

Hydromodification Management Plan

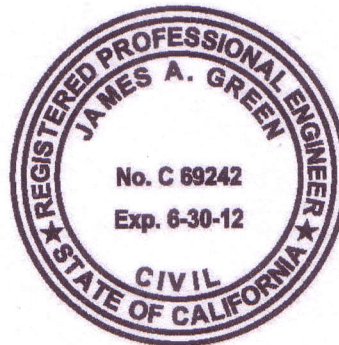
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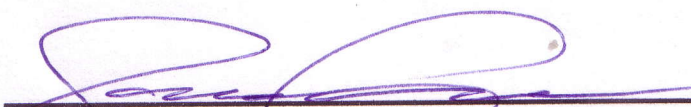
West Lilac Farms Tentative Map – TM 5276 ER 02-02-002

Prepared For:

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3-10-11
Date
revised 3-25-11 jh



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The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan have been prepared under the direction of the above-stated Registered Civil Engineer and meet the requirements of Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments.

Hydromodification refers to changes in the magnitude and frequency of stream flows as a result of urbanization and the resulting impacts on receiving channels in terms of erosion, sedimentation, and degradation of in-stream habitat. The degree to which a channel will erode is a function of the increase in driving force (shear stress), the resistance of the channel (critical shear stress), the change in sediment delivery, and the geomorphic condition of the channel. Critical shear stress is the stress threshold above which erosion occurs. Not all flows cause erosion -- only those that generate shear stress in excess of the critical shear stress of the bank and bed materials. Urbanization increases the shear stress exerted on the channel by stream flows and can trigger erosion in the form of incision (channel downcutting), widening (bank erosion), or both. Increases in flow below critical shear stress levels have little or no effect on the channel.

The need to address hydromodification and its influence on water quality is included in the San Diego Regional Water Board Order R9-2007-001, Provision D.1.g of California Regional Water Quality Control Board San Diego Region Order R9-2007-0001, which required the San Diego Stormwater Copermittees, i.e. County of San Diego, to implement a Hydromodification Management Plan (HMP) “...to manage increases in runoff discharge rates and durations from all Priority Development Projects (PDPs), where such increased rates and durations are likely to cause increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.” The HMP developed standards to control flows within the geomorphically-significant flow range. Supporting analyses were based on continuous hydrologic simulation modeling. The HMP for all applicable PDPs was implemented on January 14, 2011.

Hydromodification management analysis must adhere to the following criteria:

- For flow rates between the pre-project lower flow threshold (see below) and the pre-project 10-year runoff event, the post-project discharge rates, and durations may not deviate above the pre-project discharge rates and durations by more than 10 percent over more than 10 percent of the length of the flow duration curve.
- Lower flow thresholds may be determined using the HMP Decision Matrix (located in Chapter 6) along with a critical flow calculator and channel screening tools developed by the Southern California Coastal Water Research Project (SCCWRP), detailed in Chapter 5. These methods identify lower flow thresholds for a range of channel conditions. The critical flow calculator recommends a lower flow value of $0.1Q_2$, $0.3Q_2$, or $0.5Q_2$ dependent on the receiving channel material and dimensions. This value will be compared to the channel susceptibility rating (High, Medium, or Low) as determined from the SCCWRP screening tools located in Appendix B to determine the final lower flow threshold.
- The lower flow threshold may alternately be determined as 10 percent of the pre-project 2-year runoff event, or $0.1Q_2$. This approach, which is outlined in the HMP Decision Matrix, is available if the project applicant chooses not to complete the channel screening analysis.

West Lilac Farms is a 28-lot residential subdivision approximately 94 acres in size located east of the community of Bonsall. Reference is hereby made to the Tentative Map and Preliminary Grading Plan as well as the CEQA Preliminary Drainage Study and Stormwater Management Plan for the proposed development.

The project drains to natural swales that are not categorically exempt from HMP analysis. This project proposes the use of flow control and retention to maintain or reduce pre-project downstream erosion conditions and protect stream habitat. A high susceptibility of the downstream channels has been assumed for purposes of this analysis.

The proposed development was divided into Drainage Management Areas (DMAs) that fit into separate categories: 1. the building pad area; and 2. the private roads. The building pad area was further divided into separate DMAs consisting of impervious areas (roofs, driveways, walkways, patios, and misc. areas) and pervious areas (landscaped areas). See the attached **Preliminary Hydromodification Plan**.

