Stormwater Control Plan
For a Regulated Project
2008 Grant Street

April 2021

Kerri Watt
DeNova Homes
1500 Willow Pass Court
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Prepared by:

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Tables

Figures

This Stormwater Control Plan was prepared using the template dated January 2019.

I. Project Data

Table 1. Project Data Form

Project Name/Number	2008 Grant Street
Application Submittal Date	April 2021
Project Location	2008 Grant Street, Calistoga, CA 94515 APN: 011-010-003
Project Phase No.	N/A
Project Type and Description	15 Residential Single-Family Homes
Total Project Site Area (acres)	5.84 AC ±
Total New and Replaced Impervious Surface Area	87,015 SF ±
Total Pre-Project Impervious Surface Area	2.519 SF ±
Total Post-Project Impervious Surface Area	87,015 SF ±

II. Setting

II.A. Project Location and Description

This Stormwater Control Plan (SCP) for the 2008 Grant Street development is submitted to the city of Calistoga to provide recommendations on the use of permanent Best Management Practices (BMPs) for the proposed project. BMP technical requirements are based on the BASMAA Post-Construction Manual – Design Guidance for Stormwater Treatment and Control for Projects in Marin, Sonoma, Napa, and Solano Counties dated January 2019.

The 5.84-acre 2008 Grant Street project site is located at 2008 Grant Street in the City of Calistoga (APN: 011-010-003). The site faces Grant Street to the south and is bounded by residential parcels to the east, west, and north with a large church parking facility bordering the southwest. The site is currently zoned as R-1 Single-Family Residential. An aerial and vicinity map can be seen in Figures 1 and 2. Improvements to the 5.84-acre site will include 15 residential single-family homes.

II.B. Existing Site Features and Conditions

The existing site consists of an older residence, detached garage, and an old shed. The surrounding yard areas contain several young and mature trees, bushes, grass, and weeds. The existing impervious surface covers roughly 0.58 acres (10%) of the gross site area consisting of 2 buildings, asphalt, and a stone driveway. The existing pervious surface covers roughly 5.26 acres (90%) of the gross site area consisting of gravel, grass, and trees that will be removed during the construction phase of the project. Per mapping prepared by the Natural Resources Conservation Service (NRCS), the site is underlain

by a single dominant soil type. Approximately 100 % of the area is identified as Bale Loam, 0 to 2 percent slopes. This soil is classified as Hydrologic Soil Group B, which is moderately well drained. The site is located approximately 2,000 feet from the banks of the Napa River, and is outside of any immediate flood hazard related to overbank flooding along the Napa River. The site is shown on FEMA Flood Insurance Rate Map (FIRM) Panel 06055C0229E - effective September 26, 2008. This panels shows the project site and surrounding areas to be in an unshaded Zone X, indicating areas of minimal flood hazard. The existing pervious and impervious surface primarily sheet flows to a drainage area that runs through a portion of the property. The drainage area follows the northwest boundary and drains south to Grant Street where it connects to the storm drain on Grant Street, it then continues through the storm drain and outfalls into the Napa River. An existing conditions exhibit can be seen in Figure 3.

II.C. Opportunities and Constraints for Stormwater Control

An opportunity for this project for stormwater control is the use of bioretention basins to treat all the proposed site's runoff. The bioretention facilities will be placed along the proposed private street.

Another opportunity is the sites soil. The Hydraulic Soil Group B soils at the site have relatively high infiltration rates, so that pervious areas will contribute to groundwater discharge.

A major constraint for this project is the lack of significant difference in elevation across the site and the shallow inlet connection points. Due to the flat nature of the site and adjacent inlet elevations, CBG has determined that earthwork import will be required on most of the site to allow for proper drainage.

An additional constraint is the site runoff. Runoff from the site currently flows to the city storm drain and eventually the Napa River, which is a regionally significant water body with a wide range of beneficial uses. Therefore, it is particularly important to assure that runoff water-quality and flow-durations are managed to prevent impairment of those uses by meeting or exceeding pertinent regulatory requirements.

