



The City of San Diego

**PRIORITY DEVELOPMENT PROJECT (PDP)  
STORM WATER QUALITY MANAGEMENT  
PLAN (SWQMP) FOR**

University Manor, LLC

Insert Permit Application Numbers

Drawing Number (If Applicable) & Internal Order Number (If Applicable)

**ENGINEER OF WORK:**

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John Cruikshank, C50792  
Provide Wet Signature and Stamp Above Line

**PREPARED FOR:**

Mr. Lutfi Bustami  
8051 Main Street  
Stanton, CA 90680  
714-828-4882



**PREPARED BY:**

---

JMC^2  
411 N. Harbor Blvd., Ste. 201  
San Pedro, CA 90731  
310-241-6550

**DATE:**

May 16, 2018

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Approved by: City of San Diego

Date

**Project Name: University Manor, LLC**

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**Project Name: University Manor, LLC**

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## **ACRONYMS**

APN	Assessor's Parcel Number
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CGP	Construction General Permit
DCV	Design Capture Volume
DMA	Drainage Management Areas
ESA	Environmentally Sensitive Area
GLU	Geomorphic Landscape Unit
GW	Ground Water
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
HU	Harvest and Use
INF	Infiltration
LID	Low Impact Development
LUP	Linear Underground/Overhead Projects
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
POC	Pollutant of Concern
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollutant Protection Plan
SWQMP	Storm Water Quality Management Plan
TMDL	Total Maximum Daily Load
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Program
WQIP	Water Quality Improvement Plan

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### **CERTIFICATION PAGE**

**Project Name:** University Manor, LLC

**Permit Application Number:** Insert Permit Application Number

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Standards. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable source control and site design BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by the City Engineer is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

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Engineer of Work's Signature, PE Number & Expiration Date

John Cruikshank

---

Print Name

JMC^2

---

Company

March 09, 2018

---

Date



Engineer's Stamp

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PDP SWQMP Template Date: January, 2016

PDP SWQMP Submittal Date: Insert Date

**Project Name: University Manor, LLC**

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**Project Name: University Manor, LLC**

### SUBMITTAL RECORD

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In last column indicate changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments.

Submittal Number	Date	Project Status	Changes
1	7/18/16	<input checked="" type="radio"/> Preliminary Design/Planning/CEQA <input type="radio"/> Final Design	Initial Submittal
2	Enter a date.	<input type="radio"/> Preliminary Design/Planning/CEQA <input checked="" type="radio"/> Final Design	Click here to enter text.
3	Enter a date.	<input type="radio"/> Preliminary Design/Planning/CEQA <input checked="" type="radio"/> Final Design	Click here to enter text.
4	Enter a date.	<input type="radio"/> Preliminary Design/Planning/CEQA <input checked="" type="radio"/> Final Design	Click here to enter text.



**Project Name: University Manor, LLC**

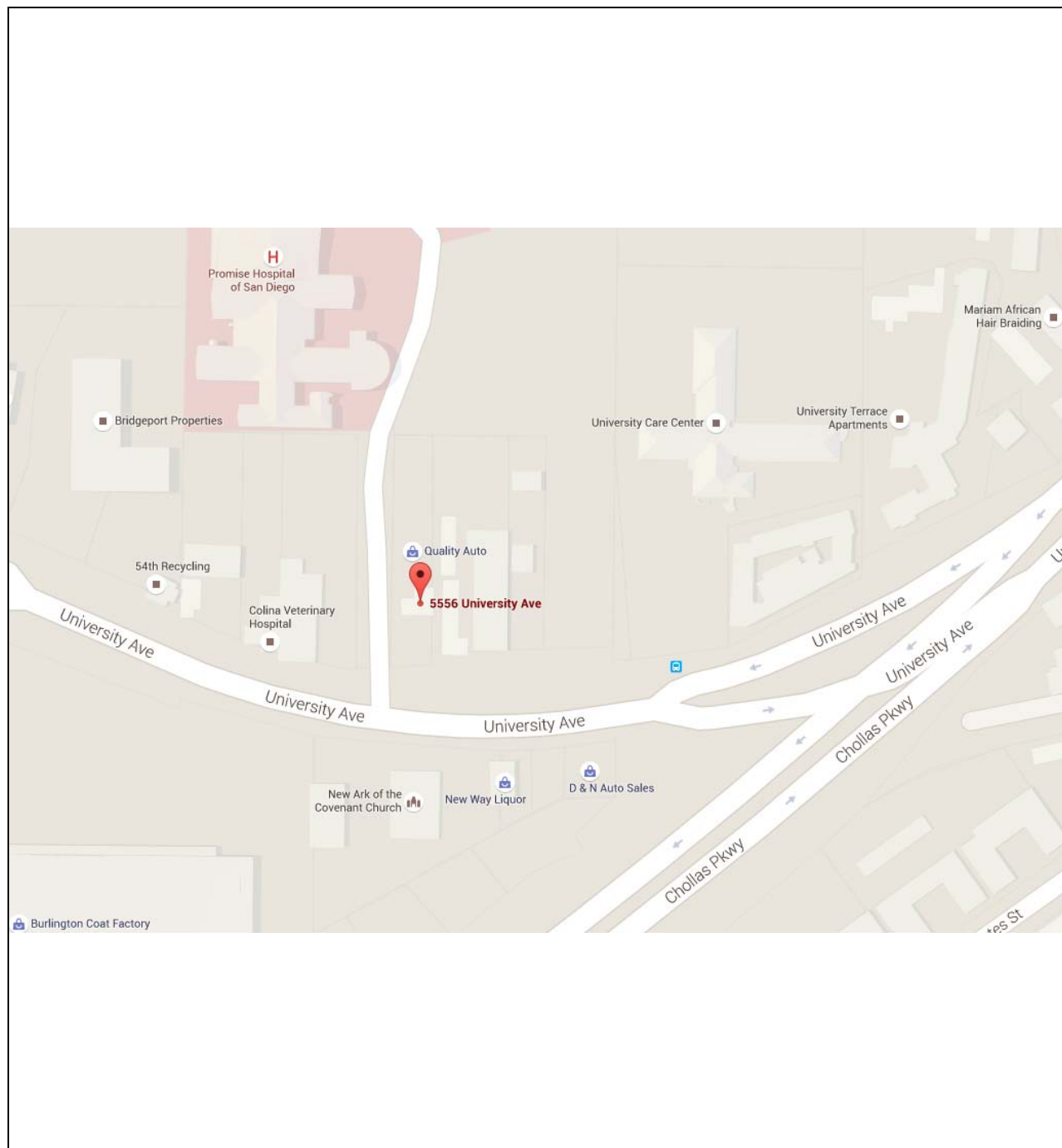
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**Project Name:** University Manor, LLC

## PROJECT VICINITY MAP

**Project Name:** University Manor, LLC


**Permit Application Number:** Insert Application Number.



**Project Name: University Manor, LLC**

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Project Name: University Manor, LLC

 THE CITY OF SAN DIEGO	City of San Diego Development Services 1222 First Ave., MD-302 San Diego, CA 92101 (619) 446-5000	<b>Storm Water Requirements Applicability Checklist</b>	<b>FORM DS-560</b> February 2016
Project Address: 5556-5592 University Avenue San Diego, CA 92105		Project Number <i>(for the City Use Only)</i> : Click here to enter project number	
<b>SECTION 1. Construction Storm Water BMP Requirements:</b> All construction sites are required to implement construction BMPs in accordance with the performance standards in the <u>Storm Water Standards Manual</u> . Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP) <sup>1</sup> , which is administrated by the State Water Resources Control Board.			
<b>For all projects complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.</b>			
<b>PART A: Determine Construction Phase Storm Water Requirements.</b>			
1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with construction activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)  <input checked="" type="radio"/> Yes; SWPPP required, skip questions 2-4 <input type="radio"/> No; next question			
2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity that results in ground disturbance and contact with storm water runoff?  <input checked="" type="radio"/> Yes; WPCP required, skip questions 3-4 <input type="radio"/> No; next question			
3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (projects such as pipeline/utility replacement)  <input checked="" type="radio"/> Yes; WPCP required, skip questions 4 <input type="radio"/> No; next question			
4. Does the project only include the following Permit types listed below? <ul style="list-style-type: none"><li>• Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.</li><li>• Individual Right of Way Permits that exclusively include one of the following activities and associated curb/sidewalk repair: water services, sewer lateral, storm drain lateral, or dry utility service.</li><li>• Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, curb and gutter replacement, and retaining wall encroachments.</li></ul> <input type="checkbox"/> Yes; no document required			
Check one of the boxes to the right, and continue to PART B:  <input type="checkbox"/> If you checked "Yes" for question 1, <b>a SWPPP is REQUIRED. Continue to PART B</b>  <input type="checkbox"/> If you checked "No" for question 1, and checked "Yes" for question 2 or 3, <b>a WPCP is REQUIRED.</b> If the project processes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. <b>Continue to PART B.</b>  <input type="checkbox"/> If you checked "No" for all question 1-3, and checked "Yes" for question 4 <b>PART B does not apply and no document is required. Continue to Section 2.</b>  More information on the City's construction BMP requirements as well as CGP requirements can be found at: <a href="http://www.sandiego.gov/stormwater/regulations/swguide/constructing.shtml">www.sandiego.gov/stormwater/regulations/swguide/constructing.shtml</a>			

PDP SWQMP Template Date: January, 2016

PDP SWQMP Submittal Date: Insert Date

<b>Page 2 of 4 City of San Diego • Development Services Department • Storm Water Requirements Applicability Checklist</b>	
<p><b>PART B: Determine Construction Site Priority.</b></p> <p>This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk. Determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. <b>NOTE:</b> The construction priority does <b>NOT</b> change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.</p>	
<p><b>Complete PART B and continued to Section 2</b></p> <p>1. <input type="checkbox"/> <b>ASBS</b></p> <p>a. Projects located in the ASBS watershed. A map of the ASBS watershed can be found here &lt;placeholder for ASBS map link&gt;</p>	
<p>2. <input type="checkbox"/> <b>High Priority</b></p> <p>a. Projects 1 acre or more determined to be Risk Level 2 or Risk Level 3 per the Construction General Permit and not located in the ASBS watershed.</p> <p>b. Projects 1 acre or more determined to be LUP Type 2 or LUP Type 3 per the Construction General Permit and not located in the ASBS watershed.</p>	
<p>3. <input type="checkbox"/> <b>Medium Priority</b></p> <p>a. Projects 1 acre or more but not subject to an ASBS or high priority designation.</p> <p>b. Projects determined to be Risk Level 1 or LUP Type 1 per the Construction General Permit and not located in the ASBS watershed.</p>	
<p>4. <input checked="" type="checkbox"/> <b>Low Priority</b></p> <p>a. Projects not subject to ASBS, high or medium priority designation.</p>	
<p><b>SECTION 2. Permanent Storm Water BMP Requirements.</b></p> <p>Additional information for determining the requirements is found in the <a href="#">Storm Water Standards Manual</a>.</p> <p><b>PART C: Determine if Not Subject to Permanent Storm Water Requirements.</b></p> <p>Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the <a href="#">Storm Water Standards Manual</a> are not subject to Permanent Storm Water BMPs.</p> <p><b>If "yes" is checked for any number in Part C, proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".</b></p> <p><b>If "no" is checked for all of the numbers in Part C continue to Part D.</b></p>	
1. Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?	<input type="radio"/> Yes <input type="radio"/> No
2. Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?	<input type="radio"/> Yes <input type="radio"/> No
3. Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).	<input type="radio"/> Yes <input type="radio"/> No

City of San Diego • Development Services Department • Storm Water Requirements Applicability Checklist		Page 3 of 4
<b>PART D: PDP Exempt Requirements.</b>  PDP Exempt projects are required to implement site design and source control BMPs.  If “yes” was checked for any questions in Part D, continue to Part F and check the box labeled “PDP Exempt.” If “no” was checked for all questions in Part D, continue to Part E.		
1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that: <ul style="list-style-type: none"> <li>• Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;</li> <li>• Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;</li> <li>• Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?</li> </ul> <div> <input checked="" type="radio"/> Yes; PDP exempt requirements apply               <input type="radio"/> No; next question             </div>		
2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the <a href="#">City's Storm Water Standards Manual</a> ? <div> <input checked="" type="radio"/> Yes; PDP exempt requirements apply               <input type="radio"/> No; PDP not exempt. PDP requirements apply.             </div>		
<b>PART E: Determine if Project is a Priority Development Project (PDP).</b> Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).  If “yes” is checked for any number in PART E, continue to PART F and check the box labeled “Priority Development Project”. If “no” is checked for every number in PART E, continue to PART F and check the box labeled “Standard Project”.		
1. <b>New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.</b> This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.		<input type="radio"/> Yes <input checked="" type="radio"/> No
2. <b>Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces.</b> This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.		<input type="radio"/> Yes <input checked="" type="radio"/> No
3. <b>New development or redevelopment of a restaurant.</b> Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface.		<input checked="" type="radio"/> Yes <input type="radio"/> No
4. <b>New development or redevelopment on a hillside.</b> The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater.		<input type="radio"/> Yes <input checked="" type="radio"/> No

Project Name: University Manor, LLC

Page 4 of 4 City of San Diego • Development Services Department • Storm Water Requirements Applicability Checklist	
5. New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	<input checked="" type="radio"/> Yes <input type="radio"/> No
6. New development or redevelopment of streets, roads, highways, freeways, and driveways. The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	<input checked="" type="radio"/> Yes <input type="radio"/> No
7. New development or redevelopment discharging directly to an Environmentally Sensitive Area. The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging- directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).	<input checked="" type="radio"/> Yes <input type="radio"/> No
8. New development or redevelopment projects of a retail gasoline outlet that creates and/or replaces 5,000 square feet of impervious surface. The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic of 100 or more vehicles per day.	<input checked="" type="radio"/> Yes <input type="radio"/> No
9. New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces. Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.	<input checked="" type="radio"/> Yes <input type="radio"/> No
10. Other Pollutant Generating Project. The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces or if they sheet flow to surrounding pervious surfaces.	<input checked="" type="radio"/> Yes <input type="radio"/> No
<b>PART F: Select the appropriate category based on the outcomes of PART C through PART E.</b>	
1. The project is <b>NOT SUBJECT TO STORM WATER REQUIREMENTS</b> .	<input type="checkbox"/>
2. The project is a <b>STANDARD PROJECT</b> . Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance.	<input type="checkbox"/>
3. The project is <b>PDP EXEMPT</b> . Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance.	<input type="checkbox"/>
4. The project is a <b>PRIORITY DEVELOPMENT PROJECT</b> . Site design, source control, and structural pollutant control BMP requirements apply. See the <a href="#">Storm Water Standards Manual</a> for guidance on determining if project requires hydromodification management.	<input type="checkbox"/>
Name of Owner or Agent ( <i>Please Print</i> ): John Cruikshank	Title: Project Civil Engineer
Signature:	Date: July 13, 2016

**Project Name: University Manor, LLC**

Applicability of Permanent, Post-Construction Storm Water BMP Requirements (Storm Water Intake Form for all Development Permit Applications)		Form I-1
Project Identification		
Project Name: University Manor, LLC		
Permit Application Number: Insert Application Number.		Date: 7/13/16
Determination of Requirements		
<p>The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short <u>summary</u> of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.</p> <p>Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop". Refer to Part 1 of Storm Water Standards sections and/or separate forms referenced in each step below.</p>		
Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	<input checked="" type="radio"/> Yes	Go to Step 2.
	<input type="radio"/> No	Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
<p>Discussion / justification if the project is <u>not</u> a "development project" (e.g., the project includes <u>only</u> interior remodels within an existing building):</p> <p>Click or tap here to enter text.</p>		
Step 2: Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, see Section 1.4 of the BMP Design Manual (Part 1 of Storm Water Standards) <u>in its entirety</u> for guidance, AND complete Storm Water Requirements Applicability Checklist.	<input type="radio"/> Standard Project	Stop. Standard Project requirements apply.
	<input checked="" type="radio"/> PDP	PDP requirements apply, including PDP SWQMP. Go to Step 3.
	<input type="radio"/> PDP Exempt	Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below.
<p>Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:</p> <p>Click or tap here to enter text.</p>		



Form I-1 Page 2		
Step	Answer	Progression
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	<input type="radio"/> Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to Step 4.
	<input checked="" type="radio"/> No	BMP Design Manual PDP requirements apply. Go to Step 4.
Discussion / justification of prior lawful approval, and identify requirements ( <u>not</u> required if prior lawful approval does not apply): Click or tap here to enter text.		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	<input type="radio"/> Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to Step 5.
	<input checked="" type="radio"/> No	Stop. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do <u>not</u> apply:  <b>The project is non-exempt from Hydromodification because a portion of channel is earthen but we provide the BMP which will capture and infiltrate the runoff to underground cistern and release an equal or less amount of water than the existing condition. Therefore the project should be exempt from Hydromodification.</b>		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	<input type="radio"/> Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). Stop.
	<input checked="" type="radio"/> No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop.
Discussion / justification if protection of critical coarse sediment yield areas does <u>not</u> apply: Click or tap here to enter text.  <b>The project is not located in the critical coarse sediment yield areas. See attached Critical Coarse Sediment Yield Areas Exhibit.</b>		



**Legend**

**PCCSY Areas**

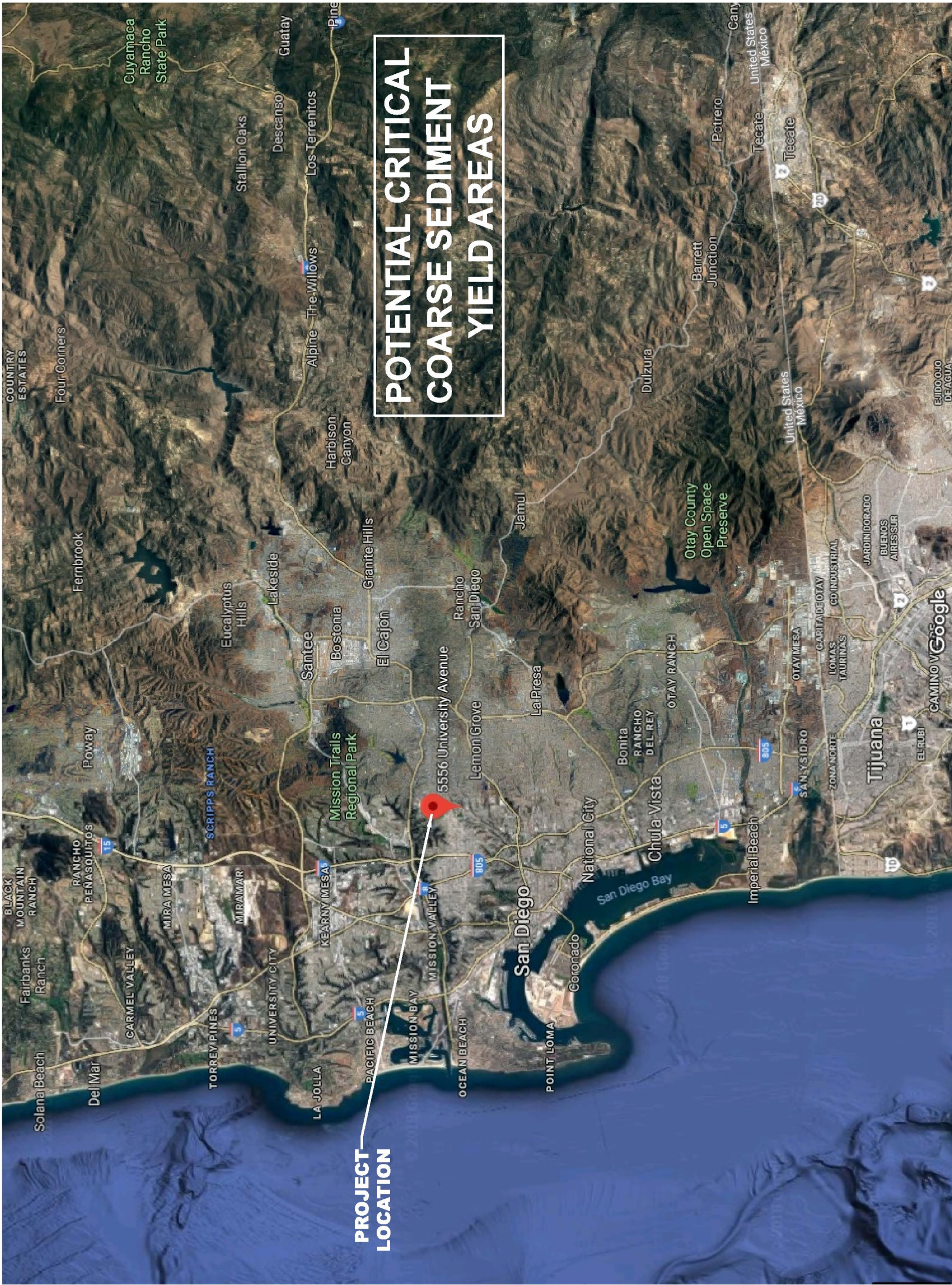
- ☐ No
- ☒ Yes

**FEMA NFHL**

- ☒ 100-YR Floodway
- ☒ 100-YR Floodplain
- ☒ 500-YR Floodplain

CCSA Exhibit

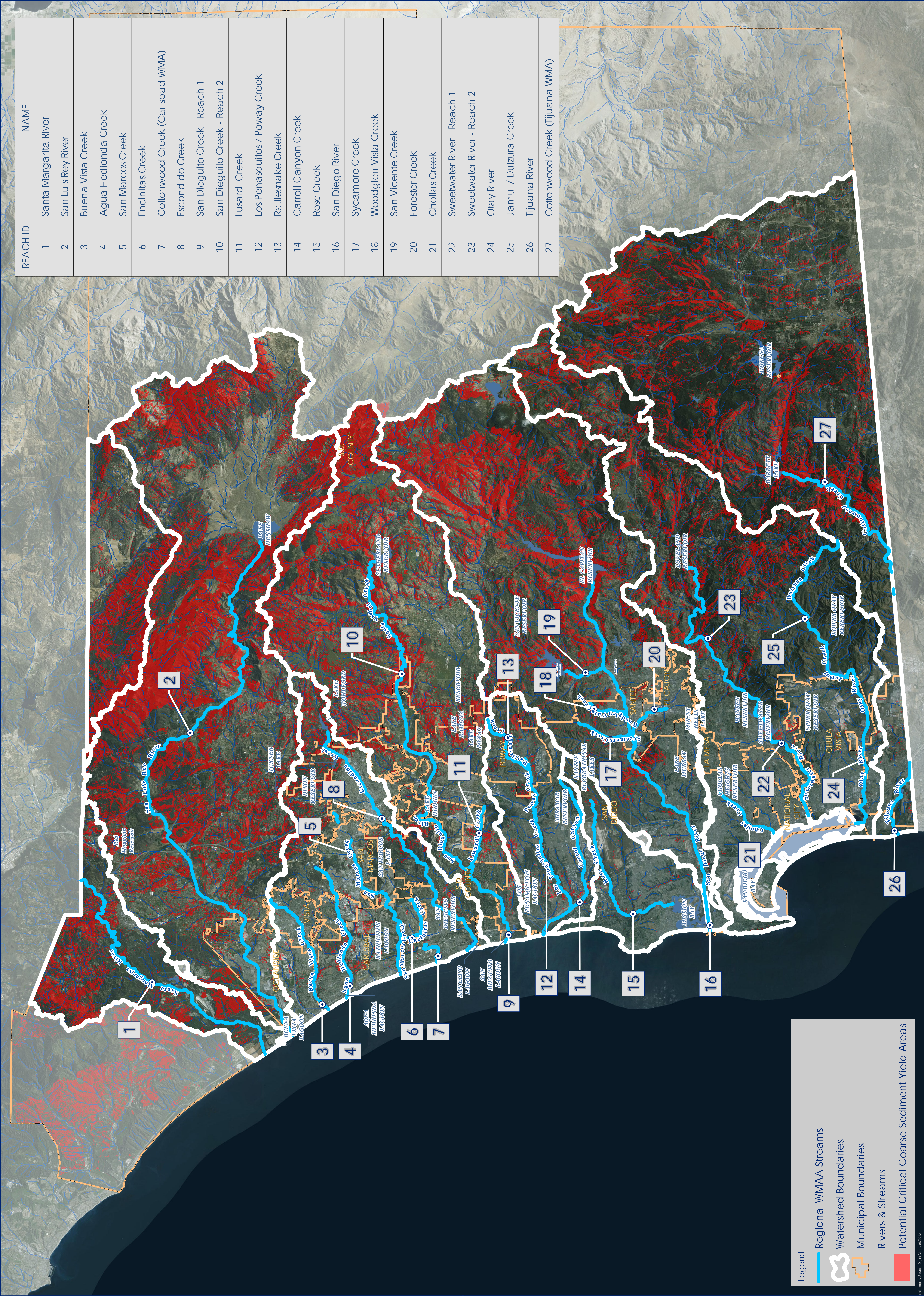




PLANS PREPARED BY  
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UNIVERSITY AVENUE MIXED USE 3556-3592 E. UNIVERSITY AVE. SAN DIEGO, CA 92103
CRITICAL COARSE SEDIMENT YIELD AREAS





REACH ID	NAME
1	Santa Margarita River
2	San Luis Rey River
3	Buena Vista Creek
4	Agua Hedionda Creek
5	San Marcos Creek
6	Encinitas Creek
7	Cottonwood Creek (Carlsbad WMA)
8	Escondido Creek
9	San Dieguito Creek - Reach 1
10	San Dieguito Creek - Reach 2
11	Lusardi Creek
12	Los Penasquitos / Poway Creek
13	Rattlesnake Creek
14	Carroll Canyon Creek
15	Rose Creek
16	San Diego River
17	Sycamore Creek
18	Woodglen Vista Creek
19	San Vicente Creek
20	Forester Creek
21	Chollas Creek
22	Sweetwater River - Reach 1
23	Sweetwater River - Reach 2
24	Otay River
25	Jamul / Dulzura Creek
26	Tijuana River
27	Cottonwood Creek (Tijuana WMA)

Legend

Regional WMAA Streams

Watershed Boundaries

Municipal Boundaries

Rivers & Streams

Potential Critical Coarse Sediment Yield Areas

# Potential Critical Coarse Sediment Yield Areas

## Regional San Diego County Watersheds

Exhibit Date: Sept. 8, 2014





PLANS PREPARED BY  
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 4111 N. Harbor Blvd., Suite 201  
 San Pedro, CA 90731  
 P: 310.241.6650 / F: 310.833.6655  
 www.jmc2.com

**LEGEND:**  
 9156-D CHANNEL  
 DRAWING NUMBER  
 STORM DRAIN TYPE

**UNIVERSITY AVENUE MIXED USE**  
 5556-5592 E. UNIVERSITY AVE.  
 SAN DIEGO, CA 92105

**HYDROMODIFICATION EXHIBIT**



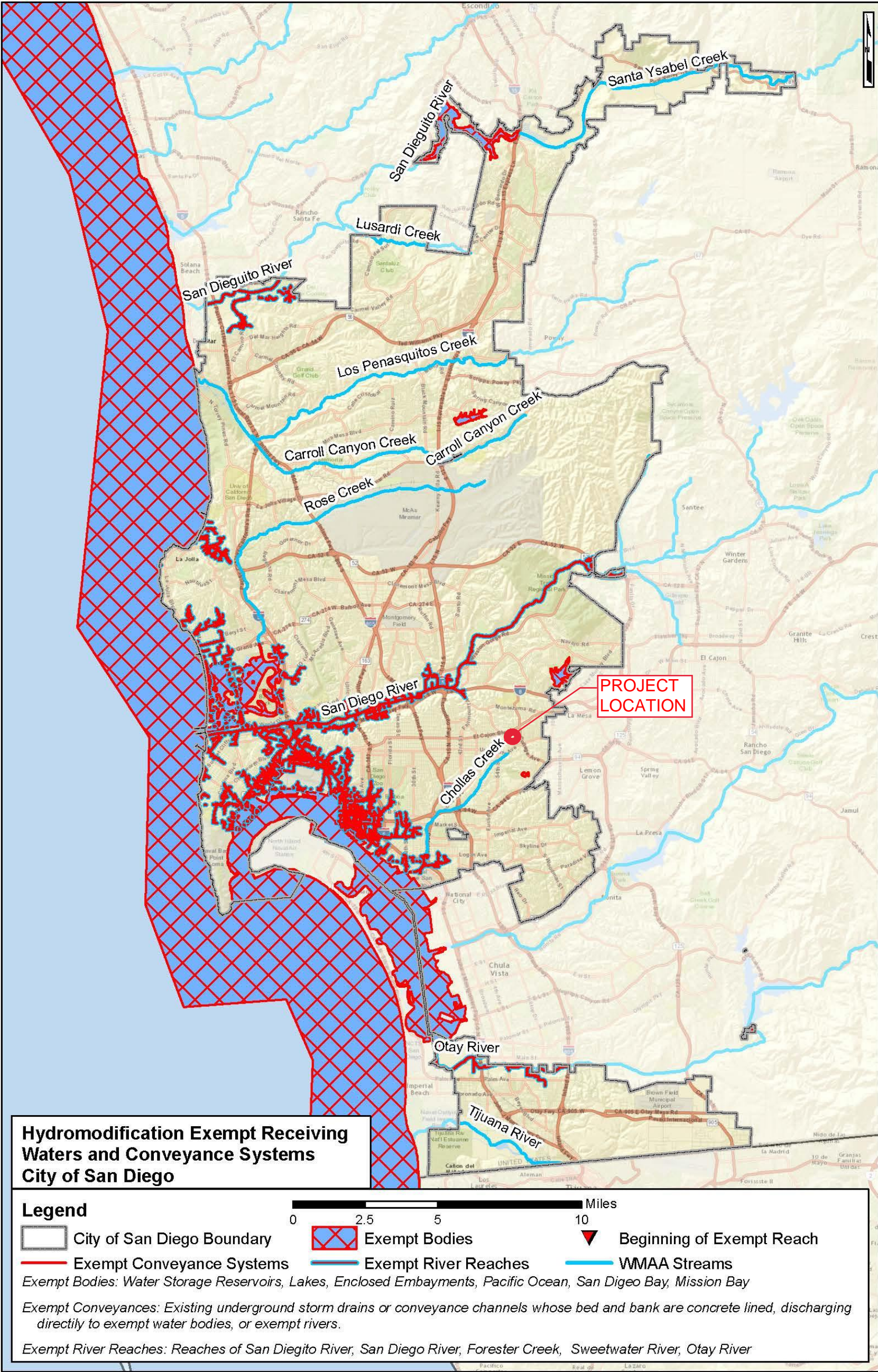


Figure H-G.2-2 Hydromodification Exempt Areas



**Project Name: University Manor, LLC**

Site Information Checklist For PDPs		Form I-3B
Project Summary Information		
Project Name	University Manor, LLC	
Project Address	5556-5592 University Avenue	
Assessor's Parcel Number(s) (APN(s))	472-410-05, 472-410-12, and 472-410-13	
Permit Application Number	Click here to enter text.	
Project Watershed	Select One: <input checked="" type="radio"/> San Dieguito River <input type="radio"/> Penasquitos <input type="radio"/> Mission Bay <input type="radio"/> San Diego River <input type="radio"/> San Diego Bay <input type="radio"/> Tijuana River	
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	908.20	
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	<b>1.51 Acres (Square Feet)</b>	
Area to be disturbed by the project (Project Footprint)	<b>1.51 Acres (Square Feet)</b>	
Project Proposed Impervious Area (subset of Project Footprint)	<b>1.22 Acres (Square Feet)</b>	
Project Proposed Pervious Area (subset of Project Footprint)	<b>0.29 Acres (Square Feet)</b>	
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.		
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition.	<b>10% increase in impervious area</b>	

Form I-3B Page 2 of 11
Description of Existing Site Condition and Drainage Patterns
<p>Current Status of the Site (select all that apply):</p> <p><input checked="" type="checkbox"/> Existing development</p> <p><input type="checkbox"/> Previously graded but not built out</p> <p><input type="checkbox"/> Agricultural or other non-impervious use</p> <p><input type="checkbox"/> Vacant, undeveloped/natural</p> <p>Description / Additional Information:</p> <p><b>The property consisted of a residential lot with two one-story units on the north and a commercial lot consisting of abandoned warehouse/workshop.</b></p>
<p>Existing Land Cover Includes (select all that apply):</p> <p><input checked="" type="checkbox"/> Vegetative Cover</p> <p><input checked="" type="checkbox"/> Non-Vegetated Pervious Areas</p> <p><input checked="" type="checkbox"/> Impervious Areas</p> <p>Description / Additional Information:</p> <p>Click or tap here to enter text.</p>
<p>Underlying Soil belongs to Hydrologic Soil Group (select all that apply):</p> <p><input type="checkbox"/> NRCS Type A</p> <p><input type="checkbox"/> NRCS Type B</p> <p><input type="checkbox"/> NRCS Type C</p> <p><input checked="" type="checkbox"/> NRCS Type D</p>
<p>Approximate Depth to Groundwater (GW):</p> <p><input checked="" type="radio"/> GW Depth &lt; 5 feet</p> <p><input type="radio"/> 5 feet &lt; GW Depth &lt; 10 feet</p> <p><input type="radio"/> 10 feet &lt; GW Depth &lt; 20 feet</p> <p><input type="radio"/> GW Depth &gt; 20 feet</p>
<p>Existing Natural Hydrologic Features (select all that apply):</p> <p><input type="checkbox"/> Watercourses</p> <p><input type="checkbox"/> Seeps</p> <p><input type="checkbox"/> Springs</p> <p><input type="checkbox"/> Wetlands</p> <p><input checked="" type="checkbox"/> None</p> <p>Description / Additional Information:</p> <p>Click or tap here to enter text.</p>



Form I-3B Page 3 of 11
Description of Existing Site Topography and Drainage:
How is storm water runoff conveyed from the site? At a minimum, this description should answer: <ol style="list-style-type: none"><li>1. Whether existing drainage conveyance is natural or urban;</li><li>2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site;</li><li>3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels;</li><li>4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.</li></ol>
Description / Additional Information:
<b>OVERALL, THE PROJECT SITE HAS A MAXIMUM 2.3:1 GRADE FROM THE NORTH TO SOUTH PROPERTY LINE AND CONSISTS PRIMARILY OF URBAN HARDSCAPE FEATURES CONVEYING SITE STORMWATER SOUTHEAST TO A LARGE CATCH BASIN JUST EAST OF THE DRIVEWAY APPROACH IN UNIVERSITY AVENUE.</b>

Form I-3B Page 4 of 11
Description of Proposed Site Development and Drainage Patterns
<p>Project Description / Proposed Land Use and/or Activities:</p> <p><b>The proposed new development includes the addition/replacement of approximately 1.22 acres of impervious and 0.29 acres of pervious areas. The new development consists of commercial and residential spaces with parking and ADA access along with permeable landscaping.</b></p> <p><b>See DMA Exhibit for DMA identification area per Section 5.2 (Issue #122)</b></p> <p><b>Removed sheet WB-3 from the report. The provided BMP is considered Proprietary BMP. Our calculation is based on Worksheet B.4-1 of Infiltration BMPs. (Issue #123)</b></p> <p><b>Appendix E.15 INF-3 Permeable Pavement is not used in the project because it is prone to clogging. The sand and fine particles can block the space between the pavers and must be removed by vacuuming which requires high maintenance. (Issue #124)</b></p> <p><b>See attachment 3 for copy of manufacturer recommendations and certification. (Issue #127)</b></p>
<p>List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):</p> <p><b>The proposed impervious features of the project are commercial and residential buildings, driveways, parking lots and courtyards.</b></p>
<p>List/describe proposed pervious features of the project (e.g., landscape areas):</p> <p><b>The proposed pervious features includes landscape areas surrounding parking lots and courtyards, landscape at frontage of property and sidewalk.</b></p>
<p>Does the project include grading and changes to site topography?</p> <p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p>Description / Additional Information:</p> <p><b>The site will be graded to a maximum 2% grade for parking and ADA access.</b></p>

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☒ Yes

☐ No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural and constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Description / Additional Information:

**The site improvements to the area will consist of new multi-unit residential and commercial developments with an improved stormwater conveyance system consisting of new PVC piping routing all water captured from the 85th percentile storm event to an underground infiltration tank with an overflow line connecting directly to the existing catch basin in University Avenue located just east of the existing driveway approach. Post construction drainage patterns and conveyance systems will be maintained and appropriate LID BMP maintenance procedures must be followed. See drainage report with pre- and post-project discharge calculation.**

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):

- ☒ On-site storm drain inlets
- ☒ Interior floor drains and elevator shaft sump pumps
- ☐ Interior parking garages
- ☒ Need for future indoor & structural pest control
- ☒ Landscape/Outdoor Pesticide Use
- ☐ Pools, spas, ponds, decorative fountains, and other water features
- ☒ Food service
- ☒ Refuse areas
- ☐ Industrial processes
- ☒ Outdoor storage of equipment or materials
- ☒ Vehicle and Equipment Cleaning
- ☐ Vehicle/Equipment Repair and Maintenance
- ☐ Fuel Dispensing Areas
- ☒ Loading Docks
- ☒ Fire Sprinkler Test Water
- ☒ Miscellaneous Drain or Wash Water
- ☒ Plazas, sidewalks, and parking lots
- ☐ Large Trash Generating Facilities
- ☐ Animal Facilities
- ☐ Plant Nurseries and Garden Centers
- ☐ Automotive-related Uses

Description / Additional Information:

Click or tap here to enter text.

Form I-3B Page 7 of 11
Identification and Narrative of Receiving Water
<p>Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable)</p> <p><b>The watershed drainage consists of a group of relatively small local creeks and pipe conveyances, many of which are concrete-lined and drain directly into San Diego Bay. The creeks in the watershed are highly impacted by urban runoff, and Chollas Creek and the mouth of the creek in San Diego Bay are listed as 303(d)-impaired water bodies for various trace metals parameters and aquatic toxicity. Five sites in San Diego Bay that are impacted by runoff from the Pueblo San Diego watershed have been identified as hot spots by California's Bay Protection Toxic Cleanup Program.</b></p>
<p>Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations.</p> <p><b>The beneficial uses of the inland surface waters in the Pueblo San Diego watershed are limited to contact (potential use) and non-contact recreation, warm freshwater habitat, and wildlife habitat. The San Diego Bay receiving water supports an extensive array of beneficial uses.</b></p>
<p>Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations.</p> <p><b>Chollas Creek, Paleta Creek, and San Diego Bay</b></p>
<p>Provide distance from project outfall location to impaired or sensitive receiving waters.</p> <p><b>The project site at 5556-5592 University Avenue is approximately 2 miles from the San Diego Bay.</b></p>
<p>Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands</p> <p><b>Per table 143-01A of the San Diego municipal code, the site is not within an environmentally sensitive area and per Figure CE-2 of the San Diego General Plan, the site is at least 3 miles from a Multi-Habitat Planning Area.</b></p>

Form I-3B Page 8 of 11			
Identification of Receiving Water Pollutants of Concern			
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:			
303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs/ WQIP Highest Priority Pollutant	
Chollas Creek	copper, lead, zinc	copper, lead, zinc	
Chollas Creek	indicator bacteria	Click or tap here to enter text.	
San Diego Bay (near Chollas)	benthic community effects	Click or tap here to enter text.	
San Diego Bay (near Chollas)	sediment toxicity	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Identification of Project Site Pollutants*			
*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated)			
Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see BMP Design Manual (Part 1 of Storm Water Standards) Appendix B.6):			
Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heavy Metals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Organic Compounds	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trash & Debris	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oxygen Demanding Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oil & Grease	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bacteria & Viruses	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pesticides	<input type="checkbox"/>	<input checked="" type="checkbox"/> No	<input type="checkbox"/>

Form I-3B Page 9 of 11

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

- ☒ Yes, hydromodification management flow control structural BMPs required.
- ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
- ☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
- ☒ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

[Click or tap here to enter text.](#)

**See attached Attachment 2 for Hydromodification Calculation and Exhibit**

Critical Coarse Sediment Yield Areas\*

\*This Section only required if hydromodification management requirements apply

Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint?

- ☐ Yes
- ☒ No, No critical coarse sediment yield areas to be protected based on WMAA maps

Discussion / Additional Information:

[Click or tap here to enter text.](#)

**The project location is not located in the critical coarse sediment yield areas. See attached map following page 19.**

Form I-3B Page 10 of 11
<p>Flow Control for Post-Project Runoff*</p> <p>*This Section only required if hydromodification management requirements apply</p> <p>List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.</p> <p>Click or tap here to enter text.</p> <p><b>See Attachment 2 for Hydromodification Calculation and Exhibit (page 48) which described the location and type of stormwater runoff through existing underground storm drain, channel and directly to exempt water bodies.</b></p>
<p>Has a geomorphic assessment been performed for the receiving channel(s)?</p> <p><input checked="" type="checkbox"/> No, the low flow threshold is 0.1Q2 (default low flow threshold)</p> <p><input type="checkbox"/> Yes, the result is the low flow threshold is 0.1Q2</p> <p><input type="checkbox"/> Yes, the result is the low flow threshold is 0.3Q2</p> <p><input type="checkbox"/> Yes, the result is the low flow threshold is 0.5Q2</p> <p>If a geomorphic assessment has been performed, provide title, date, and preparer:</p> <p>Click or tap here to enter text.</p>
<p>Discussion / Additional Information: (optional)</p> <p>Click or tap here to enter text.</p>



Form I-3B Page 11 of 11

Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

**N/A**

Optional Additional Information or Continuation of Previous Sections As Needed

This space provided for additional information or continuation of information from previous sections as needed.

**N/A**

**Project Name: University Manor, LLC**

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Source Control BMP Checklist for All Development Projects		Form I-4	
Source Control BMPs			
All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist.			
Answer each category below pursuant to the following.			
<ul style="list-style-type: none"> <li>• "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.</li> <li>• "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.</li> <li>• "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.</li> </ul>			
Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SC-1 not implemented: Click or tap here to enter text.			
SC-2 Storm Drain Stenciling or Signage	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SC-2 not implemented: Click or tap here to enter text.			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SC-3 not implemented: Click or tap here to enter text.			
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SC-4 not implemented: Click or tap here to enter text.			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SC-5 not implemented: Click or tap here to enter text.			

Form I-4 Page 2 of 2			
Source Control Requirement	Applied?		
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Interior floor drains and elevator shaft sump pumps	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Interior parking garages	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Need for future indoor & structural pest control	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Landscape/Outdoor Pesticide Use	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Pools, spas, ponds, decorative fountains, and other water features	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Food service	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Refuse areas	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Industrial processes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Outdoor storage of equipment or materials	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Vehicle/Equipment Repair and Maintenance	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Fuel Dispensing Areas	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Loading Docks	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Fire Sprinkler Test Water	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Miscellaneous Drain or Wash Water	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Plazas, sidewalks, and parking lots	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
SC-6A: Large Trash Generating Facilities	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
SC-6B: Animal Facilities	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
SC-6C: Plant Nurseries and Garden Centers	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
SC-6D: Automotive-related Uses	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
<p>Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.</p> <p><a href="#">Click or tap here to enter text.</a></p>			

Site Design BMP Checklist for All Development Projects		Form I-5	
<b>Site Design BMPs</b>			
All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist.			
Answer each category below pursuant to the following.			
<ul style="list-style-type: none"> <li>• "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.</li> <li>• "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.</li> <li>• "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.</li> </ul>			
A site map with implemented site design BMPs must be included at the end of this checklist.			
Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SD-1 not implemented: Click or tap here to enter text.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
1-2 Are street trees implemented? If yes, are they shown on the site map?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
1-3 Implemented street trees meet the design criteria in SD-1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
1-4 Is street tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
SD-2 Have natural areas, soils and vegetation been conserved?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SD-2 not implemented: Click or tap here to enter text.			

Form I-5 Page 2 of 4			
Site Design Requirement	Applied?		
SD-3 Minimize Impervious Area	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SD-3 not implemented: Click or tap here to enter text.			
SD-4 Minimize Soil Compaction	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SD-4 not implemented: Click or tap here to enter text.			
SD-5 Impervious Area Dispersion	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SD-5 not implemented: Click or tap here to enter text.			
5-1 Is the pervious area receiving runoff from impervious area identified on the site map?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
5-2 Does the pervious area satisfy the design criteria in SD-5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and SD-5 Fact Sheet in Appendix E?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	

Form I-5 Page 3 of 4			
Site Design Requirement	Applied?		
SD-6 Runoff Collection	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SD-6 not implemented: Click or tap here to enter text.			
6a-1 Are green roofs implemented in accordance with design criteria in SD-6A Fact Sheet? If yes, are they shown on the site map?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
6a-2 Is green roof credit volume calculated using Appendix B.2.1.2 and SD-6A Fact Sheet in Appendix E?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in SD-6B Fact Sheet? If yes, are they shown on the site map?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
6b-2 Is permeable pavement credit volume calculated using Appendix B.2.1.3 and SD-6B Fact Sheet in Appendix E?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
SD-7 Landscaping with Native or Drought Tolerant Species	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SD-7 not implemented: Click or tap here to enter text.			
SD-8 Harvesting and Using Precipitation	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SD-8 not implemented:  <b>Not used due to lack of pervious area on site. Underground Infiltration BMP used instead.</b>			
8-1 Are rain barrels implemented in accordance with design criteria in SD-8 Fact Sheet? If yes, are they shown on the site map?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
8-2 Is rain barrel credit volume calculated using Appendix B.2.2.2 and SD-8 Fact Sheet in Appendix E?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A

Insert Site Map with all site design BMPs identified:

Insert Site Map Here.



Summary of PDP Structural BMPs	Form I-6
<b>PDP Structural BMPs</b>	
<p>All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).</p> <p>PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual).</p> <p>Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).</p>	
<p>Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.</p> <p><b>THE PROPOSED SITE HAS AN AREA OF APPROXIMATELY 1.51 ACRES WITH 1.22 ACRES (81%) CONSISTING OF IMPERVIOUS SURFACES THEREFORE REQUIRING THE ENTIRE SITE TO BE TREATED WITH STRUCTURAL BMPS. TO ACCOMPLISH THIS, A NEW UNDERGROUND INFILTRATION TANK (BMP-1) WILL BE INSTALLED UNDER THE REDEVELOPED PARKING AREA OF TWO BUILDINGS. OVERALL, THE DRAINAGE PATTERN OF THE EXISTING SITE IS BEING MAINTAINED AS THE SITE DRAINS FROM NORTH TO SOUTH IN BOTH THE PRE-AND POST-CONSTRUCTION CONDITIONS. THE PRIMARY CHANGE IS THE ADDITION OF THE INFILTRATION BMP TO REDUCE THE AMOUNT OF WATER LEAVING THE SITE THROUGH EXISTING CITY STORM DRAINS. THE ONLY STORM WATER THAT COULD POTENTIALLY LEAVE THE SITE WILL DO SO THROUGH OVERFLOW LINES FROM THE INFILTRATION TANK TO THE NEW CATCH BASIN JUST EAST OF THE DRIVEWAY APPROACH. THE 85TH PERCENTILE STORM EVENT HAS BEEN USED FOR THE INFILTRATION BMP AND THE 100-YEAR STORM EVENT HAS BEEN USED FOR ALL OVERFLOW DEVICES AND SITE DRAINS.</b></p>	

**Project Name: University Manor, LLC**

Form I-6 Page 2 of X

(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)

(Continued from page 1)

Click or tap here to enter text.

**Project Name: University Manor, LLC**

Form I-6 Page 3 of X (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP-1	
Construction Plan Sheet No. Click or tap here to enter text.	
<p>Type of structural BMP:</p> <p><input type="checkbox"/> Retention by harvest and use (HU-1)</p> <p><input checked="" type="checkbox"/> Retention by infiltration basin (INF-1)</p> <p><input type="checkbox"/> Retention by bioretention (INF-2)</p> <p><input type="checkbox"/> Retention by permeable pavement (INF-3)</p> <p><input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1)</p> <p><input type="checkbox"/> Biofiltration (BF-1)</p> <p><input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide ( BMP type/description in discussion section below)</p> <p>Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration</p> <p><input type="checkbox"/> BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)</p> <p><input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion</p> <p><input type="checkbox"/> Detention pond or vault for hydromodification management</p> <p><input checked="" type="checkbox"/> Other (describe in discussion section below) <b>(Underground Infiltration System)</b></p>	
<p>Purpose:</p> <p><input checked="" type="checkbox"/> Pollutant control only</p> <p><input type="checkbox"/> Hydromodification control only</p> <p><input type="checkbox"/> Combined pollutant control and hydromodification control</p> <p><input type="checkbox"/> Pre-treatment/forebay for another structural BMP</p> <p><input type="checkbox"/> Other (describe in discussion section below)</p>	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	John Cruikshank, Civil Project Engineer, 310-241-6550.
Who will be the final owner of this BMP?	University Manor, LLC
Who will maintain this BMP into perpetuity?	University Manor, LLC
What is the funding mechanism for maintenance?	University Manor, LLC

PDP SWQMP Template Date: January, 2016

PDP SWQMP Submittal Date: Insert Date

Project Name: University Manor, LLC

Form I-6 Page 4 of X (Copy as many as needed)

Structural BMP ID No. BMP-1

Construction Plan Sheet No. Click or tap here to enter text.


