CITY OF ALBUQUERQUE

Richard J. Berry, Mayor

June 24, 2016

Ronald R. Bohannan
Tierra West, LLC
5571 Midway Park Pl, NE
Albuquerque, NM, 87109

RE: Bedrosian Tile
Drainage Report, Grading and Drainage Plan
Engineer's Stamp Date 5-27-2016 (File: F16D013A)

(Applicant replaced sheets on 5/27/16)

Dear Mr. Bohannan:

Based upon the information provided in your submittal received 5-17-2016, the above-referenced plan is approved for Grading Permit (ESC Permit), Building Permit and SO-19 Permit. As previously mentioned at the 6-8-2016 DRB Hearing, the project is also approved for Site Plan for Building Permit.

Please attach a copy of this approved plan in the construction sets when submitting for a building permit. Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

Please process the ESC Grading Permit (the ESC Plan has been approved) through the Stormwater Quality Engineer prior to grading on the site.

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

Sincerely,

Abiel Carrillo, P.E.
Principal Engineer, Planning Department
Development Review Services

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

Orig: Drainage file

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Bedrosians Tile & Stone **Building Permit #:** _____ **City Drainage #:** F16D013A

DRB#: 1010447 EPC#: _____ Work Order#: _____

Legal Description: Tract 2A-1B-2-A Renaissance Center

City Address: 1301 N. Renaissance Blvd. NE Albuquerque, NM 87107

Engineering Firm: Tierra West, LLC Contact: Ronald R. Bohannan

Address: 5571 Midway Park Pl. NE Albuquerque, NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: rrb@tierrawestllc.com

Owner: Paragon Industries II, Inc. Contact: Eddie Bedrosian

Address: 1515 E. Winston Rd. Anaheim, CA 92805

Phone#: 714-778-1800 Fax#: _____ E-mail: eddie.bedrosian@bedrosians.com

Architect: _____ Contact: _____

Address: _____

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

Other Contact: _____ Contact: _____

Address: _____

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

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE
____ TRAFFIC/ TRANSPORTATION
____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

____ ENGINEER/ ARCHITECT CERTIFICATION

____ CONCEPTUAL G & D PLAN
X GRADING PLAN
____ DRAINAGE MASTER PLAN
X DRAINAGE REPORT
____ CLOMR/LOMR

____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ TRAFFIC IMPACT STUDY (TIS)
____ EROSION & SEDIMENT CONTROL PLAN (ESC)

____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: X Yes ____ No

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

X BUILDING PERMIT APPROVAL
____ CERTIFICATE OF OCCUPANCY

____ PRELIMINARY PLAT APPROVAL
____ SITE PLAN FOR SUB'D APPROVAL
X SITE PLAN FOR BLDG. PERMIT APPROVAL
____ FINAL PLAT APPROVAL
____ SIA/ RELEASE OF FINANCIAL GUARANTEE
____ FOUNDATION PERMIT APPROVAL
____ GRADING PERMIT APPROVAL
X SO-19 APPROVAL
____ PAVING PERMIT APPROVAL
____ GRADING/ PAD CERTIFICATION
____ WORK ORDER APPROVAL
____ CLOMR/LOMR

____ PRE-DESIGN MEETING
____ OTHER (SPECIFY) _____

Received AC 5/17/16

Applicant replaced the submittal on 5/27/16

DATE SUBMITTED: 5/27/2016 By: Vinny Perea

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

DRAINAGE REPORT

For

Bedrosians Tile & Stone

Prepared by:

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

May 27, 2016

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
NEW MEXICO
7868
PROFESSIONAL ENGINEER

Ronald R. Bohannan
PE # 7868

Job No. 2014084

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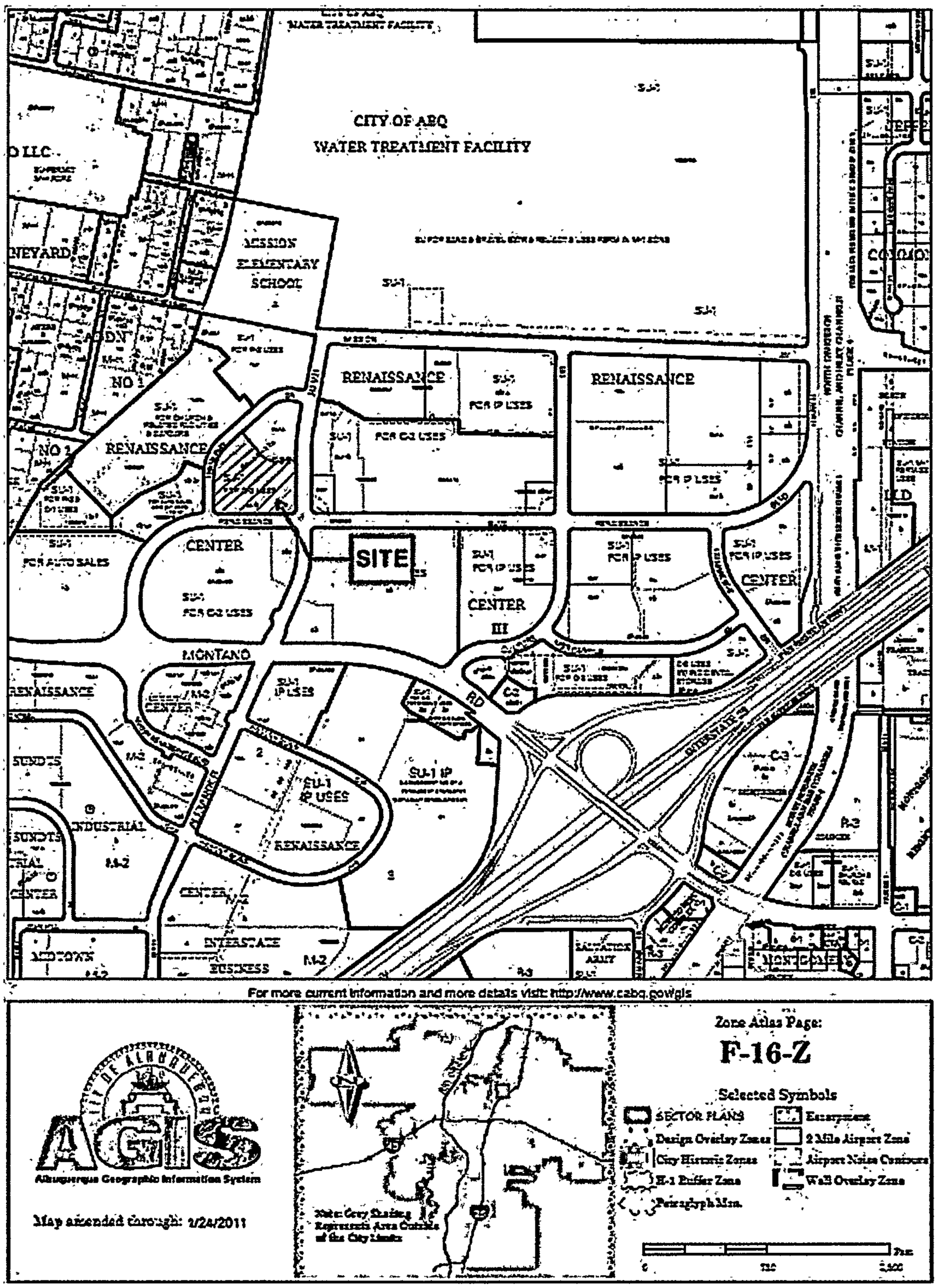
Purpose

The purpose of this report is to develop a Drainage Management Plan for a 4.30 acre parcel of land, entitled Tract 2A-1B-2-A of the Renaissance Center. The 4.30 acres will include an additional drainage inflow from the 2.10 acre developed parcel of land directly north of the site (IBEW property), giving a total of 6.40 acres of drainage area.

Location

The site is located on the northwest corner of the N. Renaissance Boulevard and Alexander Boulevard intersection; it is bound by Union Way Drive to the west, N. Renaissance Boulevard to the south, Alexander Boulevard to the east, and the IBEW property to the north. The site consists of 1 commercial lot which will be developed for a Tile Store/Warehouse plus three additional retail tenant spaces. The site is shown on the Zone Atlas Page, F-16-Z found in Exhibit A.

Exhibit A – Vicinity Map


CITY OF ABQ
WATER TREATMENT FACILITY
MESSIA ELEMENTARY SCHOOL
RENAISSANCE
RENAISSANCE
RENAISSANCE
CENTER
SITE
CENTER III
CENTER
MONTANO
RENAISSANCE
CENTER
RENAISSANCE
INDUSTRIAL
INTERSTATE BUSINESS
INTERSTATE 25
For more current information and more details visit: http://www.cabq.gov/gis
Albuquerque Geographic Information System
Map amended through: 2/24/2011
Zone Atlas Page:
F-16-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

Existing Conditions

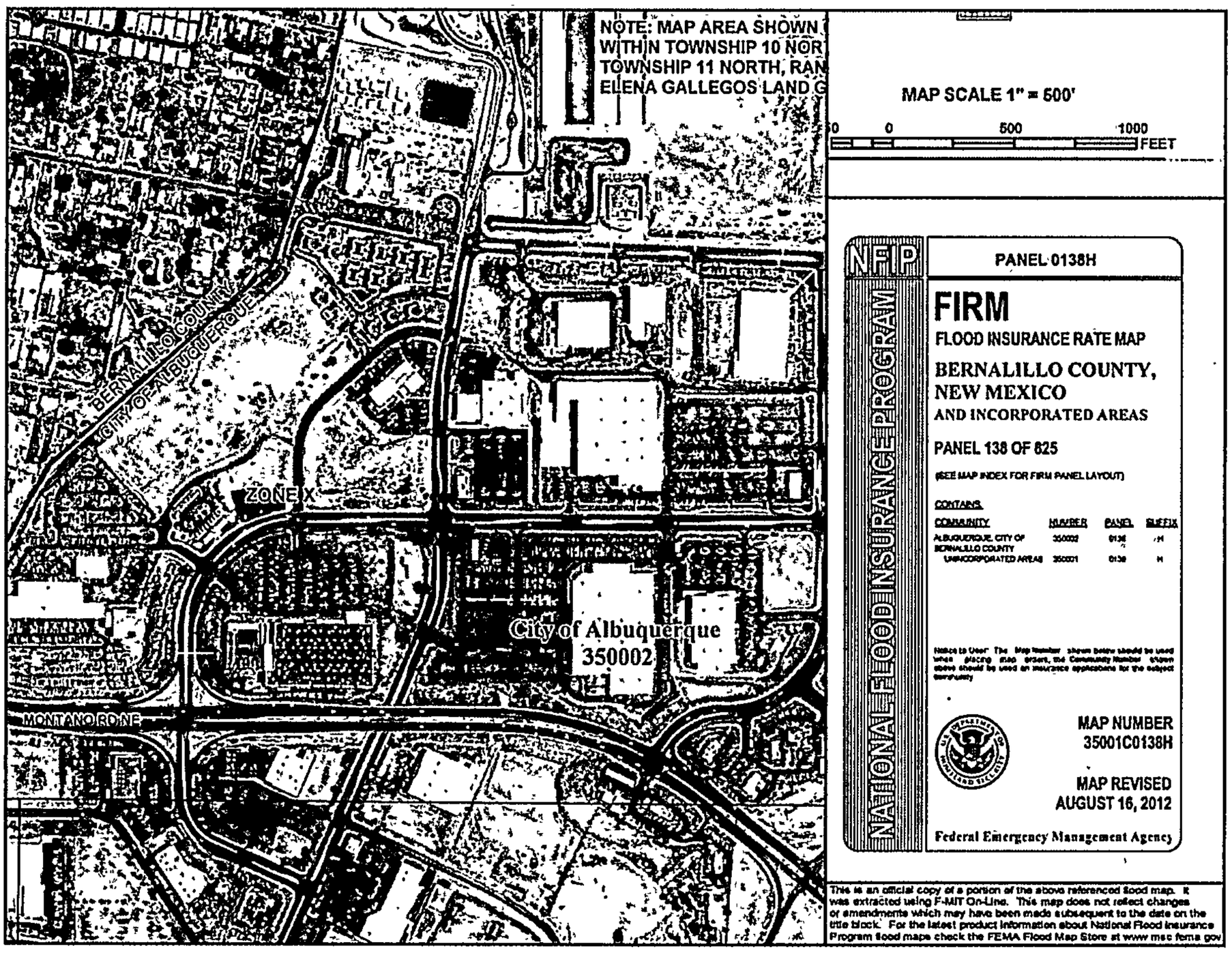
The site is undeveloped and drains naturally from north to south. The site currently consists of two drainage basins, E1 and E2. Basin E1 consists of the northwest portion of the site and all of the IBEW property to the north. The northwest portion of the site contains a temporary retention pond which captures all the flows from Basin E1, an existing 8" PVC storm drain is directed from the northern part of the IBEW property towards an inlet that is located in the temporary retention pond. This inlet doesn't direct drainage flow anywhere currently.

Basin E2 consists of the rest of the property which surface flows from north to south towards Renaissance Boulevard and enters the public storm drain system via curb inlets in Renaissance Boulevard. The existing drainage basin map and basin hydrology calculations can be found in Appendix A.

Flood Plain

The site is located on FIRM Map 35001C0138H. The map indicates that the site does not lie within a 100-year flood plain. This FIRM Map can be found in Exhibit B.

Exhibit B – FIRM Map



Proposed Conditions

All improvements will be built out in their entirety. The grading and drainage design is configured to accommodate the proposed building and associated improvements plus the drainage of the property to the north. This site falls within the Renaissance Master Plan which states that the developed discharge flow cannot exceed 0.1 cfs/acre, consequently this constrains the outflow of the 6 acres of drainage area to 0.6 cfs.

Drainage from the majority of the developed site will be collected through a network of storm drain pipes and routed through above-ground detention ponds (both landscape and parking lot surfaces) and an underground detention storage system, such as a CMP pipe and manifold system, before releasing attenuated flows into the Renaissance Blvd. storm drain system.

