City of Scottsdale

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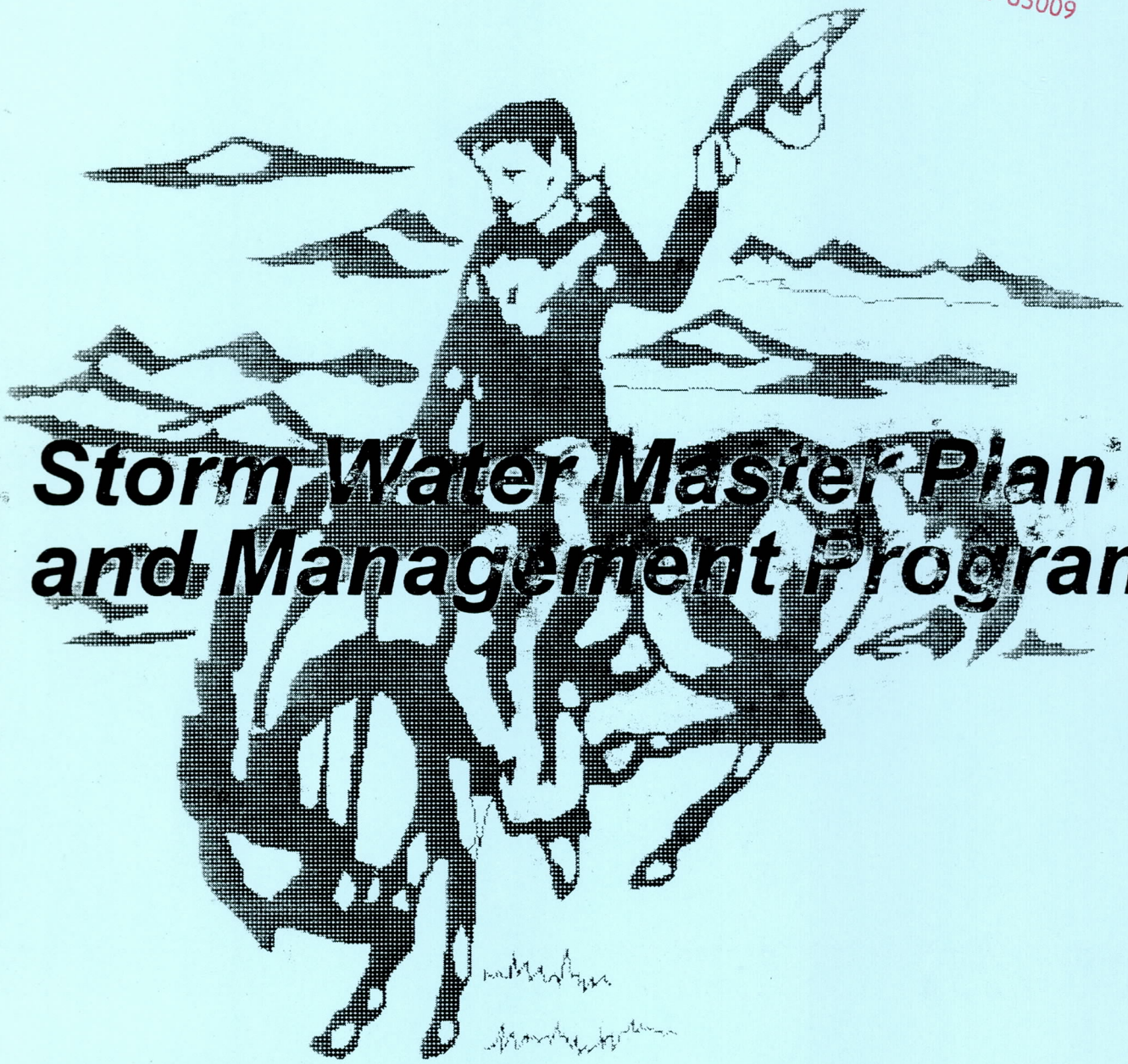


Storm Water Master Plan and Management Program

Basin Reports

Volume 1

Basins 1-10

Boyle Engineering Corporation

A027.901

City of Scottsdale
Storm Water Master Plan
and
Management Program

BASIN REPORTS

October 1993

PREFACE

In January 1993 the City of Scottsdale hired Boyle Engineering Corporation to develop a Storm Water Master Plan and Management Program to primarily address the area south of the CAP. With the City's move toward managing their infrastructure through the use of a Geographical Information System (GIS), the City rightfully requested that systems and data developed for the master plan be capable of integrating to their GIS. To facilitate the management of future changes, the City also requested a computerized Storm Water Facility Management System be developed on a Personal Computer to integrate system modeling and land use and allow City personnel to easily generate cost estimates and capital improvement plans of proposed improvements.

In developing our approach to the City's Storm Water Master Plan we have focused on the consideration of key issues by proposing a document and system that will:

- Facilitate management of the City's Storm Water System
- Facilitate updating the master plan as conditions change
- Generate Capital Improvement Programs
- Stand alone on a Personal Computer
- Integrate into the City's Geographic Information System
- Establish the foundation for a future Storm Water Utility

The results of the study are presented in the following documents:

Storm Water Master Plan	Contains a discussion of the existing conditions, basis of design, alternatives, proposed improvements including cost estimates, a capital improvement plan and water quality measures.
Basin Reports	Contains all reports and maps generated by the Storm Water Facilities Management System.
User's Manual	Documents the use of the Storm Water Facilities Management System.

This document is the **Basin Reports.**

INTRODUCTION

There are two types of reports generated by the Storm Water Facilities Management System. They are: Basin Wide Summary Reports and Individual basin reports. The Basin Wide Summary reports contain consolidated information for all major drainage basins in the system and include:

- **BASIN WIDE SUMMARY REPORTS**
  - Basin Names
  - Unit Cost Rates
  - Improvement Cost Estimate Summary
  - Capital Improvement Plan Cost Estimate Summary
  - Land Use Factors
  - Curve Numbers for Runoff Zones
  - Rainfall Data Summary

The Individual Basin reports contain specific information on the basin and include:

- **INDIVIDUAL BASIN REPORTS**
  - Improvement Cost Estimate
  - Conveyance Facilities
  - Storage Facilities
  - Land Use
  - Model Input Data
  - Drainage Area Factors
  - Rainfall Data

BASIN WIDE SUMMARY REPORTS

Code	Basin Name
**	** ALL BASINS
01	01 - WEST McKELLIPS RD. DRAINAGE BASIN
02	02 - WEST MCDOWELL RD. DRAINAGE BASIN
03	03 - BELLEVIEW ST/68th ST DRAINAGE BASIN
04	04 - MILLER RD/OAK ST DRAINAGE BASIN
05	05 - DOWNTOWN AREA DRAINAGE BASIN
06	06 - THOMAS RD/61st PL DRAINAGE BASIN
07	07 - OAK ST/60th ST DRAINAGE BASIN
08	08 - McKELLIPS/HAYDEN DRAINAGE BASIN
09	09 - PIMA RD/McKELLIPS DRAINAGE BASIN
10	10 - PIMA RD DRAINAGE BASIN
11	11 - McDOWELL/HAYDEN DRAINAGE BASIN
12	12 - THOMAS RD/HAYDEN DRAINAGE BASIN
13	13 - INDIAN SCHOOL/PIMA DRAINAGE BASIN
14	14 - WEST MCDONALD DRAINAGE BASIN
15	15 - EAST MCDONALD DRAINAGE BASIN
16	16 - MUMMY MOUNTAIN DRAINAGE BASIN

City of Scottsdale
Storm Water Master Plan and Management Program

UNIT COST RATES 10/24/93

Group	Cost Code	Description	Unit	Rate
PIPE	1000	INCH DIA OF PIPE	LF	2.00
CHANNEL	2000	CHANNEL EARTHWORKS	CY	5.00
CHANNEL	2010	CHANNEL LINING	SY	10.00
CONTINGENCY	9999	CONTINGENCY	%	20.00

Notes: 1) The unit rate for pipes is based on $/inch diameter/foot.

2) The unit rate for boxes is the same as for pipes. An equivalent pipe diameter with the same cross sectional area as the box is calculated.

City of Scottsdale

Storm Water Master Plan and Management Program

PROPOSED CONVEYANCE IMPROVEMENTS COST SUMMARY

04/18/94

Basin	Length (ft)	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
01	5,508	998,542			199,708	100,000	1,298,250
02	18,860	3,276,434			655,287		3,931,721
03	12,398	2,078,273	61,433		427,941		2,567,647
04	9,520	1,248,576			249,715		1,498,291
07	10,512	814,572		33,416	169,598		1,017,585
08	5,791	670,862			134,172		805,034
09	31,159	3,056,638	4,707,534	251,669	1,603,168		9,619,010
10	4,097	644,719			128,944		773,663
11	916	104,352			20,870		125,222
12	2,523	210,672			42,134		252,806
13	11,907	1,590,396			318,079		1,908,475
	113,191	14,694,037	4,768,967	285,085	3,949,618	100,000	23,797,707

Group/Land Use	Code	Percent Impervious	OVERLAND FLOW PARAMETERS Pervious Length	Pervious Slope	Pervious Rough's	Impervious Length	Impervious Slope	Impervious Rough's	RUNOFF COEFFICIENTS Soil Group A	B	C	D
1. RESIDENTIAL												
1 DU PER 5 ACRES	10	7	300	0.0100	0.200	100	0.0100	0.100	0.00	0.33	0.50	0.58
1 DU PER 2-3 ACRES	11	15	300	0.0100	0.200	100	0.0100	0.100	0.00	0.35	0.51	0.59
1 DU PER 1-2 ACRES	12	15	300	0.0100	0.200	100	0.0100	0.100	0.00	0.38	0.55	0.61
1-2 DU PER ACRE	13	24	150	0.0100	0.300	50	0.0100	0.100	0.00	0.40	0.56	0.62
2-4 DU PER ACRE	14	35	150	0.0100	0.300	50	0.0100	0.100	0.00	0.43	0.58	0.64
4-8 DU PER ACRE	15	54	150	0.0100	0.300	50	0.0100	0.100	0.00	0.47	0.62	0.67
8-12 DU PER ACRE	16	74	20	0.0100	0.400	200	0.0100	0.100	0.00	0.51	0.64	0.70
12-22 DU PER ACRE	17	94	20	0.0100	0.400	200	0.0100	0.100	0.00	0.76	0.83	0.87
TOURIST ACCOMMODATIONS	18	85	150	0.0100	0.300	50	0.0100	0.100	0.00	0.63	0.76	0.79
LOW INTENSITY RESORT	19	85	150	0.0100	0.300	50	0.0100	0.100	0.00	0.63	0.76	0.79
2. COMMERCIAL/OFFICE												
NEIGHBORHOOD COMMERCIAL	21	85	20	0.0100	0.400	200	0.0100	0.100	0.00	0.63	0.76	0.79
GENERAL COMMERCIAL	22	85	20	0.0100	0.400	200	0.0100	0.100	0.00	0.63	0.76	0.79
MINOR OFFICE	31	85	150	0.0100	0.300	50	0.0100	0.100	0.00	0.63	0.76	0.79
MAJOR OFFICE	32	85	20	0.0100	0.400	200	0.0100	0.100	0.00	0.63	0.76	0.79
MINOR EMPLOYMENT	33	85	20	0.0100	0.400	200	0.0100	0.100	0.00	0.63	0.76	0.79
GENERAL EMPLOYMENT	34	85	20	0.0100	0.400	200	0.0100	0.100	0.00	0.63	0.76	0.79
RESEARCH AND DEVELOPMENT	36	72	200	0.0100	0.300	200	0.0100	0.100	0.00	0.50	0.63	0.68
3. OPEN SPACE												
NATURAL OPEN SPACE	41	1	300	0.0100	0.200	100	0.0100	0.100	0.00	0.31	0.48	0.56
LIMITED USE AREA	42	1	300	0.0100	0.200	100	0.0100	0.100	0.00	0.31	0.48	0.56
DEVELOPED OPEN SPACE	43	80	300	0.0100	0.200	100	0.0100	0.100	0.00	0.33	0.56	0.66
CULTURAL/INSTITUTIONAL	44	85	200	0.0100	0.300	200	0.0100	0.100	0.00	0.63	0.76	0.79
UTILITIES	45	72	200	0.0100	0.300	200	0.0100	0.100	0.00	0.50	0.63	0.68

	Soil Group	Curve Number
Runoff Zone 1		
	A	68
	B	79
	C	86
	D	89
Runoff Zone 2		
	A	49
	B	69
	C	79
	D	84
Runoff Zone 3		
	A	63
	B	77
	C	85
	D	88

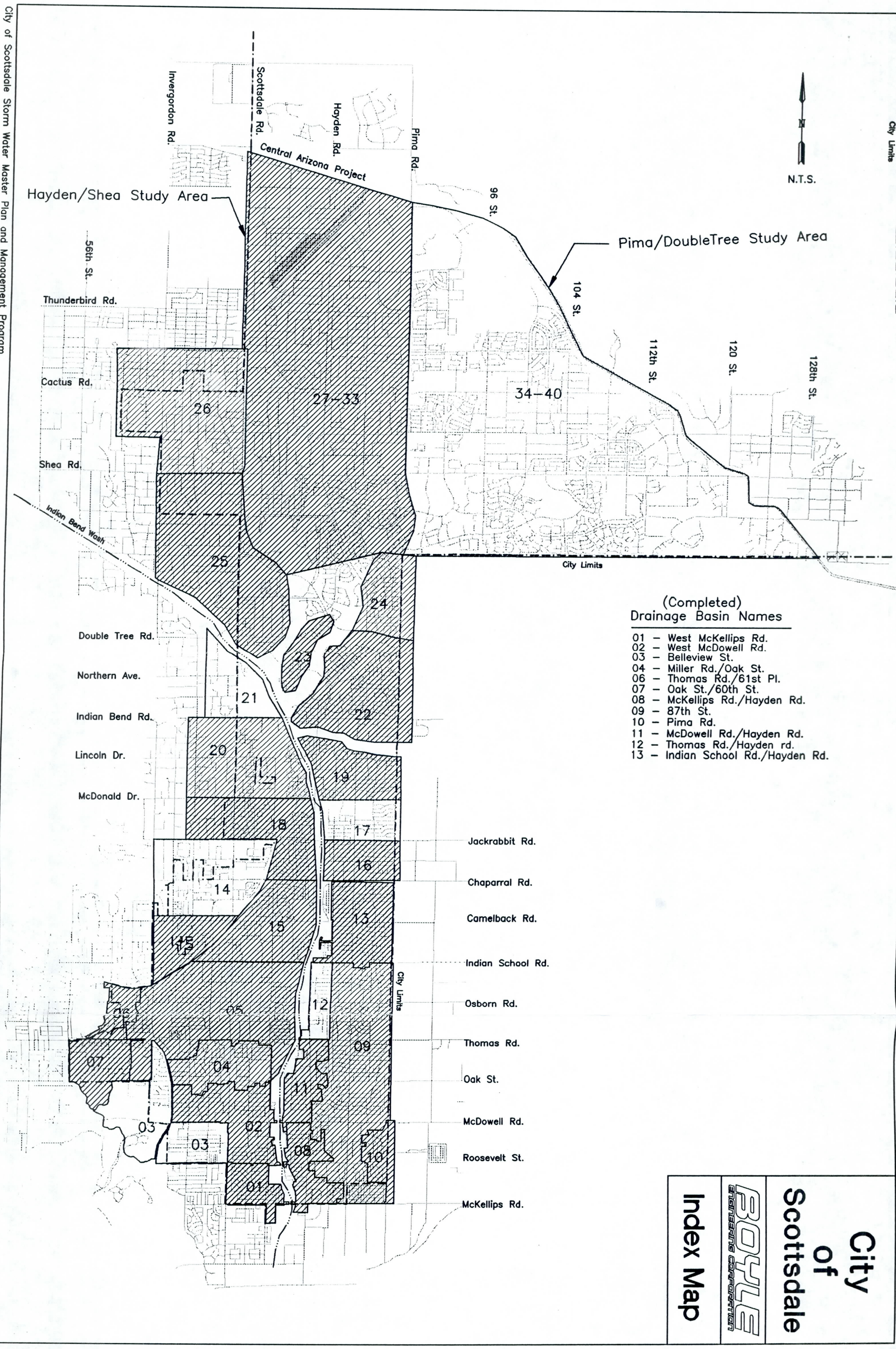
Return Period (years)	RAINFALL DURATION 5 min	10 min	15 min	30 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01 - WEST McKELLIPS RD. DRAINAGE BASIN										
2	0.25	0.38	0.46	0.61	0.74	1.17	1.46	1.15	3.50	1.35
5	0.37	0.56	0.70	0.94	1.16	1.70	2.06	2.74	4.45	6.15
10	0.45	0.68	0.86	1.16	1.44	2.05	2.46	3.24	5.11	6.97
25	0.55	0.84	1.07	1.45	1.81	2.53	3.02	3.93	6.04	8.15
50	0.63	0.97	1.24	1.68	2.10	2.91	3.45	4.47	6.77	9.08
100	0.71	1.10	1.41	1.91	2.38	3.27	3.87	3.20	7.50	3.80
02 - WEST MCDOWELL RD. DRAINAGE BASIN										
2	0.25	0.38	0.46	0.61	0.74	1.17	1.46	1.15	3.50	1.35
5	0.37	0.56	0.70	0.94	1.16	1.70	2.06	2.74	4.45	6.15
10	0.45	0.68	0.86	1.16	1.44	2.05	2.46	3.24	5.11	6.97
25	0.55	0.84	1.07	1.45	1.81	2.53	3.02	3.93	6.04	8.15
50	0.63	0.97	1.24	1.68	2.10	2.91	3.45	4.47	6.77	9.08
100	0.71	1.10	1.41	1.91	2.38	3.27	3.87	3.20	7.50	3.80
03 - BELLEVIEW ST/68th ST DRAINAGE BASIN										
2	0.25	0.38	0.46	0.61	0.74	1.17	1.46	1.15	3.50	1.35
5	0.37	0.56	0.70	0.94	1.16	1.70	2.06	2.74	4.45	6.15
10	0.45	0.68	0.86	1.16	1.44	2.05	2.46	3.24	5.11	6.97
25	0.55	0.84	1.07	1.45	1.81	2.53	3.02	3.93	6.04	8.15
50	0.63	0.97	1.24	1.68	2.10	2.91	3.45	4.47	6.77	9.08
100	0.71	1.10	1.41	1.91	2.38	3.27	3.87	3.20	7.50	3.80
04 - MILLER RD/OAK ST DRAINAGE BASIN										
2	0.31	0.47	0.57	0.75	0.91	0.99	1.05	1.15	1.25	1.35
5	0.42	0.64	0.80	1.07	1.32	1.44	1.52	1.67	1.82	1.97
10	0.49	0.75	0.95	1.28	1.59	1.73	1.83	2.01	2.19	2.38
25	0.60	0.91	1.16	1.57	1.96	2.14	2.25	2.48	2.71	2.94
50	0.68	1.04	1.33	1.80	2.24	2.45	2.58	2.84	3.11	3.37
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80
06 - THOMAS RD/61st PL DRAINAGE BASIN										
2	0.31	0.47	0.57	0.75	0.91	0.99	1.05	1.15	1.25	1.35
5	0.42	0.64	0.80	1.07	1.32	1.44	1.52	1.67	1.82	1.97
10	0.49	0.75	0.95	1.28	1.59	1.73	1.83	2.01	2.19	2.38
25	0.60	0.91	1.16	1.57	1.96	2.14	2.25	2.48	2.71	2.94
50	0.68	1.04	1.33	1.80	2.24	2.45	2.58	2.84	3.11	3.37
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80
07 - OAK ST/60th ST DRAINAGE BASIN										
2	0.31	0.47	0.57	0.75	0.91	0.99	1.05	1.15	1.25	1.35
5	0.42	0.64	0.80	1.07	1.32	1.44	1.52	1.67	1.82	1.97
10	0.49	0.75	0.95	1.28	1.59	1.73	1.83	2.01	2.19	2.38
25	0.60	0.91	1.16	1.57	1.96	2.14	2.25	2.48	2.71	2.94
50	0.68	1.04	1.33	1.80	2.24	2.45	2.58	2.84	3.11	3.37
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80

City of Scottsdale
Storm Water Master Plan and Management Program
RAINFALL DATA

04/18/94

Return Period (years)	RAINFALL DURATION 5 min	10 min	15 min	30 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs
08 - McKELLIPS/HAYDEN DRAINAGE BASIN										
2	0.31	0.47	0.57	0.75	0.91	0.99	1.05	1.15	1.25	1.35
5	0.42	0.64	0.80	1.07	1.32	1.44	1.52	1.67	1.82	1.97
10	0.49	0.75	0.95	1.28	1.59	1.73	1.83	2.01	2.19	2.38
25	0.60	0.91	1.16	1.57	1.96	2.14	2.25	2.48	2.71	2.94
50	0.68	1.04	1.33	1.80	2.24	2.45	2.58	2.84	3.11	3.37
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80
09 - PIMA RD/McKELLIPS DRAINAGE BASIN										
2	0.32	0.48	0.59	0.78	0.95	1.02	1.06	1.15	1.22	1.35
5	0.43	0.65	0.81	1.09	1.35	1.47	1.54	1.69	1.84	1.99
10	0.50	0.77	0.97	1.30	1.62	1.77	1.86	2.05	2.25	2.44
25	0.61	0.93	1.18	1.59	1.98	2.17	2.30	2.54	2.80	3.06
50	0.69	1.05	1.34	1.82	2.27	2.49	2.64	2.92	3.23	3.53
100	0.76	1.17	1.50	2.04	2.55	2.81	2.98	3.20	3.65	3.80
10 - PIMA RD DRAINAGE BASIN										
2	0.32	0.48	0.59	0.78	0.95	1.02	1.06	1.15	1.22	1.35
5	0.43	0.65	0.81	1.09	1.35	1.47	1.54	1.69	1.84	1.99
10	0.50	0.77	0.97	1.30	1.62	1.77	1.86	2.05	2.25	2.44
25	0.61	0.93	1.18	1.59	1.98	2.17	2.30	2.54	2.80	3.06
50	0.69	1.05	1.34	1.82	2.27	2.49	2.64	2.92	3.23	3.53
100	0.76	1.17	1.50	2.04	2.55	2.81	2.98	3.20	3.65	3.80
11 - McDOWELL/HAYDEN DRAINAGE BASIN										
2	0.31	0.47	0.57	0.75	0.91	0.99	1.05	1.15	1.25	1.35
5	0.42	0.64	0.80	1.07	1.32	1.44	1.52	1.67	1.82	1.97
10	0.49	0.75	0.95	1.28	1.59	1.73	1.83	2.01	2.19	2.38
25	0.60	0.91	1.16	1.57	1.96	2.14	2.25	2.48	2.71	2.94
50	0.68	1.04	1.33	1.80	2.24	2.45	2.58	2.84	3.11	3.37
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80
12 - THOMAS RD/HAYDEN DRAINAGE BASIN										
2	0.31	0.47	0.57	0.75	0.91	0.99	1.05	1.15	1.25	1.35
5	0.42	0.64	0.80	1.07	1.32	1.44	1.52	1.67	1.82	1.97
10	0.49	0.75	0.95	1.28	1.59	1.73	1.83	2.01	2.19	2.38
25	0.60	0.91	1.16	1.57	1.96	2.14	2.25	2.48	2.71	2.94
50	0.68	1.04	1.33	1.80	2.24	2.45	2.58	2.84	3.11	3.37
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80
13 - INDIAN SCHOOL/PIMA DRAINAGE BASIN										
2	0.31	0.47	0.57	0.75	0.91	0.99	1.05	1.15	1.25	1.35
5	0.42	0.64	0.80	1.07	1.32	1.44	1.52	1.67	1.82	1.97
10	0.49	0.75	0.95	1.28	1.59	1.73	1.83	2.01	2.19	2.38
25	0.60	0.91	1.16	1.57	1.96	2.14	2.25	2.48	2.71	2.94
50	0.68	1.04	1.33	1.80	2.24	2.45	2.58	2.84	3.11	3.37
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80

INDIVIDUAL BASIN REPORTS


N.T.S.
Hayden/Shea Study Area
Pima/DoubleTree Study Area
Central Arizona Project
Scottsdale Rd.
Hayden Rd.
Pima Rd.
Invergordon Rd.
56th St.
96 St.
104 St.
112th St.
120 St.
128th St.
Thunderbird Rd.
Cactus Rd.
Shea Rd.
Indian Bend Wash
City Limits
Double Tree Rd.
Northern Ave.
Indian Bend Rd.
Lincoln Dr.
McDonald Dr.
Jackrabbit Rd.
Chaparral Rd.
Camelback Rd.
Indian School Rd.
Osborn Rd.
Thomas Rd.
Oak St.
McDowell Rd.
Roosevelt St.
McKellips Rd.
26
27-33
34-40
25
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18
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08
07
05
04
03
02
01
(Completed)
Drainage Basin Names
01 – West McKellips Rd.
02 – West McDowell Rd.
03 – Belleview St.
04 – Miller Rd./Oak St.
06 – Thomas Rd./61st Pl.
07 – Oak St./60th St.
08 – McKellips Rd./Hayden Rd.
09 – 87th St.
10 – Pima Rd.
11 – McDowell Rd./Hayden Rd.
12 – Thomas Rd./Hayden rd.
13 – Indian School Rd./Hayden Rd.
City of Scottsdale
BOYLE ENGINEERING CORPORATION
Index Map

City of Scottsdale

Storm Water Master Plan and Management Program

PROPOSED CONVEYANCE IMPROVEMENTS COST

01 - WEST McKELLIPS DRAINAGE BASIN

10/24/93

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
010010-010020	357	1.6	41,397			8,279		49,676
010020-010040	243	1.6	32,874			6,575		39,448
010040-010050	417	1.6	56,413			11,283		67,696
010050-010060	538	1.6	93,577			18,715		112,292
010060-010070	1,305	1.6	252,206			50,441		302,647
010070-010080	671	1.6	155,614			31,123		186,737
010080-010090	937	1.6	217,303			43,461		260,763
010210-010220	821	1.6	111,067			22,213		133,281
010220-010070	219	1.6	38,092			7,618		45,710
	5,508		998,542			199,708		1,198,250

ID: 010010-010020

Type: ROADWAY
Length: 357
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 74TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	53
PROPOSED	Pipe:	1	0.0078	0.013	36						59
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	59
										ROW+Section Capacity:	112

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $41,397
Total Improvements Cost: $49,676

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	19	36	72	91	49	110

ID: 010020-010040

Type: ROADWAY
Length: 243
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 74TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	53
PROPOSED	Pipe:	1	0.0078	0.013	42						89
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	89
										ROW+Section Capacity:	142

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $32,874
Total Improvements Cost: $39,448

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	27	51	103	130	70	159

ID: 010040-010050

Type: ROADWAY
Length: 417
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 74TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	53
PROPOSED	Pipe:	1	0.0078	0.013	42						89
	Box:										
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	89
										ROW+Section Capacity:	142

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $56,413
Total Improvements Cost: $67,696

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	27	50	101	128	70	157

ID: 010050-010060

Type: ROADWAY
Length: 538
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 74TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	53
PROPOSED	Pipe:	1	0.0078	0.013	54						174
	Box:										
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	174
										ROW+Section Capacity:	227

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $93,577
Total Improvements Cost: $112,292

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	58	107	211	261	147	316

ID: 010060-010070

Type: ROADWAY
Length: 1,305
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MCKELLIPS RD
Drawing No(s):
Right of Way: 120
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	130
PROPOSED	Pipe:	1	0.0078	0.013	60						230
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	230
										ROW+Section Capacity:	360

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $252,206
Total Improvements Cost: $302,647

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	78	145	278	347	199	419

ID: 010070-010080

Type: PIPE
Length: 671
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MCKELLIPS RD
Drawing No(s):
Right of Way: 100
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0078	0.013	48						127
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	85
PROPOSED	Pipe:	1	0.0078	0.013	72						374
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	501
										ROW+Section Capacity:	586

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $155,614
Total Improvements Cost: $186,737

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	123	229	453	571	320	692

ID: 010080-010090

Type: PIPE
Length: 937
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MCKELLIPS RD
Drawing No(s):
Right of Way: 150
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0078	0.013	48						127
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	130
PROPOSED	Pipe:	1	0.0078	0.013	72						374
	Box:										
	Channel:								Lined: N		
	Improvement Year:									Section Capacity:	501
										ROW+Section Capacity:	631

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $217,303
Total Improvements Cost: $260,763

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	131	246	486	611	343	743

ID: 010160-010040

Type: ROADWAY
Length: 147
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: ** OVERLAND FLOW
Drawing No(s):
Right of Way: 10
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	19
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:									Section Capacity:	
										ROW+Section Capacity:	19

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):			2	3		6

ID: 010210-010220

Street Name: N MILLER RD
Type: ROADWAY
Drawing No(s):
Length: 821
Right of Way: 70
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	53
PROPOSED	Pipe:	1	0.0078	0.013	42						89
	Box:										
	Channel:								Lined: N		
Improvement Year:											
										Section Capacity:	89
										ROW+Section Capacity:	142

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $111,067
Total Improvements Cost: $133,281

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	26	47	92	116	66	141

ID: 010220-010070

Street Name: N MILLER RD
Type: ROADWAY
Drawing No(s):
Length: 219
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	86
PROPOSED	Pipe:	1	0.0078	0.013	54						174
	Box:										
	Channel:								Lined: N		
Improvement Year:											
										Section Capacity:	174
										ROW+Section Capacity:	260

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $38,092
Total Improvements Cost: $45,710

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	44	82	161	203	113	247

ID: 010310-010080

Type: ROADWAY
Length: 211
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: ** OVERLAND FLOW
Drawing No(s):
Right of Way: 20
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	33
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	33

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):			5	9	2	25

ID: 010410-010080

Type: PIPE
Length: 111
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: PRIVATE
Drawing No(s):
Right of Way:
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0078	0.013	18						9
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	9
										ROW+Section Capacity:	9

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	9	16	27	33	21	39

ID: 010510-010520

Type: PIPE
Length: 444
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: PRIVATE
Drawing No(s):
Right of Way:
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0078	0.013	24						20
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	20
										ROW+Section Capacity:	20

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	12	21	36	43	27	50

ID: 010610-010620

Type: ROADWAY
Length: 123
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: ** OVERLAND FLOW
Drawing No(s):
Right of Way: 20
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0078	Equivalent Roadway (%): 100						ROW Capacity:	33
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	33

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	25	44	76	90	58	105

ID: 010160

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	1.0	500	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	0.30	0.30							
Elevation:	0.00	1.00	2.00							
Discharge:	0.00	0.01	0.01							

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):						
Basin Design (100yr-2hr):	0.3					

ID: 010310

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	1.0	500	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	1.10	1.10							
Elevation:	0.00	1.00	2.00							
Discharge:	0.00	0.01	0.01							

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):	1.0	1.0	1.0	1.0	1.0	1.0
Basin Design (100yr-2hr):	1.1					

City of Scottsdale
Storm Water Master Plan and Management Program
LAND USE BASIN SUMMARY
01 - WEST McKELLIPS DRAINAGE BASIN

10/24/93

Group	Land Use	Code	Area (acres)	Percent Impervious (%)	Impervious Area (acres)
	2-4 DU PER ACRE	14	137.87	35	48.25
	4-8 DU PER ACRE	15	25.89	54	13.98
	12-22 DU PER ACRE	17	25.93	94	24.37
	TOURIST ACCOMMODATIONS	18	5.26	85	4.47
TOTAL RESIDENTIAL			194.95	47	91.08
	GENERAL COMMERCIAL	22	17.68	85	15.03
TOTAL COMMERCIAL/OFFICE			17.68	85	15.03
	LIMITED USE AREA	42	1.28	1	0.01
	CULTURAL/INSTITUTIONAL	44	2.97	85	2.53
TOTAL OPEN SPACE			4.26	60	2.54
TOTAL	01 - WEST McKELLIPS DRAINAGE BASIN		216.89	50	108.65

```
ID                                                                      10
IT     2                300                                             20
IO     5                                                                30
KK010010   BASIN                                                        40
BA 0.044                                                                50
PH 0.000   0.000   0.450   0.860   1.440   2.050   2.460   3.240        60
LS     0      79       0       0      98       0                        70
UK   150  0.0100    0.30      65                                        80
UK    50  0.0100    0.10      35                                        90
RK  1453  0.0078    0.02            TRAP      38     1.0                100
RK   938  0.0078    0.02            TRAP      45     1.0                110
KK010020    FROM  010010                                                120
RK   357  0.0078   0.017            TRAP    45.0       1                130
KK010020   BASIN                                                        140
BA 0.020                                                                150
LS     0      79       0       0      98       0                        160
UK   150  0.0100    0.30      65                                        170
UK    50  0.0100    0.10      35                                        180
RK  1391  0.0078    0.02            TRAP      38     1.0                190
KK010020 COMBINE                                                        200
HC     2                                                                210
KK010040    FROM  010020                                                220
RK   243  0.0078   0.017            TRAP    45.0       1                230
KK010160   BASIN                                                        240
BA 0.004                                                                250
LS     0      79       0       0      98       0                        260
UK   150  0.0100    0.30      65                                        270
UK    50  0.0100    0.10      35                                        280
RK   576  0.0078    0.04            TRAP      20     1.0                290
KK010160 STORAGE                                                        300
RS     1    STOR                                                        310
SV  0.00    0.30    0.30    0.00    0.00    0.00    0.00    0.00    0.00    0.00  320
SE  0.00    1.00    2.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00  330
SQ  0.00    0.01    0.01    0.00    0.00    0.00    0.00    0.00    0.00    0.00  340
ST   1.0     500     3.0     1.5                                        350
KK010040    FROM  010160                                                360
RK   147  0.0078   0.017            TRAP     7.5       1                370
KK010040 COMBINE                                                        380
HC     2                                                                390
KK010050    FROM  010040                                                400
RK   417  0.0078   0.017            TRAP    45.0       1                410
KK010050   BASIN                                                        420
BA 0.053                                                                430
LS     0      79       0       0      98       0                        440
UK   104  0.0100    0.34      47                                        450
UK   103  0.0100    0.10      53                                        460
RK  1791  0.0078    0.02            TRAP      38     1.0                470
RK  1509  0.0078    0.02            TRAP      38     1.0                480
KK010050 COMBINE                                                        490
HC     2                                                                500
KK010060    FROM  010050                                                510
RK   538  0.0078   0.017            TRAP    45.0       1                520
KK010060   BASIN                                                        530
BA 0.033                                                                540
LS     0      79       0       0      98       0                        550
```

```
UK    109  0.0100    0.33      34                                                  560
UK     98  0.0100    0.10      66                                                  570
RK   1938  0.0078    0.02            TRAP      90      1.0                         580
KK010060 COMBINE                                                                   590
HC      2                                                                          600
KK010070    FROM  010060                                                           610
RK   1305  0.0078   0.017            TRAP    90.0       1                         620
KK010070   BASIN                                                                   630
BA 0.017                                                                           640
LS      0      79       0       0      98       0                                  650
UK    146  0.0100    0.30      63                                                  660
UK     55  0.0100    0.10      37                                                  670
RK   1305  0.0078    0.02            TRAP      80      1.0                         680
KK010210   BASIN                                                                   690
BA 0.054                                                                           700
LS      0      79       0       0      98       0                                  710
UK    154  0.0100    0.30      61                                                  720
UK     62  0.0100    0.10      39                                                  730
RK    967  0.0078    0.02            TRAP      38      1.0                         740
RK   1481  0.0078    0.02            TRAP      60      1.0                         750
KK010220    FROM  010210                                                           760
RK    821  0.0078   0.017            TRAP    54.8       1                         770
KK010220   BASIN                                                                   780
BA 0.041                                                                           790
LS      0      79       0       0      98       0                                  800
UK    149  0.0100    0.30      61                                                  810
UK     52  0.0100    0.10      39                                                  820
RK   1302  0.0078    0.02            TRAP      38      1.0                         830
RK    821  0.0078    0.02            TRAP      60      1.0                         840
KK010220 COMBINE                                                                   850
HC      2                                                                          860
KK010070    FROM  010220                                                           870
RK    219  0.0078   0.017            TRAP    60.0       1                         880
KK010070 COMBINE                                                                   890
HC      3                                                                          900
KK010080    FROM  010070                                                           910
RK    671  0.0078   0.013            CIRC     4.0                                  920
KK010080   BASIN                                                                   930
BA 0.010                                                                           940
LS      0      79       0       0      98       0                                  950
UK    135  0.0100    0.32      46                                                  960
UK    112  0.0100    0.10      54                                                  970
RK    825  0.0078    0.02            TRAP      75      1.0                         980
KK010310   BASIN                                                                   990
BA 0.009                                                                          1000
LS      0      79       0       0      98       0                                 1010
UK     22  0.0100    0.40      11                                                 1020
UK    197  0.0100    0.10      89                                                 1030
RK    932  0.0078    0.04            TRAP      20      1.0                        1040
KK010310 STORAGE                                                                  1050
RS      1    STOR                                                                 1060
SV   0.00    1.10    1.10    0.00    0.00    0.00    0.00    0.00    0.00    0.00 1070
SE   0.00    1.00    2.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00 1080
SQ   0.00    0.01    0.01    0.00    0.00    0.00    0.00    0.00    0.00    0.00 1090
ST    1.0     500     3.0     1.5                                                 1100
```

```
KK010080    FROM  010310                                          1110
RK   211  0.0078   0.017          TRAP   15.0     1              1120
KK010410   BASIN                                                  1130
BA 0.012                                                          1140
LS     0      79       0     0     98      0                      1150
UK   150  0.0100    0.30    46                                    1160
UK    51  0.0100    0.10    54                                    1170
RK   350  0.0078    0.02          TRAP     23    1.0              1180
RK   943  0.0078    0.02          TRAP     23    1.0              1190
KK010080    FROM  010410                                          1200
RK   111  0.0078   0.013          CIRC    1.5                      1210
KK010080 COMBINE                                                  1220
HC     4                                                          1230
KK010090    FROM  010080                                          1240
RK   937  0.0078   0.013          CIRC    4.0                      1250
KK010510   BASIN                                                  1260
BA 0.016                                                          1270
LS     0      79       0     0     98      0                      1280
UK   151  0.0100    0.30    46                                    1290
UK    51  0.0100    0.10    54                                    1300
RK  1185  0.0078    0.02          TRAP     23    1.0              1310
KK010520    FROM  010510                                          1320
RK   444  0.0078   0.013          CIRC    2.0                      1330
KK010610   BASIN                                                  1340
BA 0.026                                                          1350
LS     0      79       0     0     98      0                      1360
UK    21  0.0100    0.40     7                                    1370
UK   199  0.0100    0.10    93                                    1380
RK  1682  0.0078    0.02          TRAP     23    1.0              1390
KK010620    FROM  010610                                          1400
RK   123  0.0078   0.017          TRAP   15.0     1              1410
ZZ                                                                1420
```

BASIN ID: 010010 Area: 0.044 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,453	0.0078	0.017	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	938	0.0078	0.017	TRAP	45.0	1.0

BASIN ID: 010020 Area: 0.020 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:						
Impervious:	50	0.0100	0.100	35	Main:	1,391	0.0078	0.017	TRAP	37.5	1.0

BASIN ID: 010050 Area: 0.053 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	104	0.0100	0.335	47	Collector:	1,791	0.0078	0.017	TRAP	37.5	1.0
Impervious:	103	0.0100	0.100	53	Main:	1,509	0.0078	0.017	TRAP	37.5	1.0

BASIN ID: 010060 Area: 0.033 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	109	0.0100	0.332	34	Collector:						
Impervious:	98	0.0100	0.100	66	Main:	1,938	0.0078	0.017	TRAP	90.0	1.0

BASIN ID: 010070 Area: 0.017 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	146	0.0100	0.303	63	Collector:						
Impervious:	55	0.0100	0.100	37	Main:	1,305	0.0078	0.017	TRAP	80.0	1.0

BASIN ID: 010080 Area: 0.010 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	135	0.0100	0.315	46	Collector:						
Impervious:	112	0.0100	0.100	54	Main:	825	0.0078	0.017	TRAP	75.0	1.0

BASIN ID: 010160 Area: 0.004 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:						
Impervious:	50	0.0100	0.100	35	Main:	576	0.0078	0.035	TRAP	20.0	1.0

BASIN ID: 010210 Area: 0.054 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	154	0.0100	0.300	61	Collector:	967	0.0078	0.017	TRAP	37.5	1.0
Impervious:	62	0.0100	0.100	39	Main:	1,481	0.0078	0.017	TRAP	60.0	1.0

BASIN ID: 010220 Area: 0.041 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	149	0.0100	0.301	61	Collector:	1,302	0.0078	0.017	TRAP	37.5	1.0
Impervious:	52	0.0100	0.100	39	Main:	821	0.0078	0.017	TRAP	60.0	1.0

BASIN ID: 010310 Area: 0.009 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	22	0.0100	0.398	11	Collector:						
Impervious:	197	0.0100	0.100	89	Main:	932	0.0078	0.035	TRAP	20.0	1.0

BASIN ID: 010410 Area: 0.012 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	46	Collector:	350	0.0078	0.017	TRAP	22.5	1.0
Impervious:	51	0.0100	0.100	54	Main:	943	0.0078	0.017	TRAP	22.5	1.0

BASIN ID: 010510 Area: 0.016 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	151	0.0100	0.299	46	Collector:						
Impervious:	51	0.0100	0.100	54	Main:	1,185	0.0078	0.017	TRAP	22.5	1.0

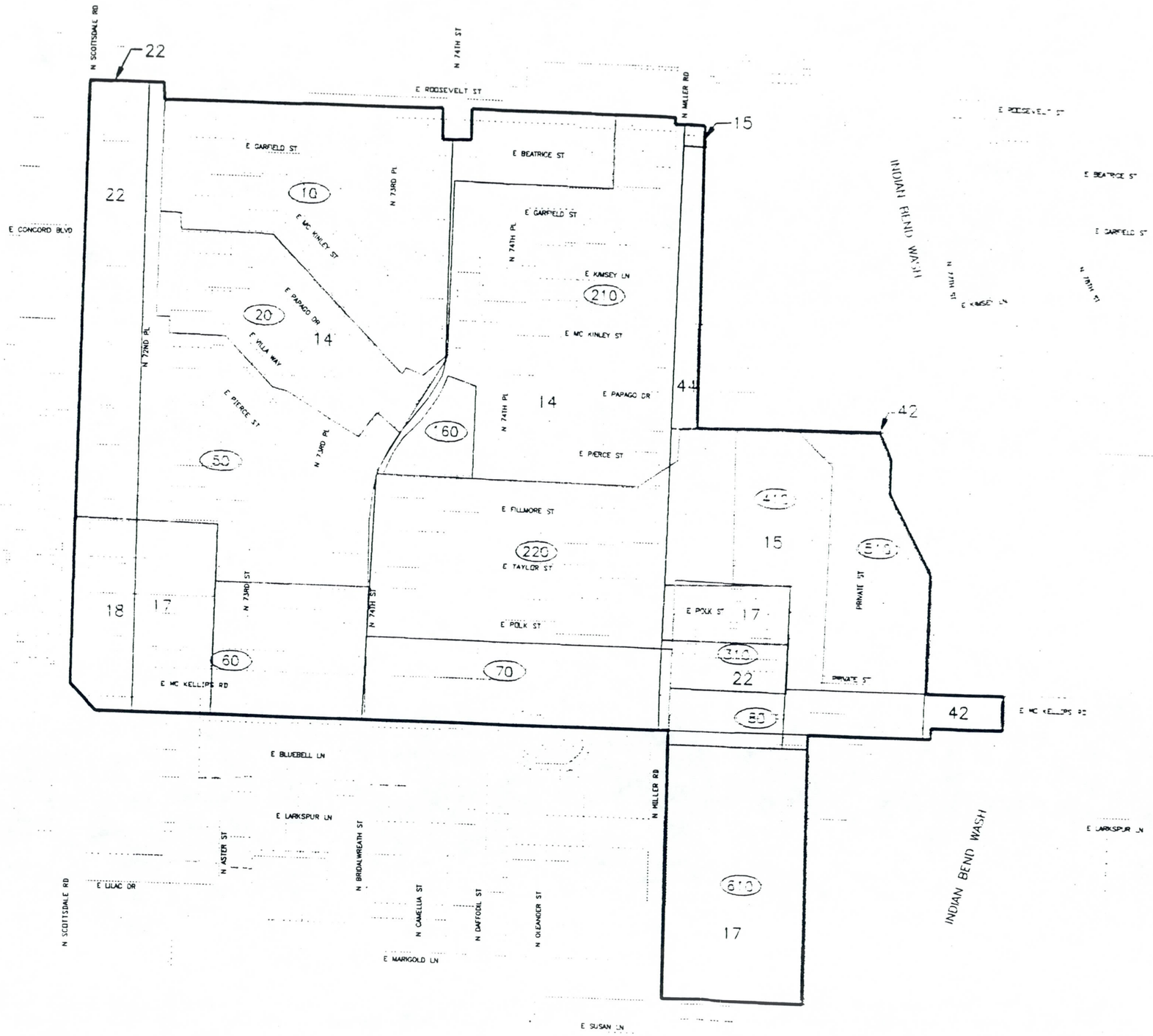
BASIN ID: 010610 Area: 0.026 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	21	0.0100	0.399	7	Collector:						
Impervious:	199	0.0100	0.100	93	Main:	1,682	0.0078	0.017	TRAP	22.5	1.0

