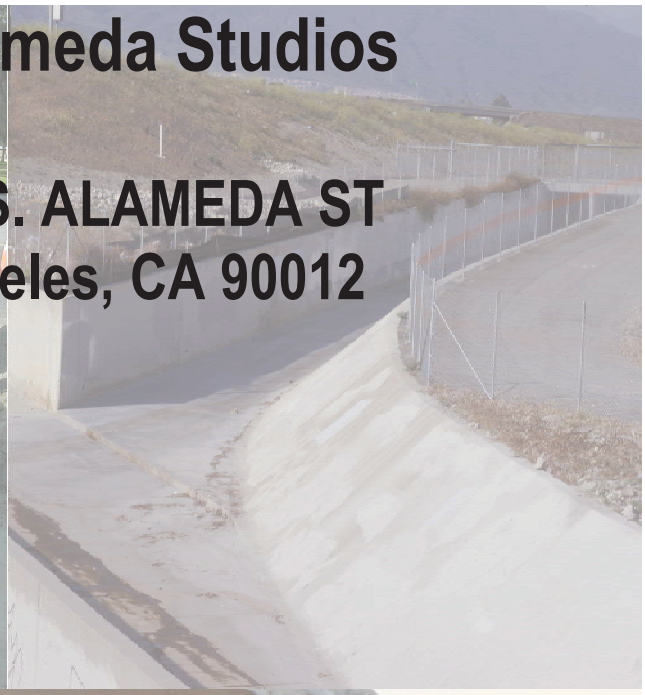
Appendix IS-9

Hydrology Report

Preliminary Hydrology & LID Study

8th & Alameda Studios

820-840 S. ALAMEDA ST
Los Angeles, CA 90012



Prepared For:

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ACG PROPERTY MANAGEMENT, LLC.
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Prepared By:

DAVID EVANS AND ASSOCIATES INC.

Travis Iverson, PE

March 2021
ATLSALA8-0001

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TABLE OF CONTENTS

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INTRODUCTION

1. PROJECT LOCATION, DESCRIPTION & SCOPE

This study has been prepared to assess the existing hydrologic conditions and post-development hydrology and Low Impact Design (LID) for the Los Angeles Printing Press site located at East 8th Street and Alameda Street in Los Angeles, California. The site is bound to the west by Alameda Street, to the south by Hunter Street and Olympic Boulevard, to the east by Lemon Avenue, and to the north by 8th Street.

The existing site operates as a printing press and consists of the main LA Times Printing Press building, vehicular maintenance building, vehicle/truck fueling station, and a surface parking lot. The proposed development will remodel the existing printing press building, remodel the existing vehicular maintenance facility building, and will construct a new 9-level parking structure, three new production studios and an office building.

The purpose of this report is to evaluate the remodel hydrological conditions of the site and analyze the 50-year storm peak flows for design of the on-site storm drain system for flood protection of the facility structures. It also demonstrates the proposed LID (Low Impact Development) techniques and BMP's (Best Management practices) for the redevelopment.

2. EXISTING SITE DESCRIPTION AND CONDITIONS

As previously stated, the existing site area is comprised of the LA Times Printing Press building, vehicular maintenance building, vehicle/truck fueling station, and a surface parking lot. There is also an existing generator fire water pump to remain and a diesel emergency generator to remain, both of which service the existing LA Times building. The site hardscape is relatively flat and is comprised of asphalt and concrete pavement. Per the record drawings provided by ATLAS and the aerial topography survey performed by PSOMAS, the site drains to a network of on-site catch basins that convey stormwater flows into the existing City of LA-maintained underground 12-foot arched concrete storm drain channel, which intersects the site from the northwest to the east through Lemon Avenue. The on-site storm drain network captures flow from the entire site including the existing roof drainage of both the LA Times building and vehicular maintenance building, and sheet flow from the surface parking lot. The existing underground 12-foot arched storm drain main conveys all flow from the site as well as flow from two catch basins at the intersection of Lawrence Street and Olympic

Boulevard and several catch basins along 8th Street and the intersection of Lawrence and 8th.

According to the soils report, the historical groundwater table is more than 120 feet below ground surface and groundwater was not encountered within the 76-foot subsurface explorations performed in 1987. Percolation testing was performed in two locations: one to the northeast near 8th Street and Lemon Avenue and another to the south of the project near Alameda Street and Hunter Street. The northeast percolation test was done to a depth of 30 feet and the measured rate was 61.3 inches per hour. The southwest percolation test was done to a depth of 50 feet and the measured rate was 43.2 inches per hour. Based on these findings, infiltration is a feasible bmp method for the site.

3. PROPOSED DEVELOPMENT

The proposed redevelopment consists of the renovation of the existing LA Times Building into several sound stages, shops and support offices, and renovation of the existing vehicle maintenance building into storage space. It also includes the construction of 5 structures: 3 new 3-story production stages with support offices, a 2-story shops building, and a 9-story parking structure. The existing canopy structure for the former fueling station will be demolished. The existing 1-story storage building to the southeast of the site will also be demolished. Generally, the proposed on-site grading will maintain the existing drainage pattern with slight grade changes. The on-site 12-foot arched storm drain main, and any existing laterals on-site, will be protected in place. The redeveloped site will convey surface and roof drainage to the proposed on-site Torrent Maxwell IV drywells before overflowing to the on-site storm system that conveys flow into the 12-foot arched storm drain main.

To meet the City of Los Angeles LID & storm water quality requirements, the underground drywell system is designed for mitigated low flow, and treatment for the required LID volumes. The proposed Torrent Maxwell IV Drywells will treat all stormwater. All on-site catch basins, storm drain pipes, LID devices and BMP's will be privately maintained. The Torrent Maxwell IV drywell Operation and Maintenance Agreement can be found in section 5 of this report. For the drainage concept and the proposed storm drain system location see the Preliminary Post-development Hydrology/LID/ SUSMP & BMP's Exhibit in Section 7 of this report.

4. HYDROLOGY & METHODOLOGY

The hydrologic data and methodology used in this report is based on the Los Angeles County Department of Public Works, Hydrology Manual dated by 2006. The Manual's

guidelines require that the developed areas having continuous grade shall be designed for the 50-year frequency storm. The site soil is class is # 006, the 50-year precipitation isoheyal is 5.8". The 85th percentile precipitation per the isoheytal map is 0.95" (greater than 0.75") in the project location, which is used for the Low Impact Design Volume calculations.

The Los County hydrologic calculator- HydroCalc was used to generate the 50-year peak discharge, time of concentration, LID Stormwater Quality Design Volume (Vd) calculations of this study. Per the soils report, the infiltration rates range from *43.2-61.3 inches per hour,* which allows for efficient infiltration. Infiltration is the preferred method of stormwater mitigation per the City of Los Angeles LID Handbook.

Hydrology & LID rainfall values used in the study:

Storm Event & Duration	Rainfall (inches)
50-Year, 24-Hour	5.80
85th Percentile 24-Hours	0.95

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On-site hydrology calculation summary tables see below:

Pre-Development Hydrology Summary Table:

Drainage Area ID	Tributary Area (acre)	Impervious Ratio	Tc (min.)	Q_{50} (cfs)	Runoff Volume (ft^3)
A	10.58	0.98	9	24.94	195,775.73
B	6.40	0.98	9	15.09	118,427.66
C	8.92	0.98	10	20.00	165,057.69
TOTAL	25.90				479,261.08

Post-Development Hydrology Summary Table:

Drainage Area ID	Tributary Area (acre)	Impervious Ratio	Tc (min.)	Q_{50} (cfs)	Runoff Volume (ft^3)
A	8.41	0.88	10	18.62	143,518.61
B	3.67	0.87	8	9.04	62,105.84
C	11.66	0.98	11	25.00	215,757.86
D	2.16	0.98	6	6.17	39,969.97
TOTAL	25.90				

Post-Development LID/SUSMP Summary Table:

Drainage Area ID	Tributary Area (acre)	Impervious Ratio	Tc (min.)	Qm (cfs)	Treatment Volume Vm (ft^3)
A	8.41	0.88	10		23,317.52
B	3.67	0.87	8		10,074.17
C	11.66	0.98	11		35,545.21
D	2.16	0.98	6		6,584.70
TOTAL	25.90				75,521.60

Total Required Vm: 75,522

The study shows that the total stormwater treatment volume Vm=75,522 ft^3. The Torrent Maxwell IV Drywell was selected as the treatment method because of the ability to efficiently store and infiltrate the 85^{th} percentile storm. The Torrent Maxwell IV Drywell calculation is shown in section 3 of the report. The system will provide 2,945 ft^3 storage volume per drywell, or 76,570 ft^3 total, which exceeds the required design storage volume Vm=75,522 ft^3.

