

County of Bernalillo

State of New Mexico

BOARD OF COUNTY COMMISSIONERS

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DISTRICT 3
BARBARA J. SEWARD, VICE CHAIR
DISTRICT 4
KEN SANCHEZ, MEMBER
DISTRICT 1
STEVE D. GALLEGOS, MEMBER
DISTRICT 2
LES HOUSTON, MEMBER
DISTRICT 5
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2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

MARK J. CARRILLO, ASSESSOR
JUDY D. WOODWARD, CLERK
IRA ROBINSON, PROBATE JUDGE
JOE BOWDICH, SHERIFF
ORLANDO VIGIL, TREASURER

August 6, 1999

Philip W. Clark, P.E.
Clark Consulting Engineers
19 Ryan Road
Edgewood, New Mexico 87015

RE: *Grading and Drainage Plan for Blair Residence, Lot 28, Block 18, Tract 2, Unit 2, North Albuquerque Acres, (D22/D30) (PWDN-990133), Engineer's Stamp Dated 6/25/99.*

Dear Phil:

Based on the information provided, the above referenced plan dated June 25, 1999 is approved for Building Permit release.

As you are aware, the Engineer's Certification is required prior to release of the Certificate of Occupancy for this residence. The certification must include verification that the proposed rip-rap channel lining has been constructed in accordance with this approved plan.

If you have any questions, please call me at 924-3982, or contact Brad Catanach at the County.

Sincerely,

A handwritten signature in cursive script, reading "Susan Calongne".

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Lisa Ann Manwill, P.E., Albuquerque Metropolitan Arroyo Flood Control Authority
Brad Catanach, P.E., Bernalillo County Public Works Division
File

BERNALILLO COUNTY

- ☒ NEW SUBMITTAL
☐ RESUBMITTAL
☐ FINAL SIGNOFF

TODAY'S DATE: 6/25/99

PWD SUBMITTAL

Use for all PWD applications EXCEPT Street Excavation

CASE NO: PWD 990133

OWNER

OWNER Mike Blair PHONE 797-7604
 MAILING ADDRESS 90 Penny Wilson - CITY Alb. ZIP 87102

AGENT

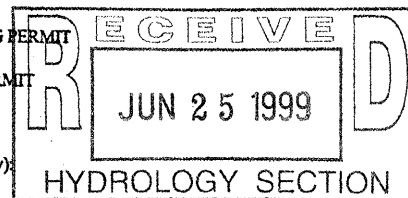
AGENT / CONTRACTOR Clark Consulting Eng'rs PHONE 281-2444
 MAILING ADDRESS 19 Rya Rd CITY Edgewood ZIP 87015
 STATE LICENSE NO. EXP DATE VOLUME CLASS
 ARCHITECT/ENGINEER LICENSE NO. PHONE

SITE INFORMATION

SITE ADDRESS / DIRECTIONS LOT 28, Bl. 18, T2, U2 ZONE ATLAS NO.: D-22
N. Alb. Acres
 LEGAL DESCRIPTION Santa Monica / Lowell LOT SIZE: .89
 EXISTING BUILDING(S) AND USE: PROPOSED BUILDING(S):
 UPC # 1-022-063-190-066-302-12

TYPE OF SUBMITTAL

- ☐ REPLAT
☐ MINOR SUBDIVISION
☐ MAJOR SUBDIVISION
☐ CONSTRUCTION DRAWINGS
☒ GRADING & DRAINAGE PLAN
☐ AS-CONSTRUCTED GRADING & DRAINAGE PLAN
☐ VARIANCE REQUEST
☐ LAND DIVISION
- ☐ TRAFFIC IMPACT ANALYSIS / TRAFFIC STUDY
☐ INFRASTRUCTURE LIST / DESIGN REVIEW
☐ SPECIAL USE PERMIT
☐ BARRICADING PERMIT
☒ BUILDING PERMIT
☐ INSPECTION
☐ OTHER (Specify)



The issuance of a permit or a review or approval of plan specifications, computations, and shop drawings, shall not be interpreted to be a permit for, or an approval of any variance or violation of any of the provisions of any COUNTY or STATE codes, ordinances, standards, or policies. Nor shall such issuance of a permit or approval of plans, specifications, computations, and shop drawings prevent any authorized COUNTY representative or COUNTY inspector form thereafter requiring the correction of errors in said plans, specifications, computations, or shop drawings or from stopping construction operations which are being carried on thereunder when in violation of any COUNTY or STATE codes, ordinances, standards, or policies.

☐ Owner
☒ Agent
☐ Contractor

Signature

OnC

Date

6/25/99

COUNTY

BERNALILLO COUNTY USE ONLY

C/R's:	TOTAL FEE:
	Receipt No.:
	Received By:

CALCULATIONS

DATE: 6/23/99

PROJECT: Blair
LOT 28, 31, 18
T2, 42: N. A16. AC.

• Det. Bank Setback per 'SEDG'

where $Q = 479$ cfs $.2Q = 96$ cfs
 $W_D = 28.5'$ $\lambda = 285'$

$BSB = 71'$

• Det. Scour Depth for Designed Erosion Control

USE HEC2, Supercritical & 'SEDG' Eq. 3.89

$Y_s/Y_n = 0.73 + 0.14 \pi F_F^2$

$F = 1.5$
 $Y_n = 1.59'$

Sect. ② $Y_s = 2.73'$ @ Sect. ③ $Y_s = 2.2'$

USE 2.8' scour depth @ Riprap Toe Wall

• Design Riprap Slope Protection - "Urban Storm Drainage Manual"

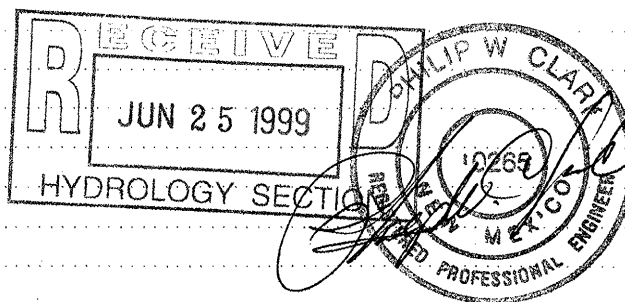
Table 5-5, Factor — where $V_{avg} = 9$ fps

