

CITY OF ALBUQUERQUE



Aug 11, 2010

Kevin Patton, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

**Re: Four Hills 21st Installment Subdivision Grading Certification
Engineer Stamp dated 6-30-10 (M23/D17)**

Dear Mr. Patton,

Based upon the information provided in your submittal dated 7-08-10, the above referenced Certification is approved for Release of SIA and Financial Guarantees. It is also approved for Final Plat action by the DRB.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Principal Engineer, Planning Dept.
Development and Building Services

Albuquerque

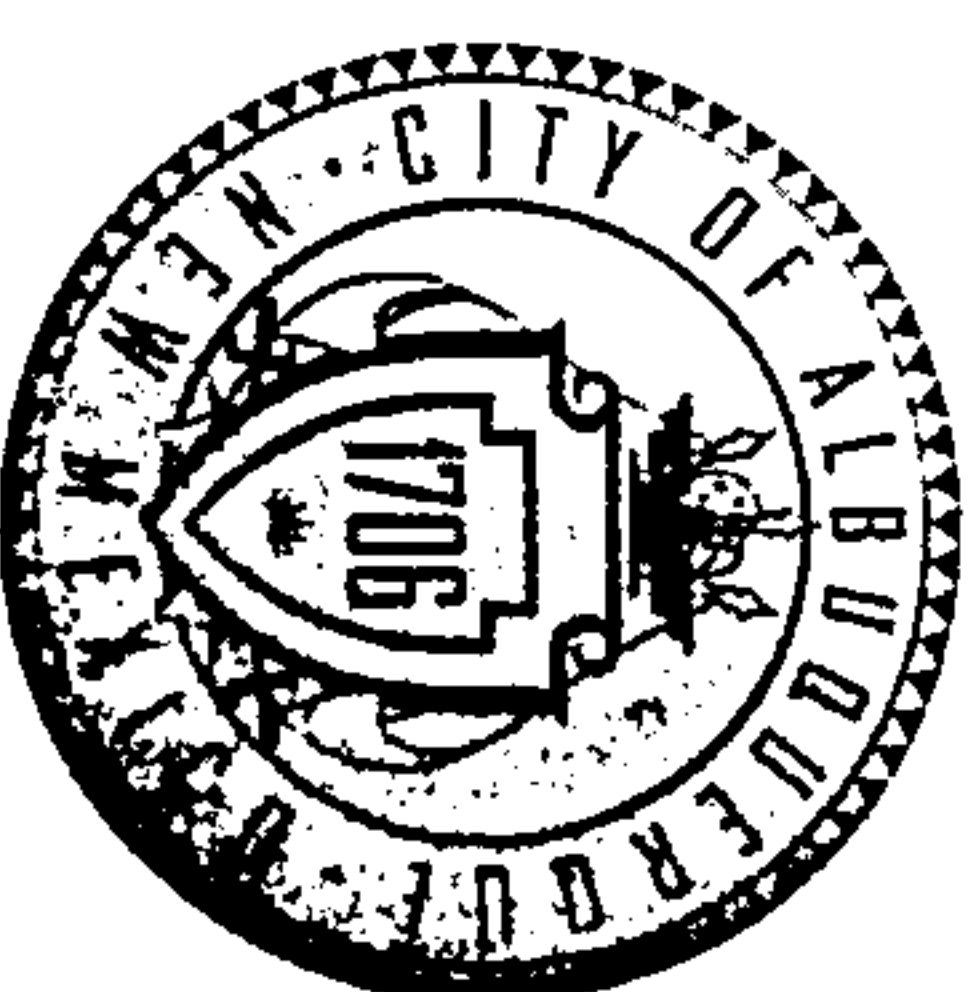
PO Box 1293

NM 87103

C: Marilyn Maldonado, CPN 523381
file

www.cabq.gov

CITY OF ALBUQUERQUE



May 18, 2009

Kevin Patton, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

Re: Four Hills 21st Installment Subdivision Drainage Report
Engineer Stamp dated 5-22-09 (M23/D17)

Dear Mr. Patton,

Based upon the information provided in your submittal dated 5-22-09, the above referenced report is approved for Preliminary Plat action by the DRB. Once that board approves the grading plan, please submit a mylar copy for my signature in order to obtain a Rough Grading Permit.

PO Box 1293

Prior to Release of SIA and Financial Guarantees, an Engineer's Certification of this grading plan will be required.

Albuquerque

If you have any questions, you can contact me at 924-3986.

NM 87103

www.cabq.gov

C: file

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Principal Engineer, Planning Dept.
Development and Building Services

DRAINAGE REPORT FOR FOUR HILLS VILLAGE 21ST INSTALLMENT

APRIL 28, 2009

Revised May 22, 2009

Prepared for:

Khani Company

102 Highway 66 East

Albuquerque, NM 87123

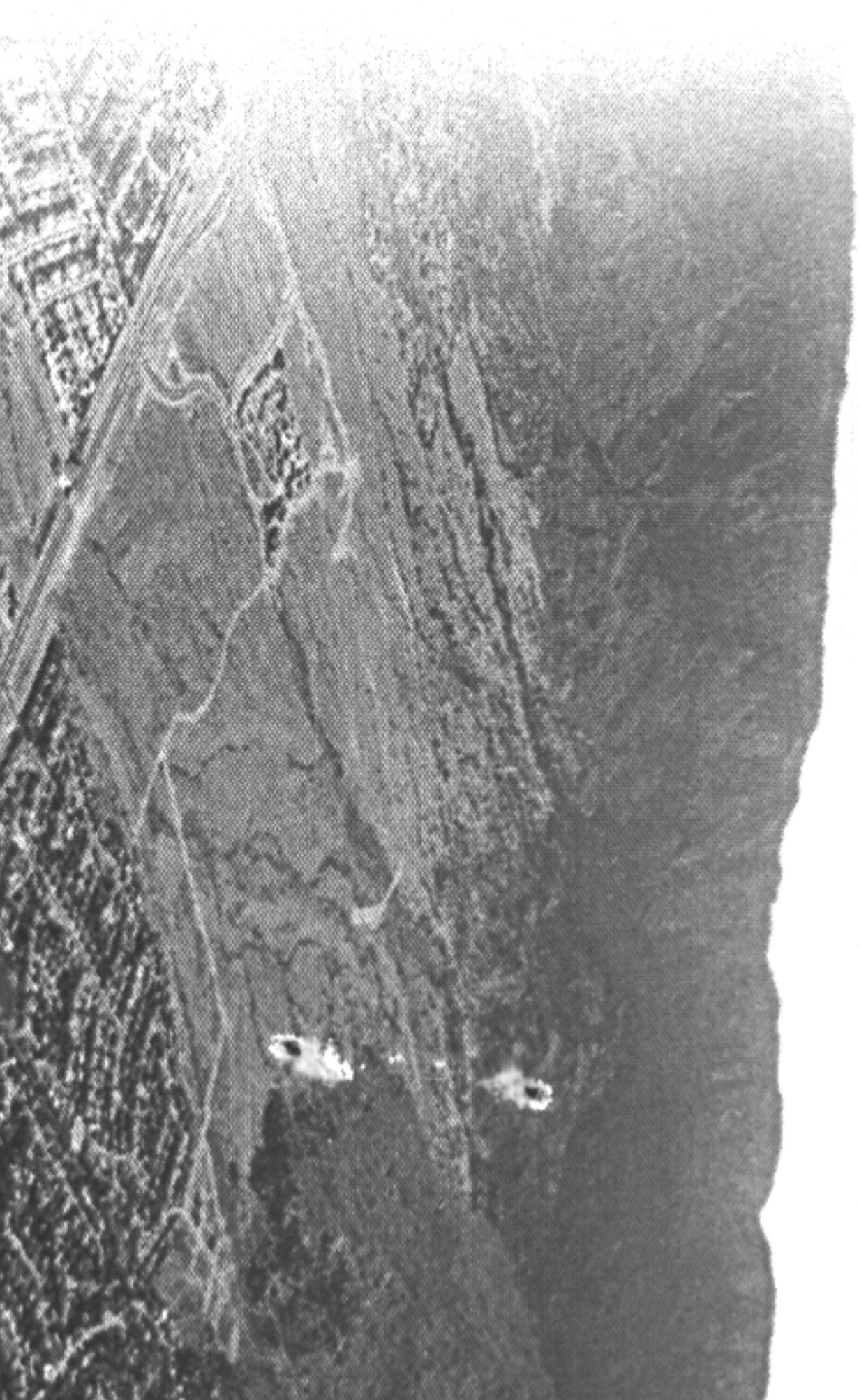
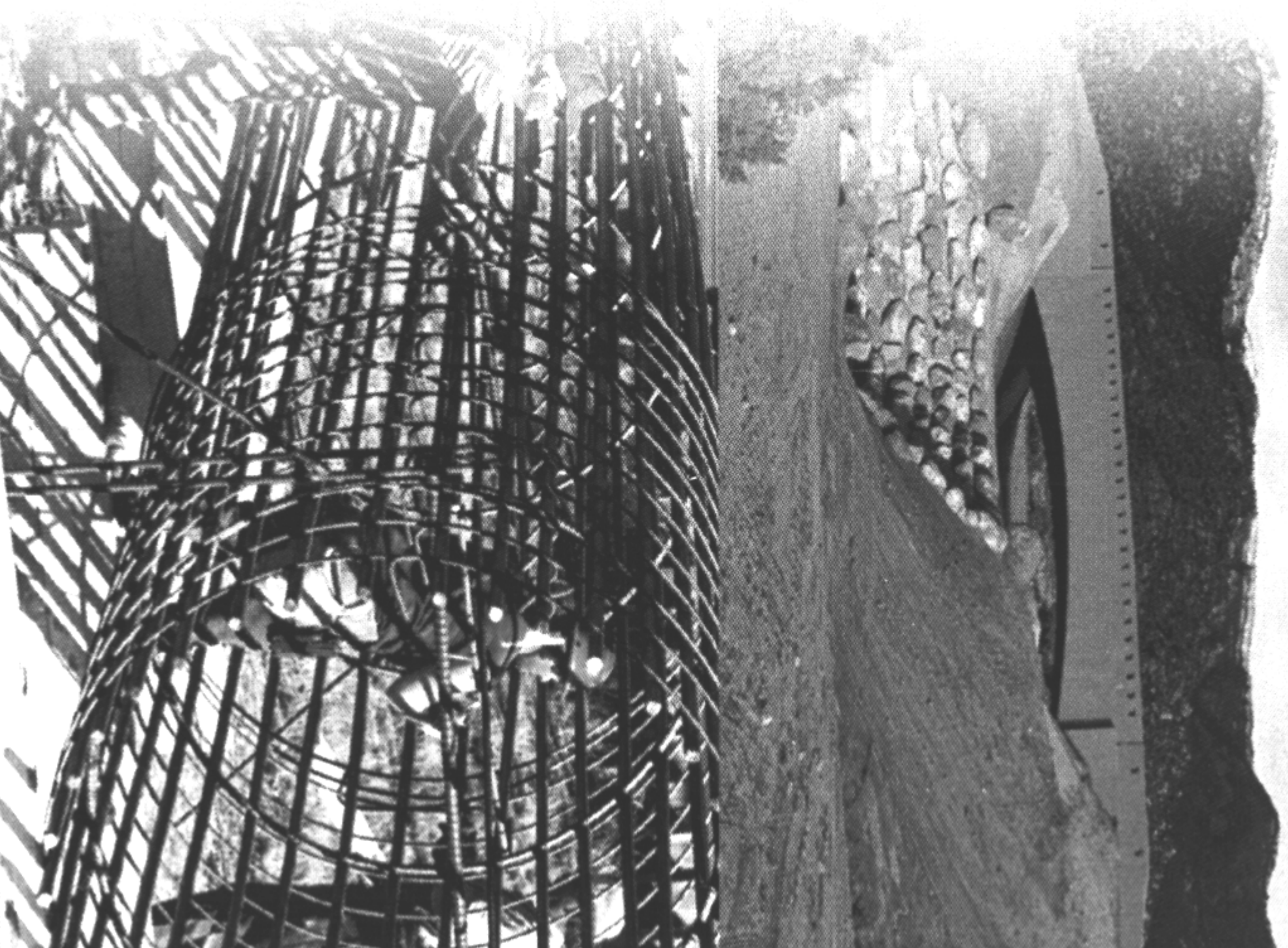
Prepared by:

Bohannan ▲ **Huston**
INC.

ENGINEERING ▲

SPATIAL DATA ▲

ADVANCED TECHNOLOGIES ▲



DRAINAGE REPORT
FOR FOUR HILLS VILLAGE
21ST INSTALLMENT

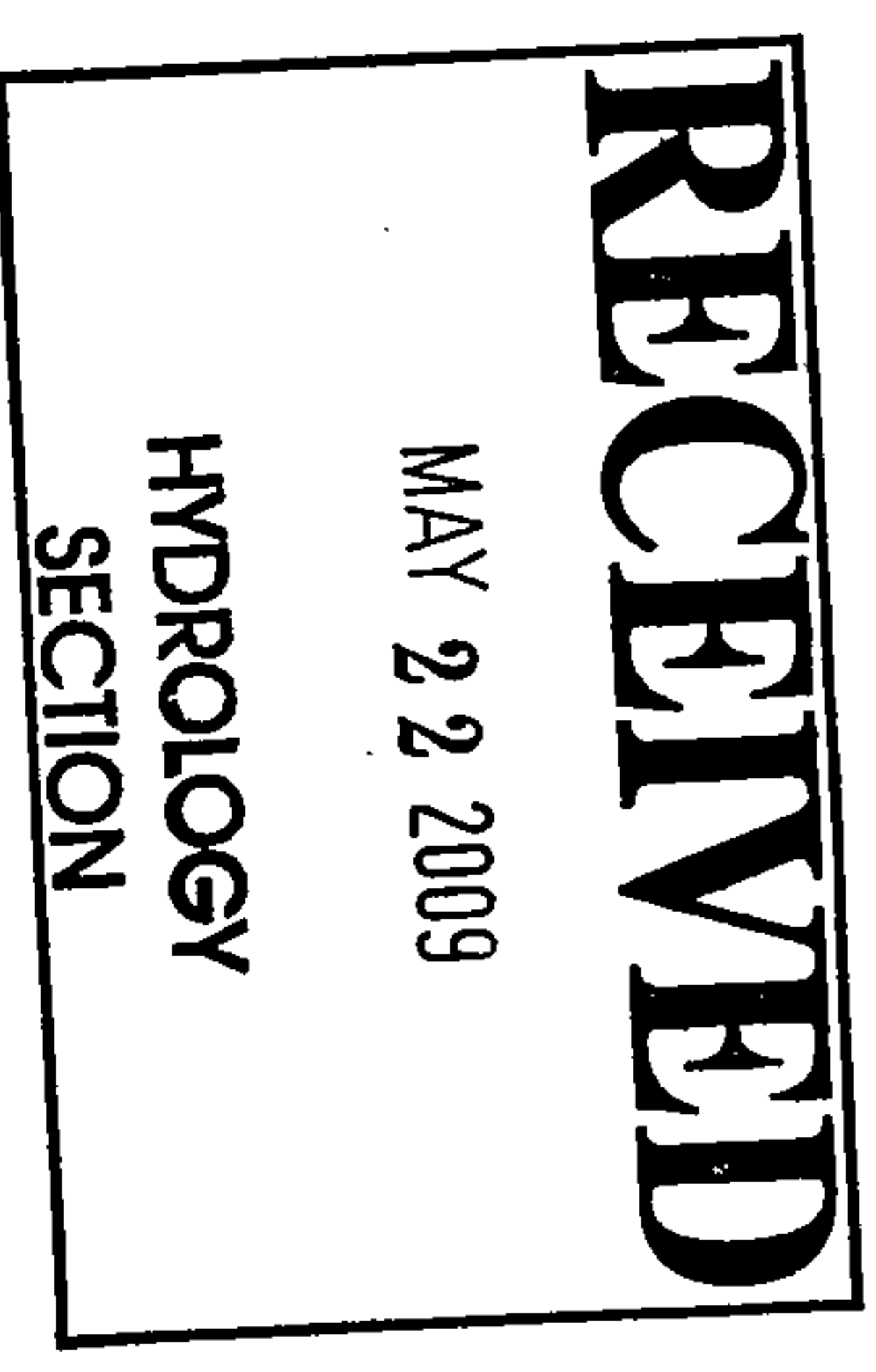
APRIL 28, 2009
REVISED MAY 22, 2009

PREPARED BY:

BOHANNAN HUSTON, INC.
COURTYARD I
7500 JEFFERSON STREET NE
ALBUQUERQUE, NM 87109

PREPARED FOR:

KHANI CO.
102 HIGHWAY 66 EAST
ALBUQUERQUE, NM 87123



Brian C. Patterson, E.I.

Date

5/22/09

Kevin G. Patton, P.E.

