

STORMWATER CONTROL PLAN
for
Laurel Road and Country Hills Drive Development
City of Antioch, CA

May 18, 2023

Prepared for:

Brightsky Residential
9160 Irvine Center Dr., Suite 100
Irvine, CA 92618

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Stormwater Control Plan Sheet

Contra Costa County Clean Water Program IMP Sizing Tool Report

I. PROJECT DATA

Table 1 Project Data

Project Name/Number	Laurel Ranch
Project Location	APN 053-060-062-6, 053-060-057-6, 053-060-055-0 Antioch, CA 94509
Name of Developer	Brightsky Residential
Project Phase No.	NA
Project Type and Description	38 townhome buildings
Total Project Site Area (acres)	18.5 Acres
Total Area of Land Disturbed (acres)	14.1 Acres
Total New Impervious Surface Area (sq. ft.)	431,492 sq. ft.
Total Replaced Impervious Surface Area	0 sq. ft.
Total Pre-Project Impervious Surface Area	0 sq. ft.
Total Post-Project Impervious Surface Area	431,492 sq.ft.
50% Rule[*]	Applies
Project Density	11.6 DU/Ac.
Applicable Special Project Categories [Complete even if all treatment is LID]	None
Percent LID and non-LID treatment	100% LID
HM Compliance [†]	Applies

[*50% rule applies if: Total Replaced Impervious Surface Area > 0.5 x Pre-Project Impervious Surface Area]

[†HM required (unless project meets one of the exemptions on *Guidebook* p. 9) if:
(Total New Impervious Surface Area + Total Replaced Impervious Surface Area) ≥ 1 acre]

II. SETTING

II.A. Project Location and Description

The site is located at the southeast corner of Laurel Road and Country Hills Drive in Antioch, CA with its easterly property line adjacent to Highway 4. This 18.5-acre site consists of three parcels containing 38 proposed townhome buildings. All treatment and detention will be self-contained on the parcels via three proposed water quality/flow control basins.

II.B. Existing Site Features and Conditions

The site is undeveloped and located on hilly terrain with slopes as steep as 2:1 falling easterly with a grade differential of approximately 55 feet. The site is vacant and covered in dirt due to recent grading and construction staging activities. The site is bounded by Laurel Road, Country Hills Drive, and Highway 4. There is an existing 36-inch drain line flowing southerly along the east side of the site which was recently constructed with the residential development on the north side of Laurel Road.

II.C. Opportunities and Constraints for Stormwater Control

The site consists of impermeable clay soils and is located on steep terrain, making it difficult to have level areas for stormwater quality. Walls will need to be used to create a level open space area for stormwater quality. However, the steep terrain does provide sufficient hydraulic head for a storm drain system.

III. LOW IMPACT DEVELOPMENT DESIGN STRATEGIES

III.A. Optimization of Site Layout

The steep terrain limits the area that can be developed, leaving portions of the site for open space areas. The streets and hardscape are also designed to the minimum required by the City of Antioch in order to minimize impervious area.

III.B. Use of Permeable Pavements

The use of permeable pavements was not used in this development due to cost constraints and geotechnical considerations.

III.C. Dispersal of Runoff to Pervious Areas

The proposed development will have paved walkways that will slope towards landscaped areas where feasible. Roof leaders will be discharged to landscaped areas where feasible and where geotechnical considerations allow.

III.D. Bioretention or other Integrated Management Practices

Runoff from houses will be directed towards the streets where it will be collected by drain inlets, ultimately discharging to the bioretention basins.

IV. DOCUMENTATION OF DRAINAGE DESIGN

IV.A. Descriptions of each Drainage Management Area

IV.A.1. Table of Drainage Management Areas

Table 2 Drainage Management Areas

<i>DMA Name</i>	<i>Area (SF)</i>	<i>Surface Type/Description</i>	<i>DMA Type/Drains to</i>
DMA 1A	137,155	Pavement	Bioretention (TCM 1A & 1B)
DMA 1B	97,000	Roof	
DMA 1C	86,605	Landscape ¹	
DMA 2A	34,745	Pavement	Bioretention (TCM 2)
DMA 2B	35,000	Roof	
DMA 2C	25,800	Landscape ¹	
DMA 3A	55,593	Pavement	Bioretention (TCM 3)
DMA 3B	72,000	Roof	
DMA 3C	47,192	Landscape ¹	
DMA 4	175,440	Landscape	Self-Treating

¹ Landscape area includes water quality/flow-control basins.