III. Low Impact Development Design Strategies

III.A. Optimization of Site Layout

Despite the site constraints discussed in the previous section, this project is designed to accommodate Low Impact Development (LID) treatment measures where feasible. Every effort was made to follow the BASMAA Design Guide to meet treatment requirements. The following design strategies were used to achieve this goal:

III.A.1. Limitation of development envelope

The project will utilize the compact nature of the site by maximizing the amount of open space on the proposed lot. The open spaces between and surrounding units will consist of pervious landscaping.

III.A.2. Preservation of natural drainage features

The majority of the existing site will maintain the existing drainage pattern onsite. The existing drainage pattern onsite will remain as the connection points for the proposed bioretention and storm drain system.

III.A.3. Setbacks from creeks, wetlands, and riparian habitats

The project site has been designed to meet setback, wetland, and riparian habitat requirements.

III.A.4. Minimization of imperviousness

Impervious surfaces have been limited through the use of landscaping elements and open space which will be employed to minimize the effects of impervious surfaces.

III.A.5. Use of drainage as a design element

All impervious asphalt, curb and gutter, and hardscape will drain towards the bioretention facilities along the proposed privately maintained street.

III.B. Dispersal of Runoff to Pervious Areas

Proposed impervious surfaces are graded to drain to adjacent landscaping areas where feasible. All on-site runoff is treated by bioretention facilities.

III.C. Stormwater Control Measures

The proposed site will have a total of 2 bioretention facilities, 1 self-retaining area, and 2 self-treating areas. On-site runoff generated by roofs, asphalt, hardscape and landscaped areas will be routed to the 2 individual bioretention facilities, self-retaining area, and self-treating areas. The facilities have been sized accordingly to treat runoff generated by each DMA area. A proposed condition exhibit and stormwater control plan can be seen in Figures 4 and 5.

IV. Documentation of Drainage Design

IV.A. Descriptions of Each Drainage Management Area

IV.A.1. Table 2. Drainage Management Areas

DMA Name	Surface Type	Area (square feet)
DMA 1	Impervious Roof, Impervious Asphalt, Hardscape, Pervious Landscape	36,900 SF ± Roof 28,707 SF ± Asphalt 12,239 SF ± Hardscape 111,327 SF ± Landscape
DMA 2	Pervious Landscape	13,908 SF ± Landscape
DMA 3	Impervious Roof, Hardscape, Pervious Landscape	2,163 SF ± Roof 1,127 SF ± Hardscape 13,357 SF ± Landscape

DMA 4	Impervious Asphalt Hardscape,	5,137 SF ± Asphalt 177 SF ± Hardscape
DMA 5	Pervious Landscape	3,645 SF ± Landscape
DMA 6	Pervious Landscape	36,942 SF ± Landscape

IV.A.2. Drainage Management Area Descriptions

DMA 1, totaling 189,173 square feet, drains roofs, asphalt, hardscape and landscape. DMA 1 drains to BR-1.

DMA 2, totaling 13,908 square feet, drains landscape. DMA 2 drains to Self-Treating Area.

DMA 3, totaling 16,647 square feet, drains roofs, hardscape and landscape. DMA 3 drains to BR-3.

DMA 4, totaling 5,314 square feet, drains asphalt, and hardscape. DMA 4 drains to Self-Retaining Area

DMA 5, totaling 3,645 square feet, drains landscape. DMA 5 drains to Self-Retaining Area.

DMA 6, totaling 36,942 square feet, drains landscape. DMA 5 drains to Self-Treating Area

IV.B.Tabulation and Sizing Calculations

IV.B.1. Table 3. Information Summary for Bioretention Facility Design

Total Project Area (Square Feet)	262,358 SF± (On-Site)
DMA 1	189,173 SF±
DMA 2	13,908 SF±
DMA 3	16,647 SF±
DMA 4	5,314 SF±
DMA 5	3,645 SF±
DMA 6	36,942 SF±

IV.B.2. Table 4. Self-Treating Areas

DMA Name	Area (Square Feet)
DMA 2	13,908
DMA 6	36,942

IV.B.3. Table 5. Self-Retaining Areas

DMA Name	Area (Square Feet)
DMA 5	3,645

IV.B.4. Table 6. Areas Draining to Self-Retaining Areas

DMA Name	Area (Square Feet)	Post Project Surface Type	Runoff Factor	Receiving Self Retaining DMA	Receiving Self-Retaining DMA Area (Square Feet)
DMA 4	5,314	Asphalt, Hardscape	1.0	5,314	3,645

