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)

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,

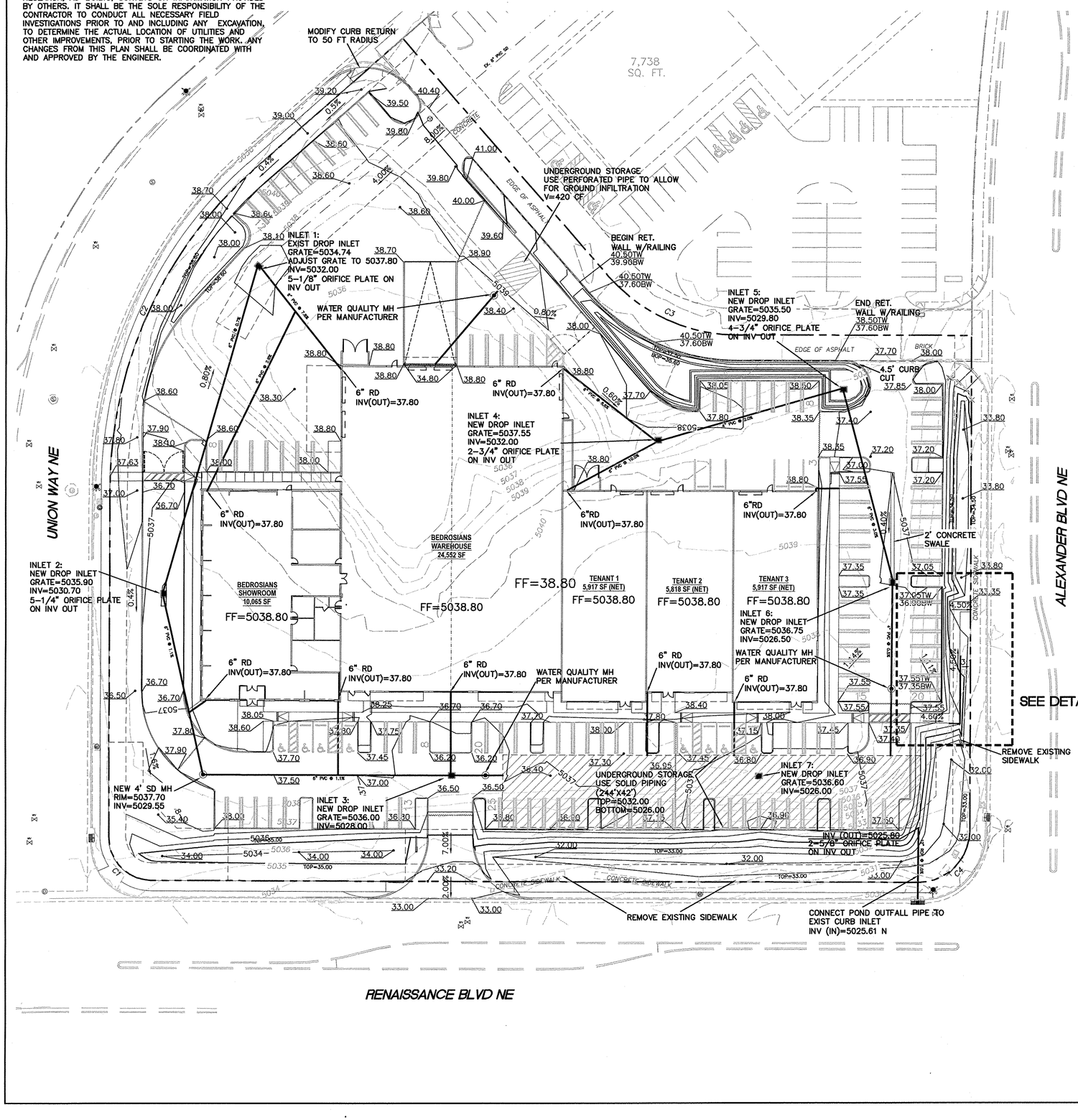
Abiel Carrillo, P.E.
Principal Engineer, Planning Department
Development Review Services

Orig: Drainage file

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

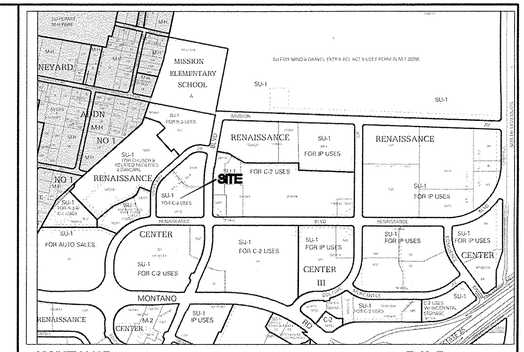
CAUTION:

ALL EXISTING UTILITIES SHOWN WERE OBTAINED FROM RESEARCH, AS-BUILTS, SURVEYS OR INFORMATION PROVIDED BY OTHERS. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO AND INCLUDING ANY EXCAVATION, TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS, PRIOR TO STARTING THE WORK. ANY CHANGES FROM THIS PLAN SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.



LEGEND

- BOUNDARY LINE
- EASEMENT
- EXISTING CURB & GUTTER
- EXISTING SD MANHOLE
- EXISTING SAS MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EX. 8" SAS — EXISTING SANITARY SEWER LINE
- EX. WL — EXISTING WATER LINE
- EX. RCP — EXISTING STORM SEWER LINE
- EXISTING INDEX CONTOUR
- EXISTING CONTOUR
- WATER BLOCK
- UNDERGRUND STORAGE



LEGAL DESCRIPTION

TRACTS 2A-1B-1 AND 2A-1B-2, REINASSANCE CENTER

NOTICE TO CONTRACTORS

1. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 765-1234, FOR LOCATION OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL CONNECTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
3. BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
4. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.
5. SOURCE OF TOPO IS ALTA/ACSM LAND TITLE SURVEY OF LOT 2 HARMS INDUSTRIAL PARK PREPARED BY PRECISION SURVEYS, INC DATED JUNE, 2014.

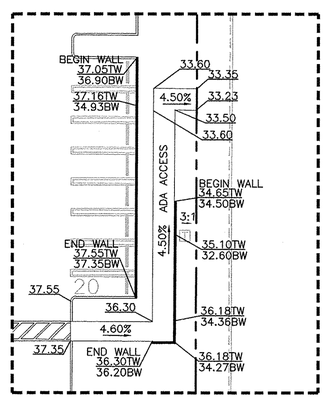
EROSION CONTROL NOTES:

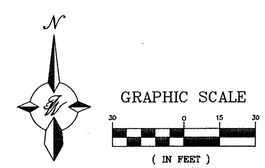
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.

PRIVATE DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY
NOTICE TO CONTRACTORS
(SPECIAL ORDER 19 ~ "SO-19")

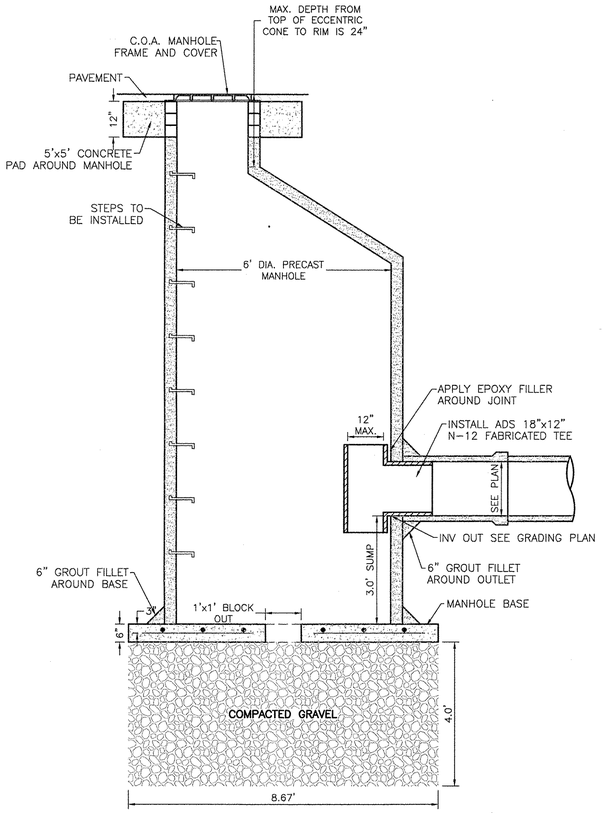
1. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT-OF-WAY.
2. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
3. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL, DIAL "811" [OR (505) 260-1990] FOR THE LOCATION OF EXISTING UTILITIES.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
5. BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
6. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.
7. WORK ON ARTERIAL STREETS SHALL BE PERFORMED ON A 24-HOUR BASIS.
8. CONTRACTOR MUST CONTACT JASON RODRIGUEZ AT (505) 235-8016 AND CONSTRUCTION COORDINATION AT (505) 924-3416 TO SCHEDULE AN INSPECTION.

