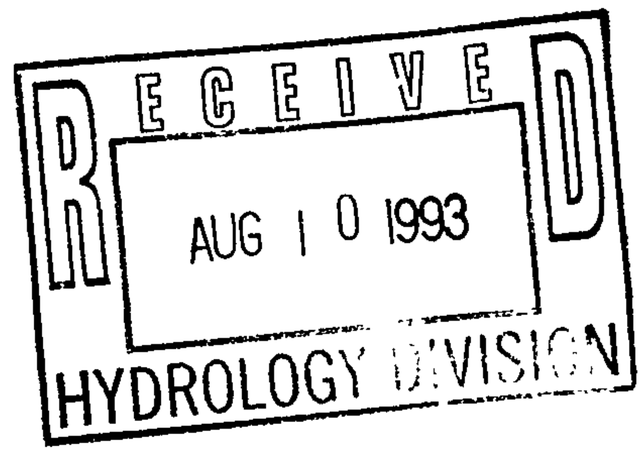
Tierra West Development
Management Services

August 10, 1993



Public Works Department
Hydrology
Post Office Box 1293
Albuquerque, New Mexico 87103

RE: KRZY Antenna Site, Z-93-82, Renaissance III

To Whom It May Concern:

Enclosed please find the final grading and drainage plan for the above mentioned project.

Should you have any questions concerning this letter or any other matter pertaining to this project, please do not hesitate to contact me.

Sincerely,

Ronald R. Bohannan, P.E.

Enclosure

Job No: 930015
RRB/cr

KRZY May
move
Antenna
Ron Bohannan
8-26-93

4600 Montgomery Blvd. NE Suite 9 • Albuquerque, NM 87109 • (505)883-7592

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 17, 1999

Ronald R. Bohanan, P.E.
Tierra West, LLC
4421 McLeod NE
Suite D
Albuquerque, NM 87109

RE: PETSMART, RENAISSANCE CENTER II (F16-D03P1). DRAINAGE REPORT AND GRADING PLAN FOR SITE DEVELOPMENT PLAN FOR BUILDING PERMIT, BUILDING PERMIT, AND GRADING PERMIT APPROVALS. ENGINEER'S STAMP DATED DECEMBER 15, 1998.

Dear Mr. Bohanan:

Based on the information provided in your December 18, 1998 submittal, the above referenced project is approved for Site Development Plan for Building Permit, Building Permit, and Grading Permit. (See also enclosed letter dated 1/30/99 by City's Consultant.)

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

Prior to Certificate of Occupancy approval, an Engineer's Certification per the DPM will be required.

If I can be of further assistance, please feel free to call me at 924-3984.

Sincerely,

John P. Murray, P.E.
Hydrology

c: Andrew Garcia
√File

DRAINAGE REPORT

for

PETSMART

Tract 13-C1 and Tract 13-D
Renaissance Center II

Prepared by
Tierra West LLC
4421 McLeod Road NE, Suite D
Albuquerque, New Mexico 87109

Prepared for
Mr. Gerald V. Dicker, GVD

December 15, 1998

Ronald R. Bohannan, P.E. No. 7868

REGISTERED PROFESSIONAL ENGINEER
RONALD RAY BOHANNAN
NEW MEXICO
12-8-98

LOCATION

The site is located in the Renaissance Center II, west of I-25 along Montano Road NW. The site is situated at the northwest corner of Alexander Boulevard and Renaissance Boulevard NW. The purpose of this report is to provide the drainage analysis and management plan for three additional building sites labeled A, B, and C, to the existing Petsmart. Buildings A and B on Tract 13-C1, are for retail business. Building C, in Tract 13-D, is for a fast food restaurant. We are requesting approval for a building permit for all three sites. The total site, Tracts 13-C1 and 13-D, consists of 5.98 ± acres.

LEGAL DESCRIPTION

Tracts 13-C1 and 13-D, South Renaissance Center , Bernalillo County, City of Albuquerque.

ZONING AND SURROUNDING DEVELOPMENT

The site is zoned M-2 and is an infill site. Petsmart and Country Dan's are existing businesses on this site. The surrounding sites are developed. North of the site is Montano Road NE, to the west, south and east are existing retail businesses.

