

APPENDIX E

PRELIMINARY HYDROLOGY STUDY

PRELIMINARY HYDROLOGY STUDY

For

MULTIFAMILY PROJECT

Northeast Corner of Ave K8 and 15th Street.
Lancaster, CA 93534
APN: 3125-009-071

Prepared for:

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Prepared: 04/28/25

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Appendix B – Hydrology and Basin Routing Calculations

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I. PROJECT DESCRIPTION

Purpose

The purpose of this drainage report is to provide hydrologic and hydraulic calculations in support of the final engineering plans for the Multifamily development 550 feet northeast of the intersection of Avenue K-8 and 15th Street in Lancaster, California. This report will demonstrate compliance with the retention requirements per the Los Angeles County Hydrology Manual (2006).

Project Summary

The purpose of this report is to calculate the pre-development and post-development hydrology conditions for the property is located at APN: 3125-009-071 as depicted in Figure 1. This project is vacant desert land and does not have an assigned address. It is located approximately 550 feet northeast of the intersection of Avenue K-8 and 15th Street in Lancaster, California. The project site is located within a Commercial Development Area and is currently zoned as CPD within the City of Lancaster Zoning Plan. The site proposes the development of a three story multifamily buildings. The purpose of the attached analysis is to determine the existing and proposed storm water discharge flow for the project. The project site is 10.86 acres and currently consists of a large impervious concrete pad. This hydrology report will provide the 25 & 100-year storm water runoff for this site using the LACDPW HydroCalc. These calculations for the pre and post-construction conditions are included in Appendix B and C of this report.

II. EXISTING CONDITIONS

This project is vacant desert land and does not have an assigned address. It is located approximately 550 feet northeast of the intersection of Avenue K-8 and 15th Street in Lancaster, California. The property is relatively flat and in its existing condition and flows south to north at a 1% grade. Site elevations range from 2409.8 to 2417.3 feet on the site. The site is a pregraded dirt lot. The easterly property line is bound by State Route 14 and to the west by 20 foot wide RCBC flood channel on the westerly property line in a City of Lancaster Flood Control easement. The southerly property line is bound by an existing commercial site. The northerly property line is bound by a graded dirt lot. In flood conditions the lot drains to the existing flood control channel at the northwest corner of the site. See Appendix D for the full geotechnical investigation report. See the Existing Conditions Drainage Exhibit in Appendix A for a graphic depiction of the existing sub-basin. See Appendix C for reference plans

III. PROPOSED CONDITIONS

The site proposes the development of a 3 story multifamily apartment complex . In the proposed condition, the entire site will be delineated into a single drainage management area and an onsite area drain system will collect stormwater flows from the roof and downspouts and route them into an infiltration system in the northerly drive aisle of the site. These flows will then confluence at the northwest corner of the site before discharging into a City of Lancaster Flood Control Facility.

The proposed site has been delineated into the following sub-basins:

DMA A-1: This drainage management area (DMA), encompasses the entire building roof, meandering parkways along the public right of way, fire lane and confluences all flows to the north west corner of the site. Flows will then discharge into an existing City of Lancaster Flood Control Facility at the northwest corner of the site.

The County of Los Angeles requires the difference between the existing and proposed 25-year storm condition for both private and public improvements. There is also a Q-allowable criteria for detention that was factored into the onsite storage requirement that will be delineated below. Due to the high impervious nature of the existing parking lot, there will be a net decrease in storm flows from the proposed site. See the Proposed Conditions Drainage Exhibit in Appendix A.

IV. METHODOLOGY

Overview

The County of Los Angeles requires the 25 & 100-year storm water runoff for this site to be studied by using the LACDPW HydroCalc and the Los Angeles County Hydrology Manual (2006).

a. Watershed:

The project is located in the Antelope Valley Watershed in the Hydrologic sub-Area 626.5.

b. FEMA:

Per flood insurance rate map no. 06037C0420F the project site lies in flood zone X. Flood “x” designation is defined as an “area with minimal flood hazard” per the FEMA website. More information can be gathered at www.fema.gov.

c. Hydrology:

The peak flows were determined using the Los Angeles County hydrocalc Calculator provided at: https://dpw.lacounty.gov/wmd/dsp_LowImpactDevelopment.cfm

1. Hydrology data was determined based on the LA County Hydrology Map located below:

2. <https://dpw.lacounty.gov/wrd/hydrologygis/>

Pre-Development Condition

Tributary Area	DMA X-1
Acreage (acre):	10.86
CN Existing (Weighted):	0.10
CN Proposed (Weighted):	0.67
85 th Percentile :	0.7
50 Year Storm Value:	3.0
Soil Type:	120

Pipes Sizing

Public pipes, gutters and curb inlets will be sized per the County of Los Angeles Hydrology Manual(2006) requires pipes to be sized for the 25-year storm with the hydraulic grade line at least 0.5 feet below ground surface. The manual requires gutter and inlet drainage to allow the 10-year storm to be contained within the limits of the curbs and the 100-year storm to be contained within the limits of the right-of-way.

Private onsite pipes, curbs, and gutters will be sized to ensure no flooding reaches the proposed buildings in the 100-year storm.

V. CALCULATIONS

Table 1:		
EXISTING CONDITION SUMMARY	25 YEAR	100 YEAR

PRELIMINARY HYDROLOGY STUDY
6 STORY MULTIFAMILY PROJECT
Northeast Corner of Ave K8 and 15th Street.
Lancaster, CA 93534

DMA	AREA (ACRES)	TC	C	IN/HR (PEAK)	CFS	VOL.	CFS	VOL.
X-1:	10.86	30	10%	0.86	1.32	18536	1.69	23687
Total:	10.86	30	10%	0.86	1.32	18536	1.69	23687

Table 2:								
EXISTING CONDITION SUMMARY					25 YEAR		100 YEAR	
DMA	AREA (ACRES)	TC	C	IN/HR (PEAK)	CFS	VOL.	CFS	VOL.
A-1:	10.86	21	67%	0.81	5.53	65494	7.80	83696
Total:	10.86	21	67%	0.81	5.53	65494	7.80	83696

VI. RESULTS

Table 3:								
SUMMARY					25 YEAR		100 YEAR	
DMA	AREA (ACRE S)	TC (min)	C	IN/HR (PEAK)	CFS	VOL.	CFS	VOL.
X-1:	10.86	30	10%	0.86	1.32	18536	1.69	23687
A-1:	10.86	21	67%	0.81	5.53	65494	7.80	83696
NET:	-	+9	+57%	+0.05	+4.21*	+46958*	+6.11	+60009

Table 4: STUDY I: Flood Routing to Basin –25 year storm (Check)							
					Flood Routing		Requirements
Basin	Area (sf)	Depth (ft)	Product	Proposed Volume (cf) Vol.	25 YR Peak Volume (cf) Vol.	25 YR Peak (cfs)	25 YR Existing (cfs)
Storage 1:	8794	8	ADS STORMTECH MC-7200	38,136	32,452	1.24	1.32*
Volume Check:	1.32 cfs > 1.24 cfs Q-Allowable CF						25 Year CFS Requirements Satisfied
Summary:	The proposed flood routing maxes out at 1.24 cfs at 32,452 cf and is below the existing condition discharge of 1.32 cfs. See Flood routing study in the appendix.						

VOL=Volume

CF= Cubic Feet

CFS= Cubic Feet per Second

Drawdown Calculations:
See Attached Geotech report.

Surface area of basin:

$$30 \text{ ft} \times 225 \text{ ft} = 6,750 \text{ ft}^2$$

Infiltration rate:

$$2 \text{ in/hr} \div 12 = 0.1667 \text{ ft/hr}$$

Volume infiltrated per hour:

$$6,750 \text{ ft}^2 \times 0.1667 \text{ ft/hr} = 1,125 \text{ ft}^3/\text{hr}$$

Total water volume:

$$\text{Given} = 32,452 \text{ ft}^3$$

Time to infiltrate all water:

$$32,452 \text{ ft}^3 \div 1,125 \text{ ft}^3/\text{hr} = 28.84 \text{ hours}$$

VII. WATER QUALITY NOTE

The current project impacts more than 1 acre of land and disturbs more than 5,000 sf of area falling within the threshold criteria of Section 2.1 of the LID manual requiring a NPDES permit issued by the Los Angeles County department of public works Land Development Division in compliance with the Los Angeles State Water Control Board. A separate Low Impact Development Report will be prepared and has been referenced in this document.

VIII. CONCLUSION

The proposed stormwater detentions systems have been adequately designed to meet the County of Los Angeles retention requirements. In a 10-year storm, and 25 year, runoff will remain within the underground stormwater detention system, posing no threat to people or structures. In an emergency storm event, stormwater will over flow to the existing LAFCD catch basin at the intersection of Olive St. and Otis Ave. and flow south along the existing LAFCD 63" RCP flood control facility and discharge into the concrete lined channel of the Los Angeles River where flows will continue south into the Pacific Ocean.

IX. GLOSSARY

1. Los Angeles County Department of Public Works, "Hydrology Manual", January 2006.
2. Los Angeles County Department of Public Works, "HydroCalc" Outputs and Data
3. Hydraflow Express Extensions for Civil 3D 2013.
4. Preliminary Grading and Utility Plan by Civil Atlas Design Inc.

X. DECLARATION OF RESPONSIBLE CHARGE

I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Profession Code,

and that the design is consistent with the prevailing standard of the engineering profession for similar work.

I understand that the check of project drawings and specifications by the City of Lancaster is confined to a review only and does not relieve me, as engineer of work, of my responsibilities for the project design.

Tyler Hilding Johnson
R.C.E. 85839

Date

APPENDIX A

Drainage Exhibits



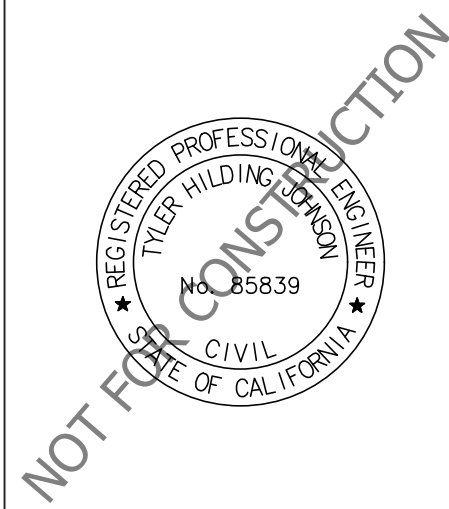
LANCASTER 15TH ST WEST
LANCASTER, CA 93534
APN: 3125-009-071



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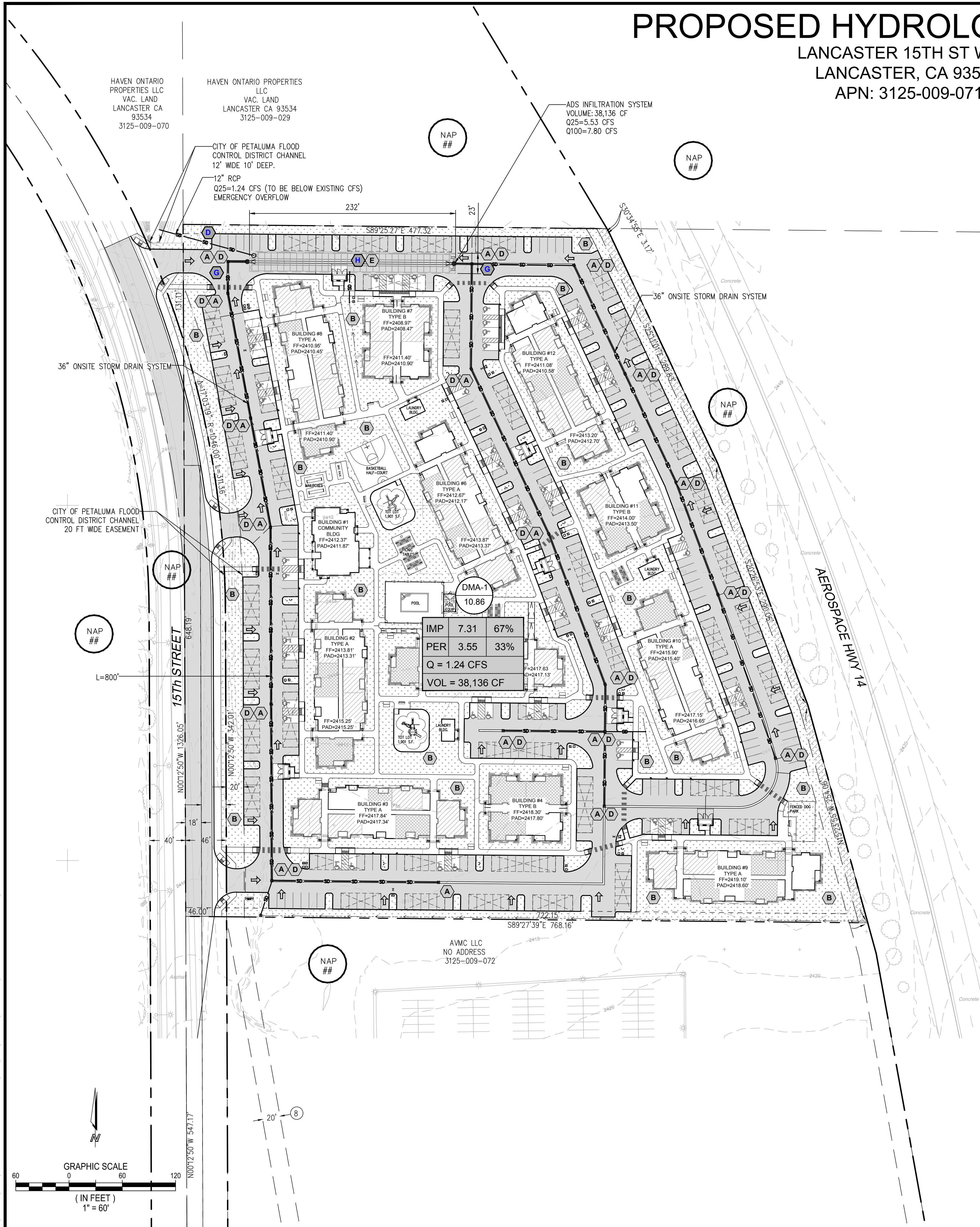
[illegible]

LANCASTER 15TH ST W
15TH ST WEST
LANCASTER, CA 93534

PROJECT NUMBER: 24-134
PREPARED ON:
REVISED ON: 4/23/25
PREPARED BY: GMH
CHECKED BY: THJ

SHEET
1 OF 2

Z:\SHARED\2024\24-134 LANCASTER 15TH ST W\CIVIL\DWG\EXHIBITS\HYDROLOGY\HY-P.DWG - PLOT DATE: April 23, 2025



	PROPERTY BOUNDARY LINE
	CENTERLINE
	LINE EASEMENT LINE
	EXISTING CONTOURS
	PROPOSED CONTOURS
	CHAIN LINK FENCE
	WROUGHT IRON FENCE
	STORM DRAIN
	PROPOSED CONCRETE
	LIGHT DUTY AC PAVEMENT
	PROPOSED LANDSCAPE
	STORM DRAIN STRUCTURES
	MAINTENANCE BMP'S (SEE SECTION V OF WQMP REPORT)
	RUNOFF FLOW DIRECTION
	DRAINAGE MANAGEMENT AREA BOUNDARY

The diagram illustrates the relationship between a Drainage Area (DMA#) and its constituent areas. A circle labeled "DMA#" contains the value "0.52". Two arrows point from this circle to the right, labeled "DRAINAGE AREA" and "AREA IN ACRE". Below the circle is a table with two rows and three columns. The first row is labeled "IMP" and contains the values "0.52" and "100%". The second row is labeled "PER" and contains the values "0.00" and "0%". Two arrows point from the right side of the table to the right, labeled "IMPERVIOUS AREA" and "PERVIOUS AREA".

IMP	0.52	100%
PER	0.00	0%

AREA OF MINIMAL FLOOD HAZARD (ZONE X) ACCORDING TO FEMA FIRMETTE
06037C0420F EFFECTIVE 9/26/2008.

THIS SITE WILL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SANTA ANA REGION ORDER NO. R8-2009-0030 DISCHARGE REQUIREMENTS (MS4 PERMIT).

BIORETENTION BASIN:
LAT: 33.423073
LONG: 117.515298

- CDS - PRE-TREATMENT UNIT
- STORMWATER STORAGE
- OVERFLOW

8. AN EASEMENT FOR DRAINAGE PURPOSES ALONG WITH APPURTENANT STRUCTURES AND INCIDENTAL PURPOSES, RECORDED MAY 31, 2018 AS INSTRUMENT NO. 18-542086 OF OFFICIAL RECORDS.

IN FAVOR OF: THE CITY OF LANCASTER, A CHARTER CITY AND MUNICIPAL CORPORATION

DATE OF MAINTENANCE AGREEMENT: _____

PROPOSED IMPERVIOUS AREA: _____ 318,556.88 SF _____ SQ.FT.

DESIGN STORM: ☒ 85TH PERCENTILE ☐ 0.7-INCH

SWQOV: 17,406.12 _____ CU.FT. 100 _____ % TO RETAIN ONSITE

LID SOLUTION: ☒ INFILTRATION ☐ BIOFILTRATION

AREA A	DETAILS
AREA (ACRES)	10.86
SOIL GROUP	124
DESIGN FREQUENCY	25-YEAR
50-YEAR RAINFALL DEPTH (IN)	3.0
PERCENT IMPERVIOUS	67%
Q_{25} (CFS) (PROPOSED)	1.24
SWQDv	VOLUME (CU-FT)
0.75-INCH STORM	18,649.37
85TH PERCENTILE STORM	17,406.12
BMP	TOTAL VOLUME CAPACITY (CU-FT)
ADS INFILTRATION SYSTEM	38,136
DRAW DOWN	2 INCHES/ HOUR
TOTAL VOLUME CAPACITY	38,136

NON-STRUCTURAL SOURCE CONTROL BMPs	
ID	DESCRIPTION
N1	EDUCATION FOR PROPERTY OWNERS, TENANTS AND OCCUPANTS
N2	ACTIVITY RESTRICTIONS
N3	LANDSCAPE MANAGEMENT
N4	BMP MAINTENANCE
N5	TITLE 22 CCR COMPLIANCE
N6	UNIFORM FIRE CODE IMPLEMENTATION
N7	LITTER / DEBRIS CONTROL PROGRAM
N8	EMPLOYEE TRAINING
N9	CATCH BASIN INSPECTION PROGRAM
N10	SWEEPING OF PRIVATE STREETS AND PARKING LOTS
STRUCTURAL SOURCE CONTROL BMPs	
 S1	PROVIDE STORM DRAIN STENCILING AND SIGNAGE (CASQA NEW DEVELOPMENT BMP HANDBOOK SD–13)
 S2	USE EFFICIENT IRRIGATION SYSTEMS & LANDSCAPE DESIGN, WATER CONSERVATION, SMART CONTROLLERS, AND SOURCE CONTROL (CASQA NEW DEVELOPMENT BMP HANDBOOK SD–12)
 S3	DESIGN AND CONSTRUCT TRASH AND WASTE STORAGE AREAS TO REDUCE POLLUTION INTRODUCTION (CASQA NEW DEVELOPMENT BMP HANDBOOK SD–32)
 S4	PROVIDE DRAIN INSERTS TO ACT AS PRE TREATMENT (CASQA NEW DEVELOPMENT BMP HANDBOOK MP–52)
	ADS STORMWATER STORAGE

PROJECT AREA	IMPERVIOUS		PERVIOUS	
	AREA (AC.)	PERCENTAGE	AREA (AC.)	PERCENTAGE
POST-PROJECT CONDITIONS	7.31	67%	3.55	33%
PRE-PROJECT CONDITIONS	1.09	10%	9.78	90%

THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS. DO NOT SCALE THE DRAWING - ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO ATLAS CIVIL DESIGN WITHOUT DELAY. THE COPYRIGHTS TO ALL DESIGNS AND DRAWINGS ARE THE PROPERTY OF ATLAS CIVIL DESIGN. REPRODUCTION OR USE FOR ANY PURPOSE OTHER THAN THAT AUTHORIZED BY ATLAS CIVIL DESIGN IS FORBIDDEN.

PROJECT INFORMATION	
ENGINEER/PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	



LANCASTER-001

LANCASTER, CA, USA

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-7200.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPERF 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 LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (1-MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-YEAR), AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 1/2".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 400 LB/FT². THE ASG IS DEFINED IN SECTION 6.2.8 OF ASTM F2418 AND 8) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
 - THE STRUCTURAL EVALUATION SHALL BE SIGNED BY A REGISTERED PROFESSIONAL ENGINEER.
 - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 6 AND 12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
- MANHOLE INLETS TO BE DETERMINED BY THE SITE DESIGN ENGINEER. SET TO THE RIGHT AND LEFT OF THE CHAMBER ROW. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONDITIONS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO MAINTAIN MANHOLE COMPLIANCE WITH THE FILL.
- ASG IS NOT A DESIGN OR PROVIDE MEMBRANE LINER SYSTEM. TO MINIMIZE THE LARGEST POTENTIAL OF LINER SYSTEM, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTECHNICAL PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

4650 TELLEMAN BLVD
LANCASTER, CA 93334

PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS:		PART TYPE		ITEM ON LAYOUT		DESCRIPTION		INVERT ABOVE BASE OF CHAMBER	
1	STORMTECH MC-7200 CHAMBER	MAXIMUM ALLOWABLE FORCE TOP OF PAVEMENT (UNPAVED)	13.7								
2	STORMTECH MC-7200 END CAP	MINIMUM ALLOWABLE FORCE UNPAVED WITH TRAFFIC	2.26								
3	STONE ABOVE	MINIMUM ALLOWABLE FORCE UNPAVED TO TRAFFIC	2.26								
4	STONE BELOW	MINIMUM ALLOWABLE FORCE TOP OF RIGID CONCRETE PAVEMENT	2.26								
5	STONE VOID	MINIMUM ALLOWABLE FORCE TOP OF RIGID CONCRETE PAVEMENT	2.26								
6	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
7	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
8	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
9	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
10	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
11	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
12	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
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19	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
20	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
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25	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
26	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
27	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
28	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
29	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
30	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
31	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
32	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
33	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
34	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
35	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
36	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
37	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
38	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
39	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
40	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
41	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
42	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
43	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
44	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
45	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
46	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
47	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
48	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
49	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
50	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
51	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
52	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
53	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
54	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
55	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
56	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
57	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
58	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
59	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
60	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
61	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
62	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
63	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
64	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
65	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
66	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
67	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
68	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
69	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
70	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
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74	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
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77	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
78	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
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84	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
85	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
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88	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
89	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
90	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
91	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
92	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
93	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
94	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
95	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
96	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
97	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
98	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
99	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								
100	PERMANENT SYSTEM VOLUME (CV)	PERMANENT SYSTEM VOLUME (CV)	19.0								

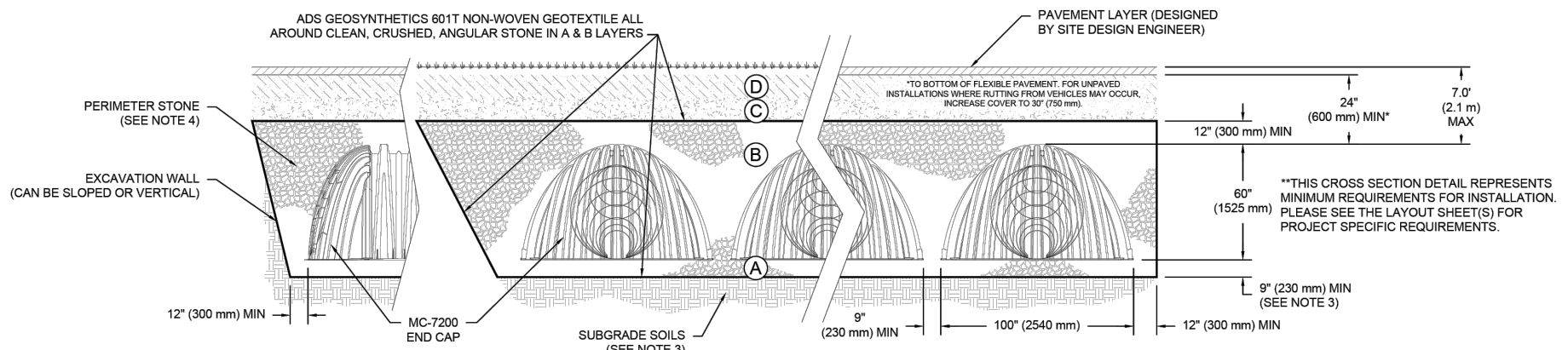
- ISOLATOR ROW PLUS (SEE DETAIL)
- PLACE MINIMUM 17.5' OF ADRIPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS
- BED LIMITS

NOTES:
1. SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
2. NOT FOR CONSTRUCTION: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVIDE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	NA	PREPARE PER SITE DESIGN ENGINEERS PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE SUBGRADE STONE (B LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBGRADE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. OR MOST PAVEMENT SUBGRADE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. CONTACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL-GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBANKMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE (A LAYER) TO THE 'C' LAYER (ASIDE).	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE ^{1,2}	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE ^{1,2}	PLATE COMPACTION OR ROLL TO ACHIEVE A FLAT SURFACE. ^{1,3}

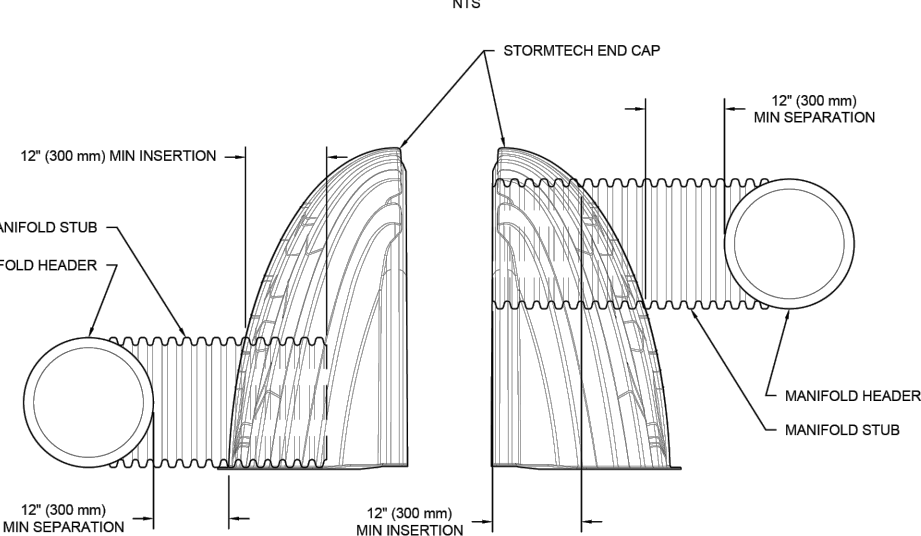
- PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #41 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M3) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERS WITH A VIBRATORY COMPACTOR.
3. WHERE INSTALLATION SURFACES MAY BE COMPROMISED BY COMPACTION FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY BANKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOLID MATERIAL CAN BE PLACED IN LAYER 'C' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBGRADE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEERS DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

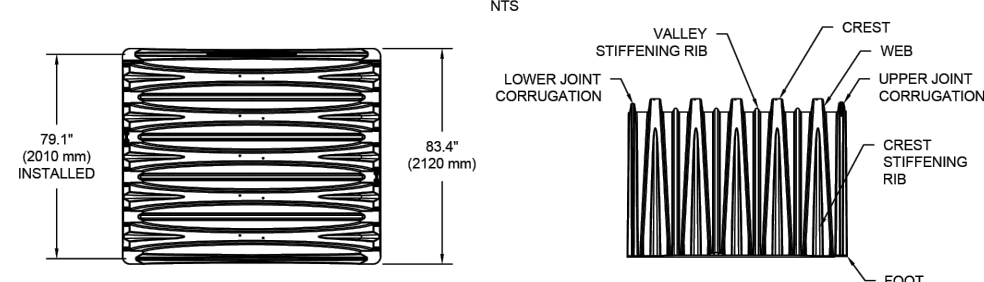
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
- MC-7200 CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING CAPACITY (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 1/2".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 400 LB/FT². THE ASG IS DEFINED IN SECTION 6.2.8 OF ASTM F2418 AND 8) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

MC-SERIES END CAP INSERTION DETAIL



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

MC-7200 TECHNICAL SPECIFICATION



NORMAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)
CHAMBER STORAGE
MINIMUM INSTALLED STORAGE¹
WEIGHT (NORMAL)

100' (30.5 m) X 80' (24.4 m) X 79' (24.1 m)
175 CUBIC FEET (4.9 m³)
267.3 CUBIC FEET (7.6 m³)
205 lbs. (93.0 kg)

NORMAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)
END CAP STORAGE
MINIMUM INSTALLED STORAGE¹
WEIGHT (NORMAL)

60' (18.3 m) X 61' (18.6 m) X 32' (9.8 m)
38 CUBIC FEET (1.1 m³)
115.3 CUBIC FEET (3.3 m³)
90 lbs. (40.8 kg)

¹ ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "V"

CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS

Z:\SHARED\2024\24-134 LANCASTER 15TH ST W\CIVIL\DWG\EXHIBITS\HYDROLOGY\HY-KING - PLOT DATE: April 23, 2025

EXISTING HYDROLOGY EXHIBIT

LANCASTER 15TH ST WEST
LANCASTER, CA 93534
APN: 3125-009-071

HAVEN ONTARIO
PROPERTIES LLC
VAC. LAND
LANCASTER, CA
93534
3125-009-070

HAVEN ONTARIO PROPERTIES
LLC
VAC. LAND
LANCASTER, CA 93534
3125-009-029

CITY OF PETALUMA FLOOD
CONTROL DISTRICT CHANNEL
12' WIDE 10' DEEP.

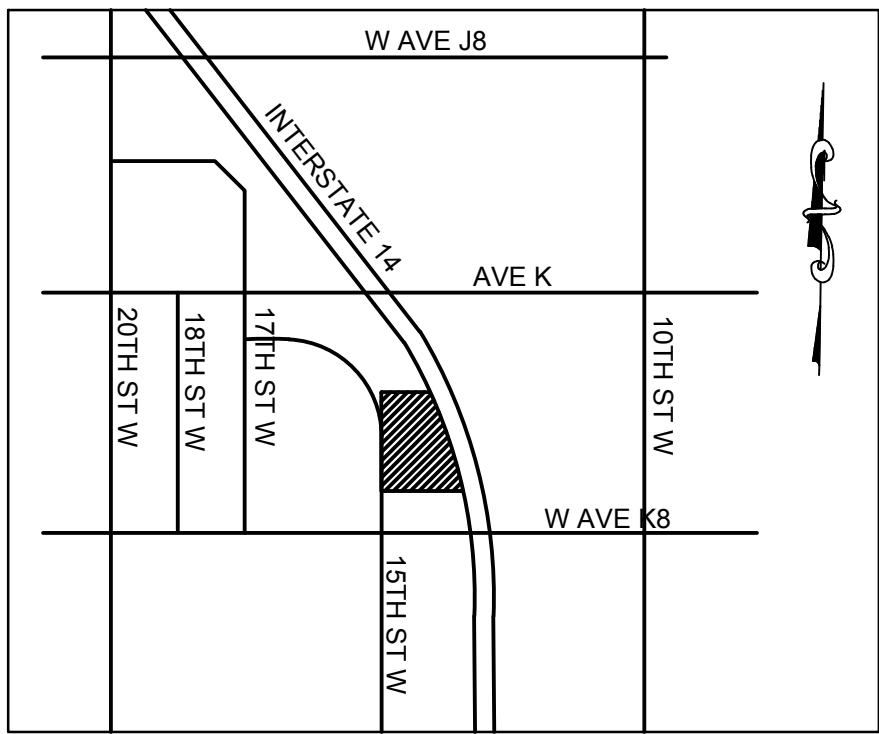
12" RCP
Q25=1.24 CFS (TO BE BELOW EXISTING CFS)
EMERGENCY OVERFLOW

DMA X-1:
Q25=1.32 CFS
Q100=1.69 CFS

CITY OF PETALUMA FLOOD
CONTROL DISTRICT CHANNEL
20 FT WIDE EASEMENT

DMA: X-1
10.86

AWMC LLC
NO ADDRESS
3125-009-072



VICINITY MAP
SCALE: NOT TO SCALE

LEGEND

- PROPERTY BOUNDARY LINE
- CENTERLINE
- LINE EASEMENT LINE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- CHAIN LINK FENCE
- WROUGHT IRON FENCE
- STORM DRAIN

- PROPOSED CONCRETE
- LIGHT DUTY AC PAVEMENT
- PROPOSED LANDSCAPE
- STORM DRAIN STRUCTURES

N16

MAINTENANCE BMP'S
(SEE SECTION V OF
WQMP REPORT)



RUNOFF FLOW DIRECTION



DRAINAGE MANAGEMENT
AREA BOUNDARY

DMA#
0.52

DRAINAGE AREA
AREA IN ACRE

IMP

0.52

100%

IMPERVIOUS AREA

PER

0.00

0%

PERVIOUS AREA

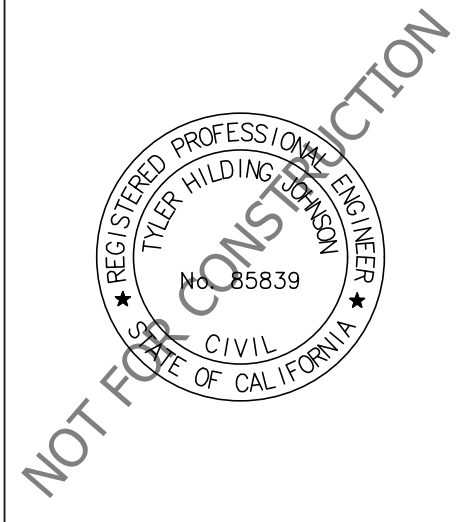
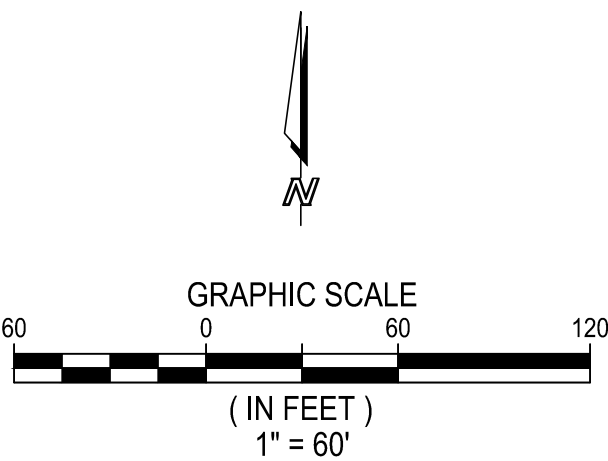
FLOOD DESIGNATION

AREA OF MINIMAL FLOOD HAZARD (ZONE X) ACCORDING TO FEMA FIRMETTE
06037C0420F EFFECTIVE 9/26/2008.

