Golden Oak Development

Oakley, CA

Preliminary Stormwater Control Plan

May 2022

Prepared for:
S&Y Properties

Prepared By:

FREYER & LAURETA, INC.

Table of Contents

Tables

Figures

Appendices

Abbreviations

BF#1	Bioretention Facility #1
BF#2	Bioretention Facility #2
BF#3	Bioretention Facility #3
BMP	Best Management Practices
DMA	Drainage Management Area
IMP	Integrated Management Practices
LID	Low Impact Development
SF	Square Feet

1 Project Data

Table 1. Project Data

Project Name/Number	Golden Oak Subdivision
Application Submittal Date	December 20, 2021
Project Location	4960 Fuschia Way, Oakley, CA 94561
Name of Developer	S&Y Properties
Project Phase No.	Not applicable
Project Type and Description	Seven single family homes with public and private streets and associated infrastructure
Project Watershed	East County Delta Drainages
Total Project Site Area	1.99 Acres
Total Area of Land Disturbed	1.99 Acres
Total New Impervious Surface Area	35,660 SF
Total Replaced Impervious Surface Area	3,497 SF
Total Pre-Project Impervious Surface Area	9,437 SF
Total Post-Project Impervious Surface Area	41,600 SF
50% Rule	Applies
Project Density	FAR = 0.27
Applicable Special Project Categories	None
Percent LID and non-LID treatment	100% LID
HMP Compliance	Not Applicable, project is located in a hardened subbasin and therefore exempt. Stormwater facilities on site have been designed for treatment only.

2 Setting

2.1 Project Location and Description

The project consists of seven new single-family homes, one existing to remain, utility mains and service laterals, a new street with a tributary private access road, and sidewalks. The site is a 2-acre parcel on Fuschia Way, two miles east of CA-160. See Figure 1.

2.2 Existing Site Features and Conditions

The existing site is a 2-acre parcel, with one existing single-family home on site that is to remain. Existing land use and zoning are both residential. See Figure 2. The existing slope on site ranges from about 0.4%-0.7%. Per the geotechnical report, the subsurface conditions of the site consisted of a mixture of non-expansive silty and clayey sand with layers of sand and clay interbedded to the explored depth of 50 feet. Groundwater was encountered at a range of 15-18 feet throughout the site.

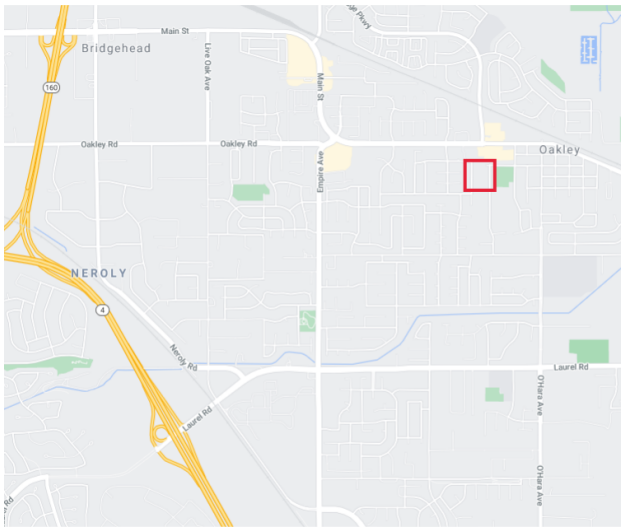
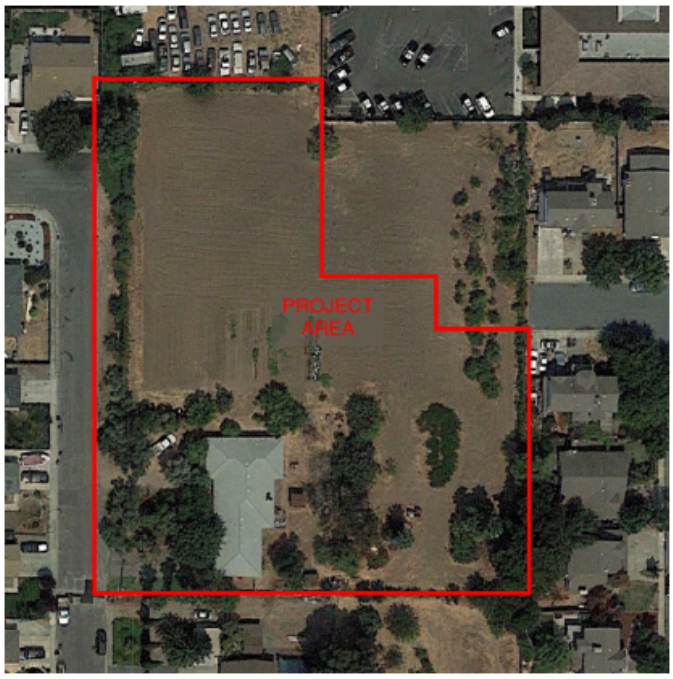


Figure 1. Vicinity Map

2.3 Opportunities and Constraints for Stormwater Control

In the existing condition, the onsite soils, being silty, clayey sand promote infiltration. Excess runoff primarily flows into Fuschia Way and West Ruby Road and into the existing catch basins on either side of the site. The planned development includes single family homes with front, side, and rear yards. Site runoff will be managed by dispersal in the planned landscaped areas, permeable pavement, or through treatment by bioretention facilities. Easement space has been allocated to serve as facilities for proposed bioretention to treat runoff as it flows into the main line which will connect to the future Line J storm drain, running north on the east side of Fuschia Way.



