Appendix H

Preliminary LID Report

3540 – 3608 Peck Road
El Monte, CA 91731

PRELIMINARY LOW IMPACT DEVELOPMENT (pLID)

Project No. 230828

Prepared by:

NA Civil, Inc.
22672 Lambert St, Suite 606
Lake Forest, CA 92630

September 2024

Table of Contents

Project Introduction

Purpose of Plan:

The purpose of this Low Impact Development (LID) is to provide Best Management Practices (BMP) for reducing pollutants in storm water discharges after the completion of the project.

Project Description:

The project is located on a 15.8-acre site, of which 3.4 acres are being modified, developed by Merlone Geier Partners. The proposed project will modify a portion of the existing site, and will consist of the construction of three buildings with concrete and asphalt surrounding the buildings. Each pad will have a new trash enclosure proposed as a part of this project. The scope of this project will include the following activities: the demolition of existing asphalt paving, concrete sidewalk, and buildings, the construction of three new buildings with associated utilities, grading of the site to provide appropriate surfaces for proposed improvements, and the installation of new on-site drainage and infiltration systems. The design intent is to propose separate BMPs for each individual pad / drainage area. The vicinity map, located in Appendix A, shows the location of the project site.

Responsible Parties:

The Owner of the property is responsible for implementation of the LID. The Owner may employ sub-contractors to assist him/her in the application of the BMP's outlined in this LID to ensure compliance with the requirements of the State of California General Permit for Storm Water Discharges.

Project Name: El Monte Drive Thrus

Project Location: 3540 – 3608 Peck Road, El Monte, CA 91731

Project Owner: Merlone Geier Partners
24422 Rockfield Boulevard
Lake Forest, CA 92630

Revisions to this LID:

This LID was prepared in September 2024 by NA Civil, Inc., Civil Engineering Consultant to the project Owner.

The Owner of the property is responsible for revising this LID when there is a change to the construction of the project that could result in a significant amount of pollutants being discharged into the storm water as a result of an ineffective BMP or lacking an effective BMP outlined in this LID. It is recommended that the owners contact, advise, and retain the services of the firm that prepared this original LID to make any appropriate changes, additions, or deletions as required and issue a revised LID to ensure compliance with the requirements of the State of California General Permit for Storm Water Discharges.

Conclusions of this LID:

This LID was prepared for the project site located at 3540 – 3608 Peck Road, El Monte, California. An analysis of the site was performed to determine which type of BMP to use, and infiltration type BMPs have been chosen as the most appropriate and most feasible type of BMP for the site. The project will utilize Triton Vault infiltration systems to treat the required storm water volume for each drainage area.

Area/Pad 1 – 27,421 sf:

The design storm drainage volume (Q_{85th}) of 1,319 cubic feet (cf) from the project area will be conveyed to, and treated in, a Triton Vault infiltration system (or equal). The time of concentration for the project area is 20 minutes. These values can be found in the HydroCalc output located in Appendix E of this report. The proposed system will treat 1,431 cubic feet. Therefore, the proposed system is adequately sized to treat the required volume.

Area/Pad 2 – 59,995 sf:

The design storm drainage volume (Q_{85th}) of 3,153 cubic feet (cf) from the project area will be conveyed to, and treated in, a Triton Vault infiltration system (or equal). The time of concentration for the project area is 29 minutes. These values can be found in the HydroCalc output located in Appendix E of this report. The proposed system will treat 3,282 cubic feet. Therefore, the proposed system is adequately sized to treat the required volume.

Area/Pad 3 – 60,150 sf:

The design storm drainage volume (Q_{85th}) of 3,342 cubic feet (cf) from the project area will be conveyed to, and treated in, a Triton Vault infiltration system (or equal). The time of concentration for the project area is 23 minutes. These values can be found in the HydroCalc output located in Appendix E of this report. The proposed system will treat 3,594 cubic feet. Therefore, the proposed system is adequately sized to treat the required volume.

3540 – 3608 Peck Road
El Monte, CA 91731

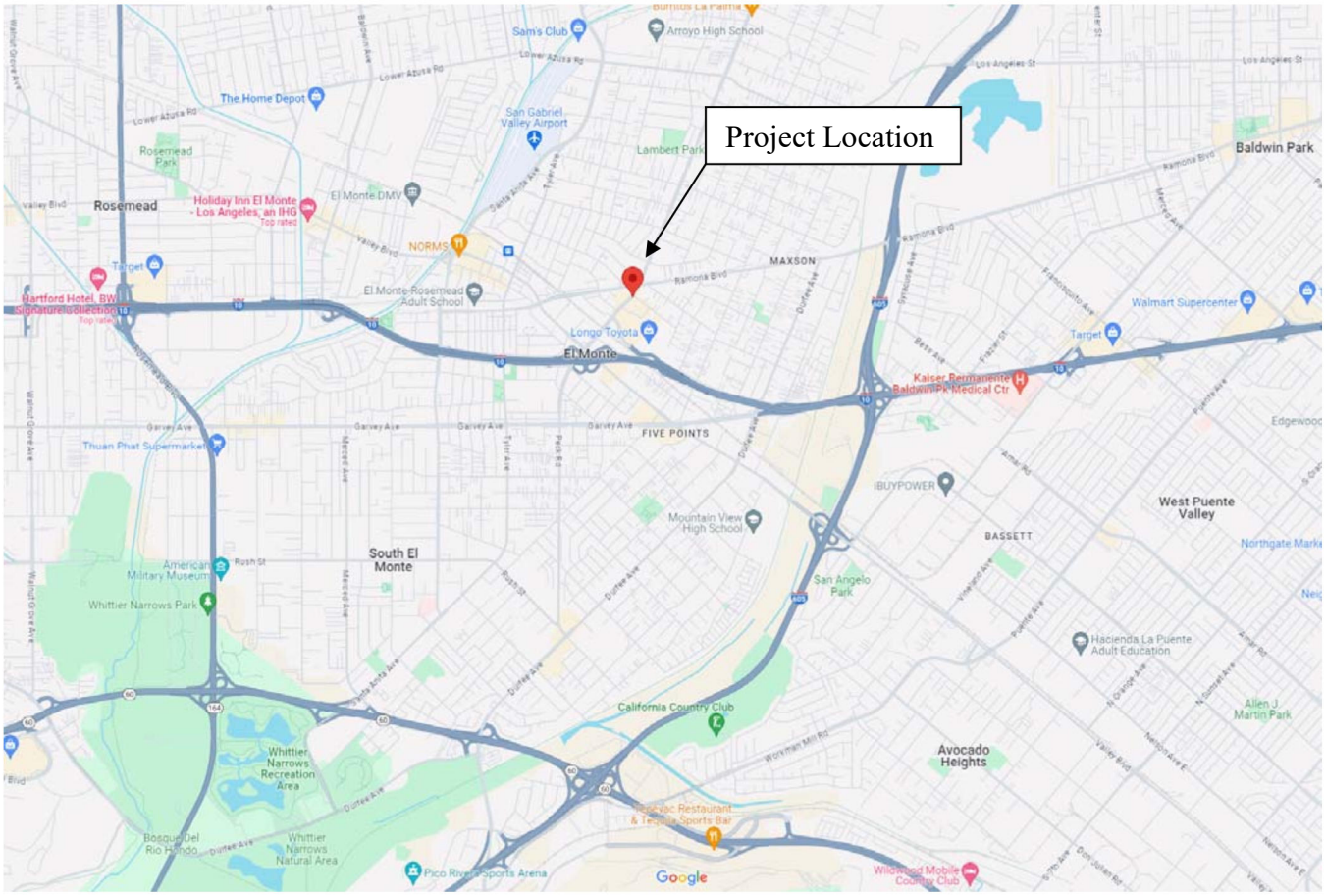
Appendix Index

Appendices:

A) Vicinity Map
B) Los Angeles County Hydrologic Map 1-H1.20
C) Master Covenant and Agreement Forms
D) Hydrology Design Criteria
E) Hydrology Calculations
F) Runoff Coefficient Curve – Soil Type 003 & 006
G) Proposed Treatment Unit Descriptions
H) Operations and Maintenance Manual for BMPs
I) LID Plot Plan

3540 – 3608 Peck Road
El Monte, CA 91731

Appendix A - Vicinity Map

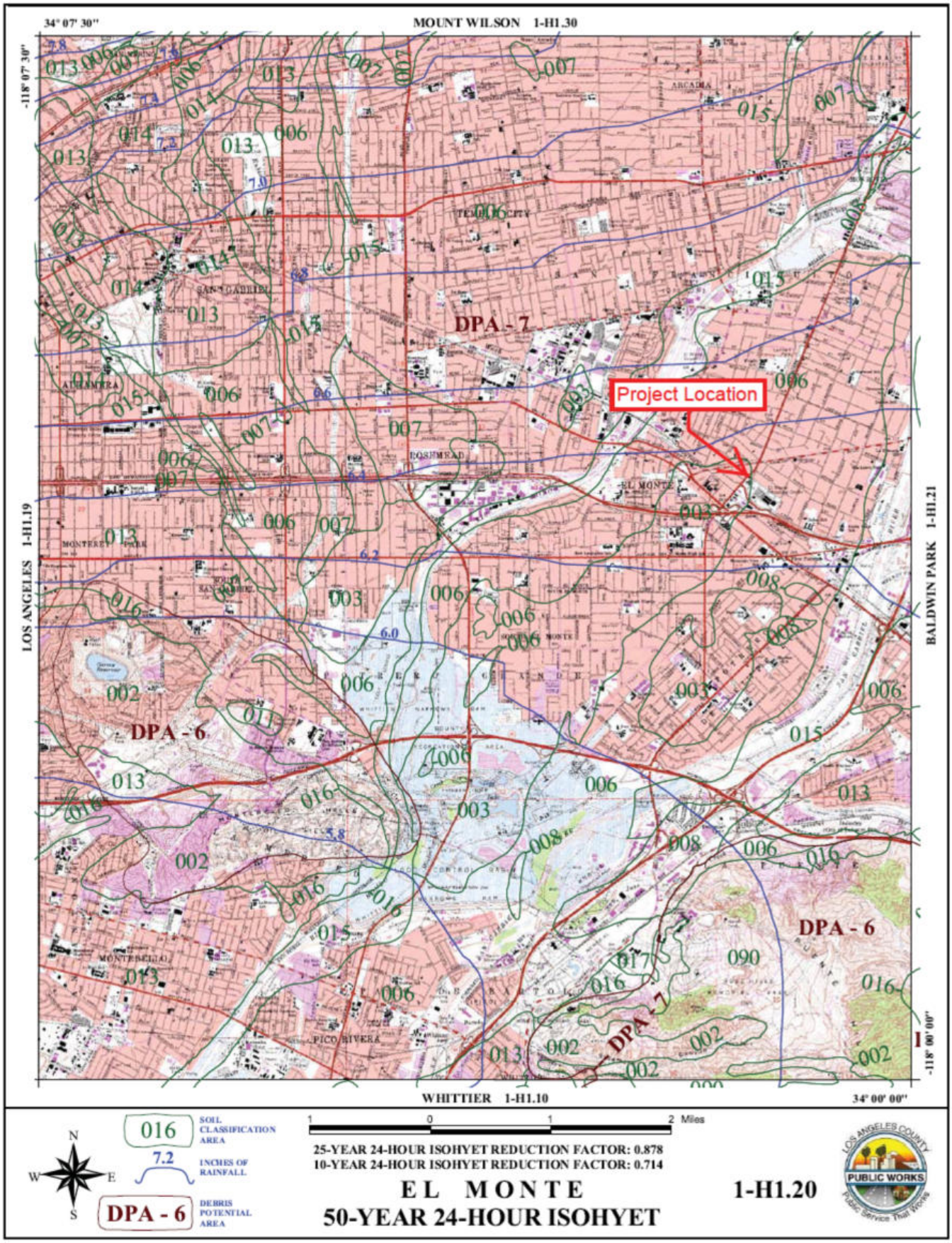


VICINITY MAP

Not to Scale

3540 – 3608 Peck Road
El Monte, CA 91731

Appendix B - Los Angeles County Hydrologic Map


34° 07' 30"
MOUNT WILSON 1-H1.30
-118° 07' 30"
LOS ANGELES 1-H1.19
BALDWIN PARK 1-H1.21
-118° 00' 00"
WHITTIER 1-H1.10
34° 00' 00"
DPA - 7
DPA - 6
DPA - 7
DPA - 6
Project Location
ARCADIA
TEMPLE CITY
SAN GABRIEL
ALHAMBRA
ROSEMEAD
EL MONTE
MONTEREY PARK
MONTEBELLO
PICO RIVERA
016
SOIL CLASSIFICATION AREA
7.2
INCHES OF RAINFALL
DPA - 6
DEBRIS POTENTIAL AREA
N
W
E
S
1 0 1 2 Miles
25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714
EL MONTE
50-YEAR 24-HOUR ISOHYET
1-H1.20
LOS ANGELES COUNTY
PUBLIC WORKS
Public Service That Works

3540 – 3608 Peck Road
El Monte, CA 91731

Appendix C – Master Covenant and Agreement Forms

Recording requested by and mail to:

Name: _____

Address: _____

_____

_____

********** Space Above This Line For Recorder's Use **********

MASTER COVENANT AND AGREEMENT

REGARDING ON-SITE STORMWATER MITIGATION MEASURES AND MAINTENANCE

I (We), the undersigned, hereby certify that I am (we are) the owner(s) of the hereinafter legally described real property ("Property") located in the City of Los Angeles, County of Los Angeles, State of California (please give the legal description):

LEGAL DESCRIPTION

ASSESSOR'S ID# _____ TRACT NO. _____ BLOCK NO. _____ LOT NO _____

Site Address 3540 - 3608 Peck Road, El Monte, CA 91731

In consideration of the City of Los Angeles allowing _____development on said Property, I (we) do hereby covenant and agree to install, operate and maintain in a good operable condition at all times, at my (our) sole cost, all on-site stormwater Best Management Practices (BMPs) per approved plans. The location and type of each BMP feature installed on the Subject Property is identified on the site diagram attached hereto as Exhibit 1. I (we) shall maintain, in accordance with the attached Operation & Maintenance Plan (Attachment 1), the following on-site stormwater BMPs:

☐ Rain Tank (min 55 gal): # of barrels _____; _____total gallons, with minimum of _____ Sq. Ft of vegetated landscaping

☐ Rain Tank / Cistern: # of tanks / cistern _____; _____total gallons, with minimum of _____ Sq. Ft of vegetated landscaping

☐ Porous pavement/pavers: _____ Sq. Ft (for incidental rainfall); and / or _____ Sq. Ft. with _____ ft sub base

☐ Rain Garden (lined): # of rain gardens _____; _____total Sq. Ft. ☐ Dry Well: _____ Cu. Ft.

☐ Rain Garden (unlined): # of rain gardens _____; _____total Sq. Ft. ☐ Infiltration Trench: _____ Cu. Ft.

☐ Flow Thru Planter: # of planters _____; _____total Sq. Ft. ☐ Green Roof: _____ Sq. Ft.

☒ Other: Three (3) Trition Vault Infiltration Chamber Systems

_____

Owner further covenants and agrees that the above-described stormwater device(s) shall not be removed from the Subject Property unless a revised Plan is approved by the Bureau of Sanitation In the event that any portion of the above-specified on-site stormwater pollution removal device(s) or BMPs is modified, I (we) shall immediately provide the Bureau of Sanitation of the City of Los Angeles with a revised Plan for their approval, and sign and record a Supplemental Covenant and Agreement, specifying all of the on-site stormwater pollution removal device(s) and BMPs, as modified (along with a modified O&M Plan). No Supplemental Covenant and Agreement shall, in any way, limit or diminish my (our) General Maintenance Obligation.

This Master Covenant and Agreement, and all obligations herein, shall run with the Property and shall be binding upon any future owners, encumbrancers, their successors, heirs or assigns and shall continue in effect until the Bureau of Sanitation approves the termination hereof.

Owner further covenants and agrees that if Owner hereafter sells the Subject Property, Owner shall provide printed educational materials to the buyer regarding the stormwater device(s) that are located on the Subject Property, including the type(s) and location(s) of all such devices, and instructions for properly maintaining all such devices.

_____ _____

(Print Name of Property Owner) (Print Name of Property Owner)

_____ _____

(Signature of Property Owner) (Signature of Property Owner)

Dated this _____ day of _____ 20____. Dated this _____ day of _____ 20____.

