HYDROLOGY H18/D18 2 PLANS

H18/D18

2 PLANS

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

MAYOR
David Rusk

February 15, 1980

H18-D18

Mr. Peter Jacobson
Assistant Structural Engineer
3939 San Pedro N. E., Suite D
Albuquerque, New Mexico 87110

Re: Good Housekeeping Drainage Report

Dear Mr. Jacobson:

Thank you for your prompt response in submitting the information I requested at our meeting of 2/12/80, concerning the need for overflow details and the outlining of drainage areas for the above referenced Drainage Report.

As you indicated on the grading plan, submitted to my office 2/13/80, Ponds 3, 4, 3B, 5 and 6 are basically balanced with their respective drainage area, with the exception of Ponds 2, 1, and 3A which will have an overflow condition, but will overflow through the drivepad. Therefore, no additional overflow system need be included.

This information satisfies my concerns, therefore the Drainage Report is approved.

Sincerely,

Fred Aguirre

Fred Aguirre
Civil Engineer
Engineering Division
Municipal Development Department

FA:pp
DRAINAGE FILE

STORM DRAINAGE STUDY RELATIVE TO DEVELOPMENT OF GOOD HOUSEKEEPING SHOP INCLUDING SUPPLEMENTAL DRAINAGE INFORMATION

ALBUQUERQUE, NEW MEXICO

FEBRUARY 1980

Boyle Engineering Corporation

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Albuquerque, New Mexico 87110

505-883-7200

GOOD HOUSEKEEPING SHOP

DRAINAGE REPORT

1. PURPOSE

This report presents data relating to storm runoff from a 1.64 acre tract of land located 210 feet West of the Northwest Intersection of Uptown Blvd. and Louisiana Blvd. This tract is being developed for use as a retail store for the Good Housekeeping Shop in Albuquerque, New Mexico (See vicinity Map in Appendix).

11. SCOPE:

The scope of this report deals with the determination of the amount of runoff from the proposed development prior to and subsequent to development based on a 2.4" (100 year) rainfall. The peak off-site runoff of the developed site shall not be in excess of the pre-development peak runoff rates. These ponds will drain over a 24 hour period to Uptown Blvd.

111. LOCATION:

The area being developed is a 1.64 acre portion of the tract called C-2-A of unit 5 of Dale Bellamah's Jeannedale and is 210 feet West of the Northwest intersection of Uptown Blvd. and Louisiana Blvd. The property is bounded on the North by a parking lot of Coronado Shopping Center, on the West by an undeveloped tract of land, and on the East by the R.B. Furniture Store, and faces South on Uptown Blvd. (See location map - appendix)

1V. EXISTING DRAINAGE CONDITIONS:

The site is composed of decomposed granite soils, sparsely vegetated with native grasses. The present drainage is characterized by overland sheet flow east to west and eventually into Uptown Blvd., then down Jeannedale Street to the AMAFCA Interstate Channel. The elevation of the site is 5277 at the high point, and 5274 at the low point. The slope is east to west at approximately 1.64%

There is no offsite drainage entering onto this proposed development. Drainage on the Uptown side (South) is taken by existing storm sewer inlets into an underground 60" RCP storm sewer. Drainage on the R.B. Furniture (East side is taken into leach lines buried on their property. Drainage on the Coronado Shopping Center Parking side (North) is prevented from entering this property by a difference in elevation of 2 feet plus a curb which is capable of holding more than the 100 year storm.

V. PROPOSED DRAINAGE PLANS:

A. Criteria:

1. General: Standards and policies being followed by the City of Albuquerque.

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.

B. Flood Protection:

1. Existing condition; Flow from contiguous properties is minimal to nonexistant. The site is not in danger of flooding during a 100 year storm.

2. Future Conditions: The proposed retail store building will cover approximately 35% of the entire site, paved parking 51% and landscaped area 14% (See Attached Site Layout and Grading Plan).