Date

5-22-09

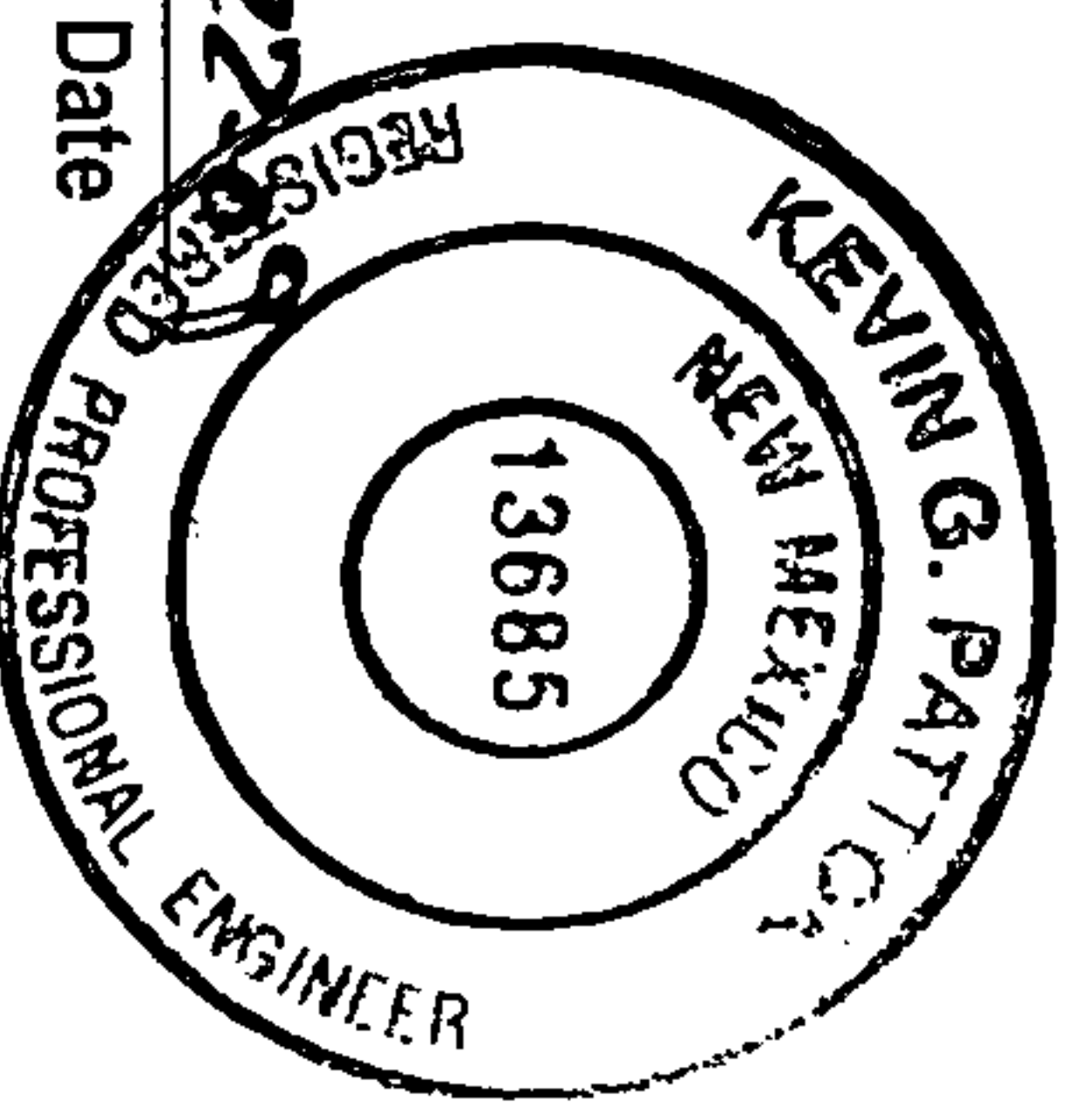


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EXHIBIT 2: EXISTING CONDITIONS BASIN MAP

EXHIBIT 3: PROPOSED CONDITIONS BASIN MAP

EXHIBIT 4: GRADING PLANS

I. PURPOSE OF REPORT

The purpose of this report is to provide site specific drainage analysis for existing and ultimate conditions for the subdivision development, referred to as Four Hills Village 21st Installment. This plan is prepared and submitted to support design and rough grading of the subdivision and internal streets and for the amended preliminary and final plat approvals. The site is approximately 7.30 acres and consists of 6 lots. The site is located between Warm Sands Drive and Hideaway Lane within the Four Hills.

For location of the site, please refer to the vicinity map on the grading and drainage plan enclosed with this report.

II. METHODOLOGIES

Site conditions are analyzed for a 100-yr, 6-hour storm event in accordance with the City of Albuquerque Drainage Ordinance and the Development Process Manual (DPM), Volume 2 Design Criteria, Section 22.2, Hydrology for the City of Albuquerque, January 2002. The Naser Property described in the "Site Location and Characteristics" section below, is approximately 7.30 acres, therefore Part A of the DPM, Section 22.2, which provides a simplified procedure for projects with sub-basins smaller than 40 acres, was used.

III. SITE LOCATION AND CHARACTERISTICS

For location of the site, please refer to the report introduction and to the location map provided in Exhibit 1.

Slopes in the project site range from 15% to 45%. Offsite slopes in the City Open Space to the east of the property and privately owned land north of the property vary from 25% to as much as 55%. We are currently waiting on a Soils Report to correctly identify the existing soil conditions. Based on a visual inspection of the site, vegetation in consists primarily of native grasses, bushes and trees with large boulders scattered throughout the property. Also, based on the Soil Conservation Service General Soil Map, the site has classified the soils in this area as a mixture of Tesajo-Millet stony sandy loams and Rock outcrop-Orthids complex.

IV. EXISTING HYDROLOGICAL AND SITE DRAINAGE CONDITIONS

Please refer to the Existing Conditions Basin Map (Exhibit 2) for the following existing conditions discussion.

The Four Hills Village 21st Installment consists of seven (7) existing basins, Offsite Basins 1, 2, 3 and 4 and Onsite Basins 5, 6 and 7. The flow generated from Offsite Basin 2 (1.96ac, Q100 = 7.23cfs) and Offsite Basin 1 (0.58 ac, Q100 = 1.82cfs) follows natural drainage patterns north to combine with flows from Onsite Basin 5 (0.93 ac, Q100 = 2.86cfs). This combined flow within Basin 5, Q100 = 11.91cfs, is directed north offsite and follows existing drainage patterns. The flow generated from Offsite Basin 3 (2.98ac, Q100 = 10.89cfs) follows natural drainage patterns north to combine with flows from Onsite Basin 6 (3.70ac, Q100 = 12.22cfs); this combined flow follows existing drainage patterns north, offsite. The flow generated from Offsite Basin 4 (4.03ac,

Q100 = 14.65cfs) flows north and combines with Basin 7 (2.72ac, Q100 = 9.62cfs). This combined flow within Basin 7, Q100 = 24.27cfs, is directed north offsite and follows existing drainage patterns.

V. DEVELOPED HYDROLOGICAL AND HYDRAULIC CONDITIONS

The development of the site proposes to preserve the natural terrain in every way possible. The proposed development contains 6 lots on approximately 7.30 acres. Each lot contains a maximum building envelope of 8,000 square feet (15,000 square feet for Lot 6). The ultimate developed site conditions will follow the existing contours as closely as possible to preserve the natural terrain. This allows storm water to flow naturally across the existing topography while minimizing disturbance of the natural terrain. In addition, Lorman Place will have Depressed Gutter curb on the upstream portion of the road and Standard curb on the downstream portion of the road, therefore allowing upstream runoff flow to enter the street and be conveyed downstream by the roadway. The flow from Basin 4 (Q100=6.78cfs) will enter Lorman Place and combine with Basin S-1 (Q100=1.57cfs); the total flow of Q100=8.35cfs will be redirected southwest onto Warm Sands Drive, where it will conveyed by standard curb and gutter to a low-point in Warm Sands Drive and then discharge north into an existing swale. The flows from Basin 5-A (Q100=4.82cfs) and Basin 3-A (Q100=3.87cfs) will discharge into Lorman Place north of the highpoint and combine with Basin S-2 (Q100=1.97cfs). The total flow of Q100=10.66cfs will be directed north in Lorman Place, where it will sheet flow off of the road and then follow natural drainage patterns north offsite.

Each lot owner is required to provide a separate, individual grading and drainage plan prepared by a New Mexico Licensed Engineer. These grading and drainage plans will be reviewed and accepted by the City of Albuquerque. Each lot will be required to pond any developed flow greater than existing flow that may occur with the development of the lot, therefore only historic flow shall discharge from each lot. Please refer to Table 1 below for lot ponding requirements. Each grading and drainage plan will be required to include innovative engineering solutions to reduce possible impacts that each developed lot may have on the existing terrain and or downstream arroyos. Building or non-native landscaping will not be permitted outside building envelopes.

<u>LOT</u>	<u>EXISTING</u>	<u>PROPOSED</u>	<u>REQUIRED TO</u>	
	<u>(CFS)</u>	<u>(CFS)</u>	<u>POUND</u>	<u>(CFS)</u>
1*	-	-		-
2*	-	-		-
3	2.54	2.84		0.30
4	2.51	2.77		0.26
5	3.78	3.99		0.21
6	9.62	10.07		0.45
TOTAL	18.45	19.67		1.22

* Additional flow already retained by retention pond

Land treatments are based on developed conditions for estate lots where each building envelope is assumed to be 75% D (impervious) and 25% (landscaped); the balance of the lot remains undisturbed. All flows within this subdivision will closely follow natural drainage patterns.

Please refer to Exhibit 3: Developed Conditions Basins Map for the following ultimate developed conditions discussion.

A. Retention Pond - Northwest

A proposed retention pond is located within Lot 1. The pond will be required to retain a 100 year-10 day storm event for developed conditions. Existing drainage entering the Pond is from Basins 1, 2 and 5 ($Q_{100} = 11.91$ cfs) and the proposed drainage entering the Pond is from Basin 1 and a portion of Basin 2 ($Q_{100} = 4.48$ cfs). The amount of proposed flow entering the Pond is less than that of existing flows due to Lorman Place redirecting a portion of the upstream flows. The required Pond volume is 14267 CF, with an actual Pond volume of 20150 CF. See Appendix B for pond details.

VI. CONCLUSION

The primary goal of this drainage plan for Four Hills Village 21st Installment is to provide sound and innovative drainage management schemes that permit preservation of the natural terrain with the least possible impact. The utilization of drainage schemes outlined in this report accomplishes this goal in a safe and adequate manner. We recommend that this plan be approved as requested.