5. CONCLUSION

In conclusion, this report demonstrates that the proposed redevelopment is designed to follow the City of Los Angeles drainage and LID requirements. The development will not increase runoff and will not cause flood risk to neighboring properties or the public storm drain system. The owner will privately maintain the on-site drainage system, consisting of catch basins, underground infiltration system and BMP's. The proposed storm drain & underground infiltration system are designed to convey the flow rates indicated herein and will comply with the flood protection and storm water quality requirements of the City of Los Angeles.

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FIGURES

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FIGURE 1

LA County Hydrology Map

About | Legend | Layers

Legend

Hydrology GIS

50yr Two Tenths (Rainfall)

Final 85th Percentile, 24-hr Rainfall

LA County Hydrology Map

Find address or place

PROJECT SITE

Imagery with Labels

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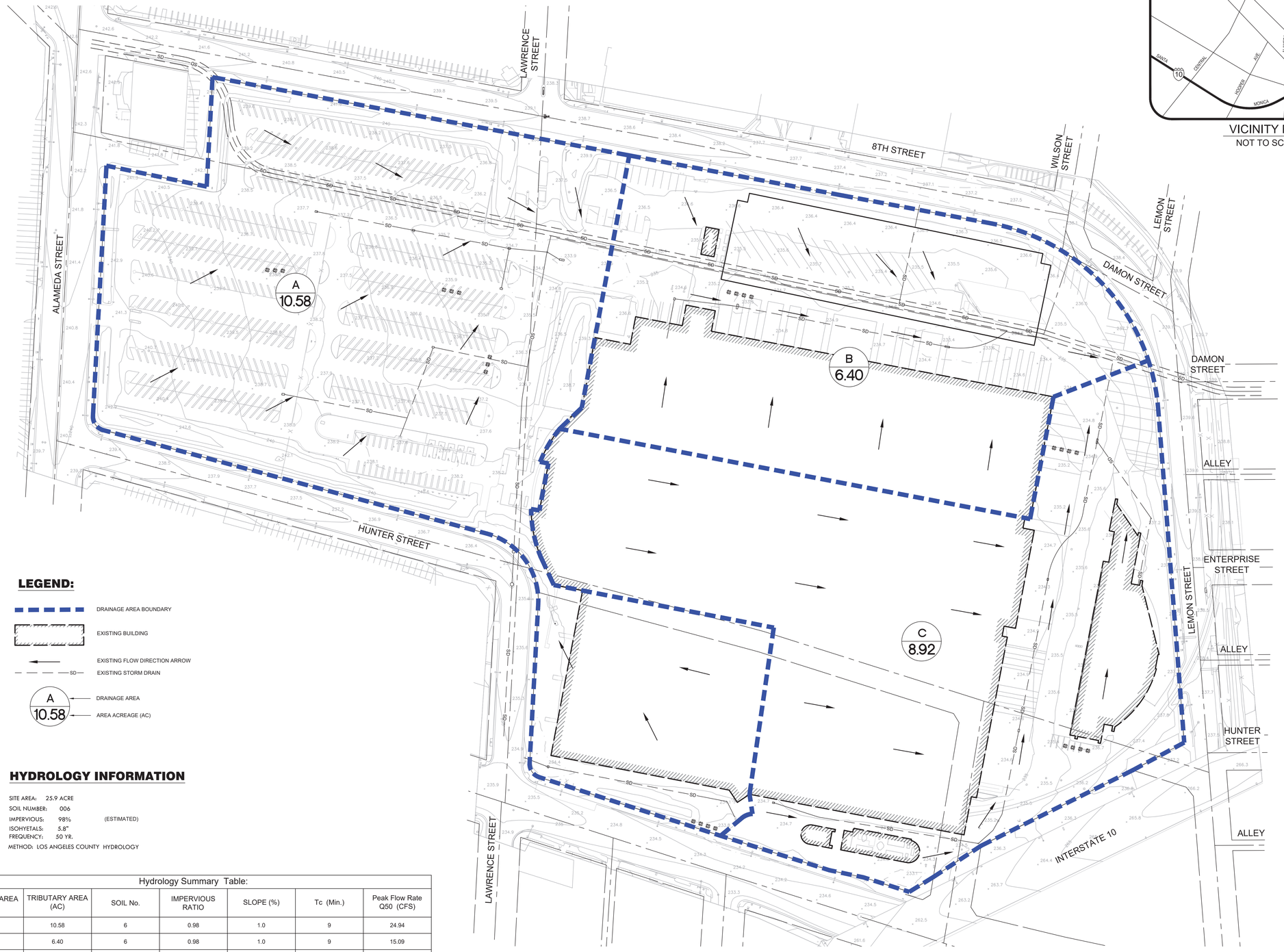
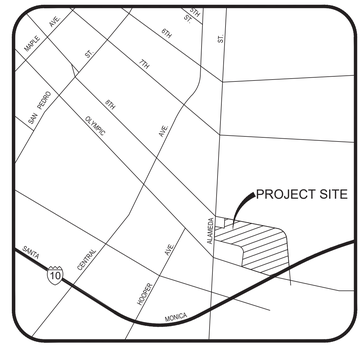
FIGURE 2

Pre-development Hydrology Plan





VICINITY MAP
NOT TO SCALE

LEGEND:

- DRAINAGE AREA BOUNDARY
- EXISTING BUILDING
- EXISTING FLOW DIRECTION ARROW
- SD — EXISTING STORM DRAIN
- A / 10.58 — DRAINAGE AREA / AREA ACREAGE (AC)

HYDROLOGY INFORMATION

SITE AREA: 25.9 ACRE
SOIL NUMBER: 006
IMPERVIOUS: 98% (ESTIMATED)
ISOHYETALS: 5.8"
FREQUENCY: 50 YR.
METHOD: LOS ANGELES COUNTY HYDROLOGY

Hydrology Summary Table:

DRAINAGE AREA No.	TRIBUTARY AREA (AC)	SOIL No.	IMPERVIOUS RATIO	SLOPE (%)	Tc (Min.)	Peak Flow Rate Q50 (CFS)
A	10.58	6	0.98	1.0	9	24.94
B	6.40	6	0.98	1.0	9	15.09
C	8.92	6	0.98	1.0	10	20.00
TOTAL	25.90					60.03

N

1"= 60'

60 0 60 120
scale 1"= 60' feet

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8TH & ALAMEDA STUDIOS

PRELIMINARY PRE-DEVELOPMENT HYDROLOGY

CHECKED BY: TI
DESIGNED BY: AK
DRAWN BY: AK

DATE: 3/12/2021

PROJECT NO.
ATLSALA80001

SHEET NO.
C1.0

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Save Date: 3/12/2021 9:24 AM
By: Adriana Klooth
By: Arj
File: P:\AA\TLSALA80001\10400\CAD\ECSHEETS\Entitlement\C1.0_ATLSALA80001_PRE-HYDRO.dwg

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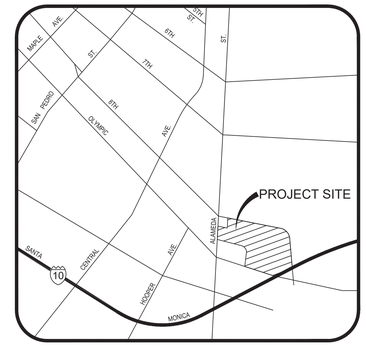
FIGURE 3

