CITY OF
Albuquerque

P.O. Box 1293, Albuquerque, NM 87103

January 2, 1997

Martin J. Chávez, Mayor

Craig Hoover, PE
Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

RE: ENGINEER'S CERTIFICATION FOR JASON DASKALOS SUBD (E-18/D17F)
FORMERLY FOREST HILLS SUBD UNIT II
RECEIVED DECEMBER 18, 1996 FOR FINANCIAL GUARANTY RELEASE
ENGINEER'S STAMP 12/17/96

Dear Mr. Hoover:

Based on the information included in the submittal referenced above and the Infrastructure List approved 3-9-93 & revised 1-31-95, City Hydrology accepts the Engineer's Certification for Financial Guaranty Release.

Contact Terri Martin to obtain the Financial Guaranty Release for City Project Number 4621.90

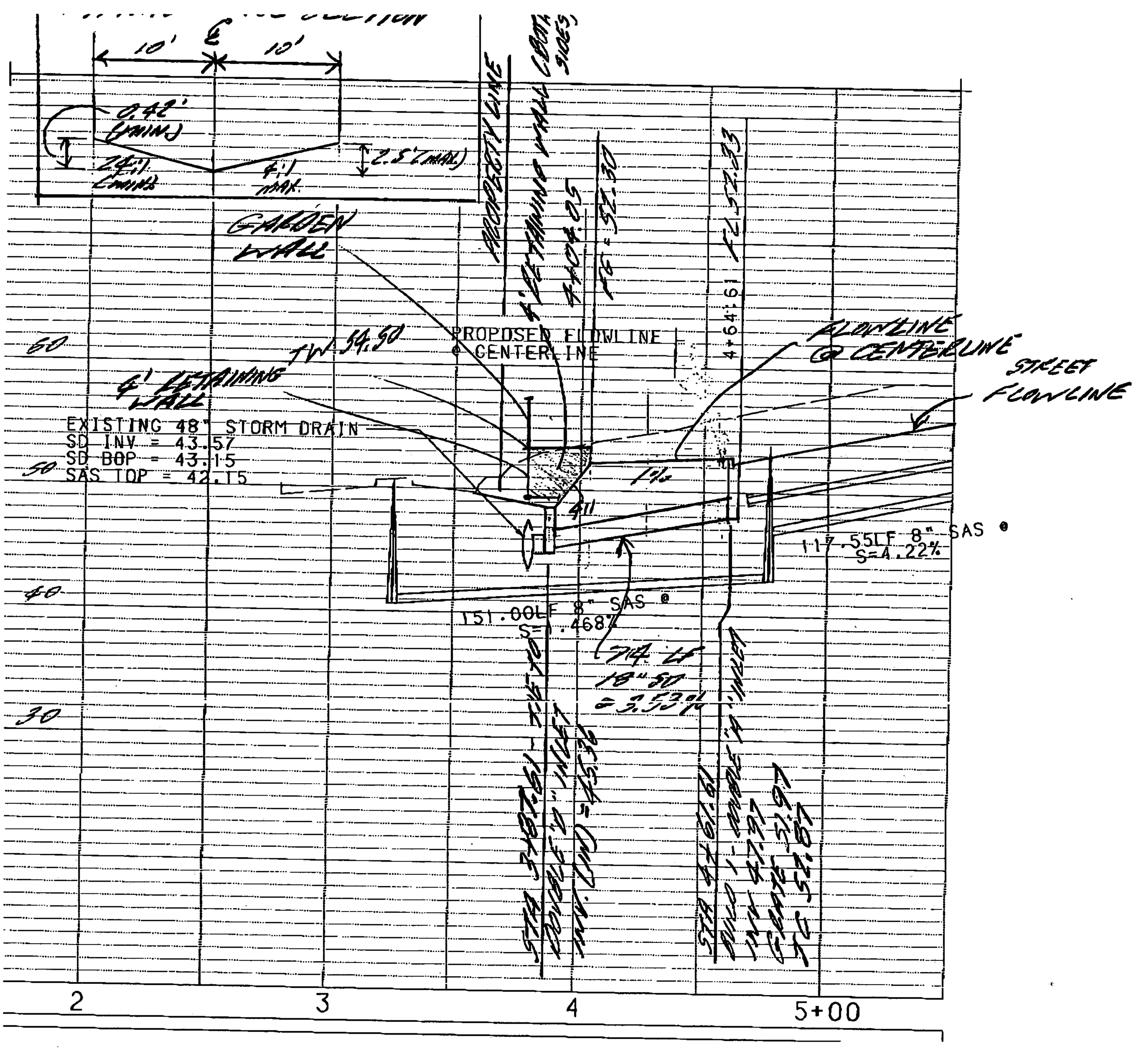
If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin

