

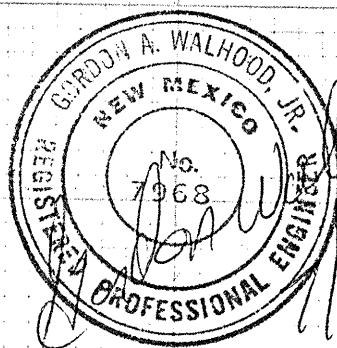
BACKUP CALCULATIONS

FOR

WOLFE PROPERTY AT

ROBERT DAM
ALBUQUERQUE, NM

By GORDON WALHOOD PE,
BOHANNAN-HUSTON
7/30/87



BOHANNAN-HUSTON INC.

PROJECT NAME DAM SHORE SHEET 1 OF 5
PROJECT NO. 63411 BY GW DATE 7/87

FLOW OFF THE PROPERTY WILL ONLY BE
THAT ORIGINATING ON THE PROPERTY, SINCE
OTHERS ROUTED AROUND BY THE EXISTING
CURB AND RUNDOWN.

BY DEFAULT $T_c = 10 \text{ min}$

WITH STEEP SLOPES, RUNOFF IS INSTANTANEOUS

UNDEVELOPED FLOWS AND VOLUMES

SOIL TYPE - E&C - EMBUDO - SOIL TYPE
HYDROLOGIC SOIL TYPE B

FROM PLATE 22.2, C-2 DPM VOL 2

FROM PLATE 22.2, C-1 DPM VOL 2

$C = .34$ FOR 0% IMPERVIOUS

TOTAL $\Phi = 9933$, PERVIOUS $\Phi = 2534$

$$\% \text{ PERVIOUS} = \frac{2534}{9933} = 25.5\%$$

$$\text{USE } 0.255(0.40) = 0.102$$

$$\% \text{ IMPERVIOUS} = 74.5\%$$

$$+ 0.745(0.90) = 0.670$$

$$\therefore \text{Developed } C = .772 \rightarrow 0.772$$

GHR RAINFALL INTENSITY = 2.5"

Multiplier from 22.2 D-2 = 2.2

$$I = 2.5(2.2) = 5.5 \text{ in/hr.}$$

$$\text{AREA} = \frac{9933}{43,560} = .228 \text{ AC.}$$



BOHANNAN-HUSTON INC.

PROJECT NAME DS SHEET 2 OF 5
PROJECT NO. 63411 BY GW DATE 7/87
SUBJECT HYDR. CH'D _____ DATE _____

$$Q_{UNDEV} = CIA = .34(5.5) .228 = .43 \text{ cfs}$$

$$Q_{DEV} = CIA = .72(5.5) .228 = .90 \text{ cfs}$$

USING RATIONAL METHOD HYDROGRAPH.

$$V = \frac{1}{2} (T_c + 2.67 T_c) Q = 1.84 Q T_c$$

$$\text{UNDEV VOL } V = 1.84(.43) 10(60) = 475 \text{ ft}^3$$

$$\text{DEV VOL } V = 1.84(.90) 10(60) = 994 \text{ ft}^3$$

$$\text{Volume increase is } 994 - 475 = 519 \text{ ft}^3$$

THIS 519 ft³ is additional runoff volume contributed to the floodpool behind the dam. The volume of borrow from below the floodpool below the +68.00 level is approximately 23,900 ft³, thereby increasing the storage capacity much greater than the additional runoff.



BOHANNAN-HUSTON INC.

PROJECT NAME D.S SHEET 3 OF
PROJECT NO. 64311 BY GW DATE 7/87
SUBJECT HYDRO. CH'D DATE

THE TRACT OF LAND IS DESCRIBED AS TRACT A-4-A, BLOCK 2 OF VISTA DEL SANDIA, REPLAT DATED MAY, 1987. THE TRACT IS ZONED R-2 WITH A PROPOSED DEVELOPMENT OF THREE TOWNHOUSE UNITS.