APPENDICES

APPENDIX A: BASIN ANALYSIS AND SUMMARY
 OF LAND TREATMENT

APPENDIX B: POND ANALYSIS

APPENDIX A

BASIN ANALYSIS AND SUMMARY OF LAND TREATMENT

EXISTING BASINS

EXISTING BASINS														
Basin	AREA	ROADWAY AREA	REMAINING LOT AREA	% DIFF	% LAND TREATMENT*				PEAK DISCHARGE - (CFS/ACRE)*				Q(100-YR) DEVELOPED	
ID	(ACRES)	(ACRES)	(ACRES)		A	B	C	D	A	B	C	D	(CFS)	
1	0.58	0.00	0.47	81.0%	34.8%	38.1%	13.0%	14.7%	100.6%	2.20	2.92	3.73	5.25	1.82
2	1.96	0.14	1.65	84.2%	9.3%	14.0%	63.1%	13.7%	100.1%	2.20	2.92	3.73	5.25	7.23
3	2.98	0.00	2.63	88.3%	7.1%	12.7%	71.5%	8.8%	100.0%	2.20	2.92	3.73	5.25	10.89
4	4.03	0.39	3.43	85.1%	10.2%	17.5%	58.7%	13.5%	99.9%	2.20	2.92	3.73	5.25	14.65
5	0.93	0.00	0.93	100.0%	19.0%	45.0%	36.0%	0.0%	100.0%	2.20	2.92	3.73	5.25	2.86
6	3.70	0.00	3.70	100.0%	10.0%	34.0%	56.0%	0.0%	100.0%	2.20	2.92	3.73	5.25	12.22
7	2.72	0.00	2.57	94.5%	10.4%	11.8%	73.7%	4.1%	99.9%	2.20	2.92	3.73	5.25	9.62
TOTAL	16.90	0.53	15.38											59.28

*NOTE: Peak Discharge calculated from Section A.6 of the ABQ DMP.



APPENDIX B

POND ANALYSIS

EXISTING BASINS														
Basin	AREA	ROADWAY AREA	REMAINING LOT AREA	% DIFF	% LAND TREATMENT*				PEAK DISCHARGE - (CFS/ACRE)*				Q(100-YR) DEVELOPED	
ID	(ACRES)	(ACRES)	(ACRES)		A	B	C	D	A	B	C	D	(CFS)	
1	0.58	0.00	0.47	81.0%	34.8%	38.1%	13.0%	14.7%	100.6%	2.20	2.92	3.73	5.25	1.82
2	1.96	0.14	1.65	84.2%	9.3%	14.0%	63.1%	13.7%	100.1%	2.20	2.92	3.73	5.25	7.23
3	2.98	0.00	2.63	88.3%	7.1%	12.7%	71.5%	8.8%	100.0%	2.20	2.92	3.73	5.25	10.89
4	4.03	0.39	3.43	85.1%	10.2%	17.5%	58.7%	13.5%	99.9%	2.20	2.92	3.73	5.25	14.65
5	0.93	0.00	0.93	100.0%	19.0%	45.0%	36.0%	0.0%	100.0%	2.20	2.92	3.73	5.25	2.86
6	3.70	0.00	3.70	100.0%	10.0%	34.0%	56.0%	0.0%	100.0%	2.20	2.92	3.73	5.25	12.22
7	2.72	0.00	2.57	94.5%	10.4%	11.8%	73.7%	4.1%	99.9%	2.20	2.92	3.73	5.25	9.62
TOTAL	16.90	0.53	15.38	.										59.28

*NOTE: Peak Discharge calculated from Section A.6 of the ABQ DMP.

BASIN 1	<u>Ac</u> 0.58 (17%)	<u>A</u> 34.8	<u>B</u> 38.1	<u>C</u> 13.0	<u>D</u> 14.7	<u>Q</u> 2.21	<u>D</u> 14.7	<u>Q</u> 2.5
BASIN 2	1.96 (56%)	9.3	14.0	7.84	63.1	35.34	13.7	7.65
BASIN 5	0.93 (27%)	19.0	45.0	12.15	36.0	4.72	0	0
	<u>3.47</u>	<u>51.3</u>	<u>26.47%</u>		<u>47.27%</u>		<u>10.17%</u>	

PROPOSED BASINS

Basin	AREA (ACRES)	ROADWAY AREA (ACRES)	REMAINING LOT AREA (ACRES)	% DIFF	% LAND TREATMENT*				PEAK DISCHARGE - (CFS/ACRE)*				Q(100-YR) DEVELOPED (CFS)
					A	B	C	D	A	B	C	D	
ID	(ACRES)	(ACRES)	(ACRES)										
1	0.58	0.00	0.47	81.0%	34.8%	38.1%	13.0%	14.7%	100.7%	2.20	2.92	3.73	5.25
2	1.34	0.00	0.97	72.4%	9.4%	43.0%	26.8%	20.6%	99.8%	2.20	2.92	3.73	5.25
3-A	1.02	0.00	0.74	72.5%	2.9%	22.7%	53.7%	20.3%	99.6%	2.20	2.92	3.73	5.25
3-B	1.75	0.00	1.47	84.0%	8.4%	30.0%	49.6%	11.8%	99.7%	2.20	2.92	3.73	5.25
4	1.83	0.00	1.49	81.4%	9.0%	13.7%	63.5%	14.1%	100.2%	2.20	2.92	3.73	5.25
5-A	1.26	0.00	1.09	86.5%	1.7%	5.1%	83.0%	10.2%	100.2%	2.20	2.92	3.73	5.25
5-B	1.72	0.00	1.37	79.7%	10.4%	18.6%	55.8%	15.3%	100.1%	2.20	2.92	3.73	5.25
6	4.03	0.39	3.43	85.1%	10.2%	17.5%	58.7%	13.5%	99.9%	2.20	2.92	3.73	5.25
7	2.72	0.00	2.23	82.0%	9.0%	13.5%	63.9%	13.5%	100.0%	2.20	2.92	3.73	5.25
S-1	0.31	-	-	-	0.0%	5.0%	5.0%	90.0%	100.0%	2.20	2.92	3.73	5.25
S-2	0.39	-	-	-	0.0%	5.0%	5.0%	90.0%	100.0%	2.20	2.92	3.73	5.25
TOTAL	16.95	0.39	13.26										62.71

*NOTE: Peak Discharge calculated from Section A.6 of the ABQ DMP.

BASIN 1	$\frac{AC}{ASB}$	(30.6)	$\frac{A}{ASB}$	31.8	10.4	$\frac{B}{ASB}$	33.1	11.4	$\frac{C}{ASB}$	13.0	39	$\frac{D}{ASB}$	14.4	4.4
	0.58													
BASIN 2	1.34	(70.6)	9.4	6.6	17.0%	43.0	30.1	26.8	18.7	20.6	14.4	18.8%		
	<u>1.92</u>													

Detention Pond Volume Calculations - POND

NOTE: Blue shaded cells require user input, all other cells should not be edited.

ASSUMPTIONS:

1. Area less than 40 acres (simplified hydrograph method)
2. 100-year, 6-hour storm event

Peak Flow per Acre - DPM Section 22.2 Table A-9

Zone	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.7
3	1.87	2.6	3.45	5.02
4	2.2	2.92	3.73	5.25

Manually put in

Basin Name: Retention Pond

Choose Zone (1 - 4)

Basin Area = (acres)

Exist Conditions				Proposed Conditions			
Treatment	Percentage	Area	Q (cfs)	Treatment	Percentage	Area	Q (cfs)
A	16.3%	0.31	0.69	A	17.0%	0.33	0.72
B	26.5%	0.51	1.48	B	41.5%	0.80	2.33
C	47.3%	0.91	3.39	C	22.6%	0.43	1.62
D	10.0%	0.19	1.01	D	18.8%	0.36	1.90
Q Peak - exist = 11.91				Peak Q Developed = 6.57			

Use my calculated exist cond. flow as the peak controlled discharge (1 = yes, or N) ??

If No, what is the maximum allowable discharge ?

Excess Precipitation - DPM Section 22.2 Table A-8

Zone	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.8	1.08	1.46	2.64

Determine Developed E (avg excess precipitation for the developed basin)

$$\%A \times E = 0.14$$

$$\%B \times E = 0.45$$

$$\%C \times E = 0.33$$

$$\%D \times E = 0.50$$

$$\text{Avg E(in)} = 1.41$$

Determine Tb (hours)

$$Tb = 0.821$$

Determine Tc (Note: Tc is assumed to be 0.2 hours, this should be checked using DPM 22.2.B.2)

$$Tc = 0.2$$

Determine Tp and Duration of Peak (hours)

$$Tp = 0.257667$$

$$\text{Peak Duration} = 0.047$$

Compute the required retention volume using the simple hydrograph, Figure A-3 in DPM Section 22.2