Drop inlets in the parking lot will contain an orifice plate sized to attenuate flow and accommodate ponding on the asphalt surface up to a depth no greater than 10 inches to prevent any water from entering parked car doors. Storm drain routing will be directed from north to south towards the underground detention basin located in the southeast corner of the site. This storm drain routing and hydraulic analysis was modeled using AHYMO and the results can be found in Appendix C.

Pond #1 will collect flows from Basins B1 and B2 through a drop inlet and convey flows through a 5-1/8" orifice plate on the inlet invert at a rate of 1.74 cfs. Pond #2 will collect these flows plus Basin B3 through a drop inlet and convey flows through a 5-1/4" orifice plate at a rate of 1.74 cfs. Flows from this pond will be routed towards the underground storm detention system where flows from Basins B4 and B5 will be collected as well.

Pond #3 will collect flows from Basin B7 through a drop inlet and convey flows through a 2-3/4" orifice plate at a rate of 0.5 cfs. Pond #4 will collect the flows from Pond #3 and Basin B8 through a drop inlet in the rear landscaped area and convey flows through a 4-3/4" orifice plate at a rate of 1.61 cfs. Pond #5 will collect the flows from Pond #4 and Basin B9 through a drop inlet and convey flows through a 4" pvc pipe (acting as an orifice plate for attenuation) at a rate of 1.38 cfs. These flows from Pond #5 are directed towards the underground storm detention system as well.

The underground storm detention system will collect all flows from Ponds #2 and 5 as well as Basins B4 and B5. The underground volume required was determined by allowing the drainage to fill up the up the entire system and back up to pond on the surface at a maximum depth of 0.5 feet higher than the drop inlet in Basin B4 (Inlet #3). A cross sectional schematic of this underground system/parking lot ponding in Basin B4 can be found in Appendix C. All flows from the underground system will discharge to the existing drop inlet at the southeast corner of the site and into the Renaissance Blvd. storm drain at a rate of 0.58 cfs which is under the allowable discharge rate.

There are four additional drainage basins that capture the runoff of the landscaped areas along the perimeter of the site. These basins/landscaped areas will be graded out to retain the flows and prevent from discharging to the streets. The drainage flows from the loading dock ramp in the rear of the building will collect flows through a trench drain placed at the bottom of the ramp. Because of the surface ponding above the onsite and inlets and the elevation of the trench drain, flows from the loading dock cannot connect to the onsite storm drain system because the surface ponding would back up to the trench drain and flood the loading ramp. Instead, flows from the trench drain will be retained in a small underground basin to infiltrate into the ground. Although this area contains collapsible soils, because this retention volume is minimal (420 cubic feet) and will be placed far enough away from the building, the underground retention will not pose any problems of settlement issues.

Water Quality Management

will be ok.

Given the potential for collapsible soils onsite, a waiver for onsite retention of the first-flush has been requested with this project. BMP's consisting of water quality manholes at the inlets of the underground detention system will be implemented onsite to reduce the pollutants entering the system. Onsite retention of the first flush volume is not feasible due to the geotechnical conditions and recommendations from the Geotechnical Investigation Report that large volumes of retention are highly discouraged. Excerpts of the geotechnical report recommendations can be found in Appendix D. It should also be noted that drainage from this area is conveyed to a regional pond which provides a disconnect from the Rio Grande.

Calculations

The Weighted E Method from the "City of Albuquerque Development Process Manual Volume I – Design Criteria, 2006 Revision" was used to calculate the runoff and volume for the site, the hydrology table can be found in Appendix A. Drainage capacities for the inlet grates and 4.5 ft curb cut in BasinB8 can be found in Appendix B. Hydraulic calculations of the surface ponds and underground detention can be found in Appendix C.

Summary

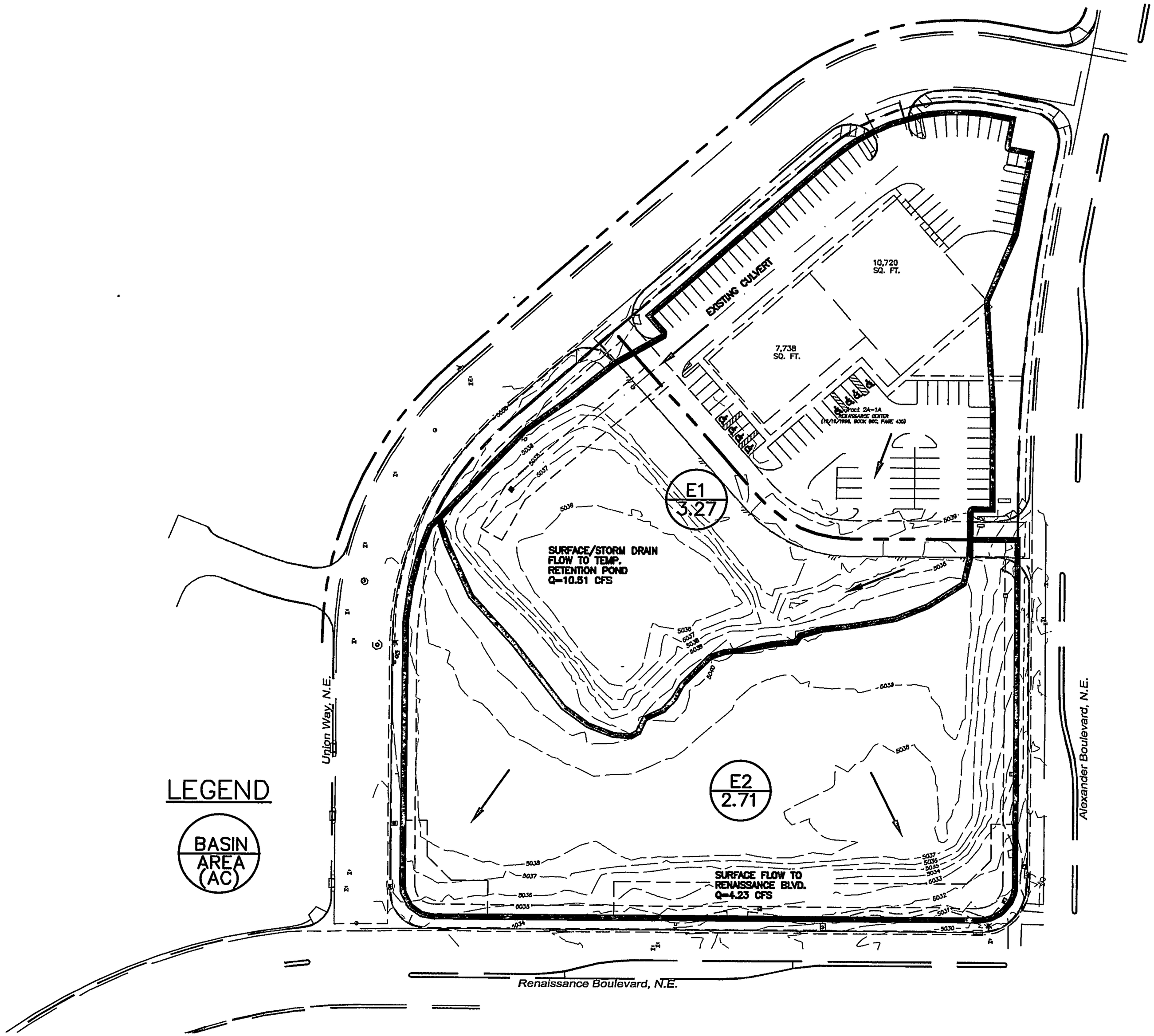
The entire site will be graded and all of the surface improvements will be built out in their entirety. The enclosed grading plan shows the grades for the entire project.

The proposed development consists of commercial development with 13 basins that includes accepting drainage from the IBEW property directly to the north. 8 of the basins will convey flow through a storm drain network with surface ponding and be directed towards an underground detention system.

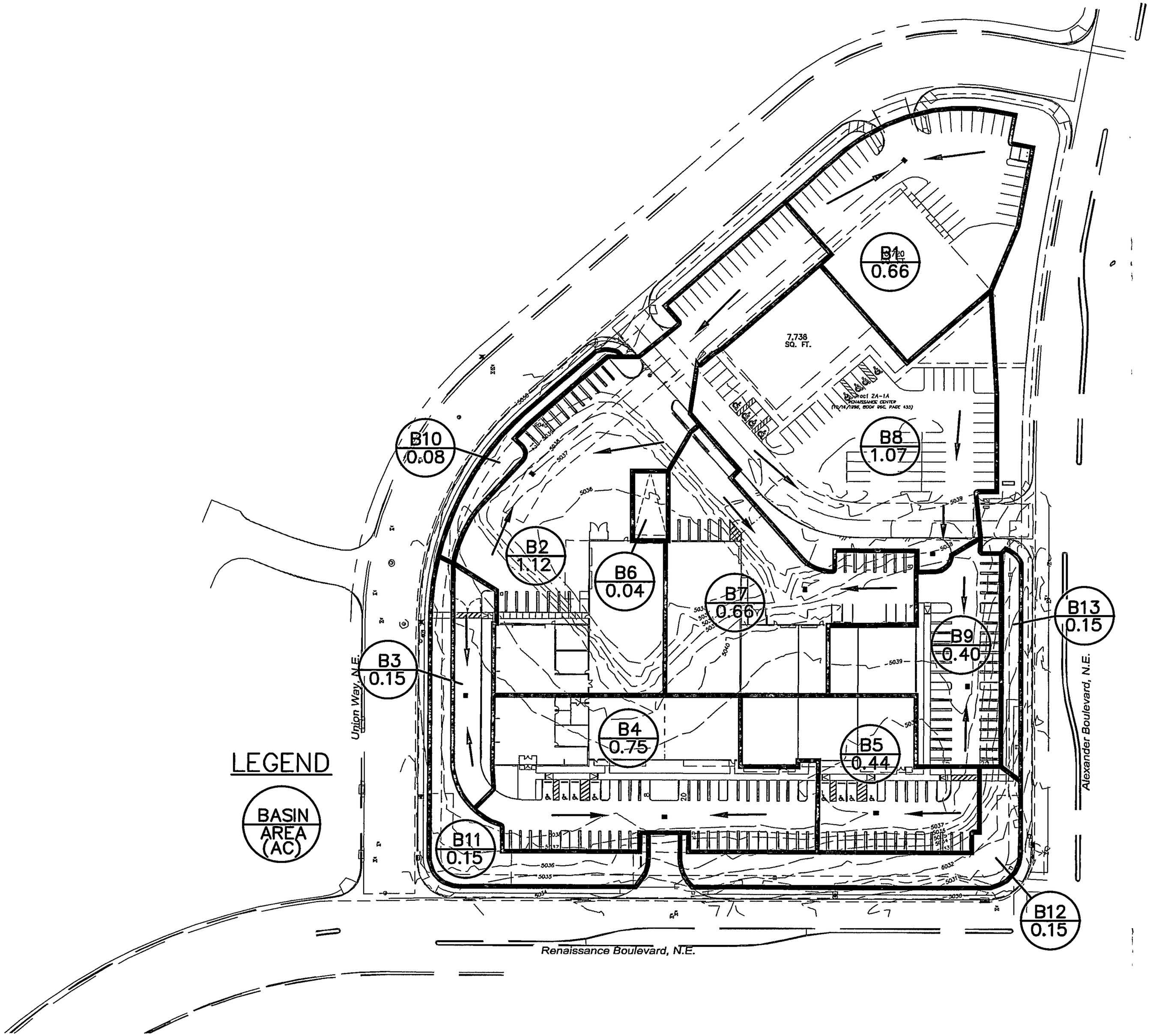
The inlets and underground detention system will contain orifice plates to attenuate flow towards the Renaissance Blvd. storm drain where the fully developed 100 year-24 hour discharge will be 0.58 cfs. This discharge rate is acceptable to the Renaissance Master Plan's allowable discharge of 0.1 cfs/acre.

APPENDIX A

Drainage Basin Maps & Hydrology Calculations



EXISTING BASINS



PROPOSED BASINS

DPM Weighted E Method

Precipitation Zone 2
NW Corner of Renaissance Blvd. & Alexander Blvd.
Bedrosian's Tile & Stone
TWLLC **Date** 5/10/2016

Existing Conditions

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr		
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
E1	142,534.18	3.272	0.00511	42%	1.374	7%	0.229	0%	0.000	51%	1.669	1.358	0.370	10.51	0.758	0.207	5.98
E2	117,975.38	2.708	0.00423	100%	2.708	0%	0.000	0%	0.000	0%	0.000	0.530	0.120	4.23	0.130	0.029	1.03
Total	**260,509.56**	**5.980**	**0.00934**		**0.000**		**0.229**		**0.000**		**1.669**		**0.490**	**14.73**		**0.236**	**7.01**

~~Existing Conditions~~ Proposed

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr		
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
B1	28,568.46	0.656	0.00102	0%	0.000	10%	0.066	0%	0.000	90%	0.590	1.986	0.109	2.92	1.234	0.067	1.92
B2	48,921.89	1.123	0.00175	0%	0.000	7%	0.079	0%	0.000	93%	1.044	2.026	0.190	5.09	1.266	0.118	3.35
B3	6,652.57	0.153	0.00024	0%	0.000	24%	0.037	0%	0.000	76%	0.116	1.798	0.023	0.63	1.086	0.014	0.40
B4	32,775.77	0.752	0.00118	0%	0.000	11%	0.083	0%	0.000	89%	0.670	1.973	0.124	3.34	1.223	0.077	2.18
B5	19,203.00	0.441	0.00069	0%	0.000	6%	0.026	0%	0.000	94%	0.414	2.040	0.075	2.01	1.276	0.047	1.33
B6	1,798.46	0.041	0.00006	0%	0.000	0%	0.000	0%	0.000	100%	0.041	2.120	0.007	0.19	1.340	0.005	0.13
B7	28,512.29	0.655	0.00102	0%	0.000	1%	0.007	0%	0.000	99%	0.648	2.107	0.115	3.06	1.329	0.073	2.04
B8	46,804.55	1.074	0.00168	0%	0.000	21%	0.226	0%	0.000	79%	0.849	1.839	0.165	4.50	1.117	0.100	2.88
B9	17,580.14	0.404	0.00063	0%	0.000	8%	0.032	0%	0.000	92%	0.371	2.013	0.068	1.82	1.255	0.042	1.20
B10	3,516.91	0.081	0.00013	0%	0.000	100%	0.081	0%	0.000	0%	0.000	0.780	0.005	0.18	0.280	0.002	0.08
B11	11,917.76	0.274	0.00043	0%	0.000	100%	0.274	0%	0.000	0%	0.000	0.780	0.018	0.62	0.280	0.006	0.26
B12	11,291.30	0.259	0.00041	0%	0.000	100%	0.259	0%	0.000	0%	0.000	0.780	0.017	0.59	0.280	0.006	0.25
B13	3,236.75	0.074	0.00012	0%	0.000	95%	0.071	0%	0.000	5%	0.004	0.847	0.005	0.18	0.333	0.002	0.08
Total	**260,779.85**	**5.987**	**0.00935**		**0.000**		**1.239**		**0.000**		**4.748**		**0.919**	**25.14**		**0.559**	**16.09**