APPROVAL	NAME	DATE
INSPECTOR		

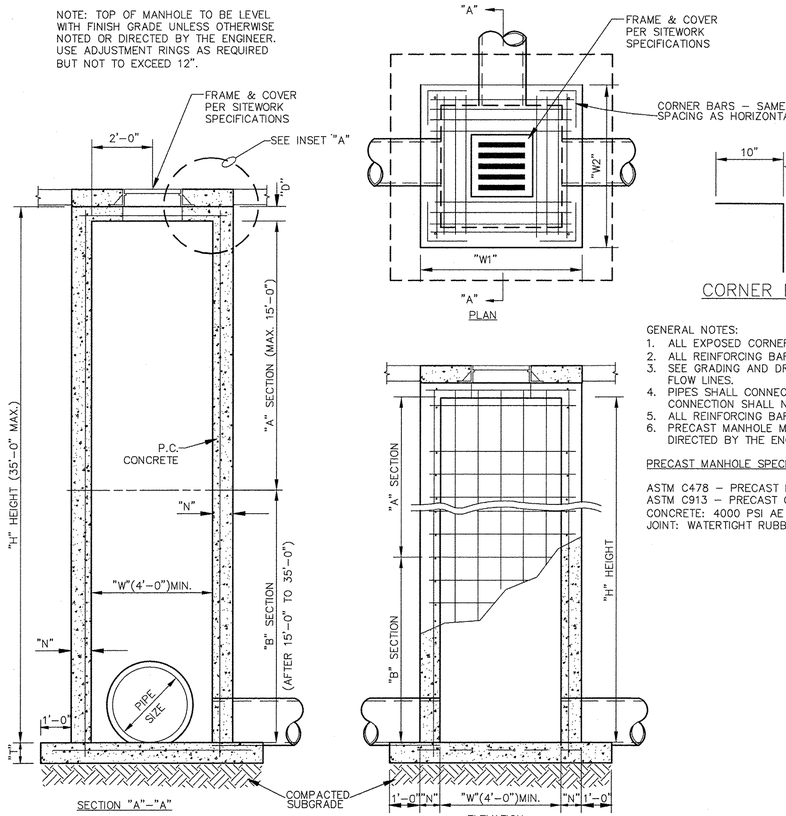




ENGINEER'S SEAL	BEDROSIAN TILE AND STONE	DRAWN BY: pm
	GRADING PLAN	DATE: 05-13-16
RONALD R. BOHANNAN P.E. #7868	TIERRA WEST, LLC 5571 MIDWAY PARK PL NE ALBUQUERQUE, NEW MEXICO 87109 (505) 858-3100 www.tierrawestllc.com	SHEET #: C1.00
		JOB #: 2014084

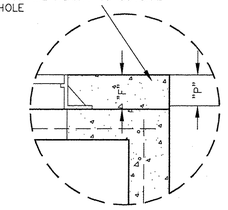


WATER QUALITY MANHOLE
NTS



GRATE INLET
N.T.S.

CORNER BAR



INSET "A"

CORNER BARS – SAME SIZE AND SPACING AS HORIZONTAL BARS

GENERAL NOTES:
1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER
2. ALL REINFORCING BARS TO HAVE 2" COVER.
3. SEE GRADING AND DRAINAGE PLAN FOR PIPE SIZES, LOCATIONS, AND FLOW LINES.
4. PIPES SHALL CONNECT TO THE ENDS OR SIDES OF THE INLET. CONNECTION SHALL NOT BE MADE AT CORNERS OF BOX.
5. ALL REINFORCING BARS TO BE GRADE 60.
6. PRECAST MANHOLE MAY BE USED UNLESS OTHERWISE NOTED OR DIRECTED BY THE ENGINEER.

PRECAST MANHOLE SPECIFICATIONS

ASTM C478 – PRECAST REINFORCED CONCRETE MANHOLE SECTIONS
ASTM C913 – PRECAST CONCRETE WATER AND WASTEWATER STRUCTURES
CONCRETE: 4000 PSI AE (MIN.)
JOINT: WATERTIGHT RUBBER GASKET

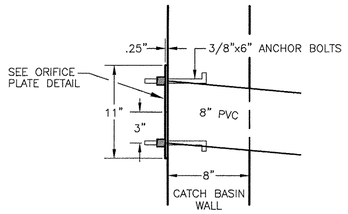
REINFORCEMENT SCHEDULE, BASE	
SECTION	
"A"	#4's @ 6" E.W.
"B"	#6's @ 6" E.W.

TABLE OF 'W' DIMENSIONS			
PIPE SIZE	SKEW OF CROSS DRAIN		
SINGLE	STRAIGHT	30°	45°
24"	4'-0"	4'-0"	4'-10"
30"	4'-0"	4'-7"	5'-8"
36"	4'-0"	5'-3"	6'-5"
42"	5'-3"	5'-11"	7'-3"
48"	5'-10"	6'-7"	8'-0"
60"	7'-0"	7'-10"	9'-8"
DOUBLE	FOR "A" SECTION ONLY		
24"	7'-0"	7'-10"	9'-5"
30"	8'-2"	9'-2"	11'-0"
36"	9'-4"	10'-6"	12'-6"
42"	10'-6"	11'-10"	14'-2"
48"	11'-8"	13'-2"	15'-10"

REINFORCEMENT SCHEDULE, WALLS			
SECTION	WIDTH ("W")	HOR.	VERT.
"A"	4'	#4's @ 9"	#4's @ 10"
	BETWEEN 4' & 7'	#6's @ 9"	#4's @ 10"
	GREATER THAN 7'	#5's @ 4 1/2"	#4's @ 10"
"B"	4'	#4's @ 6"	#4's @ 10"
	BETWEEN 4' & 7'	#6's @ 6"	#4's @ 10"

TABLE OF "T" & "N" DIMENSIONS				
SECTION	WIDTH ("W")	"T"	"N"	"D"
"A"	BETWEEN 4' & 7'	6" + PIPE THICKNESS	8"	6"
	GREATER THAN 7'	6" + PIPE THICKNESS	8"	8"
"B"	4'	6" + PIPE THICKNESS	8"	8"
	BETWEEN 4' & 7'	6" + PIPE THICKNESS	10"	8"

REINFORCEMENT SCHEDULE, TOP		
DIMENSIONS	STEEL	SPECIAL PATTERN
W1 = 7' OR LESS	#4's @ 8" E.W.	DIAGONAL @ COVER
W2 = 7' OR LESS	#4's @ 8" E.W.	DIAGONAL @ COVER
W1 = 7' OR LESS	#4's @ 8" E.W.	DIAGONAL @ COVER
W2 = 7' OR GREATER	#4'S @ 6" E.W.	DIAGONAL @ COVER
W1 = 7' OR GREATER	#4's @ 6" E.W.	DIAGONAL @ COVER
W2 = 7' OR GREATER	#4's @ 6" E.W.	DIAGONAL @ COVER

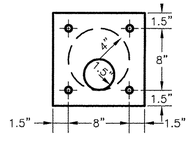


TO BE INSTALLED @ THE OUTFLOW OF ALL CATCH BASINS (SEE TABLE FOR SIZES)