FLOOD HAZARD ZONES

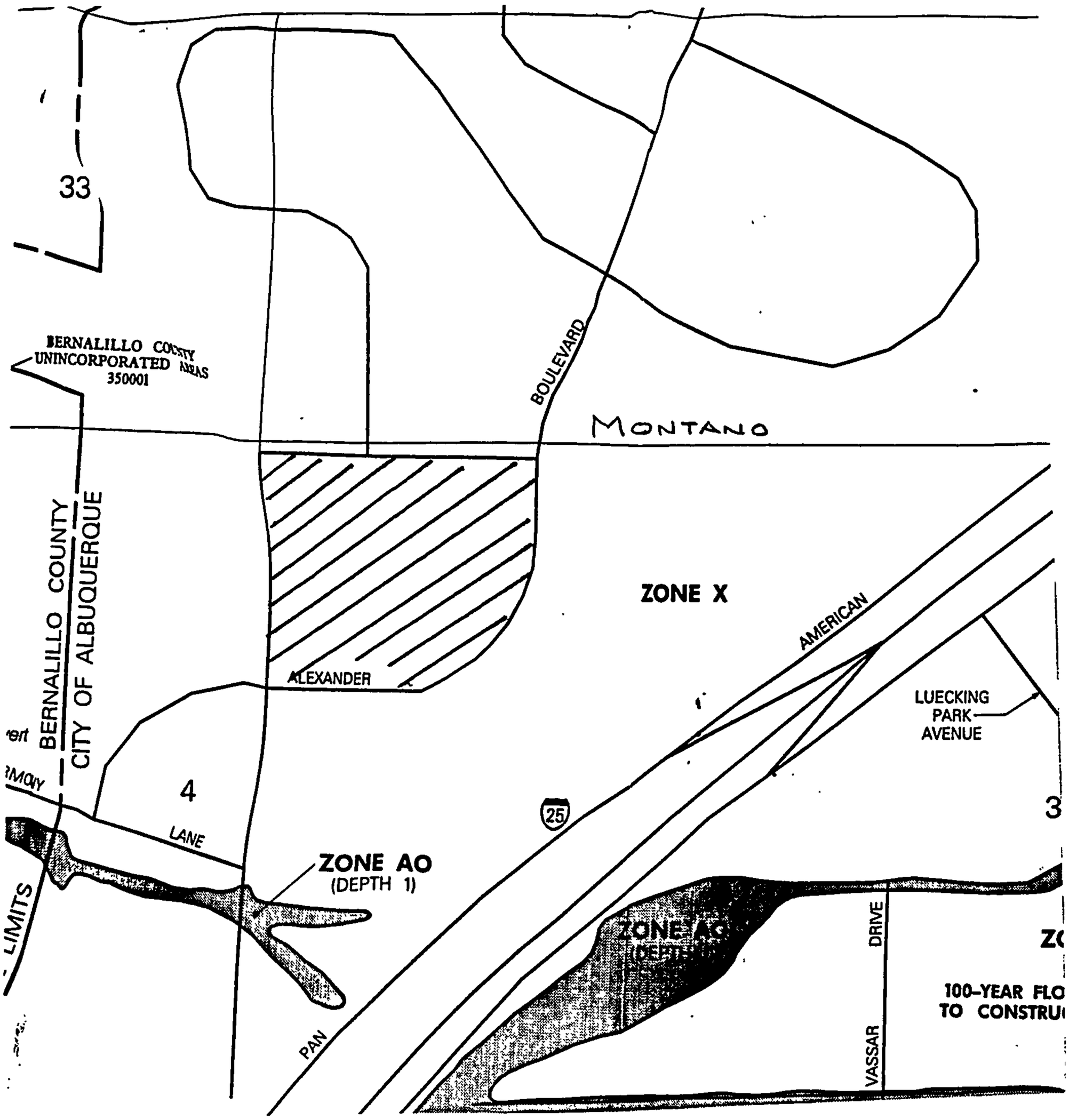
As shown in figure 3, Panel 35001C 0138D of the National Flood Insurance Rate Maps for the City of Albuquerque, dated September 20, 1996 indicates that the site is not in a floodplain.

The site contains two soil types, Bluepoint-Kokan association (BKD) and Wink-Embudo complex (WeB), as indicated on the Soil Map (sheet #21) for the Soil Conservation Service Survey of Bernalillo County.