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 (in.)		
Zone 2	100-Year	10-Year
Ea	0.53	0.13
Eb	0.78	0.28
Ec	1.13	0.52
Ed	2.12	1.34

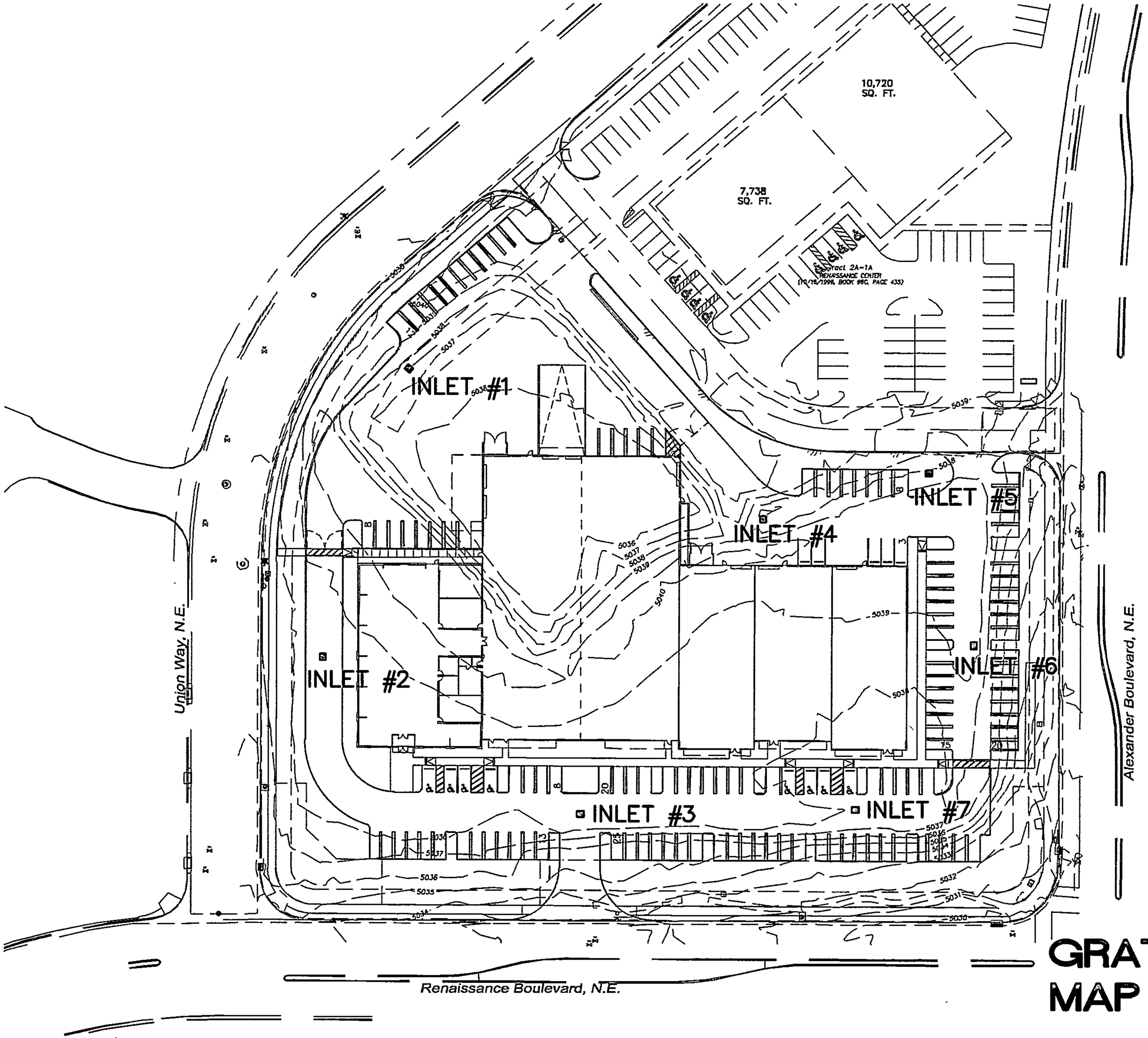
Peak Discharge (cfs/acre)		
Zone 2	100-Year	10-Year
Qa	1.56	0.38
Qb	2.28	0.95
Qc	3.14	1.71
Qd	4.70	3.14

4.75 D

5.9 Total

APPENDIX B

Inlet Grates and Curb Cut Capacities



GRATE INLET MAP

Capacity of a Single 'D' Storm Drop Inlet

Capacity of the grate:

L = 40" - 2(2"$_{ends}$) - 7(½" $_{middle\ bars}$)
= 32 1/2"
= 2.7083'

W = 25" - 13(½" $_{middle\ bars}$)
= 18.5"
= 1.54'

Area = 2.7083' x 1.54'
= 4.18 ft^2

Effective Area = 4.18- 4.18 (0.5 $_{clogging\ factor}$)
= 2.09 ft^2 at the grate

Orifice Equation

Q = CA sqrt(2gH)
Q = 0.6*2.09*sqrt(2*32.2*0.67)
Q = 8.24 cfs

Grate Capacities			
Inlet ID	Inlet Type	Q Allowed (cfs)	Q Required (cfs)
#1	Single D	8.24	5.09
#2	Single D	8.24	0.63
#3	Single D	8.24	3.34
#4	Single D	8.24	3.06
#5	Single D	8.24	4.50
#6	Single D	8.24	1.82
#7	Single D	8.24	2.01

Capacity of a Four and a Half Foot Curb Cut

Use Weir Equation:

$Q = CL(H)^{3/2}$

Q = Discharge (cfs)
C = Coefficient of Discharge = 2.95
L = Length of Curb Cut (ft) = 4.5 ft
H = Height of Curb Cut (ft) = 0.5 ft

$Q = 2.95 * 4.5 * (0.5)^{3/2}$

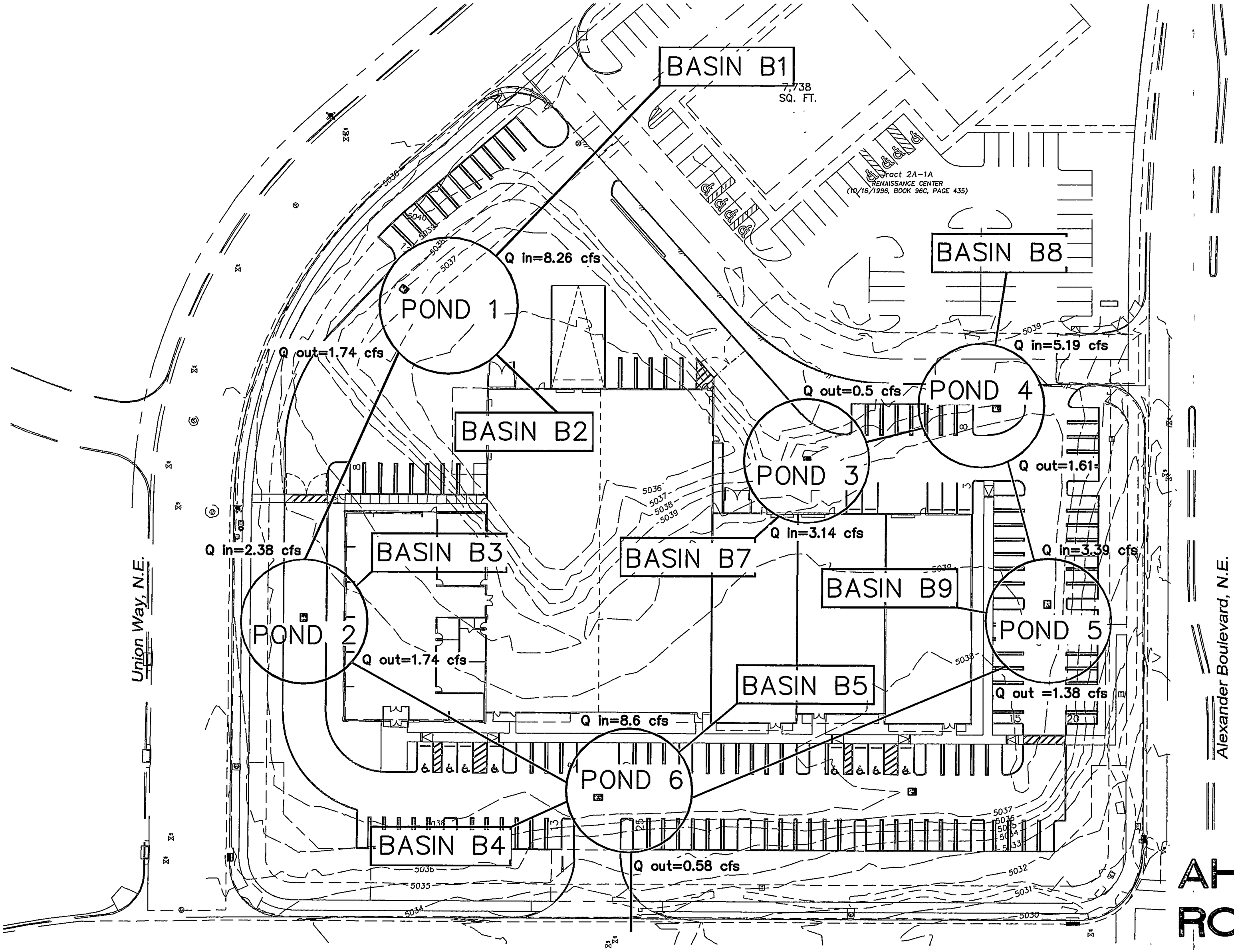
Q = 4.69 cfs

$Q_{required}$ = 4.50 cfs (Basin B8) < $Q_{capacity}$ = 4.69 cfs

Therefore Curb Cut is OK

APPENDIX C

Hydraulic Calculations and AHYMO Modeling



AHYMO ROUTING TREE

Pond 1
Volume Calculations

A_b - Bottom Of The Pond Surface Area
A_t - Top Of The Pond Surface Area
D - Water Depth
D_t - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = $A_b * D + 0.5 * C * D^2$
$C = (A_t - A_b) / D_t$

A_b =	8.52	ft^2
A_t =	17,825.91	ft^2
D_t =	0.80	ft
C =	22271.74	

ACTUAL ELEVATION	DEPTH (ft)	VOLUME (ac-ft)	Q (cfs)	Note
5032.00	0.00	0	0.0000	Invert Elevation
5033.00	1.00	0.0002	0.6117	
5034.00	2.00	0.0004	0.9219	
5035.00	3.00	0.0006	1.1514	
5036.00	4.00	0.0008	1.3422	
5037.00	5.00	0.0010	1.5091	
5037.80	5.80	0.0011	1.6303	Grate Elevation
5038.00	6.00	0.0114	1.6593	
5038.20	6.20	0.0421	1.6877	
5038.40	6.40	0.0933	1.7157	
5038.60	6.60	0.1649	1.7432	MWSE

Orifice Equation

$Q = CA(2gH)^{1/2}$

C =	0.6
Diameter (in)	5.125
Area (ft^2)=	0.143
g =	32.2
H (ft) =	Depth of water above center of orifice
Q (cfs)=	Flow

Pond 2
Volume Calculations

A_b - Bottom Of The Pond Surface Area
A_t - Top Of The Pond Surface Area
D - Water Depth
D_t - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = $A_b * D + 0.5 * C * D^2$
$C = (A_t - A_b) / D_t$

A_b =	8.52	ft^2
A_t =	2,515.00	ft^2
D_t =	0.80	ft
C =	3133.10	

ACTUAL ELEVATION	DEPTH (ft)	VOLUME (ac-ft)	Q (cfs)	Note
5030.70	0.00	0	0.0000	Invert Elevation
5031.70	1.00	0.0002	0.6398	
5032.70	2.00	0.0004	0.9661	
5033.70	3.00	0.0006	1.2071	
5034.70	4.00	0.0008	1.4075	
5035.70	5.00	0.0010	1.5827	
5035.90	5.20	0.0010	1.6155	Grate Elevation
5036.10	5.40	0.0025	1.6476	
5036.30	5.60	0.0068	1.6791	
5036.50	5.80	0.0141	1.7100	
5036.70	6.00	0.0242	1.7404	MWSE

Orifice Equation

$Q = CA(2gH)^{1/2}$

C =	0.6
Diameter (in)	5.25
Area (ft^2)=	0.150
g =	32.2
H (ft) =	Depth of water above center of orifice
Q (cfs)=	Flow

Pond 3
Volume Calculations

A_b - Bottom Of The Pond Surface Area
A_t - Top Of The Pond Surface Area
D - Water Depth
D_t - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = $A_b * D + 0.5 * C * D^2$
$C = (A_t - A_b) / D_t$

A_b =	8.52	ft^2
A_t =	7,229.56	ft^2
D_t =	0.80	ft
C =	9026.30	

ACTUAL ELEVATION	DEPTH (ft)	VOLUME (ac-ft)	Q (cfs)	Note
5032.00	0.00	0	0.0000	Invert Elevation
5033.00	1.00	0.0002	0.1869	
5034.00	2.00	0.0004	0.2727	
5035.00	3.00	0.0006	0.3374	
5036.00	4.00	0.0008	0.3915	
5037.00	5.00	0.0010	0.4390	
5037.55	5.55	0.0011	0.4630	Grate Elevation
5037.75	5.75	0.0053	0.4715	
5037.95	5.95	0.0177	0.4798	
5038.15	6.15	0.0385	0.4879	
5038.35	6.35	0.0676	0.4959	MWSE