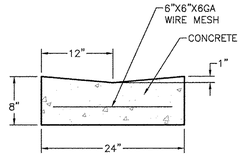
DETAIL A

ORIFICE PLATE TABLE

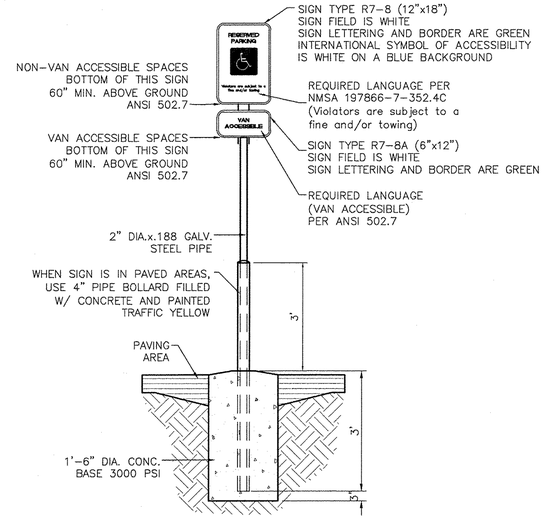
INLET #	ORIFICE SIZE
1	5.125"
2	5.25"
3	N/A
4	2.75"
5	4.75"
6	N/A
7	N/A



TYP. ORIFICE PLATE DETAIL
NTS



CONCRETE SWALE DETAIL
IN PARKING LOT



ACCESSIBLE PARKING SIGN
NTS

ENGINEER'S SEAL

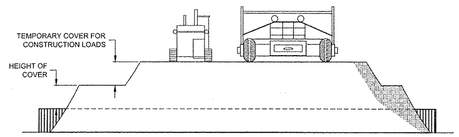
RONALD R. BOHANNAN
NEW MEXICO
5/27/16
PROFESSIONAL ENGINEER

RONALD R. BOHANNAN
P.E. #7868

BEDROSIAN TILE AND STONE
GRADING DETAILS

DRAWN BY: DY
DATE: 05-13-16
2015023-DET
SHEET #: C2.00
JOB #: 2014084

TIERRA WEST, LLC
5571 MIDWAY PARK PLACE NE
ALBUQUERQUE, NM 87109
(505) 858-3100
www.tierrawestllc.com



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, Ø INCHES	AXLE LOADS (kips)			
	32-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
STEEL				
15-42	2.0	2.5	3.0	3.0
49-72	3.0	3.0	3.5	4.0
78-108	3.0	3.5	4.0	4.5
ALUMINUM				
15-42	2.5	3.0	3.5	3.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

3 / P3 CONSTRUCTION LOADING DIAGRAM
N.T.S. ULTRA FLO

SPECIFICATION FOR ULTRA FLO STORM SEWER PIPE-ALUMINIZED TYPE 2 STEEL:

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE ALUMINIZED TYPE 2 ULTRA FLO PIPE DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M 274 OR ASTM A 929.

PIPE

THE ULTRA FLO SHALL BE MANUFACTURED WITH THE 3/4" X 3/4" X 7-1/2" EXTERNAL RIBS IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M-36 OR ASTM A 760. THE PIPE SIZES, GAUGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NCSPA (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) .

INSTALLATION

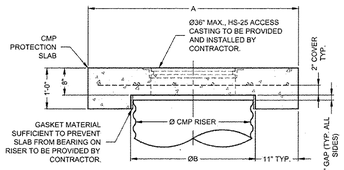
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A 798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS, THE CONTRACTOR MUST BRING THEM TO THE ATTENTION OF THE SITE ENGINEER.

IT IS RESPONSIBILITY OF THE CONTRACTORS TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

CONSTRUCTION LOADS

CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA'S GUIDELINES.

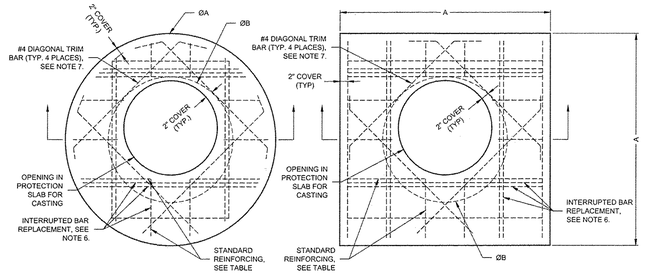
4 / P3 MATERIAL SPECIFICATION



SECTION VIEW

REINFORCING TABLE				
Ø CMP RISER	A	Ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	Ø 4' 4'x4'	26"	#5 @ 10" OCEW #5 @ 10" OCEW	2,540 1,900
30"	Ø 4'-6" 4'-6" x 4'-6"	32"	#5 @ 10" OCEW #5 @ 9" OCEW	2,260 1,670
36"	Ø 5' 5' x 5'	38"	#5 @ 9" OCEW #5 @ 8" OCEW	2,060 1,500
42"	Ø 5'-6" 5'-6" x 5'-6"	44"	#5 @ 8" OCEW #5 @ 8" OCEW	1,490 1,370
48"	Ø 6' 6' x 6'	50"	#5 @ 7" OCEW #5 @ 7" OCEW	1,210 1,270

** ASSUMED SOIL BEARING CAPACITY



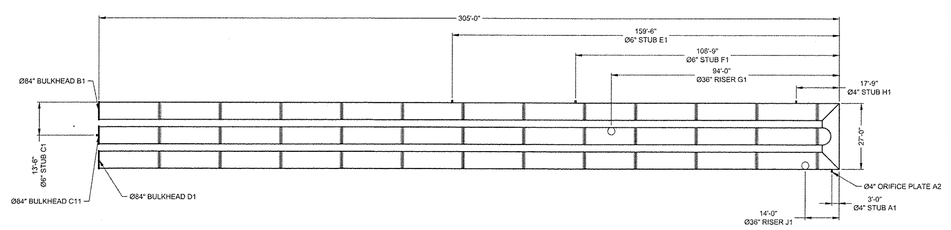
ROUND OPTION PLAN VIEW

SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION AND ACI 350.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 4,000 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERS, ARCHITECTS AND LAND SURVEYORS, ENDWELL, NY.

5 / P3 MANHOLE CAP DETAIL
N.T.S.



STUB INFORMATION		
PIECE	STUB INVERT	SYSTEM INVERT
Ø4" STUB A1	5,026.00	5,026.00
Ø6" STUB C1	5,026.00	5,026.00
Ø6" STUB E1	5,026.00	5,026.00
Ø6" STUB F1	5,026.00	5,026.00
Ø4" STUB H1	5,026.00	5,026.00

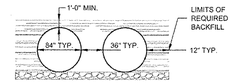
RISER INFORMATION		
PIECE	RIM ELEV.	SYSTEM INVERT
Ø36" RISER G1	5037.50	5026.00
Ø36" RISER J1	5034.00	5026.00

THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (3) PAGES INCLUDING THE FOLLOWING:

- **PIPE VOLUME = 35,445 CF**
- **MAINLINE PIPE GAGE = 12**
- **WALL TYPE = SOLID**
- **DIAMETER = 84"**
- **FINISH = ALT2**
- **CORRUGATION = ULTRA FLO**

CUSTOMER _____ DATE _____

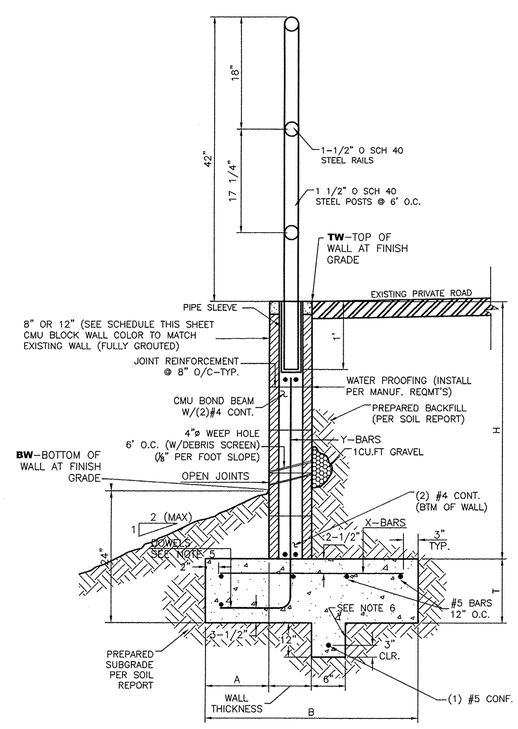
ASSEMBLY
SCALE: 1" = 30'
VOLUME: 35,445 CF
LOADING: H20/H25
SYSTEM INV = 5026.00'±



TYPICAL SECTION VIEW
SCALE: N.T.S.