$$\text{Time to Control Q (hrs)} = 0.000$$

$$\text{Time to end of Control Q (hrs)} = 0.821495$$

$$\text{Duration of Control Q (hrs)} = 0.821$$

$$\text{Required Detention Volume (CF)} = 10270.8$$

10 DAY

$$V_{DAY} = V_{360} + A(P_{1440} - P_{360})$$

12

$$210271 + 15723(595 - 2.90)$$

12

$$= 14267 \text{ CF}$$

$$A = 1.92(0.108)$$

$$= 0.36 \text{ cfs/ft}$$

$$= 15723 \text{ SF}$$

retention pond_1ot 1 volumes_5-21-09.txt					
Elevation	Incremental Volume	Cumulative Volume	Acre-Feet	Surface Area	
	cu ft	cu ft		sq ft	
5705.2500	726.5695	726.5695	0.0167	2960.5852	
5705.5000	753.8499	1480.4194	0.0340	3070.4702	
5705.7500	781.5121	2261.9315	0.0519	3181.8823	
5706.0000	809.5561	3071.4876	0.0705	3294.8228	
5706.2500	837.9818	3909.4694	0.0897	3409.2866	
5706.5000	866.7893	4776.2588	0.1096	3525.2791	
5706.7500	895.9786	5672.2373	0.1302	3642.8020	
5707.0000	925.5496	6597.7869	0.1515	3761.8503	
5707.2500	955.5024	7553.2893	0.1734	3882.4219	
5707.5000	985.8369	8539.1262	0.1960	4004.5251	
5707.7500	1016.5532	9555.6794	0.2194	4128.1533	
5708.0000	1047.6513	10603.3308	0.2434	4253.3110	
5708.2500	1079.1312	11682.4619	0.2682	4379.9946	
5708.5000	1110.9928	12793.4547	0.2937	4508.2031	
5708.7500	1143.2361	13936.6908	0.3199	4637.9390	
5709.0000	1175.8613	15112.5521	0.3469	4769.2068	
5709.2500	1208.8682	16321.4203	0.3747	4901.9956	
5709.5000	1242.2568	17563.6771	0.4032	5036.3152	
5709.7500	1276.0273	18839.7044	0.4325	5172.1565	
5710.0000	1310.1795	20149.8839	0.4626	5309.5286	
5710.2500	0.0000	20149.8839	0.0000	0.0000	
5710.5000	0.0000	20149.8839	0.0000	0.0000	
5710.7500	0.0000	20149.8839	0.0000	0.0000	
5711.0000	0.0000	20149.8839	0.0000	0.0000	

Area of Bottom of Pond = 2852 SF

FOR 10 DAY, POND MUST BE 14267 CF @ 5709' + 1' (FREE BOARD)

5710'

MIN-TOP OF POND ELEVATION = 5710.21' ✓

EXISTING BASINS															
Basin	AREA	ROADWAY AREA	REMAINING LOT AREA	% LAND TREATMENT*				PEAK DISCHARGE - (CFS/ACRE)*				Q(100-YR) DEVELOPED			
ID	(ACRES)	(ACRES)	(ACRES)		% DIFF	A	B	C	D		A	B	C	D	(CFS)
1	0.58	0.00	0.47		81.0%	34.8%	38.1%	13.0%	14.7%	100.6%	2.20	2.92	3.73	5.25	1.82
2	1.96	0.14	1.65		84.2%	9.3%	14.0%	63.1%	13.7%	100.1%	2.20	2.92	3.73	5.25	7.23
3	2.98	0.00	2.63		88.3%	7.1%	12.7%	71.5%	8.8%	100.0%	2.20	2.92	3.73	5.25	10.89
4	4.03	0.39	3.43		85.1%	10.2%	17.5%	58.7%	13.5%	99.9%	2.20	2.92	3.73	5.25	14.65
5	0.93	0.00	0.93		100.0%	19.0%	45.0%	36.0%	0.0%	100.0%	2.20	2.92	3.73	5.25	2.86
6	3.70	0.00	3.70		100.0%	10.0%	34.0%	56.0%	0.0%	100.0%	2.20	2.92	3.73	5.25	12.22
7	2.72	0.00	2.57		94.5%	10.4%	11.8%	73.7%	4.1%	99.9%	2.20	2.92	3.73	5.25	9.62
TOTAL	16.90	0.53	15.38												59.28

*NOTE: Peak Discharge calculated from Section A.6 of the ABQ DMP.

BASIN 4	AC	A	B	C	D	E	F	G	H
	4.03	10.2	6.1	17.5	10.5	35.2	13.5	0.1	
BASIN 7	2.72 (40%)	10.4	4.2	11.8	4.7	73.7	4.1	4.6	
	6.75	10.3%	15.2%	64.7%	9.7%				

TOTAL CFS = 24.27
24.27 CFS

PROPOSED BASINS													
Basin	AREA	ROADWAY AREA	REMAINING LOT AREA	% DIFF	% LAND TREATMENT*				PEAK DISCHARGE - (CFS/ACRE)*				Q(100-YR) DEVELOPED
ID	(ACRES)	(ACRES)	(ACRES)		A	B	C	D	A	B	C	D	(CFS)
1	0.58	0.00	0.47	81.0%	34.8%	38.1%	13.0%	14.7%	100.7%	2.20	2.92	3.73	5.25
2	1.34	0.00	0.97	72.4%	9.4%	43.0%	26.8%	20.6%	99.8%	2.20	2.92	3.73	5.25
3-A	1.02	0.00	0.74	72.5%	2.9%	22.7%	53.7%	20.3%	99.6%	2.20	2.92	3.73	5.25
3-B	1.75	0.00	1.47	84.0%	8.4%	30.0%	49.6%	11.8%	99.7%	2.20	2.92	3.73	5.25
4	1.83	0.00	1.49	81.4%	9.0%	13.7%	63.5%	14.1%	100.2%	2.20	2.92	3.73	5.25
5-A	1.26	0.00	1.09	86.5%	1.7%	5.1%	83.0%	10.2%	100.2%	2.20	2.92	3.73	5.25
5-B	1.72	0.00	1.37	79.7%	10.4%	18.6%	55.8%	15.3%	100.1%	2.20	2.92	3.73	5.25
6	4.03	0.39	3.43	85.1%	10.2%	17.5%	58.7%	13.5%	99.9%	2.20	2.92	3.73	5.25
7	2.72	0.00	2.23	82.0%	9.0%	13.5%	63.9%	13.5%	100.0%	2.20	2.92	3.73	5.25
S-1	0.31	-	-	-	0.0%	5.0%	5.0%	90.0%	100.0%	2.20	2.92	3.73	5.25
S-2	0.39	-	-	-	0.0%	5.0%	5.0%	90.0%	100.0%	2.20	2.92	3.73	5.25
TOTAL	16.95	0.39	13.26										62.71

*NOTE: Peak Discharge calculated from Section A.6 of the ABQ DMP.

BASIN 6	$\frac{Ac}{Ac}$	$\frac{A}{A}$											
	4.03	(6.03)	10.2	6.1	17.5	10.5	58.7	35.2	13.5	8.1			
BASIN 7	2.72	(4.03)	9.0	3.0	13.5	5.4	63.9	25.6	13.5	5.4			
	6.75			9.9%		15.9%		60.8%		13.5%			

TOTAL CFS = 24.68

EXHIBITS

**EXHIBIT 1: SUBDIVISION LOCATION MAP
AND PRELIMINARY PLAT**

EXHIBIT 2: EXISTING CONDITIONS BASIN MAP

EXHIBIT 3: PROPOSED CONDITIONS BASIN MAP

EXHIBIT 4: GRADING PLANS

EXHIBIT 1

**SUBDIVISION LOCATION MAP AND
PRELIMINARY PLAT**

EXHIBIT 2

EXISTING CONDITIONS BASIN MAP

EXHIBIT 3

DEVELOPED CONDITIONS BASIN MAP

EXHIBIT 4

GRADING PLAN

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(Rev. 12/2005)

PROJECT TITLE: **FOUR HILLS VILLAGE 21ST INSTALLMENT** ZONE MAP/DRG. FILE # **M-23** *10017*
DRB#: **1007263** EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: **UNPLATTED TRACT WITHIN SECTION 35, T10N, R4E, NMPM**
CITY ADDRESS: **LOCATED BETWEEN WARM SANDS DRIVE AND HIDEAWAY LANE WITHIN FOUR HILLS**

ENGINEERING FIRM: **BOHANNAN HUSTON INC** CONTACT: **KEVIN PATTON**
ADDRESS: **COURTYARD 1, 7500 JEFFERSON ST NE** PHONE: **(505) 823-1000**
CITY, STATE: **ALBUQUERQUE, NM** ZIP CODE: **87109**