THE TRACT HAS A TOTAL AREA OF 9933 SQUARE FEET OR 0.228 ACRES. ALL OF THE FLOWS CONSIDERED IN THIS ANALYSIS ORIGINATE FROM THE SITE ITSELF AND FLOW OFF THE PROPERTY INTO THE JOHN ROBERT DAM RESERVOIR LOCATED TO THE NORTH AND WEST OF THE PROPERTY.

UNDEVELOPED CONDITIONS

$Q = CIA$ WHERE, Q = FLOW IN CFS, I = INTENSITY OF RAINFALL
 A = AREA IN ACRES

SOIL TYPE IS THE EMBUDO SERIES ETC, HYDROLOGIC SOIL TYPE B FOR THIS SOIL TYPE AND FROM PLATES 22.2, C-1, THE RUNOFF FACTOR IS $C = 0.34$

FOR THE LOCATION AND TIME OF CONCENTRATION OF 10 MINUTES THE INTENSITY IS $I = 5.5$ INCHES PER HOUR, THEREFORE,
 $Q(100 \text{ YEAR}) = CIA = (0.34)(5.5)(.228) = 0.42 \text{ CFS}$

FOR THE VOLUME OF RUNOFF, THE RATIONAL METHOD PROVIDES A VERY CONSERVATIVE ESTIMATE, HOWEVER FOR THIS SIZE OF AN AREA IT CAN BE USED.

FROM THE PLATE 22.2, E-1 OF THE DPM VOL. II

$$VOL = 1/2(T_c + 2.67T_c)(Q) = 1.84(Q)(T_c)(60)$$

$$VOL \text{ FOR UNDEV. CONDITIONS} = 1.84(.43)(10)(60) = 475 \text{ CU. FT.}$$

DEVELOPED CONDITIONS

FLOW RATE(100 YEAR), $Q=CIA$, WHERE $C = .72$ FOR AN IMPERVIOUS RATIO OF 74.5%, SOIL TYPE B

$$Q=CIA = (0.72)(5.5)(.228) = 0.90 \text{ CFS}$$

$$VOL=1.84(0.90)(10)(60) = 994 \text{ CU. FT.}$$

AS CAN BE SEEN THE FLOW RATE DOES INCREASE BY 0.48 CFS, HOWEVER, THIS CAN EASILY BE HANDLED BY DOWN STREAM CAPACITY SINCE THE TIME TO PEAK FOR THE DAM IS MUCH LATER IN TIME THAN THE TIME OF CONCENTRATION CONSIDERED. THE MOST IMPORTANT CHANGE IS THE INCREASE IN VOLUME. THOUGH THIS IS NEGLIGIBLE WITH RESPECT TO THE VOLUME OF STORAGE, THE OWNER HAS AGREED WITH AMAFCA TO ONLY BORROW FILL MATERIAL FROM BELOW THE BOTTOM OF THE STORAGE POOL. THE DIFFERENCE IN THE VOLUME IS 994-475 OR 519 CUBIC FEET. AS CALCULATED FROM EARTHWORK FOR THE CONTOURS AS SHOWN, THE ACTUAL VOLUME REMOVED FROM BELOW THE FLOODPOOL ELEVATION IS 23,900 CUBIC FEET. THIS IS WELL IN EXCESS OF THE INCREASE IN VOLUME DUE TO DEVELOPMENT.

DEVELOPMENT CONFIGURATION

THE UNITS AS SHOWN ON THIS PLAN WILL HAVE LIVING SPACE AT ELEVATION 5778.10 FEET. THE PARKING GARAGE BELOW WILL BE AT ELEVATION 5769.00, OR 1.00 FOOT ABOVE THE FLOOD POOL ELEVATION AS SHOWN ON THE ATTACHED FEMA FLOOD INSURANCE RATE MAP(0018-C).

FLOW PATTERNS ON THE PROPERTY WILL GENERALLY BE SHEET TYPE FLOWS INTO THE DAM RESERVIOR.

THE EXISTING RUNDOWN AND EASEMENT LOCATED ON THE EAST EDGE OF THE PROPERTY WILL REMAIN AS IS.



