Appendix A

Air Quality URBEMIS2007 Model Outputs and Greenhouse Gas Emissions Calculations

CONSERVATIVE ESTIMATE OF UNMITIGATED CONSTRUCTION EMISSIONS (pounds per day)

	ROC	NO_X	CO	SO_X	PM_{10} [a]	$PM_{2.5}$ [a]	CO_2
Demolition Emissions							
On-site Total	1.73	12.75	6.97	-	9.63	2.58	1,164.93
Fugitive Dust	-	-	-	-	8.82	1.83	-
Off-Road Diesel	1.73	12.75	6.97	-	0.81	0.75	1,164.93
Off-site Total	0.89	11.41	5.15	0.01	0.53	0.44	1,638.55
On-Road Diesel	0.87	11.36	4.36	0.01	0.52	0.44	1,545.25
Worker Trips	0.02	0.05	0.79	-	0.01	-	93.30
Grand Total	**2.62**	**24.16**	**12.12**	**0.01**	**10.16**	**3.02**	**2,803.48**
Site Grading Emissions							
On-site Total	3.10	25.66	13.28	-	2.60	1.35	2,298.47
Fugitive Dust	-	-	-	-	1.47	0.31	-
Off-Road Diesel	3.10	25.66	13.28	-	1.13	1.04	2,298.47
Off-site Total	0.03	0.06	1.05	-	0.01	-	124.39
On-Road Diesel	-	-	-	-	-	-	-
Worker Trip	0.03	0.06	1.05	-	0.01	-	124.39
Grand Total	**3.13**	**25.72**	**14.33**	**-**	**2.61**	**1.35**	**2,422.86**
Building Erection/Finishing Emissions							
On-site Total	6.09	10.31	6.28	-	0.72	0.66	959.01
Off-Road Diesel, Bldg Cnst	0.80	5.04	2.76	-	0.26	0.24	517.96
Arch Coatings Off-Gas	4.16	-	-	-	-	-	-
Asphalt Off-Gas	0.10	-	-	-	-	-	-
Off-Road Diesel, Asphalt	1.03	5.27	3.52	-	0.46	0.42	441.05
Off-site Total	0.09	0.62	1.91	-	0.05	0.02	287.76
Worker Trips, Bldg Cnst	0.03	0.05	0.87	-	0.01	-	103.50
Vendor Trips, Bldg Cnst	0.01	0.14	0.11	-	0.01	0.01	26.63
Worker Trips, Arch Coatings	-	-	0.05	-	-	-	6.03
On-Road Diesel, Asphalt	0.03	0.39	0.15	-	0.02	0.01	58.32
Worker Trips, Asphalt	0.02	0.04	0.73	-	0.01	-	93.28
Grand Total	**6.18**	**10.93**	**8.19**	**-**	**0.77**	**0.68**	**1,246.77**
On-site Emissions Totals							
Demolition	1.7	12.8	7.0	-	9.6	2.6	1,164.9
Site Grading	3.1	25.7	13.3	-	2.6	1.4	2,298.5
Building Erection/Finishing	6.1	10.3	6.3	-	0.7	0.7	959.0
Maximum On-site Emissions	**6**	**26**	**13**	**-**	**10**	**3**	**2,298**
Localized Significance Threshold[b]	--	219	6,841	--	135	76	--
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Regional Emissions Totals							
Demolition	2.6	24.2	12.1	0.0	10.2	3.0	2,803.5
Site Grading	3.1	25.7	14.3	-	2.6	1.4	2,422.9
Building Erection/Finishing	6.2	10.9	8.2	-	0.8	0.7	1,246.8
Maximum Regional Emissions	**6**	**26**	**14**	**0**	**10**	**3**	**2,803**
Regional Significance Threshold	75	100	550	150	150	55	--
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Notes:

URBEMIS print-out sheets and fugitive PM calculation worksheet are attached.

[a] Fugitive PM_{10} and $PM_{2.5}$ emissions estimates take into account compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries.

[b] The project site is located in SCAQMD SRA No. 20. These LSTs are based on the site location SRA, distance to nearest sensitive receptor location from the project site (500 meters), and project area that could be under construction on any given day (one acre).

12/14/2009 12:57:59 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\Los Angeles\3_Projects_Air Quality\PRES IS\PRES_URBEMIS.urb924

Project Name: PRES

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	3.14	25.72	14.33	0.02	8.88	1.28	10.15	1.85	1.18	3.03	2,803.47
2011 TOTALS (lbs/day unmitigated)	6.10	10.64	7.97	0.00	0.01	0.73	0.74	0.00	0.67	0.67	1,246.75

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.21	0.11	1.62	0.00	0.01	0.01	106.81

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1.11	1.53	13.90	0.02	2.52	0.49	1,502.14

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1.32	1.64	15.52	0.02	2.53	0.50	1,608.95

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 10/1/2010-10/8/2010 Active Days: 6	2.62	24.15	12.12	**0.02**	**8.88**	**1.28**	**10.15**	**1.85**	**1.18**	**3.03**	**2,803.47**
Demolition 10/01/2010-10/08/2010	2.62	24.15	12.12	0.02	8.88	1.28	10.15	1.85	1.18	3.03	2,803.47
Fugitive Dust	0.00	0.00	0.00	0.00	8.82	0.00	8.82	1.83	0.00	1.83	0.00
Demo Off Road Diesel	1.73	12.75	6.97	0.00	0.00	0.81	0.81	0.00	0.75	0.75	1,164.93
Demo On Road Diesel	0.87	11.36	4.36	0.01	0.05	0.46	0.52	0.02	0.43	0.44	1,545.25
Demo Worker Trips	0.02	0.05	0.79	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.30
Time Slice 10/11/2010-11/8/2010 Active Days: 21	**3.14**	**25.72**	**14.33**	0.00	1.47	1.13	2.60	0.31	1.04	1.35	2,422.86
Mass Grading 10/09/2010-11/08/2010	3.14	25.72	14.33	0.00	1.47	1.13	2.60	0.31	1.04	1.35	2,422.86
Mass Grading Dust	0.00	0.00	0.00	0.00	1.47	0.00	1.47	0.31	0.00	0.31	0.00
Mass Grading Off Road Diesel	3.10	25.66	13.28	0.00	0.00	1.13	1.13	0.00	1.04	1.04	2,298.47
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.06	1.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39
Time Slice 11/9/2010-12/31/2010 Active Days: 39	0.84	5.23	3.75	0.00	0.01	0.27	0.27	0.00	0.24	0.25	648.09
Building 11/09/2010-05/08/2011	0.84	5.23	3.75	0.00	0.01	0.27	0.27	0.00	0.24	0.25	648.09
Building Off Road Diesel	0.80	5.04	2.76	0.00	0.00	0.26	0.26	0.00	0.24	0.24	517.96
Building Vendor Trips	0.01	0.14	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	26.63
Building Worker Trips	0.03	0.05	0.87	0.00	0.00	0.00	0.01	0.00	0.00	0.00	103.50
Time Slice 1/3/2011-3/7/2011 Active Days: 46	0.76	4.94	3.53	0.00	0.01	0.25	0.26	0.00	0.23	0.23	648.07
Building 11/09/2010-05/08/2011	0.76	4.94	3.53	0.00	0.01	0.25	0.26	0.00	0.23	0.23	648.07
Building Off Road Diesel	0.72	4.77	2.61	0.00	0.00	0.24	0.24	0.00	0.22	0.22	517.96
Building Vendor Trips	0.01	0.13	0.11	0.00	0.00	0.01	0.01	0.00	0.00	0.01	26.63
Building Worker Trips	0.03	0.05	0.81	0.00	0.00	0.00	0.01	0.00	0.00	0.00	103.47
Time Slice 3/8/2011-4/29/2011 Active Days: 39	4.92	4.94	3.57	0.00	0.01	0.25	0.26	0.00	0.23	0.23	654.11
Building 11/09/2010-05/08/2011	0.76	4.94	3.53	0.00	0.01	0.25	0.26	0.00	0.23	0.23	648.07
Building Off Road Diesel	0.72	4.77	2.61	0.00	0.00	0.24	0.24	0.00	0.22	0.22	517.96
Building Vendor Trips	0.01	0.13	0.11	0.00	0.00	0.01	0.01	0.00	0.00	0.01	26.63
Building Worker Trips	0.03	0.05	0.81	0.00	0.00	0.00	0.01	0.00	0.00	0.00	103.47
Coating 03/08/2011-06/08/2011	4.16	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03

12/14/2009 12:57:59 PM

Architectural Coating	4.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03
Time Slice 5/2/2011-5/6/2011 Active Days: 5	**6.10**	10.64	7.97	0.00	0.01	0.73	0.74	0.00	0.67	0.67	1,246.75
Asphalt 05/01/2011-05/08/2011	1.18	5.70	4.40	0.00	0.01	0.47	0.48	0.00	0.44	0.44	592.64
Paving Off-Gas	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.03	5.27	3.52	0.00	0.00	0.46	0.46	0.00	0.42	0.42	441.05
Paving On Road Diesel	0.03	0.39	0.15	0.00	0.00	0.02	0.02	0.00	0.01	0.01	58.32
Paving Worker Trips	0.02	0.04	0.73	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.28
Building 11/09/2010-05/08/2011	0.76	4.94	3.53	0.00	0.01	0.25	0.26	0.00	0.23	0.23	648.07
Building Off Road Diesel	0.72	4.77	2.61	0.00	0.00	0.24	0.24	0.00	0.22	0.22	517.96
Building Vendor Trips	0.01	0.13	0.11	0.00	0.00	0.01	0.01	0.00	0.00	0.01	26.63
Building Worker Trips	0.03	0.05	0.81	0.00	0.00	0.00	0.01	0.00	0.00	0.00	103.47
Coating 03/08/2011-06/08/2011	4.16	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03
Architectural Coating	4.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03
Time Slice 5/9/2011-6/8/2011 Active Days: 23	4.16	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03
Coating 03/08/2011-06/08/2011	4.16	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03
Architectural Coating	4.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03

Phase Assumptions

Phase: Demolition 10/1/2010 - 10/8/2010 - Default Demolition Description

Building Volume Total (cubic feet): 42000

Building Volume Daily (cubic feet): 21000

On Road Truck Travel (VMT): 364.58

Off-Road Equipment:

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Crushing/Processing Equip (142 hp) operating at a 0.78 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

12/14/2009 12:57:59 PM

Phase: Mass Grading 10/9/2010 - 11/8/2010 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 0.48

Maximum Daily Acreage Disturbed: 0.12

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Paving 5/1/2011 - 5/8/2011 - Default Paving Description

Acres to be Paved: 0.23

Off-Road Equipment:

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Building Construction 11/9/2010 - 5/8/2011 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 3/8/2011 - 6/8/2011 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

12/14/2009 12:57:59 PM

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.09	0.07	0.00	0.00	0.00	104.00
Hearth - No Summer Emissions							
Landscape	0.12	0.02	1.55	0.00	0.01	0.01	2.81
Consumer Products	0.00						
Architectural Coatings	0.08						
TOTALS (lbs/day, unmitigated)	0.21	0.11	1.62	0.00	0.01	0.01	106.81

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
General office building	1.11	1.53	13.90	0.02	2.52	0.49	1,502.14
TOTALS (lbs/day, unmitigated)	1.11	1.53	13.90	0.02	2.52	0.49	1,502.14

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
General office building		11.01	1000 sq ft	13.00	143.13	1,456.71
					143.13	1,456.71

12/14/2009 12:57:59 PM

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.6	0.8	99.0	0.2
Light Truck < 3750 lbs	7.3	2.7	94.6	2.7
Light Truck 3751-5750 lbs	23.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.6	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	64.3	35.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
General office building				35.0	17.5	47.5

12/14/2009 12:57:55 PM

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: G:\Los Angeles\3_Projects_Air Quality\PRES IS\PRES_URBEMIS.urb924

Project Name: PRES

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	3.14	25.72	14.33	0.02	8.88	1.28	10.15	1.85	1.18	3.03	2,803.47
2011 TOTALS (lbs/day unmitigated)	6.10	10.64	7.97	0.00	0.01	0.73	0.74	0.00	0.67	0.67	1,246.75

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.09	0.09	0.07	0.00	0.00	0.00	104.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1.21	1.85	13.27	0.01	2.52	0.49	1,360.30

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1.30	1.94	13.34	0.01	2.52	0.49	1,464.30

12/14/2009 12:57:49 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: G:\Los Angeles\3_Projects_Air Quality\PRES IS\PRES_URBEMIS.urb924

Project Name: PRES

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5	PM2.5	CO2
2010 TOTALS (tons/year unmitigated)	0.06	0.44	0.26	0.00	0.04	0.02	0.06	0.01	0.02	0.03	46.49
2011 TOTALS (tons/year unmitigated)	0.18	0.24	0.17	0.00	0.00	0.01	0.01	0.00	0.01	0.01	30.85

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.03	0.02	0.29	0.00	0.00	0.00	19.49

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.21	0.30	2.50	0.00	0.46	0.09	265.51

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.24	0.32	2.79	0.00	0.46	0.09	285.00

PRES

Regional Emission Calculations (lbs/day)

	ROC	NOx	CO	SOx	PM10	PM2.5
Existing Condition						
Mobile	0.0	0.0	0.0	0.0	0.0	0.0
Area	0.0	0.0	0.0	0.0	0.0	0.0
Stationary	0.0	0.0	0.0	0.0	0.0	0.0
Total Existing	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Project Condition						
Mobile	1.2	1.9	13.9	0.0	2.5	0.5
Area	0.2	0.1	1.6	0.0	0.0	0.0
Stationary	0.0	0.6	0.1	0.1	0.0	0.0
Total Project	**1.4**	**2.6**	**15.6**	**0.1**	**2.5**	**0.5**
Net Project Emissions						
Net Mobile	1.2	1.9	13.9	0.0	2.5	0.5
Net Area	0.2	0.1	1.6	0.0	0.0	0.0
Net Stationary	0.0	0.6	0.1	0.1	0.0	0.0
Total Net	1.4	2.6	15.6	0.1	2.5	0.5
SCAQMD Significance Threshold	55	55	550	150	150	55
Difference	**(54)**	**(52)**	**(534)**	**(150)**	**(147)**	**(54)**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Electricity Usage

Land Use	1,000 Sqft	Electricity Usage Rate [a] (kWh\sq.ft\yr)	Total Electricity Usage (KWh\year)	(MWh\Day)	CO 0.2	ROC 0.01	NOx 1.15	PM10 0.04	SOx 0.12
					Emission Factors (lbs/MWh) [b]				
Existing					Emissions from Electricity Consumption (lbs/day)				
Office	0.0	12.95	0	0.000	0.000	0.000	0.000	0.000	0.000
Retail	0.0	13.55	0	0.000	0.000	0.000	0.000	0.000	0.000
Hotel/Motel	0.0	9.95	0	0.000	0.000	0.000	0.000	0.000	0.000
Restaurant	0.0	47.45	0	0.000	0.000	0.000	0.000	0.000	0.000
Food Store	0.0	53.30	0	0.000	0.000	0.000	0.000	0.000	0.000
Warehouse	0.0	4.35	0	0.000	0.000	0.000	0.000	0.000	0.000
College/University	0.0	11.55	0	0.000	0.000	0.000	0.000	0.000	0.000
High School	0.0	10.50	0	0.000	0.000	0.000	0.000	0.000	0.000
Elementary School	0.0	5.90	0	0.000	0.000	0.000	0.000	0.000	0.000
Hospital	0.0	21.70	0	0.000	0.000	0.000	0.000	0.000	0.000
Miscellaneous	0.0	10.50	0	0.000	0.000	0.000	0.000	0.000	0.000
Residential (DU)	0.0	5,627	0	0.000	0.000	0.000	0.000	0.000	0.000
Total Existing			**0**	**0.000**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Project									
Office	13.0	12.95	168,350	0.461	0.092	0.005	0.530	0.018	0.055
Retail	0.0	13.55	0	0.000	0.000	0.000	0.000	0.000	0.000
Hotel/Motel	0.0	9.95	0	0.000	0.000	0.000	0.000	0.000	0.000
Restaurant	0.0	47.45	0	0.000	0.000	0.000	0.000	0.000	0.000
Food Store	0.0	53.3	0	0.000	0.000	0.000	0.000	0.000	0.000
Warehouse	0.0	4.35	0	0.000	0.000	0.000	0.000	0.000	0.000
College/University	0.0	11.55	0	0.000	0.000	0.000	0.000	0.000	0.000
High School	0.0	10.5	0	0.000	0.000	0.000	0.000	0.000	0.000
Elementary School	0.0	5.9	0	0.000	0.000	0.000	0.000	0.000	0.000
Hospital	0.0	21.7	0	0.000	0.000	0.000	0.000	0.000	0.000
Miscellaneous	0.0	10.5	0	0.000	0.000	0.000	0.000	0.000	0.000
Residential (DU)	0.0	5,627	0	0.000	0.000	0.000	0.000	0.000	0.000
Total Project			**168,350**	**0.461**	**0.09**	**0.01**	**0.53**	**0.02**	**0.06**
Net Emissions From Electricity Usage					**0.09**	**0.01**	**0.53**	**0.02**	**0.06**

Summary of Stationary Emissions

	CO	ROC	NOx	PM10	SOx
Total Existing Emissions (lbs/day)	0.00	0.00	0.00	0.00	0.00
Total Project Emissions (lbs/day)	0.11	0.01	0.63	0.02	0.06
Total Net Emissions (lbs/day)	**0.11**	**0.01**	**0.63**	**0.02**	**0.06**

[a] Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.

[b] Emission Factors from Table A9-11-B, CEQA Air Quality Handbook, SCAQMD, 1993.

[c] Natural Gas Usage Rates from Table A9-12-A, CEQA Air Quality Handbook, SCAQMD, 1993.

[d] Emission Factors from Table A9-12-B, CEQA Air Quality Handbook, SCAQMD, 1993.

[e] The emission factors for NOx in lbs per million cuft of natural gas are 120 for nonresidential uses and 80 for residential uses.

PRES

Greenhouse Gas Emissions

(Metric Tons per Year)

	Year 2020 Business as Usual	AB32 Scoping Plan Reductions	Non-mitigated Year 2020 Emissions	Percent Reductions from BAU
Project Condition				
Mobile-source	266	(79)	187	29.8%
Natural Gas Combustion	17	(2)	16	9.0%
Electricity Demand Related	79	(26)	53	33.0%
Water Consumption Related	0	(0)	0	33.0%
Total Project	**362.31**	**(106.83)**	**255.48**	**29.5%**

2020 GHG Emissions Percent Below Business as Usual	29.5%
AB 32 Percentage Below Business as Usual Target Percentage	28.5%
Meet/Exceed AB 32 GHG Reduction Target?	**Yes**

Summary of AB32 Scoping Plan Reductions	
Mobile-Source	
Pavley Emissions Standards	19.8%
Low Carbon Fuel Standard	7.2%
Vehicle Efficiency Measures	2.8%
Natural Gas	
Transmission and Distribution Emission Reductions	7.4%
Extraction Emission Reductions	1.6%
Electricity/Water Pumping	
Renewables Portfolio Standard	33.0%

AB 32 Reduction Target Calculation	
2020 California CO_2e Emissions Inventory BAU Forecast (MMT)	596.40
1990 California CO_2e Emissions Inventory (MMT)	426.60
AB 32 Reduction Target (MMT)	169.8
Required Reduction from Year 2020 BAU Emissions	28.5%

Electricity Usage

Land Use	1,000 Sqft	Electricity Usage Rate [a] (kWh\sq.ft\yr)	Total Electricity Usage (KWh\year)	(MWh\day)	CO_2 804.54	CH_4 0.0067	N_2O 0.0037	CO_2e 21/310[c]
					Emission Factors (lbs/MWh) [b]			
Existing					Emissions from Electricity (lbs/day)			
Office	0.0	12.95	-	-	-	-	-	-
Retail	0.0	13.55	-	-	-	-	-	-
Hotel/Motel	0.0	9.95	-	-	-	-	-	-
Restaurant	0.0	47.45	-	-	-	-	-	-
Food Store	0.0	53.30	-	-	-	-	-	-
Warehouse	0.0	4.35	-	-	-	-	-	-
College/University	0.0	11.55	-	-	-	-	-	-
High School	0.0	10.50	-	-	-	-	-	-
Elementary School	0.0	5.90	-	-	-	-	-	-
Hospital	0.0	21.70	-	-	-	-	-	-
Miscellaneous	0.0	10.50	-	-	-	-	-	-
Residential (DU)	0.0	5,627	-	-	-	-	-	-
Total Existing			-	-	-	-	-	-
Project								
Office	13.0	12.95	168,350.00	0.46	371.08	0.00	0.00	371.76
Retail	0.0	13.55	-	-	-	-	-	-
Hotel/Motel	0.0	9.95	-	-	-	-	-	-
Restaurant	0.0	47.45	-	-	-	-	-	-
Food Store	0.0	53.3	-	-	-	-	-	-
Warehouse	0.0	4.35	-	-	-	-	-	-
College/University	0.0	11.55	-	-	-	-	-	-
High School	0.0	10.5	-	-	-	-	-	-
Elementary School	0.0	5.9	-	-	-	-	-	-
Hospital	0.0	21.7	-	-	-	-	-	-
Miscellaneous	0.0	10.5	-	-	-	-	-	-
Residential (DU)	0.0	5,627	-	-	-	-	-	-
Total Project			**168,350.00**	**0.46**	**371.08**	**0.00**	**0.00**	**371.76**
Net Emissions From Electricity Usage					**371.08**	**0.00**	**0.00**	**371.76**

Natural Gas Usage

Land Use	1,000 Sqft	Natural Gas Usage Rate [d] (cu.ft\sq.ft\mo)	Total Natural Gas Usage (cu.ft\mo)	(Btu/day)[f]	CO_2 53.05	CH_4 0.0059	N_2O 0.0001	CO_2e 21/310[c]
					Emission Factors (kg/MMBtu) [e]			
Existing					Emissions from Natural Gas (lbs/day)			
Office	0.0	2.0	-	-	-	-	-	-
Retail	0.0	2.9	-	-	-	-	-	-
Hotel/Motel	0.0	4.8	-	-	-	-	-	-
Restaurant	0.0	4.8	-	-	-	-	-	-
Food Store	0.0	2.9	-	-	-	-	-	-
Warehouse	0.0	2.0	-	-	-	-	-	-
College/University	0.0	4.8	-	-	-	-	-	-
High School	0.0	2.9	-	-	-	-	-	-
Elementary School	0.0	2.0	-	-	-	-	-	-
Hospital	0.0	4.8	-	-	-	-	-	-
Miscellaneous	0.0	2.9	-	-	-	-	-	-
Residential (Single Family DU)	0.0	6,665	-	-	-	-	-	-
Residential (Multi-Family DU)	0.0	4,012	-	-	-	-	-	-
Total Existing			-	-	-	-	-	-
Project								
Office	13.0	2.0	**26,000.00**	**889,200.00**	104.00	0.01	0.00	104.30
Retail	0.0	2.9	-	-	-	-	-	-
Hotel/Motel	0.0	4.8	-	-	-	-	-	-
Restaurant	0.0	4.8	-	-	-	-	-	-
Food Store	0.0	2.9	-	-	-	-	-	-
Warehouse	0.0	2.0	-	-	-	-	-	-
College/University	0.0	4.8	-	-	-	-	-	-
High School	0.0	2.9	-	-	-	-	-	-
Elementary School	0.0	2.0	-	-	-	-	-	-
Hospital	0.0	4.8	-	-	-	-	-	-
Miscellaneous	0.0	2.9	-	-	-	-	-	-
Residential (Single Family DU)	0.0	6,665	-	-	-	-	-	-
Residential (Multi-Family DU)	0.0	4,012	-	-	-	-	-	-
Total Project			**26,000.00**	**889,200.00**	**104.00**	**0.01**	**0.00**	**104.30**
Net Emissions From Natural Gas Usage					**104.00**	**0.01**	**0.00**	**104.30**

Summary of Stationary Emissions

	CO_2	CH_4	N_2O	CO_2e
Total Existing Emissions (lbs/day)	-	-	-	-
Total Project Emissions (lbs/day)	475.08	0.01	0.00	476.06
Total Net Emissions (lbs/day)	**475.08**	**0.01**	**0.00**	**476.06**

[a] Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.

[b] Emission Factors from Table C.1 and Table C.2, General Reporting Protocol, California Climate Action Registry, March 2007.

[c] Global Warming Potential is 21 for CH_4 and 310 for N_2O, General Reporting Protocol, California Climate Action Registry, March 2007.

[d] Natural Gas Usage Rates from Table A9-12-A, CEQA Air Quality Handbook, SCAQMD, 1993.

[e] Emission Factors from Table C.5 and Table C.6, General Reporting Protocol, California Climate Action Registry, March 2007.

[f] 1 Cubic Foot of natural gas = 1,026 Btu. Energy Information Administration. Available http://www.eia.doe.gov/basics/conversion_basics.html

Mobile Sources

Vehicle Type	Percent Type	VMT by Type	Emission Factors [a] CH4	Emission Factors [a] N2O	CH_4	N_2O	CO_2e 21/310[b]
	0	0	CH_4	N_2O			
Existing					**Emissions from Mobile Sources (lbs/day)**		
Light Auto	0.0	-	0.06	0.08	-	-	-
Light Truck < 3750 lbs	0.0	-	0.11	0.14	-	-	-
Light Truck 3751-5750 lbs	0.0	-	0.11	0.14	-	-	-
Med Truck 5751-8500 lbs	0.0	-	0.18	0.09	-	-	-
Lite-Heavy Truck 8501-10,000 lbs	0.0	-	0.18	0.09	-	-	-
Lite-Heavy Truck 10,001-14,000 lbs	0.0	-	0.18	0.09	-	-	-
Med-Heavy Truck 14,001-33,000 lbs	0.0	-	0.08	0.05	-	-	-
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	-	0.08	0.05	-	-	-
Other Bus	0.0	-	0.08	0.05	-	-	-
Urban Bus	0.0	-	0.08	0.05	-	-	-
Motorcycle	0.0	-	0.42	0.01	-	-	-
School Bus	0.0	-	0.08	0.05	-	-	-
Motor Home	0.0	-	0.11	0.14	-	-	-
Total Existing			**1.75**	**1.03**	**-**	**-**	**-**

Vehicle Type	Percent Type	VMT by Type	Emission Factors [a] CH4	Emission Factors [a] N2O	CH_4	N_2O	CO_2e 21/310[b]
	100	1456.71	CH_4	N_2O			
Project							
Light Auto	51.6	751.66	0.06	0.08	0.10	0.13	43.18
Light Truck < 3750 lbs	7.3	106.34	0.11	0.14	0.03	0.03	10.72
Light Truck 3751-5750 lbs	23.0	335.04	0.11	0.14	0.08	0.10	33.76
Med Truck 5751-8500 lbs	10.6	154.41	0.18	0.09	0.06	0.03	10.78
Lite-Heavy Truck 8501-10,000 lbs	1.6	23.31	0.18	0.09	0.01	0.00	1.63
Lite-Heavy Truck 10,001-14,000 lbs	0.5	7.28	0.18	0.09	0.00	0.00	0.51
Med-Heavy Truck 14,001-33,000 lbs	0.9	13.11	0.08	0.05	0.00	0.00	0.50
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	7.28	0.08	0.05	0.00	0.00	0.28
Other Bus	0.1	1.46	0.08	0.05	0.00	0.00	0.06
Urban Bus	0.1	1.46	0.08	0.05	0.00	0.00	0.06
Motorcycle	2.8	40.79	0.42	0.01	0.04	0.00	1.07
School Bus	0.1	1.46	0.08	0.05	0.00	0.00	0.06
Motor Home	0.9	13.11	0.11	0.14	0.00	0.00	1.32
Total Project			**1.75**	**1.03**	**0.33**	**0.31**	**103.92**
Net Emissions From Mobile Sources					**0.33**	**0.31**	**103.92**

[a] Emission factors from Table C.4, General Reporting Protocol, California Climate Action Registry, March 2007.

[b] Global Warming Potential is 21 for CH_4 and 310 for N_2O, General Reporting Protocol, California Climate Action Registry, March 2007.

Enter Data in all yellow highlighted cells

Water Importation using CAMX emission factors

SWP Energy Intensity:	SWP west branch	9,232	kWh/MG (includes losses)
MWD Energy Intensity:	MWD west branch	1,013	kWh/MG (includes losses)
Southern California Average	N/A	9,727	kWh/MG (includes losses)

Category	Water acre/ft	Energy Use (kWh) Importation	CH4	N2O (kg/year)	CO2	CO2e (metric tons/year)
Imported from SWP		0	0.00	0.00	0	0
Imported from MWD		0	0.00	0.00	0	0
OR						
Southern California Average	1	4,179	0.06	0.02	1,351	1

For all other Sources:

Emission Factor: CO2	0.323405	kg/kWh	CAMX (eGRID)
Emission Factor: CH4	0.000014	kg/kWh	CAMX (eGRID)
Emission Factor: N2O	0.000004	kg/kWh	CAMX (eGRID)

Water Distribution (pumping)

Energy Intensity: 1,272 kWh/MG (includes losses)

	Water acre/ft	Energy Use (kWh) Distribution	CH4	N2O (kg/year)	CO2	CO2e (metric tons/year)
	1	546	0.01	0.00	177	0

Water Treatment

Energy Intensity: 111 kWh/MG (includes losses)

Year	Water acre/ft	Energy Use (kWh) treatment	CH4	N2O (kg/year)	CO2	CO2e (metric tons/year)
	1	43	0.00	0.00	14	0

Wastewater Treatment

Energy Intensity: 1,911 kWh/MG (includes losses)

	Water acre/ft	Energy Use (kWh) wastewater treatment	CH4	N2O (kg/year)	CO2	CO2e (metric tons/year)
	1	739	0.01	0.00	239	0

Summary

Category	**Energy Use** (kWh)	**CO2e** (metric tons/year)
Water Supply and Conveyance	4,179	1
Water Treatment	43	0
Water Distribution	546	0
Wastewater Treatment	739	0
Total	**5,508**	**2**

Highlighted cells are used in calculations

GHG	GWP
CH4	21
N2O	310

Conversion Factors	
metric tons/ton	0.907185
tons/metric ton	1.102311
lbs/kg	2.204623
days/year	365.25
g/lb	453.5924
kWh/MWh	1,000
million gallons (MG)/acre foot	0.32585

Emission Factors		unit	source	
CO2	0.286165	kg/kWh	SCE 2007 average EF	286.17
CH4	30.601400	lb/GWh	CA Average (eGRID)	
CH4	0.000014	kg/kWh	CA Average (eGRID)	13.88
N2O	4.497600	lb/GWh	CA Average (eGRID)	
N2O	0.000002	kg/kWh	CA Average (eGRID)	2.04
CO2	712.985300	lb/MWh	CAMX (eGRID)	
CO2	0.323405	kg/kWh	CAMX (eGRID)	323.40
CH4	30.2365	lb/GWh	CAMX (eGRID)	
CH4	0.000014	kg/kWh	CAMX (eGRID)	13.72
N2O	8.0758	lb/GWh	CAMX (eGRID)	
N2O	0.000004	kg/kWh	CAMX (eGRID)	3.66

Table C-4: Potential Adjustments to WER Table 1-3, Electricity Use in Typical Urban Water Systems

Sector	Northern California (kWh/MG)			Southern California (kWh/MG)				
	WER	Adjusted	w/Losses	WER	Adjusted	w/Losses	Loss factor	MWD loss factor
Water Supply and Conveyance	150	1,811	2,117	8,900	8,324	9,727	16.9%	11.9%
Water Treatment	100	n/a	111	100	n/a	111	11.0%	
Water Distribution	1,200	n/a	1,272	1,200	n/a	1,272	6.0%	
Wastewater	2,500	1,911	1,911	2,500	1,911	1,911	0.0%	
Total	3,950	5,022	5,411	12,700	11,535	13,022	12.9%	

SWP west branch	7,900	9,232
SWP east branch	9,900	11,569
MWD west branch	906	1,013
MWD east branch	540	604

Electricty Emission Factors	1990	unit
CH4 EF:	0.0067	lb CH4/MWh
N20 EF:	0.0037	lb N2O/MWh
CO2 EF:	804.54	lb CO2/MWh
CH4 EF:	0.0000030	kg/kWh
N20 EF:	1.67829E-06	kg/kWh
CO2 EF:	0.364933206	kg/kWh

Appendix B

Preliminary Water Quality Management Plan

PRELIMINARY
Water Quality Management Plan(WQMP)

For:

PRES INC

PLANNING APPLICATION NO.______
BUILDING PERMIT APPLICATION NO._____

Prepared for:
PRES INC
4300 VON KARMAN AVENUE
NEWPORT BEACH, CA 92660
(949)261-7737

Prepared by:
Westland Group Inc
9540 Center Ave.,
Rancho Cucamonga, CA 91730
(909)989-9789

APRIL 30, 2010

OWNER'S CERTIFICATION

WATER QUALITY MANAGEMENT PLAN
FOR BUILDING PERMIT APPLICATION NUMBER ________________

This Water Quality Management Plan (WQMP) has been prepared for PRES INC by Westland Group, Inc. The WQMP is intended to comply with the requirements of the City of Newport Beach, Planning Dept., Planning Application No. ______ and Building Dept. Building Permit Application No. ________ requiring the preparation of a Water Quality Management Plan. The undersigned is aware that Best Management Practices (BMPs) are enforceable pursuant to the City's Newport Beach Municipal Code, Chapter 14.36.040

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the: Santa Ana Region Stormwater Runoff Management Program. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Signed:	
Name:	Michael Tong
Title:	Project Manager
Company:	PRES INC
Address:	4300 Von Karman Avenue, Newport Beach, CA 92660
Telephone #:	(949)261-7737
Date:	

Contents

Section I Discretionary Permit(s) and Water Quality Conditions

Permit required: Grading & Building Permits

Water Quality Conditions:
Prior to the issuance of any grading or building permits, the applicant shall submit to the City for review and approval a Project WQMP.

Legal Description: Parcel 1, in the City of Newport Beach, County of Orange, State of California, as per Map filed in Book 60, page 14 of Parcel Maps, in the Office of the County Recorder of said County.

The site consists of an existing office building (converted from a former restaurant building), landscaped area and paved parking lot. The area of the site is 55,779 SF or 1.28 Acres. This redevelopment project includes the construction of a new office building on portions of the site's landscaped area and paved area, summarized as below:

Total Site Acreage = 55,779 SF
Area of Redevelopment = 13,331 SF
% of Site being Redeveloped = 24%
Existing landscape area (pervious) = 16,759 SF
Existing Hardscape/Parking (impervious) = 39,020 SF
Proposed conversion of pervious area to impervious area = 3,561 SF
Proposed conversion of impervious area to pervious area (including the introduction of porous AC) = 2,178 SF
Net addition of impervious area = 3,561 – 2,178 = 1,383 SF

The project is considered to be a significant redevelopment and will be classified as Priority Project Category No. 7: parking lot (including impervious roof tops) area of 5,000 square foot or more and potentially exposed to urban runoff.

Section II Project Description

Planning Area: the project is within the Planned Community (PC) District , PC15, the Koll Center. The development of the project will be subject to the land use regulations of PC District 15.

The project consists of the construction of a new office building on an existing developed site. The existing building occupying the northwest portion of the site will remain and the new building, consisting of two floors with lower level parking, will be located easterly.

The new building footprint is approximately 5,800 square feet. Per the redevelopment square footage summary listed above, about 3,561 SF of the landscaped area will be removed and replaced with rooftops and pavement. However, with the introduction of 895 square of porous pavement, the net increase in impervious area after development will be 1,383 SF.

The new building will function as a office building, primarily used for a land developer's corporate office. There will be no manufacturing or restaurant activities.

The potential stormwater pollutants expected to be associated with this project are as follows:

Pesticides: Potential
Sediment: Potential
Nutrients: Potential
Heavy Metals: Anticipated
Organic Compounds: Anticipated
Trash & Debris: Anticipated
Oxygen Demanding Substance: Potential
Oil & Grease: Anticipated
Bacteria & Viruses: Potential

SIC Codes:
8741 – Management Services

Section III Site Description

In particular, the project is within the City of Newport Beach Planned Community District 15 (PC15, Koll Center). The proposed building will be located easterly of an existing office building (formerly used as a restaurant).

Beforer development,
Total Site Area = 55,779 SF
Landscaped (pervious area) = 16,759 SF
Roof tops and pavement (impervious area) = 39,020 SF
% impervious = 39,020/55,779 = 69.95%

After development,
Total Site Area = 55,779 SF
Landscaped and porous pavement (pervious area) = 15,376 SF
Roof tops and pavement (impervious area) = 40,403 SF
% impervious = 40,403/55,779 = 72.43%

The Soil Type Type for the area is Designated as D per the Orange County Hydrology Manual. Type D soils are generally clayey and has very limited infiltration capacity. Based on a geotechnical report by TGR Geotechnical, Inc. (Report No. 07-1994, dated January 29, 2008), the site is underlain by approximately five (5) feet of fill (compacted fill is generally not favorable to infiltration). The fill consists of low to some instances, highplastic, silty to sandy clay. The fill is underlain with native low plastic silty to sandy clay to the maximum depth drilled (about 15 feet to 25 feet) for this project. Groundwater was not encountered to the maximum depth drilled (about 26.5 feet). However, the TGR report mentioned about the historic depth to high groundwater was 10 feet below existing ground surface. Due to the extensive clay soil layer and extremely low infiltration rates (0.01 inch per hour assumed versus the normal 0.5 inch per hour for better drained soils), a porous pavement with a gravel reservoir bed together with an efficient gravity fed subdrain system will be an viable alternative to mitigate hydrologic conditions of concern created by the added impervious square footage of 1,383 SF.

The new building will function as a office building, primarily used for a land developer's corporate office. There will be no manufacturing or restaurant activities.

In particular, the project is within the City of Newport Beach Planned Community District 15 (PC15, Koll Center). The proposed building will be located easterly of an existing office building (formerly used as a restaurant).

Beforer development,
Total Site Area = 55,779 SF
Landscaped (pervious area) = 16,759 SF
Roof tops and pavement (impervious area) = 39,020 SF
% impervious = 39,020/55,779 = 69.95%

After development,
Total Site Area = 55,779 SF
Landscaped and porous pavement (pervious area) = 15,376 SF
Roof tops and pavement (impervious area) = 40,403 SF
% impervious = 40,403/55,779 = 72.43%

The Soil Type Type for the area is Designated as D per the Orange County Hydrology Manual. Type D soils are generally clayey and has very limited infiltration capacity. Based on a geotechnical report by TGR Geotechnical, Inc. (Report No. 07-1994, dated January 29, 2008), the site is underlain by approximately five (5) feet of fill (compacted fill is generally not favorable to infiltration). The fill consists of low to some instances, highplastic, silty to sandy clay. The fill is underlain with native low plastic silty to sandy clay to the maximum depth drilled (about 15 feet to 25 feet) for this project. Groundwater was not encountered to the maximum depth drilled (about 26.5 feet). However, the TGR report mentioned about the historic depth to high groundwater was 10 feet below existing ground surface. Due to the extensive clay soil layer and extremely low infiltration rates (0.01 inch per hour assumed versus the normal 0.5 inch per hour for better drained soils), a porous pavement with a gravel reservoir bed together with an efficient gravity fed subdrain system will be an viable alternative to mitigate hydrologic conditions of concern created by the added impervious square footage of 1,383 SF.

The project site is a part of a larger urban watershed composed on Lots 1, 2 and 3 of Tract No. 7953 (Koll Center Development). The storm drain infrastructure is shown in the City of Newport Beach Improvement record drawings TRI-07953 dated 1973. There are subsequent storm drain modifications which are depicted other City as-built records. Watershed runoffs are conveyed by underground storm drain systems via drainage easements through the subject property and eventually connect to a public stormwater conduit within Von Karman Avenue right-of-way. The existing lake northwest of the proposed building functions as a stormwater overflow detention pond. Generally, lower frequency storm runoffs are confined within the storm drain and do not drain directly into the lake itself.

Presently the onsite runoffs flow into a concrete gutter within the existing parking lot. Stormwater travels generally westerly along the gutter and discharged into a catch basin near the southwest corner of the existing building. Stormwater then exit the catch basin via a 15" pipe southeasterly and connect to the 36 inch diameter storm drain main line within the drainage easement. Stormwater from the said mainline will drain into the City's main line in Von Karman Avenue.

The City storm drain system in Von Karman Avenue continues to flow through the City's MS4's which will flow into the San Diego Creek. Flows from the San Diego Creek empties into the Upper Newport Bay; thence southerly the Lower Newport Bay and eventually the Pacific Ocean.

According to the 2006 CWA Section 303(d), impaired water bodies within this watershed include:
San Diego Creek Reach 1 – Impairment: Fecal Coliform, Selenium, Toxaphene
San Diego Creek Reach 2 – Impairment: Metals
Upper Newport Bay – Impairment: Chlordane, Copper, DDT, Metals, PCBs, Sediment Toxicity
Lower Newport Bay – Impairment: Chlordane, Copper, DDT, Metals, PCBs, Sediment Toxicity
Rhine Channel – Impairment: Copper, Lead, Mercury, PCBs, Sediment Toxicity, Zinc

Comparing to the pollutants generated by the project site:
Bacteria/Viruses, Heavy Metals, Nutrients, Pesticides, Organic Compunds, Sediments, Trash and Debris, COD's, Oil and Grease

The pollutants of concern are:
Bacteria and Viruses, Heavy Metals, Pesticides, Organic Compounds and Sediment.

Treatment controls will be required.
Porous Pavement: Treatment Control Effective as High or Medium for Organic Compounds/Metals/Bacteria & Viruses
Bioretention Cell (Filterra Roof Drain Planter): Sediment/Metals

Source control will eliminate the use of DDT type of pesticides.

Treatment BMP's are designed to mitigate the identified pollutants of concern. Details of the BMP's are shown in the attached BMP map.

The Upper and Lower Newport Bay are classified as Environmentally Sensitive Areas (ESA's)

Section IV Best Management Practices (BMPs)

Source Control BMPs

The following tables show source control BMPs (routine non-structural and routine structural) included in this project and those that were not included.

Table 1. Routine Non-Structural BMPs

Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
N1	Education for Property Owners, Tenants and Occupants	X		
N2	Activity Restrictions	X		
N3	Common Area Landscape Management	X		
N4	BMP Maintenance	X		
N5	Title 22 CCR Compliance (How development will comply)	X		
N6	Local Industrial Permit Compliance		X	Not applicable to type of project proposed
N7	Spill Contingency Plan	X		
N8	Underground Storage Tank Compliance		X	No underground storage tank will be constructed
N9	Hazardous Materials Disclosure Compliance	X		
N10	Uniform Fire Code Implementation	X		
N11	Common Area Litter Control	X		
N12	Employee Training	X		
N13	Housekeeping of Loading Docks		X	There are no loading docks for the project
N14	Common Area Catch Basin Inspection	X		
N15	Street Sweeping Private Streets and Parking Lots	X		
N17	Retail Gasoline Outlets		X	No retail gasoline outlet will be constructed

(There is no BMP with the designation N16.)

Non-Structural Source Control BMPs

The location of the source control BMP are shown in the BMP Map included in Section VI. Section VII includes copies of the educational materials that will be used in implementing this project-specific WQMP.

(N1) Education for Property Owners, Operators, Occupants, or Employees
Practical Informational materials will be provided by the project proponent to the first occupants/operators/employees on general housekeeping practices that contribute to the protection of stormwater quality. These materials shall include general housekeeping practices that contribute to the protection of Urban Runoff quality and BMPs that eliminate or reduce pollution during subsequent property improvements. Employee Training/Education Program as it would apply to all future employees. Based on information provided by the City of Newport Beach and attached in Section VII, the owner shall familiarize himself with this document and shall provide copies of this information to all future operators and employees for training purposes.

(N2) Activity Restrictions
Pres Companies, Inc. will institute the following Activity Restriction applicable to employees, tenants and contractors hired for maintenance activities.

1. Outside of the porous asphalt pavement to the southeast of the front entrance, no pressure washing on the remaining paved surfaces will be allowed.
2. The porous asphalt pavement shall be maintained in accordance with procedures per Section V.
3. Trash – No rubbish, trash, garbage or other waste material shall be kept onsite or on any public street abutting the properties, except in sanitary container located in appropriate areas (trash containers). All dumpster lids must be closed at all times.
4. Drainage – There shall be no interference with or alteration of the established drainage pattern on the site unless an adequate alternative provision is made for proper drainage with the prior written approval of the City.
5. Hosing of spilled contents such as motor oil, transmission fluids, paints, solvents and other oils or chemicals into the catch basin and landscaped areas are prohibited.
6. Vehicle washing, maintenance, or repair on the premises will be prohibited.
7. The blowing, sweeping or hosing of debris (leaf litter, grass clippings, litter etc.) into streets, storm drain inlets, landscaped areas or other conveyances will be prohibited.

(N3) Common Area Landscape Management
All ongoing landscape maintenance shall be consistent with County Water Conservation Resolution or City equivalent, plus fertilizer and/or pesticide usage consistent with Management Guidelines for Use of Fertilizers per DAMP Section 5.5. BMP Fact Sheet No. SC-41, CASQA Landscape Maintenance (attached per Section VII) plus fertilizer and pesticide usage consistent with the instructions contained on product labels and with the regulations administered by the State Department of Pesticide Regulations, or City

equivalent. Owner to maintain porous pavement per SD-20, (from California BMP Handbook and attached per Section VII), Filterra Roof Drain Planter per manufacturer's instruction attached per Section VII), and other landscape area. Landscape maintenance must address replacement of dead vegetation, repair of eroded areas, proper disposal of green waste, etc. Irrigation system maintenance must address to the testing and observation of the irrigation system to detect overspray, broken sprinkler heads and other system failures. The irrigation system will be maintained bi-monthly (or as required if malfunctioning of the system is reported by the landscape maintenance crew) and the landscape maintenance frequency will be weekly. The responsible party will be the owner.

(N4) BMP Maintenance
The responsible party for implementation of each non-structural BMP will be the owner.

(N5) Title 22 CCR Compliance
Compliance with Title 22 of the California Code of Regulations and relevant sectons of the California Health and Safety Code regarding hazardous waste management shall be enforced by County Environmental Health (and/or City equivalent) on behalf of the State. A complete set of the site and building plans and all related documents are reviewed and approved for compliance by the City's Health Department.

(N6) Local Industrial Permit Compliance
Compliance will be achieved through the City Building Permit process based on details of the bakery operations.

(N7) Spill Contingency Plan
The plan is prepared by the owner for use by the building operator which mandates stockpiling of cleanup materials, notification of responsible agencies, disposal of cleanup materials, documentation, etc.

(N9) Hazardous Materials Disclosure Compliance
Compliance with City ordinances enforced by the City Fire Department for the management of hazardous materials. The Orange County Health Department and the State Department of Toxics Substance Control will be responsible for enforcing hazardous materials and hazardous waste handling and disposal regulations.

(N10) Uniform Fire Code Implementation
Compliance with Article 80 of the Uniform Fire Code enforced by the City of Anaheim Fire Department.

(N11) Common Area Litter Control
The owner will implement trash management and litter control procedures within and near the vicinity of the facility aimed at reducing pollution of drainage water. The owner may contract with their landscape maintenance firms to provide this service during regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles.

(N12) Employee Training
Education program (see N1) as it would apply to all existing and new employees.

(N14) Common Area Catch Basin Inspection
The owner is required to have at least 80 percent of drainage facilities inspected, cleaned and maintained on an annual basis with 100 percent of the facilities included in a two-year period. Cleaning should take place in the late summer/early fall prior to the start of the rainy season. Drainage facilities include catch basins, manholes and conveyance swales.

(N15) Street Sweeping Private Streets and Parking Lots
The areas exterior to the building will be swept as frequently as necessary to prevent sediment, landscape waste and trash from entering onsite catch basins and the adjoining public streets. At a minimum, the sweeping will be done on weekly basis.

Table 2. Routine Structural BMPs

Name	Check One		If not applicable, state brief reason
	Included	Not Applicable	
Provide storm drain system stenciling and signage (SD-13)	X		
Design and construct outdoor material storage areas to reduce pollution introduction		X	No outdoor material storage is planned
Design and construct trash and waste storage areas to reduce pollution introduction (SD-32)	X		
Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (SD-12)	X		
Protect slopes and channels and provide energy dissipation		X	No slopes or channels for this project
Incorporate requirements applicable to the following individual priority project categories:	X		
a. Dock areas		X	No Dock areas will be constructed
b. Maintenance bays		X	No maintenance bays will be constructed
c. Vehicle wash areas		X	No onsite vehicle washing will be allowed
d. Outdoor processing areas		X	None Contemplated
e. Equipment wash areas		X	Equipment washing will be conducted indoors
f. Fueling areas		X	None Planned
g. Hillside landscaping		X	Not applicable
h. Wash water control for food preparation areas		X	Not applicable
i. Community car wash racks		X	Not applicable

Structural Source Control BMPs

The location of the structural source control BMP are shown in the BMP Map included in Section VI

(S1) Provide Storm Drain System Stenciling and Signage

1. Provide stenciling or labeling of all storm drain catch basins, constructed or modified, within the project area with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
2. Maintain legibility of stencils and signs.

(S3) Design Trash Storage Areas to Reduce Pollutant Introduction

The trash containment area shall be designed and constructed to meet the following requirements:

1. Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash.
2. Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.
3. Connection of trash area drains to a sanitary sewer.

(S4) Use Efficient Irrigation Systems and Landscape Design

1. Owner will install an irrigation system which will have the following features:
2. Employ rain shut-off device that will automatically preventing irrigation during and after precipitation events
3. Provide the appropriate amount of water to meet each landscape area's specific needs
4. Use flow reducers or shuoff valves triggered by a pressure drop to control water loss due to broken sprinkler heads or lines
5. Implement landscape plan consistent with County Water Conservation Resolution or City equivalent, which should include provision of water sensors, programmable irrigation times (for short cycles), etc.
6. The timing and application methods of irrigation water shall be designed to minimize the runoff of excess irrigation water into the municipal storm drain system.

(S6) Incorporate Requirements Applicable to Individual Priority Project Categories
Parking Lots: Source Control BMP's – required.
Site Design BMPs – To be incorporated into site design.

Site Design BMPs

The following table shows site design BMPs that are included in this project. A description of each BMPs follows:

Table 3. Site Design BMPs

Technique	Included? Yes	Included? No	Brief Description of Method
Minimize Impervious Area/Maximize Permeability (C-Factor Reduction)[1]	X		Provide porous AC Pavement
Minimize Directly Connected Impervious Areas (DCIAs) (C-Factor Reduction)	X		Roof runoff drain to Filterra Roof Planter
Create Reduced or "Zero Discharge" Areas (Runoff Volume Reduction)[2]	X		Provide porous AC Pavement
Conserve Natural Areas (C-Factor Reduction)		X	No natural areas within the project areas

1. Detention and retention areas incorporated into landscape design provide areas for retaining and detaining stormwater flows, resulting in lower runoff rates and reductions in volume due to limited infiltration and evaporation. Sute Site Design BMPs may reduce the size of Treatment Control BMPs.
2. The "C" Factor is a representation of the ability of a surface to produce runoff. Surfaces that produce higher volumes of runoff are represented by higher "C" Factors. By incorporating more pervious, lower "C" Factor surfaces into a development, lower volumes of runoff will be produced. Lower volumes and rates of runoff translate directly to lowering treatment requirements.

The parking area fronting the building entrance will be constructed of porous AC pavement. An infiltration gravel bed with perforated pipes will be constructed below the porous AC. Half of the roof of the proposed building will be discharged directly into the perforated pipe system below the porous AC pavement.

Even though the underlying soil is clayey silt and sand, only a minute infiltration of 0.01 inch per hour is assumed. The subdrain system together with the gravel bed will store and eventually convey any residual stormwater runoff into the existing onsite storm drain system.

The entire roof will drain into the Filterra Roof Drainage Planter. The system is TARP approved and has demonstrated to simulate the treatment capability of a bioretention planter. The footprint is smaller in comparison and will also be easier and economical to maintain.

About 60% of the entire roof runoff will be stored and partly infiltrated by the porous pavement and Filterra Roof Planter. The area of the roof is 5,800 SF. 60% of 5,800 SF is 3,480 SF and larger than the required impervious area mitigation of 1,383 SF

Treatment Control BMPs

The following table shows treatment BMPs that are included in this project. A description of each BMP follows:

Table 4. Treatment Control BMPs

Name	Included?		If not applicable, state brief reason
	Yes	No	
Vegetated (Grass) Strips		X	None designed
Vegetated (Grass) Swales		X	None designed
Proprietary Control Measures	X		
Dry Detention Basin		X	None designed
Wet Detention Basin		X	None designed
Constructed Wetland		X	None designed
Detention Basin/Sand Filter		X	None designed
Porous Pavement Detention	X		
Porous Landscape Detention	X		
Infiltration Basin		X	Not applicable
Infiltration Trench		X	None Designed
Media Filter			Not used
Proprietary Control Measures			Not used

Along the southwest entrance, the parking area will be constructed of porous pavement with infiltration, detention and outflow system beneath the pavement.

A Filterra Roof Drain Planter is designed at the southeast corner of the building to treat and intercept the entire roof runoff.

For identified pollutants of concern that are **causing an impairment in receiving waters**, the project WQMP shall incorporate one or more Treatment Control BMPs of medium or high effectiveness in reducing those pollutants. This report will demonstrate, and document in the project WQMP, that all pollutants of concern will be fully addressed. Detailed descriptions on the implementation and long-term O&M of planned Treatment Control BMPs will be provided.

Porous Pavement (S8)
The parking area located at the southeast building front entrance will be constructed of porous asphalt with a gravel bed for storm water storage and infiltration. The porous asphalt allows water to seep into the gravel recharge bed, where the gravel voids will temporarily store the storm water and which will be partly infiltrated, and the remaining stored and gradually released via a subdrain into the existing onsite storm drain system. The roof drainage will also be discharged directly into the recharge bed via a drain pipe through the parking lot. Maintenance of the porous AC is described in Section V. BMP fact sheet SD-20 Pervious Pavement is attached per Section VII.

