

FILE COPY



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

June 18, 1986

Gilbert Aldez
Community Sciences Corporation
Post Office Box 1328
Corrales, New Mexico 87048

RE: DRAINAGE REPORT SUBMITTAL OF PRAIRIE RIDGE UNIT 3
RECEIVED JUNE 9, 1986 FOR PRELIMINARY PLAT APPROVAL
(C-12/D1A)

Dear Gilbert:

The above referenced submittal, drawing revised June, 1986, is approved for Preliminary Plat.

Work Order construction drawings must include outfall systems as required by an approved infrastructure listing. System to the Piedras Marcadas may be the permanent system or an interim system in accordance with DRB requirements. The proposed freeboard of 0.38' on the concrete channel from Homestead Hills East will be subject to DRC approval. The detention pond must be designed to standards determined by DRC since the City will operate and maintain the pond upon final acceptance. The interim retention pond for area P2 needs to be included on the infrastructure listing as a private infrastructure. Provide the design with work order construction drawings or as supplement to the Drainage Report.

Existing work order for the Coors-Montano Linear Ponds needs to be revised to include the temporary expansion as required by the Prairie Ridge Unit III Drainage Report.

Prior to Final Plat sign-off by the City Engineer, the following items are required:

1. Drainage Covenants for maintenance by the developer of the temporary retention ponds along Golf Course Road, until accepted by the City as detention ponds.

MUNICIPAL DEVELOPMENT DEPARTMENT

C. Dwayne Sheppard, P.E., City Engineer

ENGINEERING DIVISION

Telephone (505) 766-7467

AN EQUAL OPPORTUNITY EMPLOYER

Gilbert Aldez
June 18, 1986
Page 2 of 2

2. Temporary Drainage Easement and covenants for the expansion of the Coors-Montano Linear Pond in Tract 35.
3. Supplement Drainage Report with design calculations for an interim outfall system to the Piedras Marcadas Dam if the ultimate system is not to be built at this time.
4. An executed Subdivision Improvements Agreement.

A final Grading Plan must be submitted to this office for review and approval prior to Work Order Construction Set review and site grading.

If you have any questions, call me at 766-7644.

Cordially,

Roger A. Green, PE

Roger A. Green, P.E.
C.E./Hydrology Section

cc: Andre Houle, DRC
Bob Ryals, Bellamah Development Corp.

RAG/bsj

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A) Purpose and Scope

Bellamah Community Development is currently planning development of their 42 acre Prairie Ridge Subdivision, Unit III, in northwest Albuquerque. The Development will consist of approximately 205 R1 lots intended for the tract housing market. The purpose of this report is to present an overall drainage management plan for the project which is based on sound engineering practice and which is acceptable to both the City of Albuquerque and the Albuquerque Metropolitan Arroyo Flood Control Authority.

B) Site Location and Topography

Prairie Ridge, Unit 3 is located in parcel H-26, Riverview Subdivision. The area is bounded on the east by proposed Golf Course Road, on the south by proposed Homestead Circle Street, on the west by existing Homestead Hills East Subdivision, on the north by future Homestead Trail Street, as shown on Plate 1. The parcel tends to slope in a northeast and a southwest direction.

Soils are primarily gravelly sands and silts falling into the soils hydrologic group B.

C) Design Criteria

1) Engineering Parameters

In accordance with AMAFCA and City of Albuquerque Drainage Criteria all hydrological analysis is based on the 100 year frequency - 6 hour duration storm as represented in the NOAA atlas for New Mexico. The rainfall values pertinent to the study are as follows:

	<u>10 Year</u>	<u>100 Year</u>
One Hour	1.25"	1.9"
Six Hour	1.45"	2.2"

A fraction impervious of 0.57 was selected for the project based on a "typical" lot, and a curve number of 70 was selected for the pervious areas. Developed offsite watersheds were assigned a fraction impervious of 0.45 for Homestead Hills East and a curve number of 75 for the pervious area, based on Riverview Master Drainage Plan.