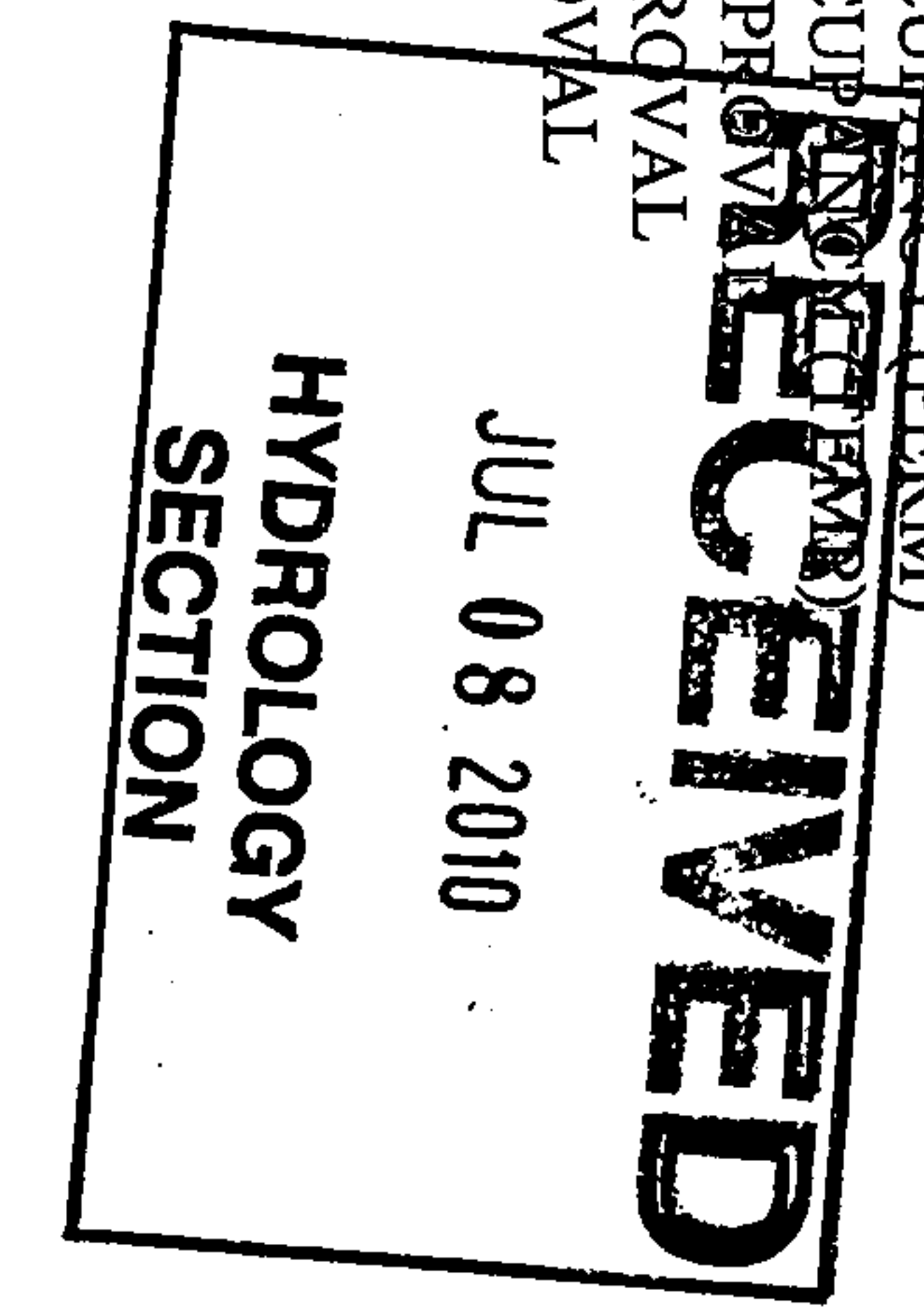
OWNER: **KHANI COMPANY** CONTACT: **NASER ALIKHANI**
ADDRESS: **102 HIGHWAY 66 EAST** PHONE: **(505) 299-1000**
CITY, STATE: **ALBUQUERQUE, NM** ZIP CODE: **87123**

ARCHITECT: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

CONTRACTOR: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

<u>TYPE OF SUBMITTAL:</u>	<u>CHECK TYPE OF APPROVAL SOUGHT:</u>
<input type="checkbox"/> DRAINAGE REPORT	<input checked="" type="checkbox"/> SI/FINANCIAL GUARANTEE RELEASE
<input type="checkbox"/> DRAINAGE PLAN 1 ST SUBMITTAL	<input type="checkbox"/> PRELIMINARY PLAT APPROVAL
<input type="checkbox"/> DRAINAGE PLAN RESUBMITTAL	<input type="checkbox"/> S. DEV. PLAN FOR SUB'D APPROVAL
<input type="checkbox"/> CONCEPTUAL G & D PLAN	<input type="checkbox"/> S. DEV. FOR BLDG. PERMIT APPROVAL
<input type="checkbox"/> GRADING PLAN	<input type="checkbox"/> SECTOR PLAN APPROVAL
<input type="checkbox"/> EROSION CONTROL PLAN	<input type="checkbox"/> FINAL PLAT APPROVAL
<input checked="" type="checkbox"/> ENGINEER'S CERT (HYDROLOGY)	<input type="checkbox"/> FOUNDATION PERMIT APPROVAL
<input type="checkbox"/> CLOMR/LOMR	<input type="checkbox"/> BUILDING PERMIT APPROVAL
<input type="checkbox"/> TRAFFIC CIRCULATION LAYOUT	<input type="checkbox"/> CERTIFICATE OF OCCUPANCY (PERM)
<input type="checkbox"/> ENGINEER CERT (TCL)	<input type="checkbox"/> CERTIFICATE OF OCCUPANCY (PERM)
<input type="checkbox"/> ENGINEER CERT (DRB SITE PLAN)	<input type="checkbox"/> GRADING PERMIT APPROVAL
<input type="checkbox"/> OTHER (SPECIFY) _____	<input type="checkbox"/> PAVING PERMIT APPROVAL
	<input type="checkbox"/> WORK ORDER APPROVAL
	<input type="checkbox"/> OTHER (SPECIFY) _____



WAS A PRE-DESIGN CONFERENCE ATTENDED:

YES

NO

COPY PROVIDED

SUBMITTED BY: _____ DATE: _____

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope to the proposed development define the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report:** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more.

CLIENT/COURIER TRANSMITTAL

To: Brad Bingham
City of Albuquerque
600 Second Street NW, 2nd Floor West

Requested by: Kevin Patton/cc
Date: July 8, 2010

Phone: 924-3986
Job No.: 080340

Job Name: Four Hills Development

Time Due: ☒ This A.M.
☐ This P.M.
☐ Rush _____
☐ By Tomorrow

<u>DELIVERY VIA</u>	
<input checked="" type="checkbox"/> Courier	<input type="checkbox"/> Federal Express
<input type="checkbox"/> Mail	<input type="checkbox"/> UPS
<input type="checkbox"/> Other	

<u>PICK UP</u>
Item: _____

<u>ITEM NO.</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
1	1	Grading and Drainage Certification
2	1	Drainage Info Sheet

COMMENTS / INSTRUCTIONS

RECD BY: _____

DATE: _____ TIME: _____

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335

www.bhinc.com

voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

July 7, 2010

Mr. Brad Bingham, P.E.
Hydrology Division
Public Works Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Grading and Drainage Certification for Four Hill Village 21st Installment
DRB #1007263 (M23/D17)

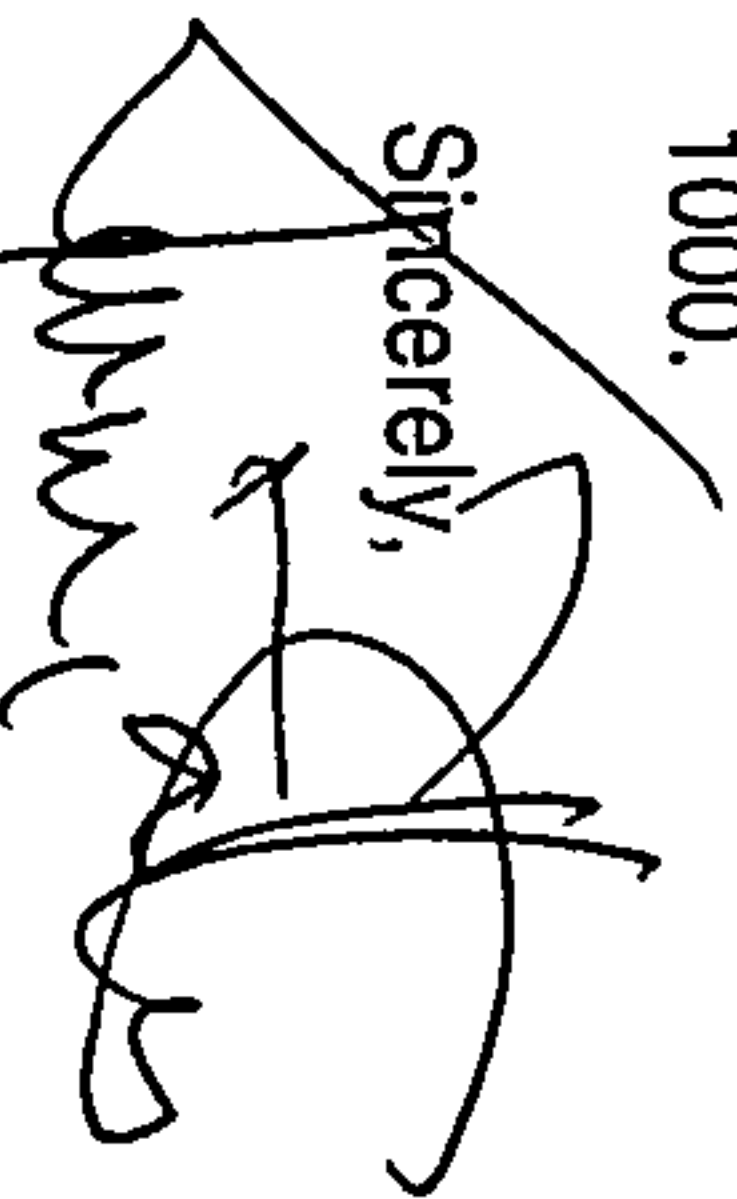
Dear Brad:

The purpose of this letter is to provide you with a copy of the grading and drainage certification for the above referenced project. The project has been graded and will drain in substantial compliance with the approved grading and drainage report/plan dated May 22, 2009. Please note that we did not obtain as built elevations of the proposed retaining walls, but instead field verified that the walls were at, or exceeded the proposed retaining wall heights required by the approved plan. Note that we only verify that the retaining walls meet or exceed the required heights but we make no verification of the structural design of the retaining walls.