Filterra Roof Drain Planter (S9)
The entire roof drainage will be discharged into the Filterra Roof Drain Planter. The manufacturer's literature and maintenance procedures of the unit is attached per Section VII.

Proprietary Treatment Device (S3)
A grating catch basin fitted with a filter insert manufactured by BioClean Environmental is constructed at the porous AC pavement. The catch basin provides access for maintenance of the underground subdrain system. This insert is for pretreatment only to increase the life-span of the gravel infiltration bed beneath. BMP fact sheets for the filters and their maintenance are described in Section V.

TREATMENT BMP CALCULATIONS

<u>For the area tributary to the porous AC</u>:

To be provided in the final WQMP

<u>For the area tributary to the Filterra Roof Drain Planter</u>:

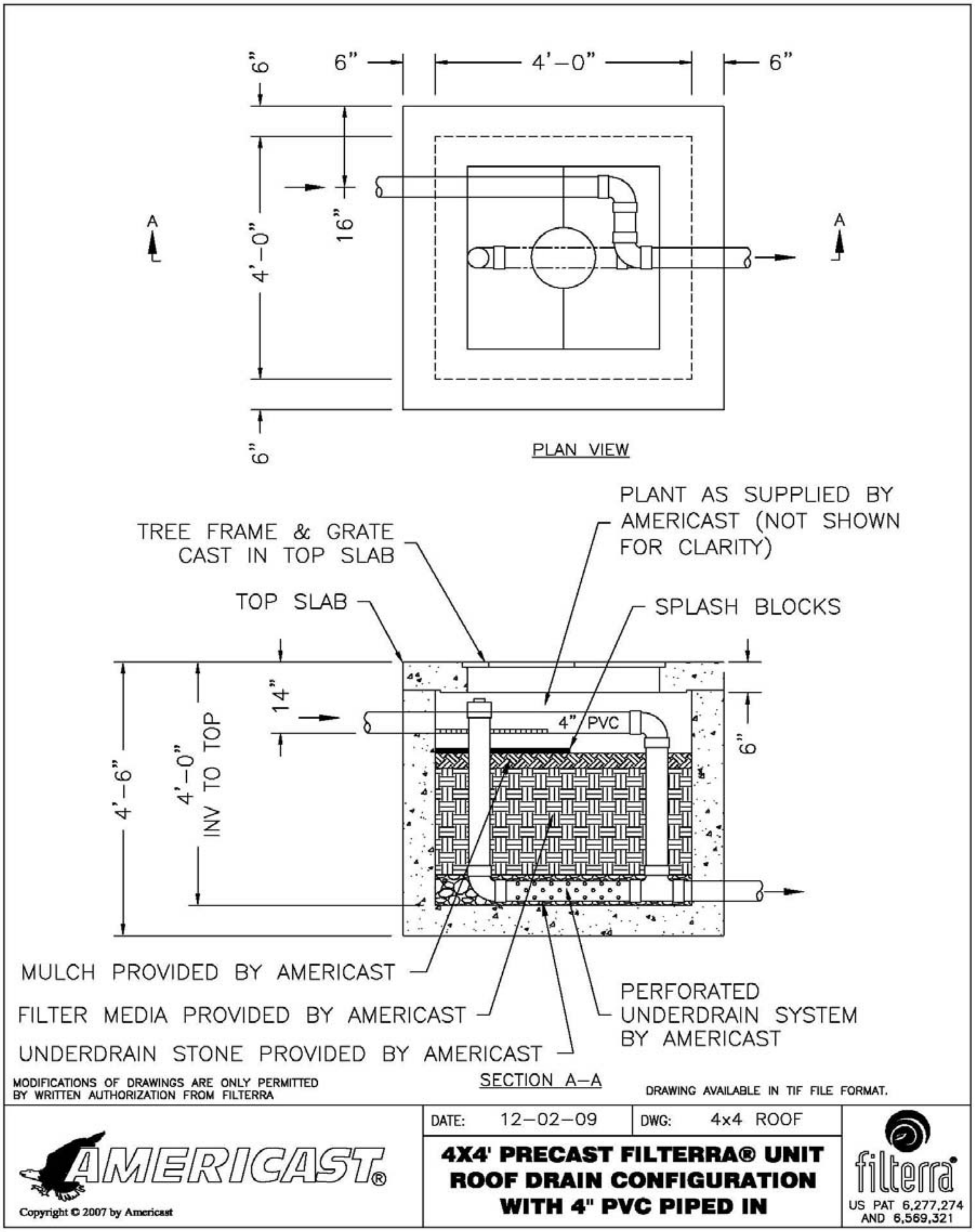
To be provided in the final WQMP

Section V Inspection/Maintenance Responsibility for BMPs: Operation and Maintenance (O&M) Plan

The inspection/maintenance responsibility for BMPs will be the owner – Pres Inc.

Filterra Roof Drain Planter Maintenance:

See next page


6"
6"
4'-0"
6"
4'-0"
16"
A
A
6"
PLAN VIEW
PLANT AS SUPPLIED BY AMERICAST (NOT SHOWN FOR CLARITY)
TREE FRAME & GRATE CAST IN TOP SLAB
TOP SLAB
SPLASH BLOCKS
14"
4" PVC
6"
4'-6"
4'-0" INV TO TOP
MULCH PROVIDED BY AMERICAST
FILTER MEDIA PROVIDED BY AMERICAST
UNDERDRAIN STONE PROVIDED BY AMERICAST
PERFORATED UNDERDRAIN SYSTEM BY AMERICAST
SECTION A–A
MODIFICATIONS OF DRAWINGS ARE ONLY PERMITTED BY WRITTEN AUTHORIZATION FROM FILTERRA
DRAWING AVAILABLE IN TIF FILE FORMAT.
DATE: 12–02–09
DWG: 4x4 ROOF
AMERICAST®
Copyright © 2007 by Americast
4X4' PRECAST FILTERRA® UNIT
ROOF DRAIN CONFIGURATION
WITH 4" PVC PIPED IN
filterra
US PAT 6,277,274 AND 6,569,321

Operation & Maintenance (OM) Manual v01

filterra®

Bioretention Systems

A Growing Idea in Stormwater Filtration.

A Division of: AMERICAST

Filterra® Stormwater Bioretention Filtration System

toll free: (866) 349 3458 | fax: (804) 798 8400 | maintenance@filterra.com | filterra.com

Table of Contents

Overview

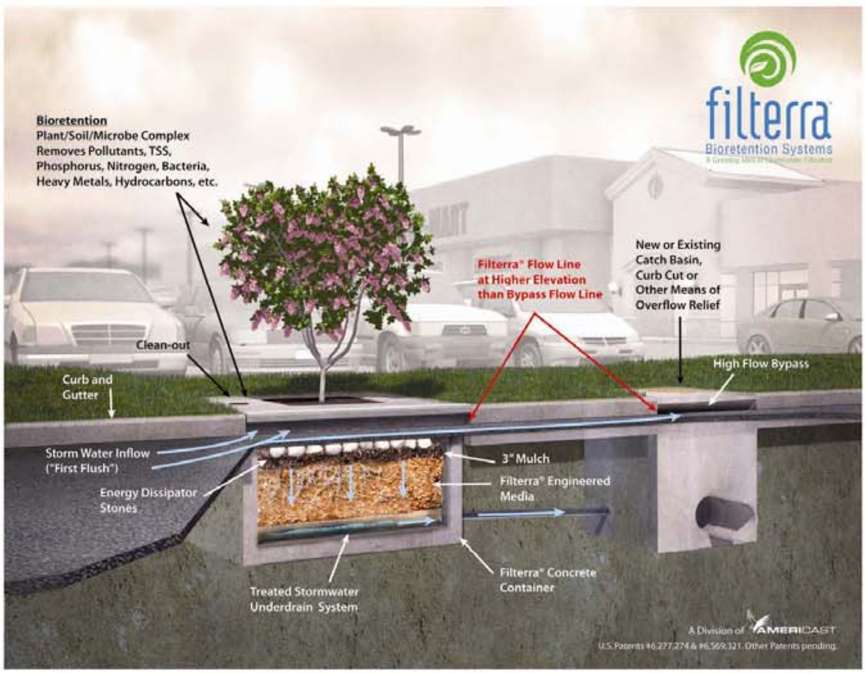
Maintenance

Resources

filterra®

General Description

The following general specifications describe the general operations and maintenance requirements for the Americast stormwater bioretention filtration system, the Filterra®. The system utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system is a fully equipped, pre-constructed drop-in place unit designed for applications in the urban landscape to treat contaminated runoff.



Stormwater flows through a specially designed filter media mixture contained in a landscaped concrete container. The mixture immobilizes pollutants which are then decomposed, volatilized and incorporated into the biomass of the Filterra® system's micro/macro fauna and flora. Stormwater runoff flows through the media and into an underdrain system at the bottom of the container, where the treated water is discharged. Higher flows bypass the Filterra® to a downstream inlet or outfall.

Maintenance is a simple, inexpensive and safe operation that does not require confined space access, pumping or vacuum equipment or specialized tools. Properly trained landscape personnel can effectively maintain Filterra® Stormwater systems by following instructions in this manual.

Basic Operations

Filterra® is a bioretention system in a concrete box. Contaminated stormwater runoff enters the filter box through the curb inlet spreading over the 3-inch layer of mulch on the surface of the filter media. As the water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the soil media where the finer particles are removed and other chemical reactions take place to immobilize and capture pollutants in the soil media. The cleansed water passes into an underdrain and flows to a pipe system or other appropriate discharge point. Once the pollutants are in the soil, the bacteria begin to break down and metabolize the materials and the plants begin to uptake and metabolize the pollutants. Some pollutants such as heavy metals, which are chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to release the metals to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria and used in their metabolic processes. Nitrogen goes through a very complex variety of biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, soil and biomass with some passing out of the system into the air or back into the water.

Design and Installation

Each project presents different scopes for the use of Filterra® systems. To ensure the safe and specified function of the stormwater BMP, Americast reviews each application before supply. Information and help may be provided to the design engineer during the planning process. Correct Filterra® box sizing (by rainfall region) is essential to predict pollutant removal rates for a given area. The engineer shall submit calculations for approval by the local jurisdiction. The contractor is responsible for the correct installation of Filterra units as shown in approved plans. A comprehensive installation manual is available at fillrerra.com.

Maintenance

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement.

- Avoid legal challenges from your jurisdiction's maintenance enforcement program.
- Prolong the expected lifespan of your Filterra media.
- Avoid more costly media replacement.
- Help reduce pollutant loads leaving your property.

Simple maintenance of the Filterra® is required to continue effective pollutant removal from stormwater runoff before discharge into downstream waters. This procedure will also extend the longevity of the living biofilter system. The unit will recycle and accumulate pollutants within the biomass, but is also subjected to other materials entering the throat. This may include trash, silt and leaves etc. which will be contained within the void below the top grate and above the mulch layer. Too much silt may inhibit the Filterra's® flow rate, which is the reason for site stabilization before activation. Regular replacement of the mulch stops accumulation of such sediment.

When to Maintain?

Americast includes a 1-year maintenance plan with each system purchase. Annual included maintenance consists of a maximum of two (2) scheduled visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as the unit installed, curb and gutter and transitions in place and activation (by Supplier) when mulch and plant are added and temporary throat protection removed.

Activation cannot be carried out until the site is **fully** stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands. The fall visit helps the system by removing excessive leaf litter.

A first inspection to determine if maintenance is necessary should be performed at least twice annually after every major storm event of greater than (1) one inch total depth (subject to regional climate). Please refer to the maintenance checklist for specific conditions that indicate if maintenance is necessary.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required. Regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency; e.g. some fast food restaurants require more frequent trash removal. Contributing drainage areas which are subject to new development wherein the recommended erosion and sediment control measures have not been implemented require additional maintenance visits.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the Supplier and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the (maintenance) Supplier of any damage to the plant(s), which constitute(s) an integral part of the bioretention technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance to the Supplier (i.e. no pruning or fertilizing).

Exclusion of Services

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant of the Filterra® system.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the Supplier maintenance contract. Should a major contamination event occur, the Owner must block off the outlet pipe of the Filterra® (where the cleaned runoff drains to, such as drop-inlet) and block off the throat of the Filterra®. The Supplier should be informed immediately.

Maintenance Visit Summary

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of Filterra® and surrounding area
2. Removal of tree grate and erosion control stones
3. Removal of debris, trash and mulch
4. Mulch replacement
5. Plant health evaluation and pruning or replacement as necessary
6. Clean area around Filterra®
7. Complete paperwork

Maintenance Tools, Safety Equipment and Supplies

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working in close proximity to traffic and also safety hats and shoes. A T-Bar or crowbar should be used for moving the tree grates (up to 170 lbs ea.).

Most visits require only replacement mulch. Three bags of double shredded mulch are used per unit (on a standard 6x6' size). Some visits may require additional Filterra® engineered soil media available from the Supplier.

Maintenance Visit Procedure

1. Inspection of Filterra® and surrounding area

- Record individual unit **before** maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

Record on Maintenance Report the following:

Standing Water	yes | no
Damage to Box Structure Damage	yes | no
to Grate	yes | no
Is Bypass Clear	yes | no

If yes answered to any of these observations, record with close-up photograph (numbered).

2. Removal of tree grate and erosion control stones

- Remove metal grates for access into Filterra® box.
- Dig out silt (if any) and mulch and remove trash & foreign items.

Record on Maintenance Report the following:

Silt/Clay	yes | no
Cups/ Bags	yes | no
Leaves	yes | no
# of Buckets Removed	

3. Removal of debris, trash and mulch

- After removal of mulch and debris, measure distance from the top of the Filterra® engineered media soil to the bottom of the top slab. If this distance is greater than 12", add Filterra® media (not top soil or other) to recharge to a 9" distance.

Record on Maintenance Report the following:

Distance to Bottom of Top Slab (inches)
# of Buckets of Media Added

Filterra® Stormwater Bioretention Filtration System

toll free: **(866) 349 3458** | fax: **(804) 798 8400** | maintenance@filterra.com | filterra.com

4. Mulch replacement

- Add double shredded mulch evenly across the entire unit to a depth of 3".
- Ensure correct repositioning of erosion control stones by the Filterra® inlet to allow for entry of trash during a storm event.
- Replace Filterra® grates correctly using appropriate lifting or moving tools, taking care not to damage the plant.

5. Plant health evaluation and pruning or replacement as necessary

- Examine the plant's health and replace if dead.
- Prune as necessary to encourage growth in the correct directions

Record on Maintenance Report the following:

Height above Grate	(feet)
Width at Widest Point	(feet)
Health	alive | dead
Damage to Plant	yes | no
Plant Replaced	yes | no

6. Clean area around Filterra®

- Clean area around unit and remove all refuse to be disposed of appropriately.

7. Complete paperwork

- Deliver Maintenance Report and photographs to appropriate location (normally Americast during maintenance contract period).
- Some jurisdictions may require submission of maintenance reports in accordance with approvals. It is the responsibility of the Owner to comply with local regulations.

Maintenance Checklist

Drainage System Failure	Problem	Conditions to Check For	Conditions That Should Exist	Actions
Inlet	Excessive sediment or trash accumulation	Accumulated sediments or trash impair free flow of water into Filterra	Inlet should be free of obstructions allowing free distributed flow of water into Filterra.	Sediments and/or trash should be removed.
Mulch Cover	Trash and floatable debris accumulation	Excessive trash and/or debris accumulation.	Minimal trash or other debris on mulch cover.	Trash and debris should be removed and mulch cover raked level. Ensure bark nugget mulch is not used.
Mulch Cover	"Ponding" of water on mulch cover.	"Ponding" in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils.	Stormwater should drain freely and evenly through mulch cover.	Recommend contact manufacturer and replace mulch as a minimum.
Vegetation	Plants not growing or in poor condition.	Soil/mulch too wet, evidence of spill. Incorrect plant selection. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact manufacturer for advice.
Vegetation	Plant growth excessive	Plants should be appropriate to the species and location of Filterra.		Trim/prune plants in accordance with typical landscaping and safety needs.
Structure	Structure has visible cracks	Cracks wider than ½ inch or evidence of soil particles entering the structure through the cracks.		Vault should be repaired.

Maintenance is ideally to be performed twice annually.
Inspection to be performed after every major storm event >1 inch total depth, subject to climate.

Filterra® Stormwater Bioretention Filtration System

toll free: (866) 349 3458 | fax: (804) 798 8400 | maintenance@filterra.com | filterra.com

Filterra® Project Maintenance Order

Project		
Address		
Directions		
Project Owner	Company	
	Contact Name	
	Telephone #	
	Owner Notified of Mtce on (date)	

Filterra Units on this Order ______
Total Units on this Project ______

Date of Maintenance	
Arrival Time	
Departure Time	
# of Workers	
Notes on Project	

Maintenance Supervisor ____________________

12/14/04

Filterra® Structure Maintenance Report

Project		**Structure Number**	
Plant Type		**Structure Size**	
Date		**GPS**	
		Pre Mtce Photo #	

Initial Observations

Standing Water	Y	N	Damage to Grate	Y	N
IF Yes, STOP NOW & call 804-798-6068			Is Bypass Clear	Y	N
			Notes		
Damage to Box Structure	Y	N			
If YES to any observation take close up photo					

Waste

Silt / Clay	Y	N	Buckets Removed (# of)	
Cups/Bags	Y	N	Notes	
Leaves	Y	N		
Other				

Media

Distance to Bottom of Top Slab (in.)		Notes
Buckets of Media Added (# of)		

Mulch

Netting Replaced	Y	N	Bags of Mulch Added (# of)	
Stones Replaced	Y	N	Notes	

Plant

	#1	(#2)		#1	(#2)
Height above Grate (feet)			Plant Replaced	Y / N	Y / N
Width at Widest Point (feet)			Notes		
Health	Alive/Dead	Alive/Dead			
Damage to Plant	Y / N	Y / N			
If YES to plant damage take close up photo					

Other Notes
(use back if necessary)

12/14/04

Filterra® Warranty

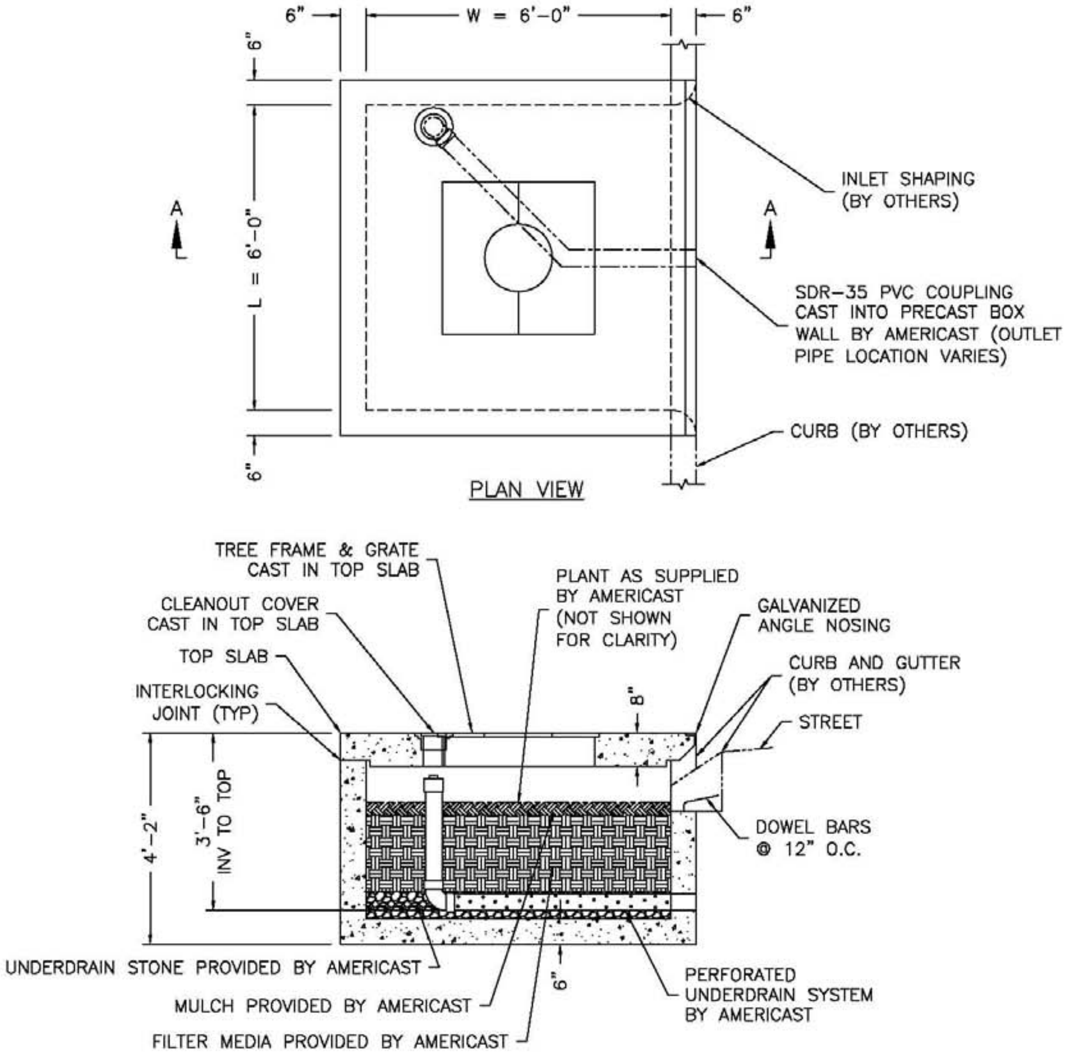
Seller warrants goods sold hereunder against defects in materials and workmanship only, for a period of (1) year from date the Seller activates the system into service. Seller makes no other warranties, express or implied.

Seller's liability hereunder shall be conditioned upon the Buyer's installation, maintenance, and service of the goods in strict compliance with the written instructions and specifications provided by the Seller. Any deviation from Seller's instructions and specifications or any abuse or neglect shall void warranties.

In the event of any claim upon Seller's warranty, the burden shall be upon the Buyer to prove strict compliance with all instructions and specifications provided by the Seller.

Seller's liability hereunder shall be limited only to the cost or replacement of the goods. Buyer agrees that Seller shall not be liable for any consequential losses arising from the purchase, installation, and/or use of the goods.

12/29/04



SECTION A-A

DESIGNATION	L	W	TREE GRATE QTY & SIZE	OUTLET PIPE
6 x 6	6'-0"	6'-0"	(1) 3x3	4" SDR-35 PVC

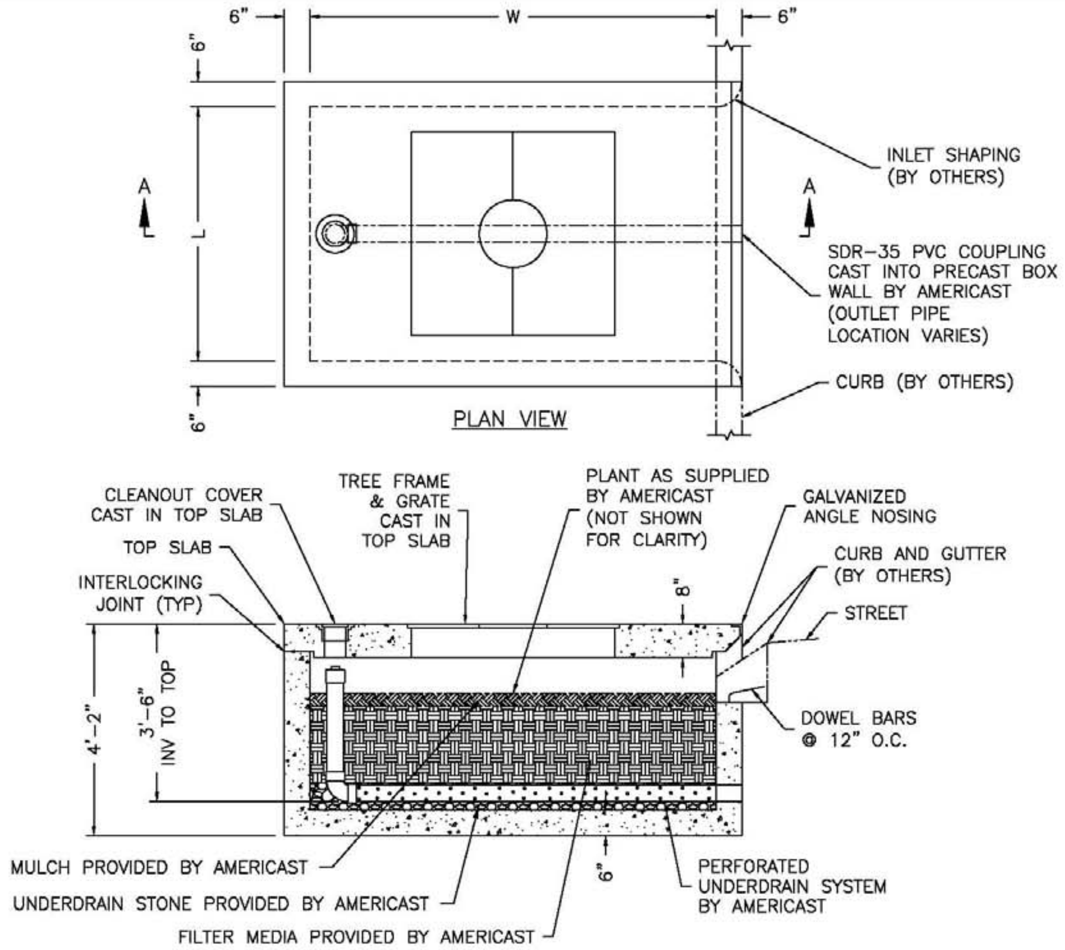
** SIZES SHOWN ARE FOR THE MID ATLANTIC AND MAY VARY ACROSS THE COUNTRY
PLEASE CONTACT FILTERRA FOR A LIST OF SIZES WITHIN YOUR REGION

AMERICAST®

DATE: 07-07-06 DWG: FTST-2

PRECAST FILTERRA® UNIT STANDARD CONFIGURATION

filterra®
US PAT 6,277,274 AND 6,569,321



SECTION A-A

DESIGNATION	L	W	TREE GRATE QTY & SIZE	OUTLET PIPE
4 x 6	4'-0"	6'-0"	(1) 3x3	4" SDR-35 PVC
4 x 8	4'-0"	8'-0"	(1) 3x3	4" SDR-35 PVC
4 x 12	4'-0"	12'-0"	(2) 3x3	4" SDR-35 PVC
6 x 8	6'-0"	8'-0"	(1) 4x4	4" SDR-35 PVC
6 x 10	6'-0"	10'-0"	(1) 4x4	6" SDR-35 PVC
6 x 12	6'-0"	12'-0"	(2) 4x4	6" SDR-35 PVC
7 x 13	7'-0"	13'-0"	(2) 4x4	6" SDR-35 PVC

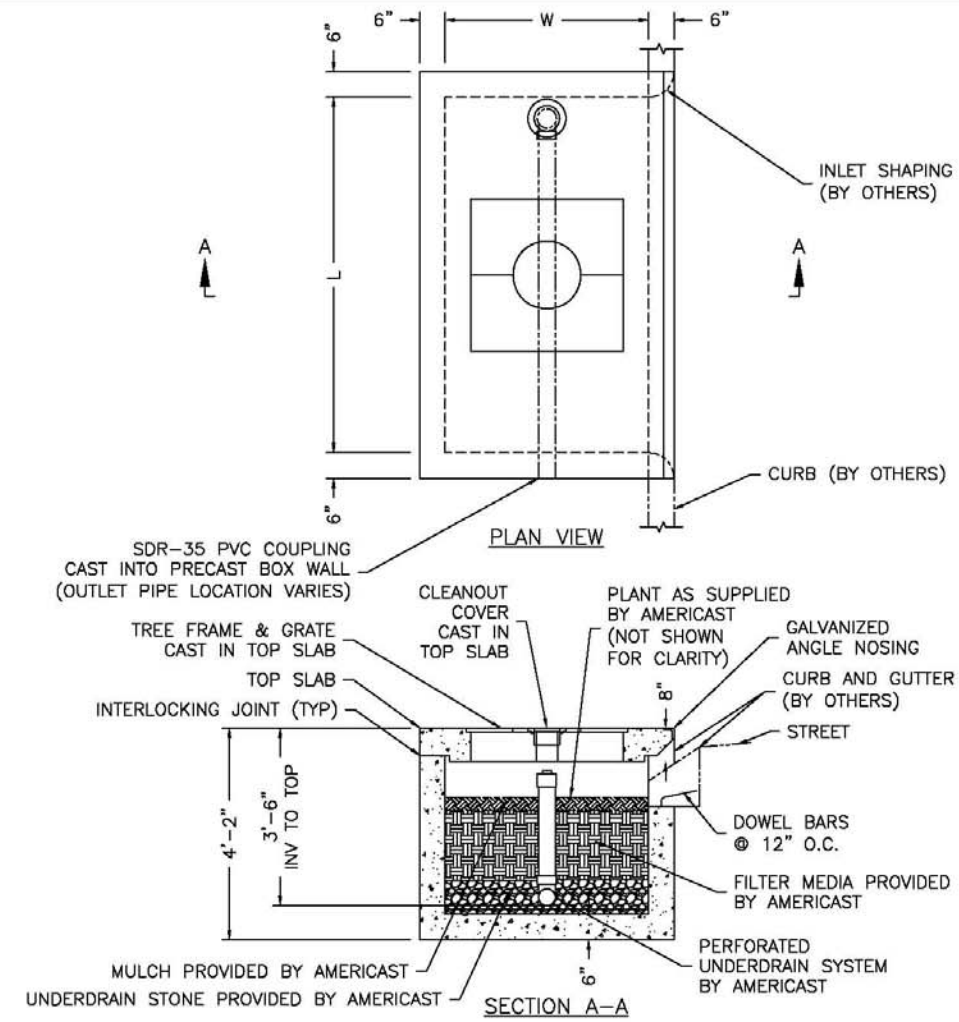
** SIZES SHOWN ARE FOR THE MID ATLANTIC AND MAY VARY ACROSS THE COUNTRY
PLEASE CONTACT FILTERRA FOR A LIST OF SIZES WITHIN YOUR REGION

AMERICAST®

DATE: 09-04-07 DWG: FTNL-3

PRECAST FILTERRA® UNIT
NARROW LENGTH CONFIGURATION

filterra®
US PAT 6,277,274
AND 6,569,321



DESIGNATION	L	W	TREE GRATE QTY & SIZE	OUTLET PIPE
6 x 4	6'-0"	4'-0"	(1) 3x3	4" SDR-35 PVC
8 x 4	8'-0"	4'-0"	(1) 3x3	4" SDR-35 PVC
8 x 6	8'-0"	6'-0"	(1) 4x4	4" SDR-35 PVC
10 x 6	10'-0"	6'-0"	(1) 4x4	6" SDR-35 PVC
12 x 4	12'-0"	4'-0"	(2) 3x3	4" SDR-35 PVC
12 x 6	12'-0"	6'-0"	(2) 4x4	6" SDR-35 PVC
13 x 7	13'-0"	7'-0"	(2) 4x4	6" SDR-35 PVC

** SIZES SHOWN ARE FOR THE MID ATLANTIC AND MAY VARY ACROSS THE COUNTRY
PLEASE CONTACT FILTERRA FOR A LIST OF SIZES WITHIN YOUR REGION

AMERICAST®

DATE: 09-04-07 DWG: FTNW-3

PRECAST FILTERRA® UNIT
NARROW WIDTH CONFIGURATION

filterra®
US PAT 6,277,274
AND 6,569,321

Porous AC Maintenance:

- Frequency: The pavement should be inspected several times in the first few months after construction, and at a minimum twice annually thereafter. Inspection should be conducted after large storms to check for surface ponding that might indicate possible clogging. The catch basin and cleanout of the porous AC parking lot provide a means of inspection for the state of infiltration below grade and should be performed a minimum of four times a year and prior to the onset of the rainy season.
- Seal coats must not be applied as they would be on dense pavement. Topcoating of any kind should be practiced only if a fully porous coating material is available.
- If the pavement is partially clogged by debris and sediment, it can be rehabilitated by vacuuming and washing. If dirt is limited to a specific pavement area, such as that tracked on by dirty tires, a vacuuming effort can be focused on the limited oart of the surface where dirt is present.
- High-pressure washing with simultaneous vacuuming is consistently the most effective at restoring infiltration after clogging. Infiltration to tightly clogged surface cannot be restored merely by vacuuming alone and sweeping followed by suction. Wet sweeping (moistening followed by sweeping) is prohibited as the infiltration will further be reduced by lodging sediment particles more tightly in the surface pores.
- All types of cleaning re most effective when they are done before clogging is complete. If cleaning is delayed and dirt is allowed to be ground into the surface by rain and traffic, it is harder to vacuum out later.
- When a surface is completed clogged, it can be restored by milling off the top one or two inches, where clogging is usually concentrated, and replacing it with equal thickness of open-graded asphalt friction course per NAPA Information Series 115 or per Caltrans specifications for OGFC (Standard Specifications Section 39) and utilize a stiff PG binder PG70-10 PM.

Catch Basin Insert

Grate Inlet Skimmer Box Media Filter

I. Specifications

Track Record: The Grate Inlet Skimmer Box Media Filter (GISB-Media Filter) is manufactured by a company whom is regularly engaged in the engineering design and production of treatment systems for stormwater. Grate Inlet Skimmer Box has been installed and in use as designed in field locations for a duration of over 10 years.

Coverage: The GISB-Media Filter provides full coverage of inlets such that all catch basin influent, at rated flows, is conveyed to the filter. The filter will retain all windblown and swept debris entering the drain.

Non-Corrosive Materials: All components of the GISB-Media Filter, including mounting hardware, fasteners, support brackets, filtration material, and support frame are constructed of non-corrosive materials (316 stainless steel, and UV/marine grade fiberglass). Fasteners are stainless steel. Primary filter mesh is 316 stainless steel welded screens. Filtration basket screens for coarse, medium and fine filtration is ¾” x 1 ¾“expanded, 10 x 10 mesh, and 35 x 35 mesh, respectively. No polypropylene, monofilament netting or fabrics shall be used in the product.

Durability: The GISB-Media Filter is constructed of an all fiberglass frame and stainless steel screens backed by ½ x ½-diamond plate stainless steel. Filter (excluding oil absorbent media) and support structures are of proven durability, with an expected service life of 10 to 15 years. The filter and mounting structures are of sufficient strength to support water, sediment, and debris loads when the filter is full, with no slippage, breaking, or tearing.

Warranty: GISB-Media Filter is **warranted for a minimum of five (5) years. Please see the: Suntree Technologies warranties that the materials used to manufacture it’s products will be able to withstand and remain durable to environmental conditions for a period of 5 years from the date of purchase.**

Oil Absorbent Media: The GISB-Media Filter is fitted with a hydrocarbon boom for removal of petroleum hydrocarbons from influent, and so placed in the filter assembly to treat influent at rated flow. Hydrocarbon booms are easily replaceable in the filter, without the necessity of removing fixed mounting brackets or mounting hardware. The hydrocarbon boom is placed in a separate trough located at the top of the filter unit. The hydrocarbon boom encompasses the total perimeter of the unit and lies horizontal for maximum absorption.

Primary Filtration Media: The GISB-Media Filter is fitted with a multi-level media filter. The media filter treat influent at a rated flow before going into bypass. The multi-level media filter has three layers. The top layer consists of granular perlite that provides treatment flow TSS, oils &

grease, and other particulate pollutants. This layer provides pretreatment for the main layer of treatment. The middle layer consist of BioMediaGREEN, this layer provides the main treatment. BioMediaGREEN is a proprietary filter media with a high sorptive capacity for dissolved pollutants. This layer provides treatment flow fine TSS, hydrocarbons, nutrients, metals, and bacteria. The bottom layer consists of granular expanded shale. This layers main function an under drain but also provides treatment of dissolved phosphorous and other dissolved pollutants.

Overflow Protection: The GISB-Media Filter is designed so that it does not inhibit storm flows entering the grate inlet, or obstruct flow through the catch basin during peak storm flows.

Filter Bypass: Water will not bypass the primary media filter at low flows, nor bypass through attachment and inlet contact surfaces at low flows.

Pollutant Removal Efficiency: The GISB-Media Filter is designed to capture high levels of trash and litter, grass and foliage, sediments, hydrocarbons, grease and oil. The filter has a multistage filtration system, which incorporates three mesh sizes and an overflow opening.

POLLUTANT	**Grate Inlet Skimmer Box**
Trash & Litter	90 to 95%
Oil & Grease	54% to 95%
Sediments/TSS	73% to 84.41%
Organics	79.3%
Total Nitrogen	65 to 79%
Total Phosphorus	71 to 98%

In addition to the above third party independently tested removal efficiencies for a standard GISB. The addition of the BioMediaGREEN allows for much higher levels of treatment. Following are the removal efficiencies for the BioMediaGREEN which is used in all GISB-Media Filters.

BioMediaGREEN

POLLUTANT	**Removal Efficiencies**
Oil & Grease (mg/L)	90%
TPH (mg/L)	99%
TSS (mg/L)	85%
Turbidity (NTU)	99%
Total Phosphorus (mg/L)	69.6%
Dissolved Metals (mg/L)	75.6%

Sil-Co-Sil 106. Mean particle diameter = 19 microns

Non-Scouring: During heavy storm flows or other flows that bypass the GISB-Media Filter, the filter water turbulence deflection shield prevents washout of debris and floatables in the filter basket.

Filter Removal: The GISB-Media Filter is readily removable from the mounting/support frame for maintenance or replacement. Removal and replacement of filter screens is accomplished without the necessity of removing mounting bolts, support frames, etc., but by lift out through the grate inlet. The filter also incorporates a removable water turbulence deflector shield and an overflow shield.

II. Installation

Installation: The GISB-Media Filter will be securely installed in the grated type catch basin, so that no filter bypass can occur at low flow. If any anchoring devices and fasteners are installed within the interior of the drain inlet they should be non corrosive metals. The GISB-Media Filter is located in the catch basin directly beneath a grate opening for direct service/access from the manhole.

Installation Notes:

1. Bio Clean Environmental Services, Inc. notes that the GISB-Media Filter shall be installed pursuant to the manufacturer's recommendations and the details on this sheet.
2. The filter shall provide coverage of entire inlet opening, to direct all flow to insert.
3. To install the GISB-Media Filter, lift the grate.
4. Place GISB-Media Filter into catch basin, the flange of the insert should sit on same lip that grate sits on. The perimeter area of catch basin can be calked to prevent water from entering catch basin under flange.
5. Grate can be replaced into catch basin, resting on the flange of the GISB-Media Filter.
6. In instances where filter cannot sit on catch basin lip an alternative installation as follows: Grate is removed and aluminum "L" channel can be placed on 2 or 4 sides on catch basin walls approximately 2 inches below lip where grate sits. The "L" channel to be attached to side of catch basin with ¼" drive pins. Basket can be then set on the "L" channel and caulked. Grate can then be placed back into catch basin, resting on catch basin lip.
7. Diagrams of both of these types of installation can be seen on cut sheets.

III. Maintenance

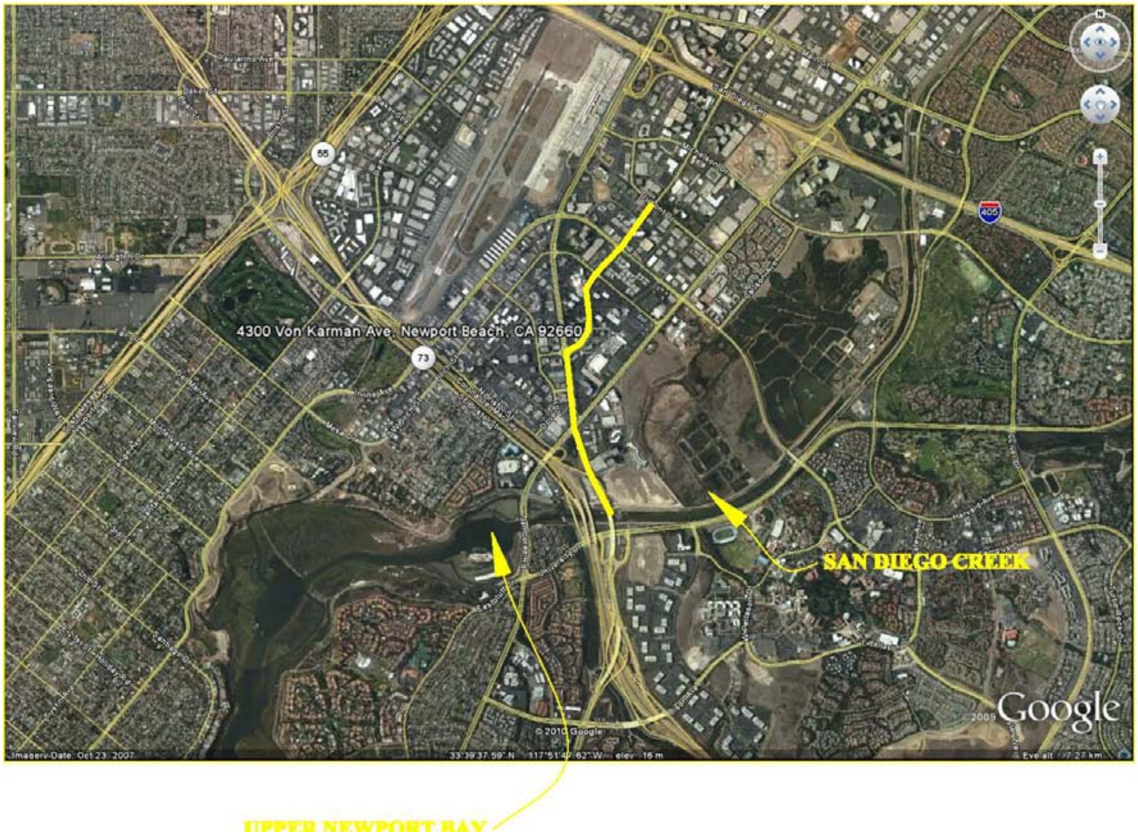
Maintenance: The GISB-Media Filter is designed to allow for the use of vacuum removal of captured materials and spent filter media, serviceable by centrifugal compressor vacuum units without causing damage to the filter or any part of the mounting and attachment hardware during normal cleaning and maintenance. The GISB-Media Filter can be cleaned without entering the catch basin.

Maintenance Notes:

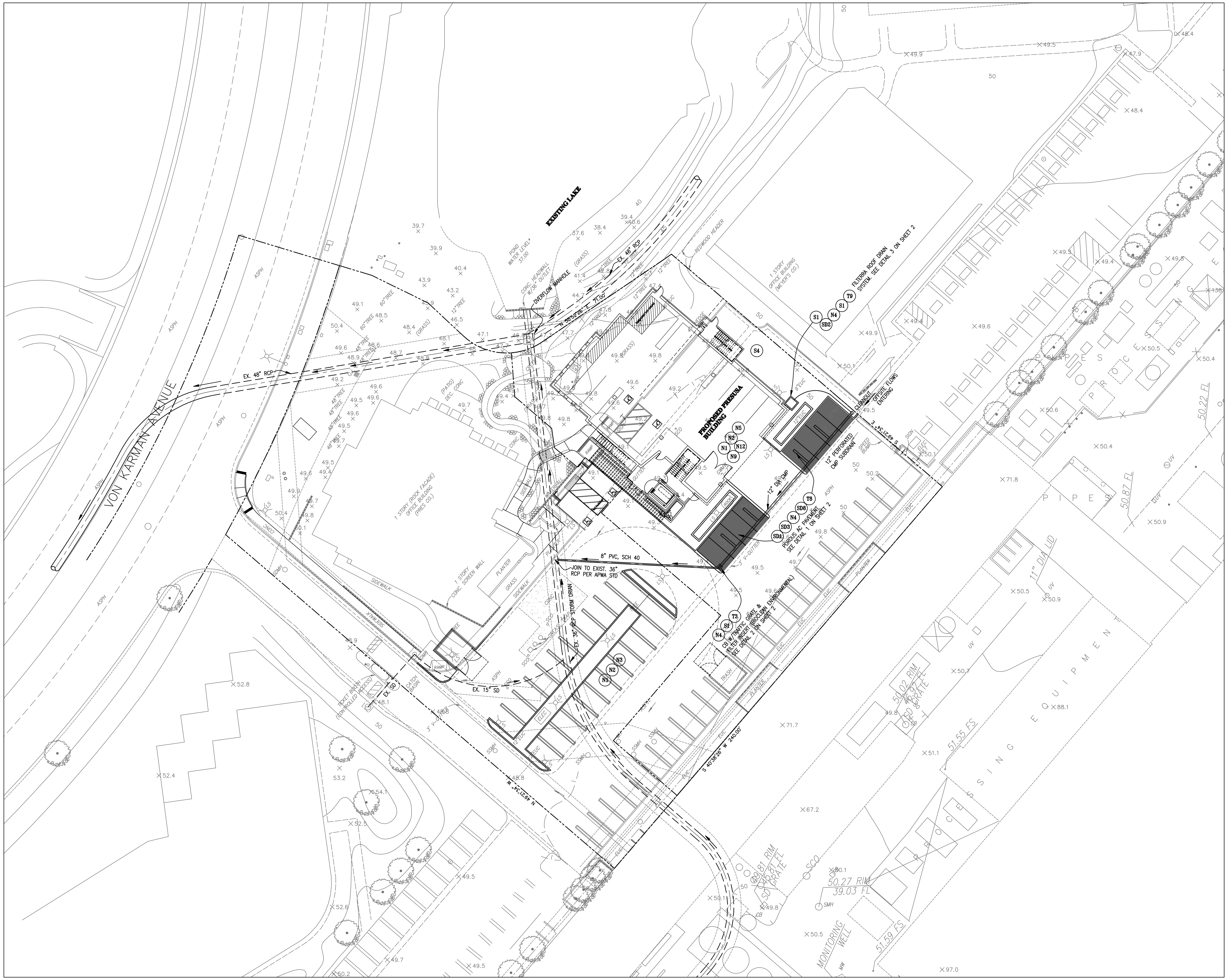
1. Bio Clean Environmental Services Inc. recommends cleaning and maintenance of the GISB-Media Filter a minimum of two times per year or following a significant rain event that would potentially accumulate a large amount of debris in the system. The hydrocarbon boom should be replaced a minimum of twice per year or at each service as needed. The primary filter media (zeolite and BioMediaGREEN) should be replaced a minimum of once per year. May vary with loading conditions.
2. Any person performing maintenance activities that require entering the catch basin or handle a toxic substance have the proper training.
3. Remove grate to gain access to GISB-Media Filter. Remove the deflector shield with the hydrocarbon boom attached. Under normal conditions, cleaning and maintenance will be performed from the above ground surface.
4. Special Note: entry into an underground manhole, catch basin or stormwater vault requires training in an approved OSHA Confined Space Entry Program.
5. Remove all trash, debris, organics, and sediments collected by the GISB-Media Filter. Removal of the trash and debris can be done manually or with the use of a vactor truck. The hose of the vactor truck will not damage the screen of the filter.
6. Evaluation of the hydrocarbon boom shall be performed at each cleaning. If the boom is filled with hydrocarbons and oils it should be replaced. Remove boom by cutting plastic ties and remove boom. Attach new boom to basket with plastic ties through pre-drilled holes in basket.
7. Evaluation of the primary filter media shall be performed at each cleaning. If the filter media is saturated or clogged with pollutants and sediments it should be replaced. To replace, first all accumulated trash and sediments should be removed from above the filter media. Pull our removable screen located directly above the media. Remove spent filter media by hand or with a vac truck. Check of the condition of the expanded shale under drain media. Replace if necessary. Install new blocks of BioMediaGREEN. Make sure fit is water tight. Replace perlite media to level equal to the removable screen. Replace removable screen and secure in place.
8. Place the deflector shield back into the filter. Replace grate.
9. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements. Please refer to state and local regulations for the proper disposal of material.
10. Following maintenance and/or inspection, the maintenance operator shall prepare a maintenance/inspection record. The record shall include any maintenance activities performed, amount and description of debris collected, and condition of filter.
11. The owner shall retain the maintenance/inspection record for a minimum of five years from the date of maintenance. These records shall be made available to the governing municipality for inspection upon request at any time.
12. Any toxic substance or item found in the filter shall be removed according to local and state requirements.

P O Box 869, Oceanside, CA 92049
(760 433-7640 Fax (760) 433-3176
www.biocleanenvironmental.net

Section VI Location Map, Plot Plan & BMP Details

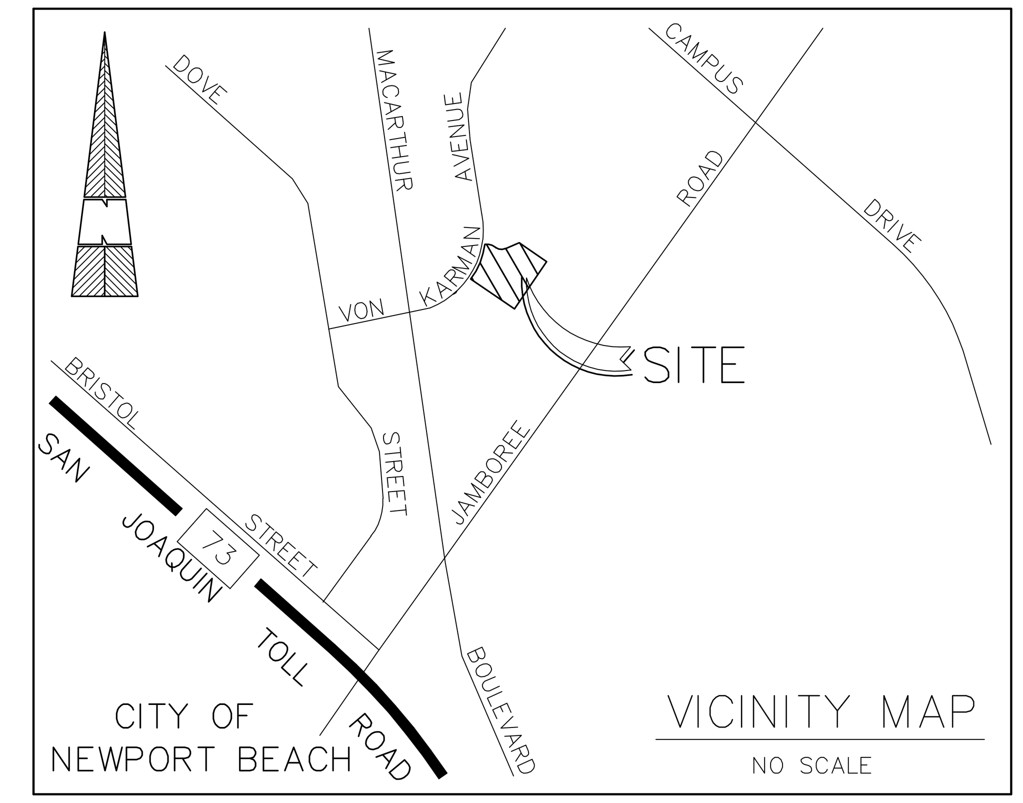


WestLAND Group, Inc. 9540 CENTER AVE., SUITE 100, RANCHO CUCAMONGA, CA PHONE: (909) 989-9789 FAX: (909) 989-9660 Land Surveyors • Civil Engineers • GIS GEORGE K. CHAN, RCE 21520 RCE 21520 EXP. 9-30-11	**MAP OF SITE LOCATION & RECEIVING WATERS** 4300 VON KARMAN AVENUE PROJECT APN 445-131-05,



GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.



