City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 8, 1994

C.A. Coonce
C.A. Coonce & Assoc.
12324 Pineridge, NE
Albuquerque, NM 87122

RE: GATE OF HEAVEN CEMETERY AND MAUSOLEUM (D-19/D1A)
ENGINEER'S STAMP DATED 11/21/94

Dear Mr. Coonce:

Based upon the revised Master Drainage Plan you have presented in your 11/28/94 submittal, the Site Development Plan for Building Permit is approved for the referenced project. I look forward to reviewing your future Building Permit submittal.

If I can be of further assistance, feel free to contact me at 768-3622.

Cordially,

Scott Davis
PWD, Hydrology Division

c: Andrew Garcia
File

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 26, 1994

Mr. C.A. Coonce
C.A. Coonce & Assoc.
12324 Pineridge NE
Albuquerque, NM 87112

RE: SITE DEVELOPMENT PLAN & MASTERPLAN APPROVAL FOR GATE OF HEAVEN CEMETERY & MAUSOLEUM (D-19/D1A) ENGINEER'S STAMP DATED 4/14/94

Dear Mr. Coonce:

Based upon your 4/1/94 submittal for the referenced project, Site Development Plan for Building Permit & Masterplan approval is granted at this time. Please keep in mind that prior to gaining actual Building Permit approval it will be necessary to obtain the required Drainage Easement.

If I can be of further assistance, feel free to contact me at 768-3622.

Cordially,

Scott Davis
PWD, Hydrology Division

(WP+8480)

c: File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 20, 1994

C.A. Pat Coonce
C.A. Coonce & Assoc. Inc.
12324 Pineridge NE
Albuquerque, NM 87122

RE: ENGINEER CERTIFICATION FOR GATE OF HEAVEN CEMETERY OFFICE BUILDING (D19-D1A) LETTER DATED 1/14/94.

Dear Mr. Coonce:

Based on the information provided on your January 14, 1994 letter, Engineer Certification for the above referenced site is acceptable.

Please be advised that no further construction will be allowed until a Master Drainage Plan is submitted for review and approval. The Master Plan must address as-built pond volumes along with all other drainage requirements.

If I can be of further assistance, please feel free to contact me at 768-2667.

Sincerely,

Bernie J. Montoya

Bernie J. Montoya, CE
Engineering Associate

BJM/dl/WPHYD/7466

xc: Inspector
File

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 25, 1993

C.A. Coonce
Coonce & Associates, Inc.
12324 Pineridge NE
Albuquerque, NM 87122

RE: DRAINAGE PLAN FOR GATE OF HEAVEN OFFICE & PAVING (D19-D1A) REVISION DATED 1/11/93.

Dear Mr. Coonce:

Based on the information provided on your January 13, 1993 resubmittal, the above referenced site is approved for Building Permit.

As you are already aware of the past requirement for a Master Drainage Plan for the Gate of Heaven site, no further Building Permits will be granted.

Also, the existing pond must be cleaned so that no debris will plug the outlet pipe and cause problems downstream.

If I can be of further assistance, please feel free to contact me at 768-2667.

Sincerely,

Bernie J. Montoya

Bernie J. Montoya, CE

BJM/dl/WPHYD/7466

xc: Alan Martinez
Charles Lucero
David Dekker
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

October 17, 1989

J. David Dekker
Design Collaborative Southwest
105 Fourth Street, SW
Albuquerque, New Mexico 87102

RE: DRAINAGE PLAN FOR GARDEN CRYPT @ GATE OF HEAVEN CEMETARY
(D-19/D1A) RECEIVED OCTOBER 3, 1989

Dear Mr. Dekker:

Based on the information provided on your submittal of October 3, 1989, the above referenced plan is approved for Building Permit.

Please attach a copy of this plan to the construction sets prior to sign-off by Hydrology.

Any future development within this area will require a master drainage plan identifying the phases of construction.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj
(WP+1343)

GATE OF HEAVEN CEMETERY AND MAUSOLEUM

MASTER DRAINAGE AND GRADING PLAN

REPORT

APRIL, 1994

PREPARED BY: C. A. COONCE & ASSOC.
PREPARED FOR: GATE OF HEAVEN CEMETERY
AND MAUSOLEUM

GATE OF HEAVEN CEMETERY AND MAUSOLEUM
MASTER DRAINAGE AND GRADING PLAN

INTRODUCTION:

Design Collaborative Southwest has prepared a master plan for the Gate of Heaven Cemetery and Mausoleum. This 20.06 acre tract is located n the S.W. corner of Paseo del Norte and Wyoming streets, N.E. The facility is bounded on the west and south by the Santa Barbara Subdivision.

The master plan incorporates a new entrance from Wyoming Blvd., N.E. This is required because the City of Albuquerque will not allow entrance from Paseo del Norte when it is upgraded to a limited access roadway. The master plan will be constructed n several phases over a number of years. The exact time frame will depend upon the economic conditions, and the demand for the facility. Temporary paving is proposed to the existing Wyoming Blvd. temporary paving, since Wyoming will also be upgraded as a divided boulevard during the Paseo del Norte construction. The new entrance to the Gate of Heaven Cemetery and Mausoleum is essentially in line with the Palomas Ave. entrance onto Wyoming Blvd., N.E. When fully developed in accordance with the architectural master plan, the facility will be 27% impervious and 73% lawn and garden area.

EXISTING RUNOFF:

The runoff from this site occurs primarily from three basins. One is sheet flow from the northern portion, which is all pervious, being either grass, natural grass or bare soil. This runoff goes to Rancho de Palomas, N.E. and via Quail Hollow Lane and Turtle Dove Lane to the lined channel east of the Federal Aviation Authority facility. The runoff from the central basin, which currently takes most of the runoff from the existing developed area, is via a retention pond and a 24" CMP to Bob White Lane, and thence to the lined channel east of the FAA facility. The south basin drains primarily along the south side and at the southwest corner. When the Santa Barbara Subdivision was first approved, Chickadee Lane bordered the south of the Gate of Heaven Cemetery. This provided an outlet for future development of the cemetery. The subdivision was re-platted, and Chickadee Lane was vacated from Rancho de Palomas eastward, thus creating a drainage outlet problem.

PROPOSED DRAINAGE:

The master plan was divide into three drainage basins, which conform with the existing flow patterns. The land treatment areas were measured for each basin, and the AHYMO computer program was run to obtain a hydrograph for each basin. In the master plan only two land treatments are planned: either D as impervious area, or B as lawn and garden areas. Copies of all hydrographs are included.

