City of Albuquerque

June 22, 2000

Guy Jackson, PE
BPLW
6200 Uptown Blvd, Ste 400
Albuquerque, NM 87110

Re: Montgomery Crossing Master Grading and Drainage Plan
Engineer's Stamp dated 6-9-00 (G20/D4B)

Dear Mr. Jackson,

Based upon the information provided in your resubmittal dated 6-12-00, the above referenced Master Drainage Plan is approved. Your Work Order construction plans should reflect this amendment from the plan previously submitted.

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

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Hydrology Review Engineer

C: file

DRAINAGE INFORMATION SHEET

PROJECT TITLE Montgomery Crossing ZONE ATLAS/DRWG. FILE # G-20/D4B

DRB#: 1000300 EPC # Z-99-140 WORK ORDER # 639681

LEGAL DESCRIPTION: Tract A-2-A Through A-2-G Inclusive Montgomery Crossing Addition

CITY ADDRESS: Montgomery Blvd. NE

ENGINEERING FIRM: BPLW CONTACT: Mike De Lilla

ADDRESS: 6200 Uptown Blvd., Suite 220 PHONE: 880-9670

OWNER: S & J Enterprises Inc. CONTACT: John Triandafilidis

ADDRESS: 3535 Princeton NE 78107 PHONE: 884-6234

ARCHITECT: SLNB Architects CONTACT: Jim Lewis

ADDRESS: 1620 Central Avenue SE PHONE: 247-1529

SURVEYOR: Harris Surveying CONTACT: T. Harris

ADDRESS: 2412 Monroe NE PHONE: 889-8056

CONTRACTOR: --- CONTACT:

ADDRESS: --- PHONE:

TYPE OF SUBMITTAL:

__ DRAINAGE REPORT
_ DRAINAGE PLAN
__CONCEPTUAL GRADING & DRAINAGE PLAN
_ GRADING PLAN
_ EROSION CONTROL PLAN
__ENGINEER'S CERTIFICATION
_X_ OTHER Master Grading Plan

PRE-DESIGN MEETING:
_X_ YES
_ NO
_ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

_ SKETCH PLAT APPROVAL
_ PRELIMINARY PLAT APPROVAL
_ S. DEV. PLAN FOR SUB'D APPROVAL
_ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
_ SECTOR PLAN APPROVAL
_ FINAL PLAT APPROVAL
__BUILDING PERMIT APPROVAL
_ CERTIFICATE OF OCCUPANCY APPROVAL
_GRADING PERMIT APPROVALS
_ PAVING PERMIT APPROVAL
_ S.A.B. DRAINAGE REPORT
__DRAINAGE REQUIREMENTS
_x_OTHER (Master Drainage Plan approval)

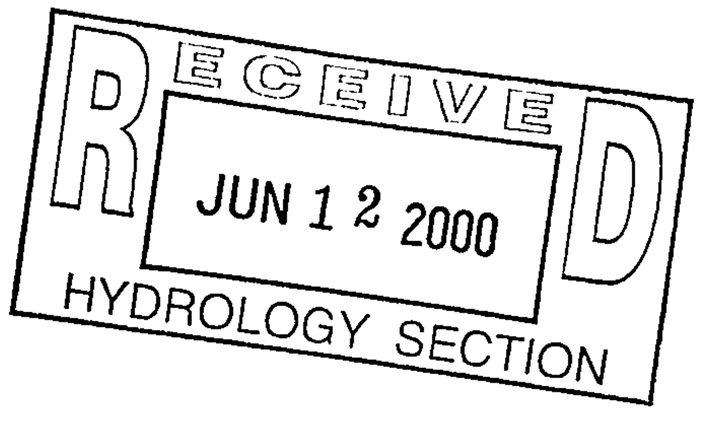
DATE SUBMITTED: June12, 2000(Revision of May 22 Submittal)
BY: Mike De Lilla

Montgomery Crossing
~~Conceptual~~ Grading and Drainage Plan
Master (G-20/D4B)

BPLW Architects and Engineers

Prepared by
Michele F. De Lilla
and
Guy Jackson

Stamped by Guy C. Jackson
PE#13289
May 22, 2000



DRAINAGE SUMMARY

DRAINAGE PLAN

The following items concerning the Montgomery Crossing Drainage Plan are contained herein: 1) Vicinity Map; 2) Grading Plan; 3) Calculations and 4)Floodplain Map.

As shown by the Vicinity Map, the site lies south of Montgomery Blvd. N.E. and east of the intersection of General Chenault N.E. and Montgomery Blvd. N.E.

Per flood insurance rate map 143 of 825 for Bernalillo County, dated September 20, 1996, the site does not lie but is adjacent to a flood hazard zone area. The nearest flood hazard zone is located and contained in Montgomery Blvd. which is located north of the site and designated as Zone A0 Depth 1. This floodplain begins just northwest of the site.

The Grading Plan shows existing and proposed spot elevations and contours at 1'-0" intervals, limit and character of the proposed improvements and also the existing conditions. As shown by this plan, the proposed construction consists of a bank, two offices, a fast food restaurant, and three townhouses with associated parking, walkways, and landscaping.

Existing Conditions:

As shown by the Vicinity Map, the 3.75 acre site (Tract 2-A) is bounded by commercial property to the east and west, Montgomery to the north and residential property to the south. The existing site drainage can be characterized by three basins, which are described as follows:

- The majority of the undeveloped site slopes from east to west at an average slope of 4% toward a detention pond located in the western portion of the site (Existing Basin"C").

- The remainder of the site drains either directly onto Montgomery Blvd. (Existing Basin "A")

- A basin located east of the access road located directly west of the site (Existing Basin "B") which outfalls into Montgomery Blvd.

Native vegetation and dirt roads transverse the site. Currently, a portion of the offsite flows, from Hendrix Road cul-de-sac, enter a public channel just east of the site and east of the Thomas Well No. 2. The offsite flows from the Thomas Well No. 2 site are allowed to enter the site and these flows are considered as part of the drainage analysis as OFFSITE BASIN "A".

In March 1991, a master drainage plan for Tracts A-1 and 2-A was prepared by BPLW A & E Inc, and was then updated by a drainage report by Brasher and Lorenz, Inc., dated December 1996. This report placed runoff rate limitations on Tract 2-A to approximately 4.81 cfs. (The 4.81 allowance has been increased by 4 cfs +/- per pre-design meeting with Guy Jackson and Brad Bingham. See attached markup. This will bring the new allowable flowrate to 8.81 cfs +/-. Currently, the aforementioned detention pond collects the majority of flows within the site, which are piped/released into Tract A-1 at a point approximately 130 feet to the west of the site per the master drainage plan referenced above. These flows then go overland approximately 200

west of the discharge point outfalling onto General Chenault, which then outfalls onto Montgomery Blvd.

Proposed Conditions:

In the proposed condition, the majority of the site will continue to drain into the pond/detention facility which will be modified from the existing condition due to the increase in runoff and due to the density of the new construction. The changes to the ponding conditions are as follows:

- Modification of the existing private drainage pond to a different configuration due to building density. This pond will be fenced for safety precautions. This has been detailed as part of the DRC plans.

- The addition of an underground runoff storage vault to allow for the increase in the V100 6-hour storm due to development. The vault and ponding area are interconnected to allow for one WSL with an elevations of 77.50. The vault and pond will be private and constructed outside any public easements/R.O.W.'s.

In addition, modifications will need to be made so as to keep the rate of flow from deviating from the previously approved plans. The changes are as follows:

- Remove the concrete headwall located at the 10" pipe's discharge point in Tract A-1 and modify sidewalk culvert.

- Place an 8" pipe at an elevation of 73.86 MSLD, in the detention pond's infall, and connect it to the 10" discharge pipe. See attached calculations for more information on flow breakdown.

As for the proposed basin boundaries, they are as follows:

- Basin "A", located centrally within the site, comprises of most of the site and drains overland into the detention pond located in the western portion of the site.
- Basin "B" drains to an inlet located between buildings 3 and 4 which is then piped to the detention pond. An overflow spillway has been placed northeast of building 3 in case the inlet gets clogged. The spillway would flow into Basin "A".
- Basin "C", located near the northwest corner of the site, drains to Montgomery Boulevard via a concrete trickle channel with associated sidewalk culvert.
- Basin "D" drains to an inlet located east of the bank building. This runoff is then piped into the underground vault. The overflow point of the basin is located southeast of the bank building and would spill into Basin "A"
- Basin "E" located along the southern portion of the site drains toward the west exiting the site via an opening in the wall. This basin freely discharges into the access road located west of the site. Flow from here directly goes into Montgomery Blvd.
- Basin "F", located along the periphery of the north and west sides of the site, drains by sheet flow directly onto Montgomery Blvd.

- Basin "G" drains a small area, located at the northwest corner of the site, into an inlet just east of building 2 at a controlled discharge rate. This inlet discharges via a 4" pipe into the underground vault. The overflow point for this basin is located in the parking lot adjacent to Basin "F".

Offsite flows do not enter the site from the south, west, and north sides because they are topographically lower than the site. Flows from the east (Hendrix Rd.), as mentioned above, are diverted via an existing drainage easement located east of the site. Only flows from the Thomas Well No.2 site enter the site (and into Basin "F"). These flows will continue to be allowed into the site and have been included as part of the drainage calculations.

The calculations, which appear herein, analyzes the developed conditions for the 100-year, 6-hour rainfall event. The procedure for 40 acre and smaller basins set by Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria, dated January 1993, has been used to quantify the peak rate of discharge and volume of runoff generated. As shown by these calculations, there will be an increase in runoff and discharge rate from the site for the developed condition versus the existing condition. But due to the other site improvements, when this is compared to the master drainage plan calculations, it can be noted that there is a slight decrease in the runoff rate with a large increase in runoff volume which will be detained onsite. A calculation summary at the end of the calculation sheets is included for additional ease of use.

DRAINAGE CALCULATIONS

Drainage Summary

Project: Montgomery Crossing
Project Numbe: 99060
Date: 02/17/00
By: Mike De Lilla

Site Location

Precipitaion Zone 3 Per Table A-1 COA DPM Section 22.2

Existing summary

Basin Name	Basin "A"	Basin "B"	Basin "C"	Offsite "A"
Soil Treatment (acres)				
Area "A"	0.00	0.00	0.00	0.00
Area "B"	0.64	0.16	2.88	0.28
Area "C"	0.00	0.00	0.00	0.00
Area "D"	0.00	0.02	0.05	0.00
Excess Runoff (acre-feet)				
100yr. 6hr.	0.05	0.02	0.23	0.02
10yr. 6hr.	0.02	0.01	0.09	0.01
2yr. 6hr.	0.00	0.00	0.02	0.00
100yr. 24hr.	0.05	0.02	0.23	0.02
Peak Discharge (cfs)				
100 yr.	1.66	0.52	7.74	0.73
10yr.	0.76	0.26	3.60	0.33
2yr.	0.13	0.07	0.71	0.06

Proposed summary

Basin Name	Basin "A"	Basin "B"	Basin "C"	Basin "D"	Basing "E"	Basing "F"	Basin "G"	Offsite "A"
Soil Treatment (acres)								
Area "A"	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Area "B"	0.14	0.00	0.01	0.04	0.00	0.11	0.02	0.28
Area "C"	0.16	0.00	0.00	0.00	0.00	0.15	0.02	0.00
Area "D"	1.51	0.10	0.11	0.23	0.20	0.55	0.40	0.00
Excess Runoff (acre-feet)								
100yr. 6hr.	0.32	0.02	0.02	0.05	0.04	0.13	0.08	0.02
10yr. 6hr.	0.20	0.01	0.01	0.03	0.03	0.08	0.05	0.01
2yr. 6hr.	0.12	0.01	0.01	0.02	0.01	0.04	0.03	0.00
100yr. 24hr.	0.39	0.02	0.03	0.06	0.05	0.16	0.10	0.02
Peak Discharge (cfs)								
100 yr.	8.50	0.50	0.57	1.26	1.00	3.56	2.13	0.73
10yr.	5.61	0.34	0.38	0.83	0.68	2.30	1.42	0.33
2yr.	3.23	0.20	0.23	0.48	0.41	1.26	0.84	0.06

BPLW

Architects and Engineers

PROJECT **Montgomery Crossing**
PROJECT NO. **99060.00**
DATE **02/17/00**
BY **Mike De Lilla**

DPM Section 22.2 - Hydrology

Part A-Watersheds less than 40 acres.
January, 1993

INSTRUCTIONS

* Spread sheet requires three input areas (dark cells):
  - Location
  - >A.1 Precipitation Zone
  - >A.3 Land Treaments
* Values from the tables are automatically placed using "if" statements.
* Table values should be checked for correctness for each use.

SUMMARY

Location	**0**	
Precipitation Zone	**3**	
Land Area	**0.64**	acres
Excess Precipitation Volume		
>>> 100-year 6-hour (design)	**0.05**	**acre-ft.**
10-year 6-hour	**0.02**	acre-ft.
2-year 6-hour	**0.00**	acre-ft.
100-year 24-hour	**0.05**	acre-ft.
Peak Discharge Rates (DPM)		
>>> Q100 (design)	**1.66**	**cfs**
Q10	**0.76**	cfs
Q2	**0.13**	cfs
Peak Discharge Rates (DPM-Rational Method)		
>>> Q100 (design)	**1.65**	**cfs**
Q10	**0.77**	cfs
Q2	**0.14**	cfs

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS

	LOCATION	0	
>A.1	PRECIPITATION ZONE (from Table A-1)	3	
>A.2	DEPTHS		
	(from Table A-2)		
	100-YEAR STORM (P60)	**2.14**	inches
	100-YEAR STORM (P360)	**2.60**	inches
	100-YEAR STORM (P1440)	**3.10**	inches
	10-YEAR (P360) (Calculated: P360*RPF10)	**1.73**	inches
	2-YEAR (P360) (Calculated: P360*RPF2)	**1.13**	inches
>A.3	**LAND TREATMENTS (Ai)**		
	Treatment A	**0.00**	acres
	Treatment B	**0.64**	acres
	Treatment C	**0.00**	acres
	Treatment D	**0.00**	acres
	Total Area	**0.64**	acres
>A.4	**ABSTRACTIONS**	**See A.5**	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.5 EXCESS PRECIPITATION 6 HOUR AND 24 HOUR (Ei) from Table A-8		
100-year 6-hour		
Treatment A	**0.66**	inches
Treatment B	**0.92**	inches
Treatment C	**1.29**	inches
Treatment D	**2.36**	inches

WEIGHTED E (Sum Ei*Ai/A)	**0.92**	inches

VOLUME V100:6h (E*A)	**0.05**	acre-ft.
	2,137.34	ft^3
	==========	
10-year 6-hour		
Treatment A	**0.19**	inches
Treatment B	**0.36**	inches
Treatment C	**0.62**	inches
Treatment D	**1.50**	inches

WEIGHTED E (Sum Ei*Ai/A)	**0.36**	inches

VOLUME V10:6h (E*A)	**0.02**	acre-ft.
	836.35	ft^3
	==========	
2-year 6-hour		
Treatment A	**0.00**	inches
Treatment B	**0.06**	inches
Treatment C	**0.20**	inches
Treatment D	**0.89**	inches

WEIGHTED E (Sum Ei*Ai/A)	**0.06**	inches

VOLUME V2:6h (E*A)	**0.00**	acre-ft.
	139.39	ft^3
	==========	
100-year 24-hour		
VOLUME V100:24h (V100-6h+Ad*P1440-P360)/12)	**0.05**	acre-ft.
	2,137.34	ft^3
	==========	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.6 PEAK DISCHARGE RATE FOR SMALL WATERSHEDS (Qi)

from Table A-9

100-year			
Treatment A		**1.87**	cfs/acre
Treatment B		**2.60**	cfs/acre
Treatment C		**3.45**	cfs/acre
Treatment D		**5.02**	cfs/acre

	Q100 (Sum Qi*Ai)	**1.66**	cfs
		==========	
10-year			
Treatment A		**0.58**	cfs/acre
Treatment B		**1.19**	cfs/acre
Treatment C		**2.00**	cfs/acre
Treatment D		**3.39**	cfs/acre

	Q10 (Sum Qi*Ai)	**0.76**	cfs
		==========	
2-year			
Treatment A		**0.00**	cfs/acre
Treatment B		**0.21**	cfs/acre
Treatment C		**0.78**	cfs/acre
Treatment D		**2.04**	cfs/acre

	Q2 (Sum Qi*Ai)	**0.13**	cfs
		==========	

CALCULATIONS FOLLOW

RATIONAL METHOD

PEAK INTENSITY (in/hr at tc=0.2 hour)
from Table A-10

Peak Intensity (I) 100-year	**5.38**
Peak Intensity (I) 10-year	**3.65**
Peak Intensity (I) 2-year	**2.21**

RATIONAL METHOD COEFFICIENT, C
from Table A-11

100-year		
Treatment A	**0.35**	cfs/acre
Treatment B	**0.48**	cfs/acre
Treatment C	**0.64**	cfs/acre
Treatment D	**0.93**	cfs/acre
Q100 (Sum Qi*I*Ai)	**1.65**	cfs
10-year		
Treatment A	**0.16**	cfs/acre
Treatment B	**0.33**	cfs/acre
Treatment C	**0.55**	cfs/acre
Treatment D	**0.93**	cfs/acre
Q10 (Sum Qi*I*Ai)	**0.77**	cfs
2-year		
Treatment A	**0.00**	cfs/acre
Treatment B	**0.10**	cfs/acre
Treatment C	**0.35**	cfs/acre
Treatment D	**0.92**	cfs/acre
Q2 (Sum Qi*I*Ai)	**0.14**	cfs

BPLW

Architects and Engineers

PROJECT **Montgomery Crossing**
PROJECT NO. **99060**
DATE **02/17/00**
BY **Mike De Lilla**

DPM Section 22.2 - Hydrology

Part A-Watersheds less than 40 acres.
January, 1993

INSTRUCTIONS

* Spread sheet requires three input areas (dark cells):
  - Location
  - >A.1 Precipitation Zone
  - >A.3 Land Treaments
* Values from the tables are automatically placed using "if" statements.
* Table values should be checked for correctness for each use.

SUMMARY

Location	**Basin "A"**		
Precipitation Zone		**3**	
Land Area		**1.81**	acres
Excess Precipitation Volume			
	>>> 100-year 6-hour (design)	**0.32**	**acre-ft.**
	10-year 6-hour	**0.20**	acre-ft.
	2-year 6-hour	**0.12**	acre-ft.
	100-year 24-hour	**0.39**	acre-ft.
Peak Discharge Rates (DPM)			
	>>> Q100 (design)	**8.50**	**cfs**
	Q10	**5.61**	cfs
	Q2	**3.23**	cfs
Peak Discharge Rates (DPM-Rational Method)			
	>>> Q100 (design)	**8.47**	**cfs**
	Q10	**5.62**	cfs
	Q2	**3.22**	cfs

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS

	LOCATION	Basin "A"	
>A.1	PRECIPITATION ZONE (from Table A-1)	3	
>A.2	DEPTHS		
	(from Table A-2)		
	100-YEAR STORM (P60)	**2.14**	inches
	100-YEAR STORM (P360)	**2.60**	inches
	100-YEAR STORM (P1440)	**3.10**	inches
	10-YEAR (P360) (Calculated: P360*RPF10)	**1.73**	inches
	2-YEAR (P360) (Calculated: P360*RPF2)	**1.13**	inches
>A.3	**LAND TREATMENTS (Ai)**		
	Treatment A	**0.00**	acres
	Treatment B	**0.14**	acres
	Treatment C	**0.16**	acres
	Treatment D	**1.51**	acres
	Total Area	**1.81**	acres
>A.4	**ABSTRACTIONS**	**See A.5**	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.5 EXCESS PRECIPITATION 6 HOUR AND 24 HOUR (Ei) from Table A-8		
100-year 6-hour		
Treatment A	**0.66**	inches
Treatment B	**0.92**	inches
Treatment C	**1.29**	inches
Treatment D	**2.36**	inches
WEIGHTED E (Sum Ei*Ai/A)	**2.15**	inches
VOLUME V100:6h (E*A)	**0.32**	acre-ft.
	14,152.64	ft^3
10-year 6-hour		
Treatment A	**0.19**	inches
Treatment B	**0.36**	inches
Treatment C	**0.62**	inches
Treatment D	**1.50**	inches
WEIGHTED E (Sum Ei*Ai/A)	**1.33**	inches
VOLUME V10:6h (E*A)	**0.20**	acre-ft.
	8,765.00	ft^3
2-year 6-hour		
Treatment A	**0.00**	inches
Treatment B	**0.06**	inches
Treatment C	**0.20**	inches
Treatment D	**0.89**	inches
WEIGHTED E (Sum Ei*Ai/A)	**0.76**	inches
VOLUME V2:6h (E*A)	**0.12**	acre-ft.
	5,025.01	ft^3
100-year 24-hour		
VOLUME V100:24h (V100-6h+Ad*P1440-P360)/12)	**0.39**	acre-ft.
	16,893.29	ft^3

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.6 PEAK DISCHARGE RATE FOR SMALL WATERSHEDS (Qi)
from Table A-9

100-year		
Treatment A	**1.87**	cfs/acre
Treatment B	**2.60**	cfs/acre
Treatment C	**3.45**	cfs/acre
Treatment D	**5.02**	cfs/acre
Q100 (Sum Qi*Ai)	**8.50**	cfs
10-year		
Treatment A	**0.58**	cfs/acre
Treatment B	**1.19**	cfs/acre
Treatment C	**2.00**	cfs/acre
Treatment D	**3.39**	cfs/acre
Q10 (Sum Qi*Ai)	**5.61**	cfs
2-year		
Treatment A	**0.00**	cfs/acre
Treatment B	**0.21**	cfs/acre
Treatment C	**0.78**	cfs/acre
Treatment D	**2.04**	cfs/acre
Q2 (Sum Qi*Ai)	**3.23**	cfs

CALCULATIONS FOLLOW

RATIONAL METHOD

PEAK INTENSITY (in/hr at tc=0.2 hour)
from Table A-10

Peak Intensity (I) 100-year	**5.38**
Peak Intensity (I) 10-year	**3.65**
Peak Intensity (I) 2-year	**2.21**

RATIONAL METHOD COEFFICIENT, C
from Table A-11

100-year		
Treatment A	**0.35**	cfs/acre
Treatment B	**0.48**	cfs/acre
Treatment C	**0.64**	cfs/acre
Treatment D	**0.93**	cfs/acre
Q100 (Sum Qi*I*Ai)	**8.47**	cfs

10-year		
Treatment A	**0.16**	cfs/acre
Treatment B	**0.33**	cfs/acre
Treatment C	**0.55**	cfs/acre
Treatment D	**0.93**	cfs/acre
Q10 (Sum Qi*I*Ai)	**5.62**	cfs

2-year		
Treatment A	**0.00**	cfs/acre
Treatment B	**0.10**	cfs/acre
Treatment C	**0.35**	cfs/acre
Treatment D	**0.92**	cfs/acre
Q2 (Sum Qi*I*Ai)	**3.22**	cfs

HYDRAULICS

Pressure Pipe Equation
Q=C*A*(2*g*h)^(0.5)
C= 0.6
h= Water elevation minus elevation of pipe at centroid
g= 32.2 ft/s^2 (gravity)
Pipe Size 8 inches

A(8"pipe)= 0.349065

Elevation	h(8")	Q (8" pipe)
73.86	0.00	0.00
74.5	0.31	0.93
75	0.81	1.51
75.5	1.31	1.92
76	1.81	2.26
76.5	2.31	2.55
77	2.81	2.82
77.5	3.31	3.06

Volume Calculations (Per the Average End Area Method)

Pond

Elevation	Area (sf)	Volume (cf)	Vol. Sum. (cf)
77.5	875		
		437.5	2905
77	875		
		437.5	2467.5
76.5	875		
		437.5	2030
76	875		
		437.5	1592.5
75.5	875		
		437.5	1155
75	875		
		437.5	776.375
74.5	875		
		280	280
73.86	0		

Pond #1b

Elevation	Area (sf)	Volume (cf)	Vol. Sum. (cf)
77.5	785		
		58.875	58.875
77.35	0		

Vault #1

Elevation	Area (sf)	Volume (cf)	Vol. Sum. (cf)
77.5	2900		
		1450	8978.25
77	2900		
		1450	7528.25
76.5	2900		
		1450	6078.25
76	2900		
		1450	4628.25
75.5	2900		
		1450	3178.25
75	2900		
		841	1728.25
74.71	2900		
		498.75	887.25
74.5	1850		
		388.5	388.5
74.08	0		

Pipe Area for pipe Invert @ 75.26

Volume = 1/8*(theta-sin(theta))*d^2 (per page 12 Open Channel Hydraulics, French)
d = 2.5 ft
theta = 284.75 degrees = 4.97 rads
Volume = 4.64 sf

Pipe Area for pipe Invert @ 75.36

Volume = 1/8*(theta-sin(theta))*d^2 (per page 12 Open Channel Hydraulics, French)
d = 2.5 ft
theta = 270.8 degrees = 4.72 rads
Volume = 4.47 sf

Pipe Area for pipe Invert @ 75.66

Volume = 1/8*(theta-sin(theta))*d^2 (per page 12 Open Channel Hydraulics, French)
d = 2.5 ft
theta = 236.33 degrees = 4.12 rads
Volume = 3.87 sf

Pipe Volume Calculations (77feet of pipe full@ V100)

Elevation	Area (sf)	Volume (cf)	Vol. Sum. (cf)
75	4.91		
		378.07	378.07
74.71	4.91		

Pipe Volume Calculations (52 feet pipe partially full@ V100)

Elevation	Area (sf)	Volume (cf)	Vol. Sum. (cf)
75.26	4.64		
		248.3	626.37
75	4.91		

Pipe Volume Calculations (60 feet pipe partially full@ V100)

Elevation	Area (sf)	Volume (cf)	Vol. Sum. (cf)
75.66	3.87		
		250.2	876.57
75.36	4.47		

Total Pond Volume (by elevation)

Elevation	Pond#1	Pond#2	Vault#1	Vault#2a	Vault#2b	Total
77.5	2905	58.875	8978.25	0	0	11942.13
77	2467.5	0	7528.25	0	0	9995.75
76.5	2030	0	6078.25	0	0	8108.25
76	1592.5	0	4628.25	0	0	6220.75
75.5	1155	0	3178.25	0	0	4333.25
75	776.375	0	2615.5	0	0	3391.875
74.5	280	0	388.5	0	0	668.5
73.86	0	0	0	0	0	0

Total Volume (Pipe Volume Included)

Total Volume (pipe volume + ponds = 11942.13 + 876.57 = 12818.70

Pipe Flow from inlets per Basin

Q=1.49/n*A*R^(2/3)s^0.5

n	0.013	Roughness Coefficient
A		Area of Pipe (Varies)
R	A/WP	Area Divided by wetted perimeter
s		Slope of pipe

Basin "B" Using 6" pipe

A	0.1963494
WP	1.570795
s	0.02

n	0.013
Q=	0.80
Q(b)=	0.68

Pipe can handle up to 0.80 cfs > 0.68 cfs

Basin "C" Using 24" pipe
This also includes flows from Offsite Basin 'A'

A	3.14159		
WP	6.28318		
s	0.01		
n	0.013		
Q=	22.68		
Q(f)=	7.62	Q(oa)=	0.73

Pipe can handle up to 22.68cfs > 8.35 cfs

Basin "D" Using 24" pipe

A	3.14159
WP	6.28318
s	0.01
n	0.013
Q=	22.68
Q(f)=	3.78

Pipe can handle up to 22.68cfs > 3.78 cfs

Basin "F" Using 6" pipe

A	0.1963494
WP	1.570795
s	0.01
n	0.013
Q=	0.56
Q(f)=	0.4

Pipe can handle up to 0.56 cfs > 0.40 cfs

Wier Equation for curb openings

Q = CLH^(3/2)		(4' opening)
C=	3.3	
L=	4	
H	0.5	
Q=	9.3338095	cfs

This opening applies for basins C&A see plans

Q = CLH^(3/2) (2' opening)
C= 3.3
L= 2
H 0.5

Q= 4.6669048 cfs

This opening applies for basin C (1/2 of basin) see plans

Q = CLH^(3/2) (24' opening)
C= 3.3
L= 24
H 0.5

Q= 56.002857 cfs

This is the spillway point for the site should a storm greater the the v100 should happen

BASIN "G" CALCULATIONS

Pressure Pipe Equation
Q=C*A*(2*g*h)^(0.5)
C= 0.6
h= Water elevation minus elevation of pipe at centroid
g= 32.2 ft/s^2 (gravity)
Pipe Size 4 inches

A(4"pipe)= 0.0872

Elevation	**h(4")**	**Q (4" pipe)**
77.73	0.00	0.00
78.0	0.10	0.13
78.5	0.60	0.33
79.0	1.10	0.44
79.7	1.80	0.56

Volume Calculations (Per the Average End Area Method)

Pond

Elevation	**Area (sf)**	**Volume (cf)**	**Vol. Sum. (cf)**
79.7	6900		
		1234	2776
79.5	5440		
		1319.5	1542
79.15	2100		
		196.5	222.5

	79	520
	78.9	0

26	26

HYDROGRAPH CALCULATIONS

BASIN "G" Unit Hydrograph

A_D = Basin A (D) + Basin B (D) + Basin D (D)

A_D = 0.4 acres

A_T = 0.44 acres

Q_p = 2.13 cfs

$E = [(A_B * 0.92) + (A_C * 1.29) + (A_D * 2.36)] / A_T$
$= [(0.02 * 0.92) + (0.02 * 1.29) + (0.40 * 2.36)] / 0.44 = 2.24$ in.