ROUTINE NON-STRUCTIONRUAL BMP'S

- (N1) EDUCATION FOR PROPERTY OWNERS, TENANTS, OCCUPANTS
- (N2) ACTIVITY RESTRICTIONS
- (N3) COMMON AREA LANDSCAPE MANAGEMENT
- (N4) BMP MAINTENANCE
- (N5) TITLE 22 CCR COMPLIANCE (HOW DEVELOPMENT WILL COMPLAY)
- (N7) SPILL CONTINGENCY PLAN
- (N9) HAZARDOUS MATERIALS DISCLOSURE COMPLIANCE
- (N10) UNIFORM FIRE CODE IMPLEMENTATION
- (N11) COMMON AREA LITTER CONTROL
- (N12) EMPLOYEE TRAINING
- (N14) COMMON AREA CATCH BASIN INSPECTION
- (N15) STREET SWEEPING PRIVATE STREETS AND PARKING LOTS

ROUTINE STRUCTIONRUAL BMP'S

- (S1) PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE
- (S3) DESIGN AND CONSTRUCT TRASH AND WASTE STORAGE AREAS TO REDUCE POLLUTION INTRODUCTION
- (S4) USE EFFICIENT IRRIGATION SYSTEMS AND LANDSCAPE DESIGN, WATER CONSERVATION, SMART CONTROLLERS, AND SOURCE CONTROL

SITE DESIGN BMP'S

- (SD1) MINIMIZE IMPERVIOUS AREA/MAXIMIZE PERMEABILITY (C-FACTOR REDUCTION)
- (SD2) MINIMIZE DIRECTLY CONNECTED IMPERVIOUS AREAS (DCIAS) (C-FACTOR REDUCTION)
- (SD3) CREATE REDUCED OR "ZERO DISCHARGE" AREAS (RUNOFF VOLUME REDUCTION)

TREATMENT CONTROL BMP'S

- (T3) PROPRIETARY STORMWATER PRETREATMENT MEASURE: BIOCLEAN ENVIRONMENTAL "GRATE INLET SKIMMER BOX". SEE DETAIL 2 ON SHEET 2
- (T8) POROUS PAVEMENT DETENTION/INFILTRATION/POROUS AC/SD-20. SEE DETAIL 1 ON SHEET 2
- (T9) POROUS LANDSCAPE DETENTION – BIORETENTION CELL/PROPRIETARY PRODUCT: FILTERRA ROOFDRAIN SYSTEM FILTERRA BIORETENTION SYSTEM. SEE DETAIL 3 ON SHEET 2

REGISTERED PROFESSIONAL ENGINEER — GEORGE K. CHAN — C-21520 — Exp. 9-30-11 — CIVIL — STATE OF CALIFORNIA

DESCRIPTION	DATE	NO.
REVISIONS		

PLAN PREPARED BY: WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
9540 CENTER AVE, SUITE 100
RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660

GEORGE K. CHAN, RCE 21520 — RCE 21520 — EXP. 9-30-11

DESIGNED BY XXX	CHECKED BY XX	SCALE	FILE NO.
DRAWN BY XX	DATE XX/XX/XX	1"=20'-0"	P10103

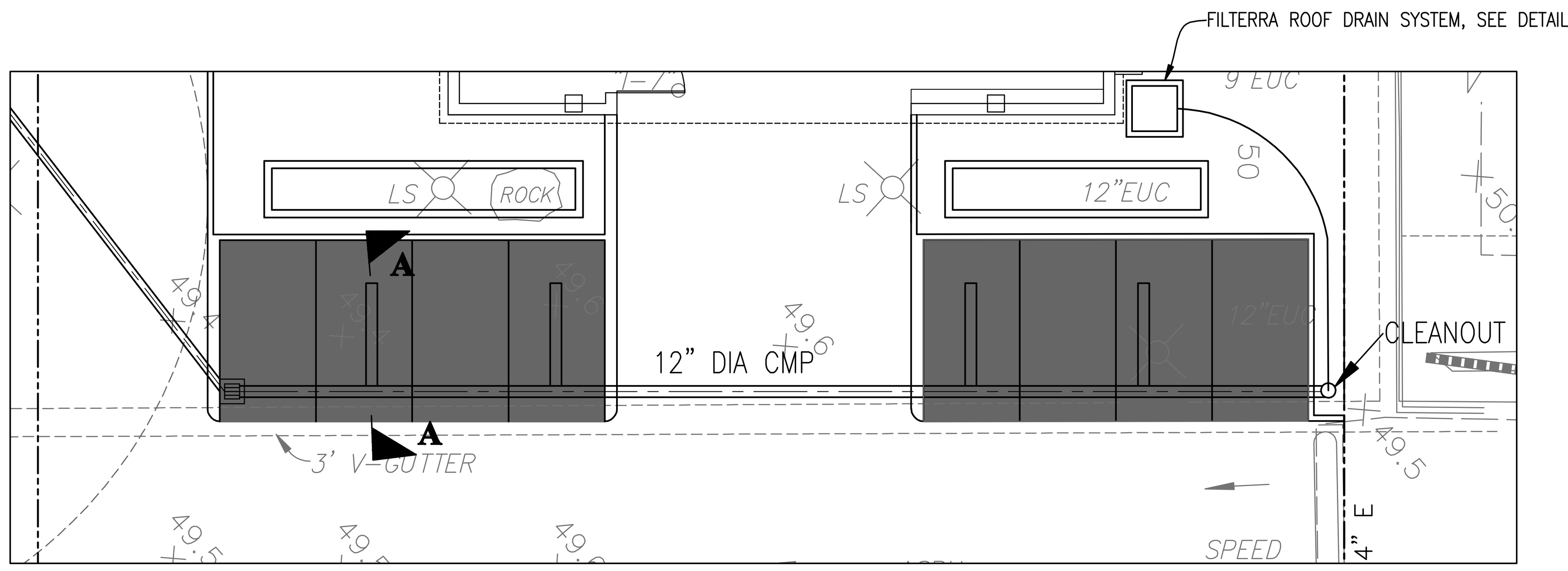
BMP MAP

4300 VON KARMAN AVENUE
NEWPORT BEACH, CALIFORNIA

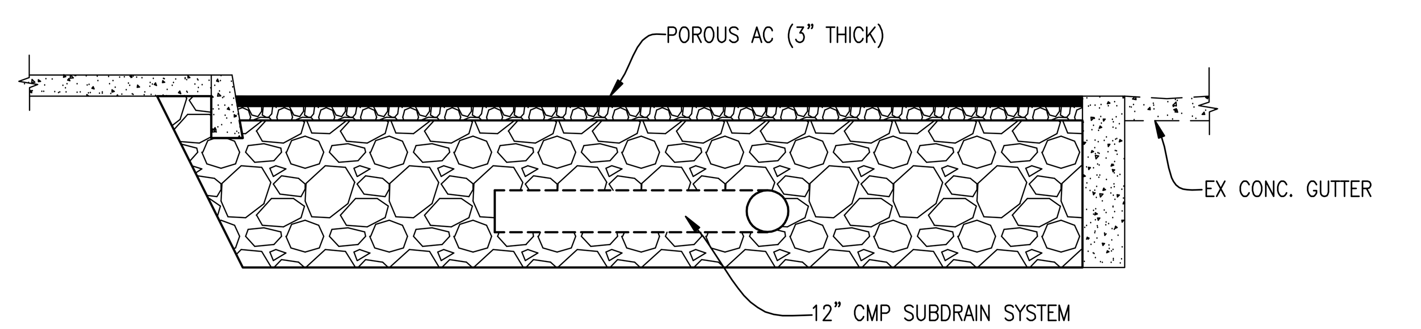
DWG. NAME **P10103 BMP**
PROJECT NO. **P10103**
DWG. NO. **1 OF 2**

DATE ISSUED: 04/27/2010

K:\PROJECTS\YEAR2010\P10103\GRADING\P10103 BMP MAP1.DWG

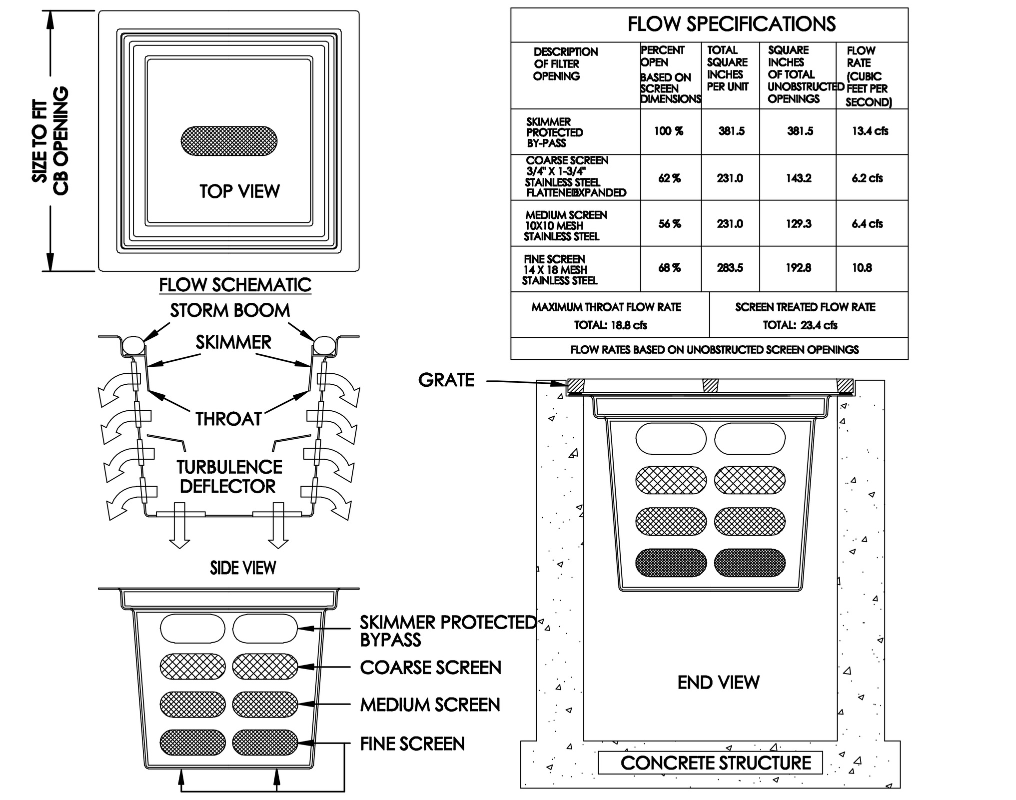


PLAN VIEW
SCALE: 1"=10'-0"



SECTION A-A
SCALE: 1"=10'-0"

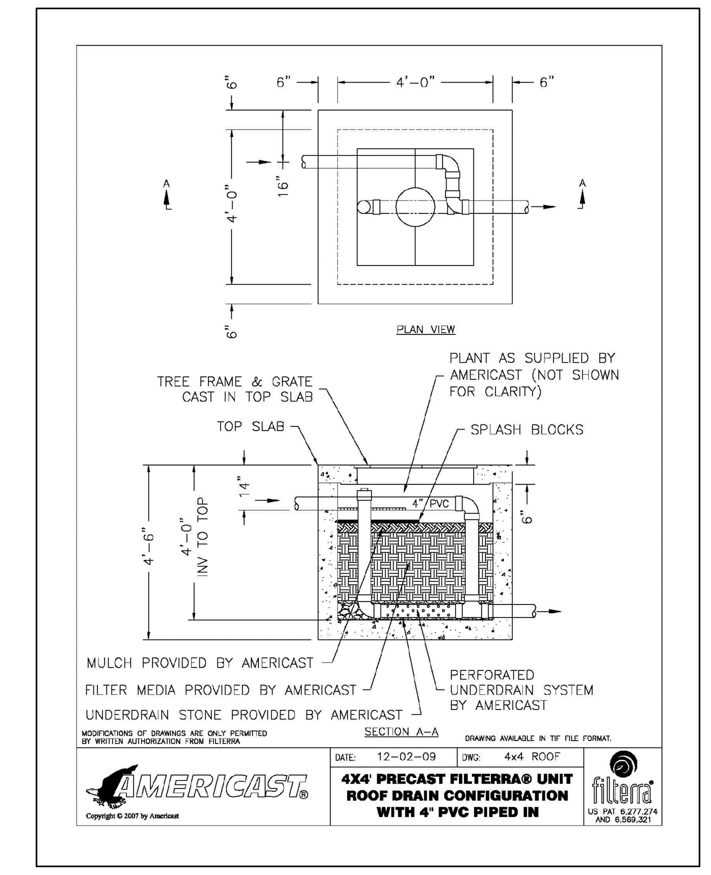
DETAIL 1
POROUS AC/SUBDRAIN SYSTEM



FLOW SPECIFICATIONS

DESCRIPTION OF FILTER OPENING	PERCENT OPEN BASED ON SCREEN DIMENSIONS	TOTAL SQUARE INCHES PER UNIT	SQUARE INCHES OF TOTAL UNOBSTRUCTED OPENINGS	FLOW RATE (CUBIC FEET PER SECOND)
SKIMMER PROTECTED BY-PASS	100 %	381.5	381.5	13.4 cfs
COARSE SCREEN 3/4" X 1-3/4" STAINLESS STEEL FLATTENED/EXPANDED	62 %	231.0	143.2	6.2 cfs
MEDIUM SCREEN 10X10 MESH STAINLESS STEEL	56 %	231.0	129.3	6.4 cfs
FINE SCREEN 14 X 18 MESH STAINLESS STEEL	68 %	283.5	192.8	10.8
MAXIMUM THROAT FLOW RATE TOTAL: 18.8 cfs		SCREEN TREATED FLOW RATE TOTAL: 23.4 cfs		
FLOW RATES BASED ON UNOBSTRUCTED SCREEN OPENINGS				

DETAIL 2
CATCH BASIN FILTER / GRATE INLET SKIMMER BOX
SCALE: NONE



DETAIL 3
FILTERRA ROOF DRAIN LANTER
SCALE: NONE

REGISTERED PROFESSIONAL ENGINEER
GEORGE K. CHAN
C-21520
Exp. 9-30-11
CIVIL
STATE OF CALIFORNIA

DESCRIPTION	DATE	NO.

REVISIONS

PLAN PREPARED BY: WestLAND Group, Inc.
Land Surveyors • Civil Engineers • GIS
9540 CENTER AVE, SUITE 100
RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660

GEORGE K. CHAN, RCE 21520
RCE 21520
EXP. 9-30-11

DESIGNED BY XXX | CHECKED BY XX
DRAWN BY XX | DATE XX/XX/XX

SCALE: NOT TO SCALE
FILE NO. P10103

BMP MAP DETAILS
4300 VON KARMAN AVENUE
NEWPORT BEACH, CALIFORNIA

DWG. NAME **P10103BMP**
PROJECT NO. **P10103**
DWG. NO. **2 OF 2**
DATE ISSUED: 04/27/2010

K:\PROJECTS\YEAR2010\P10103\GRADING\P10103 BMP MAP2.DWG

Section VII Educational Materials Included

The following is a list of educational materials included in this WQMP.

CASQA SC-41: Building & Grounds Maintenance
CASQA: Landscape Maintenance
CASQA SD-12: Efficient Irrigation
CASQA SD-13: Storm Drain Signage
CASQA SD-20: Pervious Pavements
CASQA SD-32: Trash Storage Areas
The Ocean Begins at Your Front Door – Household Tips
Tips for Landscape & Gardening
Tips for Using Concrete & Mortar
Proper Maintenance Practices for Your Business
Good Operating Practices Food/Restaurant Industry

Building & Grounds Maintenance — SC-41

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

CASQA
California Stormwater Quality Association

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.

- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.

- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.

- Use mulch or other erosion control measures when soils are exposed.

- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.

- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.

- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.

- Do not use pesticides if rain is expected.

- Do not mix or prepare pesticides for application near storm drains.

- Use the minimum amount needed for the job.

- Calibrate fertilizer distributors to avoid excessive application.

- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.

- Apply pesticides only when wind speeds are low.

- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.

- Irrigate slowly to prevent runoff and then only as much as is needed.

- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.

- Dispose of empty pesticide containers according to the instructions on the container label.

- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.

- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection
- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Training
- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.

- Train employees and contractors in proper techniques for spill containment and cleanup.

- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.

- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.

- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.

- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.

- Clean up spills immediately.

Other Considerations
Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs
- Cost will vary depending on the type and size of facility.

- Overall costs should be low in comparison to other BMPs.

Maintenance
Sweep paved areas regularly to collect loose particles. Wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Landscape Maintenance

Photo Credit: Geoff Brosseau

Description

This category includes businesses that provide landscaping and landscape maintenance/gardening services.

Pollutant Sources

The following are sources of pollutants:

- Selecting plants or landscape design
- Installing new landscaping
- Maintaining landscapes
- Using pesticides and fertilizers
- Using gas-powered equipment
- Working near waterbodies

Pollutants can include:

- Nutrients (fertilizers, yard wastes)
- Pesticides
- Heavy metals (copper, lead, and zinc)
- Hydrocarbons (fuels, oils and grease)
- Sediments

Approach

Minimize the potential for stormwater pollution and the need for resources/controls (water, pesticides, fertilizers) by creating and maintaining landscapes in a way that is compatible with the local soils, climate, and amount of rain and sun. Make stormwater

CASQA
California Stormwater Quality Association

pollution prevention BMPs a part of standard operating procedures and the employee training program. Provide employee education materials in the first language of employees, as necessary.

Source Control BMPs

The best management practices are listed by activity or area.

Landscape Design

- Specify native, low maintenance, and insectary (attract beneficial insects) plants and landscape designs.
- Design zoned, water-efficient irrigation systems using technologies such drip irrigation, soaker hoses, or microspray systems.
- Do not landscape riparian areas, except to remove non-native plants and replace them with native riparian landscaping.
- Replant with native species where possible when landscaping or building an ornamental pond. Do not assume something is native because you have seen it in your area. Contact the local nursery for information or visit the California Exotic Pest Plant Council website (www.caleppc.org).

Landscape Installation

- Protect stockpiles and landscaping materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Schedule grading and excavation projects during dry weather.
- Divert runoff from exposed soils or lower its velocity by leveling and terracing.
- Use temporary check dams or ditches to divert runoff away from storm drains.
- Protect storm drains with sandbags or other sediment controls.
- Revegetation is an excellent form of erosion control for any site. Keep soils covered with vegetation or temporary cover material (mulch) to control erosion.
- Check plant roots before buying a plant. Do not buy plants with roots are that kinked or circling around the container. Do not buy plants with soft, rotten, or deformed root crowns.
- Do not pile soil around the plant any higher than the root crown.

Landscape Maintenance

Yard Waste

- Allow leaf drop to become part of the mulch layer in tree, shrub, and groundcover areas.
- Keep lawn mower blades sharp and grasscycle.
- Grasscycle – leave grass clippings on the lawn when mowing. Once cut, grass clippings first dehydrate, then decompose, quickly disappearing from view. Proper mowing is required for successful grasscycling. Cut grass when the surface is dry, and keep mower blades sharp. Follow the "1/3 Rule": mow the lawn often enough so that no more than 1/3 of the length of the grass blade is cut in any one mowing. Frequent mowing will produce short clippings that will not cover up the grass surface. The lawn may have to be cut every seven days when the lawn is growing fast but only every 7 to 14 days when the lawn is growing slowly.

- Do not leave clippings on pavement or sidewalks where they can wash off into the street, gutter, or storm drain.
- Collect lawn and garden clippings, pruning waste, and tree trimmings. Chip if necessary, and compost or take to the local municipal yard waste recycling/composting facility.
- In communities with curbside pick-up of yard waste, place clippings and pruning waste at the curb in approved bags or containers. No curbside pickup of yard waste is available for commercial properties.
- Do not blow or rake leaves or other yard waste into the street, or place yard waste in gutters or on dirt shoulders, unless it is being piled up for recycling (allowed by some municipalities). After pick-up, sweep up any leaves, litter, or residue in gutters or on street.

Fertilizing and Pruning

- Perform soil analysis seasonally to determine actual fertilization need and application rates.
- Fertilize garden areas with a mulch of leaves, bark, or composted manure and/or garden waste.
- Apply chemical fertilizer only as needed, when plants can best use it, and when the potential for it being carried away by runoff is low. Make sure the fertilizer spreader is calibrated.
- Prune plants sparingly, if at all. A healthy plant – one that is native to the area and growing under the right conditions – should not need pruning, except when it is not in the right location (where safety or liability is a concern).

Watering

- Use soil probes to determine soil moisture depth, overall moisture levels, and the need to adjust irrigation schedules.

Pest and Weed Control

- Anyone who is in the business of landscape maintenance and performs pest control as part of providing that service must have a license from the state to apply pesticides. Contact the Department of Pesticide Regulation for more information.
- Become trained in and offer customers less-toxic pest control or Integrated Pest Management (IPM).
- The label on a pesticide container is a legal document. Use a pesticide only as instructed on the label.
- Store pesticides, fertilizers, and other chemicals indoors or in a shed or storage cabinet.
- Use pesticides sparingly, according to instructions on the label. Rinse empty containers, and use rinsewater as product.
- Dispose of rinsed, empty containers in the trash. Dispose of unused pesticides as hazardous waste.
- To control weeds, use drip irrigation and mulch. Hand-pull weeds including roots or cut down to ground. Repeat cutting before they flower, grow new leaves, or go to seed. Use herbicides containing pelargonic acid or herbicidal soap as a last resort.

Handling Gasoline

- Use only containers approved by a nationally recognized testing lab, such as Underwriters Laboratories (UL). Keep the container tightly sealed. Containers should be fitted with a spout to allow pouring without spilling and to minimize the generation of vapors.
- Fill cautiously. Always use a funnel and/or spout to prevent spilling or splashing when fueling power mowers, blowers, and all other gas-powered equipment.
- Avoid spilling gasoline on the ground, especially near wells. If a spill occurs use kitty litter, saw dust, or an absorbent towel to soak up the spill, then dispose of it properly.
- Store carefully. Gasoline moves quickly through soil and into groundwater, therefore, store and use gasoline and fuel equipment as far away from your drinking water well as possible. Be certain to keep a closed cap on the gasoline container. Store at ground level, not on a shelf to minimize the danger of falling and spilling.
- Do not dispose of gasoline down the drain, into surface water, onto the ground, or in the trash. Contact the local municipality for directions on proper disposal of excess or old gasoline. Transport old gas in an approved gasoline container.

Working Near Waterbodies

- Do not dump lawn clippings, other yard waste, or soil along creek banks or in creeks.
- Do not store stockpiles of materials (soil, mulch) along creek banks. These piles can erode over time into a creek.
- Do not spray pesticides or fertilizers by creeks.
- Do not over water near streams. The excess water may carry pesticides, fertilizers, sediments, and anything else in its path directly into the creek.
- Do not remove native vegetation along creek banks or remove large woody debris from creek banks or creeks. Instead, contact the local municipal planning department and Department of Fish & Game for guidance.

Treatment Control BMPs

Not applicable.

More Information

Bay Area Stormwater Management Agencies Association, 1999. Start at the Source – Design Guidance Manual for Stormwater Quality Protection. (http://www.basmaa.org).

Bay Area Water Pollution Prevention Agencies, 1998 - 2002. Less-Toxic Pest Management Fact Sheets, Less-Toxic Product List, and In-store display and promotion materials. (http://www.basmaa.org)

California Exotic Pest Plant Council, 1999. Exotic Pest Plant List. (http://www.caleppc.org)

California Integrated Waste Management Board, 1999. Grasscycle! Make the Most of Your Lawn. Make the Most of Your Time. (http://www.ciwmb.ca.gov/organics/Pubs.htm).

California Integrated Waste Management Board, 2001. Resource-Efficient Turf Management and Resource-Efficient Landscaping. (http://www.ciwmb.ca.gov/organics/Pubs.htm).

Contra Costa County, no date. Grasscycle! Clip your waste! (http://grasscycle.abag.ca.gov).

Marin County Stormwater Pollution Prevention Program, no date. Creek Care: A Guide for Urban Marin Residents. (http://www.mcstoppp.org/).

Professional Lawn Care Association of America, 1997. Water Quality and Your Lawn. (http://www.pesp.org/1995/plcaa95-final.htm).

San Francisquito Watershed Council and San Mateo Countywide Stormwater Pollution Prevention Program, no date. Streamside Planting Guide for San Mateo and Santa Clara County Streams. (http://www.acterra.org/watershed/)

The Alliance for Proper Gasoline Handling, 1999. Consumer Tips for Proper Gasoline Handling. (http://www.gas-care.org/consumer_tips.htm).

Videos

California Integrated Waste Management Board, 1999. Grasscycle! Make the Most of Your Lawn. Make the Most of Your Time. (http://www.ciwmb.ca.gov/organics/Pubs.htm).

CCCSD, 2001. The Healthy Home & Garden - Less-Toxic Pest Control (for residents). (http://www.centralsan.org/education/ipm/hgonlineguide.html).

References

Bay Area Stormwater Management Agencies Association, 1999. Start at the Source – Design Guidance Manual for Stormwater Quality Protection. (http://www.basmaa.org).

Bay Area Water Pollution Prevention Agencies, 1998 - 2002. Less-Toxic Pest Management Fact Sheets, Less-Toxic Product List, and In-store display and promotion materials. (http://www.basmaa.org)

California Integrated Waste Management Board, 1999. Grasscycle! Make the Most of Your Lawn. Make the Most of Your Time. (http://www.ciwmb.ca.gov/organics/Pubs.htm).

California Integrated Waste Management Board, 2001. Resource-Efficient Turf Management and Resource-Efficient Landscaping. (http://www.ciwmb.ca.gov/organics/Pubs.htm).

City of Bellevue, 1991. Water Quality Protection for Landscaping Businesses, Business Partners for Clean Water.

Contra Costa County, no date. Grasscycle! Clip your waste! (http://grasscycle.abag.ca.gov).

County of Los Angeles, no date. Landscaping and Nursery Facilities – Best Management Practices, Project Pollution Prevention.

Marin County Stormwater Pollution Prevention Program, no date. Creek Care: A Guide for Urban Marin Residents. (http://www.mcstoppp.org/).

Professional Lawn Care Association of America, 1997. Water Quality and Your Lawn. (http://www.pesp.org/1995/plcaa95-final.htm).

San Francisquito Watershed Council and San Mateo Countywide Stormwater Pollution Prevention Program, no date. Streamside Planting Guide for San Mateo and Santa Clara County Streams. (http://www.acterra.org/watershed/)

Santa Clara Valley Urban Runoff Pollution Prevention Program, 2001. Landscaping, Gardening, and Pool Maintenance – Best Management Practices for the Construction Industry.

The Alliance for Proper Gasoline Handling, 1999. Consumer Tips for Proper Gasoline Handling. (http://www.gas-care.org/consumer_tips.htm).

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.

- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:

  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff

  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect

  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible

  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth

- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include "NO DUMPING

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Pervious Pavements SD-20

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Pervious paving is used for light vehicle loading in parking areas. The term describes a system comprising a load-bearing, durable surface together with an underlying layered structure that temporarily stores water prior to infiltration or drainage to a controlled outlet. The surface can itself be porous such that water infiltrates across the entire surface of the material (e.g., grass and gravel surfaces, porous concrete and porous asphalt), or can be built up of impermeable blocks separated by spaces and joints, through which the water can drain. This latter system is termed 'permeable' paving. Advantages of pervious pavements is that they reduce runoff volume while providing treatment, and are unobtrusive resulting in a high level of acceptability.

Approach

Attenuation of flow is provided by the storage within the underlying structure or sub base, together with appropriate flow controls. An underlying geotextile may permit groundwater recharge, thus contributing to the restoration of the natural water cycle. Alternatively, where infiltration is inappropriate (e.g., if the groundwater vulnerability is high, or the soil type is unsuitable), the surface can be constructed above an impermeable membrane. The system offers a valuable solution for drainage of spatially constrained urban areas.

Significant attenuation and improvement in water quality can be achieved by permeable pavements, whichever method is used. The surface and subsurface infrastructure can remove both the soluble and fine particulate pollutants that occur within urban runoff. Roof water can be piped into the storage area directly, adding areas from which the flow can be attenuated. Also, within lined systems, there is the opportunity for stored runoff to be piped out for reuse.

Suitable Applications

Residential, commercial and industrial applications are possible. The use of permeable pavement may be restricted in cold regions, arid regions or regions with high wind erosion. There are some specific disadvantages associated with permeable pavement, which are as follows:

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Permeable pavement can become clogged if improperly installed or maintained. However, this is countered by the ease with which small areas of paving can be cleaned or replaced when blocked or damaged.

- Their application should be limited to highways with low traffic volumes, axle loads and speeds (less than 30 mph limit), car parking areas and other lightly trafficked or non-trafficked areas. Permeable surfaces are currently not considered suitable for adoptable roads due to the risks associated with failure on high speed roads, the safety implications of ponding, and disruption arising from reconstruction.

- When using un-lined, infiltration systems, there is some risk of contaminating groundwater, depending on soil conditions and aquifer susceptibility. However, this risk is likely to be small because the areas drained tend to have inherently low pollutant loadings.

- The use of permeable pavement is restricted to gentle slopes.

- Porous block paving has a higher risk of abrasion and damage than solid blocks.

Design Considerations

Designing New Installations

If the grades, subsoils, drainage characteristics, and groundwater conditions are suitable, permeable paving may be substituted for conventional pavement on parking areas, cul de sacs and other areas with light traffic. Slopes should be flat or very gentle. Scottish experience has shown that permeable paving systems can be installed in a wide range of ground conditions, and the flow attenuation performance is excellent even when the systems are lined.

The suitability of a pervious system at a particular pavement site will, however, depend on the loading criteria required of the pavement.

Where the system is to be used for infiltrating drainage waters into the ground, the vulnerability of local groundwater sources to pollution from the site should be low, and the seasonal high water table should be at least 4 feet below the surface.

Ideally, the pervious surface should be horizontal in order to intercept local rainfall at source. On sloping sites, pervious surfaces may be terraced to accommodate differences in levels.

Design Guidelines

The design of each layer of the pavement must be determined by the likely traffic loadings and their required operational life. To provide satisfactory performance, the following criteria should be considered:

- The subgrade should be able to sustain traffic loading without excessive deformation.

- The granular capping and sub-base layers should give sufficient load-bearing to provide an adequate construction platform and base for the overlying pavement layers.

- The pavement materials should not crack of suffer excessive rutting under the influence of traffic. This is controlled by the horizontal tensile stress at the base of these layers.

There is no current structural design method specifically for pervious pavements. Allowances should be considered the following factors in the design and specification of materials:

- Pervious pavements use materials with high permeability and void space. All the current UK pavement design methods are based on the use of conventional materials that are dense and relatively impermeable. The stiffness of the materials must therefore be assessed.

- Water is present within the construction and can soften and weaken materials, and this must be allowed for.

- Existing design methods assume full friction between layers. Any geotextiles or geomembranes must be carefully specified to minimize loss of friction between layers.

- Porous asphalt loses adhesion and becomes brittle as air passes through the voids. Its durability is therefore lower than conventional materials.

The single sized grading of materials used means that care should be taken to ensure that loss of finer particles between unbound layers does not occur.

Positioning a geotextile near the surface of the pervious construction should enable pollutants to be trapped and retained close to the surface of the construction. This has both advantages and disadvantages. The main disadvantage is that the filtering of sediments and their associated pollutants at this level may hamper percolation of waters and can eventually lead to surface ponding. One advantage is that even if eventual maintenance is required to reinstate infiltration, only a limited amount of the construction needs to be disturbed, since the sub-base below the geotextile is protected. In addition, the pollutant concentration at a high level in the structure allows for its release over time. It is slowly transported in the stormwater to lower levels where chemical and biological processes may be operating to retain or degrade pollutants.

The design should ensure that sufficient void space exists for the storage of sediments to limit the period between remedial works.

- Pervious pavements require a single size grading to give open voids. The choice of materials is therefore a compromise between stiffness, permeability and storage capacity.

- Because the sub-base and capping will be in contact with water for a large part of the time, the strength and durability of the aggregate particles when saturated and subjected to wetting and drying should be assessed.

- A uniformly graded single size material cannot be compacted and is liable to move when construction traffic passes over it. This effect can be reduced by the use of angular crushed rock material with a high surface friction.

In pollution control terms, these layers represent the site of long term chemical and biological pollutant retention and degradation processes. The construction materials should be selected, in addition to their structural strength properties, for their ability to sustain such processes. In general, this means that materials should create neutral or slightly alkaline conditions and they should provide favorable sites for colonization by microbial populations.

Construction/Inspection Considerations

- Permeable surfaces can be laid without cross-falls or longitudinal gradients.
- The blocks should be lain level
- They should not be used for storage of site materials, unless the surface is well protected from deposition of silt and other spillages.
- The pavement should be constructed in a single operation, as one of the last items to be built, on a development site. Landscape development should be completed before pavement construction to avoid contamination by silt or soil from this source.
- Surfaces draining to the pavement should be stabilized before construction of the pavement.
- Inappropriate construction equipment should be kept away from the pavement to prevent damage to the surface, sub-base or sub-grade.

Maintenance Requirements

The maintenance requirements of a pervious surface should be reviewed at the time of design and should be clearly specified. Maintenance is required to prevent clogging of the pervious surface. The factors to be considered when defining maintenance requirements must include:

- Type of use
- Ownership
- Level of trafficking
- The local environment and any contributing catchments

Studies in the UK have shown satisfactory operation of porous pavement systems without maintenance for over 10 years and recent work by Imbe et al. at 9th ICUD, Portland, 2002 describes systems operating for over 20 years without maintenance. However, performance under such regimes could not be guaranteed, Table 1 shows typical recommended maintenance regimes:

Table 1 Typical Recommended Maintenance Regimes	
Activity	**Schedule**
■ Minimize use of salt or grit for de-icing ■ Keep landscaped areas well maintained ■ Prevent soil being washed onto pavement	Ongoing
■ Vacuum clean surface using commercially available sweeping machines at the following times: - End of winter (April) - Mid-summer (July / August) - After Autumn leaf-fall (November)	2/3 x per year
■ Inspect outlets	Annual
■ If routine cleaning does not restore infiltration rates, then reconstruction of part of the whole of a pervious surface may be required. ■ The surface area affected by hydraulic failure should be lifted for inspection of the internal materials to identify the location and extent of the blockage. ■ Surface materials should be lifted and replaced after brush cleaning. Geotextiles may need complete replacement. ■ Sub-surface layers may need cleaning and replacing. ■ Removed silts may need to be disposed of as controlled waste.	As needed (infrequent) Maximum 15-20 years

Permeable pavements are up to 25 % cheaper (or at least no more expensive than the traditional forms of pavement construction), when all construction and drainage costs are taken into account. (Accepting that the porous asphalt itself is a more expensive surfacing, the extra cost of which is offset by the savings in underground pipework etc.) (Niemczynowicz, et al., 1987)

Table 1 gives US cost estimates for capital and maintenance costs of porous pavements (Landphair et al., 2000)

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Cost Considerations

Permeable pavements are up to 25 % cheaper (or at least no more expensive than the traditional forms of pavement construction), when all construction and drainage costs are taken into account. (Accepting that the porous asphalt itself is a more expensive surfacing, the extra cost of which is offset by the savings in underground pipework etc.) (Niemczynowicz, et al., 1987)

Table 2 gives US cost estimates for capital and maintenance costs of porous pavements (Landphair et al., 2000)

Table 2 Engineer's Estimate for Porous Pavement

Porous Pavement													
Item	Units	Price	Cycles/ Year	Quant. 1 Acre WS	Total	Quant. 2 Acre WS	Total	Quant. 3 Acre WS	Total	Quant. 4 Acre WS	Total	Quant. 5 Acre WS	Total
Grading	SY	$2.00		604	$1,208	1209	$2,418	1812	$3,624	2419	$4,838	3020	$6,040
Paving	SY	$19.00		212	$4,028	424	$8,056	636	$12,084	848	$16,112	1060	$20,140
Excavation	CY	$3.60		201	$724	403	$1,451	604	$2,174	806	$2,902	1008	$3,629
Filter Fabric	SY	$1.15		700	$805	1400	$1,610	2000	$2,300	2800	$3,220	3600	$4,140
Stone Fill	CY	$16.00		201	$3,216	403	$6,448	604	$9,664	806	$12,896	1008	$16,128
Sand	CY	$7.00		100	$700	200	$1,400	300	$2,100	400	$2,800	500	$3,500
Sight Well	EA	$300.00		2	$600	3	$900	4	$1,200	7	$2,100	7	$2,100
Seeding	LF	$0.05		644	$32	1288	$64	1932	$97	2576	$129	3220	$161
Check Dam	CY	$35.00		0	$0	0	$0	0	$0	0	$0	0	$0
Total Construction Costs					**$10,105**		**$19,929**		**$29,619**		**$40,158**		**$49,798**
Construction Costs Amortized for 20 Years					**$505**		**$996**		**$1,481**		**$2,008**		**$2,490**
Annual Maintenance Expense													
Item	Units	Price	Cycles/ Year	Quant. 1 Acre WS	Total	Quant. 2 Acre WS	Total	Quant. 3 Acre WS	Total	Quant. 4 Acre WS	Total	Quant. 5 Acre WS	Total
Sweeping	AC	$250.00	6	1	$1,500	2	$3,000	3	$4,500	4	$6,000	5	$7,500
Washing	AC	$250.00	6	1	$1,500	2	$3,000	3	$4,500	4	$6,000	5	$7,500
Inspection	MH	$20.00	5	5	$100	5	$100	5	$100	5	$100	5	$100
Deep Clean	AC	$450.00	0.5	1	$225	2	$450	3	$675	3.9	$878	5	$1,125
Total Annual Maintenance Expense					**$3,960**		**$7,792**		**$11,651**		**$15,483**		**$19,370**

Other Resources

Abbott C.L. and Comino-Mateos L. 2001. *In situ performance monitoring of an infiltration drainage system and field testing of current design procedures*. Journal CIWEM, 15(3), pp.198-202.

Construction Industry Research and Information Association (CIRIA). 2002**.** *Source Control using Constructed Pervious Surfaces C582*, London, SW1P 3AU.

Construction Industry Research and Information Association (CIRIA). 2000**.** *Sustainable urban drainage systems - design manual for Scotland and Northern Ireland Report C521,* London, SW1P 3AU.

Construction Industry Research and Information Association (CIRIA). 2000 C522 *Sustainable urban drainage systems - design manual for England and Wales*, London, SW1P 3AU.

Construction Industry Research and Information Association (CIRIA). *RP448 Manual of good practice for the design, construction and maintenance of infiltration drainage systems for stormwater runoff control and disposal*, London, SW1P 3AU.

Dierkes C., Kuhlmann L., Kandasamy J. & Angelis G. Pollution Retention Capability and Maintenance of Permeable Pavements. *Proc 9th International Conference on Urban Drainage, Portland Oregon, September 2002.*

Hart P (2002) Permeable Paving as a Stormwater Source Control System. *Paper presented at Scottish Hydraulics Study Group 14th* Annual seminar, SUDS. 22 March 2002, Glasgow.

Kobayashi M., 1999**.** Stormwater runoff control in Nagoya City. Proc. 8 th Int. Conf. on

Urban Storm Drainage, Sydney, Australia, pp.825-833.

Landphair, H., McFalls, J., Thompson, D., 2000, Design Methods, Selection, and Cost Effectiveness of Stormwater Quality Structures, Texas Transportation Institute Research Report 1837-1, College Station, Texas.

Legret M, Colandini V**,** Effects of a porous pavement with reservior strucutre on runoff water:water quality and the fate of heavy metals. Laboratoire Central Des Ponts et Chaussesss

Macdonald K. & Jefferies C. Performance Comparison of Porous Paved and Traditional Car Parks. *Proc. First National Conference on Sustainable Drainage Systems, Coventry June 2001.*

Niemczynowicz J, Hogland W, 1987: Test of porous pavements performed in Lund, Sweden, in Topics in Drainage Hydraulics and Hydrology. BC. Yen (Ed.), pub. Int. Assoc. For Hydraulic Research, pp 19-80.

Pratt C.J. SUSTAINABLE URBAN DRAINAGE – A Review of published material on the performance of various SUDS devices prepared for the UK Environment Agency. Coventry University, UK December 2001.

Pratt C.J., 1995. Infiltration drainage – case studies of UK practice. Project Report

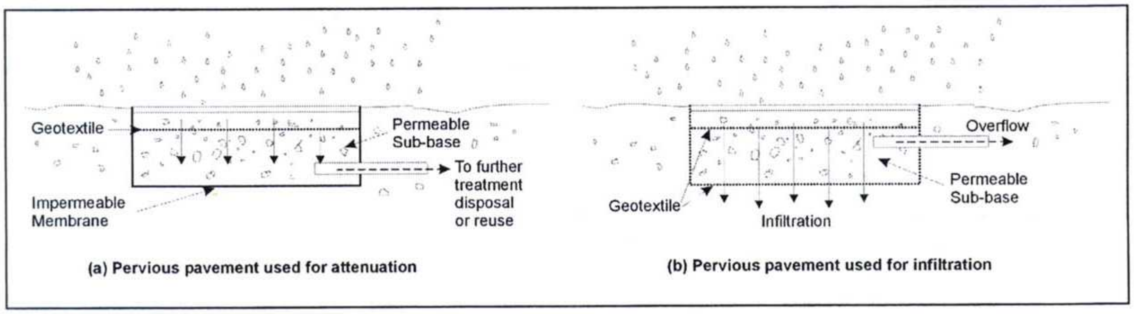
22,Construction Industry Research and Information Association, London, SW1P 3AU; also known as National Rivers Authority R & D Note 485

Pratt. C. J., 1990. Permeable Pavements for Stormwater Quality Enhancement. In: Urban Stormwater Quality Enhancement - Source Control, retrofitting and combined sewer technology, Ed. H.C. Torno, ASCE, ISBN 087262 7594, pp. 131-155

Raimbault G., 1997 French Developments in Reservoir Structures Sustainable water resources I the 21st century. Malmo Sweden

Schlüter W. & Jefferies C. Monitoring the outflow from a *Porous Car Park Proc. First National Conference on Sustainable Drainage Systems, Coventry June 2001.*

Wild, T.C., Jefferies, C., and D'Arcy, B.J. SUDS in Scotland – the Scottish SUDS database Report No SR(02)09 *Scotland and Northern Ireland Forum for Environmental Research, Edinburgh*. In preparation August 2002.



Schematics of a Pervious Pavement System

Trash Storage Areas SD-32

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.

- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

The Ocean Begins at Your Front Door

PROJECT POLLUTION PREVENTION

Follow these simple steps to help reduce water pollution:

Household Activities

- Do not rinse spills with water. Use dry cleanup methods such as applying cat litter or another absorbent material, sweep and dispose of in the trash. Take items such as used or excess batteries, oven cleaners, automotive fluids, painting products and cathode ray tubes, like TVs and computer monitors, to a Household Hazardous Waste Collection Center (HHWCC).
- For a HHWCC near you call (714) 834-6752 or visit www.oclandfills.com.
- Do not hose down your driveway, sidewalk or patio to the street, gutter or storm drain. Sweep up debris and dispose of it in the trash.

Automotive

- Take your vehicle to a commercial car wash whenever possible. If you wash your vehicle at home, choose soaps, cleaners, or detergents labeled non-toxic, phosphate- free or biodegradable. Vegetable and citrus-based products are typically safest for the environment.
- Do not allow washwater from vehicle washing to drain into the street, gutter or storm drain. Excess washwater should be disposed of in the sanitary sewer (through a sink or toilet) or onto an absorbent surface like your lawn.
- Monitor your vehicles for leaks and place a pan under leaks. Keep your vehicles well maintained to stop and prevent leaks.
- Never pour oil or antifreeze in the street, gutter or storm drain. Recycle these substances at a service station, a waste oil collection center or used oil recycling center. For the nearest Used Oil Collection Center call 1-800-CLEANUP or visit www.1800cleanup.org.

Pool Maintenance

- Pool and spa water must be dechlorinated and free of excess acid, alkali or color to be allowed in the street, gutter or storm drain.
- When it is not raining, drain dechlorinated pool and spa water directly into the sanitary sewer.
- Some cities may have ordinances that do not allow pool water to be disposed of in the storm drain. Check with your city.

Landscape and Gardening

- Do not over-water. Water your lawn and garden by hand to control the amount of water you use or set irrigation systems to reflect seasonal water needs. If water flows off your yard onto your driveway or sidewalk, your system is over-watering. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of waste by composting, hauling it to a permitted landfill, or as green waste through your city's recycling program.
- Follow directions on pesticides and fertilizer, (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Take unwanted pesticides to a HHWCC to be recycled. For locations and hours of HHWCC, call (714) 834-6752 or visit www.oclandfills.com.

Trash

- Place trash and litter that cannot be recycled in securely covered trash cans.
- Whenever possible, buy recycled products.
- Remember: Reduce, Reuse, Recycle.

Pet Care

- Always pick up after your pet. Flush waste down the toilet or dispose of it in the trash. Pet waste, if left outdoors, can wash into the street, gutter or storm drain.
- If possible, bathe your pets indoors. If you must bathe your pet outside, wash it on your lawn or another absorbent/permeable surface to keep the washwater from entering the street, gutter or storm drain.
- Follow directions for use of pet care products and dispose of any unused products at a HHWCC.

Common Pollutants

Home Maintenance

- Detergents, cleaners and solvents
- Oil and latex paint
- Swimming pool chemicals
- Outdoor trash and litter

Lawn and Garden

- Pet and animal waste
- Pesticides
- Clippings, leaves and soil
- Fertilizer

Automobile

- Oil and grease
- Radiator fluids and antifreeze
- Cleaning chemicals
- Brake pad dust

The Ocean Begins at Your Front Door

Never allow pollutants to enter the street, gutter or storm drain!

Did You Know?

- Most people believe that the largest source of water pollution in urban areas comes from specific sources such as factories and sewage treatment plants. In fact, the largest source of water pollution comes from city streets, neighborhoods, construction sites and parking lots. This type of pollution is sometimes called "non-point source" pollution.
- There are two types of non-point source pollution: stormwater and urban runoff pollution.
- Stormwater runoff results from rainfall. When rainstorms cause large volumes of water to rinse the urban landscape, picking up pollutants along the way.
- Urban runoff can happen any time of the year when excessive water use from irrigation, vehicle washing and other sources carries trash, lawn clippings and other urban pollutants into storm drains.

Where Does It Go?

- Anything we use outside homes, vehicles and businesses – like motor oil, paint, pesticides, fertilizers and cleaners – can be blown or washed into storm drains.
- A little water from a garden hose or rain can also send materials into storm drains.
- Storm drains are separate from our sanitary sewer systems; unlike water in sanitary sewers (from sinks or toilets), water in storm drains is not treated before entering our waterways.

Sources of Non-Point Source Pollution

- Automotive leaks and spills.
- Improper disposal of used oil and other engine fluids.
- Metals found in vehicle exhaust, weathered paint, rust, metal plating and tires.
- Pesticides and fertilizers from lawns, gardens and farms.
- Improper disposal of cleaners, paint and paint removers.
- Soil erosion and dust debris from landscape and construction activities.
- Litter, lawn clippings, animal waste, and other organic matter.
- Oil stains on parking lots and paved surfaces.

The Effect on the Ocean

Non-point source pollution can have a serious impact on water quality in Orange County. Pollutants from the storm drain system can harm marine life as well as coastal and wetland habitats. They can also degrade recreation areas such as beaches, harbors and bays.

Stormwater quality management programs have been developed throughout Orange County to educate and encourage the public to protect water quality, monitor runoff in the storm drain system, investigate illegal dumping and maintain storm drains.

Support from Orange County residents and businesses is needed to improve water quality and reduce urban runoff pollution. Proper use and disposal of materials will help stop pollution before it reaches the storm drain and the ocean.

For More Information

Orange County Stormwater Program

California Environmental Protection Agency
www.calepa.ca.gov

- **Air Resources Board**
  www.arb.ca.gov
- **Department of Pesticide Regulation**
  www.cdpr.ca.gov
- **Department of Toxic Substances Control**
  www.dtsc.ca.gov
- **Integrated Waste Management Board**
  www.ciwmb.ca.gov
- **Office of Environmental Health Hazard Assessment**
  www.oehha.ca.gov
- **State Water Resources Control Board**
  www.waterboards.ca.gov

Earth 911 - Community-Specific Environmental Information 1-800-cleanup or visit www.1800cleanup.org

Health Care Agency's Ocean and Bay Water Closure and Posting Hotline
(714) 433-6400 or visit www.ocbeachinfo.com

Integrated Waste Management Dept. of Orange County (714) 834-6752 or visit www.oclandfills.com for information on household hazardous waste collection centers, recycling centers and solid waste collection

O.C. Agriculture Commissioner
(714) 447-7100 or visit www.ocagcomm.com

Stormwater Best Management Practice Handbook
Visit www.cabmphandbooks.com

UC Master Gardener Hotline
(714) 708-1646 or visit www.uccemg.com

The Orange County Stormwater Program has created and moderates an electronic mailing list to facilitate communications, take questions and exchange ideas among its users about issues and topics related to stormwater and urban runoff and the implementation of program elements. To join the list, please send an email to ocstormwaterinfo-join@list.ocwatersheds.com

Aliso Viejo	(949)	425-2535
Anaheim Public Works Operations	(714)	765-6860
Brea Engineering	(714)	990-7666
Buena Park Public Works	(714)	562-3655
Costa Mesa Public Services	(714)	754-5323
Cypress Public Works	(714)	229-6740
Dana Point Public Works	(949)	248-3584
Fountain Valley Public Works	(714)	593-4441
Fullerton Engineering Dept.	(714)	738-6853
Garden Grove Public Works	(714)	741-5956
Huntington Beach Public Works	(714)	536-5431
Irvine Public Works	(949)	724-6315
La Habra Public Services	(562)	905-9792
La Palma Public Works	(714)	690-3310
Laguna Beach Water Quality	(949)	497-0378
Laguna Hills Public Services	(949)	707-2650
Laguna Niguel Public Works	(949)	362-4337
Laguna Woods Public Works	(949)	639-0500
Lake Forest Public Works	(949)	461-3480
Los Alamitos Community Dev.	(562)	431-3538
Mission Viejo Public Works	(949)	470-3056
Newport Beach, Code & Water Quality Enforcement	(949)	644-3215
Orange Public Works	(714)	532-6480
Placentia Public Works	(714)	993-8245
Rancho Santa Margarita	(949)	635-1800
San Clemente Environmental Programs	(949)	361-6143
San Juan Capistrano Engineering	(949)	234-4413
Santa Ana Public Works	(714)	647-3380
Seal Beach Engineering	(562)	431-2527 x317
Stanton Public Works	(714)	379-9222 x204
Tustin Public Works/Engineering	(714)	573-3150
Villa Park Engineering	(714)	998-1500
Westminster Public Works/Engineering	(714)	898-3311 x446
Yorba Linda Engineering	(714)	961-7138
Orange County Stormwater Program	(877)	897-7455

Orange County 24-Hour
Water Pollution Problem Reporting Hotline
1-877-89-SPILL (1-877-897-7455)

On-line Water Pollution Problem Reporting Form
www.ocwatersheds.com

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour gardening products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

UCCE Master Gardener Hotline:
(714) 708-1646

To report a spill,
call the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
1-877-89-SPILL (1-877-897-7455).

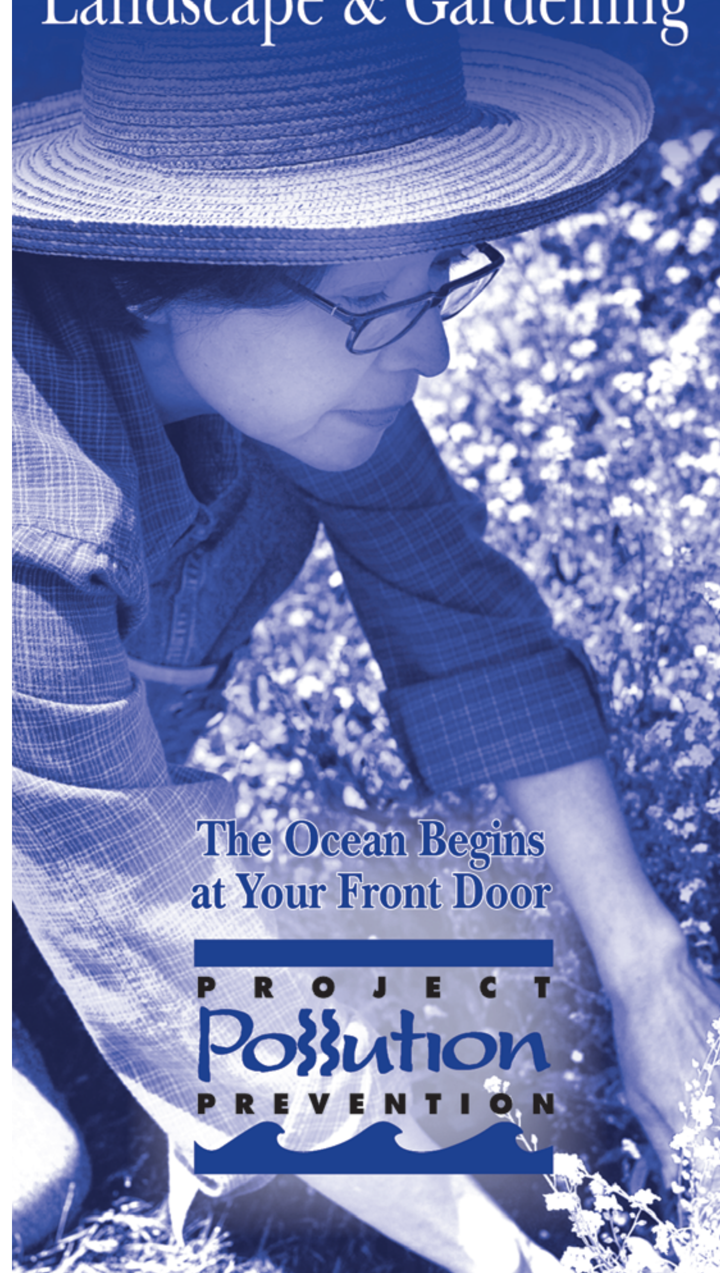
For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while landscaping or gardening. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Tips for Landscape & Gardening



The Ocean Begins at Your Front Door

PROJECT POLLUTION PREVENTION

Tips for Landscape & Gardening

Never allow gardening products or polluted water to enter the street, gutter or storm drain.

General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.
- Plant native vegetation to reduce the amount of water, fertilizers, and pesticide applied to the landscape.

- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.

Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro spray systems. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.

- Use slow-release fertilizers to minimize leaching, and use organic fertilizers.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.

- Rinse empty pesticide containers and re-use rinse water as you would use the product. Do not dump rinse water down storm drains. Dispose of empty containers in the trash.
- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting. For more information, visit **www.ipm.ucdavis.edu**.
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Hazardous Waste Collection Center to be recycled. Locations are provided below.

Household Hazardous Waste Collection Centers

Anaheim:	1071 N. Blue Gum St.
Huntington Beach:	17121 Nichols St.
Irvine:	6411 Oak Canyon
San Juan Capistrano:	32250 La Pata Ave.

