

County of Bernalillo

State of New Mexico

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ORLANDO VIGIL, TREASURER

2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

March 9, 2001

Mike E. Brazie
Harding Lawson Associates.
6400 Uptown Blvd. NE Suite 310E
Albuquerque, New Mexico 87110

**RE: Grading and Drainage Plan for Tr. A Lands of Sullivan and Hiller (L24-D5)
(PWDN 125) Dated November 27, 2000**

Dear Mr. Brazie:

The above referenced drainage plan received January 19, 2001 is approved. Upon completion of the project the engineer will need to certify the project.

If you have any questions please call me at 924-3982.

Sincerely,

A handwritten signature in black ink, appearing to read "Carlos A. Montoya".

Carlos A. Montoya
City/County Floodplain Administrator

C: Lynn Mazur, AMAFCA
Brian Kent, Bernalillo County

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2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

February 7, 2001

Mike E. Brazie
Harding Lawson Associates.
6400 Uptown Blvd. NE Suite 310E
Albuquerque, New Mexico 87110

**RE: Grading and Drainage Plan for Tr. A Lands of Sullivan and Hiller (L24-D5)
(PWDN 125) Dated November 27, 2000**

Dear Mr. Perea:

I have review the referenced drainage plan received January 19, 2001 and forward the following comments. The comments are a combination of City, County, and AMAFCA comments.

1. A drainage easement needs to be submitted to AMAFCA for the 100 year floodplain in the Tijeras Arroyo.
2. Please improve on the location and dimensions of the property on the vicinity map. The vicinity map is hard to read. Please put some street names, Tijeras Arroyo and the subject lot on the contributing watershed map.
3. I have attached the floodplain map for the Tijeras Arroyo next to your site. I believe that the location is around section "BX and BY". Please transfer the 100 year water surface from the floodplain map to your drawing.

If you have any questions please call me at 924-3982.

Sincerely,

A handwritten signature in black ink, reading "Carlos A. Montoya".

Carlos A. Montoya
City/County Floodplain Administrator

C: Lynn Mazur, AMAFCA
Brian Kent, Bernalillo County



County of Bernalillo

Case Comments Report

Permit: PWDN 125

Department: PDEV

Activity: (PWDRAN) PW GRADING & DRAINAGE PLAN REVIEW

Action: (PWDRAN) REVIEW GRADING & DRAINAGE COMMENTS

1. Note Date: 18-AUG-2000

Description:

Comments:

