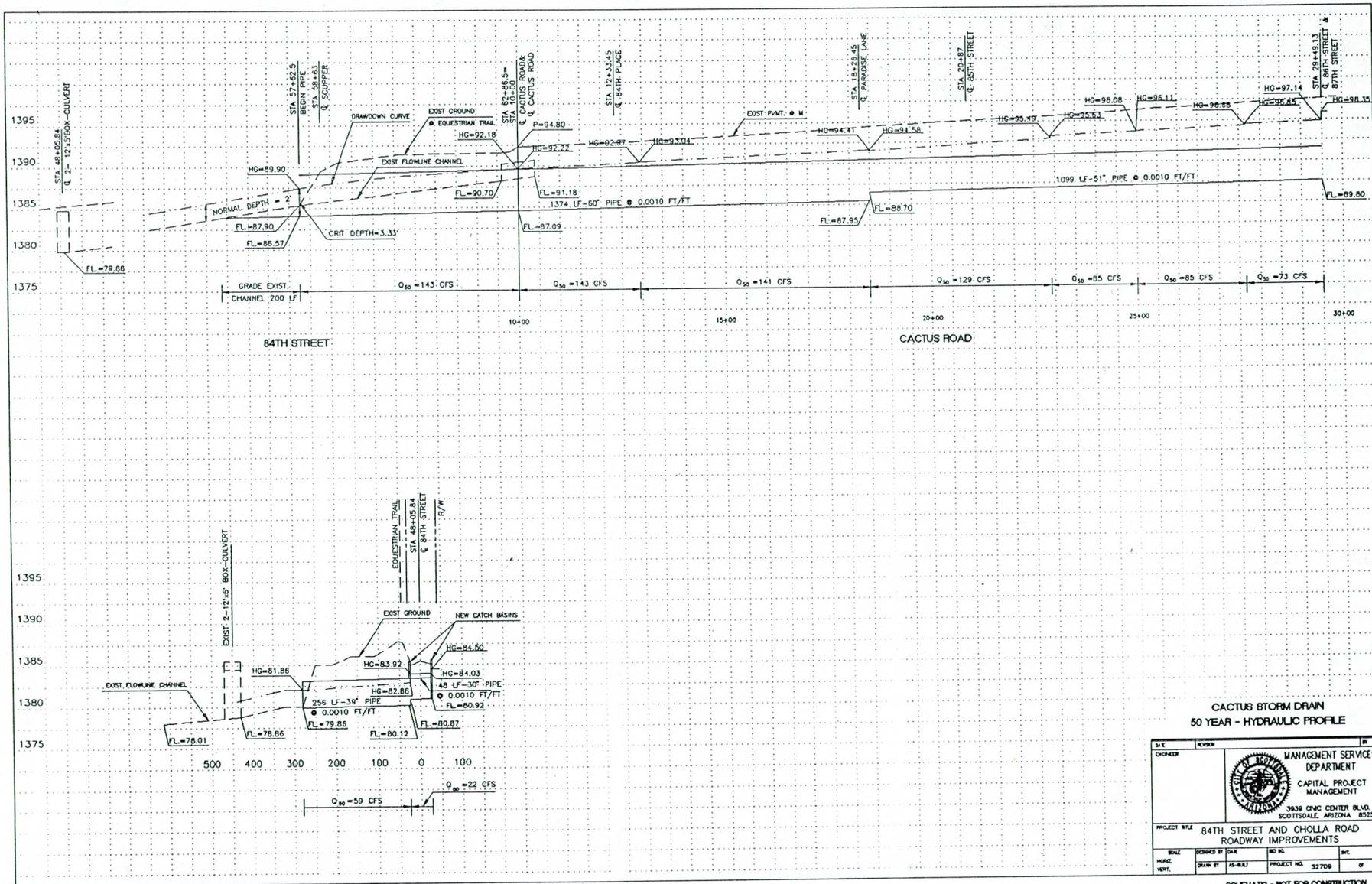
Catchment Facilities... usually, catch basins are designed to intercept flows for a 2-year storm in accordance with pavement drainage design criteria. "Catch basin or scupper inlets must be sized and located in series along a gutter grade to ensure that the estimated spread of longitudinal street flow will not exceed twelve feet (measured perpendicular to the curb face) during the peak runoff flow determined for a two-year frequency storm."

Also, for the 100-year return frequency storm, ..."The inlets must also be sized and spaced to ensure that the longitudinal street flow at the peak runoff flow rates from a 100-year frequency storm is retained in the public right-of-way and is flowing at a depth no greater than eight inches above the gutter flow line."¹⁰.

The storm sewer design including catch basins will exceed the City criteria; virtually 100 percent of the 50-year storm will be intercepted by the proposed system. However, this will require special catch basin designs. Final design considerations will include study of a special structure at Pima Road versus improving the existing pipe culvert and allowing flows to continue south.

Existing ROW... The existing ROW is 80 feet, from 84th Street to 86th Street; the south half is 40 feet from 86th Street to Pima Road; and, the north half varies from 45 feet to 55 feet between 86th Street and Pima Road. No new ROW is required for this proposed storm sewer in Cactus Road; but, new ROW will be required for the

¹⁰ City of Scottsdale, Design Procedures and Criteria, Section 3 - Design of Facilities to Manage Stormwater Runoff, p. 36.



outlet structure at the East Nine drainage swale.

Alignment... It is anticipated that the proposed storm sewer will be positioned in the existing street, thus requiring pavement cut, removal, and replacement of the existing asphalt pavement. Also, a traffic control plan will be necessary for the construction period.

After completion of the base maps, the alignment position, both horizontal and vertical, will be studied as part of the final design and plan preparation phase.

Utilities... numerous underground utilities exist in Cactus Road, thus base maps must include such prior to determining the alignment position of the storm sewer, and the position of catchment facilities.

Outfall Structure... for some of the alternate plans studied, the proposed outfall structure will be located just south of Cactus Road and just west of 84th Street in the Scottsdale Country Club East Nine drainage swale. The hydraulic profiles of the drainage swale and the proposed storm sewer must be carefully matched to ensure the proper hydraulic capacity of both systems.

Final design must consider the existing golf course, which is to remain in service during the construction period. Therefore, the position of the structure must minimize disruption of the golf facilities.

The post-construction performance of the hydraulic structure and drainage swale must eliminate erosion and silting, and the condition must be safe for public activities in the golf course area.

D. EIGHTY-FOURTH STREET (See Map on Page 2)

Proposed Improvements... for those alternate plans studied in which the Cactus Road storm sewer discharges into the East Nine drainage swale, the Cactus Road storm sewer will be designed for the 50-year return frequency storm; thus, for the 100-year storm, some flow will bypass the storm sewer in Cactus Road and turn south on 84th Street. Therefore, special catchment facilities, and an outfall pipe, will be located just north of Cortez Street. The outfall pipe is planned to flow into the East Nine drainage swale.

Existing Box Culvert... the existing box culvert located under 84th Street just north of Cactus Road in Thunderbird wash has been observed to overspill and combine with the Cactus Road surface flow. The flow continues south in 84th Street to Cholla wash at Cortez Street.

All improvement alternatives considered in this study and modeled with the HEC-1 program are based on a design period subsequent to the completion of improvements to this box culvert which eliminates overspillage into Cactus Road and 84th Street.

E. **SCOTTSDALE COUNTRY CLUB EAST NINE (See Map on Page 2)**

Initial Design... A HEC-1 model was prepared for the East Nine development by Collar, Williams and White Engineering, Inc. (C W & W) in 1984. The improvements included five lakes with a ten-foot depth; the top three feet is for detention requirements. That system is shown on the "Existing Drainage System" map included in this section of the report, on page 2. Thunderbird wash discharges into Lake 5 and Lake 5 discharges into Lake 2 as do Lakes 1, 3, and 4.

The initial hydrology design was based on a 100-year return frequency 2-hour duration storm. Current City of Scottsdale criteria requires a 6-hour duration.

The drainage areas shown on the C W & W Drainage Area Map agree very closely to that of this study; except, their drainage area 5 did not account for the detention site along Thunderbird Road which was constructed at a later date. Area 5 is tributary to Thunderbird wash.

Existing Conditions... "The Scottsdale Country Club drainage facilities consist of a system of drainage swales, lakes and detention areas. The system intercepts flows from four major channels which cross Cactus Road between Hayden Road and 84th Street, including the Thunderbird wash channel which borders this study area on the northwest side between the 84th Street / Cactus Road and the Pima Road / Thunderbird Road intersections."¹¹

The Master Drainage Plan says... "Presently, there is a major flooding problem that occurs at the southwestern corner of the Scottsdale Country Club Second Nine. The lake at this location, Lake Number 2, has two culvert outlets, one under Cholla Road and one under Hayden Road. When a 10-year storm occurs on the watershed, water begins to spill out of Lake 2 onto Cholla and Hayden. Most of the water drains south on Hayden and some is captured by catch basins along Hayden. In a 100-year storm, over 2,000 cfs spills over into Hayden and Cholla."¹²

HEC-1 Model... As stated in Volume I, The COS provided the HEC-1 model (floppy disc) for the Scottsdale Country Club East Nine's basins and drainage facilities. This model originated with the Boyle Report. The Boyle Report says... "The proposed improvements for the Scottsdale Country Club Second Nine are based on data taken from the "Grading and Drainage Plan for the Scottsdale Country Club Second Nine". Further design of the proposed improvements would require more

¹¹ SMF Engineering Corporation, Hydrology Report 84th Street and Cholla Road Roadway Improvements and 83rd Place and Shea Boulevard Neighborhood Drainage Improvements, Volume I - Existing Conditions (June 21, 1993), section 3, p. 3.

¹² Boyle Engineering Corporation, Hayden / Shea Area Master Drainage Plan, Pima/Doubletree Area Master Drainage Plan, Addendum No. 2, January 25, 1991, p. 2.

accurate data of the site".¹³ Recent field surveys indicate that in some areas elevations differ as much as two (2) feet from the Grading and Drainage Plan.

Therefore, during the final design phase the Scottsdale Country Club East (Second) Nine HEC-1 model must be updated or redone to ensure reliable results; and to ensure that an equal or better condition exists at the East Nine subsequent to construction of drainage improvements.

Combined Discharges... for one of the alternate plans studied (Alternate 9), the Thunderbird wash channel and the new Cactus Road storm sewer discharges will combine and flow in the existing swale to lake 5. This combined discharge should not exceed that of the capacity for the East Nine drainage system which includes the drainage swale or channel which approaches lake 5 and Lake 2.

HEC-1 Model Revisions... The final design will include revising the HEC-1 model of the East Nine drainage facilities; revisions consist of deleting or reducing areas A10 and A20, and adding the Cactus Road storm sewer basin. As-built geometrics of the detention basins, drainage swales (channel) and culverts require revision. Recall that in the Hayden / Shea Master Drainage Plan, the base data was taken from design plans not as-built condition. New base data should be generated from aerial mapping and digitized cross-sections.

F. CHOLLA WASH (See Map on Page 2)

Base Data... planimetric and topographic mapping with a one foot contour interval covers the existing Cholla wash area from 84th Street at Cortez extending south and southwest to a point about 500 feet south of Shea Boulevard. The mapping includes the channel overbank areas and the 12-acre parcel (Detention Site 1) at the northwest corner of 84th Street and Cholla Road. Also, photogrammetric cross-sections were collected along this channel at 50-foot maximum spacing.

Runoff Discharges... are presented in Volume I for the 2, 5, 10, 25, 50 and 100-year return frequency storms, 6-hour duration at various locations along Cholla wash. Also, see Section 1, page 3 of this Volume 11.

Improved Channel Dimensions... specific channel dimensions vary from alternate to alternate, because the specified design discharge is determined in the HEC-1 model for each alternate plan studied. However, rough dimensions are:

Depth	Varies 3 to 4 feet
Side Slopes	4:1
Top Width	Varies 22 to 28 feet
Bottom Width	Varies 6 to 12 feet

¹³ Boyle Engineering Corporation. Hayden / Shea Area Master Drainage Plan, Pima/Doubletree Area Master Drainage Plan, Addendum No. 2, January 25, 1991, p. 9.

Maintenance Vehicle Access... "If a channel is to be maintained by the City, there will be a need for maintenance vehicle access to the bottom of the channel. A flat bottom width of 8 feet and access ramps leading from the public streets to the channel bottom will be required."¹⁴

The City of Scottsdale's intent was to stipulate in the proposed drainage easement legal instruments that maintenance will be the responsibility of each home owner; therefore, the vehicle access criteria is waived for the Cholla wash proposed improvements.

Right-Of-Way... there are few existing drainage easements or rights-of-way for the existing Cholla wash. Initially, local citizen comments were a catalyst which was cause for the City to place high priority on this project. However, during the public information meeting of June 30, 1993, those property owners adjacent to or near Cholla wash were polled; eleven of the fifteen affected property owners responded to the written pole. Of those eleven, seven expressed that they were not willing to dedicate a drainage easement for the proposed Cholla wash improvements.

Channel Lining... The City of Scottsdale specified that the channel improvements shall include a concrete lining. This is to minimize the maintenance effort and erosion. Velocities exceed 3.5 fps. "...the City of Scottsdale will require channel lining for a man-made channel if the velocity of flow of the 5-year storm peak flow in the unlined channel would exceed 3.5 fps."¹⁵

Existing Floors and Water Surfaces... the HEC-2 water surface profile was calculated for Cholla wash, without improvements, from a point 500 feet south of Shea Boulevard to Cortez Street. The following table shows the water surface elevation for the 100-year storm and the floor elevation for each house adjacent to Cholla wash. Floor elevations should be one foot above the 100-year floodwater surface.

The asterisk (*) indicates that those floors violate the criteria for the 100-year return frequency storm. There are twelve homes in the Cholla wash area that have floors less than one foot above the 100-year flood water surface.

The star (★) indicates five floors that will be inundated. This number could increase due to sediment and debris load, changes in channel vegetation and other factors not easily predicted.

¹⁴ City of Scottsdale, Design Procedures and Criteria, Section 3 - Design of Facilities to Manage Stormwater Runoff, p. 4.

¹⁵ City of Scottsdale, Design Procedures and Criteria, Section 3 - Design of Facilities to Manage Stormwater Runoff, p. 7.

Location	100-Year W.S. Elevation	Floor Elevation
10610 North 82nd Place	1360.0 *	1359.1 ★
10620 North 82nd Place	1360.0	1362.2
10640 North 82nd Place	1361.5 *	1361.7
10647 North 82nd Place	1363.1 *	1363.1 ★
10809 North 82nd Place	1364.4 *	1363.9 ★
10823 North 82nd Place	1365.0 *	1365.0 ★
10818 North 83rd Street	1364.7	1365.9
10826 North 83rd Street	1365.3 *	1365.5
8235 East Desert Cove (Guest House)	1366.2	1367.5
8235 East Desert Cove	1366.8 *	1366.7 ★
8234 East Desert Cove	1367.7	1369.8
8308 East Desert Cove	1368.4	1369.7
8239 East Gail (Garage)	1368.8 *	1369.5
8239 East Gail	1368.8	1370.0
8304 East Gail	1369.6	1370.8
11043 North 83rd Place (High Floor)	1371.9 *	1372.4
11043 North 83rd Place (Low Floor)	1371.9 *	Unknown (Lower)
11208 North 84th Street	1373.6 *	1374.5
11211 North 84th Street	1374.6	1376.6
11226 North 84th Street	1374.7 *	1374.8
11231 North 84th Street	1375.5	1376.9
8339 East Cholla Road	1376.7	1377.7
8401 East Cholla Road	1376.7	1378.5

HEC-2 Water Surface Generalizations... the 100-year storm water surface puts the residential structures' floors in jeopardy and three of the floors will be inundated. The increase in water surface elevation between the 2-year storm and the 100-year storm is about one foot. Also, the vertical difference between the design storm water surface elevation and the floors should be no less than one foot. Therefore, the unimproved capacity of Cholla wash is equivalent to about a 2-year return frequency storm for existing conditions in the watershed if the design storm water surface were to be held one foot below the residential structure floors.

Cholla Wash Outfall... the existing Cholla wash channel is improved (concrete lined) from Shea Boulevard to 82nd Place and Clinton. At Shea Boulevard the flow must pass under Shea in a 2-barrel 12' x 3' box culvert. For existing conditions the Shea and Cholla channel combined runoff flow for the 100-year storm which must cross Shea is about 655 cfs. The box capacity is about 340 cfs. The runoff flow in the approach channel (Cholla channel) is 401 cfs, and the channel capacity is about 210

cfs. Runoff discharge flows greater than 340 cfs at the box culvert entrance will cause diversion to the west along Shea Boulevard and the water surface will be less than one foot below the floor at 10610 North 82nd Place.

"Regardless of the size of the culvert or bridge, the street crossing should be designed to convey the 100-year storm runoff flow under and/or over the road to the area downstream of the crossing to which the flow would have gone in the absence of the street crossing. The construction of a channel crossing must not cause the diversion of drainage flows except when that diversion of drainage flows is part of an approved plan for modification of drainage patterns."¹⁶

Diverting flows west in and along Shea Boulevard is not part of an approved diversion plan; therefore, one of several objectives to be achieved by the alternative plans studied is to reduce the flows reaching this outfall location to match the capacity of such. That is, the flow should not exceed 210 cfs in the existing lined segment of lower Cholla wash.

Increasing the capacity of the existing 2-barrel 12' x 3' box culvert under Shea Boulevard is not recommended because citizen complaints in the downstream McCormick Ranch area indicate an existing drainage problem may exist.

G. DESERT COVE PROPOSED STORM SEWER (See Map on Page 2)

Limits of Storm Sewer... the upstream end of this storm sewer pipe is at the intersection of 84th Street and Desert Cove; it extends west in Desert Cove to the vacant property along the west side of the Sundown Ranch acres subdivision; there it turns south and the outfall connects to the concrete lined segment of Cholla channel (Clinton extended).

ROW... no additional ROW is required along Desert Cove Road; however, along the west boundary of Sundown Ranch acres the existing 8-foot PUE may not be sufficient. This will require additional study during the final design period.

Purpose... the purpose of the Desert Cove storm sewer is to reduce those surface flows in Cholla wash between Clinton Street and Desert Cove; and to reduce the surface flows which reach the 84th Street / Shea Boulevard intersection. These flows must be reduced to match the capacity of existing drainage facilities.

Recall that the capacity of the unimproved Cholla wash is based on holding the 100-year storm water surface one foot below existing floor elevations. To meet this criteria, the flow in Cholla wash just north of Clinton Road should not exceed 45

¹⁶ City of Scottsdale, Design Procedures and Criteria, Section 3 - Design to Facilities to Manage Stormwater Runoff, p. 24.

cfs.

Desert Cove and 84th Street... the surface drainage flows which pass through this intersection split; a portion continues west to Cholla wash and a portion continues south to the 84th Street / Shea Boulevard intersection. For existing conditions the 100-year storm discharge at 84th Street and Shea is 206 cfs. The capacity of the existing drainage facilities at Shea is 90 cfs. The Desert Cove storm sewer will intercept flows at the Desert Cove / 84th Street intersection thus reducing the discharge which reaches Shea Boulevard at 84th Street.

Cholla Wash... as discussed in Section II, F., the capacity of Cholla wash is only equivalent to about a 2-year storm discharge. For most of the alternate plans considered, the runoff flow in Cholla wash at Cholla Road is close to zero (0). But, due to a short time of concentration interval, the discharge increases rapidly at locations south of Cholla. Between Clinton and Desert Cove the 5-year return frequency runoff discharge exceeds the channel capacity, 45 cfs. The Desert Cove storm sewer will intercept flows in Cholla wash and discharge those flows back into the concrete lined segment of the wash near Clinton Street extended.

A special structure will be required at 83rd Street and Desert Cove. Particular care will be required to design this structure to intercept the 100-year discharge and separate silts so that they do not enter the pipe system.

H. **CHOLLA ROAD DIVERSION COMPONENT (See Map on Page 2)**

Proposed Facility... this drainage facility consists of a special catchment (catch basin) design at 85th Street and Cholla Road, and a new storm sewer pipe from 85th Street to Cholla wash at 84th Street.

The pipe diameter proposed is 36-inch or 48-inch, depending upon the alternate plan considered.

This improvement was also proposed in the Hayden / Shea Master Drainage Plan.

Planned Diversion Concept... existing runoff discharges flowing south in 85th Street pass through the Cholla Road intersection, continue south in 85th Street and 84th Place to Desert Cove where it turns west to 84th Street. These flows will be intercepted at the 85th Street / Cholla Road intersection and diverted west along Cholla Road to Cholla wash, or Detention Site 1, at 84th Street.

For those alternative plans studies which include this diversion component, the objective must be to demonstrate that the affected community downstream of the proposed diversion is provided a better level of flood protection than existed prior to the diversion.

In Section II, F., it is shown that potentially twelve homes are subject to flooding with existing conditions in Cholla wash downstream of this diversion. Therefore, improvements must be realized in Cholla wash as well, if this is to be a valid planned diversion.

Rights-of-Way... no new ROW is required for this design component.

Alignment... the new storm sewer pipe will be located under new pavement of the Cholla Road roadway improvements; therefore, pavement cut, removal and replacement is not required.

Outfall... at Cholla wash, where the storm sewer pipe outfalls, a special structure will be required. Its design depends on the particular alternate under consideration.

I. DETENTION BASIN SITES (See Map on Page 2)

Sites... four distinct sites were considered with the various alternate plans which were studied. The four sites were chosen on vacant land locations. The property value of each site is quite different than the others. Therefore, site selection is a major issue. The size (acres) of site required varies with each alternate studied.

These sites are shown on the sketches of the alternates studied in Sections 3 and 4 which follow.

Site 1... is located at the northwest corner of Cholla road and 84th Street. The total parcel size is twelve acres; there is one resident (house) on the property. The site is level desert, except for the area close to the house. Cholla wash is located along the east side of the property.

Scottsdale Country Club East Nine borders this parcel on the north and on the west. This site can be made to blend quite well with the adjacent golf course, drainage swales, lakes and existing detention areas at the lakes.

This site was carried forward for further consideration.

Site 2... is located on the east side of 84th Street just north of Shea Boulevard. The property consists of 8 3/4 acres of vacant land. The Arizona District Church of the Nazarene Advisory (owner) is expected to sell the property in the future. The site is level desert land and suitable for a detention site. Saint Patrick's Church parking lot and on-site detention basins border on the north side of this Site 2.

This site was carried forward for further consideration.

Site 3... this vacant property consists of 15.8 acres located along the south side of

Desert Cove between Hayden Road and the 1/16 line of Section 24 (82nd Street extended). The site is flat desert, quite suitable for a detention basin.

The probability of this site being available is not good. The site has been master planned under the name "Desert Cove", and the City Council has approved the master plan including stipulations. The City of Scottsdale file number is 12-ZN-93. Development of this site has been initiated, further reducing the possibility of it being a viable alternative.

Recent General Plan modifications along the Shea Boulevard corridor will impact the value of this property.

This site was not carried forward for further consideration.

Site 4... is an existing desert landscaped area located along the south side of Desert Cove on the Saint Patrick's Church property. The area is only about 1.0 acres or less; therefore, the site is less desirable than the others considered.

The church has future plans for this portion of their property and condemnation is not practical. This site was not carried forward for further consideration.

Site 5... this site is undeveloped, vacant property located within ADOT's advanced acquisition ROW for the Outer Loop Highway. Even though this property is within ADOT ROW, it must be purchased at market value.

If this site were to be selected for further development and construction of a detention basin, these facilities may require reconstruction with ADOT's Outer Loop Highway Project.

The concept of a temporary drainage easement has not been discussed with ADOT, but otherwise, this is not considered a feasible site and thus was not carried forward for further consideration.



III ALTERNATIVES STUDIED

A. IMPROVEMENT PLAN OBJECTIVES 1
B. PROPOSED PERIPHERAL IMPROVEMENTS 2
C. ALTERNATIVE PLANS STUDIED 2
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MAPS

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Alternate 5A 23
Alternate 5B 24
Alternate 6A 25
Alternate 6B 26

Alternate 7A 28
Alternate 7B 29
Alternate 8 30

Alternate 9 32

III ALTERNATIVES STUDIED

A. IMPROVEMENT PLAN OBJECTIVES

Intrusion Damage... a primary objective of this project is to protect residential structure floors near Cholla wash and Shea Boulevard from floodwater intrusion of the 100-year return frequency storm. This can be accomplished by reducing the discharge flow or by increasing the capacity of Cholla wash and the Shea Boulevard 2-barrel 12' x 3' box culvert. Increasing the capacity of the box culvert is not recommended. The established criteria is that the floodwater surface for the 100-year return frequency storm shall be one (1) foot below floor elevations.

Existing Unplanned Diversions... flow greater than the capacity of the existing 2-barrel 12' x 3' box culvert in the Cholla channel at Shea Boulevard flow to the west in and along Shea Boulevard. In order to eliminate this unplanned diversion, the 100-year discharge (655 cfs) at the box culvert must be reduced to at least 340 cfs which is the capacity of the box culvert.

The hydrology / hydraulics of the 2-barrel 12' x 3' concrete box culvert under Shea Boulevard is discussed in Section II, F., Cholla Wash. In order to eliminate flooding of the floor at 10610 North 82nd Place and eliminate diversion to the west along Shea Boulevard, the combined runoff discharge for the 100-year return frequency storm must be reduced to 340 cfs.

In addition, the existing pipe culvert located on the west side of the Pima / Cactus intersection will not convey the full 100-year flow. Flows in excess of the pipe culvert capacity divert to the west in Cactus Road. The capacity of the proposed Cactus Road storm sewer must be designed to include this flow or the existing pipe culvert capacity should be increased to accommodate the 100-year return frequency discharge.

Road Closures... the proposed improvements should eliminate future road closures in Cholla Road at Cholla wash, and in Cactus Road at 84th Street. A secondary objective is to eliminate future road closures in the area of 83rd Place from Desert Cove to Gail. Street improvements in this area are necessary to raise the roadway one (1) to two (2) feet.

Excessive Street Flows... for the larger storms, three streets are subject to excessive flows; the depth of flow is in excess of 8-inches and flow is not retained within the ROW. Those streets within the study area are:

Cactus Road
84th Street
85th Street

Shea Boulevard Drainage System... at 84th Street, the combined capacity of the Shea storm sewer system and the north half of the street (Shea) is about 90 cfs. In Volume I, Section 4, it was shown that for the 100-year storm, the surface flow in 84th Street at Shea Boulevard is 206 cfs. Improvements should reduce this flow to about 90 cfs.

Erosion Damage... citizen complaints indicate that damage to yards, landscaping and other improvements has occurred at numerous locations throughout the project area in the past. Many of the improvements are encroachments in City ROW. The combined street and drainage improvements must effect surface flows which are retained in the ROW with reduced velocities which prevent erosion.

Basin to Basin Overspillage... overspillage which has occurred in the past along Thunderbird wash and at the box culvert in Thunderbird wash under 84th Street must be eliminated.

Proposed Diversions... those alternative plans which include planned diversions in Pima, Cactus and Cholla Roads must provide flood conditions equal to or better than that which existed in the downstream drainage facilities prior to the diversion.

For the 100-year storm, over 2000 cfs spills over into Hayden and Cholla, this condition must not be exacerbated by the Cactus Road diversion.

B. PROPOSED PERIPHERAL IMPROVEMENTS

Peripheral improvements in which the calculated runoff discharge values of this study are dependent upon include:

- 1) Thunderbird wash from Sweetwater to Thunderbird
- 2) Pima Road side channel from Thunderbird to Paradise Park
- 3) Box culverts under 84th Street and Cactus Road in Thunderbird channel

If these improvements are not constructed prior to or simultaneously with this project, discharges greater than those calculated for this project are expected.

C. ALTERNATIVE PLANS STUDIED

1. Series 1 Alternates 1A, 1B, 1C, and 1D (See Concept Sketches, Pages 4 - 7)

Concept... flows in the basin below Cactus Road will be reduced by the Cactus Road diversion component which discharges into the East Nine drainage swale. It will carry the 50-year storm. In 84th Street, near Cortez Street, special catch basins will intercept the 100-year storm bypass and discharge it into the East Nine swale. The Cholla diversion component will

intercept the 50-year storm at 85th Street and discharge into Cholla wash or a storm sewer in 84th Street. No new detention sites are considered for this Alternate 1 series.

Alternate 1A... includes the initial budgeted project plan which consists of improving Cholla wash from the existing 10' x 3' box culvert at 82nd Place and Clinton Street to the Cholla / 84th Street intersection, and the Cholla Road storm sewer (diversion component) from 84th Street to 85th Street. Later, the budget was increased to include the Cactus Road storm sewer (diversion component) from Pima Road to 84th Street where it outfalls into the East Nine drainage swale.

Property owners were not willing to dedicate drainage easements for the proposed improvements of Cholla wash. Because there are other possible alternative solutions, condemnation is not considered desirable or feasible. Therefore, this Alternate 1A is not considered for further development.

Alternate 1B... this plan includes the Cactus Road and Cholla Road diversion components. Improvements to Cholla wash are not feasible; therefore, the Cholla Road storm sewer continues south in 84th Street where it connects to the Desert Cove storm sewer.

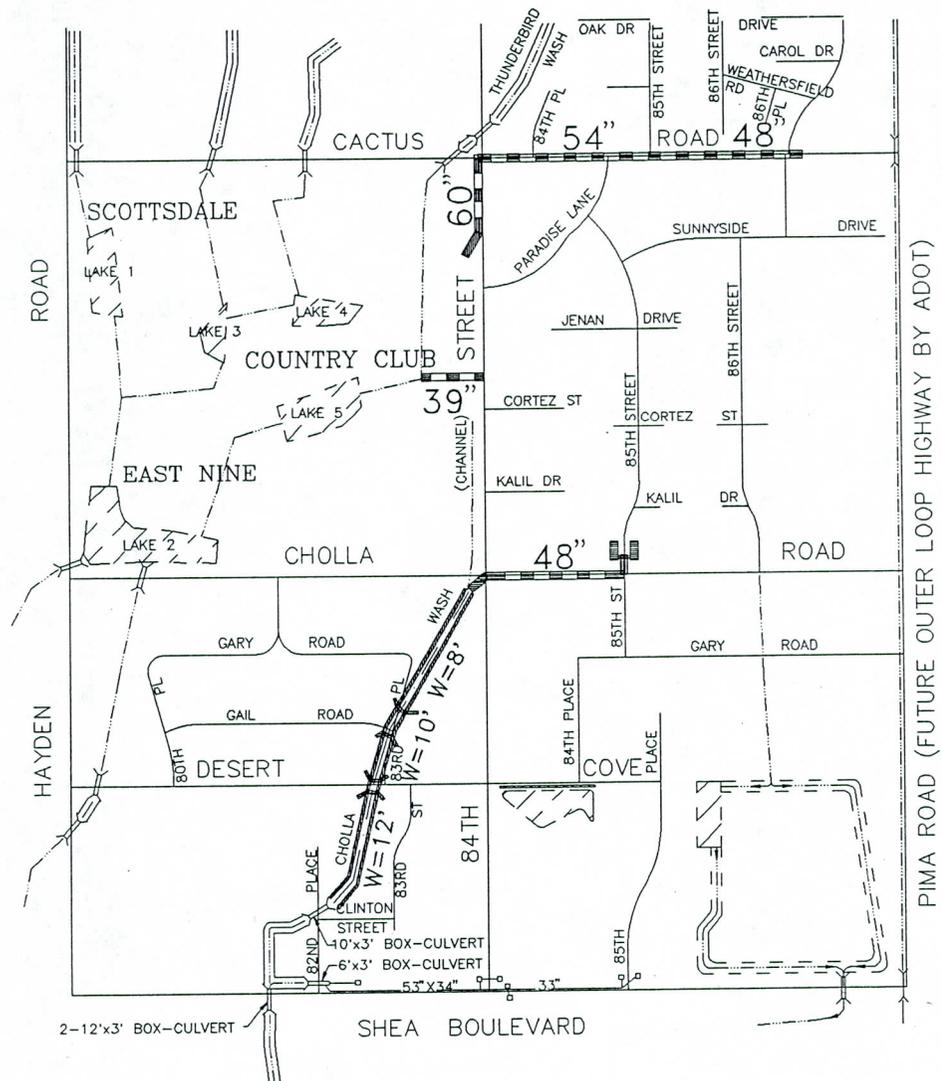
The 100-year storm discharge in the lined Cholla channel at 82nd Place and Clinton Street is 285 cfs; the capacity of the channel is about 210 cfs. The combined discharge of Cholla wash and Shea channel at the 2-barrel 12' x 3' box culvert under Shea Boulevard is 487 cfs; the culvert capacity is 340 cfs.

Therefore, this Alternate 1B does not reduce storm water flows at the outlet to a manageable level and it is not considered for further development.

Alternate 1C... this plan also includes the Cactus Road and Cholla Road diversion components. A storm sewer is included in 84th Street from Shea Boulevard to Cholla Road where the Cholla diversion pipe connects to it.

Discharge flows in Cholla wash exceed the capacity of the wash and the capacity of the Shea Boulevard drainage system is not adequate to accept the discharge from the 84th Street storm sewer. Therefore, this Alternate 1C is not considered for further development.

Alternate 1D... this plan also includes the Cactus Road diversion component and the Cholla Road diversion component. The Cholla Road pipe outfalls into Cholla wash at Cholla Road. The capacity of Cholla wash is far less than the runoff discharge. Therefore, this Alternate 1D is not considered for further development.

