Sigma Prime Geosciences, Inc.
Effective Solutions

332 PRINCETON AVENUE
HALF MOON BAY, CA 94019
650-728-3590
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DRAINAGE REPORT

TEG Property
Miramar Drive
Miramar, CA
APN 048-076-120
Sigma Prime Job #: 15-106

January 30, 2024

Project Description

The proposed project is a new house on a vacant lot, as well as the extension of an existing road. The vacant lot covers an area of 35,069 square feet. The proposed extension of the road, to be paved with asphalt, will be in an area of 13,755 square feet in the public right-of-way. The total site area is 48,824 square feet. Two different drainage systems will be designed for the roof/driveway and the road paving.

Since this project will be on both private property and in a public right-of-way, we are using the Limits of Work area of 7200 square feet (0.17 acres) as the total site area in the C3 and C6 Development Review Checklist. The property and the right-of-way are both currently undeveloped with no drainage improvements.

Project existing and proposed impervious surfaces are summarized in the table:

	Existing Impervious Area (sq. ft.)	Proposed Impervious Area (sq. ft.)
Roof	0	2200
Road	1793	6148
Driveway, walkway	0	2374
TOTAL	**0**	**10,722**

Project Site Drainage Considerations

The average slope across the lot and road alignment is 15 percent. The calculation method is included in the attached spreadsheet.

The property drains as sheet-flow down a slope to the south to an unnamed watershed that flows west to Montara Beach.

The site is in FEMA designation X. This is an area that is outside the flood area with a 0.2% probability of occurring.

A site subsurface study has not been performed yet. Groundwater is likely more than 20 feet deep, as is typical for the area. The soil type is unknown at this time. The geology at the site is mapped as granitic rock. A typical infiltration rate for a subsurface drainage system in this type of material is about 0.1 in/hr.

Project Drainage Calculations – Flow and Volume Control

The rational method was selected as the calculation method for this project because of the relatively simple nature of the project and because the project size is less than 10 acres.

A 10-year design storm was used for calculating the pre-and post-development peak flow and runoff volumes for this project per the County's minimum guidelines.

A factor of safety of 1.2 was selected to account for currently unplanned minor changes in

impervious area on-site, low maintenance periods, and potential construction errors.

Time of concentration was determined using the equation for the NRCS watershed lag method. As these values were less than the County minimum Time of Concentration, a 10 minute time of concentration was used.

Rainfall intensity for the project site was obtained from NOAA's Precipitation Frequency Data Server. As can be seen in the attached NOAA spreadsheet, the intensity for a 10-minute duration, 10-year design storm, is 2.22 inches per hour.

Pre-Development Peak Flow

Topographic site survey shows that under existing conditions, the property sheet flows to the south, so there is only one point of discharge and one tributary area for calculations. Pre-development peak flow is calculated as using the rational method, using the attached spreadsheet called "Runoff Comparison". The pre-development peak flow is estimated to be 0.801 cfs.

Post-Development Site Runoff

Post-development site runoff also flows generally to the north. Post-development as shown on the attached spread sheet, is estimated to be 1.129 cfs, for an increase of 0.328 cfs.

Project Site Drainage Considerations – Roof and Driveway

The following procedure was performed for the roof and driveway only. San Mateo County requires that project runoff from a 10-year, 1-hour duration design storm be retained onsite. For a 10-year storm, the intensity for a 1-hour duration is 0.880 in/hr.

The attached spreadsheet, called "Detention Basin Sizing", shows the steps in estimating the volume of runoff and the required lengths of different sizes of detention basins. The runoff volume is estimated to be 200 cf. 240 cf of runoff needs to be retained, based on a factor of safety of 1.2.

Proposed Mitigation Features – Roof and Driveway

In order to contain this volume of runoff, it is proposed to route stormwater to a new infiltration-based retention feature that consists of a 23.5' long 36" diameter perforated pipe surrounded by 6' of gravel on all sides. The system overflows through a 12"x12" grate at the top. The detention storage calculations are outlined on the attached spreadsheet, "Detention Basin Sizing".

The percolation rate is not adequate to drain the detention basin between storms. Therefore, a metered out let that leads to the bioretention area for the road is proposed.

Proposed Mitigation Features - Road/Driveway

In order to contain this volume of runoff, it is proposed to route stormwater to a new infiltration-based

retention feature that consists of a 1.5‘ wide bioretention area. At 4% of the paved road area, the bioretention area needs to cover an area of 246 square feet. The proposed bioretention area covers an area of 378 square feet.

Culvert Sizing

The attached spreadsheets called “Culvert Sizing” show the calculations to check on the size of the downspout pipes. Based on a 10-year storm with a 5-minute duration, a rainfall intensity of 3.10 in/hr was applied. The calculations show that a minimum pipe diameter of 3.1 inches for the house and driveway is required. We have specified a pipe dimeter of 4 inches.