John P. Curtin, P.E.
Civil Engineer/Hydrology

c: Terri Martin, CPN 4621.90



HAMMERHEAD STREET HYDRAULICS

MANNING'S N = .0170 SLOPE = .0418

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	-35.00	53.32	2	0.00	52.33	3	35.00	53.32

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
52.38	0.05	0.1	0.1	3.5	1.5	3.54
52.43	0.10	0.4	0.9	7.1	2.4	7.07
52.48	0.15	0.8	2.5	10.6	3.2	10.61
52.53	0.20	1.4	5.4	14.1	3.8	14.14
52.58	0.25	2.2	9.9	17.7	4.5	17.68
52.63	0.30	3.2	16.0	21.2	5.0	21.21
52.68	0.35	4.3	24.2	24.8	5.6	24.75
52.73	0.40	5.7	34.6	28.3	6.1	28.28
52.78	0.45	7.2	47.3	31.8	6.6	31.82
52.83	0.50	8.8	62.7	35.4	7.1	35.35
52.88	0.55	10.7	80.8	38.9	7.6	38.89
52.93	0.60	12.7	101.9	42.4	8.0	42.42
52.98	0.65	14.9	126.1	46.0	8.4	45.96
53.03	0.70	17.3	153.7	49.5	8.9	49.50
53.08	0.75	19.9	184.7	53.1	9.3	53.03
53.13	0.80	22.6	219.4	56.6	9.7	56.57
53.18	0.85	25.5	257.9	60.1	10.1	60.10
53.23	0.90	28.6	300.4	63.7	10.5	63.64
53.28	0.95	31.9	347.0	67.2	10.9	67.17
53.32	0.99	34.6	387.3	70.0	11.2	70.00

Flow at downstream end of hammerhead

$Q_{100} = 14.2 \Rightarrow Y_n = 0.28$

Top width = 20.2'

INLET AT END OF HAMMERHEAD (DOUBLE "A" W/ 2-THROATS)

WEIR COEFFICENT = 3.0500
CROSS SECTION DIVIDED INTO VERTICAL SLICES 0. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	-6.00	0.67	3	6.00	0.00			
2	-6.00	0.00	4	6.00	0.67			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS
0.05	0.05	0.60	0.41	0.68	12.00
0.10	0.10	1.20	1.16	0.96	12.00
0.15	0.15	1.80	2.13	1.18	12.00
0.20	0.20	2.40	3.27	1.36	12.00
0.25	0.25	3.00	4.57	1.52	12.00
0.30	0.30	3.60	6.01	1.67	12.00
0.35	0.35	4.20	7.58	1.80	12.00
0.40	0.40	4.80	9.26	1.93	12.00
0.45	0.45	5.40	11.05	2.05	12.00
0.50	0.50	6.00	12.94	2.16	12.00
0.55	0.55	6.60	14.93	2.26	12.00
0.60	0.60	7.20	17.01	2.36	12.00
0.65	0.65	7.80	19.18	2.46	12.00
0.67	0.67	8.04	20.07	2.50	12.00

$Q_{100} = 19.2 cfs \Rightarrow$ Required Head = 0.53' < 0.67'

$A = .5'(6.5)2 = 6.5 sf$

$h = 1.0$

$Q_o = .67(6.5)\sqrt{64.4(1.0)}$

$= 35 cfs$

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 22, 1996

Craig Hoover, PE
Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

RE: GRADING & DRAINAGE PLAN FOR JASON DASKALOS SUBD (E-18/D17F)
FORMERLY FOREST HILLS SUBD UNIT II
RECEIVED JANUARY 17,1996 FOR FINAL PLAT APPROVAL
ENGINEER'S STAMP 4/3/95

Dear Mr. Hoover:

Based on the information included in the submittal referenced above, City Hydrology accepts the Grading & Drainage plan for Final Plat. Submit the Grading Plan to DRB for their approval.

If you have any questions about this project, You may contact me at 768-2727.

Sincerely,

John P. Curtin

John P. Curtin, P.E.
Civil Engineer/Hydrology

c: Andrew Garcia
Fred Aguirre, DRB 93-18
Pete Daskalos, 5321 Menaul NE 87110

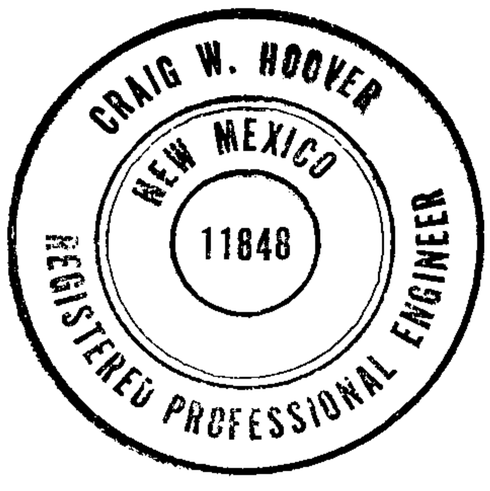
Final
Drainage Report
for Jason Daskalos Addition
(Formerly Forest Hills
Subdivision Unit II)

January 1995

I certify that I am a registered professional engineer in the State of New Mexico
and that this report was prepared by me or under my supervision.