Hydrograph Calculations

$T_P = 0.7 * T_C + (1.6 - A_D/A_T)/12$
$= 0.7 * 0.2 + (1.6 - 0.40/0.44)/12$
$= 0.1976$ hrs.

peak $= 0.25 * (A_D/A_T)$
$= 0.25 * (0.40/0.44)$
$= 0.2272$ hrs

$T_B = (2.107 * E * A_T/Q_P) - (0.25 * A_D/A_T)$
$= (2.107 * 2.24 * 0.44/2.13) - (0.25 * 0.40/0.44)$
$= 0.7477$ hrs

Volume = $[1/2 (0.1976 + (.7477 - 0.1976 - 0.2272)) + 0.2272] *$
$2.13 * 3600 = 3735$ cf

Controlled Discharge Hydrograph Calculations
Calculated with the data in the flow v.s. pond elevation table
Calculate T_P for discharge pipe
x1/0.2 = 0.1976/2.13
x1 = 0.0185 hrs.

Calculate T_B minus (T_P and peak) for discharge pipe
x2/0.56 = (0.7477-(0.1976+0.2272))/2.13
x2 = 0.0849 hrs.

peak
peak = (0.7477-(0.0185+0.0849))
peak = 0.6443 hrs.

Vol. = (0.5*((0.2)*(0.0185)+(0.56)*(0.0849))+0.2*(0.6443)+0.36*(0.6443)*0.5)*
3600 = 975 cf

Site Ponding Unit Hydrograph

A_D = Basin A (D) + Basin B (D) + Basin D (D)

A_D = 1.85 + 0.1 + 0.21
= 1.84 acres

A_T = Basin A + Basin B + Basin D
= 2.18 acres

$Q_p = Q_A + Q_B + Q_D$
Q_p = 8.5 + 0.5 + 1.26
= 10.26 cfs

$E = [(A_B * 0.92) + (A_C * 1.29) + (A_D * 2.36)] / A_T$
$= [(0.18 * 0.92) + (0.16 * 1.29) + (1.84 * 2.36)] / 2.18 = 2.16$ in.

Hydrograph Calculations

$T_P = 0.7 * T_C + (1.6 - A_D/A_T)/12$
$= 0.7 * 0.2 + (1.6 - 1.84/2.18)/12$
$= 0.2030$ hrs.

peak $= 0.25 * (A_D/A_T)$
$= 0.25 * (1.84/2.18)$
$= 0.2110$ hrs

$T_B = (2.107 * E * A_T/Q_P) - (0.25 * A_D/A_T)$
$= (2.107 * 2.16 * 2.18/10.26) - (0.25 * 1.84/2.18)$
$= 0.7560$ hrs

Volume = [1/2 (0.2030 + (.7560 – 0.2030 - 0.2110)) + 0.2110]*
10.26 * 3600 = 17,860 cf

Controlled Discharge Hydrograph Calculations
Calculated with the data in the flow v.s. pond elevation table

Calculate T_P for discharge pipe
x1/0.9 = 0.2030/10.26
x1 = 0.0178 hrs.

Calculate T_B minus (T_P and peak) for discharge pipe
x2/3.06 = (0.7560-(0.2030+0.2110))/10.26
x2 = 0.1020 hrs.

peak
peak = (0.7560-(0.0178+0.1020))

peak = 0.6362 hrs.

Vol. = (0.5*((0.9)*(0.0178)+(3.06)*(0.1020))+0.9*(0.6362)+2.16*(0.6362)*0.5)* 3600

= 5,125 cf

SUMMARY

$V_{required}$= V(hydrograph) – V(controlled discharge hydrograph)+V(discharge basin G)- V(pipe capacity)
$V_{required}$= 17,860 – 5,125 + 975 – 876 = 12,834 cf
V_{actual} = 12,818 cf

Developed unrestricted flow
Flow = Basin A+Basin B+Basin C+Basin D+Basin F+Basin G+Offsite Basin A
Flow = 10.30+0.50+0.77+1.16+1.20+3.74+0.73 = 18.4 cfs

Developed flow with the use of detention ponding
Flow = BasinC+Basin E+Basin F+Offsite Basin A+ (controlled discharge at pond)
Flow = 0.57+1.00+3.56+0.73+3.06 = 8.92 cfs which is more than the max of 4.81 cfs

Max Q = 4.81 (per previous plans + 4cfs+/- (per Guy Jackson Mtg. with Brad Bingham)
Max Q = 4.81 + 4 = 8.81 cfs +/-
Max Q (actual) = 8.92 cfs
Actual flow is minutely greater than allowed.

BPLW

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(505) 881-2759

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Martin Building, Suite 501
215 North Stanton Street
El Paso, TX 79901
(915) 545-1665

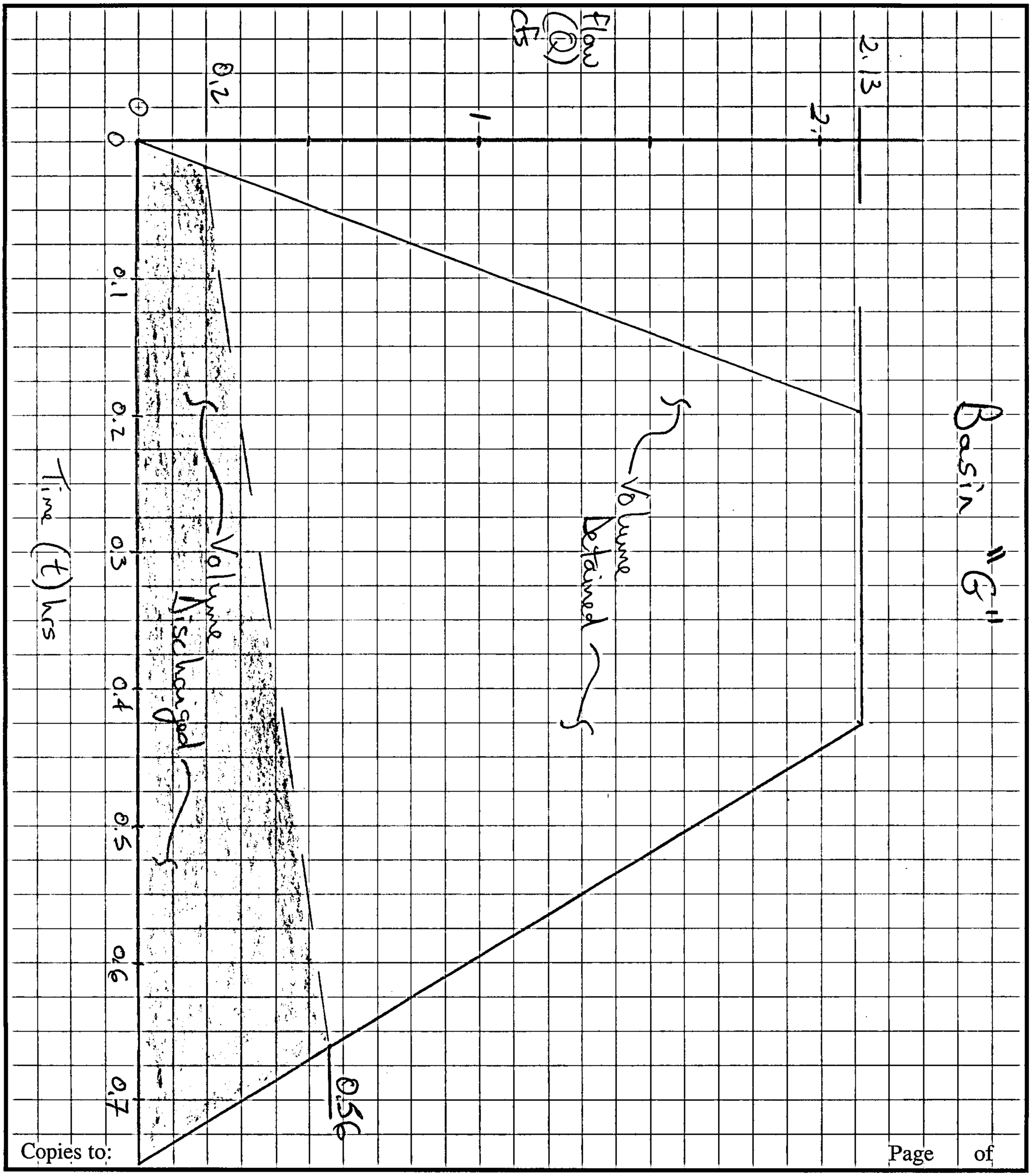
2000 East La Mar
Suite 600
Arlington, TX 76006
(817) 588-3036

Project_____

Subject_____

Project # _____ Date _____ By_____

- ❑ Memorandum
- ❑ Telephone Record
- ❑ Note to the File
- ❑ Minutes of Meeting
- ❑ To be Typed
- ❑ _____



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Project_____

Subject_____

Project # _____ Date _____ By_____

- ❑ Memorandum
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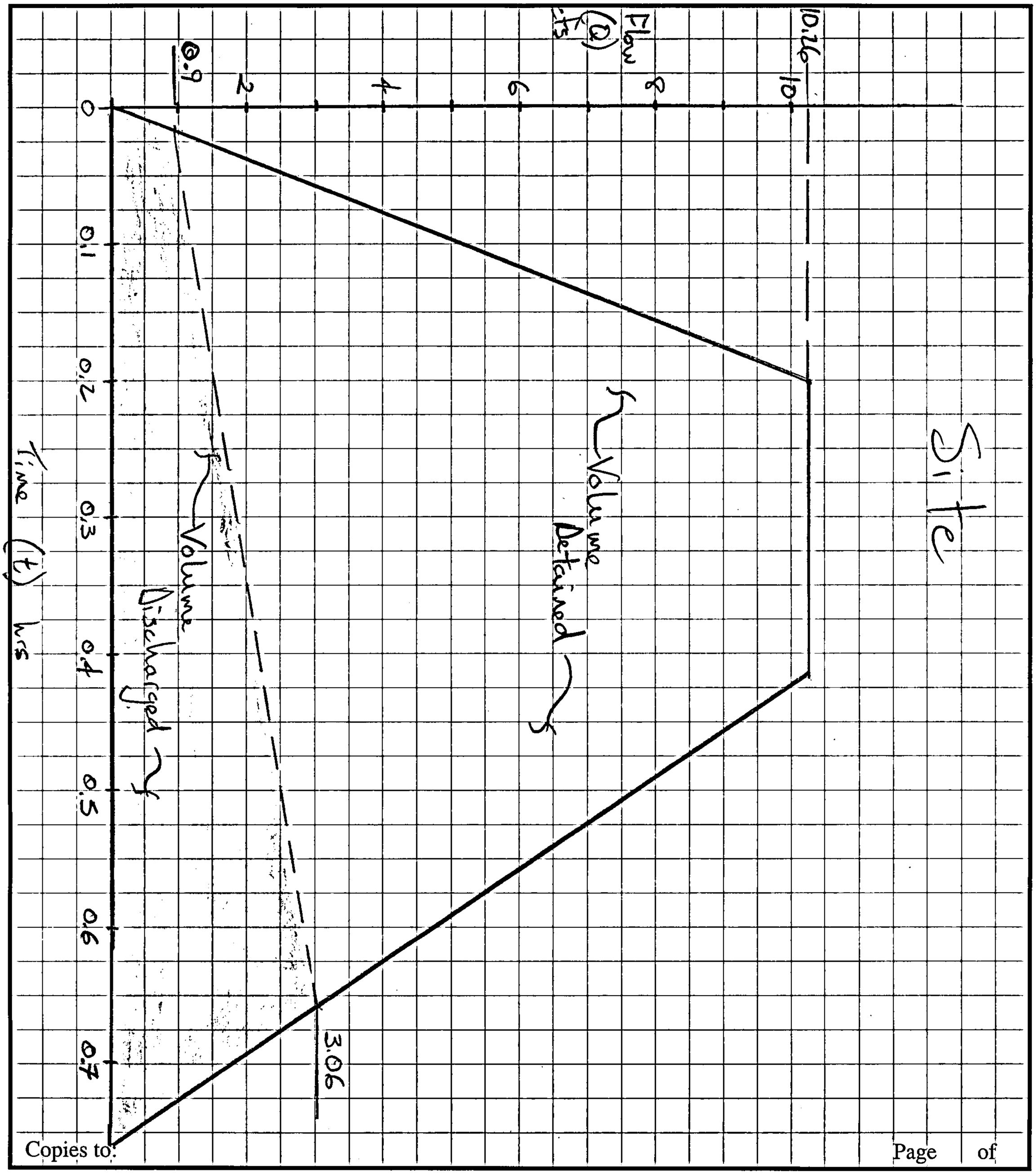
- ❑ _____



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Dec. 1993

Designing to Shape the Future

BPLW

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FAX (505) 881-1230
e-mail: bplwnm@bplw.com
web site: http://www.bplw.com

September 11, 2000

Brad Bingham, PE
Hydrology Review Engineer

Re: Grading and Drainage Plans for Kirtland Federal Credit Union
BPLW #20048
COA Hydrology #G20/D4B

Dear Brad:

Attached for your review and approval are the following:

One (1) Drainage Information Sheet

One (1) set of drawings

The site is located at 8900 Montgomery Blvd NE. This site is in compliance with the approved Montgomery Crossing Master Drainage Plan submitted in May, 2000.

Please contact me if you have any questions or comments.

Sincerely,

BPLW ARCHITECTS & ENGINEERS, INC.

Nicole M. Losack, EIT
Graduate Civil Engineer

Attachments:
xc: Guy Jackson, BPLW

DRAINAGE INFORMATION SHEET

PROJECT TITLE Kirtland Federal Credit Union ZONE ATLAS/DRWG. FILE # G-20

DRB#: _____ EPC #_____ WORK ORDER #

LEGAL DESCRIPTION: Tract A-2-B, Montgomery Crossing Addition – Phase III

CITY ADDRESS: 8900 Montgomery Blvd. NE

ENGINEERING FIRM: BPLW CONTACT: Nicole M. Losack

ADDRESS: 6200 Uptown Blvd., Suite 220 PHONE: 880-9670

OWNER: Kirtland Federal Credit Union CONTACT: David Seeley

ADDRESS: (Contact Engineer) PHONE: (Engineer)

ARCHITECT: McCleary/German Associates, Inc. CONTACT: Eric Batte

ADDRESS: (Contact Engineer) PHONE: (Engineer)

SURVEYOR: Harris Surveying CONTACT: T. Harris

ADDRESS: 2412 Monroe NE PHONE: 889-8056

CONTRACTOR: --- CONTACT:

ADDRESS: --- PHONE:

TYPE OF SUBMITTAL:

__ DRAINAGE REPORT
X DRAINAGE PLAN
__CONCEPTUAL GRADING & DRAINAGE PLAN
X GRADING PLAN
_ EROSION CONTROL PLAN
__ENGINEER'S CERTIFICATION
__ OTHER _____

PRE-DESIGN MEETING:
_ YES
X NO
_ COPY PROVIDED

DATE SUBMITTED: September 11, 2000
BY: Nicole M. Losack

CHECK TYPE OF APPROVAL SOUGHT:

_ SKETCH PLAT APPROVAL
_ PRELIMINARY PLAT APPROVAL
_ S. DEV. PLAN FOR SUB'D APPROVAL
_ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
_ SECTOR PLAN APPROVAL
_ FINAL PLAT APPROVAL
X BUILDING PERMIT APPROVAL
_ CERTIFICATE OF OCCUPANCY APPROVAL
__GRADING PERMIT APPROVALS
_ PAVING PERMIT APPROVAL
_ S.A.B. DRAINAGE REPORT
__DRAINAGE REQUIREMENTS
__OTHER _____ (SPECIFY)

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KDA Financial

KDA Financial, Inc.
350 Franklin Road,
Marietta, GA 30067-7734
Cell 228-1798.
Tel:(770)421-1532 ext.519
Fax:(770)422-7809
Job Site
Tel: 292-8497
Fax: 292-8498

5/14
CO
222

October 9, 2000

Guy Jackson, P.E.
BPLW
6200 Uptown Blvd.. Suite 400
Albuquerque, NM 87110

RE: GRADING & DRAINAGE PLAN FOR DIRTLAND FEDERAL CREDIT UNION AT MONTGOMERY CROSSING(G20/D4B)ENGINEER'S STAMP DATED SEPTEMBER 8, 2000, SUBMITTED FOR BUILDING PERMIT APPROVAL.

Dear Mr. Jackson,

Based upon the information provided in your September 8, 2000 submittal, the project referred to above is approved for Building Permit.

Include a copy of this plan with the plans submitted for building permit.

Prior to Certificate of Occupancy, the Engineer must certify completion of the Grading and Drainage plans and any construction included in Work Order for the project.

If you have any questions, please call me at 924-3980.

Sincerely,

Loren D. Meinz, P.E.
Hydrology Division

xc: Whitney Reierson
File

City of Albuquerque

April 4, 2000

Guy Jackson, PE
BPLW
6200 Uptown Blvd, Ste 400
Albuquerque, NM 87110

Re: Montgomery Crossing Grading and Drainage Plan
Engineer's Stamp dated 3-14-00 (G20/D4B)

Dear Mr. Jackson,

Based upon the information provided in your resubmittal dated 3-14-00, the above referenced site is approved for Site Development Plan for Building Permit, Site Development Plan for Subdivision, Preliminary and Final Plat. You will need to include a provision for the detention pond (with covenant and agreement) on the Infrastructure List.

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

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Hydrology Review Engineer

C: file

City of Albuquerque

March 29, 2000

Guy Jackson, PE
BPLW
6200 Uptown Blvd, Ste 400
Albuquerque, NM 87110

Re: Montgomery Crossing Grading and Drainage Plan
Engineer's Stamp dated 3-14-00 (G20/D4B)

Dear Mr. Jackson,

Based upon the information provided in your resubmittal dated 3-14-00, the above referenced site is approved for Site Development Plan for Building Permit and Site Development Plan for Subdivision. I cannot issue a Grading Permit on a conceptual grading plan. The Grading Permit will be issued with the Building Permit.

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

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Hydrology Review Engineer

C: file

DRAINAGE INFORMATION SHEET

PROJECT TITLE Montgomery Crossing ZONE ATLAS/DRWG. FILE # G-20/D4B

DRB#: 1000300 EPC #_____ WORK ORDER #_____

LEGAL DESCRIPTION: Tract A, Montgomery Crossing

CITY ADDRESS: Montgomery Blvd. NE

ENGINEERING FIRM: BPLW CONTACT: Mike De Lilla

ADDRESS: 6200 Uptown Blvd., Suite 220 PHONE: 880-9670

OWNER: _____ CONTACT: _____

ADDRESS: (See Architect) PHONE: (See Architect)

ARCHITECT: SLNB Architects CONTACT: Jim Lewis

ADDRESS: 1620 Central Avenue SE PHONE: 247-1529

SURVEYOR: Harris Surveying CONTACT: T. Harris

ADDRESS: 2412 Monroe NE PHONE: 889-8056

CONTRACTOR: --- CONTACT: _____

ADDRESS: --- PHONE: _____

TYPE OF SUBMITTAL:

__ DRAINAGE REPORT
_ DRAINAGE PLAN
X [redacted] GRADING & DRAINAGE PLAN
_ GRADING PLAN
_ EROSION CONTROL PLAN
__ENGINEER'S CERTIFICATION
_X_ OTHER _TLC_

PRE-DESIGN MEETING:
_X_ YES
_ NO
_ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

__ SKETCH PLAT APPROVAL
_ PRELIMINARY PLAT APPROVAL
_X_ S. DEV. PLAN FOR SUB'D APPROVAL
_X_ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
_ SECTOR PLAN APPROVAL
_ FINAL PLAT APPROVAL
__ BUILDING PERMIT APPROVAL
__CERTIFICATE OF OCCUPANCY APPROVAL
X GRADING PERMIT APPROVALS
__PAVING PERMIT APPROVAL
_ S.A.B. DRAINAGE REPORT
__DRAINAGE REQUIREMENTS
_OTHER ___ (SPECIFY)

DATE SUBMITTED: March ~~13~~ 14, 2000
BY: Mike De Lilla

APPLICANT'S NAME: ~~Montgomery~~ Guy Jackson — ZONE ATLAS/DRNG. FILE #: G-20/D48

DRB #: 1000300 — EPC #: _____ — WORK ORDER #: _____

LEGAL DESCRIPTION: Tract A, Montgomery Crossing

CITY ADDRESS: Montgomery Blvd NE

ENGINEERING FIRM: BRW — CONTACT: Guy Jackson

ADDRESS: 6200 Uptown Blvd NE — PHONE: 880-9670

OWNER: S & S Enterprises — CONTACT: John Triandafilidis

ADDRESS: 3535 Princeton NE — PHONE: 884-6234

ARCHITECT: SNLB — CONTACT: Jim Lewis

ADDRESS: _____ — PHONE: _____

SURVEYOR: Tony Harris — CONTACT: _____

ADDRESS: _____ — PHONE: _____

CONTRACTOR: _____ — CONTACT: _____

ADDRESS: _____ — PHONE: _____

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ___ DRAINAGE PLAN
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION
- X OTHER TLC

PRE-DESIGN MEETING:

- X YES
- ___ NO
- ___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SKETCH PLAT APPROVAL
- X PRELIMINARY PLAT APPROVAL
- X S. DEV. PLAN FOR SUB'D APPROVAL
- X S. DEV PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- X FINAL PLAT APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- ___ BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY APPROVAL
- ___ GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ S.A.D. DRAINAGE REPORT
- ___ DRAINAGE REQUIREMENTS
- ___ SUBDIVISION CERTIFICATION
- X OTHER Rough Grading (SPECIFY)

DATE SUBMITTED: March 14, 2000

BY: Guy Jackson

Revised 02/98

BPLW

Architects & Engineers, Inc.

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March 13, 2000

Bradley L. Bingham, PE
City of Albuquerque
Hydrology Review Engineer

Re: Montgomery Crossing Grading & Drainage Plan (G20/D4B)
BPLW Project Number: 99060

Dear Brad:

This letter is a summarization of the responses which have been addressed on the plans, for the comments to your letter dated March 6, 2000. For ease of reference, I will use the same numbering scheme for the comments that have been given. The responses are as follows:

1. Roof drainage for building #2 has been edited. All drainage is to go to the east as is now shown. In addition, the notation, in reference to the 24" pipe on sheet sdp7, has been fixed. The pipe has been revised to be 24".
2. Spot elevations have been added to show the elevations of the waterblock north of building #2. The overflow for basin B has been modified so that this area will discharge via a 2' curb opening located northeast of building #3. The pipe draining basin B flows into the pond located north of building #2.
3. Invert elevation has been added to the pipe which discharges into the pond from basin G.
4. Details of the pond and the underground vaults will be done with the work order plans and when the site-specific grading and drainage plans for building permit are turned in to COA for approval. I think that the piping, vaults, and their respective labels should be kept on a separate plan, as originally submitted, because this plan is very cluttered as is due to the complex nature of the site. If you do require that all information should be shown on the grading and drainage plan, I will try to do it this way when the site specific/building permit plans are submitted in the future. As for maintenance of the pond and vaults, a note has been added stating: "Ponding facilities are for the benefit of the Tracts shown hereon and are to be maintained equally by said tracts." This note will need to be modified when the plat is approved showing the tract nomenclature.
5. There is no 24" outfall pipe. This pipe in the existing condition is 10" and will be modified as stated in the design narrative. I.e. The removal of the concrete headwall in Tract A-1 and the modification of the sidewalk culvert. In addition, a 6" X4" WYE will connect to the 10"

pipe which will limit the flows to a little less than the maximum of 4.81 cfs.

6. Not all of basin "A" does drain through the curb opening north of building #3. Part of it drains through that 2' curb opening. The remainder drains through the 4' curb opening located north of the pond. I thought that since these two areas dicharge directly to the pond that I should classify them under the same basin name. I suppose that I could have separated them into basin A-1 and A-2.
7. A concrete swale with accompanying grated drains & piping with additional spot elevations have been added to this area showing the drainage patterns for the front yards of the townhouses.

If you should have any questions, please contact me at (505) 880-9670.

Sincerely,

BPLW ARCHITECTS & ENGINEERS, INC.

Michele F. De Lilla

Michele (Mike) F. De Lilla, PE
Civil Engineering Department

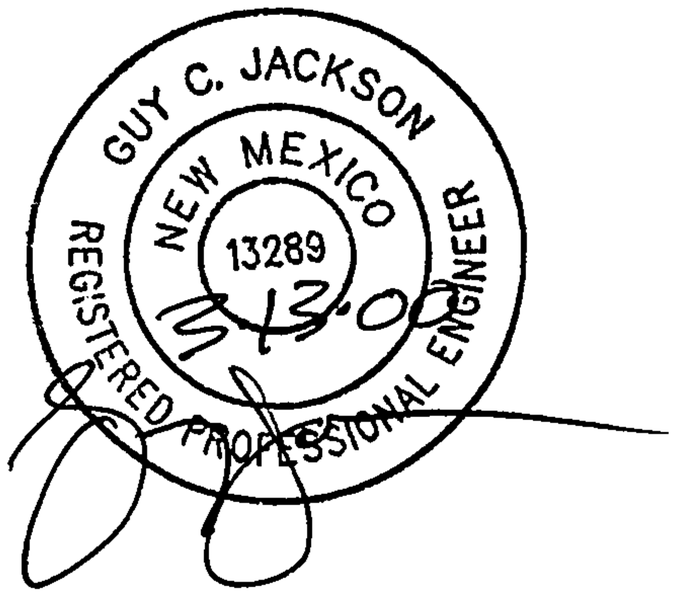
Attachments
cc: Guy Jackson

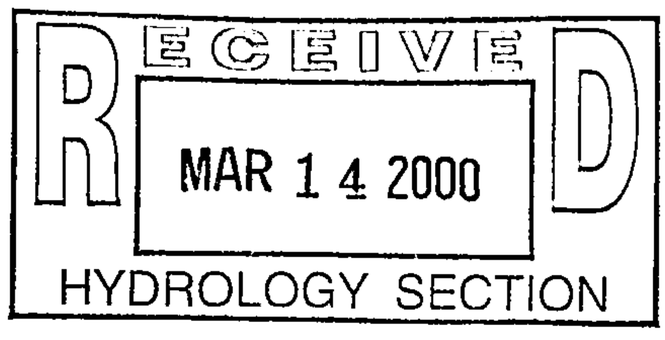
Montgomery Crossing
[redacted] Grading and Drainage Plan
(G-20/D4B)

BPLW Architects and Engineers

Prepared by
Michele F. De Lilla
and
Guy Jackson

Stamped by Guy C. Jackson
PE#13289
March 13, 2000





DRAINAGE PLAN

The following items concerning the Montgomery Crossing Drainage Plan are contained herein: 1) Vicinity Map; 2) Grading Plan; 3) Calculations and 4)Floodplain Map.

As shown by the Vicinity Map, the site lies south of Montgomery Blvd. N.E. and east of the intersection of General Chenault N.E. and Montgomery Blvd. N.E.

Per flood insurance rate map 143 of 825 for Bernalillo County, dated September 20, 1996, the site does not lie but is adjacent to a flood hazard zone area. The nearest flood hazard zone is located and contained in Montgomery Blvd. which is located north of the site and designated as Zone A0 Depth 1. This floodplain begins just northwest of the site.

