Mechenbier Construction, Inc.

San Mateo Business Park

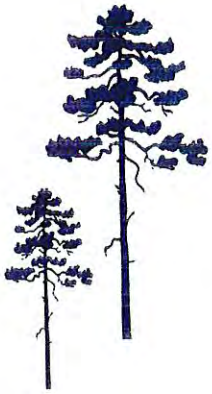
ALBUQUERQUE, NM

- Background
- Basin Analysis
- SS Analysis
- Grading Plan

Drainage Report

September 1999

C. L. Weiss Engineering, Inc.



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Background

Existing Conditions

The site consists of five lots defined by the original North Albuquerque Acres platting, situated adjacent to San Matea Blvd, west of I-25. Of the upstream area draining to the site, the eastern edge is defined by I-25, which has become a diversion line for most flows east of the freeway. Storm runoff crosses undeveloped land, following natural swales and arroyo paths to reach San Mateo Blvd., where flows are intercepted by improvements installed as part of the Citicorp development. Flows are picked up by storm sewer (SS) improvements and are routed through the Citicorp Site for outlet into the AMAFCA channel to the west.

Citicorp Report

Referring to the master drainage report for the Citicorp Site, prepared by Bohannan-Huston, Inc., May 1996, areas draining to the site are defined by specific basins, with pick-up points being referenced as AP-1, AP-2 and AP-3, with 138.7 cfs, 31.5 cfs and 19.3 cfs representing the respective existing peak flow rates. Existing drainage from Basins 1, 2, 3, 4 & 4A follow established routes onto San Mateo Blvd, with partial interception achieved either by a sediment trap at AP-1, located at the Pasadena intersection, or by curb inlets, located on the west side of San Mateo. Other inlets at AP-2 and AP-3 are not open to receive flows at present. (See Plate 2 - Existing Conditions - BHI Citicorp Report)

One small basin, referred to as Basin 1 in the BH Citicorp Report, comprised as a part of the Coronado Airport, passes under I-25 to join Basin 2 flows. Its runoff will soon be diverted north into the North Camino Arroyo by the SHD as early as the year 2000, or as late as 2002, resulting in a reduction of flows collected at AP-1. (Information supplied by Gary Shubert - NMSHD ph: 841-2700, Project Control #2683 - Tramway Interchange)

Revised Existing Conditions

In order to determine the specific effect of offsite flows impacting the eastern boundary of the proposed site, the offsite basins were reanalyzed based on COA topographic orthaphoto map (#B-18) and field inspections of the area (See existing basin map in back). Assigning the same basin references, Basin 2's overall acreage was reduced in that the basin doesn't extend all the way to Balboa Rd. as shown on Plate 2 of the Citicorp Report. This basin was further subdivided into a smaller area, represented by Basin 2A, to determine the impact on Lot 2A of the proposed development. Basin #3 was similarly subdivided into a smaller area, represented by Basin 3A, to determine the drainage passing through Lot 31A. The remaining flows from Basin 3 will be routed to AP-3 within the Venice R/W as part of the the infrastructure improvements associated with this development. Basin 4 (which includes Basin 4A from the Citicorp Report) will continue to surface drain across undeveloped property, with flows intercepted by San Mateo Blvd.

Revised Developed Conditions

Following the submittal of the Conceptual Drainage Plan for the SMBP, a meeting was held with the COA to discuss the drainage requirements for this development. In summary, existing flow patterns were to be updated to insure that capacity exists in the interim, and developed flows were to be determined on existing platting reflected by the present zone atlas, B-18-Z. As summarized in the Basin Analysis section, the results indicate changes for both the existing and developed conditions when comparing the information established by the Citicorp Report.

Proposed SS Improvements

A portion of the existing sediment trap at AP-1 will remain to pick up existing flows from Basin 2. The south side of the sediment trap will be filled in for the street construction, leaving the north portion to accept storm runoff from the arroyos. Detained flows will temporary back up to an elevation which will remain essentially within the street R/W (See pond limits drawing). The rip-rap will be left in place on the north side of the pond to minimize disturbing the existing flow conditions. The existing SS inlet stand pipe can be reused and moved north to accommodate the smaller pond area. When future development occurs on the north side of the street, this inlet can either be revised to accept street flows from curb inlets or plugged off. Changes to the SS within the revised pond area associated with this development will include removing the existing elbow, replacing it with a MH and extending the SS east to the SMBP property limits. Curb inlets will be constructed along the south curb to pick up surface discharge from the two developed lots draining to Pasadena Ave.

Basin 3 flows will be picked up by an extension of the SS from AP-2, routed south within San Mateo Blvd. R/W to the Venice R/W, then east along the front of Lots 31A and 32A. Inlets will be constructed along the north curb to pick up surface discharge from the two developed lots draining to Venice Ave.

Existing basin runoff from Basin 4 will continue to sheet flow toward San Mateo Blvd. No extensions of the SS at AP-3 will be done in conjunction with this development, but an inlet will be constructed at AP-3 to open up the 36" dia stub to receive the Basin 3 flows diverted down Venice Ave. and some minor flows from San Mateo Blvd. This will be a temporary connection in that development of Basin 4 would logically extend the SS into that basin or south along San Mateo Blvd. to pick up runoff before flows could concentrate at the intersection of Venice Ave. and San Mateo Blvd.

Developed Conditions

The proposed commercial site, located on 4 acres adjacent to the east side of San Mateo Blvd. NE, between the unimproved streets of Pasadena Ave. and Venice Ave., will be developed into four office/warehouse buildings and associated parking, with access onto Pasadena / Venice Avenues and San Mateo Blvd. Development will require improving one-half of San Mateo Blvd. between Pasadena Ave. and Venice Ave., with concrete curbs and permanent pavement, replacing the temporary pavement in place for the north lane. Additionally, curbs, pavement, water, sanitary sewers and storm sewer (SS) utilities for street improvements of Pasadena and Venice Ave. will be completed adjacent to the site.

Each building site will surface drain to the Pasadena and Venice streets, with flows intercepted by extensions to the San Mateo SS system.

Citicorp Report

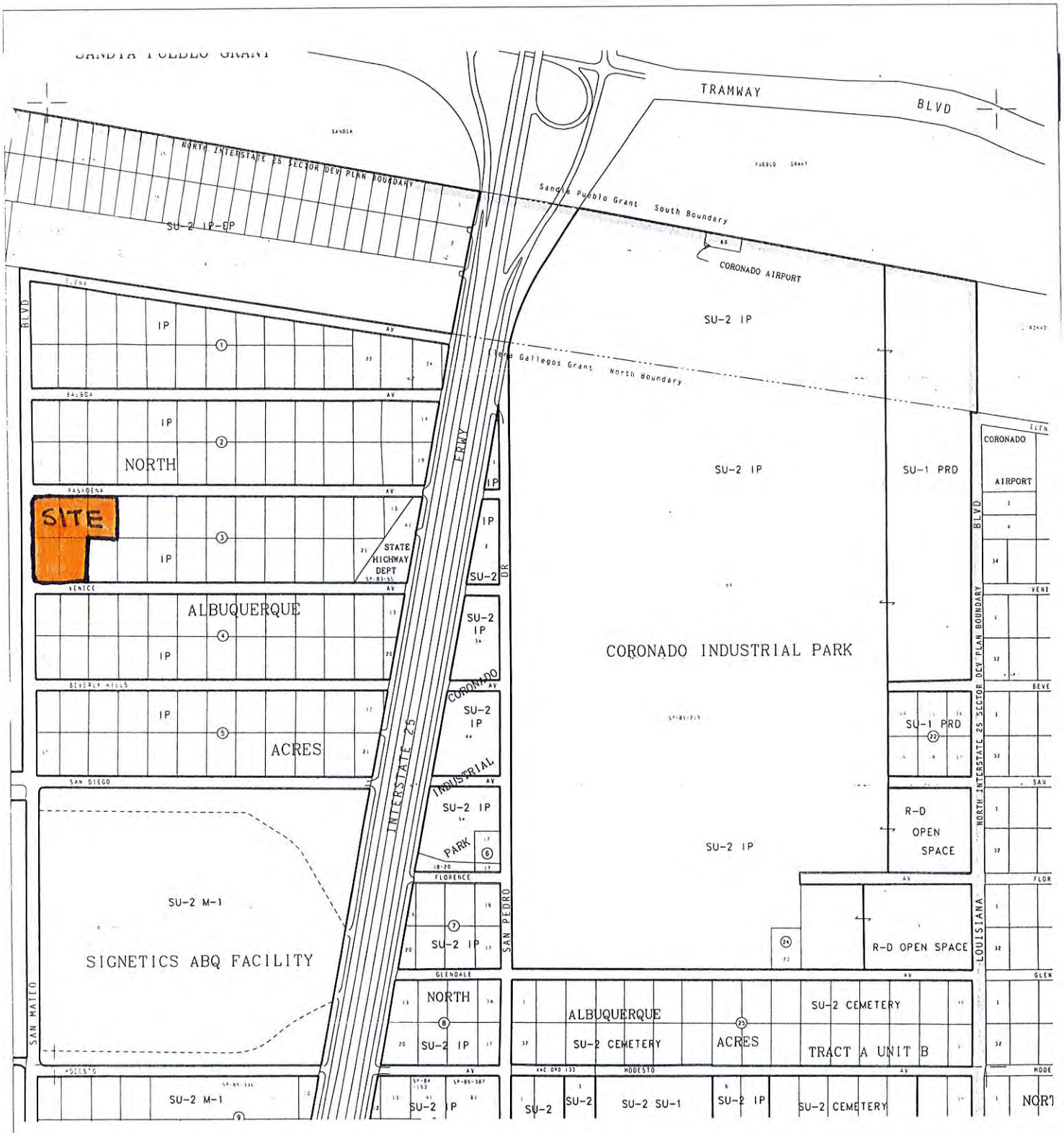
Referencing the master drainage report for the Citicorp Site, May 1996, basins draining to the SS system are defined at pick-up points AP-1, AP-2 and AP-3, with 163.7 cfs, 86 cfs and 126 cfs representing the respective developed peak flow rates. (See Plate 3 - Developed Conditions - BHI Citicorp Report)

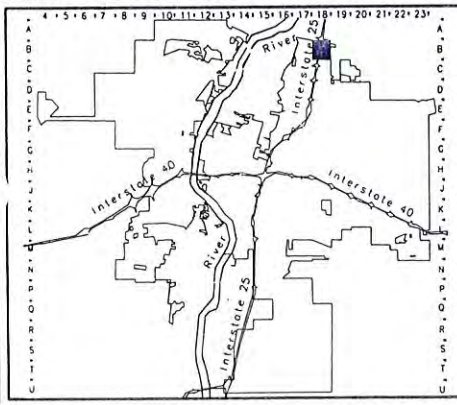
The developed Basin 2 limits indicate that the lots bordering both sides of Pasadena Ave. and the area up to Balboa Ave. will be picked up by a SS extension in Pasadena Ave. at AP-1, for a flow rate of 163.7 cfs from only Basin 2, assuming that Basin 1 has been diverted to the North Camino Arroyo, per the NMSHD comments referenced above.

The developed Basin 3 limits are less traditional in that the basin encompasses both sides of Venice Ave. to within 700 feet of San Mateo, where flows are redirected out of the Venice Ave. R/W to run through Lots 31A & 32A to AP-2, where a 36" stub of the San Mateo SS system would pick up 86 cfs.

The developed Basin #4, encompassing both sides of Beverly Ave., drains through Basin 4A which outlets at the Venice / San Mateo intersection. The routing of the 126 cfs to AP-3 was planned to cross Basin 4A in order to....."eliminate the need for additional inlets and approximately 500 feet of 24" RCP storm drain within San Mateo south of the proposed site". (Page 9 - Citicorp Report)

As-built plans for the SS system (re: COA Project #546991) shows one-diameter size reduction of some of the SS mains, when compared to information provided in the original Citicorp Report. Reanalyzing the COA as-built information, it was found that the SS reach picking up Basins 1, 2, 3, 4 & 4A has capacity for accepting the projected developed flows established by the BHI Citicorp Report. (See SS Summary - Existing System)





North

750 375 0 750

Scale: 1" = 750'

Albuquerque Geographic Information System

City of Albuquerque

LEGAL DESCRIPTION

T11N

R3E

SEC 12

UNIFORM PROPERTY CODE

1-018-065

B-18-Z

Sediment Pond @ Pasadena
looking West

Existing Stand Pipe
Inlet

Existing Sediment
Pond - looking East

San Mateo - looking South
from Pasadena Ave.

Pond Outlet

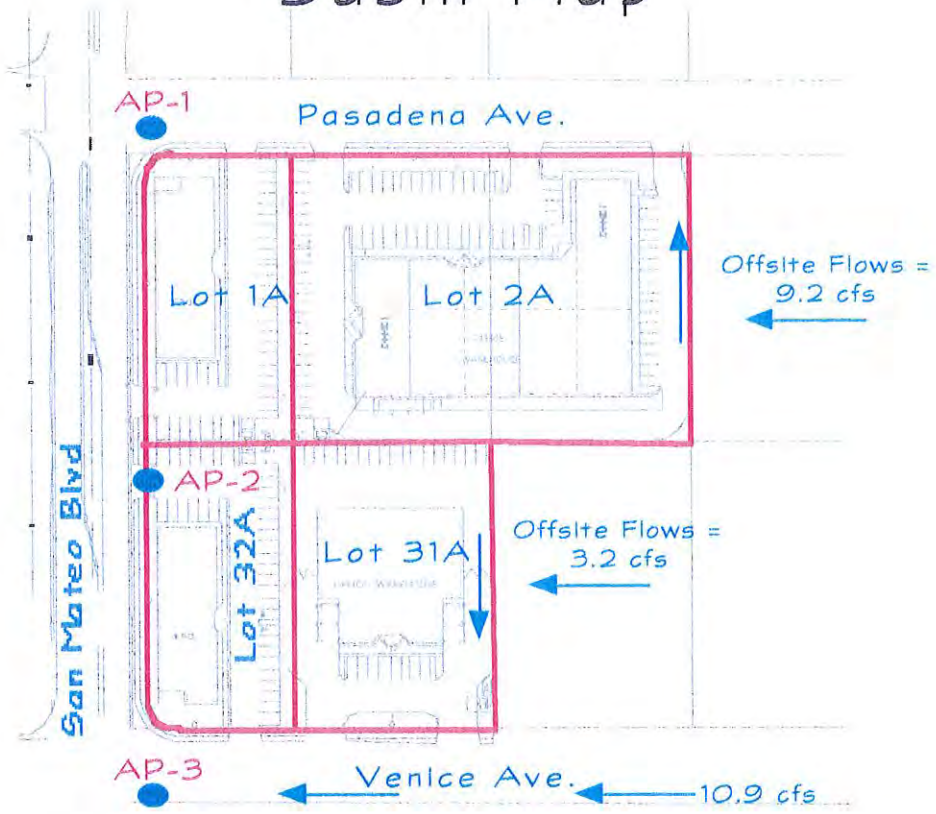
Citicorp @ Pasadena / San
Mateo Intersection

Basin Analysis

The following calculations reflect:

- The overall SMBP site flows - historic and developed;
- The individual lot flows, with path of dischorge and collection point;
- The developed flow rates based on the existing NAA platting for the areas adjoining Pasadena, Venice and Beverly Hills Avenues;
- A comparison of the Citicorp Report and this submittal of the existing and developed flows at AP-1, 2 & 3;
- And narrative of the basins draining to the analysis points and inlet capacities to intercept flows from the SMBP development.

Basin Map



Internal Drainage Basins

Referencing the above basin map, it can be seen that the site is divided into four sub-basins, defined by the individual lot lines. Internal flows from Lots 1A, 2A,& 31A will drain to adjoining streets for capture by inlets located at curb returns of either Pasadena or Venice Avenues. Internal flows from Lot 32A will drain to an inlet located within the lot near AP-2.

Adjacent Drainage Basins

The offsite Basin 2A impacting the Pasadena lots can generate a peak flow of 9.2 cfs. These flows will be intercepted by a private SS line situated within Lot 2A along the east site property line, with an inflow pipe positioned at the flow line of the arroyo to act as an inlet to receive these flows. This offsite flow will be routed to the new SS main in Pasadena Ave. When development of adjoining areas to the east is completed, these flows will surface drain onto Pasadena Ave. for each respective site, eliminating the need for the private SS line.

By diverting flows down the Venice R/W, the overall offsite basin impacting the Venice lots can be reduced to a smaller area, Basin 3A, with a flow of 3.2 cfs crossing the east side of Lot 31A, which can be routed through the site to drain to Venice Ave. The remaining portion of basin 3 flows of 10.9 cfs can be diverted west within the Venice St. R/W to an inlet connected to the existing SS system at AP-3.