The San Diego Hydrodmodification (HMP) Sizing Calculator was used to size Low Impact Development (LID) facilities that meet both HMP and treatment-control requirements. Using a conservative approach, a variety of bioretention area sizes were calculated based upon the anticipated development of small and large houses and associated driveways, walkways, patios, and miscellaneous paved or impervious areas as well as small and large drainage management area for the private roads. See the attached **LID Facility Calculations** for the range in size for the bioretention areas.

Bioretention basins were selected to manage increases in runoff discharge rates and durations in order to mitigate potential hydrodmodification impacts due to the proposed development. All stormwater runoff from the proposed development will be routed to bioretention basins. Bioretention basins consist of a surface ponding layer, an 18" growing medium, and a storage layer (with an 40% void ratio average). Each of the basins will have an overflow catchment for purposes of routing flows from larger storm events. See the attached **Bioretention Area Exhibit** for details.

Maintenance of the LIDs on the building pads will be the responsibility of the individual homeowners. Maintenance of the LIDs for the private roads will be the responsibility of the Homeowners Association (HOA). The HOA will be given the authority to ensure the long-term preservation and maintenance of the homeowners' on-site LIDs via the Covenants, Conditions, and Restrictions (CC&Rs).

A specific plan, design, and maintenance of the LIDs for the private roads will be implemented during the final engineering phase of the development. A specific plan, design, and maintenance of the LIDs for the building pad area will be implemented during the Building Permit Phase of the development. Based upon topography, some of the bioretention areas for the private roads may need to be terraced.

Reference(s):

- Final Hydromodification Management Plan dated January 13, 2011 prepared by Brown and Caldwell