Source: Google Earth, 2021

Figure 2. Existing Site Conditions

3 Low Impact Development Design Strategies

3.1 Optimization of Site Layout

The proposed site is consistent with the existing development in zoning and land use. Minimum requirements dictated by the City and Fire District have been met to allow minimization of impervious areas (streets, sidewalks, driveways, pavements, etc.) to achieve a low impact design. Some easements adjacent to the proposed streets will have bioretention facilities that will act as buffers to the residences and public access points respectively.

To offset the lack of available space for bioretention treatment in certain areas, enough bioretention space has been allocated along Fuschia Way to treat equal amounts of runoff. Areas not readily accessible to available bioretention have been designated as tradeoff areas.

3.2 Use of Permeable Pavement

Construction of the hardscaped areas including the streets, sidewalks, and driveways, will be paved using conventional concrete and asphalt. Use of permeable pavement on the private road will be used to offset the amount of stormwater running off impervious area that would need to be treated post construction. The private road is then self-retaining, allowing for the areas designated for Bioretention Facility #2 and #3 to be sufficient in treating their respective Drainage Management Area (DMA).

3.3 Dispersal of Runoff to Pervious Areas

Runoff from impervious areas of each lot is proposed to drain out to pervious areas. Excess runoff from the lot frontage, front yard, and side yards will flow to the respective bioretention facility through careful grading of each lot. Runoff from areas on the rear portion of the house/property will infiltrate into landscaped rear yards. Grading of the landscapes adjacent to the homes will meet the City's minimum requirements and as recommended by the Project's geotechnical report, provided by Engeo dated April 2021, to prevent ponding and promote proper flow of runoff.

3.4 Bioretention or other Integrated Management Practices (IMPs)

Runoff to be directed to bioretention facilities has been portioned out per DMA to flow in specific directions depending on the parcel, surface, and facility (See Appendix A).

4 Documentation of Drainage Design

4.1 Descriptions of each Drainage Management Area

Table 2. Drainage Management Areas

	DMA ID	*Area (SF)*	*Surface Type*	*Description*	*DMA Type/Drains to*
Parcel 1	1.11	4,502	Roof	Roofs	Drains to IMP (BF #1.1)
	1.21	1,392	Paved	Driveways	Drains to IMP (BF #1.1)
	1.31	10,109	Landscaped	Landscape	Drains to IMP (BF #1.1)
Parcel 2	1.12	3,362	Roof	Roofs	Drains to IMP (BF #1.2)
	1.22	468	Paved	Driveways	Drains to IMP (BF #1.2)
	1.32	5,323	Landscaped	Landscape	Drains to IMP (BF #1.2)
Parcel 3	1.13	2,085	Roof	Roofs	Drains to IMP (BF #1.3)

	DMA ID	*Area (SF)*	*Surface Type*	*Description*	*DMA Type/Drains to*
	1.23	571	Paved	Driveways	Drains to IMP (BF #1.3)
	1.33	4,858	Landscaped	Landscape	Drains to IMP (BF #1.3)
Parcel 4	2.11	1,616	Roof	Roofs	Drains to IMP (BF #2)
	2.21	448	Paved	Driveways	Drains to IMP (BF #2)
	2.31	3,317	Landscaped	Landscape	Drains to IMP (BF #2)
Parcel 5	2.12	2,678	Roof	Roofs	Drains to IMP (BF #2)
	2.22	646	Paved	Driveways	Drains to IMP (BF #2)
	2.32	3,199	Landscaped	Landscape	Drains to IMP (BF #2)
Parcel 6	3.11	2,708	Roof	Roofs	Drains to IMP (BF #3.1)
	3.21	450	Paved	Driveways	Drains to IMP (BF #3.1)
	3.31	3,471	Landscaped	Landscape	Drains to IMP (BF #3.1)
Parcel 7	3.12	2,707	Roof	Roofs	Drains to IMP (BF #3.2)
	3.22	450	Paved	Driveways	Drains to IMP (BF #3.2)
	3.32	3,146	Landscaped	Landscape	Drains to IMP (BF #3.2)
Parcel 8	3.13	2,057	Roof	Roofs	Drains to IMP (BF #3.3)
	3.23	300	Paved	Driveways	Drains to IMP (BF #3.3)
	3.33	3,521	Landscaped	Landscape	Drains to IMP (BF #3.3)
Public Road	1.41	1,145	Paved	Sidewalks, Fuschia, and W Ruby Extension	Drains to IMP (BF #1.1)
Public Road	1.42	644	Paved	Sidewalks, Fuschia, and W Ruby Extension	Drains to IMP (BF #1.2)
Public Road	1.43	1,285	Paved	Sidewalks, Fuschia, and W Ruby Extension	Drains to IMP (BF #1.3)
Public Road	2.41	5,596	Paved	Sidewalks, Fuschia, and W Ruby Extension	Drains to IMP (BF #2)

