Attachment 2: Green Streets BMP Information

Attachment 2A: Stormwater Pollutant Control Calculations

Include calculations showing that the Green Streets Performance Standard has been met. The performance standard can be found in Section K.2.1 of Appendix K of the County BMPDM. The County's Automated Pollutant Control Worksheet can be found on the Development Resources website:

www.sandiegocounty.gov/stormwater

Table K.2-1 : Green Street Performance Standard Calculations

Item			Value	Description
Required Treatment Volume	1	Land Use of New Impervious Area	Transportation	*Per project drawings.*
	2	Net Increase in Impervious Area [3]	21,248 ft^2	*Per project drawings.*
	3	85th Percentile Rainfall Depth	0.90 in.	*Determine per BMPDM Appendix B.1.*
	4	Runoff Coefficient	0.90	*Value of 0.90 applies to new impervious areas.*
	5	Required Treatment Volume	1,728 ft^3	*(Line 2 x Line 3 x Line 4) / 12*
Provided Treatment Volume	6	Land Use of Treated Area[4]	Transportation	*Per project drawings.*
	7	Land Use Factor[5]	1.00	*Determine per Note 5 below.*
	8	Water Quality Flow rate Requiring Flow-Thru Treatment	0.082 CFS	See calculations attached
	9	Alternative Treatment Volume		*Determine per supplemental applicant calculations.*
	10	Maximum Rated Water Quality Flow Rate of Proposed BMP	0.946 CFS	See calculations attached
Result	11	Is Project Green Street Compliant?	Yes	*Compliant if Line 10 ≥* Line 8 *Otherwise, non-compliant.*
	12	Optional Credit		*(Line 7 x Line 8) – Line 5*

The total net increase area has been calculated to be 11,082 sq-ft which is the minimum required treatment area per Appendix K, Green streets performance standard. The actual impervious area draining into vegetated swale has been calculated to be 21,248 sq-ft. Therefore, the greater of both (21,248 sq-ft) has been used to calculate the required water quality flow rate of the proposed flow-thru treatment BMP.

[3] The Net Increase in Impervious Area should **not** reflect any work occurring within existing impervious areas.

[4] Classify drainage area into following land use types (may use more than one) agriculture, commercial, education, industrial, multi-family residential, orchard, rural residential, single family residential, transportation, open space.

[5] If Land Uses from Lines 1 and 6 match, use a value of 1.0. Otherwise, refer to Regional Water Quality Equivalency Guidance for determination of appropriate Land Use Factor.

[6] Conventional Treatment Volume may be determined by subtracting the project's total "Deficit of Effectively Treated Stormwater" from the project's total Design Capture Volume. These values can be found in Version 2.0 of the County of San Diego Automated Control Worksheet on Line 48 of the BMP Performance Tab and Line 26 of the DCV Tab respectively.

Automated Worksheet B.1: Calculation of Design Capture Volume (V2.0)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	Provided Treatment										unitless
	2	85th Percentile 24-hr Storm Depth	0.90										inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	21,248 *										sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)											sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)	12,629 **										sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Initial Runoff Factor Calculation	22	Total Tributary Area	33,877	0	0	0	0	0	0	0	0	0	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	25	Initial Weighted Runoff Factor	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	26	Initial Design Capture Volume	1,728	0	0	0	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustments	27	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	28	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.68	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	32	Design Capture Volume After Dispersion Techniques	1,728	0	0	0	0	0	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	35	Final Adjusted Runoff Factor	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	36	Final Effective Tributary Area	23,036	0	0	0	0	0	0	0	0	0	sq-ft
	37	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	38	Final Design Capture Volume Tributary to BMP	1,728	0	0	0	0	0	0	0	0	0	cubic-feet

No Warning Messages

*The total net increase area has been calculated to be 11,082 sq-ft which is the minimum required treatment area per Appendix K, Green streets performance standard. The actual impervious area draining into vegetated swale has been calculated to be 21,248 sq-ft. Therefore, the greater of both (21,248 sq-ft) has been used to calculate the required water quality flow rate of the proposed flow-thru treatment BMP.

** Per figure A2, DMA 9 (100% pervious) also discharges into the vegetated swales, hence it has been included in these calculations.

Automated Worksheet B.2: Retention Requirements (V2.0)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Basic Analysis	1	Drainage Basin ID or Name	Provided Treatment	-	-	-	-	-	-	-	-	-	unitless
	2	85th Percentile Rainfall Depth	0.90	-	-	-	-	-	-	-	-	-	inches
	3	Predominant NRCS Soil Type Within BMP Location	D										unitless
	4	Is proposed BMP location Restricted or Unrestricted for Infiltration Activities?	Restricted										unitless
	5	Nature of Restriction	Soil Type										unitless
	6	Do Minimum Retention Requirements Apply to this Project?	No		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes/no
	7	Are Habitable Structures Greater than 9 Stories Proposed?	No										yes/no
Advanced Analysis	8	Has Geotechnical Engineer Performed an Infiltration Analysis?	No										yes/no
	9	Design Infiltration Rate Recommended by Geotechnical Engineer											in/hr
Result	10	Design Infiltration Rate Used To Determine Retention Requirements	0.000	-	-	-	-	-	-	-	-	-	in/hr
	11	Percent of Average Annual Runoff that Must be Retained within DMA	0.0%	-	-	-	-	-	-	-	-	-	percentage
	12	Fraction of DCV Requiring Retention	0.00	-	-	-	-	-	-	-	-	-	ratio
	13	Required Retention Volume	0	-	-	-	-	-	-	-	-	-	cubic-feet

Attention!

-Retention requirements have been omitted in these calculations. Such an omission is only be acceptable for Green Street projects or projects that submit supplemental calculations demonstrating retention requirements are satisfied at the project-level.

Please note that is a Green Street Project. Refer to Attachment 2A for Automated Worksheet B.6-1: Sizing Flow Thru BMPs (V1.3) calculations.

Automated Worksheet B.6-1: Sizing Flow-Thru BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Flow-Thru BMP Inputs	0	Drainage Basin ID or Name	BMP-1	-	-	-	-	-	-	-	-	-	unitless
	1	Final Effective Tributary Area	23,036	-	-	-	-	-	-	-	-	-	sq-ft
	2	Final Adjusted Runoff Factor	0.68	-	-	-	-	-	-	-	-	-	unitless
	3	Final Design Capture Volume Tributary to BMP	1,728	-	-	-	-	-	-	-	-	-	cubic-feet
	4	Volume Effectively Retained and/or Biofiltered	0	-	-	-	-	-	-	-	-	-	cubic-feet
	5	Deficit of Effectively Treated Stormwater Requiring Flow-Thru Treatment	-1,728	-	-	-	-	-	-	-	-	-	cubic-feet
	6	Maximum Rated Water Quality Flow Rate of Proposed BMP	0.946										CFS
Flow Rate Calculations	7	Adjustment Factor	1.00	-	-	-	-	-	-	-	-	-	unitless
	8	Design Rainfall Intensity for Flow-Thru BMPs	0.20	-	-	-	-	-	-	-	-	-	in/hr
	9	Water Quality Flow Rate Requiring Flow-Thru Treatment	0.106	-	-	-	-	-	-	-	-	-	CFS
Result	10	Is Flow-Thru BMP Adequately Sized?	Yes	-	-	-	-	-	-	-	-	-	unitless

Worksheet B.6-1 General Notes:

A. Applicants may use this worksheet to size flow-thru BMPs (FT-1 through FT-5) for up to 10 basins. Note that applicants proposing flow-thru BMPs must provide supplemental documentation to support the maximum water quality flow rate referenced above, demonstrate medium to high pollutant removal efficiency for project's most significant pollutants of concern, and must also implement an offsite alternative compliance project to offset the deficit of effectively treated stormwater volume. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below.

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Sep 29 2021

<Name>

Trapezoidal

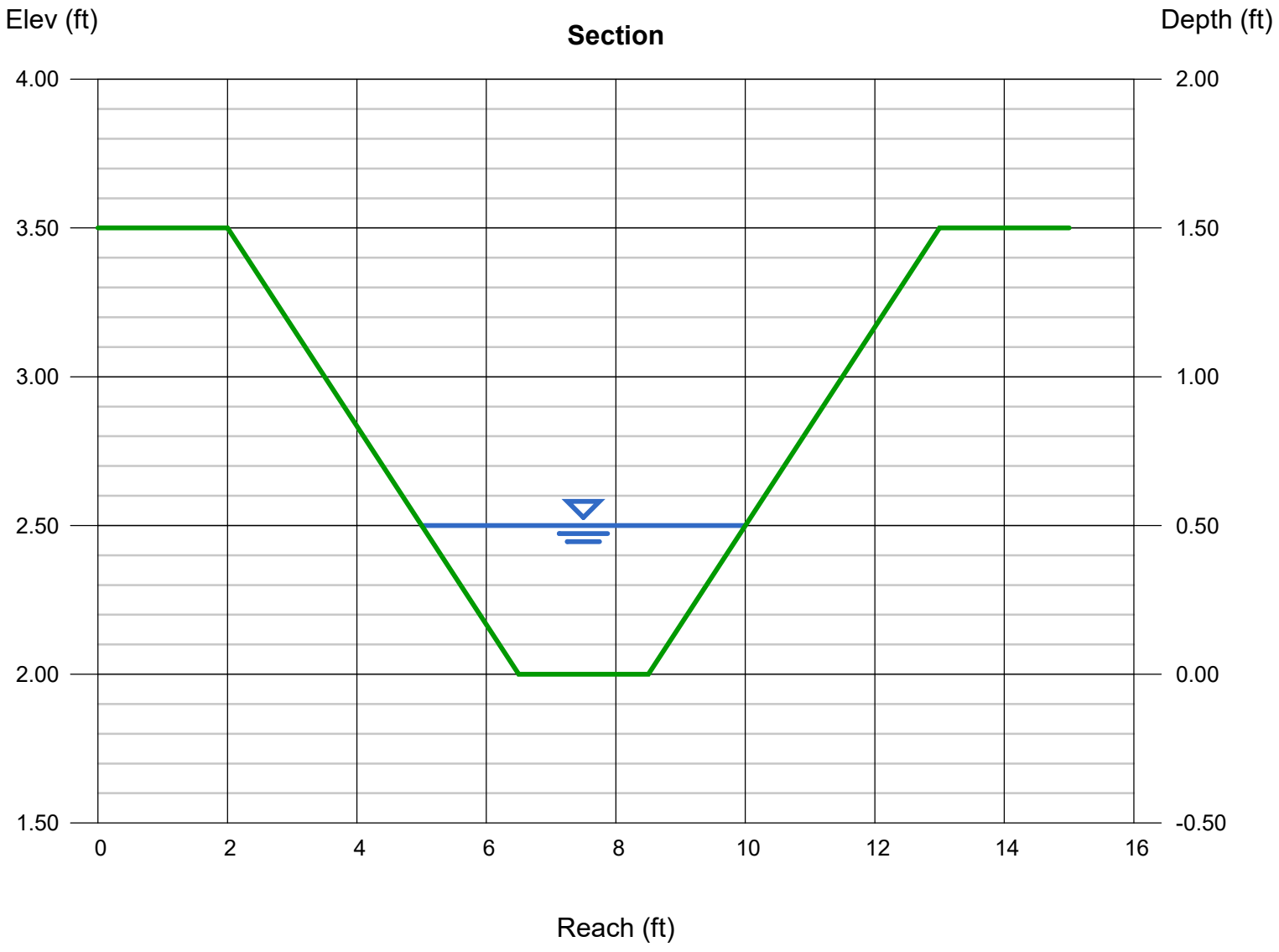
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 2.00
Slope (%)	= 3.50
N-Value	= 0.250