TM 5276 - WEST LILAC FARMS

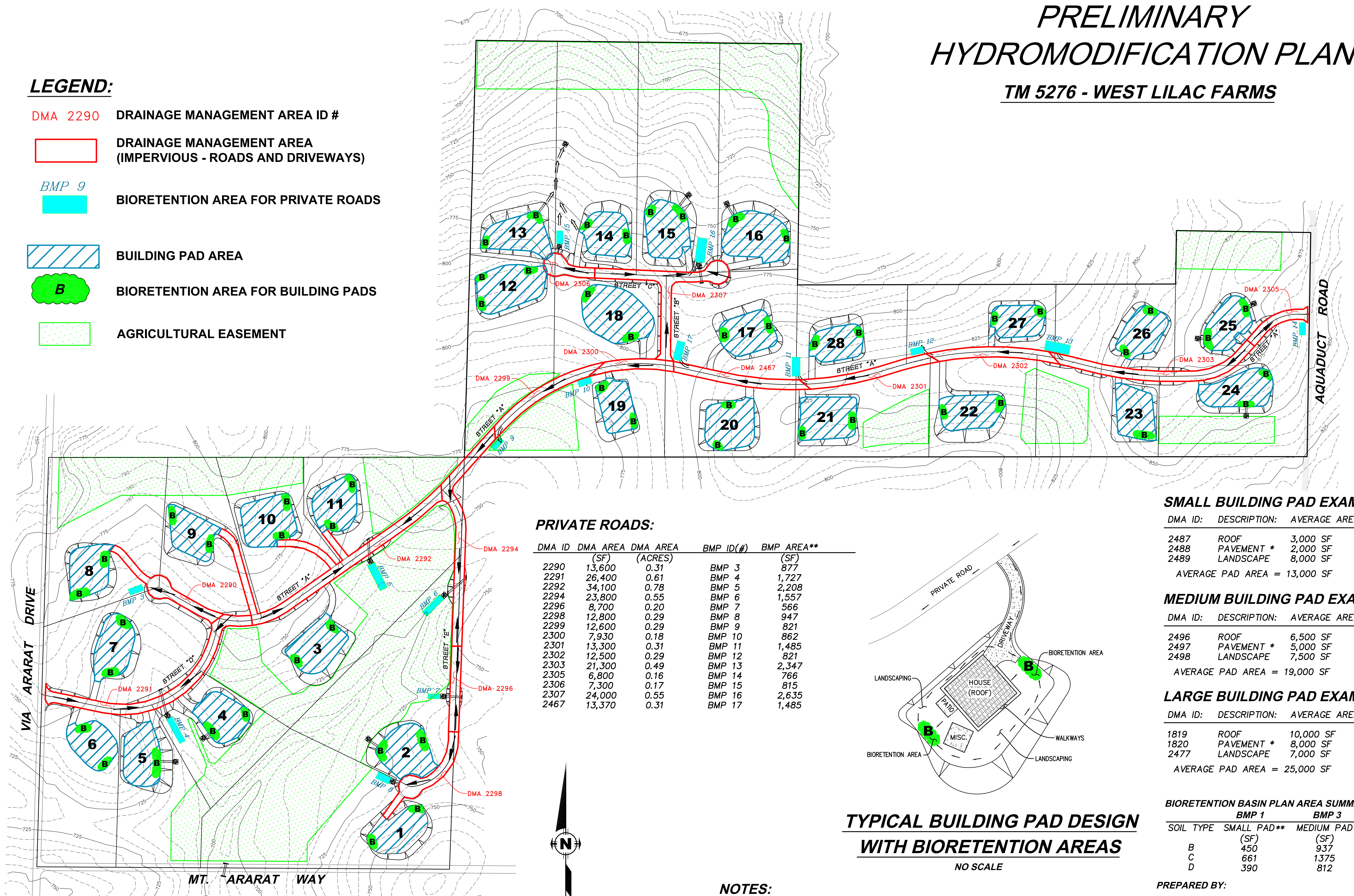
DMA 2290 DRAINAGE MANAGEMENT AREA ID

 **DRAINAGE MANAGEMENT AREA
(IMPERVIOUS - ROADS AND DRIVEWAYS)**

BMP 9 **BIORETENTION AREA FOR PRIVATE ROADS**

 **BUILDING PAD AREA**

B BIORETENTION AREA FOR BUILDING PADS


AGRICULTURAL EASEMENT

DMA ID	DMA AREA	DMA AREA	BMP ID(#)	BMP AREA**
	(SF)	(ACRES)		(SF)
2290	13,600	0.31	BMP 3	877
2291	26,400	0.61	BMP 4	1,727
2292	34,100	0.78	BMP 5	2,208
2294	23,800	0.55	BMP 6	1,557
2296	8,700	0.20	BMP 7	566
2298	12,800	0.29	BMP 8	947
2299	12,600	0.29	BMP 9	821
2300	7,930	0.18	BMP 10	862
2301	13,300	0.31	BMP 11	1,485
2302	12,500	0.29	BMP 12	821
2303	21,300	0.49	BMP 13	2,347
2305	6,800	0.16	BMP 14	766
2306	7,300	0.17	BMP 15	815
2307	24,000	0.55	BMP 16	2,635
2467	13,370	0.31	BMP 17	1,485

DMA ID:	DESCRIPTION:	AVERAGE AREA:	
2487	ROOF	3,000 SF	
2488	PAVEMENT *	2,000 SF	
2489	LANDSCAPE	8,000 SF	BMP 1
AVERAGE PAD AREA =		13,000 SF	

DMA ID:	DESCRIPTION:	AVERAGE AREA:	
2496	ROOF	6,500 SF	
2497	PAVEMENT *	5,000 SF	
2498	LANDSCAPE	7,500 SF	BMP 3
AVERAGE PAD AREA =		19,000 SF	

DMA ID:	DESCRIPTION:	AVERAGE AREA:	
1819	ROOF	10,000 SF	
1820	PAVEMENT *	8,000 SF	
2477	LANDSCAPE	7,000 SF	BMP 2
AVERAGE PAD AREA =		25,000 SF	

	<i>BMP 1</i>	<i>BMP 3</i>	<i>BMP 2</i>
SOIL TYPE	SMALL PAD**	MEDIUM PAD**	LARGE PAD**
	(SF)	(SF)	(SF)
<i>B</i>	450	937	1206
<i>C</i>	661	1375	2041
<i>D</i>	390	812	1391

NO SCALE

* = DRIVEWAYS, WALKWAYS, PATIOS, MISC. PAVEMENT

** = SEE PROJECT SUMMARY FOR LID FACILITY SIZES (PLAN AREA, VOLUME V1, VOLUME V2, ORIFICE SIZE AND FLOW)

PREPARED BY:

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Project Summary

Project Name	West Lilac Farms - TM 5276
Project Applicant	Jim Pardee, Jr.
Jurisdiction	County of San Diego
Parcel (APN)	127-271-28, 127-290-05
Hydrologic Unit	San Luis Rey