Discussion (as needed):

**THE PROPOSED ECORAIN INFILTRATION BASIN WILL TREAT THE ENTIRE 1.51 ACRE SITE. THE INFILTRATION BASIN WILL HAVE A PRE-TREATMENT FILTER FOR COARSE SEDIMENT AND TRASH REMOVAL AT THE NEW INTAKE CATCH BASINS.**

## Appendix H: Guidance for Investigation Potential Critical Coarse Sediment Yield Areas

Harvest and Use Feasibility Checklist		Form I-7
<p>1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?</p> <p> <input type="checkbox"/> Toilet and urinal flushing           <input type="checkbox"/> Landscape irrigation           <input type="checkbox"/> Other: _____         </p> <p style="text-align: center;"><b>There is no demand for harvested water at the project site.</b></p>		
<p>2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2. [Provide a summary of calculations here]</p>		
<p>3. Calculate the DCV using worksheet B-2.1. DCV = _____ (cubic feet)</p>		
<p>3a. Is the 36 hour demand greater than or equal to the DCV?</p> <p> <input type="checkbox"/> Yes    /    <input type="checkbox"/> No    ➡           </p> <p style="text-align: center;">↓</p>	<p>3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?</p> <p> <input type="checkbox"/> Yes    /    <input type="checkbox"/> No    ➡           </p> <p style="text-align: center;">↓</p>	<p>3c. Is the 36 hour demand less than 0.25DCV?</p> <p> <input type="checkbox"/> Yes           </p> <p style="text-align: center;">↓</p>
<p>Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.</p>	<p>Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.</p>	<p>Harvest and use is considered to be infeasible.</p>
<p>Is harvest and use feasible based on further evaluation?</p> <p> <input type="checkbox"/> Yes, refer to Appendix E to select and size harvest and use BMPs.           <input type="checkbox"/> No, select alternate BMPs.         </p>		

**Project Name: University Manor, LLC**

 City of San Diego <b>Development Services</b> 1222 First Ave., MD-302 San Diego, CA 92101 (619) 446-5000	<b>Permenant BMP Construction</b> Self Certification Form	FORM DS-563 January 2016
Date Prepared: 07-13-16		
Project No.: <a href="#">Click here to enter text.</a>		
Project Applicant: John Cruikshank		
Phone: 310-241-6550		
Project Address: 5556-5592 University Avenue, San Diego, CA 92105		
Project Engineer: John Cruikshank		
Phone: 310-241-6550		
<p>The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Storm Water Quality Management Plan (SWQMP) documents and drawings.</p> <p>This form must be completed by the engineer and submitted prior to final inspection of the construction permit. Completion and submittal of this form is required for all new development and redevelopment projects in order to comply with the City's Storm Water ordinances and NDPES Permit Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100. Final inspection for occupancy and/or release of grading or public improvement bonds may be delayed if this form is not submitted and approved by the City of San Diego.</p>		
<p><b>CERTIFICATION:</b></p> <p>As the professional in responsible charge for the design of the above project, I certify that I have inspected all constructed Low Impact Development (LID) site design, source control and structural BMP's required per the approved SWQMP and Construction Permit No. <a href="#">Click here to enter text.</a>; and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 of the San Diego Regional Water Quality Control Board.</p> <p>I understand that this BMP certification statement does not constitute an operation and maintenance verification.</p>		
<p>Signature: _____</p> <p>Date of Signature:    _July 13, 2016__</p> <p>Printed Name:        _John Cruikshank__</p> <p>Title:                 _Civil Project Engineer__</p> <p>Phone No.            _310-241-6550__</p> <div style="border: 1px solid black; width: 300px; height: 150px; margin-left: auto; margin-top: 20px; text-align: center; vertical-align: middle;"><u>Engineer's Stamp</u></div>		

DS-563 (12-15)

PDP SWQMP Template Date: January, 2016

PDP SWQMP Submittal Date: Insert Date

**Project Name: University Manor, LLC**

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# **ATTACHMENT 1 BACKUP FOR PDP POLLUTANT CONTROL BMPS**

This is the cover sheet for Attachment 1.



**Project Name: University Manor, LLC**

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**Project Name: University Manor, LLC**

**Indicate which Items are Included:**

Attachment Sequence	Contents	Checklist
<b>Attachment 1a</b>	DMA Exhibit (Required)  See DMA Exhibit Checklist.	<input checked="" type="checkbox"/> Included
<b>Attachment 1b</b>	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)*  *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	<input checked="" type="checkbox"/> Included on DMA Exhibit in Attachment 1a <input checked="" type="checkbox"/> Included as Attachment 1b, separate from DMA Exhibit
<b>Attachment 1c</b>	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs)  Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	<input checked="" type="checkbox"/> Included <input checked="" type="checkbox"/> Not included because the entire project will use infiltration BMPs
<b>Attachment 1d</b>	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs)  Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	<input checked="" type="checkbox"/> Included <input checked="" type="checkbox"/> Not included because the entire project will use harvest and use BMPs
<b>Attachment 1e</b>	Pollutant Control BMP Design Worksheets / Calculations (Required)  Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	<input checked="" type="checkbox"/> Included

**ATTACHMENT 1A/1B**  
**DMA EXHIBIT AND TABLE**

**Project Name: University Manor, LLC**

**Use this checklist to ensure the required information has been included on the DMA Exhibit:**

The DMA Exhibit must identify:

- ☒ Underlying hydrologic soil group
- ☒ Approximate depth to groundwater
- ☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☒ Critical coarse sediment yield areas to be protected
- ☒ Existing topography and impervious areas
- ☒ Existing and proposed site drainage network and connections to drainage offsite
- ☒ Proposed grading
- ☒ Proposed impervious features
- ☒ Proposed design features and surface treatments used to minimize imperviousness
- ☒ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- ☒ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
- ☒ Structural BMPs (identify location, type of BMP, and size/detail)



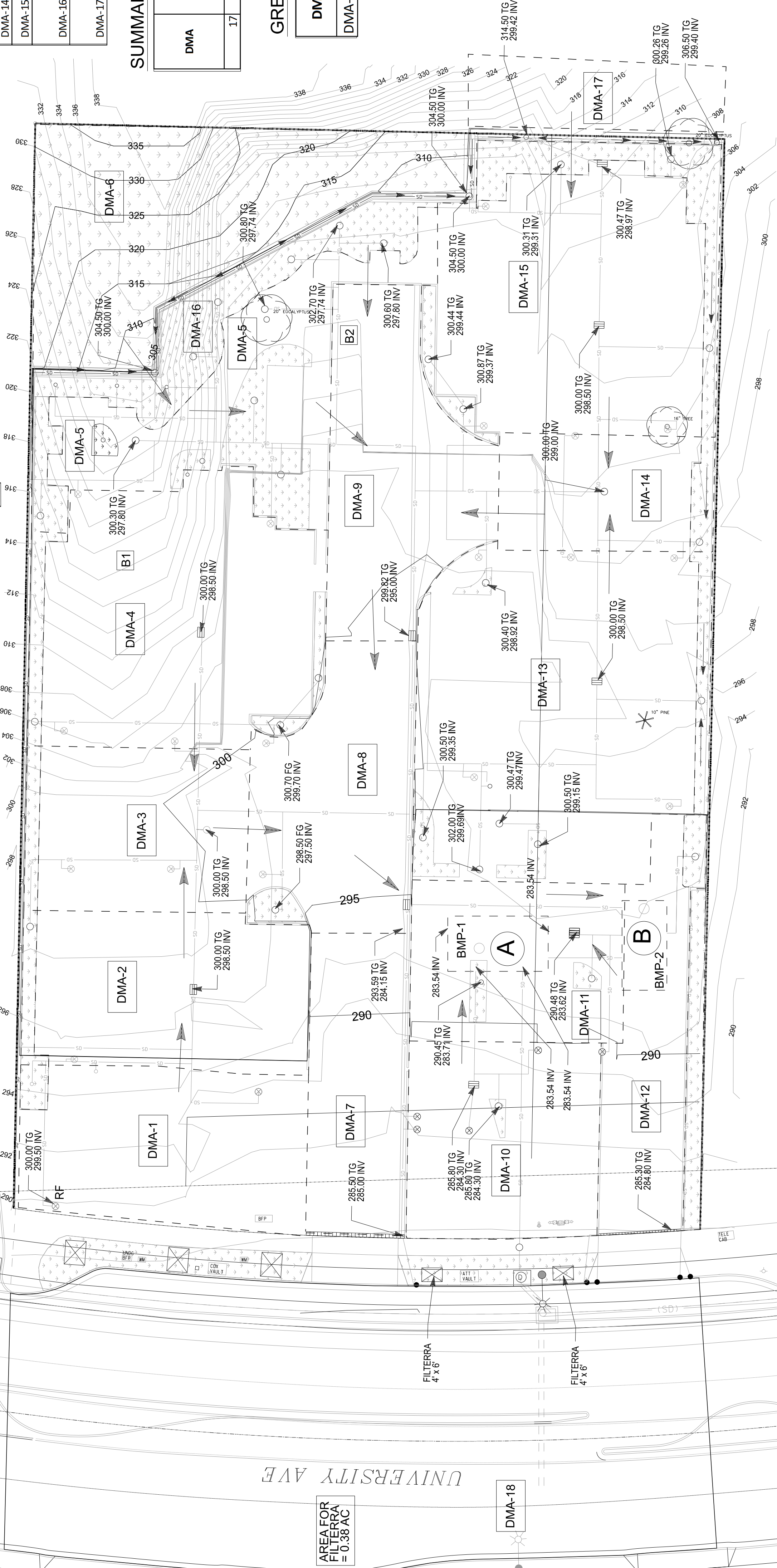
UNDERLYING SOIL GROUP/CLASSIFICATION: "D"  
DEPTH TO GROUNDWATER: GROUNDWATER NOT  
FOUND DURING SOIL INVESTIGATION

**A** NEW 470 SF UNDERGROUND INFILTRATION  
TANK (BMP-1)

**B** NEW 342 SF UNDERGROUND DETENTION  
BASIN (BMP-2)

LEGEND:

- NEW STORM DRAIN
- NEW 6" AREA DRAIN
- NEW ROOF DRAIN
- NEW CATCH BASIN
- UNDERGROUND  
ECORAIN TANK /  
DETENTION BASIN
- DRAINAGE MANAGEMENT AREA (DMA) ID
- UNDERGROUND PIPE FLOW DIRECTION
- DRAINAGE BASIN BOUNDARY
- NO GROUNDWATER FOUND AFTER 30 FT DRILLING
- NO GROUNDWATER FOUND AFTER 20 FT DRILLING
- FILTERRA
- TREE WELL



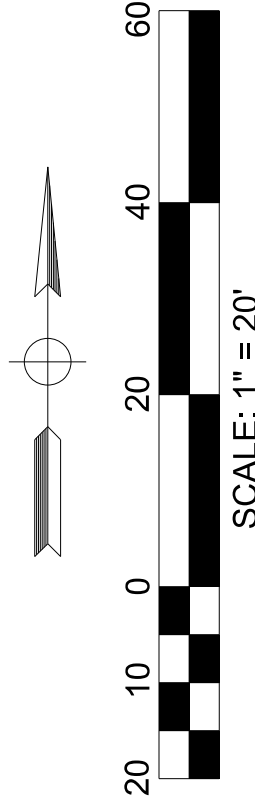
AREA FOR  
FILTERRA  
= 0.38 AC

DMA-18

UNIVERSITY AVE

FILTERRA  
4' x 6'

FILTERRA  
4' x 6'



DMA	DMA SOURCE	AREA (acres)	IMPERVIOUS AREA (acres)	PERVIOUS AREA (acres)	% IMP	HSG	AREA WEIGHTED RUNOFF COEFFICIENT	DCV (CF)	TREATED BY (BMP ID)	POLLUTANT CONTROL
DMA-1	Drain to BMP	0.086	0.084	0.002	0.97	D	0.88	151.02	CB/BMP-1	Hydrocarbon, dirt
DMA-2	Drain to BMP	0.087	0.084	0.003	0.96	D	0.87	151.25	CB/BMP-1	Hydrocarbon, dirt
DMA-3	Drain to BMP	0.071	0.066	0.005	0.93	D	0.85	120.18	CB/BMP-1	Hydrocarbon, dirt
DMA-4	Drain to BMP	0.145	0.140	0.005	0.97	D	0.87	252.54	CB/BMP-1	Hydrocarbon, dirt
DMA-5	Drain to BMP	0.083	0.062	0.020	0.76	D	0.70	116.23	CB/BMP-1	Hydrocarbon, dirt
DMA-6	Self Mitigating	0.124	0.000	0.124	0.00	D	0.10	24.75	CB/BMP-1	Hydrocarbon, dirt
DMA-7	Drain to BMP	0.061	0.061	0.000	1.00	D	0.90	109.31	CB/BMP-1	Hydrocarbon, dirt
DMA-8	Drain to BMP	0.085	0.081	0.003	0.96	D	0.87	147.13	CB/BMP-1	Hydrocarbon, dirt
DMA-9	Drain to BMP	0.086	0.086	0.000	1.00	D	0.90	154.69	CB/BMP-1	Hydrocarbon, dirt
DMA-10	Drain to BMP	0.076	0.071	0.005	0.94	D	0.85	128.79	CB/BMP-1	Hydrocarbon, dirt
DMA-11	Drain to BMP	0.066	0.064	0.003	0.96	D	0.87	115.07	CB/BMP-1	Hydrocarbon, dirt
DMA-12	Drain to BMP	0.073	0.062	0.011	0.84	D	0.78	113.67	CB/BMP-1	Hydrocarbon, dirt
DMA-13	Drain to BMP	0.180	0.174	0.006	0.97	D	0.87	314.65	CB/BMP-1	Hydrocarbon, dirt
DMA-14	Drain to BMP	0.052	0.048	0.003	0.93	D	0.85	87.31	CB/BMP-1	Hydrocarbon, dirt
DMA-15	Drain to BMP	0.158	0.135	0.023	0.85	D	0.78	247.57	CB/BMP-1	Hydrocarbon, dirt
DMA-16	Self Mitigating	0.041	0.000	0.041	0.00	D	0.30	24.61	CB/BMP-1	Hydrocarbon, dirt
DMA-17	Self Mitigating	0.036	0.000	0.036	0.00	D	0.30	21.31	CB/BMP-1	Hydrocarbon, dirt

SUMMARY:

DMA	AREA (acres)	IMPERVIOUS AREA (acres)	PERVIOUS AREA (acres)	% IMP	HSG	AREA WEIGHTED RUNOFF COEFFICIENT	DCV (CF)	TREATED BY (BMP ID)	POLLUTANT CONTROL
17	1.51	1.22	0.29	0.81		0.78	2365.51	1.51 -	

GREEN STREET:

DMA	AREA (acre)	RUNOFF COEFF. (C)	I <sub>50</sub>	PEAK FLOW Q <sub>50</sub> (cfs)	TREATMENT Q <sub>85TH</sub> (cfs)
DMA-18	0.38	0.90	6.06	2.07	0.19

REFERENCE CALCULATION:

AREA WEIGHTED RUNOFF COEFFICIENT (PER DMA) = ((AREA OF IMPERVIOUS \* 0.9) + (AREA OF PERVIOUS \* 0.1)) / TOTAL AREA

RUNOFF COEFFICIENT PER SECTION B-1.1:

RUNOFF COEFFICIENT FOR CONCRETE / AC = 0.9

RUNOFF COEFFICIENT FOR LANDSCAPE = 0.1

RUNOFF COEFFICIENT FOR NATURAL SOIL (D) = 0.3

DESIGN CAPTURE VOLUME:

DCV = 3630 x C x d A

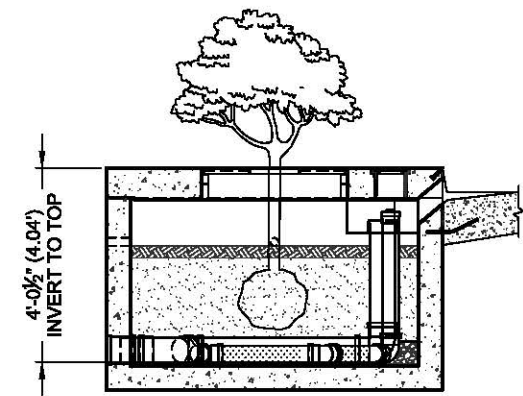
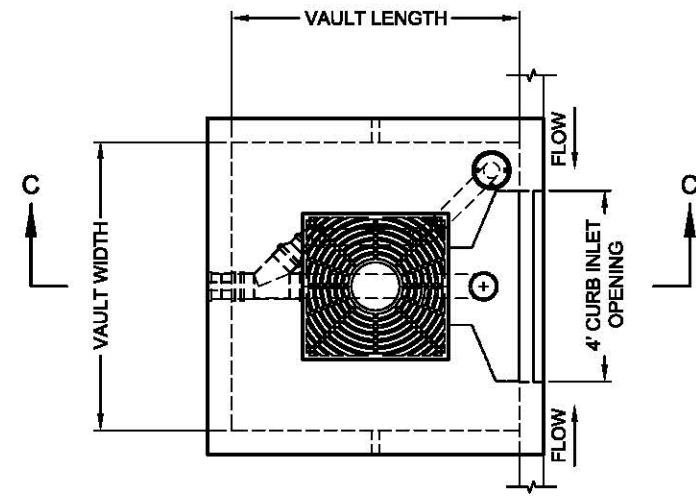
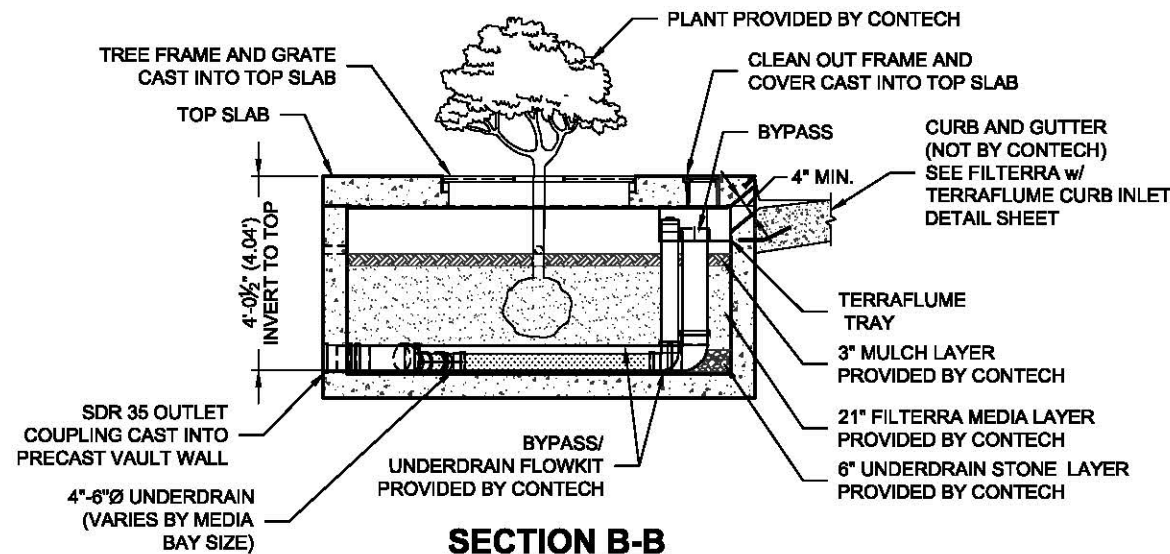
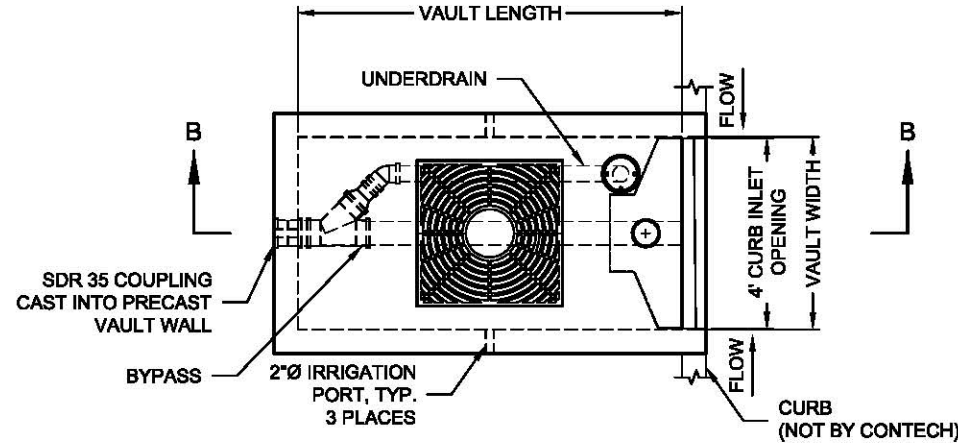
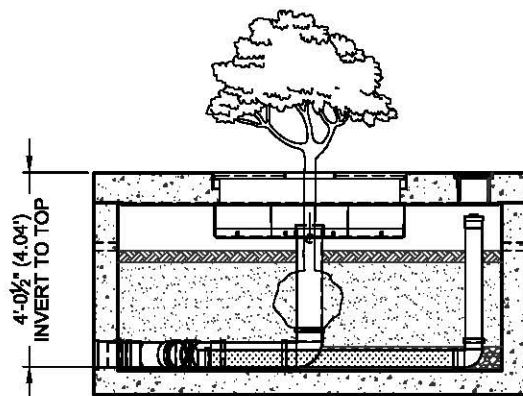
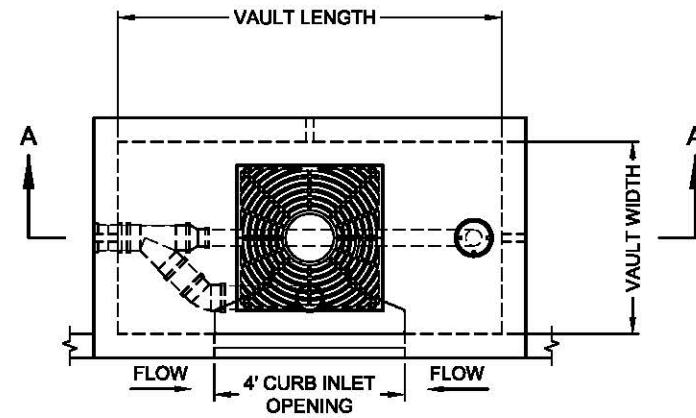
C = RUNOFF FACTOR (UNITLESS)

d = 85th PERCENTILE, 24-HR STORM EVENT RAINFALL DEPTH (INCHES).

A = TRIBUTARY AREA (ACRES) WITHIN THE PROJECT



I:\COMMON\CAD\TREATMENT\54 FILTERRA\40 STANDARD DRAWINGS\FTIBC - INTERNAL BYPASS CURB INLET\DETAILS\DWG\FTIBC INTERNAL BYPASS CURB INLET CONFIG DETAIL.DWG 11/02/2017 8:15 AM



FTIBC LONG SIDE CURB INLET

DESIGNATION	AVAIL-ABILITY	MEDIA BAY SIZE	VAULT SIZE (L x W)	MAX. OUTLET/ BYPASS PIPE DIA.	MAX. BYPASS FLOW (CFS)	UNDER-DRAIN PIPE DIA. (PERF)	TREE GRATE QTY. & SIZE
FTIBC0604	N/A CA	6 x 4	6 x 4	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC06504	CA ONLY	6.5 x 4	6.5 x 4	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC078045	MID-ATL ONLY	7.83 x 4.5	7.83 x 4.5	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC0804	N/A MID-ATL	8 x 4	8 x 4	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC0806	ALL	8 x 6	8 x 6	10" SDR 35	2.37	4" SDR 35	(1) 4' x 4'
FTIBC1006	ALL	10 x 6	10 x 6	10" SDR 35	2.37	6" SDR 35	(1) 4' x 4'
FTIBC1206	ALL	12 x 6	12 x 6	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'
FTIBC1307	ALL	13 x 7	13 x 7	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'

N/A = NOT AVAILABLE

FTIBC SHORT SIDE CURB INLET

DESIGNATION	AVAIL-ABILITY	MEDIA BAY SIZE	VAULT SIZE (W x L)	MAX. OUTLET/ BYPASS PIPE DIA.	MAX. BYPASS FLOW (CFS)	UNDER-DRAIN PIPE DIA. (PERF)	TREE GRATE QTY. & SIZE
FTIBC0406	N/A CA	4 x 6	4 x 6	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC04065	CA ONLY	4 x 6.5	4 x 6.5	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC0408	N/A MID-ATL	4 x 8	4 x 8	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC045078	MID-ATL ONLY	4.5 x 7.83	4.5 x 7.83	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC0608	ALL	6 x 8	6 x 8	10" SDR 35	2.37	4" SDR 35	(1) 4' x 4'
FTIBC0610	ALL	6 x 10	6 x 10	10" SDR 35	2.37	6" SDR 35	(1) 4' x 4'
FTIBC0612	ALL	6 x 12	6 x 12	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'
FTIBC0713	ALL	7 x 13	7 x 13	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'

N/A = NOT AVAILABLE

FTIBC SQUARE CURB INLET

DESIGNATION	AVAIL-ABILITY	MEDIA BAY SIZE	VAULT SIZE (L x W)	MAX. OUTLET/ BYPASS PIPE DIA.	MAX. BYPASS FLOW (CFS)	UNDER-DRAIN PIPE DIA. (PERF)	TREE GRATE QTY. & SIZE
FTIBC0404	ALL	4 x 4	4'-0"	6" SDR 35	1.42	4" SDR 35	(1) 3' x 3'
FTIBC0606	ALL	6 x 6	6'-0"	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'

N/A = NOT AVAILABLE

INTERNAL PIPE CONFIGURATION MAY VARY DEPENDING ON VAULT SIZE.



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800-338-1122 513-645-7000 513-645-7993 FAX

FILTERRA INTERNAL BYPASS CURB (FTIBC) CONFIGURATION DETAIL

## Appendix B: Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods

### B.1.1 Runoff Factor

Estimate the area weighted runoff factor for the tributary area to the BMP using runoff factor (from Table B.1-1) and area of each surface type in the tributary area and the following equation:

$$C = \frac{\sum C_x A_x}{\sum A_x}$$

Where:

$C_x$  = Runoff factor for area X

$A_x$  = Tributary area X (acres)

These runoff factors apply to areas receiving direct rainfall only. For conditions in which runoff is routed onto a surface from an adjacent surface, see Section B.2 for determining composite runoff factors for these areas.

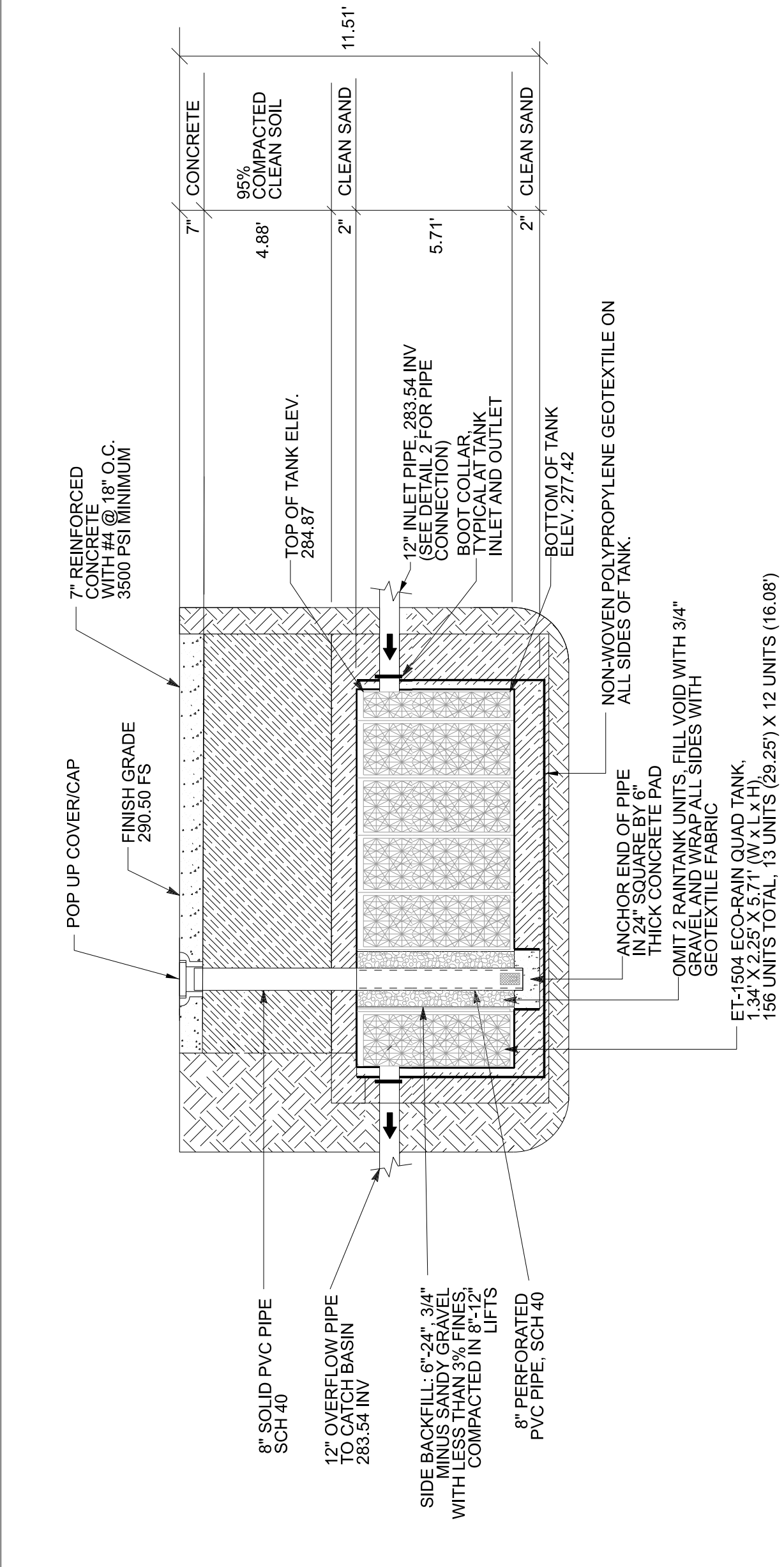
**Table B.1-1: Runoff factors for surfaces draining to BMPs – Pollutant Control BMPs**

Surface	Runoff Factor
Roofs <sup>9</sup>	0.90
Concrete or Asphalt <sup>1</sup>	0.90
Unit Pavers (grouted) <sup>1</sup>	0.90
Decomposed Granite	0.30
Cobbles or Crushed Aggregate	0.30
Mulched and Amended Soils per the Water Conservation in Landscaping Ordinance, Section 86.709 & Fact Sheet SD-F in Appendix E	0.10
Compacted Soil (e.g., unpaved parking)	0.30
Natural (A Soil)	0.10
Natural (B Soil)	0.14
Natural (C Soil)	0.23
Natural (D Soil)	0.30
Swimming pools, fountains, ponds, and other impoundments with appropriate freeboard.	0.00

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<sup>9</sup> Surface is considered impervious and could benefit from use of Site Design BMPs and adjustment of the runoff factor per Section B.2.1.





- CONSTRUCTION NOTES:**
- INSTALL TANK AFTER OTHER SITE CONSTRUCTION USE OF HEAVY EQUIPMENT THAT MUST CROSS THE BED AREA.
  - MARK EDGES OF THE TANK BED DURING AND AFTER CONSTRUCTION TO PREVENT HEAVY EQUIPMENT FROM CROSSING THE TANK BED AREA.
  - STABILIZE AREA SURROUNDING THE TANK BED TO PREVENT WASHING OF SILTS/SEDIMENT INTO THE BED.
  - REMOVE SILTS/SEDIMENT FROM EROSION THAT WASHES INTO THE BED DURING CONSTRUCTION.
  - SUBGRADE BASE MUST BE COMPACTED TO 95% MODIFIED PROCTOR, LEVELED AFTER FINAL GRADING.
  - FILL MATERIALS SHALL BE PER THE ENGINEER'S SPECIFICATION, CLEAN WASHED SAND/AGGREGATE OR GRAVEL, FREE OF LUMPS, DEBRIS OR OTHER SHARP MATERIALS AND EXCESS SILT.
  - DO NOT CUT HOLES LARGER THAN 6" INTO THE LARGE PLATE OF THE TANK.
  - READ MANUFACTURER'S SUBMITTAL AND USE THE ATTACHED CHECKLIST TO ENSURE PROPER INSTALLATION.
  - PER SOILS REPORT, INSTALL IMPERVIOUS LINER ON SIDES OF TANK TO ENSURE INFILTRATION OCCURS ONLY AT THE BOTTOM OF THE TANK.
  - ADD SIX SMALL PLATES PER UNIT.
  - ET-1401 2" DRAINAGE CELL LAYERS ON ENDS.
  - BIAXIAL GEOGRID LAYER IN ALL PARKING LOT APPLICATIONS.

## ECORAIN WATER TANK

NO SCALE

1

7-D

### MAINTENANCE PARAMETERS

Eco-Rain Tank Systems of America recommends Point Source filtration of water before it enters the Eco-Rain Tanks or Drainage Cells.

**POINT-SOURCE (BIOSWALE) WATER FILTRATION:**

Water filtration occurs through a permeable surface above the Eco-Rain Tank structure. Large suspended debris, silt, and sediment are filtered out before water enters the system. There is nothing to clean out of the Tank structure.

- \*Inspect the permeable surface every twelve months for clogging and clean if necessary.

**COMMERCIAL FILTER:**

The Tank structure via pipes must pass through a commercial filter that does not allow overflow debris - they must be installed on all inlet pipes. When properly sized by the designing Engineer, maintenance is relegated to the filter unit.

- \*Consult with the Filter manufacturer for inspection and cleanup protocol for filters.

**CATCH BASIN:**

When a catchment basin with a filter insert that does not allow debris to pass through is used, maintenance is relegated to removal of gross pollutants from the catch basin. A catch basin designed to handle the appropriate volume of water will not allow trash or large sediments to enter the Eco-Rain Tank.

- \*Inspect the catch basin at least every six months and clean-out as necessary.

When using the 1" Drainage Cells to line a catchment basin with sand in the bottom, use CLEAN river sand, scrape the surface at least every six months to keep it open and available to freely filter water into the system.

**INSPECTION & CLEANOUT PORTALS:**

Eco-Rain Tanks can be designed with inspection, clean-out and/or flushing points to remove any possible accumulation of sediment or fines. The Cleanout Portal has a round six to thirteen-inch hole at the center base of the plate to accommodate a camera and high-pressure hose. Flush water through the tank by using a high-pressure hose to clean out the tank. When using a Cleanout Portal, we recommend annual inspection of the inside of the tank. If necessary, perform a flush at that time. If water entering the tank is filtered properly, flushing may only be necessary every five years.

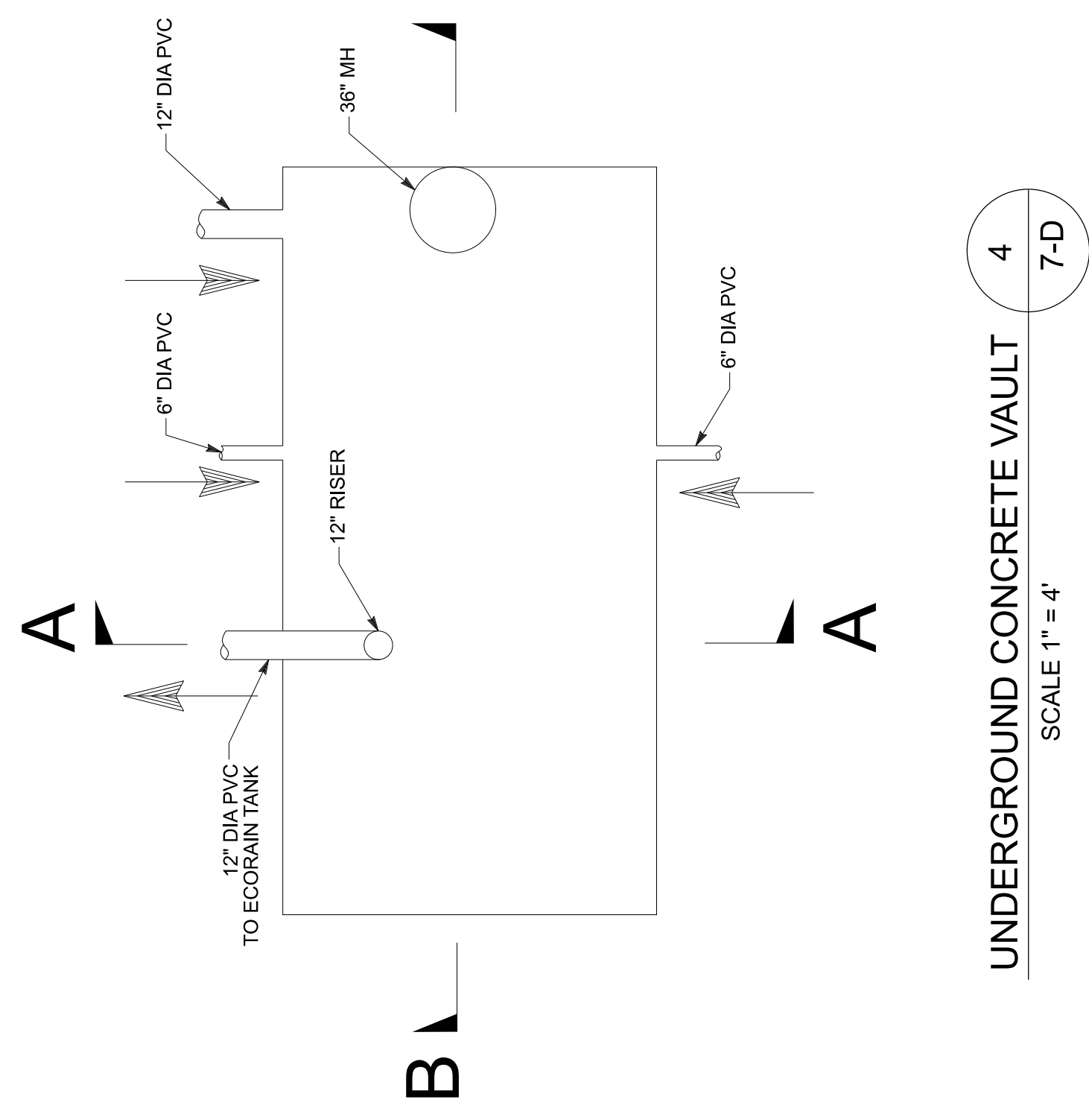
**MAINTENANCE LOG:**

Keep a log of all inspection and maintenance performed on the Eco-Rain Tank structure and filters. Keep this log on-site.

**Eco-Rain Tank Systems warranty is void if unfiltered water is directed into the Tank structure.**

+ 1.818.531.0424 | [sales@ecoraintank.com](mailto:sales@ecoraintank.com) | [www.ecoraintank.com](http://www.ecoraintank.com)

December 12, 2016

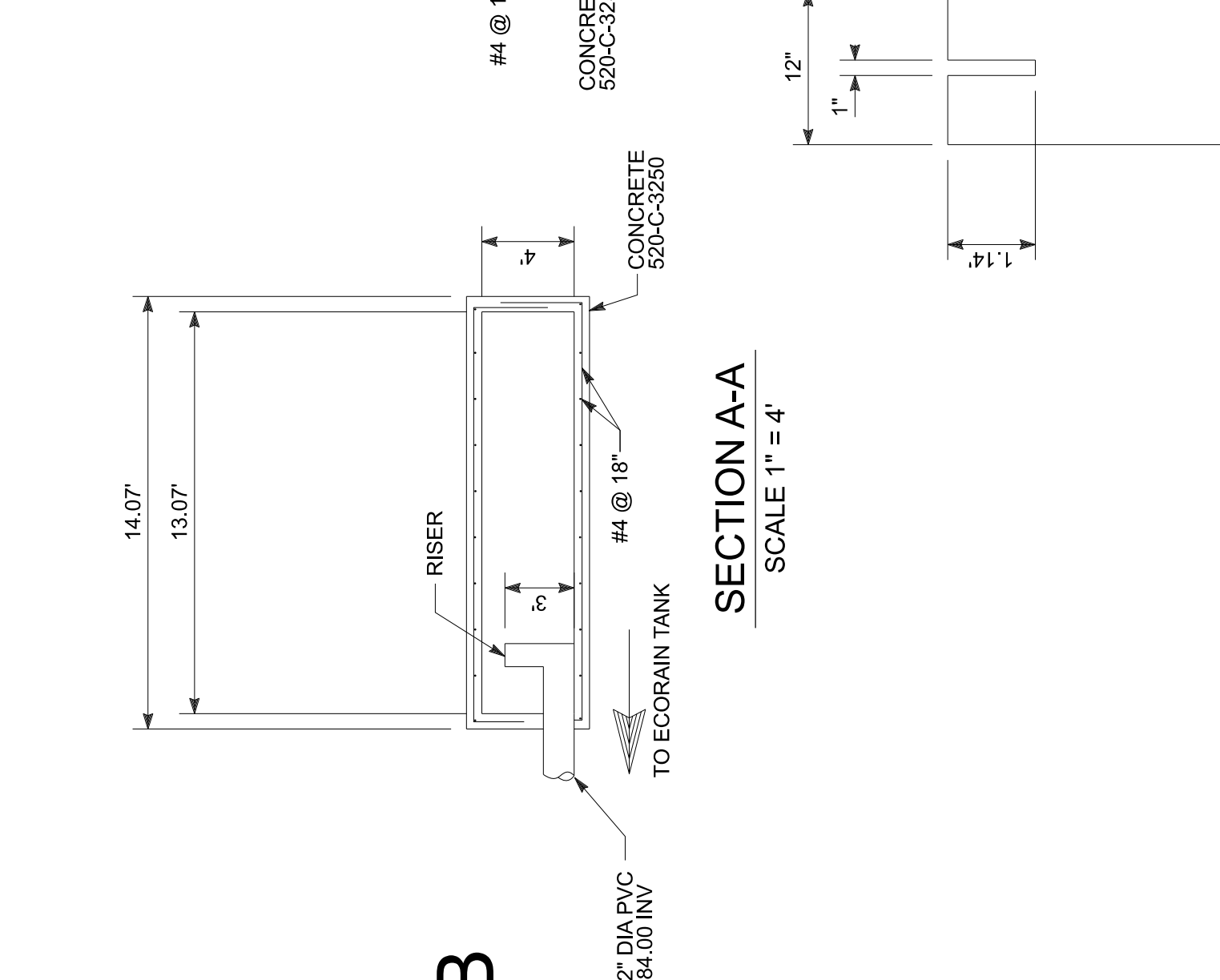


## UNDERGROUND CONCRETE VAULT

SCALE 1" = 4"

4

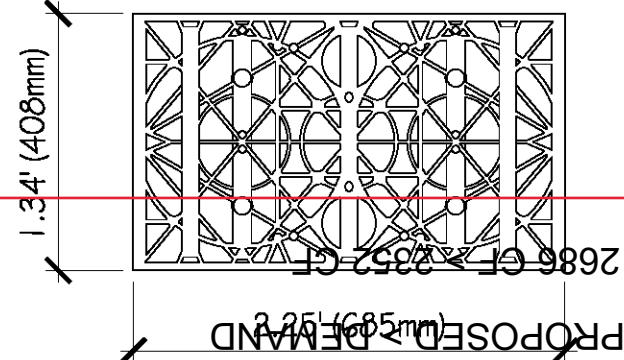
7-D



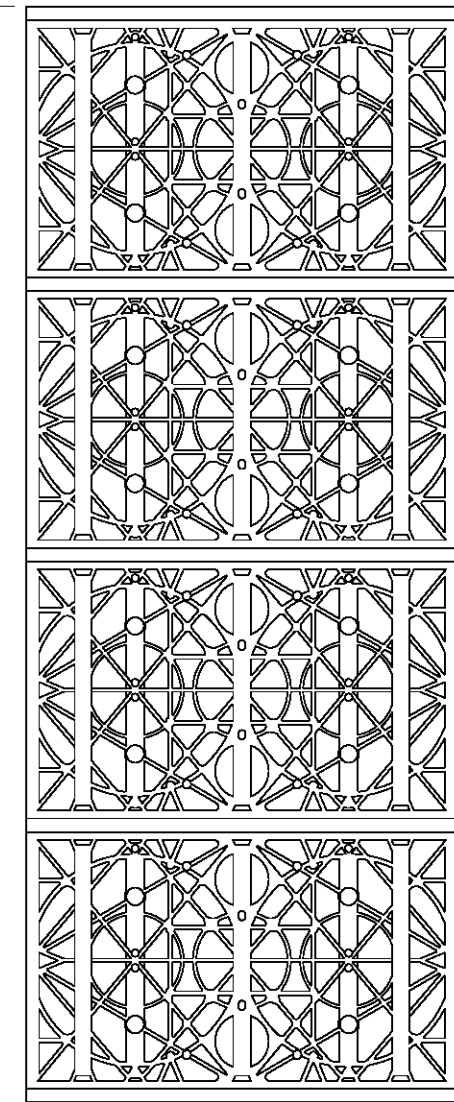


# ET-1504 Eco-Rain Quad Tank

PROPOSED TANK:  
 $12' (3.66\text{m}) \times 13' (3.96\text{m}) \times 5.7' (1.74\text{m}) = 2686\text{ CF}$   
TOTAL UNITS:  
 $156 = 12 \times 13\text{ UNITS}$   
PROPOSED > DEMAND  
 $2686\text{ CF} > 2352\text{ CF}$   
Top View



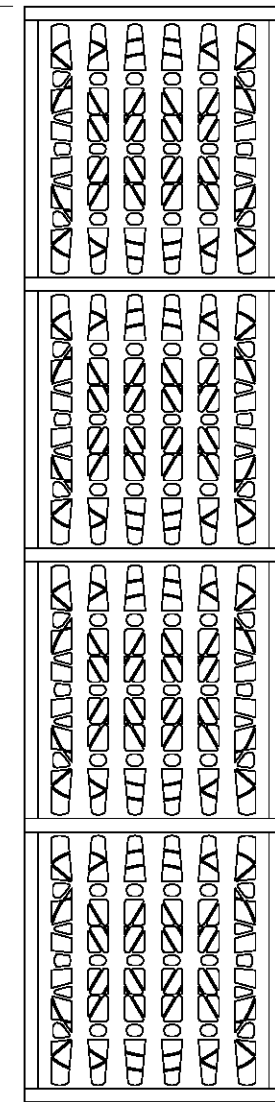
5.7' (1,740mm)



2.25' (685mm)

Front View

5.7' (1,740mm)



1.34' (408mm)

Side View

## Appendix H: Guidance for Investigation Potential Critical Coarse Sediment Yield Areas

Harvest and Use Feasibility Checklist	Form I-7	
<p>1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 35%;"> <input type="checkbox"/> Toilet and urinal flushing  <input type="checkbox"/> Landscape irrigation  <input type="checkbox"/> Other: _____                 </div> <div style="width: 60%;"> <p>The new development will not capture and use rainwater harvesting.</p> </div> </div>		
<p>2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.                  [Provide a summary of calculations here]</p>          		
<p>3. Calculate the DCV using worksheet B-2.1.                  DCV = _____ (cubic feet)</p>		
<p>3a. Is the 36 hour demand greater than or equal to the DCV?</p> <div style="display: flex; align-items: center; justify-content: center;"> <input type="checkbox"/> Yes    /    <input type="checkbox"/> No    <span style="font-size: 2em; margin: 0 10px;">⇒</span> </div> <div style="text-align: center; margin-top: 10px;"> <span style="font-size: 2em;">↓</span> </div>	<p>3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?</p> <div style="display: flex; align-items: center; justify-content: center;"> <input type="checkbox"/> Yes    /    <input type="checkbox"/> No    <span style="font-size: 2em; margin: 0 10px;">⇒</span> </div> <div style="text-align: center; margin-top: 10px;"> <span style="font-size: 2em;">↓</span> </div>	
<p>3c. Is the 36 hour demand less than 0.25DCV?</p> <div style="display: flex; align-items: center; justify-content: center;"> <input type="checkbox"/> Yes                 </div> <div style="text-align: center; margin-top: 10px;"> <span style="font-size: 2em;">↓</span> </div>	<p>Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.</p>	<p>Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.</p>
<p>Harvest and use is considered to be infeasible.</p>		
<p>Is harvest and use feasible based on further evaluation?</p> <input type="checkbox"/> Yes, refer to Appendix E to select and size harvest and use BMPs. <input type="checkbox"/> No, select alternate BMPs.		

**ATTACHMENT 1D**

**FORM 1-8 or WORKSHEET C.4-1, CATEGORIZATION OF  
INFILTRATION FEASIBILITY CONDITION**

## Appendix C: Geotechnical and Groundwater Investigation Requirements

### Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition		Worksheet C.4-1	
<p><b>Part 1 - Full Infiltration Feasibility Screening Criteria</b></p> <p><b>Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?</b></p> <p>Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.</p>			
Criteria	Screening Question	Yes	No
1	<p><b>Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</p>	X	
<p>Provide basis:</p> <p>In-situ infiltration rates at the site were measured at &lt;0.01 inches per hour in existing fill materials and 1.08 inches per hour in formational materials. Provided infiltration devices are extended into formational materials, infiltration may be feasible.</p> <p>Please note that infiltration devices utilizing these results should apply an appropriate factor of safety to determine applicable site infiltration rates prior to design.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
2	<p><b>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.</p>	X	
<p>Provide basis:</p> <p>Provided that infiltration devices are set back approximately 20 feet laterally from future structures and tops of slopes, and that the recommendations in the Ninyo &amp; Moore geotechnical report dated May 11, 2017 are incorporated into the project, we do not anticipate that infiltrating water into the subsurface will increase the risks of geotechnical hazards.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			

## Appendix C: Geotechnical and Groundwater Investigation Requirements

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	<p><b>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis:</p> <p>Provided that that the recommendations in the Ninyo &amp; Moore geotechnical report dated May 11, 2017 are incorporated into the project, we do not anticipate that infiltrating water into the subsurface will increase the risks of groundwater contamination.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
4	<p><b>Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis:</p> <p>Provided that the recommendations in the Ninyo &amp; Moore geotechnical report dated May 11, 2017 are incorporated into the project, we do not anticipate that infiltrating water into the subsurface will increase the risks associated with water balance issues.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
<p><b>Part 1 Result*</b></p>	<p>If all answers to rows 1 - 4 are “Yes” a full infiltration design is potentially feasible. The feasibility screening category is <b>Full Infiltration</b></p> <p>If any answer from row 1-4 is “No”, infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a “full infiltration” design. Proceed to Part 2</p>		Yes

\*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by County staff to substantiate findings.



