CITY OF ALBUQUERQUE

March 3, 2008

David Soule, P.E.
Rio Grande Engineering
1606 Central SE, Suite 201
Albuquerque, NM 87106

Re: Cielo Estates/ABCWUA well site, Grading and Drainage Plan
Engineer's Stamp dated 12-7-07 (D21/D028)

Dear Mr. Soule,

Based upon the information provided in your submittal received 1-24-08, the above referenced plan is approved for grading on the ABCWUA well site.

Sincerely,

Curtis A. Cherne

Curtis A. Cherne, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: file
Victoria Dery, ABCWUA

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

CITY OF ALBUQUERQUE

July 23, 2007

David Soule, PE
Rio Grande Engineering
1606 Central SE, Ste 201
Albuquerque, NM 87106

Re: Cielo Estates Grading and Drainage Plan
Engineer's Stamp dated 7-7-07(D21-D28)

Dear Mr. Soule,

Based upon the information provided in your submittal dated 7-16-07, the above referenced plan is approved for Grading Permit on the Walker Well and Reservoir Site (as long as you get concurrence from the ABCWUA Authority). The improvements you propose will better manage drainage as it comes to your site and should also allow the Authority to have the ability to expand their facilities in the future and have an improved outfall available.

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

C: Victoria Dery, ABCWUA
Lynn Mazur, AMAFCA
Brian Kent, BCPW
file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

Rio Grande
Engineering
Land Development and Civil Engineering Services

January 23, 2008

Mr. Jame Eisenberg
Development Review Engineer
Bernalillo County Public Works Division
2400 Broadway SE
Albuquerque, New Mexico 87102

RE: Drainage Plan ReSubmittal
PWDN 70023
Cielo Estates Subdivision

Dear Mr. Eisenberg:

The purpose of this letter is to accompany the attached revised grading plan with supporting calculations. A grading plan for this subdivision was approved March 9, 2007. The property owners have subsequently requested a modification to this plan. The overall drainage scheme has not changed. There are no changes to the land treatments or ponds. The changes to the plan include the following:

1. The channel located on the east side of the subdivision was relocated on to the ABCWUA well site. This channel was changed from concrete to rip-rap. The function of the channel is to force the water leaving the well site into improved channels. The relocation must be approved by ABCWUA and a copy of this plan has been submitted to both COA and ABCWUA for their approval and acceptance. The adjacent site was pot-holed to verify the location of all improvement adjacent to out site.
2. The concrete channel accepting the flow from the well site was reduced from 10' to 5'. The channel is to be privately maintained. The capacity was analyzed and is sufficient to accept and pass the flows entering the site. I have attached the supplementary calculations.
3. The east end of the subdivision was raised approximately 2'. The original grading plan was designed with balance earthwork conditions. The home builder placed more value on a short retaining wall rather than balanced dirt work.
4. The site cul-de-sacs shape was modified.

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HYDROLOGY
SECTION

We have met with Public works and Planning and intend to proceed with the submittal of the Final Plat, with the preliminary plat being approved and the changes to the site geometry deemed in substantial compliance to the approved Preliminary plat. Should you have any questions regarding this application, please do not hesitate to call me.

Sincerely,

DMM

David Soule, PE
Rio Grande Engineering
1606 Central SE, Suite 201
Albuquerque, NM 87106
505-321-9099

Enclosures
Cc: Victoria Dery, ABCWUA
Bradley Bingham, COA

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HYDROLOGY
SECTION

5' Channel Entrance

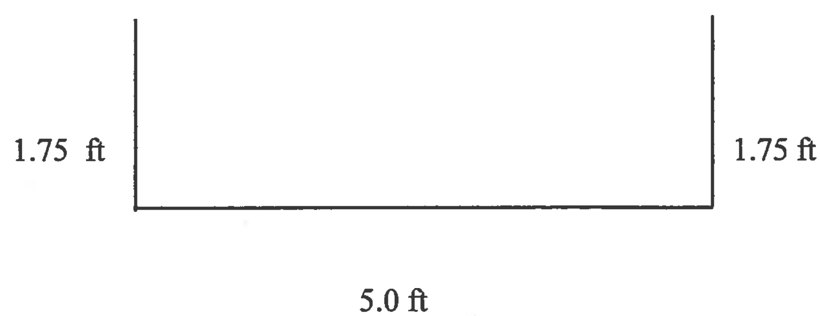
<u>Weir Equation</u>:

$$Q = CLH^{3/2}$$

Q= 28.02
C = 2.95
H = 1.0 ft
L = Length of weir

$$L = \frac{28.12}{2.95(1.75)^{3/2}}$$

L = 4.12 ft
Use 5.0 feet for length of weir
Max Q=2.95(5)(1.75^3/2)=34.15 cfs



Channel Capacity

	Top Width	Bottom Width	Depth	Area	WP	R	Slope	Q Provided	Q Required	Velocity
	(ft)	(ft)	(ft)	(ft^2)	(ft)		(%)	(cfs)	(cfs)	(ft/s)
Beginning	5	5	1.75	8.75	8.50	1.0294118	1	94.94	28.12	3.21
Middle	5	5	1	5.00	7.00	0.7142857	1	42.52	28.12	5.62
End	5	5	0.67	3.35	6.34	0.5283912	2	32.96	28.12	8.39