City of Scottsdale
Storm Water Master Plan and Management Program
RAINFALL DATA
01 - WEST McKELLIPS RD. DRAINAGE BASIN

04/18/94

Return Period (years)	RAINFALL DURATION 5 min	10 min	15 min	30 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs
2	0.25	0.38	0.46	0.61	0.74	1.17	1.46	1.15	3.50	1.35
5	0.37	0.56	0.70	0.94	1.16	1.70	2.06	2.74	4.45	6.15
10	0.45	0.68	0.86	1.16	1.44	2.05	2.46	3.24	5.11	6.97
25	0.55	0.84	1.07	1.45	1.81	2.53	3.02	3.93	6.04	8.15
50	0.63	0.97	1.24	1.68	2.10	2.91	3.45	4.47	6.77	9.08
100	0.71	1.10	1.41	1.91	2.38	3.27	3.87	3.20	7.50	3.80



0 250 500

1" = 500'

Legend

Basin Boundary

(610) Drainage Area

Land Use Boundary

Land Uses

10 – 1 DU PER 5 ACRES
11 – 1 DU PER 2–3 ACRES
12 – 1 DU PER 1–2 ACRES
13 – 1–2 DU PER ACRE
14 – 2–4 DU PER ACRE
15 – 4–8 DU PER ACRE
16 – 8–12 DU PER ACRE
17 – 12–22 DU PER ACRE
18 – TOURIST ACCOMMODATIONS
19 – LOW INTENSITY RESORT
21 – NEIGHBORHOOD COMMERCIAL
22 – GENERAL COMMERCIAL
31 – MINOR OFFICE
32 – MAJOR OFFICE
33 – MINOR EMPLOYMENT
34 – GENERAL EMPLOYMENT
36 – RESEARCH AND DEVELOPMENT
41 – NATURAL OPEN SPACE
42 – LIMITED USE AREA
43 – DEVELOPED OPEN SPACE
44 – CULTURAL/INSTITUTIONAL
45 – UTILITIES

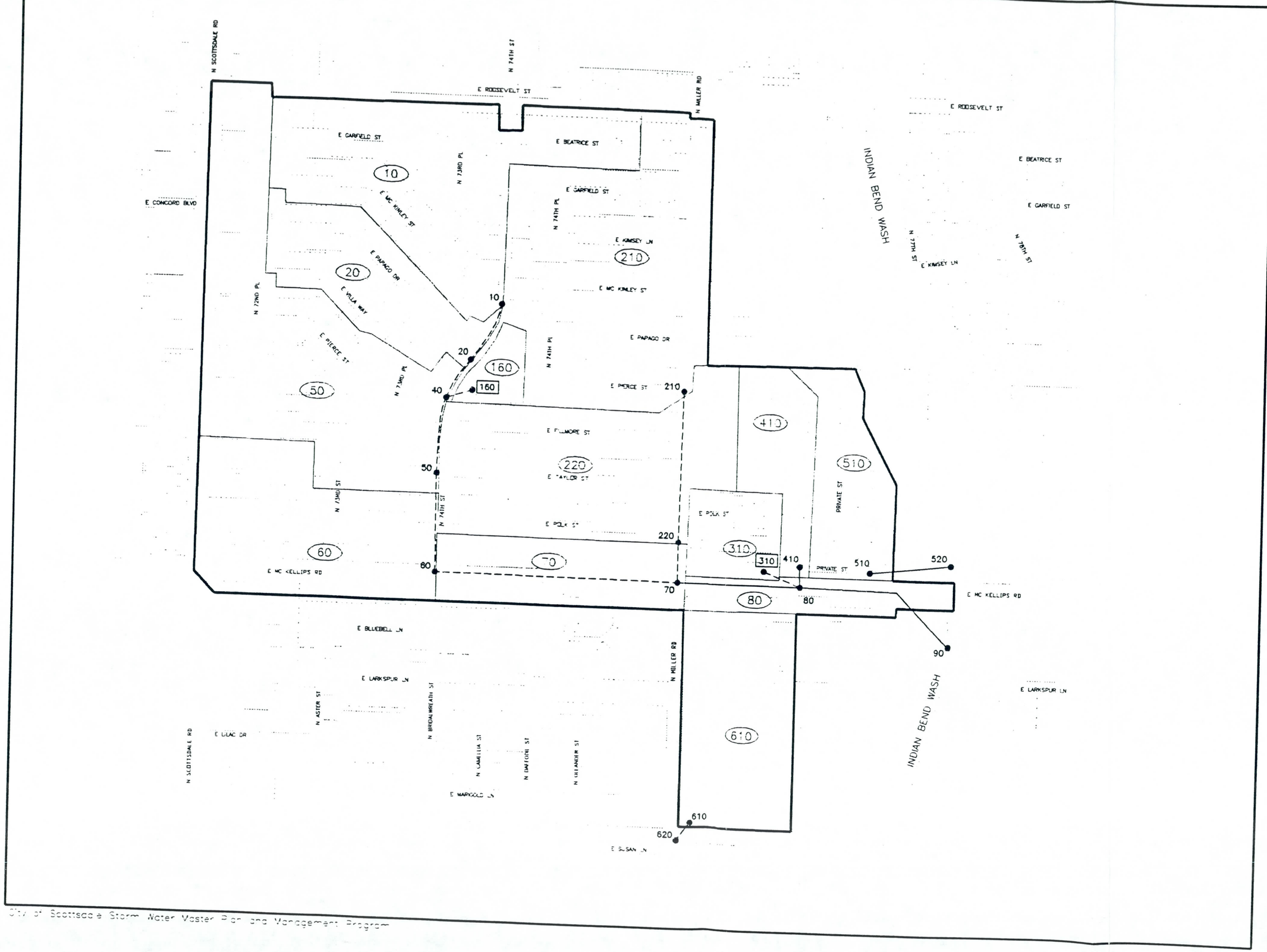
Soil Group B

Runoff Zone 1

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 01 W Mckellips Land Use Map



0 250 500

1" = 500'

Legend

- 101 Analysis Node
- 101 Storage Basin
- Basin Boundary
- 610 Drainage Area
- Roadway Reach
- Channel
- Pipe/Culvert

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 01 W Mckellips Drainage Map

City of Scottsdale

Storm Water Master Plan and Management Program

PROPOSED CONVEYANCE IMPROVEMENTS COST

02 - WEST McDOWELL DRAINAGE BASIN

10/24/93

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
020010-020020	1,331	1.6	180,061			36,012		216,074
020020-020030	1,314	1.6	228,551			45,710		274,261
020030-020040	1,251	1.6	241,770			48,354		290,124
020040-020050	1,417	1.6	301,236			60,247		361,483
020050-020060	1,355	1.6	288,056			57,611		345,667
020060-020070	3,599	1.6	765,102			153,020		918,122
020210-020220	1,411	1.6	190,884			38,177		229,061
020220-020040	1,241	1.6	191,870			38,374		230,244
020410-020420	1,246	1.6	120,402			24,080		144,482
020420-020430	931	1.6	143,941			28,788		172,729
020430-020440	894	1.6	155,498			31,100		186,598
020510-020520	731	1.6	127,147			25,429		152,576
020610-020620	1,318	1.6	203,775			40,755		244,530
020620-020630	467	1.6	90,253			18,051		108,304
020710-020720	354	1.6	47,890			9,578		57,468
	18,860		3,276,434			655,287		3,931,721

ID: 020010-020020

Type: ROADWAY
Length: 1,331
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E PALM LN
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	48
PROPOSED	Pipe:	1	0.0063	0.013	42						80
	Box:										
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	80
										ROW+Section Capacity:	128

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $180,061
Total Improvements Cost: $216,074

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	26	47	92	115	64	141

ID: 020020-020030

Type: ROADWAY
Length: 1,314
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E PALM LN
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	48
PROPOSED	Pipe:	1	0.0063	0.013	54						156
	Box:										
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	156
										ROW+Section Capacity:	204

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $228,551
Total Improvements Cost: $274,261

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	54	102	204	256	141	309

ID: 020030-020040

Type: PIPE
Length: 1,251
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N SCOTTSDALE RD
Drawing No(s):
Right of Way: 120
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0063	0.013	36						53
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	117
PROPOSED	Pipe:	1	0.0063	0.013	60						207
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	260
										ROW+Section Capacity:	377

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $241,770
Total Improvements Cost: $290,124

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	105	196	374	466	267	555

ID: 020040-020050

Type: PIPE
Length: 1,417
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N SCOTTSDALE RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0063	0.013	66						267
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	117
PROPOSED	Pipe:	1	0.0063	0.013	66						267
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	533
										ROW+Section Capacity:	650

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $301,236
Total Improvements Cost: $361,483

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	205	372	691	857	507	1,019

ID: 020050-020060

Type: PIPE
Length: 1,355
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: ALLEY
Drawing No(s):
Right of Way: 20
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0063	0.013	72						336
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	30
PROPOSED	Pipe:	1	0.0063	0.013	66						267
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	603
										ROW+Section Capacity:	633

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $288,056
Total Improvements Cost: $345,667

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	207	380	703	853	508	1,025

ID: 020060-020070

Type: PIPE
Length: 3,599
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N MILLER RD
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0063	0.013	78						416
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	77
PROPOSED	Pipe:	1	0.0063	0.013	66						267
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	683
										ROW+Section Capacity:	760

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $765,102
Total Improvements Cost: $918,122

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	255	463	839	1,039	623	1,240

ID: 020210-020220

Type: PIPE
Length: 1,411
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MCDOWELL RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0063	0.013	18						8
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	117
PROPOSED	Pipe:	1	0.0063	0.013	42						80
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	88
										ROW+Section Capacity:	205

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $190,884
Total Improvements Cost: $229,061

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	28	52	96	120	70	143

ID: 020220-020040

Type: PIPE
Length: 1,241
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MCDOWELL RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0063	0.013	24						18
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	117
PROPOSED	Pipe:	1	0.0063	0.013	48						114
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	132
										ROW+Section Capacity:	249

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $191,870
Total Improvements Cost: $230,244

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	47	88	165	203	118	240

ID: 020310-020060

Type: PIPE
Length: 123
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 74TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0063	0.013	24						18
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	48
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	18
										ROW+Section Capacity:	66

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	6	12	21	26	16	31

ID: 020410-020420

Type: ROADWAY
Length: 1,246
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 74TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	48
PROPOSED	Pipe:	1	0.0063	0.013	30						33
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	33
										ROW+Section Capacity:	80

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $120,402
Total Improvements Cost: $144,482

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	13	22	41	50	30	59

ID: 020420-020430

Type: ROADWAY
Length: 931
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E ROOSEVELT ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	48
PROPOSED	Pipe:	1	0.0063	0.013	48						114
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	114
										ROW+Section Capacity:	162

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $143,941
Total Improvements Cost: $172,729

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	42	78	151	187	106	225

ID: 020430-020440

Type: ROADWAY
Length: 894
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E ROOSEVELT ST
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	77
PROPOSED	Pipe:	1	0.0063	0.013	54						156
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	156
										ROW+Section Capacity:	233

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $155,498
Total Improvements Cost: $186,598

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	47	89	176	221	124	269

ID: 020510-020520

Type: ROADWAY
Length: 731
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N MILLER RD
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	77
PROPOSED	Pipe:	1	0.0063	0.013	54						156
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	156
										ROW+Section Capacity:	233

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $127,147
Total Improvements Cost: $152,576

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	54	98	173	208	132	247

ID: 020520-020530

Type: NATURAL CHANNEL
Length: 540
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: EASEMENT
Drawing No(s):
Right of Way:
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:		0.0063	0.027					48	22	353
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	353
										ROW+Section Capacity:	353

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	71	129	236	284	174	341

ID: 020610-020620

Type: ROADWAY
Length: 1,318
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MCDOWELL RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0063	Equivalent Roadway (%): 100						ROW Capacity:	117
PROPOSED	Pipe:	1	0.0063	0.013	48						114
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	114
										ROW+Section Capacity:	231

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $203,775
Total Improvements Cost: $244,530

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	39	73	144	178	101	214

ID: 020620-020630

Type: PIPE
Length: 467
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MCDOWELL RD
Drawing No(s):
Right of Way:
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0063	0.013	15						5
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0063	0.013	60						207
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	212
										ROW+Section Capacity:	212

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $90,253
Total Improvements Cost: $108,304

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	62	119	236	297	166	359

ID: 020710-020720

Type: PIPE
Length: 354
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E PALM LN
Drawing No(s):
Right of Way:
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0063	0.013	24						18
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0063	0.013	42						80
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	98
										ROW+Section Capacity:	98

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $47,890
Total Improvements Cost: $57,468

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	34	63	125	153	87	186

City of Scottsdale
Storm Water Master Plan and Management Program
LAND USE BASIN SUMMARY
02 - WEST McDOWELL DRAINAGE BASIN

10/24/93

Group	Land Use	Code	Area (acres)	Percent Impervious (%)	Impervious Area (acres)
	2-4 DU PER ACRE	14	278.94	35	97.63
	4-8 DU PER ACRE	15	13.66	54	7.38
	8-12 DU PER ACRE	16	8.10	74	5.99
	12-22 DU PER ACRE	17	32.99	94	31.01
TOTAL RESIDENTIAL			333.70	43	142.01
	GENERAL COMMERCIAL	22	180.89	85	153.76
TOTAL COMMERCIAL/OFFICE			180.89	85	153.76
	LIMITED USE AREA	42	4.43	1	0.04
	CULTURAL/INSTITUTIONAL	44	7.38	85	6.27
TOTAL OPEN SPACE			11.80	53	6.31
TOTAL 02 - WEST McDOWELL DRAINAGE BASIN			526.40	57	302.09

```
ID
IT     2                    300
IO     5
KK020010   BASIN
BA 0.054
PH 0.000   0.000   0.450   0.860   1.440   2.050   2.460   3.240
LS     0      79       0       0      98       0
UK   152  0.0100    0.30      63
UK    55  0.0100    0.10      37
RK  1041  0.0063    0.02            TRAP      38     1.0
RK  1105  0.0063    0.02            TRAP      60     1.0
KK020020    FROM  020010
RK  1331  0.0063   0.017            TRAP    45.0       1
KK020020   BASIN
BA 0.066
LS     0      79       0       0      98       0
UK   141  0.0100    0.31      61
UK    61  0.0100    0.10      39
RK  1085  0.0063    0.02            TRAP      38     1.0
RK  1331  0.0063    0.02            TRAP      45     1.0
KK020020 COMBINE
HC     2
KK020030    FROM  020020
RK  1314  0.0063   0.017            TRAP    45.0       1
KK020030   BASIN
BA 0.070
LS     0      79       0       0      98       0
UK    58  0.0100    0.37      28
UK   156  0.0100    0.10      72
RK  1687  0.0063    0.02            TRAP      38     1.0
RK  1314  0.0063    0.02            TRAP      45     1.0
KK020030 COMBINE
HC     2
KK020040    FROM  020030
RK  1251  0.0063   0.013            CIRC     3.0
KK020040   BASIN
BA 0.063
LS     0      79       0       0      98       0
UK    20  0.0100    0.40      15
UK   200  0.0100    0.10      85
RK  1165  0.0063    0.02            TRAP      15     1.0
RK  1251  0.0063    0.02            TRAP      90     1.0
KK020210   BASIN
BA 0.046
LS     0      79       0       0      98       0
UK   110  0.0100    0.33      50
UK    96  0.0100    0.10      50
RK   984  0.0063    0.02            TRAP      38     1.0
RK  1000  0.0063    0.02            TRAP      60     1.0
KK020220    FROM  020210
RK  1411  0.0063   0.013            CIRC     1.5
KK020220   BASIN
BA 0.030
LS     0      79       0       0      98       0
UK    67  0.0100    0.36      33
```

```
UK    146  0.0100    0.10      67                                  560
RK    635  0.0063    0.02            TRAP      38     1.0          570
RK   1411  0.0063    0.02            TRAP      98     1.0          580
KK020220 COMBINE                                                   590
HC      2                                                          600
KK020040     FROM  020220                                          610
RK   1241  0.0063   0.013            CIRC     2.0                  620
KK020040 COMBINE                                                   630
HC      3                                                          640
KK020050     FROM  020040                                          650
RK   1417  0.0063   0.013            CIRC     5.4                  660
KK020050   BASIN                                                   670
BA 0.007                                                           680
LS      0      79       0       0      98       0                  690
UK     20  0.0100    0.40      15                                  700
UK    200  0.0100    0.10      85                                  710
RK   1417  0.0063    0.02            TRAP      98     1.0          720
KK020050 COMBINE                                                   730
HC      2                                                          740
KK020060     FROM  020050                                          750
RK   1355  0.0063   0.013            CIRC     6.0                  760
KK020060   BASIN                                                   770
BA 0.057                                                           780
LS      0      79       0       0      98       0                  790
UK     20  0.0100    0.40      15                                  800
UK    200  0.0100    0.10      85                                  810
RK   1317  0.0063    0.02            TRAP      15     1.0          820
RK   1355  0.0063    0.02            TRAP      15     1.0          830
KK020310   BASIN                                                   840
BA 0.010                                                           850
LS      0      79       0       0      98       0                  860
UK     29  0.0100    0.39      19                                  870
UK    189  0.0100    0.10      81                                  880
RK   2408  0.0063    0.02            TRAP      45     1.0          890
KK020060     FROM  020310                                          900
RK    123  0.0063   0.013            CIRC     2.0                  910
KK020060 COMBINE                                                   920
HC      3                                                          930
KK020070     FROM  020060                                          940
RK   3599  0.0063   0.013            CIRC     6.5                  950
KK020410   BASIN                                                   960
BA 0.016                                                           970
LS      0      79       0       0      98       0                  980
UK     58  0.0100    0.37      24                                  990
UK    156  0.0100    0.10      76                                  1000
RK   1365  0.0063    0.02            TRAP      45     1.0          1010
KK020420     FROM  020410                                          1020
RK   1246  0.0063   0.017            TRAP    45.0       1          1030
KK020420   BASIN                                                   1040
BA 0.061                                                           1050
LS      0      79       0       0      98       0                  1060
UK    127  0.0100    0.32      56                                  1070
UK     76  0.0100    0.10      44                                  1080
RK    745  0.0063    0.02            TRAP      38     1.0          1090
RK   1648  0.0063    0.02            TRAP      45     1.0          1100
```

```
KK020420 COMBINE
HC     2
KK020430    FROM  020420
RK   931  0.0063   0.017          TRAP    45.0      1
KK020430   BASIN
BA 0.020
LS     0      79       0       0     98       0
UK   142  0.0100    0.31      62
UK    59  0.0100    0.10      38
RK   363  0.0063    0.02          TRAP      60    1.0
KK020430 COMBINE
HC     2
KK020440    FROM  020430
RK   894  0.0063   0.017          TRAP    60.0      1
KK020440   BASIN
BA 0.008
LS     0      79       0       0     98       0
UK   147  0.0100    0.31      53
UK   110  0.0100    0.10      47
RK   894  0.0063    0.02          TRAP      60    1.0
KK020440 COMBINE
HC     2
KK020510   BASIN
BA 0.064
LS     0      79       0       0     98       0
UK    42  0.0100    0.38      21
UK   175  0.0100    0.10      79
RK  1250  0.0063    0.02          TRAP      22    1.0
RK  1241  0.0063    0.02          TRAP      60    1.0
KK020520    FROM  020510
RK   731  0.0063   0.017          TRAP    60.0      1
KK020520   BASIN
BA 0.039
LS     0      79       0       0     98       0
UK   149  0.0100    0.30      62
UK    51  0.0100    0.10      38
RK  1079  0.0063    0.02          TRAP      38    1.0
RK   731  0.0063    0.02          TRAP      60    1.0
KK020520 COMBINE
HC     2
KK020530    FROM  020520
RK   540  0.0063   0.027          TRAP    22.0      1
KK020530   BASIN
BA 0.013
LS     0      79       0       0     98       0
UK    64  0.0100    0.37      33
UK   150  0.0100    0.10      67
RK   459  0.0063    0.02          TRAP      18    1.0
RK   540  0.0063    0.02          TRAP      31    1.0
KK020530 COMBINE
HC     2
KK020610   BASIN
BA 0.075
LS     0      79       0       0     98       0
UK   114  0.0100    0.33      51
```

```
UK     92  0.0100    0.10      49                                    1660
RK   1385  0.0063    0.02            TRAP     45     1.0            1670
RK   2189  0.0063    0.02            TRAP     45     1.0            1680
KK020620     FROM  020610                                            1690
RK   1318  0.0063   0.017            TRAP   97.5       1            1700
KK020620    BASIN                                                    1710
BA 0.054                                                             1720
LS      0      79       0       0     98       0                    1730
UK    114  0.0100    0.33      50                                    1740
UK     95  0.0100    0.10      50                                    1750
RK    636  0.0063    0.02            TRAP     38     1.0            1760
RK   1609  0.0063    0.02            TRAP     38     1.0            1770
KK020620 COMBINE                                                     1780
HC      2                                                            1790
KK020630     FROM  020620                                            1800
RK    467  0.0063   0.013            CIRC    1.3                    1810
KK020710    BASIN                                                    1820
BA 0.071                                                             1830
LS      0      79       0       0     98       0                    1840
UK    165  0.0100    0.29      60                                    1850
UK     73  0.0100    0.10      40                                    1860
RK   1299  0.0063    0.02            TRAP     38     1.0            1870
RK   1275  0.0063    0.02            TRAP     60     1.0            1880
KK020720     FROM  020710                                            1890
RK    354  0.0063   0.013            CIRC    2.0                    1900
ZZ                                                                   1910
```

BASIN ID: 020010 Area: 0.054 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	152	0.0100	0.300	63	Collector:	1,041	0.0063	0.017	TRAP	37.5	1.0
Impervious:	55	0.0100	0.100	37	Main:	1,105	0.0063	0.017	TRAP	60.0	1.0

BASIN ID: 020020 Area: 0.066 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	141	0.0100	0.307	61	Collector:	1,085	0.0063	0.017	TRAP	37.5	1.0
Impervious:	61	0.0100	0.100	39	Main:	1,331	0.0063	0.017	TRAP	45.0	1.0

BASIN ID: 020030 Area: 0.070 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	58	0.0100	0.371	28	Collector:	1,687	0.0063	0.017	TRAP	37.5	1.0
Impervious:	156	0.0100	0.100	72	Main:	1,314	0.0063	0.017	TRAP	45.0	1.0

BASIN ID: 020040 Area: 0.063 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	20	0.0100	0.400	15	Collector:	1,165	0.0063	0.017	TRAP	15.0	1.0
Impervious:	200	0.0100	0.100	85	Main:	1,251	0.0063	0.017	TRAP	90.0	1.0

BASIN ID: 020050 Area: 0.007 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	20	0.0100	0.400	15	Collector:						
Impervious:	200	0.0100	0.100	85	Main:	1,417	0.0063	0.017	TRAP	97.5	1.0

BASIN ID: 020060 Area: 0.057 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	20	0.0100	0.400	15	Collector:	1,317	0.0063	0.017	TRAP	15.0	1.0
Impervious:	200	0.0100	0.100	85	Main:	1,355	0.0063	0.017	TRAP	15.0	1.0

BASIN ID: 020210 Area: 0.046 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	110	0.0100	0.331	50	Collector:	984	0.0063	0.017	TRAP	37.5	1.0
Impervious:	96	0.0100	0.100	50	Main:	1,000	0.0063	0.017	TRAP	60.0	1.0

BASIN ID: 020220 Area: 0.030 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	67	0.0100	0.364	33	Collector:	635	0.0063	0.017	TRAP	37.5	1.0
Impervious:	146	0.0100	0.100	67	Main:	1,411	0.0063	0.017	TRAP	97.5	1.0

BASIN ID: 020310 Area: 0.010 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	29	0.0100	0.393	19	Collector:						
Impervious:	189	0.0100	0.100	81	Main:	2,408	0.0063	0.017	TRAP	45.0	1.0

BASIN ID: 020410 Area: 0.016 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	58	0.0100	0.371	24	Collector:						
Impervious:	156	0.0100	0.100	76	Main:	1,365	0.0063	0.017	TRAP	45.0	1.0

BASIN ID: 020420 Area: 0.061 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	127	0.0100	0.318	56	Collector:	745	0.0063	0.017	TRAP	37.5	1.0
Impervious:	76	0.0100	0.100	44	Main:	1,648	0.0063	0.017	TRAP	45.0	1.0

BASIN ID: 020430 Area: 0.020 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	142	0.0100	0.306	62	Collector:	1,186	0.0063	0.017	TRAP	37.5	1.0
Impervious:	59	0.0100	0.100	38	Main:	363	0.0063	0.017	TRAP	60.0	1.0

BASIN ID: 020440 Area: 0.008 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	147	0.0100	0.306	53	Collector:						
Impervious:	110	0.0100	0.100	47	Main:	894	0.0063	0.017	TRAP	60.0	1.0

BASIN ID: 020510 Area: 0.064 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	42	0.0100	0.383	21	Collector:	1,250	0.0063	0.017	TRAP	21.8	1.0
Impervious:	175	0.0100	0.100	79	Main:	1,241	0.0063	0.017	TRAP	60.0	1.0

BASIN ID: 020520 Area: 0.039 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	149	0.0100	0.301	62	Collector:	1,079	0.0063	0.017	TRAP	37.5	1.0
Impervious:	51	0.0100	0.100	38	Main:	731	0.0063	0.017	TRAP	60.0	1.0

BASIN ID: 020530 Area: 0.013 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	64	0.0100	0.366	33	Collector:	459	0.0063	0.017	TRAP	18.0	1.0
Impervious:	150	0.0100	0.100	67	Main:	540	0.0063	0.017	TRAP	30.8	1.0

BASIN ID: 020610 Area: 0.075 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	114	0.0100	0.328	51	Collector:	1,385	0.0063	0.017	TRAP	45.0	1.0
Impervious:	92	0.0100	0.100	49	Main:	2,189	0.0063	0.017	TRAP	45.0	1.0

BASIN ID: 020620 Area: 0.054 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	114	0.0100	0.328	50	Collector:	636	0.0063	0.017	TRAP	37.5	1.0
Impervious:	95	0.0100	0.100	50	Main:	1,609	0.0063	0.017	TRAP	37.5	1.0

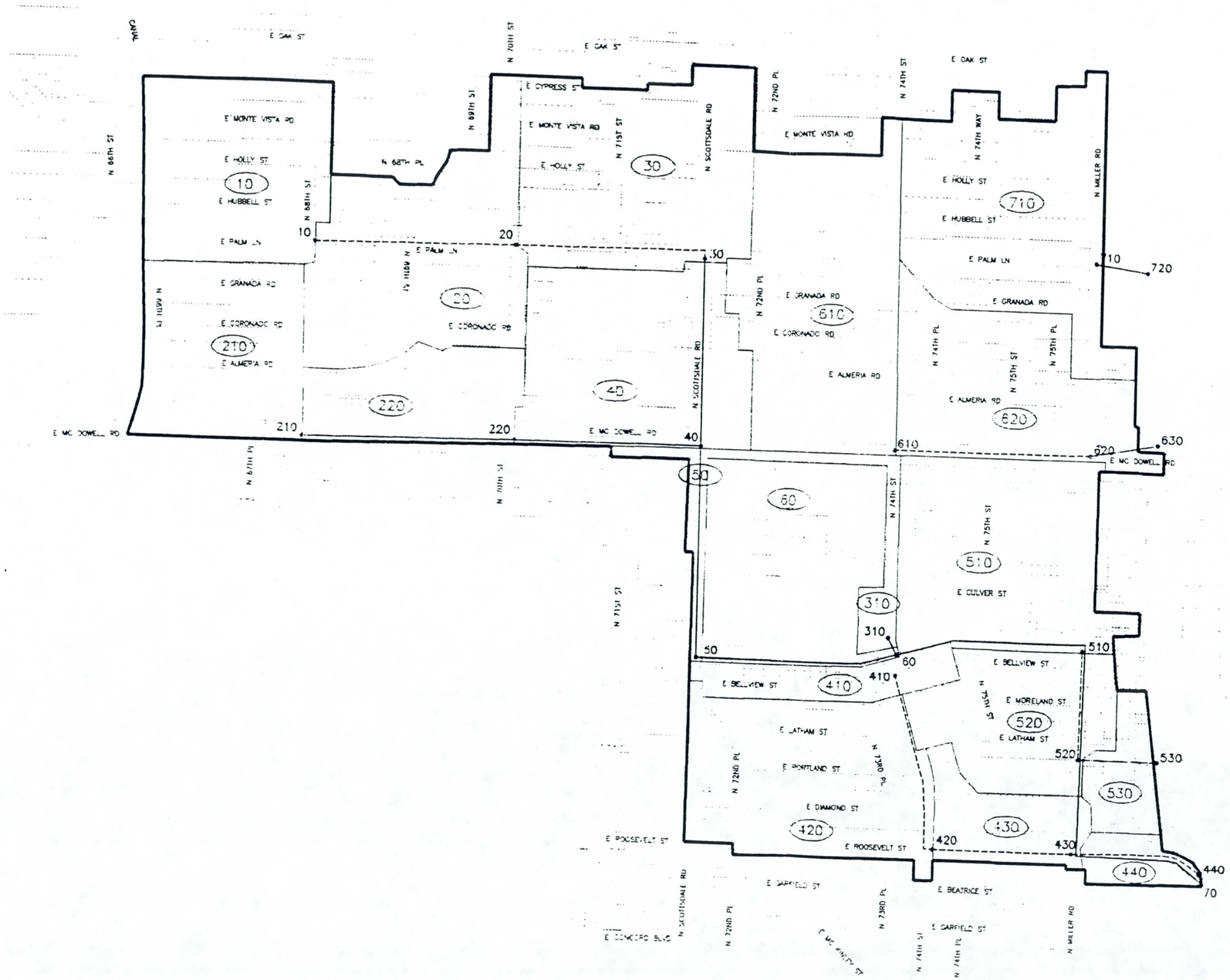
BASIN ID: 020710 Area: 0.071 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	165	0.0100	0.294	60	Collector:	1,299	0.0063	0.017	TRAP	37.5	1.0
Impervious:	73	0.0100	0.100	40	Main:	1,275	0.0063	0.017	TRAP	60.0	1.0

City of Scottsdale
Storm Water Master Plan and Management Program
RAINFALL DATA
02 - WEST MCDOWELL RD. DRAINAGE BASIN

04/18/94

Return Period (years)	RAINFALL DURATION 5 min	10 min	15 min	30 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs
2	0.25	0.38	0.46	0.61	0.74	1.17	1.46	1.15	3.50	1.35
5	0.37	0.56	0.70	0.94	1.16	1.70	2.06	2.74	4.45	6.15
10	0.45	0.68	0.86	1.16	1.44	2.05	2.46	3.24	5.11	6.97
25	0.55	0.84	1.07	1.45	1.81	2.53	3.02	3.93	6.04	8.15
50	0.63	0.97	1.24	1.68	2.10	2.91	3.45	4.47	6.77	9.08
100	0.71	1.10	1.41	1.91	2.38	3.27	3.87	3.20	7.50	3.80



0 400 800

1" = 800'

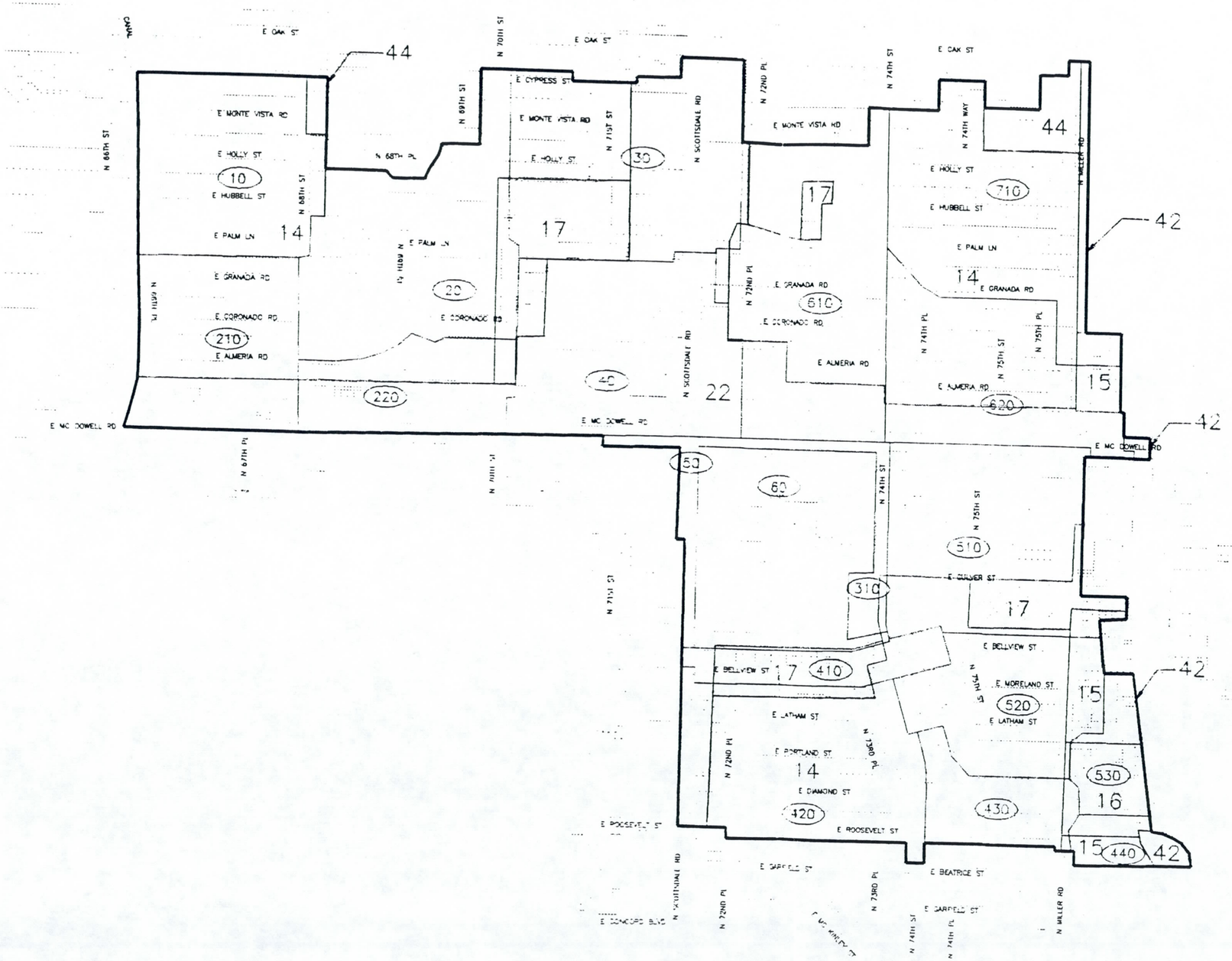
Legend

- 101 Analysis Node
- 101 Storage Basin
- Basin Boundary
- 610 Drainage Area
- Roadway Reach
- Channel
- Pipe/Culvert

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 02 W McDowell Drainage Map



0 400 800

1" = 800'

Legend

Basin Boundary

(610) Drainage Area

Land Use Boundary

Land Uses

10 - 1 DU PER 5 ACRES
11 - 1 DU PER 2-3 ACRES
12 - 1 DU PER 1-2 ACRES
13 - 1-2 DU PER ACRE
14 - 2-4 DU PER ACRE
15 - 4-8 DU PER ACRE
16 - 8-12 DU PER ACRE
17 - 12-22 DU PER ACRE
18 - TOURIST ACCOMMODATIONS
19 - LOW INTENSITY RESORT
21 - NEIGHBORHOOD COMMERCIAL
22 - GENERAL COMMERCIAL
31 - MINOR OFFICE
32 - MAJOR OFFICE
33 - MINOR EMPLOYMENT
34 - GENERAL EMPLOYMENT
36 - RESEARCH AND DEVELOPMENT
41 - NATURAL OPEN SPACE
42 - LIMITED USE AREA
43 - DEVELOPED OPEN SPACE
44 - CULTURAL/INSTITUTIONAL
45 - UTILITIES

Soil Group B

Runoff Zone 1

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 02 W McDowell Land Use Map

City of Scottsdale

Storm Water Master Plan and Management Program

PROPOSED CONVEYANCE IMPROVEMENTS COST

03 - WEST OAK DRAINAGE BASIN

10/24/93

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
030010-030020	427	1.6	66,018			13,204		79,222
030020-030030	1,326	1.6	205,011			41,002		246,014
030030-030040	1,317	1.6	254,525			50,905		305,430
030040-030050	1,317	1.6	279,978			55,996		335,973
030050-030060	129	1.6	32,410			6,482		38,892
030210-030030	154	1.6	23,810			4,762		28,572
030310-030320	683	1.6	65,999			13,200		79,198
030320-030330	641	1.6	99,104			19,821		118,925
030330-030050	670	1.6	116,537			23,307		139,844
030410-030330	464	1.6	44,837			8,967		53,804
	7,128		1,188,228			237,646		1,425,873

ID: 030010-030020

Type: ROADWAY
Length: 427
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 68TH ST
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	75
PROPOSED	Pipe:	1	0.0060	0.013	48						111
	Box:										
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	111
										ROW+Section Capacity:	187

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $66,018
Total Improvements Cost: $79,222

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	45	70	124	146	89	165

ID: 030020-030030

Type: ROADWAY
Length: 1,326
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E BELLEVIEW ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	47
PROPOSED	Pipe:	1	0.0060	0.013	48						111
	Box:										
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	111
										ROW+Section Capacity:	158

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $205,011
Total Improvements Cost: $246,014

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	54	87	142	172	107	201

ID: 030030-030040

Type: ROADWAY
Length: 1,317
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 70TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	47
PROPOSED	Pipe:	1	0.0060	0.013	60						202
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	202
										ROW+Section Capacity:	248

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $254,525
Total Improvements Cost: $305,430

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	84	142	231	282	186	335

ID: 030040-030050

Type: ROADWAY
Length: 1,317
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E CONTINENTAL DR
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	75
PROPOSED	Pipe:	1	0.0060	0.013	66						260
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	260
										ROW+Section Capacity:	336

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $279,978
Total Improvements Cost: $335,973

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	102	168	292	350	233	411

ID: 030050-030060

Type: ROADWAY
Length: 129
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N SCOTTSDALE RD
Drawing No(s):
Right of Way: 105
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	75
PROPOSED	Pipe:	1	0.0060	0.013	78						406
	Box:										
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	406
										ROW+Section Capacity:	481

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $32,410
Total Improvements Cost: $38,892

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	172	294	495	606	398	726

ID: 030210-030030

Type: ROADWAY
Length: 154
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 70TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	47
PROPOSED	Pipe:	1	0.0060	0.013	48						111
	Box:										
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	111
										ROW+Section Capacity:	158

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $23,810
Total Improvements Cost: $28,572

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	37	63	104	123	83	143

ID: 030310-030320

Type: ROADWAY
Length: 683
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N SCOTTSDALE RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	114
PROPOSED	Pipe:	1	0.0060	0.013	30						32
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	32
										ROW+Section Capacity:	146

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $65,999
Total Improvements Cost: $79,198

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	12	21	34	40	25	47

ID: 030320-030330

Type: ROADWAY
Length: 641
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N SCOTTSDALE RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	114
PROPOSED	Pipe:	1	0.0060	0.013	48						111
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	111
										ROW+Section Capacity:	225

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $99,104
Total Improvements Cost: $118,925

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	37	65	109	136	86	161

ID: 030330-030050

Type: ROADWAY
Length: 670
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N SCOTTSDALE RD
Drawing No(s):
Right of Way: 105
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	75
PROPOSED	Pipe:	1	0.0060	0.013	54						152
	Box:										
	Channel:								Lined: N		
Improvement Year:											
										Section Capacity:	152
										ROW+Section Capacity:	227

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $116,537
Total Improvements Cost: $139,844

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	51	88	146	182	118	217

ID: 030410-030330

Type: ROADWAY
Length: 464
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: ALLEY
Drawing No(s):
Right of Way: 12
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	17
PROPOSED	Pipe:	1	0.0060	0.013	30						32
	Box:										
	Channel:								Lined: N		
Improvement Year:											
										Section Capacity:	32
										ROW+Section Capacity:	49

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $44,837
Total Improvements Cost: $53,804

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	11	18	29	34	24	40

ID: 030510-030520

Type: ROADWAY
Length: 162
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 68TH ST
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0060	Equivalent Roadway (%): 100						ROW Capacity:	75
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	75

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	73	119	203	238	151	273

City of Scottsdale
Storm Water Master Plan and Management Program
LAND USE BASIN SUMMARY
03 - WEST OAK DRAINAGE BASIN

Group	Land Use	Code	Area (acres)	Percent Impervious (%)	Impervious Area (acres)
	2-4 DU PER ACRE	14	147.56	35	51.64
	4-8 DU PER ACRE	15	10.97	54	5.92
	12-22 DU PER ACRE	17	13.53	94	12.72
TOTAL RESIDENTIAL			172.06	41	70.29
	GENERAL COMMERCIAL	22	62.27	85	52.93
TOTAL COMMERCIAL/OFFICE			62.27	85	52.93
	CULTURAL/INSTITUTIONAL	44	29.98	85	25.48
TOTAL OPEN SPACE			29.98	85	25.48
TOTAL	03 - WEST OAK DRAINAGE BASIN		264.30	56	148.70

```
IT      2                     300
IO      5
KK030010   BASIN
BA 0.043
PH 0.000   0.000   0.450   0.860   1.440   2.050   2.460   3.240
LS      0      79       0       0      98       0
UK     20  0.0100    0.40      12
UK    199  0.0100    0.10      88
RK   1240  0.0060    0.02            TRAP      20     1.0
RK    869  0.0060    0.02            TRAP      60     1.0
KK030020    FROM  030010
RK    427  0.0060   0.017            TRAP    60.0       1
KK030020   BASIN
BA 0.027
LS      0      79       0       0      98       0
UK    150  0.0100    0.30      65
UK     50  0.0100    0.10      35
RK   1175  0.0060    0.02            TRAP      38     1.0
RK    427  0.0060    0.02            TRAP      60     1.0
KK030020 COMBINE
HC      2
KK030030    FROM  030020
RK   1326  0.0060   0.017            TRAP    45.0       1
KK030030   BASIN
BA 0.010
LS      0      79       0       0      98       0
UK    150  0.0100    0.30      65
UK     50  0.0100    0.10      35
RK   1326  0.0060    0.02            TRAP      45     1.0
KK030210   BASIN
BA 0.055
LS      0      79       0       0      98       0
UK    108  0.0100    0.33      49
UK     98  0.0100    0.10      51
RK   1246  0.0060    0.02            TRAP      38     1.0
RK   1109  0.0060    0.02            TRAP      45     1.0
KK030030    FROM  030210
RK    154  0.0060   0.017            TRAP    45.0       1
KK030030 COMBINE
HC      3
KK030040    FROM  030030
RK   1317  0.0060   0.017            TRAP    45.0       1
KK030040   BASIN
BA 0.056
LS      0      79       0       0      98       0
UK    150  0.0100    0.30      65
UK     50  0.0100    0.10      35
RK   1299  0.0060    0.02            TRAP      38     1.0
RK   1317  0.0060    0.02            TRAP      45     1.0
KK030040 COMBINE
HC      2
KK030050    FROM  030040
RK   1317  0.0060   0.017            TRAP    60.0       1
KK030050   BASIN
BA 0.034
```

```
LS      0       79       0       0      98       0                    560
UK     85   0.0100    0.35      28                                    570
UK    125   0.0100    0.10      72                                    580
RK    640   0.0060    0.02            TRAP      20     1.0           590
RK   1317   0.0060    0.02            TRAP      53     1.0           600
KK030310    BASIN                                                    610
BA 0.014                                                             620
LS      0       79       0       0      98       0                    630
UK     20   0.0100    0.40      15                                    640
UK    200   0.0100    0.10      85                                    650
RK   1505   0.0060    0.02            TRAP      49     1.0           660
KK030320     FROM  030310                                            670
RK    683   0.0060   0.017            TRAP    97.5       1           680
KK030320    BASIN                                                    690
BA 0.046                                                             700
LS      0       79       0       0      98       0                    710
UK    103   0.0100    0.34      47                                    720
UK    104   0.0100    0.10      53                                    730
RK   1333   0.0060    0.02            TRAP      38     1.0           740
RK   1237   0.0060    0.02            TRAP      45     1.0           750
KK030320 COMBINE                                                     760
HC      2                                                            770
KK030330     FROM  030320                                            780
RK    641   0.0060   0.017            TRAP    97.5       1           790
KK030330    BASIN                                                    800
BA 0.008                                                             810
LS      0       79       0       0      98       0                    820
UK     26   0.0100    0.40      17                                    830
UK    193   0.0100    0.10      83                                    840
RK    641   0.0060    0.02            TRAP      79     1.0           850
KK030410    BASIN                                                    860
BA 0.022                                                             870
LS      0       79       0       0      98       0                    880
UK    150   0.0100    0.30      65                                    890
UK     50   0.0100    0.10      35                                    900
RK    796   0.0060    0.02            TRAP      38     1.0           910
RK    611   0.0060    0.02            TRAP      38     1.0           920
KK030330     FROM  030410                                            930
RK    464   0.0060   0.017            TRAP     9.0       1           940
KK030330 COMBINE                                                     950
HC      3                                                            960
KK030050     FROM  030330                                            970
RK    670   0.0060   0.017            TRAP    78.8       1           980
KK030050 COMBINE                                                     990
HC      3                                                           1000
KK030060     FROM  030050                                           1010
RK    129   0.0060   0.017            TRAP    78.8       1          1020
KK030510    BASIN                                                   1030
BA 0.098                                                            1040
LS      0       78       0       0      98       0                   1050
UK    170   0.0100    0.30      40                                   1060
UK    126   0.0100    0.10      60                                   1070
RK   1061   0.0060    0.02            TRAP      38     1.0          1080
RK   2296   0.0060    0.02            TRAP      38     1.0          1090
KK030520     FROM  030510                                           1100
```

```
RK    162  0.0060   0.017          TRAP    60.0      1                    1110
ZZ                                                                         1120
```

