

# County of Bernalillo

State of New Mexico

## BOARD OF COUNTY COMMISSIONERS

TOM RUTHERFORD, CHAIR  
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  
JUAN R. VIGIL, COUNTY MANAGER



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

May 24, 1999

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

***RE: Engineer's Certification for Sutton Residence, Lot 636, Sandia Heights South Unit 6, (C23/D55) (PWD-98-46) (PWDN990106) Engineer's Stamp Dated 5/14/99.***

Dear Mr. Clark:

The above referenced Certification plan for Lot 636, Sandia Heights South, Unit 6, is approved for release of the Certificate of Occupancy for this residence.

If you have any questions, or if we may be of further assistance to you, 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: Brad Catanach, P.E., Bernalillo County Public Works Division  
Lisa Ann Manwill, P.E., Albuquerque Metropolitan Arroyo Flood Control Authority  
File



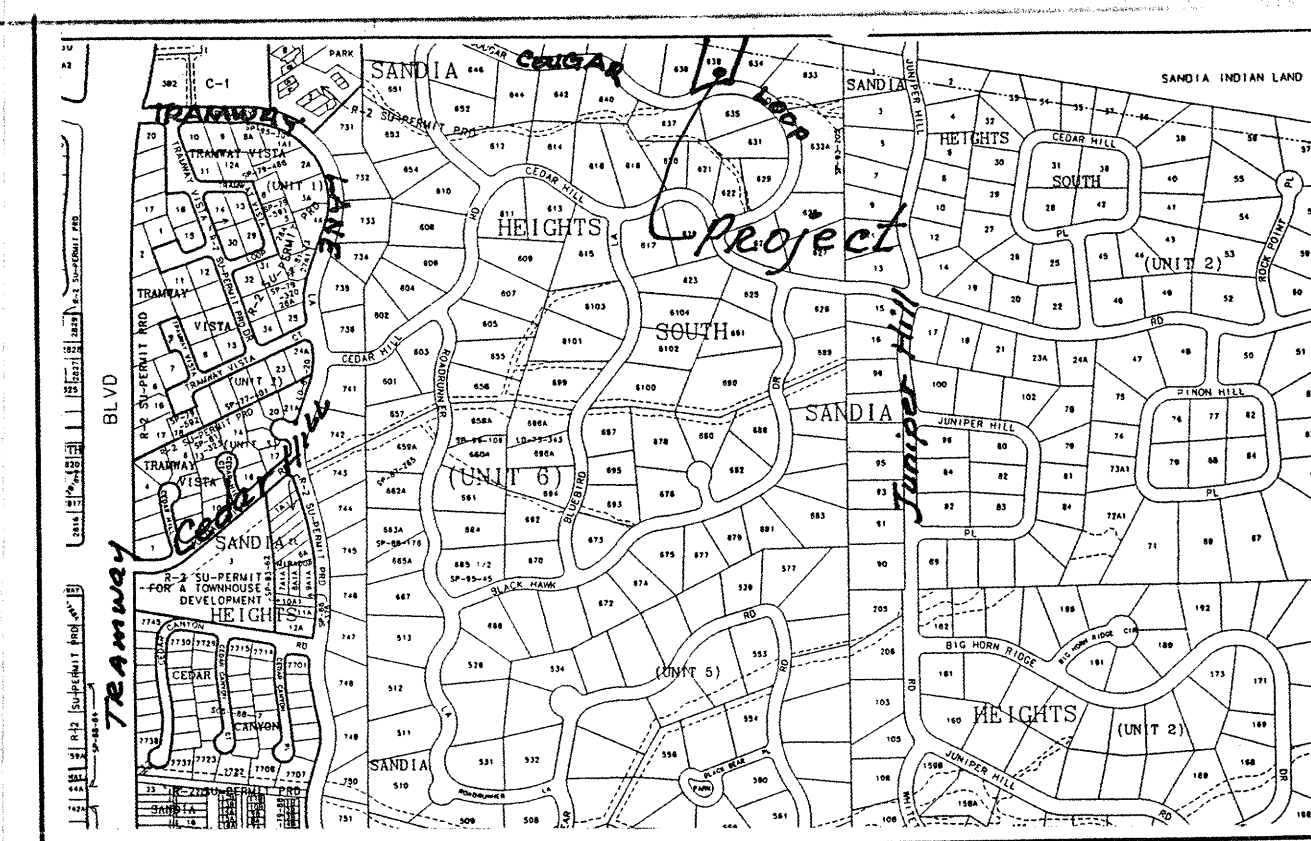
## NOTES:

1. NO PERIMETER FENCING IS PROPOSED WITH THIS PLAN.
2. PER COUNTY ORDINANCE AN ACCESS PERMIT IS REQUIRED. CONTACT PWD @ 848-1523.
3. ROCK SPECIFICATION: @ CANALES: 1/4 C.Y. OF 4" TO 6" DIA. COBBLES  
@ 6" WIDE BOTTOM SWALES; TYPE 'M' WELL GRADED  
AVERAGE DIA. 50-70%, 18"; MAX. DIA. 21"; MIN. 4"  
COLOR TO MATCH NATIVE ROCK
4. THIS SITE IS SERVED BY SANDIA UTIL. CO. (WATER AND SEWER).
5. THIS PLAN SHOWS EXISTING DRAINAGE FLOWING THROUGH THE SITE, AND MUST NOT BE IMPEDED AND CONTINUE TO DO SO, AND MAINTAINED AFTER DEVELOPMENT.

SCALE  
1"=20'

## LEGEND

EXIST. SPOT ELEV.	+92.5
EXIST. CONTOUR	08
TOP OF CURB	tc
EXIST. POWER POLE	P.P. o
REBAR AND CAP	r/c
FLOW LINE	f
SWALE	
DRAINAGE FLOW	
NEW SPOT ELEV.	10.10
NEW CONTOUR	10
NEW STRUCTURE	
NEW CONCRETE	
HEC2 ANALYSIS POINT (X-Section)	①



VICINITY MAP, ZONE C-23 @ 1"=750'

## 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:  $VOLUME = WEIGHTEGHT \times AREA$   
SOIL TYPE: 'A', TESUJO SERIES, A VERY GRAVELLY LOAMY SAND AS CLASSIFIED BY THE SOIL CONSERVATION SERVICE  
P100 = 2.9 INCHES, ZONE 4  
TIME OF CONCENTRATION, TC = 10 MINUTES  
DESIGN STORM: 100-year/6-hour, 10-year/6-hour WHERE [ ] = 10 YEAR VALUES

### II. EXISTING CONDITIONS

LOT AREA = 0.81 ACRES, WHERE EXCESS PRECIPITATION 'A' = 0.8 IN. [0.28]  
PEAK DISCHARGE Q100 = 1.8 CFS [0.70], WHERE UNIT PEAK DISCHARGE 'A' = 2.2 CFS/ACRE [0.87]  
THEREFORE:  $VOLUME_{100} = 2352 \text{ C.F.}$  [823 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	2.22 [0.87]	0.8 [0.28]
LANDSCAPING,	0.09 AC.	B	2.92 [1.45]	1.08 [0.46]
GRAVEL & COMPACTED SOIL	0.31 AC.	C	3.73 [2.26]	1.48 [0.73]
ROOF/PAVEMENT,	0.11 AC.	D	5.25 [3.57]	2.64 [1.69]
	0.81 ACRES			

Weighted = 1.32 IN. [0.65]  
Q100 = 2.63 CUBIC FEET PER SECOND (CFS) Q10 = 1.5 CFS; VOL100 = 3881 CUBIC FEET (CF), VOL10 = 1911 CF

