

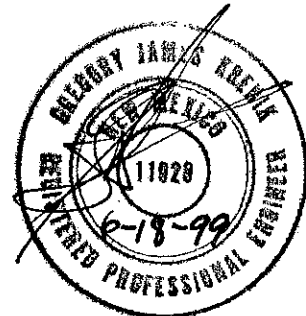
DRAINAGE CALCULATIONS

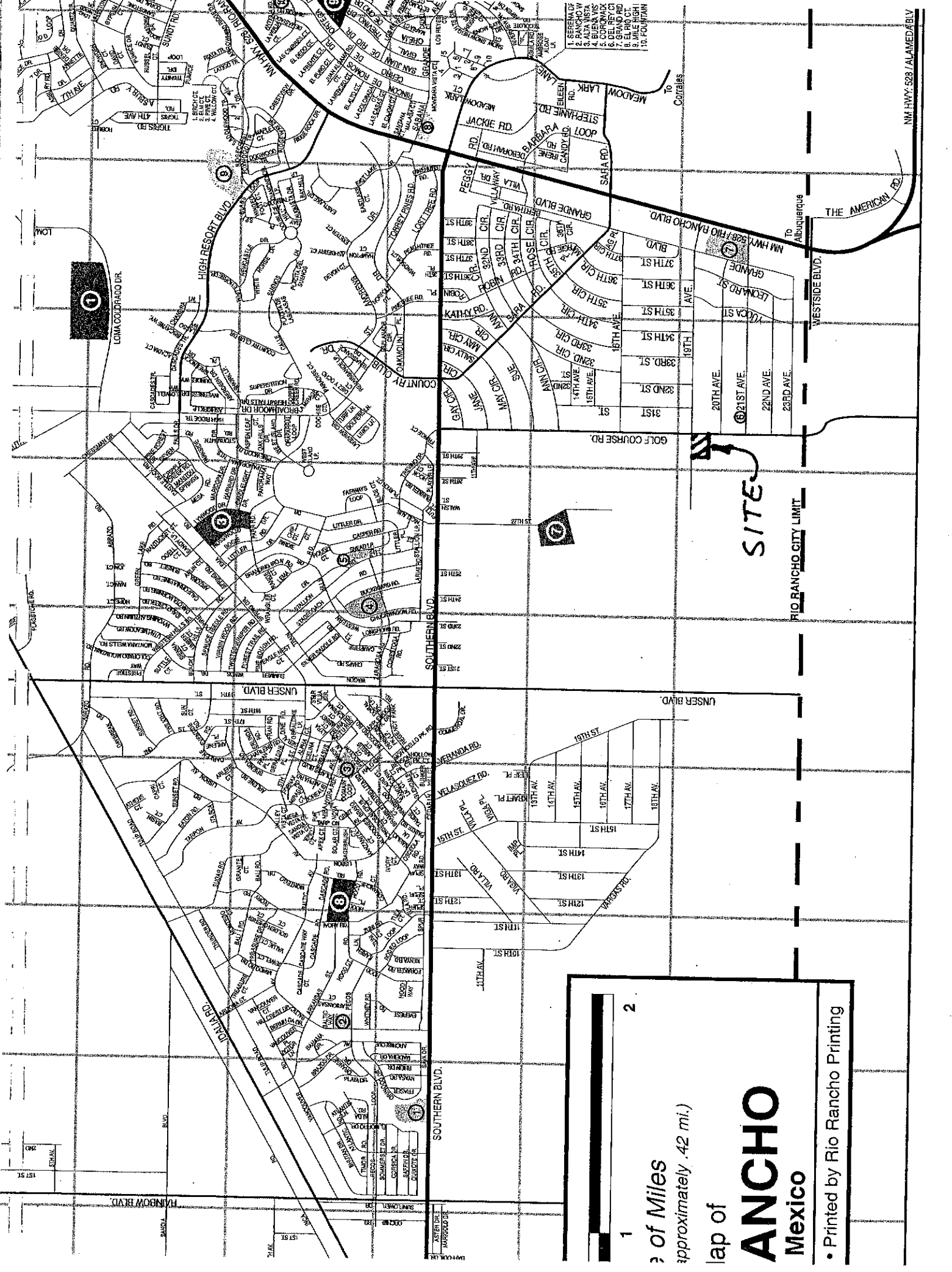
FOR

GUARDIAN STORAGE

RIO RANCHO

Sheet missing (RC)
7-2-03





2

3 of Miles

approximately .42 mi.)

