Boyle Engineering Corporation

consulting engineers

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

505 / 266-7787

February 13, 1979

Mr. Bruno Conegliano
Asst. City Engineer - Hydrology
CITY OF ALBUQUERQUE
P.O. Box 1293

RE: Drainage Report: Southwest Portion of The Shores

In response to your request made at your office on Friday, February 9, 1979 we are transmitting the report of studies, conducted by this firm regarding storm runoff drainage considerations relative to the replatted southwest portion of the already developed area called "The Shores".

The report is submitted as a revision to the previously approved 1972 drainage study for The Shores, entitled, "DRAINAGE REPORT: THE SHORES", by Bohannan, Huston and Associates.

It is our understanding that upon your approval of this drainage plan the development plan for the adjacent parcel to the south called Morris Manor Subdivision, will be approved.

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

Ted Hogsett, P.E.
Senior Civil Engineer

TH/pjf
Enclosures

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

A revision of The Shores Drainage Report, July, 1972, by Bohannan, Huston, and Associates.

FEBRUARY 1979

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

I. PURPOSE

This report presents data revising the results of the original 1972 drainage study for May 6, 1977, replat of the southwest portion of the single family planned urban development called The Shores. The Shores is located on the southwest corner of Indian School Road N.E. and Morris Street N.E., Albuquerque, New Mexico.

II. SCOPE

Estimation of maximum runoff for a 100 year storm is based on the site being completely developed as proposed. Revised runoff figures are compared with the pervious values established for the areas affected (Areas 1,2, and 3 of the 1972 study). Ponding will be provided to maintain or reduce existing runoff rates and volumes.

III. LOCATION:

The Shores, Phase I, is located on a 12.63 acre tract just west of Morris Street and south of Indian School Road. Nearly all of this tract has been constructed. All of the surrounding area has been developed with the exception of the proposed Morris Manor Subdivision to the south. The Jackson Junior High School Plant is located to the west.

This report focuses on the final 3.72 acre area of The Shores, presently being developed, which is the southwest portion of the original tract. As shown by Plate 2, Grading and Drainage Plan from the 1972 Bohannan, Huston Study, Areas 1, 2, and 3 of the original drainage plan are included.

IV. PRESENT DRAINGE CONDITIONS:

As shown on Plate 2, Grading and Drainage Plan from the 1972 Bohannan, Huston Study, a fifty foot strip on the south side of The Shores, Phase I, in Areas 1 and 2, drains to the south into the proposed Morris Manor Subdivision. It is proposed to redirect this runoff into a ponding area located at the southwest corner of The Shores.

The rest of Area 1 (not yet fully constructed) will continue to drain either to an inland lake immediately to the north or to a newly constructed ponding area east of Lots 87-90.

Area 3 will continue to drain to the west side of The Shores and then along an existing drainage channel to Indian School Road N.E.

From Table III, page 6 of the 1972 Bohannan, Huston Study, the approved 100 year storm runoff values are:

Area 1	25.00 cfs
Area 2	25.14 cfs
Area 3	19.56 cfs

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 Bohannan, Huston and Associates, July, 1972.

B. Proposed Conditions:

The proposed development arising from the May 6, 1977 replat of the area is nearly identical to the original development plan in terms of percentages of impervious subareas to the total area. There are condominium type single family houses covering approximately 45% of the area that are already constructed. The as yet unbuilt asphalt private streets, asphalt and concrete drivepads, sidewalks, and porches will compose approximately 39% of the area. Grass lawns and ponding areas will compose about 16% of the area.

C. Site Drainage

By comparing the attached site plan with Plate 2 from the 1972 Bohannan, Huston Study, it is seen that Area 1 drainage will continue to be ponded on site. The dwelling units for this southwest portion have already been constructed. A slumpblock wall is presently being built along the entire south side of The Shores which will prevent all downstream runoff to the south. The final grade adjacent to this wall will be swaled and grassed as shown in order to prevent storm runoff from flowing against the base of the wall, as the runoff flows west parallel to the wall into the proposed ponding area. Thus, the southern strip will no longer drain south into the proposed Morris Manor Subdivision, but will drain into the south-west corner ponding area instead. Area 3 will continue to drain to the west side of The Shores and then continue north in an existing drainage channel to Indian School Road N.E. The ponded water will be disposed of through evaporation and percolation.