Post-development Hydrology & LID Plan

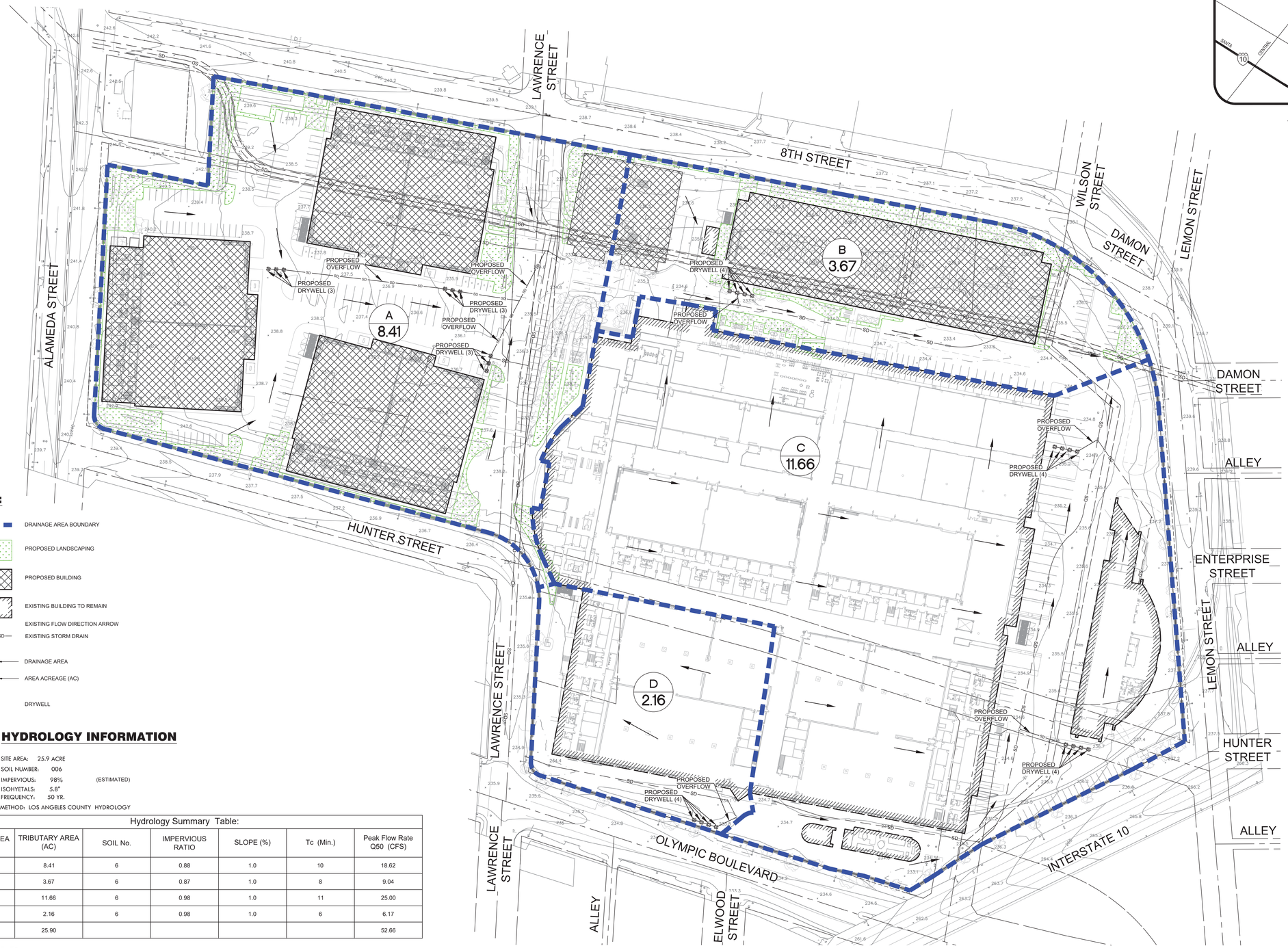
LID Summary Table:						
DRAINAGE AREA No.	TRIBUTARY AREA (AC)	IMPERVIOUS RATIO	IMPERVIOUS AREA (SF)	PERVIOUS AREA (SF)	REQ. TREATMENT VOLUME V_M (CF)	NUMBER OF DRYWELLS REQ*.
A	8.41	0.88	322378.85	43960.75	23317.52	9
B	3.67	0.87	139082.72	20782.48	10074.17	4
C	11.66	0.98	497751.41	10158.19	35545.21	11
D	2.16	0.98	92207.81	1881.79	6584.70	2
TOTAL	25.90				75521.60	26

LID 85th PERCENTILE, 24-HOUR STORM : 0.95"

*ASSUMED 1 DRYWELL PER ACRE



VICINITY MAP
NOT TO SCALE



LEGEND:

- DRAINAGE AREA BOUNDARY
- PROPOSED LANDSCAPING
- PROPOSED BUILDING
- EXISTING BUILDING TO REMAIN
- EXISTING FLOW DIRECTION ARROW
- SD — EXISTING STORM DRAIN
- A / 10.58 — DRAINAGE AREA / AREA ACREAGE (AC)
- DRYWELL

HYDROLOGY INFORMATION

SITE AREA: 25.9 ACRE
SOIL NUMBER: 006
IMPERVIOUS: 98% (ESTIMATED)
ISOHYETALS: 5.8"
FREQUENCY: 50 YR.
METHOD: LOS ANGELES COUNTY HYDROLOGY

Hydrology Summary Table:						
DRAINAGE AREA No.	TRIBUTARY AREA (AC)	SOIL No.	IMPERVIOUS RATIO	SLOPE (%)	Tc (Min.)	Peak Flow Rate Q50 (CFS)
A	8.41	6	0.88	1.0	10	18.62
B	3.67	6	0.87	1.0	8	9.04
C	11.66	6	0.98	1.0	11	25.00
D	2.16	6	0.98	1.0	6	6.17
TOTAL	25.90					52.66

NO DUMPING THIS DRAINS TO OCEAN

BEST MANAGEMENT PRACTICES (BMP's) LIST

1. DIRECT ROOFTOP RUNOFF THROUGH CLOSED PIPE SYSTEM THEN TO PROPOSED CATCH BASIN
2. ALL CATCH BASINS AND INLETS SHALL BE STENCILED WITH "WARNING! DRAINS TO OCEAN" NOTES & SYMBOLS PER NPDES BMP STANDARDS OR AS APPROVED BY D.P.W.

NOTE:

ALL ON-SITE STORM DRAIN, CATCH BASINS & AND UNDERGROUND INFILTRATION SYSTEM WILL BE PRIVATELY MAINTAINED

N

1"= 60'

60 0 60 120
scale 1"= 60' feet

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8TH & ALAMEDA STUDIOS

PRELIMINARY POST-DEVELOPMENT HYDROLOGY & LID

CHECKED BY: TI
DESIGNED BY: AK
DRAWN BY: AK

DATE: 3/12/2021

PROJECT NO.
ATLSALA80001

SHEET NO.
C3.0

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APPENDICES

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APPENDIX A

Pre-development Hydrology Calculations (Q_{50})

