ENGINEERS
SURVEYORS
PLANNERS

JOB NO. 20159136

PRELIMINARY STORM WATER MITIGATION PLAN

FOR

MEMORIAL HOSPITAL MEDICAL OFFICE BUILDING AND PARKING STRUCTURE PROJECT

Montgomery Drive and Sotoyome Street
Santa Rosa, CA

APN 009-172-001 to -007, -014, -019, -022
APN 014-081-003, -004, -027

October 1, 2017

200 4th St., Ste 300
Santa Rosa
California 95401
phone 707.583.8500
fax 707.583.8539
www.bkf.com

APPLICANT/OWNER

As the Applicant/Owner, I declare that permanent storm water Best Management Practices will be installed and maintained in accordance with this document and municipal regulations.

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CIVIL ENGINEER

This document was prepared by BKF Engineers to summarize storm water Best Management Practices proposed with this development. Storm water elements reflected in this document have been designed using sound engineering principals in general conformance with the municipality's guidelines.

PRELIMINARY

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RICHARD CARLILE PE
NO. 57885

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GENERAL INFORMATION REGARDING THE PURPOSE OF STORM WATER BMPS

Storm water runoff Best Management Practices (BMPs) are programs, processes or engineered systems designed to reduce pollutants in storm water. Temporary Best Management Practices such as straw wattle and silt fence are used to reduce pollutants in storm water during construction while permanent storm water Best Management Practices are intended to reduce pollutants in storm water for the life of the development following construction.

Studies suggest that approximately 85% of our annual rainfall volume is produced from the predominant population of smaller storms. Therefore, in an effort to treat storm water in a cost effective manner, storm water quality management is typically designed to target these smaller events.

The Low Impact Development Technical Design Manual

The Low Impact Development (LID) Technical Design Manual is a set of guidelines established for the Santa Rosa area and unincorporated areas around Sonoma County which requires certain projects to incorporate sustainable LID strategies that encourage infiltration and minimize the introduction of pollutants into downstream receiving waters. The manual requires that a "Determination Worksheet" be prepared by the Applicant to evaluate whether or not storm water BMPs are required with each development. Developments which require BMPs that are subject to planning review through the municipality must include a "Preliminary Storm Water Mitigation Plan". The purpose of this plan is to:

- Summarize the existing site condition and the proposed development.
- Describe storm water BMPs being incorporated into the development.
- Demonstrate by computation that the proposed measures are appropriately sized.
- Describe maintenance and funding for the BMPs.

Developments which require BMPs are required to include a "Final Storm Water Mitigation Plan" with ministerial permit submittals such as grading, building and encroachment permits. The "Final Storm Water Mitigation Plan" includes all of the elements required in the "Preliminary Storm Water Mitigation Plan" and a maintenance agreement between the municipality and owner which assigns the responsibility for maintaining BMPs. The agreement is recorded as a covenant, runs with the land and passes with Title.

Permanent storm water Best Management Practices are categorized in the LID Technical Design Manual as being Pollution Prevention Measures, Volume Control Measures or Treatment Control Measures which are described in the following sections of this document.

Storm Water Pollution Prevention Measures

Pollution Prevention Measures, sometimes referred to as Source Control Measures, are practices such as street sweeping which help keep pollutants from coming into contact with storm water rather than attempting to remove pollutants after they have interacted with storm water. Educational outreach programs and stenciling storm water inlets with graphics which inform people that the storm water drains to the creek are effective Pollution Prevention Measures. Trees are another effective Pollution Prevention Measure and provide several storm water management benefits. They hold water on leaves / branches and allow water to evaporate, retaining flow and dissipating the energy of runoff. Trees also reduce the amount of water coming into contact with other impervious surfaces such as parking lots, which minimizes pollution in downstream water bodies

Our local municipalities recognize the environmental benefit to incorporating Pollution Prevention Measures into designs and allow area offset credits with the implementation of trees which intercept falling precipitation, pervious pavements which encourage infiltration and storm water discharge through landscape areas as a pre-treatment measure. The pollution prevention credits reduce the size of required Volume and Treatment Control Measures.

Storm Water Volume Control Measures

Increasing the amount of impervious surface area with the development of bare land generally increases the rate which storm water flows across a site. While the impact of increasing the impervious area for a single site is often insignificant, the cumulative impact of increasing the impervious area for multiple sites may have an adverse affect on downstream facilities, because the cumulative increase has the potential to increase runoff causing downstream erosion and sediment load in the storm water conveyance system.

In order to minimize downstream erosion and protect stream habitat, the Storm Water LID Technical Design Manual prioritizes BMPs and requires that the designer first consider measures which capture storm water runoff from impervious surfaces and encourage infiltration. If this is impractical, then BMPs may be proposed which capture the difference in storm water runoff between the predevelopment and post development conditions, provided that all water discharged from impervious surfaces for the selected rainfall event is treated. Developments in areas subject to contaminated soil or high ground water are discouraged from integrating measures which infiltrate storm water, but they are required to incorporate alternative designs which harvest storm water and treat runoff from impervious surfaces. If volume control measures are not feasible at the project site, then the municipality will consider offset projects at a different location which accomplish this requirement. In some situations, payment of an offset cost may be allowed. Redevelopment projects which propose to decrease the amount of impervious surface are not required to integrate volume control measures, because decreasing the amount of impervious surface generally decreases the amount of storm water runoff.

Storm Water Treatment Control Measures

Treatment Control BMPs are engineered systems that are designed to remove pollutants from storm water and are often categorized as being landscape-based or mechanical. These types of BMPs are required whenever a development proposes to infiltrate less water than is discharged from new or redeveloped impervious surfaces during the target storm event.

Landscape-based treatment controls are required by most municipalities and include measures such as vegetated swales and bioretention systems. Mechanical treatment controls such as subsurface vaults that filter storm water through sand or engineered media are generally only allowed when used in conjunction with other landscape based BMPs.

PROJECT DESCRIPTION

Santa Rosa Memorial Hospital proposes to construct a new medical office building and a multi-story parking structure located near the corner of Sotoyome Street and Montgomery Drive. This includes parcels APN 009-172-001 through -007 and parcels 014-081-003, -004, -023, and -027. Adjacent parcels include other Memorial Hospital medical facilities. The involved parcels will be combined into one single lot. The medical office building will have a footprint of 23,220sf and the parking structure has a footprint of 37,980sf. This total improvement will include the replacement and addition of impervious surface totaling 113,500sf which is a reduction of approximately 10,000sf.

The immediate project proposes to remove the existing buildings, paving and planted surfaces, and fencing to install the proposed parking surface. Both construction and final vehicle access to the improvement will be provided at a constructed driveway located on Sotoyome Street. No additional access will be required.

Permanent Stormwater Best Management Practices are required with this development because the project proposes to reconstruct more than 10,000sf of impervious surface area.

There are no existing sensitive features such as creeks or wetlands on this site that we are aware of and the project does not propose work offsite in environmentally sensitive areas. Therefore, the project is not anticipated to need a “Clean Water Certification” from the Regional Water Quality Control Board.

The majority of the existing site is a combination of building roofs, AC paving and minor concrete paths. Drainage from these surfaces sheet flows around the existing buildings across the paved paths into the curb and gutter of Sotoyome where it is picked up by the curb inlet at the corner of Sotoyome and Montgomery. Drainage from the three properties along Montgomery Drive use a similar drainage pattern but discharge to the Montgomery curb and gutter and collect in the same curb inlet. This curb inlet connects to the city storm drain system and discharges into Santa Rosa Creek some 400ft away. The easterly lot drain in a similar manner into miscellaneous small area drains within the parking lots which connect to a larger drop inlet at the south end of the 014-081-023 parcel. This inlet is then routed to the city system manhole at Montgomery Drive.

The development proposes to integrate a volume capture media mixture under the drainage swales which capture site runoff during light precipitation events in accordance with the Priority 1 objective of the City’s LID Technical Design Manual. These BMP measures are in place to offset the net increase in impervious surface. Storm water for larger events utilize the proposed storm drain system directly. In the event the system becomes overburdened flow will have overland relief over the swales and is anticipated to drain similar to the current condition, utilizing the existing established storm drain system and discharge to Santa Rosa Creek. The portions of the site which are to be developed utilize the LID retention measure and existing storm drain connections so the proposed development is not anticipated to significantly alter the drainage.

The site has been designed to have positive gradients within the site and utilizes overland relief. The drainage basins proposed with this development are being installed as a matter of convenience to route excess storm water from the proposed LID features to the existing storm drain network. If the existing storm drain system becomes overburdened during larger storm events, storm water which falls on the site will run overland to the city’s existing established storm drain system and Santa Rosa Creek similar to the existing condition.

STORM WATER BMPS SELECTED FOR THIS SITE

Temporary, pollution prevention and permanent storm water Best Management Practices will be designed to minimize the introduction of pollutants in downstream water bodies following the Entitlement of this development,

Temporary Measures

A "Sediment Control Plan" will be prepared and included with the construction drawings requiring the contractor to implement temporary storm water BMPs. The contractor will be required to use filter fabric, gravel bags, straw wattles or similar measures to collect sediment and filter water before allowing its discharge to downstream facilities. Construction entrances/exits will be designated on the drawings as having a blanket of rock, where applicable, to assist with removing dirt from trucks to minimize soil tracked into the public street during the early stages of construction. This drawing will also require that disturbed areas be seeded to help stabilize un-vegetated areas. The project is anticipated to disturb less than 1-acre with construction. A Storm Water Pollution Prevention Plan will be prepared which more precisely identifies temporary storm water BMPs required during different phases of construction.