BASIN ID: 030010 Area: 0.043 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	20	0.0100	0.400	12	Collector:	1,240	0.0060	0.017	TRAP	20.0	1.0
Impervious:	199	0.0100	0.100	88	Main:	869	0.0060	0.017	TRAP	60.0	1.0

BASIN ID: 030020 Area: 0.027 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,175	0.0060	0.017	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	427	0.0060	0.017	TRAP	60.0	1.0

BASIN ID: 030030 Area: 0.010 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:		0.0060				
Impervious:	50	0.0100	0.100	35	Main:	1,326	0.0060	0.017	TRAP	45.0	1.0

BASIN ID: 030040 Area: 0.056 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,299	0.0060	0.017	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,317	0.0060	0.017	TRAP	45.0	1.0

BASIN ID: 030050 Area: 0.034 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	85	0.0100	0.350	28	Collector:	640	0.0060	0.017	TRAP	20.0	1.0
Impervious:	125	0.0100	0.100	72	Main:	1,317	0.0060	0.017	TRAP	52.5	1.0

BASIN ID: 030210 Area: 0.055 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	108	0.0100	0.332	49	Collector:	1,246	0.0060	0.017	TRAP	37.5	1.0
Impervious:	98	0.0100	0.100	51	Main:	1,109	0.0060	0.017	TRAP	45.0	1.0

BASIN ID: 030310 Area: 0.014 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	20	0.0100	0.400	15	Collector:		0.0060				
Impervious:	200	0.0100	0.100	85	Main:	1,505	0.0060	0.017	TRAP	48.8	1.0

BASIN ID: 030320 Area: 0.046 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	103	0.0100	0.336	47	Collector:	1,333	0.0060	0.017	TRAP	37.5	1.0
Impervious:	104	0.0100	0.100	53	Main:	1,237	0.0060	0.017	TRAP	45.0	1.0

BASIN ID: 030330 Area: 0.008 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	26	0.0100	0.395	17	Collector:		0.0060				
Impervious:	193	0.0100	0.100	83	Main:	641	0.0060	0.017	TRAP	78.8	1.0

BASIN ID: 030410 Area: 0.022 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	796	0.0060	0.017	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	611	0.0060	0.017	TRAP	37.5	1.0

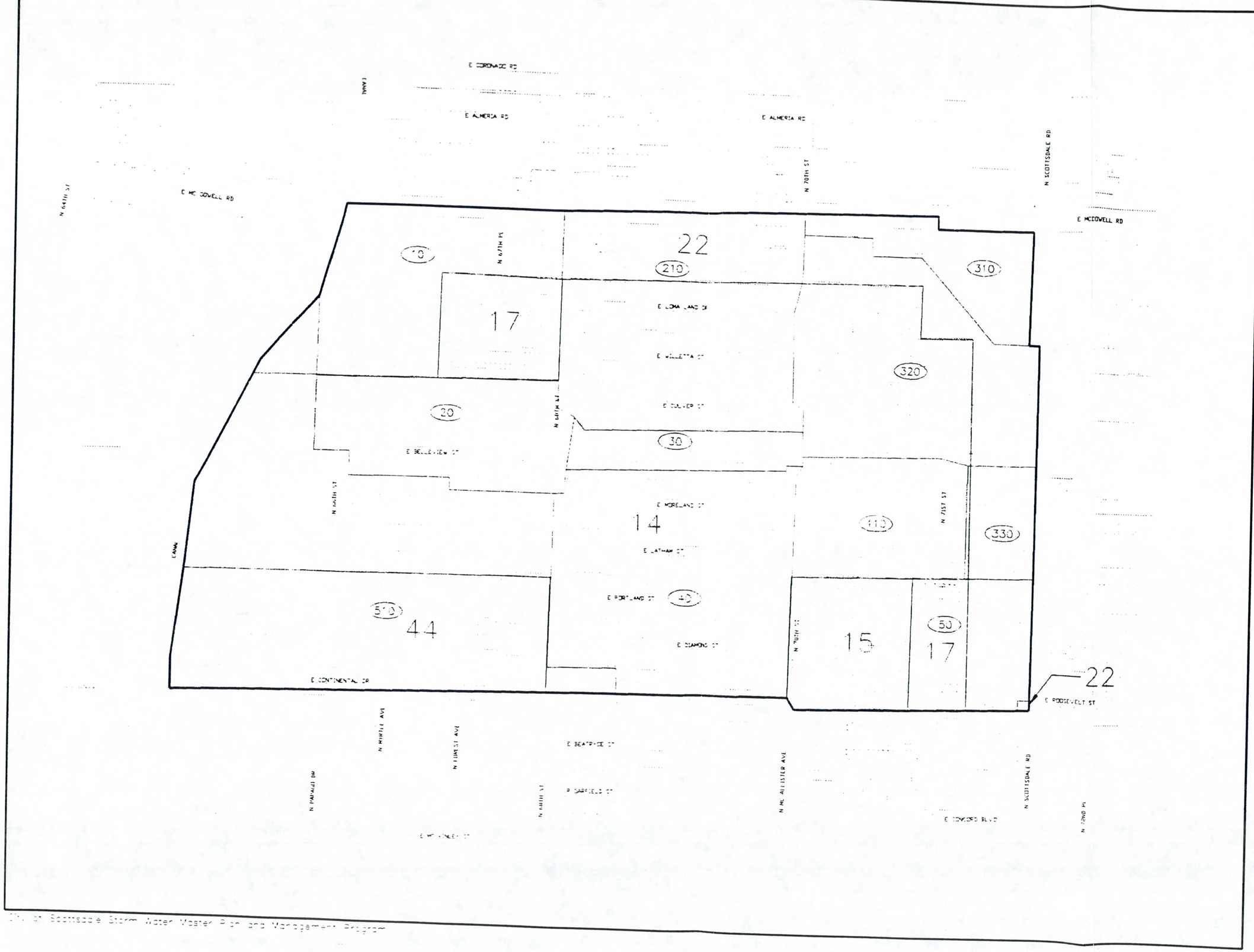
BASIN ID: 030510 Area: 0.098 Pervious CN: 78 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	170	0.0100	0.303	40	Collector:	1,061	0.0060	0.017	TRAP	37.5	1.0
Impervious:	126	0.0100	0.100	60	Main:	2,296	0.0060	0.017	TRAP	37.5	1.0

City of Scottsdale
Storm Water Master Plan and Management Program
RAINFALL DATA
03 - BELLEVIEW ST/68th ST DRAINAGE BASIN

04/18/94

Return Period (years)	RAINFALL DURATION 5 min	10 min	15 min	30 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs
2	0.25	0.38	0.46	0.61	0.74	1.17	1.46	1.15	3.50	1.35
5	0.37	0.56	0.70	0.94	1.16	1.70	2.06	2.74	4.45	6.15
10	0.45	0.68	0.86	1.16	1.44	2.05	2.46	3.24	5.11	6.97
25	0.55	0.84	1.07	1.45	1.81	2.53	3.02	3.93	6.04	8.15
50	0.63	0.97	1.24	1.68	2.10	2.91	3.45	4.47	6.77	9.08
100	0.71	1.10	1.41	1.91	2.38	3.27	3.87	3.20	7.50	3.80



N

0 250 500

1" = 500'

Legend

Basin Boundary

(610) Drainage Area

Land Use Boundary

Land Uses

10 - 1 DU PER 5 ACRES
11 - 1 DU PER 2-3 ACRES
12 - 1 DU PER 1-2 ACRES
13 - 1-2 DU PER ACRE
14 - 2-4 DU PER ACRE
15 - 4-8 DU PER ACRE
16 - 8-12 DU PER ACRE
17 - 12-22 DU PER ACRE
18 - TOURIST ACCOMMODATIONS
19 - LOW INTENSITY RESORT
21 - NEIGHBORHOOD COMMERCIAL
22 - GENERAL COMMERCIAL
31 - MINOR OFFICE
32 - MAJOR OFFICE
33 - MINOR EMPLOYMENT
34 - GENERAL EMPLOYMENT
36 - RESEARCH AND DEVELOPMENT
41 - NATURAL OPEN SPACE
42 - LIMITED USE AREA
43 - DEVELOPED OPEN SPACE
44 - CULTURAL/INSTITUTIONAL
45 - UTILITIES

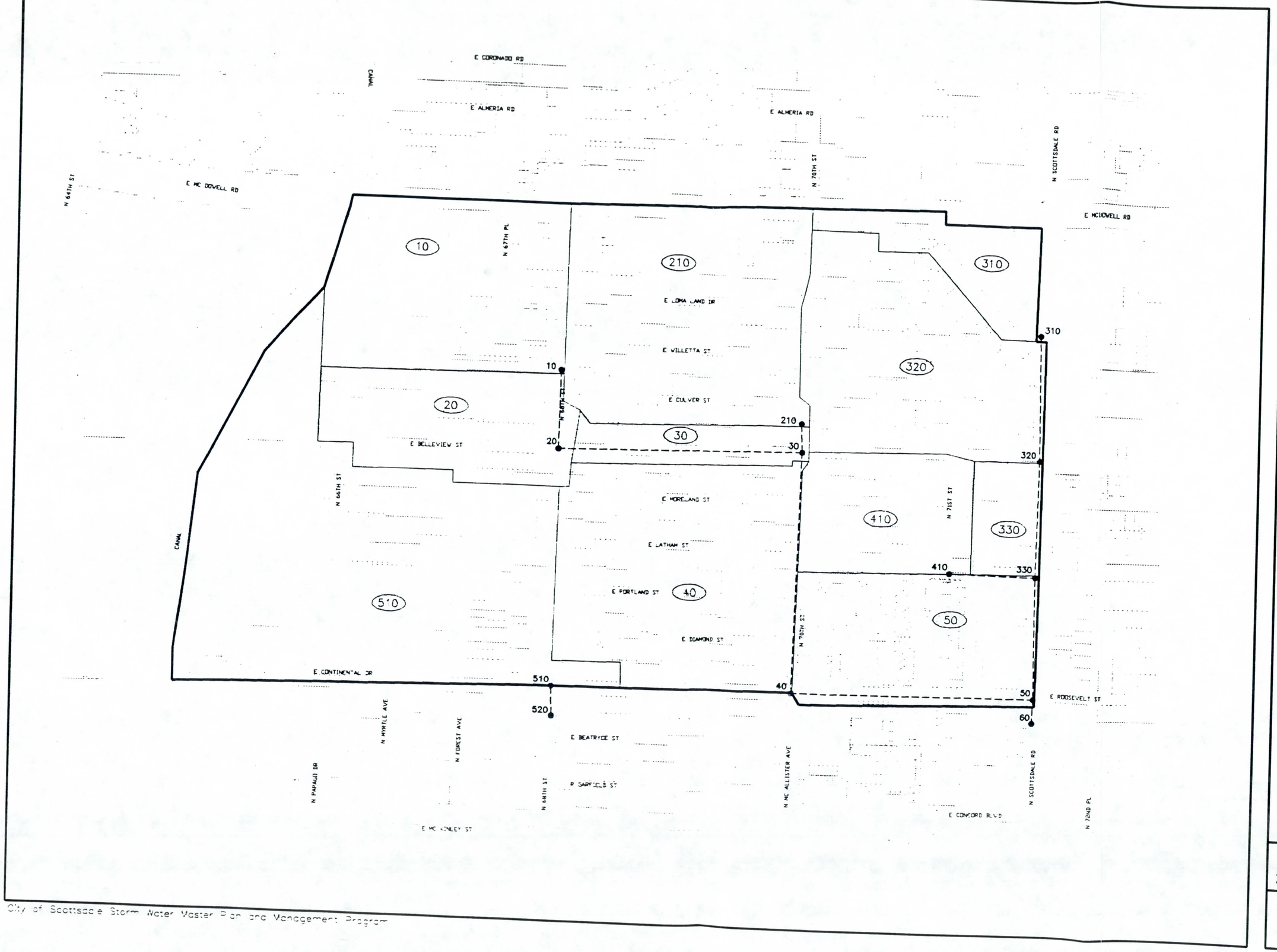
Soil Group B

Runoff Zone 1

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 03 E Belleview Land Use Map



City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 03 E Belleview Drainage Map

04-MILLER/OAK ST. Basin

Basin 04 is 390 acres which is made up of 289 acres residential, 47 acres commercial, and 54 acres open space. The basin is bounded to the north by Thomas Rd., to the south by Oak St., to the east by Miller Rd., and to the west by the Arizona canal.

The drainage pattern of this basin is from northwest to southeast. There is one major storm drain system which drains from analysis point 70 to Indian Bend wash during high flows. A 12 inch pipe at analysis point 70 drains water away from Indian Bend wash, during low flows. There were several pipe size changes along the drainage system, which drains east on Oak St. The first pipe size along the drainage system is a 36 inch pipe which is located between analysis points 110, 120 and 130. The pipe then changes size to a 42 inch pipe which is located between analysis points 130 and 40. The next change in pipe size is from the 42 inch pipe to two 42 inch pipes which are located between analysis points 40 and 50. The pipes then change size to two 48 inch pipes which are located between analysis points 50, 60 and 70 . Slopes were obtained from "as builts" or from USGS maps. When no "as builts" were available, a north-south slope and east-west slope were calculated for the basin. The east-west slope was used because this slope better represented the basin.

There was one detention basin in this drainage basin. It is located at a church on the west side of Scottsdale Rd. between Virginia Ave. and Vernon Ave.. At this detention basin, the drainage pattern is from north to south which then drains onto Scottsdale Rd. south to analysis point 40.

ASSUMPTIONS:

- A pipe at analysis point 30, on Virginia Ave., connects to a 12 inch pipe on Scottsdale Rd.
- The drainage pattern is from north to south on Scottsdale Rd. between Thomas Rd. and Oak St.. This was assumed because there is a 90 inch storm drain north of Thomas Rd. which is not in this drainage basin.

City of Scottsdale
Storm Water Master Plan and Management Program
PROPOSED CONVEYANCE IMPROVEMENTS COST
04 - MILLER RD. & OAK ST. BASIN

04/13/94

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
040020-040030	1,137	1.0	40,932			8,186		49,118
040030-040040	1,636	1.0	196,320			39,264		235,584
040040-040050	1,869	1.0	291,564			58,313		349,877
040050-040060	633	1.0	136,728			27,346		164,074
040060-040070	619	1.0	207,984			41,597		249,581
040120-040130	730	1.0	78,840			15,768		94,608
040130-040040	625	1.0	82,500			16,500		99,000
040310-040050	1,912	1.0	183,552			36,710		220,262
040410-040420	359	1.0	30,156			6,031		36,187
	9,520		1,248,576			249,715		1,498,291

ID: 040010-040020

Street Name: E VIRGINIA AVE
Type: ROADWAY
Drawing No(s):
Length: 1,136
Right of Way: 50
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0072	Equivalent Roadway (%): 100						ROW Capacity:	76
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	76

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	15	31	62	77	42	77

ID: 040020-040030

Street Name: E VIRGINIA AVE
Type: ROADWAY
Drawing No(s):
Length: 1,137
Right of Way: 50
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0072	Equivalent Roadway (%): 100						ROW Capacity:	76
PROPOSED	Pipe:	1	0.0065	0.013	18						8
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	8
										ROW+Section Capacity:	84

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $40,932
Total Improvements Cost: $49,118

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	29	62	128	163	87	164

ID: 040030-040040

Type: PIPE
Length: 1,636
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N SCOTTSDALE RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0064	0.013	12						3
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0072	Equivalent Roadway (%): 100						ROW Capacity:	125
PROPOSED	Pipe:	1	0.0064	0.013	60						208
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	211
										ROW+Section Capacity:	336

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $196,320
Total Improvements Cost: $235,584

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	57	117	236	297	163	304

ID: 040040-040050

Type: PIPE
Length: 1,869
Upstream Inv Elev: 1222.40
Upstream Grnd Elev: 1234.06

Street Name: E OAK ST
Drawing No(s): 13274-13277
Right of Way: 105
Downstream Inv Elev: 1211.20
Downstream Grnd Elev: 1218.40

Slope: 0.0060

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	2	0.0060	0.013	42						156
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0084	Equivalent Roadway (%): 100						ROW Capacity:	89
PROPOSED	Pipe:	1	0.0060	0.013	78						406
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	562
										ROW+Section Capacity:	651

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $291,564
Total Improvements Cost: $349,877

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	146	302	596	750	421	788

ID: 040050-040060

Type: PIPE
Length: 633
Upstream Inv Elev: 1210.60
Upstream Grnd Elev: 1218.40

Street Name: E OAK ST
Drawing No(s): 13273-13274
Right of Way: 80
Downstream Inv Elev: 1208.17
Downstream Grnd Elev: 1214.56

Slope: 0.0038

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	2	0.0033	0.013	48						165
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0061	Equivalent Roadway (%): 100						ROW Capacity:	76
PROPOSED	Pipe:	1	0.0033	0.013	108						718
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	883
										ROW+Section Capacity:	959

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $136,728
Total Improvements Cost: $164,074

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	229	462	906	1,134	634	1,188

ID: 040060-040070

Type: PIPE
Length: 619
Upstream Inv Elev: 1208.17
Upstream Grnd Elev: 1214.56

Street Name: E OAK ST
Drawing No(s): 13271-13273
Right of Way: 80
Downstream Inv Elev: 1206.51
Downstream Grnd Elev: 1212.10

Slope: 0.0027

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	2	0.0033	0.013	48						165
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0040	Equivalent Roadway (%): 100						ROW Capacity:	62
PROPOSED	Pipe:	2	0.0033	0.013	84						734
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	899
										ROW+Section Capacity:	961

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $207,984
Total Improvements Cost: $249,581

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	242	484	940	1,179	664	1,238

ID: 040110-040120

Type: PIPE
Length: 351
Upstream Inv Elev: 1233.80
Upstream Grnd Elev: 1242.10

Street Name: N 70TH ST
Drawing No(s): 13280-13281
Right of Way: 60
Downstream Inv Elev: 1231.46
Downstream Grnd Elev: 1241.20

Slope: 0.0067

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0069	0.013	36						55
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0026	Equivalent Roadway (%): 100						ROW Capacity:	31
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	55
										ROW+Section Capacity:	86

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	23	47	93	116	64	118

ID: 040120-040130

Type: PIPE
Length: 730
Upstream Inv Elev: 1231.46
Upstream Grnd Elev: 1241.20

Street Name: E OAK ST
Drawing No(s): 13278-13280
Right of Way: 80
Downstream Inv Elev: 1225.28
Downstream Grnd Elev: 1237.10

Slope: 0.0085

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0086	0.013	36						62
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0056	Equivalent Roadway (%): 100						ROW Capacity:	73
PROPOSED	Pipe:	1	0.0086	0.013	54						182
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	244
										ROW+Section Capacity:	317

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $78,840
Total Improvements Cost: $94,608

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	56	116	232	291	161	299

ID: 040130-040040

Street Name: E OAK ST
Drawing No(s): 13277-13278
Right of Way: 80

Type: PIPE
Length: 625
Upstream Inv Elev: 1224.78
Upstream Grnd Elev: 1237.10
Downstream Inv Elev: 1222.40
Downstream Grnd Elev: 1234.06

Slope: 0.0038

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0038	0.013	42						62
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0049	Equivalent Roadway (%): 100						ROW Capacity:	68
PROPOSED	Pipe:	1	0.0038	0.013	66						207
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	269
										ROW+Section Capacity:	337

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $82,500
Total Improvements Cost: $99,000

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	64	133	268	337	186	347

ID: 040210-040040

Street Name: N SCOTTSDALE RD
Drawing No(s):
Right of Way: 130

Type: ROADWAY
Length: 990
Upstream Inv Elev:
Upstream Grnd Elev:
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0072	Equivalent Roadway (%): 100						ROW Capacity:	125
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	125

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):			6	14	3	13

ID: 040310-040050

Street Name: N 74TH ST
Type: ROADWAY
Drawing No(s):
Length: 1,912
Right of Way: 60
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0072	Equivalent Roadway (%): 100						ROW Capacity:	51
PROPOSED	Pipe:	1	0.0065	0.013	48						116
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	116
										ROW+Section Capacity:	167

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $183,552
Total Improvements Cost: $220,262

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	34	65	125	154	91	164

ID: 040410-040420

Street Name: E MURRAY LN
Type: PIPE
Drawing No(s):
Length: 359
Right of Way: 28
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

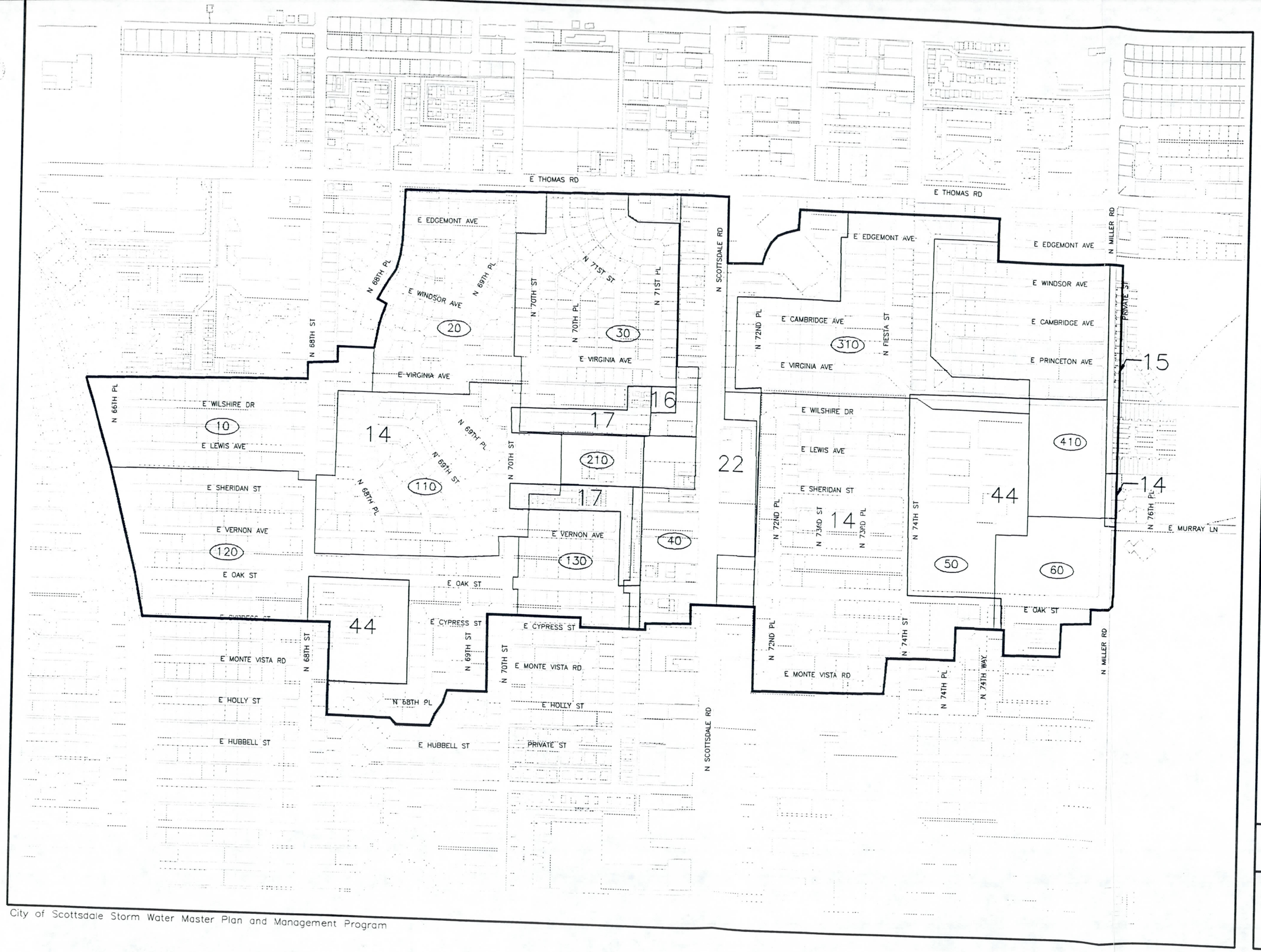
		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0072	0.013	15						5
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0065	0.013	42						81
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	87
										ROW+Section Capacity:	87

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $30,156
Total Improvements Cost: $36,187

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	29	57	106	133	77	141



0 300 600

1" = 600'

Legend

- Basin Boundary
- (610) Drainage Area
- Land Use Boundary
- City Boundary

Land Uses

10 – 1 DU PER 5 ACRES
11 – 1 DU PER 2–3 ACRES
12 – 1 DU PER 1–2 ACRES
13 – 1–2 DU PER ACRE
14 – 2–4 DU PER ACRE
15 – 4–8 DU PER ACRE
16 – 8–12 DU PER ACRE
17 – 12–22 DU PER ACRE
18 – TOURIST ACCOMMODATIONS
19 – LOW INTENSITY RESORT
21 – NEIGHBORHOOD COMMERCIAL
22 – GENERAL COMMERCIAL
31 – MINOR OFFICE
32 – MAJOR OFFICE
33 – MINOR EMPLOYMENT
34 – GENERAL EMPLOYMENT
36 – RESEARCH AND DEVELOPMENT
41 – NATURAL OPEN SPACE
42 – LIMITED USE AREA
43 – DEVELOPED OPEN SPACE
44 – CULTURAL/INSTITUTIONAL
45 – UTILITIES

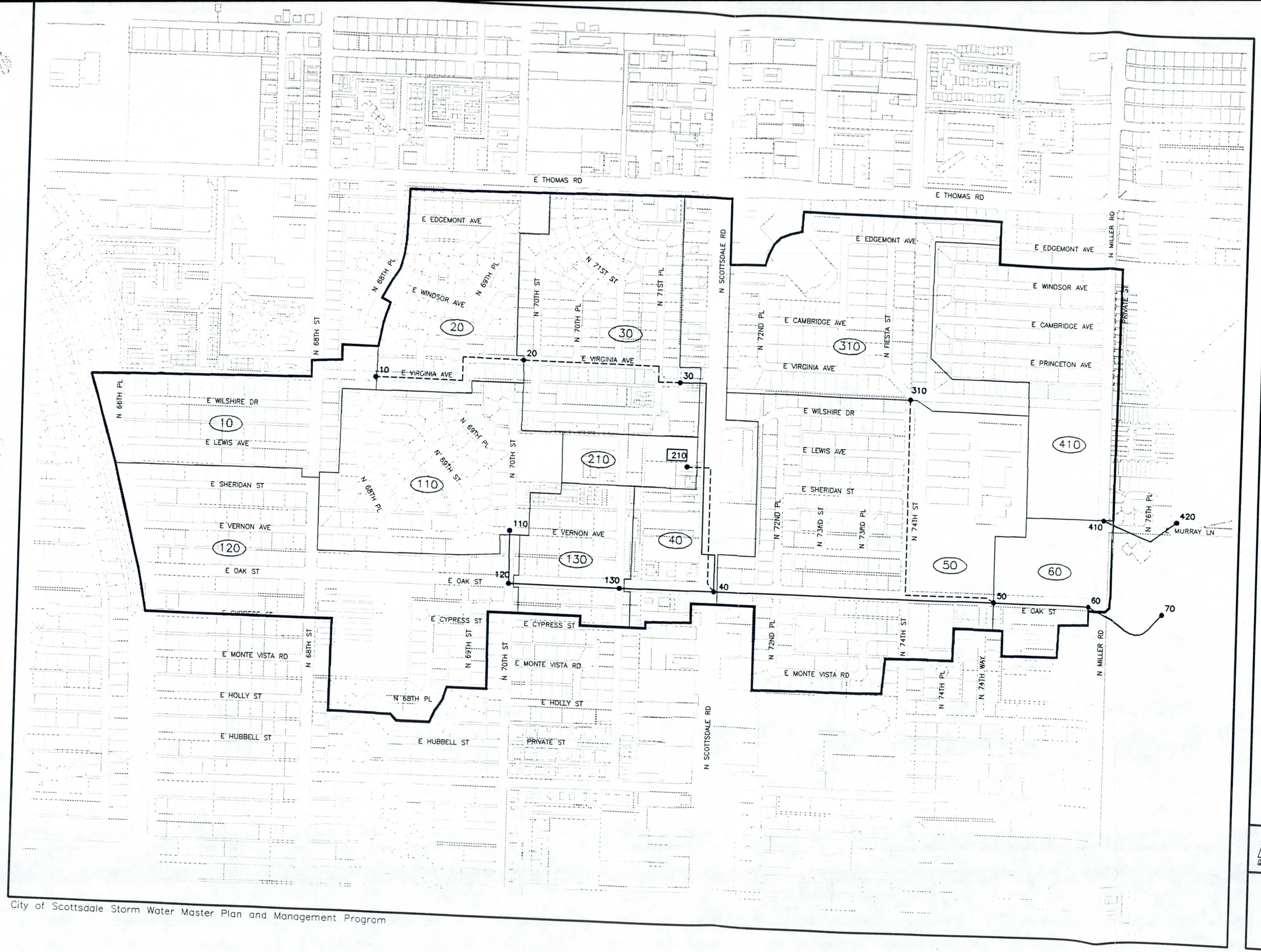
Soil Group B

Runoff Zone 1

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 04 Miller Rd. /Oak St. Land Use Map


E THOMAS RD
E EDGEMONT AVE
N 68TH PL
N 69TH PL
E WINDSOR AVE
N 68TH ST
N 70TH ST
N 71ST ST
N 70TH PL
N 71ST PL
N SCOTTSDALE RD
N 72ND PL
E CAMBRIDGE AVE
N FIESTA ST
E VIRGINIA AVE
E PRINCETON AVE
N MILLER RD
PRIVATE ST
N 66TH PL
E WILSHIRE DR
E LEWIS AVE
E SHERIDAN ST
E VERNON AVE
E OAK ST
E CYPRESS ST
E MONTE VISTA RD
E HOLLY ST
E HUBBELL ST
N 69TH ST
N 68TH PL
N 73RD ST
N 73RD PL
N 74TH ST
N 76TH PL
E MURRAY LN
N 74TH PL
N 74TH WAY
PRIVATE ST
10
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70
110
120
130
210
310
410
420
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0 300 600
1" = 600'
Legend
Analysis Node
Storage Basin
Basin Boundary
Drainage Area
Roadway Reach
Channel
Pipe/Culvert
City Boundary
City of Scottsdale
BOYLE ENGINEERING CORPORATION
Basin 04 Miller Rd. /Oak St. Drainage Map

06-THOMAS/61st PL Basin

Basin 06 is 262 acres which is made up of 242.5 acres residential, 15.5 acres commercial, and 4 acres open space. It is located in the southwest corner of Scottsdale and is bounded by Indian School Rd. to the north, Thomas Rd. to the south, 64th St. to the east, and a golf course to the west.

The drainage pattern for this basin is generally from the east to the west. There are two drainage points which drain onto a privately owned golf course. These two drainage points are represented by analysis points 320 and 40. A north-south slope and an east-west slope was calculated for the basin. The east-west slope was chosen for the calculations because its value better represented the basin. No "as builts" could be found for this area.

There were no detention basins in this drainage basin.

ASSUMPTIONS:

- None

ID: 060010-060020

Street Name: N 61ST PL
Type: ROADWAY
Drawing No(s):
Length: 852
Right of Way: 60
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0032	Equivalent Roadway (%): 100					ROW Capacity:		34
PROPOSED Pipe:										
Box:										
Channel:								Lined: N		
Improvement Year:										
								Section Capacity:		
								ROW+Section Capacity:		34

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	15	30	56	68	40	76

ID: 060020-060030

Street Name: E HOLLYHOCK ST
Type: ROADWAY
Drawing No(s):
Length: 711
Right of Way: 60
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0032	Equivalent Roadway (%): 100					ROW Capacity:		34
PROPOSED Pipe:										
Box:										
Channel:								Lined: N		
Improvement Year:										
								Section Capacity:		
								ROW+Section Capacity:		34

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	21	46	94	118	64	127

ID: 060030-060040

Street Name: E HOLLYHOCK ST
Type: ROADWAY
Drawing No(s):
Length: 368
Right of Way: 60
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0032	Equivalent Roadway (%): 100					ROW Capacity:		34
PROPOSED Pipe:										
Box:										
Channel:								Lined: N		
Improvement Year:										
								Section Capacity:		
								ROW+Section Capacity:		34

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	85	180	359	452	249	478

ID: 060110-060120

Street Name: N 60TH ST
Type: ROADWAY
Drawing No(s):
Length: 502
Right of Way: 66
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0032	Equivalent Roadway (%): 100					ROW Capacity:		34
PROPOSED Pipe:										
Box:										
Channel:								Lined: N		
Improvement Year:										
								Section Capacity:		
								ROW+Section Capacity:		34

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	9	16	28	34	21	39

ID: 060120-060030

Street Name: N 60TH ST
Type: ROADWAY
Drawing No(s):
Length: 1,181
Right of Way: 66
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0032	Equivalent Roadway (%): 100						ROW Capacity:	34
PROPOSED Pipe:										
Box:										
Channel:									Lined: N	
Improvement Year:										
									Section Capacity:	
									ROW+Section Capacity:	34

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	32	63	111	137	84	155

ID: 060210-060220

Street Name: E OSBORN RD
Type: ROADWAY
Drawing No(s):
Length: 723
Right of Way: 75
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0032	Equivalent Roadway (%): 100						ROW Capacity:	34
PROPOSED Pipe:										
Box:										
Channel:									Lined: N	
Improvement Year:										
									Section Capacity:	
									ROW+Section Capacity:	34

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	13	28	58	74	40	74

ID: 060220-060030

Type: ROADWAY
Length: 719
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 60TH ST
Drawing No(s):
Right of Way: 66
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0032	Equivalent Roadway (%): 100						ROW Capacity:	34
PROPOSED Pipe:										
Box:										
Channel:								Lined: N		
Improvement Year:									Section Capacity:	
									ROW+Section Capacity:	34

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	16	35	73	94	50	95

ID: 060310-060320

Type: IMPROVED CHANNEL
Length: 191
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 60TH ST
Drawing No(s):
Right of Way: 8
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

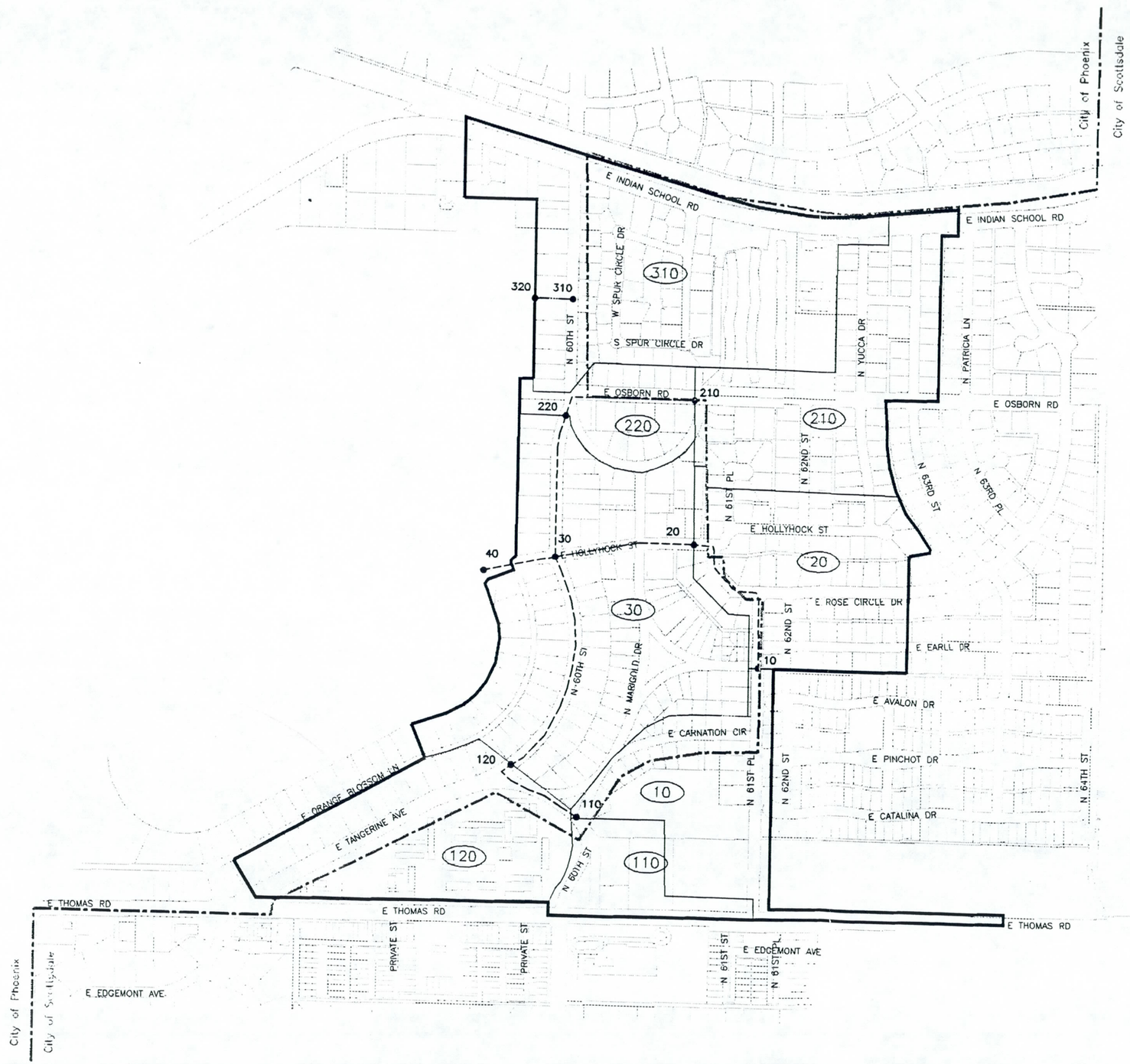
	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:		0.0032	0.025		1.5	1.0	1.0			7
Nat Channel:										
Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED Pipe:										
Box:										
Channel:								Lined: N		
Improvement Year:									Section Capacity:	7
									ROW+Section Capacity:	7

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	28	57	111	138	79	146



N

0 300 600

1" = 600'

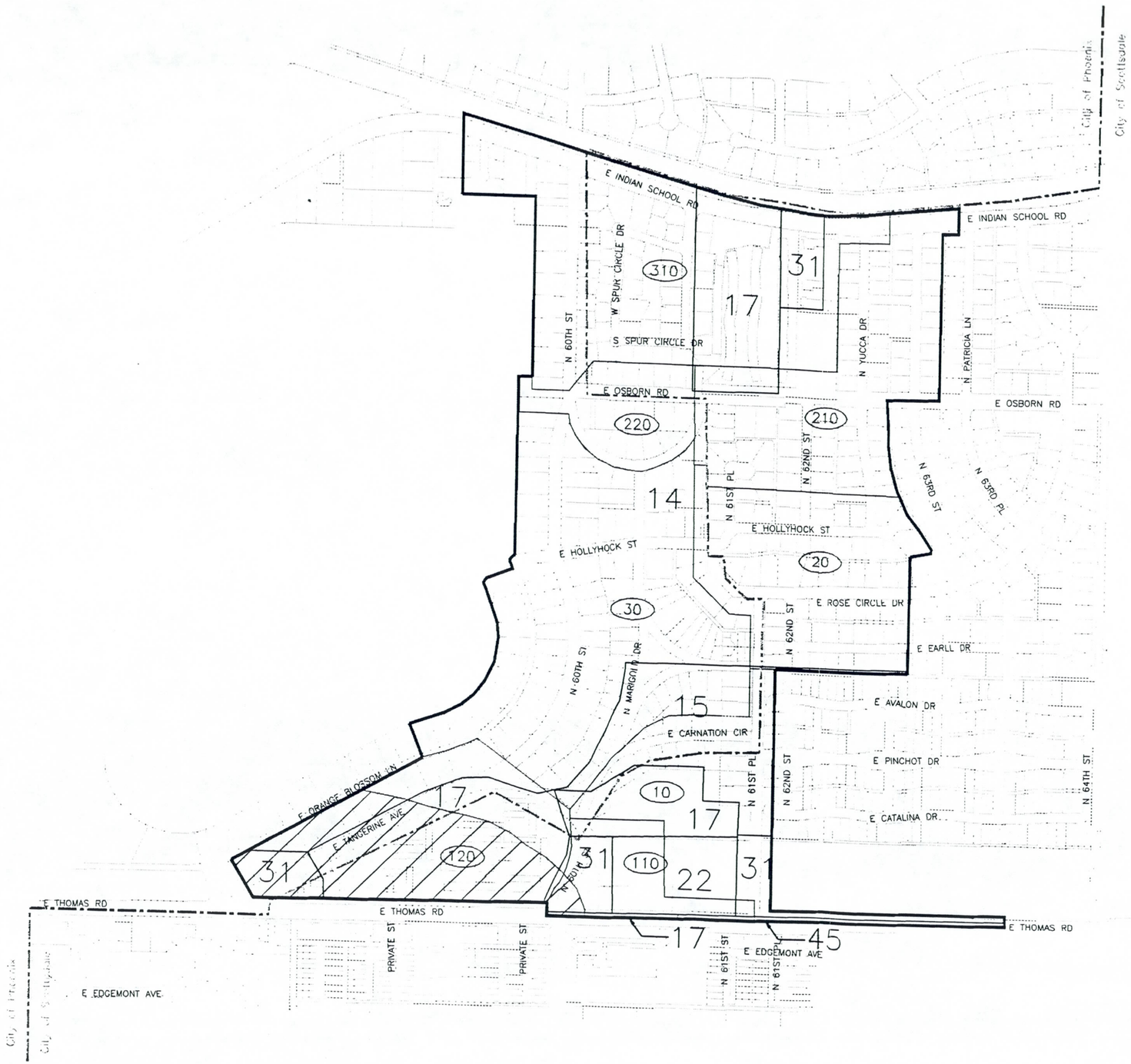
Legend

- 101 Analysis Node
- 101 Storage Basin
- Basin Boundary
- 610 Drainage Area
- Roadway Reach
- Channel
- Pipe/Culvert
- City Boundary

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 06 Thomas Rd. / 61st PL. Drainage Map



0 300 600

1" = 600'

Legend

- Basin Boundary
- (610) Drainage Area
- Land Use Boundary
- City Boundary

Land Uses

10 – 1 DU PER 5 ACRES
11 – 1 DU PER 2–3 ACRES
12 – 1 DU PER 1–2 ACRES
13 – 1–2 DU PER ACRE
14 – 2–4 DU PER ACRE
15 – 4–8 DU PER ACRE
16 – 8–12 DU PER ACRE
17 – 12–22 DU PER ACRE
18 – TOURIST ACCOMMODATIONS
19 – LOW INTENSITY RESORT
21 – NEIGHBORHOOD COMMERCIAL
22 – GENERAL COMMERCIAL
31 – MINOR OFFICE
32 – MAJOR OFFICE
33 – MINOR EMPLOYMENT
34 – GENERAL EMPLOYMENT
36 – RESEARCH AND DEVELOPMENT
41 – NATURAL OPEN SPACE
42 – LIMITED USE AREA
43 – DEVELOPED OPEN SPACE
44 – CULTURAL/INSTITUTIONAL
45 – UTILITIES

Soil Group B
Runoff Zone 1
Except where shown
Soil Group C

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 06 Thomas Rd. / 61st PL.
Land Use Map

07-OAK ST/60th ST Basin

Basin 07 is 316 acres made up of 237 acres residential, 7 acres commerial, and 72 acres open space. It is located in the southwest corner of Scottsdale and is bounded by Thomas Rd. to the north, Barnes Butte to the south, which is in the city of Phoenix, 64th St. to the east, and 58th St. to the west.