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.



8 INCH REINFORCED CONCRETE MASONRY WALL

H	A	B	T	Y-BARS	X-BARS
ft.-in.	in.	ft.-in.	in.		
2'-0"	10"	2'-4"	10"	#4 @24" O.C.	#4 @24" O.C.
2'-8"	10"	2'-4"	10"	#4 @24" O.C.	#4 @24" O.C.
3'-4"	10"	2'-4"	10"	#4 @24" O.C.	#4 @24" O.C.
4'-0"	12"	2'-8"	10"	#4 @16" O.C.	#4 @24" O.C.
4'-8"	16"	3'-4"	12"	#5 @16" O.C.	#4 @18" O.C.
5'-4"	19"	3'-10"	12"	#5 @ 8" O.C.	#5 @24" O.C.
6'-0"	20"	4'-8"	12"	#6 @ 8" O.C.	#5 @24" O.C.

Y- BARS EDGE (2 ¾") FROM RETAINING FACE

12 INCH REINFORCED CONCRETE MASONRY WALL

H	A	B	T	Y-BARS	X-BARS
ft.-in.	in.	ft.-in.	in.		
5'-4"	16"	3'-8"	12"	#5 @16" O.C.	#5 @24" O.C.
6'-0"	19"	4'-2"	12"	#5 @ 8" O.C.	#5 @24" O.C.
6'-8"	21"	4'-6"	12"	#5 @ 8" O.C.	#5 @16" O.C.
7'-4"	23"	4'-10"	12"	#6 @ 8" O.C.	#6 @18" O.C.
8'-0"	26"	5'-4"	12"	#6 @ 8" O.C.	#6 @18" O.C.
8'-8"	28"	5'-8"	12"	#6 @ 8" O.C.	#6 @12" O.C.

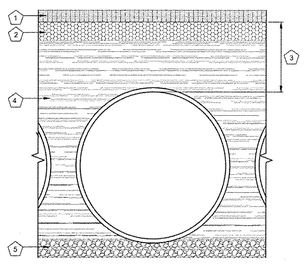
Y- BARS EDGE (3") FROM RETAINING FACE

GENERAL NOTES:

1. ALL CONCRETE IS TO BE 4000 PSI @ 28 DAYS.
2. MINIMUM COMPACTION UNDER FOOTINGS IS TO BE 95% PER ASTM. D 1557 FOR A DEPTH OF 12" MOISTURE CONTENT IS TO BE ± 2.0%.
3. BACK FILL AGAINST WALLS IS TO BE HAND-PLACED AND COMPACTED.
4. ALL BARS ARE TO BE GRADE 60, ASTM 615.
5. DOWELS SHALL BE EQUAL IN SIZE AND SPACING TO Y-BARS, SHALL PROJECT A MINIMUM OF #4-24", #5-30", #6-36" INTO THE FILLED BLOCK CORES, AND SHALL EXTEND TO THE TOE OF THE FOOTING.
6. PROVIDE KEY FOR 8" AND 12" WALLS WHERE H EXCEEDS 6'
7. USE EITHER EXPANSION JOINTS ON 20' CENTERS OR PILASTERS EVERY 16'.

RETAINING WALL DETAIL
NTS

- $f'm$ = 1500 PSI
- SOIL ALLOWABLE 2000 PSF (VERIFY W/SOILS REPORT)
- ACTIVE SOIL PRESSURE – 35 PSF/FT (VERIFY W/SOILS REPORT)
- PASSIVE SOIL PRESSURE – 250 PSF/FT (VERIFY W/SOILS REPORT)
- SOIL FRICTION FACTOR – 0.4 (VERIFY W/SOILS REPORT)



KEY

1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE
3. 12" MIN. FOR DIAMETERS THROUGH 96" 18" MIN. FOR DIAMETERS FROM 102" AND LARGER MEASURED TO TOP OF RIGID OR BOTTOM OF FLEXIBLE PAVEMENT.
4. SELECT GRANULAR FILL PER AASHTO M145 A1, A2 OR A3, OR APPROVED EQUAL PLACED IN 8" LIFTS (COMPACTED TO MIN. 90% STANDARD DENSITY PER AASHTO T99.)
5. GRANULAR BEDDING, ROUGHLY SHAPED TO FIT THE BOTTOM OF PIPE, 4" TO 6" IN DEPTH

FOUNDATION/BEDDING PREPARATION

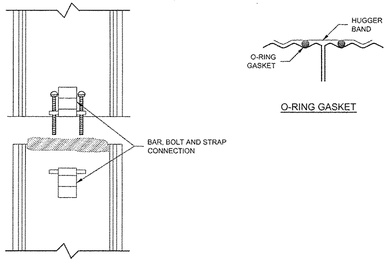
PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, 4" - 6" OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL

THE BACKFILL SHALL BE AN A1, A2 OR A3 GRANULAR FILL PER AASHTO M145, OR A WELL-GRADED GRANULAR FILL AS APPROVED BY THE SITE ENGINEER (SEE INSTALLATION GUIDELINES). THE MATERIAL SHALL BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 90% AASHTO T99 STANDARD PROCTOR DENSITY. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE DETENTION SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON THE PIPE.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.

1 / P2 BACKFILL DETAIL
SCALE: N.T.S.



O-RING GASKET

CONNECTION DETAIL
SINGLE
BOLT, BAR AND STRAP

GENERAL NOTES

1. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   12" THRU 48", 1-PIECE
   54" THRU 96", 2-PIECE
   102" THRU 144", 3-PIECES
2. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS
3. REROLLED ANNULAR END CORRUGATIONS ARE NORMALLY 2 ⅔" x ½". DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES

2 / P2 H-12 HUGGER BAND DETAIL
N.T.S.

ENGINEER'S SEAL

RONALD R. BOHANNAN NEW MEXICO 7868 PROFESSIONAL ENGINEER

RONALD R. BOHANNAN P.E. #7868

BEDROSIAN TILE AND STONE

SUBSURFACE DETENTION SYSTEM

TIERRA WEST, LLC
5571 MIDWAY PARK PLACE NE
ALBUQUERQUE, NM 87109
(505) 858-3100
www.tierrawestllc.com

DRAWN BY: DY
DATE: 05-13-16
2015023-DET
SHEET # C3.00
JOB # 2014084

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: _____ Building Permit #: _____ City Drainage #: _____

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

Legal Description: _____

City Address: _____

Engineering Firm: _____ Contact: _____

Address: _____

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

Owner: _____ Contact: _____

Address: _____

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

Architect: _____ Contact: _____

Address: _____

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

Other Contact: _____ Contact: _____

Address: _____

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

Check all that Apply:

DEPARTMENT:

_____ HYDROLOGY/ DRAINAGE
_____ TRAFFIC/ TRANSPORTATION
_____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

_____ ENGINEER/ ARCHITECT CERTIFICATION

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

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

_____ OTHER (SPECIFY) _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

_____ BUILDING PERMIT APPROVAL
_____ CERTIFICATE OF OCCUPANCY

_____ PRELIMINARY PLAT APPROVAL
_____ SITE PLAN FOR SUB'D APPROVAL
_____ 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 _____ No

