APPENDIX F

DRAINAGE TECHNICAL MEMORANDUM

TECHNICAL MEMO

WOOD RODGERS

To:	Karrie Mosca PE, Wood Rodgers, Inc.
From:	Dan Matthies PE CFM, Alexander Ma PE
CC:	Samir Sharma
Date:	2/17/16
SUBJECT:	**801 Fassler – Drainage Technical Memorandum**

1 INTRODUCTION

801 Fassler is an 11.2 acre site with a proposed 1.2 acre development located on the north side of Fassler Avenue, in the City of Pacifica, San Mateo County, California. The proposed project includes 24 single-family residential units in duet arrangements and appurtenant private drives and infrastructure.

2 PURPOSE

The purpose of the technical memorandum is to determine the following:

1. The 100-year, 24-hour storm event peak runoff rates off the Pre-Project (Existing) site.
2. The 100-year, 24-hour storm event mitigated peak runoff rates off the Post-Project (Proposed) site.

…and to document the design of the following:

3. The design of Post-Project 100-year, 24-hour storm event peak flow mitigation facilities.
4. The design of C.3 water quality facilities – treatment and flow control.

3 REFERENCES

1. *"Engineering Field Handbook Chapter 2: Estimating Runoff Peak Discharges, California EFH-2 Supplement", NRCS, February 15, 2013.*
2. *"NOAA Atlas 14, Volume 6, Version 2.3: Point Precipitation Frequency (PF) Estimates: CA", NOAA, 2011 (rev. 2014).*
3. *"C.3 Stormwater Technical Guidance, San Mateo Countywide Water Pollution Prevention Program", Version 4.1, October 2014.*
4. *"California Regional Water Quality Control Board, San Francisco Bay Region, Municipal Regional Stormwater NPDES Permit, Order R2-2009-0074, NPDES Permit No. CAS612008", October 14, 2009.*

4 CRITERIA

4.1 Peak Flow and Storage Volume

The 100-year, 24-hour storm event peak flows and volumes will be calculated using the following:

1. A synthetic rainfall distribution from the NRCS (SCS Type I, *Ref 1*).
2. NOAA Atlas 14, 100-year, 24-hour duration depth (*Ref 2*). See **Table 1**.
3. Rainfall-runoff transformation calculated using HEC-HMS
4. The routing through the stormwater basin will be conducted using HEC-HMS

4.2 MS4 Permit Requirements

The City of Pacifica falls under the California Regional Water Quality Control Board San Francisco Bay Region Municipal Regional Stormwater NPDES Permit No. CAS612008. Since the project will create 10,000 or more square feet of new impervious area, the City of Pacifica MS4 NPDES Permit C.3 requirements will apply to the project.

A Bay Area Hydrologic Model (BAHM) will be run to verify that the projects detention basin will also meet hydromodification mitigation requirements. The project will include a bio retention basin (water quality basin) upstream of the detention basin which will meet the project's water quality treatment requirements. The water quality basin will provide a small amount of storage toward the flow control requirements and will be included in the BAHM model. See the project's C.3 and C.6 Development Review Checklist and Water Quality Calculations for details and information related to the water quality basin.

Table 1 - Point Precipitation Frequency (PF) Estimates for Pacifica, CA

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.147 (0.131-0.167)	0.178 (0.158-0.202)	0.220 (0.195-0.250)	0.255 (0.224-0.293)	0.305 (0.257-0.366)	0.345 (0.283-0.425)	0.387 (0.308-0.491)	0.432 (0.332-0.568)	0.496 (0.363-0.686)	0.549 (0.384-0.791)
10-min	0.211 (0.188-0.239)	0.255 (0.227-0.289)	0.315 (0.280-0.358)	0.366 (0.321-0.420)	0.437 (0.368-0.524)	0.494 (0.406-0.609)	0.555 (0.442-0.704)	0.619 (0.476-0.813)	0.711 (0.520-0.983)	0.786 (0.551-1.13)
15-min	0.255 (0.227-0.289)	0.308 (0.275-0.350)	0.381 (0.338-0.433)	0.442 (0.388-0.509)	0.529 (0.445-0.634)	0.598 (0.491-0.736)	0.671 (0.534-0.851)	0.749 (0.576-0.984)	0.860 (0.629-1.19)	0.951 (0.666-1.37)
30-min	0.352 (0.314-0.399)	0.426 (0.379-0.483)	0.526 (0.467-0.598)	0.610 (0.536-0.702)	0.730 (0.615-0.875)	0.825 (0.677-1.02)	0.926 (0.737-1.18)	1.03 (0.795-1.36)	1.19 (0.868-1.64)	1.31 (0.920-1.89)
60-min	0.497 (0.443-0.563)	0.601 (0.536-0.682)	0.743 (0.659-0.845)	0.862 (0.757-0.991)	1.03 (0.868-1.24)	1.17 (0.956-1.44)	1.31 (1.04-1.66)	1.46 (1.12-1.92)	1.68 (1.23-2.32)	1.85 (1.30-2.67)
2-hr	0.727 (0.648-0.823)	0.872 (0.777-0.989)	1.07 (0.949-1.22)	1.24 (1.08-1.42)	1.47 (1.24-1.76)	1.65 (1.36-2.04)	1.85 (1.47-2.35)	2.06 (1.58-2.70)	2.35 (1.72-3.25)	2.59 (1.81-3.73)
3-hr	0.906 (0.809-1.03)	1.09 (0.969-1.23)	1.33 (1.18-1.52)	1.54 (1.35-1.77)	1.83 (1.54-2.19)	2.06 (1.69-2.53)	2.30 (1.83-2.92)	2.56 (1.97-3.36)	2.92 (2.13-4.03)	3.21 (2.25-4.63)
6-hr	1.27 (1.13-1.44)	1.54 (1.37-1.74)	1.89 (1.68-2.15)	2.19 (1.93-2.52)	2.61 (2.20-3.13)	2.94 (2.42-3.63)	3.29 (2.62-4.18)	3.66 (2.82-4.81)	4.18 (3.06-5.78)	4.60 (3.23-6.63)
12-hr	1.65 (1.47-1.86)	2.04 (1.81-2.31)	2.56 (2.27-2.92)	3.00 (2.64-3.45)	3.62 (3.05-4.34)	4.10 (3.37-5.05)	4.61 (3.67-5.85)	5.15 (3.96-6.76)	5.90 (4.31-8.15)	6.50 (4.56-9.38)
24-hr	2.12 (1.91-2.39)	2.68 (2.41-3.03)	3.43 (3.08-3.90)	4.06 (3.62-4.65)	4.93 (4.26-5.83)	5.62 (4.76-6.78)	6.34 (5.24-7.83)	7.09 (5.71-9.00)	8.15 (6.30-10.8)	8.99 (6.72-12.3)
2-day	2.70 (2.43-3.05)	3.39 (3.06-3.84)	4.32 (3.88-4.90)	5.09 (4.54-5.82)	6.16 (5.32-7.28)	7.00 (5.92-8.44)	7.87 (6.51-9.72)	8.79 (7.07-11.1)	10.1 (7.78-13.3)	11.1 (8.29-15.1)
3-day	3.10 (2.80-3.51)	3.88 (3.49-4.39)	4.90 (4.40-5.57)	5.75 (5.13-6.58)	6.94 (5.99-8.20)	7.86 (6.66-9.48)	8.82 (7.29-10.9)	9.83 (7.91-12.5)	11.2 (8.68-14.8)	12.3 (9.23-16.8)
4-day	3.44 (3.10-3.89)	4.29 (3.87-4.86)	5.41 (4.86-6.14)	6.34 (5.65-7.25)	7.62 (6.58-9.00)	8.62 (7.29-10.4)	9.65 (7.98-11.9)	10.7 (8.63-13.6)	12.2 (9.44-16.1)	13.4 (10.0-18.3)
7-day	4.30 (3.88-4.87)	5.37 (4.84-6.08)	6.76 (6.08-7.68)	7.90 (7.04-9.04)	9.44 (8.15-11.2)	10.6 (8.99-12.8)	11.8 (9.79-14.6)	13.1 (10.5-16.6)	14.8 (11.4-19.5)	16.1 (12.1-22.0)
10-day	4.85 (4.38-5.49)	6.08 (5.47-6.88)	7.65 (6.87-8.69)	8.92 (7.95-10.2)	10.6 (9.17-12.5)	11.9 (10.1-14.4)	13.2 (10.9-16.3)	14.6 (11.7-18.5)	16.4 (12.7-21.6)	17.8 (13.3-24.3)
20-day	6.35 (5.73-7.18)	8.01 (7.21-9.07)	10.1 (9.05-11.4)	11.7 (10.4-13.4)	13.8 (11.9-16.3)	15.4 (13.0-18.5)	16.9 (14.0-20.9)	18.4 (14.8-23.4)	20.5 (15.8-27.0)	22.0 (16.5-30.0)
30-day	7.74 (6.99-8.76)	9.80 (8.83-11.1)	12.3 (11.1-14.0)	14.3 (12.7-16.3)	16.7 (14.4-19.8)	18.5 (15.7-22.3)	20.2 (16.7-25.0)	21.9 (17.7-27.8)	24.2 (18.7-31.9)	25.8 (19.3-35.2)
45-day	9.55 (8.61-10.8)	12.1 (10.9-13.7)	15.1 (13.6-17.2)	17.4 (15.5-19.9)	20.3 (17.5-24.0)	22.3 (18.9-26.9)	24.2 (20.0-29.9)	26.1 (21.0-33.1)	28.4 (22.0-37.5)	30.2 (22.5-41.1)
60-day	11.5 (10.4-13.0)	14.5 (13.1-16.5)	18.1 (16.3-20.6)	20.8 (18.5-23.8)	24.0 (20.7-28.4)	26.3 (22.2-31.7)	28.4 (23.5-35.1)	30.4 (24.5-38.6)	33.0 (25.5-43.5)	34.8 (26.0-47.5)

[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.

5 EXISTING CONDITIONS

The existing, undisturbed property is situated on a ridge, adjacent to Fassler Avenue. The property slopes from southeast to northwest, with the highest end at the southeast at elevation 440 ft, and the lowest at the northwest end at elevation 196 ft. The portion of the property to be developed is bounded on: the northeastern edge of Fassler Avenue, the southwestern edge of Rockaway Beach Avenue, and the southern edge of Copeland Street. The portion of the property to be developed will henceforth be referred to as the “Site”.

The Site drains mostly northward down the slope to the Rockaway Beach valley below. The edge of the Site drains to an existing 15” RCP, via concrete ditch, alongside the northern edge of Fassler Avenue. See **Exhibit 1** and **Table 2** below.

Table 2 - Existing Condition Hydrological Input

Shed	Area (ac)	Area (sq. mi.)	Landuse (ac)				Impervious % Weighted Average
			Open Space	Lots	Pavement	Water	
			1%	95%	95%	95%	
A	4.1	0.0064	4.1	-	-	-	1.0%
B	1.9	0.0030	1.9	-	-	-	1.0%
C	3.4	0.0053	3.4	-	-	-	1.0%
D	0.9	0.0014	0.9	-	-	-	1.0%
E	2.2	0.0034	2.2	-	-	-	1.0%
POC	-	-	-	-	-	-	-
Total	**12.5**		**12.5**	**-**	**-**	**-**	

5.1 Peak Flow

The HEC-HMS model was set up and run. The 100-year, 24-hour storm event peak flows from each of the existing watersheds are presented in **Table 3** below. Note that the peak flows from existing Sheds A, C, and E, are treated as “aggregate” flows over the Site boundary, since the point of concentration is further downhill. These three existing watershed aggregate flows are calculated in order to confirm that the proposed post-project watershed aggregate flows are equal or less.

Table 3 - Existing HEC-HMS Runoff

Global Summary Results for Run "Existing_100yr24hr"

Project: Fassler Simulation Run: Existing_100yr24hr

Start of Run: 01Jan2014, 00:00
End of Run: 02Jan2014, 06:00
Compute Time: 26Jan2016, 18:03:17

Basin Model: Existing
Meteorologic Model: 100yr24hr
Control Specifications: 24 hour event

Show Elements: All Elements | Volume Units: IN / AC-FT | Sorting: Hydrologic

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
SHED A	0.0064	11.68	01Jan2014, 10:00	1.469
SHED B	0.003	5.48	01Jan2014, 10:00	0.689
SHED C	0.0053	9.67	01Jan2014, 10:00	1.217
SHED D	0.0014	2.56	01Jan2014, 10:00	0.321
SHED E	0.0034	6.21	01Jan2014, 10:00	0.780
POC	0.0044	8.03	01Jan2014, 10:00	1.010

6 PROPOSED CONDITIONS

The proposed project will include the development of impervious buildings and private drives within the existing watersheds C, D, and E.

The contributing area for existing watersheds C and D will be reduced due to the project. This will result in smaller 100-year peak flows from these watersheds.

The contributing area for existing watershed E, however, will be increased (along with its imperviousness). Therefore, this watershed will require mitigation. See **Exhibit 2** and **Table 4** below. The Preliminary Grading and Drainage Plan is also included in the Appendix for reference.

Table 4 - Proposed Condition Hydrological Input

Shed	Area (ac)	Area (sq. mi.)	Landuse (ac)				Impervious % Weighted Average
			Open Space	Lots	Pavement	Water	
			1%	95%	95%	95%	
A	4.0	0.0063	4.0	-	-	-	1.0%
B	1.9	0.0030	1.9	-	-	-	1.0%
C	3.2	0.0050	3.2	-	-	-	1.0%
D	0.2	0.0003	0.2	-	-	-	1.0%
E-1	1.9	0.0030	0.7	0.7	0.4	0.1	60.4%
E-2	1.3	0.0020	1.3	-	-	-	1.0%
E-1 DETENTION POND	-	-	-	-	-	-	-
POC	-	-	-	-	-	-	-
Total	**12.5**		**11.3**	**0.7**	**0.4**	**0.1**	

All of the proposed impervious area will drain to a proposed water quality basin for treatment and then be conveyed to a storm water detention/hydromodification basin for peak flow mitigation. The detention basin is connecting via a pipe to the existing point of concentration (E on **Exhibit 1**, and E-1 on **Exhibit 2**), into the existing 15" RCP, along Fassler Avenue.

The proposed stormwater basin was sized to reduce the 100-year, 24-hour storm event proposed peak flow to less than the existing 100-year, 24-hour storm event peak flow. See **Exhibit 2**. The proposed stormwater basin characteristics are shown below in **Table 5,** which reflect a 12" RCP outlet pipe.

Table 5 – Proposed Stormwater Basin Characteristics

801 FASSLER Stormwater Basin - Stage Storage					
Elevation (ft)	Area (sf)	Ave Area (sf)	Inc Vol (cf)	Cum Vol (cf)	Cum Vol (af)
291.0	2040.0			0.0	0.000
		2040.0	8160.0		
295.0	2040.0			8160.0	0.187
		2493.0	249.3		
295.1	2522.0			8409.3	0.193
		3652.5	14244.7		
299.0	4783.0			22654.1	0.520

801 FASSLER Stormwater Basin - Outlet Structure			
Item	Dia (in)	Width (in)	Elev (ft)
Riser	12.0	NA	297.8
Rectangular Notch	NA	1.000	296.3
Orifice 1	1.0	NA	291.0
Orifice 2	1.0	NA	295.5
Outlet	12.0		291.0

As a result of the mitigation in the stormwater basin, the proposed post-project 100-year, 24-hour storm event peak flow will be less than (or equal to) the existing pre-project 100-year, 24-hour storm event peak flow.

6.1 Peak Flow Mitigation

The 100-year, 24-hour peak flows off of each of the proposed watersheds are presented in **Table 6** below. Note that the aggregate peak flows from proposed Sheds A, C, and E-2 are less than the peak flows from existing Sheds A, C, and E. The peak flow from proposed Shed B is less than the existing Shed B peak flow, and the combined, mitigated (by the detention in the stormwater basin) peak flows from

proposed Shed D and E-1, is less than the peak flow from existing Shed D into the 15" RCP, along Fassler Avenue.

Table 6 – Proposed HEC-HMS Runoff

Global Summary Results for Run "Proposed_100yr24hr"

Project: Fassler Simulation Run: Proposed_100yr24hr

Start of Run: 01Jan2014, 00:00 Basin Model: Proposed
End of Run: 02Jan2014, 06:00 Meteorologic Model: 100yr24hr
Compute Time: 26Jan2016, 18:58:26 Control Specifications: 24 hour event

Show Elements: All Elements Volume Units: IN AC-FT Sorting: Hydrologic

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
SHED A	0.0063	11.50	01Jan2014, 10:00	1.446
SHED B	0.0030	5.48	01Jan2014, 10:00	0.689
SHED C	0.0050	9.13	01Jan2014, 10:00	1.148
SHED D	0.0003	0.55	01Jan2014, 10:00	0.069
SHED E-1	0.0030	5.56	01Jan2014, 10:00	0.884
SHED E-2	0.0020	3.65	01Jan2014, 10:00	0.459
E-1 DETENTION POND	0.0030	1.49	01Jan2014, 10:40	0.581
POC	0.0063	6.11	01Jan2014, 10:00	1.338

6.2 NPDES MS4 Permit Requirements

In order to meet the permit requirements, the project will:

1. Include Source Control measures, for example, the project will include storm drain system stenciling, efficient irrigation, and measures to minimize pollutants.
2. Implement Site Design and Stormwater Treatment Measures, by minimizing impervious areas, minimizing the modification of existing drainage patterns, and by treating 100% of the runoff from the newly developed impervious areas to the water quality basin for treatment.
3. Provide a hydromodification mitigation basin.

The Permit requires that for all "Regulated Projects" runoff from the project site must be treated. Exceptions are pervious areas that are "self-treating" and "self- retaining" areas that are designed to store and infiltrate runoff from rooftops or paved areas. Other than these exceptions, all areas of the project site must be treated. Since the Site does not include any significant exceptions, it is assumed that the whole site must be treated.

Stormwater treatment measures can be divided into three groups:

1. Flow based measures, (such as media filters)
2. Volume Based measures, (such as extended detention and infiltration basins)
3. Combination of Flow and Volume measures.

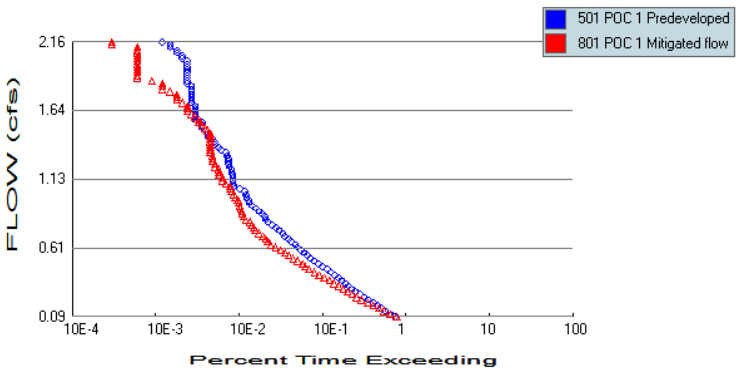
Since the use of Volume Based measures still requires some LID treatment, a separate Water Quality Basin before the stormwater basin was sized using the Combination of Flow and Volume measures criteria was chosen for the Site. See **Exhibit 2**.

The Surface Area of Treatment Measure for the Drainage Management Area (DMA) was calculated using the methodology in the San Mateo County C.3 Technical Guidance (*Ref. 3*). The final surface area of treatment was calculated to be 1,144 ft^2. This will be provided in a "water quality basin" prior to the stormwater detention basin.

The Calculations and the C.3 and C.6 Development Review Checklist are presented in the **Appendix**.

A BAHM model was developed. The outlet structure was modified until the flow duration control requirements were met.

The results are presented below:



The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0933	2472	2572	104	Pass
0.1142	2177	2143	98	Pass
0.1351	1903	1831	96	Pass
0.1560	1698	1581	93	Pass
0.1769	1521	1350	88	Pass
0.1978	1367	1163	85	Pass
0.2187	1191	981	82	Pass
0.2396	1049	861	82	Pass
0.2605	932	751	80	Pass
0.2813	825	668	80	Pass
0.3022	748	589	78	Pass
0.3231	686	520	75	Pass
0.3440	625	458	73	Pass
0.3649	565	404	71	Pass
0.3858	519	350	67	Pass
0.4067	471	304	64	Pass
0.4276	426	268	62	Pass
0.4485	379	228	60	Pass
0.4694	332	206	62	Pass
0.4903	299	191	63	Pass
0.5112	266	168	63	Pass
0.5321	238	149	62	Pass
0.5530	218	131	60	Pass
0.5739	200	118	58	Pass
0.5948	184	105	57	Pass
0.6157	167	92	55	Pass
0.6366	157	80	50	Pass
0.6575	140	74	52	Pass
0.6784	130	70	53	Pass
0.6993	117	64	54	Pass
0.7201	112	58	51	Pass
0.7410	101	52	51	Pass
0.7619	92	50	54	Pass
0.7828	84	47	55	Pass

7 SUMMARY

The proposed improvements will either not influence the watershed area (and imperviousness), or reduce the watershed area (and not influence the imperviousness) for all watersheds, except existing Shed E. Therefore, the proposed post-project 100-year peak flows will be equal to or less than the existing pre-project 100-year peak flows.

The proposed Shed E-1 runoff will undergo water quality treatment, peak flow mitigation, and hydromodification mitigation, which will ensure compliance with the NPDES MS4 permit.

8 APPENDIX

0 25 50 100 150
Scale 1" = 50'

BY	REVISION	DATE

EXISTING WATERSHED MAP

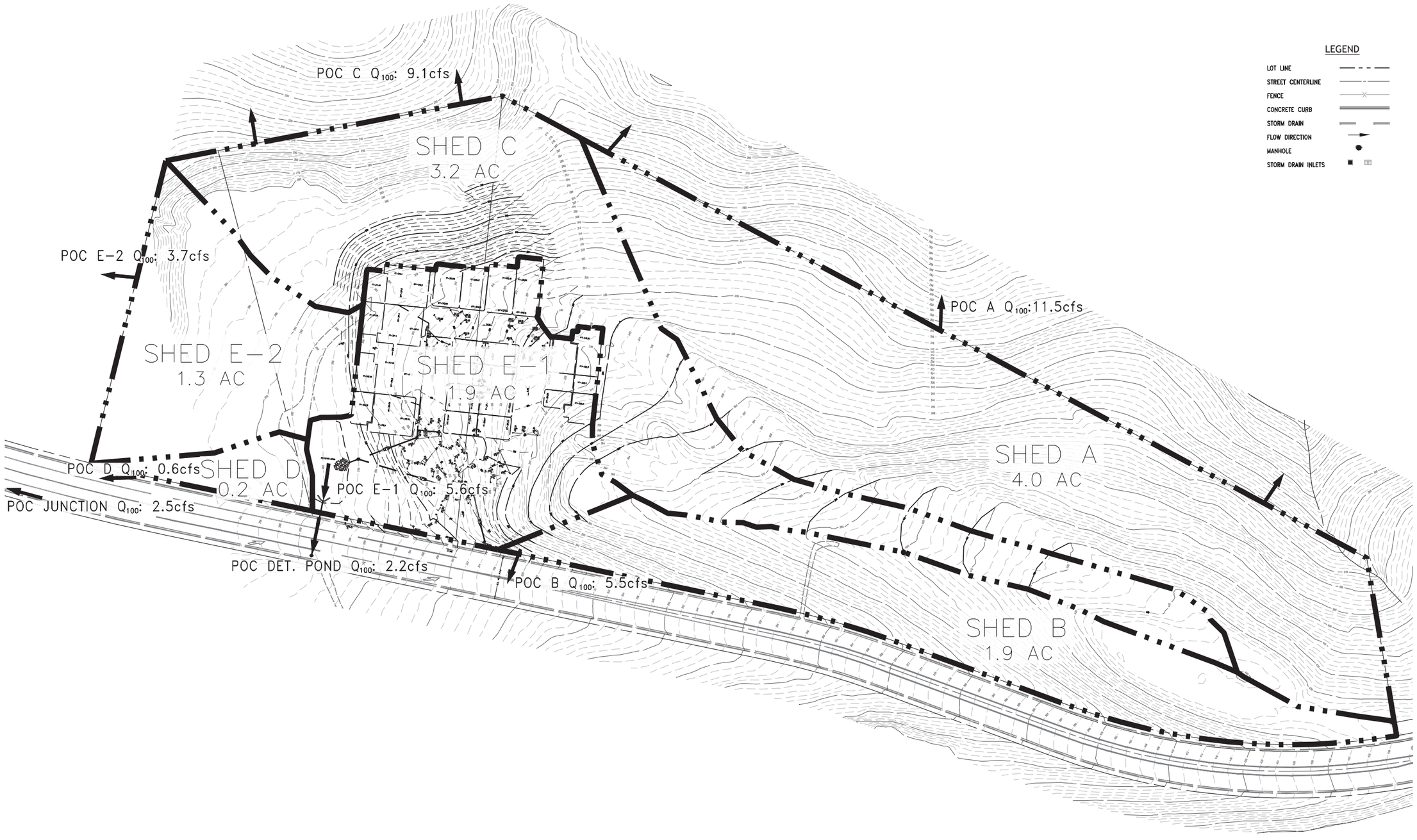
801 FASSLER AVENUE
SAN MATEO COUNTY CALIFORNIA
PACIFICA

CALL BEFORE YOU DIG
811
UNDERGROUND SERVICE ALERT
(800)227-2600

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
4301 HACIENDA DR. STE 100 TEL 925.847.1596
PLEASANTON, CA 94588 FAX 925.847.1557

PROJECT#	
DATE:	01-08-2014
SCALE:	N.T.S.
DRAWN BY:	
SHEET:	EXH 1
OF 2	SHEETS

J:\Jobs\1394_Fassler\Fassler-OA\Civil\Exhibits\410_324_EXH1_Drainage_Existing.dwg 1/8/2015 5:37 PM Alexander Ma



0 25 50 100 150

Scale 1" = 50'

LEGEND

- LOT LINE
- STREET CENTERLINE
- FENCE
- CONCRETE CURB
- STORM DRAIN
- FLOW DIRECTION
- MANHOLE
- STORM DRAIN INLETS

BY	REVISION	DATE

PROPOSED WATERSHED MAP

801 FASSLER AVENUE

SAN MATEO COUNTY CALIFORNIA

PACIFICA

CALL BEFORE YOU DIG USA UNDERGROUND SERVICE ALERT (800)227-2600

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
4301 HACIENDA DR. STE 100 TEL 925.847.1556
PLEASANTON, CA 94588 FAX 925.847.1557

PROJECT#	
DATE:	01-08-2014
SCALE:	N.T.S.
DRAWN BY:	
SHEET:	EXH 2
OF	2 SHEETS

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PRELIMINARY GRADING & DRAINAGE PLAN

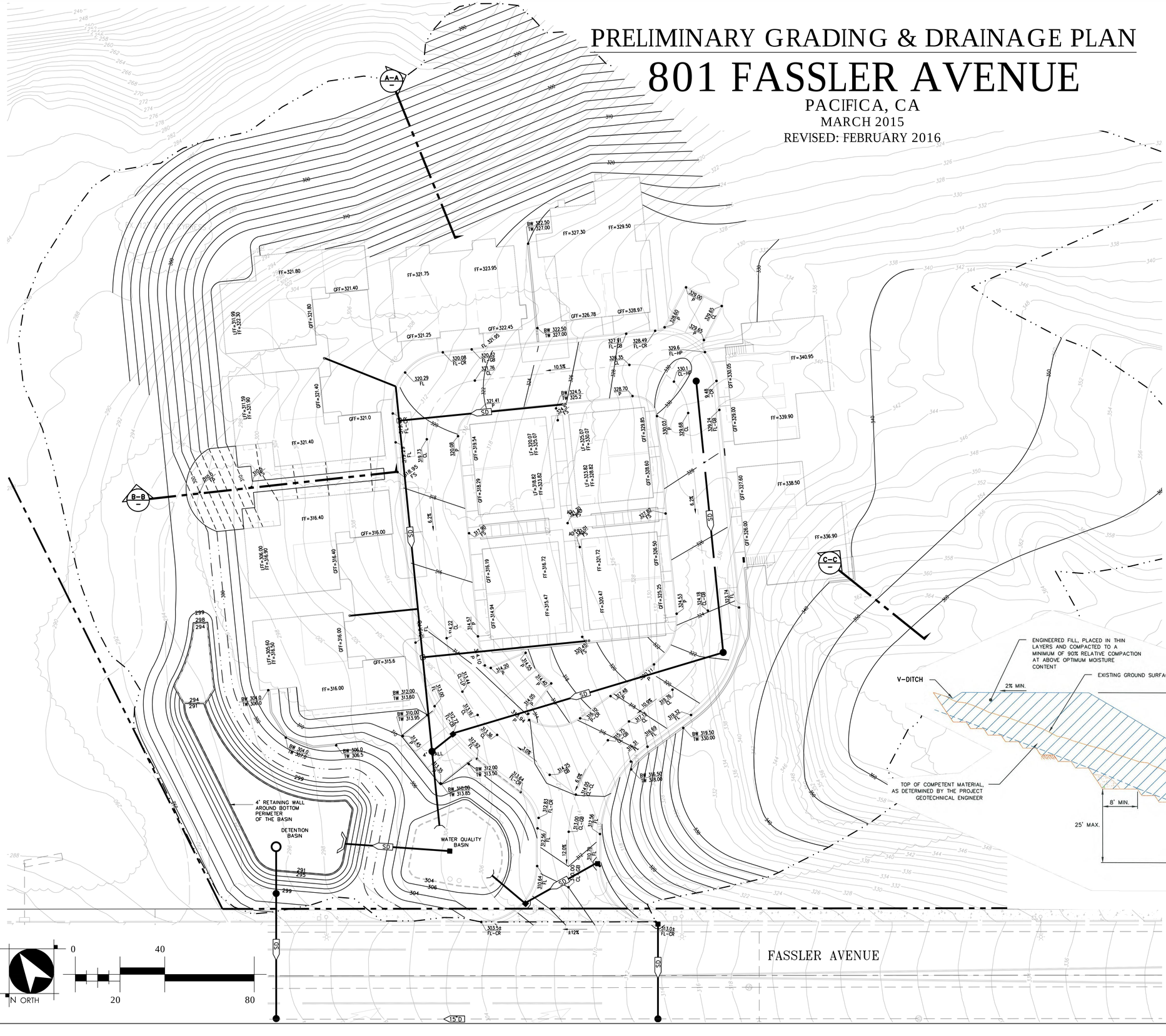
801 FASSLER AVENUE

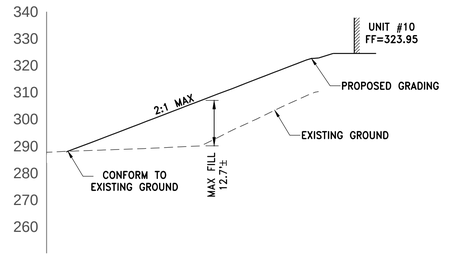
PACIFICA, CA

MARCH 2015

REVISED: FEBRUARY 2016

EARTHWORK SUMMARY		
DESCRIPTION	CUT (CY)	FILL (CY)
ROUGH GRADE	9,000	19,100
IMPORT	–	10,100





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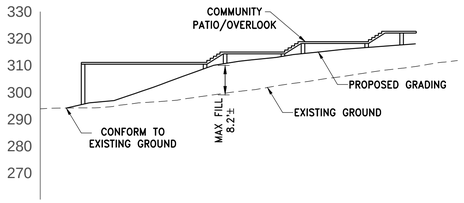

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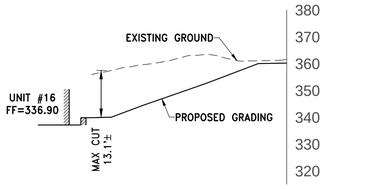

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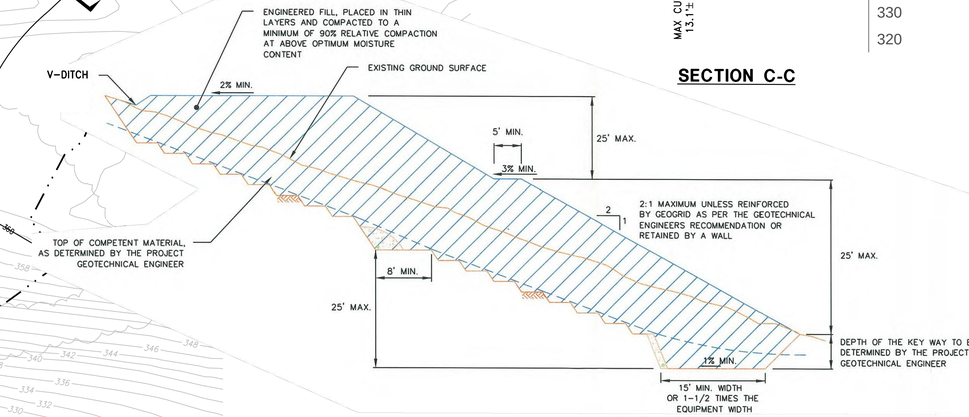

TYPICAL FILL PLACEMENT DETAIL

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
4670 WILLOW ROAD, STE 125 TEL 925.847.1556
PLEASANTON, CA 94588 FAX 925.847.1557

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Water Quality Calculations

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1	Project Name:	Fassler Avenue	
1-2	City application ID:		
1-3	Site Address or APN:		
1-4	Tract or Parcel Map No:		
1-5	Site Mean Annual Precip. (MAP)[1]	19.3	Inches
	Refer to the Mean Annual Precipitation Map in Appendix D of the C.3 Technical Guidance to determine the MAP, in inches, for the site.		
1-6	Applicable Rain Gauge	San Francisco Oceanside	

The calculations presented here are based on the 80% capture method of sizing **volume-based treatment measures** provided in the San Mateo County C.3 Technical Guidance.

MAP adjustment factor is automatically calculated as: 1.00

(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5.2, below.)

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: 1

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	45,083	1.0	45,083
2-3	Pervious service	11,092	0.1	1,109
	Total DMA Area (square feet) =	56,175		
2-4			***Total Effective Impervious Area (EIA)***	46,192 Square feet

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-2: Unit Basin Storage Volumes (in inches) for 80 Percent Capture Using 48-Hour Drawdowns

		Unit Basin Storage Volume (in) for Applicable Runoff Coefficients		
Applicable Rain Gauge	**Mean Annual Precipitation (in)**	**Coefficient of 1.00**		
Boulder Creek	55.9			2.04
La Honda	24.4			0.86
Half Moon Bay	25.92			0.82
Palo Alto	14.6			0.64
San Francisco	21			0.73
San Francisco Airport	20.1			0.85
San Francisco Oceanside	19.3			0.72

3-1 ***Unit basin storage volume from Table 5.2:*** 0.72 Inches

(The coefficient for this method is 1.00, due to the conversion of any landscaping to effective impervious area)

3-2 ***Adjusted unit basin storage volume:*** 0.72 Inches

(The unit basin storage volume is adjusted by applying the MAP adjustment factor.)

3-3 ***Required Capture Volume (in cubic feet):*** 2,772 Cubic feet

(The adjusted unit basin sizing volume [inches] is multiplied by the size of the DMA and converted to feet,

4.0 Calculate the Duration of the Rain Event

4-1	Rainfall intensity	0.2	Inches per hour
4-2	Divide Item 3-2 by Item 4-1	3.60	Hours of Rain Event Duration

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1	4% of DMA impervious surface	1,848	Square feet
5-2	Area 25% smaller than item 5-1	1,386	Square feet
5-3	Volume of treated runoff for area in Item 5-2	2,079	Cubic feet (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1	Subtract Item 5-3 from Item 3-3	693	Cubic feet (Amount of runoff to be stored in ponding area)
6-2	Divide Item 6-1 by Item 5-2	0.5	Feet (Depth of stored runoff in surface ponding area)
6-3	Convert Item 6-2 from ft to inches	6.0	Inches (Depth of stored runoff in surface ponding area)
6-4	If ponding depth in Item 6-3 meets your target depth, skip to Item 8-1. If not, continue to Step 7-1.		

7.0 Optimize Size of Treatment Measure

7-1	Enter an area larger or smaller than Item 5-2	1144	Sq.ft. (enter larger area if you need less ponding depth; smaller for more depth.)
7-2	Volume of treated runoff for area in Item 7-1	1,716	Cubic feet (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3	Subtract Item 7-2 from Item 3-3	1,056	Cubic feet (Amount of runoff to be stored in ponding area)
7-4	Divide Item 7-3 by Item 7-1	0.92	Feet (Depth of stored runoff in surface ponding area)
7-5	Convert Item 7-4 from feet to inches	11.07	Inches (Depth of stored runoff in surface ponding area)
7-6	If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.		

8.0 Surface Area of Treatment Measure for DMA

8-1	Final surface area of treatment*	1,144	Square feet (Either Item 5-2 or final amount in Item 7-1)

**Note: Check with the local jurisdiction as to its policy regarding the minimum biotreatment surface area allowed*

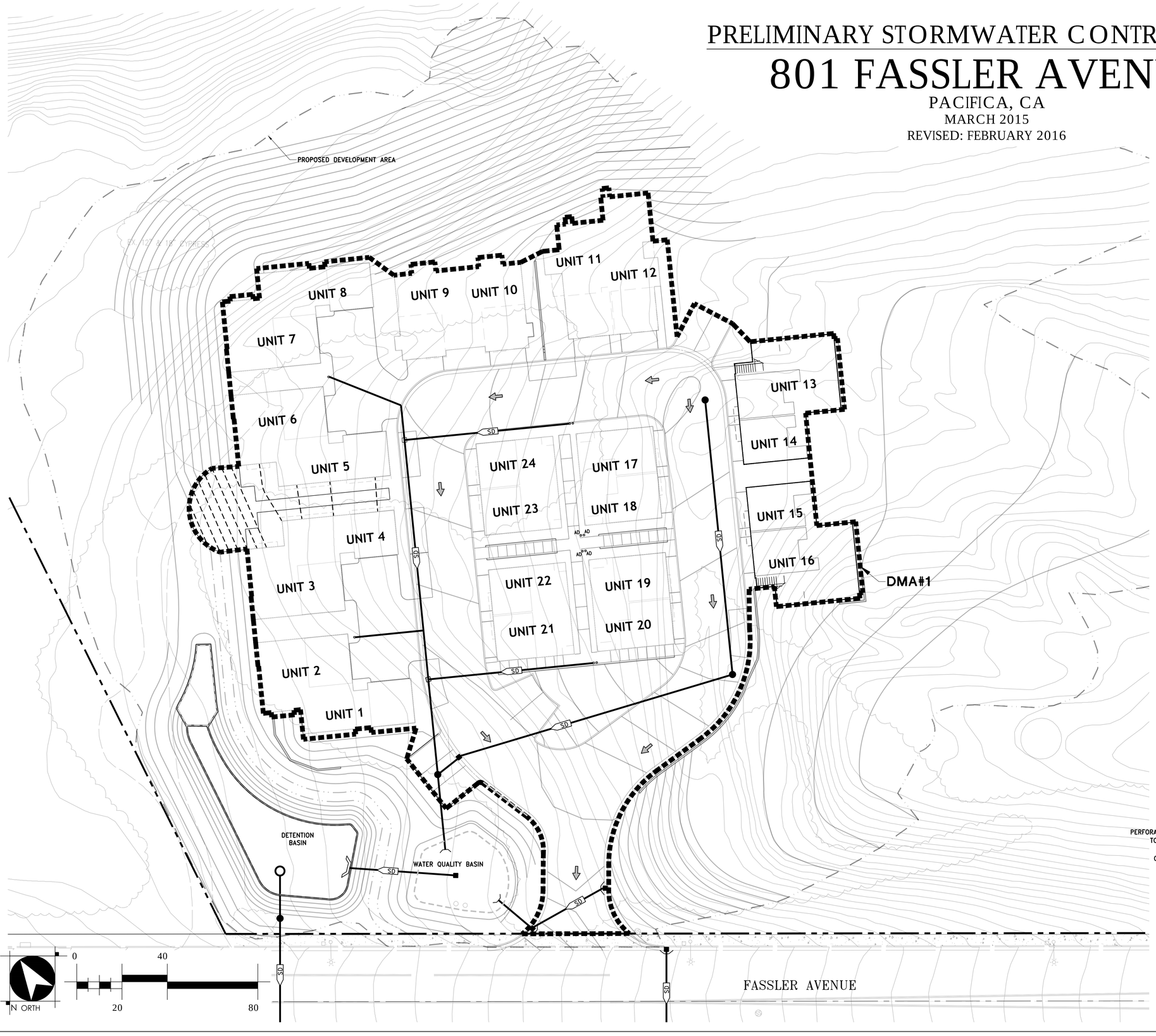
PRELIMINARY STORMWATER CONTROL PLAN

801 FASSLER AVENUE

PACIFICA, CA

MARCH 2015

REVISED: FEBRUARY 2016



Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1	Project Name:	*Fassler Avenue*	
1-2	City application ID:		
1-3	Site Address or APN:		
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1-5	Site Mean Annual Precip. (MAP)[1]	19.3	Inches
	Refer to the Mean Annual Precipitation Map in Appendix D of the C.3 Technical Guidance to determine the MAP, in inches, for the site.		
1-6	Applicable Rain Gauge	San Francisco Oceanside	

The calculations presented here are based on the 80th capture method of sizing **volume-based treatment measures** provided in the San Mateo County C.3 Technical Guidance.

