

BOARD OF COUNTY COMMISSIONERS

PATRICK J. BACA, CHAIRMAN
DISTRICT 1

JACQUELYN SCHAEFER, VICE CHAIR
DISTRICT 5

ALBERT "AL" VALDEZ, MEMBER
DISTRICT 2

EUGENE M. GILBERT, MEMBER
DISTRICT 3

PATRICIA "PAT" CASSIDY, MEMBER
DISTRICT 4

JUAN R. VIGIL, COUNTY MANAGER

County of Bernalillo

State of New Mexico

ONE CIVIC PLAZA, N.W.
ALBUQUERQUE, NEW MEXICO 87102

ADMINISTRATION (505) 768-4000

COMMISSION (505) 768-4217

FAX (505) 768-4329

October 19, 1992

RAY GALLAGHER, SHERIFF

PATRICK J. PADILLA, TREASURER

GLADYS M. DAVIS, CLERK

MARK J. CARRILLO, ASSESSOR

THOMAS J. MESCALL, PROBATE JUDGE

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

RE: DRAINAGE PLAN FOR LOT 99, SANDIA HEIGHTS SOUTH
(C-23/D28) ENGINEER'S STAMP DATED JUNE 22, 1992

Dear Mr. Topmiller:

Based on the drainage information provided on the referenced submittal received October 16, 1992, the Certification is approved for the offsite improvements requested by Ms. Tunnel Watts. This satisfies the Certification of Occupancy release for Lot 99.

If you should have any questions, please do not hesitate to call me at 768-2650.

Cordially,

Gilbert Aldaz, P.E. & P.S.
City/County Floodplain Administrator

xc: Robert Foglesong, County Public Works
Clifford E. Anderson, AMAFCA
Tom Burlison, County Building Department

file
GA

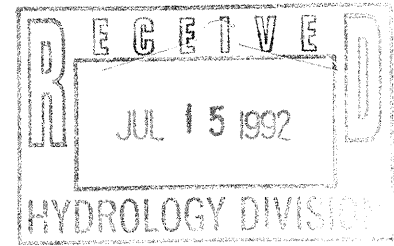
(wp+2928)

BOHANNAN-HUSTON INC.



COURTYARD I, 7500 JEFFERSON STREET, N.E. ALBUQUERQUE, NM 87109
TEL (505) 823-1000 FAX (505) 821-0892

July 2, 1992



Ms. Tunell Watts
688 Black Hawk, NE
Albuquerque, NM 87122

Re: Additional Drainage Improvements Relating to Construction on Lot 99, Sandia Heights South (C23/D27)

Dear Tunell:

The purpose of this letter is to present two alternatives for additional drainage improvements to mitigate erosion process as a result of construction on Lot 99, Sandia Heights South; your neighboring lot to the east. Two alternatives are provided in the enclosed sketches. These alternatives are those discussed with you during our field visit on Friday, June 26, 1992. The improvements are proposed to be located on your lot in order to achieve maximum effectiveness. The cost of constructing the improvements identified on the sketches will be borne by the owner of Lot 99 or the contractor.

This letter and enclosed sketches are prepared in accordance with the agreement made with you at the above-referenced meeting. The agreement is to provide alternatives for your review and approval. If the proposed improvements are to your satisfaction, you will indicate your approval by signing in the space provided on this letter.

Accordingly, please review the enclosed sketches of the proposed drainage improvement alternatives. If you have any questions, please contact me. I personally believe Alternate No. 1 may provide the most effective protection. If you approve of one of the alternatives, please indicate your approval by signing in the space provided below and indicate which alternative is acceptable to you. Please return the original of this letter to Mr. Gilbert Aldaz, City/County Floodplain Administrator, Hydrology Division, Public Works Department, City of Albuquerque, P.O. Box 1293, Albuquerque, NM 87103, telephone 768-2650. The copy is for your records.

Your signature below will also provide permission for Mr. Ray Holland to enter your lot to make the indicated improvements.

PRINCIPALS

LARRY W. HUSTON
MICHAEL M. EMERY, P.E.
BRIAN G. BURNETT, P.E.

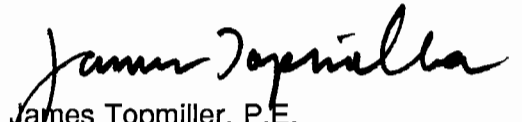
KERRY L. DAVIS, P.E.
ROBERT G. KLETZLI
LARRY A. LARRAÑAGA, P.E.

WILLIAM L. VREEKE, P.E.
GORDON A. WALHOOD JR., P.E.

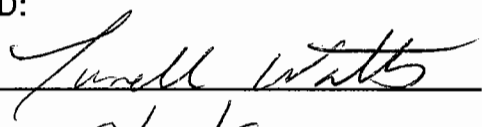
Ms. Tunell Watts
July 2, 1992
Page 2

If you so desire, additional questions may be directed to Mr. Aldaz.

Sincerely,


James Topmiller, P.E.
Project Manager
Community Development and Planning

ACCEPTED:

BY: 

DATE: 07/13/92

ALTERNATE NO: 1

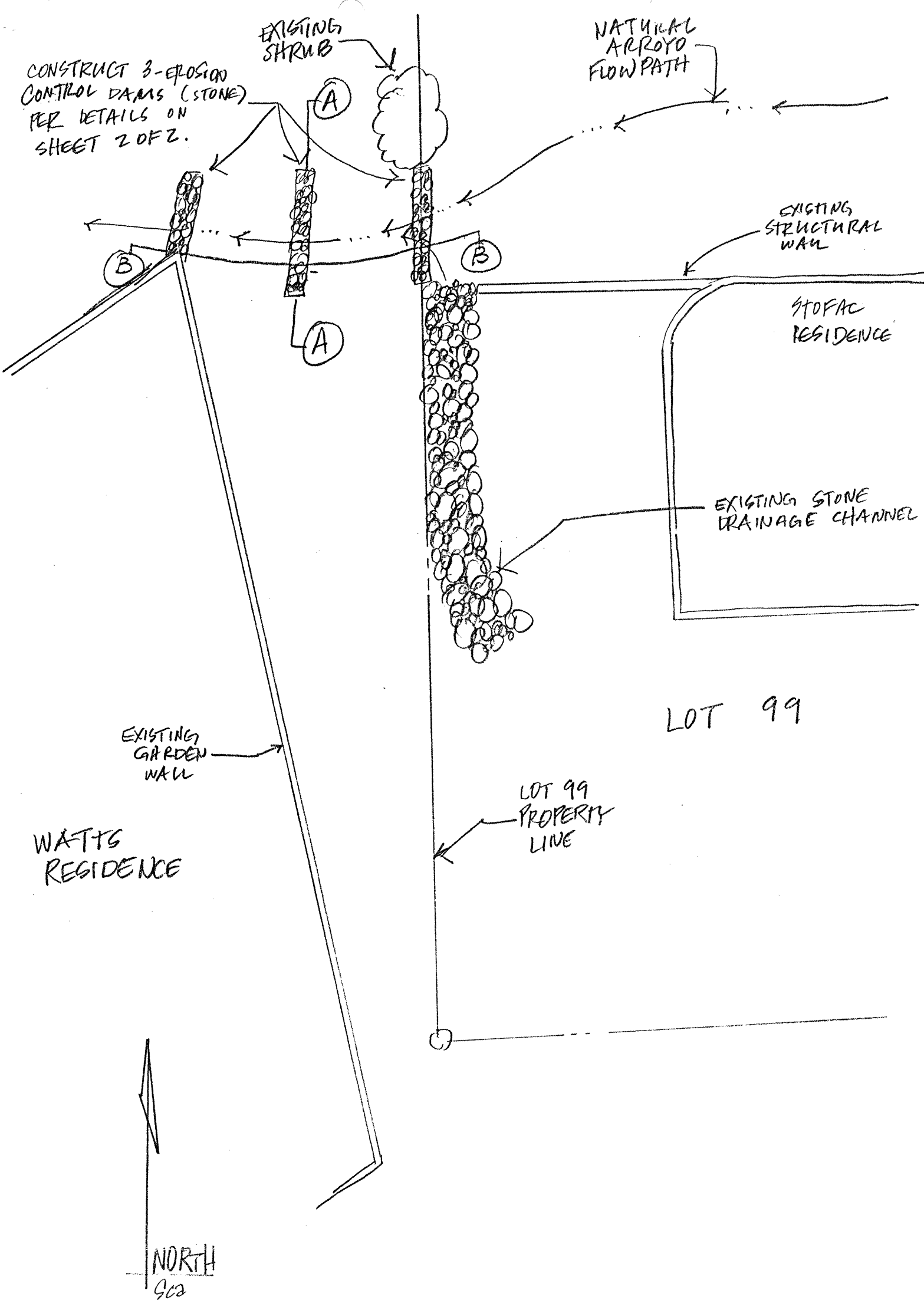
JRT/al
Job No. 91213.03

Enclosures

cc: Ray Holland
Nola Stofac
Gilbert Aldaz

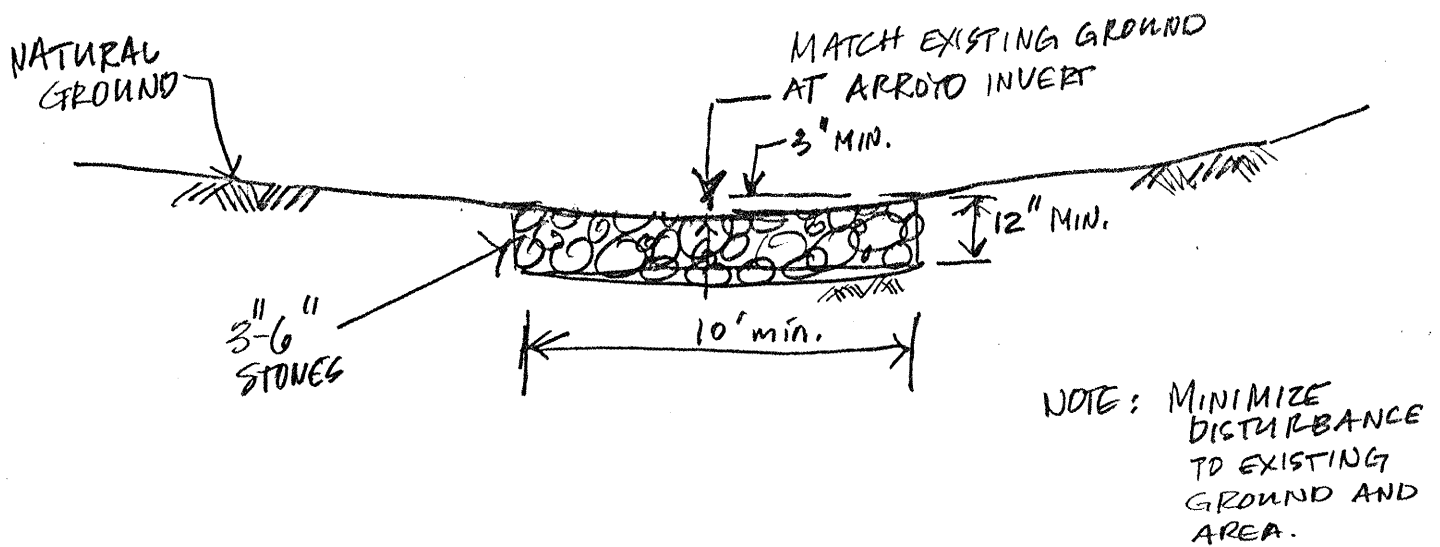
Please be advised that my signature is not meant to attest to the appropriateness of Alternative No. 1 in effectively protecting my property from water damage, as such knowledge is outside of my expertise. Further, I have relied upon the oral and written statements of the engineers involved that Alternative No. 1 will provide adequate drainage.

By my signature, I do give Mr. R. Holland and his workers permission to construct Alternative No. 1 on my property. 