	DMA ID	*Area (SF)*	*Surface Type*	*Description*	*DMA Type/Drains to*
Private Road	4.51	5,903	Permeable Pavement	Sidewalks, Fuschia, and W Ruby Extension	Self-Retaining
Public Road	5.41	6,345	Paved	Tradeoff Area	Southside of West Ruby Extension to be traded for runoff on Fuschia
Public Road	5.42	3,374	Paved	Tradeoff Area	Drains to IMP (BF #1.1)
Public Road	5.43	2,971	Paved	Tradeoff Area	Drains to IMP (BF #1.3 and #1.4)

4.1.1 Drainage Management Area Descriptions

Roofs (DMAs 1.11, 1.12, 1.13, 2.11, 2.12, 3.11, 3.12, and 3.13, totaling 21,715 square feet), drain via gutters to driveways or swales adjacent to the driveways and from there to the street gutters, which drain to Bioretention Facilities #1, #2, and #3, respectively.

Driveways (DMAs 1.21, 1.22, 1.23, 2.22, 2.23, 3.21, 3.22, and 3.23, totaling 4,725 square feet drain to the street gutters, which drain to Bioretention Facilities #1, #2, and #3, respectively.

Sidewalks, Fuschia St., and West Ruby Extension (DMAs 1.41, 1.42, 1.43 and 2.41 totaling 8,670 square feet) drain to Bioretention Facilities #1 and #2 respectively.

Private Road (4.51, totaling 5,903 square feet) is permeable pavement and self-retaining.

Landscape (DMAs 1.31, 1.32, 1.33, 2.31, 2.32, 3.31, 3.32, and 3.33, totaling 36,944 square feet) will be graded slightly concave to promote runoff retention and to direct excess run off to Bioretention Facilities #1, #2, and #3, respectively.

Tradeoff Areas (DMAs 5.42 and 5.43, totaling 6,345 square feet) equivalent amount of runoff from Fuschia Way to be treated by Bioretention Facility #1 in lieu of runoff from West Ruby that cannot be accommodated by Bioretention Facility #2.

4.2 Integrated Management Practices

Runoff directed from hardscaped areas will flow down and be directed to their respective treatment facilities, either through landscaping grades or curbs and gutters lining the adjacent streets. **Bioretention Facility (BF) #1 (Sub-IMPs #1.1 – 1.4)** sits within an easement on the east side of Fuschia Way, treating runoff from Parcels 1,2, 3, and the adjacent road frontage. Water will enter these bioretentions through curb cuts and curb drains along Fuschia Way. Runoff from the existing northwest residences, Parcels 4 and 5, and the northern half of the West Ruby Extension will be directed by way of sheet flow and curb drains to **Bioretention Facility #2**, which is adjacent to the future police parking lot and

within an easement on the north side of the West Ruby extension. **Bioretention Facility #3 (Sub-IMPs #3.1 – 3.3)** is located in the easements at the front of Parcels 6, 7, and 8 on the east side of the private road (See SWCP Exhibit). Due to the limited space available to size **Bioretention Facilities #1 and #2** have been designed with extra area to treat runoff on the east side of Fuschia Way to compensate for runoff from West Ruby Extension as a tradeoff. In the event that the sub-IMPs are inundated with runoff, excess runoff will be directed through the curb and gutter channels to adjacent sub-IMPs to be treated. All sidewalks, curbs, and gutters fronting bioretention facilities will have curb drains or curb cutouts to facilitate flow into the treatment facility (See SWCP Exhibit).