The drainage pattern for this basin is from southeast to northwest. Flows exit the basin on Thomas Rd. at analysis point 120. Drainage areas from Barnes Butte, which were determined from USGS maps, needed to be taken into account because flows from this area entered into this basin. A separate slope needed to be calculated in order to better represent this drainage area. Also, a north-south slope and an east-west slope was calculated for the basin. The north-south slope was chosen for the calculations because it better represented the basin. No "as builts" could be found for this drainage basin.

There were no detention basins in this drainage basin.

ASSUMPTIONS:

- None

City of Scottsdale
Storm Water Master Plan and Management Program
PROPOSED CONVEYANCE IMPROVEMENTS COST
07 - OAK ST/60th ST DRAINAGE BASIN

04/13/94

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
070010-070020	78	1.0	3,744			749		4,493
070030-070040	177	1.0	8,496			1,699		10,195
070040-070050	878	1.0	63,216			12,643		75,859
070050-070060	872	1.0			11,419	2,284		13,702
070060-070070	726	1.0			15,107	3,021		18,129
070070-070080	964	1.0	104,112			20,822		124,934
070080-070090	667	1.0	88,044			17,609		105,653
070090-070100	942	1.0	146,952			29,390		176,342
070100-070110	492	1.0	82,656			16,531		99,187
070110-070120	713	1.0	119,784			23,957		143,741
070210-070220	64	1.0	3,072			614		3,686
070220-070040	723	1.0	34,704			6,941		41,645
070310-070060	745	1.0			6,890	1,378		8,268
070410-070420	183	1.0	8,784			1,757		10,541
070420-070080	1,257	1.0	75,420			15,084		90,504
070510-070090	725	1.0	60,900			12,180		73,080
070610-070620	83	1.0	3,984			797		4,781
070710-070720	89	1.0	4,272			854		5,126
071010-071020	134	1.0	6,432			1,286		7,718
	10,512		814,572		33,416	169,598		1,017,585

ID: 070010-070020

Street Name: E OAK ST
Type: PIPE
Drawing No(s):
Length: 78
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0146	0.013	12						4
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100					ROW Capacity:		
PROPOSED	Pipe:	1	0.0100	0.013	24						23
	Box:										
	Channel:								Lined: N		
Improvement Year:											

Section Capacity: 27
ROW+Section Capacity: 27

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $3,744
Total Improvements Cost: $4,493

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	4	13	29	37	19	40

ID: 070020-070030

Street Name: N 60TH ST
Type: NATURAL CHANNEL
Drawing No(s):
Length: 520
Right of Way: 14
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:		0.0146	0.025					5	9	24
	Roadway:			Equivalent Roadway (%): 100					ROW Capacity:		
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
Improvement Year:											

Section Capacity: 24
ROW+Section Capacity: 24

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	4	13	29	37	19	40

ID: 070030-070040

Street Name: N 60TH ST
Type: ROADWAY
Drawing No(s):
Length: 177
Right of Way: 73
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	73
PROPOSED	Pipe:	1	0.0100	0.013	24						23
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	23
										ROW+Section Capacity:	95

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $8,496
Total Improvements Cost: $10,195

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	5	16	35	44	23	48

ID: 070040-070050

Street Name: N 60TH WAY
Type: IMPROVED CHANNEL
Drawing No(s):
Length: 878
Right of Way: 25
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0146	0.025		1.5	1.0	1.0			15
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0050	0.013	36						47
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	62
										ROW+Section Capacity:	62

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $63,216
Total Improvements Cost: $75,859

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	9	31	68	88	46	94

ID: 070050-070060

Street Name: E WILSHIRE DR
Type: IMPROVED CHANNEL
Drawing No(s):
Length: 872
Right of Way: 8
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0146	0.025		1.5	1.0	1.0			15
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:		0.0146	0.013		3.0	1.2	1.0	Lined: Y		71
Improvement Year:										Section Capacity:	85
										ROW+Section Capacity:	85

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $11,419
Total Improvements Cost: $13,702

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	14	45	97	124	66	131

ID: 070060-070070

Street Name: E WINDSOR AVE
Type: IMPROVED CHANNEL
Drawing No(s):
Length: 726
Right of Way: 8
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0146	0.025		1.5	1.0	1.0			15
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:		0.0146	0.013		4.5	1.5	1.0	Lined: Y		133
Improvement Year:										Section Capacity:	148
										ROW+Section Capacity:	148

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $15,107
Total Improvements Cost: $18,129

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	36	90	179	224	126	235

ID: 070070-070080

Street Name: N 60TH ST
Type: ROADWAY
Drawing No(s):
Length: 964
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	118
PROPOSED	Pipe:	1	0.0080	0.013	54						176
	Box:										
	Channel:								Lined: N		
Improvement Year:											
										Section Capacity:	176
										ROW+Section Capacity:	294

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $104,112
Total Improvements Cost: $124,934

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	52	124	239	298	170	314

ID: 070080-070090

Street Name: E THOMAS RD
Type: ROADWAY
Drawing No(s):
Length: 667
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	118
PROPOSED	Pipe:	1	0.0050	0.013	66						238
	Box:										
	Channel:								Lined: N		
Improvement Year:											
										Section Capacity:	238
										ROW+Section Capacity:	355

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $88,044
Total Improvements Cost: $105,653

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	76	171	327	404	235	433

ID: 070090-070100

Street Name: E THOMAS RD
Type: ROADWAY
Drawing No(s):
Length: 942
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	118
PROPOSED	Pipe:	1	0.0050	0.013	78						371
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	371
										ROW+Section Capacity:	489

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $146,952
Total Improvements Cost: $176,342

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	113	246	470	579	339	619

ID: 070100-070110

Street Name: E THOMAS RD
Type: ROADWAY
Drawing No(s):
Length: 492
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	118
PROPOSED	Pipe:	1	0.0050	0.013	84						452
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	452
										ROW+Section Capacity:	570

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $82,656
Total Improvements Cost: $99,187

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	135	308	586	726	419	773

ID: 070110-070120

Street Name: E THOMAS RD
Type: ROADWAY
Drawing No(s):
Length: 713
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	118
PROPOSED	Pipe:	1	0.0050	0.013	84						452
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	452
										ROW+Section Capacity:	570

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $119,784
Total Improvements Cost: $143,741

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	141	321	606	752	439	800

ID: 070210-070220

Street Name: OAK ST
Type: PIPE
Drawing No(s):
Length: 64
Right of Way: 40
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0146	0.013	12						4
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0080	0.013	24						20
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	25
										ROW+Section Capacity:	25

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $3,072
Total Improvements Cost: $3,686

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	3	11	25	32	16	34

ID: 070220-070040

Type: ROADWAY
Length: 723
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 60TH ST
Drawing No(s):
Right of Way: 73
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	73
PROPOSED	Pipe:	1	0.0080	0.013	24						20
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	20
										ROW+Section Capacity:	93

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $34,704
Total Improvements Cost: $41,645

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	3	11	25	32	16	34

ID: 070310-070060

Type: IMPROVED CHANNEL
Length: 745
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E CAMBRIDGE AVE
Drawing No(s):
Right of Way: 50
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0146	0.025		1.5	1.0	1.0			15
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:		0.0080	0.013		2.0	1.5	1.0	Lined: Y		40
	Improvement Year:										
										Section Capacity:	55
										ROW+Section Capacity:	55

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $6,890
Total Improvements Cost: $8,268

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	13	27	48	58	35	62

ID: 070410-070420

Street Name: E THOMAS RD
Type: ROADWAY
Drawing No(s):
Length: 183
Right of Way: 70
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	73
PROPOSED	Pipe:	1	0.0060	0.013	24						18
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	18
										ROW+Section Capacity:	90

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $8,784
Total Improvements Cost: $10,541

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	7	14	25	30	19	34

ID: 070420-070080

Street Name: E THOMAS RD
Type: ROADWAY
Drawing No(s):
Length: 1,257
Right of Way: 40
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	83
PROPOSED	Pipe:	1	0.0050	0.013	30						29
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	29
										ROW+Section Capacity:	112

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $75,420
Total Improvements Cost: $90,504

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	8	17	31	38	23	42

ID: 070510-070090

Street Name: PRIVATE ST
Type: NATURAL CHANNEL
Drawing No(s):
Length: 725
Right of Way: 12
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:		0.0146	0.025					5	9	24
	Roadway:			Equivalent Roadway (%): 100					ROW Capacity:		
PROPOSED	Pipe:	1	0.0080	0.013	42						90
	Box:										
	Channel:								Lined: N		
Improvement Year:											

Section Capacity: 114
ROW+Section Capacity: 114

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $60,900
Total Improvements Cost: $73,080

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	30	63	119	145	87	154

ID: 070610-070620

Street Name: E OAK ST
Type: ROADWAY
Drawing No(s):
Length: 83
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100					ROW Capacity:		118
PROPOSED	Pipe:	1	0.0080	0.013	24						20
	Box:										
	Channel:								Lined: N		
Improvement Year:											

Section Capacity: 20
ROW+Section Capacity: 138

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $3,984
Total Improvements Cost: $4,781

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	5	15	32	41	21	45

ID: 070620-070100

Street Name: N 58TH PL
Type: NATURAL CHANNEL
Drawing No(s):
Length: 2,833
Right of Way: 14
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:		0.0146	0.025					5	9	24
	Roadway:			Equivalent Roadway (%): 100					ROW Capacity:		
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
									Section Capacity:		24
									ROW+Section Capacity:		24

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	5	15	32	41	21	44

ID: 070710-070720

Street Name: E OAK ST
Type: ROADWAY
Drawing No(s):
Length: 89
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100					ROW Capacity:		118
PROPOSED	Pipe:	1	0.0080	0.013	24						20
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
									Section Capacity:		20
									ROW+Section Capacity:		138

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $4,272
Total Improvements Cost: $5,126

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	5	15	32	41	21	45

ID: 070720-070730

Street Name: N 57TH ST
Type: NATURAL CHANNEL
Drawing No(s):
Length: 3,005
Right of Way: 14
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:		0.0146	0.025					5	9	24
	Roadway:			Equivalent Roadway (%): 100					ROW Capacity:		
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
									Section Capacity:		24
									ROW+Section Capacity:		24

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	5	15	32	41	21	44

ID: 070730-070740

Street Name: N 56TH ST
Type: ROADWAY
Drawing No(s):
Length: 133
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100					ROW Capacity:		118
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
									Section Capacity:		
									ROW+Section Capacity:		118

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	28	68	138	169	97	177

ID: 070810-070820

Street Name: N 56TH ST
Type: ROADWAY
Drawing No(s):
Length: 106
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0146	Equivalent Roadway (%): 100					ROW Capacity:		118
PROPOSED Pipe:										
Box:										
Channel:								Lined: N		
Improvement Year:										
								Section Capacity:		
								ROW+Section Capacity:		118

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	9	18	32	40	24	42

ID: 070910-070920

Street Name: N 56TH ST
Type: ROADWAY
Drawing No(s):
Length: 113
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0146	Equivalent Roadway (%): 100					ROW Capacity:		118
PROPOSED Pipe:										
Box:										
Channel:								Lined: N		
Improvement Year:										
								Section Capacity:		
								ROW+Section Capacity:		118

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	20	42	78	96	57	101

ID: 071010-071020

Street Name: E OAK ST
Type: ROADWAY
Drawing No(s):
Length: 134
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	118
PROPOSED	Pipe:	1	0.0080	0.013	24						20
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	20
										ROW+Section Capacity:	138

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $6,432
Total Improvements Cost: $7,718

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	5	15	33	43	22	47

ID: 071020-071030

Street Name: E OAK ST
Type: NATURAL CHANNEL
Drawing No(s):
Length: 476
Right of Way: 14
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:		0.0146	0.025					5	9	24
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	24
										ROW+Section Capacity:	24

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	5	15	33	43	22	46

ID: 071030-071040

Street Name: N 56TH ST
Type: ROADWAY
Drawing No(s):
Length: 104
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

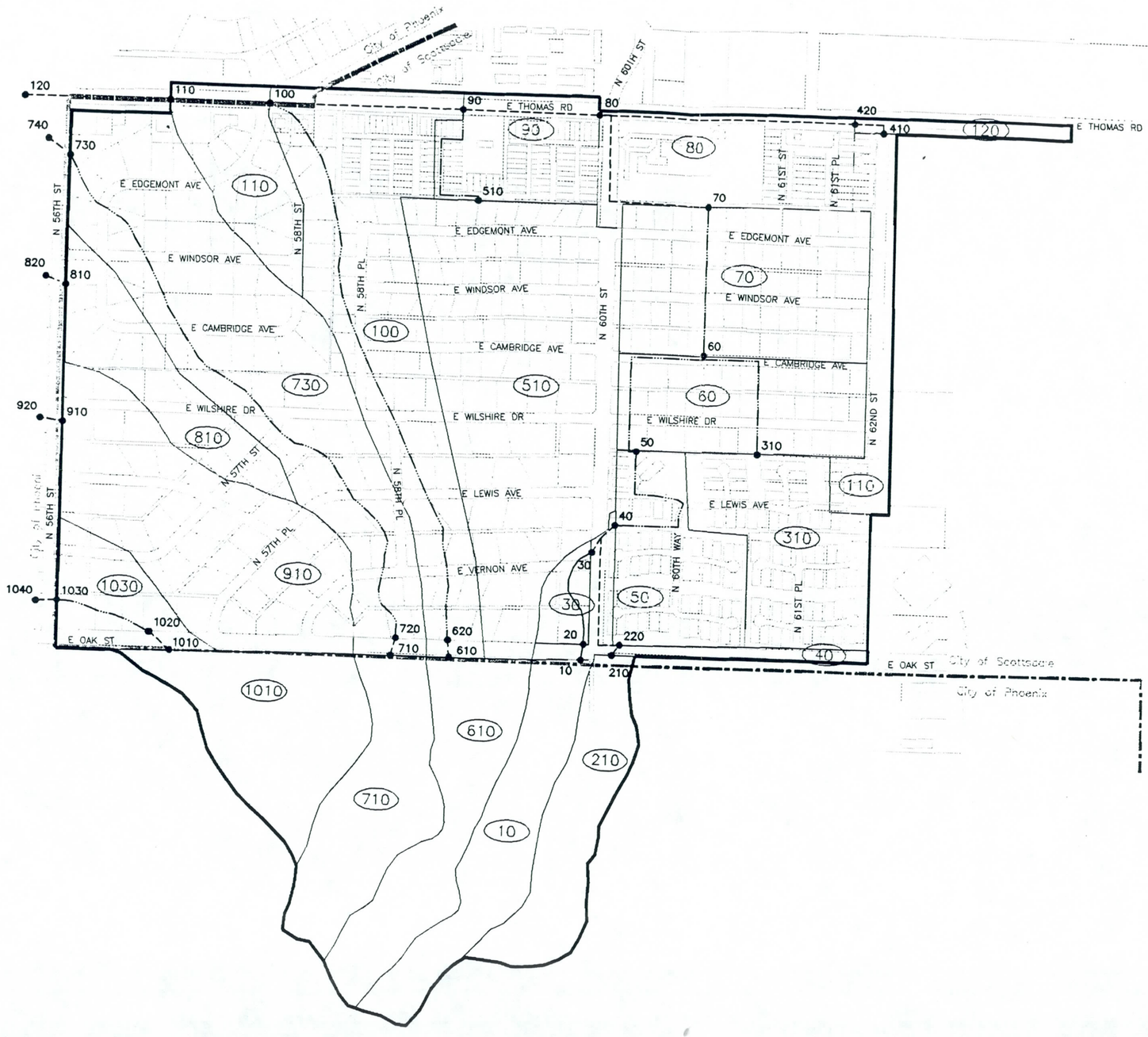
		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0146	Equivalent Roadway (%): 100						ROW Capacity:	118
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	118

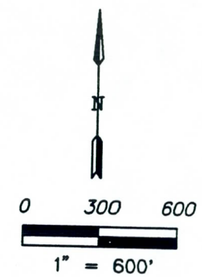
COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	6	21	48	62	32	66





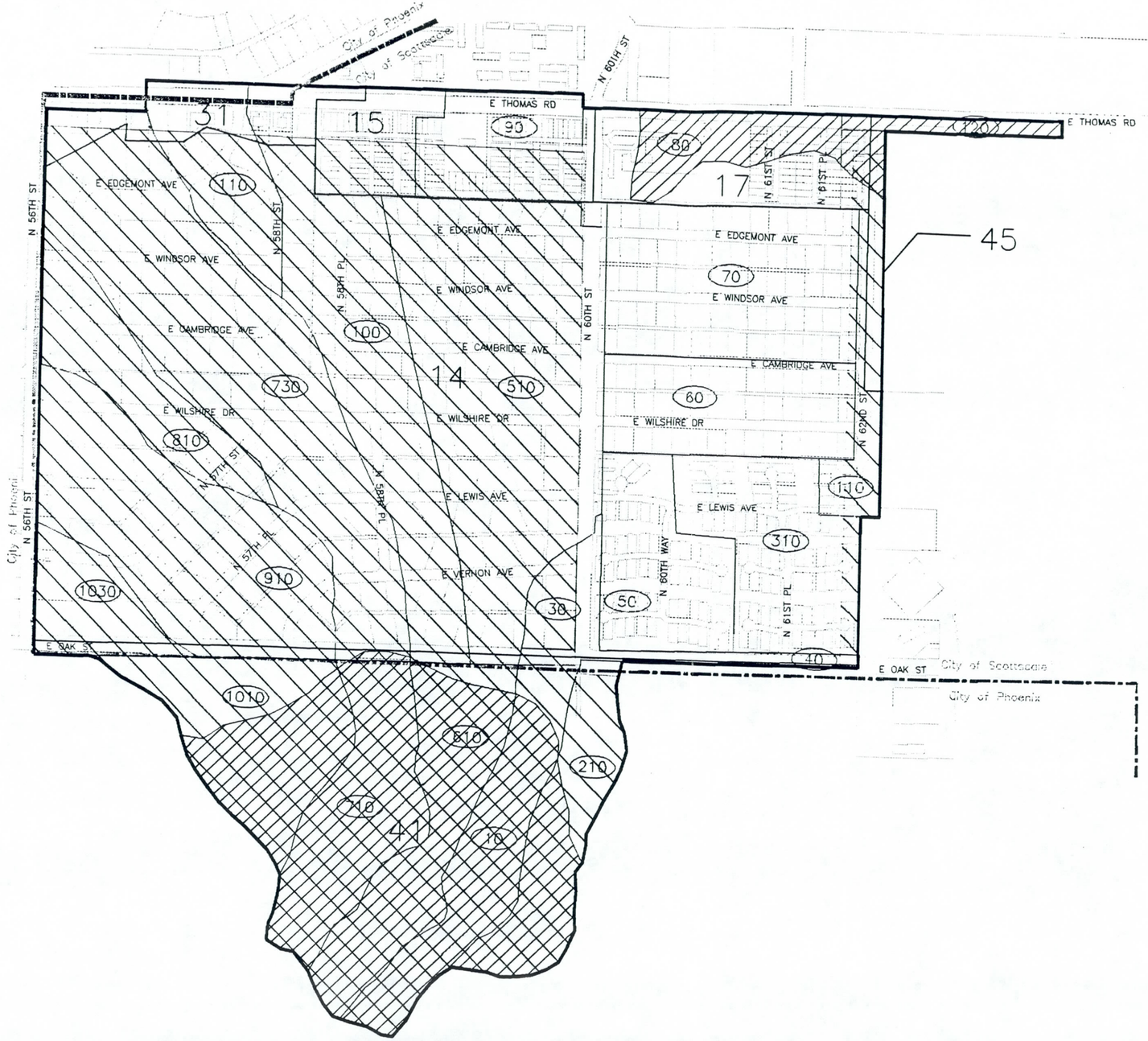
Legend

- Analysis Node
- Storage Basin
- Basin Boundary
- Drainage Area
- Roadway Reach
- Channel
- Pipe/Culvert
- City Boundary

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 07 Oak St. / 60 TH St. Drainage Map



0 300 600

1" = 600'

Legend

- Basin Boundary
- (610) Drainage Area
- Land Use Boundary
- City Boundary

Land Uses

10 – 1 DU PER 5 ACRES
11 – 1 DU PER 2–3 ACRES
12 – 1 DU PER 1–2 ACRES
13 – 1–2 DU PER ACRE
14 – 2–4 DU PER ACRE
15 – 4–8 DU PER ACRE
16 – 8–12 DU PER ACRE
17 – 12–22 DU PER ACRE
18 – TOURIST ACCOMMODATIONS
19 – LOW INTENSITY RESORT
21 – NEIGHBORHOOD COMMERCIAL
22 – GENERAL COMMERCIAL
31 – MINOR OFFICE
32 – MAJOR OFFICE
33 – MINOR EMPLOYMENT
34 – GENERAL EMPLOYMENT
36 – RESEARCH AND DEVELOPMENT
41 – NATURAL OPEN SPACE
42 – LIMITED USE AREA
43 – DEVELOPED OPEN SPACE
44 – CULTURAL/INSTITUTIONAL
45 – UTILITIES

Soil Group C
Runoff Zone 1
Except where shown

- Soil Group B
- Soil Group D
- Runoff Zone 3

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 07 Oak St. / 60 TH St.

Land Use Map

08-McKELLIPS/HAYDEN Basin

Basin 08 is 288 acres, which is made up of 151 acres residential, 92 commercial and 45 acres open space. The basin is bounded by McDowell Rd. to the north, McKellips Rd. to the south, Hayden Rd. to the east, and Indian Bend Wash to the west.

The drainage pattern of this basin is generally from northeast to southwest. There is one major drainage system in this basin that drains from analysis point 10 to analysis point 70 at Indian Bend Wash. There was one assumed pipe change along the drainage system. The assumed pipe change size is from a 36 inch pipe to a 48 inch pipe and this occurs at analysis point 50. Also, there are two 36 inch pipes which drain into Indian Bend Wash and these pipes are located between analysis points 410 and 420. However, these pipes are not part of the major drainage system of this basin. A split flow was encountered at analysis point 30. It was assumed that a certain percentage of the flow drained onto Pierce St. and the other certain percent kept flowing south on Hayden Rd. However, at this analysis point, it was modeled as if 100 percent flowed south on Hayden Rd. It was modeled this way because future road projects will correct this split flow problem. A north-south and east-west slope were calculated from a USGS map. The north-south slope was used for the calculations because it better represented the basin. No "as builts" could be found for the basin.

There were two detention basins in this drainage area. The first one is located at a church on the northwest corner of Hayden Rd. and Roosevelt St.. Its drainage pattern is from north to south which then drains onto Roosevelt St. and flows west to Indian Bend Wash. The second detention basin is at the Motorola site. There are several storage basins along the west and south sides of this site. Its drainage pattern is from north to south which then drains onto Hayden Rd. and flows south to analysis node 20.

ASSUMPTIONS:

- The pipes between analysis points 10 through 40, 710 to 40, and 40 to 50, are 36 inch pipes.
- The pipes connect at analysis point 40.
- The pipe between analysis points 510 and 520 is a 24 inch pipe.
- The pipe changes from a 36 inch pipe to a 48 inch pipe at analysis point 50
- The storage basins at the Motorola site are designed for a 2-hr 100-yr storm.

City of Scottsdale

Storm Water Master Plan and Management Program

PROPOSED CONVEYANCE IMPROVEMENTS COST

08 - MC KELLIPS/HAYDEN DRAINAGE BASIN

04/13/94

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
080020-080030	1,389	1.0	133,344			26,669		160,013
080030-080040	1,202	1.0	129,816			25,963		155,779
080040-080050	348	1.0	41,760			8,352		50,112
080050-080060	628	1.0	97,968			19,594		117,562
080060-080070	460	1.0	71,760			14,352		86,112
080120-080130	180	1.6	27,830			5,566		33,396
080130-080140	473	1.0	56,760			11,352		68,112
080140-080150	239	1.0	28,680			5,736		34,416
080510-080520	452	1.0	32,544			6,509		39,053
080710-080040	420	1.0	50,400			10,080		60,480
	5,791		670,862			134,172		805,034

ID: 080010-080020

Type: PIPE
Length: 2,098
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N HAYDEN RD
Drawing No(s):
Right of Way: 105
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0061	0.013	36						52
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 52
ROW+Section Capacity: 52

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	10	20	37	45	27	50

ID: 080020-080030

Type: PIPE
Length: 1,389
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N HAYDEN RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0061	0.013	36						52
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0055	0.013	48						107
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 159
ROW+Section Capacity: 159

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $133,344
Total Improvements Cost: $160,013

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	31	61	113	140	83	152

ID: 080030-080040

Type: PIPE
Length: 1,202
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N HAYDEN RD
Drawing No(s):
Right of Way: 105
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0061	0.013	36						52
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0055	0.013	54						146
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 198
ROW+Section Capacity: 198

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $129,816
Total Improvements Cost: $155,779

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	50	96	176	215	129	234

ID: 080040-080050

Type: PIPE
Length: 348
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MC KELLIPS RD
Drawing No(s):
Right of Way: 120
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0061	0.013	36						52
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0055	0.013	60						193
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 245
ROW+Section Capacity: 245

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $41,760
Total Improvements Cost: $50,112

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	86	155	268	321	201	359

ID: 080050-080060

Type: PIPE
Length: 628
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MC KELLIPS RD
Drawing No(s):
Right of Way: 158
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0061	0.013	48						112
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0055	0.013	78						389
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 501
ROW+Section Capacity: 501

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $97,968
Total Improvements Cost: $117,562

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	153	285	503	612	371	673

ID: 080060-080070

Type: PIPE
Length: 460
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: INDIAN BEND WASH
Drawing No(s):
Right of Way: 40
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0061	0.013	36						52
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0055	0.013	78						389
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 441
ROW+Section Capacity: 441

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $71,760
Total Improvements Cost: $86,112

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	154	287	504	616	373	678

ID: 080110-080120

Type: ROADWAY
Length: 789
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 78TH ST
Drawing No(s):
Right of Way: 50
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0061	Equivalent Roadway (%): 100						ROW Capacity:	70
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	70

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	24	48	92	114	64	117

ID: 080120-080130

Type: ROADWAY
Length: 180
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 78TH ST
Drawing No(s):
Right of Way: 50
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0061	Equivalent Roadway (%): 100						ROW Capacity:	70
PROPOSED	Pipe:	1	0.0055	0.013	48						107
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	107
										ROW+Section Capacity:	176

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $27,830
Total Improvements Cost: $33,396

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	34	69	135	169	93	172

ID: 080130-080140

Street Name: E ROOSEVELT ST
Type: ROADWAY
Drawing No(s):
Length: 473
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0061	Equivalent Roadway (%): 100						ROW Capacity:	76
PROPOSED	Pipe:	1	0.0055	0.013	60						193
	Box:										
	Channel:								Lined: N		
Improvement Year:											
										Section Capacity:	193
										ROW+Section Capacity:	269

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $56,760
Total Improvements Cost: $68,112

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	56	112	218	274	153	280

ID: 080140-080150

Street Name: E ROOSEVELT ST
Type: ROADWAY
Drawing No(s):
Length: 239
Right of Way: 80
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0061	Equivalent Roadway (%): 100						ROW Capacity:	76
PROPOSED	Pipe:	1	0.0055	0.013	60						193
	Box:										
	Channel:								Lined: N		
Improvement Year:											
										Section Capacity:	193
										ROW+Section Capacity:	269

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $28,680
Total Improvements Cost: $34,416

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	55	112	220	277	155	283

ID: 080210-080130

Street Name: E ROOSEVELT ST
Type: ROADWAY
Drawing No(s):
Length: 665
Right of Way: 66
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0061	Equivalent Roadway (%): 100						ROW Capacity:	47
PROPOSED Pipe:										
Box:										
Channel:								Lined: N		
Improvement Year:										
									Section Capacity:	
									ROW+Section Capacity:	47

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):		2	6	16	4	14

ID: 080310-080130

Street Name: N 78TH ST
Type: ROADWAY
Drawing No(s):
Length: 160
Right of Way: 50
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0061	Equivalent Roadway (%): 100						ROW Capacity:	70
PROPOSED Pipe:										
Box:										
Channel:								Lined: N		
Improvement Year:										
									Section Capacity:	
									ROW+Section Capacity:	70

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	15	30	58	71	40	73

ID: 080410-080420

Street Name: E PIERCE ST
Type: PIPE
Drawing No(s):
Length: 238
Right of Way: 16
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	2	0.0061	0.013	36						104
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 104
ROW+Section Capacity: 104

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	11	21	38	46	28	52

ID: 080510-080520

Street Name: E MC KELLIPS SR
Type: PIPE
Drawing No(s):
Length: 452
Right of Way: 15
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0061	0.013	18						8
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0061	0.013	36						52
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 60
ROW+Section Capacity: 60

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $32,544
Total Improvements Cost: $39,053

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	16	30	52	63	40	72

ID: 080610-080020

Street Name: N HAYDEN RD
Type: ROADWAY
Drawing No(s):
Length: 300
Right of Way: 105
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0061	Equivalent Roadway (%): 100						ROW Capacity:	76
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	76

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):			23	37	14	38

ID: 080710-080040

Street Name: E MC KELLIPS RD
Type: PIPE
Drawing No(s):
Length: 420
Right of Way: 105
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

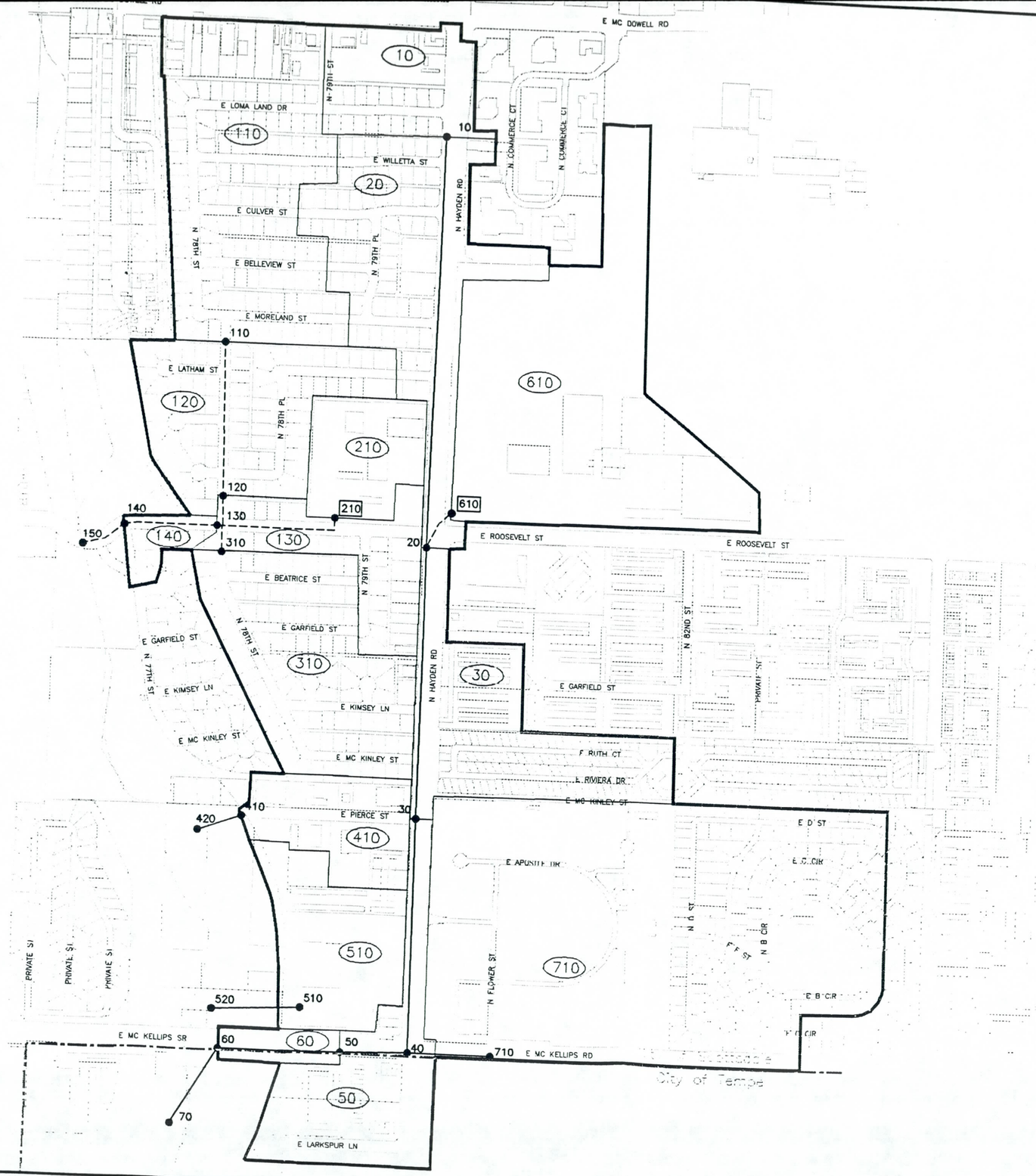
		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0061	0.013	36						52
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0061	0.013	60						203
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	256
										ROW+Section Capacity:	256

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $50,400
Total Improvements Cost: $60,480

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	87	157	269	324	203	366



0 300 600

1" = 600'

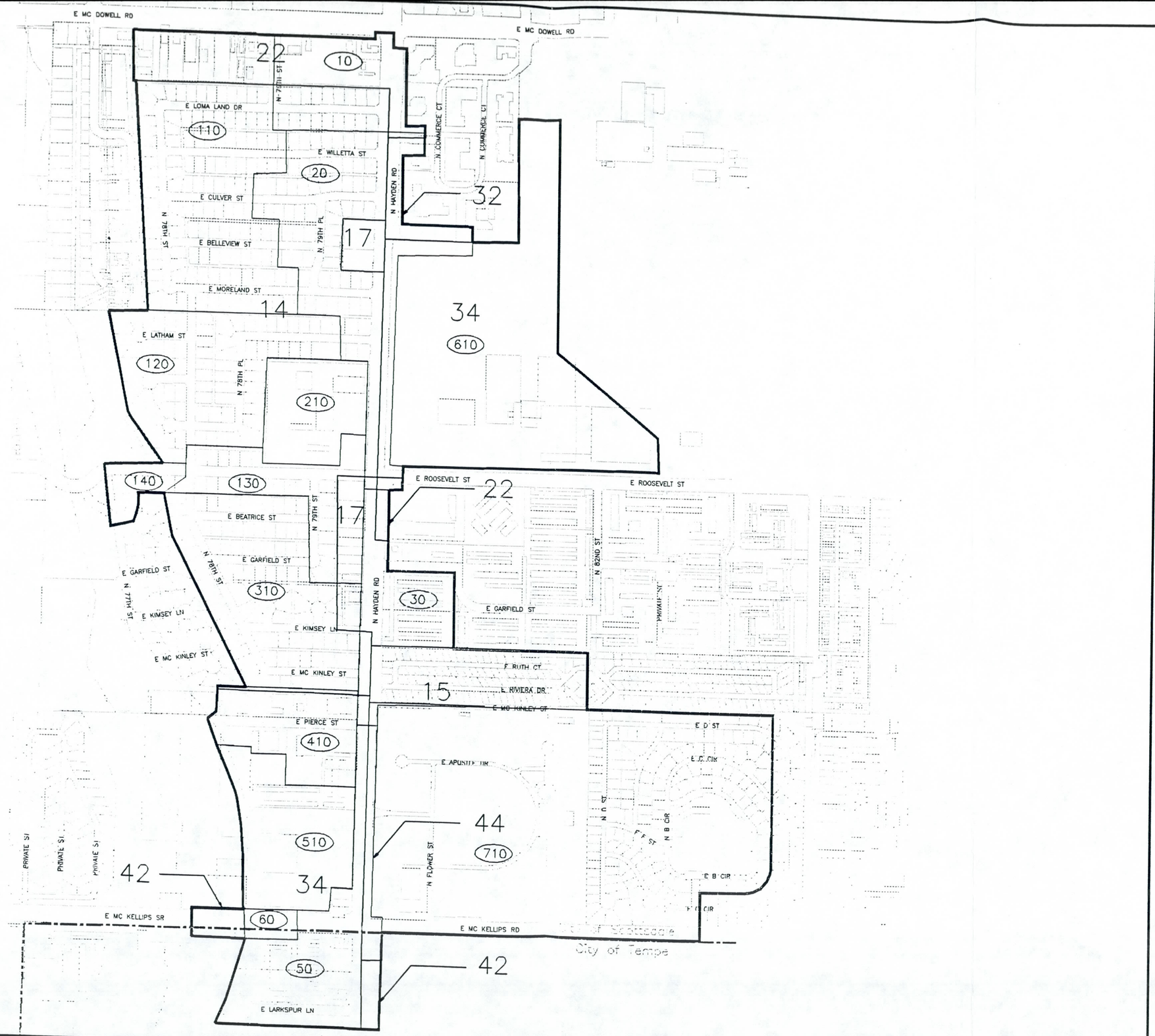
Legend

- Analysis Node
- Storage Basin
- Basin Boundary
- Drainage Area
- Roadway Reach
- Channel
- Pipe/Culvert
- City Boundary

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 08 W Mckellips / Hayden Rd. Drainage Map



N

0 300 600

1" = 600'

Legend

- Basin Boundary
- (610) Drainage Area
- Land Use Boundary
- City Boundary

Land Uses

10 – 1 DU PER 5 ACRES
11 – 1 DU PER 2–3 ACRES
12 – 1 DU PER 1–2 ACRES
13 – 1–2 DU PER ACRE
14 – 2–4 DU PER ACRE
15 – 4–8 DU PER ACRE
16 – 8–12 DU PER ACRE
17 – 12–22 DU PER ACRE
18 – TOURIST ACCOMMODATIONS
19 – LOW INTENSITY RESORT
21 – NEIGHBORHOOD COMMERCIAL
22 – GENERAL COMMERCIAL
31 – MINOR OFFICE
32 – MAJOR OFFICE
33 – MINOR EMPLOYMENT
34 – GENERAL EMPLOYMENT
36 – RESEARCH AND DEVELOPMENT
41 – NATURAL OPEN SPACE
42 – LIMITED USE AREA
43 – DEVELOPED OPEN SPACE
44 – CULTURAL/INSTITUTIONAL
45 – UTILITIES

Soil Group B

Runoff Zone 1

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 08 W Mckellips / Hayden Rd. Land Use Map

ID: 090010-090020

Type: ROADWAY
Length: 1,151
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 86TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	36
PROPOSED	Pipe:	1	0.0035	0.013	42						60
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	60
										ROW+Section Capacity:	95

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $155,711
Total Improvements Cost: $186,853

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	17	32	65	83	45	102

ID: 090020-090030

Type: IMPROVED CHANNEL
Length: 1,007
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: ALLEY
Drawing No(s):
Right of Way: 16
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0035	0.017		1.0	3.5	1.0			19
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0035	0.013	66						199
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	217
										ROW+Section Capacity:	217

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $214,075
Total Improvements Cost: $256,891

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	77	144	283	361	201	437

ID: 090030-090040

Type: IMPROVED CHANNEL
Length: 774
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E EARLL DR
Drawing No(s):
Right of Way: 30
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0035	0.020		1.0	5.0	1.5			24
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0035	0.013	72						251
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 274
ROW+Section Capacity: 274

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $179,501
Total Improvements Cost: $215,401

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	87	165	330	415	228	508

ID: 090040-090050

Type: IMPROVED CHANNEL
Length: 852
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E EARLL DR
Drawing No(s):
Right of Way: 12
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0035	0.025		2.5	8.0	2.0			105
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0035	0.013	78						310
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 415
ROW+Section Capacity: 415

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $214,056
Total Improvements Cost: $256,867

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	117	225	463	595	319	724

ID: 090050-090060

Type: IMPROVED CHANNEL
Length: 1,426
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N PIMA RD
Drawing No(s):
Right of Way: 145
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0035	0.025		2.0	2.0	2.0			23
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	87
PROPOSED	Pipe:										
	Box:	1	0.0035	0.015		6.0	8.0				403
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	426
										ROW+Section Capacity:	513

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $430,893
Total Improvements Cost: $517,072

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	152	289	597	758	409	933

ID: 090060-090070

Type: PIPE
Length: 1,373
Upstream Inv Elev: 1209.90
Upstream Grnd Elev: 1220.61

Street Name: N 87TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev: 1208.20
Downstream Grnd Elev: 1217.92

Slope: 0.0012

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0015	0.013	48						56
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 200						ROW Capacity:	71
PROPOSED	Pipe:										
	Box:	1	0.0020	0.015		8.0	10.0				604
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	659
										ROW+Section Capacity:	730

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $535,605
Total Improvements Cost: $642,726

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	257	492	1,002	1,272	691	1,554

ID: 090070-090080

Street Name: N 87TH ST
Drawing No(s):
Right of Way: 60

Type: PIPE
Length: 1,344
Upstream Inv Elev: 1208.20
Upstream Grnd Elev: 1217.92
Downstream Inv Elev: 1205.91
Downstream Grnd Elev: 1214.12

Slope: 0.0017

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0015	0.013	48						56
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 200						ROW Capacity:	71
PROPOSED	Pipe:										
	Box:	1	0.0020	0.015		10.0	10.0				816
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	872
										ROW+Section Capacity:	943

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $586,177
Total Improvements Cost: $703,412

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	271	522	1,077	1,374	737	1,677

ID: 090080-090090

Street Name: N 87TH ST
Drawing No(s):
Right of Way: 60

Type: PIPE
Length: 1,354
Upstream Inv Elev: 1205.91
Upstream Grnd Elev: 1214.12
Downstream Inv Elev: 1204.42
Downstream Grnd Elev: 1212.28

Slope: 0.0011

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0015	0.013	48						56
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 200						ROW Capacity:	71
PROPOSED	Pipe:										
	Box:	1	0.0020	0.015		10.0	10.0				816
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	872
										ROW+Section Capacity:	943

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $590,538
Total Improvements Cost: $708,646

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	327	638	1,330	1,689	907	2,078

ID: 090090-090100

Street Name: N 87TH ST
Drawing No(s):
Right of Way: 60

Type: PIPE
Length: 700
Upstream Inv Elev: 1204.42
Upstream Grnd Elev: 1212.28
Downstream Inv Elev: 1202.83
Downstream Grnd Elev: 1210.39

Slope: 0.0023

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0015	0.013	48						56
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 200						ROW Capacity:	71
PROPOSED	Pipe:										
	Box:	1	0.0020	0.015		10.0	12.0				1,038
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	1,094
										ROW+Section Capacity:	1,165

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $334,440
Total Improvements Cost: $401,328

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	356	699	1,456	1,854	993	2,274

ID: 090100-090110

Street Name: N 87TH ST
Drawing No(s):
Right of Way: 60

Type: PIPE
Length: 400
Upstream Inv Elev: 1202.83
Upstream Grnd Elev: 1210.39
Downstream Inv Elev: 1202.27
Downstream Grnd Elev: 1209.10

Slope: 0.0014

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0015	0.013	48						56
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 200						ROW Capacity:	71
PROPOSED	Pipe:										
	Box:	1	0.0020	0.015		10.0	12.0				1,038
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	1,094
										ROW+Section Capacity:	1,165

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $191,108
Total Improvements Cost: $229,330

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	364	718	1,500	1,917	1,022	2,347

ID: 090110-090120

Street Name: EASEMENT
Type: IMPROVED CHANNEL
Drawing No(s):
Length: 1,101
Right of Way: 40
Upstream Inv Elev: 1202.27
Downstream Inv Elev: 1200.50
Slope: 0.0016
Upstream Grnd Elev: 1209.10
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0015	0.025		4.5	12.0	3.0			219
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100					ROW Capacity:		
PROPOSED	Pipe:										
	Box:	1	0.0020	0.015		10.0	12.0				1,038
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 1,257
ROW+Section Capacity: 1,257