IV.B.5. Table 7. Areas Draining to Bioretention Facilities (LID Bioretention Facility Sizing Calculations)

DMA Name	DMA Area (square feet)	Post-project surface type	DMA Runoff factor	DMA Area × runoff factor	Facility Name		
					BR-1		
DMA 1A	36,900 SF	Impervious Roof	1.0	36,900 SF			
DMA 1B	28,707 SF	Asphalt	1.0	28,707 SF			
DMA 1C	12,239 SF	Hardscape	1.0	12,239 SF			
DMA 1D	111,327 SF	Pervious Landscape	0.1	11,133 SF	Sizing factor	Minimum Facility Size	Proposed Facility Size
Total>				88,979 SF	0.04	3,559 SF	8,600 SF

DMA Name	DMA Area (square feet)	Post-project surface type	DMA Runoff factor	DMA Area × runoff factor	Facility Name		
					BR-3		
DMA 3A	2,163 SF	Impervious Roof	1.0	2,163 SF			
DMA 3B	1,127 SF	Hardscape	1.0	1,127 SF			
DMA 3C	13,357 SF	Pervious Landscape	0.1	1,336 SF	Sizing factor	Minimum Facility Size	Proposed Facility Size
Total>				4,626 SF	0.04	185 SF	229 SF

V. Source Control Measures

V.A. Site activities and potential sources of pollutants

V.B. Table 8. Source Control Table

Potential source of runoff pollutants	Permanent source control BMPs	Operational source control BMPs
On-site drain inlets	All on-site and off-site inlets will be marked with the words "NO DUMPING-DRAINS TO BAY."	The markings will be repainted/replaced when needed. Storm drain inlets and pipes that connect to BMPs will be maintained per the Projects Operations and Maintenance Plan.
Landscape	The landscape will minimize the use of fertilizers, herbicides, and pesticides. It will decrease runoff and promote infiltration. Where possible, pest-resistant plants will be selected. Plants will be selected appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	

VI. Stormwater Facility Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

All stormwater management facilities in this stormwater control plan will be the responsibility of the Owner (DeNova Homes) to manage and maintain. Upon completion, the management of stormwater facilities will transfer to the future homeowners' association (HOA). It will be the duty of DeNova Homes to provide a comprehensive Stormwater Control Operations and Maintenance Plan (O&M Plan) to the HOA. The applicant accepts responsibility for interim operation and maintenance of stormwater treatment and flow control facilities until such time as this responsibility is formally transferred to a subsequent owner.

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

As stated, the O&M Plan will provide a full listing of operations and maintenance requirements. A regular inspection of the vegetation may necessitate pruning, replanting, or control over undesired invasive species. Clean up of debris blocking inlets shall be cleared prior to rain season. Weeds shall

be controlled by non-selective natural herbicides. Owner shall inspect all facilities quarterly. All scheduled maintenance should be completed annually.

VII. Table 9. Construction Checklist

Stormwater Control Plan Page #	Source Control or Treatment Control Measure	See Plan Sheet #s
Section IV & Figure 5	On-site drain inlets	C-6
Section IV & Figure 5	Landscape areas	C-6