Craig W. Hoover, P.E.

11/17/95
Date



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BOHANNAN-HUSTON INC.
ENGINEERS ARCHITECTS PHOTOGRAMMETRISTS SURVEYORS

I. PURPOSE

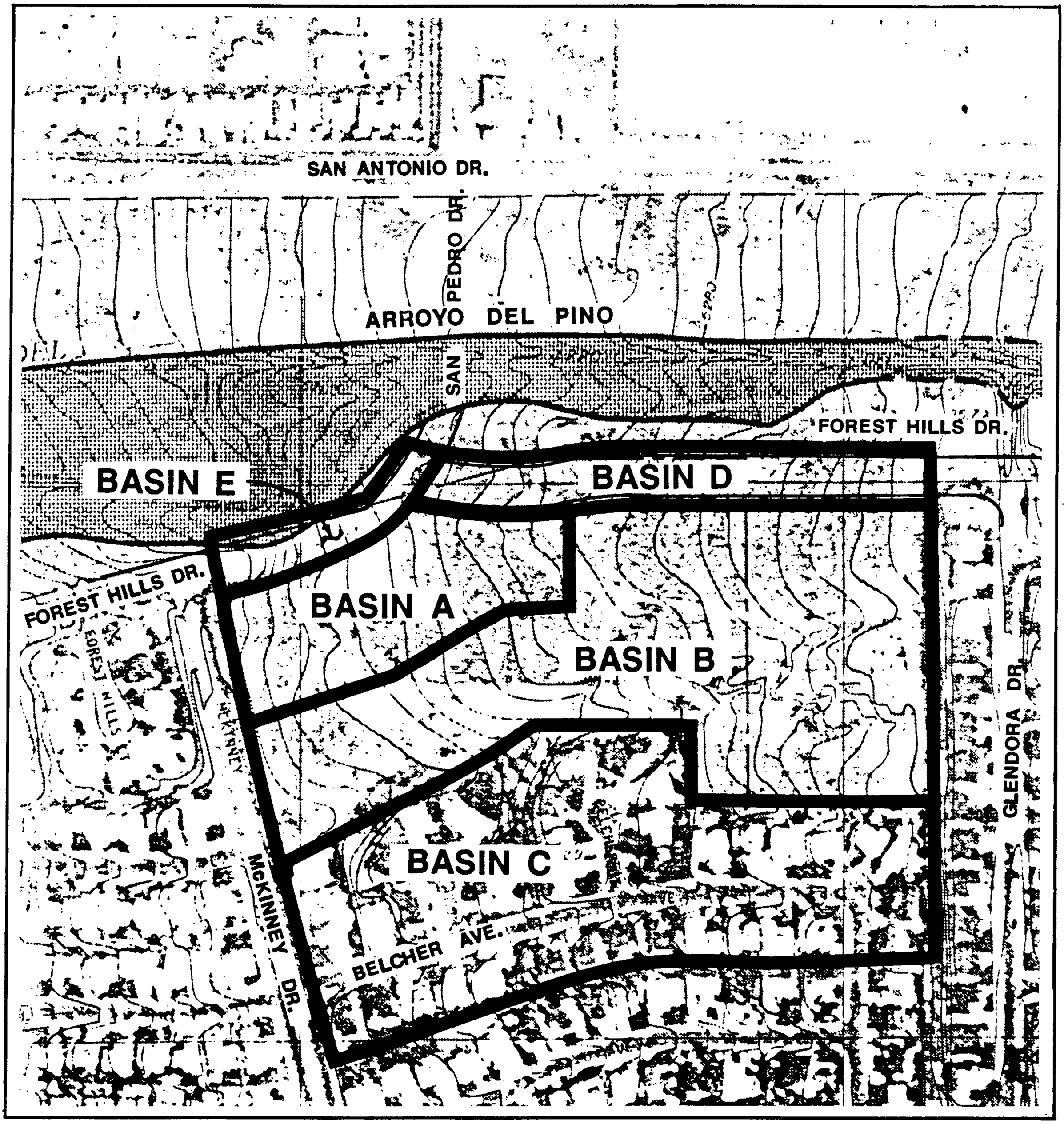
This report presents the Drainage Management Plan for preliminary plat approval for the Jason Daskalos Addition (formerly Forest Hills Subdivision Unit II). The plan is prepared in accordance with prior reports approved by the City of Albuquerque and in accordance with the Development Process Manual (DPM) of the City of Albuquerque, including the latest hydrology revisions dated January 1993 (DPM update).