Compliance Basin Summary

Basin Name:	Private Roads
Receiving Water:	varies
Rainfall Basin	Oceanside
Mean Annual Precipitation (inches)	13.3
Project Basin Area (acres):	94.00
Watershed Area (acres):	94.00
SCCWRP Lateral Channel Susceptibility (H, M, L):	
SCCWRP Vertical Channel Susceptibility (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

Drainage Management Area Summary

ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
2290	Drains to LID	BMP 3	PVT ROAD - BMP 3	0.3	Pervious (Pre)	Concrete or asphalt	Type D (high runoff - clay soi...	Steep (greater 10%)
2291	Drains to LID	BMP 4	PVT ROAD - BMP 4	0.6	Pervious (Pre)	Concrete or asphalt	Type D (high runoff - clay soi...	Steep (greater 10%)
2292	Drains to LID	BMP 5	PVT ROAD - BMP 5	0.7	Pervious (Pre)	Concrete or asphalt	Type D (high runoff - clay soi...	Steep (greater 10%)
2294	Drains to LID	BMP 6	PVT ROAD - BMP 6	0.5	Pervious (Pre)	Concrete or asphalt	Type D (high runoff - clay soi...	Steep (greater 10%)
2296	Drains to LID	BMP 7	PVT ROAD - BMP 7	0.2	Pervious (Pre)	Concrete or asphalt	Type D (high runoff - clay soi...	Steep (greater 10%)
2298	Drains to LID	BMP 8	PVT ROAD - BMP 8	0.2	Pervious (Pre)	Concrete or asphalt	Type B (moderate infiltration)	Steep (greater 10%)
2299	Drains to LID	BMP 9	PVT RD - BMP 9	0.2	Pervious (Pre)	Concrete or asphalt	Type D (high runoff - clay soi...	Steep (greater 10%)

2300	Drains to LID	BMP 10	PVT RD - BMP 10	0.1	Pervious (Pre)	Concrete or asphalt	Type C (slow infiltration)	Steep (greater 10%)
2301	Drains to LID	BMP 11	PVT RD - BMP 11	0.3	Pervious (Pre)	Concrete or asphalt	Type C (slow infiltration)	Steep (greater 10%)
2302	Drains to LID	BMP 12	PVT RD - BMP 12	0.2	Pervious (Pre)	Concrete or asphalt	Type D (high runoff - clay soi...	Steep (greater 10%)
2303	Drains to LID	BMP 13	PVT ROAD - BMP 13	0.4	Pervious (Pre)	Concrete or asphalt	Type C (slow infiltration)	Steep (greater 10%)
2305	Drains to LID	BMP 14	PVT ROAD - BMP 14	0.1	Pervious (Pre)	Concrete or asphalt	Type C (slow infiltration)	Steep (greater 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 3	Bioretention	Bioretention Area for Private Road	877	731	526	0.007	0.4
BMP 4	Bioretention	Bioretention Area for Private Road	1727	1440	1036	0.014	0.6
BMP 5	Bioretention	Bioretention Area for Private Road	2208	1841	1325	0.019	0.7
BMP 6	Bioretention	Bioretention Area for Private Road	1557	1298	934	0.013	0.6
BMP 7	Bioretention	Bioretention Area for Private Road	566	472	339	0.004	0.3
BMP 8	Bioretention	Bioretention Area for Private Road	947	789	0.00	0.005	0.3
BMP 9	Bioretention	Bioretention Area for Private Road	821	684	492	0.007	0.4
BMP 10	Bioretention	Bioretention Area for Private Road	862	719	517	0.003	0.3
BMP 11	Bioretention	Bioretention Area for Private Road	1485	1238	891	0.006	0.4
BMP 12	Bioretention	Bioretention Area for Private Road	821	684	492	0.007	0.4
BMP 13	Bioretention	Bioretention Area for Private Road	2347	1957	1408	0.010	0.5
BMP 14	Bioretention	Bioretention Area for Private Road	766	639	460	0.003	0.3

