



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

J21 - D6a

June 29, 1983

Mr. John Block
Academy Engineering
5353 Wyoming Blvd. NE
Suite 3
Albuquerque, NM 87109

RE: REVISED ALTAMIRA DRAINAGE REPORT (FORMERLY THE SHORES)

Dear Mr. Block:

The referenced drainage plan submitted 6/17/83 is approved.

Very truly yours

Fred J. Aguirre
Fred J. Aguirre, P.E.
Civil Engineer/Hydrology

FJA/tsl

MUNICIPAL DEVELOPMENT DEPARTMENT

ENGINEERING DIVISION

Telephone (505) 766-7467

Richard S. Heller, P.E., City Engineer

AN EQUAL OPPORTUNITY EMPLOYER

ACADEMY ENGINEERING INC.
5353 WYOMING BOULEVARD NE SUITE 3
ALBUQUERQUE, NEW MEXICO 87109
(505) 821-8008

TRANSMITTAL

TO: FRED AGUIRRE
DESIGN GROUP
ENGINEERING DIVISION
ATTN: _____

DATE: 6/17/83
RE: ACTAMIRA

JOB NO. 83-48-01

WE ARE SENDING THE FOLLOWING

☒ PRINTS
☐ PROPOSAL

☐ ESTIMATES
☒ REPORTS

☒ COPY OF LETTER
☐ CHANGE ORDER

☐ SPECIFICATIONS
☐ _____

J21-06a

NO. OF COPIES	DESCRIPTION
1	COVER LETTER
2	PRINTS OF GRADING & DRAINAGE PLAN
1	DRAINAGE REPORT
	RECEIVED

REMARKS: JUN 17 1983

ENGINEERING

THESE ARE TRANSMITTED:

☒ FOR YOUR USE

☒ FOR APPROVAL

☐ FOR REVIEW AND COMMENT

☐ AS REQUESTED

CC: FILE

Academy Engineering, Inc.

5353 Wyoming Blvd. N.E., Suite 3 • Albuquerque, New Mexico 87109 • (505) 821-8008

June 17, 1983

Fred Aguirre
Design Group Section
Engineering Division
City of Albuquerque

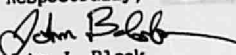
Re: Drainage Update for ALTAMIRA

Dear Fred,

Thank you for the copy of the D6, J21 drainage report. I have reviewed this report for content and found it satisfactory. The only update other than the name of the subdivision is the configuration of the TYPICAL LOT LAYOUT.

Transmitted with this letter is the drainage report with the updated lot layout. I am returning these items for your review and files.

Respectfully,


John J. Block
Project Engineer

Enclosures

JJB/lb

RECEIVED

JUN 17 1983

ENGINEERING

STORM DRAINAGE STUDY
RELATIVE TO SITE PLAN DEVELOPMENT FOR
THE SHORES SUBDIVISION
ALBUQUERQUE, NEW MEXICO

RECEIVED
JUL 17 1983
ENGINEERING

UPDATED 6/16/83
AUGUST 1978



Boyle Engineering Corporation
consulting engineers / architects

STORM DRAINAGE STUDY
RELATIVE TO SITE PLAN DEVELOPMENT FOR
THE SHORES SUBDIVISION
ALBUQUERQUE, NEW MEXICO

AUGUST 1978

Boyle Engineering Corporation

1721 Girard Boulevard, N.E.
Albuquerque, New Mexico 87106

consulting engineers

505 / 266-7789

August 18, 1978

Mr. Gerald S. Misurek
2500 Louisiana NE
Suite 101
Albuquerque, New Mexico 87110


Drainage Report: The Shores Subdivision

Transmitted herewith is the report of studies conducted by this firm relative to storm runoff drainage considerations relative to the proposed development of the subject project.

The criteria and methods of analysis conform to standards of the Albuquerque Metropolitan Arroyo Flood Control Authority, and the City of Albuquerque, New Mexico.

We will be happy to answer any questions you may have about the conclusions and recommendations of this report.

BOYLE ENGINEERING CORPORATION


Fred Burns, PE
Managing Engineer

FB: pjf
Encl.