Operations & Maintenance

Recommended operations and maintenance for the proposed drainage system onsite includes:
» Clear debris from inlets as needed.
» Clear debris from detention basin pipes and bioretention area as needed.
» Maintain appropriate vegetation for infiltration measures per the C.3 Technical Guidance.

As a C.3 Regulated Project, an Operations and Maintenance (O&M) Agreement will need to be recorded for the property prior to the Building Permit final. A draft O&M agreement has been prepared separately.

Attachments

NOAA Atlas 14 Spreadsheet

Runoff Comparison

Detention Basin Sizing

Culvert Sizing

C.3 and C.6 Development Review Checklist

NOAA Atlas 14, Volume 6, Version 2
Location name: Half Moon Bay, California, USA*
Latitude: 37.4963°, Longitude: -122.4494°
Elevation: 303 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**1.85** (1.62-2.14)	**2.21** (1.93-2.56)	**2.69** (2.35-3.12)	**3.10** (2.66-3.62)	**3.65** (3.01-4.48)	**4.09** (3.29-5.15)	**4.55** (3.54-5.89)	**5.03** (3.78-6.76)	**5.69** (4.06-8.06)	**6.23** (4.25-9.22)
10-min	**1.33** (1.16-1.53)	**1.58** (1.39-1.83)	**1.93** (1.68-2.24)	**2.22** (1.91-2.60)	**2.62** (2.16-3.20)	**2.93** (2.36-3.68)	**3.26** (2.54-4.22)	**3.60** (2.71-4.84)	**4.08** (2.91-5.78)	**4.46** (3.05-6.60)
15-min	**1.07** (0.936-1.23)	**1.28** (1.12-1.48)	**1.56** (1.36-1.80)	**1.79** (1.54-2.10)	**2.11** (1.74-2.58)	**2.36** (1.90-2.97)	**2.63** (2.04-3.41)	**2.90** (2.18-3.90)	**3.29** (2.34-4.66)	**3.60** (2.46-5.32)
30-min	**0.742** (0.650-0.856)	**0.888** (0.776-1.03)	**1.08** (0.944-1.26)	**1.24** (1.07-1.46)	**1.47** (1.21-1.80)	**1.64** (1.32-2.07)	**1.83** (1.42-2.37)	**2.02** (1.52-2.72)	**2.29** (1.63-3.24)	**2.50** (1.71-3.70)
60-min	**0.525** (0.460-0.606)	**0.628** (0.549-0.726)	**0.766** (0.667-0.888)	**0.880** (0.759-1.03)	**1.04** (0.857-1.27)	**1.16** (0.935-1.46)	**1.29** (1.01-1.68)	**1.43** (1.07-1.92)	**1.62** (1.15-2.29)	**1.77** (1.21-2.62)
2-hr	**0.386** (0.338-0.445)	**0.453** (0.396-0.523)	**0.545** (0.474-0.632)	**0.623** (0.537-0.730)	**0.734** (0.606-0.899)	**0.824** (0.662-1.04)	**0.920** (0.716-1.19)	**1.02** (0.768-1.38)	**1.17** (0.834-1.66)	**1.29** (0.882-1.91)
3-hr	**0.322** (0.282-0.372)	**0.377** (0.329-0.435)	**0.452** (0.394-0.524)	**0.517** (0.446-0.606)	**0.611** (0.504-0.747)	**0.686** (0.552-0.864)	**0.768** (0.598-0.997)	**0.857** (0.644-1.15)	**0.985** (0.702-1.40)	**1.09** (0.745-1.62)
6-hr	**0.228** (0.199-0.263)	**0.267** (0.234-0.309)	**0.323** (0.281-0.374)	**0.371** (0.319-0.435)	**0.440** (0.363-0.539)	**0.498** (0.400-0.626)	**0.560** (0.436-0.726)	**0.627** (0.471-0.843)	**0.726** (0.517-1.03)	**0.808** (0.552-1.20)
12-hr	**0.147** (0.129-0.170)	**0.178** (0.156-0.206)	**0.221** (0.192-0.256)	**0.258** (0.222-0.302)	**0.310** (0.256-0.379)	**0.352** (0.283-0.443)	**0.398** (0.309-0.516)	**0.446** (0.335-0.600)	**0.516** (0.368-0.731)	**0.573** (0.391-0.848)
24-hr	**0.094** (0.085-0.105)	**0.118** (0.107-0.132)	**0.150** (0.136-0.169)	**0.178** (0.160-0.201)	**0.216** (0.188-0.253)	**0.246** (0.210-0.295)	**0.278** (0.231-0.341)	**0.312** (0.252-0.394)	**0.359** (0.278-0.473)	**0.397** (0.297-0.541)
2-day	**0.060** (0.055-0.067)	**0.075** (0.068-0.084)	**0.096** (0.087-0.108)	**0.113** (0.102-0.128)	**0.137** (0.119-0.161)	**0.157** (0.134-0.188)	**0.177** (0.147-0.218)	**0.199** (0.161-0.251)	**0.230** (0.178-0.303)	**0.254** (0.190-0.347)
3-day	**0.047** (0.043-0.052)	**0.058** (0.053-0.065)	**0.074** (0.067-0.083)	**0.087** (0.078-0.098)	**0.105** (0.091-0.123)	**0.120** (0.102-0.144)	**0.135** (0.112-0.166)	**0.152** (0.122-0.192)	**0.175** (0.135-0.230)	**0.193** (0.145-0.264)
4-day	**0.039** (0.036-0.044)	**0.049** (0.044-0.055)	**0.062** (0.056-0.069)	**0.072** (0.065-0.082)	**0.087** (0.076-0.102)	**0.099** (0.084-0.119)	**0.111** (0.092-0.137)	**0.124** (0.100-0.157)	**0.142** (0.110-0.187)	**0.157** (0.117-0.214)
7-day	**0.028** (0.025-0.031)	**0.035** (0.032-0.039)	**0.044** (0.040-0.050)	**0.051** (0.046-0.058)	**0.061** (0.053-0.072)	**0.069** (0.059-0.083)	**0.076** (0.063-0.094)	**0.084** (0.068-0.106)	**0.095** (0.073-0.125)	**0.103** (0.077-0.140)
10-day	**0.022** (0.020-0.024)	**0.028** (0.025-0.031)	**0.035** (0.032-0.039)	**0.041** (0.037-0.046)	**0.048** (0.042-0.056)	**0.054** (0.046-0.064)	**0.059** (0.049-0.073)	**0.065** (0.052-0.082)	**0.072** (0.056-0.095)	**0.077** (0.058-0.106)
20-day	**0.014** (0.013-0.016)	**0.018** (0.017-0.021)	**0.023** (0.021-0.026)	**0.027** (0.024-0.031)	**0.032** (0.028-0.037)	**0.035** (0.030-0.042)	**0.038** (0.032-0.047)	**0.041** (0.033-0.052)	**0.045** (0.035-0.060)	**0.048** (0.036-0.066)
30-day	**0.012** (0.011-0.013)	**0.015** (0.014-0.017)	**0.019** (0.017-0.021)	**0.022** (0.020-0.025)	**0.026** (0.022-0.030)	**0.028** (0.024-0.034)	**0.031** (0.025-0.038)	**0.033** (0.027-0.042)	**0.036** (0.028-0.047)	**0.038** (0.028-0.052)
45-day	**0.010** (0.009-0.011)	**0.012** (0.011-0.014)	**0.016** (0.014-0.018)	**0.018** (0.016-0.021)	**0.021** (0.018-0.025)	**0.023** (0.020-0.028)	**0.025** (0.021-0.031)	**0.027** (0.021-0.034)	**0.029** (0.022-0.038)	**0.030** (0.022-0.041)
60-day	**0.009** (0.008-0.010)	**0.011** (0.010-0.013)	**0.014** (0.013-0.016)	**0.016** (0.015-0.018)	**0.019** (0.016-0.022)	**0.020** (0.017-0.024)	**0.022** (0.018-0.027)	**0.023** (0.019-0.030)	**0.025** (0.019-0.033)	**0.026** (0.019-0.036)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