As determined by the calculations shown in the APPENDIX, the required depth for the 3500 square foot southwest corner ponding area is 1.45 feet or 17.41 inches. The required depth for the 5200 square foot ponding area (draining the applicable portion of Area 1) located between Lots 1 and 89 is 2.63 feet or 31.55 inches. The following table of 100 year storm runoff values shows the runoff will be maintained or decreased from the 1972 drainage study values for the affected portions of Areas 1, 2, and 3.

VI. CONCLUSIONS AND RECOMMENDATIONS

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

1. Re-grade the terrain around the existing structures as shown on the site plans.
2. Landscape with grass and other plants the areas to remain pervious.
3. Construct impervious surfaces as shown on the site plan.
4. Construct slumpblock walls between The Shores and proposed Morris Manor Subdivision and swale the land strip on the north side to prevent runoff from affecting the wall's foundation.

Provided that the above listed recommendations are implemented concurrent with the development of the rest of the subject parcel, it is concluded that the proposed development will comply with A.M.A.F.C.A. Resolution 1972-2. The southwest portion of The Shores, Phase I, will not create a flood hazard to surrounding properties, nor will the property itself be in danger of flooding.

Respectfully submitted:

BOYLE ENGINEERING CORPORATION

Theodore C. Hogsett
Registered P.E. and L.S. No. 3512

Total Project Area = 162175 SF = 3.72 Acres
Average Length = 642 Ft.
Average Slope = $\frac{32 - 18}{642}$ = .0218

I. EXISTING CONDITIONS:

From the previously approved 1972 Bohannan, Huston Study, Table III, Page 6:

Allowable 100 year Storm Runoff

Area 1 - 25.00 cfs (Ponded)
Area 2 - 25.14 cfs (To proposed Morris Manor Subdivison)

Area 3 - 19.56 cfs (To Indian School Rd. N.E.)

II. PROPOSED CONDITIONS:

A. Determination of Concentration Time, tc
Undeveloped Ground - Foor grass and bare ground.

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

tc = 16.3 minutes Note: tc = 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 = $\frac{189}{tc + 25} = \frac{189}{16.3 + 25} = 4.58 \frac{in.}{hr.}$

C. Determination of Average Coefficients of Runoff

1. Southern grassed strip (areas 1 and 2)

a. Lawns and S.W. Corner Ponding Area: 40850 S.F.

(26610 S.F.) (.4) = 10644

b. Southern half of roofs of Lots 1-6, 93-95
[(6 X 48') + (2 X 34')] (40') (.9)= 12816
23460

Avg. C = 23460/40850 = .574

2. Area 1 (Lots 1-17) : 80900 S.F.

a. Roofs, Drivepads, Porches, Streets, and Sidewalks

(61438 S.F.) (.9) = 55294.2

b. Grass Lawns
(19462 S.F.) (.4) = 7784.8
63079.0

Avg. C = 63079/80900 = .780

3. Area 3 (Lots 81-95): 40425 S.F.

a. Roofs, Drivepads, Porches, Streets, and Sidewalks
(35185 S.F.) (.9) = 31666.5

b. Grass Lawns
5240 S.F. (.4) = 2096.0
33762.5

Avg. C = 33762.5/40425 = .835

D. Determination of 100 Year Storm Runoff using Rational Formula

Runoff, Q_{100} = C X I X A A = Area in acres

1. Southern grassed strip (areas 1 and 2)

(.574) (4.58) (40850/43560)= 2.46 cfs

2. Area 1

(.780) (4.58) (80900/43560) = 6.63 cfs

3. Area 3

(.835) (4.58) (40425/43560) = 3.55 cfs

Comparison of Existing and Proposed Q_{100}

Area	Existing	Proposed
1	25.00 cfs	6.63 cfs
2	25.14 cfs	2.46 cfs
3	19.56 cfs	3.55 cfs

E. Determination of Ponding Area Volumes
100 Year Storm Precipitation:

From: City of Albuquerque
Precipitation Map
100 Year Storm Precipitation = 2.6 inches

1. Southwest Corner Ponding Area:

(.574) (2.6 in./12 in./1 ft.) (40850 S.F.) =
= 5080 C.F.

2. Ponding Area East of Lots 87-90:

(.780) (2.6 in./12 in./1 ft.) (80900 S.F.) =
= 13672 C.F.