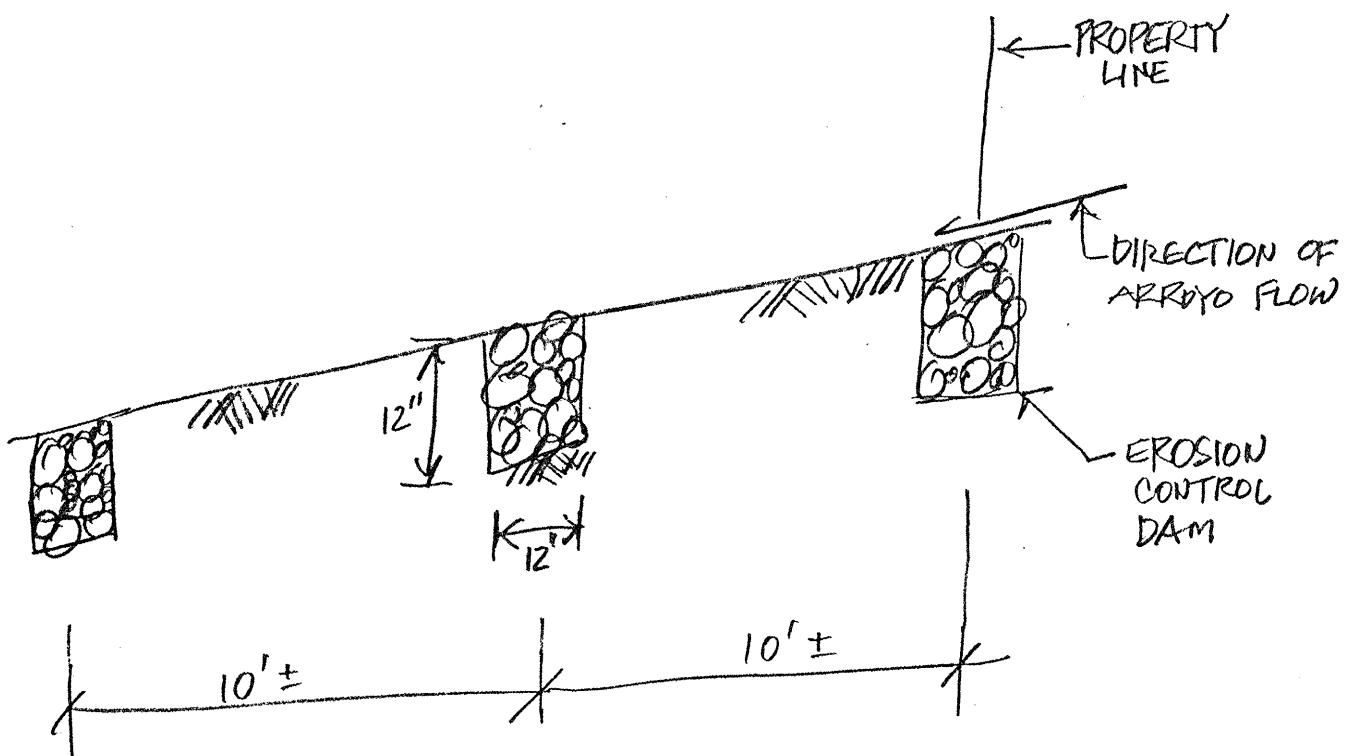
ALTERNATE # 1

EROSION
CONTROL
DAMS



SECTION (A)-(A)

EROSION CONTROL DAM DETAIL



SECTION (B)-(B)

EROSION CONTROL DAM DETAIL

ALTERNATE #1

Gilbert Aldaz, P.E.
Hydrology Section
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Re: Lot 99, Sandia Heights South - Hold Harmless Agreement

Dear Bernie:

The purpose of this letter is to provide the requested Hold Harmless Agreement for the approval of the Building Permit for the subject lot. The undersigned lot owner agrees to save the City of Albuquerque, County of Bernalillo and AMAFCA (the Authorities) harmless from any and all liability arising from the Authorities approval of this drainage plan. It is understood that the Authorities do not agree to save the undersigned owner harmless from any liability which may arise from the owner's negligent use of the property and drainage facilities constructed with the approved plan.

The undersigned lot owner fully understands that this property is within a 100-year floodplain as shown on the National Flood Insurance Program "Flood Insurance Rate Map" and may be subject to flooding. Any development of this property must conform to the Bernalillo County Flood Damage Prevention Ordinance. The property may be subject to the flood insurance requirements of the Federal Emergency Management Agency (FEMA). Until such time that a map revision is approved by FEMA for existing drainage improvements, flood insurance is likely to be required.

The agreements and obligation of this letter of the owner as set forth herein shall be binding on the owner, his heirs, assigns and successors and on the owner's property and constitute covenants running the owner's property until released by the Authorities.

WITNESS its hand and seal this 30 day of October, 1991.

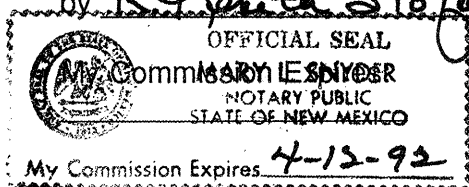
R. Kenneth Stofac
Lot Owner

Nola R. Stofac
Lot Owner

ACKNOWLEDGEMENT FOR NATURAL PERSONS

STATE OF NEW MEXICO)
SS
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 30 day of October, 1991
by R. Kenneth Stofac & Nola R. Stofac



Mary E. Snyder
Notary Public

GRANT OF EASEMENT
FLOODWAY AND STORM DRAINAGE WORKS

R. Kenneth and Nola K. Stofac,

Grantors, for good and valuable consideration, the receipt of which is hereby acknowledged, does grant, bargain, sell and convey unto the ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY, a political subdivision of the State of New Mexico, Grantee, and its successors and assigns, the permanent right and easement for drainage, flood control and conveyance of storm water and the construction, reconstruction, operation and maintenance of, and access to such facilities on, in, under, over and across the following described real estate:

The land in which the foregoing rights and easements are granted is located in the County of Bernalillo and State of New Mexico and is more particularly described in Exhibit "A" attached hereto and incorporated herein by reference.

Except by the written approval of Grantee, no fence, wall, building, or other obstruction may be placed or maintained in said easement and there shall be no alteration of the grades or contours in said easement. The granting of this easement shall not obligate the Grantee to maintain natural arroyos, drainage channels, or facilities that do not meet the standards of the Grantee for design and construction, nor shall this granting require the protection of property lying outside of the easement granted. Grantee shall only maintain property and/or improvements that it specifically agrees, by written agreement filed for public record, to maintain. Unless Grantee specifically agrees, by a written agreement, to maintain property and/or improvements, such maintenance responsibility shall remain with the Grantor, its successors or assigns. Safe locations for structures built on lands adjacent to the real property described herein may be substantially outside of the area described herein.

TO HAVE AND TO HOLD the said right and easement for the uses and purposes aforesaid, unto the Grantee, its successors and assigns, forever, except that any portion of the easement granted herein shall revert to the Grantor, its successors or assigns, as and to the extent said portion is declared unnecessary for flood control or drainage by the Board of Directors of the Albuquerque Metropolitan Arroyo Flood Control Authority. Any reversion shall be conveyed by quitclaim deed.

THERE IS RESERVED to the Grantor, its successors and assigns, the right to use said lands for open space landscaping and other purposes which will not interfere with the rights and easements hereby granted, provided that Grantor obtains Grantee's written approval for such use, not to be unreasonably withheld.

WITNESS its hand and seal this 17 day of October,
1991.

Mola R. Stofac

ACKNOWLEDGMENT FOR NATURAL PERSONS

[illegible]

The foregoing instrument was acknowledged before me this 17th
day of October, 1991 by R. Kenneth and Nola K. Stofac
(name)
husband and wife

My commission expires:
1-17-95

(~~marital~~ status)

Notary Public

(SEAL)

ACKNOWLEDGMENT FOR CORPORATION

STATE OF NEW MEXICO)
) SS.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this ____ day of _____, 199__, by _____ (name)

_____ of _____
(title) (corporation)
a _____ corporation on behalf of said corporation.
(state)

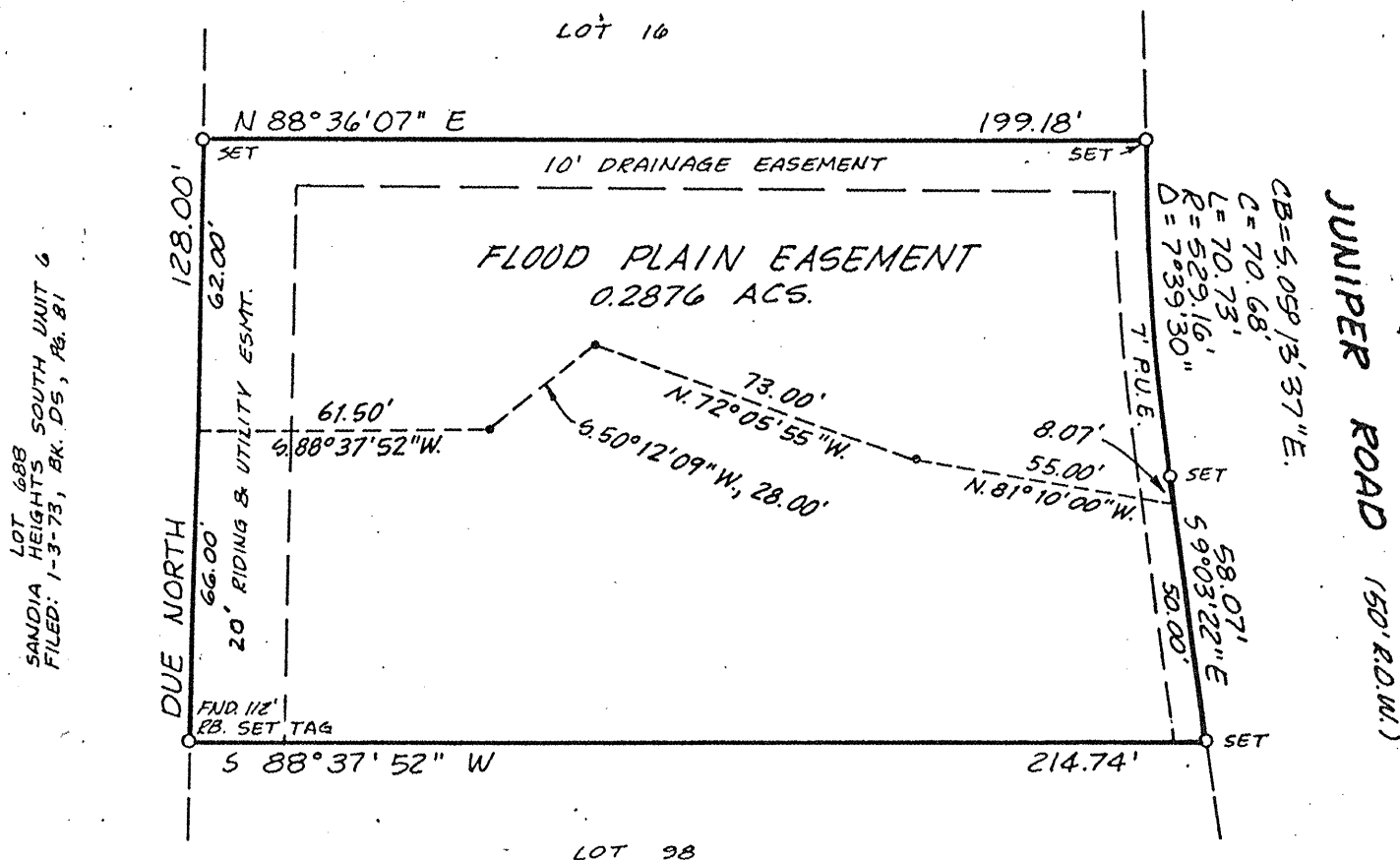
My Commission Expires:

Notary Public

(SEAL)

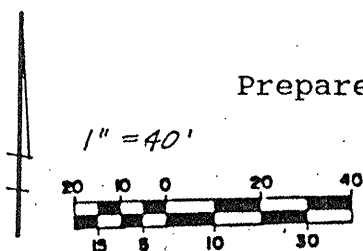
EXHIBIT "A"

LOT 99
0.6038 ACS. (Total Area)
(VACANT)



NOTE:

BASIS OF BEARING & ADJOINERS PER. SANDIA HEIGHTS SOUTH
FILED: JUNE, 20, 1966 BK. D3, PG. 144 UNLESS OTHERWISE NOTED.
ALL CORNERS MARKED "SET" ARE 1/2" RB. W/CAP LS. 6446.



Prepared by:

Southwest Surveying Co., Inc.
333 Lomas Blvd., N.E.
Albuquerque, New Mexico 87102
(505) 247-4444

Date: 10/17/91

Prepared for: Nola Stoltz

FLOOD PLAIN EASEMENT DESCRIPTION

(Determined from Bohannon-Huston Inc. drainage and grading plan 10/10/91)

A certain tract of land to be designated as a Flood Plain Easement being the Northerly portion of Lot numbered Ninety-nine (99) of SANDIA HEIGHTS SOUTH SUBDIVISION, as the same is shown and designated on said plat thereof filed in the Office of the County Clerk of Bernalillo County, New Mexico on June 20, 1966, Volume D3, Folio 144 and being more particularly described as follows:

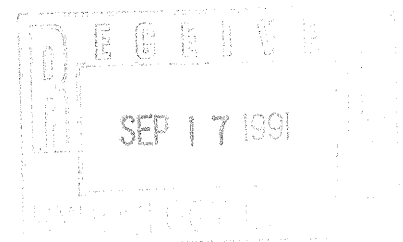
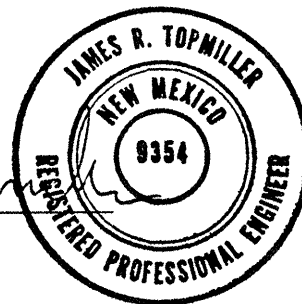
BEGINNING at the Northwest corner of said tract being the Northwest corner of said Lot 99, thence from said point of beginning N. 88° 36' 07" E., 199.18 feet to the Northeast corner, and a point on the West right-of-way of Juniper Road; thence Southerly along said right-of-way along a curve to the left through a central angle of 7° 39' 30", having a radius of 529.16 feet, a distance of 70.73 feet to a point of tangency; thence, continuing along said right-of-way, S. 09° 03' 22" E., 8.07 feet to the Southeast corner; thence, leaving said right-of-way, N. 81° 10' 00" W., 55.00 feet to a point; thence, N. 72° 05' 55" W., 73.00 feet to a point; thence, S. 50° 12' 09" W., 28.00 feet to a point; thence, S. 88° 37' 52" W., 61.50 feet to the Southwest corner; thence DUE NORTH, 62.00 feet to the point of beginning and containing 0.2876 acres, more or less.

