CITY OF ALBUQUERQUE

September 22, 2014

Fred C. Arfman, PE
Isaacson & Arfman, PA
128 Monroe St NE
Albuquerque, NM 87108

Re: LaMonica Shops
3510 Coors Blvd SW
Request Permanent C.O. - Accepted
Engineer's Stamp dated: 3-3-14 (P10D005)
Certification dated: 9-18-14

Dear Mr. Arfman,

Based on the Certification received 9/18/2014, the site is acceptable for release of Certificate of Occupancy by Hydrology.

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

Sincerely,

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

RR/CC
C: email

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Lamonica Shops Building Permit #: _____ City Drainage #: P10-D005

DRB# 1000650 EPC# _____ Work Order#: _____

Legal Description: Tracts 1-A-2-A and 1-A-2-C, Lands of Lamonica & Wenk

City Address 3510 Coors Blvd. SW - Albuquerque, NM 87121

Engineering Firm: Isaacson & Arfman, P.A. Contact Fred C. Arfman

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 Fax#: _____ E-mail: freda@iacivil.com

Owner: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Architect: Modulus Architects Contact Stephen Dunbar

Address 220 Copper Ave NW, Ste. 350

Phone#: 338-1499 Fax#: _____ E-mail: sdunbar@modulusarchitects.com

Surveyor: Cartesian Surveying, Inc. Contact: Will Plotner

Address PO Box 44414 Rio Rancho NM 87174

Phone#: (505) 897-3050 Fax#: _____ E-mail: _____

Contractor: Wilger Enterprises Contact: John Wilger

Address: _____

Phone#: 345-2854 Fax#: _____ E-mail: jwilger@ wilgerenterprises.com

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT **RESUBMITTAL**
____ DRAINAGE PLAN 1st SUBMITTAL
____ DRAINAGE PLAN RESUBMITTAL
____ CONCEPTUAL G & D PLAN
____ GRADING PLAN
____ EROSION & SEDIMENT CONTROL PLAN (ESC)
X ENGINEER'S CERT (HYDROLOGY)
____ CLOMR/LOMR
____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ ENGINEER'S CERT (TCL)
____ ENGINEER'S CERT (DRB SITE PLAN)
____ ENGINEER'S CERT (ESC)
____ SO-19
____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

____ SIA/FINANCIAL GUARANTEE RELEASE
____ PRELIMINARY PLAT APPROVAL
____ S. DEV. PLAN FOR SUB'D APPROVAL
____ S. DEV. FOR BLDG PERMIT APPROVAL
____ SECTOR PLAN APPROVAL
____ FINAL PLAT APPROVAL
X CERTIFICATE OF OCCUPANCY (PERM)
____ CERTIFICATE OF OCCUPANCY (TCL TEMP)
____ FOUNDATION PERMIT APPROVAL
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____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
____ WORK ORDER APPROVAL
____ GRADING CERTIFICATION

____ SO-19 APPROVAL
____ ESC PERMIT APPROVAL
____ ESC CERT. ACCEPTANCE
____ OTHER (SPECIFY)

RECEIVED
SEP 18 2014
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED. X Yes ____ No ____ Copy Provided

DATE SUBMITTED: Septr. 18, 2014 By: FRED ARFMAN
Isaacson & Afrman, P.A.

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

1 **Conceptual Grading and Drainage Plan** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2 **Drainage Plans** Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3. **Drainage Report** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4 **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

SDI#1
SDI#2

Cherne, Curtis

From: Cherne, Curtis
Sent: Tuesday, March 11, 2014 9:14 AM
To: 'Ronald Bohannan'
Cc: Wolfe, Bryan K.
Subject: Panda Express not draining in substantial Compliance

Ron,
Good Morning.
I am sending you this e-mail as you are the engineer of record for the Panda Express at Lamonica and Coors.
As part of the drainage report approval process for the site just south of the Panda Express, it was discovered that the orifice plates are not in place at the Panda Express site.
I would like the site to be brought into compliance.
I think the easiest way to bring the site into compliance is to have the contractor that is installing the orifice plates on the site to the south to install the orifice plates at Panda Express. Fred Arfman has a detail on his plans that could be used.
The site to the south recently got their building permit approved.
What would you recommend?
Thank you.

Curtis

From: Olson, Greg
Sent: Tuesday, March 04, 2014 2:55 PM
To: Cherne, Curtis
Cc: 'Bryan Bobrick'; Olson, Greg
Subject: P10-D005 Lamonica Shops - Grading Plan approved for Building Permit (3/4/14 seal)

Curtis,

Here are the photos from Isaacson-Arfman of the missing inlet orifices at the Panda Express site, north of the Lamonica Shops.
These inlets should have gotten inlet controls installed per the Drainage Report and Grading Plan certified by Tierra West, to limit flow to the Wal-Mart system.
Isaacson-Arfman reports that the orifice plates are also missing at the inlets on the Lamonica site, and they will retrofit those inlets with their grading improvements.

Can we work through Tierra West to get the inlet control installed on the Panda Express site, to limit the possibility of Panda Express causing downstream flooding
or have them coordinate with the Lamonica Shops contractor to get them fixed with that contract?

Thanks,

Greg Olson, PE
Senior Engineer
Planning - Hydrology
505-924-3994

From: Bryan Bobrick [mailto:bryanb@iacivil.com]
Sent: Tuesday, March 04, 2014 1:28 PM
To: Olson, Greg; 'Fred Arfman'
Subject: RE: P10-D005 Lamonica Shops - Grading Plan approved for Building Permit (3/4/14 seal)

Olson, Greg

From: Olson, Greg
Sent: Tuesday, March 04, 2014 2:55 PM
To: Cherne, Curtis
Cc: 'Bryan Bobrick'; Olson, Greg
Subject: P10-D005 Lamonica Shops - Grading Plan approved for Building Permit (3/4/14 seal)
Attachments: image001.emz; image001.emz; image007.jpg; image005.png; image010.jpg

Curtis,

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or have them coordinate with the Lamonica Shops contractor to get them fixed with that contract?

Thanks,

Greg Olson, PE
Senior Engineer
Planning - Hydrology
505-924-3994

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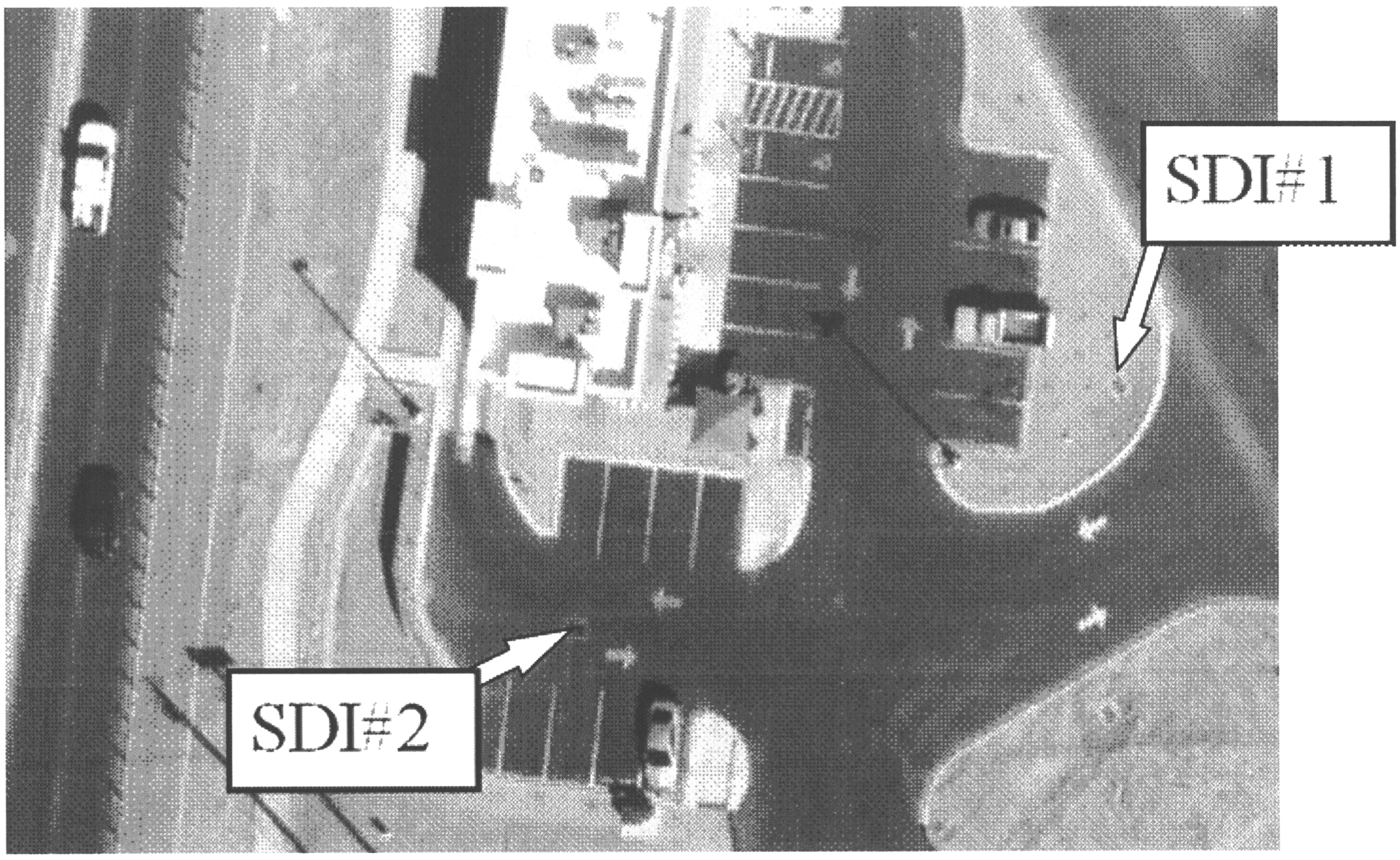
Sent: Tuesday, March 04, 2014 1:28 PM
To: Olson, Greg; 'Fred Arfman'
Subject: RE: P10-D005 Lamonica Shops - Grading Plan approved for Building Permit (3/4/14 seal)



SDI#1: No Orifice control evident

Figure 1: SDI#1

Figure 2: SDI#1

SDI#2: No Orifice control evident

Figure 3: SDI#2

Figure 4: SDI#2

Bryan J. Bobrick
Project Manager
Isaacson & Arfman, P.A.
Consulting Engineering Associates

128 Monroe St. N.E.
Albuquerque, NM 87108
Phone: (505)268-8828
Fax: (505)268-2632
bryanb@iacivil.com

CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

March 10, 2014

Mr. Fred Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. NE
Albuquerque, New Mexico 87108

FasTrax Corrected

RE: **Lamonica Shops** - 3510 Coors Blvd. SW
Updated Drainage Report for Building Permit

File: **P10-D005**
PE Stamp: **03-06-2014**

Dear Mr. Arfman,

This is to confirm our receipt and approval of the Updated Drainage Report for this project received on 3-6-2014.

This information supersedes previous drainage calculations, and supports your approved Grading and Drainage Plan with NM-PE seal date of 3-4-2014.

If you have questions, please email me or telephone 505-924-3994.

Sincerely,

3/10/14

Gregory R. Olson, P.E.
Senior Engineer
Development and Building Services

Orig: Drainage file **P10/D005**
c.pdf Addressee via Email FredA@IAcivil.com
Bryan Bobrick BryanB@IAcivil.com

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Lamonica Shops Building Permit #: _____ City Drainage #: P10-D005

DRB#: 1000650 EPC#: _____ Work Order#: _____

Legal Description: Tracts 1-A-2-A and 1-A-2-C, Lands of Lamonica & Wenk

City Address: 3510 Coors Blvd. SW - Albuquerque, NM 87121

Engineering Firm: Isaacson & Arfman, P.A. Contact: Fred C. Arfman

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 Fax#: _____ E-mail: freda@iacivil.com

Owner: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Architect: Modulus Architects Contact: Stephen Dunbar

Address: 220 Copper Ave NW, Ste. 350

Phone#: 338-1499 Fax#: _____ E-mail: sdunbar@modulusarchitects.com

Surveyor: Precision Surveys, Inc. Contact: Larry W. Medrano

Address: 5571 Midway Park Place NE -- Albuquerque, NM 87109

Phone#: (505) 856-5700 Fax#: _____ E-mail: _____

Contractor: Wilger Enterprises Contact: John Wilger

Address: _____

Phone#: 345-2854 Fax#: _____ E-mail: jwilger@ wilgerenterprises.com

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT **RESUBMITTAL**
- ____ DRAINAGE PLAN 1st SUBMITTAL
- ____ DRAINAGE PLAN RESUBMITTAL
- ____ CONCEPTUAL G & D PLAN
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- ____ OTHER (SPECIFY)

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- ____ ESC PERMIT APPROVAL
- ____ ESC CERT. ACCEPTANCE
- ____ OTHER (SPECIFY)

RECEIVED
MAR 06 2014
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: X Yes ____ No ____ Copy Provided

DATE SUBMITTED: March 6, 2014 By: FRED ARFMAN
Isaacson & Afrman, P.A.

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

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DRAINAGE REPORT

LAMONICA SHOPS

ALBUQUERQUE, NEW MEXICO

I&A Project No.: 2021

March 6, 2014

Prepared by: Fred C. Arfman

FRED C. ARFMAN
NEW MEXICO
7322
PROFESSIONAL ENGINEER

03-06-14

RECEIVED
MAR 06 2014
LAND DEVELOPMENT SECTION

ISAACSON & ARFMAN, P.A. *Consulting Engineering Associates*

*128 Monroe N.E. * Albuquerque, NM 87108 * Phone: 268-8828 * Fax: 268-2632*

I. PROJECT INFORMATION

Per a pre-design meeting with Curtis Cherne, PE with COA Hydrology, the site is permitted the following:

The proposed north, west and south retention ponds and underground stormwater retention system are required to store the 100-year 10-day storm event generated by the associated on-site basins.

Any public stormwater generated from the off-site Coors Blvd system will continue to drain into the west surface pond with the understanding that during larger storms, the public basin stormwaters will continue to backup into the Coors Blvd. R.O.W.

The east side detention pond volume will consist of a large area, shallow depth pond centered in the central landscape basin and extending outwards into the asphalt paved parking area to a depth not to exceed 8". The required orifice control will be added to the two existing on-site storm drain inlets previously constructed to limit the site discharge to allowable rates.

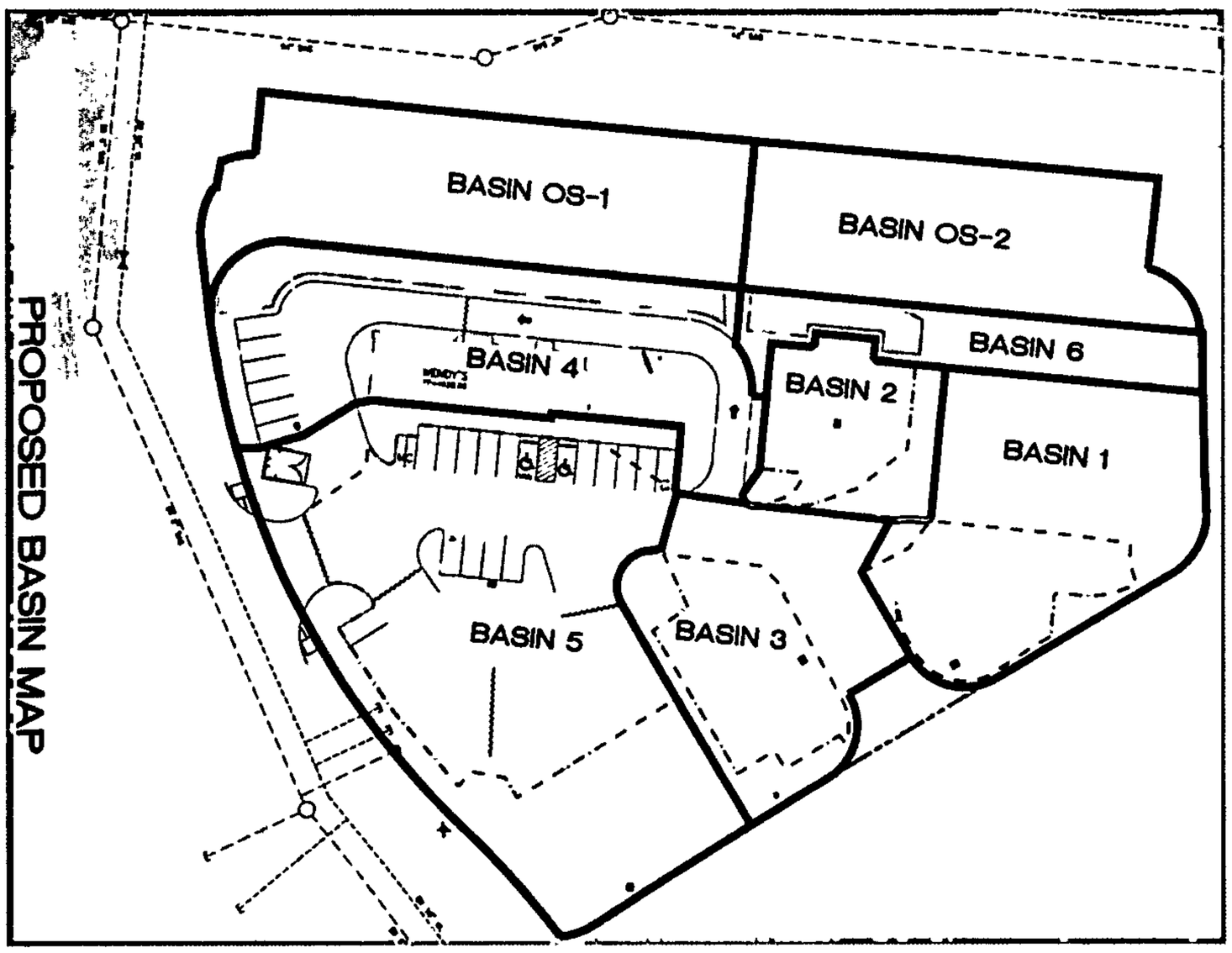
II. MASTER PLANNED BASINS

The following references the Drainage Report for Tract 1-A-2, Lands of Lamonica Wenk (2010) and the approved as-built drainage and grading plan for the Panda Express portion of the property (2012) both prepared by Tierra West, LLC.

Per the Drainage Report, the overall property (OP), which includes the Panda Express to the north, will drain to parking lot detention ponds (Master Planned Basins 1, 2, 3 and 5). An off-site private storm drain system constructed as part of the Walmart development will accept discharge from this OP for routing to Pond 9 on the Walmart property at a rate of 0.412 cfs. While this discharge rate is higher than originally approved in the Walmart reports, the OP private storm drain system was designed with individual orifice control at each inlet based on this rate with the engineer's confirmation that Pond 9 had the available capacity to accept the increases.

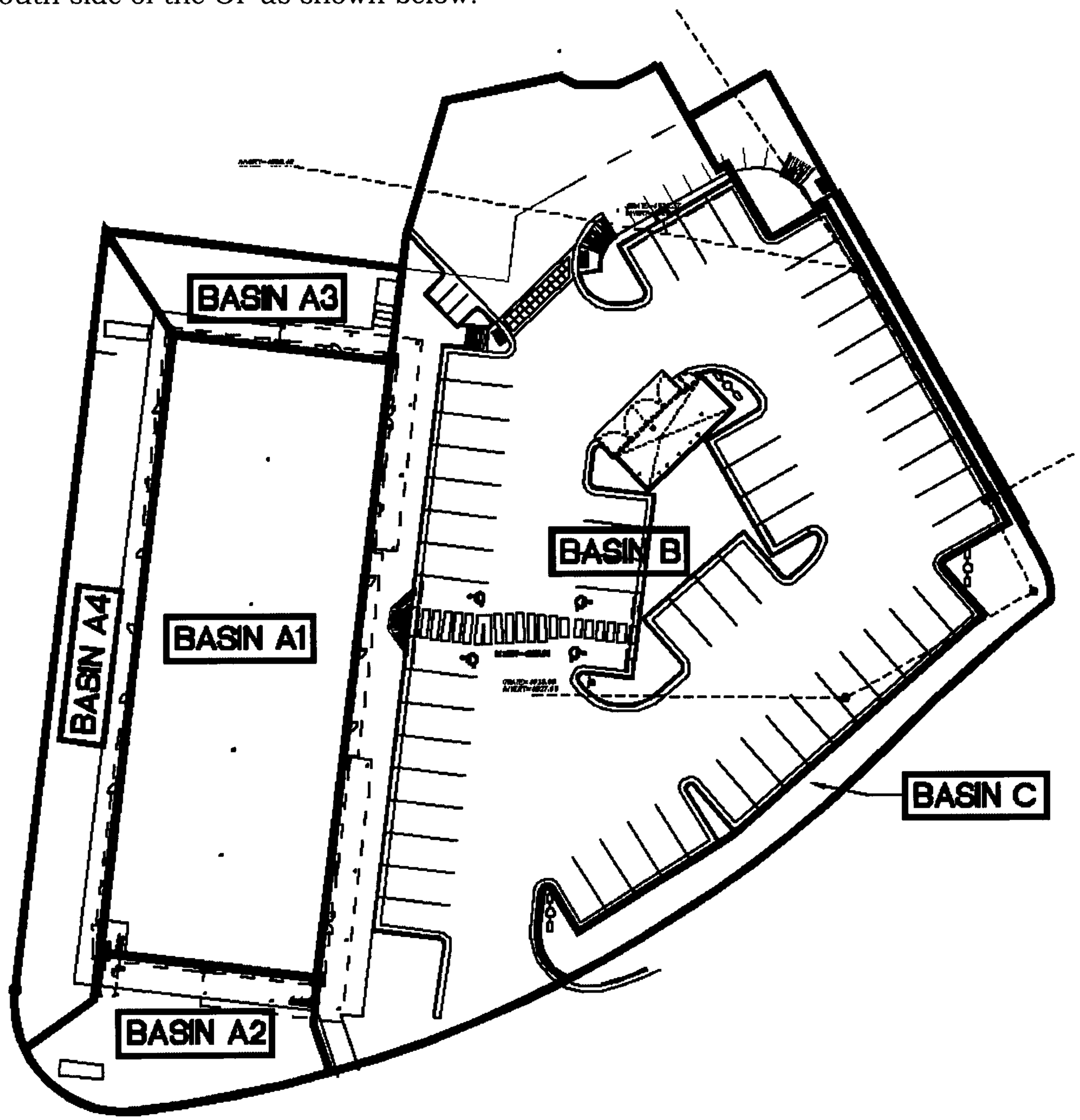
Per the Master Planned Basin Map (see image below), the OP was divided into six on-site basins. Basins 4 and 6 each drain to west side retention ponds. Basins 1 and 2 represent the Panda Express inlets and Basins 3 and 5 represent the basins to be addressed in this report.

Based on I&A site inspection of the existing inlets, the required orifice controls were not in place. As part of the proposed Lamonica Shops construction, the required orifice controls will be installed within the two on-site inlets.



III. PROPOSED BASINS

The revised site plan for this development reconfigures the drainage basins on the south side of the OP as shown below.



DRAINAGE REPORT

BASIN A: WEST RETENTION POND

The proposed on-site Basin A1 draining to the proposed StormTech system will generate 1,678 cf during the 100-year 6-hour storm event.

BASIN NO. A1		DESCRIPTION On-site Basin (Incl. Bldg.) draining to STORMTECH Chambers
Area of basin flows =	10220 SF	= 0.2 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	0%
C =	0%
D =	100%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.97 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 1678 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.0 cfs

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

V_{360} (from previous calculation)	1678
Area Treatment D (SF)	10220
Zone	1

PROPOSED
BASIN A

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	1678
A_D (SF)	=	10220
Zone	=	1
P_{10day}	=	3.67
P_{360}	=	2.2

V_{360}	=	1678
+ imp. area	=	1252

Total Pond Volume ($V_{10\ day}$)	=	2930

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

from Table A-2
Depth (inches) at 100-yr Storm

The storage required for the 100-year 10-day event is 1,678 cf + 1,252 cf for a total required volume of 2,930 cf.

StormTech
Detention • Retention • Recharge
Subsurface Stormwater Management™

MC-3500 Site Calculator

System Requirements

Units		[illegible]	
Required Storage Volume		29[illegible]	CF
Stone Porosity (Industry Standard = 40%)		3[illegible]	%
Stone Above Chambers	(12 inch min.)	[illegible]	inches
Stone Foundation Depth	(9 inch min.)	[illegible]	inches
Average Cover over Chambers	(24 inch min.)	[illegible]	inches
Bed size controlled by WIDTH or LENGTH?		LENGTH	
Limiting WIDTH or LENGTH dimension		[illegible]	feet
Storage Volume per Chamber		165.5	CF
Storage Volume per End Cap		40.4	CF

Using Stormtech provided spreadsheet with the following parameters:

12" stone above chambers
12" stone foundation depth
30% Stone Porosity Index ✓

Each installed MC-3500 chamber provides 165.5 CF and each installed end cap stores 40.4 CF. Therefore, the proposed 17 chambers and 4 end caps will have a storage capacity of 2975 CF > 2930 CF: OK.

BASINS A2: SOUTH RETENTION POND

The proposed Basin A2 located on the south side of the building will drain to the south on-site storm water retention pond.

BASIN NO. A2		DESCRIPTION	South Pond
Area of basin flows =	2567	SF =	0.1 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	55%
C =	0%
D =	45%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.26 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 268 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 0.2 cfs

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

V_{360} (from previous calculation)	268
Area Treatment D (SF)	1155
Zone	1

PROPOSED
BASIN A2

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

from Table A-2
Depth (inches) at 100-yr Storm

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	268
A_D (SF)	=	1155
Zone	=	1
P_{10day}	=	3.67
P_{360}	=	2.2

V_{360}	=	268
+ imp. area	=	142

Total Pond Volume ($V_{10\ day}$)	=	410

PROPOSED SOUTH POND		
Contour	Area	Volume
4929.80	1000	524 CF
4929.00	310	
TOTAL VOL.		**524** CF

A2: The storage required for the 100-year 10-day event is 268 cf + 142 cf for a total required volume of 410 cf.

> 410 CF OK

BASINS A3: NORTH RETENTION POND

The proposed Basin A3 located on the north side of the building will drain to the north on-site storm water retention pond.

BASIN NO. A3		DESCRIPTION	North Pond
Area of basin flows =	1833	SF =	0.0 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	66%
C =	0%
D =	34%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.11 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 170 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 0.1 cfs

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

V_{360} (from previous calculation)	170
Area Treatment D (SF)	623
Zone	1

PROPOSED
BASIN A3

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

from Table A-2
Depth (inches) at 100-yr Storm

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	170
A_D (SF)	=	623
Zone	=	1
P_{10day}	=	3.67
P_{360}	=	2.2

V_{360}	=	170
+ imp. area	=	76

Total Pond Volume ($V_{10\ day}$)	=	246

PROPOSED NORTH POND		
Contour	Area	Volume
4930.80	450	
4930.50	336	118 CF
4929.50	42	189 CF
TOTAL VOL.		**307** CF

> 246 CF OK

A3: The storage required for the 100-year 10-day event is 170 cf + 76 cf for a total required volume of 246 cf.

ON-SITE BASIN A4 AND OFF-SITE BASIN OS-1 COORS BLVD.: WEST RETENTION

Per the Master Planned Basin Map, this portion of the OP is impacted by an off-site basin (OS-1) consisting of a portion of Coors Blvd. pavement and R.O.W. This flow is accepted into the previously constructed west detention pond. With the proposed construction of the StormTech system, the surface structure will be removed to be replaced by a smaller landscaped retention pond. This retention pond will continue to retain the 100-year 10-day storm volume generated by on-site Basin A4 as well as the off-site basin (OS-1).

BASIN NO. A4		DESCRIPTION	West Pond
Area of basin flows =	4480	SF =	0.1 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	34%
C =	40%
D =	26%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E =	1.14 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} =	424 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P =	0.3 cfs

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

V_{360} (from previous calculation)	424
Area Treatment D (SF)	1165
Zone	1

PROPOSED BASIN A4

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

from Table A-2
Depth (inches) at 100-yr Storm

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	424
A_D (SF)	=	1165
Zone	=	1
P_{10day}	=	3.67
P_{360}	=	2.2

V_{360}	=	424
+ imp. area	=	143

Total Pond Volume ($V_{10\ day}$)	=	567

BASIN NO. OS-1	DESCRIPTION	Off-Site Coors Basin draining to WEST POND

Area of basin flows = 13052 SF = 0.30 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	16%
C =	0%
D =	84%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.76 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 1916 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.2 cfs

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

V_{360} (from previous calculation)	1916
Area Treatment D (SF)	10964
Zone	1

OFF-SITE
BASIN
OS-1

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	1916
A_D (SF)	=	10964
Zone	=	1
P_{10day}	=	3.67
P_{360}	=	2.2

V_{360}	=	1916
+ imp. area	=	1343

Total Pond Volume ($V_{10\ day}$)	=	3260

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

from Table A-2
Depth (inches) at 100-yr Storm

The storage required for the 100-year 10-day event is 567 cf (A4) + 3260 (OS-1) for a total required volume of 3,827 cf.

PROPOSED WEST POND		
Contour	Area	Volume
4928.60	5055	
4928.00	2935	2397 CF
4927.50	1590	1131 CF
4927.00	947	634 CF
TOTAL VOL.		**4163** CF

> 3,827 OK

DRAINAGE REPORT

BASIN B: EAST DETENTION POND

The proposed on-site Basin 2 draining to two existing storm drain inlets will generate 4,947 cf during the 100-year 6-hour storm event.

BASIN NO. B		DESCRIPTION	On-site Basin draining to EAST Stormtech System
Area of basin flows =	31713	SF =	0.73 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	0%
C =	10%
D =	90%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.87 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 4947 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 3.1 cfs

Based on an inflow / outflow hydrograph using the allowable discharge rate of 0.20 cfs (based on existing orifice controls at each inlet). The on-site pond within Basin B is required to store 4,832 cf. The total Q of 3.1 cfs will completely discharge through the existing system at the rate of 0.2 cfs in 6.7 hours.

CALCULATIONS: Lamonica Shops : 12/04/2013
HYDROGRAPH FOR SMALL WATERSHED
DPM SECTION 22-2 * PAGE A-13/14

Base time, t_B, for a small watershed hydrograph is,

$tB = (2\ 107 * E * A / Q_P) - (0\ 25 * A_D / A)$

Where			
	E	=	1 87 inches
	A	=	0 73 acres
	A_D	=	0 66 acres
	Q_P	=	3 1 cfs

t_B	=	0 71 hours

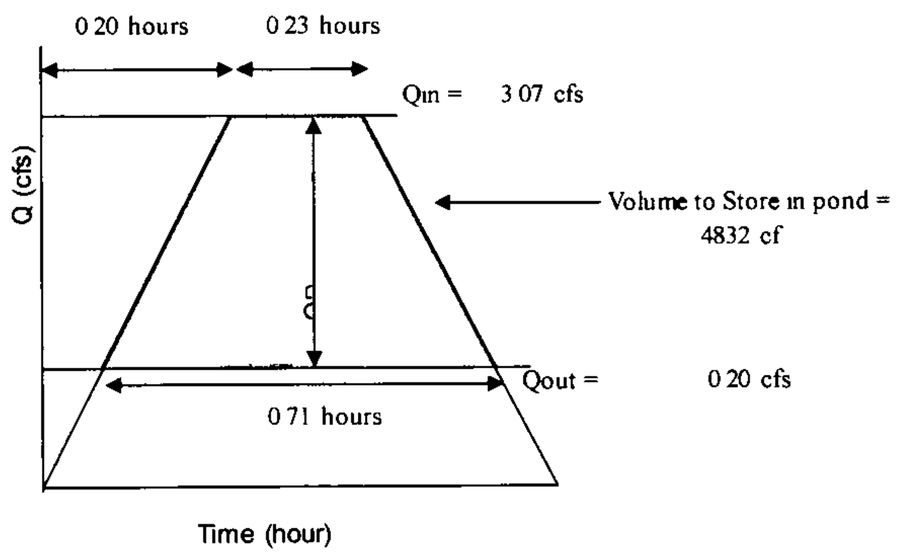
E is the excess precipitation in inches (from DPM TABLE A-8), Q_P is the peak flow, A_D is the area (acres) of treatment D, and A_I is the total area in acres Using the time of concentration, t_C (hours), the time to peak in hours is

$tP = (0\ 7 * tC) + ((1\ 6 - (A_D / A)) / 12)$

Where t_C = 0 20 hours

t_P = 0 20 hours

Continue the peak for $0\ 25 * A_D / A_I$ hours When A_D is zero, the hydrograph will be triangular When A_D is not zero, the hyrograph will be trapezoidal see the graph below



Orifice control will be installed within the two on-site inlets per the original Drainage Report.

