HYDROLOGY G12/D10 5 PLANS

G12/D10

4 Plans

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

October 20, 1983

Mr. John Andrews
Andrews, Asbury & Roberts, Inc.
149 Jackson N.E.
Albuquerque, N.M. 87108

RE: DRAINAGE REPORT FOR RIO GRANDE COMPOUND (G12-D10)

Dear Mr. Andrews:

I have reviewed the above referenced drainage report. The plan submittal dated October 4, 1983 is hereby approved.

Financial security for drainage, utility and street improvements and the appropriate "Construction Within Public Right-of-Way" documents will be required prior to sign-off.

If I can be of further assistance, please feel free to contact me.

Yours truly,

Billy J. Goolsby P.E.

Billy J. Goolsby, P.E.
Civil Engineer/Hydrology

BJG/tsl

INFORMATION SHEET

PROJECT TITLE RIO GRANDE COMPOUND TYPE OF SUBMITTAL DRAINAGE REPORT

ZONE ATLAS PAGE NO. G-12-Z CITY ADDRESS N/A

LEGAL DESCRIPTION TRACT "A", RIO GRANDE COMPOUND (filed March 31, 1983)

ENGINEERING FIRM ANDREWS, ASBURY & ROBERT CONTACT John B. Robert

ADDRESS 149 Jackson NE, Albuquerque PHONE 265-6631

OWNER HOME PLANNING DEVELOPMENT CO CONTACT Jeff Leslie

ADDRESS 5620 Eubank NE, Albuquerque PHONE 296-5451

ARCHITECT BARKER-BOL & ASSOCIATES CONTACT H. L. Barker

ADDRESS 209 Gold SW, Albuquerque PHONE 842-6789

SURVEYOR ANDREWS, ASBURY & ROBERT, INC. CONTACT Gayle Jewell

ADDRESS 149 Jackson NE, Albuquerque PHONE 265-6631

CONTRACTOR N/A CONTACT

ADDRESS PHONE

DATE SUBMITTED

BY ANDREWS, ASBURY & ROBERT, INC.

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ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers
149 Jackson, NE, Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S.

October 4, 1983

Mr. Fred Aguirre
City Engineering
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

SUBJECT: RIO GRANDE COMPOUND G12.010

Dear Mr. Aguirre:

Enclosed are two (2) copies of the drainage report for subject project for your review.

Very truly yours,

John A. Andrews

JOHN A. ANDREWS, P.E.

mt-322

Attachment (2)

cc: Mr. Jeff Leslie (w/attachment)

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

May 18, 1983

Mr. John Roberts
Andrews, Asbury and Roberts
149 Jackson N.E.
Albuquerque, N.M. 87108

RE: RIO GRANDE COMPOUND CONCEPTUAL GRADING DRAINAGE PLAN

Dear John:

Per your submittal of April 29, 1983 I am forwarding design criteria for the referenced project:

1. STREET GRADES LESS THAN THE MINIMUM GRADE OF 0.5 PERCENT ARE PERMITTED.

   Rational: As you stated, excessive filling would damage existing Cottonwood trees.

2. STORM DRAIN LINES SHALL BE A MINIMUM PIPE DIAMETER OF 24".

   Rational: Current plans are to replace the storm drainage pump station located in Trellis, just north of Campbell Rd. Also, the discharge line from the Mathew Pump Station, located in Campbell Rd., is to be abandoned. Therefore, it appears that by the 1984 flood season, work will be taking place in this area and that the existing lines will be upgraded to at least a 24" minimum.

3. TO INSURE THAT PUBLIC RUNOFF WILL NOT ENTER PRIVATE PROPERTY ADJACENT TO THE [illegible]" EASEMENTS, THE POSSIBILITY OF PLACING ADDITIONAL INLETS ON THE NORTH SIDE OF CAMPBELL LOOP SHOULD BE INVESTIGATED.

   Rational: Due to the minimum street grades, "ponding" will occur at the inlets. The system should be examined to determine the magnitude of "ponding" at the inlets during the 100-year storm.

Please contact me if you have any questions regarding these items. I would appreciate written concurrence with the requirements prior to submittal of the detailed drainage report.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/tsl

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE May 5, 1983 REF. NO._____

TO: Brian Burnett, Civil Engineer/Hydrology

FROM: Jim Fink, Asst. City Engineer, Hydrology

SUBJECT: RIO GRANDE COMPOUND

There is a storm drainage pump station in Trellis just North of Campbell Road, that we would like to eliminate and put in a gravity line. Also, the discharge line for the Mathew pump station, which will be taken out of service hopefully in the near future, is in Campbell Road. With these changes occurring, we will have a 24" or larger line proposed for Campbell Road that this subdivision can discharge into and thus they should provide a storm drain line that meets minimum city standards.

JF/tsl

Brian — Jim

1) Who pays?
2) When?

City should pay for the linens nessary to remove the trellis Pump Station
The timing is not known but this should be done befor the flood seson of 1984

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE May 4, 1983 REF. NO._____

TO: Distribution List

FROM: Brian Burnett, Civil Engineer/Hydrology BB

SUBJECT: RIO GRANDE COMPOUND

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CITY ENGINEER

Enclosed for your review and comment is a Conceptual Grading and Drainage Plan for the Rio Grande Compound located just north of Campbell Rd. N.W. and east of the Riverside Drain. As you can see, the project has some interesting design constraints. I have reviewed the plan and have the following comments:

1. Since the 12" RCP proposed does not meet minimum standards, I have passed along to John Roberts three opinions:

   a. Increase pipe size to 24".

   b. Enter into a private maintenance agreement if the line size remains less than 24".

   c. Request a variance (this appears to have been done in the report).

   I feel item b is an appropriate alternate. I am hesitant to grant a variance if the City will maintain the system.

2. To insure that public runoff would not enter private property adjacent to the 10' easements I feel it appropriate to place an inlet on the north side of Compound Loop at each of the easement locations.

Since this project does present some interesting problems, I would appreciate your comments by 5/11/83. Thank you.

BB/tsl

Distribution List:
Richard S. Heller, City Engineer
Jim Fink, Asst. City Engineer, Hydrology
Fred Aguirre, Civil Engineer, Hydrology

Send for information not review & comment to the City Engineer RSH

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers
149 Jackson, NE, Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S.