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

Ken Schultz
Mayor

UTILITY DEVELOPMENT DIVISION
HYDROLOGY SECTION
(505) 768-2650

October 5, 1987

Gordon Walhood, P.E.
Bohannon-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: GRADING & DRAINAGE REPORT FOR DAM SHORE TOWN HOUSES,
RESUBMITTED SEPTEMBER 30, 1987, FOR BUILDING PERMIT APPROVAL
(F-22/D11B)

Dear Mr. Walhood:

Your submittal, referred to above, with a revised date of September 23, 1987, is approved for building permit sign-off by Hydrology.

As we discussed on the telephone, if the owner is able to coordinate the earthwork on this project with the City's job, it should prove mutually beneficial.

Thank you for your cooperation. If you have any questions, please call me at 768-2650.

Cordially,

G. Stuart Reeder, P.E.
C.E./Hydrology Section

GSR/bsj

xc: Owner
Architect

PUBLIC WORKS DEPARTMENT

Walter Nickerson, P.E., City Engineer

ENGINEERING GROUP

Telephone (505) 768-2500

AN EQUAL OPPORTUNITY EMPLOYER

FILE COPY



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

Ken Schultz
Mayor

UTILITY DEVELOPMENT DIVISION
HYDROLOGY SECTION
(505) 768-2650

October 5, 1987

Gordon Walhood, P.E.
Bohannon-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: GRADING & DRAINAGE REPORT FOR DAM SHORE TOWN HOUSES,
RESUBMITTED SEPTEMBER 30, 1987, FOR BUILDING PERMIT APPROVAL
(F-22/D11B)

Dear Mr. Walhood:

Your submittal, referred to above, with a revised date of September 23, 1987, is approved for building permit sign-off by Hydrology.

As we discussed on the telephone, if the owner is able to coordinate the earthwork on this project with the City's job, it should prove mutually beneficial.

Thank you for your cooperation. If you have any questions, please call me at 768-2650.

Cordially,

G. Stuart Reeder, P.E.
C.E./Hydrology Section

GSR/bsj

xc: Owner
Architect

PUBLIC WORKS DEPARTMENT

Walter Nickerson, P.E., City Engineer

ENGINEERING GROUP

Telephone (505) 768-2500

AN EQUAL OPPORTUNITY EMPLOYER

DRAINAGE INFORMATION SHEET

PROJECT TITLE: DAM SHORE ZONE ATLAS/DRAINAGE FILE # F22/D11B
LEGAL DESCRIPTION: TRACT A-4-A, BLOCK 2, VISTA DEL SANDOIA.
CITY ADDRESS: PASEO DEL OSO NE
ENGINEERING FIRM: BOHANNAN-HUSTON INC. CONTACT: G WALHOOD, P.E.
ADDRESS: 7500 JEFFERSON NE PHONE: 823-1000
OWNER: BOB WOLFE CONTACT: B. WOLFE
ADDRESS: 2730 SAN PEDRO NE STE "H" PHONE: 881-1436
ARCHITECT: BARKER-FRIEDMAN & ASSOC. CONTACT: H. BARKER
ADDRESS: 209 GOLD AVE SW PHONE: 842-6789
SURVEYOR: ALBUQUERQUE SURVEYING CONTACT: FRED SANCHEZ
ADDRESS: 2119 MENAUL BLVD NE PHONE: 884-2036
CONTRACTOR: WOLFE COMPANY CONTACT: B WOLFE
ADDRESS: 2730 SAN PEDRO STELL PHONE: 881-1436

PRE-DESIGN MEETING:

☐ YES
☒ NO
☐ COPY OF CONFERENCE
RECAP SHEET PROVIDED

DRB NO. 2A-87-321

EPC NO. _____

PROJECT NO. _____

TYPE OF SUBMITTAL:

☐ DRAINAGE REPORT
☒ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAIN PLAN
☒ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

☐ SECTOR PLAN APPROVAL
☐ SKETCH PLAT APPROVAL
☐ PRELIMINARY PLAT APPROVAL
☐ SITE DEVELOPMENT PLAN APPROVAL
☐ FINAL PLAT APPROVAL
☒ BUILDING PERMIT APPROVAL
☐ FOUNDATION PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY
APPROVAL
☐ ROUGH GRADING PERMIT APPROVAL
☐ GRADING/PAVING PERMIT APPROVAL
☐ OTHER _____ (SPECIFY).