Orifice Equation
$Q = CA(2gH)^{1/2}$

C =	0.6
Diameter (in)	2.75
Area (ft^2)=	0.041
g =	32.2
H (ft) =	Depth of water above center of orifice
Q (cfs)=	Flow

Pond 4
Volume Calculations

A_b - Bottom Of The Pond Surface Area
A_t - Top Of The Pond Surface Area
D - Water Depth
D_t - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = $A_b * D + 0.5 * C * D^2$
$C = (A_t - A_b) / D_t$

A_b =	982.70	ft^2
A_t =	2,656.20	ft^2
D_t =	2.00	ft
C =	836.75	

ACTUAL ELEVATION	DEPTH (ft)	VOLUME (ac-ft)	Q (cfs)	Note
29.80	0.00	0	0.0000	Invert Elevation
30.80	1.00	0.0002	0.5307	
31.80	2.00	0.0004	0.7954	
32.80	3.00	0.0006	0.9919	
33.80	4.00	0.0008	1.1554	
34.80	5.00	0.0010	1.2984	
35.50	5.70	0.0011	1.3899	Grate Elevation
35.75	5.95	0.0074	1.4211	
36.00	6.20	0.0148	1.4516	
36.25	6.45	0.0234	1.4816	
36.50	6.70	0.0333	1.5109	
36.75	6.95	0.0443	1.5397	
37.00	7.20	0.0566	1.5679	
37.25	7.45	0.0700	1.5957	
37.50	7.70	0.0847	1.6229	MWSE

Orifice Equation
$Q = CA(2gH)^{1/2}$

C =	0.6
Diameter (in)	4.75
Area (ft^2)=	0.123
g =	32.2
H (ft) =	Depth of water above center of orifice
Q (cfs)=	Flow

Pond 5
Volume Calculations

A_b - Bottom Of The Pond Surface Area
A_t - Top Of The Pond Surface Area
D - Water Depth
D_t - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = $A_b * D + 0.5 * C * D^2$
$C = (A_t - A_b) / D_t$

A_b =	8.52	ft^2
A_t =	9,844.29	ft^2
D_t =	0.80	ft
C =	12294.71	

ACTUAL ELEVATION	DEPTH (ft)	VOLUME (ac-ft)	Q (cfs)	Note
5026.50	0.00	0	0.0000	Invert Elevation
5027.50	1.00	0.0002	0.3836	
5028.50	2.00	0.0004	0.5689	
5029.50	3.00	0.0006	0.7073	
5030.50	4.00	0.0008	0.8227	
5031.50	5.00	0.0010	0.9238	
5032.50	6.00	0.0012	1.0148	
5033.50	7.00	0.0014	1.0984	
5034.50	8.00	0.0016	1.1760	
5035.50	9.00	0.0018	1.2488	
5036.75	10.25	0.0020	1.3343	Grate Elevation
5036.95	10.45	0.0077	1.3474	
5037.15	10.65	0.0247	1.3605	
5037.35	10.85	0.0529	1.3734	
5037.55	11.05	0.0925	1.3862	MWSE

Orifice Equation
$Q = CA(2gH)^{1/2}$

C =	0.6	
Diameter (in)	4	
Area (ft^2)=	0.087	
g =	32.2	
H (ft) =	Depth of water above center of orifice	
Q (cfs)=	Flow	

Pond 6/Subsurface Detention
Volume Calculations

A_b - Bottom Of The Pond Surface Area
A_t - Top Of The Pond Surface Area
D - Water Depth
D_t - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = $A_b * D + 0.5 * C * D^2$
$C = (A_t - A_b) / D_t$

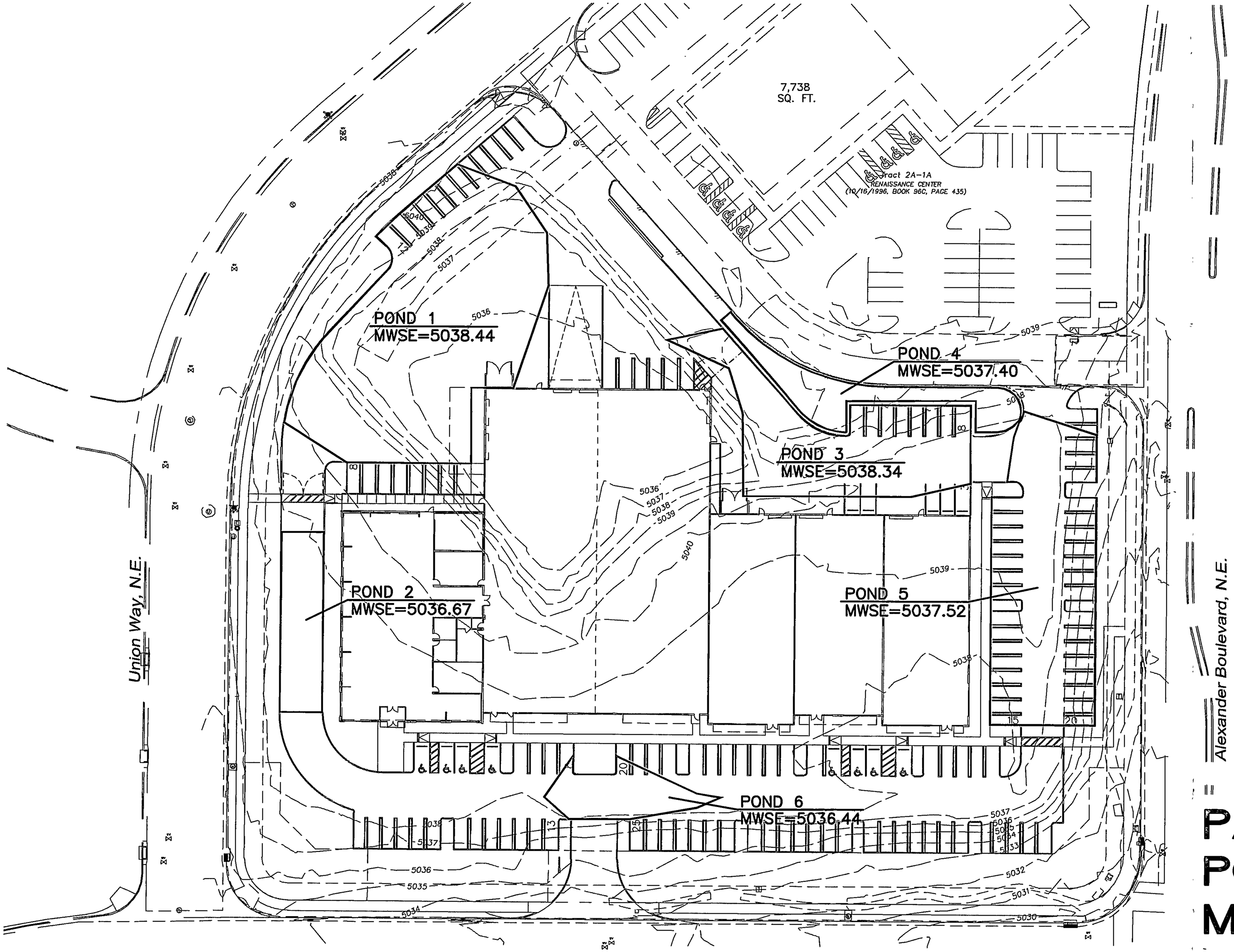
A_b = 8.52 ft^2
A_t = 2,088.07 ft^2
D_t = 0.50 ft
C = 4159.10

Underground
CMP Length= 850
(84" dia.)

ACTUAL ELEVATION	DEPTH (ft)	VOLUME (ac-ft)	Q (cfs)	Note
26.00	0.00	0	0.0000	Subsurface Bottom
26.50	0.50	0.0232	0.1131	
27.00	1.00	0.0650	0.1708	
27.50	1.50	0.1171	0.2134	
28.00	2.00	0.1758	0.2488	Inlet Invert
28.50	2.50	0.2393	0.2798	
29.00	3.00	0.3060	0.3077	
29.50	3.50	0.3738	0.3332	
30.00	4.00	0.4418	0.3569	
30.50	4.50	0.5090	0.3792	
31.00	5.00	0.5719	0.4002	
31.60	5.60	0.6304	0.4240	
32.00	6.00	0.6830	0.4392	
32.50	6.50	0.7248	0.4575	
33.00	7.00	0.7519	0.4750	Subsurface Top
33.60	7.60	0.7520	0.4953	
34.60	8.60	0.7522	0.5273	
35.60	9.60	0.7524	0.5575	
36.00	10.00	0.7524	0.5691	Grate Elevation
36.20	10.20	0.7544	0.5748	
36.40	10.40	0.7602	0.5805	
36.50	10.50	0.7645	0.5833	MWSE

Orifice Equation
$Q = CA(2gH)^{1/2}$

C = 0.6
Diameter (in) 2.625
Area (ft^2)= 0.038
g = 32.2
H (ft) = Depth of water above center of orifice
Q (cfs)= Flow