(PLEASE ATTACH NOTARY ACKNOWLEDGEMENT)

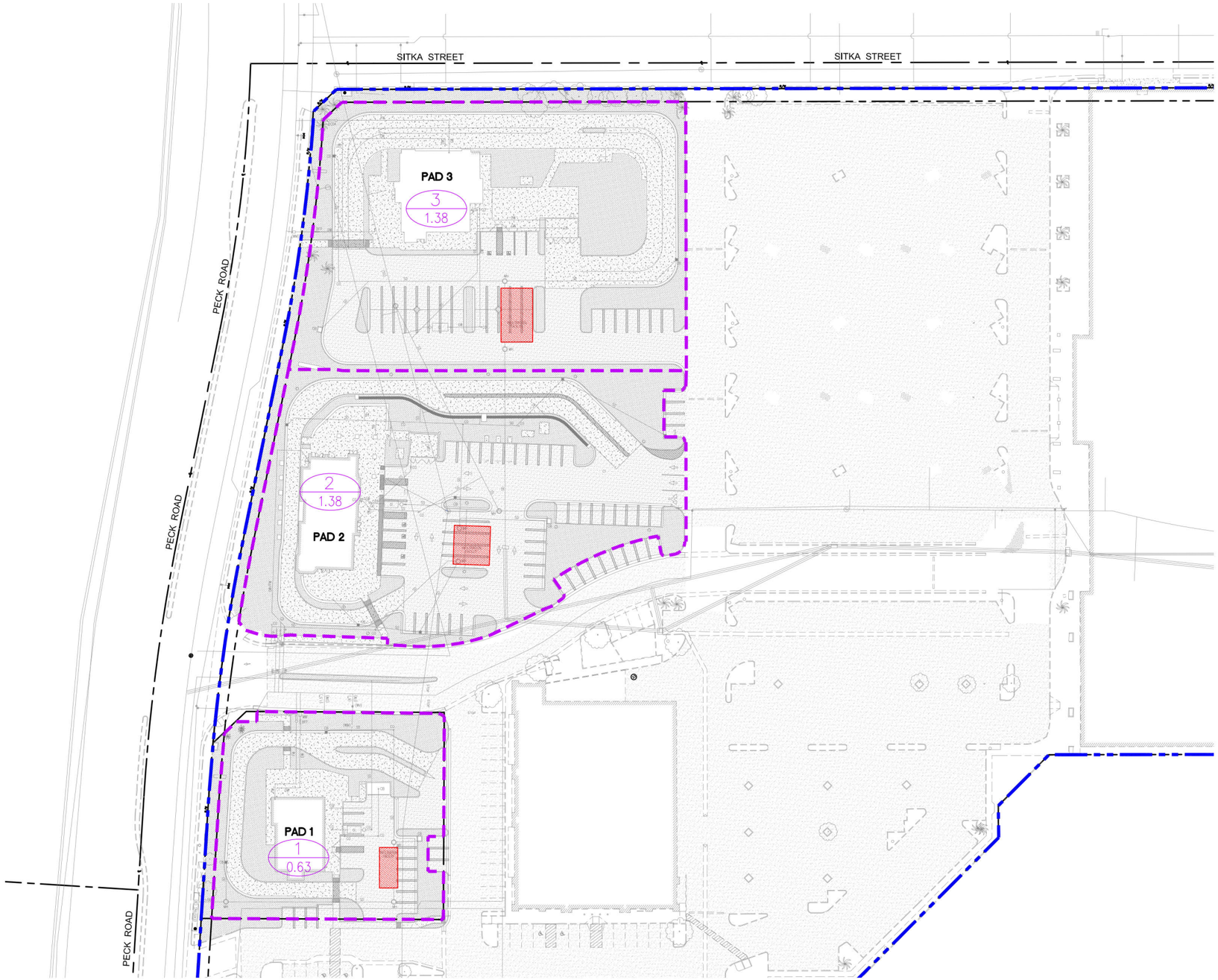
********** Space Below This Line For Bureau Internal Use **********

Permit No. _____

Approved for recording by: Department of Public Works, Bureau of Sanitation

_____ _____ Date: _____

(Print Name) Engineering Associate (Signature)



PROPERTY AREA: 689,059 S.F.
15.8 ACRES

PROJECT AREAS:

AREA A: 27,241 S.F. = 0.63 ACRES
AREA B: 59,995 S.F. = 1.38 ACRES
AREA C: 60,150 S.F. = 1.38 ACRES

LEGEND:

PROPERTY AREA DELINEATION
DRAINAGE AREA DELINEATION
X — DRAINAGE AREA NAME
X.X — DRAINAGE AREA ACERAGE

BMP:

INFILTRATION CHAMBER

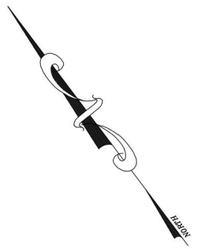
NOTE:

ANY CHANGES (TYPE, SIZE, LOCATION) TO APPROVED STORMWATER BEST MANAGEMENT PRACTICE(S) (BMPS) MUST OBTAIN WRITTEN APPROVAL FROM THE CITY OF EL MONTE PRIOR TO CONSTRUCTION OF BMP(S).

APPLY STENCIL AT ALL CATCH BASINS AND ALONG TRENCH DRAINS, SPACED AT 20 FOOT INCREMENTS.

CATCH BASIN STENCIL

N.T.S.



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Know what's below. Call before you dig.

REVISIONS

NO.	DATE	DESCRIPTION	ENGR.	APPROV.

BASIS OF BEARINGS

THE BEARINGS SHOWN HEREON ARE BASED UPON THE CENTERLINE OF SITKA STREET AS SHOWN ON THE MAP OF TRACT NO. 11601, RECORDED IN BOOK 214, PAGE 17, OF MAPS, RECORDS OF LOS ANGELES COUNTY, CALIFORNIA. BEING NORTH 53° 06' 00" WEST.

BENCHMARK

LOS ANGELES COUNTY BENCHMARK MG4897
L&BR IN S CB STEWART ST E END C.B. 2FT W/O BCR 15' S/O C/L & 84FT W/O C/L PECK RD ELEV = 289.893 (NAVD 88)

PLANS PREPARED BY:

NA CIVIL, INC.
CIVIL ENGINEERING · SURVEYING
22672 LAMBERT STREET, SUITE 606
LAKE FOREST, CA 92630
(949) 753-0600

UNDER THE SUPERVISION OF:

09/27/2024

MATTHEW PALERMO R.C.E. NO. 78355

REGISTERED PROFESSIONAL ENGINEER · MATTHEW JOHN PALERMO · No. C78355 · Exp. 09-30-25 · CIVIL · STATE OF CALIFORNIA

CITY OF EL MONTE
PUBLIC WORKS DEPARTMENT

APPROVED BY:

CITY OF EL MONTE
CITY ENGINEER — DATE

REVIEWED AND RECOMMENDED BY — DATE

CITY OF EL MONTE

DEPARTMENT OF PUBLIC WORKS - ENGINEERING DIVISION

3540, 3600 & 3608 PECK ROAD, EL MONTE, CA 91731

LID PLOT PLAN

DESIGNED BY: MP	DRAWN BY: KN	CHECKED BY: MP	SHEET 1 OF 1

TRITON
STORMWATER SOLUTIONS

Power Over Water®

Triton Stormwater Solutions Main Header Row™ O&M Manual

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The Triton Main Header Row™ is a patent pending technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

The Main Header Row™

The Main Header Row is comprised of a row of any Triton chambers that sit upon the interconnecting sediment floors that are connected to a closely located manhole for easy access. At the end of the Main Header Row there can be an optional Sump Basin Assembly (Shown as item 3 in figure 2) to help collect and contain any sediment that will be flushed out of the Main Header Row during a rain event or during a maintenance cleaning. The sump basin assembly can then be accessed from above via a manhole or up to a 33" diameter stand pipe. The Main Header Row feeds the distribution rows (shown as item 4 in figure 2) via a feed or distribution pipe. The Feed pipe is at an elevated invert height so the water in the Main Header Row has to rise to this invert height before flowing into the distribution rows thus capturing the sediments in the Main Header Row. The Main Header Row is then protecting the distribution chamber row storage areas of any sediment accumulation. This allows for preserving the infiltration rate of the area where the distribution rows are installed thus allowing the system to perform at the rate that the system was designed for.

The sediment floors are designed to prevent scouring of the underlying stone and to collect sediments from infiltrating into the ground under the Main Header Row. The sediment floors lock together and mate with the chambers so they will remain intact during very high flow events and during high pressure cleaning.

The Main Header Row is typically designed to capture the "first flush" and offers the versatility to be sized on a volume basis or flow-rate basis. An up-stream manhole not only provides access to the Main Header Row but typically includes a high flow outlet such that stormwater flow rates or volumes that exceed the capacity of the Main Header Row can overflow into the surrounding stone and or discharge through a manifold to the other chambers. The Main Header Row may also be part of a treatment train. By treating stormwater prior to entry into the Main Header Row system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the de-sign engineer are often driven by regulatory requirements. Whether pre-treatment is used or not, the Main Header Row is recommended by Triton as an effective means to minimize maintenance requirements and maintenance costs.

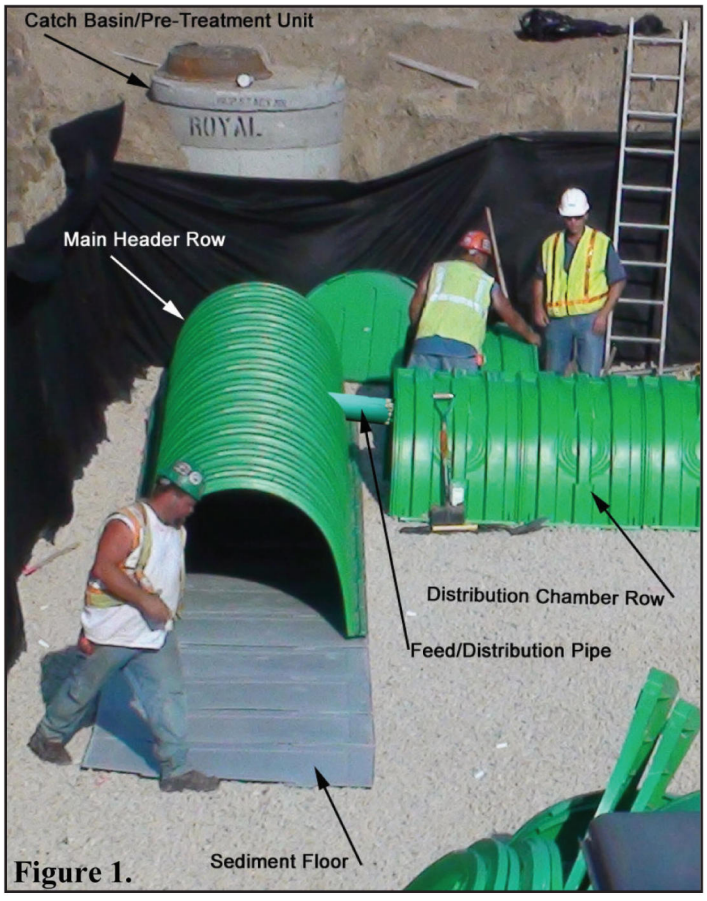


Figure 1.

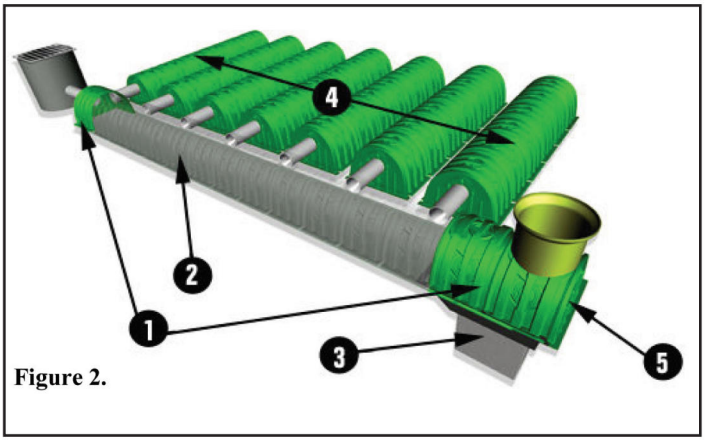


Figure 2.

Treatment Train Inspection and Maintenance

The Triton SWS recommended treatment train inlet system has three tiers of treatment upstream of the Triton SWS chambers. It is recommended that inspection and maintenance (I&M) be initiated at the furthest upstream treatment tier and continue downstream as necessary. The following I&M procedures follow this approach providing I&M information in the following order:

Tier 1- Pre-treatment (BMP);

Tier 2 - Triton SWS Main Header Row

Tier 3 - Eccentric Pipe Header System – This option is not needed when using the Triton system because the Main Header Row eliminates the need for a pipe header system.

Catch Basin/Manholes I&M

Typically a stormwater system will have catch basins and manholes upstream of the detention/retention system. In some cases these may be the only pre-treatment devices. Regular I&M of catch basins and manholes should be scheduled and per-formed as part of a site's routine maintenance plan.

Step-by-Step Maintenance Procedures

1). Inspect catch basins and manholes upstream of Triton SWS chambers for sediment

2). Remove grate or cover

3). Skim off oils and floatables

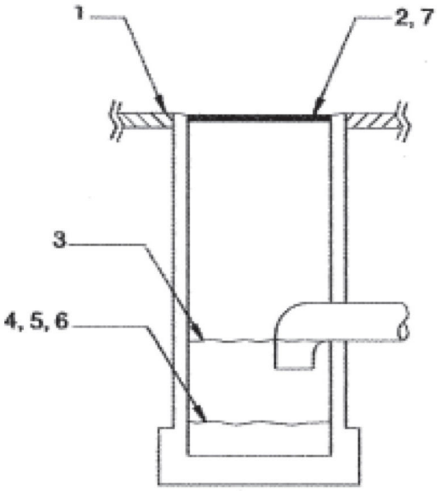
4). Using a stadia rod, measure the depth of sediment

5). If sediment is at a depth greater than 8" proceed to step 6. If not proceed to step 7.

6). Vacuum or manually remove sediment

7). Replace grate

8). Record depth & date and schedule next inspection



Pre-Treatment Device I&M

Manufacturer's I&M procedures should be followed for proprietary pretreatment devices such as baffle boxes, swirl concentrators, oil-water separators, and filtration units. Table below provides some general guidelines but is not a substitute for a manufacturer's specific instructions.

SEDIMENT CONTROL INSPECTION	INSPECTION*	MAINTENANCE**
Triton Main Header Row	Annually	JetVac-Culvert Cleaning Nozzle or High-Pressure Hose
Sediment Basin	Bi-Annually or after large storm event	Excavate sediment
Catch Basin Sump	Bi-Annually	Excavate, pump or vacuum
Sediment Structure	Bi-Annually	Excavate, pump or vacuum
Catch Basin Filter Bags	After all storm events	Clean and/or replace filter bags
Porous Pavement	Quarterly	Sweep Pavement
Pipe Header Design	Quarterly	Excavate, pump or vacuum
Water Quality Inlet	Quarterly	Excavate, pump or vacuum
Triton Filter Pucks	Bi-Annually	Clean and/or replace filter media in pucks

Main Header Row™ Inspection

The frequency of Inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc., all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, Triton recommends annual inspections. The Main Header Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Main Header Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 8" inches in the bottom of the Sump Basin and or if there is 3" throughout the length of the Main Header Row, clean-out of the Sump Basin and Main Header Row should be performed.

Main Header Row™ Maintenance

The Main Header Row was designed to reduce the cost of periodic maintenance. By confining sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the Main Header Row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined-space entries. The inside dimensions of the Triton Main Header Row Chambers are 34" tall by 48" wide.

Maintenance is accomplished by removing the sediment that has built up in the Sump Basin by using a standard vacuum truck as shown to the right. The Triton Main Header Row system was designed to allow for easy access to the Sump Basin via a manhole/inspection port up to a 33" diameter pipe. There is no need for a special process to clean out the Sump Basin and the Main Header Row but they can be cleaned using a JetVac process or can be cleaned by using a water tank truck or fire truck equipped with a hose to flush the sediment to the Sump Basin if so desired. To use a water tanker or fire truck simply insert the hose into the upstream catch basin structure and flush the sediment to the end of the main header row where the Sump Basin is located. If the Sump Basin is located close to the inlet, then vacuum out the sediment first and then back flush the Main Header Row back into the Sump Basin.

NOTE: The JetVac or high-pressure hose process shall only be performed on the Main Header Row where the Triton Sediment Floor System has been installed and only if there is 3" of sediment throughout the length of the Main Header Row.

GOINGgreen®

Main Header Row™ Step-by-Step Maintenance Procedures

Step 1. Inspect Sump Basin and Main Header Row for sediment

A. Inspection ports (if present)

i. Remove lid from floor box frame

ii. Remove cap from inspection riser

iii. Using a flashlight and stadia rod, measure depth of sediment in the Sump Basin and record results on maintenance log.

iv. If sediment is at or above 11-inch depth, proceed to Step 2. If not, proceed to step 3.