In accordance with the approved infrastructure list we are required to submit a grading and drainage certification in order to release the SIA/ Financial Guarantee. Please review and let me know if you have any comments or questions.

If you have any questions or require additional information please give me a call. I can be reached at 823-1000.

Sincerely,



Kevin G. Patton, P.E.
Senior Vice President and Managing Partner
Community Development and Planning

KP/tms
Enclosures

cc: Howard Stone, BHI (w/o enclosures)

ENGINEERING ▲

SPATIAL DATA ▲

ADVANCED TECHNOLOGIES ▲

GAF-ELK ROYAL SOVEREIGN® SHINGLE GUIDE SPECIFICATION

to be installed under this section.

1.06 REGULATORY REQUIREMENTS

- A Provide a roofing system achieving an Underwriters Laboratories (UL) Class A fire classification.
- B Provide a roofing system achieving an ENERGY STAR rating. Install all roofing products in accordance with all federal, state and local building codes.
- D All work shall be performed in a manner consistent with current OSHA guidelines.

1.07 PREINSTALLATION MEETING

- A General: For all projects in excess of 250 squares of roofing, a pre-installation meeting is strongly recommended.
- B Timing: The meeting shall take place at the start of the roofing installation, no more than 2 weeks into the roofing project.
- C Attendees: Meeting to be called for by manufacturer's certified contractor. Meeting's mandatory attendees shall include the certified contractor and the manufacturer's representative. Non-mandatory attendees shall include the owner's representative, architect or engineer's representative, and the general contractor's representative.
- D Topics: Certified contractor and manufacturer's representative shall review all pertinent requirements for the project, including but not limited to, scheduling, weather considerations, project duration, and requirements for the specified warranty.

1.08 DELIVERY, STORAGE, AND HANDLING

- A Store all products in manufacturer's unopened, labeled packaging until they are ready for installation.
- B Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in direct sunlight.
- C Store bundles on a flat surface. Maximum stacking height shall not exceed GAF-Elk's recommendations. Store all rolls on end.
- D Store and dispose of solvent-based materials in accordance with all federal, state and local regulations.

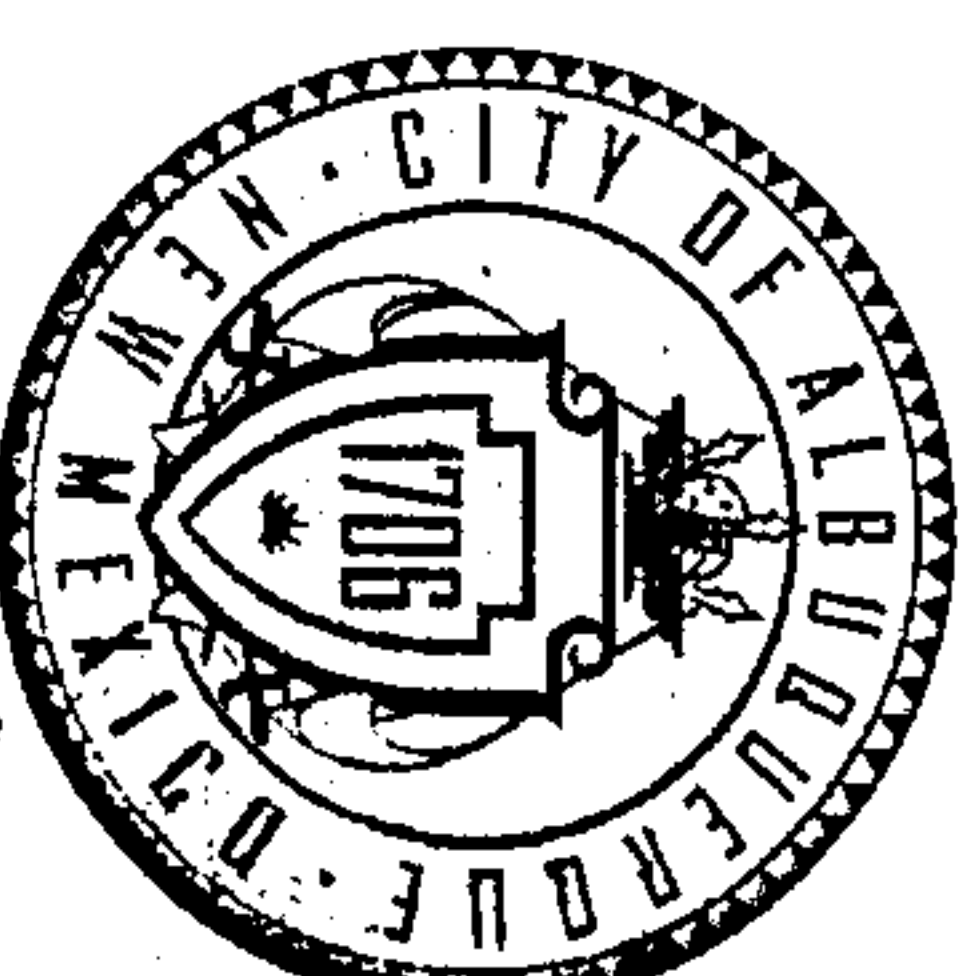
1.09 WEATHER CONDITIONS

- A Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with GAF-Elk's recommendations

1.10 WARRANTY

- A Provide to the owner a Weather Stopper® Golden Pledge® Ltd Warranty.
- B Provide to the owner a Weather Stopper® System Plus Ltd Warranty.
- C Provide to the owner a Smart Choice® Shingle Ltd. Warranty.
- D Provide to the owner a GAF-Elk WeatherStopper® Golden Pledge® Warranty. Contractor must be a GAF-Elk Certified Master Elite™ Contractor.
 - 1. Material defects: Golden Pledge® Warranty shall provide 100% non prorated coverage for materials and labor for:
 - a The first 20 years, then prorated thereafter for all 30 & 40 yr shingles.
 - b The first 50 years, then prorated thereafter for all lifetime shingles.
 - c The first 20 years, then prorated thereafter on steep slope commercial buildings regardless of shingle type.

CITY OF ALBUQUERQUE



May 18, 2009

Kevin Patton, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

**Re: Four Hills 21st Installment Subdivision Drainage Report
Engineer Stamp dated 4-28-09 (M23/D17)**

Dear Mr. Patton,

Based upon the information provided in your submittal dated 4-28-09, the above referenced report cannot be approved for Preliminary Plat until the following comments are addressed.

PO Box 1293

- Per section C.5.a of the DPM (ch 22), side slopes of an unlined pond should be 3:1 or flatter.
- 1:1 tie slopes are not stable and cannot be approved, especially if it supports a public road. If your soils report states differently, please provide a copy of the report.
- Please revise the detail sheet appropriately.

Albuquerque

NM 87103

If you have any questions, you can contact me at 924-3986.

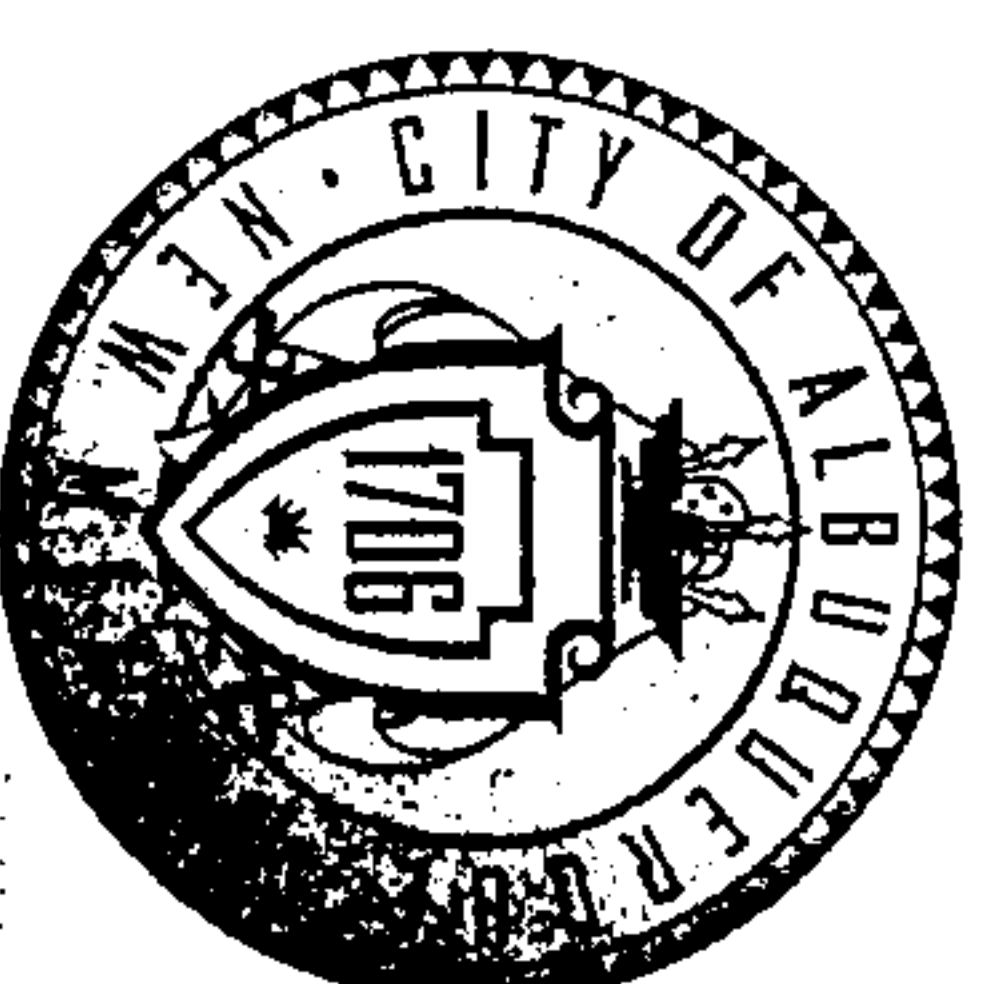
www.cabq.gov

Sincerely,

Bradley L. Bingham, PE
Principal Engineer, Planning Dept.
Development and Building Services

C: file

CITY OF ALBUQUERQUE



February 19, 2009

Kevin Patton, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

Re: Four Hills 21st Installment Subdivision Drainage Report
Engineer Stamp dated 1-16-09 (M23/D17)

Dear Mr. Patton,

Based upon the information provided in your submittal dated 1-16-09, the above referenced report cannot be approved for Preliminary Plat until the following comments are addressed.

