City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 28, 1998

John MacKenzie, P.E.
Mark Goodwin & Associates.
P.O. Box 90606
Albuquerque, NM 87199

RE: ALBERTSON'S SHOPPING CENTER - VIDEO UPDATE (K10-D27). GRADING AND DRAINAGE PLAN FOR FOUNDATION PERMIT AND BUILDING PERMIT APPROVALS. ENGINEER'S STAMP DATED OCTOBER 16, 1998.

Dear Mr. MacKenzie:

Based on the information provided on your November 4, 1998 submittal, the above referenced project is approved for Foundation and Building Permits. The Drainage Report for the shopping center itself dates to the May 24, 1995 revision.

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,

John P. Murray, P.E.
Hydrology

c: Andrew Garcia
File

CITY OF
Albuquerque

P.O. Box 1293 Albuquerque, NM 87103

July 10, 1996

Martin J. Chávez, Mayor

John MacKenzie, P.E.
Mark Goodwin & Assoc.
P. O. Box 90606
Albuquerque, NM 87199

RE: ENGINEER'S CERTIFICATION FOR ALBERTSON'S AT CENTRAL & COORS
(K-10/D27)
RECEIVED JUNE 19, 1996 FOR CERTIFICATE OF OCCUPANCY
ENGINEER'S STAMP DATED 4-1-96

Dear Mr. MacKenzie:

Based on the additional information included in the submittal referenced above, City Hydrology accepts the Engineer's Certification for a permanent certificate of occupancy.

Contact Vicki Chavez at Plaza del Sol to obtain the permanent Certificate of Occupancy for 6600 Central SW.

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

Sincerely,

John P. Curtin, PE
Civil Engineer/Hydrology

c: Andrew Garcia

D. MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS & SURVEYORS

PROJECT Albertsons @ Coors & Central
SUBJECT Drainage
BY RM DATE 20 SEPT 95
CHECKED _____ DATE _____
SHEET 1 OF 2

* From Previous Reports 6 September 95, 23 August 95, 24 May 95, & 31 January 95

Existing Conditions

Q_{PK} = 13.74 cfs V_{PK} = 0.4140 Acre-Feet

Q_{PK} Is Historical Flow And Allowable Discharge

Proposed Conditions

Basin A

Pond w/ 8" Orifice Plate

For Pond Info See Next Page

AHYMO Results

Q_{OUT} = 3.24 cfs Maximum Water Surface Elevation 89.74

Basin B

Pond w/ 12.5" Orifice Plate

For Pond Info See Next Page

AHYMO Results

Q_{OUT} = 8.84 cfs Maximum Water Surface Elevation 86.98

Combined Discharge From Ponds AHYMO Results 12.04 cfs

Total Discharge From Site

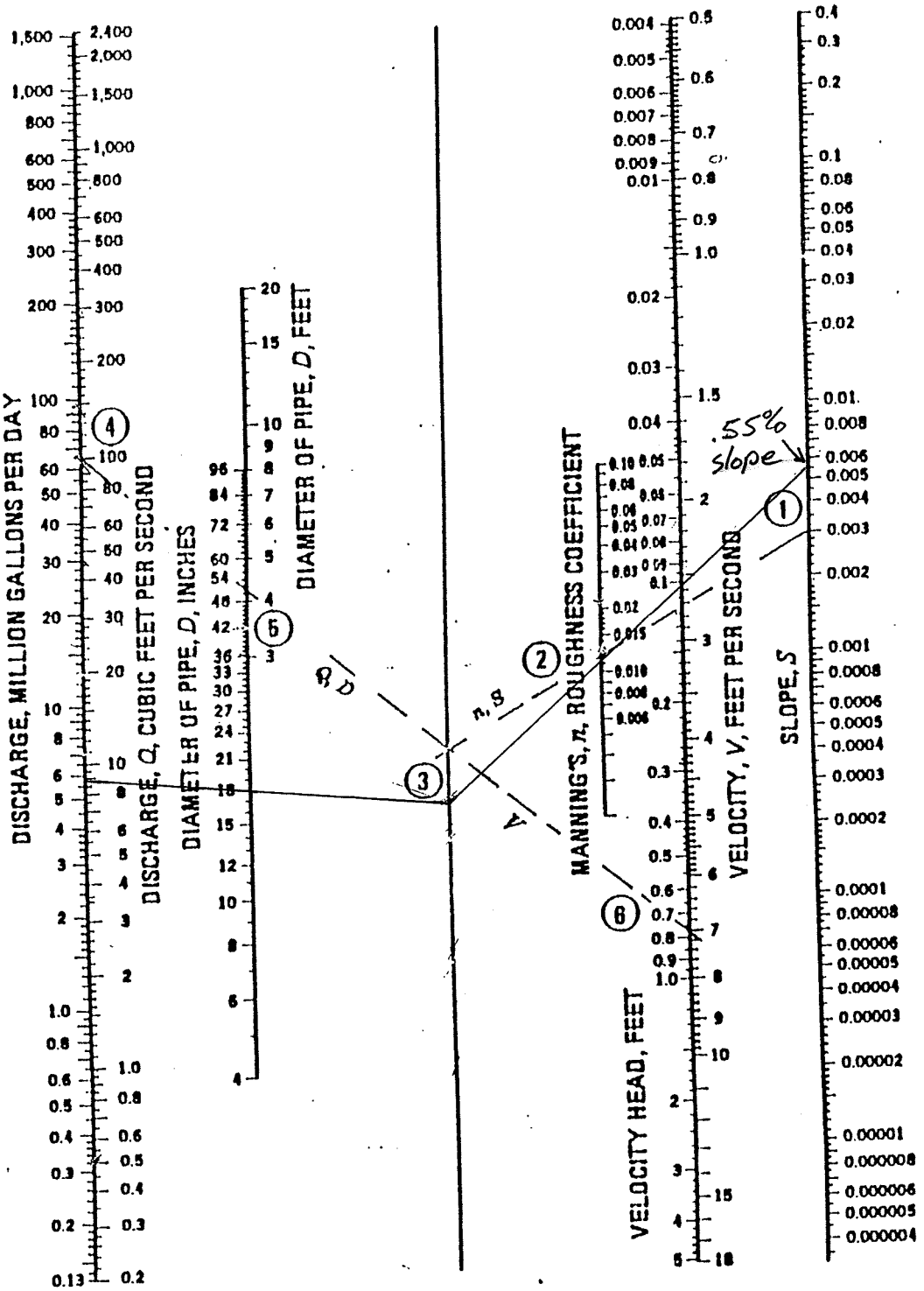
Q = 13.40 cfs V = 1.0798 Acre-Feet

Allowable Discharge > Developed Pond Routing

Q_{PK} = 13.74 cfs > Q_{OUT} = 13.40 cfs From Pg 11 AHYMO

- Pond In Basin A w/ 8" Orifice Plate Is Required
- Pond In Basin B w/ 12.5" Orifice Plate Is Required

Reference: American Concrete Pipe Association (1980).



B) Circular Pipe Solution

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 20, 1995

John MacKenzie, P.E.
Mark Goodwin & Assoc.
P. O. Box 90606
Albuquerque, NM 87199

RE: DRAINAGE REPORT FOR ALBERTSON'S AT CENTRAL & COORS (K-10/D27)
RECEIVED SEPTEMBER 20, 1995 FOR SITE DEV PLAN & BUILDING PERMIT
ENGINEER'S STAMP DATED 9-20-95

Dear Mr. MacKenzie:

Based on the information included in the submittal referenced above, City Hydrology accepts the Drainage Report for Site Development Plan & Building Permit.

Include a copy of the Grading & Drainage Plan, dated 9-20-95, in the set of construction documents that will be submitted to Code Administration for the Building Permit.

A separate permit is required for construction of private drainage facilities within the City right of way. A copy of this letter must be on hand when applying for the excavation permit.

Engineer's Certification of grading & drainage per DPM checklist must be accepted before any Certificate of Occupancy or Financial Guaranty will be released.

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

Sincerely,

John P. Curtin

John P. Curtin, PE
Civil Engineer/Hydrology

c: Andrew Garcia
Arlene Portillo
Fred Aguirre, DRB 95-192

D. MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS & SURVEYORS

PROJECT Albertsons @ Coors & Central
SUBJECT Drainage
BY RM DATE 20 Sept 95
CHECKED ____ DATE ____
SHEET 1 OF 2

*From Previous Reports 6 September 95, 23 August 95, 24 May 95, & 31 January 95

Existing Conditions

Q_{PK} = 13.74 cfs V_{PK} = 0.4140 Acre-Feet

Q_{PK} Is Historical Flow And Allowable Discharge

Proposed Conditions

Basin A

Pond w/ 8" Orifice Plate

For Pond Info See Next Page

AHYMO Results

Q_{OUT} = 3.24 cfs Maximum Water Surface Elevation 89.74

Basin B

Pond w/ 12.5" Orifice Plate

For Pond Info See Next Page

AHYMO Results

Q_{OUT} = 8.84 cfs Maximum Water Surface Elevation 86.98

Combined Discharge From Ponds AHYMO Results 12.04 cfs

Total Discharge From Site

Q = 13.40 cfs V = 0.0798 Acre-Feet

Allowable Discharge ≥ Developed Pond Routing

Q_{PK} = 13.74 cfs ≥ Q_{OUT} = 13.40 cfs From Pg 11 AHYMO

- Pond In Basin A w/ 8" Orifice Plate Is Required
- Pond In Basin B w/ 12.5" Orifice Plate Is Required

ALBERTSON'S

OUTFLOW = CA$\sqrt{2gH}$

*WHERE **C** = 0.6 AND **H** IS MEASURED FROM CENTROID OF ORIFICE PLATE*

POND IN BASIN A	8" ORIFICE PLATE			
ELEVATION	AREA SQ. FT.	VOL (CU.FT.)	STORAGE ACRE-FEET	OUTFLOW (cfs)
88.68	0.00			0.00
		360.00	0.008264	
89.00	2250.00			2.89
		5865.00	0.142906	
89.68	15000.00			3.21
		6960.00	0.302686	
90.00	28500.00			3.35

POND IN BASIN B	12.5" ORIFICE PLATE			
ELEVATION	AREA SQ. FT.	VOL (CU. FT.)	STORAGE ACRE-FEET	OUTFLOW (cfs)
85.84	0.00			7.65
		73.20	0.00205	
86.00	707.00			7.83
		4366.00	0.10191	
87.00	8025.00			8.84
		13560.00	0.41320	
88.00	19095.00			9.74

```
START                TIME=0.0

*****
*****   HYDROGRAPH FOR ALBERTSONS PAD SITE AT CENTRAL AND COORS
*****

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

*EXISTING CONDITIONS
COMPUTE NM HYD       ID=1 HYD NO=101.1 AREA=0.0116 SQ MI
                     PER A=69.64 PER B=0.0 PER C=21.11 PER D=9.25
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1

*BASIN A
COMPUTE NM HYD       ID=2 HYD NO=101.2 AREA=0.00444 SQ MI
                     PER A=0.0 PER B=0.0 PER C=18.0 PER D=82.0
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=2 CODE=1

*RESERVOIR ROUTE OUT OF BASIN A
*8" ORIFICE PLATE ON BOTH INLETS
ROUTE RESERVOIR      ID=3 HYD NO=101.3 INFLOW ID=2 CODE=24
                     OUTFLOW(CFS)      STORAGE(AC-FT)   ELEVATION(FT)
                        0.0               0.0              88.68
                        2.89              0.0083           89.00
                        3.21              0.1429           89.68
                        3.35              0.3027           90.00
PRINT HYD            ID=3  CODE=1

*BASIN B
COMPUTE NM HYD       ID=4 HYD NO=101.4 AREA=0.00627 SQ MI
                     PER A=0.0 PER B=0.0 PER C=18.0 PER D=82.0
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=4 CODE=1
```

```
*RESERVOIR ROUTE OUT OF BASIN B
*12.5" ORIFICE PLATE
ROUTE RESERVOIR     ID=5 HYD NO=101.5 INFLOW ID=4 CODE=24
                    OUTFLOW(CFS)      STORAGE(AC-FT)   ELEVATION(FT)
                       0.0               0.0               85.84
                       7.83              0.00205           86.00
                       8.84              0.10191           87.00
                       9.74              0.41320           88.00
PRINT HYD           ID=5  CODE=1

*ADDING HYDROGRAPHS FROM PONDS FOR COMBINED DISCHARGE
ADD HYD             ID=6 HYD NO=101.6 ID=3 ID=5
PRINT HYD           ID=6 CODE=1


*HYDROGRAPHS FOR OFFSITE FLOW
*CENTRAL BASIN
COMPUTE NM HYD      ID=7 HYD NO=101.7 AREA=0.00152 SQ MI
                    PER A=0.0 PER B=0.0 PER C=19.71 PER D=80.29
                    TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=7 CODE=1

*COORS BASIN
COMPUTE NM HYD      ID=8 HYD NO=101.8 AREA=0.00089 SQ MI
                    PER A=0.0 PER B=0.0 PER C=78.79 PER D=21.21
                    TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=8 CODE=1

*ADD HYDROGRAPHS FOR TOTAL FLOW OFFSITE
*COORS BASIN AND COMBINED POND DISCHARGE
ADD HYD             ID=9 HYD NO=101.6 ID=6 ID=8
PRINT HYD           ID=9 CODE=1

FINISH
```

AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
RUN DATE (MON/DAY/YR) = 09/19/1995
START TIME (HR:MIN:SEC) = 21:58:58 USER NO.= M_GOODWN.I01
INPUT FILE = ALBRTSON.DAT

START TIME=0.0

*****

***** HYDROGRAPH FOR ALBERTSONS PAD SITE AT CENTRAL AND COORS

*****

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 - PEAK AT 1.40 HR.

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	

*EXISTING CONDITIONS

COMPUTE NM HYD ID=1 HYD NO=101.1 AREA=0.0116 SQ MI

PER A=69.64 PER B=0.0 PER C=21.11 PER D=9.25

TP=0.1333 HR MASS RAINFALL=-1

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

UNIT PEAK = 4.2363 CFS UNIT VOLUME = .9965 B = 526.28 P60 = 1.8700

AREA = .001073 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .150235HR TP = .133300HR K/TP RATIO = 1.127041 SHAPE CONSTANT, N = 3.139756

UNIT PEAK = 23.141 CFS UNIT VOLUME = .9993 B = 293.03 P60 = 1.8700

AREA = .010527 SQ MI IA = .58021 INCHES INF = 1.47460 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = .66917 INCHES = .4140 ACRE-FEET

PEAK DISCHARGE RATE = 13.74 CFS AT 1.533 HOURS BASIN AREA = .0116 SQ. MI.

