

LARRY READ & ASSOCIATES

*Civil Engineers
Drainage • Site • Utility Design*

DRAINAGE REPORT

for

SUN RIVER OFFICES

in

GATEWAY NORTH

Tract G15A1

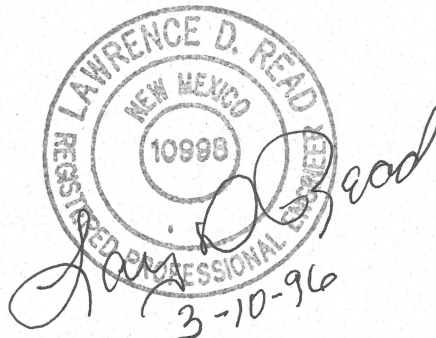
NM STATE ROAD 528

Rio Rancho, New Mexico

March 10, 1996

Prepared by

Larry D. Read, PE



*APPROVED 3/16/96
James P. Jaramila
City Engineer
City of Rio Rancho.
cc. Dolores Wood & Associates
City Dev. Dept.*

DRAINAGE REPORT

for

SUN RIVER OFFICES

Tract C-15A1, Gateway North

RIO RANCHO, NEW MEXICO

March 10, 1996

LOCATION & DESCRIPTION

The proposed site is a 2.27 acre tract located in the master planned Gateway North Development within City of Rio Rancho, Sandoval County, New Mexico. It is at the northeast corner of Grande Blvd. and the central, Street 'A', access to Gateway North. The legal description of the property is Tract C-15A1 , Gateway North, Rio Rancho, New Mexico.

The site has been recently graded and absent of any vegetation. The graded terrain slopes about 1.5% to the southwest toward the existing detention ponds at the southern end of the development. The detention ponds have been designed to limit runoff from the development to the 528 Drainage Channel (7-Bar Channel) to less than the 0.5 cfs/acre discharge currently allowed in this drainage basin. The existing drainage pattern is by shallow overland flow to Street 'A', Street 'B', and Grande Blvd. Both roads are graded to convey runoff to the existing detention ponds.

PROPOSED CONDITIONS

Tom Joseph, the owner and developer of Sun River Offices, proposes to construct a General Use Office Building enclosing approximately 13,343 square feet with an additional 19,964 square feet of paved parking and roads (including 1/2 width of the internal roads designated 'A' and 'B' adjacent to this site). The proposed building will front to the north but access will be provided from the existing internal Streets 'A' and 'B' within the development.

In compliance with the City of Rio Rancho Drainage Ordinances and the Drainage Master Plan for Gateway North, this development has been designed to freely discharge all runoff to Street

'B' and Grande Blvd. Both streets were designed to convey the drainage from the development to the existing detention ponds.

Since Street 'B' is a major storm water conveyance channel, the site has been designed with a water blocks at all property lines keep the runoff in Street 'B' from entering the site. Due to the master planned nature of this site, there is no off-site drainage entering the site from any of the adjacent property. Since this parcel discharges all runoff to Street 'B' and Grande Blvd. (and ultimately discharging to the detention ponds), there is no impact to adjacent parcels or to parcels downstream of this site.

EROSION CONTROL

The proposed erosion control consists of an earthen berm at the property lines to restrict the movement of sediment off the project site. These berms are to be installed prior to the start of grading and shall remain until the site is permanently stabilized either by pavement, landscaping or revegetation.

METHODOLOGY

The hydrology for this project was analyzed using the January 1994 release of the AHYMO computer modeling program as developed by AMAFCA. All procedures are in accordance with those shown in the January 1993 release of the City of Albuquerque Development Process Manual, Section 22.2.

The specific values used for this analysis are as follows:

- Precipitation Zone 1

- Design Storm 100-year, 24-hour duration

 - $i = 2.66$ inches ($t_c = 0.2$ hours)

To analyze the effect of runoff from this site, it was divided into two basins. Basin 'A' includes the east half of the building and area between the building and Street 'B'. This Basin is 0.376 acres and contributes runoff directly to Street 'B' by surface flow. The second basin, Basin 'B' contains the balance of the site and has three discharge points. The first is from the north parking lot to Grande Blvd. via a culvert under the sidewalk adjacent to the east side of Grande Blvd. The second is to Grande Blvd. via a short section of Street 'A' from the south end of the parking lot. The third is by sheet flow directly to Grande Blvd. from the grassy slope between the parking lot and Grande Blvd. Since this is a relatively small basin, the travel time of the runoff between three subbasins is so short there is no offset of hydrograph peaks from each of the subbasins. Therefore, the this analysis did not analyze each of the

subbasins separately but concentrated on the total runoff quantity to Grande Blvd.

The overall impermeable area of this site (both basins included) is 92%. This appears to follow the normal development

APPENDIX A

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
 INPUT FILE = D:\ACAD\SUNRIVER\SUNRIVER.DAT

RUN DATE (MON/DAY/YR) =03/10/1996
 USER NO.= CINFRNNM.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	PAGE = 1	NOTATION
*S SUN RIVER OFFICES - RIO RANCHO											
*S Compute 100 Year Flows, MARCH 10, 1996											
*S Use 24 Hour Storm											
START											
RAINFALL TYPE= 2											
*S AREA BASIN A DRAINS TO STREET 'B'-----											
COMPUTE NM HYD	101.10	-	1	.00059	1.57	.072	2.30398	1.500	4.180	PER IMP=	93.00
*S AREA BASIN B DRAINS TO GRANDE BLVD.-----											
COMPUTE NM HYD	102.10	-	2	.00296	7.81	.361	2.28637	1.500	4.125	PER IMP=	92.00
ADD HYD	103.10	1& 2	3	.00355	9.39	.433	2.28913	1.500	4.134		
FINISH											

