



7849 STOCKTON BLVD

LEVEL 2 DRAINAGE & STORM WATER QUALITY REPORT

# **Level 2 Drainage & Storm Water Quality Report**

**For**

**7849 Stockton Blvd  
Sacramento, CA 95823  
APN: 115-0061-031 & 032**

**September 2023**

**PLNP2023-00084  
Datum: NAVD88**

**Prepared by,  
CWE  
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Roseville, CA 95661  
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CWE Project No. R22155**



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## LEVEL 2 DRAINAGE &amp; STORM WATER QUALITY REPORT

**A. PURPOSE OF REPORT & PROJECT LOCATION**

This Level 2 Drainage & Storm Water Quality Report provides a summary of a preliminary drainage evaluation of the proposed improvements for 7849 Stockton Blvd, Sacramento, CA 95823. The project site has APNs of 115-0061-031 and 115-0061-032 and approximate coordinates of latitude 38.4723° and longitude -121.4167°. The vicinity map of the project site can be found in Appendix A. The North American Vertical Datum of 1988 (NAVD 88) was used to prepare this report.

**Figure 1: Aerial Image of Project Site****B. EXISTING SITE CONDITIONS**

The two parcels that make up the project site are approximately 3.86 acres in total. The entirety of the northern parcel is paved with asphalt concrete. There is one existing building with associated parking and a landscape strip with rolled curb and gutter along the frontage. The southern parcel has undeveloped natural ground with a chain link fence surrounding the site. There is a drainage ditch that runs along part of Stockton Blvd and the Victory Ave frontage. A portion of Stockton Blvd has existing curb, gutter, and sidewalk and drains south to the Victory Ave intersection. The site



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consists of soil that belongs to hydrological soil group C. The web soil survey for the project site can be found in Appendix D. Table 1 below summarizes the surrounding properties.

**Table 1: Site Description (Surrounding Areas)**

North	Developed commercial property to the northwest and undeveloped private property to the northeast. (Note, the undeveloped private property to the northeast is currently going through the approval process for a condo complex and already has an approved design level drainage study. CWE will work with Sacramento County if it is determined that the drainage design needs to be revised to accommodate the property to the northwest.)
South	Victory Avenue, beyond which is developed commercial property.
East	One undeveloped private property.
West	Stockton Boulevard, beyond which is developed commercial property.

**C. PROJECT DESCRIPTION**

This project involves the construction of a new asphalt concrete parking lot with associated semi-truck parking stalls, drive aisles, landscaping, and underground storm drain utilities for the existing site. The underground storm drain utilities will tie into the existing storm drain system within Stockton Blvd. Improvements taking place on the northern parcel are limited to painting the parking stall striping over the existing asphalt. The project site plan can be found in Appendix A.

**D. EXISTING DRAINAGE CONDITIONS**

CWE performed a topographic survey on December 20, 2022. Using this data, CWE determined that there are two drainage sheds for the existing site, A-X1 and A-X2. Given that all the existing asphalt on the northern parcel will remain undisturbed, CWE will only analyze the drainage limits of the southern parcel where impervious surface will be constructed. However, the drainage sheds include portions of the northern parcel because these portions produce runoff that flows into the southern parcel. A-X1 is approximately 0.452 acres and 61.3% impervious. Runoff in this shed generally sheet flows east to west and is tributary to the existing storm drain inlet just south of the existing driveway at the northwestern corner of the southern parcel. A-X2 is approximately 1.819 acres and 50.9% impervious. Runoff in this shed generally sheet flows north to south and into the drainage ditch at the south end of the parcel and is tributary to the 12" CMP culvert that takes drainage under Victory Ave and into the public storm drain system. Existing drainage conditions can be found on the Pre-Construction Shed Map in Appendix B.



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Table 2: Existing Storm Drain Peak Flows

Drainage Shed	100-year Peak Flow
A-X1	1.2 cfs
A-X2	4.5 cfs

**E. PROPOSED DRAINAGE CONDITIONS**

The post-construction conditions make up two drainage management areas, DMA-1 and DMA-2. DMA-1 is approximately 1.947 acres and 94.5% impervious. DMA-1 generally sheet flows north to south and into a drain inlet in the middle of southern edge of curb and gutter. From there, flow through a stormwater treatment device, into a proposed underground detention system, and then into the existing landscape drain inlet. DMA-2 is approximately 0.325 acres and 76.8% impervious. DMA-2 generally sheet flows north to south from the sidewalk and landscape, into the offsite curb and gutter, and into a proposed drain inlet about 150 feet west of the eastern property line. Proposed drainage conditions can be found on the Post-Construction Shed Map in Appendix B.

CWE performed a Nolte analysis to find flows in the existing 24” pipe downstream of the existing landscape drain inlet and the proposed 12” pipe that connects the proposed Victory Ave drain inlet to the existing public system. CWE then input this data into Hydraflow Express in Civil3D to analyze the HGL of the pipes. The HGL of water running through the pipes must maintain at least 0.5’ of freeboard from drain inlet grates and 1’ of freeboard from manhole rims. The SacCalc and Hydraflow models can be found in Appendix C and show that the pipes have more than enough capacity to take on the runoff from this project site while maintaining County standards.

CWE also used the SacCalc method to analyze the difference in 100-year peak flows between the existing site conditions and proposed site conditions. CWE exported the data from SacCalc into Excel to determine the total detention volume needed to mitigate the increase in peak flow going from existing to proposed conditions. The total onsite detention volume required to mitigate the increase in peak flow for a 24-hour, 100-year storm is 2,358 cubic feet. CWE will fully design the detention system in the future design phase of the project. A table showing the flows and volumes for the first 60 minutes of the 24-hour, 100-year storm event used to find the required detention volume can be found in Appendix C.

**F. STORM WATER QUALITY EVALUATION**

The existing project site is zoned as General Commercial and there will be no change in zoning, so this project is classified as a Commercial/Industrial Development according to the Sacramento Region Stormwater Quality Design Manual (SQDM). The total amount of impervious surface added in this project, including the offsite frontage improvements, will be less than one acre, therefore



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hydromodification control and low development impact control will not be required. This project will be required to implement treatment control, trash capture control, and source control (reference Table 3.2 from the SQDM). The Storm Water Quality Exhibit that shows the total amount of impervious surface for this project can be seen in Appendix B.

Although LID is not explicitly required, CWE used the Sacramento LID Credits worksheet for commercial sites to determine the treatment flow needed for this site, see Appendix C. Stormwater will be treated by an ADS Barracuda S3 unit that is sized to properly accommodate the required flow. A preliminary standard detail of the ADS Barracuda unit can be found in Appendix E. To fulfill the trash capture requirement, CWE proposes to implement a BrightWater Curb Inlet Filter which is a trash treatment control device approved by the California State Water Resources Control Board, see technical data sheet in Appendix E. Table 3 below summarizes source control measures that will be implemented in this project.

Table 3: Source Control Measures

Source Control	Used	Description
Efficient Irrigation	YES	Irrigation to be designed by landscape architect.
Fueling Areas	N/A	No fueling areas proposed.
Landscaping	YES	Landscape buffer between proposed parking stalls and proposed offsite sidewalk, and between proposed offsite curb and gutter and proposed offsite sidewalk.
Loading Areas	N/A	No loading areas proposed.
Outdoor Storage Areas	N/A	No outdoor storage areas proposed.
Outdoor Work Areas	YES	Outdoor work areas will be paved.
Storm Drain Markings and Signs	YES	Storm drains will be marked.
Vehicle/Equipment Wash Areas	N/A	No vehicle equipment wash areas proposed.
Waste Management Areas	N/A	No waste management areas proposed.

G. FEMA FLOOD PLAIN

Areas of this project site fall within zone AE based on FEMA Flood Map 06067C0306H. A Flood Plain Exhibit was created to demonstrate that the project will not impact the floodplain storage and surrounding properties. To analyze the floodplain storage, CWE made an arbitrary surface based off of the base flood elevations (BFE) on the FEMA Flood Plain Map. Then CWE compared both the



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*LEVEL 2 DRAINAGE & STORM WATER QUALITY REPORT*

existing and proposed surfaces to the arbitrary BFE surface to see how much volume of fill there would be, which represents how much storage volume there would be in a 100-year event. The analysis shows that there will be more storage in the proposed conditions compared to the existing conditions, so floodplain storage will not be an issue with this project. The proposed onsite drain inlet, which is also the low point on site, also has a grate elevation that is exactly 1' below the BFE at that same location, so ponding will reach a maximum of 1' in a 100-year event.

## **H. CONCLUSIONS**

The preliminary evaluation of the proposed underground drainage system shows consistency with the requirements outlined in the Sacramento County Hydrology Standards as well as the SQDM.

- There will be an estimated increase in runoff flows from the pre-construction to post-construction conditions within the project site due to increased impervious area caused by project improvements. Further impaction of existing downstream drainage facilities will be mitigated by using an underground detention system to attenuate and reduce the peak runoff flows to below pre-construction levels that will be designed during the design phase of the project.
- The Drainage Management Areas will implement treatment control, trash capture control, and source control to meet the requirements of Sacramento County.
- The project will maintain the same amount of storage volume for a 100-year event within the flood plain zone AE in the post-construction conditions as it had in the pre-construction conditions. There will also be a maximum of 1' of ponding onsite in the case of a 100-year event.