*BASIN A

COMPUTE NM HYD ID=2 HYD NO=101.2 AREA=0.00444 SQ MI

PER A=0.0 PER B=0.0 PER C=18.0 PER D=82.0

TP=0.1333 HR MASS RAINFALL=-1

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

UNIT PEAK = 14.374 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.8700

AREA = .003641 SQ MI IA = .10000 INCHES INF = .04000

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 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T =    .033330


        K =    .105867HR     TP =    .133300HR     K/TP RATIO =    .794199      SHA
PE CONSTANT, N =  4.514851
        UNIT PEAK =    2.3271     CFS    UNIT VOLUME =     .9947        B =    388.
14      P60 = 1.8700
        AREA =       .000799 SQ MI     IA =     .35000 INCHES     INF =     .83000
 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T =    .033330

     PRINT HYD           ID=2 CODE=1


                                        PARTIAL HYDROGRAPH   101.20


        RUNOFF VOLUME =      1.79069 INCHES      =         .4240 ACRE-FEET
        PEAK DISCHARGE RATE =       11.67 CFS  AT   1.500 HOURS   BASIN AREA =
   .0044 SQ. MI.




     *RESERVOIR ROUTE OUT OF BASIN A

     *8" ORIFICE PLATE ON BOTH INLETS

     ROUTE RESERVOIR     ID=3 HYD NO=101.3 INFLOW ID=2 CODE=24

                         OUTFLOW(CFS)      STORAGE(AC-FT)   ELEVATION(FT)

                           0.0               0.0               88.68
```

2.89	0.0083	89.00
3.21	0.1429	89.68
3.35	0.3027	90.00

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	88.68	.000	.00
.80	.00	88.68	.000	.00
1.60	8.08	89.62	.130	3.18
2.40	.47	89.50	.107	3.12
3.20	.09	88.69	.000	.09
4.00	.06	88.69	.000	.06
4.80	.06	88.69	.000	.06
5.60	.07	88.69	.000	.07
6.40	.01	88.68	.000	.01

PEAK DISCHARGE = 3.236 CFS - PEAK OCCURS AT HOUR 1.90
MAXIMUM WATER SURFACE ELEVATION = 89.739
MAXIMUM STORAGE = .1722 AC-FT INCREMENTAL TIME= .033330 HRS

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 101.30

RUNOFF VOLUME = 1.79063 INCHES = .4240 ACRE-FEET
PEAK DISCHARGE RATE = 3.24 CFS AT 1.900 HOURS BASIN AREA = .0044 SQ. MI.

```
     *BASIN B

     COMPUTE NM HYD       ID=4 HYD NO=101.4 AREA=0.00627 SQ MI

                          PER A=0.0 PER B=0.0 PER C=18.0 PER D=82.0

                          TP=0.1333 HR MASS RAINFALL=-1


          K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHA
PE CONSTANT, N =  7.106420
          UNIT PEAK =   20.299    CFS   UNIT VOLUME =    .9988       B =   526.
28      P60 = 1.8700
          AREA =      .005141 SQ MI    IA =    .10000 INCHES    INF =    .04000
 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T =   .033330


          K =   .105867HR    TP =   .133300HR    K/TP RATIO =   .794199     SHA
PE CONSTANT, N =  4.514851
          UNIT PEAK =   3.2863    CFS   UNIT VOLUME =    .9967       B =   388.
14      P60 = 1.8700
          AREA =      .001129 SQ MI    IA =    .35000 INCHES    INF =    .83000
 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T =   .033330

     PRINT HYD            ID=4 CODE=1


                                        PARTIAL HYDROGRAPH   101.40


          RUNOFF VOLUME =     1.79069 INCHES      =         .5988 ACRE-FEET
          PEAK DISCHARGE RATE =      16.47 CFS  AT   1.500 HOURS   BASIN AREA =
```

.0063 SQ. MI.

*RESERVOIR ROUTE OUT OF BASIN B

*12.5" ORIFICE PLATE

ROUTE RESERVOIR ID=5 HYD NO=101.5 INFLOW ID=4 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.0	0.0	85.84
7.83	0.00205	86.00
8.84	0.10191	87.00
9.74	0.41320	88.00

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	85.84	.000	.00
.80	.00	85.84	.000	.00
1.60	11.40	86.94	.096	8.78
2.40	.67	85.85	.000	.70
3.20	.13	85.84	.000	.13
4.00	.08	85.84	.000	.08
4.80	.08	85.84	.000	.08
5.60	.10	85.84	.000	.10
6.40	.01	85.84	.000	.01

PEAK DISCHARGE = 8.836 CFS - PEAK OCCURS AT HOUR 1.67

MAXIMUM WATER SURFACE ELEVATION = 86.996
MAXIMUM STORAGE = .1015 AC-FT INCREMENTAL TIME= .033330 HRS

PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 101.50

RUNOFF VOLUME = 1.79064 INCHES = .5988 ACRE-FEET
PEAK DISCHARGE RATE = 8.84 CFS AT 1.667 HOURS BASIN AREA = .0063 SQ. MI.

*ADDING HYDROGRAPHS FROM PONDS FOR COMBINED DISCHARGE

ADD HYD ID=6 HYD NO=101.6 ID=3 ID=5

PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 101.60

RUNOFF VOLUME = 1.79063 INCHES = 1.0228 ACRE-FEET
PEAK DISCHARGE RATE = 12.05 CFS AT 1.667 HOURS BASIN AREA = .0107 SQ. MI.

*HYDROGRAPHS FOR OFFSITE FLOW

*CENTRAL BASIN

COMPUTE NM HYD ID=7 HYD NO=101.7 AREA=0.00152 SQ MI

PER A=0.0 PER B=0.0 PER C=19.71 PER D=80.29

TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHA
PE CONSTANT, N = 7.106420
UNIT PEAK = 4.8182 CFS UNIT VOLUME = .9969 B = 526.
28 P60 = 1.8700
AREA = .001220 SQ MI IA = .10000 INCHES INF = .04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T = .033330

K = .105867HR TP = .133300HR K/TP RATIO = .794199 SHA
PE CONSTANT, N = 4.514851
UNIT PEAK = .87235 CFS UNIT VOLUME = .9857 B = 388.
14 P60 = 1.8700
AREA = .000300 SQ MI IA = .35000 INCHES INF = .83000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T = .033330

PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 101.70

RUNOFF VOLUME = 1.77408 INCHES = .1438 ACRE-FEET
PEAK DISCHARGE RATE = 3.98 CFS AT 1.500 HOURS BASIN AREA =

.0015 SQ. MI.

*COORS BASIN

COMPUTE NM HYD ID=8 HYD NO=101.8 AREA=0.00089 SQ MI

PER A=0.0 PER B=0.0 PER C=78.79 PER D=21.21

TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHA
PE CONSTANT, N = 7.106420
UNIT PEAK = .74527 CFS UNIT VOLUME = .9840 B = 526.
28 P60 = 1.8700
AREA = .000189 SQ MI IA = .10000 INCHES INF = .04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T = .033330

K = .105867HR TP = .133300HR K/TP RATIO = .794199 SHA
PE CONSTANT, N = 4.514851
UNIT PEAK = 2.0418 CFS UNIT VOLUME = .9941 B = 388.
14 P60 = 1.8700
AREA = .000701 SQ MI IA = .35000 INCHES INF = .83000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T = .033330

PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 101.80

RUNOFF VOLUME = 1.20037 INCHES = .0570 ACRE-FEET
PEAK DISCHARGE RATE = 1.83 CFS AT 1.500 HOURS BASIN AREA = .0009 SQ. MI.

*ADD HYDROGRAPHS FOR TOTAL FLOW OFFSITE

*COORS BASIN AND COMBINED POND DISCHARGE

ADD HYD ID=9 HYD NO=101.6 ID=6 ID=8

PRINT HYD ID=9 CODE=1

PARTIAL HYDROGRAPH 101.60

RUNOFF VOLUME = 1.74533 INCHES = 1.0798 ACRE-FEET
PEAK DISCHARGE RATE = 13.40 CFS AT 1.567 HOURS BASIN AREA = .0116 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 21:58:59

INTERIM EROSION CONTROL

Due to the sensitive nature of the sandy soils associated with this site, an Erosion Control Plan will be identified and detailed on a subsequent plan that will also address comments received after this submittal.

CONCLUSIONS

The implementation of the drainage management plan for this site can be accomplished by utilizing existing drainage facilities in Coors Boulevard. It has been adequately shown in this report and others cited, that capacities of these systems are adequate and, indeed, were masterplanned with this site in mind. It has also been shown in this report that the internal conveyance of storm water can be designed to meet all current City requirements.

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 22, 1995

John MacKenzie, P.E.
Mark Goodwin & Assoc.
P. O. Box 90606
Albuquerque, NM 87199

RE: DRAINAGE REPORT FOR ALBERTSON'S AT CENTRAL & COORS (K-10/D27)
RECEIVED JAN 31, 1995 FOR SITE DEV PLAN FOR B.P. & BUILDING PERMIT
ENGINEER'S STAMP DATED 1/27/95

Dear Mr. MacKenzie:

Based on the information included in the submittal referenced above, City Hydrology accept the general concept for this site and approves this project for Site Development Plan for B.P. The following comments must be addressed before Building Permit approval:

1. Indicate the boundary of the Off Site Basin. Adequate water blocks must be provided at entrances on Central. If Central will not drain to Coors, Then a temporary solution will be required. Obtain an access easement from the owner of Tract 60 for the western entrance on Coors.
2. An erosion control plan will be required for rough grading. A proposed Infrastructure List will be required for Preliminary Plat.
3. Indicate the Maximum Water Surface Elevation and extent of ponding for both ponds. Detail both orifice plates. It is not clear how the outflow values for the route reservoir command were calculated. Add Hydrograph 101.3 & 101.5 to determine the peak flow from the site.
4. The boundary between Basin A & B, north of the Albertson's building appears artificial. Verify that runoff will actually split along this divide. Is another basin necessary to indicate the runoff that discharges directly to Coors?

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

Sincerely,

John P. Curtin

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

c: Andrew Garcia
Fred Aguirre, EPC Z-95-23
L.David McKinney; Albertson's, Inc.; 400 S 99th Ave Ste 200: Tolleson, AZ

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

PROJECT ALBERTSON'S COOR'S & CENTRAL
SUBJECT DRAINAGE - RECIRCULATION
BY RM DATE 16 MAY 85
CHECKED _____ DATE _____
SHEET 1 OF 3

* EXISTING CONDITIONS (FROM PREVIOUS REPORT)

A = 7.4240 ACRES = 0.0116 SQ MILES

Q_{PK} = 13.74 cfs V_{PK} = 0.4140 ACRE-FEET

* PROPOSED CONDITIONS

• BASIN A

AREA = 2.84091 ACRES = 0.00444 SQ MILES

LAND TREATMENTS

TYPE "A" = 0.0% TYPE "C" = 18.0%

TYPE "B" = 0.0% TYPE "D" = 82.0%

POND IN BASIN A

$Q = CA\sqrt{2gh}$ C = 0.8 ROUNDED EDGE FROM BRATER & KING

6" ORIFICE ON PIPE
A = 0.196 ft²

ELEVATION	ft²	ft³	STORAGE ACRE-FEET	OUTFLOW (cfs)
85.73	0			0.0
		26.16	0.000601	
89.00	8			2.19
		4316.50	0.099091	
90.00	8625			2.53
		29,312.50	0.77321	
91.00	50,000			2.82

AHYMO RESULTS

Q_{PK} = 2.57 cfs V_{PK} = 0.2010 ACRE-FEET @ 2.03 HRS

MAXIMUM WATER SURFACE ELEVATION

90.15 SHOWN ON GRADING & DRAINAGE PLAN

12" RCP @ 1.00% TO BACK OF STORM INLET

CAPACITY 3.75 cfs SEE NOMOGRAPH PG 3

CONTINUED ON NEXT PAGE

* PROPOSED CONDITIONS (CONTINUED)

• BASIN B

AREA = 4.01458 ACRES = 0.00627 SQ MILES

LAND TREATMENTS

TYPE "A" = 0.0% TYPE "C" = 18.0%

TYPE "B" = 0.0% TYPE "D" = 82.0%

$h = EL - 82.17 - .46$
$- 82.63$

POND IN BASIN B

$Q = CA\sqrt{2gh}$ C = 0.8 FROM PREVIOUS

$Q = 4.24\sqrt{h}$

11" ORIFICE ON 18" RCP

$A = 0.660\ ft^2$

ELEVATION	ft^2	ft^3	STORAGE ACRE-FEET	OUTFLOW (cfs)	h	C=" Q
81.84	0			0.0		
		32	0.000735	7.59	3.21	5.7
85.84	8			7.97		
		357.50	0.00894	7.78	3.37	5.84
86.00	707			8.15		
		4366	0.10991	8.86	4.37	6.64
87.00	8025			9.19		
		13560	0.43084	9.82	5.37	7.36
88.00	19095			10.12		

AHYMO RESULTS

$Q_{PK} = 9.04$ cfs $V_{PK} = 0.5988$ ACRE-FEET @ 1.633 HRS

MAXIMUM WATER SURFACE ELEVATION

86.86 SHOWN ON GRADING & DRAINAGE PLAN

18" RCP @ 1.11% TO BACK OF STORM INLET

CAPACITY = 11.50 cfs SEE NOMOGRAPH PG 3

CONTINUED ON NEXT PAGE

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

PROJECT ALBERTSONS - COORS & CENTRAL
SUBJECT DRAINAGE - RECALCULATIONS
BY RM DATE 23 MAY 95
CHECKED _____ DATE _____
SHEET 3 OF 3

* OFFSITE

• CENTRAL BASIN

$A = 0.97567$ ACRES $= 0.00152$ SQ MILES

LAND TREATMENTS

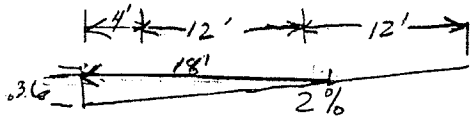
TYPE "A" = 0.0% TYPE "C" = 19.71%

TYPE "B" = 0.0% TYPE "D" = 80.29%

AHYMO RESULTS

$Q_{PK} = 3.98$ cfs $V_{PK} = 0.1438$ ACRE-FEET @ 1.5 HRS

STREET CAPACITY ON CENTRAL LEAVING 10' OPEN LANE



MINIMUM SLOPE ON CENTRAL $S = 0.25\%$

$Q = \frac{k}{n} A R_H^{2/3} S^{1/2} = \frac{1.49}{0.016} (3.24) \left(\frac{3.24}{18.36}\right)^{2/3} (.0025)^{1/2}$

$Q = 4.75$ cfs $> Q_{PK} = 3.98$ cfs $\therefore$ CONTAINS CAPACITY

• COORS BASIN

$A = 0.56818$ ACRES $= 0.00089$ SQ MILES

LAND TREATMENTS

TYPE "A" = 0.0% TYPE "C" = 78.79%

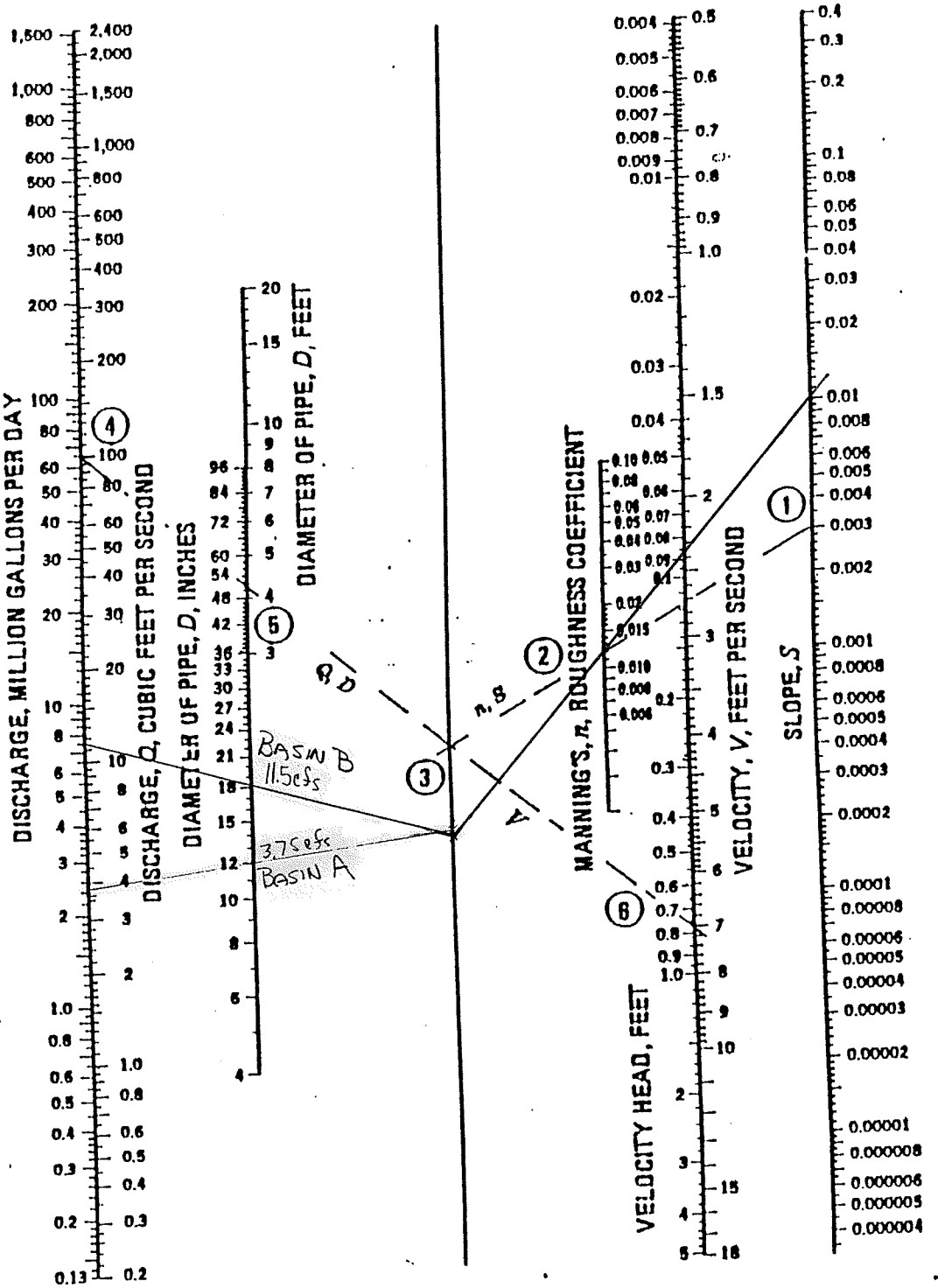
TYPE "B" = 0.0% TYPE "D" = 21.21%

AHYMO RESULTS

$Q_{PK} = 1.83$ cfs $V_{PK} = 0.0570$ ACRE-FEET @ 1.50 HRS

DEVELOPED FLOW WILL SURFACE DRAIN ONTO COORS BLVD.

Reference: American Concrete Pipe Association (1980).



B) Circular Pipe Solution