2) Flood Control Regulations

The drainage plan presented in this report has been designed to comply with the current City of Albuquerque Drainage Ordinance and associated technical criteria as published in the Development Process Manual. The key elements of the ordinance are as follows:

- 1) Street flow depths may not exceed a value of 0.2 feet above top of curb for any location for a 100 year event.
- 2) Street flow depths may not exceed a value of 0.5' at gutter line for any collector or arterial street for the 10 year event and the product of depth and velocity must be less than or equal to 6.5.
- 3) One twelve foot driving lane in each direction must be free from all flow for any arterial for the 10 year event.

D) Computational Procedures

The analysis approach utilized follows standard engineering practice. Key points of confluence were selected, and subsequently the associated individual and aggregate contributing basins were defined.

Hydrological computations were accomplished by means of our MODSCS Computer model. This model is based upon the Soil Conservation Service Triangular unit hydrograph method, but the method has been modified to be more applicable to developed watershed conditions. The model avoids the common pitfall of grappling for an appropriate developed curve number by including percent impervious as an input variable. This fraction of the watershed is then modeled at a curve number of 95. An assigned curve number is applied to the balance of the watershed, and the runoffs are combined to yield the composite hydrograph. In addition the model has the capacity to route hydrographs through reservoirs and channels, or to translate hydrographs in time for summation with other sub basins.

Times of concentration were estimated by using a combination of approximated street flow velocities and overland flow velocities (as applicable) from the upper subcatchment reaches to the confluence point of interest. A convenient formula for overland flow velocity takes the form:

$$V = KY^{0.5}$$

where V = overland flow velocity
Y = average ground slope in percent
K = a ground cover factor

Street velocities were estimated by use of the Manning equation for uniform flow.

All the characteristic hydrological parameters for each subcatchment of interest and each key point of confluence are contained in Appendix A as part of the computer model output, and a summary of parameters and peak flow rates are given in Table 1.

Following hydrological modeling street flow characteristics were analyzed by various methods. For uniform flow conditions the Manning equation with an n of 0.017 was used supplemented by DPM street capacity charts. At intersections the worst of two conditions was assumed. The theoretical hydraulic jump depth for upstream flow conditions was computed followed by the theoretical pool depth to accelerate the flow from 0 velocity head to downstream conditions. Whichever value was higher was assumed to be the potential flood depth. It should be noted that this approach is valid only for incoming supercritical flow conditions at tee intersections. Subcritical flow conditions are not considered critical at intersections unless normal flow depth is above required limits.

E) Offsite Flows

Homestead Hills East Subdivision contributes the only offsite flow into Prairie Ridge, Unit 3. This offsite flow is referred to basin HHE1 as shown on Plate 3 of the approved "Riverview Master Drainage Plan" prepared by Community Sciences Corporation and submitted July 1985.

This offsite flow is proposed to be conveyed through a standard concrete lined R.O.W. channel, into the street network, then diverted with storm sewer into the proposed pond at the southeast corner of Prairie Ridge, Unit 3.

F) Onsite Flows

Plate 3 illustrates the various subcatchments which are internal to the proposed development.

Basins A - A10 are to be directed to the southeast corner of Prairie Ridge, Unit 3 with streets. This flow is then diverted into the pond with a storm sewer.

Basins B1 and B2 are to be directed to the northeast corner of Prairie Ridge, Unit 3. This flow is then to be diverted with storm sewer through Golf Course Road and into the South Branch of the Piedras Marcadas as shown on the Riverview Master Drainage Plan.

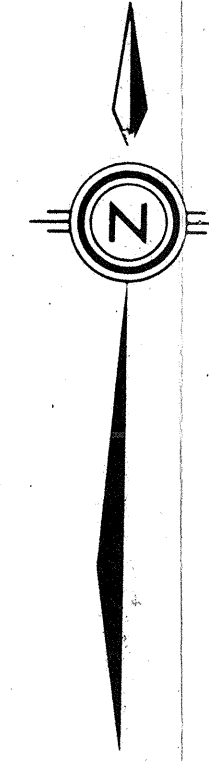
The onsite proposed detention facility will contain 150,000 cubic feet during a 100 year storm. The peak inflow rate will be 86 cfs with a controlled peak outflow rate of 7.0 cfs.