B. All Main Header Rows

i. Remove cover from manhole at upstream end of Main Header Row

ii. Using a flashlight, inspect the Main Header Row through outlet pipe and through each distribution pipe that is connected in between the Main Header Row and the distribution row of chambers

iii. If sediment is at or above the 11" mark in the sump bin, proceed to Step 2

1. Be sure to have proper footing when entering into Main Header Row.

2. Follow OSHA regulations for confined space entry if entering Main Header Row.

If not, proceed to Step 3

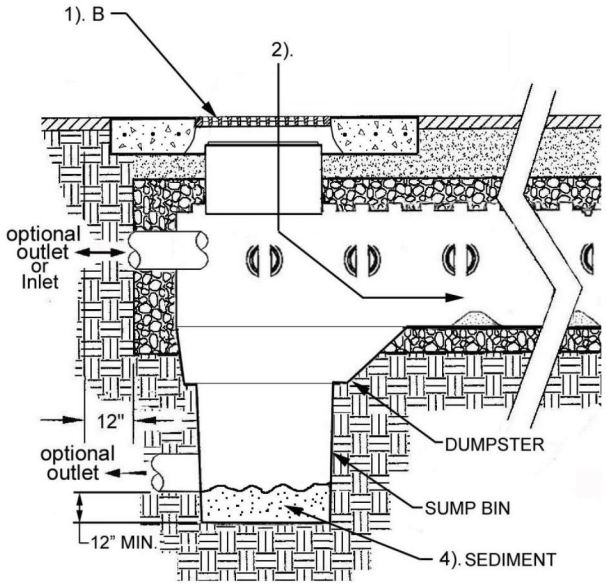
Step 2. Clean out the Sump Basin with a vacuum truck

A. Remove any secondary filtration media that may be installed in the sump basin

B. Vacuum Sump Basin as required

Step 3. Replace all caps, lids, and covers. Record observations and actions

Step 4. Inspect & clean catch basins and manholes upstream of the Triton system



Sample Maintenance Log

Date	Stadia Rod Readings		Sediment Depth (1)-(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to chamber top (2)			
4/11/2007	9.7 ft.	None		New installation. Fixed point is J1 frame at grade	KET
10/21/2007		9.6	0.1 ft.	Very little sediment in system - No maintenance required	GKT
4/11/2008		9.4	0.3 ft.	Very little sediment in system - No maintenance required	CMM
7/25/2009		9.1	0.6 ft.	Some debris/sediment is visible in sump basin assembly but not interfering with outlet	LEJ
7/20/2010		8.7	1.0 ft.	Some debris/sediment is visible in sump basin assembly - maintenance is due	DLC
8/20/2010	9.7 ft.		0	System has cleaned and vacuumed - very easy system to clean	NAT

3540 – 3608 Peck Road
El Monte, CA 91731

Appendix D – Hydrology Design Criteria

HYDROLOGY DESIGN CRITERIA

HYDROLOGY METHOD: Los Angeles County Public Works Department
Low Impact Development Standards Manual (February 2014)
Runoff Calculation Method: Rational Method

DESIGN STORM: 85th percentile

SOIL TYPE: 003 & 006 (See attached Hydrologic Map 1-H1.20)

AREA: A = Area of drainage

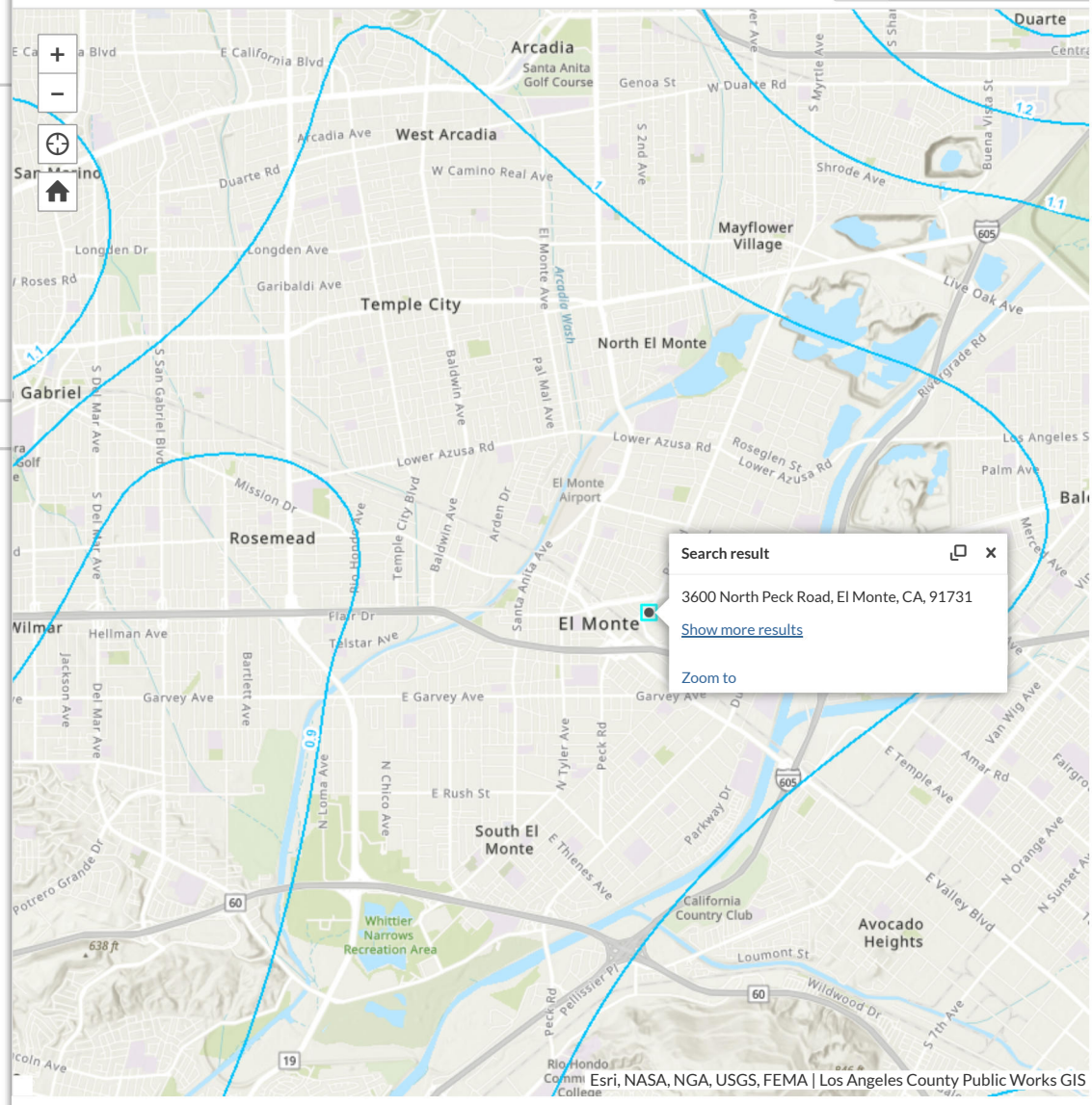
About | Legend | Layers

Layers

- [x] Hydrology GIS
  - [ ] 50yr Two Tenths (Rainfall)
  - [ ] DPA Zones
  - [ ] Soils 2004
  - [x] Final 85th Percentile, 24-hr Rainfall
  - [ ] 1-year, 1-hour Rainfall Intensity
  - [ ] Final 95th Percentile, 24-hr Rainfall
- [x] LA County Parcels

LA County Hydrology Map

3600 Peck Road, El Mo



About | Legend | Layers

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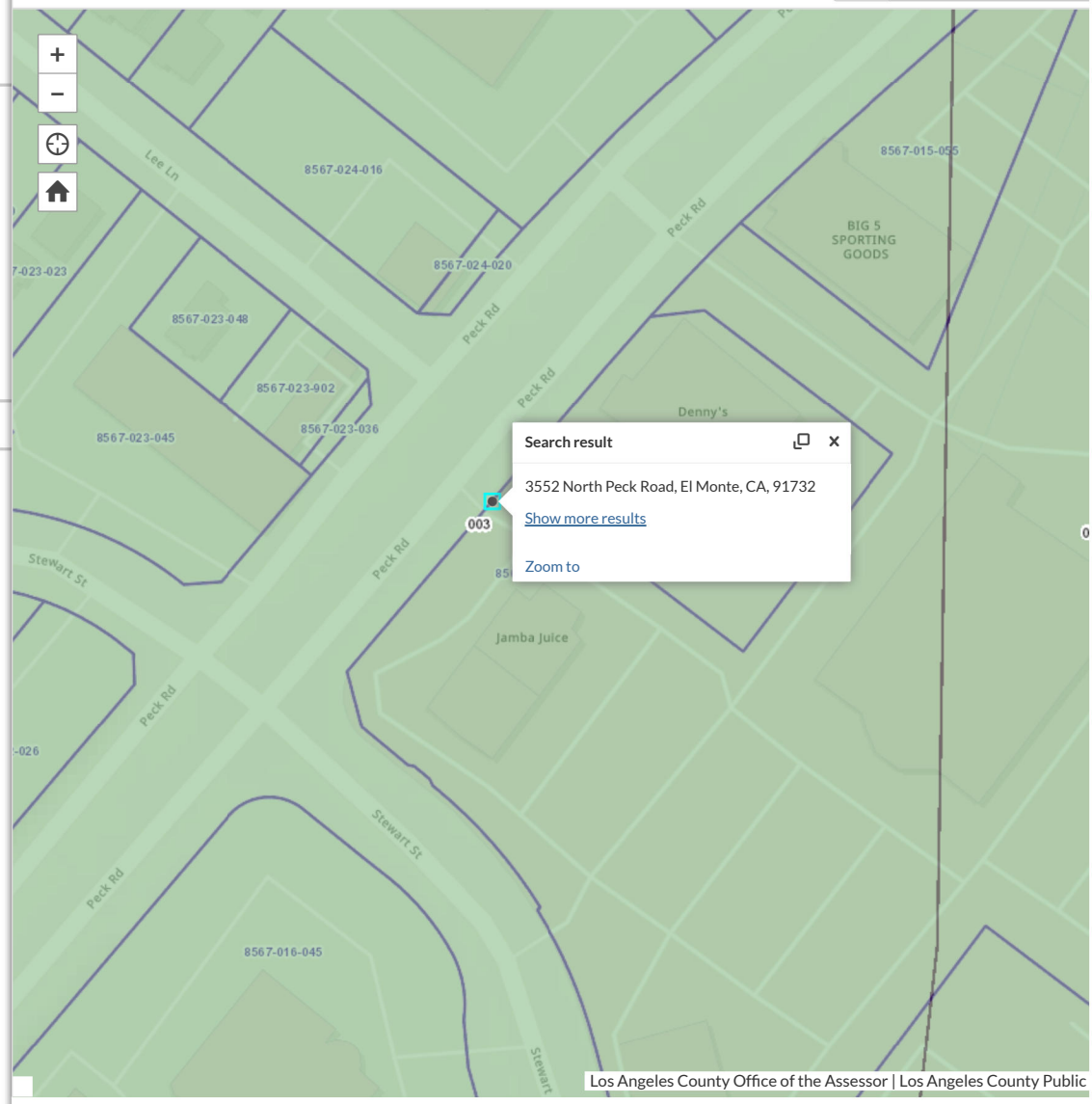
  - [ ] DPA Zones
  - [x] Soils 2004
  - [ ] Final 85th Percentile, 24-hr Rainfall
  - [ ] 1-year, 1-hour Rainfall Intensity
  - [ ] Final 95th Percentile, 24-hr Rainfall
- [x] LA County Parcels

LA County Hydrology Map

3552 Peck Road, El Mo



About | Legend | Layers

Layers

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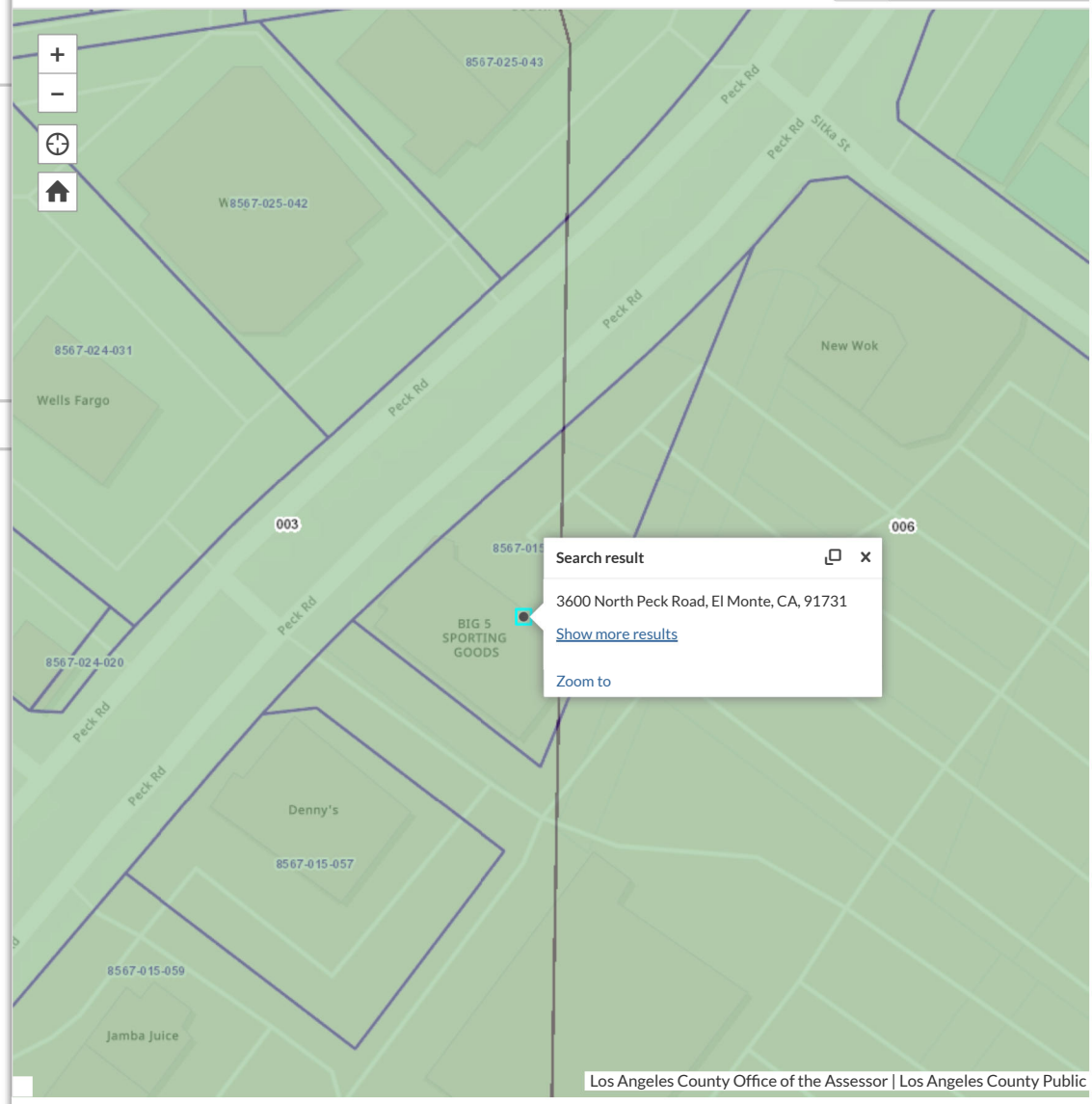
  - [ ] Final 95th Percentile, 24-hr Rainfall
- [x] LA County Parcels

LA County Hydrology Map

3600 Peck Road, El Mo



About | Legend | Layers

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  - [ ] 50yr Two Tenths (Rainfall)
  - [ ] DPA Zones
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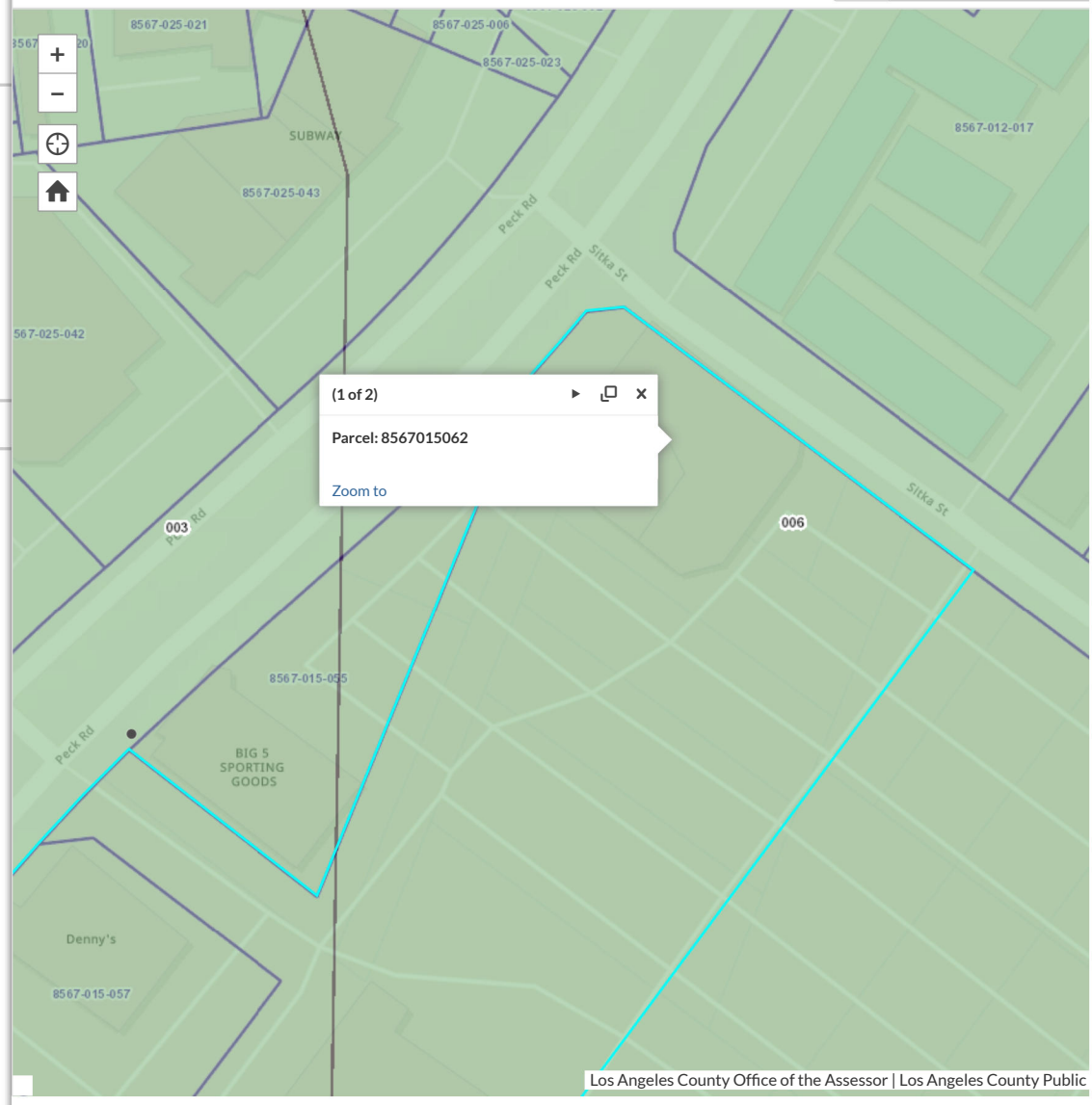
  - [ ] Final 95th Percentile, 24-hr Rainfall
- [x] LA County Parcels