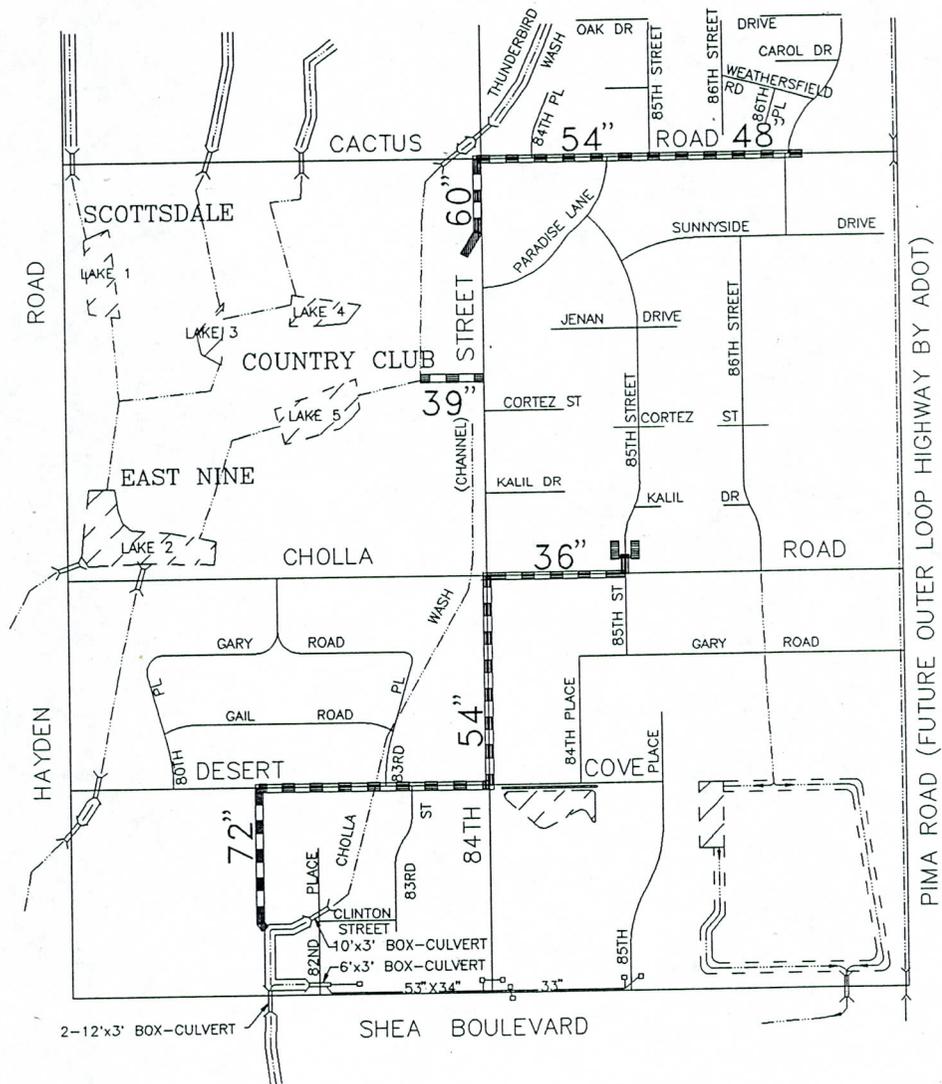


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 1A

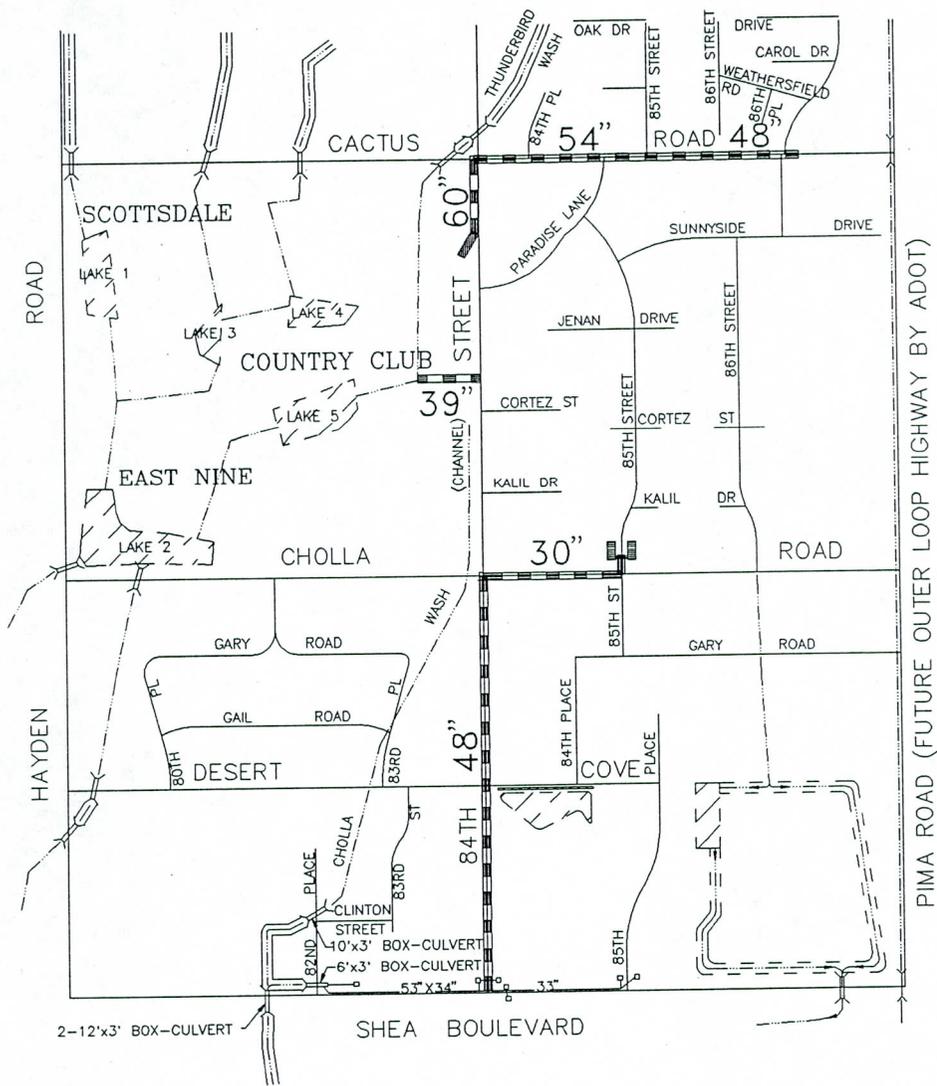


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 1B



LEGEND

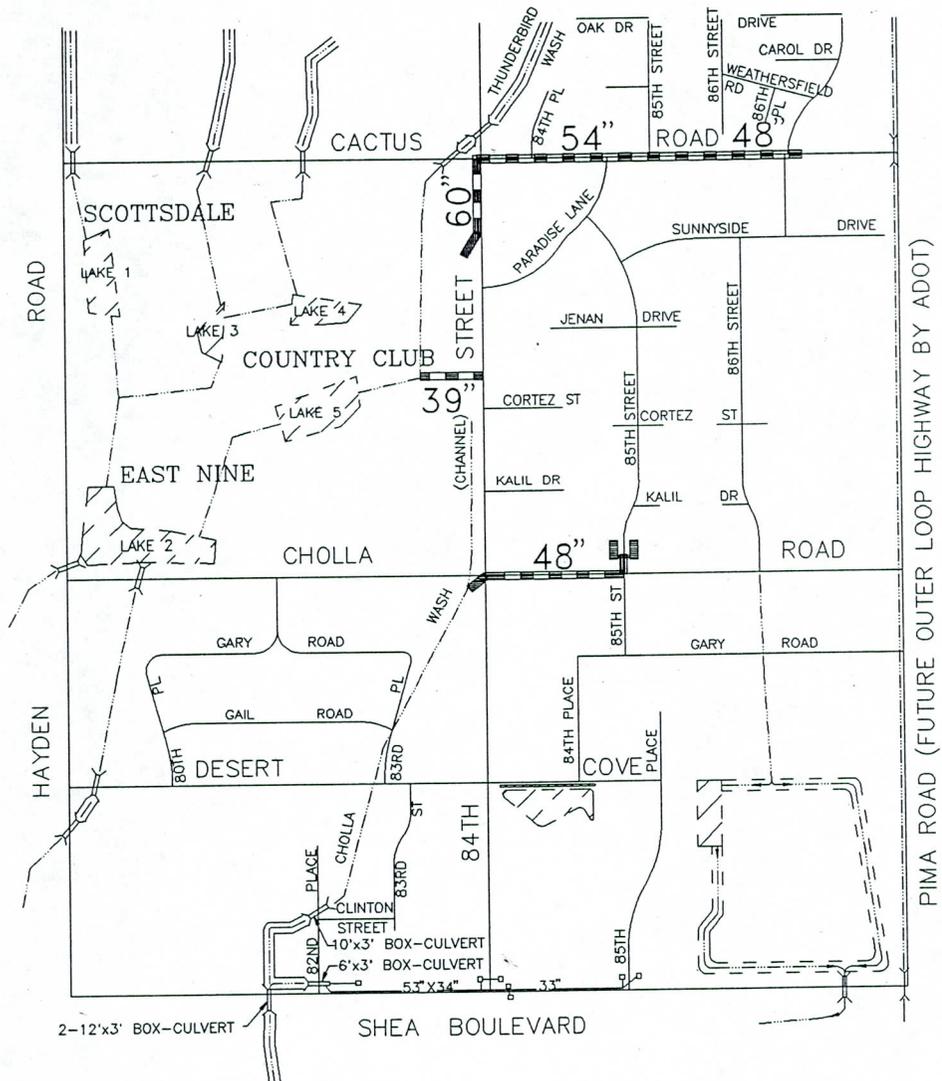
- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS

CACTUS STORM SEWER
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

84TH STREET STORM SEWER
 10-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 1C



LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 1D

2. **Series 2 Alternates 2A, 2B, 2C, and 2D (See Concept Sketches, Pages 9 - 12)**

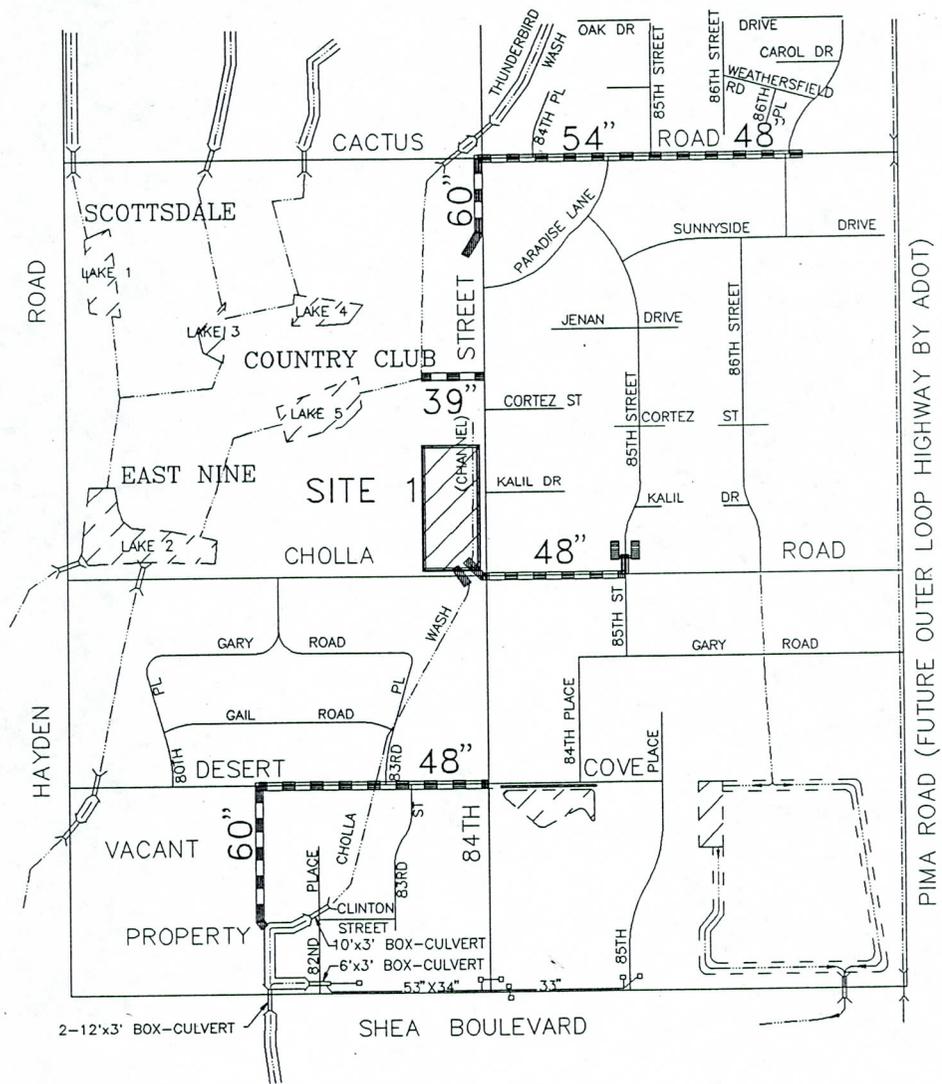
Concept... the concept for Series 2 Alternates is the same as that for Series 1, and in addition, new detention sites 1 and 2 are considered. Detention Site 1 is located at the northwest corner of the 84th Street / Cholla Road intersection. Detention Site 2 is located on the east side of 84th Street, just north of Shea Boulevard.

Alternatives 2A and 2B... these plans include the Cactus Road diversion component which discharges into the East Nine drainage swale. For Alternate Plan 2A, the Cholla Road diversion component discharges into Detention Basin Site 1; and for Alternate Plan 2B, it discharges into Detention Basin Site 2. The Site 1 detention basin discharges into Cholla wash at Cholla Road. The Site 2 detention basin discharges into the Shea Boulevard storm sewer. The Desert Cove storm sewer intercepts flows from both Cholla wash and the 84th Street / Desert Cove intersection.

The Alternate 2A and 2B plans will reduce flows at the Shea / Cholla channel outfall to an acceptable level. It also reduces the flows at 84th Street and Shea Boulevard to an acceptable level.

All objectives can be met with these alternatives. Therefore, these Alternate plans 2A and 2B are considered for further development in Section IV Preferred Plans.

Alternates 2C and 2D... Alternates 2C and 2D are the same as Alternates 2A and 2B; except, Cholla wash improvements are included from Gail to Clinton Street in lieu of the Desert Cove storm sewer. Drainage easements are required along Cholla wash for these plans and easements are not considered feasible. Therefore, these Alternate Plans 2C and 2D are not considered for further development.



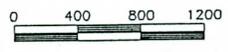
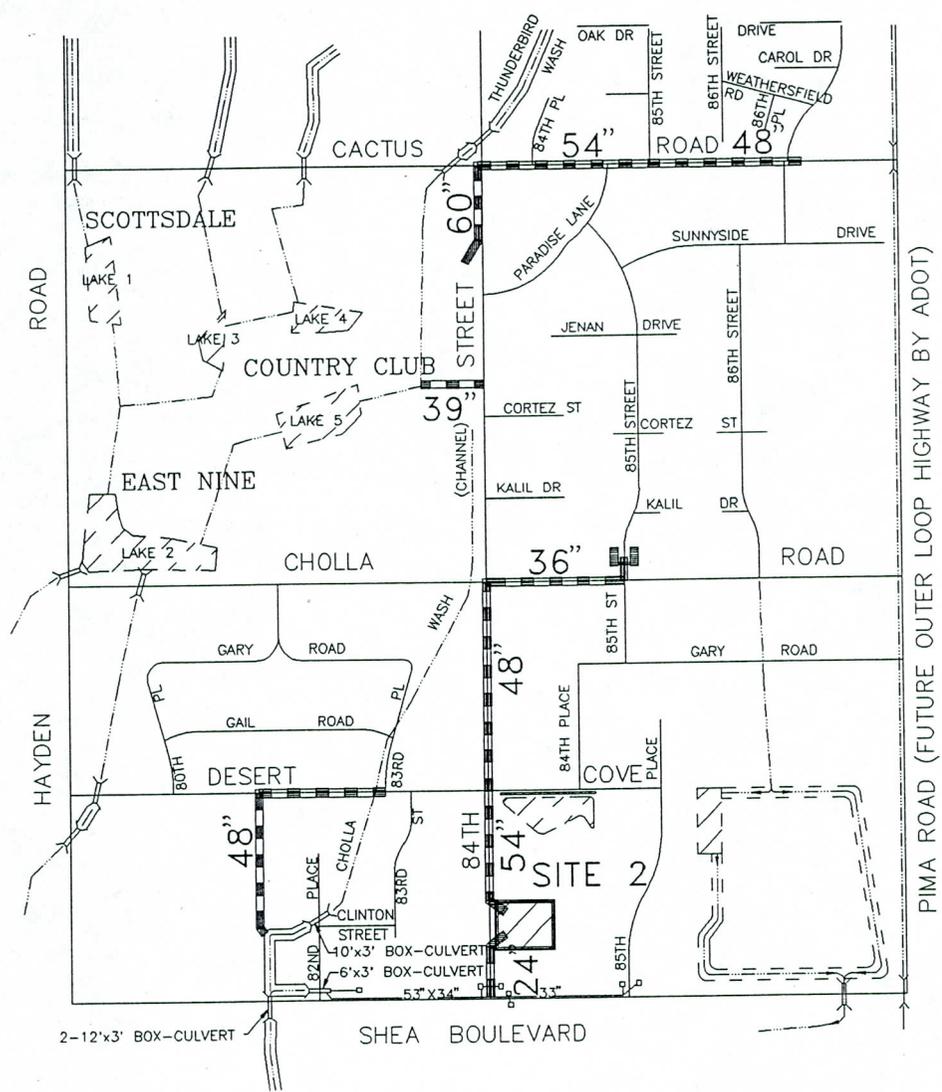
PIMA ROAD (FUTURE OUTER LOOP HIGHWAY BY ADOT)

LEGEND

- EXISTING WASH
- === EXISTING CHANNEL
- ▨ EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- ▨ PROPOSED DETENTION SITE
- EXISTING STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
50-YR RETURN FREQUENCY
6 HOUR DURATION

ALTERNATE 2A

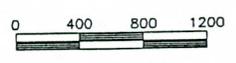
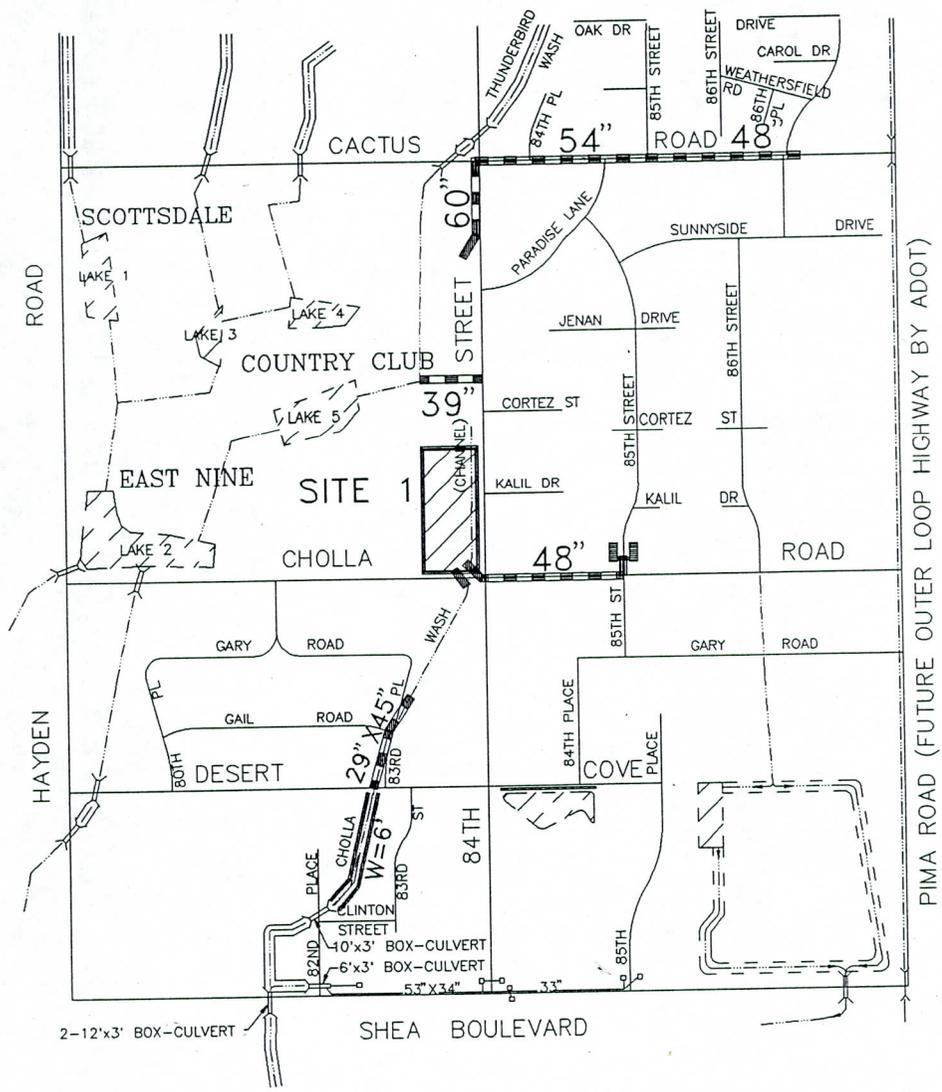


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 2B

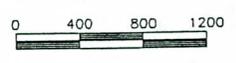
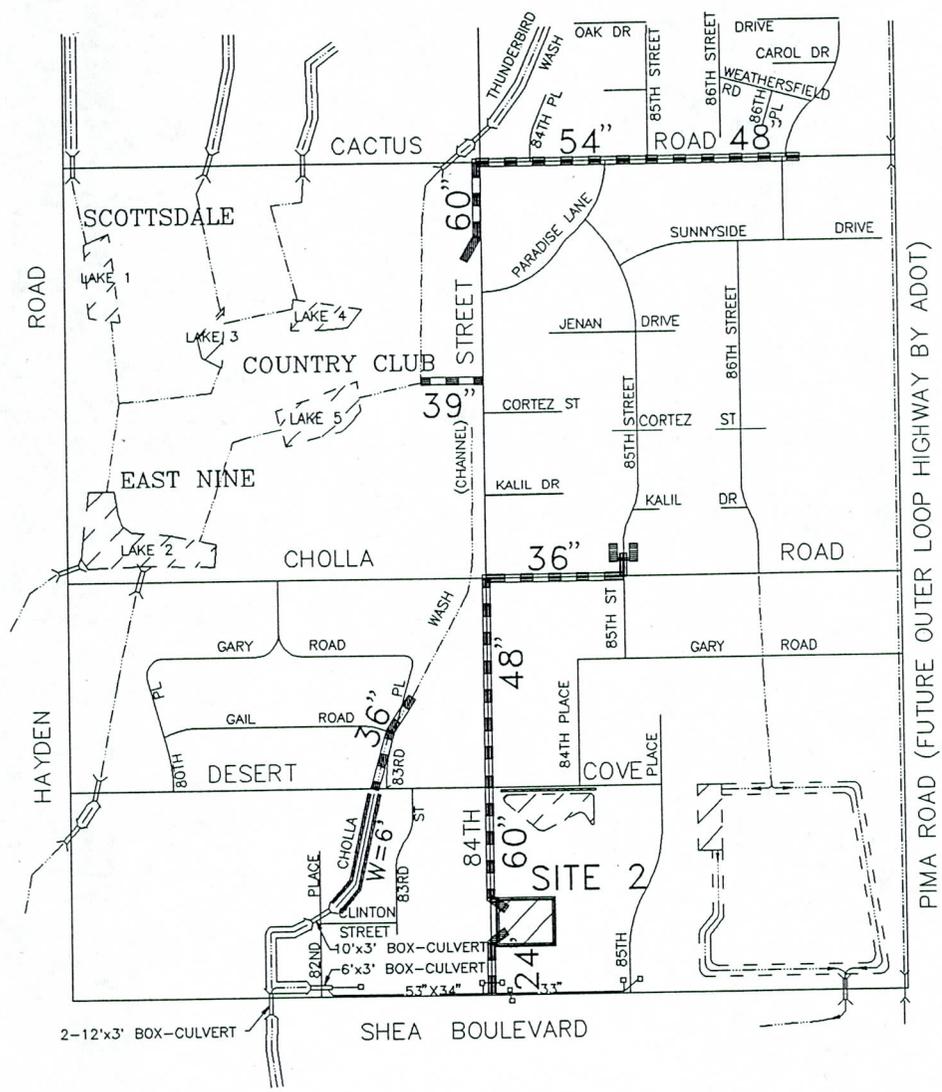


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 2C



LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 2D

3. **Series 3 and 4 Alternates 3A, 3B, 3C, 3D, 4A, 4B, 4C, and 4D**
(See Concept Sketches on Pages 14 - 21)

Concept... the Cactus Road storm sewer does not divert flows to the Scottsdale Country Club East Nine drainage swale as do the Series 1 and 2 alternates. The Cactus Road storm sewer and the Cholla Road diversion component both discharge into either the Site 1, Site 2, or Site 3 detention basin. These basins are located at the northwest corner of 84th Street and Cholla Road, the northeast corner of 84th Street and Shea Boulevard, and at 81st Street south of Desert Cove, respectively. In the event the outcome of the Country Club East Nine HEC-1 model update or the negotiations with the East Nine representatives is not favorable, these alternates can be considered because they are independent of the East Nine drainage facilities. The Desert Cove storm sewer is included to reduce flows in lower Cholla wash and at the 84th Street / Shea Boulevard intersection.

The series 4 alternates (4A, 4B, 4C, and 4D) are the same as the series 3 alternates and, in addition, they provide phasing. If special catch basins were to be constructed in 84th Street near Cortez Street, they can intercept surface flows from Cactus Road and Paradise Lane during the interim period. The Cactus Road storm sewer can be constructed at a later date.

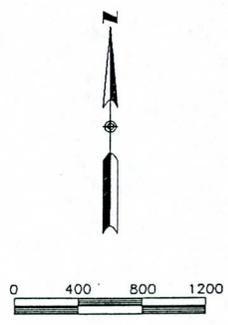
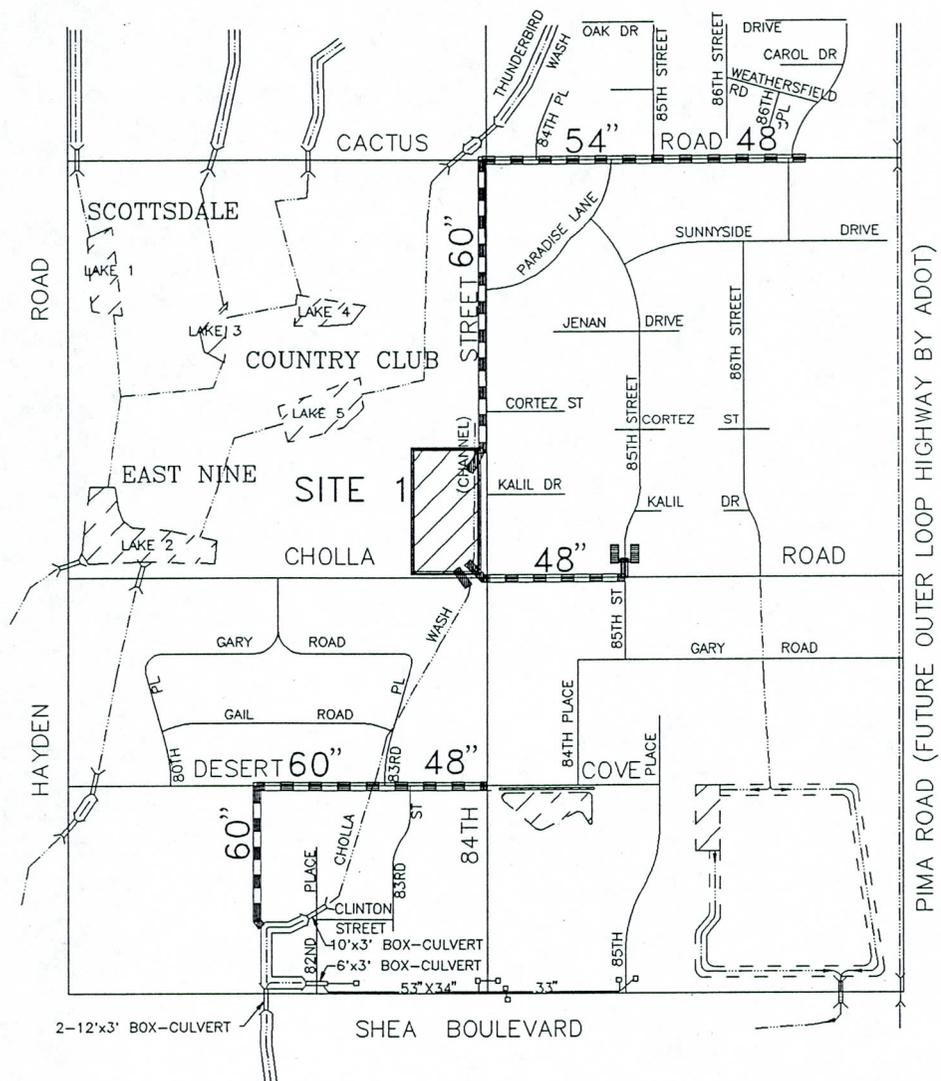
Alternates 3A and 4A... the Cactus Road storm sewer discharges into the Site 1 detention basin. The Cholla Road diversion component also discharges into the Site 1 detention basin. The Desert Cove storm sewer intercepts flows at the 84th Street / Desert Cove intersection and at Cholla wash.

Surface flows that reach the 84th Street / Shea Boulevard intersection are reduced to an acceptable level; and flows in Cholla wash are reduced to an acceptable level. The combined flow at the Cholla wash / Shea Boulevard box culvert is also reduced to a level close to the box capacity.

All objectives are met with this Alternate 3A (4A phased), therefore, it is considered in Section IV, Preferred Plans for further development.

Alternates 3B, 3C, 3D, 4B, 4C, and 4D... all of these alternate plans meet the objective of the project, however, their cost is obviously greater than that of Alternate 3A & 4A. Therefore, these alternatives are not considered for further development.

If for some reason the Site 1 detention basin property were to be unavailable, these remaining 3 and 4 series alternatives could be considered. Recall, that Site 3 is already master planned for 2 1/2 dwelling units per acre and therefore not available.

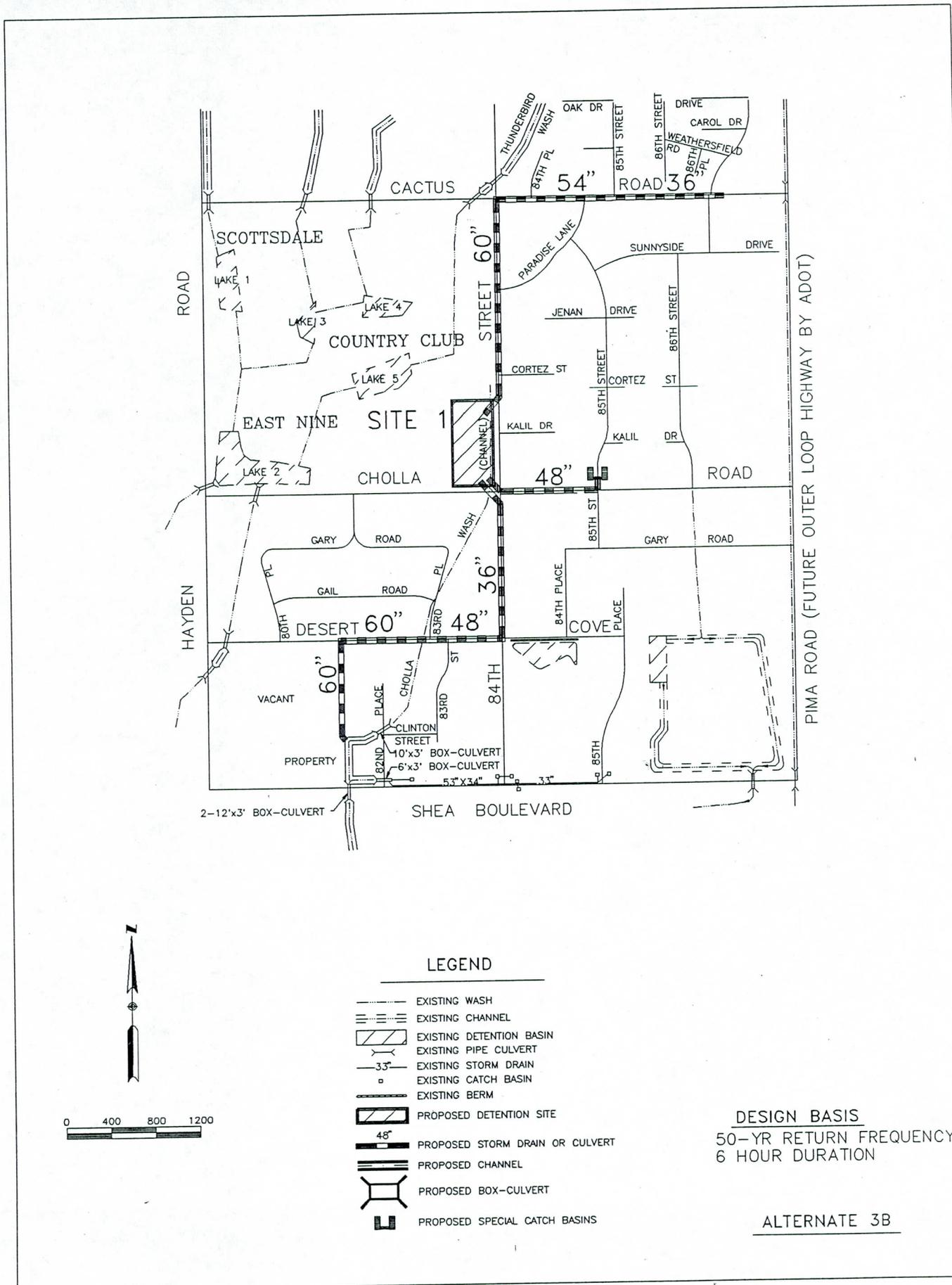


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 3A

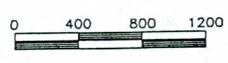
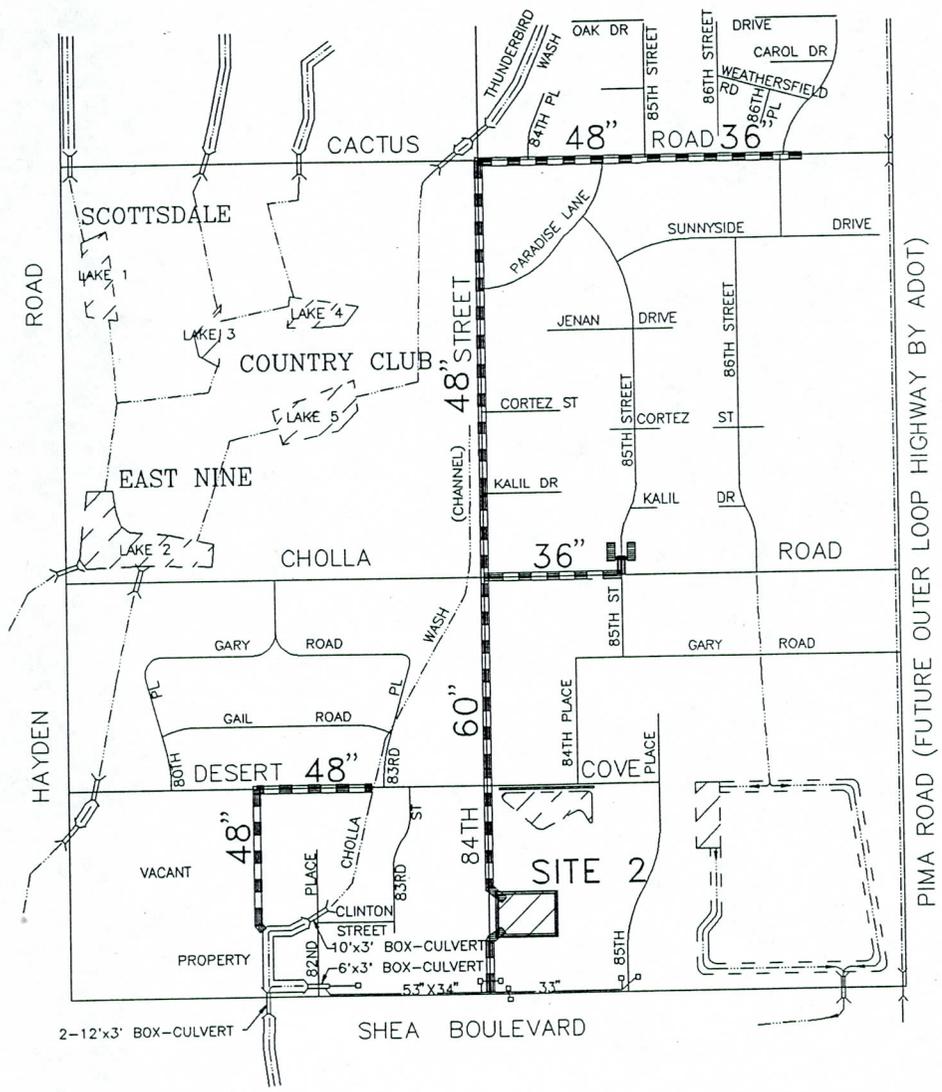