For more information, call (714) 834-6752 or visit www.oclandfills.com

Clean beaches and healthy creeks, rivers, bays, and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Materials and excess concrete or mortar can be blown or washed into the storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

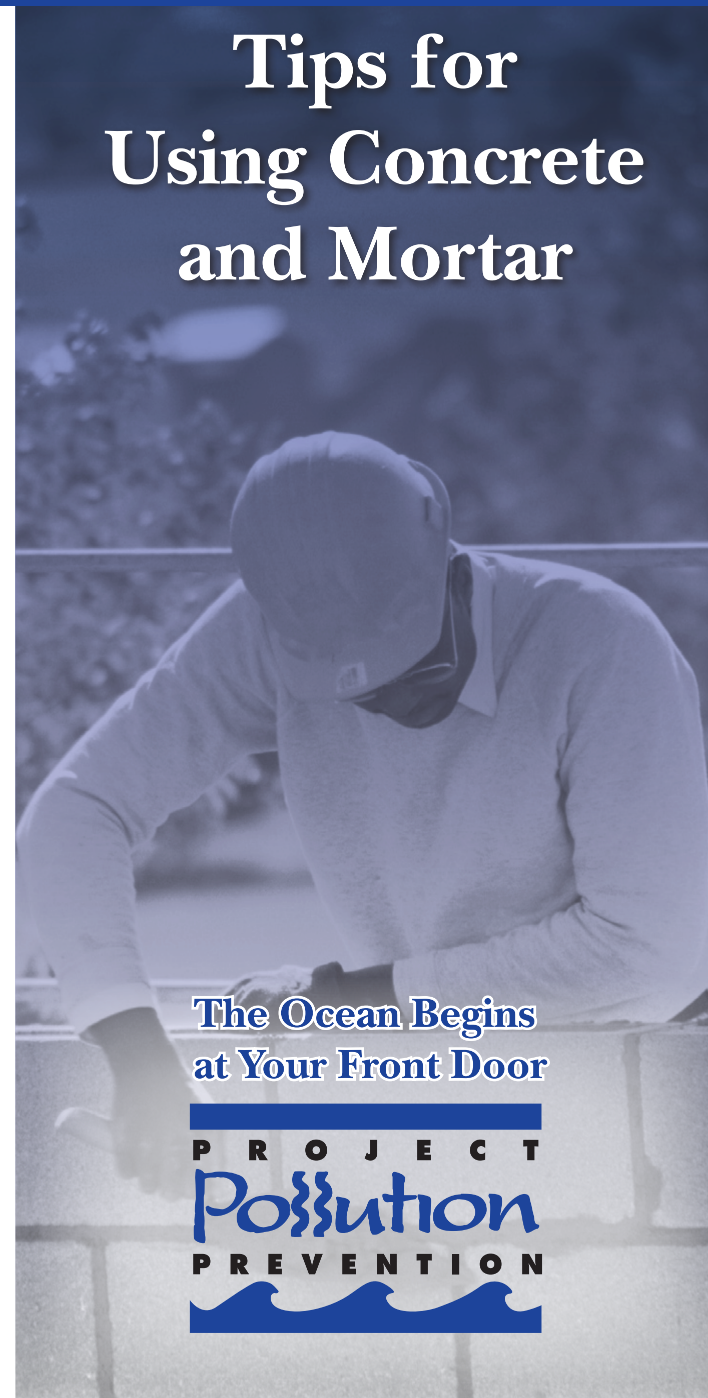
You would never throw building materials into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com.

To report a spill,
call the
Orange County 24-Hour
Water Pollution Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The Tips contained in this brochure provide useful information about how you can keep materials and washwater from entering the storm drain system. If you have other suggestions for how water and materials may be contained, please contact your city's stormwater representative or call the Orange County Stormwater Program.



Tips for Using Concrete and Mortar

The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Tips for Using Concrete and Mortar

Never allow materials or washwater to enter the street or storm drain.

Before the Project

- Schedule projects for dry weather.
- Store materials under cover, with temporary roofs or plastic sheets, to eliminate or reduce the possibility that the materials can be carried from the project site to streets, storm drains or adjacent properties via rainfall, runoff or wind.
- Minimize waste by ordering only the amount of materials needed to complete the job.
- Take measures to block nearby storm drain inlets.

During the Project

- Set up and operate small mixers on tarps or heavy drop cloths.
- Do not mix more fresh concrete or cement than is needed for the job.

- When breaking up pavement, pick up all chunks and pieces and recycle them at a local construction and demolition recycling company. (See information to the right)
- When making saw cuts in pavement, protect nearby storm drain inlets during the saw-cutting operation and contain the slurry. Collect the slurry residue from the pavement or gutter and remove from the site.

Clean-Up

- Dispose of small amounts of dry concrete, grout or mortar in the trash.
- Never hose materials from exposed aggregate concrete, asphalt or similar treatments into a street, gutter, parking lot, or storm drain.
- Wash concrete mixers and equipment in designated washout areas where the water can flow into a containment area or onto dirt. Small amounts of dried material can be disposed of in the trash. Large amounts should be recycled at a local construction and demolition recycling company. (See information below)

- Recycle cement wash water by pumping it back into cement mixers for reuse.

Spills

- Never hose down pavement or impermeable surfaces where fluids have spilled. Use an absorbent material such as cat litter to soak up a spill, then sweep and dispose in the trash.
- Clean spills on dirt areas by digging up and properly disposing of contaminated dry soil in trash.
- Immediately report significant spills to the County's 24-Hour Water Pollution Problem Reporting Hotline at 714-567-6363 or log onto the County's website at www.ocwatersheds.com and fill out an incident reporting form.

For a list of construction and demolition recycling locations in your area visit www.ciwmb.ca.gov/Recycle/.

For additional information on how to control, prevent, remove, and reduce pollution refer to the Stormwater Best Management Practice Handbook, available on-line at www.cabmphandbooks.com.

Preventing water pollution at your commercial/industrial site

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many landscape and building maintenance activities can lead to water pollution if you're not careful. Paint, chemicals, plant clippings and other materials can be blown or washed into storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour soap or fertilizers into the ocean, so why would you let them enter the storm drains? Follow these easy tips to help prevent water pollution.

Some types of industrial facilities are required to obtain coverage under the State General Industrial Permit. For more information visit: **www.swrcb.ca.gov/stormwater/industrial.html**

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

RECYCLE USED OIL

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Proper Maintenance Practices for Your Business

The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Proper Maintenance Practices for your Business

Landscape Maintenance

- Compost grass clippings, leaves, sticks and other vegetation, or dispose of it at a permitted landfill or in green waste containers. Do not dispose of these materials in the street, gutter or storm drain.
- Irrigate slowly and inspect the system for leaks, overspraying and runoff. Adjust automatic timers to avoid overwatering.
- Follow label directions for the use and disposal of fertilizers and pesticides.
- Do not apply pesticides or fertilizers if rain is expected within 48 hours or if wind speeds are above 5 mph.
- Do not spray pesticides within 100 feet of waterways.
- Fertilizers should be worked into the soil rather than dumped onto the surface.
- If fertilizer is spilled on the pavement or sidewalk, sweep it up immediately and place it back in the container.

Building Maintenance

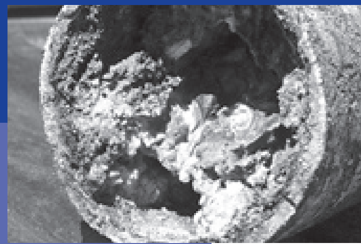
- Never allow washwater, sweepings or sediment to enter the storm drain.
- Sweep up dry spills and use cat litter, towels or similar materials to absorb wet spills. Dispose of it in the trash.
- If you wash your building, sidewalk or parking lot, you **must** contain the water. Use a shop vac to collect the water and contact your city or sanitation agency for proper disposal information. Do not let water enter the street, gutter or storm drain.
- Use drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of materials in the trash.
- Use a ground cloth or oversized tub for mixing paint and cleaning tools.
- Use a damp mop or broom to clean floors.
- Cover dumpsters to keep insects, animals, rainwater and sand from entering. Keep the area around the dumpster clear of trash and debris. Do not overfill the dumpster.
- Call your trash hauler to replace leaking dumpsters.
- Do not dump any toxic substance or liquid waste on the pavement, the ground, or near a storm drain. Even materials that seem harmless such as latex paint or biodegradable cleaners can damage the environment.

NEVER DISPOSE OF ANYTHING IN THE STORM DRAIN.

- Recycle paints, solvents and other materials. For more information about recycling and collection centers, visit **www.oclandfills.com**.
- Store materials indoors or under cover and away from storm drains.
- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry, carpet, plastic, pipes, drywall, rocks, dirt, and green waste. For a listing of construction and demolition recycling locations in your area, visit **www.ciwmb.ca.gov/recycle.**
- Properly label materials. Familiarize employees with Material Safety Data Sheets.

PROJECT POLLUTION PREVENTION

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. Fats, oils and grease from restaurants and food service facilities can cause sewer line blockages that may result in sewage overflow into your facility and into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways and should never contain washwater, trash, grease or other materials.



You would never dump oil and trash into the ocean, so don't let it enter the storm drains. Follow these tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

Report sewage spills and
discharges that are not
contained to your site to the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455)

For emergencies, dial 911.

CALIFORNIA Restaurant ASSOCIATION SINCE 1906

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Tips for the Food Service Industry

The Ocean Begins
at Your Front Door

PROJECT Pollution PREVENTION

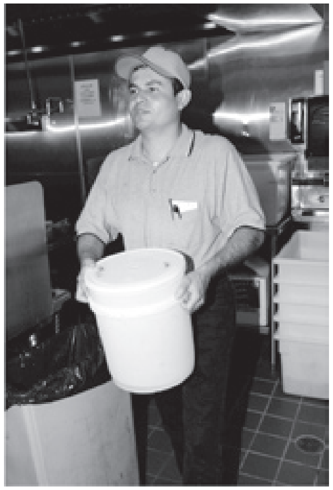
Best Kitchen Practices

Food Waste Disposal

- Scrape food waste off of plates, utensils, pots, food preparation and cooking areas and dispose of it in the trash.
- Never put food waste down the drain. Food scraps often contain grease, which can clog sewer pipes and result in sewage backups and overflows.

Grease & Oil Disposal

- Never put oil or grease down the drain. Contain grease and oil by using covered grease storage containers or installing a grease interceptor.
- Never overfill your grease storage container or transport it without a cover.
- Grease control devices must be emptied and cleaned by permitted companies.
- Keep maintenance records on site.



- For a list of oil/grease recycling companies, contact the CIWMB at **www.ciwmb.ca.gov/foodwaste/render.htm** or contact your local sanitation district.

Minor Spill Cleanup

- Always use dry cleanup methods, such as a rag, damp mop or broom.
- Never hose a spill into the street, gutter or storm drain.

Major Spill Cleanup

- Have spill containment and clean-up kits readily available, and train all employees on how to use them.
- Immediately contain and clean the spill using dry methods.
- If the spill leaves your site, call **(714) 567-6363**.

Dumpster Cleanup

- Pick up all debris around the dumpster.
- Always keep the lid on the dumpster closed.
- Never pour liquids into the dumpster or hose it out.

Floor Mat Cleaning

- Sweep the floor mats regularly, discarding the debris into the trash.
- Hose off the mats in a mop sink, at a floor drain, or in an outdoor area that can contain the water.
- Never hose the mats in an area where the wastewater can flow to the street, gutter or storm drain.

Washwater Disposal

- Dispose of washwater in a mop sink or an area with a floor drain.
- Never dispose of washwater in the street, gutter or storm drain.

PROJECT Pollution PREVENTION

Appendix C

Land Use Consistency Analysis

Policy	Consistency Analysis
GENERAL PLAN LAND USE ELEMENT	
Policy LU 1.5 Economic Health Encourage a local economy that provides adequate commercial, office, industrial, and marine-oriented opportunities that provide employment and revenue to support high-quality community services.	The proposed project is **consistent** with this policy. The proposed project would allow for the construction and operation of a new office building. As discussed in Section XIII, Population and Housing, of the Initial Study Environmental Checklist, it would provide approximately 67 construction workers and 53 professional jobs. Therefore, the proposed project would support the provision of adequate office opportunities that would provide construction and operation employment and stimulate the local economy.
Policy LU 2.2 Sustainable and Complete Community Emphasize the development of uses that enable Newport Beach to continue as a self-sustaining community and minimize the need for residents to travel outside of the community for retail, goods and services, and employment.	The proposed project is **consistent** with this policy. The proposed project would allow for the construction and operation of a new office building that would provide short-term and long-term employment opportunities for area residents. The construction and operation jobs provided by the proposed project could potentially be fulfilled by the local workforce residing in the City of Newport Beach. Therefore, the proposed project would enable Newport Beach to continue as a self-sustaining community and minimize the need for residents to travel outside of the community for employment in the real estate management field.
Policy LU 3.1 Neighborhoods, Districts, Corridors, and Open Spaces Maintain Newport Beach's pattern of residential neighborhoods, business and employment districts, commercial centers, corridors, and harbor and ocean districts.	The proposed project is **consistent** with this policy. The proposed project would amend the General Plan and Koll Center Newport Planned Community text to increase the allowable development square footage. The proposed project would be an office building within the existing developed Koll Center Newport Planned Community, which encompasses a large portion of the City's business and employment district. Furthermore, it would blend in with the existing architectural characteristics. Therefore, it would maintain Newport Beach's pattern of business and employment districts in that area.
Policy LU 3.2 Growth and Change Enhance existing neighborhoods, districts, and corridors, allowing for re-use and infill with uses that are complementary in type, form, scale, and character. Changes in use and/or density/intensity should be considered only in those areas that are economically underperforming, are necessary to accommodate Newport Beach's share of projected regional population growth, improve the relationship and reduce commuting distance between home and jobs, or enhance the values that distinguish Newport Beach as a special place to live for its residents. The scale of growth and new development shall be coordinated with the provision of adequate infrastructure and public services, including standards for acceptable traffic level	The proposed project is **consistent** with this policy. The proposed project would amend the General Plan and Koll Center Newport Planned Community text to increase the allowable development square footage, and would allow for the infill development of one new office building on a site that is currently occupied by an office building and 84 stalls of surface parking. The proposed amendments would slightly increase density/intensity in the Koll Center Newport Planned Community, but would be largely consistent with surrounding land use designations and existing zoning, and would be consistent with the density of the proposed land use designations and the surrounding business district. As discussed in Section XIV, Public Services, and Section XVII, Utilities and Service

Policy	Consistency Analysis
of service.	Systems, of the Initial Study Environmental Checklist, the proposed project would have adequate infrastructure and public services and would not exceed existing service levels for public services or utilities. Furthermore, as discussed in Section XVI, Transportation and Traffic, of the Initial Study Environmental Checklist, the slight increase in trips that would result during the construction and operation of the proposed project would not result in a significant deterioration of surrounding intersections or the roadway network. Therefore, the proposed project would result in complementary type, form, and scale of the existing neighborhood, and would be adequately served by the existing infrastructure and public services.
Policy LU 3.8 Project Entitlement Review with Airport Land Use Commission Refer the adoption or amendment of the General Plan, Zoning Code, specific plans, and Planned Community development plans for land within the John Wayne Airport planning area, as established in the JWA Airport Environs Land Use Plan (AELUP), to the Airport Land Use Commission (ALUC) for Orange County for review, as required by Section 21676 of the California Public Utilities Code. In addition, refer all development projects that include buildings with a height greater than 200 feet above ground level to the ALUC for review.	The proposed project is **consistent** with this policy. As discussed in Section VIII (e) and (f), Hazards and Hazardous Materials, in the Initial Study Environmental Checklist the proposed project site is located within the Airport Environs Land Use Plan (AELUP) jurisdiction of John Wayne Airport. Furthermore, the proposed project is within the height restriction zone for the John Wayne Airport and the notification area of the Federal Aviation Regulation (FAR) Part 77 Imaginary Surfaces aeronautical obstruction area. The proposed project includes construction of a three-level office building with a maximum height of 50 feet, on a site that is approximately 42 feet above mean sea level (AES Due Diligence 2004). The proposed project does not require notification to the FAA in accordance with Section 77.13 of the FAR because the proposed project would not be more than 200 feet above ground level and not more than 206 feet above mean sea level; the project would not create any imaginary surfaces with any of the specific slope characteristics identified within Section 77.13; the proposed project is not a highway; and the proposed project is not a modification to an existing airport. As discussed in Section VIII, Hazards and Hazardous Materials, the proposed project is exempt from filing the Form 7460-1 notice, a referral by the City to the Airport Land Use Commission for Consistency Review is required because of the location of the project site within the AELUP Planning Area and because of the nature of the required City approvals (i.e,. General Plan amendment) under PUC Section 21676(b). The proposed project would comply and be compatible with the land use standards established in the City's Municipal Code and the Airport Land Use Commission's John Wayne AELUP. The City's Emergency Management Plan also establishes safety procedures with respect to aviation hazards to promote the safety of persons on the ground while reducing risks of serious harm to aircraft crews and passengers that may need to make emergency landings in the immediate airport vicinity.
Policy LU 4.1 Land Use Diagram Accommodate land use development consistent with the Land Use Plan. Figure	The proposed project is **consistent** with this policy.

Policy	Consistency Analysis
LU1 depicts the general distribution of uses throughout the City and Figure LU2 through Figure LU15 depicts specific use categories for each parcel within defined Statistical Areas. Table LU1 (Land Use Plan Categories) specifies the primary land use categories, types of uses, and, for certain categories, the densities/intensities to be permitted. The permitted densities/intensities or amount of development for land use categories for which this is not included in Table LU1, are specified on the Land Use Plan, Figure LU4 through Figure LU15. These are intended to convey maximum and, in some cases, minimums that may be permitted on any parcel within the designation or as otherwise specified by Table LU2 (Anomaly Locations). The density/intensity ranges are calculated based on actual land area, actual number of dwelling units in fully developed residential areas, and development potential in areas where the General Plan allows additional development. To determine the permissible development, the user should: a. Identify the parcel and the applicable land use designation on the Land Use Plan, Figure LU4 through Figure LU15 b. Refer to Figure LU4 through Figure LU15 and Table LU1 to identify the permitted uses and permitted density or intensity or amount of development for the land use classification. Where densities/intensities are applicable, the maximum amount of development shall be determined by multiplying the area of the parcel by the density/intensity. c. For anomalies identified on the Land Use Map by a symbol, refer to Table LU2 to determine the precise development limits. d. For residential development in the Airport Area., refer to the policies prescribed by the Land Use Element that define how development may occur.	The project site is located in the Airport Area (Statistical Area L4) in the northern portion of the City of Newport Beach. The project site is designated as Mixed Use Horizontal2 (MU-H2) per the General Plan Land Use Element. The development limit for the project site is identified in Table LU2 of the General Plan Land Use Element as Anomaly Number 2. The development limit for Anomaly Number 2 is 1,060,146 gross square feet, as identified in Table LU2. The project site is currently zoned PC-15, Koll Center Newport Planned Community. The project site is located within a development site identified as Professional and Business Office Site B in the Koll Center Newport Planned Community. The Allowable Building Area for Office Site B is 967,803 square feet as defined by the Koll Center Newport Planned Community Text. The proposed project involves a General Plan Amendment and a Koll Center Newport Planned Community text amendment to increase the allowable development square footage on the project site. The General Plan Amendment would increase the development limit in General Plan Anomaly Location 2 by 11,544 gross square feet, and the Koll Center Newport Planned Community text amendment would increase the allowable building area in Office Site B by 9,917 net square feet. The General Plan Amendment and the Koll Center Newport Planned Community text amendment would accommodate the land use development of the proposed office building that is consistent with the land use designation and zoning of the project site.
Policy LU 5.4.1 Site Planning Require that new and renovated office and retail development projects be planned to exhibit a high-quality and cohesive "campus environment," characterized by the following: ■ Location of buildings around common plazas, courtyards, walkways, and open spaces ■ Incorporation of extensive on-site landscaping that emphasizes special features such as entryways ■ Use of landscape and open spaces to break the visual continuity of surface parking lots ■ Common signage program for tenant identification and wayfinding ■ Common streetscapes and lighting to promote pedestrian activity ■ Readily observable site access, entrance drives and building entries and minimized conflict between service vehicles, private automobiles, and	The proposed project is **consistent** with this policy. The proposed project would be located within an existing "campus environment" in the Koll Center Newport Planned Community office park. The development site is located adjacent to a landscaped retarding basin, which is used as a common open space area by the neighboring businesses. It also includes a walkway around the perimeter. Special features include aesthetically diverse architectural elements such as rocks, stones, living walls, reflective glass, aluminum panels, and canopy elements. The proposed project would use the existing site access off of Von Karman Avenue, which would be appropriately signed with the proposed building's address. Therefore, the proposed office building would exhibit a high-quality and cohesive campus environment.

Policy	Consistency Analysis
pedestrians.	
Policy LU 5.4.2 Development Form and Architecture Require that new development of business park, office, and supporting buildings be designed to convey a unified and high-quality character in consideration of the following principles: ■ Modulation of building mass, heights, and elevations and articulation of building ■ Avoidance of blank building walls that internalize uses with no outdoor orientation to public spaces ■ Minimize the mass and bulk of building facades abutting streets ■ Consistent architectural design vocabulary, articulation, materials, and color palette ■ Clear identification of entries through design elements ■ Integration of signage with the building's architectural style and character ■ Architectural treatment of parking structures consistent with their primary commercial or office building.	The proposed project is **consistent** with this policy. The proposed project would be designed to convey a unified and high-quality character. As described in Chapter 2, Project Description, Figure 2-7 and Section I, Aesthetics in the Initial Study Environmental Checklist, the proposed architectural style of the office building would be aesthetically diverse and would used textures such as rocks and living walls (i.e., walls covered in plants) to soften the composition of the building. The proposed office buildings would incorporate a mixture of textured aluminum panels, stone, reflective glass, and canopy elements. Equipment, such as heating ventilation and air conditioning units, will be screened from the public view due to the height of the buildings. All equipment would be centrally located on the roof surfaces, prohibiting views of the equipment. The parking structure would be located on the lower level of the proposed office building under the two stories of office space; therefore, architectural treatment of parking structures would be consistent with their proposed building.
Policy LU 5.6.1 Compatible Development Require that buildings and properties be designed to ensure compatibility within and as interfaces between neighborhoods, districts, and corridors.	The proposed project is **consistent** with this policy. The proposed project would not interface between differing neighborhoods, districts, or corridors. As discussed above in Policy LU 3.1, it would be consistent and compatible with the surrounding office park. It would blend in with the existing character and architectural style of the Koll Center Newport Planned Community.
Policy LU 5.6.2 Form and Environment Require that new and renovated buildings be designed to avoid the use of styles, colors, and materials that unusually impact the design character and quality of their location such as abrupt changes in scale, building form, architectural style, and the use of surface materials that raise local temperatures, result in glare and excessive illumination of adjoining properties and open spaces, or adversely modify wind patterns.	The proposed project is **consistent** with this policy. The proposed office building would be compatible with the existing campus office park scale, density, and varying architectural styles. As discussed in Section I(c), Aesthetics, in the Initial Study Environmental Checklist, the proposed project would blend in with the existing character of the area and surrounding land uses. The maximum height of the office building would be approximately 50 feet above the original grade. The proposed architectural style of the building would be aesthetically diverse and would use textures such as rocks and living walls (i.e., walls covered in plants) to soften the composition of the building. The proposed office building would incorporate a mixture of textured aluminum panels, stone, reflective glass, and canopy elements. Therefore, as the proposed project is located in a fully developed planned community and the architectural components would blend in with the existing office-complex character of the area
Policy LU 5.6.3 Ambient Lighting Require that outdoor lighting be located and designed to prevent spillover onto	The proposed project is **consistent** with this policy. Any lighting associated with the proposed project would not add significant

Policy	Consistency Analysis
adjoining properties or significantly increase the overall ambient illumination of their location.	amounts of lighting to the project area and would be similar to the existing lighting in the area.
Policy LU 5.6.4 Conformance with the Natural Environmental Setting Require that sites be planned and buildings designed in consideration of the property's topography, landforms, drainage patterns, natural vegetation, and relationship to the Bay and coastline, maintaining the environmental character that distinguishes Newport Beach.	The proposed project is **consistent** with this policy. The proposed project would fit in with the area topography and would not disrupt the existing drainage patterns, as described in Sections VI, Geology and Soils, and IX, Hydrology and Water Quality, in the Initial Study Environmental Checklist. The project site is fully developed with surface parking, has flat topography, and is generally void of vegetation with the exception of ornamental landscaping. The proposed project site is not located in the vicinity of Newport Bay and therefore would not affect any relationships to the bay and coastline. The proposed project is located within an existing build urban office complex environment. Therefore, the proposed project would not conflict with Newport Beach's natural setting.
Policy LU 6.15.1 Land Use Districts and Neighborhoods Provide for the development of distinct business park, commercial, and airport-serving districts and residential neighborhoods that are integrated to ensure a quality environment and compatible land uses.	The proposed project is **consistent** with this policy. The proposed project would be integrated into the Koll Center Newport Planned Community and would be consistent with the surrounding land uses as discussed in Policy LU 3.1. Furthermore, the proposed project would be designed and landscaped to be aesthetically diverse and blend in with the existing character of the campus office park, ensuring a quality environment as discussed in Policy LU 5.4.2. The proposed project would provide for the development of the existing distinct business park, integrated to ensure a quality of environment and compatible land uses.
Policy LU 6.15.3 Airport Compatibility Require that all development be constructed in conformance with the height restrictions set forth by Federal Aviation Administration (FAA), Federal Aviation Regulations (FAR) Part 77, and Caltrans Division of Aeronautics, and that residential development be located outside of the 65 dBA CNEL noise contour specified by the 1985 JWA Master Plan.	The proposed project is **consistent** with this policy. The maximum height of the proposed project would be approximately 50 feet above the original grade. The proposed project would comply with all height restrictions set forth by the Federal Aviation Administration, Federal Aviation Regulations, and Caltrans Division of Aeronautics. The proposed project does not include residential development and therefore would not be subject to the 65 dBA CNEL noise contour specific by the 1985 JWA Master Plan.
GENERAL PLAN CIRCULATION ELEMENT	
Policy CE 2.1.1 Level of Service Standards Plan the arterial roadway system to accommodate projected traffic at the following level of service standards: A. Level of Service (LOS) "D" throughout the City, unless otherwise noted B. LOS "E" at any intersection in the Airport Area shared with Irvine	The proposed project is **consistent** with this policy. As discussed in Section XVI(a), Traffic and Transportation, in the Initial Study Environmental Checklist, construction and operation of the proposed project would generally represent an increase of less than 2% of the existing AM and PM trips on the roadway network. It would not create substantial traffic to downgrade the level of service (LOS) at any of the intersections analyzed within the Initial Study

Policy	Consistency Analysis
	Environmental Checklist. Surrounding intersections currently operate at acceptable levels of service, and the minimal traffic generated from the proposed project would not downgrade the LOS at any intersections in the vicinity of the project site. Therefore, the proposed project would continue to accommodate projected traffic at the designated LOS.
Policy CE 6.2.1 Alternative Transportation Modes Promote and encourage the use of alternative transportation modes, such as ridesharing, carpools, vanpools, public transit, bicycles, and walking; and provide facilities that support such alternate modes.	The proposed project is **consistent** with this policy. The proposed project would encourage the use of alternative transportation. The project site is not located near bus transit.
Policy CE 7.1.1 Required Parking Require that new development provide adequate, convenient parking for residents, guests, business patrons, and visitors.	The proposed project is **consistent** with this policy. The new office building located would provide adequate parking spaces; 12 located on the first level of the proposed office building and 30 located in an open surface parking lot on proposed Parcel 2. Parcel 1 (the existing building) would provide 29 parking spaces. Therefore, a total of 71 stalls would be provided with the proposed project and the existing building. Section III of the General Parking Requirements of the Koll Center Newport Community Plan requires 1 parking space for every 225 square feet. Based on this requirement, the proposed project would result in a shortage of three parking spaces. However, Section III of the General Parking Requirements also allow for the decision making body (e.g.: the planning commission) to approve 1 parking space for every 250 square feet. Based on this requirement the proposed project would provide adequate, convenient parking for guests, employees, and business patrons with the 42 stalls allocated to parcel two and the 29 stalls allocated to parcel one.
Policy CE 7.1.8 Parking Configuration Site and design new development to avoid use of parking configurations or management programs that are difficult to maintain and enforce.	The proposed project is **consistent** with this policy. The proposed project would not include a parking management program. Currently there is a parking attendant at the entrance to the business park area which requires a ticket to park and payment to leave. The proposed project would include sufficient parking spaces, as discussed above in CE 7.1.1. Therefore, site design would provide an adequate and safe parking configuration.
GENERAL PLAN NATURAL RESOURCES ELEMENT	
Policy NR 1.1 Water Conservation in New Development Enforce water conservation measures that limit water usage, prohibit activities that waste water or cause runoff, and require the use of water–efficient landscaping and irrigation in conjunction with new construction projects.	The proposed project is **consistent** with this policy. The proposed project would include design features for water conservation. Efficient landscaping features would be incorporated, including landscaping timers and recycled water for all landscaping as required by the City of Newport Beach and water conservation measures in the bathroom fixtures.

Policy	Consistency Analysis
Policy NR 1.2 Use of Water Conserving Devices Establish and actively promote use of water conserving devices and practices in both new construction and major alterations and additions to existing buildings. This can include the use of rainwater capture, storage, and reuse facilities. Enhancement and protection of water quality of all natural water bodies, including coastal waters, creeks, bays, harbors, and wetlands.	The proposed project is **consistent** with this policy. See Response to Policy NR1.1 above. The proposed project would establish the use of water conservation devices. The proposed project would implement the Preliminary Water Quality Management Plan (WQMP), which would protect the water quality of receiving waters from stormwater runoff. Furthermore, the Final WQMP would be required for approval as part of the issuance of building and grading permits and will demonstrate that all of the best management practices (BMPs) discussed in the Final WQMP will control stormwater runoff and maintain water quality.
Policy NR 3.2 Water Pollution Prevention Promote pollution prevention and elimination methods that minimize the introduction of pollutants into natural water bodies. (Policy HB 8.2)	The proposed project is **consistent** with this policy. The proposed project would implement the Preliminary WQMP, which would promote pollution prevention methods during the operation of the proposed project. Therefore, the proposed project would promote pollution prevention and elimination methods that minimize the introduction of pollutants into natural water bodies.
Policy NR 3.4 Storm Drain Sewer System Permit Require all development to comply with the regulations under the City's municipal separate storm drain system permit under the National Pollutant Discharge Elimination System. (Policy HB 8.4)	The proposed project is **consistent** with this policy. The proposed project would be in compliance with all objectives, water quality standards, and best management practices established in the Santa Ana River Basin Plan and Orange County Drainage Area Management Plan as discussed in Section IX, Hydrology and Water Quality, of the Initial Study Environmental Checklist. Furthermore, the proposed project would comply with City of Newport Beach Municipal Code Chapter 14.36 (Water Quality) and provisions set forth in the City's National Pollution Discharge Elimination System (NPDES) municipal separate storm drain system (MS4) permit through the preparation of a Preliminary and Final WQMP incorporating best management practices for operation. MM WQ-1 requires the preparation of a stormwater pollution prevention program for construction. The proposed project would not directly discharge surface water to the bay, and would control runoff from the site. Best management practices would be incorporated into the proposed project as part of a stormwater pollution prevention plan during construction to prevent discharges of polluted stormwater from construction sites from entering the storm drains. Therefore, the proposed project would promote pollution prevention and minimize the introduction of pollutants into natural waters.
Policy NR 3.5 Natural Water Bodies Require that development does not degrade natural water bodies. (Policy HB 8.5)	The proposed project is **consistent** with this policy. There are no natural water bodies in the general vicinity of the project site. The retarding basin in the project vicinity is part of the existing storm drain system of the City. This system discharges into various receiving waters, one being San Diego Creek. The proposed project's compliance with the requirements outlined above in

Policy	Consistency Analysis
	Policy NR 3.4 would minimize and avoid degradation of natural bodies.
Policy NR 3.9 Water Quality Management Plan Require new development applications to include a Water Quality Management Plan (WQMP) to minimize runoff from rainfall events during construction and post-construction. (Policy HB 8.9)	The proposed project is **consistent** with this policy. The proposed project has prepared a Preliminary WQMP to maintain water quality and control stormwater runoff during the operation of the project and a Final WQMP would be required for approval as part of the grading and building permits for the proposed project. Furthermore, MM WQ-1 would maintain and control stormwater quality during construction.
Policy NR 3.10 Best Management Practices Implement and improve upon Best Management Practices (BMPs) for residences, businesses, development projects, and City operations. (Policy HB 8.10)	The proposed project is **consistent** with this policy. The project applicant has prepared a Preliminary WQMP and a Final WQMP would be required for review and approval by the City prior to issuance of grading and building permits for the proposed project. The Preliminary WQMP is described in Section IX(a), Hydrology and Water Quality, in the Initial Study Environmental Checklist and includes BMPs such as those listed below. • Educate property owners, tenants, and occupants regarding the management of fertilizers, pesticides, and herbicides in landscaping and gardening practices, and the impacts of littering and improper water disposal. • Manage common area landscapes, including fertilizer/pesticide usage consistent with Management Guidelines for the Use of Fertilizers per DAMP. • Provide a spill contingency plan. • Control litter in common areas.. • Prohibit the discharges of fertilizers, pesticides, and wastes to streets or storm drains. • Prohibit blowing or sweeping of debris into street or storm drains. • Prohibit hosing down any paved surfaces where the result would be the flow of non-stormwater into the street or storm drains. • Prohibit vehicle washing, maintenance, or repair on site by employees, customers, or the public. • Inspect and maintain catch basins. • Provide regular dry sweeping of debris and grass clippings instead of using blowers or hosing.

Policy	Consistency Analysis
Policy NR 3.11 Site Design and Source Control Include site design and source control BMPs in all developments. When the combination of site design and source control BMPs are not sufficient to protect water quality as required by the National Pollutant Discharge Elimination System (NPDES), structural treatment BMPs will be implemented along with site design and source control measures. (Policy HB 8.11)	The proposed project is **consistent** with this policy. The proposed project would be required to obtain a NPDES permit and to implement MM WQ-1, which will provide source control during construction activities. Further discussion of water quality and construction and operation source control is included in Section IX, Hydrology and Water Quality, in the Initial Study Environmental Checklist.
Policy NR 3.17 Parking Lots and Rights-of-Way Require that parking lots and public and private rights-of-way be maintained and cleaned frequently to remove debris and contaminated residue. (Policy HB 8.17)	The proposed project is **consistent** with this policy. The proposed project would maintain and clean the parking lots to remove debris and contaminated residue. The Preliminary WQMP requires street sweeping private streets and parking lots..
Policy NR 3.19 Natural Drainage Systems Require incorporation of natural drainage systems and stormwater detention facilities into new developments, where appropriate and feasible, to retain stormwater in order to increase groundwater recharge. (Policy HB 8.19)	The proposed project is **consistent** with this policy. The WQMP identifies additional BMPs to control the volume of stormwater generated and maintain water quality. These include, but are not limited to, pavement detention, landscape detention, efficient irrigation, runoff-minimizing landscaping, and a roof drainage planter. (See Appendix B for the location of all the BMPs proposed). These additional BMPs are designed to retain and infiltrate stormwater to provide water quality benefits and reduce urban storm flow runoff. .
Policy NR 3.20 Impervious Surfaces Require new development and public improvements to minimize the creation of and increases in impervious surfaces, especially directly connected impervious areas, to the maximum extent practicable. Require redevelopment to increase area of pervious surfaces, where feasible. (Policy HB 8.20)	The proposed project is **consistent** with this policy. The proposed project would replace an existing impervious surface parking lot and some pervious ornamental landscaping with the impervious surface of an office building. As described in Section IX, Hydrology and Water Quality in the Initial Study Environmental Checklist, the proposed project would not substantially increase the amount of impervious surfaces. . The Preliminary WQMP includes BMPs such as pavement detention through the use of porous pavement, landscape detention, efficient irrigation, runoff-minimizing landscaping, and a roof drainage planter. (See Appendix B for the location of all the BMPs proposed). The porous parking pavement is meant to minimize the directly connected impervious areas. Therefore, the proposed project would minimize the creation of more impervious surface over the existing conditions to the maximum extent practicable.
Policy NR 8.1 Management of Construction Activities to Reduce Air Pollution Require developers to use and operate construction equipment, use building materials and paints, and control dust created by construction activities to minimize air pollutants.	The proposed project is **consistent** with this policy. As discussed in Section III, Air Quality, in the Initial Study Environmental Checklist, a mass emissions inventory for the construction period was compiled based on an estimate of construction equipment as well as scheduling and phasing assumptions. More specifically, the mass emissions analysis takes into account:

Policy	Consistency Analysis
	• combustion emissions from operating onsite construction equipment, • fugitive dust emissions from moving soil on site, and • mobile-source combustion emissions from worker commute travel. As discussed in Section III(b), Air Quality, of the Initial Study Environmental Checklist, the proposed project would not create substantial air pollutant emissions. The proposed project would comply with all rules and regulations of the South Coast Air Quality Management District for control of dust and minimization of air pollutants.
Policy NR 18 Protection and preservation of important paleontological and archaeological resources.	The proposed project is **consistent** with this policy. As discussed in Section V, Cultural Resources, in the Initial Study Environmental Checklist, the project site has not been previously surveyed for cultural resources. A record search conducted on March 16, 2010 determined that no prehistoric or historical archaeological sites have been recorded in the project area. No historical structures are depicted in the project site on the 1896 and 1901 USGS Santa Ana 30 minute topographic quadrangles, or on the 1965 USGS Tustin 7.5 minute quadrangle, indicating there is no potential for historical archaeological resources associated with early settlement. The project site has undergone grading for construction of the existing surface parking lot and adjacent building, and for development of other adjacent buildings and the stormwater system and retarding basin. Ground disturbances from these previous developments likely would have inadvertently destroyed any unknown archeological resources present. Therefore, there are no important archeological resources located at the project site. The project site is situated on late Pleistocene marine deposits that have been cut to form a marine terrace commonly known as Newport Mesa (Morton and Miller 1981, California Division of Mines and Geology 1997). These deposits can be highly fossiliferous, containing vertebrate, invertebrate, and plant fossil specimens (Stadum 2010). The proposed project would involve limited grading, to a depth of approximately 5 feet to prepare for the building foundations, however a geotechnical report prepared for the project indicated that parcel is underlain by approximately 5 feet of fill (TGR Geotechnical 2008). Therefore, it is highly unlikely the proposed project would disturb any paleontological resources; however, Mitigation Measure CR-1 is incorporated to prevent the destruction of any unknown paleontological resource.
Policy NR 18.1 New Development Require new development to protect and preserve paleontological and	The proposed project is **consistent** with this policy. See above for Policy NR 18 regarding protection and preservation of archaeological

Policy	Consistency Analysis
archaeological resources from destruction, and avoid and minimize impacts to such resources in accordance with the requirements of CEQA. Through planning policies and permit conditions, ensure the preservation of significant archeological and paleontological resources and require that the impact caused by any development be mitigated in accordance with CEQA.	and paleontological resources.
Policy NR 24.2 Energy-Efficient Design Features Promote energy-efficient design features.	The proposed project is **consistent** with this policy. Per the California Building Code, Title 24, 2001 Energy Efficiency Standards, the proposed project would include energy-efficient design features where feasible.
GENERAL PLAN SAFETY ELEMENT	
Policy S 8.6 John Wayne Airport Traffic Pattern Zone Use the most currently available John Wayne Airport (JWA) Airport Environs Land Use Plan (AELUP) as a planning resource for evaluation of land use compatibility and land use intensity in areas affected by JWA operations. In particular, future land use decisions within the existing JWA Clear Zone/Runway Protection Zone (Figure S5) should be evaluated to minimize the risk to life and property associated with aircraft operations.	The proposed project is **consistent** with this policy. As discussed in Section VIII(e), Hazards and Hazardous Materials, of the Initial Study Environmental Checklist, the most current John Wayne Airport AELUP was used as a planning resource for evaluation of the land use compatibility and land use intensity in areas affected by John Wayne Airport operations. The proposed project would comply and would be compatible with the land use standards established in the City's Municipal Code and the Airport Land Use Commission's John Wayne AELUP. The City's Emergency Management Plan also establishes safety procedures with respect to aviation hazards to promote the safety of persons on the ground while reducing risks of serious harm to aircraft crews and passengers that may need to make emergency landings in the immediate airport vicinity. The AELUP vicinity height guidelines would protect public safety, health, and welfare by ensuring that aircraft could fly safely in the airspace around the airport. In addition to existing regulations, the General Plan identifies a goal to protect residents, property, and the environment from aviation-related hazards, and lists policies S8.1 through S8.4 to ensure preparation and minimize risk in the case of an aviation accident (City of Newport Beach 2006b).
GENERAL PLAN NOISE ELEMENT	
Policy N 1.1 Noise Compatibility of New Development Require that all proposed projects are compatible with the noise environment through use of Table N2, and enforce the interior and exterior noise standards shown in Table N3.	The proposed project is **consistent** with this policy. The proposed project would be compatible with the noise environment and would comply with Tables N2 and N3. The proposed project includes the construction and operation of an office building. The proposed project would be consistent with the surrounding land uses and would comply with all interior and exterior noise standards as required during building plan review and approval by the City prior to construction.
Policy N 1.2 Noise Exposure Verification for New Development Applicants for proposed projects that require environmental review and are,	The proposed project is **consistent** with this policy.

Policy	Consistency Analysis
located in areas projected to be exposed to a CNEL of 60 dBA and higher, as shown on Figure N4, Figure N5, and Figure N6 may conduct a field survey, noise measurements or other modeling in a manner acceptable to the City to provide evidence that the depicted noise contours do not adequately account for local noise exposure circumstances due to such factors as, topography, variation in traffic speeds, and other applicable conditions. These findings shall be used to determine the level of exterior or interior, noise attenuation needed to attain an acceptable noise exposure level and the feasibility of such mitigation when other planning considerations are taken into account.	As discussed in Section XII, Noise, in the Initial Study Environmental Checklist, measurements were taken in March 2010 to identify the existing noise levels at the project site. The results of the short-term sound level measurements are summarized in Table 3-7 in Section XII, Noise, of the Initial Study Environmental Checklist. Measured noise levels during daytime hours in and around the project site ranged from 60 to 63 dBA L_{eq}. Therefore, the proposed project does not need exterior or interior noise attenuation as these are acceptable levels for office buildings.
Policy N 1.8 Significant Noise Impacts Require the employment of noise mitigation measures for existing sensitive uses when a significant noise impact is identified. A significant noise impact occurs when there is an increase in the ambient CNEL produced by new development impacting existing sensitive uses. The CNEL increase is shown in the table below. <u>CNEL (dBA) dBA increase</u> 55 3 60 2 65 1 70 1 Over 75 Any increase is considered significant	The proposed project is **consistent** with this policy. As discussed in Section XII, Noise, in the Initial Study Environmental Checklist, the noise levels produced by the proposed project during construction and operation would not result in significant impacts on sensitive receptors.
Policy N 3.1 New Development Ensure new development is compatible with the noise environment by using airport noise contours no larger than those contained in the 1985 JWA Master Plan, as guides to future planning and development decisions.	The proposed project is **consistent** with this policy. As discussed in Section XII(e), Noise, in the Initial Study Environmental Checklist, the proposed project is located within approximately 0.5 mile from John Wayne Airport. Figure N2 of the City of Newport Beach General Plan shows the existing 65 dBA CNEL noise contour for John Wayne Airport. Figure N2 shows that the proposed project site is located approximately 0.25 - 05 mile outside the 65 dBA CNEL noise contour for John Wayne airport (City of Newport Beach 2006a).
Policy N 4 Minimization of Nontransportation-Related Noise Minimized nontransportation-related noise impacts on sensitive noise receptors.	The proposed project is **consistent** with this policy. See response to Policy N 1.1 and 3.1 above.
Policy N 4.1 Stationary Noise Sources Enforce interior and exterior noise standards outlined in Table N3, and in the City's Municipal Code to ensure that sensitive noise receptors are not exposed to excessive noise levels from stationary noise sources, such as heating, ventilation, and air conditioning equipment.	The proposed project is **consistent** with this policy. Sensitive noise receptors would not be exposed to excessive noise levels from stationary noise sources. All heating, ventilation, and air conditioning equipment would be appropriately screened and centrally located on the roof surfaces.

Policy	Consistency Analysis
Policy N 4.3 New Commercial Developments Require that new commercial developments abutting residentially designated properties be designed to minimize noise impacts generated by loading areas, parking lots, trash enclosures, mechanical equipment, and any other noise generating features specific to the development to the extent feasible.	The proposed project is **consistent** with this policy Currently, there are no residentially designated properties abutting or within the vicinity of the proposed project. The proposed project would not include a loading area. The trash enclosure would be enclosed and away from sensitive land uses. Therefore, the proposed project has been designed to minimize exterior noise impacts to the extent feasible.
Policy N 4.6 Maintenance or Construction Activities Enforce the Noise Ordinance noise limits and limits on hours of maintenance or construction activity in or adjacent to residential areas, including noise that results from in-home hobby or work related activities.	The proposed project is **consistent** with this policy. The proposed project would comply with the noise ordinance limits on construction activities. In addition, the proposed project would be consistent with the surrounding land uses, which do not include residential areas. Furthermore, as identified in the project description, construction hours would be limited to daytime hours specifically identified by the City of Newport Beach Municipal Code.
Policy N 5.1 Limiting Hours of Activity Enforce the limits on hours of construction activity.	The proposed project is **consistent** with this policy. As identified in the project description and Section XII, Noise, of the Initial Study Environmental Checklist, Title 10, Chapter 10.28, Section 10.28.040 of the Municipal Code specifies permitted hours for construction activities. Construction or other noise-generating activity that would disturb a person of normal sensitivity who works or resides in the vicinity will only occur between the hours of 7:00 a.m. and 6:30 p.m., Monday through Friday, and between 8:00 a.m. and 6:00 p.m. on Saturdays. No construction that would disturb a person of normal sensitivity will occur on Sundays or federal holidays.

Appendix D

Noise: Terminology, Field Sheets, and General Plan Land Use Compatibility Matrix

Noise Terminology

Noise Terminology

Noise is generally defined as unwanted sound. It may be loud, unpleasant, unexpected, or undesired sound typically associated with human activity that interferes with or disrupts the normal noise-sensitive ongoing activities of others. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance and suitability of the noise in a particular setting, the time of day and type of activity during which the noise occurs, and the sensitivity of the individual. The response to vibration is similar: First, the vibration needs to be of sufficient magnitude to be perceived, and, second, it typically would have to interfere with a desirable activity to cause annoyance.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium such as air that are sensed by the human ear. Sound is generally characterized by frequency and intensity. Frequency describes the sound’s pitch and is measured in hertz (Hz); intensity describes the sound’s level, volume, or loudness and is measured in decibels (dB). Sound frequency is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates at a certain number of times per second. Vibration of the drum skin at a rate of 100 times (or cycles) per second generates a sound pressure wave that is said to be oscillating at 100 Hz, and this pressure oscillation is perceived as a tonal pitch of 100 Hz. Sound frequencies between 20 Hz and 20,000 Hz are within the range of sensitivity of the best human ear.

Sound from a tuning fork contains a single frequency and may therefore be referred to as a pure tone. However, most sounds heard in the environment do not consist of a single frequency but rather a broad band of frequencies differing in individual sound levels. The method commonly used to quantify environmental sounds consists of evaluating all the frequencies of a sound according to a weighting system that reflects that human hearing is less sensitive at low frequencies and extremely high frequencies than at the mid-range frequencies. This frequency-dependent modification is called A-weighting, and the decibel level measured is called the A-weighted sound level (dBA. In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

For informational purposes, typical community sound levels are presented in Figure 2. A sound level of 0 dBA is the approximate threshold of human hearing. Normal speech has a sound level of approximately 60 dBA. Sound levels above about 120 dBA begin to be felt inside the human ear as discomfort and eventually pain at still higher levels.

When evaluating noise increases in the environment, the following relationships to quantifiable increases are used as a basis for assessing impacts.

- A change of 1 dBA is difficult to perceive in the outside environment.

- In the outside environment, a 3 dBA change is considered noticeable.

- An increase of 5 dBA is readily perceived as “louder” and is generally required before a change in community response would be expected.

- A 10 dBA increase is perceived as a doubling of noise.

Because of the logarithmic scale of the decibel unit, sound levels cannot be added or subtracted arithmetically and are somewhat cumbersome to handle mathematically. However, a simple rule of thumb is useful in dealing with sound levels: If a sound’s physical intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. For example, 60 dB plus 60 dB equals 63 dB, and 80 dB plus 80 dB equals 83 dB. As mentioned earlier, however, a perception of doubling of sound level requires about a 10-decibel increase.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a mixture of noise from distant sources that create a relatively steady background noise in which no particular source is identifiable. A single descriptor called the L_{eq} (equivalent sound level is used to describe the average acoustical energy in a time-varying sound. L_{eq} is the energy-mean A-weighted sound level present or predicted to occur during a specified interval. It is the “equivalent” constant sound level that a given source would need to produce to equal the fluctuating level of measured sound. It is often desirable to also know the range of acoustic levels of the noise source being measured. This is accomplished through the L_{max} and L_{min} noise descriptors. They represent the root-mean-square maximum and minimum obtainable noise levels measured during the monitoring interval. The L_{min} value obtained for a particular monitoring location represents the quietest moment occurring during the measurement period and is often called the acoustic floor for that location. Likewise, the loudest momentary sound during the measurement is represented by L_{max}.

To describe the time-varying character of environmental noise, the statistical noise descriptors L_{10}, L_{50}, and L_{90} (or other percentile values) may be used. They are the noise levels equaled or exceeded 10, 50, and 90 percent, respectively, of the time during the measured interval. The percentile descriptors are most commonly found in nuisance noise ordinances to allow for different noise levels for various portions of an hour. For example, the L_{50} value would represent 30 minutes of an hour period, the L_{25} would be associated with 15 minutes of an hour, and so on.