April 29, 1983

Mr. Brian Burnett
Civil Engineer/Hydrology
City Engineering
City of Albuquerque
Post Office Box 1293
Albuquerque, New Mexico 87103

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SUBJECT: RIO GRANDE COMPOUND

Dear Mr. Burnett:

This letter is intended to serve as the conceptual drainage plan for the proposed townhome development at the subject project. The site is located along the north side of Campbell Road N.W. It is located within the area indicated on the Location Map enclosed. (Zone Atlas Map G-12)

The site generally slopes from the north to the south at approximately 0.1 percent. The soils are of the Brazito series and are classified as fine sandy loam and silty clay loam by the Soil Conservation Service. See Soils Map attached. This soil is classified as belonging to hydrologic soil type "A".

Presently the subject property is populated by large cottonwood trees. It is a requirement of the Environmental Planning Commission that the majority of the trees within the tract be preserved, and that removal or destruction of any trees be justified. In order to prevent root damage to the trees, the ground elevation in the vicinity of the trees can not be raised or lowered by more than six inches according to leading experts in the field of forestry. To avoid cutting or filling more than six inches adjacent to any trees, it will be necessary to design the proposed streets with less than the minimum grade of 0.5 percent as proposed in the Design Producure Manual.

The site is not indicated as being located within any flood hazard areas by the Albuquerque Master Drainage Study. See attached Master Drainage Map.

There are no upland flows which impact the site.

The proposed development consists of approximately 70 patio homes. The roofs and front yards will be constructed to drain to the adjacent streets which will be constructed with four inch mountable curb and gutter. The rear yards will be ponded. The streets will drain to two low points located on Compound Loop N.W. (See enclosed Drainage Plan for location.) The storm water runoff will be intercepted by catch basins to be constructed at the low points, and will discharge into new storm drains that will be constructed in 10 foot drainage easements. The new storm drains will flow south and connect to the existing storm drain in Campbell Road N.W. This existing Campbell Road storm drain discharges to the west into the Albuquerque Riverside Drain.

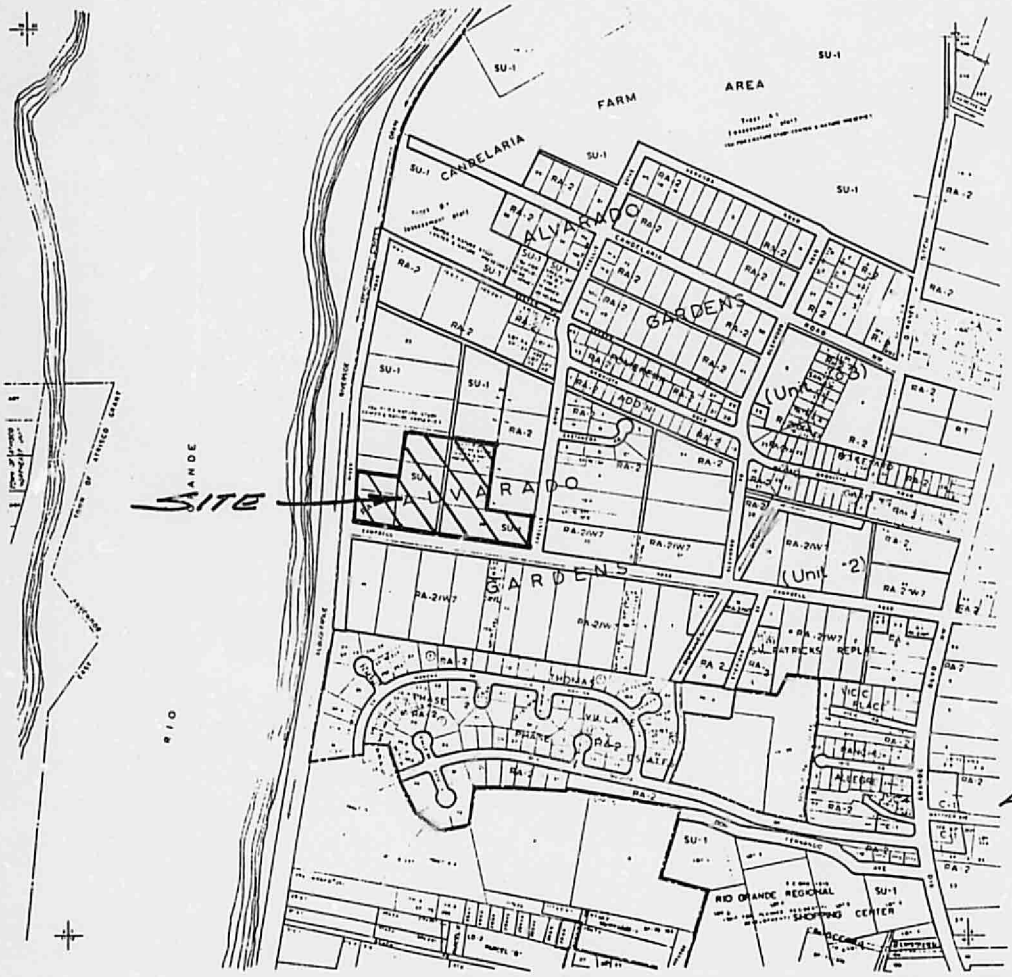
The existing storm drain in Campbell Road is a 12 inch RCP which increases in size to a 15 inch RCP at a point approximately 380 feet east of the Albuquerque Riverside Drain. Therefore, it is proposed that the new storm drains to be built under this project be 12 inch diameter RCP. It will also be necessary to have less than the minimum required invert slope on the new storm drains due to the minimal amount of cover over the existing storm drain in Campbell Road.

We believe this information and the enclosed drainage maps should allow review of the proposed development. A detailed drainage report will be provided prior to actual development.