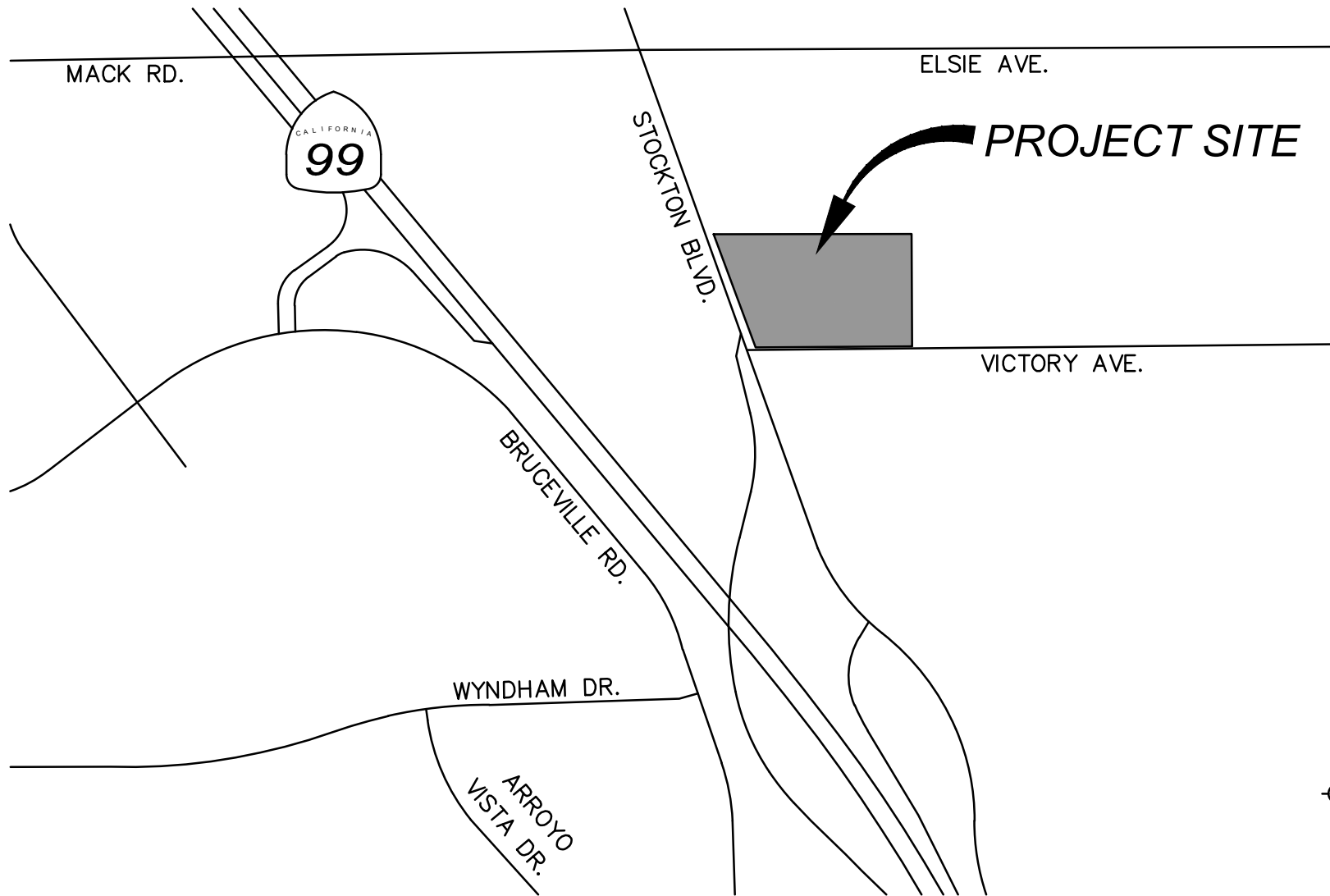
## **I. REFERENCES**

- *Sacramento County Hydrology Standards; Volume 2 of the Sacramento City/County Drainage Manual*
- *Sacramento Region Stormwater Quality Design Manual, dated July, 2018.*



## **APPENDIX A**

### ***VICINITY MAP & SITE PLAN***



NOT TO SCALE



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Ph: 916-772-7800 | www.cwecorp.com

**VICINITY MAP**

**7849 STOCKTON BLVD**  
**SACRAMENTO, CA 95823**  
**APN: 115-0061-031 & 032**

CONRAD ETHAN  
7837 STOCKTON BLVD  
APN: 115-0061-045

RKR HOMES INCORPORATED  
ELSIE AVE  
APN: 115-0061-044

HARJOT GROUP INVESTMENT LLC  
7849 STOCKTON BLVD.  
APN: 115-0061-031

HARJOT GROUP INVESTMENT LLC  
7871 VICTORY AVE.  
APN: 115-0061-032

HARJOT GROUP INVESTMENT, LLC  
7425 VICTORY AVE.  
APN: 115-0061-030

S89°58'03"E 565.60'

145.43'

420.17'

N19°50'01"W 222.89'

N19°50'01"W 355.53'

S88°43'34"E 490.15'

S00°00'45"E 330.37'

152.64'

110.12'

S89°31'00"W 445.06'



SCALE: 1" = 80'



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# SITE PLAN

**7849 STOCKTON BLVD**  
**SACRAMENTO, CA 95823**  
**APN: 115-0061-031 & 032**



## **APPENDIX B**

### **PROJECT SHED MAPS**

**LEGEND**

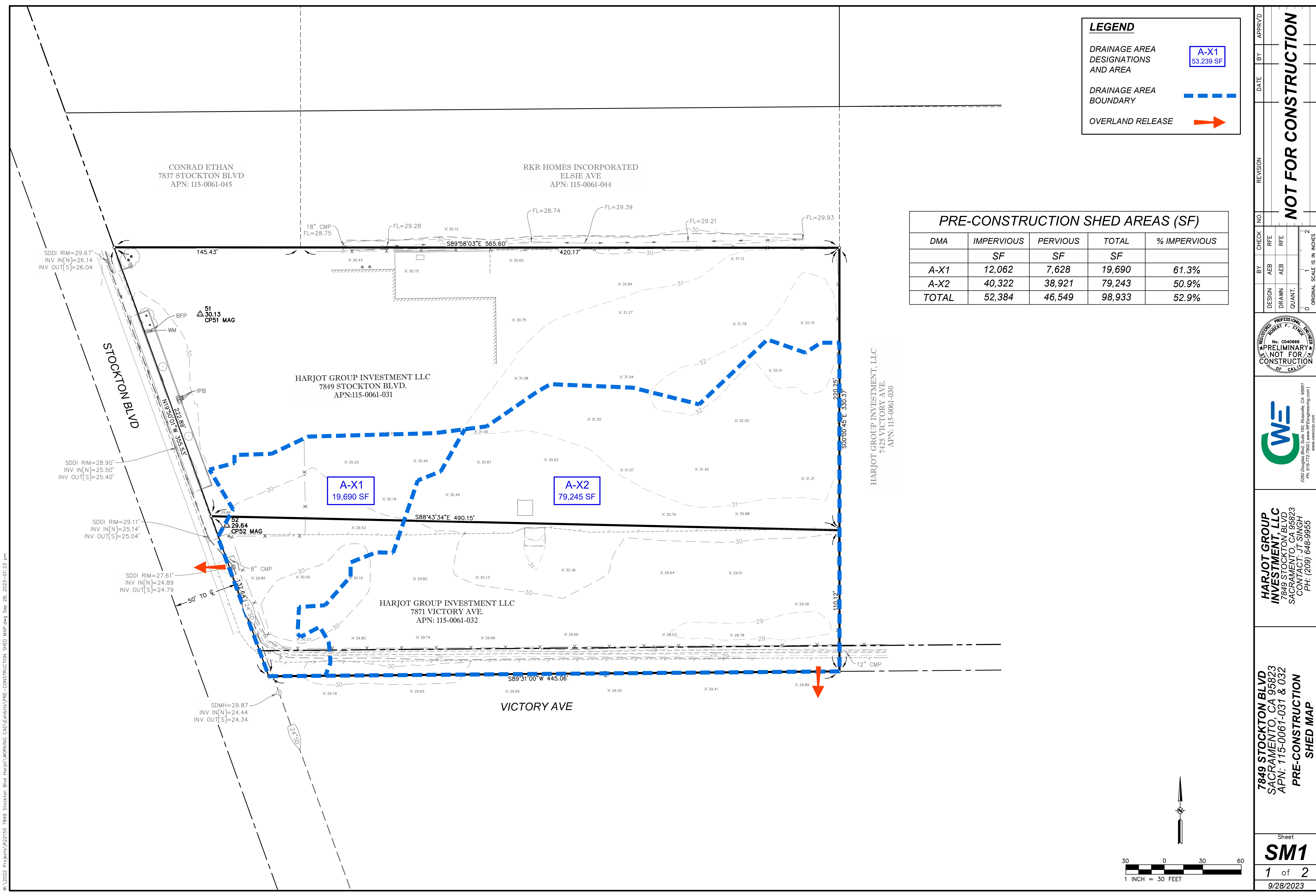
DRAINAGE AREA DESIGNATIONS AND AREA A-X1  
53,239 SF

DRAINAGE AREA BOUNDARY

OVERLAND RELEASE

**PRE-CONSTRUCTION SHED AREAS (SF)**

DMA	IMPERVIOUS SF	PERVIOUS SF	TOTAL SF	% IMPERVIOUS
A-X1	12,062	7,628	19,690	61.3%
A-X2	40,322	38,921	79,243	50.9%
<b>TOTAL</b>	<b>52,384</b>	<b>46,549</b>	<b>98,933</b>	<b>52.9%</b>



**NOT FOR CONSTRUCTION**

REVISION	NO.	CHECK	BY	DATE	BY	APPROVED

DESIGN: AEB  
DRAWN: AEB  
QUANT.:  
0

ORIGINAL SCALE IS IN INCHES  
1" = 30'

REGISTERED PROFESSIONAL ENGINEER  
No. 0040666  
PRELIMINARY  
NOT FOR CONSTRUCTION  
OF CALIFORNIA

**CWE**  
2280 Douglas Blvd, Suite 160, Roseville, CA 95661  
Ph: 916-772-7272  
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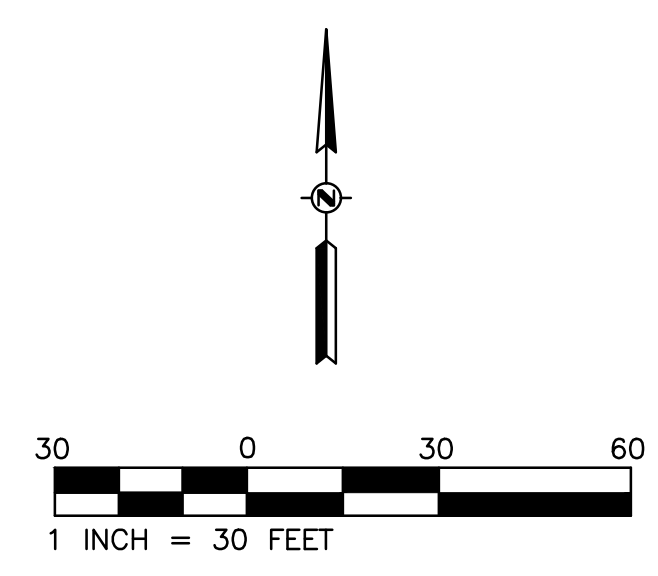
**HARJOT GROUP INVESTMENT, LLC**  
7849 STOCKTON BLVD  
SACRAMENTO, CA 95823  
CONTACT: JI SINGH  
PH: (209) 648-9955

