Appendix L-c Hydrology and Hydraulic Report - Lot 3 Valley Boulevard and Paseo Tesoro

Appendices

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HYDROLOGY AND HYDRAULIC REPORT

FOR

Walnut Business Park – Lot 3
Valley Boulevard and Paseo Tesoro
Walnut, CA 91789

Owner:

IDS Real Estate Group
515 South Figueroa Street, 16th Floor
Los Angeles, CA 90071
TEL: (213) 362-9300

Prepared by:
Atlas Civil Design
872 Higuera Street
San Luis Obispo, California
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Tyler H. Johnson, PE

This Drainage Report was prepared under my supervision:

By: _____ Date:_____

Atlas Job No. 22-136

Preliminary

06/29/2023

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Section I Project Description

The proposed project is a redevelopment of an existing industrial manufacturing park located at the Northwest intersection of Valley Boulevard and Paseo Tesoro in the City of Walnut, Los Angeles County, CA.
The total site area is 5.26 acres and the project is proposing a 94,266 sf warehouse with associated landscaping, paving and parking lots.

Existing Site Drainage Condition

The existing site is an industrial manufacturing park with associated buildings, landscaping, paving and parking lots. The site drains to the west and sheet flows at 0.71% to multiple ribbon gutters which direct runoff over the driveways and into Paseo Sonrisa (public ROW). Runoff then flows north in the curb and gutter until it is captured by existing curb inlets that are connected to the existing 90" RCP storm drain maintained by the Los Angeles County Flood Control District.

This LACFCD storm drain flows south across the site to the intersection of South Lemon Avenue and Valley Boulevard. The Storm drain becomes a 96" RCP and flows southeast into San Jose Creek. San Jose Creek flows west until it merges with the San Gabriel River which flows south until it reaches the Pacific Ocean near Seal Beach.

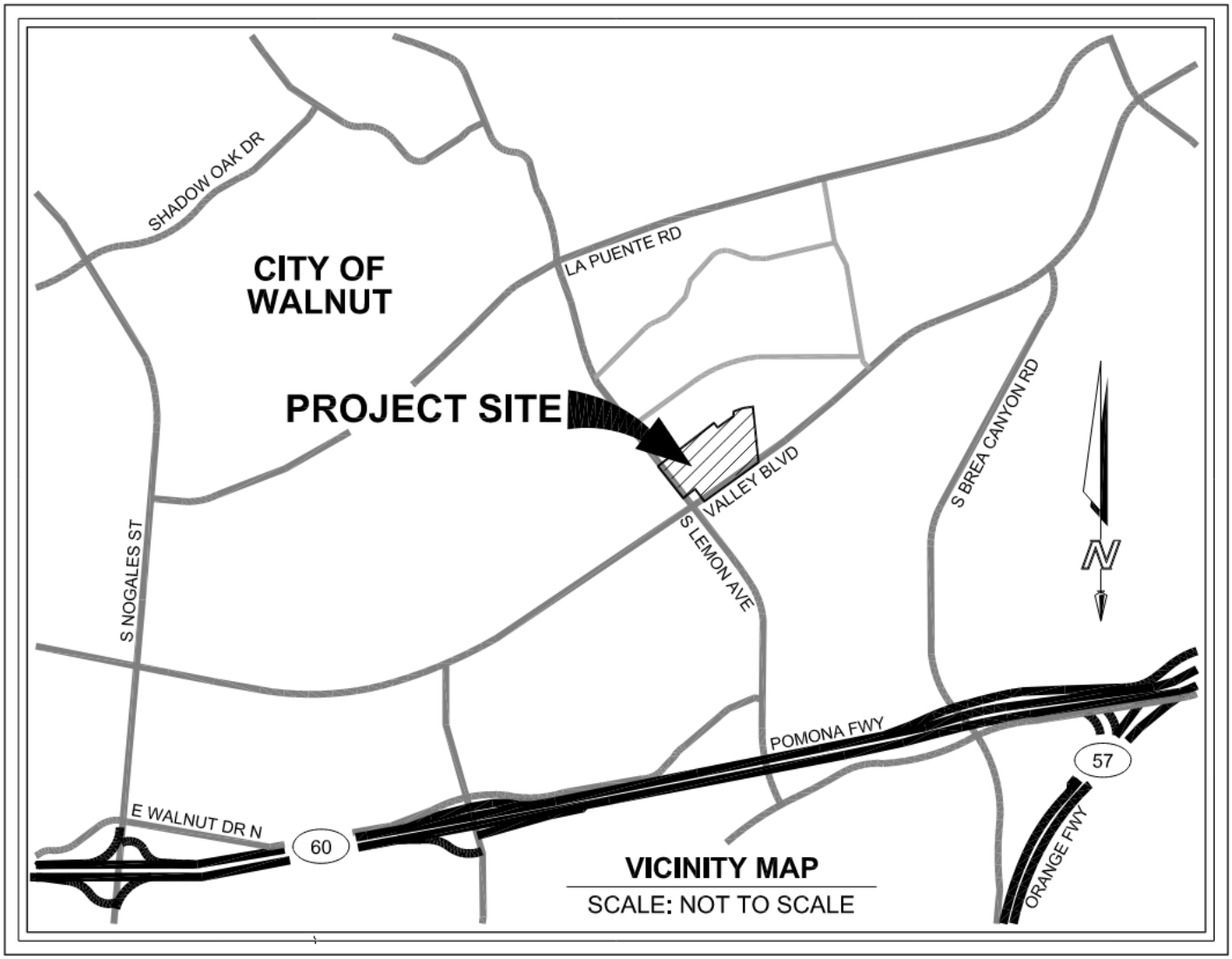
The runoff from the project site to San Jose Creek is shown in Figure-4.

Proposed Site Drainage

In the proposed condition the site drains to the southeast and sheet flows to multiple ribbon gutters which direct runoff to catch basins. This runoff is directed in pipes to an underground detention system. The underground detention system has been sized to accommodate 150% of the 85th percentile storm event. After detention the runoff will enter a Modular Wetland BMP for Treatment. After treatment the runoff will flow to a sump pump and be pumped to the curb and gutter in Paseo Sonrisa. Runoff will flow north to the existing curb inlet which is connected to the existing 90" RCP storm drain. Larger storm events shall be directed around the BMP and detention system through an overflow bypass pipe and connected to the sump pump for discharge to Paseo Sonrisa.

The existing 90" RCP storm drain is maintained by the Los Angeles County Flood Control District. This storm drain flows south across the site to the intersection of South Lemon Avenue and Valley Boulevard. The Storm drain becomes a 96" RCP and flows southeast into San Jose Creek. San Jose Creek flows west until it merges with the San Gabriel River which flows south until it reaches the Pacific Ocean near Seal Beach.

Section II Vicinity Map



Section III Hydology Analysis/ Methodolgy

Hydrologic calculations were performed in accordance with Los Angeles County HydroCalc Software. HydroCalc was used to determine the existing and proposed peak flows for the 25- and 50-year storm events as well as the runoff volumes.

Section IV Design Parameters

1. The drainage area is located in Soil Type 017.
2. The rainfall intensity varies for all of the storm events.
3. All flows are based on the complete future development of land and roads.
4. The Hydrology Maps attached to the back of this study are made a part of the study.
5. No pre-existing or post-development off-tract flow is being directed toward the proposed storm drain.
6. Per flood insurance rate map no. 06037c1725f project site lies in flood zone "x".
Flood "x" designation is defined as; "areas determined to be outside the 0.2% annual chance flood plain." Per the Fema web site.

Section V Runoff Peak Flows

Table 1:

Pre-Development Condition

Tributary Area	**DA-1**
Acreage (acres)	5.26
Time of Concentration; Tc (min)	9.0
25 yr Pre- Dev Runoff; Q_{25} (cfs)	12.18
50 yr Pre- Dev Runoff; Q_{50} (cfs)	14.71

Post-Development Condition

Tributary Area	**DMA-3**
Acreage (acres)	5.26
Time of Concentration; Tc (min)	8.0
25 yr Post- Dev Runoff; Q_{25} (cfs)	11.31
50 yr Post- Dev Runoff; Q_{50} (cfs)	15.67

Section VI Runoff Volumes

Table 2: Estimated Storm Runoff Volumes

Pre-Development Condition

Tributary Area	**DA-1**
Acreage (acre)	5.26
CN (Weighted)	0.90
25 year Pre-Develop. Volume V_{25} (cu-ft)	87,133
50 year Pre-Develop. Volume V_{50} (cu-ft)	99,660

Post-Development Condition

Tributary Area	**DMA-3**
Acreage (acre)	5.26
CN (Weighted)	0.90
25 year Post-Develop. Volume V_{25} (cu-ft)	78,877
50 year Post-Develop. Volume V_{50} (cu-ft)	102,825