Very truly yours,

JOHN B. ROBERT, P.E. & L.S.

mt-322



Location Map

G-12-Z

AND VALENCIA COUNTIES, NEW MEXICO — SHEET NUMBER 20

RQUE MASTER DRAINAGE

HOME PLANNING DEVELOPMENT CO.
Albuquerque, New Mexico

DRAINAGE REPORT
for
RIO GRANDE COMPOUND

September, 1983

ENGINEERING

HOME PLANNING DEVELOPMENT COMPANY
Albuquerque, New Mexico

DRAINAGE REPORT
for
RIO GRANDE COMPOUND

September, 1983

Prepared by

Andrews, Asbury & Robert, Inc.
Consulting Engineers
149 Jackson NE
Albuquerque, New Mexico 87108

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I. INTRODUCTION

Home Planning Development Company proposes to improve an 11.000 acre tract of land designated as Tract A, Rio Grande Compound. The tract of land is located within the northwest quadrant of Albuquerque, New Mexico; and being situate within Section 1, Township 10 North, Range 2 East, N.M.P.M. (See enclosed Location Map, Map No. 1, Zone Atlas Map G-12.)

The current zoning for this tract is SU-1. The proposed type of development will consist of townhouse units for single family residences.

It is the intent of this report to provide an acceptable method of developing the subject property without appreciably affecting the present storm drainage patterns.

Guidelines for the analysis are based on the current City of Albuquerque Drainage Ordinance and the City of Albuquerque's Development Process Manual, Volume 2, Design Criteria, Section 22.

II. EXISTING CONDITIONS

The subject property is presently undeveloped with a gentle slope of approximately 0.1 percent from north to south. In the recent past, the westerly 380 feet of the subject property was developed as a mobile home court. The only remnants of the court are a few deteriorated asphalt road surfaces. The subject property is presently populated with numerous large cottonwood trees.

The tract is bounded on the south by Campbell Road NW, which is an improved roadway with pavement, curb and gutter, and storm drains. The area to the east is presently developed with single family residences. The area to the north is undeveloped, and is zoned SU-1 for a nature study center and nature preserve. The Albuquerque Riverside Drain, a Middle Rio Grande Conservancy District (MRGCD) drainage channel, bounds the subject property on the west.

Delineation of the site on Soil Conservation Service soils maps indicates that the soil groups in the area are classified as fine sandy loam and silty clay loam, and are of Brazito (Br and Bs) series which belong to hydrologic soil group A. (See enclosed Soil Map, Map No. 2.)

Delineation of the site on the Albuquerque Master Drainage Study indicates that the area is not within any flood zones. (See enclosed Albuquerque Master Drainage Study, Map No. 3.)

Presently storm water runoff generated from the subject tract, together with other areas that drain to Campbell Road NW, are intercepted by the existing storm drain in Campbell Road NW and are discharged into the Albuquerque Riverside Drain located to the west of the subject property.

III. DEVELOPED CONDITIONS

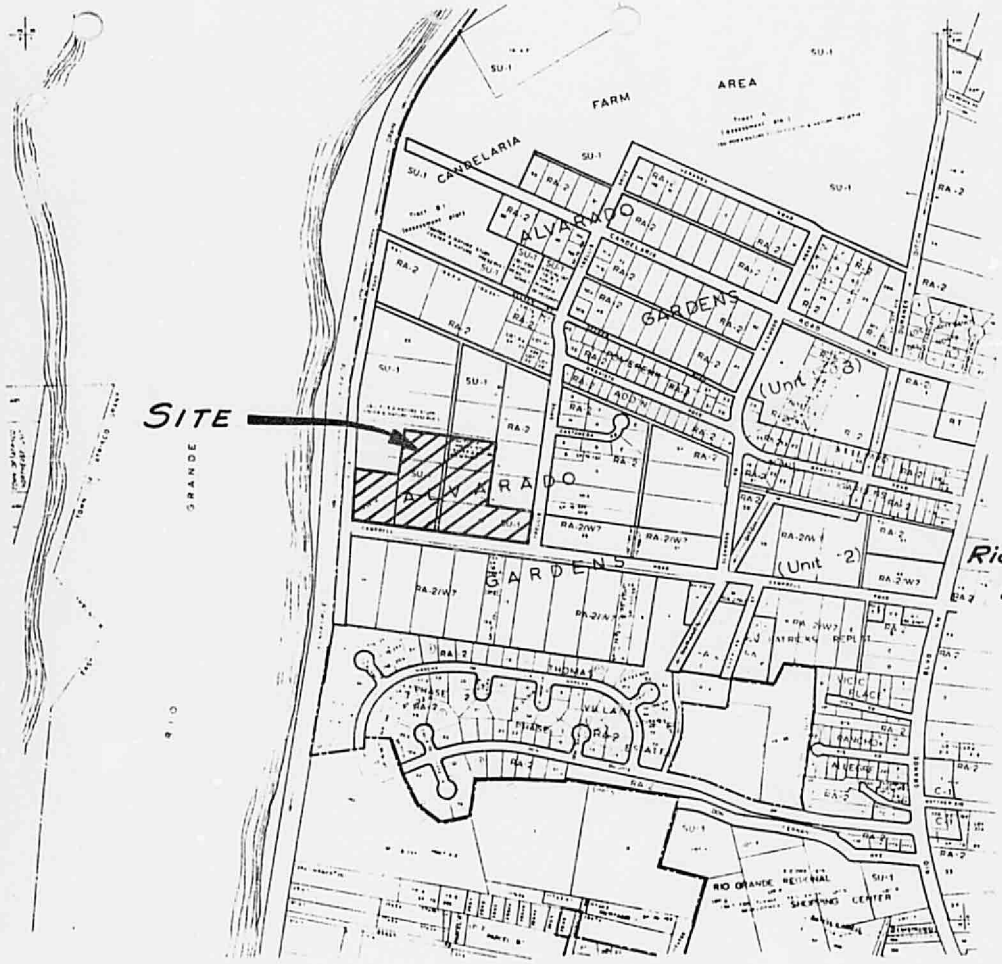
It is a requirement of the Environmental Planning Commission that as many trees as possible within the tract must be preserved, and that the removal or destruction of any trees must be justified. In order to prevent root damage to the trees, the ground elevation in the vicinity of the trees cannot be raised or lowered more than six inches according to leading experts in the field of forestry. To avoid cutting or filling more than six inches adjacent to the trees, it is necessary to design the streets with less than the minimum grade of 0.5 percent. (See enclosed Map No. 5, Developed Conditions for proposed street grades.)