LA County Hydrology Map

3608 Peck Road, El Mo



3540 – 3608 Peck Road
El Monte, CA 91731

Appendix E – Hydrology Calculations

Hydrocalc Results – Area/Pad 1

Peak Flow Hydrologic Analysis

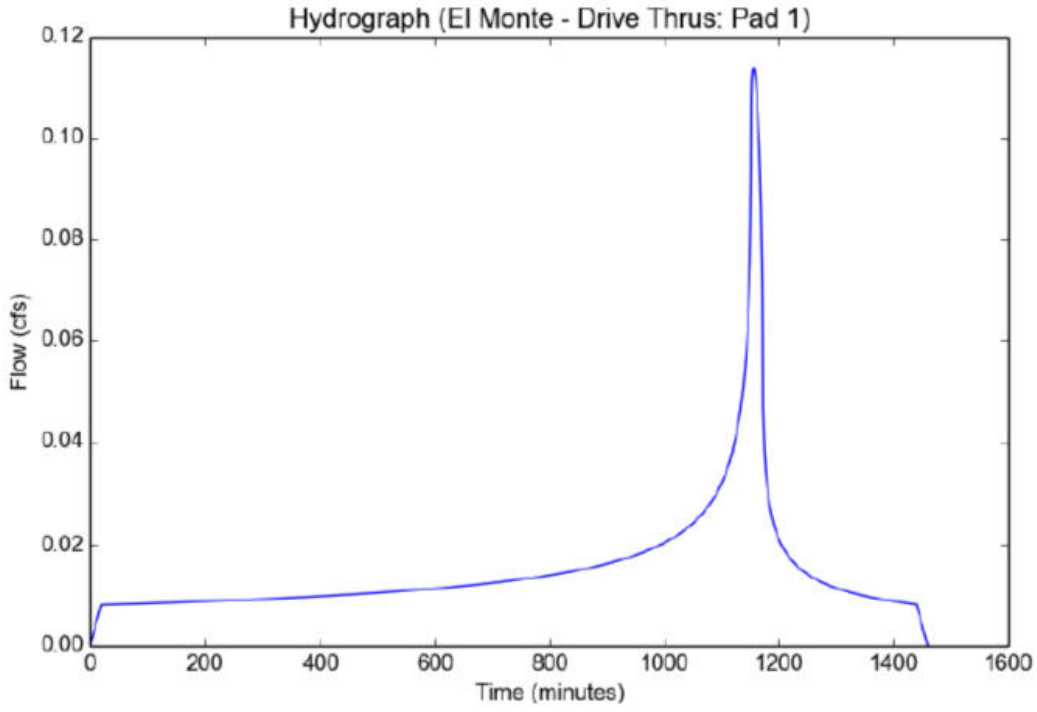
File location: F:/Job/2023/230828 El Monte DTs/Reports/LID/El Monte - Drive Thrus - Pad 1.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	El Monte - Drive Thrus
Subarea ID	Pad 1
Area (ac)	0.63
Flow Path Length (ft)	239.0
Flow Path Slope (vft/hft)	0.009
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.64
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.2954
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.612
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	0.1139
Burned Peak Flow Rate (cfs)	0.1139
24-Hr Clear Runoff Volume (ac-ft)	0.0303
24-Hr Clear Runoff Volume (cu-ft)	1318.6219



Hydrocalc Results – Area/Pad 2

Peak Flow Hydrologic Analysis

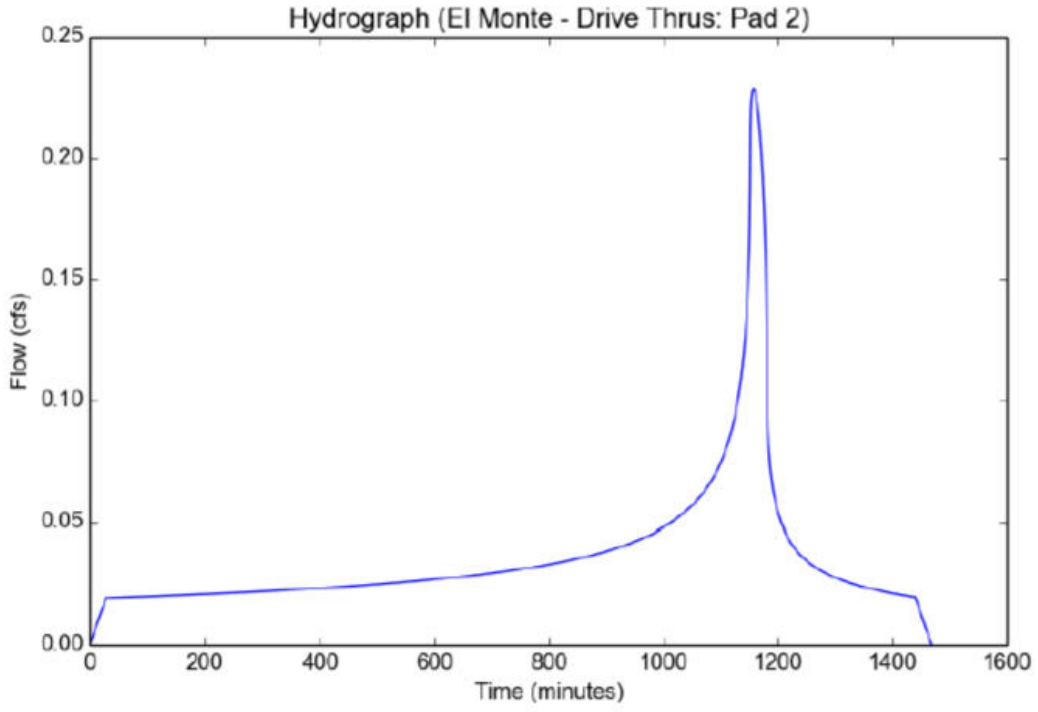
File location: F:/Job/2023/230828 El Monte DTs/Reports/LID/App E - Hydro Calcs/El Monte - Drive Thrus - Pad 2.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	El Monte - Drive Thrus
Subarea ID	Pad 2
Area (ac)	1.38
Flow Path Length (ft)	394.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.71
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.2481
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.668
Time of Concentration (min)	29.0
Clear Peak Flow Rate (cfs)	0.2287
Burned Peak Flow Rate (cfs)	0.2287
24-Hr Clear Runoff Volume (ac-ft)	0.0724
24-Hr Clear Runoff Volume (cu-ft)	3152.7266



Hydrocalc Results – Area/Pad 3

Peak Flow Hydrologic Analysis

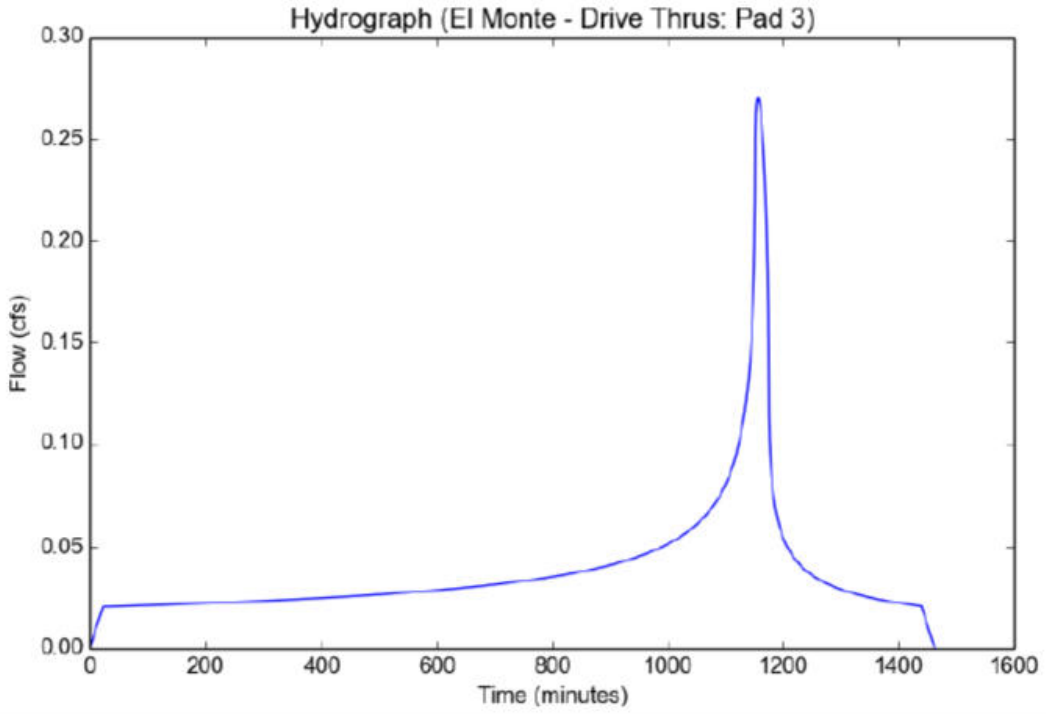
File location: F:/Job/2023/230828 El Monte DTs/Reports/LID/El Monte - Drive Thrus - Pad 3.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	El Monte - Drive Thrus
Subarea ID	Pad 3
Area (ac)	1.38
Flow Path Length (ft)	298.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.76
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.2766
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.708
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	0.2703
Burned Peak Flow Rate (cfs)	0.2703
24-Hr Clear Runoff Volume (ac-ft)	0.0767
24-Hr Clear Runoff Volume (cu-ft)	3341.4992



3540 – 3608 Peck Road
El Monte, CA 91731

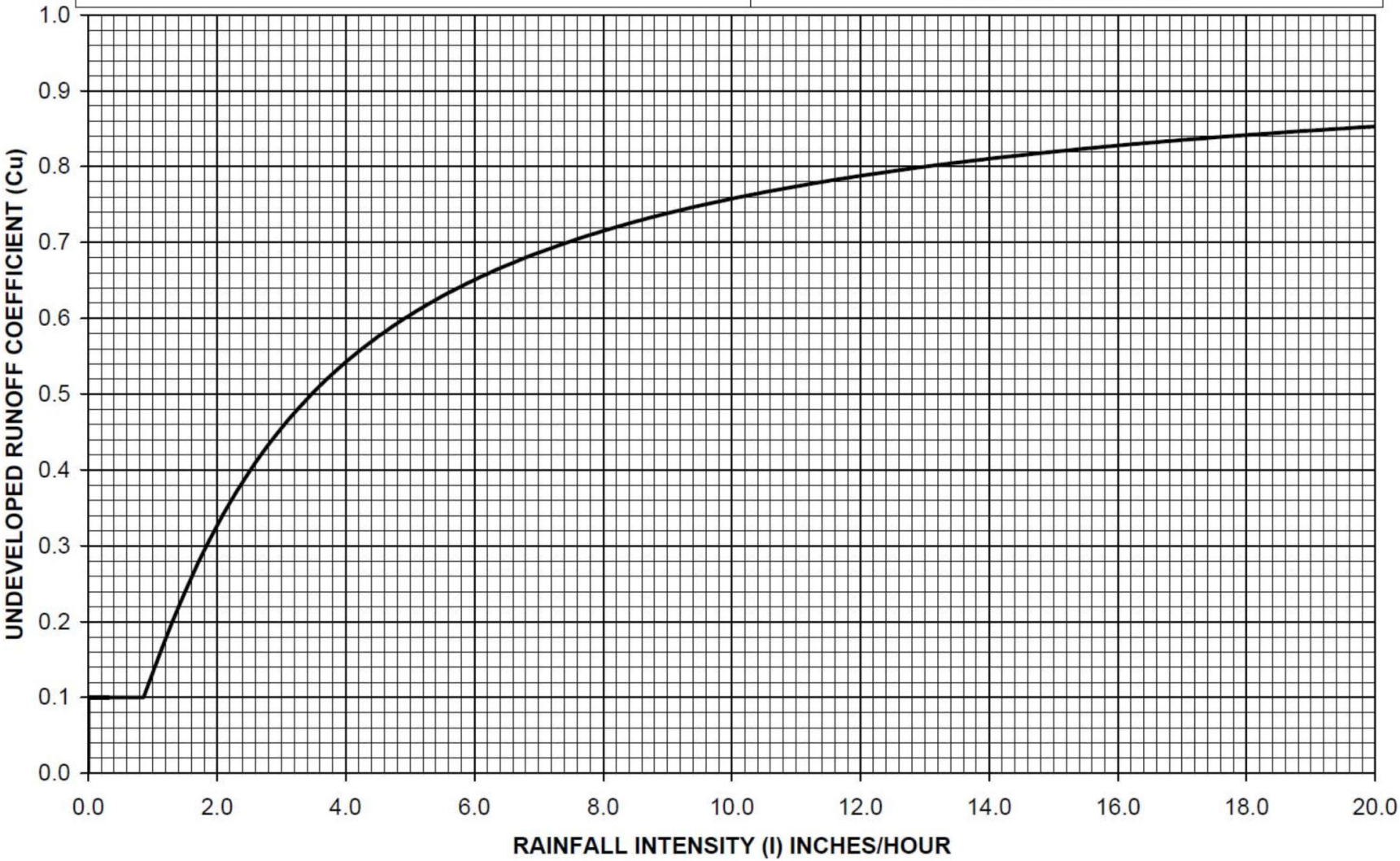
Appendix F – Runoff Coefficient Curve – Soil Type 003 & 006

$C_D = (0.9 * IMP) + (1.0 - IMP) * C_U$

Where: C_D = Developed Runoff Coefficient
IMP = Proportion Impervious
C_U = Undeveloped runoff coefficient

Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE
SOIL TYPE NO. 003

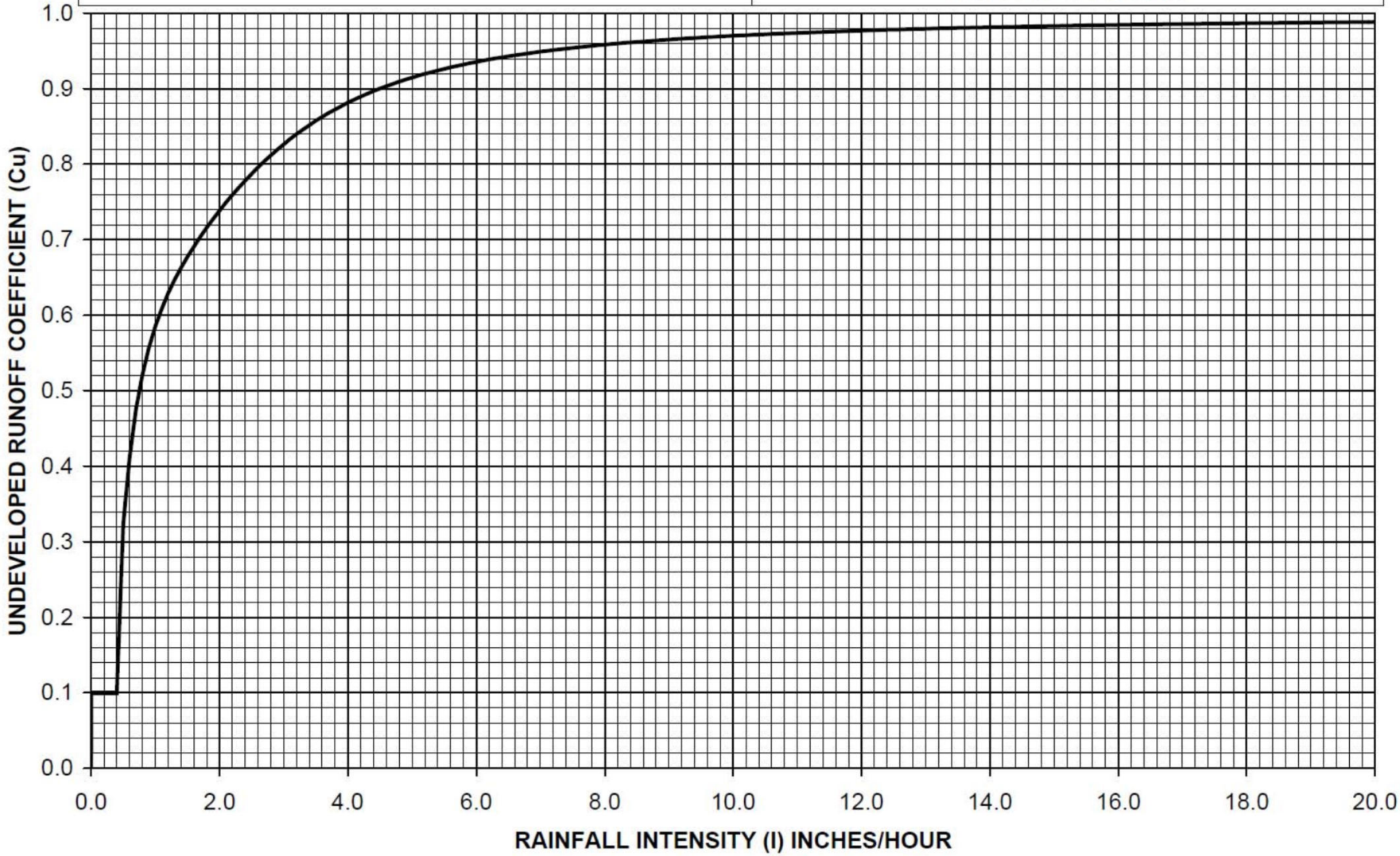


$C_D = (0.9 * IMP) + (1.0 - IMP) * C_U$

Where: C_D = Developed Runoff Coefficient
IMP = Proportion Impervious
C_U = Undeveloped runoff coefficient

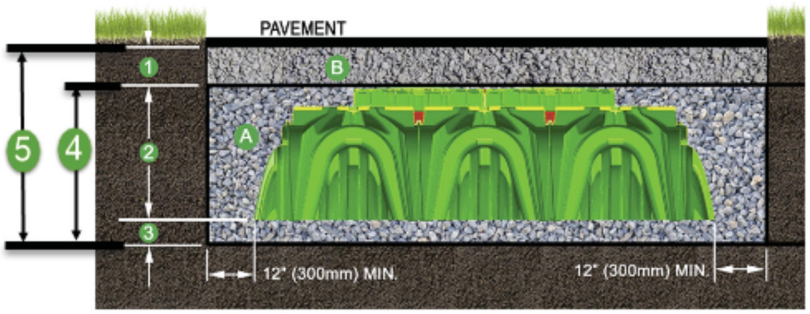
Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE
SOIL TYPE NO. 006