MAP adjustment factor is automatically calculated as: 1.00

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For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft)	Adjust Pervious Surface	Effective Impervious Area
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	Total DMA Area (square feet) =	56,175		
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(The coefficient for this method is 1.00, due to the conversion of any landscaping to effective impervious area)

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(The unit basin storage volume is adjusted by applying the MAP adjustment factor.)

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(The adjusted unit basin sizing volume [inches] is multiplied by the size of the DMA and converted to feet)

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6-2	Divide Item 6-1 by Item 5-2	0.5	**Feet** (Depth of stored runoff in surface ponding area)
6-3	Convert Item 6-2 from ft to inches	6.0	**Inches** (Depth of stored runoff in surface ponding area)
6-4	If ponding depth in Item 6-3 meets your target depth, skip to Item 8-1. If not, continue to Step 7-1.		

7.0 Optimize Size of Treatment Measure

7-1	Enter an area larger or smaller than Item 5-2	1144	**Sq.ft.** (enter larger area if you need less ponding depth; smaller for more depth.)
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8.0 Surface Area of Treatment Measure for DMA

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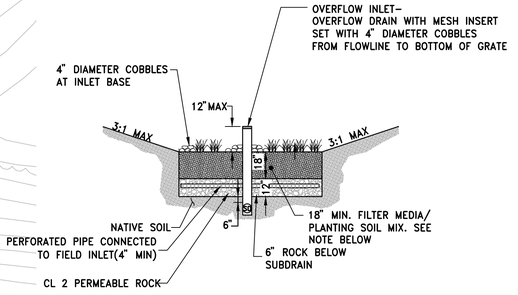
**Note: Check with the local jurisdiction as to its policy regarding the minimum biotreatment surface area allowed.*



WATER QUALITY BASIN

NOT TO SCALE

WOOD RODGERS

DEVELOPING INNOVATIVE DESIGN SOLUTIONS

4670 WILLOW ROAD, STE 125 TEL 925.847.1556

PLEASANTON, CA 94588 FAX 925.847.1557

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C3 & C6
CHECKLIST

SAN MATEO COUNTYWIDE
Water Pollution
Prevention Program

CITY OF PACIFICA
Address: 1800 Francisco Blvd
Phone: (650)738-7341
website: http://www.cityofpacifica.org

C.3 and C.6 Development Review Checklist

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

Project Information

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

Project Name: 801 Fassler Avenue Case Number:

Project Address & Cross St.: 801 Fassler Avenue

Project APN: 022-083-020 & 022-083-030 Project Watershed:

Applicant Name: Terra Holdings

Applicant Phone: (650)386-1021 Applicant Email Address:

Development type: (check all that apply)

- ☐ Single Family Residential: A stand-alone home that is not part of a larger project.
- ☒ Single Family Residential: Two or more lot residential development.[1]
- ☐ Multi-Family Residential
- ☐ Commercial
- ☐ Industrial, Manufacturing
- ☐ Mixed-Use
- ☐ Streets, Roads, etc.
- ☐ 'Redevelopment' as defined by MRP: creating, adding and/or replacing exterior existing impervious surface on a site where past development has occurred.[2]
- ☐ **'Special land use categories'** as defined by MRP: (1) auto service facilities[3], (2) retail gasoline outlets, (3) restaurants, (4) uncovered parking area (stand-alone or part of a larger project)
- ☐ Institutions: schools, libraries, jails, etc.
- ☐ Parks and trails, camp grounds, other recreational
- ☐ Agricultural, wineries
- ☐ Kennels, Ranches
- ☐ Other, Please specify_____

Project Description[4]: (Also note any past or future phases of the project.) 24 unit single family residential development in duet arrangement on 11.2±

I.A.1 Total Area of Site: 11.2 acres

I.A.2 Total Area of land disturbed during construction (include clearing, grading, excavating and stockpile area): 3.9 acres.

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.

☒ Attach Preliminary Calculations ☐ Attach Final Calculations ☒ Attach copy of site plan showing areas

Name of person completing the form: Karrie Mosca Title: Principal

Signature: Karrie Mosca Date: 1/8/15

Phone number: (925)847-1547 Email address: kmosca@woodrodgers.com

[1] Subdivisions or contiguous, commonly owned lots, for the construction of two or more homes developed within 1 year of each other are considered common plans of development and are subject to C.3 requirements.

[2] Roadway projects that replace existing impervious surface are subject to C.3 requirements only if one or more lanes of travel are added.

[3] See Standard Industrial Classification (SIC) codes here

[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?

I.B.1 Enter the amount of impervious surface[5] Retained, Replaced and/or Created by the project:

Table I.B.1 Impervious and Pervious Surfaces

Type of Impervious Surface	I.B.1.a Pre-Project Impervious Surface (sq.ft.)	I.B.1.b Existing Impervious Surface to be Retained[6] (sq.ft.)	I.B.1.c Existing Impervious Surface to be Replaced[6] (sq.ft.)	I.B.1.d New Impervious Surface to be Created[6] (sq.ft.)	I.B.1.e Post-Project Impervious Surface (sq.ft.) (=b+c+d)
Roof area(s)	0	0	0	21,854	21,854
Impervious[5] sidewalks, patios, paths, driveways, streets	0	0	0	21,528	21,528
Impervious[5] uncovered parking[7]	0	0	0	1,701	1,701
Totals of Impervious Surfaces:	0	0	0	45,083	45,083
I.B.1.f - Total Impervious Surface Replaced and Created *(sum of totals for columns I.B.1.c and I.B.1.d)*:				45,083	
Type of Pervious Surface	Pre-Project Pervious Surface (sq.ft.)				Post-project Pervious Surface (sq.ft.)
Landscaping	486,368				441,285
Pervious Paving	0				0
Green Roof	0				0
Totals of Pervious Surfaces:	486,368				441,285
Total Site Area (Total Impervious+Total Pervious=**I.A.1**)	486,368				486,368

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

	Check all that apply:	Check If Yes	Attach Worksheet
I.B.2.a	Does this project involve any earthwork?	☒	A
I.B.2.b	Is **I.B.1.f** greater than or equal to 2,500 sq.ft? *If YES, the Project is subject to Provision C.3.i.*	☒	B, C
I.B.2.c	Is the total Existing Impervious Surface to be Replaced (column **I.B.1.c**) 50 percent or more of the total Pre-Project Impervious Surface (column **I.B.1.a**)? *If YES, site design, source control and treatment requirements apply to the whole site; if NO, these requirements apply only to the impervious surface created and/or replaced.*	☒	
I.B.2.d	Is this project one of the Special Land Use Categories (box checked in section I.A. above) and is **I.B.1.f** greater than or equal to 5,000 sq.ft? *If YES, project is a C.3 Regulated Project.*	☐	D, D-1, D-2
I.B.2.e	Is **I.B.1.f** greater than or equal to 10,000 sq.ft? *If YES, project is a C.3 Regulated Project.*	☒	D, D-1, D-2
I.B.2.f	Is **I.B.1.f** greater than or equal to 43,560 sq.ft. (1 acre)? *If YES, project may be subject to Hydromodification Management requirements.*	☒	E
I.B.2.g	Is **I.A.2** (pg. 1) greater than or equal to 1 acre? *If YES, obtain coverage under the state's Construction General Permit and submit to the municipality a copy of your Notice of Intent. See: www.swrcb.ca.gov/water_issues/programs/stormwater/construction.shtml.*	☒	
I.B.2.h	Is this a Special Project or does it have the potential to be a Special Project?	☐	F
I.B.2.i	Is this project a High Priority Site? (Determined by the Permitting Jurisdiction. High Priority Sites can include those located in or within 100 feet of a sensitive habitat, ASBS, or body of water, or on sites with slopes, and are subject to monthly inspections from Oct 1 to April 30.)	☐	G
B.2.10	For Municipal Staff Use Only (Alternative Certification, O&M Submittals, Project Close Out)	☐	G

[5] Per the MRP, pavement that meets the following definition of pervious pavement is NOT an impervious surface. Pervious pavement is defined as 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.

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

[7] Uncovered parking includes the top level of a parking structure.

Worksheet A

C6 – Construction Stormwater BMPs

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

SHEETS TO BE NOTED ON CONSTRUCTION DOCUMENTS

Yes	Plan Sheet	Best Management Practice (BMP)
☒	TBD	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.
☒	TBD	Store, handle, and dispose of construction materials/wastes properly to prevent contact with stormwater.
☒	TBD	Do not clean, fuel, or maintain vehicles on-site, except in a designated area where wash water is contained and treated.
☒	TBD	Train and provide instruction to all employees/subcontractors re: construction BMPs.
☒	TBD	Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
☒	TBD	Limit construction access routes and stabilize designated access points.
☒	TBD	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.
☒	TBD	Use temporary erosion controls to stabilize all denuded areas until permanent erosion controls are established.
☒	TBD	Delineate with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.
☒	TBD	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.
☒	TBD	Perform clearing and earth moving activities only during dry weather.
☒	TBD	Use sediment controls or filtration to remove sediment when dewatering and obtain all necessary permits.
☒	TBD	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.
☒	TBD	Divert on-site runoff around exposed areas; divert off-site runoff around the site (e.g., swales and dikes).
☒	TBD	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

C3 - 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 measures	Source Control Measures (Refer to Local Source Control List for detailed requirements)
☒	TBD	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[8] [or prohibit].
☐		Parking garage	Plumb interior parking garage floor drains to sanitary sewer.[8]
☒	TBD	Landscaping	▪ Retain existing vegetation as practicable. ▪ 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]
☐		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.
☒	TBD	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."

[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.

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 2,500 – 10,000 sq.ft. of impervious surface, and stand-alone single family homes that create/replace 2,500 sq.ft. or more of impervious surface, must include* ***one of Site Design Measures a through f*** *(Provision C.3.i requirements).*[10] *Larger 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 Number	
☐		a. Direct roof runoff into cisterns or rain barrels and use rainwater for irrigation or other non-potable use.
☒	TBD	b. Direct roof runoff onto vegetated areas.
☒	TBD	c. Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
☒	TBD	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.
☐		f. Construct bike lanes, driveways, and/or uncovered parking lots with pervious surfaces.
☒	TBD	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;
☒	TBD	h. Conserve natural areas, including existing trees, other vegetation and soils.
☒	TBD	i. Minimize impervious surfaces.

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

Yes	Plan Sheet Number	
☒	TBD	j. Self-treating area (see Section 4.2 of the C.3 Technical Guidance)
☐		k. Self-retaining area (see Section 4.3 of the C.3 Technical Guidance)
☐		l. Plant or preserve interceptor trees (Section 4.1, C.3 Technical Guidance)

[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 2,500 to 10,000 sq.ft. of impervious surface and stand-alone single family homes that create/replace 2,500 sq.ft. or more of impervious surface.

Worksheet D

C3 Regulated Project - Stormwater Treatment Measures

Check all applicable boxes and indicate the treatment measure(s) included in the project.

Yes	
☐ Attach Worksheet F and Calculations	Is the project a **Special Project**?[11] If yes, consult with municipal staff about the need to evaluate the feasibility and infeasibility of 100% LID treatment. Indicate the type of non-LID treatment to be used, the hydraulic sizing method[12], and percentage of the amount of runoff specified in Provision C.3.d that is treated: (For the % not treated by non-LID measures, continue with Worksheet D-1) Non-LID Treatment Measures: / Hydraulic sizing method[12] / % of C.3.d amount of runoff treated ☐ Media filter ☐2.a ☐2.b ☐2.c ____% ☐ Tree well filter ☐2.a ☐2.b ☐2.c ____%
☐ Attach Worksheet D-1 and Calculations	It is **feasible** to treat the C.3.d amount of runoff using infiltration? Indicate the infiltration measures to be used, and hydraulic sizing method: Infiltration Measures: / Hydraulic sizing method[12] ☐ Bioinfiltration[13] ☐1.a ☐1.b ☐2.c ☐3 ☐ Infiltration trench ☐1.a ☐1.b ☐ Other (specify):
☐ Attach Plans showing system, connection to Recycled Water Line and/or Connection Approval Letter from Sanitary District ☐ Attach worksheet D-2 and Calculations	Is the project installing and using a **recycled water** plumbing system for non-potable water use and the installation of a second non-potable water system for harvested rainwater is impractical, and considered infeasible due to cost considerations? If yes, check the box below and skip ahead to worksheet D-3 (There is no need for further evaluation of Rainwater harvesting/use.) Recycled Water Measure: ☐ Recycled Water System for non-potable water use will be installed and used. It is **feasible** to treat the C.3.d amount of runoff using rainwater harvesting/use? Rainwater Harvesting/Use Measures: / Hydraulic sizing method[12] ☐ Rainwater Harvesting for indoor non-potable water use ☐1.a ☐1.b ☐ Rainwater Harvesting for landscape irrigation use ☐1.a ☐1.b
☒ Attach Worksheets D-1 and D-2 and Calculations	It is **infeasible** to treat the C.3.d amount of runoff using either infiltration or rainwater harvesting/use? Indicate the biotreatment measures to be used, and the hydraulic sizing method: Biotreatment Measures: / Hydraulic sizing method[12] ☒ Bioretention area ☐2.c ☒3 ☐ Flow-through planter ☐2.c ☐3 ☐ Other (specify): _____

A copy of the long term Operations and Maintenance (O&M) Agreement and Plan for this project will be required. Please contact the NPDES Representative of the applicable municipality for an agreement template and consult the C.3 Technical Guidance at www.flowstobay.org for maintenance plan templates for specific facility types.

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

[12] Indicate which of the following Provision C.3.d.i hydraulic sizing methods were used. 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, or 2(c) 0.2-Inch-per-hour intensity approach (recommended flow-based approach). Combination flow and volume-based approach: 3.

[13] See Section 6.1 of the C.3 Technical Guidance for conditions in which bioretention areas provide bioinfiltration.

Worksheet D-1
Feasibility of Infiltration

		Yes	No
D-1.0	**Infiltration Potential.** Based on site-specific soil report[14], do site soils either:		
	a. Have a saturated hydraulic conductivity (Ksat) less than 1.6 inches/hour), OR, if the Ksat rate is not available:	☐	☐
	b. Consist of Type C or D soils?	☒	☐
	➢ *If Yes, infiltration is not feasible – skip to D-1.9 below.*		
	➢ *If No, complete the Infiltration Feasibility checklist below:*		
	Evaluate infiltration feasibility:		
D-1.1	Would infiltration facilities[15] at this site conflict with the location of existing or proposed underground utilities or easements, or would the siting of infiltration facilities at this site result in their placement on top of underground utilities, or otherwise oriented to underground utilities, such that they would discharge to the utility trench, restrict access, or cause stability concerns? (If yes, attach evidence documenting this condition.)	☐	☐
D-1.2	Is there a documented concern that there is a potential on the site for soil or groundwater pollutants to be mobilized? (If yes, attach documentation of mobilization concerns.)	☐	☐
D-1.3	Are geotechnical hazards present, such as steep slopes, areas with landslide potential, soils subject to liquefaction, or would an infiltration facility[10] need to be built less than 10 feet from a building foundation or other improvements subject to undermining by saturated soils? (If yes, attach documentation of geotechnical hazard.)	☐	☐
D-1.4	Do local water district or other agency's policies or guidelines regarding the locations where infiltration may occur, the separation from seasonal high groundwater, or setbacks from potential sources of pollution, prevent infiltration devices[10] from being implemented at this site? (If yes, attach evidence documenting this condition.)	☐	☐
D-1.5	Would construction of an infiltration device[10] require that it be located less than 100 feet away from a septic tank, underground storage tank with hazardous materials, or other potential underground source of pollution? (If yes, attach evidence documenting this claim.)	☐	☐
D-1.6	Is there a seasonal high groundwater table or mounded groundwater that would be within 10 feet of the base of an infiltration device[10] constructed on the site? (If yes, attach documentation of high groundwater.)	☐	☐
D-1.7	Are there land uses that pose a high threat to water quality – including but not limited to industrial and light industrial activities, high vehicular traffic (i.e., 25,000 or greater average daily traffic on a main roadway or 15,000 or more average daily traffic on any intersecting roadway), automotive repair shops, car washes, fleet storage areas, or nurseries? (If yes, attach evidence documenting this claim.)	☐	☐
D-1.8	Is there a groundwater production well within 100 feet of the location where an infiltration device[10] would be constructed? (If yes, attach map showing the well.)	☐	☐
	Results of Feasibility Determination		
D-1.9	Infiltration is **Infeasible?** (If any answer to questions D-1.1 thru D-1.8 is "Yes" then Infiltration is Infeasible.) Continue to Worksheet D-2.	☒	☐
	Infiltration is **Feasible?** Do not fill out worksheet D-2. Continue to Worksheet D-3.	☐	☐

[14] If no site-specific soil report is available, refer to soil hydraulic conductivity maps in C.3 Technical Guidance Appendix I.

[15] For more information on infiltration facilities and devices, see Appendix E of the SMCWPPP C3TG Handbook.

Worksheet D-2
Feasibility of Rainwater Harvesting and Use

D-2.1 Potential Rainwater Capture Area

a. Enter the total square footage of impervious surface for this site from Table I.B.1 (Total Created and Replaced Impervious Surface from I.B.1.f)

45,083 Sq. ft.

b. If the existing impervious surface to be replaced (total from Column I.B.1.c in Table I.B.1) is 50% or more of the pre-project impervious surface (total from Column I.B.1.a in Table I.B.1), then enter the post-project impervious surface (total from Column I.B.1.e in Table I.B.1) in D-2.1.b. If not, enter zero in D-2.1.b.

0 Sq. ft.

c. Convert the larger of the amounts in Items D-2.1.a and D-2.1.b from square feet to acres (divide by 43,560).
This is the project's Potential Rainwater Capture Area, in acres.

1.03 Acres

D-2.2 Feasibility of Landscape Irrigation:

a. Enter area of post-project onsite landscaping (see Column I.B.1.e in Table I.B.1)

10.1 Acres

b. Multiply the Potential Rainwater Capture Area above (D-2.1.c) by times 3.2.

3.3 Acres

c. Is the amount in D-2.2.a (onsite landscaping) LESS than the amount in D-2.2.b (the product of 3.2 times the size of the Potential Rainwater Capture Area)[16]?

☐ **Yes** ☒ **No**

- *If Yes, continue to D-2.3.*
- *If No, there are two options:*
  1. *It may be possible to meet the treatment requirements by directing runoff from impervious areas to self-retaining areas (see Section 4.3 of the C.3 Technical Guidance).*
  2. *It may be possible use the C.3.d amount of runoff for irrigation. Refer to Table 11 and the curves in Appendix F of the LID Feasibility Report to evaluate feasibility of harvesting and using the C.3.d amount of runoff for irrigation. Complete the calculations and attach to this worksheet. If feasible that completes Worksheet D-2 and you may move on to Worksheet D-3.*

D-2.3 Feasibility Indoor Non-Potable Uses: *(check the box for the applicable project type, then fill in the requested information and answer the question):*[17]

☒ a. Residential Project

i. Number of dwelling units (total post-project): 24 Units

ii. Divide the amount in (i) by Potential Rainwater Capture Area (D-2.1.c): 24 Du/ac

iii. Is the amount in (ii) LESS than 124? ☒ **Yes** ☐ **No**

☐ b. Commercial Project

i. Floor area (total interior post-project square footage): _____ Sq.ft.

ii. Divide the amount in (i) by Potential Rainwater Capture Area (D-2.1.c): _____ Sq.ft./ac

iii. Is the amount in (ii) LESS than 84,000? ☐ **Yes** ☐ **No**

☐ c. School Project

i. Floor area (total interior post-project square footage): _____ Sq.ft.

ii. Divide the amount in (i) by Potential Rainwater Capture Area (D-2.1.c): _____ Sq.ft./ac

iii. Is the amount in (ii) LESS than 27,000? ☐ **Yes** ☐ **No**

[16] Landscape areas must be contiguous and within the same Drainage Management Area to irrigate with harvested rainwater via gravity flow.

[17] Rainwater harvested for indoor use is typically used for toilet/urinal flushing, industrial processes, or other non-potable uses.

☐ d. Industrial Project

i. Estimated demand for non-potable water (gallons/day): _____ Gal./day

ii. Is the amount in (i) LESS than 2,900? ☐ **Yes** ☐ **No**

☐ e. Mixed-Use Residential/Commercial Project[18]

	Residential	*Commercial*
i. Number of residential dwelling units and commercial floor area:	_____ Units	_____ Sq.ft.
ii. Percentage of total interior post-project floor area serving each activity:	_____ %	_____ %
iii. Prorated Potential Rainwater Capture Area per activity (multiply amount in D-2.1.c by the percentages in [ii]):	_____ Acres	_____ Acres
iv. Prorated project demand per impervious area (divide the amounts in [i] by the amounts in [iii]):	_____ Du/ac	_____ Sq.ft/ac

v. Is the amount in (iv) in the residential column less than 124, AND is the amount in the commercial column less than 84,000? ☐ **Yes** ☐ **No**

- *If you checked "Yes" for the above question for the applicable project type, rainwater harvesting for indoor use is considered infeasible for that building. If there is only one building on the site you are done with this worksheet. If there is more than one building on the site, for each that has an individual roof area of 10,000 sq. ft. or more, complete Sections D-2.2 and D-2.3 of this form for each building, Continue to D-2.4 if a "No" is checked for any building.*
- *If you checked "No" for the question applicable to the type of project, rainwater harvesting for indoor use may be feasible. Continue to D-2.4:*

D-2.4 Project Information

***- See definitions in Glossary (Attachment 1)**

4.1	Project Type: Residential	If residential or mixed use, enter # of dwelling units:	24
4.2	Enter square footage of non-residential interior floor area:		0
4.3	Total area being evaluated (entire project or individual roof with an area > 10,000 sq.ft.):		45,083 sq.ft.
4.4	If it is a Special Project*, indicate the percentage of LID treatment* reduction: *(Item 4.4 applies only to entire project evaluations, not individual roof area evaluations.)*		_____ percent
4.5	Total area being evaluated, adjusted for Special Project LID treatment reduction credit: *(This is the total area being evaluated that requires LID treatment.)*		45,083 sq.ft.

D-2.5 Calculate Area of Self-Treating Areas, Self-Retaining Areas, and Areas Contributing to Self-Retaining Areas.

5.1	Enter square footage of any self-treating areas* in the area that is being evaluated:	441,285 sq.ft.
5.2	Enter square footage of any self-retaining areas* in the area that is being evaluated:	_____ sq.ft.
5.3	Enter the square footage of areas contributing runoff to self-retaining area*:	_____ sq.ft.
5.4	TOTAL of Items 5.1, 5.2, and 5.3:	441,285 sq.ft.

D-2.6 Subtract credit for self-treating/self-retaining areas from area requiring treatment.

6.1	Subtract the TOTAL in Item 5.4 from the area being evaluated (Item 4.5). This is the potential rainwater capture area*.	396,202 sq.ft.
6.2	Convert the potential rainwater capture area (Item 6.1) from square feet to acres.	0 acres

D-2.7 Determine feasibility of use for toilet flushing based on demand

[18] For a mixed-use project involving activities other than residential and commercial activities, follow the steps for residential/commercial mixed-use projects. Prorate the Potential Rainwater Capture Area for each activity based on the percentage of the project serving each activity.

7.1	Project's dwelling units per acre of potential rainwater capture area (Divide the number in 4.1 by the number in 6.2).	2.6	dwelling units/acre
7.2	Non-residential interior floor area per acre of potential rain capture area (Divide the number in 4.2 by the number in 6.2).		Int. non-res. floor area/acre

Note: formulas in Items 7.1 and 7.2 are set up, respectively, for a residential or a non-residential project. Do not use these pre-set formulas for mixed use projects. ***For mixed use projects****, evaluate the residential toilet flushing demand based on the dwelling units per acre for the residential portion of the project (use a prorated acreage, based on the percentage of the project dedicated to residential use). Then evaluate the commercial toilet flushing demand per acre for the commercial portion of the project (use a prorated acreage, based on the percentage of the project dedicated to commercial use).*

7.3	Refer to the applicable countywide table in Attachment 2. Identify the number of dwelling units per impervious acre needed in your Rain Gauge Area to provide the toilet flushing demand required for rainwater harvest feasibility.	124	dwelling units/acre
7.4	Refer to the applicable countywide table in Attachment 2. Identify the square feet of non-residential interior floor area per impervious acre needed in your Rain Gauge Area to provide the toilet flushing demand required for rainwater harvest feasibility.		int. non-res. floor area/acre

Check "Yes" or "No" to indicate whether the following conditions apply. If "Yes" is checked for any question, then rainwater harvesting and use is infeasible. As soon as you answer "Yes", you can skip to Item D-2.9. If "No" is checked for all items, then rainwater harvesting and use is feasible and you must harvest and use the C.3.d amount of stormwater, unless you infiltrate the ***C.3.d amount of stormwater****.*

7.5	Is the project's number of dwelling units per acre of potential rainwater capture area (listed in Item 7.1) LESS than the number identified in Item 7.3?	☒ Yes	☐ No
7.6	Is the project's square footage of non-residential interior floor area per acre of potential rainwater capture area (listed in Item 7.2) LESS than the number identified in Item 7.4?	☐ Yes	☐ No

D-2.8 Determine feasibility of rainwater harvesting and use based on factors other than demand.

8.1	Does the requirement for rainwater harvesting and use at the project conflict with local, state, or federal ordinances or building codes?	☐ Yes	☐ No
8.2	Would the technical requirements cause the harvesting system to exceed 2% of the **Total Project Cost***, or has the applicant documented economic hardship in relation to maintenance costs? (If so, attach an explanation.)	☐ Yes	☐ No
8.3	Do constraints, such as a slope above 10% or lack of available space at the site, make it infeasible to locate on the site a cistern of adequate size to harvest and use the C.3.d amount of water? (If so, attach an explanation.)	☐ Yes	☐ No
8.4	Are there geotechnical/stability concerns related to the surface (roof or ground) where a cistern would be located that make the use of rainwater harvesting infeasible? (If so, attach an explanation.)	☐ Yes	☐ No
8.5	Does the location of utilities, a septic system and/or **Heritage Trees*** limit the placement of a cistern on the site to the extent that rainwater harvesting is infeasible? (If so, attach an explanation.)	☐ Yes	☐ No

Note: It is assumed that projects with significant amounts of landscaping will either treat runoff with landscape dispersal (self-treating and self-retaining areas) or will evaluate the feasibility of harvesting and using rainwater for irrigation using the curves in Appendix F of the LID Feasibility Report.

***- See definitions in Glossary (Attachment 1)**

D-2.9 Results of Feasibility Determination

		Infeasible	Feasible
a.	Based on the results of the feasibility analysis in Items 7.5, 7.6 and Section D-2.8, rainwater harvesting/use is (check one):	☒	☐

➔ *If "FEASIBLE" is indicated for Item D-2.9.a the amount of stormwater requiring treatment must be treated with harvesting/use, unless it is infiltrated into the soil.*

➔ *If "INFEASIBLE" is checked for Item D-2.9.a, then the applicant may use appropriately designed bioretention* facilities (*see definitions in Glossary – Attachment 1) for compliance with C.3 treatment requirements. If Ksat > 1.6 in./hr., and infiltration is unimpeded by subsurface conditions, then the bioretention facilities are predicted to infiltrate 80% or more average annual runoff. If Ksat < 1.6, maximize infiltration of stormwater by using bioretention if site conditions allow, and remaining runoff will be discharged to storm drains via facility underdrains. If site conditions preclude infiltration, a lined bioretention area or flow-through planter may be used.*

Worksheet E

Hydromodification Management

E-1 Is the project a Hydromodification Management[19] (HM) Project?

E-1.1 Is the total impervious area increased over the pre-project condition?

☒ Yes. Continue to E-1.2

☐ No. The project is NOT required to incorporate HM Measures.
Go to Item E-1.4 and check "No."

E-1.2 Is the site located in an HM Control Area per the HM Control Areas map (Appendix H of the C.3 Technical Guidance)?

☒ Yes. Continue to E-1.3

☐ No. Attach map, indicating project location. The project is NOT required to incorporate HM Measures.
Skip to Item E-1.4 and check "No."

E-1.3 Has an engineer or qualified environmental professional determined that runoff from the project flows only through a hardened channel or enclosed pipe along its entire length before emptying into a waterway in the exempt area?

☐ Yes. Attach map of facility. Go to Item E-1.4 and check "No."

☒ No. Attach map, indicating project location. The project is required to incorporate HM Measures.
Skip to Item E-1.4 and check "Yes."

E-1.4 Is the project a Hydromodification Management Project?

☒ Yes. The project is subject to HM requirements in Provision C.3.g of the Municipal Regional Stormwater Permit.

☐ No. The project is EXEMPT from HM requirements.

- If the project is subject to the HM requirements, incorporate in the project flow duration control measures designed such that post-project discharge rates and durations match pre-project discharge rates and durations.
- The Bay Area Hydrology Model (BAHM) has been developed to help size flow duration controls. See www.bayareahydrologymodel.org. Guidance is provided in Chapter 7 of the C.3 Technical Guidance.

E-2 Incorporate HM Controls (if required)

Are the applicable items provided with the Plans?

CONCEPTUAL GRADING & DRAINAGE PLAN FOR ENTITLEMENT PURPOSES

Yes	No	NA	
☒	☐	☐	Site plans with pre- and post-project impervious surface areas, surface flow directions of entire site, locations of flow duration controls and site design measures per HM site design requirement
☒	☐	☐	Soils report or other site-specific document showing soil type(s) on site
☒	☐	☐	If project uses the Bay Area Hydrology Model (BAHM), a list of model inputs and outputs.
☐	☐	☒	If project uses custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves), goodness of fit, and (allowable) low flow rate.
☐	☐	☒	If project uses the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM project (name, location, date of start up, entity responsible for maintenance).
☐	☐	☒	If the project uses alternatives to the default BAHM approach or settings, a written description and rationale.

[19] Hydromodification is the change in a site's runoff hydrograph, including increases in flows and durations that results when land is developed (made more impervious). The effects of hydromodification include, but are not limited to, increased bed and bank erosion of receiving streams, loss of habitat, increased sediment transport and/or deposition, and increased flooding. Hydromodification control measures are designed to reduce these effects.

Worksheet F
Special Projects

Complete this worksheet for projects that appear to meet the definition of "Special Project", per Provision C.3.e.ii of the Municipal Regional Stormwater Permit (MRP). The form assists in determining whether a project meets Special Project criteria, and the percentage of low impact development (LID) treatment reduction credit. Special Projects that implement less than 100% LID treatment must provide a narrative discussion of the feasibility or infeasibility of 100% LID treatment. See Appendix J of the C.3 Technical Guidance Handbook (download at www.flowstobay.org) for more information.

F.1 "Special Project" Determination *(Check the boxes to determine if the project meets any of the following categories.)*

Special Project Category "A"

Does the project have ALL of the following characteristics?

- ☐ Located in a municipality's designated central business district, downtown core area or downtown core zoning district, neighborhood business district or comparable pedestrian-oriented commercial district, or historic preservation site and/or district[20];
- ☐ Creates and/or replaces 0.5 acres or less of impervious surface;
- ☐ Includes no surface parking, except for incidental parking for emergency vehicle access, ADA access, and passenger or freight loading zones;
- ☐ Has at least 85% coverage of the entire site by permanent structures. The remaining 15% portion of the site may be used for safety access, parking structure entrances, trash and recycling service, utility access, pedestrian connections, public uses, landscaping and stormwater treatment.

☐ No (continue)

☐ Yes – Complete Section F.2 below

Special Project Category "B"

Does the project have ALL of the following characteristics?

- ☐ Located in a municipality's designated central business district, downtown core area or downtown core zoning district, neighborhood business district or comparable pedestrian-oriented commercial district, or historic preservation site and/or district[20];
- ☐ Creates and/or replaces an area of impervious surface that is greater than 0.5 acres, and no more than 2.0 acres;
- ☐ Includes no surface parking, except for incidental parking for emergency access, ADA access, and passenger or freight loading zones;
- ☐ Has at least 85% coverage of the entire site by permanent structures. The remaining 15% portion of the site may be used for safety access, parking structure entrances, trash and recycling service, utility access, pedestrian connections, public uses, landscaping and stormwater treatment;
- ☐ Minimum density of either 50 dwelling units per acre (for residential projects) or a Floor Area Ratio (FAR) of 2:1 (for commercial or mixed use projects)

☐ No (continue)

☐ Yes – Complete Section F-2 below

Special Project Category "C"

Does the project have ALL of the following characteristics?

- ☐ At least 50% of the project area is within 1/2 mile of an existing or planned transit hub[21] or 100% within a planned Priority Development Area[22];
- ☐ The project is characterized as a non-auto-related use[23]; and
- ☐ Minimum density of either 25 dwelling units per acre (for residential projects) or a Floor Area Ratio (FAR) of 2:1 (for commercial or mixed use projects)

☐ No (continue)

☐ Yes – Complete Section F-2 below

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[20] And built as part of a municipality's stated objective to preserve/enhance a pedestrian-oriented type of urban design.

[21] "Transit hub" is defined as a rail, light rail, or commuter rail station, ferry terminal, or bus transfer station served by three or more bus routes. (A bus stop with no supporting services does not qualify.)

[22] A "planned Priority Development Area" is an infill development area formally designated by the Association of Bay Area Government's / Metropolitan Transportation Commission's FOCUS regional planning program.

[23] Category C specifically excludes stand-alone surface parking lots; car dealerships; auto and truck rental facilities with onsite surface storage; fast-food restaurants, banks or pharmacies with drive-through lanes; gas stations; car washes; auto repair and service facilities; or other auto-related project unrelated to the concept of transit oriented development.

F.2 LID Treatment Reduction Credit Calculation

(If more than one category applies, choose only one of the applicable categories and fill out the table for that category.)

Category	Impervious Area Created/Replaced (sq. ft.)	Site Coverage (%)	Project Density or FAR	Density/Criteria	Allowable Credit (%)	Applied Credit (%)
A			N.A.	N.A.	100%	
B				Res ≥ 50 DU/ac or FAR ≥ 2:1	50%	
				Res ≥ 75 DU/ac or FAR ≥ 3:1	75%	
				Res ≥ 100 DU/ac or FAR ≥ 4:1	100%	
C				**Location credit (select one)[24]:**		
				Within ¼ mile of transit hub	50%	
				Within ½ mile of transit hub	25%	
				Within a planned PDA	25%	
				Density credit (select one):		
				Res ≥ 30 DU/ac or FAR ≥ 2:1	10%	
				Res ≥ 60 DU/ac or FAR ≥ 4:1	20%	
				Res ≥ 100 DU/ac or FAR ≥ 6:1	30%	
				Parking credit (select one):		
				≤ 10% at-grade surface parking[25]	10%	
				No surface parking	20%	
				TOTAL TOD CREDIT =		

F.3 Narrative Discussion of the Feasibility/Infeasibility of 100% LID Treatment:

If project will implement less than 100% LID, prepare a discussion of the feasibility or infeasibility of 100% LID treatment, as described in Appendix K of the C.3 Technical Guidance.

F.4 Select Certified Non-LID Treatment Measures:

If the project will include non-LID treatment measures, select a treatment measure certified for "Basic" General Use Level Designation (GULD) by the Washington State Department of Ecology's Technical Assessment Protocol – Ecology (TAPE). Guidance is provided in Appendix K of the C.3 Technical Guidance (download at www.flowstobay.org).[26]

[24] To qualify for the location credit, at least 50% of the project's site must be located within the ¼ mile or ½ mile radius of an existing or planned transit hub, as defined on page 1, footnote 2. A planned transit hub is a station on the MTC's Regional Transit Expansion Program list, per MTC's Resolution 3434 (revised April 2006), which is a regional priority funding plan for future transit stations in the San Francisco Bay Area. To qualify for the PDA location credit, 100% of the project site must be located within a PDA, as defined on page 1, footnote 3.

[25] The at-grade surface parking must be treated with LID treatment measures.

[26] TAPE certification is used in order to satisfy Special Project's reporting requirements in the MRP.

Worksheet G
(For municipal staff use only)

G-1 **Alternative Certification:** Were the treatment and/or HM control sizing and design reviewed by a qualified third-party professional that is not a member of the project team or agency staff?

☐ Yes ☐ No Name of Reviewer_____

G-2 **High Priority Site:** High Priority Sites can include those located in or within 100 feet of a sensitive habitat, Area of Special Biological Significance (ASBS), body of water, or on sites with slopes (subject to monthly inspections from Oct 1 to April 30.)

☐ Yes ☐ No If yes, then add site to Staff's Monthly Rainy Season Construction Site Inspection List

Operations and Maintenance (O&M) Submittals

G-3 Stormwater Treatment Measure and/HM Control Owner or Operator's Information:

Name:_____

Address:_____

Phone:_____ Email:_____

- *Applicant must call for inspection and receive inspection within 45 days of installation of treatment measures and/or hydromodification management controls.*

The following questions apply to C.3 Regulated Projects and Hydromodification Management Projects.