The Grading Plan shows existing and proposed spot elevations and contours at 1'-0" intervals, limit and character of the proposed improvements and also the existing conditions. As shown by this plan, the proposed construction consists of a bank, two offices, a fast food restaurant, and three townhouses with associated parking, walkways, and landscaping.

Existing Conditions:

As shown by the Vicinity Map, the 3.78 acre site (Tract 2-A) is bounded by commercial property to the east and west, Montgomery to the north and residential property to the south. The existing site drainage can be characterized by three basins, which are described as follows:

- The majority of the undeveloped site slopes from east to west at an average slope of 4% toward a detention pond located in the western portion of the site (Existing Basin"C").
- The remainder of the site drains either directly onto Montgomery Blvd. (Existing Basin "A")
- A basin located east of the access road located directly west of the site (Existing Basin "B") which outfalls into Montgomery Blvd.

Native vegetation and dirt roads transverse the site. Currently, a portion of the offsite flows, from Hendrix Road cul-de-sac, enter a public channel just east of the site and east of the Thomas Well No. 2. The offsite flows from the Thomas Well No. 2 site are allowed to enter the site and these flows are considered as part of the drainage analysis as OFFSITE BASIN "A".

In March 1991, a master drainage plan for Tracts A-1 and 2-A was prepared by BPLW A & E Inc, and was then updated by a drainage report by Brasher and Lorenz, Inc., dated December 1996. This report placed runoff rate limitations on Tract 2-A to approximately 4.81 cfs. Currently, the aforementioned detention pond collects the majority of flows within the site, which are piped/released into Tract A-1 at a point approximately 130 feet to the west of the site per the master drainage plan referenced above. These flows then go overland approximately 200 west of the discharge point outfalling onto General Chenault, which then outfalls onto Montgomery Blvd.

In the proposed condition, the majority of the site will continue to drain into the pond/detention facility which will be modified from the existing condition due to the increase in runoff and due to the density of the new construction. The changes to the ponding conditions are as follows:

- Modification of the existing private drainage pond to a smaller configuration due to building density. This pond will be covered with either a concrete slab or grate for safety precautions. This will be detailed as part of the building permit plans.

- The addition of two underground runoff storage vaults/ponds to allow for the increase in the V100 6-hour storm due to development. All the vaults and ponding areas are interconnected to allow for one WSL with an elevations of 77.50. The vaults will be private and constructed outside any easements/R.O.W.'s.

In addition, modifications will need to be made so as to keep the rate of flow from deviating from the previously approved plans. The changes are as follows:

- Remove the concrete headwall located at the 10" pipe's discharge point in Tract A-1 and modify sidewalk culvert.

- Place a 6" and 4" pipe at elevations of 73.86 MSLD, in the detention pond's infall, and connect them to the 10" discharge pipe. This will limit the flows to a little less that the maximum flow of 4.81cfs. See calculations for more information.

As for the proposed basin boundaries, they are as follows:

- Basin "A" drains overland into the detention pond located in the western portion of the site.
- Basin "B" drains to an inlet located between buildings 3 and 4 which is then piped to the detention pond. An overflow spillway has been placed northeast of building 3 in case the inlet gets clogged. The spillway would flow into Basin "A".
- Basin "C' drains to an inlet northeast of the detention area and is piped into vault #1. The overflow point of the basin is located west of the Basin "C" inlet and would spill into Basin "A"
- Basin "D" drains to an inlet located east of the bank building. This runoff is then piped into vault #2. The overflow point of the basin is located southeast of the bank building and would spill into Basin "C"
- Basin "E" located along the southern portion of the site drains toward the west exiting the site via an opening in the wall. This basin freely discharges into the access road located west of the site. Flow from here directly go into Montgomery Blvd.
- Basin "F' located along the periphery of the north and west sides of the site drain directly onto Montgomery Blvd.
- Basin "G' drains a small area into an inlet just west of building 2. The overflow point for this basin is located southwest of the fast food restaurant building and would spill into Basin "A".

Offsite flows do not enter the site from the south, west, and north sides because they are topographically lower than the site. Flows from the east (Hendrix Rd.), as mentioned above, are

diverted via an existing drainage easement located east of the site. Only flows from the Thomas Well No.2 site enter the site (and into Basin "C"). These flows will continue to be allowed into the site and have been included as part of the drainage calculations.

The calculations, which appear herein, analyzes the developed conditions for the 100-year, 6-hour rainfall event. The procedure for 40 acre and smaller basins set by Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria, dated January 1993, has been used to quantify the peak rate of discharge and volume of runoff generated. As shown by these calculations, there will be an increase in runoff and discharge rate from the site for the developed condition versus the existing condition. But due to the other site improvements, when this is compared to the master drainage plan calculations, it can be noted that there is a slight decrease in the runoff rate with a large increase in runoff volume which will be detained onsite. A calculation summary at the end of the calculation sheets is included for additional ease of use.

BPLW

Architects and Engineers

PROJECT **Montgomery Crossing**
PROJECT NO. **99060.00**
DATE **02/17/00**
BY **Mike De Lilla**

DPM Section 22.2 - Hydrology

Part A-Watersheds less than 40 acres.
January, 1993

INSTRUCTIONS

* Spread sheet requires three input areas (dark cells):
  - Location
  - >A.1 Precipitation Zone
  - >A.3 Land Treaments
* Values from the tables are automatically placed using "if" statements.
* Table values should be checked for correctness for each use.

SUMMARY

Location	**0**	
Precipitation Zone	**3**	
Land Area	**0.64**	acres
Excess Precipitation Volume		
>>> 100-year 6-hour (design)	**0.05**	**acre-ft.**
10-year 6-hour	**0.02**	acre-ft.
2-year 6-hour	**0.00**	acre-ft.
100-year 24-hour	**0.05**	acre-ft.
Peak Discharge Rates (DPM)		
>>> Q100 (design)	**1.66**	**cfs**
Q10	**0.76**	cfs
Q2	**0.13**	cfs
Peak Discharge Rates (DPM-Rational Method)		
>>> Q100 (design)	**1.65**	**cfs**
Q10	**0.77**	cfs
Q2	**0.14**	cfs

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS

	LOCATION	0	
>A.1	PRECIPITATION ZONE (from Table A-1)	3	
>A.2	DEPTHS		
	(from Table A-2)		
	100-YEAR STORM (P60)	2.14	inches
	100-YEAR STORM (P360)	2.60	inches
	100-YEAR STORM (P1440)	3.10	inches
	10-YEAR (P360) (Calculated: P360*RPF10)	1.73	inches
	2-YEAR (P360) (Calculated: P360*RPF2)	1.13	inches
>A.3	LAND TREATMENTS (Ai)		
	Treatment A	0.00	acres
	Treatment B	0.64	acres
	Treatment C	0.00	acres
	Treatment D	0.00	acres
	Total Area	0.64	acres
>A.4	ABSTRACTIONS	See A.5	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.5 EXCESS PRECIPITATION 6 HOUR AND 24 HOUR (Ei) from Table A-8		
100-year 6-hour		
Treatment A	0.66	inches
Treatment B	0.92	inches
Treatment C	1.29	inches
Treatment D	2.36	inches
WEIGHTED E (Sum Ei*Ai/A)	0.92	inches
VOLUME V100:6h (E*A)	0.05	acre-ft.
	2,137.34	ft^3
10-year 6-hour		
Treatment A	0.19	inches
Treatment B	0.36	inches
Treatment C	0.62	inches
Treatment D	1.50	inches
WEIGHTED E (Sum Ei*Ai/A)	0.36	inches
VOLUME V10:6h (E*A)	0.02	acre-ft.
	836.35	ft^3
2-year 6-hour		
Treatment A	0.00	inches
Treatment B	0.06	inches
Treatment C	0.20	inches
Treatment D	0.89	inches
WEIGHTED E (Sum Ei*Ai/A)	0.06	inches
VOLUME V2:6h (E*A)	0.00	acre-ft.
	139.39	ft^3
100-year 24-hour		
VOLUME V100:24h (V100-6h+Ad*P1440-P360)/12)	0.05	acre-ft.
	2,137.34	ft^3

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.6 PEAK DISCHARGE RATE FOR SMALL WATERSHEDS (Qi)
from Table A-9

100-year			
Treatment A		**1.87**	cfs/acre
Treatment B		**2.60**	cfs/acre
Treatment C		**3.45**	cfs/acre
Treatment D		**5.02**	cfs/acre

	Q100 (Sum Qi*Ai)	**1.66**	cfs
		==========	
10-year			
Treatment A		**0.58**	cfs/acre
Treatment B		**1.19**	cfs/acre
Treatment C		**2.00**	cfs/acre
Treatment D		**3.39**	cfs/acre

	Q10 (Sum Qi*Ai)	**0.76**	cfs
		==========	
2-year			
Treatment A		**0.00**	cfs/acre
Treatment B		**0.21**	cfs/acre
Treatment C		**0.78**	cfs/acre
Treatment D		**2.04**	cfs/acre

	Q2 (Sum Qi*Ai)	**0.13**	cfs
		==========	

CALCULATIONS FOLLOW

RATIONAL METHOD

PEAK INTENSITY (in/hr at tc=0.2 hour)
from Table A-10

Peak Intensity (I) 100-year	5.38
Peak Intensity (I) 10-year	3.65
Peak Intensity (I) 2-year	2.21

RATIONAL METHOD COEFFICIENT, C
from Table A-11

100-year

Treatment A	0.35	cfs/acre
Treatment B	0.48	cfs/acre
Treatment C	0.64	cfs/acre
Treatment D	0.93	cfs/acre
Q100 (Sum Qi*I*Ai)	1.65	cfs

10-year

Treatment A	0.16	cfs/acre
Treatment B	0.33	cfs/acre
Treatment C	0.55	cfs/acre
Treatment D	0.93	cfs/acre
Q10 (Sum Qi*I*Ai)	0.77	cfs

2-year

Treatment A	0.00	cfs/acre
Treatment B	0.10	cfs/acre
Treatment C	0.35	cfs/acre
Treatment D	0.92	cfs/acre
Q2 (Sum Qi*I*Ai)	0.14	cfs

BPLW

Architects and Engineers

PROJECT **Montgomery Crossing**
PROJECT NO. **99060**
DATE **02/17/00**
BY **Mike De Lilla**

DPM Section 22.2 - Hydrology

Part A-Watersheds less than 40 acres.
January, 1993

INSTRUCTIONS

* Spread sheet requires three input areas (dark cells):
  - Location
  - >A.1 Precipitation Zone
  - >A.3 Land Treaments
* Values from the tables are automatically placed using "if" statements.
* Table values should be checked for correctness for each use.

SUMMARY

Location	**Basin "A"**	
Precipitation Zone	3	
Land Area	0.65	acres
Excess Precipitation Volume		
>>> 100-year 6-hour (design)	**0.13**	**acre-ft.**
10-year 6-hour	0.08	acre-ft.
2-year 6-hour	0.05	acre-ft.
100-year 24-hour	0.15	acre-ft.
Peak Discharge Rates (DPM)		
>>> Q100 (design)	**3.21**	**cfs**
Q10	2.16	cfs
Q2	1.29	cfs
Peak Discharge Rates (DPM-Rational Method)		
>>> Q100 (design)	**3.20**	**cfs**
Q10	2.16	cfs
Q2	1.29	cfs

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS

	LOCATION	Basin "A"	
>A.1	PRECIPITATION ZONE (from Table A-1)	3	
>A.2	DEPTHS (from Table A-2)		
	100-YEAR STORM (P60)	2.14	inches
	100-YEAR STORM (P360)	2.60	inches
	100-YEAR STORM (P1440)	3.10	inches
	10-YEAR (P360) (Calculated: P360*RPF10)	1.73	inches
	2-YEAR (P360) (Calculated: P360*RPF2)	1.13	inches
>A.3	LAND TREATMENTS (Ai)		
	Treatment A	0.00	acres
	Treatment B	0.02	acres
	Treatment C	0.00	acres
	Treatment D	0.63	acres
	Total Area	0.65	acres
>A.4	ABSTRACTIONS	See A.5	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.5 EXCESS PRECIPITATION 6 HOUR AND 24 HOUR (Ei)
from Table A-8

100-year 6-hour		
Treatment A	**0.66**	inches
Treatment B	**0.92**	inches
Treatment C	**1.29**	inches
Treatment D	**2.36**	inches
WEIGHTED E (Sum Ei*Ai/A)	**2.32**	inches
VOLUME V100:6h (E*A)	**0.13**	acre-ft.
	5,463.88	ft^3
10-year 6-hour		
Treatment A	**0.19**	inches
Treatment B	**0.36**	inches
Treatment C	**0.62**	inches
Treatment D	**1.50**	inches
WEIGHTED E (Sum Ei*Ai/A)	**1.46**	inches
VOLUME V10:6h (E*A)	**0.08**	acre-ft.
	3,456.49	ft^3
2-year 6-hour		
Treatment A	**0.00**	inches
Treatment B	**0.06**	inches
Treatment C	**0.20**	inches
Treatment D	**0.89**	inches
WEIGHTED E (Sum Ei*Ai/A)	**0.86**	inches
VOLUME V2:6h (E*A)	**0.05**	acre-ft.
	2,039.70	ft^3
100-year 24-hour		
VOLUME V100:24h		
(V100-6h+Ad*P1440-P360)/12)	**0.15**	acre-ft.
	6,607.33	ft^3

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.6 PEAK DISCHARGE RATE FOR SMALL WATERSHEDS (Qi)
from Table A-9

100-year		
Treatment A	**1.87**	cfs/acre
Treatment B	**2.60**	cfs/acre
Treatment C	**3.45**	cfs/acre
Treatment D	**5.02**	cfs/acre
Q100 (Sum Qi*Ai)	**3.21**	cfs
10-year		
Treatment A	**0.58**	cfs/acre
Treatment B	**1.19**	cfs/acre
Treatment C	**2.00**	cfs/acre
Treatment D	**3.39**	cfs/acre
Q10 (Sum Qi*Ai)	**2.16**	cfs
2-year		
Treatment A	**0.00**	cfs/acre
Treatment B	**0.21**	cfs/acre
Treatment C	**0.78**	cfs/acre
Treatment D	**2.04**	cfs/acre
Q2 (Sum Qi*Ai)	**1.29**	cfs

CALCULATIONS FOLLOW

RATIONAL METHOD

PEAK INTENSITY (in/hr at tc=0.2 hour)
from Table A-10

Peak Intensity (I) 100-year	5.38
Peak Intensity (I) 10-year	3.65
Peak Intensity (I) 2-year	2.21

RATIONAL METHOD COEFFICIENT, C
from Table A-11

100-year

Treatment A	0.35	cfs/acre
Treatment B	0.48	cfs/acre
Treatment C	0.64	cfs/acre
Treatment D	0.93	cfs/acre
Q100 (Sum Qi*I*Ai)	3.20	cfs

10-year

Treatment A	0.16	cfs/acre
Treatment B	0.33	cfs/acre
Treatment C	0.55	cfs/acre
Treatment D	0.93	cfs/acre
Q10 (Sum Qi*I*Ai)	2.16	cfs

2-year

Treatment A	0.00	cfs/acre
Treatment B	0.10	cfs/acre
Treatment C	0.35	cfs/acre
Treatment D	0.92	cfs/acre
Q2 (Sum Qi*I*Ai)	1.29	cfs

Drainage Summary

Project: Montgomery Crossing
Project Numbe: 99060
Date: 02/17/00
By: Mike De Lilla

Site Location

Precipitaion Zone 3 Per Table A-1 COA DPM Section 22.2

Existing summary

Basin Name	Basin "A"	Basin "B"	Basin "C"	Offsite "A"
Soil Treatment (acres)				
Area "A"	0.00	0.00	0.00	0.00
Area "B"	0.64	0.16	2.88	0.28
Area "C"	0.00	0.00	0.00	0.00
Area "D"	0.00	0.02	0.05	0.00
Excess Runoff (acre-feet)				
100yr. 6hr.	0.05	0.02	0.23	0.02
10yr. 6hr.	0.02	0.01	0.09	0.01
2yr. 6hr.	0.00	0.00	0.02	0.00
100yr. 24hr.	0.05	0.02	0.23	0.02
Peak Discharge (cfs)				
100 yr.	1.66	0.52	7.74	0.73
10yr.	0.76	0.26	3.60	0.33
2yr.	0.13	0.07	0.71	0.06

Proposed summary

Basin Name	Basin "A"	Basin "B"	Basin "C"	Basin "D"	Basing "E"	Basing "F"	Basin "G"	Offsite "A"
Soil Treatment (acres)								
Area "A"	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Area "B"	0.02	0.01	0.05	0.06	0.08	0.09	0.00	0.28
Area "C"	0.00	0.00	0.06	0.09	0.11	0.07	0.00	0.00
Area "D"	0.63	0.13	1.45	0.66	0.02	0.14	0.08	0.00
Excess Runoff (acre-feet)								
100yr. 6hr.	0.13	0.03	0.30	0.14	0.02	0.04	0.02	0.02
10yr. 6hr.	0.08	0.02	0.19	0.09	0.01	0.02	0.01	0.01
2yr. 6hr.	0.05	0.01	0.11	0.05	0.00	0.01	0.01	0.00
100yr. 24hr.	0.15	0.03	0.36	0.17	0.02	0.05	0.02	0.02
Peak Discharge (cfs)								
100 yr.	3.21	0.68	7.62	3.78	0.69	1.18	0.40	0.73
10yr.	2.16	0.45	5.10	2.49	0.38	0.72	0.27	0.33
2yr.	1.29	0.27	3.02	1.43	0.14	0.36	0.16	0.06

Pressure Pipe Equation
Q=C*A*(2*g*h)^(0.5)
C= 0.67
h= Water elevation minus elevation of pipe at centroid
g= 32.2 ft/s^2 (gravity)
Pipe Size 6 inches
Pipe Size 4 inches
A(6"pipe)= 0.1963494
A(4"pipe)= 0.0872664

Elevation	h(6")	h(4")	Q (6" pipe)	Q (4" pipe)	Q (total)
73.86	0	0.00	0.00	0.00	0.00
74.5	0.39	0.22	0.66	0.22	0.88
75	0.89	0.72	1.00	0.40	1.40
75.5	1.39	1.22	1.24	0.52	1.76
76	1.89	1.89	1.45	0.65	2.10
76.5	2.39	2.22	1.63	0.70	2.33
77	2.89	2.72	1.79	0.77	2.57
77.5	3.39	3.22	1.94	0.84	2.79

Volume Calculations (Per the Average End Area Method)

Pond #1

Elevation	Area (sf)	Volume (cf)	Vol. Sum. (cf)
77.5	746		
		373	2476.72
77	746		
		373	2103.72
76.5	746		
		373	1730.72
76	746		
		373	1357.72
75.5	746		
		373	984.72
75	746		
		373	897.67
74.5	746		
		238.72	238.72
73.86	0		

Pond #2

Elevation	Area (sf)	Volume (cf)	Vol. Sum. (cf)
77.5	785		
		253.75	285.95
77	230		
		32.2	32.2
76.72	0		

Vault #1

Elevation	Area (sf)	Volume (cf)	Vol. Sum. (cf)
77.5	2900		
		1450	8932
77	2900		
		1450	7482
76.5	2900		
		1450	6032
76	2900		
		1450	4582
75.5	2900		
		1450	3132
75	2900		
		841	1682
74.71	2900		
		498.75	841
74.5	1850		
		342.25	342.25
74.13	0		

Vault #2a

Elevation	Area (sf)	Volume (cf)	Vol. Sum. (cf)
77.5	1000		
		500	2605
77	1000		
		500	2105
76.5	1000		
		500	1605
76	1000		
		500	1105
75.5	1000		
		480	605
75.02	1000		
75.02	1000		
		125	125
74.77	0		

Vault #2b

Elevation	Area (sf)	Volume (cf)	(Vol. Sum. (cf)
77.5	4032		
		2016	9031.68
77	4032		
		2016	7015.68
76.5	4032		

		2016	4999.68	
76	4032			
		2016	2983.68	
75.5	4032			
		0	967.68	
75.5	4032			
75.5	4032			
		967.68	967.68	
75.02	0			

Total Pond Volume (by elevation)

Elevation	Pond#1	Pond#2	Vault#1	Vault#2a	Vault#2b	Total
77.5	2476.72	285.95	8932	2605	9031.68	23331.35
77	2103.72	32.2	7482	2105	7015.68	18738.6
76.5	1730.72	0	6032	1605	4999.68	14367.4
76	1357.72	0	4582	1105	2983.68	10028.4
75.5	984.72	0	3132	730	1935.36	6782.08
75	897.67	0	2523	0	0	3420.67
74.5	238.72	0	342.25	0	0	580.97
73.86	0	0	0	0	0	0

Pipe Flow from inlets per Basin

Q=1.49/n*A*R^(2/3)s^0.5

n	0.013	Roughness Coefficient
A		Area of Pipe (Varies)
R	A/WP	Area Divided by wetted perimeter
s		Slope of pipe

Basin "B" Using 6" pipe

A	0.1963494
WP	1.570795
s	0.02
n	0.013
Q=	0.80
Q(b)=	0.68

Pipe can handle up to 0.80 cfs > 0.68 cfs

Basin "C" Using 24" pipe
This also includes flows from Offsite Basin 'A'

A	3.14159		
WP	6.28318		
s	0.01		
n	0.013		
Q=	22.68		
Q(f)=	7.62	Q(oa)=	0.73

Pipe can handle up to 22.68cfs > 8.35 cfs

Basin "D" Using 24" pipe

A	3.14159
WP	6.28318
s	0.01
n	0.013
Q=	22.68
Q(f)=	3.78

Pipe can handle up to 22.68cfs > 3.78 cfs

Basin "F" Using 6" pipe

A	0.1963494
WP	1.570795
s	0.01
n	0.013
Q=	0.56
Q(f)=	0.4

Pipe can handle up to 0.56 cfs > 0.40 cfs

Wier Equation for curb openings

Q = CLH^(3/2)		(4' opening)
C=	3.3	
L=	4	
H	0.5	
Q=	9.3338095	cfs

This opening applies for basins C&A see plans

Q = CLH^(3/2)		(2' opening)
C=	3.3	

L= 2
H 0.5

Q= 4.6669048 cfs
This opening applies for basin C (1/2 of basin) see plans

Q = CLH^(3/2) (24' opening)
C= 3.3
L= 24
H 0.5

Q= 56.002857 cfs
This is the spillway point for the site should a
storm greater the the v100 should happen

A_D = Basin A (D) + Basin B (D) + Basin C (D) + Basin D (D) + Basin G (D)

A_D = 0.63 + 0.13 + 1.45 + 0.66 + 0.08
= 2.95acres

A_T = Basin A + Basin B + Basin C + Basin D + Basin G + offsite A
= 3.52 acres

$Q_p = Q_A + Q_B + Q_C + Q_D + Q_G + Q_{offA}$
Q_p = 3.21 + 0.68 + 7.62 + 3.78 + 0.40 + 0.73
= 16.42 cfs

$E = [(A_B * 0.92) + (A_C * 1.29) + (A_D * 2.36)] / A_T$
$= [(0.42 * 0.92) + (0.15 * 1.29) + (2.95 * 2.36)] / 3.52 = 2.14$ in.

Hydrograph Calculations

$T_P = 0.7 * T_C + (1.6 - A_D/A_T)/12$
$= 0.7 * 0.2 + (1.6 - 2.95/3.52)/12$
$= 0.2035$ hrs.

peak $= 0.25 * (A_D/A_T)$
$= 0.25 * (2.95/3.52)$
$= 0.2095$ hrs

$T_B = (2.107 * E * A_T/Q_P) - (0.25 * A_D/A_T)$
$= (2.107 * 2.14 * 3.52/ 16.42) - (0.25 * 2.95/3.52)$
$= 0.7571$ hrs

Volume = [1/2 (.2035 + (.7571 – 0.2035- 0.2095)) + 0.2095]*
16.42 * 3600 = 28,568 cf

Controlled Discharge Hydrograph Calculations
Calculated with the data in the flow v.s. pond elevation table

Volume = 2.10(0.25)*3600/2 + (2.79-2.10)(0.7571-0.25)(3600)/2 + 2.10*
(0.7571-0.25) = 5409 cf (volume discharged)

SUMMARY

$V_{required}$= V(hydrograph) – V(controlled discharge hydrograph)
$V_{required}$= 28,568 – 5409 = 23159 cf
V_{actual} = 23331 cf

Developed unrestricted flow
Flow = Basin A+Basin B+Basin C+Basin D+Basin F+Basin G+Offsite Basin A
Flow = 3.21+0.68+7.62+3.78+0.69+1.18+0.40+0.73 = 18.29 cfs

Developed flow with the use of detention ponding
Flow = Basin E+Basin F+ (controlled discharge at pond)
Flow = 0.69+1.18+2.79 = 4.66 cfs which is less than the max of 4.81 cfs

BPLW

Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, NM 87110
(505) 881-2759

49 West First Street
Suite 100
Mesa, AZ 85201
(602) 827-2759

Martin Building, Suite 501
215 North Stanton Street
El Paso, TX 79901
(915) 545-1665

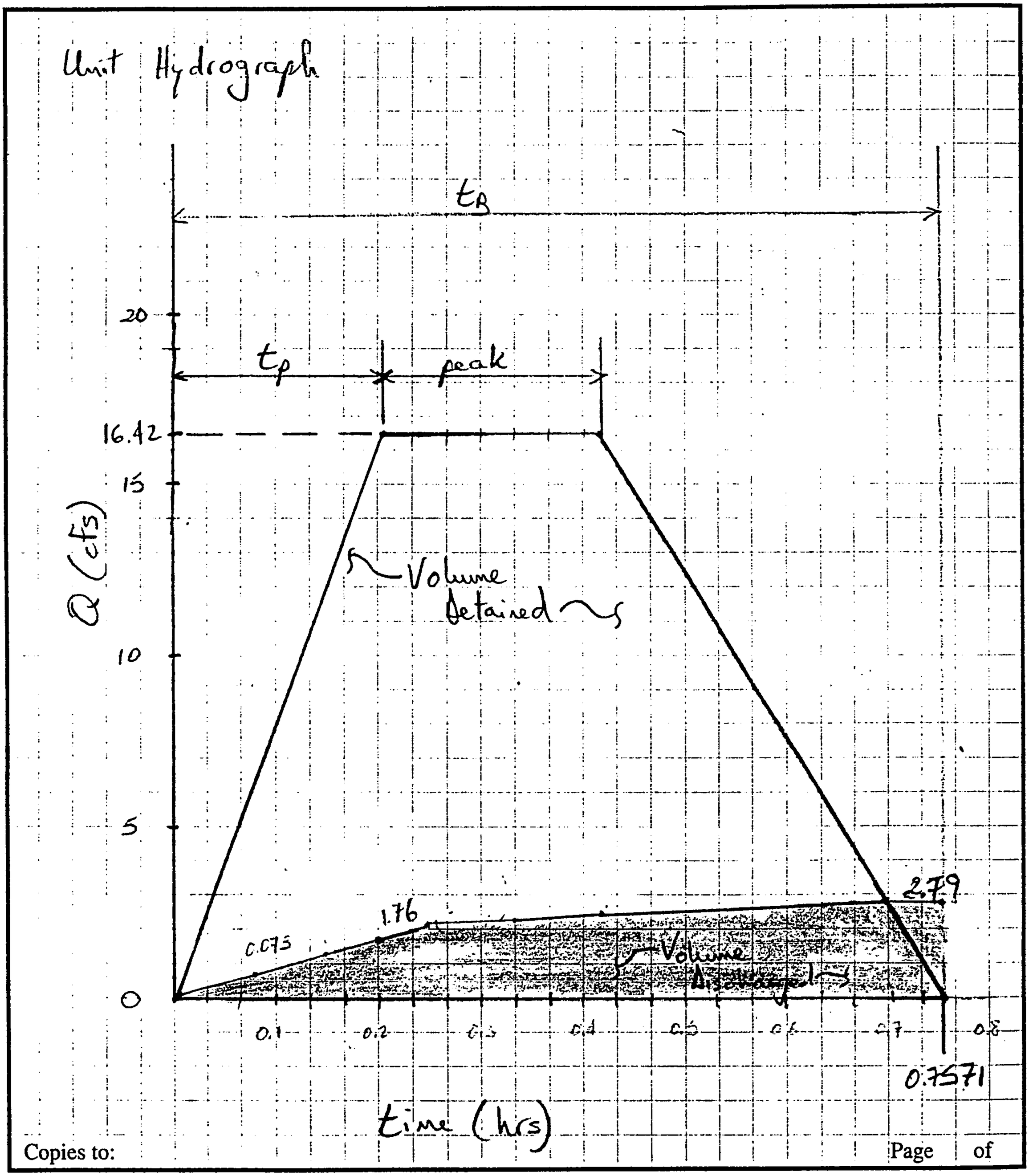
2000 East La Mar
Suite 600
Arlington, TX 76006
(817) 588-3036

Project_____

Subject_____

Project # _____ Date _____ By_____

- ☐ Memorandum
- ☐ Telephone Record
- ☐ Note to the File
- ☐ Minutes of Meeting
- ☐ To be Typed
- ☐ _____



Copies to:

Dec. 1993

Designing to Shape the Future

CITY OF ALBUQUERQUE

April 29, 2005

Guy Jackson, P.E.
BPLW Architects & Engineers, Inc.
6200 Uptown Blvd. NE Suite 400
Albuquerque, NM 87110

Re: AutoZone at Montgomery Crossing, 8820 Montgomery Blvd NE, Grading and Drainage Plan
Engineer's Stamp dated 9-10-04 (G20-D004B)
Certification dated 4-29-05

Dear Mr. Jackson,

Based upon the information provided in your submittal received 4-29-05, the above referenced certification is approved for release of permanent Certificate of Occupancy by Hydrology.