Factor = 3.79

$S_{avg} = 3\%$

USE Type L, $D_{50} = 9" \phi$

$\therefore$ Thickness_{min.} = $1.75 \times 9" = 1.31' \approx 16"$



6/25/99

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* HEC-2 WATER SURFACE PROFILES *
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* Version 4.6.2; May 1991 *
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* RUN DATE 23JUN99 TIME 13:26:57 *
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* U.S. ARMY CORPS OF ENGINEERS
*
* HYDROLOGIC ENGINEERING CENTER
*
* 609 SECOND STREET, SUITE D
*
* DAVIS, CALIFORNIA 95616-4687
*
* (916) 756-1104
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PAGE 1

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*****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
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T1 BLAIR: NAA, CLARK CONSULTING
 T2 NORTH ARROYO DEL PINO - DOWNSTREAM OF LOWELL
 T3 Q100=479 cfs
 ESTIMATE WSEL & EG SLOPE
SUPERcritical FLOW - Developed w/Channel Improvements

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	0	0	1	0.025	0	1.6	479	83.7	0
J2	NPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1	0	0	0	0	0	-1			

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	1	3	68	8	10	26	150		
NC	.045	.045	.035	.1	.3					
X1	1	12	95	110	52	56	50			
GR	85	-30	83.5	0	83	32	82.7	40	83.4	47
GR	83.4	92	83.2	95	81.7	99	81.7	105	83.2	110
GR	84.5	115	85	127						
X1	2	11	90	110	52	52	50			
GR	85.5	-10	82.7	0	81.7	30	81.2	40	81.5	50
GR	81.1	63	81.6	90	80.5	95	80.5	105	83	110
GR	83.5	119								
X1	3	9	59	104	55	45	50			
GR	83.5	-10	81.5	0	80.8	37	80	46	80.3	59
GR	79.3	75	79.1	87	79.1	99	81.6	104		
X1	4	11	55	93	55	45	50			
GR	82	-10	79.8	0	79	47	78.5	55	77.2	63
GR	77.2	79	78	86	78.5	93	79	102	78	122
GR	80	147								

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23JUN99 13:26:57 PAGE 2

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SECNO	DEPTH	CWSEL	CRIS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XLN	XLNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= .100 CEHV= .300

*SECNO 1.000

1.000	2.19	83.89	84.12	83.70	84.71	.83	.00	.00	83.20
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479.0	230.0	246.7	2.3	59.9	26.1	.9	.0	.0	83.20
.00	3.84	9.46	2.50	.045	.035	.045	.000	81.70	-7.77
.024804	0.	0.	0.	0	11	5	.00	120.41	112.65

*SECNO 2.000

2.000	1.59	82.09	82.38	.00	83.09	1.00	1.61	.02	81.60
479.0	242.3	236.7	.0	45.8	23.5	.0	.1	.1	83.00
.00	5.29	10.08	.00	.045	.035	.000	.000	80.50	18.52
.041437	52.	50.	56.	6	15	0	.00	89.64	108.17

*SECNO 3.000

3.000	1.71	80.81	80.98	.00	81.60	.79	1.42	.06	80.30
479.0	41.0	438.0	.0	12.4	59.2	.0	.2	.2	81.60
.00	3.30	7.39	.00	.045	.035	.000	.000	79.10	36.10
.020330	52.	50.	52.	4	11	0	.00	66.34	102.43

*SECNO 4.000

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.43

4.000	1.60	78.80	79.24	.00	80.14	1.35	1.40	.06	78.50
479.0	1.3	438.7	39.0	.7	45.3	11.1	.2	.3	78.50
.01	1.88	9.68	3.50	.045	.035	.045	.000	77.20	50.25
.041286	55.	50.	45.	5	8	0	.00	74.01	131.96

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PAGE 4

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

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

Q100=479 cfs

SUMMARY PRINTOUT

SECNO	CWSEL	EG	FRCH	DEPTH	HV	VCH
1.000	83.89	84.71	1.26	2.19	.83	9.46
2.000	82.09	83.09	1.56	1.59	1.00	10.08
3.000	80.81	81.60	1.12	1.71	.79	7.39
* 4.000	78.80	80.14	1.56	1.60	1.35	9.68

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23JUN99 13:26:57

PAGE 5

Q100=479 cfs

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10*KS	VCH	AREA	.01K
1.000	.00	.00	.00	81.70	479.00	83.89	84.12	84.71	248.04	9.46	86.84	30.41
2.000	50.00	.00	.00	80.50	479.00	82.09	82.38	83.09	414.37	10.08	69.29	23.53
3.000	50.00	.00	.00	79.10	479.00	80.81	80.98	81.60	203.30	7.39	71.66	33.59
* 4.000	50.00	.00	.00	77.20	479.00	78.80	79.24	80.14	412.86	9.68	57.16	23.57

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PAGE 6

Q100=479 cfs

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1.000	479.00	83.89	.00	.00	.19	120.41	.00
2.000	479.00	82.09	.00	-1.80	.00	89.64	50.00
3.000	479.00	80.81	.00	-1.28	.00	66.34	50.00
* 4.000	479.00	78.80	.00	-2.02	.00	74.01	50.00

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PAGE 7

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 4.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE


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* HEC-2 WATER SURFACE PROFILES *
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* Version 4.6.2; May 1991 *
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* RUN DATE 23JUN99 TIME 12:45:22 *
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* U.S. ARMY CORPS OF ENGINEERS
*
* HYDROLOGIC ENGINEERING CENTER
*
* 609 SECOND STREET, SUITE D
*
* DAVIS, CALIFORNIA 95616-4687
*
* (916) 756-1104
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PAGE 1

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*****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
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T1 BLAIR: NAA, CLARK CONSULTING
T2 NORTH ARROYO DEL PINO - DOWNSTREAM OF LOWELL
T3 Q100=479 cfs
ESTIMATE WSEL & EG SLOPE
SUBcritical FLOW - Developed w/Channel Improvements

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	0	0	0	0.036	0	1.6	479	79	0
J2	NPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1	0	0	0	0	0	-1			

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	1	3	68	8	10	26	150		
NC	.045	.045	.035	.1	.3					
X1	4	11	55	93						
GR	82	-10	79.8	0	79	47	78.5	55	77.2	63
GR	77.2	79	78	86	78.5	93	79	102	78	122
GR	80	147								
X1	3	9	59	104	55	45	50			
GR	83.5	-10	81.5	0	80.8	37	80	46	80.3	59
GR	79.3	75	79.1	87	79.1	99	81.6	104		
X1	2	11	90	110	52	52	50			
GR	85.5	-10	82.7	0	81.7	30	81.2	40	81.5	50
GR	81.1	63	81.6	90	80.5	95	80.5	105	83	110
GR	83.5	119								
X1	1	12	95	110	52	56	50			
GR	85	-30	83.5	0	83	32	82.7	40	83.4	47
GR	83.4	92	83.2	95	82.2	99	82.2	105	83.2	110
GR	84.5	115	85	127	81.7		81.7			