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $526,026
Total Improvements Cost: $631,231

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	373	738	1,542	1,962	1,051	2,402

ID: 090120-090130

Street Name: EASEMENT
Type: IMPROVED CHANNEL
Drawing No(s):
Length: 1,069
Right of Way: 40
Upstream Inv Elev: 1200.50
Downstream Inv Elev: 1198.99
Slope: 0.0014
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0015	0.035		7.0	10.0	2.0			222
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100					ROW Capacity:		
PROPOSED	Pipe:										
	Box:										
	Channel:		0.0015	0.018		8.0	16.0		Lined: Y		1,032
	Improvement Year:										

Section Capacity: 1,254
ROW+Section Capacity: 1,254

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $102,023
Total Improvements Cost: $122,427

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	394	772	1,597	2,037	1,095	2,485

ID: 090130-090140

Type: PIPE
Length: 1,836
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 84TH PL
Drawing No(s):
Right of Way: 50
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0015	0.013	48						56
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 150						ROW Capacity:	79
PROPOSED	Pipe:										
	Box:	1	0.0020	0.015		10.0	12.0				1,038
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	1,094
										ROW+Section Capacity:	1,173

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $877,188
Total Improvements Cost: $1,052,625

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	401	784	1,622	2,064	1,110	2,528

ID: 090140-090150

Type: PIPE
Length: 1,100
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N GRANITE REEF RD
Drawing No(s):
Right of Way: 70
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0015	0.013	54						76
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0015	Equivalent Roadway (%): 200						ROW Capacity:	47
PROPOSED	Pipe:										
	Box:	1	0.0020	0.015		10.0	12.0				1,038
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	1,114
										ROW+Section Capacity:	1,161

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $525,548
Total Improvements Cost: $630,658

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	421	825	1,694	2,163	1,166	2,639

ID: 090150-090160

Type: IMPROVED CHANNEL
Length: 218
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N GRANITE REEF RD
Drawing No(s):
Right of Way: 40
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:		0.0020	0.020		8.0	10.0	2.0			523
Nat Channel:										
Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED Pipe:										
Box:										
Channel:		0.0020	0.018		8.0	16.0		Lined: Y		1,191
Improvement Year:									Section Capacity:	1,714
									ROW+Section Capacity:	1,714

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $20,805
Total Improvements Cost: $24,966

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	445	863	1,761	2,245	1,216	2,740

ID: 090160-090170

Type: IMPROVED CHANNEL
Length: 1,358
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: EASEMENT
Drawing No(s):
Right of Way: 40
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:		0.0020	0.020		8.0	10.0	2.0			523
Nat Channel:										
Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED Pipe:										
Box:										
Channel:		0.0020	0.018		8.0	16.0		Lined: Y		1,191
Improvement Year:									Section Capacity:	1,714
									ROW+Section Capacity:	1,714

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $129,604
Total Improvements Cost: $155,525

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	448	868	1,774	2,254	1,223	2,741

ID: 090170-090180

Type: ROADWAY
Length: 222
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MC KELLIPS RD
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0025	Equivalent Roadway (%): 200						ROW Capacity:	97
PROPOSED	Pipe:										
	Box:	2	0.0020	0.015		8.0	12.0				1,525
	Channel:								Lined: N		
	Improvement Year:									Section Capacity:	1,525
										ROW+Section Capacity:	1,623

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $189,735
Total Improvements Cost: $227,682

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	483	934	1,911	2,431	1,318	2,958

ID: 090210-090220

Type: PIPE
Length: 657
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: SCHOOL GROUNDS
Drawing No(s):
Right of Way:
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0018	0.013	18						4
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0018	0.013	60						111
	Box:										
	Channel:								Lined: N		
	Improvement Year:									Section Capacity:	115
										ROW+Section Capacity:	115

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $126,973
Total Improvements Cost: $152,367

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	39	75	151	193	106	235

ID: 090220-090020

Street Name: E OSBORN RD
Type: ROADWAY
Drawing No(s):
Length: 1,313
Right of Way: 70
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	36
PROPOSED	Pipe:	1	0.0035	0.013	60						154
	Box:										
	Channel:								Lined: N		
Improvement Year:										Section Capacity:	154
										ROW+Section Capacity:	190

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $253,752
Total Improvements Cost: $304,502

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	61	114	224	280	157	339

ID: 090310-090320

Street Name: N 87TH ST
Type: ROADWAY
Drawing No(s):
Length: 1,160
Right of Way: 60
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	36
PROPOSED	Pipe:	1	0.0035	0.013	42						60
	Box:										
	Channel:								Lined: N		
Improvement Year:										Section Capacity:	60
										ROW+Section Capacity:	95

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $156,928
Total Improvements Cost: $188,314

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	14	31	70	91	46	112

ID: 090320-090040

Type: ROADWAY
Length: 162
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 87TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	36
PROPOSED Pipe:	1	0.0035	0.013	42						60
Box:										
Channel:									Lined: N	
Improvement Year:									Section Capacity:	60
									ROW+Section Capacity:	95

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $21,916
Total Improvements Cost: $26,299

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	21	42	96	126	63	157

ID: 090410-090420

Type: IMPROVED CHANNEL
Length: 1,879
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N PIMA RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:		0.0035	0.025		2.0	1.0	1.0			10
Nat Channel:										
Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	87
PROPOSED Pipe:	1	0.0035	0.013	42						60
Box:										
Channel:									Lined: N	
Improvement Year:									Section Capacity:	70
									ROW+Section Capacity:	157

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $254,196
Total Improvements Cost: $305,036

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	11	21	40	52	28	62

ID: 090420-090050

Type: IMPROVED CHANNEL
Length: 1,179
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N PIMA RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0035	0.025		2.0	1.0	1.0			10
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	87
PROPOSED	Pipe:	1	0.0035	0.013	42						60
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	70
										ROW+Section Capacity:	157

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $159,498
Total Improvements Cost: $191,398

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	25	47	95	120	66	144

ID: 090510-090520

Type: ROADWAY
Length: 1,312
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 84TH ST
Drawing No(s):
Right of Way: 70
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 120						ROW Capacity:	43
PROPOSED	Pipe:	1	0.0035	0.013	48						85
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	85
										ROW+Section Capacity:	128

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $202,847
Total Improvements Cost: $243,416

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	27	51	104	132	71	161

ID: 090520-090530

Type: ROADWAY
Length: 1,311
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E THOMAS RD
Drawing No(s):
Right of Way: 120
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 120						ROW Capacity:	105
PROPOSED	Pipe:	1	0.0035	0.013	60						154
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	154
										ROW+Section Capacity:	259

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $253,365
Total Improvements Cost: $304,039

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	53	101	212	272	143	334

ID: 090530-090060

Type: ROADWAY
Length: 1,067
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E THOMAS RD
Drawing No(s):
Right of Way: 130
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 120						ROW Capacity:	105
PROPOSED	Pipe:	1	0.0035	0.013	66						199
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	199
										ROW+Section Capacity:	303

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $226,831
Total Improvements Cost: $272,197

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	69	137	292	375	196	461

ID: 090610-090620

Type: ROADWAY
Length: 908
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 86TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	36
PROPOSED	Pipe:	1	0.0035	0.013	48						85
	Box:										
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	85
										ROW+Section Capacity:	121

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $140,385
Total Improvements Cost: $168,462

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	26	51	104	132	70	160

ID: 090620-090630

Type: ROADWAY
Length: 411
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 86TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	36
PROPOSED	Pipe:	1	0.0035	0.013	54						116
	Box:										
	Channel:									Lined: N	
Improvement Year:										Section Capacity:	116
										ROW+Section Capacity:	152

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $71,487
Total Improvements Cost: $85,785

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	40	77	159	202	107	246

ID: 090630-090080

Type: ROADWAY
Length: 454
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E OAK ST
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 120						ROW Capacity:	69
PROPOSED	Pipe:	1	0.0035	0.013	66						199
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	199
										ROW+Section Capacity:	268

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $96,515
Total Improvements Cost: $115,818

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	70	132	260	325	180	389

ID: 090710-090720

Type: ROADWAY
Length: 849
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E HUBBELL ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	36
PROPOSED	Pipe:	1	0.0035	0.013	30						24
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	24
										ROW+Section Capacity:	60

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $82,039
Total Improvements Cost: $98,447

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	11	20	40	50	28	60

ID: 090720-090090

Type: ROADWAY
Length: 276
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E HUBBELL ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	36
PROPOSED	Pipe:	1	0.0035	0.013	48						85
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	85
										ROW+Section Capacity:	121

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $42,672
Total Improvements Cost: $51,206

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	28	49	93	115	67	138

ID: 090810-090130

Type: ROADWAY
Length: 906
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: ** OVERLAND FLOW
Drawing No(s):
Right of Way:
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):			4	11	2	32

ID: 090910-090150

Type: ROADWAY
Length: 390
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: PRIVATE ST
Drawing No(s):
Right of Way: 24
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 120						ROW Capacity:	27
PROPOSED	Pipe:	1	0.0035	0.013	54						116
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	116
										ROW+Section Capacity:	143

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $67,835
Total Improvements Cost: $81,402

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	40	69	119	145	92	168

ID: 091010-090160

Type: ROADWAY
Length: 375
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: ** OVERLAND FLOW
Drawing No(s):
Right of Way:
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):			11	21		31

ID: 091110-090170

Type: ROADWAY
Length: 594
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E MC KELLIPS RD
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0035	Equivalent Roadway (%): 120						ROW Capacity:	69
PROPOSED	Pipe:	1	0.0035	0.013	60						154
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	154
										ROW+Section Capacity:	223

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $114,797
Total Improvements Cost: $137,757

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	67	123	227	280	162	331

ID: 090810

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	1.0	500	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	0.70	0.75							
Elevation:	0.00	1.00	2.00							
Discharge:	0.00	0.01	0.01							

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):	1.0	1.0	1.0	1.0	1.0	1.0
Basin Design (100yr-2hr):	0.7					

ID: 091010

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	7.0	600	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	0.65	1.29	1.94	2.58	3.23	3.87	4.52	5.00	5.00
Elevation:	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
Discharge:	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):	2.0	4.0	4.0	5.0	5.0	5.0
Basin Design (100yr-2hr):						

City of Scottsdale
Storm Water Master Plan and Management Program
LAND USE BASIN SUMMARY
09 - 87TH ST. DRAINAGE BASIN

Group	Land Use	Code	Area (acres)	Percent Impervious (%)	Impervious Area (acres)
	2-4 DU PER ACRE	14	686.10	35	240.13
	4-8 DU PER ACRE	15	140.60	54	75.93
	8-12 DU PER ACRE	16	5.21	74	3.86
	12-22 DU PER ACRE	17	85.83	94	80.68
TOTAL RESIDENTIAL			917.75	44	400.60
	GENERAL COMMERCIAL	22	22.13	85	18.81
	MINOR OFFICE	31	7.90	85	6.72
	GENERAL EMPLOYMENT	34	34.37	85	29.21
TOTAL COMMERCIAL/OFFICE			64.40	85	54.74
	DEVELOPED OPEN SPACE	43	31.10	80	24.88
	CULTURAL/INSTITUTIONAL	44	38.51	85	32.74
TOTAL OPEN SPACE			69.61	83	57.62
TOTAL	09 - 87TH ST. DRAINAGE BASIN		1,051.76	49	512.96

```
ID                                                                      10
IT     2                300                                             20
IO     5                                                                30
KK090010   BASIN                                                        40
BA 0.042                                                                50
PH 0.000   0.000   0.500   0.970   1.620   1.770   1.860   2.050        60
LS     0      79       0       0      98       0                        70
UK   150  0.0100    0.30      65                                        80
UK    50  0.0100    0.10      35                                        90
RK   707  0.0035    0.02            TRAP      38     1.0                100
RK  1410  0.0035    0.02            TRAP      45     1.0                110
KK090020     FROM  090010                                               120
RK  1151  0.0035   0.017            TRAP    45.0       1                130
KK090210   BASIN                                                        140
BA 0.095                                                                150
LS     0      79       0       0      98       0                        160
UK   150  0.0100    0.30      61                                        170
UK    50  0.0100    0.10      39                                        180
RK  1295  0.0035    0.02            TRAP      45     1.0                190
RK  1915  0.0035    0.02            TRAP      60     1.0                200
KK090220     FROM  090210                                               210
RK   657  0.0018   0.013            CIRC     1.5                        220
KK090220   BASIN                                                        230
BA 0.036                                                                240
LS     0      79       0       0      98       0                        250
UK   175  0.0100    0.30      40                                        260
UK   124  0.0100    0.10      60                                        270
RK   761  0.0035    0.02            TRAP      38     1.0                280
RK  1248  0.0035    0.02            TRAP      30     1.0                290
KK090220 COMBINE                                                        300
HC     2                                                                310
KK090020     FROM  090220                                               320
RK  1313  0.0035   0.017            TRAP    52.5       1                330
KK090020 COMBINE                                                        340
HC     2                                                                350
KK090030     FROM  090020                                               360
RK  1007  0.0035   0.017            TRAP     3.5     1.0                370
KK090030   BASIN                                                        380
BA 0.034                                                                390
LS     0      79       0       0      98       0                        400
UK   150  0.0100    0.30      65                                        410
UK    50  0.0100    0.10      35                                        420
RK  1453  0.0035    0.02            TRAP      38     1.0                430
RK  1007  0.0035    0.02            TRAP      12     1.0                440
KK090030 COMBINE                                                        450
HC     2                                                                460
KK090040     FROM  090030                                               470
RK   774  0.0035   0.020            TRAP     5.0     1.5                480
KK090040   BASIN                                                        490
BA 0.031                                                                500
LS     0      79       0       0      98       0                        510
UK   151  0.0100    0.30      63                                        520
UK    53  0.0100    0.10      37                                        530
RK  1695  0.0035    0.02            TRAP      38     1.0                540
RK  1213  0.0035    0.02            TRAP      23     1.0                550
```

```
KK090310   BASIN
BA 0.054
LS     0      79       0       0      98       0
UK   150  0.0100    0.30      65
UK    50  0.0100    0.10      35
RK   326  0.0035    0.02            TRAP      38     1.0
RK  3422  0.0035    0.02            TRAP      45     1.0
KK090320    FROM  090310
RK  1160  0.0035   0.017            TRAP    45.0       1
KK090320   BASIN
BA 0.023
LS     0      79       0       0      98       0
UK   150  0.0100    0.30      65
UK    50  0.0100    0.10      35
RK   450  0.0035    0.02            TRAP      38     1.0
RK  1160  0.0035    0.02            TRAP      45     1.0
KK090320 COMBINE
HC     2
KK090040    FROM  090320
RK   162  0.0035   0.017            TRAP    45.0       1
KK090040 COMBINE
HC     3
KK090050    FROM  090040
RK   852  0.0035   0.025            TRAP     8.0     2.0
KK090050   BASIN
BA 0.031
LS     0      79       0       0      98       0
UK   157  0.0100    0.30      55
UK    70  0.0100    0.10      45
RK   778  0.0035    0.02            TRAP      38     1.0
RK  1179  0.0035    0.02            TRAP      71     1.0
KK090410   BASIN
BA 0.024
LS     0      79       0       0      98       0
UK   167  0.0100    0.29      60
UK    56  0.0100    0.10      40
RK  1270  0.0035    0.02            TRAP      38     1.0
KK090420    FROM  090410
RK  1879  0.0035   0.025            TRAP     1.0     1.0
KK090420   BASIN
BA 0.035
LS     0      79       0       0      98       0
UK   175  0.0100    0.28      57
UK    58  0.0100    0.10      43
RK   335  0.0035    0.02            TRAP      38     1.0
RK  1879  0.0035    0.02            TRAP      58     1.0
KK090420 COMBINE
HC     2
KK090050    FROM  090420
RK  1179  0.0035   0.025            TRAP     1.0     1.0
KK090050 COMBINE
HC     3
KK090060    FROM  090050
RK  1426  0.0035   0.025            TRAP     2.0     2.0
KK090060   BASIN
```

```
BA 0.065                                                                1110
LS     0      80       0       0      98       0                       1120
UK   104  0.0100    0.34      20                                       1130
UK   162  0.0100    0.10      80                                       1140
RK  1196  0.0035    0.02            TRAP      19     1.0               1150
RK  1426  0.0035    0.02            TRAP      98     1.0               1160
KK090510   BASIN                                                       1170
BA 0.066                                                                1180
LS     0      79       0       0      98       0                       1190
UK   150  0.0100    0.30      65                                       1200
UK    50  0.0100    0.10      35                                       1210
RK  1317  0.0035    0.02            TRAP      38     1.0               1220
RK  1288  0.0035    0.02            TRAP      45     1.0               1230
KK090520    FROM  090510                                                1240
RK  1312  0.0035   0.017            TRAP    52.5       1               1250
KK090520   BASIN                                                       1260
BA 0.073                                                                1270
LS     0      79       0       0      98       0                       1280
UK   150  0.0100    0.30      64                                       1290
UK    50  0.0100    0.10      36                                       1300
RK  1309  0.0035    0.02            TRAP      94     1.0               1310
RK  1312  0.0035    0.02            TRAP      53     1.0               1320
KK090520 COMBINE                                                        1330
HC     2                                                                1340
KK090530    FROM  090520                                                1350
RK  1311  0.0035   0.017            TRAP    90.0       1               1360
KK090530   BASIN                                                       1370
BA 0.060                                                                1380
LS     0      79       0       0      98       0                       1390
UK   157  0.0100    0.30      63                                       1400
UK    52  0.0100    0.10      37                                       1410
RK  1156  0.0035    0.02            TRAP      38     1.0               1420
RK  1219  0.0035    0.02            TRAP      53     1.0               1430
KK090530 COMBINE                                                        1440
HC     2                                                                1450
KK090060    FROM  090530                                                1460
RK  1067  0.0035   0.017            TRAP    97.5       1               1470
KK090060 COMBINE                                                        1480
HC     3                                                                1490
KK090070    FROM  090060                                                1500
RK  1373  0.0015   0.013            CIRC     4.0                       1510
KK090070   BASIN                                                       1520
BA 0.072                                                                1530
LS     0      79       0       0      98       0                       1540
UK   157  0.0100    0.30      63                                       1550
UK    52  0.0100    0.10      37                                       1560
RK   872  0.0035    0.02            TRAP      38     1.0               1570
RK  1373  0.0035    0.02            TRAP      45     1.0               1580
KK090070 COMBINE                                                        1590
HC     2                                                                1600
KK090080    FROM  090070                                                1610
RK  1344  0.0015   0.013            CIRC     4.0                       1620
KK090080   BASIN                                                       1630
BA 0.056                                                                1640
LS     0      79       0       0      98       0                       1650
```

```
UK    150  0.0100    0.30      65                                  1660
UK     50  0.0100    0.10      35                                  1670
RK    550  0.0035    0.02            TRAP      38      1.0         1680
RK   1344  0.0035    0.02            TRAP      45      1.0         1690
KK090610    BASIN                                                  1700
BA 0.065                                                           1710
LS      0      79       0       0      98       0                  1720
UK    150  0.0100    0.30      65                                  1730
UK     50  0.0100    0.10      35                                  1740
RK   1285  0.0035    0.02            TRAP      38      1.0         1750
RK   1207  0.0035    0.02            TRAP      45      1.0         1760
KK090620     FROM  090610                                          1770
RK    908  0.0035   0.017            TRAP    45.0       1         1780
KK090620    BASIN                                                  1790
BA 0.037                                                           1800
LS      0      79       0       0      98       0                  1810
UK    150  0.0100    0.30      65                                  1820
UK     50  0.0100    0.10      35                                  1830
RK    507  0.0035    0.02            TRAP      38      1.0         1840
RK   1247  0.0035    0.02            TRAP      38      1.0         1850
KK090620 COMBINE                                                   1860
HC      2                                                          1870
KK090630     FROM  090620                                          1880
RK    411  0.0035   0.017            TRAP    45.0       1         1890
KK090630    BASIN                                                  1900
BA 0.049                                                           1910
LS      0      79       0       0      98       0                  1920
UK    179  0.0100    0.30      36                                  1930
UK    136  0.0100    0.10      64                                  1940
RK    274  0.0035    0.02            TRAP      38      1.0         1950
RK   1280  0.0035    0.02            TRAP      60      1.0         1960
KK090630 COMBINE                                                   1970
HC      2                                                          1980
KK090080     FROM  090630                                          1990
RK    454  0.0035   0.017            TRAP    60.0       1         2000
KK090080 COMBINE                                                   2010
HC      3                                                          2020
KK090090     FROM  090080                                          2030
RK   1354  0.0015   0.013            CIRC     4.0                  2040
KK090090    BASIN                                                  2050
BA 0.049                                                           2060
LS      0      79       0       0      98       0                  2070
UK    151  0.0100    0.30      64                                  2080
UK     52  0.0100    0.10      36                                  2090
RK   1380  0.0035    0.02            TRAP      38      1.0         2100
RK   1354  0.0035    0.02            TRAP      45      1.0         2110
KK090710    BASIN                                                  2120
BA 0.026                                                           2130
LS      0      79       0       0      98       0                  2140
UK    204  0.0100    0.27      38                                  2150
UK     91  0.0100    0.10      62                                  2160
RK   2576  0.0035    0.02            TRAP      98      1.0         2170
KK090720     FROM  090710                                          2180
RK    849  0.0035   0.017            TRAP    45.0       1         2190
KK090720    BASIN                                                  2200
```

```
BA 0.029
LS      0      79       0       0      98       0
UK     95  0.0100    0.34      43
UK    114  0.0100    0.10      57
RK    482  0.0035    0.02            TRAP      38     1.0
RK    849  0.0035    0.02            TRAP      45     1.0
KK090720 COMBINE
HC      2
KK090090    FROM  090720
RK    276  0.0035   0.017            TRAP    45.0       1
KK090090 COMBINE
HC      3
KK090100    FROM  090090
RK    700  0.0015   0.013            CIRC     4.0
KK090100   BASIN
BA 0.048
LS      0      79       0       0      98       0
UK    150  0.0100    0.30      65
UK     50  0.0100    0.10      35
RK   1346  0.0035    0.02            TRAP      38     1.0
RK    444  0.0035    0.02            TRAP      45     1.0
KK090100 COMBINE
HC      2
KK090110    FROM  090100
RK    400  0.0015   0.013            CIRC     4.0
KK090110   BASIN
BA 0.038
LS      0      79       0       0      98       0
UK    107  0.0100    0.33      46
UK    100  0.0100    0.10      54
RK   1250  0.0035    0.02            TRAP      38     1.0
RK    400  0.0035    0.02            TRAP      45     1.0
KK090110 COMBINE
HC      2
KK090120    FROM  090110
RK   1101  0.0015   0.025            TRAP    12.0     3.0
KK090120   BASIN
BA 0.044
LS      0      79       0       0      98       0
UK     29  0.0100    0.39      13
UK    190  0.0100    0.10      87
RK    517  0.0035    0.02            TRAP       9     1.0
RK   1856  0.0035    0.02            TRAP      98     1.0
KK090120 COMBINE
HC      2
KK090130    FROM  090120
RK   1069  0.0015   0.035            TRAP    10.0     2.0
KK090130   BASIN
BA 0.026
LS      0      79       0       0      98       0
UK     53  0.0100    0.38       9
UK    162  0.0100    0.10      91
RK    464  0.0035    0.02            TRAP      11     1.0
RK   1069  0.0035    0.02            TRAP      30     1.0
KK090810   BASIN
```

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BA 0.006                                                                  2760
LS     0      79       0       0      98       0                          2770
UK    20  0.0100    0.40       6                                          2780
UK   200  0.0100    0.10      94                                          2790
RK   269  0.0035    0.02            TRAP       9     1.0                  2800
KK090810 STORAGE                                                          2810
RS     1    STOR                                                          2820
SV  0.00    0.70    0.75    0.00    0.00    0.00    0.00    0.00    0.00  0.00  2830
SE  0.00    1.00    2.00    0.00    0.00    0.00    0.00    0.00    0.00  0.00  2840
SQ  0.00    0.01    0.01    0.00    0.00    0.00    0.00    0.00    0.00  0.00  2850
ST   1.0     500     3.0     1.5                                          2860
KK090130    FROM  090810                                                  2870
RK   906  0.0035   0.017            TRAP     0.0       1                  2880
KK090130 COMBINE                                                          2890
HC     3                                                                  2900
KK090140    FROM  090130                                                  2910
RK  1836  0.0015   0.013            CIRC     4.0                          2920
KK090140   BASIN                                                          2930
BA 0.078                                                                  2940
LS     0      79       0       0      98       0                          2950
UK   112  0.0100    0.33      37                                          2960
UK    94  0.0100    0.10      63                                          2970
RK  1083  0.0035    0.02            TRAP      60     1.0                  2980
RK  1836  0.0035    0.02            TRAP      38     1.0                  2990
KK090140 COMBINE                                                          3000
HC     2                                                                  3010
KK090150    FROM  090140                                                  3020
RK  1100  0.0015   0.013            CIRC     4.5                          3030
KK090150   BASIN                                                          3040
BA 0.022                                                                  3050
LS     0      79       0       0      98       0                          3060
UK    20  0.0100    0.40       6                                          3070
UK   199  0.0100    0.10      94                                          3080
RK   328  0.0035    0.02            TRAP      18     1.0                  3090
RK  1100  0.0035    0.02            TRAP      53     1.0                  3100
KK090910   BASIN                                                          3110
BA 0.042                                                                  3120
LS     0      79       0       0      98       0                          3130
UK    21  0.0100    0.40       6                                          3140
UK   199  0.0100    0.10      94                                          3150
RK  1101  0.0035    0.02            TRAP      38     1.0                  3160
RK  1107  0.0035    0.02            TRAP      18     1.0                  3170
KK090150    FROM  090910                                                  3180
RK   390  0.0035   0.017            TRAP    18.0       1                  3190
KK090150 COMBINE                                                          3200
HC     3                                                                  3210
KK090160    FROM  090150                                                  3220
RK   218  0.0020   0.020            TRAP    10.0     2.0                  3230
KK090160   BASIN                                                          3240
BA 0.016                                                                  3250
LS     0      79       0       0      98       0                          3260
UK   128  0.0100    0.32      39                                          3270
UK    76  0.0100    0.10      61                                          3280
RK  1111  0.0035    0.02            TRAP      21     1.0                  3290
KK091010   BASIN                                                          3300
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BA 0.044                                                                3310
LS     0      79       0       0      98       0                       3320
UK   149  0.0100    0.30      65                                       3330
UK    51  0.0100    0.10      35                                       3340
RK   632  0.0035    0.02            TRAP      38     1.0               3350
RK  1747  0.0035    0.02            TRAP      38     1.0               3360
KK091010 STORAGE                                                        3370
RS     1    STOR                                                       3380
SV  0.00    0.65    1.29    1.94    2.58    3.23    3.87    4.52    5.00    5.00  3390
SE  0.00    1.00    2.00    3.00    4.00    5.00    6.00    7.00    8.00    9.00  3400
SQ  0.00    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01  3410
ST   7.0     600     3.0     1.5                                        3420
KK090160    FROM  091010                                                3430
RK   375  0.0035   0.017            TRAP     0.0       1                3440
KK090160 COMBINE                                                        3450
HC     3                                                                3460
KK090170    FROM  090160                                                3470
RK  1358  0.0020   0.020            TRAP    10.0     2.0                3480
KK090170   BASIN                                                        3490
BA 0.022                                                                3500
LS     0      79       0       0      98       0                       3510
UK   150  0.0100    0.30      46                                       3520
UK    50  0.0100    0.10      54                                       3530
RK   589  0.0035    0.02            TRAP      60     1.0               3540
RK  1358  0.0035    0.02            TRAP      30     1.0               3550
KK091110   BASIN                                                        3560
BA 0.118                                                                3570
LS     0      79       0       0      98       0                       3580
UK   150  0.0100    0.30      46                                       3590
UK    50  0.0100    0.10      54                                       3600
RK  1327  0.0035    0.02            TRAP      38     1.0               3610
RK  2433  0.0035    0.02            TRAP      60     1.0               3620
KK090170    FROM  091110                                                3630
RK   594  0.0035   0.017            TRAP    60.0       1                3640
KK090170 COMBINE                                                        3650
HC     3                                                                3660
KK090180    FROM  090170                                                3670
RK   222  0.0025   0.017            TRAP    60.0       1                3680
ZZ                                                                      3690
```

City of Scottsdale

Storm Water Master Plan and Management Program

PROPOSED CONVEYANCE IMPROVEMENTS COST

09 - 87TH ST. DRAINAGE BASIN

12/20/93

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
090010-090020	1,151	1.6	155,711			31,142		186,853
090020-090030	1,007	1.6	214,075			42,815		256,891
090030-090040	774	1.6	179,501			35,900		215,401
090040-090050	852	1.6	214,056			42,811		256,867
090050-090060	1,426	1.6		430,893		86,179		517,072
090060-090070	1,373	1.6		535,605		107,121		642,726
090070-090080	1,344	1.6		586,177		117,235		703,412
090080-090090	1,354	1.6		590,538		118,108		708,646
090090-090100	700	1.6		334,440		66,888		401,328
090100-090110	400	1.6		191,108		38,222		229,330
090110-090120	1,101	1.6		526,026		105,205		631,231
090120-090130	1,069	1.6			102,023	20,405		122,427
090130-090140	1,836	1.6		877,188		175,438		1,052,625
090140-090150	1,100	1.6		525,548		105,110		630,658
090150-090160	218	1.6			20,805	4,161		24,966
090160-090170	1,358	1.6			129,604	25,921		155,525
090170-090180	222	1.6		189,735		37,947		227,682
090210-090220	657	1.6	126,973			25,395		152,367
090220-090020	1,313	1.6	253,752			50,750		304,502
090310-090320	1,160	1.6	156,928			31,386		188,314
090320-090040	162	1.6	21,916			4,383		26,299
090410-090420	1,879	1.6	254,196			50,839		305,036
090420-090050	1,179	1.6	159,498			31,900		191,398
090510-090520	1,312	1.6	202,847			40,569		243,416
090520-090530	1,311	1.6	253,365			50,673		304,039
090530-090060	1,067	1.6	226,831			45,366		272,197
090610-090620	908	1.6	140,385			28,077		168,462
090620-090630	411	1.6	71,487			14,297		85,785
090630-090080	454	1.6	96,515			19,303		115,818
090710-090720	849	1.6	82,039			16,408		98,447
090720-090090	276	1.6	42,672			8,534		51,206
090910-090150	390	1.6	67,835			13,567		81,402
091110-090170	594	1.6	114,797			22,959		137,757
	31,207		3,035,380	4,787,258	252,433	1,615,014		9,690,084

BASIN ID: 090010 Area: 0.042 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	707	0.0035	0.020	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,410	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090020 Area: 0.087 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	158	0.0100	0.300	57	Collector:	2,481	0.0035	0.020	TRAP	37.5	1.0
Impervious:	74	0.0100	0.100	43	Main:	1,151	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090030 Area: 0.034 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,453	0.0035	0.020	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,007	0.0035	0.020	TRAP	12.0	1.0

BASIN ID: 090040 Area: 0.031 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	151	0.0100	0.300	63	Collector:	1,695	0.0035	0.020	TRAP	37.5	1.0
Impervious:	53	0.0100	0.100	37	Main:	1,213	0.0035	0.020	TRAP	22.5	1.0

BASIN ID: 090050 Area: 0.031 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	157	0.0100	0.296	55	Collector:	778	0.0035	0.020	TRAP	37.5	1.0
Impervious:	70	0.0100	0.100	45	Main:	1,179	0.0035	0.020	TRAP	71.3	1.0

BASIN ID: 090060 Area: 0.065 Pervious CN: 80 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	104	0.0100	0.339	20	Collector:	1,196	0.0035	0.020	TRAP	18.8	1.0
Impervious:	162	0.0100	0.100	80	Main:	1,426	0.0035	0.020	TRAP	97.5	1.0

BASIN ID: 090070 Area: 0.072 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	157	0.0100	0.295	63	Collector:	872	0.0035	0.020	TRAP	37.5	1.0
Impervious:	52	0.0100	0.100	37	Main:	1,373	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090080 Area: 0.056 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	550	0.0035	0.020	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,344	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090090 Area: 0.049 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	151	0.0100	0.300	64	Collector:	1,380	0.0035	0.020	TRAP	37.5	1.0
Impervious:	52	0.0100	0.100	36	Main:	1,354	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090100 Area: 0.048 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,346	0.0035	0.020	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	444	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090110 Area: 0.038 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	107	0.0100	0.333	46	Collector:	1,250	0.0035	0.020	TRAP	37.5	1.0
Impervious:	100	0.0100	0.100	54	Main:	400	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090120 Area: 0.044 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	29	0.0100	0.393	13	Collector:	517	0.0035	0.020	TRAP	9.0	1.0
Impervious:	190	0.0100	0.100	87	Main:	1,856	0.0035	0.020	TRAP	97.5	1.0

BASIN ID: 090130 Area: 0.026 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	53	0.0100	0.375	9	Collector:	464	0.0035	0.020	TRAP	11.3	1.0
Impervious:	162	0.0100	0.100	91	Main:	1,069	0.0035	0.020	TRAP	30.0	1.0

BASIN ID: 090140 Area: 0.078 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	112	0.0100	0.329	37	Collector:	1,083	0.0035	0.020	TRAP	60.0	1.0
Impervious:	94	0.0100	0.100	63	Main:	1,836	0.0035	0.020	TRAP	37.5	1.0

BASIN ID: 090150 Area: 0.022 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	20	0.0100	0.400	6	Collector:	328	0.0035	0.020	TRAP	18.0	1.0
Impervious:	199	0.0100	0.100	94	Main:	1,100	0.0035	0.020	TRAP	52.5	1.0

BASIN ID: 090160 Area: 0.016 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	128	0.0100	0.317	39	Collector:						
Impervious:	76	0.0100	0.100	61	Main:	1,111	0.0035	0.020	TRAP	21.0	1.0

BASIN ID: 090170 Area: 0.022 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	46	Collector:	589	0.0035	0.020	TRAP	60.0	1.0
Impervious:	50	0.0100	0.100	54	Main:	1,358	0.0035	0.020	TRAP	30.0	1.0

BASIN ID: 090210 Area: 0.095 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	61	Collector:	1,295	0.0035	0.020	TRAP	45.0	1.0
Impervious:	50	0.0100	0.100	39	Main:	1,915	0.0035	0.020	TRAP	60.0	1.0

BASIN ID: 090220 Area: 0.036 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	175	0.0100	0.300	40	Collector:	761	0.0035	0.020	TRAP	37.5	1.0
Impervious:	124	0.0100	0.100	60	Main:	1,248	0.0035	0.020	TRAP	30.0	1.0

BASIN ID: 090310 Area: 0.054 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	326	0.0035	0.020	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	3,422	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090320 Area: 0.023 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	450	0.0035	0.020	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,160	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090410 Area: 0.024 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	167	0.0100	0.288	60	Collector:						
Impervious:	56	0.0100	0.100	40	Main:	1,270	0.0035	0.020	TRAP	37.5	1.0

BASIN ID: 090420 Area: 0.035 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	175	0.0100	0.283	57	Collector:	335	0.0035	0.020	TRAP	37.5	1.0
Impervious:	58	0.0100	0.100	43	Main:	1,879	0.0035	0.020	TRAP	57.8	1.0

BASIN ID: 090510 Area: 0.066 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,317	0.0035	0.020	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,288	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090520 Area: 0.073 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	64	Collector:	1,309	0.0035	0.020	TRAP	93.8	1.0
Impervious:	50	0.0100	0.100	36	Main:	1,312	0.0035	0.020	TRAP	52.5	1.0

BASIN ID: 090530 Area: 0.060 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	157	0.0100	0.296	63	Collector:	1,156	0.0035	0.020	TRAP	37.5	1.0
Impervious:	52	0.0100	0.100	37	Main:	1,219	0.0035	0.020	TRAP	52.5	1.0

BASIN ID: 090610 Area: 0.065 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,285	0.0035	0.020	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,207	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090620 Area: 0.037 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	507	0.0035	0.020	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,247	0.0035	0.020	TRAP	37.5	1.0

BASIN ID: 090630 Area: 0.049 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	179	0.0100	0.300	36	Collector:	274	0.0035	0.020	TRAP	37.5	1.0
Impervious:	136	0.0100	0.100	64	Main:	1,280	0.0035	0.020	TRAP	60.0	1.0

BASIN ID: 090710 Area: 0.026 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	204	0.0100	0.266	38	Collector:						
Impervious:	91	0.0100	0.100	62	Main:	2,576	0.0035	0.020	TRAP	97.5	1.0

BASIN ID: 090720 Area: 0.029 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	95	0.0100	0.343	43	Collector:	482	0.0035	0.020	TRAP	37.5	1.0
Impervious:	114	0.0100	0.100	57	Main:	849	0.0035	0.020	TRAP	45.0	1.0

BASIN ID: 090810 Area: 0.006 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	20	0.0100	0.400	6	Collector:						
Impervious:	200	0.0100	0.100	94	Main:	269	0.0035	0.020	TRAP	9.0	1.0

BASIN ID: 090910 Area: 0.042 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	21	0.0100	0.399	6	Collector:	1,101	0.0035	0.020	TRAP	37.5	1.0
Impervious:	199	0.0100	0.100	94	Main:	1,107	0.0035	0.020	TRAP	18.0	1.0

BASIN ID: 091010 Area: 0.044 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	149	0.0100	0.301	65	Collector:	632	0.0035	0.020	TRAP	37.5	1.0
Impervious:	51	0.0100	0.100	35	Main:	1,747	0.0035	0.020	TRAP	37.5	1.0

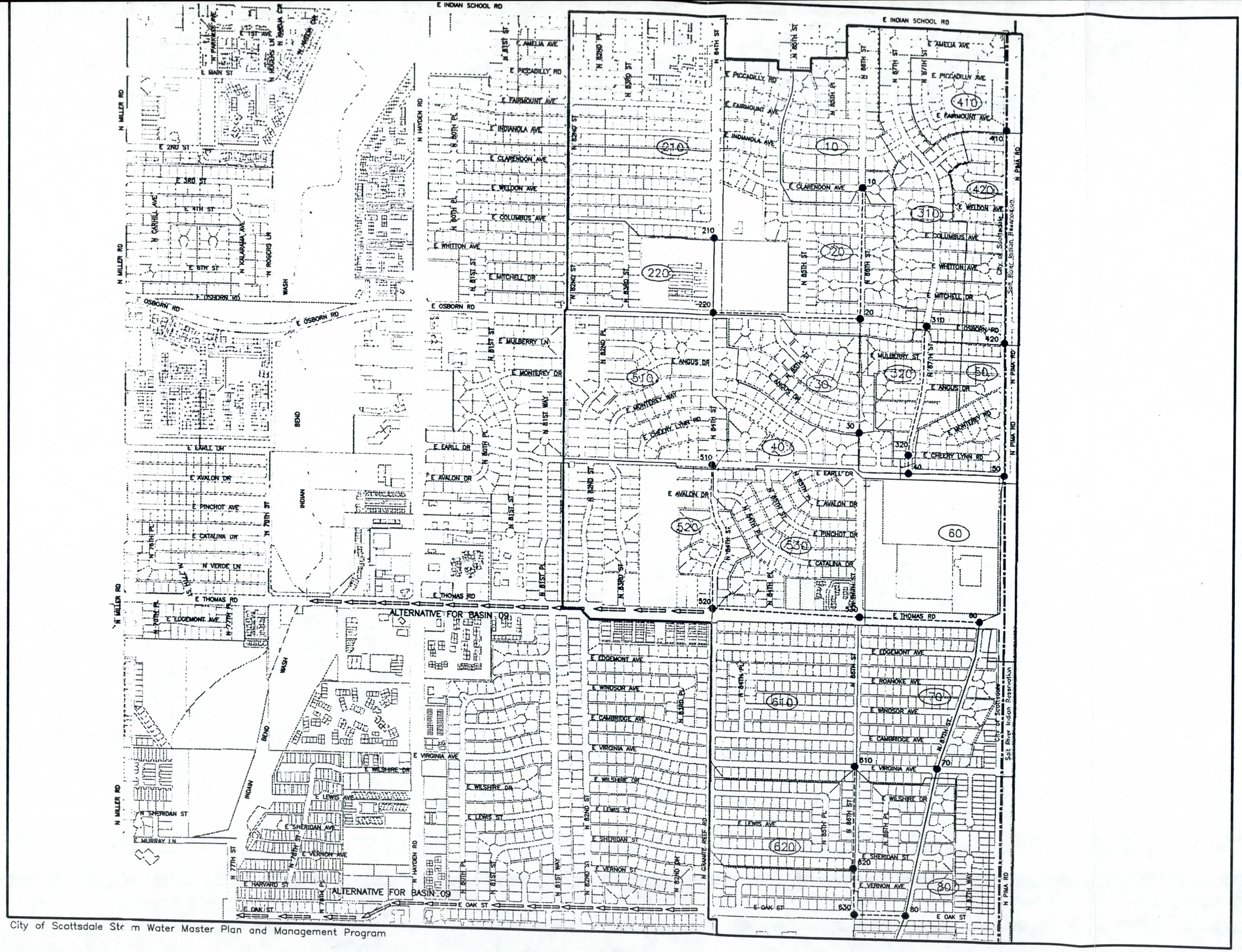
BASIN ID: 091110 Area: 0.118 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	46	Collector:	1,327	0.0035	0.020	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	54	Main:	2,433	0.0035	0.020	TRAP	60.0	1.0

City of Scottsdale
Storm Water Master Plan and Management Program
RAINFALL DATA
09 - PIMA RD/McKELLIPS DRAINAGE BASIN

04/18/94

Return Period (years)	RAINFALL DURATION 5 min	10 min	15 min	30 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs
2	0.32	0.48	0.59	0.78	0.95	1.02	1.06	1.15	1.22	1.35
5	0.43	0.65	0.81	1.09	1.35	1.47	1.54	1.69	1.84	1.99
10	0.50	0.77	0.97	1.30	1.62	1.77	1.86	2.05	2.25	2.44
25	0.61	0.93	1.18	1.59	1.98	2.17	2.30	2.54	2.80	3.06
50	0.69	1.05	1.34	1.82	2.27	2.49	2.64	2.92	3.23	3.53
100	0.76	1.17	1.50	2.04	2.55	2.81	2.98	3.20	3.65	3.80



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1" = 800'

Legend

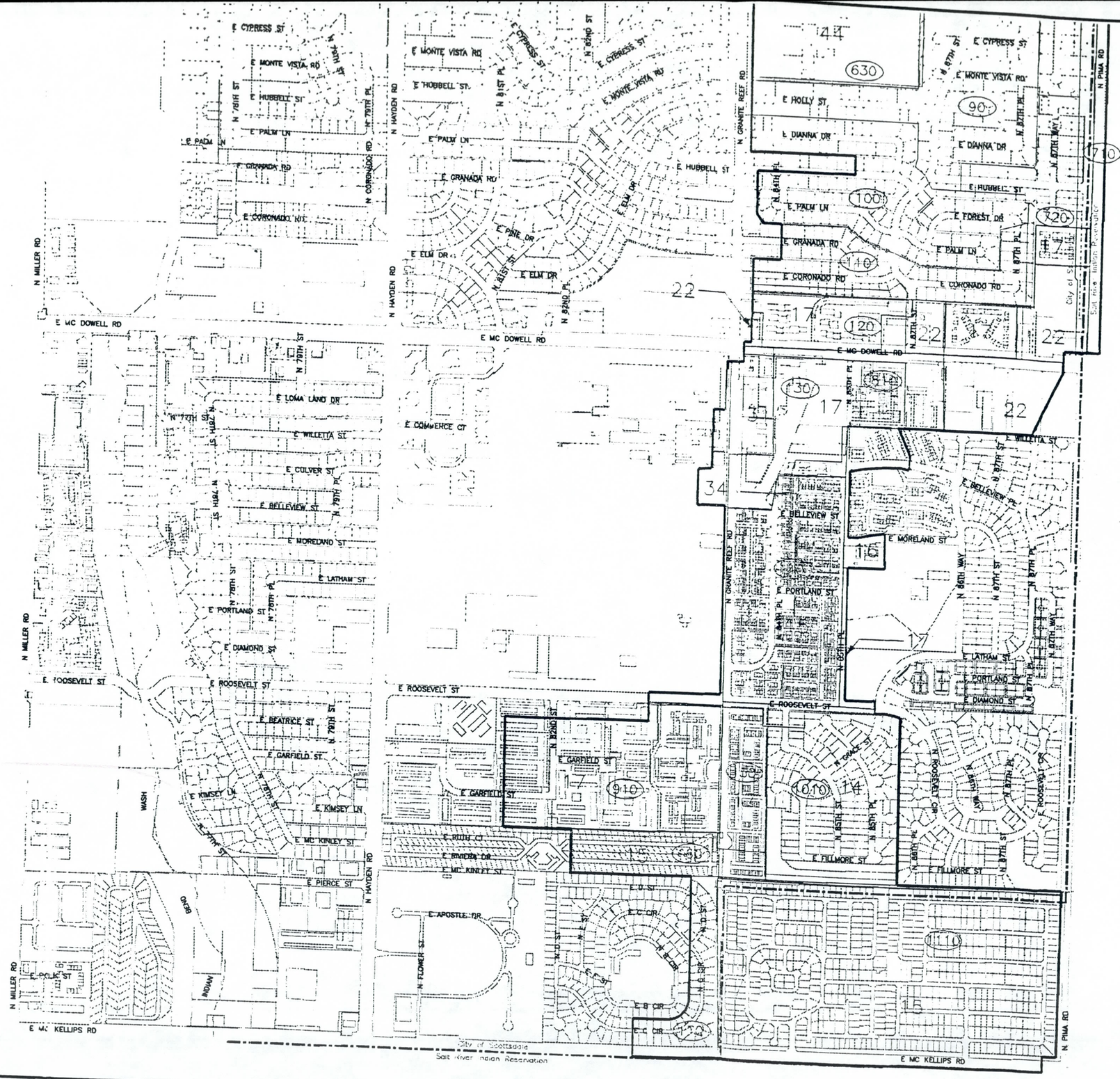
- Analysis Node
- Storage Basin
- Basin Boundary
- Drainage Area
- Roadway Reach
- Channel
- Pipe/Culvert
- City Boundary

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 09 87th St Drainage Map

Sheet 1 of 2



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1" = 800'

Legend

- Basin Boundary
- (610) Drainage Area
- Land Use Boundary
- City Boundary

Land Uses

10 – 1 DU PER 5 ACRES
11 – 1 DU PER 2–3 ACRES
12 – 1 DU PER 1–2 ACRES
13 – 1–2 DU PER ACRE
14 – 2–4 DU PER ACRE
15 – 4–8 DU PER ACRE
16 – 8–12 DU PER ACRE
17 – 12–22 DU PER ACRE
18 – TOURIST ACCOMMODATIONS
19 – LOW INTENSITY RESORT
21 – NEIGHBORHOOD COMMERCIAL
22 – GENERAL COMMERCIAL
31 – MINOR OFFICE
32 – MAJOR OFFICE
33 – MINOR EMPLOYMENT
34 – GENERAL EMPLOYMENT
36 – RESEARCH AND DEVELOPMENT
41 – NATURAL OPEN SPACE
42 – LIMITED USE AREA
43 – DEVELOPED OPEN SPACE
44 – CULTURAL/INSTITUTIONAL
45 – UTILITIES

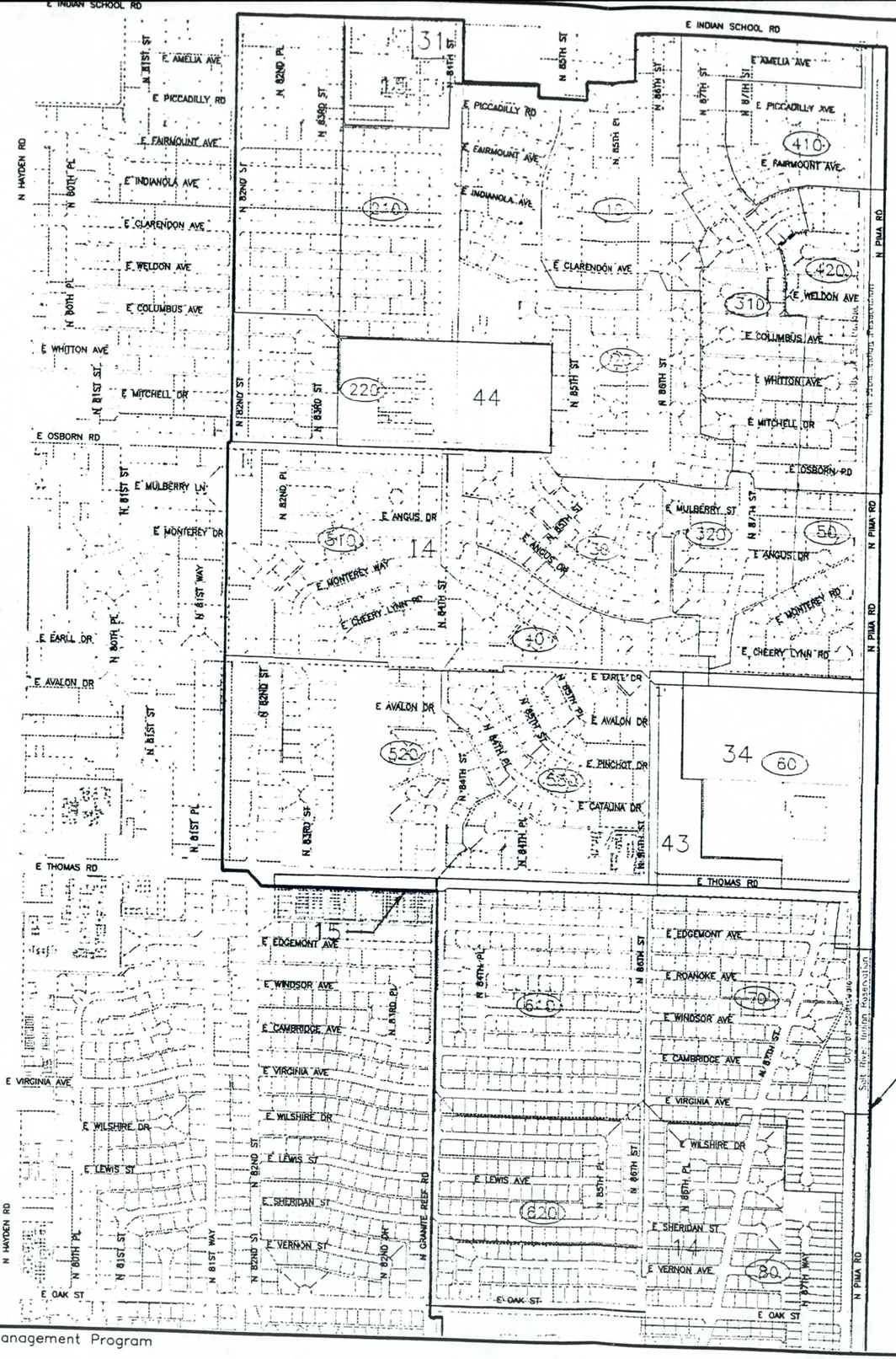
Soil Group B

Runoff Zone 1

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 09 87th St
Land Use Map
Sheet 2 of 2



0 400 800

1" = 800'

Legend

- Basin Boundary
- (610) Drainage Area
- Land Use Boundary
- City Boundary

Land Uses

10 – 1 DU PER 5 ACRES
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Soil Group B

Runoff Zone 1

City of Scottsdale

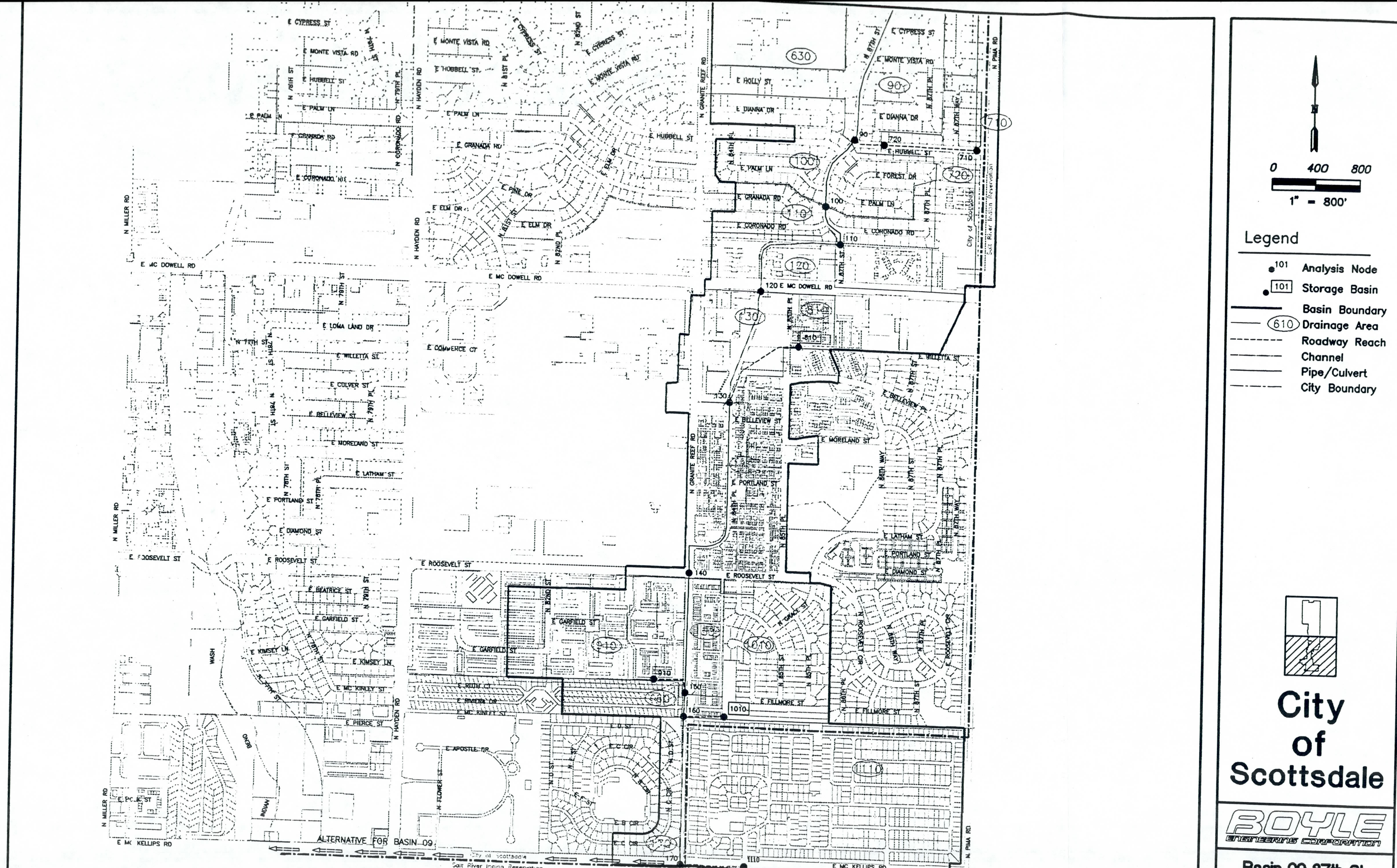
BOYLE ENGINEERING CORPORATION

~~Basin 01-W Mckellips~~

Land Use Map

Sheet 2 of 2

Basin 09



City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 09 87th St
Drainage Map
Sheet 2 of 2

ID: 100010-100020

Type: ROADWAY
Length: 112
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N PIMA RD
Drawing No(s):
Right of Way: 40
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0051	Equivalent Roadway (%):		70				ROW Capacity:	34
PROPOSED	Pipe:	1	0.0051	0.013	30						29
	Box:										
	Channel:								Lined: N		
Improvement Year:										Section Capacity:	29
										ROW+Section Capacity:	63

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $10,823
Total Improvements Cost: $12,987

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	15	25	42	51	32	59

ID: 100020-100030

Type: ROADWAY
Length: 1,021
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N PIMA RD
Drawing No(s):
Right of Way: 75
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0051	Equivalent Roadway (%):		70				ROW Capacity:	30
PROPOSED	Pipe:	1	0.0051	0.013	42						72
	Box:										
	Channel:								Lined: N		
Improvement Year:										Section Capacity:	72
										ROW+Section Capacity:	102

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $138,124
Total Improvements Cost: $165,749

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	30	51	87	108	68	124

ID: 100030-100040

Type: ROADWAY
Length: 1,321
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N PIMA RD
Drawing No(s):
Right of Way: 75
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0051	Equivalent Roadway (%):			70			ROW Capacity:	30
PROPOSED Pipe:	1	0.0051	0.013	48						103
Box:										
Channel:									Lined: N	
Improvement Year:									Section Capacity:	103
									ROW+Section Capacity:	133

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $204,238
Total Improvements Cost: $245,086

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	42	72	124	152	95	176

ID: 100040-100050

Type: ROADWAY
Length: 1,345
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N PIMA RD
Drawing No(s):
Right of Way: 75
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

	No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING Pipe:										
Box:										
Imp Channel:										
Nat Channel:										
Roadway:		0.0051	Equivalent Roadway (%):			70			ROW Capacity:	30
PROPOSED Pipe:	1	0.0051	0.013	54						140
Box:										
Channel:									Lined: N	
Improvement Year:									Section Capacity:	140
									ROW+Section Capacity:	171

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $233,943
Total Improvements Cost: $280,731

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	56	97	171	209	129	241

ID: 100050-100060

Type: ROADWAY
Length: 298
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N PIMA RD
Drawing No(s):
Right of Way: 50
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0051	Equivalent Roadway (%): 100						ROW Capacity:	64
PROPOSED	Pipe:	1	0.0051	0.013	60						186
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	186
										ROW+Section Capacity:	250

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost: $57,592
Total Improvements Cost: $69,110

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	70	122	218	266	163	310

ID: 100210-100030

Type: IMPROVED CHANNEL
Length: 98
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: ** OVERLAND FLOW
Drawing No(s):
Right of Way:
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0051	0.035		1.0	20.0	1.0			60
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	60
										ROW+Section Capacity:	60

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):			2	13		23

ID: 100310-100320

Type: ROADWAY
Length: 170
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 85TH WAY
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0051	Equivalent Roadway (%): 100						ROW Capacity:	43
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	43

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	7	15	28	34	20	42

ID: 100315-100320

Type: ROADWAY
Length: 120
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 85TH WAY
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0051	Equivalent Roadway (%): 100						ROW Capacity:	43
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	43

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):		2	9	21	4	41

ID: 100320-100330

Type: ROADWAY
Length: 1,779
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 86TH WAY
Drawing No(s):
Right of Way: 50
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0051	Equivalent Roadway (%): 100						ROW Capacity:	64
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	64

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	6	14	27	43	19	71

ID: 100330-100340

Type: ROADWAY
Length: 1,588
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N ROOSEVELT CIR
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0051	Equivalent Roadway (%): 100						ROW Capacity:	43
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	43

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):			19	33	2	50

ID: 100340-100040

Street Name: ** OVERLAND FLOW
Type: IMPROVED CHANNEL
Drawing No(s):
Length: 100
Right of Way:
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0051	0.035		1.0	20.0	1.0			60
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100					ROW Capacity:		
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
									Section Capacity:		60
									ROW+Section Capacity:		60

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.1	1.1	1.1	1.1	1.1	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):			7	32		57

ID: 100210

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	6.5	500	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	1.00	2.00	3.00	4.00	5.00	6.00	6.80	7.00	7.00
Elevation:	0.00	1.00	2.00	3.00	4.00	5.00	6.00	6.50	7.00	8.00
Discharge:	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):	3.0	4.0	5.0	7.0	7.0	7.0
Basin Design (100yr-2hr):						

ID: 100310

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	2.0	500	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	0.12	0.24	0.50	0.50					
Elevation:	0.00	1.00	2.00	3.00	4.00					
Discharge:	0.00	0.01	0.01	0.01	0.01					

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):						
Basin Design (100yr-2hr):						

ID: 100315

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	1.0	500	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	1.30	1.50	1.50						
Elevation:	0.00	1.00	2.00	3.00						
Discharge:	0.00	0.01	0.01	0.01						

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):	1.0	1.0	1.0	1.0	1.0	1.0
Basin Design (100yr-2hr):	1.3					

ID: 100330

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	7.0	500	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	7.74	8.00
Elevation:	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	7.50	8.00
Discharge:	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):	4.0	6.0	7.0	7.0	7.0	7.0
Basin Design (100yr-2hr):						

ID: 100340

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	7.0	500	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	2.00	4.00	5.00	6.00	7.00	8.00	10.20	11.00	11.00
Elevation:	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
Discharge:	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):	3.0	5.0	6.0	10.0	10.0	10.0
Basin Design (100yr-2hr):						

City of Scottsdale
Storm Water Master Plan and Management Program
LAND USE BASIN SUMMARY
10 - PIMA - McKELLIPS DRAINAGE BASIN

Group	Land Use	Code	Area (acres)	Percent Impervious (%)	Impervious Area (acres)
	2-4 DU PER ACRE	14	90.17	35	31.56
	4-8 DU PER ACRE	15	3.14	54	1.69
	8-12 DU PER ACRE	16	11.47	74	8.49
	12-22 DU PER ACRE	17	18.20	94	17.11
TOTAL RESIDENTIAL			122.98	48	58.85
	GENERAL COMMERCIAL	22	3.71	85	3.16
TOTAL COMMERCIAL/OFFICE			3.71	85	3.16
	DEVELOPED OPEN SPACE	43	49.66	80	39.72
TOTAL OPEN SPACE			49.66	80	39.72
TOTAL 10 - PIMA - McKELLIPS DRAINAGE BASIN			176.35	58	101.73

City of Scottsdale

Storm Water Master Plan and Management Program

PROPOSED CONVEYANCE IMPROVEMENTS COST

10 - PIMA RD. DRAINAGE BASIN

12/21/93

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
100010-100020	112	1.6	10,823			2,165		12,987
100020-100030	1,021	1.6	138,124			27,625		165,749
100030-100040	1,321	1.6	204,238			40,848		245,086
100040-100050	1,345	1.6	233,943			46,789		280,731
100050-100060	298	1.6	57,592			11,518		69,110
	4,097		644,719			128,944		773,663

