

Wolfenbarger, Jeanne

From: Wolfenbarger, Jeanne
Sent: Friday, June 19, 2015 4:08 PM
To: 'David Soule'
Subject: F22-D002 (Sandia Area Federal Credit Union/Starbucks)

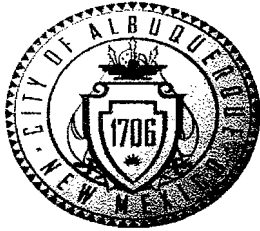
Importance: High

David,

I have reviewed the latest drainage submittal and still need to have the following comments addressed prior to approval:

1. If the temporary pond is now sized to handle the 100-year 10-day storm runoff, label the WSEL Elevation within the pond on the plan view.
2. On the actual grading and drainage plan view, label the first flush volume for each run of the storm chambers that corresponds with drainage write-up. Also, label the total volume provided by the storm chambers on the plan view that corresponds with the drainage write-up. (Provide this information directly under the label showing number of storm chambers for each run of the storm chambers.)
3. Label all pipe sizes on the plan. There are some short pipe runs especially from the that are missing pipe size call-outs.
4. Provide detail for the 10-foot by 6" emergency overflow from the temporary pond. List the elevations. (It would make sense that the above invert elevation within the pond is above the WSEL Elevation from the upstream pond when labeling it.)
5. On the water quality pond in the middle of the site, the top elevation of 49.25 is far lower than the adjacent curb cut elevation opening of 52.25 and other adjacent curb elevations. Revise as necessary.
6. On the water quality pond on the west side of the site, there are top of pond elevations of 46.5 shown where the adjacent sidewalk would be approximately 4 feet higher based on the adjacent curb flowline elevations, and the adjacent building is also approximately 4 feet higher. Revise as necessary.
7. There are new 18-inch sidewalk culverts called out on the plan near the water quality pond to the west that have no elevation information listed. Also, how does water drain from the other 18-inch sidewalk culvert to this one? Provide a couple more spot elevations for information.
8. When you mention the cross-lot drainage easements in the write-up, there is only one parcel. (?)

Jeanne



City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: sandia area federal credit union-starbucks Building Permit #: _____ City Drainage #: f22-f002
DRB#: _____ EPC#: _____ Work Order#: _____
Legal Description: lots 3a,3b,3c new holiday park
City Address: 13101 montgomery ne

Engineering Firm: RIO GRANDE ENGINEERING Contact: DAVID SOULE
Address: PO BOX 93924, ALBUQUERQUE, NM 87199
Phone#: 505.321.9099 Fax#: 505.872.0999 E-mail: DAVID@RIOGRANDEENGINEERING.COM

Owner: sandia area federal credit union Contact: _____
Address: _____
Phone#: _____ Fax#: _____ E-mail: _____

Architect: slagle Herr Contact: _____
Address: _____
Phone#: _____ Fax#: _____ E-mail: _____

Surveyor: CONSTRUCTION SURVEY INCORPORATED Contact: JOHN GALLEGOS
Address: _____
Phone#: 917.8921 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 ☐ SO-19 APPROVAL
☐ PAVING PERMIT APPROVAL ☐ ESC PERMIT APPROVAL
☐ WORK ORDER APPROVAL ☐ ESC CERT. ACCEPTANCE
☐ GRADING CERTIFICATION ☐ OTHER (SPECIFY) _____

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

DATE SUBMITTED: 5/20/15 6/18/15 By: _____

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

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3. **Drainage Report:** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
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

RIO GRANDE ENGINEERING OF NEW MEXICO, LLC

March 24, 2015

Ms. Jeanne Wolfenbarger, PE
Senior Engineer, Planning Department
Development Review
City of Albuquerque

**RE: Grading and Drainage Plan
F22-D002
11301 Montgomery**

Dear Ms. Wolfenbarger:

The purpose of this letter is to accompany the revised drainage submittal. The plan has been modified to address your written comments dated June 12, 2015. The following is a response to your comments:

1. We have added the first flush calculation to the hydraulic calculations in appendix A. We have shown roof and flow arrows. The entire flow passes thru the infiltrators and the outlet elevation provides the volume, as shown on the elevation-volume spread sheet located in appendix b.
2. We have added flow arrows.
3. We have not added elevations at the islands; we are not depressing the islands but allowing the water to pass thru and top the curb on the low side.
4. We have added the spot elevations at the street and adjacent building.
5. The plan has changed due to uncertainty with what the future lot will look like. Due to the slope and nature of our drainage solution, we do not want bare dirt areas to contribute to our infiltrator systems; therefore, we have modified the plan to retain the entire 100-year, 10-day volume generated within that basin. We have shown that 30 infiltrators with invert at 39.5 will be a reasonable solution when it develops; we have added stub for that to occur. We have added rip rap at the flow concentrations.
6. We have included a 11x17 basin map.
7. We have added the elevation of the inlet and added an orifice plate detail.
8. We have labeled the junction boxes and corrected the typo.
9. Appendix B and C contain the volume calculations for each tank section as well as a summary based upon the elevations. The pond calculation spreadsheet is a stage-storage chart that was used for the pond routing volumes in the AHYMO.
10. The discharge rate of 4.7 was the rate designated for the site on the initial development.
11. We have labeled the number of chambers and included a modification to the detail for a single row.

12. We have labeled the inlets and referenced the location of the structures on the calculation.
The type D inlet is provided only to provide adequate box to construct orifice control most flow will not enter that inlet, inlet D is designed for all flow so the capacity of the type D inlet is not relevant
13. The dumpster was revised, and the spot elevations corrected
14. Note #1 on right hand side of sheet notes all elevations are flow lines
15. We have corrected the AHYMO for 15 minute increments and corrected the input so there is not the phantom flow
16. As discussed in the meeting the asphalt warps at that area and gutter not needed

Should you have any questions regarding this submittal, please do not hesitate to call me.

Sincerely,



David Soule, PE
Rio Grande Engineering
PO Box 93924
Albuquerque, New Mexico 87199

CITY OF ALBUQUERQUE



June 12, 2015

David Soule, PE
Rio Grande Engineering
PO Box 93924
Albuquerque, NM 87199

**RE: Sandia Area Credit Union and Starbucks, 11301 Montgomery Boulevard
Grading and Drainage Plan
Engineer's Stamp Date 6-01-2015 (File: F22-D002)**

Dear Mr. Soule:

Based upon the information provided in your submittal received 6-01-15, the above referenced plan cannot be approved for Building Permit until the following comments are addressed:

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

- 1) Show first flush calculation within the report. Show roof drain locations, and explain how first flush is being managed especially with regard to impervious facilities on the east side of the site. It appears as though an additional first flush pond may be needed to handle first flush from the building on the southeast corner of the site with added curb cuts to allow drainage into the pond from the drive-thru area. Label all first flush ponds as "first flush" along with volume information.
- 2) Show flow arrows and lot lines on the grading and drainage plan.
- 3) What are the curb cuts in the medians to the north of the Starbucks for? If a first flush pond was intended here, label it, and provide elevation and volume information. Provide curb flowline elevations at all curb openings.
- 4) Show existing curb elevations on Cairo at the access point, and show existing elevations along west property line to show how these existing elevations relate to new elevations. On the north side of the site, provide elevations for the existing building that abuts the property line, and ensure that the new contours tie into the correct existing contours.
- 5) Discuss what the temporary pond is for. What is the sizing of it based on since the 100-year 6-hour volume is much higher for Basin A? Discuss what the plans are for Basin A since an impervious area of 0.988 acres was given in the computations.

Also provide riprap within the proposed swale to the bottom of the pond from the east to prevent erosion.

- 6) Provide a larger basin map. An 11x17 would be easier to read along with upsizing of the text for the labeling of the basins.
- 7) Label grate elevation for the new Type "D" inlet. Provide a detail showing all elevation information for inlet including information for orifice. Show how this inlet ties into the storm chambers with pipe invert and size information.
- 8) Label size of Nyloplat junction boxes and the pipes that tie into the storm chambers. Between the high invert elevation of 48.00 for discharge from the site and the high invert elevations of the connecting nyloplat junction boxes, how does the entire system manage to drain, given that the top of the storm chambers are set at elevation 42.50??
- 9) For the AHYMO Run, show what the pond routing information is based on. Provide computations based on orifice for which the elevations given match what is on the plan.
- 10) Discuss what the downstream capacity of 4.7 cfs for the existing outlet is based on. The proposed discharge flow should match downstream capacity.
- 11) On the proposed layout for the storm chambers with the report, label the number of chambers used and the volume of each chamber. Then provide the overall volume for the chamber on this sheet and on the plan view. Provide a cross-sectional view of the storm chamber similar to what is shown on the report showing a detail of the stone and fabric surrounding it if it is just for one row. (It should be similar to the cross-section provided in the report for the multiple chambers.)
- 12) In the report, explain location of infrastructure for which capacities calculations were provided. Where is there a channel? What are the "Volume Computations" based on? Also include capacity calculations for the sidewalk culvert and for the Type "D" inlet within the "Inlet Capacity Calculations". On the plan view for the grading and drainage plan, label the discharge flow from the site, and label the flow captured at each of the inlets.
- 13) North of the credit union building, there is a curb cut elevation at an elevation of 49.40 which should be lowered if the intent is to drain to the "water quality pond". Also, the nearby "water quality" pond is labeled at an elevation of 46.50 for the top elevation. Correct discrepancy. Also, provide additional elevation information for the corners of the trash receptacle area.
- 14) If the proposed elevations shown are at flowline, provide general note to this effect.
- 15) Show AHYMO Run in 10-minute increments until about 90% of the pond has drained to demonstrate a more clear relationship between inflow and outflow. How does the pond have a constant outflow of 1.68 cfs for a time period of more than 8 days when it peaks at 1.75 hours??

16) Provide a small valley gutter from the sidewalk culvert from Starbucks across the accessway to prevent flow from discharging out the accessway.

If you have any questions, you can contact me at 924-3924.

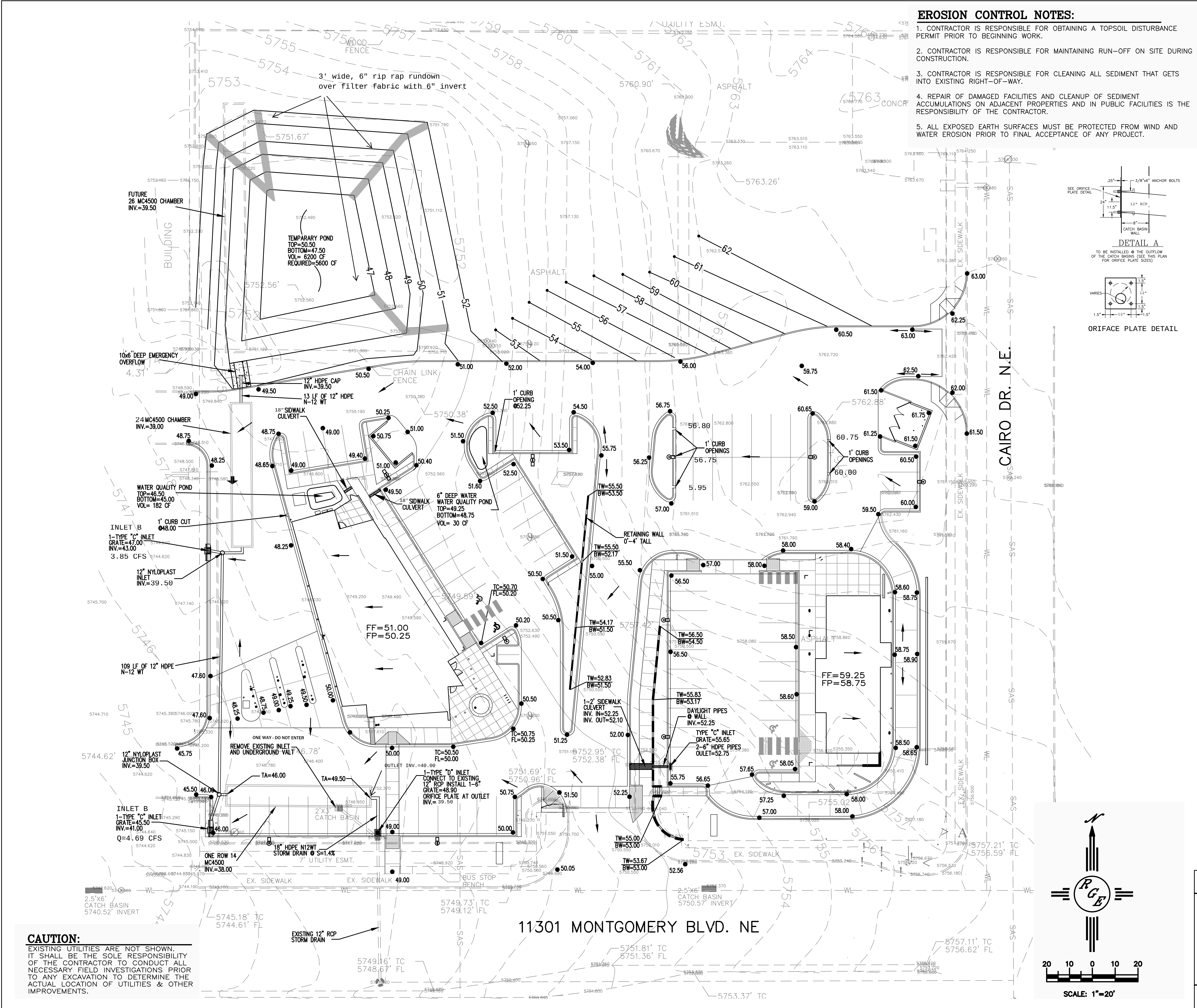
Sincerely,



Jeanne Wolfenbarger, P.E.
Senior Engineer, Planning Dept.
Development Review Services