Pollution Prevention Measures

As part of this project, storm water inlets will be stenciled with graphics which identify that the inlets drain to the creek. The building is anticipated to have a slab on grade design which discourages pest entry. The trash enclosure will be roofed. Irrigation systems will be designed to minimize overspray.

Pollution Prevention Credits

As was discussed earlier in this report, the LID Technical Design Manual allows area offset credits with the implementation of certain Pollution Prevention Measures. Although new trees will be planted with this development creating an opportunity to intercept precipitation falling on impervious surfaces beneath them, area reduction credits were not used when assessing the size of BMP areas with the final plan. In addition, the large existing trees which are to remain on site shall be evaluated to determine if they qualify as existing interceptors to offset BMP sizing.

Permanent Treatment Control Measures

A series of volume capture sections have been incorporated into the site to retain storm water during light precipitation events and promote infiltration for the life of the development. The proposed storm water measures include engineered soil which is anticipated to encourage storage and filtration.

A geotechnical report has yet to be prepared for this site improvement. According to the USGS web soil survey the site is primarily "Zamora Silty Clay Loam" which is typically classified as a class "C" hydrologic soil having an infiltration rate ~0.05in/hr to ~0.15in/hr. according to the same geotechnical research, the water table is estimated to be 200cm (6.5-feet) below the surface.

The "State Water Resources Control Board's" "GeoTracker" system was observed and does not report groundwater contamination within 50ft of proposed storm water treatment areas.

These measures were selected because they are the highest priority measures included in the LID Technical Design Manual which accomplishes the objectives of the manual and they can be reasonably incorporated into the site. An exhibit has been included in the Appendix of this report which reflects the proposed geometry and which identifies the location(s) of these elements.

DESCRIPTION OF COMPUTATION METHODS USED TO SIZE BMPS

Treatment Control Calculations

Computations were prepared to size each Bioretention Area using the municipality's storm water calculator to assess the post development storm water runoff volume. The preliminary civil drawings recommend that Bioswale Media Mix having a porosity of at least 60% be used throughout the Bioretention Areas to achieve the required capture volume. A material data sheet has been included with the calculations which suggest that this material is available having a porosity of nearly 65%. A porosity of 50% was used to conservatively assess the required capture volume and slightly increase storage to accommodate sediment accumulation. Computations are shown in the Appendix of this document and reflect that the void space in the proposed measures exceeds the required storm water capture volume.

The treatment measures designed for this site have achieved the 100% volume capture for the 85th percentile precipitation event in accordance with the Priority 1 objective of the City's LID Technical Design Manual.

MAINTENANCE OF THE SELECTED PERMANENT STORM WATER BMPs

Maintenance of permanent storm water Best Management Practices is essential to ensure that the BMPs continue to function effectively and that they do not become a nuisance. An exhibit has been included in the body of this report which identifies the locations of the permanent storm water BMPs referred to in this report which will require inspection and maintenance. It is the responsibility of the Applicant/Owner to ensure that permanent storm water BMPs are installed and maintained in accordance with municipal policy until this responsibility is legally transferred.

The Regional Water Quality Control Board requires the legally responsible party to inspect and maintain permanent storm water BMPs at least once a year. A sample inspection and reporting template has been included in the Appendix of this document for reference. Reports which document maintenance activities should be completed when maintenance is performed and kept on file for a period of at least five years. These reports shall be made available to City staff and the Regional Water Quality Control Board staff upon request.

The maintenance of permanent storm water Best Management Practices will be performed by the property owner and includes things such as pruning, weeding, mowing, trash/sediment removal, and the inspection/replacement of plants and media. The LID Technical Design Manual requires that the owner enter into a signed agreement and that this agreement be recorded as a perpetual covenant which runs with the land. A draft maintenance agreement has been included in the Appendix of this document for reference.

Every site requires some level of maintenance such as sweeping, restriping, pavement replacement, irrigation repair and replanting. The following inspection and maintenance activities are additional measures which are necessary with this development as a result of the required permanent storm water BMPs:

- Drainage inlets will be stenciled with verbiage or a graphic which suggests that the storm water system drains to a creek. Stenciling should be refreshed every 5 years. If the BMP has been removed or has experienced significant fading, then the BMP should be replaced.

- The surface of volume capture areas should be inspected on a quarterly basis, and following larger storm events for signs of erosion, damage to vegetation, foreign debris and sediment accumulation. The BMP should be repaired to maintain its character and function in substantial conformance with the original design.

- Additional information has been included in the Appendix of this report which describes the function and recommended maintenance of measures proposed in this report.

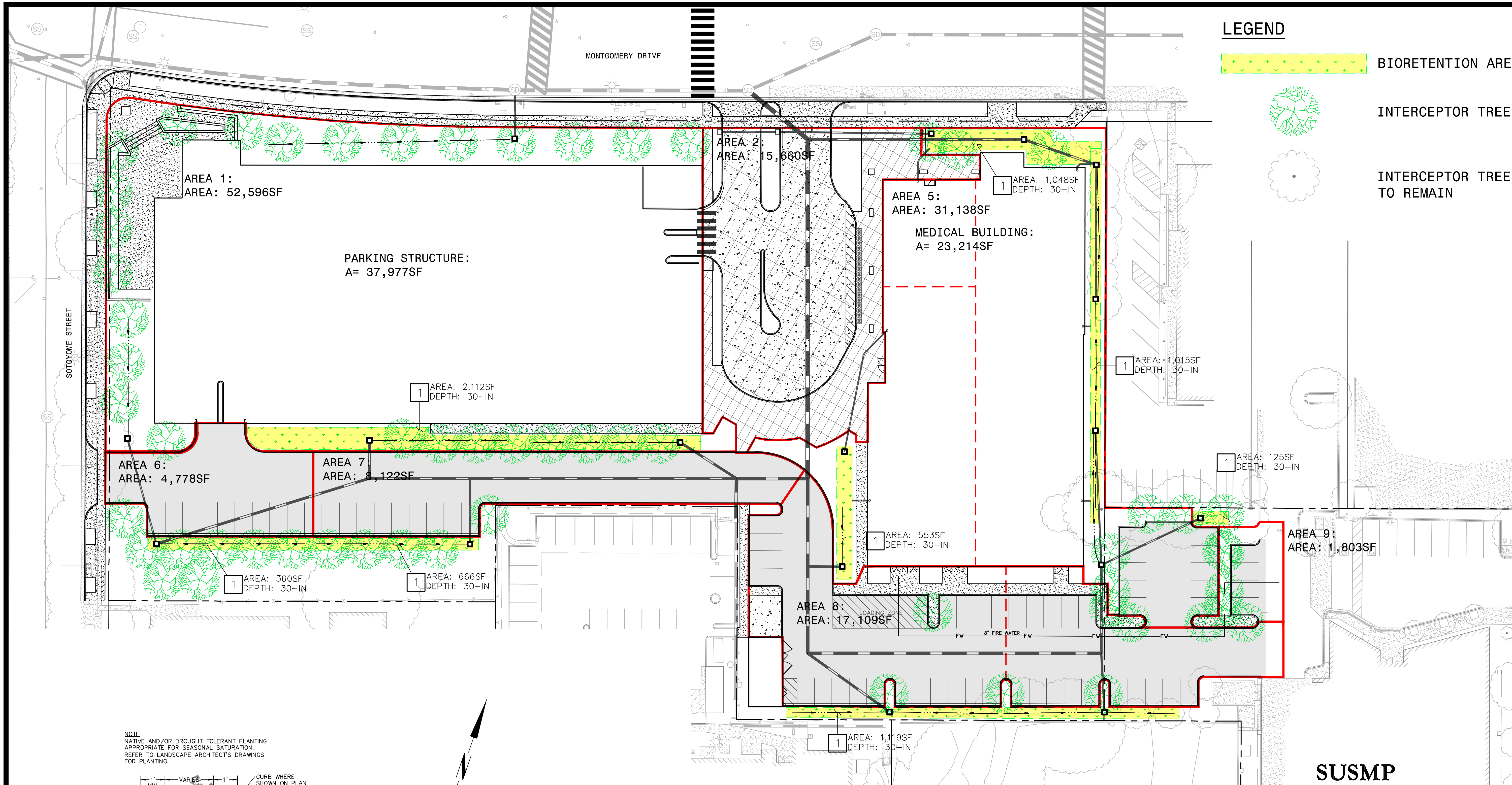
Although the proposed BMPs are anticipated to provide effective treatment for more than 10-years, their life will depend on the quality of water draining to them and how well these areas are maintained. BMP maintenance and replacement should be conducted as required to ensure that their character and function are in substantial conformance with the original design.

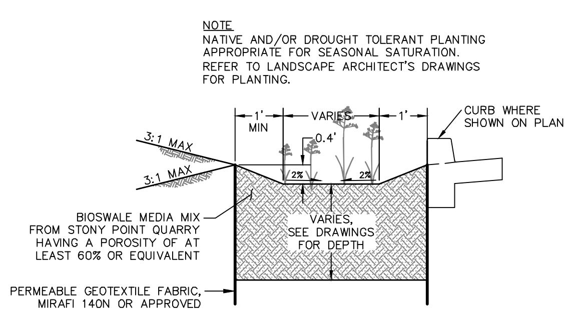
Approximate anticipated average annual costs are summarized below to assist the Owner(s) in budgeting for BMP inspection and maintenance activities. The costs reported are predicated on these activities being conducted while performing other routine maintenance which would ordinarily be performed on site.