TIME= .00
 RAIN24= 2.660

AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
 RUN DATE (MON/DAY/YR) = 03/10/1996
 START TIME (HR:MIN:SEC) = 21:13:22 USER NO.= CINFRNM.101
 INPUT FILE = D:\ACAD\SUNRIVER\SUNRIVER.DAT

*S SUN RIVER OFFICES - RIO RANCHO
 *S Compute 100 Year Flows, MARCH 10, 1996
 *S Use 24 Hour Storm

*
 START TIME=0.0 CODE 0 LINES -6
 *
 RAINFALL TYPE=-2 RAIN QUARTER=0.0 RAIN ONE=1.87
 RAIN SIX=2.2 RAIN DAY=2.66 DT=0.05

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
 DT = .050000 HOURS END TIME = 24.000000 HOURS

*S AREA BASIN A DRAINS TO STREET 'B'-----
 *

COMPUTE NM HYD ID=1 HYD NO=101.1 DA=0.000588 SQ MI
 PER A=0 PER B=7 PER C=0.0 PER D=93 TP=-.133
 MASS RAINFALL=-1

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 2.1638 CFS UNIT VOLUME = .9941 B = 526.28 P60 = 1.8700
 AREA = .000547 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .130697HR TP = .133000HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593454
 UNIT PEAK = .10122 CFS UNIT VOLUME = .8762 B = 327.09 P60 = 1.8700
 AREA = .000041 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=1 CODE=10

PARTIAL HYDROGRAPH 101.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.000	.0	10.000	.0	15.000	.0	20.000	.0
.500	.0	5.500	.0	10.500	.0	15.500	.0	20.500	.0
1.000	.0	6.000	.0	11.000	.0	16.000	.0	21.000	.0
1.500	1.6	6.500	.0	11.500	.0	16.500	.0	21.500	.0
2.000	.4	7.000	.0	12.000	.0	17.000	.0	22.000	.0
2.500	.0	7.500	.0	12.500	.0	17.500	.0	22.500	.0
3.000	.0	8.000	.0	13.000	.0	18.000	.0	23.000	.0
3.500	.0	8.500	.0	13.500	.0	18.500	.0	23.500	.0
4.000	.0	9.000	.0	14.000	.0	19.000	.0	24.000	.0
4.500	.0	9.500	.0	14.500	.0	19.500	.0		

RUNOFF VOLUME = 2.30398 INCHES = .0723 ACRE-Feet
 PEAK DISCHARGE RATE = 1.57 CFS AT 1.500 HOURS BASIN AREA = .0006 SQ. MI.

*
 *S AREA BASIN B DRAINS TO GRANDE BLVD.-----
 *

COMPUTE NM HYD ID=2 HYD NO=102.1 DA=0.002959 SQ MI
 PER A=0 PER B=8 PER C=0 PER D=92 TP=-.133
 RAIN=-1

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 10.772 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
 AREA = .002722 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .130697HR TP = .133000HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593454
 UNIT PEAK = .58217 CFS UNIT VOLUME = .9773 B = 327.09 P60 = 1.8700
 AREA = .000237 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=10

PARTIAL HYDROGRAPH 102.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.000	.0	10.000	.1	15.000	.0	20.000	.0
.500	.0	5.500	.1	10.500	.1	15.500	.0	20.500	.0
1.000	.0	6.000	.1	11.000	.1	16.000	.0	21.000	.0
1.500	7.8	6.500	.1	11.500	.1	16.500	.0	21.500	.0
2.000	1.9	7.000	.1	12.000	.0	17.000	.0	22.000	.0
2.500	.2	7.500	.1	12.500	.0	17.500	.0	22.500	.0
3.000	.1	8.000	.1	13.000	.0	18.000	.0	23.000	.0
3.500	.1	8.500	.1	13.500	.0	18.500	.0	23.500	.0
4.000	.0	9.000	.1	14.000	.0	19.000	.0	24.000	.0
4.500	.0	9.500	.1	14.500	.0	19.500	.0	24.500	.0

RUNOFF VOLUME = 2.28637 INCHES = .3608 ACRE-Feet
 PEAK DISCHARGE RATE = 7.81 CFS AT 1.500 HOURS BASIN AREA = .0030 SQ. MI.

*

ADD HYD ID=3 HYD NO 103.1 ID I =1 ID II =2
 PRINT HYD ID=3 CODE 10

PARTIAL HYDROGRAPH 103.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.000	.1	10.000	.1	15.000	.1	20.000	.0
.500	.0	5.500	.1	10.500	.1	15.500	.1	20.500	.0
1.000	.0	6.000	.1	11.000	.1	16.000	.0	21.000	.0
1.500	9.4	6.500	.1	11.500	.1	16.500	.0	21.500	.0
2.000	2.3	7.000	.1	12.000	.1	17.000	.0	22.000	.0
2.500	.3	7.500	.1	12.500	.1	17.500	.0	22.500	.0
3.000	.1	8.000	.1	13.000	.1	18.000	.0	23.000	.0
3.500	.1	8.500	.1	13.500	.1	18.500	.0	23.500	.0
4.000	.1	9.000	.1	14.000	.1	19.000	.0	24.000	.0
4.500	.1	9.500	.1	14.500	.1	19.500	.0	24.500	.0

RUNOFF VOLUME = 2.28913 INCHES = .4330 ACRE-Feet
 PEAK DISCHARGE RATE = 9.39 CFS AT 1.500 HOURS BASIN AREA = .0035 SQ. MI.