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PAGE 2

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	OLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= .100 CEHV= .300

*SECNO 4.000

3720 CRITICAL DEPTH ASSUMED

4.000	2.06	79.26	79.26	79.00	79.76	.50	.00	.00	78.50
479.0	10.7	389.5	78.8	6.1	62.9	29.7	.0	.0	78.50
.00	1.77	6.19	2.65	.045	.035	.045	.000	77.20	31.73
.010911	0.	0.	0.	0	8	5	.00	106.02	137.75

*SECNO 3.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3.000	1.88	80.98	80.98	.00	81.57	.60	.61	.03	80.30
479.0	50.8	428.2	.0	16.8	66.2	.0	.1	.1	81.60
.00	3.03	6.47	.00	.045	.035	.000	.000	79.10	27.66
.013559	55.	50.	45.	0	11	0	.00	75.10	102.75

*SECNO 2.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

2.000	1.89	82.39	82.39	.00	82.85	.46	.74	.01	81.60
479.0	275.9	203.1	.0	69.1	29.2	.0	.2	.2	83.00
.00	3.99	6.97	.00	.045	.035	.000	.000	80.50	9.32
.015580	52.	50.	52.	0	5	0	.00	99.45	108.78

*SECNO 1.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1.000	1.92	84.12	84.12	.00	84.53	.41	.78	.01	83.20
479.0	303.0	172.2	3.8	84.3	24.3	1.6	.3	.3	83.20
.01	3.60	7.08	2.35	.045	.035	.045	.000	82.20	-12.41
.014912	52.	50.	56.	0	8	0	.00	125.95	113.54

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PAGE 3

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

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

Q100=479 cfs

SUMMARY PRINTOUT

	SECNO	CWSEL	EG	PRCH	DEPTH	HV	VCH
*	4.000	79.26	79.76	.85	2.06	.50	6.19
*	3.000	80.98	81.57	.93	1.88	.60	6.47

*	2.000	82.39	82.85	.99	1.89	.46	6.97
*	1.000	84.12	84.53	.98	1.92	.41	7.08

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PAGE 4

Q100=479 cfs

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10*KS	VCH	AREA	.01K
*	4.000	.00	.00	.00	77.20	479.00	79.26	79.26	79.76	109.11	6.19	98.70	45.86
*	3.000	50.00	.00	.00	79.10	479.00	80.98	80.98	81.57	135.59	6.47	82.96	41.14
*	2.000	50.00	.00	.00	80.50	479.00	82.39	82.39	82.85	155.80	6.97	98.28	38.38
*	1.000	50.00	.00	.00	82.20	479.00	84.12	84.12	84.53	149.12	7.08	110.21	39.22

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PAGE 5

Q100=479 cfs

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	4.000	479.00	79.26	.00	.00	.26	106.02	.00
*	3.000	479.00	80.98	.00	1.72	.00	75.10	50.00
*	2.000	479.00	82.39	.00	1.41	.00	99.45	50.00
*	1.000	479.00	84.12	.00	1.73	.00	125.95	50.00

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PAGE 6

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 4.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 3.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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* HEC-2 WATER SURFACE PROFILES *
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* Version 4.6.2; May 1991 *
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* RUN DATE 22JUN99 TIME 17:17:51 *
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* U.S. ARMY CORPS OF ENGINEERS
*
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PAGE 1

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
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T1 BLAIR: NAA, CLARK CONSULTING
T2 NORTH ARROYO DEL PINO - DOWNSTREAM OF LOWELL
T3 Q100=479 cfs
ESTIMATE WSEL & EG SLOPE
SUBcritical FLOW -Exist. Conditions

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J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	0	0	0	0.036	0	1.6	479	79	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1	0	0	0	0	0	-1			

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	1	3	68	8	10	26	150		
NC	.045	.045	.035	.1	.3					
X1	4	11	55	93						
GR	82	-10	79.8	0	79	47	78.5	55	77.2	63
GR	77.2	79	78	86	78.5	93	79	102	78	122
GR	80	147								
X1	3	10	59	105	55	45	50			
GR	83.5	-10	81.5	0	80.8	37	80	46	80.3	59
GR	79.3	75	79.1	87	79.1	99	80.5	105	81.5	113
X1	2	11	90	117	52	52	50			
GR	85.5	-10	82.7	0	81.7	30	81.2	40	81.5	50
GR	81.1	63	81.6	90	80.5	100	80.5	100	82	117
GR	83.1	119								
X1	1	12	95	110	52	56	50			
GR	85	-30	83.5	0	83	32	82.7	40	83.4	47
GR	83.4	92	83.2	95	82.2	99	82.2	105	83.2	110
GR	84.5	115	85	127						

1

22JUN99 17:17:51

PAGE 2

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= .100 CEHV= .300

*SECNO 4.000

3720 CRITICAL DEPTH ASSUMED

4.000	2.06	79.26	79.26	79.00	79.76	.50	.00	.00	78.50
479.0	10.7	389.5	78.8	6.1	62.9	29.7	.0	.0	78.50
.00	1.77	6.19	2.65	.045	.035	.045	.000	77.20	31.73
.010911	0.	0.	0.	0	8	5	.00	106.02	137.75

*SECNO 3.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3.000	1.83	80.93	80.93	.00	81.52	.58	.60	.02	80.30
479.0	45.8	432.2	1.0	15.5	67.8	.8	.1	.1	80.50
.00	2.95	6.37	1.38	.045	.035	.045	.000	79.10	29.87
.013511	55.	50.	45.	0	11	0	.00	78.61	108.48

*SECNO 2.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

2.000	1.81	82.31	82.31	.00	82.77	.46	.84	.01	81.60
479.0	276.1	202.9	.0	62.9	30.6	.1	.2	.2	82.00
.00	4.39	6.62	.05	.045	.035	.045	.000	80.50	11.69
.020707	52.	50.	52.	0	5	0	.00	105.87	117.56