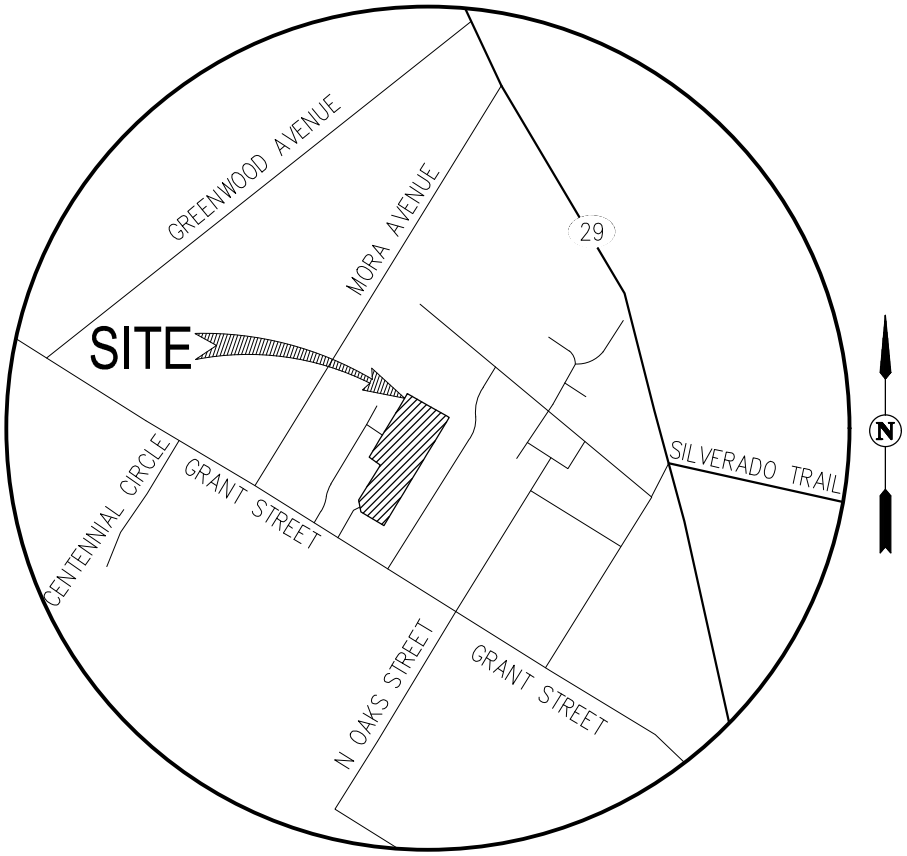
VIII. Certifications

The preliminary design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the current edition of the BASMAA *Post-Construction Manual*.

Kerri Watt, Owner

Ryan Hansen, P.E.

Figures



VICINITY MAP

2008 GRANT STREET

CITY OF CALISTOGA NAPA COUNTY CALIFORNIA

DATE: MARCH 24, 2021 SCALE: NTS

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SAN RAMON (925) 866-0322
ROSEVILLE (916)788-4456
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SITE AERIAL

2008 GRANT STREET

CITY OF CALISTOGA NAPA COUNTY CALIFORNIA

SCALE: 1" = 40' DATE: MARCH 24, 2021

0 30 60 90

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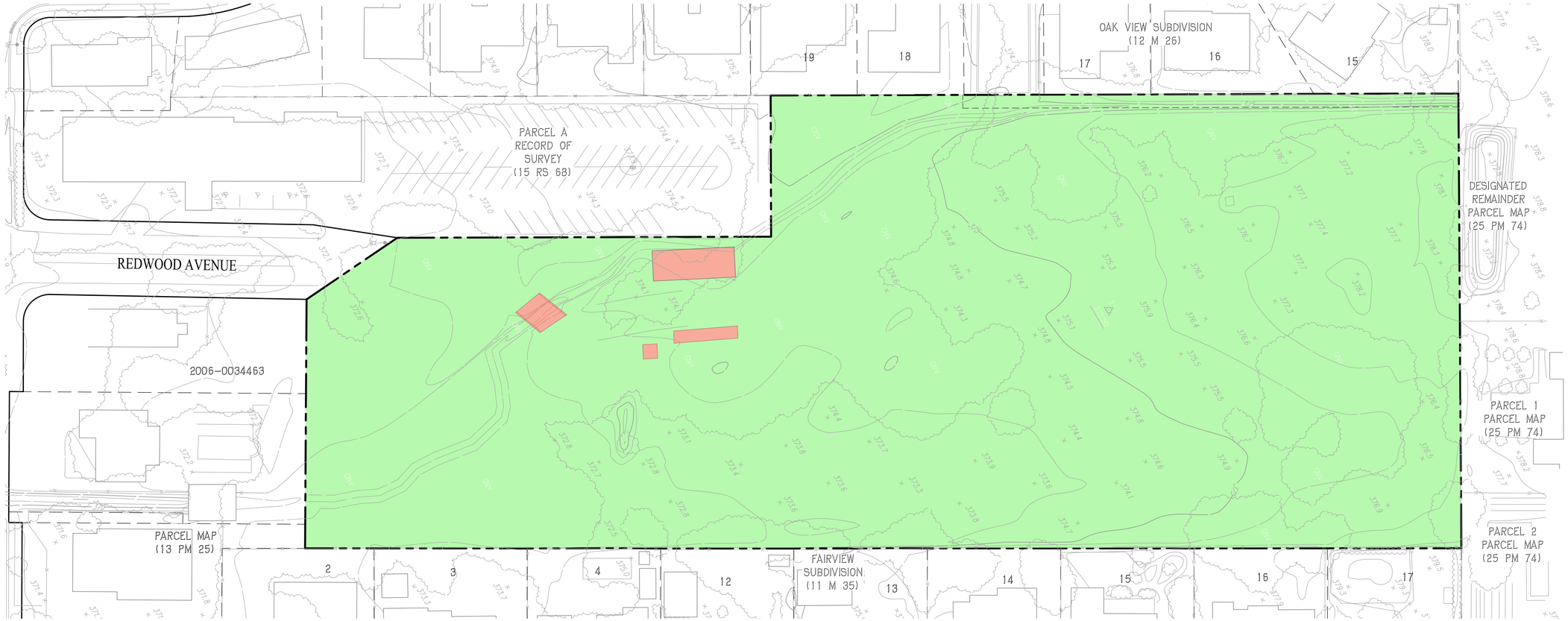