```
ID                                                                                  10
IT     2                    300                                                     20
IO     5                                                                            30
KK100010   BASIN                                                                    40
BA 0.015                                                                            50
PH 0.000   0.000   0.500   0.970   1.620   1.770   1.860   2.050                    60
LS     0      79       0       0      98       0                                    70
UK   190  0.0100    0.28      18                                                    80
UK   139  0.0100    0.10      82                                                    90
RK   399  0.0051    0.02            TRAP      19     1.0                           100
RK   630  0.0051    0.02            TRAP      30     1.0                           110
KK100020    FROM  100010                                                            120
RK   112  0.0051   0.017            TRAP    30.0       1                           130
KK100020   BASIN                                                                    140
BA 0.019                                                                            150
LS     0      79       0       0      98       0                                    160
UK   276  0.0100    0.22      27                                                    170
UK    92  0.0100    0.10      73                                                    180
RK   416  0.0051    0.04            TRAP      19     1.0                           190
RK  1082  0.0051    0.02            TRAP      56     1.0                           200
KK100020 COMBINE                                                                    210
HC     2                                                                            220
KK100030    FROM  100020                                                            230
RK  1021  0.0051   0.017            TRAP    56.3       1                           240
KK100030   BASIN                                                                    250
BA 0.016                                                                            260
LS     0      79       0       0      98       0                                    270
UK   278  0.0100    0.22      27                                                    280
UK    93  0.0100    0.10      73                                                    290
RK   424  0.0051    0.04            TRAP      19     1.0                           300
RK  1021  0.0051    0.02            TRAP      56     1.0                           310
KK100210   BASIN                                                                    320
BA 0.052                                                                            330
LS     0      79       0       0      98       0                                    340
UK   150  0.0100    0.30      65                                                    350
UK    50  0.0100    0.10      35                                                    360
RK  2327  0.0051    0.02            TRAP      38     1.0                           370
KK100210 STORAGE                                                                    380
RS     1    STOR                                                                    390
SV  0.00    1.00    2.00    3.00    4.00    5.00    6.00    6.80    7.00    7.00   400
SE  0.00    1.00    2.00    3.00    4.00    5.00    6.00    6.50    7.00    8.00   410
SQ  0.00    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   420
ST   6.5     500     3.0     1.5                                                    430
KK100030    FROM  100210                                                            440
RK    98  0.0051   0.035            TRAP    20.0       1                           450
KK100030 COMBINE                                                                    460
HC     3                                                                            470
KK100040    FROM  100030                                                            480
RK  1321  0.0051   0.017            TRAP    56.3       1                           490
KK100040   BASIN                                                                    500
BA 0.022                                                                            510
LS     0      79       0       0      98       0                                    520
UK   280  0.0100    0.21      26                                                    530
UK    93  0.0100    0.10      74                                                    540
RK   424  0.0051    0.04            TRAP      19     1.0                           550
```

```
RK   1321  0.0051    0.02            TRAP      56     1.0                          560
KK100040 COMBINE                                                                   570
HC      2                                                                          580
KK100310   BASIN                                                                   590
BA 0.014                                                                           600
LS      0      79       0       0      98       0                                  610
UK    116  0.0100    0.33      55                                                  620
UK     90  0.0100    0.10      45                                                  630
RK    544  0.0051    0.02            TRAP      38     1.0                          640
RK    576  0.0051    0.02            TRAP      38     1.0                          650
KK100310 STORAGE                                                                   660
RS      1    STOR                                                                  670
SV   0.00    0.12    0.24    0.50    0.50    0.00    0.00    0.00    0.00    0.00  680
SE   0.00    1.00    2.00    3.00    4.00    0.00    0.00    0.00    0.00    0.00  690
SQ   0.00    0.01    0.01    0.01    0.01    0.00    0.00    0.00    0.00    0.00  700
ST    2.0     500     3.0     1.5                                                  710
KK100320    FROM  100310                                                           720
RK    170  0.0051   0.017            TRAP    45.0       1                          730
KK100315   BASIN                                                                   740
BA 0.013                                                                           750
LS      0      79       0       0      98       0                                  760
UK     20  0.0100    0.40      26                                                  770
UK    200  0.0100    0.10      74                                                  780
RK    735  0.0051    0.02            TRAP      21     1.0                          790
KK100315 STORAGE                                                                   800
RS      1    STOR                                                                  810
SV   0.00    1.30    1.50    1.50    0.00    0.00    0.00    0.00    0.00    0.00  820
SE   0.00    1.00    2.00    3.00    0.00    0.00    0.00    0.00    0.00    0.00  830
SQ   0.00    0.01    0.01    0.01    0.00    0.00    0.00    0.00    0.00    0.00  840
ST    1.0     500     3.0     1.5                                                  850
KK100320    FROM  100315                                                           860
RK    120  0.0051   0.017            TRAP    45.0       1                          870
KK100320 COMBINE                                                                   880
HC      2                                                                          890
KK100330    FROM  100320                                                           900
RK   1779  0.0051   0.017            TRAP    37.5       1                          910
KK100330   BASIN                                                                   920
BA 0.038                                                                           930
LS      0      79       0       0      98       0                                  940
UK     52  0.0100    0.38      21                                                  950
UK    163  0.0100    0.10      79                                                  960
RK    563  0.0051    0.03            TRAP      19     1.0                          970
RK   1779  0.0051    0.02            TRAP      45     1.0                          980
KK100330 COMBINE                                                                   990
HC      2                                                                         1000
KK100330 STORAGE                                                                  1010
RS      1    STOR                                                                 1020
SV   0.00    1.00    2.00    3.00    4.00    5.00    6.00    7.00    7.74    8.00 1030
SE   0.00    1.00    2.00    3.00    4.00    5.00    6.00    7.00    7.50    8.00 1040
SQ   0.00    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01 1050
ST    7.0     500     3.0     1.5                                                 1060
KK100340    FROM  100330                                                          1070
RK   1588  0.0051   0.017            TRAP    45.0       1                         1080
KK100340   BASIN                                                                  1260
BA 0.061                                                                          1270
```

```
LS      0      79       0       0      98       0                                  1280
UK    150  0.0100    0.30      65                                                  1290
UK     51  0.0100    0.10      35                                                  1300
RK    969  0.0051    0.02            TRAP      45     1.0                          1310
RK   2194  0.0051    0.02            TRAP      45     1.0                          1320
KK100340 COMBINE                                                                   1330
HC      2                                                                          1340
KK100340 STORAGE                                                                   1350
RS      1    STOR                                                                  1360
SV   0.00    2.00    4.00    5.00    6.00    7.00    8.00   10.20   11.00   11.00 1370
SE   0.00    1.00    2.00    3.00    4.00    5.00    6.00    7.00    8.00    9.00 1380
SQ   0.00    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01 1390
ST    7.0     500     3.0     1.5                                                  1400
KK100040    FROM  100340                                                           1410
RK    100  0.0051   0.035            TRAP    20.0     1.0                          1420
KK100040 COMBINE                                                                   1430
HC      2                                                                          1440
KK100050    FROM  100040                                                           1450
RK   1345  0.0051   0.017            TRAP    56.3       1                          1460
KK100050   BASIN                                                                   1470
BA 0.025                                                                           1480
LS      0      79       0       0      98       0                                  1490
UK    270  0.0100    0.22      25                                                  1500
UK     90  0.0100    0.10      75                                                  1510
RK    400  0.0051    0.04            TRAP      19     1.0                          1520
RK   1345  0.0051    0.02            TRAP      56     1.0                          1530
KK100050 COMBINE                                                                   1540
HC      2                                                                          1550
KK100060    FROM  100050                                                           1560
RK    298  0.0051   0.017            TRAP    37.5       1                          1570
ZZ                                                                                 1580
```

BASIN ID: 100010 Area: 0.015 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	190	0.0100	0.279	18	Collector:	399	0.0051	0.017	TRAP	18.8	1.0
Impervious:	139	0.0100	0.100	82	Main:	630	0.0051	0.017	TRAP	30.0	1.0

BASIN ID: 100020 Area: 0.019 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	276	0.0100	0.216	27	Collector:	416	0.0051	0.035	TRAP	18.8	1.0
Impervious:	92	0.0100	0.100	73	Main:	1,082	0.0051	0.017	TRAP	56.3	1.0

BASIN ID: 100030 Area: 0.016 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	278	0.0100	0.215	27	Collector:	424	0.0051	0.035	TRAP	18.8	1.0
Impervious:	93	0.0100	0.100	73	Main:	1,021	0.0051	0.017	TRAP	56.3	1.0

BASIN ID: 100040 Area: 0.022 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	280	0.0100	0.213	26	Collector:	424	0.0051	0.035	TRAP	18.8	1.0
Impervious:	93	0.0100	0.100	74	Main:	1,321	0.0051	0.017	TRAP	56.3	1.0

BASIN ID: 100050 Area: 0.025 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	270	0.0100	0.220	25	Collector:	400	0.0051	0.035	TRAP	18.8	1.0
Impervious:	90	0.0100	0.100	75	Main:	1,345	0.0051	0.017	TRAP	56.3	1.0

BASIN ID: 100210 Area: 0.052 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	253			TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	2,327	0.0051	0.017	TRAP	37.5	1.0

BASIN ID: 100310 Area: 0.014 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	116	0.0100	0.327	55	Collector:	544	0.0051	0.017	TRAP	37.5	1.0
Impervious:	90	0.0100	0.100	45	Main:	576	0.0051	0.017	TRAP	37.5	1.0

BASIN ID: 100315 Area: 0.013 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	20	0.0100	0.400	26	Collector:						
Impervious:	200	0.0100	0.100	74	Main:	735	0.0051	0.017	TRAP	21.0	1.0

BASIN ID: 100330 Area: 0.038 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	52	0.0100	0.376	21	Collector:	563	0.0051	0.030	TRAP	18.8	1.0
Impervious:	163	0.0100	0.100	79	Main:	1,779	0.0051	0.017	TRAP	45.0	1.0

BASIN ID: 100340 Area: 0.061 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	969	0.0051	0.017	TRAP	45.0	1.0
Impervious:	51	0.0100	0.100	35	Main:	2,194	0.0051	0.017	TRAP	45.0	1.0

City of Scottsdale
Storm Water Master Plan and Management Program
LAND USE FACTORS

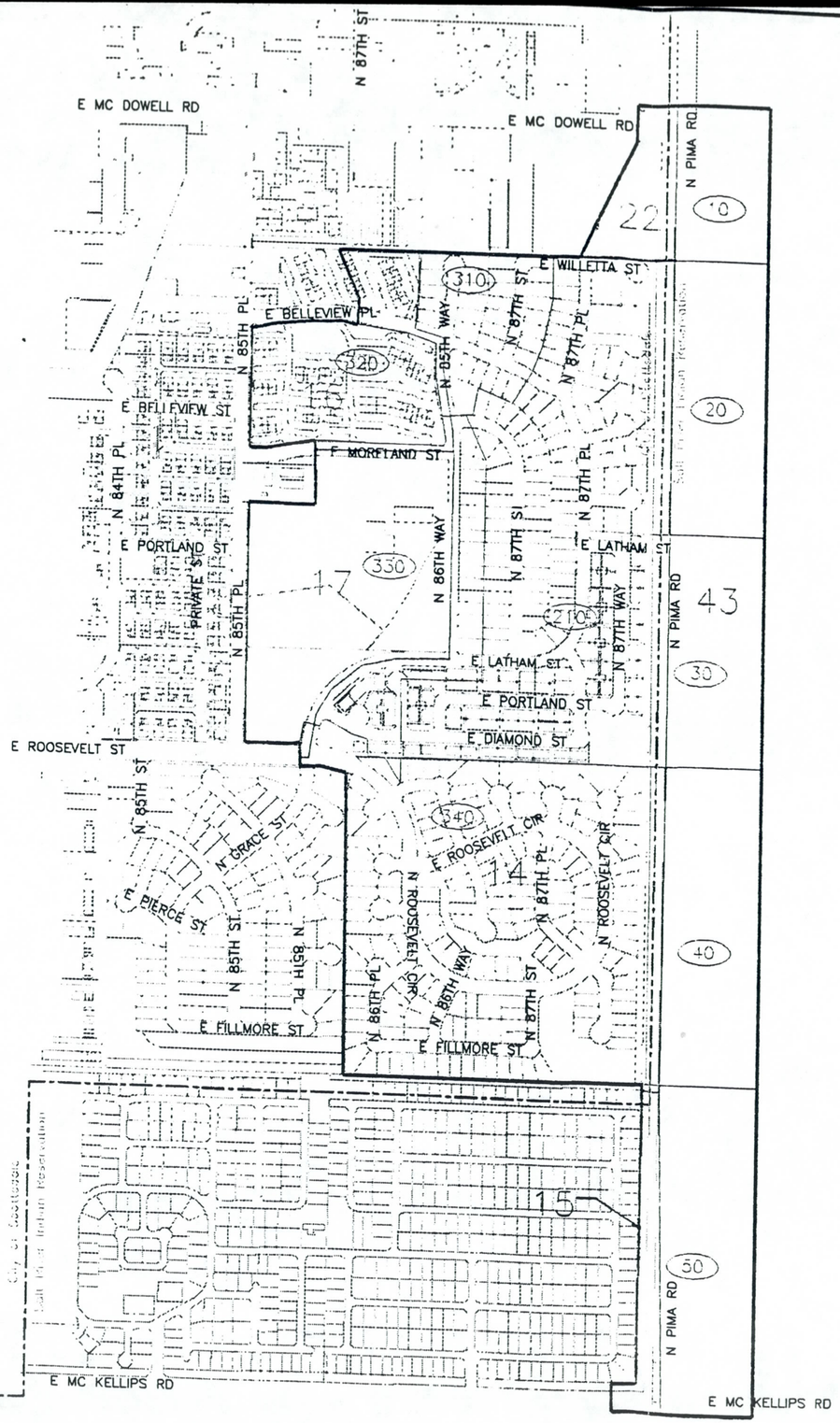
 12/02/93

Group/Land Use	Code	Percent Impervious	OVERLAND FLOW PARAMETERS Pervious Length	Pervious Slope	Pervious Rough's	Impervious Length	Impervious Slope	Impervious Rough's	RUNOFF COEFFICIENTS Soil Group A	B	C	D
1. RESIDENTIAL												
1 DU PER 5 ACRES	10	7	300	0.0100	0.200	100	0.0100	0.100	0.00	0.33	0.50	0.58
1 DU PER 2-3 ACRES	11	15	300	0.0100	0.200	100	0.0100	0.100	0.00	0.35	0.51	0.59
1 DU PER 1-2 ACRES	12	15	300	0.0100	0.200	100	0.0100	0.100	0.00	0.38	0.55	0.61
1-2 DU PER ACRE	13	24	150	0.0100	0.300	50	0.0100	0.100	0.00	0.40	0.56	0.62
2-4 DU PER ACRE	14	35	150	0.0100	0.300	50	0.0100	0.100	0.00	0.43	0.58	0.64
4-8 DU PER ACRE	15	54	150	0.0100	0.300	50	0.0100	0.100	0.00	0.47	0.62	0.67
8-12 DU PER ACRE	16	74	20	0.0100	0.400	200	0.0100	0.100	0.00	0.51	0.64	0.70
12-22 DU PER ACRE	17	94	20	0.0100	0.400	200	0.0100	0.100	0.00	0.76	0.83	0.87
TOURIST ACCOMMODATIONS	18	85	150	0.0100	0.300	50	0.0100	0.100	0.00	0.63	0.76	0.79
LOW INTENSITY RESORT	19	85	150	0.0100	0.300	50	0.0100	0.100	0.00	0.63	0.76	0.79
2. COMMERCIAL/OFFICE												
NEIGHBORHOOD COMMERCIAL	21	85	20	0.0100	0.400	200	0.0100	0.100	0.00	0.63	0.76	0.79
GENERAL COMMERCIAL	22	85	20	0.0100	0.400	200	0.0100	0.100	0.00	0.63	0.76	0.79
MINOR OFFICE	31	85	150	0.0100	0.300	50	0.0100	0.100	0.00	0.63	0.76	0.79
MAJOR OFFICE	32	85	20	0.0100	0.400	200	0.0100	0.100	0.00	0.63	0.76	0.79
MINOR EMPLOYMENT	33	85	20	0.0100	0.400	200	0.0100	0.100	0.00	0.63	0.76	0.79
GENERAL EMPLOYMENT	34	85	20	0.0100	0.400	200	0.0100	0.100	0.00	0.63	0.76	0.79
RESEARCH AND DEVELOPMENT	36	72	200	0.0100	0.300	200	0.0100	0.100	0.00	0.50	0.63	0.68
3. OPEN SPACE												
NATURAL OPEN SPACE	41	1	300	0.0100	0.200	100	0.0100	0.100	0.00	0.31	0.48	0.56
LIMITED USE AREA	42	1	300	0.0100	0.200	100	0.0100	0.100	0.00	0.31	0.48	0.56
DEVELOPED OPEN SPACE	43	80	300	0.0100	0.200	100	0.0100	0.100	0.00	0.33	0.56	0.66
CULTURAL/INSTITUTIONAL	44	85	200	0.0100	0.300	200	0.0100	0.100	0.00	0.63	0.76	0.79
UTILITIES	45	72	200	0.0100	0.300	200	0.0100	0.100	0.00	0.50	0.63	0.68

City of Scottsdale
Storm Water Master Plan and Management Program
RAINFALL DATA
10 - PIMA RD DRAINAGE BASIN

04/18/94

Return Period (years)	RAINFALL DURATION 5 min	10 min	15 min	30 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs
2	0.32	0.48	0.59	0.78	0.95	1.02	1.06	1.15	1.22	1.35
5	0.43	0.65	0.81	1.09	1.35	1.47	1.54	1.69	1.84	1.99
10	0.50	0.77	0.97	1.30	1.62	1.77	1.86	2.05	2.25	2.44
25	0.61	0.93	1.18	1.59	1.98	2.17	2.30	2.54	2.80	3.06
50	0.69	1.05	1.34	1.82	2.27	2.49	2.64	2.92	3.23	3.53
100	0.76	1.17	1.50	2.04	2.55	2.81	2.98	3.20	3.65	3.80



0 300 600

1" = 600'

Legend

- Basin Boundary
- (610) Drainage Area
- Land Use Boundary
- City Boundary

Land Uses

10 - 1 DU PER 5 ACRES
11 - 1 DU PER 2-3 ACRES
12 - 1 DU PER 1-2 ACRES
13 - 1-2 DU PER ACRE
14 - 2-4 DU PER ACRE
15 - 4-8 DU PER ACRE
16 - 8-12 DU PER ACRE
17 - 12-22 DU PER ACRE
18 - TOURIST ACCOMMODATIONS
19 - LOW INTENSITY RESORT
21 - NEIGHBORHOOD COMMERCIAL
22 - GENERAL COMMERCIAL
31 - MINOR OFFICE
32 - MAJOR OFFICE
33 - MINOR EMPLOYMENT
34 - GENERAL EMPLOYMENT
36 - RESEARCH AND DEVELOPMENT
41 - NATURAL OPEN SPACE
42 - LIMITED USE AREA
43 - DEVELOPED OPEN SPACE
44 - CULTURAL/INSTITUTIONAL
45 - UTILITIES

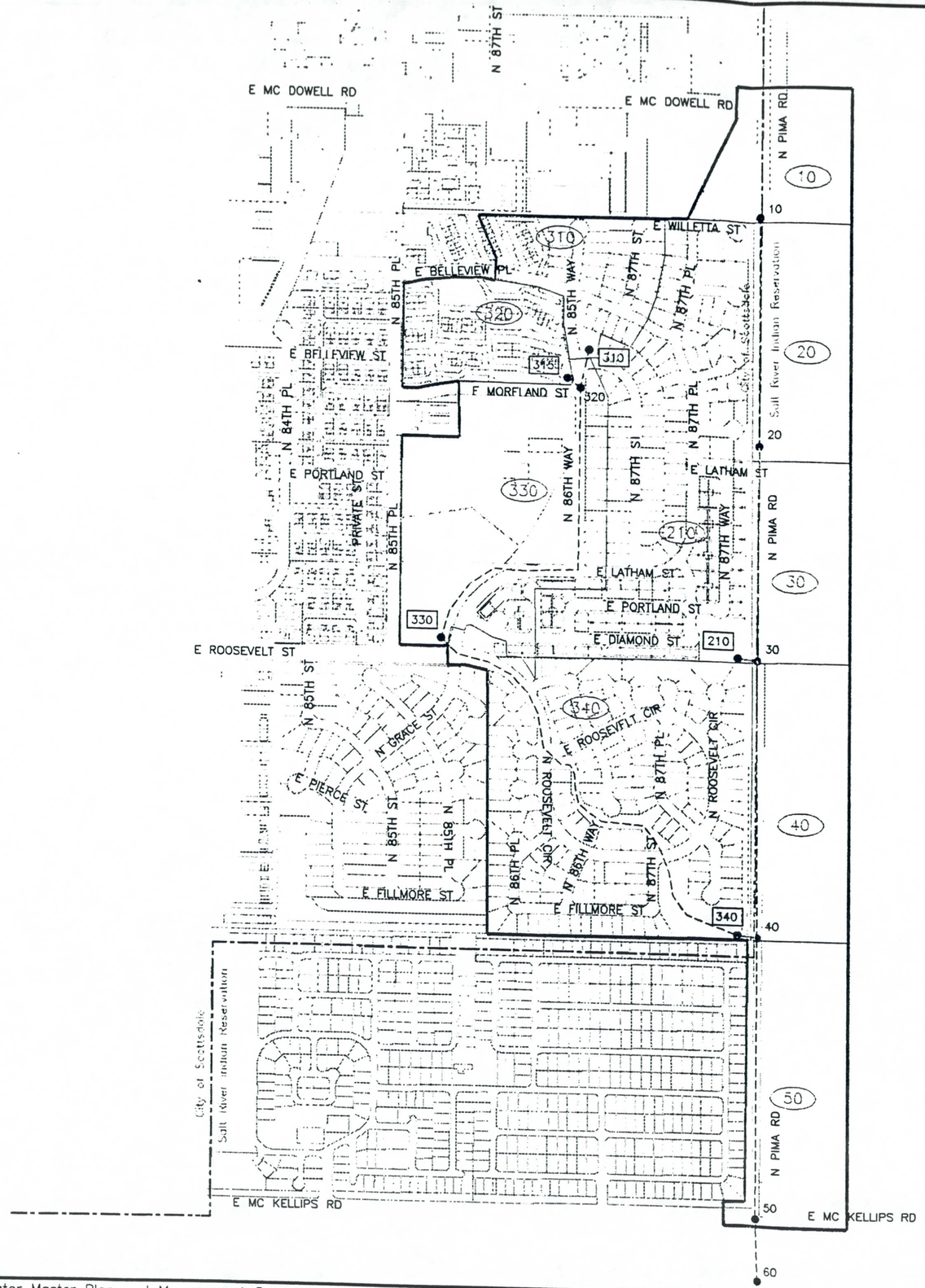
Soil Group B

Runoff Zone 1

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 10 S Pima Rd. Land Use Map



0 300 600

1" = 600'

Legend

- 101 Analysis Node
- 101 Storage Basin
- Basin Boundary
- 610 Drainage Area
- Roadway Reach
- Channel
- Pipe/Culvert
- City Boundary

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 10 S Pima Rd. Drainage Map

City of Scottsdale

Storm Water Master Plan and Management Program

Basin Reports

Volume 1

Basins 11-20

Boyle Engineering Corporation

11-McDOWELL/HAYDEN Basin

Basin 11 is 254.8 acres, which is made up of 203.9 acres residential, 43.2 commercial and 7.7 acres open space. The basin is bounded by Thomas Rd. to the north, McDowell Rd. to the south, 81st Way to the east, and Indian Bend Wash to the west.

The drainage pattern of this basin is generally from northeast to southwest. There is one major drainage system in this basin that drains from analysis point 120 to analysis point 200 at Indian Bend Wash. Also, there were several pipe changes along the system. A length of 100 ft. was added to the drainage system between analysis points 190 and 200 in order to run the HEC-1 model properly. Two other drainage points are located at analysis points 320 and 420, which both drain into Indian Bend Wash. Slopes were obtained from either "as builts" or from USGS maps. When no "as builts" were available, a north-south and east-west slope were calculated. The north-south slope was used for the calculations because it better represented the basin.

There was one detention basin in this drainage area. It is located at the southwest corner of the drainage basin. Its drainage pattern is from east to west, which then drains onto Granada Rd. to analysis point 320 then to Indian Bend Wash.

ASSUMPTIONS:

- The pipe between analysis points 320 and 330 is an 18 inch pipe.
- The pipe between analysis points 420 and 430 is an 18 inch pipe.

City of Scottsdale

Storm Water Master Plan and Management Program

PROPOSED CONVEYANCE IMPROVEMENTS COST

11 - MC DOWELL/HAYDEN DRAINAGE BASIN

04/13/94

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
110110-110120	222	1.0	18,648			3,730		22,378
110190-110200	162	1.0	27,216			5,443		32,659
110320-110330	223	1.0	21,408			4,282		25,690
110420-110430	309	1.0	37,080			7,416		44,496
	916		104,352			20,870		125,222

ID: 110010-110020

Type: PIPE
Length: 511
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E THOMAS RD
Drawing No(s):
Right of Way: 110
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0015	0.013	36						26
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										

Section Capacity: 26
ROW+Section Capacity: 26

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	13	26	47	56	35	65

ID: 110110-110120

Type: ROADWAY
Length: 222
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E VIRGINIA AVE
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0015	Equivalent Roadway (%): 100						ROW Capacity:	23
PROPOSED	Pipe:	1	0.0015	0.013	42						39
	Box:										
	Channel:									Lined: N	
	Improvement Year:										

Section Capacity: 39
ROW+Section Capacity: 62

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $18,648
Total Improvements Cost: $22,378

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	12	27	59	74	39	76

ID: 110120-110130

Type: PIPE
Length: 1,336
Upstream Inv Elev: 1219.70
Upstream Grnd Elev: 1227.17

Street Name: N HAYDEN RD
Drawing No(s): 17476-17480
Right of Way: 130
Downstream Inv Elev: 1214.82
Downstream Grnd Elev: 1225.04

Slope: 0.0037

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0041	0.013	42						64
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0016	Equivalent Roadway (%): 100						ROW Capacity:	59
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	64
										ROW+Section Capacity:	123

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	38	75	141	172	101	188

ID: 110130-110140

Type: PIPE
Length: 1,134
Upstream Inv Elev: 1212.74
Upstream Grnd Elev: 1225.04

Street Name: N HAYDEN RD
Drawing No(s): 17473-17476
Right of Way: 130
Downstream Inv Elev: 1210.07
Downstream Grnd Elev: 1221.60

Slope: 0.0024

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0020	0.013	66						150
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0030	Equivalent Roadway (%): 100						ROW Capacity:	81
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	150
										ROW+Section Capacity:	231

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	61	121	231	287	165	310

ID: 110140-110150

Street Name: N HAYDEN RD
Drawing No(s): 17470-17473
Right of Way: 120

Type: PIPE
Length: 1,390
Upstream Inv Elev: 1209.57
Upstream Grnd Elev: 1221.60
Downstream Inv Elev: 1207.05
Downstream Grnd Elev: 1220.40

Slope: 0.0018

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0018	0.013	72						180
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0009	Equivalent Roadway (%): 100						ROW Capacity:	44
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	180
										ROW+Section Capacity:	224

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	71	145	281	352	199	374

ID: 110150-110160

Street Name: E MC DOWELL RD
Drawing No(s): 17469-17470
Right of Way: 130

Type: PIPE
Length: 278
Upstream Inv Elev: 1207.05
Upstream Grnd Elev: 1220.40
Downstream Inv Elev: 1205.97
Downstream Grnd Elev: 1219.20

Slope: 0.0039

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0046	0.013	72						287
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0043	Equivalent Roadway (%): 100						ROW Capacity:	97
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	287
										ROW+Section Capacity:	384

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	71	144	279	350	198	373

ID: 110160-110170

Street Name: E MC DOWELL RD
Drawing No(s): 17467-17469
Right of Way: 130

Type: PIPE
Length: 666
Upstream Inv Elev: 1205.97
Upstream Grnd Elev: 1219.20
Downstream Inv Elev: 1204.15
Downstream Grnd Elev: 1215.73

Slope: 0.0027

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0020	0.013	72						189
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0052	Equivalent Roadway (%): 100						ROW Capacity:	106
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	189
										ROW+Section Capacity:	296

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	76	154	300	375	212	400

ID: 110170-110180

Street Name: E MC DOWELL RD
Drawing No(s): 17466-17467
Right of Way: 120

Type: PIPE
Length: 726
Upstream Inv Elev: 1204.15
Upstream Grnd Elev: 1215.73
Downstream Inv Elev: 1195.48
Downstream Grnd Elev: 1209.38

Slope: 0.0119

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0162	0.013	72						539
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0087	Equivalent Roadway (%): 100						ROW Capacity:	137
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	539
										ROW+Section Capacity:	677

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	76	154	300	372	211	397

ID: 110180-110190

Street Name: E MC DOWELL RD
Drawing No(s): 17465-17466
Right of Way: 120

Type: PIPE
Length: 274
Upstream Inv Elev: 1195.48
Upstream Grnd Elev: 1209.38
Downstream Inv Elev: 1194.95
Downstream Grnd Elev: 1208.45
Slope: 0.0019

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0023	0.013	72						203
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0126	Equivalent Roadway (%): 100						ROW Capacity:	165
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:									Section Capacity:	203
										ROW+Section Capacity:	369

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	75	154	299	372	210	395

ID: 110190-110200

Street Name: INDIAN BEND WASH
Drawing No(s): 17465
Right of Way: 65

Type: PIPE
Length: 162
Upstream Inv Elev: 1195.26
Upstream Grnd Elev: 1208.60
Downstream Inv Elev: 1195.03
Downstream Grnd Elev: 1208.45
Slope: 0.0014

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0022	0.013	72						199
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0024	Equivalent Roadway (%): 100						ROW Capacity:	29
PROPOSED	Pipe:	1	0.0022	0.013	84						300
	Box:										
	Channel:								Lined: N		
	Improvement Year:									Section Capacity:	498
										ROW+Section Capacity:	528

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $27,216
Total Improvements Cost: $32,659

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	99	198	375	465	268	501

ID: 110310-110320

Type: ROADWAY
Length: 830
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 77TH ST
Drawing No(s):
Right of Way: 134
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0015	Equivalent Roadway (%): 100						ROW Capacity:	57
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	57

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):		4	19	46	9	35

ID: 110320-110330

Type: PIPE
Length: 223
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E CORONADO RD
Drawing No(s):
Right of Way: 134
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0015	0.013	18						4
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0015	0.013	48						56
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	60
										ROW+Section Capacity:	60

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $21,408
Total Improvements Cost: $25,690

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	15	34	73	94	49	97

ID: 110410-110420

Type: ROADWAY
Length: 208
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 77TH ST
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0015	Equivalent Roadway (%): 100						ROW Capacity:	38
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	38

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	14	29	57	71	40	76

ID: 110420-110430

Type: PIPE
Length: 309
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: INDIAN BEND WASH
Drawing No(s):
Right of Way: 40
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

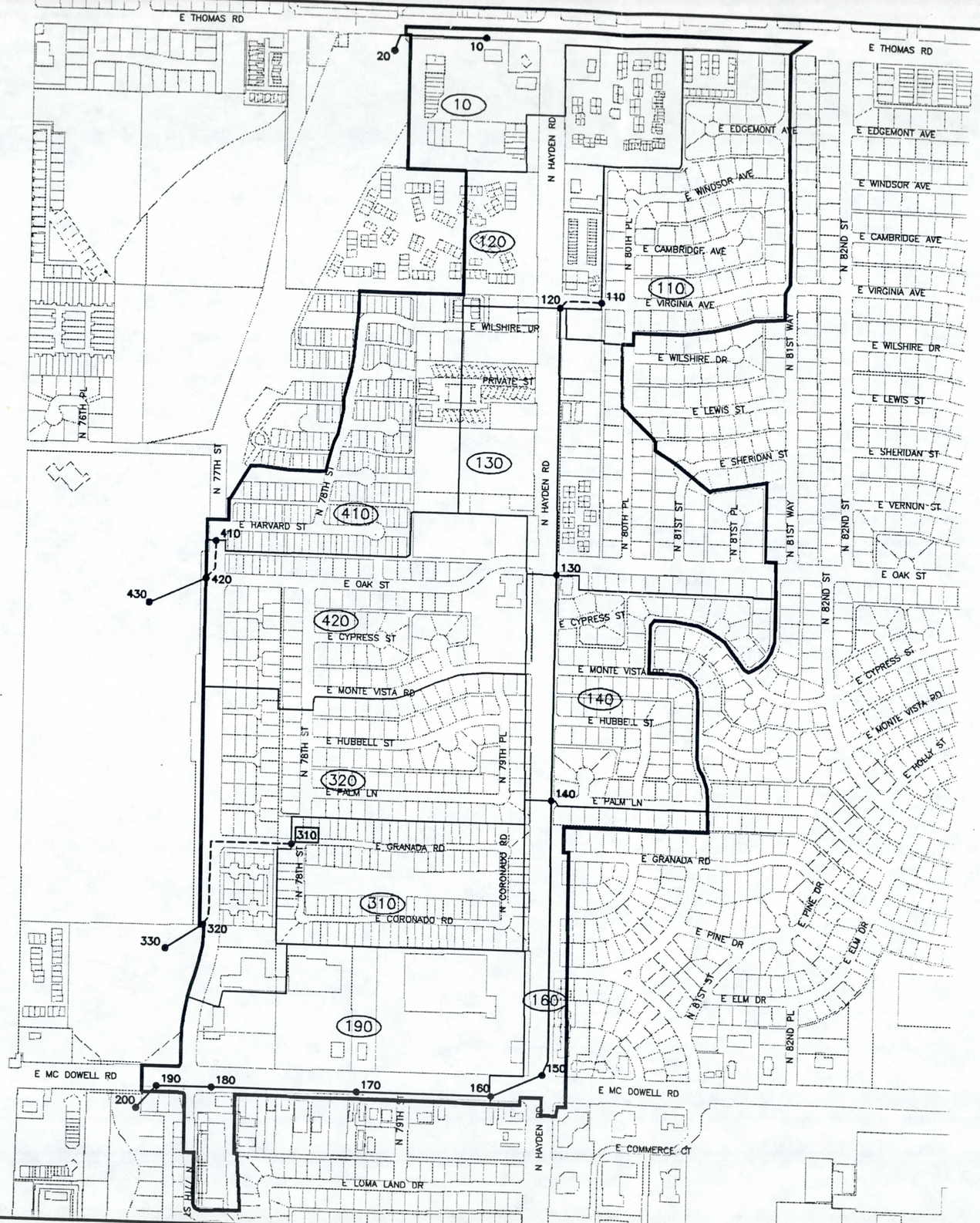
		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0015	0.013	18						4
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0015	0.013	60						101
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	105
										ROW+Section Capacity:	105

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $37,080
Total Improvements Cost: $44,496

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	28	59	120	151	83	157



0 300 600

1" = 600'

Legend

- Analysis Node
- Storage Basin
- Basin Boundary
- Drainage Area
- Roadway Reach
- Channel
- Pipe/Culvert
- City Boundary

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 11 McDowell Rd. Hayden Rd. Drainage Map

ID: 110310

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	1.0	500	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	1.90	1.90	1.90						
Elevation:	0.00	1.00	1.90	2.90						
Discharge:	0.00	0.01	0.01	0.01						

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):	1.0	2.0	2.0	2.0	2.0	2.0
Basin Design (100yr-2hr):	1.9					

City of Scottsdale
Storm Water Master Plan and Management Program
LAND USE BASIN SUMMARY
11 - McDOWELL/HAYDEN DRAINAGE BASIN

04/13/94

Group	Land Use	Code	Area (acres)	Percent Impervious (%)	Impervious Area (acres)
	2-4 DU PER ACRE	14	131.02	35	45.86
	4-8 DU PER ACRE	15	43.27	54	23.37
	12-22 DU PER ACRE	17	28.59	94	26.87
	TOURIST ACCOMMODATIONS	18	1.02	85	0.87
TOTAL RESIDENTIAL			203.91	48	96.97
	NEIGHBORHOOD COMMERCIAL	21	10.91	85	9.28
	GENERAL COMMERCIAL	22	32.22	85	27.39
TOTAL COMMERCIAL/OFFICE			43.14	85	36.67
	LIMITED USE AREA	42	4.28	1	0.04
	CULTURAL/INSTITUTIONAL	44	2.25	85	1.91
	UTILITIES	45	1.20	72	0.86
TOTAL OPEN SPACE			7.72	36	2.82
TOTAL 11 - McDOWELL/HAYDEN DRAINAGE BASIN			254.77	54	136.45