**DRAINAGE/GRADING PLAN
FOR
LOT 99
SANDIA HEIGHTS SOUTH**

September, 1991

Prepared by:

James R. Topmiller
James R. Topmiller, P.E.



DRAINAGE/GRADING PLAN
for
LOT 99, SANDIA HEIGHTS SOUTH

Prepared for:
NOLA STOFAC AND RAY HOLLAND CONSTRUCTION

Prepared by:
BOHANNAN-HUSTON, INC.
7500 JEFFERSON STREET, N.E.
COURTYARD I
ALBUQUERQUE, NM 87109

September, 1991

Job No. 91213.02

INTRODUCTION

The purpose of this report is to provide a drainage analysis and grading/drainage plan for the construction of a single-family residence in Sandia Heights South.

SITE LOCATION AND LEGAL DESCRIPTION

Lot 99, Sandia Heights South, approx. 0.6 acres. West side of Juniper Hills Road, south of Cedar Hill Road. A vicinity map is shown on the enclosed drainage/grading plan.

EXISTING SITE CHARACTERISTICS

The site's existing condition consists of light vegetation and moderate ground slopes. The natural slope of the land is approximately 8-9% falling in the westerly direction. The lot is bordered on the west, north and south sides by developed lots. The east boundary is the paved Juniper Hills Road.

Site soils are a well-drained, granular decomposed granite.

As indicated on the enclosed FEMA Floodway Map and on the drainage/grading plan, the site is nearly fully covered by a broad, shallow 100-year floodplain.

An existing 30-inch concrete culvert is located at the road's intersection with the arroyo. It is currently plugged with debris and silt.

DEFINING THE EXISTING FLOODPLAIN

The large-scale effort of the FEMA Floodplain mapping program precluded the accurate plotting and placement of the true floodplains across a small, individual lot. This section discusses the analysis method used to define the "true floodplain limit" on this site.

The upstream basin area of the floodplain across this site contains approximately 13.1 acres. Using HYMO, as modified by recent City of Albuquerque DPM Steering Committee revisions (Sept. 1991), a drainage flow for the 6-hr., 100-year storm event is determined to be 46 cfs. This flow is surprisingly low for a FEMA Floodway designation, however, rechecks of upstream basin areas and flow calculations confirm the value as correct.

HEC-2 analysis was then used to define the flow and floodplain characteristics in the arroyo as it crosses the site boundaries. The existence of the road on the east side of the site complicated the analysis by introducing a severe discontinuity in the arroyo invert. The road creates a small "dam", or flow constriction, in the flow path. This analysis worked through the complexities by assuming some conservative approaches to the problem. One conservative approach was to assume the existing culvert remains plugged indefinitely. Consequently, as the flow crosses the road, it is "spread" and made more difficult to both analyze and collect.

A second conservative analysis approach is as follows. Incoming flow to the site, as it crosses over the road, is assumed to act as passing through a weir, i.e., with zero velocity at the weir entrance. In truth, there is some velocity to the flow as it approaches and crosses the road.

This inherent velocity would tend to decrease the flow depth at the road from that being assumed in a weir condition. Thus, this is a conservative approach. This assumption establishes the depth of flow, or the water surface elevation, at the road. The water surface elevation is 81.6 (refer to the calculations section of this report).

The computer runs and output for the arroyo analysis are enclosed in this report. Water surface elevations at several stations along the arroyo within the site are identified in this analysis. The station locations and floodplain limits are shown on the enclosed sheet entitled "HEC-2 Analysis Format". The results indicate a split-flow condition within the arroyo, also shown on the enclosed plan sheets. However, the floodplain is shown to be confined to the deeper sections of the arroyo on the site's northern area, a substantially and understandably smaller floodplain area than that shown on the FEMA maps. The floodplain was widened in the east reach (the adjusted limits) over the floodplain of the HEC-2 analysis to better account for the spread condition of flow as it crosses the road. The low velocities (around 5 fps) and low depths (< 1") show the existing flow condition to be of low power and only marginally erosive.

PROPOSED DRAINAGE MANAGEMENT PLAN

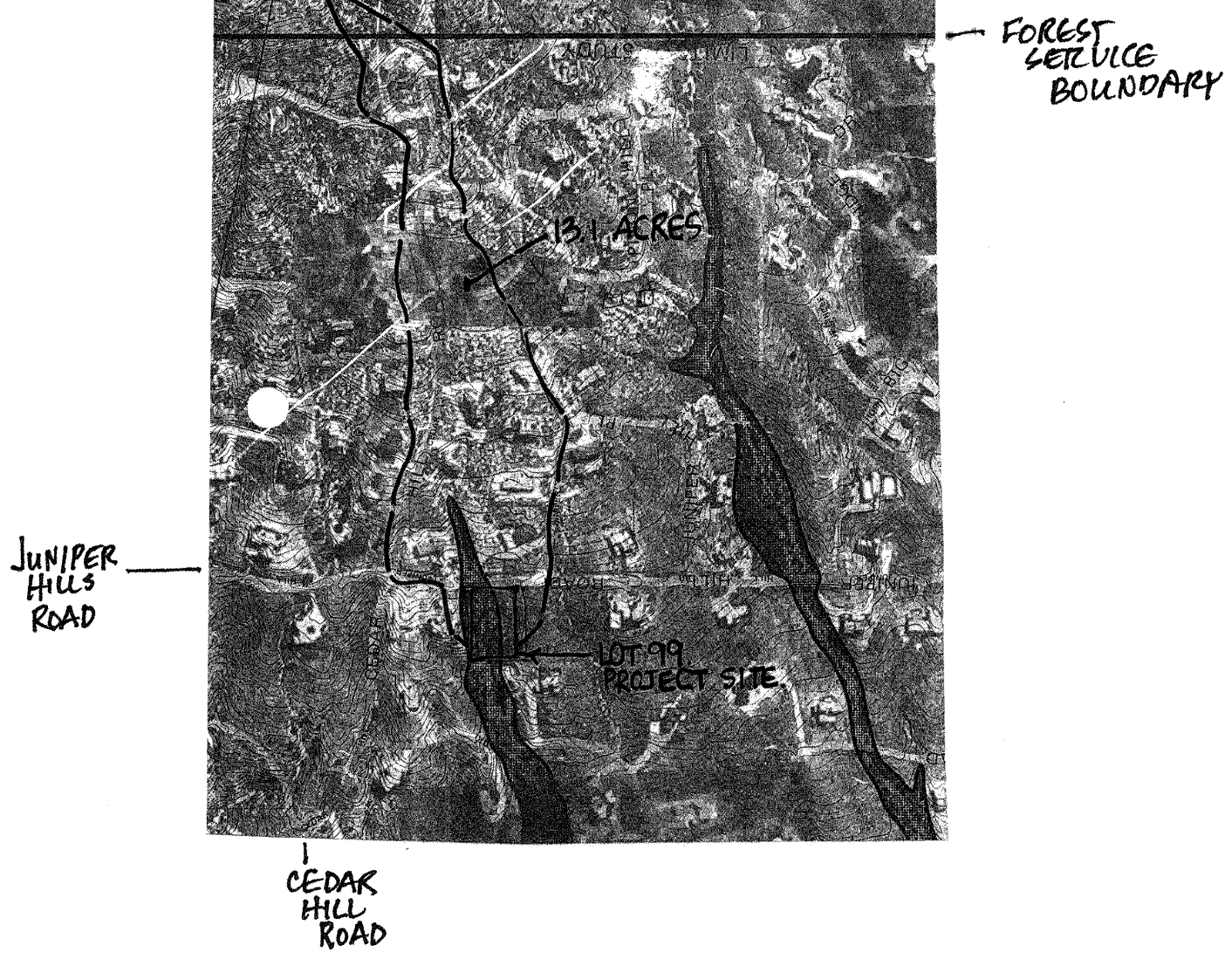
The proposed drainage management for this site is to substantially remove the proposed home construction from the existing true floodplain, as shown on the drainage/grading plan sheet. Small areas will require regrading to accomplish this. Generally, the home will be constructed a minimum of 6' from the true floodplain limit in accordance with guidelines set out by the City/County Floodplain Administrator. The exception is the northwest corner which is located 3' from the floodplain limit. This proximity is not considered a problem due to the small flows and broad widths of this floodplain.

Free discharge will continue to be permitted for the development of this property as approved in previous Sandia Heights master drainage plans for the area. Offsite flows will continue to be accepted and discharged by the site in the historical and non-disruptive manner.

To ensure collection and diversion of the southernmost reaches of the floodplain as it crosses the roadway, a cutoff wall will be installed in the site's southeast corner.

6830 V E
OCT 15 1971

← NORTH



UPSTREAM BASIN MAP &
FLOODPLAIN MAP

SCALE 1" = 500'

HYMO COMPUTER RUN

HYMO RUN USING "NM HYD" ^{simplified Hymo input}

PROJECT: LOT 99, SANDIA HEIGHTS

procedure: JAN. 1991 DPM HYDROLOGY REVISIONS

step	Calculation
1.	$P_{60} = 2.25"$ $P_{360} = 2.90"$
2.	Type of rainfall dist. = TYPE 1 (a six-hr storm)
3.	Incremental time = 0.03333 (2 min.) (DT)
4.	Quarter Hour Rainfall = 0.0
5.	Total Acreage = 13 acres (0.0203 sq. mi.) Treatment D = $\frac{9.6}{13} = 0.738$ $D = \frac{3.4}{13} = 0.261$
6.	$T_c = \left(\frac{L}{v}\right) / 60 = (2000 / 3.3) / 60 = 10 \text{ min} < 12 \text{ min.}$ $T_c, \text{ use } 12 \text{ min}$

where $v = K\sqrt{s} = 1.0\sqrt{11} = 3.3 \text{ fps}$

$K = 1.0$ (bare ground)
 $s = 11\%$ slope



BOHANNAN-HUSTON INC.

PROJECT NAME

SHEET

OF

PROJECT NO.

BY

DATE

SUBJECT

CH'D

DATE

Step

7.

$$T_p = \frac{2}{3} t_c = \frac{2}{3} (12) = 8 \text{ min.} \\ (0.1333 \text{ hr})$$



BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____
PROJECT NO. _____ BY _____ DATE _____
SUBJECT _____ CH'D _____ DATE _____

* Lot 99, Sandia Heights
 * HYMO run using AMAFCA/DPM hydrology revisions, dated January, 1991
 * Upstream drainage basin is approx. 13 acres

*
 SUMMARY 1
 RAINFALL type=1 rain quarter=0.0 rain one=2.25
 rain six=2.90 rain day=0.0 dt=.033333

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATL
 DT = 0.033333 HOURS END TIME = 5.999940 HOU

0.0000	0.0051	0.0103	0.0156	0.0210	0.0266	0.032
0.0380	0.0439	0.0500	0.0562	0.0625	0.0691	0.075
0.0826	0.0897	0.0969	0.1044	0.1121	0.1201	0.128
0.1369	0.1457	0.1549	0.1644	0.1743	0.1847	0.195
0.2069	0.2189	0.2315	0.2378	0.2444	0.2515	0.266
0.3010	0.3536	0.4292	0.5323	0.6678	0.8406	1.055
1.3182	1.5611	1.6627	1.7485	1.8248	1.8943	1.958
2.0176	2.0730	2.1250	2.1740	2.2201	2.2638	2.305
2.3441	2.3812	2.4164	2.4498	2.4815	2.4897	2.497
2.5050	2.5123	2.5192	2.5260	2.5325	2.5388	2.545
2.5510	2.5568	2.5625	2.5681	2.5735	2.5788	2.584
2.5891	2.5941	2.5990	2.6038	2.6085	2.6131	2.617
2.6222	2.6266	2.6309	2.6352	2.6394	2.6436	2.647
2.6517	2.6557	2.6597	2.6636	2.6674	2.6712	2.674
2.6787	2.6823	2.6859	2.6895	2.6931	2.6966	2.700
2.7035	2.7069	2.7102	2.7136	2.7169	2.7201	2.723
2.7266	2.7298	2.7329	2.7361	2.7392	2.7422	2.745
2.7483	2.7513	2.7543	2.7572	2.7602	2.7631	2.766
2.7688	2.7717	2.7745	2.7773	2.7801	2.7828	2.785
2.7883	2.7910	2.7937	2.7964	2.7990	2.8016	2.804
2.8069	2.8095	2.8120	2.8146	2.8171	2.8196	2.822
2.8246	2.8271	2.8296	2.8320	2.8345	2.8369	2.839
2.8417	2.8441	2.8465	2.8488	2.8512	2.8535	2.855
2.8581	2.8604	2.8627	2.8650	2.8673	2.8695	2.871
2.8740	2.8762	2.8784	2.8806	2.8828	2.8850	2.887
2.8893	2.8915	2.8936	2.8958	2.8979	2.9000	

*
 COMPUTE NM HYD id=1.0 hyd no=100 da=.0203
 per a=0.0 per b=73.8 per c=0.0 per d=26.1
 tp=.13333 mass rainfall=-1

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.073	0.545	7.11	20.9	526.28	0.005	0.1	0.04
Pervious	0.133	0.135	1.013	3.49	35.9	319.30	0.015	0.5	1.25

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

*
 PRINT HYD id=1.0 code=1

OUTFLOW HYDROGRAPH RESERVOIR 100.