The proposed development consists of approximately 70 patio homes. **The roofs and driveways will be constructed to drain to the adjacent streets which will be constructed with four inch mountable curb and gutter.** Rain falling on all other areas will be retained and is not considered as contributing to runoff. The streets, for the major part, will drain to low points located on Compound Loop NW. The storm water runoff will be intercepted by catch basins to be constructed at the low points, and will discharge into new 24 inch storm drains that will be constructed

in 10 foot drainage easements. The new storm drains will flow south and connect to the existing storm drain in Campbell Road NW.

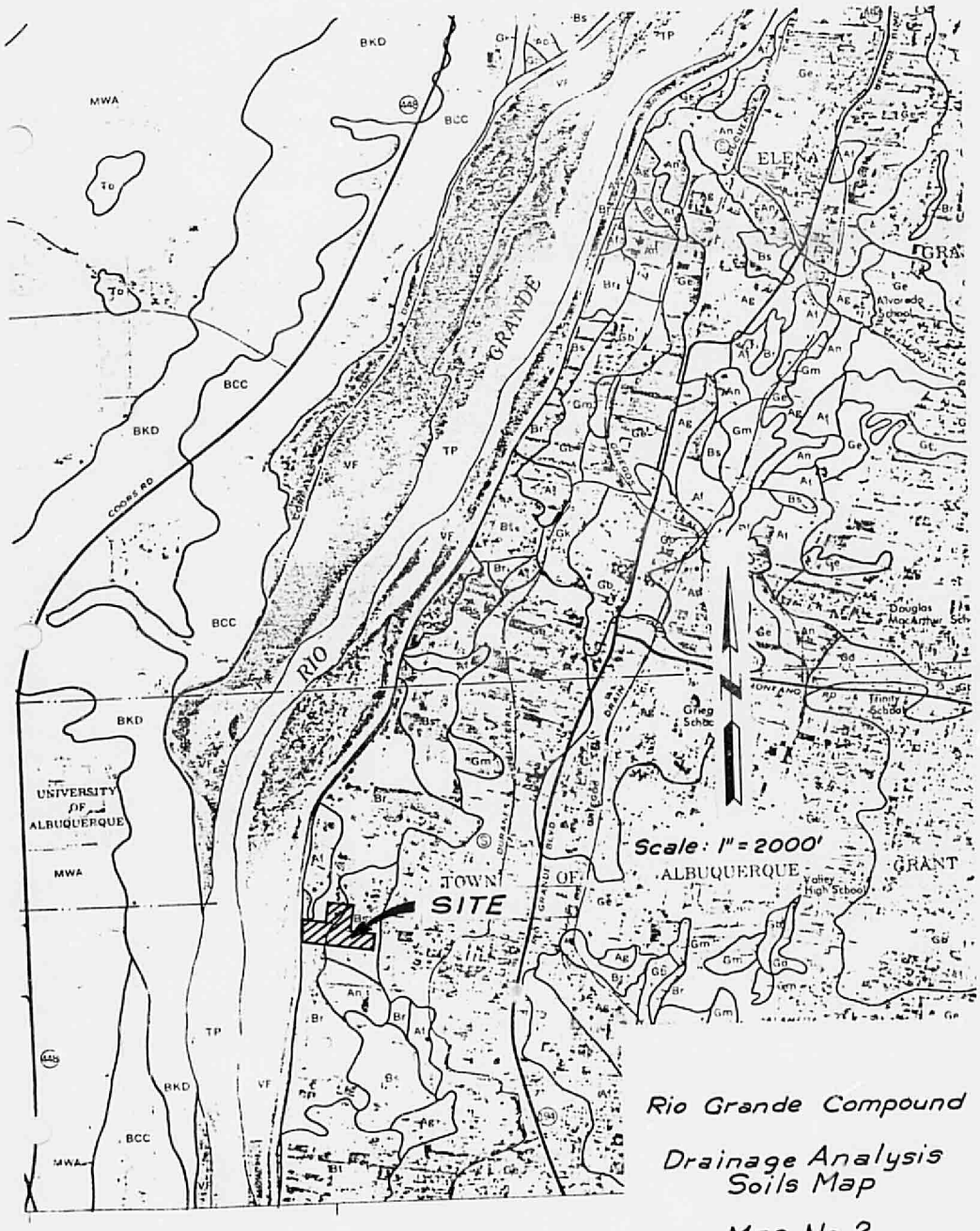
IV. EROSION CONTROL

The development of this tract will consist of improving the streets and constructing the new-onsite storm drains. No other area will be graded. Therefore, erosion will be kept to a minimum.