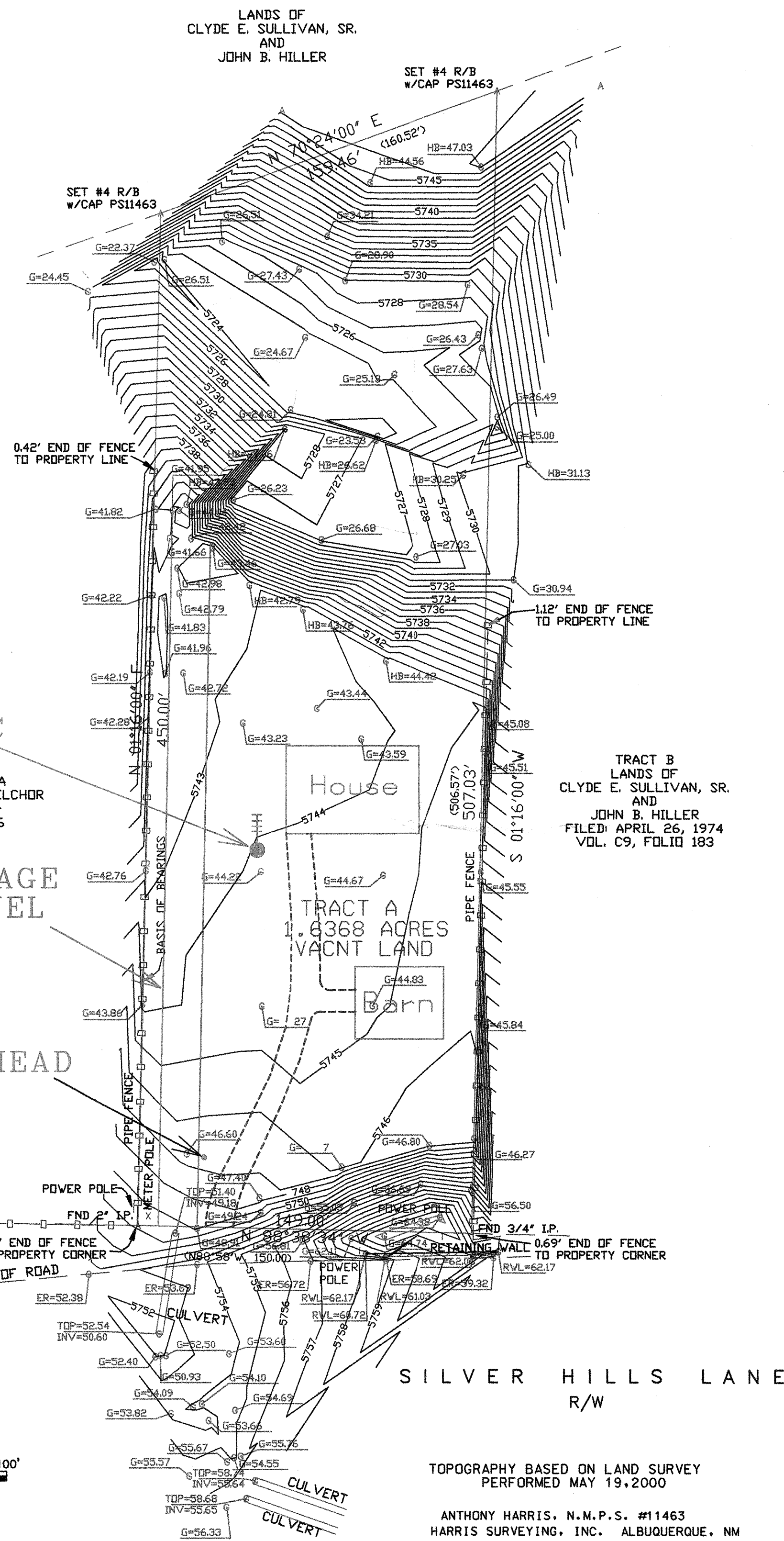
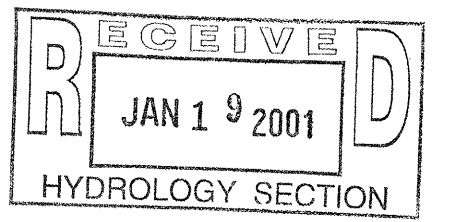
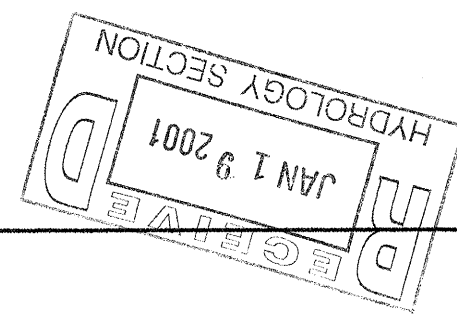
1. Show proposed development for this site.
2. Show contours with elevations.
3. This site has the Tijeras Arroyo running through it. The "Q100" for Tijeras Arroyo is approximately 14,000 cfs at Tijeras Village and 18,000 cfs at Four Hills Bridge. Provide hydraulic analysis on the arroyo (Hec-Ras is not necessary). Erosion protection must be shown, and an easement for the arroyo must also be provided.
4. The off site basin shown drops 750 feet as shown on the "contributing watershed" drawing. The slope of this basin requires a different land treatment analysis than shown in the calculations. (Table A-4 of the DPM sec.22.2). It would help if the contributing watershed drawing was more clear.
5. Show channel calculations, erosion protection will be required to keep the channel from shifting
6. Show a section detail of the fence.
7. A drainage easement will be required for the channel.