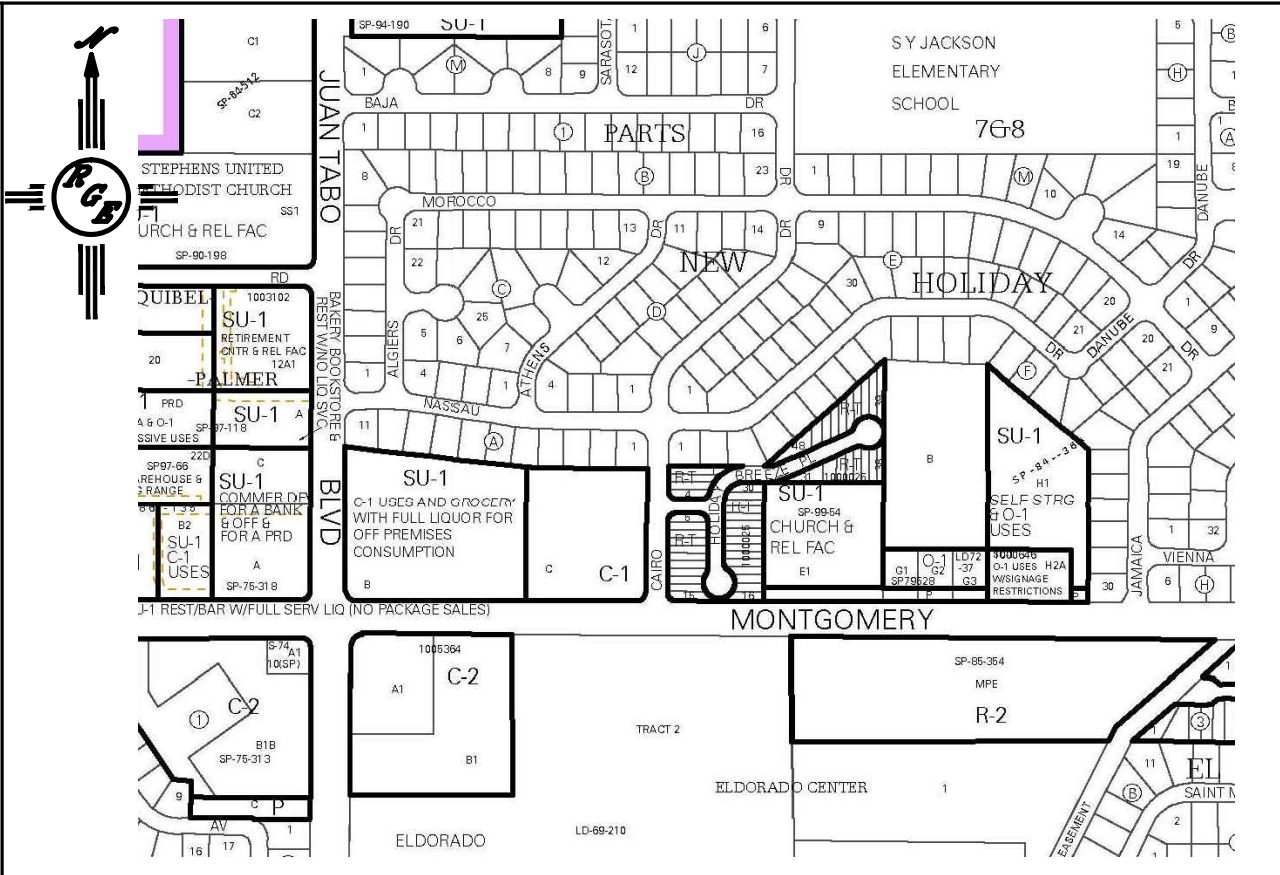
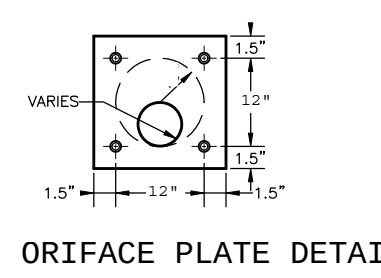
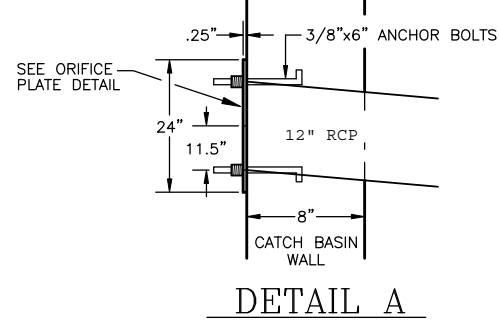
Orig: Drainage file
c.pdf Addressee via Email

emergency spill way c P.D. & Volume

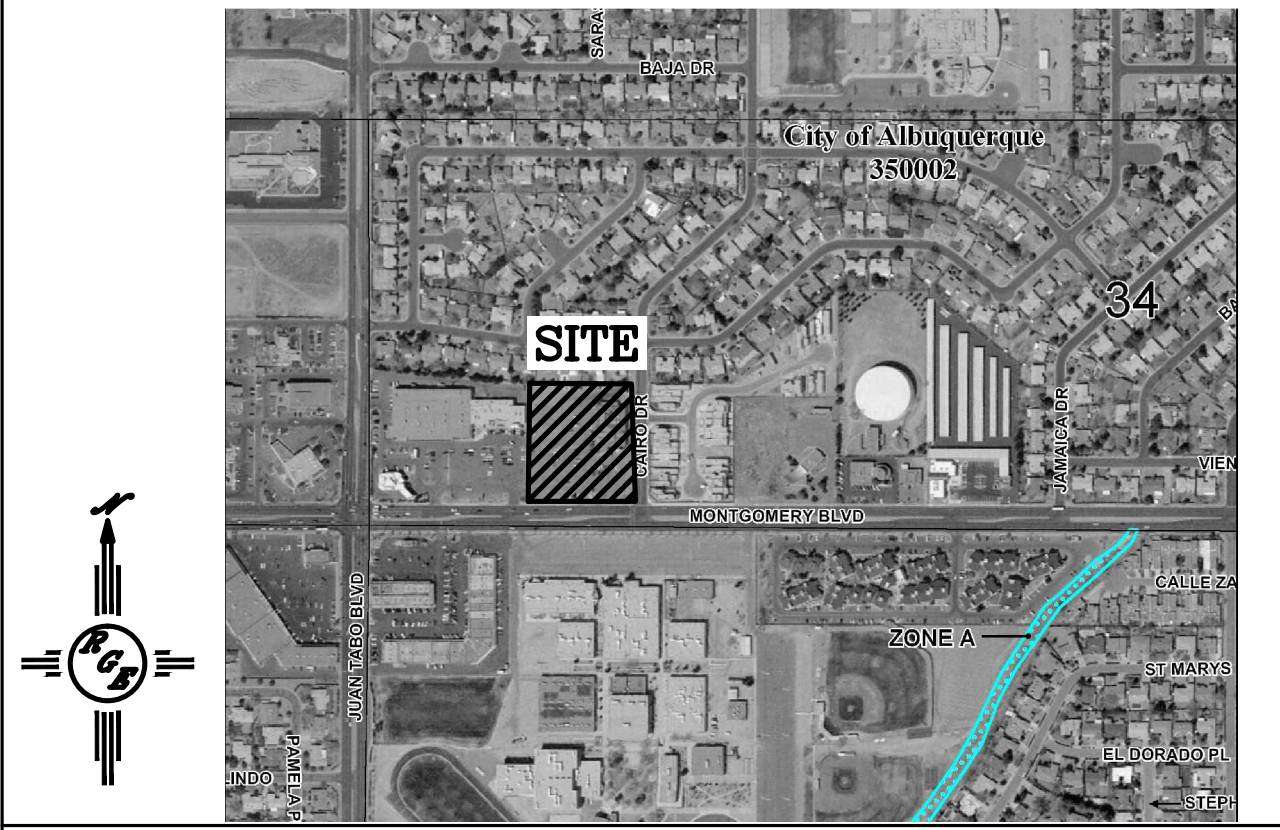


EROSION CONTROL NOTES:

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.



VICINITY MAP: F-22-Z



FIRM MAP: 35001C0144G

LEGAL DESCRIPTION:

TRACT C, THE NEW HOLIDAY PARK SUBDIVISION
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO

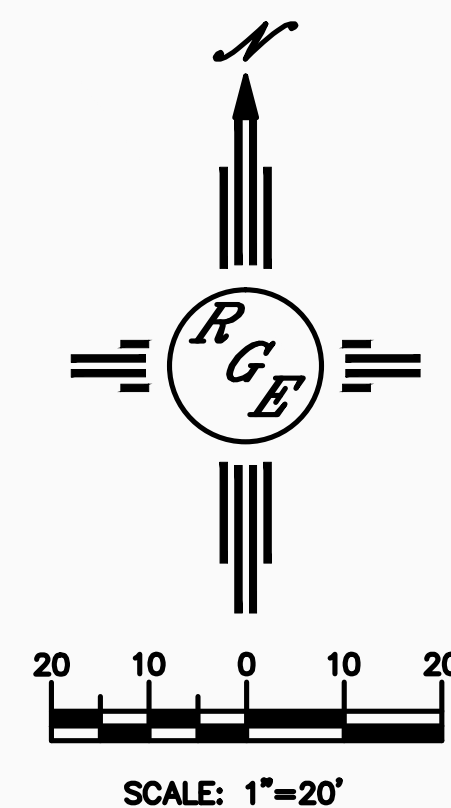
NOTES:

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.
2. UNDERGROUND WATER RETENTION SYSTEM SHALL BE STORM TECH MC4500.00

LEGEND

- 5601 — EXISTING CONTOUR
- 5600 — EXISTING INDEX CONTOUR
- 5601 — PROPOSED CONTOUR
- 5600 — PROPOSED INDEX CONTOUR
- LOT LINE
- CENTERLINE
- RIGHT-OF-WAY
- EXTENDED STEM WALL SEE ARCH PLANS FOR DETAILS
- PROPOSED ROCK FACE WALL
- EXISTING CURB AND GUTTER
- PROPOSED EDGE OF CONCRETE
- PROPOSED FLOWLINE
- EXISTING WALL

CAUTION:
EXISTING UTILITIES ARE NOT SHOWN.
IT SHALL BE THE SOLE RESPONSIBILITY
OF THE CONTRACTOR TO CONDUCT ALL
NECESSARY FIELD INVESTIGATIONS PRIOR
TO ANY EXCAVATION TO DETERMINE THE
ACTUAL LOCATION OF UTILITIES & OTHER
IMPROVEMENTS.



ENGINEER'S SEAL 6/18/15 DAVID SOULE P.E. #14522	Saftca & Starbuc	GRADING AND DRAINAGE PLAN Rio Grande Engineering 1808 CENTRAL AVENUE SUITE 201 ALBUQUERQUE, NM 87108 (505) 872-0888	DRAWN BY DEM
			DATE 8-14
			SHEET # 1 of 2
			JOB # XXXXX

REVISED
DRAINAGE REPORT

For

**SANDIA AREA FEDERAL CREDIT UNION/STARBUCKS
11301 MONTOMERY NE
Albuquerque, New Mexico**

Prepared by

Rio Grande Engineering
PO Box 93924
Albuquerque, New Mexico 87199

JUNE 2015



6/18/15

David Soule P.E. No. 14522

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Site hydrology and hydraulic calculations	A
AHYMO Proposed	B
AHYMO Future	C
ADS infiltrator specifications.....	D

Map

Site Grading and Drainage Plan

PURPOSE

The purpose of this report is to provide the Drainage Management Plan for the redevelopment of a 3 acre property located at 11301 Montgomery. This plan was prepared in accordance with the City of Albuquerque design regulations, utilizing the City of Albuquerque's Development Process Manual drainage guidelines. This report will demonstrate that the grading does not adversely affect the surrounding properties, nor the upstream or downstream facilities.

INTRODUCTION

The subject of this report, as shown on the Exhibit A, is a 3 -acre parcel of land located on the north side of Montgomery between Cairo and Juan Tabo NE. The legal description of this site is tract c1,c2,c3 of the New Holiday Park subdivision. As shown on FIRM map35013C0144G, the entire site is located within Flood Zone X. The site has been fully developed in the past and this is a redevelopment of this site.

The site was designed and constructed with a buried retention tank and metered outflow. The outflow was limited to the 100-year 6-hour discharge rate assuming 100% native. The proposed development shall match existing patterns and limit the flow to similar rate. In addition the site shall retain onsite the first flush volume required.

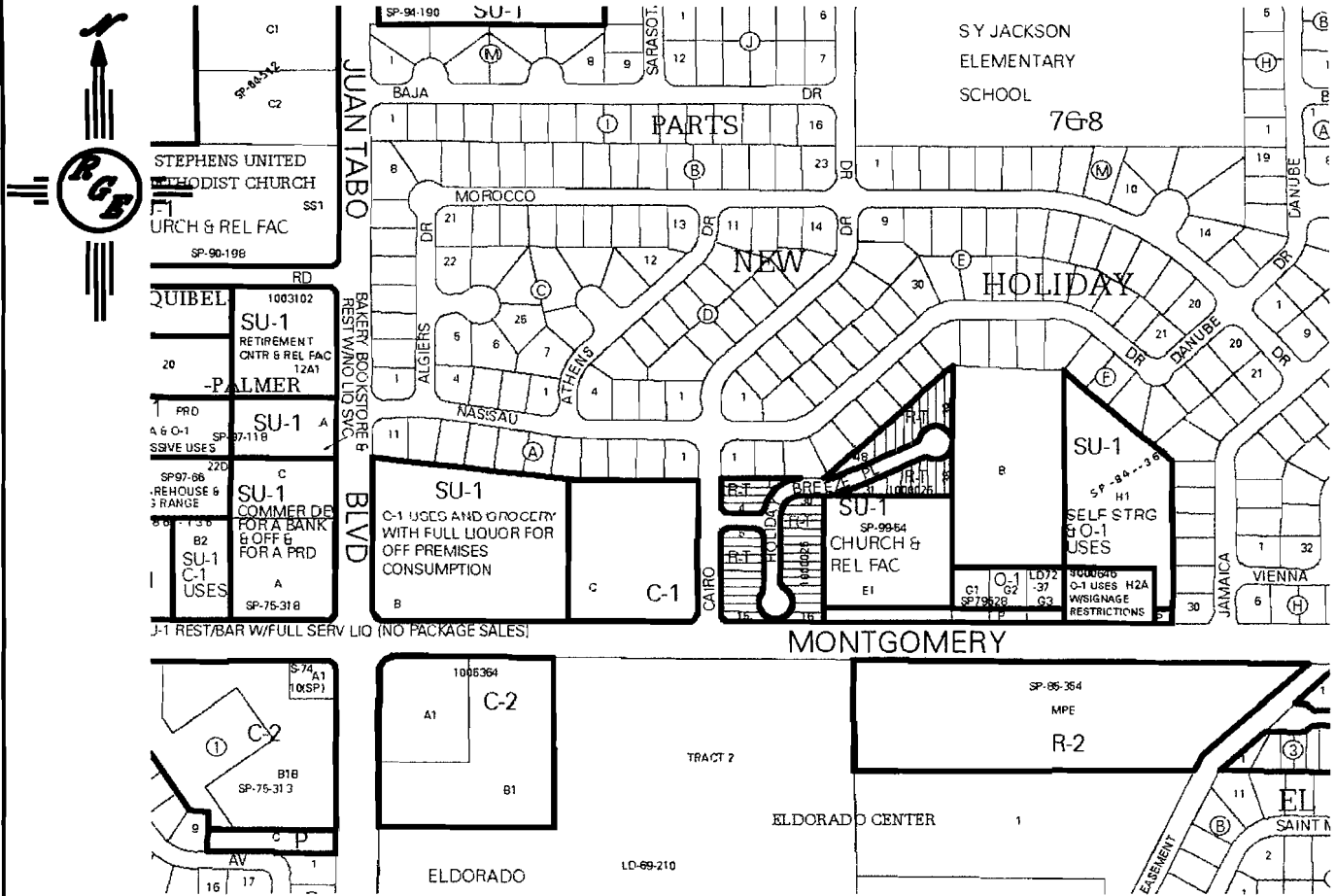
EXISTING CONDITIONS

The site currently is graded per the grading plan F22-d2. The site drains to a single type d inlet. This inlet is connected to a large underground concrete vault. The outlet is sized such that the flow will not exceed 4.7 cfs.