*

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 21:13:23

*S SUN RIVER OFFICES - RIO RANCHO
*S Compute 100 Year Flows, MARCH 10, 1996
*S Use 24 Hour Storm

*
(.RT TIME=0.0 CODE 0 LINES -6
*
RAINFALL TYPE=-2 RAIN QUARTER=0.0 RAIN ONE=1.87
RAIN SIX=2.2 RAIN DAY=2.66 DT=0.05

*S AREA BASIN A DRAINS TO STREET 'B'-----

*
COMPUTE NM HYD ID=1 HYD NO=101.1 DA=0.000588 SQ MI
PER A=0 PER B=7 PER C=0.0 PER D=93 TP=-.133
MASS RAINFALL=-1
PRINT HYD ID=1 CODE=10

*S AREA BASIN B DRAINS TO GRANDE BLVD.-----

*
COMPUTE NM HYD ID=2 HYD NO=102.1 DA=0.002959 SQ MI
PER A=0 PER B=8 PER C=0 PER D=92 TP=-.133
RAIN=-1
PRINT HYD ID=2 CODE=10

*
ADD HYD ID=3 HYD NO 103.1 ID I =1 ID II =2
PRINT HYD ID=3 CODE 10

*
FINISH

GRANDE BOULEVARD S.E.

TRACT 7A

LEGEND

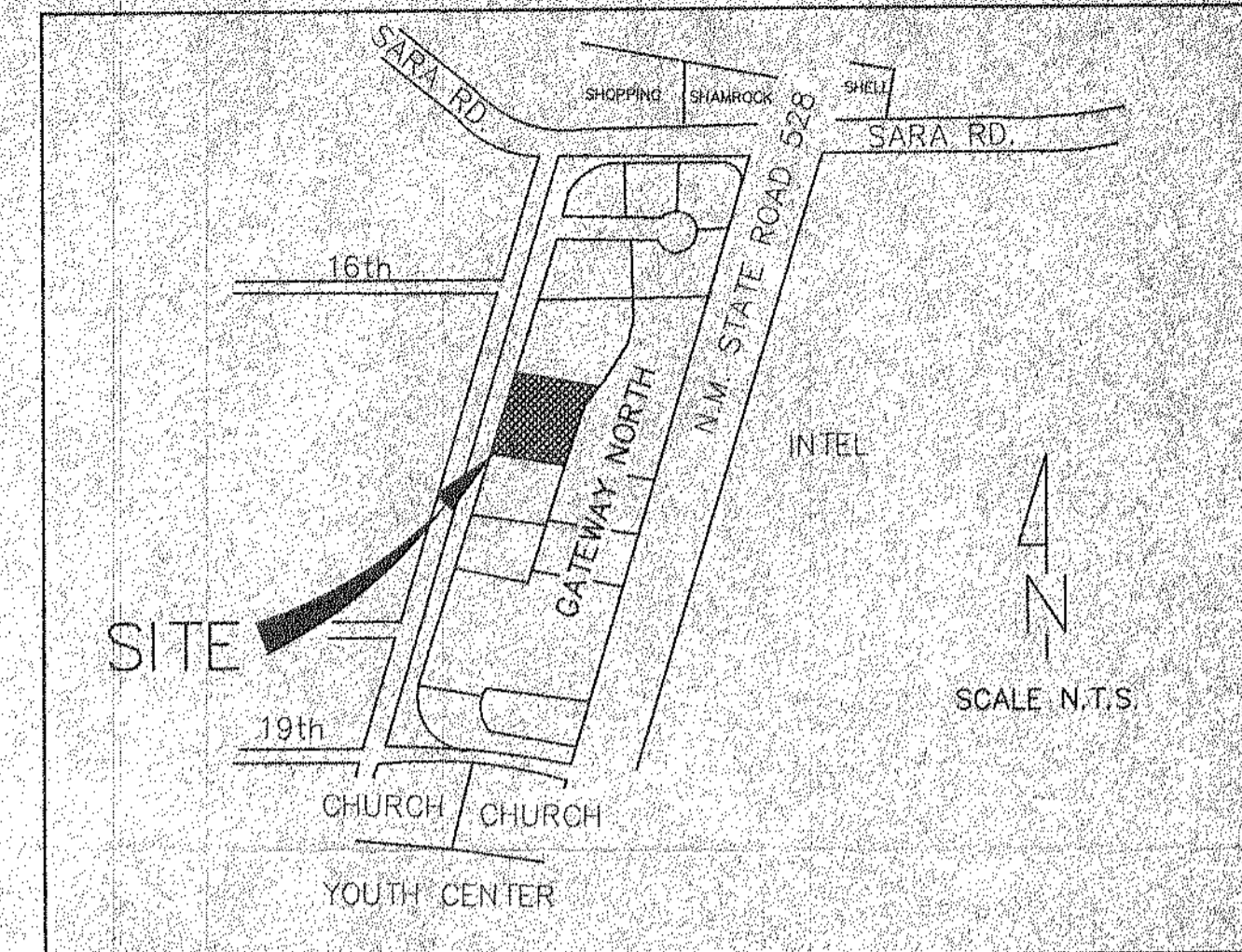
- TC TOP OF CURB
- FL CURB FLOWLINE
- TS TOP OF CONC. SIDEWALK
- EXISTING SPOT ELEVATIONS
- PROPOSED SPOT ELEVATION
- EXISTING CONTOURS
- CONCRETE
- PROPOSED FLOWLINE/DIRECTION
- PROPOSED FLOW DIRECTION

KEYED NOTES

1. 3' WIDE CONCRETE TROUGH PER DETAIL SHEET C-2.
2. 3' WIDE SIDEWALK CULVERT PER DETAIL SHEET C-2.
3. 3' WIDE CONCRETE VALLEY GUTTER PER DETAIL SHEET C-2.
4. STAIRS, 4 RISERS @ 6 1/2" EACH. SEE ARCHITECTURAL PLANS.