Basin I encompasses 5.02 acres along the northern (Paseo del Norte) section. It will be all garden level burial sites with grass. The treatment is 100% B. Currently this area is treatments A, B, C, and D. The runoff from this basin goes in the same pattern as it currently does, and that is primarily to Ranch de Palomas, thence via Quail Hollow Land and Turtle Dove Lane to the paved drainage ditch at the west side of the Santa Barbara Subdivisio;n. The 100 year peak Q is 9.91 CFS at 1.567 hours.

Basin II, which drains to Bob White Lane, is routed through a retention pond to reduce the peak 100 year flow to Bob White Lane to 14.5 CFS. Copies of the reservoir routing solution are included. The low slope (0.5%) and distance from the Basin II retention pond to Bob White Lane outfall causes the flow to be outlet controlled. A 21" diameter pipe is required to give 14.5 CFS peak flow at the maximum retention pond headwater. An enlarged detail design is provided for this detention and outfall area.

Basin III, which is largely undeveloped at the present time and drains to the south boundary and at the southwest corner, is routed to a retention pond in the low (S.W.) corner. From there it is designed to flow at a maximum rate of 10.8 CFS at the north edge of the swimming pool parking area to Rancho de Palomas Street, and thence to the Rancho de Palomas outfall into the Domingo Baca lined channel. Rancho de Palomas is a forty foot wide street, with a standard 8" curb. It was built in accordance with the approved 1982 design b y Huston and Bohannon. This section of Rancho de Palomas, from 100' north of Chickadee Lane to the Domingo Baca outfall presently drains 1.65 acres. The existing peak 100 year Q is estimated at 6.69 CFS. This existing peak Q would be over before the peak Q from the cemetery could arrive.

Copies of the design for the Rancho de Palomas to Domingo Baca Arroyo outfall were obtained from Brasher Engineering Co. The fully developed flow to this outfall is computed as 31.3 CFS by Brasher Engineering Co. The Brasher Engineering Co. calculated 31.5 CFS flow included 5 CFS2 from this site, which, when this plan is implemented, will reduce to 26.3 CFS. The total depth of flow , adding 10.8 CFS from the Gate of Heaven Cemetery to the 31.3 CFS existing, is 0.9 ft. The channel depth is two feet.

The outfall from Basin III to Rancho de Palomas, due to its short length, will act as an orifice. The required size for 10.8 CFS with the calculated retention pond headwater is 18" diameter. Copies of the reservoir routing and orifice solutions are attached.

In order to implement this drainage plan, a drainage easement will be obtained from the Santa Barbara Home Owners Association. It will also be necessary to obtain an as-built X, Y, and Z survey of the Rancho de Palomas Street to the Domingo Baca outfall, in order to make a final detail design of the outfall from Basin III to Rancho de Palomas.

18" ORIFICE OUTLET

ORIFICES

Enter up to 10 orifices.
Enter <Return> only for flowrate and area to end.

FLOWRATE (CFS)	AREA (SF)	COEFF (-)	ELEVATIONS HEADWATER (FT)	CENTER (FT)	TAILWATER (FT)
14.37	1.77	0.610	67.50	64.00	64.74
15.62	1.77	0.610	68.00	64.00	64.74
4.41	1.77	0.610	65.00	64.00	64.74
7.54	1.77	0.610	65.50	64.00	64.74
9.71	1.77	0.610	66.00	64.00	64.74
13.03	1.77	0.610	67.00	64.00	64.74

EXISTING 24" OUTFALL @ 18' LENGTH TO 6' MANHOLE W/3" TAILWATE

CULVERTS

DIAMETER (IN)	? 24
LENGTH (FT)	? 16
FRICTION COEFF (FT^1/6)	? .015
ENT+EXIT COEFF	? 0
INLET CONTROL COEFF	? .61
INV ELEV OUT (FT)	? 62.56
INV ELEV IN (FT)	? 62.64
TAILWATER ELEV (FT)	? 62.81
ELEV INCREMENT (FT)	? .1

RESULTS

HEADWATER (FT)		FLOWRATE (CFS)
64.64	OC	13.86
64.74	IC	16.13
64.84	IC	16.85
64.94	IC	17.53
65.04	IC	18.20
65.14	IC	18.84
65.24	IC	19.45
65.34	IC	20.05
65.44	IC	20.63
65.54	IC	21.20
65.64	IC	21.75
65.74	IC	22.29
65.84	IC	22.81
65.94	IC	23.32
66.04	IC	23.82
66.14	IC	24.32

<Shift> <Prt Sc> print <Return> repeat <Space Bar> back to menu

PONDS CONNECTED w/ 30" RCP; n = 0.013

CULVERTS

DIAMETER (IN)	? 30
LENGTH (FT)	? 444
FRICTION COEFF (FT^1/6)	? .013
ENT+EXIT COEFF	? 0
INLET CONTROL COEFF	? .61
INV ELEV OUT (FT)	? 64
INV ELEV IN (FT)	? 64
TAILWATER ELEV (FT)	? 66.5
ELEV INCREMENT (FT)	? .1

RESULTS

HEADWATER (FT)		FLOWRATE (CFS)
66.50	IC	0.00
66.60	OC	6.16
66.70	OC	8.71
66.80	OC	10.66
66.90	OC	12.31
67.00	OC	13.76
67.10	OC	15.08
67.20	OC	16.29
67.30	OC	17.41
67.40	OC	18.47
67.50	OC	19.47
67.60	OC	20.42
67.70	OC	21.32
67.80	OC	22.19
67.90	OC	23.03
68.00	OC	23.84

<Shift> <Prt Sc> print <Return> repeat <Space Bar> back to menu

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PONDS CONNECTED w/ 30'CMP; n = 0.015

CULVERTS

DIAMETER (IN)	? 30
LENGTH (FT)	? 444
FRICTION COEFF (FT^1/6)	? .015
ENT+EXIT COEFF	? 0
INLET CONTROL COEFF	? .61
INV ELEV OUT (FT)	? 64
INV ELEV IN (FT)	? 64
TAILWATER ELEV (FT)	? 66.5
ELEV INCREMENT (FT)	? .1

RESULTS

HEADWATER (FT)		FLOWRATE (CFS)
66.50	IC	0.00
66.60	OC	5.33
66.70	OC	7.54
66.80	OC	9.24
66.90	OC	10.67
67.00	OC	11.93
67.10	OC	13.07
67.20	OC	14.11
67.30	OC	15.09
67.40	OC	16.00
67.50	OC	16.87
67.60	OC	17.69
67.70	OC	18.48
67.80	OC	19.24
67.90	OC	19.96
68.00	OC	20.66