Section VII Conclusion

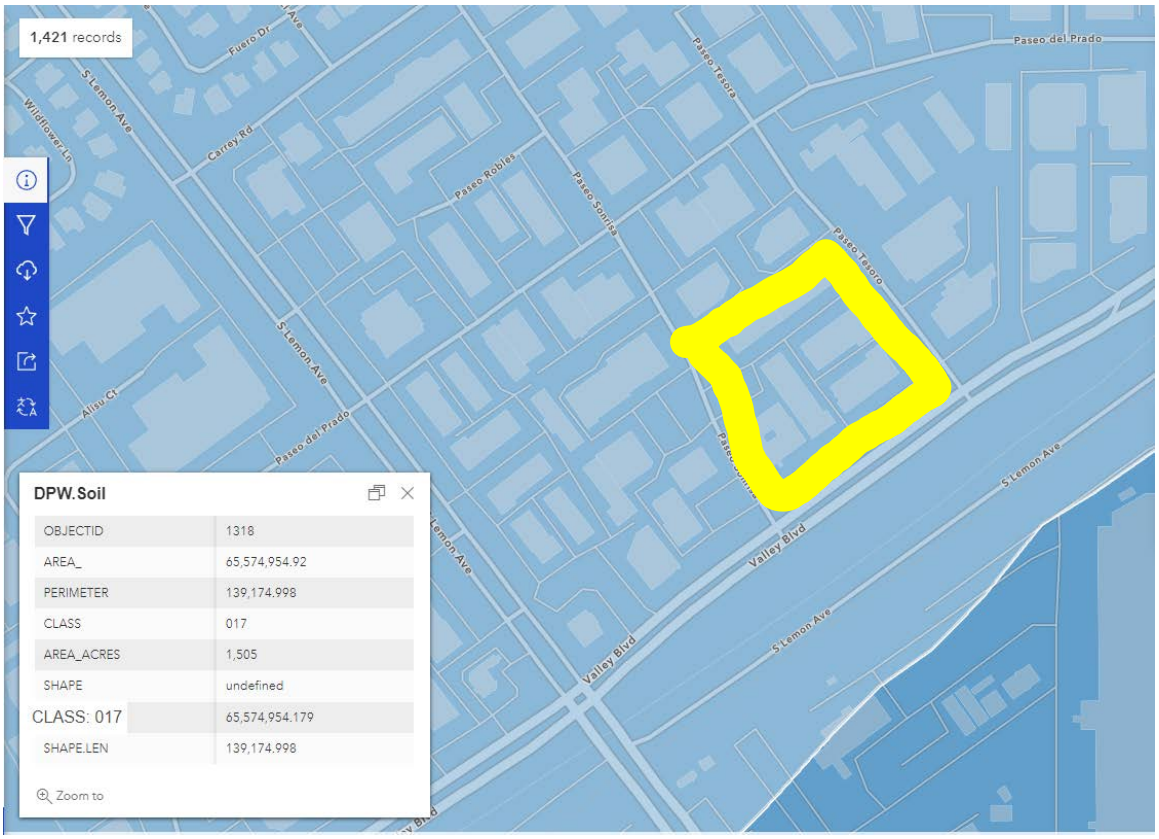
The Post-development condition will decrease peak flow by 0.87 cfs for the 25-year Storm Event.
The Post-development condition will increase peak flow by 0.96 cfs for the 50-year Storm Event.

The Post-development condition will decrease the runoff volume by 8,256 cf for the 25-year Storm Event.
The Post-development condition will increase the runoff volume by 3,165 cf for the 50-year Storm Event.

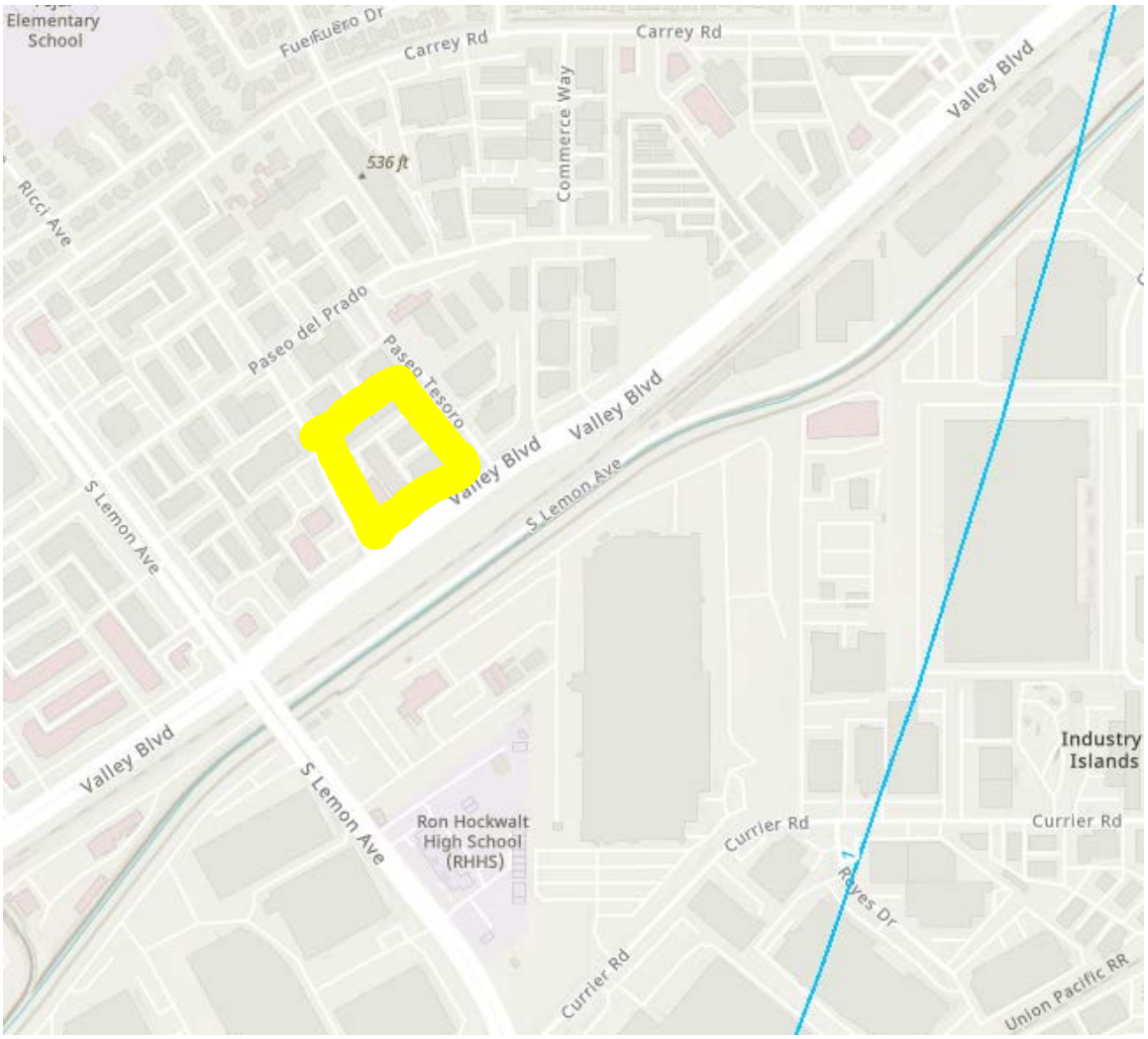
Hydraulic analysis was performed for the 25yr storm event using the Hydraflow Express Extension for Civil 3D for each DA and associated outlet. In order to avoid flooding issues for storm events larger than the 85th Percentile storm event, pipe sizing calculations uses a 25-yr storm event to evaluate feasibility of the pipes capacity. The sizing calculation uses a 25-yr storm event for the 24" Grated drop inlets. The Following exhibits provide hydraulic analysis of each DMA outlet and the grated inlet capacity. According to the calculations, the pipes and grates are able to convey the 25-yr storm.