DRAINAGE EASEMENTS

8. AN EASEMENT FOR DRAINAGE PURPOSES ALONG WITH APPURTENANT
STRUCTURES AND INCIDENTAL PURPOSES, RECORDED MAY 31, 2018
AS INSTRUMENT NO. 18-542086 OF OFFICIAL RECORDS.
IN FAVOR OF: THE CITY OF LANCASTER, A CHARTER CITY AND
MUNICIPAL CORPORATION

PROJECT AREA	IMPERVIOUS		PERVIOUS	
	AREA (AC.)	PERCENTAGE	AREA (AC.)	PERCENTAGE
POST-PROJECT CONDITIONS	7.31	67%	3.55	33%
PRE-PROJECT CONDITIONS	1.09	10%	9.78	90%



DATE	REVISIONS	BY				

LANCASTER 15TH ST W
15TH ST WEST
LANCASTER, CA 93534
EXISTING HYDROLOGY EXHIBIT

PROJECT NUMBER: 24-134
PREPARED ON:
REVISED ON: 4/23/25
PREPARED BY: GMH
CHECKED BY: THJ

SHEET
1 OF 1

THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS. DO NOT SCALE THE DRAWING - ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO ATLAS CIVIL DESIGN WITHOUT DELAY. THE COPYRIGHTS TO ALL DESIGNS AND DRAWINGS ARE THE PROPERTY OF ATLAS CIVIL DESIGN. REPRODUCTION OR USE FOR ANY PURPOSE OTHER THAN THAT AUTHORIZED BY ATLAS CIVIL DESIGN IS FORBIDDEN.

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APPENDIX B

Hydrology Calculations



Peak Flow Hydrologic Analysis

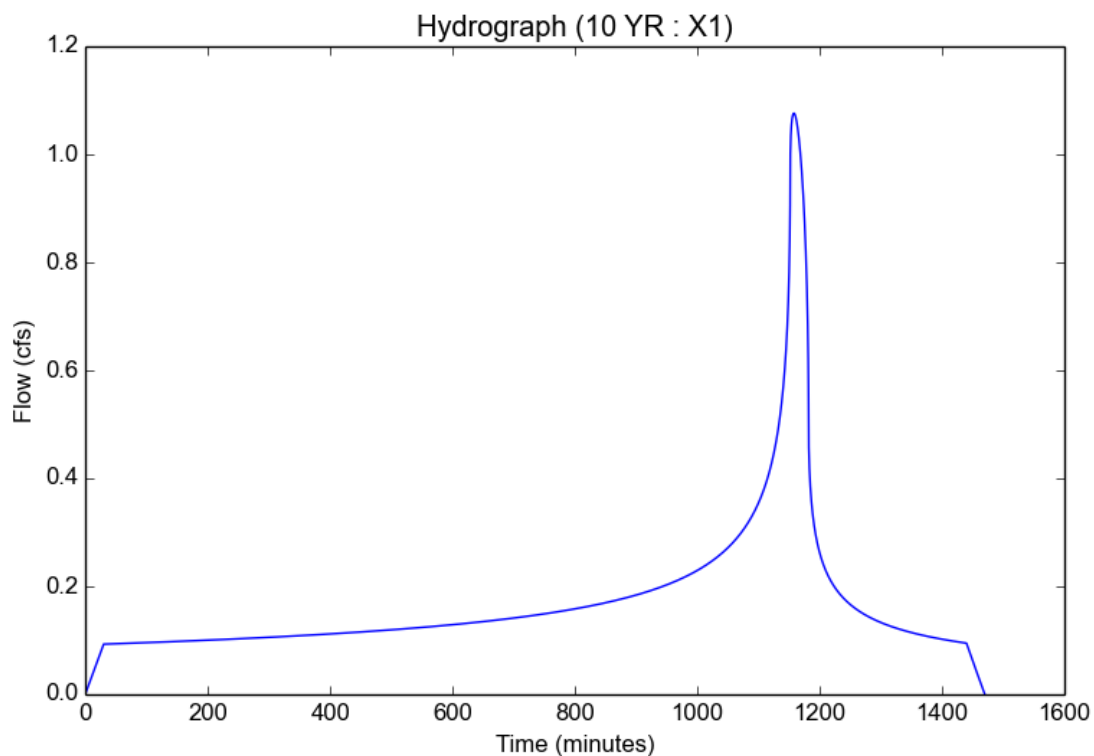
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	10 YR
Subarea ID	X1
Area (ac)	10.86
Flow Path Length (ft)	800.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	3.0
Percent Impervious	0.1
Soil Type	124
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.142
Peak Intensity (in/hr)	0.5505
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1.0762
Burned Peak Flow Rate (cfs)	1.0762
24-Hr Clear Runoff Volume (ac-ft)	0.3461
24-Hr Clear Runoff Volume (cu-ft)	15074.0268



Peak Flow Hydrologic Analysis

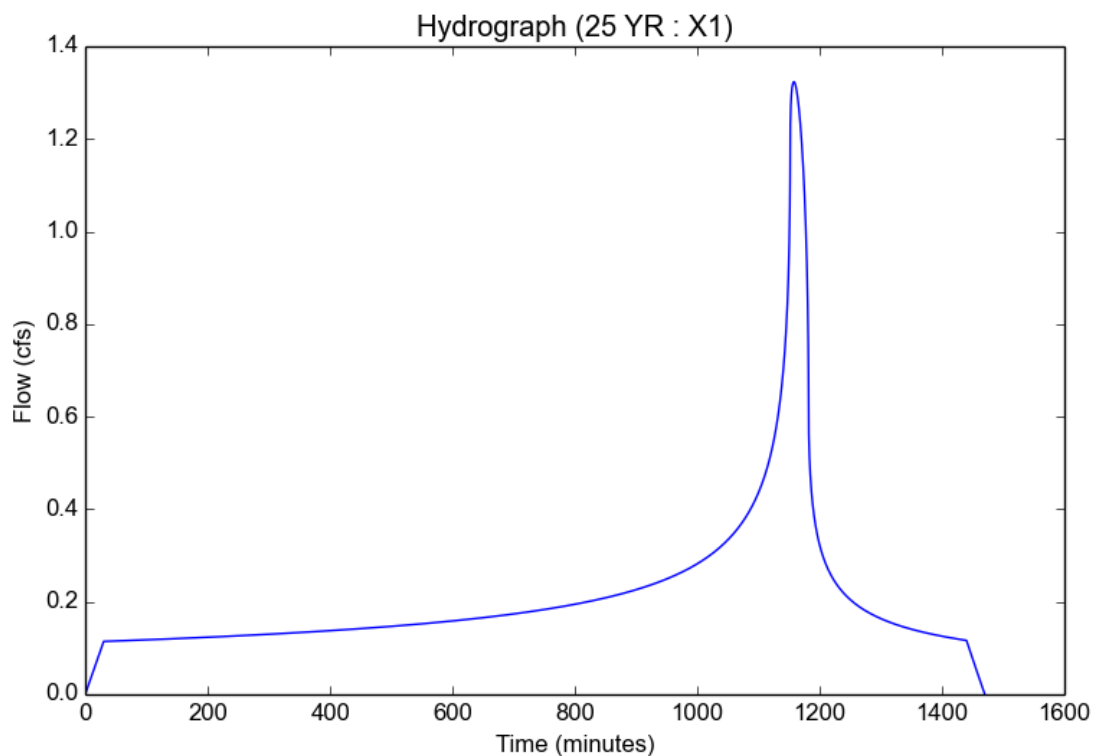
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	25 YR
Subarea ID	X1
Area (ac)	10.86
Flow Path Length (ft)	800.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	3.0
Percent Impervious	0.1
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	2.634
Peak Intensity (in/hr)	0.677
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1.3234
Burned Peak Flow Rate (cfs)	1.3234
24-Hr Clear Runoff Volume (ac-ft)	0.4255
24-Hr Clear Runoff Volume (cu-ft)	18536.4083



Peak Flow Hydrologic Analysis

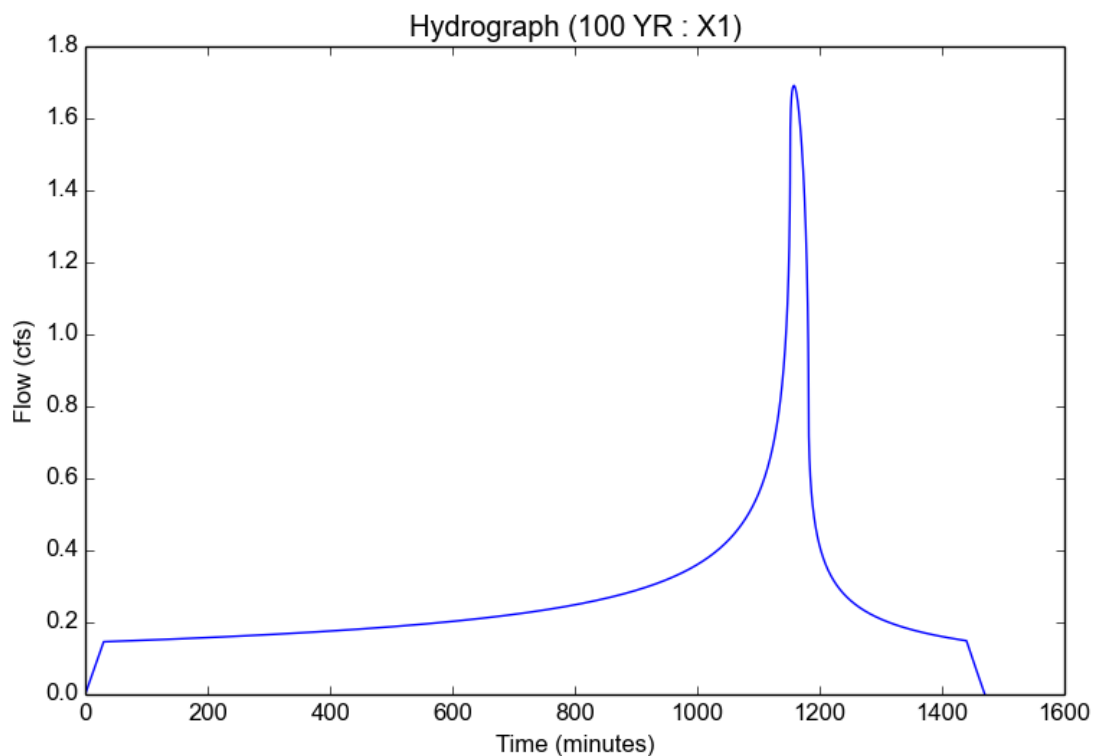
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	100 YR
Subarea ID	X1
Area (ac)	10.86
Flow Path Length (ft)	800.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	3.0
Percent Impervious	0.1
Soil Type	124
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	3.366
Peak Intensity (in/hr)	0.8651
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1.6912
Burned Peak Flow Rate (cfs)	1.6912
24-Hr Clear Runoff Volume (ac-ft)	0.5438
24-Hr Clear Runoff Volume (cu-ft)	23687.7564



Peak Flow Hydrologic Analysis

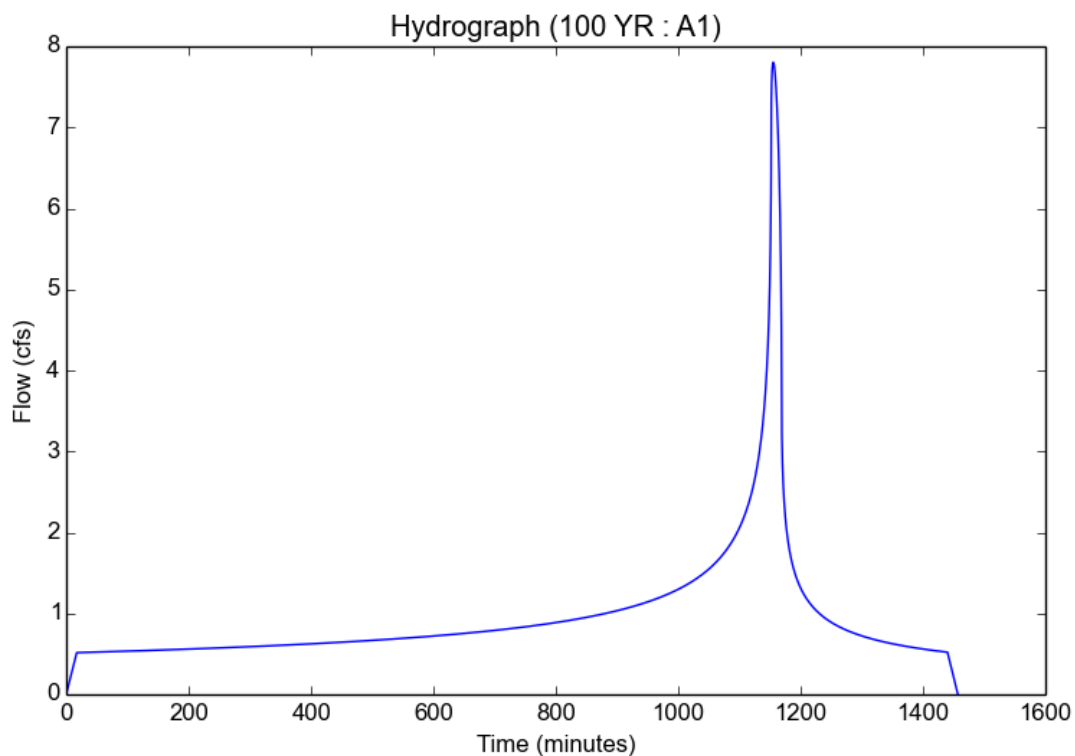
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	100 YR
Subarea ID	A1
Area (ac)	10.86
Flow Path Length (ft)	800.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	3.0
Percent Impervious	0.67
Soil Type	124
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	3.366
Peak Intensity (in/hr)	1.1299
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.636
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	7.8039
Burned Peak Flow Rate (cfs)	7.8039
24-Hr Clear Runoff Volume (ac-ft)	1.9214
24-Hr Clear Runoff Volume (cu-ft)	83696.0844



Peak Flow Hydrologic Analysis

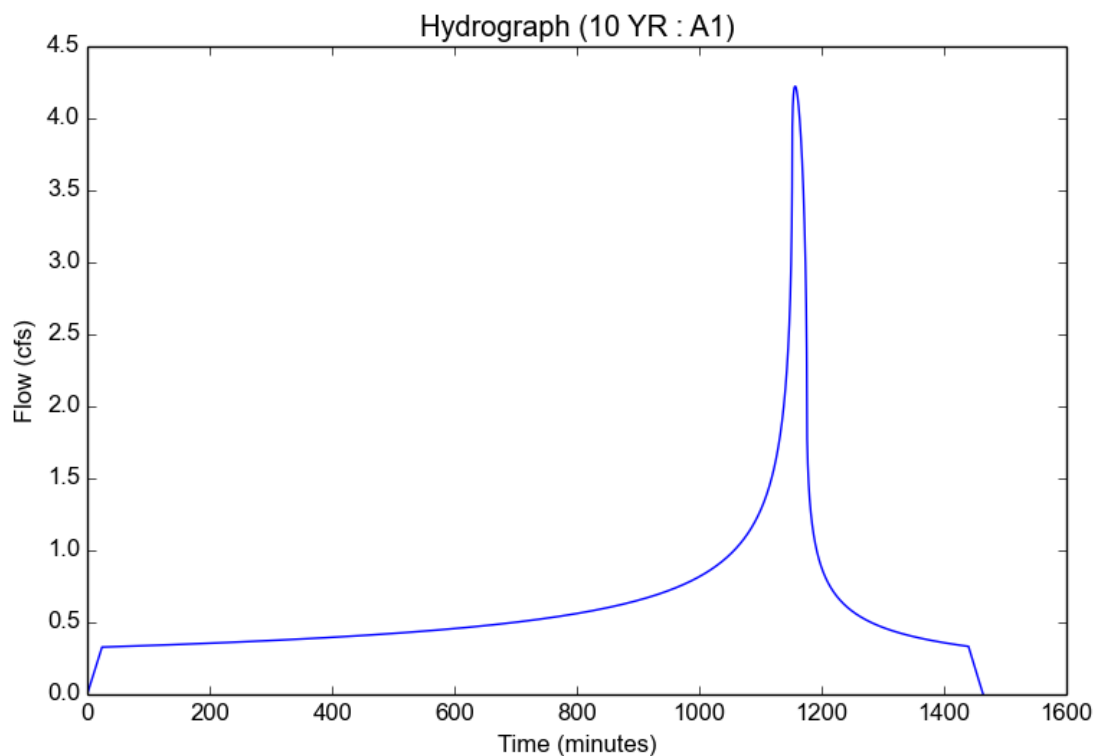
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	10 YR
Subarea ID	A1
Area (ac)	10.86
Flow Path Length (ft)	800.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	3.0
Percent Impervious	0.67
Soil Type	124
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.142
Peak Intensity (in/hr)	0.6114
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.636
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	4.2231
Burned Peak Flow Rate (cfs)	4.2231
24-Hr Clear Runoff Volume (ac-ft)	1.2227
24-Hr Clear Runoff Volume (cu-ft)	53261.3398



Peak Flow Hydrologic Analysis

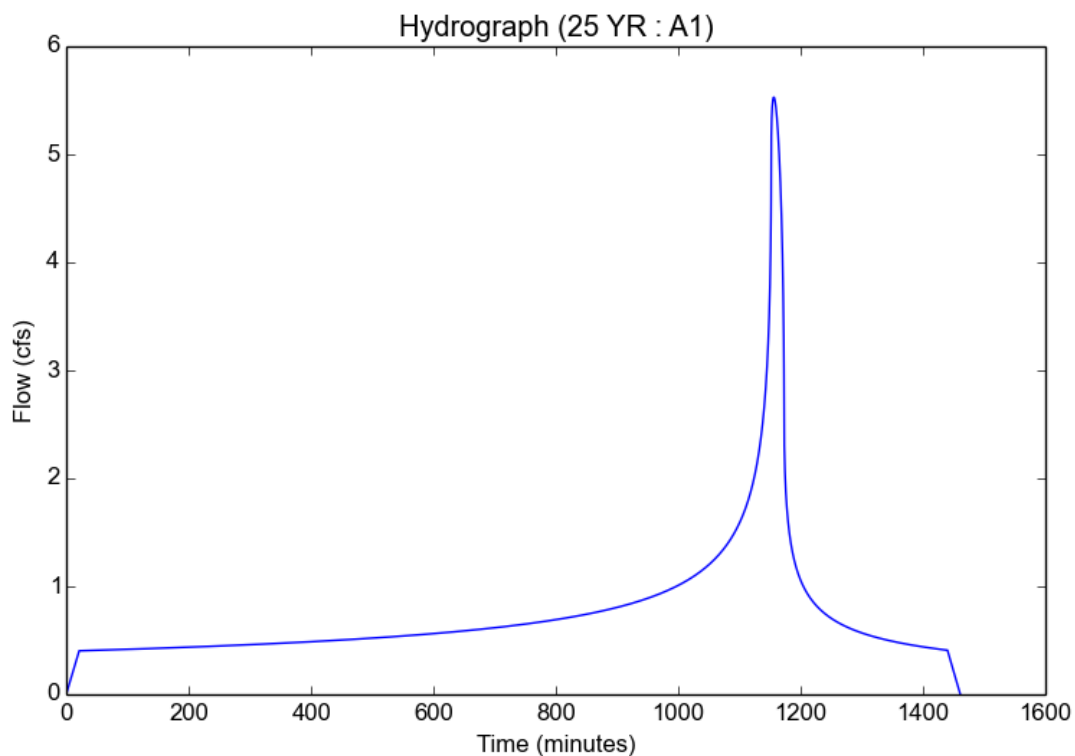
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	25 YR
Subarea ID	A1
Area (ac)	10.86
Flow Path Length (ft)	800.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	3.0
Percent Impervious	0.67
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

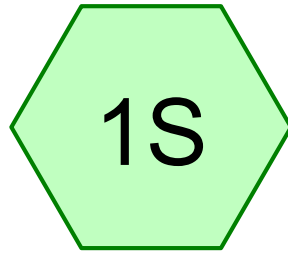
Modeled (25-yr) Rainfall Depth (in)	2.634
Peak Intensity (in/hr)	0.8006
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.636
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	5.5294
Burned Peak Flow Rate (cfs)	5.5294
24-Hr Clear Runoff Volume (ac-ft)	1.5036
24-Hr Clear Runoff Volume (cu-ft)	65494.9238



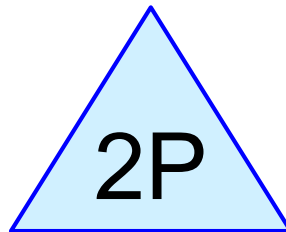
APPENDIX C

Hydraulic Calculations – Flood Routing

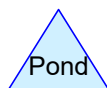
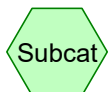




DMA A1



BASIN 1



Lancaster Flood Routing

Prepared by Christopher Rivera

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Printed 4/22/2025

Page 2

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-yr	Type II 24-hr		Default	24.00	1	3.12	2
2	100-yr	Type II 24-hr		Default	24.00	1	4.00	2
3	200-yr	Type II 24-hr		Default	24.00	1	4.44	2
4	500-yr	Type II 24-hr		Default	24.00	1	5.01	2
5	1000-yr	Type II 24-hr		Default	24.00	1	5.45	2
6	Custom	Type II 24-hr		Default	24.00	1	3.12	3

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
10.860	67	Urban commercial, 67% imp, HSG B (1S)
10.860	67	TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	10.860	0.000	0.000	0.000	10.860	Urban commercial, 67% imp	1S
0.000	10.860	0.000	0.000	0.000	10.860	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	2P	2,405.50	2,404.50	50.0	0.0200	0.013	0.0	8.0	0.0	

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Time span=0.00-34.00 hrs, dt=0.05 hrs, 681 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DMA A1

Runoff Area=10.860 ac 67.00% Impervious Runoff Depth=0.65"
Tc=0.0 min CN=67 Runoff=13.67 cfs 0.584 af

Pond 2P: BASIN 1

Peak Elev=2,403.08' Storage=0.270 af Inflow=13.67 cfs 0.584 af
Primary=0.00 cfs 0.000 af Secondary=0.44 cfs 0.582 af Outflow=0.44 cfs 0.582 af

Total Runoff Area = 10.860 ac Runoff Volume = 0.584 af Average Runoff Depth = 0.65"
33.00% Pervious = 3.584 ac 67.00% Impervious = 7.276 ac

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Type II 24-hr 25-yr Rainfall=3.12"

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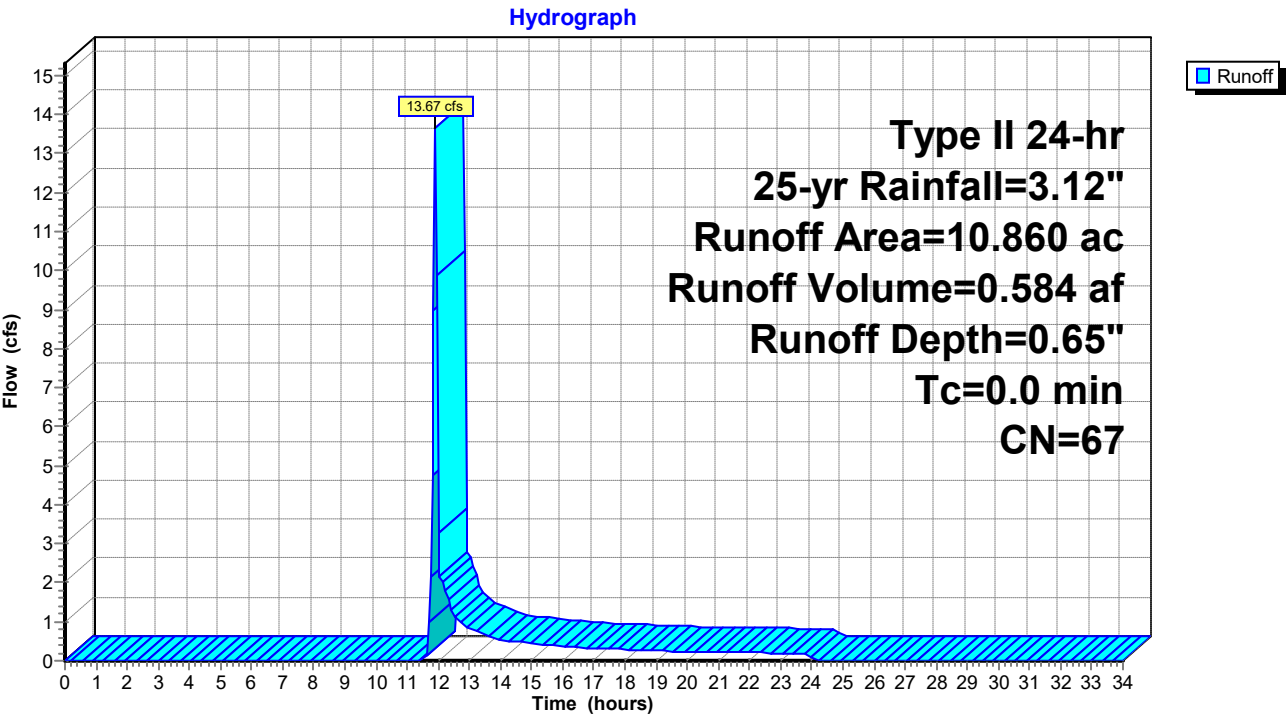
Summary for Subcatchment 1S: DMA A1

Runoff = 13.67 cfs @ 11.90 hrs, Volume= 0.584 af, Depth= 0.65"
Routed to Pond 2P : BASIN 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.12"

Area (ac)	CN	Description
* 10.860	67	Urban commercial, 67% imp, HSG B
3.584		33.00% Pervious Area
7.276		67.00% Impervious Area

Subcatchment 1S: DMA A1



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Hydrograph for Subcatchment 1S: DMA A1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	3.12	0.65	0.00
0.50	0.02	0.00	0.00	26.50	3.12	0.65	0.00
1.00	0.03	0.00	0.00	27.00	3.12	0.65	0.00
1.50	0.05	0.00	0.00	27.50	3.12	0.65	0.00
2.00	0.07	0.00	0.00	28.00	3.12	0.65	0.00
2.50	0.09	0.00	0.00	28.50	3.12	0.65	0.00
3.00	0.11	0.00	0.00	29.00	3.12	0.65	0.00
3.50	0.13	0.00	0.00	29.50	3.12	0.65	0.00
4.00	0.15	0.00	0.00	30.00	3.12	0.65	0.00
4.50	0.17	0.00	0.00	30.50	3.12	0.65	0.00
5.00	0.20	0.00	0.00	31.00	3.12	0.65	0.00
5.50	0.22	0.00	0.00	31.50	3.12	0.65	0.00
6.00	0.25	0.00	0.00	32.00	3.12	0.65	0.00
6.50	0.28	0.00	0.00	32.50	3.12	0.65	0.00
7.00	0.31	0.00	0.00	33.00	3.12	0.65	0.00
7.50	0.34	0.00	0.00	33.50	3.12	0.65	0.00
8.00	0.37	0.00	0.00	34.00	3.12	0.65	0.00
8.50	0.41	0.00	0.00				
9.00	0.46	0.00	0.00				
9.50	0.51	0.00	0.00				
10.00	0.56	0.00	0.00				
10.50	0.64	0.00	0.00				
11.00	0.73	0.00	0.00				
11.50	0.88	0.00	0.00				
12.00	2.07	0.20	3.27				
12.50	2.29	0.27	1.13				
13.00	2.41	0.32	0.83				
13.50	2.49	0.35	0.67				
14.00	2.56	0.38	0.54				
14.50	2.61	0.40	0.50				
15.00	2.66	0.43	0.45				
15.50	2.71	0.45	0.41				
16.00	2.75	0.46	0.36				
16.50	2.78	0.48	0.34				
17.00	2.81	0.49	0.33				
17.50	2.84	0.51	0.31				
18.00	2.87	0.52	0.29				
18.50	2.90	0.54	0.28				
19.00	2.93	0.55	0.26				
19.50	2.95	0.56	0.24				
20.00	2.97	0.57	0.22				
20.50	2.99	0.58	0.22				
21.00	3.01	0.59	0.21				
21.50	3.03	0.60	0.21				
22.00	3.05	0.61	0.21				
22.50	3.07	0.62	0.20				
23.00	3.08	0.63	0.20				
23.50	3.10	0.64	0.20				
24.00	3.12	0.65	0.10				
24.50	3.12	0.65	0.00				
25.00	3.12	0.65	0.00				
25.50	3.12	0.65	0.00				

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Summary for Pond 2P: BASIN 1

Inflow Area = 10.860 ac, 67.00% Impervious, Inflow Depth = 0.65" for 25-yr event
Inflow = 13.67 cfs @ 11.90 hrs, Volume= 0.584 af
Outflow = 0.44 cfs @ 15.12 hrs, Volume= 0.582 af, Atten= 97%, Lag= 192.9 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.44 cfs @ 15.12 hrs, Volume= 0.582 af

Routing by Stor-Ind method, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Peak Elev= 2,403.08' @ 15.12 hrs Surf.Area= 0.203 ac Storage= 0.270 af

Plug-Flow detention time= 318.2 min calculated for 0.581 af (99% of inflow)
Center-of-Mass det. time= 316.3 min (1,197.4 - 881.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	2,401.00'	0.344 af	28.50'W x 310.68'L x 7.00'H Field A 1.423 af Overall - 0.563 af Embedded = 0.860 af x 40.0% Voids
#2A	2,402.00'	0.563 af	ADS_StormTech MC-7200 +Cap x 138 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 138 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
		0.907 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	2,405.50'	8.0" Round Culvert L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 2,405.50' / 2,404.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	2,401.00'	2.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 2,376.00' Phase-In= 1.00'

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,401.00' (Free Discharge)

↑ **1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.44 cfs @ 15.12 hrs HW=2,403.08' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.44 cfs)



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Pond 2P: BASIN 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)

Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf

Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap

Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

46 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 308.68' Row Length +12.0" End Stone x 2 = 310.68' Base Length

3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width

12.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 7.00' Field Height

138 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 24,507.8 cf Chamber Storage

61,981.3 cf Field - 24,507.8 cf Chambers = 37,473.5 cf Stone x 40.0% Voids = 14,989.4 cf Stone Storage

Chamber Storage + Stone Storage = 39,497.2 cf = 0.907 af

Overall Storage Efficiency = 63.7%

Overall System Size = 310.68' x 28.50' x 7.00'

138 Chambers

2,295.6 cy Field

1,387.9 cy Stone



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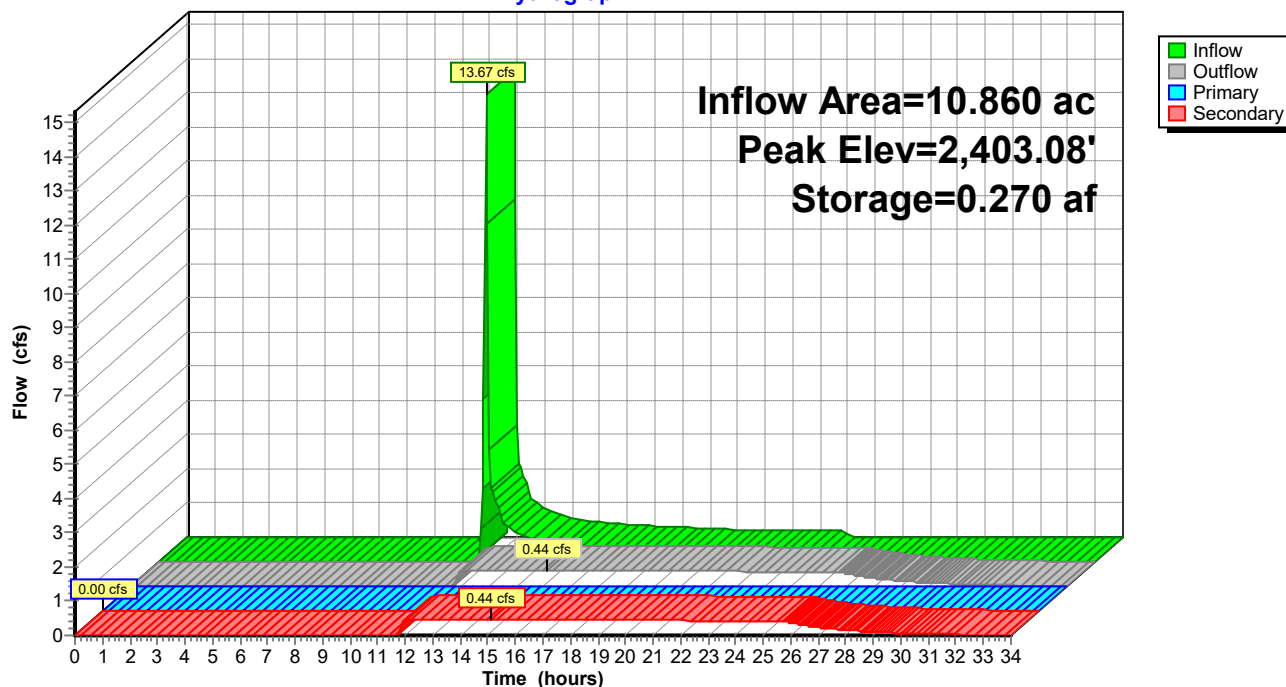
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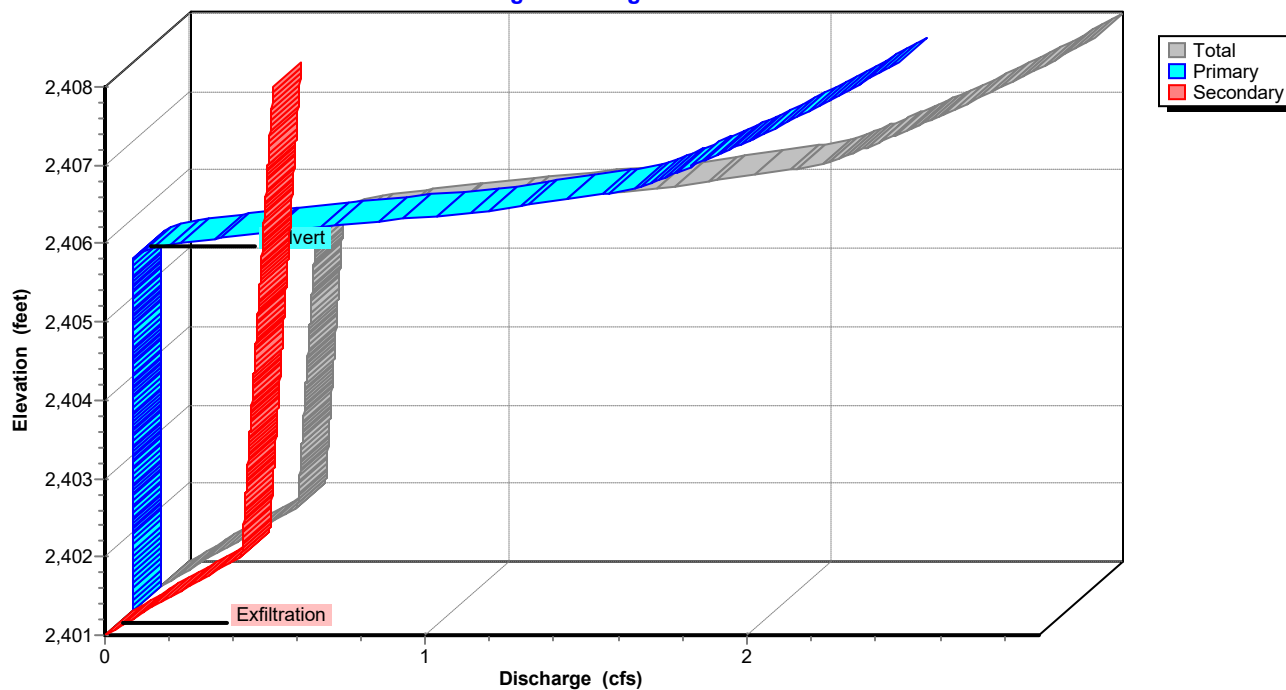
Pond 2P: BASIN 1