DMA SUMMARY (CONT'D)								
2306	Drains to LID	BMP 15	PVT RD - BMP 15	0.17	Pervious (Pre)	Concrete or AC	Type C	Steep (>10%)
2307	Drains to LID	BMP 16	PVT RD - BMP 16	0.55	Pervious (Pre)	Concrete or AC	Type C	Steep (>10%)
2467	Drains to LID	BMP 17	PVT RD - BMP 17	0.31	Pervious (Pre)	Concrete or AC	Type C	Steep (>10%)

LID FACILITY SUMMARY (CONT'D)								
BMP 15	Bioretention	Bioretention for Private Road	815	679	489	0.003	0.3	
BMP 16	Bioretention	Bioretention for Private Road	2635	2197	1581	0.012	0.5	
BMP 17	Bioretention	Bioretention for Private Road	1485	1238	891	0.006	0.4	

SMALL PAD

BASIN $A = 0.30$ (13K)

ROOFS = 0.07 (3K) DMA ID
[2487]

PAVEMENT = 0.05 (2K) [2488]

LANDSCAPE = 0.18 (8K) [2489]

SCENARIO 1 $\rightarrow$ TYPE D SOIL & BIORETENTION

$\hookrightarrow A = 390.7$ SF BMP 1

$V_1 = 325.8$ FT³

$V_2 = 234.4$ FT³

$O = 0.4$ in

SCENARIO 2 $\rightarrow$ TYPE C SOIL w/ BIORET.

$\hookrightarrow A = 661$

$V_1 = 551$

$V_2 = 398$

$O = 0.4$

SCENARIO 3 $\rightarrow$ TYPE B SOIL w/ BIO-RET.

$\hookrightarrow A = 450$

$V_1 = 376$

$V_2 = N/A$

$O = 0.3$

Project Summary

Project Name	West Lilac Farms - TM 5276
Project Applicant	Jim Pardee, Jr.
Jurisdiction	County of San Diego
Parcel (APN)	127-271-28, 127-290-05
Hydrologic Unit	San Luis Rey

Compliance Basin Summary

Basin Name:	Building Pad Area (SMALL)
Receiving Water:	
Rainfall Basin	Oceanside
Mean Annual Precipitation (inches)	13.3
Project Basin Area (acres):	0.30
Watershed Area (acres):	0.30
SCCWRP Lateral Channel Susceptibility (H, M, L):	
SCCWRP Vertical Channel Susceptibility (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

Drainage Management Area Summary

ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
2487	Drains to LID	BMP 1	Roofs - Small	0.0	Pervious (Pre)	Roofs	Type B (moderate infiltration)	Steep (greater 10%)
2488	Drains to LID	BMP 1	Pavement - small	0.0	Pervious (Pre)	Concrete or asphalt	Type B (moderate infiltration)	Steep (greater 10%)
2489	Drains to LID	BMP 1	Landscape - small	0.1	Pervious (Pre)	Landscaping	Type B (moderate infiltration)	Steep (greater 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (Inch)
BMP 1	Bioretention	Bioretention for small pad	450	375	0.00	0.005	0.3

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Compliance Basin Summary

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Receiving Water:	
Rainfall Basin	Oceanside
Mean Annual Precipitation (inches)	13.3
Project Basin Area (acres):	0.30
Watershed Area (acres):	0.30
SCCWRP Lateral Channel Susceptibility (H, M, L):	
SCCWRP Vertical Channel Susceptibility (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

Drainage Management Area Summary

ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
2487	Drains to LID	BMP 1	Roofs - Small	0.0	Pervious (Pre)	Roofs	Type C (slow infiltration)	Steep (greater 10%)
2488	Drains to LID	BMP 1	Pavement - small	0.0	Pervious (Pre)	Concrete or asphalt	Type C (slow infiltration)	Steep (greater 10%)
2489	Drains to LID	BMP 1	Landscape - small	0.1	Pervious (Pre)	Landscaping	Type C (slow infiltration)	Steep (greater 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 1	Bioretention	Bioretention for small pad	661	551	396	0.006	0.4

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Hydrologic Unit	San Luis Rey

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Receiving Water:	
Rainfall Basin	Oceanside
Mean Annual Precipitation (inches)	13.3
Project Basin Area (acres):	0.30
Watershed Area (acres):	0.30
SCCWRP Lateral Channel Susceptibility (H, M, L):	
SCCWRP Vertical Channel Susceptibility (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