Attachment A
Figures

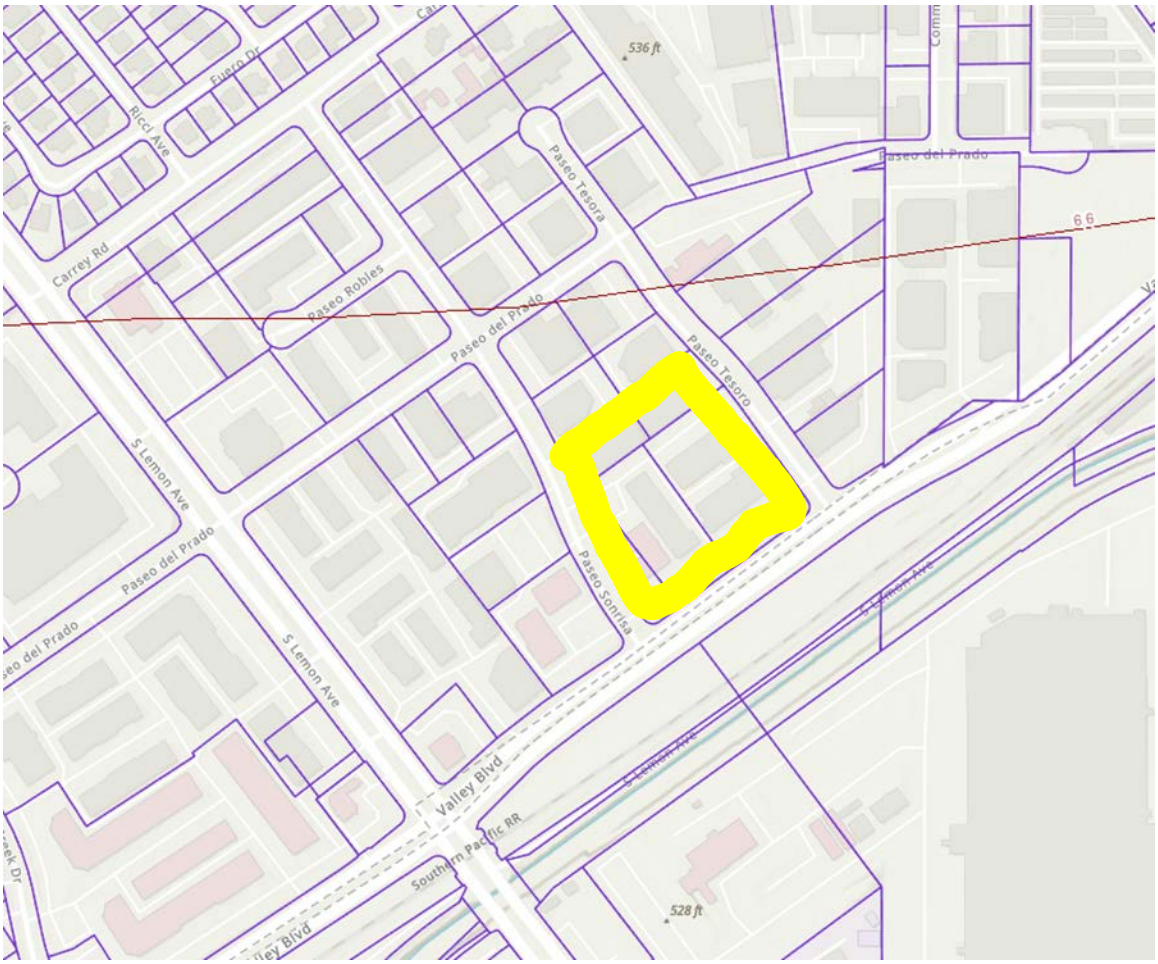
Soils Group Map



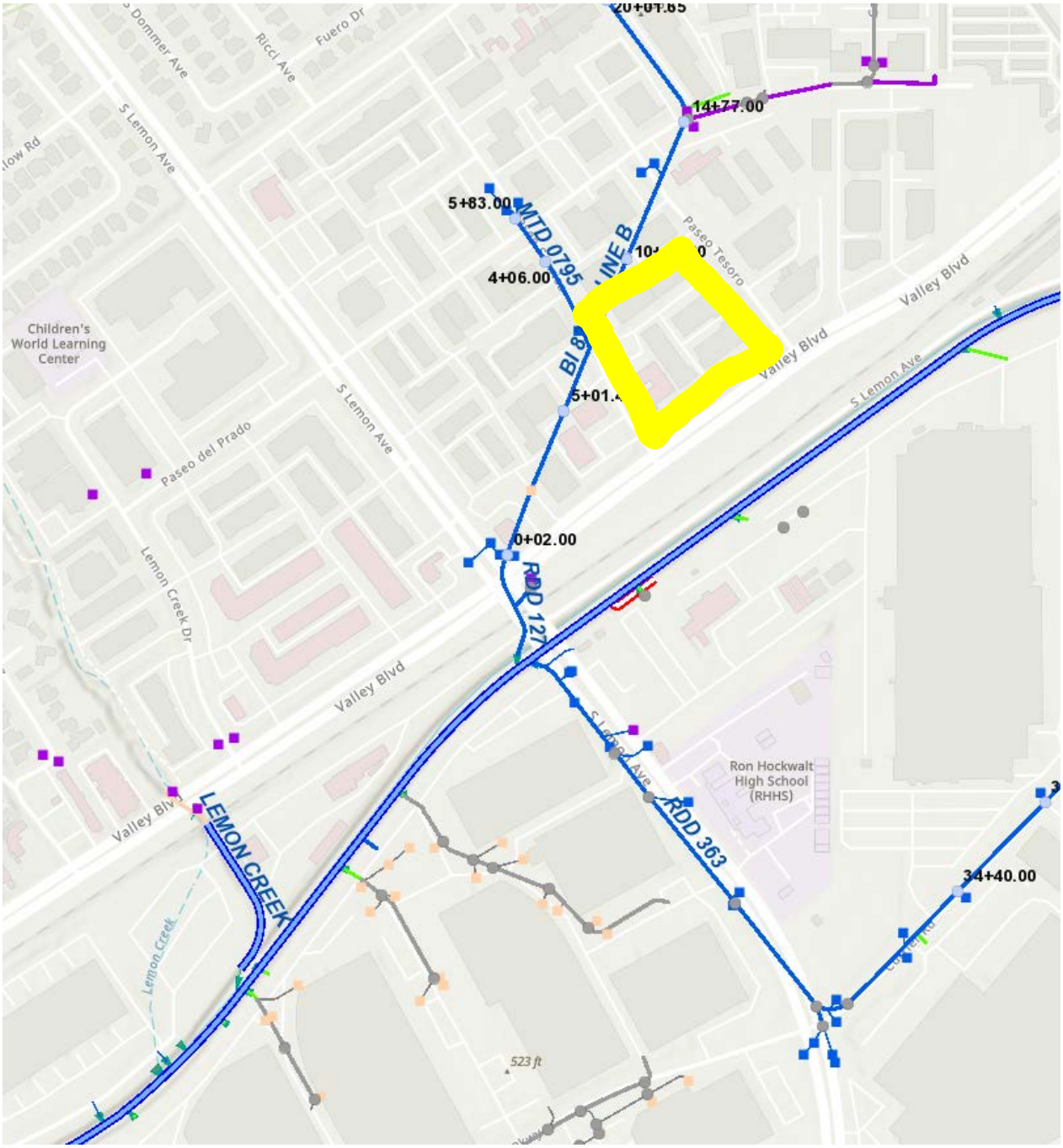
85th Percentile Storm Rainfall Map

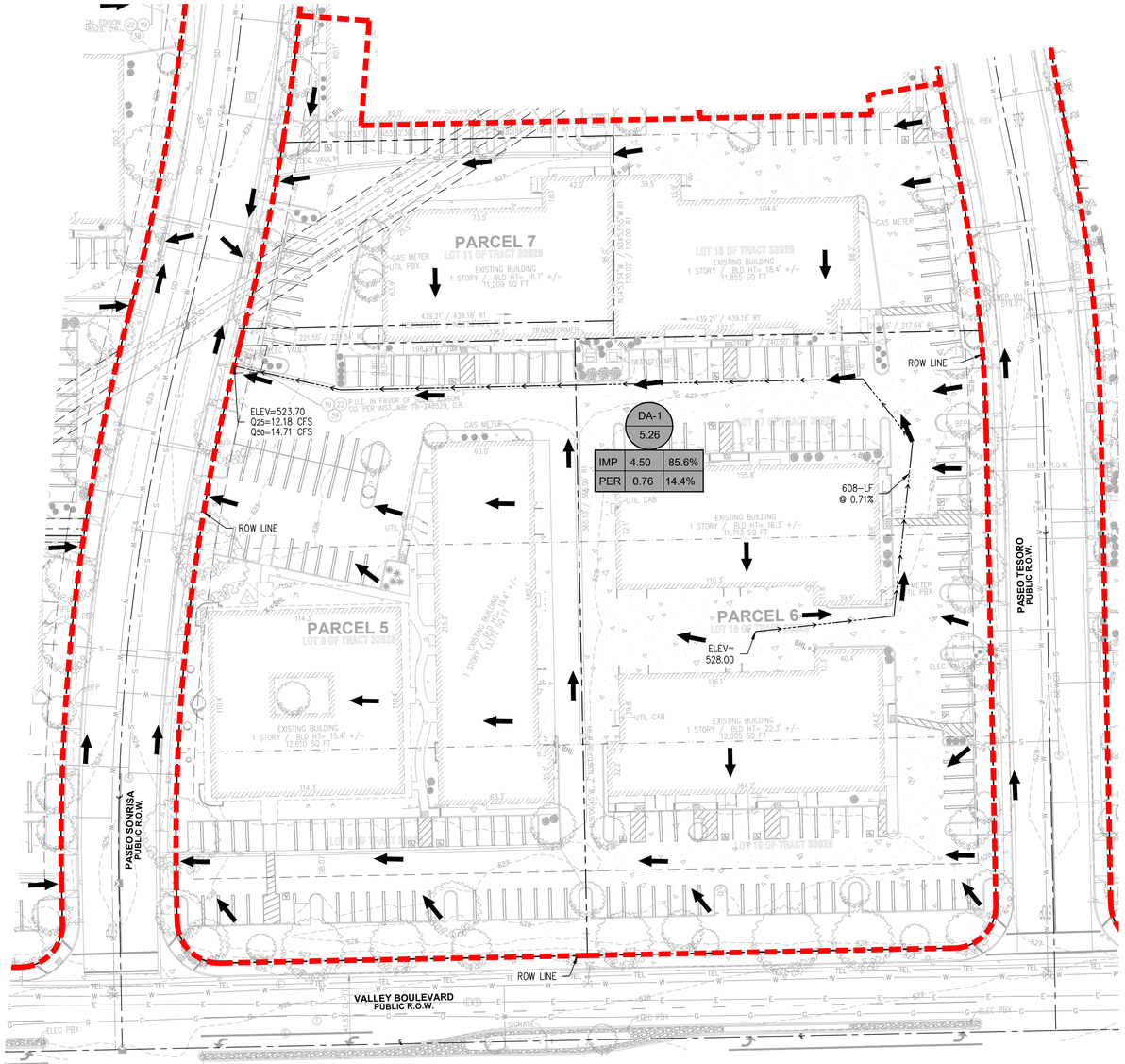


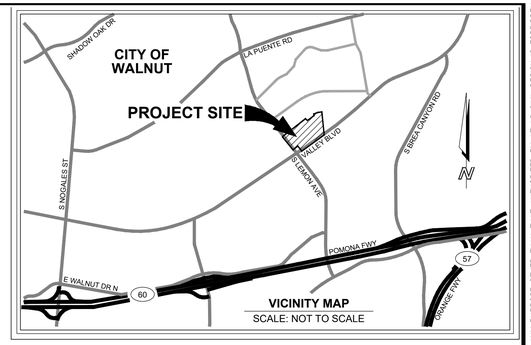
50 year Storm Rainfall Map



Regional Storm Drainage Outfall Map







LEGEND

- PROPERTY BOUNDARY LINE
- CENTERLINE
- 335 EXISTING CONTOURS
- 335 PROPOSED CONTOURS
- SD STORM DRAIN
- PROPOSED CONCRETE
- LIGHT DUTY AC PAVEMENT
- PROPOSED LANDSCAPE
- STORM DRAIN CATCH BASIN
- STORM DRAIN MANHOLE
- DMA# / 0.52 — DRAINAGE MANAGEMENT AREA / AREA IN ACRE
- IMP 0.52 100% — IMPERVIOUS AREA
- PER 0.00 0% — PERVIOUS AREA
- FLOW DIRECTION
- DRAINAGE BASIN BOUNDARY

GRAPHIC SCALE
40 0 40 80
(IN FEET)
1" = 40'

WALNUT BUSINESS PARK
CITY OF WALNUT
COUNTY OF LOS ANGELES
PRE-DEVELOPMENT HYDROLOGY MAP
LOT 3

PROJECT NUMBER:	22-136
PREPARED ON:	
REVISED ON:	6/20/23
PREPARED BY:	GMH
CHECKED BY:	THJ

SHEET 1 OF 1