The Bluepoint-Kokan association is a Bluepoint Loamy fine sand that has slow runoff, rapid permeability, and moderate to severe hazard of water erosion. Wink-Embudo complex consists of deep, well drained soils that formed in old unconsolidated alluvium modified by wind on piedmonts. This soil has a thin layer of loamy sand. See Attached soil map for site location.

RELATED REPORTS AND DRAINAGE HISTORY

This report has been prepared in accordance with the Master Drainage Plan for Tract 13, Renaissance Center II, which covers the discharge for the entire site. A copy of this plan for all of Tract 13 (prepared by Mark Goodwin and Associates (F16/D003P)) is enclosed in Map Pocket C-5.



FLOOD INSURANCE RATE MAP

Panel 35001C0138D

Tract 13 lies within the Renaissance Drainage Master Plan prepared by Andrews Asbury and Roberts, (F16/D6). This report covers the drainage for the area and provides limitation to the discharge. This report uses the criteria established in both previous plans to limit flows from this site.

EXISTING SITE CONDITIONS AND DRAINAGE PATTERN

Presently there are two retail businesses on Tract 13, Petsmart and Country Dan's. The northeast corner of Tract 13-C1 and the southeast corner of Tract 13-D are undeveloped. These areas are shown on the Master Drainage Plan for Tract 13 as future sites. (See sheet C-5.) The Master Plan divided the site into two drainage basins, Areas 1 and 2. See Basin Map.

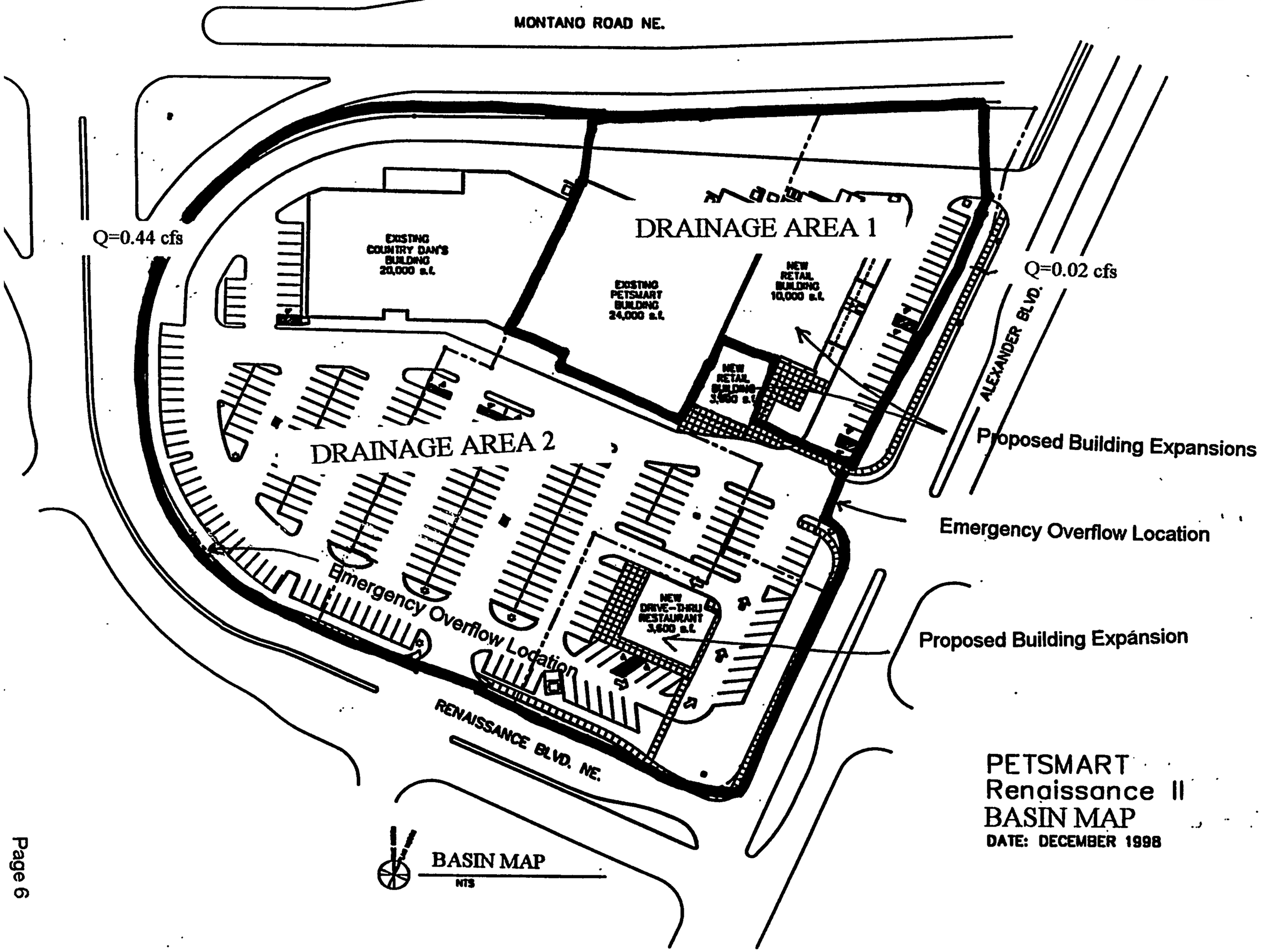
In Drainage Area 1, the developed storm water runoff is channeled into a 30,490 cf detention pond. From this detention pond, the runoff is discharged at a controlled rate to Alexander Boulevard through a 2" PVC pipe. This storm water is carried in Alexander Boulevard to an existing storm drain inlet which discharges into an existing retention basin located off site.