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STORM DRAINAGE STUDY
RELATIVE TO SITE PLAN DEVELOPMENT FOR
THE SHORES SUBDIVISION
ALBUQUERQUE, NEW MEXICO

I. PURPOSE:

This report is to present data relative to a storm run-off drainage study completed for the site of 64 single family dwelling units proposed on the remaining undeveloped portion of The Shores Subdivision Tract located on Morris Street N.E., just south of Indian School Road N.E., Albuquerque, New Mexico.

II. SCOPE:

This report is to establish development plans and site grading such that the proposed development will be protected from flooding due to storm run-off and will not increase the threat of damage to contiguous properties. Estimation of the maximum run-off is based on the site being completely developed as proposed. Ponding will be provided to maintain existing run-off rates and volumes.

III. LOCATION:

The Shores Subdivision is located on 11.6 acres adjacent to the existing condominium complex, called The Shores, located just west of Morris Street and south of Indian School Road. All of the surrounding area has been developed, and single and multi-family dwelling units have been constructed on all lots to the north, east, and south of the tract. To the west of the tract is the Jackson Junior High School plant.

IV. EXISTING DRAINAGE CONDITIONS:

The tract is located in the Northeast Heights area which for the most part is fully developed. The elevation of the land at the high point is approximately 5532.00 feet. The natural soils existing at the site are products of the weathering of the Sandia

Mountains and are of decomposed granite and limestone origin. Vegetation on the site is only sparse grass covering. The present drainage is characterized by sheet and overland flow from the tract. Overall drainage is from east to west. The only upstream run-off occurs from the north where local flows from the southwest corner of the developed The Shores drains into the undeveloped parcel. However, it is being recommended that this southwest corner of the developed parcel be re-graded to pond run-off on the adjacent development. External drainage is cut off by Morris on the east, the developed The Shores on the north and by developed lots on the south. The only outlet for site run-off is to Hannett Avenue located on the west side of the undeveloped parcel. The run-off from Hannett Avenue flows to Blume Street, Eden Drive, and eventually to Eubank Boulevard in a westerly direction. There are no existing ponding areas or other forms of drainage regulations or controls on the site. Excluding the upstream run-off from the adjacent parcel to the north (because this run-off is recommended to be retained on the site) the existing rate of run-off for a 100 year storm on the undeveloped tract is 21.25 cfs. The existing volume of run-off into Hannett Avenue is approximately 49,687 cubic feet for such a 100 year storm. See APPENDIX.

V. PROPOSED DRAINAGE PLANS:

A. Criteria:

- (1) General: Resolution No. 1972-2, Albuquerque Metropolitan Arroyo Flood Control Authority.
- (2) Project Storm: 100-year intensity; frequency duration as shown on the Curves Chart 1, "1963 Master Plan of Drainage for the City of Albuquerque and Environs", as

prepared by Gordon Herkenhoff and Associates, Inc.,
Consulting Engineers.

- (3) Previous Study: The Shores Drainage Report, by Bohannon,
Huston, and Associates, July, 1972.

B. Flood Protection

- (1) Existing Conditions: Due to both natural and constructed grading in the area, flow from contiguous properties will soon be minimal. Currently, 100% of the study site is undeveloped. The site has been included in the Special Flood Hazard Area Zone A as defined by the U.S. Department of Housing and Urban Development, Federal Insurance Administration. This apparently is erroneous as indicated in the attached letter from Mr. John J. Cunico, Chief, Flood Plain Management and Hydraulics Branch, Engineering Division, Corp. of Engineers. As a result of this communication, a request for a change in the flood hazard classification has been forwarded to the appropriate authorities. The area will not be included in Zone A following the requested change. The site is presently undeveloped with all run-off being concentrated at the intersection of Hannett Avenue and the west boundary of the property.
- (2) Future Conditions: The proposed development will cover the entire site with 64 single family houses, covering approximately 35% of the area. Grass lawns will compose over 40% of the area, and asphalt residential streets, concrete sidewalks, concrete porches, and concrete drive-pads will compose approximately 25% of the 11.6 acre tract. See attached site plan.

C. Site Drainage:

As shown on the attached site plan drawing, the general pattern of the existing topography will not have to be greatly altered in order to continue to direct all on-site run-off to Hannett Avenue. Ponding will be provided on one-third of the grass lawn areas in order to retain the additional run-off generated by the parcel's development. The ponded water will be disposed of through evaporation and percolation.