PO Box 1293

- Per section C.5.a of the DPM (ch 22), side slopes of an unlined channel should be 3:1 or flatter. Since this channel is also the access to Lot 2, this channel will need to be hard-lined and the driveway into lot 2 must be annotated on the plan. This driveway slope must not exceed 10%.

Albuquerque

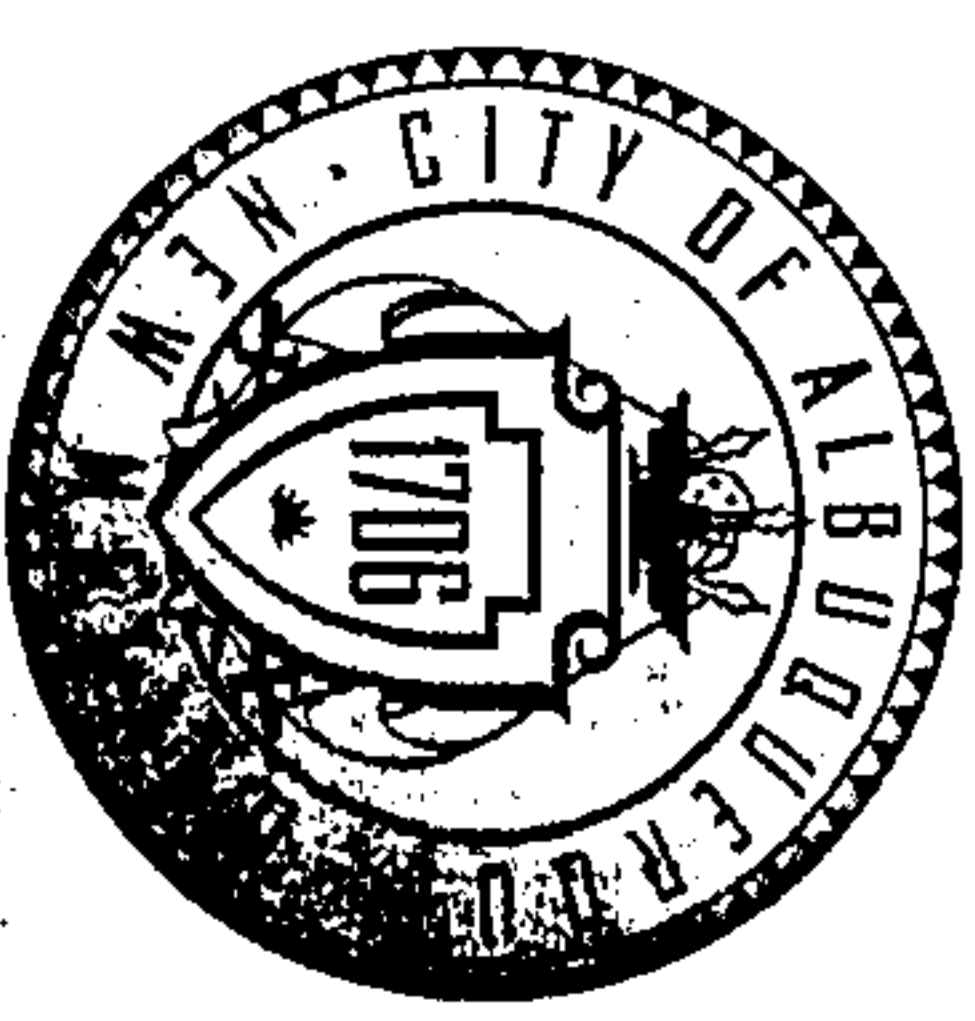
NM 87103

- Please label the major contours on the proposed and existing basin maps and the grading plan as well. Rock outcroppings should also be identified, as well as any other man-made or natural topographic features. This should include the garage and pool/retaining wall for lot 1-A and any other encroachments in the R/W
- Existing basins 1-B and 1-A appear to be represented a little smaller than I would agree with.
- By your design, you are proposing to minimize the mass grading and defer the actual grading plan to the individual lot owner. In other subdivisions (Oxbow, High Desert), this was approvable because there was a viable Homeowners Association that could be relied on and the topography wasn't nearly as challenging. With slopes ranging from "15% to 45%", it is likely that massive earth moving/rock excavation will be needed and if it isn't done *en masse*, it won't be possible on a lot-by-lot basis. Please provide a conceptual grading plan design for each lot to determine what will be needed (finished floor elevations, retaining wall height and location, pipework, etc) to develop them.

www.cabq.gov

- 1:1 tie slopes are not stable and cannot be approved, especially if it supports a public road. If your soils report states differently, please provide a copy of the report.
- Since you have an existing right of way easement, please provide a design profile for that reach north of Lorman in order to determine if the DPM criteria for that road can be satisfied.

CITY OF ALBUQUERQUE



- Per the DPM, a pond must contain 2 ac-ft or more to qualify for public maintenance. Since neither of the ponds proposed are big enough, they must be privately maintained and there is not enough design information to ensure that they will work with private maintenance. Why are the ponds designed for the difference between historic runoff and developed runoff? Will there be a spillway? Where will it be located? Where is the design for this? The report is confusing since it describes a detention pond and the grading plan denotes a retention pond.
- The subdivision ordinance, specifically section 14-14-2-3 (Land Suitability) states that a property proposed to be subdivided must be "sufficiently ameliorated." This site has difficult topography and limiting soil conditions due to the rock outcroppings. Your plan must provide enough engineering analysis to allow the DRB to proceed with the subdivision.

I would be happy to meet with you to discuss these comments. If you have any questions, you can contact me at 924-3986.

PO Box 1293

Albuquerque

NM 87103

C: file

www.cabq.gov

Sincerely,

Bradley L. Bingham, PE
Principal Engineer, Planning Dept.
Development and Building Services

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 12/05 - AP)

PROJECT TITLE: Longfellow ES ZONE MAP/DRG. FILE#: K-14-Z

DRB#: _____ EPC#: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: SEE exhibits in attached Report

CITY ADDRESS: 400 Edith Rd

ENGINEERING FIRM: Wilson & Company CONTACT: Jason Woodruff, PE

ADDRESS: 4900 Lang Ave. NE PHONE: 505-235-7250

CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: APS CONTACT: Frank Shaw

ADDRESS: 915 Oak Street PHONE: 505-975-6248

CITY, STATE: Albuquerque New Mexico ZIP CODE: 87106

ARCHITECT: Wilson & Company CONTACT: See Engineer Above

ADDRESS: 4900 Lang Ave. NE PHONE: 505-235-7250

CITY, STATE: Albuquerque, NM ZIP CODE: _____

SURVEYING FIRM: Wilson & Company LICENSED SURVEYOR: Ben Aragon

ADDRESS: 4900 Lang Ave. NE PHONE: 505-348-4067

CITY, STATE: Albuquerque, NM ZIP CODE: 87109

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

____ DRAINAGE REPORT - RESUBMITTAL

☒ DRAINAGE PLAN 1st SUBMITTAL

____ DRAINAGE PLAN RESUBMITTAL

____ CONCEPTUAL GRADING & DRAINAGE PLAN

☒ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERT (HYDROLOGY)

____ CLOMR/LOMR

____ TRAFFIC CIRCULATION LAYOUT

____ ENGINEER/ARCHITECT CERT (TCL)

____ ENGINEER/ARCHITECT CERT (DRB S. P.)

____ ENGINEER/ARCHITECT CERT (AA)

____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL SOUGHT:

____ SIA / FINANCIAL GUARANTEE RELEASE

____ PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY (PERM.)

____ CERTIFICATE OF OCCUPANCY (TEMP)

☒ GRADING PERMIT APPROVAL

☒ PAVING PERMIT APPROVAL

____ WORK ORDER APPROVAL

____ OTHER (SPECIFY) SO #19

WAS A PRE-DESIGN CONFERENCE ATTENDED:

____ YES

☒ NO

____ COPY PROVIDED

Submitted By: Jason Woodruff DATE: 05/13/09

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development define the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5)
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.