Of particular interest in this analysis are other descriptors of noise that are commonly used to help determine noise/land use compatibility and to predict an average community reaction to adverse effects of environmental noise, including traffic-generated and industrial noise. One of the most universal descriptors is the Day-Night Average Sound Level (DNL or Ldn). As recommended by the state health department and state planning law, planning agencies use this descriptor. The Ldn noise metric represents a 24-hour period and applies a time-weighted factor designed to penalize noise events that occur during nighttime hours, when relaxation and sleep disturbance is of more concern than during daytime hours. Noise occurring during the daytime hours between 7:00 a.m. and 10:00 p.m. receives no penalty. Noise occurring between 10:00 p.m. and 7:00 a.m. is penalized by adding 10 dB to the measured level. In California, the use of the Community Noise Equivalent Level (CNEL) descriptor is still permitted (and is used by the City of Moreno Valley). CNEL is similar to Ldn except CNEL adds a 5 dB penalty for noise occurring during evening hours between 7:00 p.m. and 10:00 p.m. Ldn and CNEL are approximately equal to the L_{eq} peak hour under normal traffic conditions (California Department of Transportation [Caltrans]

Field Sheets

FIELD NOISE MEASUREMENT DATA

Jones & Stokes

PROJECT: **Pres Office Building** PROJ. # **00873.09**

SITE IDENTIFICATION: ST-3 OBSERVER(S): Peter Hardie
ADDRESS: 19262 Jamboree Child Development Center
START DATE / TIME: 10:53 3-10-10 END DATE / TIME:

METEROLOGICAL CONDITIONS:
TEMP: 58 °F HUMIDITY: 54 %R.H. WIND: **CALM LIGHT MODERATE VARIABLE**
WINDSPEED: 4-6 MPH DIR: **N NE E SE S SW W NW** **STEADY GUSTY**
SKY: **SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN** **OTHER:**

ACOUSTIC MEASUREMENTS:
INSTRUMENT: LD 824 TYPE: 1 **2** SERIAL #: 0432
CALIBRATOR: CAL200 SERIAL #: 6694
CALIBRATION CHECK: PRE-TEST 94 dBA SPL POST-TEST 93.9 dBA SPL WINDSCREEN ✓

SETTINGS: **A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:**

REC #	START	END	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	OTHER:	(TYPE?)	
ST-3	10:53	11:08	63.4	72.8	54.7	57.3	62.1	66.4			

COMMENTS:

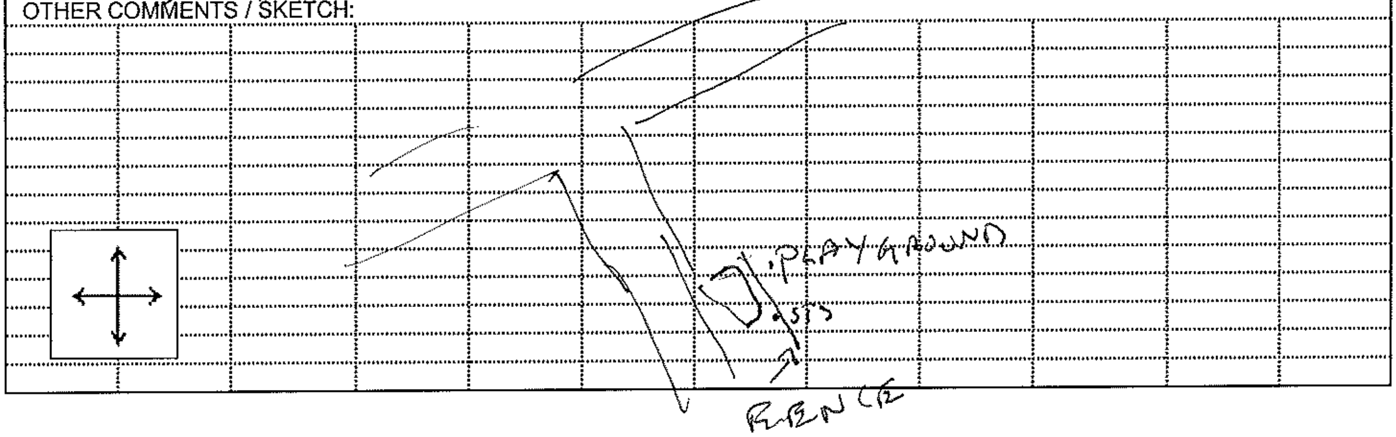
SOURCE INFO AND TRAFFIC COUNTS:
PRIMARY NOISE SOURCE: **TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:**
ROADWAY TYPE:
TRAFFIC COUNT DURATION: ___-MIN

	NB / EB	SB / WB	SPEED NB / EB	SPEED SB / WB	#2 COUNT NB / EB	#2 COUNT SB / WB	SPEED NB / EB	SPEED SB / WB
AUTOS:								
MED. TRUCKS:								
HVY TRUCKS:								
BUSES:								
MOTORCYCLES:								

SPEED ESTIMATED BY: **RADAR / DRIVING / OBSERVER**

OTHER SOURCES: **DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:**

DESCRIPTION / SKETCH:
TERRAIN: **HARD SOFT MIXED FLAT OTHER:**
PHOTOS: 567 SRN
OTHER COMMENTS / SKETCH:



FIELD NOISE MEASUREMENT DATA

Jones & Stokes

PROJECT: Pres Office Building PROJ. # 00873.09

SITE IDENTIFICATION: ST-1 OBSERVER(S): Peter Hardie
ADDRESS: 3000 TAMBOREE RD PLAZA CONDOS
START DATE / TIME: 9:40 3-10-10 END DATE / TIME:

METEROLOGICAL CONDITIONS:
TEMP: 63 °F HUMIDITY: 29 %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 4-6 MPH DIR: N NE E SE S SW W NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

ACOUSTIC MEASUREMENTS:
INSTRUMENT: LD 812 TYPE: 1 2 SERIAL #: 6432
CALIBRATOR: CAL200 SERIAL #: 6644
CALIBRATION CHECK: PRE-TEST 94 dBA SPL POST-TEST 93.4 dBA SPL WINDSCREEN ✓

SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

REC #	START	END	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	OTHER:	(TYPE?)	
ST-1	9:40	9:55	60.4	67.7	54.8	56.3	59.7	63.1			

COMMENTS:

SOURCE INFO AND TRAFFIC COUNTS:
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:
ROADWAY TYPE: → ON APPROACH TO FT WAYNE
TRAFFIC COUNT DURATION: ___-MIN

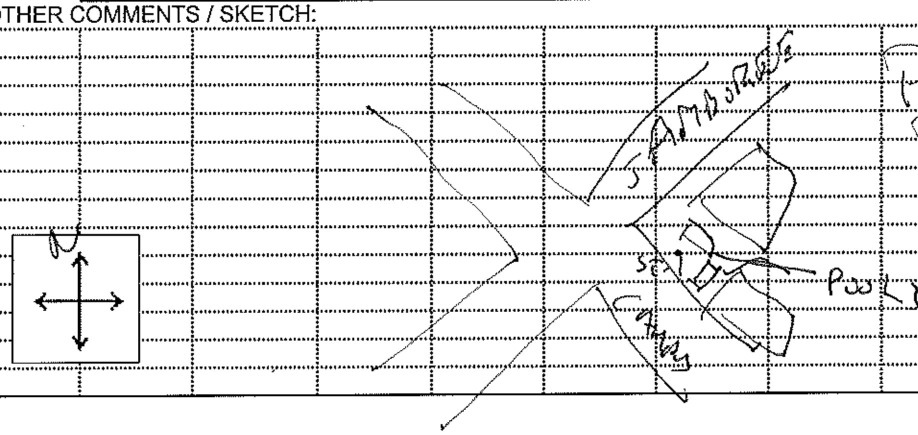
	NB / EB	SB / WB	SPEED NB / EB	SPEED SB / WB	#2 COUNT NB / EB	#2 COUNT SB / WB	SPEED NB / EB	SPEED SB / WB
AUTOS:								
MED. TRUCKS:								
HVY TRUCKS:								
BUSES:								
MOTORCYCLES:								

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:
TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS: 1234 N W S E
OTHER COMMENTS / SKETCH:

POOLS ELEVATED 20' ABOVE ROADLEVEL



FIELD NOISE MEASUREMENT DATA

Jones & Stokes

PROJECT: **Pres Office Building** PROJ. # **00873.09**

SITE IDENTIFICATION: ST-2
ADDRESS: JAZZ SEMICONDUCTOR 4311 Jam
START DATE / TIME: 10:28 3-10-10
OBSERVER(S): Peter Hardie
END DATE / TIME:

METEROLOGICAL CONDITIONS:
TEMP: 55 °F HUMIDITY: 43 %R.H. WIND: **CALM LIGHT MODERATE VARIABLE**
WINDSPEED: 4-6 MPH DIR: **N NE E SE S SW W NW** **STEADY GUSTY**
SKY: **SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:**

ACOUSTIC MEASUREMENTS:
INSTRUMENT: LD 812 TYPE: 1 2 SERIAL #: 0432
CALIBRATOR: CAL200 SERIAL #: 6644
CALIBRATION CHECK: PRE-TEST 93.9 dBA SPL POST-TEST 94.0 dBA SPL WINDSCREEN ✓

SETTINGS: **A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI** OTHER:

REC #	START	END	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	OTHER:	(TYPE?)	
ST-2	10:28	10:43	60.2	71.5	56.2	57.4	58.7	61.8			

COMMENTS: BASELINE IS SET BY LARGE HVAC UNID
DRAINED ABOUT 58 DBA
~~FAVORITE~~ NOT VERY AUDIBLE
IS PERIODIC AIRCRAFT LEAVING JOHN WAYNE

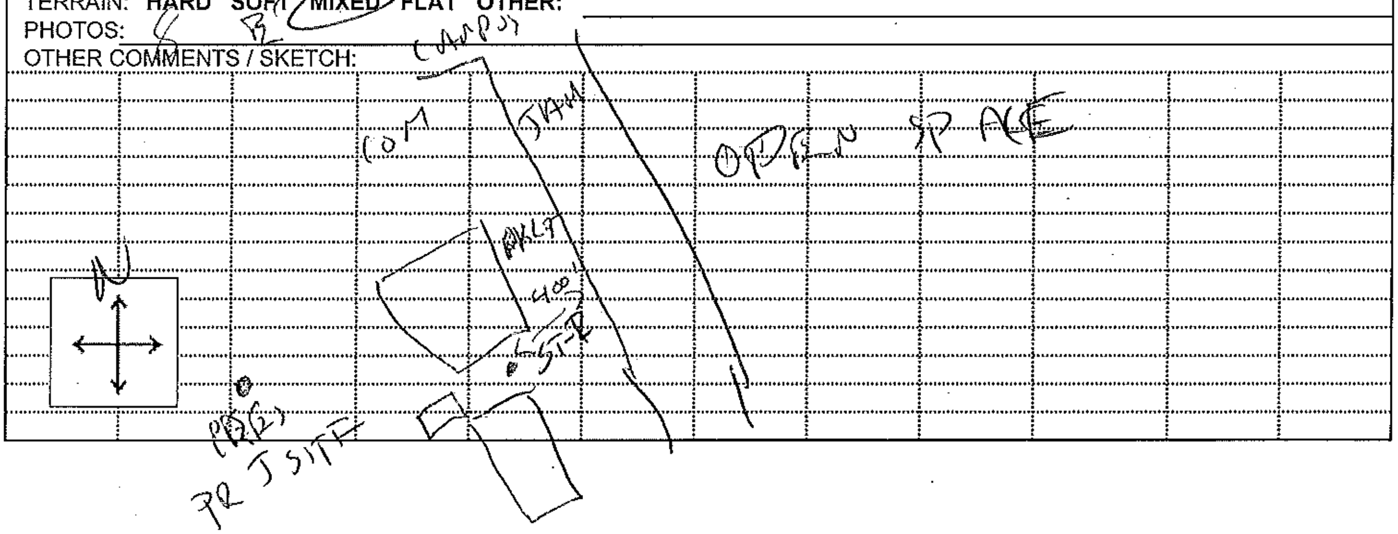
SOURCE INFO AND TRAFFIC COUNTS:
PRIMARY NOISE SOURCE: **TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:** COOLING TOWERS HVAC UNITS
ROADWAY TYPE:
TRAFFIC COUNT DURATION: ____-MIN SPEED #2 COUNT SPEED

	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB
AUTOS:								
MED. TRUCKS:								
HVY TRUCKS:								
BUSES:								
MOTORCYCLES:								

SPEED ESTIMATED BY: **RADAR / DRIVING / OBSERVER**

OTHER SOURCES: **DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:**

DESCRIPTION / SKETCH:
TERRAIN: **HARD SOFT MIXED FLAT OTHER:**
PHOTOS: 6 R
OTHER COMMENTS / SKETCH:

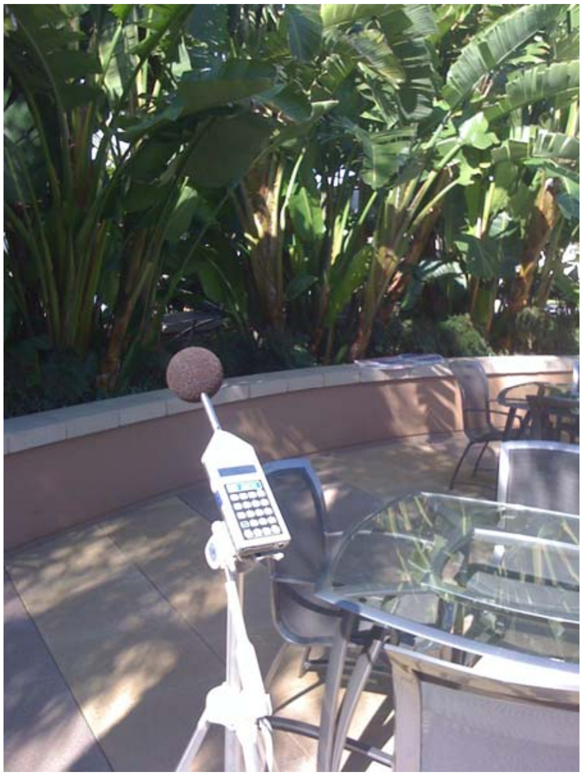


Site Photographs

Photograph A-1. ST-1 Looking East

Photograph A-2. ST-1 Looking North

Photograph A-3. ST-1 Looking South



Photograph A-4. ST-1 Looking West

Photograph A-5. ST-2 Looking West

Photograph A-6. ST-3 Looking North

Photograph A-7. ST-3 Looking South

Photograph A-8. ST-3 Looking West

Land Use Compatibility Matrix

Table N2 Land Use Noise Compatibility Matrix

Land Use Categories		Community Noise Equivalent Level (CNEL)						
Categories	**Uses**	**<55**	**55–60**	**60–65**	**65–70**	**70–75**	**75–80**	**>80**
Residential	Single Family, Two Family, Multiple Family	A	A	B	C	C	D	D
Residential	Mixed Use	A	A	A	C	C	C	D
Residential	Mobile Home	A	A	B	C	C	D	D
Commercial Regional, District	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial Regional, Village District, Special	Commercial Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
Commercial Industrial Institutional	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
Commercial Recreational Institutional Civic Center	Amphitheatre, Concert Hall Auditorium, Meeting Hall	B	B	C	C	D	D	D
Commercial Recreation	Children’s Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
Commercial General, Special Industrial, Institutional	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
Institutional	Hospital, Church, Library, Schools’ Classroom	A	A	B	C	C	D	D
Open Space	Parks	A	A	A	B	C	D	D
Open Space	Golf Course, Cemeteries, Nature Centers Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
Agriculture	Agriculture	A	A	A	A	A	A	A

SOURCE: Newport Beach, 2006

Zone A: Clearly Compatible—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Zone B: Normally Compatible**—New construction or development should be undertaken only after detailed analysis of the noise reduction requirements and are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Zone C: Normally Incompatible—New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

Zone D: Clearly Incompatible—New construction or development should generally not be undertaken.

Appendix E

Traffic Calculations

Appendix E
Traffic Calculations

Existing Traffic Conditions of Surrounding Roadway Network

Table E-1 identifies the Level of Service (LOS) at intersections within the general vicinity of the project site. All intersections are operating at LOS B or better in the AM Peak Hour and only one intersection (MacArthur Boulevard/Campus Drive) was operating at LOS D during PM peak hour. This intersection is a shared intersection between the City of Newport Beach and the City of Irvine, and is allowed to operate at LOS E according to the City of Newport Beach and City of Irvine Performance Criteria. Therefore, all intersections are currently meeting the performance criteria of both cities.

Table E-1. Existing 2009 Conditions AM and PM Peak Hour Level of Service

Intersection	AM Peak Hour	PM Peak Hour	Shared Between Newport Beach and Irvine
	V/C - LOS	V/C – LOS	
MacArthur Blvd/Campus Dr	0.50 – A	0.84 – D	Yes
MacArthur Blvd/Birch St	0.65 – B	0.75 – C	No
MacArthur Blvd/Von Karman Ave	0.37 – A	0.53 – A	No
Jamboree Rd/Campus Dr	0.67 – B	0.73 – C	Yes
Jamboree Rd/Birch St	0.57 – A	0.65 – B	No
Jamboree Rd/MacArthur Blvd	0.59 – A	0.66 – B	No
Jamboree Rd/Bristol St N	0.57 – A	0.54 – A	No
Source: LSA 2009.			

Table E-2 identifies the AM and PM peak hour traffic volumes along Jamboree, MacArthur, and Von Karman. These roads were selected as they are assumed to be the roads construction workers and employees would access for the construction and operation of the proposed project.

Table E-2. AM and PM Peak Hour Traffic Volumes

Roadway Segment	AM Peak Hour Traffic Volume	PM Peak Hour Traffic Volume
Jamboree south of Campus	3766	4046
Jamboree north of Campus	3777	4171
Campus east of Jamboree	1128	1374

Campus west of Jamboree	1127	1721
Jamboree south of MacArthur	2301	2678
Jamboree north of MacArthur	2552	3208
MacArthur east of Jamboree	2874	2815
MacArthur west of Jamboree	2463	2381
MacArthur south of Von Karman	2476	2992
MacArthur north of Von Karman	1694	2130
Von Karman east of MacArthur	1182	1300

Source: LSA 2009.

Table E-3 Estimated Percent Increase in AM Trips Associated with Construction

Roadway Segment	Existing AM Peak Hour Traffic Volume (LSA 2009)	Construction Phases		
		Demolition	Grading	Construction, Asphalting, and Architectural Finishing
		Percent Increase with 7.5 AM Trips	Percent increase with 7 AM trips	Percent increase with 16 AM trips
Jamboree south of Campus	3766	0.20%	0.19%	0.42%
Jamboree north of Campus	3777	0.20%	0.19%	0.42%
Campus east of Jamboree	1128	0.66%	0.62%	1.42%
Campus west of Jamboree	1127	0.67%	0.62%	1.42%
Jamboree south of MacArthur	2301	0.33%	0.30%	0.70%
Jamboree north of MacArthur	2552	0.29%	0.27%	0.63%
MacArthur east of Jamboree	2874	0.26%	0.24%	0.56%
MacArthur west of Jamboree	2463	0.30%	0.28%	0.65%
MacArthur south of Von Karman	2476	0.30%	0.28%	0.65%
MacArthur north of Von Karman	1694	0.44%	0.41%	0.94%
Von Karman east of MacArthur	1182	0.63%	0.59%	1.35%

Table E-4 Estimated Percent Increase in PM Trips Associated with Construction

Roadway Segment	PM Peak Hour Traffic Volume (LSA 2009)	Construction Phases		
		Demolition	Grading	Construction, Asphalting, and Architectural Finishing
		Percent Increase with 7.5 PM Trips	Percent Increase with 7 PM Trips	Percent Increase with 16 PM Trips
Jamboree south of Campus	4046	0.19%	0.17%	0.40%
Jamboree north of Campus	4171	0.18%	0.17%	0.38%
Campus east of Jamboree	1374	0.55%	0.51%	1.16%
Campus west of Jamboree	1721	0.44%	0.41%	0.93%
Jamboree south of MacArthur	2678	0.28%	0.26%	0.60%
Jamboree north of MacArthur	3208	0.23%	0.22%	0.50%
MacArthur east of Jamboree	2815	0.27%	0.25%	0.57%
MacArthur west of Jamboree	2381	0.31%	0.29%	0.67%
MacArthur south of Von Karman	2992	0.25%	0.23%	0.53%
MacArthur north of Von Karman	2130	0.35%	0.33%	0.75%
Von Karman east of MacArthur	1300	0.58%	0.54%	1.23%

Table E-5 Estimated Percent Increase in AM Trips Associated with Operation

Roadway Segment	Existing AM Peak Hour Traffic Volume (LSA 2009)	Operation of Proposed Project
		Percent Increase with 19 AM Trips
Jamboree south of Campus	3766	0.50%
Jamboree north of Campus	3777	0.50%
Campus east of Jamboree	1128	1.68%
Campus west of Jamboree	1127	1.69%
Jamboree south of MacArthur	2301	0.83%
Jamboree north of MacArthur	2552	0.74%
MacArthur east of Jamboree	2874	0.66%
MacArthur west of Jamboree	2463	0.77%
MacArthur south of Von Karman	2476	0.77%
MacArthur north of Von Karman	1694	1.12%
Von Karman east of MacArthur	1182	1.61%

Table E-6 Estimated Percent Increase in PM Trips Associated with Operation

Roadway Segment	PM Peak Hour Traffic Volume (LSA 2009)	Operation of Proposed Project Percent Increase with 18 PM Trips
Jamboree south of Campus	4046	0.44%
Jamboree north of Campus	4171	0.43%
Campus east of Jamboree	1374	1.31%
Campus west of Jamboree	1721	1.05%
Jamboree south of MacArthur	2678	0.67%
Jamboree north of MacArthur	3208	0.56%
MacArthur east of Jamboree	2815	0.64%
MacArthur west of Jamboree	2381	0.76%
MacArthur south of Von Karman	2992	0.60%
MacArthur north of Von Karman	2130	0.85%
Von Karman east of MacArthur	1300	1.38%

Appendix F

Mitigation Monitoring Plan and Report

Appendix F
Mitigation Monitoring Plan and Report

Introduction

The California Public Resources Code, Section 21081.6, requires that a lead or responsible agency adopt a mitigation monitoring plan (MMP) when approving or carrying out a project when a Mitigated Negative Declaration (MND) identifies measures to reduce potential adverse environmental impacts to less-than-significant levels. As lead agency for the proposed project, the City is responsible for adoption and implementation of the MMP.

An IS/MND has been prepared for the project that addresses the potential environmental impacts, and, where appropriate, recommends measures to mitigate these impacts. As such, an MMP is required to ensure that adopted mitigation measures are successfully implemented. This document plan lists each mitigation measure, describes the methods for implementation and verification, and identifies the responsible party or parties.

Project Overview

The project proponent proposes a General Plan Amendment and an amendment to the Koll Center Newport Planned Community text, as well as development of an 11,960-gross-square-foot single-tenant office building in the City of Newport Beach, California. Additionally, the proposed project includes a division of the existing parcel into two separate parcels and the preparation of a parcel map. The existing General Plan which identifies the development limit of Anomaly Number 2 as 1,060,146 gross square feet would be amended to increase the development limit by 11,544 gross square feet. The existing Koll Center Newport Planned Community text, which identifies the Allowable Building Area for Office Site B as 967,803 square feet would be amended to increase the allowable building area by 9,917 net square feet. These proposed amendments would increase the allowable building square footage to accommodate the development of a new 11,960-gross- square-foot office building. The project involves the demolition of an 84-stall surface parking lot and some existing landscaping and the construction of one three-level office building.

Additional details regarding the project description are contained in Chapter 2, “Project Description.”

Monitoring and Reporting Procedures

The MMP for the proposed project will be in place through all phases of the project, including design, construction, and operation. The City will be responsible for administering the MMP and ensuring that all parties comply with its provisions. The City may delegate monitoring activities to staff, consultants, or contractors. The City will also ensure that monitoring is documented through periodic reports and that deficiencies are promptly corrected. The designated environmental monitor will track and document compliance with mitigation measures, note any problems that may result, and take appropriate action to rectify problems.

Mitigation Monitoring Plan Implementation

Table F-1 lists, by resource area, each mitigation measure included in the draft IS/MND. Certain inspections and reports may require preparation by qualified individuals and these are specified as needed. The timing and method of verification for each measure is also specified.

MITIGATION MONITORING REPORT

PROJECT NAME: PRES Office Building B
PROJECT LOCATION: 55,779 square feet located along Von Karman Avenue on Assessor's Parcel Number 445-131-05 in the City of Newport Beach, near the intersection of Von Karman Avenue and MacArthur Boulevard
PROJECT DESCRIPTION: Project proposes to demolish and remove the existing 84-stall surface parking lot and some existing landscaping to prepare the site for the construction of a new 11,960-gross-square-foot office building. The proposed project includes a General Plan Amendment and Koll Center Newport Planned Community text amendment to increase the allowable building square footage of the project site from 1,060,146 gross square feet to 1,071,690 in the General Plan and from 967,803 net square feet to 977,720 net square feet in the Koll Center Newport Planned Community text.

LEAD AGENCY: City of Newport Beach
CONTACT PERSON/ TELEPHONE NO.: Janet Johnson Brown, Associate Planner, (949) 644-3236

APPLICANT: Michael Tong, PRES
CONTACT PERSON/ TELEPHONE NO.: Michael Tong, (949) 261 7737

Table F-1. Summary of Mitigation Monitoring Plan

No.	Mitigation Measure	Time Frame for Implementation& Monitoring	Responsible Monitoring Agency	Verification of Compliance		
				Initials	Date	Remarks
Biological Resources						
BIO-1	The removal of ornamental trees on site shall not be scheduled during the avian nesting season (approximately February 1 through August 31) to ensure project conformance with the Migratory Bird Treaty Act. If clearing and grubbing are proposed to occur between February 1 and August 31, a preconstruction survey for nesting birds shall be conducted by a qualified biologist no more than 7 days prior to the start of construction. If nesting birds occur within the disturbance limits, a buffer around the nest shall be determined by a qualified biologist. All construction activities shall occur outside the buffer area until a qualified biologist has determined that the nest is complete and that no new nesting activity has occurred within the buffer area.	During construction	Project construction contractor			
Cultural Resources						
CR-1	Project plans shall specify that that a qualified paleontologist shall be contacted in the event that potential paleontological resources are discovered. During construction, the contractor shall halt site excavation or preparation if suspected fossilized remains are unearthed. Construction shall cease on site and shall not be resumed until a qualified paleontologist is contacted to assess the resources and identify appropriate treatment measures, if applicable. Treatment measures may include salvaging	During construction	Project construction contractor			

No.	Mitigation Measure	Time Frame for Implementation& Monitoring	Responsible Monitoring Agency	Verification of Compliance		
				Initials	Date	Remarks
	fossils and samples of sediments as they are unearthed to avoid construction delays and/or temporarily halting or diverting equipment to allow removal of abundant or large specimens. Recovered specimens shall be prepared to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. Specimens shall be curated into a professional, accredited museum repository with permanent retrievable storage. A report of findings, with an appended itemized inventory of specimens, shall be prepared and shall signify completion of the program to mitigate impacts on paleontological resources.					
Geology and Soils						
GEO-1	Prior to approval of grading permits, soil preparation measures to minimize expansion potential shall be identified by the applicant in construction documents and grading permits. During construction, grading of the site by the contractor shall adhere to grading plans approved by the City. Soils required to bring the site to final grade shall be placed as engineered fill. The site soils may be re-used as compacted fill provided the material is cleaned of organics, demolition debris, and other deleterious materials. Fill originating on the project site shall be moisture-conditioned to approximately 130% of optimum and compacted to a minimum relative compaction of 90% in accordance with American Society for Testing and Materials (ASTM) standard D1557 for laboratory compaction characteristics. The implementation of these measures shall be verified during field inspections.	Prior to issuance of grading permits	City of Newport Beach Building Department			
GEO-2	Prior to approval of grading permits, the grading plans shall stipulate that all fill shall consist of non-expansive materials, moisture-conditioned to near optimum if cohesionless, and to 130% of optimum if cohesive or clayey. The characteristics of the fill soil shall be evaluated by the geotechnical consultant prior to placement, and confirmed to meet grading plan specifications.	Prior to issuance of grading permits	City of Newport Beach Building Department			
GEO-3	Prior to approval of grading permits, the grading plans shall stipulate that wall backfill soils shall consist of granular, cohesionless backfill with sand equivalent greater than 30 and an expansion index less than 20. The characteristics of the fill soil shall be evaluated by the geotechnical	Prior to issuance of grading permits	City of Newport Beach Building Department			

No.	Mitigation Measure	Time Frame for Implementation& Monitoring	Responsible Monitoring Agency	Verification of Compliance		
				Initials	Date	Remarks
	consultant prior to placement, and confirmed to meet grading plan specifications.					
Hydrology and Water Quality						
WQ-1	Prior to issuance of grading permits, the applicant shall prepare and have approved by the City a SWPPP to be implemented during construction, which shall include BMPs to prevent discharges of polluted stormwater from construction sites from entering the storm drains or the existing retarding basin. The SWPPP shall be prepared as directed in the City's stormwater protection requirements, and may include, but not be limited to, the following measures: ■ Diversion of off-site runoff away from the construction site. ■ Revegetation of exposed soil surfaces as soon as feasible following grading activities. ■ Installation of perimeter straw wattles to prevent off-site transport of sediment. ■ Protection of drop inlets (filters and sand bags or straw wattles) with sandbag check dams in paved roadways. ■ Provision of specifications for construction waste handling and disposal. ■ Training of subcontractors on general site housekeeping.	Prior to issuance of grading permits	City of Newport Beach Public Works Department			
Noise						
N-1	All noise-producing project equipment and vehicles using internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specification. Mobile or fixed "package" equipment (e.g., arc welders, air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.	During final design and prior to plan check approval	City of Newport Beach Code Enforcement City of Newport Beach Building Department			
N-2	All mobile and fixed noise-producing equipment used on the proposed project that is regulated for noise output by a local, state, or federal agency shall comply with such regulation while in the course of project activity.	During grading, site preparation, and construction	City of Newport Beach Code Enforcement City of Newport Beach Building Department			
N-3	Electrically powered equipment shall be used instead of pneumatic or internal combustion–	During final design and prior to plan	City of Newport Beach Code			

No.	Mitigation Measure	Time Frame for Implementation& Monitoring	Responsible Monitoring Agency	Verification of Compliance		
				Initials	Date	Remarks
	powered equipment, where feasible.	check approval During grading, site preparation, and construction	Enforcement City of Newport Beach Building Department			
N-4	Mobile noise-generating equipment and machinery shall be shut off when not in use.	During, grading, site preparation, and construction	City of Newport Beach Code Enforcement City of Newport Beach Building Department			
N-5	Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practical from noise-sensitive receptors.	During, grading, site preparation, and construction	City of Newport Beach Code Enforcement City of Newport Beach Building Department			
N-6	Construction site and access road speed limits shall be established and enforced during the construction period.	During, grading, site preparation, and construction	City of Newport Beach Code Enforcement City of Newport Beach Building Department			
N-7	The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.	During, grading, site preparation, and construction	City of Newport Beach Code Enforcement City of Newport Beach Building Department			
N-8	No project-related public address or music system shall be audible at any adjacent receptor.	During, grading, site preparation, and construction	City of Newport Beach Code Enforcement City of Newport Beach Building Department			
N-9	The onsite construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process to the project proponent shall be established prior to construction commencement that shall allow for resolution of noise problems that cannot be immediately solved by the site supervisor.	During final design and prior to plan check approval During grading, site preparation, and construction	City of Newport Beach Code Enforcement City of Newport Beach Building Department			

Appendix G

Biological Memorandum

ICF INTERNATIONAL

Memorandum

Date:	June 28, 2010
To:	Nicole Williams, Project Manager
From:	Paul Schwartz, Biologist
Subject:	**Summary of Biological Literature Review and Field Visit Conducted for the PRES Office Building B General Plan and Planned Community Text Amendments**

The above-referenced project site was reviewed for its potential to support special-status biological resources. A biological literature review was conducted for the PRES Office Building B General Plan and Planned Community Text Amendments (PRES) Project site. Additionally, a qualified ICF International (ICF) biologist, Paul Schwartz, conducted a site visit on June 22, 2010. This memorandum provides a summary of the literature review and site visit conducted for the PRES project relative to potential impacts under the California Environmental Quality Act.

The PRES Project comprises 0.15-acre and consists of the construction of an 11,960-square foot single tenant office building and is located at 4300 Von Karman Avenue in the Koll Center Newport Planned Community, in the City of Newport Beach, Orange County, California. The Project site is located at Section 50, Range 9 West, and Township 6 South on the USGS Newport Beach topographic quadrangle.

Literature Review

Prior to conducting the field survey, a California Natural Diversity Database (CNDDB) (CNDDB 2010) search was completed to detect special-status wildlife and plant species with the potential to occur within 5 miles of the project area. The species list resulting from the search is provided in **Table 1**.

Based on information from CNDDB (2010), 8 special-status plant species and 22 special-status wildlife species were initially evaluated for potential to occur within a 5-mile radius of the PRES project site (**Table 1**). Habitats identified during field surveys, along with species distribution and habitat requirements, were used to determine which species could occur at the project site. As shown in **Table 1**, of the 31 species originally identified, 30 species were eliminated from further consideration because suitable habitat for these species was not present at the project site. Only the Western mastiff bat (*Eumops perotis californicus*), a state species of special concern, was determined to have a low potential to occur onsite.

1776 Park Avenue, Suite 146 Redlands, CA 92373 909.255.7171 909.255.7175 fax icfi.com

Table 1. Special-Status Species with Potential to Occur within a 5-mile Radius of the Project Site, based on CNDDB Records

Species/Community	Status	Habitat Requirements	Likelihood of Occurrence
Wildlife			
Mexican long-tongued bat (*Choeronycteris mexicana*)	SSC	Desert and montane riparian, desert scrub, desert succulent shrub, and pinyon-juniper habitats. In California, found mainly in San Diego County, in urban habitats. Roosts in caves, mines, and buildings.	None. No suitable habitat.
Pallid bat (*Antrozous pallidus*)	SSC	Habitat includes grasslands, shrublands, woodlands, and forests. Roosts in caves, crevices, mines, hollow trees, and buildings.	None. No suitable habitat.
Western mastiff bat (*Eumops perotis californicus*)	SSC	Open semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral. Roosts in crevices in cliff faces, buildings, trees, and tunnels.	Low potential to roost in the ornamental trees on site.
Yuma myotis (*Myotis yumansis*)	SA	Open forests and woodlands with adjacent open water.	None. No suitable habitat.
Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegenensis*)	SSC; NCCP	Arid portions of westward draining slopes.	None. No suitable habitat.
Coastal California gnatcatcher (*Polioptila californica californica*)	FE, SSC, NCCP	Obligate resident of arid coastal scrub.	None. No suitable habitat.
Coastal whiptail (*Aspidoscelis tigris stejnegeri*)	None	Coastal sage scrub, grasslands and riparian woodlands.	None. No suitable habitat.
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE, NCCP	Riparian habitat (willows, dense valley foothill riparian habitat, lower portions of canyons).	None. No suitable habitat.
Long-eared owl (*Asio otus*)	SSC	Riparian, conifer, oak, and desert woodlands adjacent to grassland, meadows, or shrubs.	None. No suitable habitat.
Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)	None; NCCP	Sparse, mixed chaparral and coastal scrub, especially coastal sage scrub.	None. No suitable habitat.
White tailed kite -nesting (*Elanus leucurus*)	Full Protection	Nests in riparian trees (oaks, willows and cottonwoods).	None. No suitable habitat.

Species/Community	Status	Habitat Requirements	Likelihood of Occurrence
Coast patch-nosed snake (*Salvadora hexalepis virgultea*)	SSC	Shrubby, brushy vegetation.	None. No suitable habitat.
Coast horned lizard (*Phrynosoma blainvillii*)	SSC, NCCP	Valley-foothill hardwood, conifer, riparian, and grassland habitats.	None. No suitable habitat.
Northern red-diamond rattlesnake (*Crotalus ruber ruber*)	SSC; NCCP	Chaparral, woodland, and arid desert habitats in dense vegetation and rocky areas.	None. No suitable habitat.
Orangethroat whiptail (*Aspidoscelis hyperythra*)	SSC	Coastal scrub, chamise-redshank chaparral, mixed chaparral, and valley-foothill hardwood habitat.	None. No suitable habitat.
Rosy boa (*Charina trivirgataI)*	NCCP	Desert and chaparral habitats in southern California; in coastal areas, found in rocky chaparral-covered hillsides and canyons; in deserts, found on scrub flats with cover and in the mountains.	None. No suitable habitat.
Two-striped garter snake (*Thamnophis hammondii*)	SSC	Aquatic. Associated with permanent or semi-permanent bodies of water.	None. No suitable habitat.
Coast Range newt (*Taricha torosa torosa*)	SSC	Coastal drainages; lives in terrestrial habitats, migrating over 1 km to breeding sites (ponds, reservoirs, slow-moving streams).	None. No suitable habitat.
Northern leopard frog (*Lithbates pipiens*)	SSC	Uncommon and localized in California; highly aquatic, occurring in or near quiet permanent and semi-permanent water in various habitats.	None. No suitable habitat.
Western spadefoot (*Spea hammondii*)	SSC; NCCP	Primarily grasslands; occasionally valley-foothill hardwood woodlands.	None. No suitable habitat.
Santa Ana sucker (*Catostomus santaanae*)	FT; SSC	Endemic to Los Angeles Basin South Coastal streams.	None. No suitable habitat.
San Diego fairy shrimp (*Branchinecta sandiegonensis*)	FE; NCCP	Vernal pools in San Diego and Orange Counties.	None. No suitable habitat.
Plants			
Allen's pentachaeta (*Pentachaeta aurea* ssp. *allenii*)	1B.1	In openings in valley and foothill grasslands and coastal scrub.	None. No suitable habitat.
Chaparral sand-verbena (*Abronia villosa* var. *aurita*)	1B.1	Chaparral, coastal scrub.	None. No suitable habitat.
Intermediate mariposa lily	1B.2;	Coastal scrub, chaparral, valley and	None. No suitable

Species/Community	Status	Habitat Requirements	Likelihood of Occurrence
(*Calochortus weedii* var. *intermedius*)	NCCP	foothill grassland, woodland, lower montane coniferous forest; occurs on rocky and sandy sites, usually of granitic or alluvial material.	habitat.
Many-stemmed dudleya (*Dudleya multicaulis*)	1B.2	Chaparral, coastal scrub, valley and foothill grassland; in heavy, often clayey soils or grassy slopes.	None. No suitable habitat.
Peninsular nolina (*Nolina cismontana*)	1B.2	Chaparral, coastal scrub.	None. No suitable habitat. Not observed on site.
San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)	Federal Candidate; SE; 1B.1	Coastal scrub, sandy soils.	None. No suitable habitat.
Santa Ana River woollystar (*Eriastrum densifolium* ssp. *sanctorum*)	FE; SE; 1B.1	Coastal scrub, chaparral; in sandy soils on river floodplains or terrassed fluvial deposits.	None. No suitable habitat.
Southern tarplant (*Centromadia parryi* ssp. *australis*)	1B.1	Margins of marshes and swamps; valley and foothill grassland.	None. No suitable habitat.

Species/Community	Status	Habitat Requirements	Likelihood of Occurrence
Federal FE = Endangered FT = Threatened SC = Federal Species of Concern **State** SE = Endangered ST = Threatened SR = Rare SSC = State Species of Concern **California Native Plant Society (CNPS) Categories** 1A = List 1A species: plants presumed extinct in California. 1B = List 1B species: rare, threatened, or endangered in California and elsewhere. 2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere. 3 = List 3 species: plants for which we need more information – Review List. 4 = List 4 species: plants of limited distribution – Watch List. **California Native Plant Society Threat Code extensions** .1 = Seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat). .2 = Fairly threatened in California (20%– 80% of occurrences threatened; moderate degree and immediacy of threat). .3 = Not very threatened in California (less than 20% of occurrences threatened or no current threats known). Source: California Department of Fish and Game 2010.			

Field Visit

A field visit was conducted by Nicole Williams and Paul Schwartz on June 22, 2010. The weather conditions were sunny, with 5-10% cloud cover and no wind. The entire project footprint was surveyed on foot to assess plant communities and potentially suitable habitat for special-status species. The project site consists of approximately 0.15-acre and is comprised of a paved parking lot and a portion of lawn which supports turfgrass and ornamental plantings (sweetgum and eucalypyus trees).

Additional areas adjacent to the project site include office buildings, a small man-made pond and a retention basin. The small pond and contains ornamental water lilies and is surrounded by sparsely planted ornamental umbrella sedge (*Cyperus* sp.), which does not represent riparian vegetation. The retention basin is man-made and contains a small stand of southern cat-tail (*Typha domingensis*) and ornamental water lilies. The banks of the retention basin are vegetated with turfgrass and ornamental planting such as African fountain grass (*Pennisetum setaceum*), pampas grass (*Cortaderia selloana*) and bougainvillea (*Bougainvillea* sp.). Plant and wildlife species observed during the field visit are provided in **Table 2** and **Table 3**, respectively.

Table 2. PRES Vascular Plant Species List

Species	Common Name
Eucalyptus	*Eucalyptus* sp.
Sweetgum	*Liquidambar styraciflua*
Turf grass	N/A

Table 3. OPA Wildlife Species

Species	Common Name
Carpodacus mexicanus	house finch
Sayornis nigricans	black phoebe
Anas platyrhynchos	mallard
Cathartes aura	turkey vulture

Plant communities were mapped according to definitions provided in the Orange County Habitat Classification System (OCHCS) (1992). No area of the project site supports natural communities. The following land use/plant communities are depicted in **Figure 1**: parks and ornamental plantings (OCHCS code 15.5) and urban (OCHCS code 15.1). Specifically, the project site contains 0.05-acre of parks and ornamental plantings and 0.10-acre of urban lands. **Figure 2** contains photographs of the PRES project site and adjacent areas.

The project site and surrounding area contain no native vegetation communities or native habitats. Additionally, the ornamental vegetation present on and adjacent to the project site has no connectivity to other larger open space areas. Based on the lack of native vegetation communities and native habitat at the project site and surrounding area, the literature review, the minimum habitat requirements of the western mastiff bat and the isolated nature of the vegetation within and adjacent to the project site, it was determined that the western mastiff bat has a low potential to roost in the ornamental trees within and adjacent to the PRES project site. No diagnostic sign of roosting by any bat species (presence of guano, odor, etc…) including the western mastiff bat was observed at the PRES project site during the June 22, 2010 field visit. Given the low potential for the western mastiff bat to occur on the project site and the low sensitivity ranking given to the western mastiff bat, impacts from the proposed project would be considered less than significant, and no mitigation would be required.

Conclusions

Based on the literature review and the field survey conducted on June 22, 2010, ICF has determined that the proposed project does not have the potential to result in significant adverse environmental impacts to biological resources. Furthermore, there is no basis for the claims made in the letter dated June 7, 2010 by Palmieri, Tyler, Wiener, Wilhelm & Waldron LLP, that the project would result in adverse effects on birds that frequent the retention basin, including the brown pelican, or other migratory species.

References

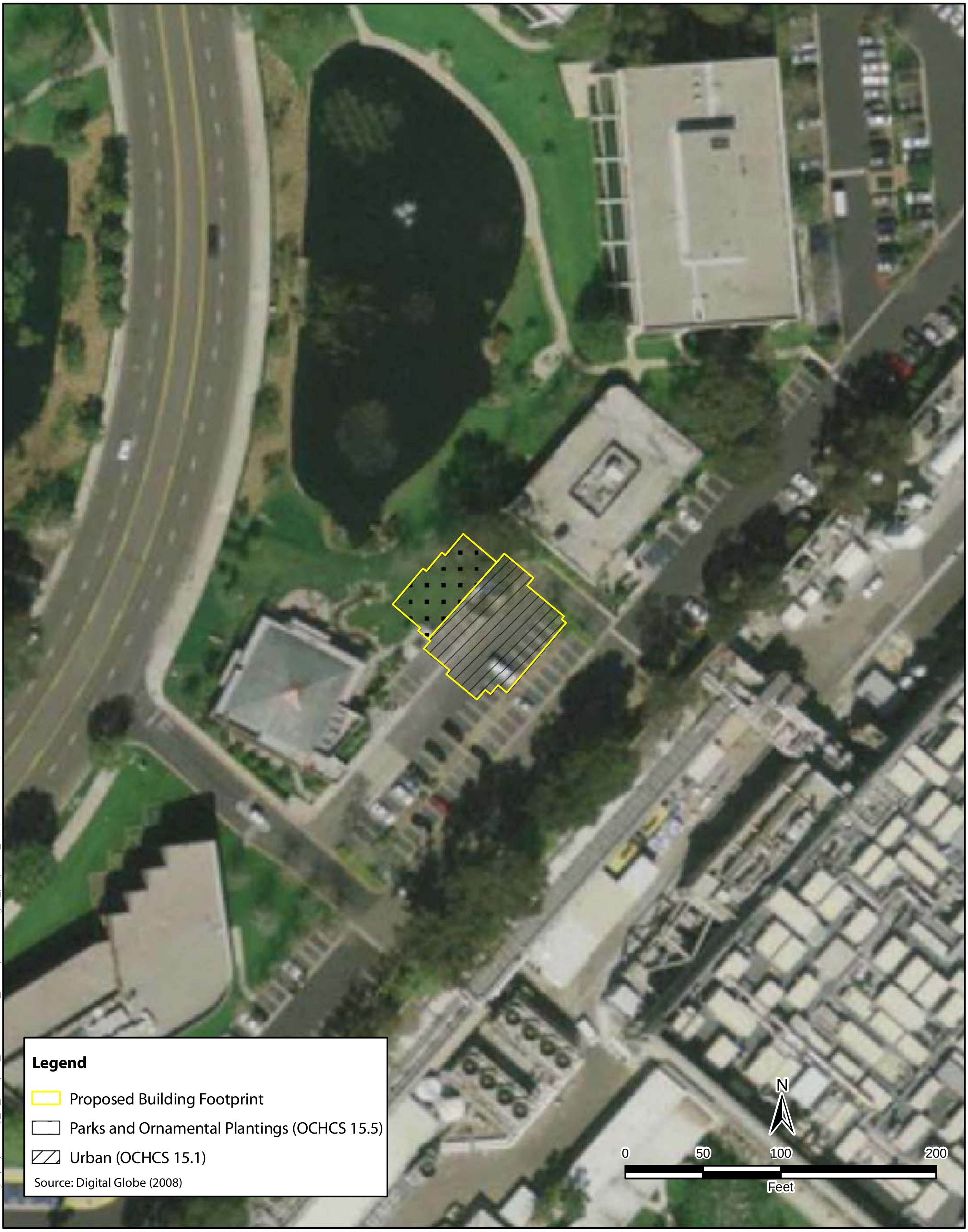
California Department of Fish and Game. 2010. *Life History Accounts and Range Maps, California Wildlife Habitat Relationships System.* Available: <http://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.aspx>.

California Natural Diversity Database. 2010. RareFind 3, Version 3.1.0. California Department of Fish and Game, Sacramento, CA.

Gray, J. and David Bramlet. 1992. *Habitat Classification System Natural Resources Geographic Information System (GIS) Project*. County of Orange Environmental Management Agency. Planning. Santa Ana, CA.

Attachment A

Figure 1



k:\irvine\gis\projects\city_of_newport_beach\00873_09\mapdoc\bio\fig01_proposed_footprint.mxd SM (07-23-10)

ICF INTERNATIONAL

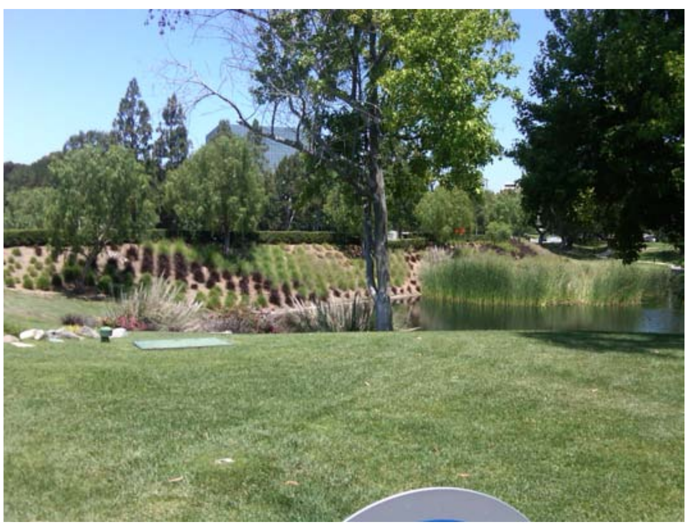
Proposed Building Footprint = 6526 sq ft (0.15 acres)
Urban = 4541 sq ft (0.10 acres)
Parks and Ornamental plantings = 1985 sq ft (0.05 acres)

Figure 1
Proposed Project Footprint
City of Newport Beach
PRES Project

Figure 2

This photograph depicts the project area within the parks and ornamental plantings vegetation community. *Eucalyptus*, sweetgum and turfgrass are depicted in this photograph.

This photograph depicts the man-made pond planted with ornamental *Cyperus* plantings. This small area of ornamental "riparian" vegetation does not constitute habitat with conservation value.



This photograph depicts a portion of the pond adjacent to the Project area. As the photograph depicts, the banks of the pond do not support any native riparian vegetation that would be adversely impacted through project implementation.

This photograph depicts a portion of the pond adjacent to the Project area. As the photograph depicts, the banks of the pond do not support any native riparian vegetation that would be adversely impacted through project implementation.

Figure 2
Vegetation Footprint Area
City of Newport Beach
PRES Project

Appendix H

Preliminary Hydrology Report

PRELIMINARY HYDROLOGY
AND STORMWATER TREATMENT
SIZING REPORT

For

Pres USA Building Project
4300 Von Karman Avenue,
Newport Beach, CA

<u>Prepared for:</u>
PRES Inc.
4300 Von Karman Avenue,
Newport Beach, CA 92660
(949) 261-7737

<u>Prepared by:</u>
Westland Group Inc.
11118 Elm Avenue,
Rancho Cucamonga, CA 91730
(909)989-9789

REGISTERED PROFESSIONAL ENGINEER
GEORGE K. CHAN
C-21520
Exp. 9-30-11
CIVIL
STATE OF CALIFORNIA

<u>Preparation Date</u>
July 16, 2010

TABLE OF CONTENTS

DISCUSSION AND METHODOLOGY

The contents of this report will address to the mitigation of hydrologic and pollutants of concern. The Table of Contents outlines the various sections of hydrologic analyses, BMP treatment flow rates, the descriptions of various treatment and other structural BMPs to be used and finally a conclusion is drawn explaining why the results of the analyses and the various treatment/mitigation BMPs deployed will meet the regulatory standards.

A Preliminary WQMP prepared by our office dated April 30, 2010 recommended the possible use of porous pavement as a mechanism to reduce site imperviousness and stormwater flowrate peak and volume. Presently, a geotechnical consultant is conducting a more in-depth screening of the feasibility of using site infiltration. Due to the presence of clayey soils and the concerns on possible soil swelling potential, even though an extensive subdrain system was previously proposed for the porous AC pavement, this report is now prepared without the use of site infiltration. Pending on the outcome of the above site infiltration screening protocol, a limited site infiltration BMP may still be introduced during the preparation of construction documents and final WQMP. But any infiltration BMP will be considered as an additional amenity and will not be a mandatory feature to achieve compliance with the City's MS4's NPDES Permit.

The hydrology calculations include the 2 Year and 10 Year frequencies in order to evaluate the changes in time of concentration and flow volumes and determine if a HCOC (hydrologic conditions of concern) should be considered.

A 100 Year frequency hydrology is also provided as the site storm drain system should also be designed to achieve flood protection.

The 2/10/100 Year Before/After Development hydrology calculations were performed using the AES 2009 Rational Method Hydrology software and the hydrograph calculations were conducted using the AES "CHI" software. Both softwares are written per the Orange County Flood Control District Hydrology Manual.

The results of the hydrology calculations are then summarized in a tabulation entitled "Summary of Hydrologic Analyses". Also, the hydrology outputs should also be viewed together with the enclosed hydrology maps.

As the site's imperviousness has been increased from 80.05% to 84.24%, the calculations have shown that the peak flows have increased by a maximum of 5% for the storm frequencies considered. Using a "Cultec" stormwater underground chamber, the stored volumes have shown that the peak flows have been decreased to below pre-development levels.

To address to site pollutants of concern, the water quality flow rates are computed and are used for the sizing of treatment control BMPs. The primary BMPs to be used are the Filterra and the Filterra Roof Drain System. Both systems have received TAPE and TARP approval and also have been approved for use by the City of Newport Beach. The manufacturer's engineering department participated in the sizing of the Filterra and their calculations and evaluations are included as a part of this report. The site BMP map previously submitted with the 4/30/2010 Preliminary WQMP report is now accordingly revised and attached herewith.

