[redacted]

DRAINAGE REPORT

FOR

EL RANCHO GRANDE UNIT 1-B

Prepared for

Curb, Inc.
6301 Indian School Rd. NE
Albuquerque, NM 87110

Prepared by

Mark Goodwin & Associates, PA
P.O. Box 90606
Albuquerque, NM 87199

JAMES D. HUGHES
11674
NEW MEXICO
REGISTERED PROFESSIONAL ENGINEER

10-17-01
Rev 11-9-01
J.D.H.

October 2001

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DRAINAGE INFORMATION SHEET

PROJECT TITLE: El Rancho Grande I Units1-B ZONE ATLAS#: M-9

DRB#: EPC# WORKORDER#:

LEGAL DESCRIPTION: A Tract of Land situate within the Town of Atrisco Grant, projected Section 33, Township 10 North, Range 2 East, projected Section 4, Township 9 North, Range 3 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico being all of Parcel 12, El Rancho Grande 1.

CITY ADDRESS:

ENGINEERING FIRM: Mark Goodwin & Associates, PA CONTACT: James D. Hughes, PE

ADDRESS: P.O. Box 90606, Albuquerque, NM 87199 PHONE: 828-2200

OWNER: Curb, Inc. CONTACT: Bo Johnson

ADDRESS: 6301 Indian School Rd. NE, Albuq., NM 87110 PHONE: 881-9190

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: Aldrich Land Surveying CONTACT: Tim Aldrich

ADDRESS: P.O. Box 30701, Albuquerque, NM 87190 PHONE: 884-1990

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

__ DRAINAGE PLAN

__ CONCEPTUAL GRADING & DRAINAGE PLAN

X GRADING PLAN

X EROSION CONTROL

__ ENGINEER'S CERTIFICATION

__ OTHER

__ EASEMENT VACATION

PRE-DESIGN MEETING:

__ YES

X NO

__ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

__ SKETCH PLAT APRROVAL

X PRELIMINARY PLAT APRROVAL

__ S. DEV. PLAN FOR SUB'D APPROVAL

__ S. DEV. PLAN FOR BLDG PERMIT APPROVAL

__ SECTOR PLAN APPROVAL

__ FINAL PLAT APPROVAL

__ FOUNDATION PERMIT APPROVAL

__ BUILDING PERMIT APPROVAL

__ CERTIFICATION OF OCCUPANCY APPROVAL

X GRADING PERMIT APPROVAL

__ PAVING PERMIT APPROVAL

__ S.A.D. DRAINAGE REPORT

__ DRAINAGE REQUIREMENTS

__ OTHER

__ RELEASE OF FINANCIAL GUARANTY

__ TRAFFIC CIRCULATION LAYOUT

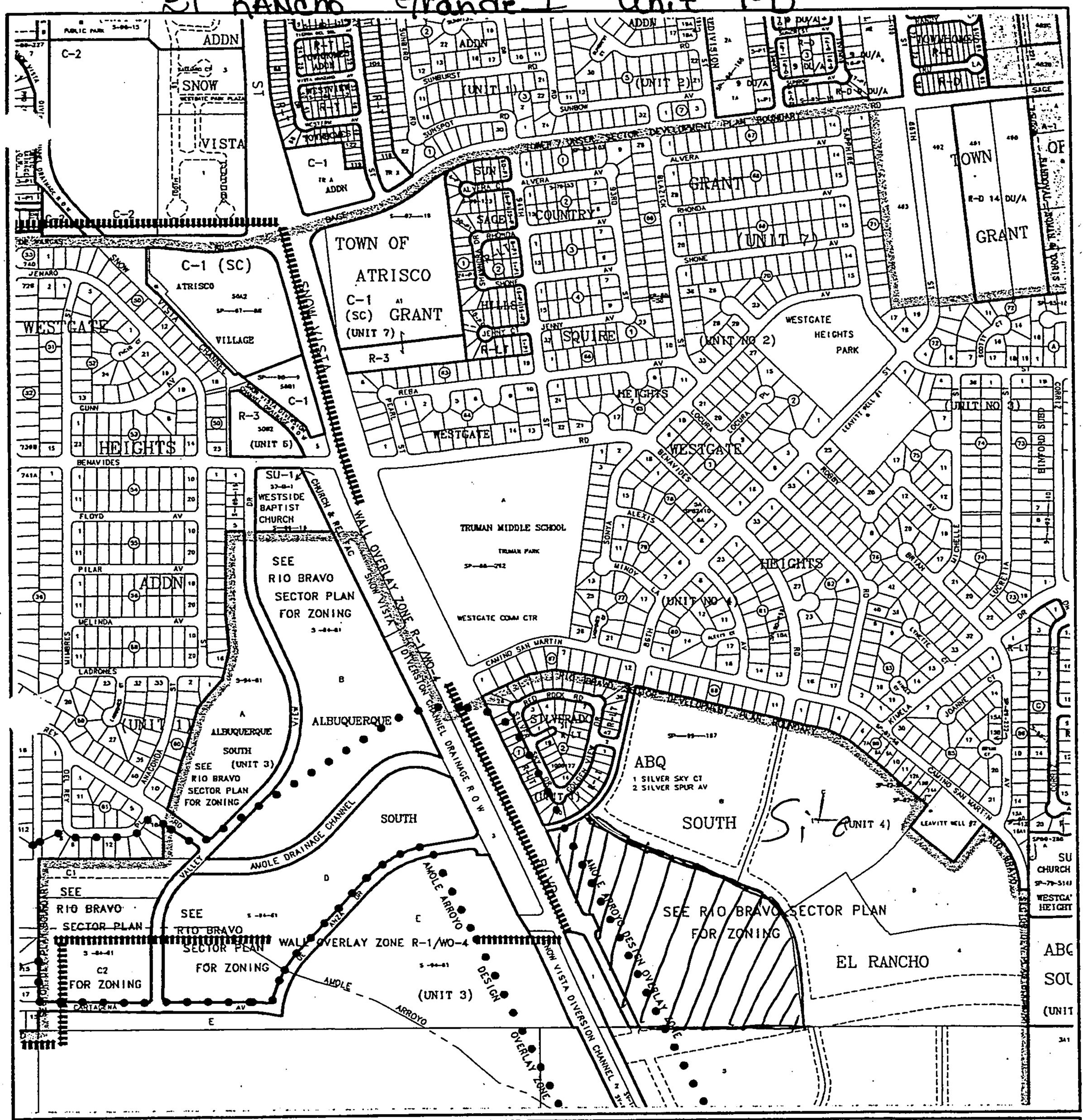
DATE SUBMITTED: 10-19-01

BY: James D. Hughes

James D. Hughes, PE

RECEIVED
OCT 19 2001
HYDROLOGY SECTION

El Rancho Grande I Unit 1-B


ADDN
C-2
SNOW VISTA
VISTA
C-1
TR A ADDN
SUNBURST
(UNIT 1)
SUNSPOT
(UNIT 2)
SUNBOW
ALVERA
GRANT
(UNIT 7)
TOWN OF ATRISCO
C-1 (SC)
ATRISCO
VILLAGE
C-1 (SC) GRANT
(UNIT 7)
R-3
SAGE
COUNTRY
RHONDA
SHONE
HILLS
JENNY
SQUIRE
WESTGATE HEIGHTS PARK
(UNIT NO 2)
WESTGATE HEIGHTS
(UNIT NO 3)
(UNIT NO 4)
WESTGATE
HEIGHTS
REBA
PEARL
JENARO
SNOW
GUNN
BENAVIDES
FLOYD
PILAR
MELINDA
LADRONES
ALEXIS
SONYA
MINDY
BRIAN
MICHELLE
LUKRETIA
KIMMELA
JOANNE
LOCURA
ROBBY
SU-1
WESTSIDE BAPTIST CHURCH
TRUMAN MIDDLE SCHOOL
TRUMAN PARK
WESTGATE COMM CTR
CAMINO SAN MARTIN
RED ROCK RD
SILVERADO
GOLDEN VIEW
ABQ
1 SILVER SKY CT
2 SILVER SPUR AV
SOUTH
(UNIT 4)
LEAVITT WELL #7
SEE RIO BRAVO SECTOR PLAN FOR ZONING
EL RANCHO
SEE RIO BRAVO SECTOR PLAN FOR ZONING
ALBUQUERQUE
ALBUQUERQUE SOUTH
(UNIT 3)
SEE RIO BRAVO SECTOR PLAN FOR ZONING
SEE RIO BRAVO SECTOR PLAN FOR ZONING
C2 FOR ZONING
WALL OVERLAY ZONE R-1/WO-4
AMOLE ARROYO
AMOLE DRAINAGE CHANNEL
SNOW VISTA DIVERSION CHANNEL
CHURCH & REID AC
VALLEY
CARTAGENA
OVERLAY ZONE
DESIGN
(UNIT 1)
(UNIT 5)
(UNIT 6)
SUNSET VISTA
SUNSHINE
SAGE
RAINBOW
TOWN OF
GRANT
R-D 14 DU/A
R-D
R-LT
R-1
R-3
C-1
C-2
SU-1
ADDN
SUNSET VISTA DIVERSION CHANNEL DRAINAGE R O W
SUNSET VISTA DIVERSION CHANNEL DRAINAGE CHANNEL
SNOW VISTA DIVERSION CHANNEL DRAINAGE R O W
PUBLIC PARK
SUNSET VISTA
SUNSET VISTA DRAINAGE R O W
SUNSET VISTA DIVERSION CHANNEL DRAINAGE CHANNEL
SUNSET VISTA DIVERSION CHANNEL

PURPOSE

The primary purpose of this report is to demonstrate the adequacy of the proposed drainage to allow this 12.7 acre site to be subdivided into about 84 single-family, detached, residential lots, and so associated public drainage infrastructure can be constructed and turned over to the City of Albuquerque for maintenance.

EXISTING CONDITIONS

This 12.7 acre site has about 25' of fall across it and drains from the Northwest to the Southeast. Upstream drainage is diverted by the Snow Vista Channel leaving a 150" wide PNM Power Transmission Easement above this site. Development of El Rancho Grande Unit 2B is underway and will complete the construction of Barbados Ave. to the east which will receive drainage from this site, and 86th Street is already complete to the north of this site.

Undeveloped commercial land is to the south, between this site and Gibson. This area is planned to drain through the private pond in the northwest corner of the intersection of Gibson and Barbados Ave., through the storm sewer in Gibson Blvd, and into the public pond in the southwest corner of the intersection of Gibson Blvd. and Unser Blvd., as identified in the Drainage Report for El Rancho Grande Units 4A & 4B, as revised March 2, 2001. (M9/D19A)

PROPOSED MANAGEMENT PLAN

This 12.7 acre residential development will free discharge surface drainage into Barbados Ave., and the private commercial pond in the north west corner of the Intersection of Gibson Blvd., and Barbados Ave. will discharge less flow such that the combined peak flow in the storm sewer at the intersection does not exceed 204.7 cfs as used in the original HGL calculation for the storm sewer in Gibson. The street capacity in Barbados Ave., below this site does not meet strict DPM criteria (ie. normal depth = 0.72', velocity =4.6 fps, energy depth = 1.05' but it fits in the right-of-way which has no driveways or intersecting streets below this site, and it is contained with walls on both sides of the street. Crushed gravel landscaping is proposed between the curbs and sidewalks to insure no erosion in the public right-of-way. The cattle guard grate on Barbados just north of Gibson Blvd. has capacity for the increased flow, and all of the onsite streets have capacity for surface drainage in accordance with DPM requirements.

ANALYSIS PROCEDURES

This 12.7 acre site was subtracted from Basin # 105 and added to Basin # 104 in the AHYMO model that was previously used for El Rancho Grande Unit 4A & 4B and the allowable discharge from the pond in the northwest corner of the intersection of Barbados Ave., and Gibson was reduced. The revised summary table, basin map, pond outlet structure calculations and AHYMO is included here in Note that basin # 104 increased by cfs from cfs to 125.64 cfs as a result of adding this 12.7 acre site. The cfs is pro rated based on area for the purpose of street capacity calculations.

TABLE 1 - SUMMARY OF HYDROLOGY

Description	Basin ID	Area	Area Sq. Mi.	Land Treatment				Hr. Tp	100YR Peak Flow		100YR Volume		10YR Peak Flow	
				A	B	C	D		Incrum.	Cumm.	6 hr	10 day	Incrum.	Cumm.
School Existing	101	20.9	0.0327	0	25	25	50	0.13	72.46	—	2.462	3.751		
(1)3.7 du/ac Existing	102 (1)	34.63	0.0541	0	24	20	56	0.27	82.42	122.89	4.254	6.646		
(3)5.4 du/ac Existing	103	31.96	0.0499	0	25	20	55	0.17	99.23	208.87	3.889	6.057		
(3)5.4 du/ac	104	34.07	0.0730	0	25	20	55	0.22	125.64	—	5.689	8		
(2)Commercial Existing	105	23.2	0.0165	0	0	10	90	0.14	44.04	10.7	1.663	4.238		
Gibson Blvd.	111	2.87	0.0045	0	35	0	65	0.13	10.41	142.7	0.367	0.597		
(3)Commercial	106	15.38	0.0240	0	0	10	90	0.13	65.87	195.3	2.418	4.125		
(3)5.4 du/ac	107	32.05	0.0501	0	25	20	55	0.13	113.50	—	3.905	6.079		
Pond In	108	2.9	0.0045	0	0	20	80	0.13	11.93	508.54	0.430	0.716		
Pond Out	—	100 YR. Elev = 48.76					—	—	—	120.41	—	—		
Unser @ Gibson	109	5.6	0.0088	0	35	0	65	0.13	12.95	122.71	0.457	0.906		
Unser @ Gibson	110	1.1	0.0018	0	35	0	65	0.13	4.17	123.58	0.147	0.235		
(3)Park	302	6.71	0.0105	0	70	10	20	0.13	17.61	17.61	0.546	0.712		
(3)5.4 du/ac	205	22.39	0.0350	0	25	20	55	0.13	79.30	96.91	2.728	4.247		
Unser Blvd.	204	3.3	0.0052	0	35	0	65	0.13	19.18	116.09	0.678	0.943		
Blake Road	203	1.9	0.0030	0	15	0	85	0.13	7.86	123.95	0.287	0.486		
(3)5.4 du/ac Future	202	22.9	0.0358	0	25	20	55	0.13	81.11	205.06	2.790	4.343		
Unser Blvd.	201	3.8	0.0059	0	35	0	65	0.13	13.64	218.70	0.482	0.787		

(1) Rear yard ponding areas are subtracted from total area (61.5 ac) @ 40% impervious and weighted impervious is based on composite calculations for 17 subareas as presented in the previously approved report for El Rancho Grande Units 1, 2 and 3 (see Basin Map and Composite Calcs).

(2) Area currently zoned commercial, but will have limited discharge due to downstream capacity constraints.

(3) Land treatments match the "Revision to the Master Drainage Plan for the Rio Bravo Sector Development Plan" March 2000.

(4) The pond on Tract 12 (Basin #105) is sized such that 100 YR peak flows combined do not exceed 204.7 cfs as used in the original HGL calculations for the storm sewer in Gibson east of Barbados.