Hydrograph



Pond 2P: BASIN 1

Stage-Discharge



Lancaster Flood Routing

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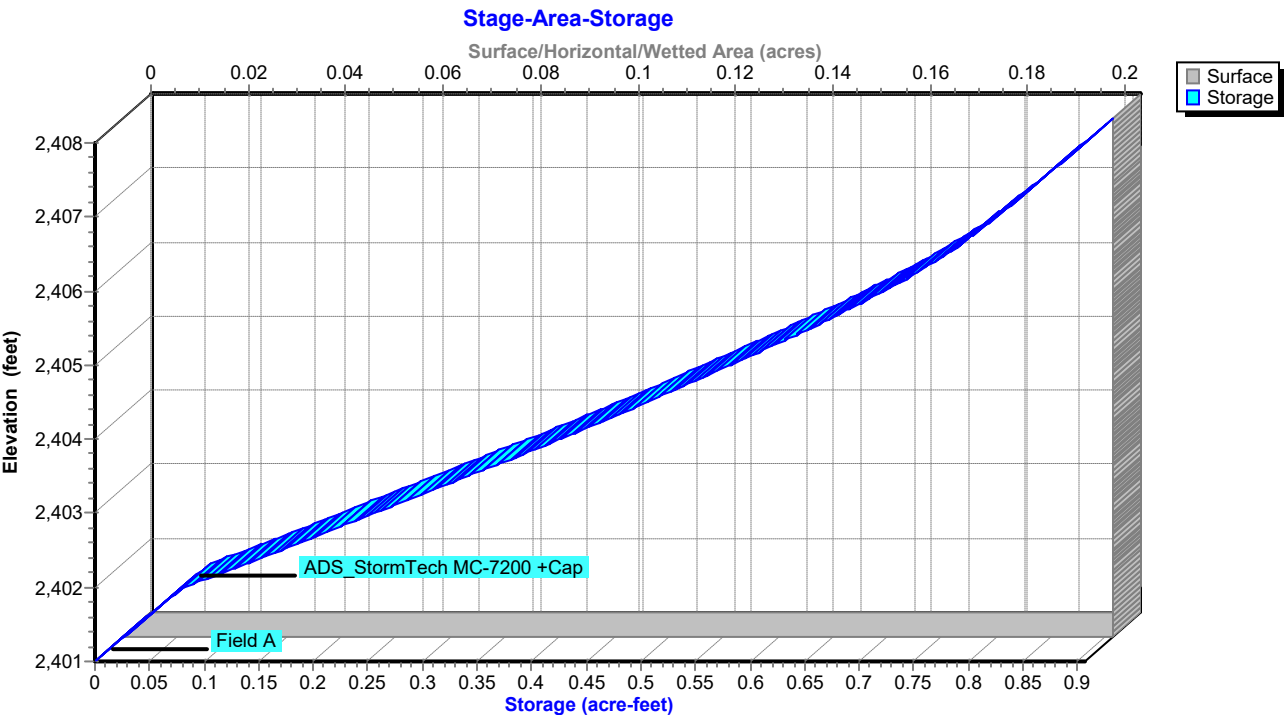
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Pond 2P: BASIN 1



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Hydrograph for Pond 2P: BASIN 1

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0.000	2,401.00	0.00	0.00	0.00
1.00	0.00	0.000	2,401.00	0.00	0.00	0.00
2.00	0.00	0.000	2,401.00	0.00	0.00	0.00
3.00	0.00	0.000	2,401.00	0.00	0.00	0.00
4.00	0.00	0.000	2,401.00	0.00	0.00	0.00
5.00	0.00	0.000	2,401.00	0.00	0.00	0.00
6.00	0.00	0.000	2,401.00	0.00	0.00	0.00
7.00	0.00	0.000	2,401.00	0.00	0.00	0.00
8.00	0.00	0.000	2,401.00	0.00	0.00	0.00
9.00	0.00	0.000	2,401.00	0.00	0.00	0.00
10.00	0.00	0.000	2,401.00	0.00	0.00	0.00
11.00	0.00	0.000	2,401.00	0.00	0.00	0.00
12.00	3.27	0.168	2,402.49	0.43	0.00	0.43
13.00	0.83	0.246	2,402.94	0.44	0.00	0.44
14.00	0.54	0.266	2,403.05	0.44	0.00	0.44
15.00	0.45	0.270	2,403.08	0.44	0.00	0.44
16.00	0.36	0.267	2,403.06	0.44	0.00	0.44
17.00	0.33	0.259	2,403.01	0.44	0.00	0.44
18.00	0.29	0.248	2,402.95	0.44	0.00	0.44
19.00	0.26	0.234	2,402.87	0.44	0.00	0.44
20.00	0.22	0.218	2,402.77	0.44	0.00	0.44
21.00	0.21	0.199	2,402.67	0.44	0.00	0.44
22.00	0.21	0.180	2,402.56	0.44	0.00	0.44
23.00	0.20	0.161	2,402.45	0.43	0.00	0.43
24.00	0.10	0.141	2,402.34	0.43	0.00	0.43
25.00	0.00	0.106	2,402.14	0.43	0.00	0.43
26.00	0.00	0.071	2,401.88	0.37	0.00	0.37
27.00	0.00	0.047	2,401.57	0.24	0.00	0.24
28.00	0.00	0.030	2,401.37	0.16	0.00	0.16
29.00	0.00	0.020	2,401.25	0.10	0.00	0.10
30.00	0.00	0.013	2,401.16	0.07	0.00	0.07
31.00	0.00	0.009	2,401.11	0.04	0.00	0.04
32.00	0.00	0.006	2,401.07	0.03	0.00	0.03
33.00	0.00	0.004	2,401.05	0.02	0.00	0.02
34.00	0.00	0.002	2,401.03	0.01	0.00	0.01

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Stage-Discharge for Pond 2P: BASIN 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
2,401.00	0.00	0.00	0.00	2,406.20	1.77	1.27	0.50
2,401.10	0.04	0.00	0.04	2,406.30	1.93	1.44	0.50
2,401.20	0.08	0.00	0.08	2,406.40	2.07	1.58	0.50
2,401.30	0.12	0.00	0.12	2,406.50	2.14	1.64	0.50
2,401.40	0.17	0.00	0.17	2,406.60	2.20	1.70	0.50
2,401.50	0.21	0.00	0.21	2,406.70	2.26	1.76	0.50
2,401.60	0.25	0.00	0.25	2,406.80	2.32	1.81	0.51
2,401.70	0.29	0.00	0.29	2,406.90	2.38	1.87	0.51
2,401.80	0.34	0.00	0.34	2,407.00	2.43	1.92	0.51
2,401.90	0.38	0.00	0.38	2,407.10	2.48	1.97	0.51
2,402.00	0.43	0.00	0.43	2,407.20	2.54	2.02	0.51
2,402.10	0.43	0.00	0.43	2,407.30	2.59	2.07	0.51
2,402.20	0.43	0.00	0.43	2,407.40	2.64	2.12	0.51
2,402.30	0.43	0.00	0.43	2,407.50	2.68	2.17	0.52
2,402.40	0.43	0.00	0.43	2,407.60	2.73	2.21	0.52
2,402.50	0.43	0.00	0.43	2,407.70	2.78	2.26	0.52
2,402.60	0.44	0.00	0.44	2,407.80	2.82	2.30	0.52
2,402.70	0.44	0.00	0.44	2,407.90	2.87	2.35	0.52
2,402.80	0.44	0.00	0.44	2,408.00	2.91	2.39	0.52
2,402.90	0.44	0.00	0.44				
2,403.00	0.44	0.00	0.44				
2,403.10	0.44	0.00	0.44				
2,403.20	0.45	0.00	0.45				
2,403.30	0.45	0.00	0.45				
2,403.40	0.45	0.00	0.45				
2,403.50	0.45	0.00	0.45				
2,403.60	0.45	0.00	0.45				
2,403.70	0.45	0.00	0.45				
2,403.80	0.46	0.00	0.46				
2,403.90	0.46	0.00	0.46				
2,404.00	0.46	0.00	0.46				
2,404.10	0.46	0.00	0.46				
2,404.20	0.46	0.00	0.46				
2,404.30	0.46	0.00	0.46				
2,404.40	0.47	0.00	0.47				
2,404.50	0.47	0.00	0.47				
2,404.60	0.47	0.00	0.47				
2,404.70	0.47	0.00	0.47				
2,404.80	0.47	0.00	0.47				
2,404.90	0.47	0.00	0.47				
2,405.00	0.48	0.00	0.48				
2,405.10	0.48	0.00	0.48				
2,405.20	0.48	0.00	0.48				
2,405.30	0.48	0.00	0.48				
2,405.40	0.48	0.00	0.48				
2,405.50	0.48	0.00	0.48				
2,405.60	0.53	0.04	0.49				
2,405.70	0.65	0.17	0.49				
2,405.80	0.84	0.36	0.49				
2,405.90	1.08	0.59	0.49				
2,406.00	1.34	0.85	0.49				
2,406.10	1.58	1.09	0.49				

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Stage-Area-Storage for Pond 2P: BASIN 1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
2,401.00	0.203	0.000	2,406.20	0.203	0.747
2,401.10	0.203	0.008	2,406.30	0.203	0.759
2,401.20	0.203	0.016	2,406.40	0.203	0.770
2,401.30	0.203	0.024	2,406.50	0.203	0.781
2,401.40	0.203	0.033	2,406.60	0.203	0.790
2,401.50	0.203	0.041	2,406.70	0.203	0.800
2,401.60	0.203	0.049	2,406.80	0.203	0.809
2,401.70	0.203	0.057	2,406.90	0.203	0.817
2,401.80	0.203	0.065	2,407.00	0.203	0.825
2,401.90	0.203	0.073	2,407.10	0.203	0.834
2,402.00	0.203	0.081	2,407.20	0.203	0.842
2,402.10	0.203	0.099	2,407.30	0.203	0.850
2,402.20	0.203	0.117	2,407.40	0.203	0.858
2,402.30	0.203	0.134	2,407.50	0.203	0.866
2,402.40	0.203	0.152	2,407.60	0.203	0.874
2,402.50	0.203	0.170	2,407.70	0.203	0.882
2,402.60	0.203	0.187	2,407.80	0.203	0.890
2,402.70	0.203	0.204	2,407.90	0.203	0.899
2,402.80	0.203	0.222	2,408.00	0.203	0.907
2,402.90	0.203	0.239			
2,403.00	0.203	0.257			
2,403.10	0.203	0.274			
2,403.20	0.203	0.291			
2,403.30	0.203	0.308			
2,403.40	0.203	0.325			
2,403.50	0.203	0.342			
2,403.60	0.203	0.359			
2,403.70	0.203	0.375			
2,403.80	0.203	0.392			
2,403.90	0.203	0.409			
2,404.00	0.203	0.425			
2,404.10	0.203	0.441			
2,404.20	0.203	0.458			
2,404.30	0.203	0.474			
2,404.40	0.203	0.490			
2,404.50	0.203	0.506			
2,404.60	0.203	0.521			
2,404.70	0.203	0.537			
2,404.80	0.203	0.552			
2,404.90	0.203	0.568			
2,405.00	0.203	0.583			
2,405.10	0.203	0.598			
2,405.20	0.203	0.612			
2,405.30	0.203	0.627			
2,405.40	0.203	0.641			
2,405.50	0.203	0.655			
2,405.60	0.203	0.669			
2,405.70	0.203	0.683			
2,405.80	0.203	0.696			
2,405.90	0.203	0.709			
2,406.00	0.203	0.722			
2,406.10	0.203	0.735			

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Type II 24-hr 100-yr Rainfall=4.00"

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Time span=0.00-34.00 hrs, dt=0.05 hrs, 681 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DMA A1

Runoff Area=10.860 ac 67.00% Impervious Runoff Depth=1.14"

Tc=0.0 min CN=67 Runoff=25.39 cfs 1.036 af

Pond 2P: BASIN 1

Peak Elev=2,405.24' Storage=0.619 af Inflow=25.39 cfs 1.036 af

Primary=0.00 cfs 0.000 af Secondary=0.48 cfs 0.858 af Outflow=0.48 cfs 0.858 af

Total Runoff Area = 10.860 ac Runoff Volume = 1.036 af Average Runoff Depth = 1.14"
33.00% Pervious = 3.584 ac 67.00% Impervious = 7.276 ac

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Summary for Subcatchment 1S: DMA A1

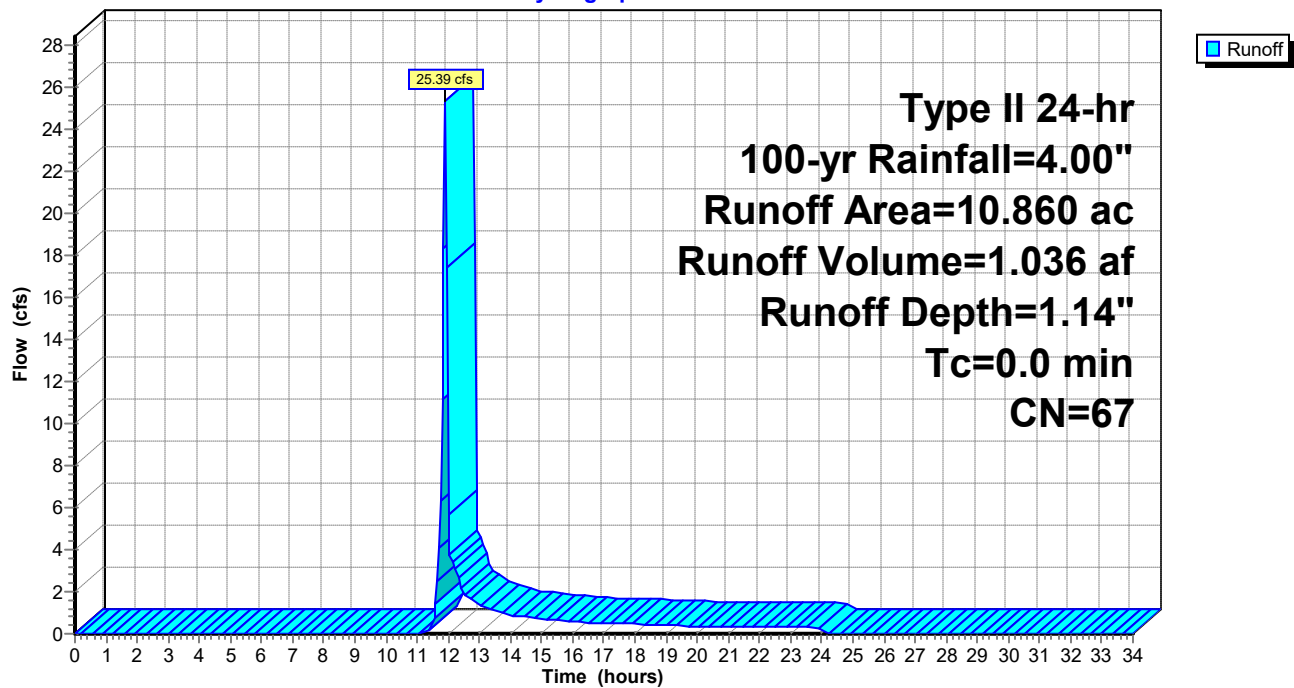
Runoff = 25.39 cfs @ 11.90 hrs, Volume= 1.036 af, Depth= 1.14"
Routed to Pond 2P : BASIN 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.00"

Area (ac)	CN	Description
* 10.860	67	Urban commercial, 67% imp, HSG B
3.584		33.00% Pervious Area
7.276		67.00% Impervious Area

Subcatchment 1S: DMA A1

Hydrograph



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Type II 24-hr 100-yr Rainfall=4.00"

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Hydrograph for Subcatchment 1S: DMA A1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	4.00	1.14	0.00
0.50	0.02	0.00	0.00	26.50	4.00	1.14	0.00
1.00	0.04	0.00	0.00	27.00	4.00	1.14	0.00
1.50	0.06	0.00	0.00	27.50	4.00	1.14	0.00
2.00	0.09	0.00	0.00	28.00	4.00	1.14	0.00
2.50	0.11	0.00	0.00	28.50	4.00	1.14	0.00
3.00	0.14	0.00	0.00	29.00	4.00	1.14	0.00
3.50	0.16	0.00	0.00	29.50	4.00	1.14	0.00
4.00	0.19	0.00	0.00	30.00	4.00	1.14	0.00
4.50	0.22	0.00	0.00	30.50	4.00	1.14	0.00
5.00	0.25	0.00	0.00	31.00	4.00	1.14	0.00
5.50	0.29	0.00	0.00	31.50	4.00	1.14	0.00
6.00	0.32	0.00	0.00	32.00	4.00	1.14	0.00
6.50	0.36	0.00	0.00	32.50	4.00	1.14	0.00
7.00	0.40	0.00	0.00	33.00	4.00	1.14	0.00
7.50	0.44	0.00	0.00	33.50	4.00	1.14	0.00
8.00	0.48	0.00	0.00	34.00	4.00	1.14	0.00
8.50	0.53	0.00	0.00				
9.00	0.59	0.00	0.00				
9.50	0.65	0.00	0.00				
10.00	0.72	0.00	0.00				
10.50	0.82	0.00	0.00				
11.00	0.94	0.00	0.00				
11.50	1.13	0.00	0.34				
12.00	2.65	0.42	5.65				
12.50	2.94	0.56	1.88				
13.00	3.09	0.63	1.36				
13.50	3.20	0.68	1.08				
14.00	3.28	0.73	0.87				
14.50	3.35	0.77	0.80				
15.00	3.41	0.80	0.72				
15.50	3.47	0.83	0.65				
16.00	3.52	0.86	0.57				
16.50	3.56	0.89	0.54				
17.00	3.61	0.91	0.52				
17.50	3.65	0.93	0.49				
18.00	3.68	0.96	0.46				
18.50	3.72	0.98	0.43				
19.00	3.75	0.99	0.40				
19.50	3.78	1.01	0.37				
20.00	3.81	1.03	0.34				
20.50	3.83	1.04	0.33				
21.00	3.86	1.06	0.33				
21.50	3.88	1.07	0.32				
22.00	3.91	1.09	0.32				
22.50	3.93	1.10	0.31				
23.00	3.95	1.12	0.31				
23.50	3.98	1.13	0.30				
24.00	4.00	1.14	0.15				
24.50	4.00	1.14	0.00				
25.00	4.00	1.14	0.00				
25.50	4.00	1.14	0.00				

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Type II 24-hr 100-yr Rainfall=4.00"

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Summary for Pond 2P: BASIN 1

Inflow Area = 10.860 ac, 67.00% Impervious, Inflow Depth = 1.14" for 100-yr event
Inflow = 25.39 cfs @ 11.90 hrs, Volume= 1.036 af
Outflow = 0.48 cfs @ 17.65 hrs, Volume= 0.858 af, Atten= 98%, Lag= 344.9 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.48 cfs @ 17.65 hrs, Volume= 0.858 af

Routing by Stor-Ind method, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Peak Elev= 2,405.24' @ 17.65 hrs Surf.Area= 0.203 ac Storage= 0.619 af

Plug-Flow detention time= 581.2 min calculated for 0.858 af (83% of inflow)
Center-of-Mass det. time= 502.2 min (1,363.1 - 860.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	2,401.00'	0.344 af	28.50'W x 310.68'L x 7.00'H Field A 1.423 af Overall - 0.563 af Embedded = 0.860 af x 40.0% Voids
#2A	2,402.00'	0.563 af	ADS_StormTech MC-7200 +Cap x 138 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 138 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
		0.907 af	Total Available Storage

Storage Group A created with Chamber Wizard

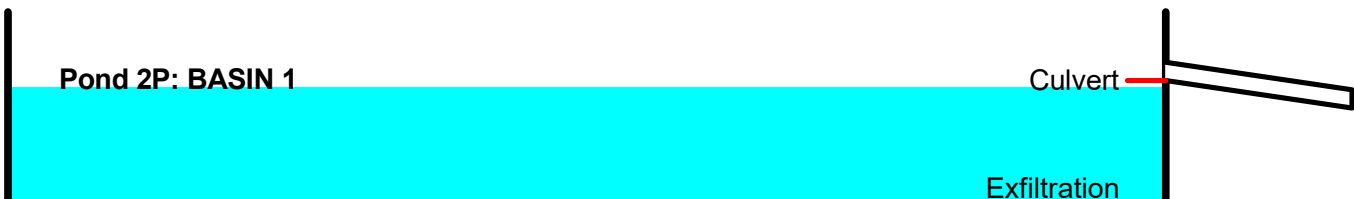
Device	Routing	Invert	Outlet Devices
#1	Primary	2,405.50'	8.0" Round Culvert L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 2,405.50' / 2,404.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	2,401.00'	2.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 2,376.00' Phase-In= 1.00'

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,401.00' (Free Discharge)

↑ **1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.48 cfs @ 17.65 hrs HW=2,405.24' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.48 cfs)



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Type II 24-hr 100-yr Rainfall=4.00"

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Pond 2P: BASIN 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)

Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf

Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap

Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

46 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 308.68' Row Length +12.0" End Stone x 2 =
310.68' Base Length

3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width

12.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 7.00' Field Height

138 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 24,507.8 cf Chamber Storage

61,981.3 cf Field - 24,507.8 cf Chambers = 37,473.5 cf Stone x 40.0% Voids = 14,989.4 cf Stone Storage

Chamber Storage + Stone Storage = 39,497.2 cf = 0.907 af

Overall Storage Efficiency = 63.7%

Overall System Size = 310.68' x 28.50' x 7.00'

138 Chambers

2,295.6 cy Field

1,387.9 cy Stone



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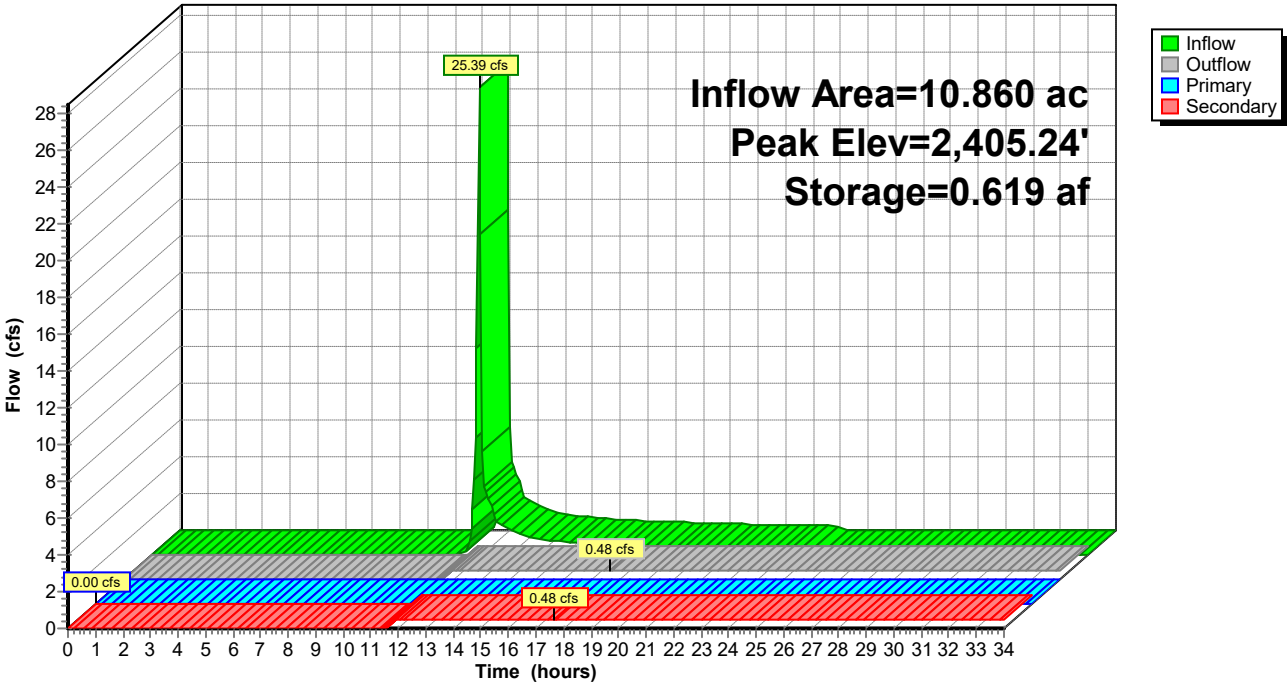
Type II 24-hr 100-yr Rainfall=4.00"

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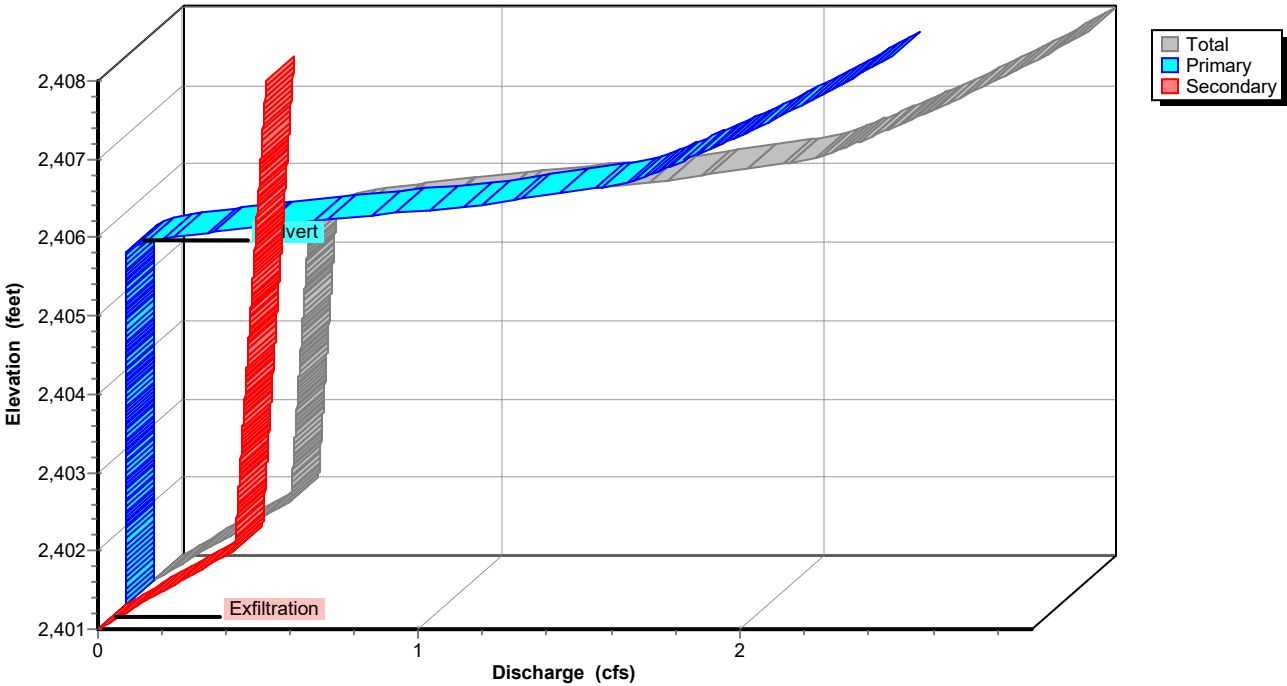
Pond 2P: BASIN 1

Hydrograph



Pond 2P: BASIN 1

Stage-Discharge



Lancaster Flood Routing

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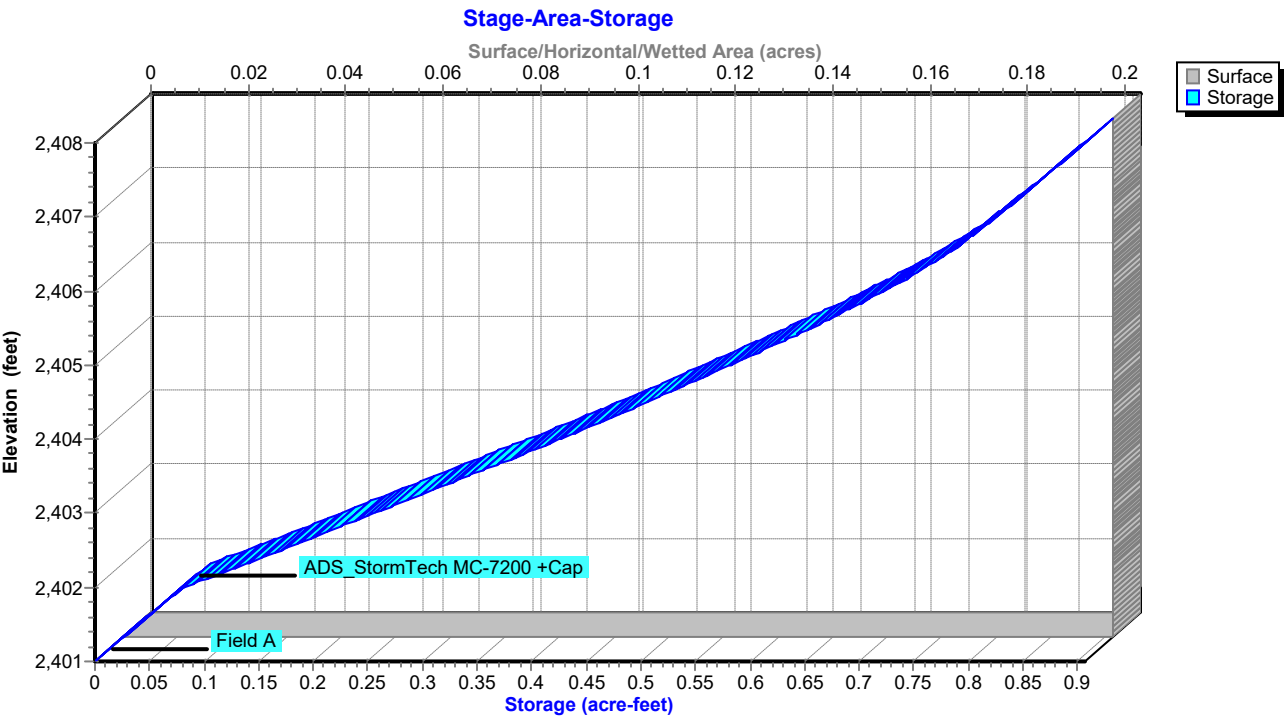
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Pond 2P: BASIN 1



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Type II 24-hr 100-yr Rainfall=4.00"

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Hydrograph for Pond 2P: BASIN 1

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0.000	2,401.00	0.00	0.00	0.00
1.00	0.00	0.000	2,401.00	0.00	0.00	0.00
2.00	0.00	0.000	2,401.00	0.00	0.00	0.00
3.00	0.00	0.000	2,401.00	0.00	0.00	0.00
4.00	0.00	0.000	2,401.00	0.00	0.00	0.00
5.00	0.00	0.000	2,401.00	0.00	0.00	0.00
6.00	0.00	0.000	2,401.00	0.00	0.00	0.00
7.00	0.00	0.000	2,401.00	0.00	0.00	0.00
8.00	0.00	0.000	2,401.00	0.00	0.00	0.00
9.00	0.00	0.000	2,401.00	0.00	0.00	0.00
10.00	0.00	0.000	2,401.00	0.00	0.00	0.00
11.00	0.00	0.000	2,401.00	0.00	0.00	0.00
12.00	5.65	0.367	2,403.65	0.45	0.00	0.45
13.00	1.36	0.520	2,404.59	0.47	0.00	0.47
14.00	0.87	0.572	2,404.93	0.47	0.00	0.47
15.00	0.72	0.599	2,405.11	0.48	0.00	0.48
16.00	0.57	0.613	2,405.20	0.48	0.00	0.48
17.00	0.52	0.618	2,405.24	0.48	0.00	0.48
18.00	0.46	0.618	2,405.24	0.48	0.00	0.48
19.00	0.40	0.614	2,405.21	0.48	0.00	0.48
20.00	0.34	0.605	2,405.15	0.48	0.00	0.48
21.00	0.33	0.594	2,405.07	0.48	0.00	0.48
22.00	0.32	0.581	2,404.99	0.48	0.00	0.48
23.00	0.31	0.568	2,404.90	0.47	0.00	0.47
24.00	0.15	0.553	2,404.81	0.47	0.00	0.47
25.00	0.00	0.515	2,404.56	0.47	0.00	0.47
26.00	0.00	0.476	2,404.31	0.46	0.00	0.46
27.00	0.00	0.438	2,404.08	0.46	0.00	0.46
28.00	0.00	0.400	2,403.85	0.46	0.00	0.46
29.00	0.00	0.362	2,403.62	0.45	0.00	0.45
30.00	0.00	0.325	2,403.40	0.45	0.00	0.45
31.00	0.00	0.288	2,403.18	0.45	0.00	0.45
32.00	0.00	0.251	2,402.97	0.44	0.00	0.44
33.00	0.00	0.215	2,402.76	0.44	0.00	0.44
34.00	0.00	0.179	2,402.55	0.44	0.00	0.44

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Stage-Discharge for Pond 2P: BASIN 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
2,401.00	0.00	0.00	0.00	2,406.20	1.77	1.27	0.50
2,401.10	0.04	0.00	0.04	2,406.30	1.93	1.44	0.50
2,401.20	0.08	0.00	0.08	2,406.40	2.07	1.58	0.50
2,401.30	0.12	0.00	0.12	2,406.50	2.14	1.64	0.50
2,401.40	0.17	0.00	0.17	2,406.60	2.20	1.70	0.50
2,401.50	0.21	0.00	0.21	2,406.70	2.26	1.76	0.50
2,401.60	0.25	0.00	0.25	2,406.80	2.32	1.81	0.51
2,401.70	0.29	0.00	0.29	2,406.90	2.38	1.87	0.51
2,401.80	0.34	0.00	0.34	2,407.00	2.43	1.92	0.51
2,401.90	0.38	0.00	0.38	2,407.10	2.48	1.97	0.51
2,402.00	0.43	0.00	0.43	2,407.20	2.54	2.02	0.51
2,402.10	0.43	0.00	0.43	2,407.30	2.59	2.07	0.51
2,402.20	0.43	0.00	0.43	2,407.40	2.64	2.12	0.51
2,402.30	0.43	0.00	0.43	2,407.50	2.68	2.17	0.52
2,402.40	0.43	0.00	0.43	2,407.60	2.73	2.21	0.52
2,402.50	0.43	0.00	0.43	2,407.70	2.78	2.26	0.52
2,402.60	0.44	0.00	0.44	2,407.80	2.82	2.30	0.52
2,402.70	0.44	0.00	0.44	2,407.90	2.87	2.35	0.52
2,402.80	0.44	0.00	0.44	2,408.00	2.91	2.39	0.52
2,402.90	0.44	0.00	0.44				
2,403.00	0.44	0.00	0.44				
2,403.10	0.44	0.00	0.44				
2,403.20	0.45	0.00	0.45				
2,403.30	0.45	0.00	0.45				
2,403.40	0.45	0.00	0.45				
2,403.50	0.45	0.00	0.45				
2,403.60	0.45	0.00	0.45				
2,403.70	0.45	0.00	0.45				
2,403.80	0.46	0.00	0.46				
2,403.90	0.46	0.00	0.46				
2,404.00	0.46	0.00	0.46				
2,404.10	0.46	0.00	0.46				
2,404.20	0.46	0.00	0.46				
2,404.30	0.46	0.00	0.46				
2,404.40	0.47	0.00	0.47				
2,404.50	0.47	0.00	0.47				
2,404.60	0.47	0.00	0.47				
2,404.70	0.47	0.00	0.47				
2,404.80	0.47	0.00	0.47				
2,404.90	0.47	0.00	0.47				
2,405.00	0.48	0.00	0.48				
2,405.10	0.48	0.00	0.48				
2,405.20	0.48	0.00	0.48				
2,405.30	0.48	0.00	0.48				
2,405.40	0.48	0.00	0.48				
2,405.50	0.48	0.00	0.48				
2,405.60	0.53	0.04	0.49				
2,405.70	0.65	0.17	0.49				
2,405.80	0.84	0.36	0.49				
2,405.90	1.08	0.59	0.49				
2,406.00	1.34	0.85	0.49				
2,406.10	1.58	1.09	0.49				