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: Phyllis Villanueva
file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

DRAINAGE INFORMATION SHEET

PROJECT TITLE AutoZone ZONE ATLAS/DRWG. FILE # G20-D4B

DRB#: _____ EPC #_____ WORK ORDER #

LEGAL DESCRIPTION: Tract A-2-A, Montgomery Crossing

CITY ADDRESS: 8820 Montgomery Blvd. NE

ENGINEERING FIRM: BPLW CONTACT: Guy Jackson

ADDRESS: 6200 Uptown Blvd., Suite 220 PHONE: 880-9670

OWNER: AutoZone, Inc. CONTACT: Arthur Nave

ADDRESS: 123 South Front St. Memphis TN, 38103 PHONE: 901-495-8714

ARCHITECT: See Owner CONTACT: See Owner
ADDRESS: _____ PHONE: See Owner

SURVEYOR: Harris Surveying CONTACT: Tony Harris

ADDRESS: 2412 Monroe NE, 87110 PHONE: 889-8056

CONTRACTOR: --- TBD CONTACT:

ADDRESS: --- PHONE:

TYPE OF SUBMITTAL:

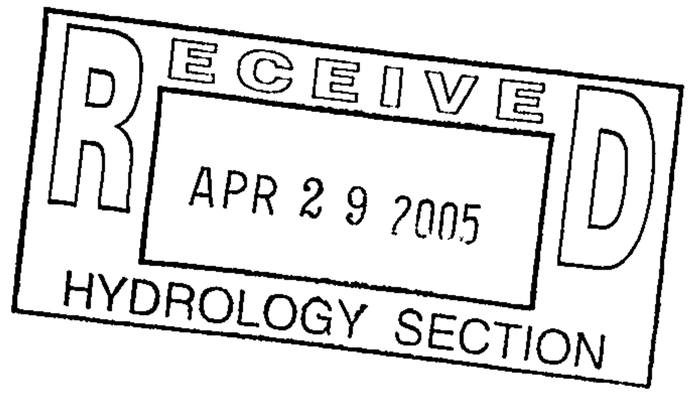
__ DRAINAGE REPORT
__ DRAINAGE PLAN
__CONCEPTUAL GRADING & DRAINAGE PLAN
__ GRADING PLAN
_ EROSION CONTROL PLAN
_X_ENGINEER'S CERTIFICATION (Drainage)
_ OTHER _____

PRE-DESIGN MEETING:
_X_ NO
_ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

_ SKETCH PLAT APPROVAL
_ PRELIMINARY PLAT APPROVAL
_ S. DEV. PLAN FOR SUB'D APPROVAL
__ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
_ SECTOR PLAN APPROVAL
_ FINAL PLAT APPROVAL
___BUILDING PERMIT APPROVAL
_X_ CERTIFICATE OF OCCUPANCY APPROVAL
_ PAVING PERMIT APPROVAL
__ S.A.B. DRAINAGE REPORT
__DRAINAGE REQUIREMENTS

DATE SUBMITTED: April 29, 2005
BY: Guy Jackson, PE



BPLW

Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, New Mexico 87110
(505) 881-BPLW (2759)
FAX (505) 881-1230
Web site: http://www.bplw.com

April 29, 2005

Arlene Portillo
Hydrology Section
City of Albuquerque Development Services
PO Box 1293
Albuquerque, New Mexico 87103

Re: AutoZone –8820 Montgomery Blvd. NE, Albuquerque, NM
(Zone Atlas Map G20)
BPLW Project Number: A04013

Dear Arlene:

Attached for review, and approval are the following revised documents:

- One (1) Drainage Information Sheet
- One (1) copy of the Certified Grading Plan

Attached for review and processing are the referenced materials. The site appears to be build in substantial compliance with the approved grading & drainage plan dated 9/10/04.

If you have any questions, please contact me at (505) 881-2759.

Sincerely,

BPLW ARCHITECTS & ENGINEERS, INC.

Guy Jackson, PE
Director of Civil Engineering

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 17, 2001

Guy Jackson, P.E.
BPLW
6200 Uptown Blvd NE Suite 220
Albuquerque, New Mexico 87110

RE: KIRTLAND FEDERAL CREDIT UNION (G-20/D4B)
(At MONTGOMERY CROSSING PHASE 3) - (Montgomery Blvd NE)
ENGINEERS CERTIFICATION FOR CERTIFICATE OF OCCUPANCY
ENGINEERS STAMP DATED 9/8/2000
ENGINEERS CERTIFICATION DATED 7/12/2001

Dear Guy:

Based upon the information provided in your Engineers Certification submittal dated 7/12/2001, the above referenced site is approved for Permanent Certificate of Occupancy for Kirtland Federal Credit Union.

If I can be of further assistance, please contact me at 924-3981.

Sincerely,

Teresa A. Martin
Hydrology Plan Checker
Public Works Department

BLM

C: Vickie Chavez, COA
approval file
drainage file

DRAINAGE INFORMATION SHEET

PROJECT TITLE Kirtland Federal Credit Union ZONE ATLAS/DRWG. FILE # G-20 / D 4B

DRB#: _____ EPC #_____ WORK ORDER #_____

LEGAL DESCRIPTION: Tract A-2-B, Montgomery Crossing Addition – Phase III

CITY ADDRESS: 8900 Montgomery Blvd. NE

ENGINEERING FIRM: BPLW CONTACT: Guy Jackson

ADDRESS: 6200 Uptown Blvd., Suite 220 PHONE: 880-9670

OWNER: Kirtland Federal Credit Union CONTACT: David Seeley

ADDRESS: (Contact Engineer) PHONE: (Engineer)

ARCHITECT: McCleary/German Associates, Inc. CONTACT: Eric Batte

ADDRESS: (Contact Engineer) PHONE: (Engineer)

SURVEYOR: Harris Surveying CONTACT: T. Harris

ADDRESS: 2412 Monroe NE PHONE: 889-8056

CONTRACTOR: --- CONTACT: _____

ADDRESS: --- PHONE: _____

TYPE OF SUBMITTAL:

__ DRAINAGE REPORT
__ DRAINAGE PLAN
__CONCEPTUAL GRADING & DRAINAGE PLAN
__ GRADING PLAN
_ EROSION CONTROL PLAN
_X_ENGINEER'S CERTIFICATION
__ OTHER _____

PRE-DESIGN MEETING:

_ YES
X NO
_ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

_ SKETCH PLAT APPROVAL
_ PRELIMINARY PLAT APPROVAL
_ S. DEV. PLAN FOR SUB'D APPROVAL
_ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
_ SECTOR PLAN APPROVAL
_ FINAL PLAT APPROVAL
__ BUILDING PERMIT APPROVAL
_ CERTIFICATE OF OCCUPANCY APPROVAL
___GRADING PERMIT APPROVALS
_ PAVING PERMIT APPROVAL
_ S.A.B. DRAINAGE REPORT
__DRAINAGE REQUIREMENTS
_X FINAL CERTIFICATE OF OCCUPANCY APPROVAL

DATE SUBMITTED: JULY 12, 2001
BY: Guy C. Jackson

RECEIVED
JUL 12 2001
HYDROLOGY SECTION

BPLW

Architects & Engineers, Inc

July 12, 2001

6200 Uptown Blvd. NE
Suite 400
Albuquerque, New Mexico 87110
(505) 881-BPLW (2759)
FAX (505) 881-1230
e-mail: bplwnm@bplw.com
web site: http://www.bplw.com

John Murray, PE
Hydrology Review Engineer

Re: Grading and Drainage Certification for Kirtland Federal Credit Union BPLW #20048 COA Hydrology #G20/D4B

Dear Mr. Murray:

Attached for your review and approval are the following:

One (1) Drainage Information Sheet

Two (2) copies of the drawing

The site is located at 8900 Montgomery Blvd NE. This site is in compliance with the approved Montgomery Crossing Master Drainage Plan submitted in May, 2000. The site now is in substantial compliance with the approved plan as shown on the certification.

Please contact me if you have any questions or comments.

Sincerely,

BPLW ARCHITECTS & ENGINEERS, INC.

Guy Jackson, PE
Director of Civil Engineering

Attachments:

G-20/D4B

DRAINAGE INFORMATION SHEET

PROJECT TITLE AutoZone - 8820 Montgomery ZONE ATLAS/DRWG. FILE # G20-D4B

DRB#: _____ EPC #_____ WORK ORDER #

LEGAL DESCRIPTION: Tract A-2-A, Montgomery Crossing

CITY ADDRESS: 8820 Montgomery Blvd. NE

ENGINEERING FIRM: BPEW CONTACT: Guy Jackson

ADDRESS: 6200 Uptown Blvd., Suite 220 PHONE: 880-9670

OWNER: AutoZone, Inc. CONTACT: Arthur Nave

ADDRESS: 123 South Front St. Memphis TN, 38103 PHONE: 901-495-8714

ARCHITECT: See Owner CONTACT: See Owner
ADDRESS: PHONE: See Owner

SURVEYOR: Harris Surveying CONTACT: Tony Harris

ADDRESS: 24[illegible] Monroe NE 87110 PHONE: 888-8056

CONTRACTOR: --- TBD CONTACT:

ADDRESS: --- PHONE:

TYPE OF SUBMITTAL:

__ DRAINAGE REPORT
__ DRAINAGE PLAN
__CONCEPTUAL GRADING & DRAINAGE PLAN
_ GRADING PLAN
_ EROSION CONTROL PLAN
__ENGINEER'S CERTIFICATION
X Traffic Circulation Plan

PRE-DESIGN MEETING:
__ YES
X NO
_ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

__ SKETCH PLAT APPROVAL
__ PRELIMINARY PLAT APPROVAL
__ S. DEV. PLAN FOR SUB'D APPROVAL
__ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
__ SECTOR PLAN APPROVAL
__ FINAL PLAT APPROVAL
X BUILDING PERMIT APPROVAL
__ CERTIFICATE OF OCCUPANCY APPROVAL
__GRADING PERMIT APPROVALS
_ PAVING PERMIT APPROVAL
__ S.A.B. DRAINAGE REPORT
__DRAINAGE REQUIREMENTS

DATE SUBMITTED: Sept 13, 2004
BY: Guy Jackson, PE

RECEIVED
SEP 16 2004
HYDROLOGY SECTION

NO TCL

DRB SITE

PLAN

BPLW

Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, New Mexico 87110
(505) 881-BPLW (2759)
FAX (505) 881-1230
Web site: http://www.bplw.com

September 13, 2004

Kristal Metro
Engineering Associate
Planning Dept.
Development & Building Services
PO Box 1293
Albuquerque, New Mexico 87103

Re: AutoZone –8820 Montgomery Blvd. NE, Albuquerque, NM
(Zone Atlas Map G20)
BPLW Project Number: A04013

Dear Kristal:
Attached for review, comment and/or approval are the following:

- One (1) Drainage Information Sheet
- One (1) copy of the Horizontal Control Plan (Traffic Circulation Plan)
- One (1) copy of the Site Paving Plan

I've also submitted a drainage submittal to hydrology for the referenced project.
If you have any questions, please contact me at (505) 881-2759.

Sincerely,

BPLW ARCHITECTS & ENGINEERS, INC.

Guy Jackson, PE
Director of Civil Engineering

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 7, 2004

Guy Jackson, P.E.
BPLW Architects & Engineers, Inc.
6200 Uptown Blvd. NE Suite 400
Albuquerque, NM 87110

Re: AutoZone at Montgomery Crossing, Site Development Plan
Engineer's Stamp dated 6-22-04 (G20-D4B)

Dear Mr. Jackson,

Based upon the information provided in your submittal received 6-22-04, the above referenced plan is approved for Site Development Plan for Subdivision and Site Development Plan for Building Permit action by the DRB.

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: file

DRAINAGE INFORMATION SHEET

PROJECT TITLE Montgomery Crossing ZONE ATLAS/DRWG. FILE # G-20/D4B

DRB#: 1000300 EPC # Z-99-140 WORK ORDER #

LEGAL DESCRIPTION: Tract A-2-A Through A-2-G Inclusive Montgomery Crossing Addition

CITY ADDRESS: Montgomery Blvd. NE

ENGINEERING FIRM: BPLW CONTACT: Guy Jackson

ADDRESS: 6200 Uptown Blvd., Suite 220 PHONE: 880-9670

OWNER: S & J Enterprises Inc. CONTACT: John Triandafilidis

ADDRESS: 3535 Princeton NE 78107 PHONE: 884-6234

ARCHITECT: CONTACT
ADDRESS: PHONE:

SURVEYOR: Harris Surveying CONTACT: Tony Harris

ADDRESS: 2412 Monroe NE, 87110 PHONE: 889-8056

CONTRACTOR: --- CONTACT:

ADDRESS: --- PHONE:

TYPE OF SUBMITTAL:

__ DRAINAGE REPORT
_ DRAINAGE PLAN
X CONCEPTUAL GRADING & DRAINAGE PLAN
_ GRADING PLAN
_ EROSION CONTROL PLAN
_ENGINEER'S CERTIFICATION
_ OTHER

PRE-DESIGN MEETING:
_ YES
X NO
_ COPY PROVIDED

DATE SUBMITTED: June 22, 2004
BY: Guy Jackson, PE

CHECK TYPE OF APPROVAL SOUGHT:

_ SKETCH PLAT APPROVAL
_ PRELIMINARY PLAT APPROVAL
X S. DEV. PLAN FOR SUB'D APPROVAL
X S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
_ SECTOR PLAN APPROVAL
_ FINAL PLAT APPROVAL
__BUILDING PERMIT APPROVAL
__ CERTIFICATE OF OCCUPANCY APPROVAL
_GRADING PERMIT APPROVALS
_ PAVING PERMIT APPROVAL
_ S.A.B. DRAINAGE REPORT
__DRAINAGE REQUIREMENTS

BPLW

Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, New Mexico 87110
(505) 881-BPLW (2759)
FAX (505) 881-1230
Web site: http://www.bplw.com

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Ronald L. Peters, AIA, AICP
Joseph D. Long, Emeritus, AIA, PE
Bill J. Waters, Emeritus, AIA
Eugene A. Valentine, FCSI, CCS, AIA
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L. Fontaine Sanchez
Molly E. Smith, AICP

June 22, 2004

Bradley L. Bingham, PE
City of Albuquerque, Public Works
PO Box 1293
Albuquerque, New Mexico 87103

Re: Montgomery Crossing –Revised Master Grading Plan (G20/D4B)
BPLW Project Number: A04014

Dear Brad: Conceptual Grading & Drainage approval
Submitted for "~~Certification of Rough Grading~~" of the referenced site are the following:

- One (1) Drainage Information Sheet
- One (1) copy of Revised Master Grading & Drainage Plan

Attached for your review are the referenced items for EPC approval.

If you should have any questions, please contact me at (505) 881-2759.

Sincerely,

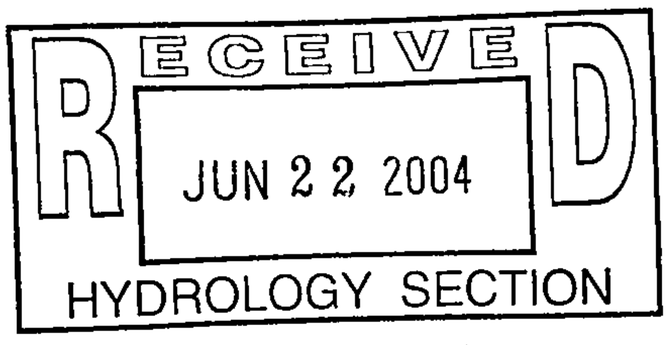
BPLW ARCHITECTS & ENGINEERS, INC.

Guy Jackson, PE
Director of Civil Engineering

MONTGOMERY CROSSING
REVISED CONCEPTUAL GRADING AND DRAINAGE PLAN
(G-20/D4B)

PREPARED BY
BPLW ARCHITECTS AND ENGINEERS

GUY C. JACKSON
PE#13289
JUNE 22, 2004



REVISED DRAINAGE PLAN

The following items concerning the Revised Montgomery Crossing Drainage Plan are contained herein:

1. Vicinity Map
2. Revised Grading Plan
3. Revised Drainage Calculations
4. Floodplain Map

As shown by the Vicinity Map, the site lies south of Montgomery Blvd. N.E. and east of the intersection of General Chenault N.E. and Montgomery Blvd. N.E.

Per flood insurance rate map 143 of 825 for Bernalillo County, dated September 20, 1996, the site does not lie within but is adjacent to a flood hazard zone area. The nearest flood hazard zone is located and contained in Montgomery Blvd, which is located north of the site and is designated as Zone A0 Depth 1. This floodplain begins just northwest of the site.

The current legal description of the property is as follows: Tract A-2-A, Tract A-2-B, Tract A-2-C, Tract A-2-D, Tract A-2-E, Tract A-2-F, and Tract A-2-G Inclusive Montgomery Crossing Addition Phase III.

The Original Grading and the Revised Grading Plan show the existing and proposed spot elevations and contours at 1'-0" intervals, site drainage, and character of the proposed improvements and also the existing conditions. The original plan for the property consisted of construction of a bank, two offices, a fast food restaurant, and three townhouses. Since the original proposal, the bank, the three townhouses, associated site work, utilities and drainage structures, have been constructed on the site. However the proposed fast food restaurant on Tract A-2-A of the property has been changed to an AutoZone Retail Store. The change of the building layout for this tract has generated minor revisions to the grading and drainage.

REVISIONS TO PROPOSED CONDITIONS:

The original Conceptual Grading and Drainage Plan submitted in May of 2000 by BPLW depicted seven proposed drainage basins, Basins A through F. The changes of the building layout for Tract A-2-A (Autozone Property) have slightly impacted four of the originally proposed drainage basins. The original intent and total discharge of the original drainage plan remains the same with slight changes to the individual basins, which are summarized below.

- Basin "A", located centrally within the site, comprises of most the site and drains overland and underground via storm drain to the underground drainage vault located on the western portion of the site. This basin has slightly decreased in size from the original proposal with Basin "G" taking some land area from this basin. Both Basin "A" and "G" in the current proposal and original proposal flow to the underground drainage vault. Thus, the underground storm sewer will not be exposed to an increase or decrease in flow.

- Basin "B" drains to an inlet located between proposed Buildings 3 and 4, which then flows underground to the underground drainage vault. There has been no change to this basin from the original plan.
- Basin "C", located near the northwest corner of the site, was originally planned to drain to the north to Montgomery Blvd. via a concrete rundown channel with an associated sidewalk culvert. This basin has slightly increased in size from the original proposal by taking some land area from Basin "F". Both ~~of these~~ basins, "C" and "F" ~~both~~ flow overland into Montgomery Blvd., so no increase in flow has been added to Montgomery Blvd. The revised Basin "C" will continue draining to Montgomery Blvd. However, the direction of flow will travel via concrete rundown to the west to the side street on the property, then north down the side street to Montgomery Blvd.
- Basin "D" drains to an inlet located to the east of the bank building. This runoff is then piped into the underground drainage vault. There has been no change to this basin from the original plan.
- Basin "E" located along the southern portion of site drains toward the west exiting the site via an opening in the wall. This basin freely discharges into the access road located west of the site and then flows to Montgomery Blvd. There has been no change to this basin from the original plan.
- Basin "F", located along the periphery of the north and west sides of the site, drains by sheet flow directly onto Montgomery Blvd. This basin has reduced in size from the original proposal. However, the land area taken from this basin has been added to Basin "C", which also drains to Montgomery via sheet flow. **So no increase or decrease of flow into Montgomery has occurred.**
- Basin "G" drains a small area, located at the northwest corner of the site to an inlet just east of the proposed fast food restaurant at a controlled discharge rate into the underground drainage vault. This basin has increased in size by taking land area from Basin "A". However, both these basins drain into the underground vault system, thus the underground vault system will see no increase of flow. The inlet that the basin drains currently will be modified to drain the basin with the new building layout.

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 17, 2001

Guy Jackson, P.E.
BPLW
6200 Uptown Blvd NE Suite 220
Albuquerque, New Mexico 87110

RE: **MONTGOMERY CROSSING PHASE 3** **(G-20/D4B)**
(Master Grading and Drainage Plan)
Engineers Certification For Release of Financial Guaranty
Engineers Stamp dated 6/9/2000
Engineer's Certification dated 6/29/2001

Dear Guy:

Based upon the information provided in your submittal dated July 2, 2001, the above referenced plan is adequate to satisfy the Grading and Drainage Certification requirements for Release of Financial Guaranty.

If you have any questions, please call me at 924-3981.

Sincerely,

Teresa A. Martin
Hydrology Plan Checker
Public Works Department

BLB

C: Arlene Portillo, PWD – #639681
File

DRAINAGE INFORMATION SHEET

PROJECT TITLE Montgomery Crossing ZONE ATLAS/DRWG. FILE # G-20/D4B

DRB#: 1000300 EPC # Z-99-140 WORK ORDER # 639681

LEGAL DESCRIPTION: Tract A-2-A Through A-2-G Inclusive Montgomery Crossing Addition

CITY ADDRESS: Montgomery Blvd. NE

ENGINEERING FIRM: BPLW CONTACT: Guy Jackson

ADDRESS: 6200 Uptown Blvd., Suite 220 PHONE: 880-9670

OWNER: S & J Enterprises Inc. CONTACT: John Triandafilidis

ADDRESS: 3535 Princeton NE 78107 PHONE: 884-6234

ARCHITECT: SLNB Architects CONTACT: Jim Lewis

ADDRESS: 1620 Central Avenue SE PHONE: 247-1529

SURVEYOR: Community Sciences Corp. CONTACT: Tony Yanchilis

ADDRESS: P.O.Box 1328 Corrales NW, 87048 PHONE: 897-0000

CONTRACTOR: --- CONTACT: _____

ADDRESS: --- PHONE: _____

TYPE OF SUBMITTAL:

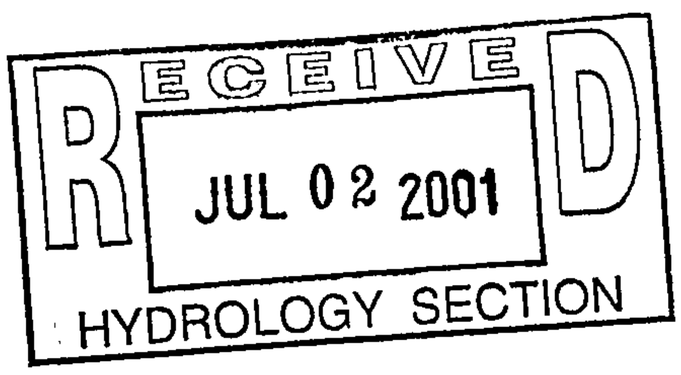
__ DRAINAGE REPORT
_ DRAINAGE PLAN
__CONCEPTUAL GRADING & DRAINAGE PLAN
_ GRADING PLAN
_ EROSION CONTROL PLAN
_X_ENGINEER'S CERTIFICATION
_ OTHER _____

PRE-DESIGN MEETING:
_X_ YES
_ NO
_ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

_ SKETCH PLAT APPROVAL
_ PRELIMINARY PLAT APPROVAL
_ S. DEV. PLAN FOR SUB'D APPROVAL
_ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
_ SECTOR PLAN APPROVAL
_ FINAL PLAT APPROVAL
__BUILDING PERMIT APPROVAL
__ CERTIFICATE OF OCCUPANCY APPROVAL
_GRADING PERMIT APPROVALS
_ PAVING PERMIT APPROVAL
_ S.A.B. DRAINAGE REPORT
__DRAINAGE REQUIREMENTS
_X_Rough Grading Certification for release of Financial Guarantee's

DATE SUBMITTED: July 2, 2001
BY: Guy Jackson, PE



BPLW

Architects & Engineers, Inc.

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web site: http://www.bplw.com

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W. Paul Waters, AIA

Vice Presidents
Edward J. Aragon, AIA
David A. Aube, PE
Paul W. Browne, AIA, CDT
Curtis L. Chavez
Manuel Gabaldon, PE
Ian F. Harmon
Pamela M. Lentini, PE
Tyler M. Mason, AIA, CCS
L. Fontaine Sanchez
Molly E. Smith
Jason M. Weaver, PE

July 2, 2001

Bradley L. Bingham, PE
City of Albuquerque, Public Works
PO Box 1293
Albuquerque, New Mexico 87103

Re: ***Montgomery Crossing Rough Grading Plan Certification (G20/D4B) COA Project No:*** 639681
BPLW Project Number: 99060

Dear Brad:

Submitted for "Certification of Rough Grading" of the referenced site are the following:

- One (1) Drainage Information Sheet
- Two (2) copies of the as-builts with Surveyor's and Engineer's Certification
- One (1) copy of the Kirtland Federal Credit Union certification for temporary certificate of occupancy.

Currently, the Kirtland Federal Credit Union site, which is located on the northeast corner of the Montgomery is undergoing site modifications listed as deficiencies in the May 16, 2001 submittal for temporary C.O. I have been working with the contractor to resolve these issues. I anticipate the work to be complete within two weeks.

The remainder of the Montgomery Crossing site appears to be within substantial compliance of the approved rough grading plan. In fact, the southwest corner of the site has been regraded by the developer to ensure that the grades match those of the existing (historic) grades as shown on the approved plan. Basically, the material next to the adjacent south property wall was removed.

If you should have any questions, please contact me at (505) 880-9670.

Sincerely,

BPLW ARCHITECTS & ENGINEERS, INC.

Guy Jackson, PE
Director of Civil Engineering

CITY OF ALBUQUERQUE

Planning Department
Transportation Development Services Section

May 5, 2005

Guy Jackson, P.E.
6200 Uptown Blvd, NE, Ste. 400
Albuquerque, NM 87110

Re: Certification Submittal for Final Building Certificate of Occupancy for
Auto Zone, [G-20 / D4B]
8820 Montgomery Blvd NE
Engineer's Stamp Dated 05/03/05

Dear Mr. Jackson:

The TCL / Letter of Certification submitted on May 3, 2005 is sufficient for acceptance by this office for final Certificate of Occupancy (C.O.). Notification has been made to the Building and Safety Section.