Approximate Average Annual Inspection and Maintenance Costs	
Inspections and Associated Paperwork	$
Stenciling Inlets	$
Sediment Removal/Erosion Repair	$
Bioretention Area/ Flow Thought Planter Replacement	$

APPENDIX "A"

SWMP SITE EXHIBIT





1 VEGETATED SWALE AND BIORETENTION AREA DETAIL

NO SCALE

50 0 50

scale feet

1" = 50'

NOTE

A GEOTECHNICAL REPORT HAS YET TO BE PREPARED FOR THIS SITE IMPROVEMENT. ACCORDING TO THE USGS WEB SOIL SURVEY THE SITE IS PRIMARILY "ZAMORA SILTY CLAY LOAM" WHICH IS TYPICALLY CLASSIFIED AS A CLASS "C" HYDROLOGIC SOIL HAVING AN INFILTRATION RATE ~0.05IN/HR TO ~0.15IN/HR. ACCORDING TO THE SAME GEOTECHNICAL RESEARCH, THE WATER TABLE IS ESTIMATED TO BE 200CM (6.5-FEET) BELOW THE SURFACE.

SUSMP SITE EXHIBIT

SANTA ROSA MEMORIAL HOSPITAL
MEDICAL OFFICE BUILDING + PARKING STRUCTURE
CITY OF SANTA ROSA, CALIFORNIA
THIS SEPTEMBER 2017

BKF
ENGINEERS / SURVEYORS / PLANNERS
200 4TH ST, STE. 300 SANTA ROSA, CA 95401
(707) 583-8500 FAX: (707) 583-8539

JOB NO. 20159136

SHEET 1 OF 1 SHEETS

159136_SITE.dwg

Plot Sep 29, 2017 at 9:58am

APPENDIX "B"

VOLUME CAPTURE CALCULATIONS

C-FACTOR

City of Santa Rosa WATER

STORM WATER CALCULATOR

LID BMP Summary Page & Site Global Values

Project Information:

Project Name: **SRMH M.O.B. & Parking Structure**
Address/Location: **Montgomery Dr & Sotoyome St**
Designer: **BKF Engineers**
Date: **9/28/2017**

Site Information:

Mean Seasonal Precipitation (MSP) of Project Site: **35.00** **(inches)**
K=MSP/3(K= **1.17**

Impervious area - pre development: **0.0** ft^2
Impervious area - post development: **112,656.0** ft^2

Based upon the pre and post development impervious area, the post construction BMP requirement is:

100% Capture

Summary of Saved BMP Results:

		Tributary Area		Requirements		BMP Design Results						
							Hydromodification Control		Flow Base Treatment		Delta Volume Capture	
	BMP ID:	Tributary Area (ft^2.)	Runoff Reduction Measures (Y/N)	Type of Requirement Met	Type of BMP Design	Percent Achieved	Required $V_{Hydromod}$ (ft^3)	Achieved (ft^3)	Required Q Treatment (cfs)	Achieved (ft^3)	Required Vdelta (ft^3)	Achieved (ft^3)
1	Area 1	52,596	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	113.4	########	########				
2	Area 2	15,660	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	72.9	########	730.0000				
3	Area 5	31,138	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	104.2	########	########				
4	Area 6	4,778	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	109.1	343.7771	375.0000				
5	Area 7	8,122	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	100.8	645.1304	650.0000				
6	Area 8	17,109	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	111.6	########	########				
7	Area 9	1,803	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	134.4	96.7309	130.0000				
8												
9												
10												
11												
12												
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STORM WATER CALCULATOR

City of Santa Rosa WATER

BMP Tributary Parameters

Project Name: SRMH M.O.B. & Parking Structure

BMP ID:	Area 1
BMP Design Criteria:	100% Capture
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	52,596.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 2,557.74 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Impervious - Paved Parking, Rooftop, Driveways
CN_{POST}:	
User Composite post development CN:	93.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 113.38 %

BMP Volume Below Ground			Ponded Water Above Ground		
Porosity:	0.50				
Depth below perforated pipe if present:	2.50	ft	Depth:	0.00	ft
Width:	0.00	ft	Width:	0.00	ft
Length:	0.00	ft	Length:	0.00	ft
Area:	2,320.00	ft^2	Area:	0.00	ft^2

STORM WATER CALCULATOR

CN Composite Work Sheet

Project:	SRMH M.O.B. & Parking Structure
Address/Location:	Montgomery Dr & Sotoyome St
Designer:	BKF Engineers
Date:	June 19, 2017
Inlet Number/Tributary Area/BMP:	Area 1

INSTRUCTIONS: Please refer to the "Urban Hydrology for Small Watersheds" (TR-55 manual).

Soil Type (Infiltration Rate)	Cover Description	CN	Area ft^2	Product of CN x Area
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Impervious - Paved Parking, Rooftop, Driveways	98	41696	4,086,208.0
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Open Space (lawns, parks, golf courses, cemeteries, etc.) - Good (>75% grass cover)	74	10900	806,600.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
		Totals =	52596	4,892,808.0

$$CN_{COMPOSIT} = \frac{(CN \times Area) + (CN \times Area) + (CN \times Area) + (CN \times Area) \ldots}{\text{Total Tributary Area}} =$$

Use this $CN_{COMPOSIT}$ = 93.0

STORM WATER CALCULATOR

City of Santa Rosa WATER

BMP Tributary Parameters

Project Name:	SRMH M.O.B. & Parking Structure
BMP ID:	Area 2
BMP Design Criteria:	100% Capture
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	15,660.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 1,001.61 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Impervious - Paved Parking, Rooftop, Driveways
CN_{POST}:	
User Composite post development CN:	96.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 72.88 %

BMP Volume Below Ground			Ponded Water Above Ground		
Porosity:	0.50				
Depth below perforated pipe if present:	2.50	ft	Depth:	0.00	ft
Width:	0.00	ft	Width:	0.00	ft
Length:	0.00	ft	Length:	0.00	ft
Area:	584.00	ft^2	Area:	0.00	ft^2

City of Santa Rosa WATER

STORM WATER CALCULATOR

CN Composite Work Sheet

Project:	SRMH M.O.B. & Parking Structure
Address/Location:	Montgomery Dr & Sotoyome St
Designer:	BKF Engineers
Date:	September 28, 2017
Inlet Number/Tributary Area/BMP:	Area 2

INSTRUCTIONS: Please refer to the "Urban Hydrology for Small Watersheds" (TR-55 manual).

Soil Type (Infiltration Rate)	Cover Description	CN	Area ft^2	Product of CN x Area
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Impervious - Paved Parking, Rooftop, Driveways	98	14193	1,390,914.0
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Open Space (lawns, parks, golf courses, cemeteries, etc.) - Good (>75% grass cover)	74	1467	108,558.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
		Totals =	15660	1,499,472.0

$$CN_{COMPOSIT} = \frac{(CN \times Area) + (CN \times Area) + (CN \times Area) + (CN \times Area) \ldots}{\text{Total Tributary Area}} =$$

Use this $CN_{COMPOSIT}$ = 95.8

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: SRMH M.O.B. & Parking Structure

BMP ID:	Area 5
BMP Design Criteria:	100% Capture
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	31,138.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 1,560.01 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Impervious - Paved Parking, Rooftop, Driveways
CN_{POST}:	
User Composite post development CN:	93.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 104.17 %

BMP Volume Below Ground			Ponded Water Above Ground		
Porosity:	0.50				
Depth below perforated pipe if present:	2.50	ft	Depth:	0.00	ft
Width:	0.00	ft	Width:	0.00	ft
Length:	0.00	ft	Length:	0.00	ft
Area:	1,300.00	ft^2	Area:	0.00	ft^2

City of Santa Rosa WATER

STORM WATER CALCULATOR

CN Composite Work Sheet

Project:	SRMH M.O.B. & Parking Structure
Address/Location:	Montgomery Dr & Sotoyome St
Designer:	BKF Engineers
Date:	September 28, 2017
Inlet Number/Tributary Area/BMP:	Area 5

INSTRUCTIONS: Please refer to the "Urban Hydrology for Small Watersheds" (TR-55 manual).

Soil Type (Infiltration Rate)	Cover Description	CN	Area ft^2	Product of CN x Area
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Impervious - Paved Parking, Rooftop, Driveways	98	25030	2,452,940.0
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Open Space (lawns, parks, golf courses, cemeteries, etc.) - Good (>75% grass cover)	74	6108	451,992.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
		Totals =	31138	2,904,932.0

$$CN_{COMPOSIT} = \frac{(CN \times Area) + (CN \times Area) + (CN \times Area) + (CN \times Area) \ldots}{\text{Total Tributary Area}} =$$

Use this $CN_{COMPOSIT}$ = 93.3

STORM WATER CALCULATOR

City of Santa Rosa WATER

BMP Tributary Parameters

Project Name:	SRMH M.O.B. & Parking Structure
BMP ID:	Area 6
BMP Design Criteria:	100% Capture
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	4,778.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 343.78 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Impervious - Paved Parking, Rooftop, Driveways
CN_{POST}:	
User Composite post development CN:	97.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 109.08 %

BMP Volume Below Ground			Ponded Water Above Ground		
Porosity:	0.50				
Depth below perforated pipe if present:	2.50	ft	Depth:	0.00	ft
Width:	0.00	ft	Width:	0.00	ft
Length:	0.00	ft	Length:	0.00	ft
Area:	300.00	ft^2	Area:	0.00	ft^2

STORM WATER CALCULATOR

BKF Engineers
September 28, 2017

City of Santa Rosa WATER

CN Composite Work Sheet

Project:	SRMH M.O.B. & Parking Structure
Address/Location:	Montgomery Dr & Sotoyome St
Designer:	BKF Engineers
Date:	September 28, 2017
Inlet Number/Tributary Area/BMP:	Area 6

INSTRUCTIONS: Please refer to the "Urban Hydrology for Small Watersheds" (TR-55 manual).