DATE SUBMITTED: 9/29/87BY: Gordon A. Walhord, P.E.

EASEMENT

Tract 1B

From # 77-10284

824

A certain parcel or tract of land lying and being situate within the Elena Gallegos Grant, City of Albuquerque, Bernalillo County, New Mexico and being more particularly described as follows:

Beginning at the southwesterly corner of the tract herein described, whence a 1 1/2" iron pipe in concrete set for the closing corner of Sections 33 and 34, T11N, R4E, N.M.P.M. (x = 420,734.73 and y = 1,504,236.13) on the south boundary of the Elena Gallegos Grant, said pipe being the southwesterly corner of the New Holiday Park Subdivision Parts 7 and 8 bears S 27° 45' 09" W a distance of 1195.24 feet; thence from said point of beginning N 69° 29' 12" W a distance of 173.39 feet; thence, N 69° 18' 45" E a distance of 435.94 feet; thence S 24° 39' 01" W a distance of 132.48 feet; thence, S 63° 37' 09" W a distance of 212.26 feet to the point of beginning which has coordinates x = 421,291.09 and y = 1,505,293.49 and contains 33715.20 square feet (0.7740 acres) more or less.

The foregoing property description designated Tract 1A^B is subject to an easement in favor of the petitioner, its successors and assigns as follows:

The right to flood and inundate with storm waters each and every portion of said land which is below 5772.0 feet above mean sea level.

Reserving to the landowner, its successors and assigns, all such rights and privileges as may be used and enjoyed without interfering with or abridging the rights of the easements hereby acquired, including the right to fill any portion of said land, and adjacent lands presently owned by Statewide Trust Investors of Texas and Investors of Texas, provided, however, that the earth and other materials used for the fill may be provided by Petitioner at no cost to the landowner from lands of the Petitioner adjacent to said tract and east of the Juan Tabo Dam, as the Petitioner may direct. The landowner may not use any earth or other materials for fill other than those set forth above without the consent of the Petitioner.

(See Exhibit B)

A 4 by
147/11/13
C 12/183

MARY
ACS BRASS TABLET
(FOUND IN PLACE)
NEW MEXICO STATE PLANE
COORDINATE SYSTEM
(CENTRAL ZONE)
Y=1,505,491.72
X=420,899.21
G=0.99962648
Δ=-00°09'08"

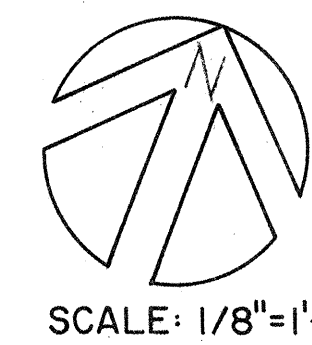
JOHN ROBERT DAM
DETENTION BASIN
SPILL WAY ELEV.= 5770.90