Peak Flow Hydrologic Analysis

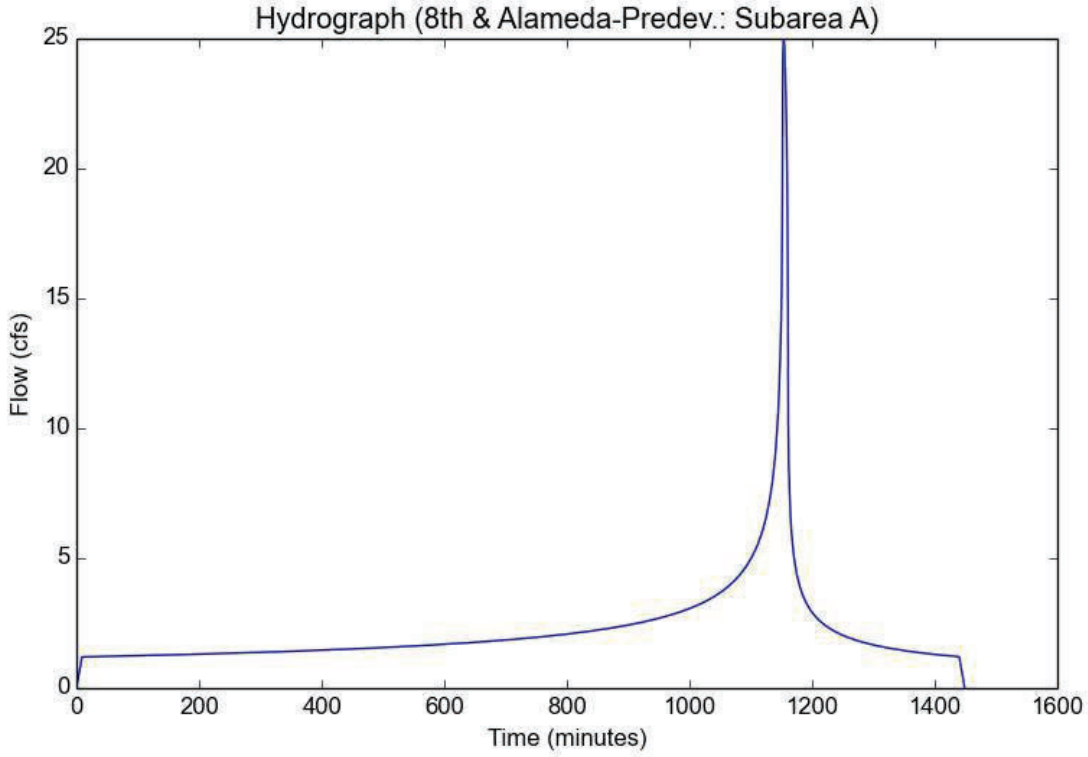
File location: P:/A/ATLSALA80001/0600INFO/0670Reports/Civil Engineering Report/Hydrology Calculations/Pre-development/8th & Alameda-Predev. - S
Version: HydroCalc 1.0.2

Input Parameters

Project Name	8th & Alameda-Predev.
Subarea ID	Subarea A
Area (ac)	10.58
Flow Path Length (ft)	700.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.98
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	2.6251
Undeveloped Runoff Coefficient (Cu)	0.796
Developed Runoff Coefficient (Cd)	0.8979
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	24.9388
Burned Peak Flow Rate (cfs)	24.9388
24-Hr Clear Runoff Volume (ac-ft)	4.4944
24-Hr Clear Runoff Volume (cu-ft)	195775.7328



Peak Flow Hydrologic Analysis

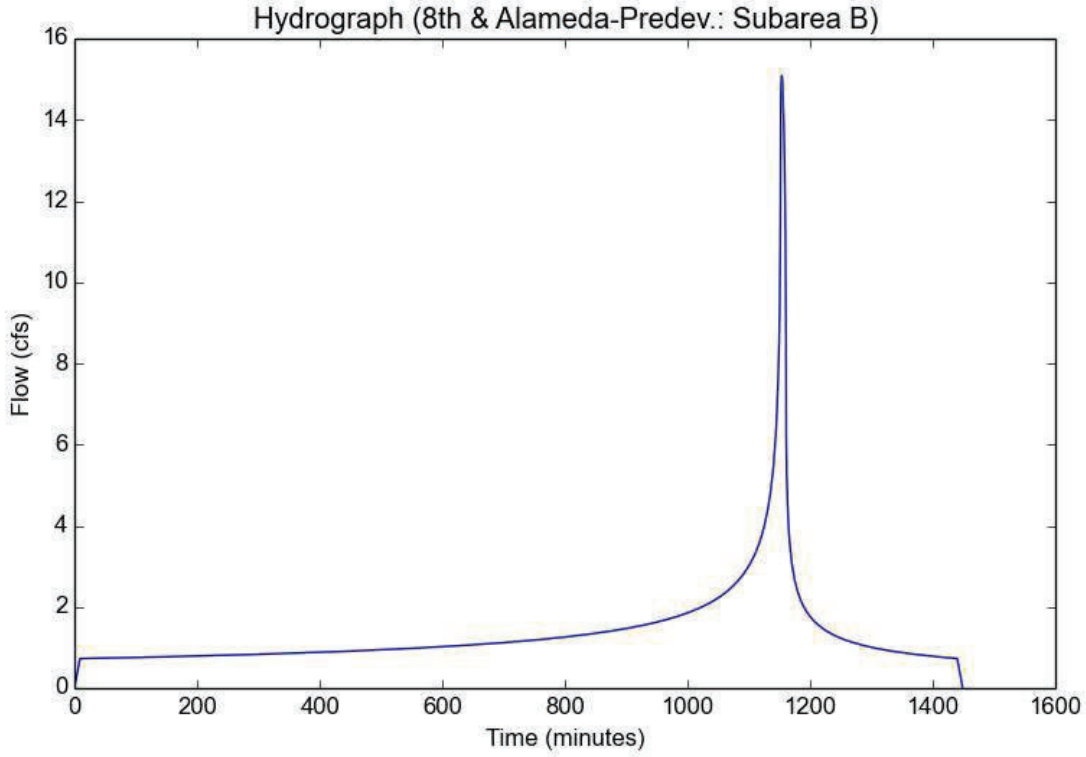
File location: P:/A/ATLSALA80001/0600INFO/0670Reports/Civil Engineering Report/Hydrology Calculations/Pre-development/8th & Alameda-Predev. - S
Version: HydroCalc 1.0.2

Input Parameters

Project Name	8th & Alameda-Predev.
Subarea ID	Subarea B
Area (ac)	6.4
Flow Path Length (ft)	700.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.98
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	2.6251
Undeveloped Runoff Coefficient (Cu)	0.796
Developed Runoff Coefficient (Cd)	0.8979
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	15.0859
Burned Peak Flow Rate (cfs)	15.0859
24-Hr Clear Runoff Volume (ac-ft)	2.7187
24-Hr Clear Runoff Volume (cu-ft)	118427.6645



Peak Flow Hydrologic Analysis

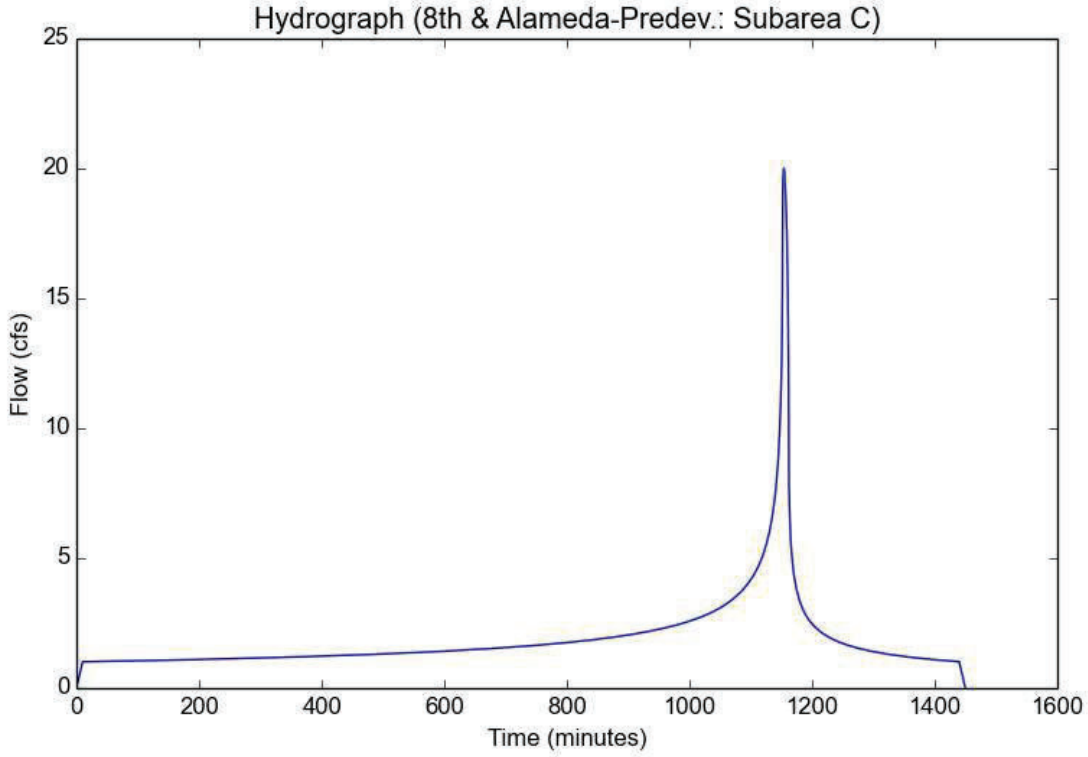
File location: P:/A/ATLSALA80001/0600INFO/0670Reports/Preliminary LID & Hydrology Study/Hydrology Calculations/Pre-development/8th & Alameda-
Version: HydroCalc 1.0.2