LEGEND:

EXISTING IMPERVIOUS AREA = 2,519 SF

EXISTING PERVIOUS AREA =253,009 SF

EXISTING CONDITIONS

2008 GRANT STREET

CITY OF CALISTOGA NAPA COUNTY CALIFORNIA

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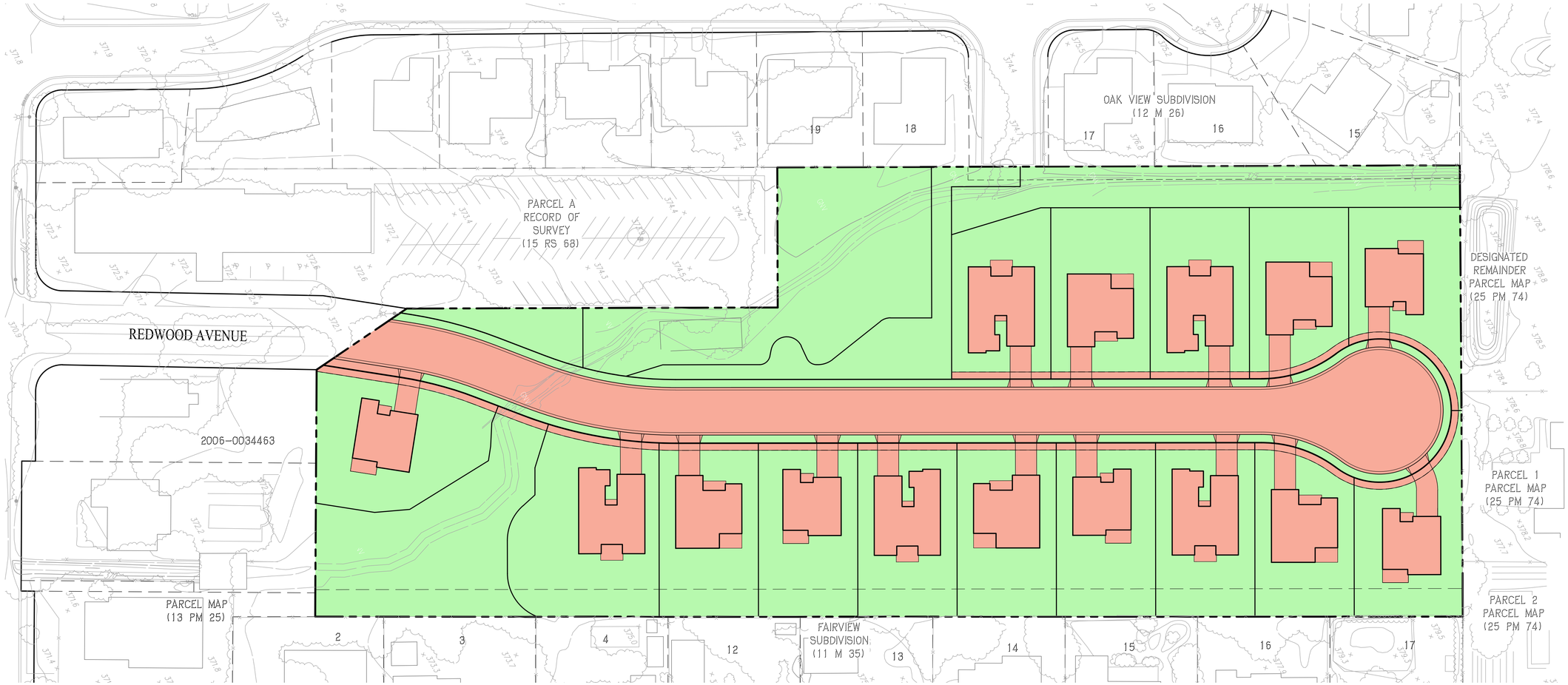