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Runoff Comparison

Job: Singh
No.: 17-132
Date 1/30/2024
by: CMK

Rational Method to Estimate Storm Runoff

$Q_p=CIA_d$

Project Area (sf):	48824	

Pre-Construction:

Pervious Area (sf):	47031	
Impervious Area (sf):	1793	
Total Area, A_d (sf):	48824	
Area, A_d (acres):	1.121	
Pervious C_{10}:	0.3	
Impervious C_{10}:	0.9	
Weighted C_{10}:	0.3220342	
Time of Concentration, t_c:	10	minutes
I (rainfall intensity):	From NOAA Atlas 14	
I_{10}=	2.22	in/hr
Q=CIA:	0.801	CFS

Post-Construction:

Pervious Area (sf):	36309	
Impervious Area (sf):	12515	
Total Area, A_d (sf):	48824	
Area, A_d (acres):	1.121	
Pervious C_{10}:	0.3	
Impervious C_{10}:	0.9	
Weighted C_{10}:	0.45	
Time of Concentration, t_c:	10	minutes
I (rainfall intensity):	From NOAA Atlas 14	
I_{10}=	2.22	in/hr
Q=CIA:	1.129	CFS

Difference:	**0.328**	**CFS**
% Increase:	**40.9**	

Detention Basin Sizing - House

Job: Singh
No.: 17-132
Date 1/30/2024
by: CMK

Rational Method to Estimate Storm Runoff

$Q_p=CIA_d$

Area, A_d (sf):	4574
Area, A_d (acres):	0.10500
C:	0.9

Duration=1 hour
I (rainfall intensity): from NOAA Atlas 14 Dataset

I_{60}= 0.880 in/hr

Q= **0.055** CFS

Detention Size (for 1-hour duration):