Soil Type (Infiltration Rate)	Cover Description	CN	Area ft^2	Product of CN x Area
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Impervious - Paved Parking, Rooftop, Driveways	98	4584	449,232.0
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Open Space (lawns, parks, golf courses, cemeteries, etc.) - Good (>75% grass cover)	74	194	14,356.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
		Totals =	4778	463,588.0

$$CN_{COMPOSIT} = \frac{(CN \times Area) + (CN \times Area) + (CN \times Area) + (CN \times Area) \ldots}{\text{Total Tributary Area}}$$

= **Use this $CN_{COMPOSIT}$ =** 97.0

City of Santa Rosa WATER

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: SRMH M.O.B. & Parking Structure

BMP ID:	Area 7
BMP Design Criteria:	100% Capture
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	8,122.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 645.13 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Impervious - Paved Parking, Rooftop, Driveways
CN_{POST}:	98
User Composite post development CN:	0.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 100.75 %

BMP Volume Below Ground

Porosity:	0.50	
Depth below perforated pipe if present:	2.50	ft
Width:	0.00	ft
Length:	0.00	ft
Area:	520.00	ft^2

Ponded Water Above Ground

Depth:	0.00	ft
Width:	0.00	ft
Length:	0.00	ft
Area:	0.00	ft^2

City of Santa Rosa WATER

STORM WATER CALCULATOR

CN Composite Work Sheet

Project:	SRMH M.O.B. & Parking Structure
Address/Location:	Montgomery Dr & Sotoyome St
Designer:	BKF Engineers
Date:	September 28, 2017
Inlet Number/Tributary Area/BMP:	Area 7

INSTRUCTIONS: Please refer to the "Urban Hydrology for Small Watersheds" (TR-55 manual).

Soil Type (Infiltration Rate)	Cover Description	CN	Area ft^2	Product of CN x Area
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Impervious - Paved Parking, Rooftop, Driveways	98	8122	795,956.0
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Open Space (lawns, parks, golf courses, cemeteries, etc.) - Good (>75% grass cover)	74	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
		Totals =	8122	795,956.0

$$CN_{COMPOSIT} = \frac{(CN \times Area) + (CN \times Area) + (CN \times Area) + (CN \times Area) \ldots}{\text{Total Tributary Area}} =$$

Use this $CN_{COMPOSIT}$ = 98.0

STORM WATER CALCULATOR

City of Santa Rosa WATER

BMP Tributary Parameters

Project Name: SRMH M.O.B. & Parking Structure

BMP ID:	Area 8
BMP Design Criteria:	100% Capture
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	17,109.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 1,293.44 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Impervious - Paved Parking, Rooftop, Driveways
CN_{POST}:	
User Composite post development CN:	98.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 111.62 %

BMP Volume Below Ground		
Porosity:	0.50	
Depth below perforated pipe if present:	2.50	ft
Width:	0.00	ft
Length:	0.00	ft
Area:	1,155.00	ft^2

Ponded Water Above Ground		
Depth:	0.00	ft
Width:	0.00	ft
Length:	0.00	ft
Area:	0.00	ft^2

STORM WATER CALCULATOR

CN Composite Work Sheet

Project: SRMH M.O.B. & Parking Structure
Address/Location: Montgomery Dr & Sotoyome St
Designer: BKF Engineers
Date: September 28, 2017

Inlet Number/Tributary Area/BMP: Area 8

INSTRUCTIONS: Please refer to the "Urban Hydrology for Small Watersheds" (TR-55 manual).

Soil Type (Infiltration Rate)	Cover Description	CN	Area ft^2	Product of CN x Area
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Impervious - Paved Parking, Rooftop, Driveways	98	16750	1,641,500.0
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Open Space (lawns, parks, golf courses, cemeteries, etc.) - Good (>75% grass cover)	74	359	26,566.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
		Totals =	17109	1,668,066.0

$$CN_{COMPOSIT} = \frac{(CN \times Area) + (CN \times Area) + (CN \times Area) + (CN \times Area) \ldots}{\text{Total Tributary Area}} =$$

Use this $CN_{COMPOSIT}$ = 97.5

STORM WATER CALCULATOR

City of Santa Rosa WATER

BMP Tributary Parameters

Project Name:	SRMH M.O.B. & Parking Structure
BMP ID:	Area 9
BMP Design Criteria:	100% Capture
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	1,803.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 96.73 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Impervious - Paved Parking, Rooftop, Driveways
CN_{POST} :	
User Composite post development CN:	94.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 134.39 %

BMP Volume Below Ground			Ponded Water Above Ground		
Porosity:	0.50				
Depth below perforated pipe if present:	1.00	ft	Depth:	0.00	ft
Width:	0.00	ft	Width:	0.00	ft
Length:	0.00	ft	Length:	0.00	ft
Area:	260.00	ft^2	Area:	0.00	ft^2

City of Santa Rosa WATER

STORM WATER CALCULATOR

CN Composite Work Sheet

Project: SRMH M.O.B. & Parking Structure
Address/Location: Montgomery Dr & Sotoyome St
Designer: BKF Engineers
Date: June 19, 2017

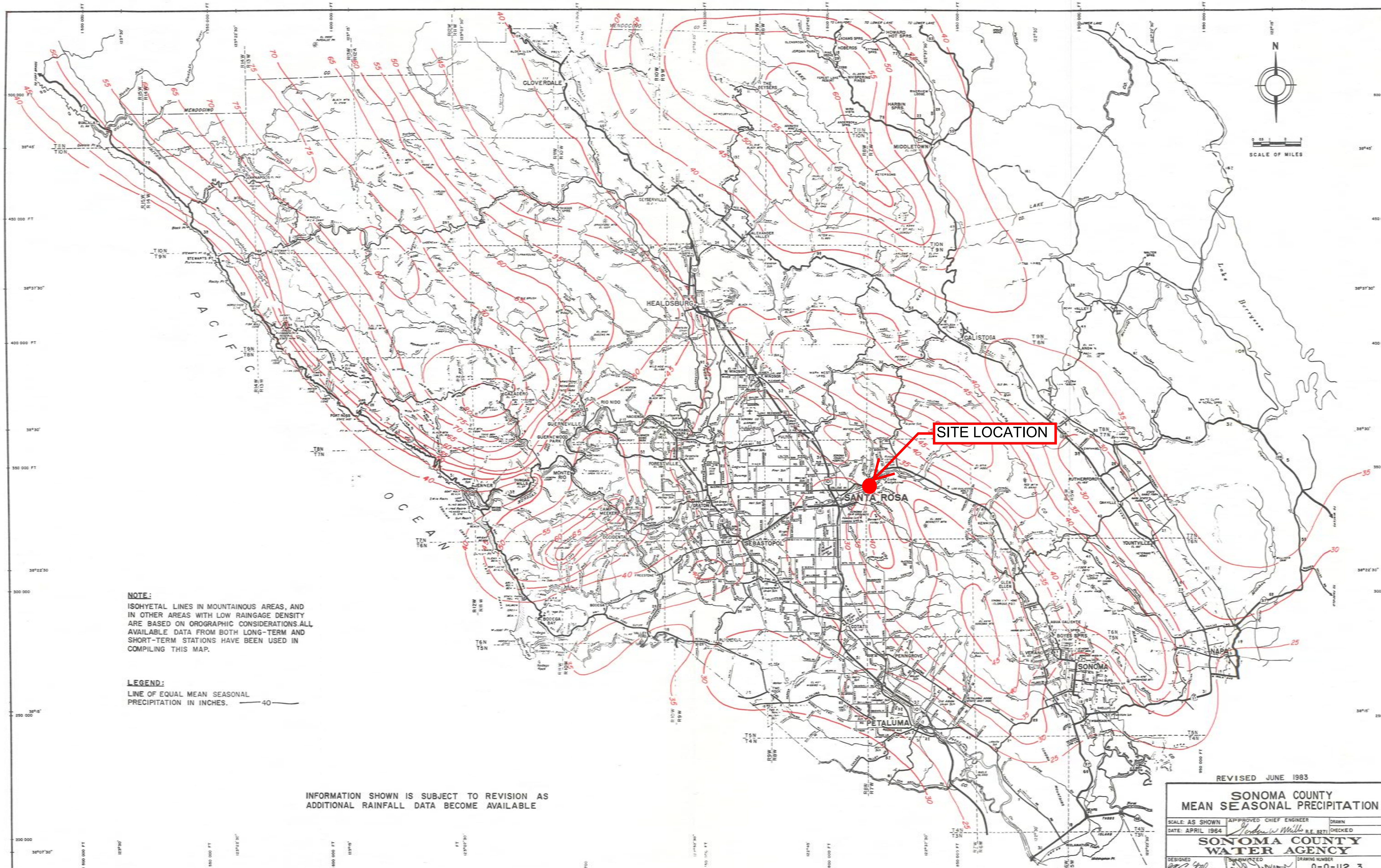
Inlet Number/Tributary Area/BMP: Area 9

INSTRUCTIONS: Please refer to the "Urban Hydrology for Small Watersheds" (TR-55 manual).