```
ID                                                                      10
IT     2                300                                             20
IO     5                                                                30
KK110010   BASIN                                                        40
BA 0.020                                                                50
PH 0.000   0.000   0.490   0.950   1.590   1.730   1.830   2.010        60
LS     0      79       0       0      98       0                       70
UK    31  0.0100    0.39      17                                       80
UK   191  0.0100    0.10      83                                       90
RK   340  0.0015    0.02            TRAP      98     1.0               100
RK  1506  0.0015    0.02            TRAP      41     1.0               110
KK110020    FROM  110010                                                120
RK   511  0.0015   0.013            CIRC     3.0                       130
KK110110   BASIN                                                        140
BA 0.040                                                                150
LS     0      79       0       0      98       0                       160
UK   146  0.0100    0.30      62                                       170
UK    54  0.0100    0.10      38                                       180
RK  2033  0.0015    0.02            TRAP      38     1.0               200
KK110120    FROM  110110                                                210
RK   222  0.0015   0.017            TRAP    45.0       1               220
KK110120   BASIN                                                        230
BA 0.031                                                                240
LS     0      79       0       0      98       0                       250
UK    24  0.0100    0.40       7                                       260
UK   196  0.0100    0.10      93                                       270
RK   574  0.0015    0.02            TRAP      23     1.0               280
RK   932  0.0015    0.02            TRAP      98     1.0               290
KK110120 COMBINE                                                        300
HC     2                                                                310
KK110130    FROM  110120                                                320
RK  1336  0.0041   0.013            CIRC     3.5                       330
KK110130   BASIN                                                        340
BA 0.051                                                                350
LS     0      79       0       0      98       0                       360
UK   121  0.0100    0.32      48                                       370
UK    86  0.0100    0.10      52                                       380
RK   898  0.0015    0.02            TRAP      60     1.0               390
RK  1336  0.0042    0.01            CIRC       4     0.0               400
KK110130 COMBINE                                                        410
HC     2                                                                420
KK110140    FROM  110130                                                430
RK  1134  0.0020   0.013            CIRC     5.5                       440
KK110140   BASIN                                                        450
BA 0.036                                                                460
LS     0      79       0       0      98       0                       470
UK   150  0.0100    0.30      65                                       480
UK    50  0.0100    0.10      35                                       490
RK  1729  0.0015    0.02            TRAP      38     1.0               500
RK  1134  0.0020    0.01            CIRC       6     0.0               510
KK110140 COMBINE                                                        520
HC     2                                                                530
KK110150    FROM  110140                                                540
RK  1390  0.0018   0.013            CIRC     6.0                       550
KK110160    FROM  110150                                                560
```

```
RK   278  0.0046   0.013          CIRC    6.0                                570
KK110160   BASIN                                                             580
BA 0.015                                                                     590
LS     0      79       0      0     98      0                                600
UK    97  0.0100    0.34     45                                              610
UK   111  0.0100    0.10     55                                              620
RK  1666  0.0018    0.01          CIRC      6     0.0                        640
KK110160 COMBINE                                                             650
HC     2                                                                     660
KK110170    FROM  110160                                                     670
RK   666  0.0020   0.013          CIRC    6.0                                680
KK110180    FROM  110170                                                     690
RK   726  0.0162   0.013          CIRC    6.0                                700
KK110190    FROM  110180                                                     710
RK   274  0.0023   0.013          CIRC    6.0                                720
KK110190   BASIN                                                             730
BA 0.047                                                                     740
LS     0      79       0      0     98      0                                750
UK    50  0.0100    0.38     19                                              760
UK   189  0.0100    0.10     81                                              770
RK  1666  0.0068    0.01          CIRC      6     0.0                        790
KK110190 COMBINE                                                             800
HC     2                                                                     810
KK110200    FROM  110190                                                     820
RK   162  0.0022   0.013          CIRC    6.0                                830
KK110310   BASIN                                                             840
BA 0.028                                                                     850
LS     0      79       0      0     98      0                                860
UK   150  0.0100    0.30     65                                              870
UK    50  0.0100    0.10     35                                              880
RK  1540  0.0015    0.02          TRAP     24     1.0                        900
KK110310 STORAGE                                                             910
RS     1    STOR                                                             920
SV  0.00    1.90    1.90   1.90  0.00    0.00    0.00    0.00    0.00    0.00 930
SE  0.00    1.00    1.90   2.90  0.00    0.00    0.00    0.00    0.00    0.00 940
SQ  0.00    0.01    0.01   0.01  0.00    0.00    0.00    0.00    0.00    0.00 950
ST   1.0     500     3.0    1.5                                               960
KK110320    FROM  110310                                                     970
RK   830  0.0015   0.017          TRAP  100.5       1                        980
KK110320   BASIN                                                             990
BA 0.051                                                                     1000
LS     0      79       0      0     98      0                                1010
UK   149  0.0100    0.30     58                                              1020
UK    64  0.0100    0.10     42                                              1030
RK  2629  0.0015    0.02          TRAP     41     1.0                        1050
KK110320 COMBINE                                                             1060
HC     2                                                                     1070
KK110330    FROM  110320                                                     1080
RK   223  0.0015   0.013          CIRC    1.5                                1090
KK110410   BASIN                                                             1100
BA 0.034                                                                     1110
LS     0      79       0      0     98      0                                1120
UK   152  0.0100    0.30     48                                              1130
UK    51  0.0100    0.10     52                                              1140
RK  2117  0.0015    0.02          TRAP     38     1.0                        1160
```

```
KK110420    FROM  110410                                                1170
RK    208  0.0015   0.017          TRAP    60.0       1                1180
KK110420   BASIN                                                       1190
BA 0.043                                                               1200
LS      0      79       0       0     98       0                       1210
UK    156  0.0100    0.30      62                                      1220
UK     56  0.0100    0.10      38                                      1230
RK    549  0.0015    0.02          TRAP      45     1.0                1240
RK   1632  0.0015    0.02          TRAP      45     1.0                1250
KK110420 COMBINE                                                       1260
HC      2                                                              1270
KK110430    FROM  110420                                                1280
RK    309  0.0015   0.013          CIRC     1.5                        1290
ZZ                                                                     1300
```

BASIN ID: 110010 Area: 0.020 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	31	0.0100	0.392	17	Collector:	340	0.0015	0.017	TRAP	97.5	1.0
Impervious:	191	0.0100	0.100	83	Main:	1,506	0.0015	0.017	TRAP	41.3	1.0

BASIN ID: 110110 Area: 0.040 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	146	0.0100	0.303	62	Collector:						
Impervious:	54	0.0100	0.100	38	Main:	2,033	0.0015	0.017	TRAP	37.5	1.0

BASIN ID: 110120 Area: 0.031 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	24	0.0100	0.397	7	Collector:	574	0.0015	0.017	TRAP	22.5	1.0
Impervious:	196	0.0100	0.100	93	Main:	932	0.0015	0.017	TRAP	97.5	1.0

BASIN ID: 110130 Area: 0.051 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	121	0.0100	0.323	48	Collector:	898	0.0015	0.017	TRAP	60.0	1.0
Impervious:	86	0.0100	0.100	52	Main:	1,336	0.0042	0.013	CIRC	3.5	

BASIN ID: 110140 Area: 0.036 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,729	0.0015	0.017	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,134	0.0020	0.013	CIRC	5.5	

BASIN ID: 110160 Area: 0.015 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	97	0.0100	0.341	45	Collector:						
Impervious:	111	0.0100	0.100	55	Main:	1,666	0.0018	0.013	CIRC	6.0	

BASIN ID: 110190 Area: 0.047 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	50	0.0100	0.381	19	Collector:						
Impervious:	189	0.0100	0.100	81	Main:	1,666	0.0068	0.013	CIRC	6.0	

BASIN ID: 110310 Area: 0.028 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:						
Impervious:	50	0.0100	0.100	35	Main:	1,540	0.0015	0.017	TRAP	24.0	1.0

BASIN ID: 110320 Area: 0.051 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	149	0.0100	0.302	58	Collector:						
Impervious:	64	0.0100	0.100	42	Main:	2,629	0.0015	0.017	TRAP	41.3	1.0

BASIN ID: 110410 Area: 0.034 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	152	0.0100	0.299	48	Collector:						
Impervious:	51	0.0100	0.100	52	Main:	2,117	0.0015	0.017	TRAP	37.5	1.0

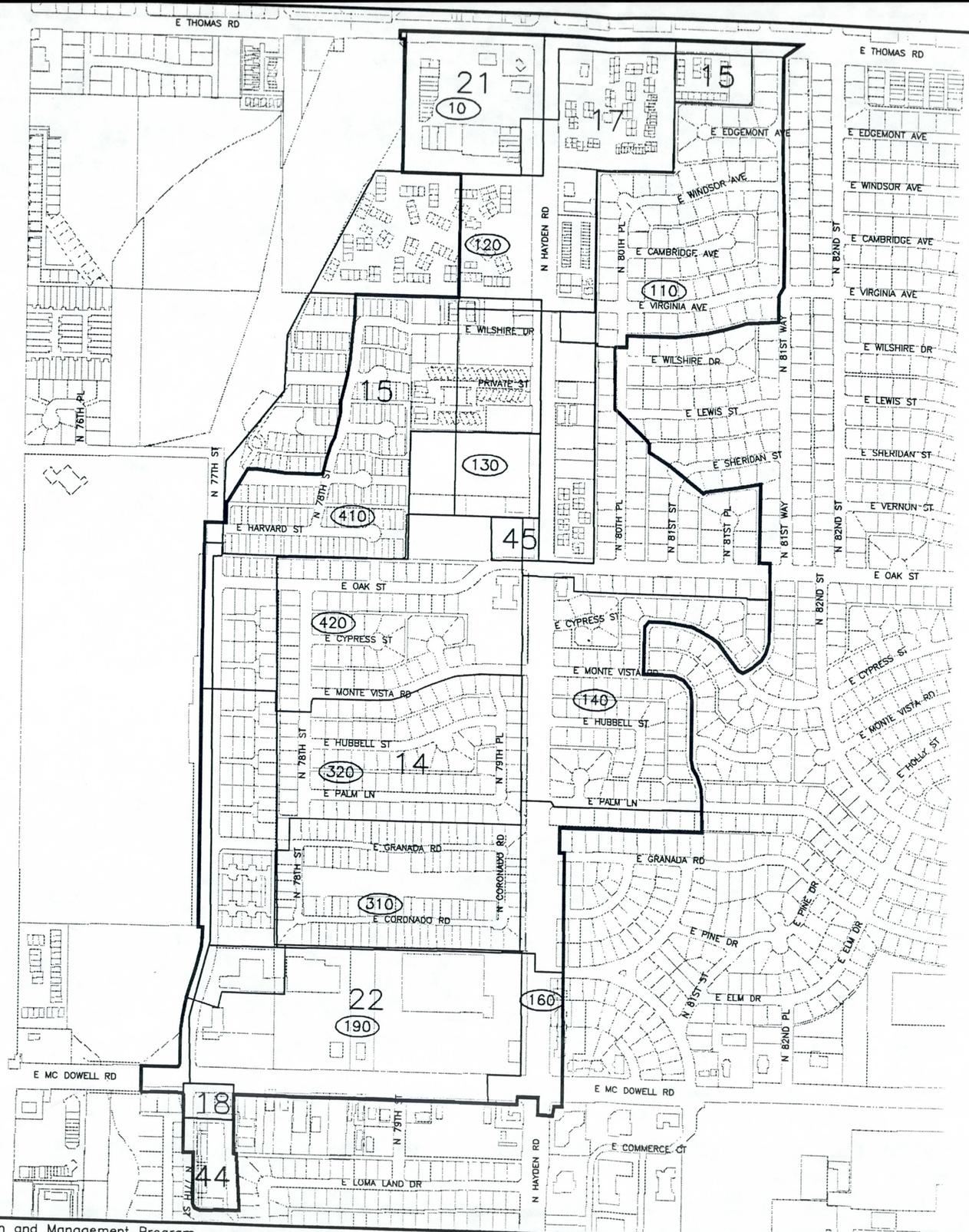
BASIN ID: 110420 Area: 0.043 Pervious CN: 79 Impervious CN: 98

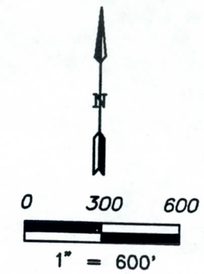
OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	156	0.0100	0.297	62	Collector:	549	0.0015	0.017	TRAP	45.0	1.0
Impervious:	56	0.0100	0.100	38	Main:	1,632	0.0015	0.017	TRAP	45.0	1.0

City of Scottsdale
Storm Water Master Plan and Management Program
RAINFALL DATA
11 - McDOWELL/HAYDEN DRAINAGE BASIN

04/13/94

Return Period (years)	RAINFALL DURATION 5 min	10 min	15 min	30 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs
2	0.31	0.47	0.57	0.75	0.91	0.99	1.05	1.15	1.25	1.35
5	0.42	0.64	0.80	1.07	1.32	1.44	1.52	1.67	1.82	1.97
10	0.49	0.75	0.95	1.28	1.59	1.73	1.83	2.01	2.19	2.38
25	0.60	0.91	1.16	1.57	1.96	2.14	2.25	2.48	2.71	2.94
50	0.68	1.04	1.33	1.80	2.24	2.45	2.58	2.84	3.11	3.37
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80





Legend

- Basin Boundary
- (610) Drainage Area
- Land Use Boundary
- City Boundary

Land Uses

10 – 1 DU PER 5 ACRES
11 – 1 DU PER 2–3 ACRES
12 – 1 DU PER 1–2 ACRES
13 – 1–2 DU PER ACRE
14 – 2–4 DU PER ACRE
15 – 4–8 DU PER ACRE
16 – 8–12 DU PER ACRE
17 – 12–22 DU PER ACRE
18 – TOURIST ACCOMMODATIONS
19 – LOW INTENSITY RESORT
21 – NEIGHBORHOOD COMMERCIAL
22 – GENERAL COMMERCIAL
31 – MINOR OFFICE
32 – MAJOR OFFICE
33 – MINOR EMPLOYMENT
34 – GENERAL EMPLOYMENT
36 – RESEARCH AND DEVELOPMENT
41 – NATURAL OPEN SPACE
42 – LIMITED USE AREA
43 – DEVELOPED OPEN SPACE
44 – CULTURAL/INSTITUTIONAL
45 – UTILITIES

Soil Group B

Runoff Zone 1

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 11 McDowell Rd. Hayden Rd. Land Use Map

12-THOMAS/HAYDEN Basin

Basin 12 is 173.8 acres, which is made up of 141.4 acres residential, 31.3 commercial and 1.2 acres open space. The basin is bounded by Indian School Rd. to the north, Thomas Rd. to the south, 82nd ST. to the east, and Indian Bend Wash to the west.

The drainage pattern is from east to west. There is one major drainage system in this basin that drains out to Indian Bend Wash at analysis point 240. There were several pipe and slope changes along the system. Information for this system was obtained from "as built" drawing numbers 15989-16011. A length of 100 ft. was added to the drainage system between analysis points 220-230, and 320-230. The length was added in order to run the HEC-1 model properly. A 30 inch pipe located in drainage basin 120310, on Hayden Rd., was not modeled because an insignificant amount of water entered into this pipe, according to our analysis. Two other drainage points are located at analysis points 20 and 120. Slopes were obtained from either "as builts" or from USGS maps. An average slope was calculated between analysis points 210 and 220 because there was a minor slope change. The east-west slope calculated from the USGS map was used because it better represented the basin.

There were no detention basins in this drainage area.

ASSUMPTIONS

- A 12 inch pipe at the intersection of Hayden Rd. and Fairmount Ave., drains water back out to Indian Bend Wash.

City of Scottsdale
Storm Water Master Plan and Management Program
PROPOSED CONVEYANCE IMPROVEMENTS COST
12 - THOMAS RD/HAYDEN DRAINAGE BASIN

04/13/94

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
120010-120020	227	1.0	21,792			4,358		26,150
120410-120420	816	1.0	58,752			11,750		70,502
120420-120430	996	1.0	83,664			16,733		100,397
120430-120440	484	1.0	46,464			9,293		55,757
	2,523		210,672			42,134		252,806

ID: 120010-120020

Type: PIPE
Length: 227
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E FAIRMOUNT AVE
Drawing No(s):
Right of Way: 16
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0050	0.013	18						7
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0050	0.013	48						102
	Box:										
	Channel:									Lined: N	
	Improvement Year:										

Section Capacity: 109
ROW+Section Capacity: 109

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $21,792
Total Improvements Cost: $26,150

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	37	71	133	165	97	173

ID: 120110-120120

Type: ROADWAY
Length: 490
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E OSBORN RD
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0050	Equivalent Roadway (%): 100						ROW Capacity:	69
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										

Section Capacity:
ROW+Section Capacity: 69

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	29	59	117	147	82	151

ID: 120210-120220

Street Name: N HAYDEN RD
Drawing No(s): 16005
Right of Way: 120

Type: PIPE
Length: 280
Upstream Inv Elev: 1221.55
Upstream Grnd Elev: 1230.25
Downstream Inv Elev: 1219.72
Downstream Grnd Elev: 1228.80

Slope: 0.0065

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0064	0.013	48						115
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0052	Equivalent Roadway (%): 100						ROW Capacity:	106
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	115
										ROW+Section Capacity:	221

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	17	32	57	70	43	79

ID: 120220-120230

Street Name: N HAYDEN RD
Drawing No(s): 16005
Right of Way: 120

Type: PIPE
Length: 172
Upstream Inv Elev: 1219.72
Upstream Grnd Elev: 1228.80
Downstream Inv Elev: 1218.28
Downstream Grnd Elev: 1229.30

Slope: 0.0084

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0053	0.013	54						143
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0069	Equivalent Roadway (%): 100						ROW Capacity:	122
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	143
										ROW+Section Capacity:	266

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	17	32	57	69	42	78

ID: 120230-120240

Street Name: EASEMENT
Drawing No(s): 16006
Right of Way: 20

Type: PIPE
Length: 567
Upstream Inv Elev: 1218.28
Upstream Grnd Elev: 1229.40
Downstream Inv Elev: 1217.01
Downstream Grnd Elev: 1227.00

Slope: 0.0022

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0022	0.013	66						158
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0042	Equivalent Roadway (%): 100						ROW Capacity:	24
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	158
										ROW+Section Capacity:	182

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	38	75	137	167	100	184

ID: 120310-120320

Street Name: N HAYDEN RD
Drawing No(s): 16003
Right of Way: 105

Type: PIPE
Length: 503
Upstream Inv Elev: 1219.29
Upstream Grnd Elev: 1226.85
Downstream Inv Elev: 1218.51
Downstream Grnd Elev: 1227.60

Slope: 0.0016

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0016	0.013	36						27
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0015	Equivalent Roadway (%): 100						ROW Capacity:	37
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	27
										ROW+Section Capacity:	64

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	5	10	17	20	13	23

ID: 120320-120230

Street Name: N HAYDEN RD
Type: PIPE
Drawing No(s): 16004
Length: 135
Right of Way: 105
Upstream Inv Elev: 1219.29
Downstream Inv Elev: 1218.28
Slope: 0.0075
Upstream Grnd Elev: 1227.60
Downstream Grnd Elev: 1229.30

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0016	0.013	48						57
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0486	Equivalent Roadway (%): 100						ROW Capacity:	213
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	57
										ROW+Section Capacity:	271

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	16	31	53	62	40	72

ID: 120410-120420

Street Name: N 81ST ST\EASEMENT
Type: IMPROVED CHANNEL
Drawing No(s):
Length: 816
Right of Way: 55
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0050	0.025		1.0	3.0	1.0			13
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0050	0.013	36						47
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	60
										ROW+Section Capacity:	60

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $58,752
Total Improvements Cost: $70,502

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	12	26	52	66	35	66

ID: 120420-120430

Street Name: E THOMAS RD
Type: ROADWAY
Drawing No(s):
Length: 996
Right of Way: 120
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0050	Equivalent Roadway (%): 100						ROW Capacity:	104
PROPOSED	Pipe:	1	0.0050	0.013	42						71
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	71
										ROW+Section Capacity:	175

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $83,664
Total Improvements Cost: $100,397

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	23	47	92	115	64	119

ID: 120430-120440

Street Name: E THOMAS RD
Type: PIPE
Drawing No(s):
Length: 484
Right of Way: 110
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0050	0.013	36						47
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0050	0.013	48						102
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	149
										ROW+Section Capacity:	149

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $46,464
Total Improvements Cost: $55,757

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	38	76	143	178	103	191

City of Scottsdale
Storm Water Master Plan and Management Program
LAND USE BASIN SUMMARY
12 - THOMAS RD/HAYDEN DRAINAGE BASIN

Group	Land Use	Code	Area (acres)	Percent Impervious (%)	Impervious Area (acres)
	2-4 DU PER ACRE	14	117.84	35	41.24
	4-8 DU PER ACRE	15	0.41	54	0.22
	12-22 DU PER ACRE	17	23.14	94	21.75
TOTAL RESIDENTIAL			141.39	45	63.21
	NEIGHBORHOOD COMMERCIAL	21	4.28	85	3.64
	GENERAL COMMERCIAL	22	22.03	85	18.72
	MINOR OFFICE	31	3.32	85	2.83
	MAJOR OFFICE	32	1.62	85	1.38
TOTAL COMMERCIAL/OFFICE			31.25	85	26.56
	LIMITED USE AREA	42	1.18	1	0.01
TOTAL OPEN SPACE			1.18	1	0.01
TOTAL 12 - THOMAS RD/HAYDEN DRAINAGE BASIN			173.82	52	89.79

```
ID                                                                      10
IT     2                300                                             20
IO     5                                                                30
KK120010   BASIN                                                        40
BA 0.066                                                                50
PH 0.000   0.000   0.490   0.950   1.590   1.730   1.830   2.010        60
LS     0      79       0       0      98       0                        70
UK   123  0.0100    0.32      54                                        80
UK    86  0.0100    0.10      46                                        90
RK   706  0.0050    0.02            TRAP      38     1.0                100
RK  1278  0.0050    0.02            TRAP      38     1.0                110
KK120020     FROM  120010                                               120
RK   227  0.0050   0.013            CIRC     1.5                        130
KK120110   BASIN                                                        140
BA 0.068                                                                150
LS     0      79       0       0      98       0                        160
UK   140  0.0100    0.31      60                                        170
UK    61  0.0100    0.10      40                                        180
RK  1237  0.0050    0.02            TRAP      60     1.0                190
RK  1053  0.0050    0.02            TRAP      98     1.0                200
KK120120     FROM  120110                                               210
RK   490  0.0050   0.017            TRAP    60.0       1                220
KK120210   BASIN                                                        230
BA 0.023                                                                240
LS     0      79       0       0      98       0                        250
UK    70  0.0100    0.36      26                                        260
UK   142  0.0100    0.10      74                                        270
RK   549  0.0050    0.02            TRAP      45     1.0                280
RK  1109  0.0050    0.02            TRAP      90     1.0                290
KK120220     FROM  120210                                               300
RK   280  0.0064   0.013            CIRC     4.0                        310
KK120230     FROM  120220                                               320
RK   172  0.0053   0.013            CIRC     4.5                        330
KK120310   BASIN                                                        340
BA 0.006                                                                350
LS     0      79       0       0      98       0                        360
UK    20  0.0100    0.40      14                                        370
UK   200  0.0100    0.10      86                                        380
RK   370  0.0050    0.02            TRAP      74     1.0                390
KK120320     FROM  120310                                               400
RK   503  0.0016   0.013            CIRC     3.0                        410
KK120320   BASIN                                                        420
BA 0.012                                                                430
LS     0      79       0       0      98       0                        440
UK    31  0.0100    0.39      10                                        450
UK   187  0.0100    0.10      90                                        460
RK   723  0.0050    0.02            TRAP      25     1.0                470
RK   503  0.0016    0.01            CIRC       3     0.0                480
KK120320 COMBINE                                                        490
HC     2                                                                500
KK120230     FROM  120320                                               510
RK   135  0.0016   0.013            CIRC     4.0                        520
KK120230   BASIN                                                        530
BA 0.022                                                                540
LS     0      79       0       0      98       0                        550
```