DATE	REVISIONS	BY

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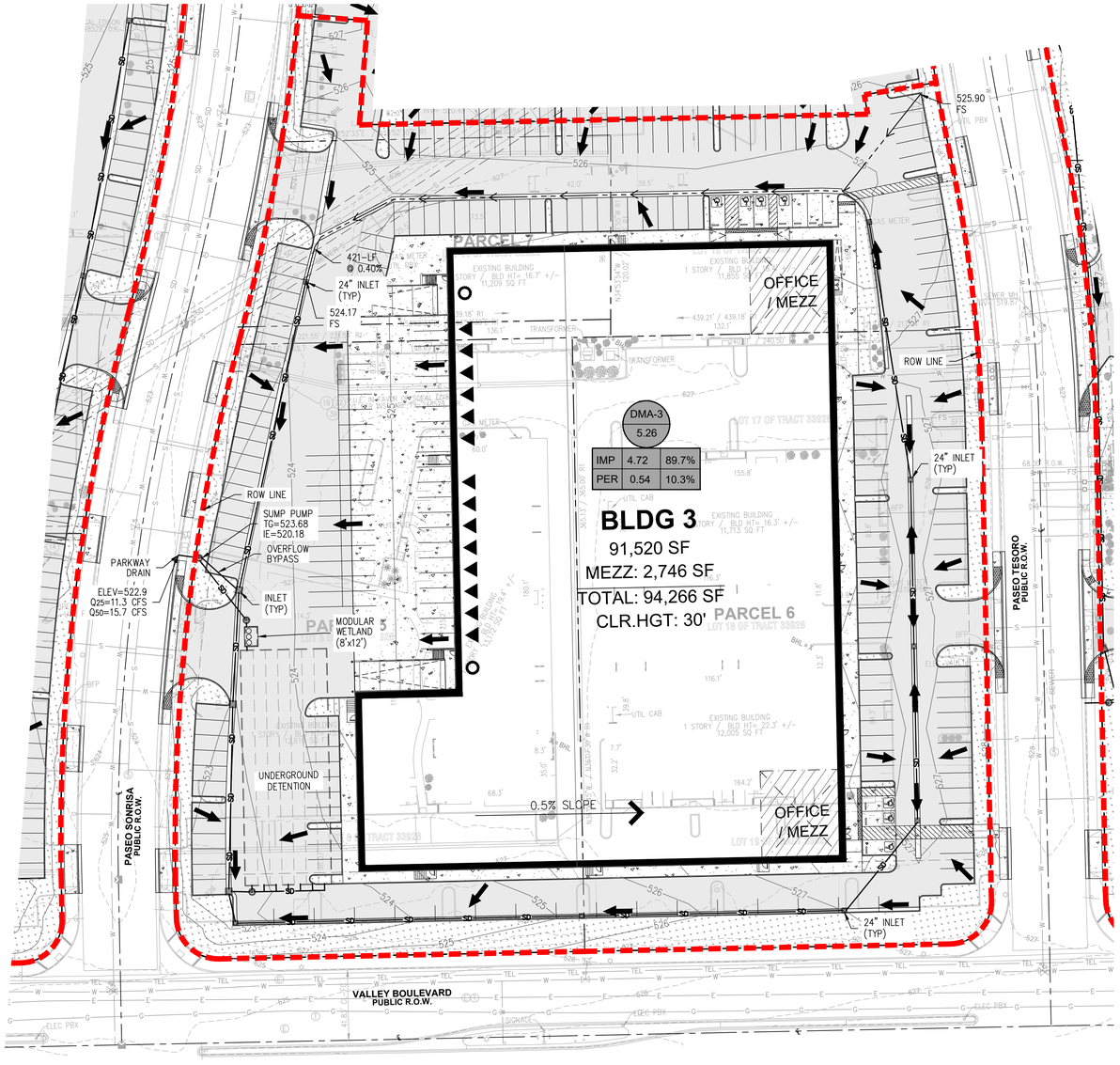
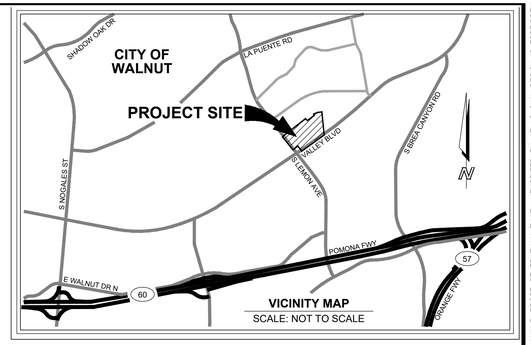
STATE OF CALIFORNIA
NOT FOR CONSTRUCTION

C:\LOCAL CLOUD\SHARED\2022\22-136 WALNUT BUSINESS PARK\CIVIL\REPORTS\HYDROLOGY\WORKING\22-136_PRE-DEV_MAP.DWG - PLOT DATE: June 20, 2023





HYDROLOGIC DATA:

DMA-3	DETAILS
AREA (ACRES)	5.26
SOIL GROUP	017
DESIGN FREQUENCY	25–YEAR
50–YEAR RAINFALL DEPTH (IN)	6.5
PERCENT IMPERVIOUS	89.7%
Q_{25} (CFS)	11.31

LEGEND

- PROPERTY BOUNDARY LINE
- CENTERLINE
- 335 EXISTING CONTOURS
- 335 PROPOSED CONTOURS
- SD STORM DRAIN
- PROPOSED CONCRETE
- LIGHT DUTY AC PAVEMENT
- PROPOSED LANDSCAPE
- STORM DRAIN CATCH BASIN
- STORM DRAIN MANHOLE
- DMA# / 0.52 — DRAINAGE MANAGEMENT AREA / AREA IN ACRE
- IMP 0.52 100% — IMPERVIOUS AREA
- PER 0.00 0% — PERVIOUS AREA
- FLOW DIRECTION
- DRAINAGE BASIN BOUNDARY

GRAPHIC SCALE
40 0 40 80
(IN FEET)
1" = 40'