10-yr Storm: **200** CF
FS = 1.2: **240** CF

Areas:	Pipe Diam-ft	Trench Width -ft	Trench Depth -ft	Trench Area-sf	Pipe Area -sf	Gravel Area-sf	w/Void Ratio 35%	Total Area-sf
	1	2	2	4	0.79	3.21	1.13	1.91
	1.5	2.5	2.5	6.25	1.77	4.48	1.57	3.34
	2	3	3	9	3.14	5.86	2.05	5.19
	3	4	4	16	7.07	8.93	3.13	10.19

Size Pipes for 10-year event:

1' diam. Pipe:	**125.4**	LF Required
1.5' diam. Pips:	**71.8**	LF Required
2' diam. Pipe:	**46.1**	LF Required
3' diam. Pipe:	**23.5**	LF Required

3-day percolation check:

Pipe Diameter:	3	feet
Estimated percolation rate:	0.1	in/hr
Estimated percolation rate:	0.0083	ft/hr
	0.20	ft/day
	3	days
	0.60	ft/sf (perc rate)
	333	sf (needed sf)
Trench Length:	22.6	feet
Trench Width:	14.72	feet
Width of Gravel:	70.3	inches

Culvert Sizing - House

Job: Singh
No.: 17-132
Date 1/30/2024
by: CMK

Rational Method to Estimate Storm Runoff (page 20-13)

$Q_p=CIA_d$ Reference: Civil Engineering Reference Manual

Area (SF):	4306	
Area, A_d (acres):	0.0989	
C (Appendix 20.A):	0.9	
I (rainfall intensity):	NOAA Atlas 14	
Storm Frequency:	10	years
Time of Concentration, t_c	5	minutes
I=	**3.10**	in/hr

Q_p= **0.28** **ft^3/sec** = 123.5 **gal/min**

Culvert Size (page 19-6)

$D=1.335(nQp/sqrt(S))^{3/8}$ Eq. 19.16b, page 19-6, full flow

n:	0.009	Manning roughness coefficient, from Appendix 19.A
S:	0.04	Slope of pipe

D=	**0.26**	**feet**
=	**3.1**	**inches**

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

C.3 and C.6 Development Review Checklist

Municipal Regional Stormwater Permit (MRP 3.0)
Stormwater Controls for Development Projects

COUNTY OF SAN MATEO
Planning & Building Department
455 County Center, 2nd Floor
Redwood City, CA 94063
BLD: 650-599-7311/PLN: 650-363-1825
http://planning.smcgov.org

Project Information (Enter information only into blue-highlighted cells - other cells are locked.)

I.A Enter Project Data (For "C.3 Regulated Projects," data will be reported in the municipality's stormwater Annual Report.)

Project Name:	Singh	Case Number:	
Project Address:	Hermosa Avenue, Miramar, Half Moon Bay	Cross Street:	Miramar Drive, Miramar
Project APN:	048-076-120	Project Watershed:	Arroyo de en Medio
Applicant Name:	Tejinder Singh	Project Phase No.	
Applicant Phone:	650-274-4653	Applicant Email Address:	tjsingh007@icloud.com

Development Type: (check all that apply)

- ☑ Small Single-Family Home Project (<10,000 sq. ft. of created and/or replaced impervious surface[1])
- ☐ Large Single-Family Home Project (≥10,000 sq. ft. of created and/or replaced impervious surface[1])
- ☐ Subdivision - Residential: Two or more lot development[2] # of units:
- ☐ Multi-Family Residential # of units:
- ☐ Commercial
- ☐ Industrial, Manufacturing
- ☐ Mixed-Use # of units:
- ☐ New, widened or reconstructed roads related to parcel-based projects[3]
- ☐ Stand-alone pavement maintenance or construction work, or similar work related to parcel-based projec
- ☐ Other redevelopment project as defined by MRP: creating, adding and/or replacing exterior existing impervious surface on a site where past development has occurred.
- ☐ Institutional: schools, libraries, jails, etc.
- ☐ Parks and trails, camp grounds, other recreational
- ☐ Kennels, Ranches
- ☐ Other, Please specify

Project Description (Don't include past or future phases)[4]: New house on vacant lot, road extension

I.A.1 Total Project Area: 48,824 square feet (on and off-site)
I.A.2 Total Area on-site: 35,069 square feet (on the private property)
I.A.3 Total Area off-site: 13,755 square feet (frontage or area in Public Right of Way being improved)
I.A.4 Total Area of land disturbed during construction: 17,280 square feet
(Include all project on-site and off-site areas of clearing, grading, excavating and stockpiling)
I.A.5 Site slope: 15 %

I.A.6 Certification:

I certify that the information provided on this form is correct and acknowledge that, should the project exceed the amount of new and/or replaced impervious surface provided in this form, the as-built project may be subject to additional improvements.

☐ Preliminary Calculations Attached ☐ Final Calculations Attached ☑ Stormwater Control Plan Attached

Name of person completing the form:	Charles Kissick	Title:	Engineer
Signature:		Date:	1/30/2024
Phone Number:	650-728-3590	E-mail:	sigmaprm@gmail.com

[1] Small and Large Detached Single-Family Homes that are not part of a common plan of development[2].