```
START                TIME=0.0

*****
*****   HYDROGRAPH FOR ALBERTSONS PAD SITE AT CENTRAL AND COORS
 ****

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

*EXISTING CONDITIONS
COMPUTE NM HYD       ID=1 HYD NO=101.1 AREA=0.0116 SQ MI
                     PER A=69.64 PER B=0.0 PER C=21.11 PER D=9.25
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1

*BASIN A
COMPUTE NM HYD       ID=2 HYD NO=101.2 AREA=0.00444 SQ MI
                     PER A=0.0 PER B=0.0 PER C=18.0 PER D=82.0
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=2 CODE=1

*RESERVOIR ROUTE OUT OF BASIN A
*6" ORIFICE PLATE
ROUTE RESERVOIR      ID=3 HYD NO=101.3 INFLOW ID=2 CODE=24
                     OUTFLOW(CFS)       STORAGE(AC-FT)   ELEVATION(FT)
                        0.0                0.0               85.73
                        2.19               0.000601          89.00
                        2.53               0.099691          90.00
                        2.82               0.773214          91.00
PRINT HYD            ID=3  CODE=1

*BASIN B
COMPUTE NM HYD       ID=4 HYD NO=101.4 AREA=0.00627 SQ MI
                     PER A=0.0 PER B=0.0 PER C=18.0 PER D=82.0
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=4 CODE=1

*RESERVOIR ROUTE OUT OF BASIN B
*11" ORIFICE PLATE
ROUTE RESERVOIR      ID=5 HYD NO=101.5 INFLOW ID=4 CODE=24
                     OUTFLOW(CFS)       STORAGE(AC-FT)   ELEVATION(FT)
                        0.0                0.0               81.84
                        7.97               0.000735          85.84
                        8.15               0.008942          86.00
                        9.19               0.109911          87.00
                       10.12               0.430841          88.00
PRINT HYD            ID=5  CODE=1

*ADDING HYDROGRAPHS FROM PONDS FOR COMBINED DISCHARGE
ADD HYD              ID=6 HYD NO=101.6 ID=3 ID=5
PRINT HYD            ID=6 CODE=1


*HYDROGRAPHS FOR OFFSITE FLOW
*CENTRAL BASIN
COMPUTE NM HYD       ID=7 HYD NO=101.7 AREA=0.00152 SQ MI
                     PER A=0.0 PER B=0.0 PER C=19.71 PER D=80.29
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=7 CODE=1

*CORER BASIN
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```
COMPUTE NM HYD       ID=8 HYD NO=101.8 AREA=0.00089 SQ MI
                     PER A=0.0 PER B=0.0 PER C=78.79 PER D=21.21
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=8 CODE=1

*ADD HYDROGRAPHS FOR TOTAL FLOW OFFSITE
*COORS BASIN AND COMBINED POND DISCHARGE
ADD HYD              ID=9 HYD NO=101.6 ID=6 ID=8
PRINT HYD            ID=9 CODE=1

FINISH
```

```
    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
         RUN DATE (MON/DAY/YR) = 05/16/1995
         START TIME (HR:MIN:SEC) = 13:31:56      USER NO.= M_GOODWN.I01
         INPUT FILE = ALBRTSON.DAT

START                TIME=0.0


*****

*****   HYDROGRAPH FOR ALBERTSONS PAD SITE AT CENTRAL AND COORS

*****


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
- PEAK AT 1.40 HR.
                  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

*EXISTING CONDITIONS

COMPUTE NM HYD       ID=1 HYD NO=101.1 AREA=0.0116 SQ MI
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```
                    PER A=69.64 PER B=0.0 PER C=21.11 PER D=9.25

                    TP=0.1333 HR MASS RAINFALL=-1


        K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE
 CONSTANT, N =  7.106420
        UNIT PEAK =   4.2363    CFS   UNIT VOLUME =    .9965       B =   526.28
      P60 = 1.8700
        AREA =      .001073 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
NCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=   .033330


        K =   .150235HR    TP =   .133300HR    K/TP RATIO =  1.127041     SHAPE
 CONSTANT, N =  3.139756
        UNIT PEAK =   23.141    CFS   UNIT VOLUME =    .9993       B =   293.03
      P60 = 1.8700
        AREA =      .010527 SQ MI    IA =    .58021 INCHES    INF =   1.47460 I
NCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=   .033330

    PRINT HYD           ID=1 CODE=1


                                        PARTIAL HYDROGRAPH   101.10


        RUNOFF VOLUME =      .66917 INCHES      =        .4140 ACRE-FEET
        PEAK DISCHARGE RATE =      13.74 CFS  AT   1.533 HOURS   BASIN AREA =
 .0116 SQ. MI.




    *BASIN A

    COMPUTE NM HYD      ID=2 HYD NO=101.2 AREA=0.00444 SQ MI

                        PER A=0.0 PER B=0.0 PER C=18.0 PER D=82.0

                        TP=0.1333 HR MASS RAINFALL=-1


        K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE
 CONSTANT, N =  7.106420
        UNIT PEAK =   14.374    CFS   UNIT VOLUME =    .9985       B =   526.28
      P60 = 1.8700
        AREA =      .003641 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
NCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=   .033330


        K =   .105867HR    TP =   .133300HR    K/TP RATIO =   .794199     SHAPE
 CONSTANT, N =  4.514851
        UNIT PEAK =   2.3271    CFS   UNIT VOLUME =    .9947       B =   388.14
      P60 = 1.8700
        AREA =      .000799 SQ MI    IA =    .35000 INCHES    INF =    .83000 I
NCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=   .033330
```

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.20

RUNOFF VOLUME = 1.79069 INCHES = .4240 ACRE-FEET
PEAK DISCHARGE RATE = 11.67 CFS AT 1.500 HOURS BASIN AREA = .0044 SQ. MI.

*RESERVOIR ROUTE OUT OF BASIN A

*6" ORIFICE PLATE

ROUTE RESERVOIR ID=3 HYD NO=101.3 INFLOW ID=2 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.0	0.0	85.73
2.19	0.000601	89.00
2.53	0.099691	90.00
2.82	0.773214	91.00

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	85.73	.000	.00
.80	.00	85.73	.000	.00
1.60	8.08	90.06	.139	2.55
2.40	.47	90.09	.159	2.56
3.20	.09	89.10	.011	2.22
4.00	.06	85.82	.000	.06
4.80	.06	85.82	.000	.06
5.60	.07	85.83	.000	.07
6.40	.01	85.74	.000	.01

PEAK DISCHARGE = 2.574 CFS - PEAK OCCURS AT HOUR 2.03
MAXIMUM WATER SURFACE ELEVATION = 90.150
MAXIMUM STORAGE = .2010 AC-FT INCREMENTAL TIME= .033330HR

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 101.30

RUNOFF VOLUME = 1.79560 INCHES = .4252 ACRE-FEET
PEAK DISCHARGE RATE = 2.57 CFS AT 2.033 HOURS BASIN AREA = .0044 SQ. MI.

*BASIN B

```
     COMPUTE NM HYD       ID=4 HYD NO=101.4 AREA=0.0062/ SQ MI
                          PER A=0.0 PER B=0.0 PER C=18.0 PER D=82.0
                          TP=0.1333 HR MASS RAINFALL=-1

          K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE
 CONSTANT, N =  7.106420
          UNIT PEAK =    20.299     CFS    UNIT VOLUME =     .9988        B =    526.28
       P60 = 1.8700
          AREA =       .005141 SQ MI     IA =     .10000 INCHES     INF =     .04000 I
 NCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
 =    .033330

          K =    .105867HR     TP =    .133300HR     K/TP RATIO =    .794199      SHAPE
 CONSTANT, N =  4.514851
          UNIT PEAK =    3.2863     CFS    UNIT VOLUME =     .9967        B =    388.14
       P60 = 1.8700
          AREA =       .001129 SQ MI     IA =     .35000 INCHES     INF =     .83000 I
 NCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
 =    .033330

     PRINT HYD            ID=4 CODE=1

                                          PARTIAL HYDROGRAPH    101.40

          RUNOFF VOLUME =      1.79069 INCHES      =         .5988 ACRE-FEET
          PEAK DISCHARGE RATE =       16.47 CFS  AT    1.500 HOURS    BASIN AREA =
 .0063 SQ. MI.



     *RESERVOIR ROUTE OUT OF BASIN B

     *11" ORIFICE PLATE

     ROUTE RESERVOIR      ID=5 HYD NO=101.5 INFLOW ID=4 CODE=24

                          OUTFLOW(CFS)       STORAGE(AC-FT)    ELEVATION(FT)
                             0.0                 0.0               81.84
                             7.97                0.000735          85.84
                             8.15                0.008942          86.00
                             9.19                0.109911          87.00
                            10.12                0.430841          88.00

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

          TIME       INFLOW     ELEV       VOLUME     OUTFLOW
          (HRS)      (CFS)      (FEET)     (AC-FT)    (CFS)

            .00         .00      81.84        .000        .00
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```
        1.60      11.40      86.81       .091      9.00
        2.40        .67      81.92       .000       .15
        3.20        .13      81.89       .000       .11
        4.00        .08      81.88       .000       .08
        4.80        .08      81.88       .000       .08
        5.60        .10      81.89       .000       .10
        6.40        .01      81.84       .000       .01
     PEAK DISCHARGE =          9.040 CFS - PEAK OCCURS AT HOUR     1.63
     MAXIMUM WATER SURFACE ELEVATION =        86.856
     MAXIMUM STORAGE =          .0954 AC-FT       INCREMENTAL TIME=      .033330HR
S

     PRINT HYD            ID=5  CODE=1


                                          PARTIAL HYDROGRAPH   101.50


        RUNOFF VOLUME =      1.79064 INCHES      =         .5988 ACRE-FEET
        PEAK DISCHARGE RATE =        9.04 CFS  AT    1.633 HOURS   BASIN AREA =
 .0063 SQ. MI.




     *ADDING HYDROGRAPHS FROM PONDS FOR COMBINED DISCHARGE

     ADD HYD              ID=6 HYD NO=101.6 ID=3 ID=5

     PRINT HYD            ID=6 CODE=1


                                          PARTIAL HYDROGRAPH   101.60


        RUNOFF VOLUME =      1.79270 INCHES      =        1.0240 ACRE-FEET
        PEAK DISCHARGE RATE =       11.60 CFS  AT    1.667 HOURS   BASIN AREA =
 .0107 SQ. MI.




