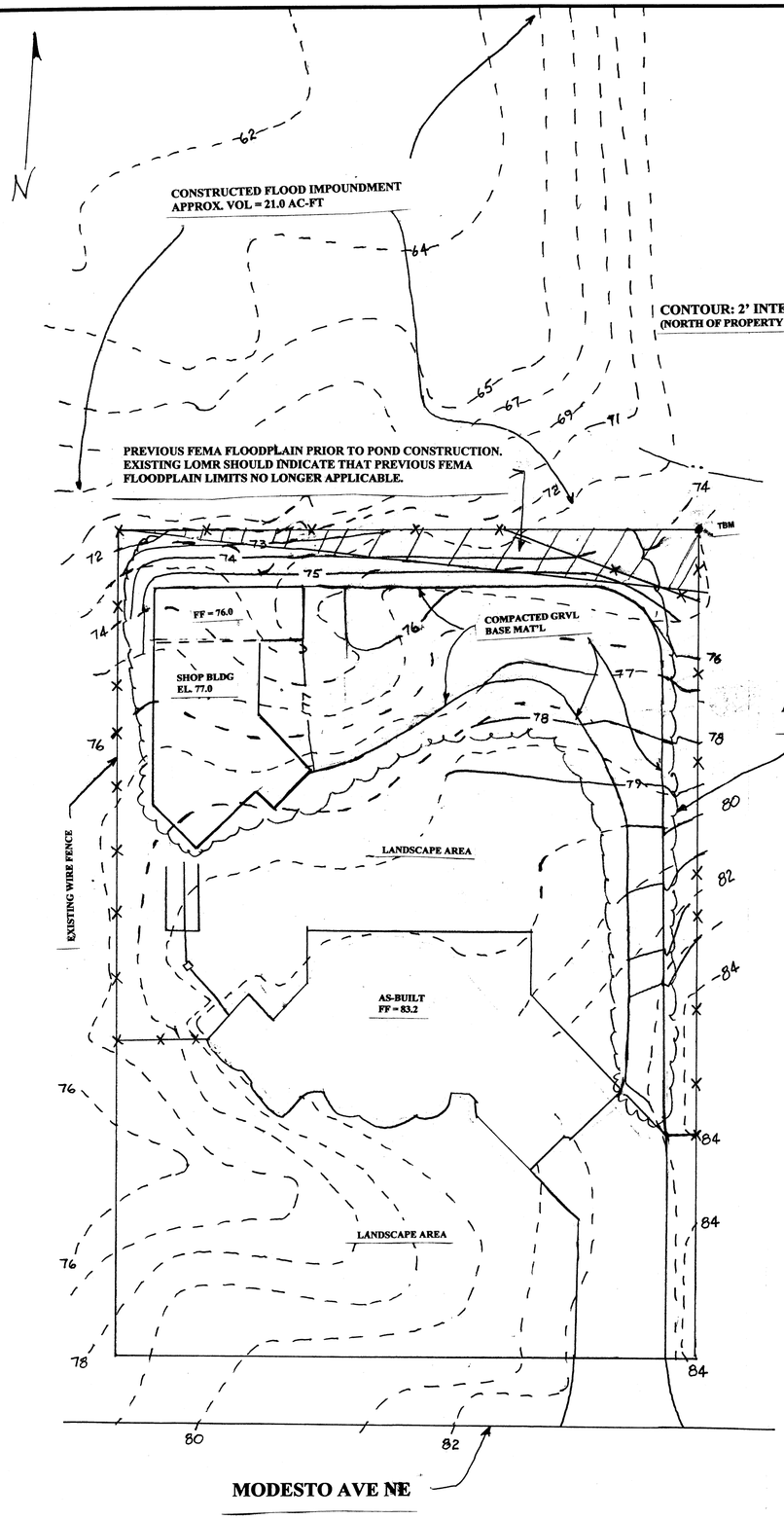


TEMPORARY BENCHMARK:
THE TEMPORARY BENCHMARK IS A #4 REBAR LOCATED AT THE NORTHEAST CORNER OF LOT 31, BLOCK 17, UNIT 3, TRACT 1 ELEVATION: 5475.1