In Drainage Area 2, the developed storm water is channeled to a series of type "D" inlets in the parking area. There is a detention pond in the parking area, surrounding the drop inlets, with a capacity of 46,744 cf. These drop inlets are connected to a storm water inlet in Renaissance Boulevard. This storm water is released into the same existing retention basin as Drainage Area 1.

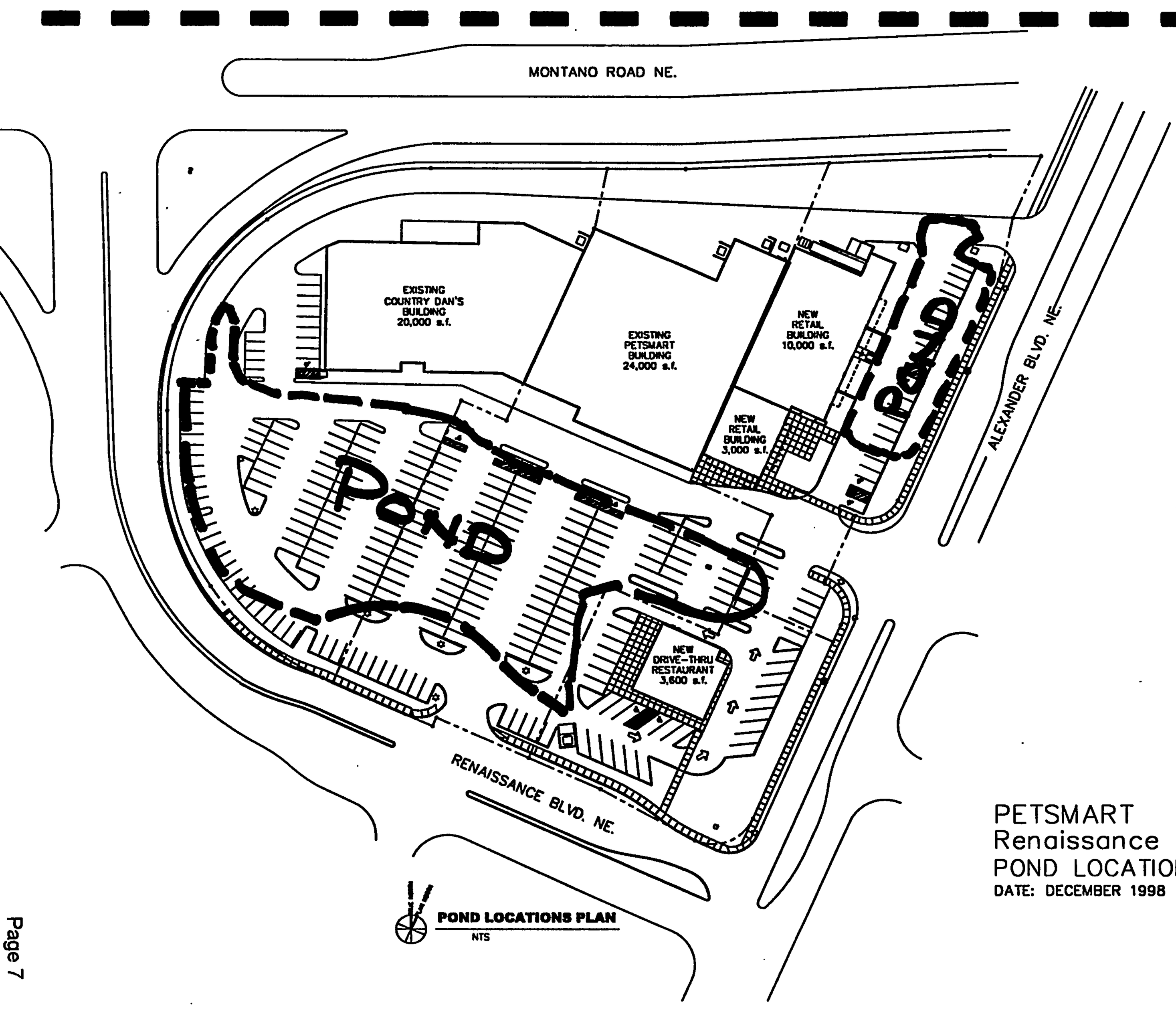
The runoff from Petsmart's roof is captured in several roof drains along the northern portion of the building. These roof drains discharge the runoff into the service road along the northern property line. The storm water then travels down the service road and into an existing detention pond which has a capacity of 30,490 cf, (see Master Drainage Plan, sheet C-5.) The storm water in this pond is discharged into Alexander Boulevard through a 2" PVC pipe at a controlled flowrate of .02 cfs.