<Shift> <Prt Sc> print <Return> repeat <Space Bar> back to menu

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[illegible] & AMIMU INPUT, t_o = 1.235 HR = 74 MIN

R E S E R V O I R   R O U T I N G

INFLOW HYDROGRAPH		CAPACITY/OUTFLOW RATING		
TIME-min	FLOW-cfs	STAGE-ft	VOLUME-cf	OUTFLOW-cfs
0	2	64	0	0
8	15.8	65	57.16	4.41
12	46.3	66	12330	9.71
14	46.4	67	22697	14.37
16	51.4	68	38373	15.62
18	50			
20	44.6			
22	38.2			
34	16.5			
74	1.7			

TIME INCREMENT (min) = 2

TIME (MIN)	INFLOW (CFS)	STAGE (FT)	VOLUME (CF)	OUTFLOW (CFS)	
36.0		68.0	37,658	15.6	<<< MAXIMUM VALUES

<Shift> <Prt Sc> print   <P> hydrograph   <Ret> repeat   <Space> back to menu

TIME (MIN)	INFLOW (CFS)	STAGE (FT)	VOLUME (CF)	OUTFLOW (CFS)
0.0	2.0	64.0	0	0.0
2.0	5.4	65.0	179	4.5
4.0	8.9	65.0	496	4.6
6.0	12.4	65.1	1,201	4.9
8.0	15.8	65.2	2,274	5.4
10.0	31.0	65.4	4,386	6.3
12.0	46.3	65.7	8,175	7.9
14.0	46.4	66.0	12,671	9.9
16.0	51.4	66.5	17,232	11.9
18.0	50.0	66.9	21,764	14.0
20.0	44.6	67.2	25,727	14.6
22.0	38.2	67.4	28,926	14.9
24.0	34.6	67.6	31,497	15.1
26.0	31.0	67.7	33,611	15.2
28.0	27.3	67.8	35,273	15.4
30.0	23.7	67.9	36,487	15.5
32.0	20.1	67.9	37,258	15.5
34.0	16.5	68.0	37,590	15.6
36.0	15.8	68.0	37,658	15.6

CITY OF ALBUQUERQUE

March 2, 2012

J. Arthur Blessen, P.E.
J. Arthur Blessen Engineering
11930 Menaul Blvd NE, Suite 109
Albuquerque, NM 87112

Re: Gate of Heaven Cemetery
Site Grading Plan
Engineer's Stamp dated 6-9-12 (D19/D001A)

Dear Mr. Blessen,

Based upon the information provided in your submittal received 2-24-12, the above referenced plan cannot be approved for Building Permit until the following comments are addressed.

- Per approved grading plans dated 6/4/2002 and 11/21/94 basins B & C were to drain into ponds B & C which was then piped to the outfall at Bob White Lane at a rate of 13.7cfs. This plan should propose the same drainage scheme.
- Provide basin, pipe and pond calculations to support the above mentioned drainage scheme.

Albuquerque's MS4 Permit became effective March 1st, 2012. Grading and Drainage Plans and Drainage Reports will have to comply with the requirements of the new permit. The permit is available online at www.cabq.gov/Planning/landcoord/Hydrology

If you have any questions, you can contact me at 924-3986 or Rudy Rael at 924-3977.

Sincerely,

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

RER/CAC
C: file

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV 12/2005)

PROJECT TITLE: Gate of Heaven Cemetery ZONE MAP: D19/001A
DRB#: _____ EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: Lots A, B, & C of Rancho de Palomas Manufactured Housing
CITY ADDRESS: 7999 Wyoming Blvd. NE.

ENGINEERING FIRM: Soleil West Architects CONTACT: Arthur Blessen
ADDRESS: 11930 Menaul NE Suite 109 PHONE: 293-1477
CITY, STATE: Albuquerque, NM 87112 ZIP CODE: 87112

OWNER: _____ CONTACT: ← JAB Engineering.com ← Architects @ soleilwest.com
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

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

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

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

TYPE OF SUBMITTAL:
- X DRAINAGE REPORT
- X DRAINAGE PLAN 1st SUBMITTAL
- _____ DRAINAGE PLAN RESUBMITTAL
- _____ CONCEPTUAL G & D PLAN
- X GRADING PLAN
- _____ EROSION CONTROL PLAN
- _____ ENGINEER'S CERT (HYDROLOGY)
- _____ CLOMR/LOMR
- _____ TRAFFIC CIRCULATION LAYOUT
- _____ ENGINEER'S CERT (TCL)
- _____ ENGINEER'S CERT (DRB SITE PLAN)
- _____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL SOUGHT:
- _____ SIA/FINANCIAL GUARANTEE RELEASE
- _____ PRELIMINARY PLAT APPROVAL
- _____ S. DEV. PLAN FOR SUB'D APPROVAL
- _____ S. DEV. FOR BLDG. PERMIT APPROVAL
- _____ SECTOR PLAN APPROVAL
- _____ FINAL PLAT APPROVAL
- _____ FOUNDATION PERMIT APPROVAL
- X BUILDING PERMIT APPROVAL
- _____ CERTIFICATE OF OCCUPANCY (PERM)
- _____ CERTIFICATE OF OCCUPANCY (TEMP)
- _____ GRADING PERMIT APPROVAL
- _____ PAVING PERMIT APPROVAL
- _____ WORK ORDER APPROVAL
- _____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:
- _____ YES
- X NO
- _____ COPY PROVIDED

RECEIVED
FEB 24 2012
HYDROLOGY SECTION

DATE SUBMITTED: _____ BY: _____

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 defines 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.

Drainage Report

for

Gate of Heaven Cemetery

7999 Wyoming Blvd. NE
Albuquerque, NM

February 15, 2012

Location:
Lots A, B and C of Rancho de Palomas Manufactured Housing
7999 Wyoming Blvd, NE

Zone map D-19-Z file: D19-001A
East side of Edith NE, north of Indian School NE.

Perception Zone 3

Existing Conditions:
The existing site is comprised of two tracts totaling 19.9 acres. The majority of the site is developed as a cemetery with several support buildings. The site do not lie within a flood hazard zone (Panel 35001C0137G and Panel 35001C0141G) and no offsite flows past through the site.

The master drainage plan for the site was prepared C A Coonce & Associates, dated November 1994. An updated drainage plan, prepared by Advanced Engineering & Consulting was approved in June 2002. The drainage plan includes several facilities, roads, and drainage structures that have not been developed at this time. The site has been divided into three drainage basins. Basin A (23% of the site) located along the north property line, Basin B (49% of the site) contains the middle section of the site, and Basin C (29% of the site) located along the south property line.