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 0.50

Highlighted

Depth (ft)	= 0.50
Q (cfs)	= 0.946
Area (sqft)	= 1.75
Velocity (ft/s)	= 0.54
Wetted Perim (ft)	= 5.16
Crit Depth, Yc (ft)	= 0.18
Top Width (ft)	= 5.00
EGL (ft)	= 0.50



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Dec 16 2021

<Name>

Circular

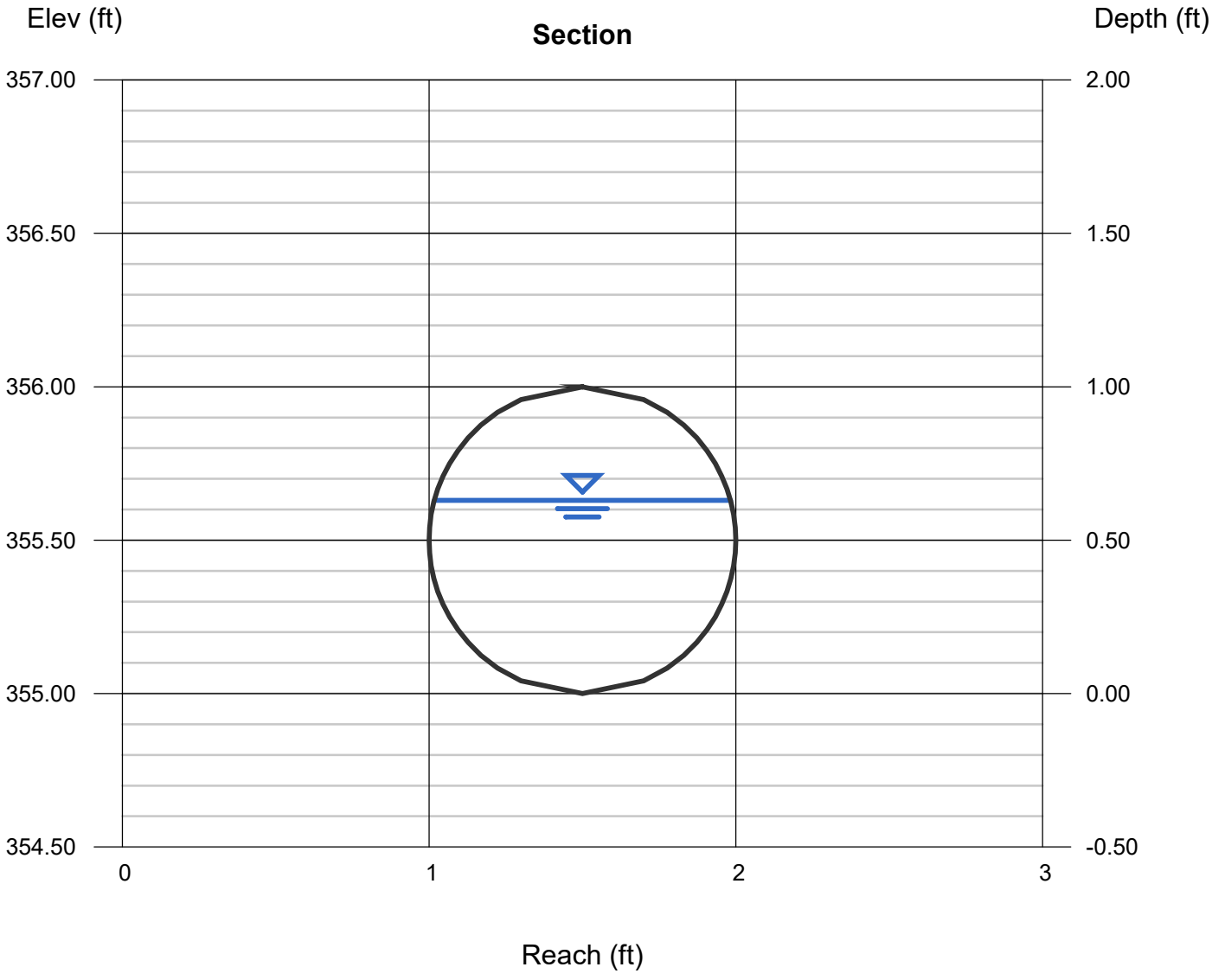
Diameter (ft)	= 1.00
Invert Elev (ft)	= 355.00
Slope (%)	= 1.00
N-Value	= 0.010

Calculations

Compute by:	Known Q
Known Q (cfs)	= 3.31

Highlighted

Depth (ft)	= 0.63
Q (cfs)	= 3.310
Area (sqft)	= 0.52
Velocity (ft/s)	= 6.34
Wetted Perim (ft)	= 1.83
Crit Depth, Yc (ft)	= 0.78
Top Width (ft)	= 0.97
EGL (ft)	= 1.26



Attachment 2B: Stormwater Pollutant Control DMA Exhibits

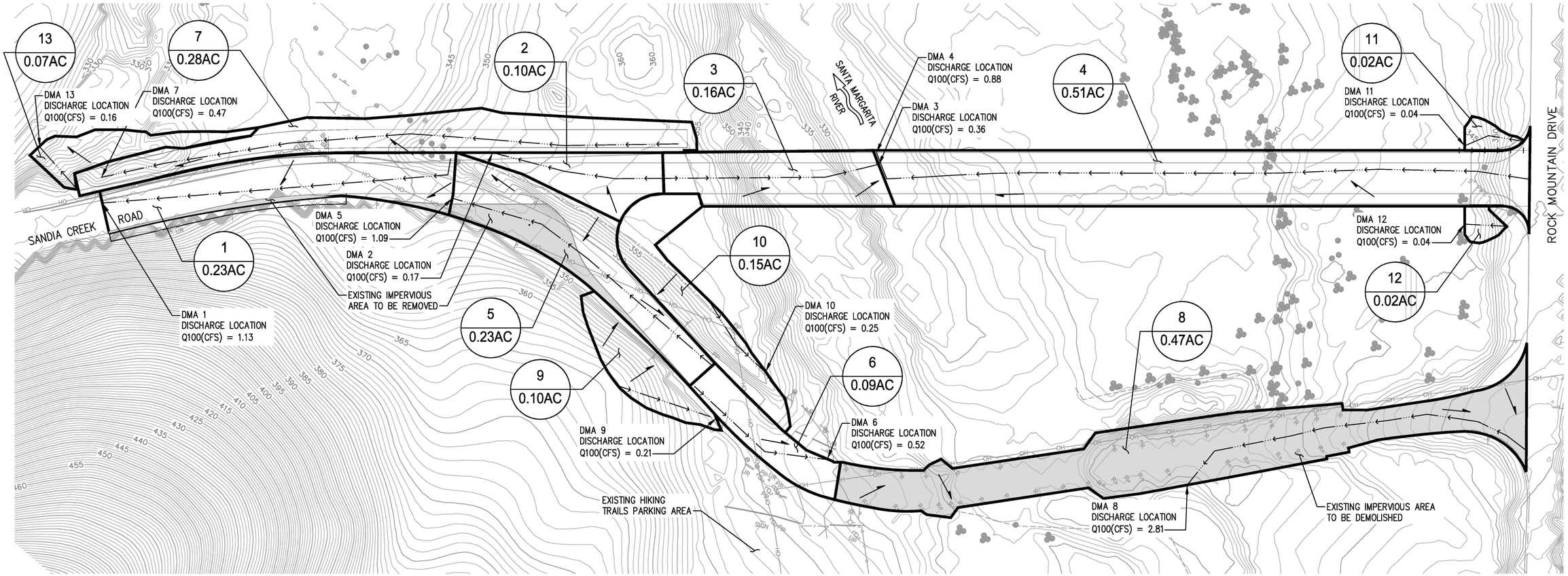
The attached exhibits must identify:

- Underlying hydrologic soil group
- Approximate depth to groundwater if less than 10 ft
- Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- Existing topography and impervious areas
- Existing and proposed site drainage network and connections to drainage offsite
- Proposed demolition
- Proposed grading
- Proposed impervious features
- Proposed design features and surface treatments used to minimize imperviousness
- Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Step 3.5)
- Green Streets BMPs (identify location, BMP ID #, type of BMP, and size/detail)
- Relevant plans: site, grading, improvement, profile, detail, construction BMP

Table 6 –Minimum Construction Stormwater BMPs

Minimum Required BMPs by Activity Type Select all applicable activities and at least one BMP for each.	References Caltrans[7]	 County of San Diego
☐ **Erosion Control for Disturbed Slopes** (choose at least 1 per season)		
☒ Vegetation Stabilization Planting[8] (Summer)	SS-2, SS-4	
☐ Hydraulic Stabilization Hydroseeding (Summer)	SS-4	
☒ Bonded Fiber Matrix or Stabilized Fiber Matrix[9] (Winter)	SS-3	
☐ Physical Stabilization Erosion Control Blanket (Winter)	SS-7	
☐ **Erosion control for disturbed flat areas (slope < 5%)**		
☐ County Standard Lot Perimeter Protection Detail	SC-2	PDS 659[10]
☒ Use of Item A erosion control measures on flat areas	SS-3, SS-4, SS-7	
☐ County Standard Desilting Basin (must treat all site runoff)	SC-2	PDS 660[11]
☐ Mulch, straw, wood chips, soil application	SS-6, SS-8	
☐ **Energy dissipation (required to control velocity for concentrated runoff or dewatering discharge)**		
☒ Energy Dissipater Outlet Protection	SS-10	RSD D-40[12]
☐ **Sediment control for all disturbed areas**		
☒ Silt Fence	SC-1	
☐ Fiber Rolls (Straw Wattles)	SC-5	
☐ Gravel & Sand Bags	SC-6, SC-8	
☐ Dewatering Filtration	NS-2	
☐ Storm Drain Inlet Protection	SC-10	
☐ Engineered Desilting Basin (sized for 10-year flow)	SC-2	
☐ **Preventing offsite tracking of sediment**		
☒ Stabilized Construction Entrance	TC-1	
☐ Construction Road Stabilization	TC-2	
☐ Entrance/Exit Tire Wash	TC-3	
☐ Entrance/Exit Inspection & Cleaning Facility	TC-1	
☒ Street Sweeping and Vacuuming	SC-7	
☐ **Materials Management**		
☒ Material Delivery & Storage	WM-1	
☒ Spill Prevention and Control	WM-4	
☐ **Waste Management[13]**		
☒ Waste Management Concrete Waste Management	WM-8	
☒ Solid Waste Management	WM-5	
☒ Sanitary Waste Management	WM-9	
☐ Hazardous Waste Management	WM-6	

[7] See Caltrans 2017 Construction Site Best Management Practices (BMP) Manual available at: https://dot.ca.gov/programs/construction/storm-water-and-water-pollution-control/manuals-and-handbooks
[8] Planting or Hydroseeding may be installed between May 1st and August 15th. Slope irrigation must be in place and operable for slopes >3 feet. Vegetation must be watered and established prior to October 1st. A contingency physical BMP must be implemented by August 15th if vegetation is not established by that date. If landscaping is proposed, erosion control measures must also be used while landscaping is being established. Established vegetation must have a subsurface mat of intertwined mature roots with a uniform vegetative coverage of 70 percent of the natural vegetative coverage or more on all disturbed areas.
[9] All slopes over three feet must have established vegetative cover prior to final permit approval.
[10] County PDS 659. Standard Lot Perimeter Protection Design System (Bldg. Division)
[11] County PDS 660. County Standard Desilting Basin for Disturbed Areas of 1 Acre or Less Bldg. Division
[12] Regional Standard Drawing D-40 – Rip Rap Energy Dissipater (also acceptable for velocity reduction)
[13] Applicants are responsible to apply appropriate BMPs for specific wastes (e.g., BMP WM-8 for concrete).