The storm water runoff from Country Dan's is captured in roof drains along the north portion of the building. The runoff is then channeled to the west through the service road to two type "D" storm drain inlets in the parking area to the south. These inlets are connected to a drop inlet at Renaissance Boulevard via a 6" PVC pipe. The flowrate for a 6" PVC pipe flowing full is 0.44 cfs. The drop inlet at Renaissance is connected to an 18" RCP which discharges into a 24" RCP that then discharges into an existing retention basin. There is a detention pond around the existing type "D" drop inlets with a capacity of 46,744 cf as shown on the Master Drainage Plan. (See sheet C-5.) The effective area of the type "D" drop inlets, assuming a 50% clogging factor, is 3.10 sf per inlet.

There are two emergency spillways on site. One is a series of 4 -2' wide sidewalk culverts with a capacity of 12.06 cfs along Renaissance Boulevard The second is the driveway along Alexander Boulevard with a capacity of 24.89 cfs. Both emergency



PETSMART
Renaissance II
BASIN MAP
DATE: DECEMBER 1998



PETSMART
Renaissance II
POND LOCATIONS PLAN
DATE: DECEMBER 1998

overflows have been shown on the Basin Map for quick reference. According to the Renaissance Master Drainage Plan, this site is allowed to discharge 0.10 cfs per acre or 0.60 cfs. This release rate matches the downstream capacity in the Andrews, Asbury and Roberts Master Plan. Presently, the site releases 0.46 cfs.

PROPOSED SITE CONDITIONS AND DRAINAGE PATTERN

The addition of two retail businesses labeled buildings A and B, and a fast food restaurant, labeled building C, is proposed. The area of the three buildings equal 16,600 square feet. Buildings A and B are located on Tract 13-C1. Building C is located on Tract 13-D.

The storm water runoff associated with the Building A site will be channeled into the detention pond along Alexander Boulevard and discharged into Alexander Boulevard at the same controlled rate (0.02 cfs) as shown on the Master Drainage Plan. The storm water runoff will continue in Renaissance Boulevard to the existing retention basin, per the original approved plan.

The storm water associated with Buildings B and C will be channeled to the existing type "D" inlets in the existing parking areas. These inlets are located in a detention pond with a capacity of 46,744 cf. These inlets discharge into a storm drain inlet in Renaissance Boulevard and eventually discharge into the existing retention pond. The storm water from this basin will discharge at the same rate, 0.44 cfs for a 6" PVC pipe as shown on the Master Drainage Plan.

The roof for Building A will be sloped to the east and the storm water runoff will be captured in roof drains which are channeled under the proposed sidewalk. The runoff then collects in the detention pond in the parking lot and landscaped area. The storm water runoff is discharged through the existing 2" PVC pipe into Alexander Boulevard at a flowrate of 0.02 cfs. This is in accordance with the Master Drainage Plan.