100 YEAR PRECIPITATION *(From Figures D, E and F, and Eq. 28 of DPM 22.2)*

P_{60} = 1.90", P_{360} = 2.22", P_{1440} = 2.67", $P_{10\ days}$ = 10.0-[24.9/(2.67")$^{1.4}$] = 3.70"

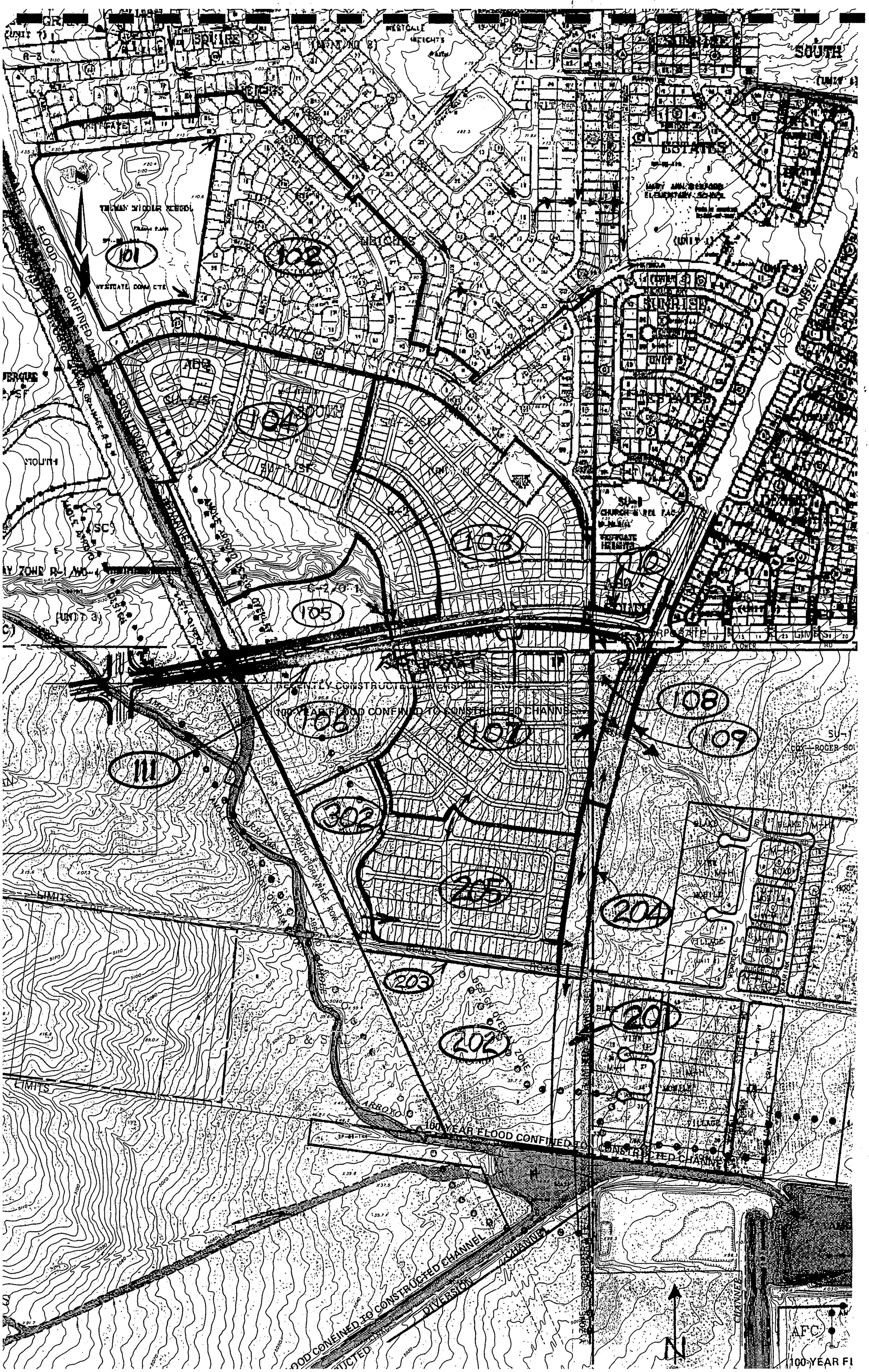

100-YEAR FLOOD CONFINED TO CONSTRUCTED CHANNEL
100-YEAR FLOOD CONFINED TO CONSTRUCTED CHANNEL
DIVERSION CHANNEL
ARROYO
SOUTH
ESTATES
SUNRISE
SPRING FLOWER RD
UNSER BLVD
ELEMENTARY SCHOOL
TAMMEN MIDDLE SCHOOL
FLOOD CONFINED
ZONE A-1 AND A-4
LIMITS
D & S RR
101
102
103
104
105
106
107
108
109
111
202
203
204
205
302
AFC
100-YEAR FL

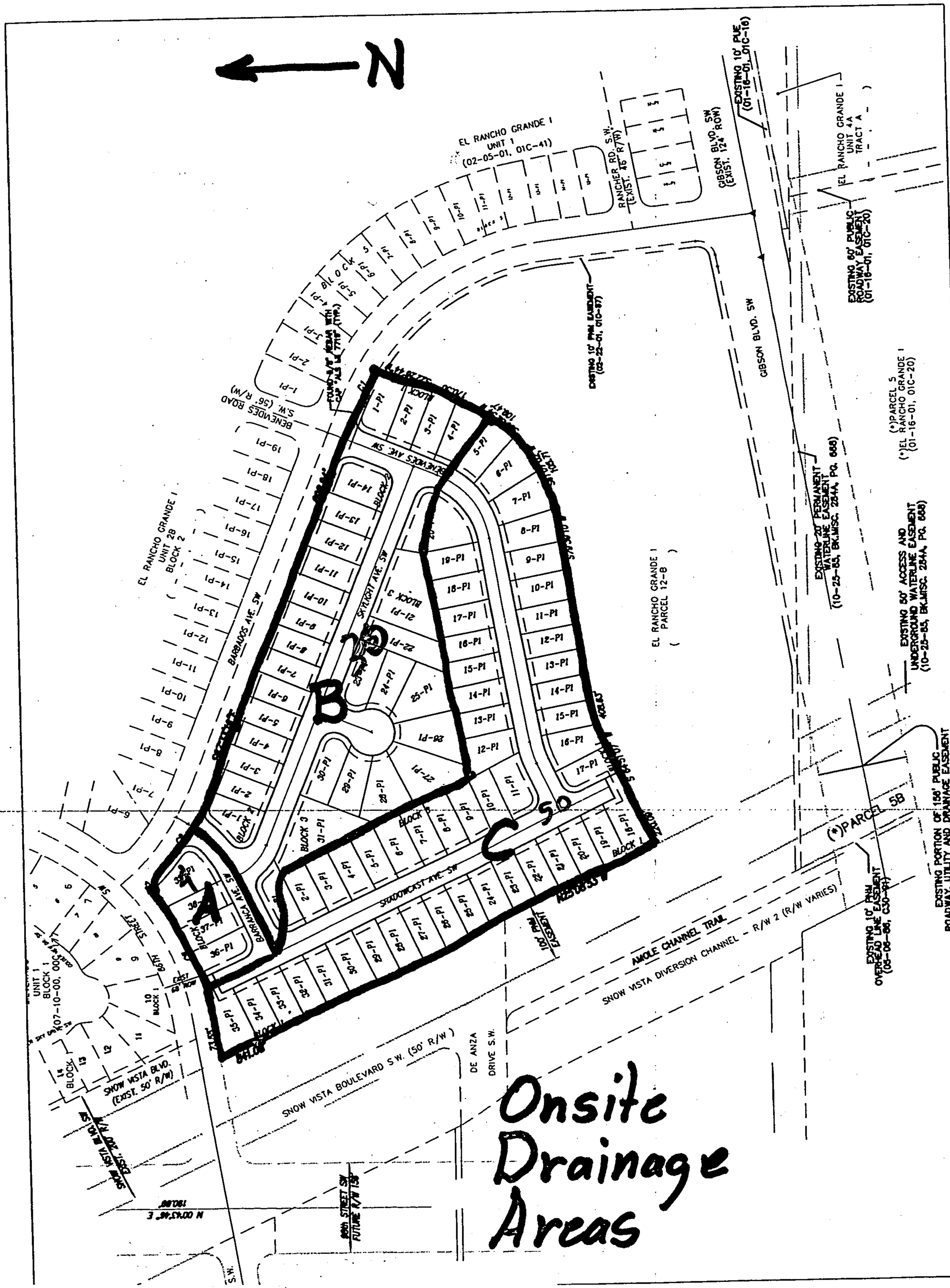
TABLE 2 — STREET DRAINAGE CAPACITIES

Basin No.	Area Ac.	% of Total	100 Year Flow (cfs)		Contributing Basins	Curb Type/Slope	Flow Depth ft(1)	Velocity fps	Energy Depth ft(2)	Location
			Increment.	Cumm.						
A	0.71	5.59%	1.90			Roll 28'/2.12%	0.26	2.5	0.36	Bavanca Ave.
B	4.88	38.43%	13.08			Std. 26'/7.7%	0.29	5.5	0.76	Sky Light Ave.
C	7.11	55.98%	19.06			Std. 26'/7.7%	0.33	6	0.88	Benevedas
B & C				34.14	B & C	Std. 28'/2.0%	0.49	4.3	0.76	Benevedas

* 100 year surface flow after inlet interception is accounted for (see inlet calcs).

(1) Flow depths are taken from Plate 22.3 D-1 and 22.3 D-2 of the DPM and reduced by 3/4" for roll curb types to account for the difference in gutter depression. Allowable depths may not exceed curb heights which are 0.33' for roll curb and gutter and 0.67' for standard curb and gutter.

(2) Energy depth is calculated as flow depth plus energy head. Allowable depths are 0.20' above top of curb.


N
EL RANCHO GRANDE I
UNIT 1
(02-05-01, 01C-41)
RANCHER RD. S.W.
(EXIST. 46' R/W)
GIBSON BLVD. SW
(EXIST. 124' ROW)
EXISTING 10' PUE
(01-16-01, 01C-16)
EL RANCHO GRANDE I
UNIT 4A
TRACT A
EXISTING 60' PUBLIC
ROADWAY EASEMENT
(01-16-01, 01C-20)
EXISTING 10' PWM EASEMENT
(02-22-01, 01C-57)
BENEMOES ROAD S.W. (56' R/W)
EL RANCHO GRANDE I
UNIT 2B
BLOCK 2
BARBADOS AVE. SW
SKYLIGHT AVE. SW
BENEMOES AVE. SW
SHADOWCAST AVE. SW
BARRANCA AVE. SW
BLOCK 1
BLOCK 2
BLOCK 3
EL RANCHO GRANDE I
PARCEL 12-B
EXISTING 20' PERMANENT
WATERLINE EASEMENT
(10-25-85, BK.MISC. 284A, PG. 668)
EXISTING 50' ACCESS AND
UNDERGROUND WATERLINE EASEMENT
(10-25-85, BK.MISC. 284A, PG. 668)
(*)EL RANCHO GRANDE I
(01-16-01, 01C-20)
(*)PARCEL 5
(*)PARCEL 5B
EXISTING PORTION OF 150' PUBLIC
ROADWAY, UTILITY AND DRAINAGE EASEMENT
(01-16-01, 01C-20)
EXISTING 10' PWM
OVERHEAD LINE EASEMENT
(05-05-86, C30-44)
100' PWM EASEMENT
AMOLE CHANNEL TRAIL
SNOW VISTA DIVERSION CHANNEL - R/W 2 (R/W VARIES)
SNOW VISTA BOULEVARD S.W. (50' R/W)
DE ANZA DRIVE S.W.
SNOW VISTA BLVD.
(EXIST. 50' R/W)
80TH STREET SW
FUTURE R/W 150'
A
B
C
5D
Onsite
Drainage
Areas

Basin #102 Composite Calculations

BASIN ID	HYD ID	AREA (SQ MI)	AREA (ACRES)	IMPERVIOUS (%)	IMPERVIOUS AREA
A	101	.01513	? 9.68	60	5.81
B-1	102	.00439	2.81	62	1.74
B-2	103	.00138	0.88	53	0.47
B-3	104	.00247	1.58	46	0.73
C-1	105	.00450	2.88	51	1.47
C-2	106	.00150	0.96	11	0.11
C-3	107	.00152	0.97	80	0.78
C-4	108	.00142	0.91	48	0.44
C-5	109	.00306	1.96	57	1.12
C-6	110	.00202	1.29	57	0.74
C-7	111	.00206	1.32	47	0.62
D-1	112	.00284	1.82	51	0.93
D-2	113	.00081	0.52	34	0.18
D-3	114	.00083	0.53	38	0.20
E-1	115	.00150	0.96	56	0.54
OS-1	116	.00120	0.77	22	0.17
OS-2	117	.00748	4.79	70	3.35
TOTAL		0.05411	34.63	56	19.37

O.S.-2
4.79 AC.

O.S.-1
3.92 AC.

O.S.-3
19.01 AC.

O.S.-4
2.01 AC.

C-4
C-7
C-4
C-5
C-6
C-3
C-1
C-8
D-1
D-3
D-2
E-1
A
B-7
B-5
B-4
B-6
B-3
B-2
B-1

SCALE IN FEET
1"=100'

LEGEND

- Q_{100} (QUANTITY AND DIRECTION OF FLOW FOR DEVELOPED RUNOFF AT POINT INDICATED IN C.F.S.)
- WATERSHED BOUNDARY.
- WATER BLOCK OR SUMMIT.
- AREA OF WATERSHED DRAINED TO AND ACCUMULATED IN LOT PONDING.
- VALLEY GUTTER AND DIRECTION OF FLOW.

LOCATION & VICINITY MAP
SCALE: 1" = 800'

WESTGATE HEIGHTS UNIT 3
WESTGATE HEIGHTS UNIT 4

REVISIONS

JOB NO. 8130011
MURRAY-McCORMICK, INC.
ENVIRONMENTAL DESIGN
ENGINEERING-PLANNING-SURVEYING

Figure 4

WESTGATE HEIGHT
UNIT NO. 4
DEVELOPED DRAINAGE
CHARACTERISTICS

DATE 1-8-79 | SCALE 1" = 100'

Basin 102
Map

M9-D9

POND-2 Version: 4.01
S/N: 88020607

POND #1, @ N.W. CORNER OF BARBADOSE AND GIBSON

Pond Volume Calcs

CALCULATED 10-16-2001 17:54:30
DISK FILE : G:ERG1B .VOL

Planimeter scale: 1 inch = 1 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	* Volume (acre-ft)	Volume Sum (acre-ft)
70.20	2,500.00	0.06	0.00	0.00	0.00
71.20	*I*	0.07	0.19	0.06	0.06
72.20	*I*	0.09	0.22	0.14	0.14
73.20	*I*	0.11	0.24	0.24	0.24
74.20	*I*	0.13	0.27	0.36	0.36
75.20	*I*	0.15	0.30	0.49	0.49
76.20	*I*	0.17	0.33	0.65	0.65
77.20	*I*	0.19	0.36	0.83	0.83
78.20	*I*	0.22	0.39	1.04	1.04
79.20	10,816.00	0.25	0.43	1.28	1.28

I ---> Interpolated area from closest two planimeter readings.

$$IA = (sq.rt(Area1) + ((Ei-E1)/(E2-E1))*(sq.rt(Area2)-sq.rt(Area1)))^2$$

where: E1, E2 = Closest two elevations with planimeter data
Ei = Elevation at which to interpolate area
Area1,Area2 = Areas computed for E1, E2, respectively
IA = Interpolated area for Ei

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Outlet Structure File: ERG1B .STR

POND-2 Version: 4.01 S/N: 88020607
Date Executed: 10-16-2001 Time Executed: 17:49:52

Pond Outflow Calcs

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
70.20	0.0	+01
71.20	2.8	+01
72.20	4.9	+01
73.20	7.1	+01
74.20	8.1	+01
75.20	9.0	+01
76.20	9.8	+03
77.20	10.6	+03
78.20	11.4	+03
79.19	12.1	+03
79.20	0.0	