     *HYDROGRAPHS FOR OFFSITE FLOW

     *CENTRAL BASIN

     COMPUTE NM HYD       ID=7 HYD NO=101.7 AREA=0.00152 SQ MI

                          PER A=0.0 PER B=0.0 PER C=19.71 PER D=80.29

                          TP=0.1333 HR MASS RAINFALL=-1


        K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE
 CONSTANT, N =  7.106420
        UNIT PEAK =    4.8182     CFS   UNIT VOLUME =     .9969        B =    526.28
      P60 = 1.8700
        AREA =       .001220 SQ MI     IA =     .10000 INCHES     INF =     .04000 I
NCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=    .033330
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        K =    .105867HR     TP =    .133300HR     K/TP RATIO =    .794199      SHAPE
 CONSTANT, N =  4.514851
        UNIT PEAK =    .87235     CFS   UNIT VOLUME =     .9857        B =    388.14
      P60 = 1.8700
        AREA =        .000300 SQ MI     IA =     .35000 INCHES     INF =     .83000 I
NCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=    .033330

     PRINT HYD             ID=7 CODE=1


                                          PARTIAL HYDROGRAPH   101.70


        RUNOFF VOLUME =      1.77408 INCHES      =         .1438 ACRE-FEET
        PEAK DISCHARGE RATE =        3.98 CFS  AT    1.500 HOURS   BASIN AREA =
 .0015 SQ. MI.




     *COORS BASIN

     COMPUTE NM HYD        ID=8 HYD NO=101.8 AREA=0.00089 SQ MI

                           PER A=0.0 PER B=0.0 PER C=78.79 PER D=21.21

                           TP=0.1333 HR MASS RAINFALL=-1


        K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE
 CONSTANT, N =  7.106420
        UNIT PEAK =    .74527     CFS   UNIT VOLUME =     .9840        B =    526.28
      P60 = 1.8700
        AREA =        .000189 SQ MI     IA =     .10000 INCHES     INF =     .04000 I
NCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=    .033330


        K =    .105867HR     TP =    .133300HR     K/TP RATIO =    .794199      SHAPE
 CONSTANT, N =  4.514851
        UNIT PEAK =    2.0418     CFS   UNIT VOLUME =     .9941        B =    388.14
      P60 = 1.8700
        AREA =        .000701 SQ MI     IA =     .35000 INCHES     INF =     .83000 I
NCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=    .033330

     PRINT HYD             ID=8 CODE=1


                                          PARTIAL HYDROGRAPH   101.80


        RUNOFF VOLUME =      1.20037 INCHES      =         .0570 ACRE-FEET
        PEAK DISCHARGE RATE =        1.83 CFS  AT    1.500 HOURS   BASIN AREA =
 .0009 SQ. MI.
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```
*ADD HYDROGRAPHS FOR TOTAL FLOW OFFSITE

*COORS BASIN AND COMBINED POND DISCHARGE

ADD HYD              ID=9 HYD NO=101.6 ID=6 ID=8

PRINT HYD            ID=9 CODE=1


                                        PARTIAL HYDROGRAPH   101.60

      RUNOFF VOLUME =      1.74724 INCHES      =        1.0809 ACRE-FEET
      PEAK DISCHARGE RATE =       13.04 CFS  AT    1.533 HOURS   BASIN AREA =
.0116 SQ. MI.