PLAN
1"=40'

ATTACHMENT 2B CHECKLIST:

UNDERLYING HYDROLOGIC SOIL GROUP: TYPE D PER COUNTY OF SAN DIEGO MANUAL HYDROLOGIC GROUPS EXHIBIT. SEE ATTACHMENT 3 IN SANTA MARGARITA RIVER BRIDGE PRELIMINARY HYDROLOGY REPORT DATED NOVEMBER 2021.

APPROXIMATE DEPTH OF GROUNDWATER: VARIES 4–15 FEET

EXISTING NATURAL HYDROLOGIC FEATURES: AS SHOWN

EXISTING TOPOGRAPHY AND IMPERVIOUS AREAS: AS SHOWN

EXISTING AND PROPOSED SITE DRAINAGE NETWORK AND CONNECTIONS TO DRAINAGE OFFSITE: EXISTING SHOWN HEREON, REFER TO FIGURE A2 FOR PROPOSED CONDITIONS

PROPOSED GRADING: REFER TO FIGURE A2

PROPOSED IMPERVIOUS FEATURES: REFER TO FIGURE A2

PROPOSED DESIGN FEATURES AND SURFACE TREATMENTS USED TO MINIMIZE IMPERVIOUSNESS: REFER TO FIGURE A2

EXISTING AND PROPOSED DRAINAGE BOUNDARY AND DRAINAGE AREA TO EACH POC: EXISTING SHOWN HEREON, REFER TO FIGURE A2 FOR PROPOSED CONDITIONS

GREEN STREET BMPS: REFER TO FIGURE A2

CONSTRUCTION BMPS: REFER TO FIGURE A4.

SOURCE CONTROL BMPS: NOT APPLICABLE, NO POLLUTANT GENERATING SOURCE BEING PROPOSED.

LEGEND:

- EXISTING CONTOUR
- FLOW LINE
- DMA BOUNDARY LIMIT
- 19 / 2.86 AC — DMA ID NUMBER / DMA AREA
- DRAINAGE FLOW ARROW
- EXISTING IMPERVIOUS AREA TO BE REMOVED

N

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50ft.

Full Size = 22" x 34", Half Size = 11" x 17"

kpff
400 Oceangate, Suite 500
Long Beach, California 90802
(562) 437-9100 Fax (562) 437-9200

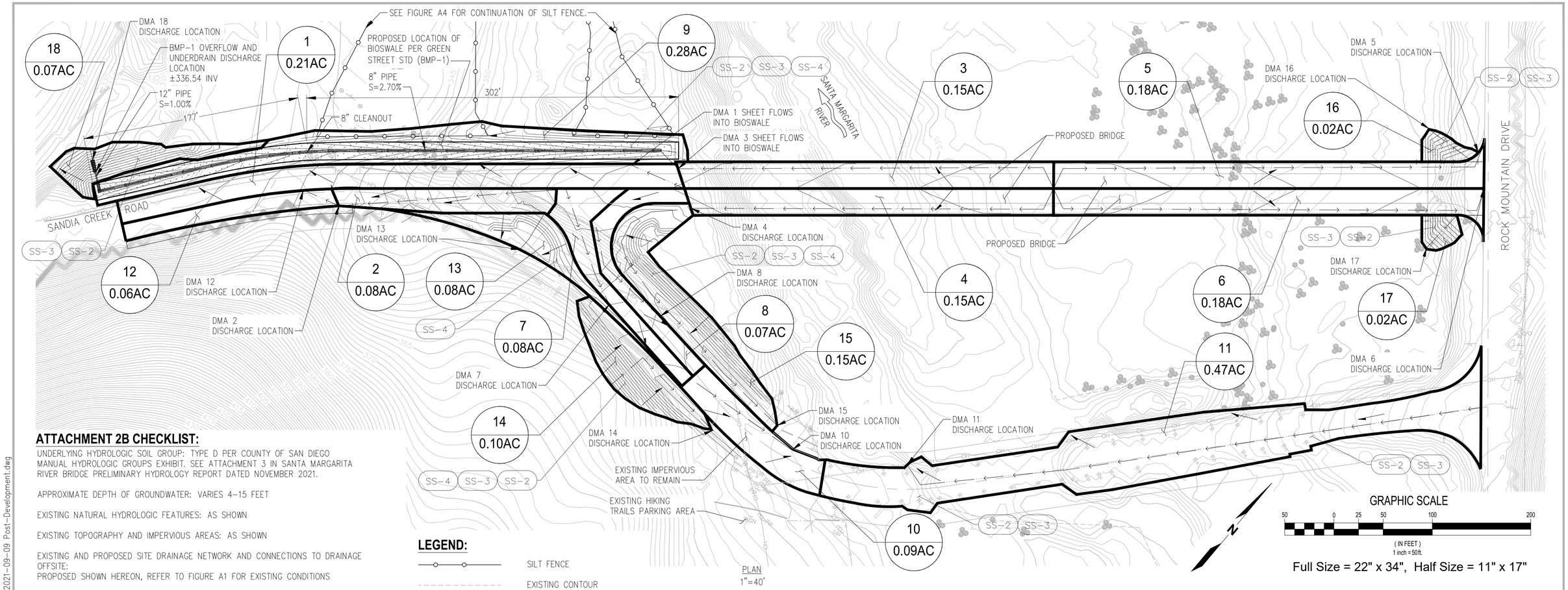
NO.	DATE	BY	REVISION

SANDIA CREEK ROAD
COUNTY OF SAN DIEGO, CA

PRE-DEVELOPMENT DRAINAGE CONDITIONS

DRAWN: LT	PROJECT NO.: 2000118
DESIGN: LM	SCALE: AS SHOWN
CHECKED: TG	DATE: NOV 19, 2021
DRAWING NO.	A1
SHEET NO.	01 OF 04

NOT FOR CONSTRUCTION



PLAN
1"=40'

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50ft.

Full Size = 22" x 34", Half Size = 11" x 17"

ATTACHMENT 2B CHECKLIST:

UNDERLYING HYDROLOGIC SOIL GROUP: TYPE D PER COUNTY OF SAN DIEGO MANUAL HYDROLOGIC GROUPS EXHIBIT. SEE ATTACHMENT 3 IN SANTA MARGARITA RIVER BRIDGE PRELIMINARY HYDROLOGY REPORT DATED NOVEMBER 2021.

APPROXIMATE DEPTH OF GROUNDWATER: VARIES 4-15 FEET

EXISTING NATURAL HYDROLOGIC FEATURES: AS SHOWN

EXISTING TOPOGRAPHY AND IMPERVIOUS AREAS: AS SHOWN

EXISTING AND PROPOSED SITE DRAINAGE NETWORK AND CONNECTIONS TO DRAINAGE OFFSITE:
PROPOSED SHOWN HEREON, REFER TO FIGURE A1 FOR EXISTING CONDITIONS

PROPOSED GRADING: AS SHOWN

PROPOSED IMPERVIOUS FEATURES: AS SHOWN

PROPOSED DESIGN FEATURES AND SURFACE TREATMENTS USED TO MINIMIZE IMPERVIOUSNESS:
AS SHOWN

EXISTING AND PROPOSED DRAINAGE BOUNDARY AND DRAINAGE AREA TO EACH POC:
PROPOSED SHOWN HEREON, REFER TO FIGURE A1 FOR EXISTING CONDITIONS

GREEN STREET BMPS: PROPOSED BIOSWALE SHOWN HEREON. REFER TO SANDIA CREEK ROAD BRIDGE REPLACEMENT DRAWING NO. C13 AND C14 FOR DETAILS. SLOPE VARIES, REFER TO DRAWING NO C8 FOR PROPOSED CONTOURS.

CONSTRUCTION BMPS: AS SHOWN. REFER TO FIGURE A4 FOR CONTINUATION.

SOURCE CONTROL BMPS: NOT APPLICABLE, NO POLLUTANT GENERATING SOURCE BEING PROPOSED.

NOTES:

1. THIS PLAN IS A REPRESENTATION OF THE MINIMUM REQUIREMENTS FOR A TEMPORARY EROSION AND SEDIMENT CONTROL PLAN. CONTRACTOR SHALL PREPARE AND IMPLEMENT THEIR PROJECT-SPECIFIC TESC PLAN IN ACCORDANCE WITH STATE, LOCAL, AND APPROVED SWPPP REQUIREMENTS.
2. CONTRACTOR SHALL INSTALL VEGETATED STABILIZING PLANTING (SS-2) DURING SUMMER SEASON.
3. CONTRACTOR SHALL INSTALL STABILIZED FIBER MATRIX (SS-3) DURING WINTER SEASON.

LEGEND:

- SILT FENCE
- EXISTING CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- FLOW LINE
- DMA BOUNDARY LIMIT
- 19 / 2.86 AC — DMA ID NUMBER / DMA AREA
- DRAINAGE FLOW ARROW
- PROPOSED BIOSWALE
- SS-2 — PRESERVATION OF EXISTING VEGETATION. SEE NOTE 1, 2, AND 3.
- SS-4 — HYDROSEEDING. SEE NOTE 1.
- SS-3 — BONDED FIBER MATRIX. SEE NOTE 1, 2, AND 3.

DMA SUMMARY TABLE:

DMA ID	DMA SURFACE TYPE	DMA AREA (SQ-FT)	DMA IMPERVIOUS AREA (SQ-FT)	DMA PERVIOUS AREA (SQ-FT)	DMA TYPE	PROPOSED STRUCTURAL OR SITE DESIGN BMP TYPE FOR IMPERVIOUS AREAS	BMP ID	BMP LENGTH (FT)	Q100 (CFS)	V100 (FPS)
DMA 1	STREET	9,145	9,145	0	DRAINS TO BMP	BIOSWALE	BMP-1	479	1.24	1.55
DMA 2	STREET	3,303	3,303	0	DRAINS TO BMP	BIOSWALE	BMP-1	479	0.45	1.12
DMA 3	STREET	6,604	6,604	0	DRAINS TO BMP	BIOSWALE	BMP-1	479	0.90	1.12
DMA 4	STREET	6,447	6,447	0	SELF MITIGATING	-	-	-	0.88	1.10
DMA 5	STREET	7,700	7,700	0	SELF MITIGATING	-	-	-	1.05	1.31
DMA 6	STREET	7,666	7,666	0	SELF MITIGATING	-	-	-	1.04	1.30
DMA 7	STREET	3,510	3,510	0	SELF MITIGATING	-	-	-	0.48	1.33
DMA 8	STREET	2,988	2,988	0	SELF MITIGATING	-	-	-	0.41	1.71
DMA 9	LANDSCAPE	12,314	0	12,314	DRAINS TO BMP	BIOSWALE	BMP-1	479	0.46	2.13
DMA 10	STREET	3,788	3,788	0	SELF MITIGATING	-	-	-	0.52	0.96
DMA 11	LANDSCAPE	20,625	0	20,625	SELF MITIGATING	-	-	-	0.76	0.70
DMA 12	LANDSCAPE	2,509	2,194	315	DRAINS TO BMP	BIOSWALE	BMP-1	479	0.32	1.58
DMA 13	LANDSCAPE	3,324	0	3,324	SELF MITIGATING	-	-	-	0.17	0.53
DMA 14	LANDSCAPE	4,200	0	4,200	SELF MITIGATING	-	-	-	0.22	1.63
DMA 15	LANDSCAPE	6,523	0	6,523	SELF MITIGATING	-	-	-	0.24	1.92
DMA 16	LANDSCAPE	788	0	788	SELF MITIGATING	-	-	-	0.04	2.72
DMA 17	LANDSCAPE	795	0	795	SELF MITIGATING	-	-	-	0.04	0.33
DMA 18	LANDSCAPE	3,072	0	3,072	SELF MITIGATING	-	-	-	3.31	6.34

