

PURPOSE:

The purpose of this Grading and Drainage Plan is to obtain approval for the construction of a single family residence on Lot 9, Unit 2A, of the Highlands at High Desert Subdivision.

BACKGROUND:

Lot 9, Unit 2A is within an area for which a number of drainage management studies have been done, including the High Desert Drainage Management Master Plan, December 1993; the Final High Desert Phase I Hydrology and Design Drainage Report, March 1994; the High Desert-Phase I Prudent Line Analysis, March 1994; and the Drainage Management Plan, Highlands Subdivision at High Desert, August 1994. All reports are by Bohannon-Huston, Inc. and are on file at the City of Albuquerque, Public Works Department, Hydrology Section.

DISCUSSION:

1. This Grading and Drainage Plan adapts the guidance and criteria developed in the master plan and studies to the specific building on lot 9.

2. Lot 9 is a panhandle lot, with a 31 feet wide access extending about 150 feet from the public street. This drive crosses a Drainage Easement which has been dedicated to AMAFCA. The site developer has constructed an erosion control crossing of the easement, consisting of two walls placed perpendicular to the direction of flow, with a rip-rap energy dissipator below the downstream wall. The only additional construction to be done within this easement is to place an impervious driveway surface between the two walls, with the surface of the new drive forming a smooth transition between the two walls.

3. The area (building envelope) on which building is permitted is designated on the plat. For lot 9, this building envelope is located 100 feet from the bank of the Arroyo Del Oso floodplain. The bank is protected from further immediate erosion by a training dike constructed upstream within the arroyo floodplain.

4. All building construction included on this plan is within the building envelope, except for the driveway and parking areas, for which impervious surfaces are permitted by the development guidelines for the subdivision.

5. Runoff within the existing lot is within three general basins, basin A, which includes the area directly adjacent to the bank, which flows directly into the floodplain; the central portion of the lot, basin B, which drains to a small arroyo which then crosses public property before entering the Arroyo Del Oso; and the northern part of the lot, including the access drive, basins C and D, which drain directly into the AMAFCA drainage easement.

6. The proposed development will have no effect on basin A. For basin B, the building will add 0.7 CFS to the discharge, (1.9-1.2), which will flow from the building site in a number of low flows to provide for sheet flow. The increased flow from basin C due to the building will be 1.1 CFS (2.6-1.5). Most of the concentrated runoff will be collected along the curb of the driveway, and directed to the erosion control wall and rip-rap within the AMAFCA drainage easement. Some of the runoff will enter the landscaped areas. Collection of the runoff in a hardened swale is the most practical method for basin C. Because of the closeness of the building envelope on the adjacent lot downstream, there is insufficient space to permit infiltration on the natural terrain. Basin D will have an increase of .2 CFS (.4-.2), which will flow from the paved surface of the drive to the adjacent landscaped strips along the drive, with overflow entering the drainage easement.

CONCLUSIONS:

1. All runoff from the proposed construction is directed to an established drainage channel.

2. There is no increased hazard to adjacent or downstream properties

3. The proposed construction is not within a designated 100 year floodplain.

REFERENCES:

A. Standard Specifications for Public Works Construction, City of Albuquerque.

B. Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, for the City of Albuquerque...Bernalillo County...AMAFCA, January 1993.

May 5, 1997

RUNOFF FOR LOT 9, UNIT 2A, HIGHLAND AT HIGH DESERT

TABLE A

Runoff Estimate: For On-site Basin of 1.465 acres.