lap of

ANCHO

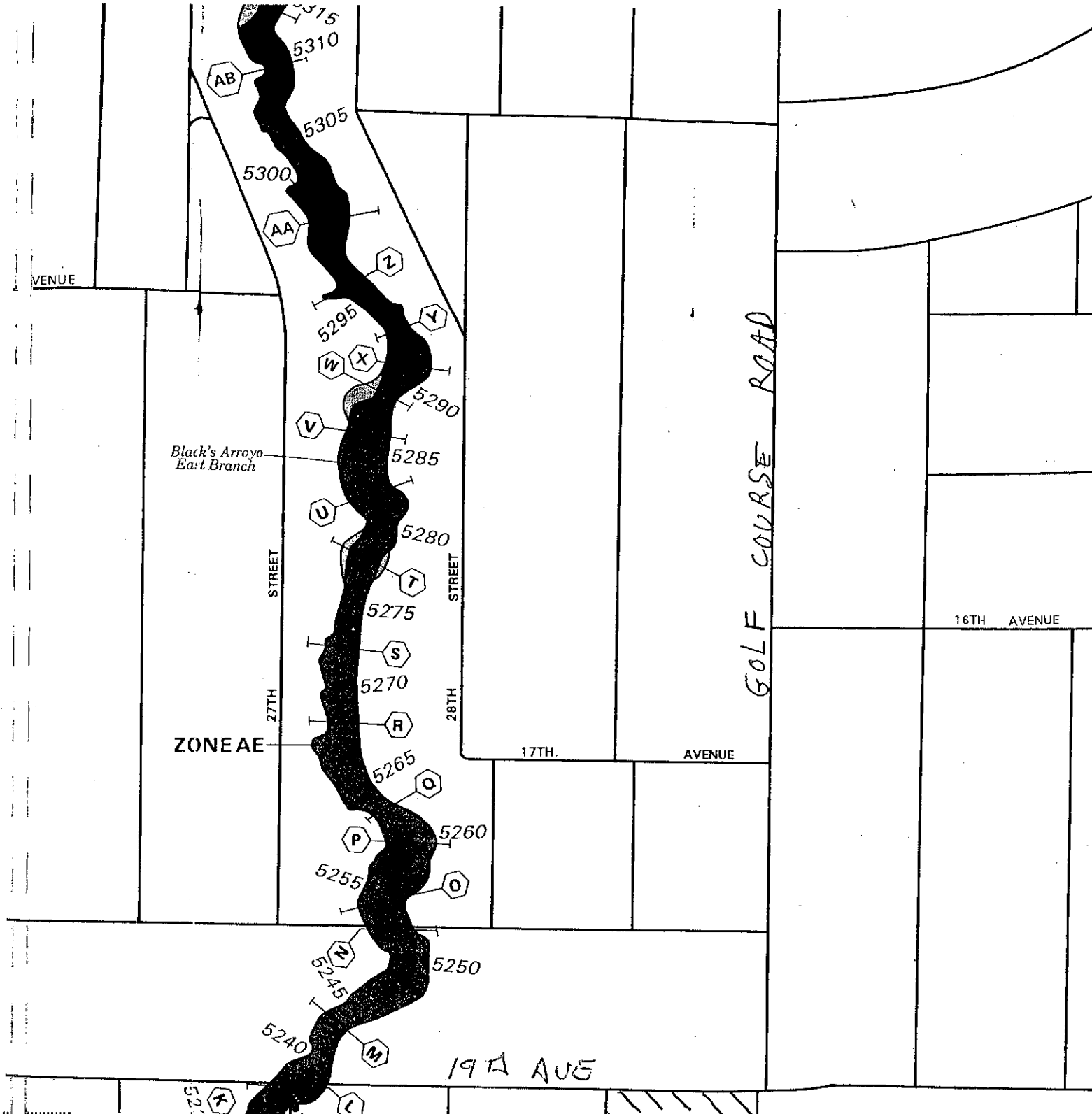
Mexico

• Printed by Rio Rancho Printing

SITE

RIO RANCHO CITY LIMIT

NM HWY 528 / ALAMEDA BLV



MAP NUMBER
35043C0894 C

EFFECTIVE DATE:
JULY 16, 1996



Federal Emergency Management Agency



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

PROJECT GUARDIAN STORAGE
SUBJECT DRAINAGE CALCS
BY GJK DATE 6-18-99
CHECKED _____ DATE _____
SHEET 1 OF _____

- THIS SITE DOES NOT LIE IN A 100 YR FLOOD ZONE.
- OFFSITE FLOWS DO NOT IMPACT THE SITE.
- TOTAL SITE AREA = 3.6442 AC.
- THE SITE IS SPLIT INTO 2 PHASES.
- DIRECT DISCHARGE IS ALLOWED TO GOLF COURSE ROAD.

PHASE I = 2.6442 AC
PHASE II = 1.0000 AC $\rightarrow$ 3.6442 AC = 0.005694 SM.

TOTAL LANDSCAPING = 0.2609 AC = 7.16%

FROM AHYMO OUTPUT SHEETS 4-6

$P_1 = 1.8711$

$P_6 = 2.2011$

$P_{24} = 2.6611$

$Q = 15.32$ CFS

- SIZE DISCHARGE

FROM NDMO SHEET 2

$Q_{18"} @ 2\% = 15$ CFS

* $Q_{24"} @ 2\% = 32$ CFS USE 24" x 18" ARCH PIPE

WE WILL USE THIS BECAUSE INLET IS IN SUMP.