[2] Common Plans of Development (subdivisions or contiguous, commonly owned lots, for the construction of two or more homes developed within 1 year of each other), and/or constructed with shared utilities, are not considered single family home projects by the MRP.

[3] Stand-alone roadway or pavement projects, or pavement work that is part of a project, creating or replacing 5,000 sq. ft. or more of impervious surface may be subject to C.3 requirements - both in public and private areas. See the Roads Factsheet at: www.flowstobay.org/newdevelopment

[4] Project description examples: 5-story office building, industrial warehouse, residential with five 4-story buildings for 200 condominiums, etc.

I.B Is the project a "C.3 Regulated Project" per MRP Provision C.3.b? (Use table below to make determination.)

I.B.1 Enter the amount of Impervious surface Retained, Replaced or Created[5] by the project (use DMA Table in Worksheet D):

Table I.B.1 Impervious[6] and Pervious[6] Surfaces (Match DMA Summary Table in Worksheet D, if applicable)

	Pre-Project	Post-Project			
Impervious Surfaces (IS) (e.g., sidewalks, driveways, parking areas, patios, roads, rooftops, pools, pathways, etc.)	**I.B.1.a** Existing (Pre-Project) Impervious Surface (sq.ft.)	**I.B.1.b** Existing Impervious Surface to be Retained[5] (sq.ft.)	**I.B.1.c** Existing Impervious Surface to be Replaced[5] (sq.ft.)	**I.B.1.d** New Impervious Surface to be Created[5] (sq.ft.)	**I.B.1.e** Post-Project Impervious Surface (sq.ft.) (=b+c+d)
On-site area (within the parcel/private site boundaries)	-		-	4,574	4,574
Off-site area (e.g., frontage/other area in Public Right of Way)	1,793	1,793	-	6,148	7,941
Subtotal:	1,793	1,793	-	10,722	12,515
Total Impervious Surface Replaced and Created: ***(sum of totals for columns I.B.1.c and I.B.1.d):***		**I.B.1.f**	**10,722 sq. ft.**		
Pervious Surfaces (PS) (e.g., landscaping, pervious pavement, bioretention areas, parking strips, street trees, etc. - both on-site and off-site)	Existing (Pre-Project) Pervious Surface (sq.ft.)				Post-project Pervious Surface (sq.ft.)
All pervious off-site area (e.g., frontage/Public Right of Way)[6]	11,962				5,814
Landscaping area on-site	35,069				30,862
Pervious Pavement area on-site	-			**I.B.1.g**	
Green Roof area on-site					
Subtotal:	47,031	**50% Rule Calculation**			36,676
Total Project Area (should be equal to **I.A.1**)	48,824	**I.B.1.h**	**0** %		49,191

I.B.2 Please review and attach additional worksheets as required below using the Total Impervious Surface (IS) Replaced or Created in cell **I.B.1.f** from Table **I.B.1** above and other factors:

	Review Steps	Check One Yes	Check One No	Attach Worksheet
I.B.2.a	Does this project involve any earthwork and/or stockpiling of soil, aggregates etc? If YES, then Check Yes, and Complete Worksheet A. If NO, then Check No, and go to I.B.2.b	☑	☐	A
I.B.2.b	Is **I.B.1.f** greater than or equal to 2,500 sq.ft? If YES, then the Project is subject to Provision C.3.i. - complete Worksheets B, C and go to I.B.2.c. If NO, go to I.B.2.i - or ask municipal staff for Small Project Checklist.	☑	☐	B, C
I.B.2.c	Does the 50% rule apply to the project? Is **I.B.1.h** 50% or more? If YES, site design, source control and treatment requirements apply to the entire on-site area. Continue to I.B.2.d If NO, these requirements apply only to the impervious surface created and/or replaced. Continue to I.B.2.d	☐	☑	
I.B.2.d	Is this project a Roadway Project and is **I.B.1.f** greater than or equal to 5,000 sq.ft? If YES, project may be C.3 Regulated Project. See the Roadways Fact Sheet at: www.flowstobay.org/newdevelopment If NO, go to I.B.2.e	☑	☐	
I.B.2.e	Is **I.B.1.f** greater than or equal to 5,000 sq.ft? Or 10,000 sq.ft. for a Large Single-Family Home? (Small Single-Family Homes are exempt) If YES, project is a C.3 Regulated Project - complete Worksheet D. Then continue to I.B.2.f. If NO, then skip to I.B.2.g.	☑	☐	D
I.B.2.f	Is **I.B.1.f** greater than or equal to 43,560 sq.ft, (i.e., one acre)? If YES, project may be subject to Hydromodification Management requirements - complete Worksheet E then go to I.B.2.g. If NO, then go to I.B.2.g.	☐	☑	E
I.B.2.g	Is **I.A.4** greater than or equal to 43,560 sq.ft., (i.e., one acre)? [**SWRS Site**: Subject to monthly inspections from Oct 1 to April 30; weekly inspections if located in ASBS Watershed] For more information see: www.swrcb.ca.gov/water_issues/programs/stormwater/construction.shtml If YES, check box, obtain coverage under CA Construction General Permit & submit Notice of Intent to municipality- go to I.B.2.h. If NO, then go to I.B.2.h.	☐	☑	
I.B.2.h	Is this a Special Project or does it have the potential to be a Special Project? If YES, complete Worksheet F - then continue to I.B.2.i. If NO, go to I.B.2.i.	☐	☑	F
I.B.2.i	Is this project a **Hillside Site**? Or a **High Priority Site**? Hillside Sites include those with ≥ 20% slope (see **I.A.5**) disturbing greater than or equal to 5,000 square feet. High Priority Sites include: 1) Project that involve grading in excess of 250 c.y. or requiring a Grading or Land Clearing Permit; or 2) Project with land disturbance of: a.) 1 sq. ft. or greater within the Fitzgerald Marine Reserve ASBS Watershed, b.) 1,000 sq. ft. or greater for areas within 100 feet of a creek, wetland, or coastline; or 3) Any public project involving work within a waterway or any private project involving work within a waterway that requires a permit issued by the Planning and Building Department. [**SWRS Site:** Subject to monthly inspections from Oct 1 to April 30; weekly inspections if located in ASBS Watershed] If YES, complete section G-2 on Worksheet G - then continue to I.B.2.j. and complete the Certification in Section **I.A.6**	☐	☑	G
I.B.2.j	**For Municipal Staff Use Only**: Are you using Alternative Certification for the project review? If YES, then fill out section G-1 on Worksheet G. Fill out other sections of Worksheet G as appropriate. See cell **I.B.1.g** above - Is the project installing 3,000 square feet or more of pervious pavement? If YES, then fill out section G-3 on Worksheet G. Add to Municipal Inspection Lists (C.3 and C.3.h)	☐ ☐	☐ ☐	G