CALCULATIONS:
TOTAL TRIBUTARY AREA TO BIOSWALE (BMP-1): 30,574 SF

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NO.	DATE	BY	REVISION

SANDIA CREEK ROAD
COUNTY OF SAN DIEGO, CA

POST-DEVELOPMENT DRAINAGE CONDITIONS

DRAWN: LT	PROJECT NO.: 2000118
DESIGN: LM	SCALE: AS SHOWN
CHECKED: TG	DATE: NOV 19, 2021
DRAWING NO.	A2
SHEET NO.	02 OF 04

NOT FOR CONSTRUCTION

Plotted: Dec 16, 2021 - 3:57am Ithao Layout: A2
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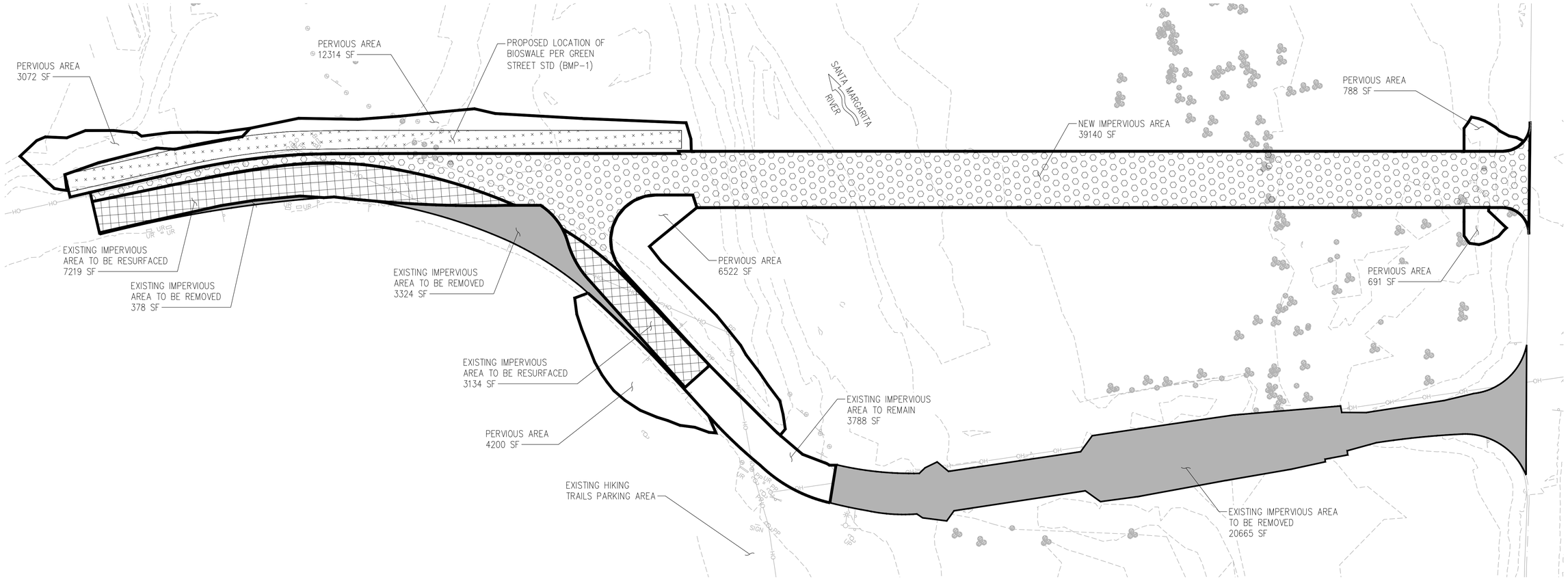

PLAN
1"=40'

GREEN STREET CALCULATIONS:

LAND USE OF NEW IMPERVIOUS AREA: TRANSPORTATION
85TH PERCENTILE RAINFALL DEPTH: 0.90 IN
RUNOFF COEFFICIENT: 0.90 IN
REQUIRED TREATMENT VOLUME: 1,728 CF
LAND USE OF TREATED AREA: TRANSPORTATION
LAND USE FACTOR: 1.00

CALCULATIONS:
TOTAL EXISTING IMPERVIOUS AREA: 38,528 SF
TOTAL NEW IMPERVIOUS AREA: 53,347 SF
TOTAL NEW PERVIOUS AREA: 51,956 SF

NET INCREASE IN IMPERVIOUS AREA: 11,031 SF

TOTAL DISTURBED AREA: 105,303 SF

LEGEND:

EXISTING CONTOUR

BOUNDARY LIMIT

PROPOSED BIOSWALE

EXISTING IMPERVIOUS AREA TO BE REMOVED

EXISTING IMPERVIOUS AREA TO REMAIN/RESURFACED

NEW IMPERVIOUS AREA

N

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50ft.

Full Size = 22" x 34", Half Size = 11" x 17"

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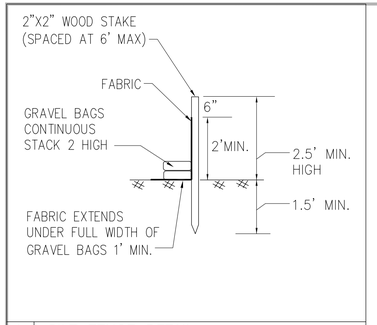
NO.	DATE	BY	REVISION

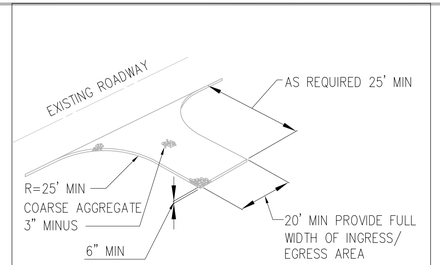
SANDIA CREEK ROAD
COUNTY OF SAN DIEGO, CA

GREEN STREET CALCULATIONS

DRAWN: LT	PROJECT NO.: 2000118
DESIGN: LM	SCALE: AS SHOWN
CHECKED: TG	DATE: NOV 19, 2021
DRAWING NO.	A3
SHEET NO.	03 OF 04



1 SILT FENCE DETAIL N.T.S.

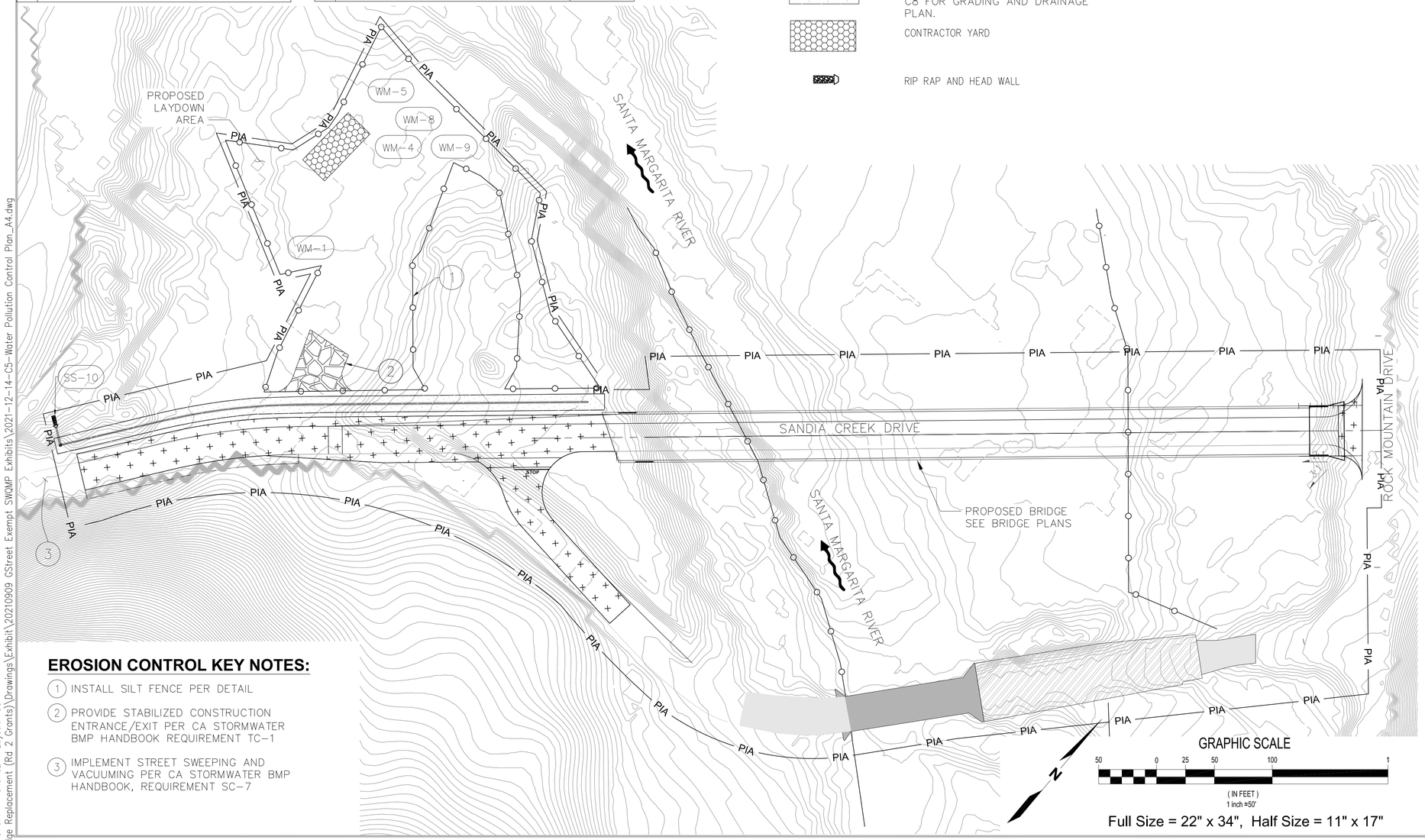


2 STABILIZED CONSTRUCTION ENTRANCE/EXIT N.T.S.

LEGEND

- SILT FENCE
- PIA — PROJECT IMPACT AREA LIMIT
- EXISTING REINFORCED CONCRETE BOXES
- EXISTING ASPHALT
- EXISTING CONCRETE DECK
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE/EXIT
- PROPOSED ROADWAY
- VEGETATED SWALE FOR REFERENCE ONLY. SEE DWG NO. C8 FOR GRADING AND DRAINAGE PLAN.
- CONTRACTOR YARD
- RIP RAP AND HEAD WALL

- WM-1 — MATERIAL DELIVERY AND STORAGE AREA
- WM-4 — SPILL PREVENTION AND CONTROL
- WM-5 — SOLID WASTE STORAGE AREA
- WM-8 — WASTE MANAGEMENT CONCRETE WASTE MANAGEMENT
- WM-9 — SANITARY WASTE MANAGEMENT
- SS-10 — OUTLET PROTECTION/VELOCITY DISSIPATION DEVICES