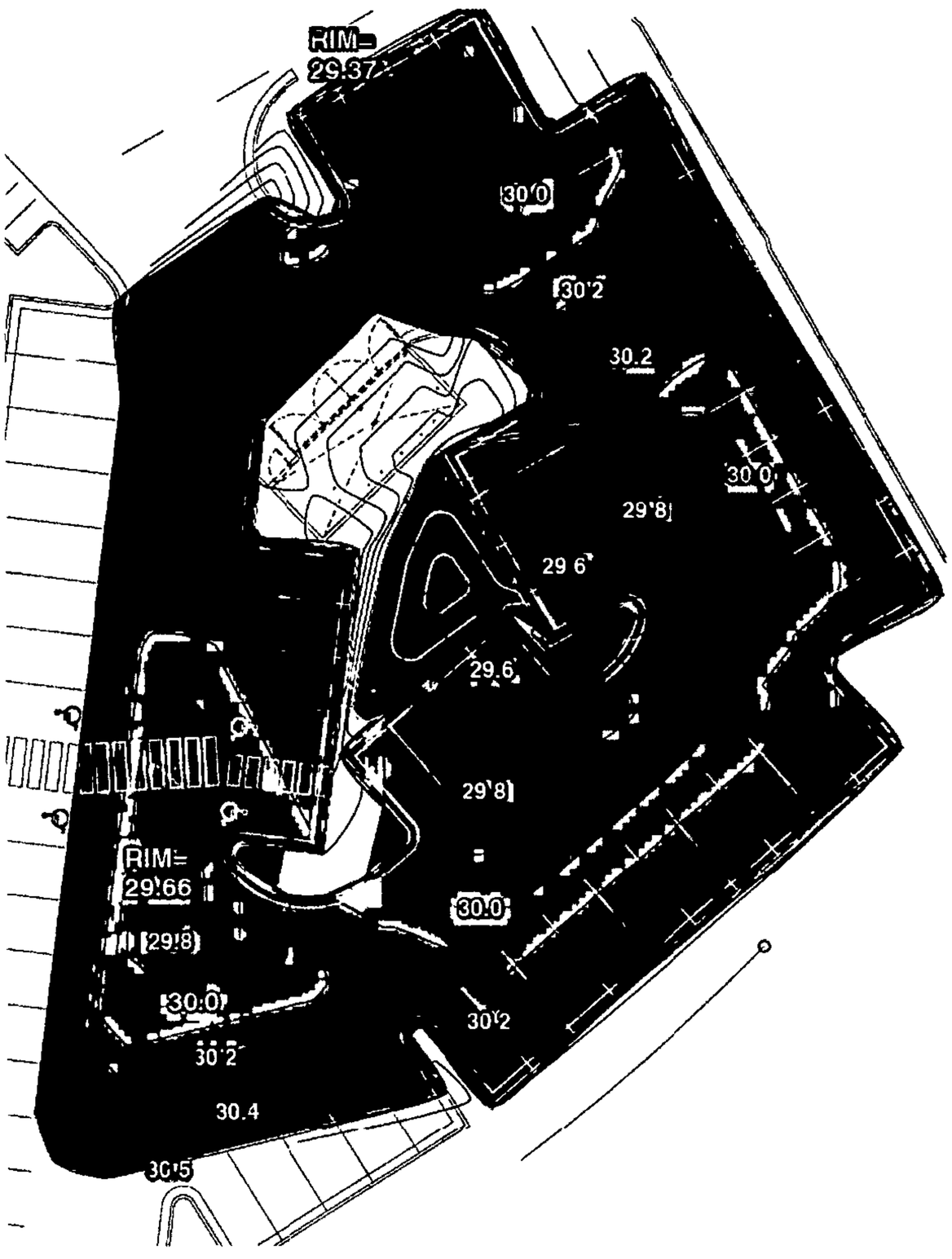
SDI#3: 1.125" dia. orifice
SDI#4: 2.0" dia. orifice

Based on CIVIL-3D volume analysis (see image below), the proposed east side Basin B is divided into three sub-basins which will equalize via overflows between basins.

The table below provides volumes of available ponding at 3" increments.

CIVIL 3D POND VOLUMES	
ELEVATION	VOLUME AVAILABLE (CF)
4929.50	143
4929.75	325
4930.00	1092
4930.25	3372
4930.50	7252

EAST PARKING LOT PONDS VOLUMES / EXHIBITS



This image at left shows the water elevations and water levels in the east ponding area.

An elevation of approximately 4930.3 represents the required volume to store the 100-year 6-hour storm.

At an elevation of 4930.5 the available ponding volume is 7,252 cf which significantly exceeds the required detention pond volume of 4,832 cf and comes close to retaining the 100-year 10-day storm event. With an emergency overflow elevation to Lamonica Rd. of 4930.7, the additional 0.2' would far exceed the 100-year 10-day storm.

DRAINAGE REPORT

BASIN C: PERIMETER LANDSCAPING

BASIN NO. C		DESCRIPTION	Perimeter
Area of basin flows =	3463	SF =	0.1 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	0%
C =	80%
D =	20%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.19 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 342 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 0.3 cfs

The perimeter landscaping will include depressed water harvesting areas which will utilize storm water for landscaping. Excess flow will pass to the exterior streets.

CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

March 4, 2014

Mr. Fred Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. NE
Albuquerque, New Mexico 87108

FASTrax

RE: **Lamonica Shops** - 3510 Coors Blvd. SW
Grading and Drainage Plan for Building Permit

File: **P10-D005**

PE Stamp: **3-4-2014**

Dear Mr. Arfman,

Based upon the information provided in your submittal received 3/4/14, the subject Grading and Drainage Plan is approved for Building Permit.

Please include a copy of this plan in the Building Permit plan set, prior to seeking Hydrology signoff.

Prior to Certificate of Occupancy release by Hydrology, an Engineer's Certification of the Grading Plan per the DPM checklist will be required.

Hydrology is asking for an electronic copy of this signed plan in .pdf format, for our records. This plan can be e-mailed to me at: GROlson@cabq.gov .

If you have questions, please email me or telephone 505-924-3994.

Sincerely,

Gregory R. Olson, P.E.
Senior Engineer
Development and Building Services

Orig: Drainage file **P10/D005**
c.pdf Addressee via Email FredA@IAcivil.com

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

P10D005_approvalLTR_GPforBP-LamonicaShops_2104MAR04seal

Olson, Greg

From: Olson, Greg
Sent: Tuesday, March 04, 2014 12:21 PM
To: 'Fred Arfman'
Cc: 'Bryan Bobrick'; Olson, Greg
Subject: P10-D005 Lamonica Shops - Grading Plan approved for Building Permit (3/4/14 seal)
Attachments: P10D005_approvalLTR_GPforBP-LamonicaShops_2104MAR04seal.pdf

Fred,

Attached is my approval letter for the subject Grading and Drainage Plan for Building Permit.
As discussed the Building Permit cannot be released by Hydrology until the Erosion and Sediment Control Plan is approved by the Storm Water Engineer.

As agreed in our meeting this morning, please submit the amended Drainage Report information for our records.

Also, please send me an electronic copy of the stamped G&D Plan for our records.

Thank you again for your field investigation work, checking the status of the ORIFICE PLATES REQUIRED IN THE INLETS.
Your fining that these restrictors were never installed will help us to avoid downstream flooding from these parcels.
Please forward your field information as soon as possible.
We will follow up with the Engineer for the adjacent site, to get those orifices installed.

If you have any questions, please email or call me.

Sincerely,

Greg Olson, PE
Senior Engineer
Planning - Hydrology
(505) 924-3994

P.S. – Please discard the Xerox copy of my letter, which I gave you earlier.
It included some typos, which have been corrected on the attached document.

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Lamonica Shops Building Permit #: _____ City Drainage #: P10-D005

DRB#: 1000650 EPC#: _____ Work Order#: _____

Legal Description: Tracts 1-A-2-A and 1-A-2-C, Lands of Lamonica & Wenk

City Address: 3510 Coors Blvd. SW - Albuquerque, NM 87121

Engineering Firm: Isaacson & Arfman, P.A. Contact: Fred C. Arfman

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 Fax#: _____ E-mail: freda@iacivil.com

Owner: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Architect: Modulus Architects Contact: Stephen Dunbar

Address: 220 Copper Ave NW, Ste. 350

Phone#: 338-1499 Fax#: _____ E-mail: sdunbar@modulusarchitects.com

Surveyor: Precision Surveys, Inc. Contact: Larry W. Medrano

Address: 5571 Midway Park Place NE -- Albuquerque, NM 87109

Phone#: (505) 856-5700 Fax#: _____ E-mail: _____

Contractor: Wilger Enterprises Contact: John Wilger

Address: _____

Phone#: 345-2854 Fax#: _____ E-mail: jwilger@ wilgerenterprises.com

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN 1st SUBMITTAL
_X_ DRAINAGE PLAN RESUBMITTAL
___ CONCEPTUAL G & D PLAN
_X_ GRADING PLAN
___ EROSION & SEDIMENT CONTROL PLAN (ESC)
___ ENGINEER'S CERT (HYDROLOGY)
___ CLOMR/LOMR
___ TRAFFIC CIRCULATION LAYOUT (TCL)
___ ENGINEER'S CERT (TCL)
___ ENGINEER'S CERT (DRB SITE PLAN)
___ ENGINEER'S CERT (ESC)
___ SO-19
___ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

___ SIA/FINANCIAL GUARANTEE RELEASE
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D APPROVAL
___ S. DEV. FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ CERTIFICATE OF OCCUPANCY (PERM)
___ CERTIFICATE OF OCCUPANCY (TCL TEMP)
___ FOUNDATION PERMIT APPROVAL
_X_ BUILDING PERMIT APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ WORK ORDER APPROVAL
___ GRADING CERTIFICATION
___ SO-19 APPROVAL
___ ESC PERMIT APPROVAL
___ ESC CERT. ACCEPTANCE
___ OTHER (SPECIFY)

RECEIVED
MAR 04 2014
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: _X_ Yes ___ No ___ Copy Provided

DATE SUBMITTED: March 4, 2014 By: FRED ARFMAN
Isaacson & Afrman, P.A.

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

1 **Conceptual Grading and Drainage Plan** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2 **Drainage Plans** Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3 **Drainage Report** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4 **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

ISAACSON & ARFMAN, P.A. *Consulting Engineering Associates*

Thomas O. Isaacson, PE(RET.) & LS(RET.) . Fred C. Arfman, PE . Åsa Nilsson-Weber, PE

March 3, 2014

Mr. Gregory R. Olson, P.E.
Senior Engineer
Development and Building Services
City of Albuquerque

RE: P10-D005 LAMONICA SHOPS – 3510 COORS BLVD. SW

Dear Mr. Olson,

Attached with this letter is a revised Drainage and Grading Plan (CG-101) and Details (CG-501) for your review. Revisions are based on your numbered comments dated February 28, 2014 as follows:

1. The proposed private drainage system has been relocated to the south side of the property outside of the existing easement. The Owners' statement has been removed from CG-101.
2. Each Detention / Retention Pond has been labeled with WSE, Vol. required, and Vol. provided.
    a. Based on site inspection of the existing storm drain inlets on this property and on the adjacent property (four total), the individual inlet orifice controls which were calculated as part of the Drainage Report for Tract 1-A-2, Lands of Lamonica and Wenk prepared by Tierra West, LLC dated December 2010 were not installed as part of the original development. See CG-101 Keyed Note 9 and CG-501 Detail 8.
    b. A note has been added to CG-101 noting that confirmation of these features will be required as part of the Engineer's Certification for CO.
3. Existing on-site drainage system clarified by comment 2.
4. Scanned exhibits reviewed.
5. ADS retention system sections and details have been updated to the revised configuration.
6. Stone void ratio revised to 30%.

If you have any additional questions or comments, please give me a call at 268-8828.

Sincerely,
ISAACSON & ARFMAN P.A.

Fred C. Arfman, PE

RECEIVED
MAR 04 2014
LAND DEVELOPMENT SECTION

*128 Monroe St. N.E. * Albuquerque, NM 87108 * (505) 268-8828 * Fax: (505) 268-2632 * www.iacivil.com*

CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

February 28, 2014

Mr. Fred Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. NE
Albuquerque, New Mexico 87108

FASTrax

RE: **Lamonica Shops** - 3510 Coors Blvd. SW
Grading and Drainage Plan for Building Permit

File: **P10-D005**
PE Stamps: **02-06 & 2-21-2014**

Dear Mr. Arfman,

Based upon the information provided in your submittal received 2/12/14 AND the revised information received 2/21/14, the subject Grading and Drainage Plan cannot be approved for Building Permit.

The following issues will need to be addressed prior to our approval:

1. The Owners' statement and signature on the 2/21/14 plan, Sheet CG-101, needs to be amended to acknowledge that the relocation of the private drainage system from the easement will be "*at the sole expense of the property owner.*"

2. Label each Detention/Retention Pond (limits shown) with WSE, Volume Required, Volume Provided, and orifice control size where appliacable. Confirmation of these features will be required as part of the Engineer's Certification for CO.

3. The existing onsite drainage system and outfall pipe needs to be more clearly shown on the plan, including the Orifice Plate locations (with Q_{max}) and verified orifice sizes installed (not assumed) to provide the proposed detention for this development.

4. I am forwarding to you a scan of my marked up G&D Plan sheets to clarify information sought in items 2 and 3 above.

5. The ADS retention system needs to be more clearly dimensioned on the Grading Plan (not just referenced to ADS). In Section A, show the double fabric under the chambers and fabric wrap around the entire stone embedment. Provide the system dimensions on the cross section, as well as dimensions to the R/W, 14'-Roadway Easement, and face of building.

6. This Design uses a 40% void ratio on the stone embedment. We will only allow 30% voids, unless a local source for higher voids can be confirmed and specified.

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

P10D005_commentLTR_GPforGBP-LamonicaShops_2014FEB06

My check of the volumes provided indicates that there is still enough volume at the 30% ratio to meet required volumes, but I'd like to see the 40% value removed from the plan, unless the local material meeting that level is available and specified. Revise these plans accordingly.

If you have questions, please email me or telephone 505-924-3994.

Sincerely,

2/28/14

Gregory R. Olson, P.E.
Senior Engineer
Development and Building Services

Attachment: Scanned copy of Markups (2)

Orig: Drainage file **P10/D005**
c.pdf Addressee via Email FredA@IAcivil.com
Bryan Bobrick BryanB@IAcivil.com

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Lamonica Shops Building Permit #: _____ City Drainage #: P10D005

DRB#: 1000650 EPC#: _____ Work Order#: _____

Legal Description: Tracts 1-A-2-A and 1-A-2-C, Lands of Lamonica & Wenk

City Address: 3510 Coors Blvd. SW - Albuquerque, NM 87121

Engineering Firm: Isaacson & Arfman, P.A. Contact: Fred C. Arfman

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 Fax#: _____ E-mail: freda@iacivil.com

Owner: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Architect: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Surveyor: Precision Surveys, Inc. Contact: Larry W. Medrano

Address: 5571 Midway Park Place NE -- Albuquerque, NM 87109

Phone#: (505) 856-5700 Fax#: _____ E-mail: _____

Contractor: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN 1st SUBMITTAL
X DRAINAGE PLAN RESUBMITTAL
___ CONCEPTUAL G & D PLAN
X GRADING PLAN
___ EROSION & SEDIMENT CONTROL PLAN (ESC)
___ ENGINEER'S CERT (HYDROLOGY)
___ CLOMR/LOMR
___ TRAFFIC CIRCULATION LAYOUT (TCL)
___ ENGINEER'S CERT (TCL)
___ ENGINEER'S CERT (DRB SITE PLAN)
___ ENGINEER'S CERT (ESC)
___ SO-19
___ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

___ SIA/FINANCIAL GUARANTEE RELEASE
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D APPROVAL
___ S. DEV. FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ CERTIFICATE OF OCCUPANCY (PERM)
___ CERTIFICATE OF OCCUPANCY (TCL TEMP)
___ FOUNDATION PERMIT APPROVAL
X BUILDING PERMIT APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ WORK ORDER APPROVAL
___ GRADING CERTIFICATION

___ SO-19 APPROVAL
___ ESC PERMIT APPROVAL
___ ESC CERT. ACCEPTANCE
___ OTHER (SPECIFY)

RECEIVED
FEB 21 2014
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: X Yes ___ No ___ Copy Provided

DATE SUBMITTED: FEBRUARY 21, 2014 By: FRED ARFMAN
Isaacson & Afrman, P.A.

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

1 **Conceptual Grading and Drainage Plan** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2 **Drainage Plans** Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3 **Drainage Report** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4 **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

5.0 Cumulative Storage Volumes

StormTech

Tables 5 and **6** provide cumulative storage volumes for the MC-3500 chamber and end cap These tables can be used to calculate the stage–storage relationship for the retention or detention system Digital spreadsheets in which the number of chambers and end caps can be input for quick cumulative storage calculations are available at www.stormtech.com. For assistance with site-specific calculations or input into routing software, contact the StormTech Technical Services Department.

TABLE 5 – MC-3500 Incremental Storage Volume Per Chamber

Assumes 40% stone porosity. Calculations are based upon a 9" (229 mm) stone base under the chambers, 12" (305 mm) of stone above chambers, and 9" (229 mm) spacing between chambers.

Depth of Water in System Inches (mm)		Cumulative Chamber Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
66 (1676)		0.00	178.96 (5 068)
65 (1651)		0.00	177.25 (5.019)
64 (1626)	Stone	0 00	175 54 (4.971)
63 (1600)	Cover	0.00	173 83 (4.922)
62 (1575)		0.00	172.11 (4.874)
61 (1549)		0.00	170 40 (4.825)
60 (1524)		0.00	168.69 (4.777)
59 (1499)		0.00	166.98 (4.728)
58 (1473)		0.00	165.27 (4.680)
57 (1448)		0.00	163.55 (4.631)
56 (1422)		0.00	161.84 (4.583)
55 (1397)		0.00	160 13 (4 534)
54 (1372)		109.95 (3.113)	158.42 (4.486)
53 (1346)		109.89 (3.112)	156.67 (4.436)
52 (1321)		109.69 (3.106)	154 84 (4.385)
51 (1295)		109.40 (3.098)	152 95 (4 331)
50 (1270)		109.00 (3.086)	151.00 (4.276)
49 (1245)		108.31 (3.067)	148 88 (4.216)
48 (1219)		107.28 (3.038)	146 55 (4.150)
47 (1194)		106.03 (3.003)	144.09 (4.080)
46 (1168)		104.61 (2 962)	141.52 (4.007)
45 (1143)		103.04 (2.918)	138 86 (3.932)
44 (1118)		101.33 (2.869)	136.13 (3.855)
43 (1092)		99.50 (2 818)	133.32 (3.775)
42 (1067)		97.56 (2 763)	130 44 (3.694)
41 (1041)		95.52 (2.705)	127.51 (3.611)
40 (1016)		93.39 (2.644)	124 51 (3 526)
39 (991)		91.16 (2.581)	121 47 (3 440)
38 (965)		88 86 (2.516)	118.37 (3.352)
37 (940)		86.47 (2.449)	115.23 (3.263)
36 (914)		84.01 (2.379)	112 04 (3.173)
35 (889)		81.49 (2 307)	108.81 (3.081)
34 (864)		78.89 (2.234)	105.54 (2.989)
33 (838)		76.24 (2.159)	102.24 (2.895)
32 (813)		73 52 (2.082)	98.90 (2 800)
31 (787)		70 75 (2 003)	95 52 (2 705)
30 (762)		67.92 (1.923)	92.12 (2.608)
29 (737)		65.05 (1.842)	88.68 (2.511)
28 (711)		62.12 (1.759)	85.21 (2.413)
27 (686)		59.15 (1.675)	81.72 (2.314)
26 (660)		56 14 (1 590)	78 20 (2 214)
25 (635)		53 09 (1 503)	74 65 (2 114)
24 (610)		49.99 (1 416)	71.09 (2 013)
23 (584)		46.86 (1 327)	67.50 (1 911)
22 (559)		43 70 (1.237)	63 88 (1 809)
21 (533)		40.50 (1.147)	60.25 (1.706)
20 (508)		37.27 (1.055)	56.60 (1.603)
19 (483)		34.01 (0 963)	52 93 (1.499)
18 (457)		30.72 (0 870)	49.25 (1.395)
17 (432)		27.40 (0.776)	45.54 (1.290)
16 (406)		24.05 (0.681)	41.83 (1.184)
15 (381)		20.69 (0.586)	38 09 (1.079)
14 (356)		17.29 (0.490)	34.34 (0 973)
13 (330)		13.88 (0.393)	30.58 (0 866)
12 (305)		10.44 (0.296)	26.81 (0.759)
11 (279)		6.98 (0.198)	23 02 (0 652)
10 (254)		3.51 (0.099)	19.22 (0.544)
9 (229)		0.00	15.41 (0.436)
8 (203)		0 00	13.70 (0.388)
7 (178)		0.00	11.98 (0.339)
6 (152)	Stone	0.00	10.27 (0.291)
5 (127)	Foundation	0.00	8 56 (0.242)
4 (102)		0.00	6.85 (0 194)
3 (76)		0.00	5.14 (0.145)
2 (51)		0 00	3.42 (0.097)
1 (25)		0.00	1.71 (0 048)

NOTE: Add 1.71 ft³ (0.048 m³) of storage for each additional inch (25 mm) of stone foundation.

Contact StormTech for cumulative volume spreadsheets in digital format.

5.0 Cumulative Storage Volumes

StormTech

TABLE 6 – MC-3500 Incremental Storage Volume Per End Cap

Assumes 40% stone porosity. Calculations are based upon a 9" (229 mm) stone base under the end caps, 12" (305 mm) of stone above end caps, 9" (229 mm) of spacing between end caps and 6" (152 mm) of stone perimeter

Depth of Water in System Inches (mm)	Cumulative End Cap Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
66 (1676)	0	46.96 (1.330)
65 (1651)	0	46.39 (1.314)
64 (1626)	Stone 0	45.82 (1.298)
63 (1600)	Cover 0	45.25 (1.281)
62 (1575)	0	44.68 (1.265)
61 (1549)	0	44.11 (1.249)
60 (1524)	0	43 54 (1.233)
59 (1499)	0	42.98 (1.217)
58 (1473)	0	42.41 (1.201)
57 (1448)	0	41 84 (1.185)
56 (1422)	0	41.27 (1 169)
55 (1397)	0	40.70 (1.152)
54 (1372)	15 64 (0 443)	40.13 (1.136)
53 (1346)	15 64 (0.443)	39.56 (1.120)
52 (1321)	15 63 (0.443)	38 99 (1 104)
51 (1295)	15 62 (0 442)	38 41 (1 088)
50 (1270)	15.60 (0.442)	37.83 (1.071)
49 (1245)	15.56 (0.441)	37.24 (1.054)
48 (1219)	15.51 (0 439)	36 64 (1.037)
47 (1194)	15.44 (0.437)	36.02 (1.020)
46 (1168)	15.35 (0.435)	35.40 (1.003)
45 (1143)	15.25 (0.432)	34.77 (0.985)
44 (1118)	15.13 (0.428)	34.13 (0.966)
43 (1092)	14.99 (0.424)	33.48 (0.948)
42 (1067)	14.83 (0 420)	32.81 (0.929)
41 (1041)	14 65 (0 415)	32.13 (0.910)
40 (1016)	14.45 (0.409)	31.45 (0.890)
39 (991)	14.24 (0 403)	30.75 (0.871)
38 (965)	14.00 (0.396)	30 03 (0 850)
37 (948)	13.74 (0.389)	29.31 (0 830)
36 (914)	13.47 (0.381)	28.58 (0 809)
35 (889)	13.18 (0.373)	27.84 (0.788)
34 (864)	12.86 (0.364)	27.08 (0.767)

Depth of Water in System Inches (mm)	Cumulative End Cap Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
33 (838)	12.53 (0 355)	26 30 (0.745)
32 (813)	12 18 (0 345)	25 53 (0.723)
31 (787)	11.81 (0.335)	24.74 (0.701)
30 (762)	11.42 (0 323)	23 93 (0 678)
29 (737)	11.01 (0 312)	23.12 (0.655)
28 (711)	10 58 (0 300)	22.29 (0.631)
27 (686)	10.13 (0.287)	21.45 (0.607)
26 (680)	9 67 (0.274)	20.61 (0.583)
25 (610)	9 19 (0 260)	19.75 (0.559)
24 (609)	8.70 (0.246)	18.88 (0.559)
23 (584)	8.19 (0.232)	18.01 (0 510)
22 (559)	7.67 (0.217)	17.13 (0.485)
21 (533)	7.13 (0.202)	16.24 (0 460)
20 (508)	6 59 (0.187)	15 34 (0 434)
19 (483)	6.03 (0 171)	14 43 (0 409)
18 (457)	5.46 (0.155)	13.52 (0 383)
17 (432)	4 88 (0 138)	12.61 (0.357)
16 (406)	4.30 (0.122)	11 69 (0 331)
15 (381)	3.70 (0 105)	10 76 (0.305)
14 (356)	3.10 (0 088)	9 83 (0.278)
13 (330)	2.49 (0.071)	8 90 (0.252)
12 (305)	1.88 (0.053)	7.96 (0.225)
11 (279)	1.26 (0.036)	7.02 (0.199)
10 (254)	0.63 (0 018)	6.07 (0.172)
9 (229)	0	5.12 (0 145)
8 (203)	0	4.55 (0.129)
7 (178)	0	3.99 (0 113)
6 (152)	0	3.42 (0 097)
5 (127)	Stone 0	2.85 (0.081)
4 (102)	Foundation 0	2.28 (0 064)
3 (76)	0	1.71 (0.048)
2 (51)	0	1.14 (0.032)
1 (25)	0	0.56 (0.016)

NOTE: Add 0.56 ft³ (0.016 m³) of storage for each additional inch (25 mm) of stone foundation.

Contact StormTech for cumulative volume spreadsheets in digital format.

$V = (2 \times 39.13) + 22.84 \times L$

$= 3,847$ CF storage

46.96 @ 40% voids
- 15.64 — end cap only
31.32 @ .4 voids
= 23.49 @ .30% 15.64 chamb. = 39.13 CF ea

L = Length (# * 7.5' chamber)
# = 22 chambers
L = 165

Table 1 – Acceptable Fill Materials

Material Location	Description	AASHTO M43 Designation[1]	Compaction/Density Requirement
Ⓓ **Final Fill:** Fill Material for layer 'D' starts from the top of the 'C' layer to the bottom of flexible pavement or unpaved finished grade above. Note that the pavement subbase may be part of the 'D' layer.	Any soil/rock materials, native soils or per engineer's plans Check plans for pavement subgrade requirements	N/A	Prepare per site design engineer's plans Paved installations may have stringent material and preparation requirements.
Ⓒ **Initial Fill:** Fill Material for layer 'C' starts from the top of the embedment stone ('B' layer) to 24" (600 mm) above the top of the chamber Note that pavement subbase may be part of the 'C' layer.	Granular well-graded soil/aggregate mixtures, <35% fines or processed aggregate. Most pavement subbase materials can be used in lieu of this layer	AASHTO M145 A-1, A-2-4, A-3 or AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	Begin compaction after 24" (600 mm) of material over the chambers is reached Compact additional layers in 12" (300 mm) max lifts to a min 95% Proctor density for well-graded material and 95% relative density for processed aggregate materials.
Ⓑ **Embedment Stone:** Fill the surrounding surrounding chambers from the foundation stone ('A' layer) to the 'C' layer above.	Clean, crushed, angular stone nominal size distribution 3/4 - 2" (20 mm - 50 mm)	AASHTO M43[1] 3, 4	No compaction required
Ⓐ **Foundation Stone:** Fill below chambers from the subgrade up to the foot (bottom) of the chamber.	Clean, crushed, angular stone, nominal size distribution between 3/4 - 2" (20 mm - 50 mm)	AASHTO M43[1] 3, 4	Place and compact in 9" (230 mm) max lifts using two full coverages with a vibratory compactor.[2,3]

PLEASE NOTE:

1. ***The listed AASHTO designations are for gradations only. The stone must also be clean, crushed, angular. For example, a specification for #4 stone would state: "clean, crushed, angular no. 4 (AASHTO M43) stone".***
2. ***StormTech compaction requirements are met for 'A' location materials when placed and compacted in 9" (230 mm) (max) lifts using two full coverages with a vibratory compactor.***
3. ***Where infiltration surfaces may be comprised by compaction, for standard installations and standard design load conditions, a flat surface may be achieved by raking or dragging without compaction equipment. For special load designs, contact StormTech for compaction requirements.***

Figure 1 – Inspection Port Detail

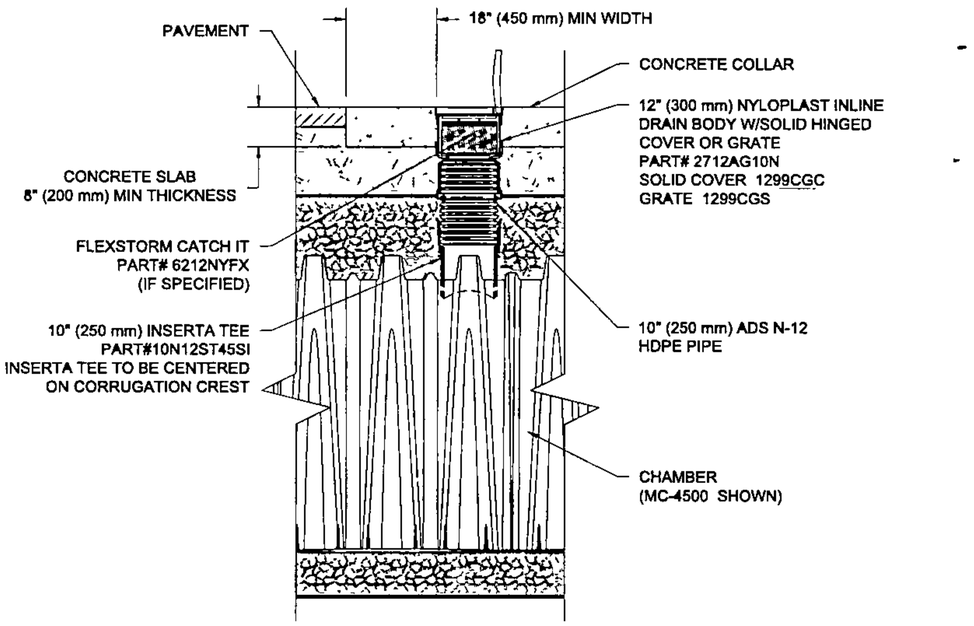
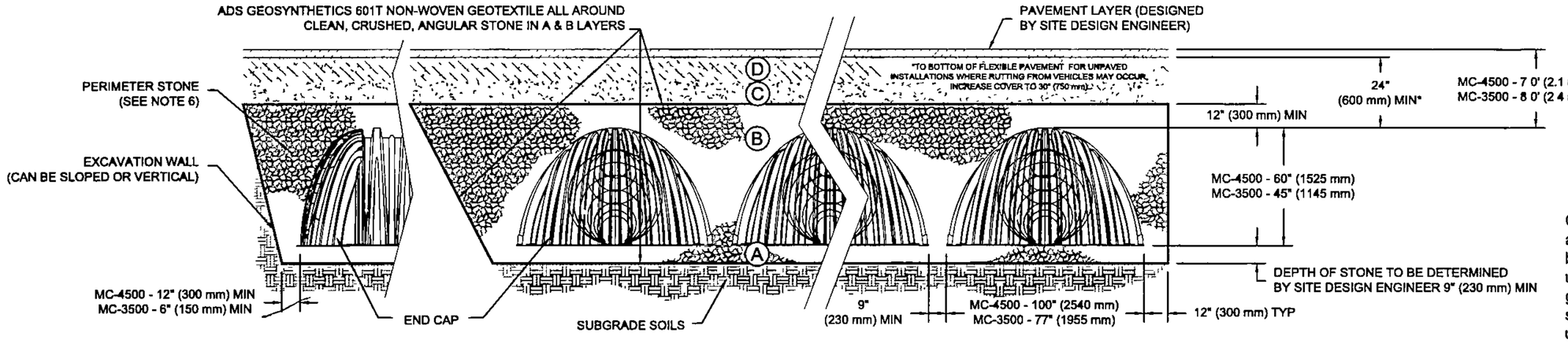


Figure 2 – Fill Material Locations



Once layer 'C' is placed any soil/material can be placed in layer 'D' up to the finished grade Most pavement subbase soils can be used to replace the materials requirements of layer 'C' or 'D' at the design engineer's discretion.

Table 2 – Maximum Allowable Construction Vehicle Loads[6]

Material Location	Fill Depth over Chambers in. [mm]	Maximum Allowable Wheel Loads		Maximum Allowable Track Loads[7]		Maximum Allowable Roller Loads
		Max Axle Load for Trucks[1,2] lbs [kN]	Max Wheel Load for Loaders lbs [kN]	Track Width in. [mm]	Max Ground Pressure[3] psf [kPa]	Max Drum Weight or Dynamic Force lbs [kN]
(D) Final Fill Material	36" [900] Compacted	32,000 [142]	16,000 [71]	12" [305] 18" [457] 24" [610] 30" [762] 36" [914]	3420 [164] 2350 [113] 1850 [89] 1510 [72] 1310 [63]	38,000 [169]
(C) Initial Fill Material	24" [600] Compacted	32,000 [142]	16,000 [71]	12" [305] 18" [457] 24" [610] 30" [762] 36" [914]	2480 [119] 1770 [85] 1430 [68] 1210 [58] 1070 [51]	20,000 [89]
	24" [600] Loose/Dumped	24,000 [107]	12,000 [53]	12" [305] 18" [457] 24" [610] 30" [762] 36" [914]	2245 [107] 1625 [78] 1325 [63] 1135 [54] 1010 [48]	16,000 [71]
	18" [450]	24,000 [107]	12,000 [53]	12" [305] 18" [457] 24" [610] 30" [762]	2010 [96] 1480 [71] 1220 [58] 1060 [51]	5,000 [22] (static loads only)[5]
(B) Embedment Stone	12" [300]	NOT ALLOWED	NOT ALLOWED	12" [305] 18" [457] 24" [610] 30" [762]	1100 [53] 715 [34] 660 [32] 580 [28]	NOT ALLOWED
	6" [150]	NOT ALLOWED	NOT ALLOWED	NOT ALLOWED	NOT ALLOWED	NOT ALLOWED

Table 3 – Placement Methods and Descriptions

Material Location	Placement Methods/ Restrictions	Wheel Load Restrictions	Track Load Restrictions	Roller Load Restrictions
		See Table 2 for Maximum Construction Loads		
(D) Final Fill Material	A variety of placement methods may be used. All construction loads must not exceed the maximum limits in Table 2	36" (900 mm) minimum cover required for dump trucks to dump over chambers.	Dozers to push parallel to rows.[4]	Roller travel parallel to rows only until 36" (900 mm) compacted cover is reached.
(C) Initial Fill Material	Excavator positioned off bed recommended. Small excavator allowed over chambers Small dozer allowed.	Asphalt can be dumped into paver when compacted pavement subbase reaches 24" (600 mm) above top of chambers.	Small LGP track dozers and skid loaders allowed to grade cover stone with at least 12" (300 mm) stone under tracks at all times. Equipment must push parallel to rows at all times.	Use dynamic force of roller only after compacted fill depth reaches 24" (600 mm) over chambers. Roller travel parallel to chamber rows only.
(B) Embedment Stone	No equipment allowed on bare chambers. Use excavator or stone conveyor positioned off bed or on foundation stone to evenly fill around all chambers to at least the top of chambers.	No wheel loads allowed. Material must be placed outside the limits of the chamber bed.	No tracked equipment is allowed on chambers until a min. 12" (300 mm) cover stone is in place.	No rollers allowed.
(A) Foundation Stone	No StormTech restrictions. Contractor responsible for any conditions or requirements by others relative to subgrade bearing capacity, dewatering or protection of subgrade.			