PROPOSED CONDITIONS

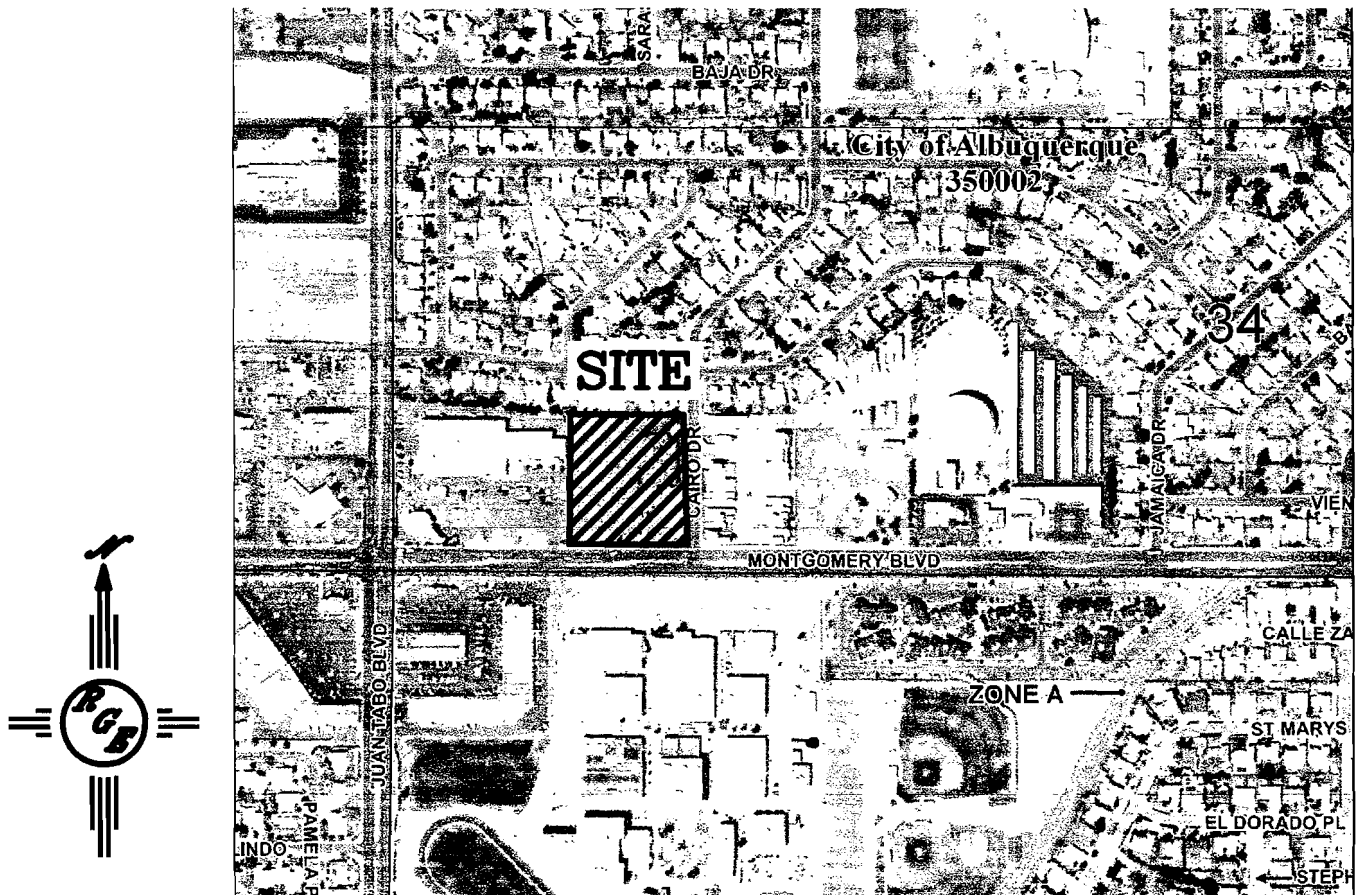
The proposed improvements consist of removal the replacement of the existing pavement and the construction of two new buildings and one parcel for future development. The lots have cross lot drainage easements and will free discharge to two inlets that are connected to an underground infiltration chamber. The site contains 5 onsite sub basins, which were partitioned to verify the capacity of each collection and conveyance structure. Basins E and D discharge 4.69 cfs to a type C inlet at the southwest corner of the site. Basin B and C discharge 3.95 cfs to a type C inlet located at the west property line. Basin A is a future development and will retain its developed flow onsite of 5600 cubic feet, with and emergency overflow. Once the flows are captured they are stored in the infiltration system and metered out by a 9" orifice plate on the existing storm drain stub. The system was modeled using the AHYMO computer program. The site was modeled for the interim condition and ultimate condition. As shown in appendix B, in the interim condition the site will discharge 3.98 cfs to the existing Montgomery storm system. In the ultimate condition the site will discharge 5.28 cfs which exceeds the existing by .58 cfs, which when the development occurs can be reduced by additional throttling of that discharge. The ultimate condition model located in appendix c was included as a guide for the future development. The interim condition which we are constructing discharges less than existing

The first flush volume is captured within the infiltrator tanks, the outlet of tank 1 is set at 40, which will retain the first 2379 cubic feet which is more than the 1922 cubic feet required. When the rear pad is developed the first flush volume will be retained by setting the outlet elevation of the tanks. A copy of the site hydrology and capacity calculations is included in appendix A. The tank volumes and stage storage spread sheet as well as the AHYMO model is included in appendix B for the proposed and ultimate conditions are in appendix C. The infiltrator details are located in appendix C.



VICINITY MAP:

F-22-Z



FIRM MAP:

35001C0144G

SUMMARY AND RECOMMENDATIONS

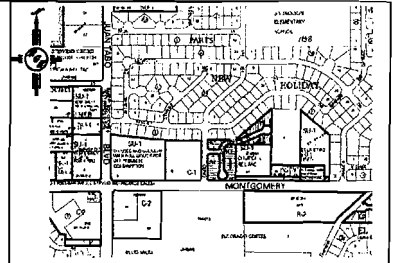
This project is a redevelopment of an existing site. The redevelopment is consistent with the approved grading plan. The proposed site will discharge less than existing and retain the first flush volume. The development will not affect the upstream or downstream properties or infrastructure. Since the effected area site encompasses more than 1 acre, a NPDES permit will be required prior to any construction activity.

APPENDIX A

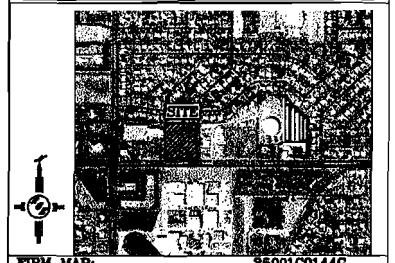
SITE HYDROLOGY AND HYDRAULIC CALCULATIONS

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.



VICINITY MAP: F-22-2



FIRM MAP: 85001CD144G

LEGAL DESCRIPTION:

TRACT C, THE NEW HOLIDAY PARK SUBDIVISION
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO

NOTES:

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.
2. UNDERGROUND WATER RETENTION SYSTEM SHALL BE STORM TECH MC4500.00.

LEGEND

- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- PROPOSED CONTOUR
- PROPOSED INDEX CONTOUR
- LOT LINE
- CENTERLINE
- RIGHT-OF-WAY
- EXTENDED STEM WALL SEE ARCH PLANS FOR DETAILS
- PROPOSED ROCK FACE WALL
- EXISTING CURB AND GUTTER
- PROPOSED EDGE OF CONCRETE
- PROPOSED FLOWLINE
- EXISTING WALL

I, DAVID SOULE, HAVE PERSONALLY INSPECTED THE PROPERTY ON X-XC-13.
NO EARTHWORK HAS BEEN PERFORMED AND THE SITE IS CONSISTENT WITH THE TOPO SHOWN.

DAVID SOULE P.E. #14522

DATE



CAUTION:
EXISTING UTILITIES ARE NOT SHOWN.
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OF THE CONTRACTOR TO CONDUCT ALL
NECESSARY FIELD INVESTIGATIONS PRIOR
TO ANY EXCAVATION TO DETERMINE THE
ACTUAL LOCATION OF UTILITIES & OTHER
IMPROVEMENTS.

EXISTING 12" RCP
STORM DRAIN

11301 MONTGOMERY BLVD. NE

CAIRO DR. N.E.

	Soles & Starbuc	DESIGN BY DES DATE 8-14
	GRADING AND DRAINAGE PLAN	SHEET # 1 of 1
3/17/15 DAVID SOULE P.E. #14522		JOB # XXXXX

Weighted E Method

Existing Developed Basins

Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		100-Year, 6-hr.			10-day
			%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
BASIN A	52473	1.205	0%	0	15.0%	0.181	5.0%	0.06023	80%	0.964	2.347	0.236	5.81	0.364
BASIN A(interim)	52473	1.205	0%	0	45.0%	0.542	50.0%	0.60231	5%	0.060	1.348	0.135	4.15	0.143
BASIN B	20564	0.472	0%	0	6.0%	0.028	5.0%	0.0236	89%	0.420	2.487	0.098	2.38	0.154
BASIN C	13388	0.307	0%	0	14.0%	0.043	10.0%	0.03073	76%	0.234	2.304	0.059	1.47	0.090
BASIN D	29585	0.679	0%	0	8.0%	0.054	5.0%	0.03396	87%	0.591	2.456	0.139	3.39	0.218
BASIN E	11480	0.264	0%	0	10.0%	0.026	5.0%	0.01318	85%	0.224	2.425	0.053	1.30	0.083
DRAINS TO ROW	4811	0.110	0%	0	10.0%	0.011	10.0%	0.01104	80%	0.088	0.410	0.004	0.10	0.016
TOTAL ONSITE	184774	4.242	0%		20.9%	0.886	18.3%	0.775	61%	2.581		0.724	18.59	
ALLOWED				0.000		0.152		0.037		0.544		-0.138	4.7CFS	-0.210

Equations:

Weighted E = $E_a \cdot A_a + E_b \cdot A_b + E_c \cdot A_c + E_d \cdot A_d$ / (Total Area)

Volume = Weighted D * Total Area

Flow = $Q_a \cdot A_a + Q_b \cdot A_b + Q_c \cdot A_c + Q_d \cdot A_d$

132301
179963
-47662

Where for 100-year, 6-hour storm (zone 4)

$E_a = 0.8$	$Q_a = 2.2$
$E_b = 1.08$	$Q_b = 2.92$
$E_c = 1.46$	$Q_c = 3.73$
$E_d = 2.64$	$Q_d = 5.25$

water harvet volume
provided

67823*.341/12

1995.98 interim only- future will contain first flush
2379.00 infiltrator below outlet (40.00)
6244.29 temp pond for undeveloped tract(100-year,10-day volume)

DROP INLET CALCULATIONS

INLET	TYPE OF INLET	AREA (SF)	Q (CFS)	H (FT)	H ALLOW (FT)
B	SINGLE C	3.84	7.7	0.1734	0.5
D	SINGLE C	3.84	9.38	0.2574	0.5

ORIFICE EQUATION

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

$$C = 0.6$$

$$g = 32.2$$

$$\text{INLET B} = \text{BASIN B} + C = 3.85 \text{ CFS} \quad 7.7$$

$$\text{INLET D} = \text{BASIN D} + E = 4.69 \text{ CFS} \quad 9.38$$

DOUBLED FLOW FOR CLOGGING FACTOR

Channel Capacity

	Top Width	Bottom Width	Depth	Area	WP	R	Slope	Q Provided	Q Required	Velocity
	(ft)	(ft)	(ft)	(ft^2)	(ft)		(%)	(cfs)	(cfs)	(ft/s)
Beginning	2	2	0.5	1.00	3.00	0.3333333	2	3.38	1.30	1.30
Beginning	1.5	1.5	0.5	0.75	2.50	0.3	2	2.36	1.47	1.96
Beginning	10	6	0.5	4.00	10.12	0.3951357	1	10.70	5.81	1.45

sidewalk culvert at basin E

sidewalk culvert at basin C

retention pond overflow at basinA

Manning's Equation:

$$Q = 1.49/n * A * R^{(2/3)} * S^{(1/2)}$$

A = Area

R = D/4

S = Slope

n = 0.03

APPENDIX B
TANK VOLUMES/STAGE STORAGE/AHYMO
PROPOSED

interimPONROUTING061615.txt

*S AHYMO - safcu
*S POND ROUTING

START TIME=0.0 PUNCH CODE=0

RAINFALL TYPE=1
QUARTER=0.0 ONE= 2.20 IN
SIX= 2.90 IN DAY= 3.70 IN DT = 0.05 HR

COMPUTE NM HYD ID=1 HYD NO=101 DA= .00243 SQ MI
PER A=00 PER B=12 PER C=6 PER D=82
TP=-.139 MASSRAIN=-1

PRINT HYD ID=1 CODE=20

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR
ROUTE RESERVOIR ID=2 HYD NO=102 INFLOW=1 CODE=3

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)
0.00	0.03	39.00
1.30	0.06	40.00
1.99	0.07	40.50
2.49	0.08	41.00
2.91	0.10	41.50
3.28	0.11	42.00
3.61	0.12	42.50
3.91	0.13	43.00
4.19	0.14	43.50
4.45	0.15	44.00
4.70	0.15	44.50
4.93	0.16	45.00
5.16	0.16	45.50
5.37	0.17	46.00