1. NARRATIVE
2. ROOF FLOW DIRECTIONS? + LOT DRAINAGE
3. DEAL W/ Q ON WEST SIDE OF LOT
4. WALLS?
5. FIRM MAP?
6. CALL OUT SPECIFIC LOMR TO REMOVE FLOOD PLAIN

CONTOUR: 1' INTERVAL
FOR LOT ONLY.

SCALE: 1" = 20'

DRAINAGE CALCULATIONS: ZONE 3

UNDEVELOPED CONDITIONS

AREA =	0.88 acres	P(100-6) =	2.6 inches
WEIGHTED "E" (100)=	0.66 inches	WEIGHTED "E" (10) =	0.19 inches
Therefore:			
Q(100) =	1.65 cfs	Q(10) =	0.51 cfs
Volume(100) =	2108 cf	Voume(10) =	607 cf

DEVELOPED CONDITIONS (MAX. RUNOFF CONDITIONS per BCPW)

	Acres	Sq. Ft.		Acres	Sq. Ft.
TOTAL AREA (ac) =	0.88	38,333			
Treatment A	0.38	16,482	Treatment C	0.18	7,667
Treatment B	0.18	7,667	Treatment D	0.15	6,517

Weighted E (100) = 1.13 inches **Weighted E (10) =** 0.53 inches

Q (100) = 2.5 cfs **Q (10) =** 1.3 cfs
Volume (100) = 3600 cf **Volume (10) =** 1702 cf

PROPOSED CONDITIONS (ACTUAL RUNOFF CONDITIONS)

	Acres	Sq. Ft.		Acres	Sq. Ft.
TOTAL AREA (ac) =	0.88	38,333			
Treatment A	0.20	8,733	Treatment C	0.30	12,987
Treatment B	0.18	7,667	Treatment D	0.20	8,946

Weighted E (100) = 1.32 inches **Weighted E (10) =** 0.68 inches

Q (100) = 2.9 cfs **Q (10) =** 1.6 cfs
Volume (100) = 4224 cf **Volume (10) =** 2158 cf

NOTES:

1. **STRUCTURE DOES NOT LIE WITHIN THE FEMA FLOODPLAIN.**
2. **ADD 5400.0 TO CONTOUR ELEVATIONS.**
3. **CONTOUR INTERVAL EQUALS 1.0 FT EXCEPT AS NOTED.**
4. **POSITIVE DRAINAGE FROM FOUNDATION.**
5. **DRAWING UTILIZED FROM THE LAYOUT OF PROPOSED RESIDENCE AS SHOWN.**
6. **DRAINAGE CALCULATIONS PREPARED IN ACCORDANCE WITH SECTIONS 22.2, HYDROLOGY DEVELOPMENT MANUAL, BERNALLILO COUNTY.**
7. **APPROXIMATE LOT SIZE IS 165 FT x 234 FT.**
8. **STRUCTURE SET-BACK ON LOT IS 10 FT. FROM WEST PROPERTY LINE AND 15 FT. FROM THE NORTH PROPERTY LINE.**
9. **ONLY AREAS NEEDED FOR CONSTRUCTION WILL BE CLEARED AND GRUBBED. OTHER AREAS WILL REMAIN UNDISTURBED.**
10. **DISTURBED AREAS WILL BE VEGETATED/LANDSCAPED IN ACCORDANCE WITH CITY OF ALBUQUERQUE/BERNALLILO COUNTY ZONING REQUIREMENTS.**

ENGINEER'S STATEMENT

I, hereby, state that I have personally inspected the land represented by this plan and I certify the contours shown on this plan substantially reflect the conditions of the site.