Input Parameters

Project Name	8th & Alameda-Predev.
Subarea ID	Subarea C
Area (ac)	8.92
Flow Path Length (ft)	900.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.98
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	2.4983
Undeveloped Runoff Coefficient (Cu)	0.787
Developed Runoff Coefficient (Cd)	0.8977
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	20.0061
Burned Peak Flow Rate (cfs)	20.0061
24-Hr Clear Runoff Volume (ac-ft)	3.7892
24-Hr Clear Runoff Volume (cu-ft)	165057.6897



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APPENDIX B

Post-development Hydrology Calculations (Q_{50})

Peak Flow Hydrologic Analysis

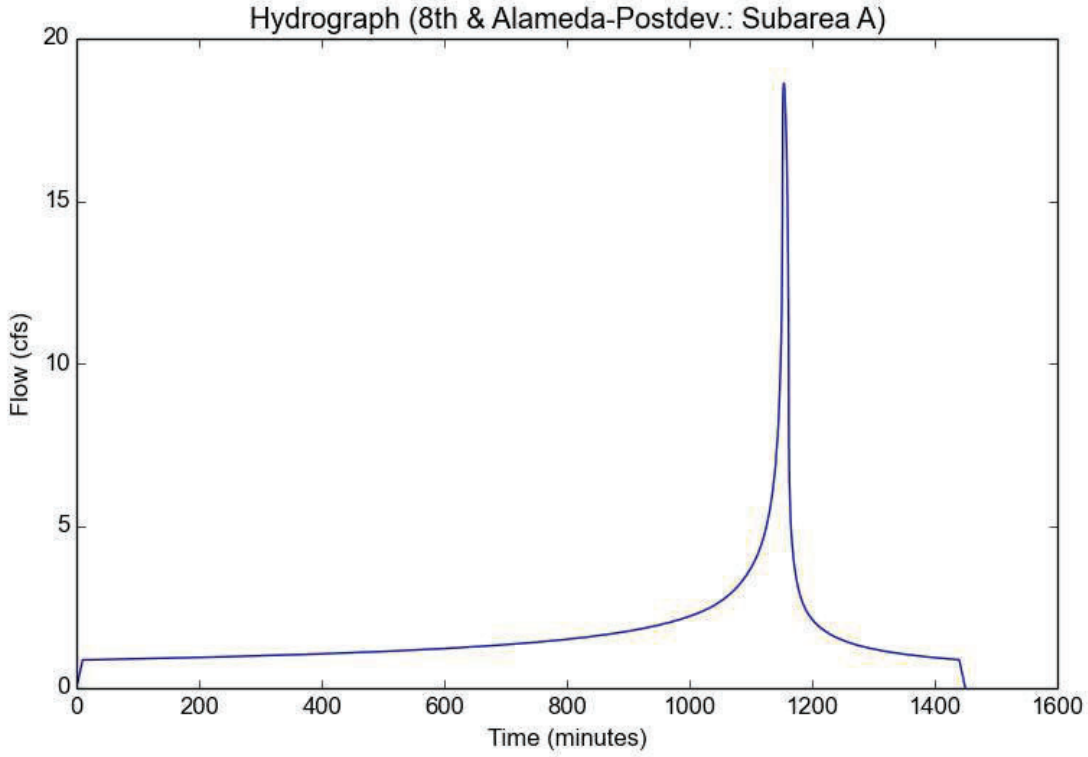
File location: P:/A/ATLSALA80001/0600INFO/0670Reports/Civil Engineering Report/Hydrology Calculations/Post-development/8th & Alameda-Postdev. -
Version: HydroCalc 1.0.2

Input Parameters

Project Name	8th & Alameda-Postdev.
Subarea ID	Subarea A
Area (ac)	8.41
Flow Path Length (ft)	800.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.88
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	2.4983
Undeveloped Runoff Coefficient (Cu)	0.787
Developed Runoff Coefficient (Cd)	0.8864
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	18.6248
Burned Peak Flow Rate (cfs)	18.6248
24-Hr Clear Runoff Volume (ac-ft)	3.2947
24-Hr Clear Runoff Volume (cu-ft)	143518.6141



Peak Flow Hydrologic Analysis

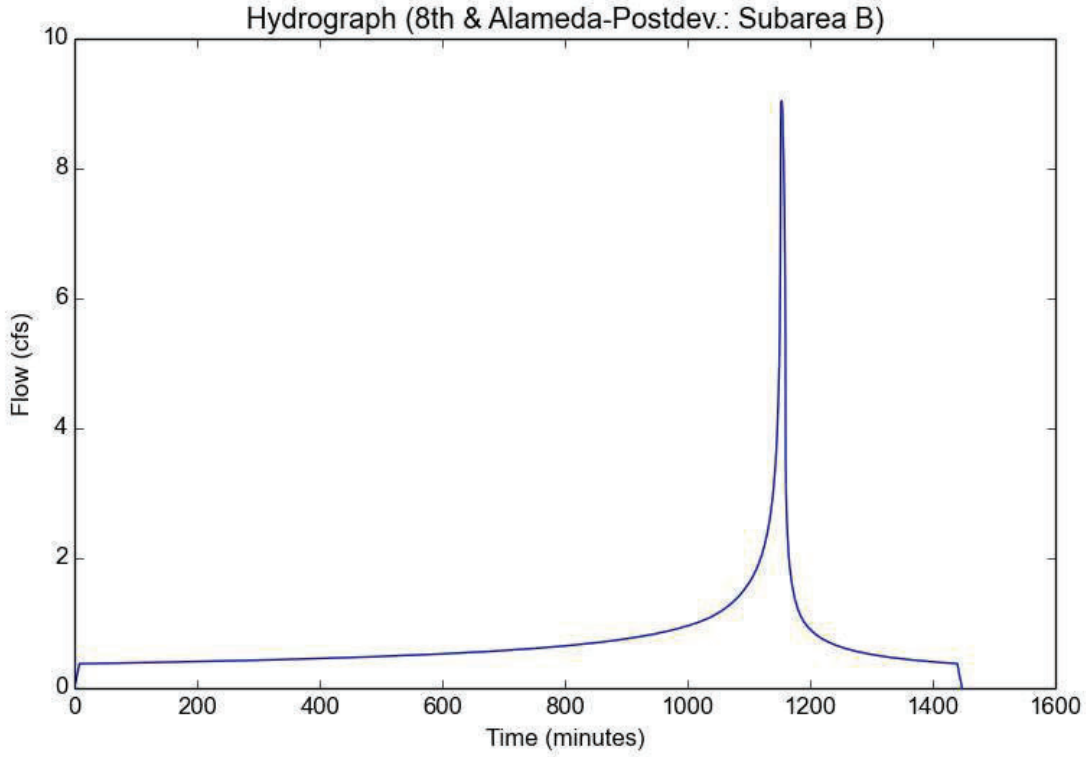
File location: P:/A/ATLSALA80001/0600INFO/0670Reports/Civil Engineering Report/Hydrology Calculations/Post-development/8th & Alameda-Postdev. -
Version: HydroCalc 1.0.2