3540 – 3608 Peck Road
El Monte, CA 91731

Appendix G – BMP Descriptions



Parameters

Units: English

Storage Volume: 1319 cu ft

Base Stone: 6 in

Additional Stone Above Tray: 12 in

Fill Above Tray: 12 in

Perimeter Stone: 12 in

*# of Inner System MHR End Caps: 0

*Main Header Row (MHR) Fabric: 0

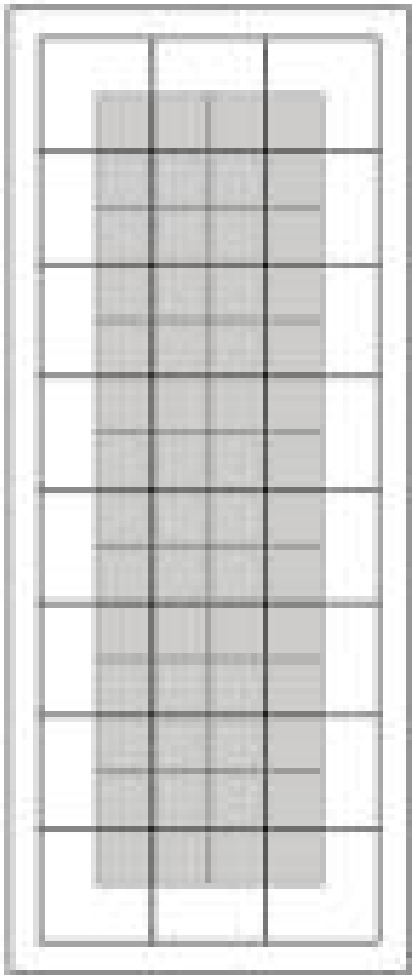
Controlled By: width 32 ft

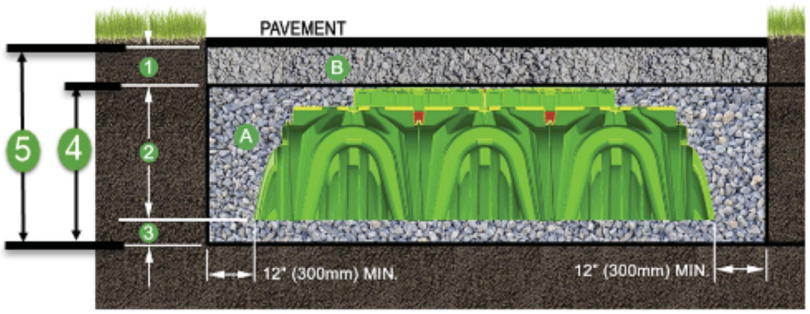
Stone Porosity: 0.4

Note: After making an input change you must hit calculate to update the Field Diagram and Project Results.
* Required for Stormwater Treatment
** The image generation will not save if using MicroSoft Edge

Project Results

1 Total Cover Over Chambers: 24 in
2 Height Of Vault and Tray: 42 in
3 Embedment Stone Under Chambers: 6 in
A Volume of Embedment Stone Required: 48 cu yd
B Volume of Fill Material Required: 16 cu yd
Total Storage Provided: 1431 cu ft
Number of Rows: 8
Number of Columns: 3
System Length: 14.09 ft
System Width: 31.29 ft
System Section Height: 5.00 ft
System Area: 441 sq ft
System Perimeter: 91 ft
Vaults: 24
Perimeter End Caps: 22
Inner System MHR End Caps: 0
Total Vault End Caps: 22
Trays: 14
Triton Close-Offs: 18
Triton Locks: 19
Required Excavation: 82 cu yd
Required Non-Woven Fabric: 99 sq yd
Required MHR Fabric: 0 sq yd
Required Stone: 48 cu yd
System Efficiency: 64.9%





Parameters

Units: English

Storage Volume: 3198 cu ft

Base Stone: 6 in

Additional Stone Above Tray: 12 in

Fill Above Tray: 12 in

Perimeter Stone: 12 in

*# of Inner System MHR End Caps: 0

*Main Header Row (MHR) Fabric: 0

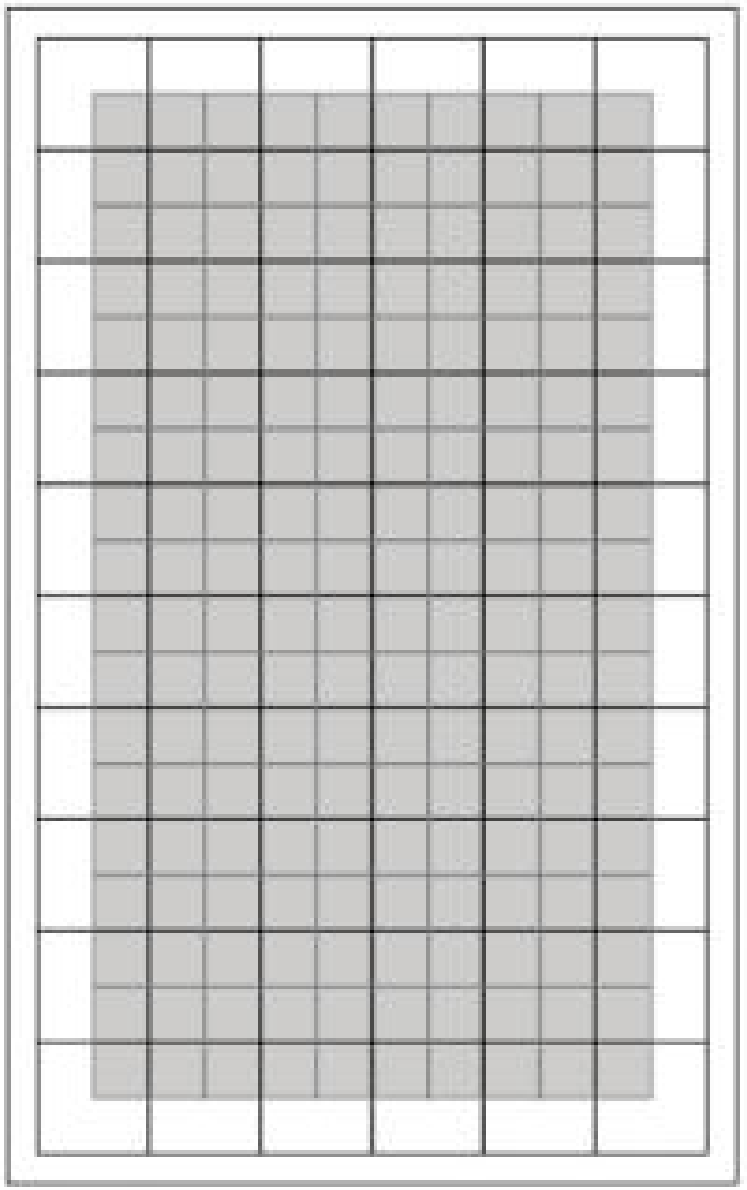
Controlled By: width 39 ft

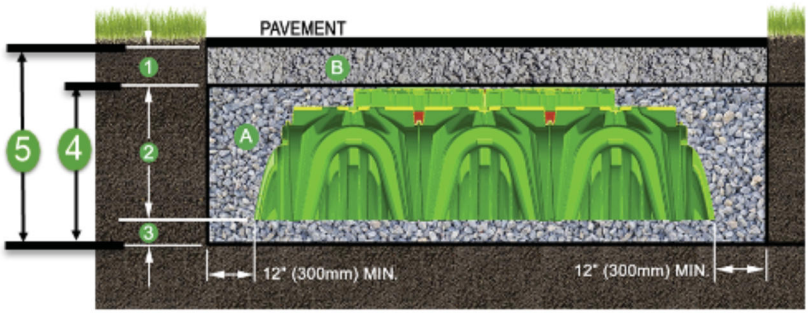
Stone Porosity: 0.4

Note: After making an input change you must hit calculate to update the Field Diagram and Project Results.
* Required for Stormwater Treatment
** The image generation will not save if using MicroSoft Edge

Project Results

1 Total Cover Over Chambers: 24 in
2 Height Of Vault and Tray: 42 in
3 Embedment Stone Under Chambers: 6 in
A Volume of Embedment Stone Required: 85 cu yd
B Volume of Fill Material Required: 35 cu yd
Total Storage Provided: 3282 cu ft
Number of Rows: 10
Number of Columns: 6
System Length: 24.41 ft
System Width: 38.17 ft
System Section Height: 5.00 ft
System Area: 932 sq ft
System Perimeter: 125 ft
Vaults: 60
Perimeter End Caps: 32
Inner System MHR End Caps: 0
Total Vault End Caps: 32
Trays: 45
Triton Close-Offs: 28
Triton Locks: 76
Required Excavation: 173 cu yd
Required Non-Woven Fabric: 173 sq yd
Required MHR Fabric: 0 sq yd
Required Stone: 85 cu yd
System Efficiency: 70.5%





Parameters

Units: English

Storage Volume: 3342 cu ft

Base Stone: 6 in

Additional Stone Above Tray: 12 in

Fill Above Tray: 12 in

Perimeter Stone: 12 in

*# of Inner System MHR End Caps: 0

*Main Header Row (MHR) Fabric: 0

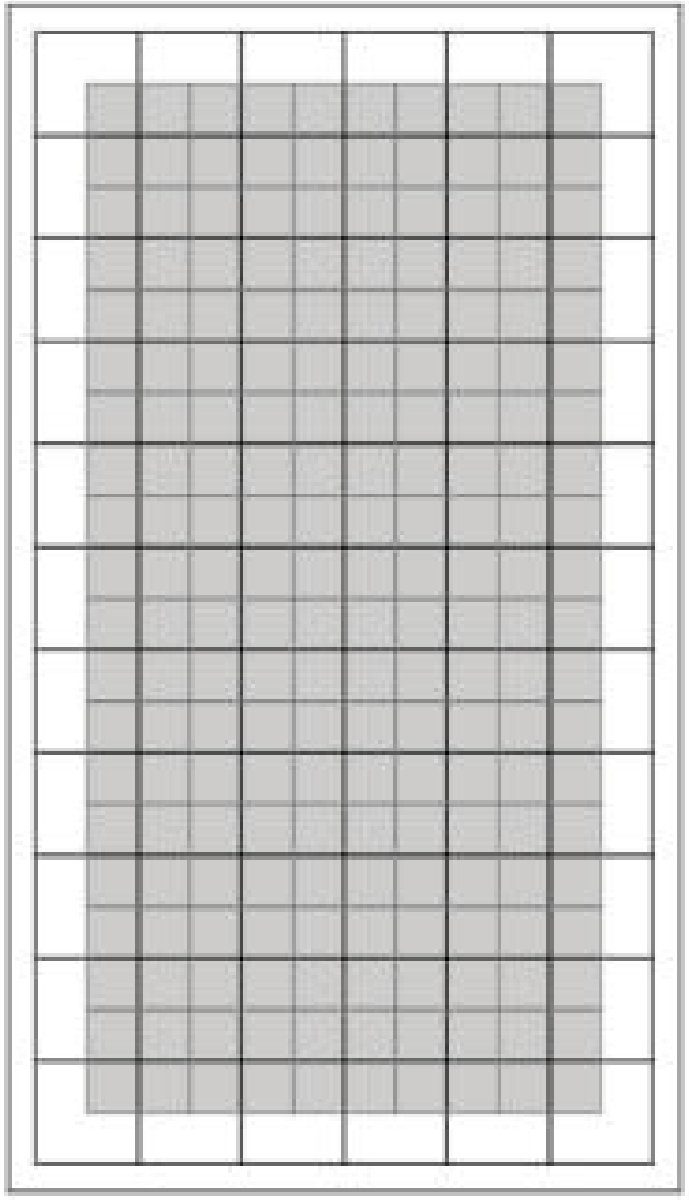
Controlled By: width 45 ft

Stone Porosity: 0.4

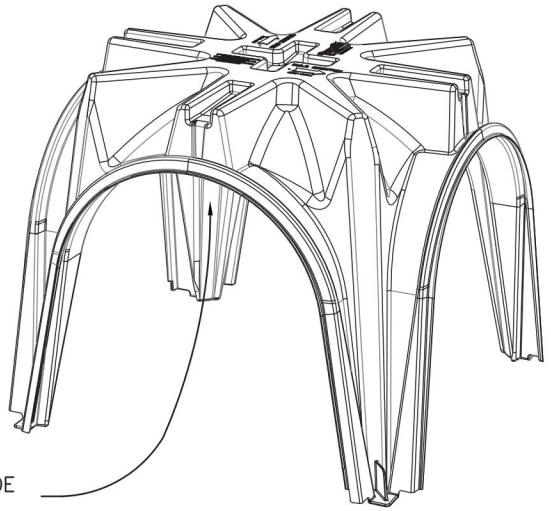
Note: After making an input change you must hit calculate to update the Field Diagram and Project Results.
* Required for Stormwater Treatment
** The image generation will not save if using MicroSoft Edge

Project Results

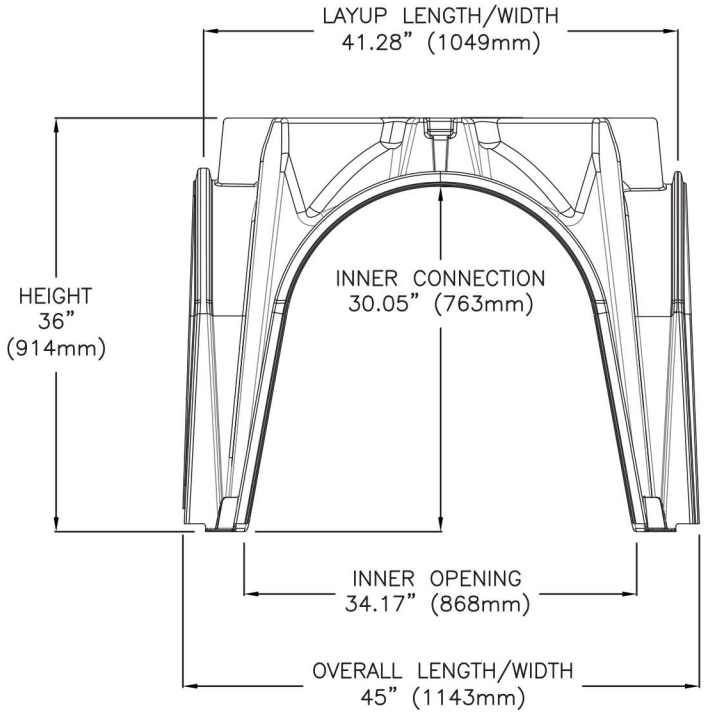
1 Total Cover Over Chambers: 24 in
2 Height Of Vault and Tray: 42 in
3 Embedment Stone Under Chambers: 6 in
A Volume of Embedment Stone Required: 92 cu yd
B Volume of Fill Material Required: 38 cu yd
Total Storage Provided: 3594 cu ft
Number of Rows: 11
Number of Columns: 6
System Length: 24.41 ft
System Width: 41.61 ft
System Section Height: 5.00 ft
System Area: 1015 sq ft
System Perimeter: 132 ft
Vaults: 66
Perimeter End Caps: 34
Inner System MHR End Caps: 0
Total Vault End Caps: 34
Trays: 50
Triton Close-Offs: 30
Triton Locks: 85
Required Excavation: 188 cu yd
Required Non-Woven Fabric: 186 sq yd
Required MHR Fabric: 0 sq yd
Required Stone: 92 cu yd
System Efficiency: 70.8%



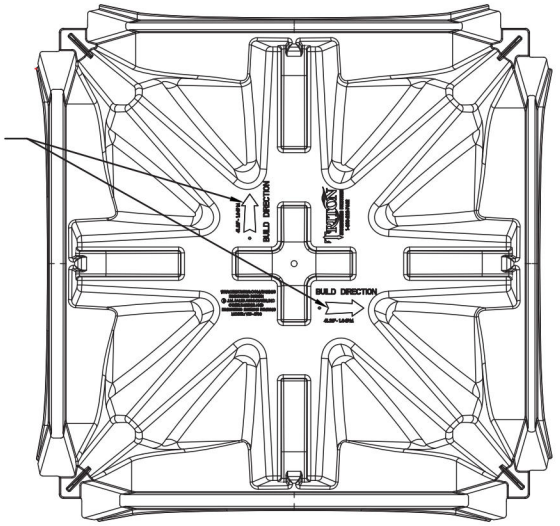
TRITON VAULT SPECS	
NOMINAL DIMENSIONS (LAYUP LENGTH X LAYUP WIDTH X HEIGHT)	41.28" X 41.28" X 36.00" (1049mm X 1049mm X 914mm)
BARE CHAMBER STORAGE	28.79 CUBIC FEET (0.815 CUBIC METERS)
VAULT WEIGHT	50 lbs (22.7 kg)
MINIMUM INSTALLED STORAGE WITHOUT TRAY (6" BASE STONE, 6" TOP STONE)	36.21 CUBIC FEET (1.025 CUBIC METERS)
MIN INSTALLED STORAGE WITH TRAY (6" BASE STONE)	43.78 CUBIC FEET (1.240 CUBIC METERS)



VAULT END CAPS WILL SLIDE UP INTO CONNECTING RIB



ENSURE BOTH BUILD DIRECTION ARROWS ARE GOING IN THE SAME DIRECTION AS PREVIOUS INSTALLED VAULTS TO ENSURE PROPER CONNECTION



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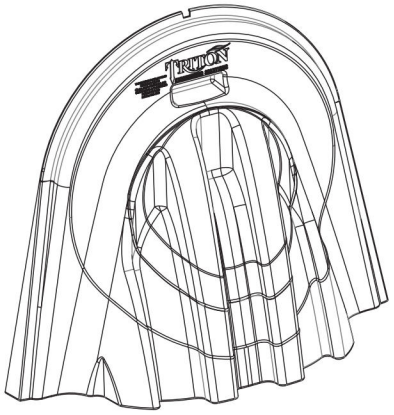
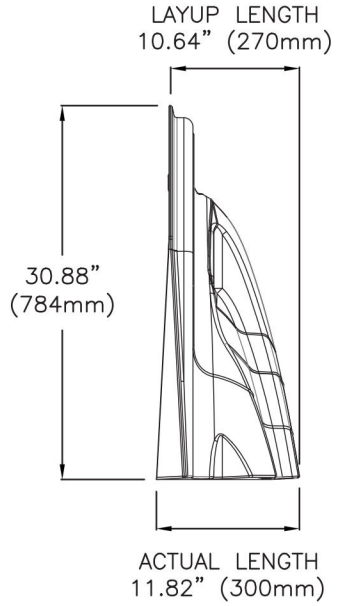
VAULT STANDARD DETAIL