Rio Grande Compound
Drainage Analysis

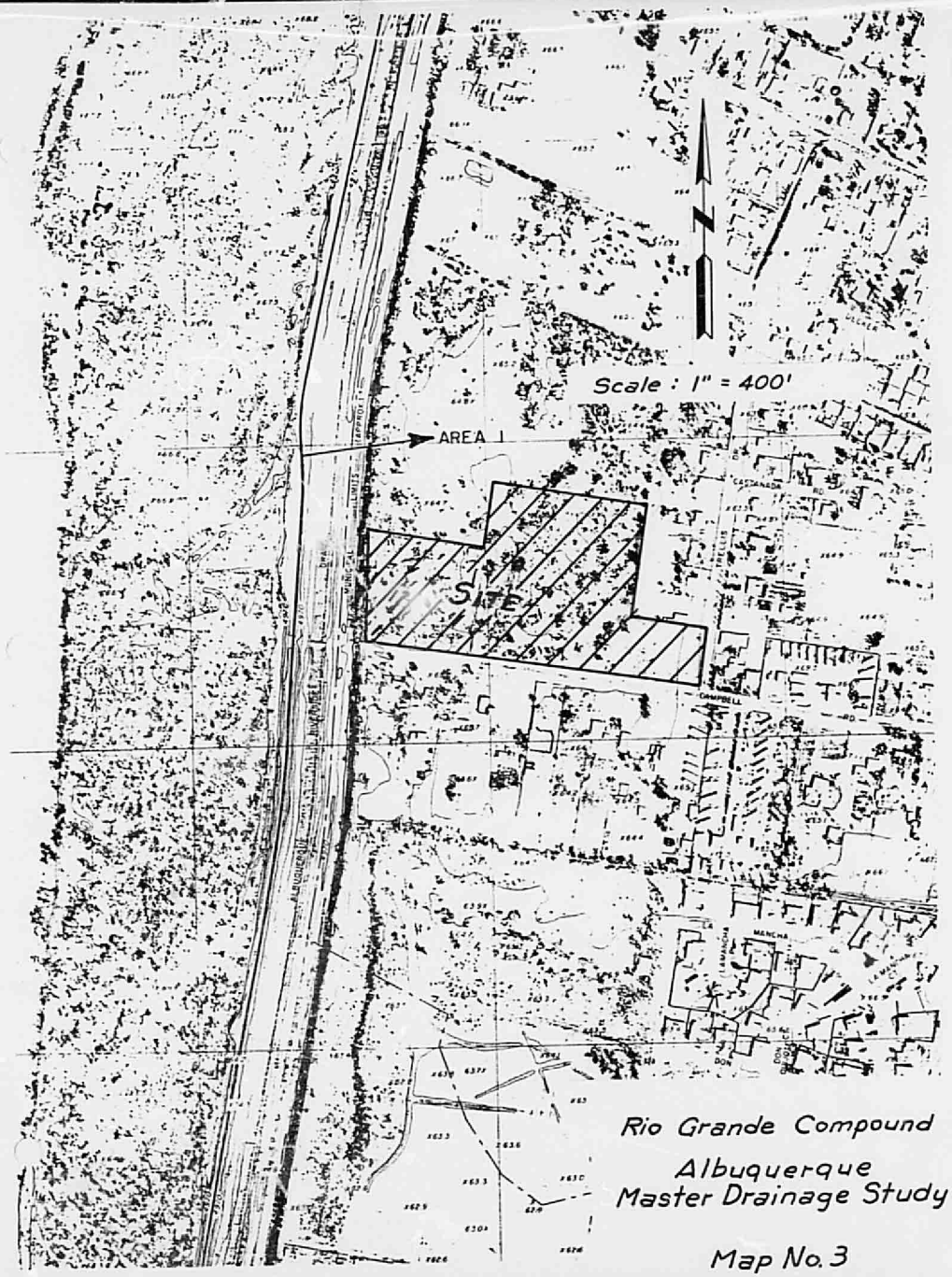
Location Map
G-12-Z
Map No. 1



Rio Grande Compound

Drainage Analysis
Soils Map

Map No. 2



Rio Grande Compound

Albuquerque
Master Drainage Study

Map No. 3

V. DRAINAGE ANALYSIS

Following is the Drainage Analysis (computations) for the subject project.

Drainage Analysis

Criteria

City of Albuquerque Drainage Ordiance.
Development Process Manual, Vol 2, Sect. 22

Design Parameters

Peak runoff - Rational Formula, Q=CIA
Runoff coefficients - from Plate 22.2 C-1 DPM
SCS soil group 'A'

$I_{100} = (2.2)\ 6.84 \times t_c^{-.51}$

$I_{10} = 0.657\ I_{100}$

Travel time determined from
Plates 22.2 B-1 & 22.2 B.2

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CONSULTING ENGINEERS
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Existing Conditions - Onsite

Total Area = 11.000 acres

Average Slope = .06%

Average Velocity = 0.2 ft/sec

Length of watershed = 800 ft

$T_c = \frac{800}{.2} \div 60 = 67$ mins

$I_{100} = 2.2 \times 6.84 \times 67^{-.51} = 1.76$ in/hr.

$I_{10} = 0.657 \times 1.76 = 1.16$ in/hr.

$C = 0.16$

$Q_{100} = 0.16 \times 1.76 \times 11.0 = 3.10$ cfs

$Q_{10} = 0.16 \times 1.16 \times 11.00 = 2.04$ cfs

TABLE 1 - DEVELOPED CONDITIONS - PEAK RATES

REFER TO MAP No 5, DEVELOPED CONDITIONS, for LOCATION AND DESIGNATION OF DRAINAGE AREAS.

ANALYSIS POINT	DRAINAGE AREA DESIGNATION	CONTRIBUTING AREA (AC)	LENGTH OF TRAVEL (FT)	SLOPE (%)	TRAVEL TIME T_a (MINS)	C	I_{10} (IN/HR)	I_{100} (IN/HR)	Q_{10} (CFS)	Q_{100} (CFS)
	A1.1	1.206	75 ROOF 30 DRIVE 620 ROAD	.5 ROOF .5 DRIVE .25 STREET	3.13+0.53 +7.95 =11.61	0.92	2.83	4.31	3.14	4.78
	A1.2	0.273	75 ROOF 30 DRIVE 140 STR.	"	<10 USE 10	0.92	3.06	4.65	0.77	1.17
	A1	1.479	USE A1.1	-	11.61	0.92	2.83	4.31	3.85	5.86
	A2.1	0.754	75 ROOF 30 DRIVE 520 STREET	.5 ROOF .5 DRIVE .25 STR.	3.13+0.53 +6.67 =10.33	0.92	3.01	4.57	2.64	4.01
	A2.2	0.808	75 ROOF 30 DRIVE 420 STREET	.5 ROOF .5 DRIVE .25 STR.	3.13+.53 +5.51 USE 10	.92	3.06	4.65	2.27	3.46
	A2	1.762	USE A2.1	-	10.33	.92	3.01	4.57	4.88	7.41
	A3.1	0.408	-	-	<10 USE 10	.92	3.06	4.65	1.15	1.75
	A3.2	0.195	-	-	"	.92	3.06	4.65	0.55	0.83
	A3	0.603	-	-	"	.92	3.06	4.65	1.70	2.58
(1)	A	3.844	USE A1.1	-	11.61	.92	2.83	4.31	10.01	15.24
	B1.1	0.458	-	-	<10 USE 10	.92	3.06	4.65	1.29	1.96
	B1.2	0.251	-	-	"	.92	"	"	0.71	1.07
	B1	0.709	-	-	"	.92	"	"	2.00	3.03
	B2.1	0.701	75 ROOF 30 DRIVE 400 STR.	.5 ROOF .5 DRIVE .25 STR.	3.13+0.53 +5.90 USE 10	.92	"	"	1.97	3.00
	B2.2	0.188	-	-	USE 10	.92	"	"	0.53	0.80

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Telephone (505) 265-6631

Project: RIO GRANDE CROSSING
DRAINAGE ANALYSIS
Sheet 3 of 17
By: RBR
Chk'd: JL
Job No. 322
Date 9/29/83

TABLE 1 · DEVELOPED CONDITIONS (CONT.)