Sincerely,

Nilo E. Salgado-Fernandez, P.E.
Senior Traffic Engineer
Development and Building Services
Planning Department

c: Engineer
Hydrology file
CO Clerk

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: Autozone Mont Crossings ZONE MAP/DRG. FILE #: G-20/D4B
DRB #: _____ EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION:
CITY ADDRESS: 8820 Montgomery Blvd NE

ENGINEERING FIRM: BPLW Architects & Engs CONTACT: Guy Jackson
ADDRESS: 6200 Uptown PHONE: 505-881-2758
CITY, STATE: Albuquerque, NM ZIP CODE: 87110

OWNER: CONTACT:
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:

Nilo: Wilfred gave them a "Verbal" 5/5/5 permanent C.O.'s. We just need a letter done & taken to Phyllis & Send to Arrival Avenue

CHECK TYPE OF SUBMITTAL:

____ DRAINAGE REPORT
____ DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal***
____ DRAINAGE PLAN RESUBMITTAL
____ CONCEPTUAL GRADING & DRAINAGE PLAN
____ GRADING PLAN
____ EROSION CONTROL PLAN
____ ENGINEER'S CERTIFICATION (HYDROLOGY)
____ CLOMR/LOMR
____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ ENGINEERS CERTIFICATION (TCL)
X ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
____ OTHER

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
X 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
____ NO
____ COPY PROVIDED

DATE SUBMITTED: _____ BY: Jon Pena

RECEIVED
MAY 03 2005
HYDROLOGY SECTION

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature , location and scope ot 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 subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

Cert. is on the ~~Plan~~ Site Plan

BPLW

Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, New Mexico 87110
(505) 881-BPLW (2759)
FAX (505) 881-1230
Web site: http://www.bplw.com

May 3, 2005

Kristal Metro
Hydrology Development Section
City of Albuquerque Public Works
PO Box 1293
Albuquerque, New Mexico 87103

Re: AutoZone –8820 Montgomery Blvd. NE, Albuquerque, NM
(Zone Atlas Map G20)
BPLW Project Number: A04013

Dear Kristal:
Attached for review, comment and/or approval are the following:

- One (1) Drainage Information Sheet for Traffic Circulation Plan Certification for C.O.
- One (1) copy of the Certified/Approved Site Plan
- One (1) copy of the Temporary Certificate of Occupancy Approval Letter.

I've also submitted a drainage submittal to hydrology for the referenced project.
If you have any questions, please contact me at (505) 881-2759.

Sincerely,

BPLW ARCHITECTS & ENGINEERS, INC.

Guy Jackson, PE
Director of Civil Engineering

CITY OF ALBUQUERQUE

April 29, 2005

Guy Jackson, P.E.
BPLW Architects & Engineers, Inc.
6200 Uptown Blvd. NE Suite 400
Albuquerque, NM 87110

Re: AutoZone at Montgomery Crossing, 8820 Montgomery Blvd NE, TEMPORARY Certificate of Occupancy (G20-D004B)

Dear Mr. Jackson,

Based upon the information provided in your submittal received 4-29-05, the above referenced certification is approved for release of 30-day Temporary Certificate of Occupancy by Transportation Development.

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: Phyllis Villanueva
file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

RECEIVED
MAY 03 2005
HYDROLOGY SECTION

CITY OF ALBUQUERQUE

April 29, 2005

Guy Jackson, P.E.
BPLW Architects & Engineers, Inc.
6200 Uptown Blvd. NE Suite 400
Albuquerque, NM 87110

Re: AutoZone at Montgomery Crossing, 8820 Montgomery Blvd NE, TEMPORARY Certificate of Occupancy (G20-D004B)

Dear Mr. Jackson,

Based upon the information provided in your submittal received 4-29-05, the above referenced certification is approved for release of 30-day Temporary Certificate of Occupancy by Transportation Development.

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: Phyllis Villanueva
file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

DRAINAGE INFORMATION SHEET
(Traffic Circulation)

PROJECT TITLE AutoZone ZONE ATLAS/DRWG. FILE # G20-D4B

DRB#: _____ EPC #_____ WORK ORDER #

LEGAL DESCRIPTION: Tract A-2-A, Montgomery Crossing

CITY ADDRESS: 8820 Montgomery Blvd. NE

ENGINEERING FIRM: BPLW CONTACT: Guy Jackson

ADDRESS: 6200 Uptown Blvd., Suite 220 PHONE: 880-9670

OWNER: AutoZone, Inc. CONTACT: Arthur Nave

ADDRESS: 123 South Front St. Memphis TN, 38103 PHONE: 901-495-8714

ARCHITECT: See Owner CONTACT: See Owner
ADDRESS: _____ PHONE: See Owner

SURVEYOR: Harris Surveying CONTACT: Tony Harris

ADDRESS: 2412 Monroe NE, 87110 PHONE: 889-8056

CONTRACTOR: --- TBD CONTACT:

ADDRESS: --- PHONE:

TYPE OF SUBMITTAL:

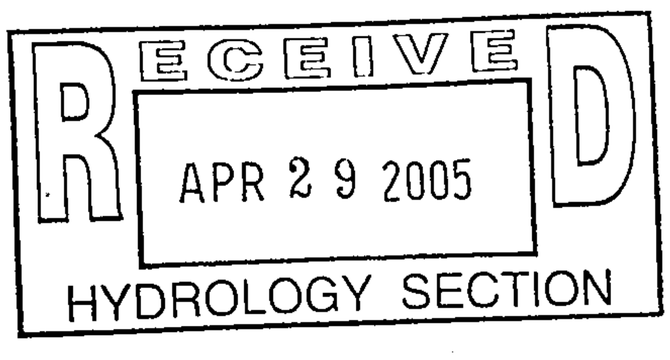
__ DRAINAGE REPORT
__ DRAINAGE PLAN
__CONCEPTUAL GRADING & DRAINAGE PLAN
_ GRADING PLAN
_ EROSION CONTROL PLAN
_X_ENGINEER'S CERTIFICATION (Traffic Circulation)

CHECK TYPE OF APPROVAL SOUGHT:

_ SKETCH PLAT APPROVAL
_ PRELIMINARY PLAT APPROVAL
_ S. DEV. PLAN FOR SUB'D APPROVAL
__ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
_ SECTOR PLAN APPROVAL
_ FINAL PLAT APPROVAL
___ BUILDING PERMIT APPROVAL
_X_ CERTIFICATE OF OCCUPANCY APPROVAL
__GRADING PERMIT APPROVALS
_ PAVING PERMIT APPROVAL
_ S.A.B. DRAINAGE REPORT
__DRAINAGE REQUIREMENTS

PRE-DESIGN MEETING:
__ YES
__ NO
_ COPY PROVIDED

DATE SUBMITTED: April 29, 2005
BY: Guy Jackson, PE



BPLW

Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, New Mexico 87110
(505) 881-BPLW (2759)
FAX (505) 881-1230
Web site: http://www.bplw.com

April 29, 2005

Kristal Metro
Hydrology Development Section
City of Albuquerque Public Works
PO Box 1293
Albuquerque, New Mexico 87103

Re: AutoZone –8820 Montgomery Blvd. NE, Albuquerque, NM (Zone Atlas Map G20)
BPLW Project Number: A04013

Dear Kristal:
Attached for review, comment and/or approval are the following:

- One (1) Drainage Information Sheet for Traffic Circulation Plan Certification for C.O.
- One (1) copy of the Certified Traffic Circulation Plan

I've also submitted a drainage submittal to hydrology for the referenced project.
If you have any questions, please contact me at (505) 881-2759.

Sincerely,

BPLW ARCHITECTS & ENGINEERS, INC.

Guy Jackson, PE
Director of Civil Engineering

CITY OF ALBUQUERQUE

October 12, 2004

Guy Jackson, P.E.
BPLW Architects & Engineers, Inc.
6200 Uptown Blvd. NE Suite 400
Albuquerque, NM 87110

Re: AutoZone at Montgomery Crossing, 8820 Montgomery Blvd NE, Grading and Drainage Plan
Engineer's Stamp dated 9-10-04 (G20-D004B)

Dear Mr. Jackson,

Based upon the information provided in your submittal received 9-16-04, the above referenced plan is approved for Building Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: File

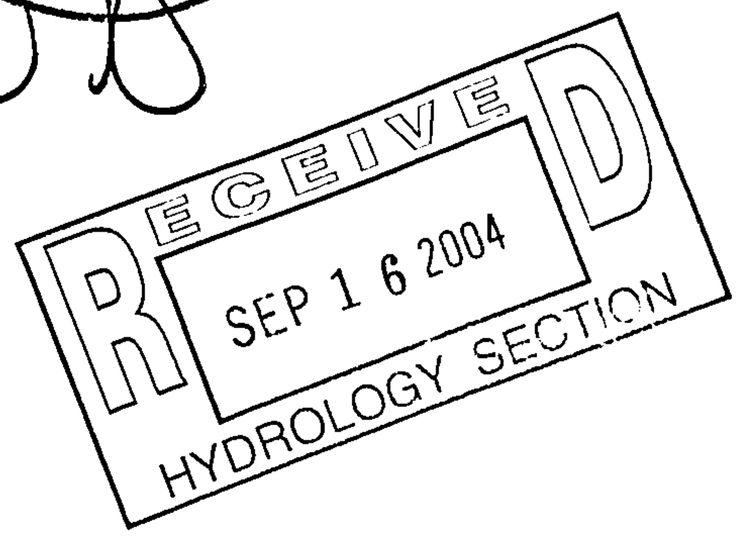
2/2/07 A separate permit (SO#19) is required for construction within City ROW. A copy of this approval letter must be on hand when applying for the excavation permit.

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

MONTGOMERY CROSSING
REVISED CONCEPTUAL GRADING AND DRAINAGE PLAN
(G-20/D4B)

PREPARED BY
BPLW ARCHITECTS AND ENGINEERS

GUY C. JACKSON
PE#13289
JUNE 22, 2004



REVISED DRAINAGE PLAN

The following items concerning the Revised Montgomery Crossing Drainage Plan are contained herein:

1. Vicinity Map
2. Revised Grading Plan
3. Revised Drainage Calculations
4. Floodplain Map

As shown by the Vicinity Map, the site lies south of Montgomery Blvd. N.E. and east of the intersection of General Chenault N.E. and Montgomery Blvd. N.E.

Per flood insurance rate map 143 of 825 for Bernalillo County, dated September 20, 1996, the site does not lie within but is adjacent to a flood hazard zone area. The nearest flood hazard zone is located and contained in Montgomery Blvd, which is located north of the site and is designated as Zone A0 Depth 1. This floodplain begins just northwest of the site.

The current legal description of the property is as follows: Tract A-2-A, Tract A-2-B, Tract A-2-C, Tract A-2-D, Tract A-2-E, Tract A-2-F, and Tract A-2-G Inclusive Montgomery Crossing Addition Phase III.

The Original Grading and the Revised Grading Plan show the existing and proposed spot elevations and contours at 1'-0" intervals, site drainage, and character of the proposed improvements and also the existing conditions. The original plan for the property consisted of construction of a bank, two offices, a fast food restaurant, and three townhouses. Since the original proposal, the bank, the three townhouses, associated site work, utilities and drainage structures, have been constructed on the site. However the proposed fast food restaurant on Tract A-2-A of the property has been changed to an AutoZone Retail Store. The change of the building layout for this tract has generated minor revisions to the grading and drainage.

REVISIONS TO PROPOSED CONDITIONS:

The original Conceptual Grading and Drainage Plan submitted in May of 2000 by BPLW depicted seven proposed drainage basins, Basins A through F. The changes of the building layout for Tract A-2-A (Autozone Property) have slightly impacted four of the originally proposed drainage basins. The original intent and total discharge of the original drainage plan remains the same with slight changes to the individual basins, which are summarized below.

- Basin "A", located centrally within the site, comprises of most the site and drains overland and underground via storm drain to the underground drainage vault located on the western portion of the site. This basin has slightly decreased in size from the original proposal with Basin "G" taking some land area from this basin. Both Basin "A" and "G" in the current proposal and original proposal flow to the underground drainage vault. Thus, the underground storm sewer will not be exposed to an increase or decrease in flow.

- Basin "B" drains to an inlet located between proposed Buildings 3 and 4, which then flows underground to the underground drainage vault. There has been no change to this basin from the original plan.
- Basin "C", located near the northwest corner of the site, was originally planned to drain to the north to Montgomery Blvd. via a concrete rundown channel with an associated sidewalk culvert. This basin has slightly increased in size from the original proposal by taking some land area from Basin "F". Both of these basins, "C" and "F" both flow overland into Montgomery Blvd., so no increase in flow has been added to Montgomery Blvd. The revised Basin "C" will continue draining to Montgomery Blvd. However, the direction of flow will travel via concrete rundown to the west to the side street on the property, then north down the side street to Montgomery Blvd.
- Basin "D" drains to an inlet located to the east of the bank building. This runoff is then piped into the underground drainage vault. There has been no change to this basin from the original plan.
- Basin "E" located along the southern portion of site drains toward the west exiting the site via an opening in the wall. This basin freely discharges into the access road located west of the site and then flows to Montgomery Blvd. There has been no change to this basin from the original plan.
- Basin "F", located along the periphery of the north and west sides of the site, drains by sheet flow directly onto Montgomery Blvd. This basin has reduced in size from the original proposal. However, the land area taken from this basin has been added to Basin "C", which also drains to Montgomery via sheet flow. **So no increase or decrease of flow into Montgomery has occurred.**
- Basin "G" drains a small area, located at the northwest corner of the site to an inlet just east of the proposed fast food restaurant at a controlled discharge rate into the underground drainage vault. This basin has increased in size by taking land area from Basin "A". However, both these basins drain into the underground vault system, thus the underground vault system will see no increase of flow. The inlet that the basin drains currently will be modified to drain the basin with the new building layout.

AUTOZONE
0.00
06/02/04
JON PENA

DPM Section 22.2 - Hydrology

Part A-Watersheds less than 40 acres.
January, 1993

INSTRUCTIONS

* Spread sheet requires three input areas (dark cells):
  - Location
  - >A.1 Precipitation Zone
  - >A.3 Land Treaments
* Values from the tables are automatically placed using "if" statements.
* Table values should be checked for correctness for each use.

SUMMARY

Location	MONT. CROSSING NE	A	B	C				TOTALS		
Precipitation Zone		3	3	3	3	3	3	3	3	
Land Area		0.64	0.18	2.93	0.00	0.00	0.00	0.28	3.75	acres
Excess Precipitation Volume										
>>>	**100-year 6-hour (design)**	0.05	0.02	0.23	#DIV/0!	#DIV/0!	#DIV/0!	0.02	0.30	acre-ft.
	10-year 6-hour	0.02	0.01	0.09	#DIV/0!	#DIV/0!	#DIV/0!	0.01	0.12	acre-ft.
	2-year 6-hour	0.00	0.00	0.02	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.02	acre-ft.
	100-year 24-hour	0.05	0.02	0.23	#DIV/0!	#DIV/0!	#DIV/0!	0.02	0.30	acre-ft.
Peak Discharge Rates (DPM)										
>>>	**Q100 (design)**	1.66	0.52	7.74	0.00	0.00	0.00	0.73	9.92	**cfs**
	Q10	0.76	0.26	3.60	0.00	0.00	0.00	0.33	4.62	cfs
	Q2	0.13	0.07	0.71	0.00	0.00	0.00	0.06	0.92	cfs
Peak Discharge Rates (DPM-Rational Method)										
>>>	**Q100 (design)**	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	**cfs**
	Q10	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	cfs
	Q2	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	cfs

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS

	LOCATION	MONT. CROSSING NE								
>A.1	PRECIPITATION ZONE (from Table A-1)	3	3	3	3	3	3	3	3	
>A.2	DEPTHS									
	(from Table A-2)								TOTALS	
	100-YEAR STORM (P60)	2.14	2.14	2.14	2.14	2.14	2.14	2.14	2.14	inches
	100-YEAR STORM (P360)	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	inches
	100-YEAR STORM (P1440)	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	inches
	10-YEAR (P360) (Calculated: P360*RPF10)	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	inches
	2-YEAR (P360) (Calculated: P360*RPF2)	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	inches
>A.3	LAND TREATMENTS (Ai)									
	Treatment A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	acres
	Treatment B	0.64	0.16	2.88	0.00	0.00	0.00	0.28	3.68	acres
	Treatment C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	acres
	Treatment D	0.00	0.02	0.05	0.00	0.00	0.00	0.00	0.07	acres
	Total Area	0.64	0.18	2.93	0.00	0.00	0.00	0.28	3.75	acres
>A.4	ABSTRACTIONS	See A.5	See A.5	See A.5	See A.5	See A.5	See A.5	See A.5	See A.5	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.5 EXCESS PRECIPITATION 6 HOUR AND 24 HOUR (Ei)
from Table A-8

							TOTALS		
100-year 6-hour									
Treatment A	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	inches
Treatment B	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	inches
Treatment C	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	inches
Treatment D	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	inches
WEIGHTED E (Sum Ei*Ai/A)	0.92	1.08	0.94	#DIV/0!	#DIV/0!	#DIV/0!	0.92	0.95	inches
VOLUME V100:6h (E*A)	0.05	0.02	0.23	#DIV/0!	#DIV/0!	#DIV/0!	0.02	0.30	acre-ft.
	2,137.34	705.67	10,046.39	#DIV/0!	#DIV/0!	#DIV/0!	935.09	12,889.40	ft^3
10-year 6-hour									
Treatment A	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	inches
Treatment B	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	inches
Treatment C	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	inches
Treatment D	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	inches
WEIGHTED E (Sum Ei*Ai/A)	0.36	0.49	0.38	#DIV/0!	#DIV/0!	#DIV/0!	0.36	0.38	inches
VOLUME V10:6h (E*A)	0.02	0.01	0.09	#DIV/0!	#DIV/0!	#DIV/0!	0.01	0.12	acre-ft.
	836.35	317.99	4,035.83	#DIV/0!	#DIV/0!	#DIV/0!	365.90	5,190.17	ft^3
2-year 6-hour									
Treatment A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
Treatment B	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	inches
Treatment C	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	inches
Treatment D	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	inches
WEIGHTED E (Sum Ei*Ai/A)	0.06	0.15	0.07	#DIV/0!	#DIV/0!	#DIV/0!	0.06	0.08	inches
VOLUME V2:6h (E*A)	0.00	0.00	0.02	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.02	acre-ft.
	139.39	99.46	788.80	#DIV/0!	#DIV/0!	#DIV/0!	60.98	1,027.65	ft^3
100-year 24-hour									
VOLUME V100:24h									
(V100-6h+Ad*P1440-P360)/12)	0.05	0.02	0.23	#DIV/0!	#DIV/0!	#DIV/0!	0.02	0.30	acre-ft.
	2,137.34	741.97	10,137.14	#DIV/0!	#DIV/0!	#DIV/0!	935.09	13,016.45	ft^3

CALCULATIONS FOLLOW

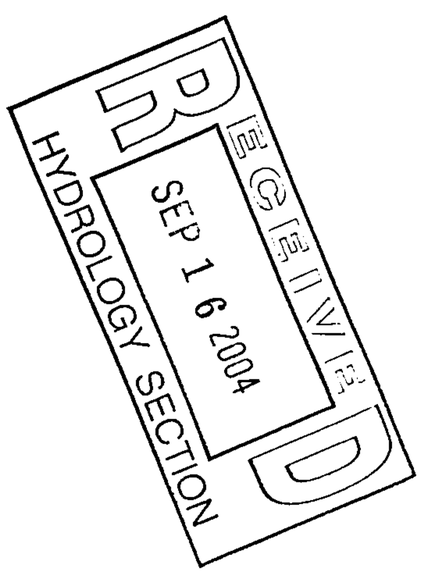
INPUT AND CALCULATIONS (CON'T)

>A.6 PEAK DISCHARGE RATE FOR SMALL WATERSHEDS (Qi)

from Table A-9

								TOTALS	
100-year									
Treatment A	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	cfs/acre
Treatment B	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	cfs/acre
Treatment C	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	cfs/acre
Treatment D	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	cfs/acre
Q100 (Sum Qi*Ai)	1.66	0.52	7.74	0.00	0.00	0.00	0.73	9.92	cfs
10-year									
Treatment A	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	cfs/acre
Treatment B	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	cfs/acre
Treatment C	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	cfs/acre
Treatment D	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	cfs/acre
Q10 (Sum Qi*Ai)	0.76	0.26	3.60	0.00	0.00	0.00	0.33	4.62	cfs
2-year									
Treatment A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	cfs/acre
Treatment B	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	cfs/acre
Treatment C	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	cfs/acre
Treatment D	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	cfs/acre
Q2 (Sum Qi*Ai)	0.13	0.07	0.71	0.00	0.00	0.00	0.06	0.92	cfs

CALCULATIONS FOLLOW



RATIONAL METHOD

PEAK INTENSITY (in/hr at tc=0.2 hour) from Table A-10								TOTALS	
Peak Intensity (I) 100-year	**5.38**	**5.38**	**5.38**	**5.38**	**5.38**	**5.38**	**5.38**	**5.38**	
Peak Intensity (I) 10-year	**3.65**	**3.65**	**3.65**	**3.65**	**3.65**	**3.65**	**3.65**	**3.65**	
Peak Intensity (I) 2-year	**2.21**	**2.21**	**2.21**	**2.21**	**2.21**	**2.21**	**2.21**	**2.21**	
RATIONAL METHOD COEFFICIENT, C from Table A-11									
100-year									
Treatment A	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**	cfs/acre
Treatment B	**0.48**	**0.48**	**0.48**	**0.48**	**0.48**	**0.48**	**0.48**	**0.48**	cfs/acre
Treatment C	**0.64**	**0.64**	**0.64**	**0.64**	**0.64**	**0.64**	**0.64**	**0.64**	cfs/acre
Treatment D	**0.93**	**0.93**	**0.93**	**0.93**	**0.93**	**0.93**	**0.93**	**0.93**	cfs/acre
Q100 (Sum Qi*I*Ai)	**1.65**	**1.65**	**1.65**	**1.65**	**1.65**	**1.65**	**1.65**	**1.65**	cfs
10-year									
Treatment A	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	cfs/acre
Treatment B	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	cfs/acre
Treatment C	**0.55**	**0.55**	**0.55**	**0.55**	**0.55**	**0.55**	**0.55**	**0.55**	cfs/acre
Treatment D	**0.93**	**0.93**	**0.93**	**0.93**	**0.93**	**0.93**	**0.93**	**0.93**	cfs/acre
Q10 (Sum Qi*I*Ai)	**0.77**	**0.77**	**0.77**	**0.77**	**0.77**	**0.77**	**0.77**	**0.77**	cfs
2-year									
Treatment A	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	cfs/acre
Treatment B	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	cfs/acre
Treatment C	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**	cfs/acre
Treatment D	**0.92**	**0.92**	**0.92**	**0.92**	**0.92**	**0.92**	**0.92**	**0.92**	cfs/acre
Q2 (Sum Qi*I*Ai)	**0.14**	**0.14**	**0.14**	**0.14**	**0.14**	**0.14**	**0.14**	**0.14**	cfs

AUTOZONE
0
06/02/04
JON PENA

DPM Section 22.2 - Hydrology

Part A-Watersheds less than 40 acres.
January, 1993

INSTRUCTIONS

* Spread sheet requires three input areas (dark cells):
  - Location
  - >A.1 Precipitation Zone
  - >A.3 Land Treaments
* Values from the tables are automatically placed using "if" statements.
* Table values should be checked for correctness for each use.

SUMMARY

Location	MONT. CROSSING NE	A	B	C	D	E	F	G	TOTALS	
Precipitation Zone		3	3	3	3	3	3	3	3	
Land Area		1.82	0.10	0.15	0.27	0.20	0.79	0.42	3.75	acres
Excess Precipitation Volume										
>>>	**100-year 6-hour (design)**	0.33	0.02	0.03	0.05	0.04	0.13	0.08	0.67	**acre-ft.**
	10-year 6-hour	0.20	0.01	0.02	0.03	0.03	0.08	0.05	0.41	acre-ft.
	2-year 6-hour	0.12	0.01	0.01	0.02	0.01	0.04	0.03	0.24	acre-ft.
	100-year 24-hour	0.39	0.02	0.03	0.06	0.05	0.15	0.09	0.80	acre-ft.
Peak Discharge Rates (DPM)										
>>>	**Q100 (design)**	8.55	0.50	0.73	1.26	1.00	3.46	2.03	17.53	**cfs**
	Q10	5.64	0.34	0.49	0.83	0.68	2.23	1.35	11.55	cfs
	Q2	3.26	0.20	0.29	0.48	0.41	1.22	0.80	6.65	cfs
Peak Discharge Rates (DPM-Rational Method)										
>>>	**Q100 (design)**	8.52	8.52	8.52	8.52	8.52	8.52	8.52	8.52	**cfs**
	Q10	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	cfs
	Q2	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	cfs

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS

	LOCATION	MONT. CROSSING NE								
>A.1	PRECIPITATION ZONE (from Table A-1)	3	3	3	3	3			3	
									TOTALS	
>A.2	DEPTHS (from Table A-2)									
	100-YEAR STORM (P60)	2.14	2.14	2.14	2.14	2.14	2.14	2.14	2.14	inches
	100-YEAR STORM (P360)	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	inches
	100-YEAR STORM (P1440)	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	inches
	10-YEAR (P360) (Calculated: P360*RPF10)	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	inches
	2-YEAR (P360) (Calculated: P360*RPF2)	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	inches
>A.3	LAND TREATMENTS (Ai)								TOTALS	
	Treatment A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	acres
	Treatment B	0.14	0.00	0.01	0.04	0.00	0.11	0.02	0.32	acres
	Treatment C	0.16	0.00	0.00	0.00	0.00	0.15	0.02	0.33	acres
	Treatment D	1.52	0.10	0.14	0.23	0.20	0.53	0.38	3.10	acres
	Total Area	1.82	0.10	0.15	0.27	0.20	0.79	0.42	3.75	acres
>A.4	ABSTRACTIONS	See A.5	See A.5	See A.5	See A.5	See A.5	See A.5	See A.5	See A.5	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.5 EXCESS PRECIPITATION 6 HOUR AND 24 HOUR (Ei) from Table A-8							TOTALS		
100-year 6-hour									
Treatment A	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	inches
Treatment B	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	inches
Treatment C	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	inches
Treatment D	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	inches
WEIGHTED E (Sum Ei*Ai/A)	2.16	2.36	2.26	2.15	2.36	1.96	2.24	2.14	inches
VOLUME V100:6h (E*A)	0.33	0.02	0.03	0.05	0.04	0.13	0.08	0.67	acre-ft.
	14,238.31	856.68	1,232.75	2,103.95	1,713.36	5,610.17	3,415.83	29,171.04	ft^3
10-year 6-hour									
Treatment A	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	inches
Treatment B	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	inches
Treatment C	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	inches
Treatment D	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	inches
WEIGHTED E (Sum Ei*Ai/A)	1.33	1.50	1.42	1.33	1.50	1.17	1.40	1.33	inches
VOLUME V10:6h (E*A)	0.20	0.01	0.02	0.03	0.03	0.08	0.05	0.41	acre-ft.
	8,819.45	544.50	775.37	1,304.62	1,089.00	3,367.19	2,140.25	18,040.37	ft^3
2-year 6-hour									
Treatment A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
Treatment B	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	inches
Treatment C	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	inches
Treatment D	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	inches
WEIGHTED E (Sum Ei*Ai/A)	0.77	0.89	0.83	0.77	0.89	0.64	0.82	0.76	inches
VOLUME V2:6h (E*A)	0.12	0.01	0.01	0.02	0.01	0.04	0.03	0.24	acre-ft.
	5,057.32	323.07	454.48	751.77	646.14	1,845.13	1,246.54	10,324.45	ft^3
100-year 24-hour									
VOLUME V100:24h (V100-6h+Ad*P1440-P360)/12)	0.39	0.02	0.03	0.06	0.05	0.15	0.09	0.80	acre-ft.
	16,997.11	1,038.18	1,486.85	2,521.40	2,076.36	6,572.12	4,105.53	34,797.54	ft^3

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.6 PEAK DISCHARGE RATE FOR SMALL WATERSHEDS (Qi)
from Table A-9

								TOTALS	
100-year									
Treatment A	**1.87**	**1.87**	**1.87**	**1.87**	**1.87**	**1.87**	**1.87**	**1.87**	cfs/acre
Treatment B	**2.60**	**2.60**	**2.60**	**2.60**	**2.60**	**2.60**	**2.60**	**2.60**	cfs/acre
Treatment C	**3.45**	**3.45**	**3.45**	**3.45**	**3.45**	**3.45**	**3.45**	**3.45**	cfs/acre
Treatment D	**5.02**	**5.02**	**5.02**	**5.02**	**5.02**	**5.02**	**5.02**	**5.02**	cfs/acre
Q100 (Sum Qi*Ai)	**8.55**	**0.50**	**0.73**	**1.26**	**1.00**	**3.46**	**2.03**	**17.53**	cfs
10-year									
Treatment A	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	cfs/acre
Treatment B	**1.19**	**1.19**	**1.19**	**1.19**	**1.19**	**1.19**	**1.19**	**1.19**	cfs/acre
Treatment C	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	cfs/acre
Treatment D	**3.39**	**3.39**	**3.39**	**3.39**	**3.39**	**3.39**	**3.39**	**3.39**	cfs/acre
Q10 (Sum Qi*Ai)	**5.64**	**0.34**	**0.49**	**0.83**	**0.68**	**2.23**	**1.35**	**11.55**	cfs
2-year									
Treatment A	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	cfs/acre
Treatment B	**0.21**	**0.21**	**0.21**	**0.21**	**0.21**	**0.21**	**0.21**	**0.21**	cfs/acre
Treatment C	**0.78**	**0.78**	**0.78**	**0.78**	**0.78**	**0.78**	**0.78**	**0.78**	cfs/acre
Treatment D	**2.04**	**2.04**	**2.04**	**2.04**	**2.04**	**2.04**	**2.04**	**2.04**	cfs/acre
Q2 (Sum Qi*Ai)	**3.26**	**0.20**	**0.29**	**0.48**	**0.41**	**1.22**	**0.80**	**6.65**	cfs