**7849 STOCKTON BLVD**  
SACRAMENTO, CA 95823  
APN: 115-0061-031 & 032  
**PRE-CONSTRUCTION SHED MAP**

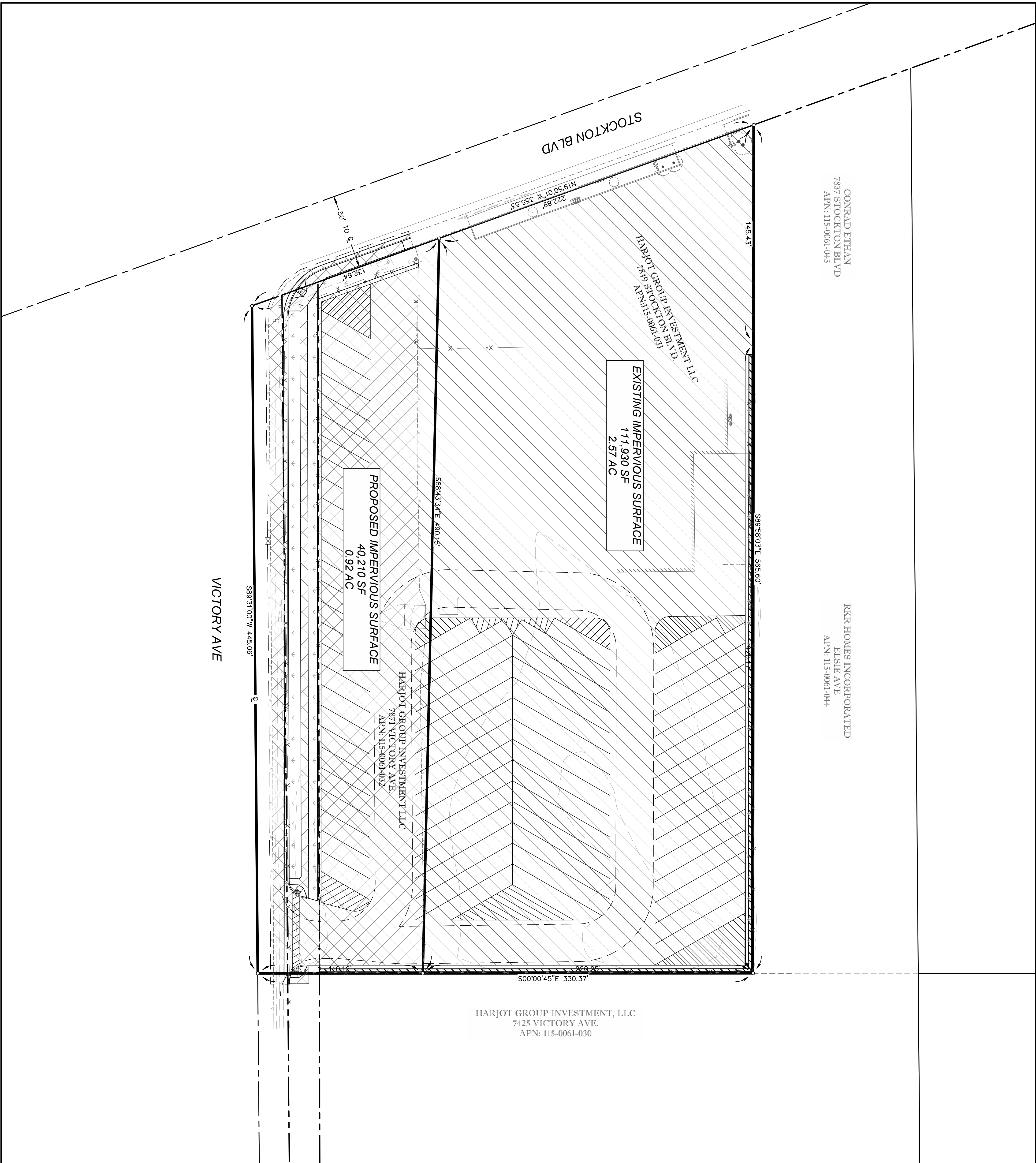
Sheet  
**SM1**  
1 of 2  
9/28/2023

CWE PROJECT R22155 - 7849 STOCKTON BLVD, SACRAMENTO, CA 95823

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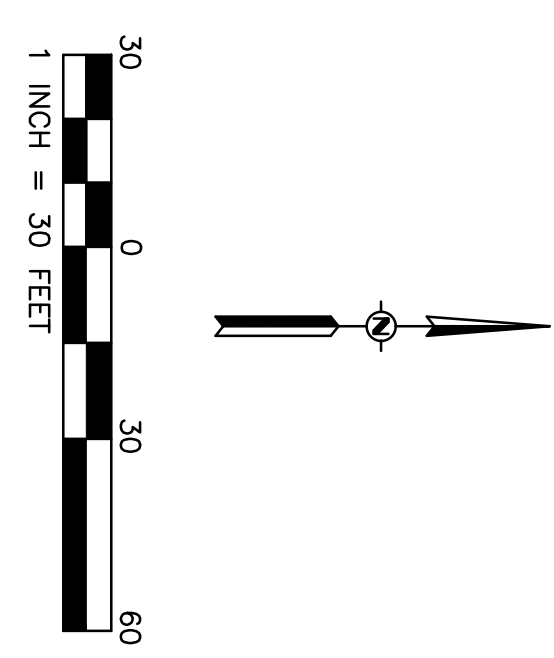




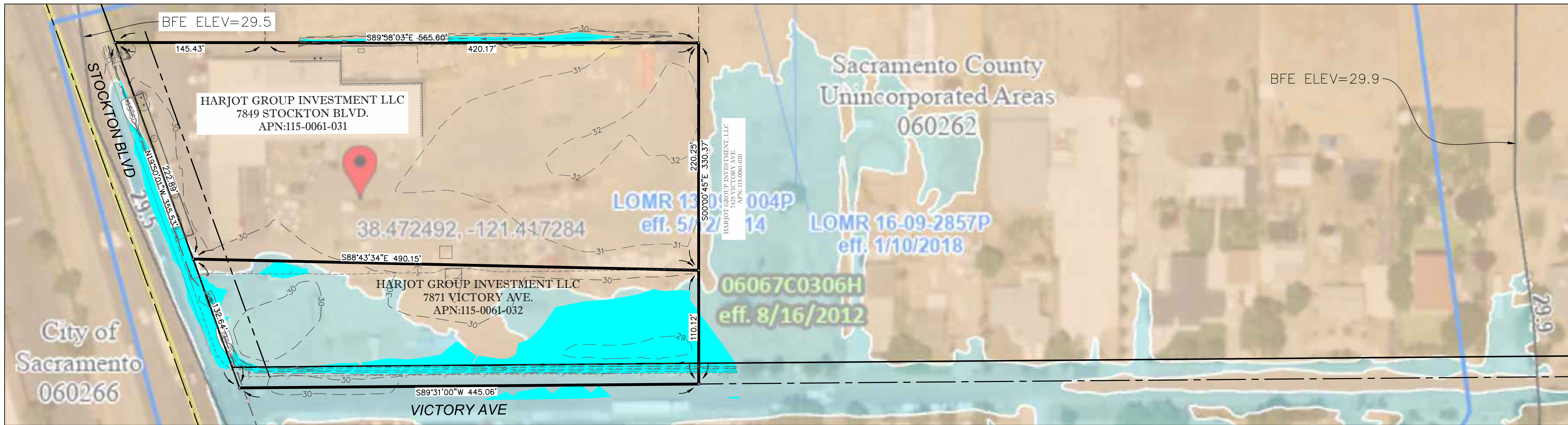
**LEGEND**

EXISTING IMPERVIOUS AREA

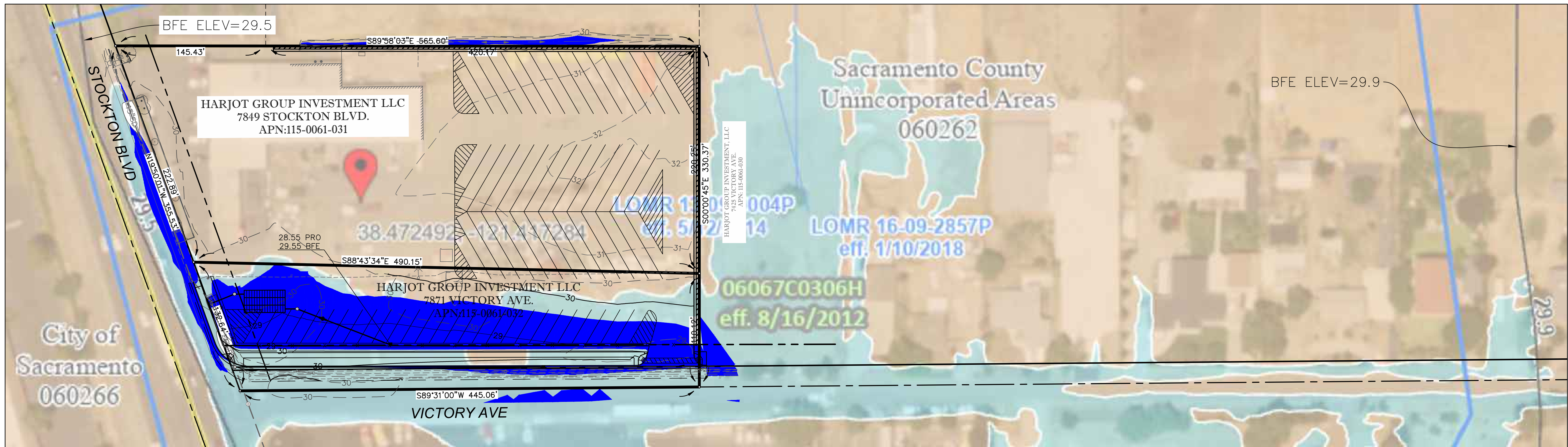
PROPOSED IMPERVIOUS AREA



Sheet <b>SW1</b> 1 of 1 9/28/2023	<b>7849 STOCKTON BLVD</b> SACRAMENTO, CA 95823 APN: 115-0061-031 & 032 <b>STORM WATER QUALITY EXHIBIT</b>	<b>HARJOT GROUP INVESTMENT, LLC</b> 7849 STOCKTON BLVD SACRAMENTO, CA 95823 CONTACT: JT SINGH PH: (209) 648-9955	 2260 Douglas Blvd, Suite 160, Roseville, CA 95661 Ph: 916-772-7800   www.RFEengineering.com   www.cwecorp.com		NO.      REVISION      DATE      BY      APPR'D	<b>NOT FOR CONSTRUCTION</b>
					DESIGN    BY    CHECK    NO.    REVISION    DATE    BY    APPR'D	
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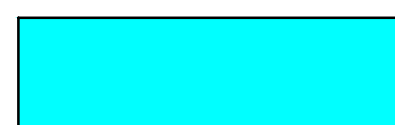
**EXISTING SITE PONDING**  
SCALE: 1" = 50'



**PROPOSED SITE PONDING**  
SCALE: 1" = 50'

**LEGEND:**

EXISTING SURFACE PONDING AREA

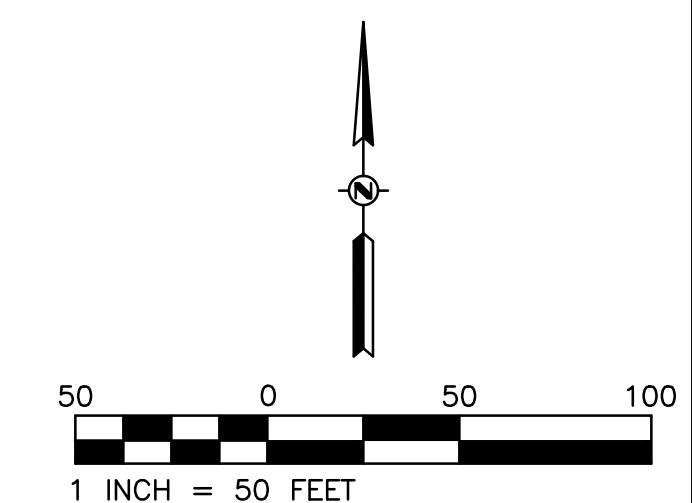


PROPOSED SURFACE PONDING AREA



Name	Cut(adjusted)(Cu. Yd.)	Fill(adjusted)(Cu. Yd.)	Net(adjusted)(Cu. Yd.)	Net Graph
<input checked="" type="checkbox"/> VOL BFE vs EXISTING	6158.65	368.57	5790.08 <Cut>	
<input checked="" type="checkbox"/> VOL BFE vs COMPOSITE	6015.22	374.41	5640.81 <Cut>	

**FLOOD PLAIN STORAGE VOLUME COMPARISON**



7849 STOCKTON BLVD  
 SACRAMENTO, CA 95823  
 APN: 115-0061-031 & 032  
**FLOOD PLAN EXHIBIT**

**HARJOT GROUP INVESTMENT, LLC**  
 7849 STOCKTON BLVD  
 SACRAMENTO, CA 95823  
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SHEET  
**F1**  
 1 of 1  
 9/8/2023

CWE PROJECT R22155 - 7849 STOCKTON BLVD, SACRAMENTO, CA 95823

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REGISTERED PROFESSIONAL ENGINEER  
 ROBERT F. EYK  
 No. 004666  
 PRELIMINARY  
 NOT FOR  
 CONSTRUCTION  
 OF CALIF.