GENERAL NOTES

1. UNLESS OTHERWISE NOTED, ALL SIDEWALKS SHALL HAVE A CROSS SLOPE OF 2% AWAY FROM THE BUILDING.
2. UNLESS OTHERWISE NOTED, ALL CROSS SLOPES WITHIN THE HANDICAP PARKING AREA AND BETWEEN THE PARKING AREA SHALL BE 2% MAX.
3. THE ENGINEER HAS NOT INVESTIGATED THE EXISTENCE OR LOCATION OF UNDERGROUND UTILITIES OR OTHER FACILITIES WITHIN THE PROJECT SITE. THE CONTRACTOR SHALL CONTACT BLUE STAKE PRIOR TO START OF CONSTRUCTION. IF ANY CONFLICT ARISES, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY.
4. THE EXISTING TOPOGRAPHY SHOWN ON THIS PLAN WAS DERIVED FROM THE ORIGINAL DESIGN PLANS FOR GATEWAY NORTH, SHEETS 4 AND 5 OF 10, PREPARED BY COMMUNITY SCIENCES CORP., DATED 1-26-95. THIS DESIGN HAS NOT VERIFIED THE CORRECTNESS OF THIS INFORMATION.

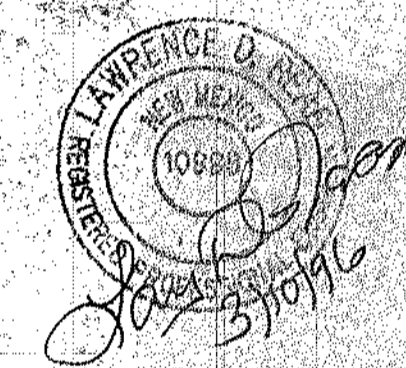


LEGAL DESCRIPTION: TRACT C-15A1
GATEWAY NORTH
SANDOVAL COUNTY, NEW MEXICO

LARRY READ & ASSOCIATES

Civil Engineers

P. O. Box 90233
Albuquerque, New Mexico 87199-0233
(505) 858-3165



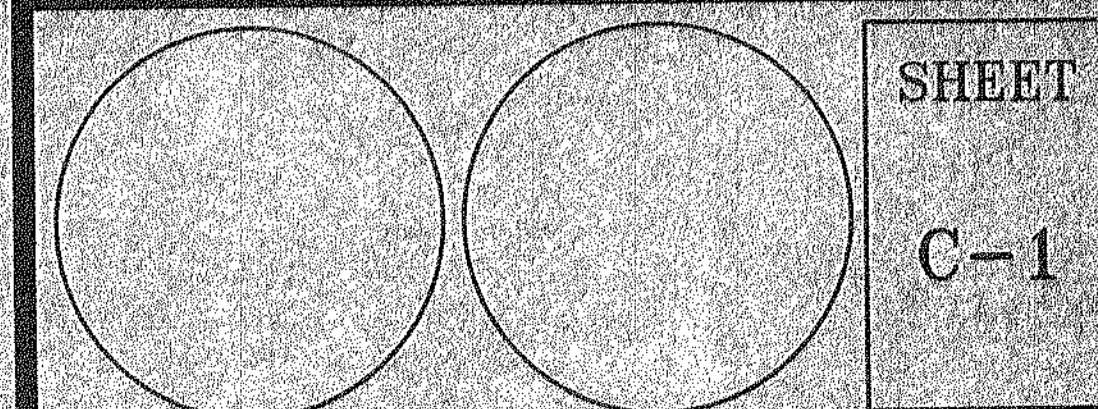
GRADING PLAN

10 MARCH 1996

1"=20'