NOTES:

1. *36" (900 mm) of stabilized cover materials over the chambers is required for full dump truck travel and dumping*
2. *During paving operations, dump truck axle loads on 24" (600mm) of cover may be necessary. Precautions should be taken to avoid rutting of the road base layer, to ensure that compaction requirements have been met. and that a minimum of 24" (600 mm) of cover exists over the chambers. Contact StormTech for additional guidance on allowable axle loads during paving.*
3. *Ground pressure for track dozers is the vehicle operating weight divided by total ground contact area for both tracks. Excavators will exert higher ground pressures based on loaded bucket weight and boom extension.*
4. *Mini-excavators (<8,000lbs/3,628 kg) can be used with at least 12" (300 mm) of stone over the chambers and are limited by the maximum ground pressures in Table 2 based on a full bucket at maximum boom extension.*
5. *StormTech does not require compaction of initial fill at 18" (450 mm) of cover. However, requirements by others for 6" (150 mm) lifts may necessitate the use of small compactors at 18" (450 mm) of cover.*
6. *Storage of materials such as construction materials, equipment, spoils, etc. should not be located over the StormTech system. The use of equipment over the StormTech system not covered in Table 2 (ex. soil mixing equipment, cranes, etc) is limited. Please contact StormTech for more information.*
7. *Allowable track loads based on vehicle travel only. Excavators shall not operate on chamber beds until the total backfill reaches 3 feet (900 mm) over the entire bed*

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City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Lamonica Shops Building Permit #: City Drainage #: P10D005

DRB#: 1000650 EPC#: Work Order#:

Legal Description: Tracts 1-A-2-A and 1-A-2-C, Lands of Lamonica & Wenk

City Address: 3510 Coors Blvd. SW - Albuquerque, NM 87121

Engineering Firm: Isaacson & Arfman, P.A. Contact: Fred C. Arfman

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 Fax#: E-mail: fred@iacivil.com

Owner: Contact:

Address:

Phone#: Fax#: E-mail:

Architect: Contact:

Address:

Phone#: Fax#: E-mail:

Surveyor: Precision Surveys, Inc. Contact: Larry W. Medrano

Address: 5571 Midway Park Place NE -- Albuquerque, NM 87109

Phone#: (505) 856-5700 Fax#: E-mail:

Contractor: Contact:

Address:

Phone#: Fax#: E-mail:

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT
____ DRAINAGE PLAN 1st SUBMITTAL
__X__ DRAINAGE PLAN RESUBMITTAL
____ CONCEPTUAL G & D PLAN
__X__ GRADING PLAN
____ EROSION & SEDIMENT CONTROL PLAN (ESC)
____ ENGINEER'S CERT (HYDROLOGY)
____ CLOMR/LOMR
____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ ENGINEER'S CERT (TCL)
____ ENGINEER'S CERT (DRB SITE PLAN)
____ ENGINEER'S CERT (ESC)
____ SO-19
____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

____ SIA/FINANCIAL GUARANTEE RELEASE
____ PRELIMINARY PLAT APPROVAL
____ S. DEV. PLAN FOR SUB'D APPROVAL
____ S. DEV. FOR BLDG. PERMIT APPROVAL
____ SECTOR PLAN APPROVAL
____ FINAL PLAT APPROVAL
____ CERTIFICATE OF OCCUPANCY (PERM)
____ CERTIFICATE OF OCCUPANCY (TCL TEMP)
____ FOUNDATION PERMIT APPROVAL
__X__ BUILDING PERMIT APPROVAL
____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
____ WORK ORDER APPROVAL
____ GRADING CERTIFICATION
____ SO-19 APPROVAL
____ ESC PERMIT APPROVAL
____ ESC CERT. ACCEPTANCE
____ OTHER (SPECIFY)

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LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: __X__ Yes ____ No ____ Copy Provided

DATE SUBMITTED: FEBRUARY 10, 2014 By: FRED ARFMAN
Isaacson & Afrman, P.A.

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

1 **Conceptual Grading and Drainage Plan** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2 **Drainage Plans** Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3 **Drainage Report** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4 **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

DRAINAGE REPORT

LAMONICA SHOPS

ALBUQUERQUE, NEW MEXICO

I&A Project No.: 2021

FEBRUARY 7, 2014

Prepared by: Fred C. Arfman

FRED C. ARFMAN
NEW MEXICO
7322
PROFESSIONAL ENGINEER

02-06-14

RECEIVED
FEB 12 2014
LAND DEVELOPMENT SECTION

ISAACSON & ARFMAN, P.A. *Consulting Engineering Associates*

*128 Monroe N.E. * Albuquerque, NM 87108 * Phone: 268-8828 * Fax: 268-2632*

I. PROJECT INFORMATION

Per a pre-design meeting with Curtis Cherne, PE with COA Hydrology, the site is permitted the following:

West retention pond volume is required to store the 100-year 10-day storm event generated by the on-site basin draining to it. Any public stormwater generated from the off-site Coors Blvd system will continue to drain into the west surface pond with the understanding that during larger storms, the public basin stormwaters will continue to backup into the Coors Blvd. R.O.W.

The east side detention pond volume will consist of a large area, shallow depth pond centered in the central landscape basin and extending outwards into the asphalt paved parking area to a depth not to exceed 8". The existing storm drain inlets previously constructed with orifice control that limits the site discharge will continue to function.

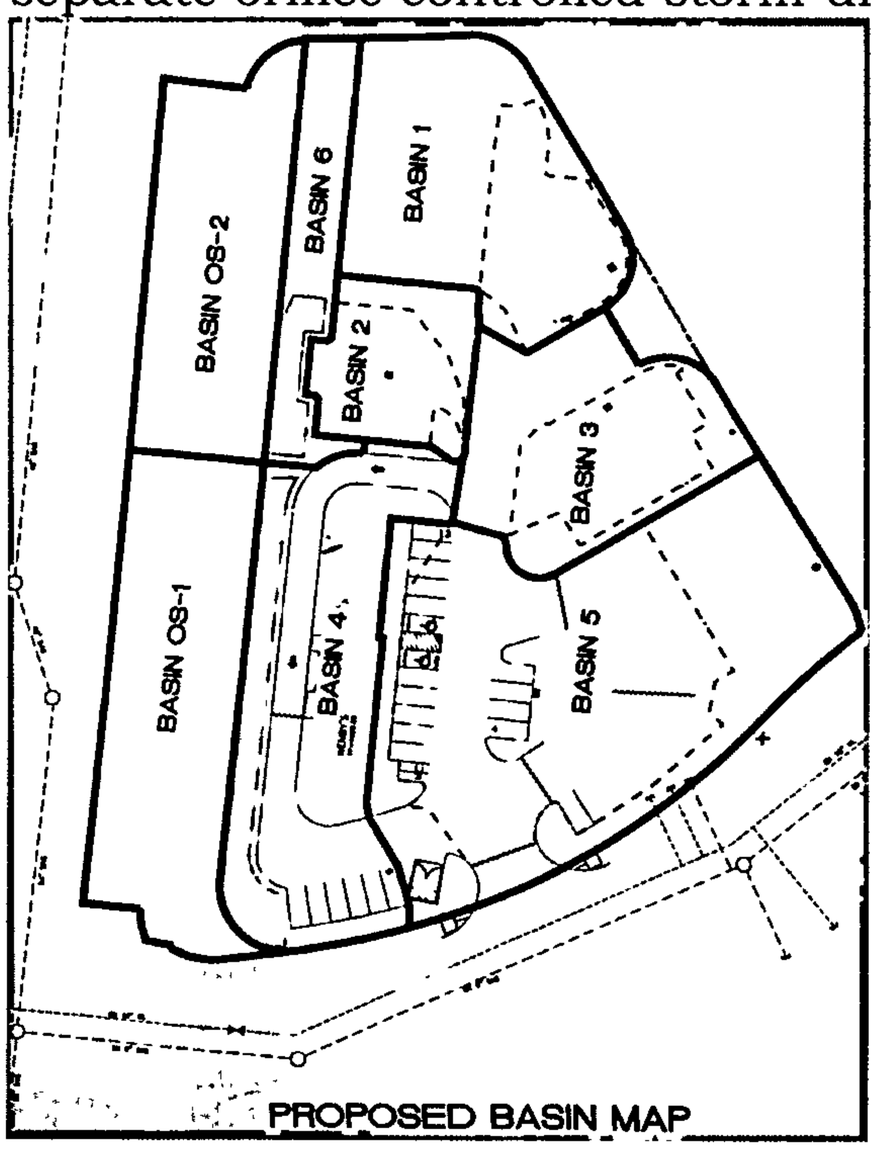
II. MASTER PLANNED BASINS

The following references the Drainage Report for Tract 1-A-2, Lands of Lamonica Wenk (2010) and the approved as-built drainage and grading plan for the Panda Express portion of the property (2012) both prepared by Tierra West, LLC.

Per the Drainage Report, the overall property, which includes the Panda Express to the north, will drain to parking lot detention ponds (Master Planned Basins 1, 2, 3 and 5). An existing private storm drain system constructed as part of the Walmart development accepts restricted discharge to Pond 9 on the Walmart property at a rate of 0.412 cfs. While this discharge rate is higher than originally approved in the Walmart reports, the on-site storm drain system with orifice control as constructed was based on this rate with the engineer's confirmation that Pond 9 had the available capacity to accept the increases.

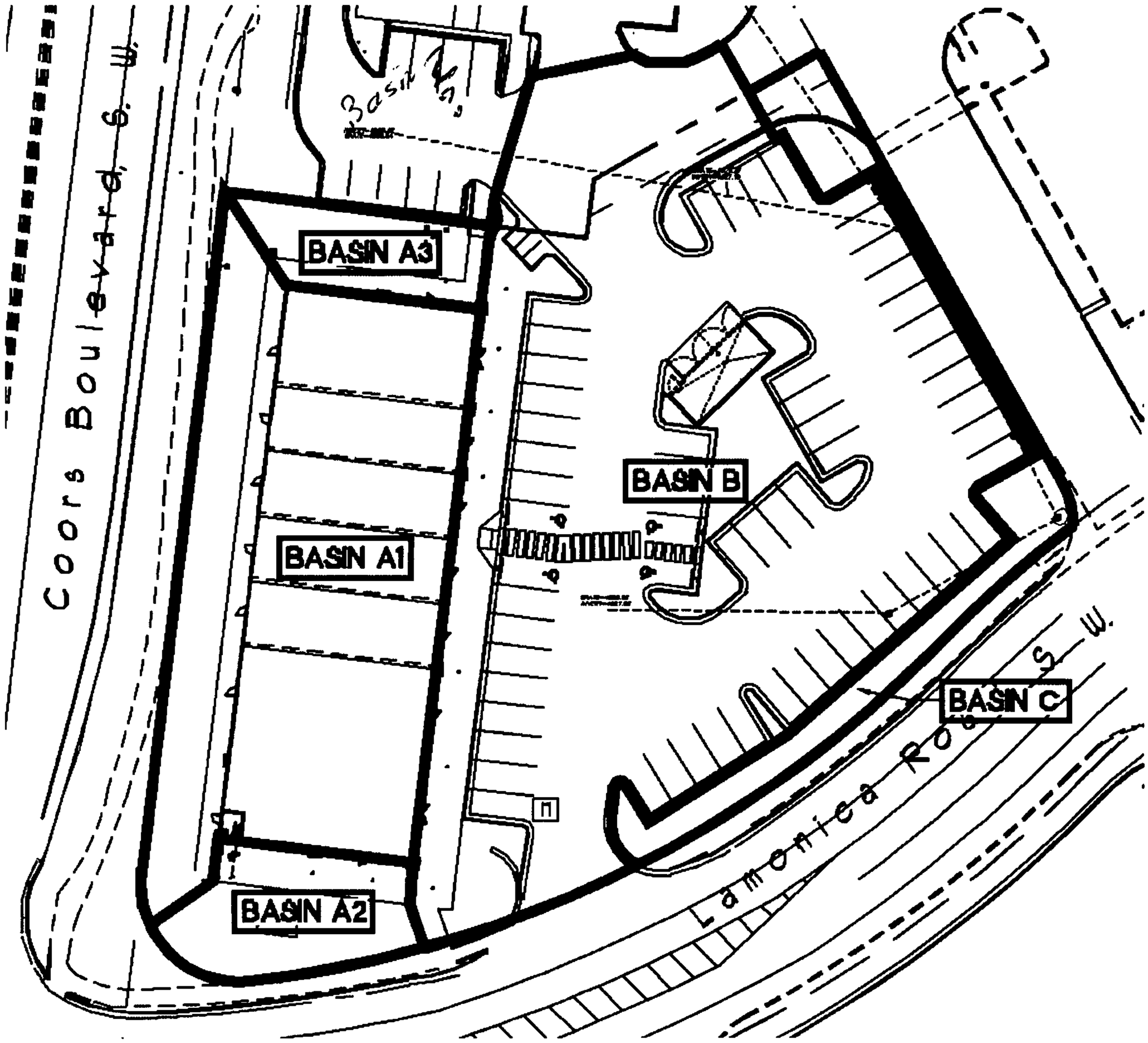
Per the Master Planned Basin Map (see image below), the overall property was subdivided into six on-site basins. Basins 4 and 6 drain to west side retention ponds. Basins 1 and 2 represent the Panda Express inlets and Basins 3 and 5 represent the basins to be addressed in this report.

As part of the Panda Express construction, the overall storm drain system with separate orifice controlled storm-drain inlets within each basin was constructed.



III. PROPOSED BASINS

The revised site plan for this development reconfigures the drainage basins on the south side of the overall property as shown below.



BASIN A: WEST RETENTION POND

The proposed on-site Basin A1 draining to the proposed StormTech system will generate 2,270 cf during the 100-year 6-hour storm event.

BASIN NO. A1		DESCRIPTION	On-site Basin (Incl. Bldg.) draining to WEST POND
Area of basin flows =	14700	SF =	0.3 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	9%
C =	0%
D =	91%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.85 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 2270 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.4 cfs

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

V_{360} (from previous calculation)	2270
Area Treatment D (SF)	13377
Zone	1

PROPOSED
BASIN A

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

from Table A-2
Depth (inches) at 100-yr Storm

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	2270
A_D (SF)	=	13377
Zone	=	1
P_{10day}	=	3.67
P_{360}	=	2.2

V_{360}	=	2270
+ imp. area	=	1639

Total Pond Volume ($V_{10\ day}$)	=	3909

The storage required for the 100-year 10-day event is 2,270 cf + 1,639 cf for a total required volume of 3,909 cf.

Using Stormtech provided volumes, each installed MC-3500 chamber stores 176.8 cf and each installed end cap stores 45.6 cf. Therefore, the proposed 22 chambers and 2 end caps will have a storage capacity of 3,980.8 CF > 3,909 CF: OK.

End Cap @30% = 39.13 cf.
Chambers @30% = 171.3 cf x 22 ea } 3,847 cf ADS

BASINS A2 AND A3: NORTH AND SOUTH RETENTION AREAS

The proposed Basins A2 and A3 located on the south and north sides of the building draining to on-site water harvesting ponds will generate 286 cf and 186 cf respectively during the 100-year 6-hour storm event.

BASIN NO. A2		DESCRIPTION	South Pond
Area of basin flows =	2567	SF =	0.1 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	55%
C =	0%
D =	45%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.26 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 268 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 0.2 cfs

PROPOSED SOUTH POND		
Contour	Area	Volume
4929.80	1000	
4929.00	310	524 CF
TOTAL VOL.		**524** CF

A2: The storage required for the 100-year 10-day event is 268 cf + 107 cf for a total required volume of 375 cf.

> 375 CF OK ✓

BASIN NO. A3		DESCRIPTION	North Pond
Area of basin flows =	1833	SF =	0.0 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	66%
C =	0%
D =	34%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.11 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 170 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 0.1 cfs

PROPOSED NORTH POND		
Contour	Area	Volume
4930.80	450	
4930.50	336	118 CF
4929.50	42	189 CF
TOTAL VOL.		**307** CF

A3: The storage required for the 100-year 10-day event is 170 cf + 76 cf for a total required volume of 246 cf.

> 246 CF OK ✓

DRAINAGE REPORT

BASIN B: EAST DETENTION POND

The proposed on-site Basin 2 draining to the existing storm drain inlets with orifice control will generate 4,947 cf during the 100-year 6-hour storm event.

BASIN NO. B		DESCRIPTION	On-site Basin draining to EAST Stormtech System
Area of basin flows =	31713 SF	=	0.73 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	0%
C =	10%
D =	90%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.87 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 4947 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 3.1 cfs

Based on an inflow / outflow hydrograph using the allowable discharge rate of 0.20 cfs (based on existing orifice controls at each inlet). The on-site pond within Basin B is required to store 4,832 cf. The total Q of 3.1 cfs will completely discharge through the existing system at the rate of 0.2 cfs in 6.7 hours.

CALCULATIONS: Lamonica Shops : 12/04/2013
HYDROGRAPH FOR SMALL WATERSHED
DPM SECTION 22-2 * PAGE A-13/14

Base time, t_B, for a small watershed hydrograph is,

$t_B = (2\ 107 * E * A / Q_P) - (0\ 25 * A_D / A)$

Where			
	E	=	1 87 inches
	A	=	0 73 acres
	A_D	=	0 66 acres
	Q_P	=	3 1 cfs

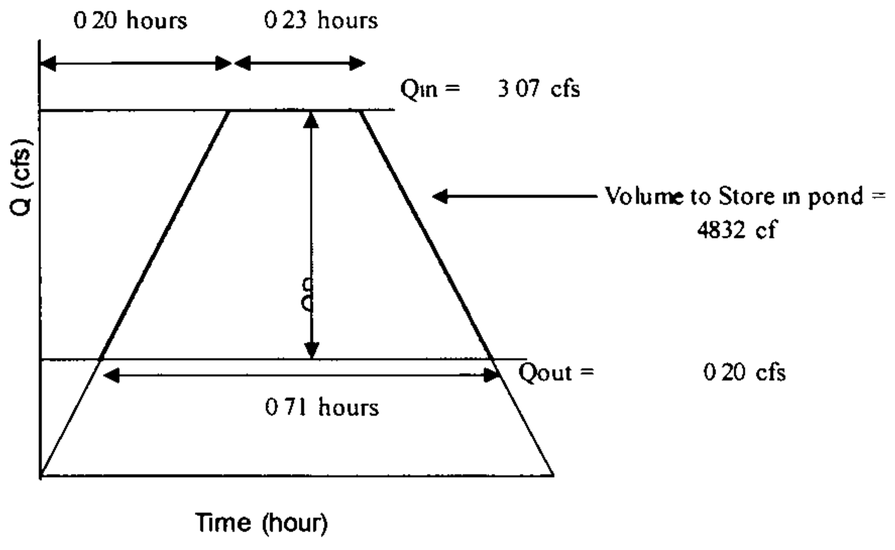
t_B	=	0 71 hours

E is the excess precipitation in inches (from DPM TABLE A-8), Q_P is the peak flow, A_D is the area (acres) of treatment D, and A_T is the total area in acres Using the time of concentration, t_C (hours), the time to peak in hours is

$t_P = (0\ 7 * tC) + ((1\ 6 - (A_D / A)) / 12)$

Where			
	t_C	=	0 20 hours
	t_P	=	0 20 hours

Continue the peak for $0\ 25 * A_D / A_T$ hours When A_D is zero, the hydrograph will be triangular When A_D is not zero, the hyrograph will be trapezoidal see the graph below

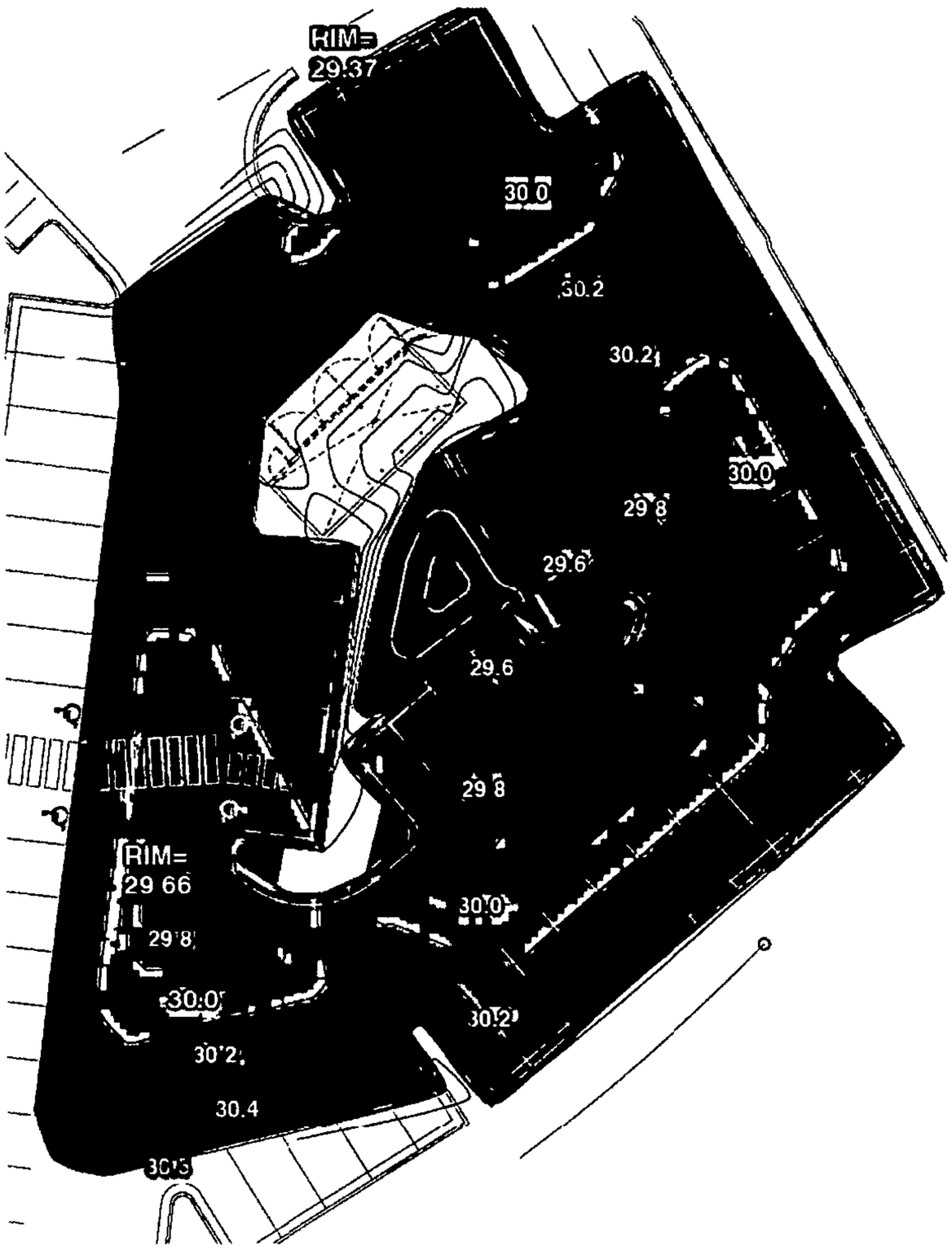


Based on CIVIL-3D volume analysis (see image below), the proposed east side Basin B is divided into three sub-basins which will equalize via overflows between basins.

The table below provides volumes of available ponding at 3" increments.

CIVIL 3D POND VOLUMES	
ELEVATION	VOLUME AVAILABLE (CF)
4929.50	143
4929.75	325
4930.00	1092
4930.25	3372
4930.50	7252

EAST PARKING LOT PONDS VOLUMES / EXHIBITS



This image at left shows the water elevations and water levels in the east ponding area.

An elevation of approximately 4930.3 represents the required volume to store the 100-year 6-hour storm.

At an elevation of 4930.5 the available ponding volume is 7,252 cf which significantly exceeds the required detention pond volume of 4,832 cf and comes close to retaining the 100-year 10-day storm event. With an emergency overflow elevation to Lamonica Rd. of 4930.7, the additional 0.2' would far exceed the 100-year 10-day storm.

BASIN C: PERIMETER LANDSCAPING

BASIN NO. C		DESCRIPTION		Perimeter
Area of basin flows =	3463	SF	=	0.1 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	0%
C =	80%
D =	20%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.19 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 342 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 0.3 cfs

The perimeter landscaping will include depressed water harvesting areas which will utilize stormwater for landscaping. Excess flow will pass to the exterior streets.

BASIN OS-1: COORS BLVD. OFF-SITE BASIN

Per the Master Planned Basin Map, this portion of the overall property included an off-site basin (OS-1) – a portion of Coors Blvd. pavement and R.O.W. This flow was accepted into the previously constructed west detention pond. With the proposed construction of the StormTech system for the on-site 100-year 10-day store volume, a shallow surface pond on the west side of the building will continue to retain the 100-year 10-day storm volume generated by the off-site basin (OS-1). Total required volume = 1916 cf + 1343 cf = 3,260 cf.

BASIN NO. OS-1		DESCRIPTION	Off-Site Coors Basin draining to WEST POND
Area of basin flows =	13052	SF	= 0.30 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	16%
C =	0%
D =	84%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E =	1.76 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} =	1916 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P =	1.2 cfs

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

V_{360} (from previous calculation)	1916
Area Treatment D (SF)	10964
Zone	1

OFF-SITE
BASIN
OS-1

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	1916
A_D (SF)	=	10964
Zone	=	1
P_{10day}	=	3.67
P_{360}	=	2.2

V_{360}	=	1916
+ imp. area	=	1343

Total Pond Volume ($V_{10\ day}$)	=	3260

from Table A-2
Depth (inches) at 100-yr Storm

At a depth of 1.3', the west pond provides storage for the offsite basin (OS-1) 100-year 10-day storm.

PROPOSED WEST POND		
Contour	Area	Volume
4928.40	3869	
4928.00	2930	1360 CF
4927.00	947	1939 CF
TOTAL VOL.		**3298** CF

> 3,260 OK

1908 ft³ remaining after Rock va

CITY OF ALBUQUERQUE

February 11, 2014

Fred Arfman, P.E.
128 Monroe St NE
Albuquerque, NM 87108

Re: Lamonica Shops Drainage Report and Grading Plan
Engineer's Stamp Date 1-28-14 (P10D005)

Dear Mr. Arfman,

Based upon the information provided in your submittal received 1-28-14, the above referenced plan is approved for Site Plan for Building Permit action by the DRB.

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

Sincerely,

Curtis Cherne, P.E.
Principal Engineer, Hydrology
Planning Dept.

C: e-mail

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: La Monica Shops Building Permit #: _____ City Drainage #: P10D00

DRB#: _____ EPC#: _____ Work Order#: _____

Legal Description: _____

City Address: _____

Engineering Firm: I & A Contact: _____

Address: _____

Phone#: 266-0622 Fax#: _____ E-mail: _____

Owner: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Architect: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Surveyor: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Contractor: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT
____ DRAINAGE PLAN 1st SUBMITTAL
____ DRAINAGE PLAN RESUBMITTAL
X CONCEPTUAL G & D PLAN
____ GRADING PLAN
____ EROSION & SEDIMENT CONTROL PLAN (ESC)
____ ENGINEER'S CERT (HYDROLOGY)
____ CLOMR/LOMR
____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ ENGINEER'S CERT (TCL)
____ ENGINEER'S CERT (DRB SITE PLAN)
____ ENGINEER'S CERT (ESC)
____ SO-19
____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

____ SIA/FINANCIAL GUARANTEE RELEASE
____ PRELIMINARY PLAT APPROVAL
____ S. DEV. PLAN FOR SUB'D APPROVAL
X S. DEV. FOR BLDG. PERMIT APPROVAL
____ SECTOR PLAN APPROVAL
____ FINAL PLAT APPROVAL
____ CERTIFICATE OF OCCUPANCY (PERM)
____ CERTIFICATE OF OCCUPANCY (TCL TEMP)
____ FOUNDATION PERMIT APPROVAL
____ BUILDING PERMIT APPROVAL
____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
____ WORK ORDER APPROVAL
____ GRADING CERTIFICATION
____ SO-19 APPROVAL
____ ESC PERMIT APPROVAL
____ ESC CERT. ACCEPTANCE
____ OTHER (SPECIFY)

RECEIVED
JAN 28 2014
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: ____ Yes ____ No ____ Copy Provided

DATE SUBMITTED: _____ By: _____

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

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2. **Drainage Plans** Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3. **Drainage Report** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

DRAINAGE REPORT

LAMONICA SHOPS

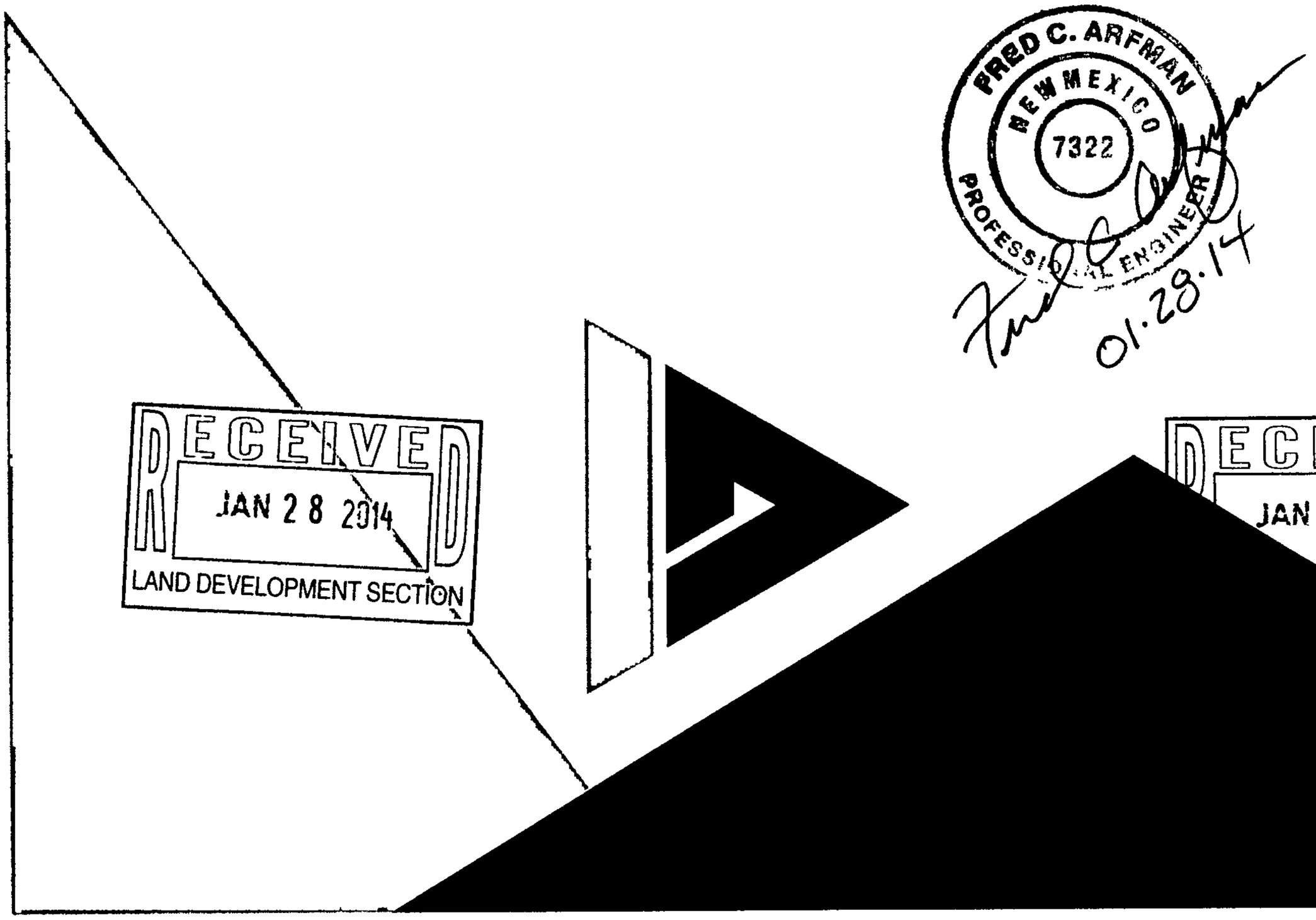
ALBUQUERQUE, NEW MEXICO

I&A Project No.: 2021

RECEIVED
JAN 2 8 2014
LAND DEVELOPMENT SECTION

JULY 24, 2013

Prepared by:



ISAACSON & ARFMAN, P.A. *Consulting Engineering Associates*

*128 Monroe N.E. * Albuquerque, NM 87108 * Phone: 268-8828 * Fax: 268-2632*

I. PROJECT INFORMATION

Per a pre-design meeting with Curtis Cherne, PE with COA Hydrology, the site is permitted the following:

West retention pond volume is required to store the 100-year 10-day storm event generated by the on-site basin draining to it. Any public stormwater generated from the off-site Coors Blvd system will continue to drain into the west surface pond with the understanding that during larger storms, the public stormwaters will continue to backup into the Coors Blvd. R.O.W.

The east side detention pond volume will consist of a large area, shallow depth pond centered in the central landscape basin and extending outwards into the asphalt paved parking area to a depth not to exceed 8". The existing storm drain inlets previously constructed with orifice control that limits the site discharge will continue to function.

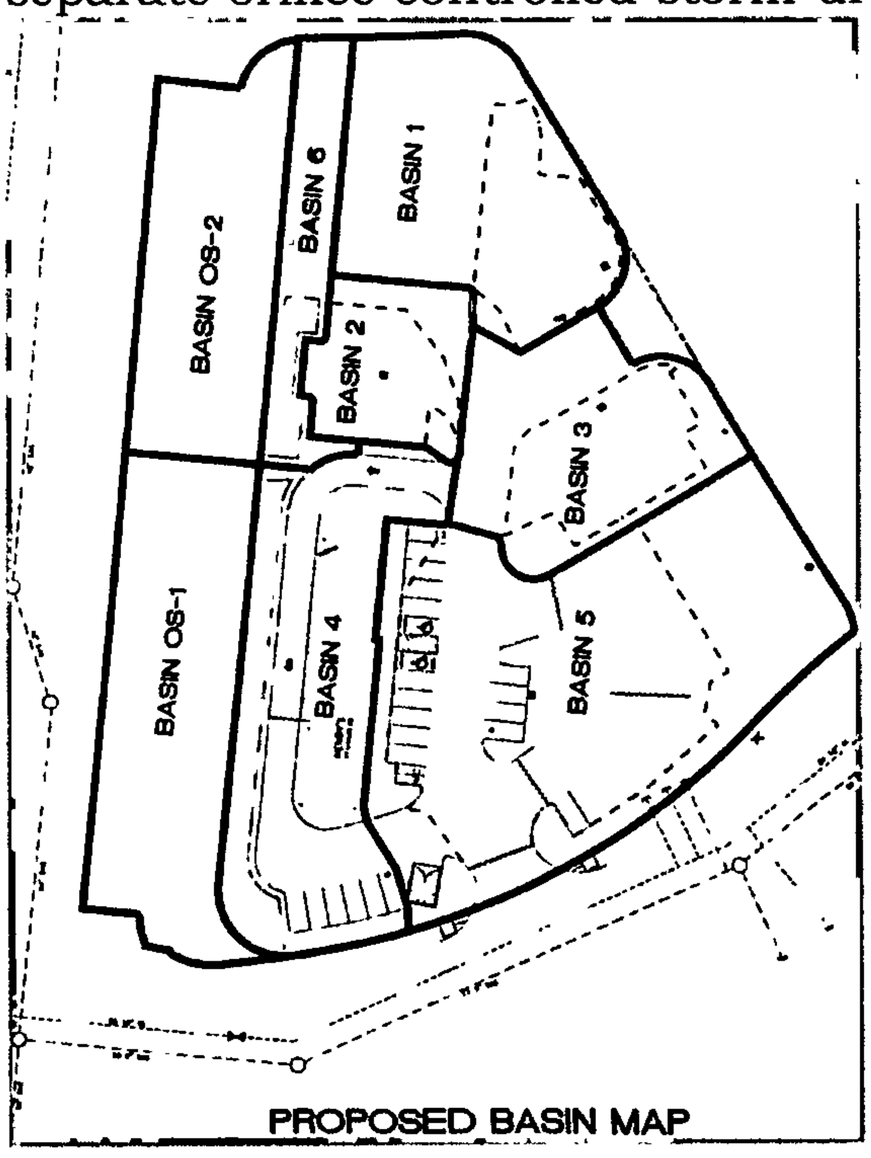
II. MASTER PLANNED BASINS

The following references the Drainage Report for Tract 1-A-2, Lands of Lamonica Wenk (2010) and the approved as-built drainage and grading plan for the Panda Express portion of the property (2012) both prepared by Tierra West, LLC.