LEGEND:

PROPOSED IMPERVIOUS AREA = 87,015 SF

PROPOSED PERVIOUS AREA = 168,513 SF

PROPOSED CONDITIONS

2008 GRANT STREET

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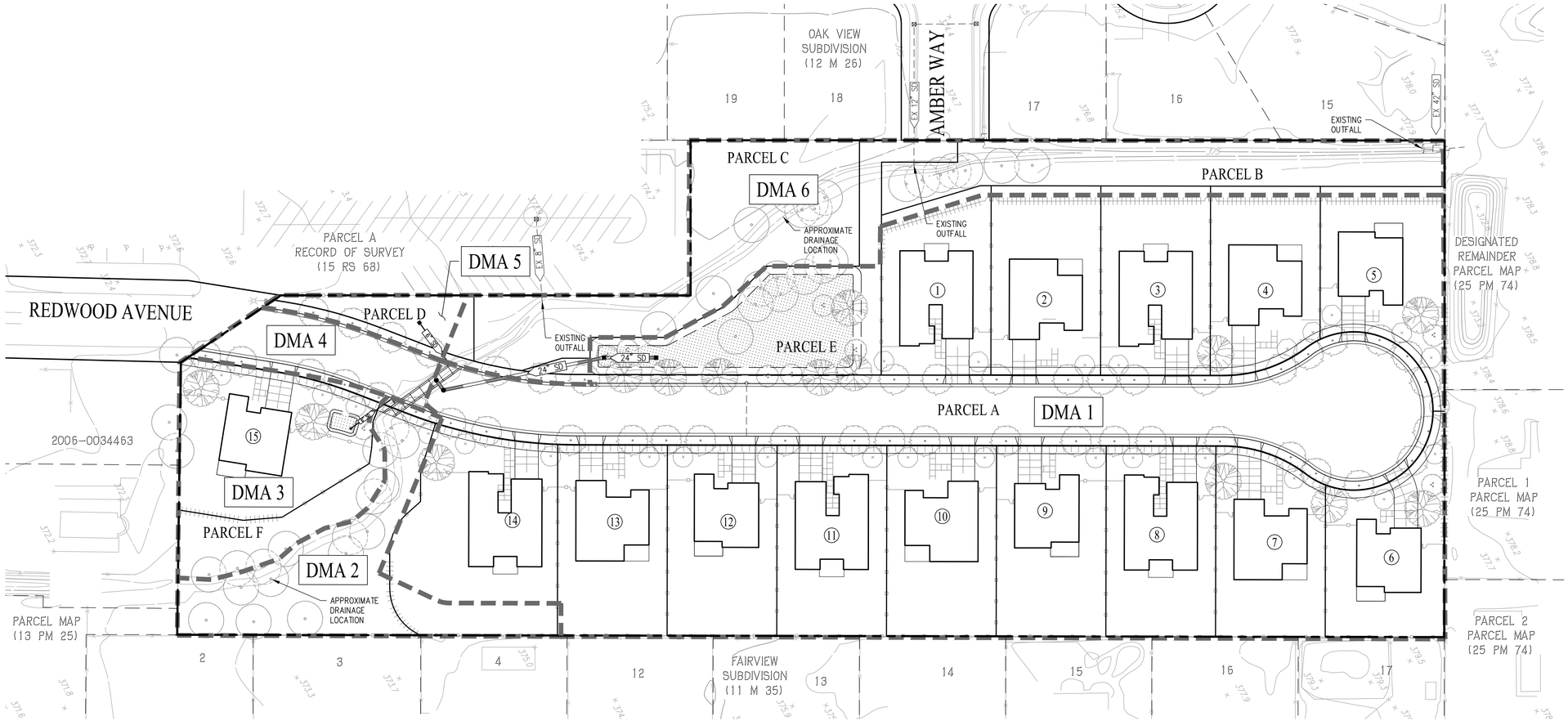
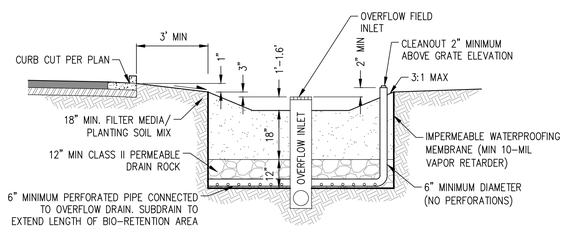