Input Parameters

Project Name	8th & Alameda-Postdev.
Subarea ID	Subarea B
Area (ac)	3.67
Flow Path Length (ft)	650.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	2.7746
Undeveloped Runoff Coefficient (Cu)	0.8064
Developed Runoff Coefficient (Cd)	0.8878
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	9.0405
Burned Peak Flow Rate (cfs)	9.0405
24-Hr Clear Runoff Volume (ac-ft)	1.4258
24-Hr Clear Runoff Volume (cu-ft)	62105.8448



Peak Flow Hydrologic Analysis

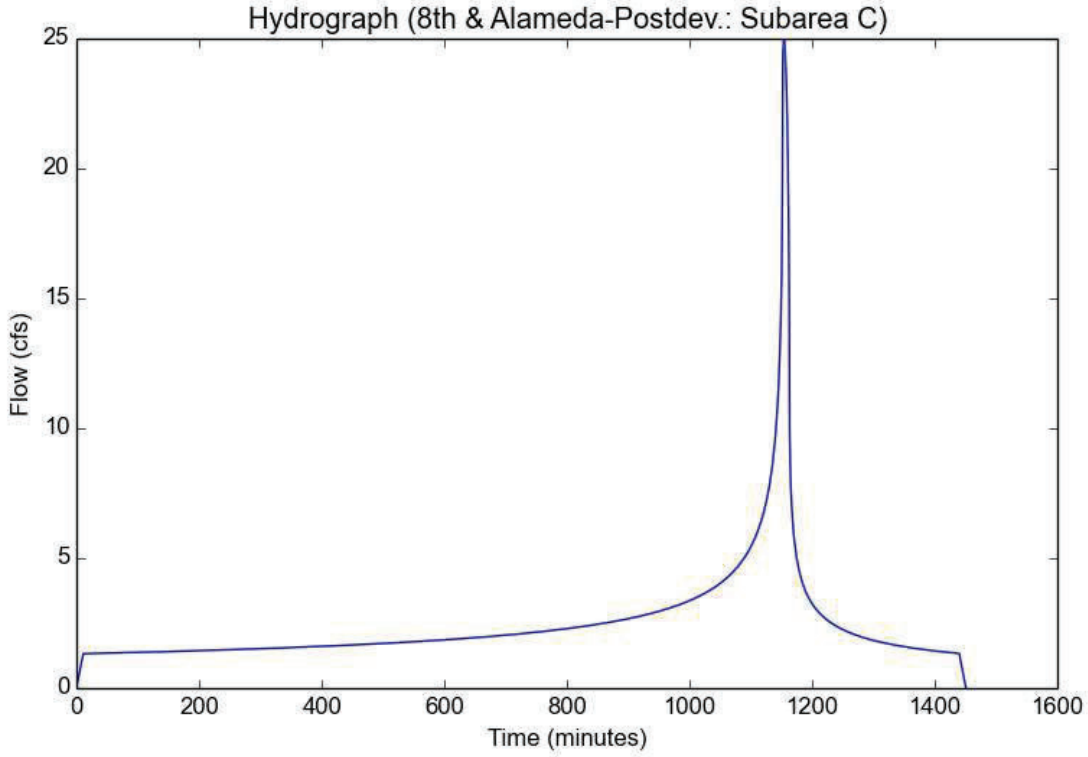
File location: P:/A/ATLSALA80001/0600INFO/0670Reports/Civil Engineering Report/Hydrology Calculations/Post-development/8th & Alameda-Postdev. -
Version: HydroCalc 1.0.2

Input Parameters

Project Name	8th & Alameda-Postdev.
Subarea ID	Subarea C
Area (ac)	11.66
Flow Path Length (ft)	950.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.98
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	2.3889
Undeveloped Runoff Coefficient (Cu)	0.775
Developed Runoff Coefficient (Cd)	0.8975
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	24.9992
Burned Peak Flow Rate (cfs)	24.9992
24-Hr Clear Runoff Volume (ac-ft)	4.9531
24-Hr Clear Runoff Volume (cu-ft)	215757.8628



Peak Flow Hydrologic Analysis

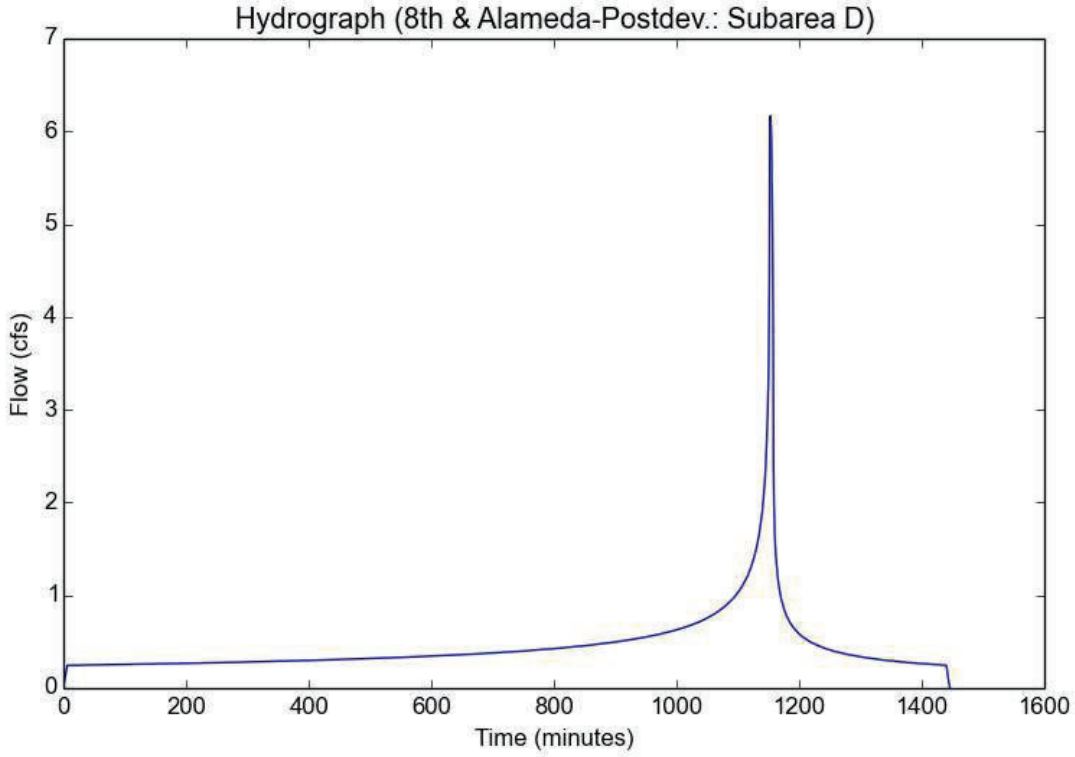
File location: P:/A/ATLSALA80001/0600INFO/0670Reports/Civil Engineering Report/Hydrology Calculations/Post-development/8th & Alameda-Postdev. -
Version: HydroCalc 1.0.2

Input Parameters

Project Name	8th & Alameda-Postdev.
Subarea ID	Subarea D
Area (ac)	2.16
Flow Path Length (ft)	400.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.98
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	3.1763
Undeveloped Runoff Coefficient (Cu)	0.8347
Developed Runoff Coefficient (Cd)	0.8987
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	6.1657
Burned Peak Flow Rate (cfs)	6.1657
24-Hr Clear Runoff Volume (ac-ft)	0.9176
24-Hr Clear Runoff Volume (cu-ft)	39969.9712



DAVID EVANS AND ASSOCIATES INC.

APPENDIX C

LID Drywell Sizing Calculations

DAVID EVANS AND ASSOCIATES INC.