The drainage of Golf Course road was reanalyzed for basin P4 as shown on the Riverview Master Drainage Plan since better street criteria and basin limits are now available as a consequence of the concurrent design work for Golf Course Road. Basin P4 was found to contain a peak inflow of 18.5 cfs, a reduction of 5.5 cfs from previous analysis. We therefore concluded the outflow for the detention ponds in Prairie Ridge, Unit 3 and basin P2 as shown in Riverview could be increased by 2.5 cfs per pond; therefore, the peak outflow was increased from 4.5 cfs to 7.0 cfs for Prairie Ridge, Unit 3. A watershed analysis of basin P4 is included as part of Appendix A.

G) Erosion Control

Control of excessive soil erosion into City Streets and drainage improvements during construction will be accomplished by use of temporary lot line, water-trap berms. These will be windrowed into place following mass grading operations and left in place until each home is constructed and sold. Plate 2 illustrates the dimensions of these berms, and they will be located along those boundaries of each lot which are common to City rights of way or public easement.

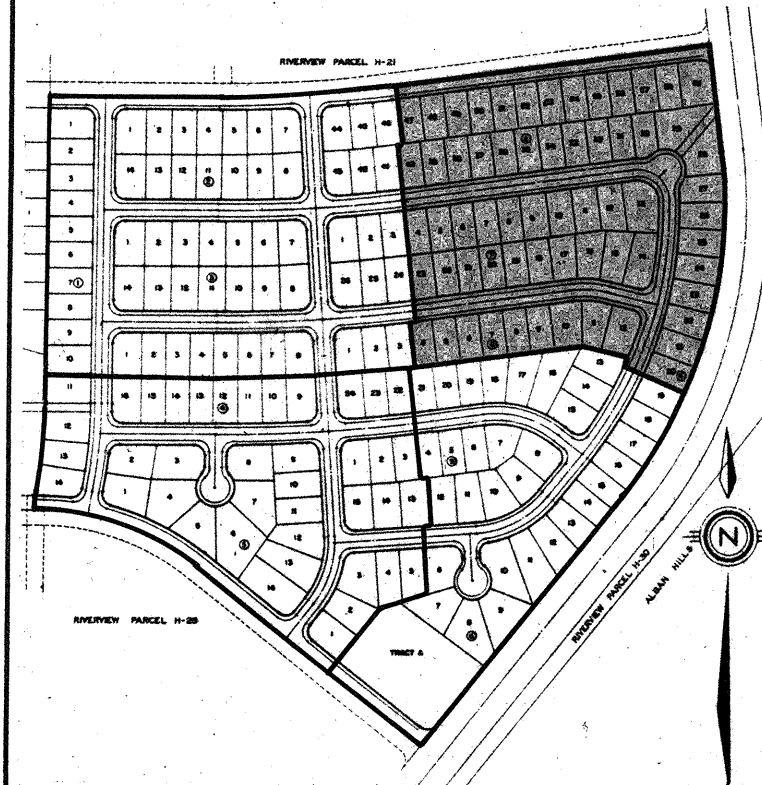
16,200N
68,600E



NOTE: * INDICATES 45' x 50' PAD
ALL OTHER PADS ARE 50' x 50'

15,400N
68,600E

15,400N
68,600E



KEY MAP
N.T.S.

SCALE
1"=50'

community
sciences
corporation

LAND PLANNING ENGINEERING SURVEYING
P.O. Box 1128 Corrales, N.M. 87048

CITY OF ALBUQUERQUE MUNICIPAL DEVELOPMENT DEPARTMENT ENGINEERING DIVISION					
TITLE: PRAIRIE RIDGE - UNIT THREE GRADING PLAN					
APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
City Engineer			Traffic		
A.C.E. - Design			Water Utilities	2/1/87	2/1/87
A.C.E. - Hydrology					
DESIGNED BY C.S.C.			DATE 4-87		
DRAWN BY C.S.C.			DATE 4-87		
CHECKED BY M.J.V.			DATE 5-87		
DRAWING NO. 2976		MAP NO. D 12		SHEET 5 OF 61	