CALCULATIONS:

Calculations are based on the Drainage Design Criteria for City of Albuquerque Section 22.2, DPM, Vol 2, dated Jan., 1993

SAN MATEO BUSINESS PARK

AREA OF SITE 171768 SF = 3.9433 Ac.

HISTORIC FLOWS:

On-Site Historic Land Condition

Area a	=	0	SF
Area b	=	171833	SF
Area c	=	0	SF
Area d	=	0	SF
Total Area	=	171833	SF

DEVELOPED FLOWS:

On-Site Developed Land Condition

Area a	=	0	SF
Area b	=	34367	SF
Area c	=	0	SF
Area d	=	137466	SF
Total Area	=	171833	SF

EXCESS PRECIPITATION:

Precip. Zone 3

Ea = 0.66
Eb = 0.92
Ec = 1.29
Ed = 2.36

On-Site Weighted Excess Precipitation (100-Year, 6-Hour Storm)

Weighted E = $\frac{EaAa + EbAb + EcAc + EdAd}{Aa + Ab + Ac + Ad}$

Historic E	=	0.92	in.	Developed E	=	2.07	in.

On-Site Volume of Runoff: V360 = E*A / 12

Historic V360	=	13174	CF	Developed V360	=	29670	CF

On-Site Peak Discharge Rate: Qp = QpaAa+QpbAb+QpcAc+QpdAd / 43,560

For Precipitation Zone 3

Qpa	=	1.87	Qpc	=	3.45
Qbb	=	2.60	Qpd	=	5.02

Historic Qp	=	10.3	CFS	Developed Qp	=	17.9	CFS

The on-site area storm runoff will increase from 10 cfs to 18 cfs, with a resulting volume increase of 16,500 cf. The present flow path from the area drains to San Mateo Blvd, with some flows intercepted at the sediment trap/SS inlet at the Pasadena intersection. Other flows are partially collected by existing inlets located on the west side of the San Mateo. After development, all site flows will be intercepted by extensions to the San Mateo SS system within Pasadena and Venice Ave., removing flows from entering the traffic patterns of San Mateo Blvd.

LOT 32A

Area of sub-basin flows = 28370 SF = 0.7 Ac.

The following calculations are based on Treatment areas as shown in table to the right

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 2.07 in.

Sub-basin Volume of Runoff (see formula above)

V360 = 4899 CF

Sub-basin Peak Discharge Rate: (see formula above)

Qp = 3.0 cfs

TREATMENT	
A =	0%
B =	20%
C =	0%
D =	80%

Drainage from this lot will collect at an inlet situated near AP-2 on the west side of the lot. See inlet information and calcs below.

NDS 18" x 18" SQUARE STEEL GRATE (PART NO. 1815) CAPACITY CALCULATIONS

Using the orifice equation Q=CA * (2gh)^0.5

C	=	0.6
A	=	2.02
g	=	32.2
h	=	0.5
Q	=	6.88

Note: Area (A) at left, is based on the open area of a single NDS 18" x 18" Galvanized steel square grate (part no. 1815). Based on calculations shown, a single inlet with a head of 0.5' will accept 6.88 cfs. If the inlet becomes 50% clogged, at an h = 0.5', the inlet will accept 3.44 cfs. Total flow from Lot 32A will be 3 cfs, intercepted by one inlet - OK.

LOT 31A

Area of sub-basin flows = 38604 SF = 0.9 Ac.

The following calculations are based on Treatment areas as shown in table to the right

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 2.07 in.

Sub-basin Volume of Runoff (see formula above)

V360 = 6666 CF

Sub-basin Peak Discharge Rate: (see formula above)

Qp = 4.0 cfs

TREATMENT	
A =	0%
B =	20%
C =	0%
D =	80%

Drainage from this lot will outlet onto Venice Ave and be collected at an inlet at the intersection curb return. See inlet information below.

LOT 1A

Area of sub-basin flows = 28370 SF = 0.7 Ac.

The following calculations are based on Treatment areas as shown in table to the right

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 2.07 in.

Sub-basin Volume of Runoff (see formula above)

V360 = 4899 CF

Sub-basin Peak Discharge Rate: (see formula above)

Qp = 3.0 cfs

TREATMENT	
A =	0%
B =	20%
C =	0%
D =	80%

Drainage from this lot will outlet onto Pasadena Ave and be collected at an inlet at the intersection curb return. See inlet information below.

LOT 2A

Area of sub-basin flows = 76424 SF = Ac.

The following calculations are based on Treatment areas as shown in table to the right

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 2.07 in.

Sub-basin Volume of Runoff (see formula above)

V360 = 13196 CF

Sub-basin Peak Discharge Rate: (see formula above)

Qp = 8.0 cfs

TREATMENT	
A =	0%
B =	20%
C =	0%
D =	80%

Drainage from this lot will outlet onto Pasadena Ave and be collected at an inlet at the intersection curb return.

SMBP FLOW SUMMARY

SUB-BASIN		DISCHARGE		DESCRIPTION
Developed Discharge Rate-Sub-Basin 32A	=	3.0	cfs	Drainage to on-site inlet
Developed Discharge Rate-Sub-Basin 31A	=	4.0	cfs	Drainage to Venice Ave
Developed Discharge Rate-Sub-Basin 1A	=	3.0	cfs	Drainage to Pasadena Ave.
Developed Discharge Rate-Sub-Basin 2A	=	8.0	cfs	Drainage to Pasadena Ave.

FUTURE UPSTREAM DEVELOPED

PASADENA AVE.

Area of sub-basin flows = 1166000 SF = 26.8 Ac.

The following calculations are based on Treatment areas as shown in table to the right

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 2.07 in.

Sub-basin Volume of Runoff (see formula above)

V360 = 201329 CF

Sub-basin Peak Discharge Rate: (see formula above)

Qp = 121.4 cfs

TREATMENT	
A =	0%
B =	20%
C =	0%
D =	80%

Drainage will outlet onto Pasadena Ave. and be collected by a storm sewer extension from AP-1

VENICE AVE.

Area of sub-basin flows = 1113000 SF = 25.6 Ac.

The following calculations are based on Treatment areas as shown in table to the right

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 2.07 in.

Sub-basin Volume of Runoff (see formula above)

V360 = 192178 CF

Sub-basin Peak Discharge Rate: (see formula above)

Qp = 115.9 cfs

TREATMENT	
A =	0%
B =	20%
C =	0%
D =	80%

Drainage will outlet onto Venice Ave. and be collected by a storm sewer extension from AP-2

BEVERLY HILLS AVE.

Area of sub-basin flows = 1060000 SF = 24.3 Ac.

The following calculations are based on Treatment areas as shown in table to the right

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 2.07 in.

Sub-basin Volume of Runoff (see formula above)

V360 = 183027 CF

Sub-basin Peak Discharge Rate: (see formula above)

Qp = 110.4 cfs

TREATMENT	
A =	0%
B =	20%
C =	0%
D =	80%

Drainage will outlet onto Beverly Hills Ave. and be collected by a storm sewer extension from AP-3

EXISTING / DEVELOPED AP-1, AP-2, AP-3 SUMMARY					
Citicorp Report	Area	cfs/ac	Existing	Developed	Comments
AP-1	69.23 ac	2.002	138.7 cfs		Represents Basins 1 & 2 existing flows
	59.5 / 40 ac			205.4 / 163.7 cfs	Represents Basins 1 & 2 / Basin 2 deveolped flows
AP-2	19.58 ac	1.607	31.5 cfs		Represents Basin 3 existing flows
	21.06 ac			86.1 cfs	Represents Basin 3 developed flows
AP-3	12.02 ac	1.607	19.3 cfs		Represents Basins 4 existing flows
	30.91 ac			126.2 cfs	Represents Basins 4 & 4A developed flows
SMBP Report	Area	cfs/ac	Existing	Developed	Comments
AP-1	52 ac	2.002	104.1 cfs		Represents Basins 1 & 2 existing flows
	6.2 ac	1.486	9.2 cfs		Represents Basins 2A existing flows
	26.8 ac			121.4 cfs	Represents future development both sides of Pasadena Ave.
AP-2	6.8 ac	1.607	10.9 cfs		Represents Basin 3 existing flows
	2 ac	1.607	3.2 cfs		Represents Basin 3A existing flows
	25.6 ac			115.9 cfs	Represents future development both sides of Venice Ave.
AP-3	20.1 ac	1.607	32.3 cfs		Represents Basin 4 existing flows
	24.3 ac			110.4 cfs	Represents future development both sides of Bererly Hills Ave.

Design Criteria:

Based on a design review meeting with the COA Hydrology Dept. following the submittal of the Conceptual Grading Plan, the following design criteria for the SS system was established:

- Existing basin limits were analyzed based on topographical orthophoto maps and field inspections. Existing flow conditions affecting the site and the SS system were checked and adjustments made to account for the undeveloped flows and patterns for the interim period. The cfs/acre rates established by the Citicorp Report were used to determine the existing flow rates for the adjusted areas.
- The ultimate flow conditions were designed for the developed conditions dictated by the existing North Albuquerque Acres platting. Developed flow rates were established from a comparable density to the SMBP development.

Basin flows comparisons @ AP-1, AP-2 & AP-3:

Existing conditions - (assuming Basin 1 continues to drain into Basin 2) is189.5 cfs (Citicorp report) vs. 159.7 cfs (SMBP Report);
Developed conditions - (assuming Basin 1 is diverted to the North Camino Arroyo, due to the projected schedule of improvements by the SHD) is 376 cfs (Citicorp Report) vs. 347.4 cfs (SMBP Report). The reduction in total flows for both the existing and proposed conditions is the result of shifts in basin boundaries from the original report. Notice changes in the distribution of flows for the developed conditions. At AP-1 there is a reduction of 42 cfs. At AP-2 there is an increase of 30 cfs. At AP-3 there is a reduction of 16 cfs.

SS data - SMBP & Future:

Developed SMBP Site & existing basins:
At AP-1 - 104.1 cfs *existing* basin flow enters the sediment pond, 11 cfs *developed* flows from the SMBP Lots 1A & 2A enters new curb inlets on south side of Pasadena Ave., and 9.2 cfs *existing* basin flow picked up on the east side of Lot 2A into a private SS connected to the Pasadena Ave. SS.
At AP-2 - 3 cfs *developed* flows from Lot 32A into new inlet adjacent to Sam Mateo Blvd., 4 cfs *developed* flows from Lot 31A enters new curb return on north side of Venice Ave., and 3.2 cfs *existing* flow enters drainage path of flows from Lot 32A onto Venice Ave., and then picked up at Venice inlet.
Developed Basins draining to Pasadena & Venice Ave.:
At AP-1 - For a total of 121.4 cfs *developed* flows, distributed equally over the length of Pasadena Ave., with 15 cfs picked up each side of the street every 550 ft by a combination Type A inlet, followed by two Double C's connected in series. The physical separation of the inlets is a minimum of 30' to allow street flows to return to the curb for interception by the inlets. The Type A inlet will be connected directly to the SS main at a MH, with the two double C's connected in series outletting into a second MH. This inlet spacing establishes a general design criteria. Actual inlet positions will be dictated by the individual driveway locations of each future developed lot.
At AP-2 - a total of 115.9 cfs *developed* flows, distributed equally over the length of Pasadena Ave., with 14.5 cfs picked up each side of the street every 525 ft by a combination Type A inlet, followed by two Double C's connected in series. The physical separation of the inlets is referenced above.

Inlet Criteria for SMBP

Per COA criteria, a Type A inlet should be used upstream in conjunction with Type C basins to minimize clogging. However, no additional interception capacity is credited for the use of a Type A grate, other than for the extended curb opening area beyond the grate limits. Using the Broad-crested weir Eq. (Q=CLH3/2, where c = 3 & curb opening length = 3'-6"), for a depth of flow of 0.45' - Pasadena Ave. (Street capacity - Plate 22.3 D-3, DPM) max. Q of 15 cfs for one half of the street at the inlet, Q = 3 cfs for the extended curb opening of the Type A inlet; for a depth of flow of 0.48' - Venice Ave., max. Q of 14.5 cfs for one half of the street at the inlet, Q = 3.5 cfs for the extended curb opening of the Type A inlet.

Inlet capacity for a type Double C combination curb/grate, based on the COA design criteria (Plate 22.3 D-6, DPM) will accept 9 cfs for the Pasadena Ave. grade of 2.5% at a flow depth of 0.45' above the normal gutter grade.
Total inlet capacity for ***Pasadena Ave.*** at the curb return Double C = 9 cfs, at the Type A = 3 cfs, for a total of 12 cfs > than 11 cfs generated - OK.

Inlet capacity for a type Double C combination curb/grate will accept 8.5 cfs for the Venice Ave. grade of 1.8% and a flow depth of 0.48' above the normal gutter grade.
Total inlet capacity for ***Venice Ave.*** at the curb return Double C = 8.5 cfs, at the Type A = 3.5 cfs, for a total of 12 cfs > than 7.2 cfs generated - OK.

SS Analysis

The following calculations reflect:

- The SS extensions adjacent to the San Mateo Business Park to handle the developed site flows and the existing offsite basins
- The SS extensions for future development of the areas adjacent to Pasadena and Venice Avenues, based on existing NAA plotting;
- Pond data for the reduced sediment trap at Pasadena Ave. and San Mateo Blvd.
- Swale data for the offsite Basin 3 flows contained within the south half of Venice Ave.

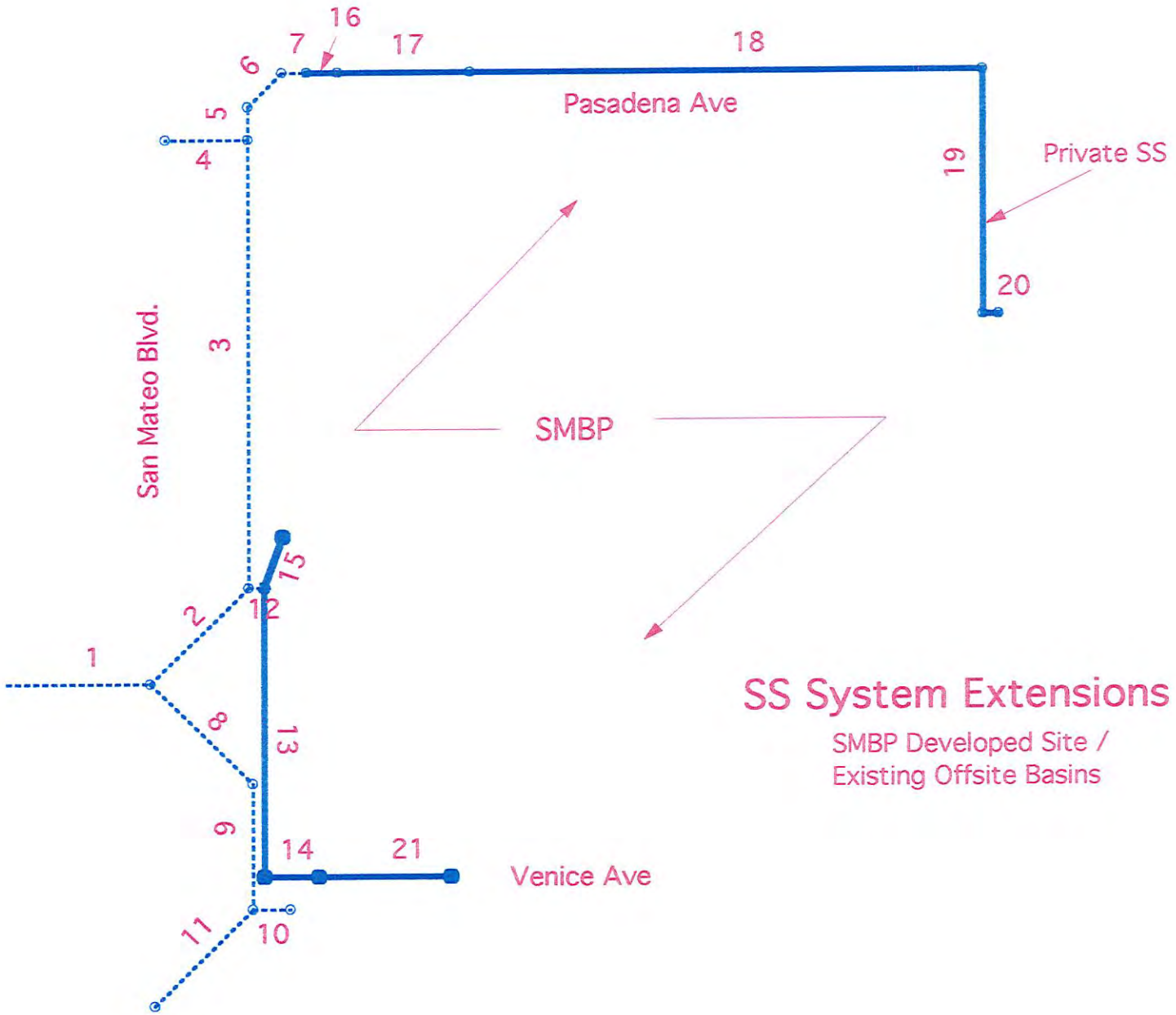
The following is the infrastructure list of SS improvements to be completed as part of the SMBP development:

Pasadena Ave.