2. Note Date: 28-SEP-2000

Description:

Comments:

1. The slope for the offsite drainage basin appears to be greater than 10%. Table A-4 indicates a land treatment of undeveloped land with slopes greater than 10% to be land treatment "B".
2. Provide a copy of the easement for the channel.
3. Gabions for the arroyo are unnecessary for this grading and drainage plan.
4. Provide erosion protection on the western side of the channel. Erosion protection should be suitable for velocities.
5. The minor contours are not legible on the Contributing Watershed Drawing.
6. Provide one copy resubmittal drawing.



LEGAL DESCRIPTION

THE SITE IS KNOWN AS TRACT "A" OF THE LANDS OF CLYDE E. SULLIVAN, SR. AND JOHN B. HILLER, WITHIN THE CANON DE CARNUE GRANT, BERNALILLO COUNTY, NEW MEXICO; SITUATED IN SECTION 25, T10N, R4E, N.M.P.M.

FLOOD HAZARD

FLOOD ZONE (FIRM) MAPPING IS NOT ADOPTED FOR THIS AREA; THE PROPOSED CONSTRUCTION SITE IS LOCATED ABOVE THE BASE FLOOD ELEVATION.

DESIGN CRITERIA

THE DESIGN CRITERIA ARE BASED ON SECTION 22.2 (HYDROLOGY) OF THE DEVELOPMENT PROCESS MANUAL, JULY 1997.

SITE LOCATION AND DESCRIPTION

THE SITE IS BOUNDED ON THE WEST, NORTH, AND EAST BY DEVELOPED LOTS, AND ON THE SOUTH BY SILVER HILLS LANE (COUNTY-MAINTAINED). THE TIJERAS ARROYO RUNS THROUGH THE NORTHERN PORTION OF THE PROPERTY FROM EAST TO WEST. THE EXISTING SITE CONSISTS OF 1.6368 ACRES OF UNDEVELOPED AND UNCOMPACTED LAND. A PIPE FENCE (DETAIL B) SURROUNDS THE PROPERTY, BUT DOES NOT IMPEDE FLOW.

EXISTING DRAINAGE CONDITION

THE SITE IS LOCATED WITHIN THE PRECIPITATION ZONE 3. THE PRESENT RUNOFF FROM THE PROPERTY IS SHEETFLOW TO THE NORTHWEST, WITH AN AVERAGE GRADIENT OF 1.8%. AN EARTH BERM AND RETAINING WALL ON THE SOUTHEAST CORNER ISOLATE THE PROPERTY FROM SHEET FLOW ALONG THE ACCESS ROAD. IN ADDITION, THE ROAD IS SUPERED TO THE SOUTH, AWAY FROM THE PROPERTY. AN EXISTING 24" CORRUGATED METAL PIPE, CONVEYING THE DISCHARGE FROM THE UPLAND DRAINAGE, ENTERS THE PROPERTY ON THE SOUTHWEST CORNER. THE PIPE CAPACITY IS 30 CFS AT A VELOCITY OF 9.7 FT/S. ANY OVERFLOW PAST THE CMP WILL FLOW TO THE TRACT WEST OF THE SUBJECT PROPERTY.

TRACT AREA = 1.6368 AC BUILDABLE AREA = 0.95 AC (58% OF TOTAL TRACT). EXCESS PRECIPITATION FOR LAND TREATMENT "A", ZONE 3 IS 1.87 CFS/AC, AND: $Q_{100} = 1.6368 \times 1.87 \text{ CFS/AC} = 3.06 \text{ CFS}$. OF WHICH 1.77 CFS (58%) IS GENERATED ON THE BUILDABLE AREA. THE BALANCE DRAINS DIRECTLY INTO THE TIJERAS ARROYO.