PARKING LOT PONDING: MWSE

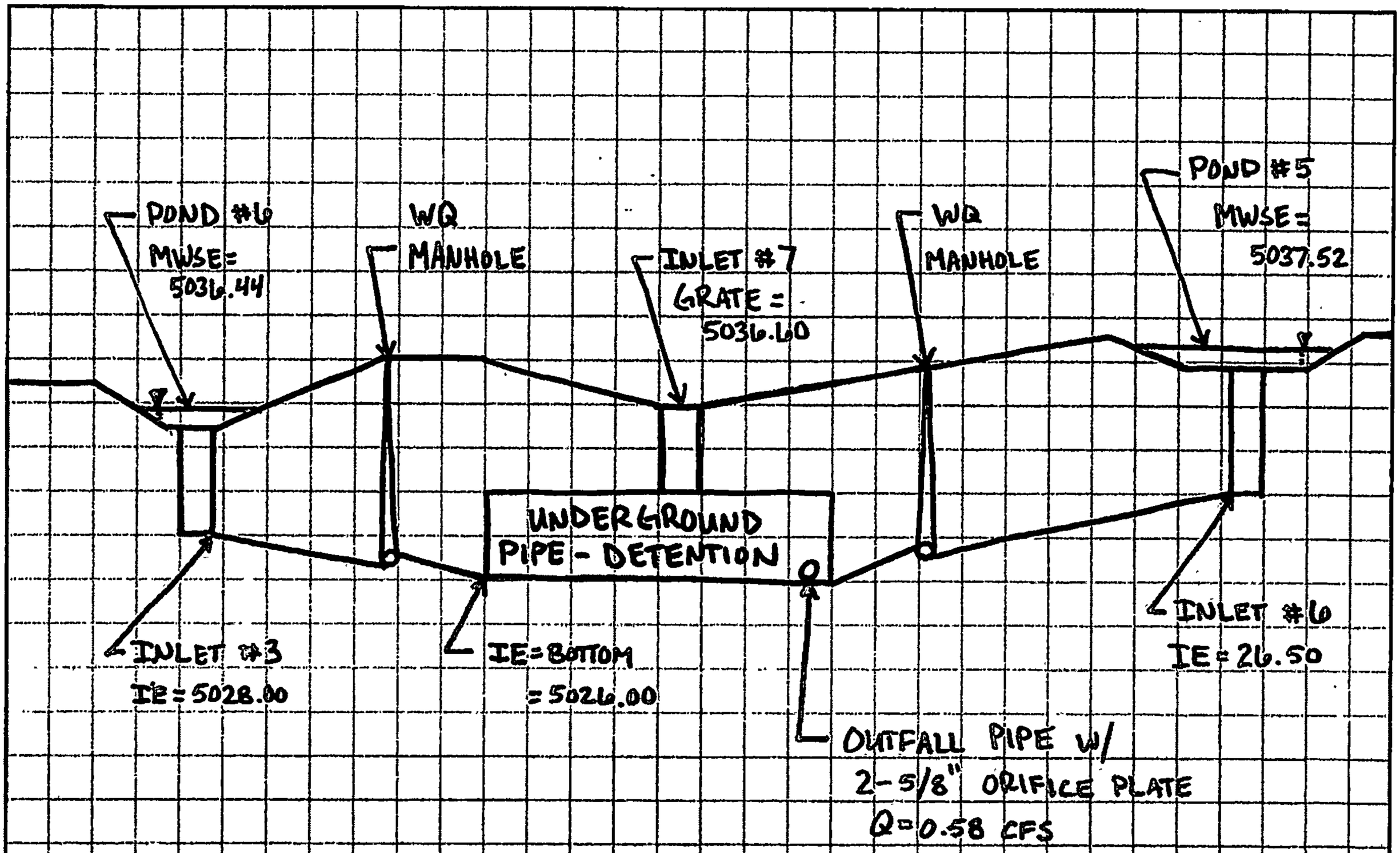
TIERRA WEST, LLC

Project BEDROSIANS TILE + STONE Date

Project No. 2014084

Meeting Purpose Sheet No ___ of ___

Attendees



DETENTION POND SYSTEM SCHEMATIC

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

INPUT

```
**********************************************************************
*          BEDROSIANS TILE AND STONE, ALBUQUERQUE, NM                *
**********************************************************************
*  100-YEAR 24-HR STORM (UNDER PROPOSED CONDITIONS) W/ ROUTING       *
**********************************************************************
START                   TIME=0.0
*
*
RAINFALL                TYPE=2 RAIN QUARTER=0.0 IN
                        RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                        RAIN DAY=2.75 IN DT=0.05 HR
*
*BASIN B1
*
COMPUTE NM HYD          ID=1 HYD NO=100.1 AREA=0.00102 SQ MI
                        PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.0
                        TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1
*
*
*BASIN B2
*
COMPUTE NM HYD          ID=2 HYD NO=200.1 AREA=0.00175 SQ MI
                        PER A=0.00 PER B=7.00 PER C=0.00 PER D=93.00
                        TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD               ID=2 CODE=1
*
*BASIN B3
*
COMPUTE NM HYD          ID=3 HYD NO=300.1 AREA=0.00024 SQ MI
                        PER A=0.00 PER B=24.00 PER C=0.00 PER D=76.0
                        TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD               ID=3 CODE=1
*
*
*BASIN B4
*
COMPUTE NM HYD          ID=4 HYD NO=400.1 AREA=0.00118 SQ MI
                        PER A=0.00 PER B=11.0 PER C=0.00 PER D=89.00
                        TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD               ID=4 CODE=1
*
*
*BASIN B5
*
COMPUTE NM HYD          ID=5 HYD NO=500.1 AREA=0.00069 SQ MI
                        PER A=0.00 PER B=6.00 PER C=0.00 PER D=94.00
                        TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD               ID=5 CODE=1
*
*
*BASIN B6
*
COMPUTE NM HYD          ID=6 HYD NO=600.1 AREA=0.00006 SQ MI
                        PER A=0.00 PER B=0.00 PER C=0.00 PER D=100.0
                        TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD               ID=6 CODE=1
*
*
*BASIN B7
*
COMPUTE NM HYD          ID=7 HYD NO=700.1 AREA=0.00102 SQ MI
                        PER A=0.00 PER B=1.00 PER C=0.00 PER D=99.00
```

```
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=7 CODE=1
*
*
*BASIN B8
*
COMPUTE NM HYD      ID=8 HYD NO=800.1 AREA=0.00168 SQ MI
                    PER A=0.00 PER B=21.00 PER C=0.00 PER D=79.0
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=8 CODE=1
*
*
*BASIN B9
*
COMPUTE NM HYD      ID=9 HYD NO=900.1 AREA=0.00063 SQ MI
                    PER A=0.00 PER B=8.00 PER C=0.00 PER D=92.00
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=9 CODE=1
*
*
*ADD BASINS B1 AND B2
*
ADD HYD             ID=12 HYD NO=120.1 ID=1 ID=2
PRINT HYD           ID=12 CODE=1
*
*
*ROUTE BASINS B1 AND B2 THROUGH POND 1
*
ROUTE RESERVOIR     ID=22 HYD NO=200.2 INFLOW ID=12 CODE=24
                    OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                    0.0000       0.0000         5032.00
                    0.6117       0.0002         5033.00
                    0.9219       0.0004         5034.00
                    1.1514       0.0006         5035.00
                    1.3422       0.0008         5036.00
                    1.5091       0.0010         5037.00
                    1.6303       0.0011         5037.80
                    1.6593       0.0114         5038.00
                    1.6877       0.0421         5038.20
                    1.7157       0.0933         5038.40
                    1.7432       0.1649         5038.60
*
PRINT HYD           ID=22 CODE=1
*
*
*ADD POND 1 AND BASIN B3
*
*
ADD HYD             ID=23 HYD NO=200.3 ID=22 ID=3
PRINT HYD           ID=23 CODE=1
*
*
*ROUTE POND 1 AND BASIN B3 THROUGH POND 2
*
ROUTE RESERVOIR     ID=33 HYD NO=300.3 INFLOW ID=23 CODE=24
                    OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                    0.0000       0.0000         5030.70
                    0.6398       0.0002         5031.70
                    0.9661       0.0004         5032.70
                    1.2071       0.0006         5033.70
                    1.4075       0.0008         5034.70
                    1.5827       0.0010         5035.70
                    1.6155       0.0010         5035.90
```

```
                    1.6476        0.0025          5036.10
                    1.6791        0.0068          5036.30
                    1.7100        0.0141          5036.50
                    1.7404        0.0242          5036.70
*
PRINT HYD           ID=33 CODE=1
*
*
*ADD POND 2 AND BASIN B4
*
ADD HYD             ID=34 HYD NO=340.1 ID=33 ID=4
*
*ADD POND 2, BASIN B4 AND BASIN B5
*
ADD HYD             ID=45 HYD NO=450.1 ID=34 ID=5
*
*
*ROUTE BASIN B7 THROUGH POND 3
*
ROUTE RESERVOIR     ID=77 HYD NO=700.7 INFLOW ID=7 CODE=24
                    OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                    0.0000        0.0000          5032.00
                    0.1869        0.0002          5033.00
                    0.2727        0.0004          5034.00
                    0.3374        0.0006          5035.00
                    0.3915        0.0008          5036.00
                    0.4390        0.0010          5037.00
                    0.4630        0.0011          5037.55
                    0.4715        0.0053          5037.75
                    0.4798        0.0177          5037.95
                    0.4879        0.0385          5038.15
                    0.4959        0.0676          5038.35
*
PRINT HYD           ID=77 CODE=1
*
*
*ADD POND 3 AND BASIN B8
*
ADD HYD             ID=78 HYD NO=780.1 ID=77 ID=8
PRINT HYD           ID=78 CODE=1
*
*
*ROUTE BASIN B7 AND POND 3 THROUGH POND 4
*
ROUTE RESERVOIR     ID=88 HYD NO=800.8 INFLOW ID=78 CODE=24
                    OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                    0.0000        0.0000          5029.80
                    0.5307        0.0002          5030.80
                    0.7954        0.0004          5031.80
                    0.9919        0.0006          5032.80
                    1.1554        0.0008          5033.80
                    1.2984        0.0010          5034.80
                    1.3899        0.0011          5035.50
                    1.4211        0.0074          5035.75
                    1.4516        0.0148          5036.00
                    1.4816        0.0234          5036.25
                    1.5109        0.0333          5036.50
                    1.5397        0.0443          5036.75
                    1.5679        0.0566          5037.00
                    1.5957        0.0700          5037.25
                    1.6229        0.0847          5037.50
*
PRINT HYD           ID=88 CODE=1
```

```
*
*
*ADD POND 4 AND BASIN B9
*
ADD HYD              ID=89 HYD NO=890.1 ID=88 ID=9
PRINT HYD            ID=89 CODE=1
*
*
*ROUTE POND 4 AND BASIN B9 THROUGH POND 5
*
ROUTE RESERVOIR      ID=99 HYD NO=900.9 INFLOW ID=89 CODE=24
                     OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                     0.0000       0.0000         5026.50
                     0.3836       0.0002         5027.50
                     0.5689       0.0004         5028.50
                     0.7073       0.0006         5029.50
                     0.8227       0.0008         5030.50
                     0.9238       0.0010         5031.50
                     1.0148       0.0012         5032.50
                     1.0984       0.0014         5033.50
                     1.1760       0.0016         5034.50
                     1.2488       0.0018         5035.50
                     1.3343       0.0020         5036.75
                     1.3474       0.0077         5036.95
                     1.3605       0.0247         5037.15
                     1.3734       0.0529         5037.35
                     1.3862       0.0925         5037.55
*
PRINT HYD            ID=99 CODE=1
*
*
*ADD POND 5 AND BASINS B4,B5 AND POND 2
*
ADD HYD              ID=69 HYD NO=690.1 ID=45 ID=99
PRINT HYD            ID=69 CODE=1
*
*ROUTE POND 5,POND 2,B4,B5 THROUGH POND 6/UNDERGROUND CMP
*
ROUTE RESERVOIR      ID=55 HYD NO=500.5 INFLOW ID=69 CODE=24
                     OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                     0.0000       0.0000         5026.00
                     0.1131       0.0232         5026.50
                     0.1708       0.0650         5027.00
                     0.2134       0.1171         5027.50
                     0.2488       0.1758         5028.00
                     0.2798       0.2393         5028.50
                     0.3077       0.3060         5029.00
                     0.3332       0.3738         5029.50
                     0.3569       0.4418         5030.00
                     0.3792       0.5090         5030.50
                     0.4002       0.5719         5031.00
                     0.4240       0.6304         5031.60
                     0.4392       0.6830         5032.00
                     0.4575       0.7248         5032.50
                     0.4750       0.7519         5033.00
                     0.4953       0.7520         5033.60
                     0.5273       0.7522         5034.60
                     0.5575       0.7524         5035.60
                     0.5691       0.7524         5036.00
                     0.5748       0.7544         5036.20
                     0.5805       0.7602         5036.40
                     0.5833       0.7645         5036.50
*
```

```
PRINT HYD            ID=55 CODE=1
*
FINISH
```

OUTPUT

```
AHYMO PROGRAM (AHYMO-S4)                    - Version: S4.01a - Rel: 01a
     RUN DATE (MON/DAY/YR) = 05/12/2016
     START TIME (HR:MIN:SEC) = 14:38:41     USER NO.=
AHYMO_Temp_User:20122010
     INPUT FILE = Z:\2014\2014084 Bedrosian's Tile and
Stone\Drainage\2014084 hymo 5-11-16.txt

**********************************************************************
*          BEDROSIANS TILE AND STONE, ALBUQUERQUE, NM                *
**********************************************************************
*  100-YEAR 24-HR STORM (UNDER PROPOSED CONDITIONS) W/ ROUTING       *
**********************************************************************
START                TIME=0.0
*
*
RAINFALL             TYPE=2 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                     RAIN DAY=2.75 IN DT=0.05 HR

                 24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
AREAS (NM & AZ) - D1
                 DT =   0.050000 HOURS       END TIME =    24.000002 HOURS
                   0.0000  0.0023  0.0046  0.0071  0.0099  0.0127  0.0159
                   0.0203  0.0272  0.0347  0.0424  0.0509  0.0595  0.0684
                   0.0776  0.0870  0.0974  0.1084  0.1204  0.1437  0.1728
                   0.2117  0.2559  0.3104  0.3831  0.4649  0.6062  0.8258
                   1.2021  1.4666  1.6752  1.7800  1.8719  1.9379  1.9905
                   2.0362  2.0697  2.1005  2.1259  2.1418  2.1530  2.1629
                   2.1722  2.1803  2.1879  2.1953  2.2025  2.2084  2.2118
                   2.2152  2.2186  2.2217  2.2247  2.2278  2.2307  2.2336
                   2.2363  2.2391  2.2417  2.2443  2.2469  2.2494  2.2518
                   2.2542  2.2565  2.2588  2.2611  2.2633  2.2654  2.2676
                   2.2697  2.2717  2.2738  2.2758  2.2778  2.2798  2.2817
                   2.2837  2.2856  2.2874  2.2893  2.2911  2.2930  2.2948
                   2.2965  2.2983  2.3000  2.3017  2.3034  2.3051  2.3068
                   2.3084  2.3100  2.3117  2.3133  2.3148  2.3164  2.3180
                   2.3195  2.3210  2.3225  2.3240  2.3255  2.3269  2.3284
                   2.3298  2.3313  2.3327  2.3341  2.3355  2.3368  2.3382
                   2.3396  2.3409  2.3422  2.3436  2.3449  2.3462  2.3474
                   2.3487  2.3500  2.3513  2.3525  2.3538  2.3551  2.3563
                   2.3576  2.3589  2.3601  2.3614  2.3627  2.3639  2.3652
                   2.3665  2.3677  2.3690  2.3702  2.3715  2.3728  2.3740
                   2.3753  2.3765  2.3778  2.3790  2.3803  2.3815  2.3828
                   2.3840  2.3853  2.3865  2.3878  2.3890  2.3903  2.3915
                   2.3927  2.3940  2.3952  2.3965  2.3977  2.3989  2.4002
                   2.4014  2.4027  2.4039  2.4051  2.4064  2.4076  2.4088
                   2.4101  2.4113  2.4125  2.4137  2.4150  2.4162  2.4174
                   2.4186  2.4199  2.4211  2.4223  2.4235  2.4247  2.4260
                   2.4272  2.4284  2.4296  2.4308  2.4320  2.4333  2.4345
                   2.4357  2.4369  2.4381  2.4393  2.4405  2.4417  2.4429
                   2.4441  2.4453  2.4465  2.4478  2.4490  2.4502  2.4514
                   2.4526  2.4538  2.4550  2.4561  2.4573  2.4585  2.4597
                   2.4609  2.4621  2.4633  2.4645  2.4657  2.4669  2.4681
                   2.4692  2.4704  2.4716  2.4728  2.4740  2.4752  2.4764
                   2.4775  2.4787  2.4799  2.4811  2.4822  2.4834  2.4846
                   2.4858  2.4869  2.4881  2.4893  2.4905  2.4916  2.4928
                   2.4940  2.4951  2.4963  2.4975  2.4986  2.4998  2.5010
                   2.5021  2.5033  2.5044  2.5056  2.5068  2.5079  2.5091
                   2.5102  2.5114  2.5125  2.5137  2.5148  2.5160  2.5171
                   2.5183  2.5194  2.5206  2.5217  2.5229  2.5240  2.5252
                   2.5263  2.5274  2.5286  2.5297  2.5309  2.5320  2.5331
                   2.5343  2.5354  2.5365  2.5377  2.5388  2.5399  2.5411
```