```
UK    145  0.0100    0.30      63                                    560
UK     56  0.0100    0.10      37                                    570
RK   2319  0.0050    0.02            TRAP      38     1.0            580
KK120230 COMBINE                                                     590
HC      3                                                            600
KK120240    FROM  120230                                             610
RK    567  0.0022   0.013            CIRC     5.5                    620
KK120410   BASIN                                                     630
BA 0.033                                                             640
LS      0      79       0       0      98       0                    650
UK    148  0.0100    0.30      64                                    660
UK     52  0.0100    0.10      36                                    670
RK    442  0.0050    0.02            TRAP      38     1.0            680
RK   1783  0.0050    0.02            TRAP      38     1.0            690
KK120420    FROM  120410                                             700
RK    816  0.0050   0.025            TRAP     3.0     1.0            710
KK120420   BASIN                                                     720
BA 0.021                                                             730
LS      0      79       0       0      98       0                    740
UK    108  0.0100    0.33      46                                    750
UK     99  0.0100    0.10      54                                    760
RK   1692  0.0050    0.02            TRAP      41     1.0            770
KK120420 COMBINE                                                     780
HC      2                                                            790
KK120430    FROM  120420                                             800
RK    996  0.0050   0.017            TRAP    90.0       1            810
KK120430   BASIN                                                     820
BA 0.021                                                             830
LS      0      79       0       0      98       0                    840
UK     27  0.0100    0.40      14                                    850
UK    197  0.0100    0.10      86                                    860
RK    572  0.0050    0.02            TRAP      30     1.0            870
RK    993  0.0050    0.02            TRAP      41     1.0            880
KK120430 COMBINE                                                     890
HC      2                                                            900
KK120440    FROM  120430                                             910
RK    484  0.0050   0.013            CIRC     3.0                    920
ZZ                                                                   930
```

City of Scottsdale
Storm Water Master Plan and Management Program
12 - THOMAS RD/HAYDEN DRAINAGE BASIN
DRAINAGE AREA FACTORS

BASIN ID: 120010 Area: 0.066 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	123	0.0100	0.321	54	Collector:	706	0.0050	0.017	TRAP	37.5	1.0
Impervious:	86	0.0100	0.100	46	Main:	1,278	0.0050	0.017	TRAP	37.5	1.0

BASIN ID: 120110 Area: 0.068 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	140	0.0100	0.308	60	Collector:	1,237	0.0050	0.017	TRAP	60.0	1.0
Impervious:	61	0.0100	0.100	40	Main:	1,053	0.0050	0.017	TRAP	97.5	1.0

BASIN ID: 120210 Area: 0.023 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	70	0.0100	0.361	26	Collector:	549	0.0050	0.017	TRAP	45.0	1.0
Impervious:	142	0.0100	0.100	74	Main:	1,109	0.0050	0.017	TRAP	90.0	1.0

BASIN ID: 120230 Area: 0.022 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	145	0.0100	0.304	63	Collector:						
Impervious:	56	0.0100	0.100	37	Main:	2,319	0.0050	0.017	TRAP	37.5	1.0

BASIN ID: 120310 Area: 0.006 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	20	0.0100	0.400	14	Collector:						
Impervious:	200	0.0100	0.100	86	Main:	370	0.0050	0.017	TRAP	73.5	1.0

BASIN ID: 120320 Area: 0.012 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	31	0.0100	0.391	10	Collector:	723	0.0050	0.017	TRAP	24.8	1.0
Impervious:	187	0.0100	0.100	90	Main:	503	0.0016	0.013	CIRC	3.0	

BASIN ID: 120410 Area: 0.033 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	148	0.0100	0.302	64	Collector:	442	0.0050	0.017	TRAP	37.5	1.0
Impervious:	52	0.0100	0.100	36	Main:	1,783	0.0050	0.017	TRAP	37.5	1.0

BASIN ID: 120420 Area: 0.021 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	108	0.0100	0.333	46	Collector:						
Impervious:	99	0.0100	0.100	54	Main:	1,692	0.0050	0.017	TRAP	41.3	1.0

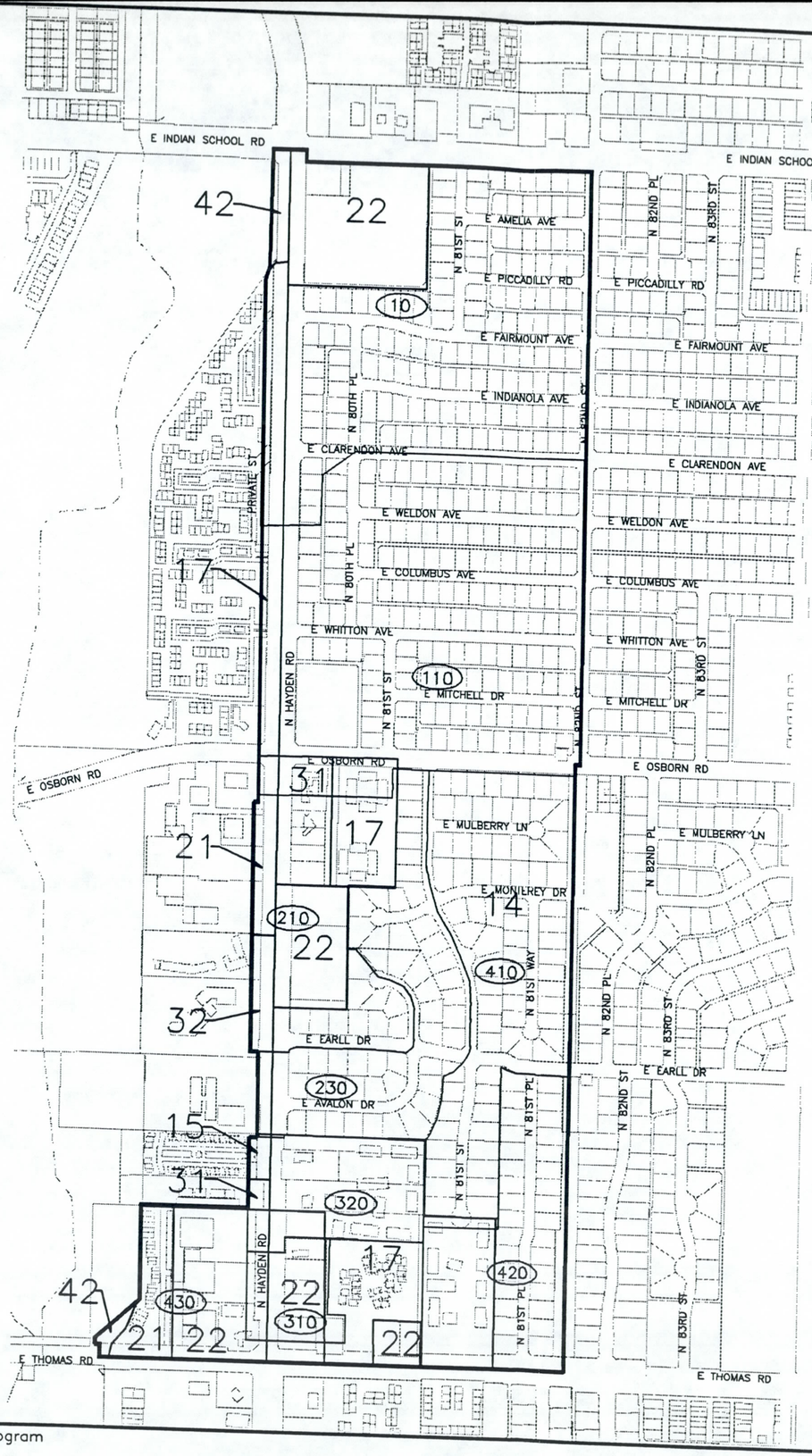
BASIN ID: 120430 Area: 0.021 Pervious CN: 79 Impervious CN: 98

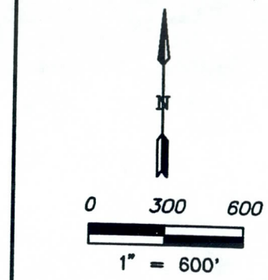
OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	27	0.0100	0.395	14	Collector:	572	0.0050	0.017	TRAP	30.0	1.0
Impervious:	197	0.0100	0.100	86	Main:	993	0.0050	0.017	TRAP	41.3	1.0

City of Scottsdale
Storm Water Master Plan and Management Program
RAINFALL DATA
12 - THOMAS RD/HAYDEN DRAINAGE BASIN

04/13/94

Return Period (years)	RAINFALL DURATION 5 min	10 min	15 min	30 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs
2	0.31	0.47	0.57	0.75	0.91	0.99	1.05	1.15	1.25	1.35
5	0.42	0.64	0.80	1.07	1.32	1.44	1.52	1.67	1.82	1.97
10	0.49	0.75	0.95	1.28	1.59	1.73	1.83	2.01	2.19	2.38
25	0.60	0.91	1.16	1.57	1.96	2.14	2.25	2.48	2.71	2.94
50	0.68	1.04	1.33	1.80	2.24	2.45	2.58	2.84	3.11	3.37
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80





Legend

- Basin Boundary
- (610) Drainage Area
- Land Use Boundary
- City Boundary

Land Uses

10 – 1 DU PER 5 ACRES
11 – 1 DU PER 2–3 ACRES
12 – 1 DU PER 1–2 ACRES
13 – 1–2 DU PER ACRE
14 – 2–4 DU PER ACRE
15 – 4–8 DU PER ACRE
16 – 8–12 DU PER ACRE
17 – 12–22 DU PER ACRE
18 – TOURIST ACCOMMODATIONS
19 – LOW INTENSITY RESORT
21 – NEIGHBORHOOD COMMERCIAL
22 – GENERAL COMMERCIAL
31 – MINOR OFFICE
32 – MAJOR OFFICE
33 – MINOR EMPLOYMENT
34 – GENERAL EMPLOYMENT
36 – RESEARCH AND DEVELOPMENT
41 – NATURAL OPEN SPACE
42 – LIMITED USE AREA
43 – DEVELOPED OPEN SPACE
44 – CULTURAL/INSTITUTIONAL
45 – UTILITIES

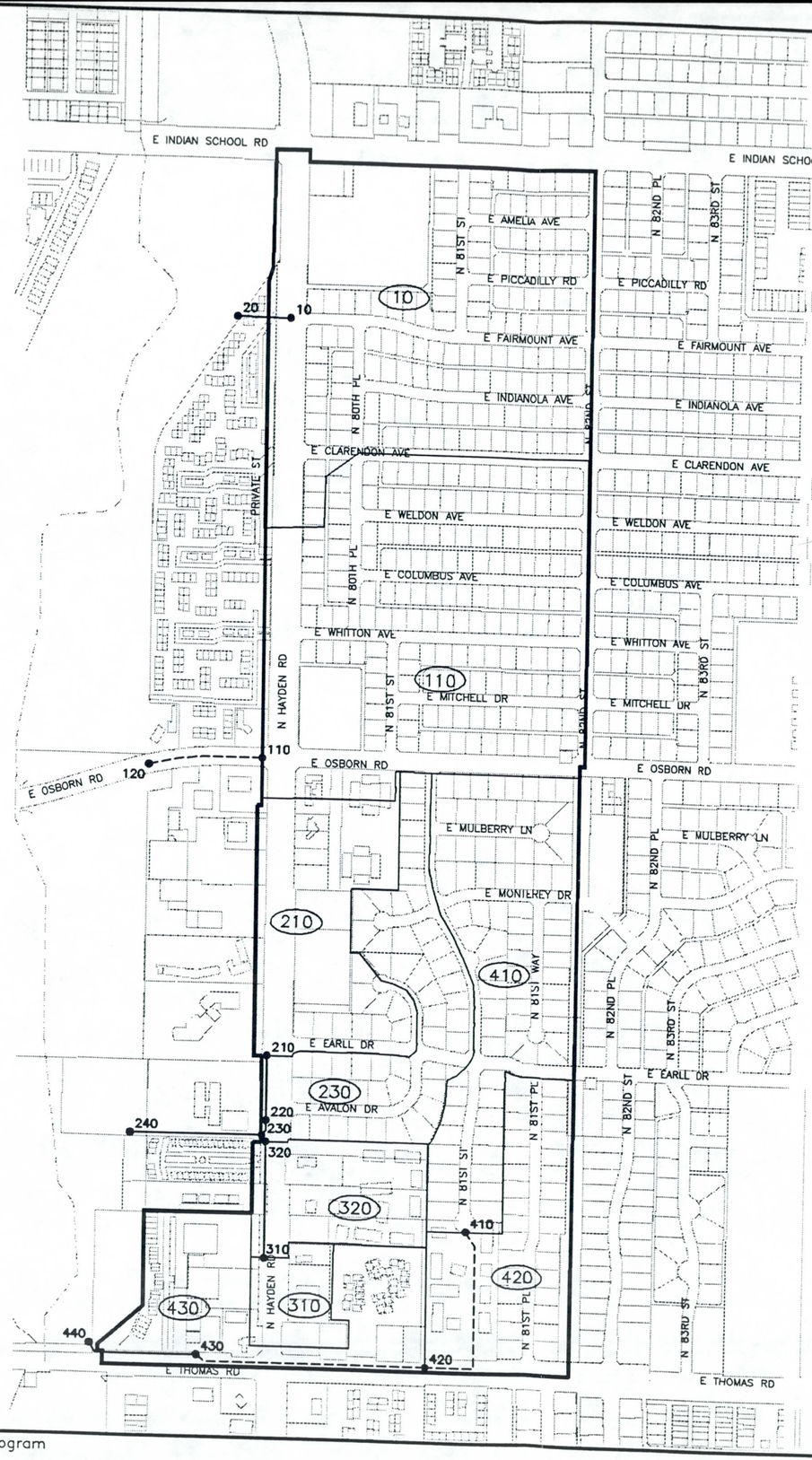
Soil Group B

Runoff Zone 1

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 12 Thomas Rd. Hayden Rd. Land Use Map



0 300 600

1" = 600'

Legend

- Analysis Node
- Storage Basin
- Basin Boundary
- Drainage Area
- Roadway Reach
- Channel
- Pipe/Culvert
- City Boundary

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 12 Thomas Rd.
Hayden Rd.
Drainage Map

13-INDIAN SCHOOL/PIMA Basin

Basin 13 is 503.7 acres, which is made up of 459.6 acres residential, 23.1 commercial and 21 acres open space. The basin is bounded by Chaparral Rd. to the north, Indian School Rd. to the south, Pima Rd. to the east, and Indian Bend Wash to the west.

The drainage pattern of this basin is from east to west. There are two major drainage systems in this basin. The first drainage system is located on Indian School Rd. and drains from analysis points 10 through 70. The second drainage system is located on Camelback Rd. and drains from analysis points 520 through 560. Information for both of the drainage systems were obtained from "as built" drawing numbers 15924-15935 and 13248-13256. A length of 100 ft. was added to the first drainage system between analysis points 60 and 70 in order to run the HEC-1 model properly. Slopes were obtained from either "as builts" or from USGS maps. The north-south slope calculated from the USGS map was used when there was no information from "as builts".

There was one detention basin in this drainage area. It is located at a residential community on the north side of Indian School Rd., in between Granite Reef Rd. and 86th St.. Its drainage pattern is from north to south which then drains onto Indian School Rd. and flows west to analysis point 40.

ASSUMPTIONS:

- Three eliptical pipes, at analysis point 610, drain water through a private community to Indian Bend Wash.

- A 24 inch pipe, at analysis point 710, drains water through this same community to Indian Bend Wash.

City of Scottsdale
Storm Water Master Plan and Management Program
PROPOSED CONVEYANCE IMPROVEMENTS COST
13 - INDIAN SCHOOL/PIMA DRAINAGE BASIN

04/13/94

ID	Length (ft)	Cost Factor	Pipe ($)	Box ($)	Channel ($)	Contingency @ 20% ($)	ROW ($)	Total ($)
130040-130050	1,270	1.0	213,360			42,672		256,032
130050-130060	1,215	1.0	204,120			40,824		244,944
130060-130070	305	1.0	51,240			10,248		61,488
130220-130230	272	1.0	29,376			5,875		35,251
130310-130040	898	1.0	43,104			8,621		51,725
130420-130430	581	1.0	55,776			11,155		66,931
130430-130030	798	1.0	95,760			19,152		114,912
130520-130530	721	1.0	112,476			22,495		134,971
130530-130540	1,017	1.0	158,652			31,730		190,382
130540-130550	1,003	1.0	156,468			31,294		187,762
130550-130560	748	1.0	143,616			28,723		172,339
130710-130720	489	1.0	41,076			8,215		49,291
130720-130730	828	1.0	79,488			15,898		95,386
130810-130820	463	1.0	50,004			10,001		60,005
130820-130520	1,299	1.0	155,880			31,176		187,056
	11,907		1,590,396			318,079		1,908,475

ID: 130010-130020

Street Name: E INDIAN SCHOOL RD
Drawing No(s): 15935
Right of Way: 105

Type: PIPE
Length: 701
Upstream Inv Elev: 1232.98
Upstream Grnd Elev: 1240.60
Downstream Inv Elev: 1232.20
Downstream Grnd Elev: 1241.60
Slope: 0.0011

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0011	0.013	72						140
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0014	Equivalent Roadway (%): 100						ROW Capacity:	36
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	140
										ROW+Section Capacity:	177

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	1	2	5	6	3	6

ID: 130020-130030

Street Name: E INDIAN SCHOOL RD
Drawing No(s): 15934
Right of Way: 105

Type: PIPE
Length: 523
Upstream Inv Elev: 1232.20
Upstream Grnd Elev: 1241.60
Downstream Inv Elev: 1231.60
Downstream Grnd Elev: 1242.60
Slope: 0.0011

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0011	0.013	72						140
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0019	Equivalent Roadway (%): 100						ROW Capacity:	42
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	140
										ROW+Section Capacity:	183

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	18	37	71	90	50	92

ID: 130030-130040

Street Name: E INDIAN SCHOOL RD
Drawing No(s): 15933
Right of Way: 115

Type: PIPE
Length: 1,323
Upstream Inv Elev: 1231.60
Upstream Grnd Elev: 1242.60
Downstream Inv Elev: 1230.00
Downstream Grnd Elev: 1243.80
Slope: 0.0012

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0011	0.013	72						140
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0009	Equivalent Roadway (%): 100						ROW Capacity:	29
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	140
										ROW+Section Capacity:	170

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	67	138	279	355	194	360

ID: 130040-130050

Street Name: E INDIAN SCHOOL RD
Drawing No(s): 15929-15931
Right of Way: 98

Type: PIPE
Length: 1,270
Upstream Inv Elev: 1230.00
Upstream Grnd Elev: 1243.80
Downstream Inv Elev: 1227.75
Downstream Grnd Elev: 1246.20
Slope: 0.0018

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0025	0.013	72						212
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0019	Equivalent Roadway (%): 100						ROW Capacity:	42
PROPOSED	Pipe:	1	0.0025	0.013	84						320
	Box:										
	Channel:									Lined: N	
	Improvement Year:									Section Capacity:	531
										ROW+Section Capacity:	574

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $213,360
Total Improvements Cost: $256,032

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	100	202	396	495	279	515

ID: 130050-130060

Street Name: E INDIAN SCHOOL RD
Drawing No(s): 15927-15929
Right of Way: 98

Type: PIPE
Length: 1,215
Upstream Inv Elev: 1227.75
Upstream Grnd Elev: 1246.20
Downstream Inv Elev: 1223.60
Downstream Grnd Elev: 1236.00
Slope: 0.0034

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0025	0.013	72						212
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0084	Equivalent Roadway (%): 100						ROW Capacity:	89
PROPOSED	Pipe:	1	0.0025	0.013	84						320
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	531
										ROW+Section Capacity:	621

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $204,120
Total Improvements Cost: $244,944

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	112	228	450	565	314	585

ID: 130060-130070

Street Name: INDIAN BEND WASH
Drawing No(s): 15926-15927
Right of Way: 40

Type: PIPE
Length: 305
Upstream Inv Elev: 1223.60
Upstream Grnd Elev: 1236.00
Downstream Inv Elev: 1222.31
Downstream Grnd Elev: 1229.00
Slope: 0.0042

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0074	0.013	72						364
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0229	Equivalent Roadway (%): 100						ROW Capacity:	103
PROPOSED	Pipe:	1	0.0074	0.013	84						550
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	914
										ROW+Section Capacity:	1,017

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $51,240
Total Improvements Cost: $61,488

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	118	240	471	590	331	612

ID: 130110-130040

Street Name: E INDIAN SCHOOL RD
Type: ROADWAY
Drawing No(s): 15931-15932
Length: 865
Right of Way: 98
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev: 1243.80
Downstream Grnd Elev: 1242.80

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0012	Equivalent Roadway (%): 100					ROW Capacity:		34
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
									Section Capacity:		
									ROW+Section Capacity:		34

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):			3	10	1	2

ID: 130210-130220

Street Name: E GLENROSA AVE
Type: ROADWAY
Drawing No(s):
Length: 1,032
Right of Way: 50
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0032	Equivalent Roadway (%): 100					ROW Capacity:		50
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
									Section Capacity:		
									ROW+Section Capacity:		50

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	20	41	81	103	57	105

ID: 130220-130230

Street Name: E GLENROSA AVE
Type: PIPE
Drawing No(s):
Length: 272
Right of Way: 16
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0032	0.013	24						13
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0032	0.013	54						111
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 124
ROW+Section Capacity: 124

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $29,376
Total Improvements Cost: $35,251

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	38	79	158	200	110	205

ID: 130310-130040

Street Name: N GRANITE REEF RD
Type: ROADWAY
Drawing No(s):
Length: 898
Right of Way: 70
Upstream Inv Elev:
Downstream Inv Elev:
Upstream Grnd Elev:
Downstream Grnd Elev:
Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0032	Equivalent Roadway (%): 100						ROW Capacity:	34
PROPOSED	Pipe:	1	0.0032	0.013	24						13
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 13
ROW+Section Capacity: 47

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $43,104
Total Improvements Cost: $51,725

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	3	8	19	24	12	24

ID: 130410-130420

Type: ROADWAY
Length: 204
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 86TH ST
Drawing No(s):
Right of Way: 55
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0032	Equivalent Roadway (%): 100						ROW Capacity:	50
PROPOSED	Pipe:										
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	
										ROW+Section Capacity:	50

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	21	42	85	108	58	108

ID: 130420-130430

Type: ROADWAY
Length: 581
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 86TH ST
Drawing No(s):
Right of Way: 55
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0032	Equivalent Roadway (%): 100						ROW Capacity:	50
PROPOSED	Pipe:	1	0.0032	0.013	48						81
	Box:										
	Channel:									Lined: N	
	Improvement Year:										
										Section Capacity:	81
										ROW+Section Capacity:	132

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $55,776
Total Improvements Cost: $66,931

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	26	54	109	137	75	138

ID: 130430-130030

Type: IMPROVED CHANNEL
Length: 798
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 86TH ST
Drawing No(s):
Right of Way: 26
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:		0.0032	0.013		1.0	10.0	1.0			64
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100					ROW Capacity:		
PROPOSED	Pipe:	1	0.0032	0.013	60						147
	Box:										
	Channel:								Lined: N		
Improvement Year:											

Section Capacity: 212
ROW+Section Capacity: 212

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $95,760
Total Improvements Cost: $114,912

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	41	86	176	225	120	225

ID: 130510-130520

Type: ROADWAY
Length: 617
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E CAMELBACK RD
Drawing No(s):
Right of Way: 80
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0032	Equivalent Roadway (%): 100					ROW Capacity:		55
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
Improvement Year:											

Section Capacity:
ROW+Section Capacity: 55

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	11	26	56	73	38	73

ID: 130520-130530

Street Name: E CAMELBACK RD
Drawing No(s): 13255-13256
Right of Way: 80

Type: PIPE
Length: 721
Upstream Inv Elev: 1242.24
Upstream Grnd Elev: 1248.06
Downstream Inv Elev: 1240.77
Downstream Grnd Elev: 1249.40

Slope: 0.0020

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0019	0.013	60						114
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0019	Equivalent Roadway (%): 100						ROW Capacity:	42
PROPOSED	Pipe:	1	0.0019	0.013	78						229
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	342
										ROW+Section Capacity:	385

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $112,476
Total Improvements Cost: $134,971

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	74	154	315	404	217	406

ID: 130530-130540

Street Name: E CAMELBACK RD
Drawing No(s): 13253-13256
Right of Way: 80

Type: PIPE
Length: 1,017
Upstream Inv Elev: 1240.77
Upstream Grnd Elev: 1249.40
Downstream Inv Elev: 1237.52
Downstream Grnd Elev: 1251.20

Slope: 0.0032

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0033	0.013	60						150
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0018	Equivalent Roadway (%): 100						ROW Capacity:	41
PROPOSED	Pipe:	1	0.0033	0.013	78						301
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	451
										ROW+Section Capacity:	492

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $158,652
Total Improvements Cost: $190,382

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	74	153	314	398	213	400

ID: 130540-130550

Street Name: E CAMELBACK RD
Drawing No(s): 13251-13253
Right of Way: 80

Type: PIPE
Length: 1,003
Upstream Inv Elev: 1237.45
Upstream Grnd Elev: 1251.20
Downstream Inv Elev: 1235.29
Downstream Grnd Elev: 1249.34

Slope: 0.0022

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0021	0.013	60						119
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0019	Equivalent Roadway (%): 100						ROW Capacity:	42
PROPOSED	Pipe:	1	0.0021	0.013	78						240
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	360
										ROW+Section Capacity:	402

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $156,468
Total Improvements Cost: $187,762

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	73	151	309	395	213	397

ID: 130550-130560

Street Name: E CAMELBACK RD
Drawing No(s): 13250-13251
Right of Way: 80

Type: PIPE
Length: 748
Upstream Inv Elev: 1235.44
Upstream Grnd Elev: 1249.24
Downstream Inv Elev: 1234.55
Downstream Grnd Elev: 1241.00

Slope: 0.0012

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0011	0.013	60						86
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0110	Equivalent Roadway (%): 100						ROW Capacity:	102
PROPOSED	Pipe:	1	0.0011	0.013	96						303
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	389
										ROW+Section Capacity:	491

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $143,616
Total Improvements Cost: $172,339

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	101	202	404	513	282	523

ID: 130610-130620

Street Name: E MEADOWBROOK AVE
Type: PIPE
Drawing No(s):
Length: 526
Right of Way: 16
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	3	0.0032	0.013	30 *						70
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:										
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	70
										ROW+Section Capacity:	70

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost:
Total Improvements Cost:

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	20	40	80	101	54	101

ID: 130710-130720

Street Name: E COOLIDGE ST
Type: ROADWAY
Drawing No(s):
Length: 489
Right of Way: 60
Upstream Inv Elev:
Downstream Inv Elev:
Slope:
Upstream Grnd Elev:
Downstream Grnd Elev:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0032	Equivalent Roadway (%): 100						ROW Capacity:	34
PROPOSED	Pipe:	1	0.0029	0.013	42						54
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	54
										ROW+Section Capacity:	88

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $41,076
Total Improvements Cost: $49,291

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	16	33	68	86	46	86

ID: 130720-130730

Type: PIPE
Length: 828
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: E COOLIDGE ST
Drawing No(s):
Right of Way: 16
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:	1	0.0032	0.013	24						13
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:			Equivalent Roadway (%): 100						ROW Capacity:	
PROPOSED	Pipe:	1	0.0029	0.013	48						77
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 90
ROW+Section Capacity: 90

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $79,488
Total Improvements Cost: $95,386

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	25	54	118	153	78	153

ID: 130810-130820

Type: ROADWAY
Length: 463
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 86TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0032	Equivalent Roadway (%): 100						ROW Capacity:	34
PROPOSED	Pipe:	1	0.0029	0.013	54						106
	Box:										
	Channel:								Lined: N		
	Improvement Year:										

Section Capacity: 106
ROW+Section Capacity: 140

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $50,004
Total Improvements Cost: $60,005

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	32	64	125	156	86	158

ID: 130820-130520

Type: ROADWAY
Length: 1,299
Upstream Inv Elev:
Upstream Grnd Elev:

Street Name: N 86TH ST
Drawing No(s):
Right of Way: 60
Downstream Inv Elev:
Downstream Grnd Elev:

Slope:

		No	Slope	Manning's N	Size	Eq Depth	Base Width	Side Slope	Section Area	Wetted Perim	Capacity
EXISTING	Pipe:										
	Box:										
	Imp Channel:										
	Nat Channel:										
	Roadway:		0.0032	Equivalent Roadway (%): 100						ROW Capacity:	34
PROPOSED	Pipe:	1	0.0029	0.013	60						140
	Box:										
	Channel:								Lined: N		
	Improvement Year:										
										Section Capacity:	140
										ROW+Section Capacity:	174

COST FACTORS

Utilities	Structural	Property Restoration	Surface Restoration	Traffic Control	Contingency
1.0	1.0	1.0	1.0	1.0	20%

Section Cost: $155,880
Total Improvements Cost: $187,056

Return Period (Yrs):	2	5	25	50	10	100
Design Runoff (cfs):	44	89	174	220	121	222

ID: 130110

	Elevation	Length	Coefficient	Exponent
Top of Dam Overflow:	1.0	500	3.0	1.5

	1	2	3	4	5	6	7	8	9	10
Volume:	0.00	0.60	0.60							
Elevation:	0.00	0.60	1.60							
Discharge:	0.00	0.01	0.01							

Return Period:	2	5	10	25	50	100
Design Volume (6 hour):		1.0	1.0	1.0	1.0	1.0
Basin Design (100yr-2hr):	0.6					

City of Scottsdale
Storm Water Master Plan and Management Program
LAND USE BASIN SUMMARY
13 - INDIAN SCHOOL/PIMA DRAINAGE BASIN

Group	Land Use	Code	Area (acres)	Percent Impervious (%)	Impervious Area (acres)
	2-4 DU PER ACRE	14	410.04	35	143.51
	4-8 DU PER ACRE	15	27.98	54	15.11
	12-22 DU PER ACRE	17	21.55	94	20.25
TOTAL RESIDENTIAL			459.57	39	178.88
	NEIGHBORHOOD COMMERCIAL	21	0.66	85	0.56
	GENERAL COMMERCIAL	22	17.67	85	15.02
	MINOR OFFICE	31	4.77	85	4.06
TOTAL COMMERCIAL/OFFICE			23.10	85	19.64
	LIMITED USE AREA	42	0.99	1	0.01
	DEVELOPED OPEN SPACE	43	2.51	80	2.01
	CULTURAL/INSTITUTIONAL	44	17.51	85	14.89
TOTAL OPEN SPACE			21.01	80	16.91
TOTAL 13 - INDIAN SCHOOL/PIMA DRAINAGE BASIN			503.69	43	215.42

```
ID                                                                      10
IT     2                300                                             20
IO     5                                                                30
KK130010   BASIN                                                        40
BA 0.004                                                                50
PH 0.000   0.000   0.490   0.950   1.590   1.730   1.830   2.010        60
LS     0      79       0       0      98       0                       70
UK   150  0.0100    0.30      60                                       80
UK    50  0.0100    0.10      40                                       90
RK  1985  0.0032    0.02            TRAP      38     1.0               110
KK130020    FROM  130010                                                190
RK   701  0.0011   0.013            CIRC     6.0                       200
KK130020   BASIN                                                        210
BA 0.041                                                                220
LS     0      79       0       0      98       0                       230
UK   150  0.0100    0.30      57                                       240
UK    50  0.0100    0.10      43                                       250
RK  1954  0.0032    0.02            TRAP      38     1.0               270
KK130020 COMBINE                                                        280
HC     2                                                                290
KK130030    FROM  130020                                                300
RK   523  0.0011   0.013            CIRC     6.0                       310
KK130410   BASIN                                                        320
BA 0.052                                                                330
LS     0      79       0       0      98       0                       340
UK   150  0.0100    0.30      65                                       350
UK    50  0.0100    0.10      35                                       360
RK  1037  0.0032    0.02            TRAP      38     1.0               370
RK   966  0.0032    0.02            TRAP      45     1.0               380
KK130420    FROM  130410                                                390
RK   204  0.0032   0.017            TRAP    41.3       1               400
KK130420   BASIN                                                        410
BA 0.017                                                                420
LS     0      79       0       0      98       0                       430
UK   150  0.0100    0.30      65                                       440
UK    50  0.0100    0.10      35                                       450
RK  1358  0.0032    0.02            TRAP      38     1.0               470
KK130420 COMBINE                                                        480
HC     2                                                                490
KK130430    FROM  130420                                                500
RK   581  0.0032   0.017            TRAP    41.3       1               510
KK130430   BASIN                                                        520
BA 0.046                                                                530
LS     0      79       0       0      98       0                       540
UK   150  0.0100    0.30      65                                       550
UK    50  0.0100    0.10      35                                       560
RK  1888  0.0032    0.02            TRAP      45     1.0               580
KK130430 COMBINE                                                        590
HC     2                                                                600
KK130030    FROM  130430                                                610
RK   798  0.0032   0.013            TRAP    10.0     1.0               620
KK130030   BASIN                                                        630
BA 0.018                                                                640
LS     0      79       0       0      98       0                       650
UK   107  0.0100    0.33      34                                       660
```

```
UK    100  0.0100    0.10     66                                          670
RK    794  0.0032    0.02          TRAP     12     1.0                   690
KK130030 COMBINE                                                          700
HC      3                                                                 710
KK130040     FROM  130030                                                 720
RK   1323  0.0011   0.013          CIRC    6.0                           730
KK130110    BASIN                                                         740
BA 0.005                                                                  750
LS      0      79       0      0     98      0                            760
UK     20  0.0100    0.40      6                                          770
UK    200  0.0100    0.10     94                                          780
RK    595  0.0032    0.02          TRAP     19     1.0                   800
KK130110 STORAGE                                                          810
RS      1    STOR                                                         820
SV   0.00    0.60    0.60   0.00   0.00   0.00   0.00   0.00   0.00   0.00 830
SE   0.00    0.60    1.60   0.00   0.00   0.00   0.00   0.00   0.00   0.00 840
SQ   0.00    0.01    0.01   0.00   0.00   0.00   0.00   0.00   0.00   0.00 850
ST    1.0     500     3.0    1.5                                          860
KK130040     FROM  130110                                                 870
RK    865  0.0012   0.017          TRAP   73.5      1                    880
KK130310    BASIN                                                         890
BA 0.014                                                                  900
LS      0      79       0      0     98      0                            910
UK    150  0.0100    0.30     65                                          920
UK     50  0.0100    0.10     35                                          930
RK   1656  0.0032    0.02          TRAP     60     1.0                   950
KK130040     FROM  130310                                                 960
RK    898  0.0032   0.017          TRAP   52.5      1                    970
KK130040    BASIN                                                         980
BA 0.045                                                                  990
LS      0      79       0      0     98      0                           1000
UK     74  0.0100    0.36     25                                         1010
UK    138  0.0100    0.10     75                                         1020
RK    815  0.0032    0.02          TRAP     60     1.0                  1030
RK   1323  0.0011    0.01          CIRC      6     0.0                  1040
KK130040 COMBINE                                                         1050
HC      4                                                                1060
KK130050     FROM  130040                                                1070
RK   1270  0.0025   0.013          CIRC    6.0                          1080
KK130050    BASIN                                                        1090
BA 0.039                                                                 1100
LS      0      79       0      0     98      0                           1110
UK    134  0.0100    0.31     58                                         1120
UK     69  0.0100    0.10     42                                         1130
RK    588  0.0032    0.02          TRAP     36     1.0                  1140
RK   1270  0.0032    0.01          CIRC      6     0.0                  1150
KK130050 COMBINE                                                         1160
HC      2                                                                1170
KK130060     FROM  130050                                                1180
RK   1215  0.0025   0.013          CIRC    6.0                          1190
KK130060    BASIN                                                        1200
BA 0.012                                                                 1210
LS      0      79       0      0     98      0                           1220
UK     37  0.0100    0.39     22                                         1230
UK    180  0.0100    0.10     78                                         1240
```

```
RK  1208  0.0025    0.01            CIRC      6     0.0
KK130060 COMBINE
HC     2
KK130070    FROM  130060
RK   305  0.0074   0.013            CIRC    6.0
KK130210   BASIN
BA 0.049
LS     0      79       0       0      98      0
UK   144  0.0100    0.31      62
UK    57  0.0100    0.10      38
RK  1212  0.0032    0.02            TRAP     38     1.0
RK   964  0.0032    0.02            TRAP     45     1.0
KK130220    FROM  130210
RK  1032  0.0032   0.017            TRAP   37.5       1
KK130220   BASIN
BA 0.046
LS     0      79       0       0      98      0
UK   138  0.0100    0.31      59
UK    71  0.0100    0.10      41
RK  1206  0.0032    0.02            TRAP     45     1.0
RK  1328  0.0032    0.02            TRAP     41     1.0
KK130220 COMBINE
HC     2
KK130230    FROM  130220
RK   272  0.0032   0.013            CIRC    2.0
KK130510   BASIN
BA 0.040
LS     0      79       0       0      98      0
UK   150  0.0100    0.30      65
UK    50  0.0100    0.10      35
RK  2464  0.0032    0.02            TRAP     38     1.0
KK130520    FROM  130510
RK   617  0.0032   0.017            TRAP   60.0       1
KK130810   BASIN
BA 0.072
LS     0      79       0       0      98      0
UK   149  0.0100    0.30      62
UK    51  0.0100    0.10      38
RK  1292  0.0032    0.02            TRAP     38     1.0
RK   755  0.0032    0.02            TRAP     45     1.0
KK130820    FROM  130810
RK   463  0.0032   0.017            TRAP   45.0       1
KK130820   BASIN
BA 0.033
LS     0      79       0       0      98      0
UK   150  0.0100    0.30      65
UK    50  0.0100    0.10      35
RK  1234  0.0032    0.02            TRAP     45     1.0
RK   463  0.0032    0.02            TRAP     45     1.0
KK130820 COMBINE
HC     2
KK130520    FROM  130820
RK  1299  0.0032   0.017            TRAP   45.0       1
KK130520   BASIN
BA 0.061
```

```
LS      0      79       0       0      98       0                 1820
UK    150  0.0100    0.30      65                                 1830
UK     50  0.0100    0.10      35                                 1840
RK    647  0.0032    0.02            TRAP      38     1.0         1850
RK   1294  0.0032    0.02            TRAP      45     1.0         1860
KK130520 COMBINE                                                  1870
HC      3                                                         1880
KK130530    FROM  130520                                          1890
RK    721  0.0019   0.013            CIRC     5.0                 1900
KK130540    FROM  130530                                          1910
RK   1017  0.0033   0.013            CIRC     5.0                 1920
KK130550    FROM  130540                                          1930
RK   1003  0.0021   0.013            CIRC     5.0                 1940
KK130550   BASIN                                                  1950
BA 0.053                                                          1960
LS      0      79       0       0      98       0                 1970
UK    187  0.0100    0.29      36                                 1980
UK    131  0.0100    0.10      64                                 1990
RK   1241  0.0032    0.02            TRAP      30     1.0         2000
RK   2741  0.0025    0.01            CIRC       5     0.0         2010
KK130550 COMBINE                                                  2020
HC      2                                                         2030
KK130560    FROM  130550                                          2040
RK    748  0.0011   0.013            CIRC     5.0                 2050
KK130610   BASIN                                                  2060
BA 0.049                                                          2070
LS      0      79       0       0      98       0                 2080
UK    150  0.0100    0.30      65                                 2090
UK     50  0.0100    0.10      35                                 2100
RK    431  0.0032    0.02            TRAP      45     1.0         2110
RK   1328  0.0032    0.02            TRAP      38     1.0         2120
KK130620    FROM  130610                                          2130
RK    526  0.0032   0.013            CIRC     2.5                 2140
KK130710   BASIN                                                  2150
BA 0.043                                                          2160
LS      0      79       0       0      98       0                 2170
UK    150  0.0100    0.30      65                                 2180
UK     50  0.0100    0.10      35                                 2190
RK   1295  0.0032    0.02            TRAP      38     1.0         2200
RK    850  0.0032    0.02            TRAP      45     1.0         2210
KK130720    FROM  130710                                          2220
RK    489  0.0032   0.017            TRAP    45.0       1         2230
KK130720   BASIN                                                  2240
BA 0.046                                                          2250
LS      0      79       0       0      98       0                 2260
UK    149  0.0100    0.30      64                                 2270
UK     52  0.0100    0.10      36                                 2280
RK   1054  0.0032    0.02            TRAP      60     1.0         2290
RK   2974  0.0032    0.02            TRAP      45     1.0         2300
KK130720 COMBINE                                                  2310
HC      2                                                         2320
KK130730    FROM  130720                                          2330
RK    828  0.0032   0.013            CIRC     2.0                 2340
ZZ                                                                2350
```

BASIN ID: 130010 Area: 0.004 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	60	Collector:						
Impervious:	50	0.0100	0.100	40	Main:	1,985	0.0032	0.017	TRAP	37.5	1.0

BASIN ID: 130020 Area: 0.041 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	57	Collector:						
Impervious:	50	0.0100	0.100	43	Main:	1,954	0.0032	0.017	TRAP	37.5	1.0

BASIN ID: 130030 Area: 0.018 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	107	0.0100	0.333	34	Collector:						
Impervious:	100	0.0100	0.100	66	Main:	794	0.0032	0.017	TRAP	12.0	1.0

BASIN ID: 130040 Area: 0.045 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	74	0.0100	0.358	25	Collector:	815	0.0032	0.017	TRAP	60.0	1.0
Impervious:	138	0.0100	0.100	75	Main:	1,323	0.0011	0.013	CIRC	6.0	

BASIN ID: 130050 Area: 0.039 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	134	0.0100	0.312	58	Collector:	588	0.0032	0.017	TRAP	36.0	1.0
Impervious:	69	0.0100	0.100	42	Main:	1,270	0.0032	0.013	CIRC	6.0	

BASIN ID: 130060 Area: 0.012 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	37	0.0100	0.387	22	Collector:						
Impervious:	180	0.0100	0.100	78	Main:	1,208	0.0025	0.013	CIRC	6.0	

BASIN ID: 130110 Area: 0.005 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	20	0.0100	0.400	6	Collector:						
Impervious:	200	0.0100	0.100	94	Main:	595	0.0032	0.017	TRAP	18.8	1.0

BASIN ID: 130210 Area: 0.049 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	144	0.0100	0.305	62	Collector:	1,212	0.0032	0.017	TRAP	37.5	1.0
Impervious:	57	0.0100	0.100	38	Main:	964	0.0032	0.017	TRAP	45.0	1.0

BASIN ID: 130220 Area: 0.046 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	138	0.0100	0.310	59	Collector:	1,206	0.0032	0.017	TRAP	45.0	1.0
Impervious:	71	0.0100	0.100	41	Main:	1,328	0.0032	0.017	TRAP	41.3	1.0

BASIN ID: 130310 Area: 0.014 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:						
Impervious:	50	0.0100	0.100	35	Main:	1,656	0.0032	0.017	TRAP	60.0	1.0

BASIN ID: 130410 Area: 0.052 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,037	0.0032	0.017	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	966	0.0032	0.017	TRAP	45.0	1.0

BASIN ID: 130420 Area: 0.017 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:						
Impervious:	50	0.0100	0.100	35	Main:	1,358	0.0032	0.017	TRAP	37.5	1.0

BASIN ID: 130430 Area: 0.046 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:						
Impervious:	50	0.0100	0.100	35	Main:	1,888	0.0032	0.017	TRAP	45.0	1.0

BASIN ID: 130510 Area: 0.040 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:						
Impervious:	50	0.0100	0.100	35	Main:	2,464	0.0032	0.017	TRAP	37.5	1.0

BASIN ID: 130520 Area: 0.061 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	647	0.0032	0.017	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,294	0.0032	0.017	TRAP	45.0	1.0

BASIN ID: 130550 Area: 0.053 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	187	0.0100	0.293	36	Collector:	1,241	0.0032	0.017	TRAP	30.0	1.0
Impervious:	131	0.0100	0.100	64	Main:	2,741	0.0025	0.013	CIRC	5.0	

BASIN ID: 130610 Area: 0.049 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	431	0.0032	0.017	TRAP	45.0	1.0
Impervious:	50	0.0100	0.100	35	Main:	1,328	0.0032	0.017	TRAP	37.5	1.0

BASIN ID: 130710 Area: 0.043 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,295	0.0032	0.017	TRAP	37.5	1.0
Impervious:	50	0.0100	0.100	35	Main:	850	0.0032	0.017	TRAP	45.0	1.0

BASIN ID: 130720 Area: 0.046 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	149	0.0100	0.301	64	Collector:	1,054	0.0032	0.017	TRAP	60.0	1.0
Impervious:	52	0.0100	0.100	36	Main:	2,974	0.0032	0.017	TRAP	45.0	1.0

BASIN ID: 130810 Area: 0.072 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	149	0.0100	0.301	62	Collector:	1,292	0.0032	0.017	TRAP	37.5	1.0
Impervious:	51	0.0100	0.100	38	Main:	755	0.0032	0.017	TRAP	45.0	1.0

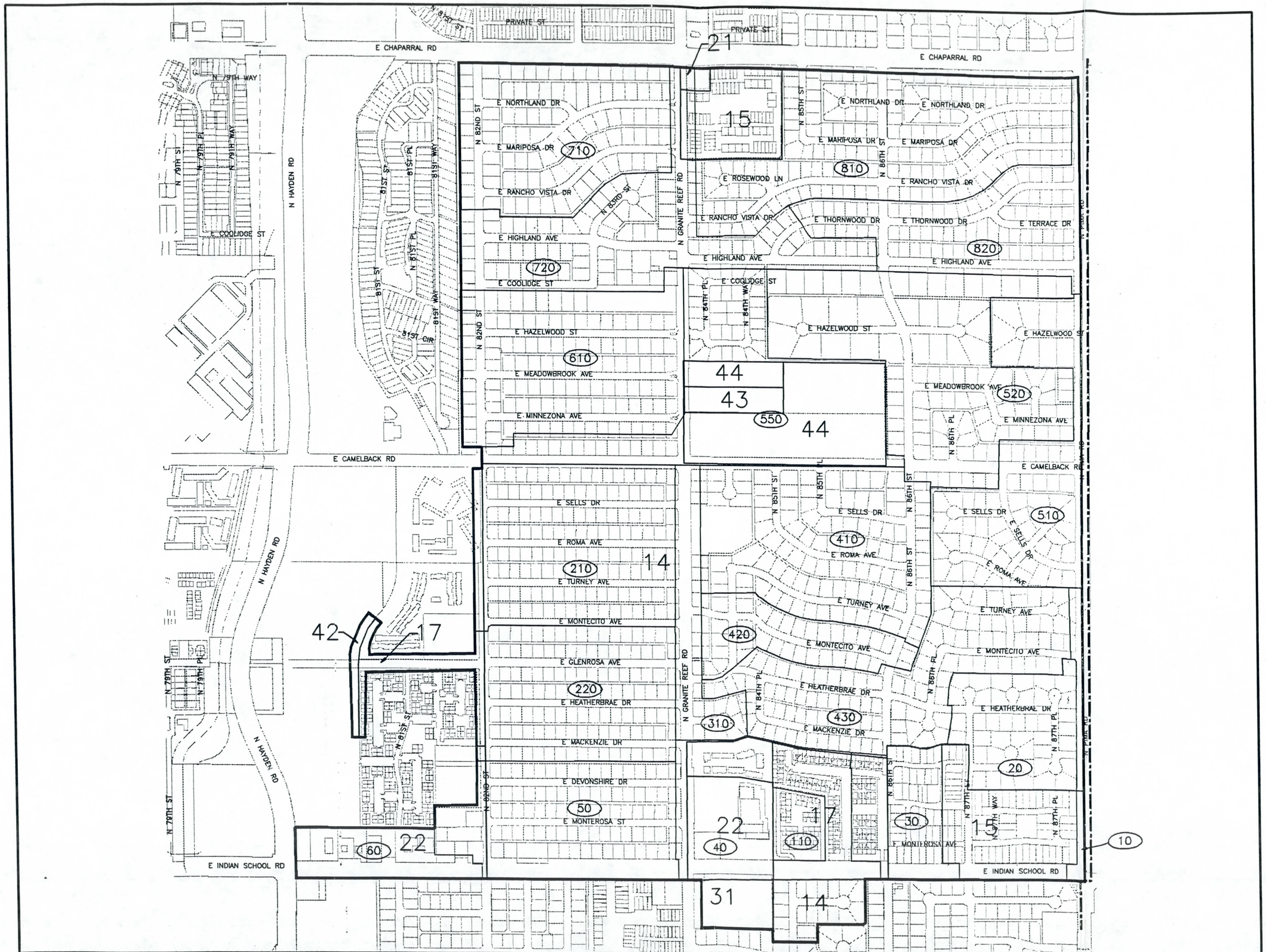
BASIN ID: 130820 Area: 0.033 Pervious CN: 79 Impervious CN: 98

OVERLAND FLOW:	Length	Slope	Rough's	Perc't	ROUTING:	Length	Slope	Rough's	Shape	Width	S/S
Pervious:	150	0.0100	0.300	65	Collector:	1,234	0.0032	0.017	TRAP	45.0	1.0
Impervious:	50	0.0100	0.100	35	Main:	463	0.0032	0.017	TRAP	45.0	1.0

City of Scottsdale
Storm Water Master Plan and Management Program
RAINFALL DATA
13 - INDIAN SCHOOL/PIMA DRAINAGE BASIN

04/13/94

Return Period (years)	RAINFALL DURATION 5 min	10 min	15 min	30 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs
2	0.31	0.47	0.57	0.75	0.91	0.99	1.05	1.15	1.25	1.35
5	0.42	0.64	0.80	1.07	1.32	1.44	1.52	1.67	1.82	1.97
10	0.49	0.75	0.95	1.28	1.59	1.73	1.83	2.01	2.19	2.38
25	0.60	0.91	1.16	1.57	1.96	2.14	2.25	2.48	2.71	2.94
50	0.68	1.04	1.33	1.80	2.24	2.45	2.58	2.84	3.11	3.37
100	0.76	1.16	1.49	2.02	2.53	2.76	2.91	3.20	3.50	3.80



0 300 600

1" = 600'

Legend

- Basin Boundary
- (610) Drainage Area
- Land Use Boundary
- City Boundary

Land Uses

10 – 1 DU PER 5 ACRES
11 – 1 DU PER 2–3 ACRES
12 – 1 DU PER 1–2 ACRES
13 – 1–2 DU PER ACRE
14 – 2–4 DU PER ACRE
15 – 4–8 DU PER ACRE
16 – 8–12 DU PER ACRE
17 – 12–22 DU PER ACRE
18 – TOURIST ACCOMMODATIONS
19 – LOW INTENSITY RESORT
21 – NEIGHBORHOOD COMMERCIAL
22 – GENERAL COMMERCIAL
31 – MINOR OFFICE
32 – MAJOR OFFICE
33 – MINOR EMPLOYMENT
34 – GENERAL EMPLOYMENT
36 – RESEARCH AND DEVELOPMENT
41 – NATURAL OPEN SPACE
42 – LIMITED USE AREA
43 – DEVELOPED OPEN SPACE
44 – CULTURAL/INSTITUTIONAL
45 – UTILITIES

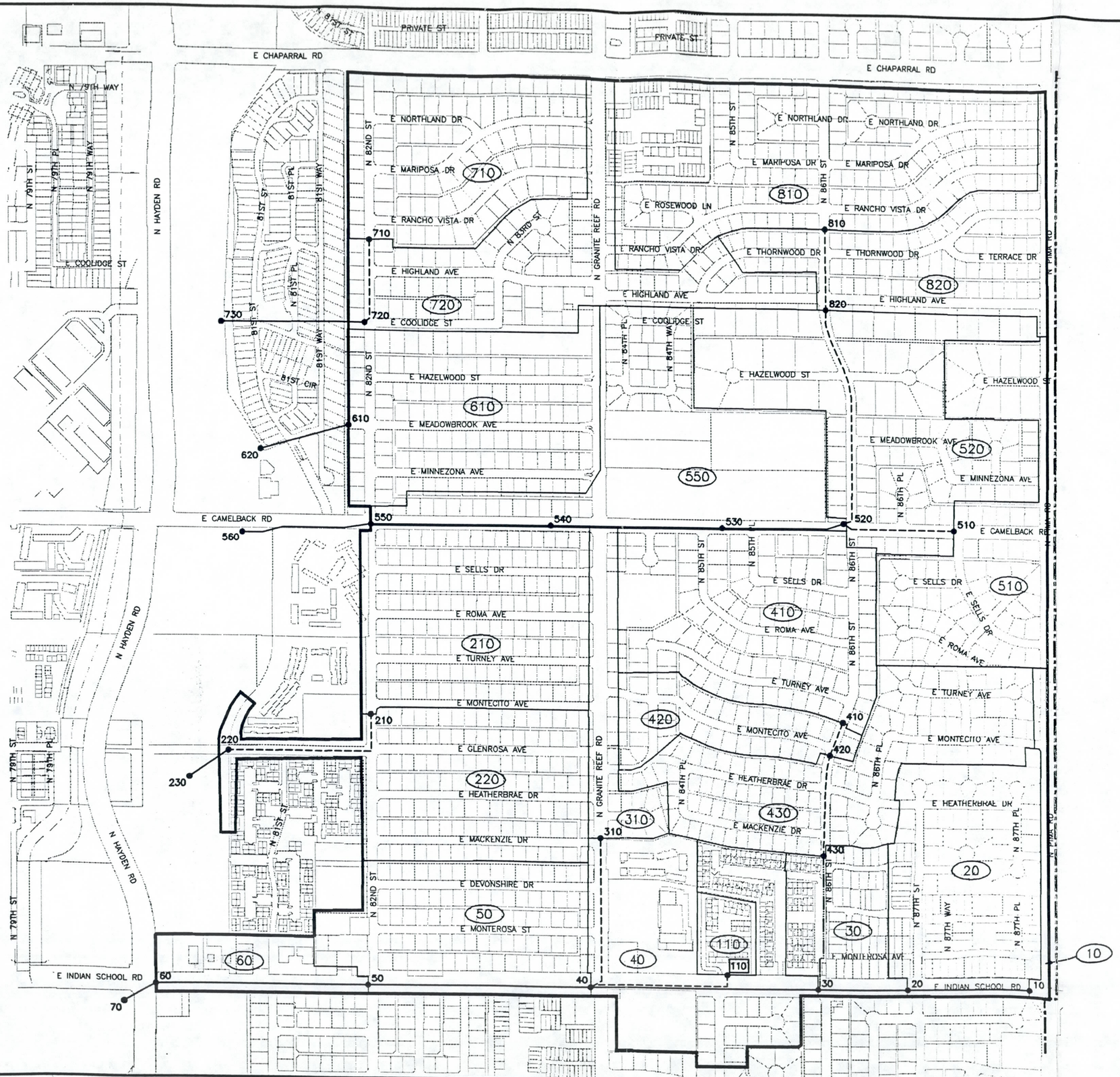
Soil Group B

Runoff Zone 1

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 13 Pima Rd. Indian School Rd. Land Use Map



N

0 300 600

1" = 600'

Legend

- 101 Analysis Node
- 101 Storage Basin
- Basin Boundary
- 610 Drainage Area
- Roadway Reach
- Channel
- Pipe/Culvert
- City Boundary

City of Scottsdale

BOYLE ENGINEERING CORPORATION

Basin 13 Pima Rd. Indian School Rd. Drainage Map