EROSION CONTROL KEY NOTES:

1. INSTALL SILT FENCE PER DETAIL
2. PROVIDE STABILIZED CONSTRUCTION ENTRANCE/EXIT PER CA STORMWATER BMP HANDBOOK REQUIREMENT TC-1
3. IMPLEMENT STREET SWEEPING AND VACUUMING PER CA STORMWATER BMP HANDBOOK, REQUIREMENT SC-7

EROSION CONTROL NOTES:

1. ALL DISTURBED SLOPES SHALL BE HYDROSEEDED.
2. CONTRACTOR TO PROVIDE CONCRETE WASH OUT FACILITY (CSP T59)
3. WHERE SILT FENCE CROSSES BEDROCK, OMIT LATH STAKES AND INSTALL GRAVEL BAGS 4 HIGH WITH SILT FENCE SECURED UNDER TOP BAG.
4. STAKES TO BE POSITIONED ON OUTSIDE OF FENCE.
5. JOINING SECTION STAKES TO OVERLAP WITH FENCE FABRIC FOLDED AROUND EACH STAKE ONE FULL TURN. SECURE FABRIC TO STAKE WITH 4 STAPLES.
6. STAKES TO BE DRIVEN TIGHTLY TOGETHER TO PREVENT POTENTIAL FLOW-THROUGH OF SEDIMENT AT JOINT. TOPS OF STAKES TO BE SECURED WITH WIRE.
7. FOR END STAKE, FENCE FABRIC SHALL BE FOLDED AROUND TWO STAKES ONE FULL TURN AND SECURED WITH 4 STAPLES.
8. MINIMUM 4 STAPLES PER STAKE, EQUALLY SPACED.
9. MAINTENANCE OPENINGS SHALL BE CONSTRUCTED IN A MANNER TO ENSURE SEDIMENT REMAINS BEHIND SILT FENCE.
10. JOINTING SECTIONS SHALL NOT BE PLACED AT SUMP LOCATIONS.
11. GRAVEL BAG ROWS AND LAYERS SHALL BE OFFSET TO ELIMINATE GAPS.
12. NO WORK HAVING POTENTIAL TO CAUSE WATER POLLUTION, AS DETERMINED BY THE ENGINEER, SHALL BE PERFORMED UNTIL THE WATER POLLUTION CONTROL PLAN (WPCP) HAS BEEN APPROVED BY THE ENGINEER.
13. THE CONTRACTOR SHALL CONSIDER OTHER CONTROL MEASURES, AS NECESSARY, TO SUPPLEMENT THE TEMPORARY CONTROL MEASURES SHOWN ON THESE PLANS, IN ORDER TO MEET THE WATER POLLUTION CONTROL OBJECTIVES.
14. ALL VEGETATION SHALL REMAIN, UNLESS OTHERWISE SPECIFIED.
15. CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AND INSTALL NEW DEVICES AS NEEDED.
16. CONTRACTOR SHALL REMOVE ALL BMPS FROM SITE UPON COMPLETION OF PROJECT AS DIRECTED BY THE ENGINEER.
17. CONTRACTOR SHALL PLACE GRAVEL BAG BERMS AT THE TOE OF ALL TEMPORARY SLOPES.
18. ALL DISTURBED AREAS WITHIN THE PIA, EXCLUDING ROCK, SHALL BE COVERED WITH TYPE D EROSION CONTROL MATERIALS.
19. THIS PLAN IS A REPRESENTATION ON THE MINIMUM REQUIREMENTS FOR A WPCP. CONTRACTOR SHALL PREPARE AND IMPLEMENT THEIR PROJECT SPECIFIC WPCP PLAN IN ACCORDANCE WITH LOCAL AND STATE REQUIREMENTS.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING THE EROSION AND SEDIMENT CONTROL MEASURES AND BMP'S SHOWN IN THE WPCP AND PROJECT SWPPP.
21. TEMPORARY EROSION CONTROL DEVICES SHOWN ON THE PLAN WHICH INTERFERE WITH THE GRADING WORK SHALL BE RELOCATED OR MODIFIED AS AND WHEN THE QSP, COUNTY INSPECTOR OR OWNER DIRECTS, AS THE WORK PROGRESSES TO MEET "AS GRADED" CONDITIONS.
22. ALL LOOSE SOIL AND DEBRIS SHALL BE REMOVED FROM THE STREET AREAS UPON STARTING OPERATIONS AND PERIODICALLY THEREAFTER AS DIRECTED BY THE OWNER.
23. EXCEPT WHEN THE QSP, COUNTY, OR OWNER DIRECTS OTHERWISE, ALL DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN RAIN IS FORECAST, AND SHALL BE MAINTAINED DURING THE RAINY SEASON.
24. GRAVEL BAGS SHALL BE STOCKPILED ON SITE, READY TO BE PLACED IN POSITION WHEN RAIN IS FORECAST, OR WHEN THE OWNER SO DIRECTS.
25. A "STANDBY EMERGENCY CREW" SHALL BE ALERTED BY THE PERMITTEE OR THE CONTRACTOR TO PERFORM EMERGENCY WORK DURING RAINSTORMS.
26. THE CONTRACTOR SHALL MONITOR THE WEATHER FORECAST, AS REQUIRED BY THE PROJECT SWPPP. IN THE EVENT THE FORECAST CALLS FOR A 50% CHANCE OF RAIN OR MORE WITHIN THE NEXT 48 HOUR WORK PERIOD, THE CONTRACTOR SHALL TAKE MEASURES TO MITIGATE THE WORK STOPPAGE DUE TO THE RAIN EVENT. THE CONTRACTOR SHALL LIMIT THE WORK THAT CAN ONLY BE PERFORMED WITHIN THE WORK DAY. EXPOSED EXCAVATIONS OR TRENCHES SHALL BE COVERED AND PROTECTED FROM WATER. CONTRACTOR SHALL GRADE AREAS SUCH THAT WATER DRAINS AWAY FROM WORK AREA.
27. CONTRACTOR SHALL INSTALL A TEMPORARY CONSTRUCTION ROADWAY (TC-2) OR GRAVEL MULCH (EC-16) IN ORDER TO PREVENT THE OFF-TRACKING OF SEDIMENT IF THE PROJECT QSP REQUIRES THE CONTRACTOR TO DO SO.
28. CONTRACTOR SHALL INSTALL PERIMETER FENCING AROUND WORK AREA IN CONFORMANCE WITH 2009 CASQA STORMWATER BMP MANUAL SECTION WE-1. FENCING SHALL BE CHAIN LINK, AT MINIMUM AND SHALL HAVE FENCE FABRIC ATTACHED.
29. THIS PLAN IS A REPRESENTATION OF THE MINIMUM REQUIREMENTS FOR A TEMPORARY EROSION AND SEDIMENT CONTROL PLAN. CONTRACTOR SHALL PREPARE AND IMPLEMENT THEIR PROJECT-SPECIFIC TESC PLAN IN ACCORDANCE WITH STATE, LOCAL, AND SWPPP REQUIREMENTS.

Full Size = 22" x 34", Half Size = 11" x 17"

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NO.	DATE	BY	REVISION

SANDIA CREEK ROAD
COUNTY OF SAN DIEGO, CA

EROSION CONTROL PLAN

DRAWN: DYU	PROJECT NO.: 2000118
DESIGN: RO	SCALE: AS SHOWN
CHECKED: TG	DATE: NOV 19, 2021
DRAWING NO.	A4
SHEET NO.	04 OF 04

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Attachment 2C: BMP Maintenance Plan

Include a maintenance plan for each Green Streets BMP type. Fill out the BMP Maintenance table below. BMP maintenance guidelines can be found in Appendix E and K of the County BMP Design Manual.

BMP ID	BMP type	BMP Category (1-4)
1	Vegetated Swale	4

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Sep 29 2021

<Name>

Trapezoidal

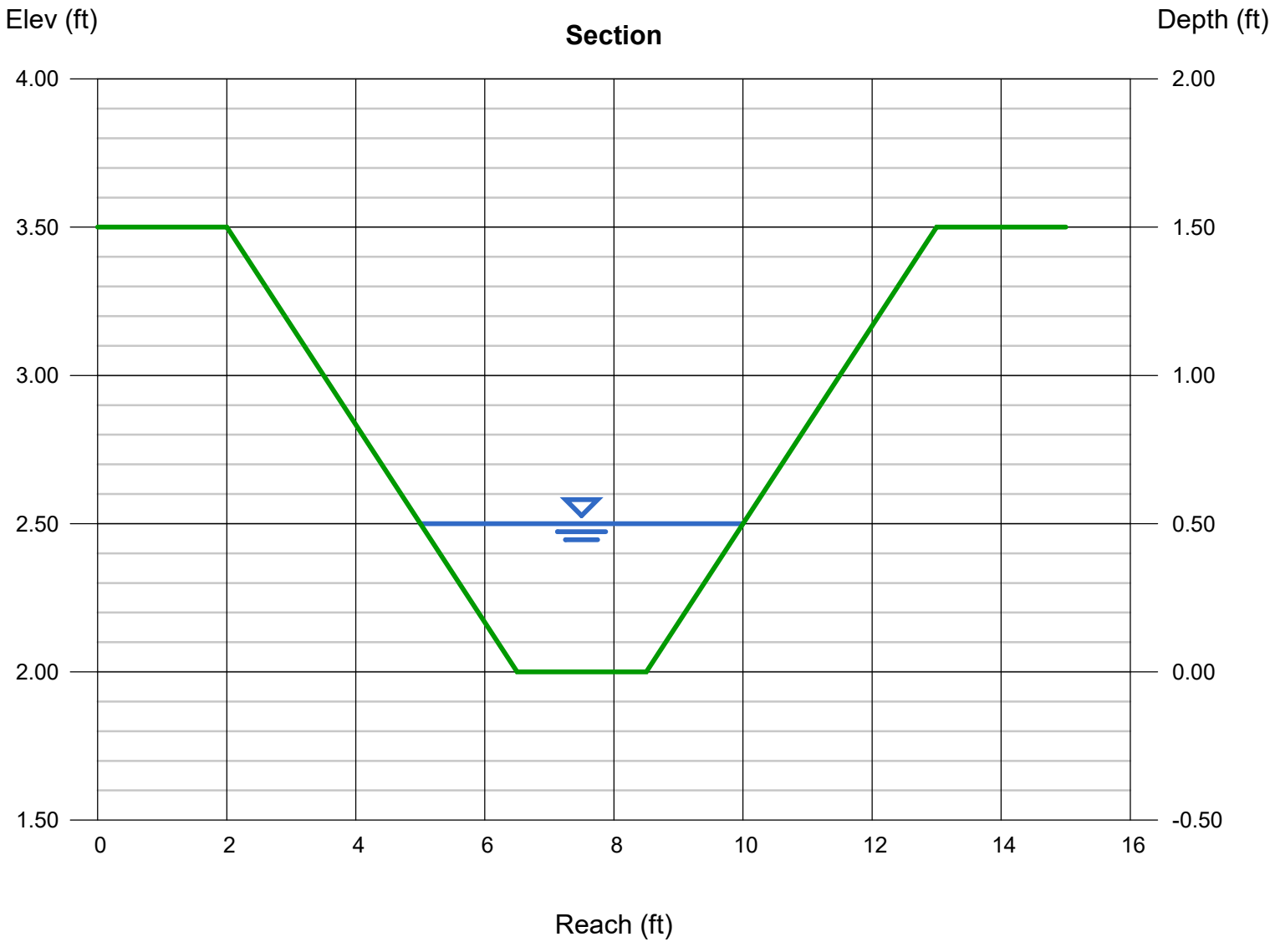
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 2.00
Slope (%)	= 3.50
N-Value	= 0.250