FINISH

      NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 13:32:10
```

EXCERPTS FROM
INVESTIGATION PHASE REPORT
FOR
THE RE-EVALUATION STUDY
OF THE
AMOLE DEL NORTE
STORM DIVERSION FACILITY

TABLE 2

Runoff Condition	Runoff (acre-Feet)	Runoff (inches)	% of Rainfall
100-Year Undeveloped	156	0.45	20.5
100-Year Developed	262	0.75	34.1
10-Year Undeveloped	46	0.13	9.0
10-Year Developed	107	0.31	21.5

None of the runoff values shown in Table 2 exceed the 377 acre-feet of runoff allowed in the design of the downstream facilities, so the 100-year runoff would still be contained in the Amole Detention Area and the Hubbell Lake Detention Area. The reduction in runoff volume could result in a lower water surface elevation in the Amole Detention Area, which could allow the Amole Del Norte channel elevation to be dropped. During the Design Development Report phase the effects of reduced runoff volumes, as well as the possibility of modifying the downstream facilities, could be investigated based on the cost of the changes versus other design options.

Another result of the Investigation Report phase is that the 100-

year storm runoff for the developed conditions can be predicted for the storm sewer in the North/South Coors Connection. Areas 14D and 18D contribute flows to this storm sewer. HYMO predicts a peak discharge rate from Area 14D of 160 cfs at 0.32hours and a peak of 188 cfs in Area 18D at 0.48 hours. All values are based on overland flow reaching the downstream end of the basin. Actual flows used for design of the storm sewer would depend on where the consultant selects his storm sewer entrance locations. For the purposes of this report it is assumed that runoff from areas 14D and 18D will be carried in the North/South Coors Connection storm sewer.

6. RECOMMENDATIONS

The following recommendations are made regarding the Investigation Report phase of the Amole Del Norte re-evaluation study:

1) That the drainage area boundary determined in this report (see Plates I-III) be accepted and approved by the City. Other Drainage plans within and adjacent to the Amole Del Norte drainage area should be adjusted or approved accordingly, including having the consultant size the North/South Coors Connection storm sewer to handle the flows intended for the Amole Hubbell Extension from Areas 14D and 18D.

TABLE E-1

HYMO DATA SUMMARY

100-YEAR STORM DEVELOPED CONDITIONS

Area No.	Hydrograph No.	Area (Mi^2)	CN	T_c (Hours)	Runoff Volume (Acre Ft.)	Peak Flow (cfs)	T_p (Hours)
1D	101	0.052	68	0.11	0.73	14	0.14
2D	102	0.265	72	0.22	5.29	83	0.26
3D	103	0.131	68	0.18	1.83	26	0.22
4D	104	0.224	68	0.20	3.12	42	0.26
5D	105	0.015	74	0.11	0.35	10	0.12
6D	106	0.038	74	0.11	0.90	24	0.12
7D	107	0.004	76	0.11	0.10	3	0.12
8D	108	0.690	83	0.27	30.32	589	0.30
9D	109	0.087	88	0.27	5.15	114	0.30
10D	110	0.034	81	0.17	1.31	36	0.18
11D	111	0.025	76	0.17	0.68	16	0.20
12D	112	0.388	85	0.40	19.16	281	0.44
13D	113	0.166	90	0.37	11.01	193	0.40
14D	114	0.117	90	0.30	7.77	160	0.32
15D	115	0.187	90	0.30	12.45	255	0.32
16D	116	0.012	92	0.20	0.87	27	0.22

TABLE E-1

HYMO DATA SUMMARY

100-YEAR STORM DEVELOPED CONDITIONS

Area No.	Hydrograph No.	Area (Mi^2)	CN	T_c (Hours)	Runoff Volume (Acre Ft.)	Peak Flow (cfs)	T_p (Hours)
17D	117	0.127	90	0.30	8.44	173	0.32
18D	118	0.329	83	0.43	14.31	188	0.48
19D	119	0.037	92	0.17	2.76	101	0.18
20D	120	0.284	85	0.30	14.09	260	0.32
21D	121	0.201	82	0.40	8.21	114	0.44
22D	122	0.187	83	0.30	8.18	145	0.34
23D	123	0.214	83	0.47	9.28	117	0.52
24D	124	0.139	77	0.17	4.10	98	0.20
25D	125	0.056	77	0.27	1.63	28	0.30
26D	126	0.141	80	0.30	5.07	84	0.34
27D	127	0.155	85	0.53	7.57	88	0.58
28D	128	0.089	79	0.17	3.01	78	0.18
29D	129	0.153	79	0.33	5.13	75	0.38
30D	130	0.152	85	0.30	7.53	139	0.32
31D	131	0.081	77	0.17	2.39	57	0.20
32D	132	0.198	79	0.37	6.64	93	0.42

DESIGN ANALYSIS REPORT

for the

AIRPORT DRIVE STORM DRAIN OUTFALL

(THE COORS UPGRADE)

OCTOBER 1992

PREPARED FOR:

SUNWEST BANK
SPECIAL ASSETS DEPARTMENT
303 Roma Avenue, N.W.
Albuquerque, New Mexico 87102

PREPARED BY:

Easterling & Associates, Inc.
10131 Coors Road, N.W.
Suite H-7
Albuquerque, NM 87114-4048

I, Charles M. Easterling, do hereby certify that this report was prepared by me or under my direction and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

Charles M. Easterling, P.E.
NMPE No. 6411

10-26-92
Date

Design Analysis Report

for the

Airport Drive Storm Drain Outfall

(The Coors Upgrade)

October 1992

Purpose

To demonstrate the adequacy of the proposed storm drain improvements.

Project Description

The project consists of approximately 780 LF of 48″ diameter reinforced concrete pipe storm drain. The proposed storm drain will connect the future Airport Drive Storm Drain (C.O.A. Project 4383.90) in Airport Drive to an existing 54″ diameter storm drain in Coors Boulevard as proposed in the Master Drainage Plan for Atrisco Business Park, September 1992. At the point of connection to the existing Coors Boulevard Storm Drain, an existing junction manhole will be removed and replaced with a series of bends and wyes to increase the hydraulic efficiency of the junctions located there. The proposed 48″ diameter storm drain will parallel an existing 24″ to 30″ diameter storm drain located in the median of Coors Boulevard. The parallel configuration was chosen over removal and replacement of the existing storm drain line in anticipation of the need for additional capacity to provide an outfall from property located north and west of the proposed storm drain.

Hydrology

The peak flow rates for the proposed storm drain were determined in the Master Drainage Plan for the Atrisco Business Park dated September 1992. The assumption made in modeling the storm drain for the Master Drainage Plan was that the 48″ storm drain would replace the existing 24″ to 30″ storm drain in Coors rather than parallel it. The model also assumed that some of the water from Coors Boulevard would not be accepted into the storm drain at the inlets adjacent to the junction with the new 48″ storm drain because of a high H.G.L. in the storm drain during peak flows. Due to physical improvements which will be made to the junction in the proposed project and refinements made to the hydraulic analysis of the downstream storm drain, the current analysis indicates the storm drain will have capacity to accept all of the flows from Coors Boulevard. The peak flow rates in the storm drain were manually adjusted to reflect these changes.

Hydraulics

Hydraulic grade line calculations were performed for the proposed storm drain, as well as for the downstream segment of the existing Coors Boulevard Storm Drain. Calculations were made in a spreadsheet utilizing equations proposed by the C.O.A. D.P.M. Chapter 22.3. A summary of these calculations is included in Appendix "A." Profiles of the storm drains included in the analysis are also located in Appendix "A."

The starting water surface elevation, at the point of discharge to the AMOLE system, for the existing Coors Boulevard Storm Drain was assumed to be 5029.00 as was used in the H.G.L. calculations for the storm drain performed by D.T.M and Associates, the designers of the Coors Boulevard Storm Drain, in 1986. No analysis was made of existing inlet capacity but rather all flows from upstream street segments were assumed to be taken into the storm drain at all inlet locations. At junction points, the flow contributed by the lateral at the time of peak flow in the trunk line was determined by subtracting the immediate upstream peak rate from the immediate downstream peak rate. Where the H.G.L. was calculated to be lower than the soffit elevation of the pipe, the H.G.L. was assumed to be at the soffit elevation.

Pipe Class and Bedding Class

An analysis was performed to demonstrate the adequacy of the pipe and bedding classes specified for the project. A copy of this analysis is included in Appendix "B." The analysis was performed per the method presented in the "Concrete Pipe Design Manual" published by the American concrete Pipe Association, June 1980 edition.

The analysis indicated Class III R.C.P. pipe bedded in Class "C" bedding is adequate for trench depths less than 14′. Class III R.C.P. should be bedded with Class "B" bedding for trench depths in the 14′ to 15′ range.

Conclusions