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.	2.367	2.	4.733	0.
0.033	0.	2.400	2.	4.767	0.
0.067	0.	2.433	2.	4.800	0.
0.100	0.	2.467	2.	4.833	0.

0.133	0.	2.500	2.	4.867	0.
0.167	0.	2.533	1.	4.900	0.
0.200	0.	2.567	1.	4.933	0.
0.233	0.	2.600	1.	4.967	0.
0.267	0.	2.633	1.	5.000	0.
0.300	0.	2.667	1.	5.033	0.
0.333	0.	2.700	1.	5.067	0.
0.367	0.	2.733	1.	5.100	0.
0.400	0.	2.767	1.	5.133	0.
0.433	0.	2.800	1.	5.167	0.
0.467	0.	2.833	1.	5.200	0.
0.500	0.	2.867	1.	5.233	0.
0.533	0.	2.900	1.	5.267	0.
0.567	0.	2.933	1.	5.300	0.
0.600	0.	2.967	1.	5.333	0.
0.633	0.	3.000	1.	5.367	0.
0.667	0.	3.033	1.	5.400	0.
0.700	0.	3.067	1.	5.433	0.
0.733	0.	3.100	0.	5.467	0.
0.767	1.	3.133	0.	5.500	0.
0.800	1.	3.167	0.	5.533	0.
0.833	1.	3.200	0.	5.567	0.
0.867	1.	3.233	0.	5.600	0.
0.900	1.	3.267	0.	5.633	0.
0.933	1.	3.300	0.	5.667	0.
0.967	1.	3.333	0.	5.700	0.
1.000	1.	3.367	0.	5.733	0.
1.033	1.	3.400	0.	5.767	0.
1.067	1.	3.433	0.	5.800	0.
1.100	1.	3.467	0.	5.833	0.
1.133	1.	3.500	0.	5.867	0.
1.167	1.	3.533	0.	5.900	0.
1.200	1.	3.567	0.	5.933	0.
1.233	2.	3.600	0.	5.967	0.
1.267	3.	3.633	0.	6.000	0.
1.300	5.	3.667	0.	6.033	0.
1.333	9.	3.700	0.	6.067	0.
1.367	16.	3.733	0.	6.100	0.
1.400	24.	3.767	0.	6.133	0.
1.433	34.	3.800	0.	6.167	0.
1.467	42.	3.833	0.	6.200	0.
1.500	46.	3.867	0.	6.233	0.
1.533	45.	3.900	0.	6.267	0.
1.567	40.	3.933	0.	6.300	0.
1.600	34.	3.967	0.	6.333	0.
1.633	29.	4.000	0.	6.367	0.
1.667	25.	4.033	0.	6.400	0.
1.700	22.	4.067	0.	6.433	0.
1.733	19.	4.100	0.	6.467	0.
1.767	17.	4.133	0.	6.500	0.
1.800	14.	4.167	0.	6.533	0.
1.833	13.	4.200	0.	6.567	0.
1.867	11.	4.233	0.	6.600	0.
1.900	10.	4.267	0.	6.633	0.
1.933	9.	4.300	0.	6.667	0.
1.967	8.	4.333	0.	6.700	0.
2.000	8.	4.367	0.	6.733	0.
2.033	7.	4.400	0.	6.767	0.
2.067	6.	4.433	0.	6.800	0.
2.100	5.	4.467	0.	6.833	0.
2.133	5.	4.500	0.	6.867	0.

2.167	4.	4.533	0.	6.900	0.
2.200	3.	4.567	0.	6.933	0.
2.233	3.	4.600	0.	6.967	0.
2.267	3.	4.633	0.	7.000	0.
2.300	2.	4.667	0.		
2.333	2.	4.700	0.		

RUNOFF VOLUME = 1.615 ACRE-FT
 PEAK DISCHARGE RATE = 46.1 CFS
 PEAK OCCURRED AT 1.50 HRS.

FINISH

HYMO SUMMARY TABLE

DESCRIPTION	HYDROGRAPH LABEL	FROM ID NO	TO ID NO	AREA SQ MI	DISCHARGE CFS	CURVE NO	TIME TO PEAK HR	CFS PER ACRE
HYDROGRAPH AT	100.	1	-	0.0203	46.1	NA	1.50	3.55

HEC-2 COMPUTER RUNS

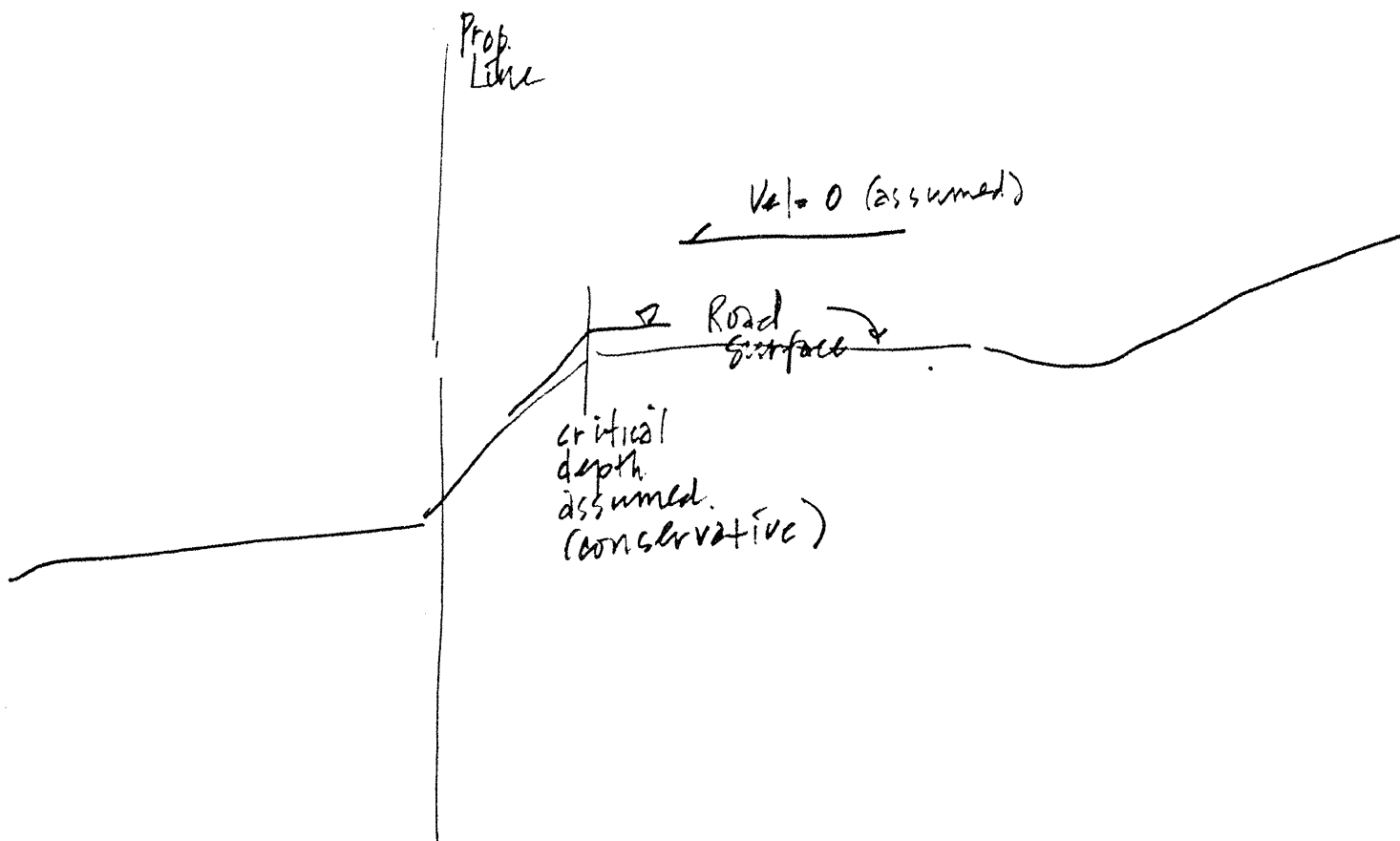
WEIR ANALYSIS AT EDGE OF ROAD

WEIR COEFFICIENT=3.0000

PROGRAM DIVIDED X-SECTION INTO VERTICAL SLICES 1. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	82.50	3	105.00	81.10			
2	50.00	81.60	4	176.00	81.90			

WSEL	DEPTH	FLOW	FLOW	FLOW	TOPWID
FT.	INC	AREA	RATE	VEL	PLUS
	FT.	SQ.FT.	(CFS)	(FPS)	OBSTRUCTIONS
81.30	0.20	3.97	4.26	1.07	39.75
81.50	0.40	15.90	24.13	1.52	79.50
81.70	0.60	35.50	66.30	1.87	113.81
81.90	0.80	61.15	133.30	2.18	142.67



WEIR

DISCHARGES=

46.0

POINT	ELEV	DIST	POINT	ELEV	DIST	POINT	ELEV	DIST
1	82.50	0.00	3	81.10	105.00			
2	81.60	50.00	4	81.90	176.00			

WSEL	DEPTH	FLOW	FLOW	FROUDE	E	M
(FT)	INC	AREA	VEL.	NO.	(FT)	CU.FT.
(FT)	(FT)	SQ.FT.	FPS			
81.30	0.20	3.97	11.57	6.45	2.28	16.80
81.50	0.40	15.90	2.89	1.14	0.53	6.25
81.70	0.60	35.50	1.30	0.41	0.63	9.00
81.90	0.80	61.15	0.75	0.20	0.81	17.79

```

*****
WATER SURFACE PROFILES
VERSION OF NOVEMBER 1976
UPDATED APRIL 1980
VAX CONV. 23-NOV-81 BOHANNAN-HUSTON INC.
* RUN DATE 31-JUL-91 TIME 15:58:35
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS
* THE HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET, SUITE 200
* DAVIS, CALIFORNIA 95616
* (916) 440-2105 (FIS) 448
*****

```

```

X   X   XXXXXX   XXXX           XXXX
X   X   X       X   X       X   X
X   X   X       X           X
XXXXXX XXXX   X   XXXXX   XXXX
X   X   X       X           X
X   X   X       X   X       X
X   X   XXXXXX   XXXX           XXXXXX

```

FILE: HEC 2 LOT 99 EXIST. IN
 COP: [JAMES]

EXISTING CONDITIONS
 CALCULATIONS

THIS RUN EXECUTED 31-JUL-91 15:58:3

 EC2 RELEASE DATED NOV 76 UPDATED APR. 1980
 ERROR CORR - 01,02,03,04
 MODIFICATION - 50,51,52,53,54

1 LOT 99, SANDIA HEIGHTS SOUTH
 HEC2 RUN, FILE= HEC2LOT99.IN
 100-YEAR, 6-HR STORM FLOW= 46 CFS

ICHECK	INQ	NINW	IDIR	SIRT	MEIRIC	HVINS	Q	WSEL	FQ
0.	0.	0.	1.	-1.000000	0.00	0.0	46.	81.550	0.000
NPROF	IPILOT	PRFVS	XSECV	XSECH	FN	ALLDC	IEW	CHNIM	TIRACE
-1.000	0.000	0.000	0.000	0.000	0.000	-1.000	0.000	0.000	0.000
VARIABLE CODES FOR SUMMARY PRINTOUT									
150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.045	0.045	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1004.000	5.000	0.000	174.000	10.000	10.000	10.000	10.000	0.000	0.000
R 82.600	0.000	82.000	30.000	81.600	50.000	81.100	105.000	81.900	174.000
1014.000	9.000	0.000	150.000	10.000	10.000	10.000	10.000	0.000	0.000
R 76.000	0.000	79.000	25.000	77.000	32.000	77.000	47.000	77.000	77.000
77.000	106.000	74.000	123.000	75.000	134.000	76.000	150.000	0.000	0.000
1024.000	8.000	0.000	135.000	10.000	10.000	10.000	10.000	0.000	0.000
77.000	0.000	77.000	28.000	75.500	35.000	76.300	77.000	76.300	100.000
73.500	123.000	75.000	135.000	75.000	149.000	0.000	0.000	0.000	0.000
1034.000	8.000	0.000	148.000	50.000	50.000	50.000	50.000	0.000	0.000
R 76.000	0.000	76.000	27.000	74.500	34.000	75.000	77.000	75.300	101.000
R 72.573.000	123.000	74.000	133.000	75.000	148.000	0.000	0.000	0.000	0.000
1084.000	8.000	0.000	143.000	50.000	50.000	50.000	50.000	0.000	0.000
74.000	0.000	72.000	7.000	70.000	30.000	71.000	76.000	69.500	85.000
70.300	105.000	69.300	124.000	72.000	143.000	0.000	0.000	0.000	0.000

[illegible]

UL-91 15:58:36

SENO	DEPTH	QWSEL	CRWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
2	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSTA
SLOPE	XLOB	XLCH	XLOER	ITRIAL	IDC	ICONT	CORAR	TOEWID	ENDST