PRINT HYD ID=2 CODE=20

FINISH

INTERIM AHYMO.OUT

AHYMO PROGRAM (AHYMO-S4) - Version: S4.01a - Rel: 01a
 RUN DATE (MON/DAY/YR) = 06/17/2015
 START TIME (HR:MIN:SEC) = 18:40:36 USER NO.=
 RioGrandeSingleA41963517
 INPUT FILE =
 Settings\Owner\Desktop\2014jobs\1498-11301MONTGOMERY\interimPONROUTING061615.txt

*S AHYMO - safcu
 *S POND ROUTING

START TIME=0.0 PUNCH CODE=0

RAINFALL TYPE=1
 QUARTER=0.0 ONE= 2.20 IN
 SIX= 2.90 IN DAY= 3.70 IN DT = 0.05 HR

6-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
 AREAS (NM & AZ) - D1

DT = 0.050000 HOURS			END TIME = 6.000000 HOURS			
0.0000	0.0047	0.0095	0.0146	0.0201	0.0259	0.0323
0.0415	0.0561	0.0718	0.0881	0.1056	0.1235	0.1418
0.1608	0.1800	0.2012	0.2234	0.2472	0.2763	0.3081
0.3508	0.3991	0.4587	0.5383	0.6279	0.7825	1.0229
1.4348	1.7243	1.9526	2.0673	2.1679	2.2402	2.2976
2.3477	2.3844	2.4181	2.4459	2.4701	2.4926	2.5127
2.5318	2.5487	2.5648	2.5804	2.5955	2.6079	2.6148
2.6216	2.6284	2.6346	2.6409	2.6469	2.6529	2.6588
2.6644	2.6699	2.6753	2.6806	2.6859	2.6909	2.6958
2.7007	2.7055	2.7103	2.7148	2.7194	2.7238	2.7282
2.7325	2.7368	2.7410	2.7452	2.7493	2.7534	2.7574
2.7614	2.7654	2.7692	2.7731	2.7769	2.7807	2.7844
2.7881	2.7917	2.7953	2.7989	2.8024	2.8059	2.8094
2.8128	2.8162	2.8196	2.8229	2.8262	2.8295	2.8327
2.8359	2.8391	2.8422	2.8453	2.8484	2.8515	2.8546
2.8576	2.8606	2.8635	2.8665	2.8694	2.8723	2.8751
2.8780	2.8808	2.8836	2.8864	2.8892	2.8919	2.8946
2.8973	2.9000					

COMPUTE NM HYD ID=1 HYD NO=101 DA= .00243 SQ MI
 PER A=00 PER B=12 PER C=6 PER D=82
 TP=-.139 MASSRAIN=-1

K = 0.075755HR TP = 0.139000HR K/TP RATIO = 0.545000 SHAPE
 CONSTANT, N = 7.106428
 UNIT PEAK = 7.5443 CFS UNIT VOLUME = 0.9972 B = 526.28
 P60 = 2.2000
 AREA = 0.001993 SQ MI IA = 0.10000 INCHES INF = 0.04000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

K = 0.131509HR TP = 0.139000HR K/TP RATIO = 0.946108 SHAPE
 CONSTANT, N = 3.736321

INTERIM AHYMO.OUT
 UNIT PEAK = 1.0611 CFS UNIT VOLUME = 0.9881 B = 337.19
 P60 = 2.2000
 AREA = 0.000437 SQ MI IA = 0.45000 INCHES INF = 1.11000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=1 CODE=20

PARTIAL HYDROGRAPH 101.00

TIME	TIME FLOW HRS CFS	FLOW CFS	TIME FLOW HRS CFS	FLOW CFS	TIME FLOW HRS CFS	FLOW CFS
6.000	0.000	0.0	2.000	1.2	4.000	0.1
	0.1					
	1.000	0.5	3.000	0.1	5.000	0.1

RUNOFF VOLUME = 2.38959 INCHES = 0.3097 ACRE-Feet
 PEAK DISCHARGE RATE = 7.51 CFS AT 1.500 HOURS BASIN AREA = 0.0024 SQ. MI.

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR

ROUTE RESERVOIR	ID=2	HYD NO=102	INFLOW=1	CODE=3
	OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)	
	0.00	0.03	39.00	
		1.30	0.06	40.00
		1.99	0.07	40.50
		2.49	0.08	41.00
	2.91	0.10	41.50	
	3.28	0.11	42.00	
	3.61	0.12	42.50	
	3.91	0.13	43.00	
	4.19	0.14	43.50	
	4.45	0.15	44.00	
	4.70	0.15	44.50	
	4.93	0.16	45.00	
	5.16	0.16	45.50	
	5.37	0.17	46.00	

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	39.00	0.030	0.00
0.15	0.00	39.00	0.030	0.00
0.30	0.00	39.00	0.030	0.00
0.45	0.00	39.00	0.030	0.00
0.60	0.04	39.00	0.030	0.00
0.75	0.32	39.07	0.032	0.09
0.90	0.43	39.16	0.035	0.21
1.05	0.61	39.26	0.038	0.34
1.20	1.09	39.42	0.043	0.55
1.35	2.56	39.80	0.054	1.04
1.50	7.51	41.34	0.094	2.77
1.65	4.75	43.06	0.131	3.95

INTERIM AHYMO.OUT				
1.80	2.35	42.73	0.125	3.75
1.95	1.36	41.72	0.104	3.07
2.10	0.88	41.08	0.083	2.56
2.25	0.61	40.29	0.066	1.69
2.40	0.45	39.85	0.056	1.11
2.55	0.25	39.60	0.048	0.78
2.70	0.17	39.42	0.043	0.54
2.85	0.12	39.29	0.039	0.38
3.00	0.10	39.20	0.036	0.27
3.15	0.09	39.15	0.034	0.19
3.30	0.08	39.11	0.033	0.15
3.45	0.07	39.09	0.033	0.12
3.60	0.07	39.08	0.032	0.10
3.75	0.07	39.07	0.032	0.09
3.90	0.07	39.06	0.032	0.08
4.05	0.07	39.06	0.032	0.07
4.20	0.07	39.05	0.032	0.07
4.35	0.06	39.05	0.032	0.07
4.50	0.06	39.05	0.032	0.07
4.65	0.06	39.05	0.032	0.07
4.80	0.06	39.05	0.032	0.07
4.95	0.06	39.05	0.031	0.06
5.10	0.06	39.05	0.031	0.06
5.25	0.07	39.05	0.031	0.06
5.40	0.07	39.05	0.032	0.07
5.55	0.07	39.05	0.032	0.07
5.70	0.07	39.05	0.032	0.07
5.85	0.07	39.05	0.032	0.07
6.00	0.07	39.05	0.032	0.07
6.15	0.03	39.05	0.031	0.06
6.30	0.01	39.03	0.031	0.04
6.45	0.00	39.02	0.031	0.03
6.60	0.00	39.01	0.030	0.02
6.75	0.00	39.01	0.030	0.01
6.90	0.00	39.00	0.030	0.01
7.05	0.00	39.00	0.030	0.00

PEAK DISCHARGE = 3.976 CFS - PEAK OCCURS AT HOUR 1.70
 MAXIMUM WATER SURFACE ELEVATION = 43.117
 MAXIMUM STORAGE = 0.1323 AC-FT INCREMENTAL TIME= 0.050000HRS

PRINT HYD ID=2 CODE=20

PARTIAL HYDROGRAPH 102.00

TIME	TIME	FLOW	TIME	TIME	FLOW	TIME	FLOW
HRS	HRS	CFS	HRS	HRS	CFS	HRS	CFS
0.000	0.0	0.0	2.000	2.9	4.000	0.1	
6.000	0.1	0.3	3.000	0.3	5.000	0.1	
7.000	0.0						

RUNOFF VOLUME = 2.38948 INCHES = 0.3097 ACRE-FEET
 PEAK DISCHARGE RATE = 3.98 CFS AT 1.700 HOURS BASIN AREA = 0.0024 SQ. MI.

FINISH

INTERIM AHYMO.OUT
NORMAL PROGRAM FINISH
END TIME (HR:MIN:SEC) = 18:40:36

task 1

Project:

Chamber Model -
Units -
Number of Chambers -
Number of End Caps -
Voids in the stone (porosity) -
Base of Stone Elevation -
Amount of Stone Above Chambers -
Amount of Stone Below Chambers -
Area of system -

MC-4500	
Imperial	Click Here for Metric
14	
2	
30	%
37.00	ft
12	in
12	in
692	sf Min. Area - 576 sf min. area



☒ Include Perimeter Stone in Calculations

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch. EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)
84	0.00	0.00	0.00	0.00	17.30	17.30	2546.96	44.00
83	0.00	0.00	0.00	0.00	17.30	17.30	2529.66	43.92
82	0.00	0.00	0.00	0.00	17.30	17.30	2512.36	43.83
81	0.00	0.00	0.00	0.00	17.30	17.30	2495.06	43.75
80	0.00	0.00	0.00	0.00	17.30	17.30	2477.76	43.67
79	0.00	0.00	0.00	0.00	17.30	17.30	2460.46	43.58
78	0.00	0.00	0.00	0.00	17.30	17.30	2443.16	43.50
77	0.00	0.00	0.00	0.00	17.30	17.30	2425.86	43.42
76	0.00	0.00	0.00	0.00	17.30	17.30	2408.56	43.33
75	0.00	0.00	0.00	0.00	17.30	17.30	2391.26	43.25
74	0.00	0.00	0.00	0.00	17.30	17.30	2373.96	43.17
73	0.00	0.00	0.00	0.00	17.30	17.30	2356.66	43.08
72	0.04	0.00	0.57	0.00	17.13	17.70	2339.36	43.00
71	0.12	0.01	1.63	0.02	16.81	18.45	2321.66	42.92
70	0.16	0.03	2.31	0.05	16.59	18.95	2303.20	42.83
69	0.21	0.05	2.92	0.10	16.39	19.41	2284.25	42.75
68	0.27	0.07	3.76	0.14	16.13	20.02	2264.84	42.67
67	0.45	0.09	6.34	0.18	15.35	21.86	2244.82	42.58
66	0.67	0.11	9.31	0.23	14.44	23.98	2222.96	42.50
65	0.80	0.14	11.19	0.28	13.86	25.33	2198.98	42.42
64	0.91	0.17	12.71	0.34	13.39	26.43	2173.65	42.33
63	1.00	0.19	14.04	0.38	12.97	27.40	2147.22	42.25
62	1.09	0.22	15.22	0.43	12.60	28.26	2119.82	42.17
61	1.16	0.24	16.29	0.48	12.27	29.04	2091.56	42.08
60	1.23	0.27	17.28	0.54	11.96	29.77	2062.52	42.00
59	1.30	0.30	18.20	0.60	11.66	30.45	2032.75	41.92
58	1.36	0.32	19.05	0.65	11.39	31.09	2002.30	41.83
57	1.42	0.35	19.86	0.70	11.13	31.69	1971.21	41.75
56	1.47	0.37	20.63	0.74	10.89	32.26	1939.51	41.67
55	1.53	0.39	21.35	0.79	10.66	32.80	1907.26	41.58
54	1.57	0.42	22.04	0.83	10.44	33.31	1874.46	41.50
53	1.62	0.44	22.70	0.88	10.23	33.81	1841.14	41.42
52	1.67	0.46	23.33	0.93	10.02	34.28	1807.34	41.33
51	1.71	0.48	23.93	0.97	9.83	34.73	1773.06	41.25
50	1.75	0.50	24.50	1.01	9.65	35.16	1738.33	41.17
49	1.79	0.53	25.05	1.05	9.47	35.57	1703.18	41.08
48	1.83	0.55	25.58	1.09	9.30	35.97	1667.61	41.00
47	1.86	0.56	26.09	1.13	9.13	36.35	1631.64	40.92
46	1.90	0.58	26.58	1.17	8.98	36.72	1595.28	40.83
45	1.93	0.60	27.05	1.20	8.83	37.07	1558.56	40.75
44	1.96	0.62	27.50	1.24	8.68	37.42	1521.49	40.67
43	2.00	0.64	27.93	1.28	8.54	37.75	1484.07	40.58
42	2.03	0.66	28.35	1.31	8.40	38.06	1446.33	40.50
41	2.05	0.67	28.75	1.35	8.27	38.37	1408.27	40.42
40	2.08	0.69	29.14	1.38	8.14	38.67	1369.90	40.33
39	2.11	0.71	29.51	1.41	8.02	38.95	1331.23	40.25
38	2.13	0.72	29.87	1.45	7.90	39.23	1292.28	40.17
37	2.16	0.74	30.22	1.48	7.79	39.49	1253.06	40.08
36	2.18	0.76	30.56	1.51	7.68	39.75	1213.57	40.00
35	2.21	0.77	30.88	1.54	7.57	39.99	1173.82	39.92
34	2.23	0.79	31.19	1.57	7.47	40.23	1133.82	39.83
33	2.25	0.80	31.48	1.60	7.37	40.46	1093.59	39.75
32	2.27	0.82	31.77	1.64	7.28	40.69	1053.13	39.67
31	2.29	0.84	32.05	1.68	7.18	40.91	1012.44	39.58
30	2.31	0.85	32.31	1.69	7.10	41.10	971.53	39.50
29	2.33	0.86	32.56	1.72	7.02	41.30	930.43	39.42
28	2.34	0.87	32.81	1.74	6.93	41.49	889.13	39.33
27	2.36	0.89	33.04	1.77	6.86	41.67	847.65	39.25
26	2.38	0.90	33.26	1.80	6.78	41.84	805.98	39.17
25	2.39	0.91	33.47	1.82	6.71	42.01	764.14	39.08
24	2.41	0.92	33.68	1.84	6.64	42.16	722.14	39.00
23	2.42	0.93	33.87	1.87	6.58	42.32	679.97	38.92
22	2.43	0.95	34.05	1.89	6.52	42.46	637.66	38.83
21	2.44	0.96	34.23	1.91	6.46	42.60	595.19	38.75
20	2.46	0.97	34.39	1.93	6.40	42.73	552.60	38.67
19	2.47	0.98	34.55	1.96	6.35	42.85	509.87	38.58

task 2

Project:

Chamber Model -
Units -
Number of Chambers -
Number of End Caps -
Voids in the stone (porosity) -
Base of Stone Elevation -
Amount of Stone Above Chambers -
Amount of Stone Below Chambers -
Area of system -

MC-4500	
Imperial	Click Here for Metric
24	
2	
30	%
38.00	ft
12	in
12	in
1086	sf Min. Area - 942 sf min. area