Bernard R Freeman 10/16/06
(Bernard R. Freeman, NMPE 8795)

CONTROL STATION DATA

City of Albuquerque, New Mexico
Public Works Department
Engineering Division

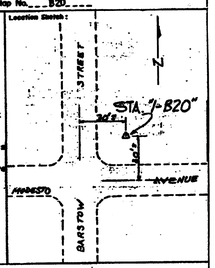
Name of Station 1-B20 State NM County Bernalillo
Establishing Agency ACS Year 1962 Chief of Party L. L. Pena
Section 8 Township 11N Range 4E Map No. B20

Description (1977)
The station is located 9 miles northeast of downtown Albuquerque.

To reach the station from the intersection of Louisiana Blvd. and Pasco Del Norte go east on Pasco Del Norte 1.0 mile to Barstow St. then north on Barstow St. 1.0 mile to Modesto Ave. The station is located in the northeast quadrant of the intersection.

The station mark is a standard ACS brass tablet, stamped "1-B20", set in top of a concrete post projecting 0.3 ft. above ground.

Location Sketch:



HORIZONTAL DATA ✓ FIELD METHOD: ☑ Traverse ☐ Triangulation ☐ Trilateration
GEOGRAPHIC POSITION (NAD 1927) 2nd order
Latitude 35 11 19.63272 Longitude 106 33 01.31409
PLANE COORDINATES Projection TM State NM Zone Central
X 410237.56 Y 1524082.46 Ground-to-Grid Factor 0.99966760

ELEVATION DATA
SPIRIT LEVEL ELEVATION (MSL 1929) ✓ Feet 5474.510 Meters 1668.634 } 2nd Order 1st-Class
ADJUSTED NAVD88 5477.18
TRIGONOMETRIC ELEVATION Feet Meters

AZIMUTH DATA ✓ D for ACCU Angle -0 10 25

Station	Azimuth	Back Azimuth	DISTANCE Feet	Meters
1-B19	90 23 05		2639.460	804.509

RECEIVED
OCT 18 2006
HYDROLOGY SECTION

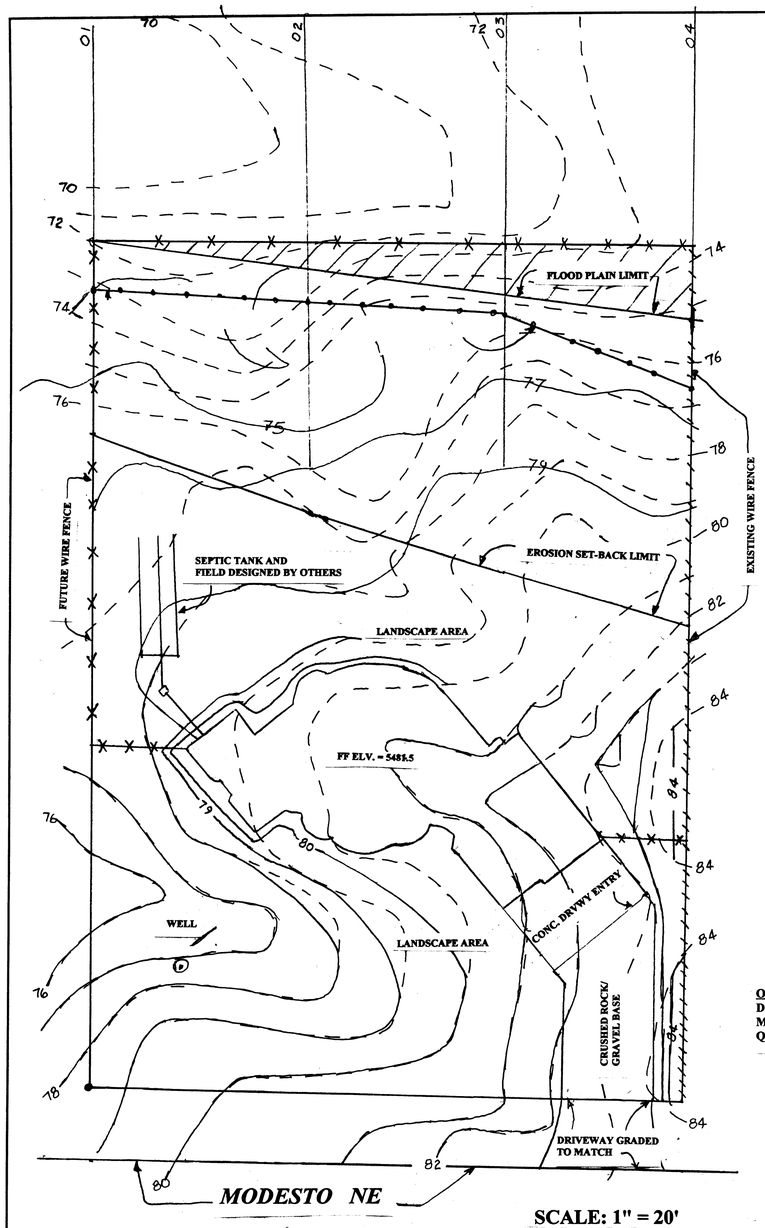
Bernard R Freeman
BERNARD R. FREEMAN
NEW MEXICO
8795
10/17/06
REGISTERED PROFESSIONAL ENGINEER