Drainage Management Area Summary

ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
2487	Drains to LID	BMP 1	Roofs - Small	0.0	Pervious (Pre)	Roofs	Type D (high runoff - clay sol...	Steep (greater 10%)
2488	Drains to LID	BMP 1	Pavement - small	0.0	Pervious (Pre)	Concrete or asphalt	Type D (high runoff - clay sol...	Steep (greater 10%)
2489	Drains to LID	BMP 1	Landscape - small	0.1	Pervious (Pre)	Landscaping	Type D (high runoff - clay sol...	Steep (greater 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 1	Bioretention	Bioretention for small pad	390	325	234	0.007	0.4

MEDIUM PAD

$$\text{BASIN } A = 0.44 (19,000 \text{ SF})$$

$$\text{ROOFS} = 0.15 (6,500 \text{ SF}) [2496]$$

$$\text{PAVEMENT} = 0.12 (5,000 \text{ SF}) [2497]$$

$$\text{LANDSCAPE} = 0.17 (7,500 \text{ SF}) [2498]$$

SCENARIO 1 $\rightarrow$ TYPE D w/ BIO RET.

$$\hookrightarrow A = 812 \text{ SF} \quad \text{BMP 3}$$

$$V_1 = 677 \text{ FT}^3$$

$$V_2 = 487 \text{ FT}^3$$

$$D = 0.5 \text{ in}$$

SCENARIO 2 $\rightarrow$ TYPE C SOIL w/ BIO RET.

$$\hookrightarrow A = 1375$$

$$V_1 = 1146$$

$$V_2 = 825$$

$$D = 0.5$$

SCENARIO 3 $\rightarrow$ TYPE B SOIL w/ BIO RET.

$$\hookrightarrow A = 937$$

$$V_1 = 781$$

$$V_2 = \text{N/A}$$

$$D = 0.5$$

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Compliance Basin Summary

Basin Name:	Building Pad Area (MEDIUM)
Receiving Water:	
Rainfall Basin	Oceanside
Mean Annual Precipitation (inches)	13.3
Project Basin Area (acres):	0.44
Watershed Area (acres):	0.44
SCCWRP Lateral Channel Susceptibility (H, M, L):	
SCCWRP Vertical Channel Susceptibility (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

Drainage Management Area Summary

ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
2496	Drains to LID	BMP 3	Roofs (Medium)	0.1	Pervious (Pre)	Roofs	Type B (moderate infiltration)	Steep (greater 10%)
2497	Drains to LID	BMP 3	Pavement (Medium)	0.1	Pervious (Pre)	Concrete or asphalt	Type B (moderate infiltration)	Steep (greater 10%)
2498	Drains to LID	BMP 3	Landscape (Medium)	0.1	Pervious (Pre)	Landscaping	Type B (moderate infiltration)	Steep (greater 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 3	Bioretention	Bioretention for Medium Pad	937	781	0.00	0.009	0.5

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Rainfall Basin	Oceanside
Mean Annual Precipitation (inches)	13.3
Project Basin Area (acres):	0.44
Watershed Area (acres):	0.44
SCCWRP Lateral Channel Susceptibility (H, M, L):	
SCCWRP Vertical Channel Susceptibility (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

Drainage Management Area Summary

ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
2496	Drains to LID	BMP 3	Roofs (Medium)	0.1	Pervious (Pre)	Roofs	Type D (high runoff - clay sol...	Steep (greater 10%)
2497	Drains to LID	BMP 3	Pavement (Medium)	0.1	Pervious (Pre)	Concrete or asphalt	Type D (high runoff - clay sol...	Steep (greater 10%)
2498	Drains to LID	BMP 3	Landscape (Medium)	0.1	Pervious (Pre)	Landscaping	Type D (high runoff - clay sol...	Steep (greater 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 3	Bioretention	Bioretention for Medium Pad	812	677	487	0.010	0.5

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Overall Channel Susceptibility (H, M, L):	HIGH
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Drainage Management Area Summary

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2496	Drains to LID	BMP 3	Roofs (Medium)	0.1	Pervious (Pre)	Roofs	Type C (slow infiltration)	Steep (greater 10%)
2497	Drains to LID	BMP 3	Pavement (Medium)	0.1	Pervious (Pre)	Concrete or asphalt	Type C (slow infiltration)	Steep (greater 10%)
2498	Drains to LID	BMP 3	Landscape (Medium)	0.1	Pervious (Pre)	Landscaping	Type C (slow infiltration)	Steep (greater 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 3	Bioretention	Bioretention for Medium Pad	1375	1146	825	0.009	0.5