☒ Include Perimeter Stone in Calculations

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch. EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)
84	0.00	0.00	0.00	0.00	27.15	27.15	4119.90	45.00
83	0.00	0.00	0.00	0.00	27.15	27.15	4092.75	44.92
82	0.00	0.00	0.00	0.00	27.15	27.15	4065.60	44.83
81	0.00	0.00	0.00	0.00	27.15	27.15	4038.45	44.75
80	0.00	0.00	0.00	0.00	27.15	27.15	4011.30	44.67
79	0.00	0.00	0.00	0.00	27.15	27.15	3984.15	44.58
78	0.00	0.00	0.00	0.00	27.15	27.15	3957.00	44.50
77	0.00	0.00	0.00	0.00	27.15	27.15	3929.85	44.42
76	0.00	0.00	0.00	0.00	27.15	27.15	3902.70	44.33
75	0.00	0.00	0.00	0.00	27.15	27.15	3875.55	44.25
74	0.00	0.00	0.00	0.00	27.15	27.15	3848.40	44.17
73	0.00	0.00	0.00	0.00	27.15	27.15	3821.25	44.08
72	0.04	0.00	0.98	0.00	26.86	27.84	3794.10	44.00
71	0.12	0.01	2.79	0.02	26.31	29.11	3766.26	43.92
70	0.16	0.03	3.95	0.05	25.95	29.95	3737.15	43.83
69	0.21	0.05	5.01	0.10	25.62	30.72	3707.20	43.75
68	0.27	0.07	6.44	0.14	25.18	31.75	3676.47	43.67
67	0.45	0.09	10.87	0.18	23.84	34.88	3644.72	43.58
66	0.67	0.11	15.97	0.23	22.29	38.48	3609.84	43.50
65	0.80	0.14	19.18	0.28	21.31	40.77	3571.36	43.42
64	0.91	0.17	21.80	0.34	20.51	42.64	3530.58	43.33
63	1.00	0.19	24.07	0.38	19.81	44.27	3487.94	43.25
62	1.09	0.22	26.10	0.43	19.19	45.72	3443.68	43.17
61	1.16	0.24	27.92	0.48	18.63	47.03	3397.96	43.08
60	1.23	0.27	29.62	0.54	18.10	48.26	3350.92	43.00
59	1.30	0.30	31.19	0.60	17.61	49.40	3302.66	42.92
58	1.36	0.32	32.66	0.65	17.16	50.47	3253.26	42.83
57	1.42	0.35	34.05	0.70	16.73	51.47	3202.79	42.75
56	1.47	0.37	35.36	0.74	16.32	52.42	3151.32	42.67
55	1.53	0.39	36.60	0.79	15.93	53.32	3098.90	42.58
54	1.57	0.42	37.79	0.83	15.56	54.19	3045.58	42.50
53	1.62	0.44	38.91	0.88	15.21	55.01	2991.39	42.42
52	1.67	0.46	39.99	0.93	14.88	55.79	2936.39	42.33
51	1.71	0.48	41.02	0.97	14.55	56.54	2880.60	42.25
50	1.75	0.50	42.00	1.01	14.25	57.26	2824.05	42.17
49	1.79	0.53	42.94	1.05	13.95	57.95	2766.80	42.08
48	1.83	0.55	43.85	1.09	13.67	58.61	2708.85	42.00
47	1.86	0.56	44.72	1.13	13.39	59.25	2650.24	41.92
46	1.90	0.58	45.56	1.17	13.13	59.86	2590.99	41.83
45	1.93	0.60	46.36	1.20	12.88	60.45	2531.14	41.75
44	1.96	0.62	47.14	1.24	12.64	61.01	2470.69	41.67
43	2.00	0.64	47.88	1.28	12.40	61.56	2409.67	41.58
42	2.03	0.66	48.60	1.31	12.18	62.09	2348.11	41.50
41	2.05	0.67	49.29	1.35	11.96	62.60	2286.03	41.42
40	2.08	0.69	49.96	1.38	11.75	63.09	2223.43	41.33
39	2.11	0.71	50.59	1.41	11.55	63.56	2160.34	41.25
38	2.13	0.72	51.21	1.45	11.35	64.01	2096.79	41.17
37	2.16	0.74	51.81	1.48	11.16	64.45	2032.78	41.08
36	2.18	0.76	52.38	1.51	10.98	64.88	1968.32	41.00
35	2.21	0.77	52.93	1.54	10.81	65.28	1903.45	40.92
34	2.23	0.79	53.46	1.57	10.64	65.68	1838.17	40.83
33	2.25	0.80	53.97	1.60	10.48	66.05	1772.49	40.75
32	2.27	0.82	54.46	1.64	10.32	66.42	1706.44	40.67
31	2.29	0.84	54.94	1.68	10.16	66.78	1640.01	40.58
30	2.31	0.85	55.39	1.69	10.03	67.11	1573.23	40.50
29	2.33	0.86	55.82	1.72	9.89	67.43	1506.12	40.42
28	2.34	0.87	56.24	1.74	9.76	67.74	1438.70	40.33
27	2.36	0.89	56.64	1.77	9.63	68.04	1370.96	40.25
26	2.38	0.90	57.02	1.80	9.51	68.32	1302.92	40.17
25	2.39	0.91	57.38	1.82	9.39	68.59	1234.60	40.08
24	2.41	0.92	57.73	1.84	9.28	68.85	1166.01	40.00
23	2.42	0.93	58.06	1.87	9.17	69.10	1097.15	39.92
22	2.43	0.95	58.38	1.89	9.07	69.34	1028.05	39.83
21	2.44	0.96	58.68	1.91	8.97	69.56	958.72	39.75
20	2.46	0.97	58.96	1.93	8.88	69.78	889.15	39.67
19	2.47	0.98	59.23	1.96	8.80	69.98	819.38	39.58

1706.44	40.67	1521.49	40.67	3227.93	
1640.01	40.58	1484.07	40.58	3124.09	
1573.23	40.50	1446.33	40.50	3019.56	40.5
1506.12	40.42	1408.27	40.42	2914.39	
1438.70	40.33	1369.90	40.33	2808.59	
1370.96	40.25	1331.23	40.25	2702.19	
1302.92	40.17	1292.28	40.17	2595.20	
1234.60	40.08	1253.06	40.08	2487.66	
1166.01	40.00	1213.57	40.00	2379.57	40
1097.15	39.92	1173.82	39.92	2270.97	
1028.05	39.83	1133.82	39.83	2161.88	
958.72	39.75	1093.59	39.75	2052.31	
889.15	39.67	1053.13	39.67	1942.28	
819.38	39.58	1012.44	39.58	1831.82	
749.40	39.50	971.53	39.50	1720.93	39.5
679.23	39.42	930.43	39.42	1609.66	
608.88	39.33	889.13	39.33	1498.02	
538.36	39.25	847.65	39.25	1386.01	
467.68	39.17	805.98	39.17	1273.66	
396.85	39.08	764.14	39.08	1160.99	
325.80	39.00	722.14	39.00	1047.94	39
298.65	38.92	679.97	38.92	978.62	
271.50	38.83	637.66	38.83	909.16	
244.35	38.75	595.19	38.75	839.54	
217.20	38.67	552.60	38.67	769.80	
190.05	38.58	509.87	38.58	699.92	
162.90	38.50	467.01	38.50	629.91	38.5
135.75	38.42	424.04	38.42	559.79	
108.60	38.33	380.96	38.33	489.56	
81.45	38.25	337.77	38.25	419.22	
54.30	38.17	294.49	38.17	348.79	
27.15	38.08	251.11	38.08	278.26	
		207.60	38.00	207.60	38
		190.30	37.92	190.30	
		173.00	37.83	173.00	
		155.70	37.75	155.70	
		138.40	37.67	138.40	
		121.10	37.58	121.10	
		103.80	37.50	103.80	37.5
		86.50	37.42	86.50	
		69.20	37.33	69.20	
		51.90	37.25	51.90	
		34.60	37.17	34.60	
		17.30	37.08	17.30	

tank 3		tank 2		tank 1		cumulative	
		4149.90		2600.96		6750.86	45.5
		4144.90		2597.96		6742.86	
		4139.90		2594.96		6734.86	
		4134.90		2591.96		6726.86	
		4129.90		2588.96		6718.86	
		4124.90		2585.96		6710.86	
		4119.90	45.00	2582.96		6702.86	45
		4092.75	44.92	2579.96		6672.71	
		4065.60	44.83	2576.96		6642.56	
		4038.45	44.75	2573.96		6612.41	
		4011.30	44.67	2570.96		6582.26	
		3984.15	44.58	2567.96		6552.11	
		3957.00	44.50	2564.96		6521.96	44.5
		3929.85	44.42	2561.96		6491.81	
		3902.70	44.33	2558.96		6461.66	
		3875.55	44.25	2555.96		6431.51	
		3848.40	44.17	2552.96		6401.36	
		3821.25	44.08	2549.96		6371.21	
		3794.10	44.00	2546.96	44.00	6341.06	44
		3766.26	43.92	2529.66	43.92	6295.92	
		3737.15	43.83	2512.36	43.83	6249.51	
		3707.20	43.75	2495.06	43.75	6202.25	
		3676.47	43.67	2477.76	43.67	6154.23	
		3644.72	43.58	2460.46	43.58	6105.18	
		3609.84	43.50	2443.16	43.50	6053.00	43.5
		3571.36	43.42	2425.86	43.42	5997.21	
		3530.58	43.33	2408.56	43.33	5939.14	
		3487.94	43.25	2391.26	43.25	5879.20	
		3443.68	43.17	2373.96	43.17	5817.63	
		3397.96	43.08	2356.66	43.08	5754.61	
		3350.92	43.00	2339.36	43.00	5690.28	43
		3302.66	42.92	2321.66	42.92	5624.32	
		3253.26	42.83	2303.20	42.83	5556.47	
		3202.79	42.75	2284.25	42.75	5487.05	
		3151.32	42.67	2264.84	42.67	5416.16	
		3098.90	42.58	2244.82	42.58	5343.72	
		3045.58	42.50	2222.96	42.50	5268.53	42.5
		2991.39	42.42	2198.98	42.42	5190.37	
		2936.39	42.33	2173.65	42.33	5110.03	
		2880.60	42.25	2147.22	42.25	5027.81	
		2824.05	42.17	2119.82	42.17	4943.87	
		2766.80	42.08	2091.56	42.08	4858.36	
		2708.85	42.00	2062.52	42.00	4771.37	42
		2650.24	41.92	2032.75	41.92	4682.99	
		2590.99	41.83	2002.30	41.83	4593.29	
		2531.14	41.75	1971.21	41.75	4502.34	
		2470.69	41.67	1939.51	41.67	4410.20	
		2409.67	41.58	1907.26	41.58	4316.93	
		2348.11	41.50	1874.46	41.50	4222.57	41.5
		2286.03	41.42	1841.14	41.42	4127.17	
		2223.43	41.33	1807.34	41.33	4030.77	
		2160.34	41.25	1773.06	41.25	3933.40	
		2096.79	41.17	1738.33	41.17	3835.12	
		2032.78	41.08	1703.18	41.08	3735.95	
		1968.32	41.00	1667.61	41.00	3635.93	41
		1903.45	40.92	1631.64	40.92	3535.09	
		1838.17	40.83	1595.28	40.83	3433.45	
		1772.49	40.75	1558.56	40.75	3331.05	

VOLUME CALCULATIONS

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
39	0	0.025	0.01
40	0.75	0.055	1.30
40.5	1.25	0.070	1.99
41	1.75	0.084	2.49
41.5	2.25	0.098	2.91
42	2.75	0.111	3.28
42.5	3.25	0.122	3.61
43	3.75	0.131	3.91
43.5	4.25	0.140	4.19
44	4.75	0.147	4.45
44.5	5.25	0.152	4.70
45	5.75	0.155	4.93
45.5	6.25	0.156	5.16
46	6.75	0.165	5.37

Orifice Equation

$$Q = CA \text{ SQRT}(2gH)$$

$$C = 0.6$$

$$\text{Diameter (in)} = 9$$

$$\text{Area (ft}^2\text{)} = 0.44178647$$

$$g = 32.2$$

$$H \text{ (Ft)} = \text{Depth of water above center of orifice}$$

$$Q \text{ (CFS)} = \text{Flow}$$

FUTURE

TANK VOLUMES/STAGE STORAGE/AHYMO

APPENDIX C

ult.