Per the Drainage Report, the overall property, which includes the Panda Express to the north, will drain to parking lot detention ponds (Master Planned Basins 1, 2, 3 and 5). An existing private storm drain system constructed as part of the Walmart development accepts restricted discharge to Pond 9 on the Walmart property at a rate of 0.412 cfs. While this discharge rate is higher than originally approved in the Walmart reports, the on-site storm drain system with orifice control as constructed was based on this rate with the engineer's confirmation that Pond 9 had the available capacity to accept the increases.

Per the Master Planned Basin Map (see image below), the overall property was subdivided into six on-site basins. Basins 4 and 6 drain to west side retention ponds. Basins 1 and 2 represent the Panda Express inlets and Basins 3 and 5 represent the basins to be addressed in this report.

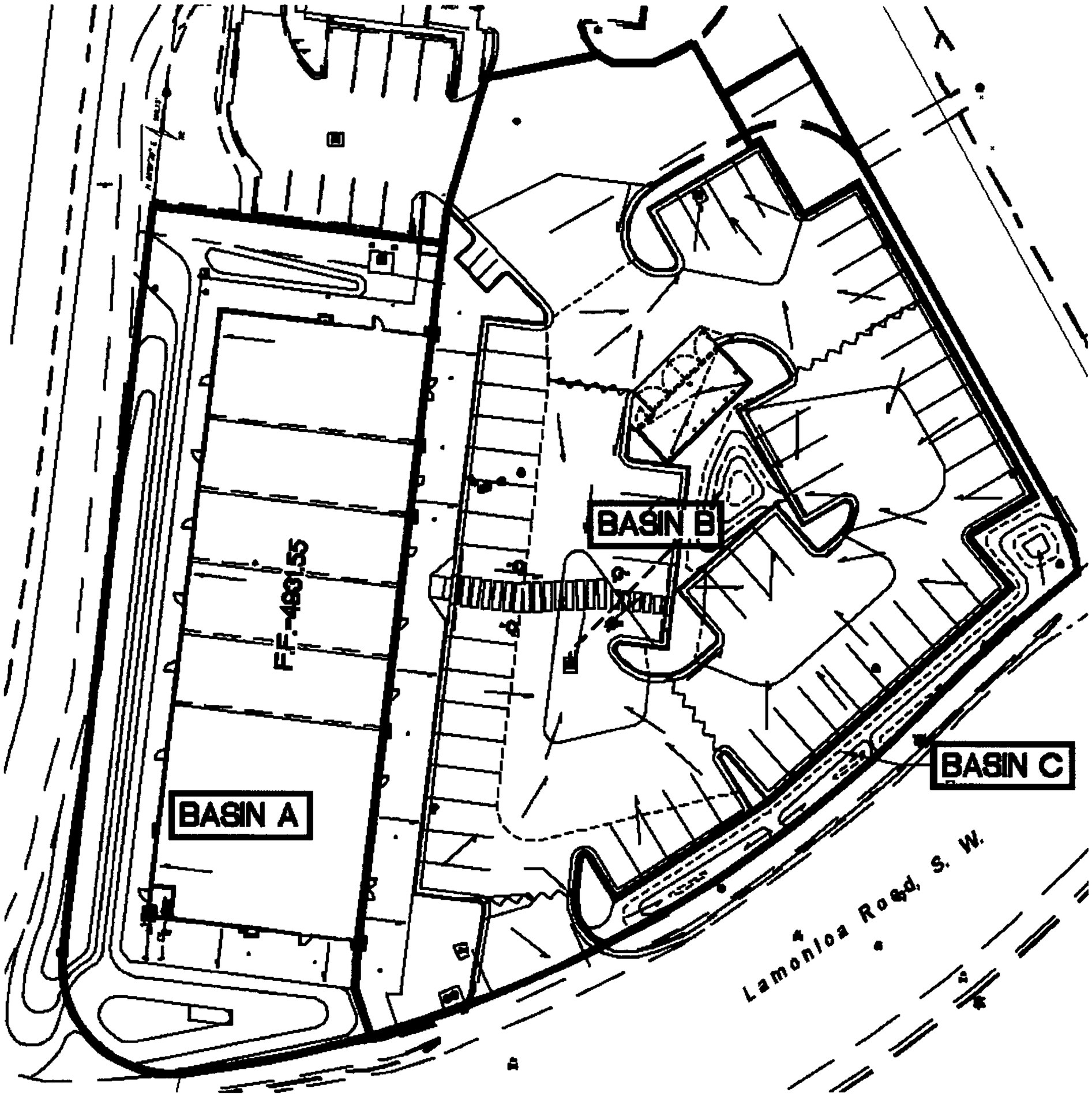
As part of the Panda Express construction, the overall storm drain system with separate orifice controlled storm-drain inlets within each basin was constructed.



PROPOSED BASIN MAP

III. PROPOSED BASINS

The revised site plan for this development reconfigures the drainage basins on the south side of the overall property.



BASIN A: WEST RETENTION POND

The proposed on-site Basin A draining to the existing west pond will generate 2,877 cf during the 100-year 6-hour storm event.

BASIN NO. A		DESCRIPTION	On-site Basin (Incl. Bldg.) draining to WEST POND
Area of basin flows =	20000 SF	=	0.5 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	15%
C =	5%
D =	80%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.73 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 2877 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.8 cfs

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

V_{360} (from previous calculation)	2877
Area Treatment D (SF)	16000
Zone	1

PROPOSED
BASIN A

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	2877
A_D (SF)	=	16000
Zone	=	1
P_{10day}	=	3.67
P_{360}	=	2.2

V_{360}	=	2877
+ imp. area	=	1960

Total Pond Volume ($V_{10\ day}$)	=	4837

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

from Table A-2
Depth (inches) at 100-yr Storm

The storage required for the 100-year 10-day event is 2,877 cf + 1,960 cf for a total retention volume of 4,837 cf. ✓

BASIN B: ~~WEST~~ EAST RETENTION POND

The proposed on-site Basin 2 draining to the existing storm drain inlets with orifice control will generate 4,947 cf during the 100-year 6-hour storm event.

BASIN NO. B		DESCRIPTION	On-site Basin draining to EAST Stormtech System
Area of basin flows =	31713 SF	=	0.73 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	0%
C =	10%
D =	90%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.87 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 4947 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 3.1 cfs

Based on an inflow / outflow hydrograph using the allowable discharge rate of 0.20 cfs (based on existing orifice controls at each inlet). The on-site pond within Basin B is required to store 4,832 cf. The total Q of 3.1 cfs will completely discharge through the existing system at the rate of 0.2 cfs in 6.7 hours.

CALCULATIONS: Lamonica Shops : 12/04/2013
HYDROGRAPH FOR SMALL WATERSHED
DPM SECTION 22-2 * PAGE A-13/14

Base time, t_B, for a small watershed hydrograph is,

$tB = (2\ 107 * E * A / Q_P) - (0\ 25 * A_D / A)$

Where

E	=	1 87 inches
A	=	0 73 acres
A_D	=	0 66 acres
Q_P	=	3 1 cfs

t_B	=	0 71 hours

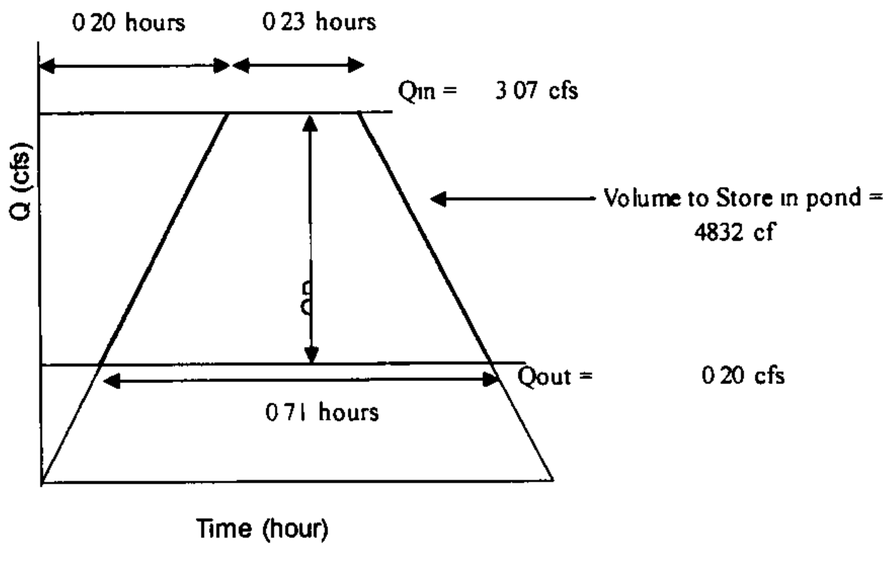
E is the excess precipitation in inches (from DPM TABLE A-8), Q_P is the peak flow, A_D is the area (acres) of treatment D, and A_T is the total area in acres Using the time of concentration, t_C (hours), the time to peak in hours is

$t_P = (0\ 7 * tC) + ((1\ 6 - (A_D / A)) / 12)$

Where t_C = 0 20 hours

t_P = 0 20 hours

Continue the peak for $0\ 25 * A_D / A_T$ hours When A_D is zero, the hydrograph will be triangular When A_D is not zero, the hyrograph will be trapezoidal see the graph below

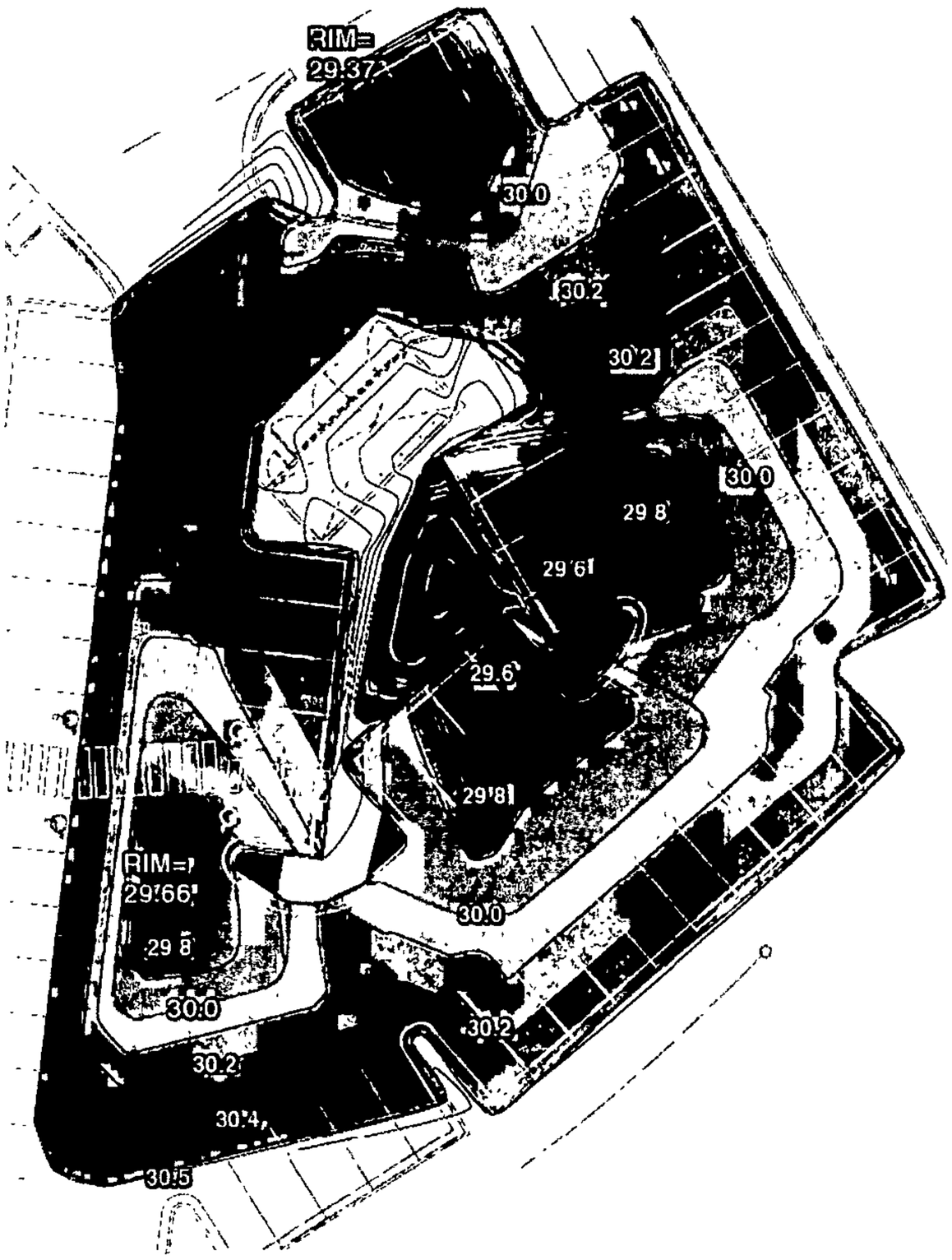


Based on CIVIL-3D volume analysis (see image below), the proposed east side Basin B is divided into three sub-basins which will equalize via overflows between basins.

The table below provides volumes of available ponding at 3" increments.

CIVIL 3D POND VOLUMES	
ELEVATION	VOLUME AVAILABLE (CF)
4929.50	143
4929.75	325
4930.00	1092
4930.25	3372
4930.50	7252

EAST PARKING LOT PONDS VOLUMES / EXHIBITS



This image at left shows the water elevations and water levels in the east ponding area.

An elevation of approximately 4930.3 represents the required volume to store the 100-year 6-hour storm.

At an elevation of 4930.5 the available ponding volume is 7,252 cf which significantly exceeds the required detention pond volume of 4,832 cf and comes close to retaining the 100-year 10-day storm event. With an emergency overflow elevation to Lamonica Rd. of 4930.7, the additional 0.2' would far exceed the 100-year 10-day storm.

At a depth of 1.3', the west pond provides storage for the offsite basin (OS-1) 100-year 10-day storm.

PROPOSED WEST POND		
Contour	Area	Volume
4928.30	3869	
4928.00	3330	1080 CF
4927.00	1170	2250 CF
TOTAL VOL.		**3330** CF

BASIN C: PERIMETER LANDSCAPING

BASIN NO. C		DESCRIPTION		Perimeter
Area of basin flows =	3463	SF	=	0.1 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	0%
C =	80%
D =	20%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.19 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 342 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 0.3 cfs

The perimeter landscaping will include depressed water harvesting areas which will utilize stormwater for landscaping. Excess flow will pass to the exterior streets.

BASIN OS-1: COORS BLVD. OFF-SITE BASIN

Per the Master Planned Basin Map, the analysis of the overall property included two off-site basins – portions of Coors Blvd. pavement and R.O.W. which drain into the property. This flow was accepted into the previously constructed west detention ponds. With the construction of the proposed StormTech system for the on-site 100-year 10-day store volume, a shallow surface pond on the west side of the building will continue to retain the 100-year 10-day storm volume generated by the off-site basin (OS-1). Total required volume = 1916 cf + 1343 cf = 3,260 cf.

BASIN NO. OS-1	DESCRIPTION	Off-Site Coors Basin draining to WEST POND

Area of basin flows = 13052 SF = 0.30 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	16%
C =	0%
D =	84%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E =	1.76 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} =	1916 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P =	1.2 cfs

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

V_{360} (from previous calculation)	1916
Area Treatment D (SF)	10964
Zone	1

OFF-SITE
BASIN
OS-1

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	1916
A_D (SF)	=	10964
Zone	=	1
P_{10day}	=	3.67
P_{360}	=	2.2

from Table A-2
Depth (inches) at 100-yr Storm

V_{360}	=	1916
+ imp. area	=	1343

Total Pond Volume ($V_{10\ day}$)	=	3260

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	PEGGY GRAHAM 720-982-6303 PEGGY GRAHAM@ADS-PIPE COM
ADS SALES REP	PETER NICHOLS 614-658-0198 PETER NICHOLS@ADS-PIPE COM
PROJECT NO	43884 REV 1

ADVANCED DRAINAGE SYSTEMS, INC.

LAMONICA SHOPS

ALBUQUERQUE, NM

STORMWATER CHAMBER SPECIFICATIONS

1 CHAMBERS SHALL BE STORMTECH MC-3500 OR APPROVED EQUAL

2 CHAMBERS SHALL BE MADE FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS

3 CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION

4 THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12 12, ARE MET FOR 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES

5 CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"

6 CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"

7 ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE

- a A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1 95 FOR DEAD LOAD AND 1 75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE
- b A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12 12, ARE MET THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE
- c STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED

8 CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1 STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS

2 STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE"

3 CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS

STORMTECH RECOMMENDS 3 BACKFILL METHODS
- STONESHOOTER LOCATED OFF THE CHAMBER BED
- BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE
- BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR

4 THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS

5 JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE

6 MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS

7 END CAPS SHALL BE FASTENED TO CHAMBERS WITH (3) 2-1/2" COARSE THREAD SCREWS

8 INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS

9 EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4

10 STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING

11 ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF

NOTES FOR CONSTRUCTION EQUIPMENT

1 STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE"

2 THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED
- NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS
- NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE"
- WEIGHT LIMITS FOR CONSRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE"

3 FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT

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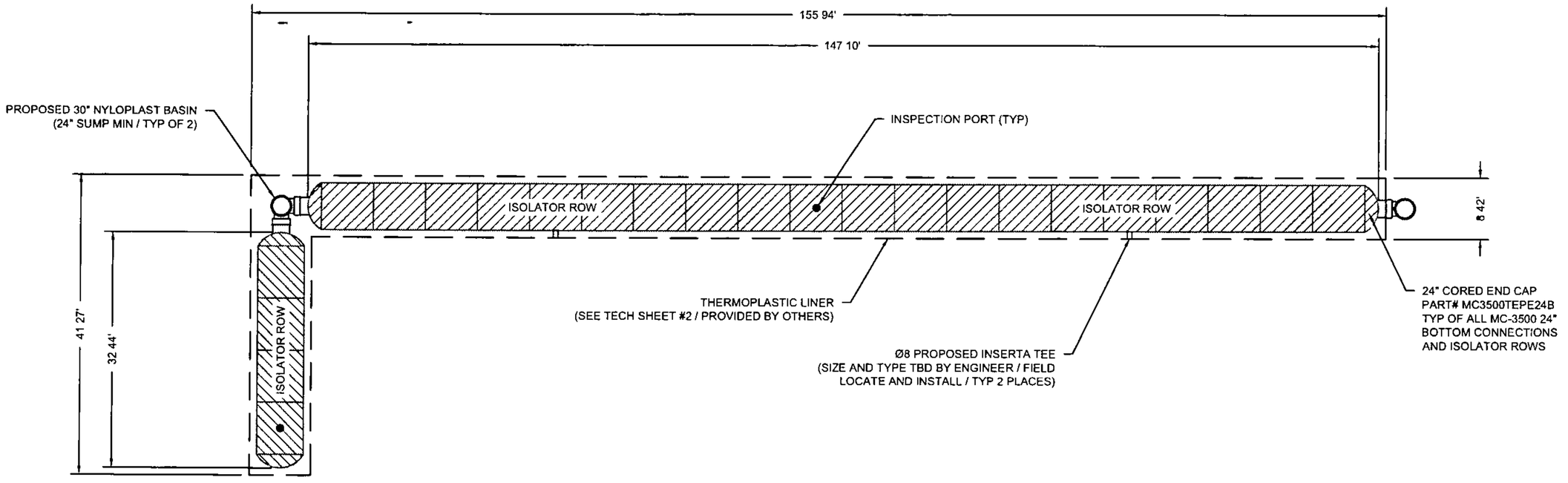
CONCEPTUAL LAYOUT

(24) STORMTECH MC-3500 CHAMBERS
(4) STORMTECH MC-3500 END CAPS
INSTALLED WITH 12" COVER STONE, 9" BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME 5,114 CF (PERIMETER STONE INCLUDED)
AREA OF SYSTEM 1588 FT²
PERIMETER OF SYSTEM 394 FT

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET
- THE SITE DESIGN ENGINEER MUST REVIEW THE PROXIMITY OF THE CHAMBERS TO THE RETAINING WALL AND CONSIDER EFFECTS OF POSSIBLE SATURATED SOILS ON THE RETAINING WALL'S INTEGRITY
- THE SITE DESIGN ENGINEER MUST REVIEW THE PROXIMITY OF THE CHAMBERS TO THE BUILDING/STRUCTURE NO FOUNDATION LOADS SHALL BE TRANSMITTED TO THE CHAMBERS THE SITE DESIGN ENGINEER MUST CONSIDER EFFECTS OF POSSIBLE SATURATED SOILS ON BEARING CAPACITY OF SOILS AND SEEPAGE INTO BASEMENTS



LAMONICA SHOPS
ALBUQUERQUE, NM

DATE 1/20/14 | DRAWN WCM
PROJECT # 43884 | CHECKED SAM

REV	DRW	CHK	DESCRIPTION
1/27/14	WCM	GFI	REVISED TO MC-3500 CHAMBERS

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HILLIARD, OH 43026
1-800-733-7473

0 15' 30'

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

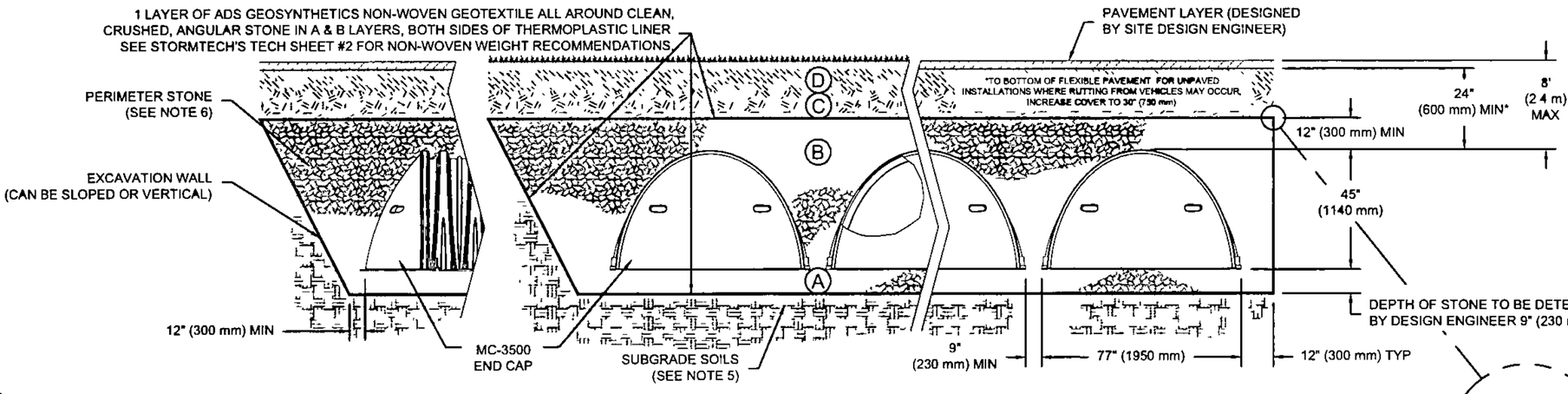
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS
C	**INITIAL FILL**: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED
A	**FOUNDATION STONE** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE [2,3]

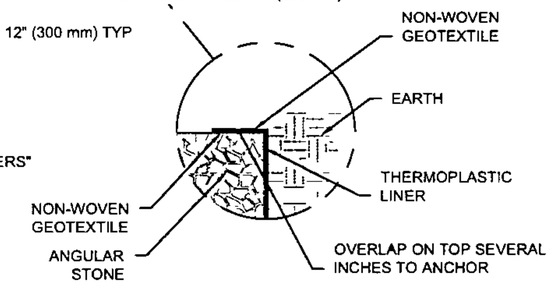
PLEASE NOTE

1 THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE "CLEAN, CRUSHED, ANGULAR NO 4 (AASHTO M43) STONE"

2 STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR

3 WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS





THERMOPLASTIC LINER DETAIL

NOTES:

1 MC-3500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"

2 MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"

3 "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS

4 THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT

5 THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS

6 PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS

7 ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION

LAMONICA SHOPS
ALBUQUERQUE, NM

DATE 1/20/14 | DRAWN WCM | CHECKED SAM | PROJECT # 43884

REV	DRW	CHK	DESCRIPTION
1/27/14	WCM	GFI	REVISED TO MC-3500 CHAMBERS

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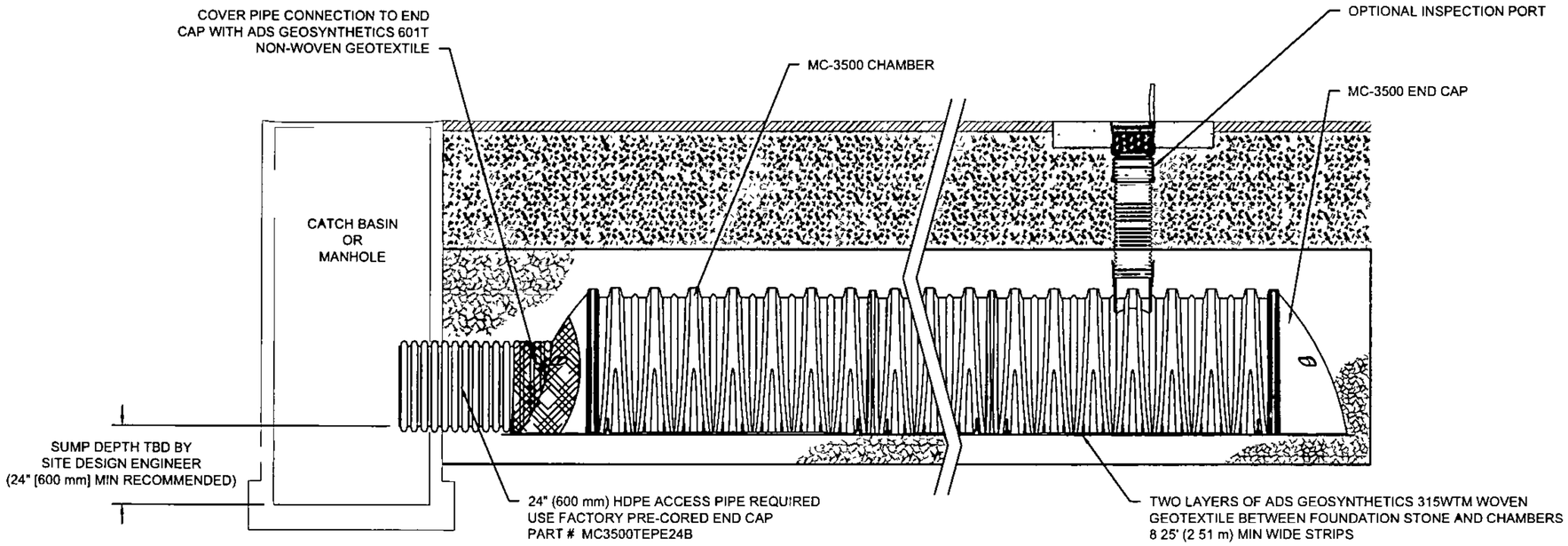


MC-3500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A INSPECTION PORTS (IF PRESENT)
  - A 1 REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A 2 REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A 3 USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A 4 LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A 5 IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2 IF NOT, PROCEED TO STEP 3
- B ALL ISOLATOR ROWS
  - B 1 REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B 2 USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B 3 IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2 IF NOT, PROCEED TO STEP 3

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1 1 m) OR MORE IS PREFERRED
- B APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C VACUUM STRUCTURE SUMP AS REQUIRED

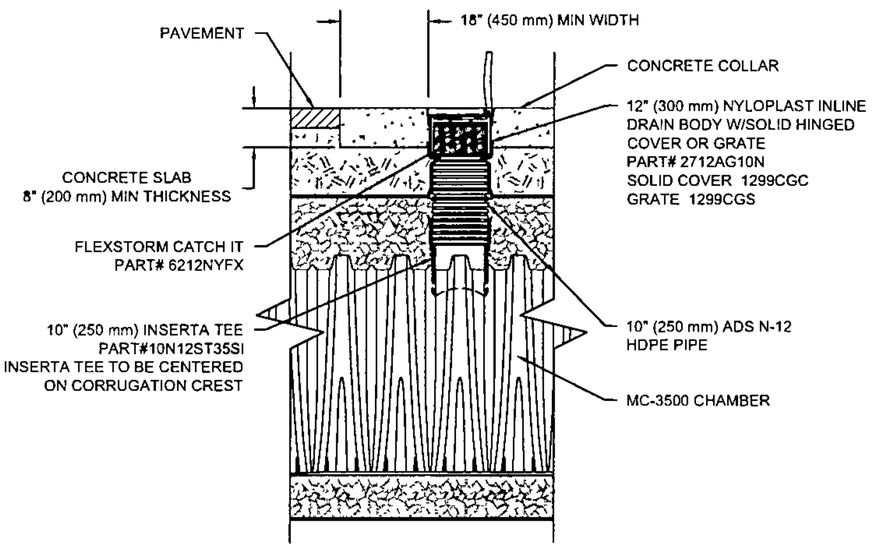
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS, RECORD OBSERVATIONS AND ACTIONS

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM

NOTES

1 INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS

2 CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY



MC-3500 INSPECTION PORT DETAIL
NTS

LAMONICA SHOPS
ALBUQUERQUE, NM

DATE 1/20/14 | DRAWN WCM | PROJECT # 43884 | CHECKED SAM

REV	DRW	CHK	DESCRIPTION
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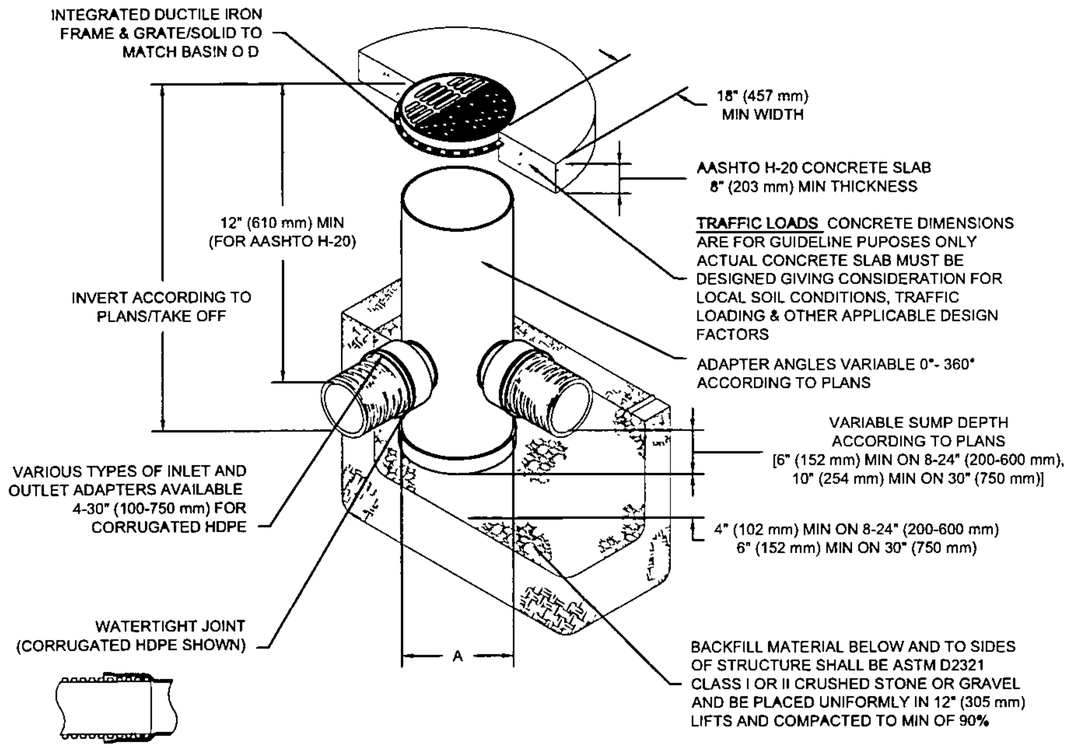
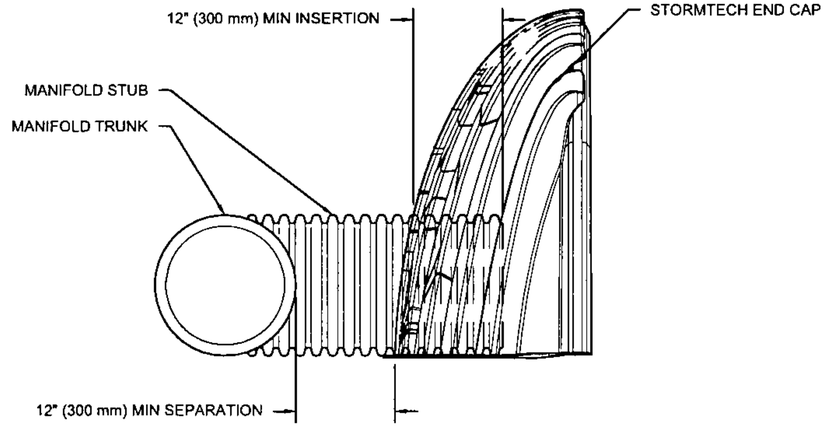
NYLOPLAST DRAIN BASIN

NTS



MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING

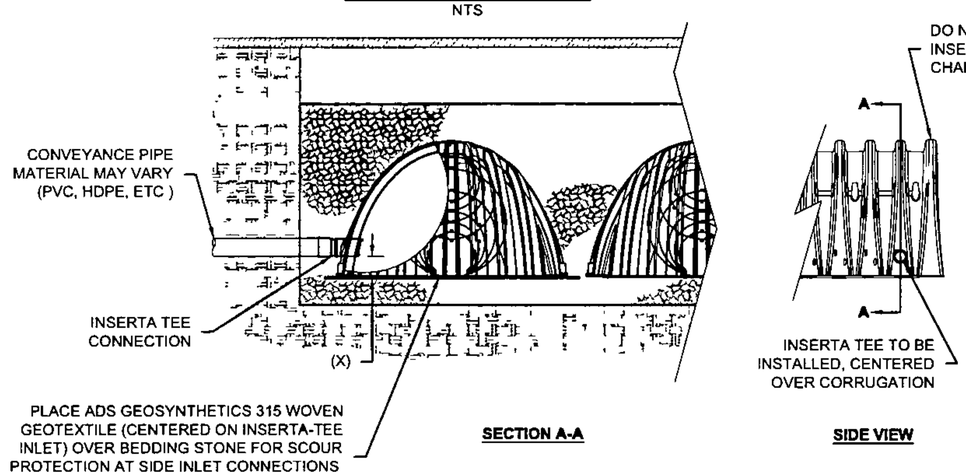
NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION **WWW NYLOPLAST-US COM**
6. TO ORDER CALL **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

INSERTA TEE DETAIL

NTS



SECTION A-A

SIDE VIEW

NOTE
PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS
CONTACT STORMTECH FOR MORE INFORMATION

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	8" (200 mm)	4" (100 mm)
DC-780	8" (200 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

LAMONICA SHOPS
ALBUQUERQUE, NM

DATE 1/20/14 | DRAWN WCM | CHECKED SAM | PROJECT # 43584

REV	DRW	CHK	DESCRIPTION
1/27/14	WCM	GFI	REVISED TO MC-3500 CHAMBERS

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FAX (770) 932 2490
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Coors Boulevard, S

#1

in #2

of Drain #3

age

28' ROW

DOOR 31.5

(12) EXISTING 10' PRIVATE WATERLINE AND SANITARY SEWER EASEMENT (03/27, 2011, 2011C-365 DOC. NO 2011086673)

REBAR

1000

Tract 1-A-2-B

Tract 1-A-2-A

EXISTING SHARED ACCESS (09/21/2005, A103 841) APPROXIMATE LOCATION DIMENSIONS PROVIDED

EXISTING ROADWAY EASEMENT (12/05/2003, 2003C-365

PAINT STRIPE

EDGE OF ASPHALT

CONCRETE SIDEWALK

FOUND NO. 4 REBAR W/ YELLOW PLASTIC CAP "PS 18"

FOUND NO. 4 REBAR PLASTIC CAP "PS 11

CONCRETE SIDEWALK

TRW=30.36

BASIN 1

140 LF 8"ø PERF. PIPE / ROCK WITH 1% SLOPE AN

Point of Beginning

F.F.=4931.55

Cherne, Curtis

From: Cherne, Curtis
Sent: Thursday, December 26, 2013 4:17 PM
To: 'Bryan Bobrick'
Cc: 'Stephen Dunbar'
Subject: RE: Lamonica Shops - revised Conceptual Plan

OK

Curtis

From: Bryan Bobrick [mailto:bryanb@iacivil.com]
Sent: Thursday, December 26, 2013 1:14 PM
To: Cherne, Curtis
Cc: 'Fred Arfman'
Subject: Lamonica Shops - revised Conceptual Plan

Curtis,

Attached is a revised conceptual G&D plan for the Lamonica Shops at Coors Rd. and Lamonica Rd.