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 3B

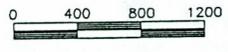
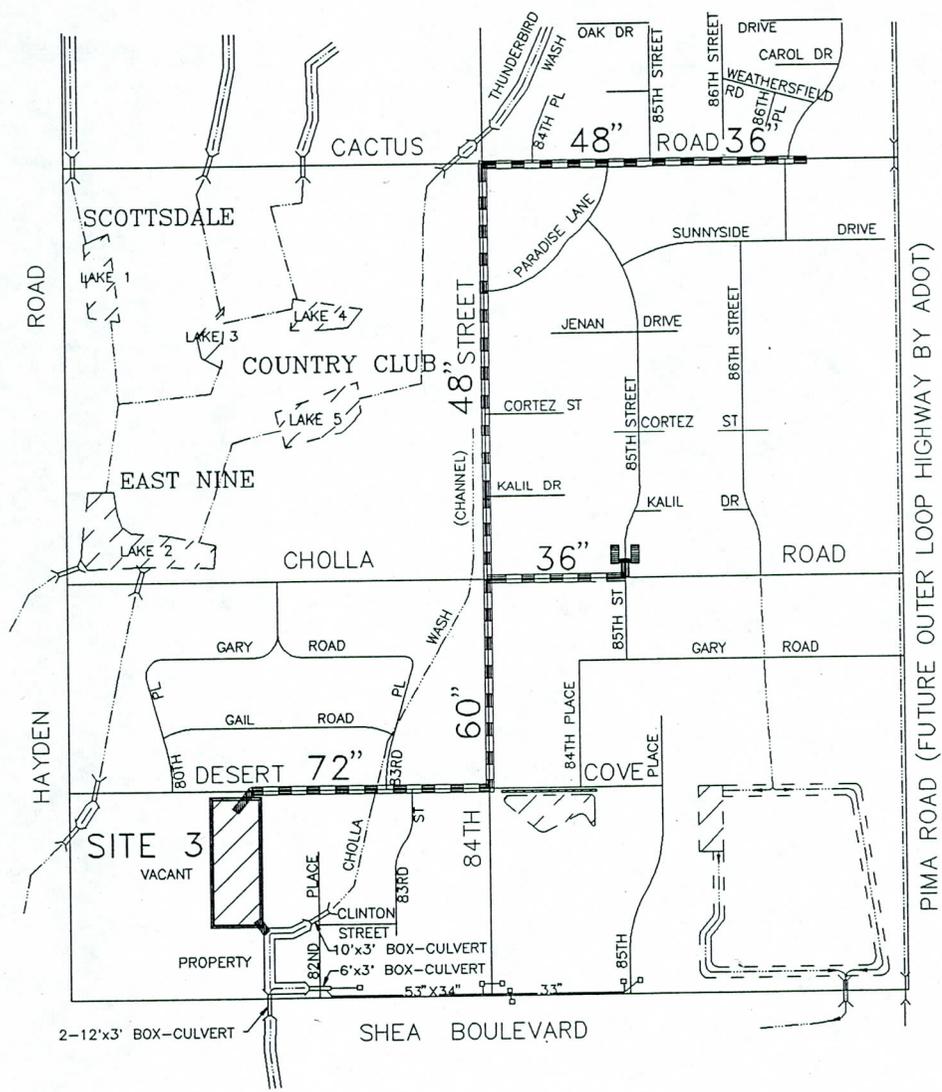


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 3C

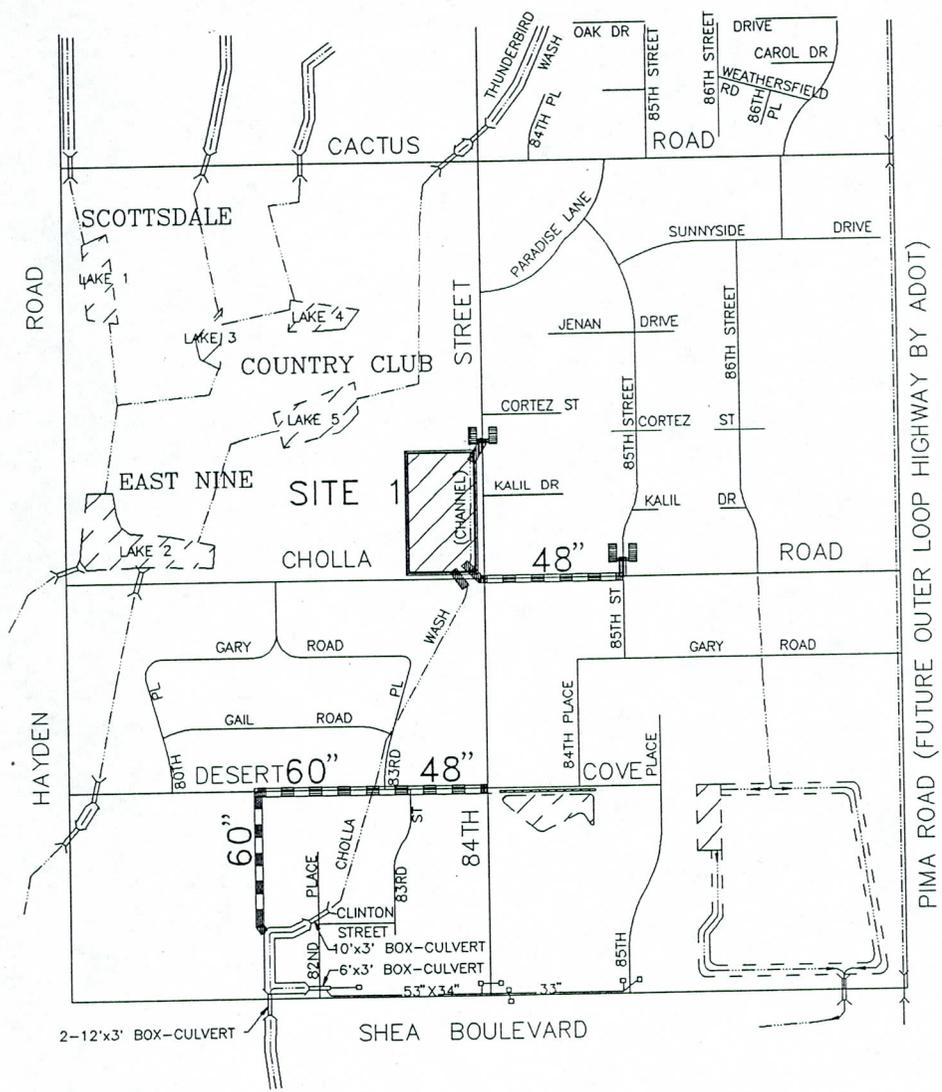


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 3D

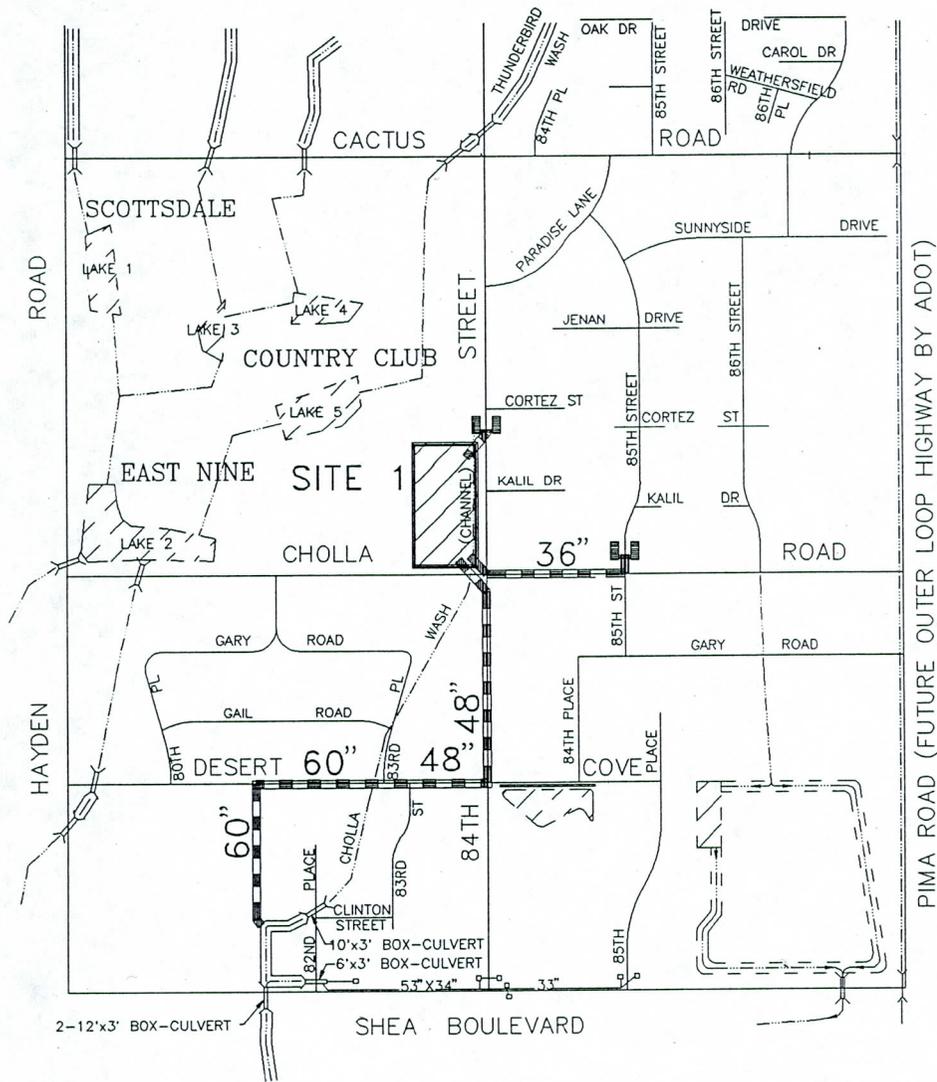


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 4A



PIMA ROAD (FUTURE OUTER LOOP HIGHWAY BY ADOT)

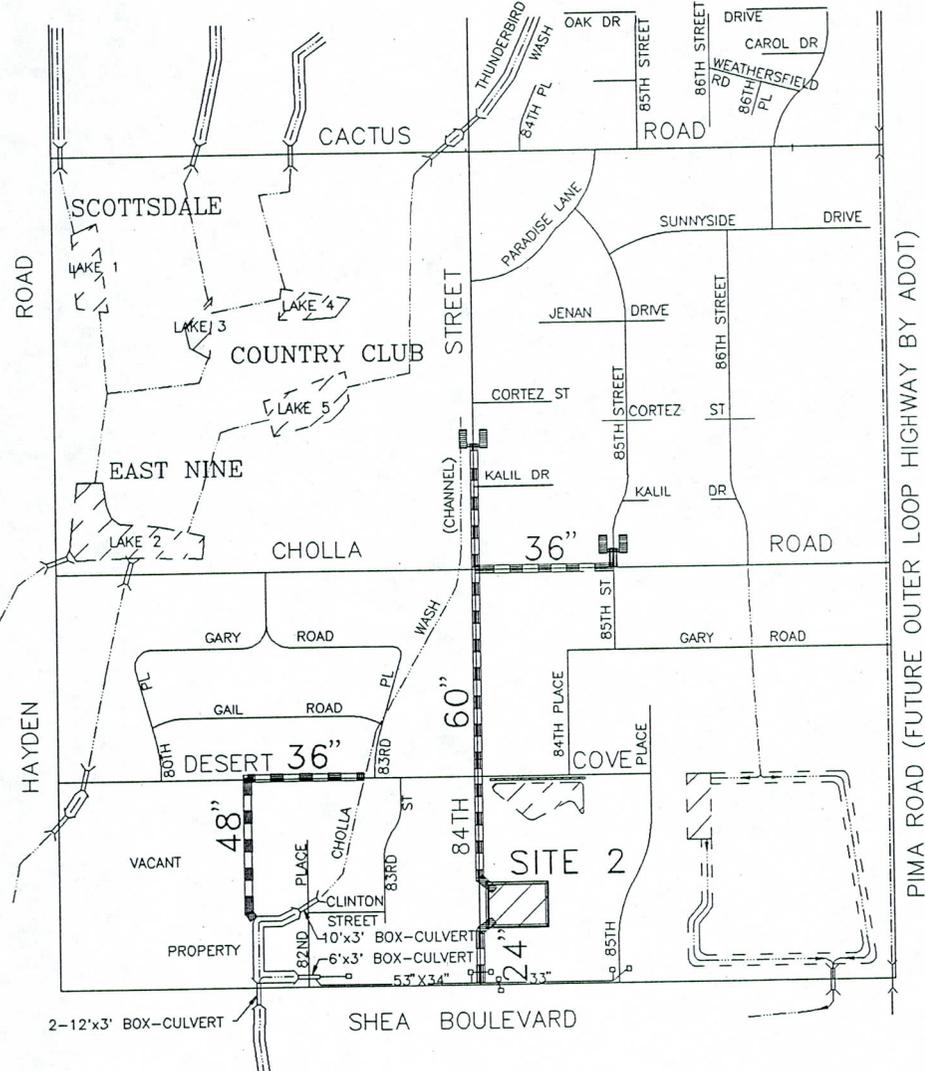
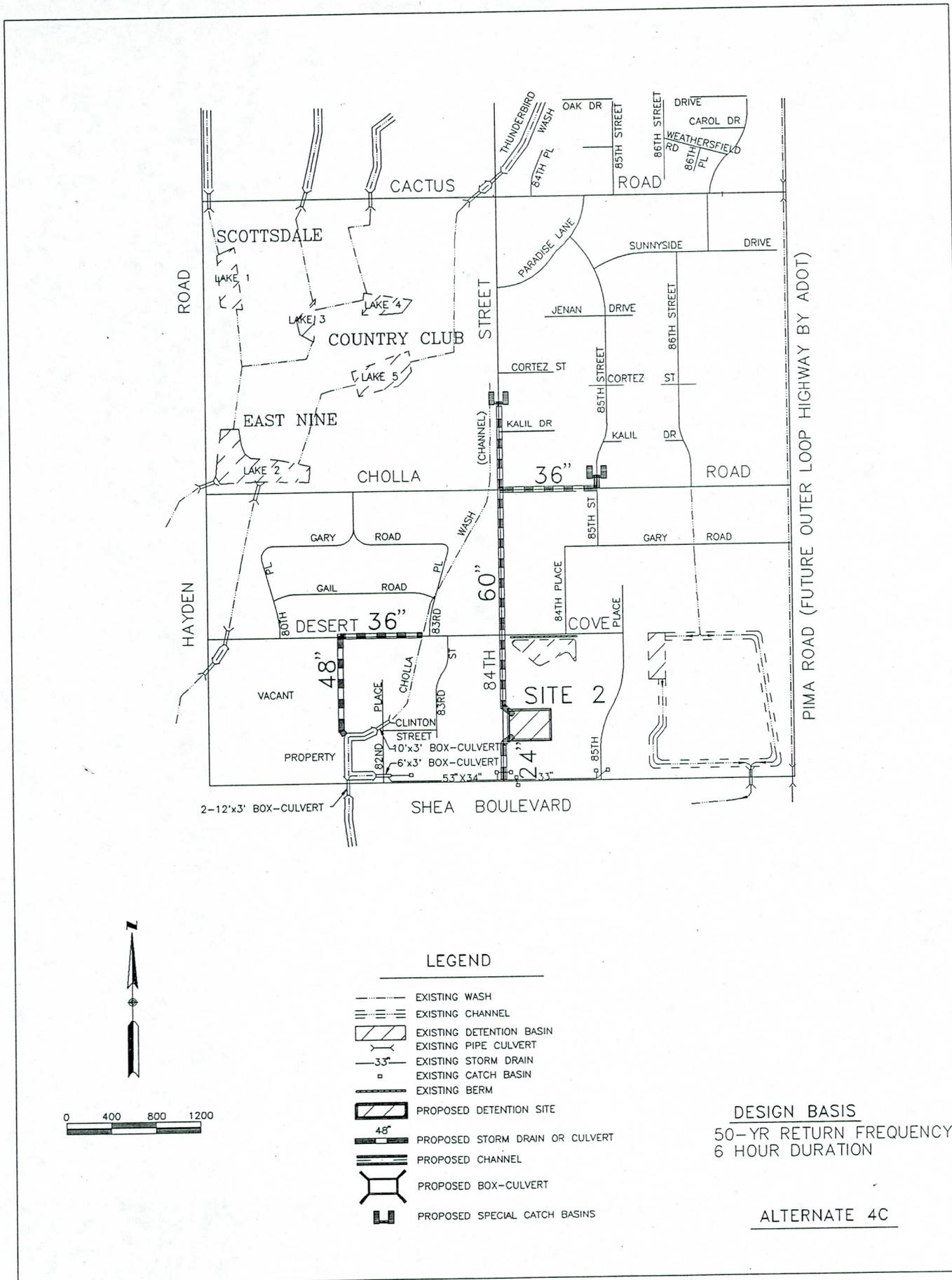


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- 33" EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- 48" PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
50-YR RETURN FREQUENCY
6 HOUR DURATION

ALTERNATE 4B

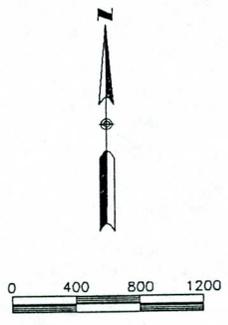


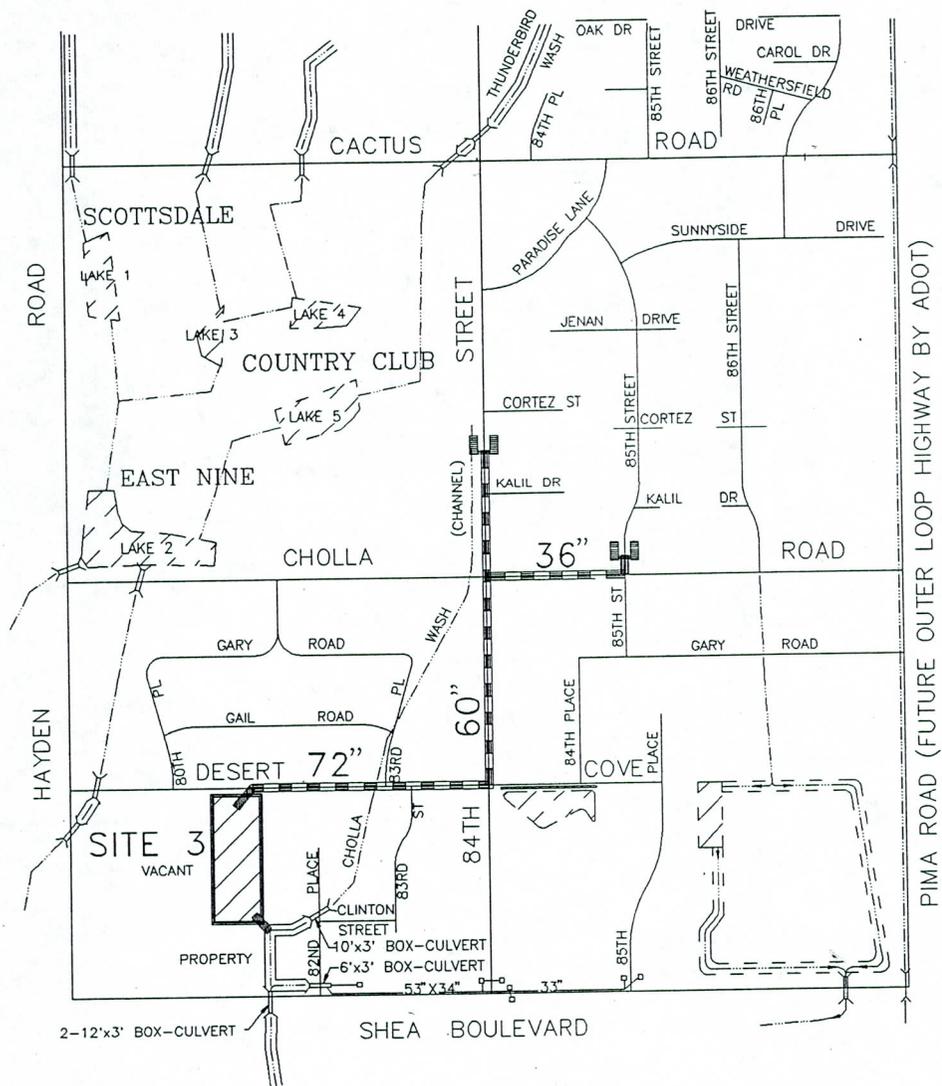
LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 4C





LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 4D

4. **Series 5 Alternates 5A and 5B (See Concept Sketches on Pages 23 and 24)**

Concept... the Cactus Road diversion component discharges into the East Nine drainage swale. Runoff flows at the 85th Street / Cholla Road intersection are intercepted and discharged into the Site 4 detention basin located at the Saint Patrick's Church site near the southwest corner of 84th Street and Desert Cove.

Alternate 5A... consists of the Cactus Road storm sewer (diversion component); a new storm sewer in 85th Street and 84th Place from Cholla Road to Desert Cove; a new detention basin at Site 4; a detention outflow pipe which outfalls into Cholla wash at Desert Cove; and improvements to Cholla wash from Gail Road to Clinton Street.

Alternate 5B... consists of the same components as does 5A, except the detention outflow connects to the Desert Cove storm sewer in lieu of Cholla wash improvements.

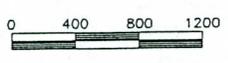
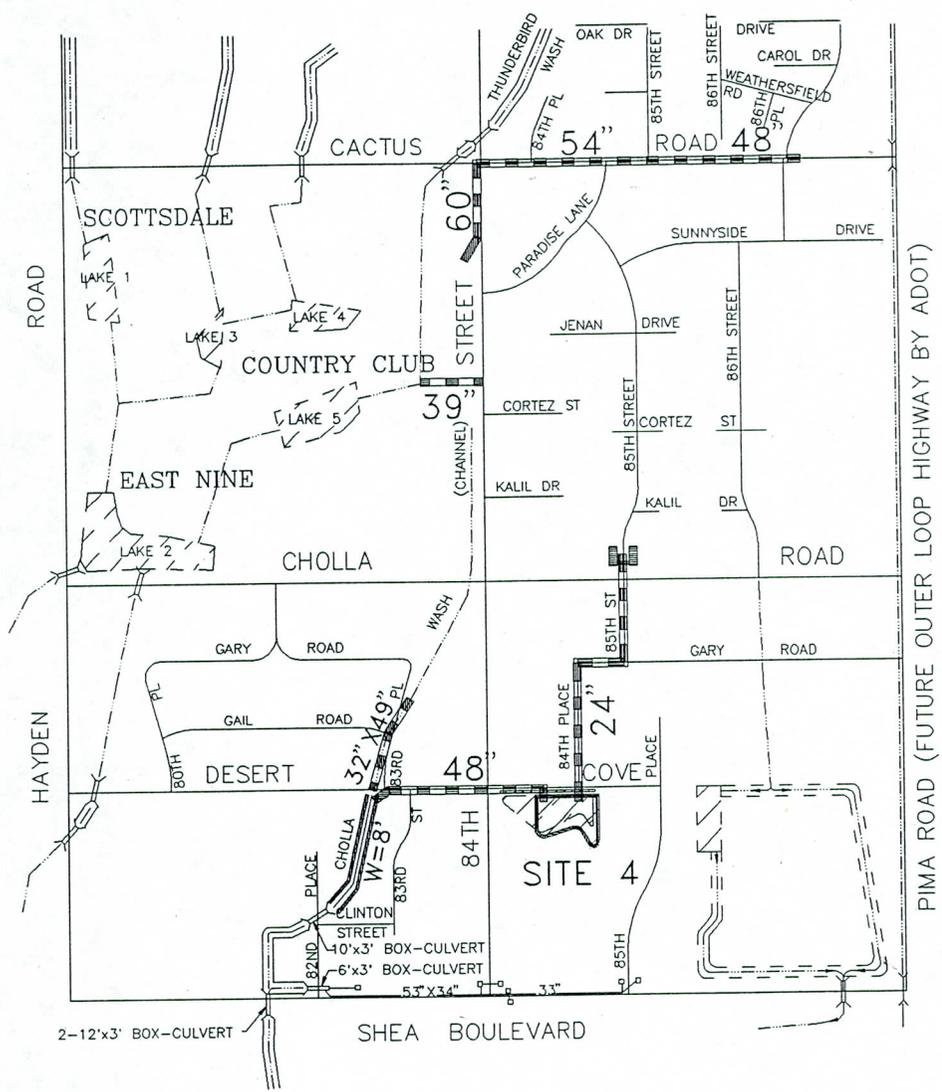
Alternates 5A and 5B... are not feasible because detention site 4 conflicts with future plans for that property which is owned by Saint Patrick's Church. Condemnation of this property is not reasonable since other alternatives are available. Also, Detention Site 4 is too small to provide the desired objectives. Therefore, these Alternatives 5A and 5B are not considered for further development.

5. **Series 6 Alternates 6A and 6B (See Concept Sketches on Pages 25 and 26)**

Concept... these are total storm sewer pipe solutions with no detention and require crossing Shea Boulevard. There is no discharge into the East Nine drainage swale.

Alternates 6A and 6B... do not include detention, therefore, the outfall flows at Shea Boulevard exceed the capacity of the existing 2-barrel 12' x 3' box culvert at Shea Boulevard. Crossing Shea Boulevard with an improved or new pipe or box culvert will require utility adjustments and disruption to traffic. The crossing would be shallow and therefore conflict with most existing utilities in Shea Boulevard.

Therefore, these Alternates 6A and 6B are undesirable and too expensive. They are not considered for further development.

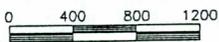
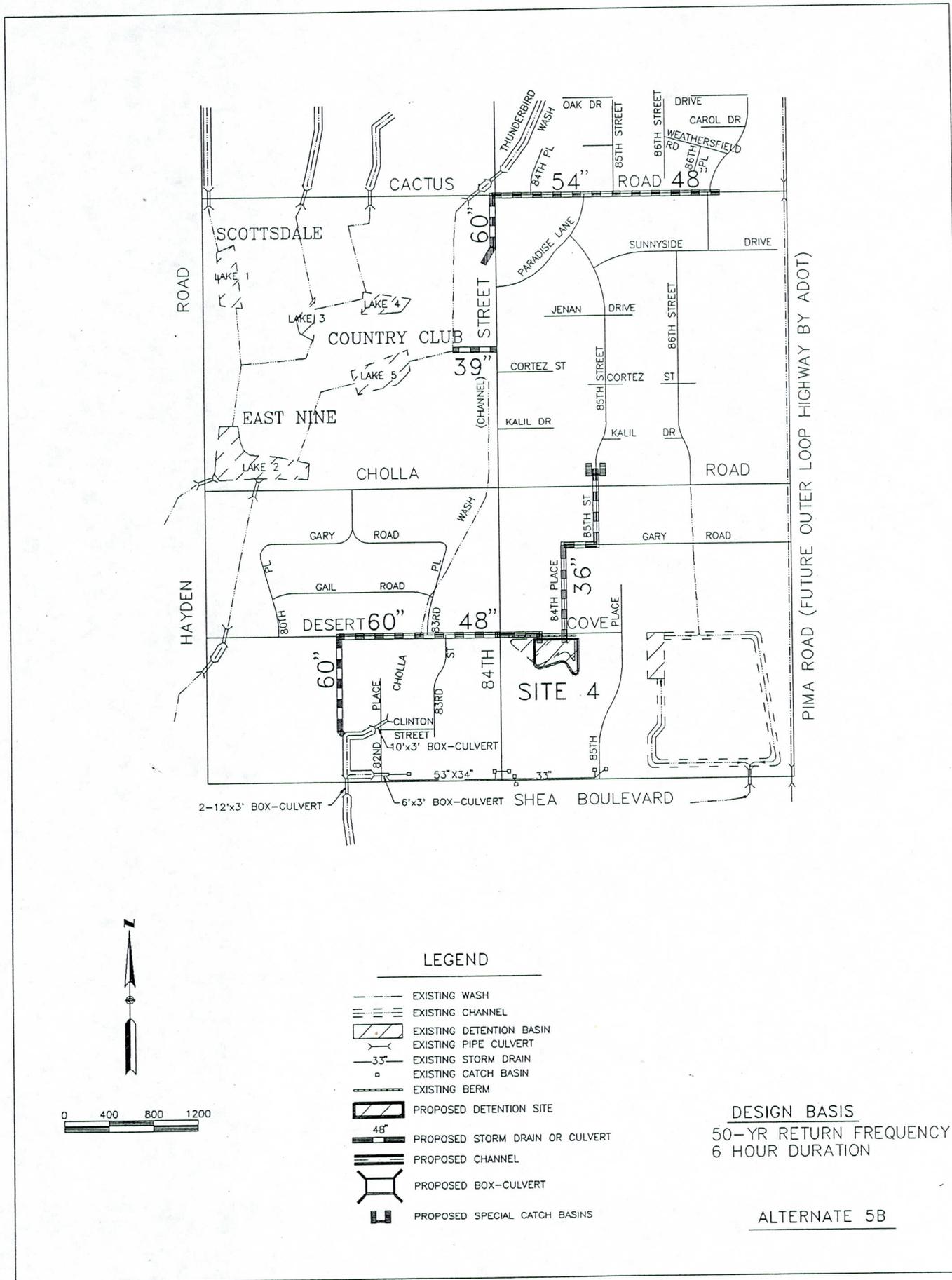


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 5A

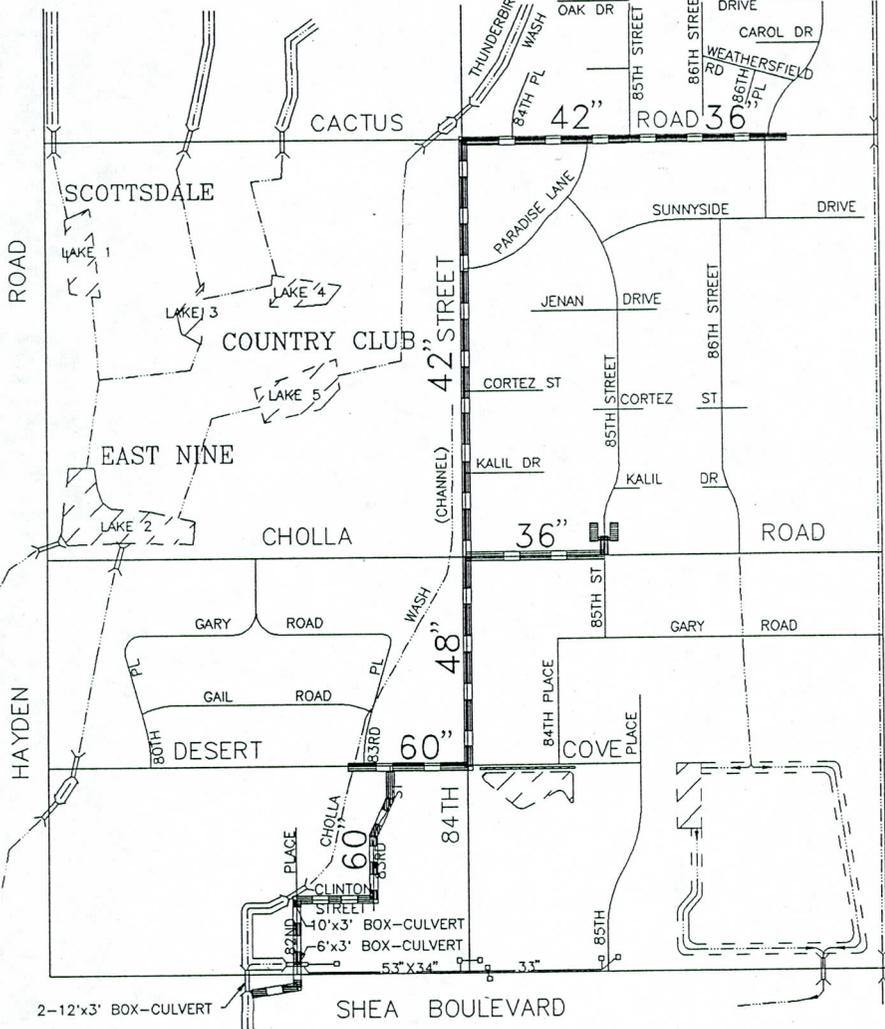
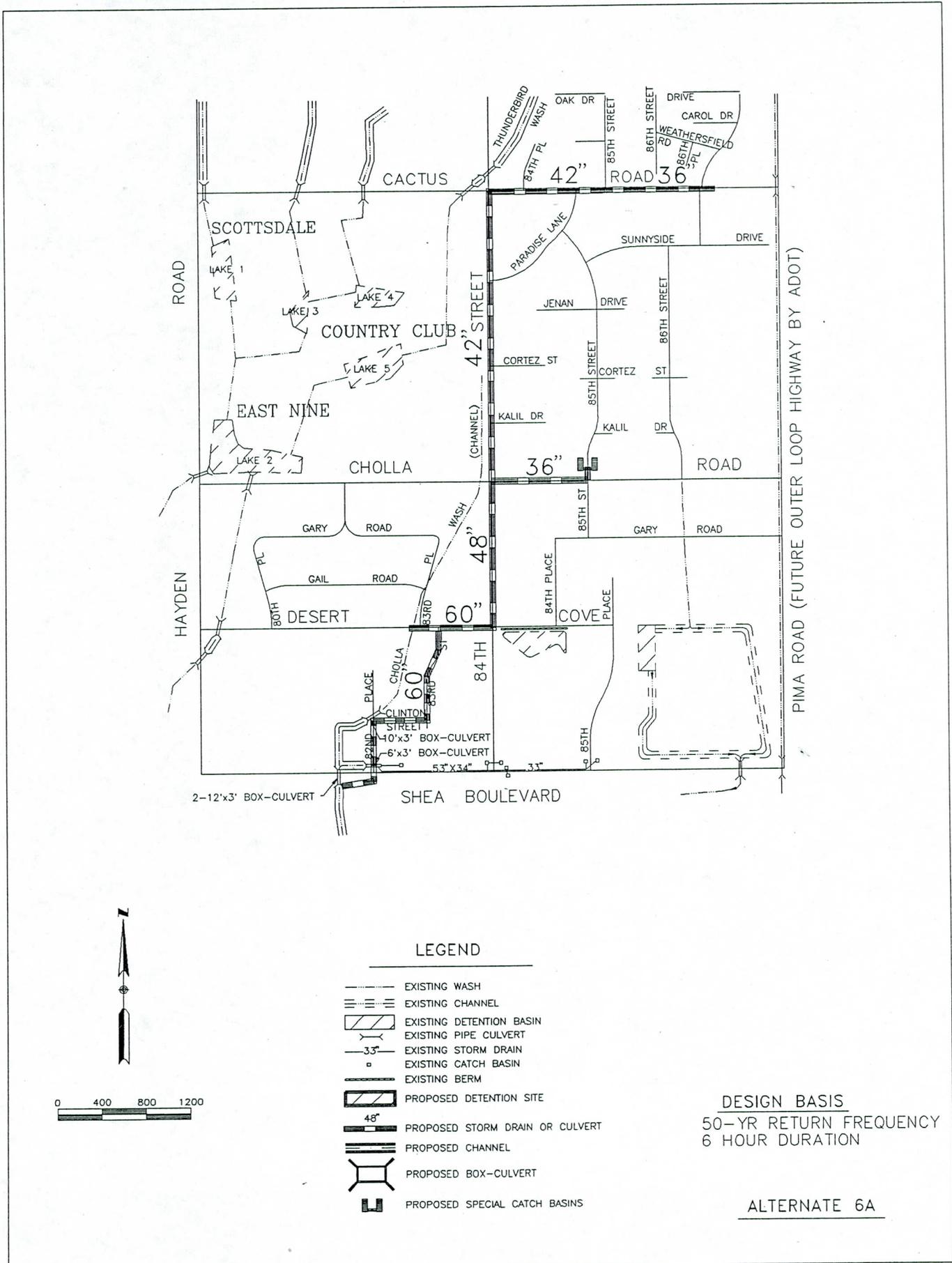