Basin A slopes to the west at a 3% slope. The excess runoff flows to an existing drainage pond located at the west end of the site, and discharges to Rancho de Palomas at a controlled rate of 9.9 cfs. The majority of the basin remains undeveloped. No new development is proposed to basin A under this submittal.

Basin B slopes to the west at a 3% slope. The excess runoff flows to an existing drainage pond, Pond B, located along the west property line, and discharges to the existing 24" CMP from Bob White Lane via a 12" CMP at a controlled rate of 13.7 CFS. The allowable discharge established by the original drainage plan by C A Coonce is 14.5 cfs. The proposed development will not increase the flows to the Pond B.

Basin C slopes to the west at a 3% slope. The excess runoff flows to an existing drainage pond, Pond C, located at the south west corner of the site. The basin currently discharges to Rancho de Palomas at a rate of 10.8 cfs per the original drainage plan by by C A Coonce. The updated drainage plan proposed the development of larger detention pond with a controlled discharge to the 24" CMP from Bob White Lane. The east end of the basin remains undeveloped, The west end of the site is being used as a maintenance yard. The proposed development will increase the flows to Pond C.

Developed Conditions:

The proposed development includes the construction of an addition to the west end of the Chapel and Mausoleum Building. The proposed addition was included in the master drainage plan prepared Advanced Engineering & Consulting. The runoff from the proposed addition will be routed to Basin C and to detention Pond C. The proposed improvements will increase the runoff from the site. A temporary pond will be created to contain the excess runoff. The runoff will continue to discharge to Rancho de Palomas at a controlled rate of 10.6 cfs.

Discharge Summary

		Discharge Rate	Historic Rate
Basin A	area 4.6 acres	9.9 csf (2.2 csf/acre)	8.5 cfs (1)
Basin B	area 9.4 acres	13.7 cfs (1.5 csf/acre)	18.1 cfs (1)
Basin C	area 5.8 acres	10.6 cfs (1.8 csf/acre)	10.6 cfs (1)

(1) From Advanced Engineering & Consulting drainage report June 2002

Calculation:
The calculations analyze the historic, existing and proposed conditions for the 6-hour, 100 year rainfall event. The analysis is in accordance with the City of Albuquerque Development Process Manual Volume II.

Pond C orifice
$Q = 0.6\ A\ (2\ g\ h)^{0.5}$

Q all = 10.6 cfs
h=2.5 ft
Dia discharge pipe 16" (A pipe = 1.40 sf)
$Q = 0.6\ (1.4)\ [2\ (32.2)\ (2)]^{0.5} = 10.6$ csf

Pond C Volume

surface area at 68.0 · 3108 sf top
surface area at 65.5 760 sf bottom 65.8

Volume = 0.5 (3108 + 760) (2.5) = 4835 cf

Increase from	Historic	Existing
Excess Volume	0.246 acre ft	0.025 acre ft
Excess Rate	7.07 cfs	0.51 csf

Drainage Calculation

City of Albuquerque DPM 1997 edition

Gates of Heaven Basin C - Proposed

Precipitation Zone 3

Basin Area = 5.802 acres

Historic Treatment

Area of A =	252756	sf	100%
Area of B =	0	sf	0%
Area of C =	0	sf	0%
Area of D =	0	sf	0%

Proposed Conditions Treatment

Area of A =		sf	0%
Area of B =	157511	sf	62%
Area of C =	68068	sf	27%
Area of D =	27177	sf	11%

Excess Precipitation, E (inches) 6 hr - 100 yr storm table A-8

Existing Conditions

Treatment	% of Area			En
A	1.00	x 0.66	=	0.66
B	0.00	x 0.912	=	0.00
C	0.00	x 1.29	=	0.00
D	0.00	x 2.36	=	0.00
		E	=	0.66

Improved Conditions

Treatment	% of Area			En
A	0.00	x 0.66	=	0.00
B	0.62	x 0.912	=	0.57
C	0.27	x 1.29	=	0.35
D	0.11	x 2.36	=	0.25
		E	=	1.17

Volume V = E A / 12

Ve =	0.660	x 5.8025	/ 12	=	0.319	acre ft	13902 cf
Vi =	1.169	x 5.8025	/ 12	=	0.565	acre ft	24633 cf

Discharge Rate, Q (cfs / acre) 100 yr storm table A-9

Existing Conditions

Treatment	% of Area			Q
A	1.00	x 1.87	=	1.87
B	0.00	x 2.6	=	0.00
C	0.00	x 3.45	=	0.00
D	0.00	x 5.02	=	0.00
		q	=	1.87

Improved Conditions

Treatment	% of Area			Q
A	0.00	x 1.87	=	0.00
B	0.62	x 2.6	=	1.62
C	0.27	x 3.45	=	0.93
D	0.11	x 5.02	=	0.54
		q	=	3.09

Peak Rate Qp = q A

Qp(e) =	1.87	x 5.8025	=	10.85 cfs
Qp(i) =	3.09	x 5.8025	=	17.92 cfs

Excess Volume = 0.246 acre ft

Excess Rate = 7.07 cfs

tc =	0.2 hr		
tb =	(2.107 *E*At/Qp)-(0.25*Ad/At) =		0.771 hr
tp =	(0.7*tc)+((1.6-(Ad/At))/12)	=	0.264 hr

Discharge Rate 10.60 cfs

Volume 25736 cf

Discharged - 21020 cf

Pond Voulme **4717** cf

Drainage Calculation

City of Albuquerque DPM 1997 edition

Gates of Heaven Basin C

Precipitation Zone 3

Basin Area = 5.802 acres

Existing Conditions

Treatment

Area of A =	0	sf	0%
Area of B =	166711	sf	66%
Area of C =	68068	sf	27%
Area of D =	17977	sf	7%

Proposed Conditions

Treatment

Area of A =		sf	0%
Area of B =	157511	sf	62%
Area of C =	68068	sf	27%
Area of D =	27177	sf	11%

Excess Precipitation, E (inches) 6 hr - 100 yr storm table A-8

Existing Conditions

Treatment	% of Area			En
A	0.00	x	0.66 =	0.00
B	0.66	x	0.912 =	0.60
C	0.27	x	1.29 =	0.35
D	0.07	x	2.36 =	0.17
			E =	1.12

Improved Conditions

Treatment	% of Area			En
A	0.00	x	0.66 =	0.00
B	0.62	x	0.912 =	0.57
C	0.27	x	1.29 =	0.35
D	0.11	x	2.36 =	0.25
			E =	1.17