Inlet Control 12" RCP Projecting

Orifice

AHYMO 100-YR SUMMARY

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =10/16/2001
INPUT FILE = ERG12-99.DAT USER NO.= M_GOODWN.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.220
COMPUTE NM HYD	101.00	-	3	.03270	72.46	2.462	1.41183	1.499	3.462	PER IMP=	50.00
ROUTE	101.10	3	1	.03270	40.50	2.462	1.41183	1.632	1.935		
COMPUTE NM HYD	102.00	-	2	.05410	82.42	4.254	1.47432	1.665	2.381	PER IMP=	56.00
ADD HYD	102.10	1& 2	3	.08680	122.89	6.716	1.45075	1.632	2.212		
COMPUTE NM HYD	103.00	-	2	.04990	99.23	3.889	1.46127	1.532	3.107	PER IMP=	55.00
ADD HYD	103.10	3& 2	1	.13670	208.87	10.605	1.45459	1.598	2.387		
COMPUTE NM HYD	104.00	-	2	.07300	125.64	5.689	1.46127	1.598	2.689	PER IMP=	55.00
COMPUTE NM HYD	105.00	-	3	.01650	44.04	1.663	1.88924	1.499	4.171	PER IMP=	90.00
ROUTE RESERVOIR	105.10	3	7	.01650	10.70	1.663	1.88922	2.031	1.013	AC-FT=	.869
ADD HYD	105.20	2& 7	4	.08950	135.28	7.352	1.54016	1.598	2.362		
COMPUTE NM HYD	111.00	-	5	.00450	10.41	.367	1.53124	1.499	3.613	PER IMP=	65.00
ADD HYD	111.10	4& 5	2	.09400	142.70	7.719	1.53972	1.598	2.372		
COMPUTE NM HYD	106.00	-	3	.02400	65.87	2.418	1.88924	1.499	4.288	PER IMP=	90.00
ADD HYD	106.10	2& 3	4	.11800	195.30	10.137	1.61081	1.565	2.586		
COMPUTE NM HYD	107.00	-	2	.05010	113.50	3.905	1.46127	1.499	3.540	PER IMP=	55.00
ADD HYD	107.10	4& 2	3	.16810	303.04	14.042	1.56624	1.532	2.817		
COMPUTE NM HYD	108.00	-	2	.00450	11.93	.430	1.79252	1.499	4.141	PER IMP=	80.00
ADD HYD	108.10	3& 2	4	.17260	314.47	14.472	1.57214	1.532	2.847		
ADD HYD	108.20	4& 1	5	.30930	508.54	25.077	1.52019	1.565	2.569		
ROUTE RESERVOIR	108.30	5	3	.30930	120.41	25.076	1.52015	2.164	.608	AC-FT=	14.243
COMPUTE NM HYD	109.00	-	2	.00560	12.95	.457	1.53124	1.499	3.612	PER IMP=	65.00
ADD HYD	109.10	3& 2	4	.31490	122.71	25.534	1.52035	2.031	.609		
COMPUTE NM HYD	110.00	-	2	.00180	4.17	.147	1.53124	1.499	3.621	PER IMP=	65.00
ADD HYD	110.10	4& 2	1	.31670	123.58	25.681	1.52041	1.998	.610		
COMPUTE NM HYD	201.00	-	1	.00590	13.64	.482	1.53124	1.499	3.612	PER IMP=	65.00
COMPUTE NM HYD	202.00	-	2	.03580	81.11	2.790	1.46127	1.499	3.540	PER IMP=	55.00
COMPUTE NM HYD	203.00	-	3	.00300	7.86	.287	1.79108	1.499	4.091	PER IMP=	85.00
COMPUTE NM HYD	204.00	-	4	.00830	19.18	.678	1.53124	1.499	3.611	PER IMP=	65.00
COMPUTE NM HYD	205.00	-	5	.03500	79.30	2.728	1.46127	1.499	3.540	PER IMP=	55.00
COMPUTE NM HYD	302.00	-	7	.01050	17.61	.546	.97483	1.499	2.621	PER IMP=	20.00
FINISH											

AHYMO 100-YR OUTPUT

```
    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
         RUN DATE (MON/DAY/YR) = 10/16/2001
         START TIME (HR:MIN:SEC) = 17:58:46     USER NO.= M_GOODWN.I01
         INPUT FILE = ERG12-99.DAT

START                TIME=0.0
***** EL RANCHO GRANDE I, UNIT 4.
***** 100-YEAR 6-HOUR STORM EVENT
***** JAN. 10, 2001
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.90 IN RAIN SIX=2.22 IN
                     RAIN DAY=2.67 IN DT=0.0333 HR

                COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                DT =    .033300 HOURS       END TIME =     5.994000 HOURS
                   .0000   .0015   .0030   .0046   .0062   .0079   .0095
                   .0113   .0130   .0148   .0167   .0186   .0205   .0226
                   .0246   .0267   .0289   .0312   .0335   .0360   .0385
                   .0411   .0438   .0466   .0495   .0525   .0557   .0591
                   .0626   .0664   .0703   .0755   .0811   .0871   .0995
                   .1278   .1716   .2346   .3206   .4338   .5783   .7582
                   .9780  1.1890  1.2755  1.3484  1.4131  1.4719  1.5260
                  1.5763  1.6232  1.6672  1.7086  1.7477  1.7846  1.8195
                  1.8526  1.8840  1.9138  1.9420  1.9689  1.9761  1.9819
                  1.9873  1.9925  1.9974  2.0022  2.0067  2.0111  2.0153
                  2.0193  2.0233  2.0271  2.0308  2.0343  2.0378  2.0412
                  2.0445  2.0477  2.0509  2.0539  2.0569  2.0598  2.0627
                  2.0655  2.0682  2.0709  2.0736  2.0762  2.0787  2.0812
                  2.0837  2.0861  2.0884  2.0908  2.0931  2.0953  2.0975
                  2.0997  2.1019  2.1040  2.1061  2.1082  2.1102  2.1122
                  2.1142  2.1162  2.1181  2.1200  2.1219  2.1238  2.1256
                  2.1275  2.1293  2.1310  2.1328  2.1345  2.1363  2.1380
                  2.1397  2.1413  2.1430  2.1446  2.1462  2.1478  2.1494
                  2.1510  2.1525  2.1541  2.1556  2.1571  2.1586  2.1601
                  2.1616  2.1631  2.1645  2.1659  2.1674  2.1688  2.1702
                  2.1716  2.1730  2.1743  2.1757  2.1770  2.1784  2.1797
                  2.1810  2.1823  2.1836  2.1849  2.1862  2.1875  2.1887
                  2.1900  2.1912  2.1924  2.1937  2.1949  2.1961  2.1973
                  2.1985  2.1997  2.2009  2.2020  2.2032  2.2043  2.2055
                  2.2066  2.2078  2.2089  2.2100  2.2111  2.2122  2.2133
                  2.2144  2.2155  2.2166  2.2177  2.2187  2.2198

COMPUTE NM HYD       ID=3 HYD NO=101.0 AREA=0.0327 SQ MI
                     PER A=0 PER B=25 PER C=25 PER D=50
                     TP=0.1333 HR MASS RAINFALL=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    64.551     CFS    UNIT VOLUME =     .9992        B =    526.28       P60 = 1.9000
```

AREA = .016350 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .118483HR TP = .133300HR K/TP RATIO = .888844 SHAPE CONSTANT, N = 3.990548
UNIT PEAK = 43.486 CFS UNIT VOLUME = 1.000 B = 354.54 P60 = 1.9000
AREA = .016350 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 101.00

RUNOFF VOLUME = 1.41183 INCHES = 2.4622 ACRE-FEET
PEAK DISCHARGE RATE = 72.46 CFS AT 1.499 HOURS BASIN AREA = .0327 SQ. MI.

COMPUTE RATING CURVE CID=1 VS NO=4 CODE=1 EL MIN=0 EL MAX=1.0 FT SLOPE=.02
FRICTION SLOPE=.02 'n'=.017 LAST STA=34

DIST	ELEV
0	1
1.0	0
16.0	0.32
33.0	0
34.0	1

RATING CURVE VALLEY SECTION 4.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.05	.14	.15	5.37
.11	.57	.98	10.74
.16	1.27	2.88	16.11
.21	2.26	6.20	21.47
.26	3.53	11.23	26.84
.32	5.09	18.27	32.21
.37	6.81	29.33	32.74
.42	8.53	42.63	32.84
.47	10.26	57.83	32.95
.53	12.00	74.82	33.05
.58	13.74	93.51	33.16
.63	15.49	113.83	33.26
.68	17.24	135.71	33.37
.74	19.00	159.09	33.47
.79	20.77	183.94	33.58
.84	22.54	210.19	33.68

.89	24.31	237.83	33.79
.95	26.09	266.81	33.89
1.00	27.88	297.10	34.00

COMPUTE TRAVEL TIME ID=1 REACH NO=1 NO VS=1 L=4400 FT SLP=.02

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.141	.15	1.1237
.105	.565	.98	.7079
.158	1.271	2.88	.5402
.211	2.260	6.20	.4459
.263	3.532	11.23	.3843
.316	5.086	18.27	.3403
.368	6.805	29.33	.2835
.421	8.531	42.63	.2446
.474	10.262	57.83	.2169
.526	11.999	74.82	.1960
.579	13.741	93.51	.1796
.632	15.489	113.83	.1663
.684	17.243	135.71	.1553
.737	19.002	159.09	.1460
.789	20.766	183.94	.1380
.842	22.537	210.19	.1310
.895	24.312	237.83	.1249
.947	26.093	266.81	.1195
1.000	27.880	297.10	.1147

ROUTE ID=1 HYD NO=101.1 INFLOW ID=3 DT=0 HR

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = 1.41183 INCHES = 2.4622 ACRE-FEET

PEAK DISCHARGE RATE = 40.50 CFS AT 1.632 HOURS BASIN AREA = .0327 SQ. MI.

COMPUTE NM HYD ID=2 HYD NO=102.0 AREA=0.0541 SQ MI
PER A=0 PER B=24 PER C=20 PER D=56
TP=0.27 HR MASS RAINFALL=-1

K = .147150HR TP = .270000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420

UNIT PEAK = 59.052 CFS UNIT VOLUME = .9998 B = 526.28 P60 = 1.9000

AREA = .030296 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

```
    K =   .242249HR     TP =   .270000HR     K/TP RATIO =   .897217     SHAPE CONSTANT, N =  3.950834
    UNIT PEAK =   31.023     CFS   UNIT VOLUME =    .9996       B =   351.88       P60 = 1.9000
    AREA =       .023804 SQ MI    IA =    .43182 INCHES     INF =   1.05909 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   102.00

    RUNOFF VOLUME =     1.47432 INCHES      =       4.2539 ACRE-FEET
    PEAK DISCHARGE RATE =      82.42 CFS  AT   1.665 HOURS   BASIN AREA =   .0541 SQ. MI.


ADD HYD             ID=3 HYD NO=102.1 ID=1 & 2
PRINT HYD           ID=3 CODE=1

                                PARTIAL HYDROGRAPH   102.10

    RUNOFF VOLUME =     1.45075 INCHES      =       6.7160 ACRE-FEET
    PEAK DISCHARGE RATE =     122.89 CFS  AT   1.632 HOURS   BASIN AREA =   .0868 SQ. MI.


COMPUTE NM HYD      ID=2 HYD NO=103.0 AREA=0.0499 SQ MI
                    PER A=0 PER B=25 PER C=20 PER D=55
                    TP=0.17 HR MASS RAINFALL=-1

    K =   .092650HR     TP =   .170000HR     K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   84.963     CFS   UNIT VOLUME =    1.000       B =   526.28       P60 = 1.9000
    AREA =       .027445 SQ MI    IA =    .10000 INCHES     INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


    K =   .152843HR     TP =   .170000HR     K/TP RATIO =   .899078     SHAPE CONSTANT, N =  3.942132
    UNIT PEAK =   46.402     CFS   UNIT VOLUME =    .9999       B =   351.29       P60 = 1.9000
    AREA =       .022455 SQ MI    IA =    .43333 INCHES     INF =   1.06333 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   103.00

    RUNOFF VOLUME =     1.46127 INCHES      =       3.8889 ACRE-FEET
    PEAK DISCHARGE RATE =      99.23 CFS  AT   1.532 HOURS   BASIN AREA =   .0499 SQ. MI.
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ADD HYD              ID=1 HYD NO=103.1 ID=3 & 2
PRINT HYD            ID=1 CODE=1

                                PARTIAL HYDROGRAPH   103.10

    RUNOFF VOLUME =      1.45459 INCHES      =       10.6049 ACRE-FEET
    PEAK DISCHARGE RATE =      208.87 CFS  AT    1.598 HOURS    BASIN AREA =    .1367 SQ. MI.


COMPUTE NM HYD       ID=2 HYD NO=104.0 AREA=0.0730 SQ MI
                     PER A=0 PER B=25 PER C=20 PER D=55
                     TP=0.22 HR MASS RAINFALL=-1

    K =    .120173HR     TP =    .220000HR     K/TP RATIO =    .546243      SHAPE CONSTANT, N =  7.085728
    UNIT PEAK =    95.868     CFS    UNIT VOLUME =     1.000        B =    525.30       P60 = 1.9000
    AREA =       .040150 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

    K =    .197248HR     TP =    .220000HR     K/TP RATIO =    .896580      SHAPE CONSTANT, N =  3.953832
    UNIT PEAK =    52.572     CFS    UNIT VOLUME =     .9998        B =    352.08       P60 = 1.9000
    AREA =       .032850 SQ MI     IA =     .43333 INCHES     INF =    1.06333 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

PRINT HYD            ID=2 CODE=1

                                PARTIAL HYDROGRAPH   104.00

    RUNOFF VOLUME =      1.46127 INCHES      =        5.6892 ACRE-FEET
    PEAK DISCHARGE RATE =      125.64 CFS  AT    1.598 HOURS    BASIN AREA =    .0730 SQ. MI.


COMPUTE NM HYD       ID=3 HYD NO=105.0 AREA=0.0165 SQ MI
                     PER A=0 PER B=0 PER C=10 PER D=90
                     TP=0.14 HR MASS RAINFALL=-1

    K =    .076300HR     TP =    .140000HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    55.823     CFS    UNIT VOLUME =     .9999        B =    526.28       P60 = 1.9000
    AREA =       .014850 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

    K =    .111543HR     TP =    .140000HR     K/TP RATIO =    .796738      SHAPE CONSTANT, N =  4.498737
```

UNIT PEAK = 4.5628 CFS UNIT VOLUME = .9972 B = 387.15 P60 = 1.9000
AREA = .001650 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 105.00

RUNOFF VOLUME = 1.88924 INCHES = 1.6625 ACRE-FEET
PEAK DISCHARGE RATE = 44.04 CFS AT 1.499 HOURS BASIN AREA = .0165 SQ. MI.

ROUTE RESERVOIR ID=7 HYD NO=105.1 INFLOW ID=3 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.0	0.0	70.2
4.9	0.14	72.2
8.1	0.36	74.2
9.8	0.65	76.2
11.4	1.04	78.2
12.8	1.54	80.2

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	70.20	.000	.00
.80	.00	70.20	.000	.00
1.60	32.47	76.01	.622	9.64
2.40	1.99	76.47	.703	10.02
3.20	.37	72.84	.210	5.92
4.00	.24	70.61	.029	1.00
4.80	.23	70.32	.009	.30
5.59	.26	70.30	.007	.26
6.39	.03	70.26	.004	.16
7.19	.00	70.21	.001	.02
7.99	.00	70.20	.000	.00

PEAK DISCHARGE = 10.699 CFS - PEAK OCCURS AT HOUR 2.03
MAXIMUM WATER SURFACE ELEVATION = 77.324
MAXIMUM STORAGE = .8692 AC-FT INCREMENTAL TIME= .033300HRS