Soil Type (Infiltration Rate)	Cover Description	CN	Area ft^2	Product of CN x Area
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Impervious - Paved Parking, Rooftop, Driveways	98	1527	149,646.0
C: 0.05 - 0.15 in/hr infiltration (transmission) rate	Open Space (lawns, parks, golf courses, cemeteries, etc.) - Good (>75% grass cover)	74	276	20,424.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
No Entry	No Entry	0	0	0.0
		Totals =	1803	170,070.0

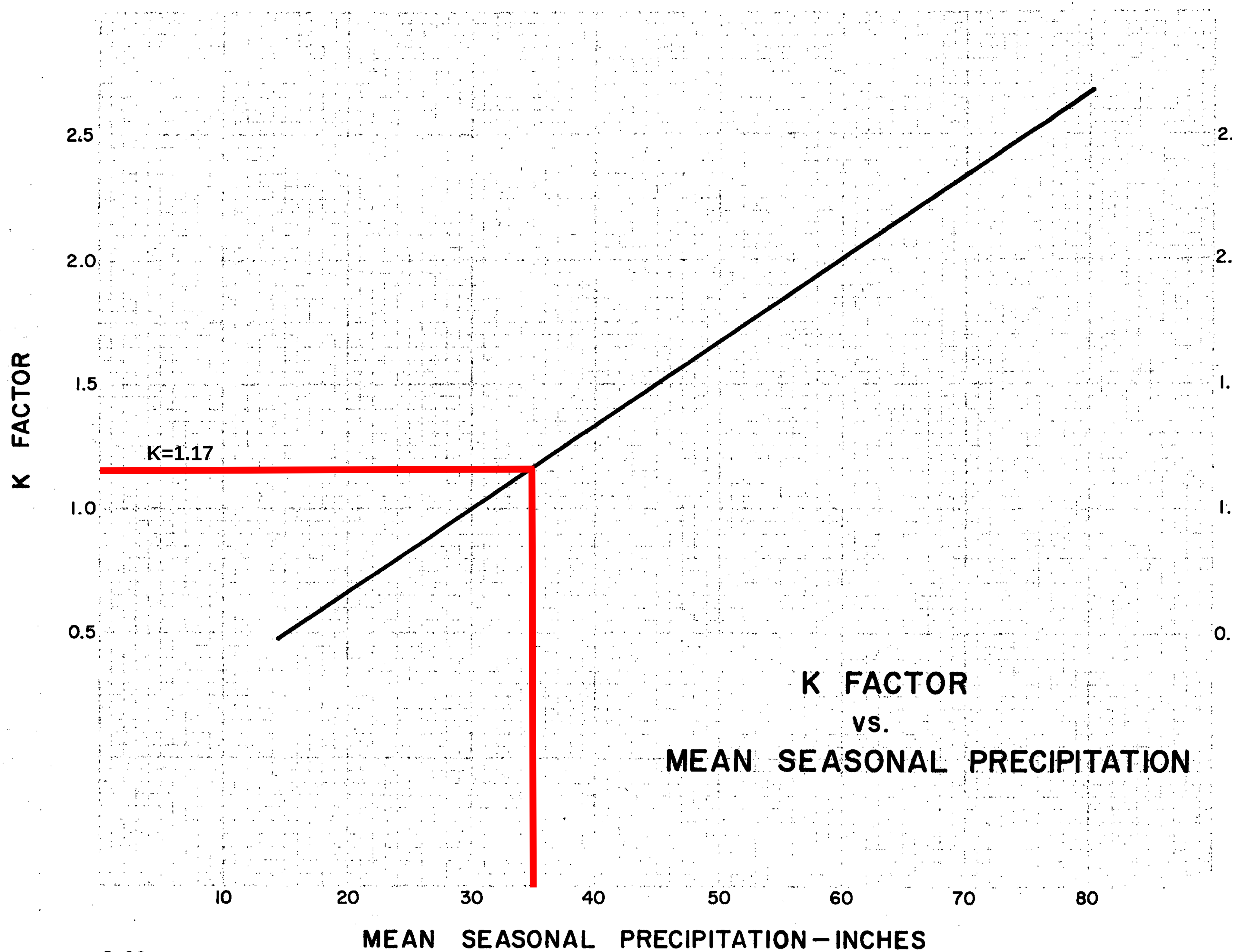
$$CN_{COMPOSIT} = \frac{(CN \times Area) + (CN \times Area) + (CN \times Area) + (CN \times Area) \ldots}{\text{Total Tributary Area}} =$$

Use this $CN_{COMPOSIT}$ = 94.3



SITE LOCATION
PACIFIC OCEAN
CLOVERDALE
GEYSERVILLE
HEALDSBURG
GUERNEVILLE
RIO NIDO
FORESTVILLE
MONTE RIO
JENNER
SEBASTOPOL
OCCIDENTAL
BODEGA BAY
SANTA ROSA
COTATI
PENNGROVE
PETALUMA
SONOMA
GLEN ELLEN
BOYES SPRS.
NAPA
YOUNTVILLE
CALISTOGA
MIDDLETOWN
MENDOCINO
SCALE OF MILES
NOTE:
ISOHYETAL LINES IN MOUNTAINOUS AREAS, AND IN OTHER AREAS WITH LOW RAINGAGE DENSITY ARE BASED ON OROGRAPHIC CONSIDERATIONS. ALL AVAILABLE DATA FROM BOTH LONG-TERM AND SHORT-TERM STATIONS HAVE BEEN USED IN COMPILING THIS MAP.
LEGEND:
LINE OF EQUAL MEAN SEASONAL PRECIPITATION IN INCHES. ——40——
INFORMATION SHOWN IS SUBJECT TO REVISION AS ADDITIONAL RAINFALL DATA BECOME AVAILABLE
REVISED JUNE 1983
SONOMA COUNTY
MEAN SEASONAL PRECIPITATION
SCALE: AS SHOWN
DATE: APRIL 1964
APPROVED CHIEF ENGINEER
R.E. 8271
DRAWN
CHECKED
SONOMA COUNTY WATER AGENCY
DESIGNED
SUBMITTED
DRAWING NUMBER
0-0-112.3

PLATE No. B-3



K FACTOR
K FACTOR
VS.
MEAN SEASONAL PRECIPITATION
K=1.17
2.5
2.0
1.5
1.0
0.5
10
20
30
40
50
60
70
80
MEAN SEASONAL PRECIPITATION — INCHES

2-66

6 Runoff Reduction Areas

6.1 Design Philosophy

Using alternative surfaces with a lower coefficient of runoff or "C-Factor" helps reduce runoff from developed areas. The C-Factor is a representation of a surface's ability to produce runoff. Surfaces that produce higher volumes of runoff are represented by higher C-Factors, such as impervious surfaces. Surfaces that produce smaller volumes of runoff are represented by lower C-Factors, such as more pervious surfaces. See Table 6-1 for typical C-Factor values for various surfaces during small storms.

Table 6-2 compares the C-Factors of conventional paving surfaces to alternative, lower C-Factor paving surfaces. By incorporating more pervious, lower C-Factor surfaces into a development, lower volumes of runoff are produced. Lower volumes and rates of runoff translate directly to lower treatment requirements.

Site design techniques may be used to reduce the C-Factor of a developed area, reducing the amount of runoff requiring treatment, including:

- Pervious Concrete
- Pervious Asphalt
- Turf Block
- Brick (un-grouted)
- Natural Stone
- Concrete Unit Pavers
- Crushed Aggregate
- Cobbles
- Wood Mulch

Other site design techniques such as disconnecting impervious areas, preservation of natural areas, and designing concave medians may be used to reduce the overall C-Factor of development areas.

Table 6-1
Estimated C-Factors for Various Surfaces During Small Storms

Paving Surface	*C-Factor*
Concrete	0.80
Asphalt	0.70
Pervious Concrete	0.60
Cobbles	0.60
Pervious Asphalt	0.55
Natural Stone without Grout	0.25
Turf Block	0.15
Brick without Grout	0.13
Unit Pavers on Sand	0.10
Crushed Aggregate	0.10
Grass	0.10
Grass Over Porous Plastic	0.05
Gravel Over Porous Plastic	0.05

Note: C-Factors for frequent small storms used to size water quality BMPs are likely to differ (be lower) than C-Factors developed for infrequent, large storms used to size flood control facilities. The above C-Factors were produced by selecting the lower end of the best available C-Factor range for each paving surface. These C-Factors are only appropriate for small storm treatment design, and should not be used for flood control sizing. Where available, locally developed small storm C-Factors for various surfaces should be utilized.

APPENDIX "C"

DETERMINATION WORKSHEET

SUSMP SUBMITTAL GUIDE CHECKLIST

BMP SELECTION TABLES

FOR OFFICE USE ONLY:
Does Project require coverage under the NPDES Storm Water Permit?
Y ◯ N ◯

Review Fee Paid?
Y ◯ N ◯

Require 401 Permitting?
Y ◯ N ◯

Propose SW LEED elements?
Y ◯ N ◯

Print Form

City of Santa Rosa

Determining Whether a Project Requires Permanent Storm Water Best Management Practices

PURPOSE: Use this form to determine whether or not your project will need to incorporate permanent storm water Best Management Practices.

Part 1:

Information:

MOB & Parking Structure	Santa Rosa Memorial Hospital
Project Name	*Applicant Name
SE Corner of Montgomery & Sotoyome	1165 Montgomery Dr.
Site Address	Mailing Address
Santa Rosa 95405	Santa Rosa, Ca 95405
City/Zip	City/State/Zip
	wesley.okamoto@yahoo.com
Permit Number(s) - if applicable	Phone/Email/Fax

Rick Carlile, BKF Engineers
Engineer Name

200 4th st., Suite 300
Mailing Address

Santa Rosa, Ca 95401
City/State/Zip

707-583-8533/ rcarlile@bkf.com
Phone/Email

Type of Application/Project:

- ☐ Subdivision
- ☐ Grading Permit
- ☐ Building Permit
- ☒ Use Permit
- ☒ Design Review
- ☐ Other

*Applicant is the owner or developer.