Volume V = E A / 12

Ve =	1.117	x	5.8025	/ 12 =	0.540	acre ft	23523 cf
Vi =	1.169	x	5.8025	/ 12 =	0.565	acre ft	24633 cf

Discharge Rate, Q (cfs / acre) 100 yr storm table A-9

Existing Conditions

Treatment	% of Area			Q
A	0.00	x	1.87 =	0.00
B	0.66	x	2.6 =	1.71
C	0.27	x	3.45 =	0.93
D	0.07	x	5.02 =	0.36
			q =	3.00

Improved Conditions

Treatment	% of Area			Q
A	0.00	x	1.87 =	0.00
B	0.62	x	2.6 =	1.62
C	0.27	x	3.45 =	0.93
D	0.11	x	5.02 =	0.54
			q =	3.09

Peak Rate Qp = q A

Qp(e) =	3.00	x	5.8025 =	17.41	cfs
Qp(i) =	3.09	x	5.8025 =	17.92	cfs

Excess Volume = 0.025 acre ft

Excess Rate = 0.51 cfs

tc = 0.2 hr

tb = (2.107 *E*At/Qp)-(0.25*Ad/At) = 0.771 hr

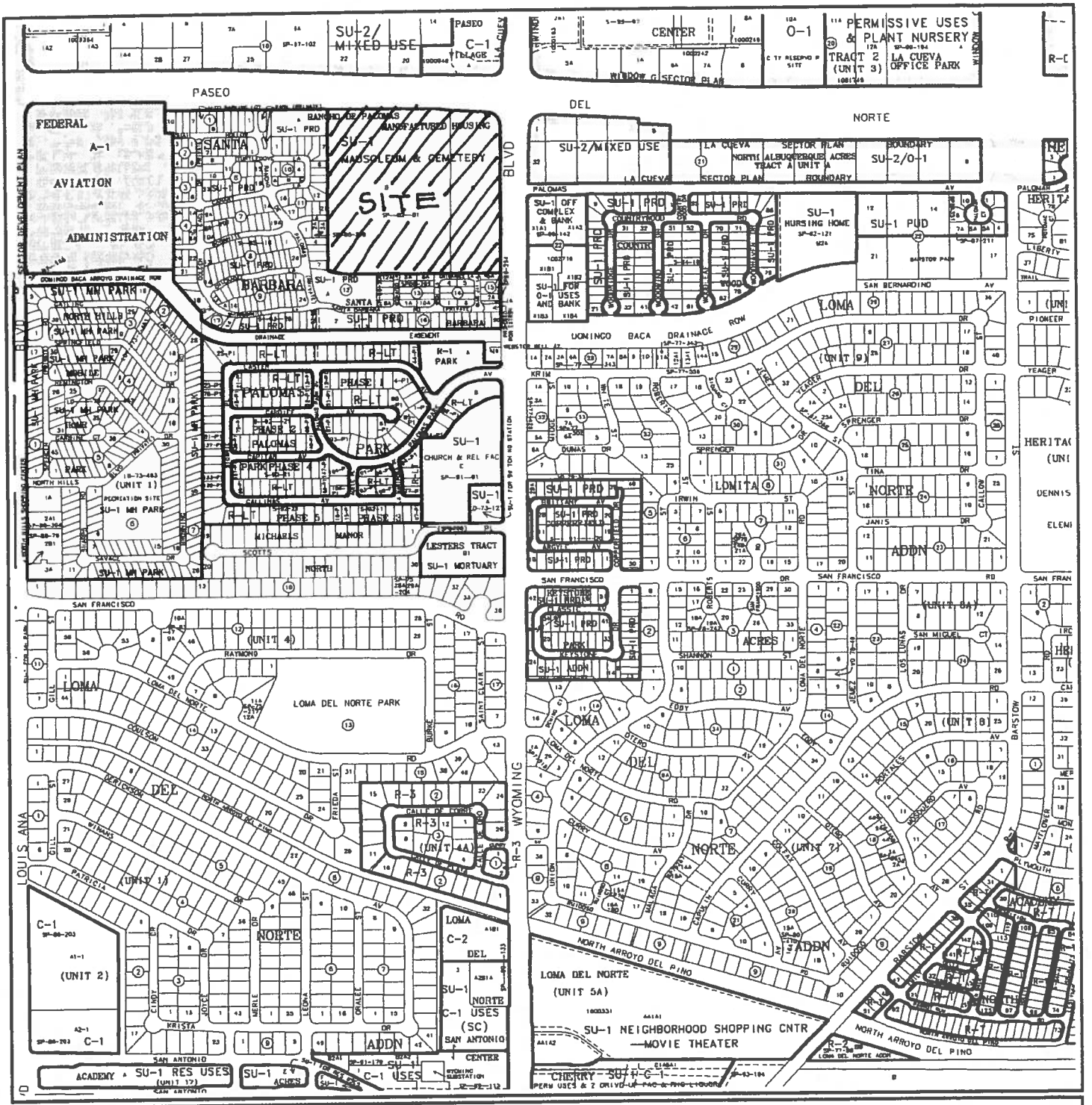
tp = (0.7*tc)+((1.6-(Ad/At))/12) = 0.264 hr