*SECNO 1.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1.000	1.92	84.12	84.12	.00	84.53	.41	.89	.01	83.20
479.0	302.9	172.3	3.8	84.2	24.3	1.6	.3	.4	83.20
.01	3.60	7.09	2.35	.045	.035	.045	.000	82.20	-12.41
.014932	52.	50.	56.	0	8	0	.00	125.95	113.54

1

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THIS RUN EXECUTED 22JUN99 17:17:51

HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

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

Q100=479 cfs

SUMMARY PRINTOUT

	SECNO	CWSEL	EG	FRCH	DEPTH	HV	VCH
*	4.000	79.26	79.76	.85	2.06	.50	6.19
*	3.000	80.93	81.52	.93	1.83	.58	6.37

*	2.000	82.31	82.77	1.10	1.81	.46	6.62
*	1.000	84.12	84.53	.98	1.92	.41	7.09

1

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Q100=479 cfs

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	4.000	.00	.00	.00	77.20	479.00	79.26	79.26	79.76	109.11	6.19	98.70	45.86
*	3.000	50.00	.00	.00	79.10	479.00	80.93	80.93	81.52	135.11	6.37	84.06	41.21
*	2.000	50.00	.00	.00	80.50	479.00	82.31	82.31	82.77	207.07	6.62	93.57	33.29
*	1.000	50.00	.00	.00	82.20	479.00	84.12	84.12	84.53	149.32	7.09	110.16	39.20

1

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PAGE 5

Q100=479 cfs

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	4.000	479.00	79.26	.00	.00	.26	106.02	.00
*	3.000	479.00	80.93	.00	1.67	.00	78.61	50.00
*	2.000	479.00	82.31	.00	1.38	.00	105.87	50.00
*	1.000	479.00	84.12	.00	1.81	.00	125.95	50.00

1

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PAGE 6

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 4.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 3.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

Table 5-1

CLASSIFICATION AND GRADATION OF ORDINARY RIPRAP

Riprap Designation	% Smaller Than Given Size By Weight	Intermediate Rock Dimension (Inches)	d_{50}^* (Inches)
Type VL	70-100	12	6**
	50-70	9	
	35-50	6	
	2-10	2	
Type L	70-100	15	9**
	50-70	12	
	35-50	9	
	2-10	3	
Type M	70-100	21	12
	50-70	18	
	35-50	12	
	2-10	4	
Type H	100	30	18
	50-70	24	
	35-50	18	
	2-10	6	
Type VH	100	42	24
	50-70	33	
	35-50	24	
	2-10	9	

* d_{50} = Mean particle size

** Bury types VL and L with native top soil and revegetate to protect from vandalism.

5.2 Wire Enclosed Rock

Wire enclosed rock refers to rocks that are bound together in a wire basket so that they act as a single unit. One of the major advantages of wire enclosed rock is that it provides an alternative in situations where available rock sizes are too small for ordinary riprap. Another advantage is the versatility that results from the regular geometric shapes of wire enclosed rock. The rectangular blocks and mats can be fashioned into almost any shape that can be

Table 5-5

RIPRAP REQUIREMENTS FOR CHANNEL LININGS **

$V S_s^{0.17} / (S_s - 1)^{0.66} *$ (ft ^{1/2} /sec)	Rock Type ***
1.4 to 3.2	VL
3.3 to 3.9	L
4.0 to 4.5	M
4.6 to 5.5	H
5.6 to 6.4	VH

* Use $S_s = 2.5$ unless the source of rock and its densities are known at the time of design.

** Table valid only for Froude number of 0.8 or less and side slopes no steeper than 2h:1v.

*** Type VL and L riprap shall be buried after placement to reduce vandalism.

SM9 slope mattress with toe protection may be substituted for Type VL or L riprap.

G12 gabion with toe protection may be substituted for Type M and Type H riprap.

5.4.3 Toe Protection

Where only the channel sides are to be lined, additional riprap is needed to provide for long term stability of the lining. In this case, the riprap blanket should extend at least 3 feet below the existing channel bed and the thickness of the blanket below the existing channel bed increased to at least 3 times d_{50} to accommodate possible channel scour during floods (see Figure 5-4a). For sandy soils, consult specific criteria for channels on sandy soils. If wire enclosed rock lining is used, the toe must be protected by placing riprap at the toe. This is needed to protect against frequently occurring abrasion, (see Figure 5-4b and 5-4c).

CHART 5

EXAMPLE

D = 36 inches (3.0 feet)
Q = 66 cfs

	$\frac{HW}{D}$	HW (feet)
(1)	1.8	5.4
(2)	2.1	6.3
(3)	2.2	6.6

^aD in feet

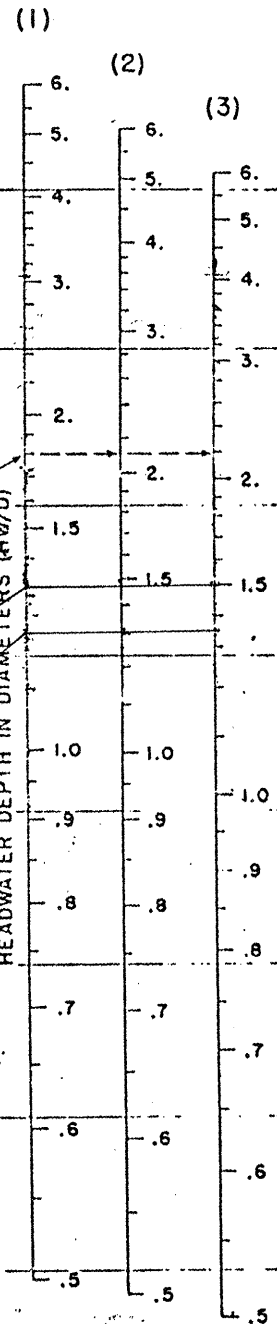
EXAMPLE

HW
D SCALE

ENTRANCE
TYPE

- (1) Headwall
- (2) Mitered to conform to slope
- (3) Projecting

To use scale (2) or (3) project horizontally to scale (1), then use straight, inclined line through D and Q scales, or reverse as illustrated.