Runoff Factors CURRENT USE PROPOSED USE
Zone 4

Land use	Peak	Total	Area Percent		Peak	Total	Area Percent		Peak	Total
					Runoff	Runoff			Runoff	Runoff
	CFS/acre	inches	SF		CFS	CF	SF		CFS	CF
A	2.26	0.66	63800.00	1.000	3.31	3509.0	39200.00	0.614	2.03	2156.0
B	3.05	0.85	0.00	0.000	0.00	0.0	6000.00	0.094	0.42	425.0
C	3.94	1.13	0.00	0.000	0.00	0.0	0.00	0.000	0.00	0.0
D	5.74	2.57	0.00	0.000	0.00	0.0	18600.00	0.292	2.45	3983.5
TOTALS			63800.00	1.000	3.31	3509.0	63800.00	1.000	4.90	6564.5
			1.465 acre				1.465 acre			

TABLE B

Runoff Estimate: For Off-site basin of 17.2 acres, flowing along AMAFCA drainage easement.

Runoff Factors CURRENT USE PROPOSED USE
Zone 4

Land use	Peak	Total	Area Percent		Peak	Total	Area Percent		Peak	Total
					Runoff	Runoff			Runoff	Runoff
	CFS/acre	inches	SF		CFS	CF	SF		CFS	CF
A	2.26	0.66	750000	1.000	38.91	41250.0	630000	0.840	32.69	34650.0
B	3.05	0.85	0	0.000	0.00	0.0	40000	0.053	2.80	2833.3
C	3.94	1.13	0	0.000	0.00	0.0	0	0.000	0.00	0.00
D	5.74	2.57	0	0.000	0.00	0.0	80000	0.107	10.54	17133.3
TOTALS			750000	1.000	38.91	41250.0	750000	1.000	46.03	54616.7
			17.218 acre				17.218 acre			

TABLE C-1

Runoff Estimate: For On-site basin of .184 acres, south portion of lot.

Runoff Factors CURRENT USE PROPOSED USE
Zone 4

Zone 4										
Land use	Peak	Total	Area Percent			Peak	Total	Area Percent		
	CFS/acre	inches	SF			Runoff	Runoff	SF		
				CFS		CF			CFS	
A	2.26	0.66	8000	1.000	0.42	440.0	8000	1.000	0.42	440.0
B	3.05	0.85	0	0.000	0.00	0.0	0	0.000	0.00	0.0
C	3.94	1.13	0	0.000	0.00	0.0	0	0.000	0.00	0.0
D	5.74	2.57	0	0.000	0.00	0.0	0	0.000	0.00	0.0
TOTALS			8000	1.000	0.42	440.0	8000	1.000	0.42	440.0
			0.184 acre				0.184 acre			

TABLE C-2

Runoff Estimate: For On-site basin of .528 acres, central portion of lot, basin B.

Runoff Factors CURRENT USE PROPOSED USE
Zone 4

Zone 4

Land use	Peak	Total	Area	Percent	Peak	Total	Area	Percent	Peak	Total
	CFS/acre	inches	SF		Runoff	Runoff	SF		Runoff	Runoff
					CFS	CF			CFS	CF
A	2.26	0.66	23000	1.000	1.19	1265.0	23000	1.000	1.19	1265.0
B	3.05	0.85	0	0.000	0.00	0.0	0	0.000	0.00	0.0
C	3.94	1.13	0	0.000	0.00	0.0	0	0.000	0.00	0.0
D	5.74	2.57	0	0.000	0.00	0.0	0	0.000	0.00	0.0
TOTALS			23000	1.000	1.19	1265.0	23000	1.000	1.19	1265.0
			0.528	acre			0.528	acre		

TABLE C-3

Runoff Estimate: For On-site basin of .657 acres, north portion of lot, basin C.

Runoff Factors CURRENT USE PROPOSED USE
Zone 4

Zone 4

Land use	Peak	Total	Area	Percent	Peak	Total	Area	Percent	Peak	Total
	CFS/acre	inches	SF		Runoff	Runoff	SF		Runoff	Runoff
					CFS	CF			CFS	C
A	2.26	0.66	28600	1.000	1.48	1573.0	28600	1.000	1.48	1573.0
B	3.05	0.85	0	0.000	0.00	0.0	0	0.000	0.00	0.0
C	3.94	1.13	0	0.000	0.00	0.0	0	0.000	0.00	0.0
D	5.74	2.57	0	0.000	0.00	0.0	0	0.000	0.00	0.0
TOTALS			28600	1.000	1.48	1573.0	28600	1.000	1.48	1573.0
			0.657	acre			0.657	acre		

TABLE C-4

Runoff Estimate: For On-site basin of .096 acres, entry way, basin D.