In a nutshell, the pond along Coors Blvd. will be reconstructed to a larger footprint and made deeper to store the 100-year 10-day storm event for the entire onsite and offsite basin (OS-1 from the original report).

- We have added a proposed pond section at the upper left corner of the page
- A new private storm drain will collect discharge from the parking area and pass it to the pond. We are also showing an overflow line which can gravity drain to the existing storm drain system once the top of pond is reached.
- We are also showing an optional sump pump drain line which could be used to pump the pond down (although it is sized for the 100-year 10-day event).

Please let me or Fred know if you have any comments regarding this concept. Stephen is hoping to receive your approval at the DRB meeting. We can officially submit it with a COA submittal form if you would prefer that.

Thank you and Happy Holidays!

Bryan

Bryan J. Bobrick
Project Manager
Isaacson & Arfman, P.A.
Consulting Engineering Associates
128 Monroe St. N.E.
Albuquerque, NM 87108
Phone: (505)268-8828
Fax: (505)268-2632
bryanb@iacivil.com

Per the Drainage Report for Tract 1-A-2, Lands of Lamonica & Wenk, Albuquerque, NM by Tierra West LLC dated December 2010, Basin 4 and offsite Basin OS-1 will be collected in Pond 4.

MASTER PLANNED POND:

Master Plan Design volume of Pond 4 is shown as 6,025 cf.

Note that on-site Basin 4 per the master plan, was calculated as 45% Land Treatment B (grassy landscaping) and 55% Land Treatment D (impervious).

The Land Treatments for the other basins for this property (Basin 1 and 3) are similarly calculated with 17% and 25% Land Treatment B (grassy) which, when recalculated based on proposed areas and land treatments, will similarly increase the runoff from these basins as well.

The existing pond at a depth of 24" (see photo) per the topographic information provided has a capacity of 3,915 CF at a depth of 2.0'. This has a capacity to retain only 65% of the required master planned volume with no freeboard!

PROPOSED POND CONDITIONS:

The proposed on-site Basin 1 shown on the conceptual G&D draining to the existing Pond 4 is larger in area by 0.09 acres (compared to the Master Planned basin 4) but, more importantly, it is significantly more impervious area rather than grassy landscaping.

Proposed 100-year 10-day volume calculated to be stored in Pond 4 = 7,878 cf.

The existing pond at a depth of 24" (see photo) per the topographic information provided has a capacity of 3,915 CF at a depth of 2.0'. This has a capacity to retain only 50% of the proposed volume with no freeboard.

MASTER PLANNED CONDITION

BASIN NO. 4		DESCRIPTION		
Area of basin flows =	15131	SF	=	0.3 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	45%
C =	0%
D =	55%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.39 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 1746 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.2 cfs

BASIN NO. OS-1		DESCRIPTION		
Area of basin flows =	13052	SF	=	0.3 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	16%
C =	0%
D =	84%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.76 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 1916 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.2 cfs

Based on the calculations above, the 100-year 6-hour volume = 1,746 CF + 1,916 CF. Because the pond is retention, it is required to store the 100-year 10-day storm.

The 100-year 10-day storm event will generate the following volume:

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

V_{360} (from previous calculation)	3663
Area Treatment D (SF)	19286
Zone	1

MASTER
PLANNED
B4 + BOS1

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

from Table A-2
Depth (inches) at 100-yr Storm

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	3663
A_D (SF)	=	19286
Zone	=	1
P_{10day}	=	3.67
P_{360}	=	2.2

V_{360}	=	3663
+ imp. area	=	2363

Total Pond Volume ($V_{10\,day}$)	=	6025

The existing pond at a depth of 24" (see photo) per the topographic information provided has a capacity of 3,915 CF (designed for 6,025) at a depth of 2.0'. This has a capacity to retain only 65% of the required volume with no freeboard.

PROPOSED CONDITION

BASIN NO. OS-1		DESCRIPTION	Off-Site Coors Basin draining to POND 4

Area of basin flows = 13052 SF = 0.3 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	16%
C =	0%
D =	84%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.76 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 1916 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.2 cfs

BASIN NO. 1		DESCRIPTION	Proposed on-site Basin to POND 4

Area of basin flows = 19054 SF = 0.4 Ac.

The following calculations are based on Treatment areas as shown in table to the right

LAND TREATMENT	
A =	0%
B =	13%
C =	7%
D =	80%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.73 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 2751 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.7 cfs

In the proposed condition, with the entire building shown to discharge to the pond, the 100-year 10-day storm event will generate the following volume:

Note: For ponds which hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

P_{360}	
Zone	D
1	2.20
2	2.35
3	2.60
4	2.90

V_{360} (from previous calculation)	4667
Area Treatment D (SF)	26207
Zone	1.29

PROPOSED CONDITIONS
B1 + BOS-1

P_{10day}	
Zone	D
1	3.67
2	3.95
3	4.90
4	5.95

For 10 Day Storms:

$V_{10day} = V_{360} + A_D * (P_{10day} - P_{360})*43560$ SF/AC

V_{360}	=	4667
A_D (SF)	=	26207
Zone	=	1.29
P_{10day}	=	3.67
P_{360}	=	2.2

from Table A-2

Depth (inches) at 100-yr Storm

V_{360}	=	4667
+ imp. area	=	3210

Total Pond Volume ($V_{10\,day}$)	=	7878

The pond would need to be doubled in area or doubled in depth or a combination of the two.

PROPOSED SOLUTION

As mentioned above, it is expected that the remaining proposed basins will also generate more storm water than the Master Plan Design volume due to the land treatments used which will pose its own set of problems during the final G&D design. There is a possibility that an additional detention pond may be needed in the central landscaped parking island.

Our recommended solution would be to enlarge the west pond using the building walk edge as a vertical side and expanding the pond to the south side of the building.

CITY OF ALBUQUERQUE
PLANNING DEPARTMENT

HYDROLOGY DEVELOPMENT SECTION
DEVELOPMENT REVIEW BOARD MEMO

DRB PROJECT NO: 1000650 **AGENDA ITEM NO: 2**

SUBJECT:

Site Plan for Building Permit

dft 12/16

ENGINEERING COMMENTS:

Hydrology spoke with the engineer concerning adequate ponding on the site. It is agreed upon that the pond needs to be larger.

In general, ponding areas are not proposed within 10 feet of a structure to prevent subsidence. The engineer is aware of this and they are making adjustments to the building design.

Update Sheet BP1, keyed notes 18 and 21, based on above comments and whatever the latest conceptual grading and drainage plan.

After Sheet BP1 is corrected, Hydrology can approved the Site Plan with the condition that based on the approved grading and drainage plan for Building Permit, an Administrative Amendment may be required.

RESOLUTION/COMMENTS:

SIGNED:
Curtis Cherne
Hydrology Section
City Engineer Designee
AMAFCA Designee
924-3986

DATE: 12-11-13

CITY OF ALBUQUERQUE

January 26, 2012

Ronald Ray Bohannan, P.E. rrb@tierrawestllc.com
Tierra West, LLC.
5571 Midway Park Place N.E.
Albuquerque, NM 87109

Re: Panda Express , 3506 Coors Blvd SW,
Request for Permanent C.O. - Approved
Engineer's Stamp dated: 08-18-2011, (P-10/D005)
Certification dated: 01-19-12

Dear Mr. Bohannan,

Based upon the information provided in the Certification received 01-20-12, the above referenced Certification is approved for a release of a Permanent Certificate of Occupancy by Hydrology.

Hydrology is asking for an electronic copy, in .pdf format, of this certification for our records. This certification can be e-mailed to me at: tsims@cabq.gov.

If you have any questions, you can contact me at 924-3982.

Sincerely,

Timothy E. Sims,
Plan Checker—Hydrology Section
Development and Building Services

C: CO Clerk—Katrina Sigala
File

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

CITY OF ALBUQUERQUE

January 24, 2012

Ronald Ray Bohannan, P.E. rrb@tierrawestllc.com
Tierra West, LLC.
5571 Midway Park Place N.E.
Albuquerque, NM 87109

Re: Panda Express – Ph- I, 3506 Coors Blvd SW,
Request for Permanent C.O. - Approved
Engineer's Stamp dated: 08-18-2011, (P-10/D005)
Certification dated: 01-19-12

Dear Mr. Bohannan,

Based upon the information provided in the Certification received 01-20-12, the above referenced Certification is approved for a release of a Permanent Certificate of Occupancy by Hydrology.

Hydrology is asking for an electronic copy, in .pdf format, of this certification for our records. This certification can be e-mailed to me at: tsims@cabq.gov.

If you have any questions, you can contact me at 924-3982.

Sincerely,

Timothy E. Sims,
Plan Checker—Hydrology Section
Development and Building Services

C: CO Clerk—Katrina Sigala
File

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 01/28/2003rd)

PROJECT TITLE: Wendy's and Panda Express, Coors and Lamonica Rd ZONE MAP/DRG. FILE #: P-10/D005
DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Tract 1-A-2 Lands of Lamonica and Wenk
CITY ADDRESS: 3506 Coors Blvd, SW Albuquerque, NM

ENGINEERING FIRM:	TIERRA WEST, LLC	CONTACT:	RONALD R. BOHANNAN, P.E.
ADDRESS:	8509 JEFFERSON NE	PHONE:	(505) 858-3100
CITY, STATE:	ALBUQUERQUE, NM	ZIP CODE:	87113
OWNER:		CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
ARCHITECT:	Hengst Streff Balko	CONTACT:	Alex Ramon
ADDRESS:	16220 N Scotsdale Rd Suite 290	PHONE:	
CITY, STATE:	Scottsdale,AZ	ZIP CODE:	85254
SURVEYOR:	Sandia Land Survey	CONTACT:	Andrew S. Medina
ADDRESS:	15 Casa Terrenos	PHONE:	(505) 867-1241
CITY, STATE:	Placitas, NM	ZIP CODE:	87043
CONTRACTOR:	MCO & Associates	CONTACT:	Mike Sofarelli
ADDRESS:	24825 N 16th Avenue, Ste 120	PHONE:	(602) 881-4403
CITY, STATE:	Phoenix, AZ	ZIP CODE:	85085

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
- X ENGINEER'S CERTIFICATION (HYDROLOGY)
- ____ CLOMR/LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEERS CERTIFICATION (TCL)
- ____ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ____ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ____ SIA / FINANACIAL 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
- X NO
- ____ COPY PROVIDED

RECEIVED
JAN 20 2012
HYDROLOGY SECTION

DATE SUBMITTED: 1/16/2012 BY: Ronald R. Bohannan, P.E.

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

1. **Conceptual Grading and Drainage Plans**: 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.

CITY OF ALBUQUERQUE

May 23, 2011

Ronald R. Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Wendy's and Panda Express, Lamonica Rd & Coors Blvd, Grading & Drainage Plan
Engineer's Stamp dated 5-12-11 Drainage Report 12-27-10 (P10/D005)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 5-12-11, the above referenced report and plan are approved for Site Plan for Building Permit action by the DRB.

The plan cannot be approved for Building Permit until the Site Plan is approved by the DRB. → AA 8-25-11

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

Sincerely,

Curtis A. Cherne

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

C: file

New St Amp 6-15-11

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

CITY OF ALBUQUERQUE

May 23, 2011

Ronald Ray Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Panda Express Restaurant Lamonica Rd & Coors Blvd.
Grading and Drainage Plan
Engineer's Stamp date- no stamp- (P10/D005A)

Dear Mr. Bohannan,

Based upon my conversation with applicant, this plan will not be approved because it is being superseded by the Wendy's and Panda Express Lamonica Rd and Coors Blvd plan, P10-D005.

It would be helpful if you updated your address on your DTIS.

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

Sincerely,

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

C: File

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

CITY OF ALBUQUERQUE

February 3, 2011

Ronald R. Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Wendy's Restaurant, Lamonica Rd & Coors Blvd, Grading & Drainage Plan
Engineer's Stamp dated 2-3-11 (P10/D005)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 2-3-11, 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.

Also, 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 924-3695.

Sincerely,

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

C: file

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: NEC Corner of Coors Blvd. & Lamonica Rd. ZONE MAP/DRG. FILE #: P-10-Z

DRB #: 1000650 EPC #: WORK ORDER #:

LEGAL DESCRIPTION: Tract 1-A-2 Lands of Lamonica and Wenk

CITY ADDRESS: NEC Corner of Coors Blvd. and Lamonica Rd.

ENGINEERING FIRM:	Tierra West, LLC	CONTACT:	
ADDRESS:	~~8509 Jefferson~~ NE 5571 Midway Park Blvd NE	PHONE:	(505) 858-3100
CITY, STATE:	Albuquerque, NM	ZIP CODE:	~~87113~~ 87109
OWNER:	WENDY'S - Double Cheese Realty Corporation	CONTACT:	Tim Hogsett
ADDRESS:	4810 Hardware Dr. NE	PHONE:	505-883-5285
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87109
ARCHITECT:	Schlegel Lewis Architects	CONTACT:	
ADDRESS:	1620 Central Ave. SW	PHONE:	505-247-1529
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87106
SURVEYOR:	TBD	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
CONTRACTOR:	TBD	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	

CHECK TYPE OF SUBMITTAL:

- ___ DRAINAGE REPORT
- ___ DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal***
- X 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)
- ___ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ___ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SIA / FINANACIAL 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
- X BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY (PERM.)
- ___ CERTIFICATE OF OCCUPANCY (TEMP.)
- ___ GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ WORK ORDER APPROVAL
- ___ SO-19

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ___ YES
- ___ NO
- ___ COPY PROVIDED

RECEIVED
FEB 03 2011
BY HYDROLOGY SECTION

DATE SUBMITTED: 2/3/2011 BY: Jonathan D. Niski, P.E.

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

1. **Conceptual Grading and Drainage Plans**: 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

TIERRA WEST, LLC

5571 Midway Park Place NE Albuquerque, NM 87109
(505) 858-3100 Fax (505) 858-1118 1-800-245-3102
tierrawestllc.com

January 28, 2011

Mr. Curtis Cherne, PE
Senior Engineer, Planning Department
City of Albuquerque
PO Box 1293
Albuquerque, NM 87102

RECEIVED
JAN 31 2011
HYDROLOGY SECTION

RE: WENDY'S RESTAURANT LAMONICA RD & COORS BLVD.
GRADING AND DRAINAGE PLAN
ENGINEER'S STAMP DATED 12-27-10 (P10/DO05)

Dear Mr. Cherne:

Per your correspondence dated January 6, 2011, regarding the above referenced property, please find the following responses addressing the comments listed below.

1. One MH Invert reads 494.63. Is this a Typo?
   That was an error and the correct invert is now shown on the plan.

2. The FF elevations are not legible at the two future building sites. We would prefer pad grades.
   The text was cleaned up to clearly show the finished floors.

3. What are the elevations at each landscape area? These areas should be depressed to accommodate water harvesting.
   All of the landscaped areas are part of ponding areas and are depressed to hold water.

4. What are the Top of Wall and Top of Curb elevations?
   All of the curb is six inch curb. All elevations shown are flowline to prevent confusion. The top of wall is called out in the cross sections and is the same elevation around the entire wall.

5. The dumpster enclosure for a restaurant must have a grease trap and drain into the sanitary sewer system. Show the grate on the plan.
   The grates and elevations were added to each dumpster location.

6. What is the slope between the pond and the drive through lane and between the pond and parking area?
   The cross section for that area was corrected to show the slope between the pond and the parking area.

7. What are the elevations west of each detention pond along Coors Blvd.? These ponds should be labeled **Retention** Ponds.

Existing spot elevations were added along the existing sidewalk to indicate the grade elevation west of each retention pond. The ponds were renamed retention.

8. The elevations in the volume calculations do not match the WSE on the plans.
ND **The WSE indicated on the plans were established using AHYMO and are shown on the Output file included in the Appendix of the Drainage Report. The volume calculations were used to provide input data for the AHYMO program.**

9. There appears to be a power pole in the parking lot. Is this pole being removed without affecting the grade?
The power pole will be relocated. The relocation will be coordinated with PNM.

If you have any questions of require additional information regarding this matter, please do not hesitate to contact me.

Sincerely,

Jonathan D. Niski, PE

Enclosure/s

JN: 29028
JN/cla

Z \2009\29028\Correspondence\29028 Curtis Cherne Grading Response Ltr 01-28-11.doc

RECEIVED
JAN 3 1 2011
HYDROLOGY
SECTION

CITY OF ALBUQUERQUE

September 27, 2011

Ronald R. Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Wendy's and Panda Express, Lamonica Rd & Coors Blvd, AA – Grading Plan and Construction Details Plan
Engineer's Stamp dated 8-18-11 Grading Plan, 2-3-11 Construction Details. 2-3-11, Drainage Report 12-27-10 (P10/D005)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 9-27-11, 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.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge and a Topsoil Disturbance Permit since it is disturbing ¾ of an acre or more.

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

Sincerely,

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

C: file
Kathy Verhage, DMD

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: NEC Corner of Coors Blvd. & Lamonica Rd.
ZONE MAP/DRG. FILE #: P-10-Z/D005
DRB #: 1000650 EPC #:
WORK ORDER #:

LEGAL DESCRIPTION: Tract 1-A-2 Lands of Lamonica and Wenk
CITY ADDRESS: NEC Corner of Coors Blvd. and Lamonica Rd

ENGINEERING FIRM:	Tierra West, LLC	CONTACT:	
ADDRESS:	~~8509 Jefferson NE~~ 215	PHONE:	(505) 858-3100
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87113
OWNER:	WENDY'S - Double Cheese Realty Corporation	CONTACT:	Tim Hogsett
ADDRESS:	4810 Hardware Dr. NE	PHONE:	505-883-5285
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87109
ARCHITECT:	Schlegel Lewis Architects	CONTACT:	
ADDRESS:	1620 Central Ave. SW	PHONE:	505-247-1529
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87106
SURVEYOR:	TBD	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
CONTRACTOR:	TBD	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	

CHECK TYPE OF SUBMITTAL:

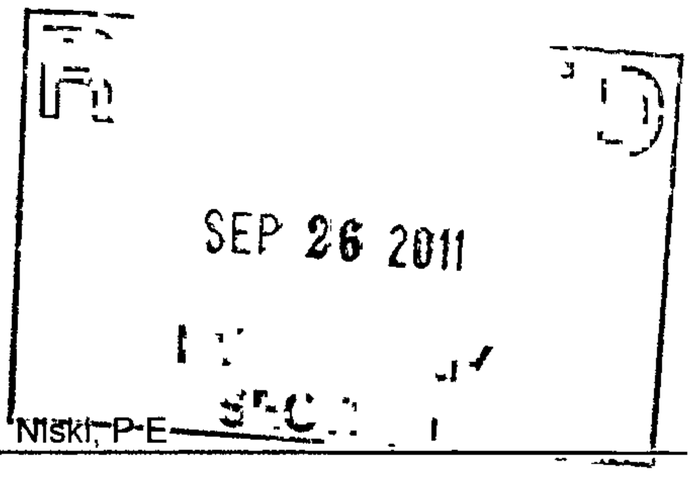
- ___ DRAINAGE REPORT
- ___ DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal***
- ___ DRAINAGE PLAN RESUBMITTAL
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- X GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ___ CLOMR/LOMR
- ___ TRAFFIC CIRCULATION LAYOUT (TCL)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

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SIA / FINANACIAL 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
- X BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY (PERM.)
- ___ CERTIFICATE OF OCCUPANCY (TEMP.)
- ___ GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ WORK ORDER APPROVAL
- ___ SO-19

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ___ YES
- ___ NO
- ___ COPY PROVIDED



DATE SUBMITTED: 9/27/2011 BY: Jonathan D Niski, P.E.

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

1. **Conceptual Grading and Drainage Plans**: 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.

6-15-11

At DRB, it was decided to build an 18" high Concrete Curb on the drive-thru's by the ponds.

ce

Pin letter from Ken Poole this on certification.

8-18-11 submitted stamp

CITY OF ALBUQUERQUE
PLANNING DEPARTMENT
HYDROLOGY DEVELOPMENT SECTION

DEVELOPMENT REVIEW BOARD MEMO

DRB PROJECT NO: 1002134 **AGENDA ITEM NO: 14**

SUBJECT:

SIA Ext of Temp Defr Sdwk Constr

ENGINEERING COMMENTS:

Hydrology has no objection.

RESOLUTION:

APPROVED ____; DENIED _____; COMMENTS PROVIDED ____; WITHDRAWN___
DEFERRED TO:_____

SIGNED: **(UD) (CE) (TRANS) (PKS) (PLNG)**
DELEGATED TO: **(UD) (CE) (TRANS) (PKS) (PLNG)**

COMMENTS:

SIGNED:
Curtis Cherne
Hydrology Section
City Engineer Designee
AMAFCA Designee
924-3986

DATE: 6-15-11

gaw

TIERRA WEST, LLC

5571 Midway Park Place NE Albuquerque, NM 87109
(505) 858-3100 Fax (505) 858-1118 1-800-245-3102
tierrawestllc.com

December 22, 2011

Mr. Shahab Biazar, P.E.
Development and Building Services
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: CERTIFICATION OF SITE PLAN FOR BUILDING PERMIT
FOR TEMPORARY CERTIFICATE OF OCCUPANCY
PANDA EXPRESS, 3506 COORS BLVD, SW ALBUQUERQUE, NM

Dear Mr. Biazar:

I, Ronald R. Bohannan, NMPE # 7868, of the firm Tierra West LLC, hereby request a Temporary Certificate of Occupancy for the project referenced above. A temporary chain link fence has been installed at the pond and will provide temporary protection until the railing can be installed.

If you have any questions or need additional information regarding this matter, please do not hesitate to contact me.

Sincerely,

Ronald R. Bohannan, P.E.

JN: 2900028
RRB/BF/jng

Z:\2009\29026\29002\Shahaub Temp CO Letter 12-13-11.doc

Verbal 1/4 days
Temp
Shahab 12/22/11

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 01/28/2003rd)

P-10/D005

PROJECT TITLE: Wendy's and Panda Express, Coors and Lamonica Rd ZONE MAP/DRG. FILE #: P-10Z
DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Tract 1-A-2 Lands of Lamonica and Wenk
CITY ADDRESS: 3506 Coors Blvd, SW Albuquerque, NM

ENGINEERING FIRM:	TIERRA WEST, LLC	CONTACT:	RONALD R. BOHANNAN, P.E.
ADDRESS:	8509 JEFFERSON NE	PHONE:	(505) 858-3100
CITY, STATE:	ALBUQUERQUE, NM	ZIP CODE:	87113
OWNER:		CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
ARCHITECT:	Hengst Streff Balko	CONTACT:	Alex Ramon
ADDRESS:	16220 N Scotsdale Rd Suite 290	PHONE:	
CITY, STATE:	Scottsdale,AZ	ZIP CODE:	85254
SURVEYOR:	Sandia Land Survey	CONTACT:	Andrew S. Medina
ADDRESS:	15 Casa Terrenos	PHONE:	(505) 867-1241
CITY, STATE:	Placitas, NM	ZIP CODE:	87043
CONTRACTOR:	MCO & Associates	CONTACT:	Mike Sofarelli
ADDRESS:	24825 N 16th Avenue, Ste 120	PHONE:	(602) 881-4403
CITY, STATE:	Phoenix, AZ	ZIP CODE:	85085

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
- X ENGINEER'S CERTIFICATION (HYDROLOGY)
- ____ CLOMR/LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEERS CERTIFICATION (TCL)
- ____ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ____ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

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

RECEIVED
DEC 22 2011
HYDROLOGY SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
- X NO
- ____ COPY PROVIDED

DATE SUBMITTED: 12/22/2011 BY: Ronald R. Bohannan, P.E.

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

1. **Conceptual Grading and Drainage Plans**: 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.

gar

TIERRA WEST, LLC

5571 Midway Park Place NE Albuquerque, NM 87109
(505) 858-3100 Fax (505) 858-1118 1-800-245-3102
tierrawestllc.com

December 22, 2011

P10/D005

Mr. Shahab Biazar, P.E.
Development and Building Services
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: CERTIFICATION OF SITE PLAN FOR BUILDING PERMIT FOR TEMPORARY CERTIFICATE OF OCCUPANCY PANDA EXPRESS, 3506 COORS BLVD, SW ALBUQUERQUE, NM

Dear Mr. Biazar:

I, Ronald R. Bohannan, NMPE # 7868, of the firm Tierra West LLC, hereby request a Temporary Certificate of Occupancy for the project referenced above. A temporary chain link fence has been installed at the pond and will provide temporary protection until the railing can be installed.

If you have any questions or need additional information regarding this matter, please do not hesitate to contact me.

Sincerely,

Ronald R. Bohannan, P.E.

Enclosure/s.

JN: 2900028
RRB/BF/jng

Z.\2009\29028\290028 Shahaub Temp CO Letter 12-13-11 doc

CITY OF ALBUQUERQUE

January 6, 2011

Ronald Ray Bohannan, P.E.
Tierra West, LLC
8509 Jefferson NE
Albuquerque, NM 87113

Re: Wendy's Restaurant Lamonica Rd & Coors Blvd.
Grading and Drainage Plan
Engineer's Stamp dated 12-27-10 (P10/D005)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 12-29-10, the above referenced plan cannot be approved for Building Permit until the following comments are addressed.

- One MH Invert reads 494.63. Is this a Typo?
- The FF elevations are not legible at the two future building sites. We would prefer pad grades.
- What are the elevations at each landscape area? These areas should be depressed to accommodate water harvesting.
- What are the Top of Wall and Top of Curb elevations?
- The dumpster enclosure for a restaurant must have a grease trap and drain into the sanitary sewer system. Show the grate on the plan.
- What is the slope between the pond and the drive through lane and between the pond and parking area?
- What are the elevations west of each detention pond along Coors Blvd.? These ponds should be labeled **Retention** Ponds.
- The elevations in the volume calculations do not match the WSE on the plans.
- There appears to be a power pole in the parking lot. Is this pole being removed without affecting the grade?

If you have any questions, you can contact me at 924-3695.

Sincerely,

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

C: File

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

talked to Josh 2-2-11. he is to resubmit w/ erosion control. cc

DRAINAGE AND TRANSPORTATION SHEET

(REV. 1/28/2003rd)

WENDY'S ②

PROJECT TITLE: NEC Corner of Coors Blvd. & Lamonica Rd. ZONE MAP/DRG. FILE #: P-10-Z D005
DRB #: 1000650 EPC #: WORK ORDER #:

LEGAL DESCRIPTION: Tract 1-A-2 Lands of Lamonica and Wenk
CITY ADDRESS: NEC Corner of Coors Blvd. and Lamonica Rd.

ENGINEERING FIRM:	Tierra West, LLC	CONTACT:	
ADDRESS:	8509 Jefferson NE	PHONE:	(505) 858-3100
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87113
OWNER:	WENDY'S - Double Cheese Realty Corporation	CONTACT:	Tim Hogsett
ADDRESS:	4810 Hardware Dr. NE	PHONE:	505-883-5285
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87109
ARCHITECT:	Schlegel Lewis Architects	CONTACT:	
ADDRESS:	1620 Central Ave. SW	PHONE:	505-247-1529
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87106
SURVEYOR:	TBD	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
CONTRACTOR:	TBD	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	

CHECK TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SIA / FINANACIAL 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
- X BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY (PERM.)
- ___ CERTIFICATE OF OCCUPANCY (TEMP.)
- ___ GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ WORK ORDER APPROVAL
- ___ SO-19

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ___ YES
- ___ NO
- ___ COPY PROVIDED

RECEIVED
DEC 28 2010
HYDROLOGY SECTION

$ 50.00

DATE SUBMITTED: Jonathan D Niski, PE BY: December 27, 2010

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

1. **Conceptual Grading and Drainage Plans**: 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.

Tierra West, LLC.

(505) 858-3100

5571 Midway Park Place NE, Albuquerque, NM 87109

LETTER OF TRANSMITTAL

DATE: 12/29/2010	JOB NO: 29028
ATTENTION: Bradley Bingham, PE	
RE: NEC Coors Boulevard and Lamonica Rd.	
PHONE: 505-924-3986	

TO City of Albuquerque
Public Works Hydrology Department
Plaza Del Sol, 4th Floor
600 N. Second Street NW
Albuquerque, NM 87102

WE ARE SENDING YOU [X] Attached [ ] Under Separate cover via _____ the following items:

[ ] Shop drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications

[ ] Copy of letter [ ] Change order [ ] _____

COPIES	DATED	NO.	DESCRIPTION
1			Drainage Report (Tract 1-A-2 Lands of Lamonica and Wenk)
1			Drainage and Transportation Sheet

THESE ARE TRANSMITTED as checked below:

[ ] For approval [ ] Approved as submitted [ ] **FOR SIGNATURE(S)**

[ ] For your use [ ] Approved as noted [ ] _____

[X] As requested [ ] Returned for corrections

[ ] For review and comments [ ] _____

[ ] FOR BIDS DUE: _____ [ ] PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO _____

RECEIVED BY _____ Date _____ SIGNED Cynthia Abeyta for Jonathan D. Niski, PE

DRAINAGE REPORT
FOR

Tract 1-A-2
Lands of Lamonica and Wenk
Albuquerque, NM

Prepared by:

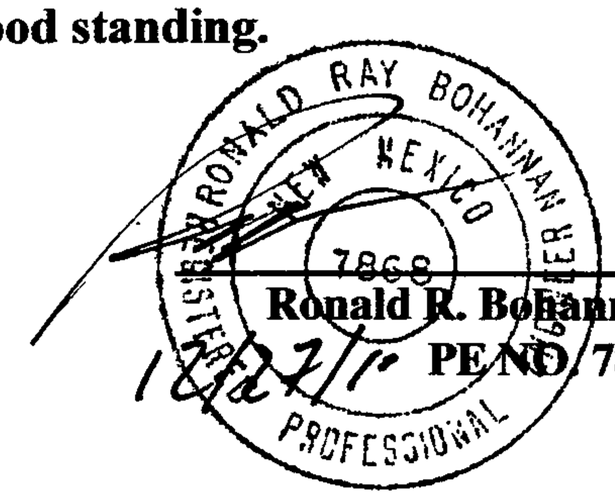
Tierra West, LLC
5571 Midway Park Pl, NE
Albuquerque, New Mexico 87109

Prepared for:
LL Partners, LLC
4810 Hardware Dr. NE
Albuquerque, NM 87109

RECEIVED
DEC 29 2010
HYDROLOGY
SECTION

December 2010

I certify that this report was prepared under my supervision, and I am a registered professional engineer in the State of New Mexico in good standing.