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REVISIONS

BY	DATE

WALNUT BUSINESS PARK
CITY OF WALNUT
COUNTY OF LOS ANGELES

POST-DEVELOPMENT HYDROLOGY MAP
LOT 3

PROJECT NUMBER:	22–136
PREPARED ON:	
REVISED ON:	6/20/23
PREPARED BY:	GMH
CHECKED BY:	THJ

SHEET 1 OF 1

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Attachment B

Peak Flow Hydrologic Analysis

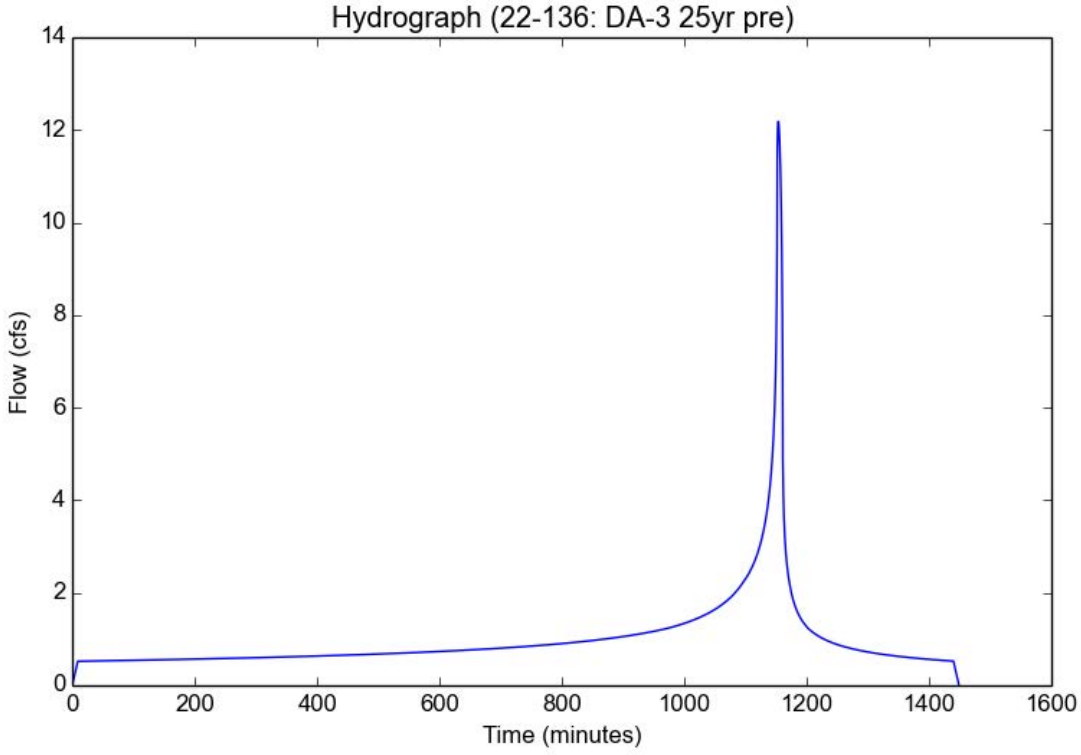
File location: C:/Local Cloud/Shared/2022/22-136 Walnut Business Park/Civil/reports/Hydrology/Working/Lot 3/22-136 - DA-3 25yr pre.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	22-136
Subarea ID	DA-3 25yr pre
Area (ac)	5.26
Flow Path Length (ft)	608.0
Flow Path Slope (vft/hft)	0.0071
50-yr Rainfall Depth (in)	6.5
Percent Impervious	0.856
Soil Type	17
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.707
Peak Intensity (in/hr)	2.5831
Undeveloped Runoff Coefficient (Cu)	0.8766
Developed Runoff Coefficient (Cd)	0.8966
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	12.1823
Burned Peak Flow Rate (cfs)	12.1823
24-Hr Clear Runoff Volume (ac-ft)	2.0003
24-Hr Clear Runoff Volume (cu-ft)	87133.264



Peak Flow Hydrologic Analysis

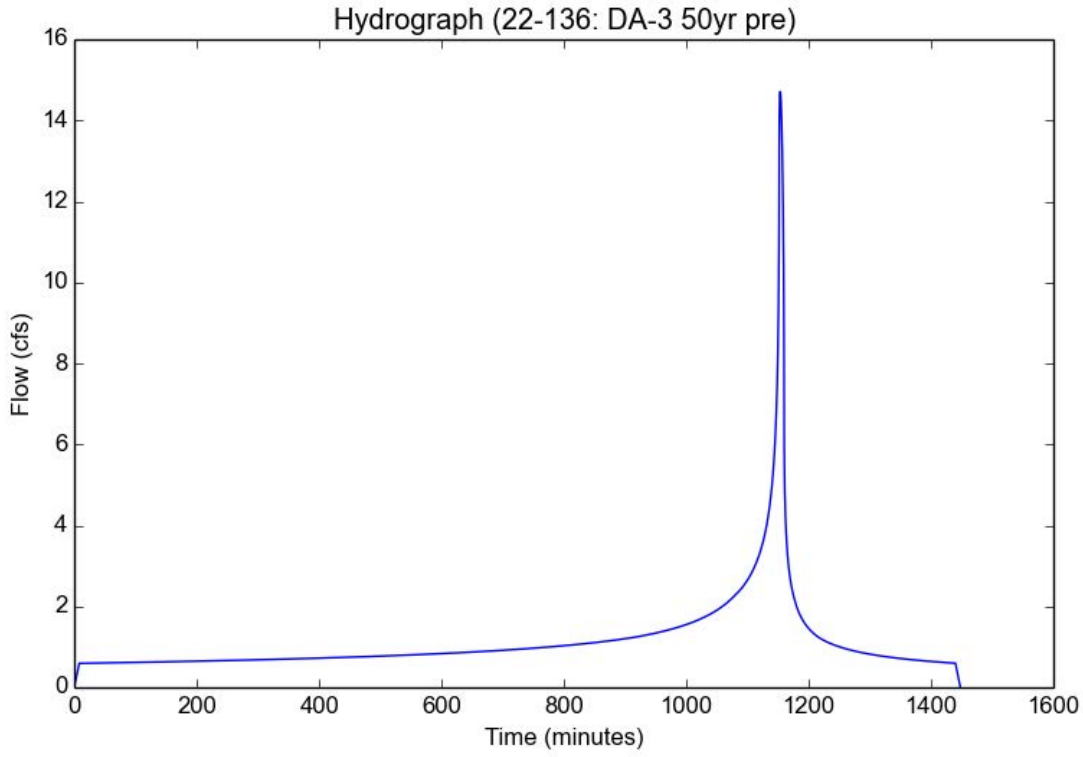
File location: C:/Local Cloud/Shared/2022/22-136 Walnut Business Park/Civil/reports/Hydrology/Working/Lot 3/22-136 - DA-3 50yr pre.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	22-136
Subarea ID	DA-3 50yr pre
Area (ac)	5.26
Flow Path Length (ft)	608.0
Flow Path Slope (vft/hft)	0.0071
50-yr Rainfall Depth (in)	6.5
Percent Impervious	0.856
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.5
Peak Intensity (in/hr)	3.1094
Undeveloped Runoff Coefficient (Cu)	0.8967
Developed Runoff Coefficient (Cd)	0.8995
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	14.7123
Burned Peak Flow Rate (cfs)	14.7123
24-Hr Clear Runoff Volume (ac-ft)	2.2879
24-Hr Clear Runoff Volume (cu-ft)	99659.965



Peak Flow Hydrologic Analysis

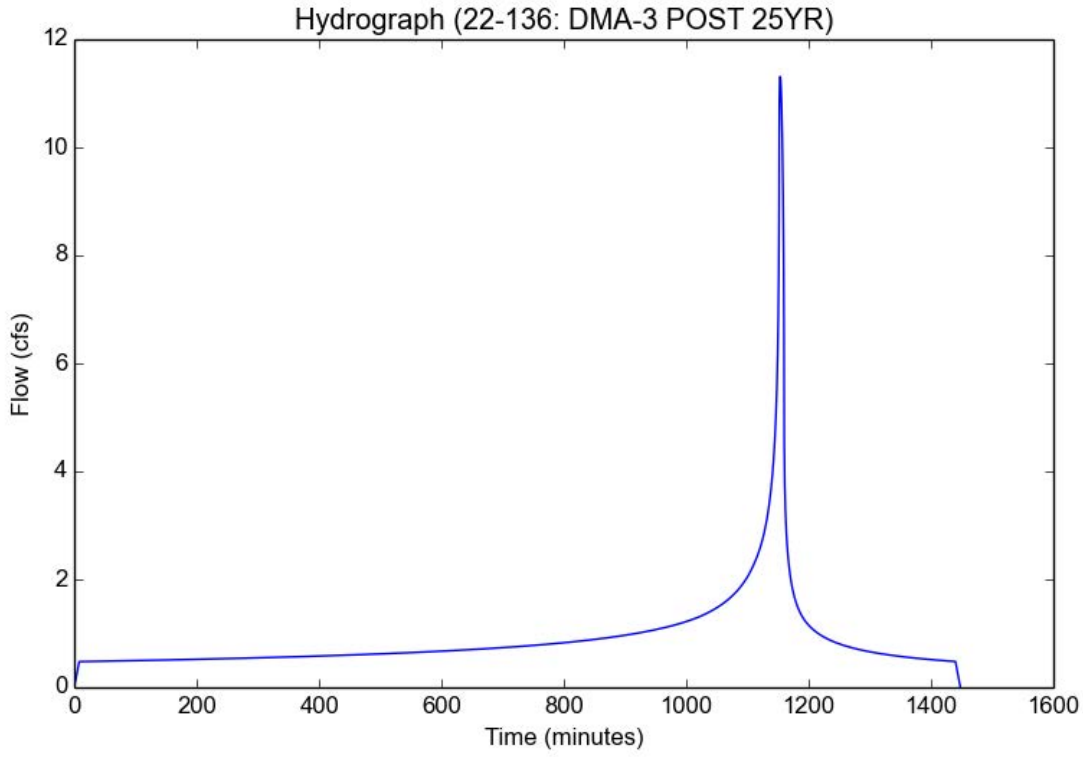
File location: C:/Local Cloud/Shared/2022/22-136 Walnut Business Park/Civil/reports/Hydrology/Working/22-136 - DMA-3 POST 25YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	22-136
Subarea ID	DMA-3 POST 25YR
Area (ac)	5.26
Flow Path Length (ft)	421.0
Flow Path Slope (vft/hft)	0.004
50-yr Rainfall Depth (in)	5.71
Percent Impervious	0.897
Soil Type	17
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0134
Peak Intensity (in/hr)	2.3983
Undeveloped Runoff Coefficient (Cu)	0.8669
Developed Runoff Coefficient (Cd)	0.8966
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	11.3104
Burned Peak Flow Rate (cfs)	11.3104
24-Hr Clear Runoff Volume (ac-ft)	1.8108
24-Hr Clear Runoff Volume (cu-ft)	78877.1234