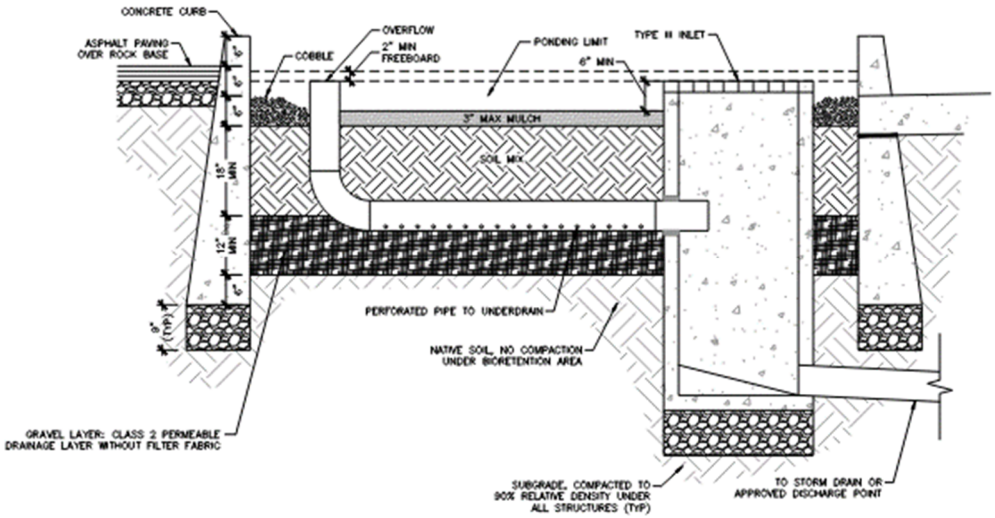


Figure 3. Bioretention Facility Cross-Section

Facilities will be designated to meet criteria in the Stormwater C.3 Guidebook, 7th Edition. Detail of the design and construction will be finalized further in the improvement plans, but will include at a minimum:

- Flat and level layers of gravel, soil, sand, compost and/or mulch
- Concrete curb perimeter
- Overflow grates, underdrains, irrigation systems
- Water-wise plantings

4.3 Tabulation and Sizing Calculations

See Appendix C, Output from the IMP Sizing Calculator.

5 Source Control Measures

5.1 Site Activities and Potential Sources of Pollutants

Indoor and structural pest control, as well as landscape maintenance, can potentially produce stormwater pollutants if done onsite.

5.2 Source Control Table

Table 3. Source Control Table

Potential Source of Runoff Pollutants	*Permanent Source Control BMPs*	*Operation Source Control BMPs*

Indoor and structural pest control	Decreasing pest entry potential with new construction	New homeowners to be provided with IPM information
Landscape maintenance	Plants to be included in the landscape design will account for ecological consistency and typical conditions of the site. Increasing pest resistance to minimize need for synthetic fertilizer or pesticide will be accounted for in the overall landscape design.	New homeowners to be provided with IPM information. Maintenance of landscape will use little to no fertilizer or pesticide.
On-site storm drain inlets	"No Dumping! Flows to the Bay" to be marked on all inlets.	New homeowners to be provided with IMP information. Markings to be maintained for legibility, to be repainted or replaced as needed.

6 Stormwater Facility Maintenance

6.1 Ownership and Responsibility for Maintenance in Perpetuity

Easements behind the back of walk have been allocated for use by the recommended IMPs in order to facilitate the joint maintenance required per Table 4.

Table 4. Facility Maintenance Designation

IMP	Sub-IMP	Location	Joint Maintenance By
Bioretention Facility # 1	BF #1.1	East side of Fuschia Way, fronting Parcel 1	Owner of Parcel 1
	BF #1.2	East side of Fuschia Way, fronting Parcel 2	Owner of Parcel 2
	BF #1.3	East side of Fuschia Way, fronting Parcel 3	Owner of Parcel 3
	BF #1.4	East side of Fuschia Way, in bulb out	Homeowner's Association
Bioretention Facility # 2	-	Adjacent to Oakley Police Department parking lot	Homeowner's Association
Bioretention Facility # 3	BF #3.1	Private Road, fronting Parcel 6	Owner of Parcel 6
	BF #3.2	Private Road, fronting Parcel 7	Owner of Parcel 7
	BF #3.3	Private Road, fronting Parcel 8	Owner of Parcel 8

Provisions in the subdivision map, Conditions, Covenants, and Restrictions (CC&Rs) recorded now and in the future for the continued operation and maintenance of the facilities must be reviewed and followed by all future owners. Facilities will be financed by the owner and maintained by the Homeowner's Association (HOA). Interim operation and maintenance of facilities shall be the responsibility of the owner.

6.2 Summary of Maintenance Requirements for Each Stormwater Facility

A Stormwater Facility Operation and Maintenance Plan, containing maintenance responsibilities and procedures information, will be submitted for review and approval. Maintenance requirements per Table 5 will be upkept to a minimum for all facilities.

Table 5. Maintenance Requirements

Timing	Maintenance Requirements
Weekly/Quarterly	• Removal of visible trash or graffiti
After Significant Rain Events	• Inspection for: o Debris needing to be removed o Surface mulch needing replacement or adjustment o Any observable signs of ponding
September	• Inspection for: o Debris needing to be removed o Surface mulch needing replacement or adjustment
Annually	• Landscape Maintenance o Concrete status and upkeep o Trimming of vegetation o Replacement of plants, soil, and mulch as needed

Synthetic pesticides or fertilizer or extraneous soil amendments will be avoided.