### IV. QUANTIFY UP-STREAM RUNOFF IMPACTING THE PROPERTY

REFERENCE D.P.M., SECTION 22.2 - PART A.7 "RATIONAL METHOD FOR WATERSHEDS LARGER THAN 40 ACRES"

$Q_p = CIA$  WHERE:  $i = 0.726 \text{ LOG}_{10} (24.6 t_c^{0.5})^{1/4} \times P_{60}^{0.33}$   
 $t_c = (12000 - L) / (72000K \times S^{0.5}) + [L - 4000] K^{0.33} / (552.25 \times 0.165)$   
FOR BASINS > 4000 FEET IN LENGTH  
K = 1.75, CONVEYANCE FACTOR FROM TABLE B-1  
 $K_N = 0.042$ , CONVEYANCE FACTOR FROM TABLE B-2  
P<sub>60</sub> = 2.23 INCHES (NOAA ISOPHYETALS)  
CC = COMPOSITE RUNOFF COEFFICIENT (INTERPOLATED FROM TABLE A-11)

DEVELOPED LAND TREATMENTS: A-1 ZONE (1 ACRE ± MINIMUM)  
PER LOT..... 6591 SF, TREATMENT 'D' WHERE C = 0.94 7754 SF, TREATMENT 'B' WHERE C = 0.52  
7754 SF, TREATMENT 'C' WHERE C = 0.66 16670 SF, TREATMENT 'A' WHERE C = 0.39

OFF-SITE DRAINAGE AREA = 100 ACRES  
THEREFORE: TOTAL 'CC' = 0.60  
L = 5230'  $L_{CA} / L = 0.5$  &  $S_1 = 45\%$ , 1500' &  $S_2 = 7\%$ , 3780'  
THEREFORE: S = 18%  
TC = 0.24 HRS. I = 5.2 IN./HR.  
Q100 = CIA = 0.60(5.2)100 = 312 CUBIC FEET/SEC. @ SE CORNER  
Q100 = 3.12 CFS/AC. x 20 AC. = 63 CFS @ PROJECT NORTH BOUNDARY (SHEET FLOW)

### V. DETERMINE HYDRAULIC PROPERTIES OF SHEET FLOW IMPACTING THE PROJECT NORTH BOUNDARY

Q100=63 CFS AND PER MANNINGS EQ.  
WHERE: N = 0.04, WIDTH(BOTTOM) = 80" SLOPE = 8.0% SIDESLOPES(AVG) 5:1, THEREFORE:  
NORMAL DEPTH = 0.2 FEET PER MANNINGS EQUATION, VEL100 = 3.6 FEET PER SECOND

ESTIMATE HYDRAULIC PROPERTIES OF FLOW AROUND STRUCTURE:  
Q100 = 63 CFS ± IN SWALE TO WEST

WIDTH(BOTTOM) = 6', SLOPE = 7% SIDESLOPE 2:1, THEREFORE  
NORMAL DEPTH = 0.9', VEL100 = 8.8 FPS,  $V^2 / 2g = 1.2'$

EROSION PROTECTION NECESSARY PER URBAN STORM DRNG. MANUAL.....USE TYPE 'M' (AVG. DIA. 12")  
(TABLE 5-5, READ 4.3 Factor)

### V. CHECK EROSION SETBACK PER SEDIMENTATION EROSION DESIGN GUIDE

Q100 = 375 CFS, Q<sub>50</sub> = 75 CFS W<sub>50</sub> = 25.87' LANDA = 259'  
THEREFORE: BANK SETBACK = 65' CENTERLINE SETBACK = 78'.....USE >

As - Constructed

I, PHILIP W. CLARK, PROFESSIONAL ENGINEER, REGISTERED IN ACCORDANCE WITH THE LAWS IN THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE GRADING AND DRAINAGE IMPROVEMENTS SHOWN ON THIS PLAN ARE IN SUBSTANTIAL COMPLIANCE WITH THE APPROVED PLAN.