C. Site Drainage

As shown on the attached site plan, the general pattern of the existing topography will not have to be altered in order to achieve the desireable development. The historic drainage pattern will remain the same as before development. Six onsite ponds will be provided

and will reduce offsite drainage below the historic pre-development condition. The ponded water will be disposed of over a 24 hour period into Uptown Blvd., and also by evaporation and percolation. Roof drains will be required to drain by downspouts or internal piping into areas designated as shown on the attached plot of drainage areas. (See Drainage Area Plan C-2 in Appendix).

VI. CONCLUSION AND RECOMMENDATIONS

On the basis of the study performed herein, the following recommendation are proposed:

1. Maintain the historic drainage pattern.
2. Provide six ponding areas as shown on the attached plan. (See Sheet C-2 Appendix)
3. Provide roof drainage, to drain those segments of the total roof area into the designated drainage areas and ponding areas. (See Drainage Area Plan C-2 in Appendix).
4. Grade all planter areas to hold and retain all direct rainfall.
5. Provide 2" drains from Ponding Areas onto Uptown Blvd., as shown in detail (4) C1 on Site Layout and Grading Plan.

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

Theodore C. Hogsett P.E.
Senior Civil Engineer

SUPPLEMENTAL DRAINAGE STUDY

GOOD HOUSEKEEPING SHOP

February 7, 1980

Alleviation of an existing hazard to the foundation of the Good Housekeeping Shop:

To the East of the Good Housekeeping Shop is the R.B. Furniture Store. On the Northwest corner, R.B. Furniture built a 115' long french drain. This drain allows surface storm water to percolate into the sub-surface; however, this french drain is immediately adjacent to the Good Housekeeping Shop - R.B. Furniture Store property line. The Good Housekeeping Shop, in order to maximize use of their land, have placed their building six feet (6) inside of the property line Due to the proximity of the french drain, the Good Housekeeping Shop's building will experience foundation problems.

In order to alleviate this problem, BOYLE ENGINEERING CORPORATION has met with the City of Albuquerque, (Richard Heller and Bruno Conegliano), and separately with both Goldberg-Mann & Associates, (Tom Mann), and Archi+Tekton, (Harry Garner). These parties have agreed that there is a problem, and the City has agreed to closing the inlet to the french drain. The capacity of the french drain will be ponded on both of the properties. Goldberg-Mann & Associates agreed to this. Archi+Tekton and their client, R.B. Furniture, agreed to this.

The present capacity of the french drain is calculated as follows;

$$115 \left[\frac{4^2\pi}{4} + \left(5 - \frac{4^2\pi}{4}\right) .27 \right] = 1753 \text{ cu.ft.}$$

This is the quantity of additional ponding that will be provided on the two properties as follows:

The Good Housekeeping Shop will build a curb on the East side, with the top of the curb 1' higher than the top of the inlet grate

(76.65 + 1.00 = 77.65). This will pond 1080 cu.ft. on the R.B. Furniture Store parking lot. To allow this water to drain, a ½"x12" vertical slit will be built in the curb.

The drainage from R.B. Furniture will flow South along the East edge of the Good Housekeeping Shop. To prevent infiltration and erosion, a concrete sidewalk will be built sloping to pond Number 6. To gain additional capacity, ponding areas 5 & 6 on the Good Housekeeping Shop property were re-shaped. This gains an additional ponding capacity of 700 cu.ft. By ponding on both R.B. Furniture and Good Housekeeping Shop, an additional capacity of 1080 + 700 = 1780 cu.ft. is created.

APPENDIX

DRAINAGE REPORT

GOOD HOUSEKEEPING SHOP

Total Project Area
Length = 214'
1.643 acres, 71559. sq.ft.

Average Slope = $\frac{5177.7 - 5174.2}{214}$ = .0164 1.64%

I. Existing Conditions:

A. Determination of concentrating time, tc
Undeveloped ground - poor grass

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

tc = 13.8 minutes

B. Determination of Intensity:

For 100 year storm - from Master Plan of Drainage City of Albuquerque, New Mexico-1963-Chart I, by Herkenhoff and Assoc.