JN. ATLSALA80001

BY AJK DATE 03/12/2020

JOB DESCRIPTION 8th & Alameda Studios

SHEET 1 OF 1 SHEETS

CALCULATION FOR Drywell Calculation

CHECKED BY _____ DATE _____

LID Summary Table:

DRAINAGE AREA No.	TRIBUTARY AREA (AC)	IMPERVIOUS RATIO	IMPERVIOUS AREA (SF)	PERVIOUS AREA (SF)	REQ. TREATMENT VOLUME V_M (CF)	NUMBER OF DRYWELLS REQ*.
A	8.41	0.88	322378.85	43960.75	23317.52	9
B	3.67	0.87	139082.72	20782.48	10074.17	4
C	11.66	0.98	497751.41	10158.19	35545.21	11
D	2.16	0.98	92207.81	1881.79	6584.70	2
TOTAL	25.90				75521.60	26

Drywell sizing parameters:
$K_{sat,\ measured}$ =43.2 in/hr
Gravel Void Ratio = 40%
Factor of Safety = 3
T = 3 hr

Rock diameter = 4 ft
Chamber Diameter = 3 ft
Chamber Depth = 15 ft
Infiltration Rock Shaft Depth = 40 ft

$k_{sat,\ des}$ = 43.2 in/hr ÷ 3 (factor of safety)
= 14.4 in/hr
= 14.4 in/hr x (1 ft/12 in)
= 1.2 ft/hr

$V_{storage\ (one\ drywell)} = V_{drywell} + V_{rock\ shaft}$
$= \pi (2\ ft)^2 (15\ ft) + \pi (3\ ft)^2 (2\ ft) (0.40) + \pi (2\ ft)^2 (40\ ft) (0.40)$
$= 412\ cf$

$A_{provided} = 2\pi (3\ ft \times 10\ ft) + 2\pi (2\ ft \times 41\ ft) + \pi(2ft)^2$

=703.7 sf

V_{3hr} = 703.7 sf x (1.2 ft/hr) x 3 hr
= 2,533.3 cf

$V_{storage\ provided}$ = 412 cf + 2,533 cf
= 2,945 cf (per drywell)
= 76,570 cf (26 drywells)

$V_{storage\ provided} = 76{,}570\ cf > V_{des,m} = 75{,}521.6\ cf$

DAVID EVANS AND ASSOCIATES INC.

APPENDIX D

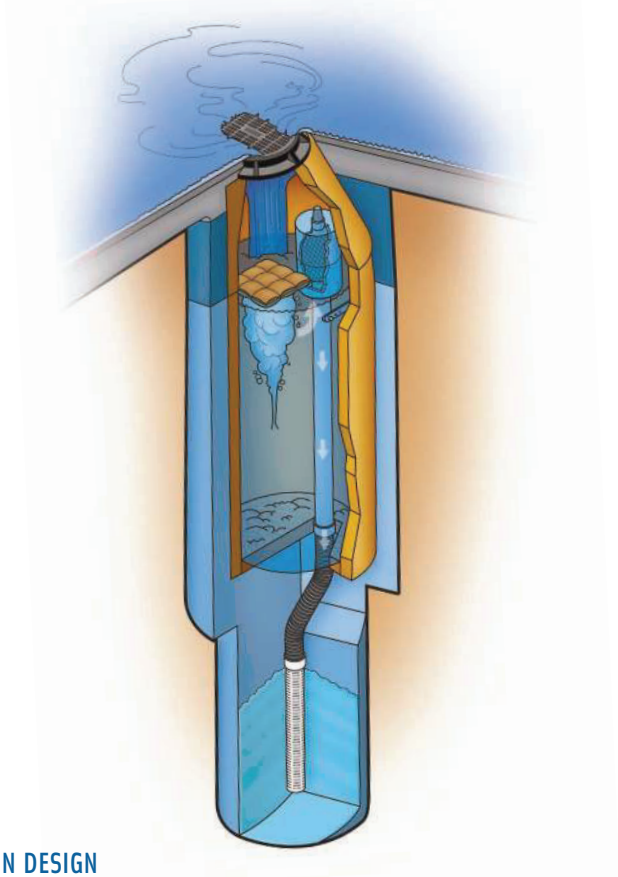
Underground Drywell Infiltration System Detail and Operations & Maintenance

MaxWell® IV DRAINAGE SYSTEM

Product Information and Design Features

TORRENT® RESOURCES

The ***MaxWell® IV,*** as manufactured and installed exclusively by Torrent Resources Incorporated, is the industry standard for draining landscaped developments and paved areas. This patented system incorporates the latest refinements in pre-treatment technology.



PROVEN DESIGN

Since 1974, nearly 65,000 MaxWell® Systems have proven their value as a cost-effective solution in a wide variety of drainage applications. They are accepted by state and municipal agencies and are a standard detail in numerous drainage manuals.

ADVANCED PRE-TREATMENT

Industry research, together with Torrent Resources' own experience, have shown that initial storm drainage flows have the greatest impact on system performance. This "first flush" occurs during the first few minutes of runoff, and carries the majority of sediment and debris. This results in the need for effective processing of runoff from landscaped and paved surfaces. In the ***MaxWell® IV,*** preliminary treatment is provided through collection and separation in a deep, large-volume chamber where silt and other heavy particles settle to the bottom. The standard MaxWell IV System has over 1,500 gallons of capacity to contain sediment and debris carried by incoming water. Floating trash, paper, pavement oil, etc. are effectively stopped by the **PureFlo®** Debris Shield on top of the overflow pipe. Water is drained from the system by rising up to the top of the overflow pipe and under the Debris Shield. The solid metal shields are equipped with an internal screen to filter suspended matter and are vented to prevent siphoning of floating surface debris. The drainage assembly returns the cleaned water into the surrounding soil through the **FloFast®** Drainage Screen.

ABSORBENT TECHNOLOGY

The MaxWell IV settling chamber is equipped with an absorbent sponge to provide prompt removal of pavement oils. These floating pillow-like devices are 100% water repellent and literally wick petrochemical compounds from the water. Each sponge has a capacity of up to 128 ounces to accommodate effective, long-term treatment. The absorbent is completely inert and will safely remove runoff constituents down to rainbow sheens that are typically no more than one molecule thick.

SECURITY FEATURES

MaxWell IV Systems include bolted, theft-deterrent, cast iron gratings and covers as standard security features. Special inset castings that are resistant to loosening from accidental impact are available for use in landscaped applications. Machined mating surfaces and "Storm Water Only" wording are standard.

THE MAXWELL FIVE-YEAR WARRANTY

Innovative engineering, quality materials and exacting construction are standard with every MaxWell System designed, manufactured and installed by Torrent Resources Incorporated. The MaxWell Drainage System Warranty is the best in the industry and guarantees against failures due to workmanship or materials for a period of five years from date of completion.