## PROJECT INFORMATION

### LEGAL DESCRIPTION:

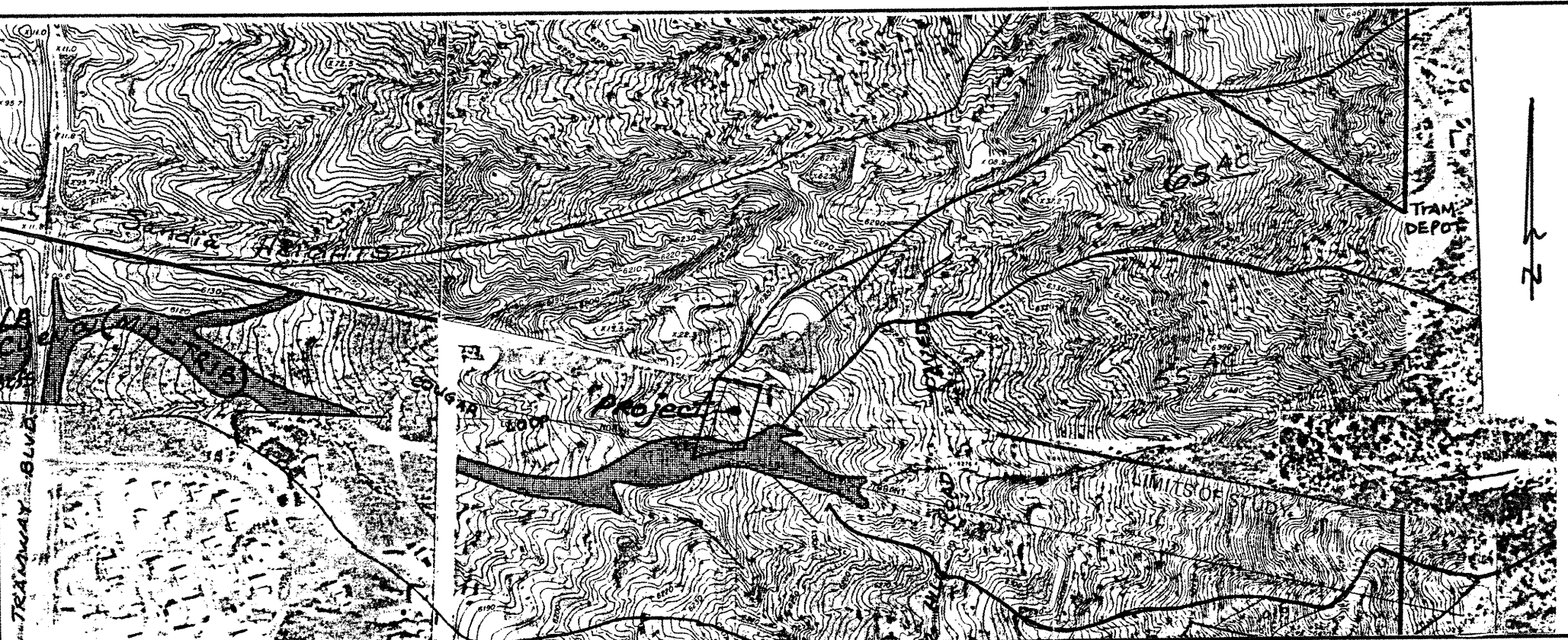
LOT 636 SANDIA HEIGHTS SOUTH, UNIT 6  
BERNALILLO COUNTY, NEW MEXICO