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- 33" EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- 48" PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 5B

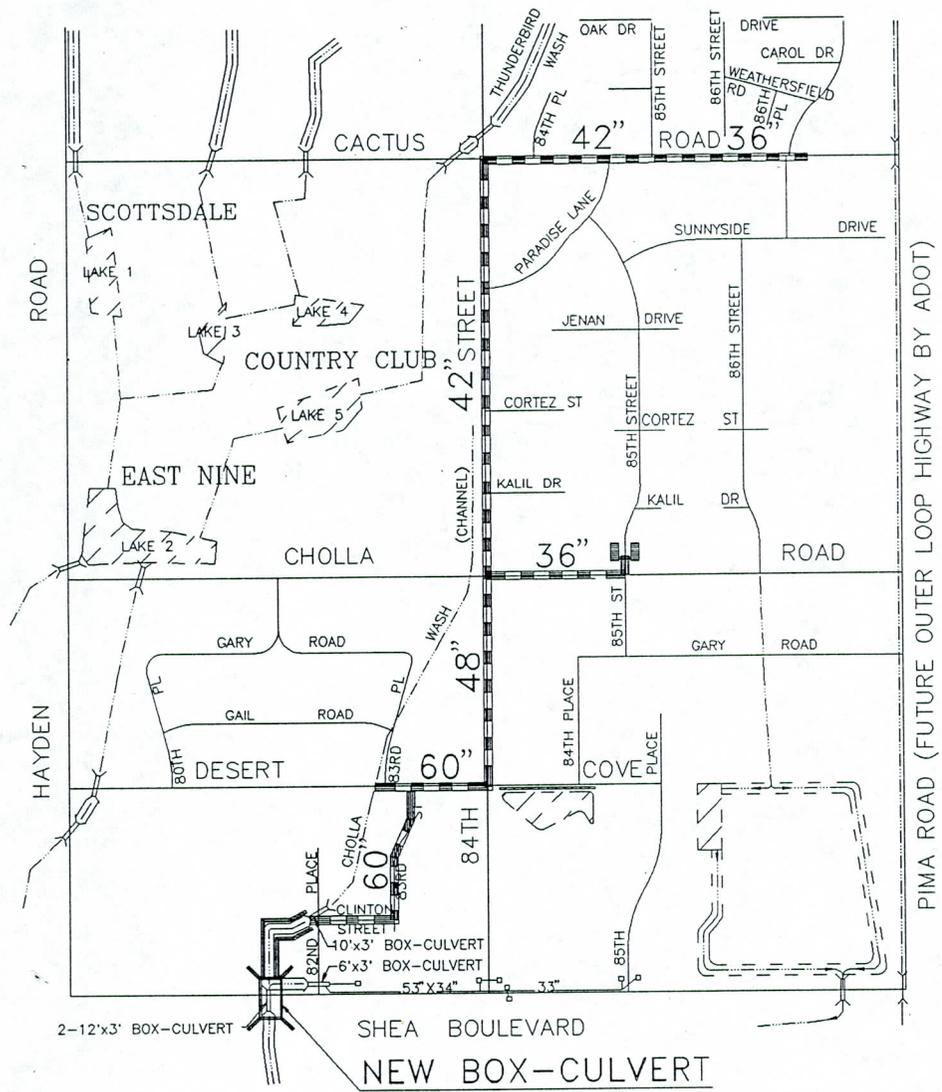


LEGEND

- EXISTING WASH
- === EXISTING CHANNEL
- ▨ EXISTING DETENTION BASIN
- |— EXISTING PIPE CULVERT
- 3"— EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- ▨ PROPOSED DETENTION SITE
- 48"— PROPOSED STORM DRAIN OR CULVERT
- === PROPOSED CHANNEL
- |— PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 6A



LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 6B

6. **Series 7 Alternates 7A and 7B (See Concept Sketches on Pages 28 and 29)**

Concept... the Cactus Road storm sewer (diversion component) outfalls into the East Nine drainage swale; the Cholla Road storm sewer (diversion component) discharges into the outfall wash of Lake 2 at the East Nine.

Alternate 7A... includes improvements to Cholla wash from Gail Road to Clinton Street, but it is not feasible to obtain easements along Cholla wash.

Alternate 7B... includes the Desert Cove storm sewer in lieu of Cholla wash improvements.

This Alternate 7B meets the objectives of the project, however, discharging the Cholla diversion component into the Lake 2 outlet wash is undesirable because, flows in that wash have generated citizen complaints in the past. Also, the Hayden / Shea Master Drainage Plan indicates that excessive flows are expected in the wash; and it proposes that the wash be improved.

It is expected that flooding conditions downstream of the proposed diversion will be exacerbated.

Therefore, these Alternates 7A and 7B are not considered for further development.

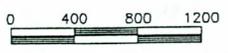
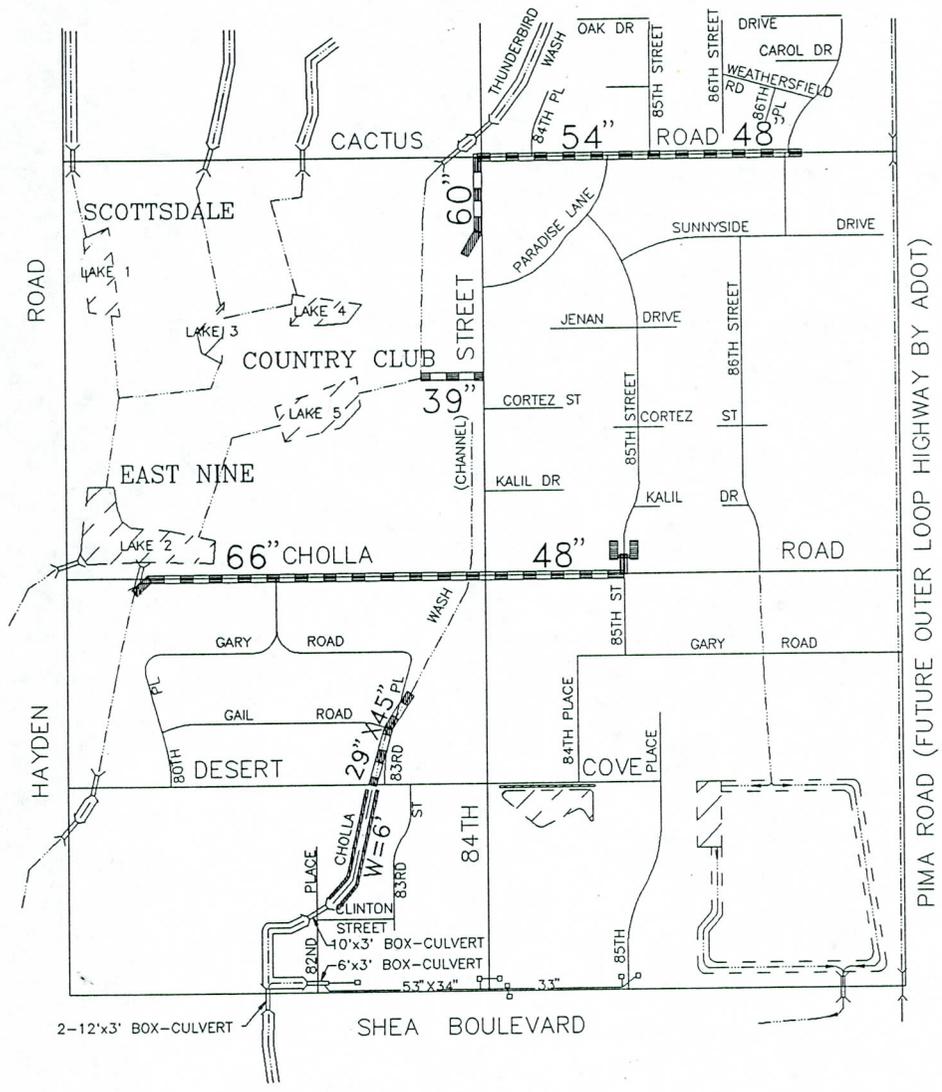
7. **Alternate 8 (See Concept Sketches on Page 30)**

Concept... this alternate provides detention at Site 5 which is located on the west side of Pima Road within the Pima Freeway (Outer Loop) ROW, just north of Cholla Road; the Cactus Road storm sewer outfalls into the Site 5 detention basin; the Cholla Road diversion component outfalls into the Site 5 detention basin; and Cholla wash is improved from Cortez Street to Clinton Street.

Drainage easements along Cholla wash are not feasible and the outfall flow at Clinton Street is not reduced to an acceptable level.

Although Detention Site 5 is located in the ROW of the future Outer Loop Highway, the site must be purchased at market value.

Therefore, this Alternate 8 is not considered for further development.

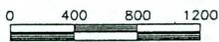
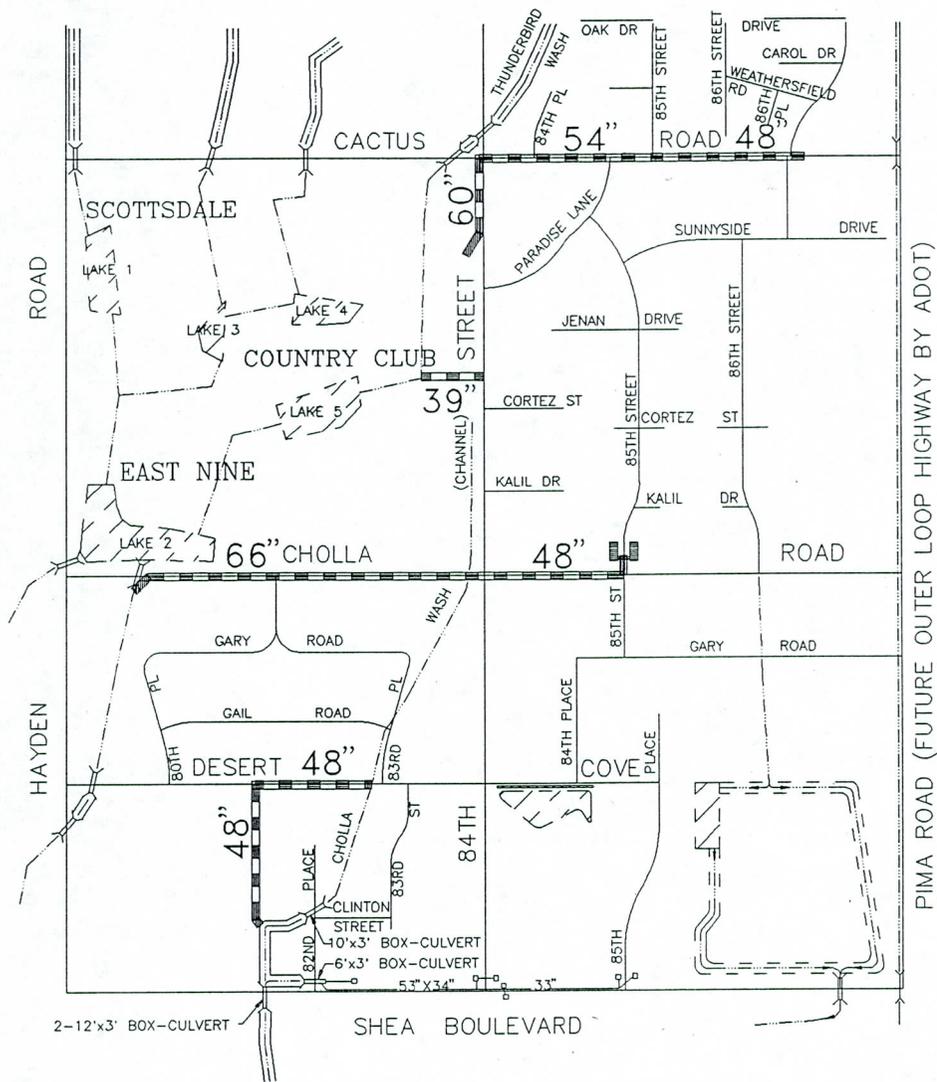


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 7A

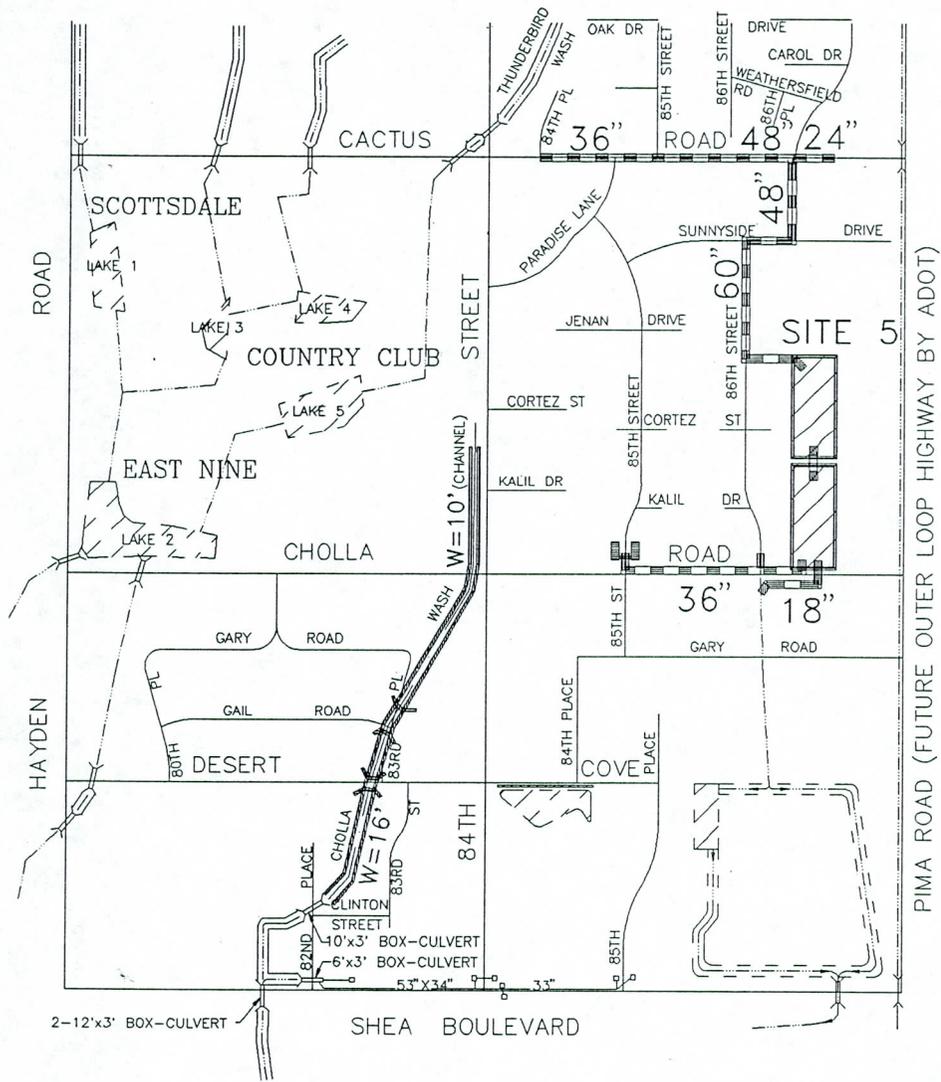


LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- 48" PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 7B



PIMA ROAD (FUTURE OUTER LOOP HIGHWAY BY ADOT)

LEGEND

- EXISTING WASH
- ≡≡≡ EXISTING CHANNEL
- ▨ EXISTING DETENTION BASIN
- |— EXISTING PIPE CULVERT
- |— EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- |— EXISTING BERM
- ▨ EXISTING DETENTION SITE
- |— 48" PROPOSED STORM DRAIN OR CULVERT
- ≡≡≡ PROPOSED CHANNEL
- |— PROPOSED BOX-CULVERT
- ▭ PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
50-YR RETURN FREQUENCY
6 HOUR DURATION

ALTERNATE 8

8. **Alternate 9 (See Concept Sketch on Page 32)**

Concept... the concept of this Alternate 9 is to make a substantial increase of the benefitting area and combine benefits that may obviate other projects or proposed improvements beyond the scope of this project.

The Hayden / Shea Master Drainage Plan indicates that the box culvert under Cholla Road, which provides for discharge from Lake 2, requires improvement to increase its capacity. Also, it recommends that the downstream wash capacity be increased by improvements. The difficulty associated with obtaining easements for this wash could be equal to that of Cholla wash.

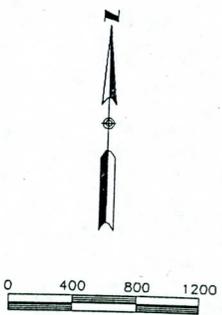
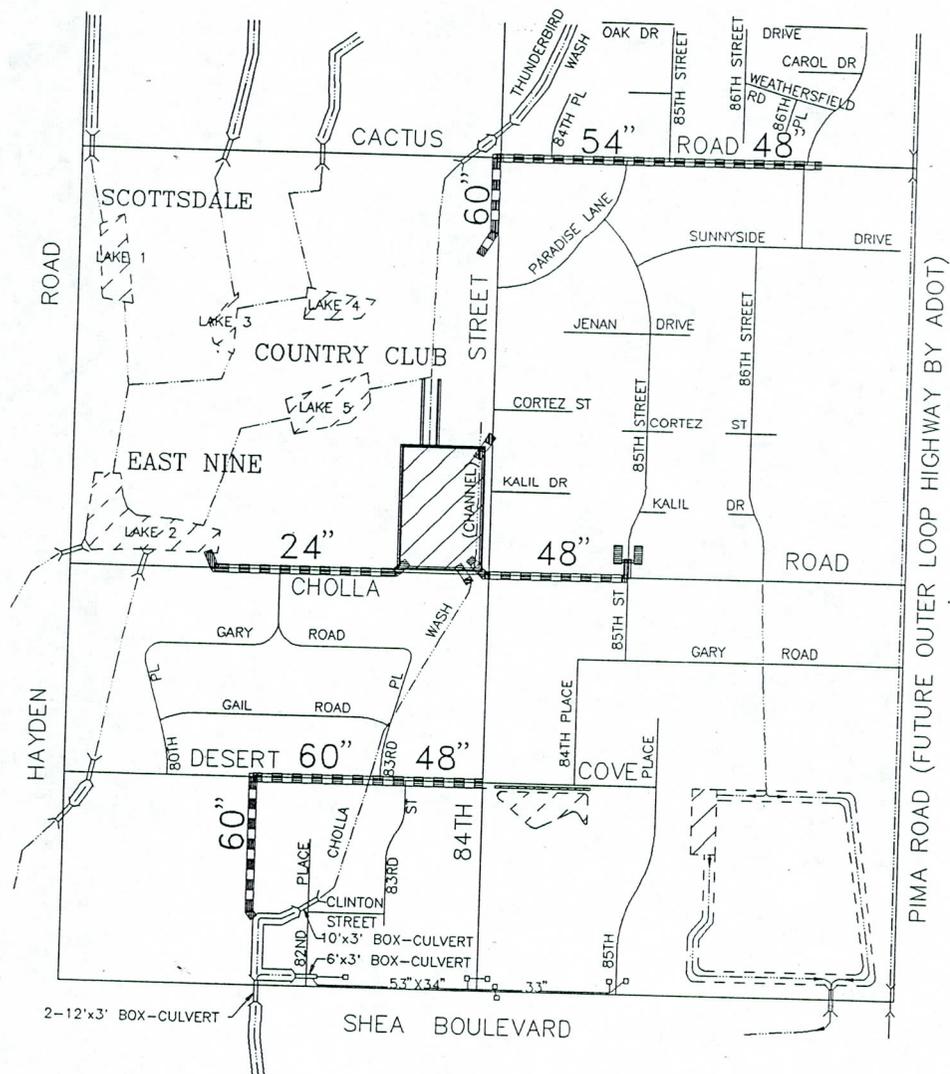
This Alternate 9 was developed to meet the objectives of this project and to effect significant improvement to the East Nine and the downstream community.

Alternate 9... consists of the Cactus Road and Cholla Road diversion components; and the Desert Cove storm sewer is included.

Detention Site 1... this detention basin includes the entire 12-acre parcel of Site 1. Its outfall pipe discharges into Lake 2. The detention basin intercepts the combined flow from both Thunderbird wash and the Cactus Road storm sewer.

The detention site costs are considerably greater than that of the other alternates; but the benefits reach far beyond this project's limits.

Therefore, this Alternate 9 is considered in Section 4, Preferred Plans for further development.



LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
 50-YR RETURN FREQUENCY
 6 HOUR DURATION

ALTERNATE 9



IV PREFERRED PLANS

A.	BEST PLANS OF ALTERNATES STUDIED	1
B.	PREFERRED ALTERNATE 2A	1
C.	PREFERRED ALTERNATE 2B	4
D.	PREFERRED ALTERNATE 3A	6
E.	PREFERRED ALTERNATE 9	9

MAPS

	PREFERRED ALTERNATE 2A	2
	PREFERRED ALTERNATE 2B	5
	PREFERRED ALTERNATE 3A	7
	PREFERRED ALTERNATE 9	10

IV PREFERRED PLANS

A. BEST PLANS OF ALTERNATES STUDIED

Plans to be Considered... in Section III, all of the alternative plans that were developed are presented in eight (8) groups, a total of 24 alternatives. Then alternate 9 was developed because the benefits appeared to be outweighed by the costs of the first eight groups. Perhaps a second approach would be to increase the benefitting area and combine the objectives of this project with that of adjacent community needs; this may improve the benefit ratio.

Four preferred plans were selected for further analysis and discussion; they are Alternates 2A, 2B, 3A, and 9.

Objectives... all of these preferred plans meet the objectives of the project.

Phasing... all of these preferred plans can be phased for construction if required to meet budgetary requirements. A specific phasing plan is shown for each alternate; however, the sequence of construction phasing can be rearranged to coincide with fund availability as desired by the City. For example, in lieu of the specific alternate plan (described in the text of this Section IV), the following sequence could be considered: The Cactus Road storm sewer can be constructed at a later date and during the interim period, special catch basins in 84th Street near Cortez Street can intercept the Cactus Road flows and discharge them into either the East Nine or Detention Site 1 located at the northwest corner of 84th Street and Cholla Road.

Also, the Desert Cove storm sewer can be phased for future construction; and during the interim, flow conditions in Cholla wash will be better than that of existing conditions due to the initial phases having been placed into service.

B. PREFERRED ALTERNATE 2A (See Concept Sketch on Page 2)

Cactus Road Diversion Component... this plan includes the Cactus Road storm sewer (diversion component) which outfalls into the East Nine drainage swale just south of Cactus Road. The Cactus Road storm sewer is sized to carry flows of the 50-year return frequency storm. Larger storms in excess of the 50-year storm will surface flow in Cactus Road to 84th Street and turn south in 84th Street; those surface flows will be intercepted by special catch basins at a location just north of Cortez Street. The catch basins will also discharge their flows into the East Nine. Thus, the 100-year return frequency level of protection will be effected.

Cholla Diversion Component... the Cholla Road storm sewer from 85th Street to 84th Street will intercept the 50-year storm flow at 85th Street with special catch basins. It will discharge the 50-year storm flow into the detention basin at Site 1.

Flows of storms in excess of the 50-year will surface flow to the 84th Street / Desert Cove intersection. The total flow at this location for the 100-year storm is 85 cfs; and, the combined capacity of the Desert Cove storm sewer and 84th Street gutters exceed the 85 cfs runoff flow.

Detention Basin Site 1... is located at the northwest corner of 84th Street and Cholla Road. This basin is sized to accommodate the 100-year return frequency storm. Its depth is about four (4) feet. The required area is three (3) acres. The outfall pipe discharges 44 cfs into Cholla wash at Cholla Road.

Desert Cove Storm Sewer... this storm sewer will intercept flows at the 84th Street / Desert Cove intersection and at Cholla wash. Notice on the drawing that 126 cfs reaches the 84th Street / Shea Boulevard intersection after improvements. The capacity of the drainage facilities, including curb and gutter at Shea Boulevard, is about 90 cfs. That is considered adequate for conceptual development purposes.

The flow in the lined segment of Cholla wash is reduced to 242 cfs and the capacity of the channel is 210 cfs, also adequate. The flow in Cholla wash just north of Clinton Street is 50 cfs and the capacity is 45 cfs. The combined flow at the Shea 2-barrel 12' x 3' box culvert is 395 cfs and the capacity is 340 cfs.

The following table summarizes these flow and capacity values:

LOCATION / FEATURE	RUNOFF	CAPACITY
Cholla Wash at Cholla Road	44	100
Cholla Wash South of Desert Cove	21	55
Unimproved Cholla Wash at Clinton	50	45
Cholla Wash Lined Segment	242	210
Shea 2-barrel 12' x 3' Box Culvert	395	340
84th Street / Shea Boulevard Intersection	126	90

Even though most of these flows exceed the facility capacity, they are adequate and can be improved by final design details.

Construction Phases... Alternate 2A can be separated into three phases as follows:
 Phase Ia - Cactus Road Storm Sewer & 84th Street Special Catch Basins
 Phase Ib - Pima Road Diversion Channel & Structure
 Phase Ic - Cholla Road Storm Sewer
 Phase II - Detention Site 1 & Outfall Structure
 Phase III- Desert Cove Storm Sewer

Construction Costs...

Phase Ia -	\$ 595,000
Phase Ib -	\$ 150,000
Phase Ic -	<u>\$ 180,000</u>
Phase I	\$ 925,000
Phase II	\$ 743,000
Phase III	<u>\$ 435,000</u>
Alternate 2A Total	\$2,103,000

C. PREFERRED ALTERNATE 2B (See Concept Sketches on Page 5)

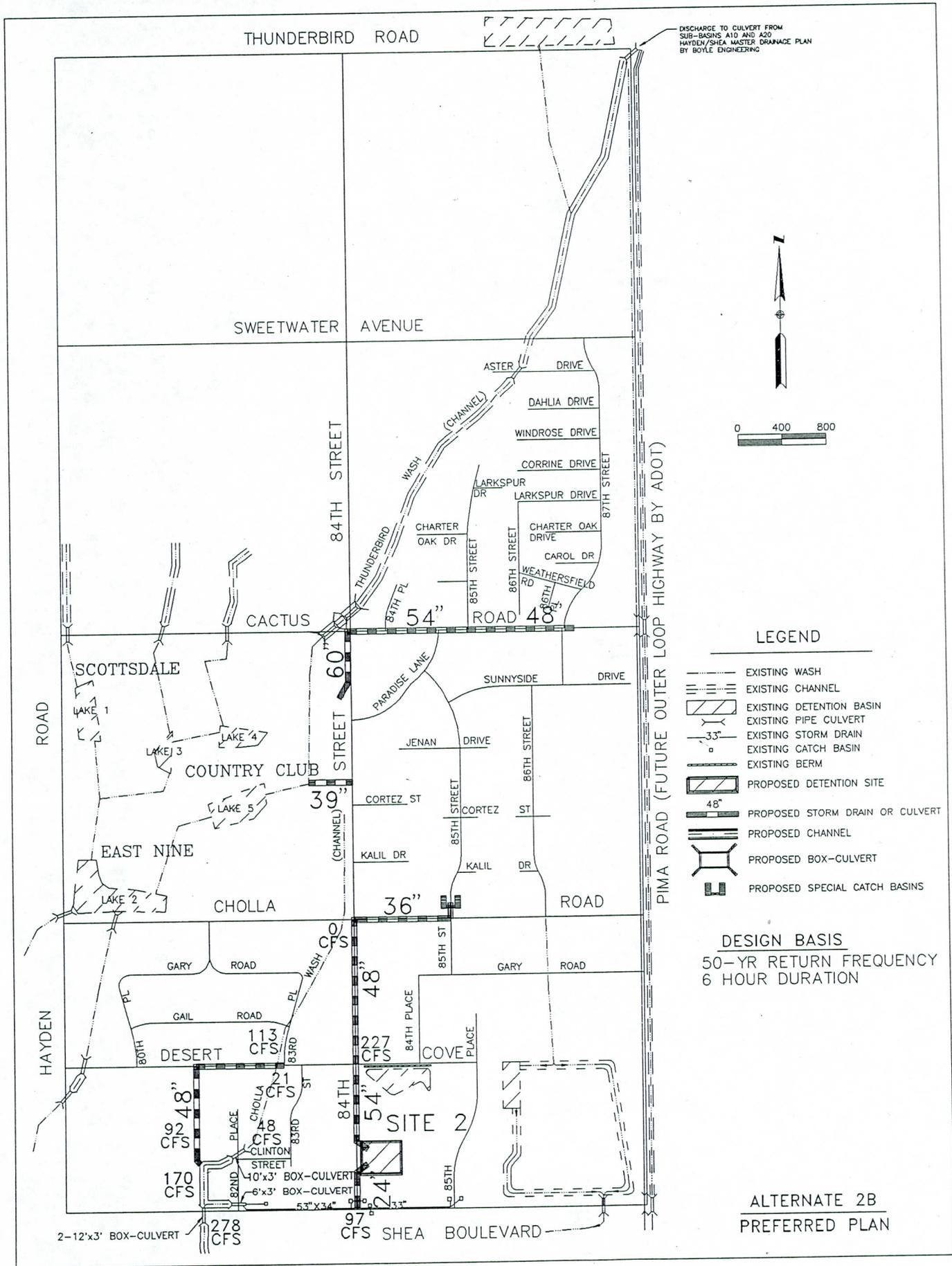
Cactus Road Diversion Component... for Alternate 2B, the Cactus Road storm sewer is the same design as is Alternate 2A, and the discussion for Alternate 2A applies.

Cholla Road / 84th Street Storm Sewer... this storm sewer does not discharge into upper Cholla wash as it does for Alternate 2A. No diversion is planned, rather, flows remain in their respective sub-basins. This storm sewer discharges the 50-year storm into Detention Basin Site 2 located at the northeast corner of 84th Street and Shea Boulevard. Storms in excess of the 50-year return frequency will surface flow in the streets.

Detention Basin Site 2... the basin is sized to accommodate the 100-year return frequency storm. Its depth is about 4 feet. The required area is 4 acres.

The 24-inch outfall pipe discharges into the existing Shea Boulevard storm sewer, and the total flow which reaches the 84th Street / Shea Boulevard intersection is 97 cfs. The combined capacity of the Shea storm sewer and gutters is 90 cfs. This is a good improvement.

Desert Cove Storm Sewer... the upper end of the storm sewer pipe terminates at Cholla wash; it does not extend to the 84th Street / Desert Cove intersection as does Alternate 2A. At Cholla wash it intercepts the flows from upper Cholla wash and discharges into the lined segment of Cholla wash near the Clinton Street alignment. The flow in the lined segment of Cholla wash is reduced to 170 cfs, and its capacity is 210 cfs. The flow in Cholla wash just north of Clinton Street is 48 cfs, and its capacity is 45 cfs. The combined flow at the Shea 2-barrel 12' x 3' box culvert is 278 cfs and the box capacity is 340 cfs.



LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS

50-YR RETURN FREQUENCY
6 HOUR DURATION

ALTERNATE 2B
PREFERRED PLAN

The following table summarizes these flow and capacity values:

LOCATION / FEATURE	RUNOFF	CAPACITY
Cholla Wash at Cholla Road	0	100
Cholla Wash South of Desert Cove	21	55
Unimproved Cholla Wash at Clinton	48	45
Cholla Wash Lined Segment	170	210
Shea 2-barrel 12' x 3' Box Culvert	278	340
84th Street / Shea Boulevard Intersection	97	90

Construction Phases... Alternate 2B can be separated into three phases as follows:

- Phase Ia - Cactus Road Storm Sewer & 84th Street Special Catch Basins
- Phase Ib - Pima Road Diversion Channel and Structure
- Phase Ic - Cholla Road & 84th Street Storm Sewer
- Phase II - Detention Site 2 & Inlet / Outlet Structures
- Phase III - Desert Cove Storm Sewer

Construction Costs...