DATE SUBMITTED: _____ By: _____

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

DRAINAGE REPORT

For

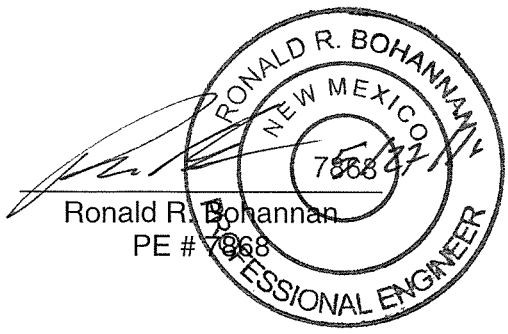
Bedrosians Tile & Stone

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
PE # 7868

Job No. 2014084

TABLE OF CONTENTS

Appendices

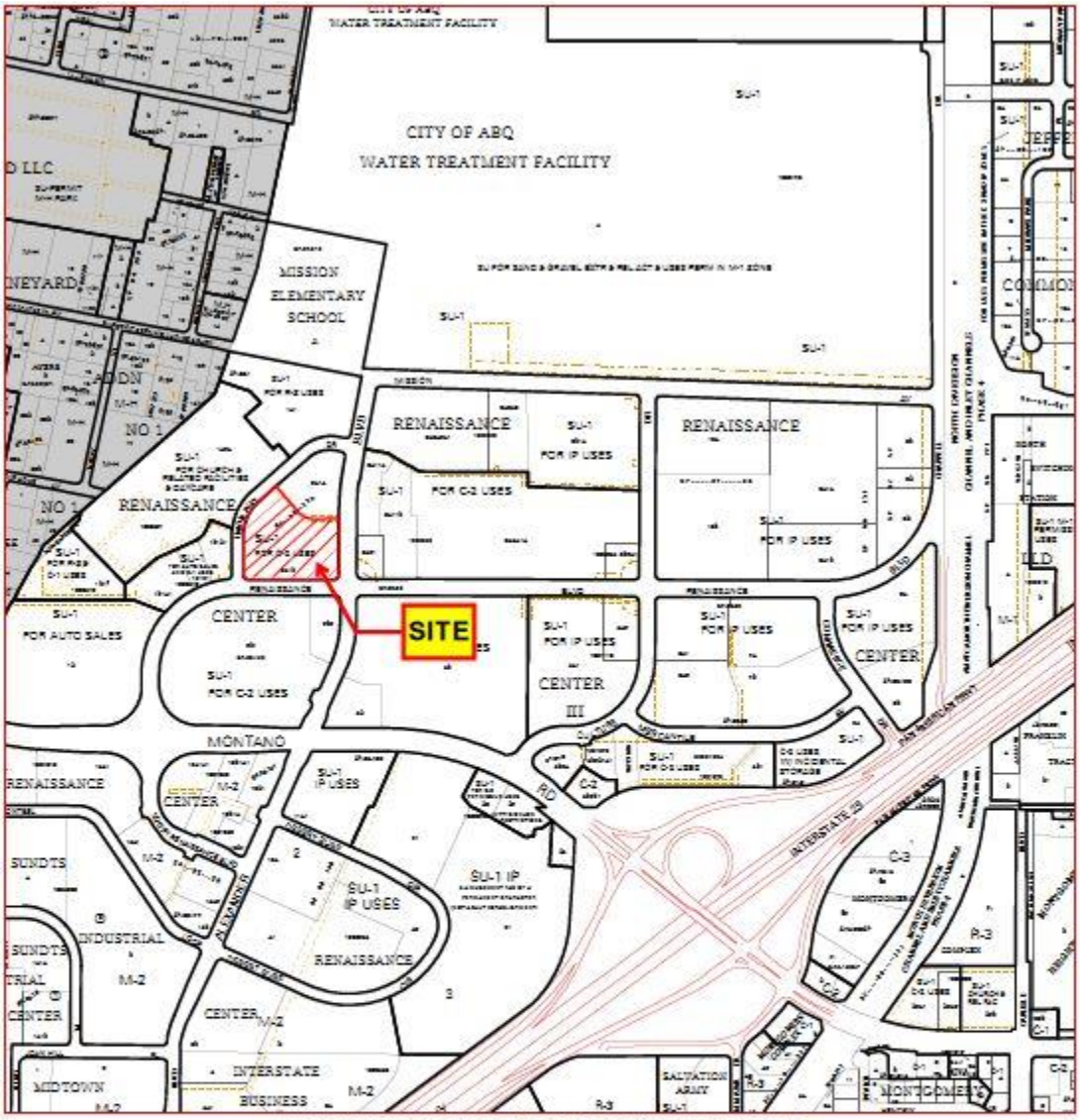
Purpose

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
MISSION
ELEMENTARY
SCHOOL
RENAISSANCE
SITE
CENTER
MONTANO
INTERSTATE 25
SUNDTS
INDUSTRIAL
MIDTOWN
BUSINESS
SALVATION
ARMY
MONTGOMERY
For more current information and more details visit: http://www.cabq.gov/gis
AGIS
Albuquerque Geographic Information System
Map amended through: 1/24/2011
Note: Grey Shading
Represents Area Outside
of the City Limits
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
Feet
0
750
1,500

Existing Conditions

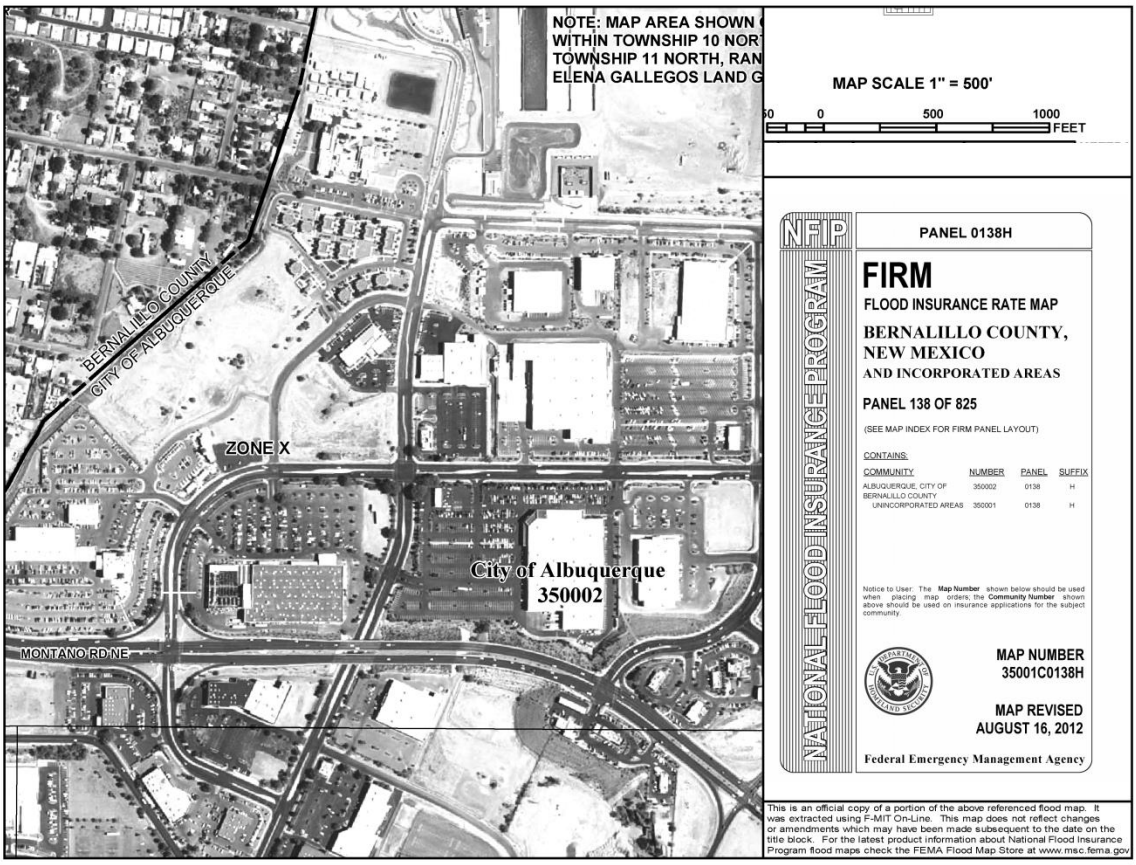
The site is undeveloped and drains naturally from north to south. The site currently consists of two drainage basins, E1 and E2. Basin E1 consists of the northwest portion of the site and all of the IBEW property to the north. The northwest portion of the site contains a temporary retention pond which 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