PROPOSED DRAINAGE CONDITION

FOR THE DEVELOPED CONDITION, THE LAND TREATMENT WAS DISTRIBUTED AS FOLLOWS: $Q_a = 1.87$, $Q_b = 2.60$, $Q_c = 3.45$, AND $Q_d = 5.02$ (FROM TABLE A-9 DPM, PAGE 22-15)

$Q_p = Q_a \times A_a + Q_b \times A_b + Q_c \times A_c + Q_d \times A_d$ (EQUATION a-10 DPM, PAGE 22-16)

AREA	LAND TREATMENT	UNIT PEAK DISCHARGE
A	$A_a = 1.24 \text{ AC}$	2.32 CFS
B	$A_b = 0.15 \text{ AC}$	0.39 CFS
C	$A_c = 0.15 \text{ AC}$	0.32 CFS
D	$A_d = 0.10 \text{ AC}$	0.50 CFS

$Q_{100} = 3.73 \text{ CFS}$, OF WHICH 3.19 CFS IS GENERATED ON THE BUILDABLE AREA. ALL SHEET FLOW FROM THE BUILDABLE AREA WILL BE CAPTURED IN A TRAPEZOIDAL CHANNEL CONSTRUCTED ON THE EXTREME WESTERN EDGE OF THE PROPERTY, APPROXIMATELY 8 FEET FROM THE PROPERTY LINE, WITH THE UPGRADE END SITUATED BELOW THE OUTFALL OF THE CMP. THE CHANNEL HAS BEEN EXCAVATED (CONTRARY TO THE TOP SHOWN) TO A DEPTH OF 10 FEET, AN AVERAGE BOTTOM WIDTH OF 10 FEET WITH 2:1 SIDE SLOPES (SEE DETAIL A), A MINIMUM LONGITUDINAL SLOPE OF 1.0%, AND TRENDING SOUTH TO NORTH. USING THE MANNING EQUATION TO DETERMINE THE MAXIMUM DISCHARGE CONVEYED WITHOUT AVULSION: $Q = 1.486 \times A \times R^{0.667} \times S^{0.5/3}$ AND $Q = 1.486 \times (12) \times (12/14.5)^{0.667} \times (0.010)^{0.5/0.025} = 63 \text{ CFS}$, WHICH IS ADEQUATE TO HANDLE THE COMBINATION OF ON-SITE AND OFF-SITE FLOWS DURING THE 100-YEAR EVENT. RIPRAP IS RECOMMENDED AT THE OUTFALL OF THE CMP. THE CHANNEL WILL BE GRASSED TO MINIMIZE EROSION WITH ROCK PROTECTION ON THE WEST SLOPE TO MINIMIZE CHANNEL MIGRATION ONTO THE ADJACENT PROPERTY ($V_{max} = Q_{max}/A = 63/12 = 5.25 \text{ FT/S}$). ANY OTHER EROSION CONTROL MEASURES MUST BE APPROVED BY A QUALIFIED ENGINEER.