PONROUTING061615.txt

*S AHYMO - safcu
*S POND ROUTING

START TIME=0.0 PUNCH CODE=0

RAINFALL TYPE=1
QUARTER=0.0 ONE= 2.20 IN
SIX= 2.90 IN DAY= 3.70 IN DT = 0.05 HR

COMPUTE NM HYD ID=1 HYD NO=101 DA= .00468 SQ MI
PER A=00 PER B=12 PER C=6 PER D=82
TP=-.139 MASSRAIN=-1

PRINT HYD ID=1 CODE=20

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR

ROUTE RESERVOIR	ID=2	HYD NO=102	INFLOW=1	CODE=3
	OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)	
	0.00	0.03	39.00	
	1.30	0.08	40.00	
	1.99	0.11	40.50	
	2.49	0.14	41.00	
	2.91	0.16	41.50	
	3.28	0.19	42.00	
	3.61	0.21	42.50	
	3.91	0.23	43.00	
	4.19	0.25	43.50	
	4.45	0.26	44.00	
	4.70	0.27	44.50	
	4.93	0.28	45.00	
	5.16	0.29	45.50	
	5.37	0.31	46.00	

PRINT HYD ID=2 CODE=20

FINISH

AHYMO.OUT

AHYMO PROGRAM (AHYMO-S4) - Version: S4.01a - Rel: 01a
 RUN DATE (MON/DAY/YR) = 06/17/2015
 START TIME (HR:MIN:SEC) = 18:15:31 USER NO.=
 RioGrandeSingleA41963517
 INPUT FILE = ts and
 Settings\Owner\Desktop\2014jobs\1498-11301MONTGOMERY\PONROUTING061615.txt

*S AHYMO - safcu
 *S POND ROUTING

START TIME=0.0 PUNCH CODE=0

RAINFALL TYPE=1
 QUARTER=0.0 ONE= 2.20 IN
 SIX= 2.90 IN DAY= 3.70 IN DT = 0.05 HR

6-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
 AREAS (NM & AZ) - D1

DT = 0.050000 HOURS			END TIME = 6.000000 HOURS			
0.0000	0.0047	0.0095	0.0146	0.0201	0.0259	0.0323
0.0415	0.0561	0.0718	0.0881	0.1056	0.1235	0.1418
0.1608	0.1800	0.2012	0.2234	0.2472	0.2763	0.3081
0.3508	0.3991	0.4587	0.5383	0.6279	0.7825	1.0229
1.4348	1.7243	1.9526	2.0673	2.1679	2.2402	2.2976
2.3477	2.3844	2.4181	2.4459	2.4701	2.4926	2.5127
2.5318	2.5487	2.5648	2.5804	2.5955	2.6079	2.6148
2.6216	2.6284	2.6346	2.6409	2.6469	2.6529	2.6588
2.6644	2.6699	2.6753	2.6806	2.6859	2.6909	2.6958
2.7007	2.7055	2.7103	2.7148	2.7194	2.7238	2.7282
2.7325	2.7368	2.7410	2.7452	2.7493	2.7534	2.7574
2.7614	2.7654	2.7692	2.7731	2.7769	2.7807	2.7844
2.7881	2.7917	2.7953	2.7989	2.8024	2.8059	2.8094
2.8128	2.8162	2.8196	2.8229	2.8262	2.8295	2.8327
2.8359	2.8391	2.8422	2.8453	2.8484	2.8515	2.8546
2.8576	2.8606	2.8635	2.8665	2.8694	2.8723	2.8751
2.8780	2.8808	2.8836	2.8864	2.8892	2.8919	2.8946
2.8973	2.9000					

COMPUTE NM HYD ID=1 HYD NO=101 DA= .00468 SQ MI
 PER A=00 PER B=12 PER C=6 PER D=82
 TP=-.139 MASSRAIN=-1

K = 0.075755HR TP = 0.139000HR K/TP RATIO = 0.545000 SHAPE
 CONSTANT, N = 7.106428
 UNIT PEAK = 14.530 CFS UNIT VOLUME = 0.9978 B = 526.28
 P60 = 2.2000
 AREA = 0.003838 SQ MI IA = 0.10000 INCHES INF = 0.04000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

K = 0.131509HR TP = 0.139000HR K/TP RATIO = 0.946108 SHAPE
 CONSTANT, N = 3.736321

AHYMO.OUT
 UNIT PEAK = 2.0435 CFS UNIT VOLUME = 0.9950 B = 337.19
 P60 = 2.2000
 AREA = 0.000842 SQ MI IA = 0.45000 INCHES INF = 1.11000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=1 CODE=20

PARTIAL HYDROGRAPH 101.00

TIME	TIME	FLOW	TIME	TIME	FLOW	TIME	FLOW
	FLOW			FLOW			
HRS	HRS	CFS	HRS	HRS	CFS	HRS	CFS
0.000	0.0	0.0	2.000	2.2	4.000	0.1	
6.000	0.1		3.000	0.2	5.000	0.1	
	1.000	1.0					

RUNOFF VOLUME = 2.38959 INCHES = 0.5964 ACRE-Feet
 PEAK DISCHARGE RATE = 14.45 CFS AT 1.500 HOURS BASIN AREA = 0.0047 SQ. MI.

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR

ROUTE RESERVOIR ID=2 HYD NO=102 INFLOW=1 CODE=3
 OUTFLOW(CFS) STORAGE(AC-FT) ELEV(FT)

0.00	0.03	39.00
1.30	0.08	40.00
1.99	0.11	40.50
2.49	0.14	41.00
2.91	0.16	41.50
3.28	0.19	42.00
3.61	0.21	42.50
3.91	0.23	43.00
4.19	0.25	43.50
4.45	0.26	44.00
4.70	0.27	44.50
4.93	0.28	45.00
5.16	0.29	45.50
5.37	0.31	46.00

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	39.00	0.030	0.00
0.15	0.00	39.00	0.030	0.00
0.30	0.00	39.00	0.030	0.00
0.45	0.00	39.00	0.030	0.00
0.60	0.08	39.00	0.030	0.00
0.75	0.61	39.08	0.034	0.11
0.90	0.83	39.21	0.041	0.28
1.05	1.18	39.36	0.048	0.47
1.20	2.10	39.61	0.060	0.79
1.35	4.92	40.11	0.087	1.45
1.50	14.45	41.84	0.180	3.16
1.65	9.14	45.23	0.285	5.03

			AHYMO.OUT		
1.80	4.52	45.76	0.300	5.27	
1.95	2.62	44.97	0.279	4.92	
2.10	1.69	43.48	0.249	4.18	
2.25	1.18	42.69	0.218	3.72	
2.40	0.87	41.95	0.187	3.24	
2.55	0.48	41.43	0.157	2.85	
2.70	0.34	40.84	0.130	2.33	
2.85	0.26	40.46	0.108	1.94	
3.00	0.21	40.15	0.089	1.51	
3.15	0.17	39.90	0.075	1.17	
3.30	0.16	39.69	0.064	0.89	
3.45	0.14	39.53	0.056	0.69	
3.60	0.14	39.41	0.051	0.54	
3.75	0.13	39.33	0.046	0.43	
3.90	0.13	39.27	0.043	0.34	
4.05	0.13	39.22	0.041	0.29	
4.20	0.13	39.19	0.039	0.24	
4.35	0.12	39.16	0.038	0.21	
4.50	0.12	39.14	0.037	0.19	
4.65	0.12	39.13	0.037	0.17	
4.80	0.12	39.12	0.036	0.16	
4.95	0.12	39.11	0.036	0.15	
5.10	0.12	39.11	0.035	0.14	
5.25	0.13	39.11	0.035	0.14	
5.40	0.13	39.10	0.035	0.13	
5.55	0.13	39.10	0.035	0.13	
5.70	0.13	39.10	0.035	0.13	
5.85	0.13	39.10	0.035	0.13	
6.00	0.13	39.10	0.035	0.13	
6.15	0.06	39.10	0.035	0.12	
6.30	0.02	39.08	0.034	0.10	
6.45	0.01	39.06	0.033	0.08	
6.60	0.00	39.04	0.032	0.06	
6.75	0.00	39.03	0.032	0.04	
6.90	0.00	39.02	0.031	0.03	
7.05	0.00	39.02	0.031	0.02	
7.20	0.00	39.01	0.031	0.02	
7.35	0.00	39.01	0.030	0.01	
7.50	0.00	39.01	0.030	0.01	
7.65	0.00	39.00	0.030	0.01	
7.80	0.00	39.00	0.030	0.00	

PEAK DISCHARGE = 5.278 CFS - PEAK OCCURS AT HOUR 1.75
 MAXIMUM WATER SURFACE ELEVATION = 45.781
 MAXIMUM STORAGE = 0.3013 AC-FT INCREMENTAL TIME= 0.050000HRS

PRINT HYD ID=2 CODE=20

PARTIAL HYDROGRAPH 102.00

TIME	TIME	FLOW	TIME	TIME	FLOW	TIME	FLOW
HRS	FLOW	CFS	HRS	FLOW	CFS	HRS	CFS
0.000	0.0	0.0	2.000	4.7	4.000	0.3	
6.000	0.1	0.4	8.000	0.0			
7.000	1.000	0.4	3.000	1.5	5.000	0.1	
	0.0						

RUNOFF VOLUME = 2.38953 INCHES = 0.5964 ACRE-Feet
 PEAK DISCHARGE RATE = 5.28 CFS AT 1.750 HOURS BASIN AREA =
 0.0047 SQ. MI.

FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 18:15:31

AHYMO.OUT

Tank3

Project:

Chamber Model -
 Units -
 Number of Chambers -
 Number of End Caps -
 Voids in the stone (porosity) -
 Base of Stone Elevation -
 Amount of Stone Above Chambers -
 Amount of Stone Below Chambers -
 Area of system -

MC-4500
Imperial
24
2
30
38.00
12
12
1086

%
ft
in
in

sf Min. Area - 942 sf min. area


☒ Include Perimeter Stone in Calculations.

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch. EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)
84	0.00	0.00	0.00	0.00	27.15	27.15	4119.90	45.00
83	0.00	0.00	0.00	0.00	27.15	27.15	4092.75	44.92
82	0.00	0.00	0.00	0.00	27.15	27.15	4065.60	44.83
81	0.00	0.00	0.00	0.00	27.15	27.15	4038.45	44.75
80	0.00	0.00	0.00	0.00	27.15	27.15	4011.30	44.67
79	0.00	0.00	0.00	0.00	27.15	27.15	3984.15	44.58
78	0.00	0.00	0.00	0.00	27.15	27.15	3957.00	44.50
77	0.00	0.00	0.00	0.00	27.15	27.15	3929.85	44.42
76	0.00	0.00	0.00	0.00	27.15	27.15	3902.70	44.33
75	0.00	0.00	0.00	0.00	27.15	27.15	3875.55	44.25
74	0.00	0.00	0.00	0.00	27.15	27.15	3848.40	44.17
73	0.00	0.00	0.00	0.00	27.15	27.15	3821.25	44.08
72	0.04	0.00	0.98	0.00	26.86	27.84	3794.10	44.00
71	0.12	0.01	2.79	0.02	26.31	29.11	3766.26	43.92
70	0.16	0.03	3.95	0.05	25.95	29.95	3737.15	43.83
69	0.21	0.05	5.01	0.10	25.62	30.72	3707.20	43.75
68	0.27	0.07	6.44	0.14	25.18	31.75	3676.47	43.67
67	0.45	0.09	10.87	0.18	23.84	34.88	3644.72	43.58
66	0.67	0.11	15.97	0.23	22.29	38.48	3609.84	43.50
65	0.80	0.14	19.18	0.28	21.31	40.77	3571.36	43.42
64	0.91	0.17	21.80	0.34	20.51	42.64	3530.58	43.33
63	1.00	0.19	24.07	0.38	19.81	44.27	3487.94	43.25
62	1.09	0.22	26.10	0.43	19.19	45.72	3443.68	43.17
61	1.16	0.24	27.92	0.48	18.63	47.03	3397.96	43.08
60	1.23	0.27	29.62	0.54	18.10	48.26	3350.92	43.00
59	1.30	0.30	31.19	0.60	17.61	49.40	3302.66	42.92
58	1.36	0.32	32.66	0.65	17.16	50.47	3253.26	42.83
57	1.42	0.35	34.05	0.70	16.73	51.47	3202.79	42.75
56	1.47	0.37	35.36	0.74	16.32	52.42	3151.32	42.67
55	1.53	0.39	36.60	0.79	15.93	53.32	3098.90	42.58
54	1.57	0.42	37.79	0.83	15.56	54.19	3045.58	42.50
53	1.62	0.44	38.91	0.88	15.21	55.01	2991.39	42.42
52	1.67	0.46	39.99	0.93	14.88	55.79	2936.39	42.33
51	1.71	0.48	41.02	0.97	14.55	56.54	2880.60	42.25
50	1.75	0.50	42.00	1.01	14.25	57.26	2824.05	42.17
49	1.79	0.53	42.94	1.05	13.95	57.95	2766.80	42.08
48	1.83	0.55	43.85	1.09	13.67	58.61	2708.85	42.00
47	1.86	0.56	44.72	1.13	13.39	59.25	2650.24	41.92
46	1.90	0.58	45.56	1.17	13.13	59.86	2590.99	41.83
45	1.93	0.60	46.36	1.20	12.88	60.45	2531.14	41.75
44	1.96	0.62	47.14	1.24	12.64	61.01	2470.69	41.67
43	2.00	0.64	47.88	1.28	12.40	61.56	2409.67	41.58
42	2.03	0.66	48.60	1.31	12.18	62.09	2348.11	41.50
41	2.05	0.67	49.29	1.35	11.96	62.60	2286.03	41.42
40	2.08	0.69	49.96	1.38	11.75	63.09	2223.43	41.33
39	2.11	0.71	50.59	1.41	11.55	63.56	2160.34	41.25
38	2.13	0.72	51.21	1.45	11.35	64.01	2096.79	41.17
37	2.16	0.74	51.81	1.48	11.16	64.45	2032.78	41.08
36	2.18	0.76	52.38	1.51	10.98	64.88	1968.32	41.00
35	2.21	0.77	52.93	1.54	10.81	65.28	1903.45	40.92
34	2.23	0.79	53.46	1.57	10.64	65.68	1838.17	40.83
33	2.25	0.80	53.97	1.60	10.48	66.05	1772.49	40.75
32	2.27	0.82	54.46	1.64	10.32	66.42	1706.44	40.67
31	2.29	0.84	54.94	1.68	10.16	66.78	1640.01	40.58
30	2.31	0.85	55.39	1.69	10.03	67.11	1573.23	40.50
29	2.33	0.86	55.82	1.72	9.89	67.43	1506.12	40.42
28	2.34	0.87	56.24	1.74	9.76	67.74	1438.70	40.33
27	2.36	0.89	56.64	1.77	9.63	68.04	1370.96	40.25
26	2.38	0.90	57.02	1.80	9.51	68.32	1302.92	40.17
25	2.39	0.91	57.38	1.82	9.39	68.59	1234.60	40.08
24	2.41	0.92	57.73	1.84	9.28	68.85	1166.01	40.00
23	2.42	0.93	58.06	1.87	9.17	69.10	1097.15	39.92
22	2.43	0.95	58.38	1.89	9.07	69.34	1028.05	39.83
21	2.44	0.96	58.68	1.91	8.97	69.56	958.72	39.75
20	2.46	0.97	58.96	1.93	8.88	69.78	889.15	39.67
19	2.47	0.98	59.23	1.96	8.80	69.98	819.38	39.58

Tank 2

Project: _____

Chamber Model -
Units -
Number of Chambers -
Number of End Caps -
Voids in the stone (porosity) -
Base of Stone Elevation -
Amount of Stone Above Chambers -
Amount of Stone Below Chambers -
Area of system -

MC-4500	
Imperial	Click Here for Metric
34	
2	
30	%
38.50	ft
12	in
12	in
1500	sf Min. Area - 1308 sf min. area