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Stage-Area-Storage for Pond 2P: BASIN 1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
2,401.00	0.203	0.000	2,406.20	0.203	0.747
2,401.10	0.203	0.008	2,406.30	0.203	0.759
2,401.20	0.203	0.016	2,406.40	0.203	0.770
2,401.30	0.203	0.024	2,406.50	0.203	0.781
2,401.40	0.203	0.033	2,406.60	0.203	0.790
2,401.50	0.203	0.041	2,406.70	0.203	0.800
2,401.60	0.203	0.049	2,406.80	0.203	0.809
2,401.70	0.203	0.057	2,406.90	0.203	0.817
2,401.80	0.203	0.065	2,407.00	0.203	0.825
2,401.90	0.203	0.073	2,407.10	0.203	0.834
2,402.00	0.203	0.081	2,407.20	0.203	0.842
2,402.10	0.203	0.099	2,407.30	0.203	0.850
2,402.20	0.203	0.117	2,407.40	0.203	0.858
2,402.30	0.203	0.134	2,407.50	0.203	0.866
2,402.40	0.203	0.152	2,407.60	0.203	0.874
2,402.50	0.203	0.170	2,407.70	0.203	0.882
2,402.60	0.203	0.187	2,407.80	0.203	0.890
2,402.70	0.203	0.204	2,407.90	0.203	0.899
2,402.80	0.203	0.222	2,408.00	0.203	0.907
2,402.90	0.203	0.239			
2,403.00	0.203	0.257			
2,403.10	0.203	0.274			
2,403.20	0.203	0.291			
2,403.30	0.203	0.308			
2,403.40	0.203	0.325			
2,403.50	0.203	0.342			
2,403.60	0.203	0.359			
2,403.70	0.203	0.375			
2,403.80	0.203	0.392			
2,403.90	0.203	0.409			
2,404.00	0.203	0.425			
2,404.10	0.203	0.441			
2,404.20	0.203	0.458			
2,404.30	0.203	0.474			
2,404.40	0.203	0.490			
2,404.50	0.203	0.506			
2,404.60	0.203	0.521			
2,404.70	0.203	0.537			
2,404.80	0.203	0.552			
2,404.90	0.203	0.568			
2,405.00	0.203	0.583			
2,405.10	0.203	0.598			
2,405.20	0.203	0.612			
2,405.30	0.203	0.627			
2,405.40	0.203	0.641			
2,405.50	0.203	0.655			
2,405.60	0.203	0.669			
2,405.70	0.203	0.683			
2,405.80	0.203	0.696			
2,405.90	0.203	0.709			
2,406.00	0.203	0.722			
2,406.10	0.203	0.735			

Lancaster Flood Routing

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Type II 24-hr 200-yr Rainfall=4.44"

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Time span=0.00-34.00 hrs, dt=0.05 hrs, 681 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DMA A1

Runoff Area=10.860 ac 67.00% Impervious Runoff Depth=1.42"
Tc=0.0 min CN=67 Runoff=31.84 cfs 1.289 af

Pond 2P: BASIN 1

Peak Elev=2,405.90' Storage=0.710 af Inflow=31.84 cfs 1.289 af
Primary=0.59 cfs 0.164 af Secondary=0.49 cfs 0.877 af Outflow=1.09 cfs 1.041 af

Total Runoff Area = 10.860 ac Runoff Volume = 1.289 af Average Runoff Depth = 1.42"
33.00% Pervious = 3.584 ac 67.00% Impervious = 7.276 ac

Lancaster Flood Routing

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Type II 24-hr 200-yr Rainfall=4.44"

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Summary for Subcatchment 1S: DMA A1

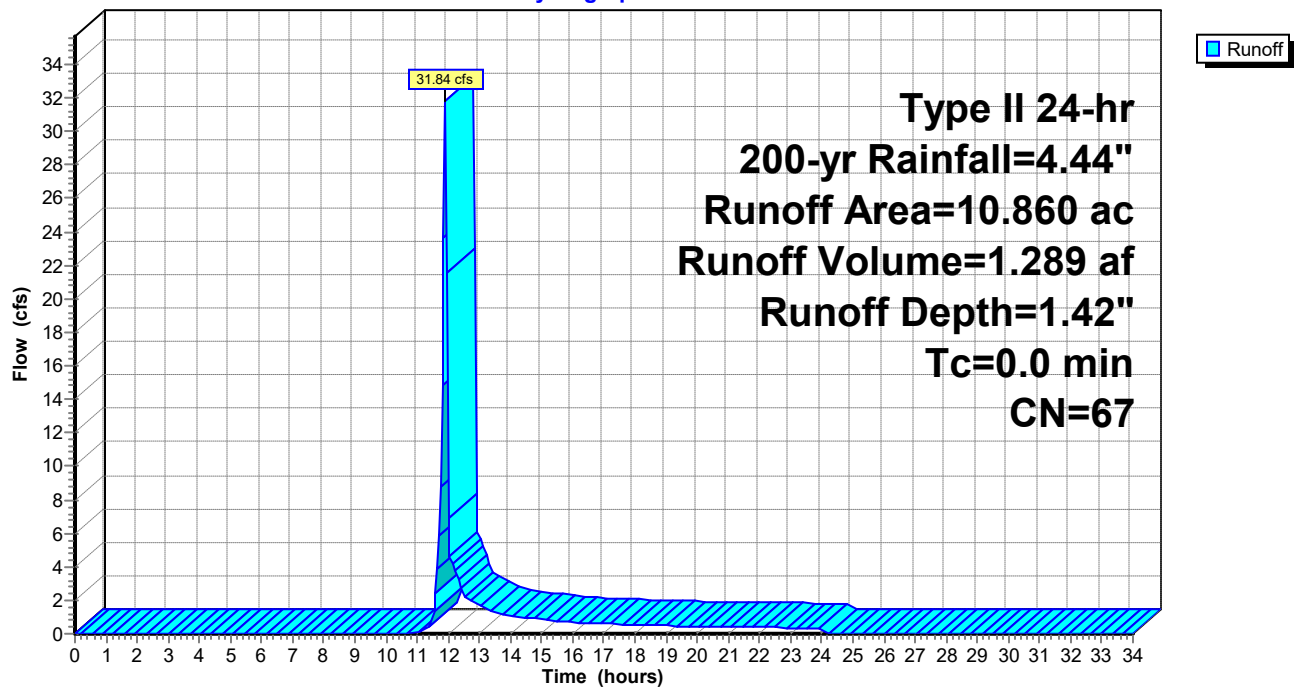
Runoff = 31.84 cfs @ 11.90 hrs, Volume= 1.289 af, Depth= 1.42"
Routed to Pond 2P : BASIN 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Type II 24-hr 200-yr Rainfall=4.44"

Area (ac)	CN	Description
* 10.860	67	Urban commercial, 67% imp, HSG B
3.584		33.00% Pervious Area
7.276		67.00% Impervious Area

Subcatchment 1S: DMA A1

Hydrograph



Lancaster Flood Routing

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Type II 24-hr 200-yr Rainfall=4.44"

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Hydrograph for Subcatchment 1S: DMA A1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	4.44	1.42	0.00
0.50	0.02	0.00	0.00	26.50	4.44	1.42	0.00
1.00	0.05	0.00	0.00	27.00	4.44	1.42	0.00
1.50	0.07	0.00	0.00	27.50	4.44	1.42	0.00
2.00	0.10	0.00	0.00	28.00	4.44	1.42	0.00
2.50	0.12	0.00	0.00	28.50	4.44	1.42	0.00
3.00	0.15	0.00	0.00	29.00	4.44	1.42	0.00
3.50	0.18	0.00	0.00	29.50	4.44	1.42	0.00
4.00	0.21	0.00	0.00	30.00	4.44	1.42	0.00
4.50	0.25	0.00	0.00	30.50	4.44	1.42	0.00
5.00	0.28	0.00	0.00	31.00	4.44	1.42	0.00
5.50	0.32	0.00	0.00	31.50	4.44	1.42	0.00
6.00	0.36	0.00	0.00	32.00	4.44	1.42	0.00
6.50	0.40	0.00	0.00	32.50	4.44	1.42	0.00
7.00	0.44	0.00	0.00	33.00	4.44	1.42	0.00
7.50	0.49	0.00	0.00	33.50	4.44	1.42	0.00
8.00	0.53	0.00	0.00	34.00	4.44	1.42	0.00
8.50	0.59	0.00	0.00				
9.00	0.65	0.00	0.00				
9.50	0.72	0.00	0.00				
10.00	0.80	0.00	0.00				
10.50	0.91	0.00	0.00				
11.00	1.04	0.00	0.08				
11.50	1.26	0.01	0.67				
12.00	2.94	0.56	6.94				
12.50	3.26	0.72	2.28				
13.00	3.43	0.81	1.64				
13.50	3.55	0.88	1.30				
14.00	3.64	0.93	1.04				
14.50	3.72	0.98	0.96				
15.00	3.79	1.02	0.87				
15.50	3.85	1.05	0.77				
16.00	3.91	1.09	0.68				
16.50	3.96	1.12	0.65				
17.00	4.00	1.15	0.61				
17.50	4.05	1.17	0.58				
18.00	4.09	1.20	0.55				
18.50	4.13	1.22	0.51				
19.00	4.16	1.25	0.48				
19.50	4.20	1.27	0.44				
20.00	4.23	1.29	0.40				
20.50	4.26	1.30	0.40				
21.00	4.28	1.32	0.39				
21.50	4.31	1.34	0.38				
22.00	4.34	1.36	0.38				
22.50	4.36	1.38	0.37				
23.00	4.39	1.39	0.36				
23.50	4.42	1.41	0.36				
24.00	4.44	1.42	0.18				
24.50	4.44	1.42	0.00				
25.00	4.44	1.42	0.00				
25.50	4.44	1.42	0.00				

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Type II 24-hr 200-yr Rainfall=4.44"

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Summary for Pond 2P: BASIN 1

Inflow Area = 10.860 ac, 67.00% Impervious, Inflow Depth = 1.42" for 200-yr event
Inflow = 31.84 cfs @ 11.90 hrs, Volume= 1.289 af
Outflow = 1.09 cfs @ 13.91 hrs, Volume= 1.041 af, Atten= 97%, Lag= 121.0 min
Primary = 0.59 cfs @ 13.91 hrs, Volume= 0.164 af
Secondary = 0.49 cfs @ 13.91 hrs, Volume= 0.877 af

Routing by Stor-Ind method, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Peak Elev= 2,405.90' @ 13.91 hrs Surf.Area= 0.203 ac Storage= 0.710 af

Plug-Flow detention time= 521.5 min calculated for 1.041 af (81% of inflow)
Center-of-Mass det. time= 436.2 min (1,290.1 - 853.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	2,401.00'	0.344 af	28.50'W x 310.68'L x 7.00'H Field A 1.423 af Overall - 0.563 af Embedded = 0.860 af x 40.0% Voids
#2A	2,402.00'	0.563 af	ADS_StormTech MC-7200 +Cap x 138 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 138 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
		0.907 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	2,405.50'	8.0" Round Culvert L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 2,405.50' / 2,404.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	2,401.00'	2.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 2,376.00' Phase-In= 1.00'

Primary OutFlow Max=0.59 cfs @ 13.91 hrs HW=2,405.90' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 0.59 cfs @ 2.70 fps)

Secondary OutFlow Max=0.49 cfs @ 13.91 hrs HW=2,405.90' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.49 cfs)



Lancaster Flood Routing

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Type II 24-hr 200-yr Rainfall=4.44"

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Pond 2P: BASIN 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)

Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf

Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap

Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

46 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 308.68' Row Length +12.0" End Stone x 2 =
310.68' Base Length

3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width

12.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 7.00' Field Height

138 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 24,507.8 cf Chamber Storage

61,981.3 cf Field - 24,507.8 cf Chambers = 37,473.5 cf Stone x 40.0% Voids = 14,989.4 cf Stone Storage

Chamber Storage + Stone Storage = 39,497.2 cf = 0.907 af

Overall Storage Efficiency = 63.7%

Overall System Size = 310.68' x 28.50' x 7.00'

138 Chambers

2,295.6 cy Field

1,387.9 cy Stone



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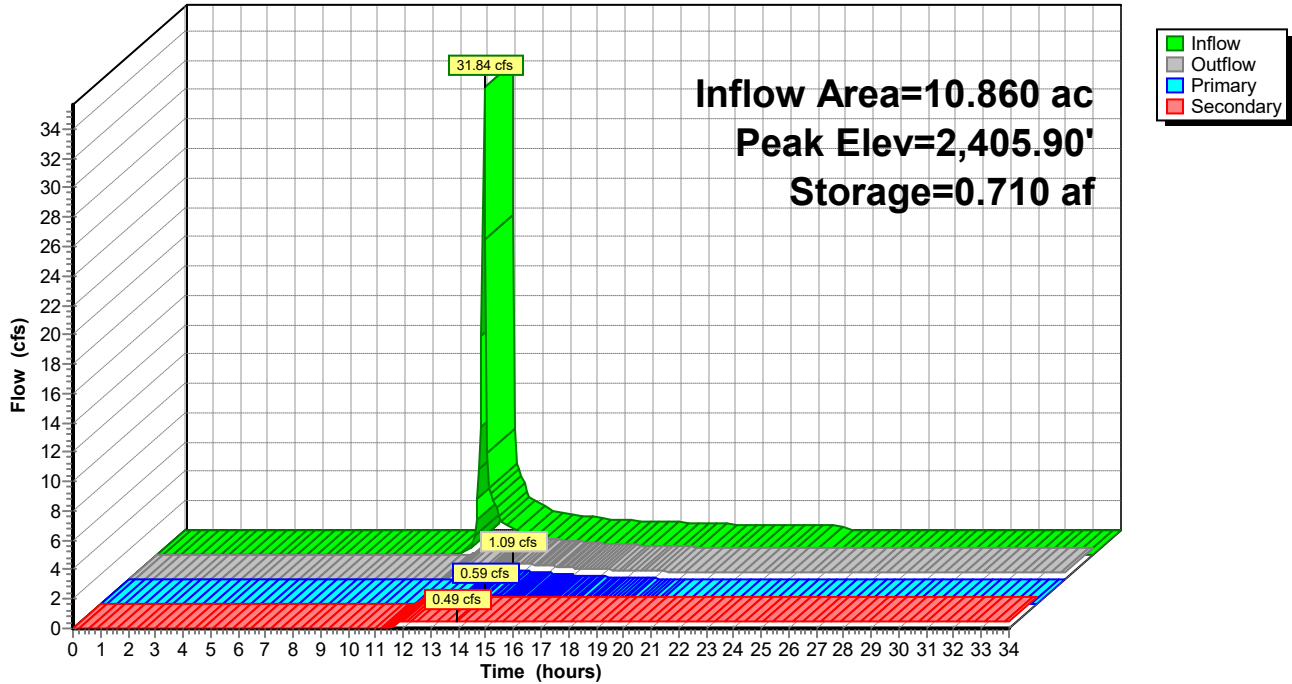
Type II 24-hr 200-yr Rainfall=4.44"

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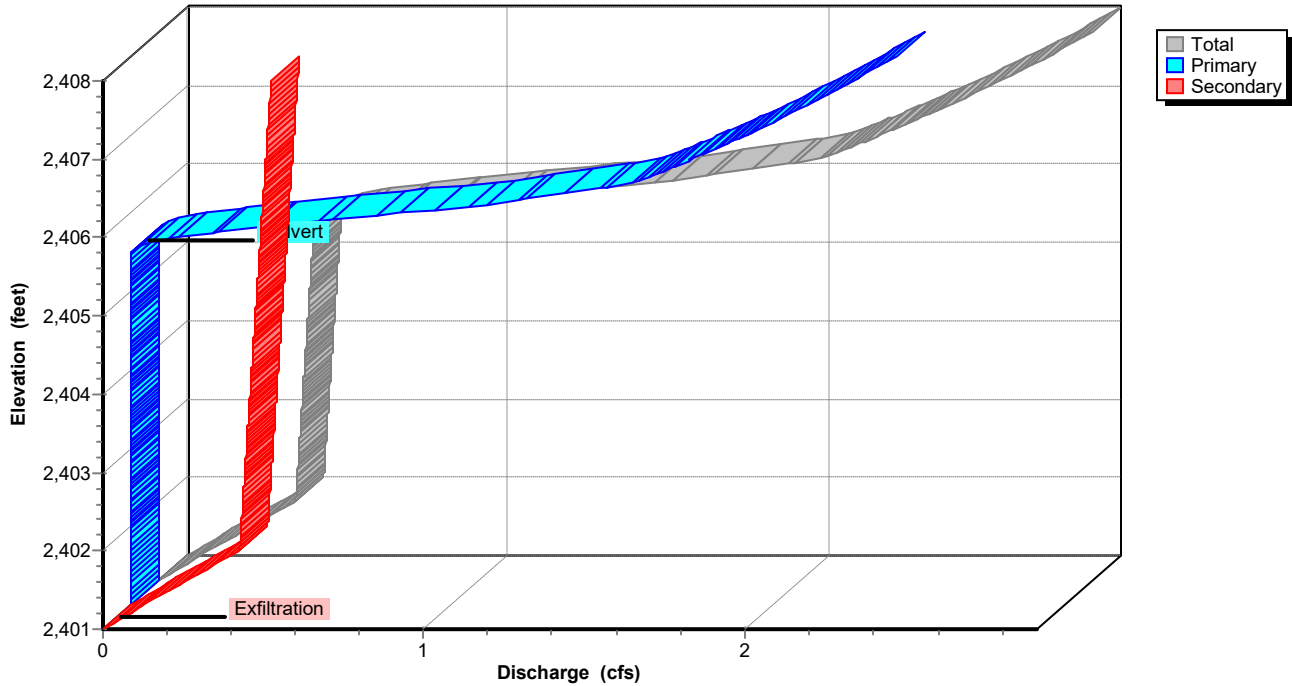
Pond 2P: BASIN 1

Hydrograph



Pond 2P: BASIN 1

Stage-Discharge



Lancaster Flood Routing

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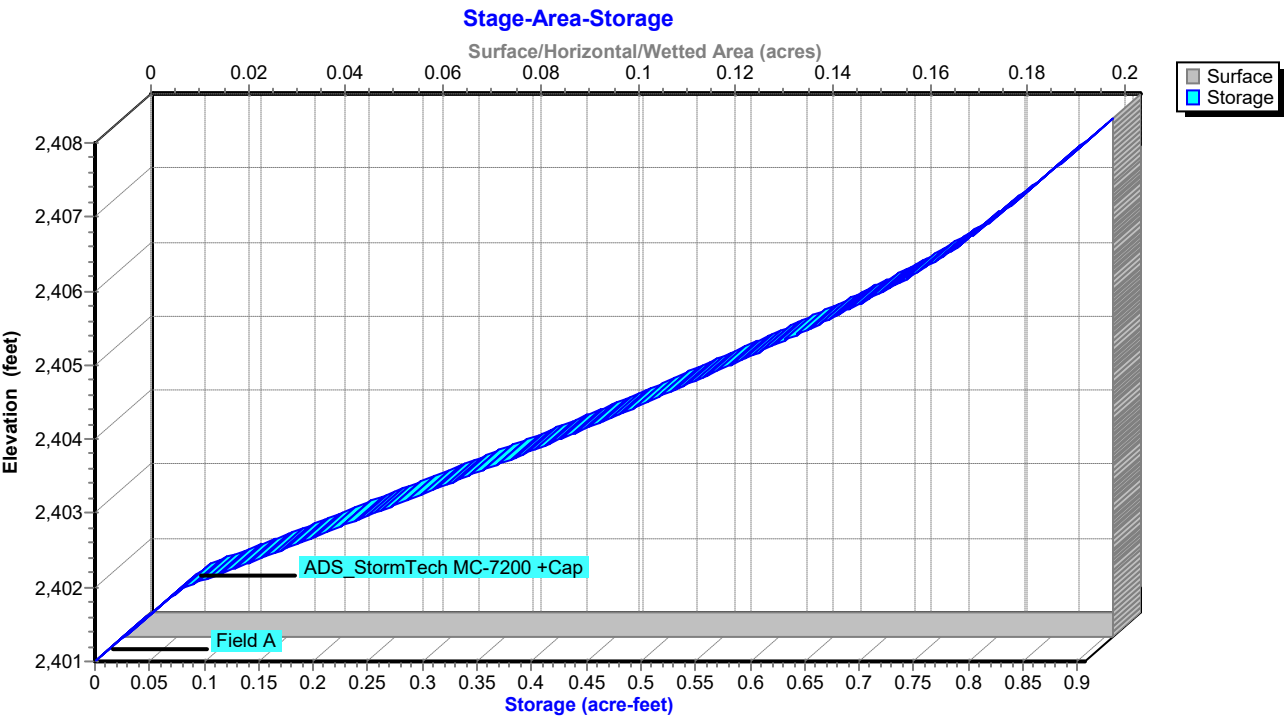
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Pond 2P: BASIN 1



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Type II 24-hr 200-yr Rainfall=4.44"

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Hydrograph for Pond 2P: BASIN 1

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0.000	2,401.00	0.00	0.00	0.00
1.00	0.00	0.000	2,401.00	0.00	0.00	0.00
2.00	0.00	0.000	2,401.00	0.00	0.00	0.00
3.00	0.00	0.000	2,401.00	0.00	0.00	0.00
4.00	0.00	0.000	2,401.00	0.00	0.00	0.00
5.00	0.00	0.000	2,401.00	0.00	0.00	0.00
6.00	0.00	0.000	2,401.00	0.00	0.00	0.00
7.00	0.00	0.000	2,401.00	0.00	0.00	0.00
8.00	0.00	0.000	2,401.00	0.00	0.00	0.00
9.00	0.00	0.000	2,401.00	0.00	0.00	0.00
10.00	0.00	0.000	2,401.00	0.00	0.00	0.00
11.00	0.08	0.001	2,401.01	0.00	0.00	0.00
12.00	6.94	0.486	2,404.38	0.47	0.00	0.47
13.00	1.64	0.678	2,405.67	0.61	0.12	0.49
14.00	1.04	0.710	2,405.90	1.08	0.59	0.49
15.00	0.87	0.703	2,405.85	0.97	0.48	0.49
16.00	0.68	0.694	2,405.78	0.81	0.32	0.49
17.00	0.61	0.686	2,405.72	0.69	0.21	0.49
18.00	0.55	0.680	2,405.68	0.62	0.13	0.49
19.00	0.48	0.673	2,405.63	0.56	0.07	0.49
20.00	0.40	0.665	2,405.57	0.51	0.02	0.48
21.00	0.39	0.657	2,405.51	0.49	0.00	0.48
22.00	0.38	0.649	2,405.45	0.48	0.00	0.48
23.00	0.36	0.640	2,405.39	0.48	0.00	0.48
24.00	0.18	0.629	2,405.32	0.48	0.00	0.48
25.00	0.00	0.590	2,405.05	0.48	0.00	0.48
26.00	0.00	0.551	2,404.79	0.47	0.00	0.47
27.00	0.00	0.512	2,404.54	0.47	0.00	0.47
28.00	0.00	0.473	2,404.30	0.46	0.00	0.46
29.00	0.00	0.435	2,404.06	0.46	0.00	0.46
30.00	0.00	0.397	2,403.83	0.46	0.00	0.46
31.00	0.00	0.360	2,403.61	0.45	0.00	0.45
32.00	0.00	0.322	2,403.39	0.45	0.00	0.45
33.00	0.00	0.286	2,403.17	0.45	0.00	0.45
34.00	0.00	0.249	2,402.96	0.44	0.00	0.44

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Type II 24-hr 200-yr Rainfall=4.44"

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Stage-Discharge for Pond 2P: BASIN 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
2,401.00	0.00	0.00	0.00	2,406.20	1.77	1.27	0.50
2,401.10	0.04	0.00	0.04	2,406.30	1.93	1.44	0.50
2,401.20	0.08	0.00	0.08	2,406.40	2.07	1.58	0.50
2,401.30	0.12	0.00	0.12	2,406.50	2.14	1.64	0.50
2,401.40	0.17	0.00	0.17	2,406.60	2.20	1.70	0.50
2,401.50	0.21	0.00	0.21	2,406.70	2.26	1.76	0.50
2,401.60	0.25	0.00	0.25	2,406.80	2.32	1.81	0.51
2,401.70	0.29	0.00	0.29	2,406.90	2.38	1.87	0.51
2,401.80	0.34	0.00	0.34	2,407.00	2.43	1.92	0.51
2,401.90	0.38	0.00	0.38	2,407.10	2.48	1.97	0.51
2,402.00	0.43	0.00	0.43	2,407.20	2.54	2.02	0.51
2,402.10	0.43	0.00	0.43	2,407.30	2.59	2.07	0.51
2,402.20	0.43	0.00	0.43	2,407.40	2.64	2.12	0.51
2,402.30	0.43	0.00	0.43	2,407.50	2.68	2.17	0.52
2,402.40	0.43	0.00	0.43	2,407.60	2.73	2.21	0.52
2,402.50	0.43	0.00	0.43	2,407.70	2.78	2.26	0.52
2,402.60	0.44	0.00	0.44	2,407.80	2.82	2.30	0.52
2,402.70	0.44	0.00	0.44	2,407.90	2.87	2.35	0.52
2,402.80	0.44	0.00	0.44	2,408.00	2.91	2.39	0.52
2,402.90	0.44	0.00	0.44				
2,403.00	0.44	0.00	0.44				
2,403.10	0.44	0.00	0.44				
2,403.20	0.45	0.00	0.45				
2,403.30	0.45	0.00	0.45				
2,403.40	0.45	0.00	0.45				
2,403.50	0.45	0.00	0.45				
2,403.60	0.45	0.00	0.45				
2,403.70	0.45	0.00	0.45				
2,403.80	0.46	0.00	0.46				
2,403.90	0.46	0.00	0.46				
2,404.00	0.46	0.00	0.46				
2,404.10	0.46	0.00	0.46				
2,404.20	0.46	0.00	0.46				
2,404.30	0.46	0.00	0.46				
2,404.40	0.47	0.00	0.47				
2,404.50	0.47	0.00	0.47				
2,404.60	0.47	0.00	0.47				
2,404.70	0.47	0.00	0.47				
2,404.80	0.47	0.00	0.47				
2,404.90	0.47	0.00	0.47				
2,405.00	0.48	0.00	0.48				
2,405.10	0.48	0.00	0.48				
2,405.20	0.48	0.00	0.48				
2,405.30	0.48	0.00	0.48				
2,405.40	0.48	0.00	0.48				
2,405.50	0.48	0.00	0.48				
2,405.60	0.53	0.04	0.49				
2,405.70	0.65	0.17	0.49				
2,405.80	0.84	0.36	0.49				
2,405.90	1.08	0.59	0.49				
2,406.00	1.34	0.85	0.49				
2,406.10	1.58	1.09	0.49				

Lancaster Flood Routing

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Type II 24-hr 200-yr Rainfall=4.44"

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Stage-Area-Storage for Pond 2P: BASIN 1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
2,401.00	0.203	0.000	2,406.20	0.203	0.747
2,401.10	0.203	0.008	2,406.30	0.203	0.759
2,401.20	0.203	0.016	2,406.40	0.203	0.770
2,401.30	0.203	0.024	2,406.50	0.203	0.781
2,401.40	0.203	0.033	2,406.60	0.203	0.790
2,401.50	0.203	0.041	2,406.70	0.203	0.800
2,401.60	0.203	0.049	2,406.80	0.203	0.809
2,401.70	0.203	0.057	2,406.90	0.203	0.817
2,401.80	0.203	0.065	2,407.00	0.203	0.825
2,401.90	0.203	0.073	2,407.10	0.203	0.834
2,402.00	0.203	0.081	2,407.20	0.203	0.842
2,402.10	0.203	0.099	2,407.30	0.203	0.850
2,402.20	0.203	0.117	2,407.40	0.203	0.858
2,402.30	0.203	0.134	2,407.50	0.203	0.866
2,402.40	0.203	0.152	2,407.60	0.203	0.874
2,402.50	0.203	0.170	2,407.70	0.203	0.882
2,402.60	0.203	0.187	2,407.80	0.203	0.890
2,402.70	0.203	0.204	2,407.90	0.203	0.899
2,402.80	0.203	0.222	2,408.00	0.203	0.907
2,402.90	0.203	0.239			
2,403.00	0.203	0.257			
2,403.10	0.203	0.274			
2,403.20	0.203	0.291			
2,403.30	0.203	0.308			
2,403.40	0.203	0.325			
2,403.50	0.203	0.342			
2,403.60	0.203	0.359			
2,403.70	0.203	0.375			
2,403.80	0.203	0.392			
2,403.90	0.203	0.409			
2,404.00	0.203	0.425			
2,404.10	0.203	0.441			
2,404.20	0.203	0.458			
2,404.30	0.203	0.474			
2,404.40	0.203	0.490			
2,404.50	0.203	0.506			
2,404.60	0.203	0.521			
2,404.70	0.203	0.537			
2,404.80	0.203	0.552			
2,404.90	0.203	0.568			
2,405.00	0.203	0.583			
2,405.10	0.203	0.598			
2,405.20	0.203	0.612			
2,405.30	0.203	0.627			
2,405.40	0.203	0.641			
2,405.50	0.203	0.655			
2,405.60	0.203	0.669			
2,405.70	0.203	0.683			
2,405.80	0.203	0.696			
2,405.90	0.203	0.709			
2,406.00	0.203	0.722			
2,406.10	0.203	0.735			

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Type II 24-hr 500-yr Rainfall=5.01"

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Time span=0.00-34.00 hrs, dt=0.05 hrs, 681 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DMA A1

Runoff Area=10.860 ac 67.00% Impervious Runoff Depth=1.81"
Tc=0.0 min CN=67 Runoff=40.62 cfs 1.638 af

Pond 2P: BASIN 1

Peak Elev=2,406.60' Storage=0.790 af Inflow=40.62 cfs 1.638 af
Primary=1.70 cfs 0.478 af Secondary=0.50 cfs 0.888 af Outflow=2.20 cfs 1.366 af

Total Runoff Area = 10.860 ac Runoff Volume = 1.638 af Average Runoff Depth = 1.81"
33.00% Pervious = 3.584 ac 67.00% Impervious = 7.276 ac

Lancaster Flood Routing

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Type II 24-hr 500-yr Rainfall=5.01"

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Summary for Subcatchment 1S: DMA A1

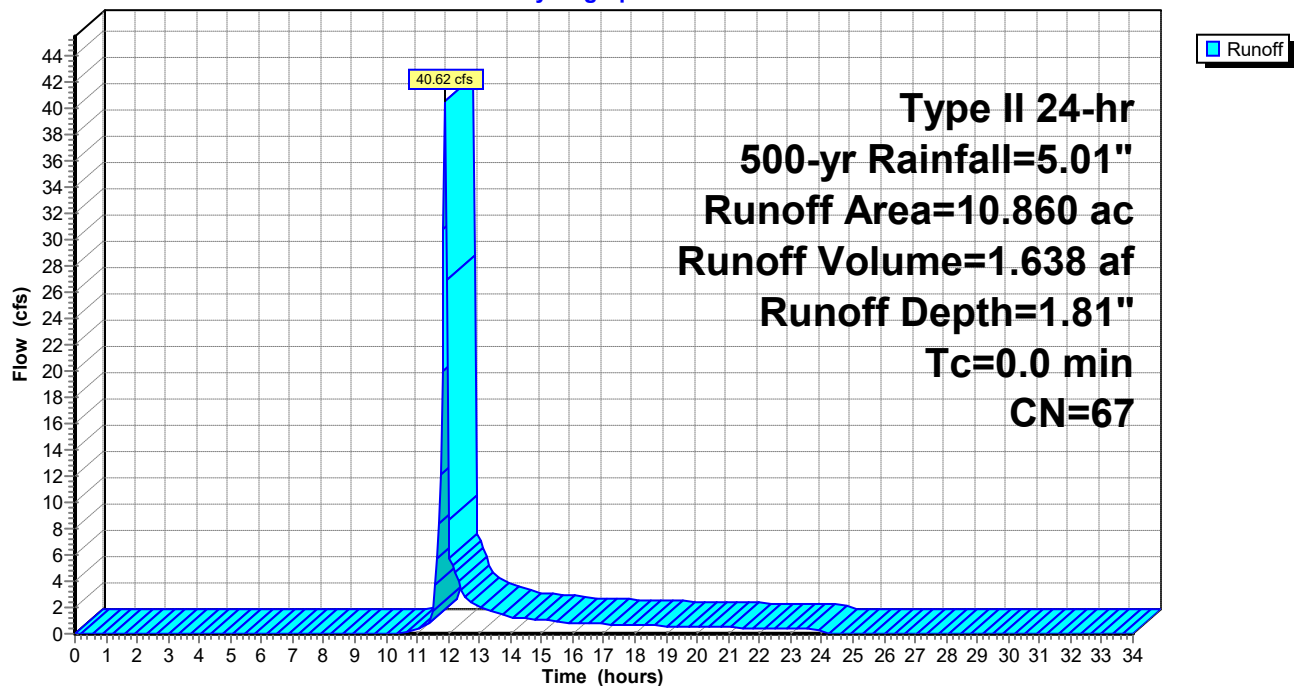
Runoff = 40.62 cfs @ 11.90 hrs, Volume= 1.638 af, Depth= 1.81"
Routed to Pond 2P : BASIN 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Type II 24-hr 500-yr Rainfall=5.01"

Area (ac)	CN	Description
* 10.860	67	Urban commercial, 67% imp, HSG B
3.584		33.00% Pervious Area
7.276		67.00% Impervious Area

Subcatchment 1S: DMA A1

Hydrograph



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Type II 24-hr 500-yr Rainfall=5.01"