Manning's Equation:

Q = 1.49/n * A * R^(2/3) * S^(1/2)

A = Area
R = D/4
S = Slope
n = 0.014

Rio Grande
Engineering
Land Development and Civil Engineering Services

July 13, 2007

Mr. Bradley Bingham, PE
Principal Engineer-Planning Department
City of Albuquerque
600 2nd street NW
Albuquerque, NM 87102

RE: Grading plan for Cielo Estates
Bernalillo County, New Mexico

Dear Mr. Bingham:

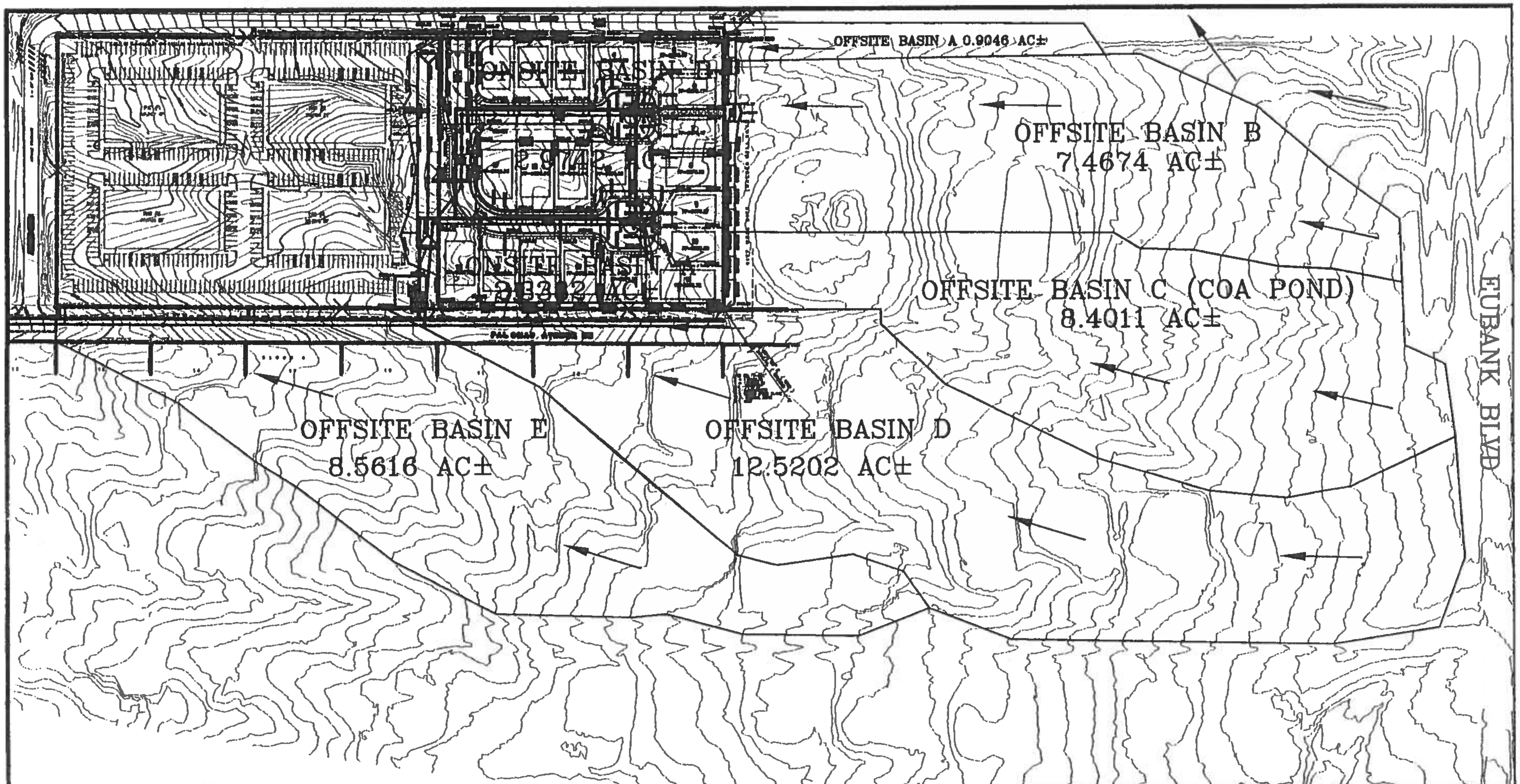
Thank you for taking the time to meet with me onsite last week. As we discussed, I have enclosed my most recent submittal to the County. I have included on the grading plan an approval block for you to sign should you approve of us grading on the adjacent well site.