LEGEND

- EXISTING BOUNDARY
- DRAINAGE AREA BOUNDARY
- PROPOSED CULVERT
- 12" SD — STORM DRAIN
- 6" SD — STORM DRAIN
- EX 12" SD — EXISTING STORM DRAIN
- MANHOLE
- EXISTING CATCH BASIN
- FIELD INLET
- DMA 1 — DRAINAGE MANAGEMENT AREA LABEL
- CURB CUT
- BIO-RETENTION AREA
- AREA DRAIN
- 1 — LOT NUMBER
- PROPOSED TREE
- PROPOSED FENCE



TYPICAL BIO-RETENTION AREA DETAIL

NOT TO SCALE

DMA	IMPERVIOUS AREA (SF)	PERVIOUS AREA (SF)	TREATMENT AREA REQUIRED (SF)	TREATMENT AREA PROVIDED (SF)	PONDING DEPTH (FT)	TREATMENT TYPE
1	77,846	111,327	3,559	8,600	1.6	BIO-RETENTION
2	0	13,908	N/A	N/A	N/A	SELF-TREATING
3	3,290	13,357	185	229	1	BIO-RETENTION
4	5,314	0	2,657	3,645	N/A	SELF-RETAINING
5	0	3,645	N/A	N/A	N/A	SELF-RETAINING
6	0	36,942	N/A	N/A	N/A	SELF-TREATING

NOTE:
1. STORM DRAIN LAYOUT AND DMA TREATMENT AREAS ARE SUBJECT TO CHANGE WITH FINAL SITE GRADING AND DRAINAGE PLAN. EXACT DOWNSPOUT LOCATION ARE UNKNOWN.
2. SELF-RETAINING AREAS ARE PERVIOUS LANDSCAPING OR PERVIOUS PAVEMENT. A RATIO OF TRIBUTARY IMPERVIOUS AREA IS NOT TO BE GREATER THAN 2:1.
3. SELF-TREATING DRAINAGE MANAGEMENT AREAS ARE NATURAL, LANDSCAPE OR PERVIOUS PAVER AREAS THAT DRAIN TO THE STORM DRAIN SYSTEM.

PRELIMINARY STORMWATER MANAGEMENT PLAN
2008 GRANT STREET

CITY OF CALISTOGA NAPA COUNTY CALIFORNIA

SCALE: 1" = 40' DATE: APRIL 9, 2021

REGISTERED PROFESSIONAL ENGINEER — RYAN T. HANSEN — 80557 — CIVIL — STATE OF CALIFORNIA

0 40 80 120

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SHEET NO. C-6 OF 10 SHEETS

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