IV.A.2. Drainage Management Area Descriptions

DMA 1, totaling 320,760 square feet, drains roadways, sidewalk, roof, and landscape to TCM 1A & 1B via road gutter and storm drain.

DMA 2, totaling 95,540 square feet, drains roadways, sidewalk, roof, and landscape to TCM 2 via road gutter and storm drain.

DMA 3, totaling 275,785 square feet, drains roadways, sidewalk, roof, and landscape to TCM 3 via road gutter and storm drain.

DMA 4, totaling 175,440 square feet is self-treating.

IV.B. Integrated Management Practice Descriptions

Runoff from the project site will be collected by a storm drain system and routed to bioretention facilities. The bioretention facilities will be constructed according to the criteria in the *Contra Costa Cleanwater Program C.3 Guidebook, 7th Edition*.

IV.C. Flow Control

This project is subject to hydromodification and Contra Costa County IMP Sizing Calculator was used for sizing calculations. The existing condition consists solely of undeveloped open space. The proposed development will use water quality/flow-control basins with metered outlets to mitigate flow to pre-development conditions.

V. TABULATION AND SIZING CALCULATIONS

Table 3 Information Summary for IMP Design

Total Project Area Requiring Treatment (SF)	591,090
Mean Annual Precipitation	12.5
IMP Designed For:	Treatment Plus Flow Control

V.A. Areas Draining to IMPs

Table 4 Drainage Management Area Summary

DMA	Total Drainage Area (SF)	Total Impervious Area (SF)	Total Pervious Area (SF)	Effective Impervious Area (SF)	Required Treatment (4%) (SF)	Provided Treatment Area (SF)	Required Flow-Control Volume (CF)	Provided Flow-Control Volume (CF)
1	320,155	234,155	86,605	242,815	9,713	17,130	36,032	37,000
2	95,540	69,745	25,800	72,324	2,893	6,685	10,732	10,963
3	275,785	127,593	47,192	132,312	5,292	13,445	19,634	21,512
4	175,440	0	175,440	-	-	-	-	-

VI. SOURCE CONTROL MEASURES

VI.A. Site activities and potential sources of pollutants

VI.B. Source Control Table

Table 5 Source Controls

<i>Potential source of runoff pollutants</i>	<i>Permanent source control BMPs</i>	<i>Operational source control BMPs</i>
On-site storm drain inlets	Mark all inlets with the words “No Dumping! Flows to Creek”	<p>Maintain and periodically repaint or replace inlet markings.</p> <p>Provide stormwater pollution prevention information to new site owners, lessees, or operators.</p> <p>See applicable operational BMPs in Fact Sheet SC-44, “Drainage System Maintenance,” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com</p> <p>Include the following in lease agreements: “Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential</p>
Landscape/ Outdoor Pesticide Use	<p>Final landscape plans will include:</p> <p>Landscape design to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.</p> <p>Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.</p> <p>Specify pest-resistant plants, especially adjacent to hardscape.</p> <p>Insure successful establishment by selecting plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.</p>	<p>Maintain landscaping using minimum or no pesticides.</p> <p>See applicable operational BMPs in Fact Sheet SC-41, “Building and Grounds Maintenance,” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com</p> <p>Provide IPM information to new owners, lessees and operators.</p>
Vehicle Cleaning, Repair and Maintenance	<p>No vehicle repair or maintenance will be done outdoors</p> <p>Management to prohibit on-site car washing.</p>	<p>No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinse water from parts cleaning into storm drains.</p> <p>No vehicle fluid removal shall be performed outside a building, nor</p>

		<p>on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.</p> <p>No person shall leave unattended drip parts or other open containers containing vehicle fluid.</p>
Private Streets		<p>Provide street sweeping on a regular basis to prevent accumulation of litter and debris.</p> <p>Collect debris from pressure washing to prevent entry into the storm drain system. Collect wash water containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.</p>

VI.C. Features, Materials, and Methods of Construction of Source Control BMPs

Source Control BMP's will be constructed per City of Antioch Standards. Drainage inlets will conform to city specifications and will be marked for no dumping. The proposed landscaped design will minimize irrigation and will maintain all native trees and shrubs where possible. Trees and shrubs will be selected based on suitability in the climate and soil conditions.