BY	CHECK	NO.	REVISION	DATE	BY	APPROVD
DESIGN	AEB	RFE				
DRAWN	AEB	RFE				
QUANT.						
0 ORIGINAL SCALE IS IN INCHES						

**NOT FOR CONSTRUCTION**

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## **APPENDIX C**

### **CALCULATIONS**

**Nolte method results**  
**(Project: 7849 Stockton Blvd)**  
**(Hydrologic zone 3)**

ID	Drainage area (acres)	Impervious area (%)	Design Q (cfs)
DMA-01	1.95	90.00	1.01
DMA-02	0.33	90.00	0.17

[View HEC-1 output](#)

**Sacramento method results**  
**(Project: 7849 Stockton Blvd)**  
**(100-year, 1-day rainfall)**

ID	Peak flow (cfs)	Time of peak (hours)	Basin area (sq. mi)	Peak stage (feet)	Peak storage (ac-ft)	Diversion volume (ac-ft)
DMA-1	4.2	12:11	.00			
A-X1	1.2	12:07	.00			
A-X2	4.5	12:07	.00			
E1	5.6	12:07	.00			

# Channel Report

## 12" Storm Drain in Victory Ave

### Circular

Diameter (ft) = 1.00

Invert Elev (ft) = 27.00

Slope (%) = 0.50

N-Value = 0.015

### Calculations

Compute by: Known Q

Known Q (cfs) = 0.17

### Highlighted

Depth (ft) = 0.19

Q (cfs) = 0.170

Area (sqft) = 0.10

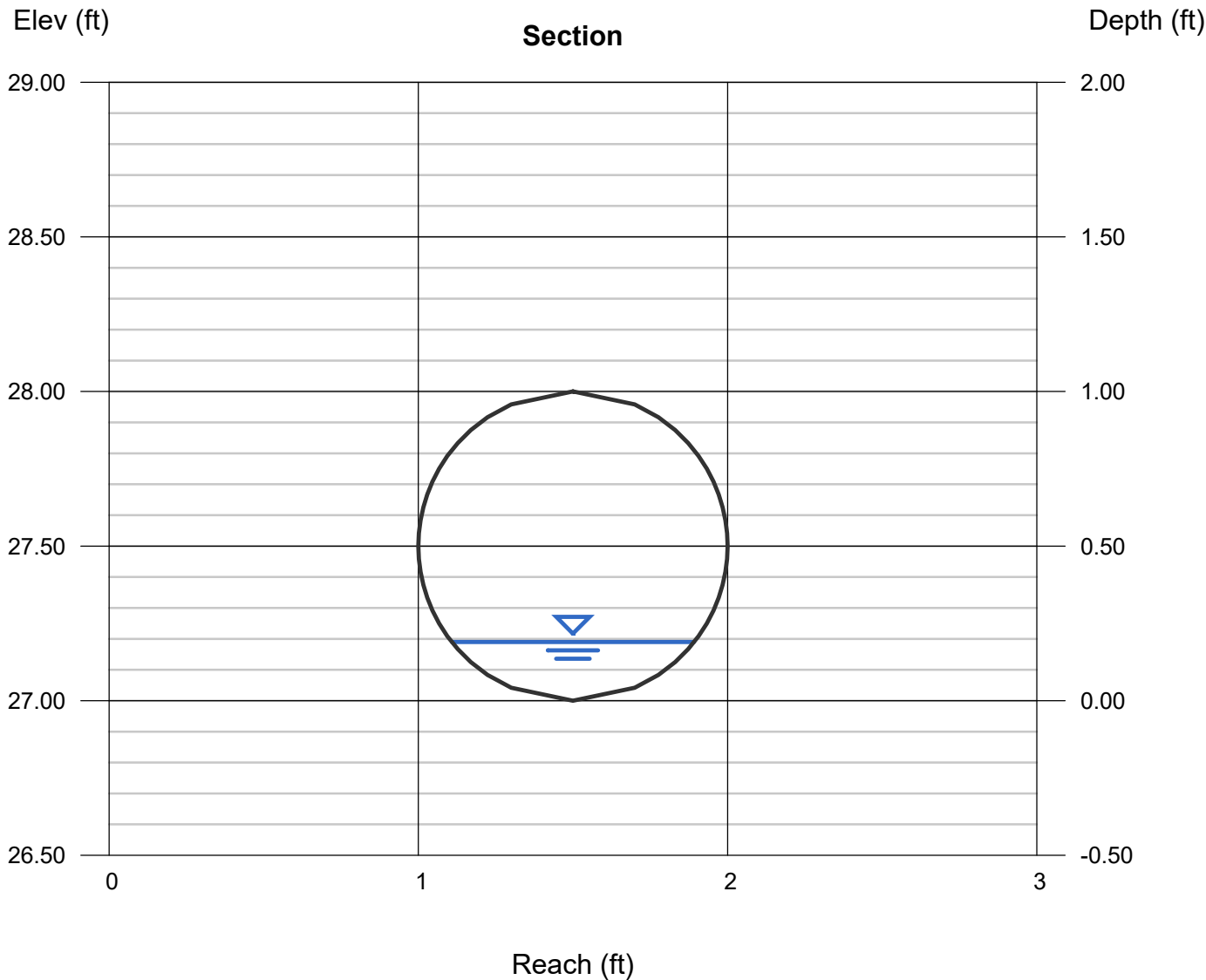
Velocity (ft/s) = 1.62

Wetted Perim (ft) = 0.90

Crit Depth, Yc (ft) = 0.17

Top Width (ft) = 0.79

EGL (ft) = 0.23



# Channel Report

## 24" Storm Drain in Victory Ave

### Circular

Diameter (ft) = 2.00

Invert Elev (ft) = 24.44

Slope (%) = 0.35

N-Value = 0.015

### Calculations

Compute by: Known Q

Known Q (cfs) = 1.01

### Highlighted

Depth (ft) = 0.40

Q (cfs) = 1.010

Area (sqft) = 0.45

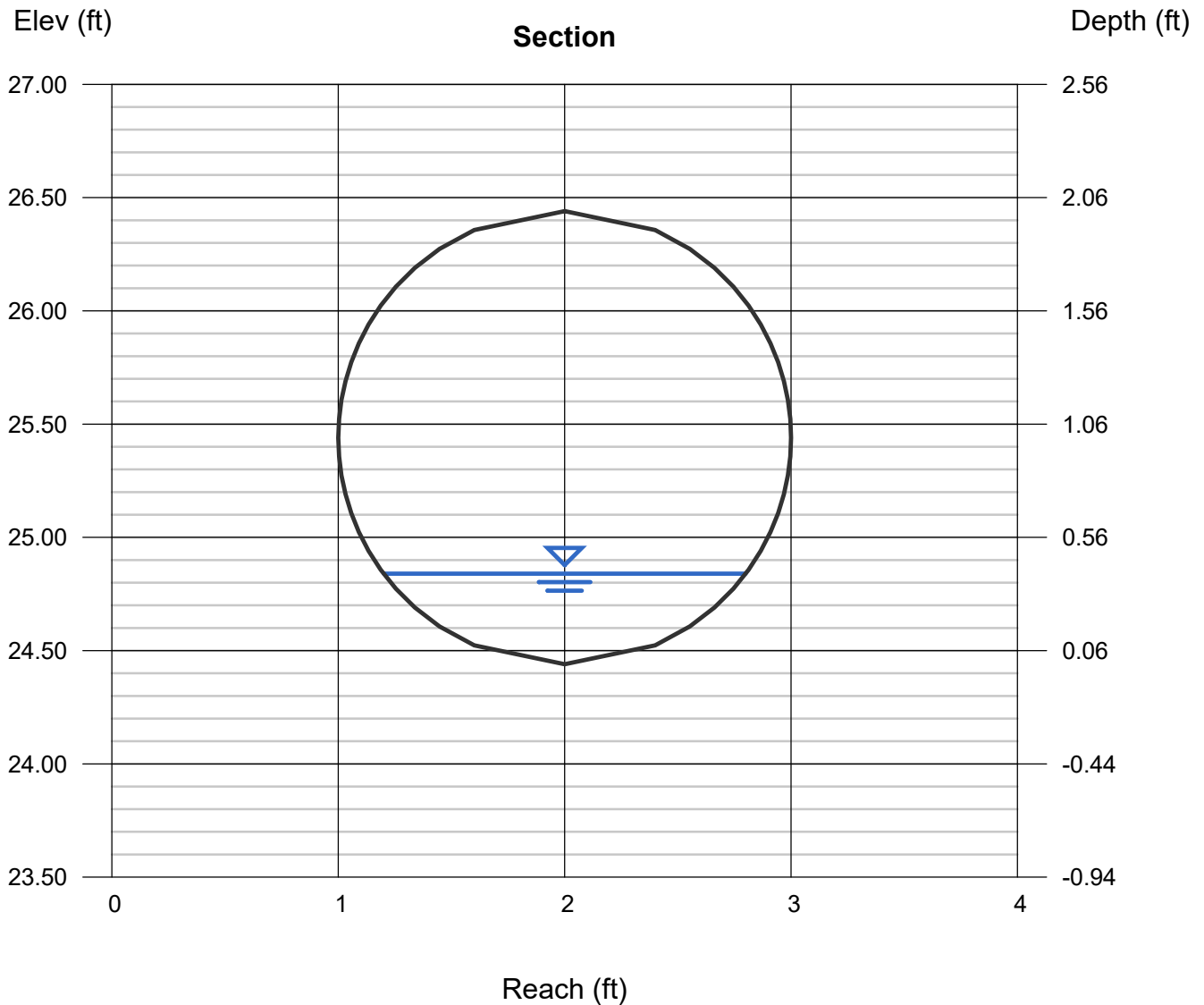
Velocity (ft/s) = 2.24

Wetted Perim (ft) = 1.86

Crit Depth, Yc (ft) = 0.35

Top Width (ft) = 1.60

EGL (ft) = 0.48



**Appendix D-2: Commercial Sites: Low Impact Development (LID) Credits and Treatment BMP Sizing Calculations**

Name of Drainage Shed: **DMA-1** Fill in Blue Highlighted boxes  
 Location of project: **Sacramento**

**Step 1 - Open Space and Pervious Area Credits**

Is your project within the drainage area of a common drainage plan that includes open space? If not, skip to 1 b.