ANALYSIS POINT	DRAINAGE AREA DESIGNATION	CONTRIBUTING AREA (ac.)	LENGTH OF TRAVEL (FT)	SLOPE (%)	TOTAL TIME T_c (mins)	C	I_{10} (in/hr)	I_{100} (in/hr)	Q_{10} (cfs)	Q_{100} (cfs)
	B2	0.689	–	–	<10 USE 10	.92	3.06	4.65	2.50	3.80
	B3.1	0.507	–	–	"	.92	"	"	1.43	2.17
	B3.2	0.257	–	–	"	.92	"	"	0.72	1.10
	B3	0.764	–	–	"	.92	"	"	2.15	3.27
2	B	2.362	–	–	"	.92	3.06	4.65	6.65	10.10
	C	0.112	–	–	"	.92	3.06	4.65	0.32	0.48
	D	0.224	–	–	"	.92	3.06	4.65	0.64	0.96

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149 Jackson, N.E., Albuquerque, N.M. 87108
Telephone (505) 265-6631

Project: Bridgeside Condominiums
Detailed Analysis
Sheet 4 of 17
Job No. 322
By RF
Chk'd JA
Date 9/26/83

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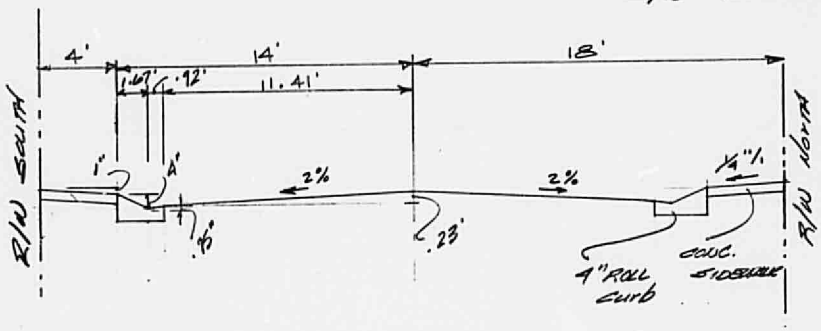
Maximum Flow depth in Streets.

Location - West of Analysis Point (1)
∴ from Sheet 3

Drainage Area A1.1; Q_{100} = 4.78 cfs
Q_{10} = 3.46 cfs

Drainage Area A2.1; Q_{100} = 4.01 cfs
Q_{10} = 2.64 cfs



Typical Street Section

Determine flow in south half of street when depth of flow is crown high.

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MAX. FLOW DEPTH IN STREET (CONT.)

$A = \frac{1}{2} \times .23 \times 11.41 + \frac{.23 + .29}{2} \times .92 + \frac{1}{2} \times .29 \times 1.47$

$= 1.31 + .24 + .21 = 1.76 \text{ FT}^2$

$P = 11.41 + .92 + 1.47 = 13.80 \text{ FT}$

$R = A/P = \frac{1.76}{13.80} = 0.1275 \text{ FT}$

$Q = \frac{1.486}{n} \times R^{2/3} S^{1/2} A$; $n = 0.017$

$S = 0.0025$ south curb

$Q = \frac{1.486}{.017} \times 0.1275^{2/3} \times .0025^{1/2} \times 1.76$

$= 1.95$ cfs.

Therefore flows from Drainage Areas A1.1 & A2.1 will result in depths deeper than crown high.

∴ determine depth of flow in street for $Q_{100} = 4.78 + 4.01 = 8.79$ cfs

$Q_{10} = 3.14 + 2.64 = 5.78$ cfs

slope of north curb = .28%

slope of south curb = .25%

∴ use avg. slope = 0.265%

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Max. Flow Depth in Street (cont.)

For Q_{10} assume depth of flow @ flowline = 0.32 ft.

$$\therefore A = 2\left(\tfrac{1}{2} \times .32 \times 1.60 + \frac{.32+.26}{2} \times .92 + \frac{.26+.03}{2} \times 11.41\right)$$

$$= 4.36 \text{ ft}^2$$

$$p = 27.86 \Rightarrow R = 0.156 \text{ ft}$$

$$Q = \frac{1.486}{.017} \times .156^{2/3} \times .00265^{1/2} \times 4.36 = 5.68 \text{ cfs}$$ ok

$$V = \frac{5.68}{4.36} = 1.3 \text{ ft/sec}; \; V \times d = .42$$ ok

For Q_{100} assume depth of flow @ flowline = 0.38 ft

$$\therefore A = 2\left(\tfrac{1}{2} \times .05 \times 2.40 + \frac{.05+.38}{2} \times 1.67 + \frac{.38+.32}{2} \times .92 + \frac{.32+.09}{2} \times 11.41\right) = 6.16 \text{ ft}^2$$

$$p = 32.80 \text{ ft} \Rightarrow R = .188 \text{ ft}$$

$$Q = \frac{1.486}{.017} \times .188^{2/3} \times .00265^{1/2} \times 6.16 = 9.10 \text{ cfs}$$ ok

$$V = \frac{9.10}{6.16} = 1.48 \text{ ft/sec}; \; V \times d = .56$$ ok

Catch Basins & Storm Drain Lines

Presently there is an existing storm drain in Campbell Road which collects the street flow and discharges west into the Riverside Drain (See Map No. 5, enclosed.) The Hydrology Department of the City of Albuquerque has indicated that the existing storm drain will be replaced with at "least" a 24" RCP (See Appendix, letter dated May 18, 1983.) This indicates that the pipe could be larger & that a 36" pipe is recommended. Therefore the following computations are based on the Campbell Road system being replaced with a 36" RCP.