SUMMARY OF HYDROLOGIC ANALYSES

SUMMARY OF HYDROLOGIC ANALYSIS

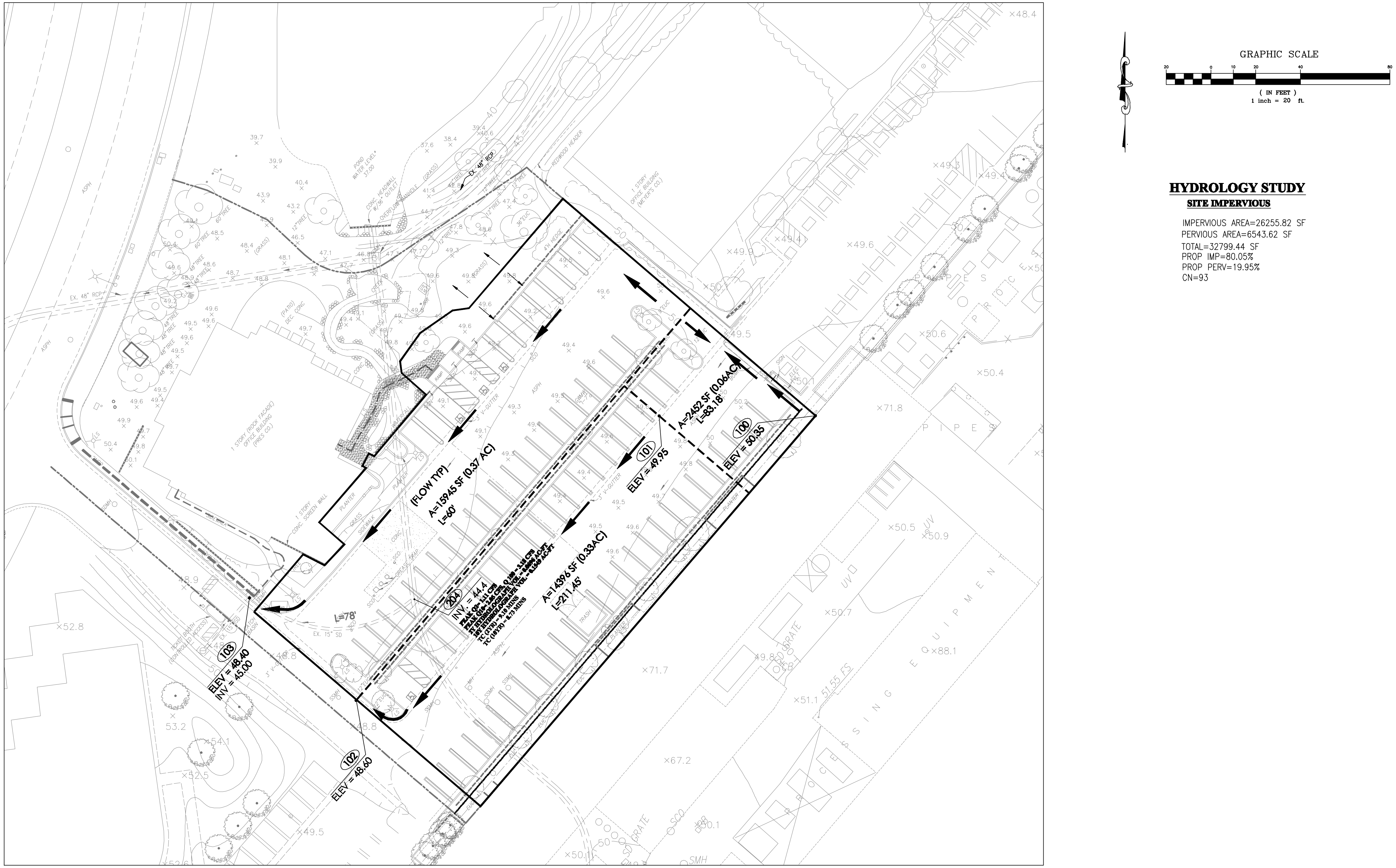
PROJECT: PRES USA BUILDING

DATE: 7/16/2010

FREQUENCY	CONDITION	TC MINS	TC DIFF MINS	PEAK FLOW* CFS	VOLUME* CF	VOL DIFF CF
2 YEAR	BEFORE	9.10	0.16	1.11	4,334.00	79.00
2 YEAR	AFTER	8.94		1.17	4,413.00	
10 YEAR	BEFORE	8.73	0.09	2.05	8,263.00	101.00
10 YEAR	AFTER	8.64		2.14	8,364.00	
100 YEAR	BEFORE	8.47	0.05	3.18		
100 YEAR	AFTER	8.42		3.32		

* PRIOR TO MITIGATION BY BMP

HYDROLOGY MAPS



HYDROLOGY STUDY

SITE IMPERVIOUS

IMPERVIOUS AREA=26255.82 SF
PERVIOUS AREA=6543.62 SF
TOTAL=32799.44 SF
PROP IMP=80.05%
PROP PERV=19.95%
CN=93

DESCRIPTION	DATE	NO.
REVISIONS		

PLAN PREPARED BY: WestLAND Group, Inc.
Land Surveyors • Civil Engineers • GIS
11118 ELM AVE
RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660

GEORGE K. CHAN, RCE 21520
RCE 21520
EXP. 9-30-11

REGISTERED PROFESSIONAL ENGINEER
GEORGE K. CHAN
C-21520
Exp. 9-30-11
CIVIL
STATE OF CALIFORNIA

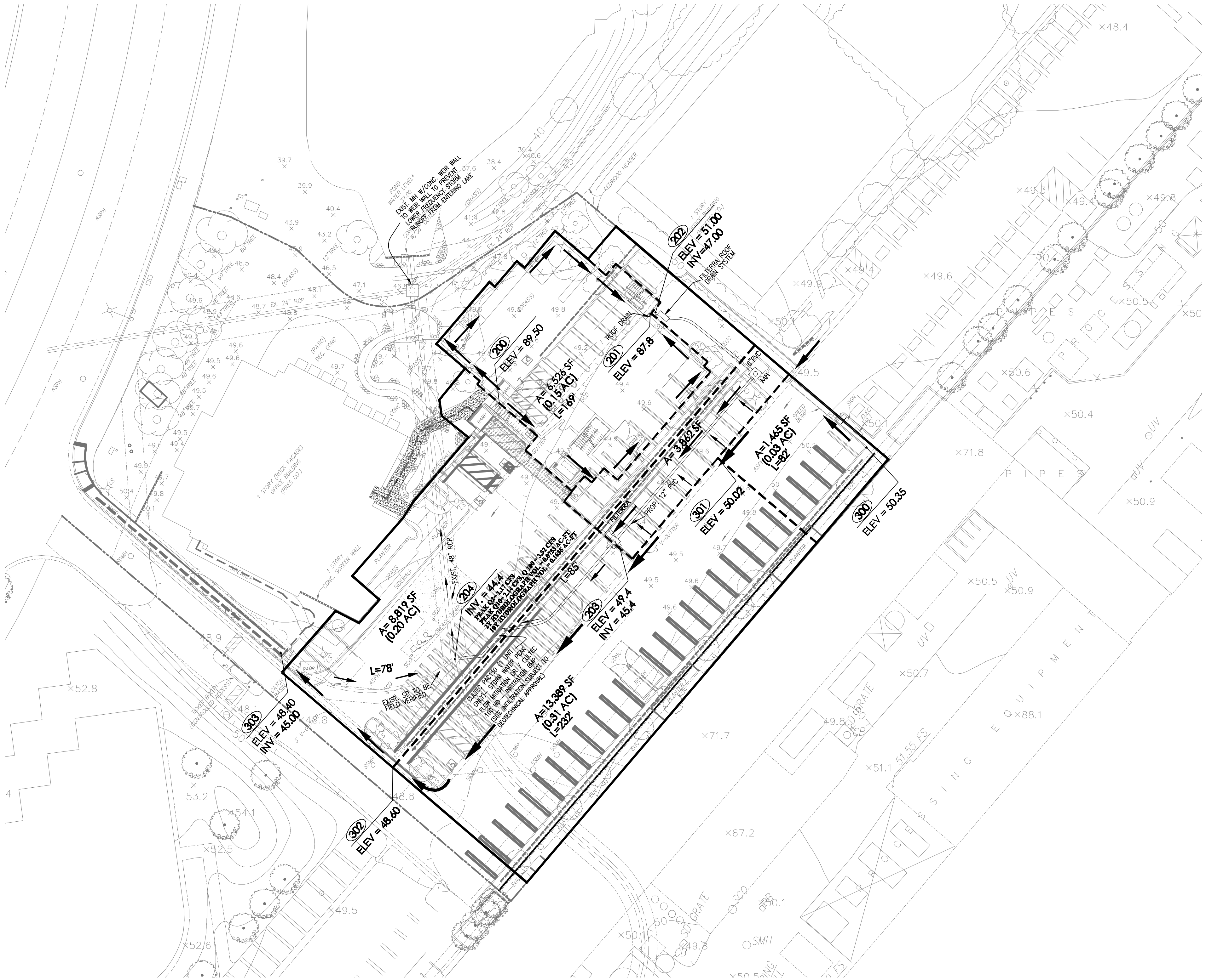
DESIGNED BY GKC
DRAWN BY AL
CHECKED BY GKC
DATE 07/16/2010
SCALE 1"=20'-0"
FILE NO. P10103

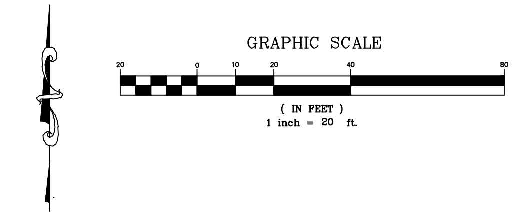
PRES-USA BUILDING
HYDROLOGY STUDY
BEFORE DEVELOPMENT

4300 VON KARMAN AVENUE
NEWPORT BEACH, CALIFORNIA

DWG. NAME P10103 BD
PROJECT NO. P10103
DWG. NO. 1 OF 2
DATE ISSUED: 07/16/2010

K:\PROJECTS\YEAR2010\P10103\GRADING\P10103 BD.DWG





HYDROLOGY STUDY

SITE IMPERVIOUS

IMPERVIOUS AREA= 28694 SF
PERVIOUS AREA= 5367 SF
TOTAL= 34063 SF
PROP IMP= 84.24%
PROP PERV= 15.76%
CN= 94

REGISTERED PROFESSIONAL ENGINEER
GEORGE K. CHAN
C-21520
Exp. 9-30-11
CIVIL
STATE OF CALIFORNIA

DESCRIPTION	DATE	NO.
REVISIONS		

PLAN PREPARED BY: WestLAND Group, Inc.
Land Surveyors • Civil Engineers • GIS
11118 ELM AVE
RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660

GEORGE K. CHAN, RCE 21520
RCE 21520
EXP. 9-30-11

DESIGNED BY GKC
DRAWN BY AL
CHECKED BY GKC
DATE 07/16/2010
SCALE 1"=20'-0"
FILE NO. P10103

PRES-USA BUILDING HYDROLOGY STUDY AFTER DEVELOPMENT

4300 VON KARMAN AVENUE
NEWPORT BEACH, CALIFORNIA

DWG. NAME **P10103 AD**
PROJECT NO. **P10103**
DWG. NO. **2 OF 2**
DATE ISSUED: 07/16/2010

K:\PROJECTS\YEAR2010\P10103\GRADING\P10103 AD.DWG

HYDROLOGY COMPUTER OUTPUTS

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
        (c) Copyright 1983-2009 Advanced Engineering Software (aes)
          Ver. 16.0  Release Date: 04/01/2009  License ID 1312

                      Analysis prepared by:

                   George Chan - Westland Group




 ************************** DESCRIPTION OF STUDY **************************
* Hydrology Study PRES USA Building                                      *
* 2 Year Frequency                                                       *
* Existing Conditions                                                    *
 **************************************************************************

  FILE NAME: 10103E02.DAT
  TIME/DATE OF STUDY: 10:14 07/14/2010
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                  --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
    HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
    WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
```

```
   2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    83.18
  ELEVATION DATA: UPSTREAM(FEET) =     50.35  DOWNSTREAM(FEET) =     49.95

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.182
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.218
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.06      0.20     0.100    75    5.18
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.06   PEAK FLOW RATE(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==============================================================================
  UPSTREAM NODE ELEVATION(FEET) =     49.95
  DOWNSTREAM NODE ELEVATION(FEET) =     48.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   211.45
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.050
  PAVEMENT LIP(FEET) =  0.030   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   1.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.748
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.33      0.20     0.100    75
```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 0.37
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.32
AVERAGE FLOW DEPTH(FEET) = 0.11 FLOOD WIDTH(FEET) = 5.61
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 2.66 Tc(MIN.) = 7.84
SUBAREA AREA(ACRES) = 0.33 SUBAREA RUNOFF(CFS) = 0.51
EFFECTIVE AREA(ACRES) = 0.39 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 0.4 PEAK FLOW RATE(CFS) = 0.61

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) = 0.13 FLOOD WIDTH(FEET) = 7.76
FLOW VELOCITY(FEET/SEC.) = 1.44 DEPTH*VELOCITY(FT*FT/SEC) = 0.18
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 294.63 FEET.

****
FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 91

>>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==
UPSTREAM NODE ELEVATION(FEET) = 48.60
DOWNSTREAM NODE ELEVATION(FEET) = 48.40
CHANNEL LENGTH THRU SUBAREA(FEET) = 60.00
"V" GUTTER WIDTH(FEET) = 3.00 GUTTER HIKE(FEET) = 0.050
PAVEMENT LIP(FEET) = 0.030 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH(FEET) = 1.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.646
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	D	0.37	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 0.88
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.15
AVERAGE FLOW DEPTH(FEET) = 0.16 FLOOD WIDTH(FEET) = 11.36
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.87 Tc(MIN.) = 8.71
SUBAREA AREA(ACRES) = 0.37 SUBAREA RUNOFF(CFS) = 0.54
EFFECTIVE AREA(ACRES) = 0.76 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 0.8 PEAK FLOW RATE(CFS) = 1.11

```
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.18   FLOOD WIDTH(FEET) =   12.79
 FLOW VELOCITY(FEET/SEC.) =   1.19   DEPTH*VELOCITY(FT*FT/SEC) =   0.21
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     354.63 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    204.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    45.00  DOWNSTREAM(FEET) =    44.40
 FLOW LENGTH(FEET) =    78.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.39
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.11
 PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    9.10
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    204.00 =     432.63 FEET.
==============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       0.8  TC(MIN.) =      9.10
 EFFECTIVE AREA(ACRES) =      0.76  AREA-AVERAGED Fm(INCH/HR)=  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =       1.11
==============================================================================
==============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
        (c) Copyright 1983-2009 Advanced Engineering Software (aes)
           Ver. 16.0  Release Date: 04/01/2009  License ID 1312

                     Analysis prepared by:

                    George Chan - Westland Group




 ************************** DESCRIPTION OF STUDY **************************
* Hydrology Study PRES USA Building                                        *
* 10 Year Frequency                                                        *
* Existing Conditions                                                      *
 **************************************************************************

  FILE NAME: 10103E10.DAT
  TIME/DATE OF STUDY: 10:19 07/14/2010
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
               --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
    HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
    WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
```

```
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    83.18
 ELEVATION DATA: UPSTREAM(FEET) =     50.35  DOWNSTREAM(FEET) =     49.95

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.182
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.977
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                D        0.06      0.20     0.100    75    5.18
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.21
 TOTAL AREA(ACRES) =      0.06   PEAK FLOW RATE(CFS) =      0.21

****************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =     49.95
 DOWNSTREAM NODE ELEVATION(FEET) =     48.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =   211.45
 "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.030   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   1.00
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.191
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                D        0.33      0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
```

```
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.67
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.45
 AVERAGE FLOW DEPTH(FEET) =   0.13   FLOOD WIDTH(FEET) =    8.30
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.43   Tc(MIN.) =    7.61
 SUBAREA AREA(ACRES) =    0.33       SUBAREA RUNOFF(CFS) =    0.94
 EFFECTIVE AREA(ACRES) =    0.39     AREA-AVERAGED Fm(INCH/HR) =   0.02
 AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
 TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       1.11

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.16   FLOOD WIDTH(FEET) =   11.00
 FLOW VELOCITY(FEET/SEC.) =   1.54   DEPTH*VELOCITY(FT*FT/SEC) =   0.25
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     294.63 FEET.

********************************************************************************
 FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  91
--------------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
================================================================================
 UPSTREAM NODE ELEVATION(FEET) =     48.60
 DOWNSTREAM NODE ELEVATION(FEET) =     48.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =    60.00
 "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.030   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   1.00
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.013
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 D        0.37      0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.61
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.25
 AVERAGE FLOW DEPTH(FEET) =   0.20   FLOOD WIDTH(FEET) =   15.31
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =    8.41
 SUBAREA AREA(ACRES) =    0.37       SUBAREA RUNOFF(CFS) =    1.00
 EFFECTIVE AREA(ACRES) =    0.76     AREA-AVERAGED Fm(INCH/HR) =   0.02
 AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
 TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       2.05
```

```
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.22   FLOOD WIDTH(FEET) =   16.93
 FLOW VELOCITY(FEET/SEC.) =   1.32   DEPTH*VELOCITY(FT*FT/SEC) =   0.29
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     354.63 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    204.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    45.00  DOWNSTREAM(FEET) =    44.40
 FLOW LENGTH(FEET) =    78.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.03
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.05
 PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    8.73
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    204.00 =     432.63 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       0.8  TC(MIN.) =      8.73
 EFFECTIVE AREA(ACRES) =      0.76  AREA-AVERAGED Fm(INCH/HR)=  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =       2.05
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

****

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE

(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)

Ver. 16.0 Release Date: 04/01/2009 License ID 1312

Analysis prepared by:

George Chan - Westland Group

************************** DESCRIPTION OF STUDY **************************

* Hydrology Study PRES USA Building *

* 100 Year Freqeuncy *

* Existing Conditions *

****

FILE NAME: 103100E.DAT

TIME/DATE OF STUDY: 10:24 07/14/2010

==

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

==

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

DATA BANK RAINFALL USED

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

```
    HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
    WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150
```

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET

as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)

```
   2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    83.18
  ELEVATION DATA: UPSTREAM(FEET) =     50.35  DOWNSTREAM(FEET) =     49.95

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.182
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.062
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.06      0.20     0.100    75    5.18
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.06   PEAK FLOW RATE(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =     49.95
  DOWNSTREAM NODE ELEVATION(FEET) =     48.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   211.45
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.050
  PAVEMENT LIP(FEET) =  0.030   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.926
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.33      0.20     0.100    75
```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.04
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.56
AVERAGE FLOW DEPTH(FEET) = 0.15 FLOOD WIDTH(FEET) = 10.46
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 2.26 Tc(MIN.) = 7.44
SUBAREA AREA(ACRES) = 0.33 SUBAREA RUNOFF(CFS) = 1.46
EFFECTIVE AREA(ACRES) = 0.39 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 0.4 PEAK FLOW RATE(CFS) = 1.72

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) = 0.19 FLOOD WIDTH(FEET) = 13.51
FLOW VELOCITY(FEET/SEC.) = 1.67 DEPTH*VELOCITY(FT*FT/SEC) = 0.31
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 294.63 FEET.

****
FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 91

>>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==
UPSTREAM NODE ELEVATION(FEET) = 48.60
DOWNSTREAM NODE ELEVATION(FEET) = 48.40
CHANNEL LENGTH THRU SUBAREA(FEET) = 60.00
"V" GUTTER WIDTH(FEET) = 3.00 GUTTER HIKE(FEET) = 0.050
PAVEMENT LIP(FEET) = 0.030 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH(FEET) = 1.00
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.666
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	D	0.37	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.50
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.36
AVERAGE FLOW DEPTH(FEET) = 0.24 FLOOD WIDTH(FEET) = 18.54
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.74 Tc(MIN.) = 8.18
SUBAREA AREA(ACRES) = 0.37 SUBAREA RUNOFF(CFS) = 1.55
EFFECTIVE AREA(ACRES) = 0.76 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 0.8 PEAK FLOW RATE(CFS) = 3.18

```
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.26   FLOOD WIDTH(FEET) =   20.52
 FLOW VELOCITY(FEET/SEC.) =   1.43   DEPTH*VELOCITY(FT*FT/SEC) =   0.36
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     354.63 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    204.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    45.00  DOWNSTREAM(FEET) =    44.40
 FLOW LENGTH(FEET) =    78.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.55
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.18
 PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    8.47
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    204.00 =     432.63 FEET.
==============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        0.8  TC(MIN.) =      8.47
 EFFECTIVE AREA(ACRES) =      0.76  AREA-AVERAGED Fm(INCH/HR)=  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =       3.18
==============================================================================
==============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

****
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)

Ver. 16.0 Release Date: 04/01/2009 License ID 1312

Analysis prepared by:

George Chan - Westland Group

************************** DESCRIPTION OF STUDY **************************
* Hydrology Study PRES USA Building *
* 2 Year Frequency *
* After Development Condition *
****

FILE NAME: 10103A2.DAT
TIME/DATE OF STUDY: 17:07 07/13/2010
==
USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==
--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET

```
     as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
   2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   169.00
 ELEVATION DATA: UPSTREAM(FEET) =     89.50  DOWNSTREAM(FEET) =     87.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.936
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.051
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 D        0.15      0.20     0.100    75    5.94
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.27
 TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.27

****************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    87.80  DOWNSTREAM(FEET) =    51.00
 FLOW LENGTH(FEET) =    26.80   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO  8.000
 DEPTH OF FLOW IN   8.0 INCH PIPE IS   0.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.24
 ESTIMATED PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.27
 PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    5.97
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     195.80 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    47.00  DOWNSTREAM(FEET) =    45.40
 FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO  8.000
 DEPTH OF FLOW IN   8.0 INCH PIPE IS   2.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   2.85
 ESTIMATED PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.27
 PIPE TRAVEL TIME(MIN.) =   0.82    Tc(MIN.) =    6.79
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =     335.80 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    6.79
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.900
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  D        0.09      0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.09      SUBAREA RUNOFF(CFS) =    0.15
 EFFECTIVE AREA(ACRES) =      0.24   AREA-AVERAGED Fm(INCH/HR) =  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       0.2       PEAK FLOW RATE(CFS) =       0.41

****************************************************************************
 FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    45.40  DOWNSTREAM(FEET) =    44.40
 FLOW LENGTH(FEET) =    85.31   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO  8.000
```

```
 DEPTH OF FLOW IN   8.0 INCH PIPE IS   3.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.20
 ESTIMATED PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.41
 PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    7.23
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =     421.11 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    204.00 TO NODE    204.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.23
 RAINFALL INTENSITY(INCH/HR) =   1.83
 AREA-AVERAGED Fm(INCH/HR) =  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.20
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.24
 TOTAL STREAM AREA(ACRES) =       0.24
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.41

****************************************************************************
 FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    82.00
 ELEVATION DATA: UPSTREAM(FEET) =     50.35  DOWNSTREAM(FEET) =     50.02

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.339
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.180
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 D        0.06      0.20      0.100    75    5.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.06   PEAK FLOW RATE(CFS) =      0.12
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =     50.02
 DOWNSTREAM NODE ELEVATION(FEET) =     48.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =   192.00
 "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.030   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   1.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.778
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 D        0.28      0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.34
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.40
 AVERAGE FLOW DEPTH(FEET) =   0.10   FLOOD WIDTH(FEET) =    4.89
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.28   Tc(MIN.) =    7.62
 SUBAREA AREA(ACRES) =    0.28       SUBAREA RUNOFF(CFS) =    0.45
 EFFECTIVE AREA(ACRES) =    0.34     AREA-AVERAGED Fm(INCH/HR) =   0.02
 AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
 TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       0.55

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.12   FLOOD WIDTH(FEET) =    7.04
 FLOW VELOCITY(FEET/SEC.) =   1.48   DEPTH*VELOCITY(FT*FT/SEC) =   0.18
 LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     274.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =     48.60
 DOWNSTREAM NODE ELEVATION(FEET) =     48.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =    60.00
 "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.050
```

PAVEMENT LIP(FEET) = 0.030 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH(FEET) = 1.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.667
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	D	0.20	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 0.70
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.10
AVERAGE FLOW DEPTH(FEET) = 0.15 FLOOD WIDTH(FEET) = 10.10
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.91 Tc(MIN.) = 8.52
SUBAREA AREA(ACRES) = 0.20 SUBAREA RUNOFF(CFS) = 0.30
EFFECTIVE AREA(ACRES) = 0.55 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 0.5 PEAK FLOW RATE(CFS) = 0.81

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) = 0.16 FLOOD WIDTH(FEET) = 11.00
FLOW VELOCITY(FEET/SEC.) = 1.12 DEPTH*VELOCITY(FT*FT/SEC) = 0.18
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 303.00 = 334.00 FEET.

****
FLOW PROCESS FROM NODE 303.00 TO NODE 204.00 IS CODE = 41

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 45.00 DOWNSTREAM(FEET) = 44.40
FLOW LENGTH(FEET) = 78.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 3.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.09
GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.81
PIPE TRAVEL TIME(MIN.) = 0.42 Tc(MIN.) = 8.94
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 204.00 = 412.00 FEET.

****
FLOW PROCESS FROM NODE 204.00 TO NODE 204.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

==

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 8.94

RAINFALL INTENSITY(INCH/HR) = 1.62

AREA-AVERAGED Fm(INCH/HR) = 0.02

AREA-AVERAGED Fp(INCH/HR) = 0.20

AREA-AVERAGED Ap = 0.10

EFFECTIVE STREAM AREA(ACRES) = 0.55

TOTAL STREAM AREA(ACRES) = 0.55

PEAK FLOW RATE(CFS) AT CONFLUENCE = 0.81

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	0.41	7.23	1.832	0.20(0.02)	0.10	0.2	200.00
2	0.81	8.94	1.621	0.20(0.02)	0.10	0.5	300.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1.15	7.23	1.832	0.20(0.02)	0.10	0.7	200.00
2	1.17	8.94	1.621	0.20(0.02)	0.10	0.8	300.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1.17 Tc(MIN.) = 8.94

EFFECTIVE AREA(ACRES) = 0.79 AREA-AVERAGED Fm(INCH/HR) = 0.02

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10

TOTAL AREA(ACRES) = 0.8

LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 421.11 FEET.

==

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 0.8 TC(MIN.) = 8.94

EFFECTIVE AREA(ACRES) = 0.79 AREA-AVERAGED Fm(INCH/HR)= 0.02

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.100

PEAK FLOW RATE(CFS) = 1.17

** PEAK FLOW RATE TABLE **

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)			(ACRES)	NODE
1	1.15	7.23	1.832	0.20(0.02)	0.10	0.7	200.00	
2	1.17	8.94	1.621	0.20(0.02)	0.10	0.8	300.00	

==

==

END OF RATIONAL METHOD ANALYSIS

****
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)

Ver. 16.0 Release Date: 04/01/2009 License ID 1312

Analysis prepared by:

George Chan - Westland Group

************************** DESCRIPTION OF STUDY **************************
* Hydrology Study PRES USA Building *
* 10 Year Frequency *
* After Development Condition *
****

FILE NAME: 10103A10.DAT
TIME/DATE OF STUDY: 17:14 07/13/2010
==
USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==
--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET

```
     as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
   2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   169.00
 ELEVATION DATA: UPSTREAM(FEET) =     89.50  DOWNSTREAM(FEET) =     87.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.936
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.679
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                D        0.15      0.20     0.100    75    5.94
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.49
 TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.49

****************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    87.80  DOWNSTREAM(FEET) =    51.00
 FLOW LENGTH(FEET) =    26.80   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO  8.000
 DEPTH OF FLOW IN   8.0 INCH PIPE IS   1.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.31
 ESTIMATED PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.49
 PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    5.96
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     195.80 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    47.00  DOWNSTREAM(FEET) =    45.40
 FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO  8.000
 DEPTH OF FLOW IN   8.0 INCH PIPE IS   3.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.34
 ESTIMATED PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.49
 PIPE TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =    6.66
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =     335.80 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
 MAINLINE Tc(MIN.) =    6.66
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.445
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  D        0.09      0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.09      SUBAREA RUNOFF(CFS) =    0.28
 EFFECTIVE AREA(ACRES) =      0.24   AREA-AVERAGED Fm(INCH/HR) =  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       0.2       PEAK FLOW RATE(CFS) =       0.74

****************************************************************************
 FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    45.40  DOWNSTREAM(FEET) =    44.40
 FLOW LENGTH(FEET) =    85.31   MANNING'S N =  0.013
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.2 INCHES
```

```
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.71
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.74
 PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    7.04
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =     421.11 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE    204.00 TO NODE    204.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.04
 RAINFALL INTENSITY(INCH/HR) =   3.34
 AREA-AVERAGED Fm(INCH/HR) =  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.20
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.24
 TOTAL STREAM AREA(ACRES) =       0.24
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.74

******************************************************************************
 FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    82.00
 ELEVATION DATA: UPSTREAM(FEET) =     50.35  DOWNSTREAM(FEET) =     50.02

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.339
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.910
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 D        0.06      0.20     0.100    75    5.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.21
 TOTAL AREA(ACRES) =      0.06   PEAK FLOW RATE(CFS) =      0.21
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =     50.02
 DOWNSTREAM NODE ELEVATION(FEET) =     48.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =   192.00
 "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.030   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   1.00
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.228
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 D        0.28      0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.61
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.51
 AVERAGE FLOW DEPTH(FEET) =   0.13   FLOOD WIDTH(FEET) =    7.58
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =    7.46
 SUBAREA AREA(ACRES) =    0.28       SUBAREA RUNOFF(CFS) =    0.82
 EFFECTIVE AREA(ACRES) =    0.34     AREA-AVERAGED Fm(INCH/HR) =   0.02
 AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
 TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.00

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.15   FLOOD WIDTH(FEET) =    9.92
 FLOW VELOCITY(FEET/SEC.) =   1.63   DEPTH*VELOCITY(FT*FT/SEC) =   0.24
 LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     274.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =     48.60
 DOWNSTREAM NODE ELEVATION(FEET) =     48.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =    60.00
 "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.030   MANNING'S N = .0150
```

```
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH(FEET) =   1.00
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.038
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
    LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL                  D        0.20      0.20     0.100    75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.27
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.20
AVERAGE FLOW DEPTH(FEET) =   0.19   FLOOD WIDTH(FEET) =   13.69
"V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.83   Tc(MIN.) =    8.29
SUBAREA AREA(ACRES) =    0.20       SUBAREA RUNOFF(CFS) =    0.55
EFFECTIVE AREA(ACRES) =    0.55     AREA-AVERAGED Fm(INCH/HR) =   0.02
AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       1.49

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) =  0.20   FLOOD WIDTH(FEET) =   14.59
FLOW VELOCITY(FEET/SEC.) =   1.25   DEPTH*VELOCITY(FT*FT/SEC) =   0.25
LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     334.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    303.00 TO NODE    204.00 IS CODE =  41
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    45.00  DOWNSTREAM(FEET) =    44.40
FLOW LENGTH(FEET) =    78.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   3.69
GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =       1.49
PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =    8.64
LONGEST FLOWPATH FROM NODE    300.00 TO NODE    204.00 =     412.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    204.00 TO NODE    204.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
```

==

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 8.64

RAINFALL INTENSITY(INCH/HR) = 2.97

AREA-AVERAGED Fm(INCH/HR) = 0.02

AREA-AVERAGED Fp(INCH/HR) = 0.20

AREA-AVERAGED Ap = 0.10

EFFECTIVE STREAM AREA(ACRES) = 0.55

TOTAL STREAM AREA(ACRES) = 0.55

PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.49

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	0.74	7.04	3.336	0.20(0.02)	0.10	0.2	200.00
2	1.49	8.64	2.966	0.20(0.02)	0.10	0.5	300.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.10	7.04	3.336	0.20(0.02)	0.10	0.7	200.00
2	2.14	8.64	2.966	0.20(0.02)	0.10	0.8	300.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2.14 Tc(MIN.) = 8.64

EFFECTIVE AREA(ACRES) = 0.79 AREA-AVERAGED Fm(INCH/HR) = 0.02

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10

TOTAL AREA(ACRES) = 0.8

LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 421.11 FEET.

==

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 0.8 TC(MIN.) = 8.64

EFFECTIVE AREA(ACRES) = 0.79 AREA-AVERAGED Fm(INCH/HR)= 0.02

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.100

PEAK FLOW RATE(CFS) = 2.14

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE

1	2.10	7.04	3.336	0.20(0.02)	0.10	0.7	200.00
2	2.14	8.64	2.966	0.20(0.02)	0.10	0.8	300.00

==

==

END OF RATIONAL METHOD ANALYSIS

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
       (c) Copyright 1983-2009 Advanced Engineering Software (aes)
          Ver. 16.0  Release Date: 04/01/2009  License ID 1312

                    Analysis prepared by:

                 George Chan - Westland Group




 ************************** DESCRIPTION OF STUDY **************************
* Hydrology Study Pres USA Building                                  *
* 100 Year Frequency                                                 *
* After Development Condition                                        *
 **************************************************************************

  FILE NAME: 103A100.DAT
  TIME/DATE OF STUDY: 17:16 07/13/2010
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
    HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
    WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
```

```
     as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
   2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   169.00
 ELEVATION DATA: UPSTREAM(FEET) =     89.50  DOWNSTREAM(FEET) =     87.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.936
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.608
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 D        0.15      0.20     0.100    75    5.94
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.75
 TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.75

****************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    87.80  DOWNSTREAM(FEET) =    51.00
 FLOW LENGTH(FEET) =    26.80   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO  8.000
 DEPTH OF FLOW IN   8.0 INCH PIPE IS   1.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  20.80
 ESTIMATED PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.75
 PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    5.96
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     195.80 FEET.
```

```
******************************************************************************
 FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    47.00  DOWNSTREAM(FEET) =    45.40
 FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.69
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.75
 PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =    6.59
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =     335.80 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
 MAINLINE Tc(MIN.) =    6.59
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.282
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 D        0.09      0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.09      SUBAREA RUNOFF(CFS) =    0.43
 EFFECTIVE AREA(ACRES) =      0.24   AREA-AVERAGED Fm(INCH/HR) =  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        0.2       PEAK FLOW RATE(CFS) =       1.14

******************************************************************************
 FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    45.40  DOWNSTREAM(FEET) =    44.40
 FLOW LENGTH(FEET) =    85.31   MANNING'S N =  0.013
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.12
```

```
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.14
 PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =    6.94
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =     421.11 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    204.00 TO NODE    204.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.94
 RAINFALL INTENSITY(INCH/HR) =   5.13
 AREA-AVERAGED Fm(INCH/HR) =  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.20
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.24
 TOTAL STREAM AREA(ACRES) =       0.24
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.14

****************************************************************************
 FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    82.00
 ELEVATION DATA: UPSTREAM(FEET) =     50.35  DOWNSTREAM(FEET) =     50.02

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.339
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.959
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 D        0.06      0.20     0.100    75    5.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.32
 TOTAL AREA(ACRES) =      0.06   PEAK FLOW RATE(CFS) =      0.32

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==============================================================================
 UPSTREAM NODE ELEVATION(FEET) =     50.02
 DOWNSTREAM NODE ELEVATION(FEET) =     48.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =   192.00
 "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.030   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.964
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 D        0.28      0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.95
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.60
 AVERAGE FLOW DEPTH(FEET) =   0.15   FLOOD WIDTH(FEET) =    9.74
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.00   Tc(MIN.) =    7.34
 SUBAREA AREA(ACRES) =    0.28       SUBAREA RUNOFF(CFS) =    1.27
 EFFECTIVE AREA(ACRES) =    0.34     AREA-AVERAGED Fm(INCH/HR) =   0.02
 AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
 TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.54

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.17   FLOOD WIDTH(FEET) =   12.43
 FLOW VELOCITY(FEET/SEC.) =   1.72   DEPTH*VELOCITY(FT*FT/SEC) =   0.30
 LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     274.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==============================================================================
 UPSTREAM NODE ELEVATION(FEET) =     48.60
 DOWNSTREAM NODE ELEVATION(FEET) =     48.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =    60.00
 "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.030   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
```

MAXIMUM DEPTH(FEET) = 1.00
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.691
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	D	0.20	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.96
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.31
AVERAGE FLOW DEPTH(FEET) = 0.22 FLOOD WIDTH(FEET) = 16.57
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.76 Tc(MIN.) = 8.10
SUBAREA AREA(ACRES) = 0.20 SUBAREA RUNOFF(CFS) = 0.85
EFFECTIVE AREA(ACRES) = 0.55 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 0.5 PEAK FLOW RATE(CFS) = 2.30

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) = 0.23 FLOOD WIDTH(FEET) = 17.82
FLOW VELOCITY(FEET/SEC.) = 1.35 DEPTH*VELOCITY(FT*FT/SEC) = 0.31
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 303.00 = 334.00 FEET.

****

FLOW PROCESS FROM NODE 303.00 TO NODE 204.00 IS CODE = 41

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

==

ELEVATION DATA: UPSTREAM(FEET) = 45.00 DOWNSTREAM(FEET) = 44.40
FLOW LENGTH(FEET) = 78.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.16
GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 2.30
PIPE TRAVEL TIME(MIN.) = 0.31 Tc(MIN.) = 8.42
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 204.00 = 412.00 FEET.

****

FLOW PROCESS FROM NODE 204.00 TO NODE 204.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

==

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 8.42
RAINFALL INTENSITY(INCH/HR) = 4.59
AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.55
TOTAL STREAM AREA(ACRES) = 0.55
PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.30

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1.14	6.94	5.129	0.20(0.02)	0.10	0.2	200.00
2	2.30	8.42	4.591	0.20(0.02)	0.10	0.5	300.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.25	6.94	5.129	0.20(0.02)	0.10	0.7	200.00
2	3.32	8.42	4.591	0.20(0.02)	0.10	0.8	300.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3.32 Tc(MIN.) = 8.42
EFFECTIVE AREA(ACRES) = 0.79 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 0.8
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 421.11 FEET.
==
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 0.8 TC(MIN.) = 8.42
EFFECTIVE AREA(ACRES) = 0.79 AREA-AVERAGED Fm(INCH/HR)= 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 3.32

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.25	6.94	5.129	0.20(0.02)	0.10	0.7	200.00

2 3.32 8.42 4.591 0.20(0.02) 0.10 0.8 300.00

==

==

END OF RATIONAL METHOD ANALYSIS

CN VALUES AND HYDROGRAPHS

CN Calculation	Before Development Condition	
Project	PRES USA Building	
Date:	7/13/2010	
Engineer:	Westland Group	
Pervious Area CN =		75
Percent Imperviousness =		80.05
CN Composite =		93

CN Calculation	After Development Conditions
Project	PRES USA Building
Date:	7/13/2010
Engineer:	Westland Group

Pervious Area CN =	75
Percent Imperviousness =	84.24
CN Composite =	94

****

NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)

AND LOW LOSS FRACTION ESTIMATIONS

==

Ver. 16.0 Release Date: 04/01/2009 License ID 1312

Analysis prepared by:

George Chan - Westland Group

****

Problem Descriptions:

Area Average Low Loss Fraction

PRES USA Bldg

2 Year Frequency Before Development

==

*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)

AND LOW LOSS FRACTION ESTIMATIONS FOR AMC II:

TOTAL 24-HOUR DURATION RAINFALL DEPTH = 2.05 (inches)

SOIL-COVER TYPE	AREA (Acres)	PERCENT OF PERVIOUS AREA	SCS CURVE NUMBER	LOSS RATE Fp(in./hr.)	YIELD
1	0.75	19.95	93.	0.200	0.845

TOTAL AREA (Acres) = 0.75

AREA-AVERAGED LOSS RATE, $\bar{F}_m$ (in./hr.) = 0.040

AREA-AVERAGED LOW LOSS FRACTION, $\bar{Y}$ = 0.155

==

Problem Descriptions:

Hydrograph Volume

PRES USA Bldg

2 Year Frequency Before Development

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 0.75
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.040
LOW LOSS FRACTION = 0.155
TIME OF CONCENTRATION(MIN.) = 9.10
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 2
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.19
30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.40
1-HOUR POINT RAINFALL VALUE(INCHES) = 0.53
3-HOUR POINT RAINFALL VALUE(INCHES) = 0.89
6-HOUR POINT RAINFALL VALUE(INCHES) = 1.22
24-HOUR POINT RAINFALL VALUE(INCHES) = 2.05

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.10
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.03

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.07	0.0001	0.02	Q	.	.	.	.
0.23	0.0003	0.02	Q	.	.	.	.
0.38	0.0005	0.02	Q	.	.	.	.
0.53	0.0008	0.02	Q	.	.	.	.
0.68	0.0010	0.02	Q	.	.	.	.
0.83	0.0012	0.02	Q	.	.	.	.
0.98	0.0015	0.02	Q	.	.	.	.
1.14	0.0017	0.02	Q	.	.	.	.
1.29	0.0019	0.02	Q	.	.	.	.
1.44	0.0022	0.02	Q	.	.	.	.
1.59	0.0024	0.02	Q	.	.	.	.
1.74	0.0027	0.02	Q	.	.	.	.
1.89	0.0029	0.02	Q	.	.	.	.
2.05	0.0032	0.02	Q	.	.	.	.
2.20	0.0034	0.02	Q	.	.	.	.
2.35	0.0037	0.02	Q	.	.	.	.

2.50	0.0039	0.02	Q	.	.	.	.
2.65	0.0042	0.02	Q	.	.	.	.
2.80	0.0044	0.02	Q	.	.	.	.
2.96	0.0047	0.02	Q	.	.	.	.
3.11	0.0049	0.02	Q	.	.	.	.
3.26	0.0052	0.02	Q	.	.	.	.
3.41	0.0055	0.02	Q	.	.	.	.
3.56	0.0057	0.02	Q	.	.	.	.
3.71	0.0060	0.02	Q	.	.	.	.
3.87	0.0063	0.02	Q	.	.	.	.
4.02	0.0065	0.02	Q	.	.	.	.
4.17	0.0068	0.02	Q	.	.	.	.
4.32	0.0071	0.02	Q	.	.	.	.
4.47	0.0074	0.02	Q	.	.	.	.
4.62	0.0077	0.02	Q	.	.	.	.
4.78	0.0079	0.02	Q	.	.	.	.
4.93	0.0082	0.02	Q	.	.	.	.
5.08	0.0085	0.02	Q	.	.	.	.
5.23	0.0088	0.02	Q	.	.	.	.
5.38	0.0091	0.02	Q	.	.	.	.
5.53	0.0094	0.02	Q	.	.	.	.
5.69	0.0097	0.02	Q	.	.	.	.
5.84	0.0100	0.02	Q	.	.	.	.
5.99	0.0103	0.02	Q	.	.	.	.
6.14	0.0106	0.02	Q	.	.	.	.
6.29	0.0109	0.02	Q	.	.	.	.
6.44	0.0112	0.03	Q	.	.	.	.
6.60	0.0115	0.03	Q	.	.	.	.
6.75	0.0119	0.03	Q	.	.	.	.
6.90	0.0122	0.03	Q	.	.	.	.
7.05	0.0125	0.03	Q	.	.	.	.
7.20	0.0128	0.03	Q	.	.	.	.
7.36	0.0132	0.03	Q	.	.	.	.
7.51	0.0135	0.03	Q	.	.	.	.
7.66	0.0138	0.03	Q	.	.	.	.
7.81	0.0142	0.03	Q	.	.	.	.
7.96	0.0145	0.03	Q	.	.	.	.
8.11	0.0149	0.03	Q	.	.	.	.
8.27	0.0152	0.03	Q	.	.	.	.
8.42	0.0156	0.03	Q	.	.	.	.
8.57	0.0160	0.03	Q	.	.	.	.
8.72	0.0163	0.03	Q	.	.	.	.
8.87	0.0167	0.03	Q	.	.	.	.

9.02	0.0171	0.03	Q	.	.	.	.
9.18	0.0175	0.03	Q	.	.	.	.
9.33	0.0179	0.03	Q	.	.	.	.
9.48	0.0183	0.03	Q	.	.	.	.
9.63	0.0187	0.03	Q	.	.	.	.
9.78	0.0191	0.03	Q	.	.	.	.
9.93	0.0195	0.03	Q	.	.	.	.
10.09	0.0199	0.03	Q	.	.	.	.
10.24	0.0203	0.03	Q	.	.	.	.
10.39	0.0208	0.03	Q	.	.	.	.
10.54	0.0212	0.04	Q	.	.	.	.
10.69	0.0216	0.04	Q	.	.	.	.
10.84	0.0221	0.04	Q	.	.	.	.
10.99	0.0226	0.04	Q	.	.	.	.
11.15	0.0230	0.04	Q	.	.	.	.
11.30	0.0235	0.04	Q	.	.	.	.
11.45	0.0240	0.04	Q	.	.	.	.
11.60	0.0245	0.04	Q	.	.	.	.
11.75	0.0250	0.04	Q	.	.	.	.
11.90	0.0255	0.04	Q	.	.	.	.
12.06	0.0261	0.04	Q	.	.	.	.
12.21	0.0267	0.05	Q	.	.	.	.
12.36	0.0274	0.05	Q	.	.	.	.
12.51	0.0281	0.06	Q	.	.	.	.
12.66	0.0288	0.06	Q	.	.	.	.
12.81	0.0295	0.06	Q	.	.	.	.
12.97	0.0302	0.06	Q	.	.	.	.
13.12	0.0310	0.06	Q	.	.	.	.
13.27	0.0318	0.06	Q	.	.	.	.
13.42	0.0326	0.07	Q	.	.	.	.
13.57	0.0334	0.07	Q	.	.	.	.
13.73	0.0343	0.07	Q	.	.	.	.
13.88	0.0352	0.07	Q	.	.	.	.
14.03	0.0361	0.08	Q	.	.	.	.
14.18	0.0371	0.08	Q	.	.	.	.
14.33	0.0381	0.09	Q	.	.	.	.
14.48	0.0392	0.09	Q	.	.	.	.
14.63	0.0404	0.09	Q	.	.	.	.
14.79	0.0416	0.10	Q	.	.	.	.
14.94	0.0429	0.11	Q	.	.	.	.
15.09	0.0442	0.11	Q	.	.	.	.
15.24	0.0457	0.13	Q	.	.	.	.
15.39	0.0473	0.13	Q	.	.	.	.

15.55	0.0490	0.14	Q . . . .
15.70	0.0509	0.16	Q . . . .
15.85	0.0534	0.24	Q . . . .
16.00	0.0570	0.34	.Q . . . .
16.15	0.0657	1.06	. Q . . . .
16.30	0.0736	0.19	Q . . . .
16.45	0.0756	0.13	Q . . . .
16.61	0.0771	0.12	Q . . . .
16.76	0.0785	0.10	Q . . . .
16.91	0.0797	0.09	Q . . . .
17.06	0.0808	0.08	Q . . . .
17.21	0.0818	0.07	Q . . . .
17.36	0.0827	0.07	Q . . . .
17.52	0.0835	0.06	Q . . . .
17.67	0.0843	0.06	Q . . . .
17.82	0.0851	0.06	Q . . . .
17.97	0.0858	0.06	Q . . . .
18.12	0.0864	0.05	Q . . . .
18.27	0.0870	0.04	Q . . . .
18.43	0.0875	0.04	Q . . . .
18.58	0.0880	0.04	Q . . . .
18.73	0.0885	0.04	Q . . . .
18.88	0.0889	0.04	Q . . . .
19.03	0.0894	0.03	Q . . . .
19.18	0.0898	0.03	Q . . . .
19.34	0.0902	0.03	Q . . . .
19.49	0.0906	0.03	Q . . . .
19.64	0.0910	0.03	Q . . . .
19.79	0.0914	0.03	Q . . . .
19.94	0.0917	0.03	Q . . . .
20.09	0.0921	0.03	Q . . . .
20.25	0.0925	0.03	Q . . . .
20.40	0.0928	0.03	Q . . . .
20.55	0.0931	0.03	Q . . . .
20.70	0.0935	0.03	Q . . . .
20.85	0.0938	0.03	Q . . . .
21.01	0.0941	0.02	Q . . . .
21.16	0.0944	0.02	Q . . . .
21.31	0.0947	0.02	Q . . . .
21.46	0.0950	0.02	Q . . . .
21.61	0.0953	0.02	Q . . . .
21.76	0.0956	0.02	Q . . . .
21.92	0.0959	0.02	Q . . . .

22.07	0.0962	0.02	Q	.	.	.	.
22.22	0.0964	0.02	Q	.	.	.	.
22.37	0.0967	0.02	Q	.	.	.	.
22.52	0.0970	0.02	Q	.	.	.	.
22.67	0.0972	0.02	Q	.	.	.	.
22.83	0.0975	0.02	Q	.	.	.	.
22.98	0.0977	0.02	Q	.	.	.	.
23.13	0.0980	0.02	Q	.	.	.	.
23.28	0.0982	0.02	Q	.	.	.	.
23.43	0.0985	0.02	Q	.	.	.	.
23.58	0.0987	0.02	Q	.	.	.	.
23.73	0.0990	0.02	Q	.	.	.	.
23.89	0.0992	0.02	Q	.	.	.	.
24.04	0.0994	0.02	Q	.	.	.	.
24.19	0.0995	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:

(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1446.9
10%	109.2
20%	27.3
30%	18.2
40%	9.1
50%	9.1
60%	9.1
70%	9.1
80%	9.1
90%	9.1

****

NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)

AND LOW LOSS FRACTION ESTIMATIONS

==

Ver. 16.0 Release Date: 04/01/2009 License ID 1312

Analysis prepared by:

George Chan - Westland Group.

****

Problem Descriptions:

Area Average Low Loss Fraction

PRES USA Bldg.

10 Year Frequency Before Development

==

*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)

AND LOW LOSS FRACTION ESTIMATIONS FOR AMC II:

TOTAL 24-HOUR DURATION RAINFALL DEPTH = 3.68 (inches)

SOIL-COVER TYPE	AREA (Acres)	PERCENT OF PERVIOUS AREA	SCS CURVE NUMBER	LOSS RATE Fp(in./hr.)	YIELD
1	0.75	19.95	93.	0.200	0.907

TOTAL AREA (Acres) = 0.75

AREA-AVERAGED LOSS RATE, $\bar{F}m$ (in./hr.) = 0.040

AREA-AVERAGED LOW LOSS FRACTION, $\bar{Y}$ = 0.093

==

Problem Descriptions:

Hydrograph Volume

PRES USA Bldg.

10 Year Frequency Before Development

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 0.75
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.040
LOW LOSS FRACTION = 0.093
TIME OF CONCENTRATION(MIN.) = 8.73
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 10
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.34
30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.72
1-HOUR POINT RAINFALL VALUE(INCHES) = 0.95
3-HOUR POINT RAINFALL VALUE(INCHES) = 1.59
6-HOUR POINT RAINFALL VALUE(INCHES) = 2.20
24-HOUR POINT RAINFALL VALUE(INCHES) = 3.68

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.19
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.04

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.14	0.0002	0.04	Q	.	.	.	.
0.29	0.0006	0.04	Q	.	.	.	.
0.43	0.0011	0.04	Q	.	.	.	.
0.58	0.0015	0.04	Q	.	.	.	.
0.72	0.0019	0.04	Q	.	.	.	.
0.87	0.0023	0.04	Q	.	.	.	.
1.01	0.0028	0.04	Q	.	.	.	.
1.16	0.0032	0.04	Q	.	.	.	.
1.30	0.0037	0.04	Q	.	.	.	.
1.45	0.0041	0.04	Q	.	.	.	.
1.60	0.0045	0.04	Q	.	.	.	.
1.74	0.0050	0.04	Q	.	.	.	.
1.89	0.0054	0.04	Q	.	.	.	.
2.03	0.0059	0.04	Q	.	.	.	.
2.18	0.0064	0.04	Q	.	.	.	.
2.32	0.0068	0.04	Q	.	.	.	.

2.47	0.0073	0.04	Q	.	.	.	.
2.61	0.0077	0.04	Q	.	.	.	.
2.76	0.0082	0.04	Q	.	.	.	.
2.91	0.0087	0.04	Q	.	.	.	.
3.05	0.0092	0.04	Q	.	.	.	.
3.20	0.0096	0.04	Q	.	.	.	.
3.34	0.0101	0.04	Q	.	.	.	.
3.49	0.0106	0.04	Q	.	.	.	.
3.63	0.0111	0.04	Q	.	.	.	.
3.78	0.0116	0.04	Q	.	.	.	.
3.92	0.0121	0.04	Q	.	.	.	.
4.07	0.0126	0.04	Q	.	.	.	.
4.21	0.0131	0.04	Q	.	.	.	.
4.36	0.0136	0.04	Q	.	.	.	.
4.51	0.0141	0.04	Q	.	.	.	.
4.65	0.0146	0.04	Q	.	.	.	.
4.80	0.0151	0.04	Q	.	.	.	.
4.94	0.0157	0.04	Q	.	.	.	.
5.09	0.0162	0.04	Q	.	.	.	.
5.23	0.0167	0.04	Q	.	.	.	.
5.38	0.0173	0.04	Q	.	.	.	.
5.52	0.0178	0.05	Q	.	.	.	.
5.67	0.0184	0.05	Q	.	.	.	.
5.82	0.0189	0.05	Q	.	.	.	.
5.96	0.0195	0.05	Q	.	.	.	.
6.11	0.0200	0.05	Q	.	.	.	.
6.25	0.0206	0.05	Q	.	.	.	.
6.40	0.0212	0.05	Q	.	.	.	.
6.54	0.0218	0.05	Q	.	.	.	.
6.69	0.0223	0.05	Q	.	.	.	.
6.83	0.0229	0.05	Q	.	.	.	.
6.98	0.0235	0.05	Q	.	.	.	.
7.12	0.0241	0.05	Q	.	.	.	.
7.27	0.0247	0.05	Q	.	.	.	.
7.42	0.0253	0.05	Q	.	.	.	.
7.56	0.0260	0.05	Q	.	.	.	.
7.71	0.0266	0.05	Q	.	.	.	.
7.85	0.0272	0.05	Q	.	.	.	.
8.00	0.0279	0.05	Q	.	.	.	.
8.14	0.0285	0.05	Q	.	.	.	.
8.29	0.0292	0.05	Q	.	.	.	.
8.43	0.0298	0.06	Q	.	.	.	.
8.58	0.0305	0.06	Q	.	.	.	.

8.73	0.0312	0.06	Q	.	.	.	.
8.87	0.0319	0.06	Q	.	.	.	.
9.02	0.0326	0.06	Q	.	.	.	.
9.16	0.0333	0.06	Q	.	.	.	.
9.31	0.0340	0.06	Q	.	.	.	.
9.45	0.0347	0.06	Q	.	.	.	.
9.60	0.0354	0.06	Q	.	.	.	.
9.74	0.0362	0.06	Q	.	.	.	.
9.89	0.0369	0.06	Q	.	.	.	.
10.03	0.0377	0.06	Q	.	.	.	.
10.18	0.0385	0.07	Q	.	.	.	.
10.33	0.0393	0.07	Q	.	.	.	.
10.47	0.0401	0.07	Q	.	.	.	.
10.62	0.0409	0.07	Q	.	.	.	.
10.76	0.0417	0.07	Q	.	.	.	.
10.91	0.0426	0.07	Q	.	.	.	.
11.05	0.0434	0.07	Q	.	.	.	.
11.20	0.0443	0.07	Q	.	.	.	.
11.34	0.0452	0.07	Q	.	.	.	.
11.49	0.0461	0.08	Q	.	.	.	.
11.64	0.0470	0.08	Q	.	.	.	.
11.78	0.0480	0.08	Q	.	.	.	.
11.93	0.0489	0.08	Q	.	.	.	.
12.07	0.0500	0.09	Q	.	.	.	.
12.22	0.0511	0.11	Q	.	.	.	.
12.36	0.0524	0.11	Q	.	.	.	.
12.51	0.0538	0.11	Q	.	.	.	.
12.65	0.0551	0.11	Q	.	.	.	.
12.80	0.0565	0.12	Q	.	.	.	.
12.94	0.0579	0.12	Q	.	.	.	.
13.09	0.0594	0.12	Q	.	.	.	.
13.24	0.0609	0.13	Q	.	.	.	.
13.38	0.0624	0.13	Q	.	.	.	.
13.53	0.0640	0.13	Q	.	.	.	.
13.67	0.0656	0.14	Q	.	.	.	.
13.82	0.0673	0.14	Q	.	.	.	.
13.96	0.0690	0.15	Q	.	.	.	.
14.11	0.0708	0.15	Q	.	.	.	.
14.25	0.0727	0.16	Q	.	.	.	.
14.40	0.0746	0.17	Q	.	.	.	.
14.55	0.0766	0.17	Q	.	.	.	.
14.69	0.0788	0.18	Q	.	.	.	.
14.84	0.0810	0.19	Q	.	.	.	.

14.98	0.0834	0.21	Q	.	.	.	.
15.13	0.0860	0.22	Q	.	.	.	.
15.27	0.0888	0.24	Q	.	.	.	.
15.42	0.0918	0.26	.Q	.	.	.	.
15.56	0.0950	0.27	.Q	.	.	.	.
15.71	0.0985	0.31	.Q	.	.	.	.
15.85	0.1031	0.47	.Q	.	.	.	.
16.00	0.1098	0.65	. Q	.	.	.	.
16.15	0.1256	1.97	. Q	.	.	.	.
16.29	0.1396	0.37	.Q	.	.	.	.
16.44	0.1433	0.25	Q	.	.	.	.
16.58	0.1462	0.23	Q	.	.	.	.
16.73	0.1488	0.20	Q	.	.	.	.
16.87	0.1511	0.18	Q	.	.	.	.
17.02	0.1531	0.16	Q	.	.	.	.
17.16	0.1550	0.15	Q	.	.	.	.
17.31	0.1567	0.14	Q	.	.	.	.
17.45	0.1583	0.13	Q	.	.	.	.
17.60	0.1599	0.12	Q	.	.	.	.
17.75	0.1613	0.12	Q	.	.	.	.
17.89	0.1627	0.11	Q	.	.	.	.
18.04	0.1640	0.11	Q	.	.	.	.
18.18	0.1652	0.08	Q	.	.	.	.
18.33	0.1661	0.08	Q	.	.	.	.
18.47	0.1671	0.08	Q	.	.	.	.
18.62	0.1680	0.07	Q	.	.	.	.
18.76	0.1688	0.07	Q	.	.	.	.
18.91	0.1696	0.07	Q	.	.	.	.
19.06	0.1705	0.07	Q	.	.	.	.
19.20	0.1712	0.06	Q	.	.	.	.
19.35	0.1720	0.06	Q	.	.	.	.
19.49	0.1727	0.06	Q	.	.	.	.
19.64	0.1734	0.06	Q	.	.	.	.
19.78	0.1741	0.06	Q	.	.	.	.
19.93	0.1748	0.06	Q	.	.	.	.
20.07	0.1755	0.05	Q	.	.	.	.
20.22	0.1761	0.05	Q	.	.	.	.
20.36	0.1768	0.05	Q	.	.	.	.
20.51	0.1774	0.05	Q	.	.	.	.
20.66	0.1780	0.05	Q	.	.	.	.
20.80	0.1786	0.05	Q	.	.	.	.
20.95	0.1792	0.05	Q	.	.	.	.
21.09	0.1797	0.05	Q	.	.	.	.