- As part of the pavement improvements for the south half of Pasadena Ave., remove existing sediment trap inlet stand pipe and move to north side of pond. Replace existing pond elbow with new MH to serve as a junction for the new 42" dia SS pipe to the east;
- Continue the 42" dia SS pipe to the east property line of the SMBP and cap;
- Extend a private 15" dia south into Lot 2A from the Pasadena Ave. SS to pick up flows from Offsite Basin 2A;
- Construct a Type Double C inlet at the south curb return of the Pasadena Ave. intersection, and a Type A at the next south curb return between driveways of Lot 1A and 2A to pick up flows from these two lots;
- Construct a Type A inlet at the south curb return of the San Matea Blvd. / Pasadena Ave. intersection to pick up minor flows from San Mateo Blvd.

Venice Ave.

- Remove the existing 36" dia 10' stub of SS at AP-2 and replace with a 42" dia pipe. Continue SS south within the San Mateo Blvd. R/W to the Venice R/W and then east to the property line of the SMBP and cap;
- Construct a Type Double C inlet at the north curb return of the Venice Ave. intersection, and a Type A at the next north curb return between driveways of Lot 31A and 32A to pick up flows from these two lots;
- Construct a Type Double D inlet at the end of the existing AP-3 stub to receive minar flows from San Mateo Blvd. and the diversion swale constructed along the south side of Venice Ave.



SS System Extensions

SMBP Developed Site /
Existing Offsite Basins

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	66W	157.0	66 c	92.0	5117.61	5120.84	3.511	5123.11	5124.25	0.18	End
2	NE 66	136.3	66 c	89.5	5120.84	5122.33	1.665	5126.34	5126.07	1.51	1
3	N 54	126.1	54 c	293.6	5123.33	5127.88	1.550	5127.83	5131.10	2.90	2
4	W Lateral	1.80	18 c	53.0	5130.88	5132.90	3.811	5134.00	5134.01	0.00	3
5	N 48	124.3	48 c	21.3	5128.38	5128.74	1.692	5134.00*	5134.16*	0.03	3
6	N 48 Bend	124.3	48 c	31.1	5128.74	5129.26	1.671	5134.19*	5134.42*	0.09	5
7	Pasadena E Ext	124.3	48 c	16.0	5129.26	5129.53	1.688	5134.51*	5134.64*	0.50	6
8	SE 36	20.70	36 c	92.9	5123.34	5128.43	5.479	5126.34	5129.88	0.00	1
9	S 36	20.70	36 c	82.3	5128.43	5133.00	5.553	5131.43	5134.45	0.13	8
10	AP-3	15.80	36 c	24.0	5133.00	5134.00	4.167	5136.00	5135.93	0.06	9
11	SW Lateral	4.90	18 c	89.3	5134.50	5136.06	1.747	5136.00	5136.90	0.00	9
12	42 Stub AP2	10.20	42 c	10.0	5131.80	5132.00	2.002	5135.30	5135.30	0.00	2
13	S 42 AP2	7.20	42 c	190.0	5132.00	5133.90	1.000	5135.50	5135.49	0.01	12
14	Venice Double C	7.20	42 c	35.0	5133.90	5134.53	1.800	5137.40	5137.40	0.00	13
15	Lot 32A	3.00	18 c	35.0	5135.00	5135.70	2.001	5136.50	5136.43	0.03	12
16	Pasadena Double C	20.20	42 c	20.0	5129.53	5130.00	2.351	5135.14*	5135.15*	0.00	7
17	Pasadena Type A	12.20	42 c	85.0	5130.00	5132.36	2.776	5135.15	5135.16	0.00	16
18	Pasadena 1	9.20	42 c	330.0	5132.36	5141.53	2.779	5135.86	5142.46	0.02	17
19	Lot 2A Private SS	9.20	15 c	160.0	5141.53	5143.13	1.000	5142.78*	5146.03*	0.22	18
20	Lot 2A Inlet	9.20	24 c	10.0	5143.13	5144.50	13.701	5146.25	5146.24	0.04	19
21	Venice Type A	3.50	42 c	85.0	5134.53	5136.61	2.447	5138.03	5138.02	0.00	14

Project File: SMBP - Exist.stm	I-D-F File: SMBP.IDF	Total No. Lines: 21	Run Date: 09-21-1999

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

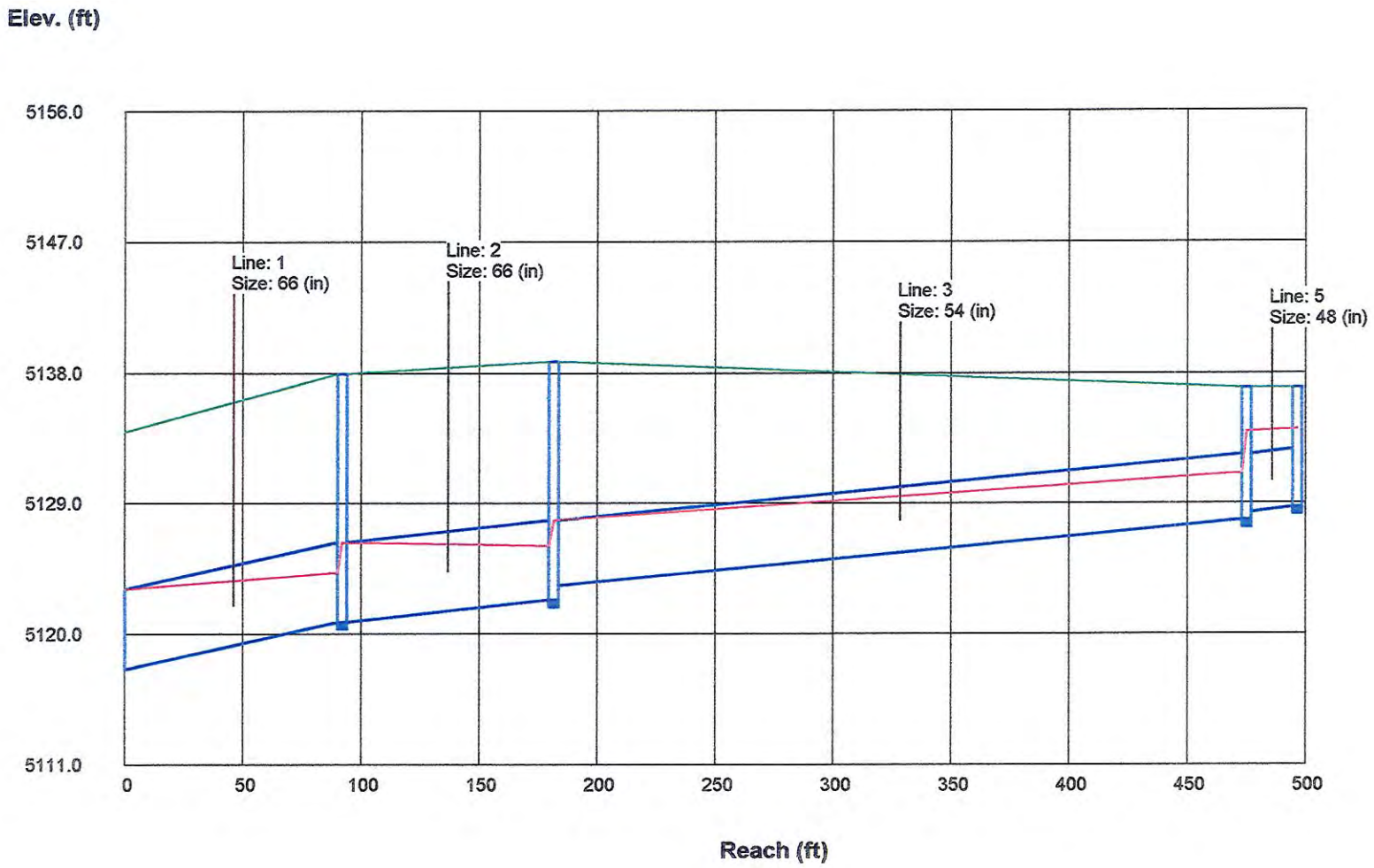
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	92.0	0.00	0.00	0.00	0.00	0.00	0.0	5.9	0.0	157.0	629.3	8.38	66	3.51	5120.84	5117.61	5124.25	5123.11	5134.00	5138.00	66W
2	1	89.5	0.00	0.00	0.00	0.00	0.00	0.0	5.4	0.0	136.3	433.4	6.84	66	1.67	5122.33	5120.84	5126.07	5126.34	5138.00	5138.80	NE 66
3	2	293.6	0.00	0.00	0.00	0.00	0.00	0.0	3.7	0.0	126.1	244.8	9.14	54	1.55	5127.88	5123.33	5131.10	5127.83	5138.80	5137.00	N 54
4	3	53.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.80	20.50	1.15	18	3.81	5132.90	5130.88	5134.01	5134.00	5137.00	5137.00	W Lateral
5	3	21.3	0.00	0.00	0.00	0.00	0.00	0.0	3.6	0.0	124.3	186.8	9.89	48	1.69	5128.74	5128.38	5134.16	5134.00	5137.00	5137.00	N 48
6	5	31.1	0.00	0.00	0.00	0.00	0.00	0.0	3.5	0.0	124.3	185.7	9.89	48	1.67	5129.26	5128.74	5134.42	5134.19	5137.00	5137.00	N 48 Bend
7	6	16.0	0.00	0.00	0.00	0.00	0.00	0.0	3.4	0.0	124.3	186.6	9.89	48	1.69	5129.53	5129.26	5134.64	5134.51	5137.00	5138.00	Pasadena E E
8	1	92.9	0.00	0.00	0.00	0.00	0.00	0.0	1.0	0.0	20.70	156.1	4.52	36	5.48	5128.43	5123.34	5129.88	5126.34	5138.00	5139.50	SE 36
9	8	82.3	0.00	0.00	0.00	0.00	0.00	0.0	0.5	0.0	20.70	157.2	4.52	36	5.55	5133.00	5128.43	5134.45	5131.43	5139.50	5142.00	S 36
10	9	24.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	15.80	136.1	2.76	36	4.17	5134.00	5133.00	5135.93	5136.00	5142.00	5143.00	AP-3
11	9	89.3	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.90	13.88	3.78	18	1.75	5136.06	5134.50	5136.90	5136.00	5142.00	5143.50	SW Lateral
12	2	10.0	0.00	0.00	0.00	0.00	0.00	0.0	1.7	0.0	10.20	142.4	1.07	42	2.00	5132.00	5131.80	5135.30	5135.30	5138.80	5139.00	42 Stub AP2
13	12	190.0	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	7.20	100.6	1.22	42	1.00	5133.90	5132.00	5135.49	5135.50	5139.00	5140.20	S 42 AP2
14	13	35.0	0.00	0.00	0.00	0.00	0.00	0.0	0.5	0.0	7.20	135.0	0.80	42	1.80	5134.53	5133.90	5137.40	5137.40	5140.20	5140.80	Venice Doubl
15	12	35.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.00	14.85	2.61	18	2.00	5135.70	5135.00	5136.43	5136.50	5139.00	5139.30	Lot 32A
16	7	20.0	0.00	0.00	0.00	0.00	0.00	0.0	3.3	0.0	20.20	154.3	2.10	42	2.35	5130.00	5129.53	5135.15	5135.14	5138.00	5137.50	Pasadena Dou
17	16	85.0	0.00	0.00	0.00	0.00	0.00	0.0	2.8	0.0	12.20	167.6	1.37	42	2.78	5132.36	5130.00	5135.16	5135.15	5137.50	5139.60	Pasadena Typ
18	17	330.0	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	9.20	167.7	2.73	42	2.78	5141.53	5132.36	5142.46	5135.86	5139.60	5148.00	Pasadena 1
19	18	160.0	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	9.20	6.46	7.50	15	1.00	5143.13	5141.53	5146.03	5142.78	5148.00	5149.30	Lot 2A Priva
20	19	10.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	9.20	83.72	3.05	24	13.70	5144.50	5143.13	5146.24	5146.25	5149.30	5150.00	Lot 2A Inlet
21	14	85.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.50	157.4	0.67	42	2.45	5136.61	5134.53	5138.02	5138.03	5140.80	5142.50	Venice Type

Project File: SMBP - Exist.stm | I-D-F File: SMBP.IDF | Total number of lines: 21 | Run Date: 09-21-1999

NOTES: Intensity = 0.00 / (Tc + 0.00) ^ 0.00; Return period = 100 Yrs. ; Initial tailwater elevation = 5123.11 (ft)