PRINT HYD ID=7 CODE=0

PARTIAL HYDROGRAPH 105.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS

.000	.0	1.665	10.1	3.330	5.1	4.995	.3	6.660	.1
.033	.0	1.698	10.2	3.363	4.9	5.028	.3	6.693	.1
.067	.0	1.732	10.3	3.397	4.5	5.062	.3	6.727	.1
.100	.0	1.765	10.4	3.430	4.1	5.095	.3	6.760	.1
.133	.0	1.798	10.5	3.463	3.8	5.128	.3	6.793	.1
.167	.0	1.832	10.6	3.496	3.4	5.161	.3	6.826	.1
.200	.0	1.865	10.6	3.530	3.2	5.195	.3	6.860	.0
.233	.0	1.898	10.6	3.563	2.9	5.228	.3	6.893	.0
.266	.0	1.931	10.7	3.596	2.6	5.261	.3	6.926	.0
.300	.0	1.965	10.7	3.630	2.4	5.295	.3	6.960	.0
.333	.0	1.998	10.7	3.663	2.2	5.328	.3	6.993	.0
.366	.0	2.031	10.7	3.696	2.1	5.361	.3	7.026	.0
.400	.0	2.065	10.7	3.730	1.9	5.395	.3	7.060	.0
.433	.0	2.098	10.7	3.763	1.7	5.428	.3	7.093	.0
.466	.0	2.131	10.6	3.796	1.6	5.461	.3	7.126	.0
.500	.0	2.165	10.6	3.829	1.5	5.494	.3	7.159	.0
.533	.0	2.198	10.5	3.863	1.4	5.528	.3	7.193	.0
.566	.0	2.231	10.4	3.896	1.3	5.561	.3	7.226	.0
.599	.0	2.264	10.4	3.929	1.2	5.594	.3	7.259	.0
.633	.0	2.298	10.3	3.963	1.1	5.628	.3	7.293	.0
.666	.0	2.331	10.2	3.996	1.0	5.661	.3	7.326	.0
.699	.0	2.364	10.1	4.029	.9	5.694	.3	7.359	.0
.733	.0	2.398	10.0	4.063	.9	5.728	.3	7.393	.0
.766	.0	2.431	9.9	4.096	.8	5.761	.3	7.426	.0
.799	.0	2.464	9.8	4.129	.8	5.794	.3	7.459	.0
.832	.0	2.497	9.7	4.162	.7	5.827	.3	7.492	.0
.866	.0	2.531	9.6	4.196	.7	5.861	.3	7.526	.0
.899	.0	2.564	9.5	4.229	.6	5.894	.3	7.559	.0
.932	.0	2.597	9.3	4.262	.6	5.927	.3	7.592	.0
.966	.0	2.631	9.2	4.296	.6	5.961	.3	7.626	.0
.999	.0	2.664	9.1	4.329	.5	5.994	.3	7.659	.0
1.032	.0	2.697	8.9	4.362	.5	6.027	.3	7.692	.0
1.066	.0	2.731	8.8	4.396	.5	6.061	.3	7.726	.0
1.099	.0	2.764	8.7	4.429	.4	6.094	.3	7.759	.0
1.132	.0	2.797	8.5	4.462	.4	6.127	.3	7.792	.0
1.166	.0	2.830	8.4	4.495	.4	6.160	.3	7.825	.0
1.199	.0	2.864	8.3	4.529	.4	6.194	.2	7.859	.0
1.232	.1	2.897	8.2	4.562	.4	6.227	.2	7.892	.0
1.265	.4	2.930	8.0	4.595	.4	6.260	.2	7.925	.0
1.299	.9	2.964	7.7	4.629	.3	6.294	.2	7.959	.0
1.332	1.7	2.997	7.4	4.662	.3	6.327	.2	7.992	.0
1.365	2.9	3.030	7.1	4.695	.3	6.360	.2	8.025	.0
1.399	4.5	3.064	6.9	4.729	.3	6.394	.2	8.059	.0
1.432	5.7	3.097	6.6	4.762	.3	6.427	.1	8.092	.0
1.465	6.8	3.130	6.4	4.795	.3	6.460	.1	8.125	.0
1.499	8.1	3.163	6.2	4.828	.3	6.493	.1	8.158	.0
1.532	8.7	3.197	5.9	4.862	.3	6.527	.1	8.192	.0
1.565	9.2	3.230	5.7	4.895	.3	6.560	.1		
1.598	9.6	3.263	5.5	4.928	.3	6.593	.1		

```
 1.632        9.9          3.297        5.3          4.962        .3           6.627        .1

    RUNOFF VOLUME =      1.88922 INCHES      =       1.6625 ACRE-FEET
    PEAK DISCHARGE RATE =       10.70 CFS  AT   2.031 HOURS   BASIN AREA =   .0165 SQ. MI.


ADD HYD              ID=4 HYD NO=105.2 ID=2 & 7
PRINT HYD            ID=4 CODE=1

                                PARTIAL HYDROGRAPH   105.20

    RUNOFF VOLUME =      1.54016 INCHES      =       7.3516 ACRE-FEET
    PEAK DISCHARGE RATE =      135.28 CFS  AT   1.598 HOURS   BASIN AREA =   .0895 SQ. MI.


COMPUTE NM HYD       ID=5 HYD NO=111.0 AREA=0.0045 SQ MI
                     PER A=0 PER B=35 PER C=0 PER D=65
                     TP=0.1333 HR MASS RAINFALL=-1
    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    11.548     CFS    UNIT VOLUME =     .9984        B =    526.28       P60 = 1.9000
    AREA =       .002925 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300


    K =    .130761HR     TP =    .133300HR     K/TP RATIO =    .980950      SHAPE CONSTANT, N =  3.599930
    UNIT PEAK =    3.8702     CFS    UNIT VOLUME =     .9967        B =    327.55       P60 = 1.9000
    AREA =       .001575 SQ MI     IA =     .50000 INCHES     INF =    1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

PRINT HYD            ID=5 CODE=1

                                PARTIAL HYDROGRAPH   111.00

    RUNOFF VOLUME =      1.53124 INCHES      =         .3675 ACRE-FEET
    PEAK DISCHARGE RATE =       10.41 CFS  AT   1.499 HOURS   BASIN AREA =   .0045 SQ. MI.


ADD HYD              ID=2 HYD NO=111.1 ID=4 & 5
PRINT HYD            ID=2 CODE=1

                                PARTIAL HYDROGRAPH   111.10
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RUNOFF VOLUME = 1.53972 INCHES = 7.7191 ACRE-FEET
PEAK DISCHARGE RATE = 142.70 CFS AT 1.598 HOURS BASIN AREA = .0940 SQ. MI.

COMPUTE NM HYD ID=3 HYD NO=106.0 AREA=0.0240 SQ MI
PER A=0 PER B=0 PER C=10 PER D=90
TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 85.278 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.9000
AREA = .021600 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .106205HR TP = .133300HR K/TP RATIO = .796738 SHAPE CONSTANT, N = 4.498737
UNIT PEAK = 6.9704 CFS UNIT VOLUME = .9986 B = 387.15 P60 = 1.9000
AREA = .002400 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 106.00

RUNOFF VOLUME = 1.88924 INCHES = 2.4182 ACRE-FEET
PEAK DISCHARGE RATE = 65.87 CFS AT 1.499 HOURS BASIN AREA = .0240 SQ. MI.

ADD HYD ID=4 HYD NO=106.1 ID=2 & 3
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 106.10

RUNOFF VOLUME = 1.61081 INCHES = 10.1373 ACRE-FEET
PEAK DISCHARGE RATE = 195.30 CFS AT 1.565 HOURS BASIN AREA = .1180 SQ. MI.

COMPUTE NM HYD ID=2 HYD NO=107.0 AREA=0.0501 SQ MI
PER A=0 PER B=25 PER C=20 PER D=55
TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 108.79 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.9000
AREA = .027555 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .119847HR TP = .133300HR K/TP RATIO = .899078 SHAPE CONSTANT, N = 3.942132
UNIT PEAK = 59.414 CFS UNIT VOLUME = 1.000 B = 351.29 P60 = 1.9000
AREA = .022545 SQ MI IA = .43333 INCHES INF = 1.06333 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 107.00

RUNOFF VOLUME = 1.46127 INCHES = 3.9045 ACRE-FEET
PEAK DISCHARGE RATE = 113.50 CFS AT 1.499 HOURS BASIN AREA = .0501 SQ. MI.

ADD HYD ID=3 HYD NO=107.1 ID=4 & 2
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 107.10

RUNOFF VOLUME = 1.56624 INCHES = 14.0418 ACRE-FEET
PEAK DISCHARGE RATE = 303.04 CFS AT 1.532 HOURS BASIN AREA = .1681 SQ. MI.

COMPUTE NM HYD ID=2 HYD NO=108.0 AREA=0.0045 SQ MI
PER A=0 PER B=0 PER C=20 PER D=80
TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 14.213 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.9000
AREA = .003600 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .106205HR TP = .133300HR K/TP RATIO = .796738 SHAPE CONSTANT, N = 4.498737
UNIT PEAK = 2.6139 CFS UNIT VOLUME = .9957 B = 387.15 P60 = 1.9000
AREA = .000900 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 108.00

RUNOFF VOLUME = 1.79252 INCHES = .4302 ACRE-FEET
PEAK DISCHARGE RATE = 11.93 CFS AT 1.499 HOURS BASIN AREA = .0045 SQ. MI.

ADD HYD ID=4 HYD NO=108.1 ID=3 & 2
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 108.10

RUNOFF VOLUME = 1.57214 INCHES = 14.4720 ACRE-FEET
PEAK DISCHARGE RATE = 314.47 CFS AT 1.532 HOURS BASIN AREA = .1726 SQ. MI.

ADD HYD ID=5 HYD NO=108.2 ID=4 & 1
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 108.20

RUNOFF VOLUME = 1.52019 INCHES = 25.0768 ACRE-FEET
PEAK DISCHARGE RATE = 508.54 CFS AT 1.565 HOURS BASIN AREA = .3093 SQ. MI.

ROUTE RESERVOIR ID=3 HYD NO=108.3 INFLOW ID=5 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.0	0.0	40.0
9.6	1.38	41.0
21.9	2.82	42.0
42.8	4.32	43.0
65.4	5.89	44.0
85.2	7.51	45.0
100.0	9.21	46.0
111.7	10.97	47.0
118.5	12.80	48.0
121.0	14.69	49.0
122.3	16.66	50.0

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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	40.00	.000	.00
.80	.00	40.00	.000	.00
1.60	487.21	44.89	7.332	83.03
2.40	56.03	48.35	13.465	119.38
3.20	15.48	45.43	8.247	91.62
4.00	5.10	43.06	4.413	44.14

4.80	3.31	41.90	2.669	20.61
5.59	3.36	41.29	1.794	13.14
6.39	.93	40.92	1.269	8.83
7.19	.19	40.60	.822	5.72
7.99	.07	40.38	.525	3.65
8.79	.03	40.24	.334	2.32
9.59	.02	40.15	.212	1.48
10.39	.01	40.10	.135	.94
11.19	.00	40.06	.085	.59
11.99	.00	40.04	.054	.38
12.79	.00	40.02	.034	.24
13.59	.00	40.02	.022	.15
14.39	.00	40.01	.014	.09
15.18	.00	40.01	.009	.06
15.98	.00	40.00	.005	.04
16.78	.00	40.00	.003	.02
17.58	.00	40.00	.002	.02
18.38	.00	40.00	.001	.01
19.18	.00	40.00	.001	.01

PEAK DISCHARGE = 120.408 CFS - PEAK OCCURS AT HOUR 2.16
MAXIMUM WATER SURFACE ELEVATION = 48.763
MAXIMUM STORAGE = 14.2425 AC-FT INCREMENTAL TIME= .033300HRS

PRINT HYD ID=3 CODE=0

PARTIAL HYDROGRAPH 108.30

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	3.996	44.1	7.992	3.7	11.988	.4	15.984	.0
.033	.0	4.029	42.6	8.025	3.6	12.021	.4	16.017	.0
.067	.0	4.063	41.2	8.059	3.5	12.055	.4	16.051	.0
.100	.0	4.096	39.8	8.092	3.5	12.088	.4	16.084	.0
.133	.0	4.129	38.5	8.125	3.4	12.121	.3	16.117	.0
.167	.0	4.162	37.2	8.158	3.3	12.155	.3	16.151	.0
.200	.0	4.196	36.0	8.192	3.3	12.188	.3	16.184	.0
.233	.0	4.229	34.8	8.225	3.2	12.221	.3	16.217	.0
.266	.0	4.262	33.6	8.258	3.1	12.254	.3	16.250	.0
.300	.0	4.296	32.5	8.292	3.1	12.288	.3	16.284	.0
.333	.0	4.329	31.4	8.325	3.0	12.321	.3	16.317	.0
.366	.0	4.362	30.4	8.358	3.0	12.354	.3	16.350	.0
.400	.0	4.396	29.4	8.392	2.9	12.388	.3	16.384	.0
.433	.0	4.429	28.4	8.425	2.9	12.421	.3	16.417	.0
.466	.0	4.462	27.5	8.458	2.8	12.454	.3	16.450	.0
.500	.0	4.495	26.6	8.491	2.8	12.488	.3	16.484	.0
.533	.0	4.529	25.7	8.525	2.7	12.521	.3	16.517	.0
.566	.0	4.562	24.9	8.558	2.7	12.554	.3	16.550	.0
.599	.0	4.595	24.1	8.591	2.6	12.587	.3	16.583	.0
.633	.0	4.629	23.3	8.625	2.6	12.621	.3	16.617	.0

.666	.0	4.662	22.6	8.658	2.5	12.654	.3	16.650	.0
.699	.0	4.695	21.9	8.691	2.5	12.687	.3	16.683	.0
.733	.0	4.729	21.4	8.725	2.4	12.721	.2	16.717	.0
.766	.0	4.762	21.0	8.758	2.4	12.754	.2	16.750	.0
.799	.0	4.795	20.6	8.791	2.3	12.787	.2	16.783	.0
.832	.0	4.828	20.2	8.824	2.3	12.821	.2	16.817	.0
.866	.0	4.862	19.8	8.858	2.2	12.854	.2	16.850	.0
.899	.0	4.895	19.4	8.891	2.2	12.887	.2	16.883	.0
.932	.0	4.928	19.1	8.924	2.2	12.920	.2	16.916	.0
.966	.0	4.962	18.7	8.958	2.1	12.954	.2	16.950	.0
.999	.0	4.995	18.3	8.991	2.1	12.987	.2	16.983	.0
1.032	.0	5.028	18.0	9.024	2.0	13.020	.2	17.016	.0
1.066	.0	5.062	17.6	9.058	2.0	13.054	.2	17.050	.0
1.099	.0	5.095	17.3	9.091	2.0	13.087	.2	17.083	.0
1.132	.0	5.128	17.0	9.124	1.9	13.120	.2	17.116	.0
1.166	.0	5.161	16.7	9.158	1.9	13.154	.2	17.150	.0
1.199	.0	5.195	16.3	9.191	1.9	13.187	.2	17.183	.0
1.232	.1	5.228	16.0	9.224	1.8	13.220	.2	17.216	.0
1.265	.5	5.261	15.7	9.257	1.8	13.253	.2	17.249	.0
1.299	1.2	5.295	15.5	9.291	1.8	13.287	.2	17.283	.0
1.332	2.4	5.328	15.2	9.324	1.7	13.320	.2	17.316	.0
1.365	4.5	5.361	14.9	9.357	1.7	13.353	.2	17.349	.0
1.399	7.6	5.395	14.6	9.391	1.7	13.387	.2	17.383	.0
1.432	12.7	5.428	14.4	9.424	1.6	13.420	.2	17.416	.0
1.465	20.2	5.461	14.1	9.457	1.6	13.453	.2	17.449	.0
1.499	34.5	5.494	13.9	9.491	1.6	13.487	.2	17.483	.0
1.532	51.7	5.528	13.6	9.524	1.5	13.520	.2	17.516	.0
1.565	68.8	5.561	13.4	9.557	1.5	13.553	.2	17.549	.0
1.598	83.0	5.594	13.1	9.590	1.5	13.586	.2	17.583	.0
1.632	92.8	5.628	12.9	9.624	1.4	13.620	.1	17.616	.0
1.665	100.7	5.661	12.7	9.657	1.4	13.653	.1	17.649	.0
1.698	106.2	5.694	12.5	9.690	1.4	13.686	.1	17.682	.0
1.732	110.9	5.728	12.3	9.724	1.4	13.720	.1	17.716	.0
1.765	113.5	5.761	12.1	9.757	1.3	13.753	.1	17.749	.0
1.798	115.4	5.794	11.9	9.790	1.3	13.786	.1	17.782	.0
1.832	117.1	5.827	11.7	9.824	1.3	13.820	.1	17.816	.0
1.865	118.5	5.861	11.5	9.857	1.3	13.853	.1	17.849	.0
1.898	118.9	5.894	11.3	9.890	1.2	13.886	.1	17.882	.0
1.931	119.3	5.927	11.1	9.923	1.2	13.919	.1	17.916	.0
1.965	119.6	5.961	10.9	9.957	1.2	13.953	.1	17.949	.0
1.998	119.9	5.994	10.8	9.990	1.2	13.986	.1	17.982	.0
2.031	120.1	6.027	10.6	10.023	1.2	14.019	.1	18.015	.0
2.065	120.2	6.061	10.4	10.057	1.1	14.053	.1	18.049	.0
2.098	120.3	6.094	10.3	10.090	1.1	14.086	.1	18.082	.0
2.131	120.4	6.127	10.1	10.123	1.1	14.119	.1	18.115	.0
2.165	120.4	6.160	9.9	10.157	1.1	14.153	.1	18.149	.0
2.198	120.4	6.194	9.8	10.190	1.0	14.186	.1	18.182	.0
2.231	120.3	6.227	9.6	10.223	1.0	14.219	.1	18.215	.0
2.264	120.1	6.260	9.4	10.256	1.0	14.252	.1	18.249	.0

2.298	120.0	6.294	9.3	10.290	1.0	14.286	.1	18.282	.0
2.331	119.8	6.327	9.1	10.323	1.0	14.319	.1	18.315	.0
2.364	119.6	6.360	9.0	10.356	1.0	14.352	.1	18.348	.0
2.398	119.4	6.394	8.8	10.390	.9	14.386	.1	18.382	.0
2.431	119.1	6.427	8.7	10.423	.9	14.419	.1	18.415	.0
2.464	118.9	6.460	8.5	10.456	.9	14.452	.1	18.448	.0
2.497	118.6	6.493	8.4	10.490	.9	14.486	.1	18.482	.0
2.531	118.1	6.527	8.2	10.523	.9	14.519	.1	18.515	.0
2.564	117.3	6.560	8.1	10.556	.9	14.552	.1	18.548	.0
2.597	116.5	6.593	7.9	10.589	.8	14.585	.1	18.582	.0
2.631	115.7	6.627	7.8	10.623	.8	14.619	.1	18.615	.0
2.664	114.9	6.660	7.7	10.656	.8	14.652	.1	18.648	.0
2.697	114.1	6.693	7.5	10.689	.8	14.685	.1	18.681	.0
2.731	113.2	6.727	7.4	10.723	.8	14.719	.1	18.715	.0
2.764	112.4	6.760	7.3	10.756	.8	14.752	.1	18.748	.0
2.797	111.4	6.793	7.1	10.789	.7	14.785	.1	18.781	.0
2.830	109.8	6.826	7.0	10.823	.7	14.819	.1	18.815	.0
2.864	108.3	6.860	6.9	10.856	.7	14.852	.1	18.848	.0
2.897	106.8	6.893	6.8	10.889	.7	14.885	.1	18.881	.0
2.930	105.3	6.926	6.6	10.922	.7	14.918	.1	18.915	.0
2.964	103.8	6.960	6.5	10.956	.7	14.952	.1	18.948	.0
2.997	102.3	6.993	6.4	10.989	.7	14.985	.1	18.981	.0
3.030	100.8	7.026	6.3	11.022	.7	15.018	.1	19.014	.0
3.064	99.1	7.060	6.2	11.056	.6	15.052	.1	19.048	.0
3.097	97.2	7.093	6.0	11.089	.6	15.085	.1	19.081	.0
3.130	95.3	7.126	5.9	11.122	.6	15.118	.1	19.114	.0
3.163	93.5	7.159	5.8	11.156	.6	15.152	.1	19.148	.0
3.197	91.6	7.193	5.7	11.189	.6	15.185	.1	19.181	.0
3.230	89.8	7.226	5.6	11.222	.6	15.218	.1	19.214	.0
3.263	88.0	7.259	5.5	11.255	.6	15.251	.1	19.248	.0
3.297	86.3	7.293	5.4	11.289	.6	15.285	.1	19.281	.0
3.330	84.3	7.326	5.3	11.322	.5	15.318	.1	19.314	.0
3.363	81.9	7.359	5.2	11.355	.5	15.351	.1	19.347	.0
3.397	79.6	7.393	5.1	11.389	.5	15.385	.1	19.381	.0
3.430	77.3	7.426	5.0	11.422	.5	15.418	.1	19.414	.0
3.463	75.1	7.459	4.9	11.455	.5	15.451	.1	19.447	.0
3.496	73.0	7.492	4.8	11.489	.5	15.485	.1	19.481	.0
3.530	70.9	7.526	4.7	11.522	.5	15.518	.0	19.514	.0
3.563	68.9	7.559	4.7	11.555	.5	15.551	.0	19.547	.0
3.596	66.9	7.592	4.6	11.588	.5	15.584	.0	19.581	.0
3.630	64.8	7.626	4.5	11.622	.5	15.618	.0	19.614	.0
3.663	62.6	7.659	4.4	11.655	.5	15.651	.0	19.647	.0
3.696	60.5	7.692	4.3	11.688	.4	15.684	.0	19.680	.0
3.730	58.4	7.726	4.2	11.722	.4	15.718	.0	19.714	.0
3.763	56.4	7.759	4.2	11.755	.4	15.751	.0	19.747	.0
3.796	54.5	7.792	4.1	11.788	.4	15.784	.0	19.780	.0
3.829	52.6	7.825	4.0	11.822	.4	15.818	.0	19.814	.0
3.863	50.8	7.859	3.9	11.855	.4	15.851	.0	19.847	.0
3.896	49.0	7.892	3.9	11.888	.4	15.884	.0	19.880	.0

3.929	47.3	7.925	3.8	11.921	.4	15.917	.0	19.914	.0
3.963	45.7	7.959	3.7	11.955	.4	15.951	.0	19.947	.0

RUNOFF VOLUME = 1.52015 INCHES = 25.0763 ACRE-FEET
PEAK DISCHARGE RATE = 120.41 CFS AT 2.164 HOURS BASIN AREA = .3093 SQ. MI.

COMPUTE NM HYD ID=2 HYD NO=109.0 AREA=0.0056 SQ MI
PER A=0 PER B=35 PER C=0 PER D=65
TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 14.371 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.9000
AREA = .003640 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .130761HR TP = .133300HR K/TP RATIO = .980950 SHAPE CONSTANT, N = 3.599930
UNIT PEAK = 4.8162 CFS UNIT VOLUME = .9975 B = 327.55 P60 = 1.9000
AREA = .001960 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 109.00

RUNOFF VOLUME = 1.53124 INCHES = .4573 ACRE-FEET
PEAK DISCHARGE RATE = 12.95 CFS AT 1.499 HOURS BASIN AREA = .0056 SQ. MI.

ADD HYD ID=4 HYD NO=109.1 SUM IDS 3 2
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 109.10

RUNOFF VOLUME = 1.52035 INCHES = 25.5336 ACRE-FEET
PEAK DISCHARGE RATE = 122.71 CFS AT 2.031 HOURS BASIN AREA = .3149 SQ. MI.

COMPUTE NM HYD ID=2 HYD NO=110.0 AREA=0.0018 SQ MI
PER A=0 PER B=35 PER C=0 PER D=65
TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420