Assumptions:

1. Flows from the developed Drainage Basins 'A' & 'B' will have passed through the

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Telephone (505) 265-6631

Catch Basins & Storm Drain Lines (cont.)

proposed 36" RCP in Campbell Rd before the peak flow from the Campbell Road drainage basin reaches the development.

2. HGL @ the outlet of the system is a elev. 4961.20

∴ project HGL to MH @ Sta 0+94 Profile 'A' (see sheet 12)

$Q = Q_A + Q_B = 15.24 + 10.10 = 25.34$ cfs

30" RCP , $L = 535$ ft

$$S_f = \left(\frac{nQ}{1.486 R^{2/3} A}\right)^2 = \left(\frac{.013 \times 25.34}{1.486 \times .75^{2/3} 7.07}\right)^2$$

$= 0.0014$

$h_f = L \times S_f = .75$

Then HGL @ Sta 0+94, Profile A = 61.2 + .75
= 61.95

Manhole Losses @ Sta 0+94, Profile A

$$h_{MH} + h_B = (.05 + .2)\frac{V^2}{2g}$$

$$V = Q/A = \frac{25.34}{7.07} = 3.58$$

$$h_{MH} + h_B = .25 \times \frac{3.58^2}{2g} = .05 \text{ ft.}$$

HGL = 61.95 + .05 = 62.00 in @ Sta 0+94 'A'

Project HGL to Manhole @ Sta 0+94
Profile B

Q = 10.10 cfs, 36" RCP, L = 265 ft

$$S_f = \left(\frac{.013 \times 10.10}{1.486 \times .75^{2/3} \times 7.07}\right)^2 = .0002$$

$$h_f = S_f \times L = .06 \text{ ft}$$

Then HGL @ Sta 0+94, Profile 'B' = 62.00 + .06 = 62.06

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Manhole Losses @ Sta 0+94 Profile 'B'

$$h_{MH} + h_B = .25 \frac{V^2}{2g}$$

$$V = \frac{10.10}{7.07} = 1.43$$

$$h_{MH} + h_B = .01$$

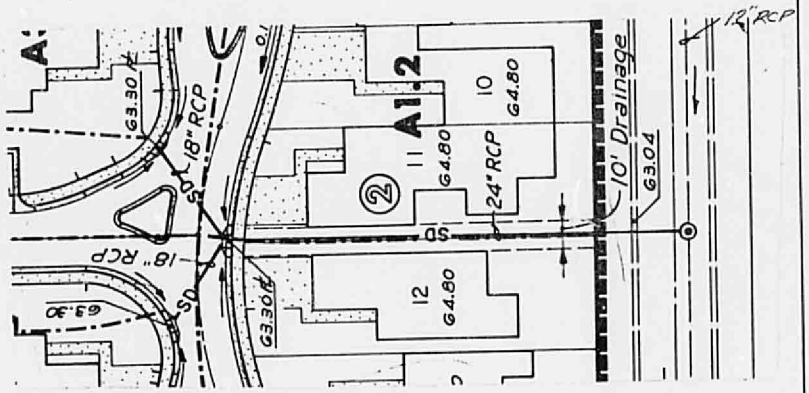
$$HGL = 62.06 + .01 = 62.07_{in}$$

@ Sta 0+94 Profile 'B'

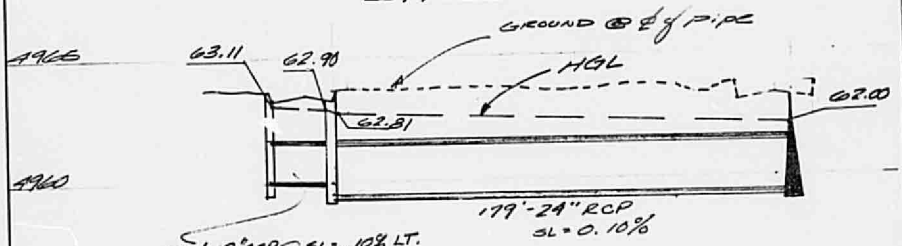
See sheets 12 & 13 for
Storm Drain Profile A & Profile B

ANDREWS, ASBURY & ROBERT, INC. CONSULTING ENGINEERS 149 Jackson, N.E., Albuquerque, N.M. 87108 Telephone (505) 265-6631	Project Rio Grande Compound Drainage Analysis By BJF Chk'd JA	Sheet 12 of 17 Job No. 322 Date 9/29/83

STORM DRAIN PROFILE - LINE 'A'



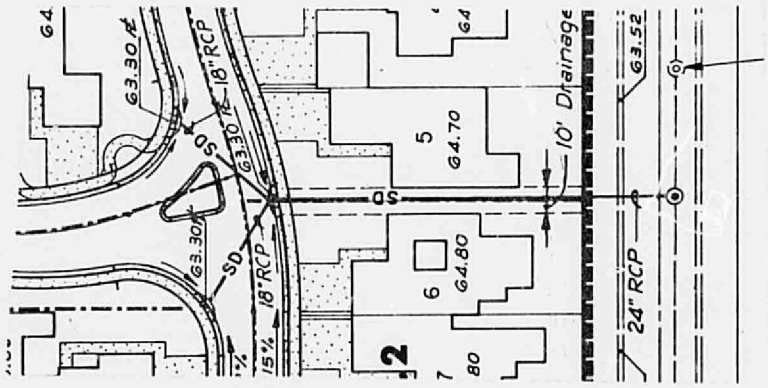
PLAN
SC: 1" = 50'