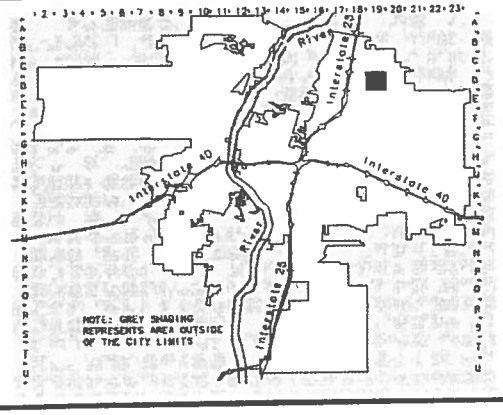
Discharge Rate 10.60 cfs

Volume 25736 cf

Discharged - 21020 cf

Pond Voulme **4717** cf





CITY OF ALBUQUERQUE · NEW MEXICO · 1706

A lbuquerque G eographic I nformation S ystem
PLANNING DEPARTMENT

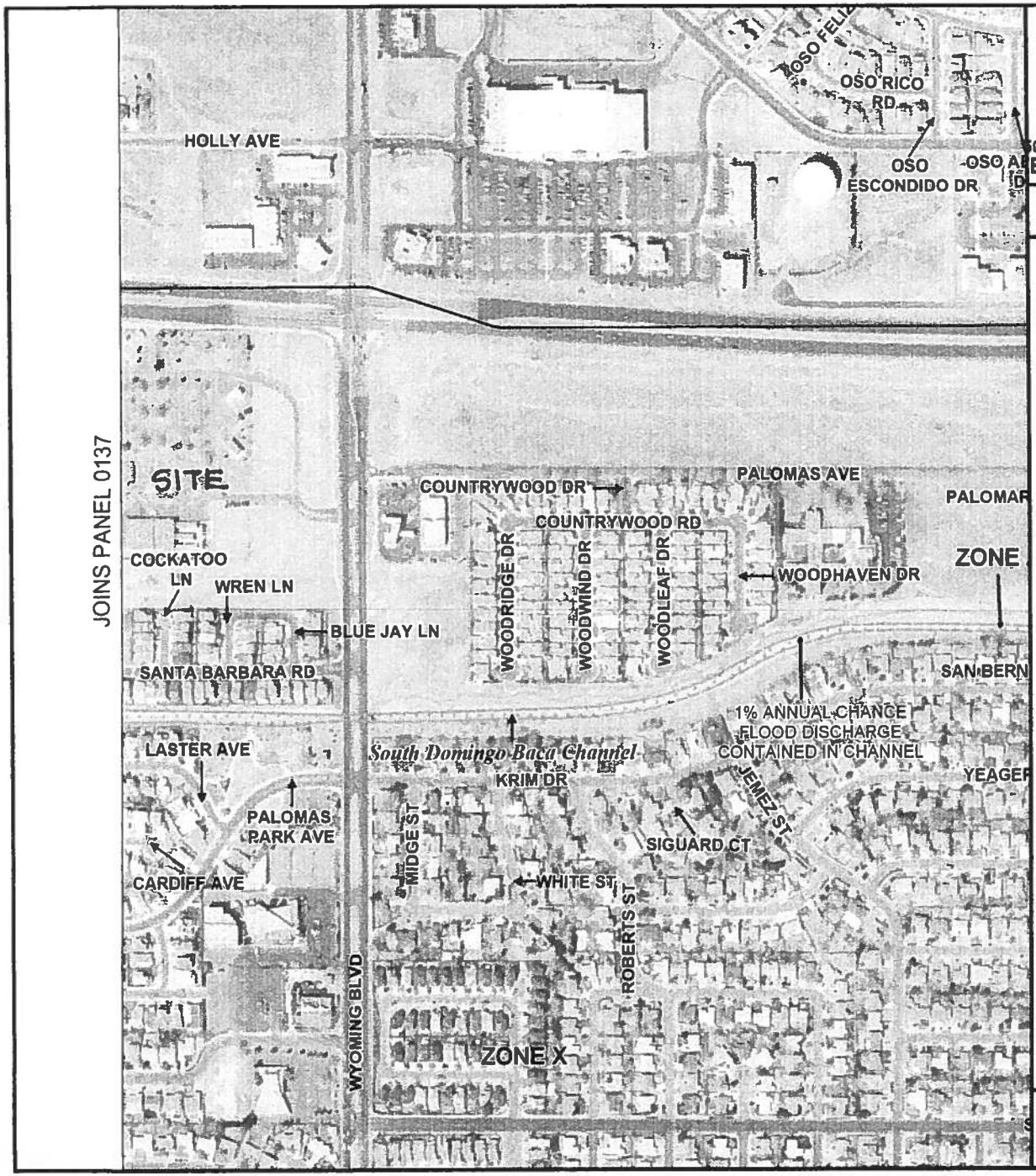
GRAPHIC SCALE IN FEET

250 0 750 1000

Zone Atlas Page

D-19-Z

Map Amended through February 01, 2005



MAP SCALE 1" = 500'

50 0 500 1000 FEET

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0141G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 141 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

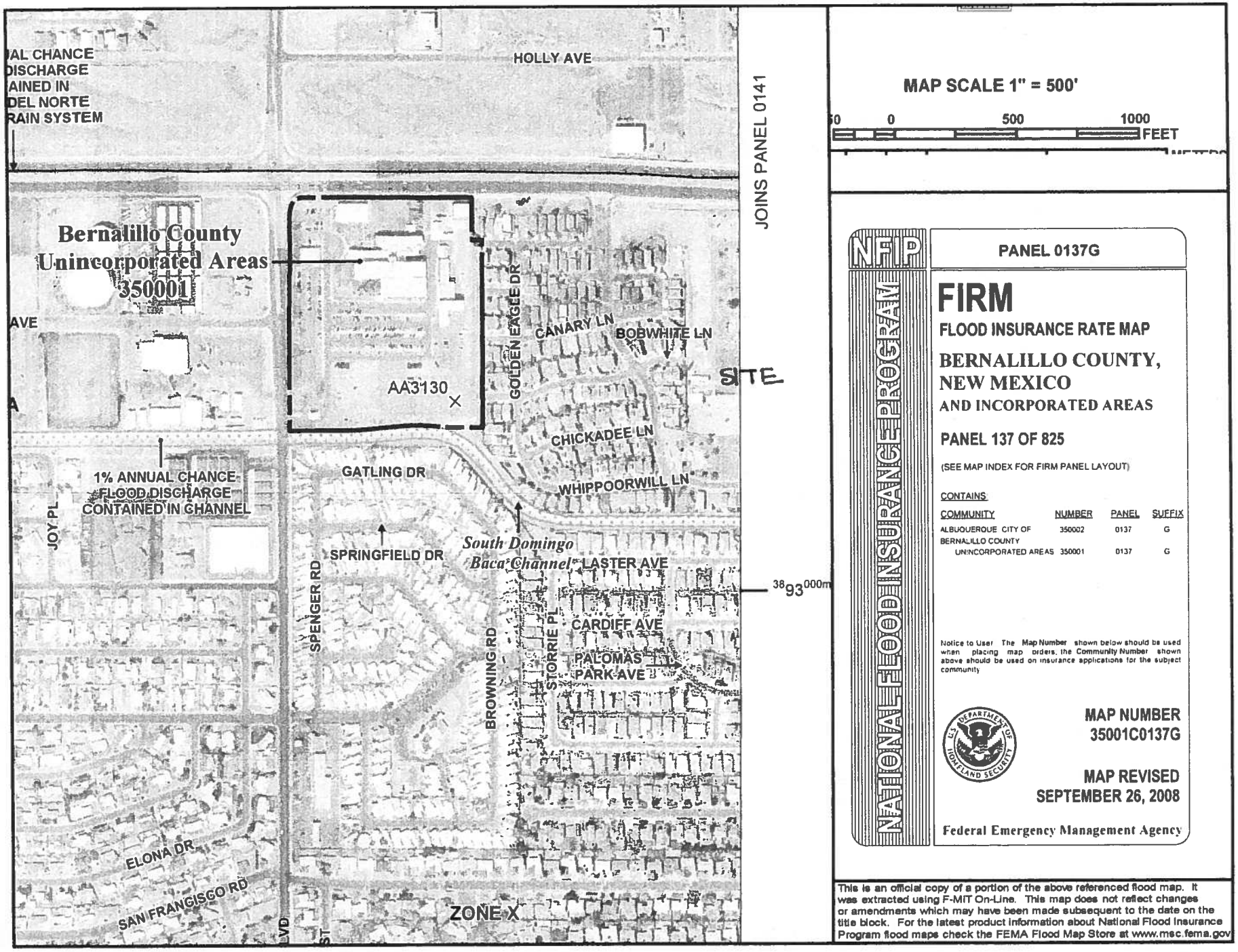
COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0141	G
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0141	G