HEADWATER DEPTH FOR
C. M. PIPE CULVERTS
WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

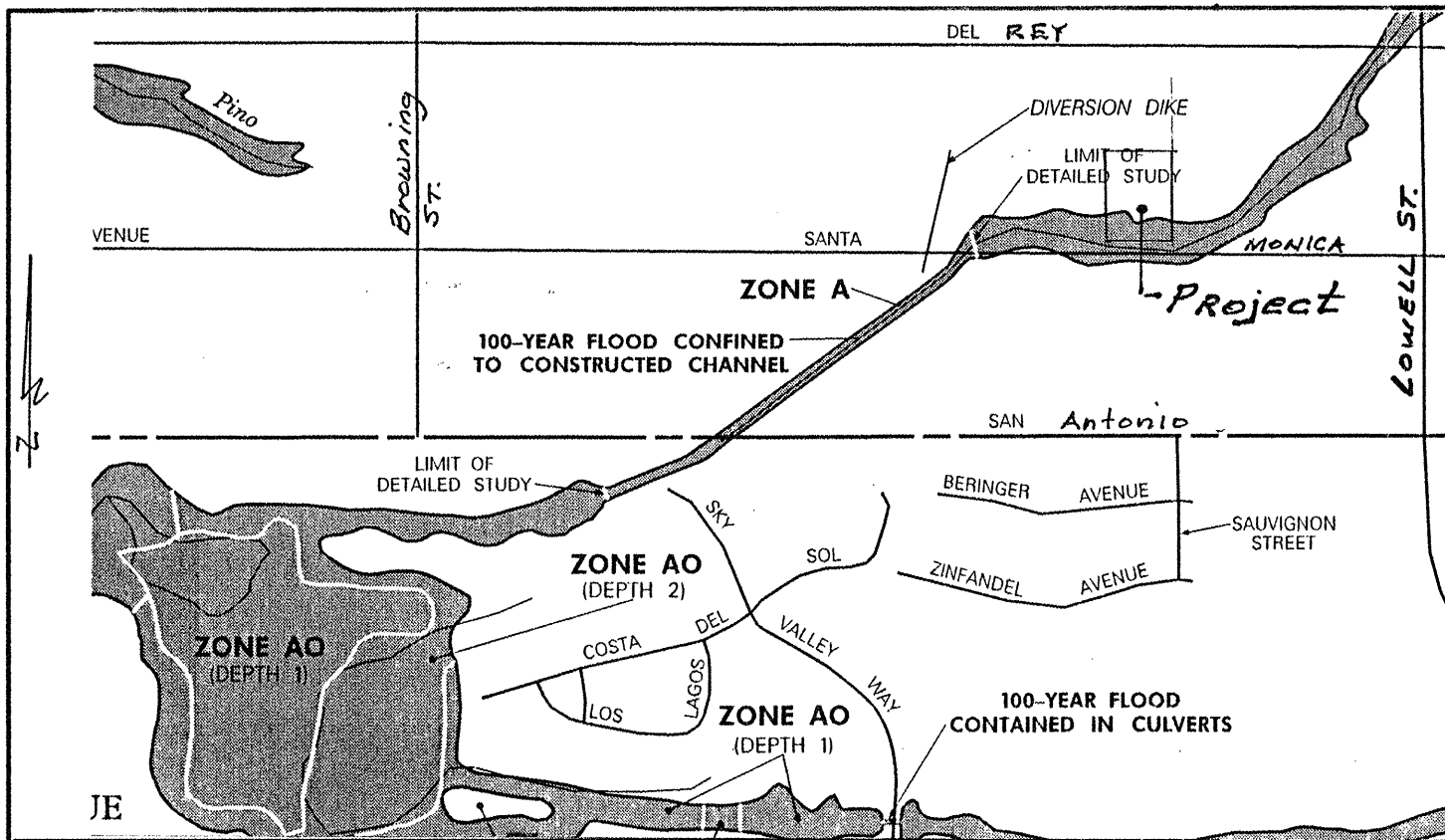
2-24" ϕ , Q = 40 cfs
Remainder Contained
w/in Easement
See HEC 2 & Plan
1-18" ϕ
Read Q = 9 cfs



LOWELL STREET

LOWELL STREET

Ref: Tom Mann Aerial 1996
1" = 100' ZAP D.22



FIRM MAP, PANEL 142 @ 1"=500'

GRADING & DRAINAGE PLAN

THE PROPOSED RESIDENTIAL HOME IS LOCATED IN NORTH ALBUQUERQUE ACRES, TRACT 2, UNIT 2, APPROXIMATELY 10 MILES NORTHEAST OF THE DOWNTOWN CORE OF ALBUQUERQUE, NEW MEXICO. THE GRADING AND DRAINAGE SCHEME HEREON IS IN COMPLIANCE WITH THE BERNALILLO COUNTY FLOOD HAZARD ORDINANCE, NO.88-46, AND STORM DRAINAGE, NO.96-5. THE PLAN IS REQUIRED IN ORDER TO FACILITATE THE OWNER'S REQUEST FOR BUILDING PERMIT. THE PROPOSED PLAN SHOWS:

1. EXISTING AND NEW CONTOURS WITH EXISTING AND NEW SPOT ELEVATIONS.
2. PROPOSED IMPROVEMENTS: RESIDENCE, CONCRETE FLATWORK, WELL AND SEPTIC LOCATION, GRAVEL DRIVEWAY, NEW GRADE ELEVATIONS, EROSION CONTROL, AND WATER HARVESTING.
3. CONTINUITY BETWEEN EXISTING AND PROPOSED ELEVATIONS.
4. QUANTIFICATION AND ACCEPTANCE OF UPSTREAM, OFF-SITE FLOWS WHICH CONTRIBUTE TO THE DEVELOPED FLOWS GENERATED BY THE IMPROVEMENTS.
5. UPSTREAM FLOOD PLAIN ANALYSIS AS TO WATER SURFACE MODEL AND EROSION SETBACK

THE PURPOSE OF THE PLAN IS TO ESTABLISH CRITERIA FOR CONTROLLING STORM RUN-OFF GENERATED BY THE PROPOSED IMPROVEMENTS, ESSENTIALLY ALLOWING HISTORIC OFF-SITE AREAS TO DRAIN THROUGHOUT THE PROPERTY AFTER DEVELOPMENT. THE PLAN DETERMINES THE RUN-OFF RESULTING FROM THE 100-YEAR/6-HOUR DURATION STORMS FOR BOTH THE EXISTING AND DEVELOPED CONDITIONS.