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Hydrograph for Subcatchment 1S: DMA A1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	5.01	1.81	0.00
0.50	0.03	0.00	0.00	26.50	5.01	1.81	0.00
1.00	0.05	0.00	0.00	27.00	5.01	1.81	0.00
1.50	0.08	0.00	0.00	27.50	5.01	1.81	0.00
2.00	0.11	0.00	0.00	28.00	5.01	1.81	0.00
2.50	0.14	0.00	0.00	28.50	5.01	1.81	0.00
3.00	0.17	0.00	0.00	29.00	5.01	1.81	0.00
3.50	0.21	0.00	0.00	29.50	5.01	1.81	0.00
4.00	0.24	0.00	0.00	30.00	5.01	1.81	0.00
4.50	0.28	0.00	0.00	30.50	5.01	1.81	0.00
5.00	0.32	0.00	0.00	31.00	5.01	1.81	0.00
5.50	0.36	0.00	0.00	31.50	5.01	1.81	0.00
6.00	0.40	0.00	0.00	32.00	5.01	1.81	0.00
6.50	0.45	0.00	0.00	32.50	5.01	1.81	0.00
7.00	0.50	0.00	0.00	33.00	5.01	1.81	0.00
7.50	0.55	0.00	0.00	33.50	5.01	1.81	0.00
8.00	0.60	0.00	0.00	34.00	5.01	1.81	0.00
8.50	0.66	0.00	0.00				
9.00	0.74	0.00	0.00				
9.50	0.82	0.00	0.00				
10.00	0.91	0.00	0.00				
10.50	1.02	0.00	0.04				
11.00	1.18	0.01	0.29				
11.50	1.42	0.03	1.15				
12.00	3.32	0.75	8.66				
12.50	3.68	0.95	2.82				
13.00	3.87	1.06	2.02				
13.50	4.00	1.15	1.59				
14.00	4.11	1.21	1.27				
14.50	4.20	1.27	1.16				
15.00	4.28	1.32	1.05				
15.50	4.35	1.36	0.94				
16.00	4.41	1.40	0.82				
16.50	4.46	1.44	0.78				
17.00	4.52	1.48	0.74				
17.50	4.57	1.51	0.70				
18.00	4.61	1.54	0.66				
18.50	4.66	1.57	0.62				
19.00	4.70	1.60	0.57				
19.50	4.74	1.62	0.53				
20.00	4.77	1.64	0.49				
20.50	4.80	1.67	0.48				
21.00	4.83	1.69	0.47				
21.50	4.86	1.71	0.46				
22.00	4.89	1.73	0.45				
22.50	4.92	1.75	0.45				
23.00	4.95	1.77	0.44				
23.50	4.98	1.79	0.43				
24.00	5.01	1.81	0.21				
24.50	5.01	1.81	0.00				
25.00	5.01	1.81	0.00				
25.50	5.01	1.81	0.00				

Lancaster Flood Routing

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Type II 24-hr 500-yr Rainfall=5.01"

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Summary for Pond 2P: BASIN 1

Inflow Area = 10.860 ac, 67.00% Impervious, Inflow Depth = 1.81" for 500-yr event
Inflow = 40.62 cfs @ 11.90 hrs, Volume= 1.638 af
Outflow = 2.20 cfs @ 12.89 hrs, Volume= 1.366 af, Atten= 95%, Lag= 59.3 min
Primary = 1.70 cfs @ 12.89 hrs, Volume= 0.478 af
Secondary = 0.50 cfs @ 12.89 hrs, Volume= 0.888 af

Routing by Stor-Ind method, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Peak Elev= 2,406.60' @ 12.89 hrs Surf.Area= 0.203 ac Storage= 0.790 af

Plug-Flow detention time= 415.4 min calculated for 1.366 af (83% of inflow)
Center-of-Mass det. time= 339.2 min (1,185.7 - 846.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	2,401.00'	0.344 af	28.50'W x 310.68'L x 7.00'H Field A 1.423 af Overall - 0.563 af Embedded = 0.860 af x 40.0% Voids
#2A	2,402.00'	0.563 af	ADS_StormTech MC-7200 +Cap x 138 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 138 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
		0.907 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	2,405.50'	8.0" Round Culvert L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 2,405.50' / 2,404.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	2,401.00'	2.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 2,376.00' Phase-In= 1.00'

Primary OutFlow Max=1.70 cfs @ 12.89 hrs HW=2,406.60' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 1.70 cfs @ 4.86 fps)

Secondary OutFlow Max=0.50 cfs @ 12.89 hrs HW=2,406.60' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.50 cfs)



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Pond 2P: BASIN 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)

Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf

Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap

Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

46 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 308.68' Row Length +12.0" End Stone x 2 = 310.68' Base Length

3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width

12.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 7.00' Field Height

138 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 24,507.8 cf Chamber Storage

61,981.3 cf Field - 24,507.8 cf Chambers = 37,473.5 cf Stone x 40.0% Voids = 14,989.4 cf Stone Storage

Chamber Storage + Stone Storage = 39,497.2 cf = 0.907 af

Overall Storage Efficiency = 63.7%

Overall System Size = 310.68' x 28.50' x 7.00'

138 Chambers

2,295.6 cy Field

1,387.9 cy Stone



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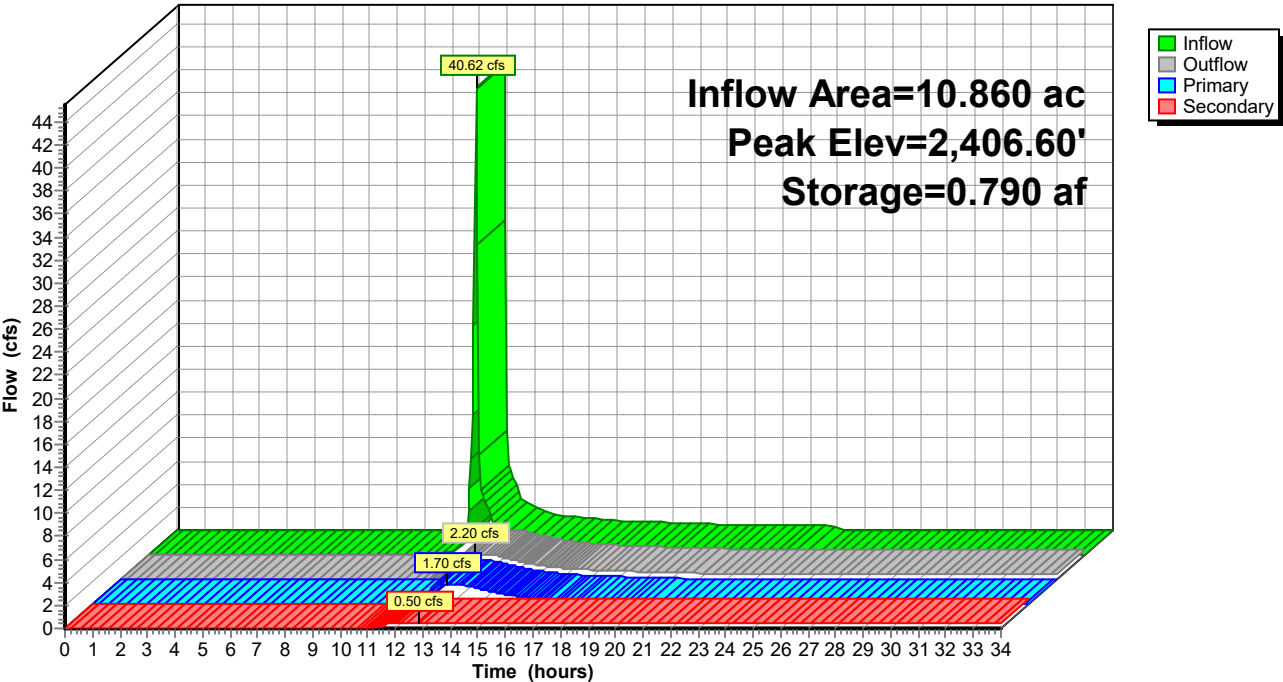
Type II 24-hr 500-yr Rainfall=5.01"

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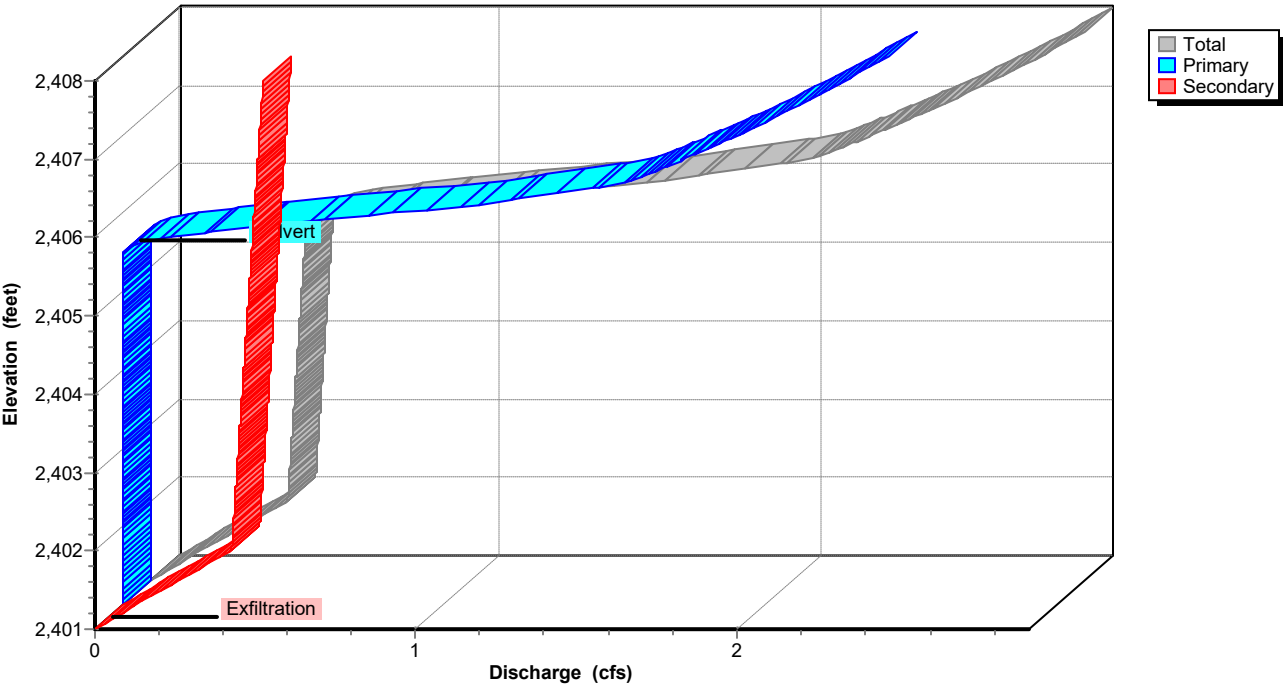
Pond 2P: BASIN 1

Hydrograph



Pond 2P: BASIN 1

Stage-Discharge



Lancaster Flood Routing

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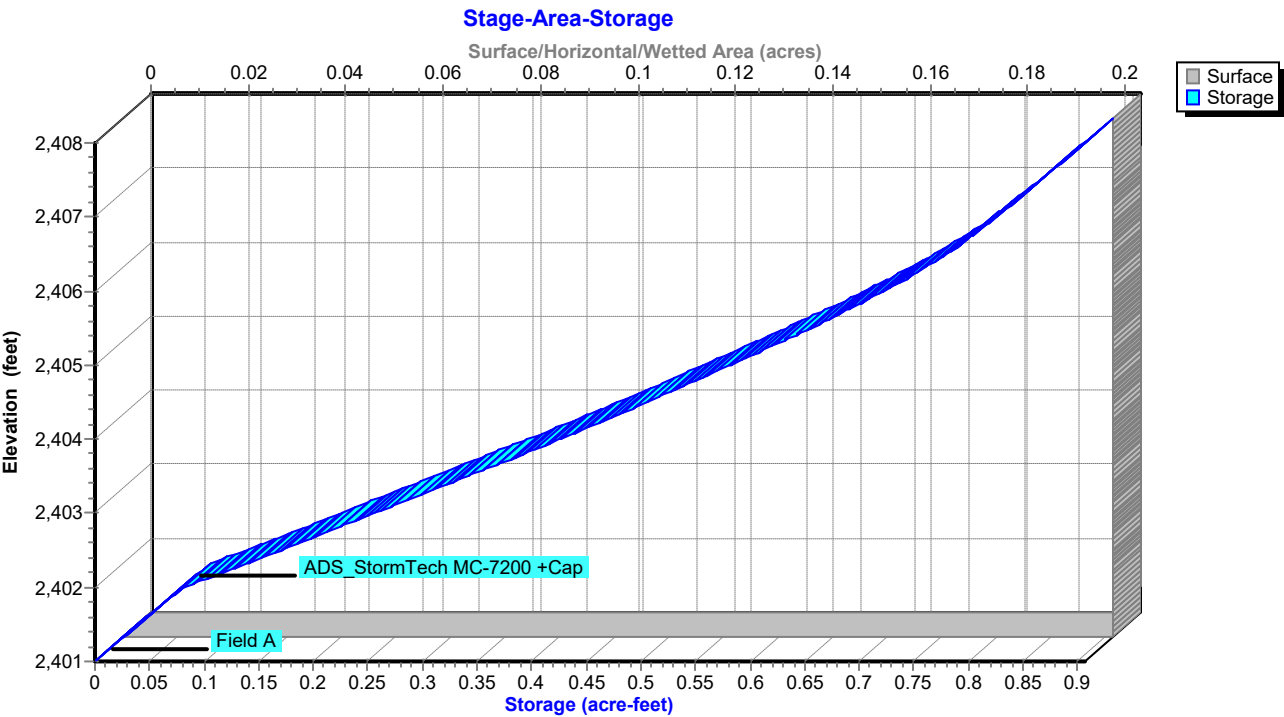
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Pond 2P: BASIN 1



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Type II 24-hr 500-yr Rainfall=5.01"

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Hydrograph for Pond 2P: BASIN 1

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0.000	2,401.00	0.00	0.00	0.00
1.00	0.00	0.000	2,401.00	0.00	0.00	0.00
2.00	0.00	0.000	2,401.00	0.00	0.00	0.00
3.00	0.00	0.000	2,401.00	0.00	0.00	0.00
4.00	0.00	0.000	2,401.00	0.00	0.00	0.00
5.00	0.00	0.000	2,401.00	0.00	0.00	0.00
6.00	0.00	0.000	2,401.00	0.00	0.00	0.00
7.00	0.00	0.000	2,401.00	0.00	0.00	0.00
8.00	0.00	0.000	2,401.00	0.00	0.00	0.00
9.00	0.00	0.000	2,401.00	0.00	0.00	0.00
10.00	0.00	0.000	2,401.00	0.00	0.00	0.00
11.00	0.29	0.006	2,401.07	0.03	0.00	0.03
12.00	8.66	0.656	2,405.50	0.48	0.00	0.48
13.00	2.02	0.789	2,406.59	2.19	1.69	0.50
14.00	1.27	0.752	2,406.24	1.84	1.34	0.50
15.00	1.05	0.720	2,405.98	1.29	0.80	0.49
16.00	0.82	0.705	2,405.86	0.99	0.50	0.49
17.00	0.74	0.695	2,405.79	0.83	0.34	0.49
18.00	0.66	0.689	2,405.74	0.73	0.25	0.49
19.00	0.57	0.683	2,405.70	0.65	0.17	0.49
20.00	0.49	0.676	2,405.65	0.58	0.09	0.49
21.00	0.47	0.669	2,405.60	0.53	0.05	0.49
22.00	0.45	0.665	2,405.57	0.51	0.02	0.48
23.00	0.44	0.661	2,405.54	0.49	0.01	0.48
24.00	0.21	0.655	2,405.50	0.48	0.00	0.48
25.00	0.00	0.616	2,405.22	0.48	0.00	0.48
26.00	0.00	0.576	2,404.96	0.47	0.00	0.47
27.00	0.00	0.537	2,404.70	0.47	0.00	0.47
28.00	0.00	0.499	2,404.46	0.47	0.00	0.47
29.00	0.00	0.460	2,404.22	0.46	0.00	0.46
30.00	0.00	0.422	2,403.98	0.46	0.00	0.46
31.00	0.00	0.384	2,403.75	0.46	0.00	0.46
32.00	0.00	0.347	2,403.53	0.45	0.00	0.45
33.00	0.00	0.310	2,403.31	0.45	0.00	0.45
34.00	0.00	0.273	2,403.10	0.44	0.00	0.44

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Stage-Discharge for Pond 2P: BASIN 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
2,401.00	0.00	0.00	0.00	2,406.20	1.77	1.27	0.50
2,401.10	0.04	0.00	0.04	2,406.30	1.93	1.44	0.50
2,401.20	0.08	0.00	0.08	2,406.40	2.07	1.58	0.50
2,401.30	0.12	0.00	0.12	2,406.50	2.14	1.64	0.50
2,401.40	0.17	0.00	0.17	2,406.60	2.20	1.70	0.50
2,401.50	0.21	0.00	0.21	2,406.70	2.26	1.76	0.50
2,401.60	0.25	0.00	0.25	2,406.80	2.32	1.81	0.51
2,401.70	0.29	0.00	0.29	2,406.90	2.38	1.87	0.51
2,401.80	0.34	0.00	0.34	2,407.00	2.43	1.92	0.51
2,401.90	0.38	0.00	0.38	2,407.10	2.48	1.97	0.51
2,402.00	0.43	0.00	0.43	2,407.20	2.54	2.02	0.51
2,402.10	0.43	0.00	0.43	2,407.30	2.59	2.07	0.51
2,402.20	0.43	0.00	0.43	2,407.40	2.64	2.12	0.51
2,402.30	0.43	0.00	0.43	2,407.50	2.68	2.17	0.52
2,402.40	0.43	0.00	0.43	2,407.60	2.73	2.21	0.52
2,402.50	0.43	0.00	0.43	2,407.70	2.78	2.26	0.52
2,402.60	0.44	0.00	0.44	2,407.80	2.82	2.30	0.52
2,402.70	0.44	0.00	0.44	2,407.90	2.87	2.35	0.52
2,402.80	0.44	0.00	0.44	2,408.00	2.91	2.39	0.52
2,402.90	0.44	0.00	0.44				
2,403.00	0.44	0.00	0.44				
2,403.10	0.44	0.00	0.44				
2,403.20	0.45	0.00	0.45				
2,403.30	0.45	0.00	0.45				
2,403.40	0.45	0.00	0.45				
2,403.50	0.45	0.00	0.45				
2,403.60	0.45	0.00	0.45				
2,403.70	0.45	0.00	0.45				
2,403.80	0.46	0.00	0.46				
2,403.90	0.46	0.00	0.46				
2,404.00	0.46	0.00	0.46				
2,404.10	0.46	0.00	0.46				
2,404.20	0.46	0.00	0.46				
2,404.30	0.46	0.00	0.46				
2,404.40	0.47	0.00	0.47				
2,404.50	0.47	0.00	0.47				
2,404.60	0.47	0.00	0.47				
2,404.70	0.47	0.00	0.47				
2,404.80	0.47	0.00	0.47				
2,404.90	0.47	0.00	0.47				
2,405.00	0.48	0.00	0.48				
2,405.10	0.48	0.00	0.48				
2,405.20	0.48	0.00	0.48				
2,405.30	0.48	0.00	0.48				
2,405.40	0.48	0.00	0.48				
2,405.50	0.48	0.00	0.48				
2,405.60	0.53	0.04	0.49				
2,405.70	0.65	0.17	0.49				
2,405.80	0.84	0.36	0.49				
2,405.90	1.08	0.59	0.49				
2,406.00	1.34	0.85	0.49				
2,406.10	1.58	1.09	0.49				

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Stage-Area-Storage for Pond 2P: BASIN 1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
2,401.00	0.203	0.000	2,406.20	0.203	0.747
2,401.10	0.203	0.008	2,406.30	0.203	0.759
2,401.20	0.203	0.016	2,406.40	0.203	0.770
2,401.30	0.203	0.024	2,406.50	0.203	0.781
2,401.40	0.203	0.033	2,406.60	0.203	0.790
2,401.50	0.203	0.041	2,406.70	0.203	0.800
2,401.60	0.203	0.049	2,406.80	0.203	0.809
2,401.70	0.203	0.057	2,406.90	0.203	0.817
2,401.80	0.203	0.065	2,407.00	0.203	0.825
2,401.90	0.203	0.073	2,407.10	0.203	0.834
2,402.00	0.203	0.081	2,407.20	0.203	0.842
2,402.10	0.203	0.099	2,407.30	0.203	0.850
2,402.20	0.203	0.117	2,407.40	0.203	0.858
2,402.30	0.203	0.134	2,407.50	0.203	0.866
2,402.40	0.203	0.152	2,407.60	0.203	0.874
2,402.50	0.203	0.170	2,407.70	0.203	0.882
2,402.60	0.203	0.187	2,407.80	0.203	0.890
2,402.70	0.203	0.204	2,407.90	0.203	0.899
2,402.80	0.203	0.222	2,408.00	0.203	0.907
2,402.90	0.203	0.239			
2,403.00	0.203	0.257			
2,403.10	0.203	0.274			
2,403.20	0.203	0.291			
2,403.30	0.203	0.308			
2,403.40	0.203	0.325			
2,403.50	0.203	0.342			
2,403.60	0.203	0.359			
2,403.70	0.203	0.375			
2,403.80	0.203	0.392			
2,403.90	0.203	0.409			
2,404.00	0.203	0.425			
2,404.10	0.203	0.441			
2,404.20	0.203	0.458			
2,404.30	0.203	0.474			
2,404.40	0.203	0.490			
2,404.50	0.203	0.506			
2,404.60	0.203	0.521			
2,404.70	0.203	0.537			
2,404.80	0.203	0.552			
2,404.90	0.203	0.568			
2,405.00	0.203	0.583			
2,405.10	0.203	0.598			
2,405.20	0.203	0.612			
2,405.30	0.203	0.627			
2,405.40	0.203	0.641			
2,405.50	0.203	0.655			
2,405.60	0.203	0.669			
2,405.70	0.203	0.683			
2,405.80	0.203	0.696			
2,405.90	0.203	0.709			
2,406.00	0.203	0.722			
2,406.10	0.203	0.735			

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Type II 24-hr 1000-yr Rainfall=5.45"

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Time span=0.00-34.00 hrs, dt=0.05 hrs, 681 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DMA A1

Runoff Area=10.860 ac 67.00% Impervious Runoff Depth=2.12"
Tc=0.0 min CN=67 Runoff=47.67 cfs 1.921 af

Pond 2P: BASIN 1

Peak Elev=2,407.93' Storage=0.901 af Inflow=47.67 cfs 1.921 af
Primary=2.36 cfs 0.741 af Secondary=0.52 cfs 0.899 af Outflow=2.88 cfs 1.640 af

Total Runoff Area = 10.860 ac Runoff Volume = 1.921 af Average Runoff Depth = 2.12"
33.00% Pervious = 3.584 ac 67.00% Impervious = 7.276 ac

Lancaster Flood Routing

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Type II 24-hr 1000-yr Rainfall=5.45"

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Summary for Subcatchment 1S: DMA A1

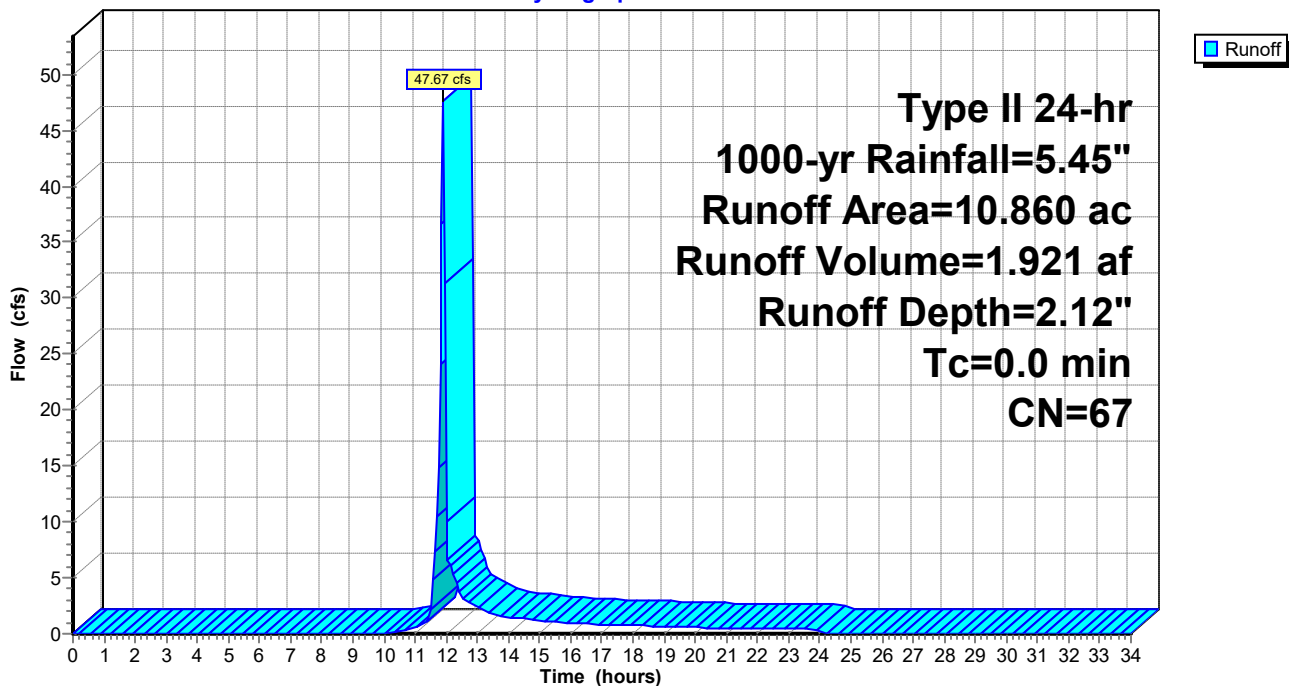
Runoff = 47.67 cfs @ 11.90 hrs, Volume= 1.921 af, Depth= 2.12"
Routed to Pond 2P : BASIN 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Type II 24-hr 1000-yr Rainfall=5.45"

Area (ac)	CN	Description
* 10.860	67	Urban commercial, 67% imp, HSG B
3.584		33.00% Pervious Area
7.276		67.00% Impervious Area

Subcatchment 1S: DMA A1

Hydrograph



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Hydrograph for Subcatchment 1S: DMA A1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	5.45	2.12	0.00
0.50	0.03	0.00	0.00	26.50	5.45	2.12	0.00
1.00	0.06	0.00	0.00	27.00	5.45	2.12	0.00
1.50	0.09	0.00	0.00	27.50	5.45	2.12	0.00
2.00	0.12	0.00	0.00	28.00	5.45	2.12	0.00
2.50	0.15	0.00	0.00	28.50	5.45	2.12	0.00
3.00	0.19	0.00	0.00	29.00	5.45	2.12	0.00
3.50	0.22	0.00	0.00	29.50	5.45	2.12	0.00
4.00	0.26	0.00	0.00	30.00	5.45	2.12	0.00
4.50	0.30	0.00	0.00	30.50	5.45	2.12	0.00
5.00	0.34	0.00	0.00	31.00	5.45	2.12	0.00
5.50	0.39	0.00	0.00	31.50	5.45	2.12	0.00
6.00	0.44	0.00	0.00	32.00	5.45	2.12	0.00
6.50	0.49	0.00	0.00	32.50	5.45	2.12	0.00
7.00	0.54	0.00	0.00	33.00	5.45	2.12	0.00
7.50	0.60	0.00	0.00	33.50	5.45	2.12	0.00
8.00	0.65	0.00	0.00	34.00	5.45	2.12	0.00
8.50	0.72	0.00	0.00				
9.00	0.80	0.00	0.00				
9.50	0.89	0.00	0.00				
10.00	0.99	0.00	0.00				
10.50	1.11	0.00	0.15				
11.00	1.28	0.02	0.48				
11.50	1.54	0.06	1.55				
12.00	3.61	0.91	10.03				
12.50	4.01	1.15	3.24				
13.00	4.21	1.27	2.32				
13.50	4.35	1.37	1.82				
14.00	4.47	1.44	1.45				
14.50	4.57	1.51	1.33				
15.00	4.65	1.56	1.20				
15.50	4.73	1.62	1.07				
16.00	4.80	1.66	0.94				
16.50	4.86	1.70	0.89				
17.00	4.91	1.74	0.84				
17.50	4.97	1.78	0.80				
18.00	5.02	1.82	0.75				
18.50	5.07	1.85	0.70				
19.00	5.11	1.88	0.65				
19.50	5.15	1.91	0.60				
20.00	5.19	1.94	0.55				
20.50	5.22	1.96	0.54				
21.00	5.26	1.98	0.53				
21.50	5.29	2.01	0.52				
22.00	5.32	2.03	0.51				
22.50	5.36	2.06	0.50				
23.00	5.39	2.08	0.50				
23.50	5.42	2.10	0.49				
24.00	5.45	2.12	0.24				
24.50	5.45	2.12	0.00				
25.00	5.45	2.12	0.00				
25.50	5.45	2.12	0.00				

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Type II 24-hr 1000-yr Rainfall=5.45"

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Summary for Pond 2P: BASIN 1

Inflow Area = 10.860 ac, 67.00% Impervious, Inflow Depth = 2.12" for 1000-yr event
Inflow = 47.67 cfs @ 11.90 hrs, Volume= 1.921 af
Outflow = 2.88 cfs @ 12.68 hrs, Volume= 1.640 af, Atten= 94%, Lag= 47.2 min
Primary = 2.36 cfs @ 12.68 hrs, Volume= 0.741 af
Secondary = 0.52 cfs @ 12.68 hrs, Volume= 0.899 af

Routing by Stor-Ind method, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Peak Elev= 2,407.93' @ 12.68 hrs Surf.Area= 0.203 ac Storage= 0.901 af

Plug-Flow detention time= 360.8 min calculated for 1.637 af (85% of inflow)
Center-of-Mass det. time= 292.5 min (1,134.2 - 841.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	2,401.00'	0.344 af	28.50'W x 310.68'L x 7.00'H Field A 1.423 af Overall - 0.563 af Embedded = 0.860 af x 40.0% Voids
#2A	2,402.00'	0.563 af	ADS_StormTech MC-7200 +Cap x 138 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 138 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
		0.907 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	2,405.50'	8.0" Round Culvert L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 2,405.50' / 2,404.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	2,401.00'	2.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 2,376.00' Phase-In= 1.00'

Primary OutFlow Max=2.36 cfs @ 12.68 hrs HW=2,407.93' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 2.36 cfs @ 6.76 fps)

Secondary OutFlow Max=0.52 cfs @ 12.68 hrs HW=2,407.93' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.52 cfs)



Lancaster Flood Routing

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Type II 24-hr 1000-yr Rainfall=5.45"

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Pond 2P: BASIN 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)

Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf

Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap

Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

46 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 308.68' Row Length +12.0" End Stone x 2 =
310.68' Base Length

3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width

12.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 7.00' Field Height

138 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 24,507.8 cf Chamber Storage

61,981.3 cf Field - 24,507.8 cf Chambers = 37,473.5 cf Stone x 40.0% Voids = 14,989.4 cf Stone Storage

Chamber Storage + Stone Storage = 39,497.2 cf = 0.907 af

Overall Storage Efficiency = 63.7%

Overall System Size = 310.68' x 28.50' x 7.00'

138 Chambers

2,295.6 cy Field

1,387.9 cy Stone



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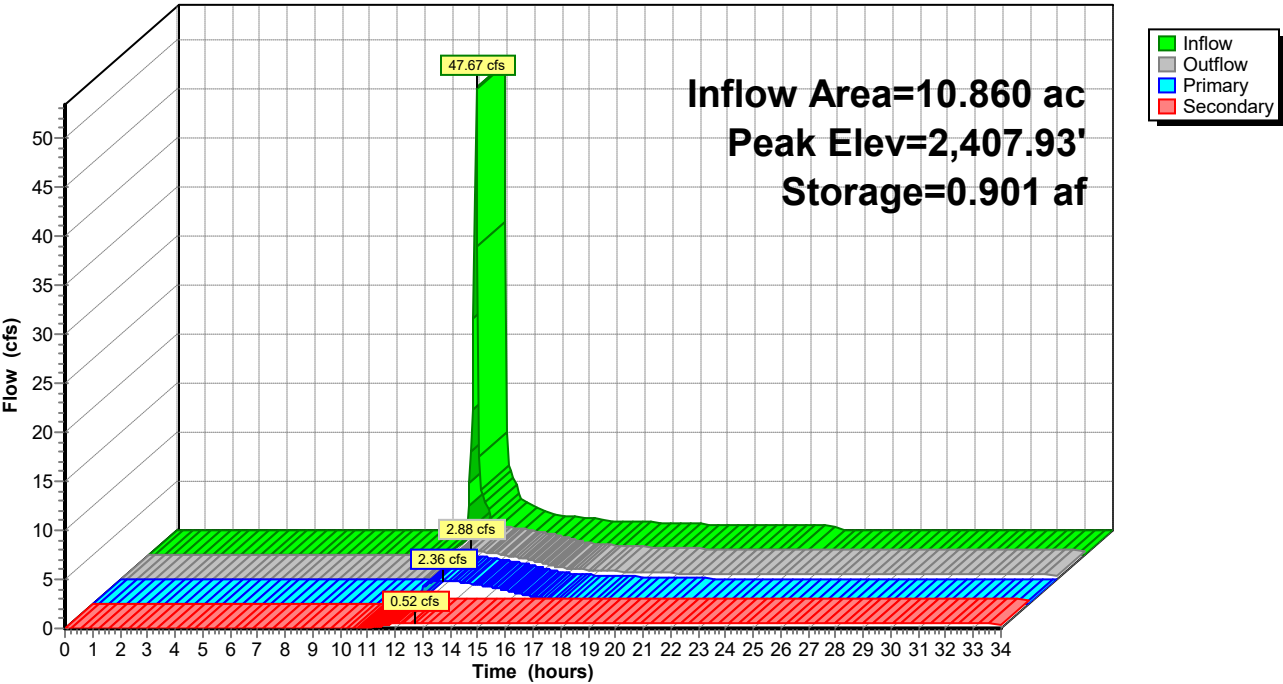
Type II 24-hr 1000-yr Rainfall=5.45"