## Appendix C: Geotechnical and Groundwater Investigation Requirements

## Worksheet C.4-1 Page 3 of 4

## Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	<b>Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		
Provide basis:			
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
6	<b>Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.		
Provide basis:			
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			

## Appendix C: Geotechnical and Groundwater Investigation Requirements

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	<b>Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis:			
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	<b>Can infiltration be allowed without violating downstream water rights?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis:			
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
<b>Part 2 Result*</b>	If all answers from row 5-8 are yes then partial infiltration design is potentially feasible. The feasibility screening category is <b>Partial Infiltration</b> .  If any answer from row 5-8 is no, then infiltration of any volume is considered to be <b>infeasible</b> within the drainage area. The feasibility screening category is <b>No Infiltration</b> .		

\*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

**ATTACHMENT 1E**

**POLLUTANT CONTROL BMP DESIGN WORKSHEETS / CALCULATIONS**





**INFILTRATION BMP STRUCTURE:**

- 7" CONCRETE
- 2' MINIMUM 95% COMPACTED CLEAN SOIL
- 2" CLEAN SAND
- 7.12' ECORAIN TANK COMPONENTS
- 2" CLEAN SAND

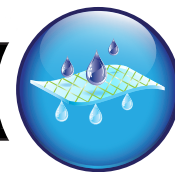
Design Capture Volume		Worksheet B-2.1		
1	85 <sup>TH</sup> Percentile 24-hour storm depth From Fig B.1-1	d =	0.55	inches
2	Area tributary to BMP(s)	A=	1.51	acres
3	Area weighted runoff factor (estimate using Appendix B.1. and B.2.1)	C=	0.78	unitless
4	Tree wells volume reduction	TCV=	-	cubic-feet
5	Rain barrels volume reduction	RCV=	-	cubic-feet
6	Calculate DCV = $3630 (0.78)(0.55)(1.51)$ $(3630 \times C \times d \times A) - TCV - RCV$	DCV=	2,351.47	cubic-feet

Simple Sizing Method for Infiltration BMPs		Worksheet B-4.1		
1	DVC (Worksheet B-2.1)	DVC=	2,351.47	Cubic feet
2	Design Infiltration Rate	$K_{design}$ =	1.08	In/hr
3	Available BMP surface area ( $DVC / D_{avg}$ )	A=	381	sf
4	Average effective depth in the BMP footprint	$D_{avg}$ =	5.71	feet
5	Drawdown time, T ( $D_{avg} * 12 / K_{design}$ )	T=	63	hours
6	Provide alternative calculation of drawdown time, if needed: Single Ecorain Unit = $1.34' \times 2.25' \times 5.71' = 17.22$ cf $5.71' \times 12 = 68.52'$ , $68.52' / 1.08 = 63.44$ hrs Proposed Total Single Units: $156 = (12 \times 13)$ Units, $12(1.34') \times 13(2.25') \times 5.71' = \mathbf{2686\ cf} > \mathbf{2352\ cf}$			









## *Removes pollutants from runoff at the source*

*FloGard +Plus is a catch basin insert filter designed to remove sediment, gross solids, trash, and petroleum hydrocarbons from stormwater runoff. FloGard +Plus is ideally suited for removal of primary pollutants from paved surfaces in commercial and residential areas. Rated filter flow capacities are designed to exceed the required "first flush" treatment flow rate, and the unique dual-bypass design typically exceeds catch basin inlet capacity.*

### **Economical Treatment**

Quick, easy, and cost-effective to install, inspect, and maintain.

### **Efficient Performance**

Removes pollutants at the inlet where they are easiest to catch.

### **Versatile Applications**

Appropriate and easy to use on new construction or retrofit projects.

### **Flexible Design**

Available in a wide variety of sizes and configurations, including custom options.

### **Durable Construction**

Built to last and withstand the loads from captured pollutants.

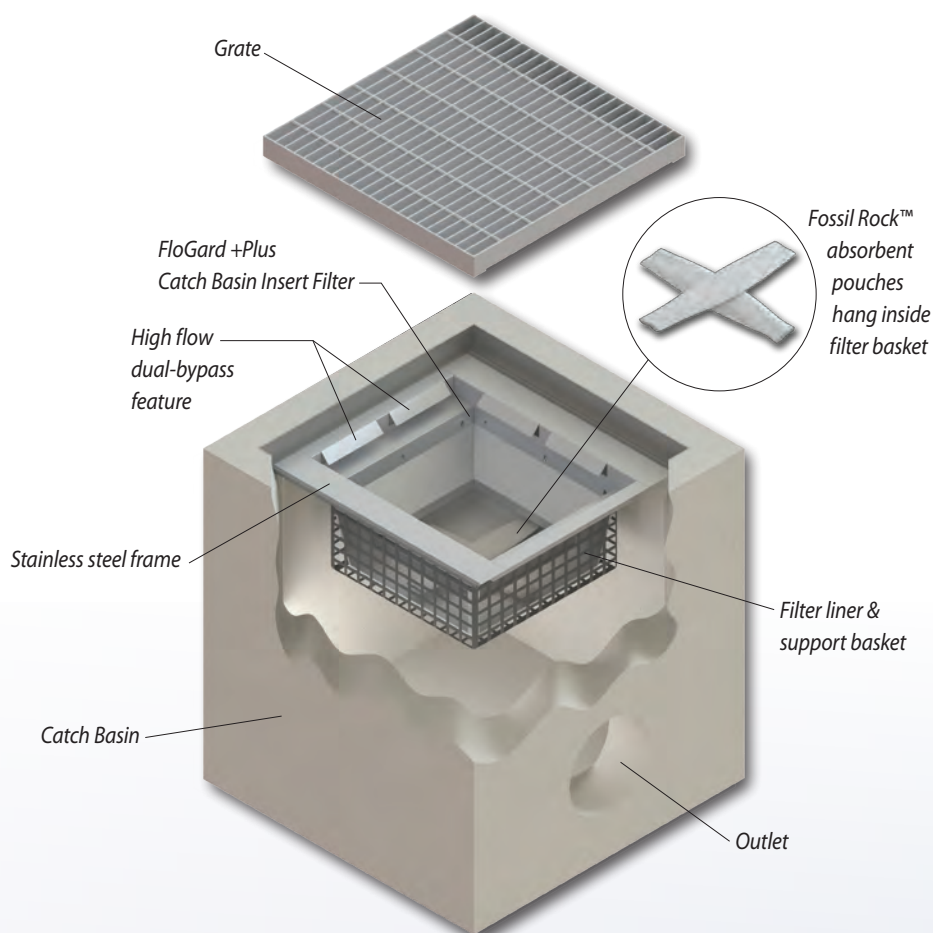
### **Environmentally Friendly**

No standing water minimizes vector, bacteria, and odor problems.

### **Proven Performance**

Field and laboratory tested with up to 86%<sup>1</sup> removal of TSS and 80%<sup>2</sup> removal of oils and grease.

1. University of Auckland laboratory testing of local street sweep material.  
2. UCLA laboratory study.



### **How It Works:**

Flows entering the unit pass through the filter liner basket for removal of sediment, trash, and debris. Optional Fossil Rock™ sorbent pouches installed in the basket effect hydrocarbon capture. As the storm flow exceeds the treatment flow rate, treatment will continue and excess flows will pass through the dual-bypass openings near the top of the unit.



# FloGard +Plus Catch Basin Insert Filter

Catch basin insert designed to capture sediment, gross solids, trash, and petroleum hydrocarbons from low (first flush) flows, even during the most extreme weather conditions.

## Example Types, Sizes, and Capacities

Additional sizes, including regional and custom options are available.

FloGard Combination Inlet								
SPECIFIER CHART								
MODEL NO.  STANDARD DEPTH	STANDARD & SHALLOW DEPTH (Data in these columns is the same for both STANDARD & SHALLOW versions)			STANDARD DEPTH -20 Inches-		MODEL NO.  SHALLOW DEPTH	SHALLOW DEPTH -12 Inches-	
	INLET ID Inside Dimension (inch x inch)	GRATE OD Outside Dimension (inch x inch)	TOTAL BYPASS CAPACITY (cu. ft. / sec.)	SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)		SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)
FGP-1633FGO	16 X 33	18 X 36	7.0	2.5	1.7	FGP-1633FGO8	1.4	1.1
FGP-1836FGO	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836FGO8	1.3	.9
FGP-2234FGO	22 X 34	24 X 36	8.1	3.6	2.1	FGP-2234FGO8	2.1	1.4
FGP-2436FGO	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436FGO8	1.95	1.15



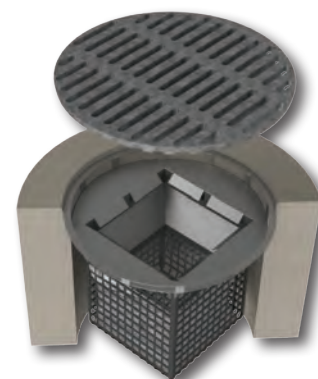
Combination Inlet

FloGard Flat Grated Inlet								
SPECIFIER CHART								
MODEL NO.  STANDARD DEPTH	STANDARD & SHALLOW DEPTH (Data in these columns is the same for both STANDARD & SHALLOW versions)			STANDARD DEPTH -20 Inches-		MODEL NO.  SHALLOW DEPTH	SHALLOW DEPTH -12 Inches-	
	INLET ID Inside Dimension (inch x inch)	GRATE OD Outside Dimension (inch x inch)	TOTAL BYPASS CAPACITY (cu. ft. / sec.)	SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)		SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)
FGP-12F	12 X 12	12 X 14	2.8	0.3	0.4	FGP-12F8	.15	.25
FGP-16F	16 X 16	16 X 19	4.7	0.8	0.7	FGP-16F8	.45	.4
FGP-18F	18 X 18	18 X 20	4.7	0.8	0.7	FGP-18F8	.45	.4
FGP-1836F	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836F8	1.3	.9
FGP-21F	22 X 22	22 X 24	6.1	2.2	1.5	FGP-21F8	1.25	.85
FGP-24F	24 X 24	24 X 27	6.1	2.2	1.5	FGP-24F8	1.25	.85
FGP-2436F	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8	1.95	1.15
FGP-2448F	24 X 48	24 X 48	9.3	4.4	2.4	FGP-2448F8	2.5	1.35
FGP-32F-TN	28 X 28	32 X 32	6.3	2.2	1.5	FGP-32F8-TN	1.25	.85
FGP-30F	30 X 30	30 X 34	8.1	3.6	2.0	FGP-30F8	2.05	1.15
FGP-36F	36 X 36	36 X 40	9.1	4.6	2.4	FGP-36F8	2.65	1.35
FGP-3648F	36 X 48	40 X 48	11.5	6.8	3.2	FGP-3648F8	3.9	1.85
FGP-48F	48 X 48	48 X 54	13.2	9.5	3.9	FGP-48F8	5.45	2.25
FGP-1633F	16 X 34	18 X 36	6.9	2.3	1.6	FGP-1633F8	1.3	.9
FGP-2234F	22 X 34	24 X 36	8.0	3.4	2.0	FGP-2234F8	1.95	1.15



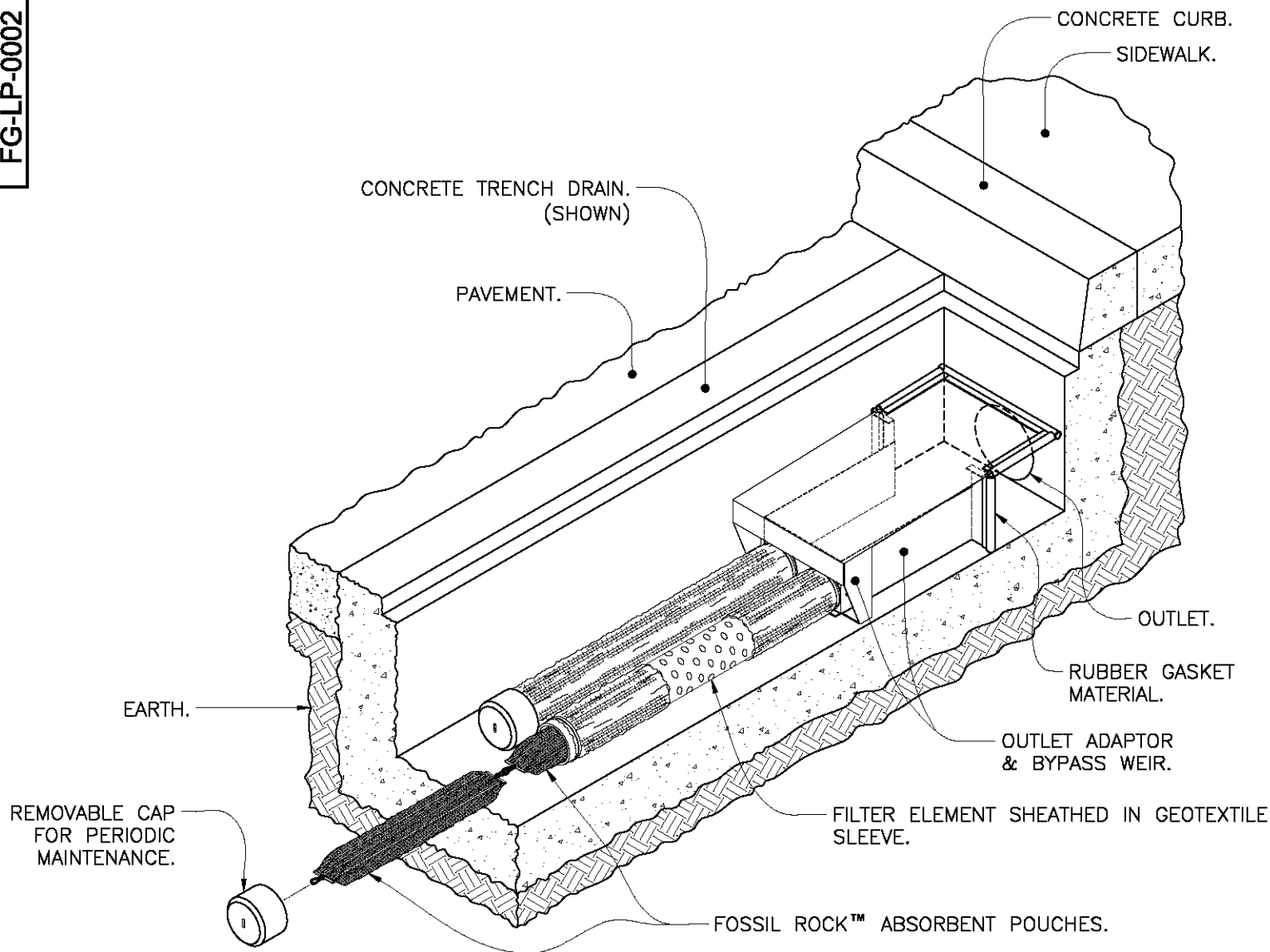
Flat Grated Inlet

FloGard Circular Grated Inlet					
SPECIFIER CHART					
MODEL NUMBER	INLET ID (Ø INCHES)	GRATE OD (Ø INCHES)	SOLIDS STORAGE CAPACITY (CU FT)	FILTERED FLOW (CFS)	TOTAL BYPASS CAPACITY (CFS)
FGP-RF15F	16	18	0.3	0.4	2.8
FGP-RF18F	18	20	0.8	0.7	4.7
FGP-RF20F	21	23	0.8	0.7	4.7
FGP-RF21F	22	23.5	0.8	0.7	4.7
FGP-RF22F	23	24	0.8	0.7	4.7
FGP-RF24F	24	26	0.8	0.7	4.7
FGP-RF30F	30	32	2.2	1.5	6.1
FGP-RF36F	36	39	3.6	2.0	8.1



Circular Frame Catch Basin

Visit our website: [oldcastlestormwater.com](http://oldcastlestormwater.com) or call (800) 579-8819 for additional sizes and options.



## NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter outlet adapter shall be constructed from stainless steel Type 304. Alternate outlet adaptor for shallow installations shall be PVC SCH-40. See detail B, sheet 2 of 2.
3. Filter medium shall be *Fossil Rock™*, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.
5. For alternate outlet adapter configurations used for extremely shallow trench drains contact Oldcastle Stormwater Solutions for engineering assistance.
6. Filter element should be a minimum of one half the length of trench. Confirm flow rate upon order.



**FloGard®**  
**Catch Basin Insert Filter**  
**Trench Drain Style**

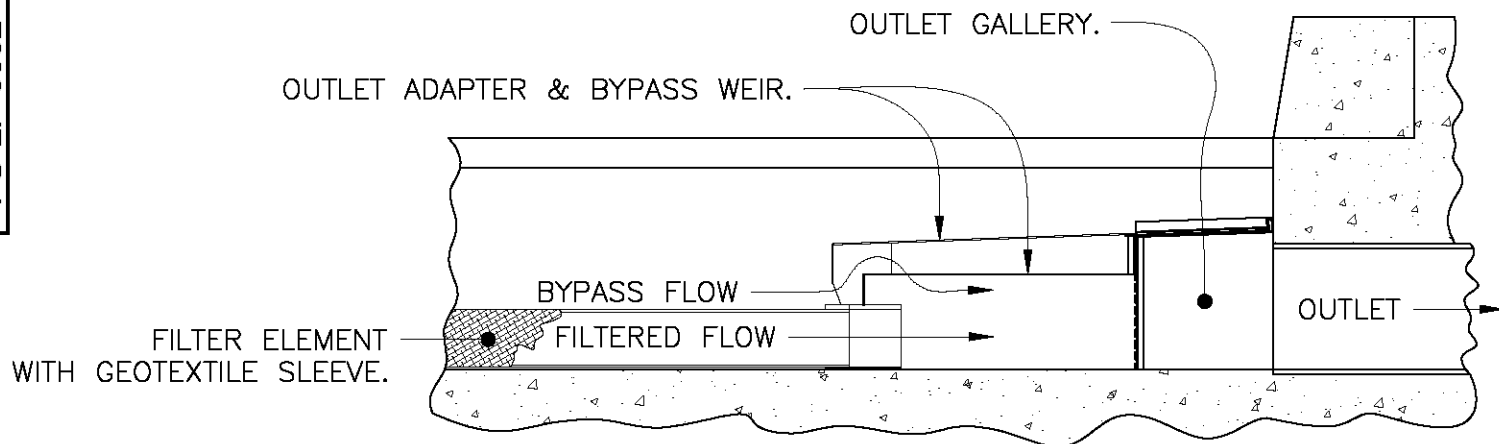


**Oldcastle®**  
**Stormwater Solutions**

7921 Southpark Plaza, Suite 200 | Littleton, CO | 80120 | Ph: 800.579.8819 | [oldcastlestormwater.com](http://oldcastlestormwater.com)

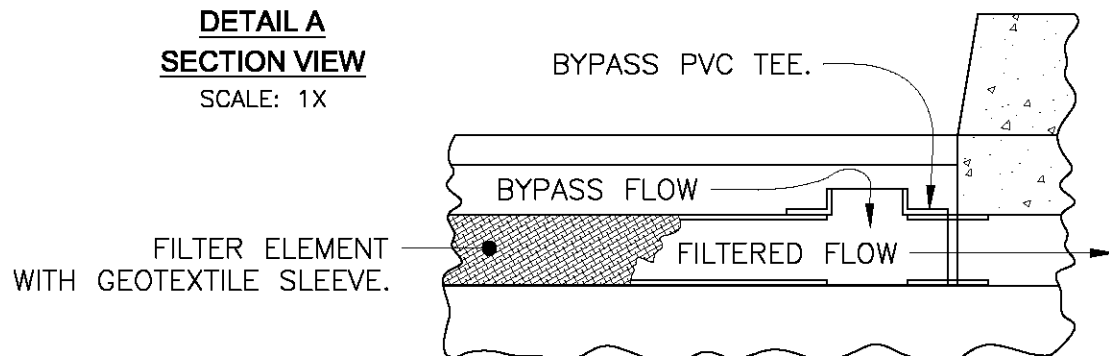
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DRAWING NO. <b>FG-LP-0002</b>	REV <b>H</b>	ECO <b>ECO-0142</b>	DATE <b>JPR 7/13/16</b>	SHEET 1 OF 2
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**DETAIL A**  
**SECTION VIEW**

SCALE: 1X



**DETAIL B**  
**SECTION VIEW**

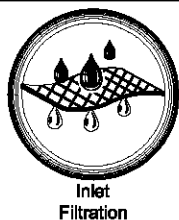
ALTERNATE ADAPTER CONFIGURATION  
SCALE: 1X

### SPECIFIER CHART

MODEL	FILTER TYPE	TRENCH WIDTH "ID" (CLEAR OPENING)	MINIMUM TRENCH DEPTH (FROM BOTTOM OF GRATE)	SOLIDS STORAGE CAPACITY CUBIC FEET **	FILTERED FLOW CUBIC FEET / SECOND **	TOTAL BYPASS CAPACITY CUBIC FEET / SECOND
FG-TDOF3	PIPE *	3.0	6.5	0.1	0.5	0.1
FG-TDOF4	PIPE *	4.0	6.5	0.2	0.5	0.1
FG-TDOF6	PIPE	6.0	6.5	0.4	0.5	0.2
FG-TDOF8	PIPE	8.0	6.5	0.7	0.5	0.3
FG-TDOF10	PIPE	10.0	6.5	0.9	0.5	0.5
FG-TDOF12	PIPE	12.0	6.5	0.9	1.0	0.6
FG-TDOF18	PIPE	18.0	6.5	1.3	1.5	1.1
FG-TDOF24	PIPE	24.0	6.5	1.8	2.0	1.5
FG-TDOA6	PANEL	6.0	4.5	0.4	0.2	0.2
FG-TDOA8	PANEL	8.0	4.5	0.7	0.2	0.3
FG-TDOA10	PANEL	10.0	4.5	0.8	0.3	0.5
FG-TDOA12	PANEL	12.0	4.5	1.0	0.4	0.6
FG-TDOA18	PANEL	18.0	4.5	1.4	0.8	1.1
FG-TDOA24	PANEL	24.0	4.5	1.8	1.1	1.5

\* ALTERNATE ADAPTER CONFIGURATION. SEE DETAIL B.

\*\*CAPACITY PER 5-FT. SEGMENT USED.



**FloGard®**  
**Catch Basin Insert Filter**  
**Trench Drain Style**



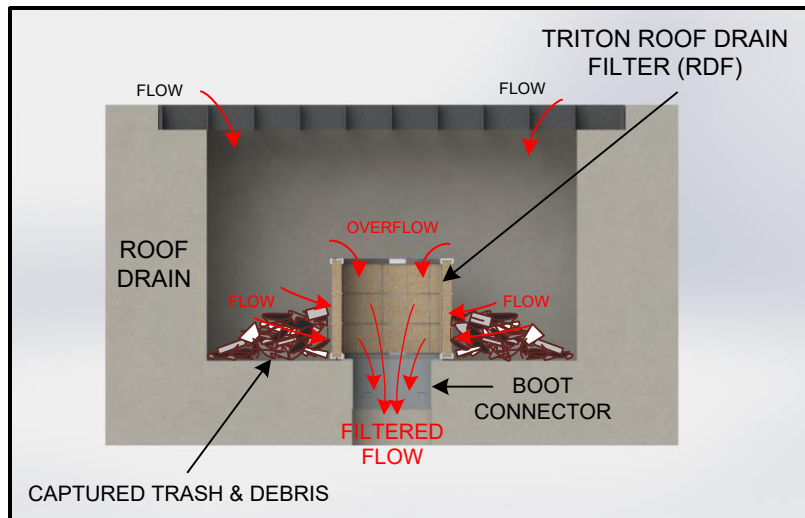
**Oldcastle®**  
**Stormwater Solutions**

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DRAWING NO. <b>FG-LP-0002</b>	REV <b>H</b>	ECO <b>ECO-0142</b> JPR 7/13/16	DATE <b>JPR 2/21/07</b>	SHEET 2 OF 2
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# REM's TRITON – (Booted Roof Drain Filter) Series

The REM TRITON - BRDF (Booted Roof Drain Filter Series) provides a multipurpose roof drain filter design to capture sediment, trash, debris, suspended solids, oils & grease and other pollutants. TRITON - BRDF filters may be utilized in new construction or retrofitted in existing roof drain structures. They are sized to spec or modified in the field for drains with unusual dimensions and unique frame and grates. Filter Cartridges may be easily removed when servicing. Media strategy may be optimized for specific pollutant concerns.



## Notes:

- The TRITON - BRDF Series Filters may be customized in the field to fit roof drain exits with irregular dimensions or unusual frame and grate types.
- REM also designs custom filters for unique storm water infrastructures and applications.
- Filter cartridge housings are constructed utilizing Type 304 Stainless Steel, with 2" welded square openings.
- Removable cartridge tops are constructed utilizing over 80% recycled ABS Plastic.
- REM TRITON replacement Filter Media Packs are charged with REM FOG media an expanded volcanic ash medium treated to be highly hydrophobic housed in a durable geo-textile perforated polypropylene woven fabric. REM FOG media effectively encapsulates liquefied petroleum hydrocarbons (Fats, Oils & Grease including animal fats). The media's hydrophobic characteristic allows for greater polishing of flow resulting in the reduction of Total Suspended Solids (TSS). Suspended solid reduction includes but is not limited to debris, trash, silt sediment and agglomerated heavy metals. (Additional media options are available including mixed blends of granulated carbon [AC] and Zeolite [ZEO].
- REM TRITON filter cartridges are removable for ease of cleaning and maintenance.
- Filter designs include a high flow overflow bypass to eliminate pooling or flooding during heavy rain events.
- See our Specifier Sheet for sizes, models and flow rate information.
- Maintenance information and replacement REM Media Packs are available upon request by contacting REM at sales@remfilters.com or (888) 526-4736.
- Made in the USA.

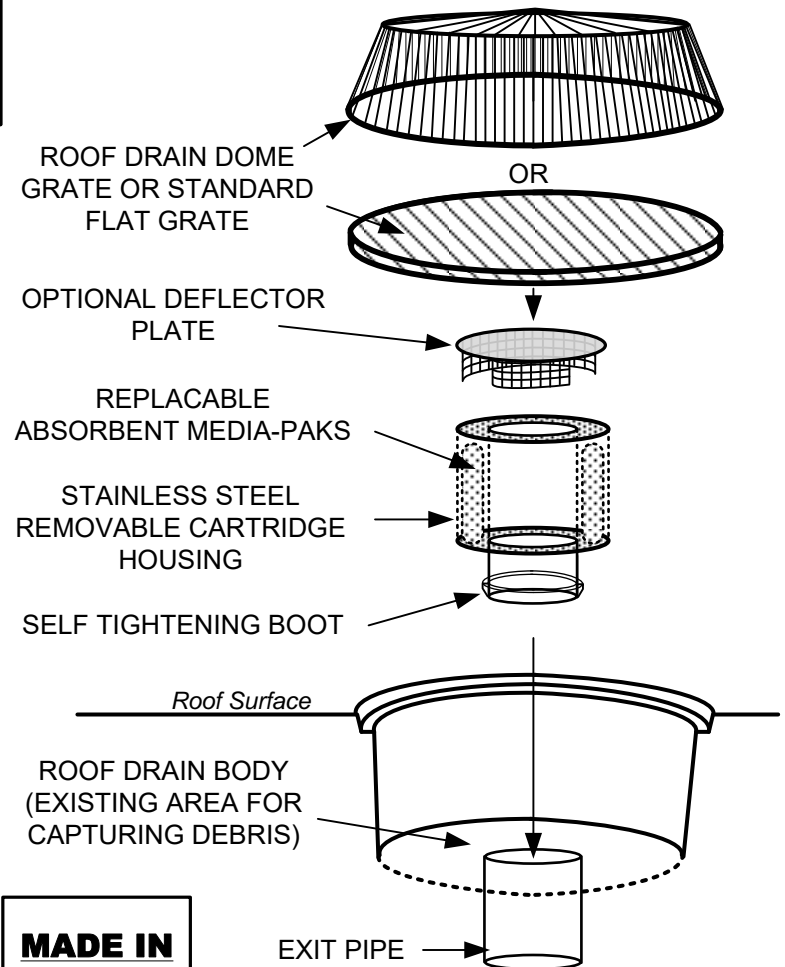


REM Model RDF-7 installed



Depending upon the depth of roof drains, the heights of the filters may vary due to each application. (Standard height for most drains is 4" to 6")

TRITON – BOOTED ROOF DRAIN SERIES FILTER  
By REM Inc. (888.526.4736)



**MADE IN  
USA**

Side View Cut - Away

THE DESIGN AND DETAIL OF THIS DRAWING IS THE PROPERTY OF REM INC. AND IS NOT TO BE USED EXCEPT IN CONNECTION WITH OUR WORK, DESIGN AND INVENTION RIGHTS ARE RESERVED.

U.S. Patent Number:  
6,217,757

PH: (888) 526-4736

DIMENSIONS ARE IN INCHES  
UNLESS OTHERWISE NOTED.

**REM Inc.**

**TRITON BOOTED ROOF DRAIN  
FILTER SERIES  
(BRDF Series)**

SCA LE	1/4 : 1	DRAWN BY: C.F.	FOR: Roof Top and Area Drain Combinations	REV
DATE: 3/3/2013		SHE ET 1 OF 1		

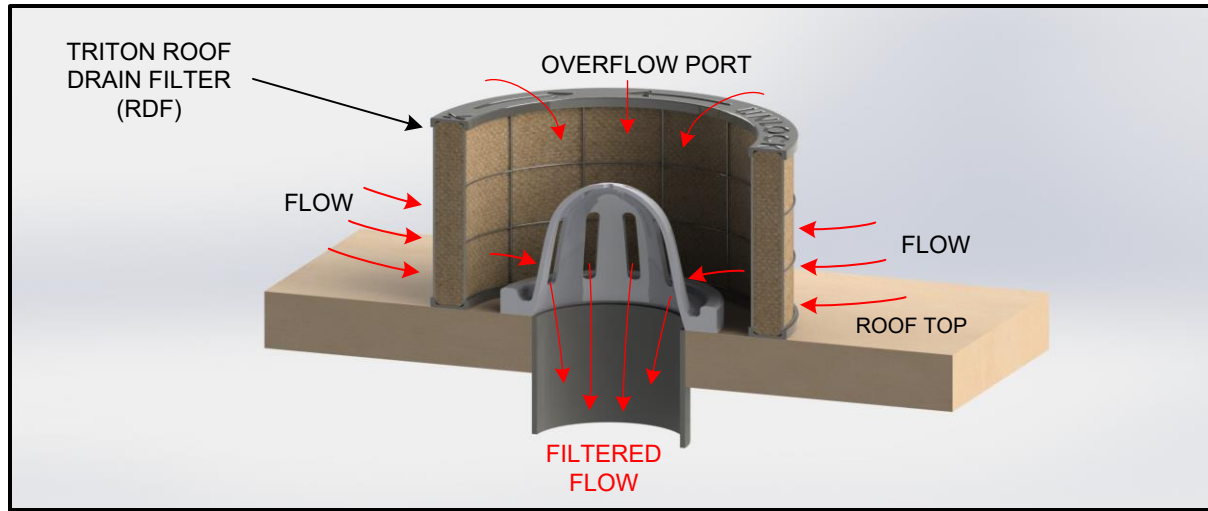


# REM's TRITON – (Roof Drain Filter) Series

The REM TRITON - RDF (Roof Drain Filter Series) provides a multipurpose roof drain filter design to capture sediment, trash, debris, suspended solids, oils & grease and other pollutants. TRITON - RDF filters may be utilized in new construction or retrofitted in existing roof drain structures. They are sized to spec or modified in the field for drains with unusual dimensions and unique frame and grates. Filter Cartridges may be easily removed when servicing. Media strategy may be optimized for specific pollutant concerns.



REM Model RDF-14 (4.5")  
installed on a domed roof drain



## Notes:

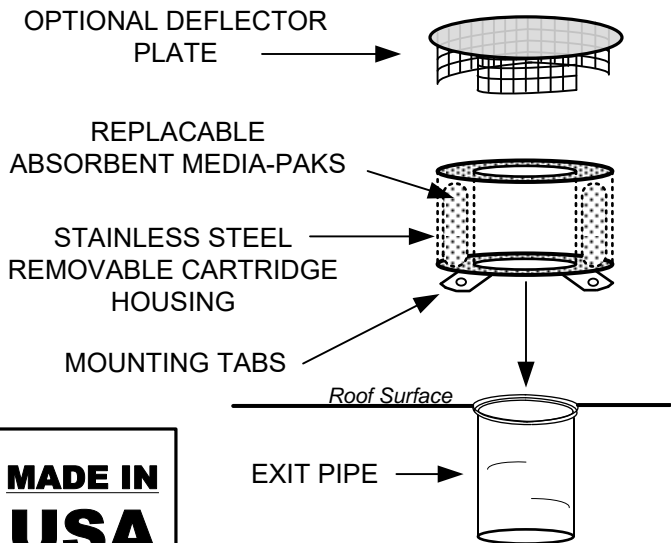
- The TRITON - RDF Series Filters may be customized in the field to fit roof drain exits with irregular dimensions or unusual frame and grate types.
- REM also designs custom filters for unique storm water infrastructures and applications.
- Filter cartridge housings are constructed utilizing Type 304 Stainless Steel, with 2" welded square openings.
- Removable cartridge tops are constructed utilizing over 80% recycled ABS Plastic.
- REM TRITON replacement Filter Media Packs are charged with REM FOG media an expanded volcanic ash medium treated to be highly hydrophobic housed in a durable geo-textile perforated polypropylene woven fabric. REM FOG media effectively encapsulates liquefied petroleum hydrocarbons (Fats, Oils & Grease including animal fats). The media's hydrophobic characteristic allows for greater polishing of flow resulting in the reduction of Total Suspended Solids (TSS). Suspended solid reduction includes but is not limited to debris, trash, silt sediment and agglomerated heavy metals. (Additional media options are available including mixed blends of granulated carbon [AC] and Zeolite [ZEO].
- REM TRITON filter cartridges are removable for ease of cleaning and maintenance.
- Filter designs include a high flow overflow bypass to eliminate pooling or flooding during heavy rain events.
- See our Specifier Sheet for sizes, models and flow rate information.
- Maintenance information and replacement REM Media Packs are available upon request by contacting REM at sales@remfilters.com or (888) 526-4736.
- Made in the USA.



Trash buildup around filter

## TRITON – ROOF DRAIN FILTER SERIES

By REM Inc. (888.526.4736)



Side View Cut - Away

**MADE IN  
USA**

Depending upon the depth of roof drains, the heights of the filters may vary due to each application. (Standard height for most drains is 4" to 6")

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U.S. Patent Number:  
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PH: (888) 526-4736

DIMENSIONS ARE IN INCHES  
UNLESS OTHERWISE NOTED.

**REM Inc.**

**TRITON ROOF DRAIN FILTER  
SERIES  
(RDF Series)**

DRAWN BY: C.F.	FOR: Roof Top and Area Drain Combinations	REV
DATE: 3/3/2013	SHEET 1 OF 1	

# **ATTACHMENT 2 BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES**

This is the cover sheet for Attachment 2.

☒ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

**Project Name: University Manor, LLC**

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# **HYDROMODIFICATION MANAGEMENT STUDY**

FOR

## **University Manor, LLC**

5556 University Avenue  
San Diego, CA 92105

June 26, 2018

### **Prepared For:**

Mr. Lutfi Bustami  
University Manor, LLC  
8051 Main Street  
Stanton, CA 90680

Project No 20150047.01  
Prepared by: Cindy Lim  
Checked by: John Cruikshank  
P.E. No. C50792

John M. Cruikshank Consultants, Inc.

## Project location



### Site Information

Site Name   
Address 5556 University Ave  
City San Diego  
Gage BONITA  
Precip Factor 1.000

### BONITA

BORREGO  
LINDBERG  
ENCINITA  
ESCONDID  
FALLBROO  
FASHIONV  
FLINN SP  
KEARNY M  
LAKE CUY  
LAKE HEN

## Post-Project SDHM Diagram (POC1)

### *Predeveloped Schematic*



### *Mitigated Schematic*



## SDHM 3.1 PROJECT REPORT

---

**Project Name:** 5556 University 6-25  
**Site Name:**  
**Site Address:** 5556 University Ave  
**City** : San Diego  
**Report Date:** 6/26/2018  
**Gage** : BONITA  
**Data Start** : 10/01/1971  
**Data End** : 09/30/2004  
**Precip Scale:** 1.00  
**Version Date:** 2018/06/15

---

**Low Flow Threshold for POC 1** : 10 Percent of the 2 Year

---

**High Flow Threshold for POC 1:** 10 year

---

### PREDEVELOPED LAND USE

**Name** : Basin 1  
**Bypass:** No

**GroundWater:** No

<u>Pervious Land Use</u>	<u>acre</u>
D,NatVeg,Moderate	.39
<b>Pervious Total</b>	<b>0.39</b>
<u>Impervious Land Use</u>	<u>acre</u>
IMPERVIOUS-FLAT	1.12
<b>Impervious Total</b>	<b>1.12</b>
<b>Basin Total</b>	<b>1.51</b>

---

<b>Element Flows To:</b>		
Surface	Interflow	Groundwater

---

### MITIGATED LAND USE

**Name** : Basin 1  
**Bypass:** No

**GroundWater:** No



<u>Pervious Land Use</u>	<u>acre</u>
D,Dirt,Moderate	.29
 Pervious Total	 0.29
<u>Impervious Land Use</u>	<u>acre</u>
IMPERVIOUS-FLAT	1.22
 Impervious Total	 1.22
 Basin Total	 1.51

---

**Element Flows To:**

<b>Surface</b>	<b>Interflow</b>	<b>Groundwater</b>
Vault 1	Vault 1	

---

Name : Vault 1

Width : 13.0689854628745 ft.

Length : 26.1379709257502 ft.

Depth: 4 ft.

Discharge Structure

Riser Height: 3 ft.

Riser Diameter: 12 in.

Notch Type: Rectangular

Notch Width: 0.092 ft.

Notch Height: 1.144 ft.

Orifice 1 Diameter: 1.25080602002 in. Elevation: 0 ft.

**Element Flows To:**

<b>Outlet 1</b>	<b>Outlet 2</b>
-----------------	-----------------

---

**Vault Hydraulic Table**

<u>Stage(feet)</u>	<u>Area(ac.)</u>	<u>Volume(ac-ft.)</u>	<u>Discharge(cfs)</u>	<u>Infilt(cfs)</u>
0.0000	0.007	0.000	0.000	0.000
0.0444	0.007	0.000	0.009	0.000
0.0889	0.007	0.000	0.012	0.000
0.1333	0.007	0.001	0.015	0.000
0.1778	0.007	0.001	0.017	0.000
0.2222	0.007	0.001	0.020	0.000
0.2667	0.007	0.002	0.021	0.000
0.3111	0.007	0.002	0.023	0.000
0.3556	0.007	0.002	0.025	0.000
0.4000	0.007	0.003	0.026	0.000
0.4444	0.007	0.003	0.028	0.000
0.4889	0.007	0.003	0.029	0.000
0.5333	0.007	0.004	0.031	0.000
0.5778	0.007	0.004	0.032	0.000



0.6222	0.007	0.004	0.033	0.000
0.6667	0.007	0.005	0.034	0.000
0.7111	0.007	0.005	0.035	0.000
0.7556	0.007	0.005	0.036	0.000
0.8000	0.007	0.006	0.038	0.000
0.8444	0.007	0.006	0.039	0.000
0.8889	0.007	0.007	0.040	0.000
0.9333	0.007	0.007	0.041	0.000
0.9778	0.007	0.007	0.042	0.000
1.0222	0.007	0.008	0.042	0.000
1.0667	0.007	0.008	0.043	0.000
1.1111	0.007	0.008	0.044	0.000
1.1556	0.007	0.009	0.045	0.000
1.2000	0.007	0.009	0.046	0.000
1.2444	0.007	0.009	0.047	0.000
1.2889	0.007	0.010	0.048	0.000
1.3333	0.007	0.010	0.049	0.000
1.3778	0.007	0.010	0.049	0.000
1.4222	0.007	0.011	0.050	0.000
1.4667	0.007	0.011	0.051	0.000
1.5111	0.007	0.011	0.052	0.000
1.5556	0.007	0.012	0.053	0.000
1.6000	0.007	0.012	0.053	0.000
1.6444	0.007	0.012	0.054	0.000
1.6889	0.007	0.013	0.055	0.000
1.7333	0.007	0.013	0.055	0.000
1.7778	0.007	0.013	0.056	0.000
1.8222	0.007	0.014	0.057	0.000
1.8667	0.007	0.014	0.058	0.000
1.9111	0.007	0.015	0.062	0.000
1.9556	0.007	0.015	0.068	0.000
2.0000	0.007	0.015	0.076	0.000
2.0444	0.007	0.016	0.084	0.000
2.0889	0.007	0.016	0.094	0.000
2.1333	0.007	0.016	0.104	0.000
2.1778	0.007	0.017	0.114	0.000
2.2222	0.007	0.017	0.126	0.000
2.2667	0.007	0.017	0.137	0.000
2.3111	0.007	0.018	0.149	0.000
2.3556	0.007	0.018	0.162	0.000
2.4000	0.007	0.018	0.174	0.000
2.4444	0.007	0.019	0.187	0.000
2.4889	0.007	0.019	0.201	0.000
2.5333	0.007	0.019	0.214	0.000
2.5778	0.007	0.020	0.228	0.000
2.6222	0.007	0.020	0.242	0.000
2.6667	0.007	0.020	0.256	0.000
2.7111	0.007	0.021	0.270	0.000
2.7556	0.007	0.021	0.284	0.000
2.8000	0.007	0.022	0.298	0.000
2.8444	0.007	0.022	0.312	0.000
2.8889	0.007	0.022	0.328	0.000
2.9333	0.007	0.023	0.345	0.000
2.9778	0.007	0.023	0.363	0.000
3.0222	0.007	0.023	0.407	0.000
3.0667	0.007	0.024	0.555	0.000
3.1111	0.007	0.024	0.763	0.000

3.1556	0.007	0.024	1.011	0.000
3.2000	0.007	0.025	1.282	0.000
3.2444	0.007	0.025	1.558	0.000
3.2889	0.007	0.025	1.823	0.000
3.3333	0.007	0.026	2.059	0.000
3.3778	0.007	0.026	2.256	0.000
3.4222	0.007	0.026	2.406	0.000
3.4667	0.007	0.027	2.516	0.000
3.5111	0.007	0.027	2.630	0.000
3.5556	0.007	0.027	2.726	0.000
3.6000	0.007	0.028	2.819	0.000
3.6444	0.007	0.028	2.908	0.000
3.6889	0.007	0.028	2.994	0.000
3.7333	0.007	0.029	3.078	0.000
3.7778	0.007	0.029	3.159	0.000
3.8222	0.007	0.030	3.237	0.000
3.8667	0.007	0.030	3.314	0.000
3.9111	0.007	0.030	3.389	0.000
3.9556	0.007	0.031	3.462	0.000
4.0000	0.007	0.031	3.533	0.000
4.0444	0.007	0.031	3.603	0.000
4.0889	0.000	0.000	3.671	0.000

---

### ANALYSIS RESULTS

---

Predeveloped Landuse Totals for POC #1  
Total Pervious Area:0.39  
Total Impervious Area:1.12

---

Mitigated Landuse Totals for POC #1  
Total Pervious Area:0.29  
Total Impervious Area:1.22

---

Flow Frequency Return Periods for Predeveloped. POC #1

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	0.526022
5 year	0.742244
10 year	0.791253
25 year	1.07266

Flow Frequency Return Periods for Mitigated. POC #1

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	0.381039
5 year	0.548533
10 year	0.620619
25 year	0.910342

---

POC #1

The Facility PASSED

The Facility **PASSED.**

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0526	1474	1079	73	Pass
0.0601	1349	887	65	Pass
0.0675	1265	786	62	Pass
0.0750	1224	722	58	Pass
0.0824	1157	661	57	Pass
0.0899	1068	596	55	Pass
0.0974	979	543	55	Pass
0.1048	910	509	55	Pass
0.1123	709	459	64	Pass
0.1198	582	425	73	Pass
0.1272	517	383	74	Pass
0.1347	466	353	75	Pass
0.1421	435	326	74	Pass
0.1496	422	312	73	Pass
0.1571	400	292	73	Pass
0.1645	378	271	71	Pass
0.1720	353	250	70	Pass
0.1794	320	229	71	Pass
0.1869	303	208	68	Pass
0.1944	292	186	63	Pass
0.2018	289	174	60	Pass
0.2093	268	163	60	Pass
0.2167	244	152	62	Pass
0.2242	214	142	66	Pass
0.2317	190	127	66	Pass
0.2391	174	119	68	Pass
0.2466	168	112	66	Pass
0.2541	159	102	64	Pass
0.2615	152	97	63	Pass
0.2690	135	93	68	Pass
0.2764	115	85	73	Pass
0.2839	103	77	74	Pass
0.2914	100	71	71	Pass
0.2988	93	68	73	Pass
0.3063	91	62	68	Pass
0.3137	85	59	69	Pass
0.3212	82	53	64	Pass
0.3287	72	50	69	Pass
0.3361	66	46	69	Pass
0.3436	61	41	67	Pass
0.3510	57	39	68	Pass
0.3585	54	39	72	Pass
0.3660	52	35	67	Pass
0.3734	50	33	66	Pass
0.3809	47	28	59	Pass
0.3884	42	26	61	Pass
0.3958	41	26	63	Pass
0.4033	38	24	63	Pass
0.4107	37	23	62	Pass
0.4182	35	21	60	Pass
0.4257	34	20	58	Pass

0.4331	33	19	57	Pass
0.4406	32	18	56	Pass
0.4480	28	18	64	Pass
0.4555	27	16	59	Pass
0.4630	26	16	61	Pass
0.4704	25	16	64	Pass
0.4779	23	14	60	Pass
0.4853	23	14	60	Pass
0.4928	22	14	63	Pass
0.5003	21	13	61	Pass
0.5077	18	12	66	Pass
0.5152	18	12	66	Pass
0.5227	18	11	61	Pass
0.5301	16	11	68	Pass
0.5376	14	10	71	Pass
0.5450	13	8	61	Pass
0.5525	11	7	63	Pass
0.5600	9	6	66	Pass
0.5674	9	6	66	Pass
0.5749	9	6	66	Pass
0.5823	9	6	66	Pass
0.5898	9	6	66	Pass
0.5973	9	5	55	Pass
0.6047	9	5	55	Pass
0.6122	9	4	44	Pass
0.6196	9	4	44	Pass
0.6271	9	4	44	Pass
0.6346	8	3	37	Pass
0.6420	8	3	37	Pass
0.6495	8	2	25	Pass
0.6570	8	2	25	Pass
0.6644	8	2	25	Pass
0.6719	7	2	28	Pass
0.6793	7	2	28	Pass
0.6868	7	2	28	Pass
0.6943	7	2	28	Pass
0.7017	7	2	28	Pass
0.7092	7	1	14	Pass
0.7166	7	1	14	Pass
0.7241	7	1	14	Pass
0.7316	7	1	14	Pass
0.7390	7	1	14	Pass
0.7465	6	1	16	Pass
0.7539	6	1	16	Pass
0.7614	5	1	20	Pass
0.7689	4	1	25	Pass
0.7763	4	1	25	Pass
0.7838	3	1	33	Pass
0.7913	3	1	33	Pass

---

#### Drawdown Time Results

Pond: Vault 1		
Days	Stage(feet)	Percent of Total Run Time
1	0.000	N/A

2	0.000	N/A
3	0.000	N/A
4	0.000	N/A
5	0.000	N/A

Maximum Stage: 3.000  
Drawdown Time: 00 05:07:40

---

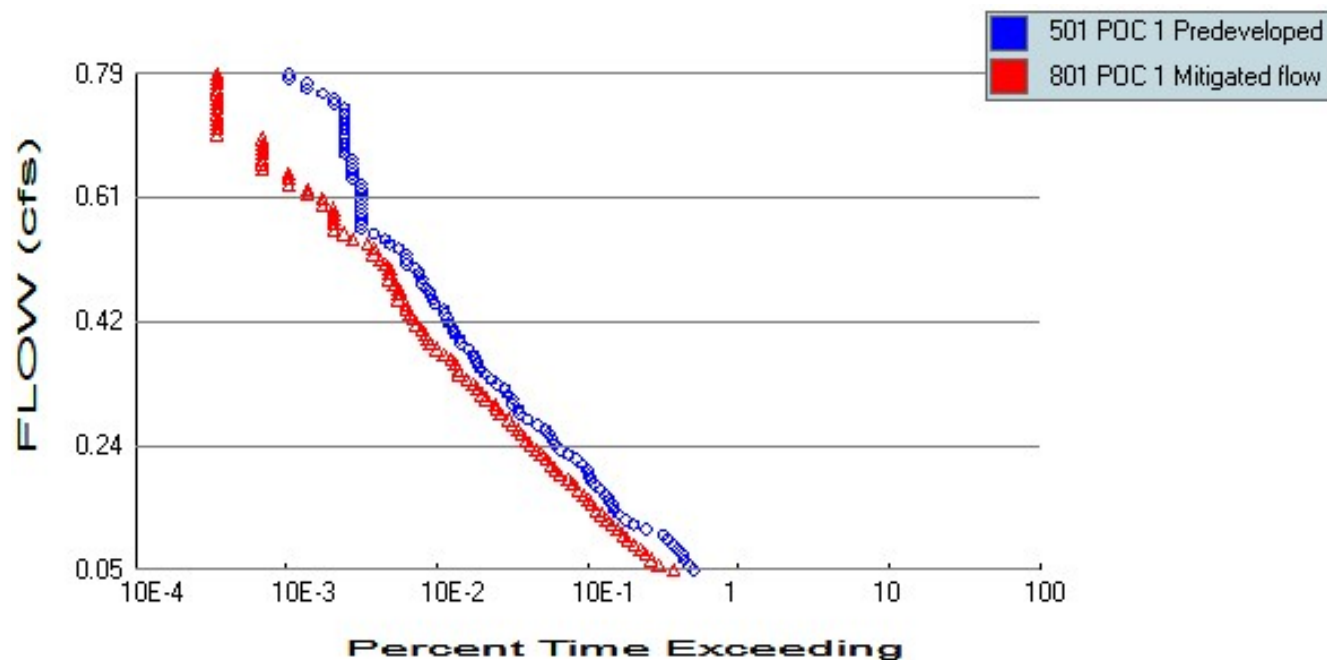
#### Perlnd and Implnd Changes

No changes have been made.