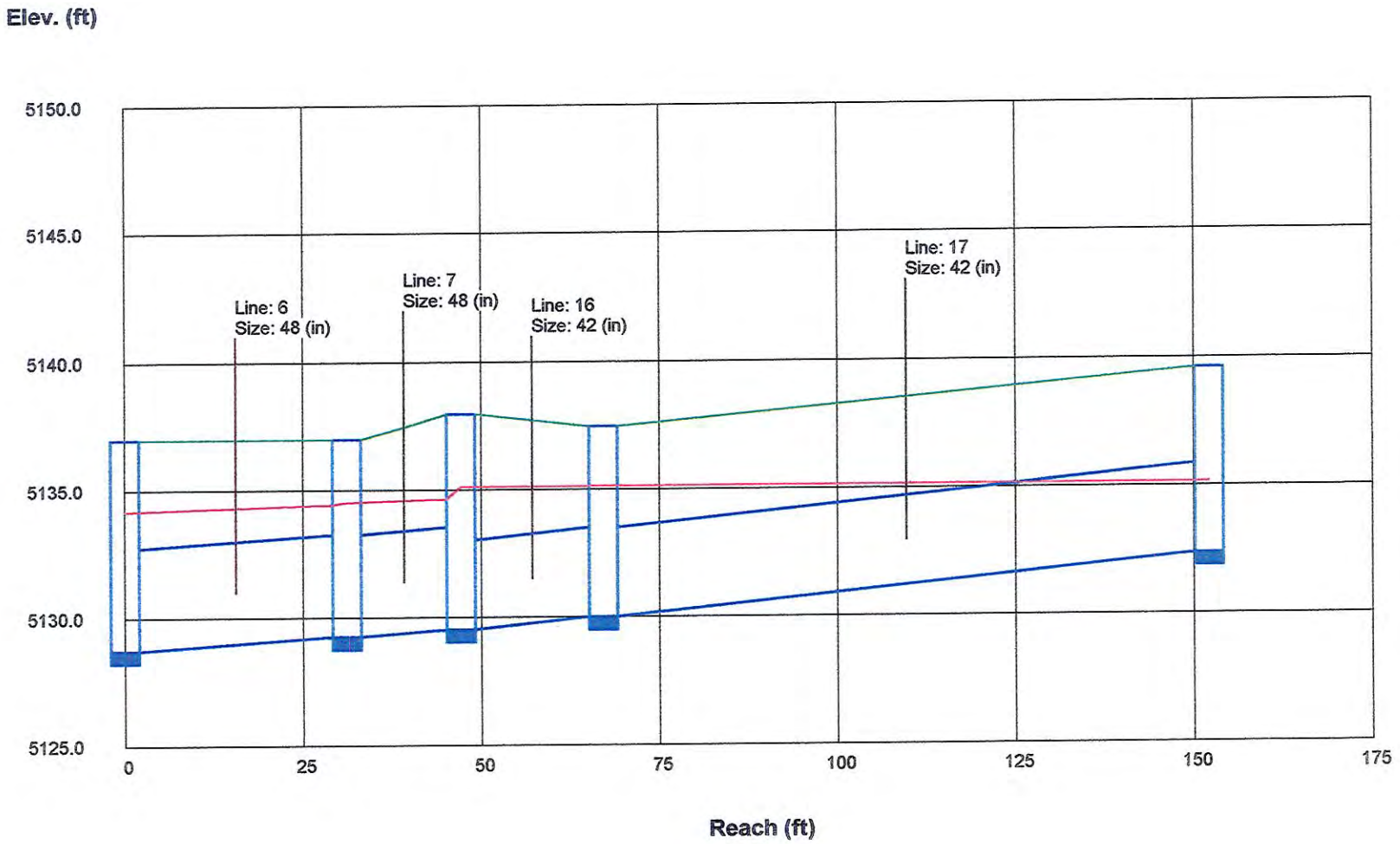
Storm Sewer Profile

Proj. file: SMBP - Exist.stm



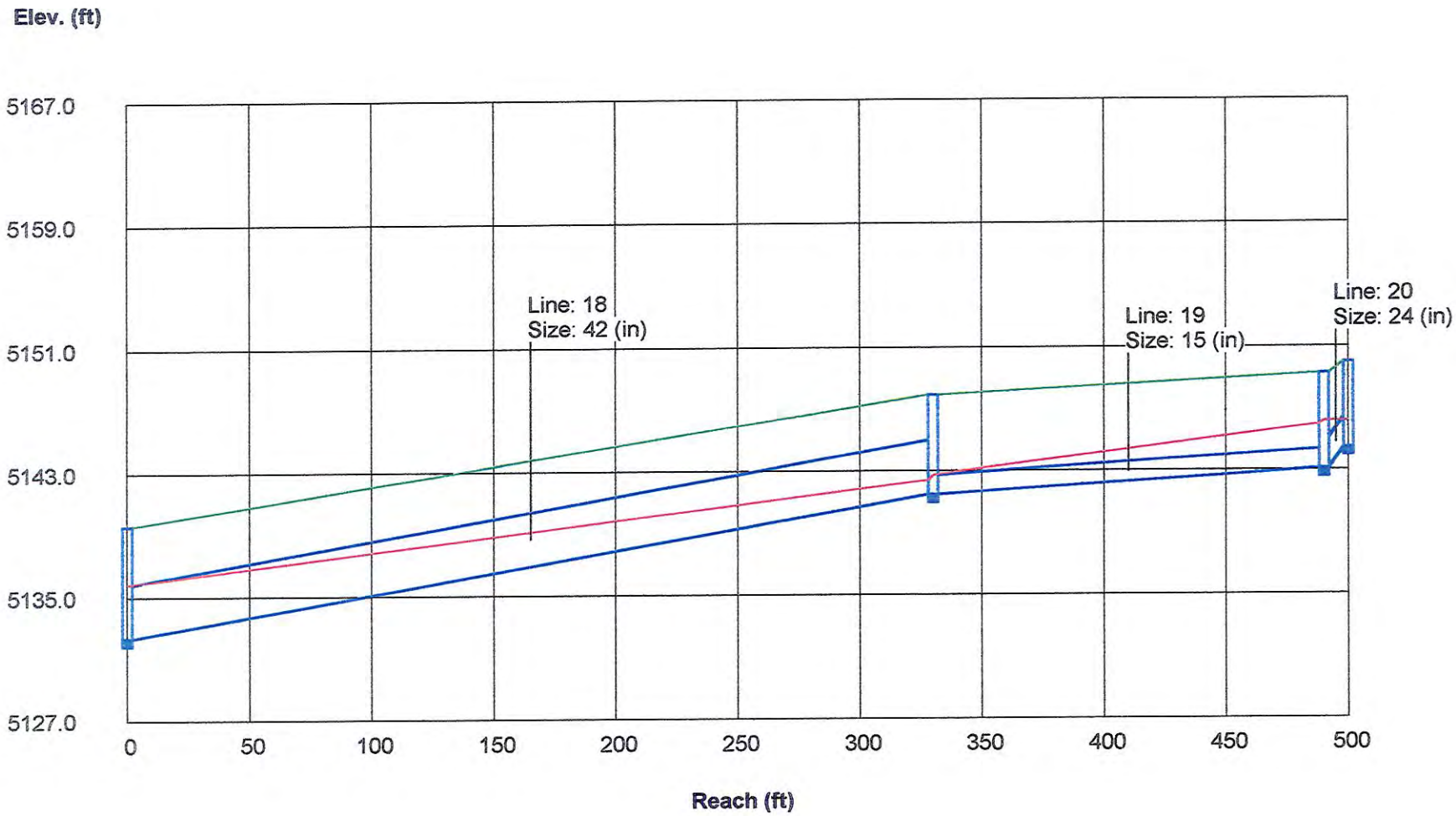
Storm Sewer Profile

Proj. file: SMBP - Exist.stm



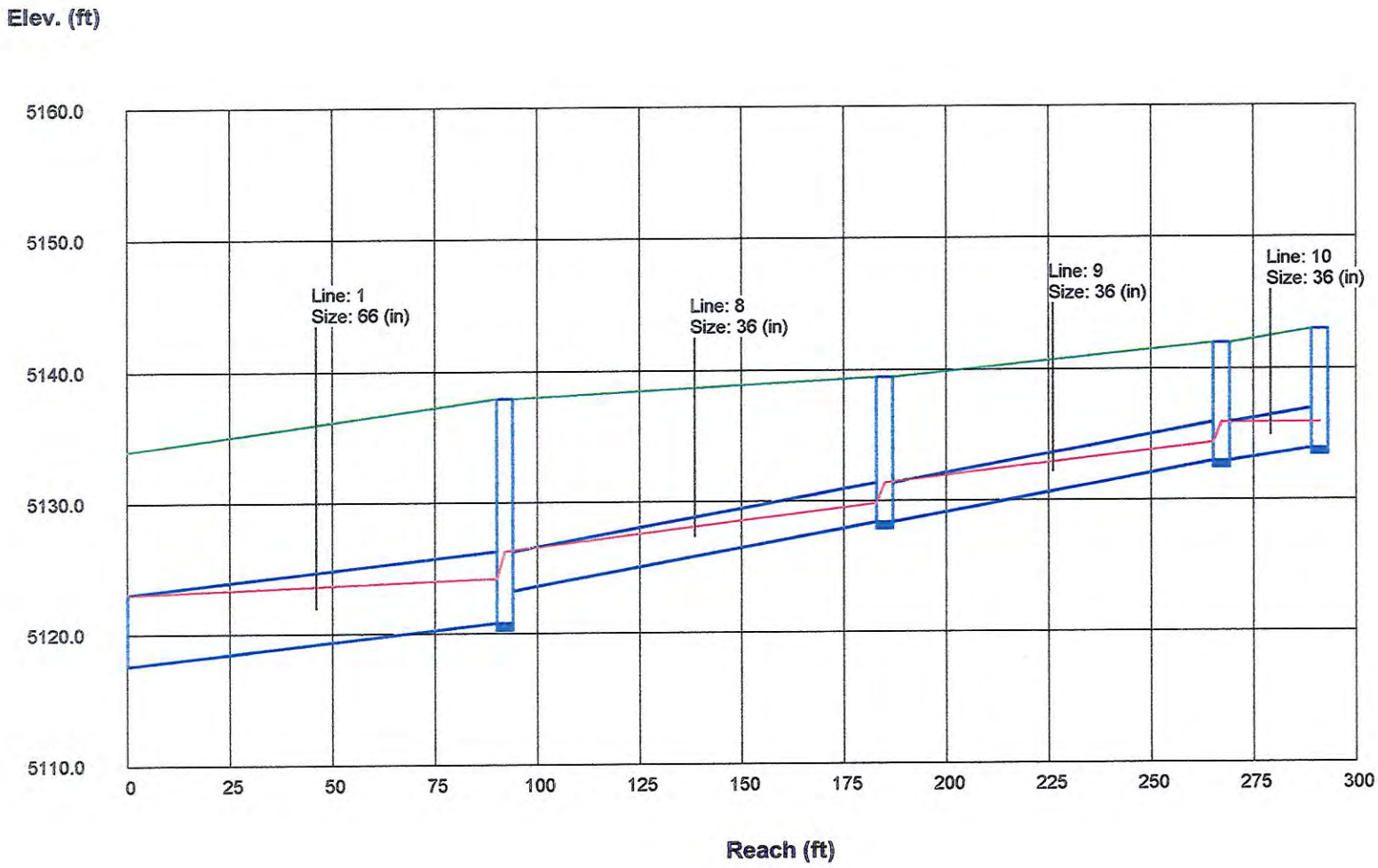
Storm Sewer Profile

Proj. file: SMBP - Exist.stm



Storm Sewer Profile

Proj. file: SMBP - Exist.stm



Storm Sewer Profile

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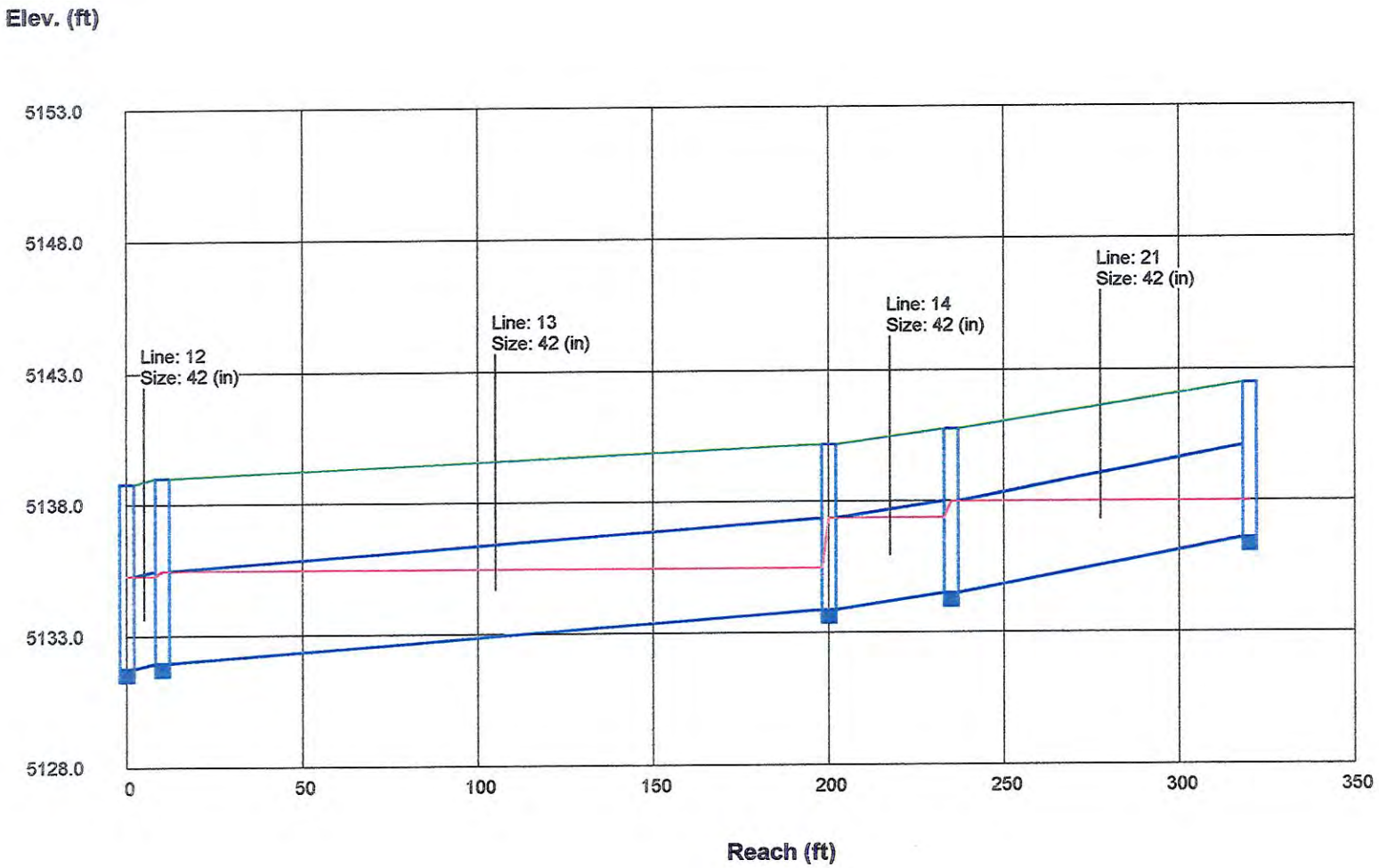
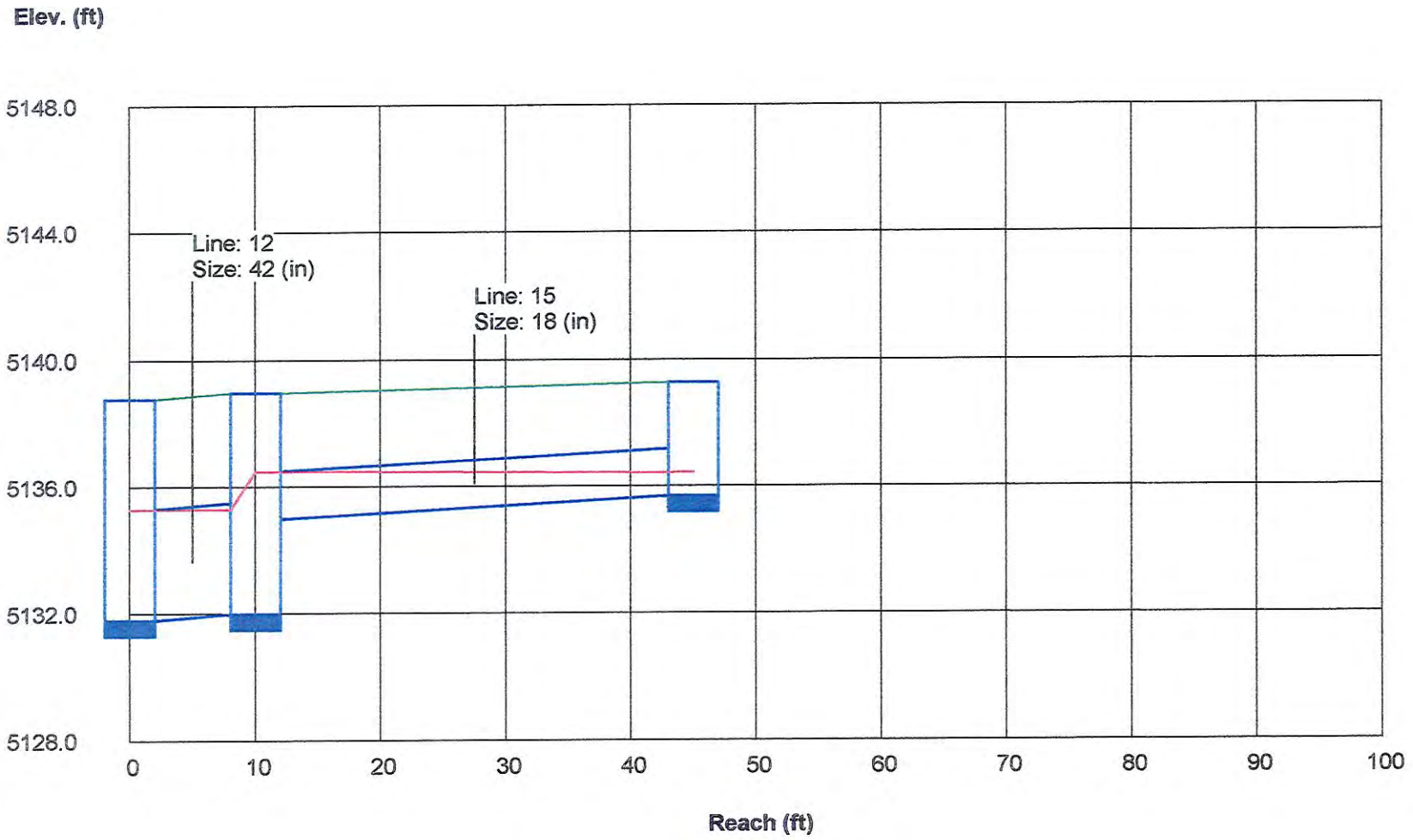
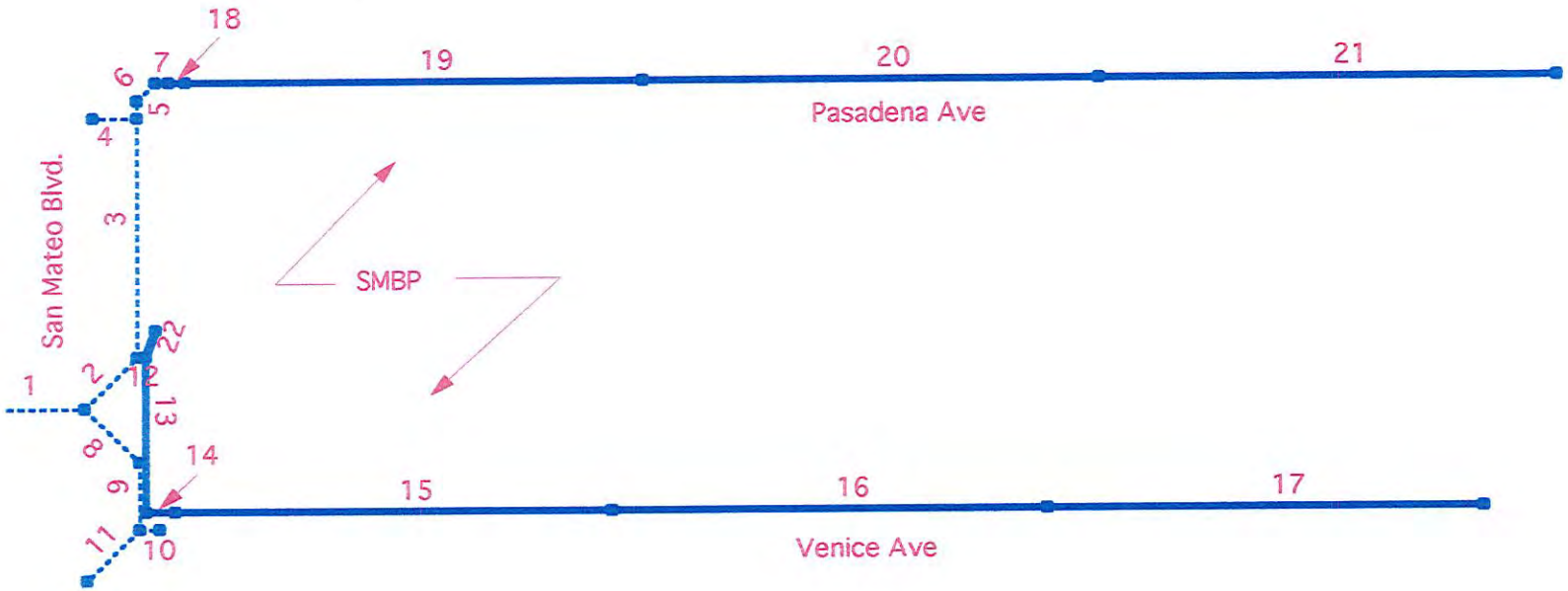