```
    UNIT PEAK =    4.6192     CFS    UNIT VOLUME =     .9969        B =    526.28       P60 = 1.9000
    AREA =       .001170 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300


    K =    .130761HR     TP =    .133300HR     K/TP RATIO =    .980950      SHAPE CONSTANT, N =  3.599930
    UNIT PEAK =    1.5481     CFS    UNIT VOLUME =     .9911        B =    327.55       P60 = 1.9000
    AREA =       .000630 SQ MI     IA =     .50000 INCHES     INF =    1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   110.00


    RUNOFF VOLUME =      1.53124 INCHES      =         .1470 ACRE-FEET
    PEAK DISCHARGE RATE =        4.17 CFS   AT    1.499 HOURS    BASIN AREA =    .0018 SQ. MI.


ADD HYD             ID=1 HYD NO=110.1 SUM IDS 4 2
PRINT HYD           ID=1 CODE=1

                                PARTIAL HYDROGRAPH    110.10


    RUNOFF VOLUME =      1.52041 INCHES      =       25.6806 ACRE-FEET
    PEAK DISCHARGE RATE =      123.58 CFS   AT    1.998 HOURS    BASIN AREA =    .3167 SQ. MI.


COMPUTE NM HYD      ID=1 HYD NO=201.0 AREA=0.0059 SQ MI
                    PER A=0 PER B=35 PER C=0 PER D=65
                    TP=0.1333 HR MASS RAINFALL=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    15.141     CFS    UNIT VOLUME =     .9986        B =    526.28       P60 = 1.9000
    AREA =       .003835 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300


    K =    .130761HR     TP =    .133300HR     K/TP RATIO =    .980950      SHAPE CONSTANT, N =  3.599930
    UNIT PEAK =    5.0742     CFS    UNIT VOLUME =     .9975        B =    327.55       P60 = 1.9000
    AREA =       .002065 SQ MI     IA =     .50000 INCHES     INF =    1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

PRINT HYD           ID=1 CODE=1

                                PARTIAL HYDROGRAPH    201.00
```

```
RUNOFF VOLUME =      1.53124 INCHES      =         .4818 ACRE-FEET
PEAK DISCHARGE RATE =       13.64 CFS  AT    1.499 HOURS    BASIN AREA =    .0059 SQ. MI.


COMPUTE NM HYD       ID=2 HYD NO=202.0 AREA=0.0358 SQ MI
                     PER A=0 PER B=25 PER C=20 PER D=55
                     TP=0.1333 HR MASS RAINFALL=-1

K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   77.737     CFS    UNIT VOLUME =     .9992        B =    526.28       P60 = 1.9000
AREA =       .019690 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300


K =    .119847HR     TP =    .133300HR     K/TP RATIO =    .899078      SHAPE CONSTANT, N =  3.942132
UNIT PEAK =   42.456     CFS    UNIT VOLUME =     1.000        B =    351.29       P60 = 1.9000
AREA =       .016110 SQ MI     IA =     .43333 INCHES     INF =    1.06333 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

PRINT HYD            ID=2 CODE=1

                     PARTIAL HYDROGRAPH    202.00

RUNOFF VOLUME =      1.46127 INCHES      =        2.7900 ACRE-FEET
PEAK DISCHARGE RATE =       81.11 CFS  AT    1.499 HOURS    BASIN AREA =    .0358 SQ. MI.


COMPUTE NM HYD       ID=3 HYD NO=203.0 AREA=0.0030 SQ MI
                     PER A=0 PER B=15 PER C=0 PER D=85
                     TP=0.1333 HR MASS RAINFALL=-1

K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   10.068     CFS    UNIT VOLUME =     .9982        B =    526.28       P60 = 1.9000
AREA =       .002550 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300


K =    .130761HR     TP =    .133300HR     K/TP RATIO =    .980950      SHAPE CONSTANT, N =  3.599930
UNIT PEAK =   1.1058     CFS    UNIT VOLUME =     .9874        B =    327.55       P60 = 1.9000
AREA =       .000450 SQ MI     IA =     .50000 INCHES     INF =    1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

PRINT HYD            ID=3 CODE=1

                     PARTIAL HYDROGRAPH    203.00
```

```
RUNOFF VOLUME =      1.79108 INCHES      =         .2866 ACRE-FEET
PEAK DISCHARGE RATE =        7.86 CFS  AT    1.499 HOURS    BASIN AREA =    .0030 SQ. MI.


COMPUTE NM HYD       ID=4 HYD NO=204.0 AREA=0.0083 SQ MI
                     PER A=0 PER B=35 PER C=0 PER D=65
                     TP=0.1333 HR MASS RAINFALL=-1

K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   21.300     CFS   UNIT VOLUME =     .9988       B =   526.28       P60 = 1.9000
AREA =       .005395 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300


K =    .130761HR     TP =    .133300HR     K/TP RATIO =    .980950     SHAPE CONSTANT, N =  3.599930
UNIT PEAK =   7.1383     CFS   UNIT VOLUME =     .9983       B =   327.55       P60 = 1.9000
AREA =       .002905 SQ MI     IA =     .50000 INCHES     INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

PRINT HYD            ID=4 CODE=1

                          PARTIAL HYDROGRAPH    204.00

RUNOFF VOLUME =      1.53124 INCHES      =         .6778 ACRE-FEET
PEAK DISCHARGE RATE =       19.18 CFS  AT    1.499 HOURS    BASIN AREA =    .0083 SQ. MI.


COMPUTE NM HYD       ID=5 HYD NO=205.0 AREA=0.0350 SQ MI
                     PER A=0 PER B=25 PER C=20 PER D=55
                     TP=0.1333 HR MASS RAINFALL=-1

K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   76.000     CFS   UNIT VOLUME =     .9992       B =   526.28       P60 = 1.9000
AREA =       .019250 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300


K =    .119847HR     TP =    .133300HR     K/TP RATIO =    .899078     SHAPE CONSTANT, N =  3.942132
UNIT PEAK =   41.507     CFS   UNIT VOLUME =     1.000       B =   351.29       P60 = 1.9000
AREA =       .015750 SQ MI     IA =     .43333 INCHES     INF =   1.06333 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