PEAK DISCHARGE OF OFFSITE FLOWS

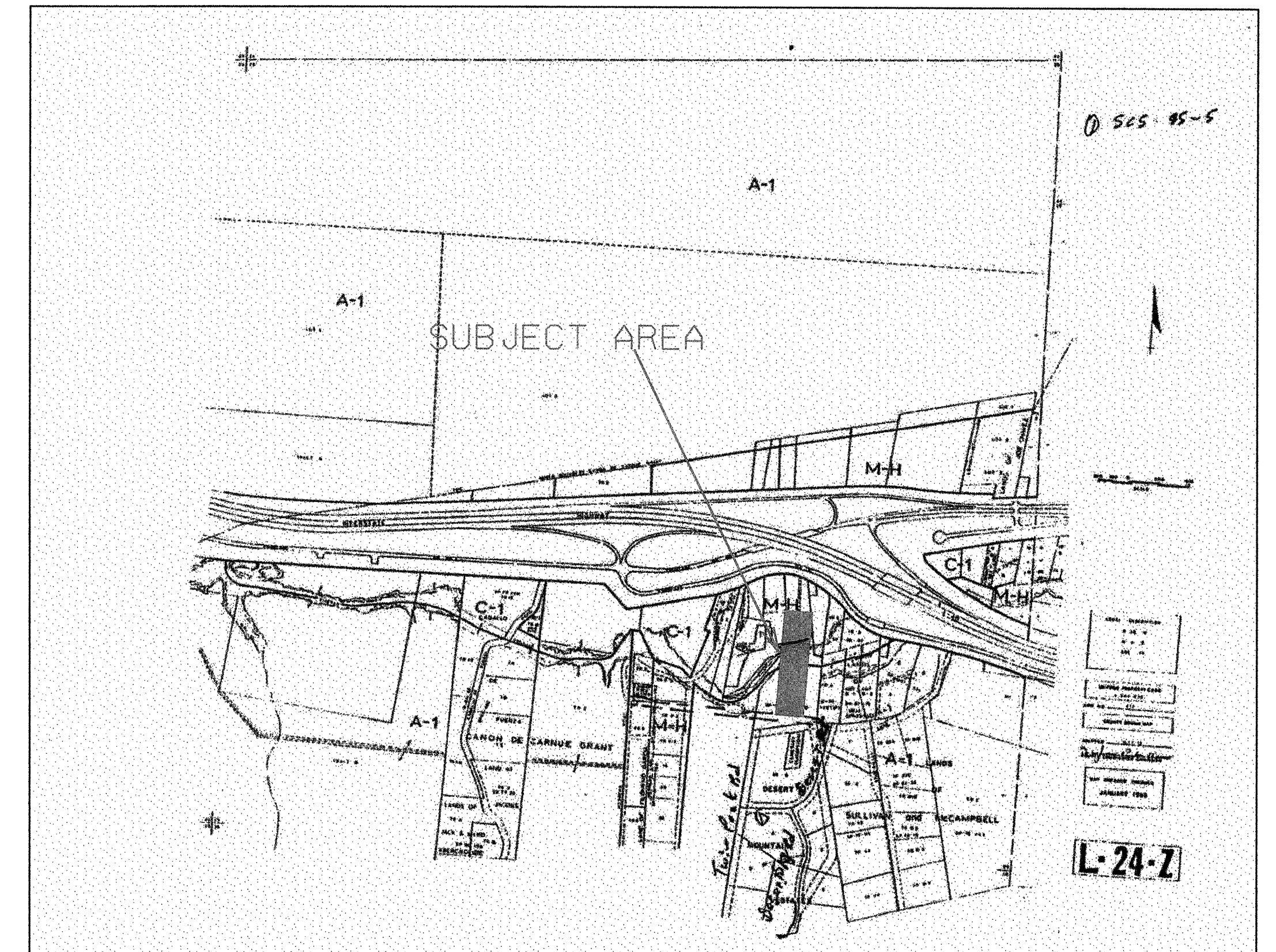
THE DRAINAGE BASIN EXTENDS FROM THE SOUTHEAST CORNER OF THE PROPERTY TO THE SOUTHEAST AND INCLUDES 20 ACRES OF 1+ ACRE PARCELS OF SINGLE-FAMILY DWELLINGS. ASSUMING DEVELOPED (15%) BASIN CONDITIONS, $B = 17.0 \text{ AC}$, $A = C = 0.0 \text{ AC}$, AND $D = 3.0 \text{ AC}$. THUS: $Q_a = 1.87$, $Q_b = 2.60$, $Q_c = 3.45$, AND $Q_d = 5.02$ (FROM TABLE A-9 DPM, PAGE 22-15) AND: $Q_p = Q_a \times A_a + Q_b \times A_b + Q_c \times A_c + Q_d \times A_d$ (EQUATION a-10 DPM, PAGE 22-16) THEREFORE, $Q_p = 2.60 \times 17.0 + 5.02 \times 3.0$ THEREFORE, $Q_p = 59.26 \text{ CFS}$ AND $V_{max} = Q_{max}/A = 59.26/12 = 4.94 \text{ FT/S}$.