- VERIFY INLET CAPACITY

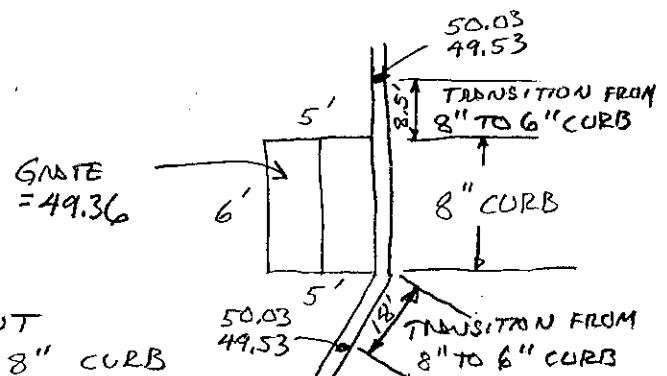
USE 2-8" OBL-D" INLETS

$P = 5 + 5 + 6 = 16$

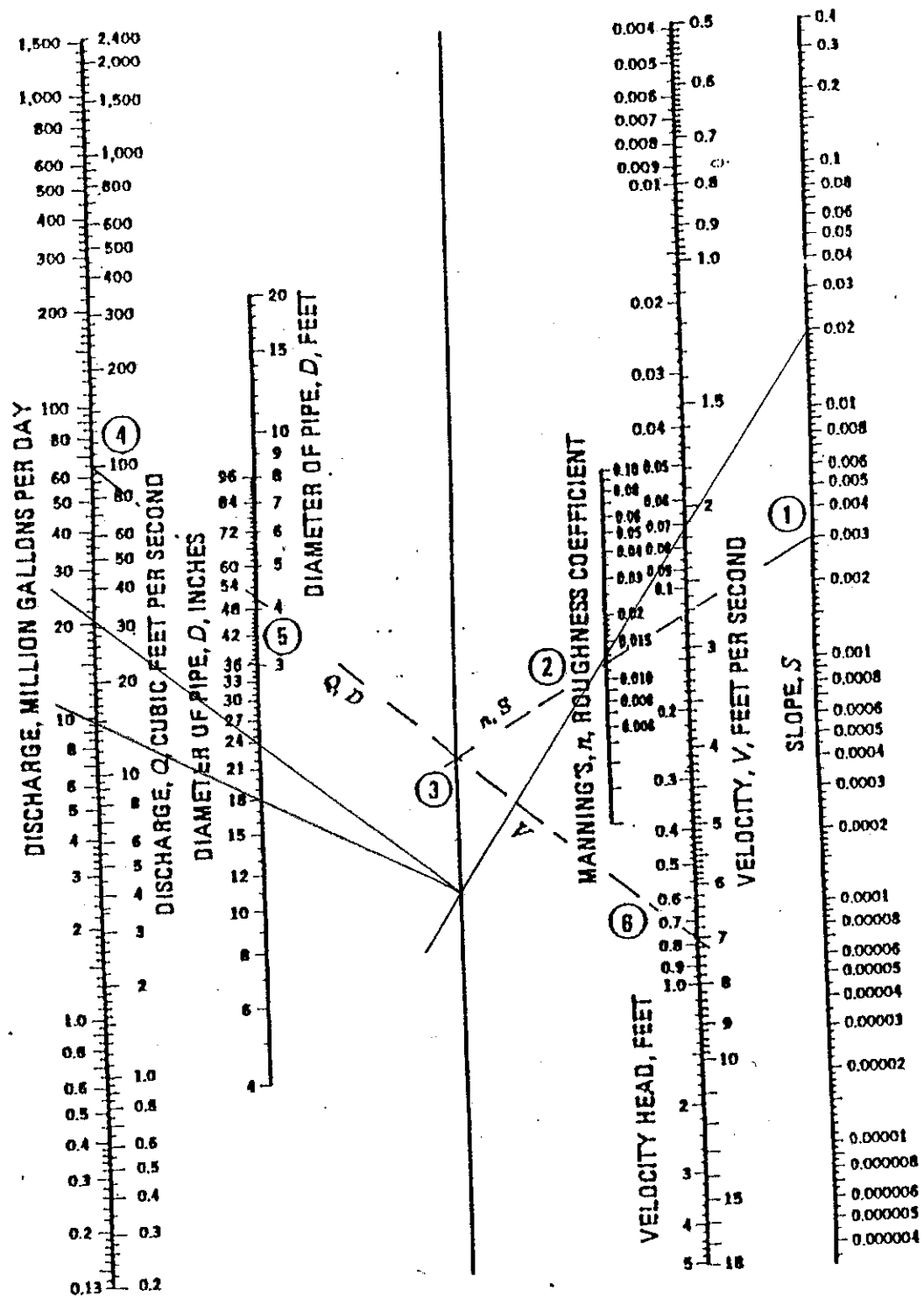
$Q/P = 3.0 H^{1.5}$ SEE SHEET 3

$= 0.47' < 0.5$

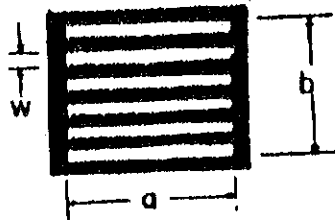
THIS IS OKAY BUT
WE WILL USE AN 8" CURB
BEHIND INLET AND KEEP
TO P OF CURB AT 50.03 UNTIL IT MEETS
TOP OF 6" CURB AT 50.03.



Reference: American Concrete Pipe Association (1980).