PART 2:

Exemptions:

1. Is this a ***routine maintenance activity*** [1] that is being conducted to maintain original line and grade, hydraulic capacity, and original purpose of facility such as resurfacing existing roads and parking lots? Y ☐ N ☒

2. Is it an ***emergency redevelopment activity*** [2] required to protect public health and safety? Y ☐ N ☒

3. Is this a project undertaken solely to install or reinstall ***public utilities*** (such as sewer or water lines) that does not include any additional street or road development or development activities? Y ☐ N ☒

4. Is it a reconstruction project, undertaken by a ***public agency***, [3] of street or roads remaining within the original footprint and less than 48 feet wide? Y ☐ N ☒

5. Is this a standalone pedestrian pathway, trail or off street bike lane? Y ☐ N ☒

Did you answer "YES" to any of the above questions in Part 2?

☐ **YES:** Stop. Your project is exempt and will not need to incorporate permanent storm water Best Management Practices.

☒ **NO:** Proceed to Part 3 below to see if your project will need to incorporate permanent storm water Best Management Practices.

Part 3:

Projects that Qualify:
Please answer the following questions to determine whether your project requires permanent storm water Best Management Practices:

1. Does your ***development or redevelopment project*** create or replace a combined total of 1.0 acres or more of impervious surface[4]? Y ☐ N ☒

---

[1] "***Routine Maintenance Activity***"- This exemption includes activities such as overlays and/or resurfacing of existing roads or parking lots as well as trenching and patching activities and reroofing activities.
[2] "***Emergency Redevelopment***"**-** The Regional Water Quality Control Board must agree that the activities are needed to protect public health and safety to qualify for this exemption.
[3] "***Reconstruction***" is defined as work that replaces surfaces down to subgrade. Street width is measured from face-of-curb to face-of-curb. Overlays, resurfacing, trenching, and patching is considered a maintenance activity and is exempt.

2. Does your project create or replace a combined total or 10,000 ft^2 or more of ***impervious street, roads, highways, or freeway construction or reconstruction***[4]***?*** Y ☐ N ☒

3. Does your project include ***four or more new homes***? Y ☐ N ☒

4. Is your project an ***industrial park***[5] creating or replacing a combined total of 10,000 ft^2 or more of impervious surface? Y ☐ N ☒

5. Is your project a ***Commercial strip mall*** [6] creating or replacing a combined total of 10,000 ft^2 or more of impervious surface? Y ☐ N ☒

6. Is your project a **retail gasoline outlet** creating or replacing a combined total of 10,000 ft^2 of more or impervious surface? Y ☐ N ☒

7. Is your project a **restaurant** creating or replacing a combined total of 10,000 ft^2 or more of impervious surface? Y ☐ N ☒

8. Is your project a **parking lot** (not included as part of a project type listed above) creating or replacing a combined total of 10,000 ft^2 or more or impervious surface or with 25 or more parking spaces? Y ☒ N ☐

9. Is your project an **automotive service facility** creating or replacing a combined total of 10,000 ft^2 or more or impervious surface? Y ☐ N ☒

Did you answer "YES" to any of the above questions in Part 3?

☒ **YES**: Your project will need to incorporate permanent storm water Best Management Practices and be designed in accordance with the Storm Water LID (Low Impact Development) Technical Manual. Complete Part 4 of this application, prepare a storm water LID plan and an existing condition and proposed condition site plan showing impervious areas and hydrologic soil type. Submit documents to the permitting authority.

4 "***Impervious Surface***" is defined as an area that has been modified to reduce storm water runoff capture and percolation into underlying soils. Such surfaces include rooftops, walkways, and parking areas. Permeable pavements shall be considered impervious for this section if they have subdrains to preclude infiltration into underlying soils.

5 "***Industrial Park***" is defined as industrial facility or building and associated impervious surface on a site zoned or planned to allow industrial or commercial development (planning for mixed-use residential, industrial or commercial development and redevelopment is included).

6"***Commercial Strip Mall***" is defined as commercial facility or impervious surface on a site zoned or planned to allow commercial or industrial use (planning for mixed-use residential, industrial or commercial development and redevelopment is included) with street access and onsite parking.

☐ **NO**: Stop. Your project will not need to incorporate permanent storm water Best Management Practices.

Part 4:

Project Description:

1. Total Lot or Site area: 130,552 Square feet or 3.00 acres.
2. Existing land use(s):
   Commercial ☐ Industrial ☒ Residential ☐ Public Other Medical

   Number and use of buildings,significant site features
   15 buildings, a mix of residential and small businesses.

3. Existing impervious surface area: 123,000 square feet or 2.82 acres.

4. Proposed Land Use (s):
   Commercial ☒ Industrial ☐ Residential ☐ Public Other

   Number and use of buildings, significant site features

   Parking lot for Memorial Hospital facilities

5. Proposed impervious surface area: 113,500 Square feet or 2.60 acres.

6. Existing and proposed site plan submitted showing impervious areas and hydrologic soil type?
   ☒ Yes ☐ No - Application not complete without site plans.

ACKNOWLEDGMENT:

As the property owner or developer, I understand that a "yes" answer to any of the questions in Part 3 of this application means that this project is required to implement permanent storm water Best Management Practices. Any unknown responses must be resolved to determine if the project is subject to the LID requirements.

____________________________________ __________________________
Signature of Property Owner or Developer Date

Implementation Requirements: *All calculations can be completed using the "Storm Water Calculator" available on the City of Santa Rosa's website at:* www.srcity.org/stormwaterLID

***Design Goa*l**: Capture (infiltration and/or reuse) of 100% of the volume of runoff generated by the 85th percentile 24 hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual. 100% volume capture is the ideal condition and if achieved satisfies all requirements so that no additional treatment is required and pages 2 and 3 of this calculator do not need to be completed. This is a retention requirement.

***Design Requirement*s**: If the Design Goal of 100% volume capture is not achieved; then both Requirement 1-100% Treatment AND Requirement 2- Volume Capture must be achieved.

***Requirement 1*:** Treatment of 100% of the flow generated by the 85th percentile 24 hour storm event, as calculated using the Rational Method and a know intensity of 0.92 inches per hour.

***Requirement* 2**: Capture (infiltration and/or reuse) of the increase in volume of storm water due to development generated by the 85th percentile 24 hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual. This is a retention requirement.

APPENDIX D **Preliminary SUSMP Submittal Guide**

Project Information:

Applicant Name (owner or developer)	Santa Rosa Memorial Hospital
Mailing Address	
City/State/Zip	Santa Rosa / CA / 95401
Phone/Email/Fax	

Project Name	MOB & Parking Structure
Site Address	Sotoyome St & Montgomery Dr
City/State/Zip	Santa Rosa / CA / 95401
Permit # (s)	

Engineer Name	BKF Engineers
Mailing Address	200 4th St, Suite 300
City/State/Zip	Santa Rosa / CA / 95401
Phone/Email/Fax	(707) 583-8533/rcarlile@bkf.com

Type of Application/Project:

☐ Subdivision ☐ Grading Permit ☐ Building Permit ☑ Design Review ☑ Use Permit ☐ Other ____________

What your Preliminary Plan must include:

Narrative:

Project Description

- ☑ Description of proposed project type, location, and any specific uses or features.
- ☑ Description of any sensitive features (creeks, wetlands, trees, etc) and weather they are going to be preserved, removed or altered.
- ☑ Description of the existing site.
- ☑ Description of how this project triggers these requirements (impervious area, CALGreen, 401 Permit, etc).

Pollution Prevention and Credits

- ☑ Description of all proposed pollution prevention measures (street sweeping, covered trash enclosures, indoor uses, etc).
- ☑ Description of all credits utilized (Interceptor Trees, Impervious Area Disconnection, and/or Alternative Driveway Design).
- ☑ Summary of tributary area reduction due to credits.

Type of BMPs proposed

- ☑ Description of the types of BMPs selected including priority group that each is in.
- ☑ Description of level of treatment and volume capture achieved (if 100% Capture is achieved treatment is not required).

Maintenance

- ☑ Description of maintenance for each type of BMP.
- ☑ Description of funding mechanism.
- ☑ Designation of Responsible Party.

<u>Exhibits:</u>

Proposed SUSMP Exhibit

- ☑ Exhibit should include: street names, property lines, storm drainage system, waterways, title block, scale, and north arrow.
- ☑ Tributary areas shown for all inlets (including offsite drainage areas).
- ☑ C value for each tributary area.
- ☑ Soil Type of existing site.
- ☑ New or replaced impervious area.
- ☑ All inlets shown (including identifier).
- ☑ All interceptor trees shown.
- ☑ All proposed BMPs shown.

Existing Condition Exhibit

- ➢ *<u>Not necessary if no impervious area existed on the undeveloped site or if the Design Goal of 100% Volume Capture is achieved.</u>*
- ☑ Exhibit should include: street names, property lines, proposed storm drainage system, waterways, title block, scale, and north arrow.
- ☑ Soil Type of existing site.
- ☑ Proposed tributary areas shown for all proposed inlets (including offsite drainage areas).
- ☑ Existing impervious areas

APPENDIX D **Preliminary SUSMP Submittal Guide**

BMP Details:

- ☑ Preliminary detail for each type of BMP selected- provide a preliminary 8.5"x11" detail for each BMP type or include on submitted drawings. These can be taken straight from the Fact Sheets if no significant changes are proposed.

On Plans:

- ☑ Show all applicable elements of the selected BMPs on the appropriate sheets.

Calculations:

- ☑ Preliminary calculations; both volume and treatment, using the "storm water calculator" for each inlet.