PROF 1

TICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

END 1004.000

3120 CRITICAL DEPTH ASSUMED

1004.00	0.42	81.52	81.52	81.55	81.63	0.11	0.00	0.00	82.60
46.	0.	46.	0.	0.	17.	0.	0.	0.	81.90
0.00	0.00	2.64	0.00	0.045	0.045	0.045	0.000	81.10	58.67
0.051107	0.	0.	0.	0	10	0	0.00	82.66	0.00

END 1014.000

35 SLOPE TOO STEEP, EXCEEDS 0.40

3301 HV CHANGED MORE THAN HVINS

1014.00	0.54	74.54	75.14	0.00	80.12	5.58	1.51	0.00	76.00
46.	0.	46.	0.	0.	2.	0.	0.	0.	76.00
0.00	0.00	18.96	0.00	0.045	0.045	0.045	0.041	74.00	119.94
..912155	10.	10.	10.	6	20	0	0.00	8.99	0.00

END 1024.000

3301 HV CHANGED MORE THAN HVINS

1024.00	0.83	74.33	74.65	0.00	75.40	1.08	4.72	0.00	77.00
46.	0.	46.	0.	0.	6.	0.	0.	0.	75.00
0.00	0.00	8.32	0.00	0.045	0.045	0.045	0.041	73.50	116.22
0.208767	10.	10.	10.	6	17	0	0.00	13.39	0.00

END 1034.000

3301 HV CHANGED MORE THAN HVINS

X-SECTION		1.6		73.6c					
1034.00	0.97	73.97	74.06	0.00	74.36	0.40	1.04	0.00	76.00
46.	0.	46.	0.	0.	9.	0.	0.	0.	75.00
0.00	0.00	5.05	0.00	0.045	0.045	0.045	0.041	73.00	113.77
0.062074	10.	10.	10.	4	11	0	0.00	18.89	0.00

JUL-91 15:58:36

SENO	DEPTH	QWSEL	CRWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSIA
SLOPE	XLOB	XLCH	XLOBR	TIRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SENO 1084.000

3 15 DIVIDED FLOW

1084.00	0.68	69.98	70.10	0.00	70.34	0.36	4.02	0.00	74.00
46.	0.	46.	0.	0.	10.	0.	0.	0.	72.00
0.00	0.00	4.80	0.00	0.045	0.045	0.045	0.043	69.30	82.12
0.108285	50.	50.	50.	4	15	0	0.00	32.58	0.00

DEPTH (TYP)

*SENO 1134.000

1134.00	0.96	65.36	65.50	0.00	65.84	0.48	4.50	0.00	70.00
46.	0.	46.	0.	0.	8.	0.	0.	0.	69.00
0.01	0.00	5.55	0.00	0.045	0.045	0.045	0.043	64.40	83.40
0.075923	50.	50.	50.	4	14	0	0.00	17.26	0.00

*SENO 1184.000

1184.00	0.72*	62.2*	61.78	0.00	61.92	0.18	3.92	0.00	66.00
46.	0.	46.	0.	0.	13.	0.	0.	0.	65.00
0.01	0.00	3.44	0.00	0.045	0.045	0.045	0.044	61.50	24.64
0.081104	50.	50.	50.	4	14	0	0.00	60.43	0.00

*REANALYZED

THIS RUN EXECUTED 31-JUL-91 15:58:4

C2 RELEASE DATED NOV 76 UPDATED APR. 1980

FOR CORR - 01,02,03,04

MODIFICATION - 50,51,52,53,54

DIE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

3-YEAR, 6-HR STORM FLOW

WARY PRINTOUT TABLE 150

SENO	XLCH	ELTRD	ELLC	ELMIN	Q	OWSEL	CRIWS	EG	10K*S	VCH	AREA
1004.000	0.00	0.00	0.00	81.10	46.00	81.52	81.52	81.63	511.07	2.64	17.
1014.000	10.00	0.00	0.00	74.00	46.00	74.54	75.14	80.12	19121.55	18.96	2.
1024.000	10.00	0.00	0.00	73.50	46.00	74.33	74.65	75.40	2087.67	8.32	5.
1034.000	10.00	0.00	0.00	73.00	46.00	73.97	74.06	74.36	620.74	5.05	9.
1084.000	50.00	0.00	0.00	69.30	46.00	69.98	70.10	70.34	1082.85	4.80	9.
1134.000	50.00	0.00	0.00	64.40	46.00	65.36	65.50	65.84	759.23	5.55	8.
1184.000	50.00	0.00	0.00	61.50	46.00	61.74	61.78	61.92	811.04	3.44	13.

YEAR, 6-HR STORM FLOW

SUMMARY PRINTOUT TABLE 150

SECD	Q	OWSEL	DIFWSP	DIFWSX	DIFWS	TOPWID	XLCH
1004.000	46.00	81.52	0.00	0.00	-0.03	82.66	0.00
1014.000	46.00	74.54	0.00	-6.98	0.00	8.99	10.00
1024.000	46.00	74.33	0.00	-0.21	0.00	13.39	10.00
1034.000	46.00	73.97	0.00	-0.36	0.00	18.89	10.00
1084.000	46.00	69.98	0.00	-3.98	0.00	32.58	50.00
1134.000	46.00	65.36	0.00	-4.62	0.00	17.26	50.00
1184.000	46.00	61.74	0.00	-3.63	0.00	60.43	50.00

SUMMARY OF ERRORS

LOCATION SECD= 1004.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

LOCATION SECD= 1014.000 PROFILE= 1 SLOPE TOO STEEP

JUL-91 15:58:41

PAGE 1

THIS RUN EXECUTED 31-JUL-91 15:58:4

EC2 RELEASE DATED NOV 76 UPDATED APR. 1980
RROR CORR - 01,02,03,04
MODIFICATION - 50,51,52,53,54

STA.1184

NORMAL DEPTH CALCULATION

OCT 15 1982

MANNINGS N=.0450

SLOPE =.0800

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	40.00	62.50	3	79.00	61.50	5	120.00	63.00
2	70.00	62.00	4	97.00	62.20			

WSEL

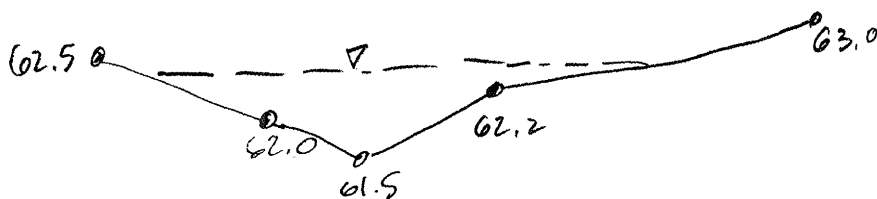
DEPTH
INCFLOW
AREA
SQ.FT.FLOW
RATE
(CFS)WETTED
PER
(FT)FLOW
VEL
(FPS)

TOPWID

FT.

61.6	0.1	0.2	0.3	4.4	1.3	4.4
61.7	0.2	0.9	1.8	8.8	2.0	8.7
61.8	0.3	2.0	5.2	13.1	2.6	13.1
61.9	0.4	3.5	11.2	17.5	3.2	17.5
62.0	0.5	5.5	20.2	21.9	3.7	21.9
62.1	0.6	8.1	31.2	30.5	3.9	30.4
62.2	0.7	11.5	47.9	39.0	4.1	39.0
62.3	0.8	15.9	71.1	47.9	4.5	47.9
62.4	0.9	21.1	102.1	56.8	4.8	56.7
62.5	1.0	27.2	141.6	65.7	5.2	65.6

$$F = \frac{V^2}{g \left(\frac{A}{T} \right)} = \frac{4.1^2}{32.2 \left(\frac{15.9}{48} \right)} = 1.6 \text{ supercritical flow}$$



5
13
24/0
5

STA. 11 + 84

OR CONJUGATE

ALTERNATE DEPTH CALCULATION TO ESTABLISH A SUBCRITICAL CHANNEL

DISCHARGES= 46.0

FLOW
DEPTH

POINT	ELEV	DIST	POINT	ELEV	DIST	POINT	ELEV	DIST
1	62.50	40.00	3	61.50	79.00	5	63.00	120.00
2	62.00	70.00	4	62.20	97.00			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW VEL. FPS	FROUDE NO.	E (FT)	M CU.FT.
61.60	0.10	0.22	210.46	165.86	687.87	300.66
61.70	0.20	0.87	52.61	29.32	43.19	75.22
61.80	0.30	1.97	23.38	10.64	8.79	33.60
61.90	0.40	3.50	13.15	5.18	3.09	19.26
62.00	0.50	5.46	8.42	2.97	1.60	12.94
62.10	0.60	8.08	5.69	1.95	1.10	9.72
Normal depth 62.20	0.70	11.55	3.98	1.29	0.95	8.24
62.30	0.80	15.89	2.89	0.89	0.93	8.05
Conjugate depth 62.40	0.90	21.12	2.18	0.63	0.97	8.87
62.50	1.00	27.24	1.69	0.46	1.04	10.59

LOT 99, SANDIA HEIGHTS SOUTH
 SUBCRITICAL RUN, HEC2 RUN, FILE= LOT99SUB.IN
 100-YEAR, 6-HR STORM FLOW= 46 CFS

1	0	0	0	0	0	0	46	62.40	0
2	-1	0	0	0	0	-1	0	0	0
J3	150								
NC	.045	.045	.045						
X1	1184	6	0	140	0	0	0	0	0
GR	63.5	73	62.2	103	61.5	121	61.5	122	62.2
GR	62.5	162	61.5	65	200				
X1	1134	8	0	147	50	50	50	0	0
GR	69	53	66	78	66.2	90	64.4	110	66
GR	66.5	129	66	190	70	200			
X1	1084	8	0	143	50	50	50	0	0
GR	72	57	69.3	76	70.3	95	69.5	115	71
GR	70	170	72	193	74	200			
X1	1034	8	0	148	50	50	50	0	0
GR	75	52	74	67	72.6	77	75.3	99	75
GR	74.5	166	76	173	76	200			
X1	1024	8	0	135	10	10	10	0	0
GR	75	51	75	65	73.5	77	76.3	100	76.3
GR	75.5	165	77	172	77	200			
X1	1014	9	0	150	10	10	10	0	0
GR	76	50	75	66	74	77	77	94	77
GR	77	153	77	168	79	175	76	200	
X1	1004	5	0	174	10	10	10	0	0
GR	81.9	26	81.1	95	81.6	50	82	170	82.6
EJ									

beginning input
 water surface
 Elevation
 (conjugate
 subcritical
 depth @
 Sta. 11+84)

ER

INPUT FILE for subcritical run

WATER SURFACE PROFILES *
VERSION OF NOVEMBER 1976 *
UPDATED APRIL 1980 *
* VAX CONV. 23-NOV-81 BOHANNAN-HUSTON INC. *
* RUN DATE 4-OCT-91 TIME 13:09:30 *

* U.S. ARMY CORPS OF ENGIN
* THE HYDROLOGIC ENGINEERI
* 609 SECOND STREET, SUITE
* DAVIS, CALIFORNIA 95616
* (916) 440-2105 (FIS) 448

X	X	XXXXXXX	XXXXX		XXXXX
X	X	X	X	X	X
X	X	X	X		X
XXXXXXX	XXXX	X		XXXXX	XXXXX
X	X	X	X		X
X	X	X	X	X	X
X	X	XXXXXXX	XXXXX		XXXXXXX

SUBCRITICAL RUN — OUTPUT FILE

THIS RUN EXECUTED 4-OCT-91 13:09:3

 HEC2 RELEASE DATED NOV 76 UPDATED APR. 1980
 ERROR CORR - 01,02,03,04
 MODIFICATION - 50,51,52,53,54

T1 LOT 99, SANDIA HEIGHTS SOUTH
 T2 SUBCRITICAL RUN, HEC2 RUN, FILE= LOT99SUB.IN
 T3 100-YEAR, 6-HR STORM FLOW= 46 CFS

J1	ICHECK	INQ	NINV	IDIR	SIRT	MEIRIC	HVINS	Q	WSEL	FQ
	0.	0.	0.	0.	0.000000	0.00	0.0	46.	62.400	0.000
J2	NEPROF	IPLOT	PREVS	XSECV	XSECH	FN	ALIDC	IBW	CHNIM	TIRACE
	-1.000	0.000	0.000	0.000	0.000	0.000	-1.000	0.000	0.000	0.000
J3	VARIABLE CODES FOR SUMMARY PRINTOUT									
	150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.045	0.045	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1184.000	6.000	0.000	140.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	63.500	73.000	62.200	103.000	61.500	121.000	61.500	122.000	62.200	132.000
GR	62.500	162.000	61.500	65.000	200.000	0.000	0.000	0.000	0.000	0.000
X1	1134.000	8.000	0.000	147.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	69.000	53.000	66.000	78.000	66.200	90.000	64.400	110.000	66.000	121.000
GR	66.500	129.000	66.000	190.000	70.000	200.000	0.000	0.000	0.000	0.000
X1	1084.000	8.000	0.000	143.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	72.000	57.000	69.300	76.000	70.300	95.000	69.500	115.000	71.000	125.000
GR	70.000	170.000	72.000	193.000	74.000	200.000	0.000	0.000	0.000	0.000
X1	1034.000	8.000	0.000	148.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	75.000	52.000	74.000	67.000	72.600	77.000	75.300	99.000	75.000	123.000
GR	74.500	166.000	76.000	173.000	76.000	200.000	0.000	0.000	0.000	0.000
X1	1024.000	8.000	0.000	135.000	10.000	10.000	10.000	0.000	0.000	0.000
GR	75.000	51.000	75.000	65.000	73.500	77.000	76.300	100.000	76.300	123.000
GR	75.500	165.000	77.000	172.000	77.000	200.000	0.000	0.000	0.000	0.000

beginning conjugate depth

[illegible]