VII. STORMWATER FACILITY MAINTENANCE

VII.A. Ownership and Responsibility for Maintenance in Perpetuity

Proper operation and maintenance of stormwater management facilities will be the responsibility of the project Home Owner's Association (HOA) in perpetuity.

The applicant will prepare and submit, for the City's review, an acceptable Stormwater Control Operation and Maintenance Plan prior to the completion of construction.

VII.B. Summary of Maintenance Requirements for Each Stormwater Facility

The bioretention facilities will be maintained on the following schedule at a minimum. Details of maintenance responsibilities and procedures will be included in a Stormwater Facility Operation and Maintenance Plan. At no time will synthetic pesticides or fertilizers be applied, nor will any soil amendments, other than aged compost mulch or sand/compost mix, be introduced.

Weekly: The facilities will be examined for visible trash, and trash will be removed. Any graffiti, vandalism, or other damage will be noted and addressed within 48 hours.

Following Significant Rain Events

A significant rain event is one that produces approximately a half-inch or more rainfall in a 24-hour period. Within 24 hours after each such event, the following will be conducted:

- The surface of the facility will be observed to confirm ponding is not prolonged.

- The surface of the mulch layer will be inspected for movement of material. Mulch will be replaced and raked smooth if needed.
- Inlets will be inspected, and any accumulations of trash or debris will be removed. Any erosion at inlets should be restored to grade.
- Side slopes, if any, will be inspected for evidence of instability or erosion, and corrections will be made as necessary.
- Check dams will be inspected for movement and corrections made as necessary.
- Outlet structures will be inspected for any obstructions.

Prior to the Start of the Rainy Season

In September of each year, facility inlets and outlets, including flow-control orifices, will be inspected to confirm there is no accumulation of debris that would block flow. Stormwater should drain freely into the bioretention facilities.

If not previously addressed during monthly maintenance, any growth and spread of plantings that blocks inlets or the movement of runoff across the surface of the facility will be cut back or removed.

Annually During Winter

Once, in December – February of each year, vegetation will be cut back as needed, debris removed, and plants and mulch replaced as needed. The concrete work will be inspected for damage. The elevation of the top of soil and mulch layer will be confirmed to be consistent with the 6-inch reservoir depth.

VIII. CERTIFICATIONS

The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R2-2015-0049.