7 Construction Plan C.3 Checklist

This section will be finalized upon development of the improvement plans to be provided at a later date.

Table 5. Construction Plan C.3 Checklist

Stormwater Control Plan Page #	*BMP Description*	*See Plan Sheet #s*
SWCP Exhibit	Drainage from DMAs 4, 5, 6, and 7 is retained by surrounding curbs.	TBD
SWCP Exhibit	Drainage from rear roofs is directed and dispersed to rear yards	TBD
SWCP Exhibit	Rear yards are graded concave	TBD
SWCP Exhibit	Front yards are graded concave	TBD
SWCP Exhibit	Front roofs and driveways drain to street	TBD

SWCP and Grading Exhibit	Street drains to bioretention facilities. High point/grade break as shown on Exhibit	TBD
N/A	Bioretention facilities are constructed per criteria in the *Stormwater C.3 Guidebook*	TBD

8 Certifications

The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan attempt to meet the requirements of Regional Water Quality Control Board Order R2-2015-0049. Certification to be stated upon issuance of final storm water control plan.

_____ _____

Signature Date

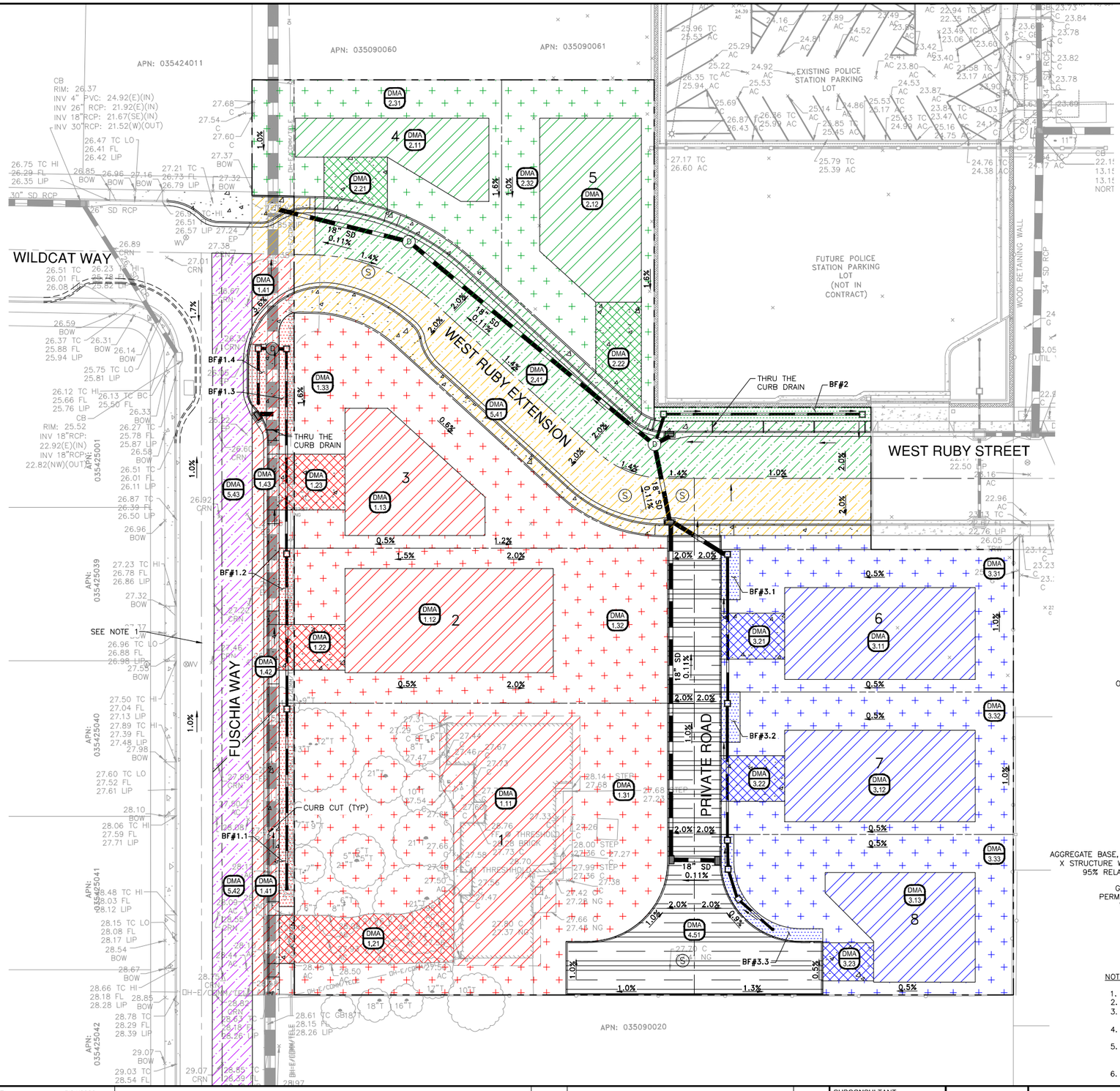
_____

Print Name

9 References

Contra Costa Clean Water Program	Stormwater C.3 Guidebook – Stormwater Quality Requirements for Development Applications prepared by Contra Clean Water Program 7th Edition dated May 17, 2017.
California State Water Resources Control Board, 2011	Runoff Coefficient (C) Fact Sheet prepared by the California State Water Resources Control Board dated 2011.