SENO	DEPH	QWSEL	CRWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOER	ITRIAL	IDC	ICONT	CORAR	TOEWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

*SENO 1184.000

subcritical depth *beginning input WS*

1184.00	0.90	62.40	62.30	62.40	62.49	0.09	0.00	0.00	113.50
46.	0.	0.	46.	0.	0.	19.	0.	0.	113.50
0.00	0.00	0.00	2.45	0.045	0.045	0.045	0.000	61.50	98.38
0.014181	0.	0.	0.	0	10	0	0.00	53.62	0.00

*SENO 1134.000

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

flow returning immediately to critical depth. probably would go lower except that the program analysis halts at critical depth

1134.00	1.10	65.50	65.50	0.00	65.78	0.28	1.09	0.00	119.00
46.	0.	0.	46.	0.	0.	11.	0.	0.	119.00
0.00	0.00	0.00	4.26	0.045	0.045	0.045	0.044	64.40	97.83
0.037512	50.	50.	50.	0	11	0	0.00	19.70	0.00

*SENO 1084.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1084.00	0.80	70.10	70.10	0.00	70.26	0.16	1.92	0.00	122.00
46.	0.	0.	46.	0.	0.	14.	0.	0.	122.00
0.01	0.00	0.00	3.23	0.045	0.045	0.045	0.044	69.30	70.38
0.039194	50.	50.	50.	0	19	0	0.00	45.24	0.00

*SENO 1034.000

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1034.00	1.17	73.77	73.77	0.00	74.07	0.30	1.90	0.00	125.00
46.	0.	0.	46.	0.	0.	10.	0.	0.	125.00
0.01	0.00	0.00	4.40	0.045	0.045	0.045	0.044	72.60	68.65
0.036814	50.	50.	50.	0	14	0	0.00	17.87	0.00

*SENO 1024.000

7185 MINIMUM SPECIFIC ENERGY

SEOND	DEPIH	OWSEL	ORIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSIA
SLOPE	XLOBL	XLCH	XLOBR	TIRIAL	IDC	ICONT	CCRAR	TOFWID	ENDST

3720 CRITICAL DEPTH ASSUMED

1024.00	1.15	74.65	74.65	0.00	74.94	0.29	0.37	0.00	125.00
46.	0.	0.	46.	0.	0.	11.	0.	0.	125.00
0.01	0.00	0.00	4.31	0.045	0.045	0.045	0.044	73.50	67.83
0.036209	10.	10.	10.	0	8	0	0.00	18.59	0.00

*SEOND 1014.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1014.00	1.13	75.13	75.13	0.00	75.42	0.28	0.35	0.00	126.00
46.	0.	0.	46.	0.	0.	11.	0.	0.	126.00
0.01	0.00	0.00	4.28	0.045	0.045	0.045	0.044	74.00	63.86
0.033404	10.	10.	10.	0	5	0	0.00	19.56	0.00

*SEOND 1004.000

1912 GR CARDS, STATIONS DONT INCREASE

26.00000	26.00000	95.00000	50.00000	170.00000	200.00000
----------	----------	----------	----------	-----------	-----------

3790, DATA ERROR, JOB DUMPED

ERROR STATEMENT APPLIES TO SECTION 1004.000

THIS RUN EXECUTED 4-OCT-91 13:09:3

 HEC2 RELEASE DATED NOV 76 UPDATED APR. 1980
 ERROR CORR - 01,02,03,04
 MODIFICATION - 50,51,52,53,54

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

00-YEAR, 6-HR STORM FLOW

SUMMARY PRINTOUT TABLE 150

	SECD	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10K*S	VCH	AREA
	1184.000	0.00	0.00	0.00	61.50	46.00	62.40	62.30	62.49	141.81	0.00	18.
*	1134.000	50.00	0.00	0.00	64.40	46.00	65.50	65.50	65.78	375.12	0.00	10.
*	1084.000	50.00	0.00	0.00	69.30	46.00	70.10	70.10	70.26	391.94	0.00	14.
*	1034.000	50.00	0.00	0.00	72.60	46.00	73.77	73.77	74.07	368.14	0.00	10.
*	1024.000	10.00	0.00	0.00	73.50	46.00	74.65	74.65	74.94	362.09	0.00	10.
*	1014.000	10.00	0.00	0.00	74.00	46.00	75.13	75.13	75.42	334.04	0.00	10.
*	1014.000	10.00	0.00	0.00	74.00	46.00-100000.00	75.13	75.13	75.42	334.04	0.00	10.

00-YEAR, 6-HR STORM FLOW

SUMMARY PRINTOUT TABLE 150

	SECD	Q	OWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	1184.000	46.00	62.40	0.00	0.00	0.00	53.62	0.00
*	1134.000	46.00	65.50	0.00	3.10	0.00	19.70	50.00
*	1084.000	46.00	70.10	0.00	4.60	0.00	45.24	50.00
*	1034.000	46.00	73.77	0.00	3.67	0.00	17.87	50.00
*	1024.000	46.00	74.65	0.00	0.88	0.00	18.59	10.00
*	1014.000	46.00	75.13	0.00	0.49	0.00	19.56	10.00
*	1014.000	46.00-100000.00		0.00	0.49	0.00	19.56	10.00

SUMMARY OF ERRORS

CAUTION	SENO= 1134.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SENO= 1134.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SENO= 1084.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SENO= 1084.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SENO= 1034.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SENO= 1034.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SENO= 1024.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SENO= 1024.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SENO= 1014.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SENO= 1014.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SENO= 1014.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SENO= 1014.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY

4-OCT-91 13:09:36

PAGE 1

THIS RUN EXECUTED 4-OCT-91 13:09:3

HEC2 RELEASE DATED NOV 76 UPDATED APR. 1980
ERROR CORR - 01,02,03,04
MODIFICATION - 50,51,52,53,54

NORMAL DEPTH FOR STA. 10+84

MANNINGS N=.0450

SLOPE =.1100

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	57.00	72.00	4	115.00	69.50	7	193.00	72.00
2	76.00	69.30	5	124.00	71.00	8	200.00	74.00
3	95.00	70.30	6	170.00	70.00			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID
FT.	INC	AREA	RATE	PER	VEL	
		SQ.FT.	(CFS)	(FT)	(FPS)	
69.4	0.1	0.1	0.2	2.6	1.5	2.6
69.5	0.2	0.5	1.2	5.2	2.4	5.2
69.6	0.3	1.3	3.6	11.0	2.7	10.9
69.7	0.4	2.7	8.8	16.7	3.3	16.6
69.8	0.5	4.6	17.9	22.4	3.8	22.3
69.9	0.6	7.2	31.6	28.1	4.4	28.0
70.0	0.7	10.3	50.7	33.8	4.9	33.7
70.1	0.8	14.2	71.7	45.3	5.1	45.2
70.2	0.9	19.3	102.8	56.8	5.3	56.6
70.3	1.0	25.5	145.1	68.3	5.7	68.1
70.4	1.1	32.7	205.1	75.4	6.3	75.1
70.5	1.2	40.6	276.8	82.4	6.8	82.2
70.6	1.3	49.1	360.7	89.5	7.3	89.2
70.7	1.4	58.4	457.4	96.6	7.8	96.3
70.8	1.5	68.4	567.6	103.7	8.3	103.4
70.9	1.6	79.1	691.9	110.7	8.8	110.4
71.0	1.7	90.5	830.9	117.8	9.2	117.5
71.1	1.8	102.3	1009.3	119.7	9.9	119.3
71.2	1.9	114.3	1202.2	121.5	10.5	121.2
71.3	2.0	126.5	1409.3	123.4	11.1	123.0
71.4	2.1	138.9	1630.5	125.3	11.7	124.9
71.5	2.2	151.5	1865.4	127.1	12.3	126.7
71.6	2.3	164.3	2114.0	129.0	12.9	128.6
71.7	2.4	177.2	2376.2	130.9	13.4	130.4
71.8	2.5	190.4	2651.8	132.7	13.9	132.3
71.9	2.6	203.7	2940.7	134.6	14.4	134.1
72.0	2.7	217.2	3243.0	136.5	14.9	136.0

normal
depth
(elev.)

$$F = \frac{4.9^2}{32.2 \left(\frac{10.3}{33.7} \right)} = 2.439 \text{ supercritical}$$

depth from supercritical Hec-2 run (elev.) = 69.98 ~ 70.0

channel is running at normal depth

CONJUGATE DEPTH FOR STA. 10+84

DISCHARGES= 46.0

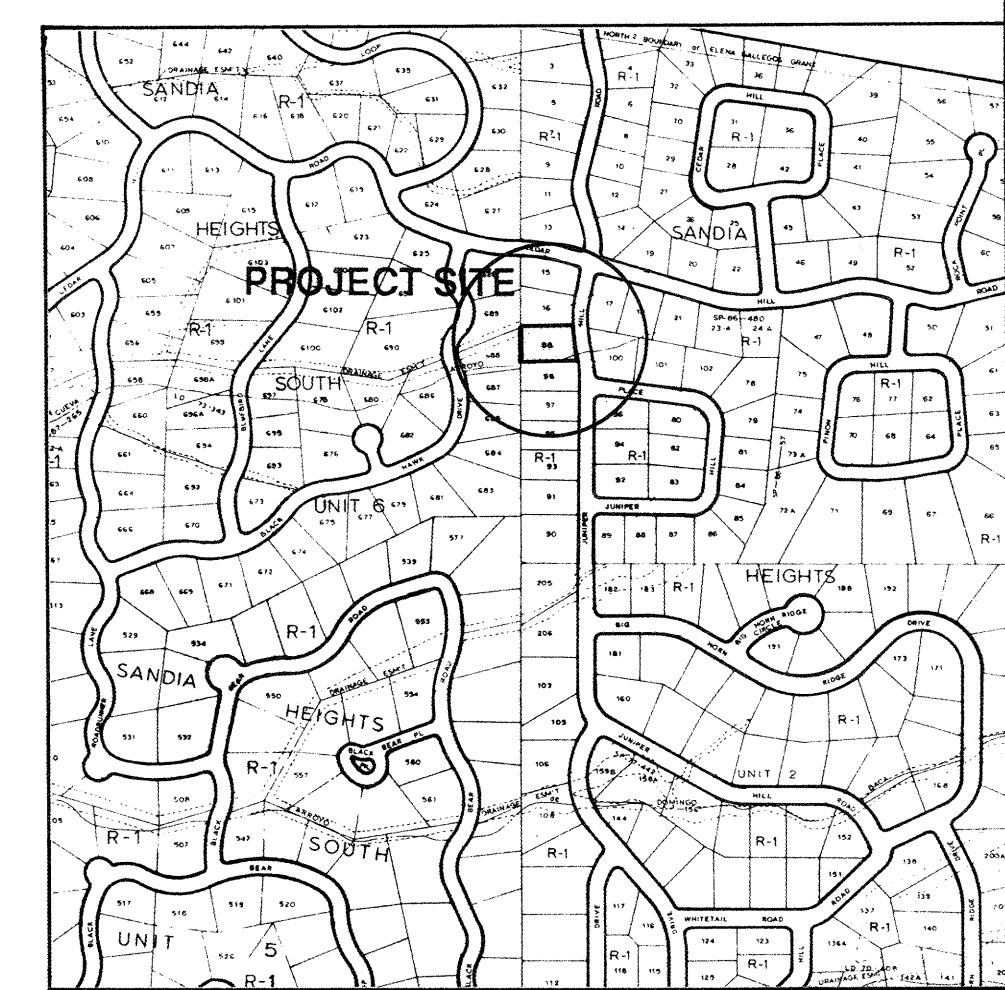
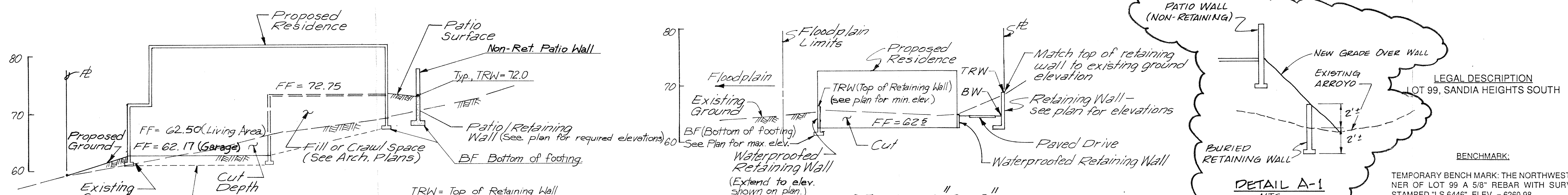
POINT	ELEV	DIST	POINT	ELEV	DIST	POINT	ELEV	DIST
1	72.00	57.00	4	69.50	115.00	7	72.00	193.00
2	69.30	76.00	5	71.00	124.00	8	74.00	200.00
3	70.30	95.00	6	70.00	170.00			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ. FT.	FLOW VEL. FPS	FROUDE NO.	E (FT)	M CU. FT.
69.40	0.10	0.13	353.34	278.47	1938.78	504.78
69.50	0.20	0.52	88.34	49.23	121.37	126.23
69.60	0.30	1.33	34.67	17.52	18.97	49.66
69.70	0.40	2.70	17.02	7.44	4.90	24.63
69.80	0.50	4.65	9.89	3.82	2.02	14.82
69.90	0.60	7.17	6.42	2.24	1.24	10.44
70.00	0.70	10.25	4.49	1.43	1.01	8.54
70.10	0.80	14.20	3.24	1.02	0.96	7.98
70.20	0.90	19.29	2.38	0.72	0.99	8.42
70.30	1.00	25.53	1.80	0.52	1.05	9.82
70.40	1.10	32.69	1.41	0.38	1.13	12.16
70.50	1.20	40.55	1.13	0.28	1.22	15.43
70.60	1.30	49.13	0.94	0.22	1.31	19.62
70.70	1.40	58.40	0.79	0.18	1.41	24.78
70.80	1.50	68.39	0.67	0.15	1.51	30.95
70.90	1.60	79.08	0.58	0.12	1.61	38.19
71.00	1.70	90.47	0.51	0.10	1.70	46.55
71.10	1.80	102.31	0.45	0.09	1.80	56.11
71.20	1.90	114.33	0.40	0.07	1.90	66.87
71.30	2.00	126.54	0.36	0.06	2.00	78.85
71.40	2.10	138.94	0.33	0.06	2.10	92.08
71.50	2.20	151.52	0.30	0.05	2.20	106.56
71.60	2.30	164.28	0.28	0.04	2.30	122.32
71.70	2.40	177.23	0.26	0.04	2.40	139.36
71.80	2.50	190.37	0.24	0.04	2.50	157.72
71.90	2.60	203.69	0.23	0.03	2.60	177.39
72.00	2.70	217.20	0.21	0.03	2.70	198.42