NOTE: 100 YR. FLOOD POOL
ELEVATION AT 5768.00
F.I.R.M. PANEL 18

2' WIDE LAYDOWN CURB SECTION

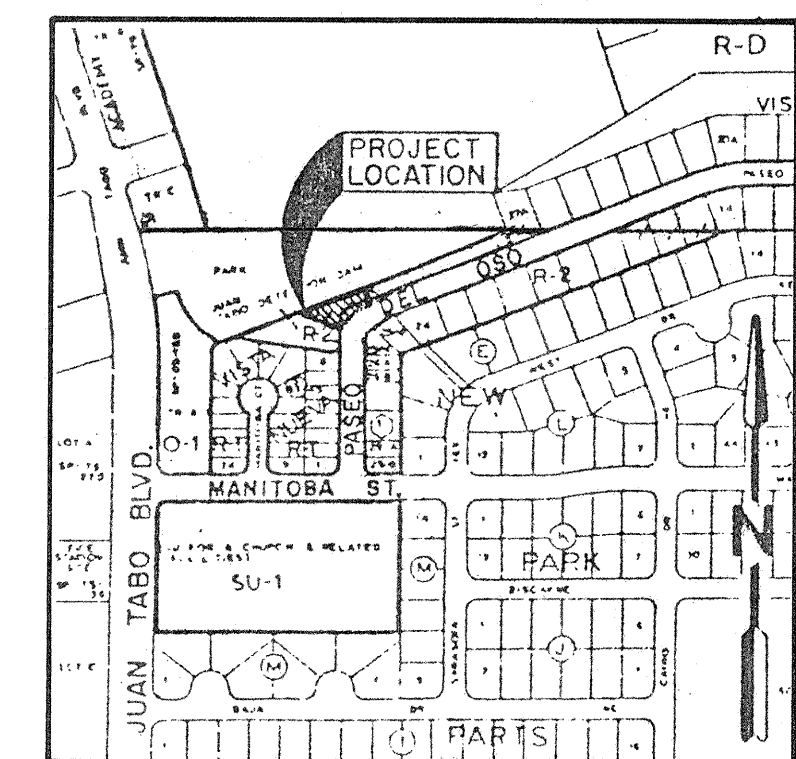
8" HEADER CURB

EXISTING 15' DRAINAGE EASEMENT
(6/27/78 - D8/150) CONCRETE LINED

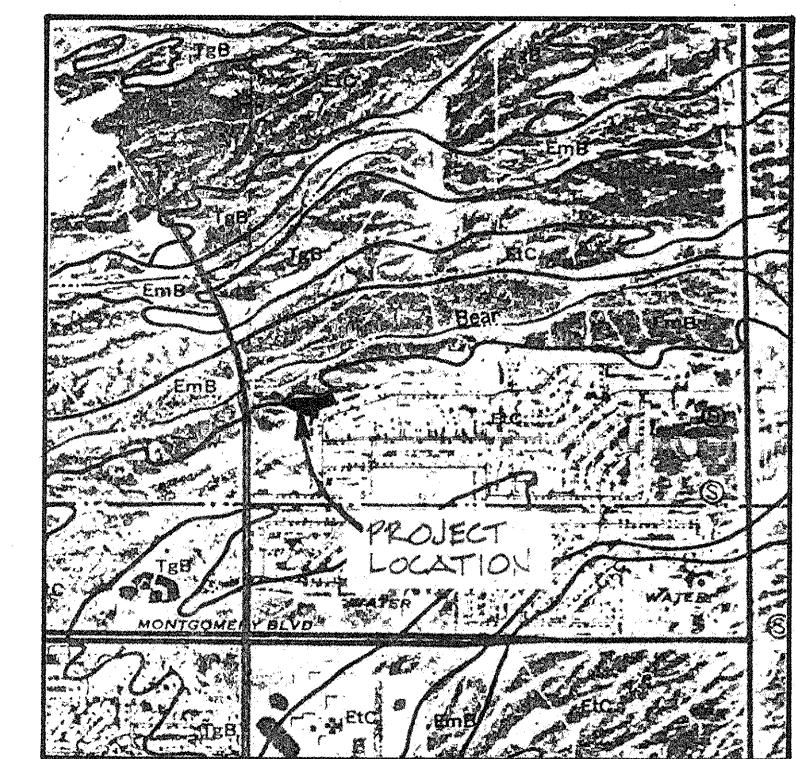


EARTHWORK NOTES

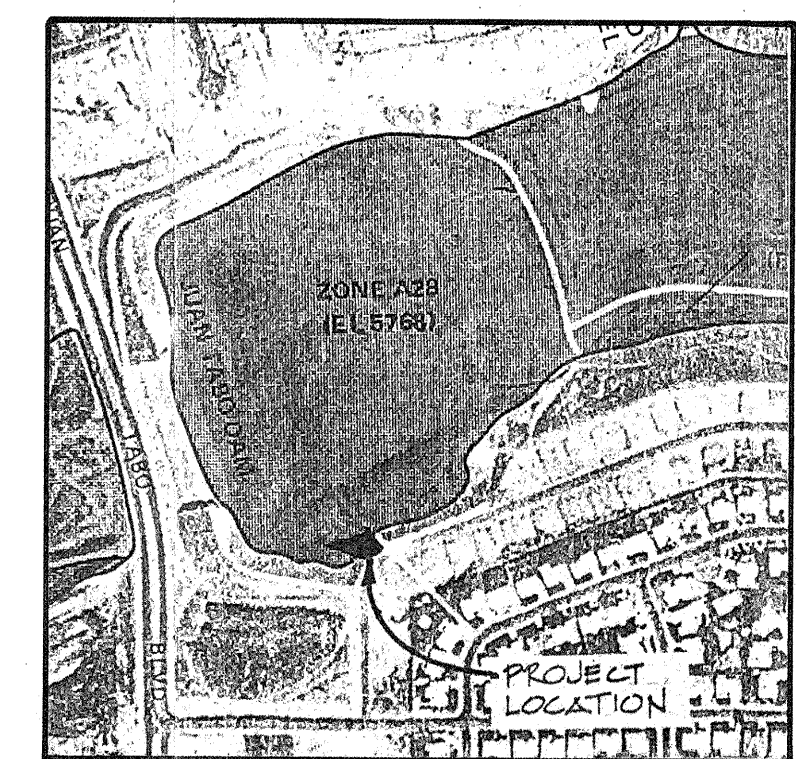
1. PRIOR TO PLACING FILL ON THE SITE, THE EXISTING SURFACE SHALL BE CLEARED OF DEBRIS, VEGETATION AND OTHER DELETERIOUS MATERIAL, MOISTENED TO OPTIMUM MOISTURE AND COMPACTED TO 90% OF OPTIMUM DENSITY PER ASTM D-1557.
2. FILL MATERIAL SHALL BE FREE FROM DEBRIS, ACCEPTABLE TO THE OWNER OR HIS DESIGNATED REPRESENTATIVE.
3. FILL SHALL BE MOISTENED TO OPTIMUM MOISTURE, PLACED IN 1 FOOT LOOSE LIFTS MAXIMUM, AND COMPACTED TO:
90% MINIMUM OVER THE ENTIRE SITE.
95% BENEATH AND EXTENDING 2'-0" FROM THE BUILDING PERIMETER FOOTING.



LOCATION MAP - GRID F-22
NO SCALE



SOILS MAP - FROM SCS SOIL SURVEY
OF BERNALILLO COUNTY



FEMA MAP - FLOOD INSURANCE RATE
MAP PANEL 18, 9/15/83

DRAINAGE PLAN

THE TRACT OF LAND IS DESCRIBED AS TRACT A-4-A, BLOCK 2 OF VISTA DEL SANDIA, REPLAT DATED MAY, 1987. THE TRACT IS ZONED R-2 WITH A PROPOSED DEVELOPMENT OF THREE TOWNHOUSE UNITS.

THE TRACT HAS A TOTAL AREA OF 9933 SQUARE FEET OR 0.228 ACRES. ALL OF THE FLOWS CONSIDERED IN THIS ANALYSIS ORIGINATE FROM THE SITE ITSELF AND FLOW OFF THE PROPERTY INTO THE JOHN ROBERT DAM RESERVOIR LOCATED TO THE NORTH AND WEST OF THE PROPERTY.