II. PROJECT LOCATION AND DESCRIPTION

The Jason Daskalos Addition is located at the southeast corner of San Pedro Drive and McKinney Drive in northeast Albuquerque. The site is zoned R-LT and consists of 26 lots on 3.364 acres. Figure 1 (Basin A) identifies the site's location.

III. EXISTING CONDITIONS

The site is bounded by McKinney Drive to the west, San Pedro Drive and Forest Hills Drive to the north and northeast, and the existing Forest Hills Subdivision Unit I to the south. The entire site is currently undeveloped. The majority of the site drains from east to west where runoff from the site flows into McKinney Drive. The northern edge of the site drains from south to north into San Pedro Drive. Runoff discharged into both San Pedro Drive and McKinney Drive then continues west flowing down Forest Hills Drive to a point immediately east of the northbound Interstate 25 frontage road where the runoff is collected by a cattle guard type catch basin. A storm sewer conveys collected runoff from the catch basin south to the Borealis Arroyo.



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LOCATION/WATERSHED MAP

SCALE:
1" = 250' (APPROX.)

LEGAL DESCRIPTION: JASON OAKPLOS ADDITION

FIGURE 1

The slope of the site ranges from approximately 2% to 20% with the typical slope being roughly 4%. The site vegetation consists of native grasses and weeds. The site soils are classified by the SCS's "Soil Survey of Bernalillo County" as TgB (Tijeras). The Tijeras series consists of deep, well drained soils that formed in decomposed granitic alluvium on old alluvial fans. These soils experience moderate runoff and water erosion.

IV. HYDROLOGIC ANALYSIS

A. On-Site Hydrology

The criteria used to develop the hydrology for the site was the latest revision of Chapter 22, Section 22.2 of the DPM dated January 1993. The site is located in Precipitation Zone 3. As such, the rainfall depths for the 6-hour storm are 1.73 inches and 2.60 inches for the 10-year and 100-year return events, respectively. The 10-year and 100-year existing and developed conditions flow rates were determined using the simplified procedure for small watersheds provided in the DPM. This procedure is based upon the Rational Method and initial abstraction/uniform infiltration precipitation losses.

B. Existing Conditions

Under existing conditions, the site is completely undeveloped and may be classified as land treatment Type A (soil uncompacted by human activity). A summary of the 10-year and 100-year existing conditions flows is shown below:

	10-Year	100-Year
Rainfall	1.73	2.60
Drainage Area (Basin A)	3.364 ac	3.364 ac
Land Use	100% Type A	100% Type A
Peak Discharge/Acre	0.58 cfs/ac	1.87 cfs/ac
Q (Peak Discharge)	1.95 cfs	6.29 cfs

C. Developed Conditions

Under developed conditions, the site will be fully developed with an average of 62.7% of the area being land use D (impervious areas, pavements, and roofs). See the Appendix for land use calculations. The remaining area is assumed to be divided among land uses B and C with three-fourths of the area being land use B (irrigated lawns), and one-fourth being land use C (soil compacted by human activity, minimal vegetation). A summary of the 10-year and 100-year developed conditions flows is shown below:

	10-Year	100-Year
Rainfall (Basin A)	1.73	2.60
Drainage Area	3.364 ac	3.364 ac
Land Use	27.9% Type B	27.9% Type B
	9.4% Type C	9.4% Type C
	62.7% Type D	62.7% Type D
Peak Discharge/Acre		
Type B	1.19 cfs/ac	2.60 cfs/ac
Type C	2.00 cfs/ac	3.45 cfs/ac
Type D	3.39 cfs/ac	5.02 cfs/ac
Q (Peak Discharge)	8.9 cfs	14.1 cfs

D. Off-Site Hydrology

The Jason Daskalos Addition comprises 3.364 acres of a 28.33 acre watershed that discharges at the intersection of San Pedro Drive and McKinney Drive. The watershed is generally bounded by Belcher Avenue to the south, Glendora Drive to the east, Forest Hills Drive and San Pedro to the north and northeast, and McKinney Drive to the west (see Figure 1). The watershed has been subdivided into five basins, A through E. The Jason Daskalos Addition comprises Basin A. Basins B through E are considered off-site basins. All of the off-site basins are fully developed.

The only storm drain facilities within the watershed are located along Pine Park Place and east of McKinney Drive between Pine Park Place and San Pedro Drive. Runoff from Forest Hills Subdivision Unit I (Basin B) is collected by a series of six double B drop inlets along Pine Park Place. These inlets once drained into a detention pond located at Forest Hills Subdivision Unit I, Block III, Lots 1 through 3. The pond was designed to reduce the peak runoff from the existing Forest Hills Subdivision to undeveloped levels which would then be discharged to McKinney Drive. Presently, there are no catch basins along McKinney Drive, San Pedro Drive, or Forest Hills Drive within the watershed.