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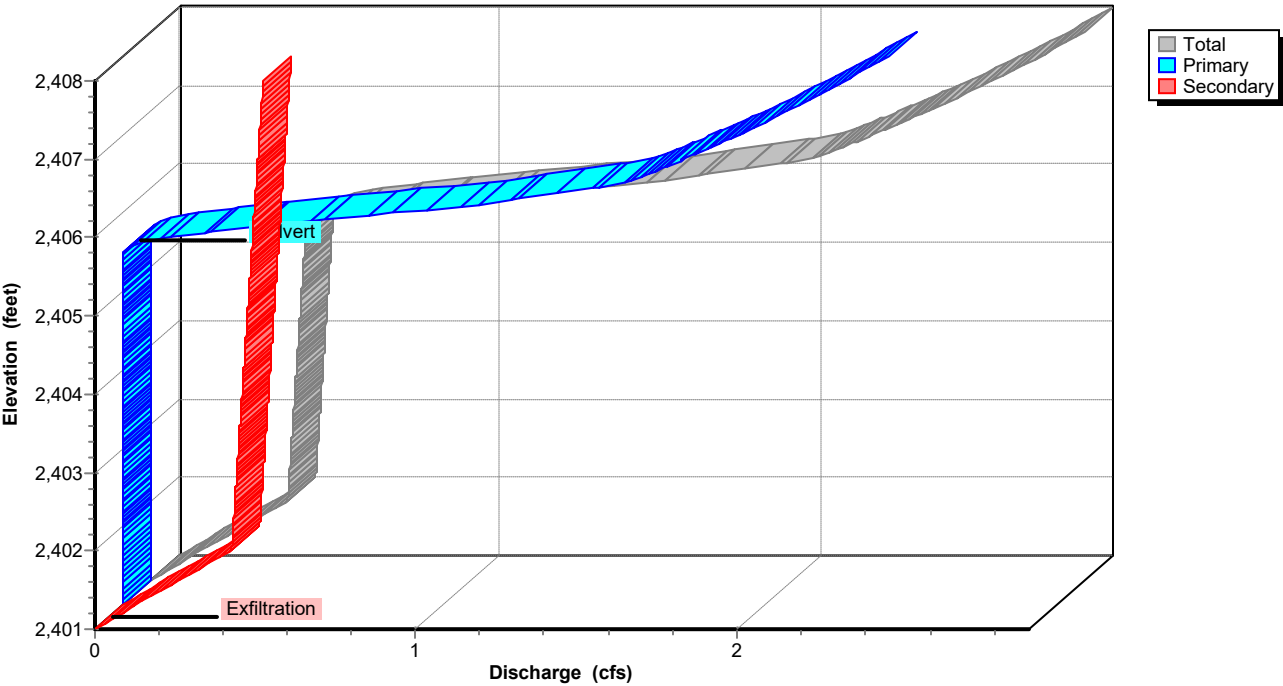
Pond 2P: BASIN 1

Hydrograph



Pond 2P: BASIN 1

Stage-Discharge



Lancaster Flood Routing

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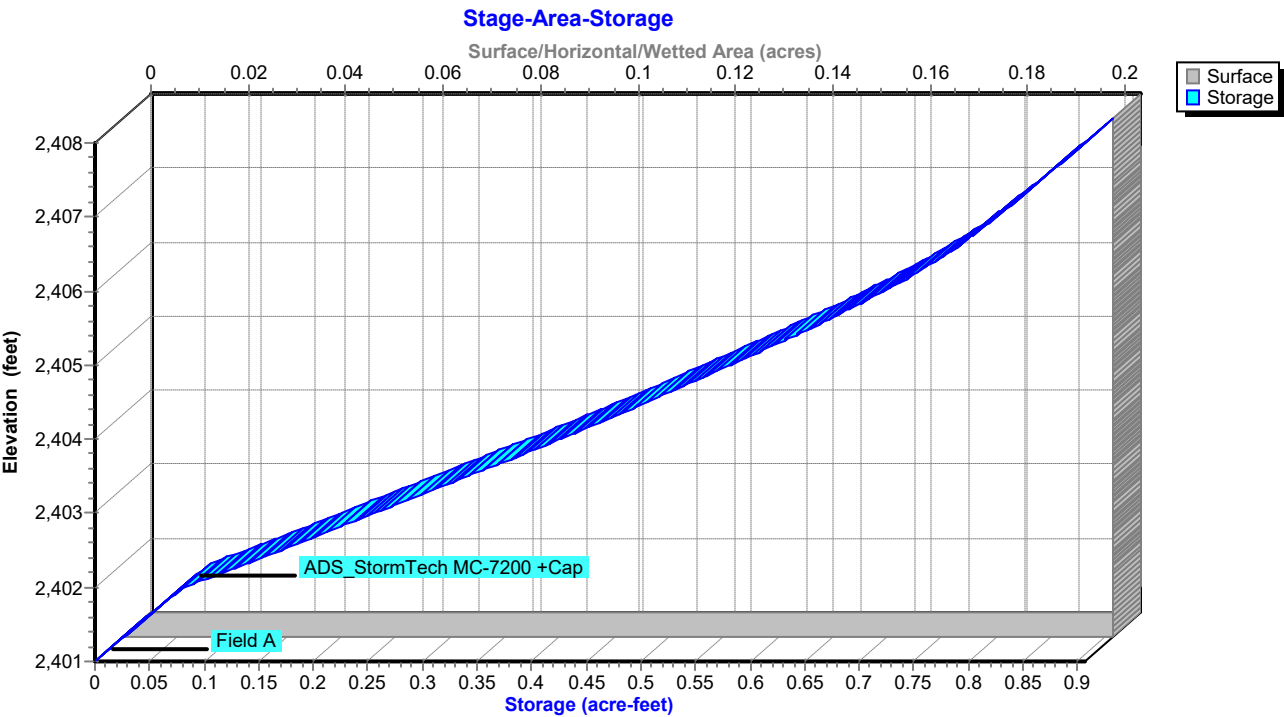
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Pond 2P: BASIN 1



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Type II 24-hr 1000-yr Rainfall=5.45"

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Hydrograph for Pond 2P: BASIN 1

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0.000	2,401.00	0.00	0.00	0.00
1.00	0.00	0.000	2,401.00	0.00	0.00	0.00
2.00	0.00	0.000	2,401.00	0.00	0.00	0.00
3.00	0.00	0.000	2,401.00	0.00	0.00	0.00
4.00	0.00	0.000	2,401.00	0.00	0.00	0.00
5.00	0.00	0.000	2,401.00	0.00	0.00	0.00
6.00	0.00	0.000	2,401.00	0.00	0.00	0.00
7.00	0.00	0.000	2,401.00	0.00	0.00	0.00
8.00	0.00	0.000	2,401.00	0.00	0.00	0.00
9.00	0.00	0.000	2,401.00	0.00	0.00	0.00
10.00	0.00	0.000	2,401.00	0.00	0.00	0.00
11.00	0.48	0.013	2,401.17	0.07	0.00	0.07
12.00	10.03	0.790	2,406.60	2.20	1.70	0.50
13.00	2.32	0.894	2,407.85	2.85	2.32	0.52
14.00	1.45	0.827	2,407.02	2.44	1.93	0.51
15.00	1.20	0.756	2,406.27	1.89	1.39	0.50
16.00	0.94	0.717	2,405.96	1.23	0.74	0.49
17.00	0.84	0.703	2,405.85	0.95	0.46	0.49
18.00	0.75	0.695	2,405.79	0.83	0.34	0.49
19.00	0.65	0.689	2,405.74	0.73	0.24	0.49
20.00	0.55	0.682	2,405.69	0.64	0.15	0.49
21.00	0.53	0.676	2,405.65	0.58	0.10	0.49
22.00	0.51	0.672	2,405.62	0.55	0.07	0.49
23.00	0.50	0.669	2,405.60	0.53	0.05	0.49
24.00	0.24	0.666	2,405.58	0.51	0.03	0.48
25.00	0.00	0.626	2,405.30	0.48	0.00	0.48
26.00	0.00	0.587	2,405.03	0.48	0.00	0.48
27.00	0.00	0.548	2,404.77	0.47	0.00	0.47
28.00	0.00	0.509	2,404.52	0.47	0.00	0.47
29.00	0.00	0.470	2,404.28	0.46	0.00	0.46
30.00	0.00	0.432	2,404.04	0.46	0.00	0.46
31.00	0.00	0.394	2,403.81	0.46	0.00	0.46
32.00	0.00	0.357	2,403.59	0.45	0.00	0.45
33.00	0.00	0.319	2,403.37	0.45	0.00	0.45
34.00	0.00	0.283	2,403.15	0.45	0.00	0.45

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Stage-Discharge for Pond 2P: BASIN 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
2,401.00	0.00	0.00	0.00	2,406.20	1.77	1.27	0.50
2,401.10	0.04	0.00	0.04	2,406.30	1.93	1.44	0.50
2,401.20	0.08	0.00	0.08	2,406.40	2.07	1.58	0.50
2,401.30	0.12	0.00	0.12	2,406.50	2.14	1.64	0.50
2,401.40	0.17	0.00	0.17	2,406.60	2.20	1.70	0.50
2,401.50	0.21	0.00	0.21	2,406.70	2.26	1.76	0.50
2,401.60	0.25	0.00	0.25	2,406.80	2.32	1.81	0.51
2,401.70	0.29	0.00	0.29	2,406.90	2.38	1.87	0.51
2,401.80	0.34	0.00	0.34	2,407.00	2.43	1.92	0.51
2,401.90	0.38	0.00	0.38	2,407.10	2.48	1.97	0.51
2,402.00	0.43	0.00	0.43	2,407.20	2.54	2.02	0.51
2,402.10	0.43	0.00	0.43	2,407.30	2.59	2.07	0.51
2,402.20	0.43	0.00	0.43	2,407.40	2.64	2.12	0.51
2,402.30	0.43	0.00	0.43	2,407.50	2.68	2.17	0.52
2,402.40	0.43	0.00	0.43	2,407.60	2.73	2.21	0.52
2,402.50	0.43	0.00	0.43	2,407.70	2.78	2.26	0.52
2,402.60	0.44	0.00	0.44	2,407.80	2.82	2.30	0.52
2,402.70	0.44	0.00	0.44	2,407.90	2.87	2.35	0.52
2,402.80	0.44	0.00	0.44	2,408.00	2.91	2.39	0.52
2,402.90	0.44	0.00	0.44				
2,403.00	0.44	0.00	0.44				
2,403.10	0.44	0.00	0.44				
2,403.20	0.45	0.00	0.45				
2,403.30	0.45	0.00	0.45				
2,403.40	0.45	0.00	0.45				
2,403.50	0.45	0.00	0.45				
2,403.60	0.45	0.00	0.45				
2,403.70	0.45	0.00	0.45				
2,403.80	0.46	0.00	0.46				
2,403.90	0.46	0.00	0.46				
2,404.00	0.46	0.00	0.46				
2,404.10	0.46	0.00	0.46				
2,404.20	0.46	0.00	0.46				
2,404.30	0.46	0.00	0.46				
2,404.40	0.47	0.00	0.47				
2,404.50	0.47	0.00	0.47				
2,404.60	0.47	0.00	0.47				
2,404.70	0.47	0.00	0.47				
2,404.80	0.47	0.00	0.47				
2,404.90	0.47	0.00	0.47				
2,405.00	0.48	0.00	0.48				
2,405.10	0.48	0.00	0.48				
2,405.20	0.48	0.00	0.48				
2,405.30	0.48	0.00	0.48				
2,405.40	0.48	0.00	0.48				
2,405.50	0.48	0.00	0.48				
2,405.60	0.53	0.04	0.49				
2,405.70	0.65	0.17	0.49				
2,405.80	0.84	0.36	0.49				
2,405.90	1.08	0.59	0.49				
2,406.00	1.34	0.85	0.49				
2,406.10	1.58	1.09	0.49				

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Type II 24-hr 1000-yr Rainfall=5.45"

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Stage-Area-Storage for Pond 2P: BASIN 1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
2,401.00	0.203	0.000	2,406.20	0.203	0.747
2,401.10	0.203	0.008	2,406.30	0.203	0.759
2,401.20	0.203	0.016	2,406.40	0.203	0.770
2,401.30	0.203	0.024	2,406.50	0.203	0.781
2,401.40	0.203	0.033	2,406.60	0.203	0.790
2,401.50	0.203	0.041	2,406.70	0.203	0.800
2,401.60	0.203	0.049	2,406.80	0.203	0.809
2,401.70	0.203	0.057	2,406.90	0.203	0.817
2,401.80	0.203	0.065	2,407.00	0.203	0.825
2,401.90	0.203	0.073	2,407.10	0.203	0.834
2,402.00	0.203	0.081	2,407.20	0.203	0.842
2,402.10	0.203	0.099	2,407.30	0.203	0.850
2,402.20	0.203	0.117	2,407.40	0.203	0.858
2,402.30	0.203	0.134	2,407.50	0.203	0.866
2,402.40	0.203	0.152	2,407.60	0.203	0.874
2,402.50	0.203	0.170	2,407.70	0.203	0.882
2,402.60	0.203	0.187	2,407.80	0.203	0.890
2,402.70	0.203	0.204	2,407.90	0.203	0.899
2,402.80	0.203	0.222	2,408.00	0.203	0.907
2,402.90	0.203	0.239			
2,403.00	0.203	0.257			
2,403.10	0.203	0.274			
2,403.20	0.203	0.291			
2,403.30	0.203	0.308			
2,403.40	0.203	0.325			
2,403.50	0.203	0.342			
2,403.60	0.203	0.359			
2,403.70	0.203	0.375			
2,403.80	0.203	0.392			
2,403.90	0.203	0.409			
2,404.00	0.203	0.425			
2,404.10	0.203	0.441			
2,404.20	0.203	0.458			
2,404.30	0.203	0.474			
2,404.40	0.203	0.490			
2,404.50	0.203	0.506			
2,404.60	0.203	0.521			
2,404.70	0.203	0.537			
2,404.80	0.203	0.552			
2,404.90	0.203	0.568			
2,405.00	0.203	0.583			
2,405.10	0.203	0.598			
2,405.20	0.203	0.612			
2,405.30	0.203	0.627			
2,405.40	0.203	0.641			
2,405.50	0.203	0.655			
2,405.60	0.203	0.669			
2,405.70	0.203	0.683			
2,405.80	0.203	0.696			
2,405.90	0.203	0.709			
2,406.00	0.203	0.722			
2,406.10	0.203	0.735			

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Type II 24-hr Custom Rainfall=3.12", AMC=3

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Time span=0.00-34.00 hrs, dt=0.05 hrs, 681 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DMA A1

Runoff Area=10.860 ac 67.00% Impervious Runoff Depth=1.54"
Tc=0.0 min AMC Adjusted CN=83 Runoff=34.35 cfs 1.397 af

Pond 2P: BASIN 1

Peak Elev=2,406.18' Storage=0.745 af Inflow=34.35 cfs 1.397 af
Primary=1.24 cfs 0.270 af Secondary=0.49 cfs 0.898 af Outflow=1.74 cfs 1.168 af

Total Runoff Area = 10.860 ac Runoff Volume = 1.397 af Average Runoff Depth = 1.54"
33.00% Pervious = 3.584 ac 67.00% Impervious = 7.276 ac

Lancaster Flood Routing

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Type II 24-hr Custom Rainfall=3.12", AMC=3

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Summary for Subcatchment 1S: DMA A1

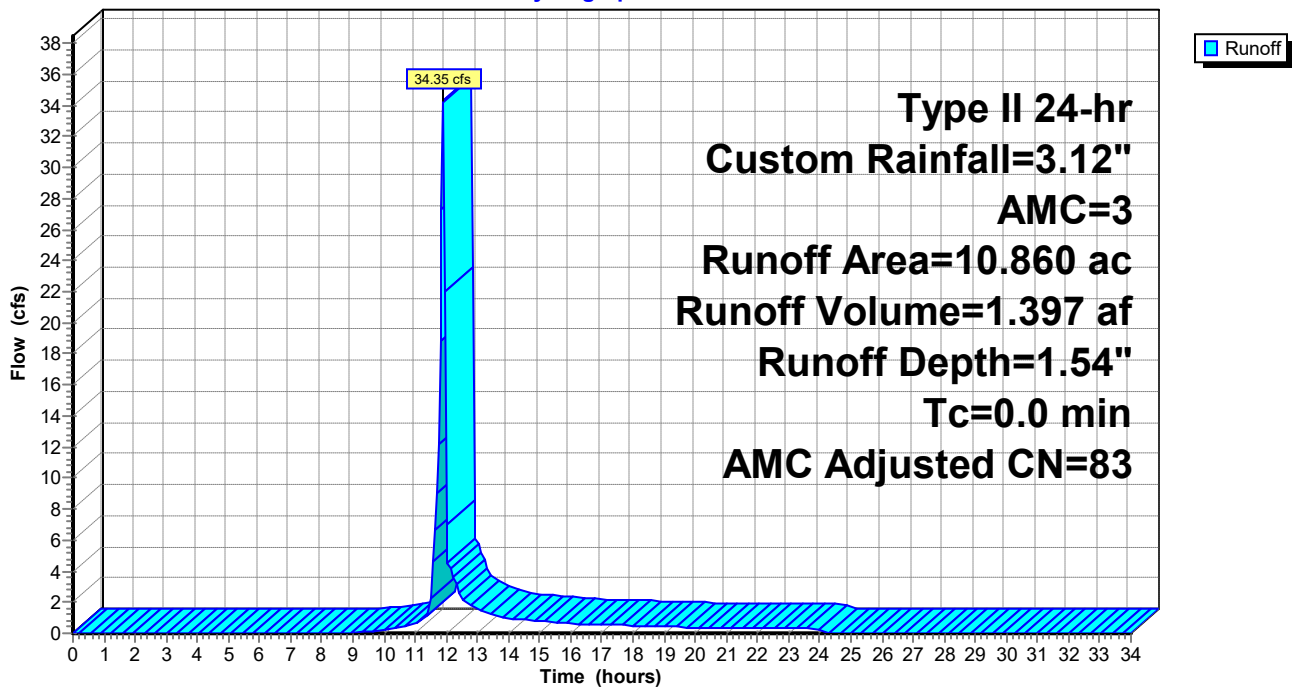
Runoff = 34.35 cfs @ 11.89 hrs, Volume= 1.397 af, Depth= 1.54"
Routed to Pond 2P : BASIN 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Type II 24-hr Custom Rainfall=3.12", AMC=3

Area (ac)	CN	Adj	Description
* 10.860	67		Urban commercial, 67% imp, HSG B
10.860	67	83	Weighted Average, AMC Adjusted
3.584			33.00% Pervious Area
7.276			67.00% Impervious Area

Subcatchment 1S: DMA A1

Hydrograph



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Hydrograph for Subcatchment 1S: DMA A1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.00	3.12	1.54	0.00
0.50	0.02	0.00	0.00	26.50	3.12	1.54	0.00
1.00	0.03	0.00	0.00	27.00	3.12	1.54	0.00
1.50	0.05	0.00	0.00	27.50	3.12	1.54	0.00
2.00	0.07	0.00	0.00	28.00	3.12	1.54	0.00
2.50	0.09	0.00	0.00	28.50	3.12	1.54	0.00
3.00	0.11	0.00	0.00	29.00	3.12	1.54	0.00
3.50	0.13	0.00	0.00	29.50	3.12	1.54	0.00
4.00	0.15	0.00	0.00	30.00	3.12	1.54	0.00
4.50	0.17	0.00	0.00	30.50	3.12	1.54	0.00
5.00	0.20	0.00	0.00	31.00	3.12	1.54	0.00
5.50	0.22	0.00	0.00	31.50	3.12	1.54	0.00
6.00	0.25	0.00	0.00	32.00	3.12	1.54	0.00
6.50	0.28	0.00	0.00	32.50	3.12	1.54	0.00
7.00	0.31	0.00	0.00	33.00	3.12	1.54	0.00
7.50	0.34	0.00	0.00	33.50	3.12	1.54	0.00
8.00	0.37	0.00	0.00	34.00	3.12	1.54	0.00
8.50	0.41	0.00	0.00				
9.00	0.46	0.00	0.05				
9.50	0.51	0.00	0.10				
10.00	0.56	0.01	0.19				
10.50	0.64	0.02	0.34				
11.00	0.73	0.04	0.63				
11.50	0.88	0.09	1.56				
12.00	2.07	0.74	6.95				
12.50	2.29	0.90	2.19				
13.00	2.41	0.99	1.55				
13.50	2.49	1.05	1.21				
14.00	2.56	1.10	0.97				
14.50	2.61	1.14	0.88				
15.00	2.66	1.18	0.79				
15.50	2.71	1.21	0.70				
16.00	2.75	1.24	0.62				
16.50	2.78	1.27	0.58				
17.00	2.81	1.30	0.55				
17.50	2.84	1.32	0.52				
18.00	2.87	1.35	0.49				
18.50	2.90	1.37	0.46				
19.00	2.93	1.39	0.42				
19.50	2.95	1.41	0.39				
20.00	2.97	1.42	0.36				
20.50	2.99	1.44	0.35				
21.00	3.01	1.45	0.34				
21.50	3.03	1.47	0.34				
22.00	3.05	1.49	0.33				
22.50	3.07	1.50	0.33				
23.00	3.08	1.52	0.32				
23.50	3.10	1.53	0.31				
24.00	3.12	1.54	0.15				
24.50	3.12	1.54	0.00				
25.00	3.12	1.54	0.00				
25.50	3.12	1.54	0.00				

Lancaster Flood Routing

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Summary for Pond 2P: BASIN 1

Inflow Area = 10.860 ac, 67.00% Impervious, Inflow Depth = 1.54" for Custom event
Inflow = 34.35 cfs @ 11.89 hrs, Volume= 1.397 af
Outflow = 1.74 cfs @ 12.85 hrs, Volume= 1.168 af, Atten= 95%, Lag= 57.6 min
Primary = 1.24 cfs @ 12.85 hrs, Volume= 0.270 af
Secondary = 0.49 cfs @ 12.85 hrs, Volume= 0.898 af

Routing by Stor-Ind method, Time Span= 0.00-34.00 hrs, dt= 0.05 hrs
Peak Elev= 2,406.18' @ 12.85 hrs Surf.Area= 0.203 ac Storage= 0.745 af

Plug-Flow detention time= 473.8 min calculated for 1.167 af (83% of inflow)
Center-of-Mass det. time= 400.6 min (1,226.0 - 825.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	2,401.00'	0.344 af	28.50'W x 310.68'L x 7.00'H Field A 1.423 af Overall - 0.563 af Embedded = 0.860 af x 40.0% Voids
#2A	2,402.00'	0.563 af	ADS_StormTech MC-7200 +Cap x 138 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 138 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
		0.907 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	2,405.50'	8.0" Round Culvert L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 2,405.50' / 2,404.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	2,401.00'	2.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 2,376.00' Phase-In= 1.00'

Primary OutFlow Max=1.24 cfs @ 12.85 hrs HW=2,406.18' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 1.24 cfs @ 3.56 fps)

Secondary OutFlow Max=0.49 cfs @ 12.85 hrs HW=2,406.18' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.49 cfs)



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Pond 2P: BASIN 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)

Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf

Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap

Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

46 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 308.68' Row Length +12.0" End Stone x 2 = 310.68' Base Length

3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width

12.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 7.00' Field Height

138 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 24,507.8 cf Chamber Storage

61,981.3 cf Field - 24,507.8 cf Chambers = 37,473.5 cf Stone x 40.0% Voids = 14,989.4 cf Stone Storage

Chamber Storage + Stone Storage = 39,497.2 cf = 0.907 af

Overall Storage Efficiency = 63.7%

Overall System Size = 310.68' x 28.50' x 7.00'

138 Chambers

2,295.6 cy Field

1,387.9 cy Stone



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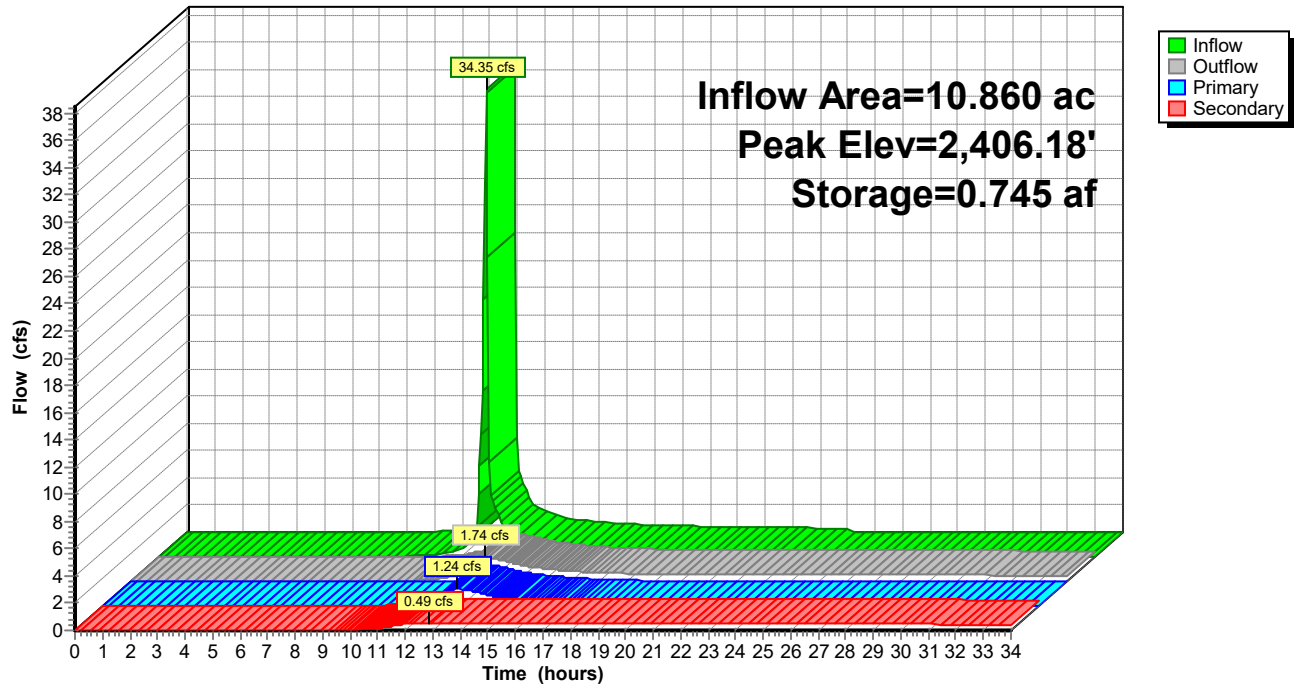
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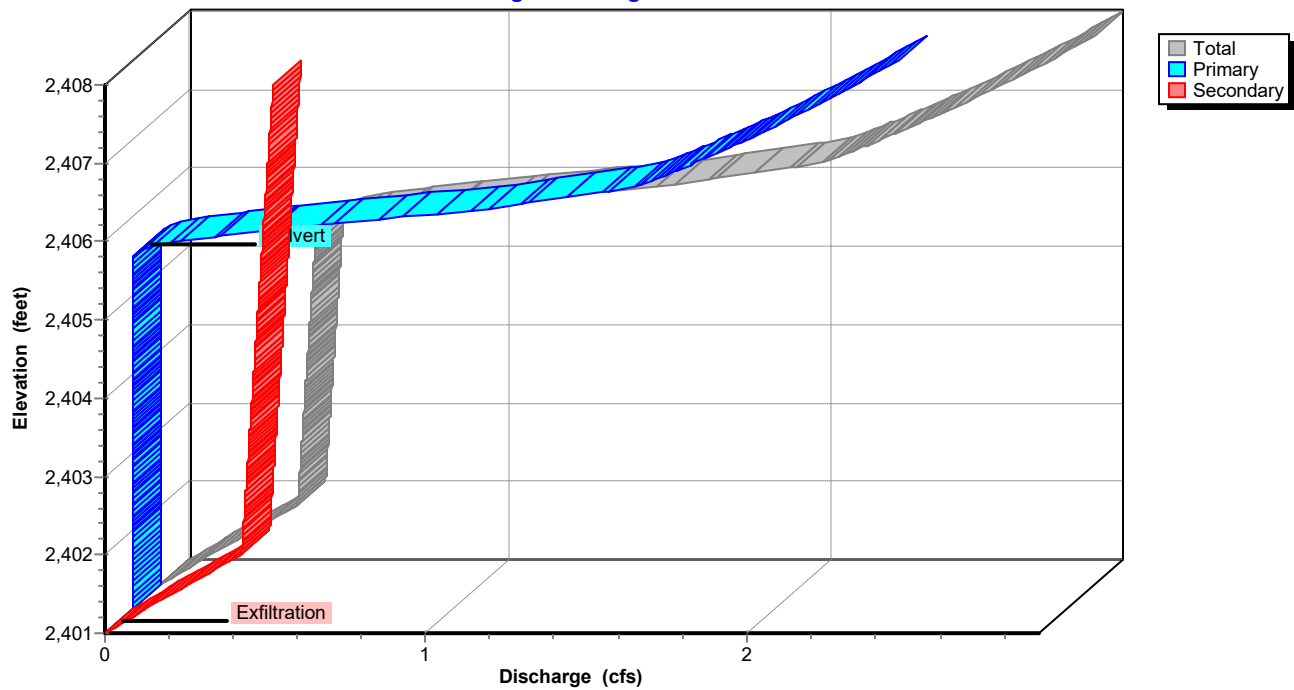
Pond 2P: BASIN 1

Hydrograph



Pond 2P: BASIN 1

Stage-Discharge



Lancaster Flood Routing

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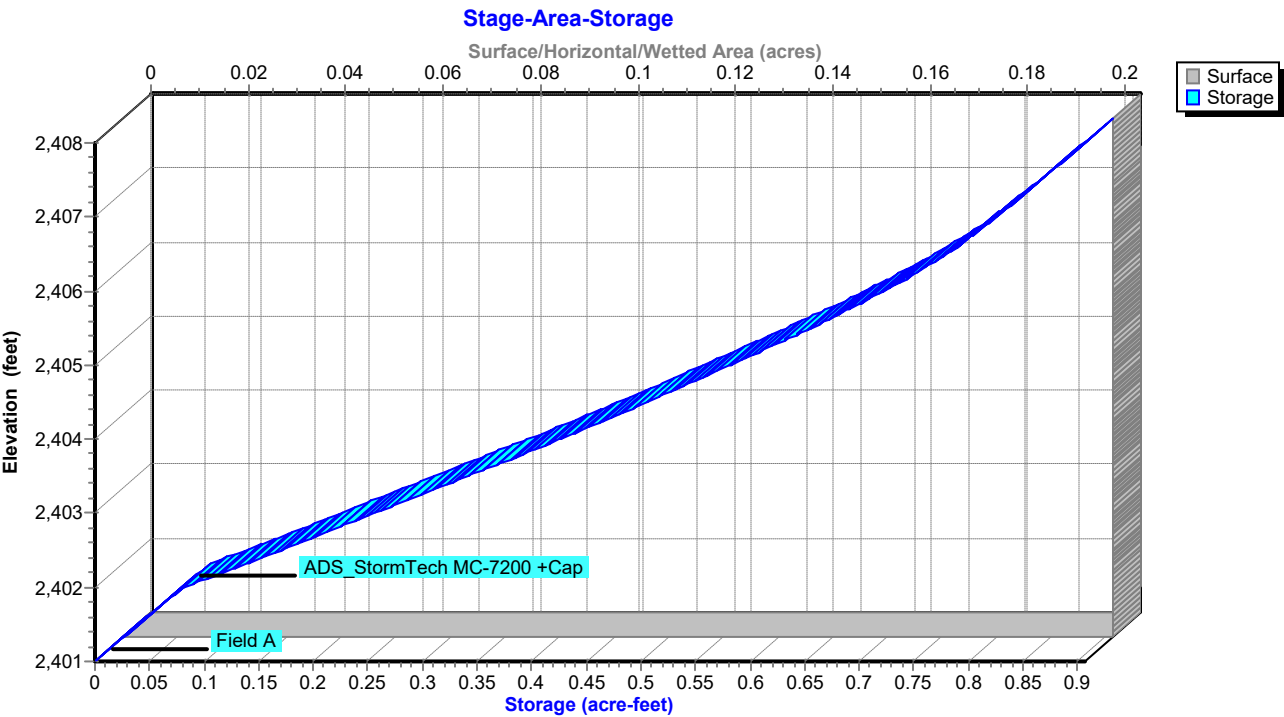
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Pond 2P: BASIN 1



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Hydrograph for Pond 2P: BASIN 1

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0.000	2,401.00	0.00	0.00	0.00
1.00	0.00	0.000	2,401.00	0.00	0.00	0.00
2.00	0.00	0.000	2,401.00	0.00	0.00	0.00
3.00	0.00	0.000	2,401.00	0.00	0.00	0.00
4.00	0.00	0.000	2,401.00	0.00	0.00	0.00
5.00	0.00	0.000	2,401.00	0.00	0.00	0.00
6.00	0.00	0.000	2,401.00	0.00	0.00	0.00
7.00	0.00	0.000	2,401.00	0.00	0.00	0.00
8.00	0.00	0.000	2,401.00	0.00	0.00	0.00
9.00	0.05	0.001	2,401.01	0.00	0.00	0.00
10.00	0.19	0.008	2,401.10	0.04	0.00	0.04
11.00	0.63	0.031	2,401.38	0.16	0.00	0.16
12.00	6.95	0.631	2,405.33	0.48	0.00	0.48
13.00	1.55	0.744	2,406.17	1.72	1.23	0.49
14.00	0.97	0.719	2,405.98	1.28	0.79	0.49
15.00	0.79	0.702	2,405.84	0.94	0.46	0.49
16.00	0.62	0.690	2,405.76	0.75	0.27	0.49
17.00	0.55	0.682	2,405.69	0.64	0.15	0.49
18.00	0.49	0.675	2,405.64	0.57	0.09	0.49
19.00	0.42	0.667	2,405.59	0.52	0.03	0.49
20.00	0.36	0.658	2,405.52	0.49	0.00	0.48
21.00	0.34	0.647	2,405.44	0.48	0.00	0.48
22.00	0.33	0.635	2,405.36	0.48	0.00	0.48
23.00	0.32	0.622	2,405.27	0.48	0.00	0.48
24.00	0.15	0.608	2,405.17	0.48	0.00	0.48
25.00	0.00	0.569	2,404.91	0.47	0.00	0.47
26.00	0.00	0.530	2,404.66	0.47	0.00	0.47
27.00	0.00	0.492	2,404.41	0.47	0.00	0.47
28.00	0.00	0.453	2,404.17	0.46	0.00	0.46
29.00	0.00	0.415	2,403.94	0.46	0.00	0.46
30.00	0.00	0.378	2,403.71	0.45	0.00	0.45
31.00	0.00	0.340	2,403.49	0.45	0.00	0.45
32.00	0.00	0.303	2,403.27	0.45	0.00	0.45
33.00	0.00	0.266	2,403.06	0.44	0.00	0.44
34.00	0.00	0.230	2,402.85	0.44	0.00	0.44