Should you have any questions regarding this matter, please do not hesitate to call me.

Sincerely,

David Soule, PE
RIO GRANDE ENGINEERING
1606 CENTRAL SE, SUITE 201
ALBUQUERQUE, NM 87106

Enclosures



ENGINEER'S SEAL	CIELO ESTATES	DRAWN BY WCWJ
	OFFSITE BASIN MAP	DATE 1-10-07
		2654-GR-12-20-06X
	Rio Grande Engineering 1606 CENTRAL AVENUE SE SUITE 201 ALBUQUERQUE, NM 87106 (505) 872-0999	SHEET # —
DAVID SOULE P.E. #14522		JOB # 2654

Weighted E Method

Existing Basins

Basin	Area	Area	Treatment A		Treatment B		Treatment C		Treatment D		100-Year		
	(sf)	(acres)	%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
onsite	231660.00	5.318	85%	4.520454545	10%	0.532	5%	0.26591	0%	0.000	0.718	0.318	10.75

Proposed Developed Basins

Basin	Area	Area	Treatment A		Treatment B		Treatment C		Treatment D		100-Year, 6-hr.		
	(sf)	(acres)	%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
OFFSITE A	39404.38	0.905	12%	0.108552	17%	0.154	29%	0.26233	42%	0.380	1.601	0.121	3.42
OFFSITE B	325279.94	7.467	22%	1.642828	23%	1.718	38%	2.83761	17%	1.269	1.248	0.777	23.70
OFFSITE C	365947.56	8.401	22%	1.84822	23%	1.932	38%	3.19238	17%	1.428	1.248	0.874	26.66
OFFSITE D	545371.20	12.520	22%	2.7544	23%	2.880	38%	4.7576	17%	2.128	1.248	1.302	39.74
OFFSITE E	372960.72	8.562	22%	1.88364	23%	1.969	38%	3.25356	17%	1.456	1.248	0.891	27.17
ONSITE A	101843.28	2.338	0%	0	22%	0.514	12%	0.28056	68%	1.590	1.962	0.382	10.29
ONSITE B	129547.44	2.974	0%	0	22%	0.654	12%	0.35688	68%	2.022	1.962	0.486	13.08
ONSITE ALLOW PER NAA	231390.72	5.312	22%	1.16864	23%	1.222	38%	2.01856	17%	0.903	1.248	0.553	16.86
ULT TOT AT HOL/PDN	1880354.52	43.17		8.24		9.82		14.94		10.27	1.343	4.833	144.06

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm

Ea= 0.66	Qa= 1.87
Eb= 0.92	Qb= 2.6
Ec= 1.29	Qc= 3.45
Ed= 2.36	Qd= 5.02

EXISTING FLOW LEAVING SITE= OFFSITE B + TOTAL ONSITE	34.45	CFS
DEVELOP FLOW LEAVING SITE= OFFSITE B+ ONSITE A+B=	47.07	CFS
ROUTED THROUGH POND (FROM AHYMO RUN)	28.04	CFS
DEVELOP FLOW LEAVING SITE IF DEV. PER NAA STDS	40.56	CFS
NET DECREASE IN PEAK FLOW FROM EXISTING	6.41	CFS

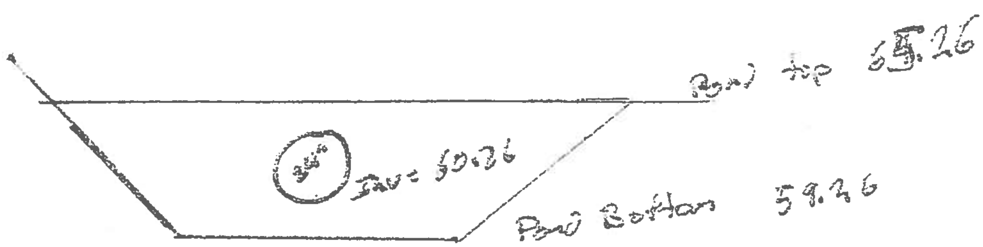
VOLUME CALCULATIONS

	ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
	59.26	0	0	0.000
invert	60.26	1.00	0.0210	0.000
	61.26	2.00	0.0860	15.127
	62.26	3.00	0.1960	21.392
	63.26	4.00	0.3550	26.200
	64.26	5.00	0.6910	30.253
	65.26	6.00	0.8290	33.824

<u>Orifice Equation</u>

Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	24
Area (ft^2)=	3.14159265
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow



EMERGENCY OVERFLOW

Weir Equation:

$$Q = CLH^{3/2}$$

Q= 47.07
C = 2.95
H = 1.0 ft
L = Length of weir

$$L = \frac{47.07}{2.95(1)^{3/2}}$$

L = 15.96 ft
Use 16.00 feet for length of weir
Max Q=2.95(16)(1^3/2)=47.2 cfs