F. Required Depth of Ponding Areas

1. Southwest Corner Ponding Area

Area = 30' X 80' + 110' X 10' = 3500 S.F.
Required Depth, h = 5080/3500 = 1.45 ft. or 17.41 inches

2. Ponding Area East of Lots 87-90:

Area = 130' X 40' = 5200 S.F.
Required Depth, h = 13672/5200 = 2.63 ft. or 31.55 inches.

DRAINAGE — RUNOFF --I

FIG. A. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 2 YEARS.

FIG B. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 10 YEARS.

FIG C. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 50 YEARS.

FIG. D. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 5 YEARS.

FIG E. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 25 YEARS.

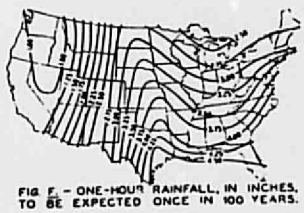

FIG F. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 100 YEARS.

COMPUTATION OF i IN RATIONAL FORMULA.

EXAMPLE: Assume expectancy period = 5 years. See Fig. D, assume locality, find 1 hour intensity = 1.15 in. per hour.

FIG. G-INTENSITY EXPECTATION FOR ONE-HOUR RAINFALL.*

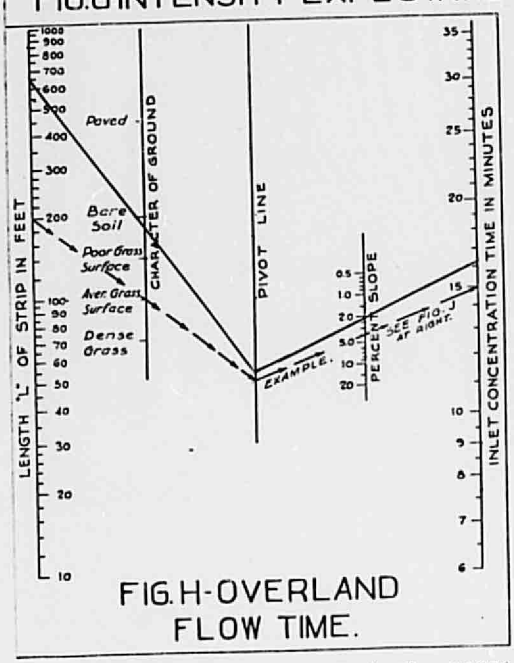

FIG. H-OVERLAND FLOW TIME.

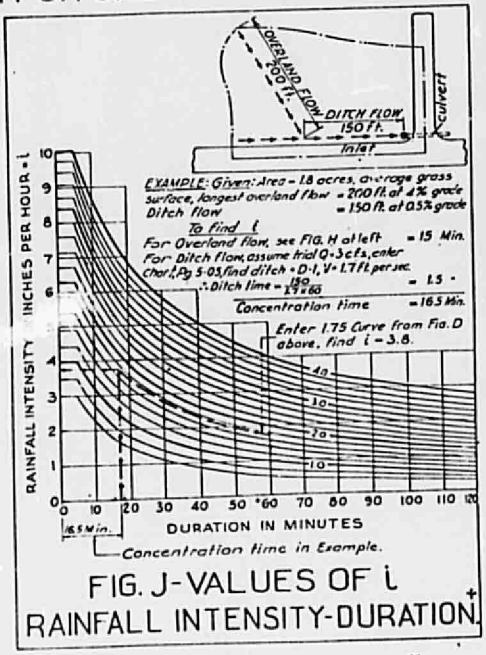

FIG. J-VALUES OF i RAINFALL INTENSITY-DURATION.

*Reproduced from Miscellaneous Publication No 204, U.S. Dept. of Agriculture, by David L. Yarnell.

†Adopted from Engineering Manual of the War Department, Part XIII Chap 1, Dec 45

CITY OF ALBUQUERQUE, NEW MEXICO
CITY ENGINEER'S OFFICE

MEMORANDUM - February 6, 1979

TO: George Paul, Street Maintenance Engineer
FROM: Ernest Harp, Asst. Street Maintenace Engineer
SUBJECT: Silt Washed into Parsifal Street

After the rains of late January I noticed that this problem is still with us with about half a truck load of silt washed into Parsifal Street.

Do you want to take it up with Mr. Heller? I think they should be able to require the builder to install facilities to solve the problem.