ARROYO HYDRAULIC ANALYSIS

THE Q_{100} DISCHARGE FOR THE TIJERAS ARROYO IN THIS REGION IS BETWEEN 14,000 CFS (AT TIJERAS VILLAGE) AND 18,000 CFS (AT FOUR HILLS BRIDGE). APPLYING THE MANNING EQUATION TO DERIVE THE ARROYO CAPACITY JUST UPSTREAM OF THE PROPERTY: $Q = 1.486 \times A \times R^{0.667} \times S^{0.5/3}$ AND $Q = 1.486 \times (2758) \times (2758/228.6)^{0.667} \times (0.005)^{0.5/0.040} = 38,111 \text{ CFS}$ WITH HEAVY VEGETATION GROWING IN THE ARROYO ($n = 0.070$), THE CAPACITY IS 220,000 CFS. DUE TO THE FACT THAT THE BUILDING SITE IS NOT IN A FLOODPLAIN, AN EROSION SETBACK DELINEATION IS NOT REQUIRED. MR. COSSEY WILL GRANT A 15-FOOT-WIDE EASEMENT ENTERED ON THE CHANNEL CENTERLINE, AND AN EASEMENT BOUNDING THE TIJERAS ARROYO IF REQUIRED.

FUTURE ISSUES

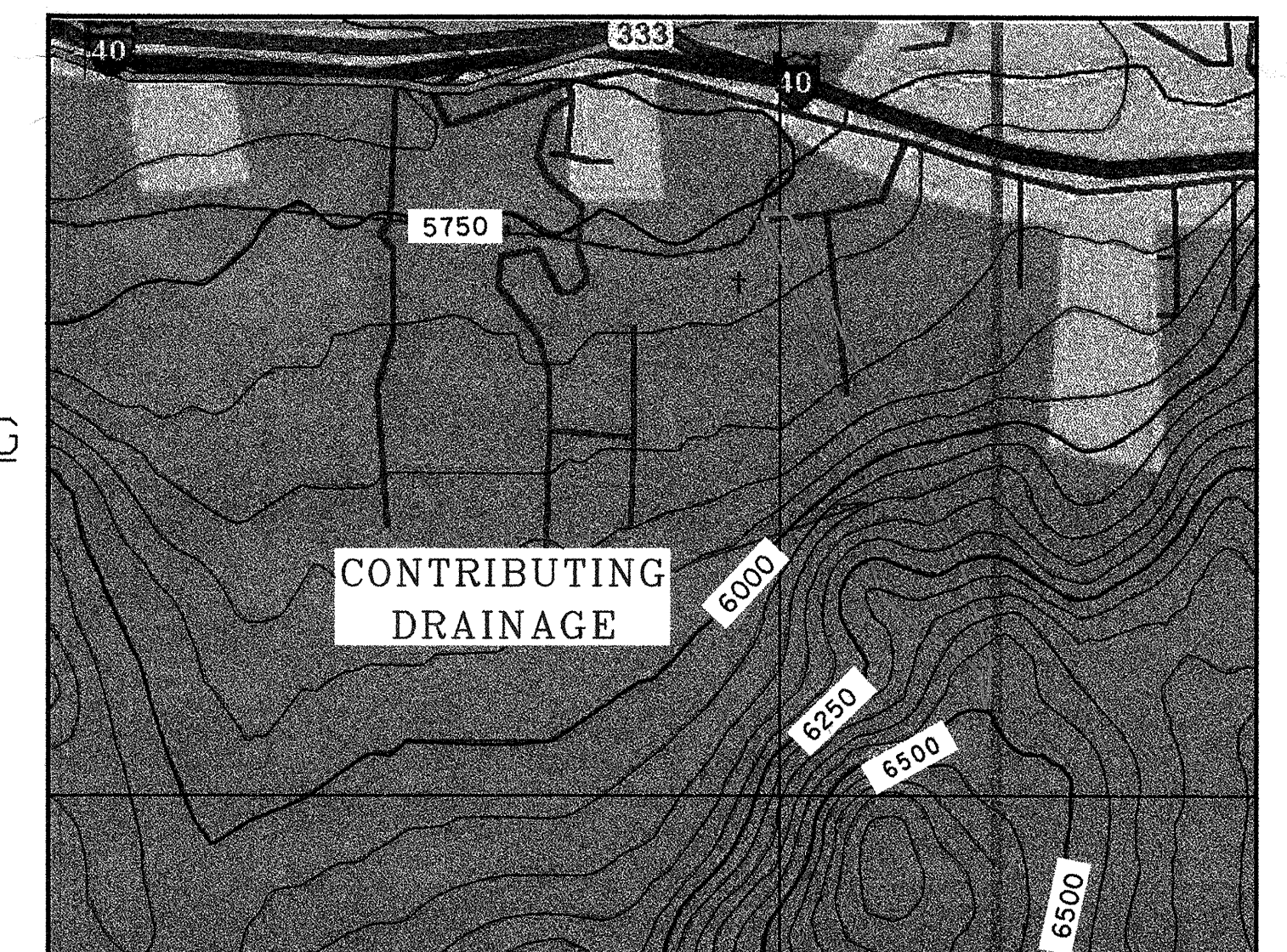