SITE MAP LEGEND

— 33 — PROPOSED CONTOUR
- - 33 - - EXISTING CONTOUR

SEE SHT 2 FOR ADDITIONAL DETAILS REGARDING PREVIOUSLY APPROVED PLAN AND OTHER DETAIL LOT INFORMATION

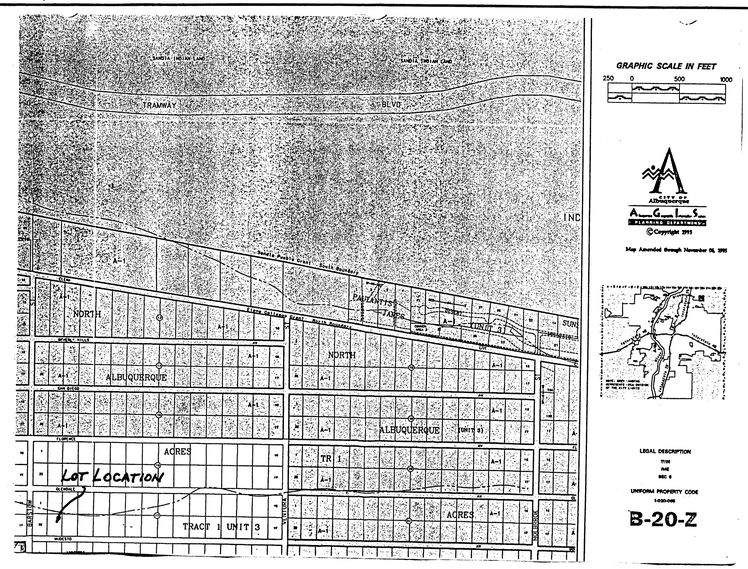
LOT 31, BLK 17, TR 1, U3
PLAN PREPARED BY :
BERNARD R. FREEMAN, PE
FOR
GARY SINGER



SCALE: 1" = 20'

SITE MAP LEGEND

— 15 —	PROPOSED CONTOUR
- - - 15 - - -	EXISTING CONTOUR
-/-/-/-/-/-/-/	EXISTING FENCE LINE
-X--X--X—	PROPOSED FENCE
–.–.–.–.–.–.	PROPOSED AMAFCA EASEMENT



VICINITY MAP

DRAINAGE CALCULATIONS - ZONE 3

Undeveloped Conditions
Area = 0.88 Ac. $Q_{100} = 1.87(.88) = 1.7$ cfs $V_{100} = .66(.88)43560/12 = 2103$ FT³
$P_{100-6} = 2.60$" $Q_{10} = .58(.88) = 0.5$ cfs $V_{10} = .19(.88)43560/12 = 607$ FT³
Weighted "E"= 0.66"