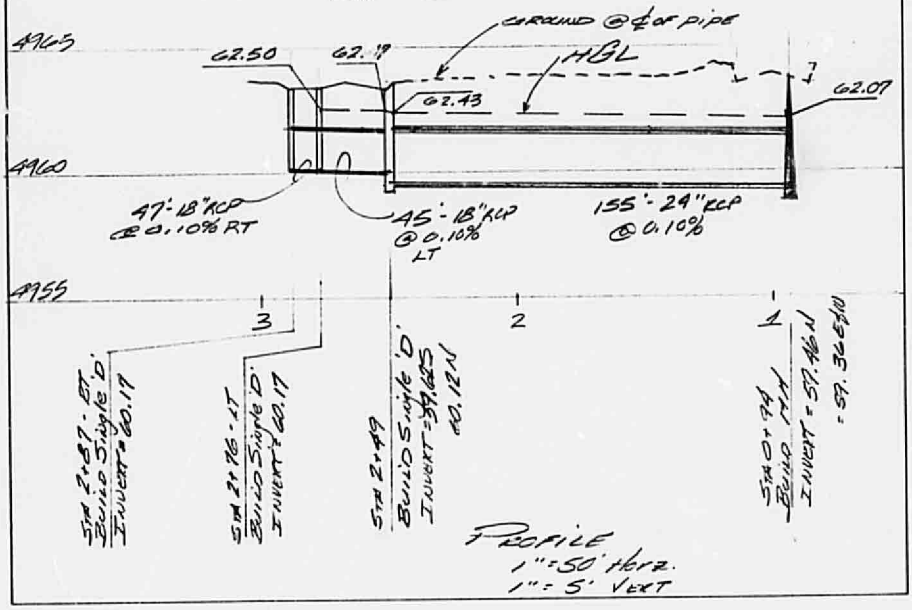
PROFILE
1" = 50' Horz.
1" = 5' Vert

ANDREWS, ASBURY & ROBERT, INC. CONSULTING ENGINEERS 149 Jackson, N.E., Albuquerque, N.M. 87108 Telephone (505) 265-6631	Project Rio Grande Compound Drainage Analysis By RT Chk'd LA	Sheet 13 of 17 Job No. 322 Date 9/29/83

Storm Drain Profile - Line B



PLAN
SC: 1"=50'



PROFILE
1"=50' Horz.
1"=5' Vert

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PROFILE LINE 'A'

HGL @ MANHOLE STA 0+94 'A'
= 62.00 (See Sh. 10 + 12)

Project HGL TO Catch Basin
@ STA 2+93.00
24" RCP, Q = 15.24 cfs, L = 179 ft

$$S_f = \left(\frac{0.013 \times 15.24}{1.486 \times .5^{2/3} \times \pi} \right)^2 = 0.0045$$

$h_f = 0.81$ ft.

HGL @ STA 2+93 = 62+.81 = 62.81 OUT

LOSSES @ Catch Basin

$$h_{CB} = .25 \frac{V^2}{2g}$$

$$V = \frac{15.24}{\pi} = 4.85$$

$h_{CB} = .09$

$\therefore$ HGL = 62.81 + .09 = 62.90 IN

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PROFILE LINE 'A' (CONT.)

Project HGL to Catch Basin @ Sta 2+98 RT,

18" RCP, $Q = 7.41$ cfs, $L = 42$ ft

$$S_f = \left(\frac{.013 \times 7.41}{1.486 \times .375^{2/3} \times 1.77}\right)^2$$

$= .0050$ ft/ft

$h_f = 0.21$

$HGL = 62.90 + .21 = 63.11$ out

Losses @ Catch Basin

$h_{CB} = .25 \frac{V^2}{2g}$, $V = \frac{7.41}{1.77} = 4.19$

$h_{CB} = .07$

$\therefore$ $HGL = 63.11 + .07 = 63.18$ in

OK

$\nexists$ @ 63.30

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PROFILE LINE 'B'

HGL @ MANHOLE STA 0+94 'B'
= 62.07 (see sh 11 & 13)

Project HGL to CATCH BASIN @ STA 2+47
24" RCP, Q = 10.10 cfs, L = 179 ft

$$S_f = \left(\frac{.013 \times 10.10}{1.486 \times .5^{2/3} \times \pi}\right)^2 = .0020 \text{ ft/ft}$$

$h_f = 0.36$ ft

HGL @ STA 2+47 = 62.07 + .36 = 62.43 in

Catch Basin Losses

$h_{CB} = .25 \, V^2/2g$ $\quad V = \frac{10.1}{\pi} = 3.21$ ft/sec

$h_{CB} = .04$ ft

HGL = 62.43 + .04 = 62.47 in

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PROFILE LINE 'B'

Project HGL to Catch Basin @
STA 2+76 LT,
24" RCP, Q = 3.80 cfs, L = 45 LF

$$S_f = \left(\frac{.013 \times 3.80}{1.486 \times .375^{2/3} \times 1.79} \right)^2 = .0013$$

$h_f = .06$

$\therefore$ HGL = 62.47 + .06 = 62.50 in

$$h_{cB} = .25 \times \frac{2.14^2}{2g} = .02 \text{ FT}$$

THEN HGL = 62.50 + .02 = 62.52 in
or
@ 63.30

APPENDIX

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

May 18, 1983

MAY 20 1983

Mr. John Roberts
Andrews, Asbury and Roberts
149 Jackson N.E.
Albuquerque, N.M. 87108

RE: RIO GRANDE COMPOUND CONCEPTUAL GRADING DRAINAGE PLAN

Dear John:

Per your submittal of April 29, 1983 I am forwarding design criteria for the referenced project:

1. STREET GRADES LESS THAN THE MINIMUM GRADE OF 0.5 PERCENT ARE PERMITTED.

   Rational: As you stated, excessive filling would damage existing Cottonwood trees.

2. STORM DRAIN LINES SHALL BE A MINIMUM PIPE DIAMETER OF 24".

   Rational: Current plans are to replace the storm drainage pump station located in Trellis, just north of Campbell Rd. Also, the discharge line for the Mathew Pump Station, located in Campbell Rd., is to be abandoned. Therefore, it appears that by the 1984 flood season, work will be taking place in this area and that the existing lines will be upgraded to at least a 24" minimum.

3. TO INSURE THAT PUBLIC RUNOFF WILL NOT ENTER PRIVATE PROPERTY ADJACENT TO THE 10" EASEMENTS, THE POSSIBILITY OF PLACING ADDITIONAL INLETS ON THE NORTH SIDE OF CAMPBELL LOOP SHOULD BE INVESTIGATED.

   Rational: Due to the minimum street grades, "ponding" will occur at the inlets. The system should be examined to determine the magnitude of "ponding" at the inlets during the 100-year storm.

Please contact me if you have any questions regarding these items. I would appreciate written concurrence with the requirements prior to submittal of the detailed drainage report.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/tsl

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SMEAD—HASTINGS, MN
NO. T118DBE

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