SHOULD MR. COSSEY DECIDE TO ALTER HIS PLAN IN THE FUTURE, HE UNDERSTANDS THAT HE WILL NEED TO RETAIN THE SERVICES OF A PROFESSIONAL ENGINEER TO DETERMINE THE IMPACTS, IF ANY, THAT MIGHT BE IMPOSED DOWNSTREAM DUE TO CONSTRUCTION ACTIVITIES. MR. COSSEY IS AWARE HE MAY BEAR LIABILITY FOR DAMAGE TO DOWNSTREAM PROPERTIES FROM CONSTRUCTION WITHIN THE EASEMENT.



VICINITY MAP

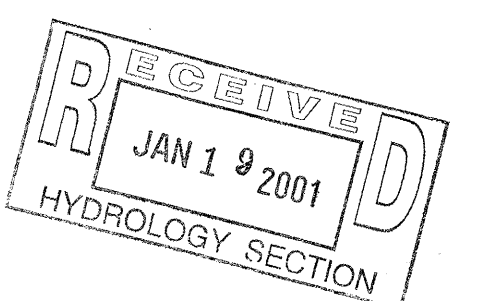
L-24-Z BERNALILLO COUNTY

CONTRIBUTING WATERSHED



*THIS SITE HAS BEEN PERSONALLY INSPECTED, AND, AS OF 15 JULY 2000, NO GRADING, FILLING, OR EXCAVATION, ASIDE FROM THE DRAINAGE CHANNEL, HAS OCCURRED SINCE THE PREPARATION OF THE TOPOGRAPHY SHOWN ON THE PLAN.

Easement to AMFCA



Harding Lawson Associates
Engineering and
Environmental Services
6400 Uptown Blvd. NE Ste. 310E
Albuquerque, New Mexico 87110

Title: Grade and Drain
Client: Cossey
County of Bernalillo

DRAWN
LJT

PROJECT NUMBER
47320.03.7

APPROVED
[Signature]

REVISED DATE
11-27-00