PRINT HYD            ID=5 CODE=1

                          PARTIAL HYDROGRAPH    205.00
```

RUNOFF VOLUME = 1.46127 INCHES = 2.7277 ACRE-FEET
PEAK DISCHARGE RATE = 79.30 CFS AT 1.499 HOURS BASIN AREA = .0350 SQ. MI.

COMPUTE NM HYD ID=7 HYD NO=302.0 AREA=0.0105 SQ MI
PER A=0 PER B=70 PER C=10 PER D=20
TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.2909 CFS UNIT VOLUME = .9980 B = 526.28 P60 = 1.9000
AREA = .002100 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .127691HR TP = .133300HR K/TP RATIO = .957924 SHAPE CONSTANT, N = 3.688764
UNIT PEAK = 21.038 CFS UNIT VOLUME = .9996 B = 333.86 P60 = 1.9000
AREA = .008400 SQ MI IA = .48125 INCHES INF = 1.19750 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=7 CODE=1

HYDROGRAPH FROM AREA 302.00

RUNOFF VOLUME = .97483 INCHES = .5459 ACRE-FEET
PEAK DISCHARGE RATE = 17.61 CFS AT 1.499 HOURS BASIN AREA = .0105 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 17:58:47

$\frac{V^2}{2g} = 0.2'$ where $V = 3.6$ fps

V fps	$\frac{V^2}{2g}$	Std Curb D	Roll Curb
4	0.25	0.62	0.396
5	0.39	0.48	0.2
6	0.56	0.31	
7	0.76	0.11	

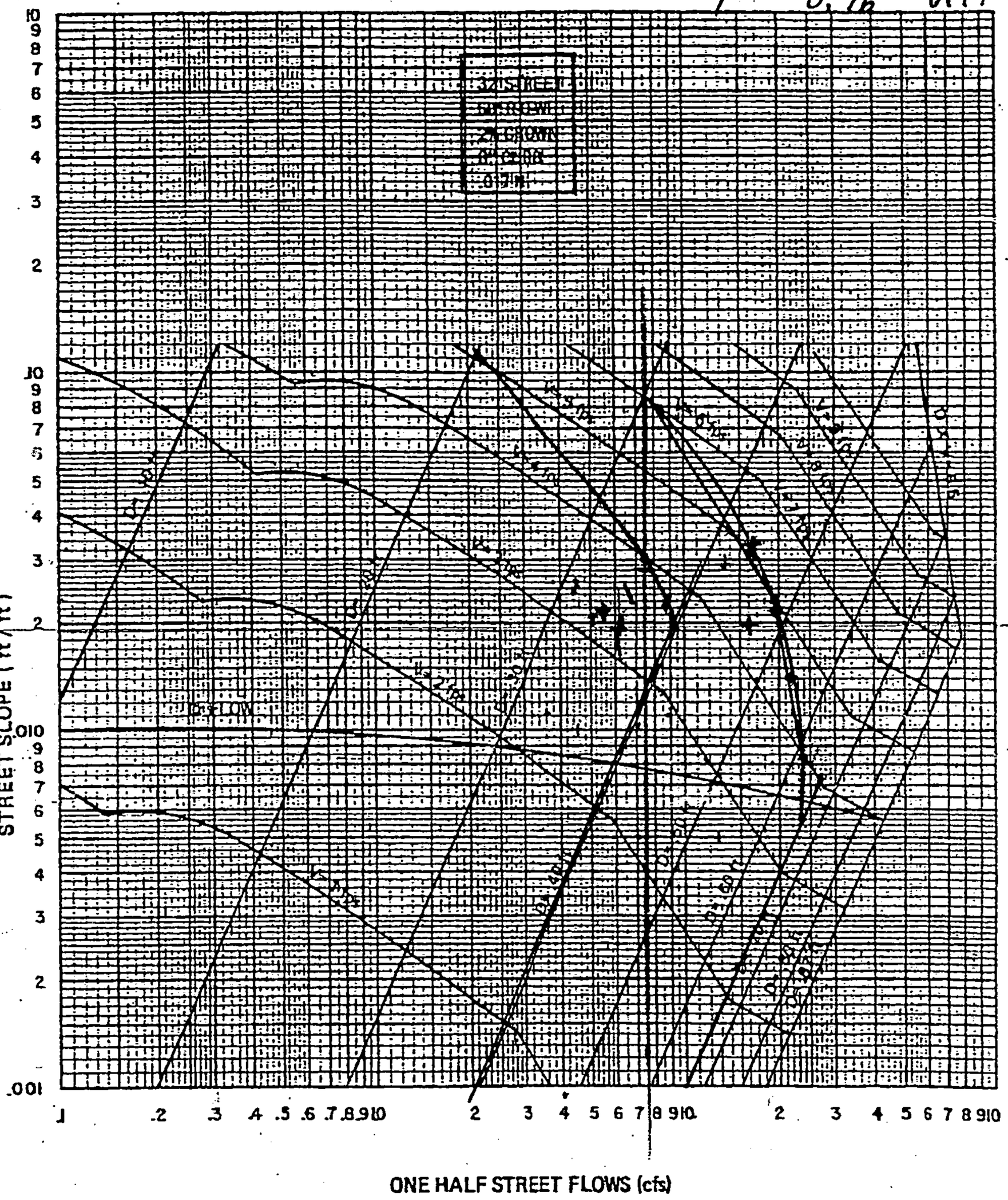

PLATE 22.3 D-1

STREET CAPACITY

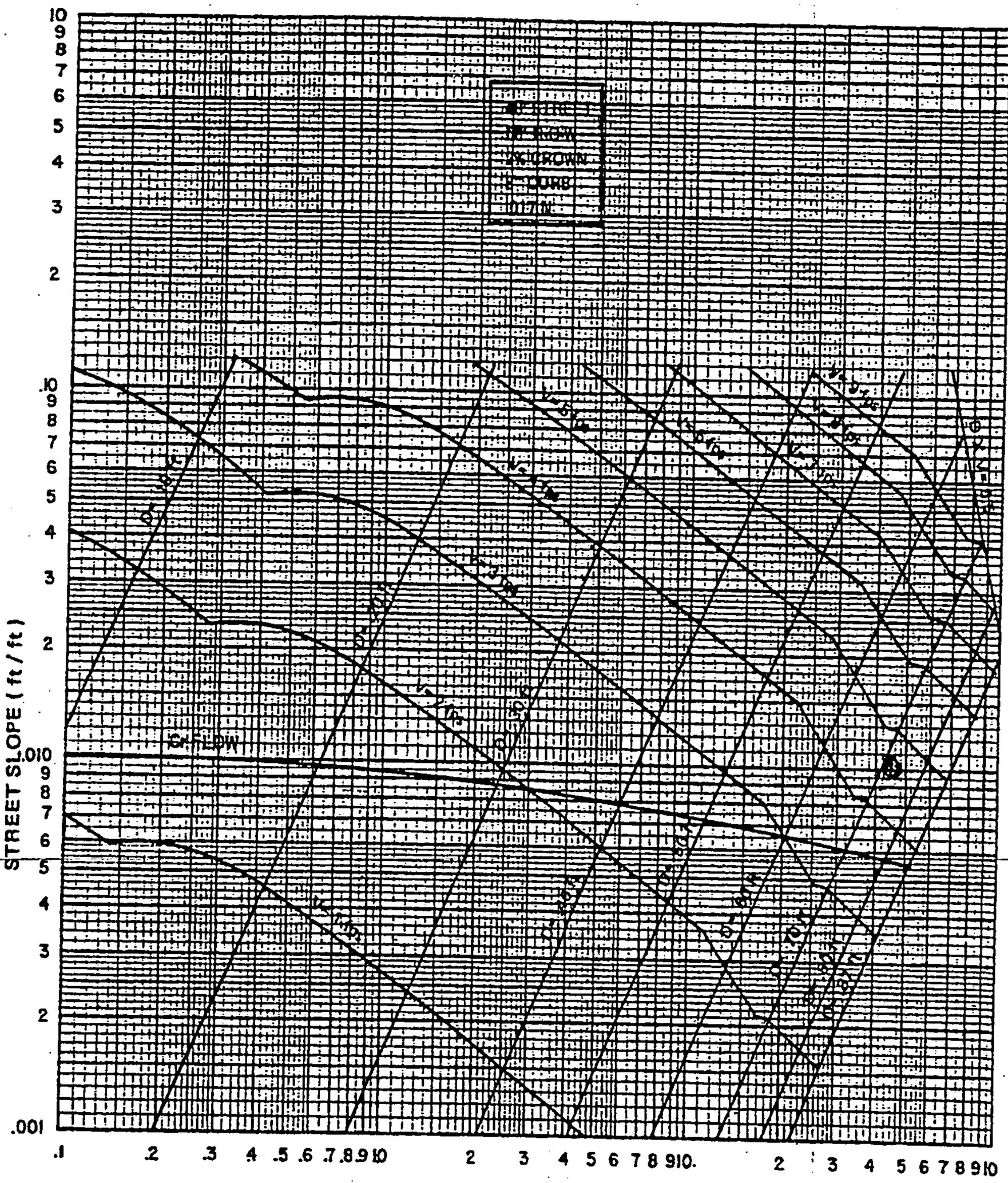

PLATE 22.3 D-3

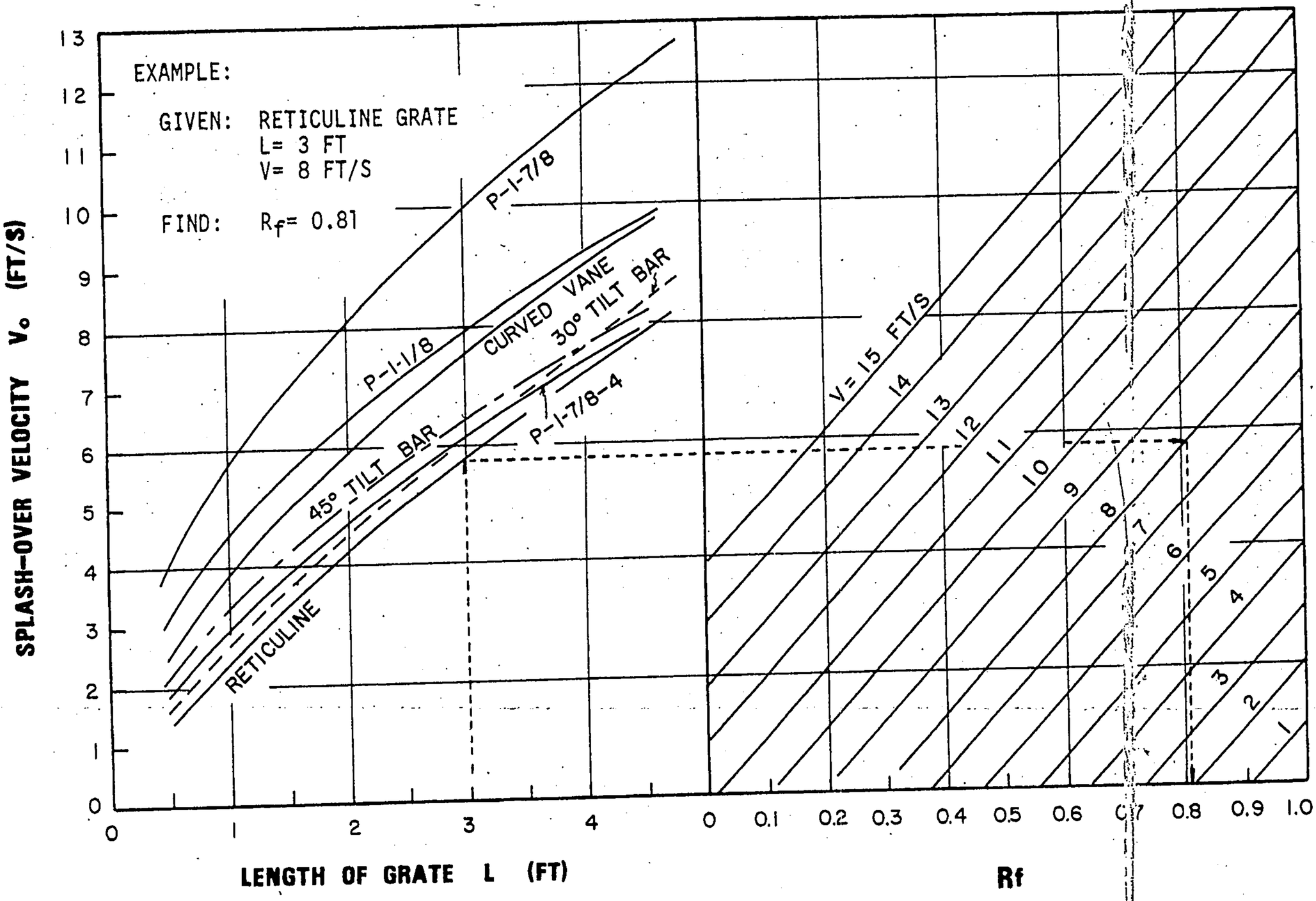

CHART 7. Grate inlet frontal flow interception efficiency.

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 8, 2003

James D. Hughes, P.E.
Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, New Mexico 87199

Re: EL RANCHO GRANDE UNIT 1B (M-9/D19C)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 1/23/2002
Engineers Certification dated 12/2/2002

Dear Doug:

Based upon the information provided in your Engineers Certification submittal dated 1/8/2003, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

If I can be of further assistance, please contact me at 924-3981.

Sincerely,

Teresa A. Martin
Hydrology Plan Checker
Development & Bldg. Ser. Division

BLB

c: Arlene Portillo, COA--Project # 645687
File

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE INFORMATION SHEET

M-9/D19C

PROJECT TITLE: El Rancho Grande I Units1-B

ZONE ATLAS#: M-9

DRB#:

EPC#

WORKORDER#: 645687

LEGAL DESCRIPTION: A Tract of Land situate within the Town of Atrisco Grant, projected Section 33, Township 10 North, Range 2 East, projected Section 4, Township 9 North, Range 3 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico being all of Parcel 12, El Rancho Grande 1.

CITY ADDRESS:

ENGINEERING FIRM:	Mark Goodwin & Associates, PA	CONTACT:	James D. Hughes, PE
ADDRESS:	P.O. Box 90606, Albuquerque, NM 87199	PHONE:	828-2200
OWNER:	Curb, Inc.	CONTACT:	Bo Johnson
ADDRESS:	6301 Indian School Rd. NE, Albuq., NM 87110	PHONE:	881-9190
ARCHITECT:		CONTACT:	
ADDRESS:		PHONE:	
SURVEYOR:	Aldrich Land Surveying	CONTACT:	Tim Aldrich
ADDRESS:	P.O. Box 30701, Albuquerque, NM 87190	PHONE:	884-1990
CONTRACTOR:		CONTACT:	
ADDRESS:		PHONE:	

TYPE OF SUBMITTAL:

- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN
- ____ CONCEPTUAL GRADING & DRAINAGE PLAN
- ____ GRADING PLAN
- ____ EROSION CONTROL
- X ENGINEER'S CERTIFICATION
- ____ OTHER

____ EASEMENT VACATION

PRE-DESIGN MEETING:

- ____ YES
- X NO
- ____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ____ SKETCH PLAT APRROVAL
- ____ PRELIMINARY PLAT APRROVAL
- ____ S. DEV. PLAN FOR SUB'D APPROVAL
- ____ S. DEV. PLAN FOR BLDG PERMIT APPROVAL
- ____ SECTOR PLAN APPROVAL
- ____ FINAL PLAT APPROVAL
- ____ FOUNDATION PERMIT APPROVAL
- ____ BUILDING PERMIT APPROVAL
- ____ CERTIFICATION OF OCCUPANCY APPROVAL
- ____ GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ S.A.D. DRAINAGE REPORT
- ____ DRAINAGE REQUIREMENTS
- ____ OTHER
- X RELEASE OF FINANCIAL GUARANTY
- ____ TRAFFIC CIRCULATION LAYOUT

RECEIVED
JAN 08 2003
HYDROLOGY SECTION

DATE SUBMITTED: 1-6-03

BY: James D Hughes

James D. Hughes, PE

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 26, 2002

James D. Hughes, PE
Mark Goodwin & Associates, PA
PO Box 90606
Albuquerque, NM 87199

Re: El Rancho Grande 1 Amended Grading and Drainage Plan
Engineer's Stamp Dated 1-23-02, (M9/D19C)

Dear Mr. Hughes,

Based on the information contained in your submittal dated 3-22-02, the above referenced plan is approved for Amended Grading as submitted.

This is the plan that must be certified for release of financial guarantees.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, PWD
Development and Building Services

c: Terri Martin, Hydrology
File (2)

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE INFORMATION SHEET

M-9/D19C

PROJECT TITLE: El Rancho Grande I Units1-B ZONE ATLAS#: M-9

DRB#: 1001450 EPC# _____ WORKORDER#: 6456.87

LEGAL DESCRIPTION: A Tract of Land situate within the Town of Atrisco Grant, projected Section 33, Township 10 North, Range 2 East, projected Section 4, Township 9 North, Range 3 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico being all of Parcel 12, El Rancho Grande 1.

CITY ADDRESS: _____

ENGINEERING FIRM:	Mark Goodwin & Associates, PA	CONTACT:	James D. Hughes, PE
ADDRESS:	P.O. Box 90606, Albuquerque, NM 87199	PHONE:	828-2200
OWNER:	Curb, Inc.	CONTACT:	Bo Johnson
ADDRESS:	6301 Indian School Rd. NE, Albuq., NM 87110	PHONE:	881-9190
ARCHITECT:		CONTACT:	
ADDRESS:		PHONE:	
SURVEYOR:	Aldrich Land Surveying	CONTACT:	Tim Aldrich
ADDRESS:	P.O. Box 30701, Albuquerque, NM 87190	PHONE:	884-1990
CONTRACTOR:		CONTACT:	
ADDRESS:		PHONE:	

TYPE OF SUBMITTAL:

- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN
- ____ CONCEPTUAL GRADING & DRAINAGE PLAN
- X GRADING PLAN
- ____ EROSION CONTROL
- ____ ENGINEER'S CERTIFICATION
- ____ OTHER
- ____ EASEMENT VACATION

PRE-DESIGN MEETING:

- ____ YES
- X NO
- ____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ____ SKETCH PLAT APRROVAL
- ____ PRELIMINARY PLAT APRROVAL
- ____ S. DEV. PLAN FOR SUB'D APPROVAL
- ____ S. DEV. PLAN FOR BLDG PERMIT APPROVAL
- ____ SECTOR PLAN APPROVAL
- ____ FINAL PLAT APPROVAL
- ____ FOUNDATION PERMIT APPROVAL
- ____ BUILDING PERMIT APPROVAL
- ____ CERTIFICATION OF OCCUPANCY APPROVAL
- ____ GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ S.A.D. DRAINAGE REPORT
- ____ DRAINAGE REQUIREMENTS
- X OTHER Amended Grading
- ____ RELEASE OF FINANCIAL GUARANTY
- ____ TRAFFIC CIRCULATION LAYOUT

DATE SUBMITTED: 3-22-02 2nd SR 3/26/02

BY: James D. Hughes

James D. Hughes, PE

RECEIVED
MAR 22 2002
HYDROLOGY SECTION

D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmg@swcp.com

March 18, 2002

Mr. Brad Bingham, PE.
Hydrology Department
City of Albuquerque
P.O. Box 1293
Albuquerque NM 87103

Re: El Rancho Grande Unit 1B Grading Plan Dated 1-23-02

Dear Mr. Bingham:

This is an application for amended Grading Plan approval hopefully to be processed administratively. The main change was to lower the middle of Benevides Ave. by about 9' to better match grade with the commercial property to the south and to balance the earthwork. Side yard slopes and lot lines were adjusted there and in block 2 to better fit the builder's house footprints. There was no change to street layout and the number of lots and their basic configuration remained unchanged. Since the commercial property is also owned by this developer, there were no significant grade changes near the perimeter of this development. Please call with questions or comments.

Sincerely,

MARK GOODWIN & ASSOCIATES, PE.

James D. Hughes

James D. Hughes, PE.
Senior Engineer

JDH/bm

f:\El Rancho Grande 1b\amended grading

D. Mark Goodwin and Associates, P.A.
Consulting Engineers

P.O. Box 90606 ❖ Albuquerque, NM 87199
(505) 828-2200 ❖ (505) 797-9539 fax
e-mail: dmg@swcp.com

LETTER OF TRANSMITTAL

TO: Mr. Brad Bingham
Hydrology Department

DATE: March 22, 2002
El Rancho Grande 1B

We are sending:

Quantity	Date	Description
1		Letter regarding Grading Plan
1		Copy of grading plan

_____ For your approval
_____ As you requested
_____ Pre-Design Meeting

_____ For your records
_____ For your comments

Project Engineer James D. Hughes, PE.

SIGNED: Bernadette Mares
Bernadette Mares

f:\\forms\transmittal letter

D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmg@swcp.com

File: M9/D19C

November 30, 2001

Mr. Brad Bingham
City of Albuquerque
Hydrology
P.O. Box 1293
Albuquerque NM 87103

Re: El Rancho Grande Unit 4B

Dear Mr Bingham;

We are now proposing to construct storm sewer from Balk Rd.. To the Amole Channel in Unser Blvd. instead of constructing the huge retention pond south of Blake Rd. as previously approved. Hopefully this can be an administrative change to the Infrastructure list if AMAFCA will allow the pipe connection to their existing unlined Amole Channel. AMAFCA is planning a project to line the arroyo soon. This project probably won't discharge water there until June 2002.

Attached please find sheet 27 revised and a new sheet 33 of the construction plans showing a 48" Storm sewer in Unser instead of the previously approved 54". That original design was based on the old floodplain map. The new design is based on a preliminary design of the proposed concrete channel(s) as recently prepared for the "Rio Bravo Sector Plan/ Public Improvements" also attached. The new HGL calculations are also attached and the HGL is shown on the plans. There was essentially no change above Blake Rd..

Please amend the infrastructure list and initial the DRC plan Changes. Call if you have questions.

Sincerely,

MARK GOODWIN & ASSOCIATES, P.A.

James D. Hughes, P.E.
Senior Engineer

JDH/bm

xc: Bo Johnson — BO-KAY Construction
Lynn Mazur — AMAFCA
Jane Rael — City of Albuquerque

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DEC 06 2001
HYDROLOGY SECTION

F:\\elranch.gr4\stmsew.rev

D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmg@swcp.com

November 30, 2001

Ms. Jane Rael
City of Albuquerque
P.O. Box 1293
Albuquerque NM 87103

Re: El Rancho Grande Unit 4B

Dear Ms. Rael;

Attached please find the revised waterline on sheet 29. We were unable to obtain the drainage easement for the offsite pond south of Blake. Instead of building that retention pond we are now proposing to construct storm sewer in Unser Blvd. From Blake Rd. to the AMOLE Arroyo. To that end please find two mylar plans and profiles of storm sewer (revised sheet 27 and new sheet 33.) The page numbers need changed on all the rest of the sheets and the table of Contents need changing on the cover page. Check with Brad Bingham about amending the Infrastructure list. You may want to schedule another DRC signature session so everyone can approve the new sheets(see 5 copies attached). Also attached is two copies of a revised Engineers Estimate that reflects all these changes done with a request for a determination of financial guarantee amount.

If there are any question regarding this please feel free to call me at 828-2200.

Sincerely,

MARK GOODWIN & ASSOCIATES, P.A.

James D. Hughes, P.E.
Senior Engineer

JDH/bm

attached:

xc: Bo Johnson — BO-KAY Construction
Brad Bingham — City of Albuquerque
Lynn Mazur — AMAFCA

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DEC 06 2001
HYDROLOGY SECTION

f:\\elrancho.gr4\waterlin.rev

D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmg@swcp.com

November 30, 2001

Ms. Lynn Mazur
AMFCA
2600 Prospect Avenue NE
Albuquerque, NM 87107

Re: Preliminary Design of Secate Blanco Confluence with AMOLE channel at Unser Blvd.

Dear Ms. Mazur;

The purpose of the preliminary design is to allow two other projects to be constructed ahead of the AMOLE Channel and not interfere with the future AMAFCA project. The two projects are a Waterline crossing with the "Rio Bravo Sector Plan/Unser Blvd. Public Improvement" and a Storm sewer connection with the " El Rancho Grande Unit 4B" plans. Both projects will require your approval for construction, and may need enroachment agreements to operate these utilities within the AMAFCA right-of-way.
The channel is extra deep at the Unser Bridge because the natural ground is very flat above the bridge. The freeboard is contained below the adjacent natural ground elevation every where the natural ground shown on the channel profiles is probably about 3' higher than reality in order to avoid additional levee requirements, and so the land north of the channel can drain into it.

The extra depth is a conservative assumption for locating the waterline. The storm sewer HGL will not be significantly affected if the channel is raised by 2 feet. So the design of these two utilities still leaves some flexibility for the final design of the Channel and Bridge.

Please let Brad Bingham know if the two utility plans are okay, and call me if you have any questions. After all DRC revisions are made we may need your signature on the plans.

Sincerely,

MARK GOODWIN & ASSOCIATES, P.A.

James D. Hughes

James D. Hughes, P.E.
Senior Engineer

JDH/bm

attached:

xc: *Nick Bell — AMERICAN SOUTHWEST HOMES*
Bo Johnson — BO-KAY Construction
Brad Bingham — City of Albuquerque
Lyn Mazur — City of Albuquerque

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DEC 06 2001
HYDROLOGY SECTION

f:\\bernie\doug.ltr

STORM DRAIN ANALYSIS PLUS

Original version by Los Angeles County Public Works
Portions Copyrighted by CIVILSOFT, 1986, 1987, 1989

Version
Serial Number

Nov 29, 2001 12: 4: 5

Input file : UNSER22.DAT
Output file: UNSER22.OUT

INPUT FILE LISTING