As determined by the calculations shown in the APPENDIX, backyard ponding areas at least 15 ft. by 50 ft. in size. Likewise, it is required that downspouts from roofs and grading around each house be so designed as to direct all roof run-off to ponding areas. FIGURE 1 shows a typical house lot and how it should be graded properly for drainage.

VI. CONCLUSIONS AND RECOMMENDATIONS:

On the basis of the study of this report, the following recommendations are proposed:

1. Re-grade the terrain surrounding the existing structures in the southwest corner of the developed The Shores parcel to cause run-off to pond on planned ponding areas on the developed tract.
2. Grade the undeveloped tract, as shown in FIGURE 1, so that the driveways and sidewalks drain to the streets. However, the entire roof must drain to backyard grass lawn ponding area at least 15 ft. by 50 ft. in size or some other combination of dimensions, as long as the total ponding area of the lot is not less than (15'X 55") = 825 square feet in area and approximately eleven inches in depth.

Provided the above listed recommendations are implemented prior to or concurrent with the development of the property, it is concluded that the proposed development will not create a flood hazard to surrounding properties, nor will the property itself be in danger of flooding.

Respectfully submitted:

BOYLE ENGINEERING CORPORATION

Fred Burns
Fred Burns, P.E.
New Mexico Registration No. 4000

REFERENCES

Albuquerque Metropolitan Arroyo Flood Control Authority. "Resolution No. 1972-2".

Bohannon, Huston, and Associates. The Shores Drainage Report, July, 1972.

Bohannon, Huston, and Associates. Flood Plain Information: Albuquerque Arroyos. Prepared for the Albuquerque Metropolitan Flood Control Authority.

Gordon Herkenhoff and Associates. Master Plan of Drainage: City of Albuquerque, New Mexico and Environs, 1963.

Seelye, Elwyn. Design: Data Book for Civil Engineers, 1960.

U. S. Department of Housing and Urban Development, Federal Insurance Administration, "Flood Hazard Boundary Map H-01-37, City of Albuquerque, New Mexico," February 14, 1978.

Total Project Area

Length = 642' Width = 787'

Area = 642 X 787 = 505254 Sq. Ft. $\frac{1 \text{ Acre}}{43560 \text{ Sq. Ft.}} = 11.6 \text{ Acres}$

Average Slope = $\frac{(102 - 82)}{642} = .0312$

I. Existing Conditions:

A. Determination of Concentrating Time, t_c
Undeveloped Ground - Poor grass and bare ground

From: Figure H - Overland Flow Time
Page 18-01, Data Book For Civil Engineers: Design
By Elwyn Seelye

$t_c = 16.3 \text{ minutes}$

Note: t_c = time of concentration

B. Determination of Intensity

For 100 year storm - From Master Plan of Drainage
City of Albuquerque - 1963
by Herkenhoff and Associates
Chart I

Intensity, $I = \frac{189}{t_c + 25} = \frac{189}{16.3 + 25} = 4.58 \frac{\text{in.}}{\text{hr.}}$

C. Determination of Runoff
For 100 year storm.

Rate of Flow, $Q_{100} = C \cdot I \cdot A$

$= (.4) (4.58) (11.6) = 21.25 \text{ cfs}$

$C = \text{undeveloped} = .4$

$\text{Vol.}_{100} = (11.6) (43560) (.4) \left(\frac{2.95}{12}\right) = 49,687 \text{ ft}^3$

C = coefficient of runoff

A = Area in acres

I = intensity $\frac{\text{in.}}{\text{hr.}}$

II. Proposed Conditions

A. Average Coefficient of Runoff

Roof	(2500)	(64)	(.95)	= 152000.
Driveways	(400)	(64)	(.95)	= 24320.
Street and Sidewalks	(104016)		(.95)	= 98815.2
Lawns	(215638)		(.4)	= 86255.2
				361390.4

Avg. $C = 361390.4 \text{ ft}^2 / 505254 \text{ ft}^2 = .715$

B. Proposed Runoff for total tract

$$\text{Rate of Flow, } Q_{100} = C_{\text{Avg.}} \cdot I \cdot A$$

$$= (.715) (4.58) (11.6) = 37.98 \text{ cfs}$$

$$\text{Volume}_{100} = 505254 (.715) (2.95/12) = 88,809 \text{ ft}^3$$

	Proposed		Existing
ΔQ	= 37.98	-	21.25 = 16.73 cfs
ΔV	= 88,809	-	49687 = 39122 ft ³