		Yes	No	N/A
G-3.1	Was maintenance plan submitted?	☐	☐	☐
G-3.2	Was maintenance plan approved?	☐	☐	☐
G-3.3	Was maintenance agreement submitted? (Date executed:_____)	☐	☐	☐

- *Attach the executed maintenance agreement as an appendix to this checklist.*

G-4 **Annual Operations and Maintenance (O&M) Submittals (for municipal staff use only):**

For C.3 Regulated Projects and Hydromodification Management Projects, indicate the dates on which the Applicant submitted annual reports for project O&M:

_____ _____

G-5 **Comments (for municipal staff use only):**

_____

_____

_____

_____

_____

G-6 **NOTES (for municipal staff use only):**

Section I Notes:_____

Worksheet A Notes:_____

Worksheet B Notes:_____

Worksheet C Notes:_____

Worksheet D-1 Notes:_____

Worksheet D-2 Notes:_____

Worksheet E Notes:_____

Worksheet F Notes:_____

G-7 Project Close-Out (for municipal staff use only):

		Yes	No	NA
7.1	Were final Conditions of Approval met?	☐	☐	
7.2	Was initial inspection of the completed treatment/HM measure(s) conducted? (Date of inspection:_____)	☐	☐	☐
7.3	Was maintenance plan submitted? (Date executed:_____)	☐	☐	☐
7.4	Was project information provided to staff responsible for O&M verification inspections? (Date provided to inspection staff:_____)	☐	☐	☐

G-8 Project Close-Out (Continued -- for municipal staff use only):

Name of staff confirming project is closed out:_____

Signature:_____ Date:_____

Name of O&M staff receiving information:_____

Signature:_____ Date:_____

HEC-HMS MODEL OUTPUT

```
Basin: Existing
     Description: Existing Conditions. Initial and Constant loss approximated per the Soil
     Type. Basin Lag times fell below 10 minutes, so 10 minutes was the minimum that was used.
     Last Modified Date: 20 January 2016
     Last Modified Time: 19:41:25
     Version: 4.0
     Filepath Separator: \
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Compute Local Flow At Junctions: No

     Enable Sediment Routing: No

     Enable Quality Routing: No
End:

Subbasin: SHED A
     Canvas X: 6782.608695652176
     Canvas Y: 3021.7391304347825
     Area: 0.0064

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 1
     Initial Loss: 0.8
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SHED B
     Canvas X: 7819.314641744548
     Canvas Y: -2040.4984423676015
     Area: 0.003
     Downstream: POC

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 1
     Initial Loss: 0.8
```

```
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SHED C
     Canvas X: 3037.3831775700946
     Canvas Y: 809.9688473520255
     Area: 0.0053

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 1
     Initial Loss: 0.8
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SHED D
     Canvas X: -4003.1152647975077
     Canvas Y: -1043.6137071651092
     Area: 0.0014
     Downstream: POC

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 1
     Initial Loss: 0.8
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD

     Baseflow: None
End:
```

```
Subbasin: SHED E
     Canvas X: -2180.6853582554522
     Canvas Y: 1433.0218068535833
     Area: 0.0034

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 1
     Initial Loss: 0.8
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: POC
     Canvas X: -5155.76323987539
     Canvas Y: -2414.330218068536
End:

Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 5000.0
     Maximum View S: -5000.0
     Maximum View W: -5000.0
     Maximum View E: 5000.0
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Name
     Draw Map Objects: No
     Draw Gridlines: No
     Draw Flow Direction: No
     Fix Element Locations: No
     Fix Hydrologic Order: No
End:
```

Project: Fassler Simulation Run: Existing_100yr24hr

Start of Run: 01Jan2014, 00:00 Basin Model: Existing
End of Run: 02Jan2014, 06:00 Meteorologic Model: 100yr24hr
Compute Time: 26Jan2016, 18:03:17 Control Specifications: 24 hour event

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
SHED A	0.0064	11.68	01Jan2014, 10:00	1.469
SHED B	0.003	5.48	01Jan2014, 10:00	0.689
SHED C	0.0053	9.67	01Jan2014, 10:00	1.217
SHED D	0.0014	2.56	01Jan2014, 10:00	0.321
SHED E	0.0034	6.21	01Jan2014, 10:00	0.780
POC	0.0044	8.03	01Jan2014, 10:00	1.010

```
Basin: Proposed
     Description: Proposed Conditions. Initial and Constant loss approximated per the Soil Type.
     Basin Lag times fell below 10 minutes, so 10 minutes was the minimum that was used.
     Last Modified Date: 25 January 2016
     Last Modified Time: 20:19:21
     Version: 4.0
     Filepath Separator: \
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Compute Local Flow At Junctions: No

     Enable Sediment Routing: No

     Enable Quality Routing: No
End:

Subbasin: SHED A
     Canvas X: 6782.608695652176
     Canvas Y: 3021.7391304347825
     Area: 0.0063

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 1
     Initial Loss: 0.8
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SHED B
     Canvas X: 7673.913043478264
     Canvas Y: -1978.260869565218
     Area: 0.0030
     Downstream: POC

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 1
     Initial Loss: 0.8
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD
```

```
     Baseflow: None
End:

Subbasin: SHED D
     Canvas X: -3582.5545171339563
     Canvas Y: -15.576323987538672
     Area: 0.0003
     Downstream: POC

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 1
     Initial Loss: 0.8
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SHED E-1
     Canvas X: -576.3239875389409
     Canvas Y: 436.137071651091
     Area: 0.0030
     Downstream: E-1 DETENTION POND

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 60.4
     Initial Loss: 0.8
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Reservoir: E-1 DETENTION POND
     Description: Water quality and flood control detention pond.
     Canvas X: -638.6292834890974
     Canvas Y: -514.0186915887843
     Label X: -85.0
     Label Y: 20.0
     Downstream: POC

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
```

```
     Initial Elevation: 291
     Storage-Outflow Table: E-1 12in Outlet Hydromod
     Elevation-Storage Table: E-1 Detention Pond
     Primary Table: Elevation-Storage
End:

Junction: POC
     Description: Proposed Point of Concentration in Fassler Avenue.
     Canvas X: -5202.492211838007
     Canvas Y: -2118.3800623052957
     Label X: -28.0
     Label Y: 21.0
End:

Subbasin: SHED C
     Canvas X: 436.1370716510901
     Canvas Y: 3161.993769470406
     Area: 0.0050

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 1
     Initial Loss: 0.8
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SHED E-2
     Canvas X: -2461.059190031153
     Canvas Y: 2056.0747663551406
     From Canvas X: 1087.7726665677374
     From Canvas Y: -913.2660632141269
     Area: 0.0020

     Canopy: None
     Plant Uptake Method: None

     Surface: None

     LossRate: Initial+Constant
     Percent Impervious Area: 1
     Initial Loss: 0.8
     Constant Loss Rate: 0.07

     Transform: SCS
     Lag: 10
     Unitgraph Type: STANDARD

     Baseflow: None
End:
```

```
Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 5000.0
     Maximum View S: -5000.0
     Maximum View W: -5000.0
     Maximum View E: 5000.0
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Name
     Draw Map Objects: No
     Draw Gridlines: No
     Draw Flow Direction: No
     Fix Element Locations: No
     Fix Hydrologic Order: No
End:
```

Project: Fassler Simulation Run: Proposed_100yr24hr

Start of Run: 01Jan2014, 00:00 Basin Model: Proposed
End of Run: 02Jan2014, 06:00 Meteorologic Model: 100yr24hr
Compute Time: 26Jan2016, 18:03:20 Control Specifications: 24 hour event

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
SHED A	0.0063	11.50	01Jan2014, 10:00	1.446
SHED B	0.0030	5.48	01Jan2014, 10:00	0.689
SHED D	0.0003	0.55	01Jan2014, 10:00	0.069
SHED E-1	0.0030	5.56	01Jan2014, 10:00	0.884
E-1 DETENTION POND	0.0030	1.49	01Jan2014, 10:40	0.581
POC	0.0063	6.11	01Jan2014, 10:00	1.338
SHED C	0.0050	9.13	01Jan2014, 10:00	1.148
SHED E-2	0.0020	3.65	01Jan2014, 10:00	0.459

BAHM2013
PROJECT
REPORT

BAHM2013

PROJECT REPORT

General Model Information

Project Name:	Fassler
Site Name:	Fassler
Site Address:	801 Fassler Avenue
City:	Pacifica
Report Date:	1/26/2016
Gage:	San Francisco
Data Start:	1959/10/01
Data End:	1997/09/30
Timestep:	Hourly
Precip Scale:	1.61
Version:	2014/08/29

POC Thresholds

Low Flow Threshold for POC1:	10 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year

Landuse Basin Data
Predeveloped Land Use

SHED D

Bypass:	No
GroundWater:	No

Pervious Land Use	Acres
C D,Shrub,Very(>20%)	0.9
Pervious Total	0.9

Impervious Land Use	Acres
Impervious Total	0
Basin Total	0.9

Element Flows To:

Surface	Interflow	Groundwater
POC JUNCTION	POC JUNCTION	

SHED B

Bypass:	No
GroundWater:	No

Pervious Land Use	Acres
C D,Shrub,Very(>20%)	1.9
Pervious Total	1.9

Impervious Land Use	Acres
Impervious Total	0
Basin Total	1.9

Element Flows To:

Surface	Interflow	Groundwater
R-SHED B to SHED D	R-SHED B to SHED D	

Mitigated Land Use

SHED D

Bypass:	No
GroundWater:	No

Pervious Land Use	Acres
C D,Shrub,Very(>20%)	0.2
Pervious Total	0.2

Impervious Land Use	Acres
Impervious Total	0
Basin Total	0.2

Element Flows To:

Surface	Interflow	Groundwater
POC JUNCTION	POC JUNCTION	

SHED B

Bypass:	No
GroundWater:	No

Pervious Land Use	Acres
C D,Shrub,Very(>20%)	1.9
Pervious Total	1.9

Impervious Land Use	Acres
Impervious Total	0
Basin Total	1.9

Element Flows To:

Surface	Interflow	Groundwater
R-SHED B	R-SHED B	

SHED E-1

Bypass:	No
GroundWater:	No

Pervious Land Use	Acres
C D,Urban,St(10-20%)	1.9
Pervious Total	1.9

Impervious Land Use	Acres
Impervious Total	0
Basin Total	1.9

Element Flows To:

Surface	Interflow	Groundwater
WQ Pond	WQ Pond	

Routing Elements
Predeveloped Routing

R-SHED B to SHED D

Bottom Length: 350.00 ft.
Bottom Width: 1.12 ft.
Manning's n: 0.012
Channel bottom slope 1: 0.117 To 1
Channel Left side slope 0: 0 To 1
Channel right side slope 2: 0 To 1
Discharge Structure
Riser Height: 0 ft.
Riser Diameter: 0 in.
Element Flows To:
Outlet 1 Outlet 2
POC JUNCTION

Channel Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.009	0.000	0.000	0.000
0.0124	0.009	0.000	0.031	0.000
0.0249	0.009	0.000	0.098	0.000
0.0373	0.009	0.000	0.190	0.000
0.0498	0.009	0.000	0.302	0.000
0.0622	0.009	0.000	0.433	0.000
0.0747	0.009	0.000	0.579	0.000
0.0871	0.009	0.000	0.739	0.000
0.0996	0.009	0.000	0.912	0.000
0.1120	0.009	0.001	1.096	0.000
0.1244	0.009	0.001	1.290	0.000
0.1369	0.009	0.001	1.494	0.000
0.1493	0.009	0.001	1.707	0.000
0.1618	0.009	0.001	1.929	0.000
0.1742	0.009	0.001	2.158	0.000
0.1867	0.009	0.001	2.394	0.000
0.1991	0.009	0.001	2.636	0.000
0.2116	0.009	0.001	2.885	0.000
0.2240	0.009	0.002	3.140	0.000
0.2364	0.009	0.002	3.400	0.000
0.2489	0.009	0.002	3.666	0.000
0.2613	0.009	0.002	3.936	0.000
0.2738	0.009	0.002	4.211	0.000
0.2862	0.009	0.002	4.490	0.000
0.2987	0.009	0.002	4.773	0.000
0.3111	0.009	0.002	5.061	0.000
0.3236	0.009	0.002	5.352	0.000
0.3360	0.009	0.003	5.646	0.000
0.3484	0.009	0.003	5.944	0.000
0.3609	0.009	0.003	6.245	0.000
0.3733	0.009	0.003	6.550	0.000
0.3858	0.009	0.003	6.857	0.000
0.3982	0.009	0.003	7.167	0.000
0.4107	0.009	0.003	7.479	0.000
0.4231	0.009	0.003	7.794	0.000
0.4356	0.009	0.003	8.112	0.000

0.4480	0.009	0.004	8.432	0.000
0.4604	0.009	0.004	8.754	0.000
0.4729	0.009	0.004	9.078	0.000
0.4853	0.009	0.004	9.404	0.000
0.4978	0.009	0.004	9.732	0.000
0.5102	0.009	0.004	10.06	0.000
0.5227	0.009	0.004	10.39	0.000
0.5351	0.009	0.004	10.72	0.000
0.5476	0.009	0.004	11.06	0.000
0.5600	0.009	0.005	11.40	0.000
0.5724	0.009	0.005	11.74	0.000
0.5849	0.009	0.005	12.08	0.000
0.5973	0.009	0.005	12.42	0.000
0.6098	0.009	0.005	12.76	0.000
0.6222	0.009	0.005	13.10	0.000
0.6347	0.009	0.005	13.45	0.000
0.6471	0.009	0.005	13.80	0.000
0.6596	0.009	0.005	14.14	0.000
0.6720	0.009	0.006	14.49	0.000
0.6844	0.009	0.006	14.84	0.000
0.6969	0.009	0.006	15.20	0.000
0.7093	0.009	0.006	15.55	0.000
0.7218	0.009	0.006	15.90	0.000
0.7342	0.009	0.006	16.26	0.000
0.7467	0.009	0.006	16.61	0.000
0.7591	0.009	0.006	16.97	0.000
0.7716	0.009	0.006	17.33	0.000
0.7840	0.009	0.007	17.68	0.000
0.7964	0.009	0.007	18.04	0.000
0.8089	0.009	0.007	18.40	0.000
0.8213	0.009	0.007	18.76	0.000
0.8338	0.009	0.007	19.13	0.000
0.8462	0.009	0.007	19.49	0.000
0.8587	0.009	0.007	19.85	0.000
0.8711	0.009	0.007	20.22	0.000
0.8836	0.009	0.008	20.58	0.000
0.8960	0.009	0.008	20.95	0.000
0.9084	0.009	0.008	21.31	0.000
0.9209	0.009	0.008	21.68	0.000
0.9333	0.009	0.008	22.04	0.000
0.9458	0.009	0.008	22.41	0.000
0.9582	0.009	0.008	22.78	0.000
0.9707	0.009	0.008	23.15	0.000
0.9831	0.009	0.008	23.52	0.000
0.9956	0.009	0.009	23.89	0.000
1.0080	0.009	0.009	24.26	0.000
1.0204	0.009	0.009	24.63	0.000
1.0329	0.009	0.009	25.00	0.000
1.0453	0.009	0.009	25.38	0.000
1.0578	0.009	0.009	25.75	0.000
1.0702	0.009	0.009	26.12	0.000
1.0827	0.009	0.009	26.49	0.000
1.0951	0.009	0.009	26.87	0.000
1.1076	0.009	0.010	27.24	0.000
1.1200	0.009	0.010	27.62	0.000

POC JUNCTION

Bottom Length: 112.40 ft.
Bottom Width: 1.12 ft.
Manning's n: 0.012
Channel bottom slope 1: 0.117 To 1
Channel Left side slope 0: 0 To 1
Channel right side slope 2: 0 To 1
Discharge Structure
Riser Height: 0 ft.
Riser Diameter: 0 in.
Element Flows To:
Outlet 1 Outlet 2

Channel Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.002	0.000	0.000	0.000
0.0124	0.002	0.000	0.031	0.000
0.0249	0.002	0.000	0.098	0.000
0.0373	0.002	0.000	0.190	0.000
0.0498	0.002	0.000	0.302	0.000
0.0622	0.002	0.000	0.433	0.000
0.0747	0.002	0.000	0.579	0.000
0.0871	0.002	0.000	0.739	0.000
0.0996	0.002	0.000	0.912	0.000
0.1120	0.002	0.000	1.096	0.000
0.1244	0.002	0.000	1.290	0.000
0.1369	0.002	0.000	1.494	0.000
0.1493	0.002	0.000	1.707	0.000
0.1618	0.002	0.000	1.929	0.000
0.1742	0.002	0.000	2.158	0.000
0.1867	0.002	0.000	2.394	0.000
0.1991	0.002	0.000	2.636	0.000
0.2116	0.002	0.000	2.885	0.000
0.2240	0.002	0.000	3.140	0.000
0.2364	0.002	0.000	3.400	0.000
0.2489	0.002	0.000	3.666	0.000
0.2613	0.002	0.000	3.936	0.000
0.2738	0.002	0.000	4.211	0.000
0.2862	0.002	0.000	4.490	0.000
0.2987	0.002	0.000	4.773	0.000
0.3111	0.002	0.000	5.061	0.000
0.3236	0.002	0.000	5.352	0.000
0.3360	0.002	0.001	5.646	0.000
0.3484	0.002	0.001	5.944	0.000
0.3609	0.002	0.001	6.245	0.000
0.3733	0.002	0.001	6.550	0.000
0.3858	0.002	0.001	6.857	0.000
0.3982	0.002	0.001	7.167	0.000
0.4107	0.002	0.001	7.479	0.000
0.4231	0.002	0.001	7.794	0.000
0.4356	0.002	0.001	8.112	0.000
0.4480	0.002	0.001	8.432	0.000
0.4604	0.002	0.001	8.754	0.000
0.4729	0.002	0.001	9.078	0.000
0.4853	0.002	0.001	9.404	0.000

0.4978	0.002	0.001	9.732	0.000
0.5102	0.002	0.001	10.06	0.000
0.5227	0.002	0.001	10.39	0.000
0.5351	0.002	0.001	10.72	0.000
0.5476	0.002	0.001	11.06	0.000
0.5600	0.002	0.001	11.40	0.000
0.5724	0.002	0.001	11.74	0.000
0.5849	0.002	0.001	12.08	0.000
0.5973	0.002	0.001	12.42	0.000
0.6098	0.002	0.001	12.76	0.000
0.6222	0.002	0.001	13.10	0.000
0.6347	0.002	0.001	13.45	0.000
0.6471	0.002	0.001	13.80	0.000
0.6596	0.002	0.001	14.14	0.000
0.6720	0.002	0.001	14.49	0.000
0.6844	0.002	0.002	14.84	0.000
0.6969	0.002	0.002	15.20	0.000
0.7093	0.002	0.002	15.55	0.000
0.7218	0.002	0.002	15.90	0.000
0.7342	0.002	0.002	16.26	0.000
0.7467	0.002	0.002	16.61	0.000
0.7591	0.002	0.002	16.97	0.000
0.7716	0.002	0.002	17.33	0.000
0.7840	0.002	0.002	17.68	0.000
0.7964	0.002	0.002	18.04	0.000
0.8089	0.002	0.002	18.40	0.000
0.8213	0.002	0.002	18.76	0.000
0.8338	0.002	0.002	19.13	0.000
0.8462	0.002	0.002	19.49	0.000
0.8587	0.002	0.002	19.85	0.000
0.8711	0.002	0.002	20.22	0.000
0.8836	0.002	0.002	20.58	0.000
0.8960	0.002	0.002	20.95	0.000
0.9084	0.002	0.002	21.31	0.000
0.9209	0.002	0.002	21.68	0.000
0.9333	0.002	0.002	22.04	0.000
0.9458	0.002	0.002	22.41	0.000
0.9582	0.002	0.002	22.78	0.000
0.9707	0.002	0.002	23.15	0.000
0.9831	0.002	0.002	23.52	0.000
0.9956	0.002	0.002	23.89	0.000
1.0080	0.002	0.002	24.26	0.000
1.0204	0.002	0.003	24.63	0.000
1.0329	0.002	0.003	25.00	0.000
1.0453	0.002	0.003	25.38	0.000
1.0578	0.002	0.003	25.75	0.000
1.0702	0.002	0.003	26.12	0.000
1.0827	0.002	0.003	26.49	0.000
1.0951	0.002	0.003	26.87	0.000
1.1076	0.002	0.003	27.24	0.000
1.1200	0.002	0.003	27.62	0.000

Mitigated Routing

R-SHED B

Bottom Length: 42.40 ft.
Bottom Width: 1.12 ft.
Manning's n: 0.012
Channel bottom slope 1: 0.01 To 1
Channel Left side slope 0: 0 To 1
Channel right side slope 2: 0 To 1
Discharge Structure
Riser Height: 0 ft.
Riser Diameter: 0 in.
Element Flows To:
Outlet 1 Outlet 2
R-SHED B to SHED D

Channel Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.001	0.000	0.000	0.000
0.0124	0.001	0.000	0.009	0.000
0.0249	0.001	0.000	0.028	0.000
0.0373	0.001	0.000	0.055	0.000
0.0498	0.001	0.000	0.088	0.000
0.0622	0.001	0.000	0.126	0.000
0.0747	0.001	0.000	0.169	0.000
0.0871	0.001	0.000	0.216	0.000
0.0996	0.001	0.000	0.266	0.000
0.1120	0.001	0.000	0.320	0.000
0.1244	0.001	0.000	0.377	0.000
0.1369	0.001	0.000	0.437	0.000
0.1493	0.001	0.000	0.499	0.000
0.1618	0.001	0.000	0.564	0.000
0.1742	0.001	0.000	0.630	0.000
0.1867	0.001	0.000	0.699	0.000
0.1991	0.001	0.000	0.770	0.000
0.2116	0.001	0.000	0.843	0.000
0.2240	0.001	0.000	0.918	0.000
0.2364	0.001	0.000	0.994	0.000
0.2489	0.001	0.000	1.071	0.000
0.2613	0.001	0.000	1.150	0.000
0.2738	0.001	0.000	1.231	0.000
0.2862	0.001	0.000	1.312	0.000
0.2987	0.001	0.000	1.395	0.000
0.3111	0.001	0.000	1.479	0.000
0.3236	0.001	0.000	1.564	0.000
0.3360	0.001	0.000	1.650	0.000
0.3484	0.001	0.000	1.738	0.000
0.3609	0.001	0.000	1.826	0.000
0.3733	0.001	0.000	1.914	0.000
0.3858	0.001	0.000	2.004	0.000
0.3982	0.001	0.000	2.095	0.000
0.4107	0.001	0.000	2.186	0.000
0.4231	0.001	0.000	2.278	0.000
0.4356	0.001	0.000	2.371	0.000
0.4480	0.001	0.000	2.465	0.000
0.4604	0.001	0.000	2.559	0.000

0.4729	0.001	0.000	2.654	0.000
0.4853	0.001	0.000	2.749	0.000
0.4978	0.001	0.000	2.845	0.000
0.5102	0.001	0.000	2.941	0.000
0.5227	0.001	0.000	3.039	0.000
0.5351	0.001	0.000	3.136	0.000
0.5476	0.001	0.000	3.234	0.000
0.5600	0.001	0.000	3.333	0.000
0.5724	0.001	0.000	3.432	0.000
0.5849	0.001	0.000	3.531	0.000
0.5973	0.001	0.000	3.631	0.000
0.6098	0.001	0.000	3.731	0.000
0.6222	0.001	0.000	3.832	0.000
0.6347	0.001	0.000	3.933	0.000
0.6471	0.001	0.000	4.034	0.000
0.6596	0.001	0.000	4.136	0.000
0.6720	0.001	0.000	4.238	0.000
0.6844	0.001	0.000	4.341	0.000
0.6969	0.001	0.000	4.443	0.000
0.7093	0.001	0.000	4.546	0.000
0.7218	0.001	0.000	4.650	0.000
0.7342	0.001	0.000	4.754	0.000
0.7467	0.001	0.000	4.857	0.000
0.7591	0.001	0.000	4.962	0.000
0.7716	0.001	0.000	5.066	0.000
0.7840	0.001	0.000	5.171	0.000
0.7964	0.001	0.000	5.276	0.000
0.8089	0.001	0.000	5.381	0.000
0.8213	0.001	0.000	5.487	0.000
0.8338	0.001	0.000	5.592	0.000
0.8462	0.001	0.000	5.698	0.000
0.8587	0.001	0.000	5.805	0.000
0.8711	0.001	0.000	5.911	0.000
0.8836	0.001	0.001	6.018	0.000
0.8960	0.001	0.001	6.124	0.000
0.9084	0.001	0.001	6.231	0.000
0.9209	0.001	0.001	6.338	0.000
0.9333	0.001	0.001	6.446	0.000
0.9458	0.001	0.001	6.553	0.000
0.9582	0.001	0.001	6.661	0.000
0.9707	0.001	0.001	6.769	0.000
0.9831	0.001	0.001	6.877	0.000
0.9956	0.001	0.001	6.985	0.000
1.0080	0.001	0.001	7.093	0.000
1.0204	0.001	0.001	7.202	0.000
1.0329	0.001	0.001	7.311	0.000
1.0453	0.001	0.001	7.419	0.000
1.0578	0.001	0.001	7.528	0.000
1.0702	0.001	0.001	7.637	0.000
1.0827	0.001	0.001	7.747	0.000
1.0951	0.001	0.001	7.856	0.000
1.1076	0.001	0.001	7.965	0.000
1.1200	0.001	0.001	8.075	0.000

R-SHED B to SHED D

Bottom Length: 350.00 ft.
Bottom Width: 1.12 ft.
Manning's n: 0.012
Channel bottom slope 1: 0.117 To 1
Channel Left side slope 0: 0 To 1
Channel right side slope 2: 0 To 1
Discharge Structure
Riser Height: 0 ft.
Riser Diameter: 0 in.
Element Flows To:
Outlet 1 Outlet 2
POC JUNCTION

Channel Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.009	0.000	0.000	0.000
0.0124	0.009	0.000	0.031	0.000
0.0249	0.009	0.000	0.098	0.000
0.0373	0.009	0.000	0.190	0.000
0.0498	0.009	0.000	0.302	0.000
0.0622	0.009	0.000	0.433	0.000
0.0747	0.009	0.000	0.579	0.000
0.0871	0.009	0.000	0.739	0.000
0.0996	0.009	0.000	0.912	0.000
0.1120	0.009	0.001	1.096	0.000
0.1244	0.009	0.001	1.290	0.000
0.1369	0.009	0.001	1.494	0.000
0.1493	0.009	0.001	1.707	0.000
0.1618	0.009	0.001	1.929	0.000
0.1742	0.009	0.001	2.158	0.000
0.1867	0.009	0.001	2.394	0.000
0.1991	0.009	0.001	2.636	0.000
0.2116	0.009	0.001	2.885	0.000
0.2240	0.009	0.002	3.140	0.000
0.2364	0.009	0.002	3.400	0.000
0.2489	0.009	0.002	3.666	0.000
0.2613	0.009	0.002	3.936	0.000
0.2738	0.009	0.002	4.211	0.000
0.2862	0.009	0.002	4.490	0.000
0.2987	0.009	0.002	4.773	0.000
0.3111	0.009	0.002	5.061	0.000
0.3236	0.009	0.002	5.352	0.000
0.3360	0.009	0.003	5.646	0.000
0.3484	0.009	0.003	5.944	0.000
0.3609	0.009	0.003	6.245	0.000
0.3733	0.009	0.003	6.550	0.000
0.3858	0.009	0.003	6.857	0.000
0.3982	0.009	0.003	7.167	0.000
0.4107	0.009	0.003	7.479	0.000
0.4231	0.009	0.003	7.794	0.000
0.4356	0.009	0.003	8.112	0.000
0.4480	0.009	0.004	8.432	0.000
0.4604	0.009	0.004	8.754	0.000
0.4729	0.009	0.004	9.078	0.000
0.4853	0.009	0.004	9.404	0.000

0.4978	0.009	0.004	9.732	0.000
0.5102	0.009	0.004	10.06	0.000
0.5227	0.009	0.004	10.39	0.000
0.5351	0.009	0.004	10.72	0.000
0.5476	0.009	0.004	11.06	0.000
0.5600	0.009	0.005	11.40	0.000
0.5724	0.009	0.005	11.74	0.000
0.5849	0.009	0.005	12.08	0.000
0.5973	0.009	0.005	12.42	0.000
0.6098	0.009	0.005	12.76	0.000
0.6222	0.009	0.005	13.10	0.000
0.6347	0.009	0.005	13.45	0.000
0.6471	0.009	0.005	13.80	0.000
0.6596	0.009	0.005	14.14	0.000
0.6720	0.009	0.006	14.49	0.000
0.6844	0.009	0.006	14.84	0.000
0.6969	0.009	0.006	15.20	0.000
0.7093	0.009	0.006	15.55	0.000
0.7218	0.009	0.006	15.90	0.000
0.7342	0.009	0.006	16.26	0.000
0.7467	0.009	0.006	16.61	0.000
0.7591	0.009	0.006	16.97	0.000
0.7716	0.009	0.006	17.33	0.000
0.7840	0.009	0.007	17.68	0.000
0.7964	0.009	0.007	18.04	0.000
0.8089	0.009	0.007	18.40	0.000
0.8213	0.009	0.007	18.76	0.000
0.8338	0.009	0.007	19.13	0.000
0.8462	0.009	0.007	19.49	0.000
0.8587	0.009	0.007	19.85	0.000
0.8711	0.009	0.007	20.22	0.000
0.8836	0.009	0.008	20.58	0.000
0.8960	0.009	0.008	20.95	0.000
0.9084	0.009	0.008	21.31	0.000
0.9209	0.009	0.008	21.68	0.000
0.9333	0.009	0.008	22.04	0.000
0.9458	0.009	0.008	22.41	0.000
0.9582	0.009	0.008	22.78	0.000
0.9707	0.009	0.008	23.15	0.000
0.9831	0.009	0.008	23.52	0.000
0.9956	0.009	0.009	23.89	0.000
1.0080	0.009	0.009	24.26	0.000
1.0204	0.009	0.009	24.63	0.000
1.0329	0.009	0.009	25.00	0.000
1.0453	0.009	0.009	25.38	0.000
1.0578	0.009	0.009	25.75	0.000
1.0702	0.009	0.009	26.12	0.000
1.0827	0.009	0.009	26.49	0.000
1.0951	0.009	0.009	26.87	0.000
1.1076	0.009	0.010	27.24	0.000
1.1200	0.009	0.010	27.62	0.000

POC JUNCTION

Bottom Length: 112.40 ft.
Bottom Width: 1.12 ft.
Manning's n: 0.012
Channel bottom slope 1: 0.117 To 1
Channel Left side slope 0: 0 To 1
Channel right side slope 2: 0 To 1
Discharge Structure
Riser Height: 0 ft.
Riser Diameter: 0 in.
Element Flows To:
Outlet 1 Outlet 2

Channel Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.002	0.000	0.000	0.000
0.0124	0.002	0.000	0.031	0.000
0.0249	0.002	0.000	0.098	0.000
0.0373	0.002	0.000	0.190	0.000
0.0498	0.002	0.000	0.302	0.000
0.0622	0.002	0.000	0.433	0.000
0.0747	0.002	0.000	0.579	0.000
0.0871	0.002	0.000	0.739	0.000
0.0996	0.002	0.000	0.912	0.000
0.1120	0.002	0.000	1.096	0.000
0.1244	0.002	0.000	1.290	0.000
0.1369	0.002	0.000	1.494	0.000
0.1493	0.002	0.000	1.707	0.000
0.1618	0.002	0.000	1.929	0.000
0.1742	0.002	0.000	2.158	0.000
0.1867	0.002	0.000	2.394	0.000
0.1991	0.002	0.000	2.636	0.000
0.2116	0.002	0.000	2.885	0.000
0.2240	0.002	0.000	3.140	0.000
0.2364	0.002	0.000	3.400	0.000
0.2489	0.002	0.000	3.666	0.000
0.2613	0.002	0.000	3.936	0.000
0.2738	0.002	0.000	4.211	0.000
0.2862	0.002	0.000	4.490	0.000
0.2987	0.002	0.000	4.773	0.000
0.3111	0.002	0.000	5.061	0.000
0.3236	0.002	0.000	5.352	0.000
0.3360	0.002	0.001	5.646	0.000
0.3484	0.002	0.001	5.944	0.000
0.3609	0.002	0.001	6.245	0.000
0.3733	0.002	0.001	6.550	0.000
0.3858	0.002	0.001	6.857	0.000
0.3982	0.002	0.001	7.167	0.000
0.4107	0.002	0.001	7.479	0.000
0.4231	0.002	0.001	7.794	0.000
0.4356	0.002	0.001	8.112	0.000
0.4480	0.002	0.001	8.432	0.000
0.4604	0.002	0.001	8.754	0.000
0.4729	0.002	0.001	9.078	0.000
0.4853	0.002	0.001	9.404	0.000

0.4978	0.002	0.001	9.732	0.000
0.5102	0.002	0.001	10.06	0.000
0.5227	0.002	0.001	10.39	0.000
0.5351	0.002	0.001	10.72	0.000
0.5476	0.002	0.001	11.06	0.000
0.5600	0.002	0.001	11.40	0.000
0.5724	0.002	0.001	11.74	0.000
0.5849	0.002	0.001	12.08	0.000
0.5973	0.002	0.001	12.42	0.000
0.6098	0.002	0.001	12.76	0.000
0.6222	0.002	0.001	13.10	0.000
0.6347	0.002	0.001	13.45	0.000
0.6471	0.002	0.001	13.80	0.000
0.6596	0.002	0.001	14.14	0.000
0.6720	0.002	0.001	14.49	0.000
0.6844	0.002	0.002	14.84	0.000
0.6969	0.002	0.002	15.20	0.000
0.7093	0.002	0.002	15.55	0.000
0.7218	0.002	0.002	15.90	0.000
0.7342	0.002	0.002	16.26	0.000
0.7467	0.002	0.002	16.61	0.000
0.7591	0.002	0.002	16.97	0.000
0.7716	0.002	0.002	17.33	0.000
0.7840	0.002	0.002	17.68	0.000
0.7964	0.002	0.002	18.04	0.000
0.8089	0.002	0.002	18.40	0.000
0.8213	0.002	0.002	18.76	0.000
0.8338	0.002	0.002	19.13	0.000
0.8462	0.002	0.002	19.49	0.000
0.8587	0.002	0.002	19.85	0.000
0.8711	0.002	0.002	20.22	0.000
0.8836	0.002	0.002	20.58	0.000
0.8960	0.002	0.002	20.95	0.000
0.9084	0.002	0.002	21.31	0.000
0.9209	0.002	0.002	21.68	0.000
0.9333	0.002	0.002	22.04	0.000
0.9458	0.002	0.002	22.41	0.000
0.9582	0.002	0.002	22.78	0.000
0.9707	0.002	0.002	23.15	0.000
0.9831	0.002	0.002	23.52	0.000
0.9956	0.002	0.002	23.89	0.000
1.0080	0.002	0.002	24.26	0.000
1.0204	0.002	0.003	24.63	0.000
1.0329	0.002	0.003	25.00	0.000
1.0453	0.002	0.003	25.38	0.000
1.0578	0.002	0.003	25.75	0.000
1.0702	0.002	0.003	26.12	0.000
1.0827	0.002	0.003	26.49	0.000
1.0951	0.002	0.003	26.87	0.000
1.1076	0.002	0.003	27.24	0.000
1.1200	0.002	0.003	27.62	0.000

R-SHED E-1

Bottom Length: 76.80 ft.
Bottom Width: 1.12 ft.
Manning's n: 0.012
Channel bottom slope 1: 0.0574 To 1
Channel Left side slope 0: 0 To 1
Channel right side slope 2: 0 To 1
Discharge Structure
Riser Height: 0 ft.
Riser Diameter: 0 in.
Element Flows To:
Outlet 1 Outlet 2
POC JUNCTION

Channel Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.002	0.000	0.000	0.000
0.0124	0.002	0.000	0.021	0.000
0.0249	0.002	0.000	0.068	0.000
0.0373	0.002	0.000	0.133	0.000
0.0498	0.002	0.000	0.212	0.000
0.0622	0.002	0.000	0.303	0.000
0.0747	0.002	0.000	0.405	0.000
0.0871	0.002	0.000	0.517	0.000
0.0996	0.002	0.000	0.638	0.000
0.1120	0.002	0.000	0.767	0.000
0.1244	0.002	0.000	0.904	0.000
0.1369	0.002	0.000	1.047	0.000
0.1493	0.002	0.000	1.196	0.000
0.1618	0.002	0.000	1.351	0.000
0.1742	0.002	0.000	1.511	0.000
0.1867	0.002	0.000	1.676	0.000
0.1991	0.002	0.000	1.846	0.000
0.2116	0.002	0.000	2.021	0.000
0.2240	0.002	0.000	2.199	0.000
0.2364	0.002	0.000	2.381	0.000
0.2489	0.002	0.000	2.567	0.000
0.2613	0.002	0.000	2.757	0.000
0.2738	0.002	0.000	2.949	0.000
0.2862	0.002	0.000	3.145	0.000
0.2987	0.002	0.000	3.343	0.000
0.3111	0.002	0.000	3.545	0.000
0.3236	0.002	0.000	3.748	0.000
0.3360	0.002	0.000	3.955	0.000
0.3484	0.002	0.000	4.163	0.000
0.3609	0.002	0.000	4.374	0.000
0.3733	0.002	0.000	4.587	0.000
0.3858	0.002	0.000	4.802	0.000
0.3982	0.002	0.000	5.020	0.000
0.4107	0.002	0.000	5.238	0.000
0.4231	0.002	0.000	5.459	0.000
0.4356	0.002	0.000	5.682	0.000
0.4480	0.002	0.000	5.906	0.000
0.4604	0.002	0.000	6.131	0.000
0.4729	0.002	0.000	6.358	0.000
0.4853	0.002	0.001	6.587	0.000

0.4978	0.002	0.001	6.817	0.000
0.5102	0.002	0.001	7.048	0.000
0.5227	0.002	0.001	7.280	0.000
0.5351	0.002	0.001	7.514	0.000
0.5476	0.002	0.001	7.749	0.000
0.5600	0.002	0.001	7.985	0.000
0.5724	0.002	0.001	8.222	0.000
0.5849	0.002	0.001	8.460	0.000
0.5973	0.002	0.001	8.700	0.000
0.6098	0.002	0.001	8.940	0.000
0.6222	0.002	0.001	9.181	0.000
0.6347	0.002	0.001	9.423	0.000
0.6471	0.002	0.001	9.666	0.000
0.6596	0.002	0.001	9.910	0.000
0.6720	0.002	0.001	10.15	0.000
0.6844	0.002	0.001	10.40	0.000
0.6969	0.002	0.001	10.64	0.000
0.7093	0.002	0.001	10.89	0.000
0.7218	0.002	0.001	11.14	0.000
0.7342	0.002	0.001	11.39	0.000
0.7467	0.002	0.001	11.63	0.000
0.7591	0.002	0.001	11.88	0.000
0.7716	0.002	0.001	12.13	0.000
0.7840	0.002	0.001	12.39	0.000
0.7964	0.002	0.001	12.64	0.000
0.8089	0.002	0.001	12.89	0.000
0.8213	0.002	0.001	13.14	0.000
0.8338	0.002	0.001	13.40	0.000
0.8462	0.002	0.001	13.65	0.000
0.8587	0.002	0.001	13.90	0.000
0.8711	0.002	0.001	14.16	0.000
0.8836	0.002	0.001	14.41	0.000
0.8960	0.002	0.001	14.67	0.000
0.9084	0.002	0.001	14.93	0.000
0.9209	0.002	0.001	15.18	0.000
0.9333	0.002	0.001	15.44	0.000
0.9458	0.002	0.001	15.70	0.000
0.9582	0.002	0.001	15.96	0.000
0.9707	0.002	0.001	16.21	0.000
0.9831	0.002	0.001	16.47	0.000
0.9956	0.002	0.002	16.73	0.000
1.0080	0.002	0.002	16.99	0.000
1.0204	0.002	0.002	17.25	0.000
1.0329	0.002	0.002	17.51	0.000
1.0453	0.002	0.002	17.77	0.000
1.0578	0.002	0.002	18.03	0.000
1.0702	0.002	0.002	18.29	0.000
1.0827	0.002	0.002	18.56	0.000
1.0951	0.002	0.002	18.82	0.000
1.1076	0.002	0.002	19.08	0.000
1.1200	0.002	0.002	19.34	0.000

Detention Pond

Bottom Length:	45.00 ft.	
Bottom Width:	45.00 ft.	
Depth:	8 ft.	
Volume at riser head:	0.4365 acre-ft.	
Side slope 1:	1.1 To 1	
Side slope 2:	1.1 To 1	
Side slope 3:	1.1 To 1	
Side slope 4:	1.1 To 1	
Discharge Structure		
Riser Height:	6.8 ft.	
Riser Diameter:	12 in.	
Notch Type:	Rectangular	
Notch Width:	0.083 ft.	
Notch Height:	1.500 ft.	
Orifice 1 Diameter:	1 in.	Elevation:0 ft.
Orifice 2 Diameter:	1 in.	Elevation:4.5 ft.