Peak Flow Hydrologic Analysis

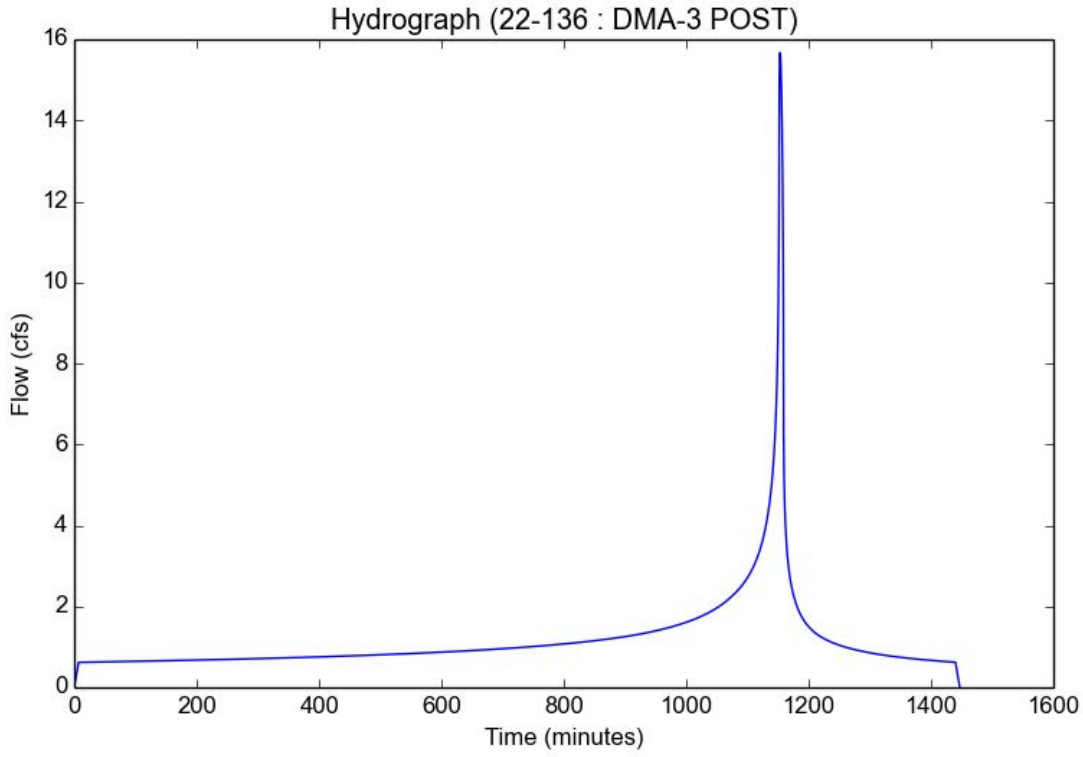
File location: P:/2022/22-136 Walnut Business Park/Civil/reports/Hydrology/Working/22-136 - DMA-3 POST 50yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	22-136
Subarea ID	DMA-3 POST
Area (ac)	5.26
Flow Path Length (ft)	421.0
Flow Path Slope (vft/hft)	0.004
50-yr Rainfall Depth (in)	6.5
Percent Impervious	0.897
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.5
Peak Intensity (in/hr)	3.3108
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	15.6735
Burned Peak Flow Rate (cfs)	15.6735
24-Hr Clear Runoff Volume (ac-ft)	2.3605
24-Hr Clear Runoff Volume (cu-ft)	102824.7187



Attachment C

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Jun 19 2023

DMA-1 12in 25yr

Circular

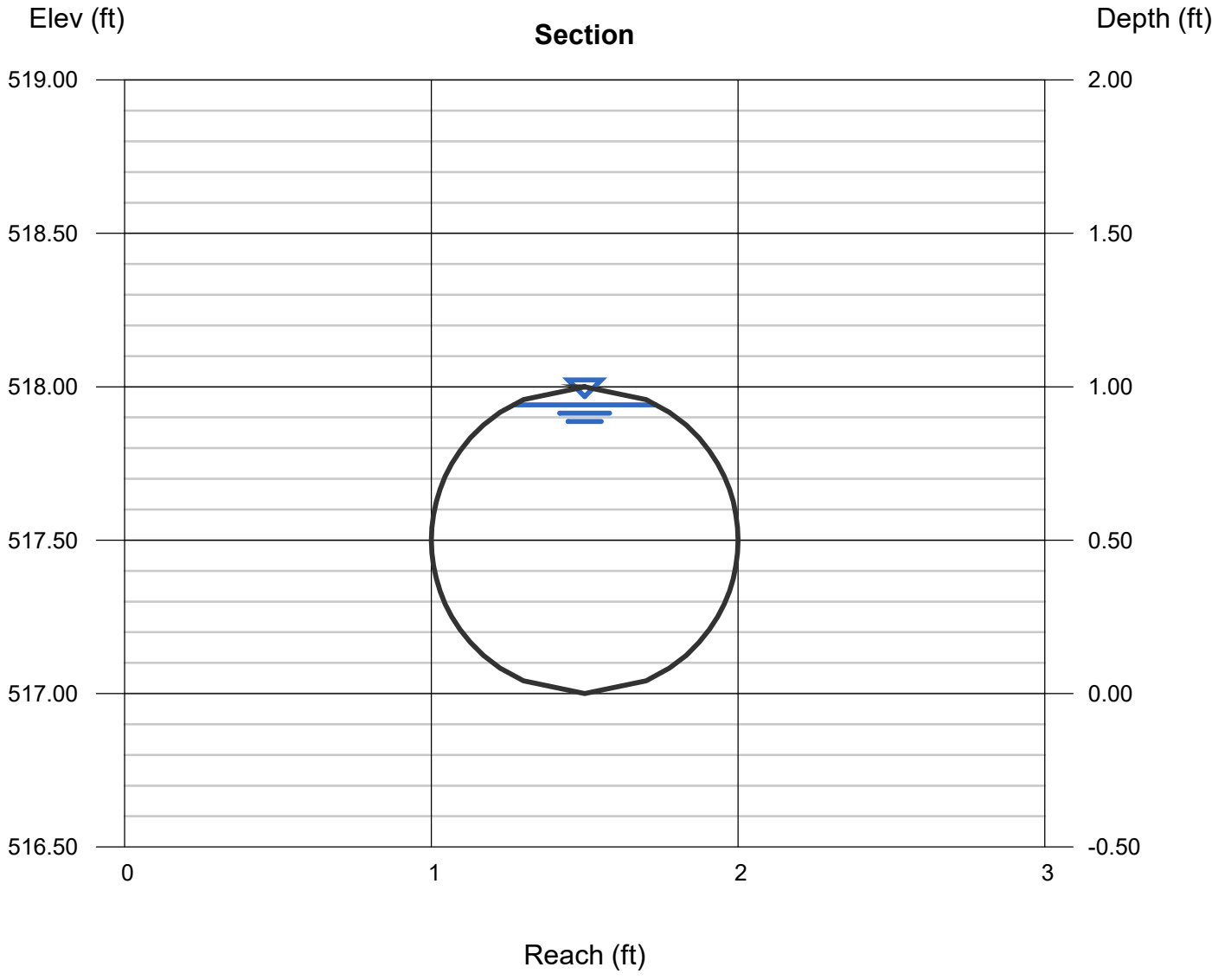
Diameter (ft)	= 1.00
Invert Elev (ft)	= 517.00
Slope (%)	= 0.50
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 17

Highlighted

Depth (ft)	= 0.94
Q (cfs)	= 2.934
Area (sqft)	= 0.77
Velocity (ft/s)	= 3.83
Wetted Perim (ft)	= 2.66
Crit Depth, Yc (ft)	= 0.74
Top Width (ft)	= 0.47
EGL (ft)	= 1.17