By

Print Name

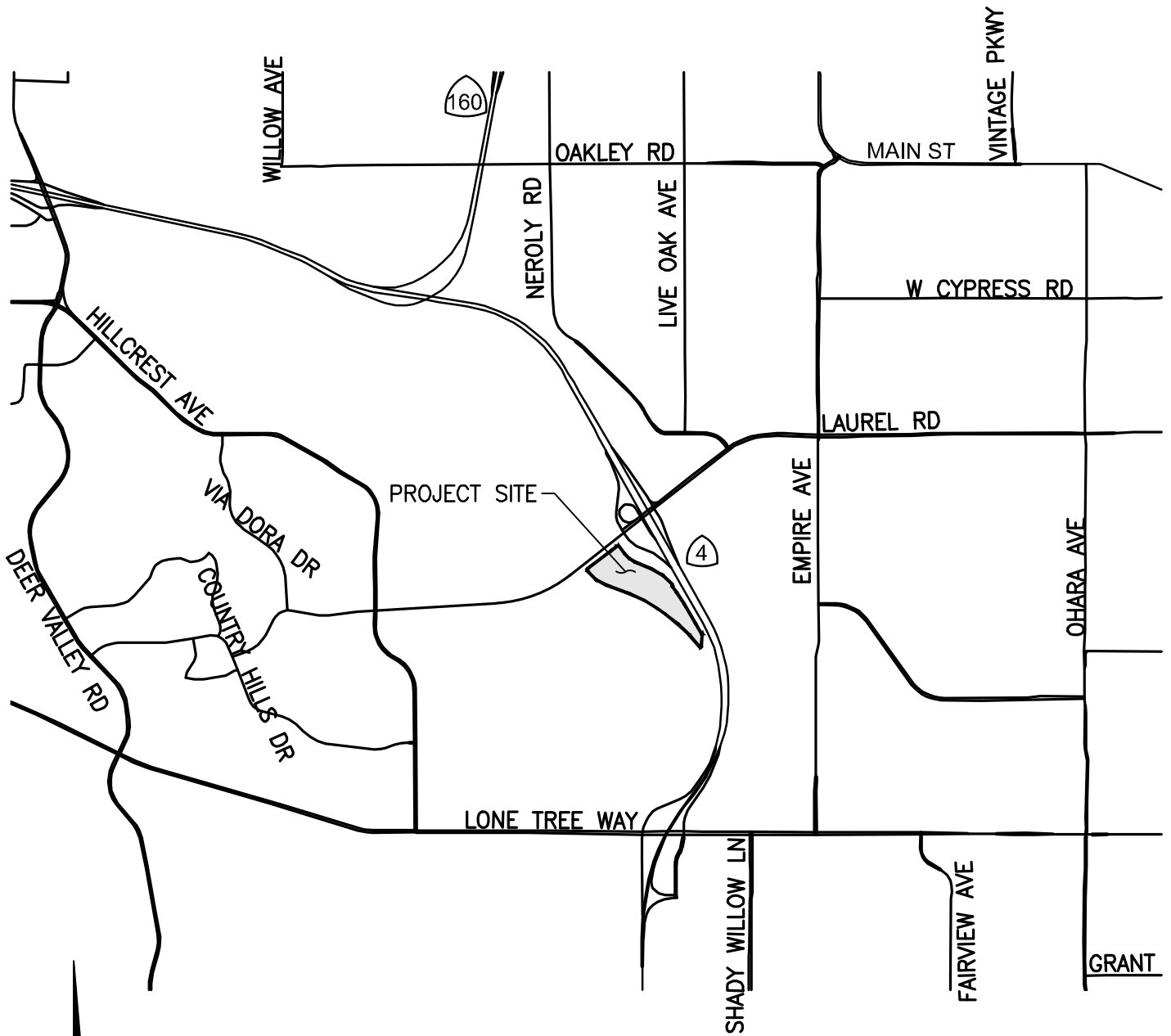
ATTACHMENTS

VICINITY MAP
LAUREL RANCH

ANTIOCH

CALIFORNIA

DECEMBER 2022



WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
4670 WILLOW ROAD, STE 125 TEL 925.847.1556
PLEASANTON, CA 94588 FAX 925.847.1557