In 1984, provision was also made with the construction of this subdivision and the detention pond to allow future diversion of runoff to the Pino Arroyo. A 48" storm drain was installed from Pine Park Place to San Pedro Drive east of McKinney Drive in a 25' drainage easement. The storm drain was plugged at a manhole in Pine Park Place to divert the flow from the Pine Park Place storm drain to the detention pond, with the intent of removing the plug once the storm drain was extended north to the Pino Arroyo.

In 1989, with the construction of the Pino Arroyo, the City of Albuquerque extended the 48" storm drain north to the Pino Arroyo, completing the storm drain

system and eliminating the need for the detention pond. At this time the plug in the storm drain at Pink Park Place was removed allowing flow to continue in the storm drain to the McKinney Drive storm drain. A plug was also installed in the northwest manhole invert eliminating flow into the pond. With the modifications to the pond proposed with this development, lots 1 through 3 of Forest Hills Subdivision Unit I, Block III will drain to the west through a proposed sidewalk culvert to McKinney Drive.

The off-site watershed basins were classified as one of the following:

- Area contributing to the existing storm drain system in Pine Park Place and

- Non-contributing areas.

The total contributing area, Basin B, is 10.82 acres with a peak discharge rate of 47.2 cfs for the 100-year storm. The non-contributing area, Basins C through E, is 14.15 acres with a peak discharge of 61.7 cfs for the 100-year storm. Detailed hydrologic calculations for all of the off-site basins are included in the Appendix.

V. HYDRAULIC ANALYSIS

The existing 48" McKinney Drive storm drain along the west end of the site is at a slope of 0.005 ft/ft and has a non-pressurized flow capacity of 101.6 cfs (see the Appendix for hydraulic calculations). The total contributing area has a peak discharge of 47.2 cfs for the 100-year storm developed conditions. However, the capacity of the existing drop inlets in Pine Park Place is only 39.2 cfs, leaving 8.0 cfs in Pine Park Place and McKinney Drive. The existing storm drain thus has the capacity to convey an additional 62.4 cfs under non-pressurized flow conditions.

This 8.0 cfs is proposed to be conveyed to the 48" storm drain by depressing a section of curb and gutter and sidewalk along the west site boundary (McKinney Drive). Flow will then be collected along with flow from the site in a tee drop inlet. (See the following section for additional information.)

VI. DRAINAGE MANAGEMENT PLAN

Under developed conditions, the site will be graded to drain to the western boundary where flow will be collected by a drop inlet connecting to the existing 48" storm drain, as shown on the Preliminary Grading/Drainage Plan. At the west end of the site, between lots 15 and 16, a 20' by 90' area (alley) will be dedicated as right-of-way. This alley will be used to convey flows to the proposed drop inlet. The proposed inlet will discharge directly into the existing 48" storm drain. The alley will also be used for proposed sanitary sewer and water lines serving the subdivision.

A concrete valley gutter section is proposed to convey runoff from the west end of the hammer head cul-de-sac to the drop inlet, as shown on the Preliminary Grading/Drainage Plan. A depressed section of sidewalk along McKinney Drive is proposed to serve as an overflow for the drop inlet and to direct low flows from McKinney Drive to the inlet.

Grading of the individual lots will be as follows:

- Lots 1 through 13 will drain to the street (to the front).

- Lots 17 through 26 will also drain to the street with the exception of the backyards which will drain through weep holes to Forest Hills Drive and San Pedro Drive. Backyard nuisance flows for these lots will be contained on-site. All roof areas will drain to the street in front of the house.

- Lot 14 will drain to McKinney Drive.

- Lots 15 and 16 will have side yard drainage directly to the proposed drop inlet.

A 0.85' waterblock will be constructed at the entrance of the development to prevent any off-site flows from entering the area. The total flow rate in Forest Hills Drive at the entrance to the development is 5.88 cfs. This represents the 100-year peak discharge from Basin D. The slope along Forest Hills Drive at this location is approximately 4.8%, and the street section is 40' wide face-to-face producing a flow depth of 0.2', well below the proposed 0.85' waterblock. (See the Appendix for flow rate and depth calculations.)