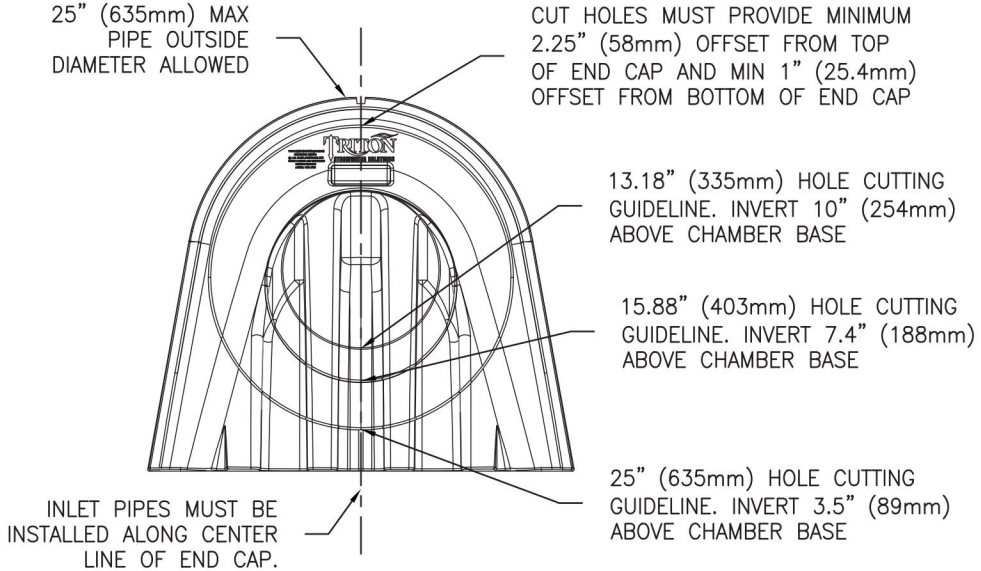
TRITON - STANDARD DETAILS

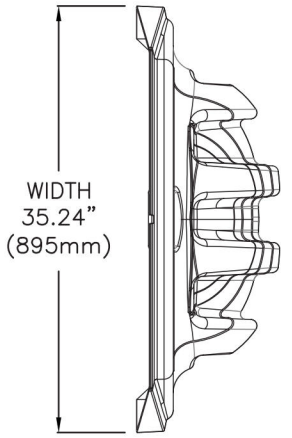
REVISED:
12-05-18 JWM

TRITON VAULT END CAP SPECS	
NOMINAL DIMENSIONS (LAYUP LENGTH X LAYUP WIDTH X HEIGHT)	10.64" X 35.24" X 30.88" (270mm X 895mm X 784mm)
BARE END CAP STORAGE	2.16 CUBIC FEET (0.061 CUBIC METERS)
END CAP WEIGHT	15 lbs (6.8 kg)









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VAULT END CAP STANDARD DETAIL

TRITON - STANDARD DETAILS

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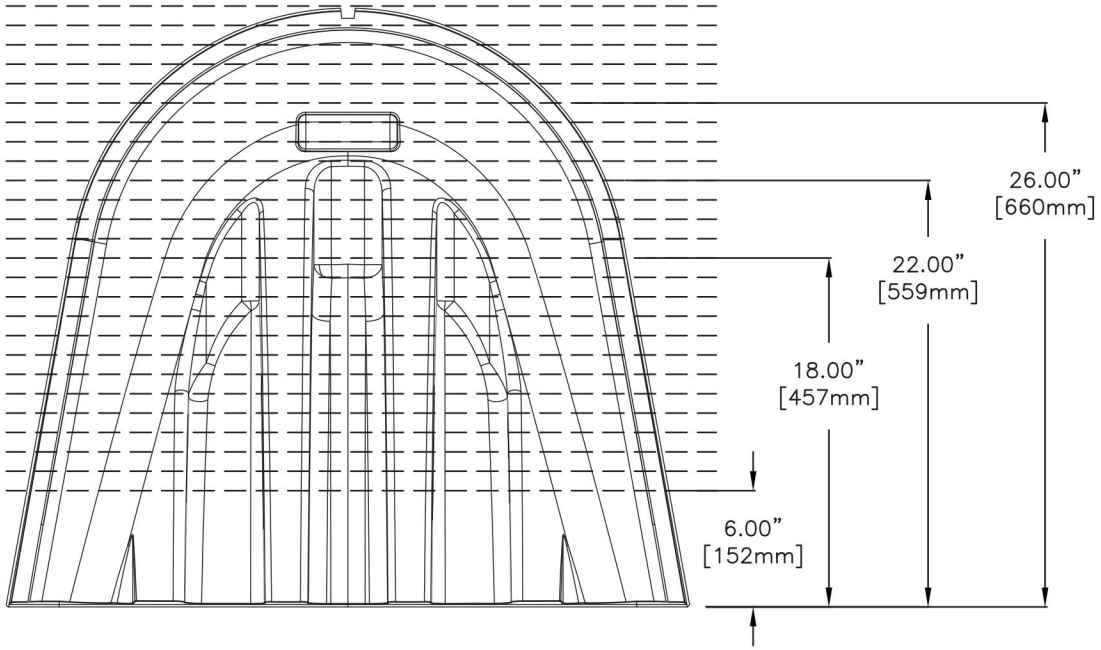
TREATMENT VOLUME CAN BE ADJUSTED BY INCREASING OR DECREASING THE BYPASS ELEVATION OF THE INNER MAIN HEADER ROW END CAP CUTS. IN ORDER TO MATCH ANY INCOMING FLOWRATE, MATCH THE TOTAL PIPE AREA OF INLET FLOW TO THE TOTAL FLOW AREA FROM THE TRITON MAIN HEADER ROW TO THE STORAGE ROWS.

EXAMPLE: A 24" PIPE HAS AN AREA OF 3.14 FT2. IF THE END CAPS ARE CUT AT 20" ABOVE THE END CAP BASE THE FLOW AREA PER CUT IS 1.354 FT2. 3.14 FT2 DIVIDED BY 1.354 FT2 EQUALS 2.3. SO 3 INNER MHR END CAPS MUST BE CUT IN ORDER TO ACCOMMODATE THAT FLOW.



Cut Height Above End Cap Base		Flow Area Per Cut	
in	mm	ft^2	m^2
6	152	4.161	0.387
7	178	3.943	0.367
8	203	3.728	0.347
9	229	3.517	0.327
10	254	3.307	0.308
11	279	3.101	0.289
12	305	2.897	0.270
13	330	2.695	0.251
14	356	2.496	0.232
15	381	2.299	0.214
16	406	2.105	0.196
17	432	1.913	0.178
18	457	1.724	0.161
19	483	1.537	0.143
20	508	1.354	0.126
21	533	1.174	0.109
22	559	0.998	0.093
23	584	0.829	0.078
24	610	0.668	0.063
25	635	0.516	0.048
26	660	0.375	0.035
27	686	0.248	0.024
28	711	0.139	0.013
29	737	0.052	0.005

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VAULT END CAP CUT AREA STANDARD DETAIL

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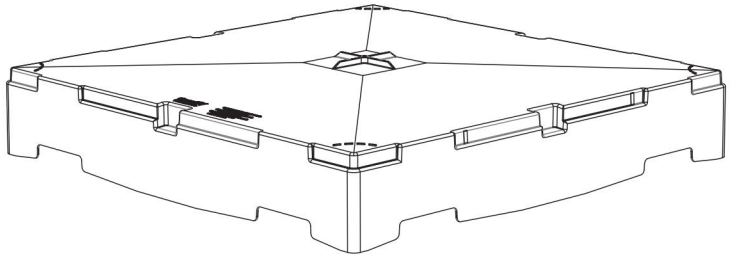
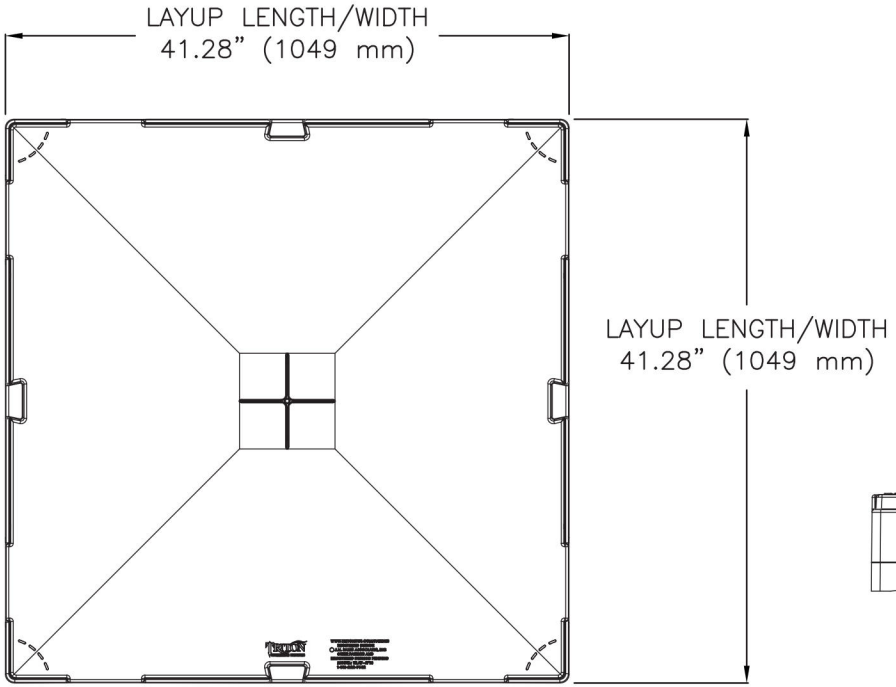
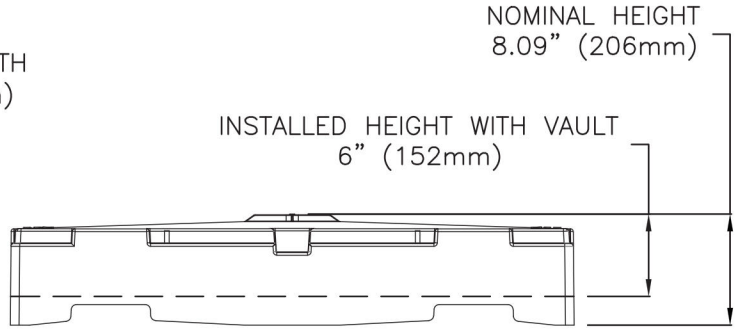
TRITON VAULT TRAY SPECS	
NOMINAL DIMENSIONS (LAYUP LENGTH X LAYUP WIDTH X HEIGHT)	41.28" X 41.28" X 8.09" (1049mm X 1049mm X 206mm)
INSTALLED DIMENSIONS (WITH TRITON VAULT) (LAYUP LENGTH X LAYUP WIDTH X HEIGHT)	41.28" X 41.28" X 6.00" (1049mm X 1049mm X 152mm)
BARE TRAY STORAGE	5.92 CUBIC FEET (0.168 CUBIC METERS)
TRAY WEIGHT	30 lbs (13.6 kg)







CONCEPTUAL PLAN DISCLAIMER

THIS GENERIC DETAIL DOES NOT ENCOMPASS THE SIZING, FIT, AND APPLICABILITY OF THE TRITON VAULT SYSTEM FOR THIS SPECIFIC PROJECT. IT IS THE ULTIMATE RESPONSIBILITY OF THE DESIGN ENGINEER TO ASSURE THAT THE STORMWATER SYSTEM DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. TRITON PRODUCTS MUST BE DESIGNED AND INSTALLED IN ACCORDANCE WITH TRITON'S MINIMUM REQUIREMENTS. TRITON STORMWATER SOLUTIONS DOES NOT APPROVE PLANS, SIZING, OR SYSTEM DESIGNS. THE DESIGN ENGINEER IS RESPONSIBLE FOR ALL DESIGN DECISIONS.

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VAULT TRAY STANDARD DETAIL

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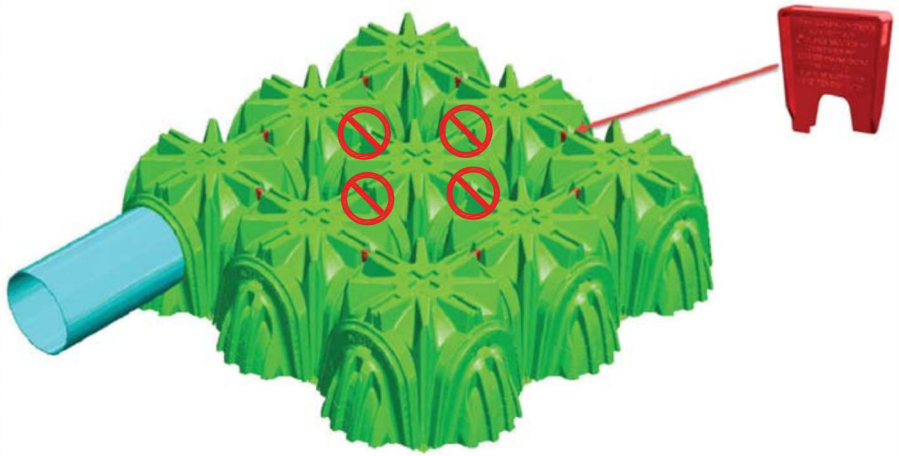
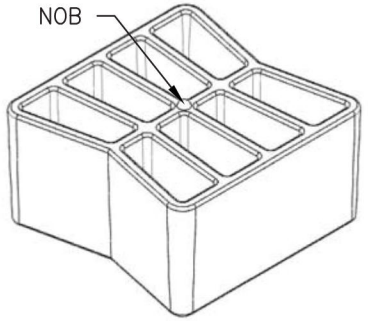
TRITON VAULT CLOSE–OFF

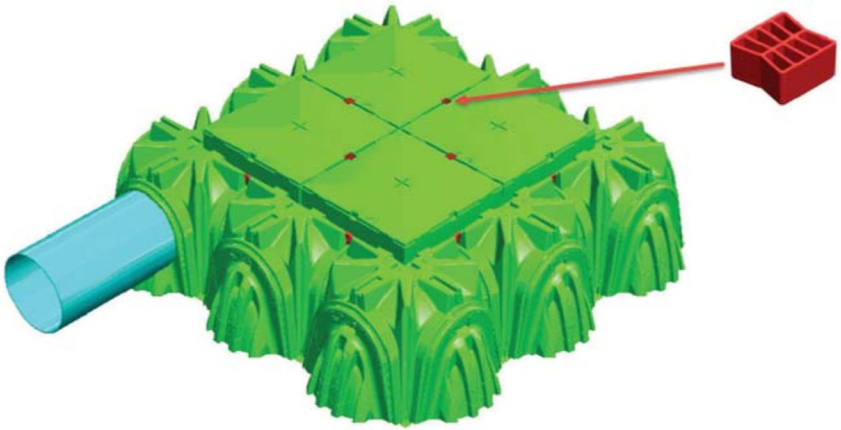
CLOSE–OFF PARTS ARE ONLY REQUIRED BETWEEN ALL THE PERIMETER (OUTSIDE) VAULTS AS SHOWN BELOW. NO CLOSE–OFFS ARE REQUIRED BETWEEN VAULTS THAT ARE ON INSIDE OF THE SYSTEM.



TRITON VAULT LOCK

THE TRITON VAULT LOCKS WILL BE USED TO LOCK TOGETHER ALL TRAYS AS SHOWN IN THE IMAGE BELOW WITH THE ORIENTATION NOB FACING UPWARD





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TRITON VAULT
LOCK AND CLOSE-OFF DETAIL

TRITON - STANDARD DETAILS

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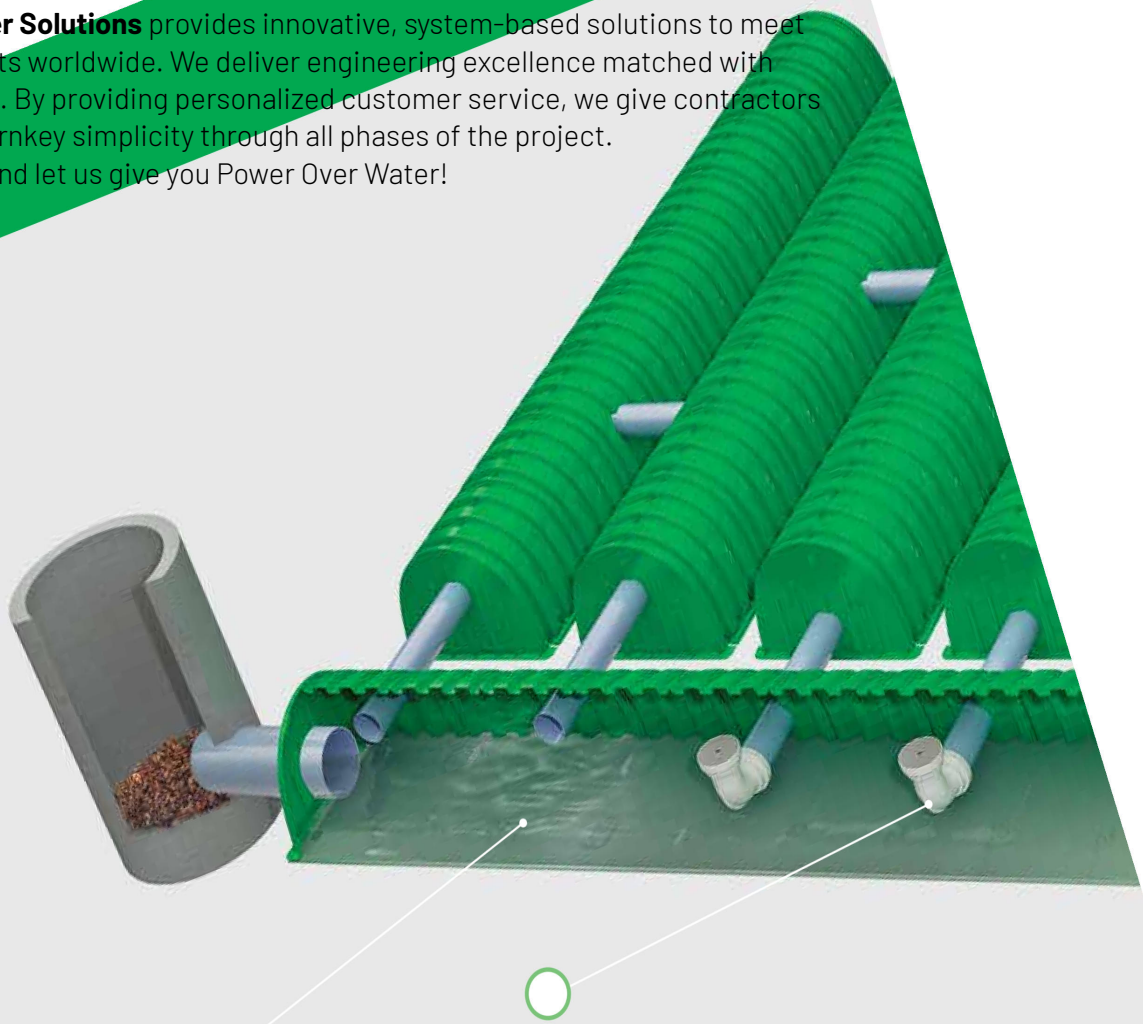


1

MAIN HEADER ROW (MHR)

The heart of the Triton system is the Main Header Row[1]. Working as a collection point and management center for incoming stormwater runoff, the Main Header Row allows sediments to be captured onto Triton's patented Sediment Floors before passing the water into the Distribution Chamber Rows. Intelligently designed, Triton's MHR systems can work in conjunction with a variety of catch basin pre-treatment devices, where required.