Storm Sewer Profile

Proj. file: SMBP - Exist.stm





SS System Extensions

Developed Conditions based on
NAA Platting

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	66W	356.1	66 c	92.0	5117.61	5120.84	3.511	5123.11	5125.90	0.42	End
2	NE 66	240.8	66 c	89.5	5120.84	5122.33	1.865	5126.34	5126.56	3.82	1
3	N 54	121.8	54 c	293.6	5123.33	5127.88	1.550	5130.17	5131.05	2.81	2
4	W Lateral	1.80	18 c	53.0	5130.88	5132.90	3.811	5133.85	5133.85	0.00	3
5	N 48	120.0	48 c	21.3	5128.38	5128.74	1.692	5133.85*	5134.00*	0.03	3
6	N 48 Bend	120.0	48 c	31.1	5128.74	5129.26	1.671	5134.03*	5134.25*	0.09	5
7	Pasadena E Ext	120.0	48 c	16.0	5129.26	5129.53	1.688	5134.33*	5134.45*	0.47	6
8	SE 36	115.3	36 c	92.9	5123.34	5128.43	5.479	5126.34	5131.37	0.00	1
9	S 36	115.3	36 c	82.3	5128.43	5133.00	5.553	5131.43	5135.94	0.98	8
10	AP-3	110.4	36 c	24.0	5133.00	5134.00	4.167	5136.90*	5137.56*	1.37	9
11	SW Lateral	4.90	18 c	89.3	5134.50	5136.06	1.747	5136.90	5137.04	0.00	9
12	42 Stub AP2	119.0	42 c	10.0	5131.80	5132.00	2.002	5135.30	5135.38	0.34	2
13	S 42 AP2	116.0	42 c	190.0	5132.00	5133.90	1.000	5135.72*	5138.25*	0.32	12
14	Venice Double C	116.0	42 c	35.0	5133.90	5134.53	1.800	5138.57*	5139.03*	0.11	13
15	Venice 1	87.00	42 c	525.0	5134.53	5147.40	2.451	5139.15	5150.26	0.08	14
16	Venice 2	58.00	36 c	525.0	5147.40	5161.90	2.762	5150.40	5164.33	0.07	15
17	Venice 3	29.00	36 c	525.0	5161.90	5176.40	2.762	5164.90	5178.12	0.03	16
18	Pasadena Double C	120.0	42 c	20.0	5129.53	5130.00	2.351	5134.91*	5135.20*	0.12	7
19	Pasadena 1	90.00	42 c	550.0	5130.00	5145.30	2.782	5135.32	5148.21	0.09	18
20	Pasadena 2	60.00	36 c	550.0	5145.30	5160.30	2.727	5148.30	5162.77	0.07	19
21	Pasadena 3	30.00	36 c	550.0	5160.30	5172.70	2.255	5163.30	5174.45	0.04	20

Project File: SMBP Future.stm	I-D-F File: SMBP.IDF	Total No. Lines: 22	Run Date: 09-20-1999

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

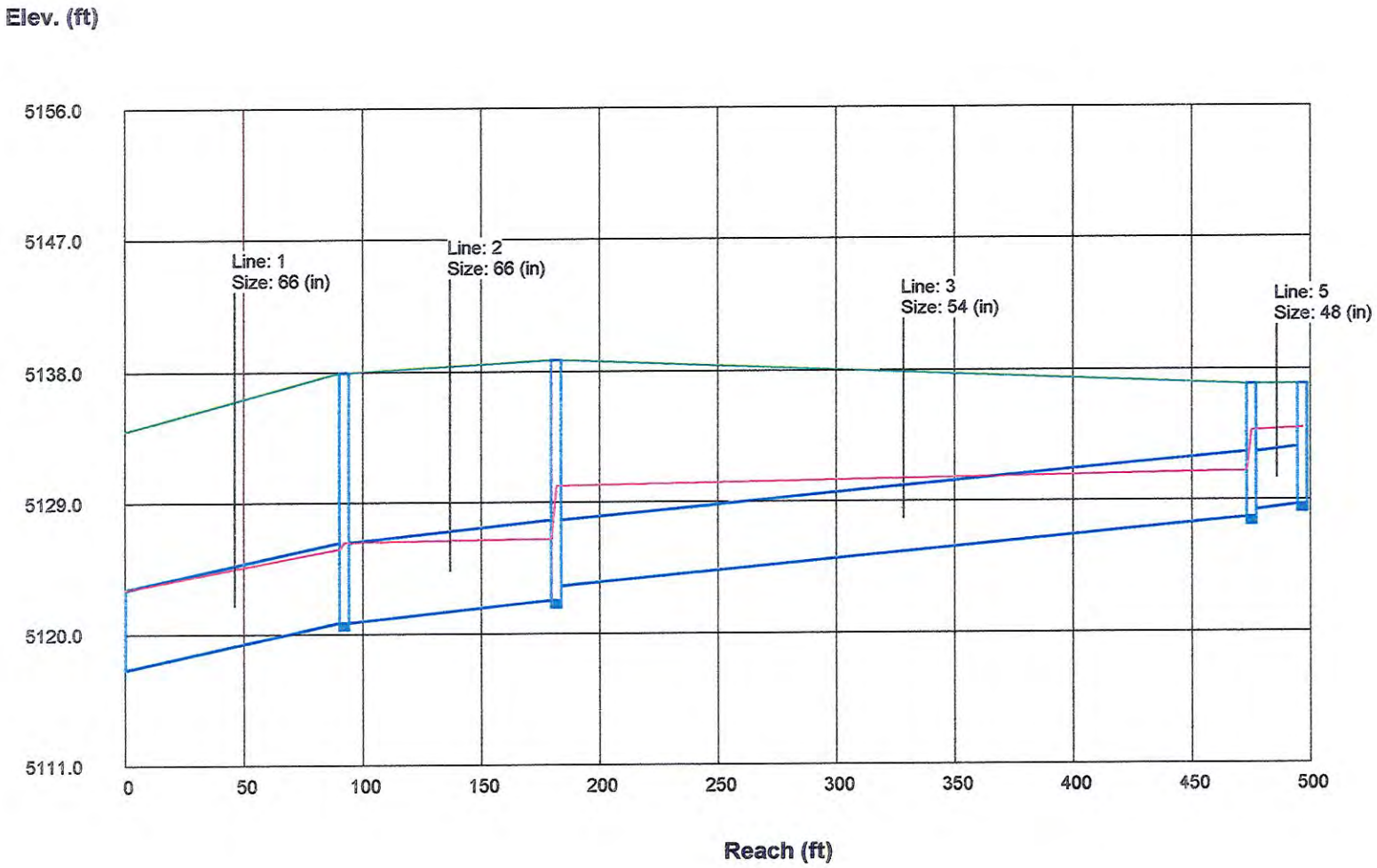
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	92.0	0.00	0.00	0.00	0.00	0.00	0.0	11.8	0.0	356.1	629.3	15.29	66	3.51	5120.84	5117.61	5125.90	5123.11	5134.00	5138.00	66W
2	1	89.5	0.00	0.00	0.00	0.00	0.00	0.0	11.3	0.0	240.8	433.4	11.22	66	1.67	5122.33	5120.84	5126.56	5126.34	5138.00	5138.80	NE 66
3	2	293.6	0.00	0.00	0.00	0.00	0.00	0.0	9.7	0.0	121.8	244.8	8.92	54	1.55	5127.88	5123.33	5131.05	5130.17	5138.80	5137.00	N 54
4	3	53.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.80	20.50	1.27	18	3.81	5132.90	5130.88	5133.85	5133.85	5137.00	5137.00	W Lateral
5	3	21.3	0.00	0.00	0.00	0.00	0.00	0.0	9.5	0.0	120.0	186.8	9.55	48	1.69	5128.74	5128.38	5134.00	5133.85	5137.00	5137.00	N 48
6	5	31.1	0.00	0.00	0.00	0.00	0.00	0.0	9.4	0.0	120.0	185.7	9.55	48	1.67	5129.26	5128.74	5134.25	5134.03	5137.00	5137.00	N 48 Bend
7	6	16.0	0.00	0.00	0.00	0.00	0.00	0.0	9.3	0.0	120.0	186.6	9.55	48	1.69	5129.53	5129.26	5134.45	5134.33	5137.00	5138.00	Pasadena E E
8	1	92.9	0.00	0.00	0.00	0.00	0.00	0.0	1.0	0.0	115.3	156.1	16.35	36	5.48	5128.43	5123.34	5131.37	5126.34	5138.00	5139.50	SE 36
9	8	82.3	0.00	0.00	0.00	0.00	0.00	0.0	0.5	0.0	115.3	157.2	16.35	36	5.55	5133.00	5128.43	5135.94	5131.43	5139.50	5142.00	S 36
10	9	24.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	110.4	136.1	15.62	36	4.17	5134.00	5133.00	5137.56	5136.90	5142.00	5143.00	AP-3
11	9	89.3	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.90	13.88	3.40	18	1.75	5136.06	5134.50	5137.04	5136.90	5142.00	5143.50	SW Lateral
12	2	10.0	0.00	0.00	0.00	0.00	0.00	0.0	10.0	0.0	119.0	142.4	12.43	42	2.00	5132.00	5131.80	5135.38	5135.30	5138.80	5139.00	42 Stub AP2
13	12	190.0	0.00	0.00	0.00	0.00	0.00	0.0	8.9	0.0	116.0	100.6	12.06	42	1.00	5133.90	5132.00	5138.25	5135.72	5139.00	5140.20	S 42 AP2
14	13	35.0	0.00	0.00	0.00	0.00	0.00	0.0	8.8	0.0	116.0	135.0	12.06	42	1.80	5134.53	5133.90	5139.03	5138.57	5140.20	5140.80	Venice Doubl
15	14	525.0	0.00	0.00	0.00	0.00	0.00	0.0	5.8	0.0	87.00	157.5	9.70	42	2.45	5147.40	5134.53	5150.26	5139.15	5140.80	5153.40	Venice 1
16	15	525.0	0.00	0.00	0.00	0.00	0.00	0.0	2.9	0.0	58.00	110.8	8.84	36	2.76	5161.90	5147.40	5164.33	5150.40	5153.40	5167.90	Venice 2
17	16	525.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	29.00	110.8	5.52	36	2.76	5176.40	5161.90	5178.12	5164.90	5167.90	5182.40	Venice 3
18	7	20.0	0.00	0.00	0.00	0.00	0.00	0.0	9.2	0.0	120.0	154.3	12.47	42	2.35	5130.00	5129.53	5135.20	5134.91	5138.00	5137.50	Pasadena Dou
19	18	550.0	0.00	0.00	0.00	0.00	0.00	0.0	6.1	0.0	90.00	167.8	9.95	42	2.78	5145.30	5130.00	5148.21	5135.32	5137.50	5151.30	Pasadena 1
20	19	550.0	0.00	0.00	0.00	0.00	0.00	0.0	3.1	0.0	60.00	110.1	9.06	36	2.73	5160.30	5145.30	5162.77	5148.30	5151.30	5168.30	Pasadena 2
21	20	550.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	30.00	100.1	5.64	36	2.25	5172.70	5160.30	5174.45	5163.30	5168.30	5178.70	Pasadena 3

Project File: SMBP Future.stm | I-D-F File: SMBP.IDF | Total number of lines: 22 | Run Date: 09-20-1999

NOTES: Intensity = 0.00 / (Tc + 0.00) ^ 0.00; Return period = 100 Yrs. ; Initial tailwater elevation = 5123.11 (ft)

Storm Sewer Profile

Proj. file: SMBP Future.stm



Storm Sewer Profile

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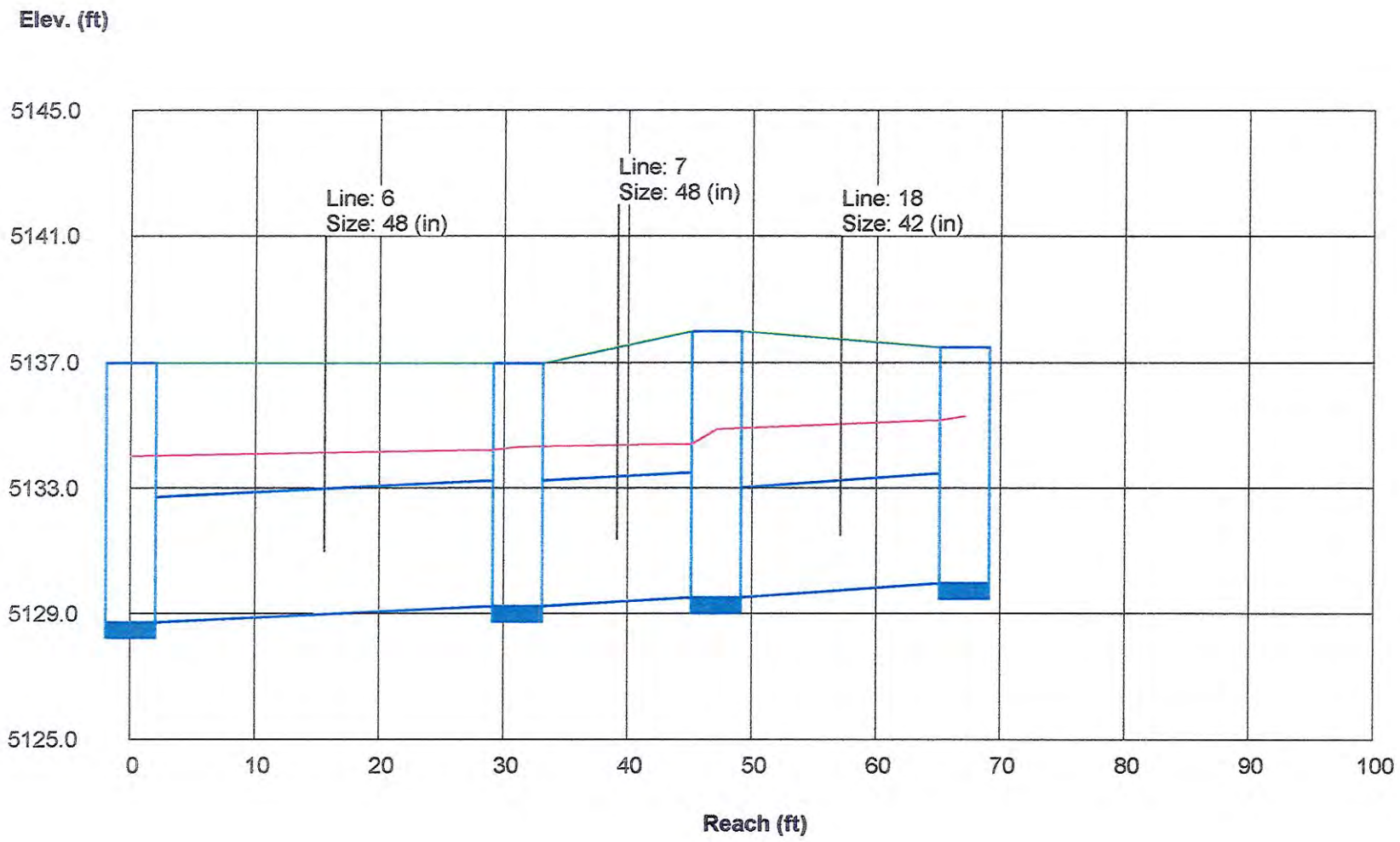