VII. CONCLUSIONS

The proposed development will result in an increase in flow of 7.8 cfs compared to the existing undeveloped 100-year flow rate. The total 100-year runoff of 14.1 cfs can easily be conveyed to the Pino Arroyo by the existing 48" storm drain at the west end of the site. The existing storm drain has a capacity of 101.6 cfs and is currently receiving only 39.2 cfs from Forest Hills Subdivision Unit I. With the excess capacity of the existing storm drain, the Drainage Management Plan presented in this report proposes diverting the 14.1 cfs from the development, as well as making provision to collect 8.0 cfs from Forest Hills Subdivision Unit I to the existing storm drain. These flows will be diverted to the existing storm drain by use of a depressed section of curb and gutter and sidewalk along the east side of McKinney Drive and a drop inlet directly over the existing storm drain at the west end of the site. The resulting flow in the existing storm drain will be 61.3 cfs, well below the existing capacity.

JASON DASKALOS ADDITION
(Formerly Forest Hills Subdivision Unit II)

LOT AREAS AND LAND USE

LOT	TOTAL AREA (sf)	BUILDING ENVELOPE AREA (sf)	OPEN SPACE AREA (sf)
1	4086	1713	2373
2	4526	2053	2473
3	5153	1857	3296
4	4635	2289	2346
5	4622	2064	2558
6	4051	2000	2051
7	4051	2000	2051
8	4051	2000	2051
9	4051	2000	2051
10	4051	2000	2051
11	4378	2211	2166
12	4069	2009	2059
13	4474	1938	2537
14	6342	2734	3608
15	4950	1650	3300
16	4950	1650	3300
17	6111	2670	3441
18	4521	1968	2553
19	4360	2233	2127
20	4526	2313	2213
21	4312	2148	2164
22	4670	2342	2328
23	5205	2700	2505
24	5667	2994	2673
25	4552	2807	1745
26	4034	1520	2514
TOTALS:	120398	55863	

IMPERVIOUS AREA FOR LOTS =	55863	(sf)
IMPERVIOUS AREA FOR STREET =	18497	(sf)
IMPERVIOUS AREA FOR SIDEWALK =	7116	(sf)
IMPERVIOUS AREA FOR DRIVEWAY =	10400	(sf)
TOTAL IMPERVIOUS AREA	91876	(sf)
TOTAL AREA = 3.364 ACRES =	146536	(sf)

PERCENT IMPERVIOUS 62.7

JASON DASKALOS ADDITION
(Formerly Forest Hills Subdivision Unit II)

OFF-SITE HYDROLOGY

Contributing Areas

BASIN	AREA (acres)	LAND USE AREAS (acres) A	B	C	D	UNIT PEAK DISCHARGE (cfs/acre) A	B	C	D	TOTAL PEAK DISCHARGE (cfs)
10-YEAR STORM										
B	10.82	0.00	2.43	0.81	7.57	0.58	1.19	2.00	3.39	30.20
100-YEAR STORM										
B	10.82	0.00	2.43	0.81	7.57	1.87	2.60	3.45	5.02	47.15

Non-Contributing Areas

BASIN	AREA (acres)	LAND USE AREAS (acres) A	B	C	D	UNIT PEAK DISCHARGE (cfs/acre) A	B	C	D	TOTAL PEAK DISCHARGE (cfs)
10-YEAR STORM										
C	11.54	0.00	2.60	0.87	8.08	0.58	1.19	2.00	3.39	32.21
D	1.31	0.00	0.29	0.10	0.92	0.58	1.19	2.00	3.39	3.66
E	1.30	0.00	0.29	0.10	0.91	0.58	1.19	2.00	3.39	3.63
									TOTAL	**39.49**
100-YEAR STORM										
C	11.54	0.00	2.60	0.87	8.08	1.87	2.60	3.45	5.02	50.29
D	1.31	0.00	0.29	0.10	0.92	1.87	2.60	3.45	5.02	5.71
E	1.30	0.00	0.29	0.10	0.91	1.87	2.60	3.45	5.02	5.67
									TOTAL	**61.66**

NOTES: 1. CONTRIBUTING AREAS ARE THOSE THAT DISHCARGE TO THE EXISTING 48" STORM DRAIN EAST OF Mc KINNEY DRIVE.
2. LAND USE AREAS BASED ON: 70% D, 22.5% B, AND 7.5% C.

FOREST HILL SUBDIVISION UNIT II

FOREST HILLS DRIVE FLOW CAPACITY

MANNING'S N = .0170 SLOPE = .0480

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.67	3	20.00	0.40	5	40.00	0.67
2	0.00	0.00	4	40.00	0.00			