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

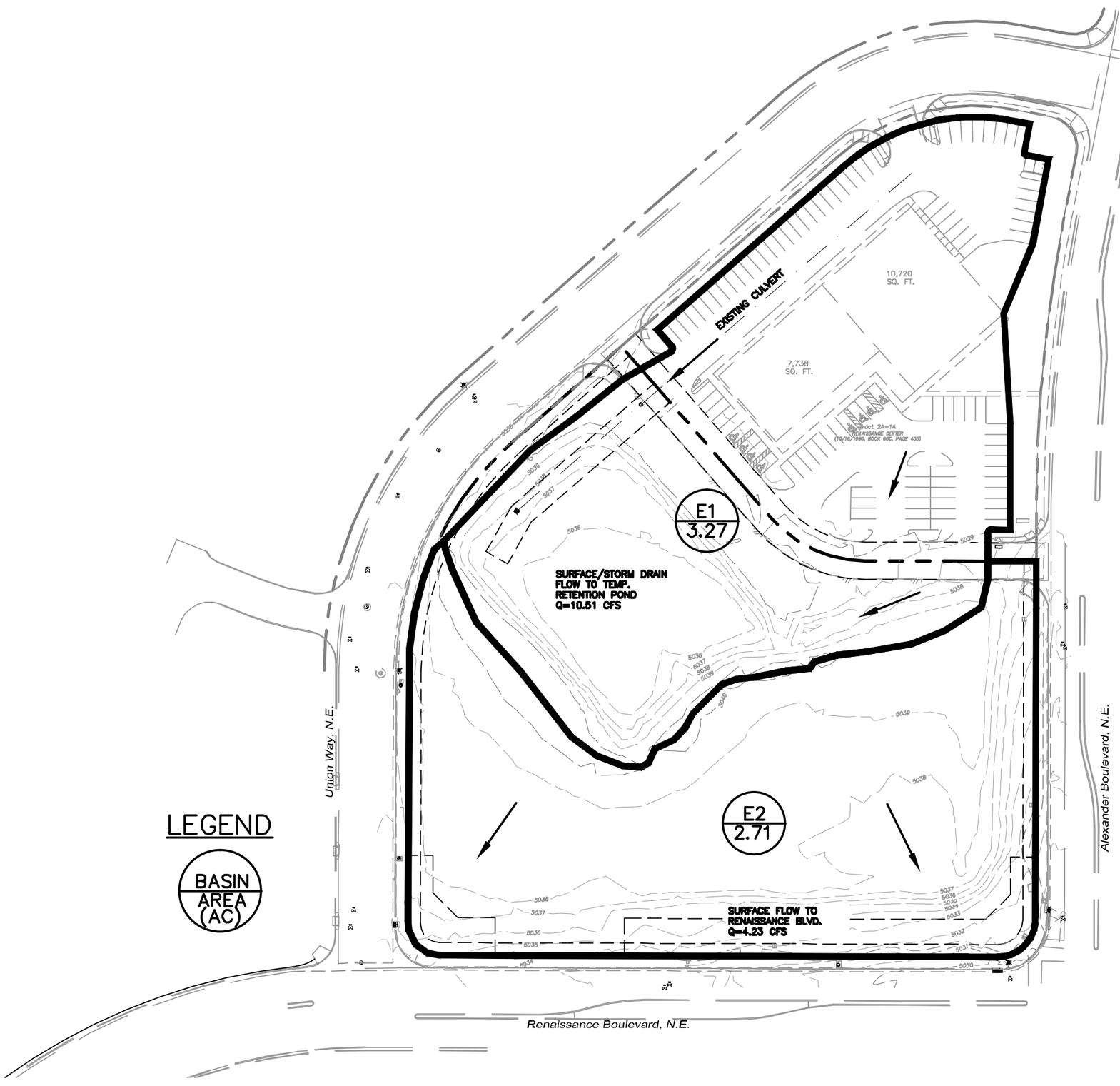
The entire site will be graded and all of the surface improvements will be built out in their entirety. The enclosed grading plan shows the grades for the entire project.

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.

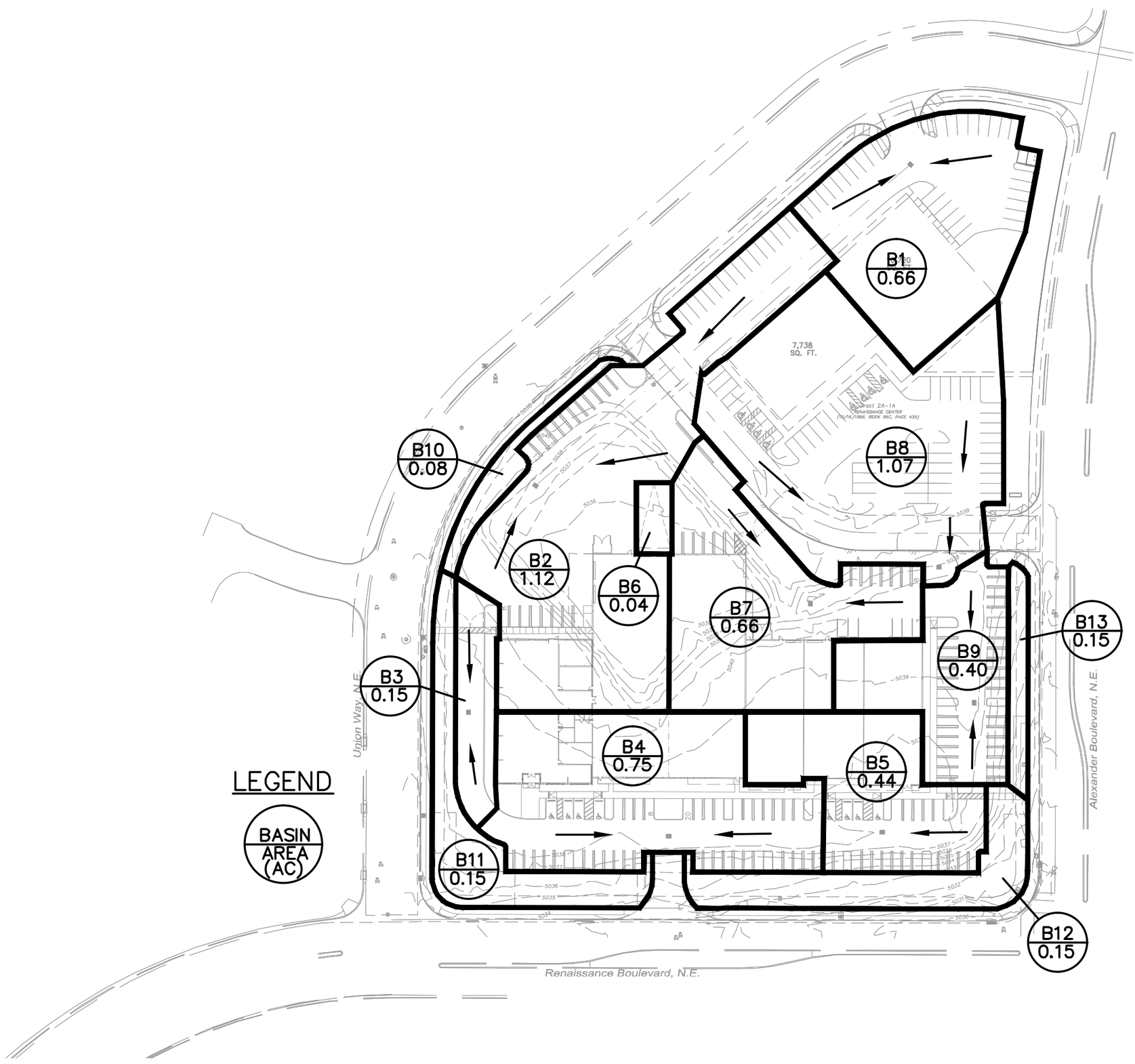
The inlets and underground detention system will contain orifice plates to attenuate flow towards the Renaissance Blvd. storm drain where the fully developed 100 year-24 hour discharge will be 0.58 cfs. This discharge rate is acceptable to the Renaissance Master Plan’s allowable discharge of 0.1 cfs/acre.