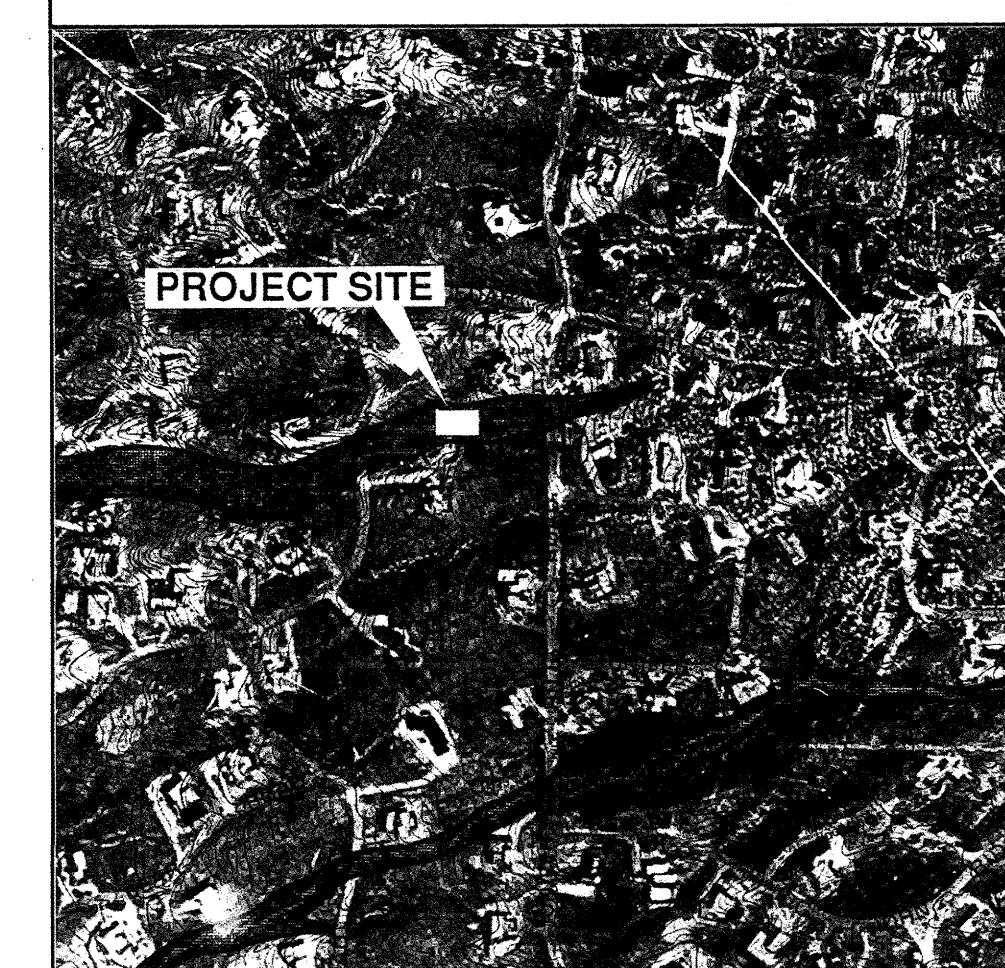
70.00 supercritical/normal depth elev.

70.25 subcritical/hydraulic jump elev. (conjugate)

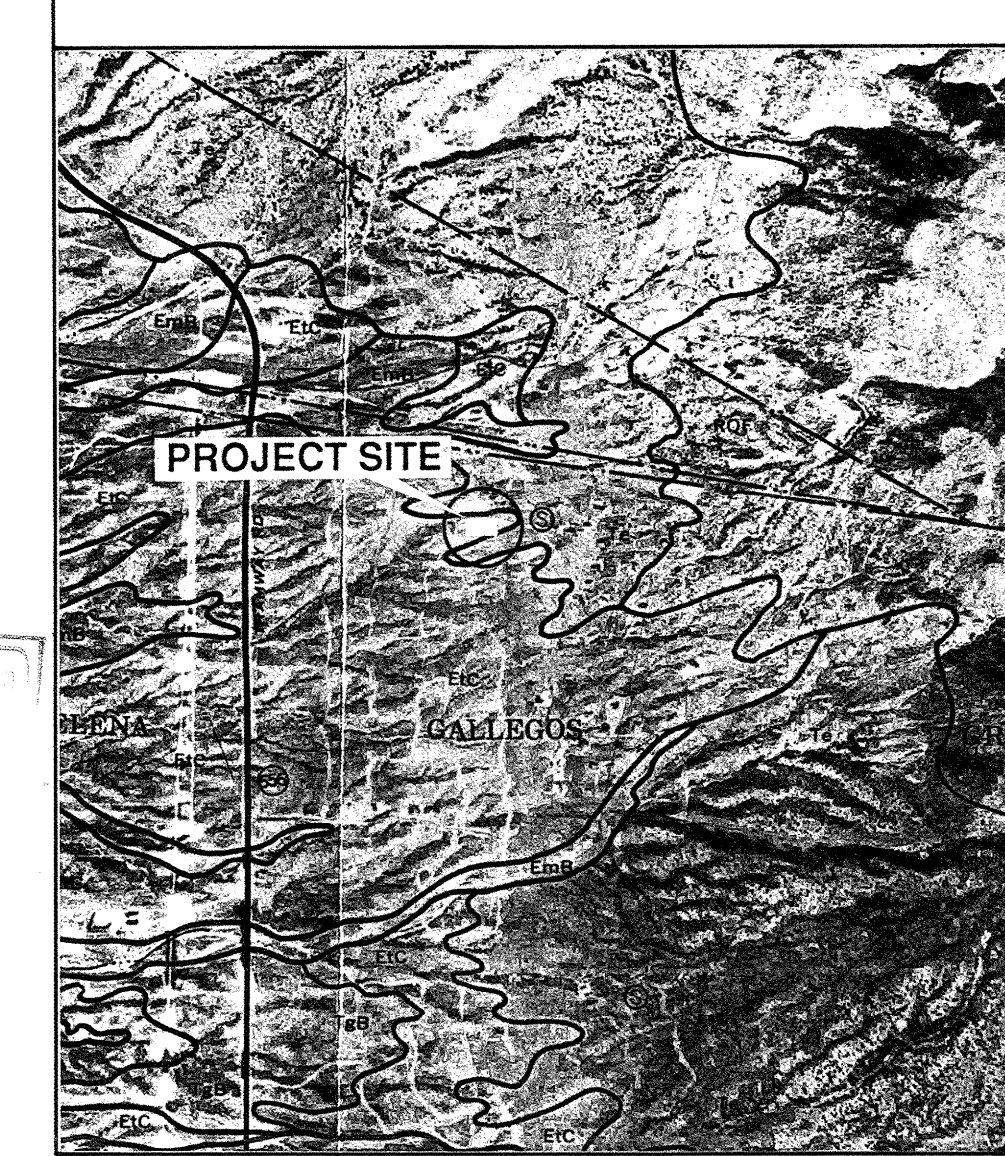
SUMMARY — there is little difference between supercritical/normal/subcritical flow depths



LOCATION MAP
ZONE ATLAS MAP C-23-Z
NOT TO SCALE



FLOOD INSURANCE MAP
REF: FLOOD INSURANCE STUDY PANELS 350002 0011



SOIL MAP
REF: SCS BERNALILLO COUNTY SOIL SURVEY
SHEET 12

SECTION "B-B"
NTS

SECTION "C-C"
NTS

DETAIL A-1
NTS

LEGAL DESCRIPTION
LOT 99, SANDIA HEIGHTS SOUTH

BENCHMARK:
TEMPORARY BENCH MARK: THE NORTHWEST CORNER OF LOT 99 A 5/8" REBAR WITH SURV CAP STAMPED "LS 6446". ELEV. = 6260.98

BENCH MARK: CITY OF ALBUQUERQUE SURVEY MONUMENT "2-023". MONUMENT IS LOCATED ON THE EAST RIGHT-OF-WAY LINE OF TRAMWAY BLVD. AND APPROXIMATELY 115' NORTH OF CEDAR HILLS ROAD. ELEV. = 6087.60

NOTES:

1. CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITIES TO THE "LIMITS OF GRADING", SHOWN ON THE PLAN.
2. RETAINING WALL DESIGN TO BE PROVIDED BY THE PROJECT STRUCTURAL ENGINEER.
3. SOILS INFORMATION AND FOUNDATION DESIGN DATA PROVIDED BY OTHERS.
4. EARTHWORK MAY OR MAY NOT BE "BALANCED" FOR THE SITE.
5. PAVEMENT/SUBGRADE DESIGN BY OTHERS.

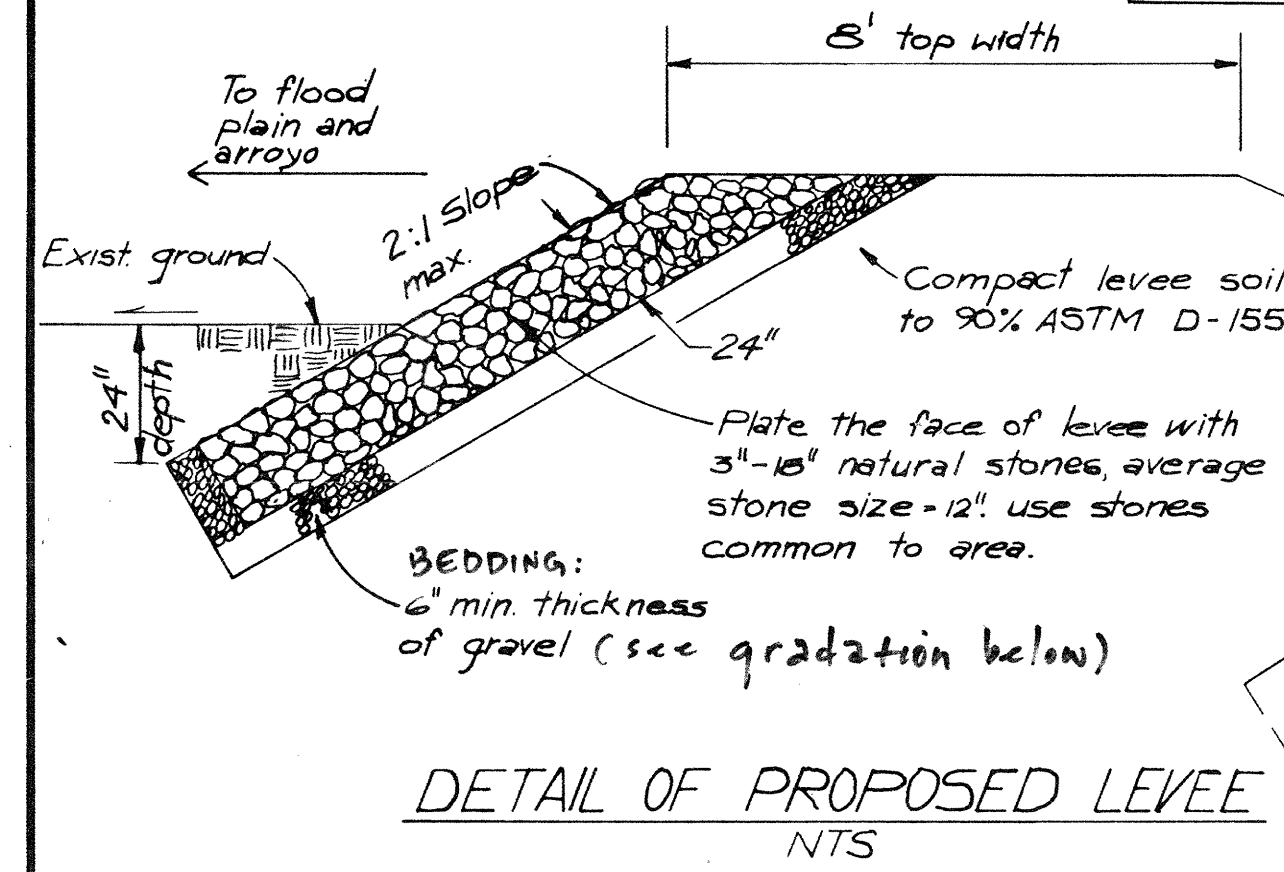
EROSION CONTROL:

1. CONTRACTOR SHALL PREVENT THE EROSION AND TRANSFER OF SEDIMENT FROM THE CONSTRUCTION SITE BY THE INSTALLATION OF 2' HIGH TRENCH/BERMS (COMBINED) ON THE DOWNSTREAM SIDE OF THE PROPERTY.