Ronald R. Bohannan
12/27/10 **PE NO. 7868**

Job No 290028

TABLE OF CONTENTS

SECTION I - REPORT
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Existing Drainage Conditions 4
Flood Plain 4
Vicinity Map 5
Flood Insurance Rate Map 6
Proposed Drainage Management 7
Proposed Basins Map 8
Calculations 9
Summary 9

SECTION II - RUNOFF CALCULATIONS
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Proposed Pond Exhibit 12
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AHYMO Calculations 32

MAP POCKET
Grading and Drainage Plan

Section I

Report

Prelude

This report is being prepared at the request of the current owner, LL Partners LLC., who proposes to develop a commercial center.

Location

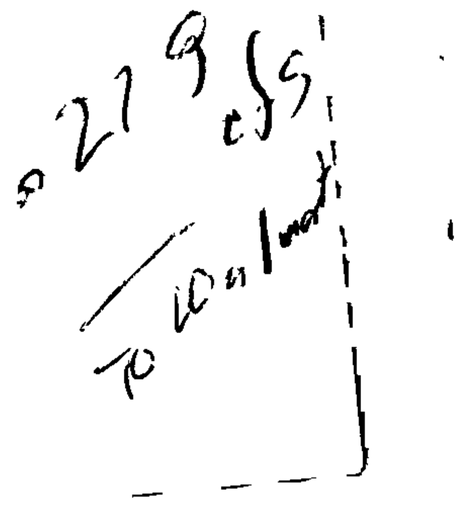
The subject site is located on the northeast corner of Coors Boulevard and Lamonica Road and consists of Tract 1-A-2, Lands of Lamonica and Wenk. The exact location of the site is shown highlighted on the enclosed Zone Atlas page number P-10. The site will be built in one phase and contains 1.7320 acres more or less.

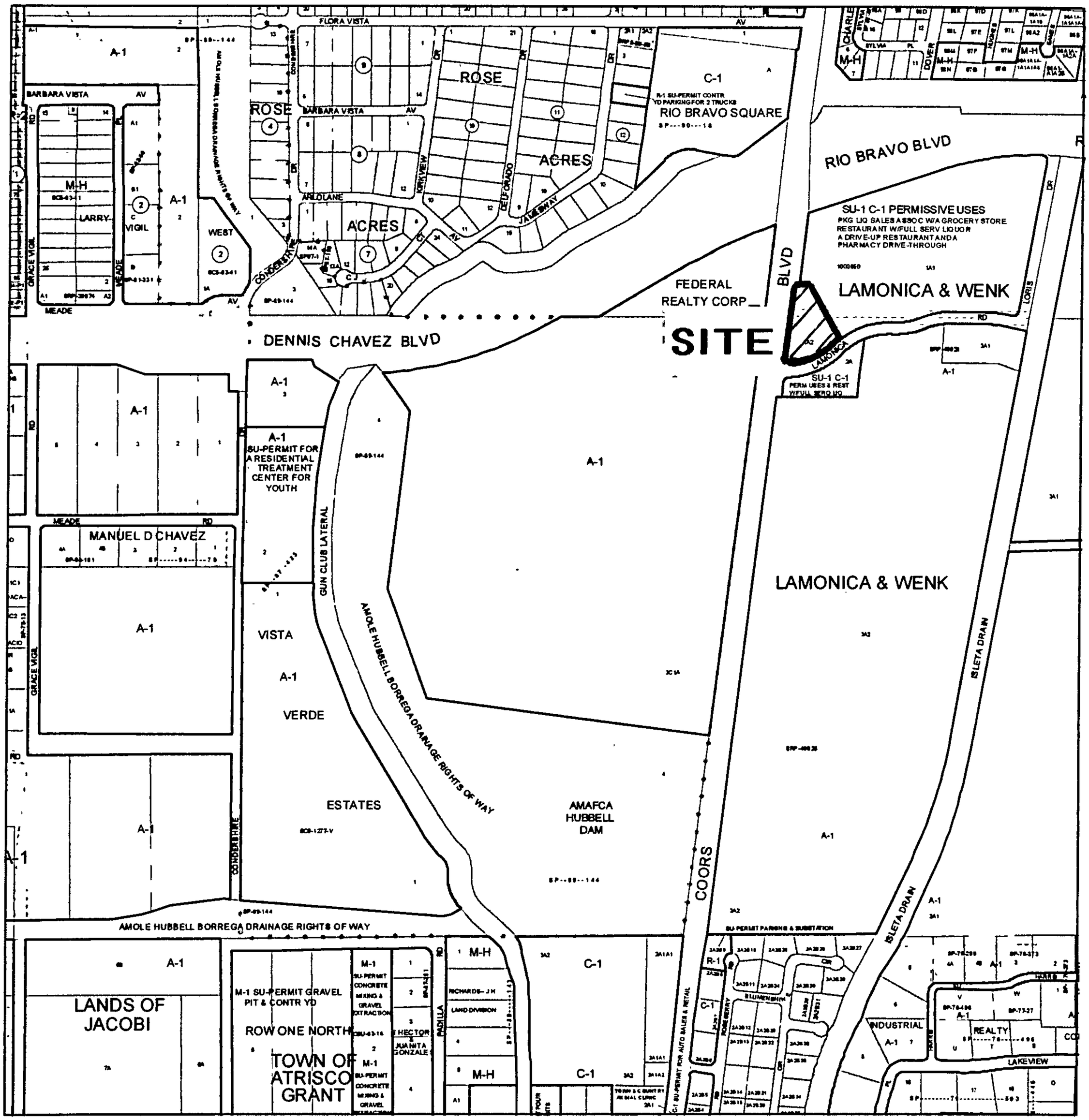
Existing Drainage Conditions

The site is currently undeveloped. It is bordered by Coors Boulevard on the west, Lamonica Road on the south and a Walmart parking lot on the north and east. This site was included in the Walmart drainage report and plan that was approved in 2004. The only off-site flows to enter the site come off of Coors Boulevard. This site drains to an existing pond on the Walmart property at a rate of 0.279 cfs.

Flood Plain

The site is located on FIRM Map 35001C0339 G as shown on the attached excerpt. The map shows that the site lies within flood zone X.

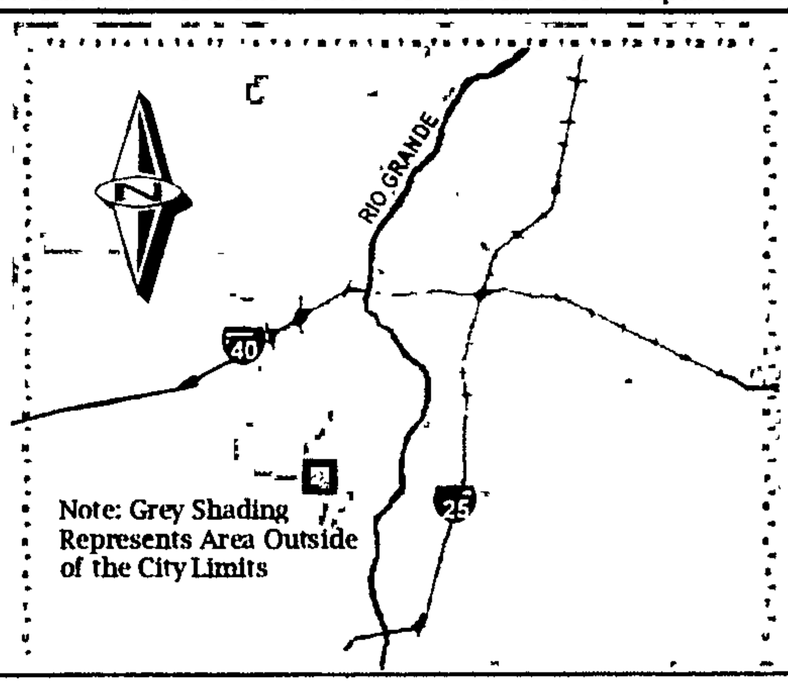




For more current information and more details visit: http://www.cabq.gov/gis

Albuquerque Geographic Information System

Map amended through: 5/1/2006



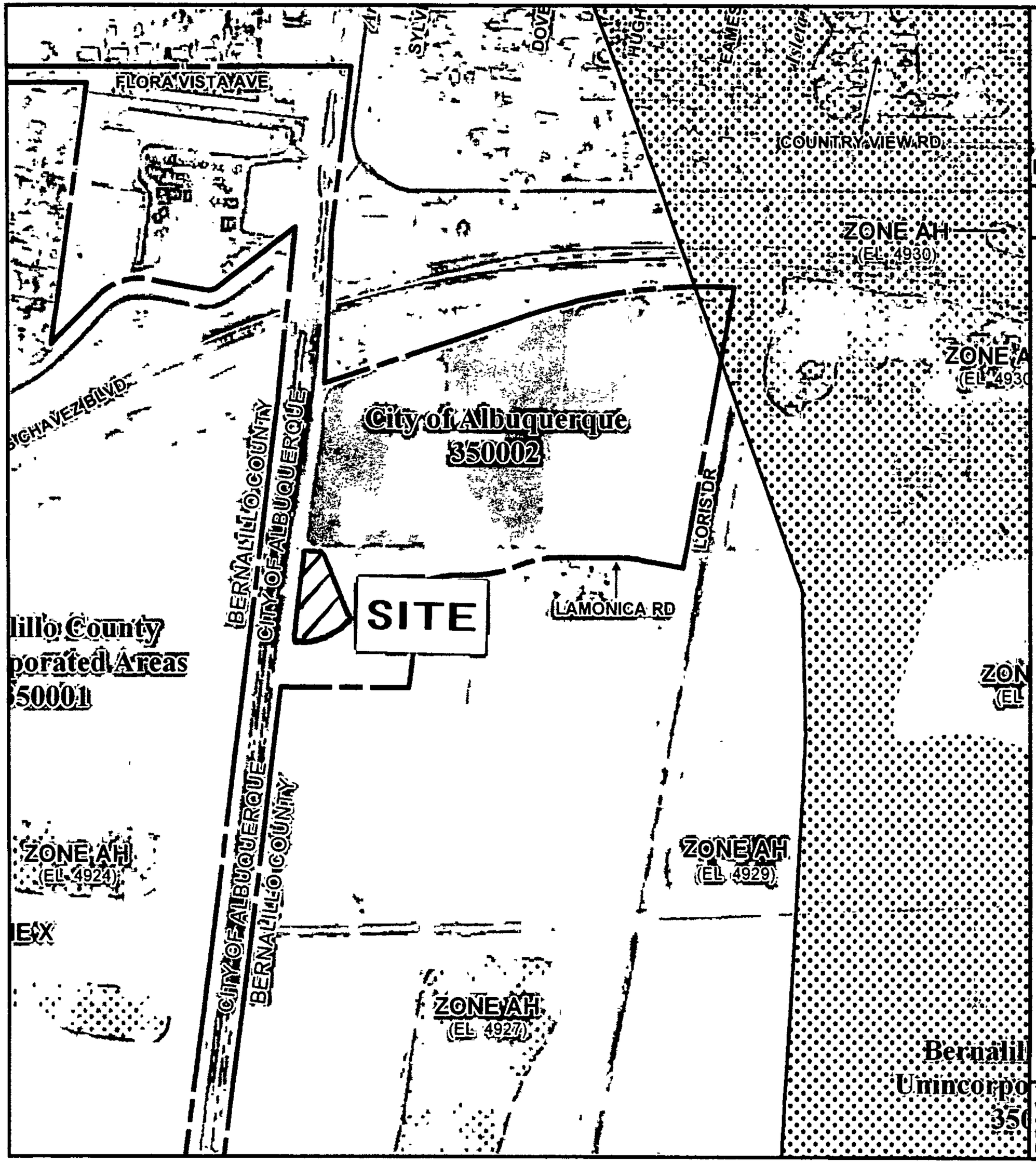
Zone Atlas Page:

P-10-Z

Selected Symbols

- SECTOR PLANS
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Petroglyph Mon.
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone

0 750 1,500 Feet



MAP SCALE 1" = 500'

0 0 500 1000 FEET

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0339G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO

AND INCORPORATED AREAS

PANEL 339 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0339	G
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0339	G

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

MAP NUMBER
35001C0339G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

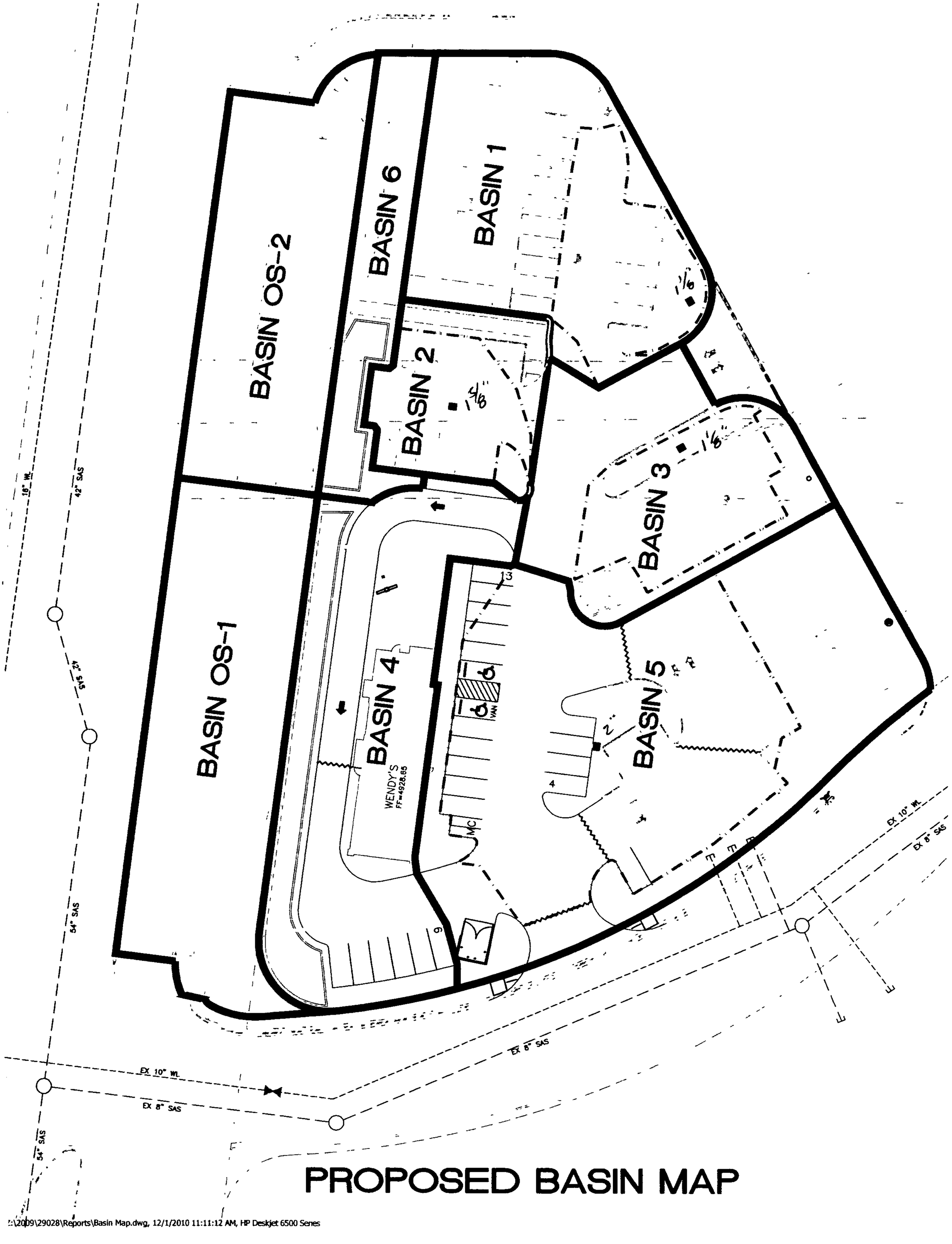
Proposed Drainage Management Plan

As shown on the attached exhibit, the proposed site is divided into 6 on-site basins and 2 off-site basins. Basins 1, 2, 3 and 5 will drain to parking lot ponds and the flows will be restricted to a peak discharge of 0.412 cfs. Those flows will be directed to Pond 9 on the Walmart property via a storm sewer in accordance with the approved Walmart drainage plan. The peak discharge does exceed the existing discharge rate of 0.279, however Pond 9 does have extra ponding capacity to handle the additional flows.

Basins 1, 2, 3, and 5 generate a combined volume of 0.182 ac-ft. The ponding capacity for those basins totals 0.140 ac-ft. leaving a need to pond 0.042 ac-ft in Pond 9. Pond 9 currently has 0.153 ac-ft of excess storage. With the additional 0.042 ac-ft of storage passed on from this project Pond 9 will still have an excess storage of 0.111 ac-ft.

Basins 4, 6, OS-1 and OS-2 will drain to retention ponds along the west property line. These ponds are sized to handle the 100-year, 10-day storm volume.

The storm drain system was modeled using the routing command within AHYMO. The pond volumes and discharge rate calculations as well as the input and output AHYMO files are located in Section II. In the event of inlet clogging or a storm event greater than the predicted 100-year, 6-hour design storm, the site will continue to pond the water overflowing to the adjacent ponding areas and parking lot until such time the clog is cleared. At no time will the water pond to a point that it will enter the building.



PROPOSED BASIN MAP

Calculations

The weighted E method from the "City of Albuquerque Development Process Manual Volume 11 – Design Criteria, 1997 Revision" was used to calculate the runoff and volume for the site.

Summary

This site will discharge 0.42 1.979 cfs into the Pond 9 on the Walmart site, which is consistant with the approved Walmart drainage report. Although this rate is slightly higher than what was shown in the Walmart report, Pond 9 has the extra capacity to handle the additional volume of water. The site accepts the offsite flow generated by Coors Boulevard and allows the flows to pond onsite.

The development of this site is consistent with the DPM, Chapter 22, Hydrology section. Since this site encompasses more than 1 acre, a NPDES permit will be required in addition to a Top Soil Disturbance Permit, prior to any construction activity.

Section II

Runoff Calculations

Weighted E Method

Developed Basins

Basin	Area (sf)	Area (acres)	Area (sq. mi.)	Treatment A		Treatment B		Treatment C		Treatment D		100-Year			10-Year		
				%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
1	12,560	0.29	0.00045	0%	0	25%	0.07	0%	0.00	75%	0.22	1.645	0.040	1.09	0.985	0.024	0.68
2	5,065	0.12	0.00018	0%	0	10%	0.01	0%	0.00	90%	0.10	1.840	0.018	0.48	1.138	0.011	0.31
3	10,878	0.25	0.00039	0%	0	17%	0.04	0%	0.00	83%	0.21	1.749	0.036	0.99	1.067	0.022	0.63
4	15,131	0.35	0.00054	0%	0	45%	0.16	0%	0.00	55%	0.19	1.385	0.040	1.15	0.781	0.023	0.67
5	26,947	0.62	0.00097	0%	0	20%	0.12	0%	0.00	80%	0.49	1.710	0.088	2.41	1.036	0.053	1.52
6	4,552	0.10	0.00016	0%	0	90%	0.09	0%	0.00	10%	0.01	0.800	0.007	0.24	0.322	0.003	0.10
OS-1	13,052	0.30	0.00047	0%	0	16%	0.05	0%	0.00	84%	0.25	1.762	0.044	1.20	1.077	0.027	0 76
OS-2	10,312	0.24	0.00037	0%	0	16%	0.04	0%	0.00	84%	0.20	1.762	0.035	0.95	1.077	0.021	0.60
Totals	98,497	2.26											0.308	8.51		0.184	5.29

Equations:

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

Volume = Weighted D * Total Area

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

Excess Precipitation, E (inches)		
Zone 1	100-Year	10 - Year
E_a	0.44	0.08
E_b	0.67	0.22
E_c	0.99	0.44
E_d	1.97	1.24

Peak Discharge (cfs/acre)		
Zone 1	100-Year	10 - Year
Q_a	1.29	0.24
Q_b	2.03	0.76
Q_c	2.87	1.49
Q_d	4.37	2.89

Weighted E Method

Developed On-Site Basins

	Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	100-Year, 6-Hr Weighted E	100-Year, 6-Hr Volume (ac-ft)	100-Year, 6-Hr Flow cfs	10-Year, 6-Hr Weighted E	10-Year, 6-Hr Volume (ac-ft)	10-Year, 6-Hr Flow cfs	2-Year, 6-Hr Weighted E	2-Year, 6-Hr Volume (ac-ft)	2-Year, 6-Hr Flow cfs	100-Year, 10-Day Weighted E	100-Year, 10-Day Volume (ac-ft)	100-Year, 10-Day Flow cfs
B	4	15,131	0.35	0%	0	45%	0.16	0%	0	55%	0.19	1.385	0 040	1.15	0.781	0.023	0.67	0.401	0.012	0 33	1.385	0.063	1 15
	OS-1	13,052	0.30	0%	0	16%	0.05	0%	0	84%	0.25	1.762	0.044	1.20	1.077	0.027	0.76	0.606	0.015	0 43	1.762	0 075	1 20
A	6	4,552	0 10	0%	0	90%	0.09	0%	0	10%	0.01	0.800	0.007	0.24	0 322	0.003	0.10	0.081	0.001	0 02	0.800	0 008	0.24
	OS-2	10,312	0.24	0%	0	16%	0.04	0%	0	84%	0.20	1.762	0.035	0 95	1 077	0.021	0.60	0.606	0.012	0.34	1.762	0.059	0.95

0.138 ac-ft = 6025 cubic feet

0.067 ac-ft = 2934 cubic feet

VOLUME CALCULATIONS
POND 1

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

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab	=	6.80
At	=	4,400.00
Dt	=	3.66
C	=	1200.33

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
4925.24	0	0	0.0000
4927.24	2.00	0.0003	0.0465
4927.66	2.415	0.0027	0.0511
4928.07	2.830	0.0099	0.0554
4928.49	3.245	0.0219	0.0594
4928.90	3.660	0.0385	0.0632

1670 cfs

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6	
Diameter (in)	1.125	
Area (ft^2)=	0.007	
g =	32.2	
H (Ft) =	Depth of water above center of orifice	
Q (CFS)=	Flow	

1 1/8" Ø

VOLUME CALCULATIONS
POND 2

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

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab =	6.80
At =	3,411.00
Dt =	2.95
C =	1153.97

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
4925.65	0	0	0.0000
4927.65	2.00	0.0003	0.0964
4927.89	2.238	0.0011	0.1021
4928.13	2.475	0.0034	0.1076
4928.36	2.713	0.0071	0.1128
4928.60	2.950	0.0124	0.1177

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	1.625
Area (ft^2)=	0.014
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

5/8" Ø

VOLUME CALCULATIONS
POND 3

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

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab =	6.80
At =	4,369.00
Dt =	2.79
C =	1563.51

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
4925.21	0	0	0.0000
4926.62	1.41	0.0002	0.0388
4926.97	1.75	0.0024	0.0434
4927.31	2.10	0.0089	0.0476
4927.66	2.44	0.0196	0.0515
4928.00	2.79	0.0346	0.0550

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	1.125
Area (ft^2)=	0.007
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS
POND 5

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

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab =	6.80
At =	15,876.00
Dt =	3.11
C =	5102.64

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
4925.14	0	0	0.0000
4927.14	2.00	0.0003	0.1454
4927.42	2.278	0.0049	0.1556
4927.70	2.555	0.0184	0.1651
4927.97	2.833	0.0410	0.1742
4928.25	3.110	0.0726	0.1828

.37 dt

2" ϕ

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	2
Area (ft^2)=	0.022
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4) - Ver. S4.01a, Rel: 01a RUN DATE (MON/DAY/YR) = 12/01/2010

INPUT FILE = Z:\2009\29028\Reports\29028DRAIN.txt USER NO.= AHYMO_Temp_User:20122010

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= 0.00
RAINFALL TYPE= 1 NOAA 14										RAIN6= 2.200
*S BASIN 1										
COMPUTE NM HYD	101.00	-	1	0.00045	1.17	0.040	1.67498	1.533	4.053	PER IMP= 75.00
*S BASIN 2										
COMPUTE NM HYD	102.00	-	2	0.00018	0.51	0.018	1.84224	1.500	4.405	PER IMP= 90.00
*S BASIN 3										
COMPUTE NM HYD	103.00	-	3	0.00039	1.05	0.037	1.76418	1.533	4.221	PER IMP= 83.00
*S BASIN 4										
COMPUTE NM HYD	104.00	-	4	0.00054	1.26	0.042	1.45198	1.533	3.643	PER IMP= 55.00
*S BASIN 5										
COMPUTE NM HYD	105.00	-	5	0.00097	2.56	0.090	1.73073	1.533	4.119	PER IMP= 80.00
*S BASIN 6										
COMPUTE NM HYD	106.00	-	6	0.00016	0.29	0.008	0.95021	1.533	2.834	PER IMP= 10.00
*S BASIN OS-1										
COMPUTE NM HYD	107.00	-	7	0.00047	1.27	0.045	1.77533	1.533	4.231	PER IMP= 84.00
*S BASIN OS-2										
COMPUTE NM HYD	108.00	-	8	0.00037	1.01	0.035	1.77533	1.533	4.248	PER IMP= 84.00
*S POND 1										
ROUTE RESERVOIR	201.00	1	9	0.00045	0.06	0.040	1.67447	2.233	0.215	AC-FT= 0.033
*S POND 2										
ROUTE RESERVOIR	202.00	2	10	0.00018	0.11	0.018	1.84113	1.866	0.993	AC-FT= 0.009
*S POND 3										
ROUTE RESERVOIR	203.00	3	11	0.00039	0.05	0.037	1.76349	2.233	0.216	AC-FT= 0.030
*S POND 5										
ROUTE RESERVOIR	204.00	5	12	0.00097	0.18	0.090	1.73044	2.166	0.292	AC-FT= 0.068
ADD HYD	301.00	9&10	20	0.00063	0.18	0.058	1.72184	1.966	0.436	
ADD HYD	302.00	11&12	21	0.00136	0.24	0.126	1.73983	2.166	0.271	
ADD HYD	303.00	20&21	22	0.00199	0.41	0.184	1.73414	2.066	0.323	
FINISH										

```
**********************************************************************
*                                                                    *
*                  WENDY'S RESTAURANT DRAINAGE ANALYSIS              *
*                COORS BLVD. AND RIO BRAVO BLVD. (29028)             *
*              PROPOSED CONDITIONS (100-YEAR, 6-HR STORM)            *
*                                                                    *
**********************************************************************
*
START                   TIME=0.0 HR
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.87 IN RAIN SIX=2.20 IN
                        RAIN DAY=2.66 IN DT=0.03333 HR
*
*S BASIN 1
*
COMPUTE NM HYD          ID=1 HYD NO=101 AREA=0.00045 SQ MI
                        PER A=0 PER B=25.00 PER C=0.00 PER D=75.00
                        TP=0 HR MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1

*
*S BASIN 2
*
COMPUTE NM HYD          ID=2 HYD NO=102 AREA=0.00018 SQ MI
                        PER A=0 PER B=10.00 PER C=0.00 PER D=90.00
                        TP=0 HR MASS RAINFALL=-1
PRINT HYD               ID=2 CODE=1

*
*S BASIN 3
*
COMPUTE NM HYD          ID=3 HYD NO=103 AREA=0.00039 SQ MI
                        PER A=0 PER B=17.00 PER C=0.00 PER D=83.00
                        TP=0 HR MASS RAINFALL=-1
PRINT HYD               ID=3 CODE=1

*
*S BASIN 4
*
COMPUTE NM HYD          ID=4 HYD NO=104 AREA=0.00054 SQ MI
                        PER A=0 PER B=45.00 PER C=0.00 PER D=55.00
                        TP=0 HR MASS RAINFALL=-1
PRINT HYD               ID=4 CODE=1

*
*S BASIN 5
*
COMPUTE NM HYD          ID=5 HYD NO=105 AREA=0.00097 SQ MI
                        PER A=0 PER B=20.00 PER C=0.00 PER D=80.00
                        TP=0 HR MASS RAINFALL=-1
PRINT HYD               ID=5 CODE=1

*
*S BASIN 6
*
COMPUTE NM HYD          ID=6 HYD NO=106 AREA=0.00016 SQ MI
                        PER A=0 PER B=90.00 PER C=0.00 PER D=10.00
                        TP=0 HR MASS RAINFALL=-1
PRINT HYD               ID=6 CODE=1


*
*S BASIN OS-1
```

```
*
COMPUTE NM HYD       ID=7 HYD NO=107 AREA=0.00047 SQ MI
                     PER A=0 PER B=16.00 PER C=0.00 PER D=84.00
                     TP=0 HR MASS RAINFALL=-1
PRINT HYD            ID=7 CODE=1


*
*S BASIN OS-2
*
COMPUTE NM HYD       ID=8 HYD NO=108 AREA=0.00037 SQ MI
                     PER A=0 PER B=16.00 PER C=0.00 PER D=84.00
                     TP=0 HR MASS RAINFALL=-1
PRINT HYD            ID=8 CODE=1

*
*S POND 1
*
ROUTE RESERVOIR      ID=9 HYD NO=201.00 INFLOW ID=1 CODE=24
                     OUTFLOW(CFS)      STORAGE(AC-FT)  ELEVATION(FT)
                         0.0000            0.0000          4925.24
                         0.0465            0.0003          4927.24
                         0.0511            0.0027          4927.66
                         0.0554            0.0099          4928.07
                         0.0594            0.0219          4928.49
                         0.0632            0.0385          4928.90

PRINT HYD            ID=9 CODE=1
*

*S POND 2
*
ROUTE RESERVOIR      ID=10 HYD NO=202.00 INFLOW ID=2 CODE=24
                     OUTFLOW(CFS)      STORAGE(AC-FT)  ELEVATION(FT)
                         0.0000            0.0000          4925.65
                         0.0964            0.0003          4927.65
                         0.1021            0.0011          4927.89
                         0.1076            0.0034          4928.13
                         0.1128            0.0071          4928.36
                         0.1177            0.0124          4928.60

PRINT HYD            ID=10 CODE=1
*

*S POND 3
*
ROUTE RESERVOIR      ID=11 HYD NO=203.00 INFLOW ID=3 CODE=24
                     OUTFLOW(CFS)      STORAGE(AC-FT)  ELEVATION(FT)
                         0.0000            0.0000          4925.21
                         0.0388            0.0002          4926.62
                         0.0434            0.0024          4926.97
                         0.0476            0.0089          4927.31
                         0.0515            0.0196          4927.66
                         0.0550            0.0346          4928.00

PRINT HYD            ID=11 CODE=1
*

*S POND 5
*
ROUTE RESERVOIR      ID=12 HYD NO=204.00 INFLOW ID=5 CODE=24
                     OUTFLOW(CFS)      STORAGE(AC-FT)  ELEVATION(FT)
                         0.0000            0.0000          4925.14
```

```
                    0.1454          0.0003          4927.14
                    0.1556          0.0049          4927.42
                    0.1651          0.0184          4927.70
                    0.1742          0.0410          4927.97
                    0.1828          0.0726          4928.25

PRINT HYD           ID=12 CODE=1
*


*
*ADD PONDS 1, 2, 3, & 5
*
ADD HYD             ID=20 HYD NO=301.00 ID=9 ID=10
ADD HYD             ID=21 HYD NO=302.00 ID=11 ID=12
ADD HYD             ID=22 HYD NO=303.00 ID=20 ID=21

PRINT HYD           ID=22 CODE=1

*
FINISH
```

```
        AHYMO PROGRAM (AHYMO-S4)                        - Version: S4.01a -
Rel: 01a
             RUN DATE (MON/DAY/YR) = 12/01/2010
             START TIME (HR:MIN:SEC) = 07:03:17     USER NO.=
AHYMO_Temp_User:20122010
             INPUT FILE = Z:\2009\29028\Reports\29028DRAIN.txt

    ************************************************************
    *                                                          *
    *              WENDY'S RESTAURANT DRAINAGE ANALYSIS        *
    *            COORS BLVD. AND RIO BRAVO BLVD. (29028)       *
    *          PROPOSED CONDITIONS (100-YEAR, 6-HR STORM)      *
    *                                                          *
    ************************************************************
    *
    START                  TIME=0.0 HR
    RAINFALL               TYPE=1 RAIN QUARTER=0.0 IN
                           RAIN ONE=1.87 IN RAIN SIX=2.20 IN
                           RAIN DAY=2.66 IN DT=0.03333 HR

                        6-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR
CONVECTIVE AREAS (NM & AZ) - D1
                        DT =   0.033330 HOURS       END TIME =     5.999400
HOURS
                          0.0000  0.0015  0.0029  0.0045  0.0061  0.0077
0.0096
                          0.0114  0.0133  0.0154  0.0175  0.0219  0.0264
0.0311
                          0.0361  0.0412  0.0466  0.0521  0.0577  0.0635
0.0693
                          0.0753  0.0814  0.0878  0.0946  0.1014  0.1091
0.1168
                          0.1296  0.1477  0.1657  0.1898  0.2140  0.2429
0.2767
                          0.3105  0.3612  0.4120  0.4810  0.5686  0.6562
0.8890
                          1.1224  1.3042  1.4336  1.5629  1.6282  1.6932
1.7463
                          1.7873  1.8282  1.8567  1.8850  1.9097  1.9304
1.9512
                          1.9670  1.9827  1.9942  2.0015  2.0087  2.0151
2.0215
                          2.0273  2.0326  2.0378  2.0426  2.0474  2.0521
2.0568
                          2.0614  2.0636  2.0659  2.0681  2.0702  2.0724
2.0744
                          2.0764  2.0784  2.0803  2.0823  2.0842  2.0860
2.0879
                          2.0896  2.0914  2.0931  2.0948  2.0965  2.0982
2.0999
                          2.1015  2.1030  2.1046  2.1062  2.1077  2.1092
2.1107
                          2.1122  2.1136  2.1150  2.1164  2.1178  2.1192
2.1206
                          2.1220  2.1233  2.1246  2.1260  2.1273  2.1286
2.1299
                          2.1312  2.1324  2.1337  2.1349  2.1362  2.1374
2.1386
                          2.1398  2.1410  2.1422  2.1434  2.1446  2.1457
2.1469
```

2.1480 2.1492 2.1503 2.1514 2.1525 2.1536
2.1547
2.1558 2.1569 2.1580 2.1591 2.1601 2.1612
2.1622
2.1633 2.1643 2.1653 2.1663 2.1673 2.1683
2.1693
2.1703 2.1713 2.1723 2.1733 2.1742 2.1752
2.1762
2.1771 2.1781 2.1790 2.1799 2.1809 2.1818
2.1827
2.1836 2.1845 2.1854 2.1863 2.1872 2.1881
2.1890
2.1898 2.1907 2.1916 2.1924 2.1933 2.1941
2.1950
2.1958 2.1967 2.1975 2.1983 2.1992 2.2000

*
*S BASIN 1
*

COMPUTE NM HYD ID=1 HYD NO=101 AREA=0.00045 SQ MI
PER A=0 PER B=25.00 PER C=0.00 PER D=75.00
TP=0 HR MASS RAINFALL=-1

*****Warning*****A value for the Time to Peak was not previously computed; use Tp=0.133333 hrs.

TIME TO PEAK (hrs)= 0.1333

K = 0.072666HR TP = 0.133333HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 1.3321 CFS UNIT VOLUME = 0.9910 B = 526.28 P60 = 1.8700
AREA = 0.000338 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.131024HR TP = 0.133333HR K/TP RATIO = 0.982685
SHAPE CONSTANT, N = 3.593298
UNIT PEAK = 0.27598 CFS UNIT VOLUME = 0.9499 B = 327.08 P60 = 1.8700
AREA = 0.000113 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.00

RUNOFF VOLUME = 1.67498 INCHES = 0.0402 ACRE-FEET
PEAK DISCHARGE RATE = 1.17 CFS AT 1.533 HOURS BASIN AREA = 0.0005 SQ. MI.