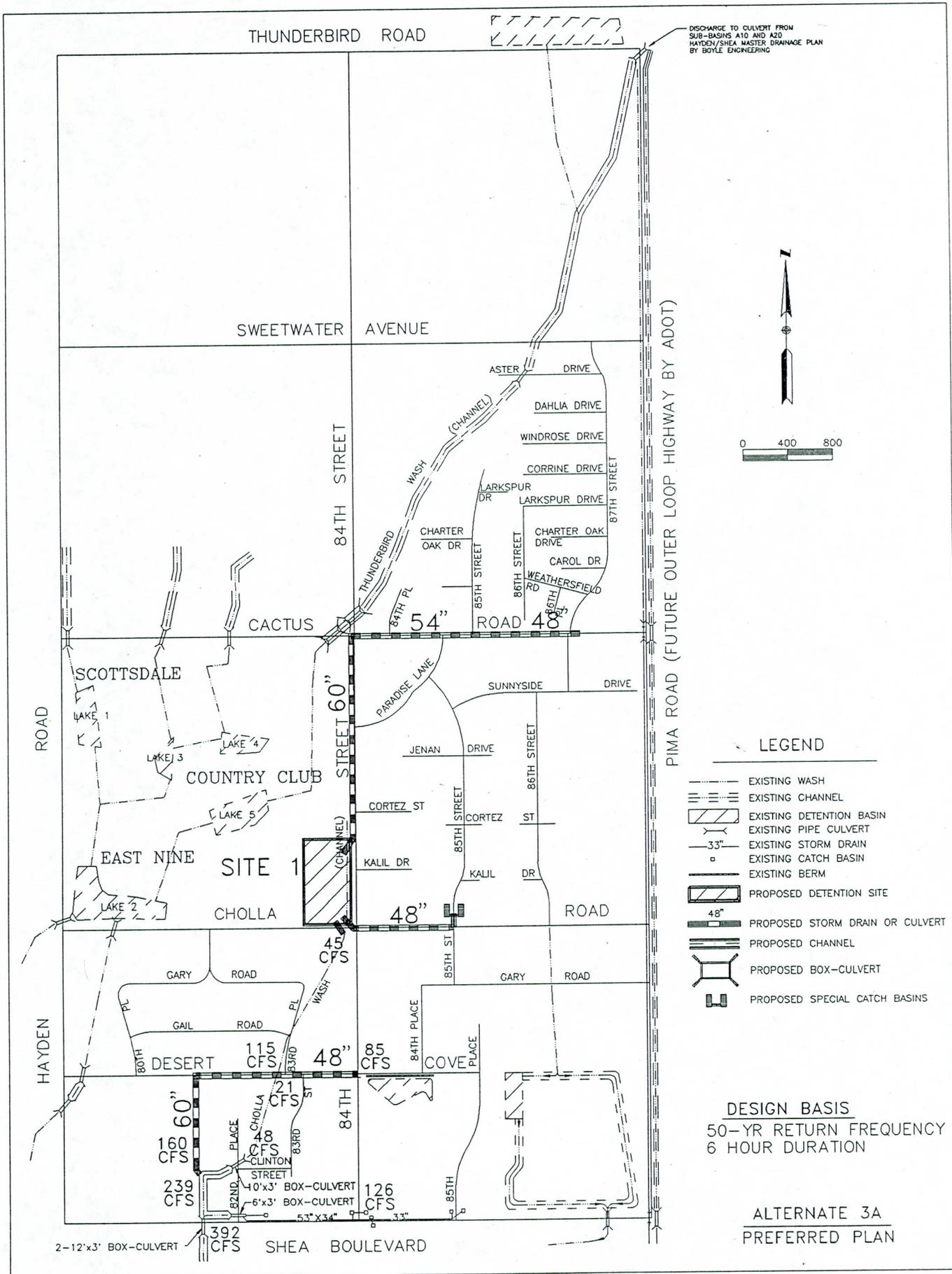
Phase Ia -	\$ 595,000
Phase Ib -	\$ 150,000
Phase Ic -	\$ 433,000
Phase I	\$1,178,000
Phase II	\$1,440,000
Phase III	\$ 262,000
Alternate 2B Total	\$2,880,000

D. PREFERRED ALTERNATE 3A (See Concept Sketch on Page 7)

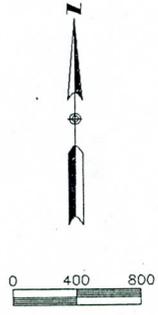
CONCEPT... this alternate does not include diversion into the East Nine (Thunderbird wash basin). Runoff flows remain in the Cholla wash basin.

Cactus Road Storm Sewer... Alternate 3A includes the Cactus Road storm sewer which discharges the 50-year return frequency storm into Detention Basin Site 1. Larger storms in excess of the 50-year storm will surface flow in Cactus Road to 84th Street and turn south in 84th Street. These surface flows will be intercepted by special catch basins at a location near Cortez Street. The catch basins will also discharge into Detention Site 1. Thus, the 100-year return frequency level of protection will be effected.

Cholla Road Diversion Component... the Cholla Road storm sewer from 85th Street to 84th Street will intercept the 50-year storm flow at 85th Street with special catch basins. It will discharge the 50-year storm flow into the detention basin at



DISCHARGE TO CULVERT FROM
SUB-BASINS A10 AND A20
HAYDEN/SHEA MASTER DRAINAGE PLAN
BY BOYLE ENGINEERING



LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
50-YR RETURN FREQUENCY
6 HOUR DURATION

**ALTERNATE 3A
PREFERRED PLAN**

Site 1. Flows of storms in excess of the 50-year will surface flow to the Desert Cove / 84th Street intersection. The total flow at this location for the 100-year storm is 85 cfs; and the combined capacity of the Desert Cove storm sewer and 84th Street gutters exceed the 85 cfs runoff.

Detention Basin Site 1... is located at the northwest corner of 84th Street and Cholla Road. This basin is sized to accommodate the 100-year return frequency storm. Its depth is about 4 feet. The required area is six (6) acres. The outfall pipe discharges 45 cfs into Cholla wash at Cholla Road.

Desert Cove Storm Sewer... this component is the same as that of Alternate 2A. The discussion of the Desert Cove storm sewer of Alternate 2A also applies to this Alternate 3A.

The following table summarizes these flow and capacity values.

LOCATION / FEATURE	RUNOFF	CAPACITY
Cholla Wash at Cholla Road	45	100
Cholla Wash South of Desert Cove	22	55
Unimproved Cholla Wash at Clinton	50	45
Cholla Wash Lined Segment	239	210
Shea 2-barrel 12' x 3' Box Culvert	392	340
84th Street/Shea Boulevard Intersection	126	90

Construction Phases... Alternate 3A can be separated into three (3) phases as follows:

- Phase Ia - Cactus Road Storm Sewer and Detention Basin Site 1
- Phase Ib - Pima Road Diversion is not required for this Alternate 3A
- Phase Ic - Cholla Road Storm Sewer
- Phase II - Detention Basin Site 1 & Outfall Structures must be constructed with Phase I to be functional
- Phase III - Desert Cove Storm Sewer

Construction Costs...

Phase Ia -	\$2,177,000 ... includes Detention Site 1
Phase Ib -	\$ -0-
Phase Ic -	\$ 180,000
Phase I -	\$2,357,000
Phase II -	\$ -0-
Phase III -	\$ 435,000
Alternate 3A Total	\$2,792,000

E. **PREFERRED ALTERNATE 9 (See Concept Sketch on Page 10)**

Concept... the concept for this Alternate 9 is:

Develop the entire 12-acres at Detention Basin Site 1.

Combine the flows from Thunderbird wash with flows from the Cactus Road storm sewer and modify the East Nine drainage swale so that these flows enter Detention Basin Site 1.

The outflow pipe from Detention Basin Site 1 discharges into Lake 2 of the East Nine.

The additional detention will reduce the outflow from Lake 2 at Cholla Road and Hayden Road. Recall, overflow at the box culverts spills over the roadway for the 10-year storm and over 2,000 cfs spills over for the 100-year storm.

This design meets the objectives of this project and, in addition, increases the benefitting area. The additional benefitting area includes the Scottsdale Country Club East Nine and areas downstream of the East Nine Lake 2.

Cactus Road Diversion Component... this storm sewer discharges into the East Nine swale just south of Cactus Road. These flows combine with flows from Thunderbird wash and are directed to Detention Basin Site 1.

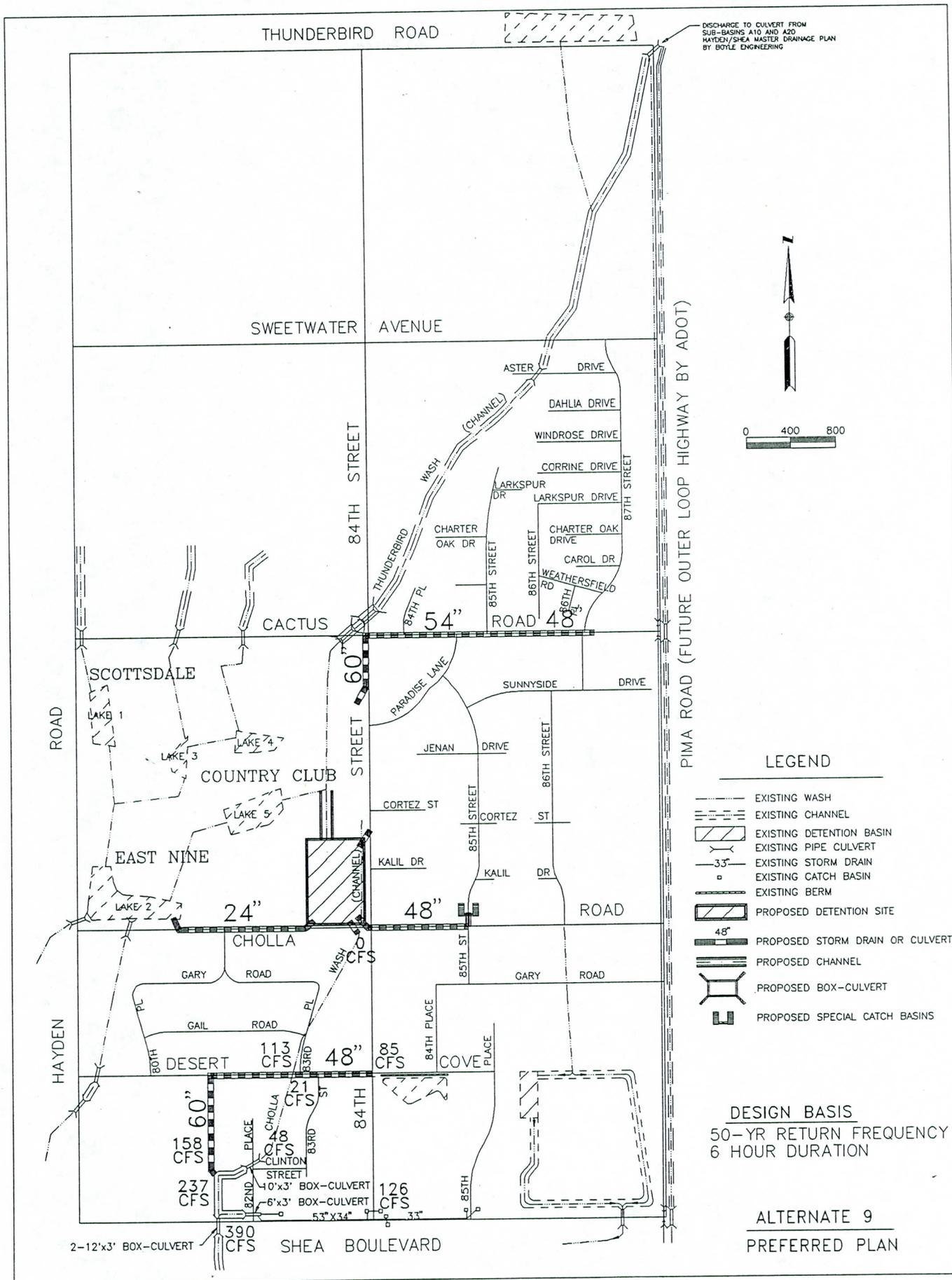
Cholla Road Diversion Component... this design is the same as that for Alternates 2A and 3A, and the discussion for those alternates also applies to this Alternate 9.

Detention Site 1... is located at the northwest corner of 84th Street and Cholla Road. This basin is sized to accommodate the 100-year return frequency storm and reduce the outflow from Lake 2 of the East Nine. The initial depth considered is four (4) feet. The required area is twelve (12) acres. Two acres are for street ROW and 10 acres for Detention Site 1.

The outflow discharge from the Detention Basin Site 1 has not been modeled for this study. The HEC-1 model update for the Scottsdale Country Club East Nine can include this feature if desired.

Desert Cove Storm Sewer... this component is the same as that of Alternated 2A and 3A. The discussion of the Desert Cove storm sewer of Alternate 2A also applies to this Alternate 9.

The following table summarizes these flows and capacity values:



DISCHARGE TO CULVERT FROM
SUB-BASINS A10 AND A20
HAYDEN/SHEA MASTER DRAINAGE PLAN
BY BOTLE ENGINEERING



LEGEND

- EXISTING WASH
- EXISTING CHANNEL
- EXISTING DETENTION BASIN
- EXISTING PIPE CULVERT
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- EXISTING BERM
- PROPOSED DETENTION SITE
- PROPOSED STORM DRAIN OR CULVERT
- PROPOSED CHANNEL
- PROPOSED BOX-CULVERT
- PROPOSED SPECIAL CATCH BASINS

DESIGN BASIS
50-YR RETURN FREQUENCY
6 HOUR DURATION

ALTERNATE 9
PREFERRED PLAN

LOCATION / FEATURE	RUNOFF	CAPACITY
Cholla Wash at Cholla Road	0	100
Cholla Wash South of Desert Cove	22	55
Unimproved Cholla Wash at Clinton	48	45
Cholla Wash Lined Segment	237	210
Shea 2-barrel 12' x 3' Box Culvert	390	340
84th Street/Shea Boulevard Intersection	126	90

Construction Phases... Alternate 9 can be phased as follows:

- Phase Ia - Cactus Road Storm Sewer & 84th Street Special Catch Basins
- Phase Ib - Pima Road Diversion Channel and Structure
- Phase Ic - Cholla Road Storm Sewer, including 24-inch Outfall from Detention Site 1
- Phase II - Detention Site 1 and Outfall Structures
- Phase III - Desert Cove Storm Sewer

Construction Costs...

Phase Ia -	\$ 595,000
Phase Ib -	\$ -0-
Phase Ic -	<u>\$ 248,000</u>
Phase I	\$ 843,000
Phase II	\$1,902,000
Phase III	<u>\$ 435,000</u>
Alternate 9 Grand Total	\$3,180,000



V CONCLUSION AND COSTS

A.	COMPONENTS COMMON TO ALTERNATES 2A, 2B, 3A AND 9	1
B.	PHASING AND COST COMPARISON	1
C.	ALTERNATE 2A	3
D.	ALTERNATE 3A	4
E.	ALTERNATE 9	4

ITEMIZED CONSTRUCTION COST ESTIMATES

ALTERNATE 2A	5
ALTERNATE 2B	7
ALTERNATE 3A	9
ALTERNATE 9	11

V CONCLUSION AND COSTS

A. COMPONENTS COMMON TO ALTERNATES 2A, 2B, 3A AND 9

Cactus Road Storm Sewer (Diversion Component)... Alternates 2A, 2B, and 9 include diversion of flows along Cactus Road into the Scottsdale Country Club East Nine. The Alternate 3A Cactus Road storm sewer discharges into Detention Basin Site 1.

Cholla Road Diversion Component... Alternates 2A, 3A and 9 include the Cholla Road Diversion Component. Alternate 2B discharges the Cholla Road storm sewer into Detention Basin Site 2.

Desert Cove Storm Sewer... All alternates (2A, 2B, 3A, and 9) include the Desert Cove storm sewer which discharges into the lined segment of Cholla wash.

Therefore... the project objectives are met by all of the Preferred Alternates. In addition, Alternate 9 provides benefits to the East Nine and the area downstream of Lake 2 which is beyond the scope of this project.

Detention... the detention basin property must be purchased for all alternates and the basin size is distinct for each alternate as follows:

<u>Site</u>	<u>Alternate</u>	<u>Area Required</u>	<u>Costs</u>
1	2A	3 Acres	\$ 743,000
2	2B	4 Acres	\$1,440,000
1	3A	6 Acres	\$1,368,000
1	9	10 Acres	\$1,902,000

The distinct total cost of any one alternate is very sensitive to the detention basin property cost, therefore, property appraisals should be completed prior to making the final alternate selection.

Detention for Alternate 2A is by far the least costly. Detention for Alternate 2B is more costly than 2A or 3A and benefits are not greater, therefore, Alternate 2B is considered the least desirable.

B. PHASING AND COST COMPARISON

Preferred Alternates 2A, 2B and 9 can be Phased as follows...

- Phase Ia - Cactus Road Storm Sewer and 84th Street Special Catch Basins
- Phase Ib - Pima Road Diversion Channel and Structure
- Phase Ic - Cholla Road Storm Sewer (2B includes 84th Street Storm Drain)

- Phase II - Detention Site and Structures
- Phase III - Desert Cove Storm Sewer
- Phase IV - Thunderbird Wash Improvements from Sweetwater Avenue to Thunderbird Road and Box Culverts at 84th Street & Cactus Road

Preferred Altnerate 3A can be Phased as follows...

- Phase Ia - Cactus Road Storm Sewer and Detention Basin Site 1
- Phase Ib - Pima Road Diversion is not required for this Alternate 3A
- Phase Ic - Cholla Road Storm Sewer

- Phase II - Detention Site 1 and Outfall Structure must be constructed with Phase Ia to be functional
- Phase III- Desert Cove Storm Sewer
- Phase IV - Same as above for Alternates 2A, 2B and 9

PHASE	ALTERNATE			
	2A	2B	3A	9
Ia	\$595,000	\$595,000	\$2,194,000	\$595,000
Ib	\$150,000	\$150,000	***	***
Ic	\$180,000	\$433,000	\$180,000	\$248,000
I	\$925,000	\$1,178,000	\$2,374,000	\$843,000
II	\$743,000	\$1,440,000	**	\$1,902,000
I & II	\$1,668,000	\$2,618,000	\$2,374,000	\$2,745,000
III	\$435,000	\$262,000	\$435,000	\$435,000
I thru III	\$2,103,000	\$2,880,000	\$2,809,000	\$3,180,000
IV	* \$470,000	* \$470,000	* \$470,000	* \$470,000
Total	\$2,573,000	\$3,350,000	\$3,279,000	\$3,650,000

- * This estimate (\$470,000) is taken from the Hayden / Shea Master Drainage Plan¹⁷ for improvements identified in that report for Thunderbird Wash.
- ** Detention Site 1 cost is included in Phase Ia.
- *** Phase Ib is not required for Alternates 3A and 9.

Alternate 2B... ranks the most costly of the other alternates (2A & 3A); therefore, it is not carried forward for further consideration.

¹⁷ Boyle Engineering Corporation. Hayden / Shea Area Master Drainage Plan, Pima/Doubletree Area Master Drainage Plan, Addendum No. 2, January 25, 1991, Exhibit 1.

C. ALTERNATE 2A

Costs... Alternate 2A is the least costly of the four Alternates at a total cost of \$2,573,000. This cost includes the Pima Road channel diversion and Thunderbird wash improvements.

This alternate meets the objectives of this project.

Based on cost and objectives, this alternate is the best choice for further development and construction.

Uncertainties... runoff flows from Cactus Road which now contribute to Cholla wash are diverted into the Scottsdale Country Club East Nine. For this planned diversion, it must be demonstrated that flow conditions in the East Nine and downstream of Lake 2 are not exacerbated by this diversion.

Because this issue can not be overlooked, the following is repeated here, as stated in Section 2, E.:

The Hayden / Shea Area Master Drainage Plan says... "Presently, there is a major flooding problem that occurs at the southwestern corner of the Scottsdale Country Club Second Nine. The lake at this location, Lake Number 2, has two culvert outlets, one under Cholla Road and one under Hayden Road. When a 10-year storm occurs on the watershed, water begins to spill out of Lake 2 onto Cholla and Hayden. Most of the water drains south on Hayden and some is captured by catch basins along Hayden. In a 100-year storm, over 2,000 cfs spills over into Hayden and Cholla."¹⁸

Before this Alternate 2A can be considered a valid alternate plan, it must be demonstrated that the proposed Pima Road diversion structure and channel will offset any addition of water to the Scottsdale Country Club East Nine system (ultimately Lake 2) so as to, at a minimum, not exacerbate existing conditions downstream of Lake 2.

For this Alternate 2A, the concept that is believed will effect those improvements is; divert area A10 and A20¹⁹ from Thunderbird wash to the Pima channel. To accomplish this, the East Nine HEC-1 model must be revised to include the Pima Road diversion and upgraded to reflect as-built geometrics of the existing channels

¹⁸ Boyle Engineering Corporation. Hayden / Shea Area Master Drainage Plan, Pima/Doubletree Area Master Drainage Plan, Addendum No. 2, January 25, 1991, p. 2.

¹⁹ Boyle Engineering Corporation. Hayden / Shea Area Master Drainage Plan, Pima/Doubletree Area Master Drainage Plan, Addendum No. 2, January 25, 1991, p. 2.

and detention sites (Lakes). It must also be demonstrated that the Pima Road diversion component meets the criteria for a valid planned diversion.

D. ALTERNATE 3A

Costs... Alternate 3A ranks second to the lowest cost at a total of \$3,279,000. The Pima channel diversion improvements are not required for this Alternate 3A. The cost is higher than 2A because additional storm sewer pipe is required in 84th Street and 3 additional (6 total) acres of Detention Site 1 are required.

This Alternate 3A is equal to Alternate 2A functionally; it meets all of the objectives of the project. This Alternate 3A has the additional advantage that it does not include diversion of the Cactus Road flows into the East Nine. Floodwaters remain in the Cholla wash basin.

If the HEC-1 update and revisions required of Alternate 2A for the Scottsdale Country Club East Nine were to prove to be unfavorable, this Alternate 3A would be the next best choice for further development and construction.

E. ALTERNATE 9

Costs... this Alternate 9 is the greatest cost of all the preferred alternates, at a total cost of \$3,650,000. The HEC-1 model for this Alternate 9 must include the Scottsdale Country Club East Nine and that model is beyond the scope of this study.

Alternate 9 meets the objectives of this project. In addition, it reduces the outflow from Lake 2 of the East Nine and it provides additional storage for the inflow from Thunderbird wash. Therefore, the benefits derived from this Alternate 9 may be far greater than the other preferred alternates. It may also be true that a cost savings would be realized from other projects downstream of the East Nine Lake 2.

Uncertainties... runoff flows from Cactus Road, which now contribute to Cholla wash, are diverted into the Scottsdale Country Club East Nine. For this planned diversion, it must be demonstrated that flow conditions in the East Nine and downstream of Lake 2 are not exacerbated by this diversion.

Also, before this Alternate 9 can be considered a valid alternate plan, it must be demonstrated that flood conditions at Lake 2 are not exacerbated. To effect this, Alternate 9 provides 6 acres solely to improve the East Nine and downstream flooding conditions.

For Alternate 9 to be valid, the East Nine HEC-1 model must be revised to reflect the Pima channel diversions, the additional 6-acres of detention and upgraded to reflect as-built geometrics of existing channels and detention sites (Lakes).

VI CONSTRUCTION COSTS

A. ALTERNATE 2A

Phase Ia: Cactus Storm Sewer & Special Catch Basins
 Phase Ib: Pima Road Diversion Channel & Structure
 Phase Ic: Cholla Road Storm Sewer

Phase Ia: Cactus Storm Sewer & Special Catch Basins

Description	Units		\$/Unit	Total
18" RCP Connector Pipes	420	L.F.	\$ 34	\$ 14,280
39" RCP Storm Drain	256	L.F.	\$ 76	\$ 19,456
51" RCP Storm Drain	1,099	L.F.	\$ 103	\$ 113,197
60" RCP Storm Drain	1,374	L.F.	\$ 122	\$ 167,628
Manhole	7	Each	\$ 2,500	\$ 17,500
Outlet Structure (39")	1	Each	\$ 8,000	\$ 8,000
Outlet Structure (60")	1	Each	\$ 12,000	\$ 12,000
Pavement Replacement	2,979	S.Y.	\$ 36	\$ 107,244
Catch Basin	12	Each	\$ 2,500	\$ 30,000
Special Catch Basins	2	Each	\$ 5,000	\$ 10,000
Misc. Removals	1	L.S.	\$ 5,000	\$ 5,000
Pipe Supports	3	Each	\$ 1,000	\$ 3,000
ROW Acquisition				\$ 10,000
15% Engin. & Conting.				\$ 77,596
Phase Ia =				\$ 594,901

Phase Ib: Pima Road Diversion Channel & Structure

Channel Improvements	1	L.S.	\$100,000	\$ 100,000
Structure	1	L.S.	\$ 30,435	\$ 30,435
15% Engin. & Conting.				\$ 19,565
Phase Ib =				\$ 150,000

Phase Ic: Cholla Road Storm Sewer

18" RCP Connector Pipes	160	L.F.	\$ 34	\$ 5,440
30" RCP Connector Pipes	48	L.F.	\$ 60	\$ 2,880
48" RCP Storm Drain	1200	L.F.	\$ 96	\$ 115,200
Manholes	3	Each	\$ 2,500	\$ 7,500
Catch Basins	6	Each	\$ 2,500	\$ 15,000
Special Catch Basins	2	Each	\$ 5,000	\$ 10,000
15% Engin. & Conting.				\$ 23,403
Phase Ic =				\$ 179,423

Summary

Phase Ia: Cactus Storm Sewer & Special Catch Basins	\$ 595,000
Phase Ib: Pima Road Diversion Channel & Structure	\$ 150,000
Phase Ic: Cholla Road Storm Sewer	\$ 180,000
Total Phase I =	\$ 925,000

ALTERNATE 2A

Phase II: Detention Site 1 and Inlet / Outfall Structures

Description	Units		\$/Unit	Total
ROW Acquisition	3 Acres		\$130,000	\$ 390,000
Drainage Excavation (4' Deep)	19,360 C.Y.		\$ 3	\$ 58,080
Topsoil	3 Acres		\$ 5,000	\$ 15,000
Seeding	3 Acres		\$ 2,000	\$ 6,000
Trees	25 Each		\$ 250	\$ 6,250
30" RCP	148 Feet		\$ 60	\$ 8,880
Inlet/Outlet Structures	3 Each		\$ 6,000	\$ 18,000
Fencing	1,440 L.F.		\$ 100	\$ 144,000
15% Engin. & Conting.				\$ 96,932
			Phase II =	\$ 743,142

Phase III: Desert Cove Storm Drain

18" Connector Pipes	240 L.F.		\$ 34	\$ 8,160
48" RCP	850 L.F.		\$ 96	\$ 81,600
60" RCP	1,550 L.F.		\$ 122	\$ 189,100
Manhole	4 Each		\$ 2,500	\$ 10,000
Outlet Structure	1 Each		\$ 5,000	\$ 5,000
Catch Basins	5 Each		\$ 2,500	\$ 12,500
Sedimentation Structure	1 Each		\$ 10,000	\$ 10,000
Pavement Replacement	1,719 S.Y.		\$ 36	\$ 61,884
15% Engin. & Conting.				\$ 56,737
			Phase III=	\$ 434,981

Grand Total

Phase I: Cactus Storm Sewer & Special Catch Basins	\$ 925,000
Phase II: Detention Site 1 & Outfall Structures	\$ 743,000
Phase III: Desert Cove Storm Drain	\$ 435,000

Grand Total = \$2,103,000

B. Alternate 2B

Phase Ia: Cactus Storm Sewer & Special Catch Basins
 Phase Ib: Pima Road Diversion Channel & Structure
 Phase Ic: Cholla Road & 84th Street Storm Sewer

Phase Ia: Cactus Road Storm Sewer & Special Catch Basins

Description	Units		\$/Unit	Total
18" RCP Connector Pipes	420	L.F.	\$ 34	\$ 14,280
39" RCP Storm Drain	256	L.F.	\$ 76	\$ 19,456
51" RCP Storm Drain	1,099	L.F.	\$ 103	\$ 113,197
60" RCP Storm Drain	1,374	L.F.	\$ 122	\$ 167,628
Manhole	7	Each	\$ 2,500	\$ 17,500
Outlet Structure (39")	1	Each	\$ 8,000	\$ 8,000
Outlet Structure (60")	1	Each	\$ 12,000	\$ 12,000
Pavement Replacement	2,979	S.Y.	\$ 36	\$ 107,244
Catch Basin	12	Each	\$ 2,500	\$ 30,000
Special Catch Basins	2	Each	\$ 5,000	\$ 10,000
Misc. Removals	1	L.S.	\$ 5,000	\$ 5,000
Pipe Supports	3	Each	\$ 1,000	\$ 3,000
ROW Acquisition				\$ 10,000
15% Engin. & Conting.				\$ 77,596
				<u>\$ 594,901</u>

Phase Ia=

Phase Ib: Pima Road Diversion Channel & Structure

Channel Improvements	1	L.S.	\$100,000	\$ 100,000
Structure	1	L.S.	\$ 30,435	\$ 30,435
15% Engin. & Conting.				\$ 19,565
				<u>\$ 150,000</u>

Phase Ib=

Phase Ic: Cholla Road & 84th Street Storm Sewer

18" Connector Pipes	480	L.F.	\$ 34	\$ 16,320
24" RCP Storm Drain	400	L.F.	\$ 46	\$ 18,400
30" RCP Connector Pipes	48	L.F.	\$ 60	\$ 2,880
36" RCP Storm Drain	1,100	L.F.	\$ 70	\$ 77,000
48" RCP Storm Drain	1,300	L.F.	\$ 96	\$ 124,800
54" RCP Storm Drain	750	L.F.	\$ 109	\$ 81,750
Manhole	6	Each	\$ 2,500	\$ 15,000
Catch Basins	10	Each	\$ 2,500	\$ 25,000
Special Catch Basins	2	Each	\$ 5,000	\$ 10,000
Pipe Supports	2	Each	\$ 1,000	\$ 2,000
Misc. Removals	1	L.S.	\$ 3,000	\$ 3,000
15% Engin. & Conting.				\$ 56,423
				<u>\$ 432,573</u>

Phase Ic=

Summary:

Phase Ia: Cactus Storm Sewer & Special Catch Basins	\$ 595,000
Phase Ib: Pima Road Diversion Channel & Structure	\$ 150,000
Phase Ic: Cholla Road & 84th Street Storm Sewer	\$ 433,000
Total Phase I =	\$1,178,000

Alternate 2B

Phase II: Detention Site 2 & Inlet / Outlet Structures

ROW Acquisition	4	Acres	\$240,000	\$ 960,000
Drainage Excavation (4' Deep)	25,800	C.Y.	\$ 3	\$ 77,400
Topsoil	4	Acres	\$ 5,000	\$ 20,000
Seeding	4	Acres	\$ 2,000	\$ 8,000
Trees	30	Each	\$ 250	\$ 7,500
Inlet/Outlet Structure	2	Each	\$ 6,000	\$ 12,000
Fencing	1,670	L.F.	\$ 100	\$ 167,000
15% Engin. & Conting.				\$ 187,740
			Phase II =	<u>\$1,439,640</u>

Phase III: Desert Cove Storm Drain

18" Connector Pipes	100	L.F.	\$ 34	\$ 3,400
48" RCP Storm Drain	1,700	L.F.	\$ 96	\$ 163,200
Manhole	3	Each	\$ 2,500	\$ 7,500
Pavement Replacement	800	S.Y.	\$ 36	\$ 28,800
Catch Basins	2	Each	\$ 5,000	\$ 10,000
Outlet Structure	1	Each	\$ 5,000	\$ 5,000
Sedimentation Structure	1	Each	\$ 10,000	\$ 10,000
15% Engin. & Conting.				\$ 34,185
			Phase III=	<u>\$ 262,085</u>

Grand Total

Phase I: Cholla Storm Drain with Detention Basin	\$1,178,000
Phase II: Cactus Storm Drain	\$1,440,000
Phase III: Desert Cove Storm Drain	<u>\$ 262,000</u>
Grand Total	\$2,880,000

C. ALTERNATE 3A

Phase Ia: Cactus Storm Sewer & Detention Basin Site 1
 Phase Ib: Pima Road Diversion Channel & Structure
 Phase Ic: Cholla Road Storm Sewer

Phase Ia: Cactus Road Storm Drain and Detention Basin Site 1

Description	Units		\$/Unit	Total
18" Connector Pipes	960 L.F.		\$ 34	\$ 32,640
51" RCP	1,099 L.F.		\$ 103	\$ 113,197
60" RCP	2,655 L.F.		\$ 122	\$ 323,910
Manhole	5 Each		\$ 2,500	\$ 12,500
Catch Basins	18 Each		\$ 2,500	\$ 45,000
Pavement Replacement	5,091 S.Y.		\$ 36	\$ 183,276
Miscellaneous Removals	1 L.S.		\$ 5,000	\$ 5,000
Pipe Supports	3 Each		\$ 1,000	\$ 3,000
ROW Acquisition	6 Acres		\$130,000	\$ 780,000
Drainage Excavation (4' Deep)	38,720 C.Y.		\$ 3	\$ 116,160
Topsoil	6 Acres		\$ 5,000	\$ 30,000
Seeding	6 Acres		\$ 2,000	\$ 12,000
Trees	40 Each		\$ 250	\$ 10,000
30" Outlet Pipe	148 Feet		\$ 34	\$ 5,032
Inlet/Outlet Structures	4 Each		\$ 6,000	\$ 24,000
Fencing	2,120 L.F.		\$ 100	\$ 212,000
15% Engin. & Conting.				\$ 286,157
Phase Ia =				\$2,193,872

Phase Ib: Pima Road Diversion Channel & Structure

Channel Improvements	1 L.S.		\$100,000	\$ 100,000
Structure	1 L.S.		\$ 30,435	\$ 30,435
15% Engin. & Conting.				\$ 19,565
Phase Ib=				\$ 150,000

Phase Ic: Cholla Road Storm Sewer

18" RCP Connector Pipes	160 L.F.		\$ 34	\$ 5,440
30" RCO Connector Pipes	48 L.F.		\$ 60	\$ 2,880
48" RCP Storm Drain	1200 L.F.		\$ 96	\$ 115,200
Manholes	3 Each		\$ 2,500	\$ 7,500
Catch Basins	6 Each		\$ 2,500	\$ 15,000
Special Catch Basins	2 Each		\$ 5,000	\$ 10,000
15% Engin. & Conting.				\$ 23,403
Phase Ic =				\$ 179,423

Summary

Phase Ia: Cactus Storm Sewer & Detention Basin Site 1	\$2,194,000
Phase Ib: Pima Road Diversion Channel & Structure	\$ 150,000
Phase Ic: Cholla Road Storm Sewer	\$ 180,000
Total Phase I =	\$2,524,000

ALTERNATE 3A

Phase II: In order to be functional, Detention Site 1 is included in Phase 1a for this Alternate 3A. The cost estimate is itemized under Phase 1a.