[5] "Retained" means to leave existing impervious surfaces in place; "Replaced" means to install new impervious surface where existing impervious surface is removed anywhere on the same site; and "Created" means the amount of new impervious surface being proposed which exceeds the total amount of existing impervious surface at the site.

[6] Per the MRP, pavement that meets the following definition of pervious pavement is NOT an impervious surface: pavement that stores and infiltrates rainfall at a rate equal to immediately surrounding unpaved, landscaped areas, or that stores and infiltrates the rainfall runoff volume described in Provision C.3. Gravel pavement is not pervious unless it is constructed using pervious pavement system designs or runoff flows to adjacent landscaping. Pervious off-site areas include landscaped areas such as parking strips and street trees; off-site pervious pavement includes pervious concrete gutters and interlocking permeable concrete paver sidewalks, etc. 7/1/23

Worksheet A

C.6 – Construction Stormwater BMPs

Identify Plan sheet showing the appropriate construction Best Management Practices (BMPs) used on this project:
(Applies to all projects with earthwork)

Yes	Plan Sheet	Best Management Practice (BMP)
☒	BMP Sheet	Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, wash water or sediments, rinse water from architectural copper, and non-stormwater discharges to storm drains and watercourses.
☒	BMP Sheet	Store, handle, and dispose of construction materials/wastes properly to prevent contact with stormwater.
☒	BMP Sheet	Do not clean, fuel, or maintain vehicles on-site, except in a designated area where wash water is contained and treated.
☒	BMP Sheet	Train and provide instruction to all employees/subcontractors re: construction BMPs.
☐		Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
☒	BMP Sheet	Limit construction access routes and stabilize designated access points.
☒	BMP Sheet	Attach the San Mateo Countywide Water Pollution Prevention Program's construction BMP plan sheet to project plans and require contractor to implement the applicable BMPs on the plan sheet.
☒	BMP Sheet	Use temporary erosion controls to stabilize all denuded areas until permanent erosion controls are established.
☐		Delineate with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.
☐		Provide notes, specifications, or attachments describing the following: ■ Construction, operation and maintenance of erosion and sediment controls, include inspection frequency; ■ Methods and schedule for grading, excavation, filling, clearing of vegetation, and storage and disposal of excavated or cleared material; ■ Specifications for vegetative cover & mulch, include methods and schedules for planting and fertilization; ■ Provisions for temporary and/or permanent irrigation.
☒	C-2	Perform clearing and earth moving activities only during dry weather.
☒	C-2	Use sediment controls or filtration to remove sediment when dewatering and obtain all necessary permits.
☐		Trap sediment on-site, using BMPs such as sediment basins or traps, earthen dikes or berms, silt fences, check dams, soil blankets or mats, covers for soil stock piles, etc.
☐		Divert on-site runoff around exposed areas; divert off-site runoff around the site (e.g., swales and dikes).
☒	C-2	Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.

Worksheet B

C.3 – Source Controls

Select appropriate source controls and identify the detail/plan sheet where these elements are shown.