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0141G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency


AL CHANCE
DISCHARGE
AINED IN
DEL NORTE
RAIN SYSTEM
HOLLY AVE
JOINS PANEL 0141
Bernalillo County
Unincorporated Areas
350001
AVE
AA3130
GOLDEN EAGLE DR
CANARY LN
BOBWHITE LN
SITE
CHICKADEE LN
WHIPPOORWILL LN
1% ANNUAL CHANCE
FLOOD DISCHARGE
CONTAINED IN CHANNEL
GATLING DR
JOY PL
SPRINGFIELD DR
South Domingo
Baca Channel
LASTER AVE
3893000m
SPENCER RD
BROWNING RD
STORRIE PL
CARDIFF AVE
PALOMAS
PARK AVE
ELONA DR
SAN FRANCISCO RD
ZONE X
MAP SCALE 1" = 500'
0
500
1000
FEET
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0137G
FIRM
FLOOD INSURANCE RATE MAP
BERNALILLO COUNTY,
NEW MEXICO
AND INCORPORATED AREAS
PANEL 137 OF 825
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS
COMMUNITY NUMBER PANEL SUFFIX
ALBUQUERQUE CITY OF 350002 0137 G
BERNALILLO COUNTY
UNINCORPORATED AREAS 350001 0137 G
Notice to User The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community
MAP NUMBER
35001C0137G
MAP REVISED
SEPTEMBER 26, 2008
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

June 27, 2002

Shahab Biazar PE
Advanced Engineering and Consulting
10205 Snowflake Ct NW
Albuquerque, NM 87114

Re: Gate of Heaven Cemetery and Mausoleum Grading and Drainage Plan
Engineer's Stamp dated 6-4-02 (D19/D1A)

Dear Mr. Biazar,

Based upon the information provided in your submittal dated 6-4-02, the above referenced plan is approved for Grading Permit and SO#19 Permit.

Please provide a mylar copy for my signature in order to obtain the Grading Permit. A separate permit is required for construction within City R/W. A copy of this approval letter must be on hand when applying for the excavation permit.

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

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Sr. Engineer, PWD
Development and Building Services

C: file

DRAINAGE REPORT
FOR

Gate of Heaven Cemetery and Mausoleum

8001 WYOMING BLVD., ALBUQUERQUE, NM

Prepared by:

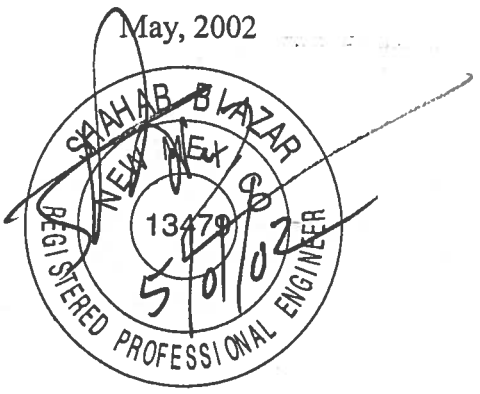
ADVANCED
ENGINEERING
and CONSULTING, LLC

10205 Snowflake Ct. NW
Albuquerque, New Mexico 87114

Prepared For:

Mt. Calvary Cemetery
1900 Edith Blvd. NE, 2B
Albuquerque, NM 87102

May, 2002



Shahab Biazar
PE NO. 13479

Location

Gate of Heaven Cemetery is located at 8001 Wyoming Boulevard. See attached Zone Atlas page number D-19-Z for exact location.

Purpose

The purpose of this drainage report is to update the overall grading and drainage plan for the above referenced site and to build the required ponds as shown on the new plans. The originally approved grading plan is fairly old, and it has an engineering stamp date of 11/21/94. We have enclosed a copy of this grading and drainage plan.

Existing Drainage Conditions

The site drains east to west. There are no offsite runoff which enter the site. The drainage plan for the new plan will have the same drainage pattern as the original grading plan with some modification to the basins and discharge rates. The site drains to an existing detention pond and an existing retention pond located on the west end of the project. The site does not fall within a 100 year floodplain. See attached floodplain map for location of the site.

Proposed Conditions and On-Site Drainage Management Plan

The runoff on site will continue to drain West. The site is analyzed under three basins A, B and C. Basin A drains west at a flow rate of 12.38 cfs. And discharges to Rancho De Palomas at a control discharge rate of 9.90 cfs (based on the originally approved grading plan). Basin B and C drain west to two detention ponds located on the west end of the property, and then will discharge via two12" pipes at a total control discharge rate of 13.66 cfs which is less than 15.60 cfs (based on the originally approved grading plan). There is an existing 24" CMP pipe which extends to site from Bob White Lane. From the existing 24" pipe we will extend two 12" CMP pipes to detention ponds B and C in order to discharge the runoff from the ponds.

Calculations

City of Albuquerque, Development Process Manuel, Section 22.2, Hydrology Section, revised January, 1993, was used for runoff calculations. See this report for the Summary Table on the runoff results , the AHYMO input, AHYMO summary output files for the runoff.

RUNOFF DRAINAGE DATA

The site is @ Zone 3

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 2.14 inches

P_{360} = 2.60 inches

P_{1440} = 3.10 inches

DEPTH (INCHES) @ 10-YEAR STORM

P_{60} = 2.14 x 0.667
= 1.43 inches

P_{360} = 1.73

P_{1440} = 2.07

See the summary output from AHYMO calculations.

Also see the following summary tables.