The roof for Building B will be sloped to the south and the storm water runoff will be captured in roof drains and channeled under the proposed sidewalk. The runoff is then channeled through the parking area to an existing type "D" drop inlet.

The storm water runoff for Building C will be captured in roof drains and channeled under the proposed sidewalks. The storm water is then carried in the paved driveways to the existing type "D" drop inlets and is then discharged at the drop inlet in Renaissance Boulevard.

The development of the three new building sites will increase the runoff to the existing ponds by 1.35 cfs. However, the release rate for the entire site is still limited to 0.46 cfs. The volume of the new development will increase by 6019 cf and will be contained in the existing parking lot ponds. (See Basin Summary and Hydrologic calculations.) Based on the Master Drainage Plan, the total site is allowed to discharge

0.10 cfs/ac due to downstream capacity. The total site is 5.98± acres and is allowed to discharge 0.60 cfs. We are discharging 0.02 cfs at Alexander Boulevard and 0.44 cfs at Renaissance Boulevard. The proposed grading and drainage plan follows the Master Drainage Plan.

SUMMARY

The purpose of this report is to obtain building permits for three buildings designated A, B, and C. This drainage analysis and management plan follows the concepts shown on the Master Drainage Plan for Tract 13. The site will discharge 0.02 cfs through the 2' PVC pipe at Alexander Boulevard and 0.44 cfs through the 6" PVC at the drop inlet in Renaissance Boulevard. The existing detention ponds have a capacity of 77,234 cf and the developed site requires 42,027 cf. The volume and rate being discharged meets the requirements of the Master Plan for rate and volume. The development of this site will not impact the downstream retention basin and there is no public infrastructure needed.

HYDROLOGY/HYDRAULICS

The runoff calculations and design are done in accordance with Section 22.2 of the Development Process Manual of the City of Albuquerque, January 1993.

RUNOFF CALCULATIONS - SIMPLIFIED PROCEDURE

By:Chris Ehrsam
Project: Petsmart

Date: 012-15-98
Zone Atlas: F-16

This procedure is in accordance with the City of Albuquerque Development Process Manual, Volume 2, Section 22.2, "Hydrology", peak discharge rate for small watersheds less than forty acres in size.

Precipitation Zone from Figure A-1: 2
Land treatment descriptions are in Table A-4.

1. RUNOFF RATE COMPUTATION

Use Equation a-10: $Q_P = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$
Values of Q_{pi} are from Table A-9, and are in CFS/acre. Area values are in acres.

BASIN	Q_{PA}	A_A	Q_{PB}	A_B	Q_{PC}	A_C	Q_{PD}	A_D	Q_P
EXISTING RATE OF RUNOFF (CFS)									
Basin 1	1.56	0.00	2.28	0.11	3.14	0.78	4.89	0.49	5.10
Basin 2	1.56	0.00	2.28	0.33	3.14	0.52	4.89	3.75	20.72
Total									25.82
DEVELOPED RATE OF RUNOFF (CFS)									
Basin 1	1.56	0.00	2.28	0.19	3.14	0.28	4.89	0.91	5.76
Basin 2	1.56	0.00	2.28	0.35	3.14	0.10	4.89	4.15	21.41
Total									27.17

2. RUNOFF VOLUME COMPUTATION

Use Equation a-5 to compute weighted excess precipitation:

$$\text{Weighted } E = \text{"E"} = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/(A_A + A_B + A_C + A_D)$$

$$(A_A + A_B + A_C + A_D) = \sum A_i$$

Use Equation a-6 to compute the volume:

$$V_{360} = \text{"E"} \times (A_A + A_B + A_C + A_D) \times 3630 \text{ feet}^3/\text{acre inch}$$

Values of E_i are from Table A-8, and are in inches. Area values are in acres.