Storm Sewer Profile

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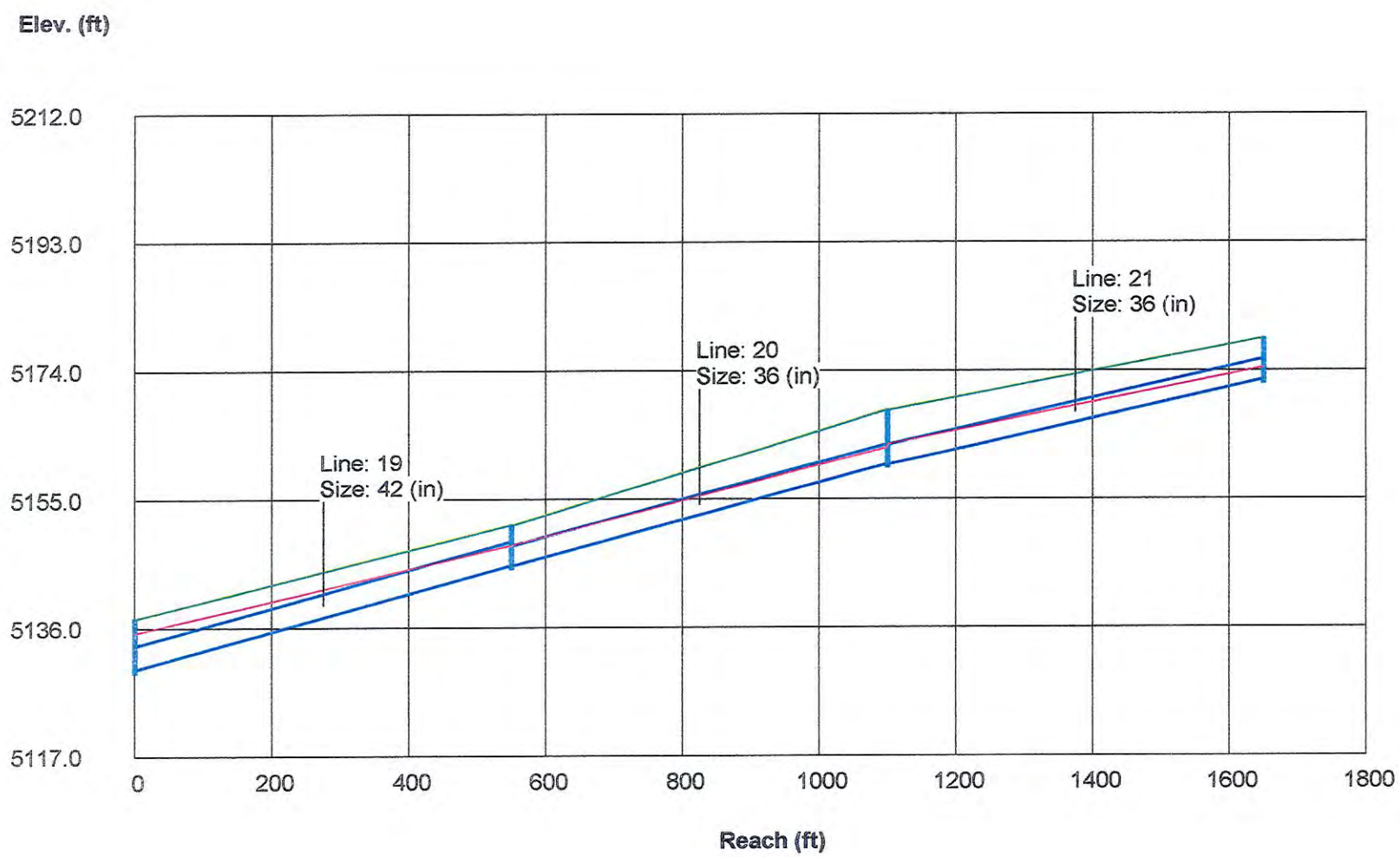
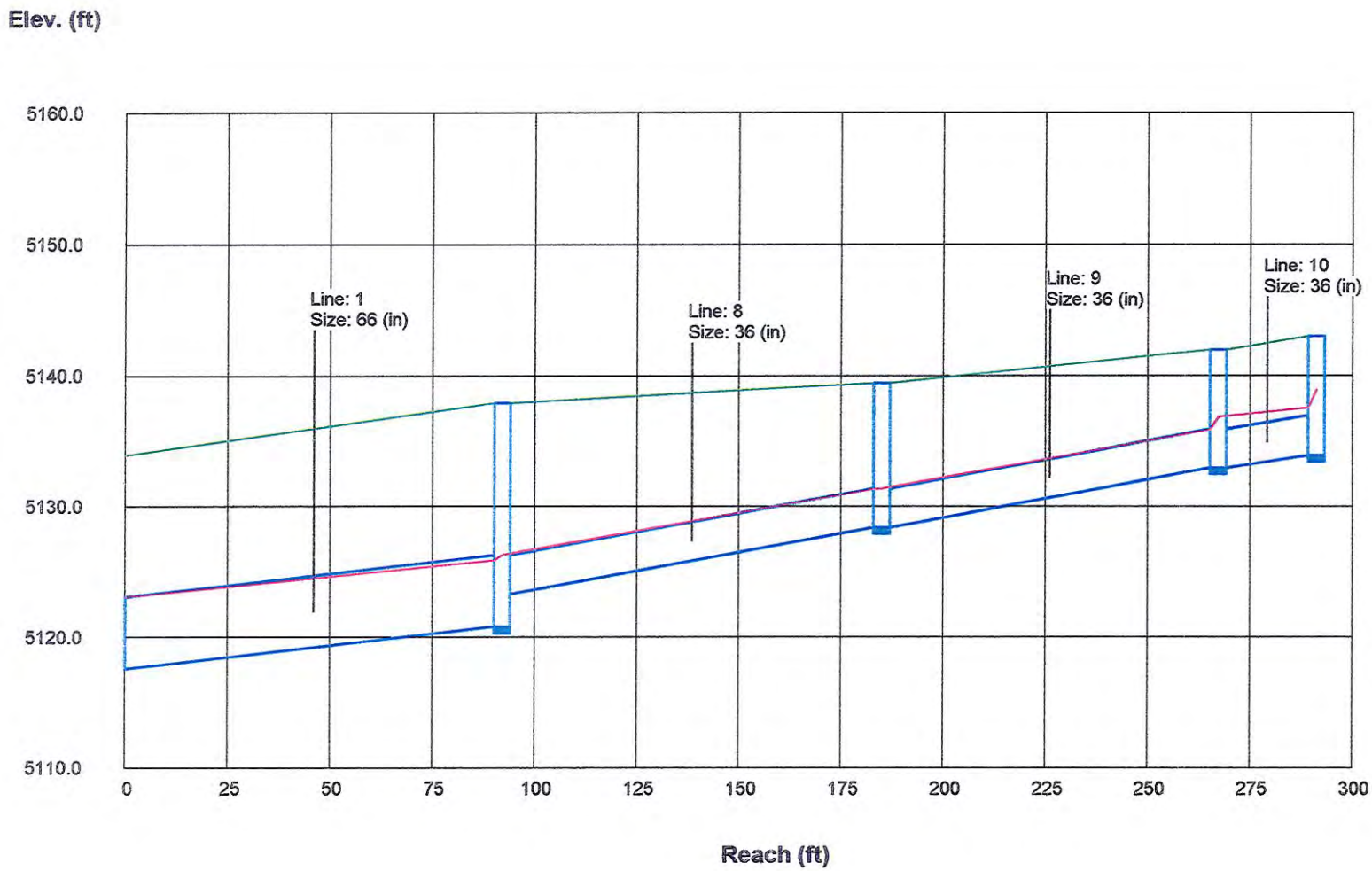