### PROJECT BENCHMARK

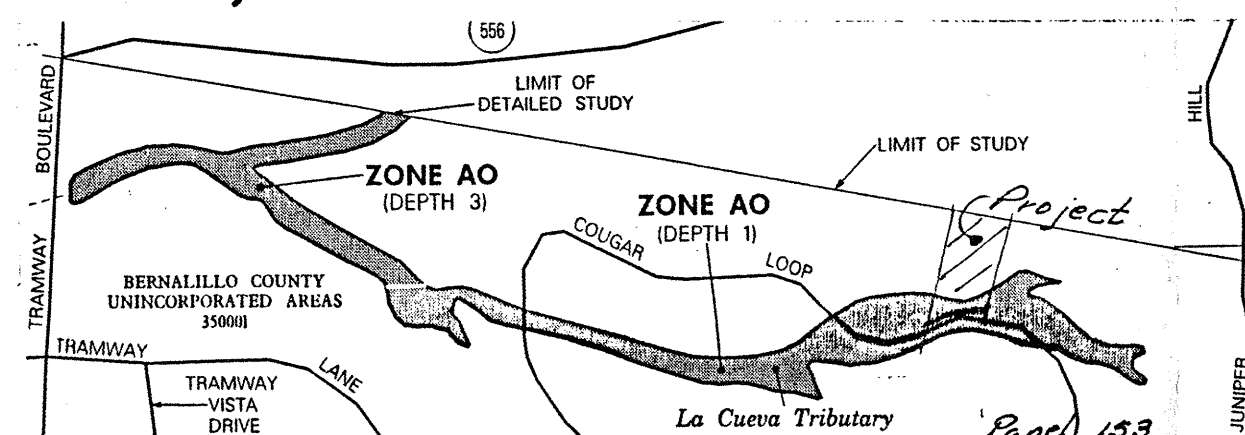
TOP OF REBAR/ALUM CAP AT THE SOUTHWEST PROPERTY CORNER, ELEVATION = 6214.50.

### PROPERTY ADDRESS:

636 COUGAR LOOP, ALBUQUERQUE, NM 87122



FEMA MAP, PANEL 11 @ 1"=500' (XREF: FIRM PANEL 153, 1996)



## GRADING & DRAINAGE PLAN

THE PROPOSED RESIDENTIAL HOME IS LOCATED IN SANDIA HEIGHTS SOUTH SUBDIVISION APPROXIMATELY 12 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.95-6. 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, GRAVEL DRIVEWAY, COURTYARD ROCK EROSION PROTECTION, AND NEW GRADE ELEVATIONS.
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. RESULTS OF HEC2 WATER SURFACE PROFILE ANALYSIS

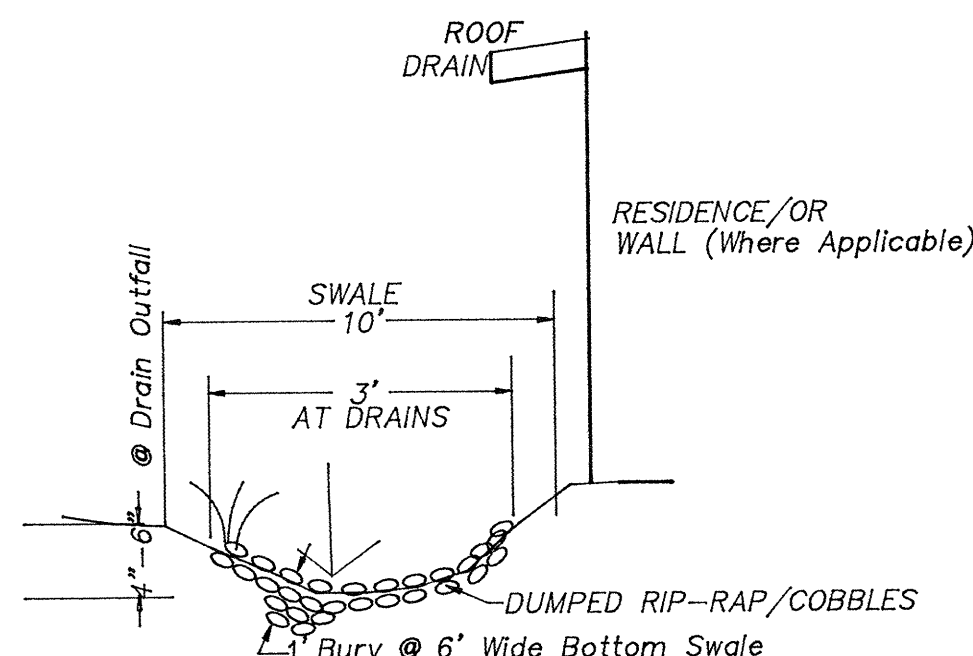
THE PURPOSE OF THE PLAN IS TO ESTABLISH CRITERIA FOR CONTROLLING STORM RUN-OFF GENERATED BY THE PROPOSED IMPROVEMENTS, ESSENTIALLY ALLOWING HISTORIC OFF-SITE AREAS TO DRAIN THROUGH THE PROPERTY AFTER DEVELOPMENT. THE PLAN DETERMINES THE RUN-OFF RESULTING FROM THE 100-YEAR/6-HOUR DURATION STORMS FOR BOTH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