EH

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE November 17, 1978 REF. NO._____

TO: BRUNO CONEGLIANO, Assistant City Engineer--Hydrology

FROM: ERNEST J. HARP, Assistant Street Maintenance Engineer

SUBJECT: DRAINAGE PROBLEM AT NEW K-MART SHOPPING CENTER
Montgomery Blvd. at Eubank

RECEIVED
8:4[illegible]
FEB 0 [illegible]
CITY ENGINEERS

The recently developed shopping center on the southwest quadrant of the Montgomery Blvd. at Eubank is creating a problem in Street Maintenance due to run-off from the west edge of the paved area, and from overflow from the settling pond at the southwest corner of the shopping center. During the recent light rains, wastewater from the parking lot drained westward across the lot onto the undeveloped land west of the shopping center then collected into rivulets and flowed into Parsifal Street carrying large quantities of silt. From Parsifal, the wastewater flows several blocks southwestward before entering a storm sewer. Silt was deposited along the entire route.

The problem arises from two things. First, the west edge of the pavement has no retaining or drainage system installed; and second, the water retainage system along the south side of the shopping center seems to be inadequate for a substantial portion of the wastewater originated as overflow from the settling basin.

Will you please initiate action to resolve this problem as soon as possible.

cc: George E. Paul, Street Maintenance Engineer
Richard Heller, City Engineer

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

MAYOR
David Rusk

March 19, 1979

Sierra Vista Partnership
900 Hazeldine Ave. S.E.
Albuquerque, New Mexico 87106

Re: Drainage Problem from K-Mart Shopping Center at Montgomery and Eubank N.E.

Gentlemen:

Enclosed are copies of memos from the Street Maintenance Division which indicate that the drainage provisions for the captioned shopping center are inadequate and result in frequent problems for the City.

I am therefore compelled to withhold the issuance of building permits in this shopping center until an adequate solution is supplied. I suggest that a meeting be held in my office to discuss possible solutions to this problem.

Very truly yours,

Bruno Conegliano
Assistant City Engineer-Hydrology

BC/fs
Enclosures

cc - Dick Heller, City Engineer
Charles Volz, Supt. Code Administration
Fred Aguirre, Asst. Hydrology Engineer
Tomm Mann, Tom Mann & Assoc.
Wolfgang Braun Architect
Drainage File

SIERRA VISTA PARTNERSHIP

P. O. BOX 1886
ALBUQUERQUE, NEW MEXICO 87103
PHONE (505) 247-3153

March 22, 1979

Mr. Richard Heller, City Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: Drainage Problem from
K-Mart, Sierra Vista
Shopping Center at
Montgomery and Eubank,N.E.

Gentlemen:

Your letter of March 19th, with enclosures, concerning this problem has been received and is of considerable concern to us.

We propose to take the following steps to alleviate the problem.

1. Immediately construct a temporary holding pond on the undeveloped land west of the parking lot. This will serve to catch the water flowing off the paved parking lot. If necessary, to prevent the pond from becoming a problem, the water will be drained through a small diameter pipe to the curb at Montgomery.

2. Concurrently we will initiate a drainage study for this undeveloped property and submit to the city for approval. As soon as we have an approved plan we will proceed with construction.

Very truly yours,

SIERRA VISTA PARTNERSHIP

H. V. Larkin, Partner

HVL:njj

cc: Bruno Conegliano, Asst. City Engineer-Hydrology
Bill Cottle, Nielson Enterprises, Inc.

Boyle Engineering Corporation

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

consulting engineers
505 / 266-7789

TO: Bruno Conegliano

DATE: 3/5/79

PROJECT: Morris Manor Subdivision

Transmittal No. _____

Forwarded herewith are 1 copies/sets ea. of:

_____ Shop Drawings _____ Schedules _____ Descriptive Literature

_____ Calculations _____ Tracings X Check Prints

_____ Details

Sheets: Print of Morris Manor Subdivision plat for your review prior to sign-off.

Shop Drawings have been checked as noted:

_____ No Exception Taken: Sheets _____

_____ Make Corrections Noted: Sheets _____

_____ Revise and Re-submit: Sheets _____

_____ Rejected

REMARKS: The plat makes all of the notations as required in your letter to us dated Oct 6, 1978 and as amended in our letter to you dated Oct. 10, 1978 which you approved in your letter to us dated Oct. 23, 1978.

By: Steve Eagan