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Jun 19 2023

DMA-1 18in 25yr

Circular

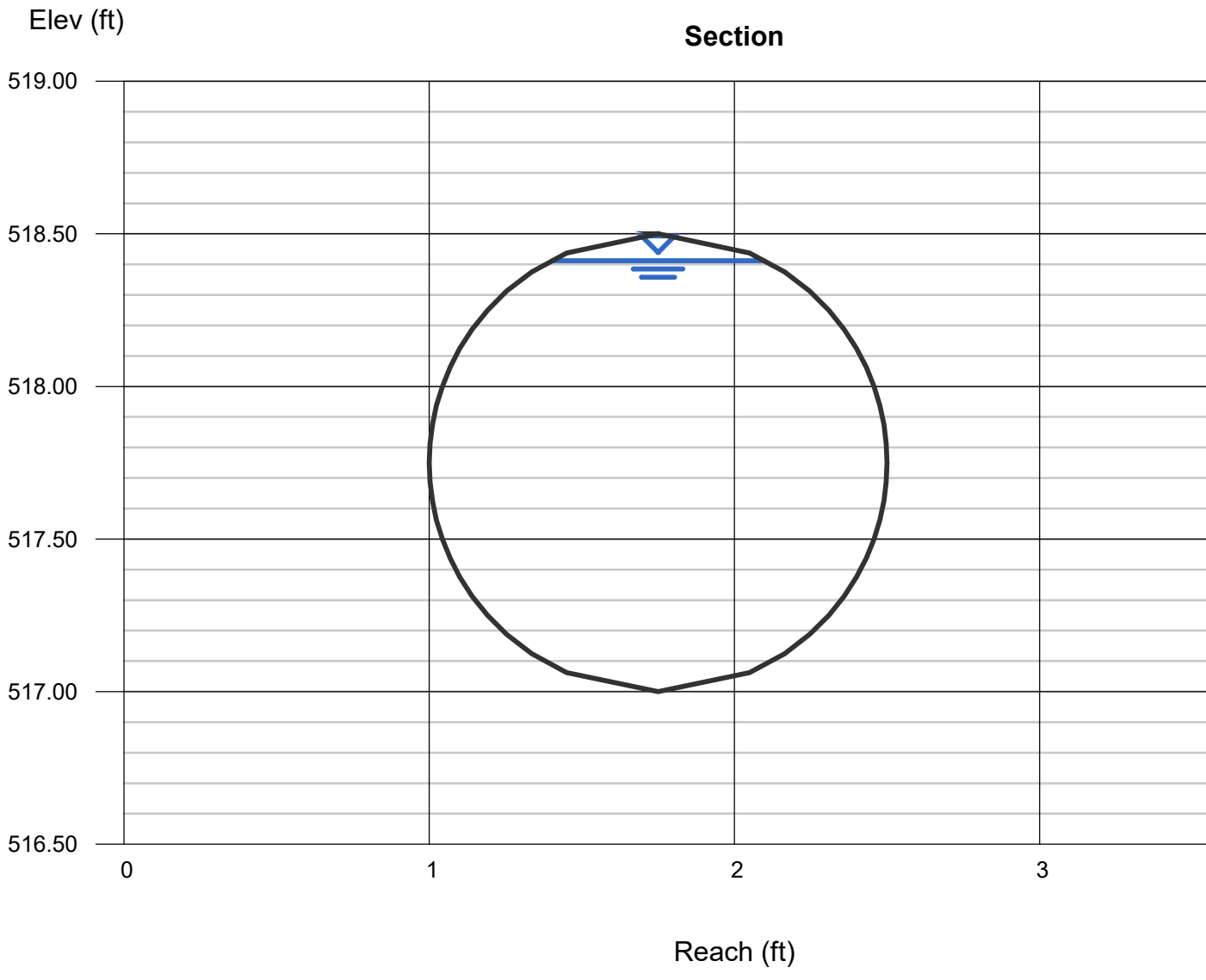
Diameter (ft)	= 1.50
Invert Elev (ft)	= 517.00
Slope (%)	= 0.50
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 17

Highlighted

Depth (ft)	= 1.41
Q (cfs)	= 8.652
Area (sqft)	= 1.73
Velocity (ft/s)	= 5.01
Wetted Perim (ft)	= 3.98
Crit Depth, Yc (ft)	= 1.14
Top Width (ft)	= 0.70
EGL (ft)	= 1.80



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Jun 19 2023

DMA-1 24in outlet

Circular

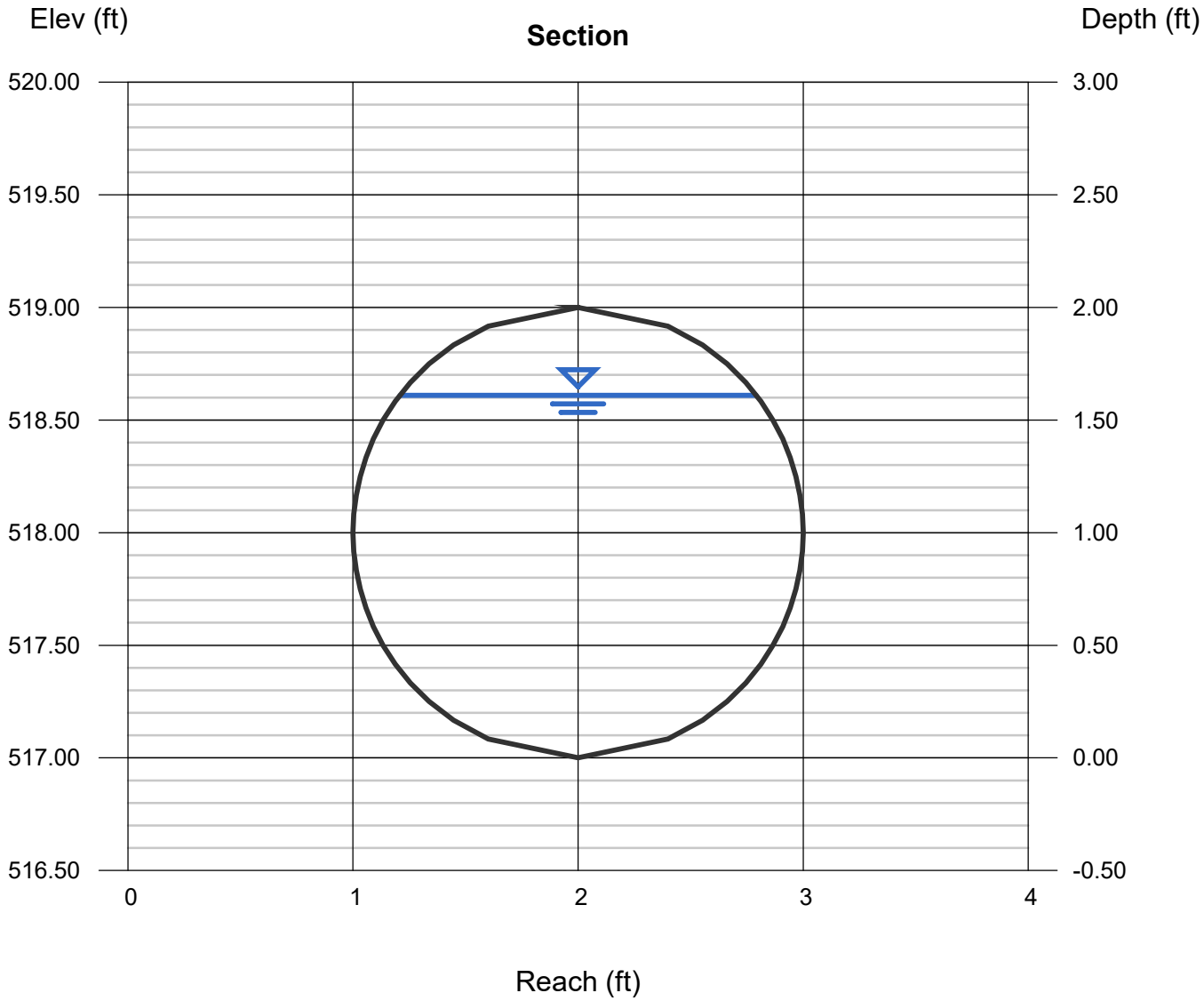
Diameter (ft)	= 2.00
Invert Elev (ft)	= 517.00
Slope (%)	= 0.50
N-Value	= 0.012

Calculations

Compute by:	Known Q
Known Q (cfs)	= 17.00

Highlighted

Depth (ft)	= 1.61
Q (cfs)	= 17.00
Area (sqft)	= 2.71
Velocity (ft/s)	= 6.26
Wetted Perim (ft)	= 4.46
Crit Depth, Yc (ft)	= 1.49
Top Width (ft)	= 1.58
EGL (ft)	= 2.22



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Jun 19 2023

24in grate inlet curb

Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 4.00
Grate Width (ft)	= 2.00
Grate Length (ft)	= 2.00

Gutter

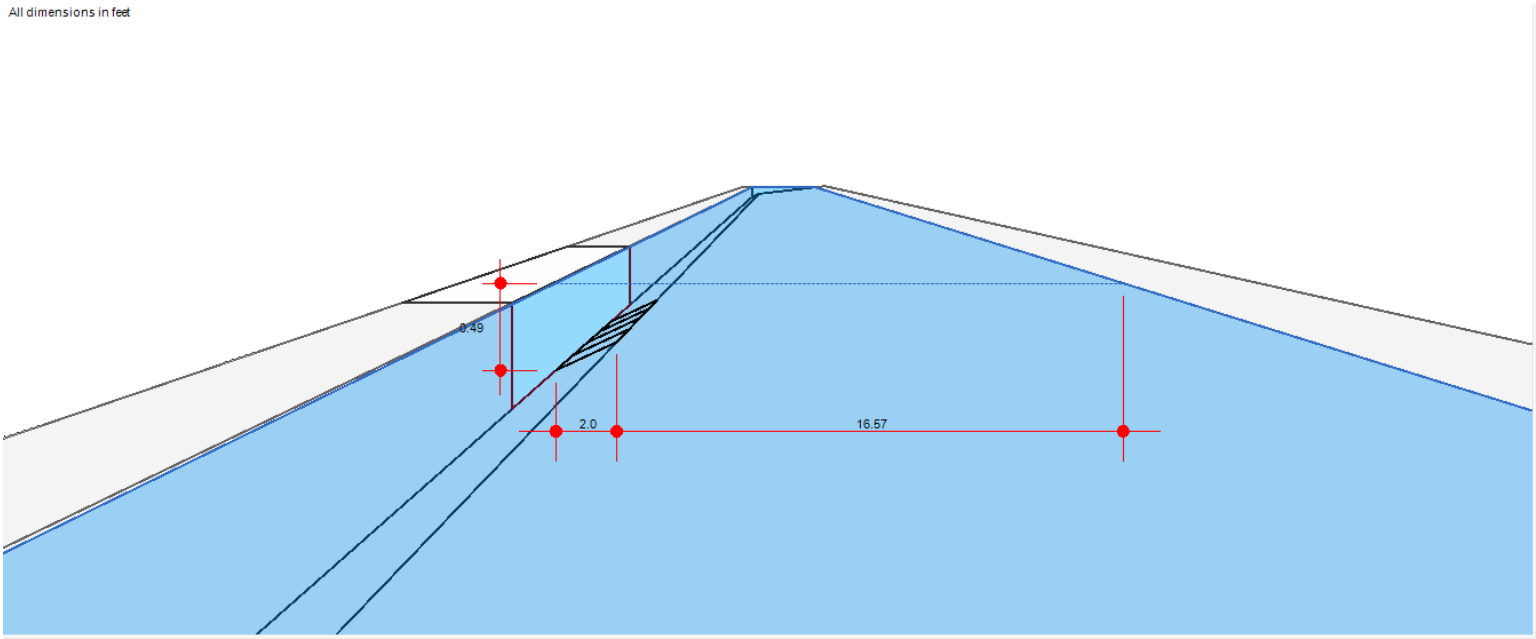
Slope, Sw (ft/ft)	= 0.080
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= -0-
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Q vs Depth
Max Depth (in)	= 6