**1 a. Common Drainage Plan Area**  acres  $A_{CDP}$

**Common Drainage Plan Open Space (Off-project)**  acres  $A_{OS}$  **see area example below**

a. Natural storage reservoirs and drainage corridors  acres  
 b. Buffer zones for natural water bodies  acres  
 c. Natural areas including existing trees, other vegetation, and soil  acres  
 d. Common landscape area/park  acres  
 e. Regional Flood Control/Drainage basins  acres

**1 b. Project Drainage Shed Area (Total)**  acres  $A$

**Project-Specific Open Space (In-project, communal\*\*)**  acres  $A_{PSOS}$  **see area example below**

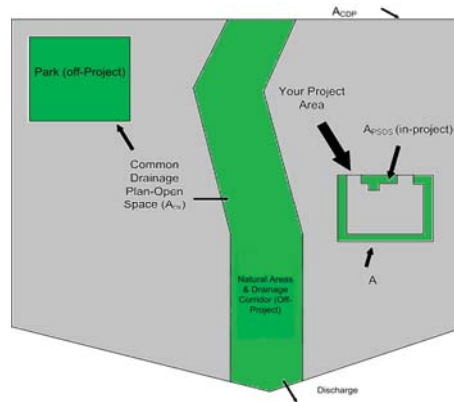
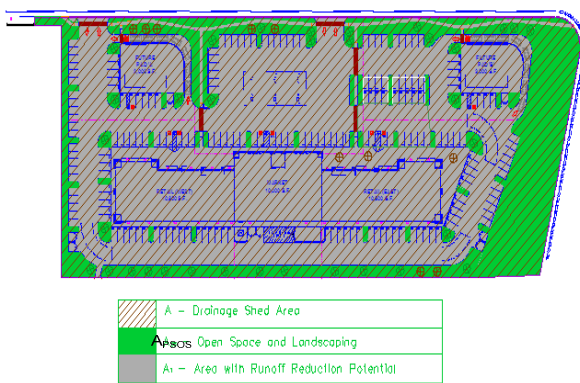
a. Natural storage reservoirs and drainage corridors  acres  
 b. Buffer zones for natural water bodies  acres  
 c. Natural areas including existing trees, other vegetation, and soil  acres  
 d. Landscape area/park  acres  
 e. Flood Control/Drainage basins  acres

\*\* Doesn't include impervious areas within individual lots and surrounding individual units. That is accounted for below using Form D-1a in Step 2.

**Area with Runoff Reduction Potential**  $A - A_{PSOS} =$   acres  $A_T$

**Assumed Initial Impervious Fraction**  $A_T / A =$    $I$

**Open Space & Pervious Area LID Credit (Step 1)**  
 $(A_{OS}/A_{CDP} + A_{PSOS}/A) \times 100 =$   pts



**Step 2 - Runoff Reduction Credits**

Runoff Reduction Treatments	Impervious Area Managed	Efficiency Factor	Effective Area Managed (Ac)
<b>Porous Pavement:</b>			
<b>Option 1: Porous Pavement</b> (see Fact Sheet, excludes porous pavement used in Option 2)	<input type="text" value="0"/> acres	x <input type="text" value=""/>	= <input type="text" value="0.000"/> acres
<b>Option 2: Disconnected Pavement</b> (see Fact Sheet, excludes porous pavement used in Option 1)	use Form D-2a for credits	→	= <input type="text" value="0.00"/> acres
<b>Landscaping used to Disconnect Pavement</b> (see Fact Sheet)	<input type="text" value="0.0000"/> acres	=	= <input type="text" value="0.00"/> acres
<b>Disconnected Roof Drains</b> (see Fact Sheet and/or Table D-2b for summary of requirements)	<input type="text" value="0"/> acres	=	= <input type="text" value="0.00"/> acres
<b>Ecoroof</b> (see Fact Sheet)	<input type="text" value="0"/> acres	=	= <input type="text" value="0.00"/> acres
<b>Interceptor Trees</b> (see Fact Sheet)	use Form D-2b for credits	→	= <input type="text" value="0.00"/> acres
<b>Total Effective Area Managed by Runoff Reduction Measures</b>		$A_c$	= <input type="text" value="0.00"/> acres
<b>Runoff Reduction Credit (Step 2)</b>		$(A_c / A_T) \times 100 =$	<input type="text" value="0"/> pts

**Table D-2a**

Porous Pavement Type	Efficiency Multiplier
Cobblestone Block Pavement	0.40
Pervious Concrete/Asphalt	0.60
Modular Block Pavement &	0.75
Reinforced Grass Pavement	1.00

**Table D-2b**

Maximum roof size	Minimum travel distance
≤ 3,500 sq ft	21 ft
≤ 5,000 sq ft	24 ft
≤ 7,500 sq ft	28 ft
≤ 10,000 sq ft	32 ft

**Form D-2a: Disconnected Pavement Worksheet**

See Fact Sheet for more information regarding Disconnected Pavement credit guidelines

Effective Area Managed (A<sub>c</sub>)

**Pavement Draining to Porous Pavement**

2. Enter area draining onto Porous Pavement  acres Box K1

3. Enter area of Receiving Porous Pavement (excludes area entered in Step 2 under Porous Pavement)  acres Box K2

4. Ratio of Areas (Box K1 / Box K2)  Box K3

5. Select multiplier using ratio from Box K3 and enter into Box K4

Ratio (Box D)	Multiplier
Ratio is ≤ 0.5	1.00
Ratio is > 0.5 and < 1.0	0.83
Ratio is > 1.0 and < 1.5	0.71
Ratio is > 1.5 and < 2.0	0.55

Box K4

6. Enter Efficiency of Porous Pavement (see table below)  Box K5

Porous Pavement Type	Efficiency Multiplier
Cobblestone Block Pavement	0.40
Pervious Concrete Asphalt Pavement	0.60
Modular Block Pavement	0.75
Porous Gravel Pavement	0.75
Reinforced Grass Pavement	1.00

7. Multiply Box K2 by Box K5 and enter into Box K6  acres Box K6

8. Multiply Boxes K1, K4, and K5 and enter the result in Box K7  acres Box K7

9. Add Box K6 to Box K7 and multiply by 60%, and enter the Result in Box K8  acres

This is the amount of area credit to enter into the "Disconnected Pavement" Box of Form D-2

**Form D-2b: Interceptor Tree Worksheet**

See Fact Sheet for more information regarding Interceptor Tree credit guidelines

**New Evergreen Trees**

1. Enter number of new evergreen trees that qualify as Interceptor Trees in Box L1.  trees Box L1

2. Multiply Box L1 by 200 and enter result in Box L2  sq. ft. Box L2

**New Deciduous Trees**

3. Enter number of new deciduous trees that qualify as Interceptor Trees in Box L3.  trees Box L3

4. Multiply Box L3 by 100 and enter result in Box L4  sq. ft. Box L4

**Existing Tree Canopy**

5. Enter square footage of existing tree canopy that qualifies as Existing Tree canopy in Box L5.  sq. ft. Box L5

6. Multiply Box L5 by 0.5 and enter the result in Box L6  sq. ft. Box L6

**Total Interceptor Tree EAM Credits**

Add Boxes L2, L4, and L6 and enter into Box L7  sq. ft. Box L7

Divide Box L7 by 43,560 and multiply by 20% to get effective area managed and enter result in Box L8  acres Box L8

This is the amount of area credit to enter into the "Interceptor Trees" Box of Form D-2

**Step 3 - Runoff Management Credits**

**Capture and Use Credits**

**Impervious Area Managed by Rain barrels, Cisterns, and automatically-emptied systems**

(see Fact Sheet)  enter gallons, for simple rain barrels  acres

**Automated-Control Capture and Use System**

(see Fact Sheet, then enter impervious area managed by the system)  acres

**Bioretention/Infiltration Credits**

**Impervious Area Managed by Bioretention BMPs**

(see Fact Sheet) Bioretention Area  sq ft  
 Subdrain Elevation  inches  
 Ponding Depth, inches  inches  acres

**Impervious Area Managed by Infiltration BMPs**

(see Fact Sheet) Drawdown Time, hrs  drawdown\_hrs\_inf  
 Soil Infiltration Rate, in/hr  soil\_inf\_rate

Sizing Option 1: Capture Volume, acre-ft  capture\_vol\_inf  acres

Sizing Option 2: Infiltration BMP surface area, sq ft  soil\_surface\_area  acres

Basin or trench?  approximate BMP depth  ft

**Impervious Area Managed by Amended Soil or Mulch Beds**

(see Fact Sheet) Mulched Infiltration Area, sq ft  mulch\_area  acres

**Total Effective Area Managed by Capture-and-Use/Bioretention/Infiltration BMPs**

A<sub>LIDC</sub>

**Runoff Management Credit (Step 3)**

A<sub>LIDC</sub>/A<sub>T</sub>\*200 =  pts

**Total LID Credits (Step 1+2+3)**

Warning: More LID Is Required

5.7

Does project require hydromodification management? If yes, proceed to using SachM.

**Adjusted Area for Flow-Based, Non-LID Treatment**

A<sub>T</sub> - A<sub>C</sub> - A<sub>LIDC</sub> =  A<sub>AT</sub>

**Adjusted Impervious Fraction of A for Volume-Based, Non-LID Treatment**

A<sub>AT</sub> / A =  I<sub>A</sub>

**Further treatment is required, see choose flow-based or volume-based sizing in Step 4**

**Step 4a Treatment - Flow-Based (Rational Method)**

Calculate treatment flow (cfs):

Flow = Runoff Coefficient x Rainfall Intensity x Area

Look up value for i in Table D-2c (Rainfall Intensity)

i

Obtain A<sub>AT</sub> from Step 3

A<sub>AT</sub>

Use C = 0.95

C

Flow = 0.95 \* i \* A<sub>AT</sub>

cfs

**Table D-2c**

Rainfall Intensity	
Roseville	i = 0.20 in/hr
Sacramento	i = 0.18 in/hr
Folsom	i = 0.20 in/hr

**Step 4b Treatment - Volume-Based (ASCE-WEF)**

Calculate water quality volume (Acre-Feet):

WQV = Area x Maximized Detention Volume (P<sub>0</sub>)

Obtain A from Step 1

A

hrs

Specified Draw Down time

Obtain P<sub>0</sub>: Maximized Detention Volume from figures E-1 to E-4 in Appendix E of this manual using I<sub>k</sub> from Step 2.