2.5422	2.5433	2.5445	2.5456	2.5467	2.5478	2.5490
2.5501	2.5512	2.5523	2.5535	2.5546	2.5557	2.5568
2.5579	2.5590	2.5602	2.5613	2.5624	2.5635	2.5646
2.5657	2.5668	2.5679	2.5691	2.5702	2.5713	2.5724
2.5735	2.5746	2.5757	2.5768	2.5779	2.5790	2.5801
2.5812	2.5823	2.5834	2.5845	2.5856	2.5867	2.5878
2.5889	2.5899	2.5910	2.5921	2.5932	2.5943	2.5954
2.5965	2.5976	2.5986	2.5997	2.6008	2.6019	2.6030
2.6040	2.6051	2.6062	2.6073	2.6084	2.6094	2.6105
2.6116	2.6126	2.6137	2.6148	2.6159	2.6169	2.6180
2.6191	2.6201	2.6212	2.6223	2.6233	2.6244	2.6254
2.6265	2.6276	2.6286	2.6297	2.6307	2.6318	2.6328
2.6339	2.6350	2.6360	2.6371	2.6381	2.6392	2.6402
2.6413	2.6423	2.6433	2.6444	2.6454	2.6465	2.6475
2.6486	2.6496	2.6506	2.6517	2.6527	2.6538	2.6548
2.6558	2.6569	2.6579	2.6589	2.6600	2.6610	2.6620
2.6630	2.6641	2.6651	2.6661	2.6672	2.6682	2.6692
2.6702	2.6712	2.6723	2.6733	2.6743	2.6753	2.6763
2.6774	2.6784	2.6794	2.6804	2.6814	2.6824	2.6834
2.6844	2.6854	2.6865	2.6875	2.6885	2.6895	2.6905
2.6915	2.6925	2.6935	2.6945	2.6955	2.6965	2.6975
2.6985	2.6995	2.7005	2.7015	2.7025	2.7034	2.7044
2.7054	2.7064	2.7074	2.7084	2.7094	2.7104	2.7114
2.7123	2.7133	2.7143	2.7153	2.7163	2.7172	2.7182
2.7192	2.7202	2.7211	2.7221	2.7231	2.7241	2.7250
2.7260	2.7270	2.7280	2.7289	2.7299	2.7309	2.7318
2.7328	2.7338	2.7347	2.7357	2.7366	2.7376	2.7386
2.7395	2.7405	2.7414	2.7424	2.7433	2.7443	2.7452
2.7462	2.7472	2.7481	2.7491	2.7500		

```
*
*BASIN B1
*
COMPUTE NM HYD        ID=1 HYD NO=100.1 AREA=0.00102 SQ MI
                      PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.0
                      TP=-0.1333 HR MASS RAINFALL=-1

        K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
        UNIT PEAK =   3.6243    CFS   UNIT VOLUME =   0.9959       B =   526.28
 P60 = 2.0100
        AREA =     0.000918 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


        K =  0.132088HR    TP =  0.133300HR    K/TP RATIO =  0.990905     SHAPE
CONSTANT, N =  3.562974
        UNIT PEAK =  0.24861    CFS   UNIT VOLUME =   0.9487       B =   324.90
 P60 = 2.0100
        AREA =     0.000102 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD             ID=1 CODE=1

                                        PARTIAL HYDROGRAPH   100.10


        RUNOFF VOLUME =      2.34994 INCHES      =       0.1278 ACRE-FEET
        PEAK DISCHARGE RATE =       3.02 CFS  AT   1.500 HOURS   BASIN AREA =
```

```
0.0010 SQ. MI.


    *
    *
    *BASIN B2
    *
    COMPUTE NM HYD       ID=2 HYD NO=200.1 AREA=0.00175 SQ MI
                         PER A=0.00 PER B=7.00 PER C=0.00 PER D=93.00
                         TP=-0.1333 HR MASS RAINFALL=-1

          K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
          UNIT PEAK =   6.4255    CFS   UNIT VOLUME =   0.9975       B =   526.28
 P60 = 2.0100
          AREA =     0.001628 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


          K =  0.132088HR    TP =  0.133300HR    K/TP RATIO =  0.990905     SHAPE
CONSTANT, N =  3.562974
          UNIT PEAK =  0.29858    CFS   UNIT VOLUME =   0.9549       B =   324.90
 P60 = 2.0100
          AREA =     0.000123 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD            ID=2 CODE=1

                                        PARTIAL HYDROGRAPH   200.10


        RUNOFF VOLUME =      2.39649 INCHES      =       0.2237 ACRE-FEET
        PEAK DISCHARGE RATE =       (5.24 CFS) AT   1.500 HOURS   BASIN AREA =
0.0018 SQ. MI.


    *
    *BASIN B3
    *
    COMPUTE NM HYD       ID=3 HYD NO=300.1 AREA=0.00024 SQ MI
                         PER A=0.00 PER B=24.00 PER C=0.00 PER D=76.0
                         TP=-0.1333 HR MASS RAINFALL=-1

          K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
          UNIT PEAK =  0.72013    CFS   UNIT VOLUME =   0.9832       B =   526.28
 P60 = 2.0100
          AREA =     0.000182 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


          K =  0.132088HR    TP =  0.133300HR    K/TP RATIO =  0.990905     SHAPE
CONSTANT, N =  3.562974
          UNIT PEAK =  0.14039    CFS   UNIT VOLUME =   0.9027       B =   324.90
 P60 = 2.0100
```

AREA = 0.000058 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=3 CODE=1

HYDROGRAPH FROM AREA 300.10

RUNOFF VOLUME = 2.13271 INCHES = 0.0273 ACRE-FEET
PEAK DISCHARGE RATE = 0.68 CFS AT 1.500 HOURS BASIN AREA = 0.0002 SQ. MI.

*
*
*BASIN B4
*
COMPUTE NM HYD ID=4 HYD NO=400.1 AREA=0.00118 SQ MI
PER A=0.00 PER B=11.0 PER C=0.00 PER D=89.00
TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 4.1462 CFS UNIT VOLUME = 0.9966 B = 526.28 P60 = 2.0100
AREA = 0.001050 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

K = 0.132088HR TP = 0.133300HR K/TP RATIO = 0.990905 SHAPE CONSTANT, N = 3.562974
UNIT PEAK = 0.31637 CFS UNIT VOLUME = 0.9604 B = 324.90 P60 = 2.0100
AREA = 0.000130 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA 400.10

RUNOFF VOLUME = 2.33442 INCHES = 0.1469 ACRE-FEET
PEAK DISCHARGE RATE = 3.47 CFS AT 1.500 HOURS BASIN AREA = 0.0012 SQ. MI.

*
*
*BASIN B5
*
COMPUTE NM HYD ID=5 HYD NO=500.1 AREA=0.00069 SQ MI
PER A=0.00 PER B=6.00 PER C=0.00 PER D=94.00
TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE

```
CONSTANT, N =  7.106428
        UNIT PEAK =   2.5607    CFS   UNIT VOLUME =   0.9951       B =   526.28
 P60 = 2.0100
        AREA =     0.000649 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


        K =  0.132088HR    TP =  0.133300HR    K/TP RATIO =  0.990905     SHAPE
CONSTANT, N =  3.562974
        UNIT PEAK =  0.10091    CFS   UNIT VOLUME =   0.8744       B =   324.90
 P60 = 2.0100
        AREA =     0.000041 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=5 CODE=1

                                        OUTFLOW HYDROGRAPH RESERVOIR   500.10


        RUNOFF VOLUME =     2.41201 INCHES     =       0.0888 ACRE-FEET
        PEAK DISCHARGE RATE =      (2.09 CFS) AT   1.500 HOURS   BASIN AREA =
0.0007 SQ. MI.


    *
    *
    *(BASIN B6)
    *
    COMPUTE NM HYD      ID=6 HYD NO=600.1 AREA=0.00006 SQ MI
                        PER A=0.00 PER B=0.00 PER C=0.00 PER D=100.0
                        TP=-0.1333 HR MASS RAINFALL=-1

        K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
        UNIT PEAK =  0.23688    CFS   UNIT VOLUME =   0.9593       B =   526.28
 P60 = 2.0100
        AREA =     0.000060 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=6 CODE=1

                                        HYDROGRAPH FROM AREA   600.10


        RUNOFF VOLUME =     2.50511 INCHES     =       0.0080 ACRE-FEET
        PEAK DISCHARGE RATE =      (0.19 CFS) AT   1.500 HOURS   BASIN AREA =
0.0001 SQ. MI.


    *
    *
    *(BASIN B7)
    *
    COMPUTE NM HYD      ID=7 HYD NO=700.1 AREA=0.00102 SQ MI
                        PER A=0.00 PER B=1.00 PER C=0.00 PER D=99.00
```

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

        K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
        UNIT PEAK =   3.9867    CFS   UNIT VOLUME =   0.9966       B =   526.28
 P60 = 2.0100
        AREA =     0.001010 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

        K =  0.132088HR    TP =  0.133300HR    K/TP RATIO =  0.990905     SHAPE
CONSTANT, N =  3.562974
        UNIT PEAK =  0.24861E-01CFS   UNIT VOLUME =   0.8744       B =   324.90
 P60 = 2.0100
        AREA =     0.000010 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=7 CODE=1

                                                HYDROGRAPH FROM AREA   700.10


        RUNOFF VOLUME =     2.48959 INCHES     =       0.1354 ACRE-FEET
        PEAK DISCHARGE RATE =      3.14 CFS  AT   1.500 HOURS   BASIN AREA =
0.0010 SQ. MI.


    *
    *
    *BASIN B8
    *
    COMPUTE NM HYD      ID=8 HYD NO=800.1 AREA=0.00168 SQ MI
                        PER A=0.00 PER B=21.00 PER C=0.00 PER D=79.0
                        TP=-0.1333 HR MASS RAINFALL=-1

        K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
        UNIT PEAK =   5.2399    CFS   UNIT VOLUME =   0.9971       B =   526.28
 P60 = 2.0100
        AREA =     0.001327 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


        K =  0.132088HR    TP =  0.133300HR    K/TP RATIO =  0.990905     SHAPE
CONSTANT, N =  3.562974
        UNIT PEAK =  0.85991    CFS   UNIT VOLUME =   0.9862       B =   324.90
 P60 = 2.0100
        AREA =     0.000353 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=8 CODE=1

                                                HYDROGRAPH FROM AREA   800.10
```

```
        RUNOFF VOLUME =      2.17926 INCHES      =        0.1953 ACRE-FEET
        PEAK DISCHARGE RATE =       (4.71 CFS) AT    1.500 HOURS   BASIN AREA =
0.0017 SQ. MI.


    *
    *
    *(BASIN B9)
    *
    COMPUTE NM HYD       ID=9 HYD NO=900.1 AREA=0.00063 SQ MI
                         PER A=0.00 PER B=8.00 PER C=0.00 PER D=92.00
                         TP=-0.1333 HR MASS RAINFALL=-1

        K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
        UNIT PEAK =   2.2883    CFS   UNIT VOLUME =   0.9941       B =   526.28
 P60 = 2.0100
        AREA =     0.000580 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


        K =  0.132088HR    TP =  0.133300HR    K/TP RATIO =  0.990905     SHAPE
CONSTANT, N =  3.562974
        UNIT PEAK =  0.12284    CFS   UNIT VOLUME =   0.8894       B =   324.90
 P60 = 2.0100
        AREA =     0.000050 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD            ID=9 CODE=1

                                                HYDROGRAPH FROM AREA   900.10


        RUNOFF VOLUME =      2.38098 INCHES      =        0.0800 ACRE-FEET
        PEAK DISCHARGE RATE =       (1.89 CFS) AT    1.500 HOURS   BASIN AREA =
0.0006 SQ. MI.


    *
    *
    *(ADD BASINS B1 AND B2)
    *
    ADD HYD              ID=12 HYD NO=120.1 ID=1 ID=2
    PRINT HYD            ID=12 CODE=1

                                     PARTIAL HYDROGRAPH   120.10

        RUNOFF VOLUME =      2.37913 INCHES      =        0.3515 ACRE-FEET
        PEAK DISCHARGE RATE =       (8.26 CFS) AT    1.500 HOURS   BASIN AREA =
0.0028 SQ. MI.


    *
    *
```

```
*ROUTE BASINS B1 AND B2 THROUGH POND 1
*
ROUTE RESERVOIR      ID=22 HYD NO=200.2 INFLOW ID=12 CODE=24
                     OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                     0.0000       0.0000         5032.00
                     0.6117       0.0002         5033.00
                     0.9219       0.0004         5034.00
                     1.1514       0.0006         5035.00
                     1.3422       0.0008         5036.00
                     1.5091       0.0010         5037.00
                     1.6303       0.0011         5037.80
                     1.6593       0.0114         5038.00
                     1.6877       0.0421         5038.20
                     1.7157       0.0933         5038.40
                     1.7432       0.1649         5038.60

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

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

   0.00      0.00   5032.00     0.000      0.00
   1.20      1.24   5035.15     0.001      1.18
   2.40      0.26   5038.43     0.104      1.72
   3.60      0.02   5032.03     0.000      0.02
   4.80      0.02   5032.04     0.000      0.02
   6.00      0.04   5032.06     0.000      0.04
   7.20      0.04   5032.07     0.000      0.04
   8.40      0.04   5032.07     0.000      0.04
   9.60      0.04   5032.06     0.000      0.04
  10.80      0.04   5032.06     0.000      0.04
  12.00      0.04   5032.06     0.000      0.04
  13.20      0.04   5032.06     0.000      0.04
  14.40      0.04   5032.06     0.000      0.04
  15.60      0.04   5032.06     0.000      0.04
  16.80      0.04   5032.06     0.000      0.04
  18.00      0.03   5032.06     0.000      0.03
  19.20      0.03   5032.06     0.000      0.03
  20.40      0.03   5032.06     0.000      0.03
  21.60      0.03   5032.05     0.000      0.03
  22.80      0.03   5032.05     0.000      0.03
  24.00      0.03   5032.05     0.000      0.03
 PEAK DISCHARGE =        1.736 CFS - PEAK OCCURS AT HOUR    1.90
 MAXIMUM WATER SURFACE ELEVATION =     5038.544
 MAXIMUM STORAGE =        0.1450 AC-FT      INCREMENTAL TIME=   0.050000HRS

*
PRINT HYD            ID=22 CODE=1

                                   PARTIAL HYDROGRAPH   200.20

        RUNOFF VOLUME =     2.38378 INCHES      =       0.3522 ACRE-FEET
        PEAK DISCHARGE RATE =       1.74 CFS  AT   1.900 HOURS   BASIN AREA =
0.0028 SQ. MI.


*
*
*ADD POND 1 AND BASIN B3
*
*
```

```
ADD HYD              ID=23 HYD NO=200.3 ID=22 ID=3
PRINT HYD            ID=23 CODE=1

                                   PARTIAL HYDROGRAPH   200.30

     RUNOFF VOLUME =      2.36368 INCHES      =       0.3794 ACRE-FEET
     PEAK DISCHARGE RATE =       2.38 CFS  AT   1.500 HOURS   BASIN AREA =
0.0030 SQ. MI.