INSPECTION REQUIREMENTS

1. FOOTING CONSTRUCTION OF NORTH WALL OF HOUSE AND PATIO RETAINING WALL. PRIOR TO BURYING.
2. RETAINING WALL PORTION OF NORTH WALL OF HOUSE AND PATIO RETAINING WALL. PRIOR TO COVERING UP THIS WORK WITH EXTERIOR/INTERIOR FACINGS.
3. SEPTIC TANK AND LEACHFIELD CONSTRUCTION. PRIOR TO BACKFILL.
4. LEVEE AND SECTION D-D RUNDOWN (POST-CONSTRUCTION).

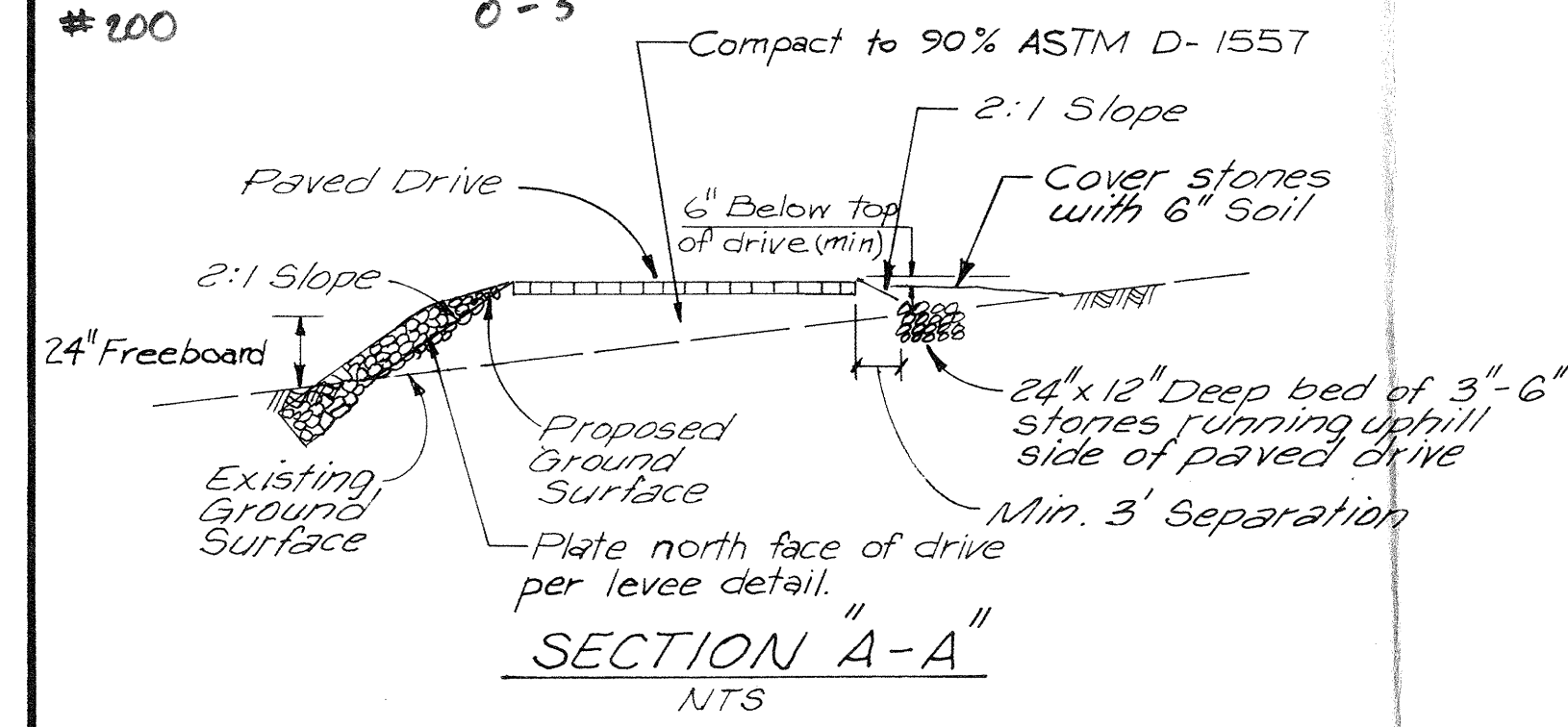
NOTE: THE ABOVE WORK ITEMS MUST BE INSPECTED BY THE ENGINEER PRIOR TO BACKFILL OR OTHER COVER UP. SURVEY MAY BE REQUIRED SO 24-HOUR NOTICE IS NEEDED. CALL JAMES TOPMILLER, 823-1000, FOR INSPECTION. THIS INSPECTION DOES NOT PRECLUDE TYPICAL CODES INSPECTION.



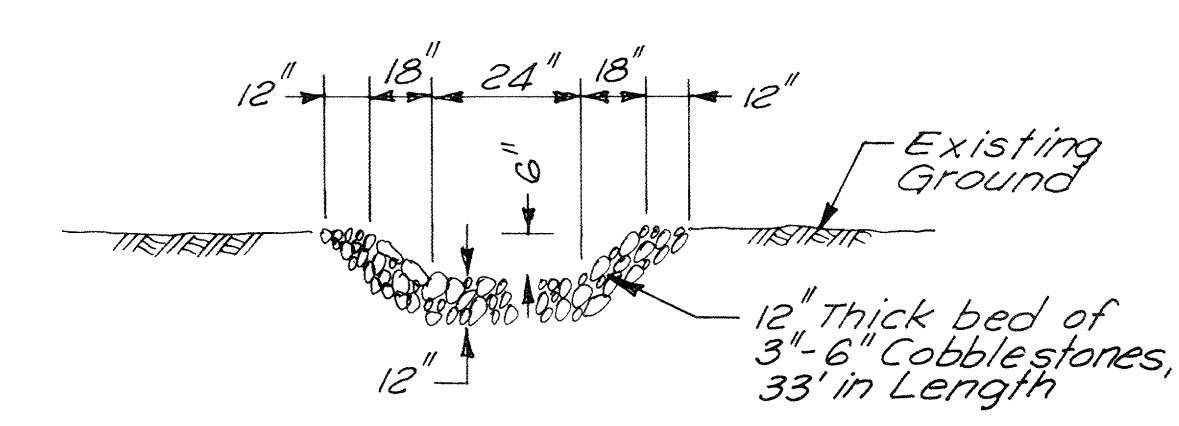
DETAIL OF PROPOSED LEVEE
NTS

GRADATION for GRANULAR BEDDING:

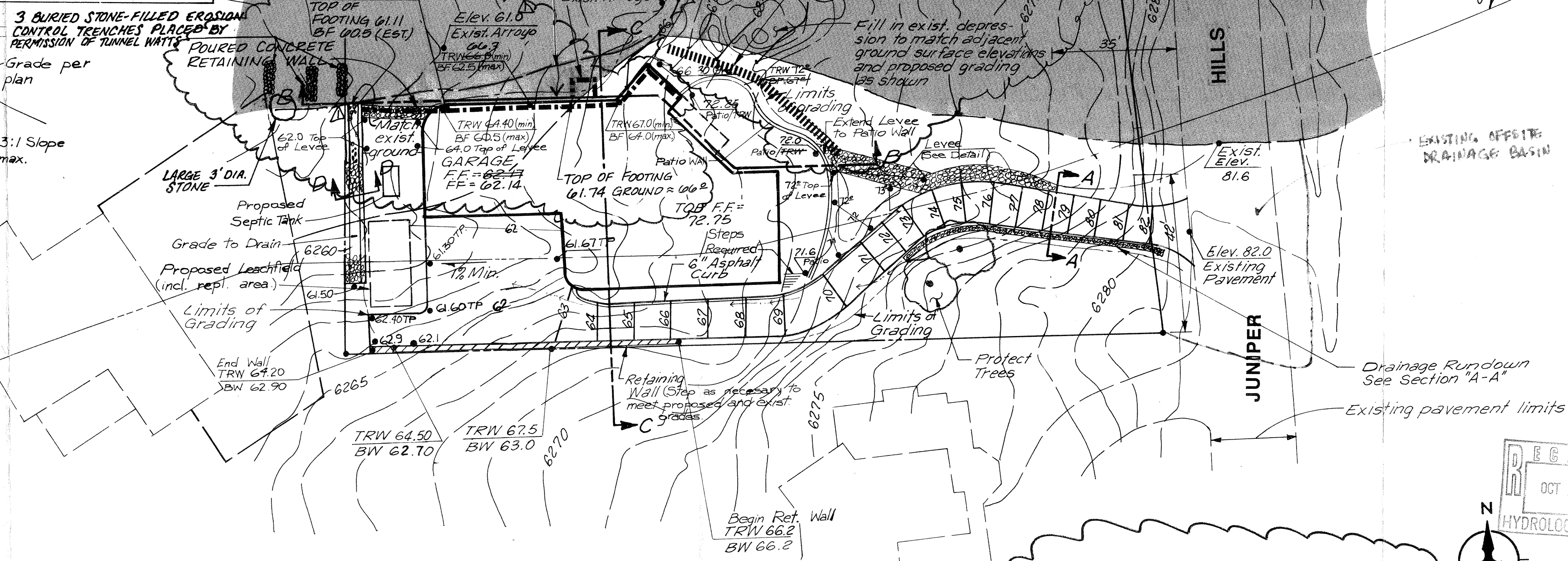
SQUARE MESH SIEVE SIZE	% PASSING BY WEIGHT
3"	90-100
3/4"	20-90
#4	0-20
#200	0-3



SECTION "A-A"
NTS



SECTION "D-D"
NTS

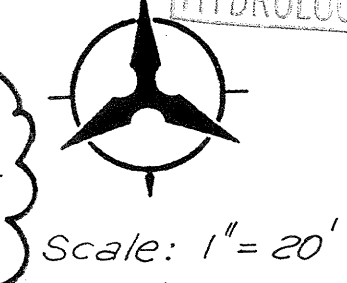
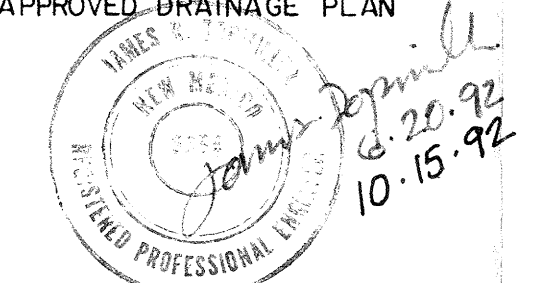


I, JAMES R. TOPMILLER, PE, A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE PROPERTY ON THIS PLAN HAS BEEN DEVELOPED AND CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED DRAINAGE PLAN.

REVISION TO CERTIFICATION: 10-15-92 TO ADD EROSION CONTROL TRENCHES ON ADJACENT LOT

NOTE: RECORD OR AS-BUILT ELEVATIONS ARE SHOWN AT SELECTED LOCATIONS ON THE SITE. WHERE RECORD INFORMATION IS SHOWN THE DESIGN ELEVATION IS CROSSED OUT. ALSO, SEE "BUBBLED" NOTES, FOR RECORD INFORMATION.

REVISION TO CERTIFICATION: 10-15-92 TO ADD EROSION CONTROL TRENCHES ON ADJACENT LOT



Note: Bottom of footing for the house shall be 0.5 below the minimum elevation of the adjacent arroyo.

APPROVED FOR BLDG. PERMIT: *[Signature]* 10-29-91
CITY/COUNTY FLOODPLAIN ADMINISTRATOR DATE

APPROVED FOR BLDG. PERMIT: *[Signature]* 10-29-91
COUNTY F.U.D. DATE

APPROVED FOR BUILDING PERMIT: *[Signature]* 10-29-91
AMAFCA DATE

**LOT 99, SANDIA HEIGHTS SOUTH
STOFAC RESIDENCE**

DRAINAGE/GRADING PLAN

Project No: *[Blank]*

Job No: 9121302 Sheet 1 of 2

Drawn By: GW Date: 9-16-91

Checked By: JAMES T. DATE: 9-27-91

Scale: 1" = 20'

Certification dated 10-15-92