BMP Selection Table

	Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with...	High Ground Water	Contamination	Slope Constraints	Achieves...	Treatment	Volume Capture	Pollution Prevention Credit	BMP in priority selected?	Yes	No	Explanation of selection
Universal LID Features- to be considered on all projects.	Living Roof	N/A	N/A		x	x	x		x	x			○	⊙	
	Rainwater Harvesting	N/A	N/A		x	x	x			x			○	⊙	
	Interceptor Trees	N/A	N/A		x	x	x				x		○	⊙	
	Vegetated Buffer Strip	UN-01	Vegetated Buffer Strip								x		○	⊙	
	Bovine Terrace	UN-02	Bovine Terrace		x						x		○	⊙	
	Impervious Area Disconnection	N/A	N/A		x	x	x				x		○	⊙	

Additional Notes:

BMP Selection Table

	Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with...	High Ground Water	Contamination	Slope Constraints	Achieves...	Treatment	Volume Capture	Pollution Prevention Credit	BMP in this priority selected?	Yes	No	Explanation of selection
Priority 1 and 1A BMPs- to be installed with no underdrains or liners. Must drain all stading water within 72 hours.	Rain Garden	P1-01	Rain Garden						x	x			○	⊙	
	Roadside Bioretention	P1-02	Roadside Bioretention - no C & G						x	x			○	⊙	
	Vegetated Swale-with Bioretention	P1-06	Swale with Bioretention						x	x			⊙	○	
	Constructed Wetlands	N/A	N/A						x	x			○	⊙	
	Infiltration Trench	P1-07	Infiltration Trench						x	x			○	⊙	

Additional Notes:

Bioretention will be incorporated into the project because they fit into the context of this site.

APPENDIX “D”

BIORETENTION AREA FACT SHEET

FACT SHEET- BIORETENTION

BIORETENTION

Also know as: Street rain garden, roadside bioretention, and bioretention cell

DESCRIPTION

The bioretention area best management practice (BMP) functions as a soil and plant-based filtration and infiltration feature that removes pollutants through a variety of natural physical, biological, and chemical treatment processes.

ADVANTAGES

- Achieves both water quality and volume capture objectives.
- Bioretention areas provide storm water treatment that enhances the quality of downstream water bodies by using natural processes.
- The vegetation provides shade and wind breaks, absorbs noise, reduces heat island effects and improves an area's landscape.
- Bioretention provides habitat for birds and attracts other pollinators like butterflies and bees.
- Does not interrupt utility installation.
- Does not interfere with tree planting.

FACT SHEET- BIORETENTION

LIMITATIONS

- Bioretention is not recommended for areas where street slopes exceed 10%.
- Should not be used in areas of know contamination. If soil and/or groundwater contamination is present on the site or within a 100' radius of the proposed BMP location, the North Coast Regional Water Quality Control Board will need to be contacted and the site reviewed.
- Should not be used in areas of high groundwater. In general a minimum of 2' of clearance should be provided between the bottom of the bioretention cell and seasonal high groundwater.
- Should not be used in areas of slope instability where infiltrated storm water may cause failure. Slope stability should be determined by a licensed geotechnical engineer.
- Do not use in locations that can negatively impact building foundation or footings. Location shall be approved by a licensed Geotechnical Engineer.

KEY DESIGN FEATURES

ALL BIORETENTION

- Structural soil should be used within the bioretention area consisting of:
  - ¾"-1 ½" highly angular crushed stone (83% of mix, by weight)- with no fines
  - Clay loam (gravel<5%, sand 25%-30%, silt 20%-40%, clay 20%-40%, organic matter 2%-5%)
  - Hydrogel tackifier (0.03% of mix, by weight)

- Structural soil shall be installed as described in Appendix F.
- Native soil should remain uncompacted to preserve infiltration capacity. Fence off the area during construction to protect.
- Bottom of bioretention should be unlined to allow infiltration into native soil.
- Moisture barrier must be installed to protect road sub-base and any trenches adjacent to the bioretention area.
- Pervious concrete shall be designed and installed as described in Appendix F.
- Porous gutter must be protected during construction to prevent sediment loading.
- Bioretention areas shall be planted with plants from the approved plant and tree list included in Appendix G and shall be planted to achieve ___% cover.
- All bioretention areas shall be designed with a designated high flow bypass inlet for storms larger than the design storm.
- 6" perforated pipe to be installed at a depth of 6" below road structural section.
- Perforated pipe shall be installed in straight runs.
- The volume below the perforated pipe must be sufficient to hold and infiltrate the design volume.

FACT SHEET- BIORETENTION

SIZING DESIGN- GOAL AND REQUIREMENTS

- The **design goal** for all bioretention areas is to capture (infiltration and/or reuse) 100% of the volume of runoff generated by the 85th percentile 24 hour storm event. This is a retention requirement. If 100% volume capture is achieved than no additional treatment is required.
- If the design goal is not achievable, then the bioretention area *sizing requirement* is:
    - **Water Quality Treatment** of 100% of the flow generated by the 85th percentile 24 hour storm event, as calculated using the Rational Method and a known intensity of 0.92 inches per hour, **<u>and</u>**
    - **Volume Capture** (infiltration and/or reuse) of the increase in volume of storm water due to development generated by the 85th percentile 24 hour storm event. This is a retention requirement.
- All calculations shall be completed using the "Storm Water Calculator" available at www.srcity.org/stormwaterLID.

INSPECTION AND MAINTENANCE REQUIREMENTS

A maintenance plan shall be provided with the Final SUSMP. The maintenance plan shall include recommended maintenance practices, state the parties responsible for maintenance and upkeep, specify the funding source for ongoing maintenance with provisions for full replacement when necessary and provide site specific inspection checklist.

At a minimum maintenance shall include the following:
- Dry street sweeping upon completion of construction
- Dry street sweeping annually, and
    - When water is observed flowing in the gutter during a low intensity storm.
    - Algae is observed in the gutter.
    - Sediment/debris covers 1/3 of the gutter width or more.
- Inspect twice annually for sedimentation and trash accumulation in the gutter. Obstructions and trash shall be removed and properly disposed of.
- Inspect twice during the rainy season for ponded water.
- Pesticides and fertilizers shall not be used in the bioretention area.
- Plants should be pruned, weeds pulled and dead plants replaced as needed.

APPENDIX “E”

SAMPLE OPERATION AND MAINTENANCE INSPECTION CHECKLISTS

PLANTER STRIP BIORETENTION- CHECKLIST

Planter Strip Bioretention
Inspection and Maintenance Checklist
(aka: Street Rain Garden, Roadside Bioretention, Bioretention Cell)

Date of Inspection: ____________________________
Inspector(s): ____________________________
BMP ID #:____________________________
Property Owner: ____________________________

Location Description: ____

Type of Inspection: ☐ Pre-rainy Season (PRS) ☐ Rainy Season (RS) ☐ After-rainy Season (ARS)

This Inspection and Maintenance Checklist is to be used in conjunction with its corresponding LID Factsheet and Maintenance Plan. Please review these documents before performing the field inspection.

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Drainage	RS	Is there standing or pooling of water in the Bioretention area after 3 days of dry weather? Is water not draining into catch basin from the overflow pipe during a high intensity storm? *		• Check perforated pipe outlet for obstruction or damage. * • Flush perforated pipe to remove obstructions/sediment. * • Remove and replace the first few inches of topsoil. • Remove soil and inspect perforated pipe. Repair or replace perforated pipe, replace with new soil and regrade.	
	PRS RS ARS	Is there sediment visible in the gutter?		• In dry weather, use a mechanical sweeper or a Vactor truck to clean gutter pan.	
	RS	Is there water flowing in the pervious concrete gutter section during a low intensity storm? *		• In wet weather, use a Vactor truck to clean gutter pan.	

* If perforated pipe is present.

PLANTER STRIP BIORETENTION- CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Erosion	RS ARS	Is there under cutting or washouts along the sidewalks and/or curbs abutting the planter strip?		• Fill in eroded areas and regrade.	
	RS ARS	Is there channelization (gully) forming along the length of the planter area?		• Fill in eroded areas and regrade.	
	RS ARS	Is there accumulation of sediment (sand, dirt, mud) in the planter?		• Remove sediment and check the grading. Add replacement soil and/or mulch.	
	PRS RS ARS	Is the mulch unevenly distributed in the planter area?		• Redistribute and add additional mulch if needed. • Regrade planter area.	
	PRS RS ARS	Are there voids or deep holes present? Is there sediment present in the catch basin and in the overflow pipe?		• Check the perforated pipe for damage.*	
	PRS RS ARS	Is there evidence of animal activity such as holes or dirt mounds from digging or borrowing?		• Repair and fill in damage areas. • Rodent control activities must be in accordance with applicable laws and do not affect any protected species.	

* If perforated pipe is present.

PLANTER STRIP BIORETENTION- CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Vegetation	PRS RS ARS	Is the vegetation clogging the inlet flow areas?		• Trim and/or remove the excess vegetation.	
	PRS RS ARS	Is the mulch distributed evenly throughout the planter area?		• Redistribute and add additional mulch if needed. • Regrade planter area.	
	PRS RS ARS	Are there dead or dry plants/weeds? Is the vegetation over grown?		• Remove dead and/or dry vegetation. Replace as needed. • Remove or trim any vegetation that is causing a visual barrier, trip, and or obstruction hazard.	