The calculations performed for this analysis demonstrate that the proposed storm drain will have adequate capacity to convey the peak 100 year flow rates established in the Master Drainage Plan for the Atrisco Business Park.

PROJECT: COORS CONNECTION STORM DRAIN (OUTLET TO 54" INLET)

JOB#: SUNWEST 3322

DATE: 10/19/1992

TIME: 9:17 am

ANALYSIS BY: VANCEL FOSSINGER, *EASTERLING & ASSOCIATES*

STARTING CONDITIONS:

TAILWATER ELEVATION = 5029.00

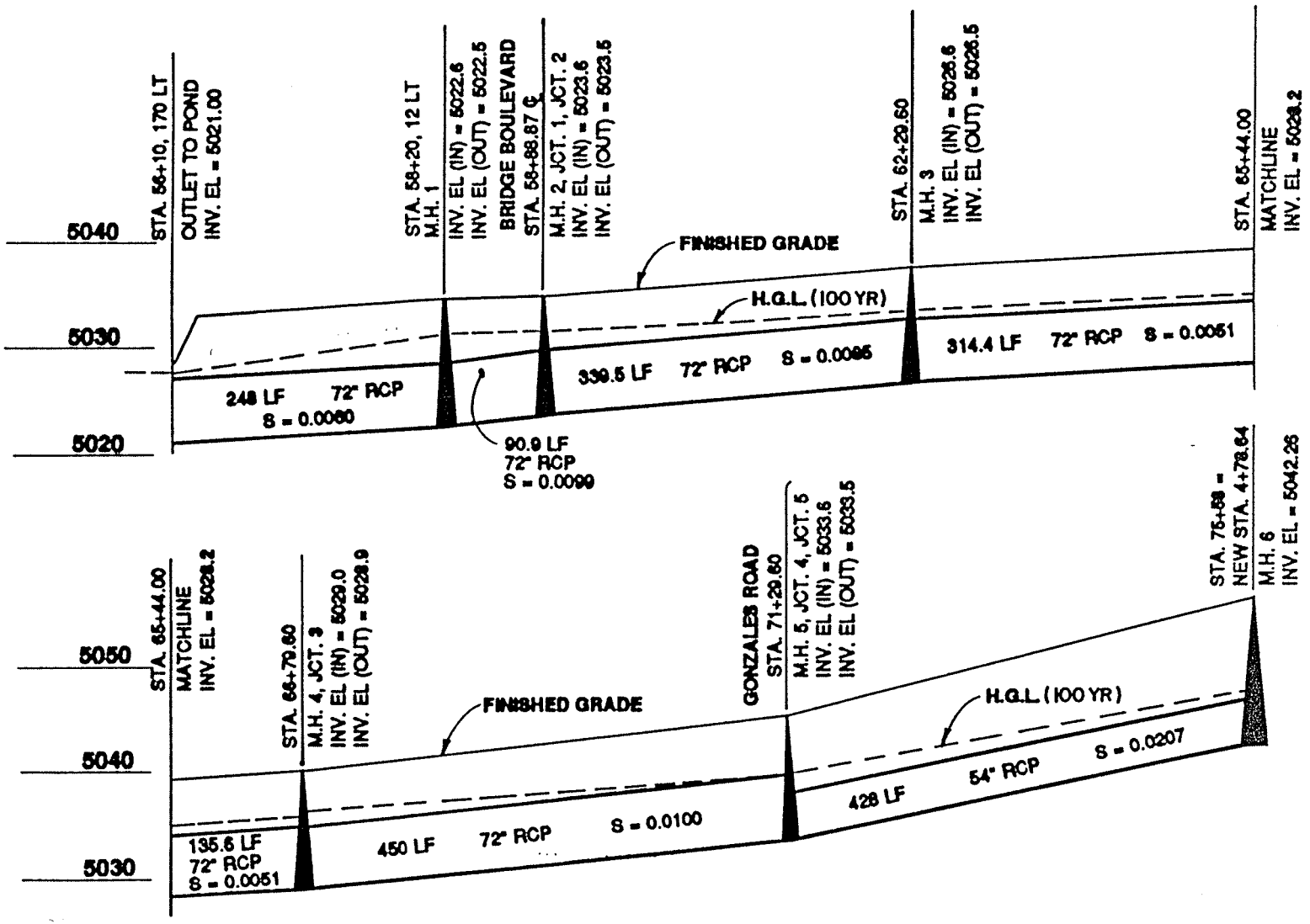
MANNING'S ROUGHNESS = 0.013

ASSUMED STARTING HGL ELEV.= 5029.00

|<-INVERT->| |<---------- HYDRAULIC GRADE LINE COMPUTATIONS ---------->|

PIPE LINK DESCRIPTION FROM	TO	MAINLINE FLOW RATE (cfs)	PIPE DIA. (inches)	MANNING'S ROUGHNESS ("n")	LAY LENGTH (feet)	PIPE SLOPE (fpf)	DOWN STREAM (elev.)	UP STREAM (elev.)	FRICTION LOSS Hf	MANHOLE LOSS Hm	ANGLE PT. LOSS Hb	JUNCTION LOSS Hj	EXPANSION LOSS Hx	SUM OF LOSSES	ENERGY GRADE LINE ELEVATION	HYDRAULIC GRADE LINE ELEVATION	FINISHED GRADE ELEVATION
															5029.00	5029.00	
STORM DRAIN OUTFALL INITIAL CONDITIONS----------> @ OUTLET = 5021.00																	
OUTLET	M.H. 1	324.0	72	0.013	248.00	0.0060	5021.00	5022.49	1.452	0.102	0.235	0.000	2.039	3.828	5032.83	5030.79	5034.61
M.H. 1	M.H. 2	324.0	72	0.013	90.87	0.0099	5022.60	5023.50	0.532	0.102	0.136	0.000	0.000	0.770	5033.60	5031.56	5034.61
M.H. 2	JCT. 1 RT	324.0	72	0.013	0.00	0.0099	5023.60	5023.60	0.000	0.000	0.000	0.044	0.000	0.044	5033.64	5031.65	5034.61
JCT. 1 RT	JCT. 2 LT	320.0	72	0.013	0.00	0.0099	5023.60	5023.60	0.000	0.000	0.000	0.048	0.000	0.048	5033.69	5031.75	5034.61
JCT. 2 LT	M.H. 3	316.0	72	0.013	339.53	0.0085	5023.60	5026.49	1.891	0.097	0.000	0.000	0.000	1.987	5035.68	5033.74	5037.72
M.H. 3	M.H. 4	316.0	72	0.013	450.00	0.0051	5026.60	5028.90	2.506	0.097	0.000	0.000	0.000	2.603	5038.28	5036.34	5040.10
M.H. 4	JCT. 3 LT	316.0	72	0.013	0.00	0.0051	5029.00	5029.00	0.000	0.000	0.000	0.204	0.000	0.204	5038.48	5036.87	5040.10
JCT. 3 LT	M.H. 5	288.0	72	0.013	450.00	0.0100	5029.00	5033.50	2.081	0.081	0.000	0.000	0.000	2.162	5041.11	5039.50	5045.58
M.H. 5	JCT. 4 RT	288.0	54	0.013	0.00	0.0100	5033.60	5033.60	0.000	0.000	0.000	0.161	0.905	1.066	5043.19	5038.28	5045.58
JCT. 4 RT	JCT. 5 LT	283.0	54	0.013	0.00	0.0100	5033.60	5033.60	0.000	0.000	0.000	0.219	0.000	0.219	5043.41	5038.73	5045.58
JCT. 5 LT	M.H. 6	276.0	54	0.013	424.00	0.0204	5033.60	5042.25	8.353	0.234	0.000	0.000	0.000	8.587	5052.00	5047.32	5056.50
M.H. 6	BEND 1	276.0	54	0.013	6.42	0.0450	5042.26	5042.55	0.126	0.000	0.473	0.000	0.000	0.599	5052.60	5047.92	5056.60
BEND 1	WYE 1 RT	276.0	54	0.013	6.88	0.0450	5042.55	5042.86	0.136	0.000	0.000	0.738	0.000	0.873	5053.47	5049.90	5056.70
WYE 1 RT	BEND 2	241.0	54	0.013	9.43	0.0450	5042.86	5043.28	0.142	0.000	0.291	0.000	0.000	0.433	5053.90	5050.34	5056.80
BEND 2	WYE 2 RT	241.0	54	0.013	3.74	0.0450	5043.29	5043.46	0.056	0.000	0.000	1.265	0.000	1.321	5055.22	5053.92	5056.90
WYE 2 RT	BEND 3	146.0	54	0.013	10.96	0.0450	5043.46	5043.95	0.060	0.000	0.107	0.000	0.000	0.167	5055.39	5054.08	5057.00
BEND 3	INLET	146.0	54	0.013	85.40	0.0720	5043.95	5050.10	0.471	0.000	0.000	0.000	0.000	0.471	5055.91	5054.60	5062.00
INLET	DUMMY	146.0	54	0.013	1.00	0.0720	5050.10	5050.17	0.006	0.000	0.000	0.000	0.000	0.006	5055.98	5054.67	5062.00

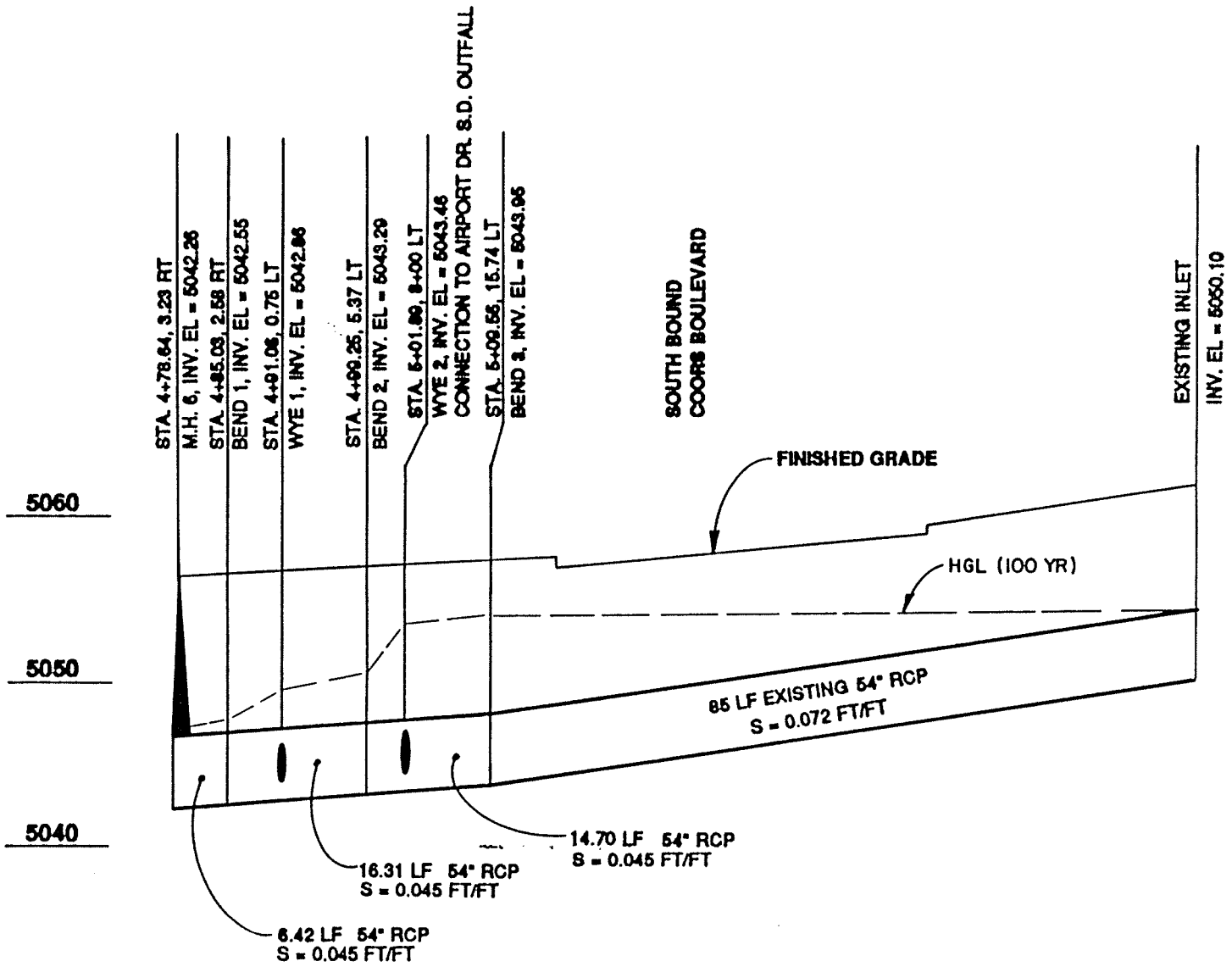
NOTE: Where less than full pipe flow is calculated, the H.G.L. is assumed to be equal to the soffit elevation.



EXISTING COORS BOULEVARD STORM DRAIN
DOWNSTREAM OF AIRPORT DRIVE STORM DRAIN OUTFALL

PROFILE N.T.S.

NOTE: STORM DRAIN DATA TAKEN FROM AS-BUILT DRAWINGS FOR THE NORTH/SOUTH COORS CONNECTION. STATIONING IS PER THE COORS CONNECTION DRAWINGS.



RECONSTRUCTED PORTION OF COORS BOULEVARD
STORM DRAIN DOWNSTREAM OF AIRPORT DR. STORM DRAIN OUTFALL

PROFILE NTS

PROJECT: AIRPORT DRIVE STORM DRAIN OUTFALL

JOB#: SUNWEST 3322

DATE: 10/16/1992

TIME: 9:25 am

ANALYSIS BY: VANCEL FOSSINGER, *EASTERLING & ASSOCIATES*

STARTING CONDITIONS:

TAILWATER ELEVATION = 5053.92

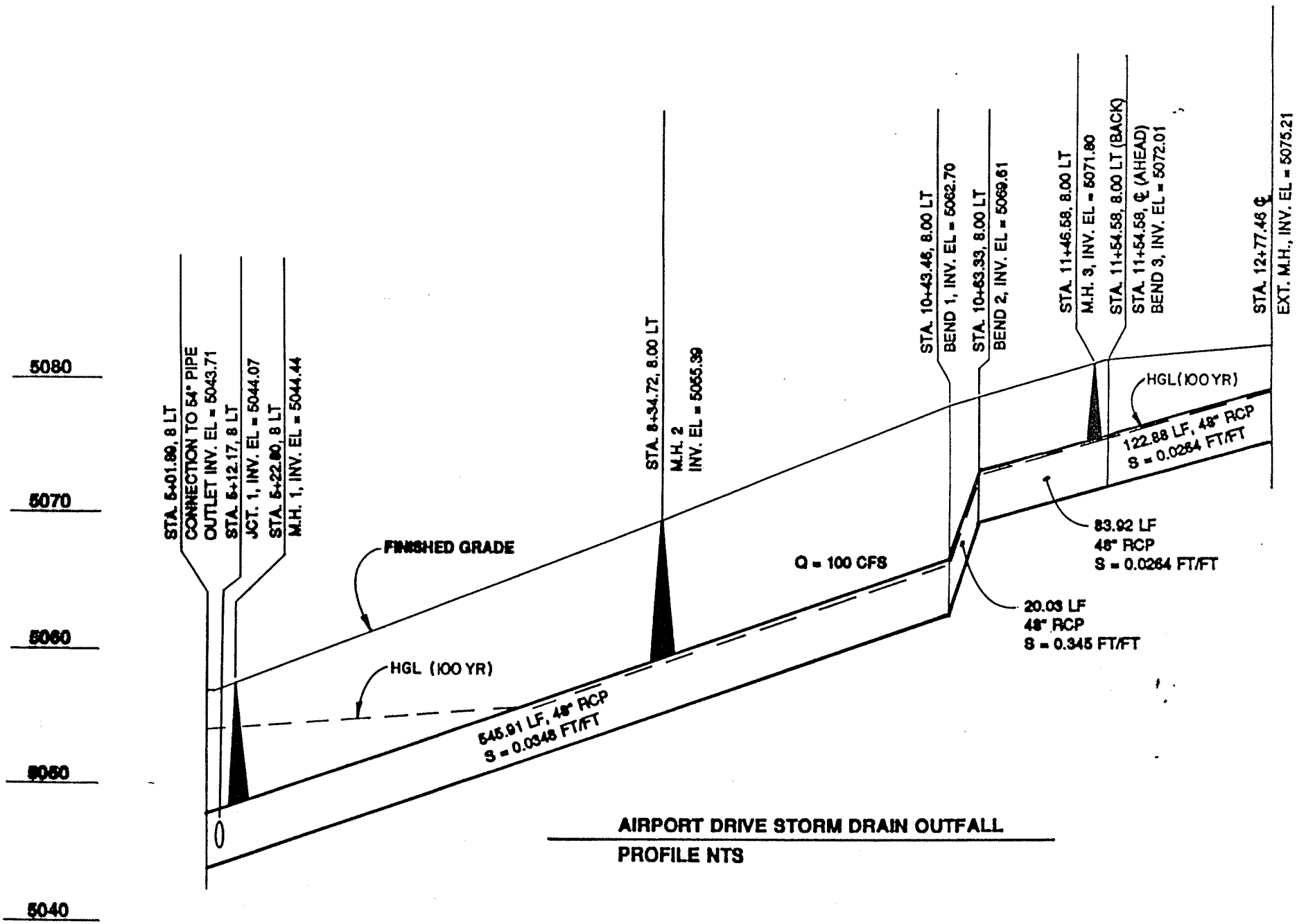
MANNING'S ROUGHNESS = 0.013

ASSUMED STARTING HGL ELEV.= 5053.92

|<-INVERT->| |<---------- HYDRAULIC GRADE LINE COMPUTATIONS ---------->|

PIPE LINK DESCRIPTION FROM	TO	MAINLINE FLOW RATE (cfs)	PIPE DIA. (inches)	MANNING'S ROUGHNESS ("n")	LAY LENGTH (feet)	PIPE SLOPE (fpf)	DOWN STREAM (elev.)	UP STREAM (elev.)	FRICTION LOSS Hf	MANHOLE LOSS Hm	ANGLE PT. LOSS Hb	JUNCTION LOSS Hj	EXPANSION LOSS Hx	SUM OF LOSSES	ENERGY GRADE LINE ELEVATION	HYDRAULIC GRADE LINE ELEVATION	FINISHED GRADE ELEVATION
STORM DRAIN OUTFALL INITIAL CONDITIONS----------> @ OUTLET = 5043.71															5053.92	5053.92	
OUTLET	WYE 1	103.0	48	0.013	10.36	0.0346	5043.71	5044.07	0.053	0.000	0.000	0.054	1.043	1.151	5055.07	5054.09	5057.20
WYE 1	M.H. 1	100.0	48	0.013	10.71	0.0348	5044.07	5044.44	0.052	0.049	0.000	0.000	0.000	0.101	5055.17	5054.19	5057.50
M.H. 1	M.H. 2	100.0	48	0.013	314.43	0.0348	5044.44	5055.38	1.524	0.049	0.000	0.000	0.000	1.573	5060.37	5059.38	5069.60
M.H. 2	V.BEND 1	100.0	48	0.013	210.42	0.0348	5055.38	5062.70	1.020	0.000	0.085	0.000	0.000	1.105	5067.69	5066.70	5078.00
V.BEND 1	V.BEND 2	100.0	48	0.013	20.03	0.3450	5062.70	5069.61	0.097	0.000	0.085	0.000	0.000	0.183	5074.60	5073.61	5078.70
V.BEND 2	M.H. 3	100.0	48	0.013	83.92	0.0261	5069.61	5071.80	0.407	0.049	0.000	0.000	0.000	0.456	5076.79	5075.80	5081.50
M.H. 3	BEND 3	100.0	48	0.013	8.06	0.0261	5071.80	5072.01	0.039	0.000	0.163	0.000	0.000	0.202	5077.00	5076.01	5081.80
BEND 3	EXIST. M.H.	100.0	48	0.013	122.88	0.0261	5072.01	5075.22	0.596	0.049	0.000	0.000	0.000	0.645	5080.20	5079.22	5082.83
EXIST. M.H.	DUMMY	100.0	48	0.013	1.00	0.0261	5075.22	5075.25	0.005	0.000	0.000	0.000	0.000	0.005	5080.23	5079.25	5082.83

NOTE: Where less than full pipe flow is calculated, the H.G.L. is assumed to be equal to the soffit elevation.



AIRPORT DRIVE STORM DRAIN OUTFALL

PROFILE NTS

Easterling & Associates, Inc.
10131 Coors Rd., NW, Suite H-7
Albuquerque, New Mexico 87114
(505) 898-8021
FAX (505) 898-8501

Project Name Airport Drive Storm Drain Outfall
Project No. 3332 Date 10-19-92
Subject Pipe Class & Bedding
By USF Sheet 1 of 3

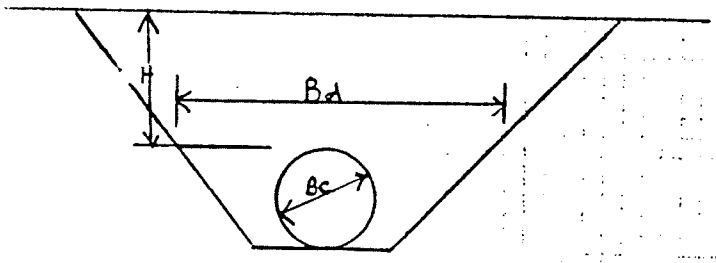
Use method presented in "Concrete Pipe Design Manual" by the American Concrete Pipe Assoc., to check pipe and bedding class.

Pipe I.D. = 48" Pipe O.D. ≈ 58"

Trench Depth Range - 9' to 15' Assume a soil weight of 120 lb/cf

Assume an OSHA Soil Classification of Type "B" (1/1 side slopes)

To be conservative assume trench side slopes may be sloped from the bottom.



Check Pipe and bedding for 3 trench depths: 9', 12', and 15'

1. Trench depth = 9' $H = 9 - 58/12 = 4.16'$ $Bd = 15.8'$ $Bc \approx 4.83'$

- From table 26-A the transition width for H = 5' - 6'6" Use Backfill Load = 2950 lb/LF at 100 lb/cf material
- Backfill load with 120 lb/cf Material = $2950 \times 1.20 = 3{,}540$ lb/LF
- Live load from table = 1,120 lb/LF
- Try Class C bedding $Bf = 1.5$

$$D\text{-load} = D_{0.01} = \frac{W_L + W_E}{Bf \times D} \times F.S.$$ For RCP use F.S. = 1

$$D_{0.01} = \frac{1{,}120 + 3{,}540}{1.5 \times 4} \times 1 = 777 \text{ lb/LF/ft I.D.}$$

From ASTM C-76 for Class III RCP $D_{0.01} = 1{,}350$ lb/LF/I.D

$777 < 1350$ OK

Class III Pipe and Class C bedding OK at depth = 9'

2. Trench depth = 12' $H = 12 - 58/12 = 7.16'$ $Bd = 15.8'$ $Bc = 4.83'$

- From table 26-A Transition Width = 7'6"
  Interpolate between H = 7' WE = 4,490 and H = 8' WE = 5,354
  $WE_{100} = (5{,}354 - 4{,}490)\,0.16 + 4{,}490 = 4{,}628$ lb/LF
  $WE = 4{,}628 \times 1.20 = 5{,}554$ lb/LF
- Interpolated from Table 45 $W_L = 560 - ((560 - 470).16) = 546$ lb/LF
- Try Class C bedding $Bf = 1.5$

Easterling & Associates, Inc.
10131 Coors Rd., NW, Suite H-7
Albuquerque, New Mexico 87114
(505) 898-8021
FAX (505) 898-8501

Project Name Airport Drive Storm Drain Outfall
Project No. 3322 Date 10-19-92
Subject Pipe class + Bedding
By USE Sheet 2 of 3

Depth = 12' 48" Dia RCP Cont.

$D_{0.01} = \frac{5,554 + 546}{1.5 \times 4} \times 1 = 1,017$ lb/LF/ I.D.

$D_{0.01}$ for Class III RCP = 1,350 > 1,017 OK

Class III RCP and Class "C" bedding OK for 12' depth

3. Trench depth = 15' H = 15 - 4.83 = 10.37 Bd = 15.8' Bc = 4.83'

- From Table 26-A Transition Width = 8'-8"
- Interpolate between H = 10' W_{E100} = 7,041 + H = 11 W_{E100} = 7,776

$W_{E100} = (7,776 - 7,041)(0.37) + 7,041 = 7,313$ lb/LF

$W_E = 7,313 \times 1.20 = 8,776$ lb/LF