RUNOFF CALCULATION RESULTS

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
BASIN A	198257.90	4.5514	0.007112
BASIN B	420272.49	9.6481	0.015075
BASIN C	247452.28	5.6807	0.008876

HISTORICAL

BASIN	Q-100 CFS	Q-10 CFS
BASIN A	8.53	2.55
BASIN B	18.06	5.41
BASIN C	10.64	3.19

PROPOSED

BASIN	Q-100 CFS	Q-10 CFS
BASIN A	12.38	5.77
BASIN B	26.04	12.21
BASIN C	15.34	7.19

SUMMARY OUTPUT FILE

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02d RUN DATE (MON/DAY/YR) =04/30/2002
INPUT FILE = 200210 USER NO.= AHYMO-I-9702c01000R31-AH

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.600
COMPUTE NM HYD	100.00	-	1	.00711	8.53	.248	.65514	1.533	1.873	PER IMP=	.00
COMPUTE NM HYD	101.00	-	1	.01508	18.06	.527	.65514	1.533	1.872	PER IMP=	.00
COMPUTE NM HYD	102.00	-	1	.00888	10.64	.310	.65514	1.533	1.873	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.600
COMPUTE NM HYD	200.00	-	1	.00711	12.38	.377	.99268	1.500	2.720	PER IMP=	5.00
COMPUTE NM HYD	201.00	-	1	.01508	26.04	.858	1.06746	1.500	2.699	PER IMP=	20.00
COMPUTE NM HYD	202.00	-	1	.00888	15.34	.505	1.06746	1.500	2.700	PER IMP=	20.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.730
COMPUTE NM HYD	110.00	-	1	.00711	2.55	.071	.18834	1.533	.561	PER IMP=	.00
COMPUTE NM HYD	111.00	-	1	.01508	5.41	.151	.18834	1.533	.561	PER IMP=	.00
COMPUTE NM HYD	112.00	-	1	.00888	3.19	.089	.18834	1.533	.561	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.730
COMPUTE NM HYD	210.00	-	1	.00711	5.77	.156	.41247	1.533	1.268	PER IMP=	5.00
COMPUTE NM HYD	211.00	-	1	.01508	12.21	.398	.49544	1.500	1.266	PER IMP=	20.00
COMPUTE NM HYD	212.00	-	1	.00888	7.19	.235	.49544	1.500	1.266	PER IMP=	20.00
FINISH											

VOLUME CALCULATIONS

DETENTION POND - B

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2

C = (At - Ab) / Dt

Ab =	4,822.65
At =	15,545.60
Dt =	4.00
C =	2680.74

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
5364.00	0.00	0.00000	0.00
5365.00	1.00	0.11071	2.67
5365.50	1.50	0.17376	3.78
5366.00	2.00	0.25220	4.63
5366.50	2.50	0.34602	5.35
5367.00	3.00	0.45522	5.98
5367.50	3.50	0.57981	6.55
5368.00	4.00	0.71979	7.07

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	12
Area (ft^2)=	0.7854
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

DETENTION POND - C

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
5364.00	0.00	0.00000	0.00
5365.00	1.00	0.03556	2.67
5365.50	1.50	0,05879	3.78
5366.00	2.00	0.08755	4.63
5366.50	2.50	0.12471	5.35
5367.00	3.00	0.17314	5.98
5367.50	3.50	0.23521	6.55
5368.00	4.00	0.31330	7.07

Orifice Equation

Q = CA SQRT(2gH)

C =	0.6	
Diameter (in)	12	
Area (ft^2)=	0.7854	
g =	32.2	
H (Ft) =	Depth of water above center of orifice	
Q (CFS)=	Flow	

POND CALCULATIONS

POND #B			
ELEVATION FT	SURFACE AREA SF	VOLEUME CF	VOLEUME AC-FT
5,368.00	15,545.60		
4.00		40,736.50	0.93518
5,364.00	4,822.65		

TOTAL VOLUME = 40,736.50 CF

POND #C			
ELEVATION FT	SURFACE AREA SF	VOLEUME CF	VOLEUME AC-FT
5,368.00	7,500.49		
0.50		3,401.46	0.07809
5,367.50	6,105.33		
0.50		2,703.88	0.06207
5,367.00	4,710.17		
0.50		2,109.61	0.04843
5,366.50	3,728.28		
0.50		1,618.66	0.03716
5,366.00	2,746.38		
0.50		1,252.79	0.02876
5,365.50	2,264.77		
0.50		1,011.98	0.02323
5,365.00	1,783.16		
0.50		833.05	0.01912
5,364.50	1,549.04		
0.50		715.99	0.01644
5,364.00	1,314.91		

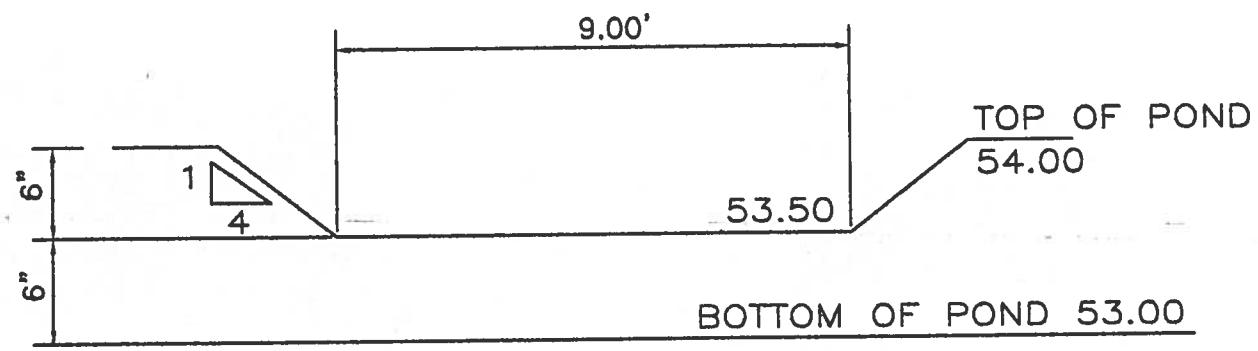
TOTAL VOLUME = 13,647.41 CF

SPILLWAY CALCULATIONS

SPILLWAY WIDTH

Weir Equation: $Q=CLH^{3/2}$
Q = 9.90 cfs (maximum allowable runoff)
C = 3.10
h = 0.50'
Opening = 9.00'

$Q = 3.1(9.00)(0.50)^{3/2}$
Q = 9.86 cfs > 9.90 cfs



SPILLWAY DETAIL
NTS POND A