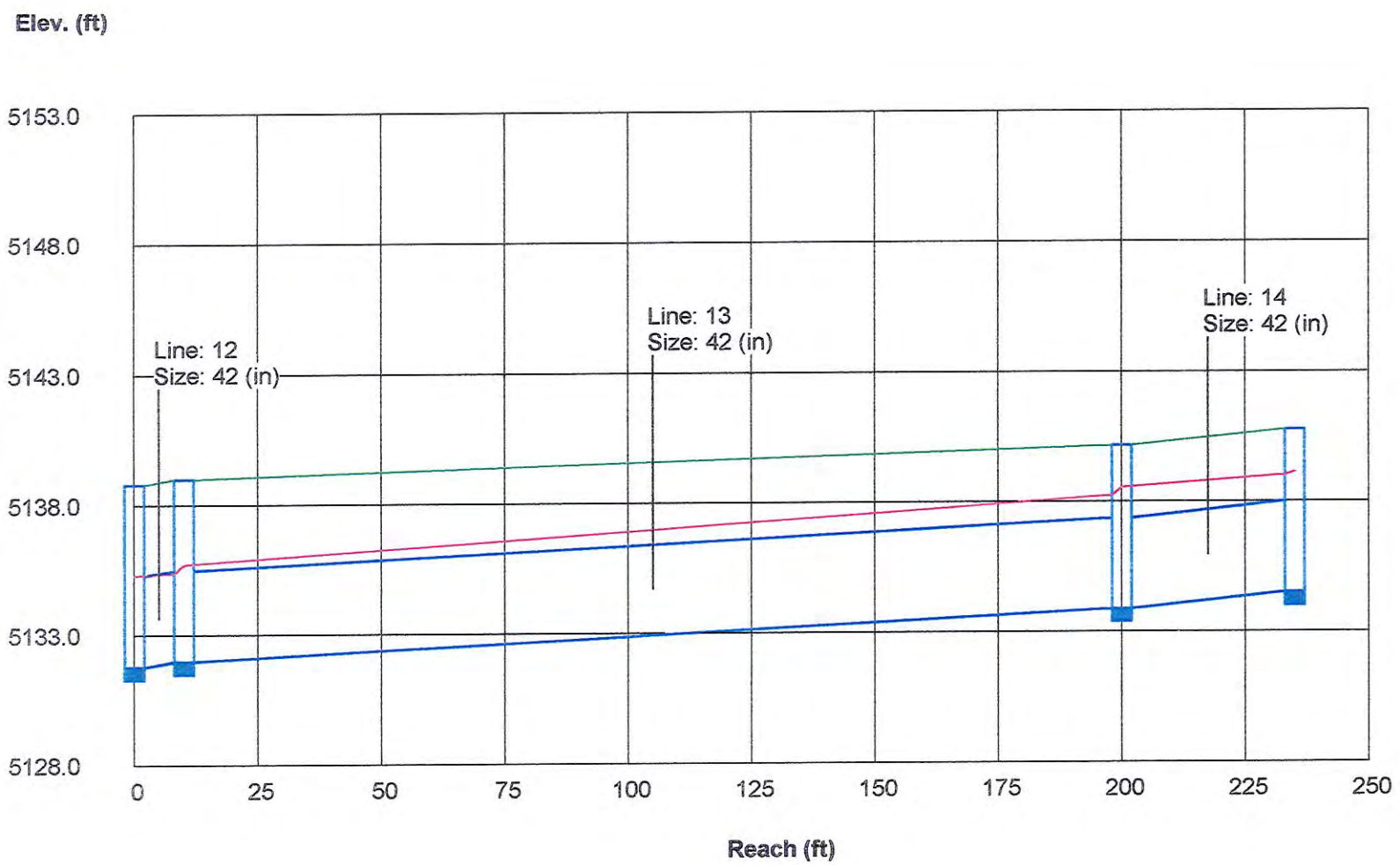
Storm Sewer Profile

Proj. file: SMBP Future.stm



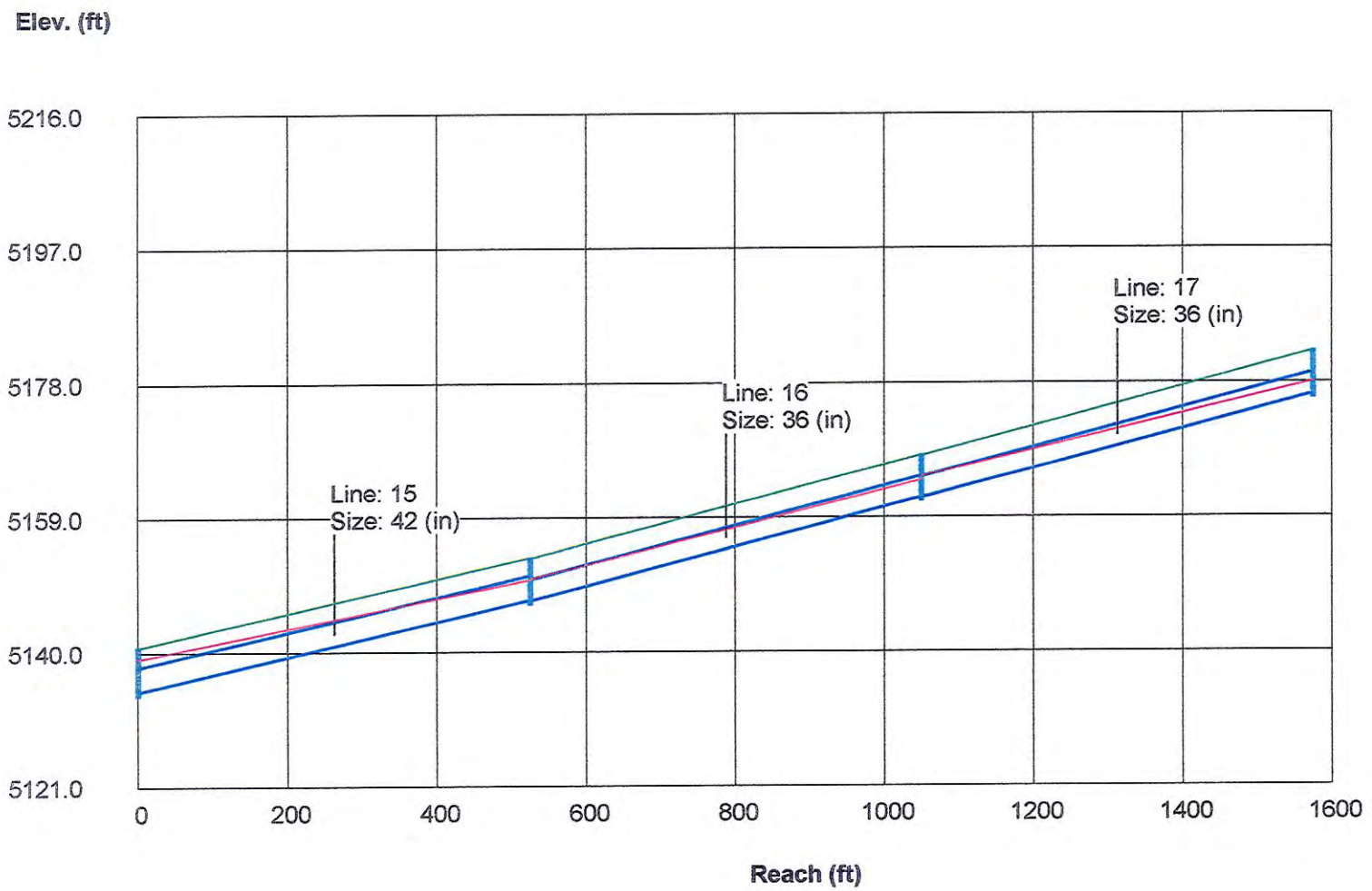
Storm Sewer Profile

Proj. file: SMBP Future.stm



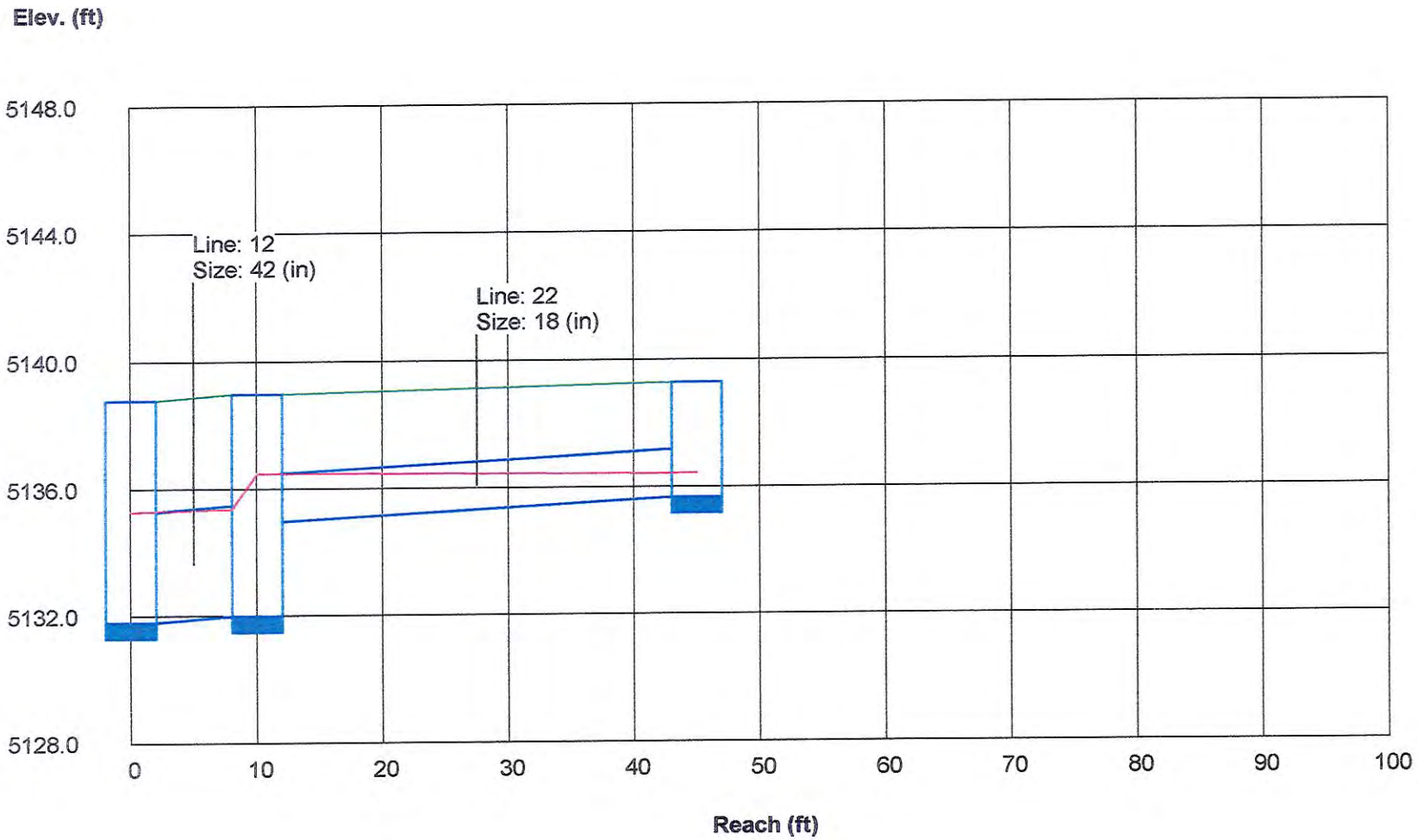
Storm Sewer Profile

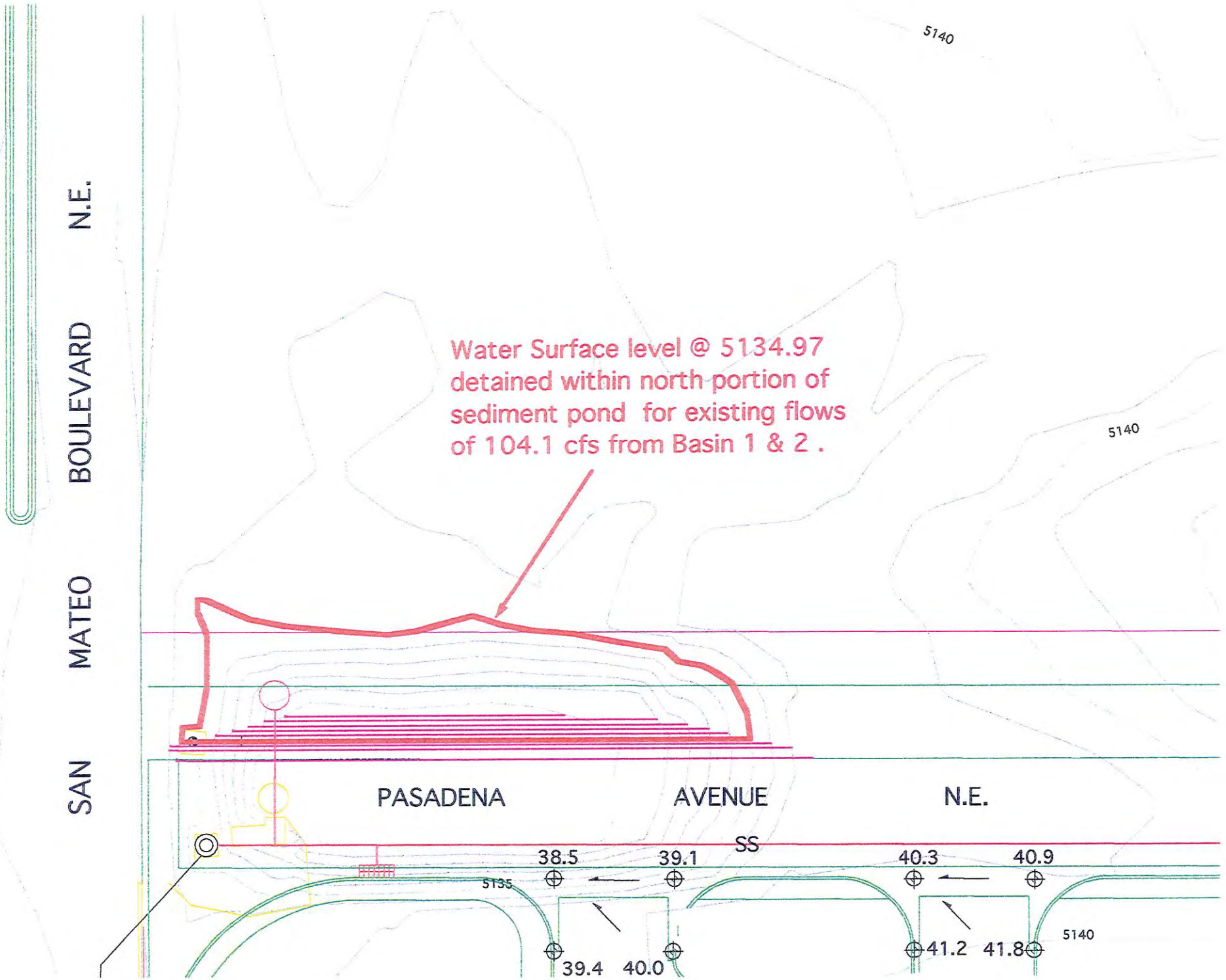
Proj. file: SMBP Future.stm



Storm Sewer Profile

Proj. file: SMBP Future.stm




SAN MATEO BOULEVARD N.E.
Water Surface level @ 5134.97 detained within north portion of sediment pond for existing flows of 104.1 cfs from Basin 1 & 2 .
5140
5140
PASADENA AVENUE N.E.
SS
38.5
39.1
40.3
40.9
5135
39.4
40.0
41.2
41.8
5140

Hydrograph Plot

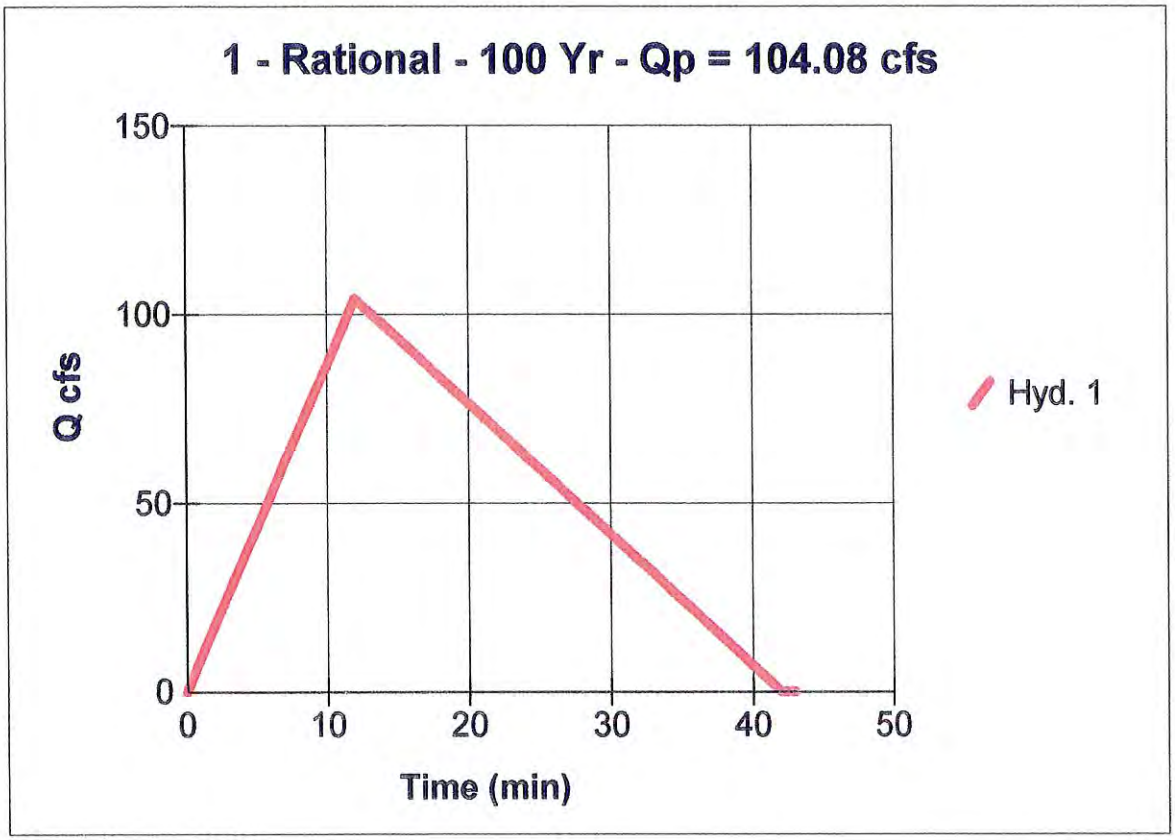
English

Hyd. No. 1

Basin 2 - Existing to AP-1

Hydrograph type	= Rational	Peak discharge	= 104.08 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 51.4 ac	Runoff coeff.	= 0.33
Intensity	= 6.14 in	Time of conc. (Tc)	= 12 min
I-D-F Curve	= Mechenbier SMBP.IDF	Reced. limb factor	= 2.5606

Total Volume = 133,416 cuft



Reservoir Report

English

Reservoir No. 1 - Sediment Pond

Pond Data

Pond storage is based on known contour areas

Stage / Storage Table

Stage ft	Elevation ft	Contour area sqft	Incr. Storage cuft	Total storage cuft
0.00	30.00	53	0	0
1.00	31.00	371	212	212
2.00	32.00	731	551	763
3.00	33.00	1,205	968	1,731
4.00	34.00	1,656	1,431	3,162
5.00	35.00	2,318	1,987	5,149
6.00	36.00	5,237	3,778	8,927
7.00	37.00	15,720	10,479	19,406
8.00	38.00	28,387	22,054	41,460

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 48.0	11.0	11.0	11.0
Span in	= 48.0	11.0	11.0	11.0
No. Barrels	= 1	6	6	10
Invert El. ft	= 29.60	29.60	31.52	33.44
Length ft	= 10.0	0.0	0.0	0.0
Slope %	= 1.60	0.00	0.00	0.00
N-Value	= .013	.013	.013	.013
Orif. Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= -----	Yes	Yes	Yes

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 113.1	0.0	0.0	0.0
Crest El. ft	= 34.86	0.00	0.00	0.00
Weir Coeff.	= 3.00	0.00	0.00	0.00
Eqn. Exp.	= 1.50	0.00	0.00	0.00
Multi-Stage	= Yes	No	No	No

Tailwater Elevation = 29.60 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
0.00	0	30.00	1.56	0.00	0.00	0.00	0.00	---	---	---	0.00
1.00	212	31.00	10.62	15.95	0.00	0.00	0.00	---	---	---	10.62
2.00	763	32.00	21.03	20.88	11.48	0.00	0.00	---	---	---	21.03
3.00	1,731	33.00	29.57	24.86	24.86	0.00	0.00	---	---	---	29.57
4.00	3,162	34.00	60.63	29.53	29.53	31.86	0.00	---	---	---	60.63
5.00	5,149	35.00	101.19	35.15	35.15	58.59	17.77	---	---	---	101.19
6.00	8,927	36.00	126.90	39.99	39.99	66.65	412.99	---	---	---	126.90
7.00	19,406	37.00	140.59	44.30	44.30	73.83	1062.20	---	---	---	140.59
8.00	41,460	38.00	153.05	48.23	48.23	80.38	1887.90	---	---	---	153.05

Hydrograph Report

English

Hyd. No. 2

N. Half Sediment Pond

Hydrograph type	= Reservoir	Peak discharge	= 100.35 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Inflow hyd. No.	= 1	Reservoir name	= Sediment Pond
Max. Elevation	= 34.97 ft	Max. Storage	= 5,099 cuft

Storage Indication method used.

Total Volume = 131,173 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
0.02	8.67	30.46	5.41	12.18	-----	-----	-----	-----	-----	-----	5.41
0.03	17.35	31.23	12.62	17.20	-----	-----	-----	-----	-----	-----	12.62
0.05	26.02	31.86	19.14	20.27	7.04	-----	-----	-----	-----	-----	19.14
0.07	34.69	32.44	24.91	22.71	22.53	-----	-----	-----	-----	-----	24.91
0.08	43.37	33.10	30.30	25.21	25.21	-----	-----	-----	-----	-----	30.30
0.10	52.04	33.66	38.12	27.39	27.39	9.03	-----	-----	-----	-----	38.12
0.12	60.72	33.98	59.54	29.41	29.41	30.60	-----	-----	-----	-----	59.54
0.13	69.39	34.08	64.59	30.00	30.00	37.41	-----	-----	-----	-----	64.59
0.15	78.06	34.24	72.26	30.95	30.95	47.80	-----	-----	-----	-----	72.27
0.17	86.74	34.42	80.26	32.02	32.02	53.37	-----	-----	-----	-----	80.26
0.18	95.41	34.63	88.27	33.17	33.17	55.28	-----	-----	-----	-----	88.27
0.20	104.08 <<	34.85	96.29	34.38	34.38	57.30	1.44	-----	-----	-----	96.29
0.22	100.61	34.97 <<	100.35	35.02	35.02	58.37	13.95	-----	-----	-----	100.35 <<
0.23	97.14	34.94	99.37	34.86	34.86	58.11	9.48	-----	-----	-----	99.37
0.25	93.68	34.87	96.71	34.45	34.45	57.41	1.77	-----	-----	-----	96.71
0.27	90.21	34.77	93.44	33.94	33.94	56.57	-----	-----	-----	-----	93.44
0.28	86.74	34.67	89.95	33.42	33.42	55.70	-----	-----	-----	-----	89.95
0.30	83.27	34.58	86.39	32.89	32.89	54.82	-----	-----	-----	-----	86.39
0.32	79.80	34.48	82.80	32.38	32.38	53.96	-----	-----	-----	-----	82.80
0.33	76.33	34.40	79.21	31.88	31.88	53.08	-----	-----	-----	-----	79.21
0.35	72.86	34.31	75.60	31.39	31.39	51.33	-----	-----	-----	-----	75.60
0.37	69.39	34.23	71.99	30.92	30.92	47.49	-----	-----	-----	-----	71.99
0.38	65.92	34.15	68.40	30.46	30.46	42.77	-----	-----	-----	-----	68.40
0.40	62.45	34.08	64.81	30.02	30.02	37.72	-----	-----	-----	-----	64.81
0.42	58.98	34.01	61.21	29.60	29.60	32.68	-----	-----	-----	-----	61.21
0.43	55.51	33.94	57.04	29.14	29.14	27.72	-----	-----	-----	-----	57.04
0.45	52.04	33.88	53.42	28.76	28.76	23.48	-----	-----	-----	-----	53.42
0.47	48.57	33.82	49.87	28.40	28.40	19.25	-----	-----	-----	-----	49.87
0.48	45.10	33.77	46.28	28.07	28.07	15.63	-----	-----	-----	-----	46.28
0.50	41.63	33.72	42.76	27.75	27.75	12.44	-----	-----	-----	-----	42.76
0.52	38.16	33.68	39.15	27.46	27.46	9.70	-----	-----	-----	-----	39.15
0.53	34.69	33.64	35.61	27.20	27.20	7.39	-----	-----	-----	-----	35.61
0.55	31.23	33.59	32.40	26.93	26.93	4.99	-----	-----	-----	-----	32.40
0.57	27.76	33.47	32.19	26.53	26.53	1.10	-----	-----	-----	-----	32.19
0.58	24.29	33.24	31.12	25.71	25.71	-----	-----	-----	-----	-----	31.12
0.60	20.82	32.89	29.02	24.44	24.44	-----	-----	-----	-----	-----	29.02