P<sub>0</sub>

Calculate treatment volume (acre-ft):

Treatment volume = A x (P<sub>0</sub> / 12)

Acre-Feet

Time (m)	Pre Avg Flow (cfs)	Post Avg Flow (cfs)	Incremental Pre Volume	Incremental Post Volume	Total Pre Volume	Total Post Volume
0	0.000945816	0.000165904	0.056748982	0.009954253	26,921	29,279
1	0.002225952	0.000720374	0.13355714	0.043222414		
2	0.004157956	0.001738876	0.249477352	0.104332542		
3	0.006883855	0.003199581	0.413031271	0.191974856		
4	0.010491093	0.005189808	0.629465589	0.311388457		
5	0.015110971	0.007808101	0.906658284	0.46848604		
6	0.020844869	0.011075041	1.250692159	0.664502475		
7	0.027379416	0.015075453	1.642764956	0.904527158		
8	0.034117093	0.019871707	2.047025599	1.192302424		
9	0.040552221	0.025567336	2.433133274	1.53404016		
10	0.046252212	0.032234063	2.775132693	1.934043802		
11	0.051088491	0.039575012	3.065309487	2.374500744		
12	0.055244582	0.047148602	3.314674906	2.828916125		
13	0.058869122	0.054683521	3.532147296	3.281011283		
14	0.062050549	0.061879778	3.723032959	3.712786697		
15	0.064868391	0.068439234	3.892103434	4.106354043		
16	0.067364823	0.074242763	4.041889384	4.454565793		
17	0.069585703	0.079376437	4.175142199	4.762586206		
18	0.071574602	0.084006783	4.294476137	5.040406957		
19	0.073369712	0.088188071	4.402182698	5.291284248		
20	0.074989527	0.091973301	4.499371648	5.518398061		
21	0.076460741	0.095439207	4.587644488	5.726352409		
22	0.077803254	0.098601989	4.668195248	5.916119367		
23	0.079028908	0.101497199	4.74173449	6.089831963		
24	0.080155171	0.10415354	4.809310287	6.249212399		
25	0.081190862	0.106595319	4.871451706	6.395719126		
26	0.082143124	0.108848754	4.928587452	6.530925259		
27	0.083027747	0.110936902	4.981664792	6.656214148		
28	0.083858509	0.112871617	5.031510517	6.772297025		
29	0.084641255	0.114666004	5.078475326	6.879960224		
30	0.085375786	0.116341885	5.12254715	6.980513111		
31	0.086063925	0.117908001	5.163835511	7.074480057		
32	0.086710174	0.119369324	5.202610418	7.162159458		
33	0.08731829	0.120739594	5.239097401	7.244375646		
34	0.087890368	0.122030027	5.273422077	7.321801633		
35	0.088428821	0.123240627	5.305729285	7.394437641		
36	0.088936541	0.124378886	5.336192474	7.462733164		
37	0.089413673	0.125452269	5.364820361	7.527136132		
38	0.089860473	0.126463898	5.39162837	7.587833852		
39	0.090279642	0.127429381	5.41677855	7.645762861		
40	0.090676423	0.128352463	5.44058539	7.701147795		
41	0.091050539	0.129235007	5.46303235	7.754100412		
42	0.091400988	0.130078249	5.484059304	7.804694921		
43	0.09173153	0.130880319	5.503891781	7.852819115		
44	0.092043176	0.131647468	5.522590578	7.898848057		
45	0.092336267	0.132381566	5.540176034	7.942893952		
46	0.092612207	0.133083239	5.556732416	7.984994352		
47	0.092871409	0.133754961	5.572284535	8.025297672		
48	0.093115617	0.134395495	5.586936995	8.063729703		
49	0.093344148	0.135008603	5.600648895	8.1005162		
50	0.093557425	0.135596752	5.613445491	8.13580513		
51	0.093758933	0.136157461	5.625535995	8.169447631		
52	0.09394969	0.136694469	5.636981428	8.201668113		
53	0.094129283	0.137207761	5.647756979	8.232465684		
54	0.094297703	0.137696125	5.657862201	8.261767477		
55	0.094456993	0.13816639	5.667419583	8.289983422		
56	0.094608538	0.138616689	5.676512271	8.317001313		
57	0.094751343	0.139045186	5.685080588	8.34271118		
58	0.094885483	0.139454335	5.693129003	8.367260098		
59	0.095012352	0.139846019	5.700741112	8.390761167		
60	0.095132239	0.140222728	5.70793435	8.413363695		

Required Storage	
2358	cubic feet
87	cubic yards
0.054	Acre-ft



## **APPENDIX D**

### **WEB SOIL SURVEY**



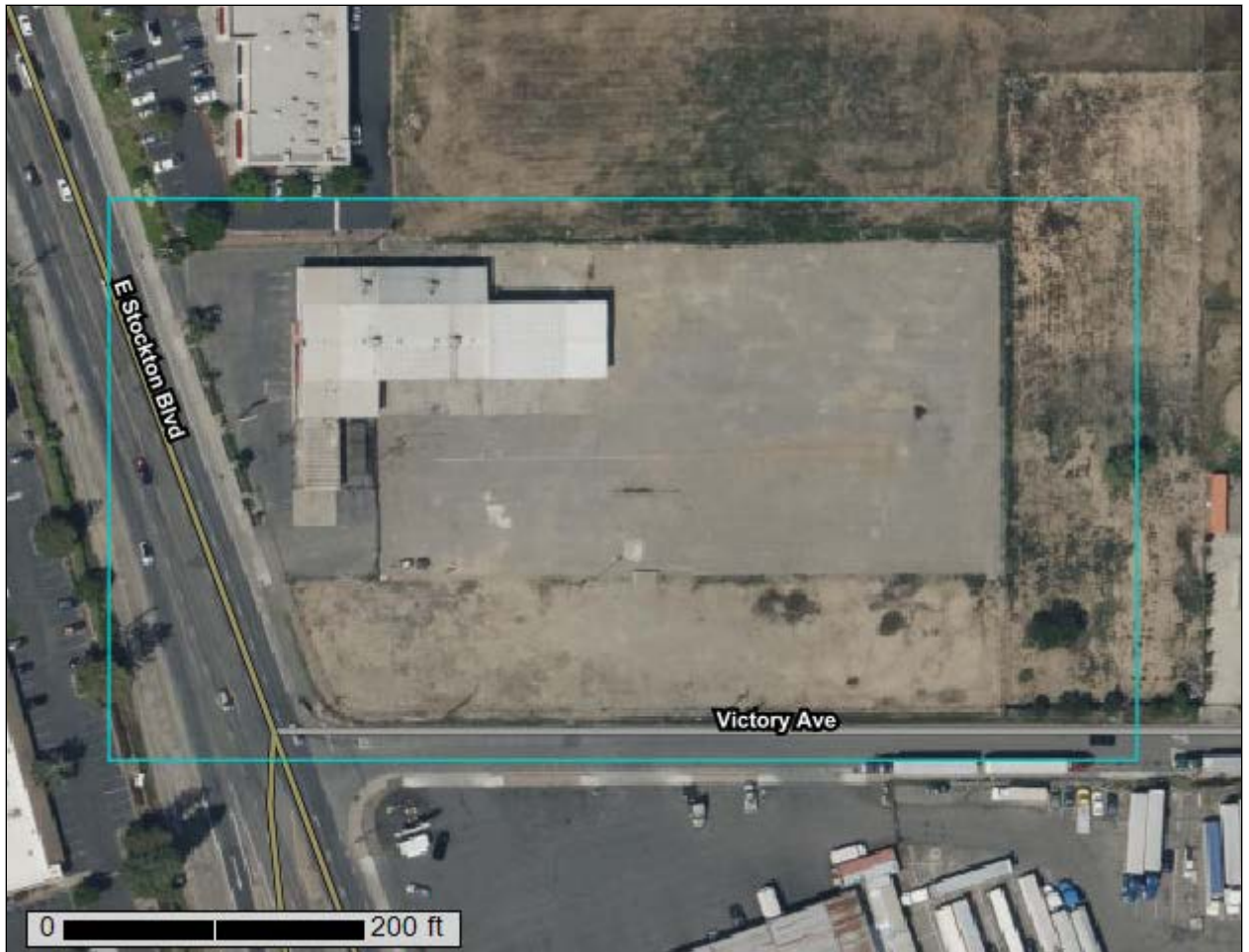
United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

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

# Custom Soil Resource Report for **Sacramento County, California**



# Preface

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

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

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

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

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# How Soil Surveys Are Made

---

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

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

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

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

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

## Custom Soil Resource Report

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

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

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

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

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

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

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

## Custom Soil Resource Report

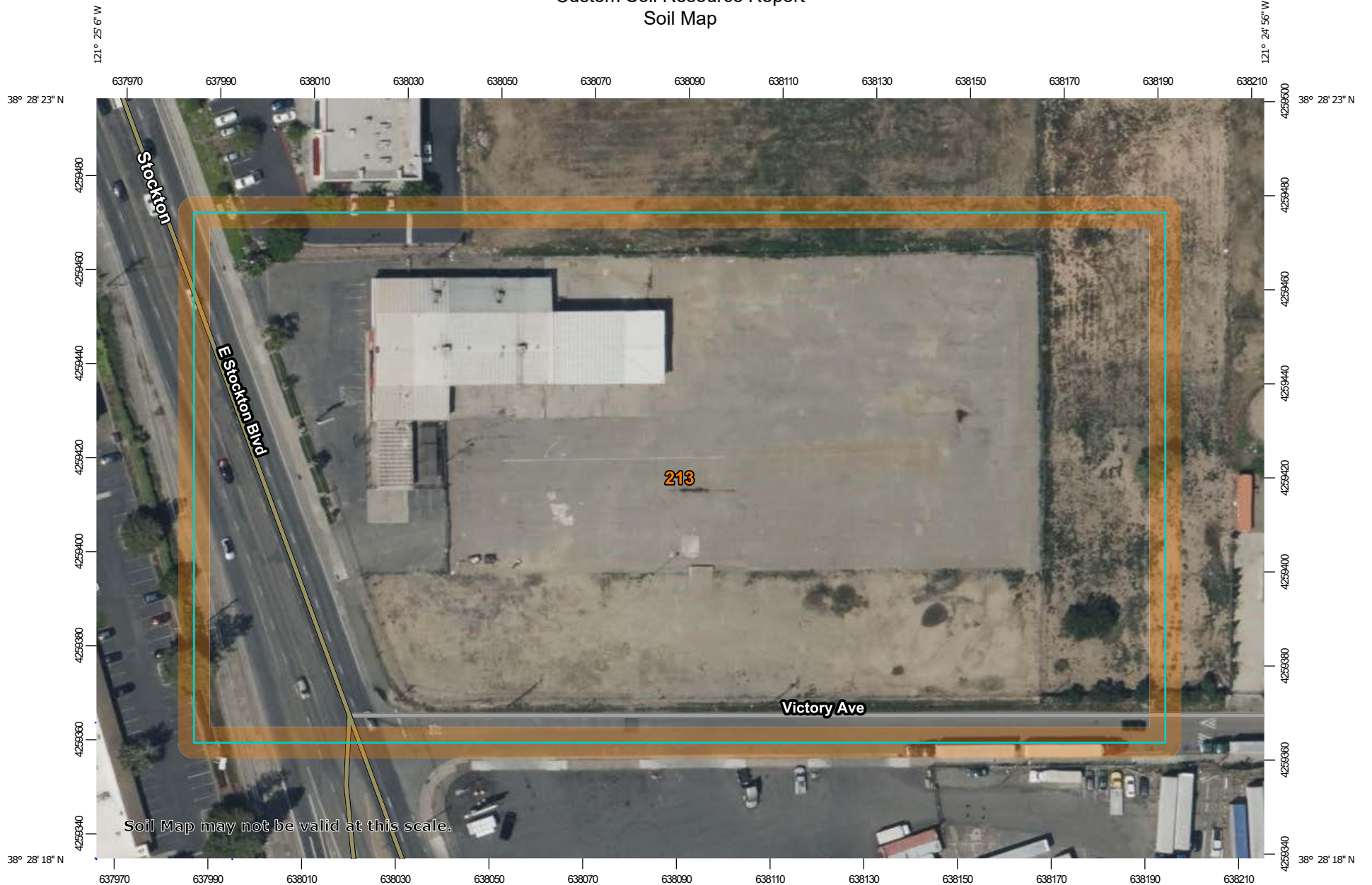
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