Element Flows To:

Outlet 1	Outlet 2
R-SHED E-1	

Pond Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
291.00	0.046	0.000	0.000	0.000
291.09	0.046	0.004	0.007	0.000
291.18	0.047	0.008	0.011	0.000
291.27	0.047	0.012	0.013	0.000
291.36	0.048	0.016	0.015	0.000
291.44	0.048	0.021	0.017	0.000
291.53	0.048	0.025	0.019	0.000
291.62	0.049	0.029	0.020	0.000
291.71	0.049	0.034	0.022	0.000
291.80	0.050	0.038	0.023	0.000
291.89	0.050	0.043	0.024	0.000
291.98	0.051	0.047	0.026	0.000
292.07	0.051	0.052	0.027	0.000
292.16	0.051	0.056	0.028	0.000
292.24	0.052	0.061	0.029	0.000
292.33	0.052	0.066	0.030	0.000
292.42	0.053	0.070	0.031	0.000
292.51	0.053	0.075	0.032	0.000
292.60	0.054	0.080	0.033	0.000
292.69	0.054	0.085	0.034	0.000
292.78	0.054	0.090	0.035	0.000
292.87	0.055	0.094	0.035	0.000
292.96	0.055	0.099	0.036	0.000
293.04	0.056	0.104	0.037	0.000
293.13	0.056	0.109	0.038	0.000
293.22	0.057	0.114	0.039	0.000
293.31	0.057	0.120	0.039	0.000
293.40	0.058	0.125	0.040	0.000
293.49	0.058	0.130	0.041	0.000
293.58	0.058	0.135	0.042	0.000
293.67	0.059	0.140	0.042	0.000
293.76	0.059	0.146	0.043	0.000
293.84	0.060	0.151	0.044	0.000

293.93	0.060	0.156	0.045	0.000
294.02	0.061	0.162	0.045	0.000
294.11	0.061	0.167	0.046	0.000
294.20	0.062	0.173	0.047	0.000
294.29	0.062	0.178	0.047	0.000
294.38	0.063	0.184	0.048	0.000
294.47	0.063	0.190	0.048	0.000
294.56	0.064	0.195	0.049	0.000
294.64	0.064	0.201	0.050	0.000
294.73	0.065	0.207	0.050	0.000
294.82	0.065	0.213	0.051	0.000
294.91	0.066	0.218	0.051	0.000
295.00	0.066	0.224	0.052	0.000
295.09	0.066	0.230	0.053	0.000
295.18	0.067	0.236	0.053	0.000
295.27	0.067	0.242	0.054	0.000
295.36	0.068	0.248	0.054	0.000
295.44	0.068	0.254	0.055	0.000
295.53	0.069	0.260	0.060	0.000
295.62	0.069	0.267	0.065	0.000
295.71	0.070	0.273	0.069	0.000
295.80	0.070	0.279	0.071	0.000
295.89	0.071	0.285	0.074	0.000
295.98	0.071	0.292	0.076	0.000
296.07	0.072	0.298	0.078	0.000
296.16	0.072	0.305	0.080	0.000
296.24	0.073	0.311	0.082	0.000
296.33	0.073	0.318	0.086	0.000
296.42	0.074	0.324	0.097	0.000
296.51	0.074	0.331	0.113	0.000
296.60	0.075	0.338	0.132	0.000
296.69	0.075	0.344	0.153	0.000
296.78	0.076	0.351	0.175	0.000
296.87	0.077	0.358	0.199	0.000
296.96	0.077	0.365	0.223	0.000
297.04	0.078	0.372	0.248	0.000
297.13	0.078	0.379	0.274	0.000
297.22	0.079	0.386	0.300	0.000
297.31	0.079	0.393	0.326	0.000
297.40	0.080	0.400	0.358	0.000
297.49	0.080	0.407	0.391	0.000
297.58	0.081	0.414	0.425	0.000
297.67	0.081	0.421	0.461	0.000
297.76	0.082	0.429	0.605	0.000
297.84	0.082	0.436	0.721	0.000
297.93	0.083	0.443	1.105	0.000
298.02	0.083	0.451	1.652	0.000
298.11	0.084	0.458	2.323	0.000
298.20	0.085	0.466	3.098	0.000
298.29	0.085	0.473	3.964	0.000
298.38	0.086	0.481	4.913	0.000
298.47	0.086	0.489	5.939	0.000
298.56	0.087	0.497	7.035	0.000
298.64	0.087	0.504	8.197	0.000
298.73	0.088	0.512	9.422	0.000
298.82	0.088	0.520	10.70	0.000
298.91	0.089	0.528	12.05	0.000
299.00	0.090	0.536	13.44	0.000

299.09	0.090	0.544	14.89	0.000

WQ Pond

Bottom Length: 37.00 ft.
Bottom Width: 37.00 ft.
Depth: 1 ft.
Volume at riser head: 0.0241 acre-ft.
Side slope 1: 2.5 To 1
Side slope 2: 2.5 To 1
Side slope 3: 2.5 To 1
Side slope 4: 2.5 To 1
Discharge Structure
Riser Height: 0.7 ft.
Riser Diameter: 12 in.
Notch Type : V-notch
Notch Angle: 0.010
Notch Height: 0.600 ft.
Orifice 1 Diameter: 1 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2
Detention Pond

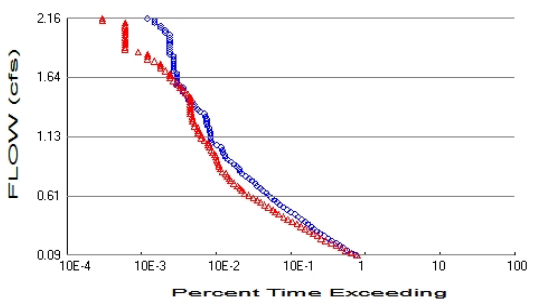
Pond Hydraulic Table

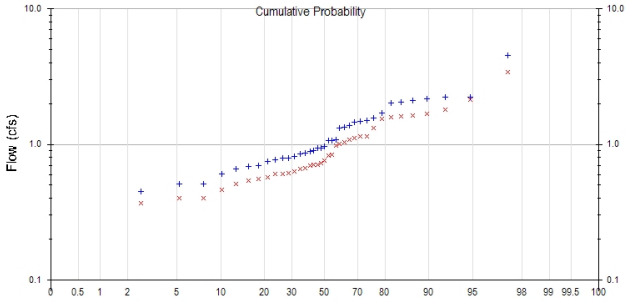
Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
305.00	0.031	0.000	0.000	0.000
305.01	0.031	0.000	0.002	0.000
305.02	0.031	0.000	0.003	0.000
305.03	0.031	0.001	0.004	0.000
305.04	0.031	0.001	0.005	0.000
305.06	0.031	0.001	0.006	0.000
305.07	0.032	0.002	0.006	0.000
305.08	0.032	0.002	0.007	0.000
305.09	0.032	0.002	0.007	0.000
305.10	0.032	0.003	0.008	0.000
305.11	0.032	0.003	0.008	0.000
305.12	0.032	0.003	0.009	0.000
305.13	0.032	0.004	0.009	0.000
305.14	0.032	0.004	0.010	0.000
305.16	0.032	0.005	0.010	0.000
305.17	0.032	0.005	0.010	0.000
305.18	0.033	0.005	0.011	0.000
305.19	0.033	0.006	0.011	0.000
305.20	0.033	0.006	0.011	0.000
305.21	0.033	0.006	0.012	0.000
305.22	0.033	0.007	0.012	0.000
305.23	0.033	0.007	0.012	0.000
305.24	0.033	0.007	0.013	0.000
305.26	0.033	0.008	0.013	0.000
305.27	0.033	0.008	0.013	0.000
305.28	0.033	0.009	0.013	0.000
305.29	0.033	0.009	0.014	0.000
305.30	0.034	0.009	0.014	0.000
305.31	0.034	0.010	0.014	0.000
305.32	0.034	0.010	0.014	0.000
305.33	0.034	0.011	0.015	0.000
305.34	0.034	0.011	0.015	0.000
305.36	0.034	0.011	0.015	0.000
305.37	0.034	0.012	0.015	0.000

305.38	0.034	0.012	0.016	0.000
305.39	0.034	0.012	0.016	0.000
305.40	0.034	0.013	0.016	0.000
305.41	0.035	0.013	0.016	0.000
305.42	0.035	0.014	0.017	0.000
305.43	0.035	0.014	0.017	0.000
305.44	0.035	0.014	0.017	0.000
305.46	0.035	0.015	0.017	0.000
305.47	0.035	0.015	0.018	0.000
305.48	0.035	0.016	0.018	0.000
305.49	0.035	0.016	0.018	0.000
305.50	0.035	0.016	0.018	0.000
305.51	0.035	0.017	0.018	0.000
305.52	0.036	0.017	0.019	0.000
305.53	0.036	0.018	0.019	0.000
305.54	0.036	0.018	0.019	0.000
305.56	0.036	0.018	0.019	0.000
305.57	0.036	0.019	0.019	0.000
305.58	0.036	0.019	0.020	0.000
305.59	0.036	0.020	0.020	0.000
305.60	0.036	0.020	0.020	0.000
305.61	0.036	0.020	0.020	0.000
305.62	0.036	0.021	0.020	0.000
305.63	0.037	0.021	0.020	0.000
305.64	0.037	0.022	0.021	0.000
305.66	0.037	0.022	0.021	0.000
305.67	0.037	0.022	0.021	0.000
305.68	0.037	0.023	0.021	0.000
305.69	0.037	0.023	0.021	0.000
305.70	0.037	0.024	0.022	0.000
305.71	0.037	0.024	0.033	0.000
305.72	0.037	0.025	0.054	0.000
305.73	0.038	0.025	0.081	0.000
305.74	0.038	0.025	0.114	0.000
305.76	0.038	0.026	0.150	0.000
305.77	0.038	0.026	0.190	0.000
305.78	0.038	0.027	0.234	0.000
305.79	0.038	0.027	0.281	0.000
305.80	0.038	0.028	0.331	0.000
305.81	0.038	0.028	0.384	0.000
305.82	0.038	0.028	0.440	0.000
305.83	0.038	0.029	0.498	0.000
305.84	0.039	0.029	0.558	0.000
305.86	0.039	0.030	0.621	0.000
305.87	0.039	0.030	0.687	0.000
305.88	0.039	0.031	0.754	0.000
305.89	0.039	0.031	0.824	0.000
305.90	0.039	0.031	0.896	0.000
305.91	0.039	0.032	0.969	0.000
305.92	0.039	0.032	1.045	0.000
305.93	0.039	0.033	1.123	0.000
305.94	0.040	0.033	1.202	0.000
305.96	0.040	0.034	1.283	0.000
305.97	0.040	0.034	1.367	0.000
305.98	0.040	0.035	1.451	0.000
305.99	0.040	0.035	1.538	0.000
306.00	0.040	0.035	1.626	0.000
306.01	0.040	0.036	1.716	0.000

Analysis Results

POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 2.8
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 4
Total Impervious Area: 0

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.932934
5 year	1.75539
10 year	2.161911
25 year	2.888223

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.720019
5 year	1.551968
10 year	1.691073
25 year	2.491567

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1960	0.789	0.608
1961	0.682	0.537
1962	1.332	1.030
1963	0.905	0.710
1964	0.796	0.605
1965	0.772	0.612
1966	0.693	0.555
1967	1.071	0.979
1968	1.450	1.108
1969	1.696	1.312
1970	2.061	1.601
1971	1.502	1.139
1972	0.604	0.463
1973	1.381	1.077

1974	0.809	0.627
1975	0.863	0.664
1976	0.000	0.014
1977	0.654	0.510
1978	0.748	0.571
1979	0.849	0.663
1980	0.890	0.699
1981	0.448	0.366
1982	1.562	1.542
1983	4.557	3.420
1984	1.080	0.826
1985	1.328	1.012
1986	2.233	1.792
1987	0.967	0.762
1988	2.157	1.634
1989	1.071	0.838
1990	0.932	0.731
1991	0.509	0.400
1992	2.219	1.683
1993	1.481	1.151
1994	0.933	0.704
1995	2.028	2.127
1996	0.506	0.400
1997	2.111	1.596

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	4.5569	3.4198
2	2.2327	2.1269
3	2.2186	1.7919
4	2.1572	1.6827
5	2.1110	1.6339
6	2.0609	1.6008
7	2.0277	1.5963
8	1.6958	1.5423
9	1.5615	1.3118
10	1.5019	1.1513
11	1.4814	1.1389
12	1.4501	1.1081
13	1.3806	1.0775
14	1.3318	1.0299
15	1.3279	1.0119
16	1.0800	0.9791
17	1.0711	0.8380
18	1.0707	0.8257
19	0.9668	0.7618
20	0.9334	0.7310
21	0.9325	0.7096
22	0.9053	0.7040
23	0.8902	0.6990
24	0.8631	0.6644
25	0.8487	0.6626
26	0.8088	0.6270
27	0.7957	0.6116
28	0.7892	0.6083
29	0.7722	0.6048
30	0.7484	0.5706

31	0.6931	0.5553
32	0.6822	0.5371
33	0.6537	0.5102
34	0.6041	0.4629
35	0.5089	0.3998
36	0.5064	0.3995
37	0.4482	0.3665
38	0.0004	0.0137

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0933	2472	2572	104	Pass
0.1142	2177	2143	98	Pass
0.1351	1903	1831	96	Pass
0.1560	1698	1581	93	Pass
0.1769	1521	1350	88	Pass
0.1978	1367	1163	85	Pass
0.2187	1191	981	82	Pass
0.2396	1049	861	82	Pass
0.2605	932	751	80	Pass
0.2813	825	668	80	Pass
0.3022	748	589	78	Pass
0.3231	686	520	75	Pass
0.3440	625	458	73	Pass
0.3649	565	404	71	Pass
0.3858	519	350	67	Pass
0.4067	471	304	64	Pass
0.4276	426	268	62	Pass
0.4485	379	228	60	Pass
0.4694	332	206	62	Pass
0.4903	299	191	63	Pass
0.5112	266	168	63	Pass
0.5321	238	149	62	Pass
0.5530	218	131	60	Pass
0.5739	200	118	58	Pass
0.5948	184	105	57	Pass
0.6157	167	92	55	Pass
0.6366	157	80	50	Pass
0.6575	140	74	52	Pass
0.6784	130	70	53	Pass
0.6993	117	64	54	Pass
0.7201	112	58	51	Pass
0.7410	101	52	51	Pass
0.7619	92	50	54	Pass
0.7828	84	47	55	Pass
0.8037	74	45	60	Pass
0.8246	70	40	57	Pass
0.8455	67	38	56	Pass
0.8664	63	36	57	Pass
0.8873	58	36	62	Pass
0.9082	53	35	66	Pass
0.9291	48	34	70	Pass
0.9500	44	33	75	Pass
0.9709	43	32	74	Pass
0.9918	41	30	73	Pass
1.0127	40	29	72	Pass
1.0336	39	27	69	Pass
1.0545	34	26	76	Pass
1.0754	29	26	89	Pass
1.0963	28	23	82	Pass
1.1172	28	21	75	Pass
1.1380	28	21	75	Pass
1.1589	28	19	67	Pass
1.1798	27	19	70	Pass

1.2007	27	19	70	Pass
1.2216	26	17	65	Pass
1.2425	25	17	68	Pass
1.2634	25	16	64	Pass
1.2843	25	16	64	Pass
1.3052	24	16	66	Pass
1.3261	23	15	65	Pass
1.3470	20	15	75	Pass
1.3679	19	15	78	Pass
1.3888	17	15	88	Pass
1.4097	17	15	88	Pass
1.4306	16	15	93	Pass
1.4515	14	15	107	Pass
1.4724	14	15	107	Pass
1.4933	13	14	107	Pass
1.5142	12	13	108	Pass
1.5351	12	12	100	Pass
1.5560	12	11	91	Pass
1.5768	10	11	110	Pass
1.5977	10	10	100	Pass
1.6186	10	9	90	Pass
1.6395	10	8	80	Pass
1.6604	10	8	80	Pass
1.6813	10	8	80	Pass
1.7022	9	7	77	Pass
1.7231	9	6	66	Pass
1.7440	9	6	66	Pass
1.7649	9	6	66	Pass
1.7858	9	5	55	Pass
1.8067	9	4	44	Pass
1.8276	9	4	44	Pass
1.8485	8	4	50	Pass
1.8694	8	3	37	Pass
1.8903	8	2	25	Pass
1.9112	8	2	25	Pass
1.9321	8	2	25	Pass
1.9530	8	2	25	Pass
1.9739	8	2	25	Pass
1.9947	8	2	25	Pass
2.0156	8	2	25	Pass
2.0365	7	2	28	Pass
2.0574	7	2	28	Pass
2.0783	6	2	33	Pass
2.0992	6	2	33	Pass
2.1201	5	2	40	Pass
2.1410	5	1	20	Pass
2.1619	4	1	25	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

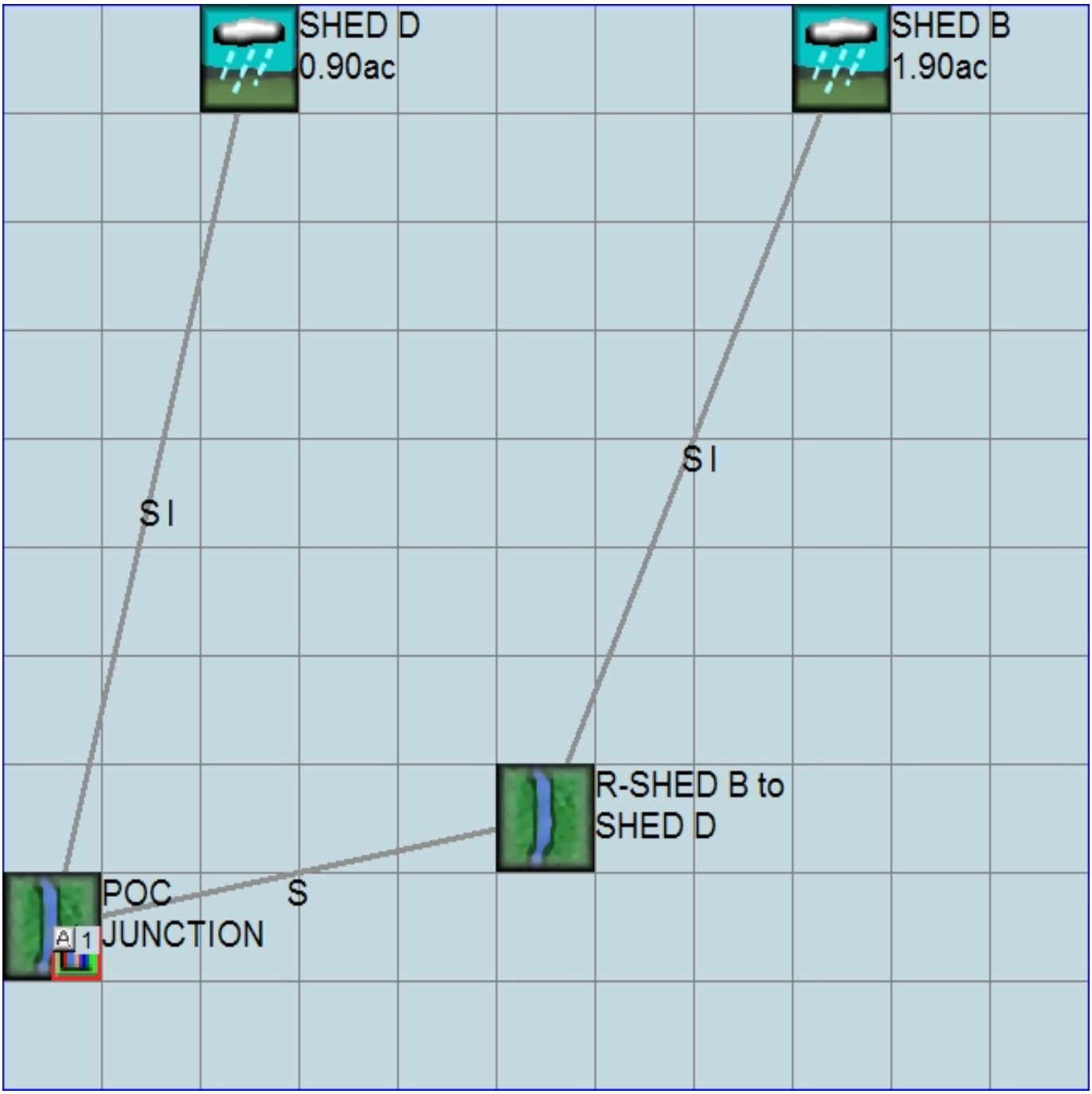
No PERLND changes have been made.

IMPLND Changes

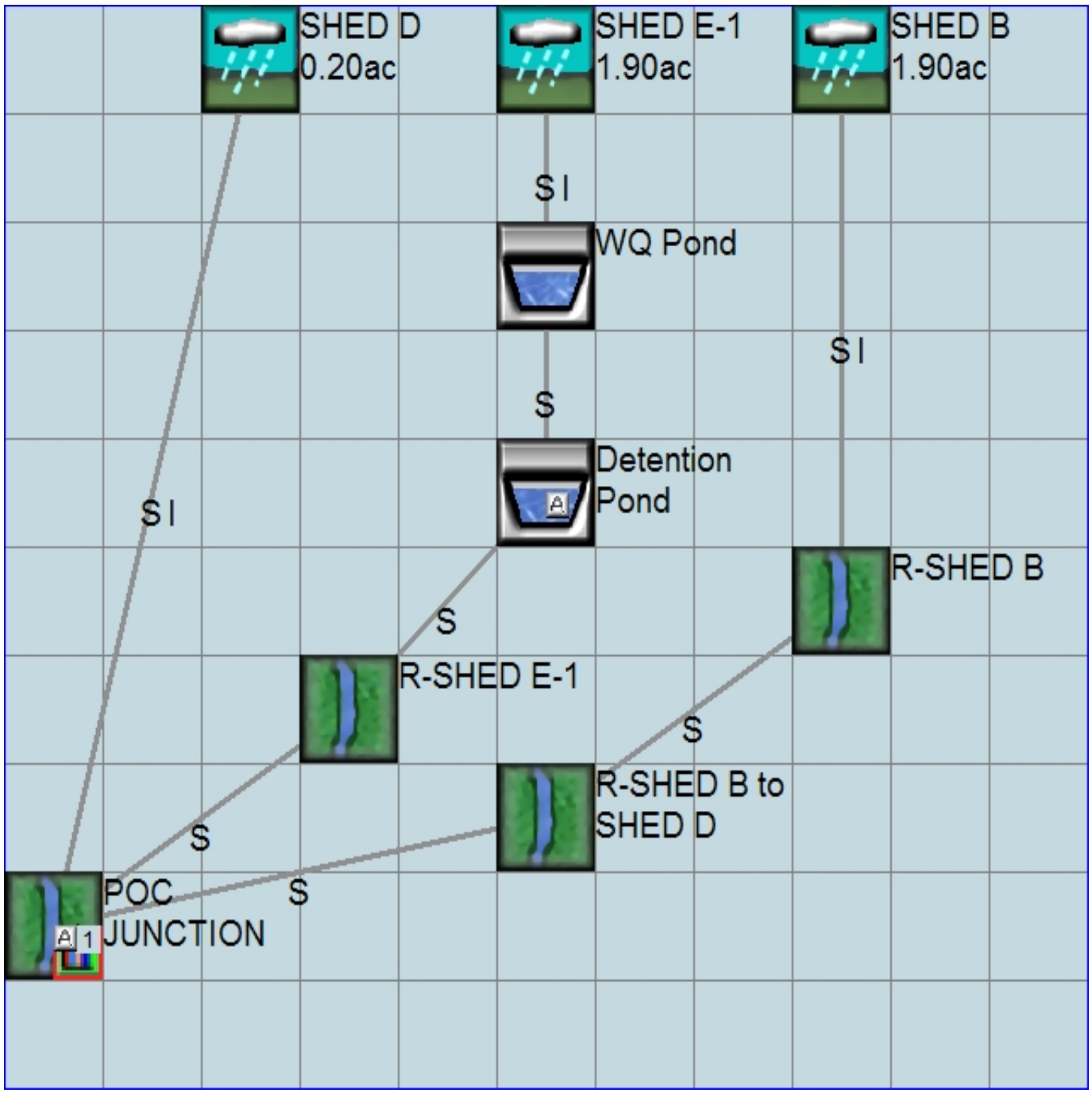
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1959 10 01        END    1997 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Fassler.wdm
MESSU       25   PreFassler.MES
            27   PreFassler.L61
            28   PreFassler.L62
            30   POCFassler1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:60
      PERLND      40
      RCHRES       1
      RCHRES       2
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        POC JUNCTION               MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   40     C/D,Shrub,Very(>20%)    1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   40         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   40         0    0    4    0    0    0    0    0    0    0    0    0    1    9
```

```
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   40         0    0    0    1    0    0    0    0    1    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   40              0       3.4     0.025       200      0.25         2      0.95
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   40             40        35         3         2      0.15      0.15         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   40              0      0.15       0.3       0.2      0.35         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   40       0.5  0.5  0.5  0.6 0.65 0.65 0.65 0.65 0.65 0.65 0.55  0.5
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   40      0.13 0.13 0.13 0.14 0.15 0.15 0.15 0.15 0.15 0.15 0.14 0.13
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   40              0         0      0.01         0       0.5       0.3      0.01
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
```

```
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
SHED D***
PERLND  40                        0.9     RCHRES   2      2
PERLND  40                        0.9     RCHRES   2      3
SHED B***
PERLND  40                        1.9     RCHRES   1      2
PERLND  40                        1.9     RCHRES   1      3

******Routing******
RCHRES   1                          1     RCHRES   2      6
RCHRES   2                          1     COPY   501     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                      in  out                               ***
    1     R-SHED B to SHED-015    1    1    1    1   28    0    1
    2     POC JUNCTION            1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                   ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1       0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
```

```
    2        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1             1      0.07       0.0       0.0       0.5       0.0
    2             2      0.02       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                           ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0          4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0          4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   90    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.008999  0.000000  0.000000
  0.012444  0.008999  0.000112  0.031326
  0.024889  0.008999  0.000224  0.098040
  0.037333  0.008999  0.000336  0.190017
  0.049778  0.008999  0.000448  0.302728
  0.062222  0.008999  0.000560  0.433232
  0.074667  0.009000  0.000672  0.579369
  0.087111  0.009000  0.000784  0.739454
  0.099556  0.009000  0.000896  0.912115
  0.112000  0.009000  0.001008  1.096205
  0.124444  0.009000  0.001120  1.290749
  0.136889  0.009000  0.001232  1.494902
  0.149333  0.009000  0.001344  1.707926
  0.161778  0.009000  0.001456  1.929170
  0.174222  0.009000  0.001568  2.158054
  0.186667  0.009000  0.001680  2.394059
  0.199111  0.009000  0.001792  2.636717
  0.211556  0.009000  0.001904  2.885607
  0.224000  0.009000  0.002016  3.140345
  0.236444  0.009001  0.002128  3.400579
  0.248889  0.009001  0.002240  3.665990
  0.261333  0.009001  0.002352  3.936284
  0.273778  0.009001  0.002464  4.211189
  0.286222  0.009001  0.002576  4.490458
  0.298667  0.009001  0.002688  4.773858
  0.311111  0.009001  0.002800  5.061177
  0.323556  0.009001  0.002912  5.352215
  0.336000  0.009001  0.003024  5.646788
  0.348444  0.009001  0.003136  5.944723
  0.360889  0.009001  0.003248  6.245862
  0.373333  0.009001  0.003360  6.550052
  0.385778  0.009001  0.003472  6.857155
  0.398222  0.009001  0.003584  7.167037
  0.410667  0.009002  0.003696  7.479576
  0.423111  0.009002  0.003808  7.794656
  0.435556  0.009002  0.003920  8.112168
  0.448000  0.009002  0.004032  8.432008
  0.460444  0.009002  0.004144  8.754079
  0.472889  0.009002  0.004256  9.078291
  0.485333  0.009002  0.004368  9.404557
  0.497778  0.009002  0.004480  9.732794
  0.510222  0.009002  0.004592  10.06293
  0.522667  0.009002  0.004704  10.39488
  0.535111  0.009002  0.004816  10.72859
```

```
0.547556  0.009002  0.004928  11.06398
0.560000  0.009002  0.005040  11.40099
0.572444  0.009003  0.005152  11.73957
0.584889  0.009003  0.005264  12.07966
0.597333  0.009003  0.005377  12.42120
0.609778  0.009003  0.005489  12.76415
0.622222  0.009003  0.005601  13.10844
0.634667  0.009003  0.005713  13.45405
0.647111  0.009003  0.005825  13.80092
0.659556  0.009003  0.005937  14.14901
0.672000  0.009003  0.006049  14.49827
0.684444  0.009003  0.006161  14.84868
0.696889  0.009003  0.006273  15.20020
0.709333  0.009003  0.006385  15.55278
0.721778  0.009003  0.006497  15.90640
0.734222  0.009003  0.006609  16.26103
0.746667  0.009004  0.006721  16.61662
0.759111  0.009004  0.006833  16.97316
0.771556  0.009004  0.006945  17.33061
0.784000  0.009004  0.007057  17.68894
0.796444  0.009004  0.007169  18.04814
0.808889  0.009004  0.007281  18.40817
0.821333  0.009004  0.007393  18.76901
0.833778  0.009004  0.007505  19.13064
0.846222  0.009004  0.007617  19.49303
0.858667  0.009004  0.007729  19.85617
0.871111  0.009004  0.007841  20.22002
0.883556  0.009004  0.007954  20.58458
0.896000  0.009004  0.008066  20.94983
0.908444  0.009005  0.008178  21.31573
0.920889  0.009005  0.008290  21.68229
0.933333  0.009005  0.008402  22.04947
0.945778  0.009005  0.008514  22.41726
0.958222  0.009005  0.008626  22.78565
0.970667  0.009005  0.008738  23.15463
0.983111  0.009005  0.008850  23.52416
0.995556  0.009005  0.008962  23.89425
1.008000  0.009005  0.009074  24.26488
1.020444  0.009005  0.009186  24.63603
1.032889  0.009005  0.009298  25.00770
1.045333  0.009005  0.009410  25.37986
1.057778  0.009005  0.009522  25.75251
1.070222  0.009006  0.009634  26.12563
1.082667  0.009006  0.009747  26.49921
1.095111  0.009006  0.009859  26.87325
1.107556  0.009006  0.009971  27.24773
END FTABLE  1
FTABLE      2
 90    4
   Depth      Area    Volume  Outflow1 Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
0.000000  0.002890  0.000000  0.000000
0.012444  0.002890  0.000036  0.031326
0.024889  0.002890  0.000072  0.098040
0.037333  0.002890  0.000108  0.190017
0.049778  0.002890  0.000144  0.302728
0.062222  0.002890  0.000180  0.433232
0.074667  0.002890  0.000216  0.579369
0.087111  0.002891  0.000252  0.739454
0.099556  0.002891  0.000288  0.912115
0.112000  0.002891  0.000324  1.096205
0.124444  0.002891  0.000360  1.290749
0.136889  0.002891  0.000396  1.494902
0.149333  0.002891  0.000432  1.707926
0.161778  0.002891  0.000468  1.929170
0.174222  0.002891  0.000504  2.158054
0.186667  0.002891  0.000540  2.394059
0.199111  0.002891  0.000576  2.636717
0.211556  0.002891  0.000612  2.885607
0.224000  0.002891  0.000648  3.140345
```

0.236444	0.002891	0.000683	3.400579
0.248889	0.002891	0.000719	3.665990
0.261333	0.002892	0.000755	3.936284
0.273778	0.002892	0.000791	4.211189
0.286222	0.002892	0.000827	4.490458
0.298667	0.002892	0.000863	4.773858
0.311111	0.002892	0.000899	5.061177
0.323556	0.002892	0.000935	5.352215
0.336000	0.002892	0.000971	5.646788
0.348444	0.002892	0.001007	5.944723
0.360889	0.002892	0.001043	6.245862
0.373333	0.002892	0.001079	6.550052
0.385778	0.002892	0.001115	6.857155
0.398222	0.002892	0.001151	7.167037
0.410667	0.002892	0.001187	7.479576
0.423111	0.002893	0.001223	7.794656
0.435556	0.002893	0.001259	8.112168
0.448000	0.002893	0.001295	8.432008
0.460444	0.002893	0.001331	8.754079
0.472889	0.002893	0.001367	9.078291
0.485333	0.002893	0.001403	9.404557
0.497778	0.002893	0.001439	9.732794
0.510222	0.002893	0.001475	10.06293
0.522667	0.002893	0.001511	10.39488
0.535111	0.002893	0.001547	10.72859
0.547556	0.002893	0.001583	11.06398
0.560000	0.002893	0.001619	11.40099
0.572444	0.002893	0.001655	11.73957
0.584889	0.002894	0.001691	12.07966
0.597333	0.002894	0.001727	12.42120
0.609778	0.002894	0.001763	12.76415
0.622222	0.002894	0.001799	13.10844
0.634667	0.002894	0.001835	13.45405
0.647111	0.002894	0.001871	13.80092
0.659556	0.002894	0.001907	14.14901
0.672000	0.002894	0.001943	14.49827
0.684444	0.002894	0.001979	14.84868
0.696889	0.002894	0.002015	15.20020
0.709333	0.002894	0.002051	15.55278
0.721778	0.002894	0.002087	15.90640
0.734222	0.002894	0.002124	16.26103
0.746667	0.002894	0.002160	16.61662
0.759111	0.002895	0.002196	16.97316
0.771556	0.002895	0.002232	17.33061
0.784000	0.002895	0.002268	17.68894
0.796444	0.002895	0.002304	18.04814
0.808889	0.002895	0.002340	18.40817
0.821333	0.002895	0.002376	18.76901
0.833778	0.002895	0.002412	19.13064
0.846222	0.002895	0.002448	19.49303
0.858667	0.002895	0.002484	19.85617
0.871111	0.002895	0.002520	20.22002
0.883556	0.002895	0.002556	20.58458
0.896000	0.002895	0.002592	20.94983
0.908444	0.002895	0.002628	21.31573
0.920889	0.002896	0.002664	21.68229
0.933333	0.002896	0.002700	22.04947
0.945778	0.002896	0.002736	22.41726
0.958222	0.002896	0.002772	22.78565
0.970667	0.002896	0.002808	23.15463
0.983111	0.002896	0.002844	23.52416
0.995556	0.002896	0.002880	23.89425
1.008000	0.002896	0.002916	24.26488
1.020444	0.002896	0.002952	24.63603
1.032889	0.002896	0.002988	25.00770
1.045333	0.002896	0.003024	25.37986
1.057778	0.002896	0.003060	25.75251
1.070222	0.002896	0.003096	26.12563
1.082667	0.002897	0.003132	26.49921
1.095111	0.002897	0.003168	26.87325

```
  1.107556  0.002897  0.003205  27.24773
  END FTABLE  2
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.607          PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.607          IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   2 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        6
RCHRES     ROFLOW                          RCHRES         INFLOW
  END MASS-LINK    6

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1959 10 01        END    1997 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Fassler.wdm
MESSU       25   MitFassler.MES
            27   MitFassler.L61
            28   MitFassler.L62
            30   POCFassler1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:60
      PERLND      40
      PERLND      47
      RCHRES       1
      RCHRES       2
      RCHRES       3
      RCHRES       4
      RCHRES       5
      RCHRES       6
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        POC JUNCTION               MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   40     C/D,Shrub,Very(>20%)    1    1    1    1   27    0
   47     C/D,Urban,St(10-20%)    1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
```

```
   40         0    0    1    0    0    0    0    0    0    0    0    0
   47         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   40         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   47         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   40         0    0    0    1    0    0    0    0    1    0    0
   47         0    0    0    1    0    0    0    0    1    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   40              0       3.4     0.025       200      0.25         2      0.95
   47              0       3.4     0.022       300      0.15         3     0.995
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   40             40        35         3         2      0.15      0.15         0
   47             40        35         3         2      0.45      0.15         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                            ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   40              0      0.15       0.3       0.2      0.35         0
   47              0       0.2      0.25      0.25       0.3         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   40       0.5  0.5  0.5  0.6 0.65 0.65 0.65 0.65 0.65 0.65 0.55  0.5
   47       0.5  0.5  0.5  0.6 0.65 0.65 0.65 0.65 0.65 0.65 0.55  0.5
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   40      0.13 0.13 0.13 0.14 0.15 0.15 0.15 0.15 0.15 0.15 0.14 0.13
   47      0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   40              0         0      0.01         0       0.5       0.3      0.01
   47              0         0      0.01         0       3.5       1.7       0.1
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
```

```
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
SHED D***
PERLND  40                         0.2     RCHRES   6      2
PERLND  40                         0.2     RCHRES   6      3
SHED B***
PERLND  40                         1.9     RCHRES   1      2
PERLND  40                         1.9     RCHRES   1      3
SHED E-1***
PERLND  47                         1.9     RCHRES   2      2
PERLND  47                         1.9     RCHRES   2      3

******Routing******
PERLND  40                         0.2     COPY     1     12
PERLND  40                         0.2     COPY     1     13
RCHRES   1                           1     RCHRES   3      6
RCHRES   3                           1     RCHRES   6      6
RCHRES   3                                 COPY     1     16
RCHRES   5                           1     RCHRES   6      6
RCHRES   5                                 COPY     1     16
RCHRES   4                           1     RCHRES   5      6
RCHRES   2                           1     RCHRES   4      6
RCHRES   6                           1     COPY   501     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
```

```
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                        in  out                              ***
    1     R-SHED B                 1    1    1    1   28    0    1
    2     WQ Pond                  1    1    1    1   28    0    1
    3     R-SHED B to SHED-032     1    1    1    1   28    0    1
    4     Detention Pond           1    1    1    1   28    0    1
    5     R-SHED E-1               1    1    1    1   28    0    1
    6     POC JUNCTION             1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
    4         1    0    0    0    0    0    0    0    0    0
    5         1    0    0    0    0    0    0    0    0    0
    6         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
    4         4    0    0    0    0    0    0    0    0    0    1    9
    5         4    0    0    0    0    0    0    0    0    0    1    9
    6         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
    1       0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    2       0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    3       0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    4       0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    5       0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    6       0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------
    1             1      0.01       0.0       0.0       0.5       0.0
    2             2      0.01       0.0     305.0       0.5       0.0
    3             3      0.07       0.0       0.0       0.5       0.0
    4             4      0.01       0.0     291.0       0.5       0.0
    5             5      0.01       0.0       0.0       0.5       0.0
    6             6      0.02       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    4           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    5           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    6           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES
```

```
SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   90    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.001090  0.000000  0.000000
  0.012444  0.001090  0.000014  0.009158
  0.024889  0.001090  0.000027  0.028662
  0.037333  0.001090  0.000041  0.055552
  0.049778  0.001090  0.000054  0.088503
  0.062222  0.001090  0.000068  0.126656
  0.074667  0.001090  0.000081  0.169380
  0.087111  0.001090  0.000095  0.216181
  0.099556  0.001090  0.000109  0.266659
  0.112000  0.001090  0.000122  0.320479
  0.124444  0.001090  0.000136  0.377354
  0.136889  0.001090  0.000149  0.437039
  0.149333  0.001090  0.000163  0.499317
  0.161778  0.001090  0.000176  0.563998
  0.174222  0.001090  0.000190  0.630913
  0.186667  0.001090  0.000204  0.699909
  0.199111  0.001090  0.000217  0.770851
  0.211556  0.001090  0.000231  0.843615
  0.224000  0.001090  0.000244  0.918088
  0.236444  0.001090  0.000258  0.994168
  0.248889  0.001090  0.000271  1.071762
  0.261333  0.001090  0.000285  1.150783
  0.273778  0.001090  0.000298  1.231152
  0.286222  0.001090  0.000312  1.312797
  0.298667  0.001090  0.000326  1.395650
  0.311111  0.001090  0.000339  1.479649
  0.323556  0.001090  0.000353  1.564734
  0.336000  0.001090  0.000366  1.650853
  0.348444  0.001090  0.000380  1.737956
  0.360889  0.001090  0.000393  1.825994
  0.373333  0.001090  0.000407  1.914925
  0.385778  0.001090  0.000421  2.004707
  0.398222  0.001090  0.000434  2.095302
  0.410667  0.001090  0.000448  2.186674
  0.423111  0.001090  0.000461  2.278789
  0.435556  0.001090  0.000475  2.371614
  0.448000  0.001090  0.000488  2.465120
  0.460444  0.001090  0.000502  2.559278
  0.472889  0.001090  0.000516  2.654063
  0.485333  0.001090  0.000529  2.749447
  0.497778  0.001090  0.000543  2.845408
  0.510222  0.001090  0.000556  2.941923
  0.522667  0.001090  0.000570  3.038971
  0.535111  0.001090  0.000583  3.136531
  0.547556  0.001090  0.000597  3.234583
  0.560000  0.001090  0.000611  3.333111
  0.572444  0.001090  0.000624  3.432096
  0.584889  0.001090  0.000638  3.531521
  0.597333  0.001090  0.000651  3.631371
  0.609778  0.001090  0.000665  3.731632
  0.622222  0.001090  0.000678  3.832288
  0.634667  0.001091  0.000692  3.933327
  0.647111  0.001091  0.000706  4.034735
  0.659556  0.001091  0.000719  4.136499
  0.672000  0.001091  0.000733  4.238609
  0.684444  0.001091  0.000746  4.341053
  0.696889  0.001091  0.000760  4.443819
  0.709333  0.001091  0.000773  4.546898
  0.721778  0.001091  0.000787  4.650280
  0.734222  0.001091  0.000801  4.753955
  0.746667  0.001091  0.000814  4.857914
  0.759111  0.001091  0.000828  4.962148
  0.771556  0.001091  0.000841  5.066650
```