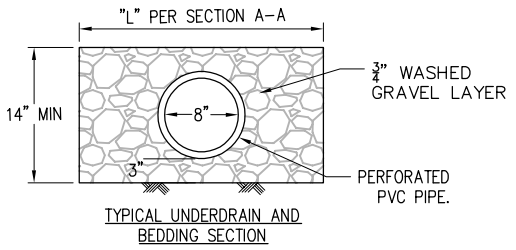
Calculations

Compute by:	Known Depth
Known Depth (ft)	= 0.50

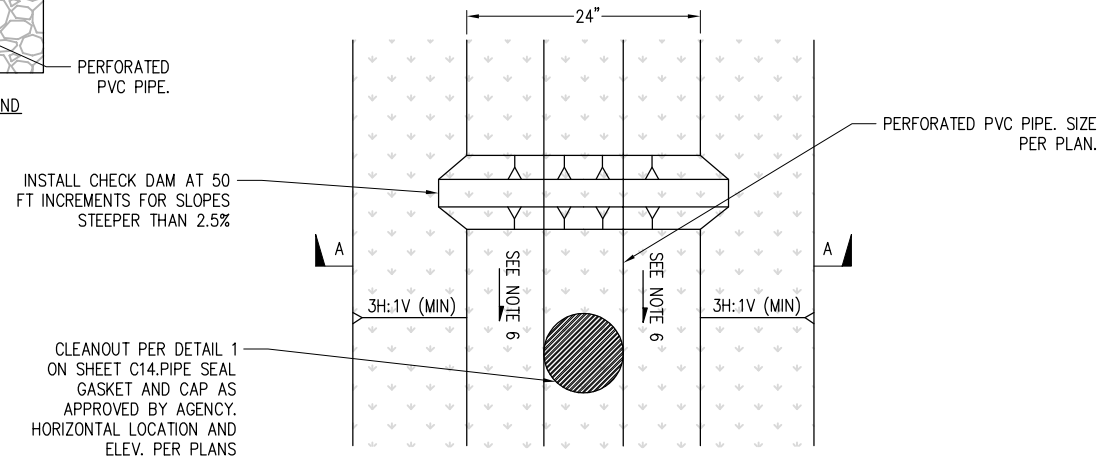
Highlighted

Depth (ft)	= 0.50
Q (cfs)	= 0.946
Area (sqft)	= 1.75
Velocity (ft/s)	= 0.54
Wetted Perim (ft)	= 5.16
Crit Depth, Yc (ft)	= 0.18
Top Width (ft)	= 5.00
EGL (ft)	= 0.50

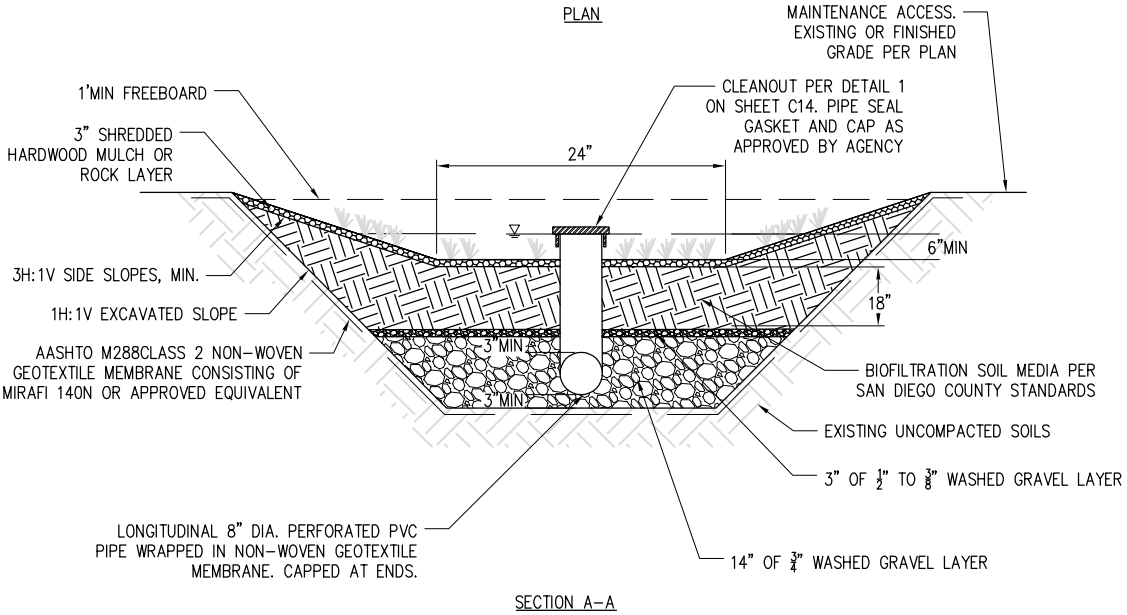




TYPICAL UNDERDRAIN AND BEDDING SECTION



PLAN



SECTION A–A

NOTES:

1. BUILD AND VEGETATE SWALE AS EARLY AS POSSIBLE TO ESTABLISH PLANTINGS BEFORE DIRECTING STORMWATER RUNOFF TO IT OR DIVERT STORMWATER AROUND FACILITY. PREFERABLY THIS PERIOD WOULD LAST A MINIMUM OF 3 MONTHS.
2. DURING INSTALLATION, DISTURB NATIVE SOILS AS LITTLE AS POSSIBLE.
3. REPAIR, SEED, OR RE–PLANT DAMAGED AREAS IMMEDIATELY.
4. VEGETATED SWALES SHALL NOT BE LOCATED ON SLOPES GREATER THAN 6%
5. THE SWALE SHALL BE VEGETATED WITH A MIX OF EROSION–RESISTANT PLANT SPECIES THAT EFFECTIVELY BIND THE SOIL. PROPOSED VEGETATION SHOULD THE FOLLOWING SPECIFICATIONS:
   a. VEGETATION SHALL BE NATIVE OR ADAPTED GRASSES PER COUNTY OF SAN DIEGO BMP DESIGN MANUAL. SUITABLE PLANT TYPES CAN ALSO BE FOUND AT HTTP://CALFLORA.ORG.
   b. VEGETATIVE COVER SHOULD BE AT LEAST 4" IN HEIGHT, ALTHOUGHT 6" IS PREFERRED.
6. PROPOSED SLOPE VARIES, REFER TO DRAWING NO. C8 FOR PROPOSED CONTOURS.

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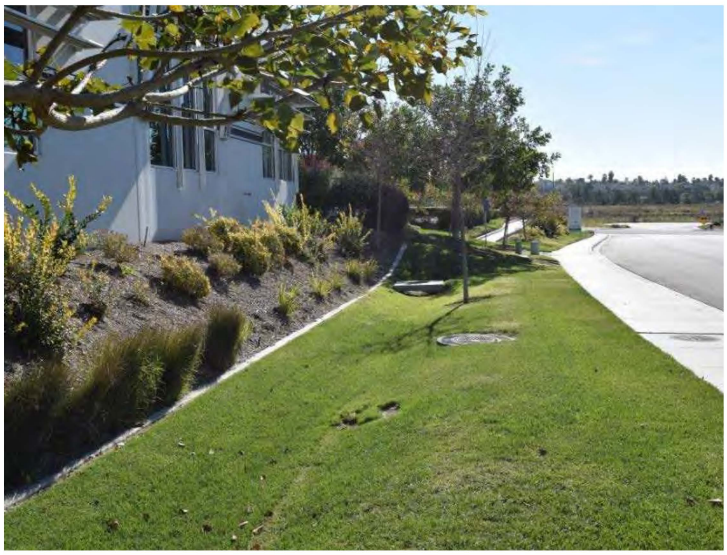
SANDIA CREEK ROAD BRIDGE REPLACEMENT VEGETATED SWALE DETAIL

DATE: 2021-11-19	SCALE: NTS
DRAWN BY: LT	SHT 1 OF 1

E.22 FT-1 Vegetated Swales



MS4 Permit Category
Flow-thru Treatment Control

Manual Category
Flow-thru Treatment Control

Applicable Performance Standard
Pollutant Control

Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation

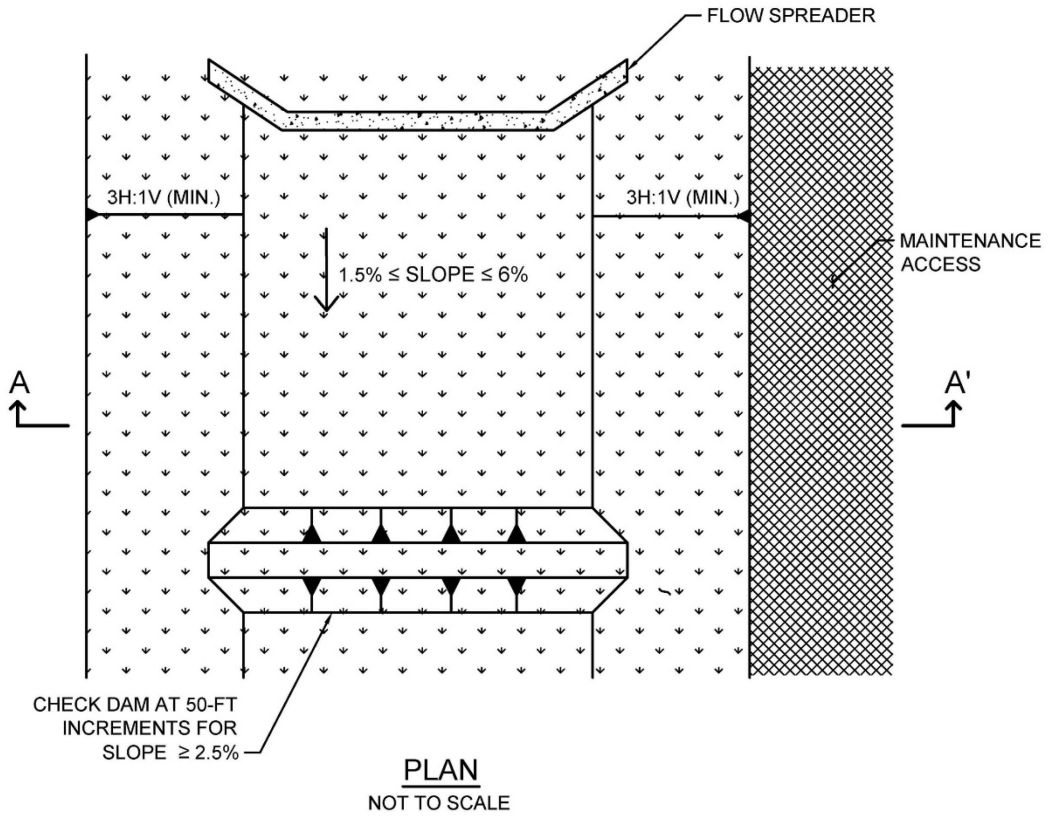
Location: Eastlake Business Center, Chula Vista, California; Photo Credit: Eric Mosolgo