Developed Conditions (Max. Runoff Conditions per Bernallilo County Requirements)
$A_T = .88$ Ac. = 38,333 FT²
$A_A = .38$ Ac. = 16,483 FT² $A_C = .18$ Ac. = 7,667 FT²
$A_B = .18$ Ac. = 7,667 FT² $A_D = .15$ Ac. = 6,546 FT²

Weighted "E"$_{100}$ = (0.66(16783) + .92(7667) + 1.29(7667) + 2.36(6546))/38333 = 1.1"
Weighted "E"$_{10}$ = (0.19(16783) + .36(7667) + .62(7667) + 1.5(6546))/38333 = 0.53"

$Q_{100} = .38(1.87) + .18(2.6) + .18(3.45) + .15(5.02) = 2.68$ cfs
$V_{100} = 1.1(.88)43560/12 = 3514$ FT³

$Q_{10} = .38(.58) + .18(1.19) + .18(2.0) + .15(3.39) = 1.3$ cfs
$V_{10} = .53(.88)43560/12 = 1693$ FT³

Developed Conditions (Actual Runoff Conditions)
$A_T = .88$ Ac. = 38,333 FT²
$A_A = .48$ Ac. = 21,043 FT² $A_C = .14$ Ac. = 6,090 FT²
$A_B = .14$ Ac. = 6,000 FT² $A_D = .12$ Ac. = 5,200 FT²

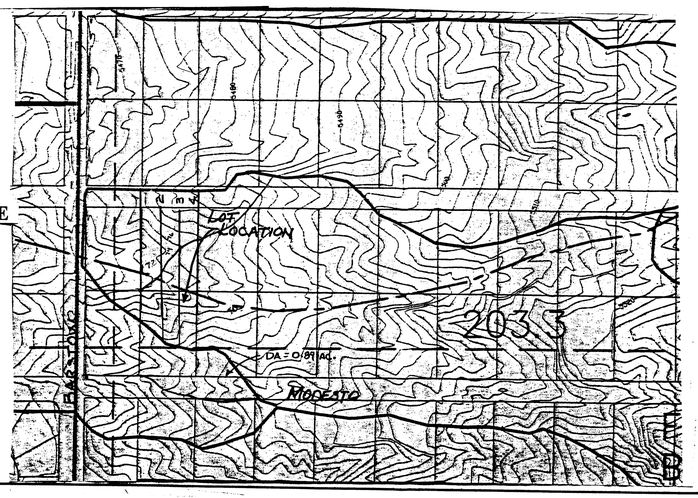
Weighted "E"$_{100}$ = (0.66(21043) + .92(6000) + 1.29(6090) + 2.36(5200)/38333 = 1.03"
Weighted "E"$_{10}$ = (0.19(21043) + .36(6000) + .62(6090) + 1.5(5200))/38333 = 0.46"

$Q_{100} = .48(1.87) + .14(2.6) + .14(3.45) + .12(5.02) = 2.34$ cfs
$V_{100} = 1.03(.88)43560/12 = 3290$ FT³

$Q_{10} = .48(.58) + .14(1.19) + .14(2.0) + .12(3.39) = 1.13$ cfs
$V_{10} = .46(.88)43560/12 = 1469$ FT³

Developed condition discharge is less than the maximum allowed, therefore proposed development is OK as proposed.

Off-Site Drainage Along South Property Line
Drainage Area = 0.89 ac.
Max. Developed Discharge = 2.86 cfs/ac
Q = (0.89)(2.86) = 2.5 cfs : No proposed improvements required for this flow.