PRESENTLY, THE SITE IS BOUNDED ON THE EAST AND NORTH BY UNDEVELOPED LOTS. PROPERTY ADJOINING TO THE WEST IS VACANT AND OWNED BY AMAFCA. SANTA MONICA AVENUE ON THE SOUTH IS A GRADED AND MAINTAINED COUNTY ROADWAY. THE ROAD IS GRAVEL SURFACED WITH BAR DITCHES ON THE NORTH SIDE SITUATED WITHIN A 60 FOOT RIGHT-OF-WAY. THE SITE GENERALLY FALLS FROM THE EAST TO WEST AT 4 TO 6 % PERCENT. THE NORTH ARROYO DEL PINO FLOWS THROUGH THE SOUTHERN PORTION OF THE SITE. THESE OFF-SITE FLOWS ARE QUANTIFIED ON THE PLAN AND WITHIN THE CALCULATIONS SECTION. THE LOT IS ENCOMBERED BY A DESIGNATED FEMA FLOOD PLAIN. SEE MAP, THIS SHEET. GRANT OF STANDARD AMAFCA DRAINAGE EASEMENTS ARE A REQUIREMENT FOR THE HOME OWNER PRIOR TO RELEASE OF BUILDING PERMIT.

HISTORICAL SITE RUN-OFF OUTFALL LOCATIONS WILL REMAIN UNCHANGED WITH RUNOFF ALLOWED TO FLOW ACROSS THE SITE AND CONVEYED TO THE HISTORIC LOCATIONS. SINCE SANTA MONICA AVENUE IS IMPROVED MINIMAL GRADIENTS ARE PROPOSED WITHIN THE RIGHT-OF-WAY. PONDING OF A PORTION OF LOT RUNOFF IS REQUIRED SINCE THE ALLOWABLE ESTABLISHED FOR NORTH ALBUQUERQUE ACRES. HYDROLOGIC PROCEDURES AND CALCULATIONS ARE IN ACCORDANCE WITH SECTION 22.2, HYDROLOGY, OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA, REVISED JANUARY 1993, FOR THE CITY OF ALBUQUERQUE, NEW MEXICO, AND ADOPTED BY BERNALILLO COUNTY.

CALCULATIONS

I. DESIGN CRITERIA

HYDROLOGIC METHODS PER SECTION 22.2, HYDROLOGY, OF THE DEVELOPMENT PROCESS MANUAL (DPM), REVISED JANUARY 1993 FOR THE CITY OF ALBUQUERQUE AND ADOPTED BY THE COUNTY OF BERNALILLO.
DISCHARGE RATE: $Q = Q_{peak} \times AREA$. "PEAK DISCHARGE RATES FOR SMALL WATERSHEDS"
VOLUMETRIC DISCHARGE: $VOLUME = Weighted \times AREA$
SOIL TYPE: "P", EMB SERIES, EMBUDO, A GRAVELLY FINE SANDY LOAM AS CLASSIFIED BY THE SOIL CONSERVATION SERVICE
 $P_{100} = 2.9$ INCHES, ZONE 4
TIME OF CONCENTRATION, $T_C = 10$ MINUTES
DESIGN STORM: 100-year/6-hour, 10-year/6-hour WHERE [] = 10 year VALUES

II. EXISTING CONDITIONS

LOT AREA = 0.89 ACRES, WHERE: EXCESS PRECIPITATION 'A' = 0.8 IN. [0.28]
PEAK DISCHARGE, $Q_{100} = 2.0$ CFS [0.78], WHERE UNIT PEAK DISCHARGE 'A' = 2.2 CFS/ACRE [0.87]
THEREFORE: $VOLUME_{100} = 2.0 \times 0.89 \times 3600 = 655$ C.F.

III. DEVELOPED CONDITIONS

DETERMINE LAND TREATMENTS, PEAK DISCHARGE & WEIGHTED EXCESS PRECIPITATION

AREA	LAND TREATMENT	UNIT PEAK DISCHARGE	'E'
UNDEVELOPED, 0.34 AC.	A	2.20[0.87]	0.8[0.28]
LANDSCAPING, 0.22 AC.	B	2.92[1.45]	1.08[0.48]
GRAVEL & COMPACTED SOIL, 0.10 AC.	C	3.73[2.26]	1.46[0.73]
ROOF/PAVEMENT, 0.23 AC.	D	5.25[3.57]	2.64[1.69]
0.89 ACRES			

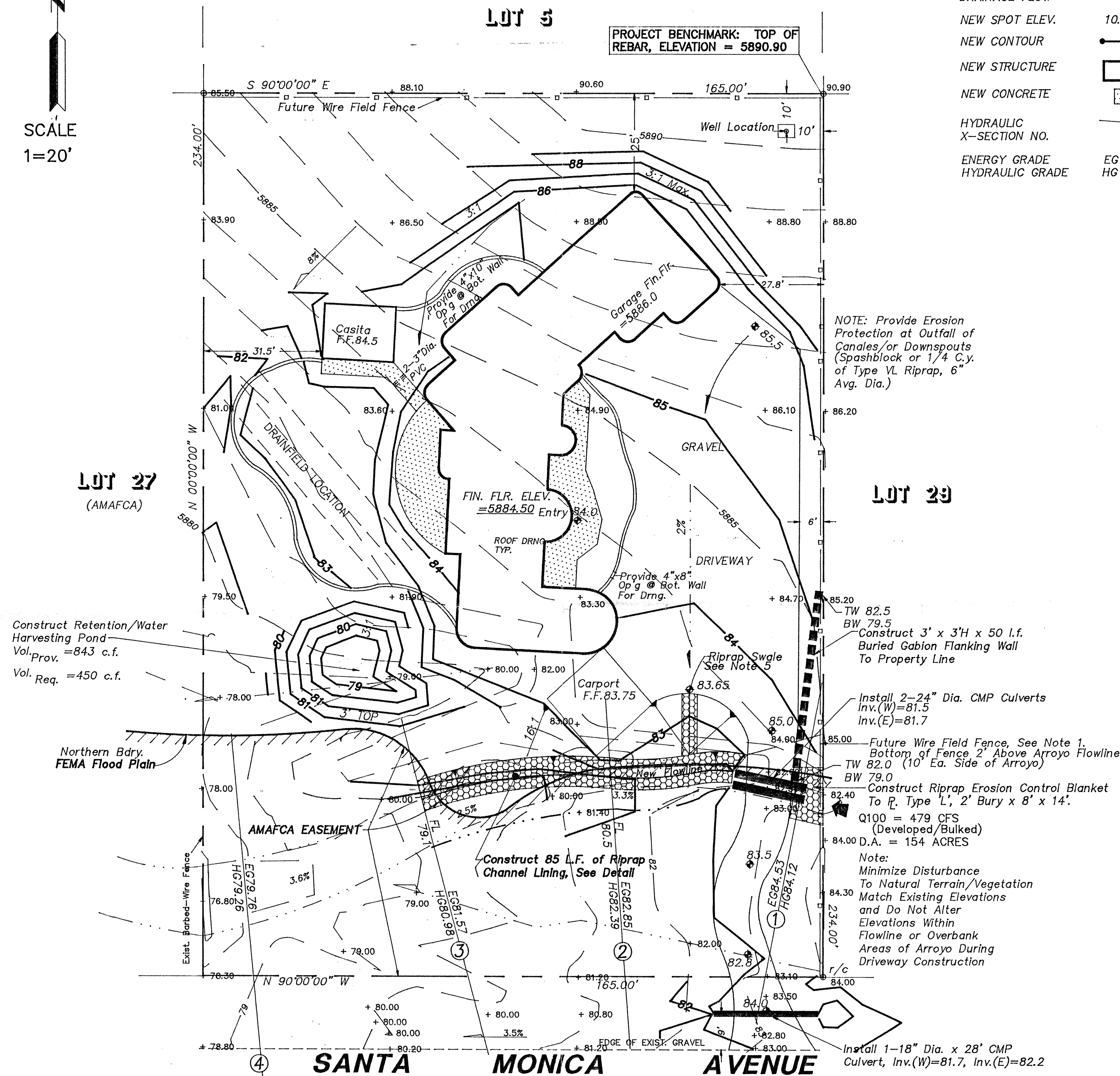
Weighted = 1.42 IN. [0.74]
 $Q_{100} = 2.97$ CUBIC FEET PER SECOND (CFS) $Q_{100} = 1.66$ CFS; $VOL_{100} = 4587$ CUBIC FEET (CF), $VOL_{10} = 2391$ OF
Zone 4 Allowable $E_{100} = 1.30$ in. Ponding Required
Therefore: $V_{Allowable} = 1.3 \times 0.89 \times 43560/12 = 4202$ CF