21.24	0.1803	0.05	Q	.	.	.	.
21.38	0.1808	0.05	Q	.	.	.	.
21.53	0.1814	0.04	Q	.	.	.	.
21.67	0.1819	0.04	Q	.	.	.	.
21.82	0.1824	0.04	Q	.	.	.	.
21.97	0.1830	0.04	Q	.	.	.	.
22.11	0.1835	0.04	Q	.	.	.	.
22.26	0.1840	0.04	Q	.	.	.	.
22.40	0.1845	0.04	Q	.	.	.	.
22.55	0.1850	0.04	Q	.	.	.	.
22.69	0.1854	0.04	Q	.	.	.	.
22.84	0.1859	0.04	Q	.	.	.	.
22.98	0.1864	0.04	Q	.	.	.	.
23.13	0.1868	0.04	Q	.	.	.	.
23.27	0.1873	0.04	Q	.	.	.	.
23.42	0.1877	0.04	Q	.	.	.	.
23.57	0.1882	0.04	Q	.	.	.	.
23.71	0.1886	0.04	Q	.	.	.	.
23.86	0.1890	0.04	Q	.	.	.	.
24.00	0.1895	0.04	Q	.	.	.	.
24.15	0.1897	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:

(Note: 100% of Peak Flow Rate estimate assumed to have

an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1440.4
10%	113.5
20%	26.2
30%	17.5
40%	8.7
50%	8.7
60%	8.7
70%	8.7
80%	8.7
90%	8.7

****

NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)

AND LOW LOSS FRACTION ESTIMATIONS

==

Ver. 16.0 Release Date: 04/01/2009 License ID 1312

Analysis prepared by:

George Chan - Westland Group

****

Problem Descriptions:

Area Average Low Loss Fraction

PRES USA Bldg

2 Year Frequency After Development Condition

==

*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)

AND LOW LOSS FRACTION ESTIMATIONS FOR AMC II:

TOTAL 24-HOUR DURATION RAINFALL DEPTH = 2.05 (inches)

SOIL-COVER TYPE	AREA (Acres)	PERCENT OF PERVIOUS AREA	SCS CURVE NUMBER	LOSS RATE Fp(in./hr.)	YIELD
1	0.75	15.76	94.	0.200	0.860

TOTAL AREA (Acres) = 0.75

AREA-AVERAGED LOSS RATE, Fm (in./hr.) = 0.032

AREA-AVERAGED LOW LOSS FRACTION, Y = 0.140

==

Problem Descriptions:

Hydrograph Volume

PRES USA Bldg

2 Year Frequency After Development Condition

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 0.75
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.032
LOW LOSS FRACTION = 0.140
TIME OF CONCENTRATION(MIN.) = 8.94
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 2
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.19
30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.40
1-HOUR POINT RAINFALL VALUE(INCHES) = 0.53
3-HOUR POINT RAINFALL VALUE(INCHES) = 0.89
6-HOUR POINT RAINFALL VALUE(INCHES) = 1.22
24-HOUR POINT RAINFALL VALUE(INCHES) = 2.05

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.10
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.03

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.06	0.0000	0.02	Q	.	.	.	.
0.21	0.0003	0.02	Q	.	.	.	.
0.36	0.0005	0.02	Q	.	.	.	.
0.50	0.0007	0.02	Q	.	.	.	.
0.65	0.0010	0.02	Q	.	.	.	.
0.80	0.0012	0.02	Q	.	.	.	.
0.95	0.0014	0.02	Q	.	.	.	.
1.10	0.0017	0.02	Q	.	.	.	.
1.25	0.0019	0.02	Q	.	.	.	.
1.40	0.0022	0.02	Q	.	.	.	.
1.55	0.0024	0.02	Q	.	.	.	.
1.70	0.0026	0.02	Q	.	.	.	.
1.85	0.0029	0.02	Q	.	.	.	.
1.99	0.0031	0.02	Q	.	.	.	.
2.14	0.0034	0.02	Q	.	.	.	.
2.29	0.0036	0.02	Q	.	.	.	.

2.44	0.0039	0.02	Q	.	.	.	.
2.59	0.0041	0.02	Q	.	.	.	.
2.74	0.0044	0.02	Q	.	.	.	.
2.89	0.0047	0.02	Q	.	.	.	.
3.04	0.0049	0.02	Q	.	.	.	.
3.19	0.0052	0.02	Q	.	.	.	.
3.34	0.0054	0.02	Q	.	.	.	.
3.48	0.0057	0.02	Q	.	.	.	.
3.63	0.0060	0.02	Q	.	.	.	.
3.78	0.0062	0.02	Q	.	.	.	.
3.93	0.0065	0.02	Q	.	.	.	.
4.08	0.0068	0.02	Q	.	.	.	.
4.23	0.0071	0.02	Q	.	.	.	.
4.38	0.0073	0.02	Q	.	.	.	.
4.53	0.0076	0.02	Q	.	.	.	.
4.68	0.0079	0.02	Q	.	.	.	.
4.83	0.0082	0.02	Q	.	.	.	.
4.97	0.0085	0.02	Q	.	.	.	.
5.12	0.0088	0.02	Q	.	.	.	.
5.27	0.0091	0.02	Q	.	.	.	.
5.42	0.0093	0.02	Q	.	.	.	.
5.57	0.0096	0.02	Q	.	.	.	.
5.72	0.0099	0.02	Q	.	.	.	.
5.87	0.0102	0.02	Q	.	.	.	.
6.02	0.0105	0.02	Q	.	.	.	.
6.17	0.0109	0.03	Q	.	.	.	.
6.32	0.0112	0.03	Q	.	.	.	.
6.46	0.0115	0.03	Q	.	.	.	.
6.61	0.0118	0.03	Q	.	.	.	.
6.76	0.0121	0.03	Q	.	.	.	.
6.91	0.0124	0.03	Q	.	.	.	.
7.06	0.0128	0.03	Q	.	.	.	.
7.21	0.0131	0.03	Q	.	.	.	.
7.36	0.0134	0.03	Q	.	.	.	.
7.51	0.0138	0.03	Q	.	.	.	.
7.66	0.0141	0.03	Q	.	.	.	.
7.81	0.0144	0.03	Q	.	.	.	.
7.95	0.0148	0.03	Q	.	.	.	.
8.10	0.0151	0.03	Q	.	.	.	.
8.25	0.0155	0.03	Q	.	.	.	.
8.40	0.0159	0.03	Q	.	.	.	.
8.55	0.0162	0.03	Q	.	.	.	.
8.70	0.0166	0.03	Q	.	.	.	.

8.85	0.0170	0.03	Q	.	.	.	.
9.00	0.0173	0.03	Q	.	.	.	.
9.15	0.0177	0.03	Q	.	.	.	.
9.30	0.0181	0.03	Q	.	.	.	.
9.44	0.0185	0.03	Q	.	.	.	.
9.59	0.0189	0.03	Q	.	.	.	.
9.74	0.0193	0.03	Q	.	.	.	.
9.89	0.0197	0.03	Q	.	.	.	.
10.04	0.0201	0.03	Q	.	.	.	.
10.19	0.0206	0.03	Q	.	.	.	.
10.34	0.0210	0.04	Q	.	.	.	.
10.49	0.0214	0.04	Q	.	.	.	.
10.64	0.0219	0.04	Q	.	.	.	.
10.79	0.0223	0.04	Q	.	.	.	.
10.93	0.0228	0.04	Q	.	.	.	.
11.08	0.0233	0.04	Q	.	.	.	.
11.23	0.0237	0.04	Q	.	.	.	.
11.38	0.0242	0.04	Q	.	.	.	.
11.53	0.0247	0.04	Q	.	.	.	.
11.68	0.0252	0.04	Q	.	.	.	.
11.83	0.0257	0.04	Q	.	.	.	.
11.98	0.0263	0.04	Q	.	.	.	.
12.13	0.0268	0.05	Q	.	.	.	.
12.27	0.0275	0.06	Q	.	.	.	.
12.42	0.0281	0.06	Q	.	.	.	.
12.57	0.0288	0.06	Q	.	.	.	.
12.72	0.0296	0.06	Q	.	.	.	.
12.87	0.0303	0.06	Q	.	.	.	.
13.02	0.0310	0.06	Q	.	.	.	.
13.17	0.0318	0.06	Q	.	.	.	.
13.32	0.0326	0.07	Q	.	.	.	.
13.47	0.0334	0.07	Q	.	.	.	.
13.62	0.0343	0.07	Q	.	.	.	.
13.77	0.0351	0.07	Q	.	.	.	.
13.91	0.0360	0.07	Q	.	.	.	.
14.06	0.0370	0.08	Q	.	.	.	.
14.21	0.0380	0.08	Q	.	.	.	.
14.36	0.0390	0.09	Q	.	.	.	.
14.51	0.0401	0.09	Q	.	.	.	.
14.66	0.0413	0.10	Q	.	.	.	.
14.81	0.0425	0.10	Q	.	.	.	.
14.96	0.0438	0.11	Q	.	.	.	.
15.11	0.0452	0.12	Q	.	.	.	.

15.26	0.0467	0.13	Q	.	.	.	.
15.40	0.0483	0.14	Q	.	.	.	.
15.55	0.0501	0.14	Q	.	.	.	.
15.70	0.0519	0.16	Q	.	.	.	.
15.85	0.0545	0.25	Q	.	.	.	.
16.00	0.0581	0.35	.Q	.	.	.	.
16.15	0.0669	1.08	. Q	.	.	.	.
16.30	0.0747	0.20	Q	.	.	.	.
16.45	0.0768	0.13	Q	.	.	.	.
16.60	0.0783	0.12	Q	.	.	.	.
16.75	0.0797	0.10	Q	.	.	.	.
16.89	0.0809	0.09	Q	.	.	.	.
17.04	0.0820	0.09	Q	.	.	.	.
17.19	0.0830	0.08	Q	.	.	.	.
17.34	0.0839	0.07	Q	.	.	.	.
17.49	0.0848	0.07	Q	.	.	.	.
17.64	0.0856	0.06	Q	.	.	.	.
17.79	0.0863	0.06	Q	.	.	.	.
17.94	0.0871	0.06	Q	.	.	.	.
18.09	0.0877	0.05	Q	.	.	.	.
18.23	0.0883	0.04	Q	.	.	.	.
18.38	0.0889	0.04	Q	.	.	.	.
18.53	0.0894	0.04	Q	.	.	.	.
18.68	0.0898	0.04	Q	.	.	.	.
18.83	0.0903	0.04	Q	.	.	.	.
18.98	0.0907	0.04	Q	.	.	.	.
19.13	0.0912	0.03	Q	.	.	.	.
19.28	0.0916	0.03	Q	.	.	.	.
19.43	0.0920	0.03	Q	.	.	.	.
19.58	0.0924	0.03	Q	.	.	.	.
19.73	0.0928	0.03	Q	.	.	.	.
19.87	0.0931	0.03	Q	.	.	.	.
20.02	0.0935	0.03	Q	.	.	.	.
20.17	0.0939	0.03	Q	.	.	.	.
20.32	0.0942	0.03	Q	.	.	.	.
20.47	0.0945	0.03	Q	.	.	.	.
20.62	0.0949	0.03	Q	.	.	.	.
20.77	0.0952	0.03	Q	.	.	.	.
20.92	0.0955	0.03	Q	.	.	.	.
21.07	0.0958	0.03	Q	.	.	.	.
21.22	0.0961	0.02	Q	.	.	.	.
21.36	0.0964	0.02	Q	.	.	.	.
21.51	0.0967	0.02	Q	.	.	.	.

21.66	0.0970	0.02	Q	.	.	.	.
21.81	0.0973	0.02	Q	.	.	.	.
21.96	0.0976	0.02	Q	.	.	.	.
22.11	0.0979	0.02	Q	.	.	.	.
22.26	0.0982	0.02	Q	.	.	.	.
22.41	0.0984	0.02	Q	.	.	.	.
22.56	0.0987	0.02	Q	.	.	.	.
22.70	0.0989	0.02	Q	.	.	.	.
22.85	0.0992	0.02	Q	.	.	.	.
23.00	0.0995	0.02	Q	.	.	.	.
23.15	0.0997	0.02	Q	.	.	.	.
23.30	0.1000	0.02	Q	.	.	.	.
23.45	0.1002	0.02	Q	.	.	.	.
23.60	0.1004	0.02	Q	.	.	.	.
23.75	0.1007	0.02	Q	.	.	.	.
23.90	0.1009	0.02	Q	.	.	.	.
24.05	0.1011	0.02	Q	.	.	.	.
24.19	0.1013	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:

(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1448.3
10%	107.3
20%	26.8
30%	17.9
40%	8.9
50%	8.9
60%	8.9
70%	8.9
80%	8.9
90%	8.9

****

NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)

AND LOW LOSS FRACTION ESTIMATIONS

==

Ver. 16.0 Release Date: 04/01/2009 License ID 1312

****

Problem Descriptions:

Area Average Low Loss Fraction

PRES USA Bldg

10 Year Frequency After Development

==

*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)

AND LOW LOSS FRACTION ESTIMATIONS FOR AMC II:

TOTAL 24-HOUR DURATION RAINFALL DEPTH = 3.68 (inches)

SOIL-COVER TYPE	AREA (Acres)	PERCENT OF PERVIOUS AREA	SCS CURVE NUMBER	LOSS RATE Fp(in./hr.)	YIELD
1	0.75	15.76	94.	0.200	0.918

TOTAL AREA (Acres) = 0.75

AREA-AVERAGED LOSS RATE, $\bar{F}_m$ (in./hr.) = 0.032

AREA-AVERAGED LOW LOSS FRACTION, $\bar{Y}$ = 0.082

==

****

SMALL AREA UNIT HYDROGRAPH MODEL

==

Ver. 16.0 Release Date: 04/01/2009 License ID 1312

****

Problem Descriptions:

Hydrograph Volume

PRES USA Bldg

10 Year After Development

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90

TOTAL CATCHMENT AREA(ACRES) = 0.75

SOIL-LOSS RATE, Fm,(INCH/HR) = 0.032

LOW LOSS FRACTION = 0.082

TIME OF CONCENTRATION(MIN.) = 8.64

SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA

ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED

RETURN FREQUENCY(YEARS) = 10

5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.34

30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.72

1-HOUR POINT RAINFALL VALUE(INCHES) = 0.95

3-HOUR POINT RAINFALL VALUE(INCHES) = 1.59

6-HOUR POINT RAINFALL VALUE(INCHES) = 2.20

24-HOUR POINT RAINFALL VALUE(INCHES) = 3.68

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.19

TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.04

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.02	0.0000	0.00	Q	.	.	.	.
0.16	0.0002	0.04	Q	.	.	.	.
0.30	0.0006	0.04	Q	.	.	.	.
0.45	0.0011	0.04	Q	.	.	.	.
0.59	0.0015	0.04	Q	.	.	.	.
0.74	0.0019	0.04	Q	.	.	.	.
0.88	0.0024	0.04	Q	.	.	.	.
1.02	0.0028	0.04	Q	.	.	.	.

1.17	0.0032	0.04	Q	.	.	.	.
1.31	0.0037	0.04	Q	.	.	.	.
1.46	0.0041	0.04	Q	.	.	.	.
1.60	0.0046	0.04	Q	.	.	.	.
1.74	0.0050	0.04	Q	.	.	.	.
1.89	0.0055	0.04	Q	.	.	.	.
2.03	0.0059	0.04	Q	.	.	.	.
2.18	0.0064	0.04	Q	.	.	.	.
2.32	0.0068	0.04	Q	.	.	.	.
2.46	0.0073	0.04	Q	.	.	.	.
2.61	0.0078	0.04	Q	.	.	.	.
2.75	0.0082	0.04	Q	.	.	.	.
2.90	0.0087	0.04	Q	.	.	.	.
3.04	0.0092	0.04	Q	.	.	.	.
3.18	0.0097	0.04	Q	.	.	.	.
3.33	0.0101	0.04	Q	.	.	.	.
3.47	0.0106	0.04	Q	.	.	.	.
3.62	0.0111	0.04	Q	.	.	.	.
3.76	0.0116	0.04	Q	.	.	.	.
3.90	0.0121	0.04	Q	.	.	.	.
4.05	0.0126	0.04	Q	.	.	.	.
4.19	0.0131	0.04	Q	.	.	.	.
4.34	0.0136	0.04	Q	.	.	.	.
4.48	0.0141	0.04	Q	.	.	.	.
4.62	0.0147	0.04	Q	.	.	.	.
4.77	0.0152	0.04	Q	.	.	.	.
4.91	0.0157	0.04	Q	.	.	.	.
5.06	0.0162	0.04	Q	.	.	.	.
5.20	0.0168	0.05	Q	.	.	.	.
5.34	0.0173	0.05	Q	.	.	.	.
5.49	0.0178	0.05	Q	.	.	.	.
5.63	0.0184	0.05	Q	.	.	.	.
5.78	0.0189	0.05	Q	.	.	.	.
5.92	0.0195	0.05	Q	.	.	.	.
6.06	0.0201	0.05	Q	.	.	.	.
6.21	0.0206	0.05	Q	.	.	.	.
6.35	0.0212	0.05	Q	.	.	.	.
6.50	0.0218	0.05	Q	.	.	.	.
6.64	0.0224	0.05	Q	.	.	.	.
6.78	0.0230	0.05	Q	.	.	.	.
6.93	0.0235	0.05	Q	.	.	.	.
7.07	0.0241	0.05	Q	.	.	.	.
7.22	0.0248	0.05	Q	.	.	.	.

7.36	0.0254	0.05	Q	.	.	.	.
7.50	0.0260	0.05	Q	.	.	.	.
7.65	0.0266	0.05	Q	.	.	.	.
7.79	0.0272	0.05	Q	.	.	.	.
7.94	0.0279	0.05	Q	.	.	.	.
8.08	0.0285	0.05	Q	.	.	.	.
8.22	0.0292	0.06	Q	.	.	.	.
8.37	0.0298	0.06	Q	.	.	.	.
8.51	0.0305	0.06	Q	.	.	.	.
8.66	0.0312	0.06	Q	.	.	.	.
8.80	0.0319	0.06	Q	.	.	.	.
8.94	0.0326	0.06	Q	.	.	.	.
9.09	0.0333	0.06	Q	.	.	.	.
9.23	0.0340	0.06	Q	.	.	.	.
9.38	0.0347	0.06	Q	.	.	.	.
9.52	0.0354	0.06	Q	.	.	.	.
9.66	0.0362	0.06	Q	.	.	.	.
9.81	0.0369	0.06	Q	.	.	.	.
9.95	0.0377	0.06	Q	.	.	.	.
10.10	0.0385	0.07	Q	.	.	.	.
10.24	0.0392	0.07	Q	.	.	.	.
10.38	0.0400	0.07	Q	.	.	.	.
10.53	0.0408	0.07	Q	.	.	.	.
10.67	0.0417	0.07	Q	.	.	.	.
10.82	0.0425	0.07	Q	.	.	.	.
10.96	0.0434	0.07	Q	.	.	.	.
11.10	0.0442	0.07	Q	.	.	.	.
11.25	0.0451	0.08	Q	.	.	.	.
11.39	0.0460	0.08	Q	.	.	.	.
11.54	0.0469	0.08	Q	.	.	.	.
11.68	0.0478	0.08	Q	.	.	.	.
11.82	0.0488	0.08	Q	.	.	.	.
11.97	0.0498	0.08	Q	.	.	.	.
12.11	0.0509	0.10	Q	.	.	.	.
12.26	0.0521	0.11	Q	.	.	.	.
12.40	0.0534	0.11	Q	.	.	.	.
12.54	0.0547	0.11	Q	.	.	.	.
12.69	0.0561	0.12	Q	.	.	.	.
12.83	0.0575	0.12	Q	.	.	.	.
12.98	0.0589	0.12	Q	.	.	.	.
13.12	0.0604	0.12	Q	.	.	.	.
13.26	0.0619	0.13	Q	.	.	.	.
13.41	0.0634	0.13	Q	.	.	.	.

13.55	0.0650	0.14	Q . . . .
13.70	0.0667	0.14	Q . . . .
13.84	0.0683	0.14	Q . . . .
13.98	0.0701	0.15	Q . . . .
14.13	0.0719	0.16	Q . . . .
14.27	0.0738	0.16	Q . . . .
14.42	0.0757	0.17	Q . . . .
14.56	0.0778	0.17	Q . . . .
14.70	0.0800	0.19	Q . . . .
14.85	0.0822	0.19	Q . . . .
14.99	0.0846	0.21	Q . . . .
15.14	0.0872	0.22	Q . . . .
15.28	0.0900	0.25	Q . . . .
15.42	0.0931	0.27	.Q . . . .
15.57	0.0964	0.27	.Q . . . .
15.71	0.0999	0.31	.Q . . . .
15.86	0.1045	0.48	.Q . . . .
16.00	0.1113	0.66	. Q . . . .
16.14	0.1270	1.99	. Q . . . .
16.29	0.1411	0.38	.Q . . . .
16.43	0.1448	0.25	Q . . . .
16.58	0.1477	0.23	Q . . . .
16.72	0.1503	0.20	Q . . . .
16.86	0.1526	0.18	Q . . . .
17.01	0.1547	0.16	Q . . . .
17.15	0.1565	0.15	Q . . . .
17.30	0.1583	0.14	Q . . . .
17.44	0.1599	0.13	Q . . . .
17.58	0.1615	0.13	Q . . . .
17.73	0.1629	0.12	Q . . . .
17.87	0.1643	0.11	Q . . . .
18.02	0.1657	0.11	Q . . . .
18.16	0.1668	0.08	Q . . . .
18.30	0.1678	0.08	Q . . . .
18.45	0.1687	0.08	Q . . . .
18.59	0.1696	0.07	Q . . . .
18.74	0.1705	0.07	Q . . . .
18.88	0.1713	0.07	Q . . . .
19.02	0.1721	0.07	Q . . . .
19.17	0.1729	0.06	Q . . . .
19.31	0.1737	0.06	Q . . . .
19.46	0.1744	0.06	Q . . . .
19.60	0.1751	0.06	Q . . . .

19.74	0.1758	0.06	Q	.	.	.	.
19.89	0.1765	0.06	Q	.	.	.	.
20.03	0.1772	0.06	Q	.	.	.	.
20.18	0.1779	0.05	Q	.	.	.	.
20.32	0.1785	0.05	Q	.	.	.	.
20.46	0.1791	0.05	Q	.	.	.	.
20.61	0.1797	0.05	Q	.	.	.	.
20.75	0.1803	0.05	Q	.	.	.	.
20.90	0.1809	0.05	Q	.	.	.	.
21.04	0.1815	0.05	Q	.	.	.	.
21.18	0.1821	0.05	Q	.	.	.	.
21.33	0.1826	0.05	Q	.	.	.	.
21.47	0.1832	0.05	Q	.	.	.	.
21.62	0.1837	0.04	Q	.	.	.	.
21.76	0.1842	0.04	Q	.	.	.	.
21.90	0.1848	0.04	Q	.	.	.	.
22.05	0.1853	0.04	Q	.	.	.	.
22.19	0.1858	0.04	Q	.	.	.	.
22.34	0.1863	0.04	Q	.	.	.	.
22.48	0.1868	0.04	Q	.	.	.	.
22.62	0.1872	0.04	Q	.	.	.	.
22.77	0.1877	0.04	Q	.	.	.	.
22.91	0.1882	0.04	Q	.	.	.	.
23.06	0.1887	0.04	Q	.	.	.	.
23.20	0.1891	0.04	Q	.	.	.	.
23.34	0.1896	0.04	Q	.	.	.	.
23.49	0.1900	0.04	Q	.	.	.	.
23.63	0.1905	0.04	Q	.	.	.	.
23.78	0.1909	0.04	Q	.	.	.	.
23.92	0.1913	0.04	Q	.	.	.	.
24.06	0.1917	0.04	Q	.	.	.	.
24.21	0.1920	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:

(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1442.9
10%	112.3

20%	25.9
30%	17.3
40%	8.6
50%	8.6
60%	8.6
70%	8.6
80%	8.6
90%	8.6

****

NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)

AND LOW LOSS FRACTION ESTIMATIONS

==

Ver. 16.0 Release Date: 04/01/2009 License ID 1312

****

Problem Descriptions:

Low Loss Fraction

PRES USA Bldg

100 YearFrequency After Development

==

*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)

AND LOW LOSS FRACTION ESTIMATIONS FOR AMC II:

TOTAL 24-HOUR DURATION RAINFALL DEPTH = 5.63 (inches)

SOIL-COVER TYPE	AREA (Acres)	PERCENT OF PERVIOUS AREA	SCS CURVE NUMBER	LOSS RATE Fp(in./hr.)	YIELD
1	0.78	15.76	94.	0.200	0.945

TOTAL AREA (Acres) = 0.78

AREA-AVERAGED LOSS RATE, $\bar{F}m$ (in./hr.) = 0.032

AREA-AVERAGED LOW LOSS FRACTION, $\bar{Y}$ = 0.055

==

Problem Descriptions:

Hydrograph Volume

PRES USA Bldg

100 YearFrequency After Development

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90

TOTAL CATCHMENT AREA(ACRES) = 0.78
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.032
LOW LOSS FRACTION = 0.055
TIME OF CONCENTRATION(MIN.) = 8.42
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 100
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.52
30-MINUTE POINT RAINFALL VALUE(INCHES) = 1.09
1-HOUR POINT RAINFALL VALUE(INCHES) = 1.45
3-HOUR POINT RAINFALL VALUE(INCHES) = 2.43
6-HOUR POINT RAINFALL VALUE(INCHES) = 3.36
24-HOUR POINT RAINFALL VALUE(INCHES) = 5.63

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.31
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.05

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.00	0.0000	0.00	Q	.	.	.	.
0.14	0.0003	0.06	Q	.	.	.	.
0.28	0.0010	0.06	Q	.	.	.	.
0.42	0.0017	0.06	Q	.	.	.	.
0.56	0.0024	0.06	Q	.	.	.	.
0.70	0.0031	0.06	Q	.	.	.	.
0.84	0.0038	0.06	Q	.	.	.	.
0.98	0.0045	0.06	Q	.	.	.	.
1.12	0.0052	0.06	Q	.	.	.	.
1.26	0.0059	0.06	Q	.	.	.	.
1.41	0.0066	0.06	Q	.	.	.	.
1.55	0.0073	0.06	Q	.	.	.	.
1.69	0.0080	0.06	Q	.	.	.	.
1.83	0.0087	0.06	Q	.	.	.	.
1.97	0.0094	0.06	Q	.	.	.	.
2.11	0.0102	0.06	Q	.	.	.	.
2.25	0.0109	0.06	Q	.	.	.	.
2.39	0.0116	0.06	Q	.	.	.	.
2.53	0.0124	0.06	Q	.	.	.	.
2.67	0.0131	0.06	Q	.	.	.	.

2.81	0.0139	0.07	Q	.	.	.	.
2.95	0.0146	0.07	Q	.	.	.	.
3.09	0.0154	0.07	Q	.	.	.	.
3.23	0.0162	0.07	Q	.	.	.	.
3.37	0.0170	0.07	Q	.	.	.	.
3.51	0.0177	0.07	Q	.	.	.	.
3.65	0.0185	0.07	Q	.	.	.	.
3.79	0.0193	0.07	Q	.	.	.	.
3.93	0.0201	0.07	Q	.	.	.	.
4.07	0.0209	0.07	Q	.	.	.	.
4.21	0.0217	0.07	Q	.	.	.	.
4.35	0.0225	0.07	Q	.	.	.	.
4.49	0.0234	0.07	Q	.	.	.	.
4.63	0.0242	0.07	Q	.	.	.	.
4.77	0.0250	0.07	Q	.	.	.	.
4.91	0.0259	0.07	Q	.	.	.	.
5.05	0.0267	0.07	Q	.	.	.	.
5.19	0.0276	0.07	Q	.	.	.	.
5.33	0.0284	0.07	Q	.	.	.	.
5.47	0.0293	0.08	Q	.	.	.	.
5.62	0.0302	0.08	Q	.	.	.	.
5.76	0.0310	0.08	Q	.	.	.	.
5.90	0.0319	0.08	Q	.	.	.	.
6.04	0.0328	0.08	Q	.	.	.	.
6.18	0.0337	0.08	Q	.	.	.	.
6.32	0.0346	0.08	Q	.	.	.	.
6.46	0.0356	0.08	Q	.	.	.	.
6.60	0.0365	0.08	Q	.	.	.	.
6.74	0.0374	0.08	Q	.	.	.	.
6.88	0.0384	0.08	Q	.	.	.	.
7.02	0.0393	0.08	Q	.	.	.	.
7.16	0.0403	0.08	Q	.	.	.	.
7.30	0.0413	0.08	Q	.	.	.	.
7.44	0.0422	0.09	Q	.	.	.	.
7.58	0.0432	0.09	Q	.	.	.	.
7.72	0.0442	0.09	Q	.	.	.	.
7.86	0.0453	0.09	Q	.	.	.	.
8.00	0.0463	0.09	Q	.	.	.	.
8.14	0.0473	0.09	Q	.	.	.	.
8.28	0.0484	0.09	Q	.	.	.	.
8.42	0.0494	0.09	Q	.	.	.	.
8.56	0.0505	0.09	Q	.	.	.	.
8.70	0.0516	0.09	Q	.	.	.	.

8.84	0.0527	0.10	Q	.	.	.	.
8.98	0.0538	0.10	Q	.	.	.	.
9.12	0.0549	0.10	Q	.	.	.	.
9.26	0.0561	0.10	Q	.	.	.	.
9.40	0.0572	0.10	Q	.	.	.	.
9.54	0.0584	0.10	Q	.	.	.	.
9.68	0.0596	0.10	Q	.	.	.	.
9.83	0.0608	0.10	Q	.	.	.	.
9.97	0.0620	0.11	Q	.	.	.	.
10.11	0.0632	0.11	Q	.	.	.	.
10.25	0.0645	0.11	Q	.	.	.	.
10.39	0.0658	0.11	Q	.	.	.	.
10.53	0.0671	0.11	Q	.	.	.	.
10.67	0.0684	0.11	Q	.	.	.	.
10.81	0.0697	0.12	Q	.	.	.	.
10.95	0.0711	0.12	Q	.	.	.	.
11.09	0.0724	0.12	Q	.	.	.	.
11.23	0.0739	0.12	Q	.	.	.	.
11.37	0.0753	0.12	Q	.	.	.	.
11.51	0.0767	0.13	Q	.	.	.	.
11.65	0.0782	0.13	Q	.	.	.	.
11.79	0.0797	0.13	Q	.	.	.	.
11.93	0.0813	0.14	Q	.	.	.	.
12.07	0.0829	0.14	Q	.	.	.	.
12.21	0.0847	0.18	Q	.	.	.	.
12.35	0.0868	0.18	Q	.	.	.	.
12.49	0.0889	0.18	Q	.	.	.	.
12.63	0.0910	0.19	Q	.	.	.	.
12.77	0.0932	0.19	Q	.	.	.	.
12.91	0.0955	0.20	Q	.	.	.	.
13.05	0.0978	0.20	Q	.	.	.	.
13.19	0.1001	0.20	Q	.	.	.	.
13.33	0.1025	0.21	Q	.	.	.	.
13.47	0.1050	0.22	Q	.	.	.	.
13.61	0.1076	0.22	Q	.	.	.	.
13.75	0.1102	0.23	Q	.	.	.	.
13.90	0.1129	0.24	Q	.	.	.	.
14.04	0.1157	0.25	Q	.	.	.	.
14.18	0.1187	0.26	.Q	.	.	.	.
14.32	0.1217	0.27	.Q	.	.	.	.
14.46	0.1249	0.28	.Q	.	.	.	.
14.60	0.1282	0.29	.Q	.	.	.	.
14.74	0.1317	0.31	.Q	.	.	.	.

14.88	0.1354	0.32	.Q	.	.	.	.
15.02	0.1393	0.35	.Q	.	.	.	.
15.16	0.1435	0.37	.Q	.	.	.	.
15.30	0.1480	0.41	.Q	.	.	.	.
15.44	0.1529	0.44	.Q	.	.	.	.
15.58	0.1582	0.47	.Q	.	.	.	.
15.72	0.1640	0.53	. Q	.	.	.	.
15.86	0.1715	0.76	. Q	.	.	.	.
16.00	0.1820	1.05	. Q	.	.	.	.
16.14	0.2067	3.21	.	. Q	.	.	.
16.28	0.2289	0.62	. Q	.	.	.	.
16.42	0.2349	0.42	.Q	.	.	.	.
16.56	0.2396	0.39	.Q	.	.	.	.
16.70	0.2438	0.34	.Q	.	.	.	.
16.84	0.2475	0.30	.Q	.	.	.	.
16.98	0.2509	0.27	.Q	.	.	.	.
17.12	0.2539	0.25	.Q	.	.	.	.
17.26	0.2567	0.23	Q	.	.	.	.
17.40	0.2594	0.22	Q	.	.	.	.
17.54	0.2618	0.21	Q	.	.	.	.
17.68	0.2642	0.20	Q	.	.	.	.
17.82	0.2664	0.19	Q	.	.	.	.
17.96	0.2686	0.18	Q	.	.	.	.
18.11	0.2706	0.17	Q	.	.	.	.
18.25	0.2723	0.13	Q	.	.	.	.
18.39	0.2739	0.13	Q	.	.	.	.
18.53	0.2753	0.12	Q	.	.	.	.
18.67	0.2767	0.12	Q	.	.	.	.
18.81	0.2781	0.12	Q	.	.	.	.
18.95	0.2794	0.11	Q	.	.	.	.
19.09	0.2807	0.11	Q	.	.	.	.
19.23	0.2819	0.11	Q	.	.	.	.
19.37	0.2831	0.10	Q	.	.	.	.
19.51	0.2843	0.10	Q	.	.	.	.
19.65	0.2854	0.10	Q	.	.	.	.
19.79	0.2865	0.09	Q	.	.	.	.
19.93	0.2876	0.09	Q	.	.	.	.
20.07	0.2887	0.09	Q	.	.	.	.
20.21	0.2897	0.09	Q	.	.	.	.
20.35	0.2907	0.09	Q	.	.	.	.
20.49	0.2917	0.08	Q	.	.	.	.
20.63	0.2927	0.08	Q	.	.	.	.
20.77	0.2937	0.08	Q	.	.	.	.

20.91	0.2946	0.08	Q	.	.	.	.
21.05	0.2955	0.08	Q	.	.	.	.
21.19	0.2964	0.08	Q	.	.	.	.
21.33	0.2973	0.08	Q	.	.	.	.
21.47	0.2982	0.07	Q	.	.	.	.
21.61	0.2990	0.07	Q	.	.	.	.
21.75	0.2999	0.07	Q	.	.	.	.
21.89	0.3007	0.07	Q	.	.	.	.
22.03	0.3015	0.07	Q	.	.	.	.
22.17	0.3024	0.07	Q	.	.	.	.
22.32	0.3032	0.07	Q	.	.	.	.
22.46	0.3039	0.07	Q	.	.	.	.
22.60	0.3047	0.07	Q	.	.	.	.
22.74	0.3055	0.07	Q	.	.	.	.
22.88	0.3062	0.06	Q	.	.	.	.
23.02	0.3070	0.06	Q	.	.	.	.
23.16	0.3077	0.06	Q	.	.	.	.
23.30	0.3084	0.06	Q	.	.	.	.
23.44	0.3091	0.06	Q	.	.	.	.
23.58	0.3099	0.06	Q	.	.	.	.
23.72	0.3106	0.06	Q	.	.	.	.
23.86	0.3112	0.06	Q	.	.	.	.
24.00	0.3119	0.06	Q	.	.	.	.
24.14	0.3126	0.06	Q	.	.	.	.
24.28	0.3129	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:

(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1448.2
10%	117.9
20%	25.3
30%	16.8
40%	8.4
50%	8.4
60%	8.4
70%	8.4
80%	8.4
90%	8.4

PEAK FLOW MITIGATION VOLUME CALCULATION

Hydrograph Storage Volume For Peak Flow Mitigation

Time (hours)	Q (cfs)	Volume (AC Ft.)		Q cutoff (cfs)	Volume (AC Ft.)		
15.30	0.41						
15.44	0.44	0.0049			0.0049		
15.58	0.47	0.0053			0.0053		
15.72	0.53	0.0058			0.0058		
15.86	0.76	0.0075			0.0075		
16.00	1.05	0.0105			0.0105		0.0105
16.13	3.18	0.0229			0.0229	This is the flow	0.0229
16.14	3.32	0.0024	*		0.0024	volume between	0.0024
16.15	3.18	0.0019			0.0019	16.09 and 16.23	0.0019
16.26	1.05	0.0194			0.0194		0.0194
16.28	0.62	0.0209			0.0209		
16.42	0.42	0.0060			0.0060		
16.56	0.39	0.0047					
16.70	0.34	0.0042					
16.84	0.30	0.0037					
		0.1200			0.1074		0.0571

* Adjust peak flow to match Q100 from rational

After development, Q100 Peak = 3.32 CFS
Before development, Q100 Peak = 3.18CFS
Volume below the 3.18 CFS = 0.0042 AC Ft

Volume to mitigate = 0.0002 AC Ft
or 8 CU. Ft

Using the minimum size Cultec Model PAC 150, Storage Available = 24.91 CF

Hence, the Q100 peak is reduced to below before development levels as only 8 CF of storage is required to mitigate the Q100 peak to predevelopment level and the minimum storage provided is 24.91 CF and exceeds 8 CF

Using a single Cultec Model Pac 150, it can be readily established that the peak Q10 and Q2 will be similarly mitigated to less than predevelopment levels.

TREATMENT BMP FLOW CALCULATIONS

TREATMENT BMP CALCULATIONS

PROJECT: PRES-USA BUILDING, NEWPORT BEACH, CA

DATE: 7/13/2010

THE AREA FROM THE PROPOSED ROOF-TOP =	6,526	SF	OR	0.150	ACRES
% PERVIOUS = 0 C VALUE =	0.9				
STORMWATER QUALITY DESIGN FLOW = 0.2 x A x C =	0.027	CFS			
THE AREA FROM THE PROPOSED SITE AREA =	3,868	SF	OR	0.089	ACRES
% PERVIOUS = 38 C VALUE =	0.43				
STORMWATER QUALITY DESIGN FLOW = 0.2 x A x C =	0.008	CFS			

The pollutants of concern for the site:

Bacteria & Viruses
Heavy Metals
Pesticides
Organic Compounds
Sediment

TREATMENT BMP SIZING CALCULATIONS AND DETAILS

July 15, 2010

George Chan
Westland Group
11118 Elm Avenue
Rancho Cucamonga, CA 91730

System Sizing and Preliminary Plan Review of Filterra®
PRES-USA Building – Newport Beach, CA

Thank you for submitting water quality information for the PRES-USA Building project in Newport Beach, California. Filterra bioretention systems have been proposed to provide water quality for this site.

The PRES-USA Building project is an appropriate application for the Filterra bioretention system. The Filterra was developed to serve the ultra-urban environment, providing high removal efficiencies for pollutants including sediment, oil and grease, heavy metals, phosphorus, and nitrogen.

The Filterra bioretention system has been approved by some of the most restrictive water quality control agencies in the United States. The City of Newport Beach, California is among the approving agencies. In Newport Beach, the Filterra is approved at the standard treatment rate of 100 inches per hour.

The current hydrology plan shows two Filterra units serving this site. Preliminary review of the two applications is addressed below:

Rooftop Treatment (At Northeast Side of Building)

According to SUSUMP/DAMP guidelines, this 0.15-acre drainage area has a water quality flow rate of 0.027 cfs. This assumes a runoff coefficient of 0.9 and a rainfall intensity of 0.2 inches per hour. A 6.5'x4' Filterra Roofdrain unit will meet this treatment requirement. Please note that the outside dimensions of this unit are approximately 7.5'x5'.

A peak flow (Q_{100}) of 0.750 cfs was provided by the engineer. The 6.5'x4' Filterra Roofdrain unit plumbed with 6" diameter internal piping can accommodate up to 1.15 cfs in bypass.

The inlet and outlet pipe will connect to the Filterra Roofdrain unit at couplings embedded in the vault wall during fabrication. Thus, inlet and outlet piping must approach the unit perpendicular to the wall. The invert elevation of the inlet must be 16" below the elevation of the surface of the top slab and the invert elevation of the outlet must be 4'-1" below the elevation of the surface of the top slab as shown in the attached detail drawing.

The Filterra Roofdrain system should be free-draining, even when the detention system shown downstream is full. The Filterra Roofdrain top slab is not designed for a traffic load. Emergency bypass relief should also be provided at the rooftop downspout.

Parking Lot Treatment (Near Southwest Corner of Building)

According to SUSUMP/DAMP guidelines, this 0.09-acre drainage area has a water quality flow rate of 0.016 cfs. This assumes a runoff coefficient of 0.9 and a rainfall intensity of 0.2 inches per hour. A 6.5'x4' Filterra Sump unit will meet this treatment requirement. Please note that the outside dimensions of this unit are approximately 7.5'x5'.

A peak flow (Q_{100}) of 0.430 cfs was provided by the engineer. The 6.5'x4' Filterra Sump unit is designed to bypass peak flow internally. The Filterra Sump unit with a 24" curb opening inlet can accommodate up to 2.00 cfs in bypass.

The outlet pipe for this type of Filterra unit does not have to approach the unit perpendicular to the vault wall. Up to 45 degrees of deflection can often be accommodated. The invert elevation of the outlet must be 4'-0" below the elevation of the surface of the top slab as shown in the attached detail drawing.

The Filterra Sump system should be free-draining. The Filterra Roofdrain top slab is not designed for a traffic load.

Conclusion

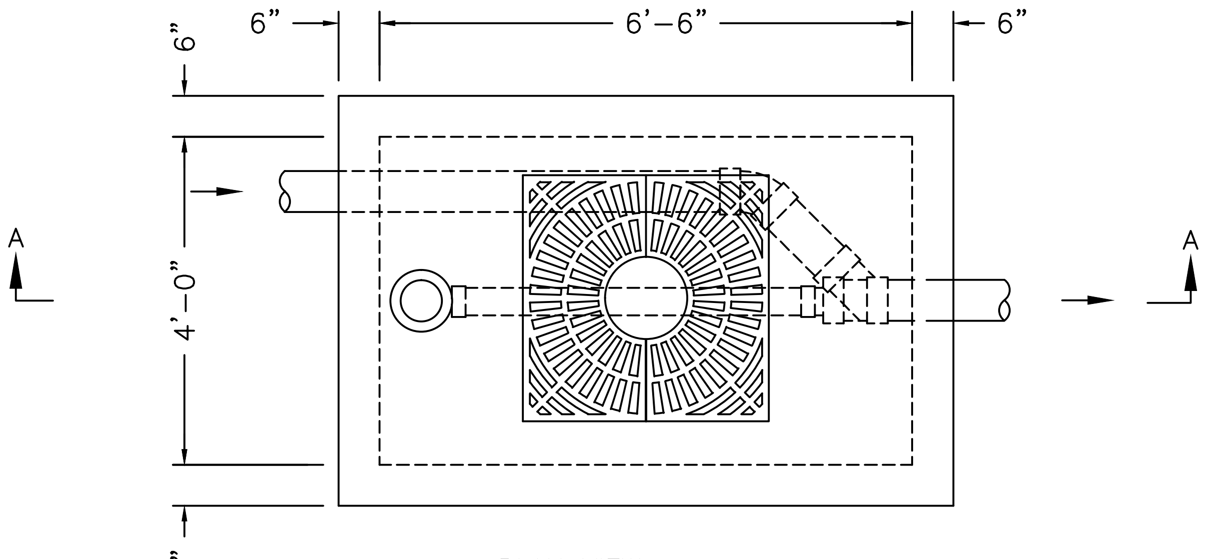
The preliminary plan review concluded that one 6.5'x4' Filterra Roofdrain unit and one 6.5'x4' Filterra Sump unit would meet the local regulatory requirements for stormwater quality, treatment capacity, and high flow bypass for the PRES-USA project.

Operational consistency of the Filterra units is contingent upon the systems being installed correctly and according to the plans, as well as regular maintenance being performed. Installation Help documents will be forwarded to the Buyer at time of order. The Filterra Installation, Operation and Maintenance Manual will be made available upon request.

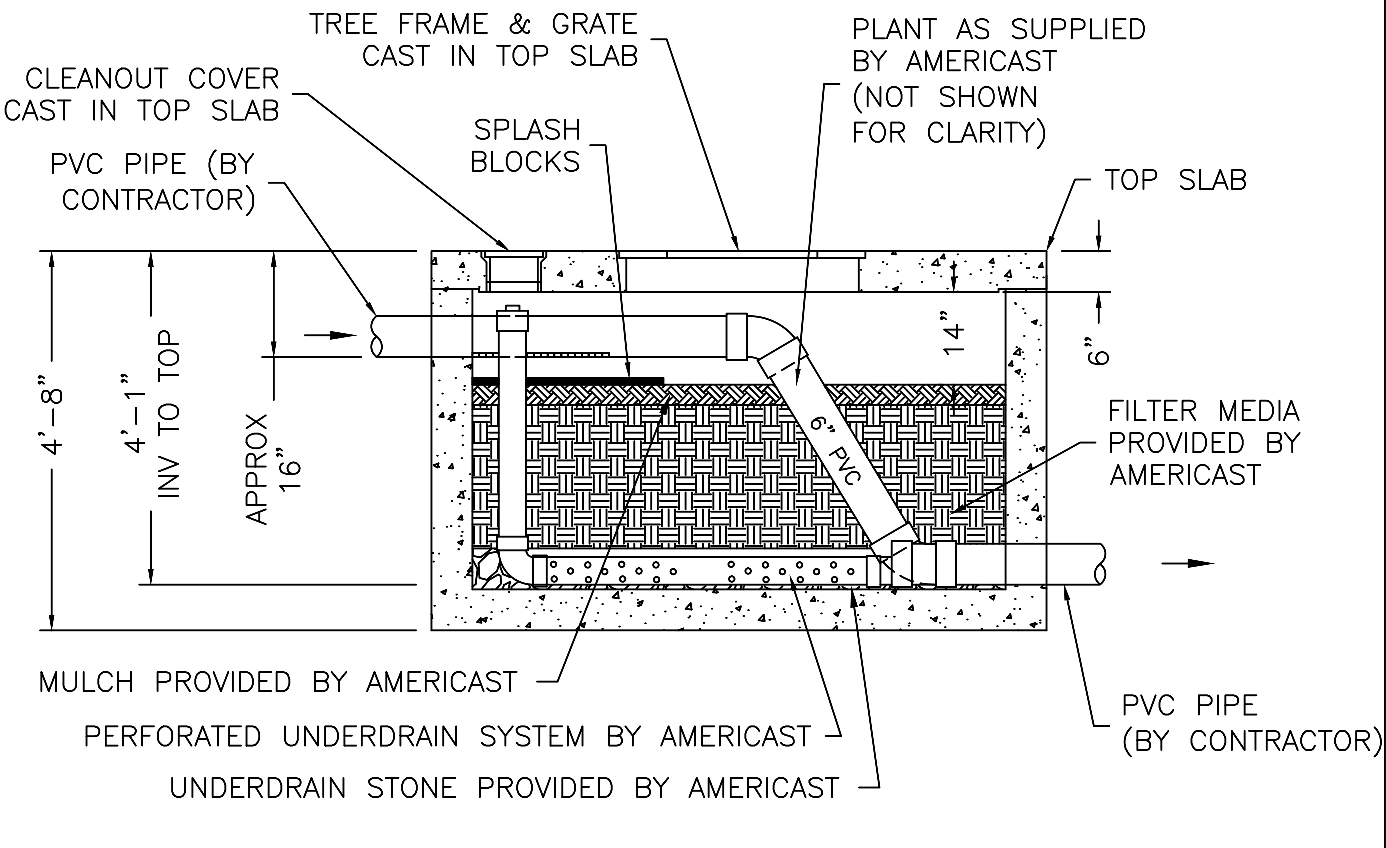
Please contact me if you have any questions with regard to this information. Thank you.

Sincerely,

Jay Holtz, PE
Filterra Bioretention Systems
503-367-9764



PLAN VIEW

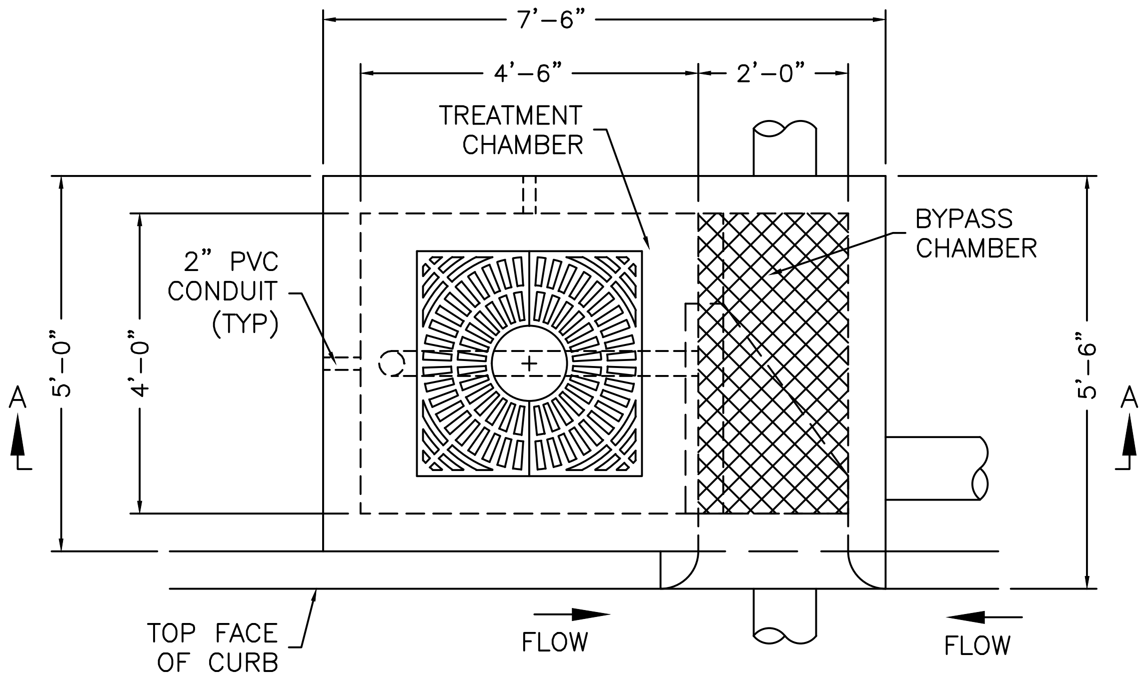


SECTION A–A

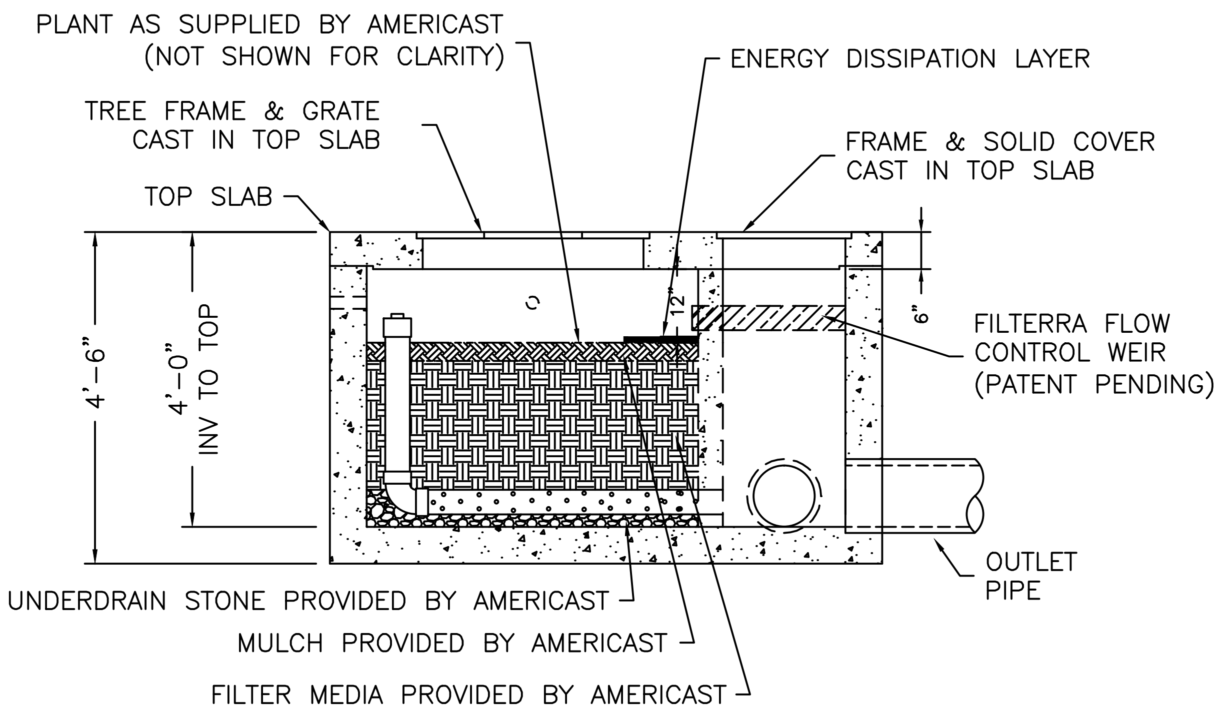
MODIFICATIONS OF DRAWINGS ARE ONLY PERMITTED
BY WRITTEN AUTHORIZATION FROM FILTERRA

DRAWING AVAILABLE IN TIF FILE FORMAT.