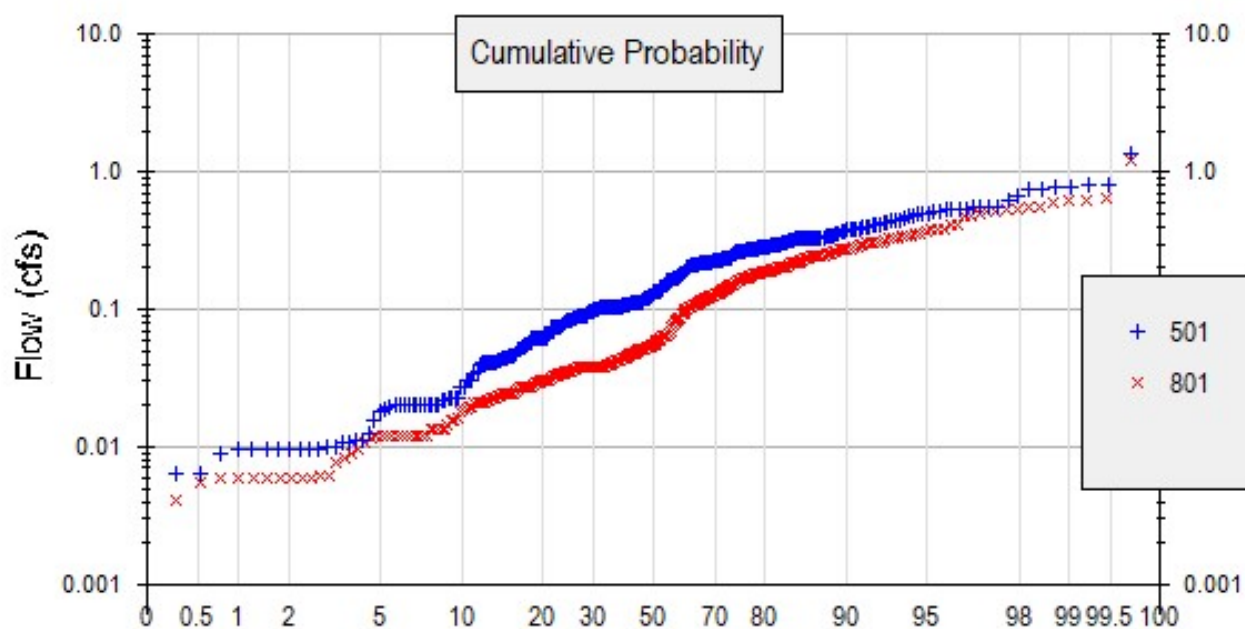
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### Duration Analysis at POC1



### Flow Frequency Analysis at POC1



## Drawdown Analysis at POC1



**Drawdown Analysis**  
Select analysis for 1001 Vault 1 STAGE Mitigated  

Analyze Stage

Pond: Vault 1

Maximum Stage3

Drawdown Time (dd hh:mm:ss)00 05:07:40

Gathering stage data for period of analysis.

DurationsFlow FrequencyDrawdownHydrograph

Analyze datasets

Compact WDMDelete Selected

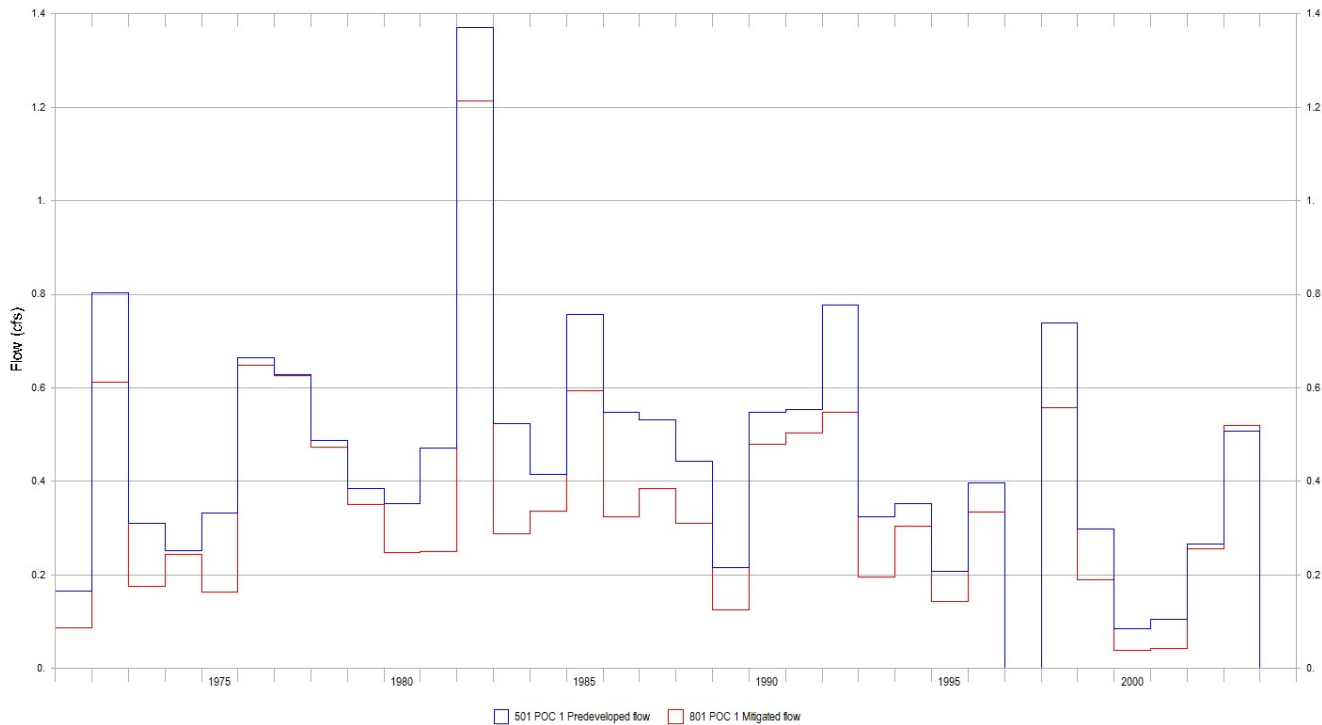
☐ Monthly FF

1001 Vault 1 STAGE Mitigated

All DatasetsFlowStagePrecipEvapPOC 1

# Hydrograph Yearly Peak Values

Clear Creek Solutions - SDHM31 - 5556 University 6-25 - 6/26/2018  
Annual Max/Peak Values





**Project Name: University Manor, LLC**

**Indicate which Items are Included:**

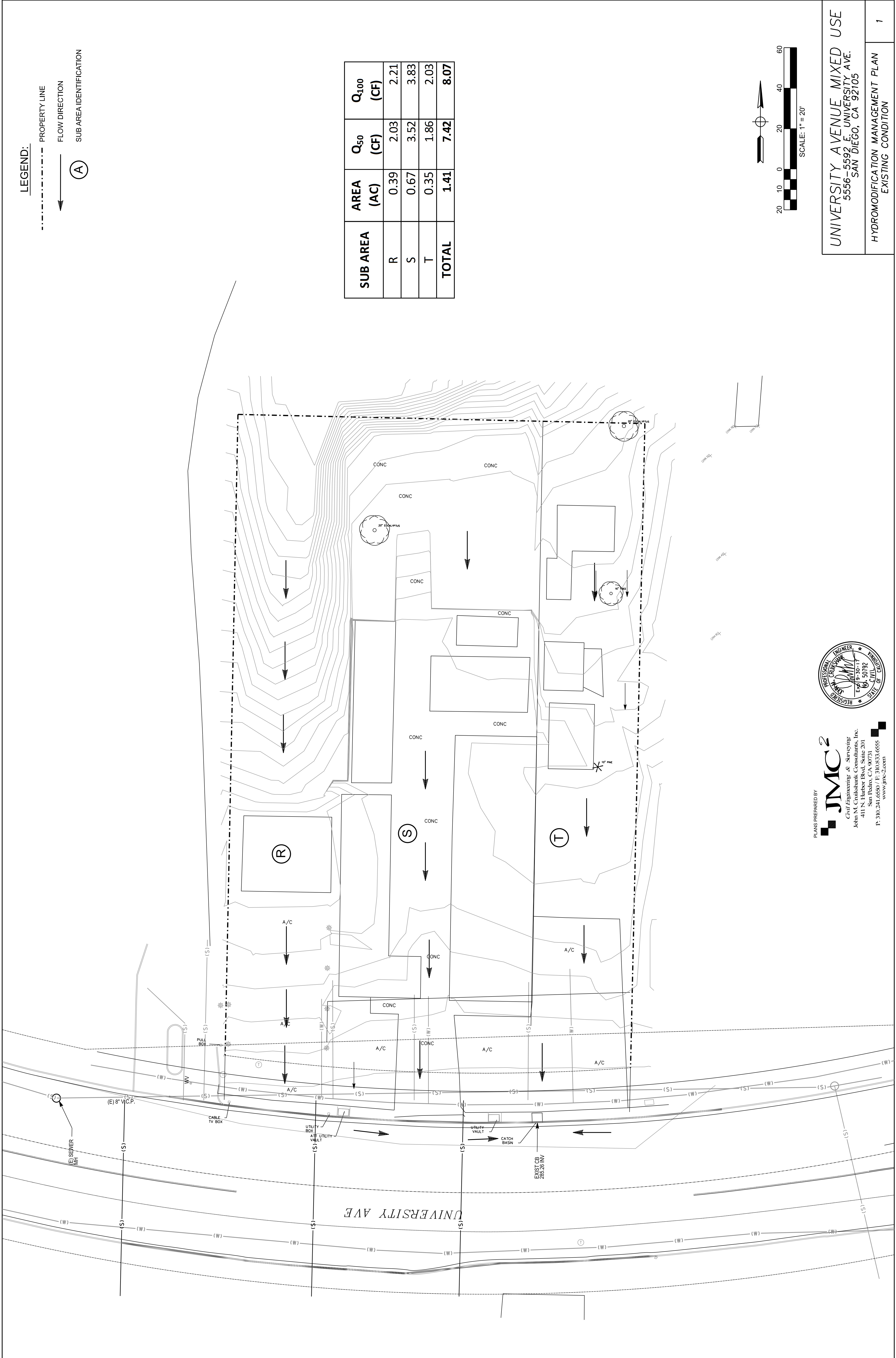
Attachment Sequence	Contents	Checklist
<b>Attachment 2a</b>	Hydromodification Management Exhibit (Required)	<input type="checkbox"/> Included See Hydromodification Management Exhibit Checklist.
<b>Attachment 2b</b>	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional)  See Section 6.2 of the BMP Design Manual.	<input type="checkbox"/> Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required)  Optional analyses for Critical Coarse Sediment Yield Area Determination <input type="checkbox"/> 6.2.1 Verification of Geomorphic Landscape Units Onsite <input type="checkbox"/> 6.2.2 Downstream Systems Sensitivity to Coarse Sediment <input type="checkbox"/> 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
<b>Attachment 2c</b>	Geomorphic Assessment of Receiving Channels (Optional)  See Section 6.3.4 of the BMP Design Manual.	<input checked="" type="checkbox"/> Not Performed <input type="checkbox"/> Included <input type="checkbox"/> Submitted as separate stand-alone document
<b>Attachment 2d</b>	Flow Control Facility Design and Structural BMP Drawdown Calculations (Required)  Overflow Design Summary for each structural BMP  See Chapter 6 and Appendix G of the BMP Design Manual	<input type="checkbox"/> Included <input checked="" type="checkbox"/> Submitted as separate stand-alone document
<b>Attachment 2e</b>	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	<input type="checkbox"/> Included <input checked="" type="checkbox"/> Not required because BMPs will drain in less than 96 hours

**Project Name: University Manor, LLC**

**Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:**

The Hydromodification Management Exhibit must identify:

- ☒ Underlying hydrologic soil group
- ☒ Approximate depth to groundwater
- ☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands) N/A
- ☐ Critical coarse sediment yield areas to be protected N/A
- ☒ Existing topography
- ☒ Existing and proposed site drainage network and connections to drainage offsite
- ☒ Proposed grading
- ☒ Proposed impervious features
- ☒ Proposed design features and surface treatments used to minimize imperviousness
- ☐ Point(s) of Compliance (POC) for Hydromodification Management
- ☒ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
- ☒ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)



LEGEND:

- PROPERTY LINE
- FLOW DIRECTION
- (A) SUB AREA IDENTIFICATION

SUB AREA	AREA (AC)	Q <sub>50</sub> (CF)	Q <sub>100</sub> (CF)
R	0.39	2.03	2.21
S	0.67	3.52	3.83
T	0.35	1.86	2.03
TOTAL	1.41	7.42	8.07

PLANS PREPARED BY

**JMC<sup>2</sup>**

Civil Engineering & Surveying  
John M. Crankshank Consultants, Inc.  
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P: 310.241.6550 / F: 310.833.6555  
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UNIVERSITY AVENUE MIXED USE  
5556-5592 E. UNIVERSITY AVE.  
SAN DIEGO, CA 92105

HYDROMODIFICATION MANAGEMENT PLAN  
EXISTING CONDITION









PLANS PREPARED BY  
**JMC<sup>2</sup>**  
 Civil Engineering & Surveying  
 John M. Crutcher & Associates, Inc.  
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**LEGEND:**  
 9156-D CHANNEL  
 DRAWING NUMBER  
 STORM DRAIN TYPE

**UNIVERSITY AVENUE MIXED USE**  
 5556-5592 E. UNIVERSITY AVE.  
 SAN DIEGO, CA 92105

**HYDROMODIFICATION EXHIBIT**



# **ATTACHMENT 3 STRUCTURAL BMP MAINTENANCE INFORMATION**

This is the cover sheet for Attachment 3.

**Project Name: University Manor, LLC**

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**Project Name: University Manor, LLC**

**Indicate which Items are Included:**

Attachment Sequence	Contents	Checklist
<b>Attachment 3a</b>	Structural BMP Maintenance Thresholds and Actions (Required)	<input checked="" type="checkbox"/> Included  See Structural BMP Maintenance Information Checklist.
<b>Attachment 3b</b>	Maintenance Agreement (Form DS-3247) (when applicable)	<input checked="" type="checkbox"/> Included <input type="checkbox"/> Not Applicable



BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
ECORAIN INFILTRATION TANK	OWNER	<p><u>MAINTENANCE INDICATOR</u> STANDING WATER IN SUBSURFACE INFILTRATION GALLERY FOR LONGER THAN 96 HOURS FOLLOWING A STORM EVENT</p> <p><u>MAINTENANCE ACTION</u> THIS CONDITION REQUIRES INVESTIGATION OF WHY INFILTRATION IS NOT OCCURRING. IF FEASIBLE, CORRECTIVE ACTION SHALL BE TAKEN TO RESTORE INFILTRATION (E.G. FLUSH FINE SEDIMENT OR REMOVE AND REPLACE CLOGGED SOILS). BMP MAY REQUIRE RETROFIT IF INFILTRATION CANNOT BE RESTORED. IF RETROFIT IS NECESSARY, THE CITY ENGINEER SHALL BE CONTACTED PRIOR TO ANY REPAIRS OR RECONSTRUCTION.</p>	
ECORAIN INFILTRATION TANK	OWNER	<p><u>MAINTENANCE INDICATOR</u> ACCUMULATION OF SEDIMENT, LITTER, OR DEBRIS IN INFILTRATION BASIN AND PRE-TREATMENT DEVICE AT CATCH BASIN</p> <p><u>MAINTENANCE ACTION</u> REMOVE AND PROPERLY DISPOSE ACCUMULATED MATERIALS.</p>	



## MAINTENANCE PARAMETERS

### ECO-RAIN TANKS, 1" (25 mm) & 2" (50mm) DRAINAGE CELLS

*Eco-Rain Tank Systems of America recommends **Point Source** filtration of water before it enters the Eco-Rain Tanks or Drainage Cells.*

#### POINT SOURCE (BIOSWALE) WATER FILTRATION:

Water filtration occurs through a permeable surface above the Eco-Rain Tank structure. Large suspended solids such as silt, fines and trash, are filtered out before water enters the system - there is nothing to clean out of the Tank structure.

*\*Inspect the permeable surface every twelve months for clogging and clean if necessary.*

#### COMMERCIAL FILTER:

Water directed into the Tank structure via pipes must pass through a commercial filter that does not allow overflow debris - they must be installed on all inlet pipes. When properly sized by the designing Engineer, maintenance is relegated to the filter unit.

*\*Consult with the Filter manufacturer for inspection and cleanout protocol for filters.*

#### CATCH BASIN:

When a catchment basin with a filter insert that does not allow debris to pass through is used, maintenance is relegated to removal of gross pollutants from the catch basin. A catch basin designed to handle the appropriate volume of water will not allow trash or large sediments to enter the Eco-Rain Tank.

*\*Inspect the catch basin at least every six months and clean-out as necessary.*

*When using the 1" Drainage Cells to line a catchment basin with sand in the bottom, use CLEAN river sand; scrape the surface at least every six months to keep it open and available to freely filter water into the system.*

#### INSPECTION & CLEANOUT PORTALS:

Eco-Rain Tanks can be designed with inspection, clean-out and/or flushing points to remove any possible accumulation of sediment or fines. The Cleanout Portal has a round six to thirteen-inch hole at the center base of the plate to accommodate a camera and high-pressure hose. Flush water through the tank by inserting a high-pressure hose through the portal on one end and vacuum it up out the opposite end. When using a Cleanout Portal, we recommend annual inspection of the inside of the tank. If necessary, perform a flush at that time. If water entering the tank is filtered properly, flushing may only be necessary every five years.

#### MAINTENANCE LOG:

Keep a log of all inspection and maintenance performed on the Eco-Rain Tank structure and filters. Keep this log on-site.

***Eco-Rain Tank Systems warranty is void if unfiltered water is directed into the Tank structure.***

+ 1.818.501.0424 - [contact@ecoraintank.com](mailto:contact@ecoraintank.com) - [www.ecoraintank.com](http://www.ecoraintank.com)



TM

## Warranty

Eco-Rain Tank Systems (Eco-Rain) warrants for a period of 10 years that Eco-Rain products will meet specifications at the time of delivery, without manufacturing defects, and will perform as stated in this document provided the applications, handling, storage and installation methods follow recommendations stated in the Submittal.

Eco-Rain is not a project designer or installer. While Eco-Rain provides general guidelines for design and installation of its products, all subsequent design and installation is the responsibility of the users. Eco-Rain recommends review of designs by a Geotechnical Engineer.

If manufacturing defects exist, Eco-Rain will replace the product free of charge. Product replacement or refund is the buyer's sole remedy and Eco-Rain will not be liable for any indirect, consequential, special or resultant damages.

Eco-Rain makes no representation or warranty to purchaser as to the suitability of the product for purchaser's intended use. It shall be the responsibility of the user to determine the suitability of the subject product.

Eco-Rain Tank Systems of America, Inc.

[www.ecoraintank.com](http://www.ecoraintank.com)

[contact@ecoraintank.com](mailto:contact@ecoraintank.com)

**Eco-Rain Tank Systems of America, Inc.**

12400 Ventura Boulevard #167

Studio City, CA 91604

# CERTIFICADO

Número SG/CAL/15/2016

NEMT REGISTER S.A de C.V.

certifica que el sistema de gestión de calidad de la empresa:

**INDUSTRIA DE PLASTICOS DELQUIN, S.A. DE C.V.**

Carr. Cadereyta-Allende km 4, Cadereyta Jiménez, Nuevo León, México, CP 67450.

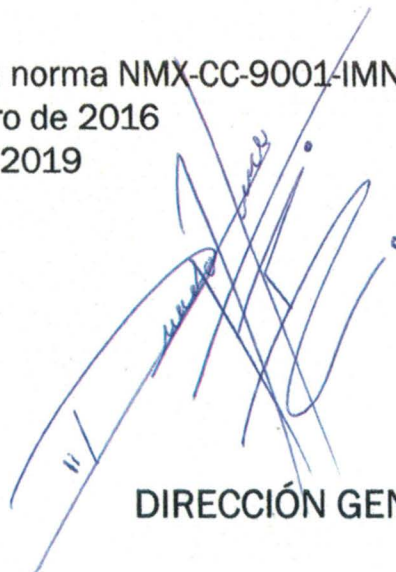
Para el siguiente alcance:

Fabricación de envases, embalajes y otros productos de plástico.

es conforme con los requisitos de la norma NMX-CC-9001-IMNC-2008 / ISO 9001:2008

Fecha de Otorgamiento: 4 de Febrero de 2016

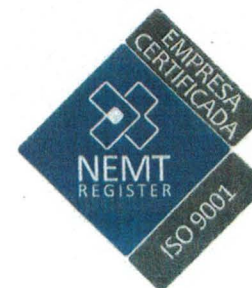
Fecha de Vigencia: 3 de Febrero de 2019



DIRECCIÓN GENERAL



No. de Acreditación: 101/15  
Vigente a partir de: 2015/05/05



Consulta el estatus del certificado en la página web: [www.nemtregister.com](http://www.nemtregister.com)

El presente certificado se considerará válido siempre que se cumplan todas las condiciones del contrato del cual este certificado forma parte.



## Sustainable City Designs with Eco-Rain Tank Systems

- I. Roadways
- II. Parking Lots & Garages
- III. Roof Gardens & Planter Boxes
- IV. Sport Fields

### Introduction

In nature, more than 90% of the earth's surface is permeable. In a typical city, more than 70% of the earth's surface is *impermeable*. During rainfall, air and surface pollutants accumulate in runoff waters, and typically wash down streets and storm drains into rivers and eventually the oceans.

Additionally, the impermeable surfaces of streets, parking lots, sidewalks, and buildings decrease humidity and cause the temperature to rise. We can reverse these degradations with designs that include permeable surfaces, more vegetation, and tested water filtration systems that mimic nature's way of cleaning water.

### I. Roadways

#### A. Permeable Pavement

The Eco-Rain 2" Drainage Cell, permeable bitumen or porous asphalt and concrete, or porous concrete can be used in lightly traveled streets, pedestrian walkways, and parking lots. The Drainage Cells are made from 100% recycled Polypropylene. Porous asphalt consists of an open-graded asphalt concrete composed of stone aggregate and an asphalt binder.

Permeable bitumen or concrete is laid over the two-inch permeable drainage cell that provides a true void space for water and air circulation. This 'structure' sits on top of a properly compacted soil base. Water that infiltrates through the road surface is collected in the underlying two-inch drainage cells, then directed into Eco-Rain Tanks that run parallel under the side of the road. Infiltration is directed away from the road base, providing underground irrigation of roadside plants and trees.

For heavily traveled streets, use the Eco-Rain Tank System design with traditional surfacing.

#### 1. Advantages to Using Eco-Rain Tank Systems

- a. The system eliminates 'road warping' and 'sink holes'.
- b. The Japanese conducted studies showing that the two-inch void space created by the drainage cell reduces the surface temperature on the average by 17 degrees Centigrade on concrete surfaces and 50 degrees Centigrade on turf. This helps reduce global warming in addition to the local benefit.
- c. The design cleans road runoff waters, making it suitable for landscape and toilet reuse, and discharge to waterways.



d. It eliminates the cost of underground piping and drain inverts. It also eliminates use of additional Storm Water Pollution Prevention devices such as sewer invert filtration systems.

e. Pervious surfacing allows 100% use of the land for structures in developed areas, as compared to use of open detention or retention ponds that require large open-land areas.

f. Eco-Rain Tank products are made from 100% recycled polypropylene, thus reducing use of virgin or earth materials, and reducing landfill.

## II. Parking Lots & Garages

### A. Garages

The top floor of parking garages can be built with an Eco-Rain Tank System that captures, cleans, and reuses storm water. The Eco-Rain Tank System allows for easy installation of garden areas in parking garages.

### B. Lots

Build parking lots with near 100% permeable surfaces that will stay level and free from ponding water. Eco-Rain Tank 2" Drainage Cells are made of durable 100% recycled Polypropylene, that when installed properly has a life expectancy of 20 to 40 years with little to no maintenance. Providing first flush pollution mitigation via pervious surfaces may be the lower cost option when compared to other BMP's. It may also be a lower installation cost than traditional parking lot construction. In addition, pervious surfaces appear to be the lower cost option over the life of the parking area.

#### 1. Advantages

- a. Same as above for roadways.
- b. Eco-Rain Tank Systems can be built to provide recharge of groundwater aquifers.
- c. Improved vegetative and tree growth, and reduced walkway maintenance. Roots remain underground.
- d. Reduced hydrocarbon pollution from reduced use of asphalt pavement and sealers.

## III. Green Roofs & Planter Boxes

A. Green Roofs are an essential element in city water management and one of the best hydrological solutions to solve city-induced floods, as well as to reduce global warming. Green Roofs absorb and retain water, reduce interior building temperatures, and assist with air purification.

In cities, roofs are a large percentage of impermeable surfaces. When rainwater washes off roofs, it carries organic materials, bacteria, heavy metals from vehicle exhaust, and industrial pollution.

Eco-Rain Drainage Cells solve complex water management issues easily, and adapt to both flat and pitched roofs. Water management is the single most important issue in establishing a roof garden. The Eco-Rain 1" Drainage Cell is a lightweight, incredibly strong structure through which water and air pass freely. It directs air, gases and water to flow in a vortex motion, which provides an aerobic environment, retarding the growth of deleterious bacteria. The cells provide a moist, humid layer under the plant roots, an ideal environment for optimum growth.

Its' open surface space of approximately 60% allows water to drain into the cell at a rapid rate during heavy storms. The internal structure is 80% open, allowing water to flow easily to a catch basin.

B. Planter Boxes are similar to Green Roofs in design and advantage, and may be built on multiple levels, utilizing more building space, with the added benefit of enhancing the view from all levels, inside and out.

#### 1. Advantages Using the 1" Drainage Cell

- a. Easy and simple installation. The Cells fit together by hand, and are lightweight.
- b. The Cells are incredibly strong and can support heavy loads.
- c. The Cells remove excess water quickly and efficiently.
- d. An ideal growing condition is created - a moist, humid passive irrigation environment in which plants thrive.
- e. The design of the system helps to purify the water, neutralizing contaminants.

As a matter of interest, Germany passed a law that requires use of green roofs. Germany contributes 50% to the cost of building a green roof for both private and public buildings.

#### IV. Sports Fields

A. *Why use the Eco-Rain Tank System for a sport field?*

- The Eco-Rain Tank System allows every day use of a sport field even during rainstorms because it provides exceptional drainage of the playing surface. Drainage rates exceed 4" (100mm) / hour.
- The Eco-Rain Tank System creates a perched water table beneath the topsoil, maintaining 'field capacity' - optimal moisture and air in the root zone for the most favorable turf. Strong turf is better able to prevent disease and lives longer.
- Sport fields using the Eco-Rain Tank System have a reduced surface temperature, providing a cooler environment thereby reducing transpiration, and increasing player stamina.
- The Eco-Rain Tank Recycling System recovers excess rain and leached irrigation water, thereby reducing irrigation costs.
- The Eco-Rain Tank System works best with the use of organic fertilizer, which is best for the environment, and turf. Less fertilizer is needed because the turf is healthier. Leached fertilizer is recycled and made available to the roots for full use, providing efficient use of resources.
- The Eco-Rain Tank System allows quick recovery of turf after heavy use. The surface stays level with reduced compaction of soil profile; and because the soil is stable, roots live in optimal condition; turf maintains strong growth even after heavy use.
- Eco-Rain Tank products are made of 100% recycled polypropylene, projected to last over 50 years underground. This system has been in use worldwide for over 20 years with no product failure. Fields will last indefinitely with proper maintenance.
- Reduced costs: turf lives longer, less use of imported water, less application of fertilizer and herbicide, no rescheduling of events due to rain.
- Eco-Rain Tank Systems when paired with an appropriate filter will clean rain, irrigation, and runoff water of pollutants.

#### Conclusion

**Eco-Rain Tank Systems are currently improving water quality and management in the following applications:**

- Commercial Developments
- Commercial Airports
- Residential Developments
- Road, Bridge and Tunnel Construction
- Sports Field Construction
- Agriculture
- Recreational Developments
- Landfills

Independent tests and testimonials from private and public agency personnel are available upon request. For more information, please contact us:

Eco-Rain Tank Systems of America, Inc.  
12400 Ventura Blvd. #167  
Studio City, CA 91604  
1.818.501.0424 office - [contact@ecoraintank.com](mailto:contact@ecoraintank.com)  
1.818.501.0713 fax



## Eco-Rain Tank Systems SUBMITTAL

### Technical Specifications, H-25 Traffic Loading, Detention, & Infiltration Tank Installation

#### PART I – GENERAL

##### 1. General Provisions

- A. The Conditions of the Contract and all Sections of Division 1 are a part of these Sections.

##### 2. Description of Work

A. Work Included:

1. Provide excavation and base preparation per Engineer's recommendations and/or as shown on drawings, to provide adequate support for project design loads. Provide excavation safety in accordance with OSHA requirements. (*See Part II – Products 2. Materials*)
2. Provide Soils Report that supports appropriate use of Eco-Rain Tanks (Infiltration or capture and reuse).
3. Provide Eco-Rain Tank modular units only, constructed and installed per the manufacturer's instructions furnished under this section. Each unit/section shall have a minimum of two interior plates evenly spaced.

B. Related Work

1. Sub-grade Excavation and Preparation - Under Earthwork Section of drawings and specifications.
2. Sub-surface Drainage Materials - Under Sub-Surface Drainage and Structures Section of drawings and specifications as needed.

##### 1. Quality Assurance

- A. Record discussions of meeting decisions and agreements reached and furnish copy of record to each party attending. Review foreseeable methods and procedures related to installation, including the following:
1. Review preparation and installation steps, coordinating and scheduling required with related work.
  2. Review proposed sources of materials.
  3. Tour, inspect and discuss condition of sub-grade, drainage structures, and other preparatory work.
  4. Review requirements for protecting the Eco-Rain Tank structure, including restriction of traffic during installation period and for remainder of construction period.
  5. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.





6. Review installation requirements (soils report, drawings, specifications, manufacturer's recommendations about installation in this submittal) and other contract documents.
  7. Review required submittals, both completed and yet to be completed.
  8. Review required inspections & testing procedures.
  9. Sign and date a copy of this Submittal verifying that the Installer has read and understands instructions. Send a copy of the signed Submittal to: Eco-Rain Tank Systems of America, 12400 Ventura Blvd., #167, Studio City, CA 91604; Fax: 818.501.0713; E-mail: [contact@ecoraintank.com](mailto:contact@ecoraintank.com)
  10. Review weather and forecasted weather conditions, and procedures for coping with unfavourable conditions.
  11. Review safety precautions relating to installation.
- B. Installation: Performed only by skilled workers with satisfactory record of performance on pipe, chamber, or pond/landfill construction projects of comparable size and quality.

## 2. Submittals

- A. Submit manufacturer's product data and installation instructions. Submit panels of one Eco-Rain Tank and one 20-inch x 20-inch section of geotextile fabric for product review. Return reviewed and accepted samples to the Contractor.
- B. Submit material specifications for Eco-Rain Tank, Class 1 non-woven geotextile fabric, Biaxial Geogrid if required, base course, and backfill materials.

## 5. Delivery, Storage, and Handling

- A. Protect all materials from damage during delivery and store under tarps to protect from sunlight exposure exceeding 5 days.
- B. Handle with equipment appropriate to the size (height) of Eco-Rain Tanks and site conditions, which may include, hand, handcart, forklifts, extension lifts, small cranes, etc; give care to minimize damage to material. Full pallets require the use of a forklift, unloaded on flat surfaces.
- C. Storage should occur on smooth surfaces, free from dirt, mud and debris.

## 6. Project Conditions

- A. All Weather
  1. Review installation procedures and coordinate Eco-Rain Tank work with other work, such as grading, excavation, utilities, construction access, and erosion control.
  2. Prevent all non-installation related construction traffic around the EcoRain Tank installation.
  3. **Either complete adjacent construction prior to the installation of Eco-Rain Tanks or provide detours for all traffic exceeding load rating for the structure.**
  4. When installing Eco-Rain Tanks, take care against damage from other construction traffic when work is in progress.
  5. Following completion of backfill, mark structure perimeter with highly visible construction tape, fencing, or other means until all site construction is complete.
  6. Protect adjacent work from damage during Eco-Rain Tank installation.



7. Direct all site stormwater runoff away from the installation area. The installation area shall not receive site runoff until the runoff area is maintained with temporary erosion control device and/or site landscaping is established to completely diminish washing of silts and clays into the installation area.
- B. Cold Weather
  1. Do not use frozen materials or materials mixed or coated with ice or frost.
  2. Do not build on frozen, wet, saturated or muddy sub-grade.

## PART II – PRODUCTS

### 1. Availability

- A. Manufacturer: Eco-Rain Tank Systems of America  
12400 Ventura Boulevard #167  
Studio City, CA 91604  
+ 1.818.501.0424  
contact@ecoraintank.com
- B. Supplier: Request a list for your area.

**2. Materials** *Specifications herein are minimum requirements for installations subject to repetitive AASHTO H25 wheel loading. When installed in competent soil conditions the AASHTO H25 loading allows a total load of 50,000 lbs as shown in test data. Backfill material, geotextile fabric and Biaxial Geogrid may vary depending upon surface loading conditions, infiltration requirements, soil conditions and soil gradation. Always follow Engineer's requirements to address these concerns.*

- A. **Base Excavation:** Shall be smooth soil, level and free of lumps or debris. Compact as required by **Soils Engineer**. Structural fill material may be used to amend the structural capacity of the soil **or six to eight inches of gravel or sand may be used as a structural base as determined by the Soils Engineer**. Geogrid and/or geotextile fabric may be required to achieve the minimum saturated bearing capacity in the base soils.
- B. **Geotextile:** Shall be non-woven Class 1, wrapped around all sides, top and bottom of the tank assembly, with a minimum six-inch joint overlap. *(See Geotextile Fabric Specifications Sheet)*
- C. **Geogrid:** Where required, use a Biaxial Geogrid (Tensar BX1200, Terragrid B120 or Synteen SF12 or equivalent) or Eco-Rain 2" Drainage Cell (405 psi) layer for structural support. Eco-Rain Systems recommends using Biaxial Geogrid or a layer of Eco-Rain 2" Drainage Cells in traffic rated installations. Follow Geogrid manufacturers or Eco-Rain Tank Systems recommendation for 2" Drainage Cell layers as to placement.
- D. **Eco-Rain Tank:** Injection moulded recycled polypropylene plastic units, 1.34' wide by 2.25' long and from .79' to 7.12' deep **as specified by the Engineer**, assembled from flat interlocking panels. Each unit shall have a minimum of two interior panels equally spaced plus two end panels for landscape applications and a minimum of three interior panels equally spaced plus two end panels for vehicle load applications. Assemble units into vertical structures as shown



- in the plan, **maximum five units tall**. *(For taller Eco-Rain Tanks, contact the manufacturer – Eco-Rain Tank Systems or consult a qualified Geotechnical Engineer.)*
- E. **Bedding Layer:** Layer a minimum of **two inches** of clean sand, gravel materials or a mix of both, free from lumps and debris or any other sharp materials - must be properly compacted as in A. above.
  - F. **Placement:** Place the Eco-Rain Tanks vertically into excavation per manufacturer's recommendations. Abut assembled Tanks in the excavation and wrap in Class 1 non-woven geotextile fabric to create one structure.
  - G. **Pipes:** Connect pipes, if any, before backfilling.
  - H. **Filters:** All water entering the Tank structure must be filtered, either through a rock/sand/soil profile or if water is directed via pipe, use of a manufactured filter that will not allow any debris to bypass the filter must be installed on all inlet pipes.
  - I. **Side Backfill:** Side backfill must be completed before top backfill is started. Fill with clean sand or gravel ( $\frac{3}{4}$ " or less – no limestone) materials or a mix of both, free from lumps and debris or any other sharp materials to backfill along the sides of the Tank. During compaction with powered mechanical compactor, cover the side of the Tank with a sheet of plywood to protect fabric and Tank from the compactor. Move the plywood sheet as the compactor moves. Compact side fill in lifts that do not exceed 12 inches as required by a **Soils Engineer**, to provide a settlement free surface of the sides of the structure. Verify by meter during progression.
- I. Top Backfill for Parking Lots and Heavy Load Applications:**
- 1. Use a minimum of five ET-1507 Small Plates in each unit of Double, Triple, Triple + Half, Quad, Quad + Half, and Pent Tanks for parking lots and heavy load applications.
  - 2. Use minimum 24 inches fill material as required by approving agency for parking lots or driveways (please contact us if project calls for less or more depth – specification will change depending on design and may include the use of additional Small Plates instead of traffic load five Small Plates per unit and/or Drainage Cells). All fill materials shall be compacted for parking lots or heavy load application **as specified by a Soils Engineer**. The use of an Eco-Rain 2" Drainage Cell layer or Biaxial Geogrid layer **between the top of the Tank structure and finished grade** is recommended – follow manufacturer recommendation for placement.
  - 3. After the side backfill is fully in place and compacted, backfill top in lifts of 12-inch depths and compact each layer, including self-compacting fill, with low-pressure tire or track vehicles, walk-behind vibratory plate compactors, or approved equipment. Do not use vibratory rollers at any time, even after full backfill. *(See Equipment Sheet for approved compactors.)*
  - 4. Top backfill will not exceed four feet in depth without prior review and written approval from the manufacturer.



5. Do not operate AASHTO H-25 load rated equipment over the Eco-Rain Tank structure until a properly compacted approved minimum cover and pavement is in place. (See *Part III - Execution, 3. Installation, F.*)

**J. Top backfill for Non-Vehicle Load Applications:**

1. Use 18-inch minimum of porous top fill to allow infiltration into the Eco-Rain **Tanks as specified by the Soils Engineer** for non-vehicle load bearing swales and landscapes above the Eco-Rain Tanks. Please contact us if project calls for less than 18-inches or more than 48-inches depth – specification will change depending on design and may include the use of additional Small Plates and/or Drainage Cells.

## **PART III – EXECUTION**

### **1. Inspection**

- A. Examine prepared excavation and conditions for level smoothness to within ½” or as specified, and compaction. Correct unsatisfactory conditions before start of EcoRain® Tank installation. **Check for presence of high water table**, which must be kept at levels below the bottom of the Eco-Rain Tank structure at all times (a layer of Eco-Rain 2” Drainage Cells can be used as the underdrain medium - contact manufacturer for details).
- B. **Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.** If existing conditions are found unsatisfactory, contact the Engineer for resolution. Saturated sub-base soils shall have a minimum allowable bearing value of **35 psi**.

### **2. Preparation**

- A. Keep all construction traffic away from the limits of excavation until the project is complete and final surface materials are in place by delineating with high visibility tape or other means.
- B. Following OSHA requirements, excavate site to proper depth, accounting for 2-inch bedding and specified height of Eco-Rain Tank and specified depth of cover over Eco-Rain Tanks. Smooth the subgrade, free of lumps, roots, & debris.
- C. If it rains after excavation, but before installation of Tanks, the base must be dry and levelled before installation begins.
- D. Place a minimum 2-inch thick layer of clean sand or gravel materials, free from lumps and debris or any other sharp materials over prepared sub-grade. Screed a 2-inch thick layer to ensure level surface to within ½” or as shown on plan.
- E. Where an impervious liner is specified to harvest rainwater or prevent groundwater intrusion, install in accordance with the plans, and Engineer’s or other professional’s specifications. If recommended by the Engineer/designer, place a layer of geotextile fabric in the bottom and sides of the excavation to protect the outside of the liner. Place and unfold the liner on top of the geotextile fabric. If recommended by the Engineer, on the inside of the liner, place six inches of



clean sand in a footprint size of the Eco-Rain Tank structure. Screed the surface. Chalk or paint lines for layout in the excavation are recommended.

- F. Inside the liner, place and stretch smooth Class 1 non-woven geotextile fabric over the entire base area and sides of the excavation in strips with sufficient amount to encase the completed Eco-Rain Tank structure. Create minimum 6-inch joint overlaps.
- G. Assemble Eco-Rain Tank units as indicated in assembly directions provided by manufacturer or distributor. Assembled unit panels shall be firmly interlocked. Place tall elevation on the vertical plane. Place narrower side in the horizontal plane. Each unit shall have a minimum of two interior Small Plates in landscape/non-traffic areas and three interior Small Plates in vehicle traffic areas. Do not use cracked or broken plates – replace with intact plates.
- H. *Inspection Ports are not required with the Eco-Rain Tank System if all debris is filtered out prior to water entering the Eco-Rain Tanks. However, if the designing Engineer desires to install maintenance/inspection ports, Eco-Rain requires that they are installed in the outside perimeter of the tank structure where a 6 - 12" diameter pipe can be angled downward to a partial or full channel (See ET-1210 & ET-1210A) unless specific approval is gained by designing Engineer.*

### 3. Installation of Eco-Rain Tanks

- A. Place assembled interlocked vertical Tank units in position on top of the Geotextile fabric in the excavation. Chalk lines for layout in the excavation are recommended. Abut vertically stacked Tank units side by side. Keep geotextile fabric on bottom, sides, and top clear of construction activity, and ensure adequate length is available to wrap the completed Tank size. **Orient** all Tanks so that the **Large Plate** is on the perimeter of the installation. This means that two ends of the structure will have a row of Tanks placed perpendicular to all the other Tanks. See ET-1211 drawing of Typical Eco-Rain Tank Assembly Layout. If not possible to place Tanks perpendicular on the ends, reinforce ends with either Eco-Rain 1" or 2" Drainage Cell layers. In structures that are using Eco-Rain Triple, Triple + Half, Quad, Quad + Half, or Pent Tanks, *perpendicular rows must be placed between every six rows or less.* See Eco-Rain drawing ET-1212B.
- B. Identify locations of filters and inlet pipes, outlet pipes, inspection ports, and/or cleanout portals, if any. Secure pipe connections to geotextile fabric using stainless steel pipe clamps, zip ties, and/or fully securing with HDPE Tape so that no soil can enter the structure. Connect pipe as follows: For side mounted inlet/outlet pipes exceeding six inches in diameter, place a layer of Eco-Rain 2" Drainage Cells vertically next to the Large Plate side only, where the pipe aligns with the Tank. In a second layer of 2" Drainage Cells, cut a hole the size of the pipe, place this layer next to the first layer, pull the geotextile fabric over the layers, and mark and cut an X in the fabric at the pipe opening in the 2" Drainage Cell layer. Cut a fabric collar with an X cut for the pipe, pull over end of pipe. Then place the pipe end in the cut layer of 2" Drainage Cells, push the collar into the fabric layer surrounding the Tanks, pull the ends of the fabric over the pipe and secure so that no soil/sand can enter the Tank. (See ER-1216 for Pipe Collar detail). Support pipe in trenches and during backfill operations to prevent damage to pipe or liner if used. **Connect pipes prior to backfilling.** See Eco-Rain drawing ET-1207 or ET-1215 for pipe connections. Proceed as outlined in C. below.



- C. When the Eco-Rain Tank modular structure is fully in place, stretch geotextile fabric up the sides and over the top of the structure, smooth wrinkles in the fabric, overlap seams by at least six inches and seal joints, fully securing with HDPE Tape so that no soil can enter the structure. (See ET-1216 for Pipe Collar detail.) Trim and fold excess geotextile fabric at corners to lay flat against sides of structure, securing folds and seams with HDPE Tape. If an impermeable liner is installed, follow the Liner manufacturer's recommended instructions to secure the liner around the structure. **Follow the Liner manufacturer's instructions to cut and seal holes in the liner.**
- D. Install 2-foot lengths of metallic underground locator tape on each top corner of the Tank structure.
- E. Place backfill carefully to avoid shoving or damage to tanks and geotextile fabric. **Excavator equipment** shall remain **clear of the excavation**, and material shall not be dropped vertically on the tank from a distance greater than **one foot**. Backfill on opposite sides of the structure at the same time, compacting material in maximum 12-inch lifts. Keep compactor equipment clear of tank structure and cover the side of the tank with a sheet of plywood to protect the fabric, tank (and liner if used) from the compactor. This plywood sheet must be moved as the compactor moves, as it acts as a temporary cover to protect the side of the structure from the compactor to avoid any possible damage to the side of the Tanks, fabric and liner.
- F. After sides are completely backfilled, check for broken plates on the top of the structure, if any they **MUST** be replaced. Then place backfill material over top of structure (see E. above). Place a minimum of 12 inches of cover to protect the Tank and fabric. Compact 12-inch lift **as specified by a Soils Engineer**, using low-pressure tire or track vehicles, light-weight vibratory plate compactors, walk behind rollers or approved equipment (Do not use equipment exceeding 6,000 lbs.). **\*\*\*Equipment shall not make turning movements on top of the Tank.** For parking lots or heavy-duty installations as specified by the Engineer, place a layer of Eco-Rain 2" Drainage Cells or Biaxial Geogrid covering entire excavation (top of Tank plus 3-foot overlap of the structure, pinning the edges into solid ground). Provide 12 inches compacted fill under Biaxial Geogrid if used. Place additional cover backfill in 12-inch lifts (or as approved) and compact with low-pressure tire or track vehicles, lightweight vibratory plates, walk-behind rollers, or approved equipment **\*\*\*Do not use vibratory rolling compactors at any time.**
- G. Place surfacing materials, such as groundcovers or shrubs, or paving materials over the structure with care to avoid displacement of cover fill and damage to surrounding areas.

#### 4. Site Cleaning

- A. Perform cleaning during the installation of work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair any damage to adjacent materials and surfaces resulting from installation of this work.





Disclaimer: All information provided in this publication is correct to the best knowledge of the company and is given in good faith. This information is intended only as a general guide, no responsibility can be accepted for any errors, omissions or incorrect assumption. As each project is unique, and as Eco-Rain Tank Systems and its distributors and agents worldwide have no direct control over the methods employed by the user in specifying, installing or supervising of its products hence no responsibility is accepted by Eco-Rain Tank Systems of America, distributors, and agents world-wide. Users should satisfy themselves as to the suitability of the product for their purpose.

Sign and date a copy of this page verifying that the Installer has read and understands these instructions. Send a hard copy of this signed page to:

- Eco-Rain Tank Systems of America 12400 Ventura Blvd., #167, Studio City, CA 91604
- Fax: 818.501.0713                      Email: [contact@ecoraintank.com](mailto:contact@ecoraintank.com)

---

Name of Project

---

City & State

---

Signature of Installer

---

Date



**Project Name: University Manor, LLC**

**Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:**

**Preliminary Design / Planning / CEQA level submittal:**

- Attachment 3a must identify:
  - ☐ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual
- Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

**Final Design level submittal:**

**Attachment 3a** must identify:

- ☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ When applicable, frequency of bioretention soil media replacement
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

**Attachment 3b:** For private entity operation and maintenance, Attachment 3b must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

- ☐ Vicinity map
- ☐ Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
- ☐ BMP and HMP location and dimensions
- ☐ BMP and HMP specifications/cross section/model
- ☐ Maintenance recommendations and frequency
- ☐ LID features such as (permeable paver and LS location, dim, SF).

Project Name: University Manor, LLC



**THE CITY OF SAN DIEGO**  
RECORDING REQUESTED BY:  
**THE CITY OF SAN DIEGO**  
AND WHEN RECORDED MAIL TO:

Click or tap here to enter text.

Click or tap here to enter text.

Click or tap here to enter text.

(THIS SPACE IS FOR THE RECORDER'S USE ONLY)

**STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT**

**APPROVAL NUMBER:**

Click or tap here to enter text.

**ASSESSOR'S PARCEL NUMBER:**

Click or tap here to enter text.

**PROJECT NUMBER:**

Click or tap here to enter text.

This agreement is made by and between the City of San Diego, a municipal corporation [City] and Click or tap here to enter text.

the owner or duly authorized representative of the owner [Property Owner] of property located at:

Click or tap here to enter text.

(PROPERTY ADDRESS)

and more particularly described as: Click or tap here to enter text.

(LEGAL DESCRIPTION OF PROPERTY)

in the City of San Diego, County of San Diego, State of California.

Property Owner is required pursuant to the City of San Diego Municipal Code, Chapter 4, Article 3, Division 3, Chapter 14, Article 2, Division 2, and the Land Development Manual, Storm Water Standards to enter into a Storm Water Management and Discharge Control Maintenance Agreement [Maintenance Agreement] for the installation and maintenance of Permanent Storm Water Best Management Practices [Permanent Storm Water BMP's] prior to the issuance of construction permits. The Maintenance Agreement is intended to ensure the establishment and maintenance of Permanent Storm Water BMP's onsite, as described in the attached exhibit(s), the project's Storm Water Quality Management Plan [SWQMP] and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): Click or tap here to enter text.

Property Owner wishes to obtain a building or engineering permit according to the Grading and/or Improvement Plan Drawing No(s) or Building Plan Project No(s): Click or tap here to enter text.

**Continued on Page 2**

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMP's, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s):Click or tap here to enter text..
2. Property Owner shall install, maintain and repair or replace all Permanent Storm Water BMP's within their property, according to the OMP guidelines as described in the attached exhibit(s), the project's WQTR and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s)Click or tap here to enter text..
3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibits(s):Click or tap here to enter text.

\_\_\_\_\_  
(Owner Signature)

\_\_\_\_\_  
Click or tap here to enter text.

\_\_\_\_\_  
(Print Name and Title)

\_\_\_\_\_  
Click or tap here to enter text.

\_\_\_\_\_  
(Company/Organization Name)

\_\_\_\_\_  
Click or tap to enter a date.

\_\_\_\_\_  
(Date)

## THE CITY OF SAN DIEGO

APPROVED:

\_\_\_\_\_  
(City Control engineer Signature)

\_\_\_\_\_  
(Print Name)

\_\_\_\_\_  
(Date)

**NOTE: ALL SIGNATURES MUST INCLUDE NOTARY ACKNOWLEDMENTS PER CIVIL CODE SEC. 1180 ET.SEQ**

# **ATTACHMENT 4**

## **COPY OF PLAN SHEETS SHOWING PERMANENT STORM WATER BMPS**

This is the cover sheet for Attachment 4.