C. Ponding Areas

Areas Contributing:

$$\begin{aligned} \text{Roofs (2500) (64)} &= 160000 \text{ ft}^2 && \text{(Total Roof Areas)} \\ \text{Ponding Areas (10'X50')} &(64) = 32000 \text{ ft}^2 && \text{(Part of back yards)} \end{aligned}$$

$$\text{Roofs} = 160000 \text{ ft}^2 \frac{1 \text{ acre}}{43560 \text{ ft}^2} = 3.673 \text{ acres}$$

$$\text{Ponding Areas} = 32000 \text{ ft}^2 \frac{1 \text{ acre}}{43560 \text{ ft}^2} = .735 \text{ acres}$$

D. Volume retained in ponding areas in a 100 year storm

$$\text{Volume}_{\text{retained}} = (3.673)(.95) + (.735)(1.0) \quad 43560 \left(\frac{2.95}{12} \right) = 45236 \text{ ft}^3$$

E. Flow Eliminated by Ponding

$$Q = (3.673)(.95) + .735(.4) (4.58)$$

$$Q = 17.33 \text{ cfs}$$

F. Final Quantities

$$\begin{aligned} \text{Total volume of runoff} &= 88809 - 45236 \text{ ft}^3 \\ &= 43572 < 49687 \text{ (existing)} \end{aligned}$$

$$\text{Rate of Runoff} = 37.98 - 17.33 \text{ cfs} = 20.65 < 21.25 \text{ (existing)}$$

G. Important Design Criteria to be followed to comply with drainage needs.

All downspouts from roofs must be located so as to lead run-off to backyard lawn ponding areas. See FIGURE 1 for design details.

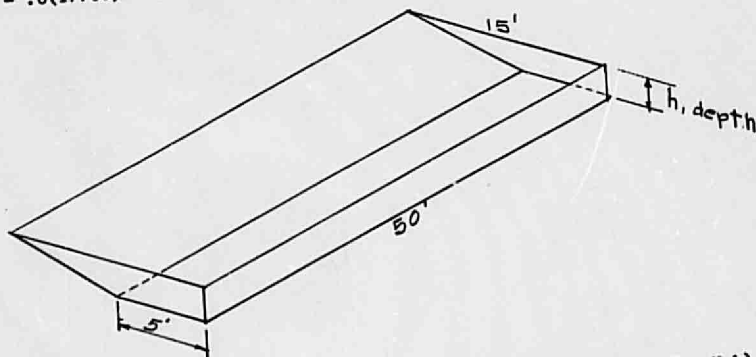
H. Required Depth of Ponding Areas

Volume retained in 100 year storm = 45236 ft^3
 Minus 60% immediate absorption of direct rainfall
 on grass, since coefficient of runoff for grass is .4 or 40%.

Volume of Rainfall falling on ponding areas

$$= 72000 \text{ ft}^2 \times 2.95 \text{ inches} \cdot \frac{1 \text{ ft.}}{12 \text{ Inches}} = 17700 \text{ ft}^3$$

Net Volume of Rainfall and Runoff not immediately absorbed:
 $= 45236 - .6(17700) = 34616 \text{ ft}^3$