```
0.784000  0.001091  0.000855  5.171410
0.796444  0.001091  0.000868  5.276422
0.808889  0.001091  0.000882  5.381678
0.821333  0.001091  0.000896  5.487171
0.833778  0.001091  0.000909  5.592894
0.846222  0.001091  0.000923  5.698840
0.858667  0.001091  0.000936  5.805004
0.871111  0.001091  0.000950  5.911378
0.883556  0.001091  0.000963  6.017958
0.896000  0.001091  0.000977  6.124738
0.908444  0.001091  0.000991  6.231711
0.920889  0.001091  0.001004  6.338874
0.933333  0.001091  0.001018  6.446221
0.945778  0.001091  0.001031  6.553747
0.958222  0.001091  0.001045  6.661447
0.970667  0.001091  0.001058  6.769317
0.983111  0.001091  0.001072  6.877352
0.995556  0.001091  0.001086  6.985549
1.008000  0.001091  0.001099  7.093903
1.020444  0.001091  0.001113  7.202410
1.032889  0.001091  0.001126  7.311067
1.045333  0.001091  0.001140  7.419869
1.057778  0.001091  0.001153  7.528814
1.070222  0.001091  0.001167  7.637897
1.082667  0.001091  0.001181  7.747116
1.095111  0.001091  0.001194  7.856467
1.107556  0.001091  0.001208  7.965947
END FTABLE  1
FTABLE      3
 90    4
   Depth      Area    Volume  Outflow1 Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
0.000000  0.008999  0.000000  0.000000
0.012444  0.008999  0.000112  0.031326
0.024889  0.008999  0.000224  0.098040
0.037333  0.008999  0.000336  0.190017
0.049778  0.008999  0.000448  0.302728
0.062222  0.008999  0.000560  0.433232
0.074667  0.009000  0.000672  0.579369
0.087111  0.009000  0.000784  0.739454
0.099556  0.009000  0.000896  0.912115
0.112000  0.009000  0.001008  1.096205
0.124444  0.009000  0.001120  1.290749
0.136889  0.009000  0.001232  1.494902
0.149333  0.009000  0.001344  1.707926
0.161778  0.009000  0.001456  1.929170
0.174222  0.009000  0.001568  2.158054
0.186667  0.009000  0.001680  2.394059
0.199111  0.009000  0.001792  2.636717
0.211556  0.009000  0.001904  2.885607
0.224000  0.009000  0.002016  3.140345
0.236444  0.009001  0.002128  3.400579
0.248889  0.009001  0.002240  3.665990
0.261333  0.009001  0.002352  3.936284
0.273778  0.009001  0.002464  4.211189
0.286222  0.009001  0.002576  4.490458
0.298667  0.009001  0.002688  4.773858
0.311111  0.009001  0.002800  5.061177
0.323556  0.009001  0.002912  5.352215
0.336000  0.009001  0.003024  5.646788
0.348444  0.009001  0.003136  5.944723
0.360889  0.009001  0.003248  6.245862
0.373333  0.009001  0.003360  6.550052
0.385778  0.009001  0.003472  6.857155
0.398222  0.009001  0.003584  7.167037
0.410667  0.009002  0.003696  7.479576
0.423111  0.009002  0.003808  7.794656
0.435556  0.009002  0.003920  8.112168
0.448000  0.009002  0.004032  8.432008
0.460444  0.009002  0.004144  8.754079
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0.472889  0.009002  0.004256  9.078291
0.485333  0.009002  0.004368  9.404557
0.497778  0.009002  0.004480  9.732794
0.510222  0.009002  0.004592  10.06293
0.522667  0.009002  0.004704  10.39488
0.535111  0.009002  0.004816  10.72859
0.547556  0.009002  0.004928  11.06398
0.560000  0.009002  0.005040  11.40099
0.572444  0.009003  0.005152  11.73957
0.584889  0.009003  0.005264  12.07966
0.597333  0.009003  0.005377  12.42120
0.609778  0.009003  0.005489  12.76415
0.622222  0.009003  0.005601  13.10844
0.634667  0.009003  0.005713  13.45405
0.647111  0.009003  0.005825  13.80092
0.659556  0.009003  0.005937  14.14901
0.672000  0.009003  0.006049  14.49827
0.684444  0.009003  0.006161  14.84868
0.696889  0.009003  0.006273  15.20020
0.709333  0.009003  0.006385  15.55278
0.721778  0.009003  0.006497  15.90640
0.734222  0.009003  0.006609  16.26103
0.746667  0.009004  0.006721  16.61662
0.759111  0.009004  0.006833  16.97316
0.771556  0.009004  0.006945  17.33061
0.784000  0.009004  0.007057  17.68894
0.796444  0.009004  0.007169  18.04814
0.808889  0.009004  0.007281  18.40817
0.821333  0.009004  0.007393  18.76901
0.833778  0.009004  0.007505  19.13064
0.846222  0.009004  0.007617  19.49303
0.858667  0.009004  0.007729  19.85617
0.871111  0.009004  0.007841  20.22002
0.883556  0.009004  0.007954  20.58458
0.896000  0.009004  0.008066  20.94983
0.908444  0.009005  0.008178  21.31573
0.920889  0.009005  0.008290  21.68229
0.933333  0.009005  0.008402  22.04947
0.945778  0.009005  0.008514  22.41726
0.958222  0.009005  0.008626  22.78565
0.970667  0.009005  0.008738  23.15463
0.983111  0.009005  0.008850  23.52416
0.995556  0.009005  0.008962  23.89425
1.008000  0.009005  0.009074  24.26488
1.020444  0.009005  0.009186  24.63603
1.032889  0.009005  0.009298  25.00770
1.045333  0.009005  0.009410  25.37986
1.057778  0.009005  0.009522  25.75251
1.070222  0.009006  0.009634  26.12563
1.082667  0.009006  0.009747  26.49921
1.095111  0.009006  0.009859  26.87325
1.107556  0.009006  0.009971  27.24773
END FTABLE  3
FTABLE      6
 90    4
   Depth      Area    Volume  Outflow1 Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
0.000000  0.002890  0.000000  0.000000
0.012444  0.002890  0.000036  0.031326
0.024889  0.002890  0.000072  0.098040
0.037333  0.002890  0.000108  0.190017
0.049778  0.002890  0.000144  0.302728
0.062222  0.002890  0.000180  0.433232
0.074667  0.002890  0.000216  0.579369
0.087111  0.002891  0.000252  0.739454
0.099556  0.002891  0.000288  0.912115
0.112000  0.002891  0.000324  1.096205
0.124444  0.002891  0.000360  1.290749
0.136889  0.002891  0.000396  1.494902
0.149333  0.002891  0.000432  1.707926
```

0.161778	0.002891	0.000468	1.929170
0.174222	0.002891	0.000504	2.158054
0.186667	0.002891	0.000540	2.394059
0.199111	0.002891	0.000576	2.636717
0.211556	0.002891	0.000612	2.885607
0.224000	0.002891	0.000648	3.140345
0.236444	0.002891	0.000683	3.400579
0.248889	0.002891	0.000719	3.665990
0.261333	0.002892	0.000755	3.936284
0.273778	0.002892	0.000791	4.211189
0.286222	0.002892	0.000827	4.490458
0.298667	0.002892	0.000863	4.773858
0.311111	0.002892	0.000899	5.061177
0.323556	0.002892	0.000935	5.352215
0.336000	0.002892	0.000971	5.646788
0.348444	0.002892	0.001007	5.944723
0.360889	0.002892	0.001043	6.245862
0.373333	0.002892	0.001079	6.550052
0.385778	0.002892	0.001115	6.857155
0.398222	0.002892	0.001151	7.167037
0.410667	0.002892	0.001187	7.479576
0.423111	0.002893	0.001223	7.794656
0.435556	0.002893	0.001259	8.112168
0.448000	0.002893	0.001295	8.432008
0.460444	0.002893	0.001331	8.754079
0.472889	0.002893	0.001367	9.078291
0.485333	0.002893	0.001403	9.404557
0.497778	0.002893	0.001439	9.732794
0.510222	0.002893	0.001475	10.06293
0.522667	0.002893	0.001511	10.39488
0.535111	0.002893	0.001547	10.72859
0.547556	0.002893	0.001583	11.06398
0.560000	0.002893	0.001619	11.40099
0.572444	0.002893	0.001655	11.73957
0.584889	0.002894	0.001691	12.07966
0.597333	0.002894	0.001727	12.42120
0.609778	0.002894	0.001763	12.76415
0.622222	0.002894	0.001799	13.10844
0.634667	0.002894	0.001835	13.45405
0.647111	0.002894	0.001871	13.80092
0.659556	0.002894	0.001907	14.14901
0.672000	0.002894	0.001943	14.49827
0.684444	0.002894	0.001979	14.84868
0.696889	0.002894	0.002015	15.20020
0.709333	0.002894	0.002051	15.55278
0.721778	0.002894	0.002087	15.90640
0.734222	0.002894	0.002124	16.26103
0.746667	0.002894	0.002160	16.61662
0.759111	0.002895	0.002196	16.97316
0.771556	0.002895	0.002232	17.33061
0.784000	0.002895	0.002268	17.68894
0.796444	0.002895	0.002304	18.04814
0.808889	0.002895	0.002340	18.40817
0.821333	0.002895	0.002376	18.76901
0.833778	0.002895	0.002412	19.13064
0.846222	0.002895	0.002448	19.49303
0.858667	0.002895	0.002484	19.85617
0.871111	0.002895	0.002520	20.22002
0.883556	0.002895	0.002556	20.58458
0.896000	0.002895	0.002592	20.94983
0.908444	0.002895	0.002628	21.31573
0.920889	0.002896	0.002664	21.68229
0.933333	0.002896	0.002700	22.04947
0.945778	0.002896	0.002736	22.41726
0.958222	0.002896	0.002772	22.78565
0.970667	0.002896	0.002808	23.15463
0.983111	0.002896	0.002844	23.52416
0.995556	0.002896	0.002880	23.89425
1.008000	0.002896	0.002916	24.26488
1.020444	0.002896	0.002952	24.63603

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1.032889  0.002896  0.002988  25.00770
1.045333  0.002896  0.003024  25.37986
1.057778  0.002896  0.003060  25.75251
1.070222  0.002896  0.003096  26.12563
1.082667  0.002897  0.003132  26.49921
1.095111  0.002897  0.003168  26.87325
1.107556  0.002897  0.003205  27.24773
END FTABLE  6
FTABLE      5
 90    4
   Depth      Area    Volume  Outflow1 Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
0.000000  0.001975  0.000000  0.000000
0.012444  0.001975  0.000025  0.021942
0.024889  0.001975  0.000049  0.068670
0.037333  0.001975  0.000074  0.133093
0.049778  0.001975  0.000098  0.212039
0.062222  0.001975  0.000123  0.303447
0.074667  0.001975  0.000147  0.405806
0.087111  0.001975  0.000172  0.517934
0.099556  0.001975  0.000197  0.638870
0.112000  0.001975  0.000221  0.767812
0.124444  0.001975  0.000246  0.904076
0.136889  0.001975  0.000270  1.047070
0.149333  0.001975  0.000295  1.196278
0.161778  0.001975  0.000319  1.351243
0.174222  0.001975  0.000344  1.511559
0.186667  0.001975  0.000369  1.676864
0.199111  0.001975  0.000393  1.846829
0.211556  0.001975  0.000418  2.021158
0.224000  0.001975  0.000442  2.199583
0.236444  0.001975  0.000467  2.381858
0.248889  0.001975  0.000492  2.567759
0.261333  0.001975  0.000516  2.757080
0.273778  0.001975  0.000541  2.949632
0.286222  0.001976  0.000565  3.145239
0.298667  0.001976  0.000590  3.343740
0.311111  0.001976  0.000614  3.544986
0.323556  0.001976  0.000639  3.748837
0.336000  0.001976  0.000664  3.955164
0.348444  0.001976  0.000688  4.163846
0.360889  0.001976  0.000713  4.374771
0.373333  0.001976  0.000737  4.587835
0.385778  0.001976  0.000762  4.802938
0.398222  0.001976  0.000787  5.019988
0.410667  0.001976  0.000811  5.238899
0.423111  0.001976  0.000836  5.459590
0.435556  0.001976  0.000860  5.681983
0.448000  0.001976  0.000885  5.906008
0.460444  0.001976  0.000910  6.131595
0.472889  0.001976  0.000934  6.358682
0.485333  0.001976  0.000959  6.587207
0.497778  0.001976  0.000983  6.817114
0.510222  0.001976  0.001008  7.048348
0.522667  0.001976  0.001032  7.280857
0.535111  0.001976  0.001057  7.514594
0.547556  0.001976  0.001082  7.749511
0.560000  0.001976  0.001106  7.985566
0.572444  0.001976  0.001131  8.222716
0.584889  0.001976  0.001155  8.460923
0.597333  0.001976  0.001180  8.700148
0.609778  0.001976  0.001205  8.940355
0.622222  0.001976  0.001229  9.181510
0.634667  0.001977  0.001254  9.423582
0.647111  0.001977  0.001278  9.666537
0.659556  0.001977  0.001303  9.910348
0.672000  0.001977  0.001328  10.15499
0.684444  0.001977  0.001352  10.40042
0.696889  0.001977  0.001377  10.64663
0.709333  0.001977  0.001401  10.89359
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0.721778  0.001977  0.001426  11.14128
0.734222  0.001977  0.001451  11.38967
0.746667  0.001977  0.001475  11.63873
0.759111  0.001977  0.001500  11.88846
0.771556  0.001977  0.001524  12.13883
0.784000  0.001977  0.001549  12.38982
0.796444  0.001977  0.001574  12.64141
0.808889  0.001977  0.001598  12.89358
0.821333  0.001977  0.001623  13.14633
0.833778  0.001977  0.001647  13.39962
0.846222  0.001977  0.001672  13.65345
0.858667  0.001977  0.001697  13.90780
0.871111  0.001977  0.001721  14.16266
0.883556  0.001977  0.001746  14.41800
0.896000  0.001977  0.001770  14.67383
0.908444  0.001977  0.001795  14.93012
0.920889  0.001977  0.001820  15.18686
0.933333  0.001977  0.001844  15.44405
0.945778  0.001977  0.001869  15.70166
0.958222  0.001977  0.001894  15.95969
0.970667  0.001978  0.001918  16.21813
0.983111  0.001978  0.001943  16.47696
0.995556  0.001978  0.001967  16.73619
1.008000  0.001978  0.001992  16.99578
1.020444  0.001978  0.002017  17.25575
1.032889  0.001978  0.002041  17.51607
1.045333  0.001978  0.002066  17.77674
1.057778  0.001978  0.002090  18.03776
1.070222  0.001978  0.002115  18.29910
1.082667  0.001978  0.002140  18.56077
1.095111  0.001978  0.002164  18.82276
1.107556  0.001978  0.002189  19.08505
END FTABLE  5
FTABLE      4
 91    4
   Depth      Area    Volume  Outflow1 Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
0.000000  0.046488  0.000000  0.000000
0.088889  0.046893  0.004150  0.007830
0.177778  0.047299  0.008337  0.011074
0.266667  0.047708  0.012559  0.013563
0.355556  0.048118  0.016818  0.015661
0.444444  0.048530  0.021113  0.017509
0.533333  0.048943  0.025446  0.019180
0.622222  0.049359  0.029815  0.020717
0.711111  0.049776  0.034221  0.022148
0.800000  0.050195  0.038664  0.023491
0.888889  0.050616  0.043144  0.024762
0.977778  0.051038  0.047662  0.025970
1.066667  0.051463  0.052218  0.027125
1.155556  0.051888  0.056811  0.028233
1.244444  0.052316  0.061442  0.029299
1.333333  0.052746  0.066112  0.030327
1.422222  0.053177  0.070820  0.031322
1.511111  0.053610  0.075566  0.032285
1.600000  0.054045  0.080350  0.033221
1.688889  0.054481  0.085174  0.034132
1.777778  0.054920  0.090036  0.035019
1.866667  0.055360  0.094937  0.035883
1.955556  0.055801  0.099878  0.036728
2.044444  0.056245  0.104858  0.037553
2.133333  0.056690  0.109877  0.038361
2.222222  0.057137  0.114936  0.039152
2.311111  0.057586  0.120035  0.039927
2.400000  0.058037  0.125174  0.040688
2.488889  0.058489  0.130352  0.041434
2.577778  0.058943  0.135572  0.042168
2.666667  0.059399  0.140831  0.042889
2.755556  0.059857  0.146132  0.043598
2.844444  0.060316  0.151473  0.044295
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2.933333  0.060777  0.156854  0.044982
3.022222  0.061240  0.162277  0.045659
3.111111  0.061704  0.167742  0.046325
3.200000  0.062171  0.173247  0.046982
3.288889  0.062639  0.178794  0.047630
3.377778  0.063109  0.184383  0.048270
3.466667  0.063580  0.190014  0.048901
3.555556  0.064054  0.195686  0.049524
3.644444  0.064529  0.201401  0.050139
3.733333  0.065006  0.207158  0.050747
3.822222  0.065485  0.212958  0.051347
3.911111  0.065965  0.218800  0.051941
4.000000  0.066447  0.224685  0.052528
4.088889  0.066931  0.230613  0.053108
4.177778  0.067417  0.236584  0.053682
4.266667  0.067904  0.242598  0.054250
4.355556  0.068393  0.248656  0.054813
4.444444  0.068884  0.254757  0.055369
4.533333  0.069377  0.260902  0.060715
4.622222  0.069872  0.267091  0.065648
4.711111  0.070368  0.273324  0.069073
4.800000  0.070866  0.279601  0.071927
4.888889  0.071366  0.285922  0.074450
4.977778  0.071867  0.292288  0.076751
5.066667  0.072370  0.298699  0.078889
5.155556  0.072875  0.305154  0.080899
5.244444  0.073382  0.311654  0.082807
5.333333  0.073891  0.318200  0.086306
5.422222  0.074401  0.324791  0.097942
5.511111  0.074913  0.331427  0.113836
5.600000  0.075427  0.338108  0.132542
5.688889  0.075942  0.344836  0.153319
5.777778  0.076459  0.351609  0.175672
5.866667  0.076978  0.358429  0.199234
5.955556  0.077499  0.365294  0.223709
6.044444  0.078022  0.372207  0.248854
6.133333  0.078546  0.379165  0.274457
6.222222  0.079072  0.386170  0.300334
6.311111  0.079600  0.393222  0.326945
6.400000  0.080130  0.400322  0.358662
6.488889  0.080661  0.407468  0.391610
6.577778  0.081194  0.414661  0.425743
6.666667  0.081729  0.421902  0.461019
6.755556  0.082266  0.429191  0.605597
6.844444  0.082804  0.436527  0.721043
6.933333  0.083344  0.443912  1.105149
7.022222  0.083886  0.451344  1.652399
7.111111  0.084429  0.458825  2.323347
7.200000  0.084975  0.466354  3.098289
7.288889  0.085522  0.473932  3.964755
7.377778  0.086071  0.481558  4.913920
7.466667  0.086622  0.489233  5.939110
7.555556  0.087174  0.496957  7.035050
7.644444  0.087728  0.504731  8.197430
7.733333  0.088284  0.512554  9.422646
7.822222  0.088842  0.520426  10.70762
7.911111  0.089401  0.528348  12.04970
8.000000  0.089962  0.536320  13.44653
END FTABLE  4
FTABLE      2
 91    4
   Depth      Area    Volume  Outflow1 Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
0.000000  0.031428  0.000000  0.000000
0.011111  0.031522  0.000350  0.002768
0.022222  0.031617  0.000700  0.003915
0.033333  0.031712  0.001052  0.004795
0.044444  0.031807  0.001405  0.005537
0.055556  0.031902  0.001759  0.006190
0.066667  0.031997  0.002114  0.006781
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0.077778	0.032092	0.002470	0.007325
0.088889	0.032187	0.002827	0.007830
0.100000	0.032283	0.003185	0.008305
0.111111	0.032379	0.003545	0.008755
0.122222	0.032475	0.003905	0.009182
0.133333	0.032571	0.004266	0.009590
0.144444	0.032667	0.004629	0.009982
0.155556	0.032763	0.004992	0.010359
0.166667	0.032860	0.005357	0.010722
0.177778	0.032956	0.005722	0.011074
0.188889	0.033053	0.006089	0.011415
0.200000	0.033150	0.006457	0.011746
0.211111	0.033247	0.006826	0.012068
0.222222	0.033344	0.007196	0.012382
0.233333	0.033441	0.007567	0.012688
0.244444	0.033539	0.007939	0.012987
0.255556	0.033636	0.008312	0.013279
0.266667	0.033734	0.008686	0.013565
0.277778	0.033832	0.009062	0.013845
0.288889	0.033930	0.009438	0.014120
0.300000	0.034028	0.009816	0.014389
0.311111	0.034126	0.010194	0.014654
0.322222	0.034224	0.010574	0.014914
0.333333	0.034323	0.010955	0.015169
0.344444	0.034422	0.011337	0.015421
0.355556	0.034521	0.011720	0.015668
0.366667	0.034620	0.012104	0.015912
0.377778	0.034719	0.012489	0.016152
0.388889	0.034818	0.012876	0.016388
0.400000	0.034917	0.013263	0.016621
0.411111	0.035017	0.013651	0.016852
0.422222	0.035117	0.014041	0.017079
0.433333	0.035216	0.014432	0.017303
0.444444	0.035316	0.014824	0.017524
0.455556	0.035417	0.015217	0.017743
0.466667	0.035517	0.015611	0.017959
0.477778	0.035617	0.016006	0.018173
0.488889	0.035718	0.016402	0.018384
0.500000	0.035818	0.016800	0.018593
0.511111	0.035919	0.017198	0.018800
0.522222	0.036020	0.017598	0.019005
0.533333	0.036121	0.017999	0.019207
0.544444	0.036223	0.018401	0.019408
0.555556	0.036324	0.018804	0.019606
0.566667	0.036425	0.019208	0.019803
0.577778	0.036527	0.019613	0.019998
0.588889	0.036629	0.020019	0.020191
0.600000	0.036731	0.020427	0.020382
0.611111	0.036833	0.020836	0.020572
0.622222	0.036935	0.021246	0.020760
0.633333	0.037038	0.021656	0.020947
0.644444	0.037140	0.022069	0.021132
0.655556	0.037243	0.022482	0.021315
0.666667	0.037346	0.022896	0.021497
0.677778	0.037449	0.023312	0.021678
0.688889	0.037552	0.023728	0.021857
0.700000	0.037655	0.024146	0.022035
0.711111	0.037758	0.024565	0.033615
0.722222	0.037862	0.024985	0.054643
0.733333	0.037966	0.025407	0.081821
0.744444	0.038069	0.025829	0.113973
0.755556	0.038173	0.026253	0.150418
0.766667	0.038277	0.026677	0.190697
0.777778	0.038382	0.027103	0.234474
0.788889	0.038486	0.027530	0.281487
0.800000	0.038590	0.027958	0.331526
0.811111	0.038695	0.028388	0.384418
0.822222	0.038800	0.028818	0.440016
0.833333	0.038905	0.029250	0.498194
0.844444	0.039010	0.029683	0.558841

```
  0.855556  0.039115  0.030117  0.621860
  0.866667  0.039220  0.030552  0.687166
  0.877778  0.039326  0.030988  0.754680
  0.888889  0.039432  0.031426  0.824333
  0.900000  0.039537  0.031865  0.896059
  0.911111  0.039643  0.032305  0.969802
  0.922222  0.039749  0.032746  1.045507
  0.933333  0.039856  0.033188  1.123124
  0.944444  0.039962  0.033631  1.202607
  0.955556  0.040068  0.034076  1.283913
  0.966667  0.040175  0.034522  1.367003
  0.977778  0.040282  0.034969  1.451838
  0.988889  0.040389  0.035417  1.538383
  1.000000  0.040496  0.035866  1.626606
  END FTABLE  2
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.607          PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.607          IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP
WDM     22 IRRG     ENGL    0.7       SAME PERLND  47     EXTNL  SURLI
WDM      2 PREC     ENGL    1.607          RCHRES   2     EXTNL  PREC
WDM      2 PREC     ENGL    1.607          RCHRES   4     EXTNL  PREC
WDM      1 EVAP     ENGL    1              RCHRES   2     EXTNL  POTEV
WDM      1 EVAP     ENGL    1              RCHRES   4     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   6 HYDR   RO     1 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   6 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     12.1      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    801 FLOW     ENGL      REPL
RCHRES   4 HYDR   RO     1 1        1      WDM   1004 FLOW     ENGL      REPL
RCHRES   4 HYDR   STAGE  1 1        1      WDM   1005 STAG     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        6
RCHRES     ROFLOW                          RCHRES         INFLOW
  END MASS-LINK    6

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16
```

```
END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1969/12/20 10: 0

RCHRES:     2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
91 1542.8     1562.3     1563.7
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1969/12/20 10: 0

RCHRES:     2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
4.6609E+00 3518.7     -3.768E+03    1.0698  1.0694E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1969/12/20 12: 0

RCHRES:     2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
91 1.5428E+03 1562.3     1654.2
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1969/12/20 12: 0

RCHRES:     2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
4.6609E+00 3518.7     -2.008E+04    5.6638  5.6638E+00      3
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1970/11/28  8: 0