CLAUDIO VIGIL ARCHITECTS

SUN RIVER OFFICES
GATEWAY NORTH
GRANDE BLVD., N.E.
RIO RANCHO, NEW MEXICO

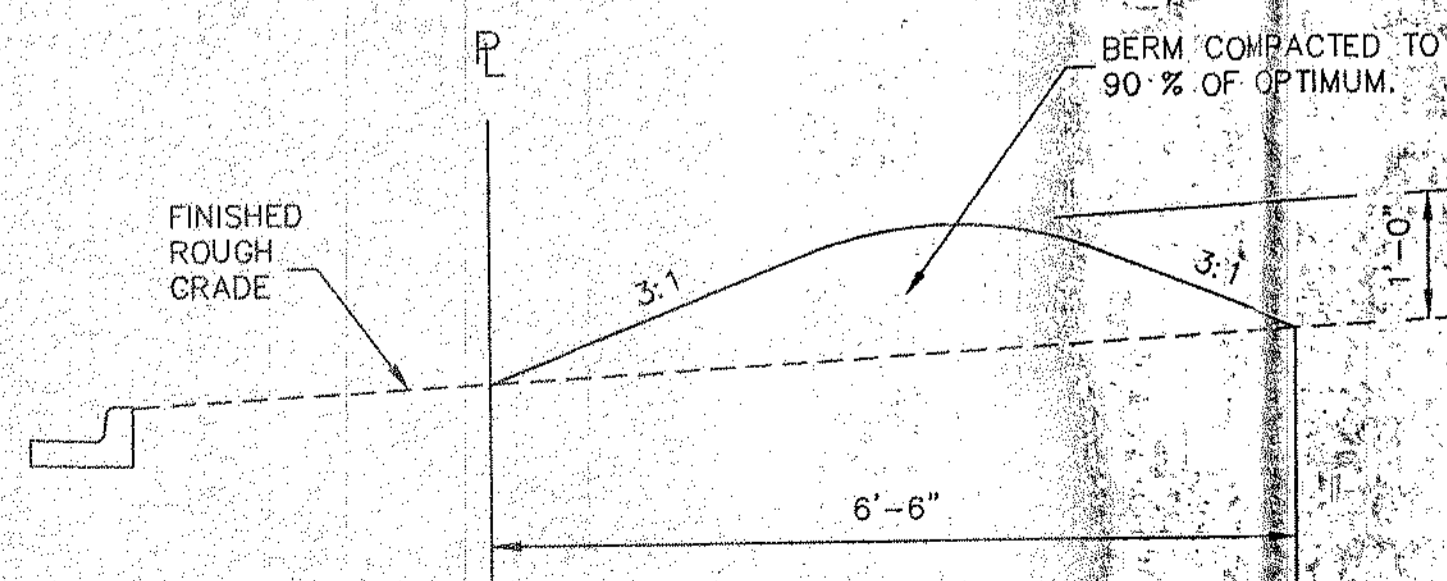


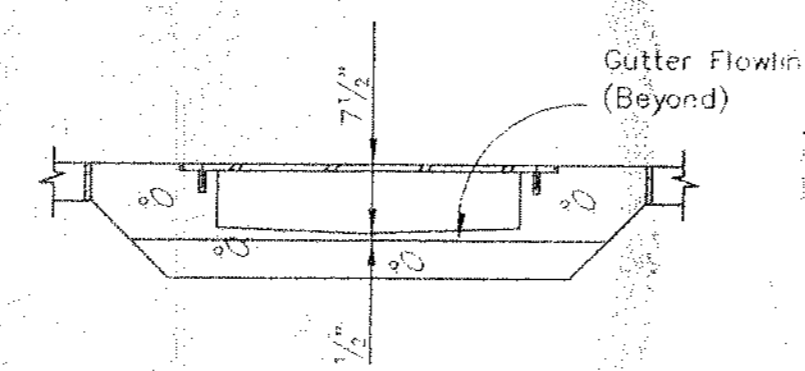
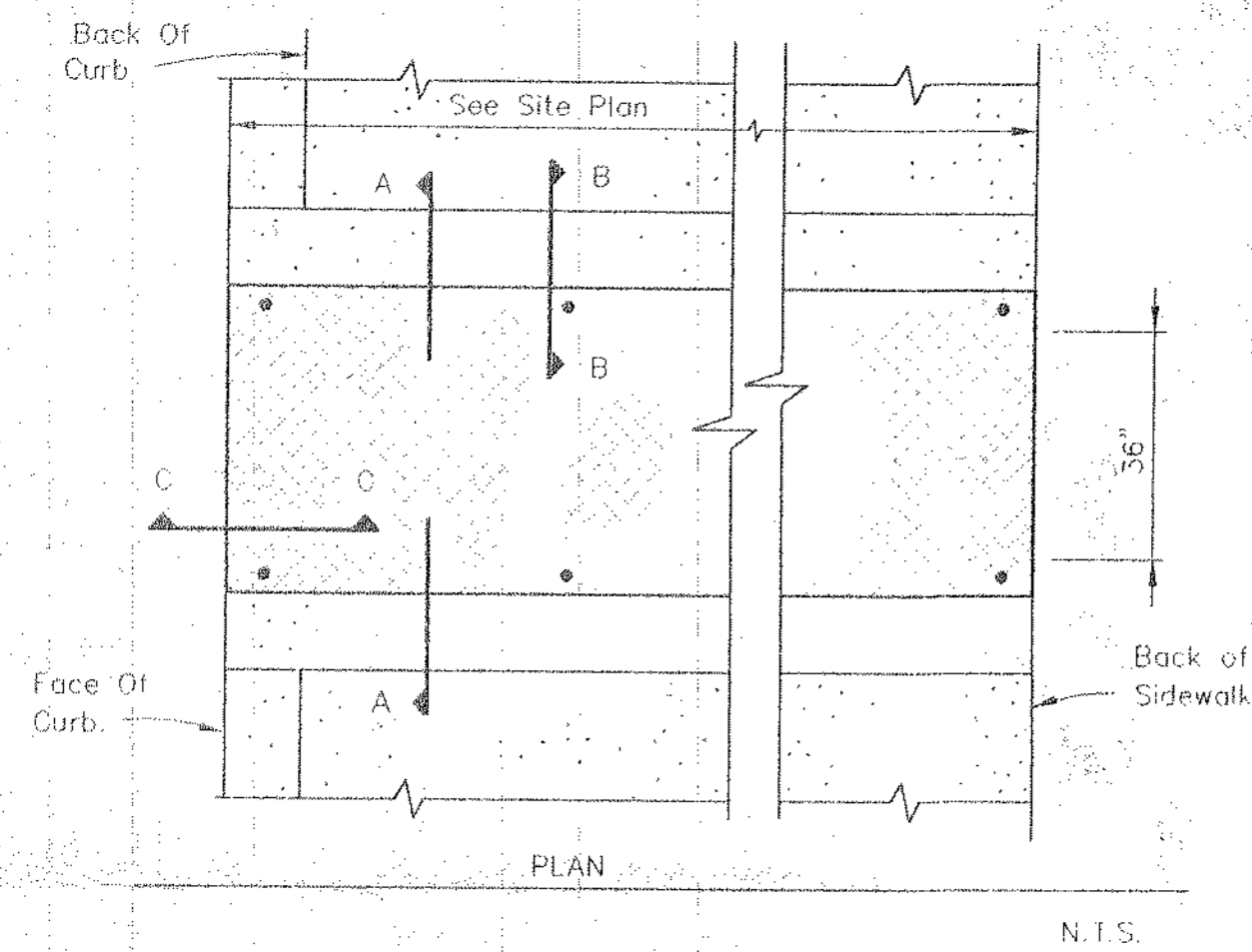
1305 Tijeras NW Albuquerque, NM 87102-2882
Phone: 505/842-1113 Fax: 505/842-1330

EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL CONFORM TO ALL CITY, COUNTY, STATE, AND FEDERAL DUST CONTROL MEASURES AND REQUIREMENTS AND WILL BE RESPONSIBLE FOR PREPARING AND OBTAINING ALL NECESSARY APPLICATIONS AND APPROVALS.
2. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE CONSTRUCTION SITE ONTO ADJACENT PUBLIC OR PRIVATE LANDS OR ONTO A PUBLIC RIGHT-OF-WAY. THIS RESULT MAY BE ACHIEVED BY CONSTRUCTING TEMPORARY EROSION CONTROL BERMS PER THE DETAIL ON THIS SHEET AND BY WETTING THE SOIL TO PREVENT IT FROM BLOWING.
3. EROSION CONTROL BERMS, PER THE DETAIL ON THIS SHEET, ARE REQUIRED AROUND THE ENTIRE SITE. BERMS AND SEDIMENT POND MUST BE IN PLACE AND ENGINEER CERTIFIED PRIOR TO START OF SITE GRADING.
4. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING UP ANY SEDIMENT THAT GETS INTO THE PUBLIC RIGHT-OF-WAY.
5. THE CONTRACTOR SHALL RESEED ALL DISTURBED SOILS OUTSIDE PROPERTY LINE AS SOON AS GRADING IS COMPLETED. RESEEDING TYPE SHALL MATCH EXISTING VEGETATION IN CONTENT AND DENSITY.

EROSION CONTROL BERM DETAIL
N.T.S.