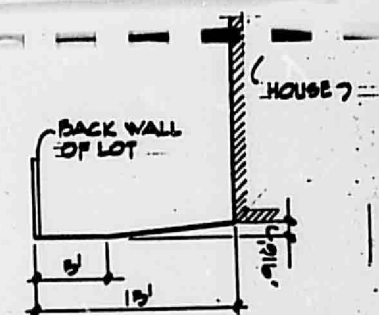
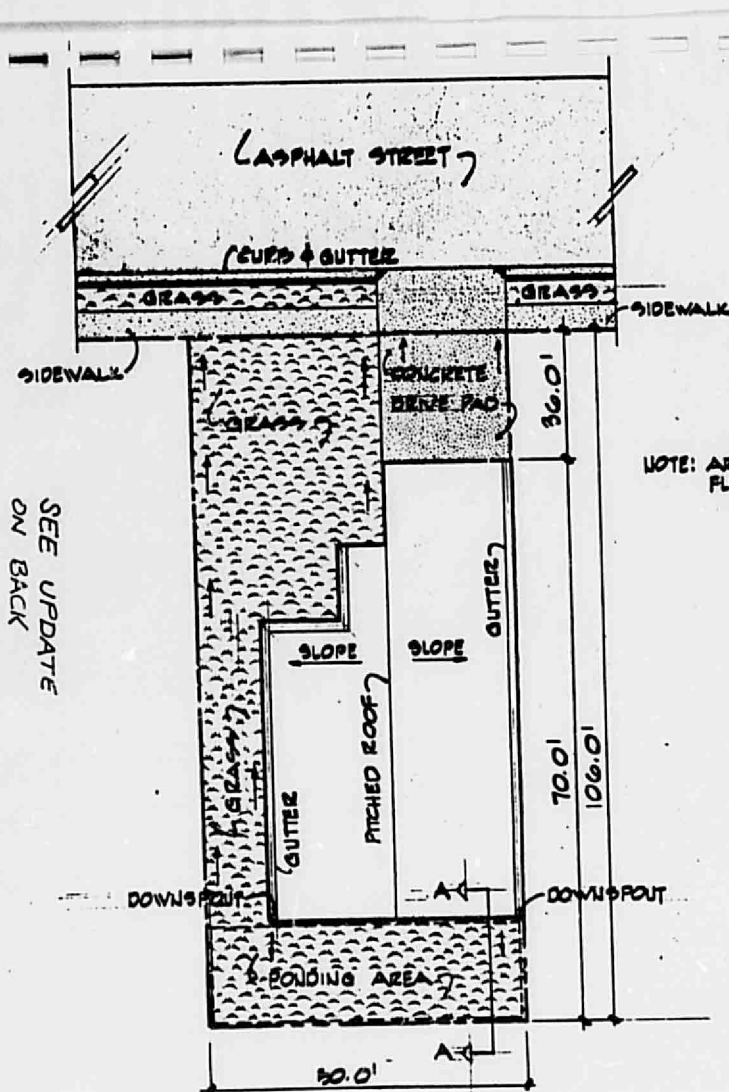


$$\text{Volume of 64 Ponding areas} = (50 \text{ ft.} \times 5 \text{ ft.} \times h) + \frac{1}{2} (50 \text{ ft.} \times 10 \text{ ft.} \times h) \cdot 64$$

$$34616 \text{ ft}^3 = 32000 h \text{ ft}^3$$

$$h = .92 \text{ ft.} \times \frac{12 \text{ in.}}{1 \text{ ft.}} = 11 \text{ inches}$$

Recommended depth, $h = 11 \text{ inches}$

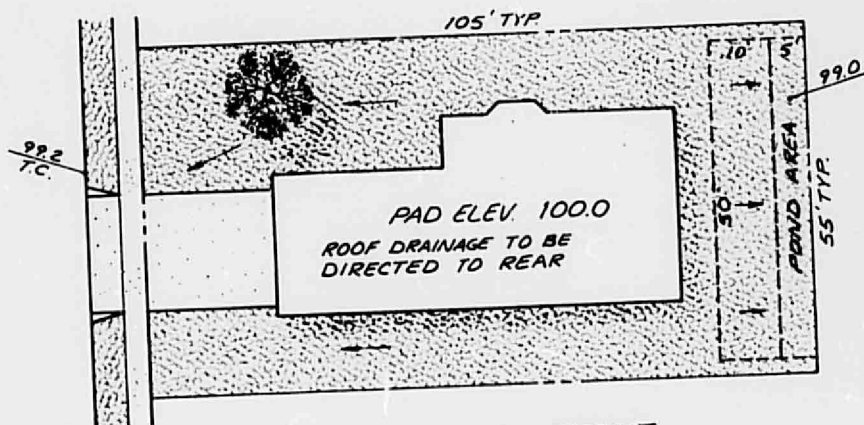


BACKYARD PONDING AREA
SECTION A-A
SCALE: 1" = 10'

THE SHORES SUBDIVISION
(UNDEVELOPED TRACT)
GRADING PLAN FOR TYPICAL HOUSE LOT
SCALE: 1" = 20'

FIGURE 1

GRADING AND DRAINAGE PLAN FOR
AN AMENDED SITE DEVELOPMENT PLAN OF
ALTAMIRA



TYPICAL LOT LAYOUT