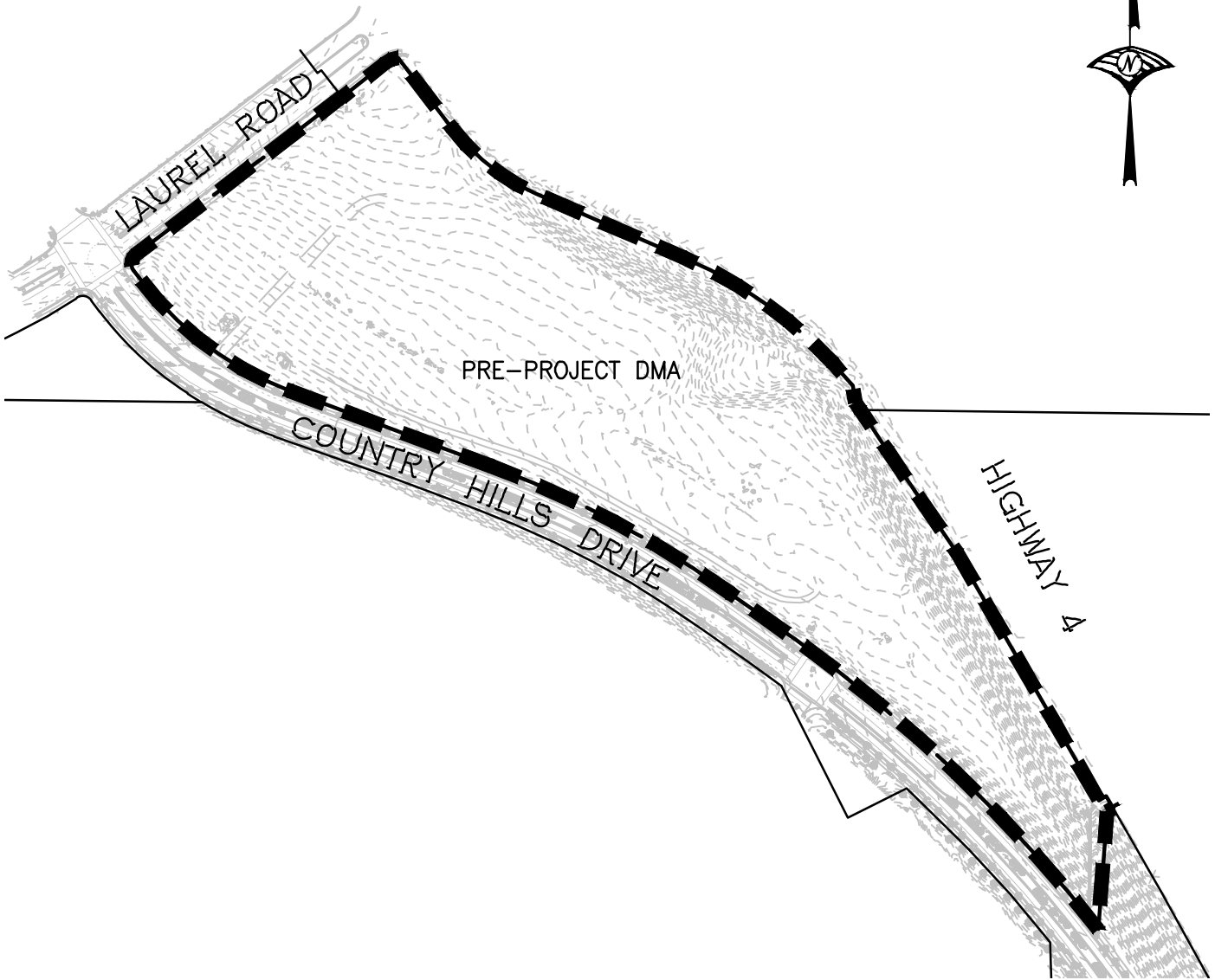
EXISTING CONDITIONS EXHIBIT

LAUREL RANCH

ANTIOCH

CALIFORNIA

DECEMBER 2022



300' 150' 0 300'



SCALE: 1" = 300'

LEGEND

■ ■ ■ DMA AREA



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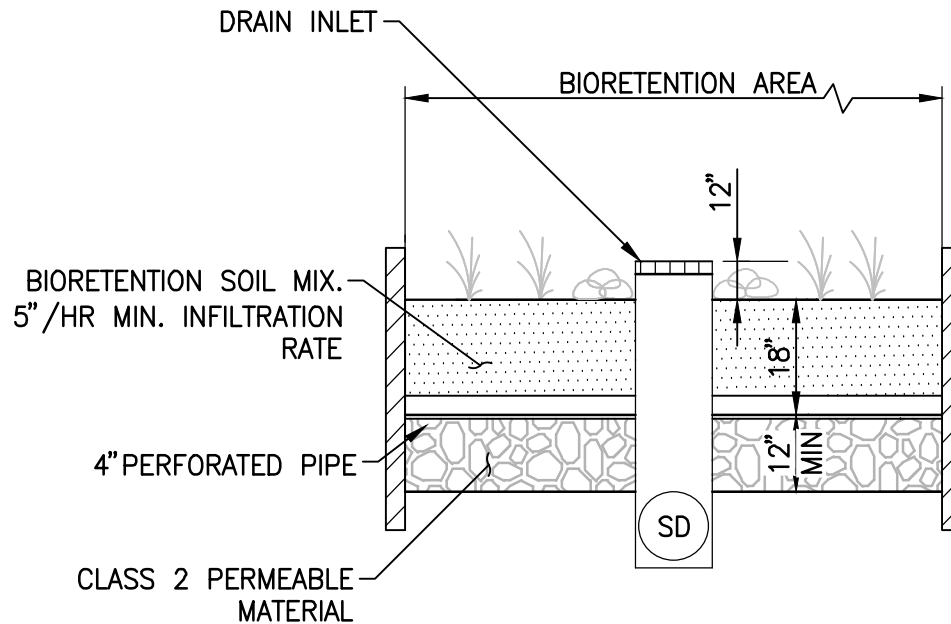
BIORETENTION/HYDROMODIFICATION BASIN SECTION

LAUREL RANCH

ANTIOCH

CALIFORNIA

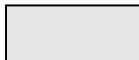
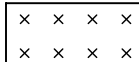