PLANTER STRIP BIORETENTION- CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
BMP General	PRS RS ARS	Is there debris/trash in the planter area?		• Remove all trash and debris.	
	PRS RS ARS	Is graffiti present?		• Remove all graffiti from the area.	
	PRS RS ARS	Are there missing or disturbed aesthetics features?		• Replace and/or reposition aesthetics features to original placement. • Placement should not disrupt flow characteristics/design.	
	PRS RS ARS	Is the vegetation irrigation functional?		• Repaired broken missing spray/drip emitters. • Reposition and/or adjust to eliminate over spray and/or over watering.	
	PRS RS ARS	Are the aesthetic features firmly secured in placed?		• Repair and/or replace loose or damage features.	
	PRS RS ARS	Check for damage sidewalk, curb, gutter, and catch basin including uplift and settling.		• Remove and replace damaged areas.	

APPENDIX “F”

MAINTENANCE DECLARATION

RECORDING REQUESTED BY AND WHEN RECORDED MAIL TO:

County of Sonoma
Permit and Resource Management Department
2550 Ventura Avenue
Santa Rosa, California 95403
Attn: ____________

Property: Montgomery Drive & Sotoyome Street
APN: 009-172-001 through -007

MAINTENANCE AND MONITORING AGREEMENT AND DECLARATION OF COVENANTS REGARDING STORM WATER BMP FACILITIES

THIS AGREEMENT is made and entered into this __th day of ____2016 (Effective Date), by and between __________________ (Landowner), and County of Sonoma (County).

RECITALS

WHEREAS, the North Coast Regional Water Quality Control Board NPDES Permit, Order #31-2009-0050 (NPDES Permit), requires that the County shall require that all new development and redevelopment projects subject to post-construction Best Management Practice (BMP) requirements provide for maintenance of BMPs by way of legally binding maintenance agreements and/or other equivalent measures.

WHEREAS, the NPDES Permit further requires that BMP maintenance agreements shall ensure that the BMPs implemented will remain fully functional, and that all areas identified for treatment will discharge to the treatment BMP system.

WHERAS, the NPDES Permit further specifically requires:

- The developer's signed statement accepting responsibility for maintenance of BMPs until the responsibility is legally transferred; and
- Written conditions in any sales or lease agreement, in enough detail to be easily understood by the future owner or tenant, that require the property owner or tenant to assume responsibility for BMP maintenance and conduct a maintenance inspection at least once a year; and
- The County to notify the Regional Water Board and commence progressive enforcement against the owner or operator where necessary to rectify failure to implement and maintain post-construction BMPs.

WHEREAS, the Storm Water Low Impact Development Technical Design Manual (LID Manual) adopted by the County and City of Santa Rosa further requires a legally binding, signed maintenance agreement or equivalent mechanism for all BMPs located on private property.

WHEREAS, the LID Manual requires that maintenance agreements shall legally assign maintenance responsibility to the property owner; shall be recorded among the deed records at the County Recorder's Office so they will run with the title to the land; and shall be included in any future sales and/or lease agreements.

WHEREAS, the LID Manual further requires that the funding of all inspection, maintenance, and replacement of BMPs on private land is the sole responsibility of the property owner, and that annual inspections and maintenance and any corrective actions, repairs, or replacements shall be documented, retained for at least five years, and made available to the County upon request.

WHEREAS, Landowner is the owner of certain real property described in Exhibit A, attached hereto and incorporated as though fully set forth herein (Property).

WHEREAS, the Project includes a final Storm Water Mitigation Plan (SWMP) that has been submitted, reviewed, and approved, and that includes provisions for the construction of BMPs identified in Exhibit B, attached hereto and incorporated as though fully set forth herein.

WHEREAS, the SWMP identifies post-construction storm water management BMPs, assigns monitoring and maintenance responsibility to the project owner, and includes Inspection and Maintenance Checklists that identify when and how BMPs will be inspected, when maintenance will be required, and how maintenance has or will be conducted.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing recitals, the mutual covenants contained herein, and the following terms and conditions, the parties agree as follows:

1. Landowner shall, at its sole cost and expense, construct, inspect, and maintain the BMPs in accordance with the conditions of approval and SWMP specifications.

2. Landowner shall ensure the BMPs remain fully functional and in good working condition as determined solely by the County, and that all areas identified for treatment discharge to the treatment BMP system.

3. Landowner accepts sole responsibility for all inspection, maintenance, remediation, and replacement of the BMPs.

4. These responsibilities run with the land, and shall transfer to the new owner or tenant in the event the Property is sold or leased.

5. Landowner will perform inspections and maintenance in accordance with the SWMP. All work shall conform to the requirements of the SWMP, County-identified BMP manuals and handbooks, and specific maintenance requirements established by the manufacturer as approved by the County. Specific manufacturer maintenance requirements for the BMP will be submitted to the County.

6. Landowner hereby grants permission to the County and its authorized agents and employees to enter the Property and inspect the storm water management/BMP facilities whenever the County deems necessary. The purpose of the inspection is to assure safe and proper functioning of the facilities, including any berms, inlet and outlet structures,

vegetation, infiltration media, pond areas, underground retention areas, and access roads. If deficiencies are noted, County shall notify Landowner and provide the inspection findings and requirements to cure the deficiencies.

7. Landowner hereby grants permission to County and its authorized agents, employees, and consultants to enter upon the Property to install, operate and maintain equipment to monitor the flow characteristics and pollutant content of the influent, effluent and intermediate points in the facilities. Landowner further agrees to design and construct the facility to provide access for monitoring as outlined in the LID manual and/or in the manufacturer manual for the BMP.

8. All records regarding inspections and maintenance shall be retained by Landowner for at least five years and made available to the County upon request. These records shall include copies of completed inspection reports and maintenance checklists to document any inspection and maintenance activities that were conducted over the last five years. Any corrective actions, repairs, or replacements shall also be documented and kept in the BMP inspection and maintenance records for a minimum of five years.

9. In the event Landowner fails to maintain the storm water management/BMP facilities in good working condition acceptable to County, County may enter upon the Property and take whatever steps it deems reasonably necessary to maintain the storm water management/BMP facilities. This provision shall not be construed to allow County to erect any structure of a permanent nature on the Property outside of an easement in favor of County. It is expressly understood and agreed that County is under no obligation to maintain or repair facilities, and in no event shall this Agreement be construed to impose such an obligation on County.

10. In the event that County, pursuant to this Agreement, performs work of any nature, or expends any funds in the performance of such work for labor, use of equipment, supplies, materials, and the like, due to the failure of Landowner to perform such maintenance or work, Landowner shall reimburse County within 30 days of receipt of notice of all costs incurred by the County to undertake such work. If Landowner fails to reimburse County for these costs within 30 days, County shall have the right to record a lien against the property in the amount of such costs, plus the legal rate of interest for judgments, and may enforce the lien in the same manner a lien for real property taxes may be enforced.

11. Landowner shall indemnify, defend and hold harmless County and its employees, officials, and agents, from and against any liability, (including liability for claims, suits, actins arbitration proceedings, administrative proceedings, regulatory proceedings, losses, expenses or costs of any kind, whether actual, alleged or threatened, interest, defense costs, and expert witness fees), where same results from or arises out of the construction, presence existence, or maintenance of the storm water management/BMP facilities or the performance of this Agreement by Landowner, its officers, employees, agents, and sub-contractors, excepting only that resulting from the sole, active negligence or intentional misconduct of County, its employees, officials, or agents. This indemnification obligation is not limited in any way by any limitation on the amount or type of damages or compensation payable to or for Landowner or its agents under workers' compensation acts, disability benefits acts or other employees' benefits acts. In the event a claim is

asserted against County, its agents or employees', County shall promptly notify landowner. Thereafter, Landowner shall defend at its own expense any suite based upon such claim. If any judgment or claim against the County, its agents or employees', shall be entered, Landowner shall pay all costs and expenses in connection therewith.

12. Any violation of the final SWMP or this Agreement by Landowner shall be deemed a public nuisance under the Sonoma County Code and the County shall be entitled to the remedies available to it under the Sonoma County Code, in addition to and cumulative of all other remedies, civil or criminal, which may be pursued by the County.

13. Landowner shall not assign this Agreement to a third party without the express prior written consent of the County, provided that such consent will not be unreasonably withheld and that such consent shall not be required for Landowner to sell or lease the property to a third party.

14. Landowner binds itself, its partners, successors, legal representatives and assigns to the County and to the partners, successors, legal representatives and assigns of the County with respect to all promises and agreements contained herein.

15. This Agreement shall be recorded by Landowner, and shall: a) constitute a "covenant running with the land;" b) be binding in perpetuity upon Landowner and Landowner's successors, heirs, and assigns; and, c) benefit the County of Sonoma, its successors, and assigns. Any breach of this Agreement shall render Landowner or Landowner's heirs, successors or assigns liable pursuant to the provisions of the Sonoma County Code.

16. All future sales or lease agreements shall include a copy of this Agreement, and written conditions, in enough detail to be easily understood by the future property owner or tenant, that require the property owner or tenant to assume responsibility for BMP maintenance and compliance with this Agreement.

17. If any provisions of the Agreement shall be held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provision shall not in any way be affected or impaired thereby.

18. This Agreement shall be governed according to the laws of the State of California. Because this Agreement is to be performed in the County of Sonoma, the parties hereto agree that the forum for the adjudication of any dispute regarding the Agreement or enforcement shall be brought exclusively and solely in Sonoma County, California.

19. This Agreement is effective as of the Effective Date identified above.

LANDOWNER:

By: ___________________________

Name: _________________________

Title: _________________________

THE COUNTY OF SONOMA:

By: ___________________________

Name: _________________________

Title: _________________________

ATTEST:

By: ___________________________

Name:__________________________

Title: __________________________

Attachments:

Exhibit A – Property description

Exhibit B – Location map of BMPs as part of this agreement

Notary Acknowledgment