The Triton Main Header Row eliminates the need for manifolds and manholes altogether, because our products are so strong they can take a direct connection into the end cap or side of the chamber.

2

POLLUTION CONTROL OPTIONS

The key to the system's robust pollution abatement is twofold. First, the Main Header Row will allow the sediment to settle out as the water from the inlet manhole rises upward to the connecting pipe inverts.

Then, once the water is inside the Main Header Row, the Triton-designed upward Elbow and Filter Puck system gives designers the ability to use any type of customer sourced filtration media (Zeolite, Granular Activated Carbon (GAC), Metal Zorb, etc.). This flexibility allows the user to target a wide range of common contaminants before the water is sent to the distribution chambers.

The water in the distribution (storage) chambers then leaches back through the soil to recharge aquifers just as it would in nature. If a liner is used with the system, the water can be used for landscape irrigation, toilets or wet fire suppression systems.

By adding a Puck Sceen, the download Elbow and Filter Puck System could also be used to prevent floatables from entering the storage chambers.

The image above shows three different options: Connecting pipes without the Elbows, with Elbows and Filters Pucks pointing up, and with the Elbows and Filter Pucks pointing down.

TRITON STORMWATER SOLUTIONS

3 EFFICIENT EQUALIZATION

Equalization Pipes[2] can be placed anywhere within the Triton System to allow for the most efficient equalization of the system based on flow rates coming into the Distribution Rows.

4 STRENGTH, STORAGE & FLEXIBILITY

Triton chamber systems are the strongest in the market. The Triton products were designed to exceed the ASTM F2418, F2787, F2922 standards and AASHTO LFRD Bridge specifications, and have been validated through independent third-party performance testing. Because of their strength, the Triton chambers can be double-stacked to allow for greater storage in a smaller area and can be buried to depths of 50 feet. The strength of the chambers allows for direct connections into the front, side or top of the units so the Triton system can eliminate the need for cumbersome manifold systems and expensive catch basins.

5 INSPECTION & MAINTENANCE

Large inlet and access ports are easily accommodated into the Triton system to allow for easy inspection and clean-out. Inlets can be placed virtually anywhere in the system per the engineer's requirements.
The access pipes can be PVC or dual-wall corrugated pipe that sits inside a concrete top slab with a frame and lid. Refer to the Triton Details found on the Resources/Downloads page of the Triton website for full details.

SEDIMENT CONTROL

Sediment sumps[3] can be incorporated into the system to help act as a collection point for sediment and debris. These sumps provide a location for sediment trapped within the Main Header Row to backwash into, as well as helping to expedite cleaning via a Jet Vac Truck during the maintenance phase.

[1] Can be installed perpendicular or parallel.

[2] Standard designs will not have pipes between every row. Multiple equalization pipes shown for flexibility purposes only.

[3] Sumps can be customer sourced.

COMMERCIAL

Triton Stormwater Solutions is the ideal system for commercial installations. The combination of chamber strength and storage capacity allows required storage in a small footprint while preserving valuable surface area for development.

Car Dealership Maximizes Parking Area

PROJECT: Champion Chrysler, Jeep, Dodge Auto Dealership

LOCATION: Lansing, Michigan

CHALLENGE: Existing detention pond would need to be expanded to meet requirements — Costing the dealership 20 parking spots.

60 PARKING SPACES GAINED

TRITON'S SOLUTION: Replace the 185' x 75' detention pond with an underground system that stores more water than the old pond which added 60 new parking spaces.

Shopping Complex Protects Local Creek

PROJECT: Keyser Shopping Complex

LOCATION: Keyser, West Virginia

CHALLENGE: Preserve space, protect a local creek, store large volumes of runoff.

HANDLED STORAGE DEMANDS

TRITON'S SOLUTION: Placement of nearly 2,550 chambers under a parking lot with only 16" of top-fill due to the tremendous strength of the chambers. The system is able to handle the demands of storage, even with the negligible change in elevation that creates large volumes of water being held for long periods of time.

Fast Food Restaurant Gets Upgrade

PROJECT: Restaurant Remodel and Renovation

LOCATION: St. Paul, Minnesota

CHALLENGE: New watershed requirements, return land previously used by detention pond.

MET CITY'S STRICT REQUIREMENTS

TRITON'S SOLUTION: A high-volume underground storage system that was placed in conjunction with ongoing street work in the area to minimize disruption. The system meets the city's strict requirements while providing almost 7,800 cubic feet of storage.

Panda Express Retains Shallow Depth

PROJECT: Panda Express New Build

LOCATION: Midland, MI

CHALLENGE: Provide a stormwater system with ample storage while having to retain a very shallow depth.

M6 ACHIEVES SHALLOW FOOTPRINT

TRITON'S SOLUTION: Using the M6 chamber system, contractor was able to maximize storage volume keeping a shallow footprint. Triton was also able to supply the fabric and pipe, along with the chambers, to deliver the entire packaged system saving money and time.

MUNICIPAL

Triton's money-saving systems are perfect for municipalities who require proven bang-for-the-buck solutions that can deliver long-term performance.

Minnesota Bus Stop Project Runs on Time

PROJECT: Metro Transit Bus Stop Improvement

LOCATION: Brooklyn Park, Minnesota

CHALLENGE: Triangular site with an existing pond on one side and a mall on the other side with limited storage options.

ADAPT TO FIT TRIANGULAR SITE

TRITON'S SOLUTION: The flexibility inherent in the Triton system allowed the triangular site to work, which gave developers the ability to tie into the existing inflow and outflow pipes.

Duluth Airport Flies High

PROJECT: Duluth International Airport Upgrade

LOCATION: Duluth, Minnesota

CHALLENGE: Extreme weather and a rocky landscape coupled with a need to protect the area's natural beauty.

CHEMICAL RESISTANT MATERIAL

TRITON'S SOLUTION: A design incorporating a hydrocarbon-capturing pretreatment system into our main header row was used to mitigate pollution, while our large-capacity S29 chambers provided the needed storage and strength at a shallow depth.

Resort Relaxing at Ontario's Friday Harbor

PROJECT: Friday Harbor Four Season Resort

LOCATION: Lake Simcoe, Ontario

CHALLENGE: The site's elevation and an existing barrier wall made a strong, large-capacity system a must.

ACCOMMODATED PUMPING STATIONS

TRITON'S SOLUTION: An extra-long main header row was used to accommodate four pumping stations — three to get water to the storage system and one to bring water to the surface when needed.

Penn DOT Gives Green Light

PROJECT: Intersection Upgrade

LOCATION: Dubois, Pennsylvania

CHALLENGE: Developers needed to gather runoff from a large hospital parking lot, as well as the street intersection all while collecting sediment to protect the city's water supply.

PROTECTED CITIES WATER SUPPLY

TRITON'S SOLUTION: A large capacity storage system with a collection port to easily clean the sediment catch basins, as well as a pressure washing inlet on the opposite end of the main header row, to allow any sediments on the floor to be easily flushed or washed back down to the catch basins for collection.

CORPORATE

The efficiencies of the Triton system make us a natural fit for corporate projects, where return on investment is a must.

Flexibility, Storage Mark 3M Path

PROJECT: 3M Community Walking Path

LOCATION: Maplewood, Minnesota

CHALLENGE: Existing structures had to be worked around, and the project team had to minimize disruption to ongoing work at the facility.

SYSTEM DESIGN ALLOWS FLEXIBILITY

TRITON'S SOLUTION: The design flexibility of the Triton system allowed the engineers to create a system that met the storage needs without compromising existing natural features and landmarks.

Strength Speaks Volumes for Lowe's

PROJECT: Lowe's Home Improvement Centers Silverton Store

LOCATION: Silverton, Colorado

CHALLENGE: Sloping terrain and nearby water features that needed to be protected.

BURY DEPTH OF 10 FEET

TRITON'S SOLUTION: A system with a main header row allowed the inclusion of an oil-separating pre-treatment device to protect nearby waters. Used chambers strong enough to be buried 10 feet below the surface to accommodate the slope of the land.

Multiple Chamber Sizes for IKEA

PROJECT: IKEA Jacksonville Store

LOCATION: Jacksonville, Florida

CHALLENGE: Not only would this be the largest underground stormwater system in the Southeastern US, but it also had to collect water from a variety of sources to work within the seasonal high water table limitations.

LARGEST SYSTEM IN SOUTHWEST U.S.

TRITON'S SOLUTION: A robust, flexible system that could handle runoff from parking lots, roof lines and unimproved lands was designed. By incorporating a main header row, the Triton system could filter out sediments when needed, allowing pass through of water to storage chambers during heavy rainfall events.

Ease of Installation at Skate Park

PROJECT: Skateboard Park

LOCATION: Ann Arbor, Michigan

CHALLENGE: Limited space and an existing outlet pipe presented a depth restriction.

RECOVERED LAND USE

TRITON'S SOLUTION: A system with an integrated but offset Main Header Row was chosen to help filter sediments from the water before it entered the distribution rows, while still conforming to the drainage field's unique shape.

COMMUNITY

Triton Stormwater Solutions is a tremendous asset to community developers. Installations are faster than traditional stormwater management options and can be done with minimum disruption.

Neighborhood Upgrade at Detroit's Brush Park

PROJECT: Community Park Stormwater System

LOCATION: Detroit, Michigan

CHALLENGE: Limited space compounded by contaminated soils and utility easements.

MULTIPLE SYSTEMS

TRITON'S SOLUTION: Instead of the planned stormwater pipes, Triton created 20 individual systems that could work together to prevent infiltration of the contaminated soils, while providing 45,600 cubic feet of storage.

Community Center for St. Cloud

PROJECT: St. Cloud Community Center

LOCATION: St. Cloud, Minnesota

CHALLENGE: The proposed site had a very small area that needed to comply with Minnesota's B-3 Guidelines for stormwater management.

DOUBLE-STACKED EFFICIENCY

TRITON'S SOLUTION: By designing the installation to utilize Triton's strength in a double-stacked configuration, engineers were able to drain three acres of impervious surface runoff into a 36' x 140' drainfield to protect local waterways and meet state requirements.

School Install Earns an "A" in Indiana

PROJECT: Brown Elementary School Parking Lot

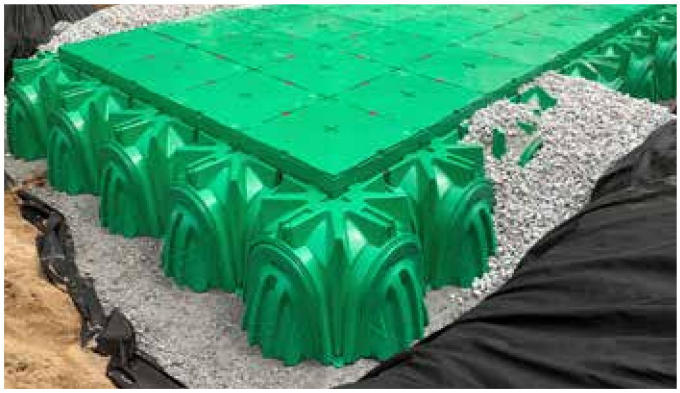
LOCATION: Brownsburg, Indiana

CHALLENGE: A tight footprint combined with the need to minimize disruption to ongoing class schedules and activities.

MINIMIZED DISRUPTION

TRITON'S SOLUTION: By using the S29 Chamber rather than the originally specified competitive product, the contractor was able to achieve greater storage capacity with a faster, easier install that also required less stone — saving time, money and hassle.

1ST Global Vault Multiplex Install in Michigan



PROJECT: Studio Park Complex

LOCATION: Grand Rapids, MI

CHALLENGE: The site had an extremely narrow jobsite with a need for maximum storage capacity.

1ST WORLDWIDE INSTALLATION

TRITON'S SOLUTION: The Brand New Vault system not only provided the best stormwater storage solution, it allowed the owner of the site to save money by reducing stone backfill, cutting in half the need for stone/backfill trucks and eliminating the need for an expensive pretreatment system by customizing the system's expandable sediment forebay.

INNOVATION TIMELINE

From its founding, Triton Stormwater Solutions has been driven by a single focus: to solve problems of stormwater management through innovative engineering approaches and product development.

2004
PROBLEM
After watching uncontrolled water runoff in front of his house, Triton founder Joe Miskovich looked for ways to protect his property and nearby water features and found that no suitable options existed.

2007
SOLUTION

Miskovich invented the S29 Chamber and launched Triton Stormwater Solutions.

2008
PROBLEM
The S29 Chamber was not meeting the needs of customers who had to deal with high water tables, shallow footprints or other storage challenges.

2009
SOLUTION

Triton introduced the M6 and C10 chambers, which reduced chamber heights to allow designs with shallow footprints. Thus, the benefits of underground storage can be realized in almost any environment.

2010
PROBLEM
The international market could not be easily serviced by existing chambers, because they did not fit efficiently into sea freight containers.

2012
SOLUTION

Triton introduced the S22 Chamber, which maximized shipping efficiencies by modifying the design of the S29 to create an easily transported chamber that delivered cost-efficient stormwater storage.

2015
PROBLEM
The stormwater market was turning to larger and larger chambers to achieve needed storage, which created new issues with installation in areas where stone costs are high.

2019
SOLUTION

Triton developed the revolutionary Vault System which matched or exceeded the largest volume chambers on the market, while maintaining the height of the S29 Chamber and offering system design flexibility never before seen in the market — all while requiring 70% less stone than comparable products!

COMPLETE STORMWATER SYSTEMS

MINI | Model: M-6
34" W x 17.5" H x 32" L 12 lbs
863.6mm x 44.5mm x 812.8mm 6.8 kg.

Bare Chamber Storage 5.6 cf (.16 m^3)
With 6" (160mm) Stone Above and Below 11.5 cf (.326 m^3)

COMPACT | Model: C-10
40" W x 25" H x 32" L 15 lbs
1016mm x 635mm x 812.8mm 6.8 kg.

Bare Chamber Storage 9.8 cf (.28 m^3)
With 6" (160mm) Stone Above and Below 17.6 cf (.498 m^3)

MEGA | Model: S-22
55" W x 35" H x 30" L 28 lbs
1397mm x 863.6mm x 762mm 12.7kg

Bare Chamber Storage 23.2 cf (.66 m^3)
With 6" (150mm) Stone Above and Below 33.8 cf (.96 m^3)

ULTIMATE | Model: S-29
59" W x 36" H x 35" L 37 lbs
1498.6mm x 914.4mm x 889mm 14.5 kg.

Bare Chamber Storage 29 cf (.82 m^3)
With 6" (160mm) Stone Above and Below 41.1 cf (1.161 m^3)

VAULT
41.28" W x 36" H x 41.28" L 50 lbs
1049mm x 1049mm x 914mm 22.7kg
Bare Chamber Storage 28.79 cf (.82 m^3)

Without Tray and 6" (150mm) Stone Above and Below 36.21 cf (1.025 m^3)

With Tray and 6" (150mm) Stone Above and Below 43.78 cf (1.24 m^3)

TRITON STORMWATER SOLUTIONS

LIFETIME SYSTEM WARRANTY

810-222-7652 | tritonsws.com
7600 Grand River • Suite 195 • Brighton, Michigan 48114

Power Over Water®

3540 – 3608 Peck Road
El Monte, CA 91731

Appendix H – Operation and Maintenance Manual for BMPs

TRITON
STORMWATER SOLUTIONS

Power Over Water®

Triton Stormwater Solutions Main Header Row™ O&M Manual

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The Triton Main Header Row™ is a patent pending technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

The Main Header Row™

The Main Header Row is comprised of a row of any Triton chambers that sit upon the interconnecting sediment floors that are connected to a closely located manhole for easy access. At the end of the Main Header Row there can be an optional Sump Basin Assembly (Shown as item 3 in figure 2) to help collect and contain any sediment that will be flushed out of the Main Header Row during a rain event or during a maintenance cleaning. The sump basin assembly can then be accessed from above via a manhole or up to a 33" diameter stand pipe. The Main Header Row feeds the distribution rows (shown as item 4 in figure 2) via a feed or distribution pipe. The Feed pipe is at an elevated invert height so the water in the Main Header Row has to rise to this invert height before flowing into the distribution rows thus capturing the sediments in the Main Header Row. The Main Header Row is then protecting the distribution chamber row storage areas of any sediment accumulation. This allows for preserving the infiltration rate of the area where the distribution rows are installed thus allowing the system to perform at the rate that the system was designed for.

The sediment floors are designed to prevent scouring of the underlying stone and to collect sediments from infiltrating into the ground under the Main Header Row. The sediment floors lock together and mate with the chambers so they will remain intact during very high flow events and during high pressure cleaning.