JANUARY 2023



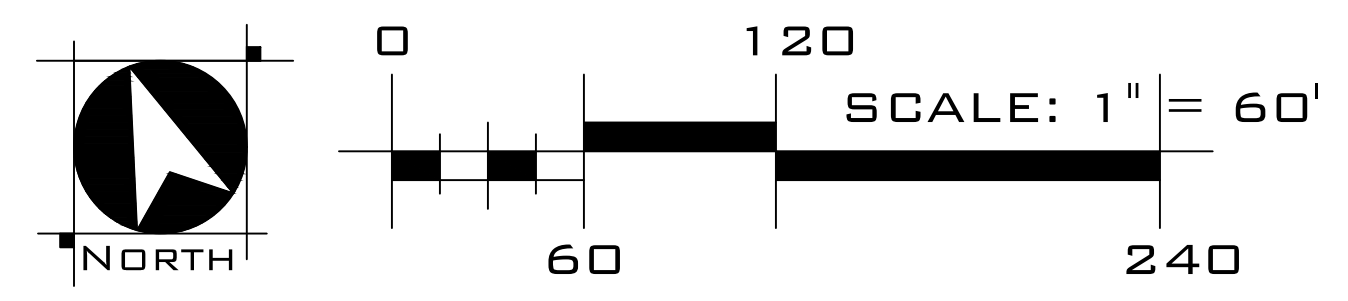
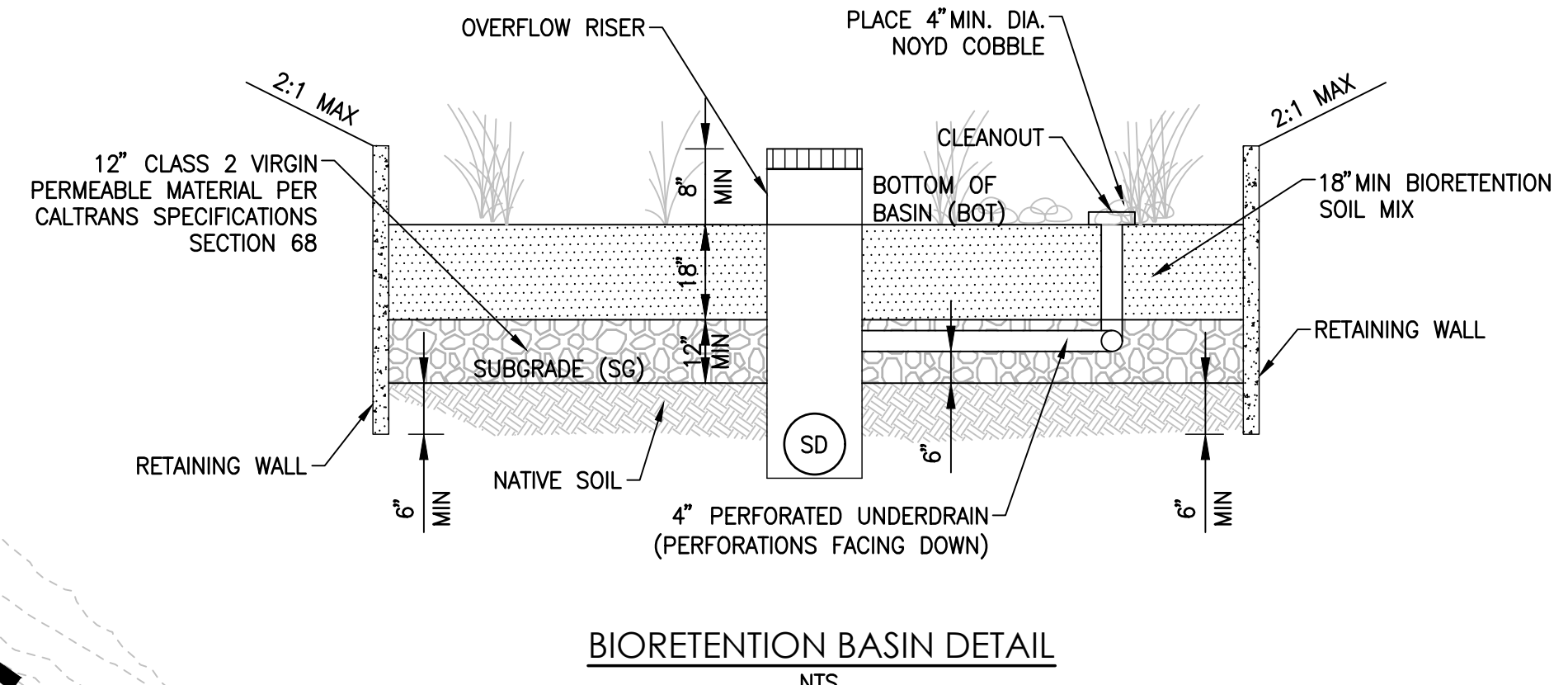
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DRAINAGE MANAGEMENT AREA (DMA) SUMMARY									
DMA	TOTAL DRAINAGE AREA (SF)	TOTAL IMPERVIOUS AREA (ROOFS AND PAVEMENT) (SF)	TOTAL PERVIOUS AREA (SF)	EFFECTIVE IMPERVIOUS AREA (SF)	REQUIRED TREATMENT AREA (4%) (SF)	PROVIDED TREATMENT AREA (SF)	REQUIRED FLOW-CONTROL VOLUME (CF)	PROVIDED FLOW-CONTROL VOLUME (CF)	TREATMENT MEASURE
1	320,760	234,155	86,605	242,815	9,713	17,130	36,032	37,000	BIORETENTION
2	95,540	69,745	25,800	72,324	2,893	6,685	10,732	10,963	BIORETENTION
3	275,785	127,593	47,192	132,312	5,292	13,445	19,634	21,512	BIORETENTION
4	175,440	0	175,440	-	-	-	-	-	SELF-TREATING