Highlighted

Q Total (cfs)	= 4.75
Q Capt (cfs)	= 4.75
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 5.90
Efficiency (%)	= 100
Gutter Spread (ft)	= 18.57
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Jun 19 2023

24in grate inlet curb

Drop Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 4.00
Grate Width (ft)	= 2.00
Grate Length (ft)	= 2.00

Gutter

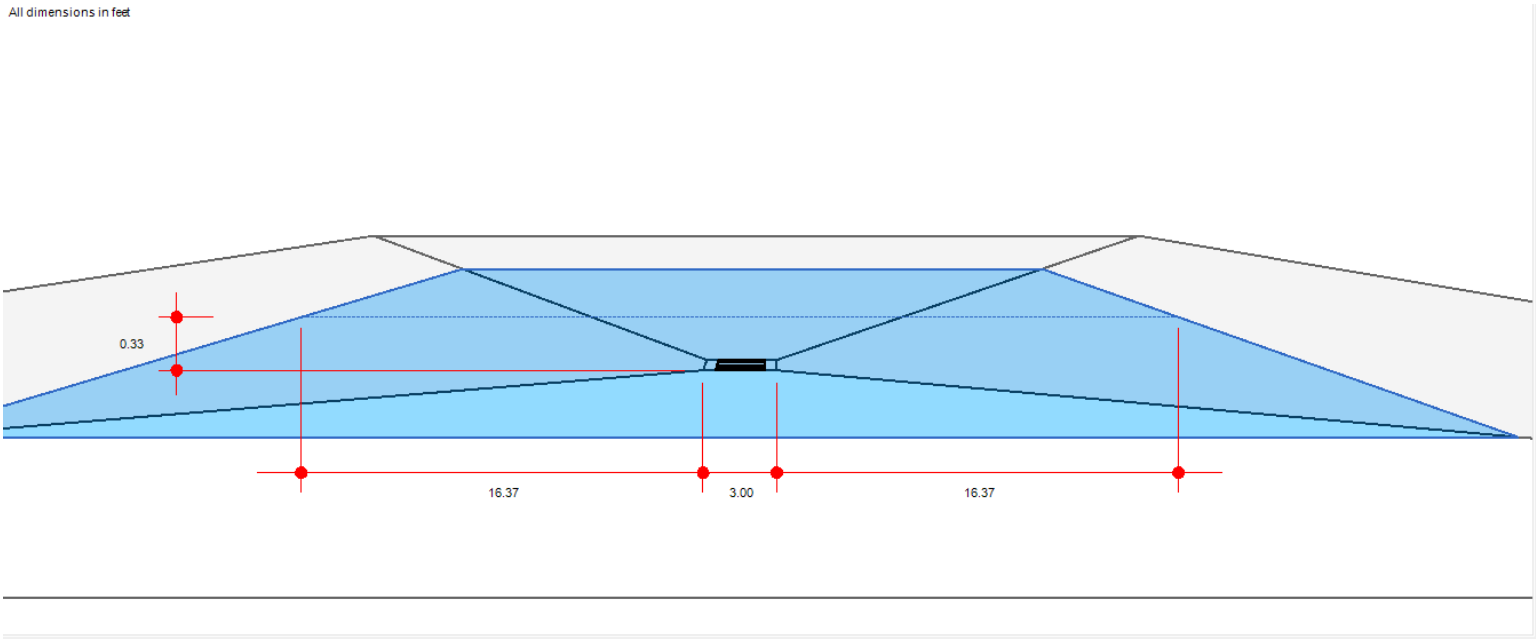
Slope, Sw (ft/ft)	= 0.020
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= -0-
Gutter Width (ft)	= 3.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Q vs Depth
Max Depth (in)	= 6

Highlighted

Q Total (cfs)	= 4.50
Q Capt (cfs)	= 4.50
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 3.93
Efficiency (%)	= 100
Gutter Spread (ft)	= 35.74
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Jun 19 2023

36in grate inlet gutter

Drop Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 4.00
Grate Width (ft)	= 3.00
Grate Length (ft)	= 3.00

Gutter

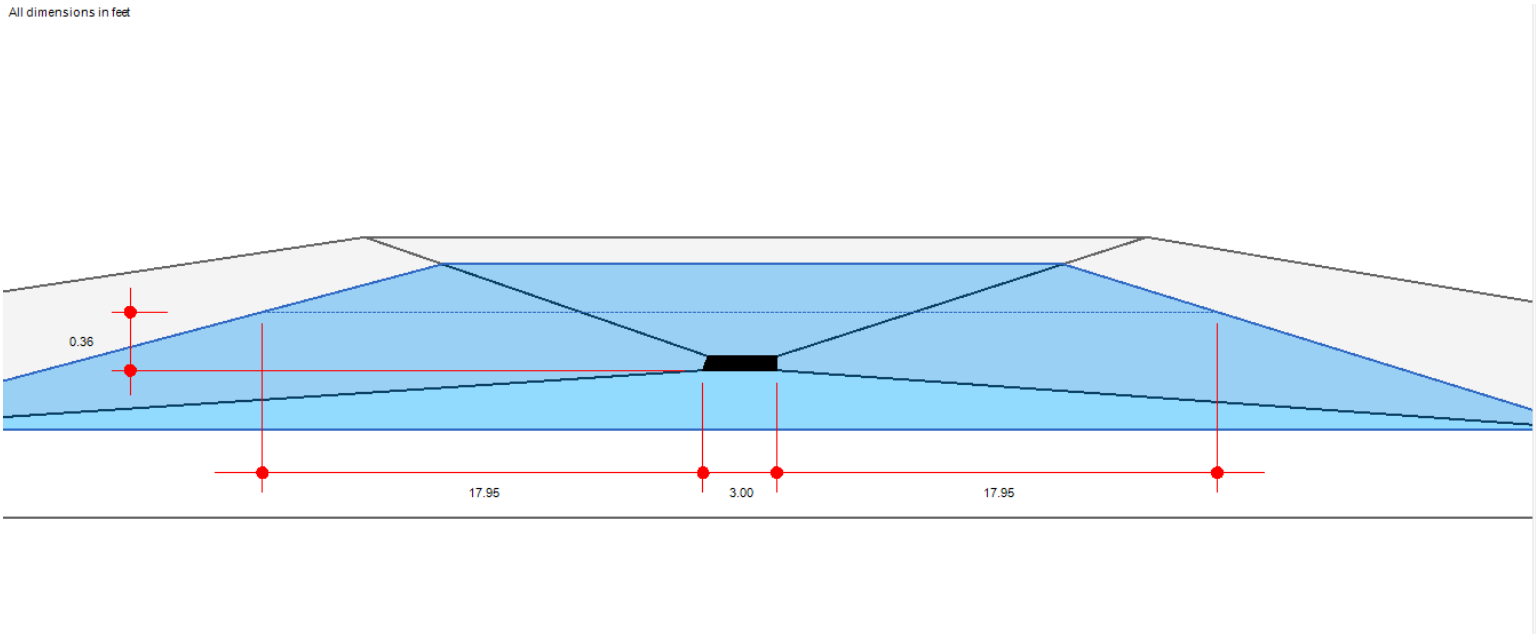
Slope, Sw (ft/ft)	= 0.020
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= -0-
Gutter Width (ft)	= 3.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Q vs Depth
Max Depth (in)	= 6

Highlighted

Q Total (cfs)	= 7.75
Q Capt (cfs)	= 7.75
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 4.31
Efficiency (%)	= 100
Gutter Spread (ft)	= 38.90
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Jun 19 2023

36in grate inlet

Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 9.00
Grate Width (ft)	= 3.00
Grate Length (ft)	= 3.00

Gutter

Slope, Sw (ft/ft)	= 0.080
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= -0-
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Q vs Depth
Max Depth (in)	= 6

Highlighted

Q Total (cfs)	= 6.00
Q Capt (cfs)	= 6.00
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 5.84
Efficiency (%)	= 100
Gutter Spread (ft)	= 18.34
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-