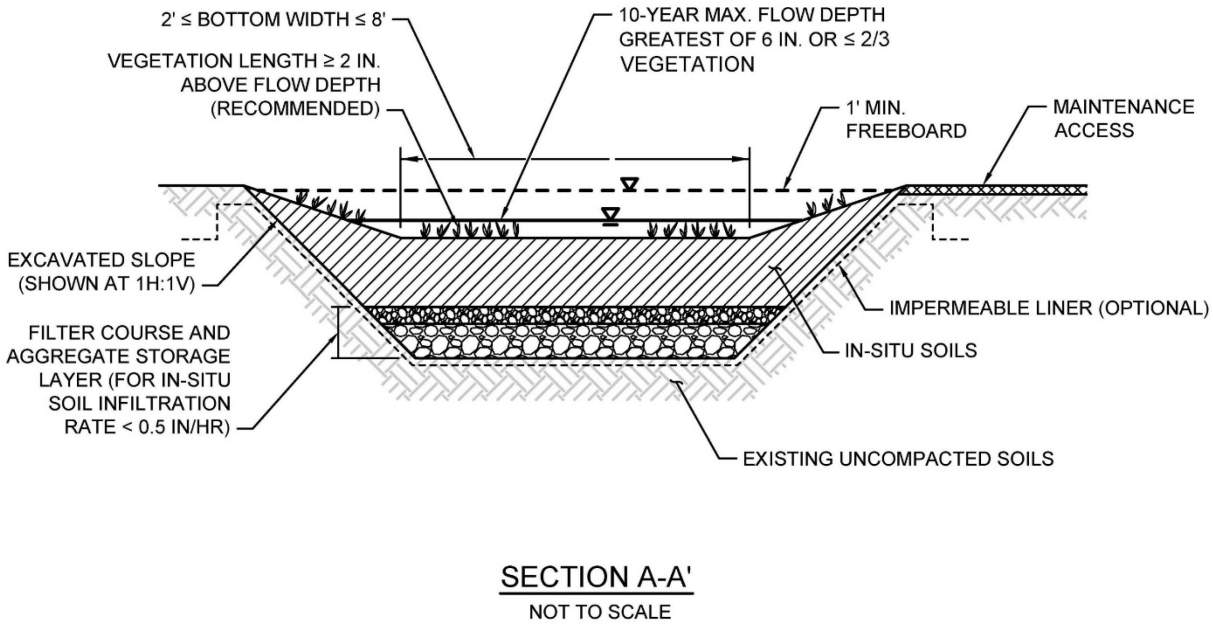
Description

Vegetated swales are shallow, open channels that are designed to remove storm water pollutants by physically straining/filtering runoff through vegetation in the channel. Swales can be used in place of traditional curbs and gutters and are well-suited for use in linear transportation corridors to provide both conveyance and treatment via filtration. An effectively designed vegetated swale achieves uniform sheet flow through densely vegetated areas. When soil conditions allow, infiltration and volume reduction are enhanced by adding a gravel drainage layer underneath the swale. Vegetated swales with a subsurface media layer can provide enhanced infiltration, water retention, and pollutant-removal capabilities. Pollutant removal effectiveness can also be maximized by increasing the hydraulic residence time of water in swale using weirs or check dams.

Typical vegetated swale components include:

- Inflow distribution mechanisms (e.g., flow spreader)
- Surface flow
- Vegetated surface layer
- Check dams (if required)
- Optional aggregate storage layer with underdrain(s)





Typical plan and Section view of a Vegetated Swale BMP

Design Adaptations for Project Goals

Site design BMP to reduce runoff volumes and storm peaks. Swales without underdrains are an alternative to lined channels and pipes and can provide volume reduction through infiltration. Swales can also reduce the peak runoff discharge rate by increasing the time of concentration of the site and decreasing runoff volumes and velocities.

Flow-thru treatment BMP for storm water pollutant control. The system is lined or un-lined to provide incidental infiltration with an underdrain and designed to provide pollutant removal through settling and filtration in the channel vegetation (usually grasses). This configuration is considered to provide flow-thru treatment via horizontal surface flow through the swale. Sizing for flow-thru treatment control is based on the surface flow rate through the swale that meets water quality treatment performance objectives.

Design Criteria and Considerations

Vegetated swales must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of County staff if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, and liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents storm water from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area ≤ 2 acres.	Higher ratios increase the potential for clogging but may be acceptable for relatively clean tributary areas.
☐	Longitudinal slope is ≥ 1.5% and ≤ 6%.	Flatter swales facilitate increased water quality treatment while minimum slopes prevent ponding.
☐	For site design goal, in-situ soil infiltration rate ≥ 0.5 in/hr (if < 0.5 in/hr, an underdrain is required and design goal is for pollutant control only).	Well-drained soils provide volume reduction and treatment. An underdrain should only be provided when soil infiltration rates are low or per geotechnical or groundwater concerns.

Siting and Design		*Intent/Rationale*
Surface Flow		
☐	Maximum flow depth is ≤ 6 inches or ≤ $^2/_3$ the vegetation length, whichever is greater. Ideally, flow depth will be ≥ 2 inches below shortest plant species.	Flow depth must fall within the height range of the vegetation for effective water quality treatment via filtering.
	A minimum of 1 foot of freeboard is provided.	Freeboard minimizes risk of uncontrolled surface discharge.
☐	Cross sectional shape is trapezoidal or parabolic with side slopes ≥ 3H:1V.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
☐	Bottom width is ≥ 2 feet and ≤ 8 feet.	A minimum of 2 feet minimizes erosion. A maximum of 8 feet prevents channel braiding.
☐	Minimum hydraulic residence time ≥ 10 minutes.	Longer hydraulic residence time increases pollutant removal.
☐	Swale is designed to safely convey the 10-yr storm event unless a flow splitter is included to allow only the water quality event.	Planning for larger storm events lessens the risk of property damage due to flooding.
☐	Flow velocity is ≤ 1 ft/s for water quality event. Flow velocity for 10-yr storm event is ≤ 3 ft/s.	Lower flow velocities provide increased pollutant removal via filtration and minimize erosion.
Vegetated Surface Layer (amendment with media is Optional)		
☐	Soil is amended with 2 inches of media mixed into the top 6 inches of in-situ soils, as needed, to promote plant growth (optional). For enhanced pollutant control, 2 feet of media can be used in place of in-situ soils. Media meets either of these two media specifications: City of San Diego Storm Water Standards Appendix F, February 2016; Or County of San Diego Low Impact Development Handbook, June 2014: Appendix G -Bioretention Soil Specification.	Amended soils aid in plant establishment and growth. Media replacement for in-situ soils can improve water quality treatment and site design volume reduction.

Siting and Design		*Intent/Rationale*
Vegetated Surface Layer (amendment with media is Optional)		
☐	Vegetation is appropriately selected low-growing, erosion-resistant plant species that effectively bind the soil, thrive under site-specific climatic conditions and require little or no irrigation.	Plants suited to the climate and expected flow conditions are more likely to survive.
Check Dams		
☐	Check dams are provided at 50-foot increments for slopes ≥ 2.5%.	Check dams prevent erosion and increase the hydraulic residence time by lowering flow velocities and providing ponding opportunities.
Filter Course Layer (For Underdrain Design)		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and impede infiltration.
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer (For Underdrain Design)		
☐	The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.
☐	Aggregate used for the aggregate storage layer is washed and free of fines.	Washing aggregate will help eliminate fines that could clog aggregate storage layer void spaces or underdrain.
Inflow and Underdrain Structures		
☐	Inflow and underdrains are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
Inflow and Underdrain Structures		

Siting and Design		*Intent/Rationale*
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where vegetated swales can be used in the site design to replace traditional curb and gutter facilities and provide volume reduction through infiltration.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design vegetated swales for storm water pollutant control only, the following steps should be taken:

1. Verify that siting and design criteria have been met, including bottom width and longitudinal and side slope requirements.
2. Calculate the design flow rate per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet to determine flow-thru treatment sizing of the vegetated swale and if flow velocity, flow depth, and hydraulic residence time meet required criteria. Swale configuration should be adjusted as necessary to meet design requirements.

Maintenance Overview

Normal Expected Maintenance. Vegetated swales require routine maintenance to: remove accumulated materials such as sediment, trash, and debris; maintain vegetation health; and maintain integrity of side slopes, channel bottom, inlets, energy dissipaters, weirs or check dams, and outlets to ensure runoff will be conveyed as uniform flow throughout the swale (i.e., flow will spread uniformly

Attachment 3: Private Project Documentation

Attachment 3A: Installation Verification Form

County of San Diego PDP Structural BMP Verification for Permitted Land Development Projects should be prepared by the project proponent and submitted to the County upon completion of BMP construction. The Installation Verification Form can be found on the Development Resources website under "Submittal Templates":

www.sandiegocounty.gov/stormwater

Attachment 3B: Maintenance Agreements

For Green Street BMPs within the public right-of-way, a consultation with DPW Transportation Division may be required to determine whether the County will take over maintenance after construction. If an Encroachment Maintenance and Removal Agreement (EMRA) is agreed upon, it must be prepared and recorded at the County of San Diego Recorder's office. Attach a draft version of that agreement here.

For Green Street BMPs outside the public right-of-way and on private property, a Category 1 or 2 Maintenance Agreement must be prepared and recorded at the County of San Diego Recorder's office. Attach draft versions of those agreements here.

Templates for the agreements can be found on the Development Resources website under "Submittal Templates":

www.sandiegocounty.gov/stormwater

ATTACHMENT 3A
BMP INSTALLATION VERIFICATION

This form must be accepted by the County prior to the release of construction permits or granting of occupancy for applicable portions of a Priority Development Project (PDP). Its purpose is to provide documentation of the final installation of permanent Best Management Practices (BMPs) used to satisfy Structural Performance Standards for the development project. Compliance with these standards reduces the discharge of pollutants and flows from the completed project site. Applicable standards may be satisfied using Structural BMPs (S-BMPs), Significant Site Design BMPs (SSD-BMPs), or both. Applicants are responsible for providing all requested information.

PART 1 PROJECT INFORMATION

A. Project Summary Information	
Project Name	
Record ID (e.g. grading/improvement plan number, building permit)	
Project Address	
Assessor's Parcel Number(s) APN(s)	
Project Watershed (Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	
B. Owner Information	
Name	
Address	
Email Address	
Phone Number	

COUNTY – OFFICIAL USE ONLY	
INTAKE ID#	
ACCEPTANCE ID#	

****THIS PAGE IS FOR PARTIAL VERIFICATIONS ONLY ****

If final grade release or granting of occupancy is being requested for only a portion of the Priority Development Project (PDP) please fill out the table below. Include ALL of the Structural BMPs and/or Significant Site Design BMPs for the entire project in the table. **Include a mark-up of the DMA map from the approved SWQMP with this Verification package that clearly shows which DMAs you are submitting for approval and which DMAs have already been accepted (if any).**

DMA #	APN or Lot #	BMP ID #	WPP Acceptance Date (If applicable)	WPP Acceptance ID# (If applicable, e.g. 20/21-001)

PART 2 BMP INVENTORY INFORMATION

Use this table to document Structural BMPs (S-BMPs) and Significant Site Design BMPs (SSD-BMPs) for the PDP. All DMAs that are not self-mitigating or de minimis must have at least one Structural BMP or Significant Site Design BMP.

- In **Part A** list all Structural BMPs (including both Pollutant Control and/or Hydromodification as applicable) by DMA.
- Complete **Part B** for all DMAs that contain only Significant Site Design BMPs. SSD-BMPs are Site Design BMPs (SD-BMPs) that are sized and constructed to satisfy Structural Performance Standards for a DMA.
- The information provided for each BMP in the table must match that provided in the Stormwater Quality Management Plan (SWQMP), construction plans, maintenance agreements, and other relevant project documentation.