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.05	0.05	0.1	0.2	5.1	1.6	5.0
0.1	0.1	0.5	1.3	10.2	2.6	10.0
0.15	0.15	1.1	3.8	15.3	3.4	15.0
---------- FOREST HILL @ SAN PEDRO Q=5.71 CFS ----------						
0.2	0.2	2.0	8.1	20.4	4.1	20.0
0.25	0.25	3.1	14.8	25.5	4.7	25.0
0.3	0.3	4.5	24.0	30.6	5.3	30.0
0.35	0.35	6.1	36.2	35.7	5.9	35.0
0.4	0.4	8.0	51.7	40.8	6.5	40.0
0.45	0.45	10.0	74.9	40.9	7.5	40.0
0.5	0.5	12.0	101.3	41.0	8.4	40.0
0.55	0.55	14.0	130.8	41.1	9.3	40.0
0.6	0.6	16.0	163.1	41.2	10.2	40.0
0.65	0.65	18.0	198.1	41.3	11.0	40.0
0.67	0.67	18.8	212.9	41.3	11.3	40.0

JASON DASKALOS ADDITION - MONAHITI PLACE STREET FLOW CAPACITY ANALYSIS
(46' R/W, 27' F-F, ROLL CURB)

MANNING'S N = .0170 SLOPE = .0418

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	-23.00	0.66	5	-11.50	0.06	9	14.13	0.33
2	-19.00	0.58	6	0.00	0.29	10	19.00	0.58
3	-14.13	0.33	7	11.50	0.06	11	23.00	0.66
4	-12.53	0.00	8	12.53	0.00			

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.05	0.05	0.1	0.1	2.2	1.5	2.20
0.10	0.10	0.3	0.6	7.1	2.0	7.03
0.15	0.15	0.8	2.1	12.6	2.8	12.51
0.20	0.20	1.5	5.2	18.0	3.4	18.00
0.25	0.25	2.6	10.4	23.5	4.1	23.48
---------- Q(100) = 14.1 CFS			Yn = 0.27 FT		V(100) = 4.4 FPS	----------
0.30	0.30	3.9	18.4	28.0	4.8	27.97
0.35	0.35	5.3	30.3	29.1	5.7	29.04
0.40	0.40	6.8	44.0	31.1	6.5	30.99
0.45	0.45	8.4	60.1	33.0	7.2	32.94
0.50	0.50	10.1	78.6	35.0	7.8	34.88
0.55	0.55	11.9	99.6	36.9	8.4	36.83
0.60	0.60	13.8	120.7	40.1	8.8	40.00
0.65	0.65	15.9	141.8	45.1	8.9	45.00
0.66	0.66	16.4	146.4	46.1	9.0	46.00

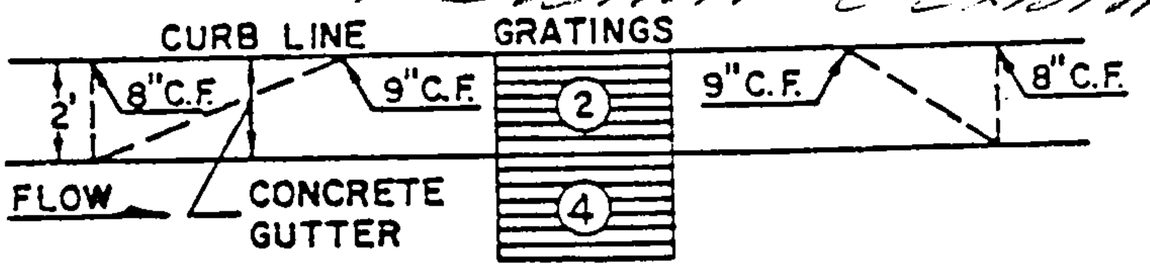
Velocity Head = V^2/2g = 0.30'
Energy Grade Line (EGL) = 0.27' + 0.30' = 0.57'

Note: Elevation at Right-of-Way = 0.66' which is greater than the calculated EGL of 0.57'.

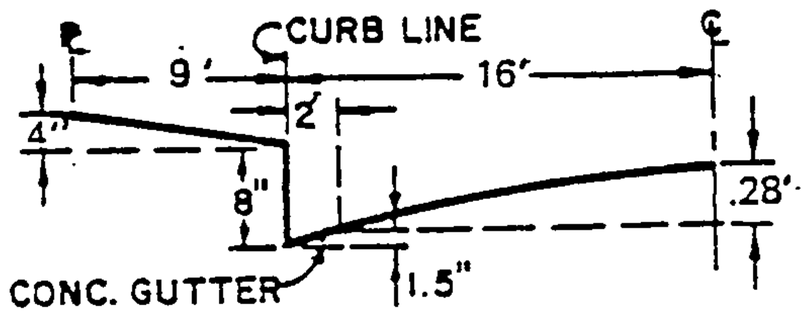
.33
.19
52

GRATING CAPACITIES FOR TYPE "B"

CALCULATION OF Q FOR EXISTING STORM DRAIN (EXISTING INLET CAPACITY)



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

At 1st Pair on Inlets
$Q_{100} = 47.2 \Rightarrow D = 0.43$
$S = 0.03$
$Cap = 10.5$
$\times 2$ (for 2 inlets)