IV. QUANTIFY UP-STREAM RUNOFF IMPACTING THE PROPERTY

- UPSTREAM BASIN IMPACTING PROPERTY IS DEFINED AS THE NORTH DEL PINO ARROYO SEE FEMA MAP FOR PORTION OF BASIN, AND 1997 RESOURCE TECH, INC. NAA MASTER DRAINAGE PLAN

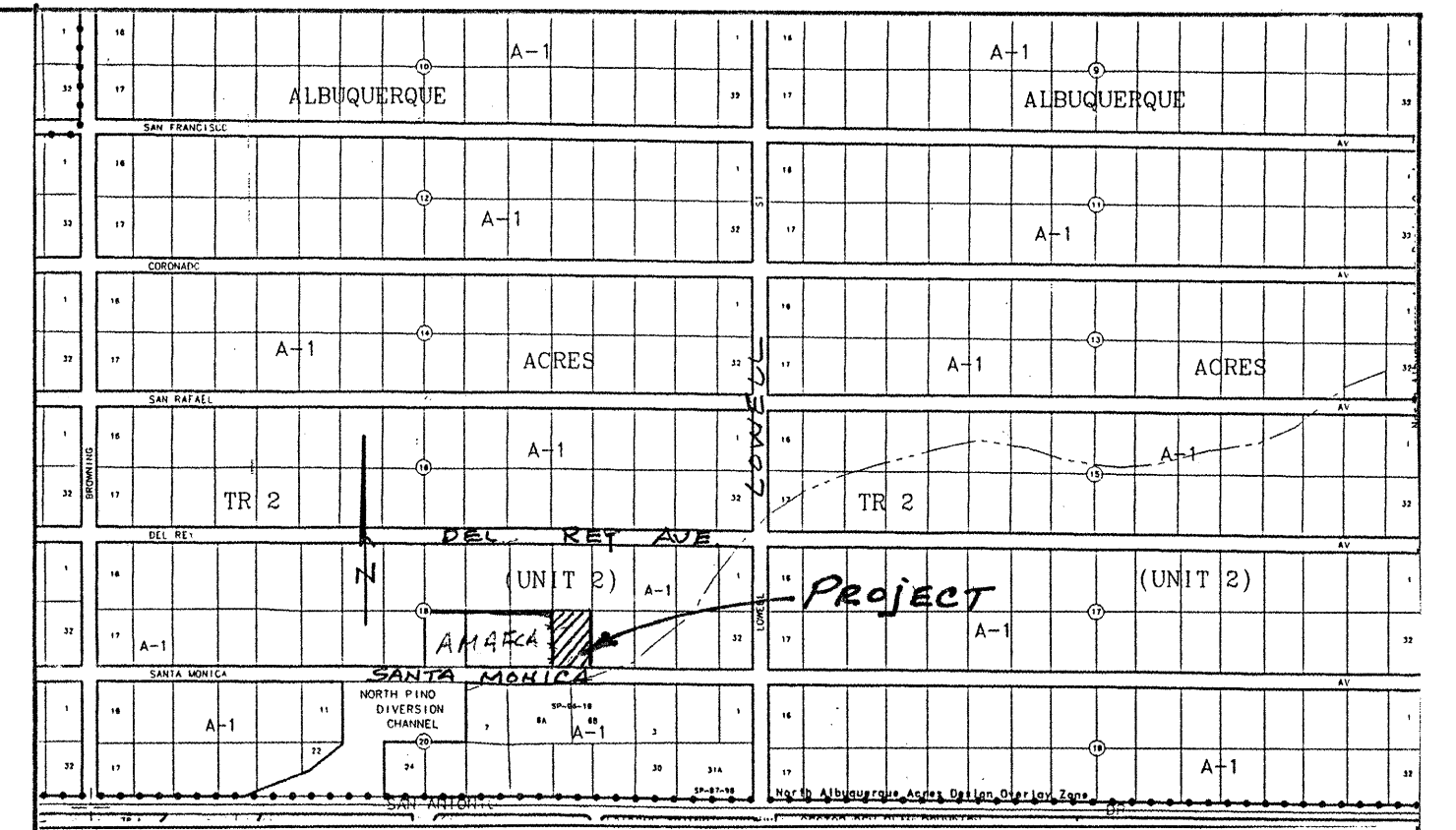
$Q_{100} = 479$ CFS @ SAN ANTONIO DIVERSION Developed & Bulked per RTI Report
(REFERENCE "SUPPLEMENTAL CALCS" PWD FILE FOR PROPOSED IMPROVEMENT DESIGN ANALYSIS)