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 B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
				%	(acres)	%	(acres)	%	(acres)	%	(acres)						
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

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr		
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
				%	(acres)	%	(acres)	%	(acres)	%	(acres)						
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

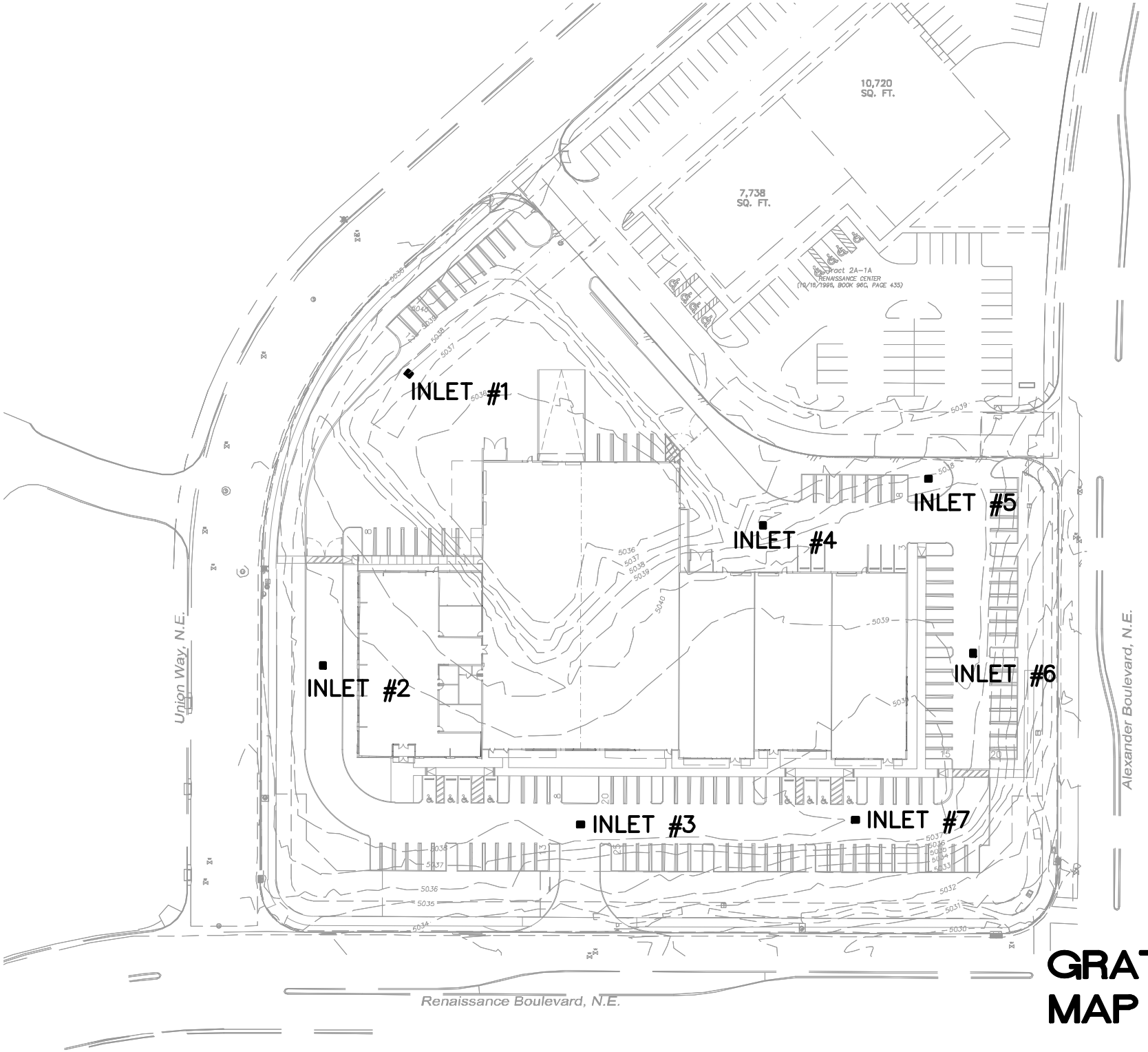
Excess Precipitation, E (in.)		
Zone 2	100-Year	10-Year
Ea	0.53	0.13
Eb	0.78	0.28
Ec	1.13	0.52
Ed	2.12	1.34