Manufactured and Installed Exclusively by Torrent Resources Incorporated

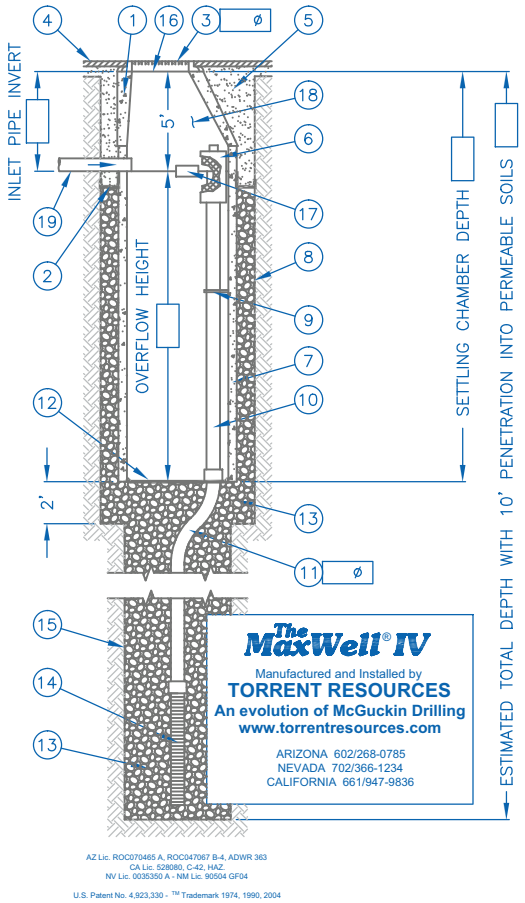
Please see reverse side for additional information

U.S. Patent No. 4,923,330

MAXWELL® IV DRAINAGE SYSTEM DETAIL AND SPECIFICATIONS

ITEM NUMBERS

1. **Manhole Cone** - Modified Flat Bottom.
2. **Moisture Membrane** - 6 Mil. Plastic. Applies only when native material is used for backfill. Place membrane securely against eccentric cone and hole sidewall.
3. **Bolted Ring & Grate** - Diameter as shown. Clean cast iron with wording **"Storm Water Only"** in raised letters. **Bolted in 2 locations** and secured to cone with mortar. Rim elevation ±0.02' of plans.
4. **Graded Basin or Paving** (by Others).
5. **Compacted Base Material** - 1-Sack Slurry except in landscaped installtions with no pipe connections.
6. **PureFlo® Debris Shield** - Rolled 16 ga. steel X 24" length with vented anti-siphon and Internal .265" Max. SWO flattened expanded steel screen X 12" length. **Fusion bonded epoxy coated.**
7. **Pre-cast Liner** - 4000 PSI concrete 48" ID. X 54" OD. **Center in hole** and align sections **to maximize bearing surface.**
8. **Min. 6' Ø Drilled Shaft.**
9. **Support Bracket** - Formed 12 Ga. steel. **Fusion bonded epoxy coated.**
10. **Overflow Pipe** - Sch. 40 PVC mated to drainage pipe at base seal.
11. **Drainage Pipe** - ADS highway grade with TRI-A coupler. **Suspend pipe** during backfill operations to prevent buckling or breakage. Diameter as noted.
12. **Base Seal** - Geotextile or concrete slurry.
13. **Rock** - Washed, sized between 3/8" and 1-1/2" to **best complement soil conditions.**
14. **FloFast® Drainage Screen** - Sch. 40 PVC 0.120" slotted well screen with 32 slots per row/ft.Diameter varies 120" overall length with TRI-B coupler.
15. **Min. 4' Ø Shaft** - Drilled to **maintain permeability** of drainage soils.
16. **Fabric Seal** - U.V. resistant geotextile - **to be removed by customer** at project completion.
17. **Absorbent** – Hydrophobic Petrochemical Sponge. Min. to 128 oz. capacity.
18. **Freeboard Depth** Varies with inlet pipe elevation. Increase settling chamber depth as needed to maintain all inlet pipe elevations above overflow pipe inlet.
19. **Optional Inlet Pipe** (Maximum 4", by Others). Extend moisture membrane and compacted base material or 1 sack slurry backfill below pipe invert.



AZ Lic. ROC070465 A, ROC047067 B-4, ADWR 363
CA Lic. 528080, C-42, HAZ.
NV Lic. 0035350 A - NM Lic. 90504 GF04

U.S. Patent No. 4,923,330 - ™ Trademark 1974, 1990, 2004

The referenced drawing and specifications are available on CAD either through our office or web site. This detail is copyrighted (2004) but may be used as is in construction plans without further release. For information on product application, individual project specifications or site evaluation, contact our Design Staff for no-charge assistance in any phase of your planning.

CALCULATING MAXWELL IV REQUIREMENTS

The type of property, soil permeability, rainfall intensity and local drainage ordinances determine the number and design of MaxWell Systems. For general applications draining retained stormwater, use one standard **MaxWell IV** per the instructions below for up to 3 acres of landscaped contributory area, and up to 1 acre of paved surface. For larger paved surfaces, subdivision drainage, nuisance water drainage, connecting pipes larger than 4" Ø from catch basins or underground storage, or other demanding applications, refer to our **MaxWell® Plus** System. For industrial drainage, including gasoline service stations, our **Envibro® System** may be recommended. For additional considerations, please refer to **"Design Suggestions For Retention And Drainage Systems"** or consult our Design Staff.

COMPLETING THE MAXWELL IV DRAWING

To apply the **MaxWell IV** drawing to your specific project, simply fill in the blue boxes per instructions below. For assistance, please consult our Design Staff.

' ESTIMATED TOTAL DEPTH

The Estimated Total Depth is the approximate depth required to achieve 10 continuous feet of penetration into permeable soils. Torrent utilizes specialized **"crowd"** equipped drill rigs to penetrate difficult, cemented soils and to reach permeable materials at depths up to **180 feet.** Our extensive database of drilling logs and soils information is available for use as a reference. Please contact our Design Staff for site-specific information on your project.

' SETTLING CHAMBER DEPTH

On MaxWell IV Systems of over 30 feet overall depth and up to 0.25cfs design rate, the **standard** Settling Chamber Depth is **18 feet.** For systems exposed to greater contributory area than noted above, extreme service conditions, or that require higher design rates, chamber depths up to 25 feet are recommended.

' OVERFLOW HEIGHT

The Overflow Height and Settling Chamber Depth determine the effectiveness of the settling process. The higher the overflow pipe, the deeper the chamber, the greater the settling capacity. For normal drainage applications, an overflow height of **13 feet** is used with the standard settling chamber depth of **18 feet**. Sites with higher design rates than noted above, heavy debris loading or unusual service conditions require greater settling capacities

"Ø DRAINAGE PIPE

This dimension also applies to the **PureFlo®** Debris Shield, the **FloFast®** Drainage Screen, and fittings. The size selected is based upon system design rates, soil conditions, and the need for adequate venting. Choices are 6", 8", or 12" diameter. Refer to "Design Suggestions for Retention and Drainage Systems" for recommendations on which size best matches your application.

"Ø BOLTED RING & GRATE

Standard models are quality cast iron and available to fit 24" Ø or 30" Ø manhole openings. All units are bolted in two locations with wording "Storm Water Only" in raised letters. For other surface treatments, please refer to "Design Suggestions for Retention and Drainage Systems."

"Ø INLET PIPE INVERT

Pipes up to 4" in diameter from catch basins, underground storage, etc. may be connected into the settling chamber. Inverts deeper than 5 feet will require additional settling chamber depth to maintain effective overflow height.

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An evolution of McGuckin Drilling

The watermark for drainage solutions.®

TORRENT® RESOURCES

OPERATION AND MAINTENANCE OF *MaxWell*® DRYWELL

The Operation and Maintenance Format will include the following key components:

1.) Inspection Guidelines:

New installations

Newly installed systems should receive a thorough visual examination following the first several significant rainfall events. This assessment will assure that there is no standing water, and that runoff or nuisance water flows are being eliminated within the allowable 48 hour draw-down timeframe.

Ongoing Operations

At a minimum, the drainage structures should be inspected annually, and within 48 hours following a significant storm event to ensure that there is no standing water in the chambers.

2.) Maintenance Format:

After the first 12-months of entering service, it is recommended that an initial cleaning be undertaken. This will help to establish the amount of accumulated particulate matter and debris to be expected on a yearly basis. Thereafter, the systems should receive inspection at least annually, and cleaning should be undertaken when the evaluation reveals that 15% or more of the original chamber volume is occupied by silt and sediment.

During the maintenance operation, all screens and filters should be serviced and the floating absorbent blankets replaced, along with the geo-textile fabric at the bottom of the chambers. Should repair be needed, descriptions of deficiencies and estimated costs for suggested corrections should be provided. The above information shall be submitted in writing to the Owner at the conclusion of the maintenance service. Replacement is recommended for drywells that no longer dispose of ponded water within 48 hours after cleaning.

3.) Maintenance Records:

A written log shall be kept on-site of all inspections and maintenance performed on the drainage systems.

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