DMA #	BMP Information			Maintenance Category (1, 2, 3, or 4)	Maintenance Agreement Recorded DOC #	Construction Plan Sheet #	Landscape Plan Sheet #	FOR DPW-WPP USE ONLY
	Quantity	Description/Type of Structural BMP	BMP ID #					
A. Structural BMPs (S-BMPs)								
Add rows as needed. Click into the last column in the row below this, then press TAB to add a new row.								
B. Significant Site Design BMPs (SSD-BMPs)								
				Choose				
				Choose				
				Choose				
				Choose				
				Choose				
				Choose				
Add rows as needed. Click into the last column in the row below this, then press TAB to add a new row.								

PART 3 REQUIRED ATTACHMENTS

For the permanent BMPs listed in Part 2, submit the following to the County inspector along with this Verification form as a package (check all that are attached):

☐ **PHOTOGRAPHS:** Final construction photos of every permanent BMP listed in Part 2 are required. Final photos must be recent and be labeled with the date and a BMP Identifier. Additional photographs illustrating proper construction of the BMPs are recommended to be included and may be requested by WPP prior to acceptance of this Verification (e.g. excavation depths, liners, hydromodification orifices, Biofiltration Soil Media (BSM), vegetation, mulch).

☐ **MAINTENANCE AGREEMENTS:** Copies of approved and recorded Storm Water Maintenance Agreements (SWMA), Category 1 Maintenance Notification Agreements (MN), or Encroachment Maintenance and Removal Agreements (EMRA) for all S-BMPs.

Note: Significant Site Design (SSD) BMPs and most Category 4 BMPs do not require recorded maintenance agreements.

☐ **CONSTRUCTION PLANS:** Submit electronic and/or 11" X 17" hard copies of the current approved Construction Plan sheets for the Record ID(s) listed on Page 1:

- ☐ Grading Plans
- ☐ Improvement Plans
- ☐ Precise Grading Plan
- ☐ Building Plan (Applicable BMP Sheets only)
- ☐ Other (Please specify) _____

For each Construction Plan, the sheets submitted must incorporate all of the following:

- A BMP Table on Sheet 1, AND
- A plan detail cross-section of each verified as-built BMP, AND
- The location of each verified as-built BMP

☐ **LANDSCAPE PLANS**: If the PDP includes vegetated BMPs and has a Landscape Plan, submit the following:

- ☐ Final Landscape Plans
- ☐ Proof of Irrigation Installed (if applicable)

PART 4 PREPARER'S CERTIFICATION

By signing below, I certify that the BMP(s) listed in Part 2 of this Verification Form have been constructed and are in substantial conformance with the approved plans and applicable regulations. I understand the County reserves the right to inspect the above BMPs to verify compliance with the approved plans and Watershed Protection Ordinance (WPO). Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Note: Structural BMPs must be certified by a licensed professional engineer.

Please sign and, if applicable, provide your seal below.

Preparer's Name:	
Email Address:	
Phone Number:	
Preparer's Signature:	
Date:	

[SEAL]

PROJECT RECORD ID: _____

COUNTY - OFFICIAL USE ONLY

County Inspector Approval:

***NOTE: The County approved SWQMP document and any Addendums or Revisions must be included with this BMP Installation Verification submittal package.**

- ☐ DPW Private Development Construction Inspection (PDCI)
- ☐ PDS Building
- ☐ DGS
- ☐ DPR

By signing below, the County Inspector concurs that every BMP listed in Part 2 of this BMP Installation Verification form has been installed per plan.

Inspector Name: _____

Inspector's Signature: _____ Date: _____

DPW Watershed Protection Program (WPP) Acceptance:

Date Received: _____

WPP Reviewer: _____

WPP Reviewer concurs that the BMPs accepted in **Part 2** above may be entered into County inventory.

WPP Reviewer's Signature: _____ Date: _____

Enter Acceptance ID# on page 1.

NOTES:

ATTACHMENT 3B
MAINTENANCE AGREEMENT

Attachment 3B: Maintenance Agreements

Santa Margarita Bridge Replacement

The Department of Public Works (DPW) in conjunction with Department of Planning & Development Services (PDS) acknowledges California Trout efforts to find and obtain public grants for a private development project to replace the Santa Margarita River Bridge at Sandia Creek Drive. The new bridge will be designed to improve the ability for Southern Steelhead Trout to travel upstream to spawn, by removing a passage barrier on the mainstem of the Santa Margarita River. Your project will also provide better access for the public to traverse over the river during major storms.

PDS has been leading the effort, with support from DPW staff, to review and condition the private development project so that once the new bridge is completed it can be accepted, in perpetuity, into the County Maintained Road System pursuant to California Streets & Highways Code section 941. As part of the private development process, PDS will work cooperatively with you and your team to process your project application and issue an encroachment permit to allow you to perform work connecting the new bridge to the existing County maintained roads. The encroachment permit will be conditioned to require, among other things, that the bridge be built in accordance with County Public Road and Drainage Standards and that any required right-of-way dedications are adequate. Once the project is completed in accordance with the conditions in the permit, the new bridge can be accepted into the County maintained system for DPW to maintain in perpetuity.

As part of this County maintained system, the County of San Diego Field Operations Divisions will be in charge of all maintenance activities for proposed BMPs within the site according to the conditions set forth in an MOU between CalTrout and the County of San Diego to be completed by 12/31/2022.

Please see confirmation letter attached from COSD DPW from July 2021.

County of San Diego

JEFF MONEDA
DIRECTOR

DEPARTMENT OF PUBLIC WORKS
5510 OVERLAND AVENUE, SUITE 410
SAN DIEGO, CA 92123-1237
(858) 694-2212
www.sdcounty.ca.gov/dpw/

July 7, 2021

Dr. Sandra Jacobson, Director
California Trout
sjacobson@caltrout.org

Dear Dr. Jacobson:

SANTA MARGARITA BRIDGE REPLACEMENT

The Department of Public Works (DPW) in conjunction with Department of Planning & Development Services (PDS) acknowledges your efforts to find and obtain public grants for a private development project to replace the Santa Margarita River Bridge at Sandia Creek Drive. The new bridge will be designed to improve the ability for Southern Steelhead Trout to travel upstream to spawn, by removing a passage barrier on the mainstem of the Santa Margarita River. Your project will also provide better access for the public to traverse over the river during major storms.

PDS has been leading the effort, with support from DPW staff, to review and condition the private development project so that once the new bridge is completed it can be accepted, in perpetuity, into the County Maintained Road System pursuant to California Streets & Highways Code section 941. As part of the private development process, PDS will work cooperatively with you and your team to process your project application and issue an encroachment permit to allow you to perform work connecting the new bridge to the existing County maintained roads. The encroachment permit will be conditioned to require, among other things, that the bridge be built in accordance with County Public Road and Drainage Standards and that any required right-of-way dedications are adequate. Once the project is completed in accordance with the conditions in the permit, the new bridge can be accepted into the County maintained system for DPW to maintain in perpetuity.

If you have any questions or need any additional information regarding DPW's involvement, please contact me at derek.gade@sdcounty.ca.gov or by calling (858) 694-3897. If you have questions on processing of the project, please contact Ken Brazell at Kenneth.brazell@sdcounty.ca.gov or by calling (858) 694-2728.

Sincerely,

DEREK R GADE, Assistant Director
Department of Public Works

cc: Ken Brazell – Department of Planning & Development Services

Siting and Design		*Intent/Rationale*
Inflow and Underdrain Structures		
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where vegetated swales can be used in the site design to replace traditional curb and gutter facilities and provide volume reduction through infiltration.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design vegetated swales for storm water pollutant control only, the following steps should be taken:

1. Verify that siting and design criteria have been met, including bottom width and longitudinal and side slope requirements.
2. Calculate the design flow rate per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet to determine flow-thru treatment sizing of the vegetated swale and if flow velocity, flow depth, and hydraulic residence time meet required criteria. Swale configuration should be adjusted as necessary to meet design requirements.

Maintenance Overview

Normal Expected Maintenance. Vegetated swales require routine maintenance to: remove accumulated materials such as sediment, trash, and debris; maintain vegetation health; and maintain integrity of side slopes, channel bottom, inlets, energy dissipaters, weirs or check dams, and outlets to

ensure runoff will be conveyed as uniform flow throughout the swale (i.e., flow will spread uniformly across the width of the swale as it is conveyed from upstream to downstream).

Non-Standard Maintenance or BMP Failure. If any of the following scenarios are observed, the BMP is not performing as intended to protect downstream waterways from pollution and/or erosion. Corrective maintenance, increased inspection and maintenance, BMP replacement, or a different BMP type will be required.

- The BMP is not drained between storm events. Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from deposited materials or overgrowth of vegetation within the swale blocking drainage conveyance or blocking an outlet structure, or localized erosion issues that cause channelization and prevent uniform flow throughout the swale. The specific cause of the drainage issue must be determined and corrected. If the issue is not corrected by restoring the BMP to the original plan and grade, the County reviewer shall be contacted prior to any additional repairs or reconstruction.
- Sediment, trash, or debris accumulation blocking drainage becomes a chronic issue observed at every inspection. This means the load from the tributary drainage area is too high, reducing BMP function or clogging the BMP. This would require pretreatment measures within the tributary area draining to the BMP to intercept the materials.
- Erosion due to concentrated storm water runoff flow that is not readily corrected by adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the County reviewer shall be contacted prior to any additional repairs or reconstruction.

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Summary of Standard Inspection and Maintenance

The property owner is responsible to ensure inspection, operation and maintenance of permanent BMPs on their property unless responsibility has been formally transferred to an agency, community facilities district, homeowners association, property owners association, or other special district.

Maintenance frequencies listed in this table are average/typical frequencies. Actual maintenance needs are site-specific, and maintenance may be required more frequently. Maintenance must be performed whenever needed, based on maintenance indicators presented in this table. The BMP owner is responsible for conducting regular inspections to see when maintenance is needed based on the maintenance indicators. During the first year of operation of a structural BMP, inspection is recommended at least once prior to August 31 and then monthly from September through May. Inspection during a storm event is also recommended. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined based on the results of the first year inspections.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to vegetation.	• Inspect monthly. If accumulated materials are observed blocking drainage, increase inspection frequency to monthly plus after every 0.1-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Obstructed inlet or outlet structure	Clear blockage.	• Inspect monthly and after every 0.5-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.	• Inspect annually. • Maintain when needed.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintain when needed.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Dead or diseased vegetation	Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintain when needed.
Overgrown vegetation	Mow or trim as appropriate.	• Inspect monthly. • Maintain when needed.
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.	• Inspect monthly. • Maintain when needed.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the County reviewer shall be contacted prior to any additional repairs or reconstruction.	• Inspect after every 0.5-inch or larger storm event. If erosion due to storm water flow has been observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed. If the issue is not corrected by restoring the BMP to the original plan and grade, the County reviewer shall be contacted prior to any additional repairs or reconstruction.
Standing water in BMP following a storm event	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, the County reviewer shall be contacted prior to any additional repairs or reconstruction.	• Inspect monthly and after every 0.5-inch or larger storm event. If standing water is observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Presence of mosquitos/larvae For images of egg rafts, larva, pupa, and adult mosquitos, see http://www.mosquito.org/biology	If mosquitos/larvae are observed: first, immediately remove any standing water by dispersing to nearby landscaping; second, make corrective measures as applicable to restore BMP drainage to prevent standing water. If mosquitos persist following corrective measures to remove standing water, the County reviewer shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.	• Inspect monthly and after every 0.5-inch or larger storm event. If mosquitos are observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed.

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