Yes	Detail/Plan Sheet No.	Features that require source control	Source Control Measures (Refer to Local Source Control List for detailed requirements)
☐		Storm Drain	Mark on-site inlets with the words "No Dumping! Flows to Bay" or equivalent.
☐		Floor Drains	Plumb interior floor drains to sanitary sewer [or prohibit].
☐		Parking garage	Plumb interior parking garage floor drains to sanitary sewer.[8]
☐		Landscaping	■ Retain existing vegetation as practicable. ■ Follow ReScape (www.rescapeca.org) principles. Select diverse species appropriate to the site. Include plants that are pest- and/or disease-resistant, drought-tolerant, and/or attract beneficial insects. ■ Minimize use of pesticides and quick-release fertilizers. ■ Use efficient irrigation system; design to minimize runoff.
☐		Pool/Spa/Fountain	Provide connection to the sanitary sewer to facilitate draining.[8]
☐		Food Service Equipment (non-residential)	Provide sink or other area for equipment cleaning, which is: ■ Connected to a grease interceptor prior to sanitary sewer discharge.[8] ■ Large enough for the largest mat or piece of equipment to be cleaned. ■ Indoors or in an outdoor roofed area designed to prevent stormwater run-on and run-off, and signed to require equipment washing in this area.
☐		Refuse Areas	■ Provide a roofed and enclosed area for dumpsters, recycling containers, etc., designed to prevent stormwater run-on and runoff. ■ Connect any drains in or beneath dumpsters, compactors, and tallow bin areas serving food service facilities to the sanitary sewer.[8] ■ For more information, see the New Development Projects Litter Reduction Fact Sheet at: https://www.flowstobay.org/wp-content/uploads/2021/06/New-Dev-Litter-Reduction-Fact-Sheet-
☐		Outdoor Process Activities[9]	Perform process activities either indoors or in roofed outdoor area, designed to prevent stormwater run-on and runoff, and to drain to the sanitary sewer.[8]
☐		Outdoor Equipment/ Materials Storage	■ Cover the area or design to avoid pollutant contact with stormwater runoff. ■ Locate area only on paved and contained areas. ■ Roof storage areas that will contain non-hazardous liquids, drain to sanitary sewer[8], and contain by berms or similar.
☐		Vehicle/ Equipment Cleaning	■ Roofed, pave and berm wash area to prevent stormwater run-on and runoff, plumb to the sanitary sewer[8], and sign as a designated wash area. ■ Commercial car wash facilities shall discharge to the sanitary sewer.[8]
☐		Vehicle/ Equipment Repair and Maintenance	■ Designate repair/maintenance area indoors, or an outdoors area designed to prevent stormwater run-on and runoff and provide secondary containment. Do not install drains in the secondary containment areas. ■ No floor drains unless pretreated prior to discharge to the sanitary sewer.[8] ■ Connect containers or sinks used for parts cleaning to the sanitary sewer.[8]
☐		Fuel Dispensing Areas	■ Fueling areas shall have impermeable surface that is a) minimally graded to prevent ponding and b) separated from the rest of the site by a grade break. ■ Canopy shall extend at least 10 ft. in each direction from each pump and drain away from fueling area.
☐		Loading Docks	■ Cover and/or grade to minimize run-on to and runoff from the loading area. ■ Position downspouts to direct stormwater away from the loading area. ■ Drain water from loading dock areas to the sanitary sewer.[8] ■ Install door skirts between the trailers and the building.
☐		Fire Sprinklers	Design for discharge of fire sprinkler test water to landscape or sanitary sewer.[8]
☐		Miscellaneous Drain or Wash Water	■ Drain condensate of air conditioning units to landscaping. Large air conditioning units may connect to the sanitary sewer.[8] ■ Roof drains from equipment drain to landscaped area where practicable. ■ Drain boiler drain lines, roof top equipment, all wash water to sanitary sewer.[8]
☐		Architectural Copper Rinse Water	■ Drain rinse water to landscaping, discharge to sanitary sewer[8], or collect and dispose properly offsite. See flyer "Requirements for Architectural Copper."[10]

8 Any connection to the sanitary sewer system is subject to sanitary district approval.
9 Businesses that may have outdoor process activities/equipment include machine shops, auto repair, industries with pretreatment facilities.
10 See the Flowstobay website: https://flowstobay.org/wp-content/uploads/2020/04/ArchitecturalcopperBMPs.pdf

Worksheet C

Low Impact Development – Site Design Measures

Select Appropriate Site Design Measures *(Required for C.3 Regulated Projects; all other projects are encouraged to implement site design measures, which may be required at municipality discretion.) Projects that create and/or replace between 2,500 and 5,000 sq.ft. of impervious surface, and detached single family homes that create/replace between 2,500 and 10,000 sq.ft. of impervious surface, must include* ***one of Site Design Measures a through f*** *(Provision C.3.i requirements).*[10] *Larger (>=5,000 sq.ft) projects must also include applicable Site Design Measures g through i. Consult with municipal staff about requirements for your project.*

Select appropriate site design measures and Identify the Plan Sheet where these elements are shown.