BASIN	E_A	A_A	E_B	A_B	E_C	A_C	E_D	A_D	$\sum A_i$	"E"	V_{360}
EXISTING VOLUME OF RUNOFF (CUBIC FEET)											
Basin 1	0.53	0.00	0.78	0.11	1.13	0.78	2.12	0.49	1.38	0.81	4082
Basin 2	0.53	0.00	0.78	0.33	1.13	0.52	2.12	3.75	4.60	1.91	31926
Total											36,008
DEVELOPED VOLUME OF RUNOFF (CUBIC FEET)											
Basin 1	0.53	0.00	0.78	0.19	1.13	0.28	2.12	0.91	1.38	0.99	8689
Basin 2	0.53	0.00	0.78	0.35	1.13	0.10	2.12	4.15	4.60	1.66	33338
Total											42,027

Basin Runoff Summary

Basin	Existing Q (cfs)	Developed Q (cfs)	Discharge Point
1	5.10	5.76	2" pipe @ Alexander Blvd.
2	20.72	21.41	Drop inlet @ Renaissance Blvd.

Basin Runoff Volume Summary

Basin	Existing Vol. (cf)	Developed Vol.(cf)	Discharge Point
1	4082	8689	2" pipe @ Alexander Blvd.
2	31926	33338	Drop inlet @ Renaissance Blvd.

drs9878

SIDEWALK CULVERT

Orifice Equation:

$$Q=CA\sqrt{2gH}$$

Solve for Q

C = 0.6

A = 0.5833*2 = 1.167 ft^2

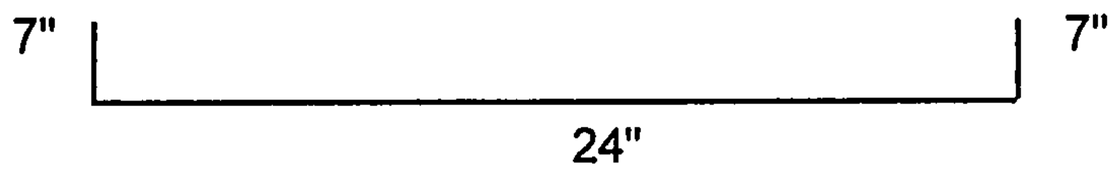
g = 32.2

H = Height of water measured from center of orifice

$$Q=0.6(1.167)\sqrt{2*32.2*\frac{0.5833}{2}}$$

Q=3.04 cfs

4 - 2 ft wide sidewalk culverts 3.04*4=12.06 cfs sidewalk culvert



EMERGENCY SPILLWAY
DRIVEWAY

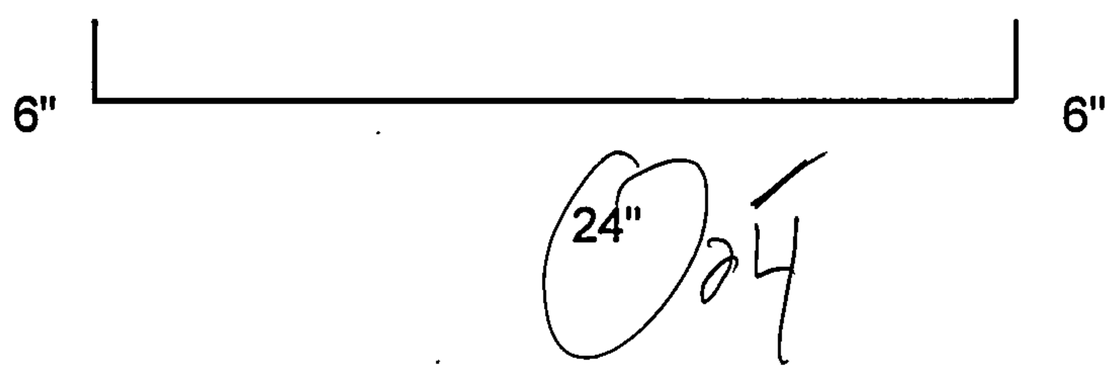
Orifice Equation:

$$Q = CA\sqrt{2gH}$$

Solve for Q
C = 0.6
A = 0.5*24 = 6.0 ft^2
g = 32.2

$$Q = 0.6(12)\sqrt{2 * 32.2 * \frac{0.5}{2}}$$

H = Height of water measured from center of orifice
Q=24.89 cfs



STORM DRAIN INLET
EFFECTIVE AREA ASSUMING A 50% CLOGGING FACTOR

SINGLE 'D':

Area at the grate:

L = 48" - 9 (1/2" $_{\text{middle bars}}$)
= 43.5
= 3.625'

W = 27" - 13 (1/2 $_{\text{middle bars}}$)
= 20.5"
= 1.708'