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Stage-Discharge for Pond 2P: BASIN 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
2,401.00	0.00	0.00	0.00	2,406.20	1.77	1.27	0.50
2,401.10	0.04	0.00	0.04	2,406.30	1.93	1.44	0.50
2,401.20	0.08	0.00	0.08	2,406.40	2.07	1.58	0.50
2,401.30	0.12	0.00	0.12	2,406.50	2.14	1.64	0.50
2,401.40	0.17	0.00	0.17	2,406.60	2.20	1.70	0.50
2,401.50	0.21	0.00	0.21	2,406.70	2.26	1.76	0.50
2,401.60	0.25	0.00	0.25	2,406.80	2.32	1.81	0.51
2,401.70	0.29	0.00	0.29	2,406.90	2.38	1.87	0.51
2,401.80	0.34	0.00	0.34	2,407.00	2.43	1.92	0.51
2,401.90	0.38	0.00	0.38	2,407.10	2.48	1.97	0.51
2,402.00	0.43	0.00	0.43	2,407.20	2.54	2.02	0.51
2,402.10	0.43	0.00	0.43	2,407.30	2.59	2.07	0.51
2,402.20	0.43	0.00	0.43	2,407.40	2.64	2.12	0.51
2,402.30	0.43	0.00	0.43	2,407.50	2.68	2.17	0.52
2,402.40	0.43	0.00	0.43	2,407.60	2.73	2.21	0.52
2,402.50	0.43	0.00	0.43	2,407.70	2.78	2.26	0.52
2,402.60	0.44	0.00	0.44	2,407.80	2.82	2.30	0.52
2,402.70	0.44	0.00	0.44	2,407.90	2.87	2.35	0.52
2,402.80	0.44	0.00	0.44	2,408.00	2.91	2.39	0.52
2,402.90	0.44	0.00	0.44				
2,403.00	0.44	0.00	0.44				
2,403.10	0.44	0.00	0.44				
2,403.20	0.45	0.00	0.45				
2,403.30	0.45	0.00	0.45				
2,403.40	0.45	0.00	0.45				
2,403.50	0.45	0.00	0.45				
2,403.60	0.45	0.00	0.45				
2,403.70	0.45	0.00	0.45				
2,403.80	0.46	0.00	0.46				
2,403.90	0.46	0.00	0.46				
2,404.00	0.46	0.00	0.46				
2,404.10	0.46	0.00	0.46				
2,404.20	0.46	0.00	0.46				
2,404.30	0.46	0.00	0.46				
2,404.40	0.47	0.00	0.47				
2,404.50	0.47	0.00	0.47				
2,404.60	0.47	0.00	0.47				
2,404.70	0.47	0.00	0.47				
2,404.80	0.47	0.00	0.47				
2,404.90	0.47	0.00	0.47				
2,405.00	0.48	0.00	0.48				
2,405.10	0.48	0.00	0.48				
2,405.20	0.48	0.00	0.48				
2,405.30	0.48	0.00	0.48				
2,405.40	0.48	0.00	0.48				
2,405.50	0.48	0.00	0.48				
2,405.60	0.53	0.04	0.49				
2,405.70	0.65	0.17	0.49				
2,405.80	0.84	0.36	0.49				
2,405.90	1.08	0.59	0.49				
2,406.00	1.34	0.85	0.49				
2,406.10	1.58	1.09	0.49				

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Stage-Area-Storage for Pond 2P: BASIN 1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
2,401.00	0.203	0.000	2,406.20	0.203	0.747
2,401.10	0.203	0.008	2,406.30	0.203	0.759
2,401.20	0.203	0.016	2,406.40	0.203	0.770
2,401.30	0.203	0.024	2,406.50	0.203	0.781
2,401.40	0.203	0.033	2,406.60	0.203	0.790
2,401.50	0.203	0.041	2,406.70	0.203	0.800
2,401.60	0.203	0.049	2,406.80	0.203	0.809
2,401.70	0.203	0.057	2,406.90	0.203	0.817
2,401.80	0.203	0.065	2,407.00	0.203	0.825
2,401.90	0.203	0.073	2,407.10	0.203	0.834
2,402.00	0.203	0.081	2,407.20	0.203	0.842
2,402.10	0.203	0.099	2,407.30	0.203	0.850
2,402.20	0.203	0.117	2,407.40	0.203	0.858
2,402.30	0.203	0.134	2,407.50	0.203	0.866
2,402.40	0.203	0.152	2,407.60	0.203	0.874
2,402.50	0.203	0.170	2,407.70	0.203	0.882
2,402.60	0.203	0.187	2,407.80	0.203	0.890
2,402.70	0.203	0.204	2,407.90	0.203	0.899
2,402.80	0.203	0.222	2,408.00	0.203	0.907
2,402.90	0.203	0.239			
2,403.00	0.203	0.257			
2,403.10	0.203	0.274			
2,403.20	0.203	0.291			
2,403.30	0.203	0.308			
2,403.40	0.203	0.325			
2,403.50	0.203	0.342			
2,403.60	0.203	0.359			
2,403.70	0.203	0.375			
2,403.80	0.203	0.392			
2,403.90	0.203	0.409			
2,404.00	0.203	0.425			
2,404.10	0.203	0.441			
2,404.20	0.203	0.458			
2,404.30	0.203	0.474			
2,404.40	0.203	0.490			
2,404.50	0.203	0.506			
2,404.60	0.203	0.521			
2,404.70	0.203	0.537			
2,404.80	0.203	0.552			
2,404.90	0.203	0.568			
2,405.00	0.203	0.583			
2,405.10	0.203	0.598			
2,405.20	0.203	0.612			
2,405.30	0.203	0.627			
2,405.40	0.203	0.641			
2,405.50	0.203	0.655			
2,405.60	0.203	0.669			
2,405.70	0.203	0.683			
2,405.80	0.203	0.696			
2,405.90	0.203	0.709			
2,406.00	0.203	0.722			
2,406.10	0.203	0.735			

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PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	



LANCASTER-001

LANCASTER, CA, USA

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-7200.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS 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 LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
 - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
 - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

- STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 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 AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 9" (230 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 OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
- 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.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

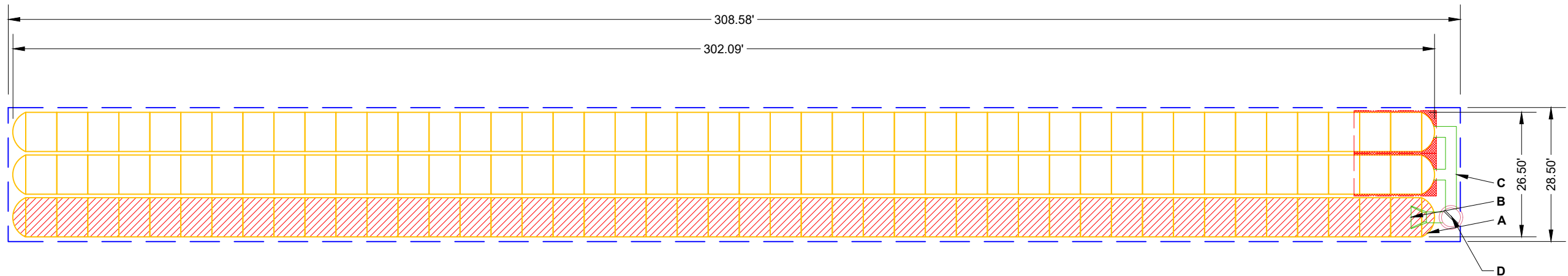
NOTES FOR CONSTRUCTION EQUIPMENT

- STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
- THE USE OF EQUIPMENT OVER MC-7200 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-7200 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-7200 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 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS:		*INVERT ABOVE BASE OF CHAMBER				
				PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
135	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	12.75	PREFABRICATED END CAP	A	24" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP24B / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.26"	
6	STORMTECH MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	8.25					
12	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	7.75					
9	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	7.75					
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	7.75	FLAMP	B	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MCFLAMP		
38136	INSTALLED SYSTEM VOLUME (CF)	TOP OF STONE:	6.75	MANIFOLD	C	24" x 24" BOTTOM MANIFOLD, ADS N-12	2.26"	19.0 CFS IN
	(PERIMETER STONE INCLUDED)	TOP OF MC-7200 CHAMBER:	5.75	CONCRETE STRUCTURE W/WEIR	D	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		
	(COVER STONE INCLUDED)	24" x 24" BOTTOM MANIFOLD INVERT:	0.94					
	(BASE STONE INCLUDED)	24" ISOLATOR ROW PLUS INVERT:	0.94					
8794	SYSTEM AREA (SF)	BOTTOM OF MC-7200 CHAMBER:	0.75					
674.2	SYSTEM PERIMETER (ft)	BOTTOM OF STONE:	0.00					



- | | |
|---|---|
|  | ISOLATOR ROW PLUS
(SEE DETAIL) |
|  | PLACE MINIMUM 17.50' OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING
STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL
CHAMBER INLET ROWS |

— — BED LIMITS

NOTES

- NOTES
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
 - **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

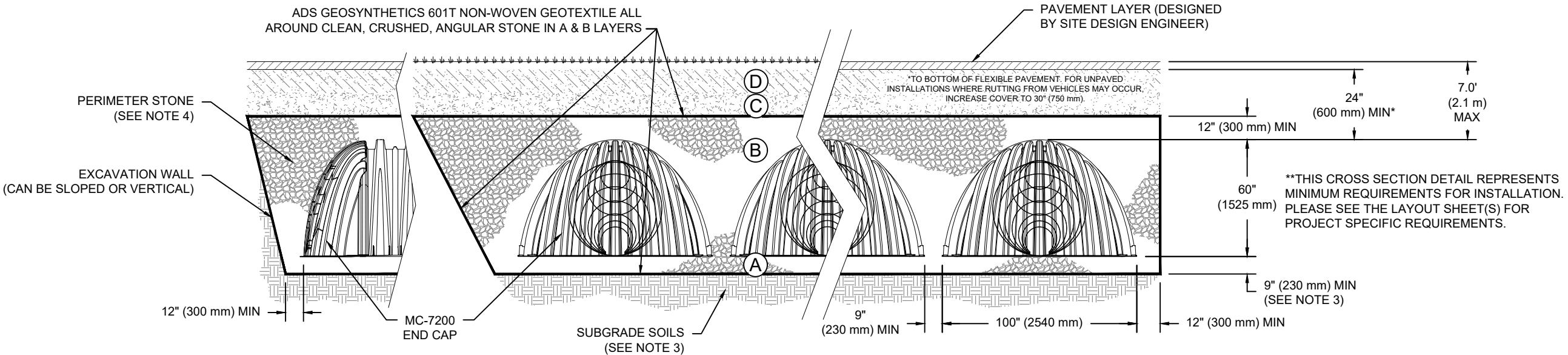
 4640 TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473		StormTech® Chamber System 1-800-821-6710 WWW.STORMTECH.COM		<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																																																																						LANCASTER-001 LANCASTER, CA, USA	
				DATE: 04/22/2025		DRAWN: CR																																																																																					
				PROJECT #:		CHECKED: N/A																																																																																					
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS/STORMTECH UNDER THE DIRECTION OF THE PROJECT'S ENGINEER OF RECORD (TEOR) OR OTHER PROJECT REPRESENTATIVE. THIS DRAWING IS NOT INTENDED FOR USE IN BIDDING OR CONSTRUCTION WITHOUT THE EOR'S PRIOR APPROVAL. EOR SHALL REVIEW THIS DRAWING PRIOR TO BIDDING AND/OR CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE EOR TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.																																																																																											
SHEET 2 OF 5																																																																																											

ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

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

PLEASE NOTE:

1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. 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.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-7200 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. 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. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

LANCASTER-001

LANCASTER, CA, USA

DATE: 04/22/2025

PROJECT #:	CHECKED: N/A
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DESCRIPTION

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Chamber System

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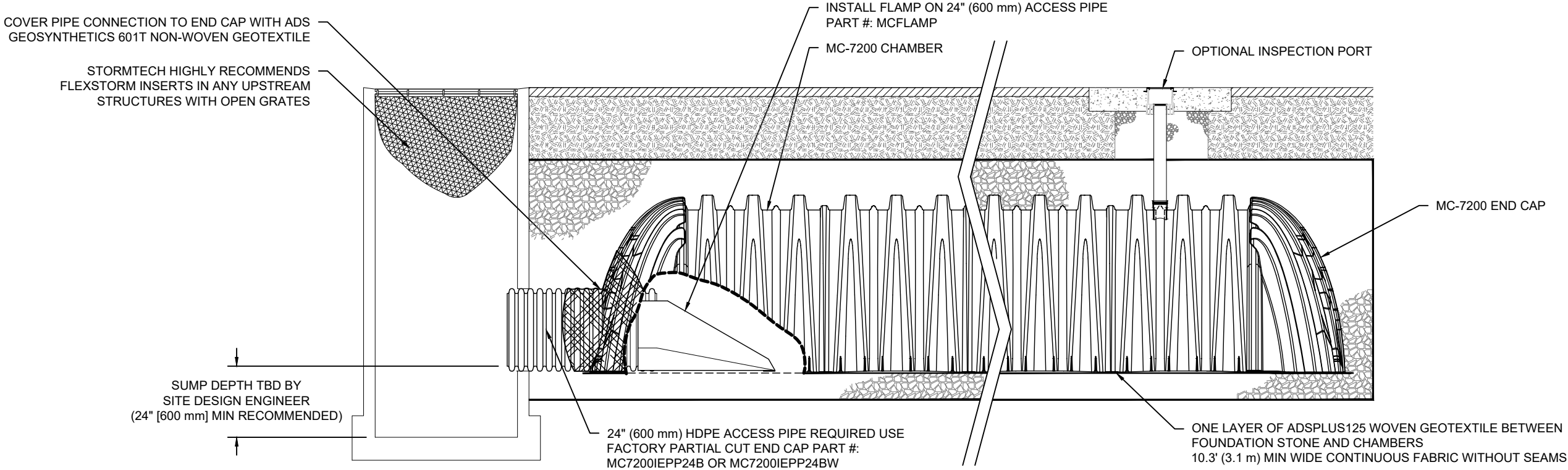
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HILLIARD, OH 43026
1-800-733-7473



ALLS REGULATIONS, AND PROJECT REQUIREMENTS.

SHEET

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MC-7200 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
 - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
 - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
 - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
 - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
 - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
 - B. ALL ISOLATOR PLUS ROWS
 - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
 - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
 - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
 - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
 - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
 - B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
 - C. VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

LANCASTER-001

LANCASTER, CA, USA

DATE: 04/22/2025

DRAWN: CR

PROJECT #:

CHECKED: N/A

DESCRIPTION

CHK

DRW

DATE

StormTech®
Chamber System

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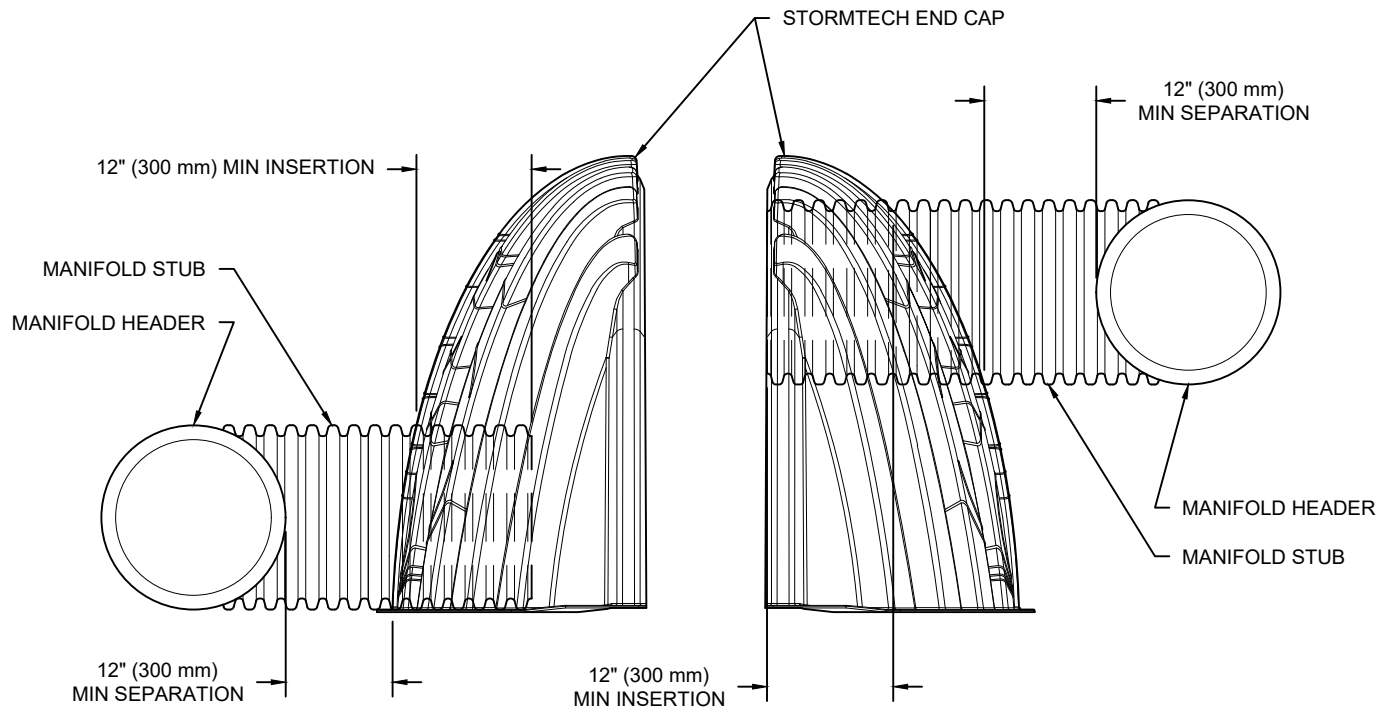


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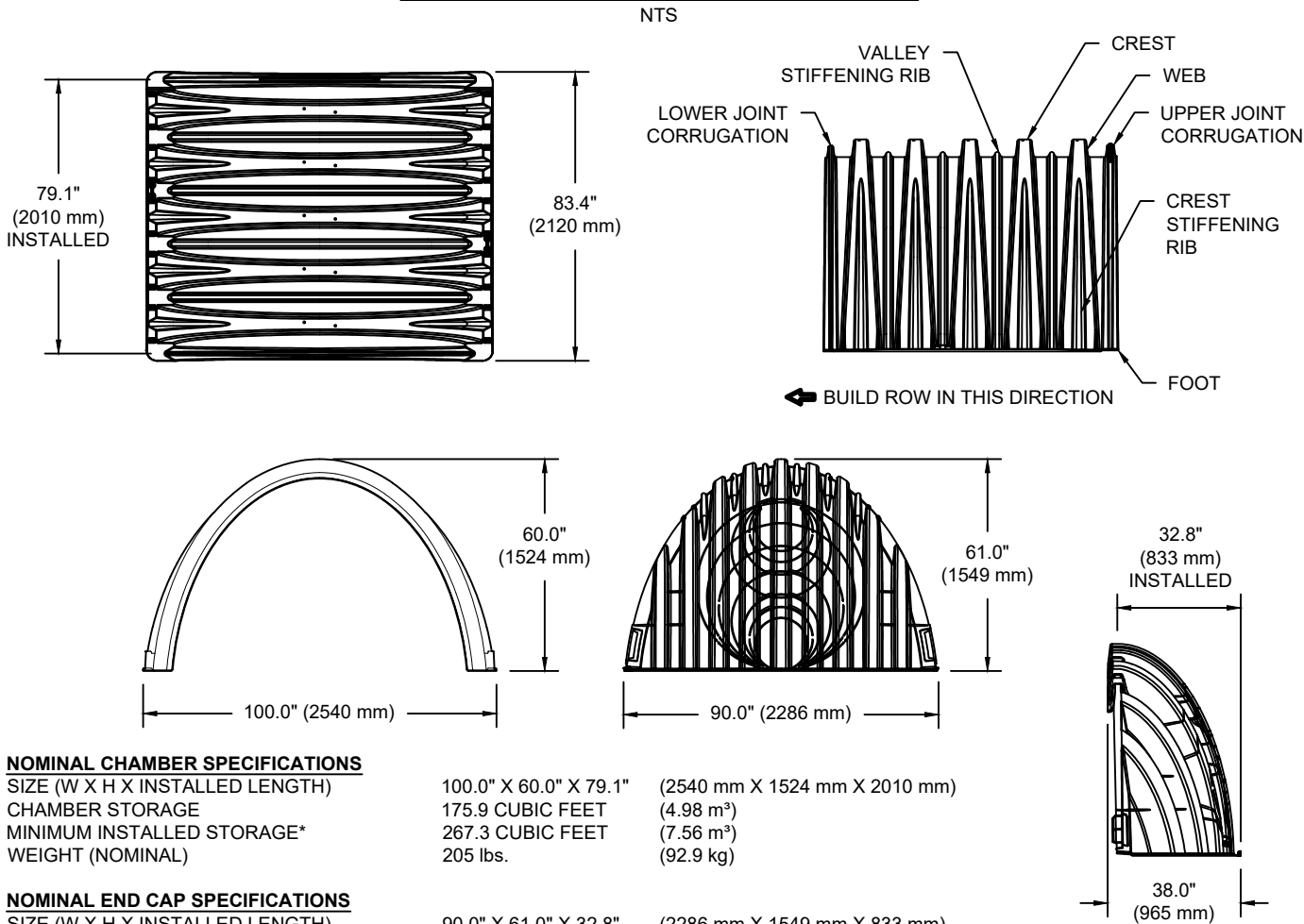
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MC-SERIES END CAP INSERTION DETAIL



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

MC-7200 TECHNICAL SPECIFICATION



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

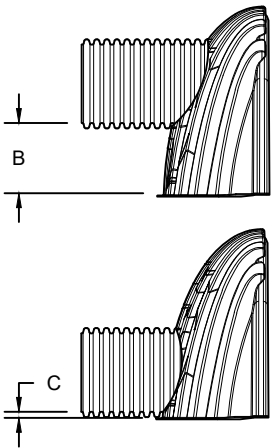
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

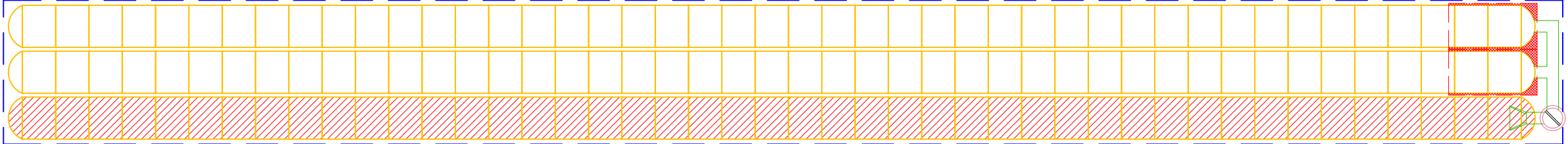
PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC7200IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC7200IEPP06B		---	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B		---	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B		---	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC7200IEPP12B		---	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B		---	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEPP18TW		---	1.97" (50 mm)
MC7200IEPP18B			
MC7200IEPP18BW		24" (600 mm)	23.05" (585 mm)
MC7200IEPP24T			
MC7200IEPP24TW	---		2.26" (57 mm)
MC7200IEPP24B			
MC7200IEPP24BW	30" (750 mm)	---	2.95" (75 mm)
MC7200IEPP30BW	36" (900 mm)	---	3.25" (83 mm)
MC7200IEPP36BW	42" (1050 mm)	---	3.55" (90 mm)

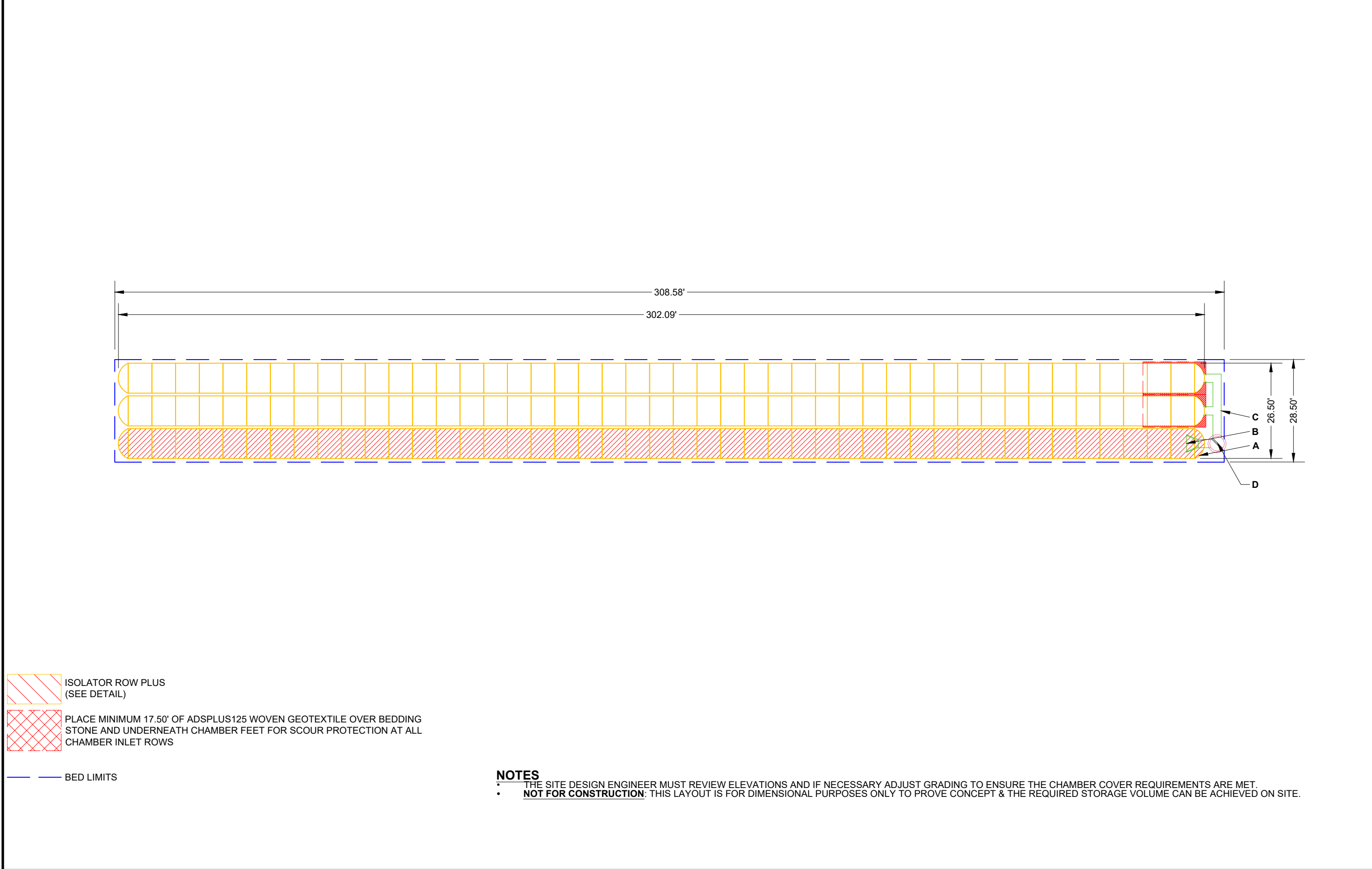
NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PREFABRICATED 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-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

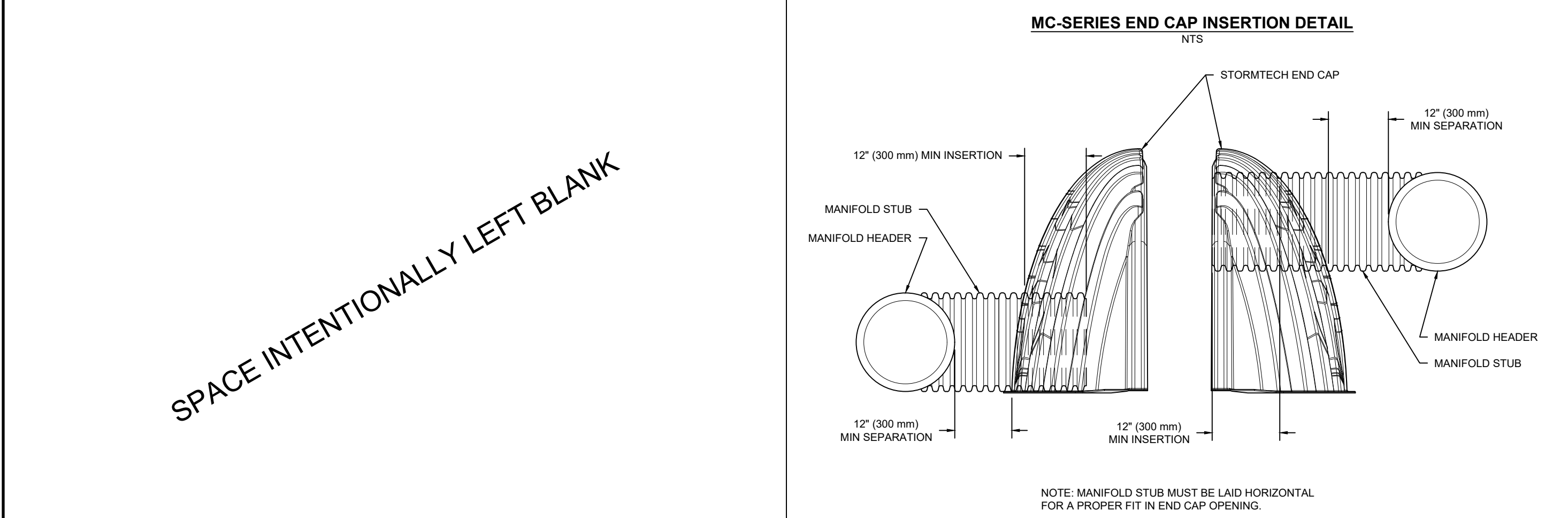


PROPOSED LAYOUT			CONCEPTUAL ELEVATIONS:		PART TYPE		ITEM ON LAYOUT	DESCRIPTION	INVERT	MAX FLOW
135	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)	12.75							
6	STORMTECH MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TR&F)	8.25							
12	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)	7.75						2.26'	
9	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT)	7.75							
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)	7.75							
	INSTALLED SYSTEM VOLUME (CF)	TOP OF STONE	6.75						2.26'	
38136	(PERIMETER STONE INCLUDED)	TOP OF MC-7200 CHAMBER	5.75							
	(COVER STONE INCLUDED)	24" x 24" BOTTOM MANIFOLD INVERT	0.94							
	(BASE STONE INCLUDED)	24" ISOLATOR ROW PLUS INVERT	0.94							
8794	SYSTEM AREA (SF)	BOTTOM OF MC-7200 CHAMBER	0.75							
674.2	SYSTEM PERIMETER (ft)	BOTTOM OF STONE	0.00							19.0 CFS IN



INSPECTION & MAINTENANCE	
STEP 1)	INSPECT ISOLATOR ROW PLUS FOR SEDIMENT A. INSPECTION PORTS (IF PRESENT) A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN A.2. REMOVE AND CLEAN FLEXISTORM FILTER IF INSTALLED A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL) A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3. B. ALL ISOLATOR PLUS ROWS B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3. STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLOSH WATER IS CLEAN C. VACUUM STRUCTURE SUMP AS REQUIRED STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS. STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.
NOTES	1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS. 2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

3	MC-7200 ISOLATOR ROW PLUS DETAIL
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4	MC-SERIES END CAP INSERTION DETAIL
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MC-7200 TECHNICAL SPECIFICATION

NOMINAL CHAMBER SPECIFICATIONS		
SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m ³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m ³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)
NOMINAL END CAP SPECIFICATIONS		
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	36.6 CUBIC FEET	(1.12 m ³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m ³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC7200IEPP06T	---	42.54" (1081 mm)	---
MC7200IEPP06B	6" (150 mm)	---	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B	---	---	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B	---	---	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC7200IEPP12B	---	---	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B	---	---	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEPP18W	---	---	1.97" (50 mm)
MC7200IEPP18B	---	---	---
MC7200IEPP18BW	---	---	---
MC7200IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC7200IEPP24W	---	---	---
MC7200IEPP24B	---	---	2.26" (57 mm)
MC7200IEPP24BW	---	---	---
MC7200IEPP30B	30" (750 mm)	---	2.95" (75 mm)
MC7200IEPP36B	36" (900 mm)	---	3.25" (83 mm)
MC7200IEPP42B	42" (1050 mm)	---	3.55" (90 mm)

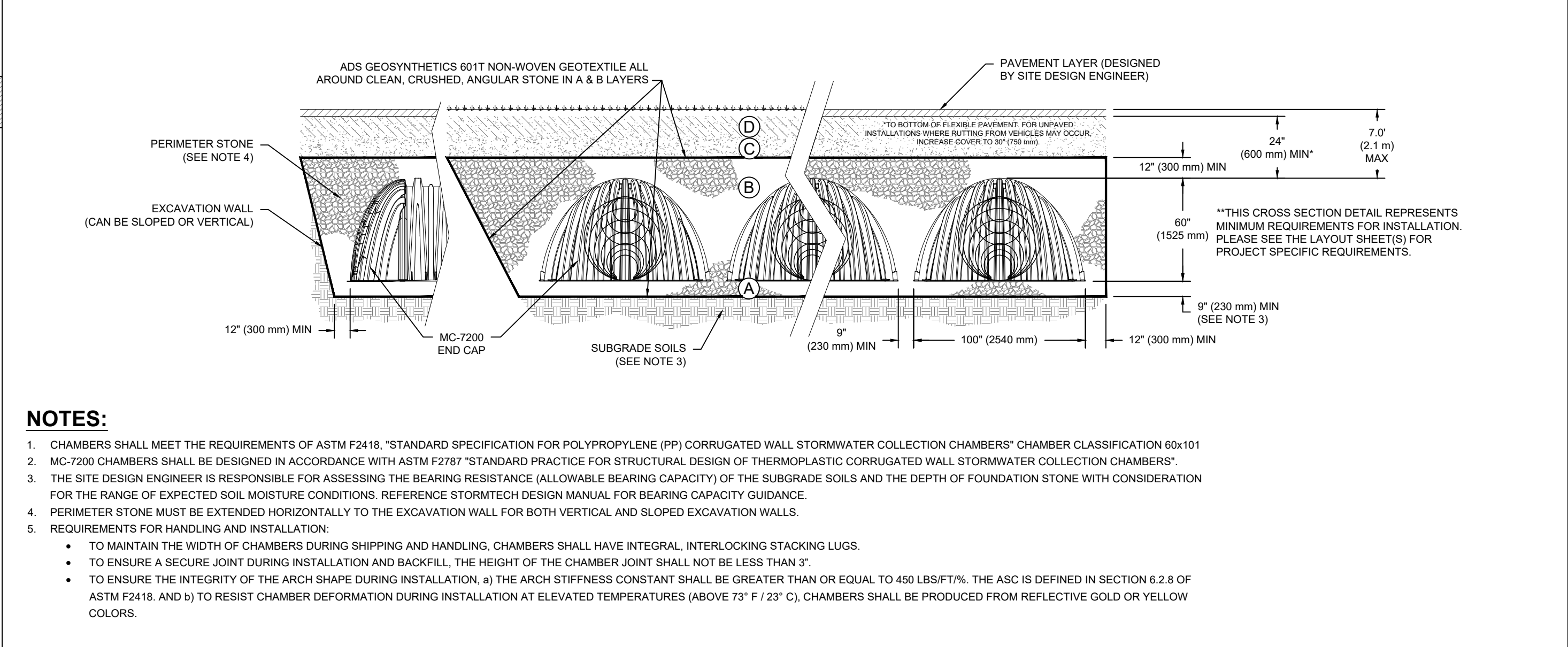
NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) SIZE. ECCENTRIC MANIFOLDS, CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

2

MC-7200 TECHNICAL SPECIFICATION

ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS			
MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE ¹	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE ¹	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE ^{2,3}



1	MC-7200 CROSS SECTION DETAIL
---	------------------------------

 4640 TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473	StormTech® Chamber System 1-800-821-6710 WWW.STORMTECH.COM	LANCASTER-001		DRAWN: CR	DATE: 04/22/2025
		LANCASTER, CA, USA		CHECKED: N/A	PROJECT #:
				REV:	NOT TO SCALE
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS/STORMTECH UNDER THE DIRECTION OF THE PROJECT'S ENGINEER OF RECORD ("EOR") OR OTHER PROJECT REPRESENTATIVE. THIS DRAWING IS NOT INTENDED FOR USE IN BIDDING OR CONSTRUCTION WITHOUT THE EOR'S PRIOR APPROVAL. EOR SHALL REVIEW THIS DRAWING PRIOR TO BIDDING AND/OR CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE EOR TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.					
SHEET					
1 OF 1					

APPENDIX D

Hydraulic Calculations – Pipes, Gutters, and Inlets

WIL BE PROVIDED IN FINAL



APPENDIX E

Reference Material



<https://gispublic.waterboards.ca.gov/portal/apps/webappviewer/index.html?id=e2def63cce54eedbee4ad726ab1552c>

CALIFORNIA WATER BOARDS
State Water Resources Control Board

California 2018 Integrated Report

About the Integrated Report

+
-

▼

43228 16th St W, Lancaster X

Show search results for 43228 ...