Yes	Plan Sheet No.	Site Design Measures
☐		a. Direct roof runoff into cisterns or rain barrels and use rainwater for irrigation or other non-potable use.
☐		b. Direct roof runoff onto vegetated areas.
☒	C-1	c. Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
☐		d. Direct runoff from driveways and/or uncovered parking lots onto vegetated areas.
☐		e. Construct sidewalks, walkways, and/or patios with pervious or permeable surfaces. Use the specifications in the C.3 Regulated Projects Guide downloadable at www.flowstobay.org/newdevelopment
☐		f. Construct bike lanes, driveways, and/or uncovered parking lots with pervious surfaces. Use the specifications in the C.3 Regulated Projects Guide downloadable at www.flowstobay.org/newdevelopment
☐		g. Limit disturbance of natural water bodies and drainage systems; minimize compaction of highly permeable soils; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies;
☐		h. Conserve natural areas, including existing trees, other vegetation and soils.
☒	C-1	i. Minimize impervious surfaces.

Regulated Projects can also consider the following site design measures to reduce treatment system sizing:

Yes	Plan Sheet No.	Site Design Measures
☐		j. Self-treating area (see Section 4.2 of the C.3 Regulated Projects Guide)
☒	C-1	k. Self-retaining area (see Section 4.3 of the C.3 Regulated Projects Guide)

[10] See MRP Provision C.3.a.i.(6) for non-C.3 Regulated Projects, C.3.c.i.(2)(a) for Regulated Projects, C.3.i for projects that create/replace between 2,500 and 5,000 sq.ft. of impervious surface and detached single family homes that create/replace between 2,500 and 10,000 sq.ft. of impervious surface.

Worksheet D

C.3 Regulated Projects and Non-Regulated GI Projects

Stormwater Treatment Measures and Site Design Measures by Drainage Management Area (DMA)

Check all applicable boxes, answer questions and fill in cells related to the site design and treatment measure(s) included in the project.

Drainage Management Area Summary Table

Complete the information below at the Entitlement, Building Permit and Certificate of Occupancy stages for Regulated C.3 Projects and Non-Regulated Green Infrastructure Projects. (The first four cells are automatically filled in from the Project Info sheet.)

Project Name:	Singh		
Project Address:	Hermosa Avenue, Miramar		
Cross Streets:	Terrace Avenue		
APN:	048-076-120		
Special Project[11]?	No		**of C.3.d amount of runoff treated by Non-LID Systems on the Special Project site.**
C.3 Regulated?	Yes		
Public or Private Project?	Private	Public projects are those on public property or ROW; private projects are on privately-owned property but can include improvements in the public ROW required as part of the project.	

DMA Identification Number	Impervious Area[12] (ft^2)	Pervious Area[13] (ft^2)	Type of Site Design Measure or Treatment Measure[14]	Sizing Criteria Used[15]	Size Required[16]	Size Provided
DMA 1	4574	5814	Self-retaining area	2c: Flow	pending	pending
DMA 2	6148	30,862	Bioretention unlined with underdrain	Other	< 2:1 ratio	1:1 ratio
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
add rows, if needed						
TOTALS	-	-	N/A	N/A	N/A	N/A
Totals from Project Info Sheet Cells	-	-				

Is the project harvesting and using rainwater? Yes ☐

Rainwater Harvesting/Use Measures:

☐ Rainwater Harvesting for indoor non-potable water use

☐ Rainwater Harvesting for landscape irrigation use

A long term Operations and Maintenance (O&M) Agreement and Plan for this project will be required. Please contact the municipality for an agreement template and/or consult the C.3 Regulated Projects Guide and table of contents at www.flowstobay.org/newdevelopment for maintenance plan templates for specific facility types.

11 Special Projects are smart growth, high density, transit-oriented or affordable housing developments with the criteria defined in Provision C.3.e.ii.(2), (3) or (4) (see Worksheet F).

12 The sq.ft. of impervious area within the Drainage Management Area

13 The sq.ft. of pervious area within the Drainage Management Area

14 "Lined" refers to an impermeable liner placed on the bottom of a bioretention area, such that no infiltration into native soil occurs.

15 Select from the menu which of the following Provision C.3.d.i hydraulic sizing methods was used, if any. Volume based approaches: 1(a) Urban Runoff Quality Management approach, or 1(b) 80% capture approach (recommended volume-based approach). Flow-based approaches: 2(a) 10% of 50-year peak flow approach, 2(b) 2 times the 85th percentile rainfall intensity approach, 2(c) 0.2-Inch-per-hour intensity approach (recommended flow-based approach - also known as the 4% rule for bioretention), or 3 Combination flow and volume-based approach. "Other" is used for Site Design Measures such as Self-Retaining or Self-Treating Areas.

16 Each DMA should drain to one treatment area (unless it is self-treating or self-retaining). If multiple DMAs are draining to one treatment area, they should be combined into one DMA. If one DMA drains to multiple treatment areas, that DMA should be split up so there is one DMA per treatment area (which allows the treatment area to be properly sized).