Runoff Factors CURRENT USE PROPOSED USE
Zone 4

Zone 4										
Land use	Peak	Total	Area Percent		Peak	Total	Area Percent		Peak	Total
	CFS/acre	inches	SF	1,000	CFS	CF	SF	1,000	CFS	CF
A	2.26	0.66	4200	1.000	0.22	231.0	2200	0.524	0.11	121.0
B	3.05	0.85	0	0.000	0.00	0.0	0	0.000	0.00	0.0
C	3.94	1.13	0	0.000	0.00	0.0	0	0.000	0.00	0.0
D	5.74	2.57	0	0.000	0.00	0.0	2000	0.476	0.26	428.0
TOTALS			4200	1.000	0.22	231.0	4200	1.000	0.38	549.0
			0.096 acre				0.096 acre			

TABLE D-1

Runoff Estimate: For On-site basin of .680 acres, south portion of house and adjacent lot.

Runoff Factors CURRENT USE PROPOSED USE
Zone 4

Zone 4											
Land use	Peak	Total	Area Percent			Peak	Total	Area Percent		Peak	Total
	CFS/acre	inches	SF	1,000	1.54	Runoff	Runoff	SF	1,000	1.94	Runoff
					CFS		CF			CFS	CF
A	2.26	0.66	29600	1.000	1.54	1628.0		23000	0.777	1.19	1265.0
B	3.05	0.85	0	0.000	0.00	0.0		2000	0.068	0.14	141.0
C	3.94	1.13	0	0.000	0.00	0.0		0	0.000	0.00	0.0
D	5.74	2.57	0	0.000	0.00	0.0		4600	0.155	0.61	985.0
TOTALS			29600	1.000	1.54	1628.0		29600	1.000	1.94	2391.0
			0.680 acre					0.680 acre			

TABLE D-2

Runoff Estimate: For On-site basin of .689 acres, north portion of house, driveway and lot.

Runoff Factors CURRENT USE PROPOSED USE
Zone 4

Zone 4									
Land use	Peak	Total	Area Percent		Peak	Total	Area Percent		Peak
	CFS/acre	inches	SF	1,000	Runoff	Runoff	SF	1,000	Runoff
					CFS	CF			CFS
A	2.26	0.66	30000	1.000	1.56	1650.0	14000	0.467	0.73
B	3.05	0.85	0	0.000	0.00	0.0	4000	0.133	0.28
C	3.94	1.13	0	0.000	0.00	0.0	0	0.000	0.00
D	5.74	2.57	0	0.000	0.00	0.0	12000	0.400	1.58
TOTALS			30000	1.000	1.56	1650.0	30000	1.000	2.59
			0.689 acre				0.689 acre		3623

NOTES:

a. Runoff factors from Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, City of Albuquerque, Bernalillo County and AMAFCA, January, 1993

b. Land use descriptions: A. Uncompacted soil

B. Lawn, shrubs

C. Compacted soil

D. Impervious areas

c. Peak runoff = Area (acres) x factor (CFS/acre) = CFS

d. Total runoff = Area (SF) x factor (inches) / 12 (inches /foot) = CF

e. Peak and total runoff is based on 6 hour, 100 year frequency storm

f. The current use is for the site in its natural state, or partially developed if off-site.

The proposed use is for full development of the basin, under present zoning

PRELIMINARY MRK MAY 5, 1997

APPROVALS REVISIONS BY DATE

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GRADING AND DRAINAGE PLAN

LOT 9, UNIT 2 A

HIGHLANDS AT HIGH DESERT

PROJECT NO MAP NO SHEET OF

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