```
T1 UNSER BLAKE INTERSECTION TO UNSER AMOLE ARROYO
T2
T3 MAIN LINE ANALYSIS
SO     858.00   16.60 10                                  18.52
TS     863.00   16.65  3       .013
R     1021.00   18.44  3       .013
JX    1024.00   18.50  3  2    .013     94.8          19.44         90.
TS    1027.00   18.94  5       .013
R     1571.00   23.29  5       .013                                      1
R     1953.00   26.40  5       .013                                      1
JX    1959.00   26.50  5  8    .013      7.9          28.50         45.
R     2084.00   27.10  5       .013                                      1
JX    2087.00   27.15  5  8    .013      9.6          29.20         45.
TS    2090.00   27.60  2       .013
R     2204.00   28.80  2       .013                              45.     1
R     2210.00   30.30  2       .013
R     2302.00   36.50  2       .013                              45.     1
JX    2305.00   36.60  2  6    .013     58.2          38.50         50.
TS    2308.00   38.50  7       .013
R     2319.00   38.66  7       .013                              45.     1
JX    2322.00   38.76  7  8    .013     19.4          39.00         90.
TS    2325.00   39.16  8       .013
R     2359.00   39.50  8       .013                              90.     1
SH                     8
1                                                      SP
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

```
0 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE    ZL    ZR   INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
  CODE   NO   TYPE  PIERS   WIDTH    DIAMETER  WIDTH              DROP
  CD      1    4                     4.50
  CD      2    4                     3.50
```

```
  CD      3    4                          5.50
  CD      4    4                          5.00
  CD      5    4                          4.00
  CD      6    4                          3.00
  CD      7    4                          2.50
  CD      8    4                          2.00
  CD      9    4                          1.50
  CD     10    2       0        .00       50.00     5.50                    .00
  CD     11    2       0        .00       50.00    24.00                    .00
  CD     12    3       0        .00        7.50    10.00    3.00   3.00     .00
```



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1
0                          WATER SURFACE PROFILE - TITLE CARD LISTING
0HEADING LINE NO 1 IS -
0                            UNSER BLAKE INTERSECTION TO UNSER AMOLE ARROYO
0HEADING LINE NO 2 IS -
0
0HEADING LINE NO 3 IS -
0                            MAIN LINE ANALYSIS
```



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1
0                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
0 ELEMENT NO    1 IS A SYSTEM OUTLET      *          *      *
                  U/S DATA    STATION     INVERT   SECT                                  W S ELEV
                                858.00    16.60    10                                    18.52

0 ELEMENT NO    2 IS A TRANSITION         *          *      *
                  U/S DATA    STATION     INVERT   SECT                N
                                863.00    16.65    3                   .013

0 ELEMENT NO    3 IS A REACH              *          *      *
                  U/S DATA    STATION     INVERT   SECT                N                                RADIUS   ANGLE   ANG PT   MAN H
                                1021.00   18.44    3                   .013                               .00      .00     .00      0

0 ELEMENT NO    4 IS A JUNCTION           *          *      *      *                    *                          *                *
                  U/S DATA    STATION     INVERT   SECT LAT-1 LAT-2  N       Q3         Q4     INVERT-3 INVERT-4  PHI 3    PHI 4
                                1024.00   18.50    3      2      0    .013    94.8        .0     19.44      .00     90.00     .00

0 ELEMENT NO    5 IS A TRANSITION         *          *      *
                  U/S DATA    STATION     INVERT   SECT                N
                                1027.00   18.94    5                   .013

0 ELEMENT NO    6 IS A REACH              *          *      *
                  U/S DATA    STATION     INVERT   SECT                N                                RADIUS   ANGLE   ANG PT   MAN H
                                1571.00   23.29    5                   .013                               .00      .00     .00      1

0 ELEMENT NO    7 IS A REACH              *          *      *
                  U/S DATA    STATION     INVERT   SECT                N                                RADIUS   ANGLE   ANG PT   MAN H
                                1953.00   26.40    5                   .013                               .00      .00     .00      1

0 ELEMENT NO    8 IS A JUNCTION           *          *      *      *                    *                          *                *
                  U/S DATA    STATION     INVERT   SECT LAT-1 LAT-2  N       Q3         Q4     INVERT-3 INVERT-4  PHI 3    PHI 4
                                1959.00   26.50    5      8      0    .013     7.9        .0     28.50      .00     45.00     .00

0 ELEMENT NO    9 IS A REACH              *          *      *
                  U/S DATA    STATION     INVERT   SECT                N                                RADIUS   ANGLE   ANG PT   MAN H
                                2084.00   27.10    5                   .013                               .00      .00     .00      1

0 ELEMENT NO   10 IS A JUNCTION           *          *      *      *                    *                          *                *
                  U/S DATA    STATION     INVERT   SECT LAT-1 LAT-2  N       Q3         Q4     INVERT-3 INVERT-4  PHI 3    PHI 4
```

```
                                2087.00   27.15    5     8     0   .013      9.6       .0    29.20      .00  45.00      .00
0 ELEMENT NO  11 IS A TRANSITION        *         *     *
                  U/S DATA   STATION     INVERT  SECT                N
                                2090.00   27.60    2                .013
1                                                                                                          PAGE NO   3
0                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
0 ELEMENT NO  12 IS A REACH             *         *     *
                  U/S DATA   STATION     INVERT  SECT                N                                RADIUS  ANGLE  ANG PT  MAN H
                                2204.00   28.80    2                .013                                  .00    .00   45.00      1
0 ELEMENT NO  13 IS A REACH             *         *     *
                  U/S DATA   STATION     INVERT  SECT                N                                RADIUS  ANGLE  ANG PT  MAN H
                                2210.00   30.30    2                .013                                  .00    .00     .00      0
0 ELEMENT NO  14 IS A REACH             *         *     *
                  U/S DATA   STATION     INVERT  SECT                N                                RADIUS  ANGLE  ANG PT  MAN H
                                2302.00   36.50    2                .013                                  .00    .00   45.00      1
0 ELEMENT NO  15 IS A JUNCTION          *         *     *     *                    *                     *                 *
                  U/S DATA   STATION     INVERT  SECT LAT-1 LAT-2   N       Q3        Q4     INVERT-3 INVERT-4  PHI 3   PHI 4
                                2305.00   36.60    2     6     0   .013     58.2       .0     38.50      .00  50.00      .00
0 ELEMENT NO  16 IS A TRANSITION        *         *     *
                  U/S DATA   STATION     INVERT  SECT                N
                                2308.00   38.50    7                .013
0 ELEMENT NO  17 IS A REACH             *         *     *
                  U/S DATA   STATION     INVERT  SECT                N                                RADIUS  ANGLE  ANG PT  MAN H
                                2319.00   38.66    7                .013                                  .00    .00   45.00      1
0 ELEMENT NO  18 IS A JUNCTION          *         *     *     *                    *                     *                 *
                  U/S DATA   STATION     INVERT  SECT LAT-1 LAT-2   N       Q3        Q4     INVERT-3 INVERT-4  PHI 3   PHI 4
                                2322.00   38.76    7     8     0   .013     19.4       .0     39.00      .00  90.00      .00
0 ELEMENT NO  19 IS A TRANSITION        *         *     *
                  U/S DATA   STATION     INVERT  SECT                N
                                2325.00   39.16    8                .013
0 ELEMENT NO  20 IS A REACH             *         *     *
                  U/S DATA   STATION     INVERT  SECT                N                                RADIUS  ANGLE  ANG PT  MAN H
                                2359.00   39.50    8                .013                                  .00    .00   90.00      1
0 ELEMENT NO  21 IS A SYSTEM HEADWORKS                                *                     *
                  U/S DATA   STATION     INVERT  SECT                                    W S ELEV
                                2359.00   39.50    8                                        .00
 NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

  ** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC
                                                                                                           PAGE     1
1
                                                WATER SURFACE PROFILE LISTING
                                     UNSER BLAKE INTERSECTION TO UNSER AMOLE ARROYO

                                                MAIN LINE ANALYSIS
0 STATION    INVERT   DEPTH     W.S.          Q       VEL      VEL      ENERGY   SUPER   CRITICAL              HGT/    BASE/     ZL    NO  AVBPR
           ELEV    OF FLOW    ELEV                              HEAD    GRD.EL.   ELEV     DEPTH                DIA     ID NO.          PIER
0 L/ELEM     SO                                           SF AVE      HF                        NORM DEPTH                        ZR
*************************************************************************************************************************************
0   858.00   16.60     2.35     18.95      209.3   16.19     4.07     23.02     .00     3.56                 50.00    5.50    .00    0    .00
```

0TRANS STR	.01000					.01206	.06						.00				
0 863.00	16.65	3.20	19.85	209.3	14.61	3.31	23.16	.00	4.05		5.50	.00	.00	0	.00		
0 51.77	.01133					.00913	.47			3.02			.00				
0 914.77	17.24	3.28	20.52	209.3	14.17	3.12	23.63	.00	4.05		5.50	.00	.00	0	.00		
0 48.88	.01133					.00827	.40			3.02			.00				
0 963.65	17.79	3.41	21.20	209.3	13.51	2.84	24.04	.00	4.05		5.50	.00	.00	0	.00		
0 28.69	.01133					.00733	.21			3.02			.00				
0 992.34	18.12	3.56	21.67	209.3	12.88	2.58	24.25	.00	4.05		5.50	.00	.00	0	.00		
0 17.08	.01133					.00651	.11			3.02			.00				
0 1009.42	18.31	3.71	22.02	209.3	12.28	2.34	24.36	.00	4.05		5.50	.00	.00	0	.00		
0 8.86	.01133					.00579	.05			3.02			.00				
0 1018.28	18.41	3.87	22.28	209.3	11.71	2.13	24.41	.00	4.05		5.50	.00	.00	0	.00		
0 2.72	.01133					.00517	.01			3.02			.00				
0 1021.00	18.44	4.05	22.49	209.3	11.16	1.94	24.43	.00	4.05		5.50	.00	.00	0	.00		
0JUNCT STR	.02000					.00302	.01						.00				
0 1024.00	18.50	6.61	25.11	114.5	4.82	.36	25.47	.00	2.97		5.50	.00	.00	0	.00		
0TRANS STR	.14667					.00376	.01						.00				
0 1027.00	18.94	5.44	24.38	114.5	9.11	1.29	25.67	.00	3.23		4.00	.00	.00	0	.00		
0 544.00	.00800					.00635	3.46			2.94			.00				
0 1571.00	23.29	4.61	27.90	114.5	9.11	1.29	29.19	.00	3.23		4.00	.00	.00	0	.00		
0 375.00	.00814					.00631	2.37			2.92			.00				

WATER SURFACE PROFILE LISTING

UNSER BLAKE INTERSECTION TO UNSER AMOLE ARROYO

MAIN LINE ANALYSIS

0 STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
0 L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
0 1946.00	26.34	4.00	30.34	114.5	9.11	1.29	31.63	.00	3.23		4.00	.00	.00	0	.00
0 7.00	.00814					.00615	.04			2.92			.00		
0 1953.00	26.40	3.98	30.38	114.5	9.12	1.29	31.68	.00	3.23		4.00	.00	.00	0	.00
0JUNCT STR	.01667					.00577	.03						.00		
0 1959.00	26.50	4.23	30.73	106.6	8.48	1.12	31.85	.00	3.12		4.00	.00	.00	0	.00
0 103.98	.00480					.00551	.57			3.65			.00		
0 2062.98	27.00	4.35	31.35	106.6	8.48	1.12	32.47	.00	3.12		4.00	.00	.00	0	.00
0HYDRAULIC JUMP													.00		
0 2062.98	27.00	2.14	29.14	106.6	15.53	3.75	32.89	.00	3.12		4.00	.00	.00	0	.00
0 21.02	.00480					.01850	.39			3.65			.00		
0 2084.00	27.10	2.07	29.17	106.6	16.22	4.09	33.26	.00	3.12		4.00	.00	.00	0	.00
0JUNCT STR	.01667					.02469	.07						.00		
0 2087.00	27.15	1.74	28.89	97.0	18.53	5.34	34.22	.00	2.98		4.00	.00	.00	0	.00
0TRANS STR	.15000					.02790	.08						.00		
0 2090.00	27.60	1.95	29.55	97.0	17.60	4.82	34.37	.00	3.03		3.50	.00	.00	0	.00
0 14.12	.01053					.02695	.38			2.69			.00		
0 2104.12	27.75	1.91	29.65	97.0	18.10	5.09	34.75	.00	3.03		3.50	.00	.00	0	.00
0 22.73	.01053					.02980	.68			2.69			.00		
0 2126.86	27.99	1.84	29.82	97.0	18.98	5.60	35.42	.00	3.03		3.50	.00	.00	0	.00