- LEGEND**
-  ASPHALT PAVING
 -  BIORETENTION
 -  DMA BOUNDARY
 -  DRAIN INLET
 -  STORM DRAIN MANHOLE

NOTES:
 1. ALL TREATMENT MEASURES AND TECHNICAL REQUIREMENTS FOR THIS PROJECT ARE BASED ON THE CONTRA COSTA CLEAN WATER PROGRAM C.3 GUIDEBOOK, 7TH EDITION
 2. REQUIRED TREATMENT AREA WAS CALCULATED USING THE CONTRA COSTA CLEAN WATER PROGRAM IMP SIZING TOOL SOFTWARE.



LAUREL RD & COUNTRY HILLS DR DEVELOPMENT
 ANTIOCH, CALIFORNIA
 JANUARY 2023 (REVISED MARCH 24, 2023)

STORMWATER CONTROL PLAN
C7

WOOD RODGERS
 BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
 4670 WILLOW ROAD, SUITE 125 Tel 925.847.1556
 Pleasanton, CA. 94588 Fax 925.847.1557

Project Name: Laurel Ranch Apartments
Project Type: Treatment and Flow Control
APN:
Drainage Area: 591,090
Mean Annual Precipitation: 12.5

IV. Areas Draining to IMPs

IMP Name: TCM 1A & 1B
IMP Type: Bioretention Facility
Soil Group: TCM 1A & 1B

DMA Name DMA1	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
					IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
DMA1A	137,155	Concrete or Asphalt	1.00	137,155				
DMA1B	97,000	Conventional Roof	1.00	97,000				
DMA1C	69,475	Landscape	0.70	48,633				
Total				282,788				
Area					0.050	1.339	18,930	17,130
Surface Volume					0.042	1.339	15,901	17,130
Subsurface Volume					0.055	1.339	20,823	19,871
Maximum Underdrain Flow (cfs)								0.28
Orifice Diameter (in)								3.39

IMP Name: TCM 2
IMP Type: Bioretention Facility
Soil Group: TCM 2

DMA Name DMA2	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
					IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
DMA2A	34,745	Concrete or Asphalt	1.00	34,745				
DMA2B	35,000	Conventional Roof	1.00	35,000				
DMA2C	19,115	Landscape	0.70	13,381				
Total				83,126				
Area					0.050	1.339	5,564	6,685
Surface Volume					0.042	1.339	4,674	6,685
Subsurface Volume					0.055	1.339	6,121	4,278
Maximum								0.08

Underdrain Flow (cfs)	
Orifice Diameter (in)	1.83

IMP Name: TCM 3
IMP Type: Bioretention Facility
Soil Group: TCM 3

DMA Name DMA3	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume	
DMA3A	55,593	Concrete or Asphalt	1.00	55,593						
DMA3B	72,000	Conventional Roof	1.00	72,000						
DMA3C	33,747	Landscape	0.70	23,623						
Total				151,216						
					Area	0.050	1.339	10,122	13,445	
					Surface Volume	0.042	1.339	8,503	13,445	
					Subsurface Volume	0.055	1.339	11,135	8,067	
									Maximum Underdrain Flow (cfs)	0.15
									Orifice Diameter (in)	2.47