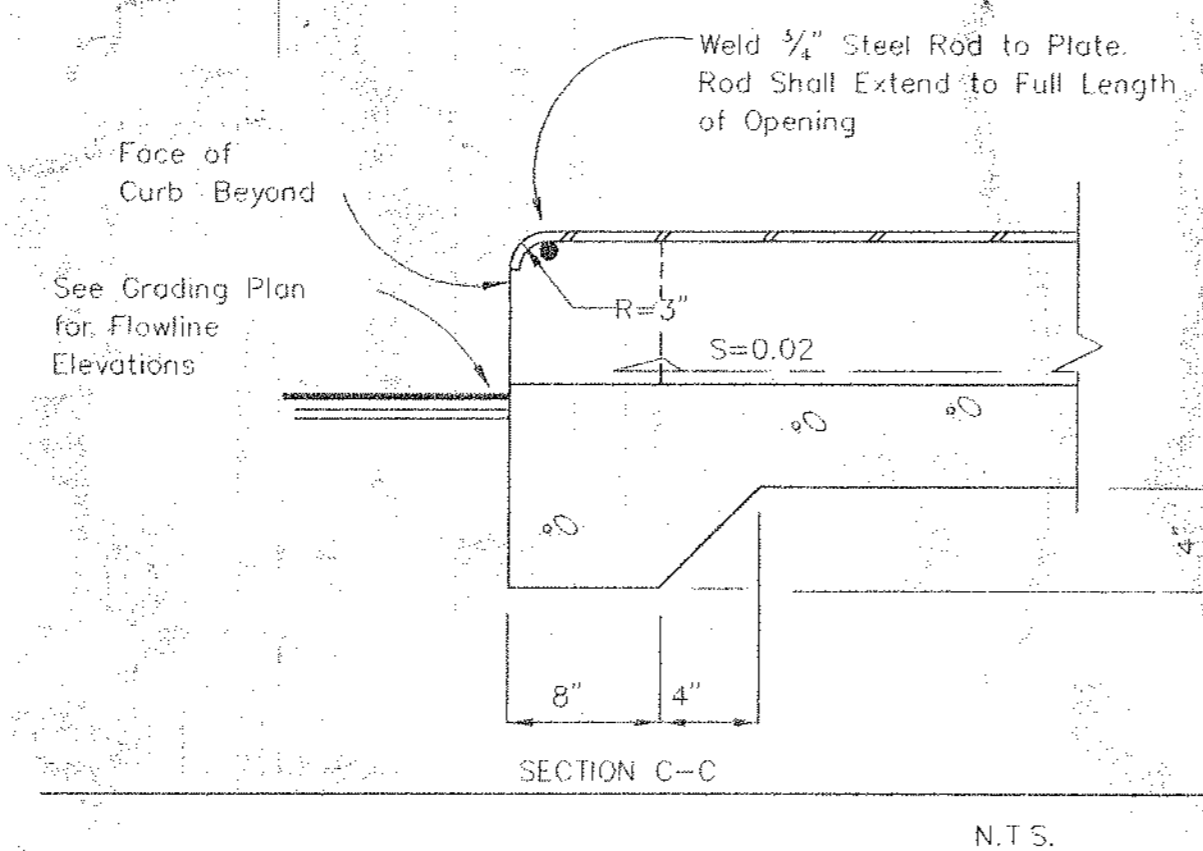
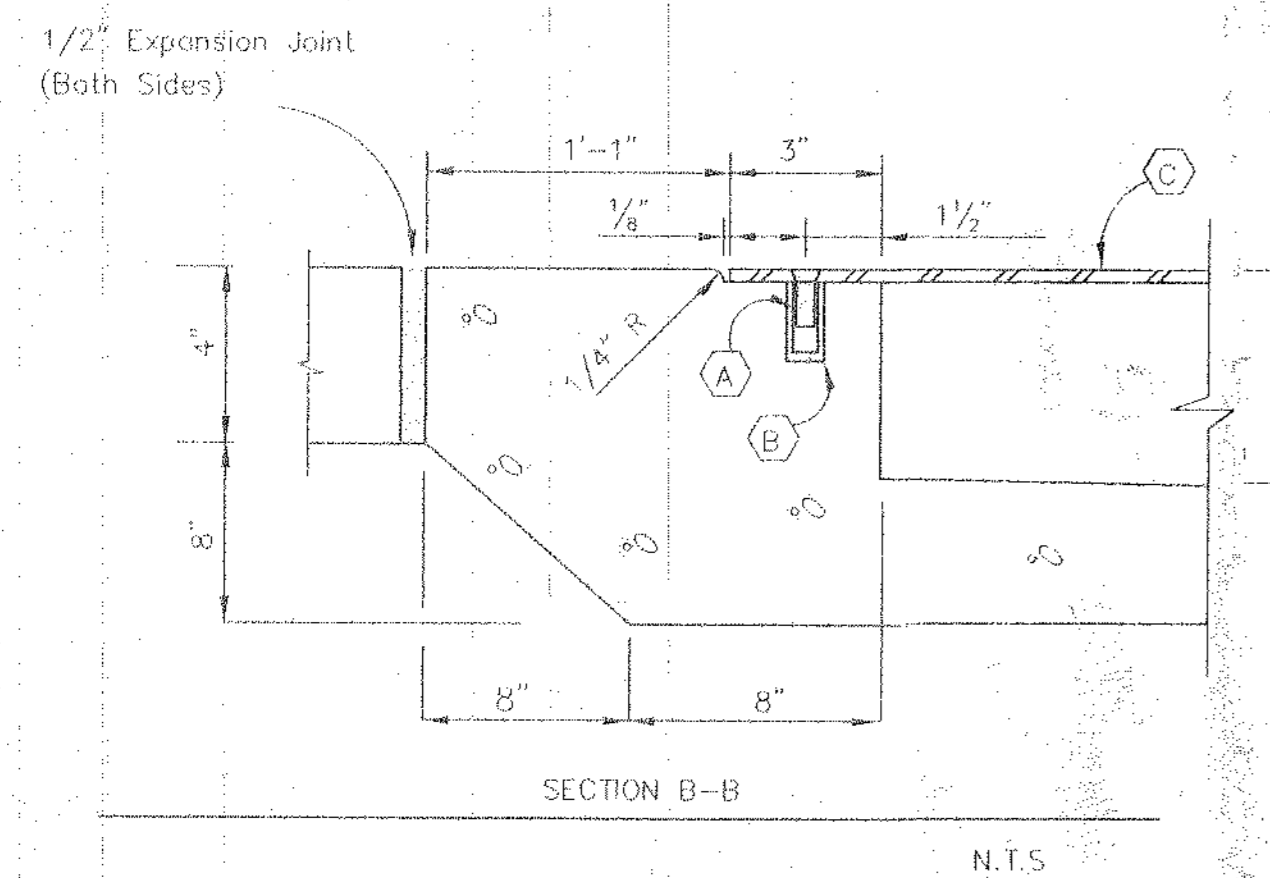


CONSTRUCTION NOTES

1. Culvert Shall be Poured Monolithically.
2. The Invert Shall be Troweled to Produce a Hard Polished Surface of Maximum Density and Smoothness. Invert Shall be V-Shaped to Within 3" of the Outlet, then Warped Parallel to Flowline at the Outlet.
3. All Exposed Concrete Surfaces Shall Match Grade, Color, Finish and Scoring of Adjacent Curb and Sidewalk.
4. Plates Shall Be Stress-Relieved After Fabrication. Clean Surface of Plate And Framing Members And Paint With One Coat of Red Lead and Two Finish Coats Of Aluminum Paint (AASHTO A-69).