APPROVED FOR ROUGH GRADING
(± 1 Ft.)
3-31-87
CITY HYDROLOGY

SURVEY INFORMATION			BENCH MARKS	AS BUILT INFORMATION		
NO.	BY	DATE		CONTRACTOR	WORKS STARTED BY	DATE
			G.L.O. BRASS CAP FOR SECTION 23, 24, 25 AND 26, LOCATED WITHIN PARCEL H-28, RIVERVIEW APPROX. 250' NORTH OF THE INTERSECTION OF GOLF COURSE ROAD, N.W. AND LA ORILLA RD., N.W. ELEV. = 5112.83.	INSPECTOR'S FIELD CHECK BY	DATE	
				VERIFICATION BY	DATE	
				CORRECTED BY	DATE	
				MICRO-FILM INFORMATION		
				RECORDED BY	DATE	
				NO.		

ENGINEER'S SEAL
J. J. KOS
REGISTERED PROFESSIONAL ENGINEER
No. 9485
3/12/87

REMARKS		BY	
DESIGN			
NO.		DATE	
DATE 4-87		DATE 4-87	
CHECKED BY M.J.V.		DATE 5-87	

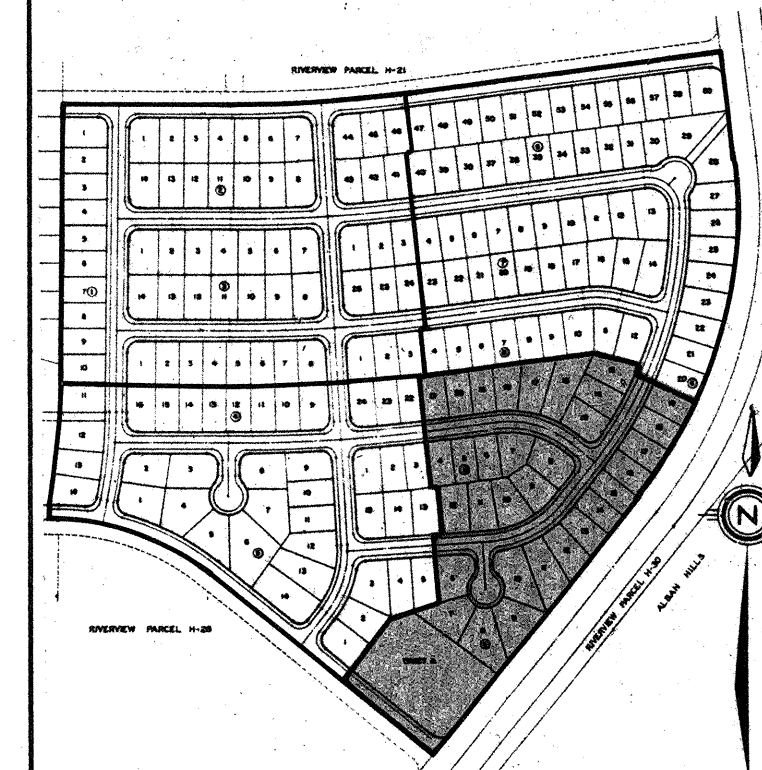
TRACT A

DETENTION POND SPECIFICATIONS:
100-YR. VOLUME = 133,000 C.F.
100-YR. WS. ELEV. = 5107.55



NOTE: * INDICATES 45' x 50' PAD
ALL OTHER PADS ARE 50' x 50'

APPROVED FOR ROUGH GRADING
(2' 1' Ft.)
3-21-87
CITY/HYDROLOGY



SCALE
1"=50'