*
*
*ROUTE POND 1 AND BASIN B3 THROUGH POND 2
*
ROUTE RESERVOIR      ID=33 HYD NO=300.3 INFLOW ID=23 CODE=24
                     OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                     0.0000       0.0000         5030.70
                     0.6398       0.0002         5031.70
                     0.9661       0.0004         5032.70
                     1.2071       0.0006         5033.70
                     1.4075       0.0008         5034.70
                     1.5827       0.0010         5035.70
                     1.6155       0.0010         5035.90
                     1.6476       0.0025         5036.10
                     1.6791       0.0068         5036.30
                     1.7100       0.0141         5036.50
                     1.7404       0.0242         5036.70

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

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

      0.00        0.00    5030.70      0.000       0.00
      1.20        1.27    5033.74      0.001       1.22
      2.40        1.73    5036.66      0.022       1.73
      3.60        0.02    5030.71      0.000       0.01
      4.80        0.03    5030.74      0.000       0.03
      6.00        0.04    5030.77      0.000       0.04
      7.20        0.04    5030.77      0.000       0.04
      8.40        0.04    5030.77      0.000       0.04
      9.60        0.04    5030.77      0.000       0.04
     10.80        0.04    5030.77      0.000       0.04
     12.00        0.04    5030.76      0.000       0.04
     13.20        0.04    5030.76      0.000       0.04
     14.40        0.04    5030.76      0.000       0.04
     15.60        0.04    5030.76      0.000       0.04
     16.80        0.04    5030.76      0.000       0.04
     18.00        0.04    5030.76      0.000       0.04
     19.20        0.04    5030.76      0.000       0.04
     20.40        0.04    5030.76      0.000       0.04
     21.60        0.04    5030.75      0.000       0.04
     22.80        0.03    5030.75      0.000       0.03
     24.00        0.03    5030.75      0.000       0.03
 PEAK DISCHARGE =        1.735 CFS - PEAK OCCURS AT HOUR    2.40
 MAXIMUM WATER SURFACE ELEVATION =    5036.665
 MAXIMUM STORAGE =        0.0224 AC-FT      INCREMENTAL TIME=    0.050000HRS

*
PRINT HYD            ID=33 CODE=1
```

HYDROGRAPH FROM AREA 300.30

RUNOFF VOLUME = 2.36754 INCHES = 0.3801 ACRE-FEET
PEAK DISCHARGE RATE = 1.73 CFS AT 2.400 HOURS BASIN AREA = 0.0030 SQ. MI.

```
*
*
*ADD POND 2 AND BASIN B4
*
ADD HYD              ID=34 HYD NO=340.1 ID=33 ID=4
*
*ADD POND 2, BASIN B4 AND BASIN B5
*
ADD HYD              ID=45 HYD NO=450.1 ID=34 ID=5
*
*
*ROUTE BASIN B7 THROUGH POND 3
*
ROUTE RESERVOIR      ID=77 HYD NO=700.7 INFLOW ID=7 CODE=24
                     OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                     0.0000       0.0000         5032.00
                     0.1869       0.0002         5033.00
                     0.2727       0.0004         5034.00
                     0.3374       0.0006         5035.00
                     0.3915       0.0008         5036.00
                     0.4390       0.0010         5037.00
                     0.4630       0.0011         5037.55
                     0.4715       0.0053         5037.75
                     0.4798       0.0177         5037.95
                     0.4879       0.0385         5038.15
                     0.4959       0.0676         5038.35

* * * * * * * * * * * * * * * * *
```

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	5032.00	0.000	0.00
1.20	0.49	5036.39	0.001	0.41
2.40	0.10	5038.27	0.056	0.49
3.60	0.01	5037.83	0.010	0.47
4.80	0.01	5032.05	0.000	0.01
6.00	0.02	5032.08	0.000	0.02
7.20	0.02	5032.09	0.000	0.02
8.40	0.02	5032.09	0.000	0.02
9.60	0.02	5032.08	0.000	0.02
10.80	0.02	5032.08	0.000	0.02
12.00	0.02	5032.08	0.000	0.02
13.20	0.01	5032.08	0.000	0.01
14.40	0.01	5032.08	0.000	0.01
15.60	0.01	5032.08	0.000	0.01
16.80	0.01	5032.08	0.000	0.01
18.00	0.01	5032.07	0.000	0.01
19.20	0.01	5032.07	0.000	0.01
20.40	0.01	5032.07	0.000	0.01
21.60	0.01	5032.07	0.000	0.01
22.80	0.01	5032.07	0.000	0.01
24.00	0.01	5032.07	0.000	0.01

PEAK DISCHARGE = 0.495 CFS - PEAK OCCURS AT HOUR 2.00

```
MAXIMUM WATER SURFACE ELEVATION =     (5038.336)
MAXIMUM STORAGE =         0.0655 AC-FT      INCREMENTAL TIME=    0.050000HRS

*
PRINT HYD            ID=77 CODE=1

                                          HYDROGRAPH FROM AREA   700.70


      RUNOFF VOLUME =     2.48928 INCHES     =       0.1354 ACRE-FEET
      PEAK DISCHARGE RATE =      (0.50 CFS) AT   2.000 HOURS   BASIN AREA =
 0.0010 SQ. MI.


*
*
(*ADD POND 3 AND BASIN B8)
*
ADD HYD              ID=78 HYD NO=780.1 ID=77 ID=8
PRINT HYD            ID=78 CODE=1

                                          HYDROGRAPH FROM AREA   780.10


      RUNOFF VOLUME =     2.29624 INCHES     =       0.3307 ACRE-FEET
      PEAK DISCHARGE RATE =      (5.19 CFS) AT   1.500 HOURS   BASIN AREA =
0.0027 SQ. MI.


*
*
(*ROUTE BASIN B7 AND POND 3 THROUGH POND 4)
*
ROUTE RESERVOIR      ID=88 HYD NO=800.8 INFLOW ID=78 CODE=24
                     OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                     0.0000       0.0000         5029.80
                     0.5307       0.0002         5030.80
                     0.7954       0.0004         5031.80
                     0.9919       0.0006         5032.80
                     1.1554       0.0008         5033.80
                     1.2984       0.0010         5034.80
                     1.3899       0.0011         5035.50
                     1.4211       0.0074         5035.75
                     1.4516       0.0148         5036.00
                     1.4816       0.0234         5036.25
                     1.5109       0.0333         5036.50
                     1.5397       0.0443         5036.75
                     1.5679       0.0566         5037.00
                     1.5957       0.0700         5037.25
                     1.6229       0.0847         5037.50

*  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
```

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	5029.80	0.000	0.00
1.20	1.06	5032.85	0.001	1.00
2.40	0.65	5036.87	0.050	1.55
3.60	0.48	5030.70	0.000	0.48
4.80	0.02	5029.84	0.000	0.02

```
  6.00      0.04   5029.87     0.000      0.04
  7.20      0.04   5029.87     0.000      0.04
  8.40      0.04   5029.87     0.000      0.04
  9.60      0.04   5029.87     0.000      0.04
 10.80      0.04   5029.87     0.000      0.04
 12.00      0.04   5029.87     0.000      0.04
 13.20      0.03   5029.87     0.000      0.03
 14.40      0.03   5029.86     0.000      0.03
 15.60      0.03   5029.86     0.000      0.03
 16.80      0.03   5029.86     0.000      0.03
 18.00      0.03   5029.86     0.000      0.03
 19.20      0.03   5029.86     0.000      0.03
 20.40      0.03   5029.86     0.000      0.03
 21.60      0.03   5029.86     0.000      0.03
 22.80      0.03   5029.85     0.000      0.03
 24.00      0.03   5029.85     0.000      0.03
PEAK DISCHARGE =        1.612 CFS - PEAK OCCURS AT HOUR    1.85
MAXIMUM WATER SURFACE ELEVATION =    (5037.396)
MAXIMUM STORAGE =        0.0786 AC-FT      INCREMENTAL TIME=    0.050000HRS

*
PRINT HYD            ID=88 CODE=1

                                          HYDROGRAPH FROM AREA   800.80


    RUNOFF VOLUME =     2.29665 INCHES     =       0.3307 ACRE-FEET
    PEAK DISCHARGE RATE =      (1.61 CFS) AT   1.850 HOURS   BASIN AREA =
0.0027 SQ. MI.


*
*
*(ADD POND 4 AND BASIN B9)
*
ADD HYD              ID=89 HYD NO=890.1 ID=88 ID=9
PRINT HYD            ID=89 CODE=1

                                          HYDROGRAPH FROM AREA   890.10


    RUNOFF VOLUME =     2.31252 INCHES     =       0.4107 ACRE-FEET
    PEAK DISCHARGE RATE =      (3.39 CFS) AT   1.500 HOURS   BASIN AREA =
0.0033 SQ. MI.


*
*
*(ROUTE POND 4 AND BASIN B9 THROUGH POND 5)
*
ROUTE RESERVOIR      ID=99 HYD NO=900.9 INFLOW ID=89 CODE=24
                     OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                     0.0000       0.0000         5026.50
                     0.3836       0.0002         5027.50
                     0.5689       0.0004         5028.50
                     0.7073       0.0006         5029.50
                     0.8227       0.0008         5030.50
                     0.9238       0.0010         5031.50
                     1.0148       0.0012         5032.50
                     1.0984       0.0014         5033.50
                     1.1760       0.0016         5034.50
```

1.2488	0.0018	5035.50
1.3343	0.0020	5036.75
1.3474	0.0077	5036.95
1.3605	0.0247	5037.15
1.3734	0.0529	5037.35
1.3862	0.0925	5037.55

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	5026.50	0.000	0.00
1.20	1.28	5034.09	0.002	1.14
2.40	1.61	5037.49	0.080	1.38
3.60	0.48	5037.30	0.046	1.37
4.80	0.03	5026.57	0.000	0.03
6.00	0.05	5026.62	0.000	0.05
7.20	0.05	5026.62	0.000	0.05
8.40	0.05	5026.62	0.000	0.05
9.60	0.05	5026.62	0.000	0.05
10.80	0.05	5026.62	0.000	0.05
12.00	0.04	5026.61	0.000	0.04
13.20	0.04	5026.61	0.000	0.04
14.40	0.04	5026.61	0.000	0.04
15.60	0.04	5026.61	0.000	0.04
16.80	0.04	5026.61	0.000	0.04
18.00	0.04	5026.60	0.000	0.04
19.20	0.04	5026.60	0.000	0.04
20.40	0.04	5026.60	0.000	0.04
21.60	0.04	5026.60	0.000	0.04
22.80	0.04	5026.59	0.000	0.04
24.00	0.04	5026.59	0.000	0.04

PEAK DISCHARGE = 1.384 CFS - PEAK OCCURS AT HOUR 3.00
MAXIMUM WATER SURFACE ELEVATION = (5037.517)
MAXIMUM STORAGE = 0.0859 AC-FT INCREMENTAL TIME= 0.050000HRS

*
PRINT HYD ID=99 CODE=1

HYDROGRAPH FROM AREA 900.90

RUNOFF VOLUME = 2.31692 INCHES = 0.4115 ACRE-FEET
PEAK DISCHARGE RATE = (1.38 CFS) AT 3.000 HOURS BASIN AREA =
0.0033 SQ. MI.

*
*
*(ADD POND 5 AND BASINS B4,B5 AND POND 2)
*
ADD HYD ID=69 HYD NO=690.1 ID=45 ID=99
PRINT HYD ID=69 CODE=1

HYDROGRAPH FROM AREA 690.10

RUNOFF VOLUME = 2.34590 INCHES = 1.0272 ACRE-FEET
PEAK DISCHARGE RATE = (8.60 CFS) AT 1.500 HOURS BASIN AREA =
0.0082 SQ. MI.

```
*
*ROUTE POND 5,POND 2,B4,B5 THROUGH POND 6/UNDERGROUND CMP)
*
ROUTE RESERVOIR      ID=55 HYD NO=500.5 INFLOW ID=69 CODE=24
                     OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                     0.0000       0.0000         5026.00
                     0.1131       0.0232         5026.50
                     0.1708       0.0650         5027.00
                     0.2134       0.1171         5027.50
                     0.2488       0.1758         5028.00
                     0.2798       0.2393         5028.50
                     0.3077       0.3060         5029.00
                     0.3332       0.3738         5029.50
                     0.3569       0.4418         5030.00
                     0.3792       0.5090         5030.50
                     0.4002       0.5719         5031.00
                     0.4240       0.6304         5031.60
                     0.4392       0.6830         5032.00
                     0.4575       0.7248         5032.50
                     0.4750       0.7519         5033.00
                     0.4953       0.7520         5033.60
                     0.5273       0.7522         5034.60
                     0.5575       0.7524         5035.60
                     0.5691       0.7524         5036.00
                     0.5748       0.7544         5036.20
                     0.5805       0.7602         5036.40
                     0.5833       0.7645         5036.50

      * * * * * * * * * * * * * * * *
```

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	5026.00	0.000	0.00
1.20	3.19	5026.65	0.036	0.13
2.40	3.29	5030.38	0.493	0.37
3.60	1.39	5032.51	0.725	0.46
4.80	0.07	5032.74	0.738	0.47
6.00	0.11	5032.22	0.702	0.45
7.20	0.12	5031.90	0.670	0.44
8.40	0.12	5031.66	0.639	0.43
9.60	0.11	5031.37	0.608	0.42
10.80	0.11	5031.07	0.579	0.40
12.00	0.11	5030.83	0.551	0.39
13.20	0.11	5030.61	0.523	0.38
14.40	0.11	5030.40	0.496	0.37
15.60	0.10	5030.21	0.470	0.37
16.80	0.10	5030.02	0.444	0.36
18.00	0.10	5029.83	0.419	0.35
19.20	0.10	5029.66	0.395	0.34
20.40	0.10	5029.48	0.371	0.33
21.60	0.09	5029.31	0.348	0.32
22.80	0.09	5029.15	0.326	0.32
24.00	0.09	5028.98	0.304	0.31
25.20	0.00	5028.77	0.275	0.29
26.40	0.00	5028.56	0.247	0.28
27.60	0.00	5028.34	0.219	0.27
28.80	0.00	5028.14	0.193	0.26
30.00	0.00	5027.94	0.168	0.24
31.20	0.00	5027.74	0.145	0.23
32.40	0.00	5027.55	0.123	0.22

```
33.60        0.00   5027.35      0.102      0.20
34.80        0.00   5027.17      0.083      0.19
36.00        0.00   5027.00      0.065      0.17
37.20        0.00   5026.81      0.049      0.15
38.40        0.00   5026.65      0.035      0.13
39.60        0.00   5026.50      0.023      0.11
40.80        0.00   5026.31      0.014      0.07
42.00        0.00   5026.19      0.009      0.04
43.20        0.00   5026.12      0.005      0.03
44.40        0.00   5026.07      0.003      0.02
45.60        0.00   5026.04      0.002      0.01
46.80        0.00   5026.03      0.001      0.01
48.00        0.00   5026.02      0.001      0.00
PEAK DISCHARGE =          0.581 CFS - PEAK OCCURS AT HOUR    4.10
MAXIMUM WATER SURFACE ELEVATION =     (5036.433)
MAXIMUM STORAGE =          0.7616 AC-FT      INCREMENTAL TIME=    0.050000HRS

*
PRINT HYD            ID=55 CODE=1

                                   OUTFLOW HYDROGRAPH RESERVOIR   500.50


RUNOFF VOLUME =      2.34590 INCHES      =       1.0272 ACRE-FEET
PEAK DISCHARGE RATE =       (0.58 CFS) AT   4.100 HOURS   BASIN AREA =
0.0082 SQ. MI.