OFF-SITE DRAINAGE MAP
SCALE 1" = 200'

NOTES

1. RESIDENCE DOES NOT LIE WITHIN THE FEMA FLOOD BOUNDARY.
2. ADD 5400.0 TO CONTOUR ELEVATIONS.
3. CONTOUR INTERVAL EQUALS 1.0 FOOT.
4. POSITIVE DRAINAGE FROM FOUNDATION.
5. DRAWING UTILIZED FOR THE LAYOUT OF PROPOSED RESIDENCE AS SHOWN.
6. DRAINAGE CALCULATIONS PREPARED IN ACCORDANCE WITH SECTIONS 22.2, HYDROLOGY, DEVELOPMENT PROCESS MANUAL, BERNALLILO COUNTY.
7. APPROXIMATE LOT SIZE IS 165 FT. x 234 FT.
8. RESIDENCE SET BACK ON LOT IS 52 FT. FROM SOUTH PROPERTY LINE AND 25 FT. FROM THE EAST PROPERTY LINE.
9. SEPTIC TANK/LEACH FIELD TO BE DESIGNED AND INSTALLED BY OTHERS.
10. ONLY AREAS NEEDED FOR CONSTRUCTION WILL BE CLEARED AND GRUBBED. OTHER AREAS WILL REMAIN UNDISTURBED.
11. DISTURBED AREAS WILL BE REVEGETATED/LANDSCAPED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE ZONING REQUIREMENTS.

ENGINEER'S STATEMENT

I, hereby, state that I have personally inspected the land represented by this plan and I certify that the contours shown on this plan substantially reflect the conditions of the site and that no grading, excavation, or filling has occurred since this plan was prepared.

Bernard R Freeman 11/25/02

(Bernard R. Freeman, NMPE 8795)

TEMPORARY BENCHMARK

THE TEMPORARY BENCHMARK IS #4 REBAR LOCATED AT THE SW CORNER OF LOT 31, BLOCK 17, UNIT 3 AND TRACT 1
ELEVATION = 5478.5

LEGAL DESCRIPTION

NORTH ALBUQUERQUE ACRES, LOT 31, BLOCK 17, UNIT 3, TRACT 1
ZONE ATLAS B-20-Z

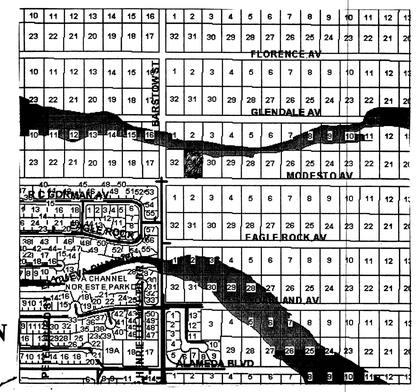
AMAFCA EASEMENT :
The 100 yr. runoff amount was pre-determined from the North Albuquerque Acres and Sandia Heights Drainage Study: Flood Prone Maps dated June 1999 and prepared by RTI Associates. Per RTI, the discharge at the east property line of Lot 31 is calculated to be 793 cfs. The Energy Grade Line (EGL) was determined using COE HEC-RAS2 (see attachment for input and output) software and is designated on the map.

EROSION SET BACK DISTANCE FROM BANK
$Q_D = 0.2(793) = 158.6$ cfs
$W_D = 4.6(158.6)^{0.4} = 35'$

$S_c = 0.037(23)^{-0.133} = 0.01886$; S = 0.02667; WHEN S > S_c THEN
Max. Lateral Distance = 11.5(158.6)$^{0.4}$ + 0.5(35)= 105.0' (NOTE: Lateral distance is measure from channel centerline as shown on off-site drainage map. This erosion set-back distance does not impact this residence.)

The proposed AMAFCA Easement is the EGL and is shown on the drawing.

FLOOD PLAIN MAP: ABQ GIS PLAT



APPROVED GRADING AND DRAINAGE PLAN - 2002

Bernard R Freeman 11/24/02

LOT 31 BLK 17 TR 1 U 3
PLAN PREPARED BY :
BERNARD R. FREEMAN, PE
FOR
DAN & CHERYL SHELL

2/2

RECEIVED OCT 18 2005 HYDROLOGY SECTION