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

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

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

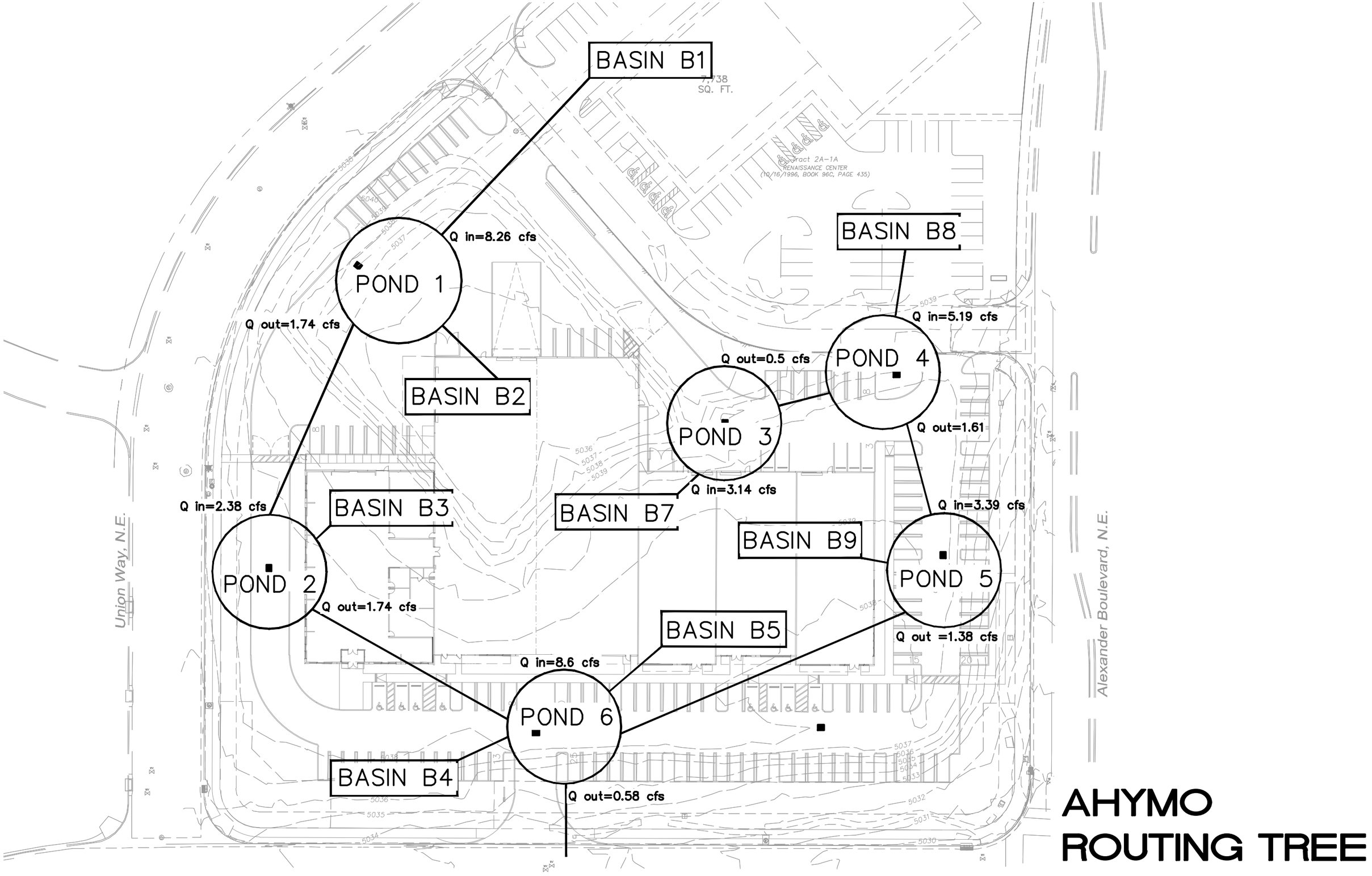
Q = 4.69 cfs

$Q_{required}$ = 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

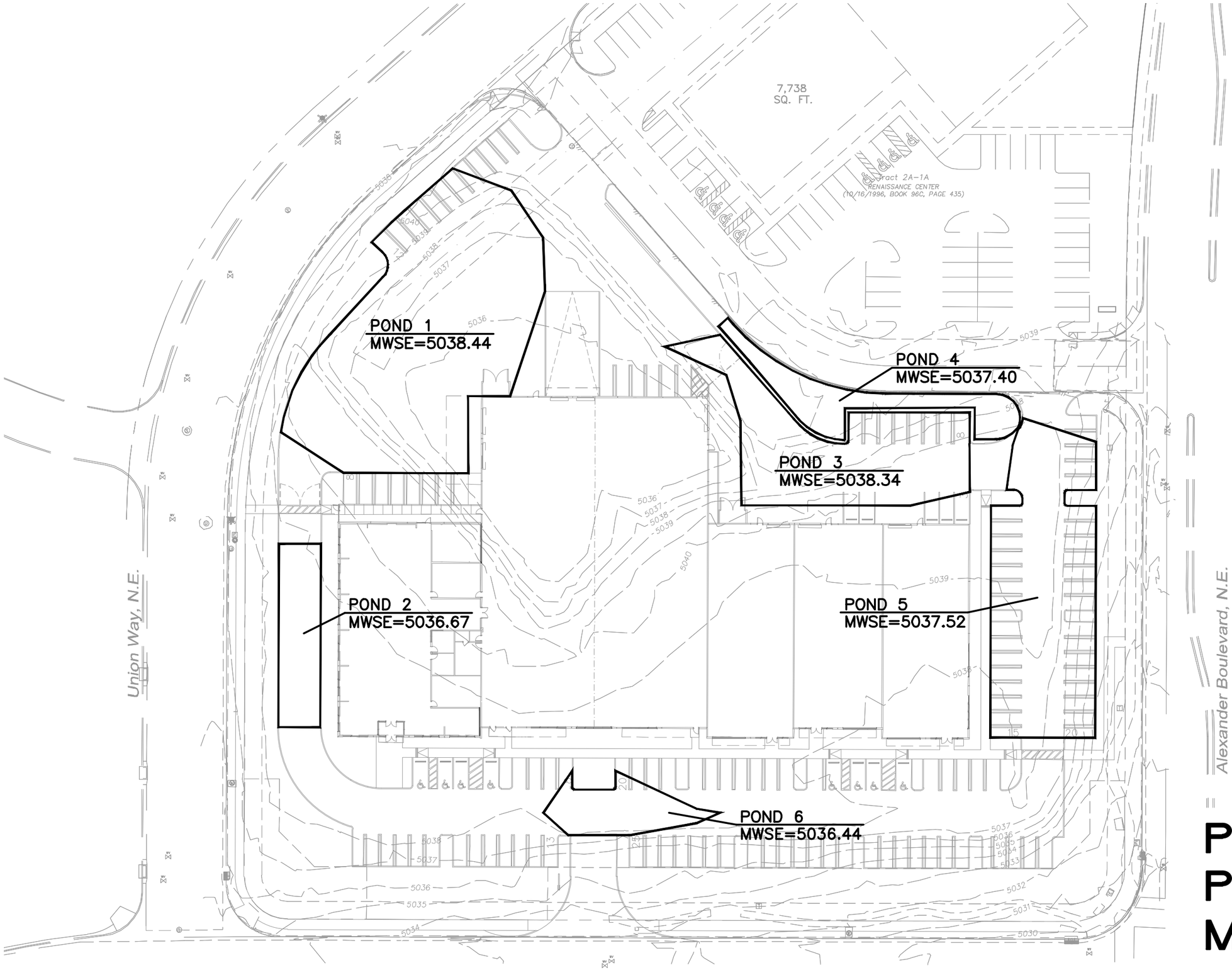
Underground
CMP Length= 850
(84" dia.)

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

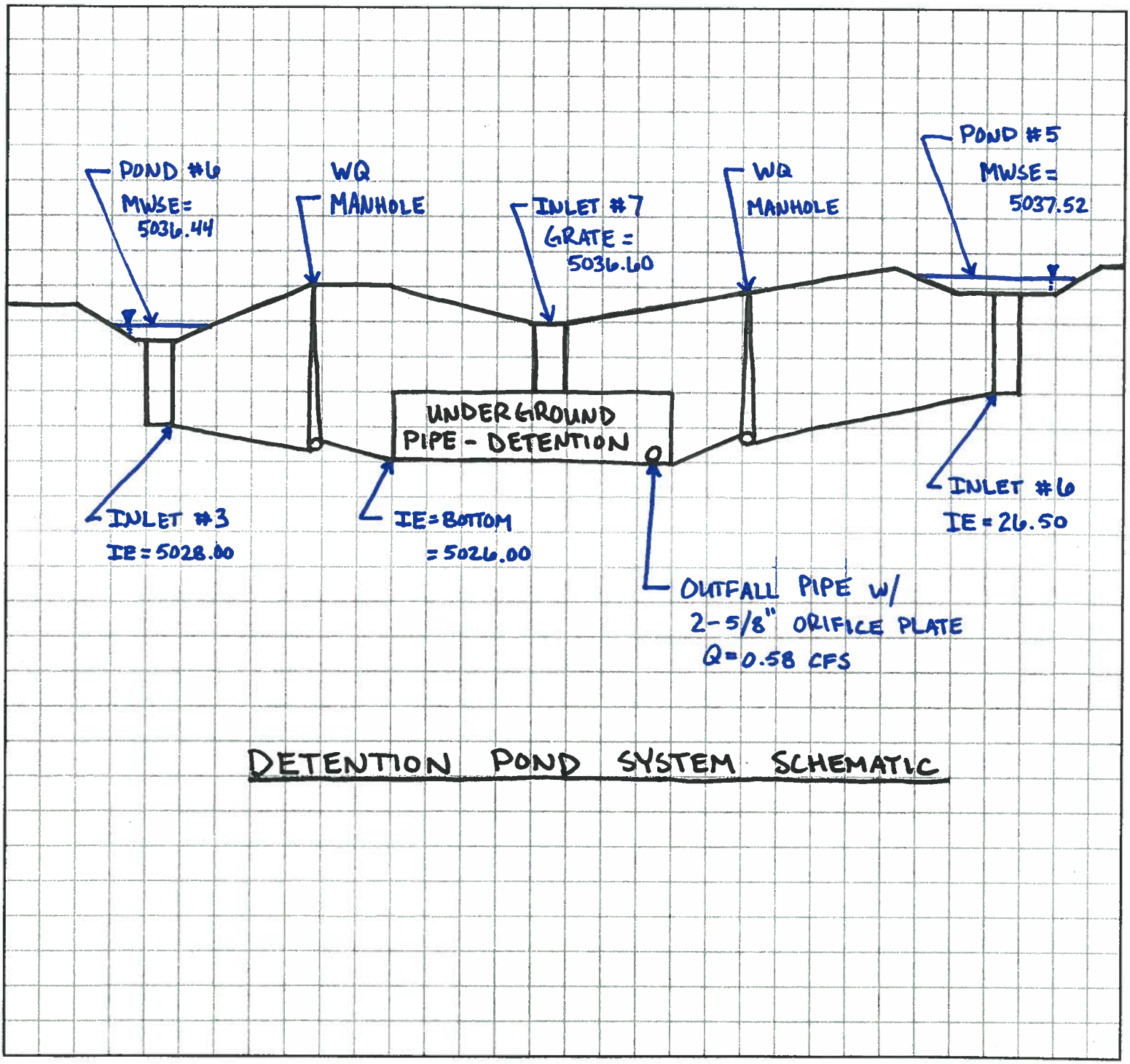
TIERRA WEST, LLC

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