**Project Name: University Manor, LLC**

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**Project Name: University Manor, LLC**

**Use this checklist to ensure the required information has been included on the plans:**

The plans must identify:

- ☒ Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
- ☒ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- ☒ Details and specifications for construction of structural BMP(s)
- ☒ Signage indicating the location and boundary of structural BMP(s) as required by the City Engineer
- ☒ How to access the structural BMP(s) to inspect and perform maintenance
- ☒ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☒ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☒ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☒ Recommended equipment to perform maintenance
- ☒ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- ☒ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- ☒ All BMPs must be fully dimensioned on the plans
- ☒ When propriety BMPs are used, site specific cross section with outflow, inflow and model number shall be provided. Broucher photocopies are not allowed.



ABBREVIATIONS:

BFP BACK FLOW PREVENTER  
CP COMPACT  
EG EDGE OF GUTTER  
FF FINISH FLOOR  
FG FINISH GRADE  
FL FLOW LINE  
FS FINISH SURFACE  
HP HIGH POINT  
LP LIGHT POLE  
LS LANDSCAPE  
INV INVERT ELEVATION  
MH MANHOLE

PA PLANTER AREA  
PB PULL BOX  
SW SIDEWALK  
TC TOP OF CURB  
TG TOP OF GRATE  
TL TELEPHONE  
TS TOP OF SLAB/STEP  
TW TOP OF WALL  
UNDG UNDERGROUND  
WM WATER METER  
WV WATER VALVE

LEGEND:

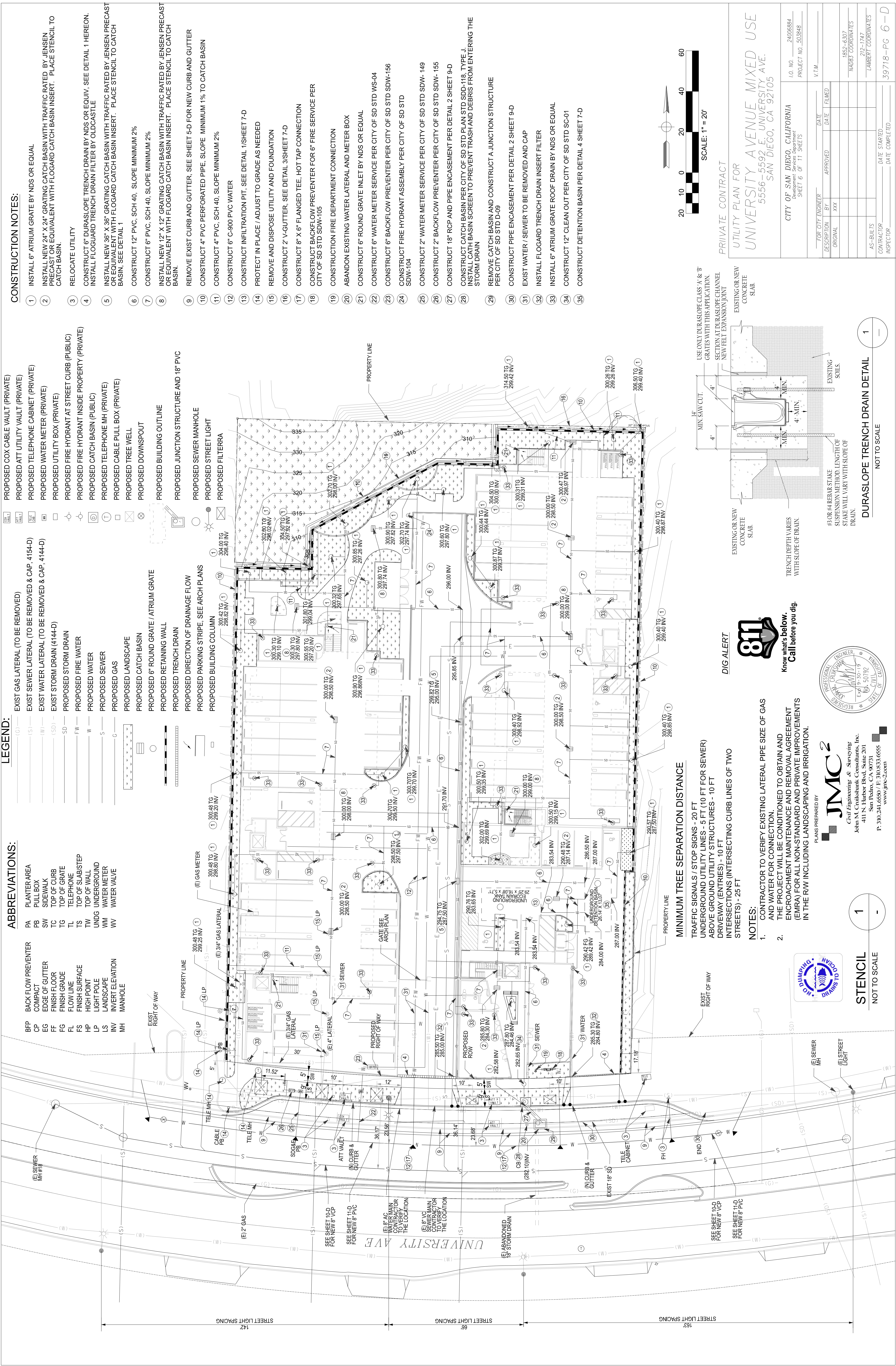
(G) EXIST GAS LATERAL (TO BE REMOVED)  
(S) EXIST SEWER LATERAL (TO BE REMOVED & CAP - 4154-D)  
(W) EXIST WATER LATERAL (TO BE REMOVED & CAP - 4144-D)  
(SD) EXIST STORM DRAIN (4144-D)  
SD- PROPOSED STORM DRAIN  
F-W PROPOSED FIRE WATER  
W PROPOSED WATER  
S PROPOSED SEWER  
C PROPOSED GAS  
+ + + + + PROPOSED LANDSCAPE  
+ + + + + PROPOSED CATCH BASIN  
+ + + + + PROPOSED 6" ROUND GRATE / ATRIUM GRATE  
+ + + + + PROPOSED RETAINING WALL  
+ + + + + PROPOSED TRENCH DRAIN  
+ + + + + PROPOSED DIRECTION OF DRAINAGE FLOW  
+ + + + + PROPOSED PARKING STRIPE, SEE ARCH PLANS  
+ + + + + PROPOSED BUILDING COLUMN  
+ + + + + PROPOSED STREET LIGHT  
+ + + + + PROPOSED FILTERRA

PROPOSED COX CABLE VAULT (PRIVATE)  
PROPOSED ATT UTILITY VAULT (PRIVATE)  
PROPOSED TELEPHONE CABINET (PRIVATE)  
PROPOSED WATER METER (PRIVATE)  
PROPOSED UTILITY BOX (PRIVATE)  
PROPOSED FIRE HYDRANT AT STREET CURB (PUBLIC)  
PROPOSED FIRE HYDRANT INSIDE PROPERTY (PRIVATE)  
PROPOSED CATCH BASIN (PUBLIC)  
PROPOSED TELEPHONE MH (PRIVATE)  
PROPOSED CABLE PULL BOX (PRIVATE)  
PROPOSED TREE WELL  
PROPOSED DOWNSPOUT  
PROPOSED BUILDING OUTLINE  
PROPOSED JUNCTION STRUCTURE AND 18" PVC  
PROPOSED SEWER MANHOLE  
PROPOSED STREET LIGHT  
PROPOSED FILTERRA

PROPOSED COX CABLE VAULT (PRIVATE)  
PROPOSED ATT UTILITY VAULT (PRIVATE)  
PROPOSED TELEPHONE CABINET (PRIVATE)  
PROPOSED WATER METER (PRIVATE)  
PROPOSED UTILITY BOX (PRIVATE)  
PROPOSED FIRE HYDRANT AT STREET CURB (PUBLIC)  
PROPOSED FIRE HYDRANT INSIDE PROPERTY (PRIVATE)  
PROPOSED CATCH BASIN (PUBLIC)  
PROPOSED TELEPHONE MH (PRIVATE)  
PROPOSED CABLE PULL BOX (PRIVATE)  
PROPOSED TREE WELL  
PROPOSED DOWNSPOUT  
PROPOSED BUILDING OUTLINE  
PROPOSED JUNCTION STRUCTURE AND 18" PVC  
PROPOSED SEWER MANHOLE  
PROPOSED STREET LIGHT  
PROPOSED FILTERRA

CONSTRUCTION NOTES:

- 1 INSTALL 6" ATRIUM GRATE BY NDS OR EQUAL
- 2 INSTALL NEW 24" X 24" GRATING CATCH BASIN WITH TRAFFIC RATED, BY JENSEN PRECAST OR EQUIVALENT WITH FLOGARD CATCH BASIN INSERT. PLACE STENCIL TO CATCH BASIN.
- 3 RELOCATE UTILITY
- 4 CONSTRUCT 6" DURASLOPE TRENCH DRAIN BY NDS OR EQUIV. SEE DETAIL 1 HEREON. INSTALL FLOGARD TRENCH DRAIN FILTER BY OLDCASTLE
- 5 INSTALL NEW 36" X 36" GRATING CATCH BASIN WITH TRAFFIC RATED BY JENSEN PRECAST OR EQUIVALENT WITH FLOGARD CATCH BASIN INSERT. PLACE STENCIL TO CATCH BASIN. SEE DETAIL 1
- 6 CONSTRUCT 12" PVC, SCH 40, SLOPE MINIMUM 2%
- 7 CONSTRUCT 6" PVC, SCH 40, SLOPE MINIMUM 2%
- 8 INSTALL NEW 12" X 12" GRATING CATCH BASIN WITH TRAFFIC RATED BY JENSEN PRECAST OR EQUIVALENT WITH FLOGARD CATCH BASIN INSERT. PLACE STENCIL TO CATCH BASIN.
- 9 REMOVE EXIST CURB AND GUTTER, SEE SHEET 5-D FOR NEW CURB AND GUTTER
- 10 CONSTRUCT 4" PVC PERFORATED PIPE, SLOPE MINIMUM 1% TO CATCH BASIN
- 11 CONSTRUCT 4" PVC, SCH 40, SLOPE MINIMUM 2%
- 12 CONSTRUCT 6" C-900 PVC WATER
- 13 CONSTRUCT INFILTRATION PIT, SEE DETAIL 1/SHEET 7-D
- 14 PROTECT IN PLACE / ADJUST TO GRADE AS NEEDED
- 15 REMOVE AND DISPOSE UTILITY AND FOUNDATION
- 16 CONSTRUCT 2" V-GUTTER, SEE DETAIL 3/SHEET 7-D
- 17 CONSTRUCT 8" X 6" FLANGED TEE, HOT TAP CONNECTION
- 18 CONSTRUCT BACKFLOW PREVENTER FOR 6" FIRE SERVICE PER CITY OF SD STD SDW-105
- 19 CONSTRUCTION FIRE DEPARTMENT CONNECTION
- 20 ABANDON EXISTING WATER LATERAL AND METER BOX
- 21 CONSTRUCT 6" ROUND GRATE INLET BY NDS OR EQUAL
- 22 CONSTRUCT 6" WATER METER SERVICE PER CITY OF SD STD WS-04
- 23 CONSTRUCT 6" BACKFLOW PREVENTER PER CITY OF SD STD SDW-156
- 24 CONSTRUCT FIRE HYDRANT ASSEMBLY PER CITY OF SD STD SDW-104
- 25 CONSTRUCT 2" WATER METER SERVICE PER CITY OF SD STD SDW- 149
- 26 CONSTRUCT 2" BACKFLOW PREVENTER PER CITY OF SD STD SDW- 155
- 27 CONSTRUCT 18" RCP AND PIPE ENCASEMENT PER DETAIL 2 SHEET 9-D
- 28 CONSTRUCT CATCH BASIN PER CITY OF SD STD PLAN STD SDD-118, TYPE J. INSTALL CATH BASIN SCREEN TO PREVENT TRASH AND DEBRIS FROM ENTERING THE STORM DRAIN
- 29 REMOVE CATCH BASIN AND CONSTRUCT A JUNCTION STRUCTURE PER CITY OF SD STD D-09
- 30 CONSTRUCT PIPE ENCASEMENT PER DETAIL 2 SHEET 9-D
- 31 EXIST WATER / SEWER TO BE REMOVED AND CAP
- 32 INSTALL FLOGARD TRENCH DRAIN INSERT FILTER
- 33 INSTALL 6" ATRIUM GRATE ROOF DRAIN BY NDS OR EQUAL
- 34 CONSTRUCT 12" CLEAN OUT PER CITY OF SD STD SC-01
- 35 CONSTRUCT DETENTION BASIN PER DETAIL 4 SHEET 7-D



MINIMUM TREE SEPARATION DISTANCE

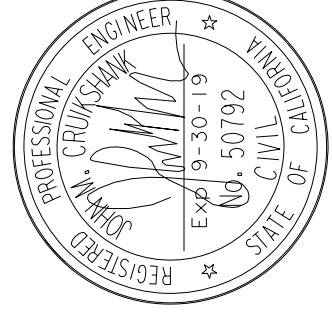
TRAFFIC SIGNALS / STOP SIGNS - 20 FT  
UNDERGROUND UTILITY LINES - 5 FT (10 FT FOR SEWER)  
ABOVE GROUND UTILITY STRUCTURES - 10 FT  
DRIVEWAY (ENTRIES) - 10 FT  
INTERSECTIONS (INTERSECTING CURB LINES OF TWO STREETS) - 25 FT

NOTES:

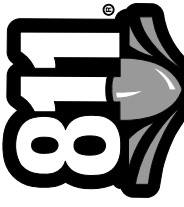
1. CONTRACTOR TO VERIFY EXISTING LATERAL PIPE SIZE OF GAS AND WATER FOR CONNECTION.
2. THE PROJECT WILL BE CONDITIONED TO OBTAIN AND ENCROACHMENT MAINTENANCE AND REMOVAL AGREEMENT (EMRA) FOR ALL NON-STANDARD AND PRIVATE IMPROVEMENTS IN THE RW INCLUDING LANDSCAPING AND IRRIGATION.



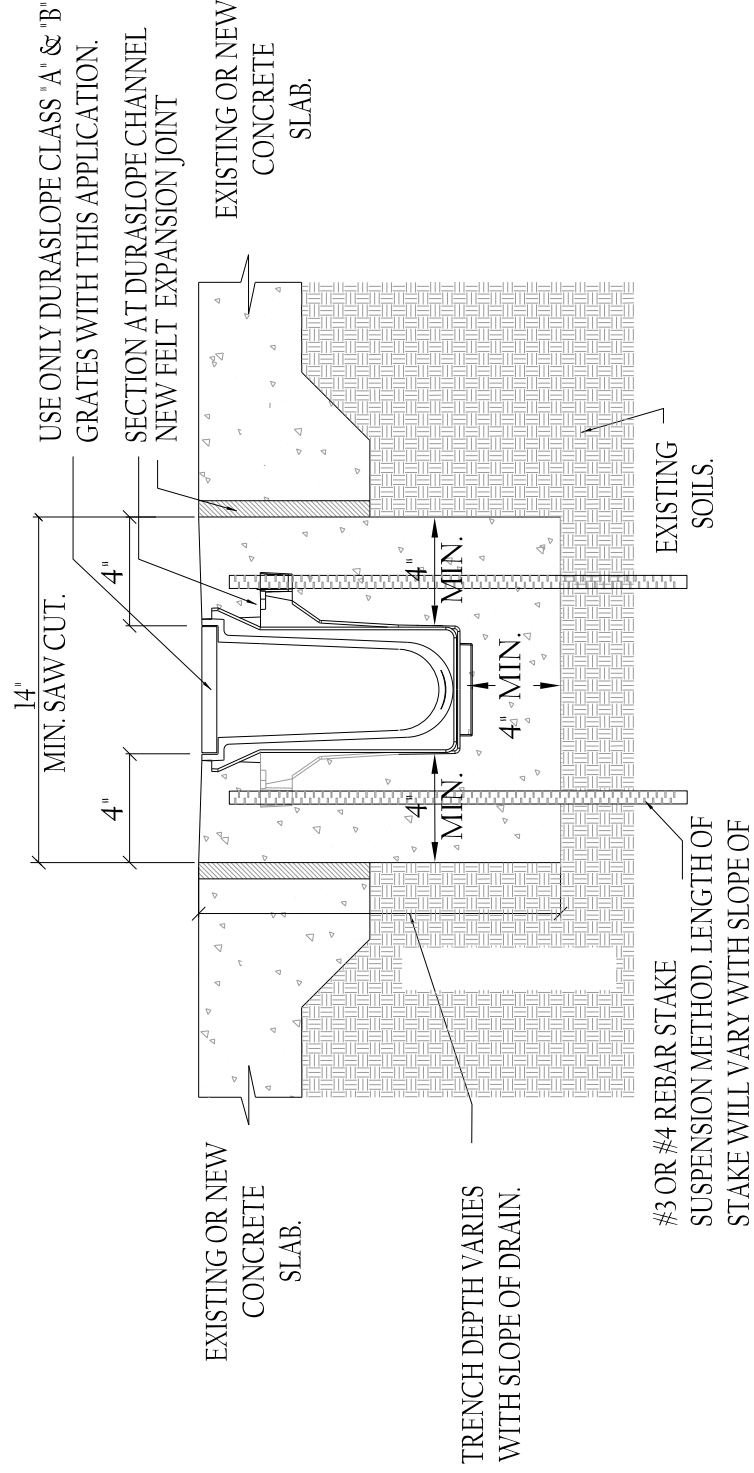
PLANS PREPARED BY  
**JMC<sup>2</sup>**  
Civil Engineering & Surveying  
John M. Crunkshank Consultants, Inc.  
411 N. Harbor Blvd, Suite 201  
San Pedro, CA 90731  
P: 310.241.6550 / F: 310.833.6555  
www.jmc-2.com



Know what's below.  
Call before you dig.



DIG ALERT



STENCIL  
NOT TO SCALE

1

DURASLOPE TRENCH DRAIN DETAIL  
NOT TO SCALE

1

PRIVATE CONTRACT

UTILITY PLAN FOR

**UNIVERSITY AVENUE MIXED USE**  
5556 - 5592 E. UNIVERSITY AVE.  
SAN DIEGO, CA 92105

CITY OF SAN DIEGO, CALIFORNIA Development Services Department SHEET 6 OF 11 SHEETS	I.O. NO. 24006884 PROJECT NO. 503848	
	V.T.M. _____	
FOR CITY ENGINEER	DATE	DATE
DESCRIPTION BY	APPROVED	FILED
ORIGINAL	XXX	
		1852-6-07
		NAD83 COORDINATES
		212-1747
		LAMBERT COORDINATES
AS-BUILT		
CONTRACTOR	DATE STARTED	
INSPECTOR	DATE COMPLETED	39718-Pg 6-D



**Project Name: University Manor, LLC**

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## **ATTACHMENT 5 DRAINAGE REPORT**

Attach project's drainage report. Refer to Drainage Design Manual to determine the reporting requirements.

**Project Name: University Manor, LLC**

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# **ATTACHMENT 6**

## **GEO TECHNICAL AND GROUNDWATER INVESTIGATION REPORT**

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

**Project Name: University Manor, LLC**

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# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM BIORETENTION FACILITIES, VEGETATED SWALES & HIGHER RATE BIOFILTERS

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** Southeast of Level 1 parking lot

**Responsible Party:** University Manor, LLC

**Phone Number:** ( 714 ) 828-4882 **Email:** lutfib@usscalbuilders.com

**Responsible Party Address:** 8051 Main Street, Stanton CA 90680

Number      Street Name & Suffix      City/Zip

☐ Check here for Address or phone number change

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the fiscal year (July 1 – June 30), and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and a description of the maintenance. **REFER TO THE BACK OF THIS SHEET FOR MORE INFORMATION DESCRIBING TYPICAL MAINTENANCE INDICATORS AND MAINTENANCE ACTIVITIES.** If no maintenance was required based on the inspection results, state "no maintenance required."

What To Look For?	Date Inspected	Results of Inspection: Work needed? (Yes/No)	Date Maintenance Completed and Description of Maintenance Conducted
Accumulation of Sediment, Litter, Grease			
Standing Water			
Erosion			
Overgrown Vegetation			
Poor Vegetation Establishment			
Structural Damage			

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to: County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123 **OR**  
Email: [Watersheds@sdcounty.ca.gov](mailto:Watersheds@sdcounty.ca.gov)

**Signature of Responsible Party**

**Print Name**

**Date**



# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM BIORETENTION FACILITIES, VEGETATED SWALES & HIGHER RATE BIOFILTERS-SIDE 2

**This guide sheet provides general indicators for maintenance only and for a wide array of treatment control BMPs. Your developer prepared maintenance plans specifically for your treatment control BMP as an appendix to the Stormwater Management Plan. Also, if you have a manufactured structure, please refer to the manufacturer's maintenance instructions.**

Biofilters include the following :

☐ **Vegetated Filter Strip/Swale**      ☐ **Bioswale**      ☒ **Bioretention Facility**      ☐ **Planter Boxes**  
☐ **Manufactured Higher-Flow-Rate Biofilters, such as Tree-Pit-Style Units.**

Routine maintenance is needed to ensure that flow is unobstructed, that erosion is prevented, and that soils are held together by plant roots and are biologically active. Typical maintenance consists of the following:

Bioretention BMPs Inspection and Maintenance Checklist	
Typical Maintenance Indicators	Typical Maintenance Actions
Accumulation of sediment (over 2 inches deep or covers vegetation), litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation. Confirm that soil is not clogging and that the area drains after a storm event. Till or replace soil as necessary.
Poor vegetation establishment	Ensure vegetation is healthy and dense enough to provide filtering and to protect soils from erosion. Replenish mulch as necessary (if less than 3 inches deep), remove fallen leaves and debris, prune large shrubs or trees, and mow turf areas.
Overgrown vegetation—woody vegetation not part of design is present and grass excessively tall (greater than 10 inches)	Mow or trim as appropriate, but not less than the design height of the vegetation (typically 4-6 inches for grass). Confirm that irrigation is adequate and not excessive and that sprays do not directly enter overflow grates. Replace dead plants and remove noxious and invasive weeds.
Erosion due to concentrated irrigation flow	Repair/re-seed eroded areas and adjust the irrigation.
Erosion due to concentrated stormwater runoff flow	Repair/re-seed eroded areas and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or re-grading where necessary. Remove obstructions and sediment accumulations so water disperses.
Standing water (BMP not draining) . If mosquito larvae are present and persistent, contact the San Diego County Vector Control Program at (858) 694-2888. Mosquito larvicides should be applied only when absolutely necessary and then only by a licensed individual or contractor.	Where there is an underdrain, such as in planter boxes and manufactured biofilters, check the underdrain piping to make sure it is intact and unobstructed. Abate any potential vectors by filling holes in the ground in and around the biofilter facility and by insuring that there are no areas where water stands longer than 96 hours following a storm .
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet, or outlet structures	Repair or replace as applicable.
Before the wet season and after rain events: remove sediment and debris from screens and overflow drains and downspouts; ensure pumps are functioning, where applicable; check integrity of mosquito screens; and; check that covers are properly seated and locked.	Where cisterns are part of the system
<b>For manufactured high-flow-rate biofilters, see manufacturer's maintenance guidelines</b>	

# FORM J-1

BMP Applicability and Selection for Green Street Exemption			Form J-1																																				
<b>Project Identification</b>																																							
Project Name:																																							
Permit Application Number:			Date:																																				
<b>Project Characterization and Selection Synopsis</b>																																							
<p>The purpose of this form is to guide the selection of BMPs, given project specific constraints to meet the Green Streets exemption as defined in Appendix J.2 of the BMP Design Manual. In order to qualify for a PDP exemption, the project must incorporate all applicable Green Street BMP elements described in Appendix J.2, based on the applicability guidance provided in Appendix J.2.</p> <p>Complete the sections below providing detailed justification for each selection.</p> <p><b>Step 1: Does this project include retrofitting or redevelopment of an existing alley, street, or roadway criteria?</b> Exemptions do not apply for projects that construct new alleys, streets, or roadways. See Appendix J for additional guidance on distinguishing between redevelopment of a street and new development.</p> <p><input type="checkbox"/> Yes    <input type="checkbox"/> No (if No is selected, the Green Street exemption is not applicable)</p> <p>Provide a brief overview of the project, key details, and site-specific opportunities and constraints:</p>																																							
<p><b>Step 2: Complete the BMP-specific applicability checklists on the following pages and attach them to this form. Complete forms for all BMPs, including those that were used and those that were not used.</b></p> <p><b>Step 3: Summarize the BMP(s) that were selected through the guidance process (Select all that apply):</b></p> <table border="1"> <thead> <tr> <th>BMP Type</th> <th>Applicable?</th> <th>Used?</th> <th>Summary of justification for Inclusion or Finding of Non-applicability</th> </tr> </thead> <tbody> <tr> <td>Vegetated Swales</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Sidewalk Planters</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Curb Extensions</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Permeable Surfaces</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Green Gutters</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Rain Gardens</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Trees</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Other_____</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> </tbody> </table>				BMP Type	Applicable?	Used?	Summary of justification for Inclusion or Finding of Non-applicability	Vegetated Swales	<input type="checkbox"/>	<input type="checkbox"/>		Sidewalk Planters	<input type="checkbox"/>	<input type="checkbox"/>		Curb Extensions	<input type="checkbox"/>	<input type="checkbox"/>		Permeable Surfaces	<input type="checkbox"/>	<input type="checkbox"/>		Green Gutters	<input type="checkbox"/>	<input type="checkbox"/>		Rain Gardens	<input type="checkbox"/>	<input type="checkbox"/>		Trees	<input type="checkbox"/>	<input type="checkbox"/>		Other_____	<input type="checkbox"/>	<input type="checkbox"/>	
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Other_____	<input type="checkbox"/>	<input type="checkbox"/>																																					



Form J-1 Page 2 of 8: Vegetated Swale

**Brief Description:** Vegetated Swales are shallow, open channels that are designed to remove storm water pollutants by physically straining/filtering runoff through vegetation in the channel.

Site Type (Check all that apply):	Street Type	Rating <sup>1</sup>	Present in Project?
	Residential Streets	●	<input type="checkbox"/>
	Commercial Street/ Business District	○	<input type="checkbox"/>
	Collector Street	●	<input type="checkbox"/>
	Arterial and Boulevard	●	<input type="checkbox"/>
	Alleys	○	<input type="checkbox"/>
	Parking Areas	●	<input type="checkbox"/>
Key Opportunities for Vegetated Swales (Check all that apply):	Parkway strips		<input type="checkbox"/>
	Medians		<input type="checkbox"/>
	Long, mostly continuous space		<input type="checkbox"/>
	Other (must justify below)		<input type="checkbox"/>
Site-Specific Factors (Check all that apply):	Favorable Conditions for Vegetated Swales		
	Slope > 1% and <3%		<input type="checkbox"/>
	Conveying run-on to a site		<input type="checkbox"/>
	Infiltration is partially feasible or not feasible		<input type="checkbox"/>
	Long continuous segments available		<input type="checkbox"/>
	More parkway width		<input type="checkbox"/>
	Unfavorable Conditions for Vegetated Swales		
	Available width is < 8 feet		<input type="checkbox"/>
	Frequent driveway interruption		<input type="checkbox"/>
	ROW width too limited		<input type="checkbox"/>
<b>Summary of Findings:</b>			
Were Vegetated Swales determined to be applicable as part of the Green Streets BMP plan? <input type="checkbox"/> Yes <input type="checkbox"/> No		If yes, were they used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Provide discussion/justifications for selections and decisions above:			

- <sup>1</sup>
- High applicability within this category, however may still be limited by site-specific factors
  - Generally applicable in this category; largely dependent on site-specific factors
  - Limited applicability within this category; may still be applicable in some cases; should be considered

Form J-1 Page 3 of 8: Sidewalk Planters

**Brief Description:** A planter imbedded in the sidewalk designed to manage storm water runoff from the adjacent roadway and sidewalk.

Site Type (Check all that apply):	Street Type	Rating <sup>2</sup>	Present in Project?
	Residential Streets	⊙	<input type="checkbox"/>
	Commercial Street/ Business District	⊙	<input type="checkbox"/>
	Collector Street	●	<input type="checkbox"/>
	Arterial and Boulevard	●	<input type="checkbox"/>
	Alleys	○	<input type="checkbox"/>
	Parking Areas	⊙	<input type="checkbox"/>
Key Opportunities for Sidewalk Planters (Check all that apply):	Parkway strips		<input type="checkbox"/>
	Medians		<input type="checkbox"/>
	Between driveways		<input type="checkbox"/>
	Other (must justify below)		<input type="checkbox"/>
Site-Specific Factors (Check all that apply):	Favorable Conditions for Sidewalk Planters		
	Slope <4%		<input type="checkbox"/>
	Wide sidewalks		<input type="checkbox"/>
	More parkway width		<input type="checkbox"/>
	Unfavorable Conditions for Sidewalk Planters		
	Conflicts with car egress		<input type="checkbox"/>
	ROW width too limited		<input type="checkbox"/>
<b>Summary of Findings:</b>			
Were Sidewalk Planters determined to be applicable as part of the Green Streets BMP plan? <input type="checkbox"/> Yes <input type="checkbox"/> No		If yes, were they used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Provide discussion/justifications for selections and decisions above:			

- <sup>2</sup> ● High applicability within this category, however may still be limited by site-specific factors
- ⊙ Generally applicable in this category; largely dependent on site-specific factors
- Limited applicability within this category; may still be applicable in some cases; should be considered

Form J-1 Page 4 of 8: Curb Extensions

**Brief Description:** Curb extensions expand the edge of the sidewalk into the roadway or parking area and allow storm water runoff to collect and infiltrate through a detention area of porous media.

Site Type (Check all that apply):	Street Type	Rating <sup>3</sup>	Present in Project?
	Residential Streets	●	<input type="checkbox"/>
	Commercial Street/ Business District	●	<input type="checkbox"/>
	Collector Street	⊙	<input type="checkbox"/>
	Arterial and Boulevard	⊙	<input type="checkbox"/>
	Alleys	○	<input type="checkbox"/>
	Parking Areas	⊙	<input type="checkbox"/>
Key Opportunities for Curb Extensions (Check all that apply):	Intersections		<input type="checkbox"/>
	Parking area		<input type="checkbox"/>
	Other (must justify below)		<input type="checkbox"/>
Site-Specific Factors (Check all that apply):	Favorable Conditions for Curb Extensions		
	Slope <4%		<input type="checkbox"/>
	Traffic calming needed		<input type="checkbox"/>
	Unfavorable Conditions for Curb Extensions		
	Conflicts with bike lanes		<input type="checkbox"/>
	Site distance issues at intersection		<input type="checkbox"/>
<b>Summary of Findings:</b>			
Were Curb Extensions determined to be applicable as part of the Green Streets BMP plan? <input type="checkbox"/> Yes <input type="checkbox"/> No		If yes, were they used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Provide discussion/justifications for selections and decisions above:			

- <sup>3</sup> ● High applicability within this category, however may still be limited by site-specific factors
- ⊙ Generally applicable in this category; largely dependent on site-specific factors
- Limited applicability within this category; may still be applicable in some cases; should be considered



Form J-1 Page 5 of 8: Permeable Surfaces

**Brief Description:** Permeable surfaces are pavement that allows for percolation through void spaces into subsurface layers.

Site Type (Check all that apply):	Street Type	Rating <sup>4</sup>	Present in Project?
	Residential Streets	●	<input type="checkbox"/>
	Commercial Street/ Business District	●	<input type="checkbox"/>
	Collector Street	⊙	<input type="checkbox"/>
	Arterial and Boulevard	⊙	<input type="checkbox"/>
	Alleys	●	<input type="checkbox"/>
	Parking Areas	⊙	<input type="checkbox"/>
Key Opportunities for Permeable Surfaces (Check all that apply):	Sidewalks		<input type="checkbox"/>
	Parking strips		<input type="checkbox"/>
	Shoulders		<input type="checkbox"/>
	Low traffic roadways		<input type="checkbox"/>
	Other (must justify below)		<input type="checkbox"/>
Site-Specific Factors (Check all that apply):	Favorable Conditions for Permeable Surfaces		
	Slope < 2-3%		<input type="checkbox"/>
	Conveying limited run-on to a site		<input type="checkbox"/>
	Low traffic area		<input type="checkbox"/>
	Unfavorable Conditions for Permeable Surfaces		
	High traffic area		<input type="checkbox"/>
	Run-on has high sediment load		<input type="checkbox"/>
<b>Summary of Findings:</b>			
Were Permeable Surfaces determined to be applicable as part of the Green Streets BMP plan? <input type="checkbox"/> Yes <input type="checkbox"/> No		If yes, were they used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Provide discussion/justifications for selections and decisions above:			

- <sup>4</sup> ● High applicability within this category, however may still be limited by site-specific factors  
 ⊙ Generally applicable in this category; largely dependent on site-specific factors  
 ○ Limited applicability within this category; may still be applicable in some cases; should be considered

Form J-1 Page 6 of 8: Green Gutters

**Brief Description:** Green Gutters are shallow and narrow strips of landscaping in a typical curb and gutter location with a lower elevation than the street gutter elevation to allow capture of storm water from the sidewalk and street.

Site Type (Check all that apply):	Street Type	Rating <sup>5</sup>	Present in Project?
	Residential Streets	<input type="radio"/>	<input type="checkbox"/>
	Commercial Street/ Business District	<input checked="" type="radio"/>	<input type="checkbox"/>
	Collector Street	<input type="radio"/>	<input type="checkbox"/>
	Arterial and Boulevard	<input type="radio"/>	<input type="checkbox"/>
	Alleys	<input checked="" type="radio"/>	<input type="checkbox"/>
	Parking Areas	<input type="radio"/>	<input type="checkbox"/>
Key Opportunities for Green Gutters (Check all that apply):	Parkway strips		<input type="checkbox"/>
	Medians		<input type="checkbox"/>
	Long, mostly continuous space		<input type="checkbox"/>
	Other (must justify below)		<input type="checkbox"/>
Site-Specific Factors (Check all that apply):	Favorable Conditions for Green Gutters		
	Slope > 1% and <3%		<input type="checkbox"/>
	Conveying run-on to a site		<input type="checkbox"/>
	Infiltration is partially feasible or not feasible		<input type="checkbox"/>
	Long continuous segments available		<input type="checkbox"/>
	Narrower spaces (as little as 2 to 3 feet)		<input type="checkbox"/>
	Unfavorable Conditions for Green Gutters		
	Frequent driveway interruption		<input type="checkbox"/>
	ROW width too limited		<input type="checkbox"/>
<b>Summary of Findings:</b>			
Were Green Gutters determined to be applicable as part of the Green Streets BMP plan? <input type="checkbox"/> Yes <input type="checkbox"/> No		If yes, were they used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Provide discussion/justifications for selections and decisions above:			

- <sup>5</sup>
- High applicability within this category, however may still be limited by site-specific factors
  - ⦿ Generally applicable in this category; largely dependent on site-specific factors
  - Limited applicability within this category; may still be applicable in some cases; should be considered

### Form J-1 Page 7 of 8: Rain Gardens

**Brief Description:** Rain Gardens are shallow detention basins with vegetation that temporarily store water to allow for infiltration of the stored volume. Rain Gardens could be bioretention or biofiltration with partial retention or a biofiltration BMP.

Site Type (Check all that apply):	Street Type	Rating <sup>6</sup>	Present in Project?
	Residential Streets	<input checked="" type="radio"/>	<input type="checkbox"/>
	Commercial Street/ Business District	<input checked="" type="radio"/>	<input type="checkbox"/>
	Collector Street	<input checked="" type="radio"/>	<input type="checkbox"/>
	Arterial and Boulevard	<input checked="" type="radio"/>	<input type="checkbox"/>
	Alleys	<input type="radio"/>	<input type="checkbox"/>
	Parking Areas	<input checked="" type="radio"/>	<input type="checkbox"/>
Key Opportunities for Rain Gardens (Check all that apply):	Irregularly shaped areas in ROW		<input type="checkbox"/>
	Broad and flat areas		<input type="checkbox"/>
	Other (must justify below)		<input type="checkbox"/>
Site-Specific Factors (Check all that apply):	Favorable Conditions for Rain Gardens		
	Slope <2%		<input type="checkbox"/>
	Infiltration is partially feasible or not feasible		<input type="checkbox"/>
	Large area available		
	Unfavorable Conditions for Rain Gardens		
	Slope > 2%		<input type="checkbox"/>
	ROW too limited		<input type="checkbox"/>
<b>Summary of Findings:</b>			
Were Rain Gardens determined to be applicable as part of the Green Streets BMP plan? <input type="checkbox"/> Yes <input type="checkbox"/> No		If yes, were they used?  <input type="checkbox"/> Yes <input type="checkbox"/> No	
Provide discussion/justifications for selections and decisions above:			

- <sup>6</sup> ● High applicability within this category, however may still be limited by site-specific factors
- Generally applicable in this category; largely dependent on site-specific factors
- Limited applicability within this category; may still be applicable in some cases; should be considered



Form J-1 Page 8 of 8: Trees

**Brief Description:** Trees planted in the sidewalk right-of-way provide rainfall interception and infiltration benefits and typically supplement other storm water management tools.

Site Type (Check all that apply):	Street Type	Rating <sup>7</sup>	Present in Project?
	Residential Streets	●	<input type="checkbox"/>
	Commercial Street/ Business District	⦿	<input type="checkbox"/>
	Collector Street	⦿	<input type="checkbox"/>
	Arterial and Boulevard	⦿	<input type="checkbox"/>
	Alleys	⦿	<input type="checkbox"/>
	Parking Areas	●	<input type="checkbox"/>
Key Opportunities for Trees (Check all that apply):	Parkway strips		<input type="checkbox"/>
	Medians		<input type="checkbox"/>
	Irregularly shaped areas		<input type="checkbox"/>
	Extra ROW on back side of sidewalk		<input type="checkbox"/>
	Other (must justify below)		<input type="checkbox"/>
Site-Specific Factors (Check all that apply):	Favorable Conditions for Trees		
	Located outside of clear zone		<input type="checkbox"/>
	Infiltration is feasible		<input type="checkbox"/>
	ROW not limiting		<input type="checkbox"/>
	Unfavorable Conditions for Trees		
	Limited space for root growth		<input type="checkbox"/>
	Clear zone issues		<input type="checkbox"/>
<b>Summary of Findings:</b>			
Were Trees determined to be applicable as part of the Green Streets BMP plan? <input type="checkbox"/> Yes <input type="checkbox"/> No		If yes, were they used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Provide discussion/justifications for selections and decisions above:			

- <sup>7</sup> ● High applicability within this category, however may still be limited by site-specific factors  
 ⦿ Generally applicable in this category; largely dependent on site-specific factors  
 ○ Limited applicability within this category; may still be applicable in some cases; should be considered



City of San Diego  
Development Services  
1222 First Ave., MS-302  
San Diego, CA 92101  
(619) 446-5000

THE CITY OF SAN DIEGO

# Storm Water Requirements Applicability Checklist

FORM  
**DS-560**  
FEBRUARY 2016

Project Address:

Project Number *(for City Use Only)*:

## SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the [Storm Water Standards Manual](#). Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)<sup>1</sup>, which is administered by the State Water Resources Control Board.

**For all project complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.**

### PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)  
  
☒ Yes; SWPPP required, skip questions 2-4      ☐ No; next question
2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity that results in ground disturbance and contact with storm water runoff?  
  
☐ Yes; WPCP required, skip 3-4      ☐ No; next question
3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)  
  
☐ Yes; WPCP required, skip 4      ☐ No; next question
4. Does the project only include the following Permit types listed below?
  - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
  - Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
  - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb and gutter replacement, and retaining wall encroachments.

☐ Yes; no document required

Check one of the boxes to the right, and continue to PART B:

- ☐ If you checked "Yes" for question 1,  
**a SWPPP is REQUIRED. Continue to PART B**
- ☐ If you checked "No" for question 1, and checked "Yes" for question 2 or 3,  
**a WPCP is REQUIRED.** If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**
- ☐ If you checked "No" for all questions 1-3, and checked "Yes" for question 4  
**PART B does not apply and no document is required. Continue to Section 2.**

1. More information on the City's construction BMP requirements as well as CGP requirements can be found at:  
[www.sandiego.gov/stormwater/regulations/index.shtml](http://www.sandiego.gov/stormwater/regulations/index.shtml)

**PART B: Determine Construction Site Priorit**

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a “high threat to water quality.” The City has aligned the local definition of “high threat to water quality” to the risk determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

**Complete PART B and continued to Section 2**

1. ☐ **ASBS**  
a. Projects located in the ASBS watershed.
2. ☐ **High Priority**  
a. Projects 1 acre or more determined to be Risk Level 2 or Risk Level 3 per the Construction General Permit and not located in the ASBS watershed.  
b. Projects 1 acre or more determined to be LUP Type 2 or LUP Type 3 per the Construction General Permit and not located in the ASBS watershed.
3. ☐ **Medium Priority**  
a. Projects 1 acre or more but not subject to an ASBS or high priority designation.  
b. Projects determined to be Risk Level 1 or LUP Type 1 per the Construction General Permit and not located in the ASBS watershed.
4. ☒ **Low Priority**  
a. Projects requiring a Water Pollution Control Plan but not subject to ASBS, high, or medium priority designation.

**SECTION 2. Permanent Storm Water BMP Requirements.**

Additional information for determining the requirements is found in the [Storm Water Standards Manual](#).

**PART C: Determine if Not Subject to Permanent Storm Water Requirements.**

Projects that are considered maintenance, or otherwise not categorized as “new development projects” or “redevelopment projects” according to the [Storm Water Standards Manual](#) are not subject to Permanent Storm Water BMPs.

**If “yes” is checked for any number in Part C, proceed to Part F and check “Not Subject to Permanent Storm Water BMP Requirements”.**

**If “no” is checked for all of the numbers in Part C continue to Part D.**

1. Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water? ☐ Yes ☒ No
2. Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces? ☐ Yes ☒ No
3. Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair). ☐ Yes ☒ No



**PART D: PDP Exempt Requirements.**

**PDP Exempt projects are required to implement site design and source control BMPs.**

**If “yes” was checked for any questions in Part D, continue to Part F and check the box labeled “PDP Exempt.”**

**If “no” was checked for all questions in Part D, continue to Part E.**

1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:
  - Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;
  - Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;
  - Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City’s Storm Water Standards manual?

☐ Yes; PDP exempt requirements apply      ☒ No; next question
2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the [City’s Storm Water Standards Manual](#)?
 

☐ Yes; PDP exempt requirements apply      ☒ No; project not exempt. PDP requirements apply

**PART E: Determine if Project is a Priority Development Project (PDP).**

Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

**If “yes” is checked for any number in PART E, continue to PART F.**

**If “no” is checked for every number in PART E, continue to PART F and check the box labeled “Standard Development Project”.**

1. **New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ☒ Yes ☐ No
2. **Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ☒ Yes ☐ No
3. **New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface. ☐ Yes ☒ No
4. **New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater. ☒ Yes ☐ No
5. **New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).** ☐ Yes ☒ No
6. **New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site). ☐ Yes ☒ No

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). ☐ Yes ☒ No
8. **New development or redevelopment projects of a retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. ☐ Yes ☒ No
9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ☐ Yes ☒ No
10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces or if they sheet flow to surrounding pervious surfaces. ☐ Yes ☒ No

**PART F: Select the appropriate category based on the outcomes of PART C through PART E.**

1. The project is **NOT SUBJECT TO STORM WATER REQUIREMENTS.** ☐
2. The project is a **STANDARD DEVELOPMENT PROJECT.** Site design and source control BMP requirements apply. See the [Storm Water Standards Manual](#) for guidance. ☐
3. The project is **PDP EXEMPT.** Site design and source control BMP requirements apply. See the [Storm Water Standards Manual](#) for guidance. ☐
4. The project is a **PRIORITY DEVELOPMENT PROJECT.** Site design, source control, and structural pollutant control BMP requirements apply. See the [Storm Water Standards Manual](#) for guidance on determining if project requires a hydromodification plan management ☒

Name of Owner or Agent (Please Print): John M. Cruikshank, PE

Title: Project Civil Engineer

Signature:

*John Cruikshank*

Date: 07/12/2017

# STORMWATER POLLUTION PREVENTION PLAN

for

University Manor, LLC

**RISK LEVEL** 1

**Legally Responsible Person (LRP):**

Allen Othman  
8051 Main Street  
Stanton, CA 90680  
714-828-4882

**Approved Signatory:**

Allen Othman  
714-828-4882

**Prepared for:**

Mr. Lutfi Bustami  
University Manor, LLC  
8051 Main Street  
Stanton, CA 90680

**Project Address:**

5556 University Avenue  
San Diego, CA 92105

**SWPPP Prepared by:**

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QSD/QSP Certificate No. 00797

**SWPPP Preparation Date**

March 24, 2017

**Estimated Project Dates:**

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Start of Construction	01-2018	Completion of Construction	01-2019
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## Qualified SWPPP Developer

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### Approval and Certification of the Stormwater Pollution Prevention Plan

Project Name:

University Manor, LLC

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Project Number/ID:

20160035.01

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“This Stormwater Pollution Prevention Plan and Attachments were prepared under my direction to meet the requirements of the California Construction General Permit (SWRCB Orders No. 2009-009-DWQ as amended by Order 2010-0014-DWQ). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below.”

---

*QSD Signature*

---

*Date*

---

*QSD Name*

---

*QSD Certificate Number*

---

*Title and Affiliation*

---

*Telephone Number*

---

*Email*



## Legally Responsible Person

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Approval and Certification of the Stormwater Pollution Prevention Plan

Project Name:

University Manor, LLC

---

Project Number/ID

20160035.01

---

"I certify under penalty of law that this document and all Attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

---

Legally Responsible Person

---

Signature of Legally Responsible Person  
or Approved Signatory

---

Date

---

Name of Legally Responsible Person  
or Approved Signatory

---

Telephone Number

## Amendment Log

Project Name:

University Manor, LLC.

Project Number/ID

20160035.01

[illegible]

# **Section 1     SWPPP Requirements**

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## **1.1            INTRODUCTION**

The University Ave (San Diego) project comprises approximately 1.49 ac and is located at 5556 University Avenue San Diego, CA 92105. The property is owned by and is being developed by University Manor LLC. The projects location is shown on the Site Map in Appendix B.

This Stormwater Pollution Prevention Plan (SWPPP) is designed to comply with California's General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (General Permit) Order No. 2009-0009-DWQ as amended by Order No. 2010-0014-DWQ (NPDES No. CAS000002) issued by the State Water Resources Control Board (State Water Board). This SWPPP has been prepared following the SWPPP Template provided on the California Stormwater Quality Association Stormwater *Best Management Practice Handbook Portal: Construction* (CASQA, 2010). In accordance with the General Permit, Section XIV, this SWPPP is designed to address the following:

- Pollutants and their sources, including sources of sediment associated with construction, construction site erosion and other activities associated with construction activity are controlled;
- Where not otherwise required to be under a Regional Water Quality Control Board (Regional Water Board) permit, all non-stormwater discharges are identified and either eliminated, controlled, or treated;
- Site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity to the Best Available Technology/Best Control Technology (BAT/BCT) standard;

Calculations and design details as well as BMP controls for are complete and correct, Appendix A.

## **1.2            PERMIT REGISTRATION DOCUMENTS**

Required Permit Registration Documents (PRDs) shall be submitted to the State Water Board via the Stormwater Multi Application and Report Tracking System (SMARTS) by the Legally Responsible Person (LRP), or authorized personnel (i.e., Approved Signatory) under the direction of the LRP. The project-specific PRDs include:

1. Notice of Intent (NOI);
2. Risk Assessment (Construction Site Sediment and Receiving Water Risk Determination);
3. Site Map;
4. Annual Fee;
5. Signed Certification Statement (LRP Certification is provided electronically with SMARTS PRD submittal); and
6. SWPPP.



Site Maps can be found in Appendix B. A copy of the submitted PRDs shall also be kept in Appendix C along with the Waste Discharge Identification (WDID) confirmation.

Additional PRDs may be required depending on the construction type and location.

### **1.3 SWPPP AVAILABILITY AND IMPLEMENTATION**

The discharger shall make the SWPPP available at the construction site during working hours (see Section 7.5 of CSMP for working hours) while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone. (CGP Section XIV.C)

The SWPPP shall be implemented concurrently with the start of ground disturbing activities.

### **1.4 SWPPP AMENDMENTS**

The SWPPP should be revised when:

- If there is a General Permit violation.
- When there is a reduction or increase in total disturbed acreage (General Permit Section II Part C).
- BMPs do not meet the objectives of reducing or eliminating pollutants in stormwater discharges.

Additionally, the SWPPP shall be amended when:

- There is a change in construction or operations which may affect the discharge of pollutants to surface waters, groundwater(s), or a municipal separate storm sewer system (MS4);
- When there is a change in the project duration that changes the project's risk level; or
- When deemed necessary by the QSD. The QSD has determined that the changes listed in Table 1.1 can be field determined by the QSP. All other changes shall be made by the QSD as formal amendments to the SWPPP.

The following items shall be included in each amendment:

- Who requested the amendment;
- The location of proposed change;
- The reason for change;
- The original BMP proposed, if any; and
- The new BMP proposed.

Amendment shall be logged at the front of the SWPPP and certification kept in Appendix D. The SWPPP text shall be revised replaced, and/or hand annotated as necessary to properly convey the amendment. SWPPP amendments must be made by a QSD. The following changes have been designated by the QSD as "to be field determined" and constitute minor changes that the QSP may implement based on field conditions.

**Table 1.1 List of Changes to be Field Determined**

<b>Candidate changes for field location or determination by QSP<sup>(1)</sup></b>	<b>Check changes that can be field located or field determined by QSP</b>
Increase quantity of an Erosion or Sediment Control Measure	X
Relocate/Add stockpiles or stored materials	X
Relocate or add toilets	X
Relocate vehicle storage and/or fueling locations	X
Relocate areas for waste storage	X
Relocate water storage and/or water transfer location	X
Changes to access points (entrance/exits)	X
Change type of Erosion or Sediment Control Measure	X
Changes to location of erosion or sediment control	X
Minor changes to schedule or phases	X
Changes in construction materials	X
<i>(1) Any field changes not identified for field location or field determination by QSP must be approved by QSD</i>	

## **1.5 RETENTION OF RECORDS**

Paper or electronic records of documents required by this SWPPP shall be retained for a minimum of three years from the date generated or date submitted, whichever is later, for the following items:

- Site inspections
- Compliance certifications
- Discharge reports
- Approved SWPPP document and amendments

These records shall be available at the Site until construction is complete. Records assisting in the determination of compliance with the General Permit shall be made available within a reasonable time, to the Regional Water Board, State Water Board or U.S. Environmental Protection Agency (EPA) upon request.