AMERICAST®	DATE: 07–15–10	DWG: 6.5x4 ROOF
	6.5'x4' PRECAST FILTERRA® ROOF DRAIN CONFIGURATION WITH 6" PVC PIPED IN	filterra® US PAT 6,277,274 AND 6,569,321



PLAN VIEW



SECTION A–A

AMERICAST®

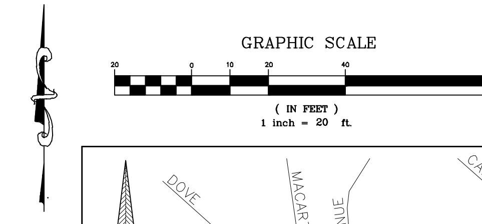
DATE: 07–16–10 DWG: FTSUMP654–CI

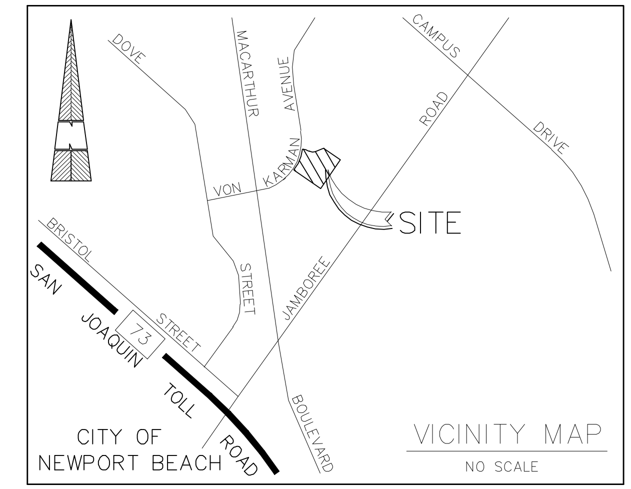
6.5'x4' PRECAST FILTERRA SUMP UNIT CURB INLET

filterra®

US PAT 6,277,274 AND 6,569,321

REVISED SITE BMP MAP





ROUTINE NON-STRUCTIONRUAL BMP'S

- N1 EDUCATION FOR PROPERTY OWNERS, TENANTS, OCCUPANTS
- N2 ACTIVITY RESTRICTIONS
- N3 COMMON AREA LANDSCAPE MANAGEMENT
- N4 BMP MAINTENANCE
- N5 TITLE 22 CCR COMPLIANCE (HOW DEVELOPMENT WILL COMPLY)
- N7 SPILL CONTINGENCY PLAN
- N9 HAZARDOUS MATERIALS DISCLOSURE COMPLIANCE
- N10 UNIFORM FIRE CODE IMPLEMENTATION
- N11 COMMON AREA LITTER CONTROL
- N12 EMPLOYEE TRAINING
- N14 COMMON AREA CATCH BASIN INSPECTION
- N15 STREET SWEEPING PRIVATE STREETS AND PARKING LOTS

ROUTINE STRUCTIONRUAL BMP'S

- S1 PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE
- S3 DESIGN AND CONSTRUCT TRASH AND WASTE STORAGE AREAS TO REDUCE POLLUTION INTRODUCTION
- S4 USE EFFICIENT IRRIGATION SYSTEMS AND LANDSCAPE DESIGN, WATER CONSERVATION, SMART CONTROLLERS, AND SOURCE CONTROL

SITE DESIGN BMP'S

- SD2 MINIMIZE DIRECTLY CONNECTED IMPERVIOUS AREAS (DCIAS) (C–FACTOR REDUCTION)

TREATMENT CONTROL BMP'S

- T9 POROUS LANDSCAPE DETENTION – BIORETENTION CELL/PROPRIETARY PRODUCT: FILTERRA ROOFDRAIN SYSTEM FILTERRA BIORETENTION SYSTEM. SEE DETAIL 3 ON SHEET 2. FILTERRA CATCH BASIN, SEE DETAIL 4 ON SHEET 2

REGISTERED PROFESSIONAL ENGINEER
GEORGE K. CHAN
C-21520
Exp. 9-30-11
CIVIL
STATE OF CALIFORNIA

DESCRIPTION	DATE	NO.
REVISIONS		

PLAN PREPARED BY: WestLAND Group, Inc.
Land Surveyors • Civil Engineers • GIS
11118 ELM AVE
RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660

GEORGE K. CHAN, RCE 21520
RCE 21520
EXP. 9-30-11

DESIGNED BY GKC	CHECKED BY GKC	SCALE	FILE NO.
DRAWN BY AL	DATE 07/16/2010	1"=20'-0"	P10103

BMP MAP

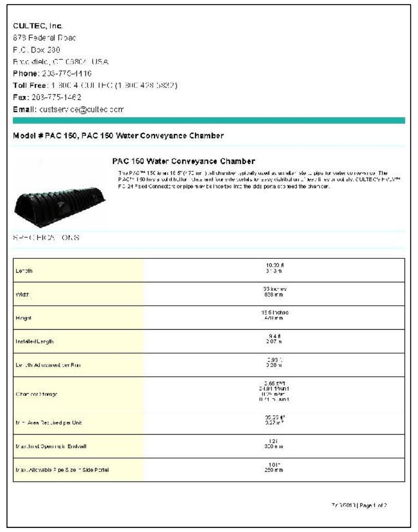
(REVISED 7/16/2010)

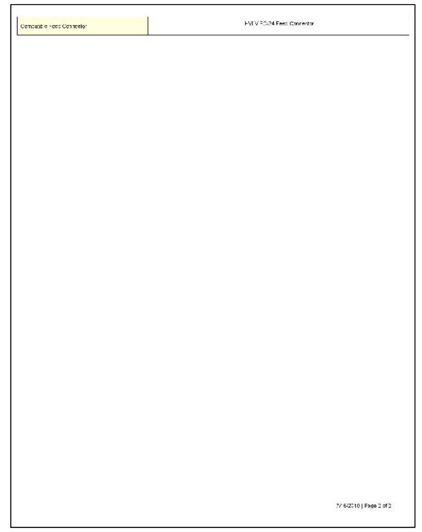
4300 VON KARMAN AVENUE
NEWPORT BEACH, CALIFORNIA

DWG. NAME **P10103 BMP**
PROJECT NO. **P10103**
DWG. NO. **1 OF 2**

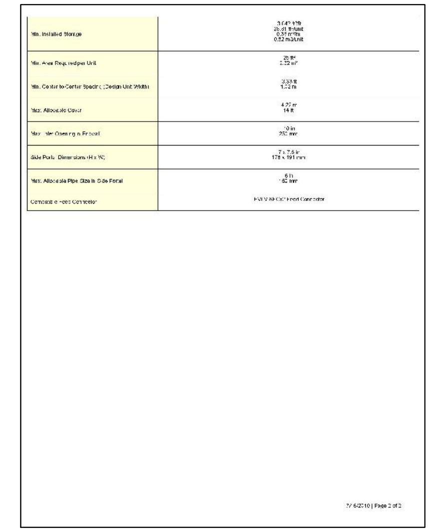
K:\PROJECTS\YEAR2010\P10103\GRADING\P10103 BMP MAP1.DWG

DATE ISSUED: 07/16/2010

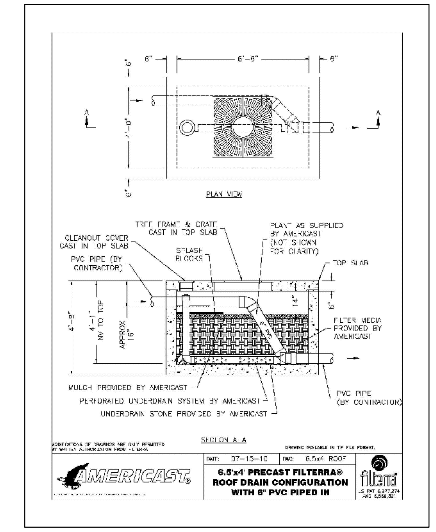




DETAIL 1
CULTEC PAC 150 DETAIL
NOT TO SCALE



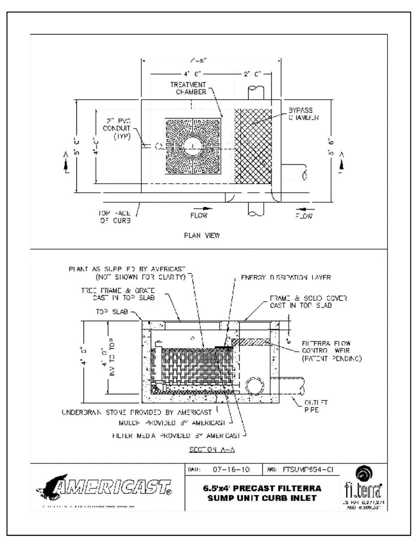
DETAIL 2
CULTEC HD 100 DETAIL
NOT TO SCALE



(FOR MAINTENANCE & PURCHASE INFO, VISIT WWW.FILTERRA.COM OR CALL (877)345-1450)

FILTERRA ROOF DRAIN

SCALE: NONE



DETAIL 4
FILTERRA SUMP UNIT CURB INLET
NOT TO SCALE

DESCRIPTION	DATE	NO.
REVISIONS		

PLAN PREPARED BY: WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
11118 ELM AVENUE
RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660

GEORGE K. CHAN, RCE 21520 RCE 21520 EXP. 9-30-11

DESIGNED BY GKC CHECKED BY GKC
DRAWN BY AL DATE 07/16/2010
SCALE AS SHOWN
FILE NO. P10103

BMP MAP DETAILS
4300 VON KARMAN AVENUE
NEWPORT BEACH, CALIFORNIA

DWG. NAME P10103BMP
PROJECT NO. P10103
DWG. NO. 2 OF 2
DATE ISSUED: 07/16/2010

CONCLUSIONS

1. From the Summary of Hydrologic Analyses tabulation above, it can be readily calculated that the 2 year post development TC (time of concentration) has been shortened by 1.76% (0.16/9.1 x 100% = 1.76%) and the 10 year post development TC (time of concentration) has been shortened by 1.03% (0.09/8.73 x 100% = 1.03%). Per Section 2.2.4.1 (Page 2-7) of Technical Guidance Document (TEG) for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plan (WQMP) dated May 24, 2010, HCOC will exist if the TC of post-development runoff for the 2 year 24 hour storm event is less than the TC of the pre-development condition by more than 5%. Since the 1.76% is less than the 5% threshold, no HCOC will occur as a result of this development. Similarly, the storm volume difference for the before and after development for 2 year and 10 year frequencies are less than 2% (less than the 5% allowable threshold)

2. From the Summary of Hydrologic Analyses tabulation above, it can be observed that the after development peak flows are nearly identical to pre-development levels. However, a "minimum" size Cultec stormwater underground chamber is added and the peak flows are considerably lessened for all storm frequencies. Not including in the calculations are the potential stormwater storage within the soil media and evapotranspiration potential of the proposed Filterra units.

3. The site infiltration feasibility screening is currently being conducted by a geotechnical consultant. Should site infiltration be allowed without adverse effects, the Client may elect to add an infiltration element below the Cultec stormwater chamber to augment the effects of stormwater peak flow and volume mitigation.

4. The use of porous pavement as first suggested may not be feasible pending on the outcome of the geotechnical feasibility screening. However, this report has proved that the site water quality and quantity compliance can be achieved without the reliance on site infiltration BMPs.

Appendix I

Biological Memorandum II

Biological Memorandum II

Date:	August 13, 2010
To:	Nicole Williams, Project Manager
From:	Kurt F. Campbell, Senior Biologist
Subject:	**Updated Evaluation of Potential Effects on Biological Resources Conducted for the PRES Office Building B General Plan and Planned Community Text Amendments**

This memorandum was prepared by ICF International (ICF) to supplement the June 28, 2010 Evaluation of Potential Effects on Biological Resources Conducted for the PRES Office Building B General Plan and Planned Community Text Amendments (Appendix G of the Final IS/MND). The project site and surroundings for the proposed project were previously evaluated by an ICF biologist, and comments have been received requesting additional consideration of potential impacts to biological resources including letters on June 7, 2010 and August 5, 2010 from Palmieri, Tyler, Weiner, Wilhelm, and Waldron, LLP. To address these comments an updated evaluation of such impacts was conducted. Specifically, the August 5, 2010 comment letter raised three biological resource issues (pp. 11-13): (1) the ICF survey was not conducted at appropriate times, (2) omission of the study of other special-status species, and (3) foraging and flight path. This updated evaluation consisted of a review of relevant biological literature, data sources, and project-specific information, an evaluation of conditions and resources at and adjacent to the proposed project site, and an analysis of this resulting information in the context of the California Environmental Quality Act (CEQA). This memorandum summarizes methods, results, and findings for the additional evaluation.

The project site consists of a single area that is approximately 0.15 acres. The proposed project consists of constructing a three-level, 11,960-square-foot, single-tenant office building at 4300 Von Karman Avenue in the Koll Center Newport Planned Community, within the City of Newport Beach, Orange County, California. This is within the area of the Tustin, California, 7.5-minute U.S. Geological Survey topographic quadrangle map (Tustin 1981; 10-foot contour intervals).

Literature Review

A comprehensive review of potentially relevant species, natural communities, and biological functions was conducted as follows. Searches of the current California Natural Diversity Database (CNDDB 2010) and California Native Plant Society online inventory (CNPS 2010) were completed to compile an initial list of wildlife, plants, and natural communities for review. The CNDDB search provided data results for eight USGS quadrangles centered on the Tustin, California quadrangle, or approximately 500 square miles surrounding the project site. These searches replace the earlier check of the CNDDB and cover a larger and more relevant geographical area than included in Appendix G. Based on the biologists' extensive knowledge of the region and checks of relevant literature (e.g., California Consortium of Herbaria 2010, CDFG 2008, Hamilton and Willick 1996, Lemm 2006, Roberts 2008, Shuford and Gardali 2008), other species and/or natural communities not in the CNDDB list were then added. This step is often necessary to ensure inclusion of poorly-reported or overlooked species, such as those for which special status is relatively recent or local. The resulting list of special-status species and natural communities is provided in **Table 1** at the end of this letter. Finally, the context of the project site was examined at coarse scales using Google Earth (2010) online remote imagery, the relevant USGS 7.5-minute topographic quadrangle (cited above), and the current Thomas Brothers map book for Orange County (Rand McNally 2009). See the discussion below for application of this information in the evaluation.

Field Visit

A field visit was conducted by Kurt F. Campbell (credentials attached to this letter) on August 12, 2010. The project site was visited from 3:32 p.m. to 4:28 p.m. and the surrounding areas before and after that, for a total time of three hours. Initial conditions were 81˚F, 46% relative humidity, wind 0 to 4 miles per hour from south to east, 0% cloud cover, and good visibility. Upland ground surfaces were dry, there was no fog or precipitation during the visit, and end conditions were similar. The entire project site was surveyed on foot. Adjacent areas were also examined on foot to a distance of no less than 250 meters (about 820 feet), with no constraints encountered to visiting any relevant areas. The site location and boundaries were confirmed with map and project information provided before the visit by ICF staff and through follow-up discussion with staff after the visit. The project site consists of approximately 0.15 acres and is comprised of a paved parking lot and a smaller area of planted and maintained turf grass lawn and ornamental plantings, primarily American Sweet Gum (*Liquidambar styraciflua*) and Australian gum trees (*Eucalyptus* spp.).

Areas adjacent to the project site consist of paved parking lots and parking structures, office buildings, additional ornamental plantings, paved roadways, a retention basin holding water at the time of the visit, temporary supply storage areas, fast food restaurants, and a small reflecting pool. No fallow, weedy, or remnant natural areas are present. Associated with the areas of standing water are Fragrant Waterlily (*Nymphaea odorata*), ornamental umbrella sedge (*Cyperus* sp.) and broad-leaved cat-tail (*Typha latifolia*). Ornamental plants in the area are varied and include American Sycamore (*Platanus occidentalis*), Black Locust (*Robinia pseudoacacia*), a cultivar of African fountain grass (*Pennisetum setaceum*), pampas grass (*Cortaderia selloana*) Natal plum (*Anechites nerium*), and Paper Flower (*Bougainvillea glabra × B. spectabilis*). Nearly all vegetation present is obviously planted and maintained; some species are also considered invasive weeds when in natural areas (Cal-IPC 2006, 2007). Exceptions to intentional presence include a few small weeds such as Spotted Sandmat (*Chamaesyce maculata*); the pampas grass may also be present as a weed as it is known to be highly invasive and was not obviously planted based on the presence of a few, isolated individuals. All non-ornamental plants and wildlife detected on the site or buffer area during either field visit are listed in **Table 2**.

The plant community classification system followed is the Orange County Habitat Classification System (OCHCS) (1992). At both coarse and fine scales (i.e., down to a few square feet), no area of the project site supports natural communities or fallow areas that are either barren (e.g., bare dirt or rock) or dominated by volunteer, ruderal (disturbance-adapted) plants. The only portion of adjacent areas with fallow land or natural vegetation is a small extent of the retention basin dominated primarily by Broad-leaved Cattail (*Typha latifolia*). See Appendix G for figures depicting

(1) parks and ornamental plantings (OCHCS code 15.5) and urban (OCHCS code 15.1), and (2) representative photographs of the site and adjacent areas. The project site itself contains 0.05 acres of parks and ornamental plantings and 0.10 acres of urban lands, totaling about 0.15 acres.

The project site and adjacent areas are embedded within a long-standing urban area. The nearest open space is a regularly plowed, weedy field providing some level of open-space buffer for San Joaquin Marsh, a restored system of wetlands maintained by the Irvine Regional Water District on the far side of the fields. The space between the proposed site and the weedy field is roughly 275 meters (900 feet) to the southeast of the site across heavily-trafficked Jamboree Road, an active commercial strip, and paved parking lots. John Wayne Airport lies to the northwest several times as far away as the field, across high-density urban development. The airport has no fallow areas or natural communities, the closest facsimile being heavily maintained, very short-cut grassy or weedy areas among paved runways.

Evaluation and Conclusions

Special-status legal and regulatory categories vary in the degree to which they correlate with biological endangerment. Due to specific definitions and criteria, all species with the following types of special status were assumed to qualify as biologically rare, threatened or endangered under CEQA: (1) endangered, threatened, proposed endangered or threatened, or candidate under the federal or state Endangered Species Acts; (2) rare under the state Native Plant Protection Act; (3) state fully protected species and state species of special concern; and (4) on CNPS lists 1A, 1B, or 2.

As a next step in the evaluation process, information on species in the list which *lack* any of the above types of status were analyzed with respect to whether the site has reasonable potential to be regionally important. Regional importance refers to situations where loss of even a small, isolated population or substantial portion thereof would be a potentially significant effect under CEQA because, for example, the population is an important outlier or connector geographically or available data suggests it is biologically unique. Species which lack the above types of special status and for which there is also no evidence of potential for regionally significant effects from the proposed project were then dropped from further review.

Communities and special-status species remaining under review at this step were then evaluated for any reasonable potential to occur either within the project site or within a surrounding buffer of 250 meters (about 820 feet). For those with such potential, the evaluation then addressed whether there is any reasonable potential for the proposed project to have direct, indirect, or cumulative effects to those species or communities.

Finally, the project site and surroundings were evaluated with regard to any special biological functions they may provide, such as buffering an adjacent natural area or being part of an important movement corridor or habitat linkage.

As indicated under Literature Review, above, information used in the multi-step analysis was developed through a broad review of published and unpublished resources. This addressed relevant species' habitat requirements, current and historic distribution, population trajectories, relevant conservation issues, and both tolerances to and requirements for disturbance. Also incorporated was information provided by other biologists over time and developed through experience and knowledge of the biologist across several decades in the region. For evaluation of project effects the specific project design, existing project site, and site context at multiple scales were all considered. At all times, caution was applied where particular uncertainty of information was relevant.

Timing of Field Surveys

It is generally both unnecessary and infeasible to conduct daily biological fieldwork for project evaluation under CEQA for entire seasons or years. This is because conclusions are not only based on direct observation. The purpose of general biological fieldwork for CEQA is to gather sufficient information about the site for relevant judgments; direct observation or confirmation of absence for most potentially relevant species and issues is unnecessary. Multiple visits are normally unnecessary except where potential for a particular, focused issue is known or uncovered by the initial work and the particular issue must be addressed using special methods (e.g., wetland delineation or a multi-visit, protocol survey for a particular species). For example, determining the presence and condition of a particular natural community on or near a site may immediately clarify potential for an array of species dependent on that community. The current biological evaluation was competently conducted, complete, soundly-based, and found neither a need for further fieldwork nor any basis for a fair argument of a potentially significant impact to biological resources under CEQA.

Special Status Species

The omission of the study of other special-status species from Appendix G is in principle correct; the additional species mentioned in Exhibit A of the August 5, 2010 letter (letter from Mr. Paul Lehman) should have received explicit review previously. The commenter states that potential impacts must be disclosed. This has been done, however, where there are no impacts, no impacts are available for disclosure. Exhibit A suggests that many of the species mentioned have little chance of occurrence. No substantial evidence is presented by the commenter or Mr. Lehman that the proposed project may have any specific direct, indirect, or cumulative effects to biological resources on the site or surroundings, such as on the retarding basin. Regardless of this, the current review includes all species previously reviewed, all those mentioned by the commenter, and others. Few have any reasonable potential to occur on the project site even as rare visitors and most have no reasonable potential to occur even in the vicinity in that role (see Table 1). The few that might rarely occur would, like the retarding basin, be entirely unaffected by the proposed project. No fair argument is presented in Exhibit A of the letter based on substantial evidence that there is a reasonable potential for the proposed project to result in significant impacts to any of the species under CEQA.

One factual error in the August 5th letter should be addressed. The commenter states that, "several species that are considered California Species of Special Concern and are listed on the California Department of Fish and Game's Special Animals List have been observed, and may be expected to occur, at the Project." This is incorrect. Exhibit A of the comment letter includes the statement that an Allen's Hummingbird (*Selasphorus sasin*) was observed *near* the project site; Exhibit A does not assert any special-status species have been detected on the project site. In addition, Allen's Hummingbird is not a Species of Special Concern. Finally, the reason this species is on the Special Animals list is due to apparent long-term declines in the subspecies occurring well north of the project site region, while the subspecies in the project region is in fact expanding its range. This example appears in keeping with other biological issues raised. Regardless of the low potential for stray observations of rare occurrences of species with minor special status, no relevant species have been detected or claimed at the project site. All relevant species are unlikely or less than reasonable and, beyond this, the proposed project has no reasonable potential to affect any such species even if they did, surprisingly, appear.

Foraging and Flight Path

At relatively fine scales of context, the project site is in an established, urban context with a high density of existing buildings, several of which are taller than the proposed project. Several of the existing structures have expansively smooth, mirrored surfaces (known to be of potential risk to flying birds), while the proposed project would have a broken-surfaced face in the direction of the retarding basin. During the fieldwork on and adjacent to the project site, a search was conducted for bird kills at the bases of the surrounding buildings. None were found, though quick removal by scavengers could explain this as well as simple absence of mortality, as crows and sign (scat and food leavings) of Black Rats (*Rattus rattus*) were present and both species are known to scavenge bird strikes.

No indication was seen that the retarding basin receives substantial use by birds. It is divided by a busy road, the water does not appear clean, no small fishes or amphibians were detected (a few large fish, perhaps Common Carp [*Cyprinus carpio*] were detected), and no staining, droppings, or other evidence of numbers of waterfowl were found at the basin's edge or in or below adjacent, taller trees. These factors and the specific context of surrounding human activity makes substantial use of the retarding basin by special-status birds appear very unlikely. For example, based on extensive experience with their occasional use of freshwater foraging, it appears highly unlikely that either Brown Pelicans (*Pelecanus occidentalis*) or Least Terns (*Sternula antillarum*) would be willing to visit the retarding basin except in very rare and unusual circumstances.

No indications were detected of substantial or important movement through the project site and surrounding area by birds or other wildlife. Standing at varied points at and near the project site, no natural or obvious potential flight pathway incorporating the project site at relevant altitudes was detectable. A review of the site context at coarser scales using Google Earth, USGS topographic maps, and the current Thomas Guide street map, suggest one reasonable flight path that might be important and cross over the site. This would be movement between San Joaquin Marsh southeast of the proposed project site and either Bolsa Chica Ecological Reserve or the Fairview Park /Talbert Regional Park / Costa Mesa Golf Course areas, both to the northwest of the project site. This is a flight distance of roughly six to 12 miles, quite reasonable for waterbirds to utilize in a daily routine such as moving between roosting to foraging areas. However, nearly all of the intervening space between those endpoints is urban.

As mentioned above, the project site does not contrast with its urban surroundings with regard to potential flight paths. There are existing, adjacent buildings at varied heights and the project site does not present a gap or flight path through the area. Waterbirds moving between San Joaquin Marsh and the other natural areas are unlikely to fly low amongst buildings and parking lots; they generally make use of prevailing winds to fly along coastlines or high above wind obstructions for greater efficiency and safety. This well-established pattern in urban areas along southern California coastal areas has been observed by Mr. Campbell in particular on a number of professional projects over the years. This includes an ongoing study generating quantitative data on bird flights for a proposed wind turbine project along the Palos Verdes Peninsula. These flight patterns hold across seasons, across times of day, and across a broad array of waterbird groups. No fair argument is presented in Exhibit A based on substantial evidence that a reasonable potential exists that the proposed project would interrupt a substantial flight path or result in any detectable increase in bird mortality. Migrant landbirds generally migrate thousands of feet above the height of the proposed project and therefore would not be attracted to the site as a stopover or feeding area.

The Draft IS/MND and Appendix G of the Final IS/MND included one mitigation measure, designed to allow the proposed project to avoid violation of the federal Migratory Bird Treaty Act (MBTA) and similar sections of the state Fish and Game Code. These laws protect nearly all native birds; MBTA for example currently covers more than 1000 species, many of which do not migrate. It should be clarified that, for the proposed project, the need for this mitigation measure under CEQA arises only to ensure consistency between the project's CEQA compliance and that for these other legal requirements. It is not needed to reduce potential CEQA impacts of the proposed project to a level of less than significant. This is due to the fact that the potential level of impacts to species covered under those laws from this proposed project would otherwise be extremely small in a CEQA context, limited to few or no individuals of a few very common species. While MBTA protects individual birds (of covered species) and affords no explicit protections to species per se, CEQA addresses the significance of impacts to species and populations at biologically meaningful (significant) scales.

Summary of Conclusions

Based on a comprehensive review of species, natural communities, and biological functions; findings from site examinations by two of ICF's biologists; and evaluation of potential project effects at multiple scales, ICF makes two determinations: (1) the proposed project has no reasonable potential to result in significant adverse effects on biological resources; and (2) there is no fair argument based on substantial evidence supporting the potential for any such effects.

References

California Consortium of Herbaria. 2010. Data provided by the participants of the Consortium of California Herbaria; accessed 11 August 2010 at http://ucjeps.berkeley.edu/consortium/.

California Department of Fish and Game, California Interagency Wildlife Task Group. 2008. California Wildlife Habitat Relationships System (CWHR), version 8.2 personal computer program. Sacramento, CA: California Department of Fish and Game.

California Department of Fish and Game. 2010. California Natural Diversity Data Base (CNDDB). Sacramento, CA: Wildlife and Habitat Data Analysis Branch, California Dept. of Fish and Game. Element reports for the Tustin, California and immediately surrounding USGS 7.5-minute quadrangle maps. Data date: 11 August 2010.

[Cal-IPC] California Invasive Plant Council. 2006. California Invasive Plant Inventory. Berkeley, CA: California Invasive Plant Council. Dated February 2006. Accessed at: www.cal-ipc.org.

[Cal-IPC] California Invasive Plant Council. 2007. New Weeds Added to Cal-IPC Inventory. Berkeley, CA: California Invasive Plant Council. Dated February 2007. Accessed at: <http://www.cal-ipc.org/ip/inventory/pdf/WebUpdate2007.pdf>

[CNPS] California Native Plant Society. 2008. Inventory of Rare and Endangered Plants, Online Edition. Sacramento, CA: California Native Plant Society. Accessed 11 August 2010 at http://www.cnps.org/inventory.

Google Earth. 2010. Google Earth imagery software program, version 5.2.1.1547. Mountain View, CA: Google Corporation. Imagery accessed 11 August 2010.

Gray, J. and David Bramlet. 1992. *Habitat Classification System Natural Resources Geographic Information System (GIS) Project*. County of Orange Environmental Management Agency. Planning. Santa Ana, CA.

Hamilton, R. A., and D. R. Willick. 1996. The Birds of Orange County: Status and Distribution. Irvine, CA: Sea and Sage Press.

Lemm, J. M. 2006. Field Guide to Amphibians and Reptiles of the San Diego Region. Berkeley, CA: University of California Press.

Rand McNally. 2009. The Thomas Guide: 2010 Orange County Street Guide. Chicago, IL: Thomas Brothers Maps, Rand McNally & Company.

Roberts, Jr., F. M. 2008. The Vascular Plants of Orange County, California: An Annotated Checklist, 3rd ed. San Luis Rey, CA: F. M. Roberts Publications.

Shuford, W. D., and T. Gardali, eds. 2008. California Bird Species of Special Concern. Studies of Western Birds No. 1. Camarillo, CA, and Sacramento, CA: Western Field Ornithologists and California Department of Fish and Game.

Tustin. 1981. Tustin, California 7.5-minute topographic map. Reston, VA: U.S. Geological Survey. Color 1978, revised 1981, scale 1:24,000, 10-foot elevation contours, datum NAD27.

Table 1. Reviewed Special-Status Species and Natural Communities

CNDDB Data Date = 2/28/2010 CNPS accessed = 8/11/2010 ***Legal Status Codes** Federal E = Endangered T = Threatened FP = Proposed for Endangered or Threatened BGEPA = Bald and Golden Eagle Protection Act State E = Endangered T = Threatened C = Candidate for listing as Endangered or Threatened R = Rare (Native Plant Protection Act only) SC = Species of Special Concern FP = Fully Protected Species	CNPS Status Codes 1A = Presumed extinct in California 1B = Rare, threatened, or endangered in California and elsewhere 2 = Rare, threatened, or endangered in California, but more common elsewhere 3 = More information needed 4 = Limited distribution; Watch List 0.1 = Seriously endangered in California 0.2 = Fairly endangered in California 0.3 = Not very endangered in California CNDDB = Tracked by CNDDB but currently with no formal special status (e.g., federal Species of Concern, a category no longer evaluated); includes plant communities classified by CDFG as depleted or high priority for inventory	****Terms for Evaluated Potential** LTR = Less than reasonable potential to occur. There is no basis to conclude that occurrence at this time, in the defined area, has any reasonable potential. LOW = Low but reasonable potential. Occurrence at this time, in the defined area, appears unlikely but not less than reasonable. MOD = Moderate potential. There is some basis to anticipate occurrence in the defined area, but also substantial uncertainty. NE = No potential effects and no potential fair argument for adverse effects under CEQA at either the level of significance or the level of a cumulatively considerable contribution to a regionally significant impact.

Scientific and English Names	**Legal Status***	**Evaluated Potential****		
	F/S/CNPS	**On Site**	**In Buffer**	**Effects**
Abronia villosa var. aurita Chaparral Sand-verbena	-/-/1B.1	LTR	LTR	NE
Accipiter cooperi Cooper's Hawk	CNDDB	LOW	LOW	NE
Accipiter striatus Sharp-shinned Hawk	CNDDB	LOW	LOW	NE
Actinemys marmorata Western Pond Turtle	-/SC/-	LTR	LTR	NE
Agelaius tricolor Tricolored Blackbird	-/SC/-	LTR	LOW	NE
Aimophila ruficeps canescens Southern California Rufous-crowned Sparrow	CNDDB	LTR	LTR	NE
Ammodramus savannarum Grasshopper Sparrow	-/SC/-	LTR	LTR	NE
Amphispiza belli belli Bell's Sage Sparrow	CNDDB	LTR	LTR	NE
Anaxyrus californicus Arroyo Toad	E/SC/-	LTR	LTR	NE
Anniella pulchra pulchra Silvery Legless Lizard	-/SC/-	LTR	LTR	NE
Antrozous pallidus Pallid Bat	-/SC/-	LOW	LOW	NE
Aphanisma blitoides Aphanisma	-/-/1B.2	LTR	LTR	NE
Aquila chrysaetos Golden Eagle	BGEPA/FP/-	LTR	LTR	NE
Ardea alba Great Egret	CNDDB	LTR	LOW	NE
Ardea herodias Great Blue Heron	CNDDB	LTR	LOW	NE

Asio flammeus Short-eared Owl	-/SC/-	LTR	LTR	NE
Asio otus Long-eared Owl	-/SC/-	LTR	LTR	NE
Aspidoscelis hyperythra Orangethroat Whiptail	-/SC/-	LTR	LTR	NE
Aspidoscelis tigris stejnegeri Coastal Whiptail	CNDDB	LTR	LTR	NE
Astragalus brauntonii Braunton's Milk-vetch	E/-/1B.1	LTR	LTR	NE
Astragalus oocarpus San Diego Milk-vetch	-/-/1B.2	LTR	LTR	NE
Athene cunicularia Burrowing Owl	-/SC/-	LTR	LTR	NE
Atriplex coulteri Coulter's Saltbush	-/-/1B.2	LTR	LTR	NE
Atriplex pacifica South Coast Saltscale	-/-/1B.2	LTR	LTR	NE
Atriplex parishii Parish's Brittlescale	-/-/1B.1	LTR	LTR	NE
Atriplex serenana var. davidsonii Davidson's Saltscale	-/-/1B.2	LTR	LTR	NE
Aythya americana Redhead	-/SC/-	LTR	LOW	NE
Aythya valisineria Canvasback	CNDDB	LTR	LOW	NE
Baccharis malibuensis Malibu Baccharis	-/-/1B.1	LTR	LTR	NE
Baeolophus inornatus Oak Titmouse	CNDDB	LTR	LTR	NE
Bassariscus astutus Ring-tailed Cat	-/FP/-	LTR	LTR	NE
Berberis nevinii Nevin's Barberry	E/E/1B.1	LTR	LTR	NE
Botaurus lentiginosus American Bittern	CNDDB	LTR	LTR	NE
Branchinecta sandiegonensis San Diego Fairy Shrimp	E/-/-	LTR	LTR	NE
Brodiaea filifolia Thread-leaved Brodiaea	T/E/1B.1	LTR	LTR	NE
Buteo regalis Ferruginous Hawk	CNDDB	LTR	LTR	NE
Callitropsis forbesii Tecate Cypress	-/-/1B.1	LTR	LTR	NE
Calochortus plummerae Plummer's Mariposa-lily	-/-/1B.2	LTR	LTR	NE
Calochortus weedii var. intermedius Intermediate Mariposa-lily	-/-/1B.2	LTR	LTR	NE
Calypte costae Costa’s Hummingbird	CNDDB	LOW	LOW	NE
Campylorhynchus brunneicapillus sandiegensis / Coastal Cactus Wren	-/SC/-	LTR	LTR	NE
Carduelis lawrencei Lawrence’s Goldfinch	CNDDB	LTR	LOW	NE
Catostomus santaanae Santa Ana Sucker	T/SC/-	LTR	LTR	NE

Caulanthus simulans Payson's jewel-flower	-/-/4.2	LTR	LTR	NE
Centromadia parryi ssp. australis Southern Tarplant	-/-/1B.1	LTR	LTR	NE
Chaenactis glabriuscula var. orcuttiana Orcutt's Pincushion	-/-/1B.1	LTR	LTR	NE
Chaenactis parishii Parish's Chaenactis	-/-/1B.3	LTR	LTR	NE
Chaetodipus californicus femoralis Dulzura Pocket Mouse	-/SC/-	LTR	LTR	NE
Chaetodipus fallax fallax Northwestern San Diego Pocket Mouse	-/SC/-	LTR	LTR	NE
Chaetura vauxi Vaux's Swift	-/SC/-	LOW	MOD	NE
Charadrius alexandrinus nivosus Western Snowy Plover	T/SC/-	LTR	LTR	NE
Charina trivirgata Rosy Boa	CNDDB	LTR	LTR	NE
Choeronycteris Mexicana Mexican Long-tongued Bat	-/SC/-	LTR	LTR	NE
Chondestes grammacus Lark Sparrow	CNDDB	LTR	LOW	NE
Chorizanthe parryi var. fernandina San Fernando Valley Spineflower	C/E/1B.1	LTR	LTR	NE
Chorizanthe polygonoides var. longispina Long-spined Spineflower	-/-/1B.2	LTR	LTR	NE
Cicindela gabbii Western Tidal-flat Tiger Beetle	CNDDB	LTR	LTR	NE
Cicindela hirticollis gravida Sandy Beach Tiger Beetle	CNDDB	LTR	LTR	NE
Cicindela latesignata latesignata Western Beach Tiger Beetle	CNDDB	LTR	LTR	NE
Circus cyaneus Northern Harrier	-/SC/-	LTR	LTR	NE
Cistothorus palustris clarkae Clark’s Marsh Wren	-/SC/-	LTR	LOW	NE
Coelus globosus Globose Dune Beetle	CNDDB	LTR	LTR	NE
Coleonyx variegatus abbotti San Diego Banded Gecko	CNDDB	LTR	LTR	NE
Comarostaphylis diversifolia ssp. diversifolia Summer Holly	-/-/1B.2	LTR	LTR	NE
Contopus cooperi Olive-sided Flycatcher	-/SC/-	LTR	LOW	NE
Cordylanthus maritimus ssp. maritimus Salt Marsh Bird's-beak	E/E/1B.2	LTR	LTR	NE
Crotalus ruber ruber Northern Red-diamond Rattlesnake	-/SC/-	LTR	LTR	NE
Danaus plexippus Monarch Butterfly	CNDDB	LTR	LOW	NE
Dendroica occidentalis Hermit Warbler	CNDDB	LTR	LOW	NE
Dendroica petechia brewsteri Yellow Warbler	-/SC/-	LTR	LOW	NE
Diadophis punctatus similis San Diego Ringneck Snake	CNDDB	LTR	LTR	NE

Dipodomys merriami collinus Earthquake Merriam's Kangaroo Rat	CNDDB	LTR	LTR	NE
Dipodomys stephensi Stephens' Kangaroo Rat	E/T/-	LTR	LTR	NE
Dudleya multicaulis Many-stemmed Dudleya	-/-/1B.2	LTR	LTR	NE
Dudleya stolonifera Laguna Beach Dudleya	T/T/1B.1	LTR	LTR	NE
Egretta thula Snowy Egret	CNDDB	LTR	LOW	NE
Elanus leucurus White-tailed Kite	-/FP/-	LTR	LTR	NE
Empidonax traillii brewsteri Little Willow Flycatcher	-/E/-	LOW	MOD	NE
Empidonax traillii extimus Southwestern Willow Flycatcher	E/E/-	LTR	LOW	NE
Eremophila alpestris actia California Horned Lark	CNDDB	LTR	LTR	NE
Eriastrum densifolium ssp. sanctorum Santa Ana River Woollystar	E/E/1B.1	LTR	LTR	NE
Eucyclogobius newberryi Tidewater Goby	E/SC/-	LTR	LTR	NE
Euderma maculatum Spotted Bat	-/SC/-	LTR	LTR	NE
Eumeces skiltonianus interparietalis Coronado Skink	-/SC/-	LTR	LTR	NE
Eumops perotis californicus Western Mastiff Bat	-/SC/-	LOW	LOW	NE
Euphorbia misera Cliff Spurge	-/-/2.2	LTR	LTR	NE
Euphydryas editha quino Quino Checkerspot Butterfly	E/-/-	LTR	LTR	NE
Falco columbarius Merlin	CNDDB	LOW	LOW	NE
Falco peregrinus anatum American Peregrine Falcon	-/FP/-	LOW	LOW	NE
Gavia immer Common Loon	-/SC/-	LTR	LTR	NE
Geothlypis trichas sinuosa Saltmarsh Common Yellowthroat	-/SC/-	LTR	LOW	NE
Gila orcuttii Arroyo Chub	-/SC/-	LTR	LTR	NE
Helianthus nuttallii ssp. parishii Los Angeles Sunflower	-/-/1A	LTR	LTR	NE
Horkelia cuneata ssp. puberula Mesa Horkelia	-/-/1B.1	LTR	LTR	NE
Icteria virens Yellow-breasted Chat	-/SC/-	LTR	LTR	NE
Ixobrychus exilis Least Bittern	-/SC/-	LTR	LOW	NE
Lampropeltis zonata pulchra, California Mountain Kingsnake (San Diego population)	-/SC/-	LTR	LTR	NE
Lanius ludovicianus Loggerhead Shrike	-/SC/-	LTR	LTR	NE
Larus californicus California Gull	CNDDB	LOW	MOD	NE

Lasiurus cinereus Hoary Bat	CNDDB	LOW	LOW	NE
Lasiurus xanthinus Western Yellow Bat	-/SC/-	LOW	LOW	NE
Lasthenia glabrata ssp. coulteri Coulter's Goldfields	-/-/1B.1	LTR	LTR	NE
Laterallus jamaicensis coturniculus California Black Rail	-/T,FP/-	LTR	LTR	NE
Lepechinia cardiophylla Heart-leaved Pitcher Sage	-/-/1B.2	LTR	LTR	NE
Lepus californicus bennettii San Diego Black-tailed Jackrabbit	-/SC/-	LTR	LTR	NE
Lithobates pipiens Northern Leopard Frog	-/SC/-	LTR	LTR	NE
Macrotus californicus California leaf-nosed bat	-/SC/-	LTR	LTR	NE
Monardella macrantha ssp. hallii Hall's Monardella	-/-/1B.3	LTR	LTR	NE
Monardella nana ssp. leptosiphon San Felipe Monardella	-/-/1B.2	LTR	LTR	NE
Myotis yumanensis Yuma Myotis	CNDDB	LTR	LTR	NE
Nama stenocarpum Mud Nama	-/-/2.2	LTR	LTR	NE
Nasturtium gambelii Gambel's Water Cress	E/T/1B.1	LTR	LTR	NE
Navarretia prostrata Prostrate Vernal Pool Navarretia	-/-/1B.1	LTR	LTR	NE
Nemacaulis denudata var. denudata Coast Woolly-heads	-/-/1B.2	LTR	LTR	NE
Neotoma lepida intermedia San Diego Desert Woodrat	-/SC/-	LTR	LTR	NE
Nolina cismontana Peninsular Nolina	-/-/1B.2	LTR	LTR	NE
Nycticorax nycticorax Black-crowned Night-Heron	CNDDB	LTR	LOW	NE
Nyctinomops femorosaccus Pocketed Free-tailed Bat	CNDDB	LOW	LOW	NE
Nyctinomops macrotis Big Free-tailed Bat	-/SC/-	LOW	LOW	NE
Onychomys torridus ramona Southern Grasshopper Mouse	-/SC/-	LTR	LTR	NE
Pandion haliaetus Osprey	CNDDB	LTR	LTR	NE
Passerculus sandwichensis beldingi Belding's Savannah Sparrow	-/E/-	LTR	LTR	NE
Passerculus sandwichensis rostratus Large-billed Savannah Sparrow	-/SC/-	LTR	LOW	NE
Pelecanus erythrorhynchos American White Pelican	-/SC/-	LTR	LTR	NE
Pelecanus occidentalis Brown Pelican	-/FP/-	LTR	LTR	NE
Penstemon californicus California Beardtongue	-/-/1B.2	LTR	LTR	NE
Pentachaeta aurea ssp. allenii Allen's Pentachaeta	-/-/1B.1	LTR	LTR	NE

Perognathus longimembris brevinasus Los Angeles Little Pocket Mouse	-/SC/-	LTR	LTR	NE
Perognathus longimembris pacificus Pacific Little Pocket Mouse	E/SC/-	LTR	LTR	NE
Phalacrocorax auritus Double-crested Cormorant	CNDDB	LTR	LOW	NE
Phrynosoma blainvillii Coast Horned Lizard	-/SC/-	LTR	LTR	NE
Picoides nuttallii Nuttall's Woodpecker	CNDDB	LTR	LOW	NE
Piranga rubra Summer Tanager	-/SC/-	LTR	LTR	NE
Plegadis chihi White-faced Ibis	CNDDB	LTR	LTR	NE
Polioptila californica californica Coastal California Gnatcatcher	T/SC/-	LTR	LTR	NE
Pooecetes gramineus affinis Oregon Vesper Sparrow	CNDDB	LTR	LTR	NE
Pseudognaphalium leucocephalum White Rabbit-Tobacco	-/-/2.2	LTR	LTR	NE
Quercus dumosa Nuttall's Scrub Oak	-/-/1B.1	LTR	LTR	NE
Rallus longirostris levipes Light-footed Clapper Rail	E/E,FP/-	LTR	LTR	NE
Rhinichthys osculus ssp. 3 Santa Ana Speckled Dace	-/SC/-	LOW	LTR	NE
Riparia riparia Bank Swallow	-/T/-	LTR	LOW	NE
Rynchops niger Black Skimmer	-/SC/-	LTR	LTR	NE
Salvadora hexalepis virgultea Coast Patch-nosed Snake	-/SC/-	LTR	LTR	NE
Selasphorus rufus Rufous Hummingbird	CNDDB	LOW	MOD	NE
Selasphorus sasin Allen's Hummingbird	CNDDB	LOW	MOD	NE
Senecio aphanactis Chaparral Ragwort	-/-/2.2	LTR	LTR	NE
Sidalcea neomexicana Salt Spring Checkerbloom	-/-/2.2	LTR	LTR	NE
Sorex ornatus salicornicus Southern California Saltmarsh Shrew	-/SC/-	LTR	LTR	NE
Spea hammondii Western Spadefoot	-/SC/-	LTR	LTR	NE
Spizella breweri Brewer's Sparrow	CNDDB	LTR	LTR	NE
Spizella passerina Chipping Sparrow	CNDDB	LTR	LTR	NE
Sterna forsteri Forster's Tern	CNDDB	LTR	LOW	NE
Sternula antillarum browni California Least Tern	E/E,FP/-	LTR	LOW	NE
Streptocephalus woottoni Riverside Fairy Shrimp	E/-/-	LTR	LTR	NE
Suaeda esteroa Estuary Seablite	-/-/1B.2	LTR	LTR	NE

Symphyotrichum defoliatum San Bernardino Aster	-/-/1B.2	LTR	LTR	NE
Taricha torosa torosa Coast Range Newt	-/SC/-	LTR	LTR	NE
Taxidea taxus American Badger	-/SC/-	LTR	LTR	NE
Thamnophis hammondii Two-striped Garter Snake	-/SC/-	LTR	LTR	NE
Thamnophis sirtalis ssp. South Coast Common Garter Snake	-/SC/-	LTR	LTR	NE
Tryonia imitator Mimic Tryonia (=California Brackishwater Snail)	CNDDB	LTR	LTR	NE
Verbesina dissita Big-leaved Crownbeard	T/T/1B.1	LTR	LTR	NE
Vireo bellii pusillus Least Bell's Vireo	E/E/-	LTR	LTR	NE
Xanthocephalus xanthocephalus Yellow-headed Blackbird	-/SC/-	LTR	LTR	NE
California Walnut Woodland	CNDDB	LTR	LTR	NE
Riversidian Alluvial Fan Sage Scrub	CNDDB	LTR	LTR	NE
S. Calif. Arroyo Chub/Santa Ana Sucker Stream	CNDDB	LTR	LTR	NE
Southern Coast Live Oak Riparian Forest	CNDDB	LTR	LTR	NE
Southern Coastal Salt Marsh	CNDDB	LTR	LTR	NE
Southern Cottonwood Willow Riparian Forest	CNDDB	LTR	LTR	NE
Southern Dune Scrub	CNDDB	LTR	LTR	NE
Southern Foredunes	CNDDB	LTR	LTR	NE
Southern Interior Cypress Forest	CNDDB	LTR	LTR	NE
Southern Riparian Scrub	CNDDB	LTR	LTR	NE
Southern Sycamore Alder Riparian Woodland	CNDDB	LTR	LTR	NE
Southern Willow Scrub	CNDDB	LTR	LTR	NE
Valley Needlegrass Grassland	CNDDB	LTR	LTR	NE

CNDDB Data Date = 2/28/2010
CNPS accessed = 8/11/2010

***Legal Status Codes**

Federal
E = Endangered
T = Threatened
FP = Proposed for Endangered or Threatened
BGEPA = Bald and Golden Eagle Protection Act

State
E = Endangered
T = Threatened
C = Candidate for listing as Endangered or Threatened
R = Rare (Native Plant Protection Act only)
SC = Species of Special Concern
FP = Fully Protected Species

CNPS Status Codes
1A = Presumed extinct in California
1B = Rare, threatened, or endangered in California and elsewhere
2 = Rare, threatened, or endangered in California, but more common elsewhere
3 = More information needed
4 = Limited distribution; Watch List
0.1 = Seriously endangered in California
0.2 = Fairly endangered in California
0.3 = Not very endangered in California

CNDDB = Tracked by CNDDB but currently with no formal special status (e.g., federal Species of Concern, a category no longer evaluated); includes plant communities classified by CDFG as depleted or high priority for inventory

****Terms for Evaluated Potential**

LTR = Less than reasonable potential to occur. There is no basis to conclude that occurrence at this time, in the defined area, has any reasonable potential.

LOW = Low but reasonable potential. Occurrence at this time, in the defined area, appears unlikely but not less than reasonable.

MOD = Moderate potential. There is some basis to anticipate occurrence in the defined area, but also substantial uncertainty.

NE = No potential effects and no potential fair argument for adverse effects under CEQA at either the level of significance or the level of a cumulatively considerable contribution to a regionally significant impact.

Table 2. Detected Non-ornamental Vascular Plant and Vertebrate Wildlife Species

Species	**Common Name**
Vascular Plants	
**Chamaesyce maculata*	Spotted Sandmat
**Cortaderia selloana*	Pampas Grass
**Polypogon monspeliensis*	Annual Beard-grass
**Sonchus oleraceus*	Annual Sow-thistle
Typha latifolia	Broad-leaved Cattail
*(none; appears to be of cultivar/hybrid origin)	turf grass
Vertebrate Wildlife	
Anas platyrhynchos	Mallard
Cathartes aura	Turkey Vulture
Fulica americana	American Coot
**Columba livia*	Rock Pigeon
**Streptopelia decaocto*	Eurasian Collared-Dove
Sayornis nigricans	Black Phoebe
Corvus brachyrhynchos	American Crow
Carpodacus mexicanus	House Finch
**Passer domesticus*	House Sparrow
Sylvilagus auduboni	Desert Cottontail
**Rattus rattus*	Black Rat
* - Nonnative species	

Kurt Campbell

Senior Biologist

Kurt has over 30 years of experience as an active field and conservation biologist with extensive and integrated knowledge of animals, plants, ecology, and conservation biology. He has an extensive knowledge of environmental regulations, including CEQA, NEPA, the federal ESA, the California ESA, the Migratory Bird Treaty Act (MBTA), CWA, and the state Lake and Streambed Alteration Program in the context of natural resources. He has several peer-reviewed, scientific publications in print relevant to California conservation biology. He is widely known throughout California as an expert in the ecology, distribution, natural history, and identification of birds, and was an author and regional editor for four years for *North American Birds* magazine. Kurt has conducted numerous special-status species studies, including focused surveys and habitat evaluations. Kurt's expertise extends to nearly all California bird species and many other vertebrates, invertebrates, and plants.

Project Experience

South Region High School #15 Implementation of Biological and Archaeological Monitoring Plan—Los Angeles Unified School District, San Pedro

For a proposed wind turbine component of a new high school, Kurt designed, prepared, and implemented a wind turbine long-term management and monitoring program incorporating existing research on turbine impacts to birds and bats and an adaptive management study design. Work included negotiations among client, public stakeholders, and staff at multiple agencies.

Construction and Mitigation Monitoring for California Gnatcatcher at Diamond Valley Reservoir—Metropolitan Water District

Kurt managed a 3-person monitoring team that surveyed and monitored construction activities for California gnatcatchers over more than 1000 acres of pristine coastal sage scrub in the North Domenigoni Hills during six years of construction for the Diamond Valley Reservoir. Evaluated results, made management recommendations, and produced or reviewed all annual reports.

Special Training

Geographical ecology and conservation biology

Professional Memberships

American Association for the Advancement of Science

American Birding Association

American Institute for Biological Sciences

American Ornithologists' Union

Association of Environmental Professionals

Association of Field Ornithologists

California Botanical Society

California Native Plant Society

Cooper Ornithological Society

Natural Areas Association

Raptor Research Foundation

Society for Conservation Biology

Society for Ecological Restoration (National and California Chapter)

Society of Wetland Scientists

Southern California Academy of Sciences

Southern California Botanists

Southwestern Association of Naturalists

Waterbird Society

Western Bird Banding Association

Western Field Ornithologists

The Wildlife Society (National, Western Sect., Southern California Chapter)

Wilson Ornithological Society

Certifications/Licenses

USFWS 10(a)1(A) Recovery Permit, #TE7814856: southwestern willow flycatcher and coastal California gnatcatcher in California, Arizona, and Nevada

CDFG SCP, SCIN #801066-03 (currently in the renewal process)

Principal Investigator for Memorandum of Understanding with California DFG

California Gnatcatcher Dispersal Study—County of San Diego

Kurt contracted and supervised a field team to document nesting, monitor, and color-band young gnatcatchers for a study of natal dispersal across Interstate 8 in Lakeside. Documented color-marked juveniles' successful crossing of the multiple-lane freeway. Results were interpreted and discussed in light of relevant conservation biology and management issues at both local and regional scales.

Southwestern Willow Flycatcher Focused Studies—Glenn Lukos Associates, Los Angeles

Under contract to Glenn Lukos Associates for the County of Orange and the Irvine Land Company in both 2001 and 2002, Kurt conducted and reported on a focused survey for southwestern willow flycatcher, including riparian habitat suitability evaluation over several hundred acres in the Irvine Lake area. Unusual survey results in 2001 and unusual conditions (drought) in 2002 were interpreted in light of current research and changing survey protocols related to the species.

Avian Point Count Surveys—San Diego Natural History Museum

As part of a museum contract to the U.S. Forest Service, Kurt conducted over 100 point counts in Cleveland National Forest, San Diego County, California. This included substantial logistical efforts locating and confirming existing point count locations on a tight schedule, along with preliminary data interpretation and review of the draft museum report.

Biological Reference Evaluation and Management Recommendations—County of San Diego

Under state funding in 2001 and 2002, Kurt conducted a thorough reference evaluation of baseline conditions for newly acquired conservation lands in the Lakeside Archipelago of lands conserved under the southwestern San Diego Multiple Species Conservation Program. This included documentation of existing conditions through compilation of extensive plant, invertebrate, and vertebrate species lists (over 400 species recorded in all), mapping of vegetation communities and other resources, detailed evaluation of California Gnatcatcher populations beyond presence/absence, evaluation of wildlife corridor and linkage issues, establishment of an avian monitoring program using point counts, thorough discussion of historic and existing disturbance impacts, and analysis of site needs and opportunities at multiple scales.