☒ Include Perimeter Stone in Calculations

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch. EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)
84	0.00	0.00	0.00	0.00	37.50	37.50	5734.85	45.50
83	0.00	0.00	0.00	0.00	37.50	37.50	5697.35	45.42
82	0.00	0.00	0.00	0.00	37.50	37.50	5659.85	45.33
81	0.00	0.00	0.00	0.00	37.50	37.50	5622.35	45.25
80	0.00	0.00	0.00	0.00	37.50	37.50	5584.85	45.17
79	0.00	0.00	0.00	0.00	37.50	37.50	5547.35	45.08
78	0.00	0.00	0.00	0.00	37.50	37.50	5509.85	45.00
77	0.00	0.00	0.00	0.00	37.50	37.50	5472.35	44.92
76	0.00	0.00	0.00	0.00	37.50	37.50	5434.85	44.83
75	0.00	0.00	0.00	0.00	37.50	37.50	5397.35	44.75
74	0.00	0.00	0.00	0.00	37.50	37.50	5359.85	44.67
73	0.00	0.00	0.00	0.00	37.50	37.50	5322.35	44.58
72	0.04	0.00	1.39	0.00	37.08	38.48	5284.85	44.50
71	0.12	0.01	3.95	0.02	36.31	40.28	5246.37	44.42
70	0.16	0.03	5.60	0.05	35.80	41.46	5206.10	44.33
69	0.21	0.05	7.10	0.10	35.34	42.53	5164.64	44.25
68	0.27	0.07	9.12	0.14	34.72	43.98	5122.11	44.17
67	0.45	0.09	15.39	0.18	32.83	48.40	5078.12	44.08
66	0.67	0.11	22.62	0.23	30.65	53.49	5029.72	44.00
65	0.80	0.14	27.17	0.28	29.27	56.71	4976.23	43.92
64	0.91	0.17	30.88	0.34	28.14	59.35	4919.52	43.83
63	1.00	0.19	34.10	0.38	27.16	61.64	4860.17	43.75
62	1.09	0.22	36.97	0.43	26.28	63.68	4798.53	43.67
61	1.16	0.24	39.56	0.48	25.49	65.53	4734.85	43.58
60	1.23	0.27	41.96	0.54	24.75	67.25	4669.32	43.50
59	1.30	0.30	44.19	0.60	24.06	68.85	4602.08	43.42
58	1.36	0.32	46.27	0.65	23.42	70.35	4533.23	43.33
57	1.42	0.35	48.24	0.70	22.82	71.75	4462.88	43.25
56	1.47	0.37	50.09	0.74	22.25	73.08	4391.13	43.17
55	1.53	0.39	51.86	0.79	21.71	74.35	4318.05	43.08
54	1.57	0.42	53.53	0.83	21.19	75.56	4243.70	43.00
53	1.62	0.44	55.13	0.88	20.70	76.71	4168.14	42.92
52	1.67	0.46	56.65	0.93	20.23	77.80	4091.43	42.83
51	1.71	0.48	58.11	0.97	19.78	78.85	4013.63	42.75
50	1.75	0.50	59.50	1.01	19.35	79.86	3934.77	42.67
49	1.79	0.53	60.84	1.05	18.93	80.82	3854.92	42.58
48	1.83	0.55	62.12	1.09	18.54	81.75	3774.09	42.50
47	1.86	0.56	63.36	1.13	18.15	82.64	3692.34	42.42
46	1.90	0.58	64.54	1.17	17.79	83.50	3609.70	42.33
45	1.93	0.60	65.68	1.20	17.43	84.32	3526.21	42.25
44	1.96	0.62	66.78	1.24	17.09	85.11	3441.89	42.17
43	2.00	0.64	67.83	1.28	16.77	85.88	3356.77	42.08
42	2.03	0.66	68.85	1.31	16.45	86.61	3270.90	42.00
41	2.05	0.67	69.83	1.35	16.15	87.32	3184.28	41.92
40	2.08	0.69	70.77	1.38	15.85	88.01	3096.96	41.83
39	2.11	0.71	71.67	1.41	15.57	88.66	3008.96	41.75
38	2.13	0.72	72.55	1.45	15.30	89.30	2920.29	41.67
37	2.16	0.74	73.40	1.48	15.04	89.91	2830.99	41.58
36	2.18	0.76	74.21	1.51	14.78	90.50	2741.08	41.50
35	2.21	0.77	74.99	1.54	14.54	91.07	2650.58	41.42
34	2.23	0.79	75.74	1.57	14.31	91.62	2559.51	41.33
33	2.25	0.80	76.46	1.60	14.08	92.15	2467.89	41.25
32	2.27	0.82	77.16	1.64	13.86	92.66	2375.74	41.17
31	2.29	0.84	77.83	1.68	13.65	93.15	2283.08	41.08
30	2.31	0.85	78.47	1.69	13.45	93.61	2189.93	41.00
29	2.33	0.86	79.08	1.72	13.26	94.06	2096.32	40.92
28	2.34	0.87	79.67	1.74	13.08	94.49	2002.26	40.83
27	2.36	0.89	80.24	1.77	12.90	94.90	1907.77	40.75
26	2.38	0.90	80.78	1.80	12.73	95.30	1812.86	40.67
25	2.39	0.91	81.29	1.82	12.57	95.68	1717.56	40.58
24	2.41	0.92	81.79	1.84	12.41	96.04	1621.88	40.50
23	2.42	0.93	82.25	1.87	12.26	96.39	1525.84	40.42
22	2.43	0.95	82.70	1.89	12.12	96.71	1429.45	40.33
21	2.44	0.96	83.12	1.91	11.99	97.03	1332.74	40.25
20	2.46	0.97	83.53	1.93	11.86	97.32	1235.71	40.17
19	2.47	0.98	83.90	1.96	11.74	97.60	1138.39	40.08

Tank 1

Project: _____

Chamber Model -
Units -
Number of Chambers -
Number of End Caps -
Voids in the stone (porosity) -
Base of Stone Elevation -
Amount of Stone Above Chambers -
Amount of Stone Below Chambers -
Area of system -

MC-4500
Imperial
14
2
30 %
37.00 ft
12 in
12 in
692 sf

Min. Area - 576 sf min. area



☒ Include Perimeter Stone in Calculations

Height of System (Inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch. EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)
84	0.00	0.00	0.00	0.00	17.30	17.30	2546.96	44.00
83	0.00	0.00	0.00	0.00	17.30	17.30	2529.66	43.92
82	0.00	0.00	0.00	0.00	17.30	17.30	2512.36	43.83
81	0.00	0.00	0.00	0.00	17.30	17.30	2495.06	43.75
80	0.00	0.00	0.00	0.00	17.30	17.30	2477.76	43.67
79	0.00	0.00	0.00	0.00	17.30	17.30	2460.46	43.58
78	0.00	0.00	0.00	0.00	17.30	17.30	2443.16	43.50
77	0.00	0.00	0.00	0.00	17.30	17.30	2425.86	43.42
76	0.00	0.00	0.00	0.00	17.30	17.30	2408.56	43.33
75	0.00	0.00	0.00	0.00	17.30	17.30	2391.26	43.25
74	0.00	0.00	0.00	0.00	17.30	17.30	2373.96	43.17
73	0.00	0.00	0.00	0.00	17.30	17.30	2356.66	43.08
72	0.04	0.00	0.57	0.00	17.13	17.70	2339.36	43.00
71	0.12	0.01	1.63	0.02	16.81	18.45	2321.66	42.92
70	0.16	0.03	2.31	0.05	16.59	18.95	2303.20	42.83
69	0.21	0.05	2.92	0.10	16.39	19.41	2284.25	42.75
68	0.27	0.07	3.76	0.14	16.13	20.02	2264.84	42.67
67	0.45	0.09	6.34	0.18	15.35	21.86	2244.82	42.58
66	0.67	0.11	9.31	0.23	14.44	23.98	2222.96	42.50
65	0.80	0.14	11.19	0.28	13.86	25.33	2198.98	42.42
64	0.91	0.17	12.71	0.34	13.39	26.43	2173.65	42.33
63	1.00	0.19	14.04	0.38	12.97	27.40	2147.22	42.25
62	1.09	0.22	15.22	0.43	12.60	28.26	2119.82	42.17
61	1.16	0.24	16.29	0.48	12.27	29.04	2091.56	42.08
60	1.23	0.27	17.28	0.54	11.96	29.77	2062.52	42.00
59	1.30	0.30	18.20	0.60	11.66	30.45	2032.75	41.92
58	1.36	0.32	19.05	0.65	11.39	31.09	2002.30	41.83
57	1.42	0.35	19.86	0.70	11.13	31.69	1971.21	41.75
56	1.47	0.37	20.63	0.74	10.89	32.26	1939.51	41.67
55	1.53	0.39	21.35	0.79	10.66	32.80	1907.26	41.58
54	1.57	0.42	22.04	0.83	10.44	33.31	1874.46	41.50
53	1.62	0.44	22.70	0.88	10.23	33.81	1841.14	41.42
52	1.67	0.46	23.33	0.93	10.02	34.28	1807.34	41.33
51	1.71	0.48	23.93	0.97	9.83	34.73	1773.06	41.25
50	1.75	0.50	24.50	1.01	9.65	35.16	1738.33	41.17
49	1.79	0.53	25.05	1.05	9.47	35.57	1703.18	41.08
48	1.83	0.55	25.58	1.09	9.30	35.97	1667.61	41.00
47	1.86	0.56	26.09	1.13	9.13	36.35	1631.64	40.92
46	1.90	0.58	26.58	1.17	8.98	36.72	1595.28	40.83
45	1.93	0.60	27.05	1.20	8.83	37.07	1558.56	40.75
44	1.96	0.62	27.50	1.24	8.68	37.42	1521.49	40.67
43	2.00	0.64	27.93	1.28	8.54	37.75	1484.07	40.58
42	2.03	0.66	28.35	1.31	8.40	38.06	1446.33	40.50
41	2.05	0.67	28.75	1.35	8.27	38.37	1408.27	40.42
40	2.08	0.69	29.14	1.38	8.14	38.67	1369.90	40.33
39	2.11	0.71	29.51	1.41	8.02	38.95	1331.23	40.25
38	2.13	0.72	29.87	1.45	7.90	39.23	1292.28	40.17
37	2.16	0.74	30.22	1.48	7.79	39.49	1253.06	40.08
36	2.18	0.76	30.56	1.51	7.68	39.75	1213.57	40.00
35	2.21	0.77	30.88	1.54	7.57	39.99	1173.82	39.92
34	2.23	0.79	31.19	1.57	7.47	40.23	1133.82	39.83
33	2.25	0.80	31.48	1.60	7.37	40.46	1093.59	39.75
32	2.27	0.82	31.77	1.64	7.28	40.69	1053.13	39.67
31	2.29	0.84	32.05	1.68	7.18	40.91	1012.44	39.58
30	2.31	0.85	32.31	1.69	7.10	41.10	971.53	39.50
29	2.33	0.86	32.56	1.72	7.02	41.30	930.43	39.42
28	2.34	0.87	32.81	1.74	6.93	41.49	889.13	39.33
27	2.36	0.89	33.04	1.77	6.86	41.67	847.65	39.25
26	2.38	0.90	33.26	1.80	6.78	41.84	805.98	39.17
25	2.39	0.91	33.47	1.82	6.71	42.01	764.14	39.08
24	2.41	0.92	33.68	1.84	6.64	42.16	722.14	39.00
23	2.42	0.93	33.87	1.87	6.58	42.32	679.97	38.92
22	2.43	0.95	34.05	1.89	6.52	42.46	637.66	38.83
21	2.44	0.96	34.23	1.91	6.46	42.60	595.19	38.75
20	2.46	0.97	34.39	1.93	6.40	42.73	552.60	38.67
19	2.47	0.98	34.55	1.96	6.35	42.85	509.87	38.58

Summary Volume

tank 3		tank 2		tank 1		cumulative	
5734.85	45.50	4149.90		2600.96		12485.71	45.5
5697.35	45.42	4144.90		2597.96		12440.21	
5659.85	45.33	4139.90		2594.96		12394.71	
5622.35	45.25	4134.90		2591.96		12349.21	
5584.85	45.17	4129.90		2588.96		12303.71	
5547.35	45.08	4124.90		2585.96		12258.21	
5509.85	45.00	4119.90	45.00	2582.96		12212.71	45
5472.35	44.92	4092.75	44.92	2579.96		12145.06	
5434.85	44.83	4065.60	44.83	2576.96		12077.41	
5397.35	44.75	4038.45	44.75	2573.96		12009.76	
5359.85	44.67	4011.30	44.67	2570.96		11942.11	
5322.35	44.58	3984.15	44.58	2567.96		11874.46	
5284.85	44.50	3957.00	44.50	2564.96		11806.81	44.5
5246.37	44.42	3929.85	44.42	2561.96		11738.18	
5206.10	44.33	3902.70	44.33	2558.96		11667.76	
5164.64	44.25	3875.55	44.25	2555.96		11596.15	
5122.11	44.17	3848.40	44.17	2552.96		11523.46	
5078.12	44.08	3821.25	44.08	2549.96		11449.33	
5029.72	44.00	3794.10	44.00	2546.96	44.00	11370.78	44
4976.23	43.92	3766.26	43.92	2529.66	43.92	11272.15	
4919.52	43.83	3737.15	43.83	2512.36	43.83	11169.03	
4860.17	43.75	3707.20	43.75	2495.06	43.75	11062.42	
4798.53	43.67	3676.47	43.67	2477.76	43.67	10952.76	
4734.85	43.58	3644.72	43.58	2460.46	43.58	10840.03	
4669.32	43.50	3609.84	43.50	2443.16	43.50	10722.32	43.5
4602.08	43.42	3571.36	43.42	2425.86	43.42	10599.29	
4533.23	43.33	3530.58	43.33	2408.56	43.33	10472.37	
4462.88	43.25	3487.94	43.25	2391.26	43.25	10342.08	
4391.13	43.17	3443.68	43.17	2373.96	43.17	10208.76	
4318.05	43.08	3397.96	43.08	2356.66	43.08	10072.66	
4243.70	43.00	3350.92	43.00	2339.36	43.00	9933.97	43
4168.14	42.92	3302.66	42.92	2321.66	42.92	9792.46	
4091.43	42.83	3253.26	42.83	2303.20	42.83	9647.90	
4013.63	42.75	3202.79	42.75	2284.25	42.75	9500.67	
3934.77	42.67	3151.32	42.67	2264.84	42.67	9350.94	
3854.92	42.58	3098.90	42.58	2244.82	42.58	9198.63	
3774.09	42.50	3045.58	42.50	2222.96	42.50	9042.63	42.5
3692.34	42.42	2991.39	42.42	2198.98	42.42	8882.71	
3609.70	42.33	2936.39	42.33	2173.65	42.33	8719.74	
3526.21	42.25	2880.60	42.25	2147.22	42.25	8554.02	
3441.89	42.17	2824.05	42.17	2119.82	42.17	8385.76	
3356.77	42.08	2766.80	42.08	2091.56	42.08	8215.13	
3270.90	42.00	2708.85	42.00	2062.52	42.00	8042.27	42
3184.28	41.92	2650.24	41.92	2032.75	41.92	7867.27	
3096.96	41.83	2590.99	41.83	2002.30	41.83	7690.25	
3008.96	41.75	2531.14	41.75	1971.21	41.75	7511.30	
2920.29	41.67	2470.69	41.67	1939.51	41.67	7330.50	
2830.99	41.58	2409.67	41.58	1907.26	41.58	7147.93	
2741.08	41.50	2348.11	41.50	1874.46	41.50	6963.65	41.5
2650.58	41.42	2286.03	41.42	1841.14	41.42	6777.75	
2559.51	41.33	2223.43	41.33	1807.34	41.33	6590.27	
2467.89	41.25	2160.34	41.25	1773.06	41.25	6401.29	
2375.74	41.17	2096.79	41.17	1738.33	41.17	6210.86	
2283.08	41.08	2032.78	41.08	1703.18	41.08	6019.03	
2189.93	41.00	1968.32	41.00	1667.61	41.00	5825.86	41
2096.32	40.92	1903.45	40.92	1631.64	40.92	5631.40	
2002.26	40.83	1838.17	40.83	1595.28	40.83	5435.71	
1907.77	40.75	1772.49	40.75	1558.56	40.75	5238.82	