Truck Live Loads are insignificant at H > 10'

$D_{0.01} = \frac{8,776}{1.5 \times 4} \times 1 = 1,463$ lb/LF/ID

$D_{0.01}$ for Class III RCP = 1,350 < 1,463 No Good

CLASS III RCP AND CLASS "C" BEDDING IS NOT ADEQUATE AT 15' DEPTH

TRY Trench Depth = 14' H = 14 - 4.83 = 9.17' Bd = 15.8 Bc = 4.83'

From Table 26-A Transition Width = 8'-6"

Interpolate between H = 9' W_{E100} = 6,287 and H = 10' W_{E100} = 7,041

$W_{E100} = (7,041 - 6,287)(.17) + 6,287 = 6,415$ lb/LF

$W_E = 6,415 \times 1.20 = 7,698$ lb/LF

Use W_L for 9' depth for W_L W_L = 410 lb/LF

$D_{0.01} = \frac{7,698 + 410}{1.5 \times 4} \times 1 = 1,351$

$D_{0.01}$ for Class III RCP = 1350 ≈ 1,351 O.K.

Class III RCP and Class "C" bedding OK. to 14' depth

Try Class "B" Bedding for 15' depth Bf = 1.9

From above W_E = 8,776 lb/LF $W_L \approx 0$

$D_{0.01} = \frac{8,776}{1.9 \times 4} = 1,155$ lb/LF < 1350 lb/LF O.K.

CLASS III RCP and Class "B" bedding O.K. for 14' > depth < 15'

Easterling & Associates, Inc.
10131 Coors Rd., NW, Suite H-7
Albuquerque, New Mexico 87114
(505) 898-8021
FAX (505) 898-8501

Project Name Airport Drive Storm Drain Outfall
Project No. 3322 Date 10-19-92
Subject Pipe Class & Bedding
By JSF Sheet 3 of 3

Pipe ID = 54" Pipe O.D. = 5.42'
Trench depth = 14'
Assume soil wt and OSHA soil type as per 48" dia calcs
H = 14 - 5.42 = 8.58' Bd = 17.59' Bc = 5.42'
- From Table 27-A the transition width = 8'-10"
- Interpolate between H = 8' WE_{100} 5,790 & H = 9' WE_{100} = 6,765
WE_{100} = (6,765 - 5,790)0.58 + 5,790 = 6,356 lb/LF
WE = 6,356 X 1.20 = 7,627 lb/LF
- Interpolate Wh from Table 45 520 - ((520 - 440)(0.58)) = 474 lb/LF

$$D_{0.01} = \frac{7,627 + 474}{1.5 \times 4.5} \times 1 = 1,200 \text{ lb/LF/I.D.}$$

$D_{0.01}$ for Class III RCP = 1,350 lb/LF/ID > 1,200 lb/LF/I.D. OK

Class III RCP and Class "C" bedding OK for 14' depth

PURPOSE

The pupose of this report is to present the grading and drainage plan for the Albertson's Shopping Center site in order to obtain site development plan and building permit approval. All applicable ordinances, the DPM, and AHYMO were utilized to prepare this plan.

EXISTING CONDITIONS

The project comprises an area of 7.4240 acres within lots 61, 62 & 63 at the southwest corner of Central and the New Coors By-Pass (Appendix A). This site is bounded by Central Avenue to the north, Coors Boulevard to the east and south and by vacant property to the west.

The tract is relatively level and slopes from north to south at approximately 0.33 percent. Vegetative cover is typical of west side property, and the soils are sandy. The site drains overland and sheet flows onto Coors Boulevard where the runoff is collected by a series of storm inlets. Based upon existing surficial conditions, AHYMO anticipates this site to produce 13.74 cfs during the 100 year-6 hour storm.

HYDROLOGIC ANALYSIS

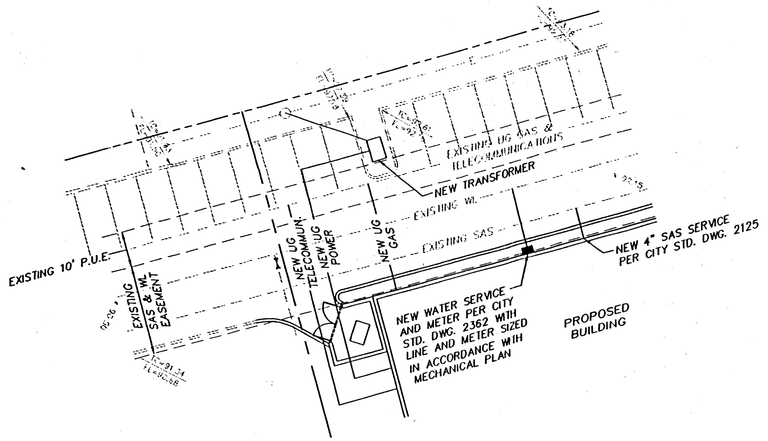
AHYMO was utilized for this analysis with the intent to discharge developed flow at a rate that is presently generated by this site. The Coors Boulevard storm drain system was intended to eventually accept all flows from a 285.5 acre basin when it was designed inthe early to mid 1980's. This was verified utilizing the Boyle Engineering Corporation analysis of the Amole Del Norte storm diversion facility and the Easterling and Associates, Inc. analysis of the Airport Drive storm drain outfall (the Coors Upgrade). The Airport Drive study contains as-built plan and profile sheets of the Coors storm drain by NMSH&TD, which were also utilized in this analysis (sheets 1893). All of the pertinent hydrologic parameters and calculation methods are presented in Appendix B of this report.

PROPOSED MANAGEMENT PLAN

As a developed site, this amended plan still proposes to discharge from two on-site locations and will add a basin fronting Coors Boulevard with a combined maximum flow rate of 13.04 cfs into existing storm inlets on Coors Boulevard. The existing flow generated by this site is 13.74 cfs, which is greater than the throttled discharge rate.

The amended improvements preserve the concept of two basins with ponds retaining the difference in volumes between existing and proposed (See Appendix B). The ponds will be located in parking areas (See Sheet 1) and the ponds will have controlled discharge into the back of the existing storm inlets in Coors Boulevard. Basin A is controlled by a 6" Orifice Plate on the pipe invert with a discharge of 2.60 cfs. Basin B is controlled by an 11" Orifice Plate on the pipe invert with a discharge of 9.04 cfs. The maximum water surface elevation for the ponds are 90.15 for Basin A and 86.86 for Basin B. The basin fronting Coors will surface drain into the same storm inlets with a discharge of 1.83 cfs. These three rates were tabulated and given as the discharge rate for the entire site.

The off-site flows from Central Avenue will be directed from the western property line east to Coors Boulevard (See Appendix B). This basin's developed flow is 3.98 cfs and will remain in the right-of-way of Central and Coors.



UTILITY PLAN
SCALE: 1" = 20'

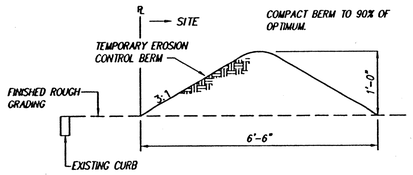
UTILITY NOTES

1. WATER AND SANITARY SEWER SERVICE IS ARRANGED THROUGH THE CITY CUSTOMER SERVICE DEPARTMENT AT 768-2840.
2. GAS LINE AND METER INSTALLATION IS TO BE ARRANGED THROUGH PNM GAS DIVISION (MILDRED MARTINEZ AT 241-7742).
3. ELECTRIC POWER SUPPLY AND TRANSFORMER INSTALLATION IS THROUGH PNM ELECTRIC DIVISION (ERROL SINGER AT 241-3698).
4. TELECOMMUNICATION SERVICE TO BUILDING IS ARRANGED THROUGH US WEST (ELISA BALLI AT 245-6996).

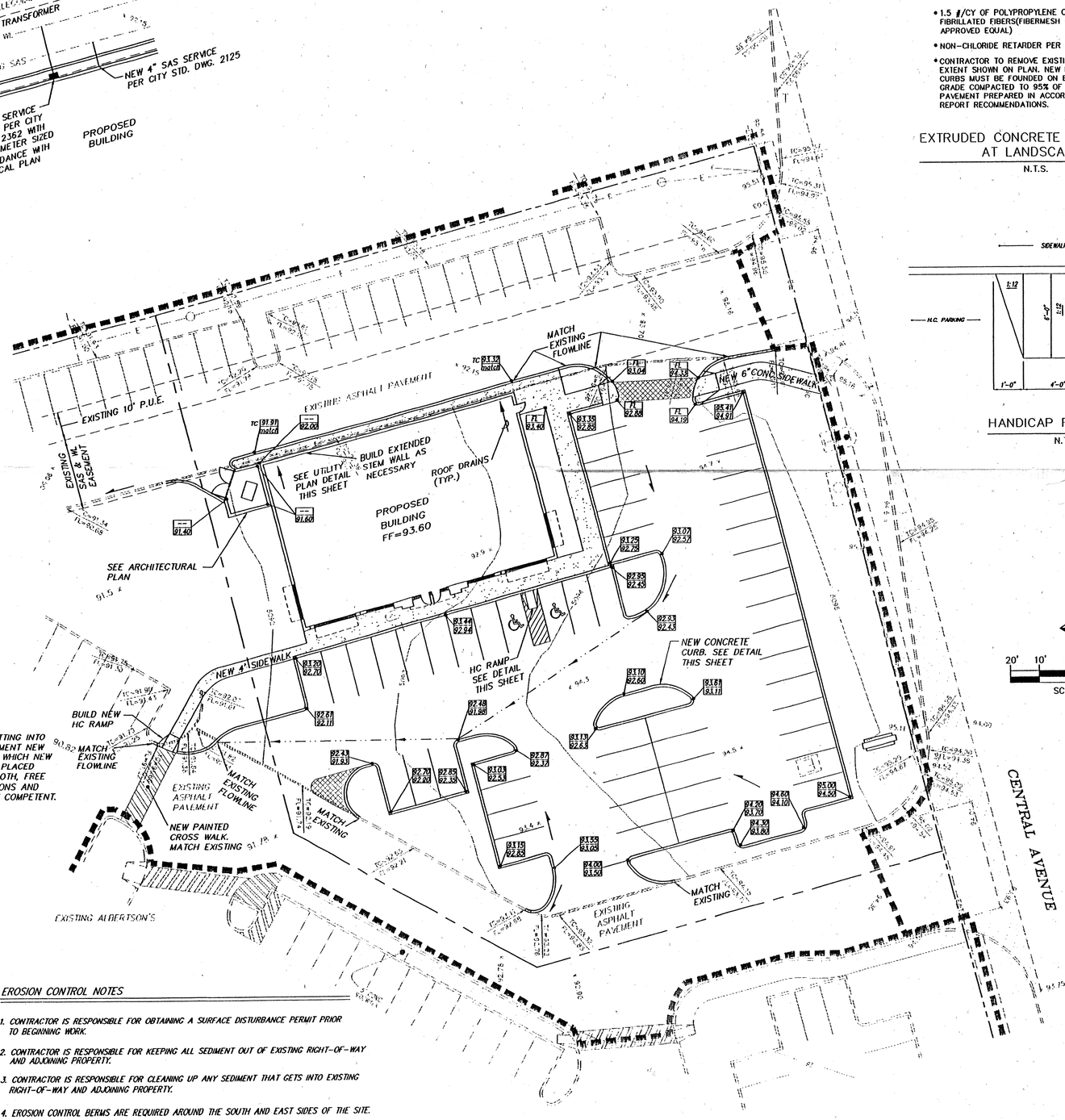
WHEN SAW CUTTING INTO EXISTING PAVEMENT NEW EDGE AGAINST WHICH NEW CURB WILL BE PLACED SHALL BE SMOOTH, FREE OF IMPERFECTIONS AND STRUCTURALLY COMPETENT.

NOTES:
1. PROVIDE EXPANSION JOINTS AT 25' O.C. MAX. AND AT CURVES, TANGENTS, AND CORNERS.
2. BASE OF CURB TO REST ON FILL COMPACTED TO 95% OF OPTIMUM.
3. SACK FINISH EXPOSED SURFACES.
4. RUN BARS CONT. THUR EXPANSION JOINTS.

CURB AT SIDEWALK
N.T.S.

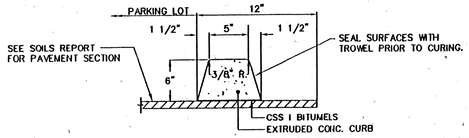


EROSION CONTROL BERM DETAIL
N.T.S.



EROSION CONTROL NOTES

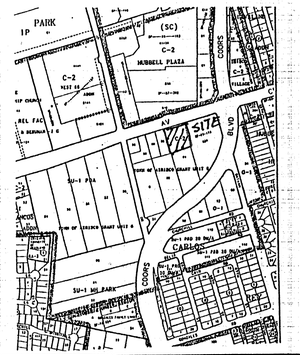
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A SURFACE DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL SEDIMENT OUT OF EXISTING RIGHT-OF-WAY AND ADJOINING PROPERTY.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING UP ANY SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY AND ADJOINING PROPERTY.
4. EROSION CONTROL BERMS ARE REQUIRED AROUND THE SOUTH AND EAST SIDES OF THE SITE.



- 3000 PSI COMP. STRENGTH AT 28 DAYS
- 1.5 #/CY OF POLYPROPYLENE COLLATED FIBRILLATED FIBERS(FIBERMESH OR APPROVED EQUAL)
- NON-CHLORIDE RETARDER PER MANUF. RECOMM.
- CONTRACTOR TO REMOVE EXISTING CURB TO THE EXTENT SHOWN ON PLAN. NEW EXTRUDED CONCRETE CURBS MUST BE FOUNDED ON BACKFILL OR EXISTING GRADE COMPACTED TO 95% OF OPTIMUM AND ON NEW PAVEMENT PREPARED IN ACCORDANCE WITH SOILS REPORT RECOMMENDATIONS.

EXTRUDED CONCRETE CURB DETAIL AT LANDSCAPING
N.T.S.

HANDICAP RAMP DETAIL
N.T.S.



VICINITY MAP ZONE MAP: K-10-Z

TBM (TEMPORARY BENCHMARK)

TOP OF MANHOLE IN WEST DRIVEWAY JUST NORTH OF NORTH PROPERTY LINE. ELEV.=5094.44.

ACS BENCHMARK

ACS MONUMENT "5-K10" Y=1484685.30 X=362341.63 G-G=0.99967811
$\Delta\alpha$=-00°15'52" CENTRAL ZONE (NAD 1927/SLD 1929)
ELEVATION=5093.73

LEGAL DESCRIPTION

TRACT 61A2, TOWN OF ATRISCO GRANT UNIT 6.

NOTES

1. AN EXISTING 25' PUBLIC SANITARY SEWER AND WATERLINE EASEMENT BEGINS APPROXIMATELY 6 INCHES WEST OF THE PROPOSED BUILDINGS WESTERN EDGE.
2. IN ACCORDANCE WITH CITY HYDROLOGY DRAINAGE FILE K-10/D-27, THIS SITE IS ALLOWED TO DISCHARGE DEVELOPED RUNOFF TO ADJOINING DOWNSTREAM PROPERTY (ALBERTSON'S TRACT 61A1).
3. CONTRACTOR IS RESPONSIBLE FOR REVIEWING SOILS REPORT AND PREPARING FINAL GRADES IN ACCORDANCE WITH REPORT RECOMMENDATIONS.
4. ALL UNDERGROUND UTILITIES MAY NOT BE IDENTIFIED. CONTRACTOR IS URGED TO PERFORM SITE INSPECTION BEFORE BIDDING ON WORK AND IS REQURED TO CONTACT BURIED LINE LOCATION SERVICE PRIOR TO BEGINNING WORK.

LEGEND

93.11 / 92.61	PROPOSED TOP OF CURB AND FLOWLINE SPOT ELEVATION
TC=92.65 / FL=92.21	EXISTING TOP OF CURB AND FLOWLINE SPOT ELEVATION
x 92.15	EXISTING SPOT ELEVATION
5093	EXISTING CONTOUR
	EXISTING EASEMENT
	EXISTING CONCRETE OR ASPHALT CURB TO REMAIN