B) Circular Pipe Solution

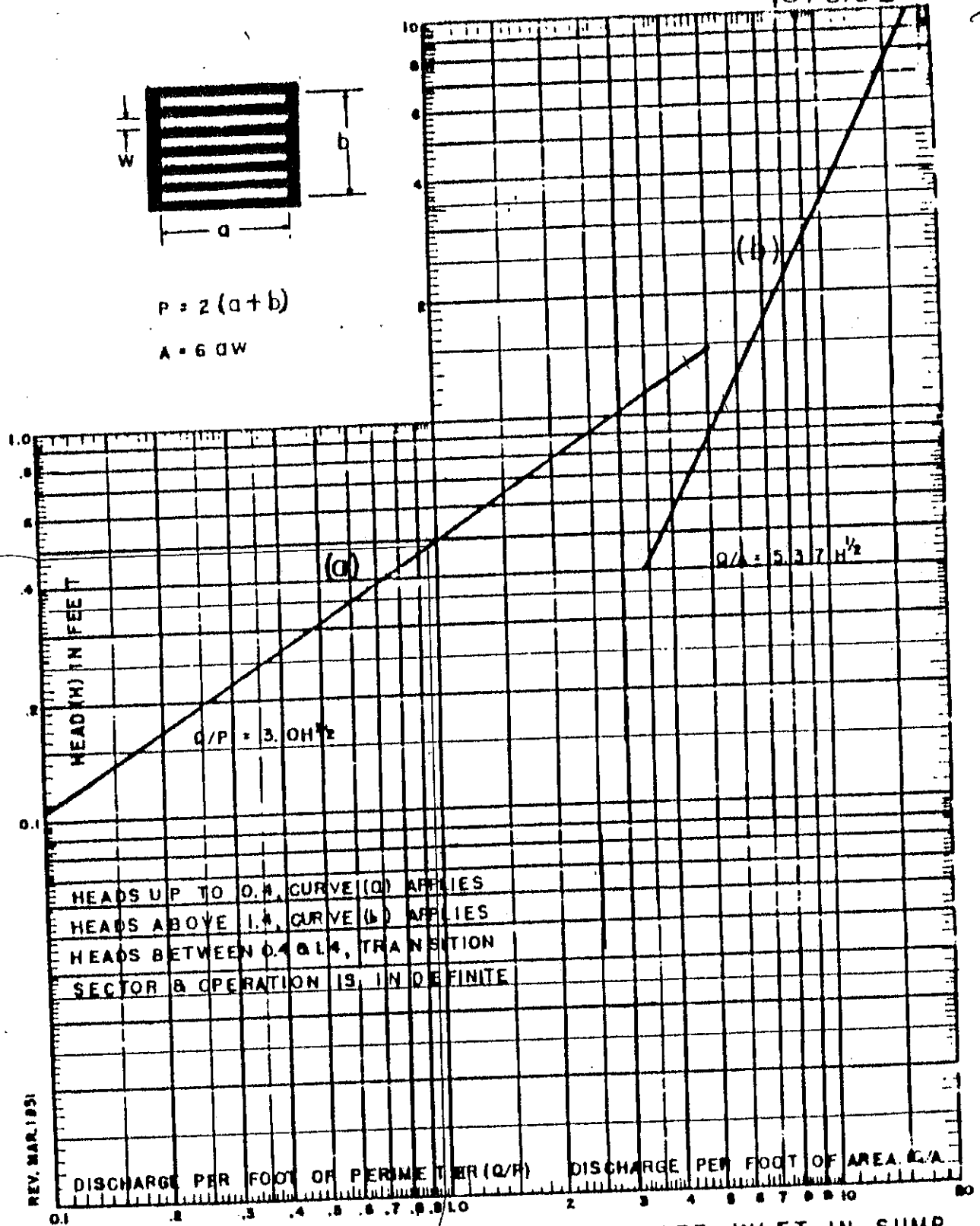


$$P = 2(a + b)$$

$$A = 6.0W$$

1073.02

0.47



BUREAU OF PUBLIC ROADS
DIVISION TWO WASH, D.C.