*
FINISH
NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 14:38:42
```

APPENDIX D

Geotechnical Report Excerpt

3.0 SUBSURFACE CONDITIONS

3.1 Typical Subsurface Profile

Specific conditions encountered at each boring location are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual. Details for each of the borings can be found on the boring logs included in Appendix A of this report. Based on the results of the borings, subsurface conditions on the project site can be generalized as follows:

Description	Approximate Depth to Bottom of Stratum (feet)	Material Encountered	Consistency/Density
Stratum 1	4 to 12	Fill: Sand. The clay, silt, and gravel content varied.	Loose to Dense
Stratum 2	6-½ to 31-½	Sand. The silt, clay and gravel content varied	Medium Dense to Very Dense
Stratum 3	31-½	Clay. The sand and gravel content varied	Hard

The sand fill soils were non-plastic to medium in plasticity.

Laboratory tests were conducted on selected soil samples and the test results are presented in Appendix B. Laboratory test results indicate that the surface and near surface fill soils exhibit low compressibility potentials at in-situ moisture contents. The test results indicate that the near surface fill soils have a low to high tendency for hydro-compaction (collapse) and a non-expansion potential when wetted and under increasing anticipated foundation loads. Due the granular nature of the subsurface soils and the moderate field penetration resistance, the test results likely reflect some sample disturbance. It is our opinion that the near surface fill soils have a low to moderate tendency for hydro-compaction (collapse) and a non-expansion potential when wetted and under increasing anticipated foundation loads. When water is added to samples of laboratory compacted near-surface fill soils, we anticipate that the soils will exhibit non- to low expansion potential and a non- to low compression potential when subjected to light loading conditions such as those imposed by floor slabs.

Laboratory test results indicate that on-site soils have a soluble sulfate concentration of 390 mg/kg.

3.1 Groundwater

Groundwater was not observed in the test borings at the time of field exploration, nor when checked upon completion of drilling. These observations represent groundwater conditions at the time of the field exploration and may not be indicative of other times, or at other locations.

Material Type and Location	Per the Modified Proctor Test (ASTM D 1557)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction	
		Minimum	Maximum
On-site soils or approved imported fill soils:			
Beneath foundations:	95	-3%	+3%
Beneath slabs:	95	-3%	+3%
Beneath pavements:	95	-3%	+3%
Aggregate base	95	-3%	+3%
Miscellaneous backfill	90	-3%	+3%

4.2.6 Grading and Drainage

It is imperative that all grades provide effective drainage away from the building during and after construction. Water permitted to pond next to the building can result in greater soil movements than those discussed in this report. If landscaping is required/desired, we recommend using xeriscaping or very low water demand plantings. These greater movements can result in unacceptable differential floor slab movements, cracked slabs and walls, and roof leaks. Estimated movements described in this report are based on effective drainage for the life of the structure and cannot be relied upon if effective drainage is not maintained.

Exposed ground should be sloped at a minimum 3 percent away from the building for at least 5 feet beyond the perimeter of the buildings. After building construction and landscaping (if applicable), we recommend verifying final grades to document that effective drainage has been achieved. Grades around the structures should also be periodically inspected and adjusted as necessary, as part of the structure's maintenance program.

Flatwork and pavements will be subject to post construction movement. Maximum grades practical should be used for paving and flatwork to prevent water from ponding. Allowances in final grades should also consider post-construction movement of flatwork, particularly if such movement would be critical. Where paving or flatwork abuts the structure, effectively seal and maintain joints to prevent surface water infiltration.

4.2.7 Corrosion Potential

Laboratory test results indicate that on-site soils have a soluble sulfate concentration of 390 mg/kg. Results of soluble sulfate testing indicate that ASTM Type I/II or II Portland cement is suitable for all concrete on and below grade. Foundation concrete should be designed for low sulfate exposure in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

Abiel X. Carrillo

From: Abiel X. Carrillo
Sent: Monday, June 20, 2016 3:24 PM
To: Vinny Perea
Cc: 'Ron Bohannan'
Subject: Bedrosian Tile - BP Submittal
Attachments: SO 19 NOTES with sig C.DOC

Vinny,

I reviewed the submittal for Bedrosian Tile, I just have some minor comments on the Grading Sheets below. If you'd like (and to reduce turnaround time) you can swap out sheets with the same stamp date (or noted as revised) instead of making a resubmittal, just let me know what you would prefer:

1. The connection to the existing curb inlet in the right of way needs to be completed through SO-19 Permit, so attach the SO-19 notes I included in this email.

2. Since the connection referenced in the previous comment is in the right of way, you'll need to transition to RCP or HPPP at the prop line since PVC is not allowed in the right of way regardless of length. Alternatively you can use HPPP/RCP for the entire length.

3. It's understood that the smaller underground pipe will infiltrate, I recommend that you clarify that the pipe to be used is to be perforated (or however you intend for it to recharge the chamber) to the contractor. The detail included in the plans is specific to the larger manifold.

4. The Site Plan had been previously approved, once the comments above are addressed, I'll reference that prior approval in the Building Permit approval.

Any question just let me know.

Also, just a minor note, but I appreciate how well put together the report is.

Abiel Carrillo, PE, CFM

Principal Engineer - Hydrology
Planning Department
Development Review Services Division
City of Albuquerque
505-924-3986
acarrillo@cabq.gov
600 2nd Street NW
Albuquerque, NM 87102

City of Albuquerque

Planning Department

Development & Building Services Division

RAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Renaissance Center Tract 2A-1B City Drainage #: F16D013A

DRB#: 1010447 EPC#: Work Order#:

Legal Description: Tract 2A-1B Plat of Tracts 2A-1A & 2A-1B of Renaissance Center

City Address: Renaissance Blvd Albuquerque, NM

Engineering Firm: Tierra West LLC Contact: Ronald R. Bohannan

Address: 5571 Midway Park Place NE Albuquerque, NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: rrb@tierrawestllc.com

Owner: United NM Trust Co/ Trustee of Union Pension Contact: Jim Trump

Address: 122 Tulane Dr. SE Albuquerque, NM 87106

Phone#: 505-268-1200 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
- ___ 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
- ___ 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)

AO verified email

RECEIVED JUL 31 2015 LAND DEVELOPMENT SECTION

8-7-15

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

DATE SUBMITTED: 7/31/15 By: Vinny Perea

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

CITY OF ALBUQUERQUE

August 21, 2015

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

Re: Renaissance Tract 2A-1B
Grading Plan
Engineer's Stamp Date 7/31/2015 (F16/D013A)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 7-31-15, the plan is approved for grading. Please submit an Erosion and Sediment Control plan to Curtis Cherne for review and approval prior to grading of the site.

If you have any questions, you can contact me at 924-3999.

Sincerely,

Shahab Biazar, P.E.
City Engineer, Planning Dept.
Development Review Services

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 09/2015)

Project Title: Bedrosians Tile & Stone Building Permit #: _____ City Drainage #: F16D013A

DRB#: 1010447 EPC#: _____ Work Order#: _____

Legal Description: Tract 2A-1B-2-A Renaissance Center

City Address: 1301 N. Renaissance Blvd. NE Albuquerque, NM 87107

Engineering Firm: Tierra West, LLC Contact: Ronald R. Bohannan

Address: 5571 Midway Park Pl. NE Albuquerque, NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: rrb@tierrawestllc.com

Owner: Paragon Industries II, Inc. Contact: Eddie Bedrosian

Address: 1515 E. Winston Rd. Anaheim, CA 92805

Phone#: 714-778-1800 Fax#: _____ E-mail: eddie.bedrosian@bedrosians.com

Architect: _____ Contact: _____

Address: _____

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

Other Contact: _____ Contact: _____

Address: _____

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

Check all that Apply:

DEPARTMENT:

x HYDROLOGY/ DRAINAGE
___ TRAFFIC/ TRANSPORTATION
___ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

___ ENGINEER/ ARCHITECT CERTIFICATION

___ CONCEPTUAL G & D PLAN
x GRADING PLAN
___ DRAINAGE MASTER PLAN
x DRAINAGE REPORT
___ CLOMR/LOMR

___ TRAFFIC CIRCULATION LAYOUT (TCL)
___ TRAFFIC IMPACT STUDY (TIS)
x EROSION & SEDIMENT CONTROL PLAN (ESC)

___ OTHER (SPECIFY) _____

RECEIVED MAY 17 2016 LAND DEVELOPMENT SECTION

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

x BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY

___ PRELIMINARY PLAT APPROVAL
___ SITE PLAN FOR SUB'D APPROVAL
x SITE PLAN FOR BLDG. PERMIT APPROVAL
___ FINAL PLAT APPROVAL
___ SIA/ RELEASE OF FINANCIAL GUARANTEE
___ FOUNDATION PERMIT APPROVAL
___ GRADING PERMIT APPROVAL
___ SO-19 APPROVAL
___ PAVING PERMIT APPROVAL
___ GRADING/ PAD CERTIFICATION
___ WORK ORDER APPROVAL
___ CLOMR/LOMR

___ PRE-DESIGN MEETING
___ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: ___ Yes x No

DATE SUBMITTED: 5/17/2016 By: Vinny Perea

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

City of Albuquerque

Planning Department

Development & Building Services Division

RAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Renaissance Center Tract 2A-1B City Drainage #: F16D013A

DRB#: 1010447 EPC#: Work Order#:

Legal Description: Tract 2A-1B Plat of Tracts 2A-1A & 2A-1B of Renaissance Center

City Address: Renaissance Blvd Albuquerque, NM

Engineering Firm: Tierra West LLC Contact: Ronald R. Bohannan

Address: 5571 Midway Park Place NE Albuquerque, NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: rrb@tierrawestllc.com

Owner: United NM Trust Co/ Trustee of Union Pension Contact: Jim Trump

Address: 122 Tulane Dr. SE Albuquerque, NM 87106

Phone#: 505-268-1200 Fax#: E-mail:

Architect: TBD Contact:

Address:

Phone#: Fax#: E-mail:

Surveyor: TBD Contact:

Address:

Phone#: Fax#: E-mail:

Contractor: TBD Contact:

Address:

Phone#: Fax#: E-mail:

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
X 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
X 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
___ 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
MAY 20 2015
LAND DEVELOPMENT SECTION

VS Verified
$50.00

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

DATE SUBMITTED: 5/19/2015 By: Vinny Perea

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

emailed PLNDRS 5·20·15

CITY OF ALBUQUERQUE

July 27, 2015

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

Re: Renaissance Tract 2A-1B
Conceptual Grading Plan
Engineer's Stamp Date 3/20/2015 (F16/D013A)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 5-20-15, the Conceptual Grading Plan is approved for Site Plan Building Permit.

Please submit a Final Grading Plan prior to building permit approval. This project requires an approved Erosion and Sediment Control plan prior to building permit approval as well for disturbing one acre or more.

If you have any questions, you can contact me at 924-3999.

Sincerely,

Shahab Biazar, P.E.
City Engineer, Planning Dept.
Development Review Services

C: e-mail

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

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

May 18, 2015

Ms. Rita Harmon, Senior Engineer
City of Albuquerque Hydrology
Public Works Department
P.O. Box 1293
Albuquerque, New Mexico 87103

RE: TRACT 2A-1B RENAISSANCE CENTER
CONCEPTUAL GRADING AND DRAINAGE PLAN FOR DRB ACTION

Dear Ms. Harmon:

Please find the following responses addressing your comments for the Site Plan for Subdivision (DRB Project #1010447) dated April 29, 2015:

1. The Conceptual Drainage Plan Should account for flows from Tract 2A-1A.
   Response: Directional flow arrows were added to Tract 1-A-1A to show offsite flows entering 2A-1B-1 and 2A-1B-2; this is accounted for in the hydrology calculations.

2. Show an exclusive easement for the underground SD from Tract 2A-1A.
   Response: A 20 ft. Storm Drain easement was added to the plat as well as the conceptual grading plan. This easement accounts for the existing storm drain that goes from tract 2A-1A to 2A-1B-1.

3. Both Tracts 2A-1B-1 and 2A-1B-2 need cross-lot drainage easements for the benefit of Tract 2A-1A to collect surface flows.
   Response: The cross lot drainage easement was added to the plat and is also shown on the conceptual grading and drainage plan.

4. Our records indicate there is a Temporary Ponding Easement on these tracts. Has this been released?
   Response: The temporary pond easement was added to the plat as well as the conceptual grading plan with a note: "To be vacated with this plat". The easement was recorded on 04-01/1997.

5. An Approved drainage report, grading plan are required prior to Site Plan for Building Permit.
   Response: A separate drainage report will be submitted when the Site Plan for Building Permit is applied for; at this time a drainage report is not necessary for this submittal since the request is only for Site Plan for Subdivision.

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

Sincerely,

Ronald R. Bohannan, PE

JN: 2015023
RRB/vp/cwg

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MAY 20 2015
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