Regional_Board_Boundaries: Lahontan

Regional Board 6

Regional Board Name Lahontan

[Zoom to](#) ...

W Avenue L

600ft

MI Ranchito

About

Welcome to the 2018 California Integrated Report Map!

Map Layers and Table:

- **2018 Integrated Report Streams, Rivers, and Beaches:** Spatial representation of the assessed linear waterbodies in California.
- **2018 Integrated Report Lakes, Bays, and Reservoirs:** Spatial representation of the non-linear (polygon) waterbodies in California.
- **Regional Water Board Boundaries:** Spatial boundaries of the Regional Water Quality Control Boards

The layers can also be accessed and downloaded [here](#).

How to Use the Map:

- Navigate to your point of interest by either using the search bar in the upper left-hand corner of the map or by zooming in on the map. You may enter a waterbody name or address into the search bar.
- Click on a waterbody of interest, such as a river, lake, or beach, and a pop-up box will appear with a summary of the pollutant assessments conducted for that waterbody.
- Select the ellipsis ("...") in a pop-up window or the layers to view the attribute table. This table can be further filtered and exported in a tabular format.
- Click on the layers icon in the upper right hand corner to toggle map layers on and off.
- Click on the filter button in the upper right corner to filter for a specific Regional Board and to select for 303(d) listed waterbodies only. Note, this should be done for both layers.
- More details on each waterbody can be found by scrolling to the bottom of a waterbody pop-up and selecting "Waterbody Fact Sheet- More information".

Pop Up Description:

- **WBID:** Unique identifier for each waterbody used in the Integrated Report.
- **Waterbody Name:** Name of the mapped waterbody assessed for the Integrated Report.
- **Waterbody Type:** Type of water (Coastal & Bay Shoreline, Freshwater Wetland, Tidal Wetland, Saline Lake, River & Stream, Ocean, Lake and Reservoir, Estuary, and Bay & Harbor).
- **Regional Board:** Which Regional Water Quality Control Board has jurisdiction over the waterbody.
- **Waterbody Condition Category:** Integrated Report 305(b) Category for the waterbody.
- **Waterbody Listing Status:** If the waterbody has been placed on the 303(d) list as impaired for one or more pollutant, it will be identified as "Listed". If it was assessed for one or more pollutant and not determined to be impaired, it will be identified as "Not Listed".

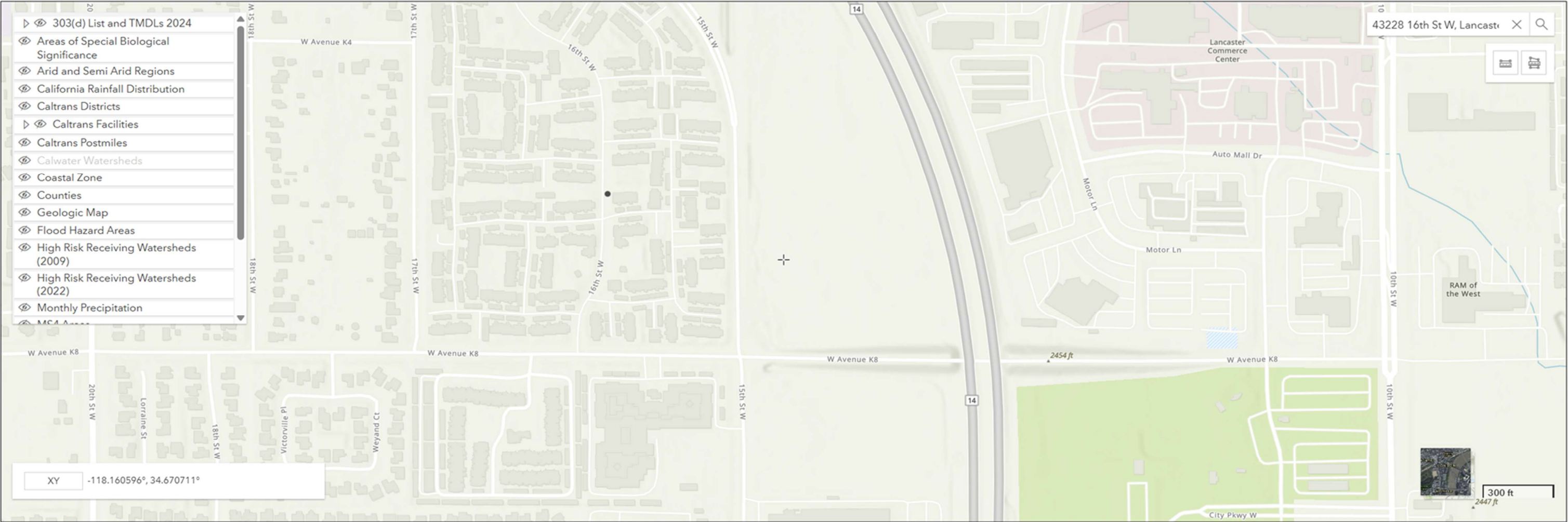
CALTRANS WATER QUALITY PLANNING TOOL

http://svctenvims.dot.ca.gov/wqpt/wqpt.aspx



Caltrans Water Quality Planning Tool

The Water Quality Planning Tool was created to help planners and designers comply with environmental permits. It uses a map interface to find information based on a project's location. This application is being updated for digital accessibility and will continue to function while updates are in progress.



Caltrans Postmiles

County:

Watershed Information

CALWATER WATERSHED

Hydrologic Unit	ANTELOPE	Hydrologic Area	Lancaster	Hydrologic Sub-Area #	626.50
Hydrologic Sub-Area Name	undefined	Planning Watershed	9626500000	HSA Area (acres)	557620
Latitude, Longitude	34.66877, -118.15616				

Caltrans Postmiles

County:

Watershed Information

CALWATER WATERSHED

Hydrologic Unit	ANTELOPE	Hydrologic Area	Lancaster	Hydrologic Sub-Area #	626.50
Hydrologic Sub-Area Name	undefined	Planning Watershed	9626500000	HSA Area (acres)	557620
Latitude, Longitude	34.66893, -118.15538				

WATERSHED BOUNDARY DATASET

Watershed	Amargosa Creek	Subwatershed	Upper Amargosa Creek	Hydrologic Unit Code	180902061406
Average Annual Precipitation (inches)	9.21				

TMDLs & 303(d) Listed Water Bodies (2024 List)

Key: Water body on 303(d) list Water body with a TMDL

Name	Pollutant	Size	Sources	Status
Palmdale Lake	Dieldrin	226.2 Acres	A Source Unknown	TMDL required

Water Quality Objectives

The following waterbodies are in or near HSA 626.50. Click on the waterbody to get information on water quality objectives and beneficial uses

Waterbody Name	Beneficial Uses	Sediment-Sensitive Waterbody
Agua Dulce Canyon Creek	AGR, FRSH, GWR, IND, MUN, PROC, RARE, REC1, REC2, WARM, WILD	False
Aliso Canyon Creek	AGR, GWR, MUN, REC1, REC2, WARM, WET, WILD	False
Agua Dulce Canyon Creek	GWR, IND, PROC, RARE	False
Big Rock Creek	AGR, COLD, COMM, GWR, IND, MUN, REC1, REC2, SPWN, WILD	False
Bouquet Canyon	AGR, COLD, FRSH, GWR, IND, MUN, PROC, REC1, REC2, SPWN, WARM, WET, WILD	False
Buttes Hydrologic Area - Minor Surface Waters	AGR, GWR, MUN, REC1, REC2, WARM, WILD	False
Buttes Hydrologic Area - Minor Wetlands	AGR, FLD, FRSH, GWR, MUN, REC1, REC2, WARM, WILD, WQE	False
Castaic Creek	AGR, FRSH, GWR, IND, MUN, PROC, RARE, REC1, REC2, WARM, WILD	False
Castaic Lagoon	AGR, FRSH, GWR, IND, MUN, PROC, REC1, REC2, WARM, WILD	False
Castaic Lake	AGR, COLD, FRSH, GWR, IND, MUN, POW, PROC, RARE, REC1, REC2, SPWN, WARM, WILD	False
Chafee Hydrologic Area - Minor Surface Waters	AGR, GWR, MUN, REC1, REC2, WARM, WILD	False

WATERBOARDS:

https://www.waterboards.ca.gov/waterboards_map.html



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State Water Resources Control Board

BoardProgramsDrinking WaterWater QualityWater RightsNoticesWater BoardsSearch

- [State and Regional Water Boards Brochure \(.pdf\)](#)
- [California Regional Water Quality Control Boards](#) - A list of the Regional Boards, their addresses, main telephone and fax numbers.
- [Regional Water Quality Control Boards](#)

--Select--

To find the Regional Water Board for a particular location, click on the map or enter a street address below: (Example: "123 Main Street, Sacramento, CA" or "123 Main Street, 95814")

43228 16th St W, Lancaster, CA X

+

-

Home

Layers

Basemap

Regional Board: 6V / Lahontan

Address 15095 Amargosa Road, Bldg. 2, Suite 210

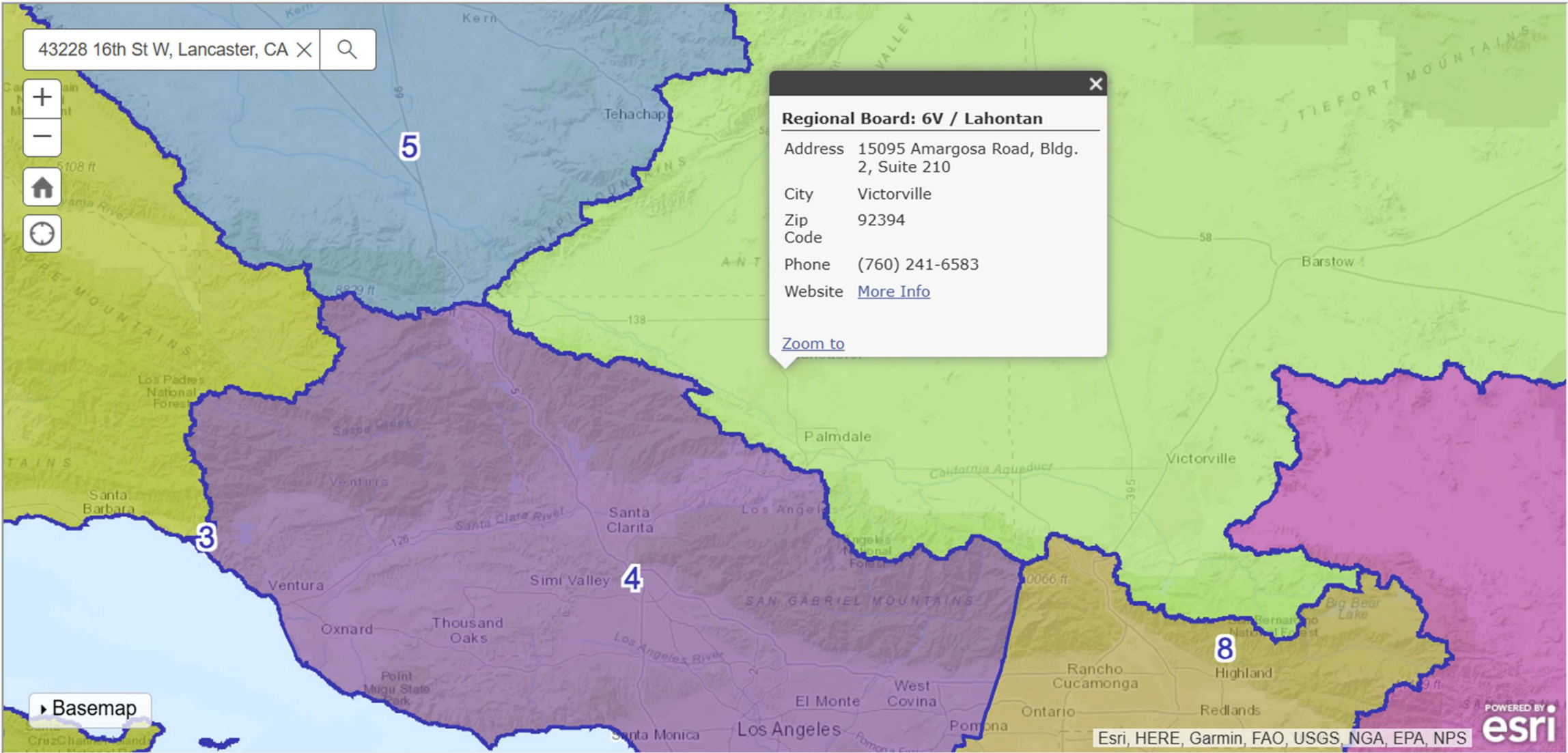
City Victorville

Zip Code 92394

Phone (760) 241-6583

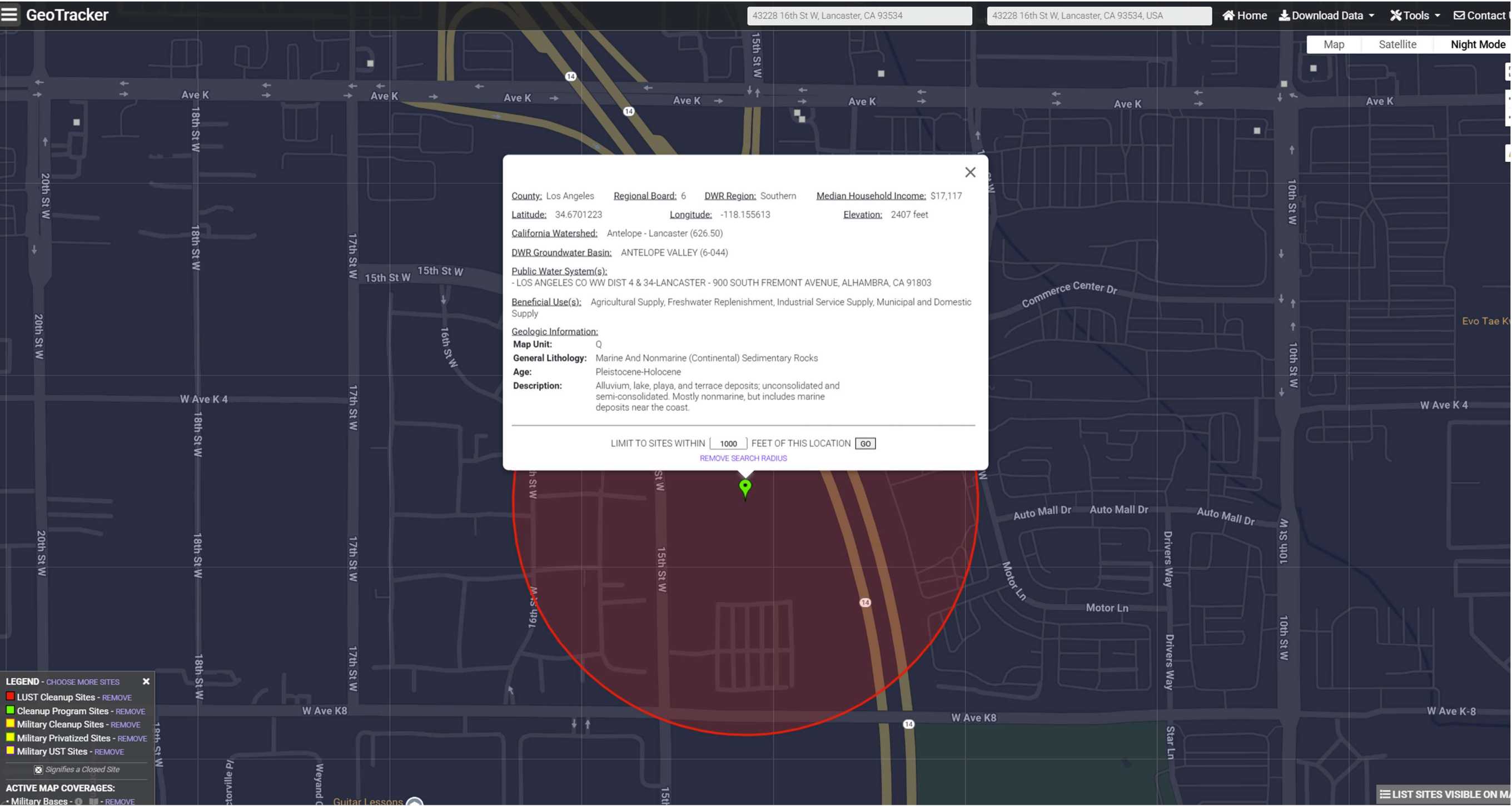
Website [More Info](#)

[Zoom to](#)



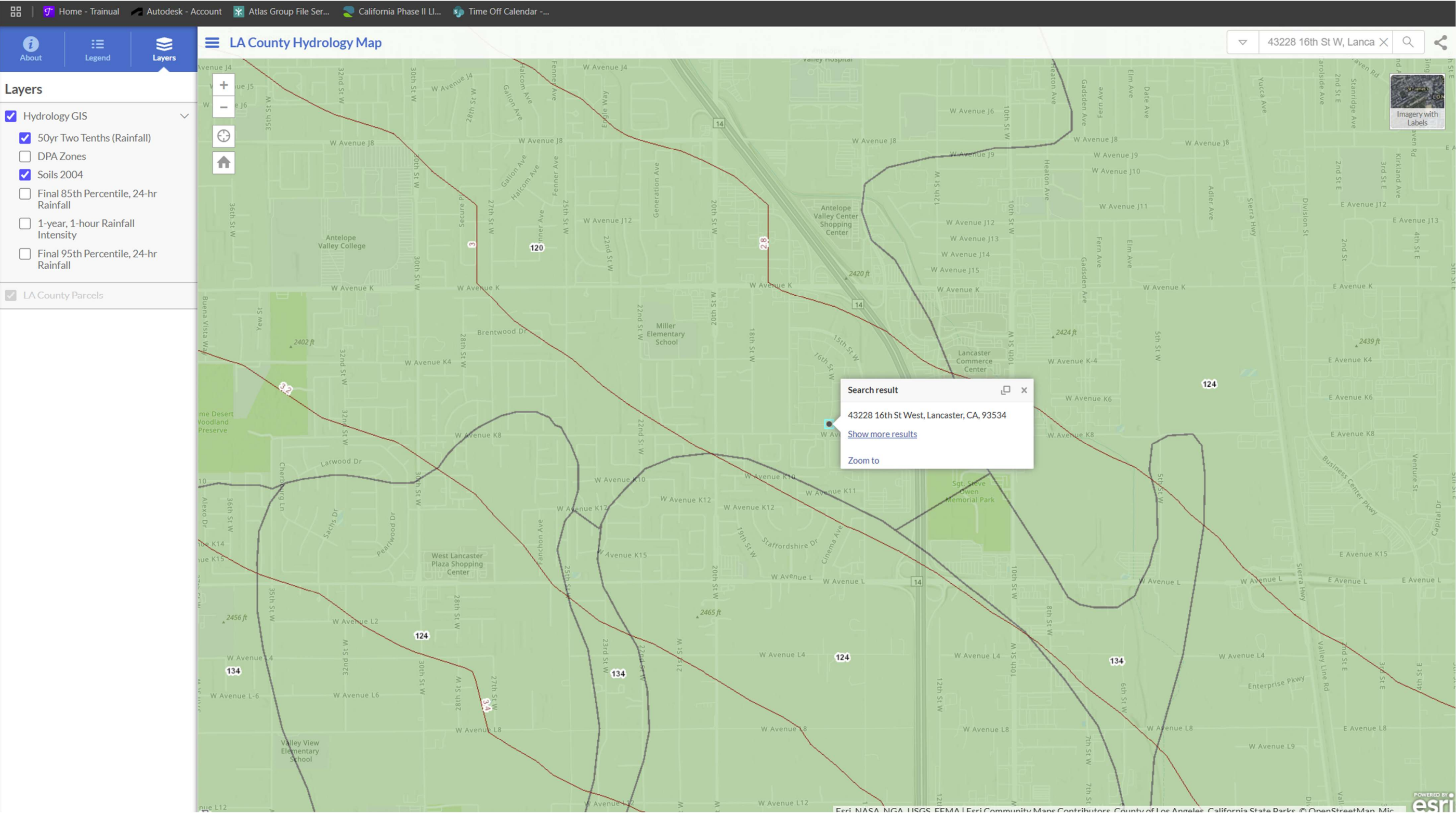
GEOTRACKER – STATE WATER BOARDS

https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=Search+GeoTracker



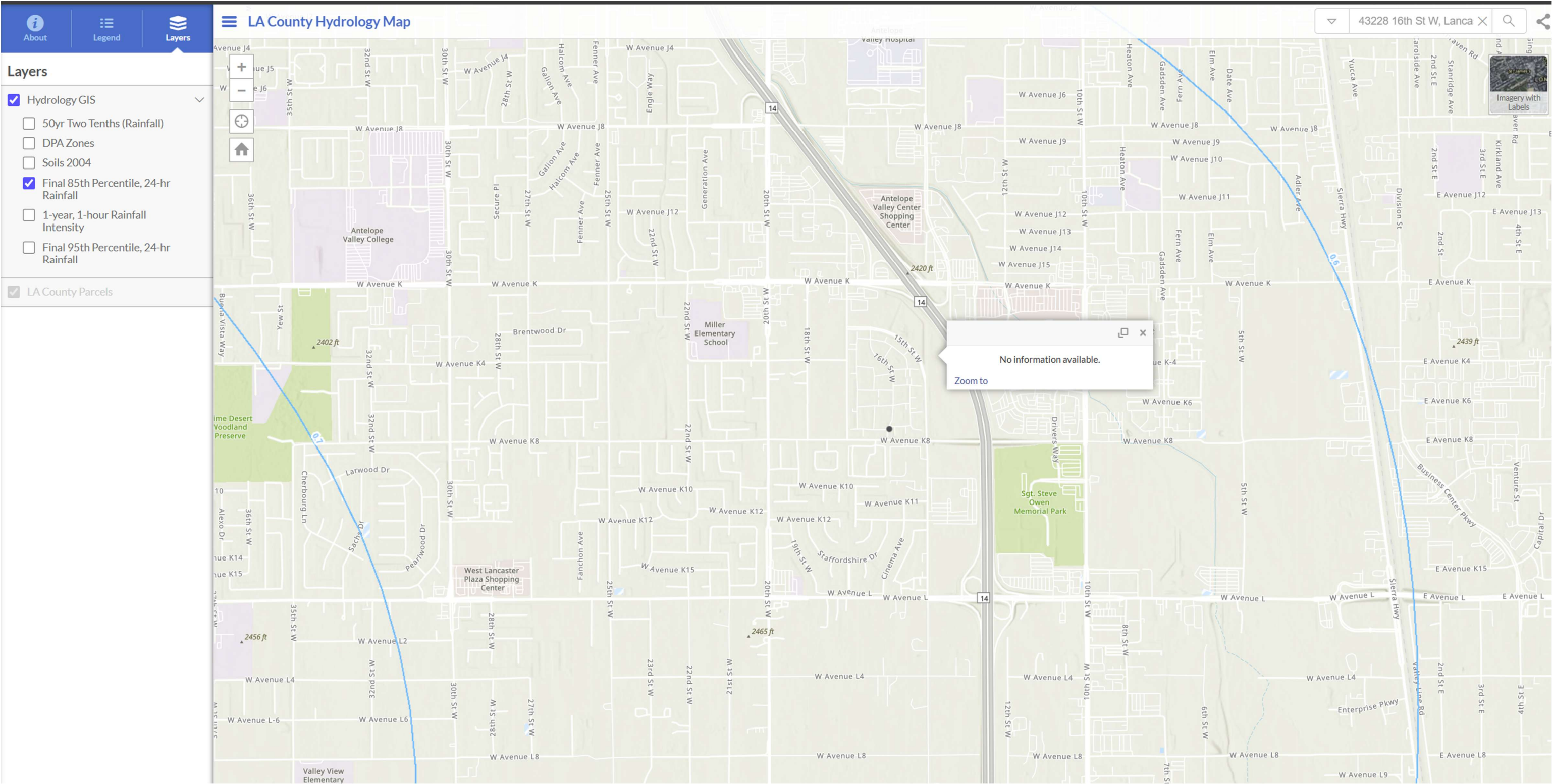
Los Angeles County Hydrology Manual - Soil: 124, 50 year = 3.0

https://dpw.lacounty.gov/wrd/hydrologygis/



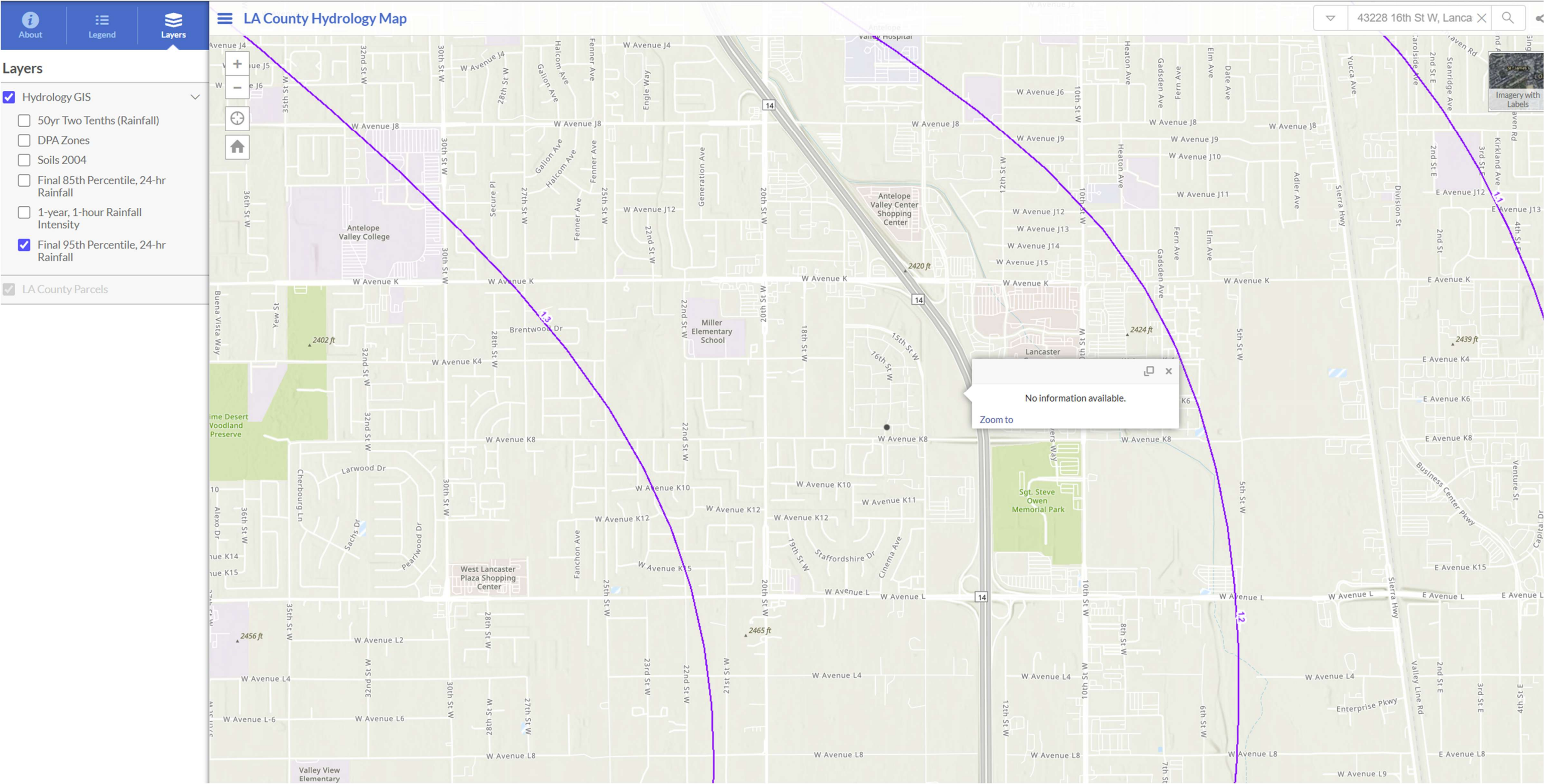
Los Angeles County Hydrology Manual

<https://dpw.lacounty.gov/wrd/hydrologygis/>



Los Angeles County Hydrology Manual

<https://dpw.lacounty.gov/wrd/hydrologygis/>



APPENDIX F

Infiltration Testing and Geotechnical Report





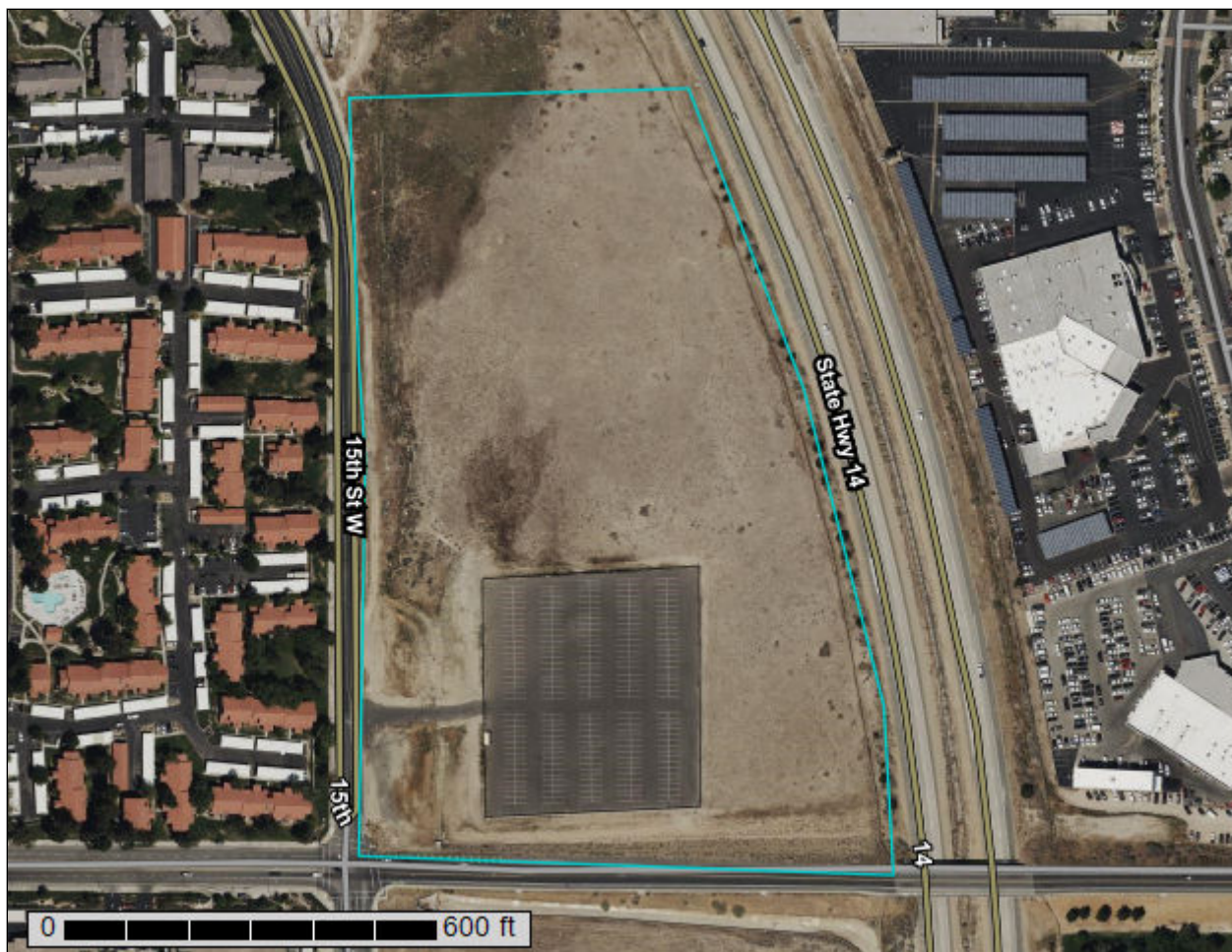
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Antelope Valley Area, California**



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Ro—Rosamond fine sandy loam.....	13
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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Antelope Valley Area, California
Survey Area Data: Version 17, Aug 30, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 14, 2022—Apr 23, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ro	Rosamond fine sandy loam	20.7	98.0%
Sw	Sunrise sandy loam, shallow	0.4	2.0%
Totals for Area of Interest		21.1	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Antelope Valley Area, California

Ro—Rosamond fine sandy loam

Map Unit Setting

National map unit symbol: hcgy
Elevation: 1,900 to 3,360 feet
Mean annual precipitation: 3 to 8 inches
Mean annual air temperature: 54 to 64 degrees F
Frost-free period: 210 to 270 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Rosamond and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rosamond

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 4 inches: fine sandy loam
C2 - 4 to 20 inches: very fine sandy loam
C3 - 20 to 28 inches: silty clay loam
C4 - 28 to 34 inches: sandy clay loam
C5 - 34 to 48 inches: loam
C6 - 48 to 61 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R030XG021CA - LOAMY 4-9"
Hydric soil rating: No

Minor Components

Cajon

Percent of map unit: 10 percent
Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R030XA038CA - Sandy Fan
Hydric soil rating: No

Hesperia

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R030XA038CA - Sandy Fan
Hydric soil rating: No

Sw—Sunrise sandy loam, shallow

Map Unit Setting

National map unit symbol: hchl
Elevation: 1,500 to 3,500 feet
Mean annual precipitation: 5 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 230 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Sunrise and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sunrise

Setting

Landform: Basin floors
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 5 inches: sandy loam
H2 - 5 to 20 inches: loam

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H3 - 20 to 30 inches: cemented

H4 - 30 to 60 inches: stratified gravelly sandy loam to loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: 20 to 40 inches to petrocalcic

Drainage class: Moderately well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: C

Ecological site: R030XG020CA - ALKALI FLATS 4-9"

Hydric soil rating: No

Minor Components

Tray

Percent of map unit: 5 percent

Hydric soil rating: No

Merrill

Percent of map unit: 5 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 4 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Landform: Playas

Hydric soil rating: Yes

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