Construction Cost	\$1,189,192
15% Engin. & Conting.	\$ 178,379
Phase II =	<u>\$1,367,571</u>

Phase III:

18" Connector Pipes	240	L.F.	\$	34	\$	8,160
48" RCP	850	Feet	\$	96	\$	81,600
60" RCP	1,550	Feet	\$	122	\$	189,100
Manhole	4	Each	\$	2,500	\$	10,000
Catch Basins	5	Each	\$	2,500	\$	12,500
Sedimentation Structure	1	Each	\$	10,000	\$	10,000
Outlet Structure	1	Each	\$	5,000	\$	5,000
Pavement Replacement	1,719	S.Y.	\$	36	\$	61,884
15% Engin. & Conting.					\$	<u>56,737</u>
				Phase III=	\$	<u>434,981</u>

Grand Total

Phase I: Cholla Storm Drain & Detention Basin	\$2,524,000
Phase II: Included with Phase Ia	\$ -0-
Phase III: Desert Cove Storm Drain	\$ 435,000
Grand Total	<u>\$2,959,000</u>

D. ALTERNATE 9

Phase Ia: Cactus Storm Sewer & Special Catch Basins
 Phase Ib: Pima Road Diversion Channel & Structure
 Phase Ic: Cholla Road Storm Sewer

Phase Ia: Cactus Road Storm Sewer & Special Catch Basins

Description	Units		\$/Unit	Total
18" RCP Connector Pipes	420	L.F.	\$ 34	\$ 14,280
39" RCP Storm Drain	256	L.F.	\$ 76	\$ 19,456
51" RCP Storm Drain	1,099	L.F.	\$ 103	\$ 113,197
60" RCP Storm Drain	1,374	L.F.	\$ 122	\$ 167,628
Manhole	7	Each	\$ 2,500	\$ 17,500
Outlet Structure (39")	1	Each	\$ 8,000	\$ 8,000
Outlet Structure (60")	1	Each	\$ 12,000	\$ 12,000
Pavement Replacement	2,979	S.Y.	\$ 36	\$ 107,244
Catch Basin	12	Each	\$ 2,500	\$ 30,000
Special Catch Basins	2	Each	\$ 5,000	\$ 10,000
Misc. Removals	1	L.S.	\$ 5,000	\$ 5,000
Pipe Supports	3	Each	\$ 1,000	\$ 3,000
ROW Acquisition				\$ 10,000
15% Engin. & Conting.				\$ 77,596
			Phase Ia =	\$ 594,901

Phase Ib: Pima Road Diversion Channel & Structure

Channel Improvements	1	L.S.	\$100,000	\$ 100,000
Structure	1	L.S.	\$ 30,435	\$ 30,435
15% Engin. & Conting.				\$ 19,565
			Phase Ib =	\$ 150,000

Phase Ic: Cholla Road Storm Sewer including 24-inch Outfall from Detention Site 1 to Lake 2

18" RCP Connector Pipes	160	L.F.	\$ 34	\$ 5,440
24" RCP Connector Pipes	1300	L.F.	\$ 46	\$ 59,800
30" RCP Connector Pipes	48	L.F.	\$ 60	\$ 2,880
48" RCP Storm Drain	1200	L.F.	\$ 96	\$ 115,200
Manholes	3	Each	\$ 2,500	\$ 7,500
Catch Basins	6	Each	\$ 2,500	\$ 15,000
Special Catch Basins	2	Each	\$ 5,000	\$ 10,000
Outlet Structure	1	Each	\$ 8,000	\$ 8,000
15% Engin. & Conting.				\$ 32,373
			Phase Ic =	\$ 248,193

Summary

Phase Ia: Cactus Storm Sewer & Special Catch Basins	\$ 595,000
Phase Ib: Pima Road Diversion Channel & Structure	\$ 150,000
Phase Ic: Cholla Road Storm Sewer	\$ 248,000
Total Phase I =	\$ 993,000

ALTERNATE 9

Phase II: Detention Site 1 and Outlet / Inlet Structures

Description	Units	\$/Unit	Total
ROW Acquisition	10 Acres	\$130,000	\$1,300,000
Drainage Excavation (4' Deep)	64,530 C.Y.	\$ 3	\$ 193,590
Topsoil	10 Acres	\$ 5,000	\$ 50,000
Seeding	10 Acres	\$ 2,000	\$ 20,000
Trees	80 Each	\$ 250	\$ 20,000
30" Outlet Pipe	148 Feet	\$ 60	\$ 8,880
Inlet/Outlet Structures	4 Each	\$ 6,000	\$ 24,000
T-bird Channel Connect.	1 L.S.	\$ 30,000	\$ 30,000
Demolition	1 L.S.	\$ 7,000	\$ 7,000
15% Engin. & Conting.			\$ 248,021
Phase II =			<u>\$1,901,491</u>

Phase III: Desert Cove Storm Drain

18" Connector Pipes	240 L.F.	\$ 34	\$ 8,160
48" RCP	850 L.F.	\$ 96	\$ 81,600
60" RCP	1,550 L.F.	\$ 122	\$ 189,100
Manhole	4 Each	\$ 2,500	\$ 10,000
Outlet Structure	1 Each	\$ 5,000	\$ 5,000
Catch Basins	5 Each	\$ 2,500	\$ 12,500
Sedimentation Structure	1 Each	\$ 10,000	\$ 10,000
Pavement Replacement	1,719 S.Y.	\$ 36	\$ 61,884
15% Engin. & Conting.			\$ 56,737
Phase III=			<u>\$ 434,981</u>

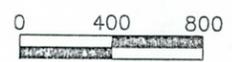
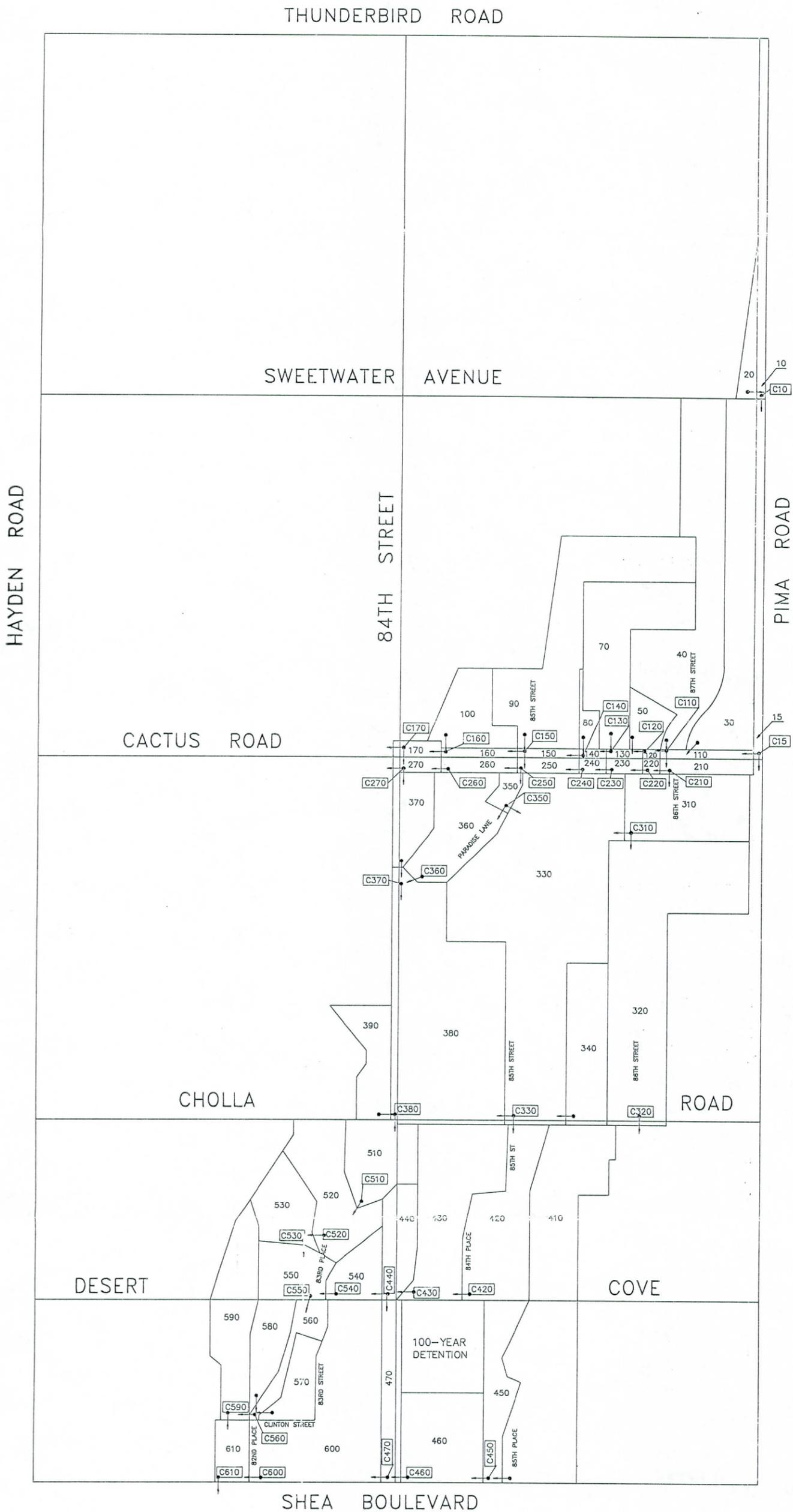
Grand Total

Phase I: Cactus Storm Sewer & Special Catch Basins	\$ 993,000
Phase II: Detention Site & Outlet/Inlet Structures	\$1,902,000
Phase III: Desert Cove Storm Drain	\$ 435,000
Total	<u>\$3,330,000</u>

Phase 1b is not required for this Alternate 9 (\$ 150,000)

Grand Total \$3,180,000





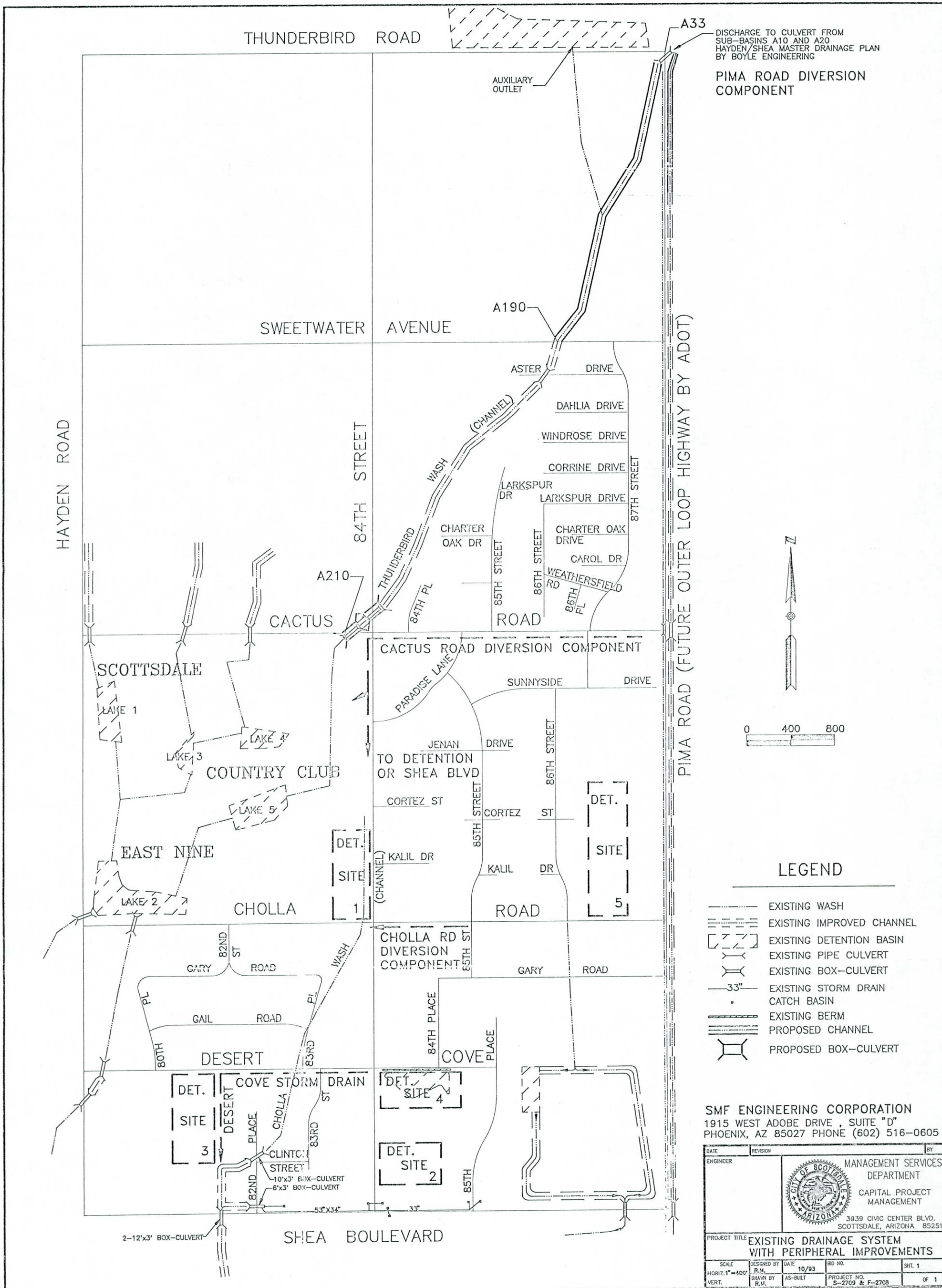
LEGEND

- 380 SUB-BASIN NUMBER
- ← C380 CONCENTRATION POINT WITH DIRECTION OF FLOW
- ↘ DIVERTED FLOW

SMF ENGINEERING CORPORATION
 1915 WEST ADOBE DRIVE, SUITE "D"
 PHOENIX, AZ 85027 PHONE (602) 516-0605

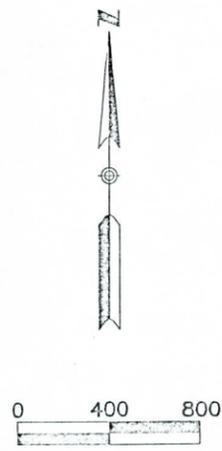
DATE	REVISION	BY
ENGINEER		
		MANAGEMENT SERVICES DEPARTMENT
		CAPITAL PROJECT MANAGEMENT
3939 CIVIC CENTER BLVD. SCOTTSDALE, ARIZONA 85251		
PROJECT TITLE		
DRAINAGE AREA MAP		
SCALE	DESIGNED BY	DATE
HORIZ. 1"=400'	R.M.	10/93
VERT.	DRAWN BY	AS-BUILT
	R.M.	S-2709 & F-2708
BID NO.	SHT. 1	
	OF 1	





DISCHARGE TO CULVERT FROM SUB-BASINS A10 AND A20 HAYDEN/SHEA MASTER DRAINAGE PLAN BY BOYLE ENGINEERING

PIMA ROAD DIVERSION COMPONENT



- LEGEND**
- EXISTING WASH
 - EXISTING IMPROVED CHANNEL
 - EXISTING DETENTION BASIN
 - EXISTING PIPE CULVERT
 - EXISTING BOX-CULVERT
 - EXISTING STORM DRAIN CATCH BASIN
 - EXISTING BERM
 - PROPOSED CHANNEL
 - PROPOSED BOX-CULVERT

SMF ENGINEERING CORPORATION
 1915 WEST ADOBE DRIVE, SUITE "D"
 PHOENIX, AZ 85027 PHONE (602) 516-0605

DATE	REVISION	BY
ENGINEER	MANAGEMENT SERVICES DEPARTMENT CAPITAL PROJECT MANAGEMENT 3939 CIVIC CENTER BLVD. SCOTTSDALE, ARIZONA 85251	
PROJECT TITLE: EXISTING DRAINAGE SYSTEM WITH PERIPHERAL IMPROVEMENTS		
SCALE: HORIZ. 1"=400'	DESIGNED BY: R.M.	DATE: 10/93
VERT.:	DRAWN BY: R.M.	AS-BUILT
PROJECT NO. S-2709 & F-2708		SHT. 1 OF 1



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*****
HEC-2 WATER SURFACE PROFILES *
*
* Version 4.6.2; May 1991 *
*
* RUN DATE 06OCT93 TIME 14:59:00 *
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*****
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616-4687 *
* (916) 756-1104 *
*****
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X X XXXXXXX XXXXX XXXXX
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THIS RUN EXECUTED 06OCT93 14:59:00

HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

T1 SHEA BOULEVARD AND 82ND STREET DRAINAGE IMPROVEMENTS
T2 EXISTING CHANNEL - NO IMPROVEMENTS
-T2 FILE CHALLEX.DAT
T3 100-YEAR STORM

J1 ICHECK INQ NINV IDIR STRT METRIC HVINS Q WSEL FQ
0 7 0 0 .01 0 0.3 0 1354.5 0

J2 NPROF IPLOT PRFVS XSECV XSECH FN ALLDC IBW CHNIM ITRACE
1 0 -1

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38 43 13 14 15 42 53 54 8 1
2 17

J5 LPRNT NUMSEC *****REQUESTED SECTION NUMBERS*****
-10 -10

NC 0.030 0.030 0.020 0.1 0.3
QT 6 96 209 283 408 526 655
X1 1.00 22 9968.4 10024.6
GR 1358.7 9915.3 1358.9 9937.4 1358.9 9960.3 1356.0 9963.1 1356.0 9968.4
GR 1354.5 9978.4 1353.4 9983.7 1352.3 9987.0 1352.2 9993.1 1351.4 9997.6
GR 1351.8 10000.0 1353.4 10006.8 1354.4 10014.1 1355.6 10020.5 1355.9 10024.6
GR 1356.0 10032.5 1355.9 10042.0 1355.5 10051.7 1355.0 10060.0 1354.8 10069.1
GR 1354.4 10073.8 1354.4 10100.9 0.0 0.0 0.0 0.0 0.0 0.0

X1 2.00 22 9972.9 10023.2 57 57 57
GR 1358.5 9900.4 1358.7 9919.3 1358.5 9941.0 1358.2 9964.1 1356.8 9965.6
GR 1355.9 9972.9 1355.7 9979.4 1353.4 9989.9 1352.6 9994.5 1351.8 9998.7
GR 1352.1 10000.0 1353.1 10005.5 1353.8 10011.7 1355.3 10019.1 1355.9 10023.2
GR 1356.2 10030.8 1356.7 10043.9 1356.4 10057.6 1356.4 10066.8 1356.5 10078.3
GR 1356.7 10084.6 1356.8 10100.6 0.0 0.0 0.0 0.0 0.0 0.0

NC 0.3 0.5
X1 4.00 20 9994.0 10006.0 56 56 56
X3 10 1356.7 1356.7
GR 1357.3 9901.3 1357.5 9918.9 1357.1 9951.5 1357.7 9952.0 1357.7 9960.0
GR 1357.4 9968.3 1356.9 9978.3 1356.5 9980.0 1355.5 9986.8 1351.6 9994.0
GR 1351.6 10000.0 1351.6 10006.0 1355.5 10014.6 1356.5 10020.9 1356.5 10021.0

GR	1357.0	10031.2	1357.0	10043.6	1356.8	10052.8	1357.0	10078.3	1357.0	10102.9
S	1.012	0.5	3.0	0	3	12	80	8.3	1352.3	1351.6
X1	5.00	19	9994.0	10006.0	75	85	80			
X2	0	0	2							
X3	10							1357.7	1357.7	
BT	3	9900	1357.8		10000	1357.8		10100	1357.7	
GR	1357.0	9900.4	1356.6	9923.4	1356.8	9941.0	1356.5	9958.8	1356.5	9973.3
GR	1355.9	9983.7	1354.6	9991.1	1352.3	9994.0	1352.3	9999.6	1352.3	10000.0
GR	1352.3	10006.0	1356.3	10007.1	1357.1	10012.6	1357.2	10022.0	1357.1	10033.9
GR	1356.6	10035.5	1356.7	10058.0	1356.5	10085.2	1356.3	10101.5	0.0	0.0
NC				0.1	0.3					
X1	6.00	22	9972.4	10017.5	9	14	17			
GR	1356.8	9901.7	1356.8	9917.1	1356.6	9941.7	1356.5	9962.6	1356.3	9972.4
GR	1355.6	9979.0	1354.3	9986.4	1353.2	9990.2	1352.9	9993.7	1352.8	9996.9
GR	1352.8	10000.0	1353.0	10006.5	1353.8	10009.7	1356.3	10014.6	1357.0	10017.5
GR	1357.0	10023.9	1357.0	10035.8	1356.9	10048.7	1356.5	10050.1	1356.6	10065.2
GR	1356.3	10088.8	1356.2	10099.8	0.0	0.0	0.0	0.0	0.0	0.0
X1	7.00	23	9968.8	10027.9	26	31	28			
GR	1358.1	9900.7	1358.1	9902.1	1357.1	9910.8	1356.6	9921.1	1356.3	9941.0
GR	1356.4	9957.9	1356.2	9968.8	1355.8	9975.1	1354.8	9983.3	1353.4	9992.3
GR	1353.3	9996.9	1353.3	10000.0	1353.5	10005.9	1353.9	10011.4	1354.6	10016.8
GR	1355.8	10022.7	1356.3	10027.9	1356.5	10034.0	1356.6	10047.8	1356.1	10060.6
GR	1356.2	10073.8	1356.2	10089.2	1356.3	10101.5	0.0	0.0	0.0	0.0
X	8.00	22	9967.5	10026.0	33	55	45			
GR	1357.8	9901.2	1358.0	9908.8	1357.7	9918.5	1357.0	9932.2	1356.7	9944.9
GR	1356.4	9958.7	1356.3	9967.5	1355.6	9977.0	1354.5	9985.8	1353.9	9991.2
GR	1353.7	9998.5	1353.8	10000.0	1354.0	10006.2	1354.2	10011.8	1355.2	10020.2
GR	1356.0	10026.0	1356.1	10032.8	1356.2	10042.5	1356.2	10056.7	1356.4	10073.0
GR	1356.3	10090.7	1356.3	10100.6	0.0	0.0	0.0	0.0	0.0	0.0
X1	9.00	20	9953.9	10032.2	48	51	49			
GR	1359.0	9900.8	1358.3	9943.5	1358.3	9953.9	1356.4	9974.9	1355.6	9981.2
GR	1354.3	9986.7	1354.0	9991.8	1354.0	9999.2	1354.0	10000.0	1354.0	10006.2
GR	1354.4	10012.1	1355.1	10019.4	1355.6	10026.2	1356.3	10032.2	1356.2	10039.1
GR	1356.5	10046.2	1356.3	10055.8	1356.3	10073.1	1355.9	10095.7	1355.8	10100.4
X1	10.00	17	9901.2	10031.2	51	49	50			
GR	1358.7	9851.1	1358.8	9901.2	1355.7	9976.5	1354.4	9986.5	1354.1	9992.1
GR	1354.0	9997.2	1354.1	10000.0	1354.4	10005.4	1354.9	10013.4	1355.7	10019.1
GR	1356.2	10024.9	1356.5	10031.2	1356.8	10040.2	1356.6	10043.4	1356.4	10051.8
GR	1355.9	10094.6	1356.0	10100.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	11.00	20	9961.3	10033.9	51	49	50			
GR	1357.8	9906.2	1357.7	9937.7	1358.0	9941.1	1357.9	9950.1	1357.8	9961.3
GR	1357.3	9969.3	1355.2	9983.7	1354.7	9990.1	1354.4	9996.0	1354.3	10000.0
GR	1354.6	10005.0	1354.9	10012.9	1355.5	10020.3	1356.2	10026.9	1356.6	10033.9
GR	1356.5	10043.6	1356.2	10055.0	1356.0	10074.2	1356.0	10087.8	1356.0	10106.0

X1	12.00	23	9951.3	10036.2	50	50	50			
GR	1358.0	9900.4	1357.9	9912.6	1357.8	9928.4	1357.2	9938.9	1357.1	9951.3
GR	1355.6	9973.5	1355.1	9980.4	1355.3	9985.5	1355.1	9989.1	1354.5	9993.7
GR	1354.2	9997.2	1354.2	9998.4	1354.3	10000.0	1355.0	10004.9	1355.6	10011.3
GR	1356.1	10017.8	1356.3	10025.7	1356.6	10036.2	1356.4	10049.2	1356.0	10060.7
GR	1356.0	10076.4	1356.0	10097.6	1356.1	10100.2	0.0	0.0	0.0	0.0
X1	13.00	19	9927.3	10034.4	51	49	50			
GR	1357.3	9900.7	1357.3	9912.8	1357.3	9927.3	1356.8	9943.7	1356.2	9960.4
GR	1355.7	9971.4	1355.4	9980.7	1355.5	9988.6	1355.0	9993.1	1354.8	9998.2
GR	1354.9	10000.0	1355.3	10005.7	1356.0	10013.4	1356.3	10023.0	1356.5	10034.4
GR	1356.4	10048.1	1356.4	10065.4	1356.4	10079.8	1356.2	10101.5	0.0	0.0
X1	14.00	23	9908.6	10043.3	51	49	50			
GR	1360.0	9906.0	1360.0	9908.6	1359.1	9919.6	1358.6	9930.8	1357.9	9945.3
GR	1357.7	9958.0	1357.3	9968.5	1356.2	9977.7	1355.3	9986.8	1354.4	9995.2
GR	1353.9	9997.5	1354.1	9999.4	1354.1	10000.0	1354.3	10004.0	1354.7	10007.2
GR	1355.7	10014.4	1356.2	10022.1	1356.6	10033.6	1357.2	10043.3	1357.0	10061.5
GR	1356.7	10078.5	1356.5	10098.0	1356.4	10106.8	0.0	0.0	0.0	0.0
X1	15.00	27	9947.5	10043.8	50	24	37			
GR	1359.9	9912.7	1359.9	9935.2	1359.5	9947.5	1358.8	9959.7	1358.1	9970.9
GR	1357.4	9978.1	1355.6	9982.1	1354.5	9985.2	1354.5	9987.1	1355.0	9989.5
GR	1354.9	9992.9	1354.5	9997.4	1354.3	10000.0	1354.0	10002.3	1354.3	10005.4
GR	1354.4	10008.2	1354.8	10011.6	1355.9	10019.3	1356.6	10023.4	1356.8	10033.3
GR	1357.0	10043.8	1357.3	10054.4	1356.9	10065.2	1356.7	10073.8	1356.8	10091.1
GR	1356.5	10110.5	1356.5	10112.3	0.0	0.0	0.0	0.0	0.0	0.0
NC				0.3	0.5					
X1	16.00	14	9988.0	10012.0	41	6	25			
X3	10							1358.7	1358.7	
GR	1359.9	9901.0	1359.8	9957.2	1359.3	9985.3	1354.6	9988.0	1354.3	9996.9
GR	1354.3	10000.0	1354.3	10004.6	1354.3	10012.0	1359.3	10012.0	1359.4	10017.7
GR	1359.6	10026.4	1359.5	10033.6	1359.5	10086.5	1359.4	10101.0	0.0	0.0
SC	2.012	0.4	3.0	0	3	12	111	8.3	1354.5	1354.3
X1	17.00	18	9988.0	10012.0	111	106	111			
X2	0	0	2							
X3	10							1359.7	1359.7	
BT	4	9955.5	1359.7		9969.5	1359.7		10000	1359.8	
BT	10100	1359.9								
GR	1359.8	9947.0	1359.8	9955.5	1359.1	9969.5	1356.5	9978.6	1355.7	9985.4
GR	1354.7	9985.5	1354.5	9988.0	1354.5	9996.8	1354.5	10000.0	1354.5	10010.0
GR	1354.5	10012.0	1358.0	10013.4	1358.5	10025.4	1359.0	10038.3	1358.9	10054.4
GR	1358.7	10071.4	1358.5	10089.0	1359.9	10100	0.0	0.0	0.0	0.0
NC				0.1	0.3					
QT	6	61	129	176	254	323	401			
X1	18.00	17	9989.6	10008.8	25	44	28			
GR	1358.7	9901.0	1358.6	9920.1	1358.5	9950.0	1358.5	9971.5	1358.5	9989.6
GR	1355.3	9994.4	1354.9	9996.6	1354.9	10000.0	1354.9	10002.9	1358.3	10008.8
GR	1358.1	10017.1	1358.0	10035.8	1357.8	10051.1	1357.6	10066.6	1357.5	10077.9
GR	1357.7	10088.7	1357.6	10101.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	19.00	21	9989.0	10008.7	37	37	37				
GR	1359.0	9901.0	1358.8	9912.6	1358.6	9931.2	1358.6	9952.4	1358.6	9972.0	
GR	1358.5	9989.0	1355.3	9994.0	1355.0	9995.0	1355.0	9998.6	1355.0	10000.0	
GR	1355.0	10002.7	1358.6	10008.7	1358.6	10010.1	1358.3	10014.3	1358.1	10028.1	
GR	1358.0	10047.1	1357.9	10062.1	1357.6	10070.0	1358.0	10077.7	1358.1	10087.3	
GR	1358.0	10100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
X1	20.00	22	9938.9	10008.2	39	39	39				
GR	1359.7	9900.0	1359.9	9908.4	1359.9	9938.9	1359.1	9940.1	1358.8	9954.9	
GR	1358.8	9969.0	1358.8	9983.3	1358.6	9988.9	1355.1	9994.6	1355.1	9998.3	
GR	1355.1	10000.0	1355.2	10002.9	1358.6	10008.2	1358.4	10015.3	1358.5	10025.3	
GR	1358.4	10046.4	1358.3	10060.4	1358.0	10068.3	1357.8	10076.1	1357.9	10082.1	
GR	1358.3	10094.7	1358.3	10101.0	0.0	0.0	0.0	0.0	0.0	0.0	
X1	21.00	25	9989.2	10008.8	56	56	56				
GR	1359.5	9901.0	1359.3	9909.9	1359.2	9926.4	1359.1	9955.3	1359.3	9971.0	
GR	1359.1	9982.5	1359.0	9987.9	1358.8	9989.2	1355.1	9995.3	1355.1	9998.4	
GR	1355.2	10000.0	1355.4	10003.2	1358.8	10008.8	1358.6	10013.6	1358.4	10021.5	
GR	1358.5	10033.3	1358.7	10047.3	1358.7	10067.0	1358.4	10075.5	1358.1	10081.3	
GR	1357.8	10083.3	1358.5	10086.9	1358.1	10090.3	1358.6	10093.8	1358.7	10101.0	
X1	22.00	26	9988.6	10008.2	58	58	58				
GR	1359.4	9901.0	1359.2	9918.3	1359.1	9934.3	1359.2	9948.6	1359.4	9963.0	
GR	1359.4	9974.0	1359.1	9982.6	1359.0	9988.6	1355.3	9994.3	1355.3	9998.0	
GR	1355.4	10000.0	1355.3	10002.1	1359.1	10008.2	1359.1	10013.4	1359.2	10020.6	
GR	1359.0	10027.7	1359.0	10038.0	1359.1	10049.3	1359.0	10058.2	1358.5	10065.5	
GR	1358.3	10068.1	1358.3	10073.5	1359.1	10079.5	1359.1	10085.7	1359.0	10096.7	
GR	1358.7	10100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
X1	23.00	25	9989.3	10009.0	53	53	53				
GR	1361.8	9919.3	1361.7	9945.2	1359.7	9949.1	1359.3	9961.0	1359.6	9970.0	
GR	1360.6	9975.2	1359.7	9979.1	1359.4	9984.7	1359.1	9989.3	1355.5	9994.8	
GR	1355.6	9998.6	1355.6	10000.0	1355.7	10002.9	1359.2	10009.0	1359.2	10015.6	
GR	1359.5	10026.6	1359.5	10032.6	1359.2	10040.4	1359.1	10046.9	1358.8	10049.8	
GR	1359.3	10055.9	1359.2	10067.7	1359.4	10080.2	1359.5	10092.4	1359.3	10101.0	
X1	24.00	23	9989.1	10008.8	41	41	41				
GR	1360.9	9928.9	1360.2	9940.1	1360.1	9943.8	1359.9	9958.8	1359.9	9972.9	
GR	1360.0	9979.3	1359.8	9984.9	1359.5	9987.4	1359.3	9989.1	1355.8	9994.6	
GR	1355.7	9998.3	1355.6	10000.0	1355.6	10002.3	1359.6	10008.8	1359.7	10015.6	
GR	1360.1	10023.7	1360.1	10030.2	1359.7	10041.1	1359.7	10050.4	1359.8	10062.3	
GR	1359.7	10078.7	1359.7	10097.7	1359.7	10101.0	0.0	0.0	0.0	0.0	
X1	25.00	18	9988.3	10008.8	90	1	51				
GR	1360.2	9951.1	1360.1	9960.2	1359.9	9975.6	1359.7	9984.7	1359.7	9988.3	
GR	1355.8	9994.1	1355.8	9997.5	1355.7	10000.0	1355.7	10001.3	1360.5	10008.8	
GR	1360.3	10015.3	1360.6	10025.6	1360.7	10039.4	1360.4	10056.0	1360.4	10071.7	
GR	1360.7	10087.0	1361.0	10099.7	1360.9	10100.1	0.0	0.0	0.0	0.0	