Area = 1.708' x 3.625'
= 6.193 ft^2

Effective Area= 6.193 - 0.5 (6.193)
= 3.10 ft^2

Effective Area = 3.10 ft^2

$n = 0.012$ for PVC

Pipe capacities

2"

6"

$$Q = \frac{1.49}{0.012} \cdot A \cdot R^{2/3} \times S^{1/2}$$

$$Q_{2"} = \frac{1.49}{0.012} * 0.022 \cdot \left(\frac{.022}{0.524}\right)^{2/3} \cdot (.005)^{1/2} = .02$$

$$Q_{6"} = \frac{1.49}{.012} * 0.2 * \left(\frac{.2}{1.57}\right)^{2/3} \cdot (.005)^{1/2} \quad Q = .44$$

$\frac{\pi d^2}{4} =$ 2" = .022

$P = 2\pi R = 0.52$ $\quad Q = 0.46$

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 12, 1995

Ron Bohannan
Tierra West Development
4600 Montgomery NE Suite 3
Albuquerque, NM 87109

RE: ENGINEER CERTIFICATION FOR FLOORS A PLENTY (F16-D3P1)
CERTIFICATION STATEMENT DATED 12/23/94.

Dear Mr. Bohannan:

Based on the information provided on your January 9, 1995 resubmittal, the above referenced site is acceptable for Engineer Certification.

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

Sincerely,

Bernie J. Montoya

Bernie J. Montoya, CE
Engineering Associate

BJM/dl

c: Andrew Garcia
Jim Trump
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 27, 1994

Ronald R. Bohannan
Tierra West Development Management Services
4600 Montgomery NE Suite #3
Albuquerque, NM 87109

RE: DRAINAGE PLAN FOR FLOORS A PLENTY (F16-D3P1) ENGINEER'S STAMP DATED 7/1/94.

Dear Mr. Bohannan:

Based on the information provided on your July 25, 1994 submittal, the above referenced site is approved for Building Permit.

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

Also, prior to Certificate of Occupancy release, Engineer Certification per the D.P.M. checklist will be required.

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

Sincerely,

Bernie J. Montoya, CE
Engineering Associate

BJM/dl/WPHYD/8671

c: Andrew Garcia
File

ELENA

GALLEGOS

GRANT

SU-1

SU FOR SAND & GRAVEL EXTR & REL ACT & USES PERM IN M-1 ZONE

MISSION ELEMENTARY SCHOOL

VINEYARD ADDN

NO 1 RENAISSANCE

SU-1 FOR R-3 USES

SU-1 FOR C-2 USES

SU-1 FOR AUTO SALES

CENTER

SU-1 IP USES

SU-1 IP & AMUSEMENT FAC OF A TEEN CHARACTER (NO ADULT ESTABLISHMENT)

SUNDTS INDUSTRIAL M-2

MIDTOWN

SALVATION ARMY

MONTGOMERY

SITE LOCATION

ERRERS COMMONS

NORTH DIVERSION CHANNEL AND INLET CHANNELS PHASE 4

AMAFCA NORTH DIVERSION CHANNEL

INTERSTATE 25

MONTANO

MISSION AV

RENAISSANCE BLVD

CULTURE MERCANTILE

CHURCH & REL FAC

R-3 COMPLEX

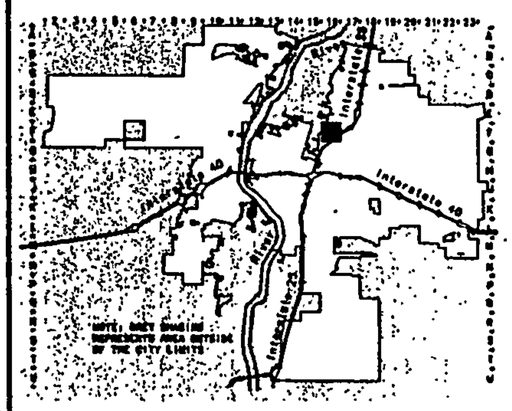
C-3

C-2

C-1

M-1

M-2



CITY OF Albuquerque

Albuquerque Geographic Information System

PLANNING DEPARTMENT

N W E S

GRAPHIC SCALE IN FEET

250 0 500 1000

Zone Atlas Page

F-16-Z

Map Amended through July 08, 1998