PRESENTLY, THE SITE IS BOUNDED ON THE EAST AND WEST BY DEVELOPED LOTS. PROPERTY ADJACENT TO THE NORTH IS DEVELOPED (CITY WATER TANK). COUGAR LOOP ADJACENT ON THE SOUTH BOUNDARY IS A 22' WIDE PAVED AND COUNTY MAINTAINED ROADWAY SITUATED WITHIN A 50' R.O.W.

THE SITE GENERALLY SLOPES MODERATELY FROM NORTHEAST TO SOUTHWEST RANGING FROM 5 TO 10 PERCENT. OFFSITE DRAINAGE FLOWS ENTER THE SITE AT THE NORTH BOUNDARY, AND ARE CONVEYED TO THE SOUTHWEST PORTION OF THE PROPERTY. THE SITE IS ENCOMBERED BY A FEDERALLY DESIGNATED (LA CUEVA MIDDLE TRIBUTARY) FLOOD PLAIN AS DEPICTED ON PANEL 11 OF THE FEMA MAPS, SEE UPPER LEFT CORNER THIS SHEET. THESE FLOWS ARE ANALYZED IN ORDER TO PROTECT THE STRUCTURE FROM FLOODING AND EROSION.

HISTORICAL SITE RUN-OFF OUTFALL LOCATIONS WILL REMAIN UNCHANGED WITH RUNOFF ALLOWED TO FLOW ACROSS THE SITE AND CONVEYED TO HISTORIC OUTFALL LOCATIONS. SINCE COUGAR LOOP IS IMPROVED MINIMAL GRADING IMPROVEMENTS ARE PROPOSED WITHIN THE RIGHT-OF-WAY. FREE DISCHARGE OF SITE RUN-OFF IS ACCEPTABLE SINCE RUN-OFF DOES NOT EXCEED THE MAXIMUM ALLOWABLE UNIT DISCHARGE ESTABLISHED FOR SANDIA HEIGHTS SOUTH.