National Oceanic and Atmospheric Administration, 2017	NOAA Atlas 14 Point Precipitation Frequency Estimates: Ca prepared by the U.S. Department of Commerce – National Oceanic and Atmospheric Administration dated April 21, 2017.
Contra Costa County, 1973	Roughness Factor (Manning's n) for Pipes and Channels prepared by Contra Costa County, October 1973.
Engeo, 2021	Geotechnical Exploration prepared by Engeo dated April 23, 2021.
National Resources Conservation Service	GIS prepared by the National Resources Conservation Service accessed April, 2021.

APPENDIX A: PRELIMINARY STORM WATER CONTROL PLAN



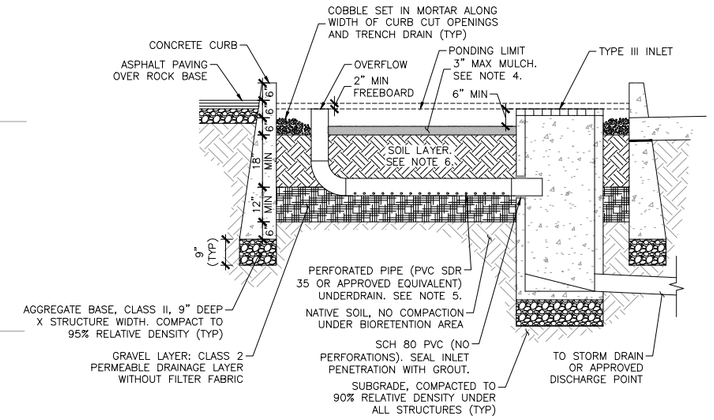
LEGEND

- BF#1 – BIORETENTION AREA
- BF#1 – SURFACE TYPE: 1 – ROOF
- BF#1 – SURFACE TYPE: 2 – DRIVEWAY
- BF#1 – SURFACE TYPE: 3 – LANDSCAPE
- BF#1 – SURFACE TYPE: 4 – ROADWAY
- BF#2 – BIORETENTION AREA
- BF#2 – SURFACE TYPE: 1 – ROOF
- BF#2 – SURFACE TYPE: 2 – DRIVEWAY
- BF#2 – SURFACE TYPE: 3 – LANDSCAPE
- BF#2 – SURFACE TYPE: 4 – ROADWAY
- BF#3 – BIORETENTION AREA
- BF#3 – SURFACE TYPE: 1 – ROOF
- BF#3 – SURFACE TYPE: 2 – DRIVEWAY
- BF#3 – SURFACE TYPE: 3 – LANDSCAPE
- BF#3 – SURFACE TYPE: 4 – ROADWAY
- TRADE OFF AREA – SURFACE TYPE: 4 – ROADWAY
- EQUIVALENT SPACE – SURFACE TYPE: 4 – ROADWAY
- SURFACE TYPE: 5 – PERMEABLE PAVEMENT
- DRAINAGE MANAGEMENT ID (DMA 1.11)
  - SURFACE ID
  - SURFACE TYPE
  - BIORETENTION FACILITY ID
- X.X% DIRECTION AND SLOPE OF PIPE FLOW
- DIRECTION OF OVERLAND FLOW

NOTE:

1. EQUIVALENT RUNOFF FROM FUSCHIA WAY TO BE TREATED IN BIORETENTION FACILITY #1 IN EXCHANGE FOR RUNOFF FROM DMA 5.41, AS REPRESENTED BY THE PURPLE AREAS IN DMA 5.42 AND DMA 5.43.