CAPACITY OF GRATE INLET IN SUMP
WATER PONDED ON GRATE

0.96

36

4

```
START          TIME=0.0
***** HYDROGRAPH FOR GUARDIAN STORAGE - RIO RANCHO
RAINFALL      TYPE=1 RAIN QUARTER=0.0 IN
              RAIN ONE=1.87 IN RAIN SIX=2.20 IN
              RAIN DAY=2.66 IN DT=0.03333 HR
COMPUTE NM HYD ID=1 HYD NO=101.1 AREA=0.005694 SQ MI
              PER A=00.00 B=7.16 C=00 D=92.84
              TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD     ID=1 CODE=1
FINISH
```

5
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
RUN DATE (MON/DAY/YR) = 06/21/1999
START TIME (HR:MIN:SEC) = 09:33:02 USER NO. = M_GOODWN.I01
INPUT FILE = GARDRR.DAT

START TIME=0.0
***** HYDROGRAPH FOR GUARDIAN STORAGE - RIO RANCHO
RAINFALL TYPE=1 RAIN QUARTER=0.0 IN
RAIN ONE=1.87 IN RAIN SIX=2.20 IN
RAIN DAY=2.66 IN DT=0.03333 HR

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
DT = .033330 HOURS END TIME = 5.999400 HOURS

.0000	.0016	.0033	.0050	.0067	.0085	.0103
.0122	.0141	.0160	.0180	.0201	.0222	.0243
.0266	.0289	.0312	.0337	.0362	.0388	.0415
.0443	.0472	.0502	.0534	.0567	.0601	.0637
.0675	.0715	.0758	.0809	.0865	.0924	.1050
.1334	.1771	.2398	.3254	.4379	.5814	.7600
.9780	1.1804	1.2649	1.3363	1.3997	1.4575	1.5106
1.5600	1.6061	1.6493	1.6900	1.7284	1.7646	1.7989
1.8314	1.8623	1.8915	1.9193	1.9456	1.9518	1.9576
1.9630	1.9682	1.9732	1.9780	1.9825	1.9869	1.9912
1.9953	1.9993	2.0031	2.0068	2.0104	2.0140	2.0174
2.0207	2.0240	2.0272	2.0303	2.0333	2.0363	2.0392
2.0420	2.0448	2.0475	2.0502	2.0528	2.0554	2.0580
2.0605	2.0629	2.0653	2.0677	2.0700	2.0723	2.0746
2.0768	2.0790	2.0812	2.0833	2.0855	2.0875	2.0896
2.0916	2.0936	2.0956	2.0976	2.0995	2.1014	2.1033
2.1051	2.1070	2.1088	2.1106	2.1124	2.1141	2.1159
2.1176	2.1193	2.1210	2.1227	2.1244	2.1260	2.1276
2.1292	2.1308	2.1324	2.1340	2.1355	2.1371	2.1386
2.1401	2.1416	2.1431	2.1446	2.1460	2.1475	2.1489
2.1504	2.1518	2.1532	2.1546	2.1560	2.1573	2.1587
2.1600	2.1614	2.1627	2.1640	2.1654	2.1667	2.1680
2.1692	2.1705	2.1718	2.1731	2.1743	2.1756	2.1768
2.1780	2.1792	2.1804	2.1817	2.1829	2.1840	2.1852
2.1864	2.1876	2.1887	2.1899	2.1910	2.1922	2.1933
2.1944	2.1956	2.1967	2.1978	2.1989	2.2000	

COMPUTE NM HYD ID=1 HYD NO=101.1 AREA=0.005694 SQ MI
PER A=00.00 B=7.16 C=00 D=92.84
TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE
UNIT PEAK = 20.871 CFS UNIT VOLUME = .9988 B = 526.28
AREA = .005286 SQ MI IA = .10000 INCHES INF = .04000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

K = .130992HR TP = .133300HR K/TP RATIO = .982685 SHAPE
UNIT PEAK = 1.0004 CFS UNIT VOLUME = .9862 B = 327.09
AREA = .000408 SQ MI IA = .50000 INCHES INF = 1.25000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.10

6

RUNOFF VOLUME = 1.87254 INCHES = .5686 ACRE-FEET
PEAK DISCHARGE RATE = 15.32 CFS AT 1.500 HOURS BASIN AREA =

FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 09:33:02