CALCULATIONS FOLLOW

RATIONAL METHOD

PEAK INTENSITY (in/hr at tc=0.2 hour)
from Table A-10

								TOTALS	
Peak Intensity (I) 100-year	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	
Peak Intensity (I) 10-year	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65	
Peak Intensity (I) 2-year	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	

RATIONAL METHOD COEFFICIENT, C
from Table A-11

100-year									
Treatment A	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	cfs/acre
Treatment B	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	cfs/acre
Treatment C	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	cfs/acre
Treatment D	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	cfs/acre
Q100 (Sum Qi*I*Ai)	8.52	8.52	8.52	8.52	8.52	8.52	8.52	8.52	cfs
10-year									
Treatment A	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	cfs/acre
Treatment B	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	cfs/acre
Treatment C	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	cfs/acre
Treatment D	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	cfs/acre
Q10 (Sum Qi*I*Ai)	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	cfs
2-year									
Treatment A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	cfs/acre
Treatment B	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	cfs/acre
Treatment C	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	cfs/acre
Treatment D	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	cfs/acre
Q2 (Sum Qi*I*Ai)	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	cfs

G-20|D4B

DRAINAGE INFORMATION SHEET

PROJECT TITLE AutoZone -8820 Montgomery ZONE ATLAS/DRWG. FILE # G20-D4B

DRB#: _____ EPC #_____ WORK ORDER #

LEGAL DESCRIPTION: Tract A-2-A, Montgomery Crossing

CITY ADDRESS: 8820 Montgomery Blvd. NE

ENGINEERING FIRM: BPLW CONTACT: Guy Jackson

ADDRESS: 6200 Uptown Blvd., Suite 220 PHONE: 880-9670

OWNER: AutoZone, Inc. CONTACT: Mitch Bramlitt

ADDRESS: 123 South Front St. Memphis TN, 38103 PHONE: 901-495-8714

ARCHITECT: See Owner CONTACT: See Owner
ADDRESS: _____ PHONE: See Owner

SURVEYOR: Harris Surveying CONTACT: Tony Harris

ADDRESS: 2412 Monroe NE, 87110 PHONE: 889-8056

CONTRACTOR: --- TBD CONTACT:

ADDRESS: --- PHONE:

TYPE OF SUBMITTAL:

__ DRAINAGE REPORT
X DRAINAGE PLAN 2nd Submittal
__CONCEPTUAL GRADING & DRAINAGE PLAN
X GRADING PLAN
_ EROSION CONTROL PLAN
_ENGINEER'S CERTIFICATION
_ OTHER _____

PRE-DESIGN MEETING:
_ YES
X NO
_ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

_ SKETCH PLAT APPROVAL
_ PRELIMINARY PLAT APPROVAL
_ S. DEV. PLAN FOR SUB'D APPROVAL
__ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
_ SECTOR PLAN APPROVAL
_ FINAL PLAT APPROVAL
X BUILDING PERMIT APPROVAL
__ CERTIFICATE OF OCCUPANCY APPROVAL
X GRADING PERMIT APPROVALS
X PAVING PERMIT APPROVAL
_ S.A.B. DRAINAGE REPORT
__DRAINAGE REQUIREMENTS

DATE SUBMITTED: September 13, 2004
BY: Guy Jackson, PE

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 7, 2004

Guy Jackson, P.E.
BPLW Architects & Engineers, Inc.
6200 Uptown Blvd. NE Suite 400
Albuquerque, NM 87110

Re: AutoZone at Montgomery Crossing, Site Development Plan
Engineer's Stamp dated 6-22-04 (G20-D4B)

Dear Mr. Jackson,

Based upon the information provided in your submittal received 6-22-04, the above referenced plan is approved for Site Development Plan for Subdivision and Site Development Plan for Building Permit action by the DRB.

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: file

DRAINAGE INFORMATION SHEET

PROJECT TITLE: EL PINTO RESTAURANT ZONE ATLAS/DRNG. FILE #: G20/D044B

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

LEGAL DESCRIPTION: TR 2-A, MONTGOMERY CROSSING

CITY ADDRESS: MONTGOMERY BLVD NE

ENGINEERING FIRM: Brasher & Lorenz, Inc. CONTACT: Dennis A. Lorenz

ADDRESS: 2201 San Pedro NE Bldg.1 Suite 210 Albuquerque, New Mexico 87110 PHONE: 888-6088

OWNER: JT PARTNERS CONTACT: _____

ADDRESS: 10500 FOURTH NW PHONE: _____

ARCHITECT: RICK BENNETT CONTACT: SAME

ADDRESS: 1118 PARK SW PHONE: 242-1859

SURVEYOR: HARRIS SURVEYING CONTACT: A. HARRIS

ADDRESS: 2412 MONROE NE PHONE: 889-8056

CONTRACTOR: NA CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN
X CONCEPTUAL GRADING & DRAINAGE PLAN
___ GRADING PLAN
___ EROSION CONTROL PLAN
___ ENGINEER'S CERTIFICATION
___ OTHER _____

PRE-DESIGN MEETING:

Y YES
___ NO
___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D. APPROVAL
X S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ FOUNDATION PERMIT APPROVAL
___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ S.A.D. DRAINAGE REPORT
___ DRAINAGE REQUIREMENTS
___ OTHER _____ (SPECIFY)

DATE SUBMITTED: 12-5-96

BY: Dennis A. Lorenz

RECEIVED
DEC - 5 1996
HYDROLOGY DIVISION

CITY OF
Albuquerque

December 16, 1996

Martin J. Chávez, Mayor

Dennis Lorenz
Brasher & Lorenz Inc.
2201 San Pedro NE Building 1 Suite 210
Albuquerque, NM 87110

RE: CONCEPTUAL DRAINAGE PLAN FOR EL PINTO RESTAURANT (G20-D4B) ENGINEER'S STAMP DATED 12/2/96.

Dear Mr. Lorenz:

Based on the information provided on your December 5, 1996 , the above referenced site is approved for Site Development Plan for Building Permit.

Please be advised that prior to Building Permit release, the following must be addressed:

1. Does the existing 10" pipe have the orifice control hole?
2. Plan drawing indicates that construction will take place within the Thomas Well site. Is there an agreement allowing the construction?
3. Please include the slopes within the parking lot swales.
4. Pond fencing is required if not fenced yet. Identify the fence within the plan drawing.

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

Sincerely,

Bernie J. Montoya, CE
Engineering Associate

BJM/dl

c: Andrew Garcia
File

CONCEPTUAL DRAINAGE REPORT

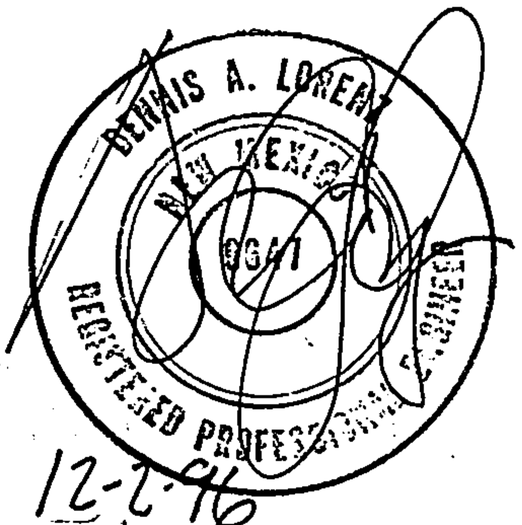
FOR

EL PINTO RESTAURANT

Albuquerque, New Mexico

Prepared By:

BRASHER & LORENZ, INC.
Consulting Engineers
San Pedro NE Building 1, Suite 210
Albuquerque, New Mexico 87110



December, 1996

12-2-96

TABLE OF CONTENTS

LIST OF FIGURES AND EXHIBITS

PURPOSE AND SCOPE

Pursuant to the established Drainage Ordinance for the City of Albuquerque and the Development Process Manual, this Conceptual Drainage Report outlines the drainage management criteria for controlling developed runoff from the project site. The property is to be developed as the El Pinto Restaurant, with associated paving, landscaping, utility, grading, and drainage improvements. The scope of this plan is to provide conceptual grading and drainage information to support the project Site Development Plan.

EXISTING CONDITIONS

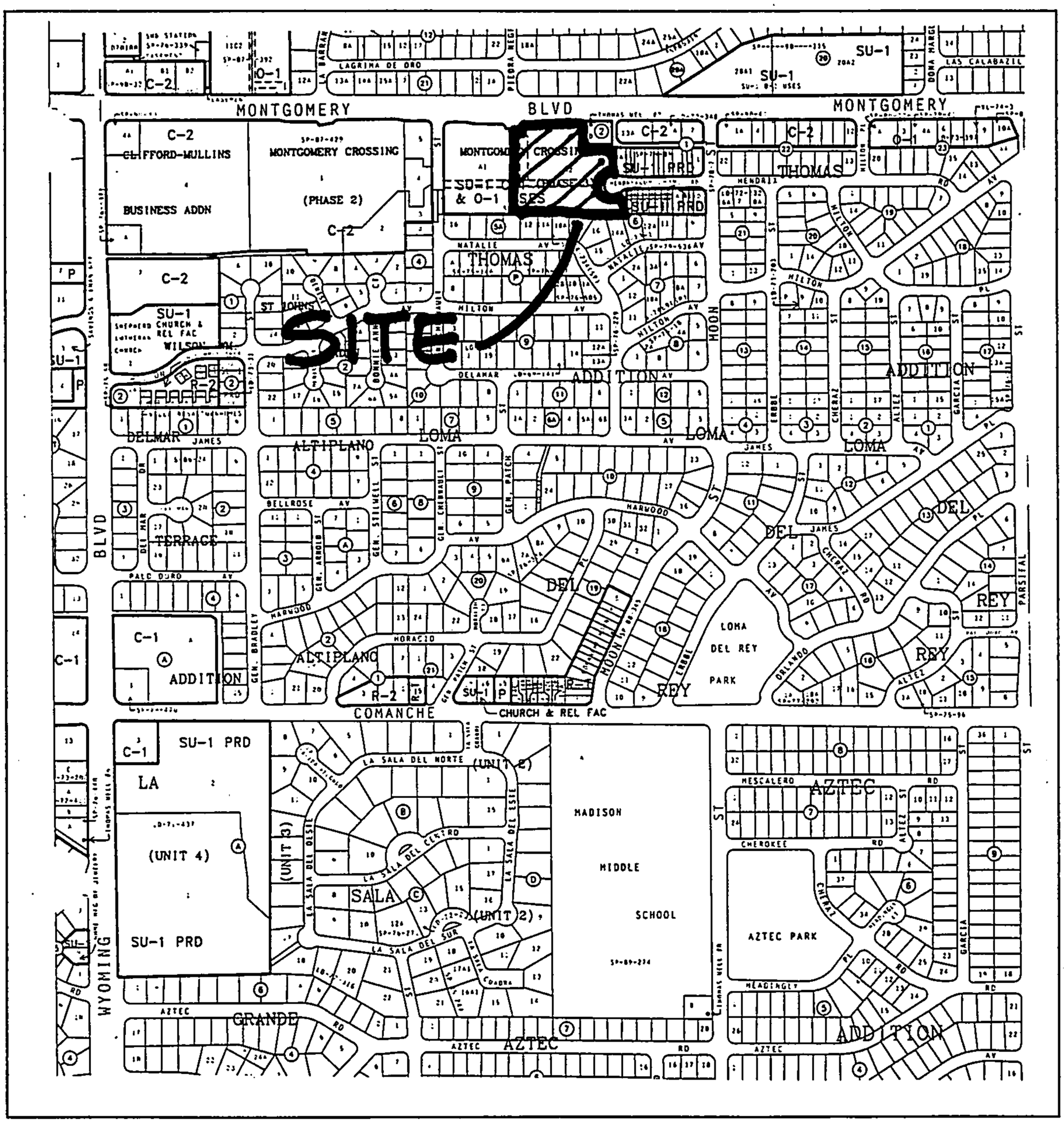
The project site is approximately 3.78 acres in size and is located on Montgomery Boulevard NE, just east of Wyoming Boulevard NE. The site is bounded by Montgomery on the north, developed commercial property on the east and west, and developed residential property on the south. The site is described as Tract 2-A, Montgomery Crossing. Presently the site is undeveloped. Site topography slopes from west to east at approximately 4%. The site is sparsely covered with native vegetation. Evidence of grading and vehicular traffic exists on the site.

The site is impacted by off-site flows from the east which concentrate in Hendrix Road and along the east property line. Hendrix Road drains to the end of a cul-de-sac, and then north to Montgomery through an improved public channel located along the east property line. Flows from the City of Albuquerque Thomas Well No.2 enter the site from the east. On-site all runoff generally flows northwest to Montgomery Boulevard. A ponding area was constructed with the development of Tract A-1 (FHP) for the purposes of detaining developed runoff from the site to mitigate downstream capacity limitations. The pond drains west by a 10 inch storm drain, which outfalls into the parking lot on Tract A-1.

As shown by the attached FIRM Panel, this site does not lie within a designated flood hazard zone.

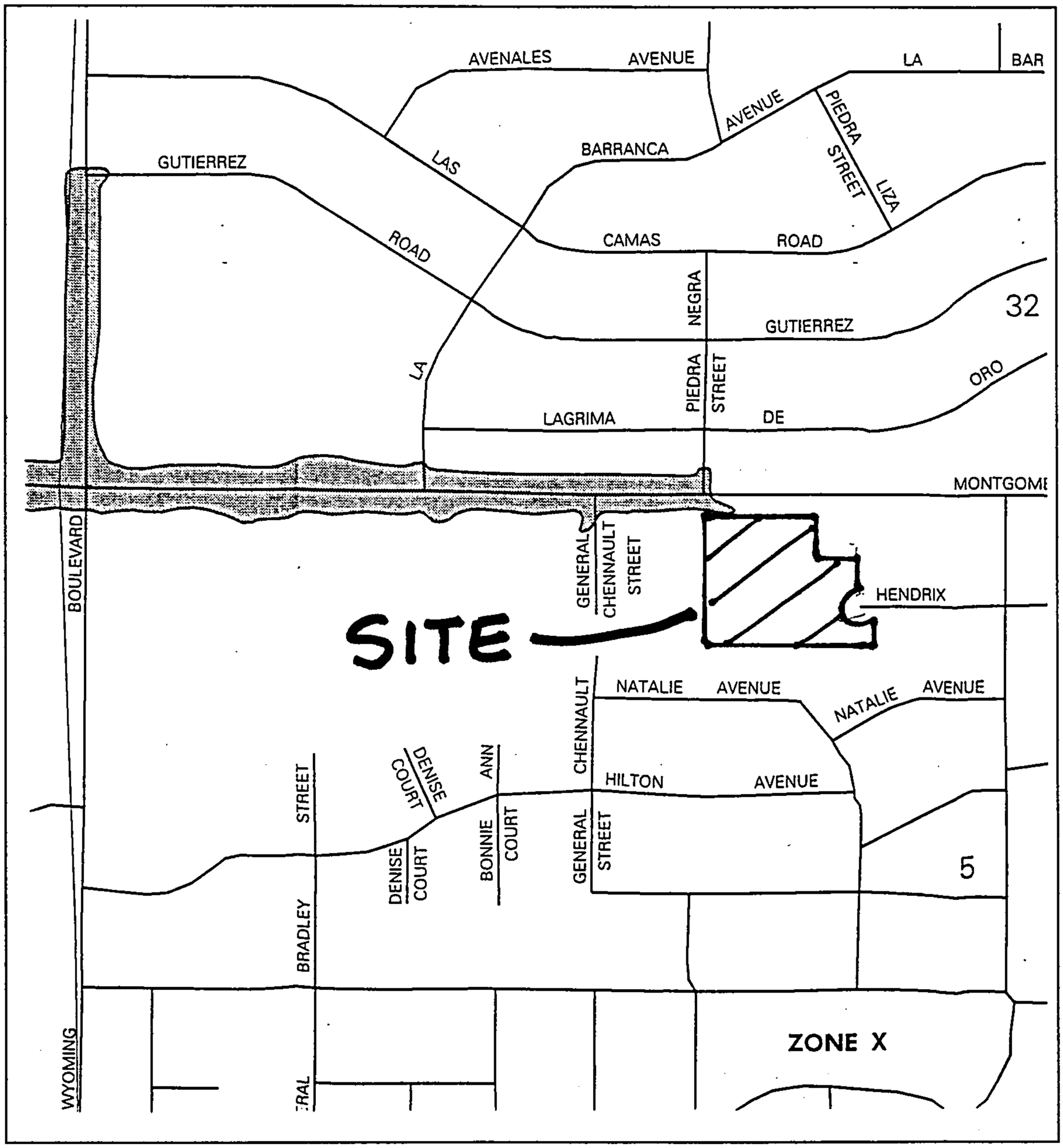
PROJECT DRAINAGE MASTERPLAN

The Masterplan for this site was prepared by BPLW Architects & Engineers, Inc. for FHP Health Care, March 1991. The Masterplan (see Appendix) allowed free discharge of developed runoff from the FHP Health Care site (Tract A-1) and placed a discharge limitation on Tract 2-A. The intent of the Masterplan was to limit discharge from the total acreage to historic rates. The result of allowing FHP to free discharge was to limit Tract 2-A to approximately 0.5 cfs per acre.



LOCATION MAP

Figure 1



FLOOD INSURANCE RATE MAP

Figure 2

PROPOSED CONDITIONS

As shown by the Plan, the project consists of the development of the property into a restaurant. The Plan shows the elevations required to properly grade and construct the recommended improvements. The direction of drainage flows are given by flow arrows and the project hydrology is tabulated for both existing and developed conditions.

All drainage flows will be managed on-site by paved swales within the parking lot which will drain to existing drainage improvements. The site will be routed to the existing detention pond located along the west property line, as required by the approved Masterplan. The pond will drain by an existing 10 inch storm drain as described above. Per the Masterplan discharge from this site is limited to 0.5 cfs per acre from Tracts A-1 and 2-A, plus off-site Basin 0.1(Thomas Well No. 2) for a total allowable discharge of 4.58 cfs. Per the project hydrology, 3.54 cfs will drain from the pond through the drainline. Portions of the private access road and landscaped areas along Montgomery will free discharge into Montgomery, which account for 1.27 cfs. The total discharge from the developed site is approximately 4.81 cfs.

The project drainage basins are described as follows:

1. Basins A.1 through A.6 represent the bulk of the site. These basins are routed through the existing detention pond.

2. Basins B.1 through B.3 represent the private access road and perimeter landscaping areas which by virtue of topography cannot be routed through the detention pond. These areas free discharge into Montgomery Blvd.

3. Basin C.1 represents the public drainage channel located along the east property line which drains Hendrix Road.

4. Basin O.1 represents the City of Albuquerque *** well site. This basin will be routed overland to the detention pond.

5. Basin P.1 represents the existing detention pond.

The ponding facility is equipped with an overflow spillway, sized for the 100 year developed flowrate, which overflows into the adjacent access road.

TEMPORARY EROSION CONTROL PLAN

1. The intent of this temporary erosion control plan is to limit the discharge of

sediment into the public street and/or storm drainage system and to protect adjacent properties from excess runoff during construction.

2. The Contractor shall obtain a Top Soil Disturbance Permit from Environmental Health prior to performing any earthwork related operations.

3. Temporary erosion control berms should be constructed along the north, and west project boundaries to direct excess runoff to the ponding area.

4. It is the Contractor's responsibility to properly maintain all temporary erosion control facilities during the construction phase of the project.

CALCULATIONS

The calculations shown herein define the 100 year/6 hour design storm falling with the project area under existing and developed conditions. The Hydrology is per "Section 22.2, Part A, DPM, Vol 2" Dated January 1993. Calculations are provided to demonstrate on-site improvement capacities and downstream capacity.

APPENDIX

CALCULATIONS

EL PINTO		1/
	12·2·96	6025

① SITE PONDING REQUIREMENTS

PER MASTERPLAN:

Q_{ALLOW} = 0.5 CFS/AC FOR TR A-1, 2-A

PLUS DEV BASIN 0.1

TR A-1 A = 2.67 AC

TR 2-A A = 3.78 AC

6.45 AC

6.5 (6.45) = 3.23 CFS

ADD BASIN 0.1 (1.35 CFS)

Q_{ALLOW} = 4.58 CFS.

② POND ROUTING

EXISTING POND DATA:

SURF AREA = 3900 SF

BOTTOM @ 73.5

SPILLWAY @ 78.33

MAX STORAGE = 18,837 CF (0.4324 AF)

EXISTING 10" DRAINLINE INV = 73.5

A. DET POND DISCHARGE

Q_{ALLOW} = 4.58 CFS

BASINS B.1 - B.3 FREE DISCHG

Q_{100} = 1.27 CFS

Q_{OUT} = 4.58 - 1.27 = 3.31 CFS ±

PROVIDE ORIFICE PLATE OVER 10" SD TO LIMIT Q_{OUT}

A 8" HOLE = 0.35 SF

USE $Q = CA\sqrt{2gh}$ C = 0.6

WSE	h, FT	VOL, AF	Q_{OUT}, CFS
73.83	0	0	0
75.0	1.17	0.10475	1.82
76.0	2.17	0.19428	2.48
77.0	3.17	0.28382	3.00
78.0	4.17	0.37335	3.42
78.33	4.50	0.40289	3.56

EL PINTO		3
	12-2-96	6025

PER AHYMO:

Q_{OUT} = 3.54 CFS

VOL = 0.3976 AF

= 17,320 CF

WSE = 78.27

⇒ TOTAL DISCHG FROM SITE = 3.54 CFS

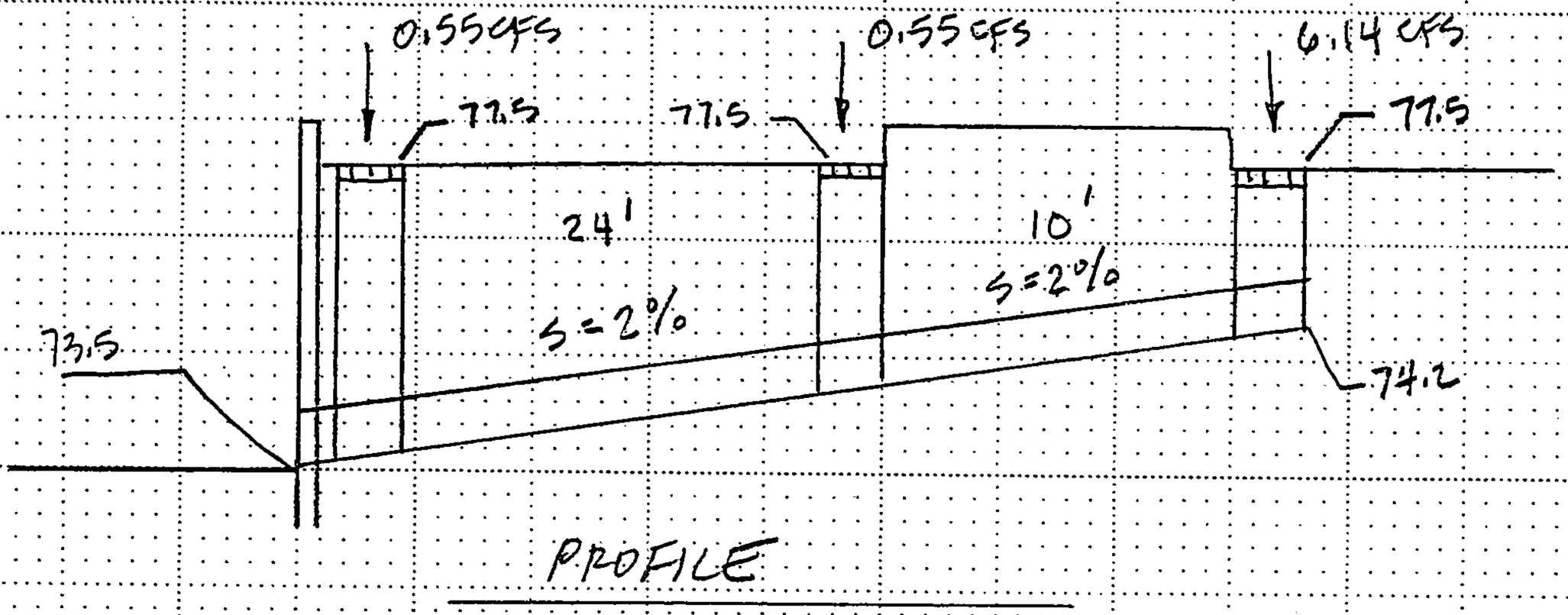
+ 1.27 CFS (BASINS B.1 - B.3) = 4.81 CFS.

EL PINTO		4/
	12-2-96	6025

(3) PRIVATE SD DESIGN

CONTRIB AREAS = BASINS A.3 – A.6

PER AHYMO Q100 = 7.23 CFS



PROFILE

SEWER PIPES

Enter up to 10 pipes.
Enter <Return> only for flowrate and diameter to end.

FLOWRATE (CFS)	DIAMETER (IN)	FRICTION (FT^1/6)	SLOPE (%)	VELOCITY (FPS)
7.23	13.74	0.0130	2.00	7.02

⇒ USE 15" DIA SD (min)

(4) SIDEWALK CULVERT + CHANNEL SIZING

A. SIDEWALK CULVERTS

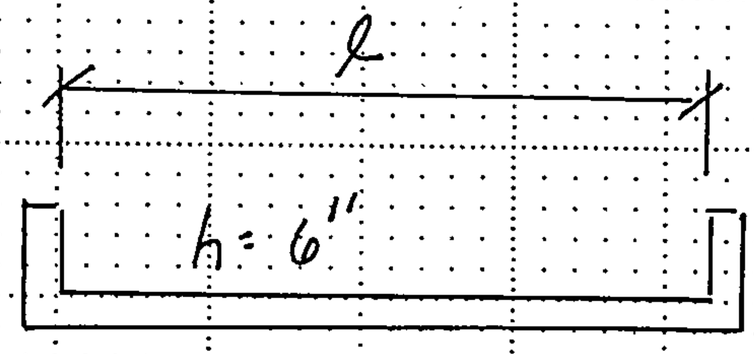
USE $Q = CLH^{3/2}$ $C = 2.50$

$H = 0.50'$

BASIN	Q_{100}, CFS	L, FT
A-1	8.13	9.2'
A-2	0.82	0.9'
A-3	5.05	5.7'
A-4	5.42	6.1'

B. CHANNEL

BASIN A-4 $Q_{100} = 5.42$ CFS



USING MANNINGS $Q = \frac{1.49}{n} AR^{2/3} S^{1/2}$

$S = 1\%$

$n = 0.013$

$\ell = 1.98'$ min.