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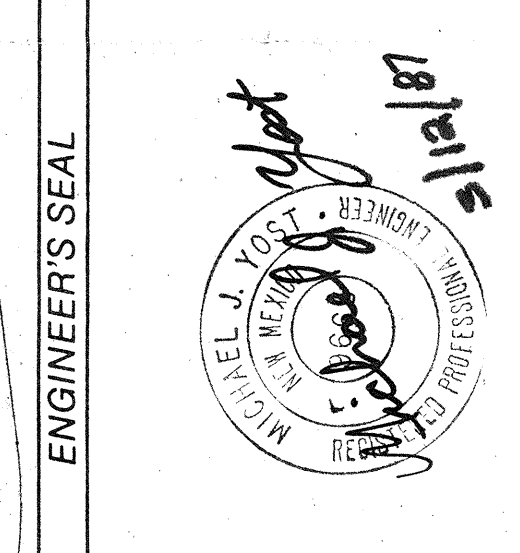
CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

TITLE: PRAIRIE RIDGE - UNIT THREE
GRADING PLAN

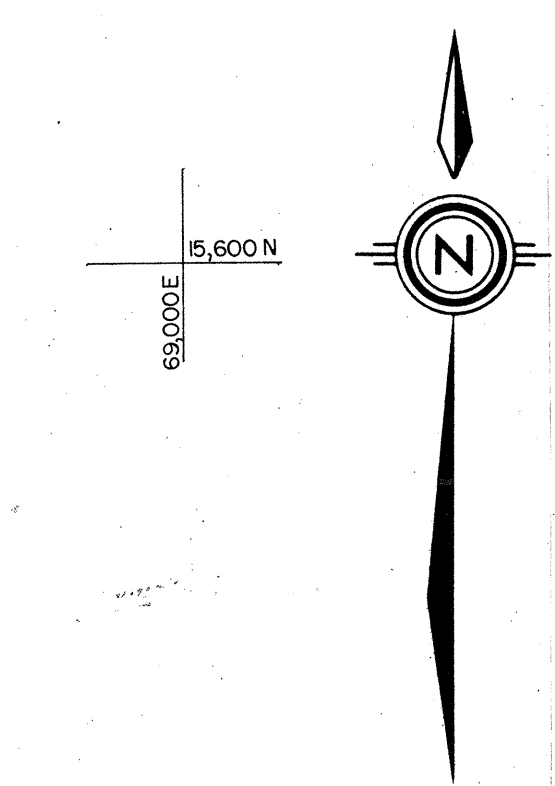
APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
City Engineer					
A.C.E. - Design			Traffic		
A.C.E. - Hydrology			Water Utilities		

DRAWING NO. 2976 MAP NO. D-12 SHEET 6 OF 61

SURVEY INFORMATION		BENCH MARKS		AS BUILT INFORMATION	
NO.	BY	DATE	G.L.O. BRASS CAP FOR SECTION 23, 24, 25 AND 26, LOCATED WITHIN PARCEL H-28, RIVERVIEW APPROX. 250' NORTH OF THE INTERSECTION OF GOLF COURSE ROAD, N.W. AND LA ORILLA RD., N.W. ELEV. = 5112.83.	CONTRACTOR	DATE



REVISIONS		REMARKS	
NO.	DATE	BY	REMARKS
1	4-87	CSC	DESIGN
2	4-87	CSC	
3	5-87	MJJ	



APPROVED FOR ROUGH GRADING
(± 1 Ft.)
Roger A. Green PE 3-31-87
CITY HYDROLOGY DATE



community
sciences
corporation

DRAWING NO.	2976	MAP NO.	D-12	SHEET	7	OF	61
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<i>SURVEY INFORMATION</i>		<i>BENCH MARKS</i>	<i>AS BUILT INFORMATION</i>
	FIELD NOTES		
NO.	BY DATE	G.I.O., BRASS CAP FOR SECTION 23, 24, 25 AND 26, LOCATED WITHIN PARCEL H-28, RIVERVIEW APPROX. 250' NORTH OF THE INTERSECTION OF GOLF COURSE ROAD, N.W. AND LA ORILLA RD., N.W. ELEV. = 5112.83.	CONTRACTOR WORK STARTED BY _____ ACCEPTANCE BY _____ DATE _____ FIELD LOCATION BY _____ DRAWINGS CORRECTED BY _____ DATE _____ <i>MICRO-FILM INFORMATION</i> RECORDED BY _____ DATE _____ NO

[illegible]