RCHRES:     2
```

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
91	1.5428E+03	1562.3	1609.3

ERROR/WARNING ID: 341   5

DATE/TIME: 1970/11/28 8: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
4.6609E+00	3518.7	-1.199E+04	3.3922	3.3922E+00	3

ERROR/WARNING ID: 341   6

DATE/TIME: 1980/12/ 3 19: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
91	1.5428E+03	1562.3	1728.0

ERROR/WARNING ID: 341   5

DATE/TIME: 1980/12/ 3 19: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
4.6609E+00	3518.7	-3.337E+04	9.3665	9.3665	3

ERROR/WARNING ID: 341   6

DATE/TIME: 1982/ 3/31 15: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
91	1542.8	1562.3	1601.2

ERROR/WARNING ID: 341   5

DATE/TIME: 1982/ 3/31 15: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
4.6609E+00	3518.7	-1.052E+04	2.9793	2.9793	3

ERROR/WARNING ID: 341   6

DATE/TIME: 1983/ 2/26 8: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
91	1542.8	1562.3	2243.1

ERROR/WARNING ID: 341   5

DATE/TIME: 1983/ 2/26 8: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
4.6609E+00	3518.7	-1.262E+05	34.297	3.4297E+01	4

ERROR/WARNING ID: 341   6

DATE/TIME: 1983/ 3/ 1 8: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
91	1.5428E+03	1562.3	1716.3

ERROR/WARNING ID: 341   5

DATE/TIME: 1983/ 3/ 1 8: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).

Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
4.6609E+00	3518.7	-3.127E+04	8.7840	8.7840E+00	3

ERROR/WARNING ID: 341   6

DATE/TIME: 1986/ 2/18 24: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
91	1.5428E+03	1562.3	1759.0

ERROR/WARNING ID: 341   5

DATE/TIME: 1986/ 2/18 24: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
4.6609E+00	3518.7	-3.895E+04	10.910	1.0910E+01	3

ERROR/WARNING ID: 341   6

DATE/TIME: 1987/12/ 8 14: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
91	1.5428E+03	1562.3	1729.0

ERROR/WARNING ID: 341   5

DATE/TIME: 1987/12/ 8 14: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
4.6609E+00	3518.7	-3.355E+04	9.4176	9.4176E+00	3

ERROR/WARNING ID: 341   6

DATE/TIME: 1992/ 3/ 5 15: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
91	1.5428E+03	1562.3	1743.4

ERROR/WARNING ID: 341 5

DATE/TIME: 1992/ 3/ 5 15: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
4.6609E+00	3518.7	-3.614E+04	10.134	10.134	3

ERROR/WARNING ID: 341 6

DATE/TIME: 1997/ 3/ 6 15: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
91	1542.8	1562.3	1740.2

ERROR/WARNING ID: 341 5

DATE/TIME: 1997/ 3/ 6 15: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
4.6609E+00	3518.7	-3.557E+04	9.9759	9.9759E+00	3

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APPENDIX G

TRAFFIC AND TRANSPORTATION

APPENDIX G–1

TRAFFIC STUDY FOR PROPOSED RESIDENTIAL PROJECT AT 801 FASSLER AVENUE IN PACIFICA, CALIFORNIA
HEXAGON TRANSPORTATION CONSULTANTS
JUNE 6, 2014

HEXAGON TRANSPORTATION CONSULTANTS, INC.

June 6, 2014

Mr. Jesse Matta
1106 Nevada, LLC
1433 Floribunda Ave, Unit 3
Burlingame, CA 94010

Re: Traffic Study for Proposed Residential Project (Formerly "The Prospects") at 801 Fassler Avenue in Pacifica, California

Dear Mr.Matta :

This letter presents the results of the traffic study conducted for the proposed 24-unit residential project located at 801 Fassler Avenue in Pacifica, California (see Figure 1). The project would be built on the site of "The Prospects" 34-unit development, which was approved but never built. The site is currently vacant.

This study updates the traffic study prepared for The Prospects Environmental Impact Report (EIR), which was published in December 2006. Hexagon has determined that traffic conditions haven't significantly changed in the area since the EIR was published. The original 34-unit project was found to have a less-than-significant traffic impact because its added traffic would be minimal compared to existing traffic levels. Since the current project is smaller, it would generate even less traffic, and the same conclusion applies. More detailed analysis follows, as well as an analysis of the proposed project's access point.

Comparison of 2006 EIR to 2014 Conditions

The traffic study for the 2006 EIR analyzed the project impact on two nearby intersections along Highway 1:

- Highway 1 & Fassler Avenue
- Highway 1 & Reina del Mar Avenue

All project traffic would pass through the intersection of Hwy 1/Fassler Avenue, and because most traffic would be oriented to and from the north, most project traffic also would pass through the intersection of Hwy 1/Reina del Mar Avenue. As shown in Exhibit 1, which is the existing level of service table from the EIR, both intersections were operating at LOS F during the AM peak hour in 2006, and the Reina del Mar intersection was operating at LOS F also during the PM peak hour. The Fassler intersection was operating at LOS D during the PM peak hour in 2006.

Field observations were conducted by Hexagon in May 2014 at the two study intersections during the AM and PM peak hours to determine whether the existing count data and resulting calculated levels of service adequately represent existing field conditions. Observations show that traffic flow on northbound Highway 1 during the AM peak hour is very heavy. In addition to the heavy traffic on Highway 1, westbound Fassler Avenue and westbound Reina del Mar Avenue (westbound right turn movements) both carry significant traffic volume at their intersections with Highway 1. Despite the high traffic volumes, the queues at the Fassler Avenue intersection almost always clear during each signal cycle. However, occasionally traffic heading northbound could not enter the

intersection because of very long queues building up at the downstream intersection of Highway 1 and Reina del Mar Avenue, extended to the intersection with Fassler Avenue. Traffic conditions at the Highway 1 / Reina del Mar Avenue intersection are worse because of the very heavy demand on northbound Highway 1 and high conflicting traffic volumes on Reina del Mar Avenue. Stop and go traffic operations occur on northbound Highway 1, between Fassler Avenue and Reina del Mar Avenue. In addition, right turn queues on Reina del Mar Avenue do not always clear in one cycle because of the heavy demand.

Exhibit 1
Existing LOS Table from 2006 EIR

Table IV.F-2
Existing Condition – LOS Results

Intersection	Peak Hour	Average Delay	LOS	HCM Crit. V/C[1]
SR1/Reina del Mar Avenue	AM	124.6	F	1.204
	PM	81.7	F	1.291
SR1/Fassler Avenue	AM	96.0	F	1.140
	PM	37.3	D	0.846

1 HCM critical V/C is calculated using Synchro output values and Equations 16-7 and 16-8 of the signalized intersection LOS methodology contained in the 2000 HCM. This approach to calculating inter section critical V/C in some cases may not match the V/C results obtained with the Synchro software but provides a close approximation. This is so because the Synchro software calculates adjusted total lost times and critical volumes at the intersection when some intersection movements overlap each other and run concurrently, whereas he HCM method uses a more simplified approach, which does not necessarily account for overlapping critical movements.

V/C = volume to capacity ratio

Source: Dowling Associates, Inc. and Hexagon Transportation Consultants, Inc., 2006.

During the PM peak hour, very long southbound vehicle queues build up at the Reina del Mar Avenue intersection because this is the first signal-controlled intersection on State Route 1 after it transitions from a freeway to a highway. Stop and go traffic on southbound Highway 1 occurs and the moving queue often extends beyond the upstream intersection with Westport Drive, which is approximately 3,000 feet to the north. Because the traffic volumes on the others approaches of the Highway 1 / Reina del Mar Avenue intersection are relatively low, traffic queues generally clear each signal cycle. PM traffic operations at the Highway1 / Fassler Avenue intersection showed heavy traffic on southbound Highway1, which resulted in long, but moving queues. Traffic volumes for the conflicting movements with southbound Highway 1 traffic are relatively low and the vehicular queues typically clear during each signal cycle.

It should be noted that, because of the very long cycle length of approximately 200 to 240 seconds and the long green time of about 160 to180 seconds given to traffic on Highway 1 at the intersection with Reina del Mar Avenue, the wait times for conflicting traffic, including pedestrians crossing Highway 1, are very long.

Based on our field observations it can be concluded that conditions at the study intersections have not changed since 2006. The levels of service can be characterized as LOS F during the AM peak hour and LOS D (Fassler) and F (Reina del Mar) during the PM peak hour.

Project Trip Generation

The approved project for the site ("The Prospects") contained a mix of single-family and multi-family homes totaling 34 units. The currently-proposed project contains 24 units, and while many of them would have attached walls, they can be considered single-family homes. Table 1 shows that the currently-proposed project would generate 15 fewer trips during the AM peak hour and 17 fewer trips during the PM peak hour than the approved project.

Table 1
Trip Generation Estimates for 801 Fassler Avenue

			AM Peak Hour		PM Peak Hour	
Land Use	Size		Pk-Hr Rate	Total	Pk-Hr Rate	Total
Approved Project						
Residential [1]	34	units	n/a	33	n/a	41
Proposed Project						
Single-family Homes [2]	24	units	0.75	18	1.00	24
Difference				**-15**		**-17**

Notes:
[1] Based on "The Prospects" EIR December 2006.
[2] Rates based on ITE Land Use Code 210 (Single-family Home), average rate used.
Source: ITE Trip Generation, 9th Edition 2012.

Analysis of Project Impacts

The 2006 EIR found that the addition of the project traffic to the two study intersections would result in less-than-significant impacts. The actual language from the EIR is as follows:

"The addition of project traffic at the signalized study intersections would result in delay increases that exceed the City's interim one second standard for an intersection operating at LOS F. However, the project would not cause the V/C at these intersections to increase by more than 0.010. Thus, the project would not exceed the City's standard of significance. Therefore, the project's traffic impacts related to LOS would be ***less than significant.***"

The 2006 EIR also included a cumulative analysis, which found the project's impact to be less than significant. The actual language was "Therefore, the project's contribution to cumulative LOS at the study intersections would be ***less than significant.***"

Analysis of Project Driveway

Hexagon analyzed the operations and safety of the proposed project driveway on Fassler Avenue. The project proposes to make a striping change on Fassler Avenue that would facilitate turns into

and out of the project site (see Figure 2). To facilitate left turns into the site, the proposed striping would provide a left turn pocket. To facilitate left turns out of the site, the striping would provide a median refuge area. This would allow left turn vehicles to find gaps in the westbound and eastbound traffic separately if they chose to do so. With the proposed striping changes on Fassler Avenue, turns in and out of the project driveway would operate with minor delays and no disruption to through traffic.

Hexagon checked the sight distance at the proposed driveway location to make sure that the driveway could be used safely. We found that sight distance is adequate in both directions. Sight distance to the east (uphill) is about 1,100 feet (see Exhibit 2). Sight distance to the west (downhill) is about 700 feet (see Exhibit 3). These distances are good for a speed up to 65 mph. Although traffic on Fassler appears to be exceeding the speed limit of 35 mph, a design speed of 65 mph provides an adequate margin of safety.

Conclusions

The 2006 EIR for "The Prospects" project on the same site found no significant traffic impacts. Hexagon has determined that traffic conditions on Highway 1 at the study intersections of Fassler Avenue and Reina del Mar Avenue have not changed. The proposed project would be smaller than what was studied in the EIR: 24 homes versus 34 homes. Therefore, it can be concluded that the current project would have no significant traffic impacts. The proposed striping changes on Fassler Avenue at the project driveway would facilitate turns into and out of the site. The sight distance at the proposed driveway is adequate.

We appreciate the opportunity to prepare this updated traffic analysis. If you have any questions please do not hesitate to contact us.

Sincerely,

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Gary K. Black
President

Exhibit 2
Sight Distance to the East

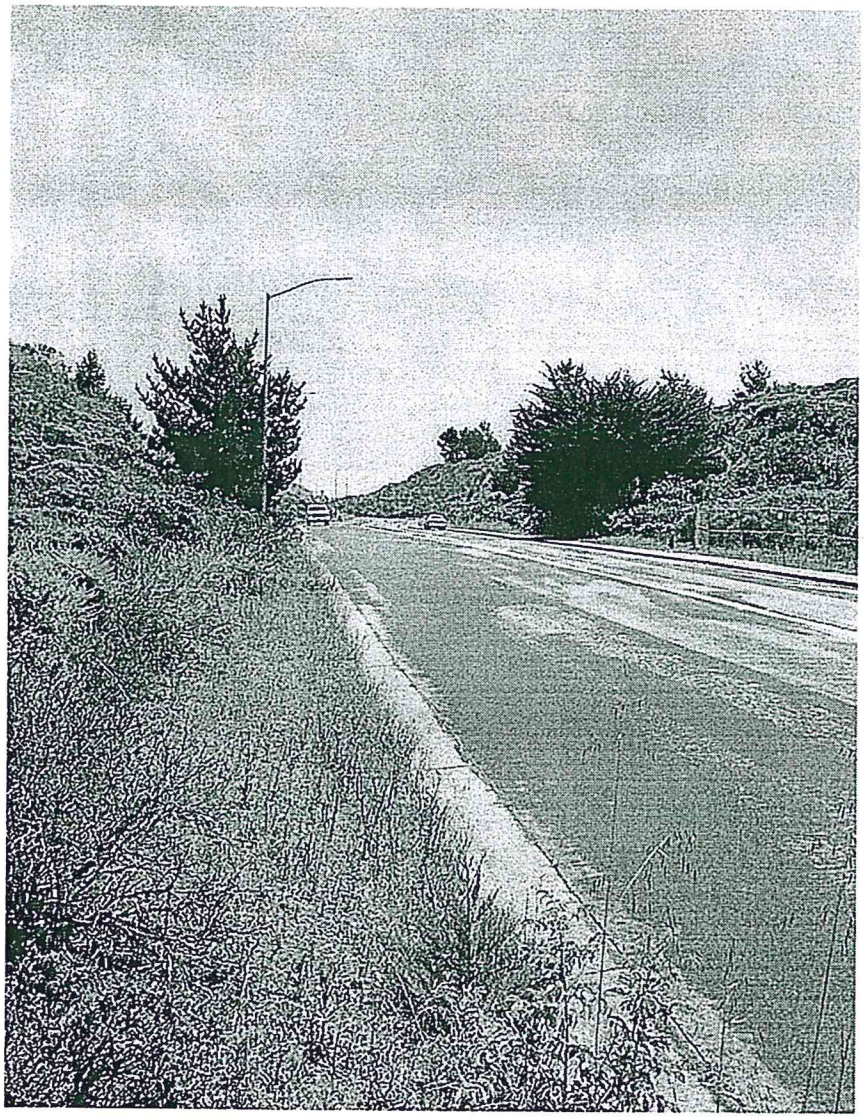


Exhibit 3
Sight Distance to the West

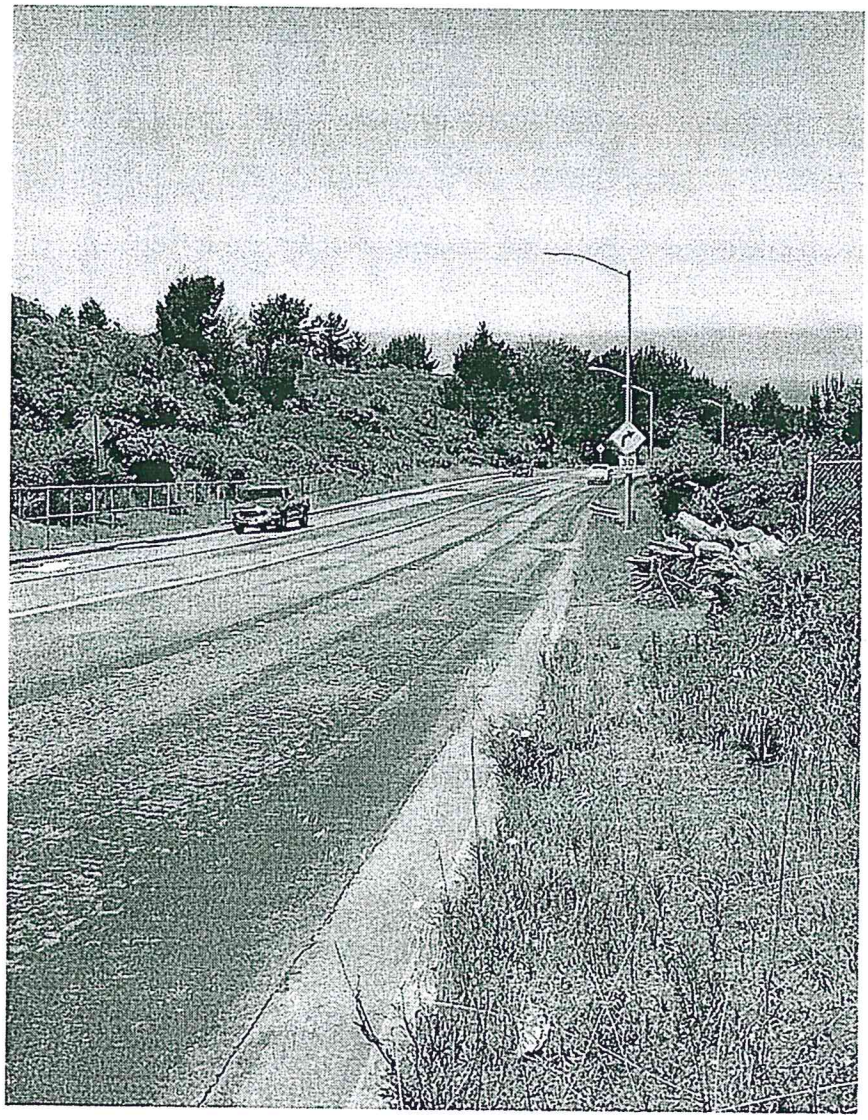


Figure 1
Site Plan

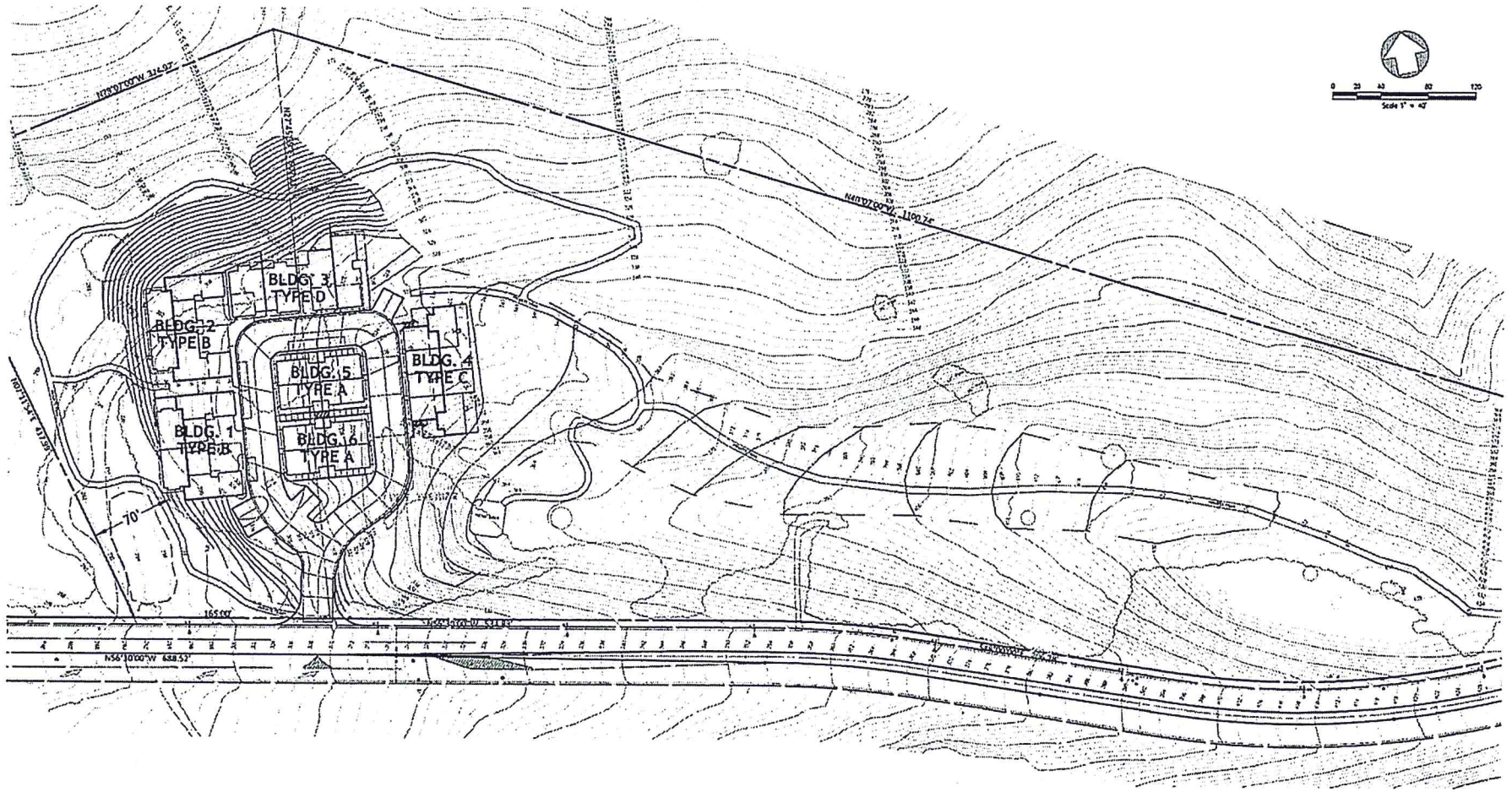
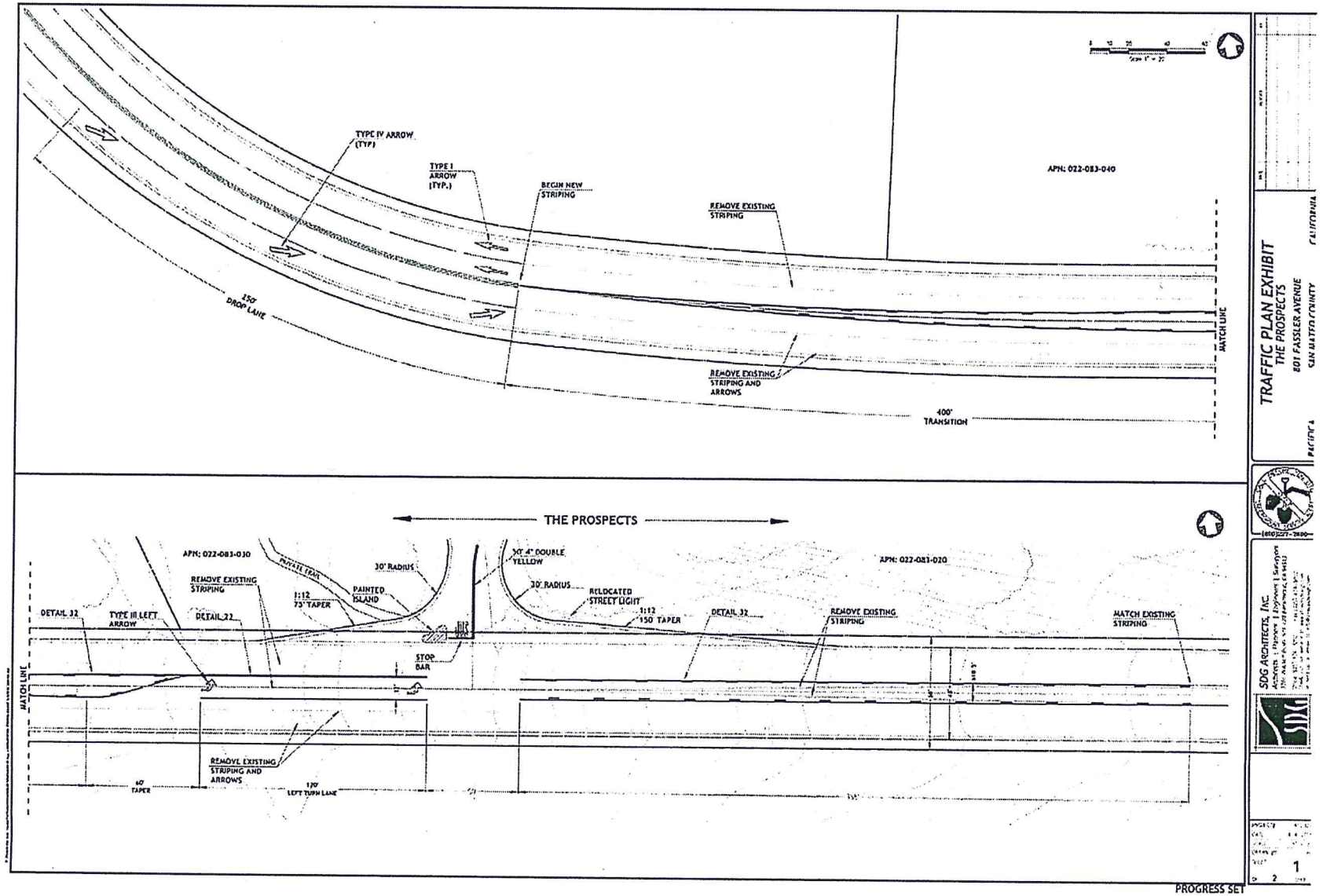


Figure 2
Proposed Striping Change



APPENDIX G–2

TRAFFIC REPORT PEER REVIEW
FEHR & PEERS, NOVEMBER 2015

FEHR PEERS

MEMORANDUM

Date: November 19, 2015

To: Kathryn Farbstein, City of Pacifica

From: Dan Hennessey, Fehr & Peers

Subject: Peer Review for the Proposed Residential Project at 801 Fassler Avenue in Pacifica, California

SF15-0849

Fehr & Peers conducted a peer review of two traffic studies previously prepared for the proposed residential development at 801 Fassler Avenue in Pacifica, CA (hereafter referred to as the "Project"). The original traffic study was completed in 2006 for a 34-unit residential development that was approved but never built. An update of this 2006 study was then conducted in June 2014 for the current 24-unit proposal.

The following memorandum is intended to summarize the results of our review and assist the City with the preparation of the final environmental clearance documentation.

PROJECT DESCRIPTION

The Project consists of 24 residential condominium units in 12 duplex buildings. Each residential unit would have a two-car garage. Site access is proposed by one full-access vehicular entrance via Fassler Avenue in the form of a private circular driveway that would connect to four buildings inside the driveway loop, eight buildings outside of the driveway loop, 13 guest surface parking spaces, and two common driveways for Units 1-4 and Units 5-8. In addition to the proposed residential units, the Project would include various recreational and open spaces for use by site residents. The site plan reviewed for this Project is attached at the end of this memorandum.

ANALYSIS LOCATIONS AND METHODS

Two intersections in the immediate vicinity of the site are evaluated for the weekday morning (7-9 AM) and evening (4-6 PM) peak periods, plus the Project driveway in the Plus Project scenarios:

- SR-1 / Reina Del Mar Avenue
- SR-1 / Rockaway Beach Avenue / Fassler Avenue
- Fassler Avenue / Project Driveway (Plus Project scenarios only)

These intersections have been identified as those most likely to be affected by the proposed Project.

ANALYSIS METHODS

The operational performance of a roadway network is commonly described with the term level of service (LOS). LOS is a qualitative description of operating conditions, ranging from LOS A (free-flow traffic conditions with little or no delay) to LOS F (oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays.) LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F.

Signalized Intersections

Traffic operations at signalized intersections are evaluated using the LOS method described in Chapter 16 of the Highway Capacity Manual (HCM). A signalized intersection's LOS is based on the weighted average control delay measured in seconds per vehicle and includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration. **Table 1** summarizes the relationship between the control delay and LOS for signalized intersections.

TABLE 1: SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (seconds per vehicle)
A	Operations with very low delay occurring with favorable traffic signal progression and/or short cycle lengths.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55.0 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Source: *Highway Capacity Manual, Transportation Research Board, 2000.*

Unsignalized Intersections

Traffic conditions at unsignalized intersections are evaluated using the method from Chapter 17 of the HCM. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. For all-way stop-controlled intersections, the average control delay is calculated for the intersection as a whole. At two-way or side street-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left turn movement from the major street, and the entire intersection. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

TABLE 2: UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (seconds per vehicle)
A	Little or no delays	< 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: *Highway Capacity Manual, Transportation Research Board, 2000.*

EXISTING CONDITIONS – VEHICLE OPERATIONS

Existing peak hour vehicle turning movement, bicycle, and pedestrian volume counts were collected from 7:00 to 9:00 AM and from 4:00 to 6:00 PM on Tuesday, June 2, 2015. **Table 3** compares these counts to those collected in 2006 used for both previous traffic studies. The AM peak hour shows that the number of vehicles entering the intersection decreased by ten percent at Reina Del Mar Avenue and seventeen percent at Fassler Avenue, though the reported volumes at the Fassler Avenue intersection in the 2006 study had been adjusted to account for the queuing.

The PM differences are within the typical day-to-day variation of intersection volumes, but the decrease in AM volumes is higher than typical variation, suggesting that volumes through these intersections have decreases since 2006. Traffic count data are available in **Attachment A**.

TABLE 3: TRAFFIC COUNT COMPARISON – 2006 AND 2015

Intersection	Time	Total Volume Entering Intersection		Difference
		2006[1]	2015[2]	
SR-1 / Reina Del Mar Avenue	AM	4,521	4,050	***-10%***
	PM	4,627	4,366	***-6%***
SR-1 / Rockaway Beach Avenue / Fassler Avenue	AM	4,168	3,461	***-17%***
	PM	4,557	4,122	***-10%***

Notes:
1. From "The Prospects Residential Project Draft Environmental Impact Report," 2006.
2. From data collected on Tuesday, June 2, 2015.

Source: Fehr & Peers, October 2015.

Additional data collection was also completed on two occasions in September 2015, including observations of the lane configurations, signal timings, intersection operations and vehicle queuing. Signal timing sheets were collected from Caltrans; both were last updated in July 2012, and each signal was observed to operate differently than the signal timing sheets showed, as explained on the following page. Existing vehicle queues were also observed at the study intersections to ensure that the Synchro models were properly calibrated.

Traffic operations throughout the study area are analyzed using the Synchro 8.0 software program. Synchro calculations are based on the procedures outlined in the HCM. **Table 4** shows the LOS results for the existing weekday AM and PM peak hours. The levels of service reported are consistent with the SR-1 Calera Parkway Project Final Traffic Operations Report (July 2008).

TABLE 4: EXISTING CONDITIONS INTERSECTION OPERATIONS SUMMARY

Intersection	Control[1]	Peak Hour	Existing Conditions	
			Delay[2]	LOS[2]
SR-1 / Reina Del Mar Avenue	Signal	AM	**126**	**F**
		PM	**132**	**F**
SR-1 / Rockaway Beach Avenue / Fassler Avenue	Signal	AM	**217**	**F**
		PM	**121**	**F**

Notes: Bold indicates unacceptable intersection operations.
1. Signal = signalized intersection.
2. Traffic operations results include LOS (level of service) and delay (seconds per vehicle). LOS is based on delay thresholds published in the Highway Capacity Manual (Transportation Research Board, 2000).

Source: Fehr & Peers, October 2015.

AM PEAK HOUR OBSERVATIONS

In the AM peak hour, long queues were observed on northbound SR-1 stemming back from the Reina Del Mar Avenue intersection. These queues reached as far back as Crespi Avenue (approximately 1.3 miles) throughout the AM peak hour. Because the queue length did not change over the peak hour, counts reflect demand volumes during the peak hour. Queues were also observed for the westbound right-turn movements from Fassler Avenue (back to Roberts Road) and Reina Del Mar (back to Vallemar Elementary School) onto SR-1. These queues did not clear each cycle; instead, vehicles needed two to three cycles to access SR-1. As a result of the westbound queuing on Fassler Avenue, vehicles were observed to use Sea Bowl Lane to access SR-1 northbound from Fassler Avenue.

With respect to the operation of the traffic signals, signal split phase times were longer for the westbound movement than conveyed on the obtained signal timing sheets from Caltrans and have been incorporated into the operations analysis model. At the SR-1 / Reina Del Mar intersection, the signal timing sheet showed northbound through phases as long as four minutes, which were corroborated by field observations. When the northbound left-turn phase, westbound phase, and the pedestrian phase for the eastbound approach are all actuated, as

many as 85 seconds are dedicated to those phases while no northbound traffic can get through the intersection. This time creates the long queues that can extend past the Fassler Avenue intersection. North of Reina Del Mar, SR-1 transitions to a freeway and operates at free flow conditions.

At Fassler Avenue, vehicles in the westbound right-turn lanes do not call the westbound phase. Instead, the detectors for these lanes call the southbound left-turn phase, with which the westbound right-turn movement overlaps. As mentioned, the queue from Reina Del Mar was also observed to extend back through the intersection through both the westbound right-turn phase and the northbound through phase, leaving significant green time during the peak during which no vehicles can advance through the intersection. Additionally, the northbound queue (and the constant stream of northbound traffic) does not allow for right turns on red; as a result, this option has been removed from the Synchro model. Lastly, the Synchro model does not account for the queue spillback from the upstream intersection. As a result, the capacity of the northbound through movement has been modified to reflect the existing count, in order to more accurately reflect the observed conditions.

PM PEAK HOUR OBSERVATIONS

In the PM peak hour, long queues were observed on southbound SR-1 stemming back from both the Fassler Avenue and Reina Del Mar signalized intersections. This queue was observed at both the beginning and end of the peak hour, and grew from just north of Westport Drive to near the Sharp Park Road overcrossing (approximately one-third of a mile). Because the queue grows over the course of the PM peak hour and the counts capture only those vehicles that pass through the intersection, the counts are lower than the demand volumes during the peak hour; given the amount of growth in the queue, the demand volumes for the southbound approach at Reina Del Mar Avenue are likely 100 to 150 vehicles more than the counts show.

Given the long green times at the Reina Del Mar intersection, the queue is typically a moving queue, with speeds between 10 and 25 miles per hour. The grade and horizontal curve approaching the intersection, as well as the speed limit change south of Mori Point Road, contribute to the queuing.

On several occasions, the queue from the Fassler Avenue intersection extended back through the Reina Del Mar intersection; despite southbound vehicles having allotted green time in this scenario, those vehicles were unable to proceed through the intersection along the SR-1 corridor.

The southbound left-turn pocket from SR-1 to Reina Del Mar was also observed to extend to the end of its storage length on multiple occasions, though it did not affect the southbound through movement. The southbound left-turn pocket from SR-1 to Fassler Avenue was typically able to contain its queues during the PM peak hour. This location has two left-turn lanes and demand for this turn movement was likely metered by the upstream queueing.

With respect to the operation of the traffic signals, signal split phase times were longer for the westbound movement than conveyed on the obtained signal timing sheets from Caltrans and have been incorporated into the operations analysis model. The signal timing sheet showed southbound through phases as long as three minutes, which were corroborated by field observations. However, during the same southbound phase, the northbound through phase and southbound left-turn phase would alternate several times through a single cycle. This has been incorporated into the operations analysis model. The capacity of the southbound through movement has been modified to reflect the existing count, in order to more accurately reflect the observed conditions.

At Fassler Avenue, the southbound left-turn phase occurs both before the northbound through phase and after, similar to the phasing at Reina Del Mar. The changes to the signal phasing for the westbound movements mentioned for the AM peak hour were also made to the PM peak hour models, but right turns on red from Fassler Avenue to northbound SR-1 were observed and are included in the operations model.

As mentioned, the queue from this signal was observed to occasionally extend back through the Reina Del Mar intersection. The grade and curve south of Fassler Avenue near the Sea Bowl tend to make southbound drivers slow down after clearing this intersection, contributing to the queuing. The capacity of the northbound through movement has been modified to reflect the existing count, in order to more accurately reflect the observed conditions.

CITY OF PACIFICA SIGNIFICANCE CRITERIA

The City of Pacifica currently uses a level of service standard of LOS D for all intersections. Both study intersections operate at LOS F under existing conditions; therefore, a project is said to have created a significant impact at a signalized intersection if the addition of project traffic causes both the critical movement delay at the intersection to increase by one or more seconds and the critical intersection volume-to-capacity (V/C) ratio to increase by more than 0.010. For

unsignalized intersections, impacts occur if the worst stop-controlled approach would operate at LOS E or F with the project and the addition of project traffic causes the volumes to satisfy peak hour volume warrants for traffic signals provided by Caltrans. These are the same criteria used in the 2006 study.

VEHICLE TRIP GENERATION, DISTRIBUTION, ASSIGNMENT

TRIP GENERATION

Vehicle trip generation estimates for the proposed Project during both AM and PM peak hours have been developed using the trip generation equations and rates presented in Institute of Transportation Engineers' (ITE) *Trip Generation, 9th Edition*. Due to the isolated, single-use nature of the Proposed Project, no reductions are made to account for internal trips, pass-by trips, or transit use. Additionally, as there are no current land uses at the Project site, no reductions are made for the elimination of current land uses.

Table 5 shows the vehicle trip generation estimates. The original 2006 EIR used the trip generation equations in *ITE Trip Generation, 7th Edition*, for the Single-Family Detached Housing Category (Land Use 210). The 2014 traffic study update used average rates instead of the equations, which resulted in fewer trips on a per-unit basis.

We recommend using the equations for the Single-Family Detached Housing Category (Land Use 220) in *ITE Trip Generation, 9th Edition*. Though many of the units have attached walls, the development will operate as 24 single-family homes. The proposed development would generate approximately 283 daily trips, 27 AM peak hour trips and 29 PM peak hour trips. For comparison purposes only, the previous estimates of trip generation from the 2006 EIR and the 2014 update are also provided.

TABLE 5: PROJECT TRIP GENERATION

Land Use	ITE Code	Units	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
2015 Project	***210[1]***	***24 dwelling units***	***283***	***7***	***20***	***27***	***18***	***11***	***29***
2006 Analysis	210[2]	34 dwelling units	n/a	8	25	33	26	15	41
2014 Update	210[3]	24 dwelling units	228	5	13	18	15	9	24

Notes:
1. ITE trip generation average rates used (ITE Code 210 – Single-Family Detached Housing, 9th Edition):
   Daily: LN (T) = 0.92 * LN (X) + 2.72
   AM: T = 0.70 * X + 9.74; Enter = 25%, Exit = 75%
   PM: T = 0.90 * LN (X) + 0.51; Enter = 63%, Exit = 37%
   Where X = total dwelling units, T = number of vehicle trips
2. ITE trip generation average rates used (ITE Code 210 – Single-Family Detached Housing, 7th Edition):
   Daily: LN (T) = 0.92 * LN (X) + 2.71
   AM: T = 0.70 * X + 9.74; Enter = 25%, Exit = 75%
   PM: T = 0.90 * LN (X) + 0.53; Enter = 63%, Exit = 37%
   Where X = total dwelling units, T = number of vehicle trips
3. ITE trip generation average rates used (ITE Code 210 – Single-Family Detached Housing, 9th Edition):
   Daily: T = 9.52 * X
   AM: T = 0.75 * X; Enter = 25%, Exit = 75%
   PM: T = 1.00 * X; Enter = 63%, Exit = 37%
   Where X = total dwelling units, T = number of vehicle trips

Source: *Trip Generation Manual (7th Edition), ITE, 2003; Trip Generation Manual (9th Edition), ITE, 2012.*

TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution refers to the directions of approach and departure that vehicles would use to arrive at and depart from the site. This traffic analysis assumes that all new Project trips would be distributed proportionately based on an assessment of the current movements at the existing SR-1 intersections with Fassler Avenue and Reina Del Mar, as well as vehicles that use the Sea Bowl Lane cut-through to avoid queues. The movements to/from Fassler Avenue serve to inform the potential trip distribution for the Project because Fassler Avenue primarily provides access between SR-1 and residential neighborhoods.

EXISTING PLUS PROJECT TRAFFIC OPERATIONS

Existing Plus Project traffic operations throughout the study area are analyzed using the existing peak hour Synchro models and applying the Project trip assignment discussed in the previous sections. **Table 6** shows the LOS results for both scenarios; the additional traffic due to the

Project would have a **less-than-significant impact** on the study intersections. The delay for the critical westbound right turn movement from Fassler Avenue to SR-1 would increase by 13 seconds per vehicle, though the critical intersection vehicle-to-capacity ratio would increase by only 0.007 during the AM peak hour.

TABLE 6: EXISTING PLUS PROJECT CONDITIONS INTERSECTION OPERATIONS

Intersection	Control[1]	Peak Hour	Existing Conditions		Existing Plus Project Conditions	
			Delay[2]	LOS[2]	Delay[2]	LOS[2]
SR-1 / Reina Del Mar Avenue	Signal	AM PM	**126** **132**	**F** **F**	**128** **135**	**F** **F**
SR-1 / Rockaway Beach Avenue / Fassler Avenue	Signal	AM PM	**217** **121**	**F** **F**	**220** **121**	**F** **F**
Fassler Avenue / Proposed Access Driveway	SSSC[3]	AM PM	n/a	n/a	1 (24) 1 (12)	A (C) A (B)

Notes: Bold indicates unacceptable intersection operations.
1. Signal = signalized intersection; SSSC = side-street stop controlled intersection.
2. Traffic operations results include LOS (level of service) and delay (seconds per vehicle). LOS is based on delay thresholds published in the Highway Capacity Manual (Transportation Research Board, 2000).
3. Delay is reported as: Average delay for intersection (Average delay for Project driveway).

Source: Fehr & Peers, October 2015.

CUMULATIVE TRAFFIC CONDITIONS

The 2006 EIR analyzes a Cumulative Conditions scenario that includes a one percent growth factor for ten years, plus a development project that would include 63 condominium units and 24,000 square feet of retail space. The EIR states that "[t]his one percent growth rate is typical for areas that are not completely built out, and is consistent with growth of jobs and households projected by the Association of Bay Area Governments (ABAG) for Pacifica in its latest publication of land use projections, Projections 2005." The current ABAG land use projections, Projections 2013, indicate a similar growth rate. Given that the 2015 volumes were lower than those collected in 2006 and that growth rates are approximately the same, we have evaluated the trip generation for the updated Project description against the background growth forecasts previously developed for the 2006 impact analysis. These forecasts account for proposed developments nearby such as the Harmony-at-One residential development across Fassler Avenue and other developments

throughout the City of Pacifica, including the Holiday Inn Expansion on Nick Gust Way just west of the SR-1 / Fassler Avenue / Rockaway Beach Avenue intersection.

Table 7 shows the Cumulative Conditions LOS results. These results reflect a scenario without the Calera Parkway Project, which would add a lane to SR-1 in each direction between Fassler Avenue and Reina Del Mar Avenue.

TABLE 7: CUMULATIVE CONDITIONS INTERSECTION OPERATIONS

Intersection	Control[1]	Peak Hour	Cumulative Conditions No Project	
			Delay[2]	LOS[2]
SR-1 / Reina Del Mar Avenue	Signal	AM PM	**179** **187**	**F** **F**
SR-1 / Rockaway Beach Avenue / Fassler Avenue	Signal	AM PM	**312** **145**	**F** **F**

Notes: Bold indicates unacceptable intersection operations.
1. Signal = signalized intersection.
2. Traffic operations results include LOS (level of service) and delay (seconds per vehicle). LOS is based on delay thresholds published in the Highway Capacity Manual (Transportation Research Board, 2000).

Source: Fehr & Peers, October 2015.

CUMULATIVE PLUS PROJECT TRAFFIC OPERATIONS

The Project vehicle trip turning movements at the study intersections are added to the Cumulative No Project traffic volumes to obtain the Cumulative Plus Project traffic volumes. The Synchro models are used to evaluate the cumulative traffic forecasts (without and with Project) and the resulting LOS is shown in **Table 8**. The additional traffic due to the Project would have a **less-than-significant impact** the study intersections.

The delay for the critical westbound right turn movement from Fassler Avenue to SR-1 would increase by 14 seconds per vehicle, though the critical intersection vehicle-to-capacity ratio would increase by only 0.007 during the AM peak hour**.**

TABLE 8: CUMULATIVE PLUS PROJECT INTERSECTION OPERATIONS

Intersection	Control[1]	Peak Hour	Cumulative No Project		Cumulative Plus Project	
			Delay[2]	LOS[2]	Delay[2]	LOS[2]
SR-1 / Reina Del Mar Avenue	Signal	AM PM	**179** **187**	**F** **F**	**181** **189**	**F** **F**
SR-1 / Rockaway Beach Avenue / Fassler Avenue	Signal	AM PM	**312** **145**	**F** **F**	**315** **146**	**F** **F**
Fassler Avenue / Proposed Access Driveway	SSSC[3]	AM PM	n/a	n/a	1 (29) 1 (12)	A (D) A (B)

Notes: Bold indicates unacceptable intersection operations.
1. Signal = signalized intersection; SSSC = side-street stop controlled intersection.
2. Traffic operations results include LOS (level of service) and delay (seconds per vehicle). LOS is based on delay thresholds published in the Highway Capacity Manual (Transportation Research Board, 2000).
3. Delay is reported as: Average delay for intersection (Average delay for Project driveway).

Source: Fehr & Peers, October 2015.

TRAFFIC IMPACT SIGNIFICANCE DETERMINATION

As stated earlier, the City of Pacifica's standard for the SR-1 study intersections is LOS D (less than 55 seconds of average control delay per vehicle for signalized intersections and less than 35 seconds of average control delay per vehicle for unsignalized intersections). Because the signalized intersections already operate at LOS F, the significance criteria indicates that facilities are impacted if the addition of project traffic causes both the critical-movement delay at the intersection to increase by one or more seconds, and the critical intersection V/C to increase by more than 0.010 for intersections already operating at LOS F. None of the study intersections meet criteria, and as a result, the Project has a less-than-significant impact on the study intersections. The Synchro worksheets used to complete this analysis are provided in **Attachment B**.

SITE PLAN REVIEW

The Project site plan has been reviewed with consideration for safe and efficient circulation of motor vehicles, bicyclists, and pedestrians through the Project site and on the roadways adjacent to the Project site. The site plan that was reviewed for this study is dated March 11, 2015. The review focuses on:

- Existing pedestrian, bicycle, and transit facilities
- Vehicle access and circulation, including parking layout within the site
- Emergency vehicle access to the site
- Pedestrian access and circulation within and adjacent to the site
- Bicycle access and circulation within and adjacent to the site, as well as bicycle parking
- Vehicle sight distance to and from the proposed driveway
- Accommodation of the driveway for the Harmony-at-One project across Fassler
- Viability of and need for a westbound right-turn lane into the Project

EXISTING PEDESTRIAN, BICYCLE, AND TRANSIT FACILITIES

In the vicinity of the Project area, there is a sidewalk on the south side of Fassler Avenue, typically four- to five-feet wide, which extends between Roberts Road and the end of Fassler Avenue to the east. A sidewalk continues on the north side of Fassler Avenue from Roberts Road to SR-1. There is no crossing treatment to aid pedestrians crossing from one side of Fassler Avenue to the other. At the study intersections, crosswalks are provided across the east and south legs of the SR-1 / Fassler Avenue / Rockaway Beach Avenue intersection, as well as the east, west, and south legs of the SR-1 / Reina Del Mar intersection. Pedestrian clearance times at both intersections correspond to a walking speed of approximately four feet per second.