*
*S BASIN 2
*

```
    COMPUTE NM HYD       ID=2 HYD NO=102 AREA=0.00018 SQ MI
                         PER A=0 PER B=10.00 PER C=0.00 PER D=90.00
                         TP=0 HR MASS RAINFALL=-1
          TIME TO PEAK (hrs)=  0.1333
          *****Warning*****This Tp value was used for a previously
computed hydrograph.
                              A new Tp value should be computed.


          K =  0.072666HR    TP =  0.133333HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
          UNIT PEAK =  0.63943    CFS   UNIT VOLUME =   0.9815       B =
526.28      P60 = 1.8700
          AREA =     0.000162 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =  0.033330

          K =  0.131024HR    TP =  0.133333HR    K/TP RATIO =  0.982685
SHAPE CONSTANT, N =  3.593298
          UNIT PEAK =  0.44156E-01CFS   UNIT VOLUME =   0.8721       B =
327.08      P60 = 1.8700
          AREA =     0.000018 SQ MI    IA =   0.50000 INCHES    INF =
1.25000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =  0.033330

     PRINT HYD            ID=2 CODE=1

                                        PARTIAL HYDROGRAPH   102.00


          RUNOFF VOLUME =     1.84224 INCHES     =       0.0177 ACRE-FEET
          PEAK DISCHARGE RATE =       0.51 CFS  AT   1.500 HOURS   BASIN
AREA =  0.0002 SQ. MI.


*
*S BASIN 3
*
     COMPUTE NM HYD       ID=3 HYD NO=103 AREA=0.00039 SQ MI
                          PER A=0 PER B=17.00 PER C=0.00 PER D=83.00
                          TP=0 HR MASS RAINFALL=-1
          TIME TO PEAK (hrs)=  0.1333
          *****Warning*****This Tp value was used for a previously
computed hydrograph.
                              A new Tp value should be computed.


          K =  0.072666HR    TP =  0.133333HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
          UNIT PEAK =   1.2777    CFS   UNIT VOLUME =   0.9910       B =
526.28      P60 = 1.8700
          AREA =     0.000324 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =  0.033330
```

K = 0.131024HR TP = 0.133333HR K/TP RATIO = 0.982685
SHAPE CONSTANT, N = 3.593298
UNIT PEAK = 0.16264 CFS UNIT VOLUME = 0.9164 B =
327.08 P60 = 1.8700
AREA = 0.000066 SQ MI IA = 0.50000 INCHES INF =
1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = 0.033330

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 103.00

RUNOFF VOLUME = 1.76418 INCHES = 0.0367 ACRE-FEET
PEAK DISCHARGE RATE = 1.05 CFS AT 1.533 HOURS BASIN
AREA = 0.0004 SQ. MI.

*S BASIN 4

COMPUTE NM HYD ID=4 HYD NO=104 AREA=0.00054 SQ MI
PER A=0 PER B=45.00 PER C=0.00 PER D=55.00
TP=0 HR MASS RAINFALL=-1
TIME TO PEAK (hrs)= 0.1333
*****Warning*****This Tp value was used for a previously
computed hydrograph.
A new Tp value should be computed.

K = 0.072666HR TP = 0.133333HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 1.1723 CFS UNIT VOLUME = 0.9897 B =
526.28 P60 = 1.8700
AREA = 0.000297 SQ MI IA = 0.10000 INCHES INF =
0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = 0.033330

K = 0.131024HR TP = 0.133333HR K/TP RATIO = 0.982685
SHAPE CONSTANT, N = 3.593298
UNIT PEAK = 0.59611 CFS UNIT VOLUME = 0.9768 B =
327.08 P60 = 1.8700
AREA = 0.000243 SQ MI IA = 0.50000 INCHES INF =
1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = 0.033330

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 104.00

RUNOFF VOLUME = 1.45198 INCHES = 0.0418 ACRE-FEET
PEAK DISCHARGE RATE = 1.26 CFS AT 1.533 HOURS BASIN
AREA = 0.0005 SQ. MI.

*S BASIN 5

COMPUTE NM HYD ID=5 HYD NO=105 AREA=0.00097 SQ MI
PER A=0 PER B=20.00 PER C=0.00 PER D=80.00
TP=0 HR MASS RAINFALL=-1

TIME TO PEAK (hrs)= 0.1333
*****Warning*****This Tp value was used for a previously computed hydrograph.
A new Tp value should be computed.

K = 0.072666HR TP = 0.133333HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 3.0629 CFS UNIT VOLUME = 0.9955 B = 526.28 P60 = 1.8700
AREA = 0.000776 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.131024HR TP = 0.133333HR K/TP RATIO = 0.982685
SHAPE CONSTANT, N = 3.593298
UNIT PEAK = 0.47591 CFS UNIT VOLUME = 0.9725 B = 327.08 P60 = 1.8700
AREA = 0.000194 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 105.00

RUNOFF VOLUME = 1.73073 INCHES = 0.0895 ACRE-FEET
PEAK DISCHARGE RATE = 2.56 CFS AT 1.533 HOURS BASIN AREA = 0.0010 SQ. MI.

*S BASIN 6

COMPUTE NM HYD ID=6 HYD NO=106 AREA=0.00016 SQ MI
PER A=0 PER B=90.00 PER C=0.00 PER D=10.00
TP=0 HR MASS RAINFALL=-1

TIME TO PEAK (hrs)= 0.1333
*****Warning*****This Tp value was used for a previously computed hydrograph.
A new Tp value should be computed.

K = 0.072666HR TP = 0.133333HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428

```
         UNIT PEAK =  0.63153E-01CFS   UNIT VOLUME =   0.8873       B =
526.28      P60 = 1.8700
         AREA =     0.000016 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =  0.033330


         K =  0.131024HR    TP =  0.133333HR    K/TP RATIO =  0.982685
SHAPE CONSTANT, N =  3.593298
         UNIT PEAK =  0.35325    CFS   UNIT VOLUME =   0.9612       B =
327.08      P60 = 1.8700
         AREA =     0.000144 SQ MI    IA =   0.50000 INCHES    INF =
1.25000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =  0.033330

    PRINT HYD           ID=6 CODE=1
                                PARTIAL HYDROGRAPH   106.00

         RUNOFF VOLUME =     0.95021 INCHES     =       0.0081 ACRE-FEET
         PEAK DISCHARGE RATE =       0.29 CFS  AT   1.533 HOURS   BASIN
AREA =  0.0002 SQ. MI.


    *
    *S BASIN OS-1
    *
    COMPUTE NM HYD      ID=7 HYD NO=107 AREA=0.00047 SQ MI
                        PER A=0 PER B=16.00 PER C=0.00 PER D=84.00
                        TP=0 HR MASS RAINFALL=-1
          TIME TO PEAK (hrs)=  0.1333
          *****Warning*****This Tp value was used for a previously
computed hydrograph.
                             A new Tp value should be computed.


         K =  0.072666HR    TP =  0.133333HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
         UNIT PEAK =   1.5583    CFS   UNIT VOLUME =   0.9922       B =
526.28      P60 = 1.8700
         AREA =     0.000395 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =  0.033330


         K =  0.131024HR    TP =  0.133333HR    K/TP RATIO =  0.982685
SHAPE CONSTANT, N =  3.593298
         UNIT PEAK =  0.18447    CFS   UNIT VOLUME =   0.9233       B =
327.08      P60 = 1.8700
         AREA =     0.000075 SQ MI    IA =   0.50000 INCHES    INF =
1.25000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =  0.033330
```

PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 107.00

RUNOFF VOLUME = 1.77533 INCHES = 0.0445 ACRE-FEET
PEAK DISCHARGE RATE = 1.27 CFS AT 1.533 HOURS BASIN AREA = 0.0005 SQ. MI.

*S BASIN OS-2

COMPUTE NM HYD ID=8 HYD NO=108 AREA=0.00037 SQ MI
PER A=0 PER B=16.00 PER C=0.00 PER D=84.00
TP=0 HR MASS RAINFALL=-1
TIME TO PEAK (hrs)= 0.1333
*****Warning*****This Tp value was used for a previously computed hydrograph.
A new Tp value should be computed.

K = 0.072666HR TP = 0.133333HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 1.2268 CFS UNIT VOLUME = 0.9897 B = 526.28 P60 = 1.8700
AREA = 0.000311 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.131024HR TP = 0.133333HR K/TP RATIO = 0.982685
SHAPE CONSTANT, N = 3.593298
UNIT PEAK = 0.14522 CFS UNIT VOLUME = 0.9090 B = 327.08 P60 = 1.8700
AREA = 0.000059 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 108.00

RUNOFF VOLUME = 1.77533 INCHES = 0.0350 ACRE-FEET
PEAK DISCHARGE RATE = 1.01 CFS AT 1.533 HOURS BASIN AREA = 0.0004 SQ. MI.

*
*S POND 1
*

ROUTE RESERVOIR ID=9 HYD NO=201.00 INFLOW ID=1 CODE=24
OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)

0.0000	0.0000	4925.24
0.0465	0.0003	4927.24
0.0511	0.0027	4927.66
0.0554	0.0099	4928.07
0.0594	0.0219	4928.49
0.0632	0.0385	4928.90

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	4925.24	0.000	0.00
0.80	0.00	4925.24	0.000	0.00
1.60	0.94	4928.43	0.020	0.06
2.40	0.03	4928.75	0.032	0.06
3.20	0.00	4928.66	0.029	0.06
4.00	0.00	4928.57	0.025	0.06
4.80	0.00	4928.47	0.021	0.06
5.60	0.00	4928.34	0.018	0.06
6.40	0.00	4928.21	0.014	0.06
7.20	0.00	4928.08	0.010	0.06
8.00	0.00	4927.89	0.007	0.05
8.80	0.00	4927.69	0.003	0.05
9.60	0.00	4925.95	0.000	0.02

PEAK DISCHARGE = 0.062 CFS - PEAK OCCURS AT HOUR 2.23
MAXIMUM WATER SURFACE ELEVATION = 4928.757
MAXIMUM STORAGE = 0.0327 AC-FT INCREMENTAL TIME= 0.033330HRS

PRINT HYD ID=9 CODE=1

PARTIAL HYDROGRAPH 201.00

RUNOFF VOLUME = 1.67447 INCHES = 0.0402 ACRE-FEET
PEAK DISCHARGE RATE = 0.06 CFS AT 2.233 HOURS BASIN AREA = 0.0005 SQ. MI.

*
*S POND 2
*

ROUTE RESERVOIR ID=10 HYD NO=202.00 INFLOW ID=2 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.0000	0.0000	4925.65
0.0964	0.0003	4927.65
0.1021	0.0011	4927.89
0.1076	0.0034	4928.13
0.1128	0.0071	4928.36
0.1177	0.0124	4928.60

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

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

0.00	0.00	4925.65	0.000	0.00
0.80	0.00	4925.65	0.000	0.00
1.60	0.41	4928.31	0.006	0.11
2.40	0.01	4928.28	0.006	0.11
3.20	0.00	4925.70	0.000	0.00

PEAK DISCHARGE = 0.114 CFS - PEAK OCCURS AT HOUR 1.87
MAXIMUM WATER SURFACE ELEVATION = 4928.436
MAXIMUM STORAGE = 0.0088 AC-FT INCREMENTAL TIME= 0.033330HRS

PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = 1.84113 INCHES = 0.0177 ACRE-FEET
PEAK DISCHARGE RATE = 0.11 CFS AT 1.866 HOURS BASIN AREA = 0.0002 SQ. MI.

*
*S POND 3
*

ROUTE RESERVOIR ID=11 HYD NO=203.00 INFLOW ID=3 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.0000	0.0000	4925.21
0.0388	0.0002	4926.62
0.0434	0.0024	4926.97
0.0476	0.0089	4927.31
0.0515	0.0196	4927.66
0.0550	0.0346	4928.00

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	4925.21	0.000	0.00
0.80	0.00	4925.21	0.000	0.00
1.60	0.85	4927.63	0.019	0.05
2.40	0.03	4927.89	0.030	0.05
3.20	0.00	4927.82	0.027	0.05
4.00	0.00	4927.75	0.023	0.05
4.80	0.00	4927.67	0.020	0.05
5.60	0.00	4927.57	0.017	0.05
6.40	0.00	4927.47	0.014	0.05
7.20	0.00	4927.37	0.011	0.05
8.00	0.00	4927.24	0.007	0.05
8.80	0.00	4927.08	0.004	0.04
9.60	0.00	4926.84	0.002	0.04

PEAK DISCHARGE = 0.054 CFS - PEAK OCCURS AT HOUR 2.23
MAXIMUM WATER SURFACE ELEVATION = 4927.897
MAXIMUM STORAGE = 0.0300 AC-FT INCREMENTAL TIME= 0.033330HRS

PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 203.00

RUNOFF VOLUME = 1.76349 INCHES = 0.0367 ACRE-FEET
PEAK DISCHARGE RATE = 0.05 CFS AT 2.233 HOURS BASIN AREA = 0.0004 SQ. MI.

*

*S POND 5

*

ROUTE RESERVOIR ID=12 HYD NO=204.00 INFLOW ID=5 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.0000	0.0000	4925.14
0.1454	0.0003	4927.14
0.1556	0.0049	4927.42
0.1651	0.0184	4927.70
0.1742	0.0410	4927.97
0.1828	0.0726	4928.25

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	4925.14	0.000	0.00
0.80	0.00	4925.14	0.000	0.00
1.60	2.06	4927.98	0.043	0.17
2.40	0.09	4928.20	0.067	0.18
3.20	0.01	4928.11	0.056	0.18
4.00	0.00	4928.01	0.045	0.18
4.80	0.01	4927.88	0.034	0.17
5.60	0.01	4927.76	0.023	0.17
6.40	0.00	4927.58	0.013	0.16
7.20	0.00	4927.27	0.002	0.15

PEAK DISCHARGE = 0.182 CFS - PEAK OCCURS AT HOUR 2.17
MAXIMUM WATER SURFACE ELEVATION = 4928.209
MAXIMUM STORAGE = 0.0680 AC-FT INCREMENTAL TIME= 0.033330HRS

PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 204.00

RUNOFF VOLUME = 1.73044 INCHES = 0.0895 ACRE-FEET
PEAK DISCHARGE RATE = 0.18 CFS AT 2.166 HOURS BASIN AREA = 0.0010 SQ. MI.

*

*

*ADD PONDS 1, 2, 3, & 5

*

ADD HYD ID=20 HYD NO=301.00 ID=9 ID=10

ADD HYD ID=21 HYD NO=302.00 ID=11 ID=12

```
    ADD HYD                          ID=22 HYD NO=303.00 ID=20 ID=21

    PRINT HYD                        ID=22 CODE=1

                                                  HYDROGRAPH FROM AREA
303.00

        RUNOFF VOLUME =      1.73414 INCHES     =        0.1840 ACRE-FEET
        PEAK DISCHARGE RATE =        0.41 CFS   AT    2.066 HOURS   BASIN
AREA =  0.0020 SQ. MI.


    *
    FINISH

        NORMAL PROGRAM FINISH            END TIME (HR:MIN:SEC) = 07:03:17
```

Map Pocket

Grading and Drainage Plan

CITY OF ALBUQUERQUE

March 7, 2007

Patrick J. Conley, P.E.
Smith Engineering Company
2201 San Pedro NE, Bldg. 4, Suite 200
Albuquerque, NM 87110

Re: Wendy's Restaurant at Coors & Lamonica Rd., (P10/D5)
Tract 1A2, Lands of Lamonica & Wenk, Engineer's Stamp Dated 2-15-07

Dear Mr. Conley,

Based upon the information provided in your submittal received on February 16, 2007, the above referenced plan is approved for DRB action on the proposed Site Development Plan for Building Permit. However, there are some additional items that must be addressed prior to Building Permit approval. Those items are as follows.

- Runoff from dumpster enclosures may not be transported off-site via surface flow. Enclosures for restaurants must include a drain to the sanitary sewer system via the grease trap. Please provide a detail for the enclosure with the four (4) corner spot and grate elevations.
- Will median curb be utilized at the site entrance? Please provide a detail for the on-site curb(s) and gutter(s) and / or reference the appropriate standard drawing(s).
- Please include a cross section of the proposed concrete rundowns from the parking lot to the ponds. Will the southwestern catch basin (keyed note 5) be the equivalent of a type 'D' storm drain inlet? If not, please provide a detail for this structure as well.
- Please call out the inverts of the pipe from the catch basin to pond D along with the pipe size. Also indicate the sizes of the various balancing pipes on the plan.
- There are several unlabeled spot elevations in the drive through lane and within the parking lot around the new structure.

If you have any questions or need additional information, feel free to contact me at 924-3990.

Sincerely,

Jeremy Hoover, P.E.
Senior Engineer
Hydrology Section
Development and Building Services

cc: file (P10/D5)

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

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

P10/0005

PROJECT TITLE: WENDY'S RESTAURANT ZONE MAP/DRG. FILE #: ~~P-10-Z~~
DRB#: 00193 EPC#: WORK ORDER#:

LEGAL DESCRIPTION: TRACT 1-A-2
CITY ADDRESS: NO ADDRESS. SITE LOCATED AT COORS SW AND LAMONICA SW

ENGINEERING FIRM: SMITH ENG. CO. CONTACT: PAT CONLEY
ADDRESS: 2201 SAN PEDRO NE, BLDG 4, STE 200 PHONE: 884-0700
CITY, STATE: ALBUQUERQUE, NM 87110 ZIP CODE:

OWNER: LOS LUNAS PARTNERS LLC CONTACT: TIM HOGSETT
ADDRESS: 4810 HARDWARE NE PHONE:
CITY, STATE: ALBUQUERQUE, NM 87109 ZIP CODE:

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

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

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

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

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

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

RECEIVED
FEB 16 2007
HYDROLOGY SECTION

SUBMITTED BY: PATRICK S. CONLEY DATE: 2/15/07

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

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.

2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.

3. **Drainage Report:** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more.

Smith Engineering Company

A Full Service Engineering Company

February 15, 2007

Mr. Brad Bingham, PE
City of Albuquerque Planning Department
Hydrology Development Section
Plaza del Sol Building
602 Second Street NW
Albuquerque, NM 87102

Re: Hydrology Letter Report for the Proposed Wendy's Restaurant on Tract 1-A-2 Coors and Rio Bravo, SW
Zone Atlas #P-10-Z
SEC# 106624

Dear Mr. Bingham

Smith Engineering Company (SEC) is providing the design for a Wendy's Restaurant at the referenced location. The site is zoned SU-1 for C-1, Permissive. The site for the proposed development is a 1.73-acre out parcel on the Super Wal-Mart Center located near the intersection of Rio Bravo and Coors Blvd. SW. The proposed development at this time is the Wendy's Restaurant located at the south end of the site. It is anticipated that another retail store will be located at the north end of the site at some future date. This development will construct the Wendy's Restaurant (and associated private utilities) and the parking areas and drainage facilities for both of the anticipated developments on the site.

Hydrology:

The contributing drainage basins to the site are an off-site basin consisting of part of Coors Blvd. and the Tract 1-A-2. The drainage calculations for this site and the off-site basin were performed by Tierra West when the Wal-Mart was going through the review process. SEC concurs with the assumed land uses for the contributing drainage basins and we have incorporated into the hydrology for this submittal. The drainage basin areas from the Tierra West report are used as the basis of the land areas for this report (please refer to the attached "Proposed Basin Map").

The Wal-Mart site and this parcel drain to the MRGCD drain located on the east side of the Wal-Mart through a series of interconnected ponds (see the "Proposed Pond Map" taken from the Tierra West report). Each of the ponds is control discharged to the next pond through a limited discharge outlet. Pond 7, located on this proposed development

2201 San Pedro Drive, NE Albuquerque, NM 87110 Telephone 505/884-0700 Fax 505/884-2376
Building 4, Suite 200 PatC@secnm.com

site, will discharge through an 8" PVC pipe with a 2.50 inch diameter hole drilled in a cap attached to the outlet pipe.

The proposed development uses four ponding areas located on the site and these are labeled Pond A, B, C and D. The maximum ponding elevation is 4930.00. If the water surface goes above 4930.00 in the ponds, the excess runoff will over flow the sidewalk at the southeast corner of the site to Lamonica Road. The available ponding volumes are as follows:

Pond	Volume, ac-ft
A	0.1065
B	0.0574
C	0.0752
D	0.1343
Total	**0.3734**

All of the ponds for the anticipated development of the site will be constructed with the proposed Wendy's project and they will contain the final developed runoff volume for the site. The ponds will be interconnected with PVC drains that will act as balancing pipes between the basins creating a "bathtub" effect. This will allow the runoff to equalize between the basins thus utilizing all the available ponding area for detention. The PVC drains will slope towards the final discharge point located in Basin D. The ponds will discharge to the existing pond system on the Wal-Mart site through the 2.5-inch diameter orifice plate drilled in a cap over an existing 8-inch PVC drain. A perforated riser will be constructed over the outlet to reduce the amount of trash that could collect on the outlet orifice.

Results of the hydrology calculations area as follows:

Basin	Land Use	Area, acres	Peak Q (cfs), 100-Year	Runoff Volume (ac-ft), 100-Year
OS-4	B = 16% and D = 84%	0.54	2.16	0.079
7	B = 20% and D = 80%	1.73	6.78	0.247
OS-4 and 7 Added	N/A	2.27	8.94	0.325

The added hydrograph was routed through Detention Basins A, B, C, and D and the peak discharge through the orifice plate is 0.28 cfs at 2.50 hours. The maximum water surface elevation is 4929.65 and the maximum storage volume is 0.277 acre-feet. The SEC AHYMO printout supporting this data is included with this letter.

Conclusions:

The design of the on-site ponding system has to match the allowable runoff rates that were calculated in the Tierra West report for the site as the system has to operate as intended. The key variable is the maximum runoff rate from the proposed development (the combined OS-4 and Basin 7 in the Tierra West report). The allowable maximum runoff rate from the Tierra West report is 0.28 cfs (rounded up). The maximum outflow rate from the proposed development is 0.28 cfs. The proposed detention basins contain the excess runoff and, in the event of clogging of the outlet orifice, the finish floor of the Wendy's Restaurant is two feet above the overflow onto Lamonica Road.

If you have any questions or need additional information, please call me at 884-0700.

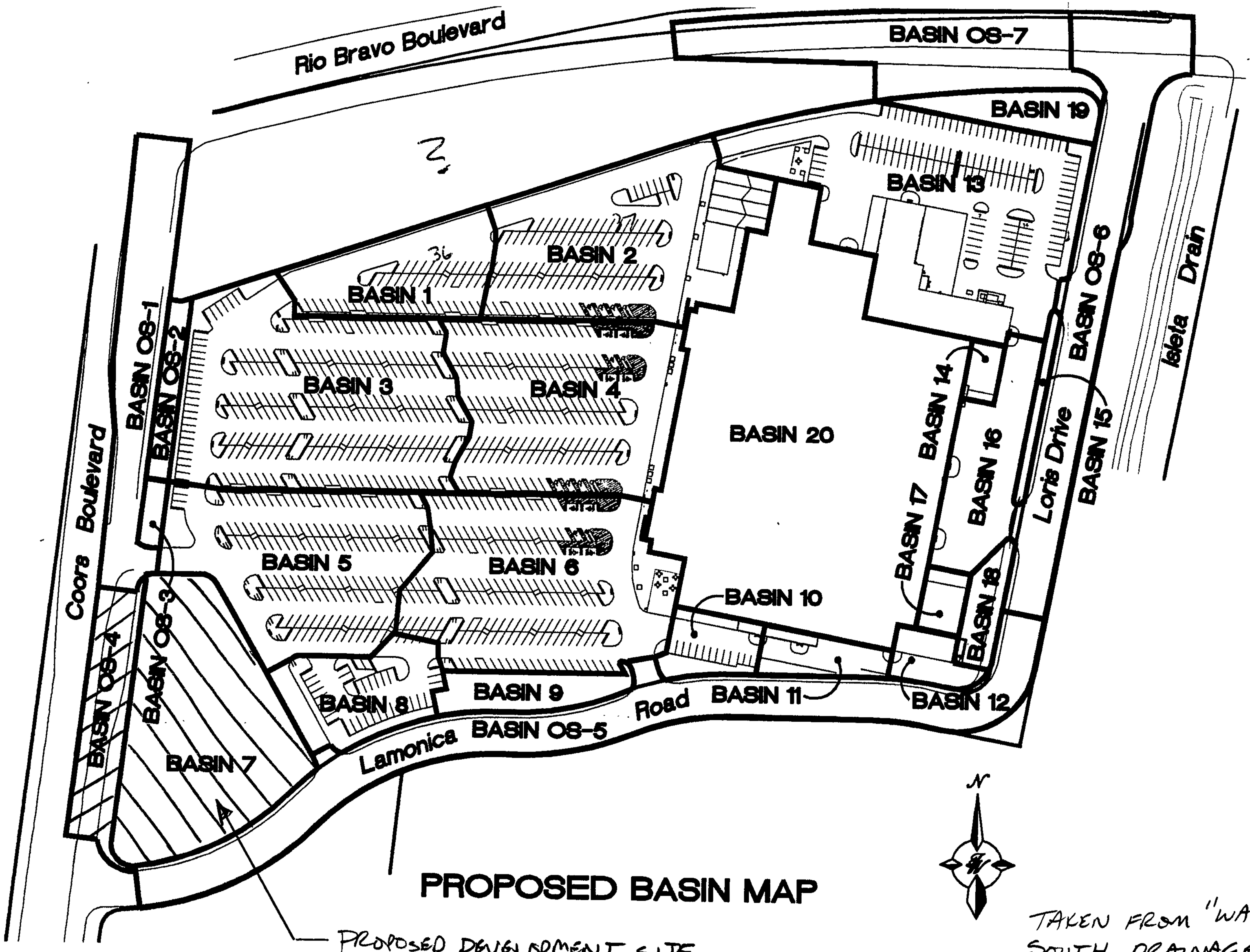
Sincerely,

Smith Engineering Company

Patrick J. Conley
Project Manager

Enclosure

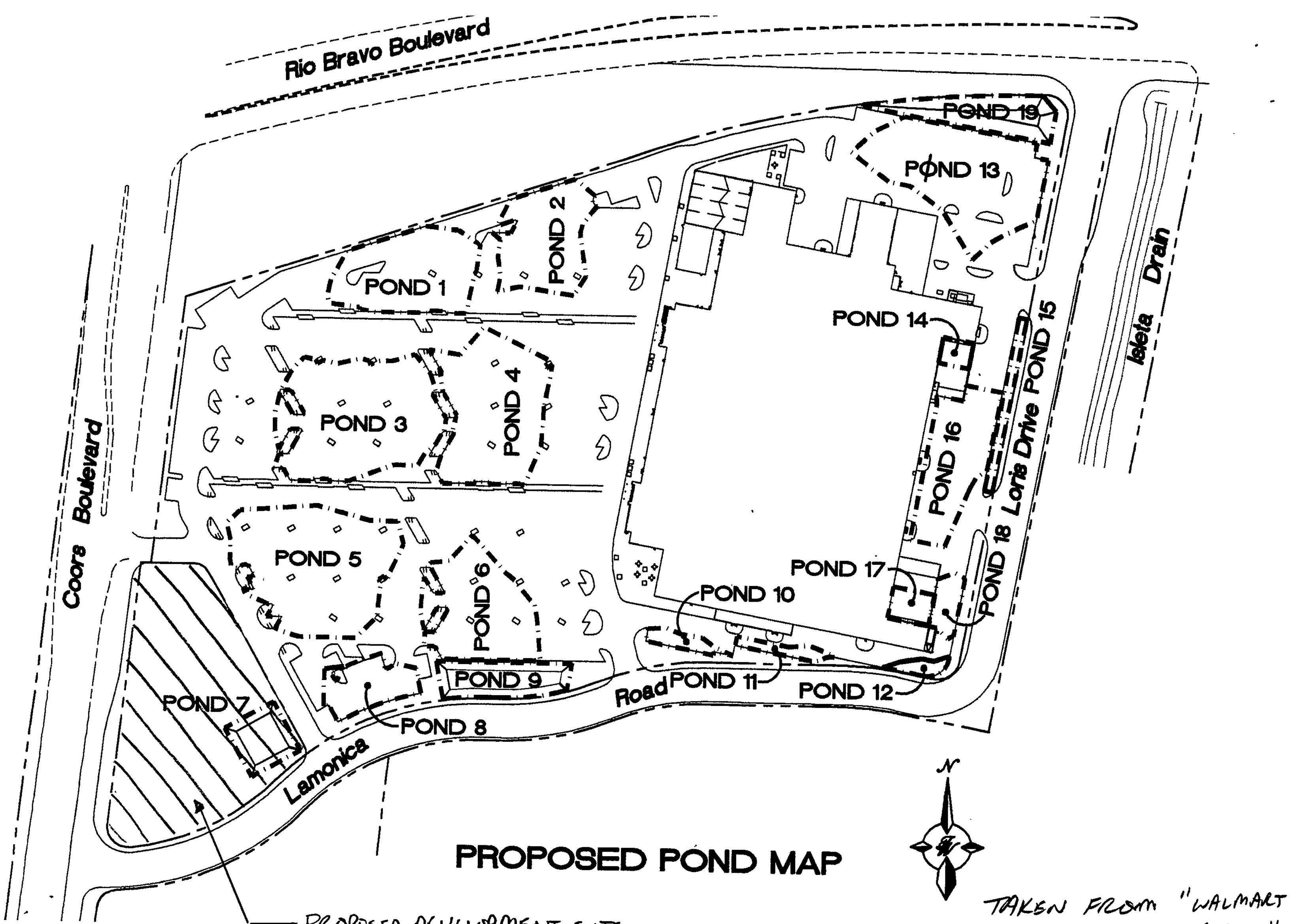
cc: File
Tim Hogsett



PROPOSED BASIN MAP

PROPOSED DEVELOPMENT SITE

TAKEN FROM "WALMART SOUTH DRAINAGE REPORT" BY TIERRAWEST



PROPOSED POND MAP

TAKEN FROM "WALMART SOUTH DRAINAGE REPORT" BY TIERRA WEST

SEC Project No.: 106634
Project Name: Wendy's at Rio Bravo and Coors
Date: 2/5/2007
Engineer: RCC

ORIFICE CALCULATIONS FOR CONTROL DISCHARGE FROM POND "D"

ACTUAL ELEVATION	DEPTH, H (FT)	VOLUME, V (AC-FT)	FLOW, Q* (CFS)
4926.60	0.00	0.0000	0.00
4927.00	0.40	0.0001	0.10
4928.00	1.40	0.0100	0.19
4929.00	2.40	0.1020	0.25
4930.00	3.40	0.3730	0.30

* Orifice Equation

Q = C*A*SQRT(2*g*H)

Where:

C =	0.60
Diameter (in.) =	2.50
Area, A (ft^2) =	0.0341
g (ft/sec^2) =	32.20
Depth, H (ft) =	Depth of water surface above center of orifice
Q (cfs) =	Flow

```
AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) -                          - VERSION:  1997.02c      RUN DATE (MON/DAY/YR) =02/05/2007
INPUT FILE = Z:\Projects\2006PR-1\106634-1\HYDROL-1\AHYMO\106634.IN                          USER NO.= AHYMO-S-9702c01SEC01A-AH

                                FROM  TO                    PEAK        RUNOFF                TIME TO    CFS       PAGE =   1
                    HYDROGRAPH   ID   ID        AREA      DISCHARGE     VOLUME      RUNOFF      PEAK      PER
COMMAND        IDENTIFICATION    NO.  NO.     (SQ MI)      (CFS)       (AC-FT)    (INCHES)   (HOURS)    ACRE      NOTATION

START                                                                                                        TIME=       .00
*S
*S DATE CREATED:  FEBRUARY 5, 2007
*S
*S FILENAME - input          :  106634.IN
*S FILENAME - output         :  106634.OUT
*S FILENAME - summary table :  106634.SUM
*S
*S PROJECT TITLE: WENDY'S AT RIO BRAVO AND COORS
*S
*S SEC PROJECT NUMBER: 106634
*S CONSULTANT: SMITH ENGINEERING COMPANY
*S ASSUMPTIONS: LAND TREATMENTS ARE PER C.O.A. DPM CHAPTER 22
*s
*S
*S ---------------------------------------------------------------
*S
*S        100-YR, 6 HOUR STORM EVENT
*S ---------------------------------------------------------------
*S  RAINFALL DATA TAKEN FROM COA DPM TABLE A-2.
RAINFALL  TYPE= 1                                                                            RAIN6=     2.200
*S
*S %%%%
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         RUN DATE (MON/DAY/YR) = 02/05/2007
         START TIME (HR:MIN:SEC) = 16:37:38     USER NO.= AHYMO-S-9702c01SEC01A-AH
         INPUT FILE = Z:\Projects\2006PR~1\106634~1\HYDROL~1\AHYMO\106634.IN

START
*
*S
*S DATE CREATED:  FEBRUARY 5, 2007
*S
*S FILENAME - input         :  106634.IN
*S FILENAME - output        :  106634.OUT
*S FILENAME - summary table :  106634.SUM
*S
*S PROJECT TITLE: WENDY'S AT RIO BRAVO AND COORS
*S
*S SEC PROJECT NUMBER: 106634
*S CONSULTANT: SMITH ENGINEERING COMPANY
*S ASSUMPTIONS: LAND TREATMENTS ARE PER C.O.A. DPM CHAPTER 22
*s
*S
*S ---------------------------------------------------------------
*S
*S        100-YR, 6 HOUR STORM EVENT
*S ---------------------------------------------------------------
*
*S  RAINFALL DATA TAKEN FROM COA DPM TABLE A-2.
*
RAINFALL              TYPE=1  RAIN QUARTER=0.0
                      RAIN ONE=1.87 IN   RAIN SIX=2.20 IN
                      RAIN DAY=2.66 IN   DT=0.033333 HR

                 COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                 DT =     .033333 HOURS       END TIME =     5.999940 HOURS
                    .0000   .0016   .0033   .0050   .0067   .0085   .0103
                    .0122   .0141   .0160   .0180   .0201   .0222   .0243
                    .0266   .0289   .0312   .0337   .0362   .0388   .0415
                    .0443   .0472   .0502   .0534   .0567   .0601   .0637
                    .0675   .0715   .0758   .0810   .0865   .0924   .1051
                    .1335   .1773   .2400   .3257   .4384   .5820   .7607
                    .9789  1.1808  1.2652  1.3365  1.4000  1.4577  1.5108
                   1.5602  1.6063  1.6495  1.6902  1.7285  1.7648  1.7991
                   1.8316  1.8624  1.8917  1.9194  1.9458  1.9519  1.9576
                   1.9631  1.9683  1.9732  1.9780  1.9826  1.9870  1.9912
                   1.9953  1.9993  2.0031  2.0068  2.0105  2.0140  2.0174
                   2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
                   2.0420  2.0448  2.0476  2.0502  2.0529  2.0554  2.0580
                   2.0605  2.0629  2.0653  2.0677  2.0701  2.0724  2.0746
                   2.0769  2.0791  2.0812  2.0834  2.0855  2.0876  2.0896
```

```
                2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
                2.1052  2.1070  2.1088  2.1106  2.1124  2.1142  2.1159
                2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
                2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
                2.1401  2.1416  2.1431  2.1446  2.1461  2.1475  2.1489
                2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
                2.1601  2.1614  2.1627  2.1641  2.1654  2.1667  2.1680
                2.1693  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
                2.1780  2.1793  2.1805  2.1817  2.1829  2.1841  2.1852
                2.1864  2.1876  2.1887  2.1899  2.1911  2.1922  2.1933
                2.1945  2.1956  2.1967  2.1978  2.1989  2.2000

*S
*S %%%%
```

```
*
*S TOTAL FLOW FROM WENDY'S PROPERTY (BASIN 7).
*
*
COMPUTE NM HYD        ID=3    HYD=7  DA=0.00271 SQ MI
                      PER A=0 PER B=20 PER C=0 PER D=80
                                  TP=0.1333 HR MASS RAIN=-1

     K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   8.5594     CFS   UNIT VOLUME =     .9981        B =   526.28       P60 = 1.8700
     AREA =       .002168 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333


     K =    .130992HR     TP =    .133300HR     K/TP RATIO =    .982685      SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   1.3299     CFS   UNIT VOLUME =     .9903        B =   327.09       P60 = 1.8700
     AREA =       .000542 SQ MI     IA =     .50000 INCHES     INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

*
PRINT HYD             ID=3    CODE=1

                                    OUTFLOW HYDROGRAPH REACH      7.00

     RUNOFF VOLUME =     1.70585 INCHES      =         .2466 ACRE-FEET
     PEAK DISCHARGE RATE =       6.78 CFS  AT    1.500 HOURS    BASIN AREA =    .0027 SQ. MI.


*
*S TOTAL FLOW FROM BASIN OS-4 FLOW AND BASIN 7.
*
ADD HYD               ID=2  HYD=OS-4&7  ID I=1  ID II=3
*
PRINT HYD             ID=2    CODE=1

                                        HYDROGRAPH FROM AREA OS-4&7

     RUNOFF VOLUME =     1.71797 INCHES      =         .3253 ACRE-FEET
     PEAK DISCHARGE RATE =       8.94 CFS  AT    1.500 HOURS    BASIN AREA =    .0036 SQ. MI.


*
*S ROUTE TOTAL FLOW FROM BASIN OS-4 FLOW AND BASIN 7 THROUGH POND 7.
*S OUTFALLS TO POND 8.
*
ROUTE RESERVOIR       ID=4  HYD NO=POND_7  INFLOW ID=2  CODE=5
```

4/7

OUTFLOW(CFS)	STORAGE(AC FT)	ELEV(FT)
0	0	4926.60
0.10	0.0001	4927.00
0.19	0.0100	4928.00
0.25	0.1020	4929.00
0.30	0.3730	4930.00

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4926.60	.000	.00
.17	.00	4926.60	.000	.00
.33	.00	4926.60	.000	.00
.50	.00	4926.60	.000	.00
.67	.00	4926.60	.000	.00
.83	.00	4926.60	.000	.00
1.00	.00	4926.60	.000	.00
1.17	.02	4926.65	.000	.01
1.33	2.50	4928.01	.011	.19
1.50	8.94	4928.85	.088	.24
1.67	4.55	4929.28	.179	.26
1.83	2.87	4929.45	.224	.27
2.00	2.08	4929.56	.254	.28
2.17	.95	4929.63	.272	.28
2.33	.45	4929.65	.277	.28
2.50	.27	4929.65	.278	.28
2.67	.18	4929.65	.277	.28
2.83	.12	4929.64	.275	.28
3.00	.09	4929.63	.273	.28
3.17	.07	4929.62	.270	.28
3.33	.06	4929.61	.267	.28
3.50	.06	4929.60	.264	.28
3.67	.05	4929.59	.261	.28
3.83	.05	4929.57	.257	.28
4.00	.05	4929.56	.254	.28
4.17	.05	4929.55	.251	.28
4.33	.05	4929.54	.248	.28
4.50	.05	4929.53	.245	.28
4.67	.05	4929.52	.242	.28
4.83	.05	4929.50	.238	.28
5.00	.05	4929.49	.235	.27
5.17	.05	4929.48	.232	.27
5.33	.05	4929.47	.229	.27
5.50	.05	4929.46	.226	.27
5.67	.05	4929.45	.223	.27
5.83	.06	4929.44	.220	.27
6.00	.06	4929.42	.217	.27
6.17	.02	4929.41	.214	.27

6.33	.01	4929.40	.210	.27
6.50	.00	4929.39	.207	.27
6.67	.00	4929.37	.203	.27
6.83	.00	4929.36	.199	.27
7.00	.00	4929.35	.196	.27
7.17	.00	4929.33	.192	.27
7.33	.00	4929.32	.188	.27
7.50	.00	4929.31	.185	.27
7.67	.00	4929.29	.181	.26
7.83	.00	4929.28	.177	.26
8.00	.00	4929.26	.174	.26
8.17	.00	4929.25	.170	.26
8.33	.00	4929.24	.167	.26
8.50	.00	4929.23	.163	.26
8.67	.00	4929.21	.159	.26
8.83	.00	4929.20	.156	.26
9.00	.00	4929.19	.152	.26
9.17	.00	4929.17	.149	.26

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
9.33	.00	4929.16	.145	.26
9.50	.00	4929.15	.142	.26
9.67	.00	4929.13	.138	.26
9.83	.00	4929.12	.134	.26
10.00	.00	4929.11	.131	.26
10.17	.00	4929.09	.127	.25
10.33	.00	4929.08	.124	.25
10.50	.00	4929.07	.120	.25
10.67	.00	4929.06	.117	.25
10.83	.00	4929.04	.113	.25
11.00	.00	4929.03	.110	.25
11.17	.00	4929.02	.107	.25
11.33	.00	4929.00	.103	.25
11.50	.00	4928.97	.100	.25
11.67	.00	4928.94	.096	.25
11.83	.00	4928.90	.093	.24
12.00	.00	4928.86	.090	.24
12.17	.00	4928.83	.086	.24
12.33	.00	4928.79	.083	.24
12.50	.00	4928.76	.080	.24
12.67	.00	4928.72	.076	.23
12.83	.00	4928.69	.073	.23
13.00	.00	4928.65	.070	.23
13.17	.00	4928.62	.067	.23
13.33	.00	4928.58	.064	.23
13.50	.00	4928.55	.061	.22
13.67	.00	4928.52	.058	.22
13.83	.00	4928.48	.055	.22

14.00	.00	4928.45	.052	.22
14.17	.00	4928.42	.049	.22
14.33	.00	4928.39	.046	.21
14.50	.00	4928.36	.043	.21
14.67	.00	4928.32	.040	.21
14.83	.00	4928.29	.037	.21
15.00	.00	4928.26	.034	.21
15.17	.00	4928.23	.031	.20
15.33	.00	4928.20	.029	.20
15.50	.00	4928.17	.026	.20
15.67	.00	4928.14	.023	.20
15.83	.00	4928.11	.020	.20
16.00	.00	4928.08	.018	.19
16.17	.00	4928.05	.015	.19
16.33	.00	4928.02	.012	.19
16.50	.00	4927.96	.010	.19
16.67	.00	4927.72	.007	.16
16.83	.00	4927.50	.005	.15
17.00	.00	4927.31	.003	.13
17.17	.00	4927.15	.002	.11
17.33	.00	4926.97	.000	.09

PEAK DISCHARGE = .282 CFS - PEAK OCCURS AT HOUR 2.50
MAXIMUM WATER SURFACE ELEVATION = 4929.648
MAXIMUM STORAGE = .2777 AC-FT INCREMENTAL TIME= .033333HRS

*
PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA POND_7

RUNOFF VOLUME = 1.71816 INCHES = .3253 ACRE-FEET
PEAK DISCHARGE RATE = .28 CFS AT 2.500 HOURS BASIN AREA = .0036 SQ. MI.

*
FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 16:37:38

TAKEN FROM "WALMART SOUTH DRAINAGE REPORT" BY TIERRA WEST.

```
          K =    .131024HR     TP =    .133333HR     K/TP RATIO =    .982685
SHAPE CONSTANT, N =  3.593454
          UNIT PEAK =    .29634     CFS    UNIT VOLUME =     .9540        B =
327.09       P60 = 1.8700
          AREA =       .000121 SQ MI     IA =     .50000 INCHES     INF =   1.25000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=    .033330

     PRINT HYD            ID=6 CODE=1

                                        PARTIAL HYDROGRAPH    106.00

          RUNOFF VOLUME =      1.91356 INCHES      =          .3082 ACRE-FEET
          PEAK DISCHARGE RATE =        8.28 CFS  AT    1.500 HOURS    BASIN AREA =
.0030 SQ. MI.
```

```
     *
     *S BASIN 7
     *
     COMPUTE NM HYD       ID=7 HYD NO=107 AREA=0.00271 SQ MI
                          PER A=0 PER B=20.00 PER C=0.00 PER D=80.00
                          TP=0 HR MASS RAINFALL=-1
          TIME TO PEAK (hrs)=    .1333
          *****Warning*****This Tp value was used for a previously computed
hydrograph.
                              A new Tp value should be computed.


          K =    .072666HR     TP =    .133333HR     K/TP RATIO =    .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =    8.5573     CFS    UNIT VOLUME =     .9980        B =
526.28       P60 = 1.8700
          AREA =       .002168 SQ MI     IA =     .10000 INCHES     INF =     .04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=    .033330


          K =    .131024HR     TP =    .133333HR     K/TP RATIO =    .982685
SHAPE CONSTANT, N =  3.593454
          UNIT PEAK =    1.3296     CFS    UNIT VOLUME =     .9903        B =
327.09       P60 = 1.8700
          AREA =       .000542 SQ MI     IA =     .50000 INCHES     INF =   1.25000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=    .033330

     PRINT HYD            ID=7 CODE=1

                                        PARTIAL HYDROGRAPH    107.00
```

RUNOFF VOLUME = 1.70586 INCHES = .2466 ACRE-FEET
PEAK DISCHARGE RATE = 6.78 CFS AT 1.500 HOURS BASIN AREA = .0027 SQ. MI.

*
*S BASIN 8
*
COMPUTE NM HYD ID=8 HYD NO=108 AREA=0.00094 SQ MI
PER A=0 PER B=25.00 PER C=0.00 PER D=75.00
TP=0 HR MASS RAINFALL=-1
TIME TO PEAK (hrs)= .1333
*****Warning*****This Tp value was used for a previously computed hydrograph.
A new Tp value should be computed.

K = .072666HR TP = .133333HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.7827 CFS UNIT VOLUME = .9955 B = 526.28 P60 = 1.8700
AREA = .000705 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .131024HR TP = .133333HR K/TP RATIO = .982685
SHAPE CONSTANT, N = 3.593454
UNIT PEAK = .57649 CFS UNIT VOLUME = .9768 B = 327.09 P60 = 1.8700
AREA = .000235 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 108.00

RUNOFF VOLUME = 1.64096 INCHES = .0823 ACRE-FEET
PEAK DISCHARGE RATE = 2.29 CFS AT 1.500 HOURS BASIN AREA = .0009 SQ. MI.

*
*S BASIN 9
*
COMPUTE NM HYD ID=9 HYD NO=109 AREA=0.00049 SQ MI
PER A=0 PER B=100.00 PER C=0.00 PER D=0.00

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```
          RUNOFF VOLUME =       .79719 INCHES      =          .0119 ACRE-FEET
          PEAK DISCHARGE RATE =          .42 CFS  AT    1.500 HOURS   BASIN AREA =
.0003 SQ. MI.



      *
      *S BASIN OS-3
      *
      COMPUTE NM HYD       ID=23 HYD NO=123 AREA=0.00011 SQ MI
                           PER A=0 PER B=90.00 PER C=0.00 PER D=10.00
                           TP=0 HR MASS RAINFALL=-1
           TIME TO PEAK (hrs)=    .1333
           *****Warning*****This Tp value was used for a previously computed
hydrograph.
                               A new Tp value should be computed.


          K =    .072666HR    TP =    .133333HR    K/TP RATIO =    .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =    .43418E-01CFS   UNIT VOLUME =     .8873        B =
526.28       P60 = 1.8700
          AREA =       .000011 SQ MI    IA =     .10000 INCHES    INF =     .04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=    .033330


          K =    .131024HR    TP =    .133333HR    K/TP RATIO =    .982685
SHAPE CONSTANT, N =  3.593454
          UNIT PEAK =    .24286    CFS   UNIT VOLUME =     .9454        B =
327.09       P60 = 1.8700
          AREA =       .000099 SQ MI    IA =     .50000 INCHES    INF =   1.25000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
=    .033330

      PRINT HYD            ID=23 CODE=1

                                        PARTIAL HYDROGRAPH    123.00

          RUNOFF VOLUME =       .79719 INCHES      =          .0047 ACRE-FEET
          PEAK DISCHARGE RATE =          .17 CFS  AT    1.500 HOURS   BASIN AREA =
.0001 SQ. MI.


      *
      *S BASIN OS-4
      *
      COMPUTE NM HYD       ID=24 HYD NO=124 AREA=0.00084 SQ MI
                           PER A=0 PER B=16.00 PER C=0.00 PER D=84.00
                           TP=0 HR MASS RAINFALL=-1
           TIME TO PEAK (hrs)=    .1333
```

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*****Warning*****This Tp value was used for a previously computed hydrograph.
A new Tp value should be computed.

K = .072666HR TP = .133333HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.7851 CFS UNIT VOLUME = .9955 B = 526.28 P60 = 1.8700
AREA = .000706 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .131024HR TP = .133333HR K/TP RATIO = .982685
SHAPE CONSTANT, N = 3.593454
UNIT PEAK = .32971 CFS UNIT VOLUME = .9578 B = 327.09 P60 = 1.8700
AREA = .000134 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=24 CODE=1

PARTIAL HYDROGRAPH 124.00

RUNOFF VOLUME = 1.75779 INCHES = .0787 ACRE-FEET
PEAK DISCHARGE RATE = 2.16 CFS AT 1.500 HOURS BASIN AREA = .0008 SQ. MI.

*
*S BASIN OS-5
*
COMPUTE NM HYD ID=25 HYD NO=125 AREA=0.00305 SQ MI
PER A=0 PER B=0.00 PER C=0.00 PER D=100.00
TP=0 HR MASS RAINFALL=-1
TIME TO PEAK (hrs)= .1333
*****Warning*****This Tp value was used for a previously computed hydrograph.
A new Tp value should be computed.

K = .072666HR TP = .133333HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 12.039 CFS UNIT VOLUME = .9984 B = 526.28 P60 = 1.8700
AREA = .003050 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

9/6

```
      RUNOFF VOLUME =     1.87493 INCHES     =         .3960 ACRE-FEET
      PEAK DISCHARGE RATE =      10.69 CFS  AT   1.500 HOURS   BASIN AREA =
.0040 SQ. MI.


      *
      *S ADD BASINS 7, AND OS-4
      *
      ADD HYD                    ID=31 HYD NO=154.00 ID=7 ID=24
      PRINT HYD                ID=31 CODE=1

                                        PARTIAL HYDROGRAPH   154.00


      RUNOFF VOLUME =     1.71799 INCHES     =         .3253 ACRE-FEET
      PEAK DISCHARGE RATE =       8.94 CFS  AT   1.500 HOURS   BASIN AREA =
.0036 SQ. MI.


      *
      *S ADD BASINS 9, AND OS-5
      *
      ADD HYD                      ID=32 HYD NO=155.00 ID=9 ID=25
      PRINT HYD                ID=32 CODE=1

                                        PARTIAL HYDROGRAPH   155.00


      RUNOFF VOLUME =     1.78569 INCHES     =         .3371 ACRE-FEET
      PEAK DISCHARGE RATE =       9.18 CFS  AT   1.500 HOURS   BASIN AREA =
.0035 SQ. MI.


      *
      *S ADD BASINS 15 AND OS-6
      *
      ADD HYD                      ID=33 HYD NO=156.00 ID=15 ID=26
      PRINT HYD                ID=33 CODE=1

                                        PARTIAL HYDROGRAPH   156.00


      RUNOFF VOLUME =     1.88553 INCHES     =         .2454 ACRE-FEET
      PEAK DISCHARGE RATE =       6.61 CFS  AT   1.500 HOURS   BASIN AREA =
.0024 SQ. MI.


      *
      *S ADD BASINS 19, 20 AND OS-7
```

RUNOFF VOLUME = 1.91409 INCHES = .3083 ACRE-FEET
PEAK DISCHARGE RATE = .57 CFS AT 2.266 HOURS BASIN AREA = .0030 SQ. MI.

*

*S POND 7

*

ROUTE RESERVOIR ID=42 HYD NO=207.00 INFLOW ID=31 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.0000	0.0000	4923.00
0.1156	0.0432	4923.60
0.1718	0.0909	4924.20
0.2137	0.1476	4924.80
0.2487	0.2132	4925.40
0.2793	0.2879	4926.00

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4923.00	.000	.00
.80	.00	4923.00	.000	.00
1.60	6.22	4924.86	.154	.22
2.40	.36	4925.95	.282	.28
3.20	.07	4925.89	.274	.27
4.00	.05	4925.77	.260	.27
4.80	.05	4925.66	.245	.26
5.60	.05	4925.55	.231	.26
6.40	.00	4925.43	.217	.25
7.20	.00	4925.29	.201	.24
8.00	.00	4925.15	.185	.23
8.80	.00	4925.01	.170	.23
9.60	.00	4924.87	.155	.22
10.40	.00	4924.73	.141	.21
11.20	.00	4924.59	.128	.20
12.00	.00	4924.46	.115	.19
12.80	.00	4924.33	.103	.18
13.60	.00	4924.20	.091	.17
14.40	.00	4924.07	.080	.16
15.20	.00	4923.94	.070	.15
16.00	.00	4923.82	.061	.14
16.80	.00	4923.71	.052	.13
17.60	.00	4923.61	.044	.12
18.40	.00	4923.51	.037	.10
19.20	.00	4923.43	.031	.08

PEAK DISCHARGE = .277 CFS - PEAK OCCURS AT HOUR 2.50
MAXIMUM WATER SURFACE ELEVATION = 4925.954
MAXIMUM STORAGE = .2821 AC-FT INCREMENTAL TIME= .033330HRS

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: LAMONICA SHOPS Building Permit #: _____ City Drainage #: P10D005

DRB#: 1000650 EPC#: _____ Work Order#: _____

Legal Description: N.E.C of GOERS & LAMONICA

City Address: _____

Engineering Firm: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Owner: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Architect: MODULUS ARCHITECTS Contact: Stephen Dunbar

Address: 220 COPPER AVE N.W STE 350

Phone#: 338-1499 x 106 Fax#: _____ E-mail: SDUNBAR@modulusarchitects.com

Surveyor: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Contractor: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT
____ DRAINAGE PLAN 1st SUBMITTAL
____ DRAINAGE PLAN RESUBMITTAL
____ CONCEPTUAL G & D PLAN
____ GRADING PLAN
____ EROSION & SEDIMENT CONTROL PLAN (ESC)
____ ENGINEER'S CERT (HYDROLOGY)
____ CLOMR/LOMR
__X__ TRAFFIC CIRCULATION LAYOUT (TCL)
____ ENGINEER'S CERT (TCL)
____ ENGINEER'S CERT (DRB SITE PLAN)
____ ENGINEER'S CERT (ESC)
____ SO-19
____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

____ SIA/FINANCIAL GUARANTEE RELEASE
____ PRELIMINARY PLAT APPROVAL
____ S. DEV. PLAN FOR SUB'D APPROVAL
____ S. DEV. FOR BLDG. PERMIT APPROVAL
____ SECTOR PLAN APPROVAL
____ FINAL PLAT APPROVAL
__X__ CERTIFICATE OF OCCUPANCY (PERM)
____ CERTIFICATE OF OCCUPANCY (TCL TEMP)
____ FOUNDATION PERMIT APPROVAL
____ BUILDING PERMIT APPROVAL
____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
____ WORK ORDER APPROVAL
____ GRADING CERTIFICATION

____ SO-19 APPROVAL
____ ESC PERMIT APPROVAL
____ ESC CERT. ACCEPTANCE
____ OTHER (SPECIFY)

RECEIVED
SEP 19 2014
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: ____ Yes ____ No ____ Copy Provided

DATE SUBMITTED: 9/19/14 By: Stephen Dunbar

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

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2. **Drainage Plans**. Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3. **Drainage Report**: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

TRAFFIC CERTIFICATION

I, Stephen Dunbar , NMRA 4218 , of the FIRM MODULUS ARCHITECTS INC. Hereby certify that this project is in substantial design compliance with and in accordance with the design intent of the APPROVED PLAN DATED 3/4/14(DRB). The record information edited onto the original design document has been obtained by Stephen Dunbar of the firm MODULUS ARCHITECTS INC. I further certify that I have personally visited the site on 9/05/14 and have determined by visual inspection that the survey data provided is representative of actual site conditions and is true and correct to the best of my knowledge and belief. This certification is submitted in support of a request for FINAL CERTIFICATE OF OCCPANCY.

THE RECORD INFORMATION PRESENTED HEREON IS NOT NECESSARILY COMPLETE AND INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE TRAFFIC ASPECTS OF THIS PROJECT. THOSE RELYING ON THE RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING IT FOR ANY OTHER PURPOSE.

STATE OF NEW MEXICO
STEPHEN A. DUNBAR
No. 4218
7/17/14
REGISTERED ARCHITECT

_____ ARCHITECT'S STAMP
Signature of Engineer or Architect

_____
Date

RECEIVED
SEP 19 2014
LAND DEVELOPMENT SECTION

MODULUS ARCHITECTS
220 Copper Ave. NW, Suite 350
Albuquerque, New Mexico 87102
p 505.338.1499 f 505.338.1498

CITY OF ALBUQUERQUE

Planning Department
Transportation Development Services Section

January 20, 2012

Ronald R. Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Certification Submittal for a Permanent Building Certificate of Occupancy (C.O.) for **Panda Express** [P-10 / D005]
3506 Coors Blvd. SW
Engineer's Stamp Dated 01/20/12

Dear Mr. Bohannan:

Based upon the information provided in your submittal received 01-20-12, Transportation Development has no objection to the issuance of a Permanent Certificate of Occupancy. This letter serves as a "green tag" from Transportation Development for a Permanent Certificate of Occupancy to be issued by the Building and Safety Division.

If you have any questions, please contact me at (505)924-3630.

Sincerely,

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

c: Engineer
Hydrology file
CO Clerk

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 01/28/2003rd)

PROJECT TITLE: Wendy's and Panda Express, Coors and Lamonica Rd ZONE MAP/DRG. FILE #: P-10 / D005.
DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Tract 1-A-2 Lands of Lamonica and Wenk
CITY ADDRESS: 3506 Coors Blvd, SW Albuquerque, NM

ENGINEERING FIRM:	TIERRA WEST, LLC	CONTACT:	RONALD R. BOHANNAN, P.E.
ADDRESS:	8509 JEFFERSON NE	PHONE:	(505) 858-3100
CITY, STATE:	ALBUQUERQUE, NM	ZIP CODE:	87113
OWNER:		CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
ARCHITECT:	Hengst Streff Balko	CONTACT:	Alex Ramon
ADDRESS:	16220 N Scotsdale Rd Suite 290	PHONE:	
CITY, STATE:	Scottsdale,AZ	ZIP CODE:	85254
SURVEYOR:	Sandia Land Survey	CONTACT:	Andrew S. Medina
ADDRESS:	15 Casa Terrenos	PHONE:	(505) 867-1241
CITY, STATE:	Placitas, NM	ZIP CODE:	87043
CONTRACTOR:	MCO & Associates	CONTACT:	Mike Sofarelli
ADDRESS:	24825 N 16th Avenue, Ste 120	PHONE:	(602) 881-4403
CITY, STATE:	Phoenix, AZ	ZIP CODE:	85085

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 / FINANACIAL 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
- X NO
- ____ COPY PROVIDED

RECEIVED
JAN 20 2012
HYDROLOGY SECTION

DATE SUBMITTED: 1/16/2012 BY: Ronald R. Bohannan, P.E.

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

1. **Conceptual Grading and Drainage Plans**: 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.

TIERRA WEST, LLC

5571 Midway Park Place NE Albuquerque, NM 87109
(505) 858-3100 Fax (505) 858-1118 1-800-245-3102
tierrawestllc.com

January 17, 2012

Ms. Kristal Metro, P.E.
Development and Building Services
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: CERTIFICATION OF SITE PLAN FOR BUILDING PERMIT FOR PERMANENT CERTIFICATE OF OCCUPANCY PANDA EXPRESS, 3506 COORS BLVD, SW ALBUQUERQUE, NM

Dear Ms. Metro:

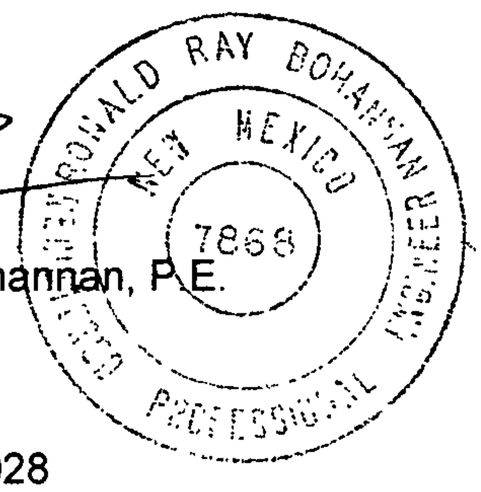
I, Ronald R. Bohannan, NMPE # 7868, of the firm Tierra West LLC, hereby request approval of the As Built Approved Site Plan for Building Permit supporting issuance of the Permanent Certificate of Occupancy for the project referenced above. The previously noted punchlist items have been completed and are in accordance with the design intent of the As-built Amended Approved Site Plan for Building Permit dated 9/20/11. This certification is submitted in support of a request for Permanent Certificate of Occupancy.

The record information presented hereon is not necessarily complete and intended only to verify substantial compliance of the traffic aspects of this project. Those relying on the record document are advised to obtain independent verification of its accuracy before using it for any other purpose.

Enclosed, please find the information sheet and the as-built Approved Site Plan for Building Permit. Therefore, we request approval of the as-built Approved Site Plan for Building Permit for a Permanent Certificate of Occupancy.

If you have any questions or need additional information regarding this matter, please do not hesitate to contact me.

Sincerely,



Ronald R. Bohannan, P.E.

Enclosure/s

JN: 2900028
RRB/BF/cla

Z \2009\290028 - Wendy's Panda Express\Correspondence\290028 Kristal Metro Perm CO Letter 1-16-12 doc

CITY OF ALBUQUERQUE

Planning Department
Transportation Development Services Section

December 22, 2011

Ronald R. Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Certification for a 30-Day Temporary Certificate of Occupancy ***(C.O.)***
Panda Express, [P-10/D005]
3506 Coors Blvd. SW
Engineer's Stamp Dated 12/22/11

Dear Mr. Bohannan:

Based upon the information provided in your submittal received 10-31-11, Transportation Development has downgraded your request from a Permanent to a ***30-day Temporary Certificate of Occupancy***. This letter serves as a "green tag" from Transportation Development for a ***30-day Temporary Certificate of Occupancy*** to be issued by the Building and Safety Division.

The following items will need to be addressed prior to issuance of a Permanent Certificate of Occupancy (**As a condition for Permanent CO approval**): Completion of striping, handicap signage, and installation of the fall prevention railing on the retention pond.

If you have any questions, please contact me at (505)924-3630.

Sincerely,

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

c: Engineer
Hydrology file
CO Clerk

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 01/28/2003rd)

P-10/0005

PROJECT TITLE: [redacted] and Panda Express, Coors and Lamonica Rd ZONE MAP/DRG. FILE #: P-10Z
DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Tract 1-A-2 Lands of Lamonica and Wenk
CITY ADDRESS: 3506 Coors Blvd, SW Albuquerque, NM

ENGINEERING FIRM:	TIERRA WEST, LLC	CONTACT:	RONALD R. BOHANNAN, P.E.
ADDRESS:	8509 JEFFERSON NE	PHONE:	(505) 858-3100
CITY, STATE:	ALBUQUERQUE, NM	ZIP CODE:	87113
OWNER:		CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
ARCHITECT:	Hengst Streff Balko	CONTACT:	Alex Ramon
ADDRESS:	16220 N Scotsdale Rd Suite 290	PHONE:	
CITY, STATE:	Scottsdale,AZ	ZIP CODE:	85254
SURVEYOR:	Sandia Land Survey	CONTACT:	Andrew S. Medina
ADDRESS:	15 Casa Terrenos	PHONE:	(505) 867-1241
CITY, STATE:	Placitas, NM	ZIP CODE:	87043
CONTRACTOR:	MCO & Associates	CONTACT:	Mike Sofarelli
ADDRESS:	24825 N 16th Avenue, Ste 120	PHONE:	(602) 881-4403
CITY, STATE:	Phoenix, AZ	ZIP CODE:	85085

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 / FINANACIAL GUARANTEE RELEASE
- ____ PRELIMINARY PLAT APPROVAL
- ____ S. DEV. PLAN FOR SUB'D. APPROVAL
- ____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ____ SECTOR PLAN APPROVAL
- ____ FINAL PLAT APPROVAL
- ____ FOUNDATION PERMIT APPROVAL
- ____ BUILDING PERMIT APPROVAL
- ____ CERTIFICATE OF OCCUPANCY (PERM.)
- X CERTIFICATE OF OCCUPANCY (TEMP.)
- ____ GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ WORK ORDER APPROVAL
- ____ OTHER (SPECIFY)

RECEIVED
DEC 22 2011
HYDROLOGY SECTION

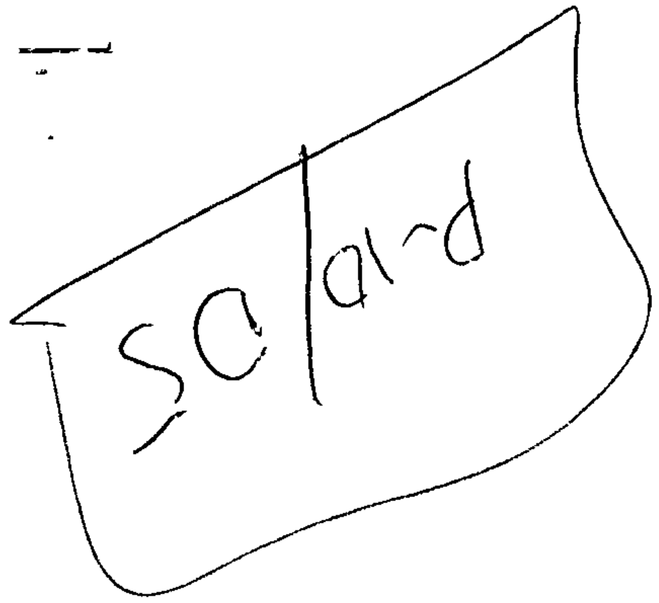
WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
- X NO
- ____ COPY PROVIDED

DATE SUBMITTED: 12/22/2011 BY: Ronald R. Bohannan, P.E.

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

1. **Conceptual Grading and Drainage Plans**: 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.


salad

TIERRA WEST, LLC

5571 Midway Park Place NE Albuquerque, NM 87109
(505) 858-3100 Fax (505) 858-1118 1-800-245-3102
tierrawestllc.com

December 22, 2011

Ms. Kristal Metro, P.E.
Development and Building Services
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: CERTIFICATION OF SITE PLAN FOR BUILDING PERMIT
FOR TEMPORARY CERTIFICATE OF OCCUPANCY
PANDA EXPRESS, 3506 COORS BLVD, SW ALBUQUERQUE, NM

Dear Ms. Metro:

I, Ronald R. Bohannan, NMPE # 7868, of the firm Tierra West LLC, hereby request a Temporary Certificate of Occupancy for the project referenced above. With the exception of completing the site's striping, handicap signage and the installation of the fall prevention railing on the retention pond, this project is in substantial compliance as inspected on December 21, 2011, and is in accordance with the design intent of the As-built Administrative Amendment Site Plan for Building Permit dated 9/20/11. This certification is submitted in support of a request for Temporary Certificate of Occupancy to allow the contractor to complete these items while the owner conducts training of its employees. A temporary chain link fence is to be in place to secure the pond until the railing can be manufactured.

The record information presented hereon is not necessarily complete and intended only to verify substantial compliance of the traffic aspects of this project. Those relying on the record document are advised to obtain independent verification of its accuracy before using it for any other purpose.

Enclosed, please find the information sheet, the As-built Administrative Amendment Site Plan for Building Permit. Therefore, we request approval of the As-built Administrative Amendment Site Plan for Building Permit for a Temporary Certificate of Occupancy.

If you have any questions or need additional information regarding this matter, please do not hesitate to contact me.

Sincerely,

Ronald R. Bohannan, P.E.

Enclosure/s

RECEIVED
DEC 22 2011
HYDROLOGY SECTION

JN: 2900028
RRB/BF/jng

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