AHYMO OUTPUT FILES

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =12/04/1996

INPUT FILE = A:6025.DAT USER NO.= BRASHERE.I01

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	UNDEV.SITE	-	1	.00591	7.08	.206	.65514	1.533	1.873	PER IMP= .00
COMPUTE NM HYD	A.1	-	2	.00269	8.13	.310	2.16371	1.500	4.724	PER IMP= 85.00
COMPUTE NM HYD	A.2	-	3	.00026	.82	.030	2.16371	1.500	4.835	PER IMP= 85.00
COMPUTE NM HYD	A.3	-	4	.00122	3.70	.141	2.16371	1.500	4.737	PER IMP= 85.00
COMPUTE NM HYD	A.4	-	5	.00012	.37	.014	2.16371	1.500	4.903	PER IMP= 85.00
COMPUTE NM HYD	A.5	-	6	.00068	2.07	.079	2.16371	1.500	4.759	PER IMP= 85.00
COMPUTE NM HYD	A.6	-	7	.00036	1.09	.041	2.16371	1.500	4.803	PER IMP= 85.00
COMPUTE NM HYD	B.1	-	8	.00012	.37	.014	2.16371	1.500	4.903	PER IMP= 85.00
COMPUTE NM HYD	B.2	-	9	.00018	.56	.021	2.16371	1.500	4.856	PER IMP= 85.00
COMPUTE NM HYD	B.3	-	10	.00011	.34	.012	2.16371	1.500	4.923	PER IMP= 85.00
COMPUTE NM HYD	C.1	-	11	.00004	.14	.005	2.35528	1.500	5.393	PER IMP= 100.00
COMPUTE NM HYD	0.1	-	12	.00044	1.35	.051	2.16371	1.500	4.788	PER IMP= 85.00
COMPUTE NM HYD	P.1	-	13	.00013	.43	.016	2.35528	1.500	5.124	PER IMP= 100.00
COMPUTE NM HYD	DEV.SITE	-	14	.00591	17.83	.682	2.16371	1.500	4.718	PER IMP= 85.00
COMPUTE NM HYD	PONDED.AC	-	15	.00590	17.81	.681	2.16371	1.500	4.718	PER IMP= 85.00
ROUTE RESERVOIR	POND.OUT	15	16	.00590	3.54	.681	2.16366	2.066	.936	AC-FT= .398
FINISH										

```
**********************************************************************
*                        EL PINTO RESTAURANT
*                         PROJECT HYDROLOGY
**********************************************************************
START               TIME=0.0  PUNCH CODE=0
RAINFALL            TYPE=1  RAIN QUARTER=0.0  RAIN ONE=2.14
                    RAIN SIX=2.60  RAIN DAY=3.10  DT=0.03333 HRS
**********************************************************************
* UNDEVELOPED CONDITION
* SITE
COMPUTE NM HYD      ID=1  HYD NO=UNDEV.SITE  DA=0.005906 SQ MI
                    PER A=100  PER B=0  PER C=0  PER D=0
                    TP=0.1333 HR  MASS RAIN=-1
**********************************************************************
* DEVELOPED CONDITION
* BASIN A.1
COMPUTE NM HYD      ID=2  HYD NO=A.1  DA=0.002688 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN A.2
COMPUTE NM HYD      ID=3  HYD NO=A.2  DA=0.000264 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN A.3
COMPUTE NM HYD      ID=4  HYD NO=A.3  DA=0.001222 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN A.4
COMPUTE NM HYD      ID=5  HYD NO=A.4  DA=0.000118 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN A.5
COMPUTE NM HYD      ID=6  HYD NO=A.5  DA=0.000681 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN A.6
COMPUTE NM HYD      ID=7  HYD NO=A.6  DA=0.000356 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN B.1
COMPUTE NM HYD      ID=8  HYD NO=B.1  DA=0.000118 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN B.2
COMPUTE NM HYD      ID=9  HYD NO=B.2  DA=0.000181 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN B.3
COMPUTE NM HYD      ID=10  HYD NO=B.3  DA=0.000107 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN C.1
COMPUTE NM HYD      ID=11  HYD NO=C.1  DA=0.000041 SQ MI
                    PER A=0  PER B=0  PER C=0  PER D=100
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN O.1
COMPUTE NM HYD      ID=12  HYD NO=O.1  DA=0.000441 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* BASIN P.1
```

```
COMPUTE NM HYD      ID=13  HYD NO=P.1  DA=0.000130 SQ MI
                    PER A=0  PER B=0  PER C=0  PER D=100
                    TP=0.1333 HR  MASS RAIN=-1
* SITE
COMPUTE NM HYD      ID=14  HYD NO=DEV.SITE  DA=0.005906 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
* PONDED ACREAGE - BASINS A.1 THRU A.6, P.1 & 0.1
COMPUTE NM HYD      ID=15  HYD NO=PONDED.AC  DA=0.005900 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1
*
PRINT HYD           ID=1  CODE=1
PRINT HYD           ID=2  CODE=1
PRINT HYD           ID=3  CODE=1
PRINT HYD           ID=4  CODE=1
PRINT HYD           ID=5  CODE=1
PRINT HYD           ID=6  CODE=1
PRINT HYD           ID=7  CODE=1
PRINT HYD           ID=8  CODE=1
PRINT HYD           ID=9  CODE=1
PRINT HYD           ID=10 CODE=1
PRINT HYD           ID=11 CODE=1
PRINT HYD           ID=12 CODE=1
PRINT HYD           ID=13 CODE=1
PRINT HYD           ID=14 CODE=1
PRINT HYD           ID=15 CODE=1
*
* ROUTE PONDED ACREAGE THRU POND
ROUTE RESERVOIR     ID=16  HYD NO=POND.OUT  INFLOW=15  CODE=2
                    OUT(CFS)     STORAGE(AC-FT)   ELEV(FT)
                    0            0                73.83
                    1.82         0.10475          75.00
                    2.48         0.19428          76.00
                    3.00         0.28382          77.00
                    3.42         0.37335          78.00
                    3.56         0.40289          78.33
*
PRINT HYD           ID=16 CODE=2
PLOT HYD            ID=16
FINISH
```

```
    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
         RUN DATE (MON/DAY/YR) = 12/04/1996
         START TIME (HR:MIN:SEC) = 15:47:30     USER NO.= BRASHERE.I01
         INPUT FILE = A:6025.DAT

**********************************************************************************
*                           EL PINTO RESTAURANT
*                            PROJECT HYDROLOGY
**********************************************************************************
START                TIME=0.0  PUNCH CODE=0
RAINFALL             TYPE=1  RAIN QUARTER=0.0  RAIN ONE=2.14
                     RAIN SIX=2.60  RAIN DAY=3.10  DT=0.03333 HRS

               COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
               DT =    .033330 HOURS       END TIME =     5.999400 HOURS
                  .0000   .0027   .0055   .0084   .0113   .0143   .0173
                  .0204   .0236   .0269   .0302   .0337   .0372   .0408
                  .0445   .0484   .0523   .0564   .0606   .0649   .0694
                  .0741   .0789   .0839   .0892   .0946   .1003   .1063
                  .1126   .1192   .1262   .1322   .1385   .1452   .1597
                  .1922   .2422   .3139   .4119   .5407   .7049   .9093
                 1.1588  1.3904  1.4871  1.5687  1.6414  1.7074  1.7683
                 1.8247  1.8775  1.9270  1.9735  2.0174  2.0589  2.0982
                 2.1354  2.1707  2.2041  2.2359  2.2661  2.2737  2.2807
                 2.2875  2.2939  2.3001  2.3060  2.3117  2.3172  2.3226
                 2.3277  2.3328  2.3376  2.3423  2.3470  2.3514  2.3558
                 2.3601  2.3643  2.3683  2.3723  2.3762  2.3801  2.3838
                 2.3875  2.3911  2.3947  2.3982  2.4016  2.4050  2.4083
                 2.4115  2.4147  2.4179  2.4210  2.4241  2.4271  2.4301
                 2.4330  2.4359  2.4388  2.4416  2.4444  2.4472  2.4499
                 2.4526  2.4553  2.4579  2.4605  2.4631  2.4656  2.4681
                 2.4706  2.4731  2.4755  2.4779  2.4803  2.4827  2.4850
                 2.4873  2.4896  2.4919  2.4942  2.4964  2.4986  2.5008
                 2.5030  2.5052  2.5073  2.5094  2.5115  2.5136  2.5157
                 2.5177  2.5198  2.5218  2.5238  2.5258  2.5277  2.5297
                 2.5317  2.5336  2.5355  2.5374  2.5393  2.5412  2.5430
                 2.5449  2.5467  2.5486  2.5504  2.5522  2.5540  2.5557
                 2.5575  2.5593  2.5610  2.5627  2.5645  2.5662  2.5679
                 2.5696  2.5713  2.5729  2.5746  2.5762  2.5779  2.5795
                 2.5811  2.5828  2.5844  2.5860  2.5876  2.5891  2.5907
                 2.5923  2.5938  2.5954  2.5969  2.5984  2.6000

**********************************************************************************
* UNDEVELOPED CONDITION
* SITE
COMPUTE NM HYD       ID=1  HYD NO=UNDEV.SITE  DA=0.005906 SQ MI
                     PER A=100  PER B=0  PER C=0  PER D=0
                     TP=0.1333 HR  MASS RAIN=-1

    K =   .158399HR    TP =   .133300HR    K/TP RATIO =  1.188293     SHAPE CONSTANT, N =  2.988024
    UNIT PEAK =   12.443    CFS   UNIT VOLUME =    .9986      B =   280.84      P60 = 2.1400
    AREA =      .005906 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

**********************************************************************************
* DEVELOPED CONDITION
* BASIN A.1
COMPUTE NM HYD       ID=2  HYD NO=A.1  DA=0.002688 SQ MI
                     PER A=0  PER B=8  PER C=7  PER D=85
```

```
                TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   9.0205    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 2.1400
    AREA =      .002285 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   1.0467    CFS   UNIT VOLUME =    .9872       B =   346.06      P60 = 2.1400
    AREA =      .000403 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* BASIN A.2
COMPUTE NM HYD      ID=3  HYD NO=A.2  DA=0.000264 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .88594    CFS   UNIT VOLUME =    .9862       B =   526.28      P60 = 2.1400
    AREA =      .000224 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   .10280    CFS   UNIT VOLUME =    .8715       B =   346.06      P60 = 2.1400
    AREA =      .000040 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* BASIN A.3
COMPUTE NM HYD      ID=4  HYD NO=A.3  DA=0.001222 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   4.1008    CFS   UNIT VOLUME =    .9965       B =   526.28      P60 = 2.1400
    AREA =      .001039 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   .47586    CFS   UNIT VOLUME =    .9730       B =   346.06      P60 = 2.1400
    AREA =      .000183 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* BASIN A.4
COMPUTE NM HYD      ID=5  HYD NO=A.4  DA=0.000118 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .39599    CFS   UNIT VOLUME =    .9711       B =   526.28      P60 = 2.1400
    AREA =      .000100 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   .45951E-01CFS   UNIT VOLUME =    .8715       B =   346.06      P60 = 2.1400
    AREA =      .000018 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
* BASIN A.5
COMPUTE NM HYD      ID=6  HYD NO=A.5  DA=0.000681 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.2853    CFS   UNIT VOLUME =    .9941       B =   526.28      P60 = 2.1400
    AREA =      .000579 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   .26519    CFS   UNIT VOLUME =    .9485       B =   346.06      P60 = 2.1400
    AREA =      .000102 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* BASIN A.6
COMPUTE NM HYD      ID=7  HYD NO=A.6  DA=0.000356 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.1947    CFS   UNIT VOLUME =    .9897       B =   526.28      P60 = 2.1400
    AREA =      .000303 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   .13863    CFS   UNIT VOLUME =    .9023       B =   346.06      P60 = 2.1400
    AREA =      .000053 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* BASIN B.1
COMPUTE NM HYD      ID=8  HYD NO=B.1  DA=0.000118 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .39599    CFS   UNIT VOLUME =    .9711       B =   526.28      P60 = 2.1400
    AREA =      .000100 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   .45951E-01CFS   UNIT VOLUME =    .8715       B =   346.06      P60 = 2.1400
    AREA =      .000018 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* BASIN B.2
COMPUTE NM HYD      ID=9  HYD NO=B.2  DA=0.000181 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .60741    CFS   UNIT VOLUME =    .9815       B =   526.28      P60 = 2.1400
    AREA =      .000154 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   .70484E-01CFS   UNIT VOLUME =    .8715       B =   346.06      P60 = 2.1400
    AREA =      .000027 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* BASIN B.3
COMPUTE NM HYD      ID=10  HYD NO=B.3  DA=0.000107 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .35908    CFS   UNIT VOLUME =    .9664       B =   526.28      P60 = 2.1400
    AREA =      .000091 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   .41667E-01CFS   UNIT VOLUME =    .8715       B =   346.06      P60 = 2.1400
    AREA =      .000016 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* BASIN C.1
COMPUTE NM HYD      ID=11  HYD NO=C.1  DA=0.000041 SQ MI
                    PER A=0  PER B=0  PER C=0  PER D=100
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .16187    CFS   UNIT VOLUME =    .9286       B =   526.28      P60 = 2.1400
    AREA =      .000041 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* BASIN 0.1
COMPUTE NM HYD      ID=12  HYD NO=0.1  DA=0.000441 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.4799    CFS   UNIT VOLUME =    .9911       B =   526.28      P60 = 2.1400
    AREA =      .000375 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   .17173    CFS   UNIT VOLUME =    .9186       B =   346.06      P60 = 2.1400
    AREA =      .000066 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* BASIN P.1
COMPUTE NM HYD      ID=13  HYD NO=P.1  DA=0.000130 SQ MI
                    PER A=0  PER B=0  PER C=0  PER D=100
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .51325    CFS   UNIT VOLUME =    .9786       B =   526.28      P60 = 2.1400
    AREA =      .000130 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* SITE
COMPUTE NM HYD      ID=14  HYD NO=DEV.SITE  DA=0.005906 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
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```
                TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   19.820    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 2.1400
    AREA =      .005020 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   2.2999    CFS   UNIT VOLUME =    .9946       B =   346.06      P60 = 2.1400
    AREA =      .000886 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

* PONDED ACREAGE - BASINS A.1 THRU A.6, P.1 & O.1
COMPUTE NM HYD      ID=15  HYD NO=PONDED.AC  DA=0.005900 SQ MI
                    PER A=0  PER B=8  PER C=7  PER D=85
                    TP=0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   19.799    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 2.1400
    AREA =      .005015 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .122109HR    TP =   .133300HR    K/TP RATIO =   .916046     SHAPE CONSTANT, N =  3.864862
    UNIT PEAK =   2.2975    CFS   UNIT VOLUME =    .9946       B =   346.06      P60 = 2.1400
    AREA =      .000885 SQ MI    IA =    .43000 INCHES    INF =   1.05400 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

*
PRINT HYD           ID=1  CODE=1

                                HYDROGRAPH FROM AREA UNDEV.SITE


    RUNOFF VOLUME =      .65514 INCHES     =        .2064 ACRE-FEET
    PEAK DISCHARGE RATE =       7.08 CFS  AT   1.533 HOURS   BASIN AREA =   .0059 SQ. MI.


PRINT HYD           ID=2  CODE=1

                                HYDROGRAPH FROM AREA A.1


    RUNOFF VOLUME =     2.16371 INCHES     =        .3102 ACRE-FEET
    PEAK DISCHARGE RATE =       8.13 CFS  AT   1.500 HOURS   BASIN AREA =   .0027 SQ. MI.


PRINT HYD           ID=3  CODE=1

                                HYDROGRAPH FROM AREA A.2


    RUNOFF VOLUME =     2.16371 INCHES     =        .0305 ACRE-FEET
    PEAK DISCHARGE RATE =        .82 CFS  AT   1.500 HOURS   BASIN AREA =   .0003 SQ. MI.
```

PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA A.3

RUNOFF VOLUME = 2.16371 INCHES = .1410 ACRE-FEET
PEAK DISCHARGE RATE = 3.70 CFS AT 1.500 HOURS BASIN AREA = .0012 SQ. MI.

PRINT HYD ID=5 CODE=1

HYDROGRAPH FROM AREA A.4

RUNOFF VOLUME = 2.16371 INCHES = .0136 ACRE-FEET
PEAK DISCHARGE RATE = .37 CFS AT 1.500 HOURS BASIN AREA = .0001 SQ. MI.

PRINT HYD ID=6 CODE=1

HYDROGRAPH FROM AREA A.5

RUNOFF VOLUME = 2.16371 INCHES = .0786 ACRE-FEET
PEAK DISCHARGE RATE = 2.07 CFS AT 1.500 HOURS BASIN AREA = .0007 SQ. MI.

PRINT HYD ID=7 CODE=1

HYDROGRAPH FROM AREA A.6

RUNOFF VOLUME = 2.16371 INCHES = .0411 ACRE-FEET
PEAK DISCHARGE RATE = 1.09 CFS AT 1.500 HOURS BASIN AREA = .0004 SQ. MI.

PRINT HYD ID=8 CODE=1

HYDROGRAPH FROM AREA B.1

RUNOFF VOLUME = 2.16371 INCHES = .0136 ACRE-FEET
PEAK DISCHARGE RATE = .37 CFS AT 1.500 HOURS BASIN AREA = .0001 SQ. MI.

PRINT HYD ID=9 CODE=1

HYDROGRAPH FROM AREA B.2

RUNOFF VOLUME = 2.16371 INCHES = .0209 ACRE-FEET
PEAK DISCHARGE RATE = .56 CFS AT 1.500 HOURS BASIN AREA = .0002 SQ. MI.

PRINT HYD ID=10 CODE=1

HYDROGRAPH FROM AREA B.3

RUNOFF VOLUME = 2.16371 INCHES = .0123 ACRE-FEET
PEAK DISCHARGE RATE = .34 CFS AT 1.500 HOURS BASIN AREA = .0001 SQ. MI.

PRINT HYD ID=11 CODE=1

HYDROGRAPH FROM AREA C.1

RUNOFF VOLUME = 2.35528 INCHES = .0052 ACRE-FEET
PEAK DISCHARGE RATE = .14 CFS AT 1.500 HOURS BASIN AREA = .0000 SQ. MI.

PRINT HYD ID=12 CODE=1

HYDROGRAPH FROM AREA O.1

RUNOFF VOLUME = 2.16371 INCHES = .0509 ACRE-FEET
PEAK DISCHARGE RATE = 1.35 CFS AT 1.500 HOURS BASIN AREA = .0004 SQ. MI.

PRINT HYD ID=13 CODE=1

HYDROGRAPH FROM AREA P.1

RUNOFF VOLUME = 2.35528 INCHES = .0163 ACRE-FEET
PEAK DISCHARGE RATE = .43 CFS AT 1.500 HOURS BASIN AREA = .0001 SQ. MI.

PRINT HYD ID=14 CODE=1

HYDROGRAPH FROM AREA DEV.SITE

RUNOFF VOLUME = 2.16371 INCHES = .6815 ACRE-FEET
PEAK DISCHARGE RATE = 17.83 CFS AT 1.500 HOURS BASIN AREA = .0059 SQ. MI.

PRINT HYD ID=15 CODE=1

HYDROGRAPH FROM AREA PONDED.AC

RUNOFF VOLUME = 2.16371 INCHES = .6808 ACRE-FEET
PEAK DISCHARGE RATE = 17.81 CFS AT 1.500 HOURS BASIN AREA = .0059 SQ. MI.

```
*
* ROUTE PONDED ACREAGE THRU POND
ROUTE RESERVOIR     ID=16  HYD NO=POND.OUT  INFLOW=15  CODE=2
                    OUT(CFS)     STORAGE(AC-FT)   ELEV(FT)
                    0            0                73.83
                    1.82         0.10475          75.00
                    2.48         0.19428          76.00
                    3.00         0.28382          77.00
                    3.42         0.37335          78.00
                    3.56         0.40289          78.33

  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *

    TIME      INFLOW    ELEV      VOLUME    OUTFLOW
    (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

      .00        .00     73.83        .000       .00
      .07        .00     73.83        .000       .00
      .13        .00     73.83        .000       .00
      .20        .00     73.83        .000       .00
      .27        .00     73.83        .000       .00
      .33        .00     73.83        .000       .00
      .40        .00     73.83        .000       .00
      .47        .00     73.83        .000       .00
      .53        .00     73.83        .000       .00
      .60        .00     73.83        .000       .00
      .67        .00     73.83        .000       .00
      .73        .00     73.83        .000       .00
      .80        .00     73.83        .000       .00
      .87        .00     73.83        .000       .00
      .93        .03     73.83        .000       .00
     1.00        .21     73.84        .001       .01
     1.07        .36     73.85        .002       .04
     1.13        .42     73.87        .004       .07
     1.20        .75     73.90        .006       .11
     1.27       2.23     73.98        .013       .23
     1.33       5.25     74.18        .031       .54
     1.40      10.17     74.59        .068      1.19
     1.47      16.33     75.31        .132      2.02
     1.53      16.98     76.23        .215      2.60
     1.60      12.35     76.96        .280      2.98
     1.67       9.09     77.42        .322      3.18
     1.73       7.33     77.72        .349      3.30
     1.80       6.28     77.94        .368      3.39
     1.87       5.46     78.09        .381      3.46
     1.93       4.79     78.19        .390      3.50
     2.00       4.22     78.25        .395      3.52
     2.07       3.60     78.27        .398      3.54
     2.13       2.46     78.24        .395      3.52
     2.20       1.61     78.15        .387      3.48
     2.27       1.19     78.02        .375      3.43
     2.33        .96     77.88        .362      3.37
     2.40        .80     77.73        .349      3.30
     2.47        .67     77.57        .335      3.24
     2.53        .58     77.41        .321      3.17
     2.60        .50     77.25        .306      3.11
     2.67        .44     77.09        .292      3.04
     2.73        .38     76.93        .278      2.96
     2.80        .34     76.77        .264      2.88
     2.87        .30     76.62        .250      2.80
```

2.93	.27	76.47	.236	2.72
3.00	.25	76.32	.223	2.64
3.07	.23	76.17	.210	2.57
3.13	.21	76.03	.197	2.50
3.20	.20	75.89	.184	2.41
3.27	.19	75.76	.173	2.32
3.33	.18	75.63	.161	2.23
3.40	.17	75.50	.150	2.15
3.47	.17	75.38	.139	2.07
3.53	.16	75.27	.129	2.00
3.60	.16	75.16	.119	1.93
3.67	.16	75.05	.109	1.85

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
3.73	.15	74.95	.100	1.74
3.80	.15	74.86	.092	1.60
3.87	.15	74.77	.084	1.47
3.93	.14	74.69	.077	1.34
4.00	.14	74.62	.071	1.24
4.07	.14	74.56	.065	1.14
4.13	.14	74.50	.060	1.04
4.20	.14	74.45	.055	.96
4.27	.14	74.40	.051	.89
4.33	.14	74.36	.047	.82
4.40	.13	74.32	.043	.76
4.47	.13	74.28	.040	.70
4.53	.13	74.25	.037	.65
4.60	.13	74.22	.035	.60
4.67	.13	74.19	.032	.56
4.73	.13	74.16	.030	.52
4.80	.13	74.14	.028	.48
4.87	.13	74.12	.026	.45
4.93	.13	74.10	.024	.42
5.00	.13	74.08	.023	.40
5.07	.13	74.07	.021	.37
5.13	.13	74.05	.020	.35
5.20	.13	74.04	.019	.33
5.27	.13	74.03	.018	.31
5.33	.13	74.02	.017	.30
5.40	.14	74.01	.016	.28
5.47	.14	74.00	.015	.27
5.53	.14	73.99	.015	.26
5.60	.14	73.99	.014	.24
5.67	.14	73.98	.014	.24
5.73	.14	73.98	.013	.23
5.80	.14	73.97	.013	.22
5.87	.14	73.97	.012	.21
5.93	.14	73.96	.012	.21
6.00	.14	73.96	.011	.20
6.07	.14	73.96	.011	.19
6.13	.08	73.95	.011	.19
6.20	.04	73.94	.010	.18
6.27	.02	73.93	.009	.16
6.33	.02	73.93	.009	.15
6.40	.01	73.92	.008	.14
6.47	.01	73.91	.007	.13
6.53	.01	73.90	.007	.11
6.60	.00	73.90	.006	.10

6.67	.00	73.89	.005	.10
6.73	.00	73.89	.005	.09
6.80	.00	73.88	.005	.08
6.87	.00	73.88	.004	.07
6.93	.00	73.87	.004	.07
7.00	.00	73.87	.003	.06
7.07	.00	73.86	.003	.05
7.13	.00	73.86	.003	.05
7.20	.00	73.86	.003	.04
7.27	.00	73.86	.002	.04
7.33	.00	73.85	.002	.04
7.40	.00	73.85	.002	.03

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
7.47	.00	73.85	.002	.03
7.53	.00	73.85	.002	.03
7.60	.00	73.85	.001	.03
7.67	.00	73.84	.001	.02

7.

73	.00	73.84	.001	.02
7.80	.00	73.84	.001	.02
7.87	.00	73.84	.001	.02
7.93	.00	73.84	.001	.02
8.00	.00	73.84	.001	.01
8.07	.00	73.84	.001	.01
8.13	.00	73.84	.001	.01
8.20	.00	73.84	.001	.01
8.27	.00	73.84	.001	.01
8.33	.00	73.84	.001	.01
8.40	.00	73.84	.000	.01
8.47	.00	73.83	.000	.01
8.53	.00	73.83	.000	.01
8.60	.00	73.83	.000	.01
8.67	.00	73.83	.000	.01
8.73	.00	73.83	.000	.00

PEAK DISCHARGE = 3.535 CFS - PEAK OCCURS AT HOUR 2.07
MAXIMUM WATER SURFACE ELEVATION = 78.271
MAXIMUM STORAGE = .3976 AC-FT INCREMENTAL TIME= .033330HRS

*

PRINT HYD ID=16 CODE=2

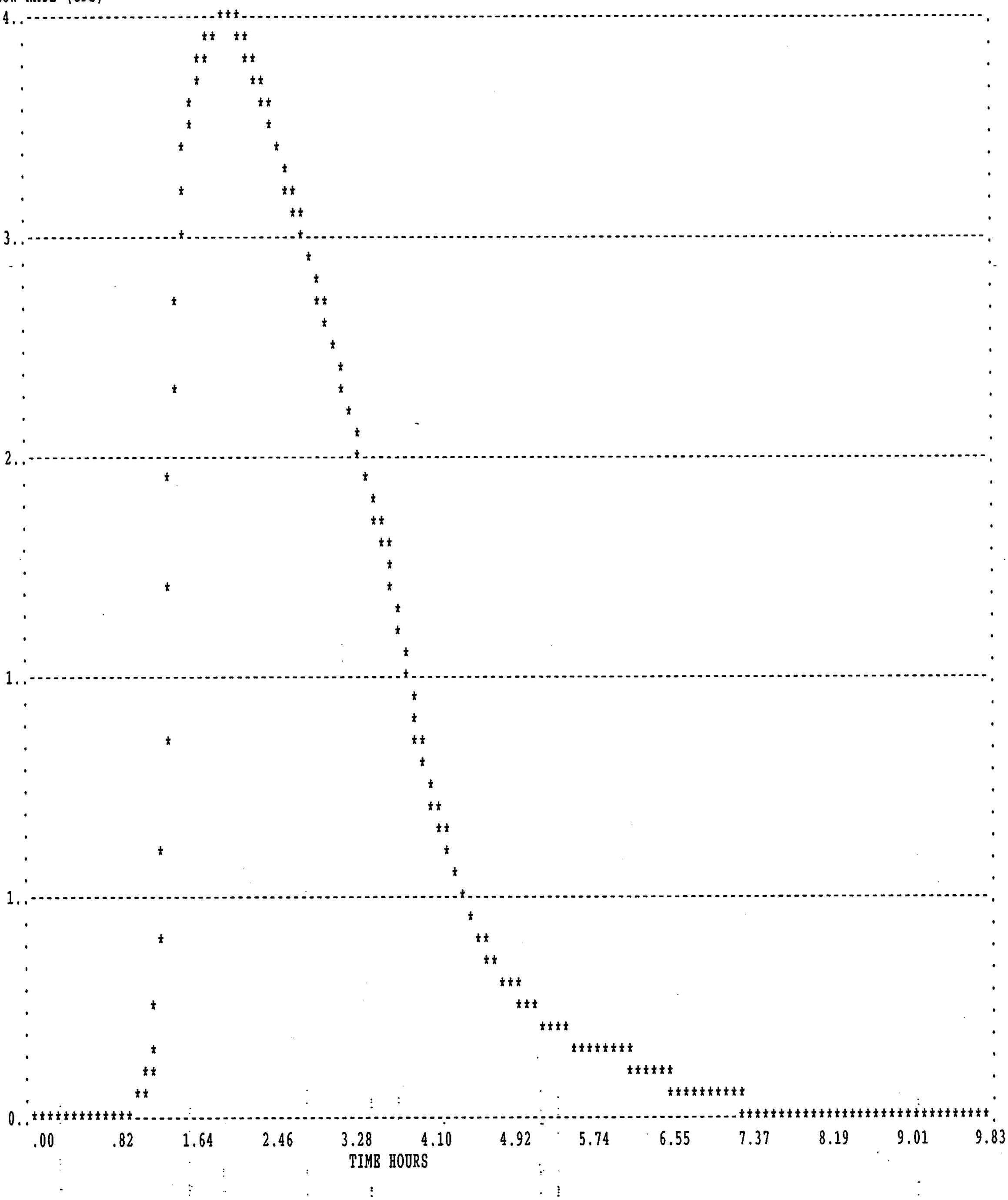
HYDROGRAPH FROM AREA POND.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	3.5	4.000	1.2	5.999	.2	7.999	.0
.067	.0	2.066	3.5	4.066	1.1	6.066	.2	8.066	.0
.133	.0	2.133	3.5	4.133	1.0	6.133	.2	8.133	.0
.200	.0	2.200	3.5	4.200	1.0	6.199	.2	8.199	.0
.267	.0	2.266	3.4	4.266	.9	6.266	.2	8.266	.0
.333	.0	2.333	3.4	4.333	.8	6.333	.1	8.332	.0
.400	.0	2.400	3.3	4.400	.8	6.399	.1	8.399	.0
.467	.0	2.466	3.2	4.466	.7	6.466	.1	8.466	.0
.533	.0	2.533	3.2	4.533	.6	6.533	.1	8.532	.0
.600	.0	2.600	3.1	4.600	.6	6.599	.1	8.599	.0
.667	.0	2.666	3.0	4.666	.6	6.666	.1	8.666	.0
.733	.0	2.733	3.0	4.733	.5	6.733	.1	8.732	.0
.800	.0	2.800	2.9	4.800	.5	6.799	.1	8.799	.0
.867	.0	2.866	2.8	4.866	.5	6.866	.1	8.866	.0
.933	.0	2.933	2.7	4.933	.4	6.933	.1	8.932	.0
1.000	.0	3.000	2.6	4.999	.4	6.999	.1	8.999	.0
1.067	.0	3.066	2.6	5.066	.4	7.066	.1	9.066	.0
1.133	.1	3.133	2.5	5.133	.3	7.133	.0	9.132	.0
1.200	.1	3.200	2.4	5.199	.3	7.199	.0	9.199	.0
1.267	.2	3.266	2.3	5.266	.3	7.266	.0	9.266	.0
1.333	.5	3.333	2.2	5.333	.3	7.333	.0	9.332	.0
1.400	1.2	3.400	2.2	5.399	.3	7.399	.0	9.399	.0
1.467	2.0	3.466	2.1	5.466	.3	7.466	.0	9.466	.0
1.533	2.6	3.533	2.0	5.533	.3	7.533	.0	9.532	.0
1.600	3.0	3.600	1.9	5.599	.2	7.599	.0	9.599	.0
1.667	3.2	3.666	1.9	5.666	.2	7.666	.0	9.666	.0
1.733	3.3	3.733	1.7	5.733	.2	7.733	.0	9.732	.0
1.800	3.4	3.800	1.6	5.799	.2	7.799	.0	9.799	.0
1.866	3.5	3.866	1.5	5.866	.2	7.866	.0		
1.933	3.5	3.933	1.3	5.933	.2	7.933	.0		

RUNOFF VOLUME = 2.16366 INCHES = .6808 ACRE-FEET
PEAK DISCHARGE RATE = 3.54 CFS AT 2.066 HOURS BASIN AREA = .0059 SQ. MI.