At 2nd Pair Inlets
$Q = 47.2 - 21 = 26.2$
$\Rightarrow D = 0.33$ $Cap = 5.4$
$\times 2$ (for 2 inlets)

At 3rd Pair Inlets
$Q = 26.2 - 10.8 = 15.4$
$\Rightarrow D = 0.28$ $Cap = 3.7$
$15.4 - 7.4 = 8.0$

Total Capacity of Inlets = 39.2 cfs

JASON DASKALOS ADDITION (Formerly Forset Hills Subdivision Unit II)

EXISTING STORM DRAIN CAPACITY

CULVERT RATING TABLE

48. INCH DIAMETER PIPE

N = 0.01300 INCREMENT = 2.00 SLOPE = 0.00500

FLOW DEPTH (IN)	FLOW AREA (SQ FT)	DISCHARGE (CFS)	VELOCITY (FPS)
2.00000	0.17915	0.33030	1.84365
4.00000	0.50017	1.44412	2.88727
6.00000	0.90662	3.38253	3.73093
8.00000	1.37665	6.13301	4.45501
10.00000	1.89666	9.65994	5.09312
12.00000	2.45673	13.91335	5.66335
14.00000	3.04898	18.83283	6.17676
16.00000	3.66675	24.34973	6.64068
18.00000	4.30421	30.38838	7.06015
20.00000	4.95605	36.86681	7.43876
--------- Q (Existing) = 39.2 cfs D = 20.68"=1.72'----------			
22.00000	5.61729	43.69709	7.77904
24.00000	6.28318	50.78548	8.08277
26.00000	6.94907	58.03215	8.35106
--------- Q (w/Development) = 61.3 cfs D = 26.89"=2.24'-------			
28.00000	7.61031	65.33073	8.58450
30.00000	8.26215	72.56744	8.78312
32.00000	8.89961	79.61965	8.94642
34.00000	9.51738	86.35354	9.07325
36.00000	10.10963	92.62036	9.16160
38.00000	10.66970	98.25001	9.20832
40.00000	11.18971	103.03874	9.20835
42.00000	11.65974	106.72390	9.15319
44.00000	12.06619	108.91997	9.02687
46.00000	12.38721	108.88951	8.79048
48.00000	12.56637	101.57108	8.08277

NOTE: Q (w/Development) = 39.2 + 14.1 + 8.0 = 61.3 cfs
WHERE THE 8.0 cfs REPRESENTS FLOWS FROM FOREST HILLS UNIT I, DIVERTED TO THE PROPOSED DROP INLET THROUGH THE DEPRESSED SECTION OF CURB AND GUTTER AND SIDEWALK ALONG McKINNEY DRIVE AT ADJACENT TO THE PROPOSED CONCRETE DRAINAGE ALLEY AT THE WEST END OF MONHITI PLACE.

HAMMER HEAD CONCRETE RUNDOWN TO MCKINNEY STORM DRAIN

MANNING'S N = .0170 SLOPE = .0400

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	1.00	4	10.00	0.00	7	20.00	1.00
2	0.00	0.35	5	12.00	0.13			
3	8.00	0.13	6	20.00	0.35			

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.05	0.05	0.0	0.1	1.5	1.5	1.54
0.10	0.10	0.2	0.4	3.1	2.4	3.08
0.15	0.15	0.4	1.0	5.5	2.8	5.45
0.20	0.20	0.7	2.3	9.1	3.2	9.09
0.25	0.25	1.3	4.7	12.7	3.7	12.73
0.30	0.30	2.0	8.5	16.4	4.3	16.36
0.35	0.35	2.9	14.0	20.0	4.8	20.00
---------- Q(100) = 14.1 CFS			Yn = 0.35 FT		V(100) = 4.8 FPS	----------
0.40	0.40	3.9	22.8	20.1	5.9	20.00
0.45	0.45	4.9	33.3	20.2	6.8	20.00
0.50	0.50	5.9	45.2	20.3	7.7	20.00
0.55	0.55	6.9	58.5	20.4	8.5	20.00
0.60	0.60	7.9	73.1	20.5	9.3	20.00
0.65	0.65	8.9	88.9	20.6	10.0	20.00
0.70	0.70	9.9	105.8	20.7	10.7	20.00
0.75	0.75	10.9	123.8	20.8	11.4	20.00
0.80	0.80	11.9	142.8	20.9	12.0	20.00
0.85	0.85	12.9	162.9	21.0	12.6	20.00
0.90	0.90	13.9	183.9	21.1	13.2	20.00
0.95	0.95	14.9	205.8	21.2	13.8	20.00
1.00	1.00	15.9	228.6	21.3	14.4	20.00

Velocity Head = V^2/2g = 0.36'
Energy Grade Line (EGL) = 0.35' + 0.36' = 0.71'