SCALE
1"=20'



LEGEND

EXIST. SPOT ELEV.	+92.5
EXIST. CONTOUR	08
REBAR AND CAP	r/c
FLOW LINE	fl
SWALE	---
DRAINAGE FLOW	→
NEW SPOT ELEV.	10.10
NEW CONTOUR	10
NEW STRUCTURE	□
NEW CONCRETE	▨
HYDRAULIC X-SECTION NO.	②
ENERGY GRADE	EG
HYDRAULIC GRADE	HG

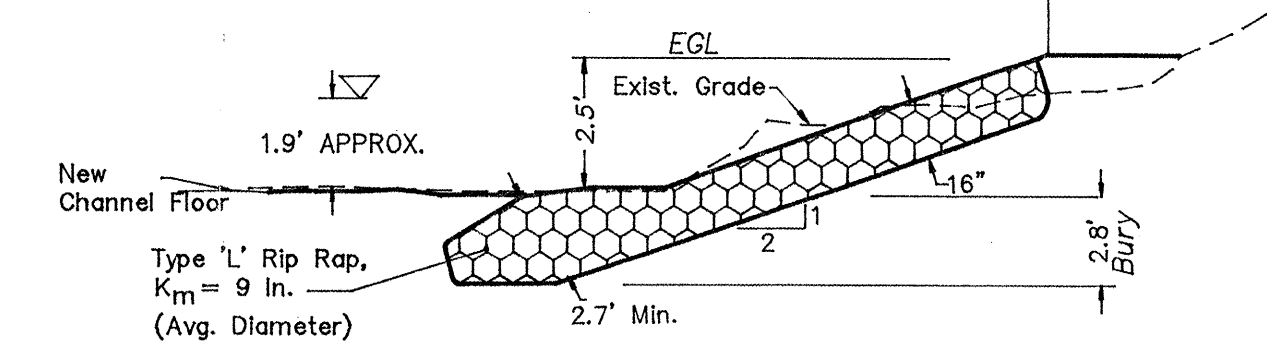


VICINITY MAP, ZONE D-22 @ 1"=750'

NOTES:

1. PERIMETER FENCING AROUND THE PROPERTY BOUNDARY IS NOT PROPOSED. CONSTRUCTION OF ANY FUTURE PERIMETER FENCING SHALL PERMIT THE PASSING OF DRAINAGE TO AND FROM HISTORIC SITE OUTFALL AND ENTRANCE LOCATIONS. OWNER SHALL MAINTAIN ALL FENCING AND KEEP FENCING FREE OF DEBRIS, WEEDS, AND/OR OBSTRUCTIONS.
2. THIS PLAN SHOWS A FIXED PERCENTAGE OF LAND TREATMENT A. REMAINING IN AN UNDISTURBED CONDITION. IF A GREATER AREA IS DISTURBED A REVISED PLAN WILL BE REQUIRED PER B.C. STORM DRAINAGE ORDINANCE, NO.96-5. (UNLESS THE COMPOSITE TREATMENTS ARE < ALLOWABLE).
3. CONTACT HOSS FOSTER FOR ACCESS PERMIT: 848-1523, COUNTY PUBLIC WORKS DEPT. @ 2400 SOUTH BROADWAY.
4. REVEGETATE ALL DISTURBED AREAS DUE TO CONSTRUCTION PER CITY OF ALBUQUERQUE NATIVE MIX SPEC. 1011.
5. CONSTRUCT 4'W x 17 I.F. 'V' RIPRAP SWALE, 6" BURY. TYPE 'V', AVG. DIAMETER 6".

Note: All Construction Per City of Albuquerque Specifications
All Compaction 90% Mod. Proctor
ASTM 1557



RIPRAP CHANNEL LINING

NO SCALE

TYPE 'L' RIP RAP	15" DIA., 70-100% SMALLER BY WEIGHT
	12" DIA., 50-70% " " "
	9" DIA., 35-55% " " "
	3" DIA., 2-10% " " "

NOTE: Revegetate All Disturbed Areas Due To Channel Construction per City of Albuquerque Specification, #1011.01.

PROJECT INFORMATION

LEGAL DESCRIPTION:

LOT 28, BLOCK 18, TRACT 2, UNIT 2, NORTH ALBUQUERQUE ACRES, BERNALILLO COUNTY, NEW MEXICO

PROJECT BENCHMARK

TOP OF REBAR AT THE NORTHEAST PROPERTY CORNER, ELEVATION = 5890.9, AS TIED FROM ALBUQUERQUE CONTROL SURVEY.

PROPERTY ADDRESS:

SANTA MONICA AVENUE, ALBUQUERQUE, NM 87122

TOPOGRAPHIC SURVEY:

PERFORMED/ DIGITIZED USING DCA SOFTDESK SOFTWARE FROM TOM MANN AERIAL SURVEY (1995) BY CLARK CONSULTING ENGINEERS, 6/99

I, PHILIP W. CLARK, A PROFESSIONAL ENGINEER LICENSED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT I HAVE VISITED THE SITE SHOWN HEREON, AND THAT THE CONTOURS SHOWN REPRESENT THE EXISTING GROUND CONDITIONS, AND DO FURTHER CERTIFY THAT NO EARTHWORK OF ANY KIND, NOR ANY DISTURBANCE OF THE EXISTING GROUND, HAS OCCURRED ON THIS SITE SINCE THE CONTOURS WERE DETERMINED.

PHILIP W. CLARK
N.M.P.E. #10265
6-21-99
10265
NEW MEXICO
PROFESSIONAL ENGINEER

PHILIP W. CLARK
6/25/99
PROFESSIONAL ENGINEER

R
JUN 25 1999
D
HYDROLOGY SECTION

Clark Consulting Engineers Edgewood, New Mexico 87015 Tele: (505) 281-2444 Fax: (505) 281-2444			
DATE	REVISION	LOT 28, BLOCK 18, TRACT 2, UNIT 2 NORTH ALBUQUERQUE ACRES BLAIR RESIDENCE GRADING & DRAINAGE PLAN	
DESIGNED BY: PVC	DRAWN BY: CCE	JOB NO: NAFUS_99	SHEET NO.
CHECKED BY: PVC	DATE: 6/17/99	FILE NO: G&D	1 of 1