## **1.6 REQUIRED NON-COMPLIANCE REPORTING**

If a discharge violation occurs the QSP shall immediately notify the LRP and the LRP shall file a violation report electronically to the Regional Water Board within 30 days of identification of non-compliance using SMARTS. Corrective measures will be implemented immediately following the discharge or written notice of non-compliance from the Regional Water Board. Discharges and corrective actions will be documented on the NAL/NEL Exceedance Site Evaluation Report Form in CSMP Attachment 3 “Example Forms.”

The report to the LRP and to the Regional Water Board will contain the following items:

- The date, time, location, nature of operation and type of unauthorized discharge.
- The cause or nature of the notice or order.
- The control measures (BMPs) deployed before the discharge event, or prior to receiving notice or order.
- The date of deployment and type of control measures (BMPs) deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent re-occurrence.

## **1.7 ANNUAL REPORT**

The General Permit requires that permittees prepare, certify, and electronically submit an Annual Report no later than September 1st of each year. Reporting requirements are identified in Section XVI of the General Permit. Annual reports will be filed in SMARTS and in accordance with information required by the on-line forms.

## **1.8 CHANGES TO PERMIT COVERAGE**

The General Permit allows for the reduction or increase of the total acreage covered under the General Permit when: a portion of the project is complete and/or conditions for termination of coverage have been met; when ownership of a portion of the project is purchased by a different entity; or when new acreage is added to the project.

Modified PRDs shall be filed electronically within 30 days of a reduction or increase in total disturbed area if a change in permit covered acreage is to be sought. The SWPPP shall be modified appropriately, shall be logged at the front of the SWPPP and certification of SWPPP amendments are to be kept in Appendix D. Updated PRDs submitted electronically via SMARTS can be found in Appendix E.

## **1.9 NOTICE OF TERMINATION**

A Notice of Termination (NOT) must be submitted electronically by the LRP via SMARTS to terminate coverage under the General Permit. The NOT must include a final Site Map and representative photographs of the project site that demonstrate final stabilization has been achieved. The NOT shall be submitted within 90 days of completion of construction. The Regional Water Board will consider a construction site complete when the conditions of the General Permit, Section II.D have been met.



## **Section 2     Project Information**

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### **2.1             PROJECT AND SITE DESCRIPTION**

#### **2.1.1             Site Description**

The University Ave (San Diego) project site comprises approximately 1.49-acre parcel and is located at 5556 University Avenue San Diego, CA 92105. The project site is located 1,095 ft east of the intersection of University Ave and 54<sup>th</sup> street. The nearest freeway is the 8 Interstate Freeway (Mission Valley Freeway) which is 2.16 miles North of the project site. The project site is located approximately 1.04 miles Southeast of the Chollas Reservoir. The project is identified as Latitude 33°9'33.05"N and Longitude 117°20'55.90"W and is shown on the Site Map in Appendix B.

#### **2.1.2             Existing Conditions**

The 1.49-acre project site is currently comprised of commercial and residential structures which will be demolished to build a new multi-unit housing and commercial development.

#### **2.1.3     Existing Drainage**

The project site is slightly inclined and slopes to the south; the overall site sits above University Avenue with drainage directed towards the street. The elevation of the project site ranges from 286 to 310 feet above mean sea level (msl). Existing site topography, drainage patterns, and storm water conveyance systems are shown on the project survey drawing.

#### **2.1.4             Geology and Groundwater**

Per Geotechnical Investigation: University Avenue project prepared by Professional Engineers Consulting, Inc. dated October 16, 2015, the following are summarized:

- Subsurface: The subsurface soils consisted brown sandy silt, medium dense fill material, some gravel. Below 2' to 7.5' consisted gray siltstone, no bedding and dense. Moist and weathered within the top two feet, very dense at 5' and bedrock at 6' or more. In some area, bedrock could be found at 2.5'.
- Groundwater was not encountered during the investigation.

#### **2.1.5             Project Description**

The proposed new development includes the addition/replacement of approximately 52,436 sf of impervious surfaces consisting of commercial and residential spaces with parking/ADA access along with 12,361.70 sf of permeable landscaping. Overall, site drainage will remain similar in the pre- and post- construction conditions as the overall site sits above University Avenue with drainage directed towards the street.

### 2.1.6 Developed Condition

A new infiltration tank (BMP-1) is being added under the new parking area just north of the entry driveway between Buildings 102 and 103. Overall, the drainage pattern of the existing site is being maintained as the new development will drain towards the street. The only change is the addition of the BMPs to reduce the amount of water leaving the site through existing city storm drains. The only storm water that could potentially leave the site will do so through overflow lines at the infiltration tank which have been sized for the 50-year storm event.

**Table 2.1 Construction Site Estimates**

Construction site area	1.48	acres
Percent impervious before construction	88	%
Runoff coefficient before construction	0.87	
Percent impervious after construction	75	%
Runoff coefficient after construction	0.87	

## 2.2 PERMITS AND GOVERNING DOCUMENTS

In addition to the General Permit, the following documents have been taken into account while preparing this SWPPP

- Regional Water Board requirements
- Basin Plan requirements
- Contract Documents
- Air Quality Regulations and Permits
- Federal Endangered Species Act
- National Historic Preservation Act/Requirements of the State Historic Preservation Office
- State of California Endangered Species Act
- Clean Water Act Section 401 Water Quality Certifications and 404 Permits
- CA Department of Fish and Game 1600 Streambed Alteration Agreement

## 2.3 STORMWATER RUN-ON FROM OFFSITE AREAS

Run on to the site may arrive from the West and North side of the adjacent property's.

## 2.4 FINDINGS OF THE CONSTRUCTION SITE SEDIMENT AND RECEIVING WATER RISK DETERMINATION

A construction site risk assessment has been performed for the project and the resultant risk level is **Risk Level 1**.

The risk level was determined through the use of the Risk Determination Worksheet provided by State Water Resources Control Board (SWRCB). The risk level is based on project duration, location, proximity to impaired receiving waters and soil conditions. A copy of the Risk Level determination submitted on SMARTS with the PRDs is included in Appendix C

Table 2.2 and Table 2.3 summarize the sediment and receiving water risk factors and document the sources of information used to derive the factors.

**Table 2.2 Summary of Sediment Risk**

<b>RUSLE Factor</b>	<b>Value</b>	<b>Method for establishing value</b>
R	32.19	Risk Determination Worksheet provided by SWRCB
K	.20	Risk Determination Worksheet provided by SWRCB
LS	2.11	Risk Determination Worksheet provided by SWRCB
<b>Total Predicted Sediment Loss (tons/acre)</b>		<b>13.58</b>
<b>Overall Sediment Risk</b> Low Sediment Risk < 15 tons/ acre Medium Sediment Risk >= 15 and < 75 tons/acre High Sediment Risk >= 75 tons/acre		<input checked="" type="checkbox"/> <b>Low</b> <input type="checkbox"/> <b>Medium</b> <input type="checkbox"/> <b>High</b>

Surface runoff from the project site is collected by several catch basin inlets, which are conveyed into the Sediment Basin unit for treatment and then filtered stormwater is carried into the underground detention basin (CISTERN). The overflow runoff will be discharged into public storm drain on Coldwater Canyon

**Table 2.3 Summary of Receiving Water Risk**

<b>Receiving Water Name</b>	<b>303(d) Listed for Sediment Related Pollutant<sup>(1)</sup></b>	<b>TMDL for Sediment Related Pollutant<sup>(1)</sup></b>	<b>Beneficial Uses of COLD, SPAWN, and MIGRATORY<sup>(1)</sup></b>
<b>Tujunga Wash</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Overall Receiving Water Risk</b>			<input checked="" type="checkbox"/> <b>Low</b> <input type="checkbox"/> <b>High</b>
(1) If yes is selected for any option the Receiving Water Risk is High			

### ***Risk Level 1***

Risk Level 1 sites are subject to the narrative effluent limitations specified in the General Permit. The narrative effluent limitations require stormwater discharges associated with construction



activity to minimize or prevent pollutants in stormwater and authorized non-stormwater through the use of controls, structures, and best management practices. This SWPPP has been prepared to address Risk Level 1 requirements (General Permit Attachment C).

## **2.5 CONSTRUCTION SCHEDULE**

The site sediment risk was determined based on construction taking place between from 01/2018 to 01/2019. Modification or extension of the schedule (start and end dates) may affect risk determination and permit requirements. The LRP shall contact the QSD if the schedule changes during construction to address potential impact to the SWPPP. The estimated schedule for planned work can be found in Appendix F when developed by the contractor. The schedule will be updated on a regular basis to show changes in start or completion dates.

The General Permit recognizes four distinct phases of construction. Each phase has activities that can result in different water quality effects from different water quality pollutants.

- Grading and Land Development Phase
- Streets and Utilities Phase
- Vertical Construction Phase
- Final Landscaping and Site Stabilization Phase

## **2.6 POTENTIAL CONSTRUCTION ACTIVITY AND POLLUTANT SOURCES**

Appendix G includes a list of construction activities and associated materials that are anticipated to be used onsite. These activities and associated materials will or could potentially contribute pollutants, other than sediment, to stormwater runoff.

Non-visible pollutants discharges may result from materials that:

- Are being used in construction activities;
- Are stored on the construction site;
- Were spilled during construction operations and not cleaned up;
- Were stored (or used) in a manner that presented the potential for a release of the material during past land use activities;
- Were spilled during previous land use activities and not cleaned up; or
- Were applied to soil as part of past land use activities.

The anticipated activities and associated pollutants were used in Section 3 to select the Best Management Practices for the project. Location of anticipated pollutants and associated BMPs are show on the Site Map in Appendix B.

For sampling requirements for non-visible pollutants associated with construction activity please refer to Section 7.7.1. For a full and complete list of onsite pollutants, refer to the Material Safety Data Sheets (MSDS), which are retained onsite at the construction trailer.

## **2.7 IDENTIFICATION OF NON-STORMWATER DISCHARGES**

Non-stormwater discharges consist of discharges which do not originate from precipitation events. The General Permit provides allowances for specified non-stormwater discharges that do not cause erosion or carry other pollutants.

Non-stormwater discharges into storm drainage systems or waterways, which are not authorized under the General Permit and listed in the SWPPP, or authorized under a separate NPDES permit, are prohibited.

Non-stormwater discharges that are authorized from this project site include the following:

- None

These authorized non-stormwater discharges will be managed with the stormwater and non-stormwater BMPs described in Section 3 of this SWPPP and will be minimized by the QSP.

Activities at this site that may result in unauthorized non-stormwater discharges include:

- None

Steps will be taken, including the implementation of appropriate BMPs, to ensure that unauthorized discharges are eliminated, controlled, disposed, or treated on-site.

Discharges of construction materials and wastes, such as fuel or paint, resulting from dumping, spills, or direct contact with rainwater or stormwater runoff, are also prohibited.

The following discharge(s) have been authorized by (a) regional NPDES permit(s):

- None

## 2.8 REQUIRED SITE MAP INFORMATION

The construction project's Site Map(s) showing the project location, surface water boundaries, geographic features, construction site perimeter and general topography and other requirements identified in Attachment B of the General Permit is located in Appendix B. Table 2.6 identifies those required elements to be shown on the Site Maps / Drawings.

**Table 2.6 Required Map Information**

Included on Map/Plan Sheet No. <sup>(1)</sup>	Required Element
Yes	The project's surrounding area (vicinity)
Yes	Site layout
Yes	Construction site boundaries
Yes	Drainage areas
Yes	Discharge locations
Yes	Sampling locations
Yes	Areas of soil disturbance (temporary or permanent)
Yes	Active areas of soil disturbance (cut or fill)

**Table 2.6 Required Map Information**

<b>Included on Map/Plan Sheet No. <sup>(1)</sup></b>	<b>Required Element</b>
Yes	Locations of runoff BMPs
Yes	Locations of erosion control BMPs
Yes	Locations of sediment control BMPs
N/A	ATS location (if applicable)
N/A	Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
Yes	Locations of all post construction BMPs
Yes	Waste storage areas
Yes	Vehicle storage areas
Yes	Material storage areas
Yes	Entrance and Exits
Yes	Fueling Locations

Notes: (1) Indicate maps or drawings that information is included on (e.g., Vicinity Map, Site Map, Drainage Plans, Grading Plans, Progress Maps, etc.)



## **Section 3      Best Management Practices**

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### **3.1                      SCHEDULE FOR BMP IMPLEMENTATION**

The BMP schedule is the component of the project SWPPP that shows the timeline for when BMPs will be installed so that the project is in compliance with the General Permit. The schedule provides information necessary to plan for adequate materials and crews to install BMPs at the right time so that they are effective. Use Table 3.1 to identify BMP and their schedule for implementation. Contractor / QSP shall complete the implementation and duration in Table 3.1.

BMPs must be implemented, modified, and maintained to reflect the phase of construction and the weather conditions.

In order to be effective, some BMPs must be installed before the site is disturbed (e.g., to provide protection during grading operations or to reduce or minimize pollution from historic areas of contamination during construction).

The BMP schedule shall show implementation by location for:

- Deployment of temporary soil stabilization BMPs
- Deployment of temporary sediment control BMPs
- Deployment of wind erosion control BMPs
- Deployment of tracking control BMPs
- Deployment of non-stormwater BMPs
- Deployment of waste management and material pollution control BMPs

The BMP schedule shall address applicable phase of development including:

- Grading and Land Development Phase
- Streets and Utilities Phase
- Vertical Construction Phase
- Final Landscaping and Site Stabilization Phase

**Table 3.1 BMP Implementation Schedule**

	<b>BMP</b>	<b>Implementation</b>	<b>Duration</b>
<b>Erosion Control</b>	EC-1, Scheduling	Prior to Construction	Entirety of Project
	EC-2, Preservation of Existing Vegetation	Start of Construction	Entirety of Project
	EC-3, Hydraulic Mulch (as applicable)	As applicable	
	EC-4, Hydroseeding (as applicable)	As applicable	
	EC-7, Geotextiles and Mats (as applicable)	As applicable	
<b>Sediment Control</b>	SE-1, Silt Fence	Start of Construction	Entirety of project
	SE-5, Fiber Rolls	Start of Construction	Entirety of project
	SE-7, Street Sweeping and Vacuuming	Start of Construction	Entirety of project
	SE-8, Sandbag Barrier	Start of Construction	Entirety of project
	SE-10, Storm Drain Inlet Protection	Start of Construction	Entirety of project
<b>Tracking Control</b>	TC-1, Stabilized Construction Entrance / Exit	Start of Construction	Entirety of project
	TC-2, Stabilized Construction Roadway (as applicable)	As applicable	
	TC-3, Entrance / Outlet Tire Wash (as applicable)	As applicable	
<b>Wind Erosion</b>	WE-1, Wind Erosion Control	Start of Construction	Entirety of project

### 3.2 EROSION AND SEDIMENT CONTROL

Erosion and sediment controls are required by the General Permit to provide effective reduction or elimination of sediment related pollutants in stormwater discharges and authorized non-stormwater discharges from the Site. Applicable BMPs are identified in this section for erosion control, sediment control, tracking control, and wind erosion control.

### **3.2.1 Erosion Control**

Erosion control, also referred to as soil stabilization, consists of source control measures that are designed to prevent soil particles from detaching and becoming transported in stormwater runoff. Erosion control BMPs protect the soil surface by covering and/or binding soil particles.

This construction project will implement the following practices to provide effective temporary and final erosion control during construction:

1. Preserve existing vegetation where required and when feasible.
2. The area of soil disturbing operations shall be controlled such that the Contractor is able to implement erosion control BMPs quickly and effectively.
3. Stabilize non-active areas within 14 days of cessation of construction activities or sooner if stipulated by local requirements.
4. Control erosion in concentrated flow paths by applying erosion control blankets, check dams, erosion control seeding or alternate methods.
5. Prior to the completion of construction, apply permanent erosion control to remaining disturbed soil areas.

Sufficient erosion control materials shall be maintained onsite to allow implementation in conformance with this SWPPP.

The following temporary erosion control BMP selection table indicates the BMPs that shall be implemented to control erosion on the construction site. Fact Sheets for temporary erosion control BMPs are provided in Appendix H.

**NOTE:** Prior to commencement of construction, Contractor/QSP shall confirm and identify location of BMPs on the Local SWPPP drawing, as applicable. As construction activities progress and BMPs change, Local SWPPP drawing shall be revised and dated, and SWPPP shall be amended accordingly.

**Table 3.2 Temporary Erosion Control BMPs**

CASQA Fact Sheet	BMP Name	Meets a Minimum Requirement <sup>(1)</sup>	BMP Used		If not used, state reason
			YES	NO	
EC-1	Scheduling	✓	✓		
EC-2	Preservation of Existing Vegetation	✓		✓	N/A
EC-3	Hydraulic Mulch	✓ <sup>(2)</sup>		✓	N/A
EC-4	Hydroseed	✓ <sup>(2)</sup>		✓	N/A
EC-5	Soil Binders	✓ <sup>(2)</sup>		✓	N/A
EC-6	Straw Mulch	✓ <sup>(2)</sup>		✓	N/A
EC-7	Geotextiles and Mats	✓ <sup>(2)</sup>		✓	N/A
EC-8	Wood Mulching	✓ <sup>(2)</sup>		✓	N/A
EC-9	Earth Dike and Drainage Swales	✓ <sup>(3)</sup>		✓	N/A
EC-10	Velocity Dissipation Devices			✓	N/A
EC-11	Slope Drains			✓	N/A
EC-12	Stream Bank Stabilization			✓	N/A
EC-14	Compost Blankets	✓ <sup>(2)</sup>		✓	N/A
EC-15	Soil Preparation-Roughening			✓	N/A
EC-16	Non-Vegetated Stabilization	✓ <sup>(2)</sup>		✓	N/A
WE-1	Wind Erosion Control	✓	✓		
<b>Alternate BMPs Used:</b>					<b>If used, state reason:</b>
<sup>(1)</sup> Applicability to a specific project shall be determined by the QSD. <sup>(2)</sup> The QSD shall ensure implementation of one of the minimum measures listed or a combination thereof to achieve and maintain the Risk Level requirements. <sup>(3)</sup> Run-on from offsite shall be directed away from all disturbed areas, diversion of offsite flows may require design/analysis by a licensed civil engineer and/or additional environmental permitting					



These temporary erosion control BMPs shall be implemented in conformance with the following guidelines and as outlined in the BMP Factsheets provided in Appendix H. If there is a conflict between documents, the Site Map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site specific details in the Site Map prevail over standard details included in the Site Map. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

### ***Implementation of Erosion Control BMPs***

BMPs will be deployed in a sequence to follow the progress of grading and construction. As the locations of soil disturbance change, erosion and sedimentation controls will be adjusted accordingly to control storm water runoff at the downgrade perimeter and drain inlets. BMPs will be mobilized as follows:

#### ***Year-round***

- The Qualified Stormwater Practitioner (QSP) will monitor weather using National Weather Service reports to track conditions and alert crews to the onset of rainfall events.
- Disturbed soil areas will be stabilized with temporary erosion control or with permanent erosion control as soon as possible after grading or construction is complete.
- All hazardous waste and materials shall be covered, enclosed, and protected.

#### ***During the rainy season***

- Disturbed areas will be stabilized with temporary or permanent erosion control before rain events.
- Prior to forecast storm events, temporary erosion control BMPs will be deployed and inspected.
- Retain adequate sand/gravel bags on-site for perimeter/inlet/slope protection.
- Cover sloped areas with visqueen anchored with sand/gravel bags.
- Building materials and stockpiles shall be covered with visqueen anchored with sand/gravel bags.
- Sloped areas shall be bermed with sand/gravel bags.
- Inlets and storm drain systems shall be inspected, cleaned, and cleared of any sediment/debris for capture of pollutants during rain event.

#### ***Wind Erosion Control / Dust Control***

- Potable and/or On-site water will be applied to disturbed soil areas of the project site to control dust and maintain optimum moisture levels for compaction.
- BMP WE-1, Wind Erosion Control, and BMP NS-1, Water Conservation Practices, will be implemented to provide dust control and prevent discharges from dust control activities and water supply equipment. Water application rates will be minimized as necessary to prevent runoff ponding and water equipment leaks will be repaired immediately.

- During windy conditions (forecast or actual wind conditions of approximately 25 mph or greater), dust control will be applied to disturbed areas, including haul roads, to adequately control wind erosion.
- BMP WM-3, Stockpile Management, using silt fences and plastic covers will be implemented to prevent wind dispersal of sediment from stockpiles.

### **3.2.2 Sediment Controls**

Sediment controls are temporary or permanent structural measures that are intended to complement the selected erosion control measures and reduce sediment discharges from active construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water.

The following sediment control BMP selection table indicates the BMPs that shall be implemented to control sediment on the construction site. Fact Sheets for temporary sediment control BMPs are provided in Appendix H.

NOTE: Prior to commencement of construction, Contractor/QSP shall confirm and identify location of BMPs on the Local SWPPP drawing, as applicable. As construction activities progress and BMPs change, Local SWPPP drawing shall be revised and dated, and SWPPP shall be amended accordingly.

**Table 3.3 Temporary Sediment Control BMPs**

CASQA Fact Sheet	BMP Name	Meets a Minimum Requirement <sup>(1)</sup>	BMP used		If not used, state reason
			YES	NO	
SE-1	Silt Fence	✓ <sup>(2) (3)</sup>	✓		
SE-2	Sediment Basin			✓	N/A
SE-3	Sediment Trap			✓	N/A
SE-4	Check Dams			✓	N/A
SE-5	Fiber Rolls	✓ <sup>(2)(3)</sup>	✓	✓	
SE-6	Gravel Bag Berm	✓ <sup>(3)</sup>		✓	Sandbag barrier (SE-8) is used instead
SE-7	Street Sweeping	✓	✓		
SE-8	Sandbag Barrier		✓		
SE-9	Straw Bale Barrier			✓	Sandbag barrier (SE-8) is used instead
SE-10	Storm Drain Inlet Protection	✓ RL2&3	✓		
SE-11	ATS			✓	
SE-12	Temporary Silt Dike			✓	
SE-13	Compost Sock and Berm	✓ <sup>(3)</sup>		✓	
SE-14	Biofilter Bags	✓ <sup>(3)</sup>		✓	
TC-1	Stabilized Construction Entrance and Exit	✓	✓		
TC-2	Stabilized Construction Roadway		✓		As applicable
TC-3	Entrance Outlet Tire Wash		✓		As applicable
<b>Alternate BMPs Used:</b>					<b>If used, state reason:</b>
<sup>(1)</sup> Applicability to a specific project shall be determined by the QSD <sup>(2)</sup> The QSD shall ensure implementation of one of the minimum measures listed or a combination thereof to achieve and maintain the Risk Level requirements <sup>(3)</sup> Risk Level 2 & 3 shall provide linear sediment control along toe of slope, face of slope, and at the grade breaks of exposed slope					

These temporary sediment control BMPs shall be implemented in conformance with the following guidelines and in accordance with the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site specific details in the Site Map prevail over standard details included in the Site Map. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

### ***Implementation of Temporary Sediment Controls***

- Temporary sediment control BMPs will be deployed according to the schedule shown in this SWPPP Section 3.1.
- During the rainy season, temporary sediment controls will be implemented at the draining perimeter of disturbed soil areas, at the toe of slopes, at storm drain inlets and at outfall areas at all times.
- During the non-rainy season, temporary sediment controls will be implemented at the draining perimeter of disturbed soil areas and at storm drain downstream from disturbed areas before rain events.
- Silt fences will be deployed along the toe of exterior slopes to filter storm water runoff.
- Storm drain inlet protection will be used at all operational internal inlets to the storm drain system during the rainy season, as applicable.
- During the non-rainy season, in the event of a predicted storm, the following temporary sediment control materials will be maintained on-site: silt fence materials, sandbags for linear barriers, fiber rolls.
- Street sweeping and vacuuming should be performed as necessary to protect the street surface from soil and debris carried off the construction site.

### ***Stabilized Construction Entrance/Exit***

- A Stabilized construction entrance/exit will be constructed and maintained at construction site entrances and exits, equipment yard, PCC batch plants and crushing plants, water filling area for water trucks, and project office location.
- The site entrance/exit will be stabilized to reduce tracking of sediment as a result of construction traffic. Stabilization material will be 3 to 6-inch aggregate. The entrance will be flared where it meets the existing road to provide an adequate turning radius. During dirt-hauling activities that extend over a one-week time period, a site entrance/exit will be installed to reduce tracking of sediment.

### ***Stabilized Construction Roadway (as applicable)***

- The construction roadway through the site will also be designated and stabilized to prevent erosion and to control tracking of mud and soil material onto adjacent roads. The roadway will be clearly marked for limited speed to control dust. Stabilization material will be 3 to 6-inch aggregate. A regular maintenance program will be conducted to replace sediment-clogged stabilization material with new stabilization material.

### ***Entrance/Outlet Tire Wash (as applicable)***



- An entrance/outlet tire wash station will be used to ensure that sediment tracking to public streets is minimized.

#### ***Road Cleaning BMPs – Street Sweeping and Vacuuming***

- Road sweeping and vacuuming will occur during soil hauling and as necessary to keep street surfaces clear of soil and debris. Washing of sediment tracked onto the streets into storm drains will not occur.

### **3.3 NON-STORMWATER CONTROLS AND WASTE AND MATERIALS MANAGEMENT**

#### **3.3.1 Non-Stormwater Controls**

Non-stormwater discharges into storm drainage systems or waterways, which are not authorized under the General Permit, are prohibited. Non-stormwater discharges for which a separate NPDES permit is required by the local Regional Water Board are prohibited unless coverage under the separate NPDES permit has been obtained for the discharge. The selection of non-stormwater BMPs is based on the list of construction activities with a potential for non-stormwater discharges identified in Section 2.7 of this SWPPP.

The following non-stormwater control BMP selection table indicates the BMPs that shall be implemented to control sediment on the construction site. Fact Sheets for temporary non-stormwater control BMPs are provided in Appendix H.

**NOTE:** Prior to commencement of construction, Contractor/QSP shall confirm and identify location of BMPs on the Local SWPPP drawing, as applicable. As construction activities progress and BMPs change, Local SWPPP drawing shall be revised and dated, and SWPPP shall be amended accordingly.

**Table 3.4 Temporary Non-Stormwater BMPs**

CASQA Fact Sheet	BMP Name	Meets a Minimum Requirement <sup>(1)</sup>	BMP used		If not used, state reason
			YES	NO	
NS-1	Water Conservation Practices	✓		✓	
NS-2	Dewatering Operation			✓	As applicable
NS-3	Paving and Grinding Operation		✓		
NS-4	Temporary Stream Crossing			✓	N/A – No streams within the project site
NS-5	Clear Water Diversion			✓	N/A – No streams within the project site
NS-6	Illicit Connection- Illegal Discharge Connection	✓		✓	
NS-7	Potable Water Irrigation Discharge Detection			✓	N/A
NS-8	Vehicle and Equipment Cleaning	✓	✓		
NS-9	Vehicle and Equipment Fueling	✓	✓		As applicable
NS-10	Vehicle and Equipment Maintenance	✓		✓	
NS-11	Pile Driving Operation			✓	N/A
NS-12	Concrete Curing			✓	
NS-13	Concrete Finishing			✓	
NS-14	Material and Equipment Use Over Water			✓	N/A – No water body adjacent to the project site.
NS-15	Demolition Removal Adjacent to Water			✓	N/A – No water body adjacent to the project site.
NS-16	Temporary Batch Plants			✓	N/A
Alternate BMPs Used:			If used, state reason:		
<sup>(1)</sup> Applicability to a specific project shall be determined by the QSD					

Non-stormwater BMPs shall be implemented in conformance with the following guidelines and in accordance with the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site specific details in the Site Map prevail over standard details included in the Site Map. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

### ***Paving Operations***

- BMP NS-3, Paving and Grinding Operations, will be implemented to prevent paving materials from being discharged off-site. Covers will be placed over each inlet adjacent to paving operations. The covers will consist of scrap carpeting placed over, and tucked under, each inlet grate. Following paving operations, the area will be swept, inlet covers will be removed, and the inlets will be inspected for paving materials.

### ***Illicit Connection/Illegal Discharge Detection and Reporting***

- QSP and all other contractor staffs will report any illicit connections or illegally dumped/discharged materials on a construction site throughout the duration of the project.

### ***Vehicle and Equipment Operations***

- Several types of vehicles and equipment will be used on-site throughout the project, including graders, scrapers, excavators, loaders, paving equipment, rollers, trucks and trailers, backhoes, forklifts, generators, compressors, and traffic control equipment. BMPs NS-9, Vehicle and Equipment Fueling, and NS-10, Vehicle and Equipment Maintenance will be utilized to prevent discharges of fuel and other vehicle fluids. Except for concrete wash out, vehicle cleaning will not be performed on-site.
- If applicable, a paved temporary fueling area will be constructed in the Contractor's yard. All self-propelled vehicles will be fueled off-site or at the temporary fueling area. Fuel trucks, each equipped with absorbent spill clean-up materials, will be used for all on-site fueling, whether at the temporary fueling area or for mobile fueling elsewhere on the site. Drip pans will be used for all mobile fueling. The fueling truck will be parked on the paved fueling area for overnight storage.
- Drip pans or absorbent pads will be used for all vehicle and equipment maintenance activities that involve grease, oil, solvents, or other vehicle fluids.
- All vehicle maintenance and mobile fueling operations will be conducted at least 50 feet away from operational inlets and drainage facilities and on a level graded area.

### ***Concrete Saw-cutting***

- Saw-cutting operations will not be conducted during or immediately prior to rainfall events.
- BMP WM-08, Concrete Waste Management, will be implemented to contain and dispose of saw-cutting slurries. The slurry will be vacuumed and discharged to the designated concrete washout facility. Dried and cured concrete wastes will be disposed off-site during concrete washout maintenance activities.

### **3.3.2 Materials Management and Waste Management**

Materials management control practices consist of implementing procedural and structural BMPs for handling, storing and using construction materials to prevent the release of those materials into stormwater discharges. The amount and type of construction materials to be utilized at the Site will depend upon the type of construction and the length of the construction period. The materials may be used continuously, such as fuel for vehicles and equipment, or the materials may be used for a discrete period, such as soil binders for temporary stabilization.

Waste management consist of implementing procedural and structural BMPs for handling, storing and ensuring proper disposal of wastes to prevent the release of those wastes into stormwater discharges. If applicable to the project site, waste management should be conducted in accordance with the Project's Construction Waste Management Plan.

Materials and waste management pollution control BMPs shall be implemented to minimize stormwater contact with construction materials, wastes and service areas; and to prevent materials and wastes from being discharged off-site. The primary mechanisms for stormwater contact that shall be addressed include:

- Direct contact with precipitation
- Contact with stormwater run-on and runoff
- Wind dispersion of loose materials
- Direct discharge to the storm drain system through spills or dumping
- Extended contact with some materials and wastes, such as asphalt cold mix and treated wood products, which can leach pollutants into stormwater.

A list of construction activities is provided in Section 2.6. The following Materials and Waste Management BMP selection table indicates the BMPs that shall be implemented to handle materials and control construction site wastes associated with these construction activities. Fact Sheets for Materials and Waste Management BMPs are provided in Appendix H.

NOTE: Prior to commencement of construction, Contractor/QSP shall confirm and identify location of BMPs on the Local SWPPP drawing, as applicable. As construction activities progress and BMPs change, Local SWPPP drawing shall be revised and dated, and SWPPP shall be amended accordingly.



**Table 3.5 Temporary Materials Management BMPs**

CASQA Fact Sheet	BMP Name	Meets a Minimum Requirement <sup>(1)</sup>	BMP used		If not used, state reason
			YES	NO	
WM-01	Material Delivery and Storage	✓	✓		
WM-02	Material Use	✓		✓	
WM-03	Stockpile Management	✓	✓		
WM-04	Spill Prevention and Control	✓		✓	
WM-05	Solid Waste Management	✓	✓		
WM-06	Hazardous Waste Management	✓		✓	
WM-07	Contaminated Soil Management			✓	
WM-08	Concrete Waste Management	✓	✓		
WM-09	Sanitary-Septic Waste Management	✓	✓		
WM-10	Liquid Waste Management			✓	
Alternate BMPs Used:				If used, state reason:	
<sup>(1)</sup> Applicability to a specific project shall be determined by the QSD.					

Material management BMPs shall be implemented in conformance with the following guidelines and in accordance with the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site specific details in the Site Map prevail over standard details included in the Site Map. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

### ***Material Delivery, Storage, and Use***

- In general, BMPs WM-1 and WM-2 will be implemented to help prevent discharges of construction materials during delivery, storage, and use. The general material storage area shall be located as shown on the Local SWPPP drawing. A sandbag barrier (BMP SE-8) will be provided around the storage area to prevent run-on from adjacent areas. Two types of storage/containment facilities will be provided within the storage area to minimize storm water contact with construction materials:
  - Watertight shipping containers will be used to store hand tools, small parts, and most construction materials that can be carried by hand, such as paint cans, solvents, and grease.
  - A separate covered storage/containment facility will be constructed adjacent to the shipping containers to provide storage for larger items such as drums and items shipped or stored on pallets.
- Very large items, such as light standards, framing materials, and stockpiled lumber, will be stored in the open in the general storage area. Such materials will be elevated with wood blocks to minimize contact with run-on.
- Spill clean-up materials, material safety data sheets, a material inventory, and emergency contact numbers will be maintained and stored in the secured contractor's staging area.

### ***Stockpile Management***

- BMPs WM-3, Stockpile Management, will be implemented to reduce or eliminate pollution of storm water from stockpiles of soil and paving materials such as Portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate subbase, pre-mixed aggregate, and asphalt minder (so called "cold mix" asphalt). Stockpiles will be surrounded with sediment controls (SE-5, Fiber Rolls or SE-8, Sandbag Barrier). Plastic covers (EC-7, Geotextiles & Mats), or EC-5, Soil Binders, will also be used as necessary.

### ***Spill Prevention and Control***

- BMP WM-4, Spill Prevention and Control, will be implemented to contain and clean-up spills and prevent material discharges to the storm drain system. Spill prevention is also discussed above in "Material Delivery, Storage, and Use" and below in the following "Waste Management" sections.

### ***Waste Management***

- BMP WM-5, Solid Waste Management, and BMP WM-6, Hazardous Waste Management will be implemented to minimize storm water contact with waste materials and prevent waste discharges. Solid wastes will be loaded directly into trucks for off-site disposal. When on-site storage is necessary, solid wastes will be stored in watertight

dumpsters in the general storage area of the Contractors yard. AC and PCC rubble will be stockpiled in the general storage area and will be surrounded with sediment controls (SE-8, Sandbag Barrier) and covered when necessary. Solid waste, including rubble stockpiles, will be removed and disposed off-site regularly. Hazardous wastes will be stored in the shipping containers or covered containment area discussed above for materials storage. Hazardous wastes will be appropriately and clearly marked and segregated from other non-waste materials.

### ***Contaminated Soil Management***

- When contaminated soils are encountered, the City (or the County) Engineer will be notified, the contaminated soils will be contained, covered if stockpiled, and disposed of per WM-7, Contaminated Soil Management, and the contract documents. Employees will be instructed to recognize evidence of contaminated soil, such as buried debris, discolored soil, and unusual odors.

### ***Concrete Residuals and Washout Wastes***

- Concrete pours will not be conducted during or immediately prior to rainfall events.
- If applicable, BMP WM-8 Concrete Waste Management, will be implemented and a below grade concrete washout facility will be constructed and maintained at the Contractor's yard. All excess concrete and concrete washout slurries will be discharged to the washout facility for drying. The minimum-sized washout, at 10 ft x 10 ft x 3.3 ft deep, will provide more than sufficient volume to contain concrete washout wastes and waste collected from concrete saw-cutting operations, discussed above. BMP maintenance, waste disposal, and BMP removal will be conducted as described in WM-8. Dried-off concrete will be used as fill material, as permitted.
- Concrete waste solids/liquids will be removed and disposed of as required by WM-8.

### ***Sanitary and Septic Wastes***

- The Contractor will implement BMP WM-9, Sanitary and Septic Waste Management, and portable toilets will be located and maintained at the Contractor's yard for the duration of the project. Weekly maintenance will be provided and wastes will be disposed off-site. The toilets will be located away from concentrated flow paths and traffic flow.

## **3.4 POST CONSTRUCTION STORMWATER MANAGEMENT MEASURES**

Post construction BMPs are permanent measures installed during construction, designed to reduce or eliminate pollutant discharges from the site after construction is completed.

This site is located in an area subject to a Phase I or Phase II Municipal Separate Storm Sewer System (MS4) permit approved Stormwater Management Plan. ☐ Yes ☒ No

The following source control post construction BMPs to comply with General Permit Section XIII.B and local requirements have been identified for the site:

- Sediment Basin
- Infiltration Basin – Ecorain Tank (CISTERN)

A plan for the post construction funding and maintenance of these BMPs has been developed to address at minimum five years following construction. The post construction BMPs that are described above shall be funded and maintained by the LRP. If required, post construction funding and maintenance will be submitted with the NOT.



## **Section 4      BMP Inspection, Maintenance, and Rain Event Action Plans (REAPs)**

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### **4.1              BMP INSPECTION AND MAINTENANCE**

The General Permit requires routine weekly inspections of BMPs, along with inspections before, during, and after qualifying rain events. A BMP inspection checklist must be filled out for inspections and maintained on-site with the SWPPP. The inspection checklist includes the necessary information covered in Section 7.6. A blank inspection checklist can be found in Appendix I. Completed checklists shall be kept in CSMP Attachment 2 “Monitoring Records.

BMPs shall be maintained regularly to ensure proper and effective functionality. If necessary, corrective actions shall be implemented within 72 hours of identified deficiencies and associated amendments to the SWPPP shall be prepared by the QSD.

Specific details for maintenance, inspection, and repair of Construction Site BMPs can be found in the BMP Factsheets in Appendix H.

### **4.2              RAIN EVENT ACTION PLANS**

#### ***Risk Level 1***

Rain Event Action Plans (REAPs) are not required for Risk Level 1 projects.

## **Section 5     Training**

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The following text should be modified accordingly

Appendix L identifies the QSPs for the project. To promote stormwater management awareness specific for this project, periodic training of job-site personnel shall be included as part of routine project meetings (e.g. daily/weekly tailgate safety meetings), or task specific trainings as needed.

The QSP shall be responsible for providing this information at the meetings, and subsequently completing the training logs shown in Appendix K, which identifies the site-specific stormwater topics covered as well as the names of site personnel who attended the meeting. Tasks may be delegated to trained employees by the QSP provided adequate supervision and oversight is provided. Training shall correspond to the specific task delegated including: SWPPP implementation; BMP inspection and maintenance; and record keeping.

Documentation of training activities (formal and informal) is retained in SWPPP Appendix K.

## Section 6 Responsible Parties and Operators

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### 6.1 RESPONSIBLE PARTIES

Approved Signatory(ies) who are responsible for SWPPP implementation and have authority to sign permit-related documents is(are) listed below. Written authorizations from the LRP for these individuals are provided in Appendix L. The Approved Signatory(ies) assigned to this project is(are):

Name	Title	Phone Number
Allen Othman	Lead Responsible Person	714-828-4882

QSPs identified for the project are identified in Appendix L. The QSP shall have primary responsibility and significant authority for the implementation, maintenance and inspection/monitoring of SWPPP requirements. The QSP will be available at all times throughout the duration of the project. Duties of the QSP include but are not limited to:

- Implementing all elements of the General Permit and SWPPP, including but not limited to:
  - Ensuring all BMPs are implemented, inspected, and properly maintained;
  - Performing non-stormwater and stormwater visual observations and inspections;
  - Performing non-stormwater and storm sampling and analysis, as required;
  - Performing routine inspections and observations;
  - Implementing non-stormwater management, and materials and waste management activities such as: monitoring discharges; general Site clean-up; vehicle and equipment cleaning, fueling and maintenance; spill control; ensuring that no materials other than stormwater are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems; etc.;
- The QSP may delegate these inspections and activities to an appropriately trained employee, but shall ensure adequacy and adequate deployment.
- Ensuring elimination of unauthorized discharges.
- The QSPs shall be assigned authority by the LRP to mobilize crews in order to make immediate repairs to the control measures.
- Coordinate with the Contractor(s) to assure all of the necessary corrections/repairs are made immediately and that the project complies with the SWPPP, the General Permit and approved plans at all times.

- Notifying the LRP or Authorized Signatory immediately of off-site discharges or other non-compliance events.

## **6.2 CONTRACTOR LIST**

The General Permit requires (Section VII.B.5) that the SWPPP include a list of names of all contractors, subcontractors and individuals who will be directed by the QSP.

Include this list in this section or in Appendix M.

### **Contractor**

Name:

Title:

Company:

Address:

Phone Number:

Number (24/7):



## **Section 7     Construction Site Monitoring Program**

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### **7.1             Purpose**

This Construction Site Monitoring Program was developed to address the following objectives:

1. To demonstrate that the site is in compliance with the Discharge Prohibitions of the Construction General Permit;
2. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
3. To determine whether immediate corrective actions, additional Best Management Practices (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in stormwater discharges and authorized non-stormwater discharges;
4. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in stormwater discharges and authorized non-stormwater discharges.

### **7.2             Applicability of Permit Requirements**

This project has been determined to be a Risk Level 1 project. The General Permit identifies the following types of monitoring as being applicable for a Risk 1 project.

#### **Risk Level 1**

- Visual inspections of Best Management Practices (BMPs);
- Visual monitoring of the site related to qualifying storm events;
- Visual monitoring of the site for non-stormwater discharges;
- Sampling and analysis of construction site runoff for non-visible pollutants when applicable; and
- Sampling and analysis of construction site runoff as required by the Regional Water Board when applicable.

### **7.3.            Weather and Rain Event Tracking**

Visual monitoring and inspections requirements of the General Permit are triggered by a qualifying rain event. The General Permit defines a qualifying rain event as any event that produces ½ inch of precipitation. A minimum of 48 hours of dry weather will be used to distinguish between separate qualifying storm events.

#### **7.3.1    Weather Tracking**

The QSP should daily consult the National Oceanographic and Atmospheric Administration (NOAA) for the weather forecasts. These forecasts can be obtained at <http://www.srh.noaa.gov/>. Weather reports should be printed and maintained with the SWPPP in CSMP Attachment 1 “Weather Reports”.

### **7.3.2 Rain Gauges**

The QSP shall install at least one rain gauge on the project site. Locate the gauge in an open area away from obstructions such as trees or overhangs. Mount the gauge on a post at a height of 3 to 5 feet with the gauge extending several inches beyond the post. Make sure that the top of the gauge is level. Make sure the post is not in an area where rainwater can indirectly splash from sheds, equipment, trailers, etc.

The rain gauge(s) shall be read daily during normal site scheduled hours. The rain gauge should be read at approximately the same time every day and the date and time of each reading recorded. Log rain gauge readings in CSMP Attachment 1 “Weather Records”. Follow the rain gauge instructions to obtain accurate measurements.

Once the rain gauge reading has been recorded, accumulated rain shall be emptied and the gauge reset. Alternatively, if an automated recording rain gauge is used, please follow the manufacturer’s instructions.

For comparison with the site rain gauge, the nearest appropriate governmental rain gauge [316-LA 96th & Cen.] can be found at <http://ladpw.org/wrd/Precip/index.cfm>.

## **7.4 Monitoring Locations**

Monitoring locations are shown on the Site Maps in Appendix B. Monitoring locations are described in the Sections 7.6 and 7.7.

Whenever changes in the construction site might affect the appropriateness of sampling locations, the sampling locations shall be revised accordingly. All such revisions shall be implemented as soon as feasible and the SWPPP amended. Temporary changes that result in a one-time additional sampling location do not require a SWPPP amendment.

## **7.5 Safety and Monitoring Exemptions**

Safety practices for sample collection will be in accordance with the Contractor’s health and safety plan as well as in compliance with Occupational Safety & Health Administration (OSHA) standards. A summary of the safety requirements that apply to sampling personnel shall be provided below by the general Contractor / QSP.

- 
- 
- 
- 

This project is not required to collect samples or conduct visual observations (inspections) under the following conditions:

- During dangerous weather conditions such as flooding and electrical storms.
- Outside of scheduled site business hours.

Scheduled site business hours are:

[Contractor / QSP to specify site business days and hours]

If monitoring (visual monitoring or sample collection) of the site is unsafe because of the dangerous conditions noted above then the QSP shall document the conditions for why an exception to performing the monitoring was necessary. The exemption documentation shall be filed in CSMP Attachment 2 “Monitoring Records”.

## 7.6 Visual Monitoring

Visual monitoring includes observations and inspections. Inspections of BMPs are required to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Visual observations of the site are required to observe storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources.

Table 7.1 identifies the required frequency of visual observations and inspections. Inspections and observations will be conducted at the locations identified in Section 7.6.3.

**Table 7.1 Summary of Visual Monitoring and Inspections**

Type of Inspection	Frequency
<i>Routine Inspections</i>	
BMP Inspections	Weekly <sup>1</sup>
BMP Inspections – Tracking Control	Daily
BMP Inspections – Erosion Control	Daily
BMP Inspections – Sediment Control	Daily
Non-Stormwater Discharge Observations	Quarterly during daylight hours
<i>Rain Event Triggered Inspections</i>	
Site Inspections Prior to a Qualifying Event	Within 48 hours of a qualifying event <sup>2</sup>
BMP Inspections During an Extended Storm Event	Every 24-hour period of a rain event <sup>2</sup>
Site Inspections Following a Qualifying Event	Within 48 hours of a qualifying event <sup>2</sup>
<sup>1</sup> Most BMPs must be inspected weekly; those identified below must be inspected more frequently.	
<sup>2</sup> Inspections are only required during scheduled site operating hours. Note however, these inspections are required daily regardless of the amount of precipitation.	

### **7.6.1      *Routine Observations and Inspections***

Routine site inspections and visual monitoring are necessary to ensure that the project is in compliance with the requirements of the Construction General Permit.

#### **7.6.1.1      *Routine BMP Inspections***

Inspections of BMPs are conducted to identify and record:

- BMPs that are properly installed;
- BMPs that need maintenance to operate effectively;
- BMPs that have failed; or
- BMPs that could fail to operate as intended.

#### **7.6.1.2      *Non-Stormwater Discharge Observations***

Each drainage area will be inspected for the presence of or indications of prior unauthorized and authorized non-stormwater discharges. Inspections will record:

- Presence or evidence of any non-stormwater discharge (authorized or unauthorized);
- Pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.); and
- Source of discharge.

### **7.6.2      *Rain-Event Triggered Observations and Inspections***

Visual observations of the site and inspections of BMPs are required prior to a qualifying rain event; following a qualifying rain event, and every 24-hour period during a qualifying rain event. Pre-rain inspections will be conducted after consulting NOAA and determining that a precipitation event with a 50% or greater probability of precipitation has been predicted.

#### **7.6.2.1      *Visual Observations Prior to a Forecasted Qualifying Rain Event***

Within 48-hours prior to a qualifying event a stormwater visual monitoring site inspection will include observations of the following locations:

- Stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources;
- BMPs to identify if they have been properly implemented;
- Any stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

[BMP inspections and visual monitoring will be triggered by a NOAA prediction of rain in the project area.]

or

Consistent with guidance from the State Water Resources Control Board, pre-rain BMP inspections and visual monitoring will be triggered by a NOAA forecast that indicates a probability of precipitation of 50% or more in the project area.

or

BMP inspections and visual monitoring will be triggered by a NOAA quantitative predicted forecast (QPF) that indicates ½-inch or more of rain will occur in the project area.]



#### **7.6.2.2 BMP Inspections During an Extended Storm Event**

During an extended rain event BMP inspections will be conducted to identify and record:

- BMPs that are properly installed;
- BMPs that need maintenance to operate effectively;
- BMPs that have failed; or
- BMPs that could fail to operate as intended.

If the construction site is not accessible during the rain event, the visual inspections shall be performed at all relevant outfalls, discharge points, downstream locations. The inspections should record any projected maintenance activities.

#### **7.6.2.3 Visual Observations Following a Qualifying Rain Event**

Within 48 hours following a qualifying rain event (0.5 inches of rain) a stormwater visual monitoring site inspection is required to observe:

- Stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources;
- BMPs to identify if they have been properly designed, implemented, and effective;
- Need for additional BMPs;
- Any stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard; and
- Discharge of stored or contained rain water.

### **7.6.3 Visual Monitoring Procedures**

Visual monitoring shall be conducted by the QSP or staff trained by and under the supervision of the QSP.

The name(s) and contact number(s) of the site visual monitoring personnel are listed below and their training qualifications are provided in Appendix K.

Assigned inspector:

Contact phone:

Alternate inspector:

Contact phone:

Stormwater observations shall be documented on the *Visual Inspection Field Log Sheet* (see CSMP Attachment 3 “Example Forms”). BMP inspections shall be documented on the site specific BMP inspection checklist. Any photographs used to document observations will be referenced on stormwater site inspection report and maintained with the Monitoring Records in Attachment 2.

The QSP shall within 3 days of the inspection submit copies of the completed inspection report to LRP / Owner’s Authorized Representative.

The completed reports will be kept in CSMP Attachment 2 “Monitoring Records”.

### **7.6.4 Visual Monitoring Follow-Up and Reporting**

Correction of deficiencies identified by the observations or inspections, including required repairs or maintenance of BMPs, shall be initiated and completed as soon as possible.

If identified deficiencies require design changes, including additional BMPs, the implementation of changes will be initiated within 72 hours of identification and be completed as soon as

possible. When design changes to BMPs are required, the SWPPP shall be amended to reflect the changes.