UNDEVELOPED CONDITIONS
Q=CIA WHERE Q=FLOW IN CFS, I= INTENSITY OF RAINFALL
A=AREA IN ACRES

SOIL TYPE IS THE EMBUDO SERIES ETC, HYDROLOGIC SOIL TYPE B FOR THIS SOIL TYPE AND FROM PLATES 22.2, C-1, THE RUNOFF FACTOR IS C=0.34
FOR THE LOCATION AND TIME OF CONCENTRATION OF 10 MINUTES THE INTENSITY IS 1-5.5 INCHES PER HOUR, THEREFORE,
 $Q(100 \text{ YEAR})=CIA = (0.34)(5.5)(.228) = 0.42 \text{ CFS}$

FOR THE VOLUME OF RUNOFF, THE RATIONAL METHOD PROVIDES A VERY CONSERVATIVE ESTIMATE, HOWEVER FOR THIS SIZE OF AN AREA IT CAN BE USED.
FROM THE PLATE 22.2, E-1 OF THE DPM VOL. II
 $VOL=1/2(Tc+2.67Tc)(Q)=1.84(Q)(Tc)(60)$
VOL FOR UNDEV. CONDITIONS=1.84(.43)(10)(60)=475 CU. FT.

DEVELOPED CONDITIONS
FLOW RATE(100 YEAR), Q=CIA, WHERE C=.72 FOR AN IMPERVIOUS RATIO OF 74.5%, SOIL TYPE B
 $Q=CIA = (0.72)(5.5)(.228) = 0.90 \text{ CFS}$
 $VOL=1.84(0.90)(10)(60) = 994 \text{ CU. FT.}$

AS CAN BE SEEN THE FLOW RATE DOES INCREASE BY 0.48 CFS, HOWEVER, THIS CAN EASILY BE HANDLED BY DOWN STREAM CAPACITY SINCE THE TIME TO PEAK FOR THE DAM IS MUCH LATER IN TIME THAN THE TIME OF CONCENTRATION CONSIDERED. THE MOST IMPORTANT CHANGE IS THE INCREASE IN VOLUME. THOUGH THIS IS NEGLIGIBLE WITH RESPECT TO THE VOLUME OF STORAGE, THE OWNER HAS AGREED WITH AMAFCA TO ONLY BORROW FILL MATERIAL FROM WITHIN THE STORAGE POOL. THE DIFFERENCE IN THE VOLUME IS 994-475 OR 519 CUBIC FEET. AS CALCULATED FROM EARTHWORK FOR THE CONTOURS AS SHOWN, THE ACTUAL VOLUME REMOVED FROM THE BASIN AND PLACED ABOVE THE 5768.00 FLOODPOOL ELEVATION IS 42,800 CUBIC FEET. THIS IS WELL IN EXCESS OF THE INCREASE IN RUNOFF VOLUME DUE TO DEVELOPMENT.

DEVELOPMENT CONFIGURATION
THE UNITS AS SHOWN ON THIS PLAN WILL HAVE LIVING SPACE AT ELEVATION 5772.00, OR 400 FOOT ABOVE THE FLOOD POOL ELEVATION AS SHOWN ON THE ATTACHED FEMA FLOOD INSURANCE RATE MAP(0018-C), AND 1.0 FEET ABOVE THE EMERGENCY SPILLWAY ELEVATION.
FLOW PATTERNS ON THE PROPERTY WILL GENERALLY BE SHEET TYPE FLOWS INTO THE DAM RESERVOIR.
THE EXISTING RUNDOWN AND EASEMENT LOCATED ON THE EAST EDGE OF THE PROPERTY WILL REMAIN AS IS.

LEGEND

NEW CONTOURS	---
EXIST. CONTOURS	---
IMPERVIOUS SURFACE ON SITE	[White Box]
PERVIOUS SURFACE ON SITE	[Shaded Box]
EXIST. SPOT ELEV.	78.50
NEW SPOT ELEV.	78.50
FLOW PATH	---

BOHANNAN HUSTON, INC.

PROJECT TITLE
DAM SHORE TOWNHOUSES
WOLFE COMPANY

CONTENTS
DRAINAGE PLAN

REVISIONS	DRAWN	PAGE
8/3/87	HCB	
9/23/87	CHECKED	
	GAW	
	PROJECT NO.	
	64311	
		SHEET
		1