X1	26.00	23	9987.4	10006.8	100	1	50			
GR	1360.1	9950.0	1360.4	9957.4	1360.3	9963.6	1360.3	9969.1	1360.4	9975.7
GR	1360.0	9983.9	1359.8	9986.0	1359.8	9987.4	1356.1	9993.8	1356.1	9996.9
GR	1356.2	10000.0	1356.3	10001.1	1359.9	10006.8	1359.8	10008.5	1360.0	10014.6
GR	1360.5	10020.9	1360.4	10030.0	1360.4	10043.8	1360.5	10060.9	1360.8	10073.9
GR	1361.1	10088.4	1361.3	10097.3	1361.3	10099.0	0.0	0.0	0.0	0.0
X1	27.00	21	9982.8	10007.4	55	55	55			
GR	1361.7	9955.6	1361.1	9969.3	1361.0	9978.8	1360.8	9982.8	1360.1	9986.9
GR	1360.1	9988.3	1356.4	9994.5	1356.4	9997.5	1356.4	10000.0	1356.4	10001.7
GR	1360.1	10007.4	1360.1	10008.6	1360.3	10014.0	1360.6	10025.6	1360.7	10036.4
GR	1360.8	10049.6	1360.6	10057.7	1360.8	10067.1	1361.4	10078.8	1361.8	10088.3
GR	1361.8	10099.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	28.00	28	9987.0	10009.9	26	55	44			
GR	1359.7	9901.0	1360.3	9916.2	1360.4	9932.7	1360.7	9942.0	1361.2	9951.5
GR	1361.6	9958.6	1361.6	9966.5	1361.3	9973.1	1361.3	9978.9	1361.2	9981.5
GR	1360.4	9985.7	1360.4	9987.0	1356.3	9993.6	1356.3	9997.2	1356.5	10000.0
GR	1356.4	10003.6	1360.3	10009.9	1360.3	10011.6	1360.7	10015.0	1361.0	10023.1
GR	1360.9	10030.9	1361.0	10042.2	1360.6	10051.6	1360.5	10058.6	1360.7	10066.3
GR	1360.9	10074.5	1361.0	10084.4	1361.9	10100.9	0.0	0.0	0.0	0.0
X1	29.00	33	9988.3	10007.9	28	55	43			
GR	1360.9	9899.3	1361.3	9911.7	1361.4	9925.6	1361.4	9936.5	1361.2	9944.5
GR	1361.1	9953.1	1361.3	9961.9	1361.4	9969.4	1361.2	9974.1	1360.6	9978.2
GR	1360.3	9987.0	1360.4	9988.3	1356.8	9993.0	1356.8	9997.0	1356.6	10000.0
GR	1356.7	10001.5	1360.4	10007.9	1360.5	10009.9	1361.0	10012.8	1361.4	10016.5
GR	1361.3	10022.1	1361.2	10028.3	1361.3	10034.3	1361.0	10037.6	1360.8	10039.0
GR	1361.0	10044.2	1361.0	10052.1	1361.0	10059.6	1361.1	10068.4	1361.2	10073.8
GR	1361.4	10083.7	1361.4	10086.9	1361.4	10098.8	0.0	0.0	0.0	0.0
NC				0.3	0.5					
X1	31.00	30	9994.0	10006.0	4	4	4			
X3	10							1360.8	1360.8	
GR	1360.9	9900.1	1361.0	9908.5	1360.8	9916.0	1360.9	9924.1	1361.2	9928.5
GR	1361.5	9936.2	1361.2	9949.0	1361.1	9962.9	1361.2	9974.1	1360.9	9981.9
GR	1360.9	9984.8	1361.2	9991.5	1356.7	9994.0	1356.7	10000.0	1356.7	10004.2
GR	1356.7	10006.0	1360.5	10011.0	1360.5	10016.0	1360.5	10020.1	1361.1	10023.5
GR	1360.7	10028.8	1361.2	10033.9	1361.1	10039.8	1361.1	10048.2	1361.0	10058.0
GR	1361.0	10069.4	1361.4	10078.6	1361.5	10087.5	1361.7	10092.8	1361.7	10099.0
SC	1.012	0.4	3.0	0	3	12	55	8.3	1356.8	1356.7
X1	32.00	29	9994.0	10006.0	55	55	55			
X2	0	0	2							
X3	10							1360.8	1360.8	
BT	4	9988.8	1360.9		9994	1360.8		10006	1360.8	
BT	10012	1361.1								
GR	1361.5	9900.7	1361.2	9905.0	1362.0	9908.6	1361.9	9911.2	1361.1	9913.4
GR	1361.3	9918.2	1361.1	9922.2	1361.2	9928.4	1361.3	9933.8	1361.3	9936.0
GR	1361.6	9938.2	1361.8	9943.0	1361.6	9952.8	1361.4	9965.8	1361.1	9977.3
GR	1361.0	9985.5	1360.9	9988.8	1356.8	9994.0	1356.8	10000.0	1356.8	10006.0
GR	1361.1	10012	1361.4	10026.2	1361.6	10037.8	1361.7	10049.4	1361.6	10062.9
GR	1361.4	10070.2	1361.2	10080.5	1361.0	10091.2	1361.1	10100.2	0.0	0.0

NC	0.030	0.030	0.045	0.1	0.3					
DT	6	58	122	165	237	301	372			
X1	33.00	26	9966.6	10025.2	5	5	5			
GR	1361.3	9899.8	1361.0	9908.7	1360.9	9919.1	1361.4	9928.7	1361.3	9935.3
GR	1361.7	9937.1	1361.7	9943.0	1361.6	9956.2	1361.5	9966.6	1361.1	9973.6
GR	1360.8	9981.3	1360.8	9984.8	1359.2	9987.8	1359.2	10000.0	1359.3	10004.6
GR	1361.2	10007.6	1361.2	10013.7	1361.5	10025.2	1361.7	10038.3	1361.9	10050.0
GR	1362.0	10062.0	1361.9	10072.5	1361.7	10075.3	1361.4	10083.6	1361.2	10095.8
GR	1361.2	10100.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	34.00	29	9969.1	10007.9	3	3	3			
GR	1361.3	9899.3	1361.1	9908.0	1361.0	9917.6	1361.3	9926.1	1361.3	9933.1
GR	1361.7	9935.9	1361.8	9944.8	1361.7	9958.6	1361.5	9969.1	1361.1	9974.5
GR	1360.9	9980.0	1360.5	9982.8	1359.2	9987.9	1359.2	9990.8	1358.7	9995.9
GR	1358.3	9998.3	1358.6	10000.0	1359.4	10004.4	1361.1	10007.9	1361.3	10010.7
GR	1361.5	10021.5	1361.6	10036.4	1361.9	10049.3	1361.9	10062.4	1361.9	10072.7
GR	1361.8	10075.9	1361.4	10080.0	1361.3	10089.5	1361.2	10099.9	0.0	0.0
X1	35.00	30	9983.8	10010.4	6	38	15			
GR	1362.1	9892.7	1362.1	9892.7	1362.2	9902.7	1362.2	9916.0	1362.0	9927.6
GR	1361.8	9930.3	1361.8	9938.3	1361.9	9943.6	1361.9	9951.2	1361.9	9954.5
GR	1362.2	9959.3	1362.5	9963.8	1362.4	9972.0	1362.2	9983.8	1361.4	9990.6
GR	1359.1	9994.2	1358.9	9997.6	1359.1	10000.0	1361.3	10005.5	1361.5	10010.4
GR	1361.6	10018.0	1361.7	10029.1	1361.9	10040.3	1362.0	10052.5	1362.1	10061.8
GR	1362.1	10071.9	1361.9	10079.8	1361.6	10082.0	1361.4	10091.0	1361.2	10095.7
X1	36.00	32	9990.8	10014.3	27	36	36			
GR	1362.1	9891.5	1361.9	9897.2	1361.8	9912.0	1361.9	9926.3	1362.0	9929.1
GR	1362.0	9940.2	1362.0	9950.4	1362.1	9967.3	1362.1	9978.8	1362.2	9985.6
GR	1361.9	9990.8	1360.9	9994.0	1359.5	9995.2	1359.9	9998.5	1360.5	10000.0
GR	1361.9	10003.9	1362.2	10006.7	1362.3	10014.3	1362.1	10022.1	1361.8	10028.3
GR	1361.6	10035.0	1361.8	10040.0	1361.6	10045.0	1361.7	10049.7	1362.1	10056.0
GR	1362.3	10064.6	1362.5	10073.6	1362.5	10081.4	1362.3	10088.9	1361.9	10090.0
GR	1361.7	10095.4	1361.5	10100.9	0.0	0.0	0.0	0.0	0.0	0.0
X1	37.00	33	9985.4	10006.6	15	35	24			
GR	1362.2	9885.3	1362.3	9901.6	1362.1	9925.1	1362.1	9948.5	1362.1	9964.6
GR	1362.4	9974.9	1362.5	9982.4	1362.3	9985.4	1361.7	9991.6	1360.5	9994.2
GR	1359.5	9996.0	1359.4	9997.1	1359.8	9998.4	1360.6	10000.0	1361.8	10003.0
GR	1362.4	10006.6	1362.4	10008.1	1362.3	10016.6	1362.0	10024.7	1361.7	10032.1
GR	1361.8	10037.0	1361.8	10042.9	1361.6	10047.6	1361.5	10048.9	1362.0	10055.3
GR	1362.2	10062.1	1362.4	10069.5	1362.6	10079.2	1362.5	10087.7	1362.4	10090.9
GR	1362.0	10092.7	1362.2	10094.7	1362.0	10099.9	0.0	0.0	0.0	0.0
X1	38.00	28	9983.1	10012.0	28	30	33			
GR	1362.8	9861.6	1362.3	9954.5	1362.2	9967.9	1362.2	9974.9	1362.0	9983.1
GR	1361.3	9988.0	1360.4	9994.0	1359.6	9996.3	1359.5	9997.1	1359.6	9998.7
GR	1360.5	10000.0	1360.5	10000.0	1361.5	10003.2	1361.8	10005.9	1362.2	10012.0
GR	1361.8	10017.1	1362.2	10023.8	1362.3	10033.6	1362.1	10046.1	1361.5	10051.0
GR	1362.0	10057.0	1362.2	10063.6	1362.5	10071.9	1362.6	10078.6	1362.6	10085.6
GR	1362.4	10092.5	1362.2	10095.1	1361.9	10100.2	0.0	0.0	0.0	0.0

X1	39.00	22	9963.5	10006.6	67	35	55			
GR	1362.8	9879.1	1362.7	9904.6	1362.9	9921.5	1363.1	9950.8	1363.0	9963.5
GR	1362.7	9978.7	1362.5	9988.8	1361.1	9993.8	1359.8	9995.7	1359.8	9996.8
GR	1360.1	9998.0	1361.1	10000.0	1362.9	10003.6	1363.0	10006.6	1362.6	10012.4
GR	1362.7	10022.0	1362.4	10038.9	1362.4	10054.8	1362.6	10068.1	1362.7	10080.4
GR	1362.7	10091.7	1362.6	10100.6	0.0	0.0	0.0	0.0	0.0	0.0
X1	40.00	17	9988.9	10020.3	47	46	51			
GR	1363.0	9895.4	1363.1	9907.2	1363.0	9942.5	1362.9	9963.9	1363.1	9978.0
GR	1363.2	9978.4	1363.0	9988.9	1360.6	9996.4	1360.4	10000.0	1362.2	10014.4
GR	1362.9	10020.3	1362.9	10037.7	1362.9	10046.9	1362.7	10051.1	1362.7	10062.5
GR	1362.8	10073.5	1362.8	10100.8	0.0	0.0	0.0	0.0	0.0	0.0
X1	41.00	15	9967.6	10005.0	58	74	72			
GR	1363.2	9867.7	1363.3	9890.1	1363.4	9904.6	1363.4	9918.2	1363.3	9939.3
GR	1363.4	9959.0	1363.6	9967.6	1360.1	9993.5	1360.8	9997.6	1361.8	10000.0
GR	1364.3	10005.0	1364.2	10011.1	1363.4	10025.0	1363.4	10036.4	1363.5	10043.9
X1	42.00	28	9990.0	10009.7	65	57	62			
GR	1363.5	9890.1	1363.5	9899.2	1363.6	9914.5	1363.5	9933.0	1363.5	9950.6
GR	1363.7	9962.7	1363.9	9972.0	1363.8	9979.0	1363.8	9988.7	1363.7	9990.0
GR	1362.9	9993.1	1360.6	9997.1	1360.8	9998.3	1362.0	10000.0	1364.3	10005.3
GR	1363.3	10007.5	1364.1	10009.7	1364.2	10011.1	1363.2	10013.9	1364.1	10014.7
GR	1364.0	10022.7	1364.0	10025.6	1363.7	10039.3	1363.6	10048.1	1363.8	10053.7
GR	1363.8	10073.3	1363.6	10086.8	1363.7	10095.0	0.0	0.0	0.0	0.0
X1	43.00	22	9989.0	10012.2	52	94	80			
GR	1364.4	9912.1	1364.1	9919.9	1363.8	9929.9	1363.8	9943.2	1363.6	9954.6
GR	1363.6	9963.4	1363.8	9973.3	1364.0	9983.4	1363.9	9989.0	1362.9	9992.9
GR	1360.9	9996.4	1360.9	9997.8	1362.0	10000.0	1364.0	10002.2	1364.3	10005.0
GR	1364.4	10012.2	1364.2	10013.0	1364.1	10031.5	1364.0	10040.4	1363.9	10071.2
GR	1363.8	10129.3	1363.8	10153.5	0.0	0.0	0.0	0.0	0.0	0.0
X1	44.00	27	9989.8	10012.1	53	45	50			
GR	1365.0	9896.9	1365.0	9908.7	1364.4	9920.2	1364.1	9930.1	1364.0	9942.0
GR	1364.1	9952.4	1364.0	9960.7	1363.9	9969.6	1363.8	9971.1	1364.2	9977.9
GR	1364.3	9986.7	1364.4	9989.8	1364.1	9992.6	1361.2	9997.3	1361.0	9997.8
GR	1361.4	10000.0	1364.4	10004.6	1364.6	10012.1	1364.1	10030.0	1364.2	10037.3
GR	1364.5	10056.8	1363.9	10085.8	1363.7	10122.6	1364.1	10139.9	1364.4	10148.7
GR	1364.7	10158.2	1364.7	10159.1	0.0	0.0	0.0	0.0	0.0	0.0
X1	45.00	29	9998.0	10034.8	43	54	50			
GR	1364.8	9900.0	1364.6	9928.7	1364.3	9948.4	1364.3	9956.8	1364.2	9962.2
GR	1363.8	9966.3	1364.2	9969.9	1364.1	9978.1	1364.2	9986.7	1364.5	9992.8
GR	1364.6	9998.0	1362.2	10006.0	1362.1	10008.0	1362.5	10010.2	1364.7	10015.1
GR	1365.0	10022.8	1365.3	10034.8	1365.1	10042.5	1364.8	10050.8	1364.2	10079.1
GR	1363.9	10105.9	1363.9	10119.7	1363.7	10131.1	1364.1	10135.8	1364.0	10147.8
GR	1364.5	10156.6	1364.7	10158.4	1364.8	10168.1	1364.8	10177.5	0.0	0.0

X1	46.00	28	9988.4	10038.2	49	51	51			
GR	1365.6	9938.3	1365.0	9944.8	1365.1	9952.0	1365.2	9958.6	1365.2	9961.8
GR	1365.3	9972.3	1364.4	9976.1	1364.5	9982.4	1364.7	9988.4	1364.5	9992.7
GR	1362.4	9999.0	1362.3	10000.0	1364.1	10003.2	1364.8	10009.9	1364.9	10026.4
GR	1365.2	10038.2	1364.8	10046.4	1364.8	10055.1	1364.9	10062.1	1364.7	10069.3
GR	1364.4	10083.8	1364.3	10095.5	1364.2	10108.4	1364.3	10117.7	1364.4	10194.2
GR	1364.6	10227	1364.6	10240.4	1364.7	10253.2				

X1	47.00	31	9969.9	10042.4	49	50	50			
GR	1365.6	9900.0	1365.7	9924.1	1365.5	9929.4	1365.1	9931.2	1365.2	9940.3
GR	1365.0	9950.3	1365.0	9958.7	1365.1	9962.9	1365.9	9969.9	1365.6	9973.7
GR	1364.7	9977.2	1364.7	9983.7	1364.7	9983.9	1364.7	9990.4	1362.7	9999.5
GR	1362.7	10001.1	1364.5	10005.1	1364.7	10017.2	1364.8	10024.2	1365.1	10037.7
GR	1365.2	10042.4	1364.9	10059.2	1364.7	10072.8	1364.5	10085.9	1364.6	10106.0
GR	1364.5	10126.9	1364.5	10144.2	1364.7	10173.5	1364.7	10204.0	1364.8	10231.5
GR	1364.8	10252.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	48.00	31	9986.0	10023.0	46	49	48			
GR	1365.5	9890.0	1365.3	9904.1	1365.3	9917.2	1365.9	9925.5	1364.9	9932.8
GR	1364.8	9948.0	1365.0	9964.8	1365.0	9973.0	1365.5	9986.0	1364.8	9990.0
GR	1363.7	9993.9	1361.8	9995.8	1361.7	9997.7	1362.8	10000.0	1364.1	10002.7
GR	1364.7	10008.1	1365.0	10020.3	1365.1	10023.0	1365.0	10028.5	1365.0	10036.7
GR	1364.6	10051.5	1364.5	10064.7	1364.4	10078.4	1364.4	10096.8	1364.5	10110.7
GR	1364.4	10118.6	1364.5	10128.3	1364.5	10137.4	1364.5	10143.3	1365.0	10183.7
GR	1365.4	10235.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	49.00	35	9996.1	10012.8	62	45	51			
GR	1365.6	9888.7	1365.6	9905.6	1365.6	9923.7	1365.2	9942.5	1365.2	9968.1
GR	1365.9	9973.7	1365.3	9980.6	1365.1	9987.9	1365.2	9989.7	1365.1	9996.1
GR	1362.5	9997.7	1363.2	10000.0	1364.9	10004.8	1365.3	10012.8	1365.2	10017.5
GR	1365.5	10029.1	1365.5	10032.6	1365.8	10042.3	1365.6	10050.5	1365.6	10056.2
GR	1366.0	10060.8	1366.3	10069.4	1366.2	10074.3	1364.7	10082.0	1364.7	10091.9
GR	1364.8	10107.1	1364.7	10116.8	1364.6	10119.6	1364.9	10123.4	1365.1	10131.7
GR	1364.9	10135.1	1365.2	10148.5	1365.3	10157.3	1366.2	10169.2	1366.5	10224.3

X1	50.00	31	9989.6	10022.0	46	48	52			
GR	1365.6	9900.2	1365.5	9911.0	1365.3	9925.0	1365.1	9936.4	1365.3	9950.3
GR	1365.4	9962.5	1365.5	9972.4	1365.6	9981.2	1365.6	9989.6	1365.2	9993.2
GR	1362.9	9997.5	1364.5	10000.0	1364.7	10001.0	1365.1	10009.6	1365.7	10022.0
GR	1366.3	10038.8	1365.7	10049.2	1365.7	10063.1	1365.8	10075.0	1365.4	10084.4
GR	1365.1	10093.7	1365.2	10106.8	1365.2	10116.9	1365.3	10133.0	1365.4	10148.8
GR	1365.8	10162.6	1365.9	10172.6	1366.1	10187.0	1366.2	10207.8	1366.4	10226.3
GR	1366.3	10236.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	51.00	25	9977.8	10010.0	51	49	49			
GR	1366.1	9947.5	1366.5	9962.8	1366.6	9977.8	1366.4	9987.0	1365.9	9992.0
GR	1362.9	9994.1	1362.9	9999.2	1363.6	10000.0	1363.9	10002.2	1365.8	10010.0
GR	1365.8	10021.1	1366.0	10038.5	1366.0	10059.0	1365.9	10072.8	1365.6	10088.4
GR	1365.5	10105.2	1365.5	10121.2	1365.8	10137.6	1366.3	10154.1	1366.3	10168.3
GR	1366.5	10186.6	1366.6	10201.1	1366.9	10215.0	1367.0	10228.4	1367.4	10229.8

X1	8.00	25	9929	10044.2	54	44	51			
GR	1368.8	9844.9	1368.3	9908.0	1368.1	9929.0	1367.9	9948.7	1367.4	9961.8
GR	1367.6	9970.7	1367.3	9974.8	1367.3	9978.4	1367.0	9984.4	1367.7	9988.7
GR	1367.8	9993.8	1368.0	9999.2	1368.1	10000.0	1368.1	10008.3	1367.7	10016.3
GR	1365.5	10025.5	1365.5	10027.3	1367.8	10036.6	1368.4	10044.2	1368.3	10055.0
GR	1368.2	10072.0	1368.3	10086.3	1368.3	10108.2	1368.9	10123.6	1369.2	10138.4
X1	59.00	27	9914	10023.9	65	31	49			
GR	1369.3	9819.0	1368.4	9897.7	1368.4	9906.9	1368.6	9914.0	1368.3	9920.2
GR	1368.4	9930.9	1368.3	9940.7	1368.3	9946.5	1367.9	9954.3	1367.4	9958.8
GR	1367.2	9962.0	1367.4	9968.3	1367.2	9973.4	1366.9	9981.4	1367.4	9988.7
GR	1367.0	9994.7	1366.3	10000.0	1366.8	10001.4	1367.3	10006.3	1367.3	10014.8
GR	1367.8	10023.9	1367.8	10024.7	1368.7	10033.3	1368.9	10039.1	1369.1	10048.6
GR	1369.1	10050.9	1369.1	10052.5	0.0	0.0	0.0	0.0	0.0	0.0
X1	60.00	25	9951.0	10027.2	40	50	52			
GR	1369.2	9818.7	1368.9	9868.2	1368.7	9880.6	1369.0	9893.2	1368.9	9914.5
GR	1368.8	9941.3	1368.9	9951.0	1367.0	9957.2	1367.1	9963.0	1366.5	9969.1
GR	1366.6	9975.2	1366.1	9982.5	1366.4	9985.4	1366.4	9991.0	1367.3	9995.9
GR	1367.4	10000.0	1367.5	10005.7	1368.2	10012.9	1368.6	10019.6	1368.8	10027.2
GR	1368.7	10040.3	1368.7	10054.2	1369.0	10102.6	1369.1	10119.7	1369.1	10120.7
X1	61.00	49	100	133	191	246	306			
GR	1369.1	9839.0	1369.1	9850.4	1369.0	9864.9	1368.9	9881.1	1369.0	9898.5
GR	1369.1	9902.9	1368.8	9913.6	1368.8	9928.3	1368.9	9939.2	1369.1	9946.1
GR	1369.0	9956.3	1366.4	9971.9	1366.4	9981.0	1366.5	9992.5	1366.8	10000.0
GR	1367.6	10013.8	1368.0	10025.5	1368.4	10040.6	1368.6	10057.1	1368.7	10074.8
GR	1368.3	10083.5	1368.4	10086.7	1368.4	10097.0	1368.6	10106.2	1369.0	10112.8
GR	1369.1	10116.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	62.00	22	9958.5	10063.6	60	38	49			
GR	1369.1	9840.4	1369.1	9855.0	1368.9	9872.8	1369.0	9887.7	1368.8	9926.0
GR	1368.8	9958.5	1368.2	9969.8	1367.4	9978.8	1366.5	9986.2	1366.8	9992.1
GR	1367.1	9998.0	1367.1	10000.0	1367.0	10004.1	1367.5	10009.4	1368.6	10014.8
GR	1368.9	10021.8	1369.0	10035.2	1369.4	10048.6	1369.7	10063.6	1369.7	10077.8
GR	1369.9	10089.6	1369.9	10099.2	0.0	0.0	0.0	0.0	0.0	0.0
X1	63.00	24	9958.0	10056.6	53	39	51			
GR	1369.7	9831.5	1369.5	9876.2	1369.3	9893.2	1369.1	9924.7	1369.2	9944.9
GR	1369.0	9953.4	1369.2	9958.0	1369.1	10000.0	1368.6	10011.1	1368.1	10011.9
GR	1368.4	10016.7	1368.5	10020.6	1368.5	10025.5	1368.5	10028.0	1368.9	10034.2
GR	1369.3	10040.8	1369.6	10048.4	1370.0	10056.6	1370.0	10068.6	1370.0	10079.5
GR	1370.1	10089.8	1370.1	10094.0	1370.0	10109.2	1370.2	10121.7	0.0	0.0
X1	64.00	34	9973.8	10051.5	48	54	52			
GR	1369.7	9860.2	1369.6	9890.2	1369.5	9907.3	1369.5	9921.4	1369.4	9929.8
GR	1369.4	9943.2	1369.3	9954.3	1369.4	9964.1	1369.6	9973.8	1369.7	9996.4
GR	1368.2	10000.0	1367.3	10002.8	1367.3	10005.2	1370.3	10012.8	1370.5	10023.1
GR	1370.8	10028.4	1370.6	10033.6	1369.0	10036.3	1369.3	10040.7	1369.4	10046.4
GR	1369.6	10051.5	1369.3	10056.4	1369.3	10060.7	1369.3	10063.4	1369.6	10069.0
GR	1370.0	10074.3	1369.9	10077.9	1369.6	10081.1	1369.5	10091.7	1369.7	10104.3
GR	1369.9	10115.9	1369.9	10125.8	1369.9	10136.7	1370.0	10141.7	0.0	0.0

	0.030	0.030	0.045							
X1	70.00	19	9987.2	10069.1	48	30	41			
GR	1371.8	9892.3	1371.6	9934.8	1372.0	9941.3	1371.7	9948.6	1371.6	9959.2
GR	1371.8	9974.2	1371.8	9987.2	1371.7	9993.6	1369.5	10000.0	1367.5	10003.0
GR	1367.6	10005.4	1371.9	10025.2	1372.0	10054.9	1372.3	10069.1	1372.2	10085.7
GR	1372.0	10097.7	1372.0	10112.3	1372.3	10126.5	1372.4	10127.6	0.0	0.0
X1	71.00	25	9995.8	10050.4	50	48	50			
GR	1372.3	9904.0	1372.4	9923.0	1372.0	9937.7	1371.8	9953.2	1371.7	9965.9
GR	1371.8	9977.6	1371.9	9983.1	1373.0	9986.5	1373.2	9988.6	1373.4	9995.8
GR	1371.3	10000.0	1371.1	10003.8	1371.9	10007.7	1372.0	10008.6	1372.0	10012.6
GR	1370.7	10015.6	1371.6	10019.1	1371.9	10024.4	1372.1	10033.0	1372.2	10050.4
GR	1372.1	10061.0	1372.3	10082.4	1372.3	10101.6	1372.4	10122.1	1372.5	10123.1
X1	72.00	28	9989.5	10022.1	49	50	50			
GR	1372.4	9905.6	1372.3	9918.2	1372.3	9931.8	1372.2	9940.2	1372.5	9950.6
GR	1372.5	9956.1	1372.2	9961.5	1372.3	9969.1	1372.4	9975.8	1372.2	9977.9
GR	1372.3	9986.4	1372.2	9989.5	1369.9	10000.0	1369.3	10003.6	1371.1	10008.0
GR	1372.4	10014.1	1372.8	10022.1	1372.5	10033.0	1372.3	10037.3	1372.3	10056.1
GR	1372.4	10069.7	1372.3	10077.0	1372.4	10087.3	1372.9	10094.8	1373.3	10101.6
GR	1373.5	10107.0	1373.3	10120.7	1373.2	10120.8	0.0	0.0	0.0	0.0
X1	73.00	26	9991.7	10025.0	47	32	40			
GR	1373.1	9898.6	1373.0	9919.7	1372.9	9934.9	1372.8	9946.6	1372.6	9957.9
GR	1372.5	9966.0	1372.6	9975.2	1372.6	9981.4	1373.1	9985.2	1373.5	9989.0
GR	1373.3	9991.7	1372.9	9994.1	1369.9	10000.0	1369.8	10005.0	1372.1	10013.9
GR	1373.4	10020.5	1373.5	10025.0	1372.9	10027.2	1372.6	10029.7	1372.9	10035.7
GR	1373.0	10046.5	1372.9	10060.2	1373.0	10076.7	1373.0	10094.6	1373.2	10113.6
GR	1373.2	10118.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	74.00	27	9990.1	10013.5	65	39	53			
GR	1373.9	9900.8	1374.0	9911.6	1373.7	9944.9	1373.3	9967.3	1372.9	9975.0
GR	1372.7	9982.8	1373.0	9987.6	1374.0	9990.1	1370.4	10000.0	1373.0	10007.4
GR	1373.0	10013.5	1372.1	10019.3	1371.7	10033.6	1371.3	10041.9	1371.1	10050.4
GR	1371.4	10055.0	1371.5	10060.7	1372.4	10066.9	1372.6	10069.4	1371.9	10072.4
GR	1372.0	10079.4	1372.9	10083.7	1372.6	10087.7	1372.2	10089.9	1372.8	10112.0
GR	1373.4	10117.4	1373.7	10119.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	75.00	23	9990.6	10014.5	33	28	29			
GR	1373.8	9913.5	1373.6	9943.2	1373.3	9970.0	1373.4	9980.8	1373.6	9986.2
GR	1374.1	9990.6	1370.1	9999.5	1369.9	10000.0	1371.9	10007.6	1373.8	10014.5
GR	1373.3	10023.8	1373.0	10036.6	1373.2	10050.8	1373.2	10060.2	1372.8	10066.7
GR	1372.8	10074.6	1373.0	10081.5	1372.8	10089.4	1372.4	10098.1	1372.0	10103.6
GR	1372.5	10111.4	1373.3	10117.8	1373.3	10121.0	0.0	0.0	0.0	0.0
X1	76.00	23	9982.8	10014.9	38	32	36			
GR	1373.8	9932.7	1373.5	9939.4	1373.6	9953.7	1373.4	9966.1	1373.3	9974.7
GR	1373.5	9979.1	1374.5	9982.8	1369.5	9991.4	1369.5	9994.1	1371.6	9996.4
GR	1371.4	10000.0	1373.3	10007.3	1373.6	10014.9	1373.2	10028.3	1373.1	10040.7
GR	1373.1	10053.2	1373.1	10060.7	1373.4	10067.7	1373.0	10072.9	1373.2	10080.3
GR	1373.0	10085.1	1374.0	10094.2	1373.9	10101.2	1373.8	10110.9	0.0	0.0

X1	77.00	19	9992.6	10027.1	34	49	39			
GR	1374.3	9897.2	1373.9	9920.1	1373.7	9936.3	1373.6	9953.1	1373.6	9969.3
GR	1373.7	9980.7	1373.7	9986.0	1374.5	9989.9	1374.7	9992.6	1374.0	9995.3
GR	1373.4	9997.2	1369.9	10000.0	1369.6	10002.6	1372.2	10005.8	1373.2	10008.4
GR	1373.5	10013.6	1373.8	10019.7	1374.1	10027.1	1374.0	10031.3	0.0	0.0

X1	78.00	31	9985.0	10026.7	42	65	58			
GR	1375.3	9877.4	1374.8	9892.3	1374.3	9896.2	1374.4	9899.3	1374.5	9910.3
GR	1374.2	9921.9	1373.5	9923.2	1373.8	9927.3	1374.1	9931.8	1374.7	9936.2
GR	1374.9	9939.2	1375.1	9943.7	1374.2	9947.9	1374.3	9953.5	1373.7	9961.7
GR	1373.1	9968.5	1372.6	9972.8	1373.1	9978.4	1373.8	9985.0	1373.7	9990.2
GR	1370.3	9995.7	1370.3	9996.6	1370.9	10000.0	1371.8	10003.0	1372.2	10008.5
GR	1372.6	10015.6	1373.3	10021.2	1373.6	10026.7	1374.1	10035.7	1374.4	10042.6
GR	1374.4	10042.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	79.00	43	9981.0	10031.2	42	62	55			
GR	1375.4	9877.0	1375.2	9887.0	1374.8	9900.0	1374.8	9910.2	1374.8	9917.6
GR	1374.3	9919.3	1374.1	9922.9	1374.1	9924.4	1374.3	9928.0	1374.3	9934.6
GR	1374.2	9942.7	1374.1	9945.3	1373.7	9949.0	1373.5	9952.3	1374.0	9956.9
GR	1374.6	9960.3	1374.6	9965.1	1374.6	9970.2	1374.8	9975.2	1374.6	9981.0
GR	1374.0	9986.2	1373.7	9990.8	1373.6	9993.1	1371.3	9995.2	1371.5	9996.5
GR	1373.3	10000.0	1374.1	10004.6	1374.6	10007.6	1374.3	10011.5	1372.7	10015.6
GR	1371.6	10019.0	1370.1	10021.8	1370.1	10022.9	1373.6	10027.9	1374.3	10031.2
GR	1374.2	10034.1	1373.5	10037.9	1373.2	10041.5	1373.4	10047.6	1373.7	10052.9
GR	1373.9	10060.0	1374.2	10067.7	1374.7	10071.4	0.0	0.0	0.0	0.0

X1	80.00	32	10000	10052.8	0.3	0.5	60			
X3	10				62	51		1374.4	1373.6	
GR	1375.6	9878.7	1375.6	9888.2	1375.1	9899.4	1375.1	9910.7	1375.2	9919.9
GR	1374.7	9923.1	1374.1	9927.6	1374.1	9930.7	1374.4	9939.0	1374.2	9948.5
GR	1373.9	9952.8	1373.5	9957.7	1374.1	9964.7	1374.0	9971.8	1373.7	9977.5
GR	1374.0	9981.7	1374.1	9982.9	1374.6	9996.0	1374.8	10000.0	1374.7	10006.8
GR	1374.4	10010.9	1371.9	10017.0	1371.4	10018.0	1369.7	10019.9	1370.3	10022.8
GR	1372.3	10026.9	1373.1	10030.9	1373.6	10036.4	1374.1	10042.9	1374.4	10052.8
GR	1374.4	10070.3	1374.6	10090.8	0.0	0.0	0.0	0.0	0.0	0.0

SB		1.56	3.0	0	10	0	28	1	0	0
X1	81.00	28	9987.9	10029.4	13	14	13			
X2	0	0	1	1372.8	1373.4	0	0	0	0	
X3	10							1373.7	1373.5	
BT	2	9982	1373.5	1372.8	9996	1373.5	1372.8			
GR	1375.8	9879.6	1375.0	9911.2	1375.6	9923.8	1373.9	9927.8	1374.2	9931.4
GR	1374.2	9940.7	1374.0	9947.4	1373.8	9950.2	1373.1	9953.9	1373.2	9963.4
GR	1373.2	9968.4	1373.4	9978.7	1373.7	9987.9	1371.0	9997.4	1371.0	10000.0
GR	1371.0	10005.3	1371.0	10008.4	1371.0	10019.0	1373.0	10029.4	1372.8	10029.9
GR	1373.2	10032.7	1373.7	10039.0	1374.1	10044.6	1374.3	10056.3	1374.5	10069.7
GR	1374.4	10078.5	1374.4	10089.5	1374.4	10092.7	0.0	0.0	0.0	0.0