	EXISTING CONCRETE OR ASPHALT CURB TO BE REMOVED
	ASPHALT SWALE
	FLOW ARROW
	EXISTING DRAINAGE BASIN BOUNDARY
	4" THICK P.C. TEXTURED CONCRETE SURFACE RAISED SLIGHTLY ABOVE EXISTING PAVEMENT
	CONCRETE SURFACE

20' 10' 0 20' 40'
SCALE: 1" = 20'

11818
10-16-98

RECEIVED
NOV 04 1998
HYDROLOGY SECTION

VIDEO UPDATE

GRADING AND DRAINAGE / UTILITY PLAN

MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505)828-2200, FAX (505)797-9539

Designed: JMM	Drawn: WLV	Checked: DMG	Sheet 1 of 1
Scale: 1" = 20'	Date: 3/98	Job: 97124	

SITE PLAN: SITE2\07-20-98
7124VU\7124GD20\10-16-98\WLV

SEEDING SPECIFICATIONS

GENERAL

This work shall consist of furnishing seed, surface preparation, seed application, mulching and other items of work in conjunction with revegatation of the site. All surface areas that have been disturbed due to on-site construction must be revegetated per these specifications.

SURFACE PREPARATION

The surface shall be soft enough to allow for crimping or tucking of mulch to a minimum depth of 2 inches. Areas of loose or sandy soil may not require additional preparation. Areas of compacted soil shall be worked by disc, chisel, or tilling to a minimum depth of 4 inches.

SEED

Seed mix and rate shall be based on the following list:

Name	Rate/Acre (PLS)#Seed/lb.
"Paloma" Indian Rice Grass	4.0 lbs 175,000
"Viva" Galleta Grass	2.5 lbs145,000
"El Reno" Sideoats	3.0 lbs191,000
"Hachita" Blue Grama	1.0 lbs825,000
Sand Dropseed	.05 lbs 1,742,000
Fourwing Saltbush	1.0 lbs (dewinged)

Seed quantities and type must be verified by Inspector prior to mixing by CONTRACTOR. Bags which are not sealed or to which suppliers tags are not affixed and removed by Inspector at the time seed is mixed will not be allowed.

SEEDING

The area to be seeded must be free of any clods, rock, wood, metal, or other debris which could interfere with the seeding operation. Seed shall be applied by broadcasting using a mechanical broadcast seeder approved by ENGINEER. Hydro seeding will not allowed. No more area may be seeded than can be mulched by the end of the work day during which seeding occurred.

FERTILIZER

No fertilizer is required.

IRRIGATION

No supplemental irrigation is required. Installation which occurs under exceptionally dry or windy conditions may require watering down after crimping to aid in holding mulch in place. Mulch which is so dry and brittle that it cannot be crimped to the requisite depth may be pre-wetted to increase flexibility.

SITE PROTECTION

Areas or sites which have been stabilized and/or seeded will be posted against vehicular trespass (by OWNER) and marked by means of fence, flag line, barricade, perimeter berms, or combination of these methods as appropriate to the site (by the CONTRACTOR).

NOTICE TO CONTRACTOR

1. An excavation/construction permit will be required before beginning any work within City right of way. An approved copy of these plans must be submitted at the time of application for this permit.

2. All work detailed on these plans to be performed, except as otherwise stated or provided hereon, shall be constructed in accordance with "City of Albuquerque Standard Specifications for Public Works Construction" (1986 Edition).

3. Two working days prior to any excavation, Contractor must contact the Line Locating Service, 765-1234, for location of existing utilities.

4. Prior to construction, the Contractor shall excavate and verify the horizontal and vertical locations of all obstructions. Should a conflict exist, the Contractor shall notify the Engineer so that the conflict can be resolved with a minimum of delay.

5. Backfill compaction shall be according to residential street use.

6. Maintenance of these facilities shall be the responsibility of the Owner of the property served.

7. Contractor is responsible for obtaining excavation permit for the S.O. 19 and providing proof of acceptance by the City prior to Hydrology sign-off for Certificate of Occupancy.

ACCEPTANCE

DRAINAGE FACILITIES WITHIN CITY RIGHT OF WAY

HYDROLOGY SECTION	DATE
CONSTRUCTION SECTION	DATE
CONSTRUCTION/SECTION/PERMITS	DATE

NOTES

1. CATCH BASINS are TYPE 'D'.

2. All landscape areas adjacent to building to be graded such that roof runoff does not pond.

3. City of Albuquerque Standard Specifications for Public Works Construction, latest edition, shall govern all work.

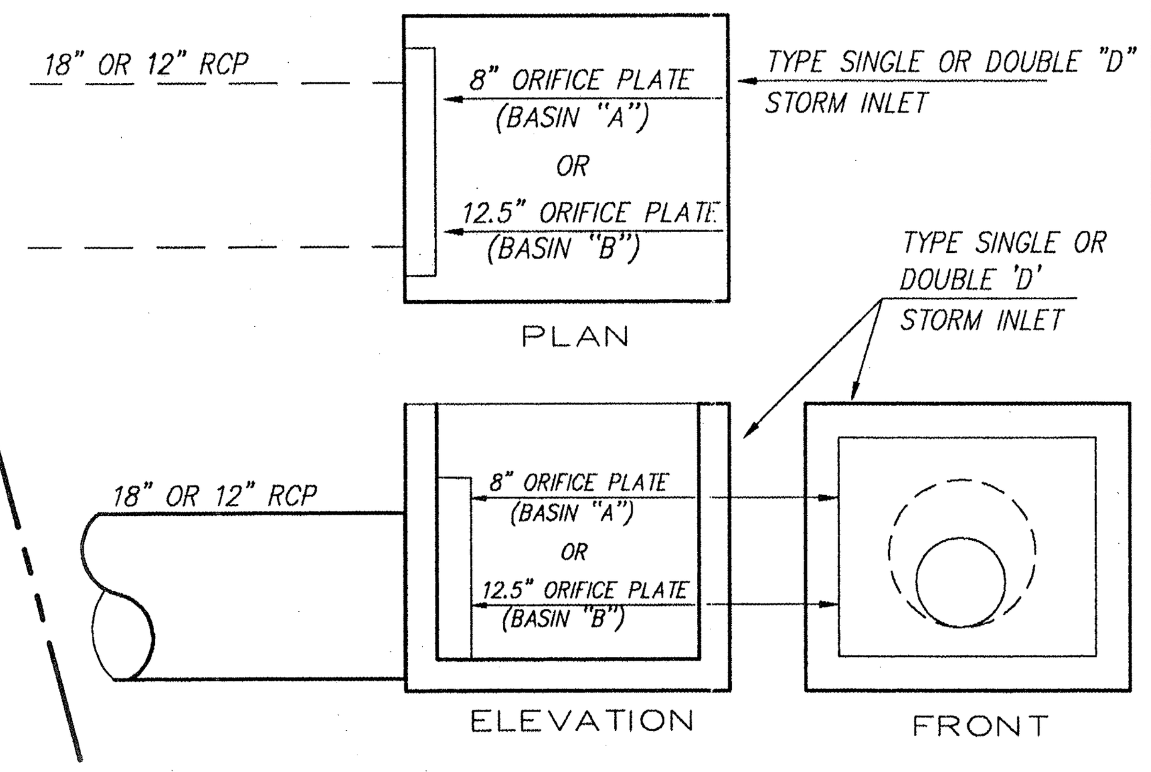
4. The Contractor shall conform to all local, state and federal dust control measures and applicable storm water pollution regulations. Contractor will be responsible for preparing required applications and obtaining all necessary approvals.

5. Contractor is responsible for obtaining a topsoil disturbance permit prior to beginning work. Contact Larry Caudill at 768-2600 to arrange for pre-con meeting to submit an erosion control plan.

6. Contractor is responsible for keeping all sediment out of existing right-of-way, and for cleaning up any sediment that gets into existing right-of-way.

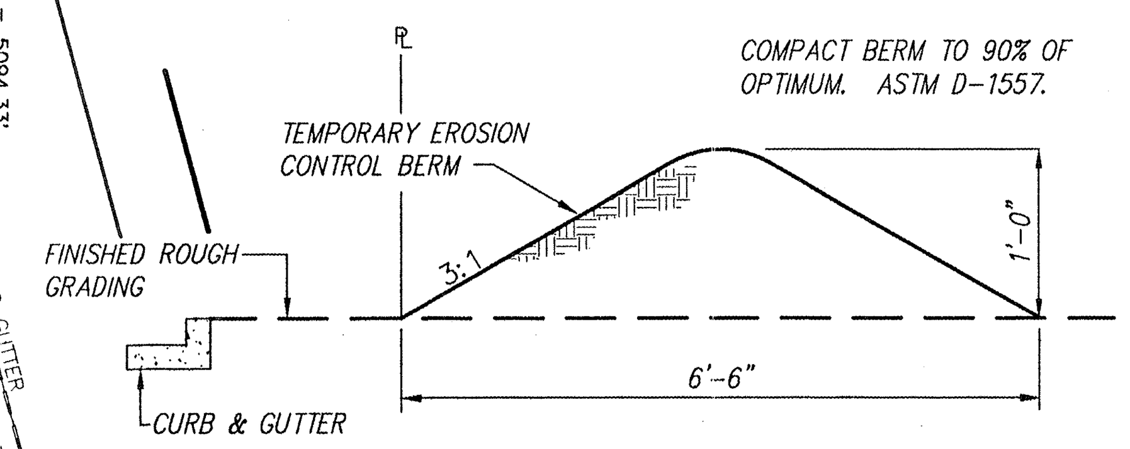
7. Erosion control berms are required around the easterly and southerly boundaries during construction and shall be maintained around future pad 'A' after construction.

8. Disturbed pad 'A' shall be reseeded and hydro mulched per the attached seeding specifications upon completion of grading.



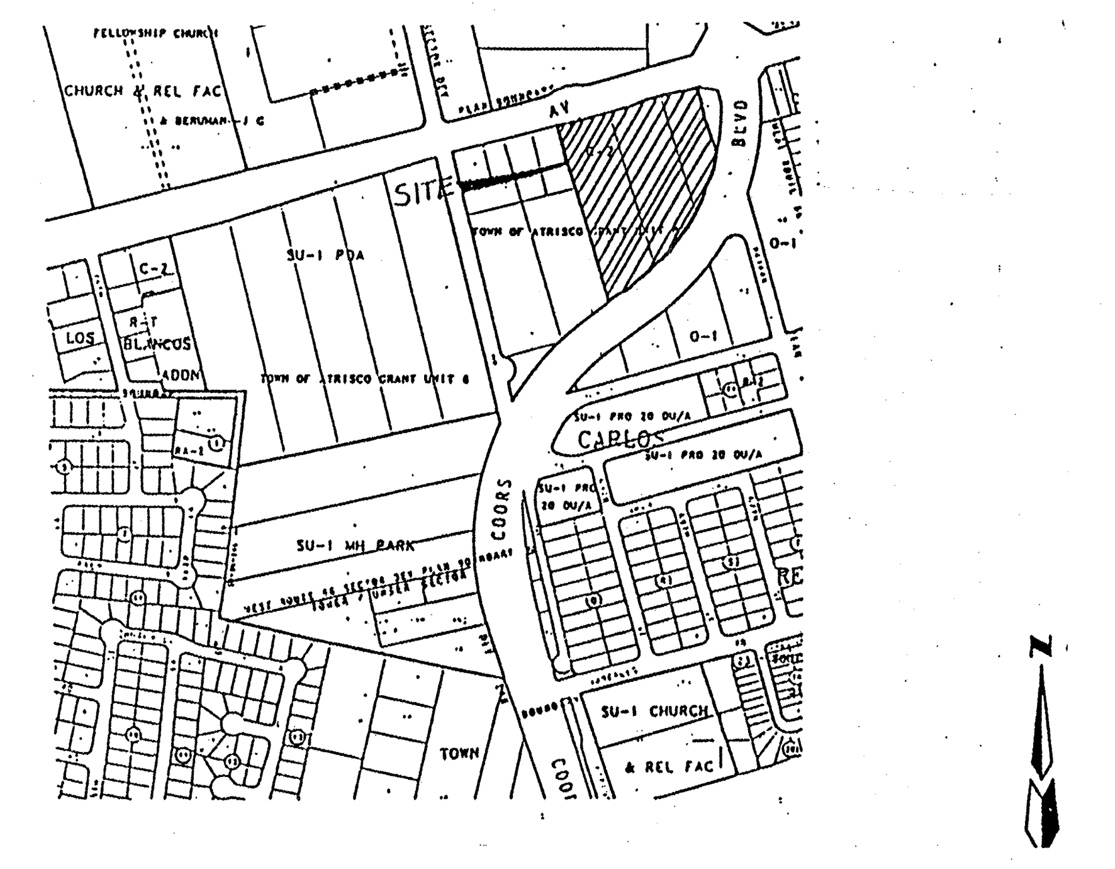
ORIFICE PLATE DETAIL

(BASINS "A" & "B") N.T.S.



EROSION CONTROL BERM DETAIL

N.T.S.



VICINITY MAP

ZONE MAP: K-10-Z

ACS BENCHMARK

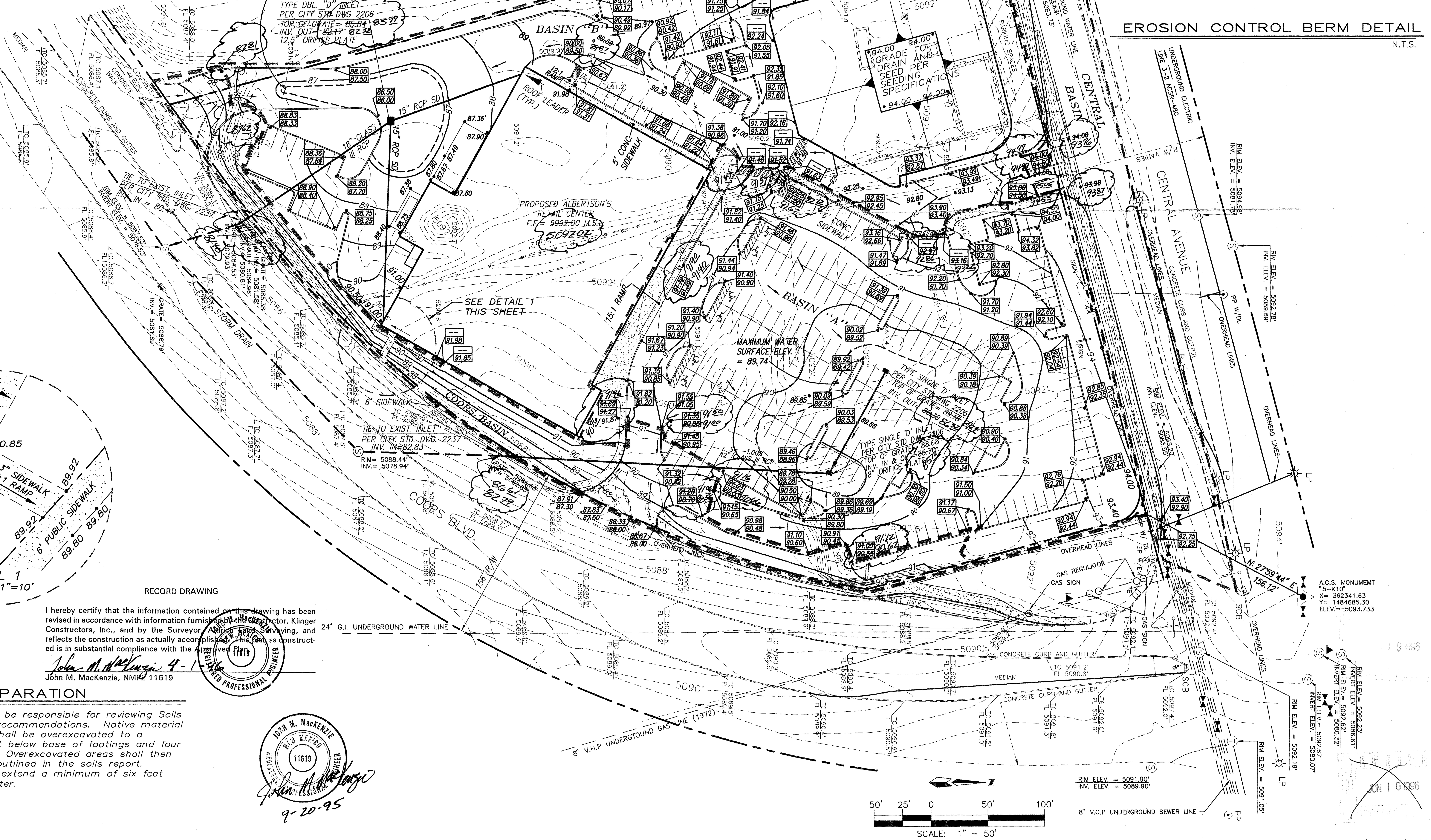
THE STATION IS AN ACS 3 1/4" ALUM. CAP SET FLUSH IN THE TOP OF CURB AND IS STAMPED "5-K10, 1989". TO REACH THE STATION FROM THE INTERSECTION OF I-40 AND COORS BLVD., TRAVEL SO. ON COORS BLVD., 1.89 MILES TO THE INTERSECTION OF CENTRAL AVE., AND COORS BLVD. THE STATION IS LOCATED IN THE N.W. QUADRANT IN A TRAFFIC ISLAND. THE STATION IS 52.6' NORTH OF CENTRAL AVE., AND IS 2.7' WEST OF BACK OF CURB ON THE ISLAND.
X=362,341.63, Y=1,484,685.30, Z=5093.733

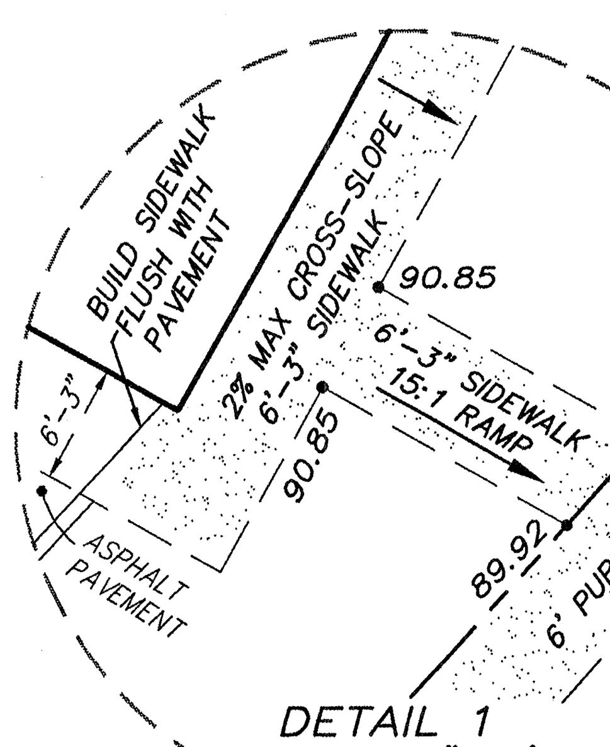
LEGAL DESCRIPTION

TRACTS 60, 61, 62 AND 63 TOWN OF ATRISCO GRANT UNIT NO. 6

LEGEND

Symbol	Description
92.61 / 92.11 (92.77 / 92.27)	PROPOSED SPOT ELEVATION / As-BUILT ELEV.
	PROPOSED DRAINAGE BASIN BOUNDARY
90	PROPOSED CONTOUR
	FLOW ARROW
	EXISTING CONTOUR
	EXISTING GAS METER
	EXISTING LIGHT POLE
	EXISTING POWER POLE
PP / PP-LP	EXISTING POWER POLE/LIGHT POLE
PP W/DL	EXISTING POWER POLE WITH DROP LINE
PPT	EXISTING POWER POLE WITH TRANSFORMER
SP	EXISTING SERVICE POLE
SP W/EM	EXISTING POWER POLE WITH ELECTRIC METER
	EXISTING SIGNAL LIGHT POLE (HANGING)
	EXISTING SIGNAL LIGHT POLE (STANDING)
A	EXISTING ANCHOR
	EXISTING ELEC. PANEL BOX
L	EXISTING PULL BOX
E	EXISTING ELECTIC METER
S	EXISTING SANITARY SEWER MAN HOLE
T	EXISTING TELEPHONE MAN HOLE
	EXISTING WATER VALVE
T	EXISTING TELEPHONE RISER
TV	EXISTING CABLE TELEVISION RISER
	EXISTING WATER METER
	EXISTING IRRIGATION CONTROL BOX
	EXISTING FIREHYDRANT
	EXISTING FENCE
	EXISTING BUILDING FOOT PRINT
	EXISTING STORM DRAIN
TC 92.61 / FL 92.11	EXISTING SPOT ELEVATION





DETAIL 1
SCALE: 1"=10'

RECORD DRAWING

I hereby certify that the information contained on this drawing has been revised in accordance with information furnished by the Contractor, Klinger Constructors, Inc., and by the Surveyor, Aldrich Land Surveying, and reflects the construction as actually accomplished. This plan as constructed is in substantial compliance with the Approved Plan.

John M. MacKenzie 4-1-96
John M. MacKenzie, NMPE 11619

BUILD PAD PREPARATION

Earthwork Contractor shall be responsible for reviewing Soils Report and implementing recommendations. Native material and any fill encountered shall be overexcavated to a minimum depth of six feet below base of footings and four feet below base of slabs. Overexcavated areas shall then receive engineered fill as outlined in the soils report. Overexcavated areas shall extend a minimum of six feet beyond the footing perimeter.

JOHN M. MacKENZIE NEW MEXICO 11619 REGISTERED PROFESSIONAL ENGINEER
John M. MacKenzie 9-20-95

JUN 10 1996

4150ALBR\GD50R/9-06

ALBERTSON'S COORS – CENTRAL

GRADING & DRAINAGE PLAN

D. MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS & SURVEYORS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 345-2010

Designed: JMM	Drawn: BJG	Checked: DMG	Sheet C3 of 12
Scale: 1"=50'	Date: 6/95	Job: 94150	