PLOT HYD ID=16

FLOW RATE (CFS)



FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 15:47:32

PROJECT DRAINAGE MASTERPLAN

6025

GRADING & DRAINAGE PLAN

for

FHP HEALTH CARE

MARCH, 1991

Prepared by: BPLW Architects & Engineers, Inc.
2400 Louisiana Blvd. NE
AFC #5, Suite 400
Albuquerque, NM 87110

Author: Stephen L. Crawford, PE #10274

18 MAR 91

TABLE OF CONTENTS

1. GENERAL INFORMATION:

The project site is located at the southeast corner of Wyoming and General Chenault, NE. The project is a medical office complex situated on Tract A-1 (formerly the westerly 2.67 acres of Tract A, Montgomery Crossing Phase III). Montgomery Blvd. to the north of this site is designated as a 100 year floodway by the FEMA floodway maps. The site's soils consist of Embudo-Tijeras Complex (EtC) and Tijeras gravelly loam (TgB) soil associations, both of which are designated as hydrologic soil group 'B' by the SCS. Because Montgomery Blvd. currently carries significant surface flows in the 100 year storm, previous drainage studies have limited the peak developed discharge from the entire 6.52 acres of former Tract A (now Tracts A-1 & A-2).

2. PROJECT DEVELOPMENT BACKGROUND:

A Conceptual Grading and Drainage Plan was prepared for Tract A (before it was subdivided) in December of 1990. During this time period, the EPC site plan for Tract A was administratively amended to accomodate the proposed medical office uses on the west half of the site (now Tract A-1). The Conceptual Grading & Drainage Plan (Engineer's stamp dated 16 Dec, 1990) was based directly on the original site plan drainage scheme as prepared by Bohannan/Huston in April of 1987. This drainage scheme combined the public offsite storm waters from Hendrix Road to the east with the onsite developed flows and routed them through a series of detention ponds in order to mitigate the sites runoff to an average of 0.5 cfs/acre. These ponds were located in the center of former Tract A. Tract A was subdivided just west of the ponds and the westerly portion was sold to FHP, Inc. based on the site plan as modified. This effectively gave Tract A-1 free discharge at the expense of Tract A-2 and the offsite flows to the east being greatly restricted by the detention ponds. The December Conceptual Grading & Drainage Plan was approved in January of 1991 after Tract A-1 was sold to FHP, Inc.

In February, 1991 the design Grading & Drainage Plan was prepared along with Public Infrastructure Design Plans for the ponds. By the design of the approved Conceptual Grading and Drainage Plan, the ponds were proposed to be public since they carried street runoff from Hendrix Road to the east.

During the DRC review of the Public Infrastructure Design for the ponds, numerous issues pertaining to the City's liabilty concerning the public nature of the detention ponds were raised. Discussions were held with the City Engineer and his staff at which time it was agreed that the public interest would be best served if the public nature of the detention ponds could be eliminated. The developers of Tracts A-1 and A-2 were both agreeable to diverting the Hendrix Road storm waters directly north in a public surface conveyance channel and converting the detention pond to exclusively non-public storm flows. For practical reasons (the sale of Tract A-1 to FHP, Inc. with a free discharge understanding), the discharge rate for Tract A-2 only will be limited to the 0.5 cfs/acre discharge rate commonly applied along this portion of Montgomery Blvd. This modification of the average discharge rate for former Tract A is allowable in lieu of the reduction in liability to the City which is affected by changing the detention ponding area from a public to a private concern. This design change will also improve the visual appearance of the site from Montgomery Blvd. by reducing the area devoted to detention ponding by about 40%.

3. EXISTING CONDITIONS:

The site currently receives offsite flows from the east from two offsite flow basins.

A) OS-1 is a City Well site and has the following hydrologic properties:

A = 0.34 acres
P100 = 2.4 inches

Tc < 10 minutes
I100 = 5.07 in/hr
CC = 0.53
12%(0.90)+13%(0.95)+75%(0.40)
Q100 = 0.91 cfs

%Imp = 25
Perv CN = 79 (poor range)
CCN = 83
RO = 1.0 inches
V100 = 1234 cf

B) OS-2 is a developed (medium density residential) site and has the following hydrologic properties:

A = 2.65 acres

Tc < 10 minutes
I100 = 5.07 in/hr
C = 0.79
Q100 = 10.61 cfs

%Imp = 65
CN = 85
RO = 1.2 inches
V100 = 11,540 cf

C) The onsite existing hydrologic conditions for basin B-1 (the project site) are as follows:

A = 2.67 acres

Tc < 10 minutes
I100 = 5.07 in/hr
C = 0.40
Q100 = 5.41 cfs

CN = 70 (fair range)
RO = 0.5 inches
V100 = 4850 cf

D) Basin B-2 (east portion Tract A) has the following existing hydrologic properties:

A = 3.85 acres

Tc < 10 minutes
I100 = 5.07 in/hr
C = 0.40
Q100 = 7.81 cfs

CN = 70 (fair range)
RO = 0.5 inches
V100 = 6990 cf

E) The total existing 100 year flow rate (offsite and onsite) from Tract A into Montgomery Blvd. is 24.74 cfs.

4. PROPOSED DRAINAGE SOLUTION:

To mitigate the effects of developing Tracts A-1 & A-2, onsite detention ponding will be constructed in basin B-2 near the center of former Tract A. Based on the Project Development history recited in section 2 of this plan: the flows from basin B-1 will be allowed to discharge freely; the flows from basin OS-2 will be diverted north to Montgomery via a surface conveyance channel; and the flows from basins OS-1 & B-2 will be routed through an on-site detention pond. This will reduce the cumulative developed peak flows from Tract A to an acceptable level and will allow Tract A-1 to be developed as indicated on the site plan without adversely impacting the drainage conditions in Montgomery Blvd. Basin B-1 can be developed with a free discharge condition provided that the construction of the detention ponding and offsite water block (at NE corner of OS-1) are done concurrently. See sheet C2.3 in the map pocket and the calculations in Appendix 'A'.

5. DEVELOPED CONDITIONS:

A) The site/grading plan (see sheet C2.1 in map pocket) for basin B-1 indicates that it will have the following hydrologic properties after development:

A = 2.67 acres

Tc < 10 minutes
I100 = 5.07 in/hr
CC = 0.79
21%(0.90)+22%(0.25)+57%(0.95)
Q100 = 10.69 cfs

%Imp = 78
Perv CN = 61 (good lawn)
CCN = 88
RO = 1.4 inches
V100 = 13,570 cf

B) Tract A-2 (basin B-2) is assumed to be developed with commercial uses and will have the following developed hydrologic properties:

A = 3.85 acres

Tc < 10 minutes
I100 = 5.07 in/hr
C = 0.85
Q100 = 16.59 cfs

%Imp = 85
Perv CN = 61 (good lawn)
CCN = 90
RO = 1.5 inches
V100 = 20,960 cf

6. DETENTION POND DESIGN:

The total peak discharge from Tract A-2 after development must be limited to:

0.91	+	1.93	=	2.84 cfs
(OS-1)		(6.52 x 0.5cfs/acre)		

The cummulative hydrologic properties of the basins tributary to the ponding area are as follows:

A = 4.19 acres
P100 = 2.4 inches

Tc < 10 minutes
I100 = 5.07 in/hr
CC = 0.82
Q100 = 17.41 cfs

CCN = 89
RO = 1.4 inches
V100 = 21,290 cf

Assuming a pond depth of about 5 feet and given the allowable discharge of 2.84 cfs, a single 7 inch outlet orifice will control the discharge adequately (inlet control). The pond hydrograph (per DPM chapter 22.2, part F) shows that a total of 17,610 cf of detention volume is required to satisfy the discharge requirement and that the pond will be drained in about 4 hours after the 100-year event. A pond with vertical sides, a commercial area guardrail, 3900 sq ft of bottom area, and 4.52 feet deep will be needed. The hydrograph is located in Appendix 'B'.

The 10 inch PVC outlet pipe (n=0.010) at a slope of 1.5% has a capacity of 3.49 cfs (Mannings). OK

Check 12' wide inlet weir, $17.41=2.65(12)H^{1.5}$; H = 0.67'.
The opening sides will be one CMU block high (0.67'). OK

7. SUMMARY:

The development of Tracts A-1 & A-2 will result in a slight reduction of peak flows into Montgomery Blvd due to the construction of the detention ponding. The peak flows will be changed from 24.74 cfs (before) to 23.95 cfs (after) which represents a 3% reduction. The project will also redirect Hendrix Road public storm flows, which currently sheet flow across private property, to a new public surface channel north to Montgomery Blvd.

The on-site pond will have a maximum water surface elevation of 78.15 during the 100-year storm. A twenty foot section of the pond wall with top elevation of 78.33 (at the northwest corner of the pond) will serve as the pond's overflow spillway.

17.41 cfs = 2.65(20 lf)H^1.5 ; H = 0.67'.

The opening sides will be one CMU block high (0.67'). OK

APPENDIX A

BPLW
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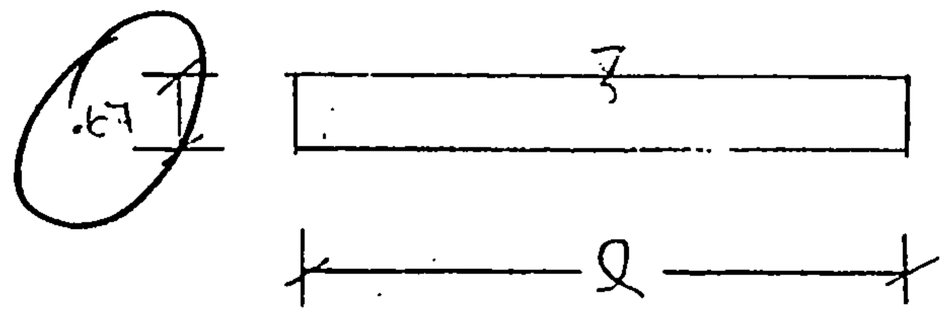
Project FHP
Subject END WALL @ HENDRIX [illegible]
Project No. 91001 Date 7-91 By [illegible]

☐ Memorandum
☐ Telephone record
☐ Note to the file
☐ Minutes of meeting
☐ To be typed
☐ _____

CHANNEL INLET AT HENDRIX CUL-DE-SAC



SINCE CHANNEL DIRECTION @ ADVERSE TO FLOW, RECOMMEND THROAT to BE EAST RESULTING IN L = 25', NEED GATES @ BOTH ENDS

$Q_{ACT} = 11 CFS$

$Q = 2.65 Q_{.67}^{1.5}$

$Q = \frac{11}{2.65 \times .67^{1.5}} = 7.63$ FT

1 * JUST MAKE OPENING 10 FT

$2.65 \times 10 \times .67^{1.5} = 14.42$ CFS > 11 CFS OK

$Q = C L H^{3/2}$

$H = \left(\frac{Q}{CL}\right)^{2/3} = \left(\frac{11 \text{ CFS}}{2.65 \times 25}\right)^{2/3} = 0.30'$

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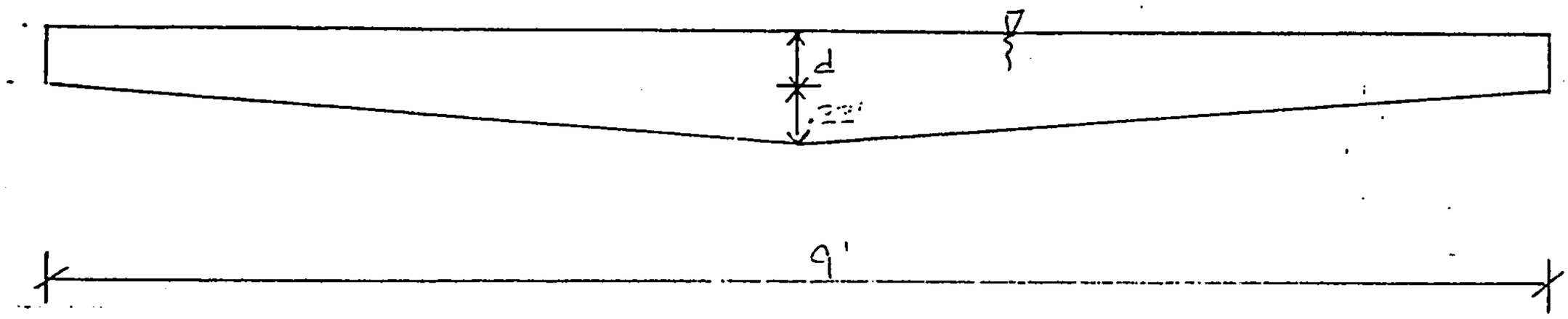
Project EHP

Subject FLOW CAPACITY THRU CHANNEL

Project No. 91021 Date 3-91 By LSH

- ☐ Memorandum
- ☐ Telephone record
- ☐ Note to the file
- ☐ Minutes of meeting
- ☐ To be typed
- ☐ _____

STANDARD COA DRAINAGE CHANNEL



$Q_{ACT} = 11 CFS$ 11cfs

$Q \geq Q_{ACT}$

$n = .013$ .014

$S_o = .007$ .005

$$Q = \frac{1.49 A R^{2/3} S^{1/2}}{n}$$

$A = 9d + 1.5$

$P = 2d + 9.02$

$R = A/P$

$$Q = \frac{1.49 [9d + 1.5]}{.014} \left[\frac{9d + 1.5}{2d + 9.02}\right]^{2/3} [.005]^{1/2}$$

$$Q = 7.72 (9d + 1.5) \left(\frac{9d + 1.5}{2d + 9.02}\right)^{2/3}$$

LET $d = 4" = .33'$ (HEIGHT OF SIDEWALLS)

$Q = 20.31 CFS > 11 CFS$ OK

* FOR CONSTRUCTION EASE, USE 8" SIDEWALLS

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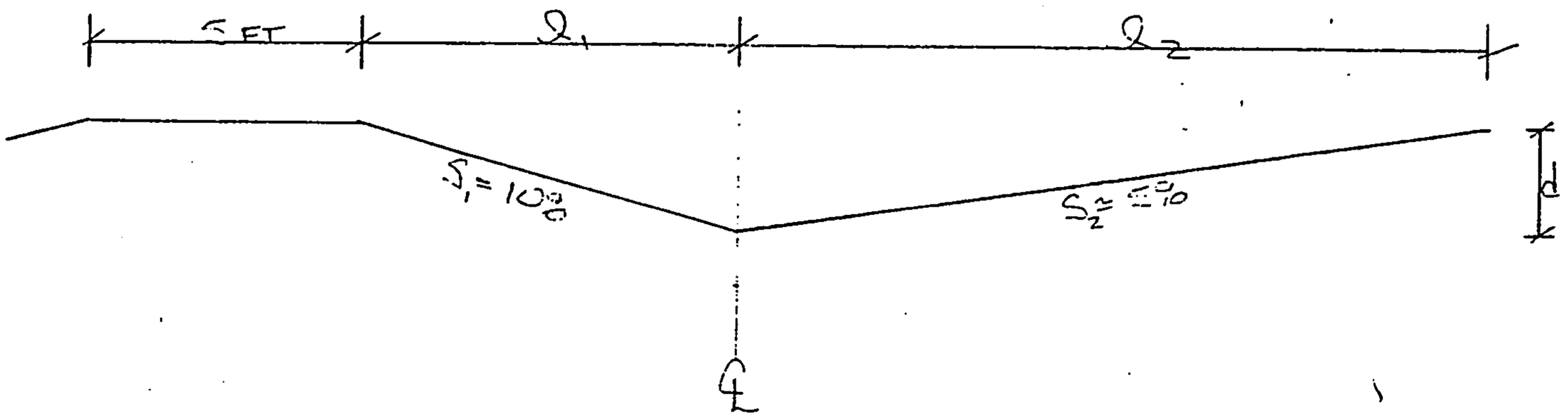
Project EHP

Subject FLOOD FLOW

Project No. 91001 Date 3-91 By LPH

☐ Memorandum
☐ Telephone record
☐ Note to the file
☐ Minutes of meeting
☐ To be typed
☐ _____

ENTER & EXIT FLOOD FLOWS - ADJACENT TO WELL SITE DRIVEWAY



$n = .017$

$S_o = .5\% = .005$

$$Q = \frac{1.49 A R^{2/3} S^{1/2}}{n} \geq 11 \text{ CFS}$$

LET $d = .41'$

$Q_1 = 4.5$ FT

$Q_2 = 9$ FT

$A = \frac{1}{2}(.41)(4.5+9) = 3.04$ FT^2

$R = \frac{A}{P} = \frac{3.04}{\sqrt{.41^2+4.5^2} + \sqrt{4.5^2+9^2}} = \frac{3.04}{13.53} = .024$ FT

$Q = 1.49(3.04)(.024)^{2/3}(.005)^{1/2}(1/.017) = 6.95$ CFS $<$ 11 CFS NG

BPLW

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Project EHP

Subject FLOW CALCS

Project No. 91001 Date 3-91 By CAH

- ☐ Memorandum
- ☐ Telephone record
- ☐ Note to the file
- ☐ Minutes of meeting
- ☐ To be typed
- ☐ _____

TRY $d = .55$ FT
$y_1 = 5.5$ FT
$y_2 = 11$ FT

$A = 4.54$ FT^2

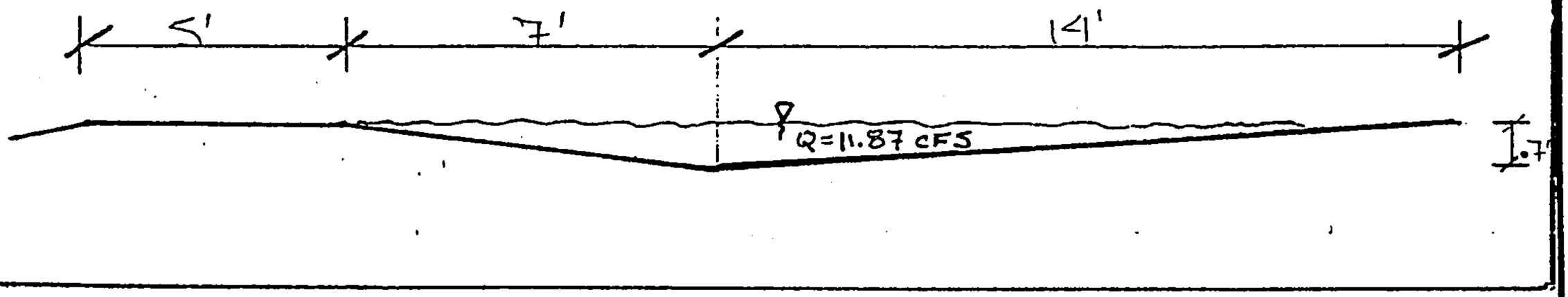
$P = \{(.55)^2 + (5.5)^2\}^{1/2} + \{(5.5)^2 + (11)^2\}^{1/2} = 16.54$ FT

$R = A/P = .27$ FT

$Q = 1.49 (4.54)(.27)^{2/3} (.005)^{1/2} (1/.017) = 11.87$ CFS > 11 CFS OK

ADD .15 FT FOR FREE BOARD.

$d = .55' + .15' = .70$
$y_1 = 7$ FT
$y_2 = 14$ FT



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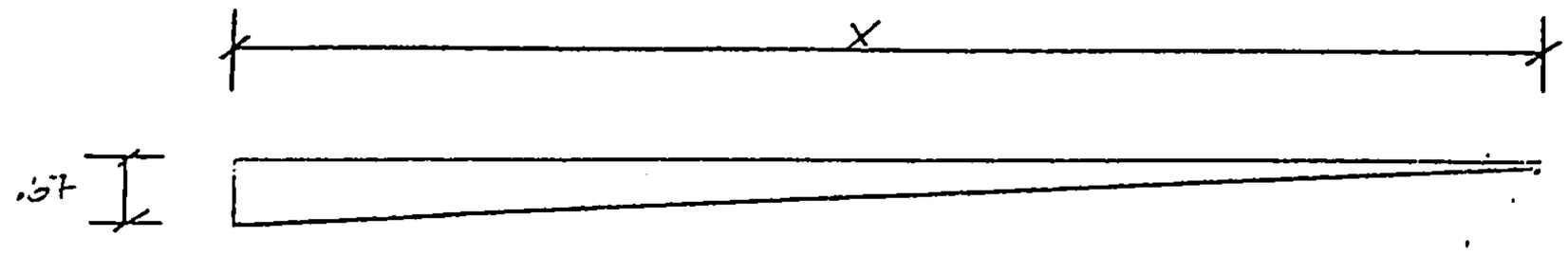
Project FLD

Subject FLOOD CALCS

Project No. 91001 Date 3-91 By LAH

- ☐ Memorandum
- ☐ Telephone record
- ☐ Note to the file
- ☐ Minutes of meeting
- ☐ To be typed
- ☐ _____

DI GUTZ BY EXISTING WATER METER JUST SOUTH OF MONTGOMERY



Q_{ACT} = 11 CFS

n = .017

S_o = .005

USE x = 18 FT

$A = \frac{1}{2}(.67)(18) = 6\ FT^2$

$P = 18.01\ FT$

$R = A/P = .333\ FT$

$R^{2/3} = .48$

$$Q = \frac{1.49\,A\,R^{2/3}\,S^{1/2}}{n} = \frac{1.49(6)(.48)(.005)^{1/2}}{(.017)}$$

Q = 17.87 CFS > 11 CFS OK

APPENDIX B

DIMENSIONLESS UNIT HYDROGRAPH TRACT A-2 POND
(City of Albuquerque)

A = 4.19 P100 = 2.40 RO = 1.40
Tc = 10 CN = 89

Point	t/Tp	t(min)	y	In Q(cfs)	In V (cf)	Out Q(cfs)	Out V(cf)	Total Net V	Pond Depth
1	0.0	0.00	0.000	0.00	0	0.00	0	0	0.00
2	0.1	1.00	0.030	0.80	48	0.00	0	48	0.01
3	0.2	2.00	0.100	2.66	160	0.00	0	208	0.05
4	0.3	3.00	0.190	5.06	304	0.01	0	511	0.13
5	0.4	4.00	0.310	8.26	495	0.05	3	1,003	0.26
6	0.5	5.00	0.470	12.52	751	0.28	0	1,754	0.45
7	0.6	6.00	0.660	17.58	1,055	0.57	34	2,774	0.71
8	0.7	7.00	0.820	21.84	1,310	0.87	52	4,032	1.03
9	0.8	8.00	0.930	24.77	1,486	1.14	68	5,450	1.40
10	0.9	9.00	0.990	26.37	1,582	1.38	83	6,950	1.78
11	1.0	10.00	1.000	26.63	1,598	1.59	95	8,452	2.17
12	1.1	11.00	0.990	26.37	1,582	1.78	107	9,927	2.55
13	1.2	12.00	0.930	24.77	1,486	1.95	117	11,297	2.90
14	1.3	13.00	0.860	22.90	1,374	2.09	125	12,546	3.22
15	1.4	14.00	0.780	20.77	1,246	2.21	133	13,659	3.50
16	1.5	15.00	0.680	18.11	1,087	2.32	139	14,607	3.75
17	1.6	16.00	0.560	14.91	895	2.40	144	15,358	3.94
18	1.7	17.00	0.460	12.25	735	2.47	148	15,945	4.09
19	1.8	18.00	0.390	10.39	623	2.52	151	16,417	4.21
20	1.9	19.00	0.330	8.79	527	2.55	153	16,791	4.31
21	2.0	20.00	0.280	7.46	447	2.59	155	17,083	4.38
22	2.2	22.00	0.207	5.51	662	2.61	313	17,432	4.47
23	2.4	24.00	0.147	3.91	470	2.64	317	17,585	4.51
24	2.6	26.00	0.107	2.85	342	2.65	318	17,609	4.52
25	2.8	28.00	0.077	2.05	246	2.65	318	17,537	4.50
26	3.0	30.00	0.055	1.46	176	2.65	318	17,395	4.46
27	3.2	32.00	0.040	1.07	128	2.63	316	17,207	4.41
28	3.4	34.00	0.029	0.77	93	2.62	314	16,985	4.36
29	3.6	36.00	0.021	0.56	67	2.60	312	16,740	4.29
30	3.8	38.00	0.015	0.40	48	2.58	310	16,478	4.23
31	4.0	40.00	0.011	0.29	35	2.56	307	16,206	4.16
32	4.5	45.00	0.005	0.13	40	2.54	761	15,485	3.97
33	5.0	50.00	0.000	0.00	0	2.48	743	14,742	3.78
-	-	60.00	-	0.00	0.00	2.41	1,447	13,294	3.41
-	-	80.00	-	0.00	0.00	2.28	2,738	10,556	2.71
-	-	100.00	-	0.00	0.00	2.01	2,415	8,141	2.09
-	-	120.00	-	0.00	0.00	1.74	2,089	6,052	1.55
-	-	140.00	-	0.00	0.00	1.47	1,758	4,294	1.10
-	-	160.00	-	0.00	0.00	1.18	1,421	2,873	0.74
-	-	180.00	-	0.00	0.00	0.90	1,075	1,798	0.46
-	-	200.00	-	0.00	0.00	0.59	708	1,090	0.28
-	-	220.00	-	0.00	0.00	0.22	265	825	0.21
-	-	240.00	-	0.00	0.00	0.18	216	609	0.16

TOTAL VOLUME = 21,097

NOTES: 1) Hydrograph assumes outlet is one 7 inch diameter orifice
(Q = 0.6 * A * (2gH)^0.5)
2) Pond depths based on 3900 sf, vertical wall design