Currently, there is a Class I path (separated pedestrian/bicycle path) on the west side of SR-1 between Reina Del Mar to the north and Linda Mar Boulevard to the south. The path becomes a Class III (bicycle route with sharrows) facility between San Marlo Way and Old County Road along Dondee Street and Nick Gust Way. Nearer to the Project, there are no designated bicycle facilities along Fassler Avenue. It should be noted that Fassler Avenue has a significant grade that may discourage biking, particularly eastbound. No bicyclists were observed or counted on Fassler Avenue during field observations and data collection.

The Project site is approximately one-half mile from the nearest transit stop, located at SR-1 and Fassler Avenue / Rockaway Beach Avenue. Currently, SamTrans Routes 16, 19, 49, 110, 112, and 118 utilize these stops. Stops for these routes are also provided at the SR-1 / Reina Del Mar intersection.

Route 16 runs between Serramonte Center in Daly City and Terra Nova High School on school days only. Route 16 runs two buses from 6:57 AM to 7:35 AM (ten minute headway) and 3:15 PM to 3:49 PM (three minute headway) on weekdays. There is no weekend service. ***Route 19*** runs between Ingrid B Lacy Middle School and the Linda Mar Park & Ride on school days only. Route 19 runs one bus from 8:04 AM to 8:44 AM and one bus from 3:25 PM to 3:59 PM on weekdays (2:25 PM to 2:59 PM on Wednesdays). There is no weekend service. ***Route 49*** runs between San Francisco International Airport (SFO) and Terra Nova High School on school days only. Route 49 runs one bus from 6:57 AM to 7:42 AM and one bus from 3:08 PM to 3:55 PM on weekdays. There is no weekend service.

Route 110 runs between the Daly City Bay Area Rapid Transit (BART) Station and the Linda Mar Park & Ride. Route 110 runs from 5:41 AM to 10:54 PM (30- to 60-minute headways) on weekdays. On Saturdays, the route runs from 5:35 AM to 8:44 PM with one-hour headways. On Sundays, the route runs from 5:35 AM to 8:44 PM with 90-minute headways. Two buses make stops at Terra Nova High School during the morning school drop-off period and the afternoon school pick-up period. ***Route 112*** runs between the Colma BART Station and the Linda Mar Park & Ride. Route 112 runs from 5:48 AM to 8:05 PM with one-hour headways on weekdays. On Saturdays, the route runs from 8:39 AM to 7:39 PM with one-hour headways. On Sundays, the route runs from 8:10 AM to 8:34 PM with one-hour headways. ***Route 118*** between the Colma BART Station and the Linda Mar Park & Ride. In the northbound direction on weekdays, Route 118 runs three buses from 6:30 AM to 8:25 AM (30- to 60-minute headways) and two buses from 5:07 PM to 6:26 PM (60-minute headways). In the southbound direction on weekdays, Route 118 runs two buses from 5:45 AM to 7:57 AM (110-minute headway) and three buses from 4:46 PM to 7:07 PM (60-minute headways). There is no weekend service.

VEHICULAR ACCESS AND CIRCULATION

As previously noted, access for the Project would be provided from a new driveway on the north side of Fassler Avenue. The driveway would be located approximately 60 feet to the east of a proposed right-in, right-out driveway on the south side of Fassler Avenue for the 10-unit Harmony-at-One residential development, which is under construction.

Fassler Avenue is signed with a 35 mile per hour speed limit, though observations suggested that the prevailing speed westbound on Fassler Avenue is higher. Though somewhat winding, Fassler Avenue has a downhill grade toward SR-1, likely contributing to the higher than posted vehicle speeds. Eastbound vehicle speeds were not observed to be significantly different than the posted speed. No on-street parking is currently provided on Fassler Avenue, and none is proposed as part of the Project.

The stopping sight distance (SSD) is the distance required for vehicles on the major roadway to stop safely should there be an interruption in the roadway. The major roadway has a constant grade and no horizontal curvature in the immediate vicinity of the Project driveway, providing significant sight distance approaching the intersection. Because of the excess SSD, a westbound right-turn pocket on Fassler Avenue allowing vehicles to turn into the Project is not necessary.

Intersection sight distance (ISD), also known as corner sight distance (CSD), is the sight distance required for the vehicle stopped on the minor roadway to see approaching vehicles on the major roadway and have time to make the decision to enter the intersection without interrupting flow. Section 205.2 of the Caltrans Highway Design Manual describes the requirements for private road connections. It references Figure 405.7 and Section 405.1 (2) (c), as well as Index 205.2 and Index 205.4, which dictates that the minimum CSD shall be equal to the SSD as given in Table 201.1, measured from at least fifteen feet from the edge of the travel way.

Should the driveway be designated as an urban driveway, Section 205.3 of the Caltrans Highway Design Manual describes the requirements for urban driveways. It references sections 405.1 and 201.3, which provide the requirements for sight distance from a driveway. CSD is not required from an urban driveway, leaving SSD distance as the minimum standard. The required stopping sight distance from the driveway for a 35 mile per hour road would be 250 feet.

Section 201.3 also warns that "the stopping sight distances in Table 201.1 should be increased by 20 percent on sustained downgrades steeper than 3 percent and longer than one mile." Though not longer than one mile, the required stopping sight distance when the downgrade is accounted for is 300 feet. Based on field measurements, there is approximately 700 feet of sight distance from the proposed driveway looking to the west (downhill). Looking to the east from the driveway (uphill), with the fifteen-foot setback from the edge of the travel way, there is approximately only 60 feet of sight distance. The sight distance to the east is blocked by a tree and a hill, as shown in the photograph on the following page. Drivers would have to pull out into the travel way in order to gain the necessary sight distance. The tree and potentially part of the

hillside may need to be removed in order to provide adequate sight distance. Additionally, the proposed re-striping allows for two 18-foot travel lanes and a 12-foot left-turn lane into the project. The re-striping could be done to provide a shoulder on the north side of Fassler Avenue, which would allow vehicles to pull out into the roadway without conflicting with eastbound downhill vehicles and gain adequate sight distance. Narrowing of the 18-foot travel lanes to 12 feet may also provide bicycles with a safer riding area along Fassler Avenue.

The proposed driveway appears to have larger-than-necessary curb radii given the low speed desired for vehicles entering and exiting the Project. It is unclear from the site plan if the access point is provided via a standard driveway apron or an intersection design with raised curbs. A standard driveway apron should be provided, as the apron design would create lower vehicle speeds entering and exiting the driveway and a more pleasant pedestrian experience by preserving the sidewalk grade across the driveway.

Consultant Recommendation 1: Provide adequate sight distance to/from westbound Fassler Avenue at the Project driveway. This can be accomplished by removing the tree, cutting back a portion of the hill to the east of the project driveway, and/or re-striping Fassler Avenue to provide a shoulder. Decrease the curb radii and/or include a standard driveway apron at the driveway to slow vehicles entering and exiting the Project site. The grade of the sidewalk should remain constant across the driveway.

Intersection sight distance at the Project site looking to the east

As mentioned, the proposed re-striping of Fassler Avenue would provide a 120-foot left-turn pocket in the eastbound (uphill) direction into the Project site. As a result of this new twelve-foot lane, Fassler Avenue would have one eighteen-foot lane in each direction near the proposed driveway. These wide lanes will provide an area for bicyclists but could also encourage parking. Signage and red curb paint should be used to prohibit parking in this area on both sides of the street. There is also a centerline stripe that is indicated to be white. Centerline striping should be yellow throughout; the only white stripe should be the stripe indicating the separation of the left-turn pocket from the eastbound travel lane.

Consultant Recommendation 2: Prohibit parking along both sides of Fassler Avenue with signage and red curb paint. All centerline striping should be yellow.

Lastly, the Fassler Avenue driveway for the Harmony-at-One development is about 60 feet to the west of the Project driveway and would be a right-in, right-out (the development provides a second access point with no restrictions on Roberts Road), and no conflicts are anticipated

between the two access points. The left-turn pocket may provide a location for vehicles exiting the Harmony-at-One site to U-turn back toward SR-1, though the second access point should minimize the desire to make this movement. Additionally, the project has only ten residential units, indicating that the movement would not be performed often, if at all. If a driver desired to make this movement, it is likely they would attempt to turn left from the right-in, right-out driveway.

EMERGENCY VEHICLE ACCESS

Factors such as number of access points, roadway width, and proximity to fire stations determine whether a project provides sufficient emergency access. The proposed Project provides a point of entry on Fassler Avenue under the proposed plan. The *Pacifica, California Municipal Code* does not provide a minimum access drive width for emergency vehicles; many jurisdictions have requirements that access drives must be at least 20-feet wide. The drive aisle proposed as part of this Project is 28-feet wide throughout. On-street parking spaces are eight-feet wide per the site plan, leaving at least 20 feet for emergency vehicles. The access point from Fassler Avenue also provides adequate access for emergency vehicles. Additionally, should an emergency vehicle need to remain on the internal drive aisle, each unit should have an alternative path to enter/exit the Project site.

The fire station most likely to serve the site is located on Linda Mar Boulevard, approximately two miles from the site via SR-1, Crespi Drive/Roberts Road, or Sheila Lane/Crespi Drive. A second fire station within the City is located at on Edgemar Avenue, approximately three-and-a-half miles from the Project site. Emergency vehicles would have several options to access the site and would not have to complete any U-turns to gain entry. Given these considerations, the Project provides sufficient emergency access.

PEDESTRIAN ACCESS AND CIRCULATION

The site plan does not call out a continuous proposed sidewalk on the main roadway within the Project site. Municipal Code Section 10-1.905 (c) states that sidewalks may be omitted from subdivision plans if recommended by the Planning Commission and approved by the Council. There appears to be five- to eight-foot spaces for pedestrians along the perimeter of the internal circulation roadway and five- to six-foot spaces along the roadway for the interior units.

The site plan proposes a five foot sidewalk along the Project frontage on Fassler Avenue. This is compliant with *Americans with Disabilities Act Standards for Accessible Design*, which requires four feet of clear distance. The sidewalk does not connect to another sidewalk. There are existing sidewalks on the south side of Fassler Avenue, across from the Project. The site plan does not propose a crosswalk to access that sidewalk. Pedestrians will not have a continuous pathway to access the transit stops at the SR-1 / Fassler Avenue / Rockaway Beach Avenue intersection.

The Project also provides a pedestrian path connecting the area between Units 4 and 5 to the open space to the west of the residential units.

PARKING SUPPLY AND DEMAND

The site plan shows 63 parking spaces, including two garage spaces for each unit and 13 uncovered spaces for guests of residents. The guest parking will include six parallel on-street spaces and seven perpendicular parking stalls along the driveway loop. Per Municipal Code, this proposed parking supply does not include sufficient uncovered parking for residents and guests, and at least two more uncovered spaces would be needed to meet code. No bicycle parking is required per code and none is provided; it is anticipated that bicycles would be stored within the individual units.

CITY CODE REQUIREMENTS

Currently, the development site is classified as part of the Hillside Preservation District (HPD). The City of Pacifica's off-street parking requirement in the HPD is two covered spaces plus one-half uncovered spaces per single-family attached dwelling unit and one guest space per every ten dwelling units, or fraction thereof (Article 22.5, Sec. 9-4.2259, [b] and [d], of the Municipal Code).

With 24 single-family attached dwelling units, a total of 63 parking stalls are required per the calculation below:

Covered stalls: 24 units x 2 stalls/unit = 48 stalls

Uncovered stalls: (24 units x 0.5 stalls/unit) + [24 units * (1 guest stall/10 units, or fraction thereof)] = 15 stalls

Total: 48 stalls covered + 15 stalls uncovered = 63 total stalls

The site plan shows 61 parking spaces, including two garage spaces for each unit and 13 uncovered spaces. The proposed number of covered stalls would meet Municipal Code requirements, but the proposed uncovered parking supply would not. At least two additional uncovered stalls would be required for the proposal to meet code.

The Municipal Code does state that "uncovered parking spaces may include areas such as driveways outside garages or carports and off-street parking bays," as long as "each required space shall be accessible at all times." The common driveways would not be included in this count, because vehicles parked in this area would prohibit access to the parking spaces in the garages.

Table 9 provides a summarized comparison of parking requirements and proposed supplies.

TABLE 9: PARKING REQUIREMENTS AND SUPPLY

Parking Type	Covered Parking			Uncovered Parking			Does Parking Supply Meet City Code?
	Required	Supplied	Surplus / Deficit	Required	Supplied	Surplus / Deficit	
Resident	48	48[1]	0	12	13[2]	-2	***No***
Guest	-	-	-	3			
Total	***48***	***48***	***0***	***15***	***13***	***-2***	

Notes:
1. Two-car garages provided for each unit.
2. Parallel and perpendicular parking stalls along circular roadway.

Source: Fehr & Peers, October 2015.

Consultant Recommendation 3: Incorporate two additional uncovered parking stalls onto the site plan (15 uncovered stalls in total).

This completes our review of the previous studies for the 801 Fassler Avenue development. Please call Dan Hennessey at (415) 348-0300 with any comments or questions.

Attachments:

Project Site Plan

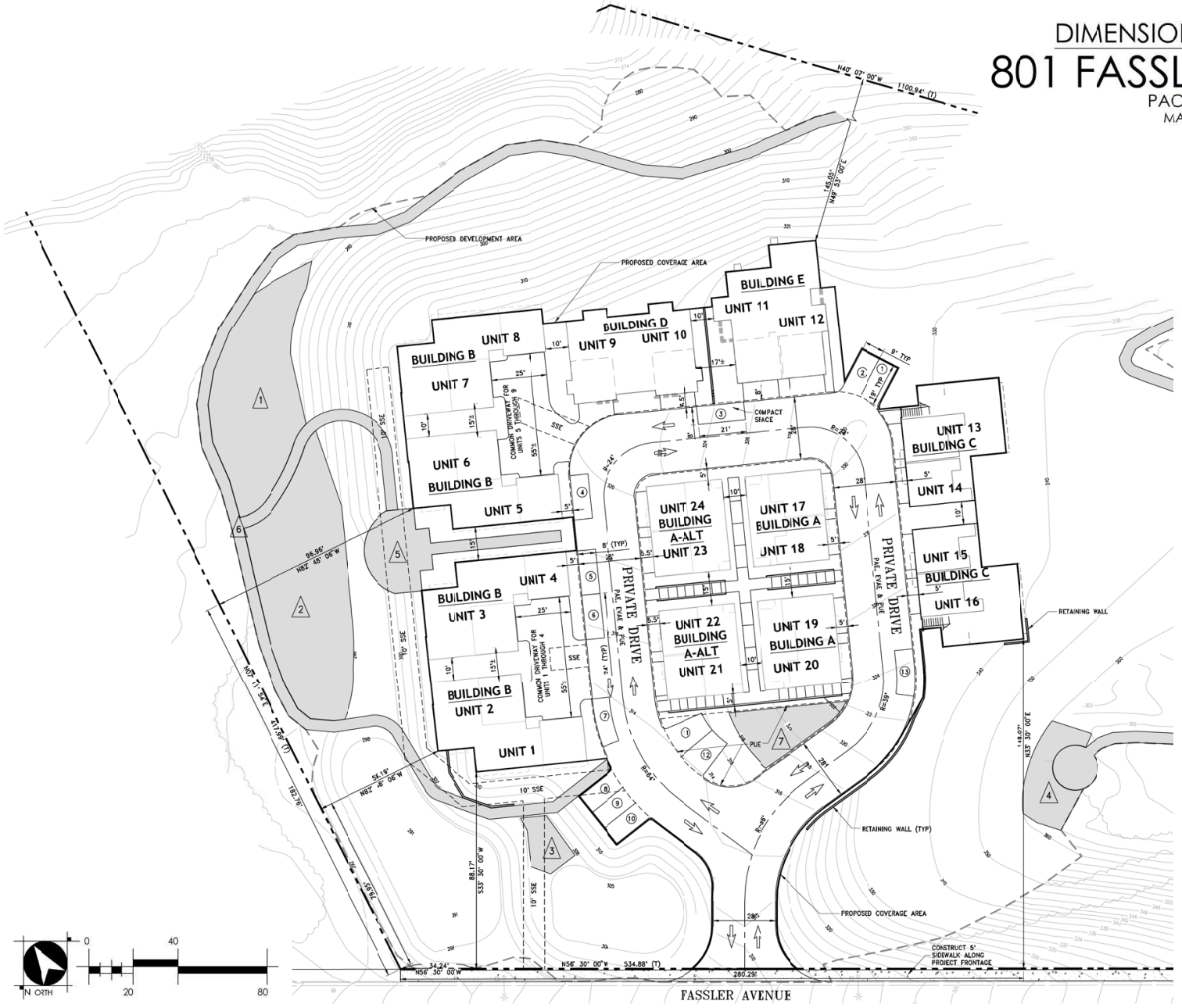
Attachment A Traffic Counts
Attachment B Synchro Worksheets

DIMENSIONAL SITE PLAN

801 FASSLER AVENUE

PACIFICA, CA

MARCH 2015



ALL CURBS TO BE PAINTED RED EXCEPT AT DRIVEWAY AND DESIGNATED PARKING AREAS SHOWN ON THIS PLAN

OPEN SPACE SUMMARY		
REQUIRED COMMON OPEN SPACE	750 SF * 20 UNITS = 15,000 SF 450 SF * 4 UNITS = 1,800 SF = 16,800 SF	
PROVIDED COMMON OPEN SPACE		
1	3,193 SF	
2	4,017 SF	
3	375 SF	
4	775 SF	
5	1,173 SF	
6	7,802 SF	
7	789 SF	
TOTAL	18,124 SF	

BUILDING SUMMARY				
DESCRIPTION	UNIT MIX		# OF STRUCTURES	MAX HEIGHT
BUILDING A	UNIT 2	UNIT 2	8	44'-5"
BUILDING B	UNIT 3	UNIT 1	8	39'-8"
BUILDING C	UNIT 4	UNIT 7	4	37'-3"
BUILDING D	UNIT 5	UNIT 5	2	31'-1"
BUILDING E	UNIT 6	UNIT 8	2	35'-8"

UNIT SUMMARY					
DESCRIPTION	LIVING	GARAGE	PORCH	DECK	PRIVATE YARD
UNIT 1	1,253	385	50	136	73
UNIT 2	1,472	451	34	115	82
UNIT 3	1,548	389	18	110	
UNIT 4	1,727	404	27		150
UNIT 5	1,677	378	26	110	
UNIT 6	1,793	405	28	72	150
UNIT 7	2,143	456	68	14	150
UNIT 8	2,052	381	32	176	150

WOOD RODGERS

DEVELOPING INNOVATIVE DESIGN SOLUTIONS

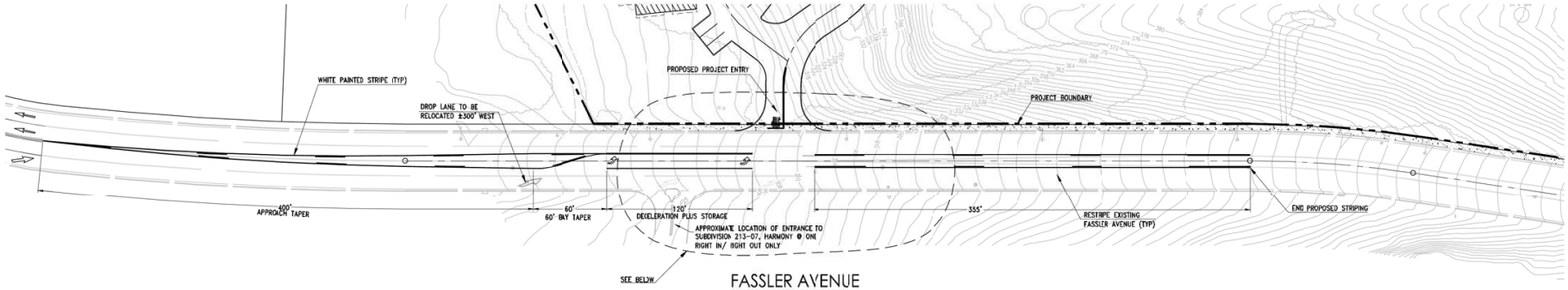
4301 HACIENDA DR. STE 100 TEL 925.847.1556

PLEASANTON, CA 94588 FAX 925.847.1557

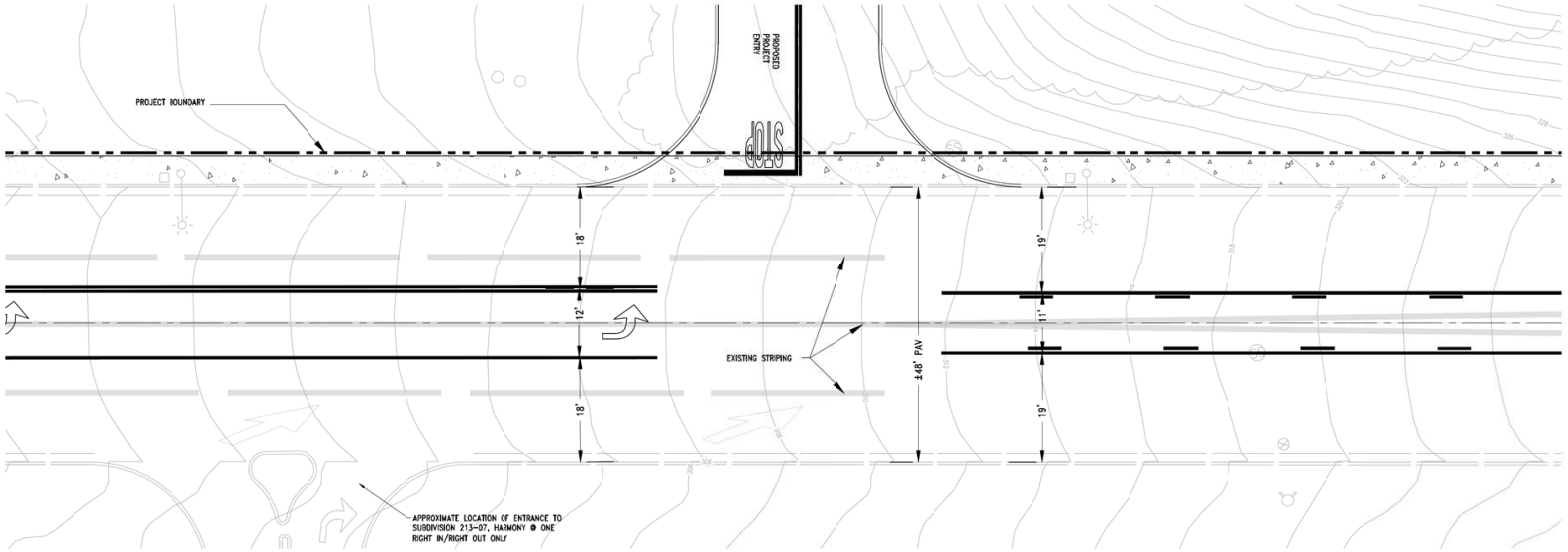
PRELIMINARY FASSLER AVENUE STRIPING PLAN

801 FASSLER AVENUE

PACIFICA, CA
MARCH 2015



FASSLER AVENUE
SCALE 1"=40'



INTERSECTION DETAIL
SCALE 1"=10'

N ORTH

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
4301 HACIENDA DR. STE 100 TEL 925.847.1556
PLEASANTON, CA 94588 FAX 925.847.1557

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7467-001 SR 1-Reina Del Mar Avenue.ppd
Date : 6/2/2015

Unshifted Count = All Vehicles

	SR 1 Southbound					Reina Del Mar Avenue Westbound					SR 1 Northbound					Reina Del Mar Avenue Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	7	127	2	3	139	5	0	49	0	54	0	664	16	0	680	1	1	1	0	3	876	3
07:15	16	152	0	1	169	9	0	49	0	58	0	667	16	0	683	0	1	1	0	2	912	1
07:30	19	177	4	0	200	5	1	66	0	72	0	588	23	0	611	3	2	0	0	5	888	0
07:45	34	266	17	3	320	16	0	64	0	80	1	541	28	1	571	3	10	0	0	13	984	4
Total	76	722	23	7	828	35	1	228	0	264	1	2460	83	1	2545	7	14	2	0	23	3660	8
08:00	29	277	50	2	358	18	0	92	0	110	0	510	71	0	581	1	27	2	0	30	1079	2
08:15	39	267	18	2	326	36	0	112	0	148	0	517	31	1	549	2	25	1	0	28	1051	3
08:30	23	240	6	1	270	26	0	73	0	99	0	546	17	1	564	0	3	0	0	3	936	2
08:45	22	282	2	1	307	17	0	40	0	57	0	532	12	0	544	1	2	0	0	3	911	1
Total	113	1066	76	6	1261	97	0	317	0	414	0	2105	131	2	2238	4	57	3	0	64	3977	8
16:00	55	626	4	1	686	26	0	34	0	60	1	333	32	1	367	1	0	0	0	1	1114	2
16:15	49	561	4	4	618	25	1	35	0	61	0	312	15	2	329	3	0	3	0	6	1014	6
16:30	50	579	2	6	637	22	0	32	0	54	1	329	16	0	346	1	1	2	0	4	1041	6
16:45	52	606	1	1	660	24	0	28	0	52	1	341	16	2	360	2	1	0	0	3	1075	3
Total	206	2372	11	12	2601	97	1	129	0	227	3	1315	79	5	1402	7	2	5	0	14	4244	17
17:00	52	602	5	3	662	31	1	47	0	79	0	334	18	4	356	6	1	2	0	9	1106	7
17:15	41	685	3	0	729	28	1	32	0	61	0	329	22	1	352	0	1	1	0	2	1144	1
17:30	54	618	0	1	673	26	0	24	0	50	0	287	23	6	316	1	0	0	0	1	1040	7
17:45	58	592	4	5	659	26	0	24	0	50	1	273	40	3	317	2	2	2	0	6	1032	8
Total	205	2497	12	9	2723	111	2	127	0	240	1	1223	103	14	1341	9	4	5	0	18	4322	23
Grand Total	600	6657	122	34	7413	340	4	801	0	1145	5	7103	396	22	7526	27	77	15	0	119	16203	56
Apprch %	8.1%	89.8%	1.6%	0.5%		29.7%	0.3%	70.0%	0.0%		0.1%	94.4%	5.3%	0.3%		22.7%	64.7%	12.6%	0.0%			
Total %	3.7%	41.1%	0.8%	0.2%	45.8%	2.1%	0.0%	4.9%	0.0%	7.1%	0.0%	43.8%	2.4%	0.1%	46.4%	0.2%	0.5%	0.1%	0.0%	0.7%	100.0%	

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7467-001 SR 1-Reina Del Mar Avenue.ppd
Date : 6/2/2015

Unshifted Count = All Vehicles

AM PEAK HOUR	SR 1 Southbound					Reina Del Mar Avenue Westbound					SR 1 Northbound					Reina Del Mar Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:45 to 08:45																					
Peak Hour For Entire Intersection Begins at 07:45																					
07:45	34	266	17	3	320	16	0	64	0	80	1	541	28	1	571	3	10	0	0	13	984
08:00	29	277	50	2	358	18	0	92	0	110	0	510	71	0	581	1	27	2	0	30	1079
08:15	39	267	18	2	326	36	0	112	0	148	0	517	31	1	549	2	25	1	0	28	1051
08:30	23	240	6	1	270	26	0	73	0	99	0	546	17	1	564	0	3	0	0	3	936
Total Volume	125	1050	91	8	1274	96	0	341	0	437	1	2114	147	3	2265	6	65	3	0	74	4050
% App Total	9.8%	82.4%	7.1%	0.6%		22.0%	0.0%	78.0%	0.0%		0.0%	93.3%	6.5%	0.1%		8.1%	87.8%	4.1%	0.0%		
PHF	.801	.948	.455	.667	.890	.667	.000	.761	.000	.738	.250	.968	.518	.750	.975	.500	.602	.375	.000	.617	.938

PM PEAK HOUR	SR 1 Southbound					Reina Del Mar Avenue Westbound					SR 1 Northbound					Reina Del Mar Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	50	579	2	6	637	22	0	32	0	54	1	329	16	0	346	1	1	2	0	4	1041
16:45	52	606	1	1	660	24	0	28	0	52	1	341	16	2	360	2	1	0	0	3	1075
17:00	52	602	5	3	662	31	1	47	0	79	0	334	18	4	356	6	1	2	0	9	1106
17:15	41	685	3	0	729	28	1	32	0	61	0	329	22	1	352	0	1	1	0	2	1144
Total Volume	195	2472	11	10	2688	105	2	139	0	246	2	1333	72	7	1414	9	4	5	0	18	4366
% App Total	7.3%	92.0%	0.4%	0.4%		42.7%	0.8%	56.5%	0.0%		0.1%	94.3%	5.1%	0.5%		50.0%	22.2%	27.8%	0.0%		
PHF	.938	.902	.550	.417	.922	.847	.500	.739	.000	.778	.500	.977	.818	.438	.982	.375	1.000	.625	.000	.500	.954

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
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Nothing on Bank 2

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Bank 1 Count = Peds & Bikes

	SR 1 Southbound					Reina Del Mar Avenue Westbound					SR 1 Northbound					Reina Del Mar Avenue Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Ped Total
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
07:15	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	1	2
07:30	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	1	0	1	3
07:45	0	0	0	0	0	0	1	0	1	1	0	0	0	8	0	0	0	0	1	0	1	10
Total	0	0	0	0	0	1	1	0	1	2	0	0	1	14	1	0	0	0	2	0	3	17
08:00	0	0	0	0	0	0	1	0	2	1	0	0	0	18	0	0	0	0	4	0	1	24
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
08:30	0	1	1	0	2	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	3	2
08:45	1	1	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	2	3
Total	1	2	1	0	4	1	1	0	2	2	0	0	0	25	0	0	0	0	5	0	6	32
16:00	0	0	2	0	2	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	3	1
16:15	1	0	0	0	1	0	0	0	0	0	0	0	0	3	0	3	0	0	1	3	4	4
16:30	0	0	1	0	1	1	0	0	0	1	0	0	0	1	0	1	0	0	0	1	3	1
16:45	0	0	1	0	1	0	0	0	0	0	0	0	0	4	0	1	0	0	2	1	2	6
Total	1	0	4	0	5	1	0	0	0	1	0	1	0	9	1	5	0	0	3	5	12	12
17:00	0	0	1	0	1	0	0	1	0	1	0	2	0	2	2	0	1	0	1	1	5	3
17:15	0	0	2	0	2	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	4	0
17:30	0	1	1	0	2	0	0	0	0	0	0	0	0	3	0	1	0	0	0	1	3	3
17:45	0	3	0	0	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3	2
Total	0	4	4	0	8	0	0	2	0	2	0	2	0	7	2	2	1	0	1	3	15	8
Grand Total	2	6	9	0	17	3	2	2	3	7	0	3	1	55	4	7	1	0	11	8	36	69
Apprch %	11.8%	35.3%	52.9%			42.9%	28.6%	28.6%			0.0%	75.0%	25.0%			87.5%	12.5%	0.0%				
Total %	5.6%	16.7%	25.0%		47.2%	8.3%	5.6%	5.6%		19.4%	0.0%	8.3%	2.8%		11.1%	19.4%	2.8%	0.0%		22.2%	100.0%	

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7467-001 SR 1-Reina Del Mar Avenue.ppd
Date : 6/2/2015

Bank 1 Count = Peds & Bikes

AM PEAK HOUR	SR 1 Southbound					Reina Del Mar Avenue Westbound					SR 1 Northbound					Reina Del Mar Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 07:45 to 08:45																					
Peak Hour For Entire Intersection Begins at 07:45																					
07:45	0	0	0	0	0	0	1	0	1	1	0	0	0	8	0	0	0	0	1	0	1
08:00	0	0	0	0	0	0	1	0	2	1	0	0	0	18	0	0	0	0	4	0	1
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
08:30	0	1	1	0	2	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	3
Total Volume	0	1	1	0	2	1	2	0	3	3	0	0	0	31	0	0	0	0	5	0	5
% App Total	0.0%	50.0%	50.0%			33.3%	66.7%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.250	.250		.250	.250	.500	.000		.750	.000	.000	.000		.000	.000	.000	.000		.000	.417

PM PEAK HOUR	SR 1 Southbound					Reina Del Mar Avenue Westbound					SR 1 Northbound					Reina Del Mar Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	0	0	1	0	1	1	0	0	0	1	0	0	0	1	0	1	0	0	0	1	3
16:45	0	0	1	0	1	0	0	0	0	0	0	0	0	4	0	1	0	0	2	1	2
17:00	0	0	1	0	1	0	0	1	0	1	0	2	0	2	2	0	1	0	1	1	5
17:15	0	0	2	0	2	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	4
Total Volume	0	0	5	0	5	1	0	2	0	3	0	2	0	7	2	3	1	0	3	4	14
% App Total	0.0%	0.0%	100.0%			33.3%	0.0%	66.7%			0.0%	100.0%	0.0%			75.0%	25.0%	0.0%			
PHF	.000	.000	.625		.625	.250	.000	.500		.750	.000	.250	.000		.250	.750	.250	.000		1.000	.700

Southbound Peds = North Leg (traveling EB or WB)
Westbound Peds = East Leg (traveling NB or SB)
Northbound Peds = South Leg (traveling EB or WB)
Eastbound Peds = West Leg (traveling NB or SB)

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7467-001 SR 1-Reina Del Mar Avenue.ppd
Date : 6/2/2015

Bank 2 Count = Nothing

	SR 1 Southbound					Reina Del Mar Avenue Westbound					SR 1 Northbound					Reina Del Mar Avenue Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Ped Total
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7467-001 SR 1-Reina Del Mar Avenue.ppd
Date : 6/2/2015

Bank 2 Count = Nothing

AM PEAK HOUR	SR 1 Southbound					Reina Del Mar Avenue Westbound					SR 1 Northbound					Reina Del Mar Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 07:45 to 08:45																					
Peak Hour For Entire Intersection Begins at 07:45																					
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

PM PEAK HOUR	SR 1 Southbound					Reina Del Mar Avenue Westbound					SR 1 Northbound					Reina Del Mar Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

Southbound Peds = North Leg (traveling EB or WB)
Westbound Peds = East Leg (traveling NB or SB)
Northbound Peds = South Leg (traveling EB or WB)
Eastbound Peds = West Leg (traveling NB or SB)

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7467-002 SR 1-Fassler Avenue.ppd
Date : 6/2/2015

Unshifted Count = All Vehicles

	SR 1 Southbound					Fassler Avenue Westbound					SR 1 Northbound					Rockaway Beach Avenue Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	24	79	5	0	108	1	0	216	0	217	0	475	1	0	476	8	2	4	0	14	815	0
07:15	37	120	4	0	161	2	4	189	0	195	2	429	2	0	433	8	0	4	0	12	801	0
07:30	27	126	9	0	162	1	2	183	0	186	1	394	1	0	396	14	1	5	0	20	764	0
07:45	67	204	12	0	283	1	3	197	0	201	2	410	1	0	413	15	1	4	0	20	917	0
Total	155	529	30	0	714	5	9	785	0	799	5	1708	5	0	1718	45	4	17	0	66	3297	0
08:00	82	197	13	0	292	3	4	190	0	197	5	351	3	0	359	14	3	4	0	21	869	0
08:15	105	197	9	0	311	4	1	178	0	183	5	392	0	0	397	13	0	5	0	18	909	0
08:30	75	171	8	0	254	3	7	198	0	208	5	277	1	0	283	9	5	7	0	21	766	0
08:45	64	220	9	0	293	2	4	172	0	178	13	314	5	1	333	7	2	9	0	18	822	1
Total	326	785	39	0	1150	12	16	738	0	766	28	1334	9	1	1372	43	10	25	0	78	3366	1
16:00	181	429	20	0	630	5	3	87	0	95	7	243	5	1	256	19	7	22	0	48	1029	1
16:15	171	395	18	0	584	2	7	74	0	83	13	235	5	0	253	19	3	15	0	37	957	0
16:30	164	407	17	0	588	4	5	100	0	109	8	226	2	0	236	13	3	12	0	28	961	0
16:45	168	410	16	0	594	4	7	74	0	85	12	256	1	0	269	24	7	15	0	46	994	0
Total	684	1641	71	0	2396	15	22	335	0	372	40	960	13	1	1014	75	20	64	0	159	3941	1
17:00	199	433	16	0	648	6	6	85	0	97	4	233	3	1	241	26	8	14	0	48	1034	1
17:15	231	454	14	0	699	7	3	83	0	93	13	236	1	1	251	19	10	15	0	44	1087	1
17:30	190	448	17	0	655	5	4	57	0	66	7	238	3	1	249	18	2	10	0	30	1000	1
17:45	207	402	23	0	632	4	8	85	0	97	9	208	5	0	222	25	8	17	0	50	1001	0
Total	827	1737	70	0	2634	22	21	310	0	353	33	915	12	3	963	88	28	56	0	172	4122	3
Grand Total	1992	4692	210	0	6894	54	68	2168	0	2290	106	4917	39	5	5067	251	62	162	0	475	14726	5
Apprch %	28.9%	68.1%	3.0%	0.0%		2.4%	3.0%	94.7%	0.0%		2.1%	97.0%	0.8%	0.1%		52.8%	13.1%	34.1%	0.0%			
Total %	13.5%	31.9%	1.4%	0.0%	46.8%	0.4%	0.5%	14.7%	0.0%	15.6%	0.7%	33.4%	0.3%	0.0%	34.4%	1.7%	0.4%	1.1%	0.0%	3.2%	100.0%	

ALL TRAFFIC DATA

City of Pacifica
(916) 771-8700
orders@atdtraffic.com

All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 15-7467-002 SR 1-Fassler Avenue.ppd
Date : 6/2/2015

Unshifted Count = All Vehicles

AM PEAK HOUR	SR 1 Southbound					Fassler Avenue Westbound					SR 1 Northbound					Rockaway Beach Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:45 to 08:45																					
Peak Hour For Entire Intersection Begins at 07:45																					
07:45	67	204	12	0	283	1	3	197	0	201	2	410	1	0	413	15	1	4	0	20	917
08:00	82	197	13	0	292	3	4	190	0	197	5	351	3	0	359	14	3	4	0	21	869
08:15	105	197	9	0	311	4	1	178	0	183	5	392	0	0	397	13	0	5	0	18	909
08:30	75	171	8	0	254	3	7	198	0	208	5	277	1	0	283	9	5	7	0	21	766
Total Volume	329	769	42	0	1140	11	15	763	0	789	17	1430	5	0	1452	51	9	20	0	80	3461
% App Total	28.9%	67.5%	3.7%	0.0%		1.4%	1.9%	96.7%	0.0%		1.2%	98.5%	0.3%	0.0%		63.8%	11.3%	25.0%	0.0%		
PHF	.783	.942	.808	.000	.916	.688	.536	.963	.000	.948	.850	.872	.417	.000	.879	.850	.450	.714	.000	.952	.944

PM PEAK HOUR	SR 1 Southbound					Fassler Avenue Westbound					SR 1 Northbound					Rockaway Beach Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	199	433	16	0	648	6	6	85	0	97	4	233	3	1	241	26	8	14	0	48	1034
17:15	231	454	14	0	699	7	3	83	0	93	13	236	1	1	251	19	10	15	0	44	1087
17:30	190	448	17	0	655	5	4	57	0	66	7	238	3	1	249	18	2	10	0	30	1000
17:45	207	402	23	0	632	4	8	85	0	97	9	208	5	0	222	25	8	17	0	50	1001
Total Volume	827	1737	70	0	2634	22	21	310	0	353	33	915	12	3	963	88	28	56	0	172	4122
% App Total	31.4%	65.9%	2.7%	0.0%		6.2%	5.9%	87.8%	0.0%		3.4%	95.0%	1.2%	0.3%		51.2%	16.3%	32.6%	0.0%		
PHF	.895	.956	.761	.000	.942	.786	.656	.912	.000	.910	.635	.961	.600	.750	.959	.846	.700	.824	.000	.860	.948

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7467-002 SR 1-Fassler Avenue.ppd
Date : 6/2/2015

Bank 1 Count = Peds & Bikes

	SR 1 Southbound					Fassler Avenue Westbound					SR 1 Northbound					Rockaway Beach Avenue Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Ped Total
07:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
07:45	0	0	0	0	0	0	0	0	1	0	0	1	0	6	1	0	0	0	0	0	1	7
Total	0	0	0	0	0	0	0	0	1	0	0	2	0	9	2	0	0	0	0	0	2	10
08:00	0	0	0	0	0	0	0	0	12	0	0	0	0	13	0	0	0	0	9	0	0	34
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0	4
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	12	0	0	14
08:45	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	5	0	1	7
Total	0	1	0	0	1	0	0	0	12	0	0	0	0	18	0	0	0	0	29	0	1	59
16:00	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	1
16:15	0	0	0	0	0	0	0	0	2	0	2	0	0	2	2	0	1	0	0	1	3	4
16:30	0	0	0	0	0	0	1	0	2	1	0	0	0	5	0	0	0	0	0	0	1	7
16:45	0	0	0	0	0	0	1	0	2	1	0	0	0	3	0	0	0	0	0	0	1	5
Total	0	0	0	0	0	0	2	0	6	2	3	0	0	11	3	0	1	0	0	1	6	17
17:00	0	0	1	0	1	0	1	0	1	1	0	0	0	2	0	0	0	0	0	0	2	3
17:15	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1	1	0	3	3	2
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	1	1
17:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0
Total	0	1	1	0	2	0	1	0	2	1	0	0	0	4	0	2	1	2	0	5	8	6
Grand Total	0	2	1	0	3	0	3	0	21	3	3	2	0	42	5	2	2	2	29	6	17	92
Apprch %	0.0%	66.7%	33.3%			0.0%	100.0%	0.0%			60.0%	40.0%	0.0%			33.3%	33.3%	33.3%				
Total %	0.0%	11.8%	5.9%		17.6%	0.0%	17.6%	0.0%		17.6%	17.6%	11.8%	0.0%		29.4%	11.8%	11.8%	11.8%		35.3%	100.0%	

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7467-002 SR 1-Fassler Avenue.ppd
Date : 6/2/2015

Bank 1 Count = Peds & Bikes

AM PEAK HOUR	SR 1 Southbound					Fassler Avenue Westbound					SR 1 Northbound					Rockaway Beach Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 07:45 to 08:45																					
Peak Hour For Entire Intersection Begins at 07:45																					
07:45	0	0	0	0	0	0	0	0	1	0	0	1	0	6	1	0	0	0	0	0	1
08:00	0	0	0	0	0	0	0	0	12	0	0	0	0	13	0	0	0	0	9	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	12	0	0
Total Volume	0	0	0	0	0	0	0	0	13	0	0	1	0	22	1	0	0	0	24	0	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.250

PM PEAK HOUR	SR 1 Southbound					Fassler Avenue Westbound					SR 1 Northbound					Rockaway Beach Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	0	1	0	1	0	1	0	1	1	0	0	0	2	0	0	0	0	0	0	2
17:15	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1	1	0	3	3
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	1
17:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
Total Volume	0	1	1	0	2	0	1	0	2	1	0	0	0	4	0	2	1	2	0	5	8
% App Total	0.0%	50.0%	50.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			40.0%	20.0%	40.0%			
PHF	.000	.250	.250		.500	.000	.250	.000		.250	.000	.000	.000		.000	.500	.250	.500		.417	.667

Southbound Peds = North Leg (traveling EB or WB)
Westbound Peds = East Leg (traveling NB or SB)
Northbound Peds = South Leg (traveling EB or WB)
Eastbound Peds = West Leg (traveling NB or SB)

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7467-002 SR 1-Fassler Avenue.ppd
Date : 6/2/2015

Bank 2 Count = Nothing

	SR 1 Southbound					Fassler Avenue Westbound					SR 1 Northbound					Rockaway Beach Avenue Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Ped Total
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	

ALL TRAFFIC DATA

City of Pacifica
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

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orders@atdtraffic.com

File Name : 15-7467-002 SR 1-Fassler Avenue.ppd
Date : 6/2/2015

Bank 2 Count = Nothing

AM PEAK HOUR	SR 1 Southbound					Fassler Avenue Westbound					SR 1 Northbound					Rockaway Beach Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 07:45 to 08:45																					
Peak Hour For Entire Intersection Begins at 07:45																					
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

PM PEAK HOUR	SR 1 Southbound					Fassler Avenue Westbound					SR 1 Northbound					Rockaway Beach Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

Southbound Peds = North Leg (traveling EB or WB)
Westbound Peds = East Leg (traveling NB or SB)
Northbound Peds = South Leg (traveling EB or WB)
Eastbound Peds = West Leg (traveling NB or SB)

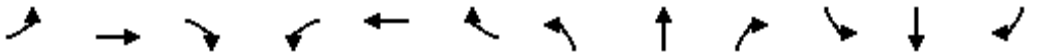
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	6	65	3	96	0	341	3	1	2114	147	8	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-2%				2%			
Total Lost time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Lane Util. Factor		1.00			1.00	1.00		1.00	0.95	1.00		1.00
Frpb, ped/bikes		1.00			1.00	0.98		1.00	1.00	0.96		1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Frt		0.99			1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		1.00			0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1802			1787	1564		1752	2800	1506		1787
Flt Permitted		1.00			0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1802			1787	1564		1752	2800	1506		1787
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	6	69	3	102	0	363	3	1	2249	156	9	133
RTOR Reduction (vph)	0	1	0	0	0	161	0	0	0	10	0	0
Lane Group Flow (vph)	0	77	0	0	102	202	0	4	2249	146	0	142
Confl. Peds. (#/hr)			31							3		
Confl. Bikes (#/hr)						3						
Turn Type	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	4	4		3	3		5	5	2		1	1
Permitted Phases						3				2		
Actuated Green, G (s)		27.8			20.5	20.5		2.9	227.0	227.0		26.0
Effective Green, g (s)		27.8			20.5	20.5		2.9	227.0	227.0		26.0
Actuated g/C Ratio		0.09			0.06	0.06		0.01	0.72	0.72		0.08
Clearance Time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	5.5	5.5		3.0
Lane Grp Cap (vph)		158			115	101		16	2010	1081		146
v/s Ratio Prot		c0.04			0.06			0.00	c0.80			c0.08
v/s Ratio Perm						c0.13				0.10		
v/c Ratio		0.49			0.89	2.00		0.25	1.12	0.14		0.97
Uniform Delay, d1		137.4			146.7	147.8		155.5	44.6	13.9		144.7
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		2.4			50.0	483.9		8.1	60.9	0.1		65.8
Delay (s)		139.7			196.7	631.7		163.6	105.5	14.1		210.5
Level of Service		F			F	F		F	F	B		F
Approach Delay (s)		139.7			536.2				99.6			
Approach LOS		F			F				F			

Intersection Summary			
HCM 2000 Control Delay	126.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	316.1	Sum of lost time (s)	14.8
Intersection Capacity Utilization	119.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1050	91
Ideal Flow (vphpl)	1900	1900
Grade (%)	-2%	
Total Lost time (s)	4.8	
Lane Util. Factor	0.95	
Frpb, ped/bikes	0.99	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3513	
Flt Permitted	1.00	
Satd. Flow (perm)	3513	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1117	97
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1213	0
Confl. Peds. (#/hr)		5
Confl. Bikes (#/hr)		2
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	250.1	
Effective Green, g (s)	250.1	
Actuated g/C Ratio	0.79	
Clearance Time (s)	4.8	
Vehicle Extension (s)	6.0	
Lane Grp Cap (vph)	2779	
v/s Ratio Prot	0.35	
v/s Ratio Perm		
v/c Ratio	0.44	
Uniform Delay, d1	10.5	
Progression Factor	1.00	
Incremental Delay, d2	0.3	
Delay (s)	10.8	
Level of Service	B	
Approach Delay (s)	31.7	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	9	20	11	15	763	17	1430	5	329	769	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-4%			-5%			-1%	
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.96		1.00	1.00	1.00	1.00	0.97	1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1761	1494		1860	2842	1814	1500	1572	3450	3557	1535
Flt Permitted		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1761	1494		1860	2842	1814	1500	1572	3450	3557	1535
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	54	10	21	12	16	812	18	1521	5	350	818	45
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	2	0	0	9
Lane Group Flow (vph)	0	64	2	0	28	812	18	1521	3	350	818	36
Confl. Peds. (#/hr)			22						13			24
Confl. Bikes (#/hr)									1			
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8	1	5	2		1	6	
Permitted Phases			7						2			6
Actuated Green, G (s)		11.7	11.7		5.1	30.4	3.1	83.0	83.0	30.4	110.3	110.3
Effective Green, g (s)		11.7	11.7		5.1	30.4	3.1	83.0	83.0	30.4	110.3	110.3
Actuated g/C Ratio		0.08	0.08		0.04	0.21	0.02	0.57	0.57	0.21	0.76	0.76
Clearance Time (s)		3.0	3.0		3.0	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Vehicle Extension (s)		3.2	3.2		3.2	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Lane Grp Cap (vph)		142	120		65	597	38	860	901	724	2711	1170
v/s Ratio Prot		c0.04			c0.02	c0.29	0.01	c1.01		0.10	0.23	
v/s Ratio Perm			0.00						0.00			0.02
v/c Ratio		0.45	0.01		0.43	1.36	0.47	1.77	0.00	0.48	0.30	0.03
Uniform Delay, d1		63.4	61.2		68.4	57.1	70.0	30.8	13.2	50.2	5.3	4.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.4	0.1		4.9	172.7	9.0	350.6	0.0	0.5	0.2	0.0
Delay (s)		65.9	61.2		73.2	229.9	79.0	381.5	13.2	50.8	5.5	4.2
Level of Service		E	E		E	F	E	F	B	D	A	A
Approach Delay (s)		64.7			224.7			376.8			18.5	
Approach LOS		E			F			F			B	

Intersection Summary			
HCM 2000 Control Delay	216.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.50		
Actuated Cycle Length (s)	144.7	Sum of lost time (s)	14.5
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	9	4	5	105	2	139	7	2	1333	72	10	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-2%				2%			
Total Lost time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Lane Util. Factor		1.00			0.95	0.95		1.00	0.95	1.00		1.00
Frpb, ped/bikes		0.99			1.00	0.98		1.00	1.00	0.98		1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Frt		0.96			0.98	0.85		1.00	1.00	0.85		1.00
Flt Protected		0.98			0.96	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1695			1670	1490		1752	3504	1534		1787
Flt Permitted		0.98			0.96	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1695			1670	1490		1752	3504	1534		1787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	4	5	111	2	146	7	2	1403	76	11	205
RTOR Reduction (vph)	0	5	0	0	3	63	0	0	0	18	0	0
Lane Group Flow (vph)	0	13	0	0	132	61	0	9	1403	58	0	216
Confl. Peds. (#/hr)			7									
Confl. Bikes (#/hr)			4			3				2		