The Main Header Row is typically designed to capture the "first flush" and offers the versatility to be sized on a volume basis or flow-rate basis. An up-stream manhole not only provides access to the Main Header Row but typically includes a high flow outlet such that stormwater flow rates or volumes that exceed the capacity of the Main Header Row can overflow into the surrounding stone and or discharge through a manifold to the other chambers. The Main Header Row may also be part of a treatment train. By treating stormwater prior to entry into the Main Header Row system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the de-sign engineer are often driven by regulatory requirements. Whether pre-treatment is used or not, the Main Header Row is recommended by Triton as an effective means to minimize maintenance requirements and maintenance costs.

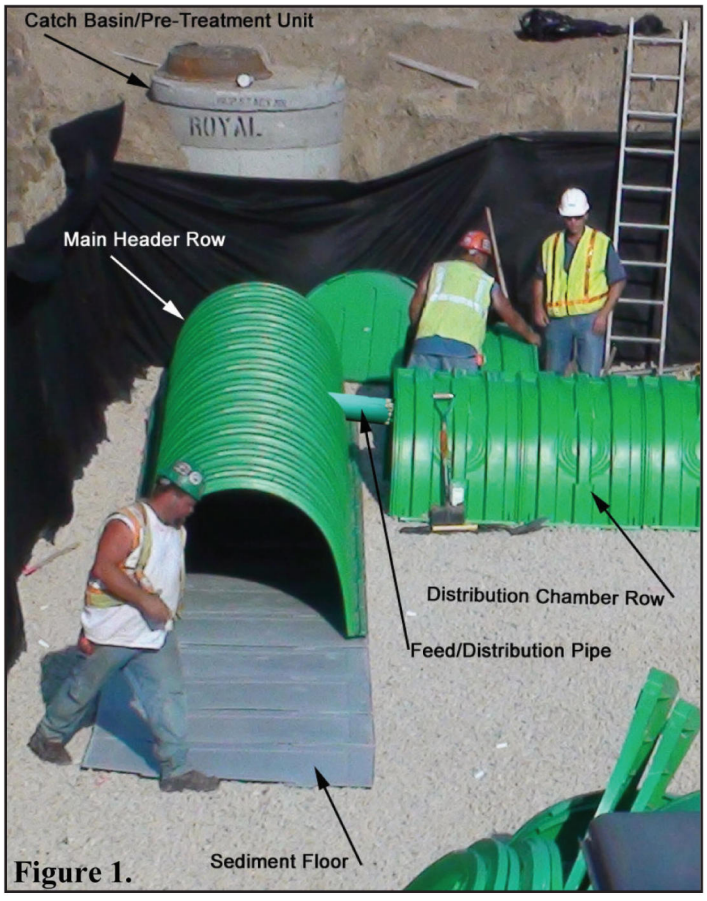


Figure 1.

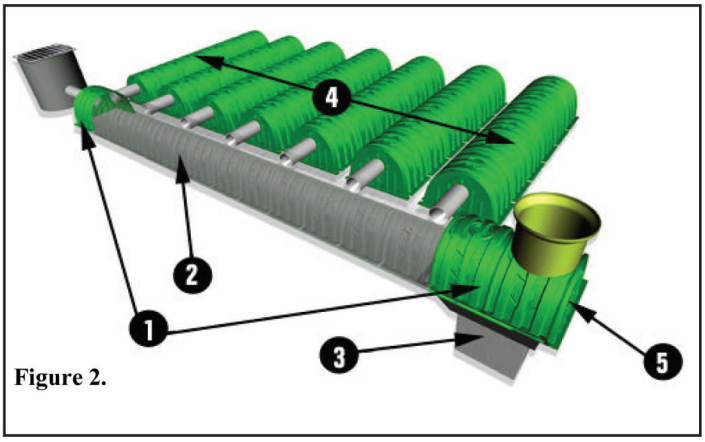


Figure 2.

Treatment Train Inspection and Maintenance

The Triton SWS recommended treatment train inlet system has three tiers of treatment upstream of the Triton SWS chambers. It is recommended that inspection and maintenance (I&M) be initiated at the furthest upstream treatment tier and continue downstream as necessary. The following I&M procedures follow this approach providing I&M information in the following order:

Tier 1- Pre-treatment (BMP);

Tier 2 - Triton SWS Main Header Row

Tier 3 - Eccentric Pipe Header System – This option is not needed when using the Triton system because the Main Header Row eliminates the need for a pipe header system.

Catch Basin/Manholes I&M

Typically a stormwater system will have catch basins and manholes upstream of the detention/retention system. In some cases these may be the only pre-treatment devices. Regular I&M of catch basins and manholes should be scheduled and per-formed as part of a site's routine maintenance plan.

Step-by-Step Maintenance Procedures

1). Inspect catch basins and manholes upstream of Triton SWS chambers for sediment

2). Remove grate or cover

3). Skim off oils and floatables

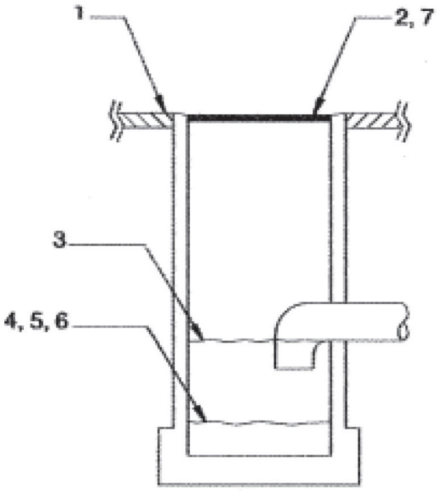
4). Using a stadia rod, measure the depth of sediment

5). If sediment is at a depth greater than 8" proceed to step 6. If not proceed to step 7.

6). Vacuum or manually remove sediment

7). Replace grate

8). Record depth & date and schedule next inspection



Pre-Treatment Device I&M

Manufacturer's I&M procedures should be followed for proprietary pretreatment devices such as baffle boxes, swirl concentrators, oil-water separators, and filtration units. Table below provides some general guidelines but is not a substitute for a manufacturer's specific instructions.

SEDIMENT CONTROL INSPECTION	INSPECTION*	MAINTENANCE**
Triton Main Header Row	Annually	JetVac-Culvert Cleaning Nozzle or High-Pressure Hose
Sediment Basin	Bi-Annually or after large storm event	Excavate sediment
Catch Basin Sump	Bi-Annually	Excavate, pump or vacuum
Sediment Structure	Bi-Annually	Excavate, pump or vacuum
Catch Basin Filter Bags	After all storm events	Clean and/or replace filter bags
Porous Pavement	Quarterly	Sweep Pavement
Pipe Header Design	Quarterly	Excavate, pump or vacuum
Water Quality Inlet	Quarterly	Excavate, pump or vacuum
Triton Filter Pucks	Bi-Annually	Clean and/or replace filter media in pucks

Main Header Row™ Inspection

The frequency of Inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc., all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, Triton recommends annual inspections. The Main Header Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Main Header Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 8" inches in the bottom of the Sump Basin and or if there is 3" throughout the length of the Main Header Row, clean-out of the Sump Basin and Main Header Row should be performed.

Main Header Row™ Maintenance

The Main Header Row was designed to reduce the cost of periodic maintenance. By confining sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the Main Header Row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined-space entries. The inside dimensions of the Triton Main Header Row Chambers are 34" tall by 48" wide.

Maintenance is accomplished by removing the sediment that has built up in the Sump Basin by using a standard vacuum truck as shown to the right. The Triton Main Header Row system was designed to allow for easy access to the Sump Basin via a manhole/inspection port up to a 33" diameter pipe. There is no need for a special process to clean out the Sump Basin and the Main Header Row but they can be cleaned using a JetVac process or can be cleaned by using a water tank truck or fire truck equipped with a hose to flush the sediment to the Sump Basin if so desired. To use a water tanker or fire truck simply insert the hose into the upstream catch basin structure and flush the sediment to the end of the main header row where the Sump Basin is located. If the Sump Basin is located close to the inlet, then vacuum out the sediment first and then back flush the Main Header Row back into the Sump Basin.

NOTE: The JetVac or high-pressure hose process shall only be performed on the Main Header Row where the Triton Sediment Floor System has been installed and only if there is 3" of sediment throughout the length of the Main Header Row.

GOINGgreen®

Main Header Row™ Step-by-Step Maintenance Procedures

Step 1. Inspect Sump Basin and Main Header Row for sediment

A. Inspection ports (if present)

i. Remove lid from floor box frame

ii. Remove cap from inspection riser

iii. Using a flashlight and stadia rod, measure depth of sediment in the Sump Basin and record results on maintenance log.

iv. If sediment is at or above 11-inch depth, proceed to Step 2. If not, proceed to step 3.

B. All Main Header Rows

i. Remove cover from manhole at upstream end of Main Header Row

ii. Using a flashlight, inspect the Main Header Row through outlet pipe and through each distribution pipe that is connected in between the Main Header Row and the distribution row of chambers

iii. If sediment is at or above the 11" mark in the sump bin, proceed to Step 2

1. Be sure to have proper footing when entering into Main Header Row.

2. Follow OSHA regulations for confined space entry if entering Main Header Row.

If not, proceed to Step 3

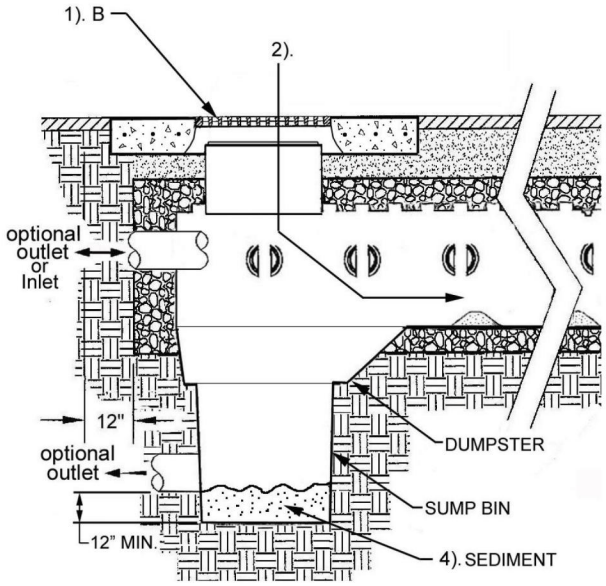
Step 2. Clean out the Sump Basin with a vacuum truck

A. Remove any secondary filtration media that may be installed in the sump basin

B. Vacuum Sump Basin as required

Step 3. Replace all caps, lids, and covers. Record observations and actions

Step 4. Inspect & clean catch basins and manholes upstream of the Triton system

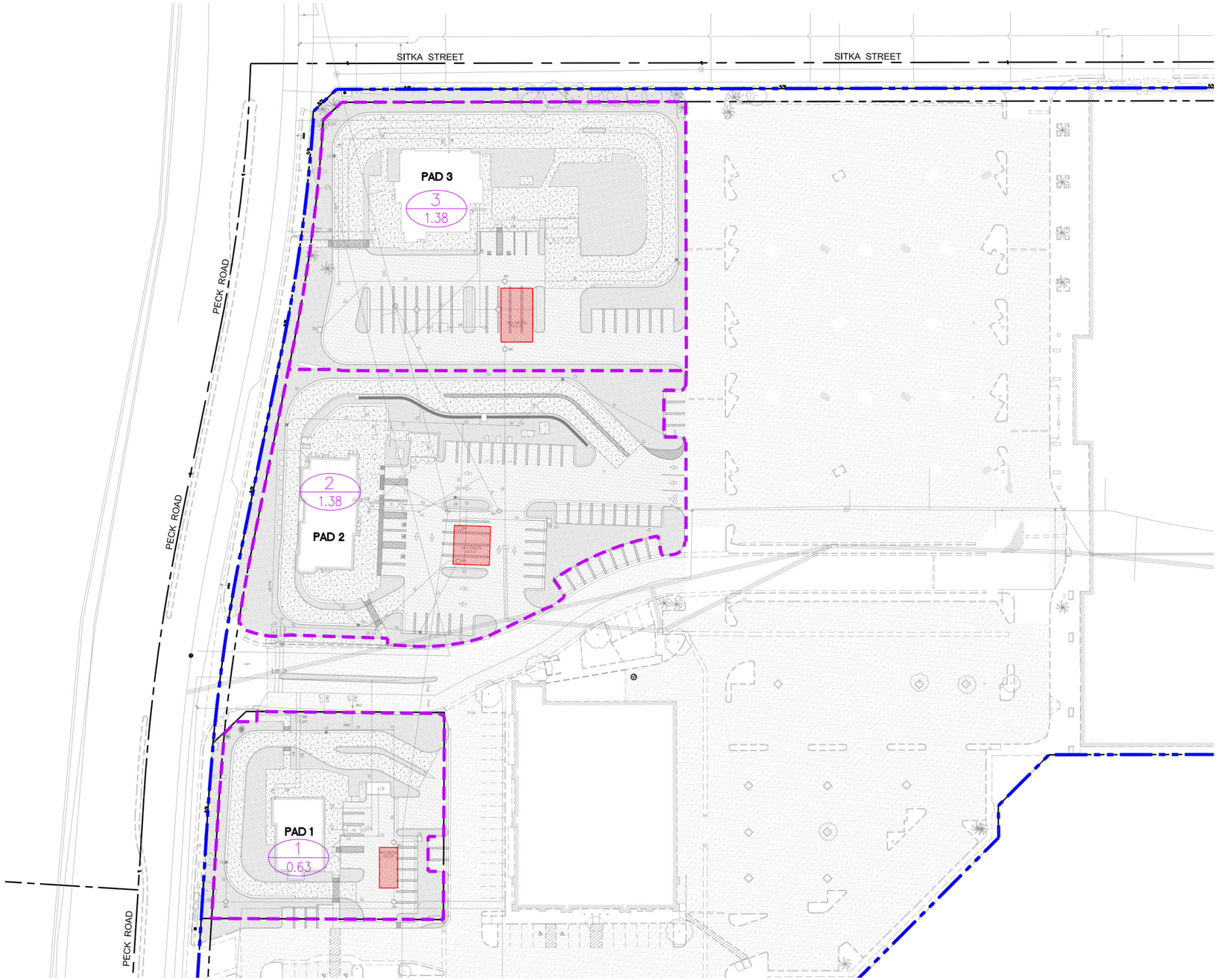


Sample Maintenance Log

Date	Stadia Rod Readings		Sediment Depth (1)-(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to chamber top (2)			
4/11/2007	9.7 ft.	None		New installation. Fixed point is J1 frame at grade	KET
10/21/2007		9.6	0.1 ft.	Very little sediment in system - No maintenance required	GKT
4/11/2008		9.4	0.3 ft.	Very little sediment in system - No maintenance required	CMM
7/25/2009		9.1	0.6 ft.	Some debris/sediment is visible in sump basin assembly but not interfering with outlet	LEJ
7/20/2010		8.7	1.0 ft.	Some debris/sediment is visible in sump basin assembly - maintenance is due	DLC
8/20/2010	9.7 ft.		0	System has cleaned and vacuumed - very easy system to clean	NAT

3540 – 3608 Peck Road
El Monte, CA 91731

Appendix I – LID Plot Plan



PROPERTY AREA: 689,059 S.F.
15.8 ACRES

PROJECT AREAS:

AREA A: 27,241 S.F. = 0.63 ACRES
AREA B: 59,995 S.F. = 1.38 ACRES
AREA C: 60,150 S.F. = 1.38 ACRES

LEGEND:

PROPERTY AREA DELINEATION
DRAINAGE AREA DELINEATION
X — DRAINAGE AREA NAME
X.X — DRAINAGE AREA ACERAGE

BMP:

INFILTRATION CHAMBER

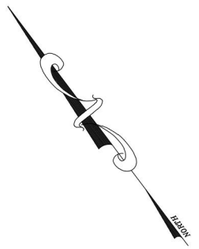
NOTE:

ANY CHANGES (TYPE, SIZE, LOCATION) TO APPROVED STORMWATER BEST MANAGEMENT PRACTICE(S) (BMPS) MUST OBTAIN WRITTEN APPROVAL FROM THE CITY OF EL MONTE PRIOR TO CONSTRUCTION OF BMP(S).

APPLY STENCIL AT ALL CATCH BASINS AND ALONG TRENCH DRAINS, SPACED AT 20 FOOT INCREMENTS.

CATCH BASIN STENCIL

N.T.S.



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Know what's below. Call before you dig.

REVISIONS

NO.	DATE	DESCRIPTION	ENGR.	APPROV.

BASIS OF BEARINGS

THE BEARINGS SHOWN HEREON ARE BASED UPON THE CENTERLINE OF SITKA STREET AS SHOWN ON THE MAP OF TRACT NO. 11601, RECORDED IN BOOK 214, PAGE 17, OF MAPS, RECORDS OF LOS ANGELES COUNTY, CALIFORNIA. BEING NORTH 53° 06' 00" WEST.

BENCHMARK

LOS ANGELES COUNTY BENCHMARK MG4897
L&BR IN S CB STEWART ST E END C.B. 2FT W/O BCR 15' S/O C/L & 84FT W/O C/L PECK RD ELEV = 289.893 (NAVD 88)

PLANS PREPARED BY:

NA CIVIL, INC.
CIVIL ENGINEERING · SURVEYING
22672 LAMBERT STREET, SUITE 606
LAKE FOREST, CA 92630
(949) 753-0600

UNDER THE SUPERVISION OF:

09/27/2024

MATTHEW PALERMO R.C.E. NO. 78355

REGISTERED PROFESSIONAL ENGINEER · MATTHEW JOHN PALERMO · No. C78355 · Exp. 09-30-25 · CIVIL · STATE OF CALIFORNIA

CITY OF EL MONTE
PUBLIC WORKS DEPARTMENT

APPROVED BY:

CITY OF EL MONTE
CITY ENGINEER — DATE

REVIEWED AND RECOMMENDED BY — DATE

CITY OF EL MONTE

DEPARTMENT OF PUBLIC WORKS - ENGINEERING DIVISION

3540, 3600 & 3608 PECK ROAD, EL MONTE, CA 91731

LID PLOT PLAN

DESIGNED BY: MP	DRAWN BY: KN	CHECKED BY: MP	SHEET 1 OF 1