DRAINAGE PLAN

ting to the drainage plan for the property at 8820 Florence Avenue, N.E. are

As shown on Panel 4 of 50 of the National Flood Insurance Program's Flood Insurance Rate Map(FIRM) dated October 14, 1983, this site does not lie within a designated flood hazard zone. A flood hazard zone, associated with the El Camino Arroyo, has been identified to the south of the subject property. Based on the above referenced flood map, the north floodplain boundary of said arroyo lies to the south approximately 170 feet from the south property line of this subject site. As calculated herein, the actual setback of the proposed improvements from the floodplain exceed the minimum requirements for crossion setback.

- Existing grades shown by spot elevations with contours on 1.0 foot intervals developed from field topo survey dated 25 October 1998.
 Proposed final grades with contours at 1.0 foot intervals.
 Proposed building footprint for single family residence.
 Limits of gravel surfaced private driveways.
 Offsite 2009.

calculations shown hereon present an analysis of the existing and proposed future developed titions anticipated during the 100 year, 6 hour, flood event. Section 22.2, Hydrology, of the lopment Process Manual (DPM), Volume 2, Design Criteria, dated January 1993, was used to develop existing and proposed onsite flow conditions. A negligible increase of flows is anticipated due to the sed development and will not effect properties downstream of this site.

The subject property, containing 0.89 acres, is within Precipitation Zone 3 as defined in Table A-1 of the DPM. The property generally slopes from the southeast to the northwest at an approximate 4 percent grade and has native ground cover equating to a Land Treatment of "A". Drainage in the area of proposed development is sheet flow with the beginning of channelized flow at the northwest corner. No indication of erosion was evident during the field investigation and topo survey.

Offsite flows indicated hereon generated approximately 3.0 cfs in the developed condition. Offsite drainage basin contibuting flows to this property totals approximately 1.0 acres.

CALCULATIONS

ONSITE CONDITIONS - EXISTING

- $Q_p = Q_{pA}A_A$ $Q_p = Q_{100} = (1.87)(0.89) = 1.66 \text{ cfs}, \text{ use } 2.0 \text{ cfs}$

 $E_w = E_A(A_A) / A_T$ $E_w = 0.66(0.89) / 0.89 = 0.59 in$

 $V_{100} = (E_W / 12) A_T$ $V_{100} = (0.59 / 12) 0.89 = 0.0438$ ac ft = 1,906 cu ft

ONSITE CONDITIONS - PROPOSED

From Table A-5, DPM

 $D = 7[(1)(1) + 5(1)]^{1/2} = 17\%$

2. Developed Land Treatments

Treatment	Arca (acres)	<u>%</u>
A	0.383	43.
B	0.178	20.0
c	0.178	20.
n	0.151	17

Peak Discharge From Equation A-10, DPM

 $\begin{aligned} Q_P &= Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D \\ Q_P &= Q_{100} = 1.87(0.383) + 2.60(0.178) + 3.45(0.178) + 5.02(0.151) \\ &= 2.6 \text{ cfs}, \text{ use } 3.0 \text{ cfs} \end{aligned}$

 $E_W = [E_A A_A + E_B A_B + E_C A_C + E_D A_D] / A_T$ $E_W = [0.66(0.383) + 0.92(0.178) + 1.29(0.178) + 2.36(0.151)] / 0.89$

= 1.13 inches $V_{100} = (E_W/12) A_T$ = (1.13/12) 0.89 = 0.0838 ac ft = 3,651 cu ft

- a. Increase in peak discharge
- 3.0 cfs 2.0 cfs = 1.0 cfs increase

3,651 cu ft - 1,906 cu ft = 1,745 cu ft increase

OFFSITE FLOWS ONTO SUBJECT PROPERTY

For drainage basin affecting subject property see portion of AMAFCA map, Zone Atlas B-20 hereit Total drainage basin area = 0.55 acres, use 1.0 acres.

Developed Land Treatments

Area (acres)	%
0.43	43.
0.20	20.
0.20	20.
0.17	17
	0.43 0.20 0.20

4. Peak Discharge From Equation A-10, DPM;

 $\begin{aligned} Q_{p} &= Q_{pA}A_{A} + Q_{pB}A_{B} + Q_{pC}A_{C} + Q_{pB}A_{D} \\ Q_{p} &= Q_{100} = 1.87(0.43) + 2.60(0.20) + 3.45(0.20) + 5.02(0.17) \\ &= 2.87 \text{ cfs, use } 3.0 \text{ cfs} \end{aligned}$

 $E_{W} = [E_{A}A_{A} + E_{B}A_{B} + E_{C}A_{C} + E_{D}A_{D}] / A_{T}$ = [0.66(0.43) + 0.92(0.20) + 1.29(0.20) + 2.36(0.17) / 1.0= [0.66(0.43) -= 1.13 inches

 $V_{100} = (E_W / 12) A_T$ = 0.0942 ac ft = 4,102 cu ft

TOTAL OF DEVELOPED ONSITE AND OFFSITE FLOWS

EROSION SETBACK FROM EL CAMINO - MAIN CHANNEL

Using the * SEDIMENT AND EROSION DESIGN GUIDE *, prepared for AMAFCA by Musetter, Lagasse and Harvey, dated November 1994, and a 100 year flood event flow of 3,500 cfs in the El Camino Arroyo, the erosion set back is calculated as follows:

Equation 3.80 * Critical Slope = $S_c = 0.037 Q_D^{-0.133}$, Equation 3.77 * where $Q_D =$ dominant discharge = 0.20 Q_{loo} , therefore, $Q_D = 0.20(3,500) = 700$ cfs,

 $S_C = 0.037(700)^{-0.133} = 0.0155$ or 1.6%

Slope in the El Camino Arroyo immediately to the south of this project is a

Therefore; The slope in El Camino Arroyo is greater than critical slope, use Equation 3.81b, Maximum Lateral Erosion Distance = $[0.92+4.6\log(Q_D)]Q_D^{0.4} = 192.5 \text{ ft}$, use 200 ft.

Actual setback is approximately 290 feet from the proposed structure to the northe boundary of the El Camino Arroyo.

EROSION SETBACK FROM POTENTIAL AVULSION NO. 5

A potential avulsion has been identified by Resource Technology, Inc. in their "Report on North Albuquerque Acres Arroyo Avulsion Problems" that would affect this property. This potential avulsion is identified as No. 5 on mapping shown in above referenced document and shown hereon. While subject mapping indicates the avulsion would occupy Florence Avenue in the area of subject to actual field topo indicates that the flow would be north of this property as indicated on the drainage plan herein. Flow in this potential avulsion No. 5 is estimated at 638 cfs as indicated in Table 2, Avulsion Matrix, page 8 of the report.

Treatment	Area (acres)	%
A	12.9	43.0
В	6.0	20.0
С	6.0	20.0
D	5.1	17.

Peak Discharge From Equation A-10, DPM;

 $Q_P = Q_{DA}A_A + Q_{DB}A_B + Q_{DC}A_C + Q_{DD}A_D$ $Q_P = Q_{100} = 1.87(12.9) + 2.60(6.0) + 3.45(6.0) + 5.02(5.1)$ =134.6 cfs, use 135 cfs

 $E_W = [E_AA_A + E_BA_B + E_CA_C + E_DA_D] / A_T$ = [0.66(12.9) + 0.92(6.0) + 1.29(6.0) + 2.36(5.1) / 30.0
= 1.13 inches

 $V_{100} = (E_W / 12) A_T$ = 2.83 ac ft = 123,057 cu ft

Total flow = $Q_{\text{avulsion#3}}$ + Peak discharge (Q_{100}) = 638 cfs + 135 cfs = 773 cfs.

CALCULATION OF EROSION SETBACK FROM AVULSION No. 5

Equation 3.80 * Critical Slope = $S_C \approx 0.037 Q_D^{-0.133}$, Equation 3.77 * where Q_D = dominant discharge = 0.20 Q_{100} therefore, $Q_D \approx 0.20(773) \approx 155$ cfs,

 $S_C = 0.037(155)^{-0.133} = 0.0189 \text{ or } 1.9\%$

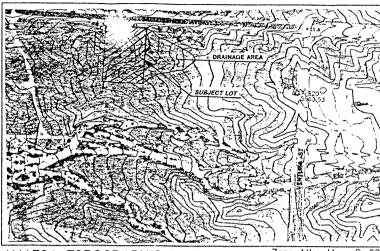
Slope in the arroyo immediately to the north of this project is approximately 4.0%.

Therefore; The slope in subject arroyo is greater than critical slope, use Equation 3.81b, Maximum Lateral Erosion Distance = $[0.92+4.6log(Q_D)]Q_D^{0.4}$ =82.6 ft , use 83 ft.

FLOWS IN BAR/ROAD DITCH SOUTH SIDE OF FLORENCE AVENUE

THE RESIDENCE OF THE PROPERTY OF THE PROPERTY

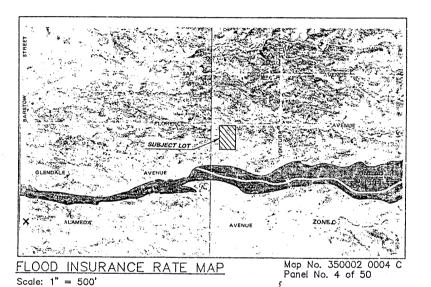
Field topographic survey and investigation upstream (east of project site) along with AMAFCA mapping indicate that flows are carried from the south side of Florence Avenue to the north side. No existing culverts were found on the south side of Florence Avenue east of the subject lot to Ventura Street. Crossing from Florence Avenue to driveway across existing road ditch will be by slight swale or dip section. No culvert(s) will be used.



AMAFCA TOPOGRAPHIC MAP Scale: 1'' = 200'

Zone Atlas Map: B-20

BLDG & SAFET



NOV - 2 2000 U.B.C. PLAN CHECK SECTION

AMAFCA MAPPING - AVULSION #5 Not To Scale

MAP, MAP

SURVEYING

E. A. R. COMPANY

THE B.1

22 JUNE 1999