0	21.14	.01053					.03380	.71			2.69			.00			
0	2148.00	28.21	1.77	29.98	97.0	19.91	6.16	36.14	.00	3.03		3.50	.00	.00	0	.00	
0	19.79	.01053					.03837	.76			2.69			.00			
1															PAGE	3	

WATER SURFACE PROFILE LISTING

UNSER BLAKE INTERSECTION TO UNSER AMOLE ARROYO

MAIN LINE ANALYSIS

0	STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
0	L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
0	2167.78	28.42	1.70	30.12	97.0	20.88	6.78	36.90	.00	3.03		3.50	.00	.00	0	.00
0	18.62	.01053					.04359	.81			2.69			.00		
0	2186.40	28.61	1.64	30.25	97.0	21.90	7.45	37.71	.00	3.03		3.50	.00	.00	0	.00
0	17.60	.01053					.04957	.87			2.69			.00		
0	2204.00	28.80	1.58	30.38	97.0	22.97	8.20	38.58	.00	3.03		3.50	.00	.00	0	.00
0	2.96	.25000					.05002	.15			1.04			.00		
0	2206.96	29.54	1.63	31.17	97.0	22.06	7.56	38.73	.00	3.03		3.50	.00	.00	0	.00
0	3.04	.25000					.04444	.14			1.04			.00		
0	2210.00	30.30	1.69	31.99	97.0	21.03	6.87	38.87	.00	3.03		3.50	.00	.00	0	.00
0	.00	.25000					.04160	.00			1.04			.00		
0	2210.00	30.30	1.69	31.99	97.0	21.03	6.87	38.87	.00	3.03		3.50	.00	.00	0	.00
0	10.65	.06739					.04032	.43			1.48			.00		
0	2220.65	31.02	1.73	32.74	97.0	20.54	6.55	39.30	.00	3.03		3.50	.00	.00	0	.00
0	17.27	.06739					.03671	.63			1.48			.00		
0	2237.91	32.18	1.79	33.97	97.0	19.58	5.96	39.93	.00	3.03		3.50	.00	.00	0	.00
0	13.48	.06739					.03234	.44			1.48			.00		
0	2251.40	33.09	1.86	34.95	97.0	18.67	5.42	40.37	.00	3.03		3.50	.00	.00	0	.00
0	10.81	.06739					.02852	.31			1.48			.00		
0	2262.21	33.82	1.93	35.75	97.0	17.80	4.92	40.67	.00	3.03		3.50	.00	.00	0	.00
0	8.78	.06739					.02517	.22			1.48			.00		
0	2270.99	34.41	2.01	36.42	97.0	16.97	4.48	40.90	.00	3.03		3.50	.00	.00	0	.00
0	7.22	.06739					.02225	.16			1.48			.00		
1															PAGE	4

WATER SURFACE PROFILE LISTING

UNSER BLAKE INTERSECTION TO UNSER AMOLE ARROYO

MAIN LINE ANALYSIS

0	STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
0	L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
0	2278.21	34.90	2.09	36.99	97.0	16.18	4.07	41.06	.00	3.03		3.50	.00	.00	0	.00
0	5.95	.06739					.01969	.12			1.48			.00		
0	2284.16	35.30	2.18	37.47	97.0	15.43	3.70	41.17	.00	3.03		3.50	.00	.00	0	.00
0	4.91	.06739					.01745	.09			1.48			.00		
0	2289.07	35.63	2.27	37.90	97.0	14.71	3.36	41.26	.00	3.03		3.50	.00	.00	0	.00
0	4.02	.06739					.01550	.06			1.48			.00		

0	2293.10	35.90	2.36	38.26	97.0	14.03	3.06	41.32	.00	3.03		3.50	.00	.00	0	.00
0	3.24	.06739					.01379	.04			1.48			.00		
0	2296.34	36.12	2.47	38.59	97.0	13.37	2.78	41.37	.00	3.03		3.50	.00	.00	0	.00
0	2.54	.06739					.01231	.03			1.48			.00		
0	2298.88	36.29	2.58	38.87	97.0	12.75	2.53	41.40	.00	3.03		3.50	.00	.00	0	.00
0	1.89	.06739					.01104	.02			1.48			.00		
0	2300.77	36.42	2.70	39.12	97.0	12.16	2.30	41.42	.00	3.03		3.50	.00	.00	0	.00
0	1.23	.06739					.00995	.01			1.48			.00		
0	2302.00	36.50	2.84	39.34	97.0	11.59	2.09	41.43	.00	3.03		3.50	.00	.00	0	.00
0	JUNCT STR	.03333					.02355	.07						.00		
0	2305.00	36.60	1.06	37.66	38.8	15.81	3.89	41.54	.00	1.94		3.50	.00	.00	0	.00
0	TRANS STR	.63333					.02405	.07						.00		
0	2308.00	38.50	1.90	40.40	38.8	9.70	1.46	41.86	.00	2.10		2.50	.00	.00	0	.00
0	TRANS STR	.63333					.01045	.00						.00		
0	2308.00	38.50	1.90	40.40	38.8	9.70	1.46	41.86	.00	2.10		2.50	.00	.00	0	.00
0	.14	.01455					.01044	.00			1.67			.00		

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WATER SURFACE PROFILE LISTING

UNSER BLAKE INTERSECTION TO UNSER AMOLE ARROYO

MAIN LINE ANALYSIS

0	STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
0	L/ELEM	SO					SF AVE	HF						ZR		
0	2308.14	38.50	1.90	40.40	38.8	9.69	1.46	41.86	.00	2.10		2.50	.00	.00	0	.00
0	8.38	.01455					.00993	.08			1.67			.00		
0	2316.52	38.62	1.99	40.62	38.8	9.24	1.33	41.95	.00	2.10		2.50	.00	.00	0	.00
0	2.48	.01455					.00899	.02			1.67			.00		
0	2319.00	38.66	2.10	40.76	38.8	8.81	1.21	41.97	.00	2.10		2.50	.00	.00	0	.00
0	JUNCT STR	.03333					.00540	.02						.00		
0	2322.00	38.76	3.79	42.55	19.4	3.95	.24	42.79	.00	1.49		2.50	.00	.00	0	.00
0	TRANS STR	.13333					.00480	.01						.00		
0	2325.00	39.16	3.12	42.28	19.4	6.18	.59	42.87	.00	1.58		2.00	.00	.00	0	.00
0	34.00	.01000					.00735	.25			1.42			.00		
0	2359.00	39.50	3.24	42.74	19.4	6.18	.59	43.33	.00	1.58		2.00	.00	.00	0	.00

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City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

November 13, 2001

James D Hughes, PE
Mark Goodwin & Associates
P.O. 90606
Albuquerque, NM 87199

Re: El Rancho Grande Subdivision Unit 1B Drainage Report
Engineer's Stamp dated 11-9-01 (M9/D19C)

Dear Mr. Hughes,

Based upon the information provided in your submittal dated 11-7-01, the above referenced plan is approved for Preliminary Plat action by the DRB. Upon approval from that board, please submit a mylar to my office for signature so that Rough Grading may proceed.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Sr. Engineer, Hydrology

C: file

M-9 | D19C

DRAINAGE INFORMATION SHEET

PROJECT TITLE: El Rancho Grande I Units1-B ZONE ATLAS#: M-9

DRB#: EPC# WORKORDER#:

LEGAL DESCRIPTION: A Tract of Land situate within the Town of Atrisco Grant, projected Section 33, Township 10 North, Range 2 East, projected Section 4, Township 9 North, Range 3 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico being all of Parcel 12, El Rancho Grande 1.

CITY ADDRESS:

ENGINEERING FIRM:	Mark Goodwin & Associates, PA	CONTACT:	James D. Hughes, PE
ADDRESS:	P.O. Box 90606, Albuquerque, NM 87199	PHONE:	828-2200
OWNER:	Curb, Inc.	CONTACT:	Bo Johnson
ADDRESS:	6301 Indian School Rd. NE, Albuq., NM 87110	PHONE:	881-9190
ARCHITECT:		CONTACT:	
ADDRESS:		PHONE:	
SURVEYOR:	Aldrich Land Surveying	CONTACT:	Tim Aldrich
ADDRESS:	P.O. Box 30701, Albuquerque, NM 87190	PHONE:	884-1990
CONTRACTOR:		CONTACT:	
ADDRESS:		PHONE:	

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ___ DRAINAGE PLAN
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- X GRADING PLAN
- X EROSION CONTROL
- ___ ENGINEER'S CERTIFICATION
- ___ OTHER
- ___ EASEMENT VACATION

PRE-DESIGN MEETING:

- ___ YES
- X NO
- ___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SKETCH PLAT APRROVAL
- X PRELIMINARY PLAT APRROVAL
- ___ S. DEV. PLAN FOR SUB'D APPROVAL
- ___ S. DEV. PLAN FOR BLDG PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- ___ FINAL PLAT APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- ___ BUILDING PERMIT APPROVAL
- ___ CERTIFICATION OF OCCUPANCY APPROVAL
- X GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ S.A.D. DRAINAGE REPORT
- ___ DRAINAGE REQUIREMENTS
- ___ OTHER
- ___ RELEASE OF FINANCIAL GUARANTY
- ___ TRAFFIC CIRCULATION LAYOUT

DATE SUBMITTED: 10-19-01

BY: James D. Hughes
James D. Hughes, PE

RECEIVED
OCT 19 2001
HYDROLOGY SECTION

No Map

Current DRC
Project Number:_____

FIGURE 12

INFRASTRUCTURE LIST

Date Submitted:_____
Date Site Plan Approved:_____
Date Preliminary Plat Approved:_____
Date Preliminary Plat Expires:_____
DRB Project No.:_____
DRB Application No.:_____

EXHIBIT "A"
TO SUBDIVISION IMPROVEMENTS AGREEMENT
DEVELOPMENT REVIEW BOARD (D.R.B.) REQUIRED INFRASTRUCTURE LIST

El Rancho Grande I, Unit 1-B
PROPOSED NAME OF PLAT AND/OR SITE DEVELOPMENT PLAN

Parcel 12, El Rancho Grande
EXISTING LEGAL DESCRIPTION PRIOR TO PLATTING ACTION

Following is a summary of PUBLIC/PRIVATE Infrastructure required to be constructed or financially guaranteed for the above development. This Listing is not necessarily a complete listing. During the SIA process and/or in the review of the construction drawings, if the DRC Chair determines that appurtenant items and/or unforeseen items have not been included in the infrastructure listing, the DRC Chair may include those items in the listing and related financial guarantee. Likewise, if the DRC Chair determines that appurtenant or non-essential items can be deleted from the listing, those items may be deleted as well as the related portions of the financial guarantees. All such revisions require approval by the DRC Chair, the User Department and agent/owner. If such approvals are obtained, these revisions to the listing will be incorporated administratively. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility will be required as a condition of project acceptance and close out by the City.

SIA Sequence #	COA DRC Project #	Size PAVING	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
		4'	Sidewalk (E. side only)	Barbados Ave.	86th Street	S. Boundary			
		28' FF	Residential Pvmt Roll Curb 4' Sidewalk (both sides) *	Golden Sky Ave.	Shadowcast Ave	Barbados Ave	/	/	/
		26' FF	Residential Pvmt Std C & G ** 4' Sidewalk (both sides) *	Shadowcast Ave	Golden Sky Ave.	Benevides Ave	/	/	/
		26' FF	Residential Pvmt Std C & G ** 4' Sidewalk (both sides) *	Skylight Ave	Golden Sky. Ave.	Benenvides Ave	/	/	/
		26' FF	Residential Pvmt Std C & G ** 4' Sidewalk (both sides) *	Benevides Ave	Shadowcast Ave	Skylight Ave	/	/	/
		28' FF	Residential Pvmt Std C & G ** 4' Sidewalk (both sides) *	Benevides Ave	Barbados Ave	Skylight Ave	/	/	/
		35' radius	Cul-de-sac Resdential Pvmt Roll Curb 4' Sidewalk (both sides) *	Skylight Ct	Skylight Ave	end of cul-de-sac	/	/	/
		24FF	Residential Pavement STD C & G 4' Sidewalk (south side only)	86TH St.	West boundry	Barbadose Ave			

revised 07/01/01

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
		24' FF	Stub Street Residential Pvmt Roll Curb 4' Sidewalk (W. side only) *	Shadowcast Ave	Barranca Ave	N. end of stub	/	/	/
		24' FF	Stub Street Residential Pvmt Std C & G ** 4' Sidewalk (W. side only) *	Shadowcast Ave	Benevides Ave	S. end of stub	/	/	/
		WATER							
		8"	Waterline	Barbados Ave	86th Street	Barranca Ave	/	/	/
		8"	Waterline	Golden Sky Ave.	Shadowcast Ave	Barbados Ave	/	/	/
		8"	Waterline	Shadowcast Ave	Golden Sky Ave.	Benevides Ave	/	/	/
		6"	Waterline	Skylight Ave	Golden Sky Ave.	Benevides Ave	/	/	/
		8"	Waterline	Benevides Ave	Shadowcast Ave	Barbadose Ave	/	/	/
		4"	Waterline	Skylight Ave	Skylight Ave	End of cul-de-sac	/	/	/
		4"	Waterline	Shadowcast Ave	Golden Sky Ave.	N. end of stub	/	/	/
		4"	Waterline	Shadowcast Ave	Benevides Ave	S. end of stub	/	/	/
		SANITARY SEWER							
		8"	Sanitary Sewer	Barbados Ave	86th Street	Golden Sky Ave.	/	/	/
		8"	Sanitary Sewer	Golden Sky Ave.	Shadowcast Ave	Barbados Ave	/	/	/
		8"	Sanitary Sewer	Shadowcast Ave	Golden Sky Ave.	Benevides Ave	/	/	/
		8"	Sanitary Sewer	Skylight Ave	Golden Sky Ave.	Benevides Ave	/	/	/
		8"	Sanitary Sewer	Benevides Ave	Shadowcast Ave	Barbados Ave	/	/	/
		8"	Sanitary Sewer	Skylight Ct	Skylight Ave	End of cul-de-sac	/	/	/
		8"	Sanitary Sewer	Shadowcast Ave	Golden Sky Ave.	N. end of stub	/	/	/
		8"	Sanitary Sewer	Shadowcast Ave	Benevides Ave	S. end of stub 8"	/	/	/
		STORM DRAINAGE							
		Engineer's Certification of Private Grading and Drainage. Not to be financially guaranteed.							

PLAN_____

NOTES

* All internal sidewalks to be deferred

** Standard curb and gutter will be used instead of roll curb and gutter where required for drainage.

> Stormdrain to include manholes, inlets, riprap and outfall.

> Water infrastructure to include valves, fittings, valve boxes and fire hydrants.

> Sanitary sewer to include manholes and services connections.

1 _____

_____

2 _____

_____

3 _____

_____

AGENT / OWNER	DEVELOPMENT REVIEW BOARD MEMBER APPROVALS

James D. Hughes, PE
NAME (print)

Mark Goodwin & Associates, PA
FIRM

_____
SIGNATURE - date

MAXIMUM TIME ALLOWED TO CONSTRUCT THE IMPROVEMENTS WITHOUT A DRB EXTENSION: _____

_____
DRB CHAIR - date

_____
PARKS & GENERAL SERVICES - date

_____
TRANSPORTATION DEVELOPMENT - date

_____
AMAFCA - date

_____
UTILITY DEVELOPMENT - date

_____ - date

_____
CITY ENGINEER - date

_____ - date

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT / OWNER