LARGE PAD

BASIN $A = 0.57$ acres (25K SF)

ROOFS = 0.23 (10K) [1819]

PAVEMENT = 0.18 (8K) [1820]

LANDSCAPE = 0.16 (7K) [2477]

SCENARIO 1 $\rightarrow$ TYPE D SOIL w/ BIORETENTION
BMP 2

$\hookrightarrow A = 1,206$ SF

$V_1 = 1,006$ ~~FT~~³

$V_2 = 724$ FT³

$D = 0.6$ in

SCENARIO 2 $\rightarrow$ TYPE C SOIL w/ BIORETENTION

$\hookrightarrow A = 2,041$

$V_1 = 1,701$

$V_2 = 1,225$

$D = 0.5$ in

SCENARIO 3 $\rightarrow$ TYPE B SOIL w/ BIO RET.

$\hookrightarrow A = 1391.7$

$V_1 = 1159.8$

$D = 0.5$ in

Project Summary

Project Name	West Lilac Farms - TM 5276
Project Applicant	Jim Pardee, Jr.
Jurisdiction	County of San Diego
Parcel (APN)	127-271-28, 127-290-05
Hydrologic Unit	San Luis Rey

Compliance Basin Summary

Basin Name:	Building Pad Area (LARGE)
Receiving Water:	PAD DAYLIGHT
Rainfall Basin	Oceanside
Mean Annual Precipitation (Inches)	13.3
Project Basin Area (acres):	0.57
Watershed Area (acres):	0.57
SCCWRP Lateral Channel Susceptibility (H, M, L):	
SCCWRP Vertical Channel Susceptibility (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

Drainage Management Area Summary

ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
1819	Drains to LID	BMP 2	Roof(s) - LARGE	0.2	Pervious (Pre)	Roofs	Type B (moderate infiltration)	Steep (greater 10%)
1820	Drains to LID	BMP 2	Pavement - LARGE	0.1	Pervious (Pre)	Concrete or asphalt	Type B (moderate infiltration)	Steep (greater 10%)
2477	Drains to LID	BMP 2	Landscape - Large	0.1	Pervious (Pre)	Landscaping	Type B (moderate infiltration)	Steep (greater 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (Inch)
BMP 2	Bioretention	LARGE BIORETENTION	1391	1159	0.00	0.010	0.5

Project Summary

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Compliance Basin Summary

Basin Name:	Building Pad Area (LARGE)
Receiving Water:	PAD DAYLIGHT
Rainfall Basin	Oceanside
Mean Annual Precipitation (inches)	13.3
Project Basin Area (acres):	0.57
Watershed Area (acres):	0.57
SCCWRP Lateral Channel Susceptibility (H, M, L):	
SCCWRP Vertical Channel Susceptibility (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

Drainage Management Area Summary

ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
1819	Drains to LID	BMP 2	Roof(s) - LARGE	0.2	Pervious (Pre)	Roofs	Type C (slow infiltration)	Steep (greater 10%)
1820	Drains to LID	BMP 2	Pavement - LARGE	0.1	Pervious (Pre)	Concrete or asphalt	Type C (slow infiltration)	Steep (greater 10%)
2477	Drains to LID	BMP 2	Landscape - Large	0.1	Pervious (Pre)	Landscaping	Type C (slow infiltration)	Steep (greater 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 2	Bioretention	LARGE BIORETENTION	2041	1701	1224	0.012	0.5

Project Summary

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Project Applicant	Jim Pardee, Jr.
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Parcel (APN)	127-271-28, 127-290-05
Hydrologic Unit	San Luis Rey