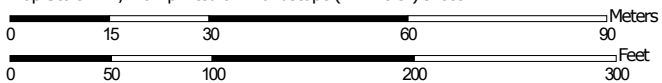
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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce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

# Custom Soil Resource Report Soil Map




Map Scale: 1:1,140 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)




















**Soils**







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


**Water Features**

 Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

**Background**

 Aerial Photography

### MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Sacramento County, California  
 Survey Area Data: Version 22, Sep 1, 2022

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

Date(s) aerial images were photographed: Apr 23, 2022—Apr 24, 2022

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

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
213	San Joaquin silt loam, leveled, 0 to 1 percent slopes	5.8	100.0%
<b>Totals for Area of Interest</b>		<b>5.8</b>	<b>100.0%</b>

## Map Unit Descriptions

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

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

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

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

## Custom Soil Resource Report

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

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

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

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

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

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

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

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

## Sacramento County, California

### 213—San Joaquin silt loam, leveled, 0 to 1 percent slopes

#### Map Unit Setting

*National map unit symbol:* hhpv

*Elevation:* 20 to 500 feet

*Mean annual precipitation:* 10 to 22 inches

*Mean annual air temperature:* 61 to 63 degrees F

*Frost-free period:* 250 to 300 days

*Farmland classification:* Farmland of statewide importance

#### Map Unit Composition

*San joaquin and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of San Joaquin

##### Setting

*Landform:* Terraces

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from granite

##### Typical profile

*H1 - 0 to 23 inches:* silt loam

*H2 - 23 to 28 inches:* clay loam

*H3 - 28 to 54 inches:* indurated

*H4 - 54 to 60 inches:* stratified sandy loam to loam

##### Properties and qualities

*Slope:* 0 to 1 percent

*Depth to restrictive feature:* More than 80 inches; 28 to 54 inches to duripan

*Drainage class:* Moderately well drained

*Runoff class:* High

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

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Low (about 3.4 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 3s

*Land capability classification (nonirrigated):* 3s

*Hydrologic Soil Group:* C

*Ecological site:* R017XY902CA - Duripan Vernal Pools

*Hydric soil rating:* No

#### Minor Components

##### Bruella

*Percent of map unit:* 3 percent

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*Hydric soil rating: No*

### **Durixeralfs**

*Percent of map unit: 3 percent*

*Hydric soil rating: No*

### **Xerarents**

*Percent of map unit: 2 percent*

*Hydric soil rating: No*

### **Galt**

*Percent of map unit: 2 percent*

*Landform: Depressions*

*Hydric soil rating: Yes*

### **Hedge**

*Percent of map unit: 2 percent*

*Hydric soil rating: No*

### **Kimball**

*Percent of map unit: 2 percent*

*Hydric soil rating: No*

### **Unnamed, rarely flooded**

*Percent of map unit: 1 percent*

*Hydric soil rating: No*

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- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

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United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053624](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624)

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## **APPENDIX E**

### **STANDARD DETAILS**



1030 Deer Hollow Drive 1-800-BAYSAVER  
 Mount Airy, MD 21771 1-800-229-7283

APPROVED BY: \_\_\_\_\_

SIGNED \_\_\_\_\_

DATE \_\_\_\_\_

COMPANY: \_\_\_\_\_

PHONE & EMAIL \_\_\_\_\_



7849 Stockton Blvd  
 Sacramento,  
 CA

**CONTRACTOR PROVIDED DELIVERY SCHEDULE & SITE INFORMATION:**

SCHEDULING INFORMATION							
SYSTEM DESIGNATION / SIZE							
SYSTEM DELIVERY DATE							

\*ACTUAL DATE REQUIRED, ASAP IS NOT ACCEPTABLE AND A MINIMUM OF 4 WEEKS MUST BE PROVIDED UNLESS OTHERWISE DISCUSSED WITH A SALES REPRESENTATIVE.

DELIVERY INFORMATION			
JOB SITE STREET ADDRESS		CITY	
CONTACT		CONTACT PHONE	
ALTERNATE CONTACT		ALTERNATE PHONE	

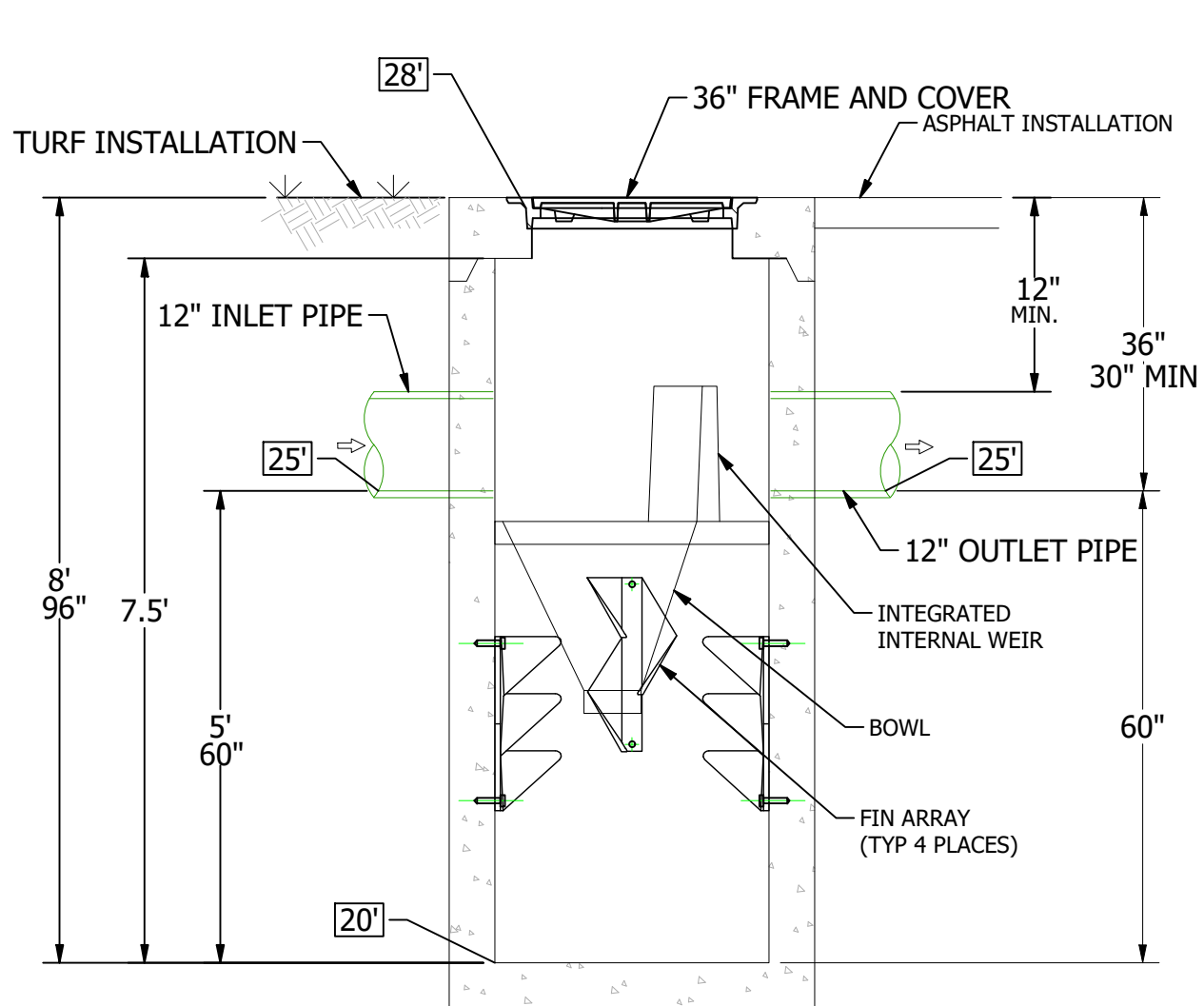
DIRECTIONS TO JOB SITE FROM NEAREST INTERSTATE:  
 (PLEASE NO MAPS)

**PRODUCT SPECIFICATIONS**

- THE STORMWATER TREATMENT UNIT SHALL BE AN INLINE UNIT CAPABLE OF CONVEYING 100% OF THE DESIGN PEAK FLOW. IF PEAK FLOW RATES EXCEED MAXIMUM HYDRAULIC RATE, THE UNIT SHALL BE INSTALLED OFFLINE.
- THE BARRACUDA UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 80% OF THE SUSPENDED SOLIDS ON AN ANNUAL AGGREGATE REMOVAL BASIS. SAID REMOVAL SHALL BE BASED ON FULL-SCALE THIRD PARTY TESTING USING OK-110 MEDIA GRADATION OR EQUIVALENT AND 300 mg/L INFLUENT CONCENTRATION. SAID FULL SCALE TESTING SHALL HAVE INCLUDED SEDIMENT CAPTURE BASED ON ACTUAL TOTAL MASS COLLECTED BY THE STORMWATER TREATMENT UNIT.
- OR -
- THE BARRACUDA UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 50% OF TSS USING A MEDIA MIX WITH  $d/50=75$  MICRON AND 200 MG/L INFLUENT CONCENTRATION.
- OR -
- THE BARRACUDA UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 50% OF TSS PER CURRENT NJDEP/NJCAT HDS PROTOCOL.

BARRACUDA S3	
UNIT ID	S3
PEAK FLOW RATE CFS	N/A
TREATMENT FLOW RATE CFS	0.31
*TREATMENT FLOW RATE PER OK-110	

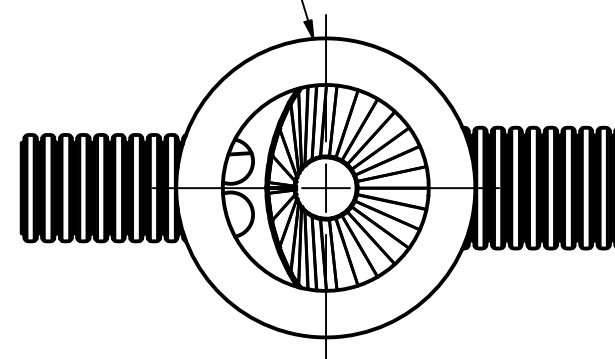
7849 STOCKTON BLVD SACRAMENTO, CA	DATE:	PROJECT #:	DRAWN:	CHECKED:
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**SECTION VIEW A-A**  
SCALE: N.T.S.