1812.86	40.67	1706.44	40.67	1521.49	40.67	5040.79	
1717.56	40.58	1640.01	40.58	1484.07	40.58	4841.65	
1621.88	40.50	1573.23	40.50	1446.33	40.50	4641.44	40.5
1525.84	40.42	1506.12	40.42	1408.27	40.42	4440.23	
1429.45	40.33	1438.70	40.33	1369.90	40.33	4238.04	
1332.74	40.25	1370.96	40.25	1331.23	40.25	4034.93	
1235.71	40.17	1302.92	40.17	1292.28	40.17	3830.91	
1138.39	40.08	1234.60	40.08	1253.06	40.08	3626.05	
1040.79	40.00	1166.01	40.00	1213.57	40.00	3420.36	40
942.92	39.92	1097.15	39.92	1173.82	39.92	3213.89	
844.80	39.83	1028.05	39.83	1133.82	39.83	3006.68	
746.45	39.75	958.72	39.75	1093.59	39.75	2798.76	
647.87	39.67	889.15	39.67	1053.13	39.67	2590.15	
549.09	39.58	819.38	39.58	1012.44	39.58	2380.90	
450.00	39.50	749.40	39.50	971.53	39.50	2170.93	39.5
412.50	39.42	679.23	39.42	930.43	39.42	2022.16	
375.00	39.33	608.88	39.33	889.13	39.33	1873.02	
337.50	39.25	538.36	39.25	847.65	39.25	1723.51	
300.00	39.17	467.68	39.17	805.98	39.17	1573.66	
262.50	39.08	396.85	39.08	764.14	39.08	1423.49	
225.00	39.00	325.80	39.00	722.14	39.00	1272.94	39
187.50	38.92	298.65	38.92	679.97	38.92	1166.12	
150.00	38.83	271.50	38.83	637.66	38.83	1059.16	
112.50	38.75	244.35	38.75	595.19	38.75	952.04	
75.00	38.67	217.20	38.67	552.60	38.67	844.80	
37.50	38.58	190.05	38.58	509.87	38.58	737.42	
		162.90	38.50	467.01	38.50	629.91	38.5
		135.75	38.42	424.04	38.42	559.79	
		108.60	38.33	380.96	38.33	489.56	
		81.45	38.25	337.77	38.25	419.22	
		54.30	38.17	294.49	38.17	348.79	
		27.15	38.08	251.11	38.08	278.26	
				207.60	38.00	207.60	38
				190.30	37.92	190.30	
				173.00	37.83	173.00	
				155.70	37.75	155.70	
				138.40	37.67	138.40	
				121.10	37.58	121.10	
				103.80	37.50	103.80	37.5
				86.50	37.42	86.50	
				69.20	37.33	69.20	
				51.90	37.25	51.90	
				34.60	37.17	34.60	
				17.30	37.08	17.30	

VOLUME CALCULATIONS

for Pond Retig

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
39	0	0.030	0.01
40	0.75	0.080	1.30
40.5	1.25	0.108	1.99
41	1.75	0.135	2.49
41.5	2.25	0.161	2.91
42	2.75	0.186	3.28
42.5	3.25	0.209	3.61
43	3.75	0.230	3.91
43.5	4.25	0.248	4.19
44	4.75	0.262	4.45
44.5	5.25	0.273	4.70
45	5.75	0.282	4.93
45.5	6.25	0.288	5.16
46	6.75	0.296	5.37

Orifice Equation

$$Q = CA \text{ SQRT}(2gH)$$

$$C = 0.6$$

$$\text{Diameter (in)} = 9$$

$$\text{Area (ft}^2\text{)} = 0.44178647$$

$$g = 32.2$$

$$H \text{ (Ft)} = \text{Depth of water above center of orifice}$$

$$Q \text{ (CFS)} = \text{Flow}$$

APPENDIX D

ADS INFILTRATOR SPECIFICATIONS

PROJECT INFORMATION	
ENGINEERED	PEGGY GRAHAM
PRODUCT	720-982-4900
MANAGER	PEGGY GRAHAM@ADS-PIPE.COM
ADS SALES REP	PETER NICHOLS
	505-301-5804
	PETER.NICHOLS@ADS-PIPE.COM
PROJECT NO	84281



SAFCU ALBUQUERQUE, NM

STORMWATER CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-4500 OR APPROVED EQUAL
- CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12 ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
- CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING, UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
 - A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.55 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD. THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE
 - A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12 ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE
 - STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

- STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS
- STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE"
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS
STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONESHOOTER LOCATED OFF THE CHAMBER BED
 - BACKFILL AIR ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM WOE OR EXCAVATOR
- THE FOUNDATION STONE SHALL BE LEVELLED AND COMPACTED PRIOR TO PLACING CHAMBERS
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE
- MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4" 2" (19-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4
- STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING
- ADS RECOMMENDS THE USE OF "FLEX STORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF

NOTES FOR CONSTRUCTION EQUIPMENT

- STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE"
 - THE USE OF EQUIPMENT OVER MC-4500 CHAMBERS IS LIMITED:
 - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS
 - NO RUBBER Tired LOADER, DUMP TRUCK OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE"
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE"
 - FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING
- USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

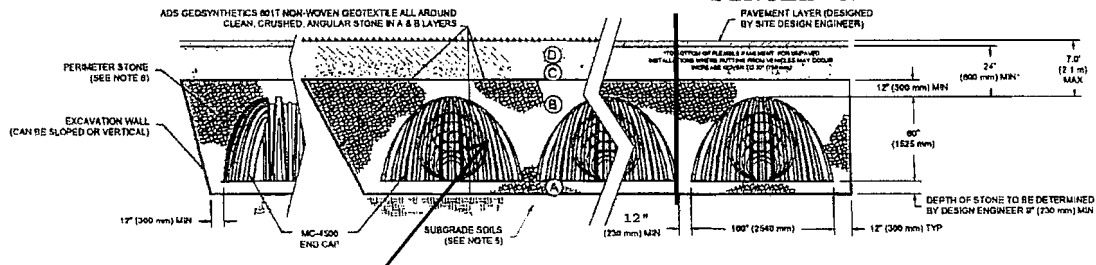
CONTACT STORMTECH AT 1-888-822-2604 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS / OR CONSTRUCTION EQUIPMENT

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE (B LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 2, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 93% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE (A LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	NO COMPACTION REQUIRED
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. **

PLEASE NOTE

- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE A SPECIFICATION FOR #4 STONE WOULD STATE "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO #4) STONE".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) MAX. LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



MULTIPLE CHAMBERS NOT USED FOR THIS APPLICATION

NOTES:

- MC-4500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2118 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2171 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

SAFCA & STARBUCKS
ALBUQUERQUE, NM

DATE: 3/11/15
PROJECT # 1041
DRAWN: MCA
CHECKED: MGP

DESCRIPTION

REV

DATE

BY

CHK

APP

DESIGN

CONSTRUCTION

MAINTENANCE

OPERATION

REPAIR

REPLACE

REMOVE

RECONSTRUCT

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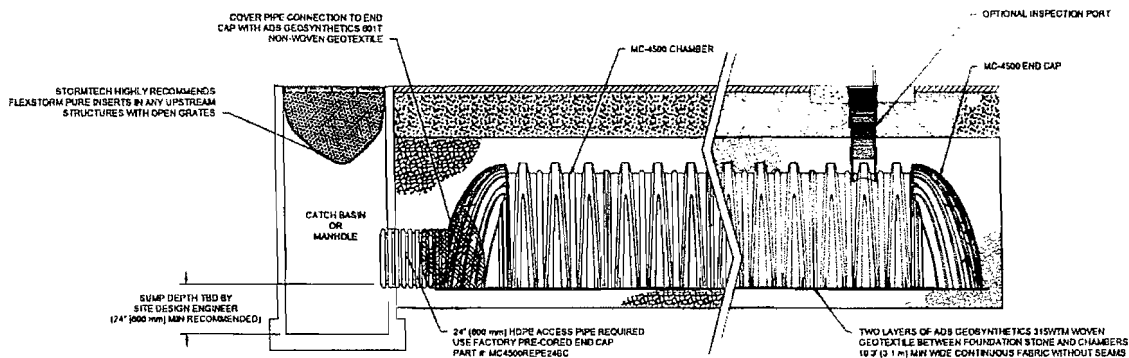
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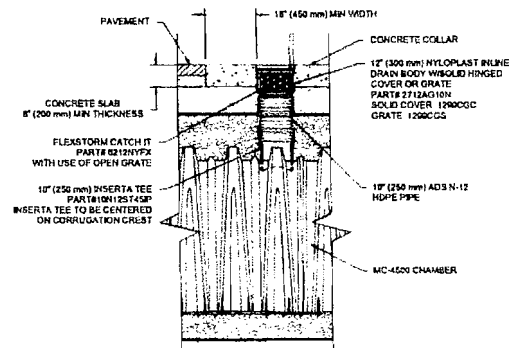
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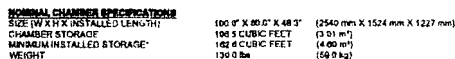


INSPECTION & MAINTENANCE

NOTES

[illegible]

NTS



SIZE (W X H X INS TALL LENGTH)	90" 2" X 50" 4" X 30" 2"	(2291 mm X 1509 mm X 781 mm)
END CAP STORAGE	35 ? CUBIC FEET	(1.01 m ³)
MINIMUM INSTALLED STORAGE*	106 ? CUBIC FEET	(3.06 m ³)
WEIGHT	135.0 lbs	(61.2 kg)

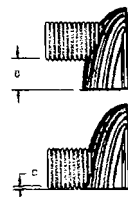
*ASSUMES 12" (305 mm) STONE ABOVE 6" (129 mm) STONE FOUNDATION AND BETWEEN CHAMBERS
12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

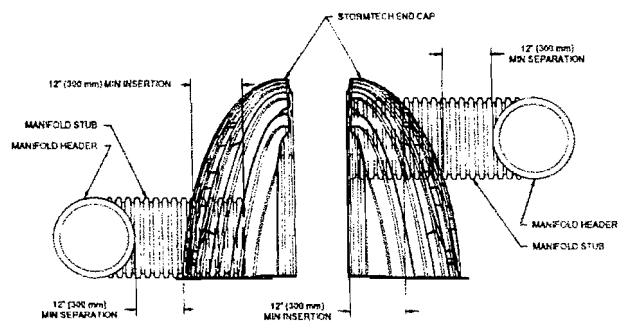
STUB END CAP FOR PARTS NUMBERED ENDING IN 100			
PART #	STUB	B	C
MC4500REP080T	0" (150 mm)	43.82" (1,091 mm)	—
MC4500REP080B	—	—	0.80" (20 mm)
MC4500REP080T	8" (203 mm)	42.82" (1,092 mm)	—
MC4500REP080B	—	—	1.67" (42 mm)
MC4500REP080T	10" (254 mm)	38.37" (975 mm)	—
MC4500REP080B	—	—	1.37" (34 mm)
MC4500REP080T	12" (305 mm)	35.96" (912 mm)	—
MC4500REP080B	—	—	1.52" (39 mm)
MC4500REP080T	15" (375 mm)	32.72" (833 mm)	—
MC4500REP080B	—	—	1.72" (44 mm)
MC4500REP080T	18" (450 mm)	29.35" (746 mm)	—
MC4500REP080B	—	—	1.89" (48 mm)
MC4500REP080T	24" (600 mm)	23.05" (585 mm)	—
MC4500REP080B	—	—	2.25" (57 mm)
MC4500REP080T	30" (750 mm)	20" (508 mm)	—
MC4500REP080B	—	—	2.95" (75 mm)
MC4500REP080T	42" (1,050 mm)	15" (381 mm)	—
MC4500REP080B	—	—	3.55" (90 mm)

NOTE ALL DIMENSIONS ARE NOMINAL

CUSTOM PRECIGED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 16" (250 mm). THE INVERT LOCATION IN COLUMBIA ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

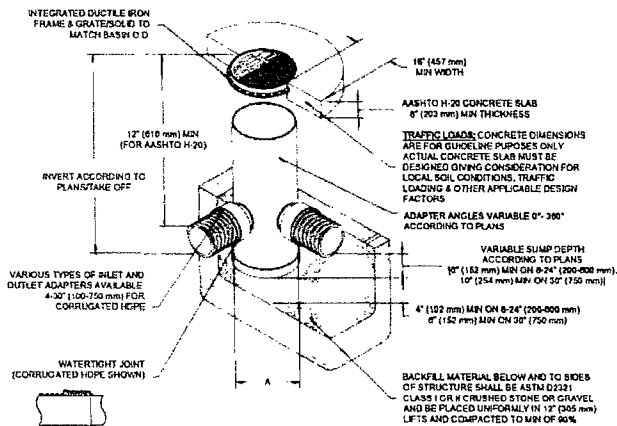


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NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING

NYLOPLAST DRAIN BASIN NTS



NOTES

1. 6-32\"/>

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (203 mm)	2080AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (254 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (305 mm)	2612AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2915AG	PEDESTRIAN AASHTO H-16	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (457 mm)	2618AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (609 mm)	2624AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (762 mm)	2030AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

SAFCA & STARBUCKS
ALBUQUERQUE, NM
DATE: 3/31/15
PROJECT # 84381
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DESCRIPTION
REV. DATE
1. 3/31/15
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