Intensity, $I = \frac{189}{tc + 25} = \frac{189}{13.8 + 25}$ = 4.87 in. per hour

C. Determination of Runoff for 100 Year storm

C=Coefficient of Runoff
A=Area in acres
Intensity

Rate of Flow, Q100 = CIA

Q100 = .4(4.87)(1.643)=3.20 cfs

Volume of Runoff V_{100} =(Asq.ft.)(C)(inches rainfall)
=(71559)(.4)$\frac{(2.4)}{12}$ = 5725 cu.ft.

II. Condition After Development

A. Runoff for Proposed Development

Rate of Flow = C_{av} I.A.
Q100 = (.9)(6.09)(1.643) = 9.01 cfs

Volume of Runoff
V100 = 71559(.9)$\frac{(2.4)}{12}$ = 12,800

Change in Runoff due to development

Proposed		Existing		
Change Q =	9.01	- 3.20	=	5.81 cfs
Change V =	12,880	- 5725	=	7155 cu.ft

B. AREAS CONTRIBUTING TO PONDING (See drainage area plans, C-2)

POND	VOLUME	SURFACE AREA
1	2360 cu.ft.	1400 sq.ft.
2	1490 cu.ft.	990 sq.ft.
3	2040 cu.ft.	1360 sq.ft.
4	300 cu.ft.	600 sq.ft.
5	1060 cu.ft.	700 sq.ft.
6	880 cu.ft.	720 sq.ft.
TOTAL	8130 cu.ft.	5770 sq.ft.

C. AREAS DRAINING INTO PONDS

Note that due to changes on the site of R.B. Furniture as described in the supplemental drainage study above an additional 700 cu.ft. of storm water will be ponded on the Good Housekeeping Shop property.

Roof Area 4492 cu.ft.

Pond 1	2360 cu.ft.
Pond 5	1060 cu.ft.
Pond 6	880 cu.ft.
Pond 2	1490 cu.ft.
	5790 cu.ft.

Ponds greater than 100 year volume

PARKING AREA 8388 cu.ft.

Pond 1	filled
Pond 2	1298 cu.ft.(partially filled)
Pond 3	2040 cu.ft.
Pond 4	300 cu.ft.
Pond 5	filled
Pond 6	filled
	3638 cu.ft.

100 year runoff exceeds pond capacity by 8388 - 3638 = 4750 cu.ft.

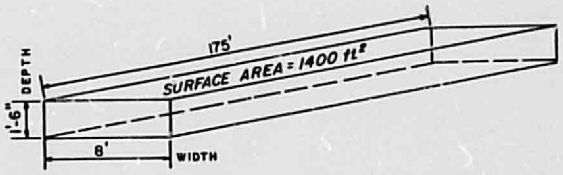
Total site runoff will be 4750 cu.ft. + 700 cu.ft. from R.B. Furniture for a total of 5450 cu.ft.

D. RUNOFF FROM SITE AFTER DEVELOPMENT

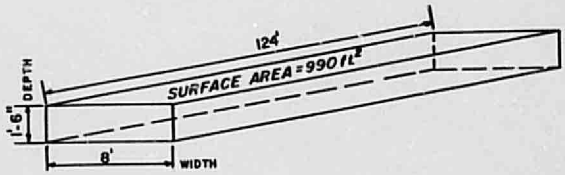
Original Condition	Developed Condition
5,725 cu.ft.	5450 cu.ft.

Developed condition less than original condition, therefore okay.

POND Nº 1 VOLUME = 2,360 ft.³

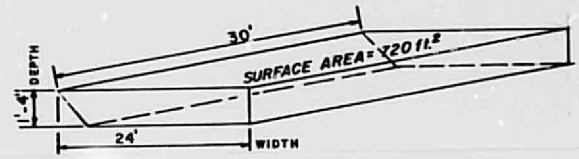


POND Nº 2 VOLUME = 1,490 ft.³



POND Nº 3 VOLUME = 2,040 ft.³

POND Nº 4 VOLUME = 300 ft.³

POND Nº 5 VOLUME = 1060 ft.³

POND Nº 6 VOLUME = 880 ft.³