Deficiencies identified in site inspection reports and correction of deficiencies will be tracked on the *Inspection Field Log Sheet* or *BMP Inspection Report* and shall be submitted to the QSP and shall be kept in CSMP Attachment 2 “Monitoring Records”.

The QSP shall within 3 days of the inspection submit copies of the completed *Inspection Field Log Sheet* or *BMP Inspection Report* with the corrective actions to LRP/QSD.

Results of visual monitoring must be summarized and reported in the Annual Report.

### **7.6.5 Visual Monitoring Locations**

The inspections and observations identified in Sections 7.6.1 and 7.6.2 will be conducted at the locations identified in this section.

BMP locations are shown on the Site Maps in SWPPP Appendix B.

There are (1) drainage area on the project site and the contractor’s yard, staging areas, and storage areas. Drainage area(s) are shown on the Site Maps in Appendix B and Table 7.2 identifies each drainage area by location.

**Table 7.2 Site Drainage Areas**

<b>Location No.</b>	<b>Location</b>
1	Project Site

There are 2 stormwater storage or containment area(s) are on the project site. Stormwater storage or containment area(s) are shown on the Site Maps in Appendix B and Table 7.3 identifies each stormwater storage or containment area by location.

**Table 7.3 Stormwater Storage and Containment Areas**

<b>Location No.</b>	<b>Location</b>
1	Proposed infiltration basin is located at the South East of Level 1 parking lot

There are two (2) discharge location(s) on the project site. Site stormwater discharge location(s) are shown on the Site Maps in Appendix B and Table 7.4 identifies each stormwater discharge location.

**Table 7.4 Site Stormwater Discharge Locations**

<b>Location No.</b>	<b>Location</b>
1	Overflow from the Sediment Basin (SE) is discharged into public Catch Basin at University Avenue

## **7.7 Water Quality Sampling and Analysis**

### **7.7.1 *Sampling and Analysis Plan for Non-Visible Pollutants in Stormwater Runoff Discharges***

This Sampling and Analysis Plan for Non-Visible Pollutants describes the sampling and analysis strategy and schedule for monitoring non-visible pollutants in stormwater runoff discharges from the project site.

Sampling for non-visible pollutants will be conducted when (1) a breach, leakage, malfunction, or spill is observed; and (2) the leak or spill has not been cleaned up prior to the rain event; and (3) there is the potential for discharge of non-visible pollutants to surface waters or drainage system.

The following construction materials, wastes, or activities, as identified in Section 2.6, are potential sources of non-visible pollutants to stormwater discharges from the project. Storage, use, and operational locations are shown on the Site Maps in Appendix B.

#### Materials / Wastes

- Vehicle fluids, including oil, grease, petroleum, and coolants
- Asphaltic emulsions associated with asphalt-concrete operations
- Cement materials associated with PCC concrete paving operations
- Base and subbase material
- Joint and curing compounds
- Concrete curing compounds
- Paints
- Solvents, Thinners, Acids
- Mortar Mix
- Sandblasting Materials
- BMP materials (sandbags, liquid copolymer)
- PCC rubble
- Masonry block rubble
- General litter

#### Activities

- Clear and grub operations
- Precise grading operations
- Soil import / export operations

- Sandblasting operations
- Utility excavation and installation operations
- Parking lot paving and striping operations

The following existing site features, as identified in Section 2.6, are potential sources of non-visible pollutants to stormwater discharges from the project. Locations of existing site features contaminated with non-visible pollutants are shown on the Site Maps in Appendix B.

- None

The following soil amendments have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil and will be used on the project site. Locations of soil amendment application are shown on the Site Maps in Appendix B.

- None

The project has the potential to receive stormwater run-on from the following locations with the potential to contribute non-visible pollutants to stormwater discharges from the project. Locations of such run-on to the project site are shown on the Site Maps in Appendix B.

- None

#### 7.7.1.1 *Sampling Schedule*

Samples for the potential non-visible pollutant(s) and a sufficiently large unaffected background sample shall be collected during the first two hours of discharge from rain events that result in a sufficient discharge for sample collection. Samples shall be collected during the site's scheduled hours and shall be collected regardless of the time of year and phase of the construction.

Collection of discharge samples for non-visible pollutant monitoring will be triggered when any of the following conditions are observed during site inspections conducted prior to or during a rain event.

- Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions. Watertight conditions are defined as (1) storage in a watertight container, (2) storage under a watertight roof or within a building, or (3) protected by temporary cover and containment that prevents stormwater contact and runoff from the storage area.
- Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but (1) a breach, malfunction, leakage, or spill is observed, (2) the leak or spill is not cleaned up prior to the rain event, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.
- A construction activity, including but not limited to those in Section 2.6, with the potential to contribute non-visible pollutants (1) was occurring during or within 24 hours prior to the rain event, (2) BMPs were observed to be breached, malfunctioning, or improperly implemented, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.



- Soil amendments that have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil have been applied, and there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.
- Stormwater runoff from an area contaminated by historical usage of the site has been observed to combine with stormwater runoff from the site, and there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.

#### 7.7.1.2 Sampling Locations

Sampling locations are based on proximity to planned non-visible pollutant storage, occurrence or use; accessibility for sampling, and personnel safety. Planned non-visible pollutant sampling locations are shown on the Site Maps in Appendix B and include the locations identified in Table 7.5 through 7.10.

No sampling location(s) on the project site and the contractor's yard have been identified for the collection of samples of runoff from planned material and waste storage areas and areas where non-visible pollutant producing construction activities are planned.

**Table 7.6 Non-Visible Pollutant Sample Locations – Contractors' Yard**

<b>Sample Location Number</b>	<b>Sample Location Description</b>	<b>Sample Location Latitude and Longitude (Decimal Degrees)</b>

No sampling locations have been identified for the collection of samples of runoff from drainage areas where soil amendments will be applied that have the potential to affect water quality.

**Table 7.7 Non-Visible Pollutant Sample Locations – Soil Amendment Areas**

<b>Sample Location Number</b>	<b>Sample Location</b>	<b>Sample Location Latitude and Longitude (Decimal Degrees)</b>

No sampling locations have been identified for the collection of samples of runoff from drainage areas contaminated by historical usage of the site.

**Table 7.8 Non-Visible Pollutant Sample Locations – Areas of Historical Contamination**

<b>Sample Location Number</b>	<b>Sample Location</b>	<b>Sample Location Latitude and Longitude (Decimal Degrees)</b>

No sampling location(s) has been identified for the collection of an uncontaminated sample of runoff as a background sample for comparison with the samples being analyzed for non-visible pollutants. This location(s) was selected such that the sample will not have come in contact with the operations, activities, or areas identified in Section 7.7.1 or with disturbed soils areas.

**Table 7.9 Non-Visible Pollutant Sample Locations – Background (Unaffected Sample)**

Sample Location Number	Sample Location	Sample Location Latitude and Longitude (Decimal Degrees)
		[Enter Longitude]

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No sampling locations have been identified for the collection of samples of run-on to the project site. Run-on from these locations has the potential to combine with discharges from the site being sampled for non-visible pollutants. These samples are intended to identify potential sources of non-visible pollutants that originate off the project site.

**Table 7.10 Non-Visible Pollutant Sample Locations – Site Run-On**

Sample Location Number	Sample Location	Sample Location Latitude and Longitude (Decimal Degrees)
		[Enter Latitude] [Enter Longitude]

If a stormwater visual monitoring site inspection conducted prior to or during a storm event identifies the presence of a material storage, waste storage, or operations area with spills or the potential for the discharge of non-visible pollutants to surface waters or a storm drain system that is at a location not listed above and has not been identified on the Site Maps, sampling locations will be selected by the QSP using the same rationale as that used to identify planned locations. Non-visible pollutant sampling locations shall be identified by the QSP on the pre-rain event inspection form and/or Rain Event Action Plan prior to a forecasted qualifying rain event.

### **7.7.1.3 Monitoring Preparation**

Non-visible pollutant samples will be collected by:

Contractor ☐ Yes ☐ No  
 Consultant ☐ Yes ☐ No  
 Laboratory ☐ Yes ☐ No

#### ***If Contractor Personnel will collect samples:***

Samples on the project site will be collected by the following contractor sampling personnel:

Name/Telephone Number:

Alternate(s)/Telephone Number:

An adequate stock of monitoring supplies and equipment for monitoring non-visible pollutants will be available on the project site prior to a sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule. Supplies maintained at the project site will include, but are not limited to, clean powder-free nitrile gloves, sample collection equipment, coolers, appropriate number and volume of sample bottles, identification labels, re-sealable storage bags, paper towels, personal rain gear, ice, and *Effluent Sampling Field Log Sheets* and Chain of Custody (CoC) forms, which are provided in CSMP Attachment 3 “Example Forms”.

***If Contractor Personnel will collect samples:***

Samples on the project site will be collected by the following [specify laboratory or environmental consultant]:

Company Name:

Street Address:

City, State Zip:

Telephone Number:

Point of Contact:

Name of Sampler(s):

Name of Alternate(s):

The QSP or his/her designee will contact [specify name of laboratory or environmental consultant] 24 hours prior to a predicted rain event or for an unpredicted event, as soon as a rain event begins if one of the triggering conditions is identified during an inspection to ensure that adequate sample collection personnel and supplies for monitoring non-visible pollutants are available and will be mobilized to collect samples on the project site in accordance with the sampling schedule.

NOTE: State-certified analytical laboratories can be found by using the Environmental Laboratory Accreditation Program’s (ELAP) website at:  
<http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx>.

***7.7.1.4 Analytical Constituents***

Table 7.11 lists the specific sources and types of potential non-visible pollutants on the project site and the water quality indicator constituent(s) for that pollutant.

**Table 7.11      Potential Non-Visible Pollutants and Water Quality Indicator Constituents**

<b>Common Non-Visible Pollutants and Water Quality Indicator Constituents Worksheet</b>	
<b>General Work Activity/Potential Pollutants</b>	<b>Water Quality Indicators of Potential Constituents</b> (Review product literature and Material Safety Data Sheets to confirm potential constituents)
<b>Adhesives</b>	COD, Phenols, SVOCs
<b>Asphalt Work</b>	VOCs
<b>Cleaning</b>	
Acids	pH
Bleaches	Residual chlorine
TSP	Phosphate
Solvents	VOCs, SVOCs
Detergents	MBAS
<b>Concrete / Masonry Work</b>	
Sealant (Methyl methacrylate)	SVOC
Curing compounds	VOCs, SVOCs, pH
Ash, slag, sand	pH, Al, Ca, Va, Zn
<b>Drywall</b>	Cu, Al, General Minerals
<b>Framing / Carpentry</b>	
Treated Wood	Cu, Cr, As, Zn
Particle board	Formaldehyde
Untreated wood	BOD
<b>Grading / Earthworks</b>	
Gypsum / Lime amendments	pH
Contaminated Soil	Constituents specific to known contaminants, check with Laboratory
<b>Heating, Ventilation, Air Conditioning</b>	Freon
<b>Insulation</b>	Al, Zn
<b>Landscaping</b>	
Pesticides/Herbicides	Product dependent, see label and check with Laboratory
Fertilizers	TKN, NO <sub>3</sub> , BOD, COD, DOC, Sulfate, NH <sub>3</sub> , Phosphate, Potassium
Aluminum sulfate	Al, TDS, Sulfate
<b>Liquid Waste</b>	Constituents specific to materials, check with Laboratory



<b>Common Non-Visible Pollutants and Water Quality Indicator Constituents Worksheet</b>	
<b>General Work Activity/Potential Pollutants</b>	<b>Water Quality Indicators of Potential Constituents</b> (Review product literature and Material Safety Data Sheets to confirm potential constituents)
<b>Painting</b>	
Resins	COD, SVOCs
Thinners	COD, VOCs
Paint strippers	VOCs, SVOCs, metals
Lacquers, varnishes, enamels	COD, VOCs, SVOCs
Sealants	COD
Adhesives	Phenols, SVOCs
<b>Planting / Vegetation Management</b>	
Vegetation stockpiles	BOD
Fertilizers	TKN, NO <sub>3</sub> , BOD, COD, DOC, sulfate, NH <sub>3</sub> , Phosphate, Potassium
Pesticides/Herbicides	Product dependent, see label and check with Laboratory
<b>Plumbing</b>	
Solder, flux, pipe fitting	Cu, Pb, Sn, Zn
<b>Pools and Fountains</b>	Residual chlorine, Cu, chloramines
<b>Removal of existing structures</b>	Zn, VOCs, PCBs (see also other applicable activity categories, e.g., grading, painting)
<b>Roofing</b>	Cu, Pb, VOCs
<b>Sanitary Waste</b> Sewer line breaks and Portable Toilets (using clear fluid – blue fluid is visible if discharged)	BOD, Total/Fecal coliform
<b>Soil Preparation / Amendments/Dust Control</b>	
Polymer/Co-polymers	TKN, NO <sub>3</sub> , BOD, COD, DOC, Sulfate, Ni
Lignin sulfate	TDS, alkalinity
Psyllium	COD, TOC
Guar/Plant Gums	COD, TOC, Ni
<b>Solid Waste (leakage)</b>	BOD
<b>Utility Line Testing and Flushing</b>	Residual chlorine, chloramines
<b>Vehicle and Equipment Use</b>	

<b>Common Non-Visible Pollutants and Water Quality Indicator Constituents Worksheet</b>	
<b>General Work Activity/Potential Pollutants</b>	<b>Water Quality Indicators of Potential Constituents</b> (Review product literature and Material Safety Data Sheets to confirm potential constituents)
Batteries	Sulfuric acid; Pb, pH

Adapted from *Attachment S, Caltrans SWPPP/WPCP Preparation Manual, February 2003*, and *CASQA Construction BMP Handbook, 2003*

#### 7.7.1.5 Sample Collection

Samples of discharge shall be collected at the designated non-visible pollutant sampling locations shown on the Site Maps in Appendix B or in the locations determined by observed breaches, malfunctions, leakages, spills, operational areas, soil amendment application areas, and historical site usage areas that triggered the sampling event.

Grab samples shall be collected and preserved in accordance with the methods identified in the Table, "Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants" provided in Section 7.7.1.6. Only the QSP, or personnel trained in water quality sampling under the direction of the QSP shall collect samples.

Sample collection and handling requirements are described in Section 7.7.7.

#### 7.7.1.6 Sample Analysis

Samples shall be analyzed using the analytical methods identified in the Table 7.12.

Samples will be analyzed by:

Laboratory Name:

Street Address:

City, State Zip:

Telephone Number:

Point of Contact:

ELAP Certification  
Number:

Samples will be delivered to the laboratory by:

Driven by Contractor	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Picked up by Laboratory Courier	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Shipped	<input type="checkbox"/> Yes	<input type="checkbox"/> No

**Table 7.12 Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants**

<b>Constituent</b>	<b>Analytical Method</b>	<b>Minimum Sample Volume</b>	<b>Sample Containers</b>	<b>Sample Preservation</b>	<b>Reporting Limit</b>	<b>Maximum Holding Time</b>
pH	EPA 150.1					
Herbicides						
Pesticides/PCBs						
VOCs-Solvents						
SVOCs						
COD						
BOD						
DO						
Metals (Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, Se, Na, Th, Va, Zn)						
Metals (Chromium VI)						
Nitrate						
Phosphate						



**Table 7.12 Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants**

Constituent		Analytical Method	Minimum Sample Volume	Sample Containers	Sample Preservation	Reporting Limit	Maximum Holding Time
Notes:	°C	Degree Celsius			µg/L	Micrograms per Liter	
	BOD	Biological Oxygen Demand			mL	Milliliter	
	COD	Chemical Oxygen Demand			PCB	Polychlorinated Biphenyl	
	DO	Dissolved Oxygen			SVOC	Semi-Volatile Organic Compound	
	EPA	Environmental Protection Agency			SM	Standard Method	
	HCL	Hydrogen Chloride			TPH	Total Petroleum Hydrocarbons	
	H2SO4	Hydrogen Sulfide			TRPH	Total Recoverable Petroleum Hydrocarbons	
	HNO3	Nitric Acid			VOA	Volatile Organic Analysis	
	L	Liter			VOC	Volatile Organic Compound	
	mg/L	Chemical Oxygen Demand					

#### **7.7.1.7      *Data Evaluation and Reporting***

The QSP shall complete an evaluation of the water quality sample analytical results.

Runoff/downgradient results shall be compared with the associated upgradient/unaffected results and any associated run-on results. Should the runoff/downgradient sample show an increased level of the tested analyte relative to the unaffected background sample, which cannot be explained by run-on results, the BMPs, site conditions, and surrounding influences shall be assessed to determine the probable cause for the increase.

As determined by the site and data evaluation, appropriate BMPs shall be repaired or modified to mitigate discharges of non-visible pollutant concentrations. Any revisions to the BMPs shall be recorded as an amendment to the SWPPP.

The General Permit prohibits the storm water discharges that contain hazardous substances equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4. The results of any non-stormwater discharge results that indicate the presence of a hazardous substance in excess of established reportable quantities shall be immediately reported to the Regional Water Board and other agencies as required by 40 C.F.R. §§ 117.3 and 302.4.

Results of non-visible pollutant monitoring shall be reported in the Annual Report.

#### **7.7.2              *Sampling and Analysis Plan for pH and Turbidity in Stormwater Runoff Discharges***

Sampling and analysis of runoff for pH and turbidity is not required for Risk Level 1 projects.

#### **7.7.3    *Additional Monitoring Following an NEL Exceedance***

This project is not subject to NELs.

#### **7.7.4              *Sampling and Analysis Plan for Non-Stormwater Discharges***

This project is not subject to the non-stormwater sampling and analysis requirements of the General Permit because it is a Risk Level 1 project.

#### **7.7.5              *Sampling and Analysis Plan for Other Pollutants Required by the Regional Water Board***

The Regional Water Board has not specified monitoring for additional pollutants.

#### **7.7.6              *Training of Sampling Personnel***

Sampling personnel shall be trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring program (SWAMP) 2008 Quality Assurance Program Plan (QAPrP). Training records of designated contractor sampling personnel are provided in Appendix K.

The stormwater sampler(s) and alternate(s) have received the following stormwater sampling training:

**Name**

**Training**

The stormwater sampler(s) and alternates have the following stormwater sampling experience:

**Name**

**Experience**

### **7.7.7            *Sample Collection and Handling***

#### **7.7.7.1            *Sample Collection***

Samples shall be collected at the designated sampling locations shown on the Site Maps and listed in the preceding sections. Samples shall be collected, maintained and shipped in accordance with the SWAMP 2008 Quality Assurance Program Plan (QAPrP).

Grab samples shall be collected and preserved in accordance with the methods identified in preceding sections.

To maintain sample integrity and prevent cross-contamination, sample collection personnel shall follow the protocols below.

- Collect samples (for laboratory analysis) only in analytical laboratory-provided sample containers;
- Wear clean, powder-free nitrile gloves when collecting samples;
- Change gloves whenever something not known to be clean has been touched;
- Change gloves between sites;
- Decontaminate all equipment (e.g. bucket, tubing) prior to sample collection using a trisodium phosphate water wash, distilled water rinse, and final rinse with distilled water. (Dispose of wash and rinse water appropriately, i.e., do not discharge to storm drain or receiving water). Do not decontaminate laboratory provided sample containers;
- Do not smoke during sampling events;
- Never sample near a running vehicle;
- Do not park vehicles in the immediate sample collection area (even non-running vehicles);
- Do not eat or drink during sample collection; and
- Do not breathe, sneeze, or cough in the direction of an open sample container.

The most important aspect of grab sampling is to collect a sample that represents the entire runoff stream. Typically, samples are collected by dipping the collection container in the runoff flow paths and streams as noted below.

- i. For small streams and flow paths, simply dip the bottle facing upstream until full.

- ii. For larger stream that can be safely accessed, collect a sample in the middle of the flow stream by directly dipping the mouth of the bottle. Once again making sure that the opening of the bottle is facing upstream as to avoid any contamination by the sampler.
- iii. For larger streams that cannot be safely waded, pole-samplers may be needed to safely access the representative flow.
- iv. Avoid collecting samples from ponded, sluggish or stagnant water.
- v. Avoid collecting samples directly downstream from a bridge as the samples can be affected by the bridge structure or runoff from the road surface.

Note, that depending upon the specific analytical test, some containers may contain preservatives. These containers should **never** be dipped into the stream, but filled indirectly from the collection container.

#### 7.7.7.2 *Sample Handling*

Turbidity and pH measurements must be conducted immediately. Do not store turbidity or pH samples for later measurement.

Samples for laboratory analysis must be handled as follows. Immediately following sample collection:

- Cap sample containers;
- Complete sample container labels;
- Sealed containers in a re-sealable storage bag;
- Place sample containers into an ice-chilled cooler;
- Document sample information on the *Effluent Sampling Field Log Sheet*; and
- Complete the CoC.

All samples for laboratory analysis must be maintained between 0-6 degrees Celsius during delivery to the laboratory. Samples must be kept on ice, or refrigerated, from sample collection through delivery to the laboratory. Place samples to be shipped inside coolers with ice. Make sure the sample bottles are well packaged to prevent breakage and secure cooler lids with packaging tape.

Ship samples that will be laboratory analyzed to the analytical laboratory right away. Hold times are measured from the time the sample is collected to the time the sample is analyzed. The General Permit requires that samples be received by the analytical laboratory within 48 hours of the physical sampling (unless required sooner by the analytical laboratory).

Laboratory Name:

Address:

City, State Zip:

Telephone Number:

Point of Contact:

#### 7.7.7.3 *Sample Documentation Procedures*

All original data documented on sample bottle identification labels, *Effluent Sampling Field Log Sheet*, and CoCs shall be recorded using waterproof ink. These shall be considered accountable



documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated.

Duplicate samples shall be identified consistent with the numbering system for other samples to prevent the laboratory from identifying duplicate samples. Duplicate samples shall be identified in the Effluent Sampling Field Log Sheet.

Sample documentation procedures include the following:

Sample Bottle Identification Labels: Sampling personnel shall attach an identification label to each sample bottle. Sample identification shall uniquely identify each sample location.

Field Log Sheets: Sampling personnel shall complete the *Effluent Sampling Field Log Sheet* and *Receiving Water Sampling Field Log Sheet* for each sampling event, as appropriate.

Chain of Custody: Sampling personnel shall complete the CoC for each sampling event for which samples are collected for laboratory analysis. The sampler will sign the CoC when the sample(s) is turned over to the testing laboratory or courier.

## **7.8 Active Treatment System Monitoring**

An Active Treatment System (ATS) will be deployed on the site?

☐ Yes ☒ No

This project does not require a project specific Sampling and Analysis Plan for an ATS because deployment of an ATS is not planned.

## **7.9 Bioassessment Monitoring**

This project is not subject to bioassessment monitoring because it is not a Risk Level 3 project

## **7.10 Watershed Monitoring Option**

This project is not participating in a watershed monitoring option.

## **7.11 Quality Assurance and Quality Control**

An effective Quality Assurance and Quality Control (QA/QC) plan shall be implemented as part of the CSMP to ensure that analytical data can be used with confidence. QA/QC procedures to be initiated include the following:

- Field logs;
- Clean sampling techniques;
- CoCs;
- QA/QC Samples; and
- Data verification.

Each of these procedures is discussed in more detail in the following sections.

### **7.11.1 Field Logs**

The purpose of field logs is to record sampling information and field observations during monitoring that may explain any uncharacteristic analytical results. Sampling information to be

included in the field log include the date and time of water quality sample collection, sampling personnel, sample container identification numbers, and types of samples that were collected. Field observations should be noted in the field log for any abnormalities at the sampling location (color, odor, BMPs, etc.). Field measurements for pH and turbidity should also be recorded in the field log. A Visual Inspection Field Log, an Effluent Sampling Field Log Sheet, and a Receiving Water Sampling Field Log Sheet are included in CSMP Attachment 3 “Example Forms”.

#### **7.11.2      *Clean Sampling Techniques***

Clean sampling techniques involve the use of certified clean containers for sample collection and clean powder-free nitrile gloves during sample collection and handling. As discussed in Section 7.7.7, adoption of a clean sampling approach will minimize the chance of field contamination and questionable data results.

#### **7.11.3      *Chain of Custody***

The sample CoC is an important documentation step that tracks samples from collection through analysis to ensure the validity of the sample. Sample CoC procedures include the following:

- Proper labeling of samples;
- Use of CoC forms for all samples; and
- Prompt sample delivery to the analytical laboratory.

Analytical laboratories usually provide CoC forms to be filled out for sample containers. An example CoC is included in CSMP Attachment 3 “Example Forms”.

#### **7.11.4      *QA/QC Samples***

QA/QC samples provide an indication of the accuracy and precision of the sample collection; sample handling; field measurements; and analytical laboratory methods. The following types of QA/QC will be conducted for this project:

- ☒ Field Duplicates at a frequency of [5 percent or 1 duplicate minimum per sampling event]  
(Required for all sampling plans with field measurements or laboratory analysis)
- ☐ Equipment Blanks at a frequency of [Insert frequency required by method]  
(Only needed if equipment used to collect samples could add the pollutants to sample)
- ☐ Field Blanks at a frequency of [Insert frequency required by method]  
(Only required if sampling method calls for field blanks)
- ☐ Travel Blanks at a frequency of [Insert frequency required by method]  
(Required for sampling plans that include VOC laboratory analysis)

##### **7.11.4.1      *Field Duplicates***

Field duplicates provide verification of laboratory or field analysis and sample collection. Duplicate samples shall be collected, handled, and analyzed using the same protocols as primary samples. The sample location where field duplicates are collected shall be randomly selected from the discharge locations. Duplicate samples shall be collected immediately after the primary sample has been collected. Duplicate samples must be collected in the same manner and as close

in time as possible to the original sample. Duplicate samples shall not influence any evaluations or conclusion.

#### **7.11.4.2      Equipment Blanks**

Equipment blanks provide verification that equipment has not introduced a pollutant into the sample. Equipment blanks are typically collected when:

- New equipment is used;
- Equipment that has been cleaned after use at a contaminated site;
- Equipment that is not dedicated for surface water sampling is used; or
- Whenever a new lot of filters is used when sampling metals.

#### **7.11.4.3      Field Blanks**

Field blanks assess potential sample contamination levels that occur during field sampling activities. De-ionized water field blanks are taken to the field, transferred to the appropriate container, and treated the same as the corresponding sample type during the course of a sampling event.

#### **7.11.4.4      Travel Blanks**

Travel blanks assess the potential for cross-contamination of volatile constituents between sample containers during shipment from the field to the laboratory. De-ionized water blanks are taken along for the trip and held unopened in the same cooler with the VOC samples.

### **7.11.5          Data Verification**

After results are received from the analytical laboratory, the QSP shall verify the data to ensure that it is complete, accurate, and the appropriate QA/QC requirements were met. Data must be verified as soon as the data reports are received. Data verification shall include:

- Check the CoC and laboratory reports.  
*Make sure all requested analyses were performed and all samples are accounted for in the reports.*
- Check laboratory reports to make sure hold times were met and that the reporting levels meet or are lower than the reporting levels agreed to in the contract.
- Check data for outlier values and follow up with the laboratory.  
*Occasionally typographical errors, unit reporting errors, or incomplete results are reported and should be easily detected. These errors need to be identified, clarified, and corrected quickly by the laboratory. The QSP should especially note data that is an order of magnitude or more different than similar locations, or is inconsistent with previous data from the same location.*
- Check laboratory QA/QC results.  
*EPA establishes QA/QC checks and acceptable criteria for laboratory analyses. These data are typically reported along with the sample results. The QSP shall evaluate the reported QA/QC data to check for contamination (method, field, and equipment blanks), precision (laboratory matrix spike duplicates), and accuracy (matrix spikes and laboratory control samples). When QA/QC checks are outside acceptable ranges, the*

*laboratory must flag the data, and usually provides an explanation of the potential impact to the sample results.*

- Check the data set for outlier values and, accordingly, confirm results and re-analyze samples where appropriate.

*Sample re-analysis should only be undertaken when it appears that some part of the QA/QC resulted in a value out of the accepted range. Sample results may not be discounted unless the analytical laboratory identifies the required QA/QC criteria were not met and confirms this in writing.*

Field data including inspections and observations must be verified as soon as the field logs are received, typically at the end of the sampling event. Field data verification shall include:

- Check field logs to make sure all required measurements were completed and appropriately documented;
- Check reported values that appear out of the typical range or inconsistent; Follow-up immediately to identify potential reporting or equipment problems, if appropriate, recalibrate equipment after sampling;
- Verify equipment calibrations;
- Review observations noted on the field logs; and
- Review notations of any errors and actions taken to correct the equipment or recording errors.

## **7.12 Records Retention**

All records of stormwater monitoring information and copies of reports (including Annual Reports) must be retained for a period of at least three years from date of submittal or longer if required by the Regional Water Board.

Results of visual monitoring, field measurements and laboratory analyses must be kept in the SWPPP along with CoCs, and other documentation related to the monitoring.

Records are to be kept onsite while construction is ongoing. Records to be retained include:

- The date, place, and time of inspections, sampling, visual observations, and/or measurements, including precipitation;
- The individual(s) who performed the inspections, sampling, visual observation, and/or field measurements;
- The date and approximate time of field measurements and laboratory analyses;
- The individual(s) who performed the laboratory analyses;
- A summary of all analytical results, the method detection limits and reporting limits, and the analytical techniques or methods used;
- Rain gauge readings from site inspections;
- QA/QC records and results;
- Calibration records;
- Visual observation and sample collection exemption records;
- The records of any corrective actions and follow-up activities that resulted from analytical results, visual observations, or inspections; and
- NAL Exceedance Reports (if applicable); and
- NEL Violation Reports (if applicable).

## **CSMP Attachment 1: Weather Reports**

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## INSTRUCTIONS

Place printed NOAA weather forecasts in this Attachment.

## **CSMP Attachment 2:      Monitoring Records**

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## INSTRUCTIONS

Place completed BMP Inspection Forms, Visual Monitoring, Effluent Sampling and Receiving Water Field Logs, Monitoring Exceptions, and NAL/NEL Exceedance Reports in this Attachment.

## **CSMP Attachment 3:      Example Forms**

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## INSTRUCTIONS

Place example forms and check lists, e.g., Rain Gauge Logs, Field Logs, NAL/NEL Exceedance Reports, CoCs, in this Attachment.



Rain Gauge Log Sheet				
Construction Site Name:				
WDID #:				
Date (mm/dd/yy)	Time (24-hr)	Initials	Rainfall Depth (Inches)	Notes:

**Risk Level 1, 2, 3  
Visual Inspection Field Log Sheet**

Date and Time of Inspection:				Report Date:		
Inspection Type:	<input type="checkbox"/> Weekly	<input type="checkbox"/> Before predicted rain	<input type="checkbox"/> During rain event	<input type="checkbox"/> Following qualifying rain event	<input type="checkbox"/> Contained stormwater release	<input type="checkbox"/> Quarterly non-stormwater
<b>Site Information</b>						
Construction Site Name:						
Construction stage and completed activities:					Approximate area of exposed site:	
<b>Weather and Observations</b>						
Date Rain Predicted to Occur:				Predicted % chance of rain:		
Estimate storm beginning: _____ (date and time)		Estimate storm duration:_____ (hours)		Estimate time since last storm: _____ (days or hours)		Rain gauge reading:_____ (inches)
Observations: If yes identify location						
Odors                      Yes <input type="checkbox"/> No <input type="checkbox"/>						
Floating material      Yes <input type="checkbox"/> No <input type="checkbox"/>						
Suspended Material   Yes <input type="checkbox"/> No <input type="checkbox"/>						
Sheen                    Yes <input type="checkbox"/> No <input type="checkbox"/>						
Discolorations        Yes <input type="checkbox"/> No <input type="checkbox"/>						
Turbidity                Yes <input type="checkbox"/> No <input type="checkbox"/>						
<b>Site Inspections</b>						
<b>Outfalls or BMPs Evaluated</b>			<b>Deficiencies Noted</b>			
(add additional sheets or attached detailed BMP Inspection Checklists)						
Photos Taken:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Photo Reference IDs:			
<b>Corrective Actions Identified (note if SWPPP/REAP change is needed)</b>						
<b>Inspector Information</b>						
Inspector Name:				Inspector Title:		
Signature:					Date:	

<b>Risk Level 2 Effluent Sampling Field Log Sheets</b>			
Construction Site Name:		Date:	Time Start:
Sampler:			
Sampling Event Type:	<input type="checkbox"/> Stormwater	<input type="checkbox"/> Non-stormwater	<input type="checkbox"/> Non-visible pollutant
Field Meter Calibration			
pH Meter ID No./Desc.: Calibration Date/Time:		Turbidity Meter ID No./Desc.: Calibration Date/Time:	
Field pH and Turbidity Measurements			
Discharge Location Description	pH	Turbidity	Time
Grab Samples Collected			
Discharge Location Description	Sample Type		Time
Additional Sampling Notes:			
Time End:			

<b>Risk Level 3 Effluent Sampling Field Log Sheets</b>				
Construction Site Name:		Date:		Time Start:
Sampler:				
Sampling Event Type:	<input type="checkbox"/> Stormwater	<input type="checkbox"/> Non-stormwater	<input type="checkbox"/> Non-visible pollutant	<input type="checkbox"/> Post NEL Exceedance
Field Meter Calibration				
pH Meter ID No./Desc.: Calibration Date/Time:		Turbidity Meter ID No./Desc.: Calibration Date/Time:		
Field pH and Turbidity Measurements				
Discharge Location Description	pH	Turbidity	Time	
Grab Samples Collected				
Discharge Location Description	SSC	Other (specify)	Time	
Additional Sampling Notes:				
Time End:				

<b>Risk Level 3</b> <b>Receiving Water Sampling Field Log Sheets</b>			
Construction Site Name:		Date:	Time Start:
Sampler:			
Receiving Water Description and Observations			
Receiving Water Name/ID:			
Observations:			
Odors	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Floating material	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Suspended Material	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Sheen	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Field Meter Calibration			
pH Meter ID No./Desc.:		Turbidity Meter ID No./Desc.:	
Calibration Date/Time:		Calibration Date/Time:	
Field pH and Turbidity Measurements and SSC Grab Sample			
Upstream Location			
Type	Result	Time	Notes
pH			
Turbidity			
SSC	Collected Yes <input type="checkbox"/> No <input type="checkbox"/>		
Downstream Location			
Type	Result	Time	Notes
pH			
Turbidity			
SSC	Collected Yes <input type="checkbox"/> No <input type="checkbox"/>		
Additional Sampling Notes:			
Time End:			



NAL or NEL Exceedance Evaluation Summary Report		Page __ of __
Project Name		
Project WDID		
Project Location		
Date of Exceedance		
Type of Exceedance	<p>NAL Daily Average    <input type="checkbox"/> pH    <input type="checkbox"/> Turbidity</p> <p>NEL Daily Average    <input type="checkbox"/> pH    <input type="checkbox"/> Turbidity</p> <p><input type="checkbox"/> Other (specify) _____</p>	
Measurement or Analytical Method	<p><input type="checkbox"/> Field meter (Sensitivity: _____)</p> <p><input type="checkbox"/> Lab method (specify) _____ (Reporting Limit: _____) (MDL: _____)</p>	
Calculated Daily Average	<p><input type="checkbox"/> pH _ pH units</p> <p><input type="checkbox"/> Turbidity __ NTU</p>	
Rain Gauge Measurement	_____ inches	
Compliance Storm Event	_____ inches (5-year, 24-hour event)	
Visual Observations on Day of Exceedance		

NAL or NEL Exceedance Evaluation Summary Report		Page ____ of ____
<b>Description of BMPs in Place at Time of Event</b>		
<b>Initial Assessment of Cause</b>		
<b>Corrective Actions Taken (deployed after exceedance)</b>		
<b>Additional Corrective Actions Proposed</b>		
<b>Report Completed By</b>	<hr/> <b>(Print Name, Title)</b>	
<b>Signature</b>	<hr/>	

**CHAIN-OF-CUSTODY**
**DATE:**
**Lab ID:**

<b>DESTINATION LAB:</b>  <b>ATTN:</b>  <b>ADDRESS:</b>  <b>Office Phone:</b>  <b>Cell Phone:</b>  <b>SAMPLED BY:</b> <input type="text"/> <b>Contact:</b> <input type="text"/>  <b>Project Name</b> <input type="text"/>  							<b>REQUESTED ANALYSIS</b>				<b>Notes:</b>	
							<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
							<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
							<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
							<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
<b>Client Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Matrix</b>	<b>Container</b>								
				<b>#</b>	<b>Type</b>	<b>Pres.</b>						
<b>SENDER COMMENTS:</b>							<b>RELINQUISHED BY</b>					
							Signature: <input type="text"/>					
							Print: <input type="text"/>					
							Company: <input type="text"/>					
							Date: <input type="text"/> TIME: <input type="text"/>					
<b>LABORATORY COMMENTS:</b>							<b>RECEIVED BY</b>					
							Signature: <input type="text"/>					
							Print: <input type="text"/>					
							Company: <input type="text"/>					
							Date: <input type="text"/> TIME: <input type="text"/>					

## **CSMP Attachment 4:      Field Meter Instructions**

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## INSTRUCTIONS

Place instructions for field meters that will be used by contractor personnel in this Attachment.



## **CSMP Attachment 5: Supplemental Information**

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## INSTRUCTIONS

Place documents related to Regional Board required monitoring, watershed monitoring option approval, and bioassessment exception approval in this Attachment.

## Section 8      References

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State Water Resources Control Board (2009). Order 2009-0009-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm Water Discharge Associated with Construction and Land Disturbing Activities. Available on-line at:  
[http://www.waterboards.ca.gov/water\\_issues/programs/stormwater/construction.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml).

State Water Resources Control Board (2010). Order 2010-0014-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm Water Discharge Associated with Construction and Land Disturbing Activities. Available on-line at:  
[http://www.waterboards.ca.gov/water\\_issues/programs/stormwater/construction.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml).

CASQA 2009, *Stormwater BMP Handbook Portal: Construction*, November 2009,  
[www.casqa.org](http://www.casqa.org)

## ***Appendix A: Calculations***

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## INSTRUCTIONS

- *Include calculations here*



## ***Appendix B: Site Maps***

---

## INSTRUCTIONS

- *Include maps here*

## ***Appendix C: Permit Registration Documents***

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## INSTRUCTIONS

- *Include Copies of Permit Registration Documents submitted to SMARTS, other than the SWPPP itself*
  - Notice Of Intent (NOI)
  - Risk Assessment
  - Signed Certification Statement
  - Post Construction Water Balance
  - Copy of Annual Fee Receipt
  - ATS Design Documents
  - Site Map, see Appendix B
- Include the project Waste Discharge Identification (WDID) confirmation

## ***Appendix D: SWPPP Amendment Certifications***

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## INSTRUCTIONS

- *Include certification statements for each SWPPP amendment.*

**SWPPP Amendment No.**

\_\_\_\_\_

Project Name:

\_\_\_\_\_

Project Number:

\_\_\_\_\_

**Qualified SWPPP Developer's Certification of the  
Stormwater Pollution Prevention Plan Amendment**

"This Stormwater Pollution Prevention Plan and attachments were prepared under my direction to meet the requirements of the California Construction General Permit (SWRCB Order No. 2009-009-DWQ as amended by 2010-0014-DWQ). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below."

\_\_\_\_\_  
QSD's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
QSD Name

\_\_\_\_\_  
QSD Certificate Number

\_\_\_\_\_  
Title and Affiliation

\_\_\_\_\_  
Telephone

\_\_\_\_\_  
Address

\_\_\_\_\_  
Email

\_\_\_\_\_

## ***Appendix E: Submitted Changes to PRDs***

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## Log of Updated PRDs

The General Permit allows for the reduction or increase of the total acreage covered under the General Permit when a portion of the project is complete and/or conditions for termination of coverage have been met; when ownership of a portion of the project is purchased by a different entity; or when new acreage is added to the project.

Modified PRDs shall be filed electronically within 30 days of a reduction or increase in total disturbed area if a change in permit covered acreage is to be sought. The SWPPP shall be modified appropriately, with revisions and amendments recorded in Appendix C. Updated PRDs submitted electronically via SMARTS can be found in this Appendix.

---

This appendix includes all of the following updated PRDs (check all that apply):

- ☐ Revised Notice of Intent (NOI);
- ☐ Revised Site Map;
- ☐ Revised Risk Assessment;
- ☐ New landowner's information (name, address, phone number, email address); and
- ☐ New signed certification statement.

---

Legally Responsible Person [if organization]

---

Signature of [Authorized Representative of] Legally  
Responsible Person or Approved Signatory

---

Date

---

Name of [Authorized Representative of] Legally  
Responsible Person or Approved Signatory

---

Telephone Number

## ***Appendix F: Construction Schedule***

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## INSTRUCTIONS

- *Include a copy of construction schedule*

## ***Appendix G: Construction Activities, Materials Used, and Associated Pollutants***

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## INSTRUCTIONS

- List construction materials that will be used and construction activities that will have the potential to contribute to the discharge of pollutants to stormwater.
- List construction activities (i.e., construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation) that have the potential to contribute sediment or other pollutants to stormwater discharges.
- Delete phases that are not applicable to Project
- Insert as many lines to Table G.1 as necessary to complete the list, use Table G.a below to assist in the completion of Table G.1
- Pollutant Categories identified are consistent with the *CASQA BMP Handbook Portal: Construction*: Sediment, Nutrients, Bacteria and Viruses, Oil and Grease, Metals, Synthetic Organics, Pesticides, Gross Pollutants, and Vector Production
- For sampling requirements for non-visible pollutants associated with construction site activity please refer to Section 7.7.1.

**Table G.1 POLLUTANTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

General Work Activity/ Products With Potential Stormwater Pollutants	Specific Work Activity/Products With Potential Stormwater Pollutants	Pollutant Categories
Adhesives	<ul style="list-style-type: none"> <li>• Adhesives, glues, resins, epoxy synthetics, PVC cement</li> <li>• Caulks, sealers, putty, sealing agents and</li> <li>• Coal tars (naphtha, pitch)</li> </ul>	Oil and Grease, Synthetic Organics <sup>1</sup>
Asphalt paving/curbs	<ul style="list-style-type: none"> <li>• Hot and cold mix asphalt</li> </ul>	Oil and Grease
Cleaners	<ul style="list-style-type: none"> <li>• Polishes (metal, ceramic, tile)</li> <li>• Etching agents</li> <li>• Cleaners, ammonia, lye, caustic sodas, bleaching agents and chromate salts</li> </ul>	Metals, Synthetic Organics
Concrete / Masonry	<ul style="list-style-type: none"> <li>• Cement and brick dust</li> <li>• Colored chalks</li> <li>• Concrete curing compounds</li> <li>• Glazing compounds</li> <li>• Surfaces cleaners</li> <li>• Saw cut slurries</li> <li>• Tile cutting</li> </ul>	Metals, Synthetic Organics
Drywall	<ul style="list-style-type: none"> <li>• Saw-cutting drywall</li> </ul>	Metals
Framing/Carpentry	<ul style="list-style-type: none"> <li>• Sawdust, particle board dust, and treated woods</li> <li>• Saw cut slurries</li> </ul>	Metals, Synthetic Organics
Heating, Ventilation, Air Conditioning	<ul style="list-style-type: none"> <li>• Demolition or construction of air condition and heating systems</li> </ul>	Metals, Synthetic Organics
Insulation	<ul style="list-style-type: none"> <li>• Demolition or construction involving insulation, venting systems</li> </ul>	Metals, Synthetic Organics
Liquid waste	<ul style="list-style-type: none"> <li>• Wash waters</li> <li>• Irrigation line testing/flushing</li> </ul>	Metals, Synthetic Organics

**Table G.1 POLLUTANTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

<b>General Work Activity/ Products With Potential Stormwater Pollutants</b>	<b>Specific Work Activity/Products With Potential Stormwater Pollutants</b>	<b>Pollutant Categories</b>
Painting	<ul style="list-style-type: none"> <li>• Paint thinners, acetone, methyl ethyl ketone, stripper paints, lacquers, varnish, enamels, turpentine, gum spirit, solvents, dyes, stripping pigments and sanding</li> </ul>	Metals, Synthetic Organics
Planting / Vegetation Management	<ul style="list-style-type: none"> <li>• Vegetation control (pesticides/herbicides)</li> <li>• Planting</li> <li>• Plant maintenance</li> <li>• Vegetation removal</li> </ul>	Nutrients, Metals, Synthetic Organics
Plumbing	<ul style="list-style-type: none"> <li>• Solder (lead, tin), flux (zinc chloride), pipe fitting</li> <li>• Galvanized metal in nails, fences, and electric wiring</li> </ul>	Metals, Synthetic Organics
Pools/fountains	<ul style="list-style-type: none"> <li>• Chlorinated water</li> </ul>	Synthetic Organics
Removal of existing structures	<ul style="list-style-type: none"> <li>• Demolition of asphalt, concrete, masonry, framing, roofing, metal structures.</li> </ul>	Metals, Oil and Grease, Synthetic Organics
Roofing	<ul style="list-style-type: none"> <li>• Flashing</li> <li>• Saw cut slurries (tile cutting)</li> <li>• Shingle scrap and debris</li> </ul>	Metals, Oil and Grease, Synthetic Organics
Sanitary waste	<ul style="list-style-type: none"> <li>• Portable toilets</li> <li>• Disturbance of existing sewer lines.</li> </ul>	Nutrients
Soil preparation/amendments	<ul style="list-style-type: none"> <li>• Use of soil additives/amendments</li> </ul>	Nutrients
Solid waste	<ul style="list-style-type: none"> <li>• Litter, trash and debris</li> <li>• Vegetation</li> </ul>	Gross Pollutants
Utility line testing and flushing	<ul style="list-style-type: none"> <li>• Hydrostatic test water</li> <li>• Pipe flushing</li> </ul>	Synthetic Organics
Vehicle and equipment use	<ul style="list-style-type: none"> <li>• Equipment operation</li> <li>• Equipment maintenance</li> <li>• Equipment washing</li> <li>• Equipment fueling</li> </ul>	Oil and Grease
<sup>1</sup> Synthetic Organics are defined in Table 1.2 of the CASQA <i>Stormwater BMP Handbook Portal: Construction</i> as adhesives, cleaners, sealants, solvents, etc. These are generally categorized as VOCs or SVOCs.		

**Table G.1 Construction Activities and Associated Pollutants**

Phase	Activity	Associated Materials or Pollutants	Pollutant Category <sup>(1)</sup>
Grading and Land Development			
Streets and Utilities Phase			
Vertical Construction Phase			
Landscaping and Site Stabilization Phase			

<sup>(1)</sup> Categories per CASQA BMP Handbook (i.e., Sediment, Nutrients, Bacteria and Viruses, Oil and Grease, Metals, Synthetic Organics, Pesticides, Gross Pollutants, and Vector Production)



***Appendix H: CASQA Stormwater BMP Handbook  
Portal: Construction Fact Sheets***

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## INSTRUCTIONS

- *Fact Sheets for BMPs identified in Section 3 of this SWPPP can be found at “California Stormwater Quality Association (CASQA)” websites:*

*< <http://www.casqa.org> & < <http://www.cabmphandbooks.com>>*

## ***Appendix I: BMP Inspection Form***

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## BMP INSPECTION REPORT

Date and Time of Inspection:		Date Report Written:		
Inspection Type: (Circle one)	Weekly <i>Complete Parts I, II, III and VII</i>	Pre-Storm <i>Complete Parts I, II, III, IV and VII</i>	During Rain Event <i>Complete Parts I, II, III, V, and VII</i>	Post-Storm <i>Complete Parts I, II, III, VI and VII</i>
<b>Part I. General Information</b>				
Site Information				
Construction Site Name:				
Construction stage and completed activities:			Approximate area of site that is exposed:	
Photos Taken: (Circle one)	Yes	No	Photo Reference IDs:	
Weather				
Estimate storm beginning: (date and time)		Estimate storm duration: (hours)		
Estimate time since last storm: (days or hours)		Rain gauge reading and location: (in)		
Is a "Qualifying Event" predicted or did one occur (i.e., 0.5" rain with 48-hrs or greater between events)? (Y/N) If yes, summarize forecast:				
Exemption Documentation (explanation required if inspection could not be conducted). Visual inspections are not required outside of business hours or during dangerous weather conditions such as flooding or electrical storms.				
Inspector Information				
Inspector Name:			Inspector Title:	
Signature:			Date:	

Part II. BMP Observations. Describe deficiencies in Part III.			
Minimum BMPs for Risk Level _____ Sites	Failures or other short comings (yes, no, N/A)	Action Required (yes/no)	Action Implemented (Date)
<b>Good Housekeeping for Construction Materials</b>			
Inventory of products (excluding materials designed to be outdoors)			
Stockpiled construction materials not actively in use are covered and bermed			
All chemicals are stored in watertight containers with appropriate secondary containment, or in a completely enclosed storage shed			
Construction materials are minimally exposed to precipitation			
BMPs preventing the off-site tracking of materials are implemented and properly effective			
<b>Good Housekeeping for Waste Management</b>			
Wash/rinse water and materials are prevented from being disposed into the storm drain system			
Portable toilets are contained to prevent discharges of waste			
Sanitation facilities are clean and with no apparent for leaks and spills			
Equipment is in place to cover waste disposal containers at the end of business day and during rain events			
Discharges from waste disposal containers are prevented from discharging to the storm drain system / receiving water			
Stockpiled waste material is securely protected from wind and rain if not actively in use			
Procedures are in place for addressing hazardous and non-hazardous spills			
Appropriate spill response personnel are assigned and trained			
Equipment and materials for cleanup of spills is available onsite			
Washout areas (e.g., concrete) are contained appropriately to prevent discharge or infiltration into the underlying soil			
<b>Good Housekeeping for Vehicle Storage and Maintenance</b>			
Measures are in place to prevent oil, grease, or fuel from leaking into the ground, storm drains, or surface waters			
All equipment or vehicles are fueled, maintained, and stored in a designated area with appropriate BMPs			
Vehicle and equipment leaks are cleaned immediately and disposed of properly			



Part II. BMP Observations Continued. Describe deficiencies in Part III.			
Minimum BMPs for Risk Level _____ Sites	Adequately designed, implemented and effective (yes, no, N/A)	Action Required (yes/no)	Action Implemented (Date)
<b>Good Housekeeping for Landscape Materials</b>			
Stockpiled landscape materials such as mulches and topsoil are contained and covered when not actively in use			
Erodible landscape material has not been applied 2 days before a forecasted rain event or during an event			
Erodible landscape materials are applied at quantities and rates in accordance with manufacturer recommendations			
Bagged erodible landscape materials are stored on pallets and covered			
<b>Good Housekeeping for Air Deposition of Site Materials</b>			
Good housekeeping measures are implemented onsite to control the air deposition of site materials and from site operations			
<b>Non-Stormwater Management</b>			
Non-Stormwater discharges are properly controlled			
Vehicles are washed in a manner to prevent non-stormwater discharges to surface waters or drainage systems			
Streets are cleaned in a manner to prevent unauthorized non-stormwater discharges to surface waters or drainage systems.			
<b>Erosion Controls</b>			
Wind erosion controls are effectively implemented			
Effective soil cover is provided for disturbed areas inactive (i.e., not scheduled to be disturbed for 14 days) as well as finished slopes, open space, utility backfill, and completed lots			
The use of plastic materials is limited in cases when a more sustainable, environmentally friendly alternative exists.			
<b>Sediment Controls</b>			
Perimeter controls are established and effective at controlling erosion and sediment discharges from the site			
Entrances and exits are stabilized to control erosion and sediment discharges from the site			
Sediment basins are properly maintained			
Linear sediment control along toe of slope, face of slope and at grade breaks (Risk Level 2 & 3 Only)			
Limit construction activity to and from site to entrances and exits that employ effective controls to prevent offsite tracking (Risk Level 2 & 3 Only)			

Ensure all storm, drain inlets and perimeter controls, runoff control BMPs and pollutants controls at entrances and exits are maintained and protected from activities the reduce their effectiveness (Risk Level 2 & 3 Only)			
Inspect all immediate access roads daily (Risk Level 2 & 3 Only)			
<b>Run-On and Run-Off Controls</b>			
Run-on to the site is effectively managed and directed away from all disturbed areas.			
<b>Other</b>			
Are the project SWPPP and BMP plan up to date, available on-site and being properly implemented?			