			0.1	0.3						
NC										
X1	82.00	40	9981.8	10031.4	23	21	30			
GR	1375.6	9877.7	1375.5	9887.9	1374.9	9904.1	1375.1	9910.8	1375.4	9919.3
GR	1375.1	9922.4	1374.2	9926.6	1373.8	9926.7	1374.1	9932.9	1374.3	9940.3
GR	1374.3	9947.0	1374.0	9950.0	1373.3	9954.7	1373.6	9958.6	1373.9	9963.1
GR	1374.0	9967.2	1374.6	9971.3	1375.3	9975.3	1375.6	9977.2	1375.9	9981.8
GR	1375.5	9985.3	1372.1	9990.3	1372.0	9994.0	1372.1	9994.2	1372.5	10000.0
GR	1372.4	10016.7	1374.3	10024.2	1376.2	10028.9	1376.4	10031.4	1375.5	10034.3
GR	1375.7	10035.0	1375.5	10041.5	1375.1	10047.2	1374.9	10051.2	1374.7	10060.1
GR	1374.6	10066.9	1374.9	10089.6	1374.6	10091.2	1375.1	10092.7	1375.2	10095.1
X1	83.00	31	9976.8	10034.4	32	58	50			
GR	1375.7	9882.4	1375.9	9894.9	1375.6	9911.6	1375.5	9922.7	1375.3	9925.9
GR	1374.4	9928.1	1374.3	9934.1	1374.7	9935.9	1374.9	9940.3	1374.9	9945.3
GR	1374.8	9951.3	1374.5	9954.4	1374.2	9956.7	1374.5	9962.7	1375.1	9968.9
GR	1375.0	9971.5	1375.2	9976.8	1371.4	9985.7	1371.7	9986.8	1373.0	10000.0
GR	1373.5	10006.7	1373.7	10010.0	1374.6	10019.3	1374.9	10025.8	1375.1	10034.4
GR	1375.1	10035.5	1375.6	10040.3	1375.7	10050.3	1375.3	10060.5	1375.0	10070.0
GR	1375.2	10089.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	84.00	27	9977.3	10015.0	45	56	52			
GR	1376.5	9886.0	1376.4	9896.3	1376.1	9906.5	1376.1	9914.6	1375.9	9920.4
GR	1376.2	9925.1	1375.6	9932.1	1375.6	9937.4	1375.6	9939.1	1375.7	9944.9
GR	1375.7	9951.1	1375.3	9957.4	1375.1	9962.9	1375.2	9970.5	1375.3	9974.8
GR	1375.4	9977.3	1374.1	9982.1	1372.3	9984.9	1372.0	9988.0	1372.2	9992.4
GR	1374.4	10000.0	1375.5	10005.9	1375.5	10015.0	1375.5	10035.4	1375.3	10055.5
GR	1375.2	10067.3	1375.5	10081.1	0.0	0.0	0.0	0.0	0.0	0.0
X1	85.00	28	9980.7	10010.7	46	53	50			
GR	1376.9	9887.8	1377.3	9899.8	1377.4	9907.9	1376.7	9917.0	1376.5	9927.4
GR	1376.4	9935.8	1376.1	9938.3	1376.5	9942.2	1376.7	9950.0	1376.5	9953.6
GR	1376.0	9960.2	1375.6	9962.4	1375.8	9966.9	1375.9	9974.3	1376.0	9974.8
GR	1376.0	9980.7	1373.3	9991.8	1373.3	9996.1	1373.1	9997.0	1373.9	10000.0
GR	1375.1	10006.9	1376.7	10010.7	1376.7	10017.3	1376.2	10033.0	1376.1	10048.8
GR	1376.0	10063.3	1376.1	10075.8	1376.1	10083.3	0.0	0.0	0.0	0.0
X1	86.00	27	9982.5	10013.9	54	42	48			
GR	1377.3	9890.8	1377.2	9902.9	1377.2	9919.3	1377.3	9930.1	1376.0	9935.9
GR	1375.6	9940.4	1375.5	9944.1	1375.8	9949.3	1375.9	9954.2	1375.7	9963.1
GR	1375.9	9967.4	1376.7	9972.9	1377.3	9978.6	1377.2	9982.5	1376.7	9986.1
GR	1373.1	9997.9	1372.9	10000.0	1372.8	10006.6	1376.7	10013.9	1376.8	10021.3
GR	1376.8	10033.7	1376.9	10039.3	1376.7	10044.3	1376.2	10051.9	1376.2	10065.6
GR	1376.3	10074.4	1376.5	10078.1	0.0	0.0	0.0	0.0	0.0	0.0
X1	87.00	32	9983.7	10026.6	51	51	50			
GR	1378.0	9853.8	1378.1	9865.5	1378.1	9881.3	1377.9	9892.0	1377.8	9900.2
GR	1377.6	9905.0	1377.0	9911.6	1376.0	9918.9	1375.2	9924.9	1375.1	9928.1
GR	1375.3	9932.9	1375.3	9940.1	1375.0	9947.9	1374.8	9953.9	1374.7	9963.8
GR	1374.3	9970.0	1374.3	9972.6	1375.9	9979.3	1376.5	9983.7	1376.4	9987.1
GR	1375.2	9992.2	1372.9	9995.2	1373.2	10000.0	1373.4	10002.0	1375.0	10014.8
GR	1376.3	10020.8	1376.8	10026.6	1376.5	10043.2	1376.4	10059.3	1376.8	10074.6
GR	1377.0	10089.3	1377.1	10098.1	0.0	0.0	0.0	0.0	0.0	0.0

X	88.00	36	9946.5	10027.0	17	17	17			
GR	1378.3	9852.7	1378.6	9856.7	1379.3	9860.7	1379.3	9863.1	1378.7	9866.3
GR	1379.1	9869.1	1378.3	9872.1	1378.3	9882.2	1377.9	9888.9	1377.0	9897.7
GR	1376.2	9907.0	1375.6	9915.3	1375.1	9920.5	1375.3	9922.9	1375.5	9930.1
GR	1375.5	9938.0	1375.0	9946.5	1374.8	9954.0	1374.5	9963.2	1374.2	9973.5
GR	1374.0	9976.0	1373.7	9977.4	1374.2	9980.6	1373.7	9987.7	1373.5	9997.8
GR	1373.2	10000.0	1373.4	10006.5	1374.2	10014.0	1375.6	10021.5	1376.5	10027.0
GR	1376.7	10037.6	1376.8	10052.1	1376.8	10067.5	1376.9	10083.1	1377.3	10090.4
GR	1377.5	10100.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

QT	6	44	91	120	173	222	270			
X1	89.00	23	9948.8	10062.1	17	17	17			
GR	1376.9	9908.2	1376.5	9920.7	1376.2	9935.2	1375.3	9948.8	1375.5	9956.5
GR	1375.7	9965.1	1375.7	9977.2	1375.6	9990.5	1375.3	10000.0	1374.8	10011.8
GR	1374.1	10027.5	1373.5	10042.8	1373.3	10051.8	1373.2	10055.6	1373.3	10062.1
GR	1373.5	10069.8	1374.0	10078.5	1374.9	10088.3	1375.7	10096.3	1376.3	10108.8
GR	1376.7	10119.4	1377.1	10132.3	1377.5	10152.8	0.0	0.0	0.0	0.0

X1	90.00	28	9925.4	10000.0	16	16	16			
GR	1376.3	9853.7	1376.4	9861.6	1376.6	9872.5	1376.6	9882.0	1376.1	9894.9
GR	1375.8	9909.5	1375.6	9925.4	1375.3	9938.8	1374.7	9949.3	1374.5	9955.1
GR	1374.0	9958.0	1374.2	9965.0	1374.5	9975.6	1374.3	9990.9	1373.3	9993.5
GR	1373.2	9997.6	1373.3	10000.0	1373.3	10003.3	1374.0	10006.3	1374.8	10010.5
GR	1374.8	10017.0	1374.0	10019.9	1374.2	10024.3	1375.6	10042.1	1376.6	10057.4
GR	1376.9	10075.8	1377.1	10091.2	1376.9	10094.2	0.0	0.0	0.0	0.0

X	91.00	30	9974.0	10024.5	20	17	16			
GR	1376.8	9864.7	1376.6	9875.1	1376.5	9891.6	1376.0	9907.1	1375.6	9925.2
GR	1375.8	9938.8	1375.4	9950.1	1376.0	9953.9	1377.9	9958.2	1377.8	9965.7
GR	1378.4	9974.0	1378.3	9980.7	1378.2	9986.7	1377.6	9990.8	1375.3	9994.6
GR	1373.1	9998.9	1373.1	10000.0	1373.2	10001.9	1374.7	10005.0	1374.8	10010.9
GR	1374.5	10014.5	1376.3	10020.0	1377.1	10024.5	1376.5	10030.1	1377.2	10034.8
GR	1378.1	10040.3	1378.3	10055.4	1378.2	10065.2	1377.6	10074.7	1377.4	10100.0

X1	92.00	43	9962.6	10000.0	46	49	49			
GR	1378.6	9869.9	1378.6	9881.1	1377.7	9884.6	1377.9	9888.8	1377.9	9895.3
GR	1378.5	9899.0	1378.5	9904.0	1377.7	9907.9	1377.4	9911.5	1377.2	9917.4
GR	1377.1	9923.4	1376.7	9924.2	1377.2	9932.6	1377.2	9938.4	1377.1	9946.1
GR	1377.2	9948.8	1377.8	9952.8	1378.3	9956.3	1378.3	9962.6	1377.9	9969.4
GR	1377.5	9977.9	1376.9	9985.5	1375.9	9992.4	1375.0	9995.4	1373.6	9997.5
GR	1373.6	9998.6	1373.6	9999.4	1374.2	10000.0	1375.1	10002.3	1375.9	10006.6
GR	1376.7	10012.7	1376.8	10013.0	1377.1	10020.7	1376.9	10027.2	1376.9	10029.4
GR	1377.4	10034.9	1377.5	10038.6	1379.0	10044.6	1377.7	10048.1	1377.8	10058.4
GR	1377.8	10075.0	1377.9	10092.9	1378.0	10099.9	0.0	0.0	0.0	0.0

X1	93.00	35	9961.6	10000.0	53	47	50			
GR	1380.3	9872.5	1380.0	9878.8	1380.0	9882.2	1379.9	9886.9	1378.7	9893.2
GR	1378.0	9900.9	1377.9	9908.3	1378.1	9914.3	1378.0	9919.0	1377.8	9923.0
GR	1377.4	9926.9	1377.0	9927.3	1377.3	9933.2	1377.6	9941.2	1377.5	9949.5
GR	1377.8	9950.7	1378.6	9955.6	1378.7	9961.6	1378.4	9967.9	1378.0	9974.5
GR	1377.4	9980.6	1375.4	9995.0	1375.1	9997.6	1374.1	9999.1	1374.1	10000.0
GR	1374.5	10002.5	1377.0	10006.8	1377.3	10011.8	1378.2	10019.9	1378.6	10026.1
GR	1378.3	10047.7	1378.2	10062.6	1378.3	10083.4	1378.3	10099.6	1378.3	10099.6

X1	94.00	34	9962.4	10000.0	55	42	50			
GR	1382.1	9877.9	1383.8	9882.3	1380.7	9889.2	1379.0	9894.5	1378.4	9901.2
GR	1378.0	9912.6	1378.2	9921.3	1378.0	9925.1	1377.7	9937.1	1377.4	9937.9
GR	1377.7	9945.8	1377.9	9960.8	1378.2	9962.4	1379.3	9967.9	1379.2	9972.1
GR	1377.6	9984.8	1376.0	9993.9	1375.2	9997.0	1375.0	9999.9	1374.9	10000.0
GR	1375.0	10001.7	1376.9	10008.1	1378.4	10012.3	1377.9	10017.5	1376.6	10024.7
GR	1376.5	10029.7	1377.8	10035.0	1379.1	10039.9	1378.9	10044.9	1378.1	10050.1
GR	1378.0	10057.4	1378.0	10067.2	1378.6	10083.7	1379.1	10100.2	0.0	0.0
X1	95.00	33	10084.1	10134.2	42	46	50			
GR	1379.6	10000.0	1379.5	10008.6	1378.9	10020.2	1378.5	10031.4	1378.4	10042.4
GR	1378.4	10049.0	1378.0	10052.9	1378.1	10058.7	1377.8	10059.3	1378.1	10070.6
GR	1378.1	10077.5	1378.0	10082.0	1378.3	10084.1	1379.4	10088.3	1379.5	10090.5
GR	1379.4	10091.1	1379.1	10094.9	1378.7	10099.6	1378.1	10104.6	1374.7	10107.2
GR	1374.5	10109.4	1374.8	10110.3	1376.5	10114.2	1376.9	10118.3	1377.1	10121.6
GR	1378.1	10124.8	1378.4	10134.2	1378.4	10136.5	1378.4	10147.4	1378.6	10163.3
GR	1378.9	10175.2	1379.1	10189.9	1379.2	10211.0	0.0	0.0	0.0	0.0
X1	96.00	29	9991.9	10000.0	52	48	51			
GR	1380.3	9898.5	1380.1	9904.7	1379.5	9911.1	1379.1	9922.4	1378.8	9933.5
GR	1378.7	9944.8	1378.5	9956.0	1378.2	9956.3	1378.4	9962.2	1378.5	9972.2
GR	1378.6	9979.5	1378.6	9981.6	1378.7	9984.2	1379.4	9987.2	1379.8	9991.9
GR	1377.4	9994.9	1376.8	9998.0	1375.6	9999.2	1375.7	10000.0	1375.8	10002.5
GR	1377.0	10005.0	1377.9	10008.9	1378.2	10014.1	1378.6	10027.4	1378.9	10043.2
GR	1379.4	10058.3	1379.6	10074.8	1379.6	10094.1	1379.6	10100.6	0.0	0.0
X1	97.00	26	9988.1	10000.0	40	52	50			
GR	1380.4	9899.0	1380.0	9910.8	1379.7	9926.2	1379.4	9941.1	1379.2	9950.3
GR	1379.0	9957.6	1379.0	9958.1	1378.6	9958.5	1378.8	9967.2	1378.9	9978.0
GR	1378.9	9983.3	1379.9	9988.1	1379.1	9991.9	1376.7	9995.7	1376.5	10000.0
GR	1376.5	10001.1	1377.4	10004.6	1377.8	10010.0	1379.0	10016.2	1379.3	10020.3
GR	1379.7	10027.9	1379.8	10042.1	1379.8	10056.2	1379.9	10073.0	1380.1	10087.3
GR	1380.2	10100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	98.00	27	9989.9	10000.0	50	50	50			
GR	1381.2	9903.0	1381.0	9909.2	1380.4	9910.2	1380.1	9921.2	1380.2	9932.4
GR	1380.0	9938.3	1379.5	9939.0	1379.4	9945.4	1379.5	9954.4	1379.4	9961.7
GR	1378.9	9962.4	1379.2	9969.6	1379.1	9979.0	1379.1	9984.6	1379.1	9985.7
GR	1379.3	9989.9	1377.9	9993.2	1376.9	9999.4	1377.0	10000.0	1377.0	10005.4
GR	1378.1	10015.8	1379.1	10027.8	1379.2	10041.1	1380.1	10053.1	1380.4	10068.6
GR	1380.5	10083.5	1380.4	10099.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	99.00	25	9989.2	10000.0	50	48	50			
GR	1382.1	9901.0	1382.0	9908.9	1381.1	9918.5	1380.2	9927.9	1379.8	9937.3
GR	1379.8	9946.1	1379.6	9959.4	1379.3	9960.1	1379.5	9969.4	1379.5	9980.6
GR	1379.6	9984.0	1381.0	9986.6	1381.1	9989.2	1378.7	9994.5	1377.6	9997.8
GR	1377.5	10000.0	1377.4	10002.6	1378.9	10008.7	1379.8	10014.7	1380.4	10025.1
GR	1380.5	10035.0	1380.2	10045.9	1380.7	10061.3	1380.7	10079.5	1380.8	10098.0

X	107.00	27	9958.9	10000.0	56	50	50			
GR	1384.1	9920.0	1383.5	9949.7	1383.7	9953.2	1384.8	9957.1	1384.6	9958.9
GR	1383.3	9959.5	1383.0	9969.2	1382.7	9973.4	1382.7	9974.9	1382.6	9976.2
GR	1382.9	9983.9	1382.8	9991.2	1382.7	10000.0	1382.5	10008.3	1381.9	10013.4
GR	1381.6	10015.9	1381.8	10019.8	1382.1	10023.1	1382.7	10027.2	1383.4	10034.1
GR	1383.3	10042.2	1383.3	10055.8	1383.5	10064.8	1382.9	10074.9	1382.8	10088.8
GR	1382.7	10106.1	1382.7	10117.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	108.00	28	9975.2	10022.3	77	50	50			
GR	1383.5	9920.0	1383.4	9932.2	1384.0	9936.9	1384.1	9939.5	1384.0	9943.2
GR	1383.8	9946.4	1383.4	9948.6	1383.5	9956.6	1383.5	9967.7	1383.4	9975.2
GR	1383.0	9975.9	1383.2	9983.4	1383.2	9989.1	1383.1	9997.6	1383.2	10000.0
GR	1383.0	10013.1	1382.9	10021.4	1383.3	10022.3	1383.4	10028.2	1383.1	10033.6
GR	1383.3	10038.4	1383.7	10042.4	1383.9	10049.4	1383.4	10059.0	1382.9	10072.8
GR	1382.6	10090.6	1382.5	10109.6	1382.3	10118.0	0.0	0.0	0.0	0.0
X1	109.00	30	9975.5	10021.9	61	50	50			
GR	1385.1	9920.0	1384.0	9930.4	1383.9	9941.6	1383.6	9952.9	1383.9	9964.8
GR	1383.9	9971.1	1383.8	9974.7	1383.4	9975.5	1383.5	9981.3	1383.7	9989.7
GR	1383.5	9999.1	1383.6	10000.0	1383.5	10011.6	1383.3	10021.4	1383.6	10021.9
GR	1383.7	10026.6	1383.9	10029.9	1383.8	10036.3	1383.6	10044.6	1382.9	10051.9
GR	1382.3	10058.2	1382.3	10063.6	1382.6	10068.6	1383.2	10074.2	1383.9	10081.4
GR	1384.2	10089.5	1384.0	10097.4	1384.5	10106.3	1385.0	10117.1	1385.1	10119.0
X1	110.00	31	9975.2	10021.6	51	50	50			
GR	1384.9	9933.3	1384.7	9949.1	1384.4	9953.5	1384.3	9959.6	1384.4	9965.7
GR	1384.2	9970.6	1384.2	9974.2	1383.9	9975.2	1384.0	9981.1	1384.1	9989.7
GR	1384.0	10000.0	1383.8	10009.8	1383.7	10020.9	1384.0	10021.6	1384.0	10025.9
GR	1384.6	10030.3	1385.1	10035.9	1386.0	10040.3	1386.4	10043.6	1386.5	10046.9
GR	1385.9	10052.2	1384.8	10058.4	1384.1	10063.2	1384.0	10068.3	1384.4	10073.9
GR	1385.3	10080.2	1386.4	10089.6	1387.6	10098.8	1388.3	10107.5	1388.9	10118.0
GR	1388.9	10119.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	111.00	36	9974.1	10021.4	50	51	50			
GR	1384.9	9919.0	1385.1	9929.2	1384.8	9944.2	1384.7	9944.7	1384.7	9952.5
GR	1384.3	9957.6	1384.5	9961.9	1384.6	9968.7	1384.4	9974.1	1384.0	9974.6
GR	1384.3	9980.6	1384.4	9990.7	1384.3	10000.0	1384.2	10010.4	1384.1	10020.6
GR	1384.3	10021.4	1384.5	10025.5	1384.8	10029.1	1385.6	10035.1	1386.2	10039.3
GR	1386.6	10041.5	1386.5	10044.1	1386.1	10048.9	1385.0	10056.2	1384.4	10063.0
GR	1384.5	10068.8	1385.5	10074.4	1386.6	10081.3	1388.2	10088.5	1389.4	10095.8
GR	1390.5	10102.6	1391.4	10106.6	1391.8	10113.6	1391.0	10118.9	1390.1	10120.2
GR	1389.5	10121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	112.00	29	9976.2	10022.1	50	50	50			
GR	1385.0	9920.0	1384.9	9931.1	1384.7	9948.8	1384.6	9964.4	1384.4	9976.2
GR	1384.6	9984.5	1384.7	9994.8	1384.7	10000.0	1384.6	10010.8	1384.2	10021.5
GR	1384.5	10022.1	1384.5	10026.4	1385.0	10031.7	1385.7	10037.4	1386.2	10041.4
GR	1386.5	10043.9	1386.2	10047.7	1385.3	10053.4	1384.7	10058.8	1385.0	10062.6
GR	1385.1	10069.6	1385.7	10074.3	1387.0	10085.6	1388.5	10092.3	1389.8	10098.2
GR	1390.2	10103.8	1390.5	10109.6	1390.6	10116.1	1389.6	10122.0	0.0	0.0

THIS RUN EXECUTED 06OCT93 14:59:13

 HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100-YEAR STORM

SUMMARY PRINTOUT

SECNO	Q	QLOB	QCH	QROB	ELMIN	SSTA	ENDST	DEPTH	CWSEL	CRWS	K* XNCH
* 1.000	655.00	.00	595.30	59.70	1351.40	9974.01	10100.90	3.76	1355.16	1355.16	20.00
* 2.000	655.00	.00	655.00	.00	1351.80	9979.59	10021.54	3.86	1355.66	1355.66	20.00
* 4.000	655.00	.00	655.00	.00	1351.60	9994.00	10006.00	4.51	1356.11	1356.11	20.00
5.000	655.00	217.52	274.42	163.06	1352.30	9900.40	10101.50	6.03	1358.33	.00	20.00
6.000	655.00	107.15	424.30	123.56	1352.80	9901.70	10099.80	5.58	1358.38	.00	20.00
7.000	655.00	94.36	431.72	128.92	1353.30	9900.70	10101.50	5.10	1358.40	.00	20.00
8.000	655.00	65.65	438.75	150.60	1353.70	9901.20	10100.60	4.70	1358.40	.00	20.00
9.000	655.00	.20	483.83	170.97	1354.00	9937.13	10100.40	4.40	1358.40	.00	20.00
10.000	655.00	.00	491.42	163.58	1354.00	9910.13	10100.00	4.43	1358.43	.00	20.00
11.000	655.00	17.99	436.91	200.10	1354.30	9906.20	10106.00	4.13	1358.43	.00	20.00
12.000	655.00	26.22	458.35	170.43	1354.20	9900.40	10100.20	4.25	1358.45	.00	20.00
13.000	655.00	22.73	480.03	152.24	1354.80	9900.70	10101.50	3.66	1358.46	.00	20.00
14.000	655.00	.00	515.35	139.65	1353.90	9933.79	10106.80	4.56	1358.46	.00	20.00
15.000	655.00	.00	509.28	145.72	1354.00	9965.18	10112.30	4.46	1358.46	.00	20.00
* 16.000	655.00	.00	655.00	.00	1354.30	9988.00	10012.00	3.81	1358.11	.00	20.00
* 17.000	655.00	99.94	465.67	89.39	1354.50	9947.00	10099.78	5.37	1359.87	.00	20.00
18.000	401.00	84.88	142.88	173.24	1354.90	9901.00	10101.00	5.12	1360.02	.00	20.00

SECNO	Q	QLOB	QCH	QROB	ELMIN	SSTA	ENDST	DEPTH	CWSEL	CRIWS	K*XCNH
19.000	401.00	83.73	157.02	160.26	1355.00	9901.00	10100.00	5.02	1360.02	.00	20.00
20.000	401.00	1.16	225.61	174.22	1355.10	9900.00	10101.00	4.92	1360.02	.00	20.00
21.000	401.00	51.73	202.41	146.86	1355.10	9901.00	10101.00	4.91	1360.01	.00	20.00
22.000	401.00	58.46	236.31	106.23	1355.30	9901.00	10100.00	4.70	1360.00	.00	20.00
* 23.000	401.00	12.88	324.47	63.65	1355.50	9948.74	10101.00	4.38	1359.88	.00	20.00
* 24.000	401.00	.29	400.71	.00	1355.60	9986.63	10008.79	3.99	1359.59	.00	20.00
25.000	401.00	.00	401.00	.00	1355.70	9988.31	10007.54	4.00	1359.70	.00	20.00
26.000	401.00	.00	401.00	.00	1356.10	9987.52	10006.54	3.64	1359.74	.00	20.00
27.000	401.00	.00	401.00	.00	1356.40	9988.51	10007.20	3.57	1359.97	1359.97	20.00
* 28.000	401.00	37.23	352.28	11.49	1356.30	9901.00	10085.00	4.73	1361.03	.00	20.00
* 29.000	401.00	3.80	396.37	.83	1356.60	9977.03	10011.47	4.18	1360.78	.00	20.00
31.000	401.00	.00	401.00	.00	1356.70	9994.00	10006.00	3.85	1360.55	.00	20.00
* 32.000	401.00	68.10	263.64	69.26	1356.80	9900.70	10100.20	5.18	1361.98	.00	20.00
* 33.000	372.00	108.43	206.87	56.70	1359.20	9899.80	10100.50	2.92	1362.12	.00	45.00
34.000	372.00	87.50	209.03	75.47	1358.30	9899.30	10099.90	3.82	1362.12	.00	45.00
* 35.000	372.00	32.45	211.91	127.63	1358.90	9892.70	10095.70	3.33	1362.23	1362.23	45.00
* 36.000	372.00	159.31	75.42	137.27	1359.50	9891.50	10100.90	3.15	1362.65	.00	45.00
37.000	372.00	124.91	93.13	153.96	1359.40	9885.30	10099.90	3.35	1362.75	.00	45.00
38.000	372.00	88.03	142.65	141.32	1359.50	9861.60	10100.20	3.38	1362.88	.00	45.00
* 39.000	372.00	45.01	133.27	193.72	1359.80	9879.10	10100.60	3.30	1363.10	.00	45.00
* 40.000	372.00	76.84	173.59	121.58	1360.40	9895.40	10100.80	3.11	1363.51	.00	45.00
41.000	372.00	77.70	283.04	11.26	1360.10	9867.70	10043.90	3.63	1363.73	.00	45.00
42.000	372.00	180.46	103.26	88.28	1360.60	9890.10	10095.00	3.60	1364.20	.00	45.00
* 43.000	372.00	123.01	64.71	184.28	1360.90	9912.10	10153.50	3.69	1364.59	.00	45.00
44.000	372.00	98.53	71.53	201.94	1361.00	9913.98	10159.10	3.72	1364.72	.00	45.00
45.000	372.00	95.35	68.61	208.04	1362.10	9900.00	10177.50	2.80	1364.90	.00	45.00

SECNO	Q	QLOB	QCH	QROB	ELMIN	SSTA	ENDST	DEPTH	CWSEL	CRIWS	K*VNCH
46.000	372.00	16.66	47.06	308.28	1362.30	9943.81	10253.20	2.79	1365.09	.00	45.00
47.000	372.00	7.21	84.44	280.35	1362.70	9930.36	10252.50	2.59	1365.29	.00	45.00
* 48.000	372.00	34.78	70.19	267.03	1361.70	9894.47	10235.10	3.74	1365.44	1364.98	45.00
* 49.000	372.00	46.13	82.92	242.95	1362.50	9927.50	10160.20	3.02	1365.52	1365.52	45.00
* 50.000	372.00	132.51	73.28	166.20	1362.90	9900.20	10184.39	3.16	1366.06	.00	45.00
* 51.000	372.00	.11	191.89	179.99	1362.90	9947.50	10150.63	3.30	1366.20	1366.19	45.00
* 52.000	372.00	.00	229.08	142.92	1363.70	9992.33	10177.17	2.97	1366.67	.00	45.00
* 53.000	372.00	.00	276.36	95.64	1364.20	9973.14	10162.26	2.55	1366.75	.00	45.00
* 54.000	360.00	.00	355.01	4.99	1364.60	9868.37	10182.56	2.43	1367.03	.00	45.00
* 55.000	360.00	44.71	315.29	.00	1364.90	9855.06	10115.10	2.23	1367.13	.00	45.00
* 56.000	360.00	4.03	327.68	28.29	1365.70	9905.20	10114.89	1.69	1367.39	.00	45.00
* 57.000	360.00	.00	297.70	62.30	1365.70	9924.09	10135.56	2.29	1367.99	.00	45.00
* 58.000	360.00	9.97	336.75	13.28	1365.50	9892.89	10111.27	2.91	1368.41	.00	45.00
* 59.000	360.00	20.14	325.86	14.00	1366.30	9860.32	10037.00	2.53	1368.83	.00	45.00
60.000	360.00	9.45	335.45	15.10	1366.10	9850.61	10103.73	2.91	1369.01	.00	45.00
61.000	306.00	15.42	257.86	32.71	1366.40	9839.00	10116.80	2.77	1369.17	.00	45.00
* 62.000	306.00	55.61	250.39	.00	1366.50	9840.40	10042.94	2.73	1369.23	.00	45.00
* 63.000	306.00	108.85	197.14	.00	1368.10	9867.66	10046.83	1.45	1369.55	1369.54	45.00
* 64.000	306.00	147.83	83.10	75.07	1367.30	9860.20	10141.70	2.94	1370.24	.00	45.00
* 65.000	306.00	64.96	66.15	174.89	1368.10	9874.20	10153.60	2.25	1370.35	.00	45.00
66.000	306.00	.00	259.85	46.15	1366.60	9967.82	10139.20	4.10	1370.70	1370.19	45.00
67.000	306.00	47.81	217.36	40.83	1367.50	9883.80	10127.90	3.64	1371.14	.00	45.00
* 68.000	306.00	27.91	267.06	11.03	1367.40	9898.20	10103.50	3.81	1371.21	.00	45.00
* 69.000	277.00	30.88	205.48	40.63	1367.80	9913.20	10128.00	4.10	1371.90	.00	513.56
* 70.000	277.00	95.22	168.78	13.00	1367.50	9892.30	10127.51	4.89	1372.39	.00	45.00
* 71.000	277.00	148.13	98.46	30.40	1370.70	9904.00	10122.62	1.76	1372.46	1372.44	45.00

SECNO	Q	QLOB	QCH	QROB	ELMIN	SSTA	ENDST	DEPTH	CWSEL	CRIWS	K*NXCH
* 72.000	277.00	108.19	87.08	81.73	1369.30	9905.60	10120.80	4.06	1373.36	.00	45.00
73.000	277.00	86.31	141.79	48.90	1369.80	9898.60	10118.90	3.57	1373.37	.00	45.00
74.000	277.00	9.48	27.77	239.74	1370.40	9958.47	10117.71	3.06	1373.46	.00	45.00
* 75.000	277.00	.80	128.24	147.96	1369.90	9959.40	10121.00	3.52	1373.42	1373.17	45.00
76.000	277.00	7.44	192.02	77.54	1369.50	9936.87	10090.68	4.12	1373.62	.00	45.00
* 77.000	277.00	86.28	190.71	.00	1369.60	9911.71	10031.30	4.45	1374.05	1374.05	45.00
78.000	277.00	90.35	176.86	9.79	1370.30	9894.58	10042.70	4.21	1374.51	.00	45.00
79.000	277.00	37.86	157.19	81.95	1370.10	9918.27	10070.69	4.50	1374.60	.00	45.00
80.000	277.00	97.94	164.66	14.40	1369.70	9922.61	10090.80	5.07	1374.77	.00	45.00
81.000	277.00	90.78	132.35	53.86	1371.00	9890.38	10092.70	4.52	1375.52	.00	45.00
* 82.000	277.00	105.89	141.03	30.07	1372.00	9886.17	10095.10	3.51	1375.51	.00	45.00
83.000	277.00	66.97	197.36	12.67	1371.40	9919.66	10089.10	4.13	1375.53	.00	45.00
* 84.000	277.00	14.55	250.25	12.20	1372.00	9954.18	10081.10	3.50	1375.50	1375.44	45.00
85.000	277.00	7.33	269.67	.00	1373.10	9959.95	10065.67	2.92	1376.02	1375.70	45.00
86.000	277.00	68.47	192.56	15.97	1372.80	9932.99	10078.10	3.86	1376.66	.00	45.00
* 87.000	277.00	181.91	90.35	4.73	1372.90	9913.15	10074.12	3.89	1376.79	.00	45.00
88.000	277.00	57.48	218.70	.82	1373.20	9899.89	10069.37	3.61	1376.81	.00	45.00
* 89.000	270.00	11.59	150.23	108.18	1373.20	9910.79	10123.18	3.62	1376.82	.00	45.00
90.000	270.00	25.11	127.02	117.87	1373.20	9853.70	10071.05	3.62	1376.82	.00	45.00
91.000	270.00	133.30	136.29	.41	1373.10	9865.26	10032.04	3.69	1376.79	.00	45.00
* 92.000	270.00	9.72	111.27	149.01	1373.60	9915.26	10033.50	3.67	1377.27	1377.27	45.00
93.000	270.00	12.51	119.63	137.86	1374.10	9924.36	10015.05	3.56	1377.66	1377.66	45.00
* 94.000	270.00	23.06	77.46	169.48	1374.90	9908.39	10071.26	3.25	1378.15	.00	45.00
95.000	270.00	46.38	223.41	.21	1374.50	10039.11	10149.78	3.93	1378.43	1378.43	45.00
96.000	270.00	44.73	46.47	178.79	1375.60	9927.55	10045.03	3.36	1378.96	1378.94	45.00
* 97.000	270.00	36.39	69.58	164.03	1376.50	9945.62	10020.33	2.80	1379.30	1379.30	45.00

SECNO	Q	QLOB	QCH	QROB	ELMIN	SSTA	ENDST	DEPTH	CWSEL	CRIWS	K*XCNC
98.000	270.00	35.22	43.93	190.85	1376.90	9938.63	10048.58	2.86	1379.76	.00	45.00
* 99.000	270.00	78.57	50.34	141.09	1377.40	9927.88	10045.97	2.80	1380.20	1380.20	45.00
100.000	270.00	64.83	71.30	133.87	1378.00	9954.12	10061.83	2.54	1380.54	.00	45.00
* 101.000	270.00	.00	19.97	250.03	1378.90	9968.64	10058.66	2.03	1380.93	.00	45.00
* 102.000	270.00	5.62	54.44	209.94	1379.10	9925.79	10081.15	2.20	1381.30	1381.30	45.00
* 103.000	270.00	.00	30.56	239.44	1378.90	9958.09	10113.00	2.72	1381.62	1381.62	45.00
* 104.000	270.00	.00	31.85	238.15	1378.80	9961.09	10115.00	3.70	1382.50	1382.50	45.00
* 105.000	270.00	1.58	51.41	217.02	1380.30	9930.48	10116.00	2.65	1382.95	1382.95	45.00
* 106.000	270.00	27.89	36.61	205.50	1381.20	9920.00	10117.00	2.12	1383.32	.00	45.00
107.000	270.00	.00	39.04	230.96	1381.60	9959.42	10117.00	1.88	1383.48	.00	45.00
108.000	270.00	13.95	46.55	209.50	1382.30	9920.00	10118.00	1.42	1383.72	.00	45.00
* 109.000	270.00	14.08	40.46	215.45	1382.30	9930.18	10097.82	1.72	1384.02	1384.02	45.00
* 110.000	270.00	43.09	159.04	67.87	1383.70	9945.88	10076.29	1.04	1384.74	1384.74	45.00
* 111.000	270.00	90.31	124.93	54.76	1384.00	9919.00	10073.74	1.38	1385.38	.00	45.00
112.000	270.00	129.15	91.88	48.97	1384.20	9920.00	10073.39	1.38	1385.58	.00	45.00