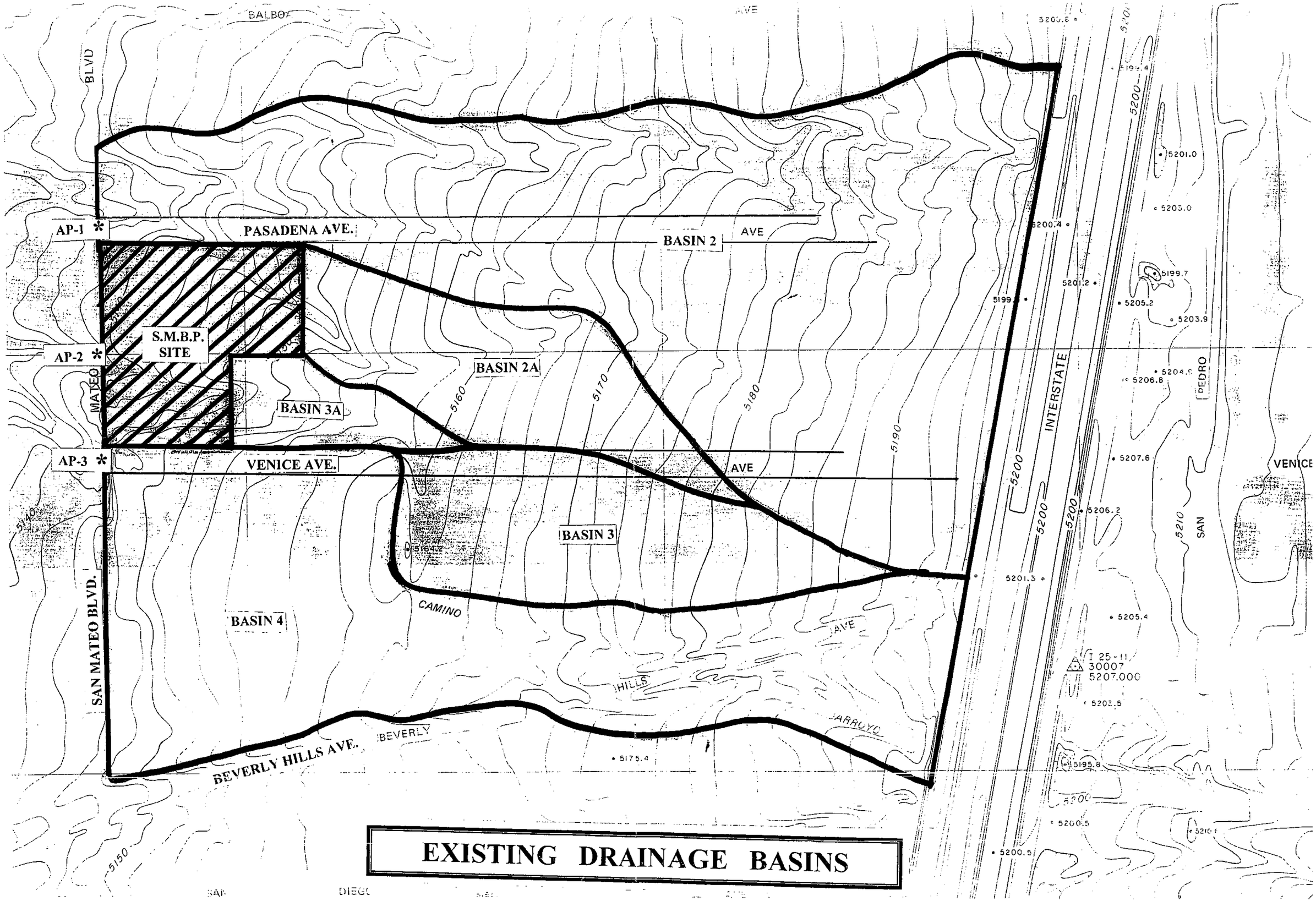
Continues on next page...

South Half Venice Ave. Swale
Worksheet for Trapezoidal Channel

Project Description	
Project File	c:\hydrology\haestad\fmw\mechenbi.fm2
Worksheet	Offsite Diversion
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.022	
Channel Slope	0.024500	ft/ft
Left Side Slope	2.000000	H : V
Right Side Slope	2.000000	H : V
Bottom Width	4.00	ft
Discharge	10.50	cfs

Results		
Depth	0.42	ft
Flow Area	2.02	ft^2
Wetted Perimeter	5.87	ft
Top Width	5.67	ft
Critical Depth	0.54	ft
Critical Slope	0.009732	ft/ft
Velocity	5.19	ft/s
Velocity Head	0.42	ft
Specific Energy	0.84	ft
Froude Number	1.53	
Flow is supercritical.		



EXISTING DRAINAGE BASINS

CITICORP DRAINAGE FLOW RATE SUMMARY

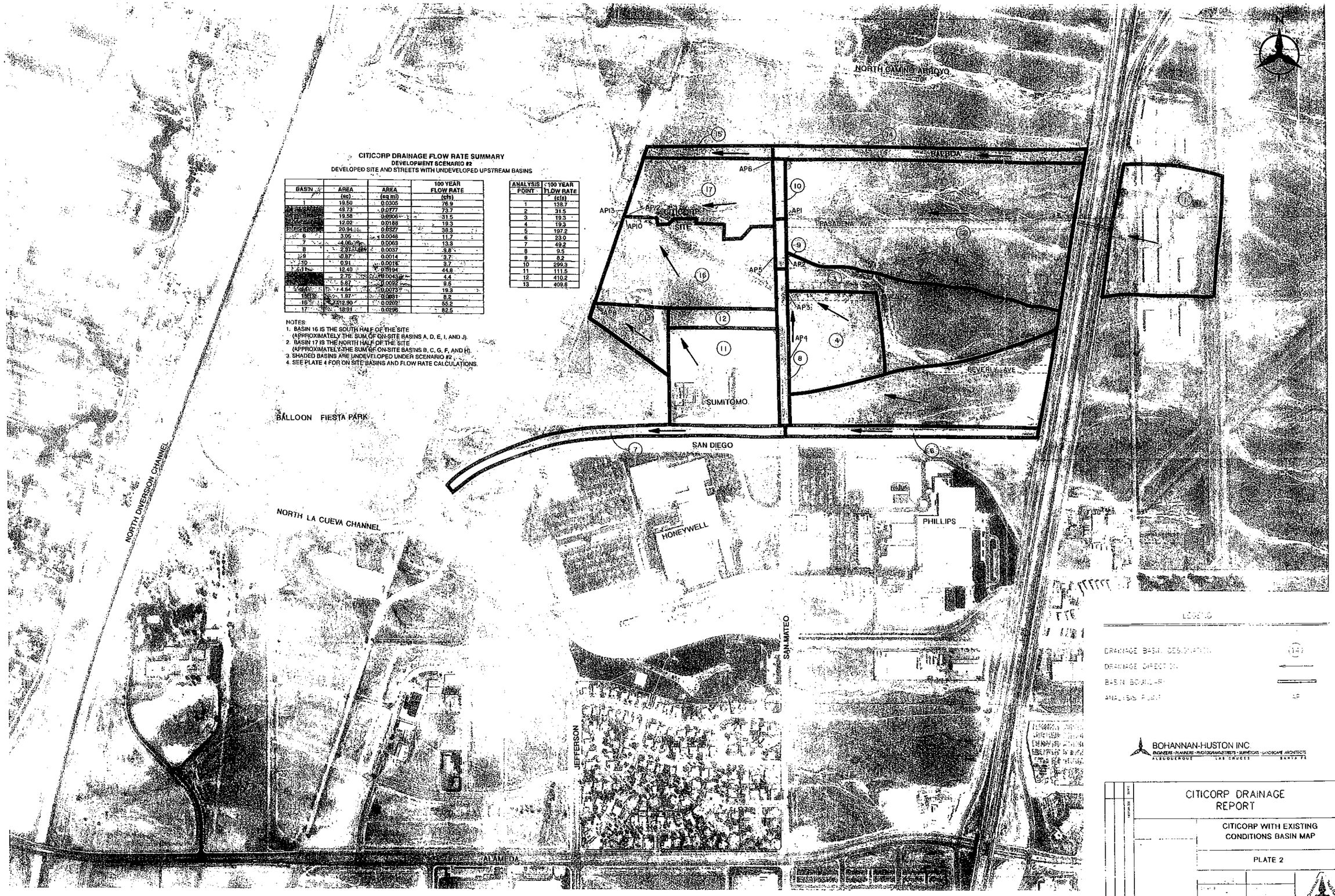
DEVELOPMENT SCENARIO #2

DEVELOPED SITE AND STREETS WITH UNDEVELOPED UPSTREAM BASINS

BASIN	AREA (ac)	AREA (sq mi)	100 YEAR FLOW RATE (cfs)
1	19.50	0.0305	76.9
[illegible]	49.73	0.0777	73.7
[illegible]	19.58	0.0306	31.5
[illegible]	12.02	0.0188	19.3
[illegible]	20.94	0.0327	38.8
6	3.05	0.0048	11.7
7	4.06	0.0063	13.3
8	2.37	0.0037	9.8
9	0.97	0.0014	3.7
10	0.91	0.0014	3.7
11	12.40	0.0194	44.8
[illegible]	2.75	0.0043	4.4
[illegible]	5.67	0.0092	9.5
[illegible]	4.64	0.0073	19.3
15	1.57	0.0061	8.2
16	212.90	0.0209	55.2
17	18.91	0.0296	82.5

ANALYSIS POINT	100 YEAR FLOW RATE (cfs)
1	138.7
2	31.5
3	19.3
4	19.3
5	197.2
6	23.0
7	49.2
8	9.5
9	8.2
10	299.8
11	111.5
12	410.2
13	409.6

NOTES:
1. BASIN 16 IS THE SOUTH HALF OF THE SITE (APPROXIMATELY THE SUM OF ON-SITE BASINS A, D, E, I, AND J).
2. BASIN 17 IS THE NORTH HALF OF THE SITE (APPROXIMATELY THE SUM OF ON-SITE BASINS B, C, G, F, AND H).
3. SHADED BASINS ARE UNDEVELOPED UNDER SCENARIO #2.
4. SEE PLATE 4 FOR ON SITE BASINS AND FLOW RATE CALCULATIONS.



LEGEND

DRAINAGE BASIN DESIGNATION (16)

DRAINAGE DIRECTION

BASIN BOUNDARY

ANALYSIS POINT AP

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ALBUQUERQUE LAS CRUCES SANTA FE

CITICORP DRAINAGE REPORT

CITICORP WITH EXISTING CONDITIONS BASIN MAP

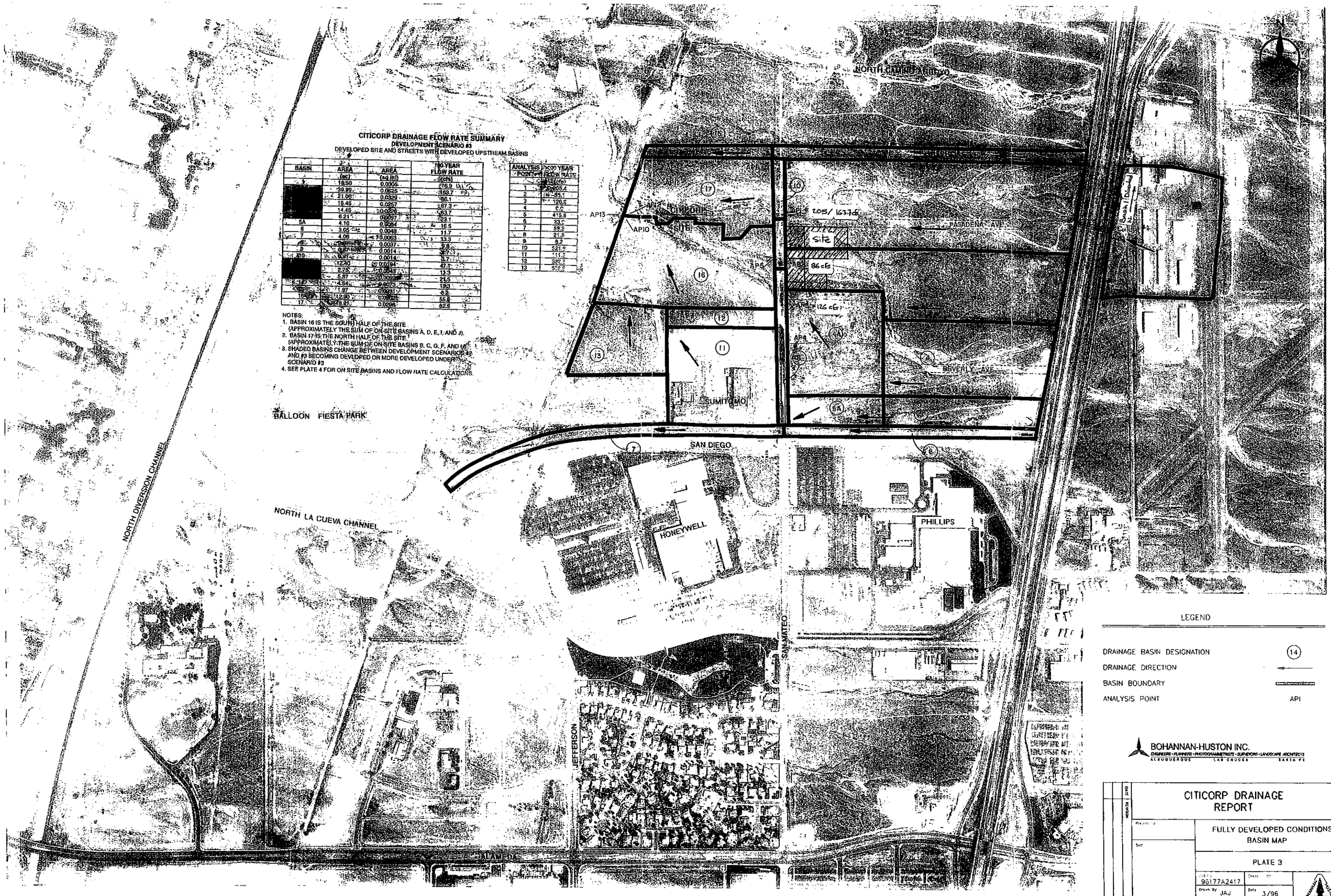
PLATE 2

CITICORP DRAINAGE FLOW RATE SUMMARY
DEVELOPMENT SCENARIO #3
DEVELOPED SITE AND STREETS WITH DEVELOPED UPSTREAM BASINS

BASIN	AREA (ac)	AREA (sq mi)	100 YEAR FLOW RATE (cfs)
1	19.50	0.0305	276.9
2	39.99	0.0625	459.7
3	21.06	0.0329	186.1
4	16.45	0.0257	67.3
5	14.40	0.0225	63.7
5A	6.21	0.0097	23.1
6	4.10	0.0064	16.5
7	3.05	0.0048	11.7
8	4.06	0.0063	13.3
9	2.36	0.0037	9.8
10	0.91	0.0014	3.7
11	0.91	0.0014	3.7
12	12.30	0.0194	47.5
13	2.75	0.0043	13.9
14	5.87	0.0092	21.5
15	4.64	0.0073	19.3
16	11.97	0.0187	49.2
16A	12.90	0.0202	55.8
17	16.87	0.0264	82.5

ANALYSIS POINT	100 YEAR FLOW RATE (cfs)
1	2605.4
2	1[illegible]95.1
3	1265
4	6.0
5	415.8
6	33.0
7	59.5
8	21.5
9	9.2
10	521.5
11	111.5
12	382.5
13	502.5

NOTES:
1. BASIN 16 IS THE SOUTH HALF OF THE SITE (APPROXIMATELY THE SUM OF ON-SITE BASINS A, D, E, I, AND J).
2. BASIN 17 IS THE NORTH HALF OF THE SITE (APPROXIMATELY THE SUM OF ON-SITE BASINS B, C, G, F, AND H).
3. SHADED BASINS CHANGE BETWEEN DEVELOPMENT SCENARIOS #2 AND #3 BECOMING DEVELOPED OR MORE DEVELOPED UNDER SCENARIO #3
4. SEE PLATE 4 FOR ON SITE BASINS AND FLOW RATE CALCULATIONS.



LEGEND

DRAINAGE BASIN DESIGNATION	(14)
DRAINAGE DIRECTION	
BASIN BOUNDARY	
ANALYSIS POINT	API

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CITICORP DRAINAGE REPORT

FULLY DEVELOPED CONDITIONS BASIN MAP

PLATE 3

Project No.	96177A2417
Sheet No.	
Drawn By	JAJ
Date	3/96
Checked By	CWH
Scale	1"=300'