Turn Type	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	4	4		3	3		5	5	2 10		1 9	1 9
Permitted Phases						3				2 10		
Actuated Green, G (s)		12.9			20.6	20.6		2.9	129.0	129.0		32.7
Effective Green, g (s)		12.9			20.6	20.6		2.9	129.0	129.0		32.7
Actuated g/C Ratio		0.06			0.09	0.09		0.01	0.59	0.59		0.15
Clearance Time (s)		3.5			3.5	3.5		3.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		100			157	140		23	2075	908		268
v/s Ratio Prot		c0.01			c0.08			0.01	0.40			c0.12
v/s Ratio Perm						0.04				0.04		
v/c Ratio		0.13			0.84	0.43		0.39	0.68	0.06		0.81
Uniform Delay, d1		97.1			97.0	93.1		106.6	30.2	18.8		89.5
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		0.6			31.6	2.1		10.7	1.3	0.1		16.0
Delay (s)		97.8			128.6	95.2		117.2	31.5	18.9		105.5
Level of Service		F			F	F		F	C	B		F
Approach Delay (s)		97.8			112.6				31.3			
Approach LOS		F			F				C			

Intersection Summary			
HCM 2000 Control Delay	132.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	217.8	Sum of lost time (s)	22.6
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	2472	11
Ideal Flow (vphpl)	1900	1900
Grade (%)	-2%	
Total Lost time (s)	4.8	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	2500	
Flt Permitted	1.00	
Satd. Flow (perm)	2500	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	2602	12
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	2614	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		5
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	166.6	
Effective Green, g (s)	166.6	
Actuated g/C Ratio	0.76	
Clearance Time (s)	4.8	
Vehicle Extension (s)	6.0	
Lane Grp Cap (vph)	1912	
v/s Ratio Prot	c1.05	
v/s Ratio Perm		
v/c Ratio	1.37	
Uniform Delay, d1	25.6	
Progression Factor	1.00	
Incremental Delay, d2	168.7	
Delay (s)	194.3	
Level of Service	F	
Approach Delay (s)	187.5	
Approach LOS	F	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	88	28	56	22	21	310	3	33	915	12	827	1737
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-4%				-5%			-1%
Total Lost time (s)		3.0	3.0		3.0	3.0		3.0	5.5	5.5	3.0	5.5
Lane Util. Factor		1.00	1.00		1.00	0.88		1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes		1.00	0.98		1.00	1.00		1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.96	1.00		0.98	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1767	1522		1853	2842		1814	3628	1599	3450	2000
Flt Permitted		0.96	1.00		0.98	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1767	1522		1853	2842		1814	3628	1599	3450	2000
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	93	29	59	23	22	326	3	35	963	13	871	1828
RTOR Reduction (vph)	0	0	50	0	0	223	0	0	0	9	0	0
Lane Group Flow (vph)	0	122	9	0	45	103	0	38	963	4	871	1828
Confl. Peds. (#/hr)			4							2		
Confl. Bikes (#/hr)			5			1						
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	7		8	8	1 9	5	5	2		1 9	6
Permitted Phases			7							2		
Actuated Green, G (s)		21.7	21.7		7.5	43.5		6.5	47.3	47.3	43.5	87.3
Effective Green, g (s)		21.7	21.7		7.5	43.5		6.5	47.3	47.3	43.5	87.3
Actuated g/C Ratio		0.16	0.16		0.05	0.32		0.05	0.34	0.34	0.32	0.63
Clearance Time (s)		3.0	3.0		3.0			3.0	5.5	5.5		5.5
Vehicle Extension (s)		3.2	3.2		3.2			3.0	5.5	5.5		5.5
Lane Grp Cap (vph)		278	240		101	899		85	1248	550	1091	1269
v/s Ratio Prot		c0.07			c0.02	0.04		0.02	0.27		c0.25	c0.91
v/s Ratio Perm			0.01							0.00		
v/c Ratio		0.44	0.04		0.45	0.11		0.45	0.77	0.01	0.80	1.44
Uniform Delay, d1		52.4	49.1		63.0	33.3		63.8	40.3	29.7	43.0	25.1
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.2	0.1		3.3	0.1		3.7	3.7	0.0	4.2	202.8
Delay (s)		53.6	49.1		66.3	33.4		67.5	44.0	29.7	47.1	227.9
Level of Service		D	D		E	C		E	D	C	D	F
Approach Delay (s)		52.1			37.4				44.7			165.3
Approach LOS		D			D				D			F

Intersection Summary			
HCM 2000 Control Delay	121.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	137.5	Sum of lost time (s)	17.5
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	70
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1558
Flt Permitted	1.00
Satd. Flow (perm)	1558
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	74
RTOR Reduction (vph)	14
Lane Group Flow (vph)	60
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	2
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	87.3
Effective Green, g (s)	87.3
Actuated g/C Ratio	0.63
Clearance Time (s)	5.5
Vehicle Extension (s)	5.5
Lane Grp Cap (vph)	989
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.06
Uniform Delay, d1	9.5
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	9.6
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

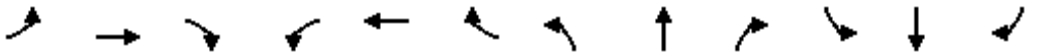
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	6	65	3	96	0	341	3	1	2130	148	8	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-2%				2%			
Total Lost time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Lane Util. Factor		1.00			1.00	1.00		1.00	0.95	1.00		1.00
Frpb, ped/bikes		1.00			1.00	0.98		1.00	1.00	0.96		1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Frt		0.99			1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		1.00			0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1802			1787	1564		1752	2800	1506		1787
Flt Permitted		1.00			0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1802			1787	1564		1752	2800	1506		1787
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	6	69	3	102	0	363	3	1	2266	157	9	133
RTOR Reduction (vph)	0	1	0	0	0	161	0	0	0	10	0	0
Lane Group Flow (vph)	0	77	0	0	102	202	0	4	2266	147	0	142
Confl. Peds. (#/hr)			31							3		
Confl. Bikes (#/hr)						3						
Turn Type	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	4	4		3	3		5	5	2		1	1
Permitted Phases						3				2		
Actuated Green, G (s)		27.8			20.5	20.5		2.9	227.0	227.0		26.0
Effective Green, g (s)		27.8			20.5	20.5		2.9	227.0	227.0		26.0
Actuated g/C Ratio		0.09			0.06	0.06		0.01	0.72	0.72		0.08
Clearance Time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	5.5	5.5		3.0
Lane Grp Cap (vph)		158			115	101		16	2010	1081		146
v/s Ratio Prot		c0.04			0.06			0.00	c0.81			c0.08
v/s Ratio Perm						c0.13				0.10		
v/c Ratio		0.49			0.89	2.00		0.25	1.13	0.14		0.97
Uniform Delay, d1		137.4			146.7	147.8		155.5	44.6	13.9		144.7
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		2.4			50.0	483.9		8.1	64.4	0.1		65.8
Delay (s)		139.7			196.7	631.7		163.6	108.9	14.1		210.5
Level of Service		F			F	F		F	F	B		F
Approach Delay (s)		139.7			536.2				102.9			
Approach LOS		F			F				F			

Intersection Summary			
HCM 2000 Control Delay	127.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	316.1	Sum of lost time (s)	14.8
Intersection Capacity Utilization	120.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1056	91
Ideal Flow (vphpl)	1900	1900
Grade (%)	-2%	
Total Lost time (s)	4.8	
Lane Util. Factor	0.95	
Frpb, ped/bikes	0.99	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3513	
Flt Permitted	1.00	
Satd. Flow (perm)	3513	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1123	97
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1219	0
Confl. Peds. (#/hr)		5
Confl. Bikes (#/hr)		2
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	250.1	
Effective Green, g (s)	250.1	
Actuated g/C Ratio	0.79	
Clearance Time (s)	4.8	
Vehicle Extension (s)	6.0	
Lane Grp Cap (vph)	2779	
v/s Ratio Prot	0.35	
v/s Ratio Perm		
v/c Ratio	0.44	
Uniform Delay, d1	10.6	
Progression Factor	1.00	
Incremental Delay, d2	0.3	
Delay (s)	10.9	
Level of Service	B	
Approach Delay (s)	31.7	
Approach LOS	C	

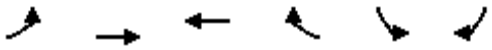
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	9	20	11	15	780	17	1430	5	335	769	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-4%			-5%			-1%	
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.96		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1761	1494		1860	2842	1814	1500	1538	3450	3557	1535
Flt Permitted		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1761	1494		1860	2842	1814	1500	1538	3450	3557	1535
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	54	10	21	12	16	830	18	1521	5	356	818	45
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	2	0	0	9
Lane Group Flow (vph)	0	64	2	0	28	830	18	1521	3	356	818	36
Confl. Peds. (#/hr)			22						13			24
Confl. Bikes (#/hr)									1			
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8	1	5	2		1	6	
Permitted Phases			7						2			6
Actuated Green, G (s)		11.7	11.7		5.1	30.4	3.1	83.0	83.0	30.4	110.3	110.3
Effective Green, g (s)		11.7	11.7		5.1	30.4	3.1	83.0	83.0	30.4	110.3	110.3
Actuated g/C Ratio		0.08	0.08		0.04	0.21	0.02	0.57	0.57	0.21	0.76	0.76
Clearance Time (s)		3.0	3.0		3.0	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Vehicle Extension (s)		3.2	3.2		3.2	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Lane Grp Cap (vph)		142	120		65	597	38	860	882	724	2711	1170
v/s Ratio Prot		c0.04			c0.02	c0.29	0.01	c1.01		0.10	0.23	
v/s Ratio Perm			0.00						0.00			0.02
v/c Ratio		0.45	0.01		0.43	1.39	0.47	1.77	0.00	0.49	0.30	0.03
Uniform Delay, d1		63.4	61.2		68.4	57.1	70.0	30.8	13.2	50.3	5.3	4.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.4	0.1		4.9	185.8	9.0	350.6	0.0	0.5	0.2	0.0
Delay (s)		65.9	61.2		73.2	242.9	79.0	381.5	13.2	50.9	5.5	4.2
Level of Service		E	E		E	F	E	F	B	D	A	A
Approach Delay (s)		64.7			237.4			376.8			18.7	
Approach LOS		E			F			F			B	

Intersection Summary			
HCM 2000 Control Delay	219.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	144.7	Sum of lost time (s)	14.5
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	6	531	1166	1	2	18
Sign Control		Free	Free		Stop	
Grade		7%	-12%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	577	1267	1	2	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1268				1858	1268
vC1, stage 1 conf vol					1268	
vC2, stage 2 conf vol					590	
vCu, unblocked vol	1268				1858	1268
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	90
cM capacity (veh/h)	548				240	206

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	7	577	1268	22
Volume Left	7	0	0	2
Volume Right	0	0	1	20
cSH	548	1700	1700	209
Volume to Capacity	0.01	0.34	0.75	0.10
Queue Length 95th (ft)	1	0	0	9
Control Delay (s)	11.7	0.0	0.0	24.2
Lane LOS	B			C
Approach Delay (s)	0.1		0.0	24.2
Approach LOS				C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	9	4	5	106	2	139	7	2	1342	72	10	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-2%				2%			
Total Lost time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Lane Util. Factor		1.00			0.95	0.95		1.00	0.95	1.00		1.00
Frpb, ped/bikes		0.99			1.00	0.98		1.00	1.00	0.98		1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Frt		0.96			0.98	0.85		1.00	1.00	0.85		1.00
Flt Protected		0.98			0.96	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1695			1670	1490		1752	3504	1534		1787
Flt Permitted		0.98			0.96	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1695			1670	1490		1752	3504	1534		1787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	4	5	112	2	146	7	2	1413	76	11	205
RTOR Reduction (vph)	0	5	0	0	3	63	0	0	0	18	0	0
Lane Group Flow (vph)	0	13	0	0	133	61	0	9	1413	58	0	216
Confl. Peds. (#/hr)			7									
Confl. Bikes (#/hr)			4			3				2		
Turn Type	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	4	4		3	3		5	5	2 10		1 9	1 9
Permitted Phases						3				2 10		
Actuated Green, G (s)		12.9			20.7	20.7		2.9	129.0	129.0		32.7
Effective Green, g (s)		12.9			20.7	20.7		2.9	129.0	129.0		32.7
Actuated g/C Ratio		0.06			0.09	0.09		0.01	0.59	0.59		0.15
Clearance Time (s)		3.5			3.5	3.5		3.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		100			158	141		23	2074	908		268
v/s Ratio Prot		c0.01			c0.08			0.01	0.40			c0.12
v/s Ratio Perm						0.04				0.04		
v/c Ratio		0.13			0.84	0.43		0.39	0.68	0.06		0.81
Uniform Delay, d1		97.2			97.0	93.0		106.6	30.4	18.9		89.5
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		0.6			31.6	2.1		10.7	1.3	0.1		16.0
Delay (s)		97.8			128.6	95.1		117.3	31.7	18.9		105.6
Level of Service		F			F	F		F	C	B		F
Approach Delay (s)		97.8			112.6				31.6			
Approach LOS		F			F				C			

Intersection Summary			
HCM 2000 Control Delay	134.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	217.9	Sum of lost time (s)	22.6
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	2486	11
Ideal Flow (vphpl)	1900	1900
Grade (%)	-2%	
Total Lost time (s)	4.8	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	2500	
Flt Permitted	1.00	
Satd. Flow (perm)	2500	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	2617	12
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	2629	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		5
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	166.6	
Effective Green, g (s)	166.6	
Actuated g/C Ratio	0.76	
Clearance Time (s)	4.8	
Vehicle Extension (s)	6.0	
Lane Grp Cap (vph)	1911	
v/s Ratio Prot	c1.05	
v/s Ratio Perm		
v/c Ratio	1.38	
Uniform Delay, d1	25.7	
Progression Factor	1.00	
Incremental Delay, d2	172.5	
Delay (s)	198.1	
Level of Service	F	
Approach Delay (s)	191.1	
Approach LOS	F	

Intersection Summary

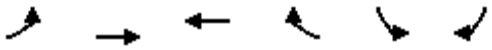
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	88	29	56	22	22	319	3	33	915	12	842	1737
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-4%				-5%			-1%
Total Lost time (s)		3.0	3.0		3.0	3.0		3.0	5.5	5.5	3.0	5.5
Lane Util. Factor		1.00	1.00		1.00	0.88		1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes		1.00	0.98		1.00	1.00		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.96	1.00		0.98	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1768	1522		1854	2842		1814	3628	1583	3450	2000
Flt Permitted		0.96	1.00		0.98	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1768	1522		1854	2842		1814	3628	1583	3450	2000
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	93	31	59	23	23	336	3	35	963	13	886	1828
RTOR Reduction (vph)	0	0	50	0	0	229	0	0	0	9	0	0
Lane Group Flow (vph)	0	124	9	0	46	107	0	38	963	4	886	1828
Confl. Peds. (#/hr)			4							2		
Confl. Bikes (#/hr)			5			1						
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	7		8	8	1 9	5	5	2		1 9	6
Permitted Phases			7							2		
Actuated Green, G (s)		21.8	21.8		7.6	44.1		6.5	47.5	47.5	44.1	88.1
Effective Green, g (s)		21.8	21.8		7.6	44.1		6.5	47.5	47.5	44.1	88.1
Actuated g/C Ratio		0.16	0.16		0.05	0.32		0.05	0.34	0.34	0.32	0.64
Clearance Time (s)		3.0	3.0		3.0			3.0	5.5	5.5		5.5
Vehicle Extension (s)		3.2	3.2		3.2			3.0	5.5	5.5		5.5
Lane Grp Cap (vph)		278	239		101	904		85	1244	542	1098	1272
v/s Ratio Prot		c0.07			c0.02	0.04		0.02	0.27		c0.26	c0.91
v/s Ratio Perm			0.01							0.00		
v/c Ratio		0.45	0.04		0.46	0.12		0.45	0.77	0.01	0.81	1.44
Uniform Delay, d1		52.9	49.5		63.4	33.4		64.3	40.7	30.0	43.3	25.2
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.2	0.1		3.5	0.1		3.7	3.7	0.0	4.4	201.2
Delay (s)		54.1	49.5		66.9	33.5		68.0	44.4	30.0	47.7	226.4
Level of Service		D	D		E	C		E	D	C	D	F
Approach Delay (s)		52.6			37.5				45.1			163.9
Approach LOS		D			D				D			F

Intersection Summary			
HCM 2000 Control Delay	120.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	138.5	Sum of lost time (s)	17.5
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	70
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1558
Flt Permitted	1.00
Satd. Flow (perm)	1558
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	74
RTOR Reduction (vph)	14
Lane Group Flow (vph)	60
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	2
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	88.1
Effective Green, g (s)	88.1
Actuated g/C Ratio	0.64
Clearance Time (s)	5.5
Vehicle Extension (s)	5.5
Lane Grp Cap (vph)	991
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.06
Uniform Delay, d1	9.5
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	9.6
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	770	460	2	1	10
Sign Control		Free	Free		Stop	
Grade		7%	-12%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	837	500	2	1	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	502				1373	501
vC1, stage 1 conf vol					501	
vC2, stage 2 conf vol					872	
vCu, unblocked vol	502				1373	501
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	98
cM capacity (veh/h)	1062				355	570

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	17	837	502	12
Volume Left	17	0	0	1
Volume Right	0	0	2	11
cSH	1062	1700	1700	540
Volume to Capacity	0.02	0.49	0.30	0.02
Queue Length 95th (ft)	1	0	0	2
Control Delay (s)	8.4	0.0	0.0	11.8
Lane LOS	A			B
Approach Delay (s)	0.2		0.0	11.8
Approach LOS				B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

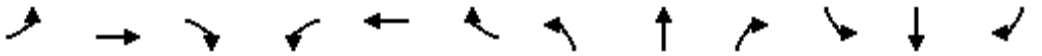
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	7	67	3	110	1	367	3	2	2437	172	8	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-2%				2%			
Total Lost time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Lane Util. Factor		1.00			1.00	1.00		1.00	0.95	1.00		1.00
Frpb, ped/bikes		1.00			1.00	0.98		1.00	1.00	0.96		1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Frt		0.99			1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		1.00			0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1802			1793	1564		1752	2800	1506		1787
Flt Permitted		1.00			0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1802			1793	1564		1752	2800	1506		1787
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	7	71	3	117	1	390	3	2	2593	183	9	151
RTOR Reduction (vph)	0	0	0	0	0	150	0	0	0	10	0	0
Lane Group Flow (vph)	0	81	0	0	118	240	0	5	2593	173	0	160
Confl. Peds. (#/hr)			31							3		
Confl. Bikes (#/hr)						3						
Turn Type	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	4	4		3	3		5	5	2		1	1
Permitted Phases						3				2		
Actuated Green, G (s)		27.9			20.5	20.5		3.0	227.0	227.0		26.0
Effective Green, g (s)		27.9			20.5	20.5		3.0	227.0	227.0		26.0
Actuated g/C Ratio		0.09			0.06	0.06		0.01	0.72	0.72		0.08
Clearance Time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	5.5	5.5		3.0
Lane Grp Cap (vph)		159			116	101		16	2010	1081		146
v/s Ratio Prot		c0.04			0.07			0.00	c0.93			c0.09
v/s Ratio Perm						c0.15				0.12		
v/c Ratio		0.51			1.02	2.38		0.31	1.29	0.16		1.10
Uniform Delay, d1		137.6			147.8	147.8		155.6	44.6	14.2		145.1
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		2.6			88.2	650.3		10.9	134.4	0.2		102.5
Delay (s)		140.2			236.1	798.2		166.4	179.0	14.4		247.6
Level of Service		F			F	F		F	F	B		F
Approach Delay (s)		140.2			667.6				168.1			
Approach LOS		F			F				F			

Intersection Summary			
HCM 2000 Control Delay	178.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	316.2	Sum of lost time (s)	14.8
Intersection Capacity Utilization	131.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1178	94
Ideal Flow (vphpl)	1900	1900
Grade (%)	-2%	
Total Lost time (s)	4.8	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3518	
Flt Permitted	1.00	
Satd. Flow (perm)	3518	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1253	100
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1352	0
Confl. Peds. (#/hr)		5
Confl. Bikes (#/hr)		2
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	250.0	
Effective Green, g (s)	250.0	
Actuated g/C Ratio	0.79	
Clearance Time (s)	4.8	
Vehicle Extension (s)	6.0	
Lane Grp Cap (vph)	2781	
v/s Ratio Prot	0.38	
v/s Ratio Perm		
v/c Ratio	0.49	
Uniform Delay, d1	11.3	
Progression Factor	1.00	
Incremental Delay, d2	0.4	
Delay (s)	11.6	
Level of Service	B	
Approach Delay (s)	36.6	
Approach LOS	D	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	11	22	15	19	866	21	1674	7	394	873	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-4%			-5%			-1%	
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.96		1.00	1.00	1.00	1.00	0.97	1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1761	1493		1859	2842	1814	1500	1571	3450	3557	1534
Flt Permitted		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1761	1493		1859	2842	1814	1500	1571	3450	3557	1534
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	60	12	23	16	20	921	22	1781	7	419	929	49
RTOR Reduction (vph)	0	0	21	0	0	0	0	0	3	0	0	10
Lane Group Flow (vph)	0	72	2	0	36	921	22	1781	4	419	929	39
Confl. Peds. (#/hr)			22						13			24
Confl. Bikes (#/hr)									1			
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8	1	5	2		1	6	
Permitted Phases			7						2			6
Actuated Green, G (s)		14.0	14.0		7.2	30.2	4.8	81.9	81.9	30.2	107.3	107.3
Effective Green, g (s)		14.0	14.0		7.2	30.2	4.8	81.9	81.9	30.2	107.3	107.3
Actuated g/C Ratio		0.09	0.09		0.05	0.20	0.03	0.55	0.55	0.20	0.73	0.73
Clearance Time (s)		3.0	3.0		3.0	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Vehicle Extension (s)		3.2	3.2		3.2	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Lane Grp Cap (vph)		166	141		90	580	58	831	870	704	2582	1113
v/s Ratio Prot		c0.04			c0.02	c0.32	0.01	c1.19		0.12	0.26	
v/s Ratio Perm			0.00						0.00			0.03
v/c Ratio		0.43	0.02		0.40	1.59	0.38	2.14	0.00	0.60	0.36	0.03
Uniform Delay, d1		63.2	60.7		68.2	58.8	70.0	33.0	14.7	53.3	7.5	5.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.9	0.0		3.1	272.7	4.1	518.5	0.0	1.4	0.2	0.0
Delay (s)		65.1	60.7		71.3	331.5	74.2	551.4	14.7	54.6	7.7	5.7
Level of Service		E	E		E	F	E	F	B	D	A	A
Approach Delay (s)		64.0			321.7			543.5			21.7	
Approach LOS		E			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	311.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.74		
Actuated Cycle Length (s)	147.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	103.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	9	5	7	124	2	150	7	3	1526	86	10	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-2%				2%			
Total Lost time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Lane Util. Factor		1.00			0.95	0.95		1.00	0.95	1.00		1.00
Frpb, ped/bikes		0.99			1.00	0.98		1.00	1.00	0.98		1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Frt		0.95			0.98	0.85		1.00	1.00	0.85		1.00
Flt Protected		0.98			0.96	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1684			1677	1490		1752	3504	1534		1787
Flt Permitted		0.98			0.96	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1684			1677	1490		1752	3504	1534		1787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	5	7	131	2	158	7	3	1606	91	11	229
RTOR Reduction (vph)	0	7	0	0	2	63	0	0	0	18	0	0
Lane Group Flow (vph)	0	14	0	0	150	76	0	10	1606	73	0	240
Confl. Peds. (#/hr)			7									
Confl. Bikes (#/hr)			4			3				2		
Turn Type	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	4	4		3	3		5	5	2 10		1 9	1 9
Permitted Phases						3				2 10		
Actuated Green, G (s)		14.3			20.7	20.7		3.0	127.4	127.4		34.2
Effective Green, g (s)		14.3			20.7	20.7		3.0	127.4	127.4		34.2
Actuated g/C Ratio		0.07			0.09	0.09		0.01	0.58	0.58		0.16
Clearance Time (s)		3.5			3.5	3.5		3.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		109			158	140		23	2036	891		278
v/s Ratio Prot		c0.01			c0.09			0.01	0.46			c0.13
v/s Ratio Perm						0.05				0.05		
v/c Ratio		0.13			0.95	0.54		0.43	0.79	0.08		0.86
Uniform Delay, d1		96.6			98.7	94.7		107.3	35.5	20.2		90.2
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		0.6			56.8	4.2		12.6	2.5	0.1		23.1
Delay (s)		97.2			155.5	98.9		119.9	38.0	20.3		113.3
Level of Service		F			F	F		F	D	C		F
Approach Delay (s)		97.2			128.5				37.6			
Approach LOS		F			F				D			

Intersection Summary			
HCM 2000 Control Delay	187.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	219.2	Sum of lost time (s)	22.6
Intersection Capacity Utilization	108.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	2817	11
Ideal Flow (vphpl)	1900	1900
Grade (%)	-2%	
Total Lost time (s)	4.8	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	2500	
Flt Permitted	1.00	
Satd. Flow (perm)	2500	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	2965	12
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	2977	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		5
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	166.4	
Effective Green, g (s)	166.4	
Actuated g/C Ratio	0.76	
Clearance Time (s)	4.8	
Vehicle Extension (s)	6.0	
Lane Grp Cap (vph)	1897	
v/s Ratio Prot	c1.19	
v/s Ratio Perm		
v/c Ratio	1.57	
Uniform Delay, d1	26.4	
Progression Factor	1.00	
Incremental Delay, d2	258.8	
Delay (s)	285.2	
Level of Service	F	
Approach Delay (s)	272.4	
Approach LOS	F	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	96	33	60	26	24	371	3	38	1064	16	982	1942
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-4%				-5%			-1%
Total Lost time (s)		3.0	3.0		3.0	3.0		3.0	5.5	5.5	3.0	5.5
Lane Util. Factor		1.00	1.00		1.00	0.88		1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes		1.00	0.97		1.00	1.00		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.96	1.00		0.97	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1769	1520		1852	2842		1814	3628	1598	3450	2000
Flt Permitted		0.96	1.00		0.97	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1769	1520		1852	2842		1814	3628	1598	3450	2000
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	101	35	63	27	25	391	3	40	1120	17	1034	2044
RTOR Reduction (vph)	0	0	54	0	0	259	0	0	0	11	0	0
Lane Group Flow (vph)	0	136	9	0	52	132	0	43	1120	6	1034	2044
Confl. Peds. (#/hr)			4							2		
Confl. Bikes (#/hr)			5			1						
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	7		8	8	1 9	5	5	2		1 9	6
Permitted Phases			7							2		
Actuated Green, G (s)		22.7	22.7		8.4	52.2		7.0	53.9	53.9	52.2	102.1
Effective Green, g (s)		22.7	22.7		8.4	52.2		7.0	53.9	53.9	52.2	102.1
Actuated g/C Ratio		0.15	0.15		0.05	0.34		0.05	0.35	0.35	0.34	0.66
Clearance Time (s)		3.0	3.0		3.0			3.0	5.5	5.5		5.5
Vehicle Extension (s)		3.2	3.2		3.2			3.0	5.5	5.5		5.5
Lane Grp Cap (vph)		259	223		100	958		82	1264	556	1164	1319
v/s Ratio Prot		c0.08			c0.03	0.05		0.02	0.31		c0.30	c1.02
v/s Ratio Perm			0.01							0.00		
v/c Ratio		0.53	0.04		0.52	0.14		0.52	0.89	0.01	0.89	1.55
Uniform Delay, d1		61.0	56.7		71.2	35.6		72.2	47.5	33.0	48.5	26.3
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.0	0.1		5.1	0.1		5.9	8.5	0.0	8.5	251.1
Delay (s)		63.0	56.7		76.3	35.7		78.2	56.0	33.0	57.0	277.4
Level of Service		E	E		E	D		E	E	C	E	F
Approach Delay (s)		61.0			40.4				56.5			198.5
Approach LOS		E			D				E			F

Intersection Summary			
HCM 2000 Control Delay	145.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	154.7	Sum of lost time (s)	17.5
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	75
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1558
Flt Permitted	1.00
Satd. Flow (perm)	1558
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	79
RTOR Reduction (vph)	13
Lane Group Flow (vph)	66
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	2
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	102.1
Effective Green, g (s)	102.1
Actuated g/C Ratio	0.66
Clearance Time (s)	5.5
Vehicle Extension (s)	5.5
Lane Grp Cap (vph)	1028
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.06
Uniform Delay, d1	9.3
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	9.4
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	7	67	3	110	1	367	3	2	2453	173	8	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-2%				2%			
Total Lost time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Lane Util. Factor		1.00			1.00	1.00		1.00	0.95	1.00		1.00
Frpb, ped/bikes		1.00			1.00	0.98		1.00	1.00	0.96		1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Frt		0.99			1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		1.00			0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1802			1793	1564		1752	2800	1506		1787
Flt Permitted		1.00			0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1802			1793	1564		1752	2800	1506		1787
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	7	71	3	117	1	390	3	2	2610	184	9	151
RTOR Reduction (vph)	0	0	0	0	0	150	0	0	0	10	0	0
Lane Group Flow (vph)	0	81	0	0	118	240	0	5	2610	174	0	160
Confl. Peds. (#/hr)			31							3		
Confl. Bikes (#/hr)						3						
Turn Type	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	4	4		3	3		5	5	2		1	1
Permitted Phases						3				2		
Actuated Green, G (s)		27.9			20.5	20.5		3.0	227.0	227.0		26.0
Effective Green, g (s)		27.9			20.5	20.5		3.0	227.0	227.0		26.0
Actuated g/C Ratio		0.09			0.06	0.06		0.01	0.72	0.72		0.08
Clearance Time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	5.5	5.5		3.0
Lane Grp Cap (vph)		159			116	101		16	2010	1081		146
v/s Ratio Prot		c0.04			0.07			0.00	c0.93			c0.09
v/s Ratio Perm						c0.15				0.12		
v/c Ratio		0.51			1.02	2.38		0.31	1.30	0.16		1.10
Uniform Delay, d1		137.6			147.8	147.8		155.6	44.6	14.2		145.1
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		2.6			88.2	650.3		10.9	138.1	0.2		102.5
Delay (s)		140.2			236.1	798.2		166.4	182.7	14.4		247.6
Level of Service		F			F	F		F	F	B		F
Approach Delay (s)		140.2			667.6				171.6			
Approach LOS		F			F				F			

Intersection Summary			
HCM 2000 Control Delay	180.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	316.2	Sum of lost time (s)	14.8
Intersection Capacity Utilization	131.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

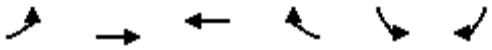
Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1184	94
Ideal Flow (vphpl)	1900	1900
Grade (%)	-2%	
Total Lost time (s)	4.8	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3518	
Flt Permitted	1.00	
Satd. Flow (perm)	3518	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1260	100
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1359	0
Confl. Peds. (#/hr)		5
Confl. Bikes (#/hr)		2
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	250.0	
Effective Green, g (s)	250.0	
Actuated g/C Ratio	0.79	
Clearance Time (s)	4.8	
Vehicle Extension (s)	6.0	
Lane Grp Cap (vph)	2781	
v/s Ratio Prot	0.39	
v/s Ratio Perm		
v/c Ratio	0.49	
Uniform Delay, d1	11.3	
Progression Factor	1.00	
Incremental Delay, d2	0.4	
Delay (s)	11.7	
Level of Service	B	
Approach Delay (s)	36.5	
Approach LOS	D	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	11	22	15	19	883	21	1674	7	400	873	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-4%			-5%			-1%	
Total Lost time (s)		3.0	3.0		3.0	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.96		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1761	1493		1859	2842	1814	1500	1537	3450	3557	1534
Flt Permitted		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1761	1493		1859	2842	1814	1500	1537	3450	3557	1534
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	60	12	23	16	20	939	22	1781	7	426	929	49
RTOR Reduction (vph)	0	0	21	0	0	0	0	0	3	0	0	10
Lane Group Flow (vph)	0	72	2	0	36	939	22	1781	4	426	929	39
Confl. Peds. (#/hr)			22						13			24
Confl. Bikes (#/hr)									1			
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8	1	5	2		1	6	
Permitted Phases			7						2			6
Actuated Green, G (s)		14.0	14.0		7.2	30.2	4.8	81.9	81.9	30.2	107.3	107.3
Effective Green, g (s)		14.0	14.0		7.2	30.2	4.8	81.9	81.9	30.2	107.3	107.3
Actuated g/C Ratio		0.09	0.09		0.05	0.20	0.03	0.55	0.55	0.20	0.73	0.73
Clearance Time (s)		3.0	3.0		3.0	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Vehicle Extension (s)		3.2	3.2		3.2	3.0	3.0	5.5	5.5	3.0	5.5	5.5
Lane Grp Cap (vph)		166	141		90	580	58	831	851	704	2582	1113
v/s Ratio Prot		c0.04			c0.02	c0.33	0.01	c1.19		0.12	0.26	
v/s Ratio Perm			0.00						0.00			0.03
v/c Ratio		0.43	0.02		0.40	1.62	0.38	2.14	0.00	0.61	0.36	0.03
Uniform Delay, d1		63.2	60.7		68.2	58.8	70.0	33.0	14.7	53.4	7.5	5.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.9	0.0		3.1	286.4	4.1	518.5	0.0	1.5	0.2	0.0
Delay (s)		65.1	60.7		71.3	345.2	74.2	551.4	14.7	54.9	7.7	5.7
Level of Service		E	E		E	F	E	F	B	D	A	A
Approach Delay (s)		64.0			335.1			543.5			22.0	
Approach LOS		E			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	314.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.75		
Actuated Cycle Length (s)	147.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	103.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	6	593	1291	1	2	18
Sign Control		Free	Free		Stop	
Grade		6%	-12%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	645	1403	1	2	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1404				2061	1404
vC1, stage 1 conf vol					1404	
vC2, stage 2 conf vol					658	
vCu, unblocked vol	1404				2061	1404
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	89
cM capacity (veh/h)	486				207	171

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	7	645	1404	22
Volume Left	7	0	0	2
Volume Right	0	0	1	20
cSH	486	1700	1700	174
Volume to Capacity	0.01	0.38	0.83	0.12
Queue Length 95th (ft)	1	0	0	10
Control Delay (s)	12.5	0.0	0.0	28.6
Lane LOS	B			D
Approach Delay (s)	0.1		0.0	28.6
Approach LOS				D

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	9	5	7	125	2	150	7	3	1535	86	10	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-2%				2%			
Total Lost time (s)		3.5			3.5	3.5		3.0	4.8	4.8		3.0
Lane Util. Factor		1.00			0.95	0.95		1.00	0.95	1.00		1.00
Frpb, ped/bikes		0.99			1.00	0.98		1.00	1.00	0.98		1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Frt		0.95			0.98	0.85		1.00	1.00	0.85		1.00
Flt Protected		0.98			0.96	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1684			1677	1490		1752	3504	1534		1787
Flt Permitted		0.98			0.96	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1684			1677	1490		1752	3504	1534		1787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	5	7	132	2	158	7	3	1616	91	11	229
RTOR Reduction (vph)	0	7	0	0	2	63	0	0	0	18	0	0
Lane Group Flow (vph)	0	14	0	0	151	76	0	10	1616	73	0	240
Confl. Peds. (#/hr)			7									
Confl. Bikes (#/hr)			4			3				2		
Turn Type	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	4	4		3	3		5	5	2 10		1 9	1 9
Permitted Phases						3				2 10		
Actuated Green, G (s)		14.3			20.7	20.7		3.0	127.4	127.4		34.2
Effective Green, g (s)		14.3			20.7	20.7		3.0	127.4	127.4		34.2
Actuated g/C Ratio		0.07			0.09	0.09		0.01	0.58	0.58		0.16
Clearance Time (s)		3.5			3.5	3.5		3.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		109			158	140		23	2036	891		278
v/s Ratio Prot		c0.01			c0.09			0.01	0.46			c0.13
v/s Ratio Perm						0.05				0.05		
v/c Ratio		0.13			0.96	0.54		0.43	0.79	0.08		0.86
Uniform Delay, d1		96.6			98.8	94.7		107.3	35.7	20.2		90.2
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		0.6			58.2	4.2		12.6	2.6	0.1		23.1
Delay (s)		97.2			157.0	98.9		119.9	38.3	20.3		113.3
Level of Service		F			F	F		F	D	C		F
Approach Delay (s)		97.2			129.3				37.8			
Approach LOS		F			F				D			

Intersection Summary			
HCM 2000 Control Delay	189.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	219.2	Sum of lost time (s)	22.6
Intersection Capacity Utilization	109.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	2831	11
Ideal Flow (vphpl)	1900	1900
Grade (%)	-2%	
Total Lost time (s)	4.8	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	2500	
Flt Permitted	1.00	
Satd. Flow (perm)	2500	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	2980	12
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	2992	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		5
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	166.4	
Effective Green, g (s)	166.4	
Actuated g/C Ratio	0.76	
Clearance Time (s)	4.8	
Vehicle Extension (s)	6.0	
Lane Grp Cap (vph)	1897	
v/s Ratio Prot	c1.20	
v/s Ratio Perm		
v/c Ratio	1.58	
Uniform Delay, d1	26.4	
Progression Factor	1.00	
Incremental Delay, d2	262.3	
Delay (s)	288.7	
Level of Service	F	
Approach Delay (s)	275.7	
Approach LOS	F	

Intersection Summary

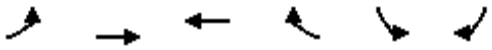
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	96	34	60	26	25	380	3	38	1064	16	997	1942
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-4%				-5%			-1%
Total Lost time (s)		3.0	3.0		3.0	3.0		3.0	5.5	5.5	3.0	5.5
Lane Util. Factor		1.00	1.00		1.00	0.88		1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes		1.00	0.97		1.00	1.00		1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.96	1.00		0.98	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1520		1853	2842		1814	3628	1582	3450	2000
Flt Permitted		0.96	1.00		0.98	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1520		1853	2842		1814	3628	1582	3450	2000
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	101	36	63	27	26	400	3	40	1120	17	1049	2044
RTOR Reduction (vph)	0	0	54	0	0	265	0	0	0	11	0	0
Lane Group Flow (vph)	0	137	9	0	53	135	0	43	1120	6	1049	2044
Confl. Peds. (#/hr)			4							2		
Confl. Bikes (#/hr)			5			1						
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	7		8	8	1 9	5	5	2		1 9	6
Permitted Phases			7							2		
Actuated Green, G (s)		22.8	22.8		8.5	52.2		7.0	53.9	53.9	52.2	102.1
Effective Green, g (s)		22.8	22.8		8.5	52.2		7.0	53.9	53.9	52.2	102.1
Actuated g/C Ratio		0.15	0.15		0.05	0.34		0.05	0.35	0.35	0.34	0.66
Clearance Time (s)		3.0	3.0		3.0			3.0	5.5	5.5		5.5
Vehicle Extension (s)		3.2	3.2		3.2			3.0	5.5	5.5		5.5
Lane Grp Cap (vph)		260	223		101	957		81	1262	550	1162	1318
v/s Ratio Prot		c0.08			c0.03	0.05		0.02	0.31		c0.30	c1.02
v/s Ratio Perm			0.01							0.00		
v/c Ratio		0.53	0.04		0.52	0.14		0.53	0.89	0.01	0.90	1.55
Uniform Delay, d1		61.1	56.7		71.2	35.7		72.3	47.6	33.1	48.9	26.4
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.0	0.1		5.1	0.1		6.5	8.6	0.0	9.9	251.7
Delay (s)		63.1	56.8		76.4	35.8		78.9	56.3	33.1	58.8	278.1
Level of Service		E	E		E	D		E	E	C	E	F
Approach Delay (s)		61.1			40.6				56.7			198.9
Approach LOS		E			D				E			F

Intersection Summary			
HCM 2000 Control Delay	145.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	154.9	Sum of lost time (s)	17.5
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	75
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1558
Flt Permitted	1.00
Satd. Flow (perm)	1558
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	79
RTOR Reduction (vph)	13
Lane Group Flow (vph)	66
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	2
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	102.1
Effective Green, g (s)	102.1
Actuated g/C Ratio	0.66
Clearance Time (s)	5.5
Vehicle Extension (s)	5.5
Lane Grp Cap (vph)	1026
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.06
Uniform Delay, d1	9.4
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	9.5
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	858	517	2	1	10
Sign Control		Free	Free		Stop	
Grade		6%	-12%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	933	562	2	1	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	564				1530	563
vC1, stage 1 conf vol					563	
vC2, stage 2 conf vol					967	
vCu, unblocked vol	564				1530	563
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	98
cM capacity (veh/h)	1007				318	526

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	17	933	564	12
Volume Left	17	0	0	1
Volume Right	0	0	2	11
cSH	1007	1700	1700	496
Volume to Capacity	0.02	0.55	0.33	0.02
Queue Length 95th (ft)	1	0	0	2
Control Delay (s)	8.6	0.0	0.0	12.4
Lane LOS	A			B
Approach Delay (s)	0.2		0.0	12.4
Approach LOS				B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		