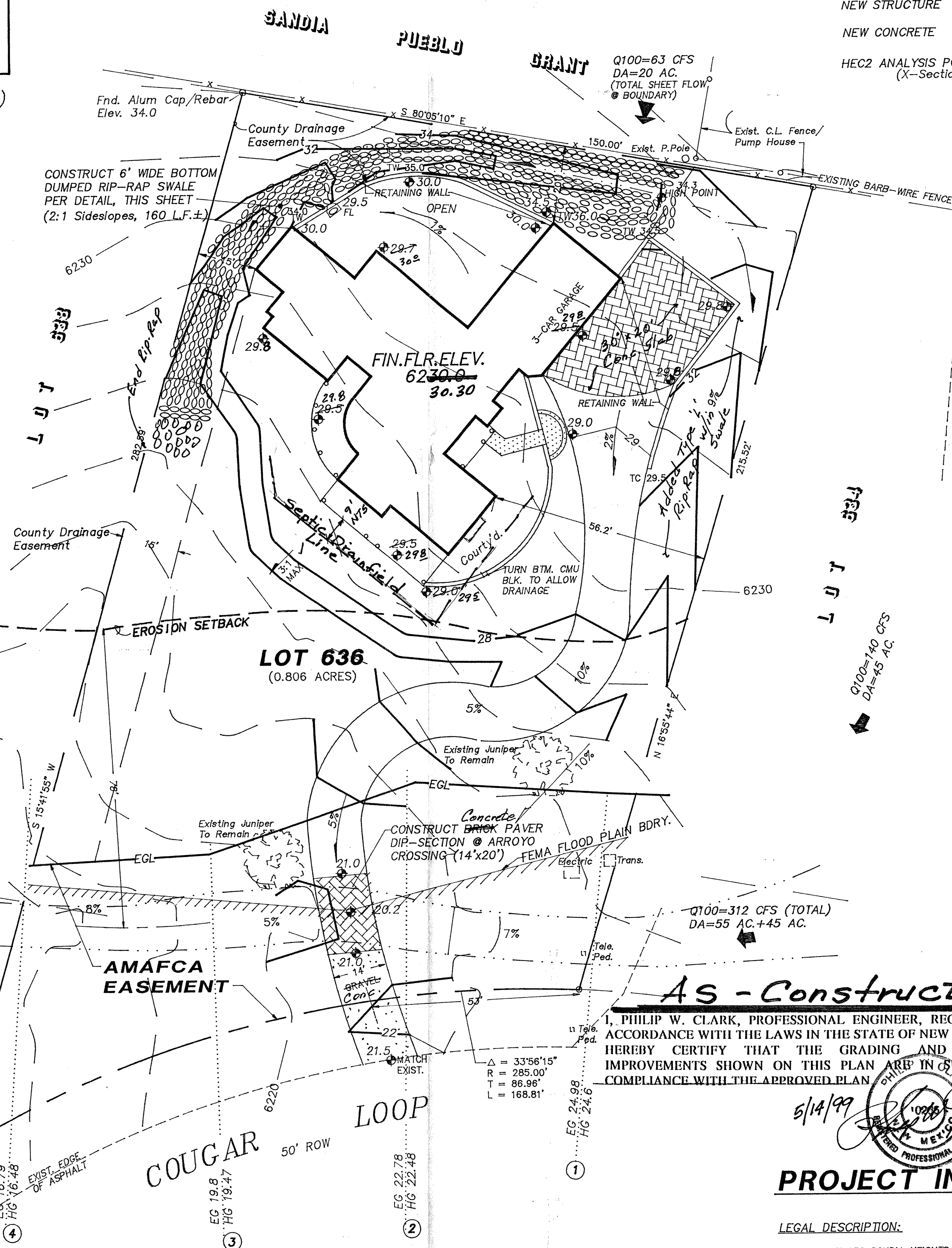
HYDROLOGIC PROCEDURES AND CALCULATIONS ARE IN ACCORDANCE WITH SECTION 22.2, HYDROLOGY, OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA, REVISED JANUARY 1993, FOR THE CITY OF ALBUQUERQUE, NEW MEXICO, AND ADOPTED BY BERNALILLO COUNTY.



## EROSION PROTECTION DETAIL

SEE NOTE 3

Project Bench  
ELEV. = 6214.5  
TOP OF REBAR/CAP



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 OCCURRED ON THIS SITE SINCE THE CONTOURS WERE DETERMINED.

PHILIP W. CLARK  
3-1-98  
10285

Clark Consulting Engineers  
Edgewood, New Mexico 87015

Tel: (505) 281-2444 Fax: (505) 281-2444

DATE REVISION LOT 636, SANDIA HEIGHTS SOUTH, UNIT 6  
6/4/98 Revised by MELVIN & MARY SUTTON RESIDENCE  
5-17-99 As-built by

GRADING &  
DRAINAGE PLAN