Compliance Basin Summary

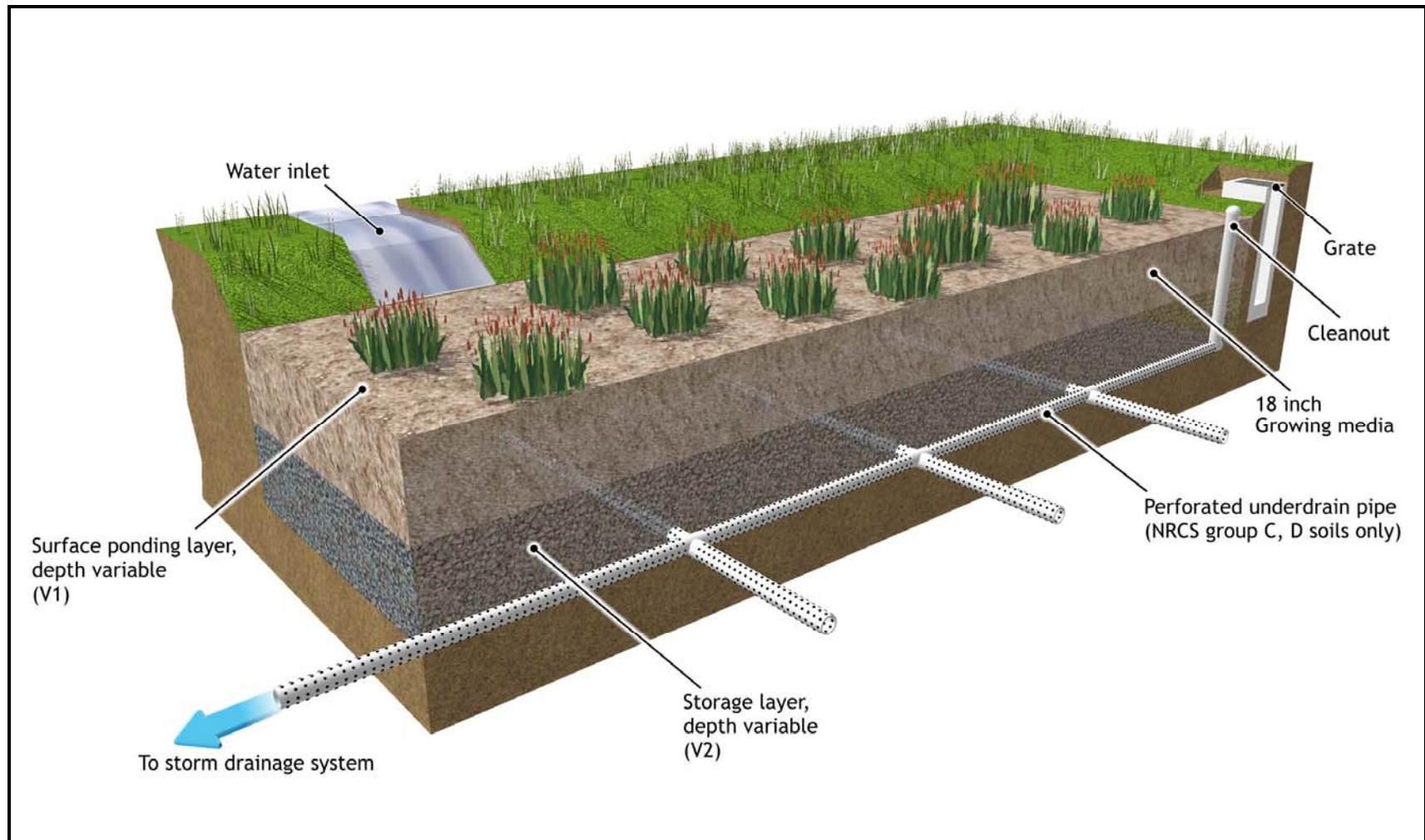
Basin Name:	Building Pad Area (LARGE)
Receiving Water:	PAD DAYLIGHT
Rainfall Basin	Oceanside
Mean Annual Precipitation (inches)	13.3
Project Basin Area (acres):	0.57
Watershed Area (acres):	0.57
SCCWRP Lateral Channel Susceptibility (H, M, L):	
SCCWRP Vertical Channel Susceptibility (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

Drainage Management Area Summary

ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
1819	Drains to LID	BMP 2	Roof(s) - LARGE	0.2	Pervious (Pre)	Roofs	Type D (high runoff - clay soi...	Steep (greater 10%)
1820	Drains to LID	BMP 2	Pavement - LARGE	0.1	Pervious (Pre)	Concrete or asphalt	Type D (high runoff - clay soi...	Steep (greater 10%)
2477	Drains to LID	BMP 2	Landscape - Large	0.1	Pervious (Pre)	Landscaping	Type D (high runoff - clay soi...	Steep (greater 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (Inch)
BMP 2	Bioretention	LARGE BIORETENTION	1206	1005	723	0.013	0.6



Bioretention Area Exhibit (typical)