PARCEL	DMA ID	AREA (SF)	DESCRIPTION	DMA TYPE/DRAINS TO
1	1.11	4,502	ROOF	BF#1.1
1	1.21	1,392	DRIVEWAY	BF#1.1
1	1.31	10,109	LANDSCAPE	BF#1.1
2	1.12	3,362	ROOF	BF#1.2
2	1.22	468	DRIVEWAY	BF#1.2
2	1.32	5,323	LANDSCAPE	BF#1.2
3	1.13	2,085	ROOF	BF#1.3
3	1.23	571	DRIVEWAY	BF#1.3
3	1.33	4,858	LANDSCAPE	BF#1.3
4	2.11	1,616	ROOF	BF#2
4	2.21	448	DRIVEWAY	BF#2
4	2.31	3,317	LANDSCAPE	BF#2
5	2.12	2,678	ROOF	BF#2
5	2.22	646	DRIVEWAY	BF#2
5	2.32	3,199	LANDSCAPE	BF#2
6	3.11	2,708	ROOF	BF#3.1
6	3.21	450	DRIVEWAY	BF#3.1
6	3.31	3,471	LANDSCAPE	BF#3.1
7	3.12	2,707	ROOF	BF#3.2
7	3.22	450	DRIVEWAY	BF#3.2
7	3.32	3,146	LANDSCAPE	BF#3.2
8	3.13	2,057	ROOF	BF#3.3
8	3.23	300	DRIVEWAY	BF#3.3
8	3.33	3,521	LANDSCAPE	BF#3.3
FUSCHIA WAY	1.41	1,145	SIDEWALK, FUSCHIA WAY	BF#1.1
FUSCHIA WAY	1.42	644	SIDEWALK, FUSCHIA WAY	BF#1.3
FUSCHIA WAY	1.43	1,285	SIDEWALK, FUSCHIA WAY	BF#1.3
WEST RUBY EXTENSION	2.41	5,596	SIDEWALKS, FUSCHIA, AND W RUBY EXTENSION	BF#2
PRIVATE ROAD	4.51	5,903	PERMEABLE PAVEMENT	SELF-RETAINING
WEST RUBY EXTENSION	5.41	6,345	TRADEOFF AREA	SEE NOTE 1
FUSCHIA WAY	5.42	3,374	EQUIVALENT SPACE	BF#1.1
FUSCHIA WAY	5.43	2,971	EQUIVALENT SPACE	BF#1.3,1.4



BIORETENTION DETAIL

SCALE: NTS

NOTES:

1. NO LINER, NO FILTER FABRIC, NO LANDSCAPE CLOTH.
2. ELEVATION OF PERFORATED PIPE UNDERDRAIN IS ATOP GRAVEL LAYER.
3. ALL CONCRETE STRUCTURES (VERTICAL, CURB, INLET) SHALL BE CONSTRUCTED ATOP 9" DEEP CLASS II AB AND COMPACTED SUBGRADE.
4. ALL MULCH WITHIN STORMWATER PLANTING AREAS SHALL BE 3" OF WASHED PEA GRAVEL. CONTRACTOR SHALL SUBMIT SAMPLE FOR REVIEW AND APPROVAL.
5. UNDERDRAIN SHALL HAVE OUTLET LOCATED FLUSH OR NEARLY FLUSH WITH PLANTER BOTTOM, WITH CLEANOUT PORT CONSISTING OF A VERTICAL, RIGID, NON-PERFORATED PVC PIPE. IT SHALL BE CONNECTED TO THE UNDERDRAIN VIA A SWEEP BEND, WITH A MINIMUM DIAMETER OF 4" AND A WATERTIGHT CAP.
6. SOIL LAYER SHALL CONSIST OF SOIL MIX WITH MINIMUM LONG-TERM INFILTRATION RATE OF 5"/HOUR.

NORTH

NOT TO SCALE

DATE:	5/24/2022
SCALE:	AS SHOWN
DESIGNED:	CSM
DRAWN:	CSM
CHECKED:	RJL
PROJ. ENGR:	LFH

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DATE	DESCRIPTION OF REVISIONS	APP'D

SUBCONSULTANT:

PRELIMINARY STORMWATER CONTROL PLAN

TENTATIVE PARCEL MAP NO. 9580
GOLDEN OAK SUBDIVISION
OAKLEY, CALIFORNIA

SHEET **SWCP**

JOB NO. 316002

APPENDIX B: PRELIMINARY GRADING PLAN

EARTHWORK SUMMARY		
CUT (CY±)	FILL (CY±)	NET CUT (CY±)
2,053	141	712

NOTES:

1. LOTS HAVE BEEN CONCEPTUALLY GRADED TO DRAIN.
2. PAD ELEVATIONS ARE APPROXIMATE AND SUBJECT TO CHANGE.

WILDCAT WAY

FUSCHIA WAY

WEST RUBY STREET

DUARTE AVENUE

OAKLEY CITY HALL

FUTURE POLICE STATION PARKING LOT (NOT IN CONTRACT)

EXISTING POLICE STATION PARKING LOT

SINGLE STORY STUCCO HOUSE

APN: 035424011
APN: 035090060
APN: 035090061
APN: 035425001
APN: 035425039
APN: 035425040
APN: 035425041
APN: 035425042
APN: 035090020
APN: 035682001
APN: 035682002
APN: 035682003
APN: 035681008
APN: 035681007
APN: 035681006
APN: 035681005

NORTH

NOT TO SCALE

DATE:	5/24/2022
SCALE:	AS SHOWN
DESIGNED:	CSM
DRAWN:	CSM
CHECKED:	RJL
PROJ. ENGR:	LFH

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DATE	DESCRIPTION OF REVISIONS	APP'D

SUBCONSULTANT:

PRELIMINARY GRADING PLAN

TENTATIVE PARCEL MAP NO. 9580
GOLDEN OAK SUBDIVISION
OAKLEY, CALIFORNIA

SHEET
GRADING

JOB NO.
316002

APPENDIX C: IMP SIZING CALCULATOR OUTPUT

Project Name: Golden Oak Subdivision
Project Type: Treatment Only
APN: 035-090-080
Drainage Area: 86,492
Mean Annual Precipitation: 11.3

II. Self-Retaining Areas

Self-Retaining DMA	
DMA Name	**Area (sq ft)**
DMA 4.51	5,903

IV. Areas Draining to IMPs

IMP Name: Bioretention Facility #1.1
IMP Type: Bioretention Facility
Soil Group: Bioretention Facility #1.1

DMA Name	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
DMA 1.11	4,502	Conventional Roof	1.00	4,502
DMA 1.21	1,392	Concrete or Asphalt	1.00	1,392
DMA 1.31	10,109	Landscape	0.10	1,011
DMA 1.41	1,145	Concrete or Asphalt	1.00	1,145
DMA 5.42	3,374	Concrete or Asphalt	1.00	3,374
			Total	11,424
			Area	

IMP Sizing

IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
0.040	1.000	457	474

IMP Name: Bioretention Facility #1.2
IMP Type: Bioretention Facility
Soil Group: Bioretention Facility #1.2

DMA Name	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
DMA 1.12	3,362	Conventional Roof	1.00	3,362
DMA 1.22	468	Concrete or Asphalt	1.00	468
DMA 1.32	5,323	Landscape	0.10	532
			Total	4,362
			Area	

IMP Sizing

IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
0.040	1.000	174	179

IMP Name: Bioretention Facility #1.3

IMP Type: Bioretention Facility
Soil Group: Bioretention Facility #1.3

DMA Name	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
DMA 1.13	2,085	Conventional Roof	1.00	2,085
DMA 1.23	571	Concrete or Asphalt	1.00	571
DMA 1.33	4,858	Landscape	0.10	486
DMA 1.42	644	Concrete or Asphalt	1.00	644
DMA 1.43	1,285	Conventional Roof	1.00	1,285
			Total	5,071
			Area	

IMP Sizing

IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
0.040	1.000	203	275

IMP Name: Bioretention Facility #1.4
IMP Type: Bioretention Facility
Soil Group: Bioretention Facility #1.4

DMA Name	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
DMA 5.43	2,971	Concrete or Asphalt	1.00	2,971
			Total	2,971
			Area	

IMP Sizing

IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
0.040	1.000	119	180

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

DMA Name	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
DMA 2.11	1,616	Conventional Roof	1.00	1,616
DMA 2.21	448	Concrete or Asphalt	1.00	448
DMA 2.31	3,317	Landscape	0.10	332
DMA 2.12	2,678	Conventional Roof	1.00	2,678
DMA 2.22	646	Concrete or Asphalt	1.00	646
DMA 2.32	3,199	Landscape	0.10	320
DMA 2.41	5,596	Concrete or Asphalt	1.00	5,596
			Total	11,636

IMP Sizing

IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume

Area	0.040	1.000	465	486

IMP Name: Bioretention Facility #3.1
IMP Type: Bioretention Facility
Soil Group: Bioretention Facility #3.1

DMA Name	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
DMA 3.11	2,708	Conventional Roof	1.00	2,708
DMA 3.21	450	Concrete or Asphalt	1.00	450
DMA 3.31	3,471	Landscape	0.10	347
			Total	3,505

	IMP Sizing			
	IMP Sizing Factor	**Rain Adjustment Factor**	**Minimum Area or Volume**	**Proposed Area or Volume**
Area	0.040	1.000	140	148

IMP Name: Bioretention Facility #3.2
IMP Type: Bioretention Facility
Soil Group: Bioretention Facility #3.2

DMA Name	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
DMA 3.12	2,707	Conventional Roof	1.00	2,707
DMA 3.22	450	Concrete or Asphalt	1.00	450
DMA 3.32	3,146	Landscape	0.10	315
			Total	3,472

	IMP Sizing			
	IMP Sizing Factor	**Rain Adjustment Factor**	**Minimum Area or Volume**	**Proposed Area or Volume**
Area	0.040	1.000	139	148

IMP Name: Bioretention Facility #3.3
IMP Type: Bioretention Facility
Soil Group: Bioretention Facility #3.3

DMA Name	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
DMA 3.13	2,057	Conventional Roof	1.00	2,057
DMA 3.23	300	Concrete or Asphalt	1.00	300
DMA 3.33	3,521	Landscape	0.10	352
			Total	2,709

	IMP Sizing			
	IMP Sizing Factor	**Rain Adjustment Factor**	**Minimum Area or Volume**	**Proposed Area or Volume**
Area	0.040	1.000	108	323

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