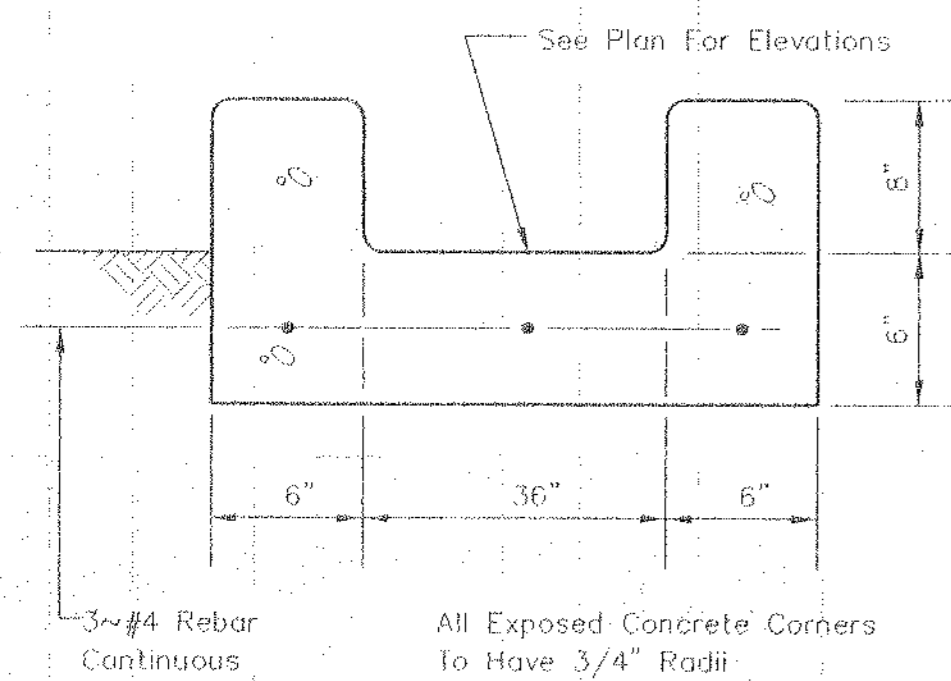
KEYED NOTES:

- A $\frac{3}{8}$ " - 16 X $1\frac{1}{4}$ " Countersunk, F.H.; Stainless Steel Machine Screw.
- B 1" X 5" S.S. Rod Anchors. Install Per Manufacturer's Instructions at a Maximum of 24" O.C. (On Each Side) and within 3" of Each End.
- C $\frac{3}{8}$ " Checkered Steel Plate.

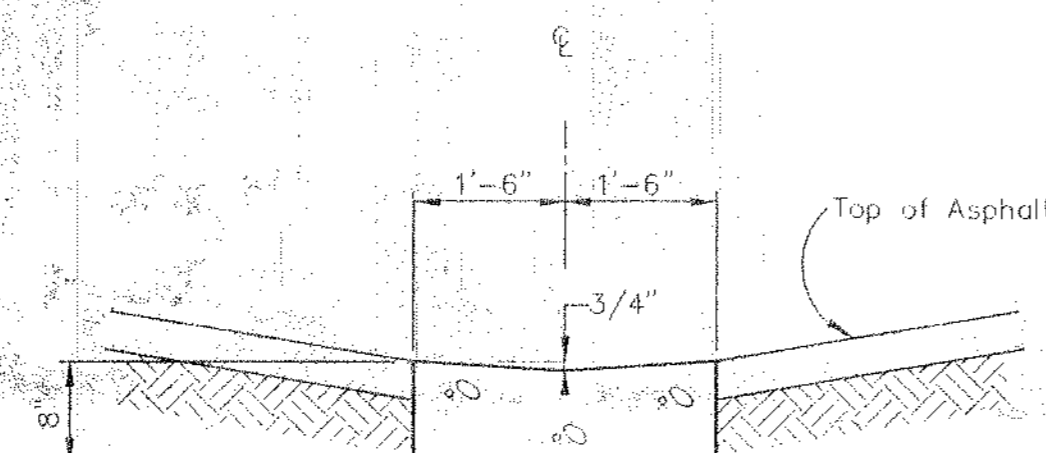


SIDEWALK GULVERT

4000 PSI PCC At 28 Days. Provide 1/2" Expansion Joints @ 36" O.C. and @ Immovable Objects. Provide 1" Deep Contraction Joints @ 6" O.C. Seal All Joints.



4000 PSI PCC At 28 Days. Provide 1/2" Expansion Joint @ 36" O.C. and @ Immovable Objects. Provide 1" Deep Contraction Joint @ 6" O.C. Seal All Joints.



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DETAILS

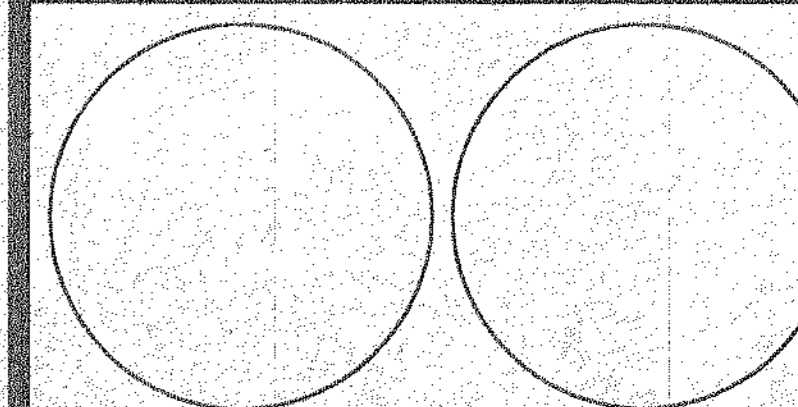
10 MARCH 1996

AS SHOWN



CLAUDIO VIGIL ARCHITECTS

SUN RIVER OFFICES
GATEWAY NORTH
GRANDE BLVD., N.E.
RIO RANCHO, NEW MEXICO



SHEET

C-2

1305 Tijeras NW Albuquerque, NM 87102-2882
Phone: 505/842-1113 Fax: 505/842-1330