**BC-1**  
BARRACUDA S3  
(36" MANHOLE PROVIDED BY BAYSAVER)

12" INLET PIPE AT 0 DEG  
12" OUTLET PIPE AT 180 DEG

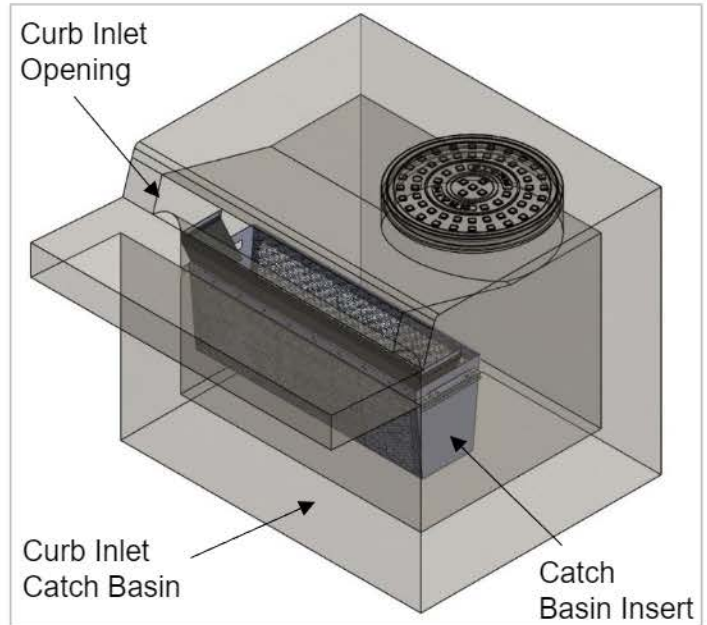


**SITE SPECIFIC PLAN VIEW**  
SCALE 1:27

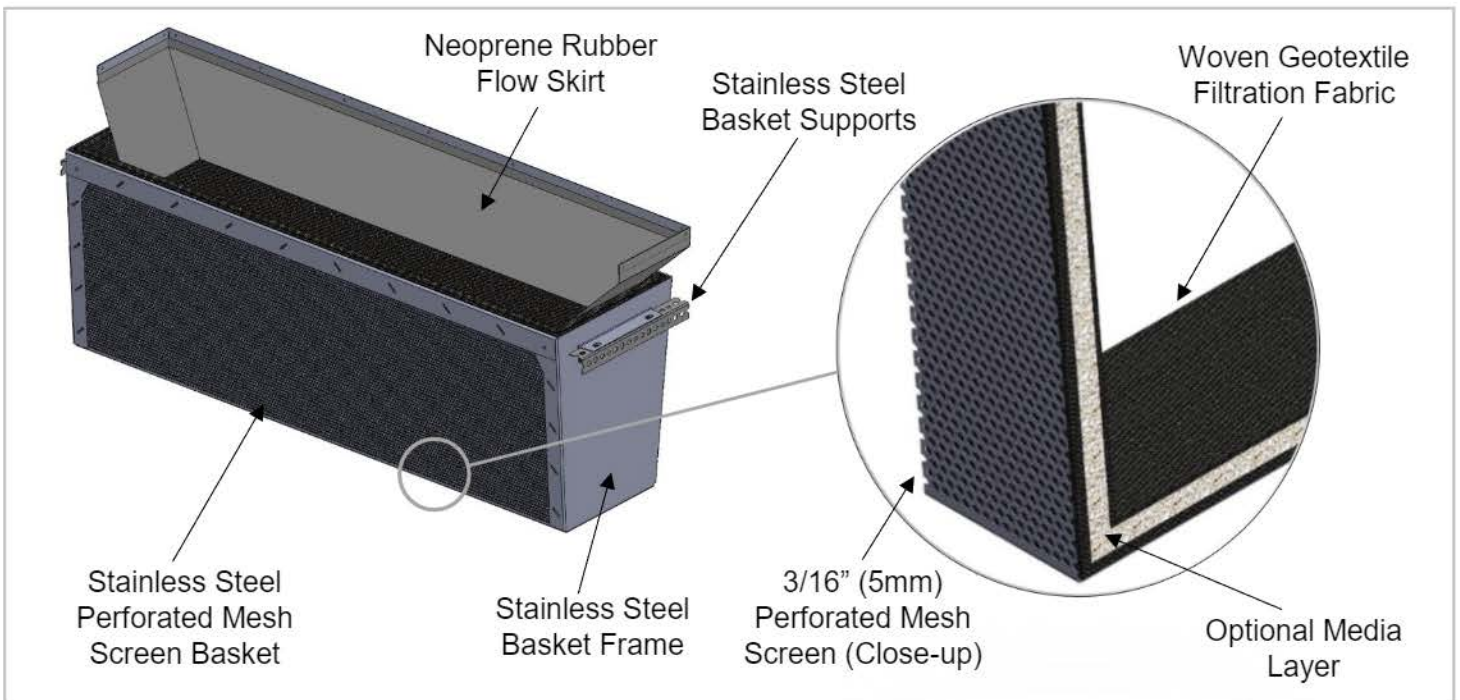
1030 Deer Hollow Drive Mount Airy, MD 21771	<b>Barracuda</b> ADVANCED DRAINAGE SYSTEMS, INC.	1-800-BAYSAVER 1-800-229-7283
4640 TRUEMAN BLVD HILLIARD, OH 43026	<b>ADS</b>	SCALE: <b>AS NOTED</b>
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.		SHEET: <b>1</b> OF <b>1</b>

The BrightWater™ Catch Basin Filter Insert for Curb Inlets is a post-construction, stormwater Best Management Practice (BMP) designed to capture coarse to medium grained sediment, oil and grease, and gross pollutants including trash and debris. The device, which consists of a filtration basket with filtration membrane(s) and mounting framework, installs beneath the curb opening of the catch basin and filters pollutants contained within the stormwater flow entering the catch basin. Capturing pollutants at this point closest to the source is an economical and efficient approach to stormwater management.

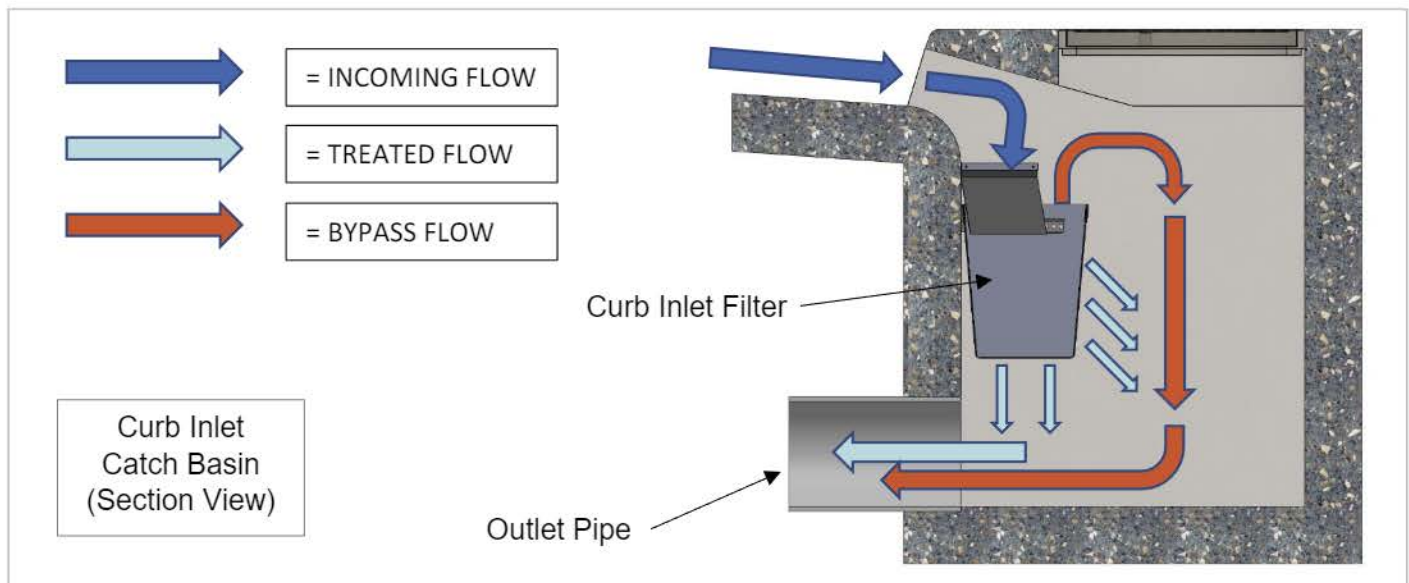
The device is available with different filter basket configurations and media that allow the targeting of specific pollutants of concern. Maintenance time and costs are minimized with removable and reusable components.



**COMPONENTS:** The Curb Inlet Filter is comprised of several different components that all contribute to the installation, operation, and maintenance of the device. All structural components and all metal components are made from Grade 304 Stainless Steel. The device utilizes other materials that are designed to be consumable or replaceable and these materials are made from industrial grade rubbers, plastics and media.



**OPERATION:** The Curb Inlet Filter is a passive, gravity-fed device with no moving parts. Operation is simple and efficient. Pollutant laden stormwater enters the curb opening and is directed by the flow skirt into the Curb Inlet Filter. The stormwater is filtered and screened through the geotextile membrane, media, and perforated mesh basket before exiting the catch basin outlet pipe. Peak flows in excess of the Maximum Treatment Flow Rate (MTFR) are allowed to bypass over the top of the basket and exit the catch basin directly.



**PERFORMANCE:** Characteristics and capacities of standard size Curb Inlet Filter models are included in the table below.

Model Number and Size		Maximum Sediment Treatment Flow Rate <sup>1</sup>	Maximum Trash Treatment Flow Rate <sup>2</sup>	Trash Storage Capacity <sup>3</sup>	Sediment Storage Capacity <sup>3</sup>	Oil Capture Capacity
(Model No.)	(ft.)	(cfs)	(cfs)	(ft <sup>3</sup> )	(ft <sup>3</sup> )	(gal)
BWCIF-2.0	2.0	0.76	1.52	0.77	0.38	3.52
BWCIF-2.5	2.5	1.00	2.01	1.01	0.51	4.67
BWCIF-3.0	3.0	1.25	2.50	1.26	0.63	5.81
BWCIF-3.5	3.5	1.49	2.99	1.51	0.76	6.95
BWCIF-4.0	4.0	1.74	3.48	1.76	0.88	8.09
BWCIF-5.0	5.0	2.23	4.46	2.26	1.13	10.38
BWCIF-6.0	6.0	2.72	5.45	2.75	1.38	12.67
BWCIF-7.0	7.0	3.21	6.43	3.25	1.62	14.95
BWCIF-10.0	10.0	4.69	9.38	4.74	2.37	21.81
BWCIF-14.0	14.0	6.65	13.31	6.72	3.36	30.95
BWCIF-21.0	21.0	10.09	20.19	10.20	5.10	46.95
BWCIF-28.0	28.0	13.53	27.07	13.68	6.84	62.95

This table lists commonly specified standard model sizes. Additional standard model sizes and custom sizes are available.

1. The Maximum Sediment Treatment Flow Rate is based on 80% instantaneous removal of suspended sediment with a mean particle (d50) size distribution of 250um. The Maximum Sediment Treatment Flow Rate considers a Safety Factor of 2X.
2. The Maximum Trash Treatment Capacity is the maximum flow rate of the device at which 100% removal of floatables 5mm or greater in size can be captured and retained. The Maximum Trash Treatment Capacity considers a Safety Factor of 2X.
3. Storage capacity reflects the maximum pollutant capacity prior to impeding maximum treatment flow rates.

For more information, please contact us at [customerservice@wearebrightwater.com](mailto:customerservice@wearebrightwater.com)  
P.O. Box 85430 | San Diego, California 92186 | (619) 821-1558 | [www.wearebrightwater.com](http://www.wearebrightwater.com)