<b>Part III. Descriptions of BMP Deficiencies</b>		
<b>Deficiency</b>	<b>Repairs Implemented:</b> <b>Note - Repairs must begin within 72 hours of identification and, complete repairs as soon as possible.</b>	
	<b>Start Date</b>	<b>Action</b>
1.		
2.		
3.		
4.		

<b>Part IV. Additional Pre-Storm Observations. Note the presence or absence of floating and suspended materials, sheen, discoloration, turbidity, odors, and source(s) of pollutants(s).</b>	
	Yes, No, N/A
Do stormwater storage and containment areas have adequate freeboard? If no, complete Part III.	
Are drainage areas free of spills, leaks, or uncontrolled pollutant sources? If no, complete Part VII and describe below.	
Notes:	
Are stormwater storage and containment areas free of leaks? If no, complete Parts III and/or VII and describe below.	

Notes:	

<b>Part V. Additional During Storm Observations. If BMPs cannot be inspected during inclement weather, list the results of visual inspections at all relevant outfalls, discharge points, and downstream locations. Note odors or visible sheen on the surface of discharges. Complete Part VII (Corrective Actions) as needed.</b>	
Outfall, Discharge Point, or Other Downstream Location	
Location	Description
Location	Description
Location	Description
Location	Description
Location	Description
Location	Description
Location	Description
Location	Description

**Part VI. Additional Post-Storm Observations.** Visually observe (inspect) stormwater discharges at all discharge locations within two business days (48 hours) after each qualifying rain event, and observe (inspect) the discharge of stored or contained stormwater that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Complete Part VII (Corrective Actions) as needed.

Discharge Location, Storage or Containment Area	Visual Observation

**Part VII. Additional Corrective Actions Required.** Identify additional corrective actions not included with BMP Deficiencies (Part III) above. Note if SWPPP change is required.

Required Actions	Implementation Date

## ***Appendix J: Project Specific Rain Event Action Plan Template***

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## INSTRUCTIONS

- *The QSP will modify the project specific template for each phase/rain event*
- *File REAPs completed by the QSP in this Appendix*

### Predicted Rain Event Triggered Actions

Below is a list of suggested actions and items to review for this project. Each active Trade should check all material storage areas, stockpiles, waste management areas, vehicle and equipment storage and maintenance, areas of active soil disturbance, and areas of active work to ensure the proper implementation of BMPs. Project-wide BMPs should be checked and cross-referenced to the BMP progress map.

Trade or Activity	Suggested action(s) to perform / item(s) to review prior to rain event
<input type="checkbox"/> Information & Scheduling	<input type="checkbox"/> Inform trade supervisors of predicted rain <input type="checkbox"/> Check scheduled activities and reschedule as needed <input type="checkbox"/> Alert erosion/sediment control provider <input type="checkbox"/> Alert sample collection contractor (if applicable) <input type="checkbox"/> Schedule staff for extended rain inspections (including weekends & holidays) <input type="checkbox"/> Check Erosion and Sediment Control (ESC) material stock <input type="checkbox"/> Review BMP progress map <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Material storage areas	<input type="checkbox"/> Material under cover or in sheds (ex: treated woods and metals) <input type="checkbox"/> Perimeter control around stockpiles <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Waste management areas	<input type="checkbox"/> Dumpsters closed <input type="checkbox"/> Drain holes plugged <input type="checkbox"/> Recycling bins covered <input type="checkbox"/> Sanitary stations bermed and protected from tipping <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Trade operations	<input type="checkbox"/> Exterior operations shut down for event (e.g., no concrete pours or paving) <input type="checkbox"/> Soil treatments (e.g., fertilizer) ceased within 24 hours of event <input type="checkbox"/> Materials and equipment (ex: tools) properly stored and covered <input type="checkbox"/> Waste and debris disposed in covered dumpsters or removed from site <input type="checkbox"/> Trenches and excavations protected <input type="checkbox"/> Perimeter controls around disturbed areas <input type="checkbox"/> Fueling and repair areas covered and bermed <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Site ESC BMPs	<input type="checkbox"/> Adequate capacity in sediment basins and traps <input type="checkbox"/> Site perimeter controls in place <input type="checkbox"/> Catch basin and drop inlet protection in place and cleaned <input type="checkbox"/> Temporary erosion controls deployed <input type="checkbox"/> Temporary perimeter controls deployed around disturbed areas and stockpiles <input type="checkbox"/> Roads swept; site ingress and egress points stabilized <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Concrete rinse out area	<input type="checkbox"/> Adequate capacity for rain <input type="checkbox"/> Wash-out bins covered <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Spill and drips	<input type="checkbox"/> All incident spills and drips, including paint, stucco, fuel, and oil cleaned <input type="checkbox"/> Drip pans emptied <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____

**Continued on next page.**

<input type="checkbox"/> Other / Discussion / Diagrams	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
--	--

	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	
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**Attach a printout of the weather forecast from the NOAA website to the REAP.**

I certify under penalty of law that this Rain Event Action Plan (REAP) will be performed in accordance with the General Permit by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Date: \_\_\_\_\_

\_\_\_\_\_  
 Qualified SWPPP Practitioner (Use ink please)

## ***Appendix K: Training Reporting Form***

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# **Trained Contractor Personnel Log**

## **Stormwater Management Training Log and Documentation**

Project Name: \_\_\_\_\_

WDID #: \_\_\_\_\_

Stormwater Management Topic: (check as appropriate)

- |  |   |
|--|---|
| <input type="checkbox"/> Erosion Control           | <input type="checkbox"/> Sediment Control                                 |
| <input type="checkbox"/> Wind Erosion Control      | <input type="checkbox"/> Tracking Control                                 |
| <input type="checkbox"/> Non-Stormwater Management | <input type="checkbox"/> Waste Management and Materials Pollution Control |
| <input type="checkbox"/> Stormwater Sampling       |   |

Specific Training Objective: \_\_\_\_\_

Location: \_\_\_\_\_

Date: \_\_\_\_\_

Instructor: \_\_\_\_\_

Telephone: \_\_\_\_\_

Course Length (hours): \_\_\_\_\_

### **Attendee Roster (Attach additional forms if necessary)**

Name	Company	Phone

As needed, add proof of external training (e.g., course completion certificates, credentials for QSP, QSD).

## ***Appendix L: Responsible Parties***

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### Authorization of Approved Signatories

Project Name: \_\_\_\_\_

WDID #: \_\_\_\_\_

Name of Personnel	Project Role	Company	Signature	Date

\_\_\_\_\_  
LRP's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
LRP Name and Title

\_\_\_\_\_  
Telephone Number

## Identification of QSP

Project Name: \_\_\_\_\_

WDID #: \_\_\_\_\_

The following are QSPs associated with this project

Name of Personnel <sup>(1)</sup>	Company	Date

(1) If additional QSPs are required on the job site add additional lines and include information here

**OPTIONAL**

**Authorization of Data Submitters**

Project Name: \_\_\_\_\_

WDID #: \_\_\_\_\_

Name of Personnel	Project Role	Company	Signature	Date

\_\_\_\_\_  
Approved Signatory's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Approved Signatory  
Name and Title

\_\_\_\_\_  
Telephone Number

## ***Appendix M: Contractors and Subcontractors***

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## ***Appendix N: Construction General Permit***

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## INSTRUCTIONS

- *Include a copy of the General Permit, or reference permanent location of General Permit that is kept on the construction site.*



May 15, 2018

Mr. Mark Gottschlich  
USS Cal Builders  
8051 Main Street  
Stanton, CA 90680

LLG Reference: 3-17-2740

Subject: **University Manor Mixed-Use Transportation / Access Analysis**  
San Diego

Dear Mr. Gottschlich:

Linscott, Law and Greenspan, Engineers (LLG) has prepared this access analysis for the proposed University Manor Mixed-Use Project to be located at 5556 University Avenue in San Diego. The Project requires Planned Development Permit Process 4, and Process 5 - Vacation R.O.W. The attached conceptual site plan depicts the proposed project layout and the two proposed access driveways.

## 1. PROJECT DESCRIPTION

The proposed Project includes two three-story residential structures, with a total of 63 multi-family dwelling units and approximately 5,047.70 SF of commercial /office space in three tenant spaces. The retail tenants are not identified at this time. Therefore, 1,460.67 SF is assumed to be a delicatessen and the remaining 3,587.03 SF is assumed to be medical/dental office. Residential parking spaces will be provided below the two structures at street level. The site will be served by two driveways on University Avenue, one a gated access to the residential units and the second at the eastern boundary of the site serving the commercial area.

The commercial driveway provides access to the commercial parking area at street level. The residential access provides access to the residential parking several feet above the street level and hence two separate access driveways are needed. Access between the retail and residential parking areas will not be possible within the site due to the difference in grades.

**Figure 1** depicts the Conceptual Site Plan.

**Engineers & Planners**  
Traffic  
Transportation  
Parking

**Linscott, Law &  
Greenspan, Engineers**  
4542 Ruffner Street  
Suite 100  
San Diego, CA 92111  
**858.300.8800** T  
858.300.8810 F  
www.llgengineers.com

Pasadena  
Irvine  
San Diego  
Woodland Hills

Philip M. Linscott, PE (1924-2000)  
Jack M. Greenspan, PE (Ret.)  
William A. Law, PE (Ret.)  
Paul W. Wilkinson, PE  
John P. Keating, PE  
David S. Shender, PE  
John A. Boarman, PE  
Clare M. Look-Jaeger, PE  
Richard E. Barretto, PE  
Keil D. Maberry, PE

An LG2WB Company Founded 1966

## 2. EXISTING CONDITIONS AND TRAFFIC VOLUMES

### Existing Conditions

University Avenue is designated as a 4-Lane Major Road in the Mid-City Communities Plan. Currently, it is built as a four-lane facility with a two-way-left-turn lane fronting the Project site. Curb, gutter and sidewalk are provided. The posted speed limit is 40 mph. On-street parking is permitted intermittently in the Project vicinity

### Existing Traffic Volumes

Existing traffic volume counts were conducted at the following two intersections and one segment on Thursday, March 30, 2017:

#### Intersections

- University Avenue / 54<sup>th</sup> Street
- University Avenue / 58<sup>th</sup> Street

#### Segments

- University Avenue / 54<sup>th</sup> Street to 58<sup>th</sup> Street

**Appendix A** includes the peak hour intersection and segment count sheets. **Figure 2** depicts the Existing traffic volumes.

## 3. PROJECT TRIP GENERATION

Project trip generation was estimated using the City of San Diego *Trip Generation Manual*, May 2003. The City of San Diego Trip Generation Manual does not provide the trip rates for a Delicatessen. Therefore, the SANDAG trip rate was used. As mentioned previously, the retail tenants are not identified at this time and therefore worst case (in terms of trip generation) land use categories were used in the analysis. The trip rates for Multiple Dwelling Unit: Over 20 dwelling units/acre was used for the apartments. Given the size of the proposed commercial use, the land uses with the highest possible trip rates were assumed in order to provide a conservative analysis.

Currently, an auto body shop is conducting business at the site. No credit was applied for this current land use that will be replaced by the project. Also, no mixed-use or pass-by credits were applied to the proposed retail land uses at the site.

**Table A** summarizes the Project trip generation. As seen in *Table A*, the commercial portion of the project is estimated to generate 398 daily trips with 31 AM peak hour trips (21 inbound and 10 outbound) and 25 PM peak hour trips (7 inbound and 18 outbound).

The residential portion of the project is estimated to generate 378 daily trips with 30 AM peak hour trips (6 inbound and 24 outbound) and 34 PM peak hour trips (24 inbound and 10 outbound).

The entire project is estimated to generate a total of 776 daily trips with 61 AM peak hour trips (27 inbound and 34 outbound) and 59 PM peak hour trips (31 inbound and 28 outbound).

Based on the trip generation, a full transportation impact analysis is not required.

**Figure 3** depicts the Project traffic volumes.

#### 4. TRAFFIC VOLUMES

The Project traffic was distributed and assigned. The Project traffic was added to the Existing Traffic volumes to obtain the Existing + Project traffic volumes.

**Figure 4** depicts the Existing + Project traffic volumes.

A car wash is currently under construction at the northeast corner of the University Avenue / 54<sup>th</sup> Street intersection and this project was included in the baseline opening day volumes. Additionally, based on a comparison of the existing counts collected by LLG and historical counts from City of San Diego records dating to 2009, traffic volumes on University Avenue have increased by less than 1% per year in the past decade. Hence, a conservative growth rate of 1% per year was applied to the existing traffic volumes for a period of two (2) years to obtain the Project Opening Day (Year 2019) traffic volumes. The historical count data is included in *Appendix A*.

The Project traffic was added to the Project Opening Day (Year 2019) traffic volumes to obtain the Project Opening Day (Year 2019) + Project traffic volumes.

**Figure 5** depicts the Opening Day (Year 2019) traffic volumes and **Figure 6** depicts the Opening Day (Year 2019) + Project traffic volumes.

**TABLE A**  
**TRIP GENERATION**

Land Use	Size	Daily Trip Ends (ADT)		AM Peak Hour					PM Peak Hour				
		Rate <sup>a</sup>	Volume	% of ADT <sup>a</sup>	In:Out Split <sup>a</sup>	Volume			% of ADT <sup>a</sup>	In:Out Split	Volume		
						In	Out	Total			In	Out	Total
Deli <sup>a</sup>	1,460.67 KSF	150 /KSF	219	9%	60:40	12	8	20	3%	30:70	2	5	7
Medical / Dental office <sup>b</sup>	3,587.03 KSF	50 /KSF	179	6%	80:20	9	2	11	10%	30:70	5	13	18
<i>Subtotal Commercial</i>	<i>5,047.70 KSF</i>		<i>398</i>			<i>21</i>	<i>10</i>	<i>31</i>			<i>7</i>	<i>18</i>	<i>25</i>
Multiple Dwelling Units (Over 20 DU per acre)	63 DU	6 /DU	378	8%	20:80	6	24	30	9%	70:30	24	10	34
<b>Total Trips</b>			<b>776</b>			<b>27</b>	<b>34</b>	<b>61</b>			<b>31</b>	<b>28</b>	<b>59</b>

**Footnotes:**

- City of San Diego Trip Generation Manual does not have a rate for a delicatessen. The rate from the *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002, SANDAG is used.
- Rates are based on City of San Diego Trip Generation Manual, May 2003.

## 5. ANALYSIS

### EXISTING

**Table B** summarizes the Existing intersection operations. As seen in *Table B*, the two intersections are calculated to currently operate at LOS D or better.

**Table C** summarizes the Existing segment operations. As seen in *Table C*, the two subject segments are calculated to currently operate at LOS D.

### EXISTING + PROJECT

*Table B* summarizes the Existing + Project intersection operations. As seen in *Table B*, with the addition of Project traffic, the access points and the two subject intersections are calculated to operate at LOS D or better.

*Table C* summarizes the Existing + Project segment operations. As seen in *Table C*, with the addition of Project traffic, the two subject segments are calculated to continue to operate at LOS D.

### OPENING DAY (YEAR 2019)

**Table D** summarizes the Opening Day (Year 2019) intersection operations. As seen in *Table D*, on Opening Day, the two intersections are calculated to operate at LOS D or better.

**Table E** summarizes the Opening Day (Year 2019) segment operations. As seen in *Table E*, the two subject segments are calculated to currently operate at LOS D or better.

### OPENING DAY (YEAR 2019) + PROJECT

*Table D* also summarizes the Opening Day (Year 2019) + Project intersection operations. As seen in *Table D*, with the addition of Project traffic, the access points and the two subject intersections are calculated to operate at LOS D or better.

*Table E* also summarizes the Opening Day (Year 2019) + Project segment operations. As seen in *Table E*, with the addition of Project traffic, the two subject segments are calculated to continue to operate at LOS D.

Thus, based on the intersection and segment analyses, the project does not have any significant impacts on the adjacent roadway network.

**TABLE B  
EXISTING + PROJECT INTERSECTION OPERATIONS**

Intersection	Traffic Control	Peak Hour	Existing		Existing + Project		Significant?
			Delay <sup>a</sup>	LOS <sup>b</sup>	Delay	LOS	
1. University Ave / 54 <sup>th</sup> St	Signal	AM	27.3	C	27.5	C	No
		PM	35.5	D	35.9	D	No
2. University Ave / Residential Dwy	MSSC <sup>d</sup>	AM	<sup>e</sup>	<sup>e</sup>	11.1	B	No
		PM	<sup>e</sup>	<sup>e</sup>	11.1	B	No
3. University Ave / Commercial Dwy	SBL EBL SBL EBL	MSSC	AM	<sup>e</sup>	10.9	B	No
			<sup>e</sup>	<sup>e</sup>	9.3	A	No
		PM	<sup>e</sup>	<sup>e</sup>	11.1	B	No
			<sup>e</sup>	<sup>e</sup>	9.4	A	No
		Signal	AM	21.5	C	C	No
			PM	23.2	C	C	No

**Footnotes:**

- a. Delay in seconds per vehicle.
- b. Level of Service
- c. Increase in delay due to project
- d. MSSC – Minor street stop controlled. SB left-turn delay and LOS reported
- e. Intersection does not exist.

**General Note:**

NA – Not Applicable

**TABLE C  
EXISTING + PROJECT SEGMENT OPERATIONS**

Segment	Functional Classification <sup>a</sup>	LOS E <sup>b</sup> Capacity	Existing			Existing + Project			$\Delta$ V/C <sup>e</sup>	Impact Type
			Volume	LOS <sup>c</sup>	V/C <sup>d</sup>	Volume	LOS	V/C		
University Avenue										
54 <sup>th</sup> St to Project Dwy	4-Lane Collector	30,000	21,400	D	0.713	22,330	D	0.744	0.031	None
Project Dwy to 58 <sup>th</sup> St	4-Lane Collector	30,000	21,400	D	0.713	21,710	D	0.724	0.011	None

**Footnotes:**

- a. The City of San Diego roadway classification at which the roadway currently functions.
- b. The capacity of the roadway at Level of Service E.
- c. The Volume to Capacity ratio.
- d. Level of Service.
- e. Increase in V/C ratio due to the addition of project traffic.



**TABLE D**  
**OPENING DAY (YEAR 2019) INTERSECTION OPERATIONS**

Intersection	Traffic Control	Peak Hour	Opening Day		Opening Day + Project		Significant?
			Delay <sup>a</sup>	LOS <sup>b</sup>	Delay	LOS	
1. University Ave / 54 <sup>th</sup> St	Signal	AM	27.7	C	27.9	C	No
		PM	36.4	D	37.2	D	No
2. University Ave / Residential Dwy	MSSC <sup>d</sup>	AM	e	e	11.1	B	No
		PM	e	e	11.2	B	No
3. University Ave / Commercial Dwy	SBL						
	EBL						
	SBL						
	EBL						
	MSSC	AM	e	e	10.9	B	No
			e	e	9.4	A	No
			e	e	11.1	B	No
			e	e	9.5	A	No
		PM	e	e			
4. University Ave / 58 <sup>th</sup> St	Signal	AM	21.8	C	21.8	C	No
		PM	23.2	C	23.7	C	No

**Footnotes:**

- a. Delay in seconds per vehicle.
- b. Level of Service
- c. Increase in delay due to project
- d. MSSC – Minor street stop controlled. SB left-turn delay and LOS reported
- e. Intersection does not exist.

**General Note:**

NA – Not Applicable

**TABLE E**  
**OPENING DAY (YEAR 2019) SEGMENT OPERATIONS**

Segment	Functional Classification <sup>a</sup>	LOS E <sup>b</sup> Capacity	Opening Day			Opening Day + Project			$\Delta$ V/C <sup>e</sup>	Impact Type
			Volume	LOS <sup>c</sup>	V/C <sup>d</sup>	Volume	LOS	V/C		
<b>University Avenue</b>										
54 <sup>th</sup> St to Project Dwy	4-Lane Collector	30,000	21,940	D	0.731	22,870	D	0.762	0.031	None
Project Dwy to 58 <sup>th</sup> St	4-Lane Collector	30,000	21,940	D	0.731	22,250	D	0.742	0.011	None

**Footnotes:**

- a. The City of San Diego roadway classification at which the roadway currently functions.
- b. The capacity of the roadway at Level of Service E.
- c. The Volume to Capacity ratio.
- d. Level of Service.
- e. Increase in V/C ratio due to the addition of project traffic.

## 6. ACCESS ANALYSIS

*Figure 7* depicts the proposed configurations of the two project access driveways. The project is required to improve the road to 4-Lane Major Road standards with a raised median along the project frontage. The project will dedicate 11 feet and widen the road by 11 feet to meet City of San Diego 4-Lane Major Road standards and provide a raised median along the project frontage. A left turn in only median opening is proposed at the commercial driveway as described in the following paragraphs.

### RESIDENTIAL DRIVEWAY

As seen in *Figure 7*, a new raised median will be provided across this driveway. Thus, only right-in and right-out movements will be possible at this driveway. Inbound residential traffic from the west will be able to make a U-turn at the retail driveway and access the driveway from the east. Outbound residential traffic desiring to proceed to the east will need to utilize 54<sup>th</sup> Street and execute a U-turn at the University Avenue/54<sup>th</sup> Street intersection to ultimately head east. U-turns on University Avenue are permitted at the 54<sup>th</sup> Street /University Avenue intersection.

### COMMERCIAL DRIVEWAY

As seen in *Figure 7*, a median opening is proposed on University Avenue at this driveway to allow only eastbound left-turns in, and U-turns. An eastbound left-turn lane with an approximate storage length of 100 feet is proposed. The peak hour intersection analysis of this intersection indicates LOS A with the calculated 95<sup>th</sup> percentile queue being about 1 vehicle (or 20 feet). Hence, the proposed 100-foot left-turn lane will provide sufficient storage for the left-turning and U-turning vehicles. Also, given the spacing between the existing Promise Hospital driveway at the western boundary of the Project site and the proposed retail driveway, this is the maximum storage that can be provided and still provide the necessary taper of 60 feet.

As explained above, left-in, U turn, right-in and right-out (but no left-out) movements will be possible at the commercial driveway. Sufficient westbound width will be provided to allow eastbound traffic to execute U-turns at the proposed median opening. Outbound retail traffic desiring to proceed to the east will need to utilize University Avenue and execute a westbound U-turn at 54<sup>th</sup> Street/University Avenue intersection to ultimately head east.

Additionally, inbound residential traffic on eastbound University Avenue will be able to execute an eastbound U-turn at this driveway. It is estimated that approximately 4/14 trips will execute U-turns during the AM / PM peak hours at this driveway to access the residential driveway.

It is estimated that the Project will add 14 trips in the AM and 11 trips in the PM peak hour to the westbound U-turn movement on University Avenue at the 54<sup>th</sup> Street intersection.

*Section 5, Analysis*, shows that the two access driveway intersections are calculated to operate adequately, with the left-turn in movement operating at LOS B or better in the Existing + Project and the Opening Day (Year 2019) + Project conditions.

## 7. PARKING

*Table F* summarizes the required parking and the actual parking provided. A total of 87 residential parking spaces and 12 commercial parking spaces are provided, including accessible and Electric Vehicle (EV) spaces, as described below.

### RESIDENTIAL PARKING

As seen in *Table F*, a total of 87 residential parking spaces are required and will be provided. Two accessible spaces are required and four will be provided. Of these, two spaces will be accessible to automobiles and two will be van accessible. Six motorcycle spaces are required and seven will be provided. 27 bicycles spaces are required and 28 will be provided.

### COMMERCIAL PARKING

As seen in *Table F*, a total of 11 commercial parking spaces are required and 12 will be provided. One accessible space is required and two will be provided. Two short-term bicycle spaces are required and eight will be provided. One long-term bicycle space is required and six will be provided.

Thus, the project is adequately served by the proposed parking spaces.

The 87 residential spaces and 2 commercial spaces will be accessible from the residential driveway and 10 commercial spaces will be accessible from the commercial driveway. These commercial spaces are provided prior to the gate and are accessible without entering through the gate.

Parking is not provided along the project frontage. *Figure 8* depicts the project frontage.

## 8. GATED ENTRY ANALYSIS

The available storage at the gated entry at the residential driveway is 48 feet. The following is an analysis of the gated entry at the residential driveway to determine whether the queue will back-up onto University Avenue. The City of Los Angeles Driveway Design dated February 2003 (included in *Appendix C*) provides the basis for this analysis.

- The Average Service Rate (headway) for a card operated gate is 8.9 seconds (page 8, Parking Control Service Rate).
- This corresponds to a capacity of 405 vehicles per hour.
- The queue of vehicles at the gate can be calculated using the graph, Reservoir Needs vs Traffic Intensity (page 9 of *Appendix C*).
- The traffic intensity, or the arrival rate during the peak hour is number of vehicles entering in one hour.
- The maximum number of vehicles entering the residential driveway during the peak hour is 24.
- Using a peak hour factor (PHF) of 0.92, this is equal to 26 vehicles.
- The arrival rate is  $(26/3600 = 0.007)$ , or, 0.01 vehicles per second.
- Per the graph referenced in the third bullet above, the queue at the gate is 1 vehicle.

Based on the above analysis, the maximum queue is 1 vehicle, or, 20 feet, less than the available 48 feet of storage. Therefore, the available storage can accommodate the calculated queue at the entrance gate.

## 9. CONCLUSION

As seen from the above, the access driveways are calculated to operate at acceptable levels of service and the median opening at the retail driveway will operate adequately. Residential traffic from the west will be able to make U-turns at the median opening to access the residential driveway. The following are recommended:

- Access at the Residential Driveway should be limited to right-turns only.
- Commercial Driveway should prohibit left-turns out of the site by extending the raised median further east as shown in *Figure 7*.
- Provide a raised median from the Promise Hospital Driveway to just east of the commercial driveway. This will restrict the residential driveway to right-turns only and prohibit left-turns out of the Commercial Driveway.

A sight distance analysis provided under separate cover demonstrates that adequate stopping sight distance will be available at both the residential and retail driveways. Some landscaping in public right-of-way will need to be removed / trimmed.

Sincerely,

**Linscott, Law & Greenspan, Engineers**



John Boarman, P. E.  
Principal



Narasimha Prasad  
Senior Transportation Engineer

cc: File

**TABLE F**  
**PARKING CALCULATIONS**

**Residential Parking Requirements**

Land Use Type	Number	Motorcycle			Bicycle			Automobile		
		Rate	Required	Provided	Rate	Required	Provided	Rate	Required	Provided
Studio	15 Units	0.05 /Unit	0.75	1	0.3 /Unit	4.5	6	1 /Unit	15	15
1 Bedroom Units	24 Units	0.1 /Unit	2.4	3	0.4 /Unit	9.6	10	1.25 /Unit	30	30
2 Bedroom Units	24 Units	0.1 /Unit	2.4	3	0.5 /Unit	12	12	1.75 /Unit	42	42
<b>Subtotal</b>	<b>63</b>		<b>6</b>	<b>7</b>		<b>27</b>	<b>28</b>		<b>87</b>	<b>87</b>
Accessible Parking	2% of the residential units. For 63 units = 1.26, or 2 spaces								2	2
Van										2
Electric Vehicle Charging	3% of Total Parking Spaces = 3% of 87 Spaces = 2.61, or 3 spaces								3	3

**Commercial Parking Requirements**

Land Use Type	Number	Bicycle Parking						Automobile		
		Short Term			Long Term					
		Rate	Required	Provided	Rate	Required	Provided	Rate	Required	Provided
Commercial	5047.63    SF	0.1    / 1,000 SF	2	8	5% of Required vehicle spaces or minimum 1	1	6	2.1    /KSF	11	12
Accessible Parking		1 for every 25 vehicular spaces: 12/25 = 0.48							1	1
Van Accessible Parking										1
Designated Spaces - Fuel Efficient / Low Emitting / Carpool		1 space for 10 - 25 spaces							1	2
Motorcycle Parking										2
Electric Vehicle Charging		3% of Total Parking Spaces = 3% of 12 spaces = 0.36, or 1 space							1	1



## FIGURES

FIGURE 1	CONCEPTUAL SITE PLAN
FIGURE 2	EXISTING TRAFFIC VOLUMES
FIGURE 3	PROJECT TRAFFIC VOLUMES
FIGURE 4	EXISTING + PROJECT TRAFFIC VOLUMES
FIGURE 5	OPENING DAY (YEAR 2019) TRAFFIC VOLUMES
FIGURE 6	OPENING DAY (YEAR 2019) + PROJECT TRAFFIC VOLUMES
FIGURE 7	PROJECT ACCESS DRIVEWAYS AND MEDIAN TREATMENT ON UNIVERSITY AVENUE
FIGURE 8	PROJECT FRONTAGE



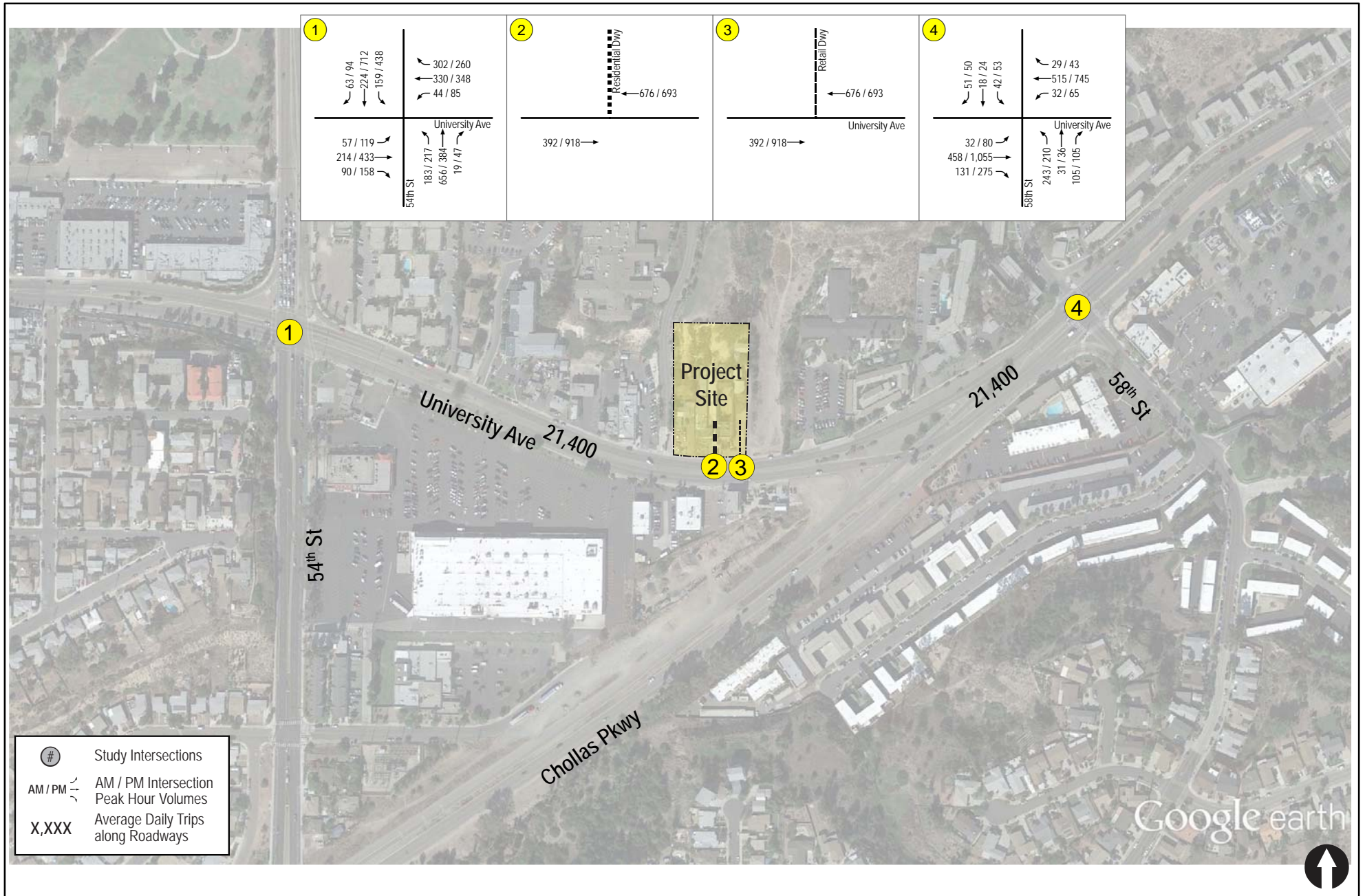


Figure 2

## Existing Traffic Volumes

UNIVERSITY MANOR



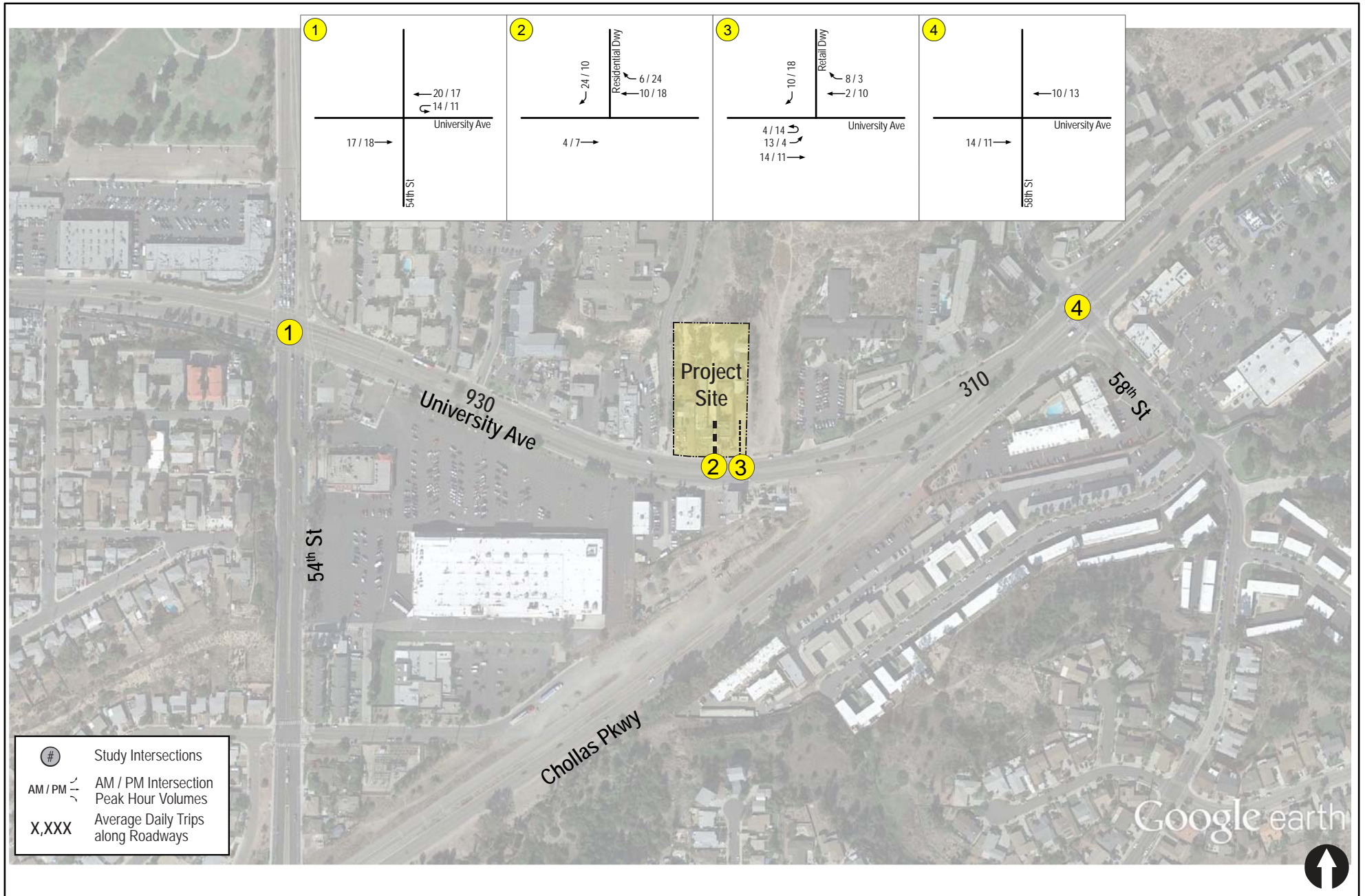


Figure 3

## Project Traffic Volumes

UNIVERSITY MANOR



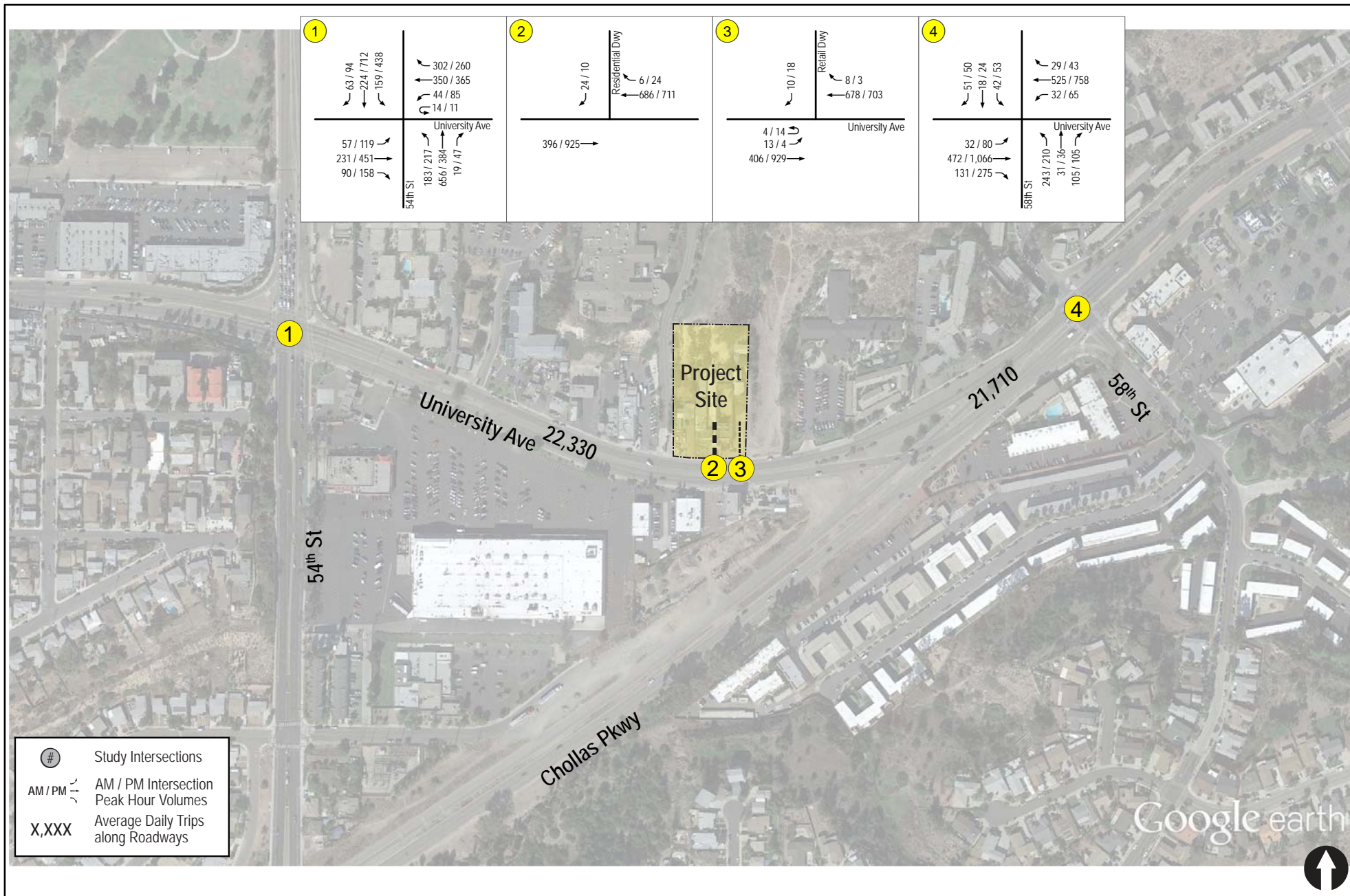


Figure 4

## Existing + Project Traffic Volumes

UNIVERSITY MANOR



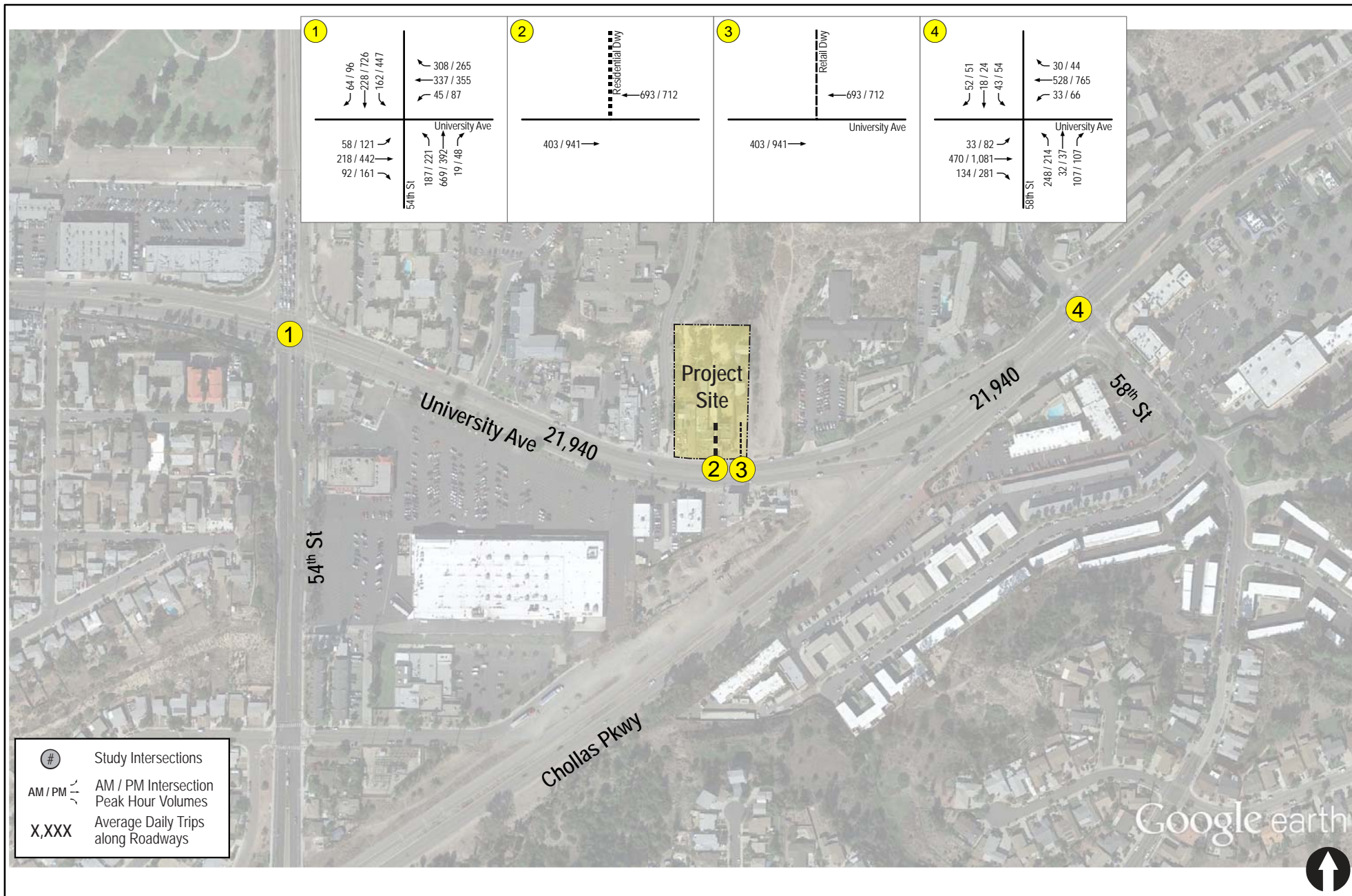


Figure 5

## Opening Day (Year 2019) Traffic Volumes

UNIVERSITY MANOR



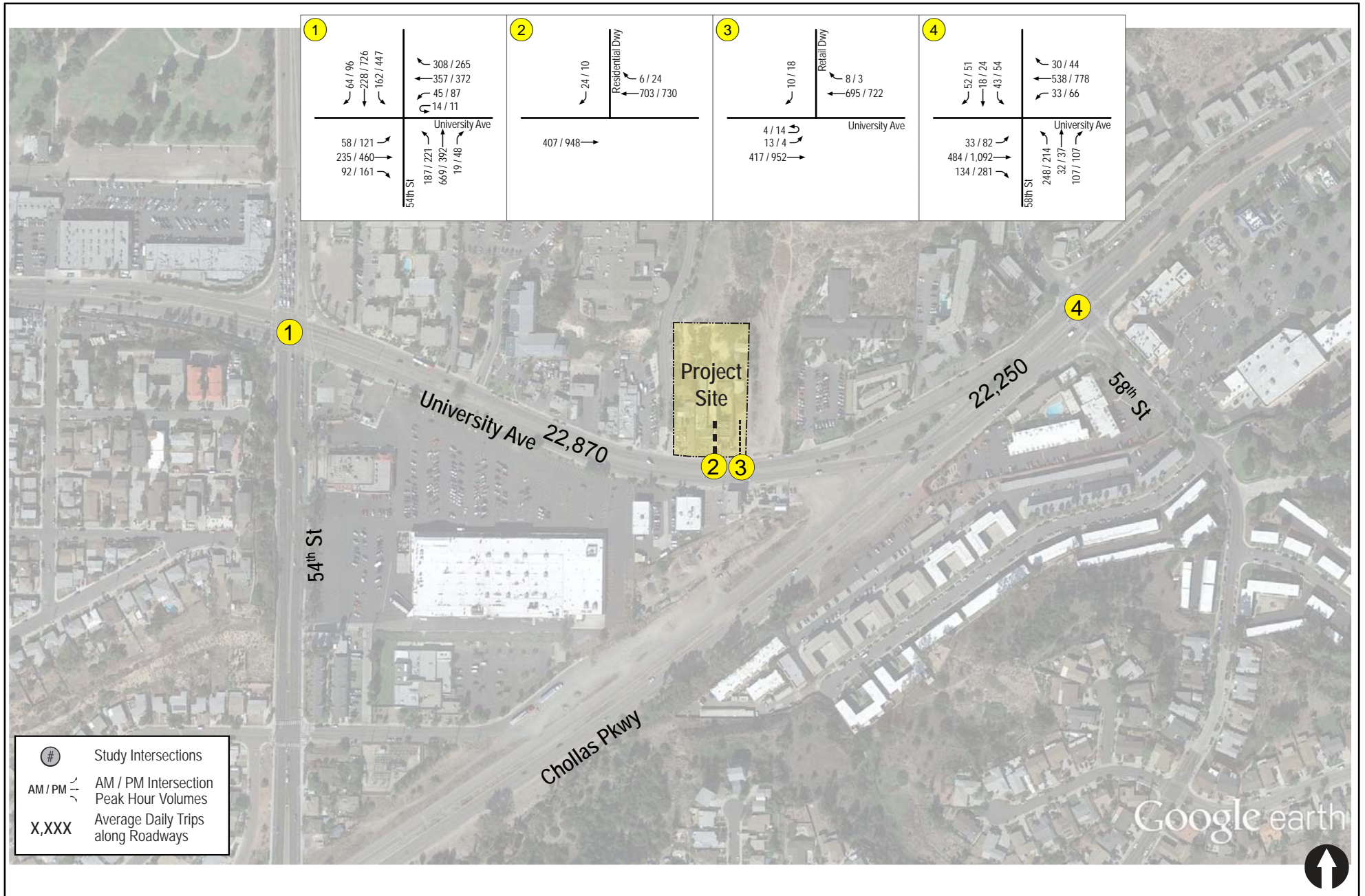


Figure 6

## Opening Day (Year 2019) + Project Traffic Volumes

UNIVERSITY MANOR



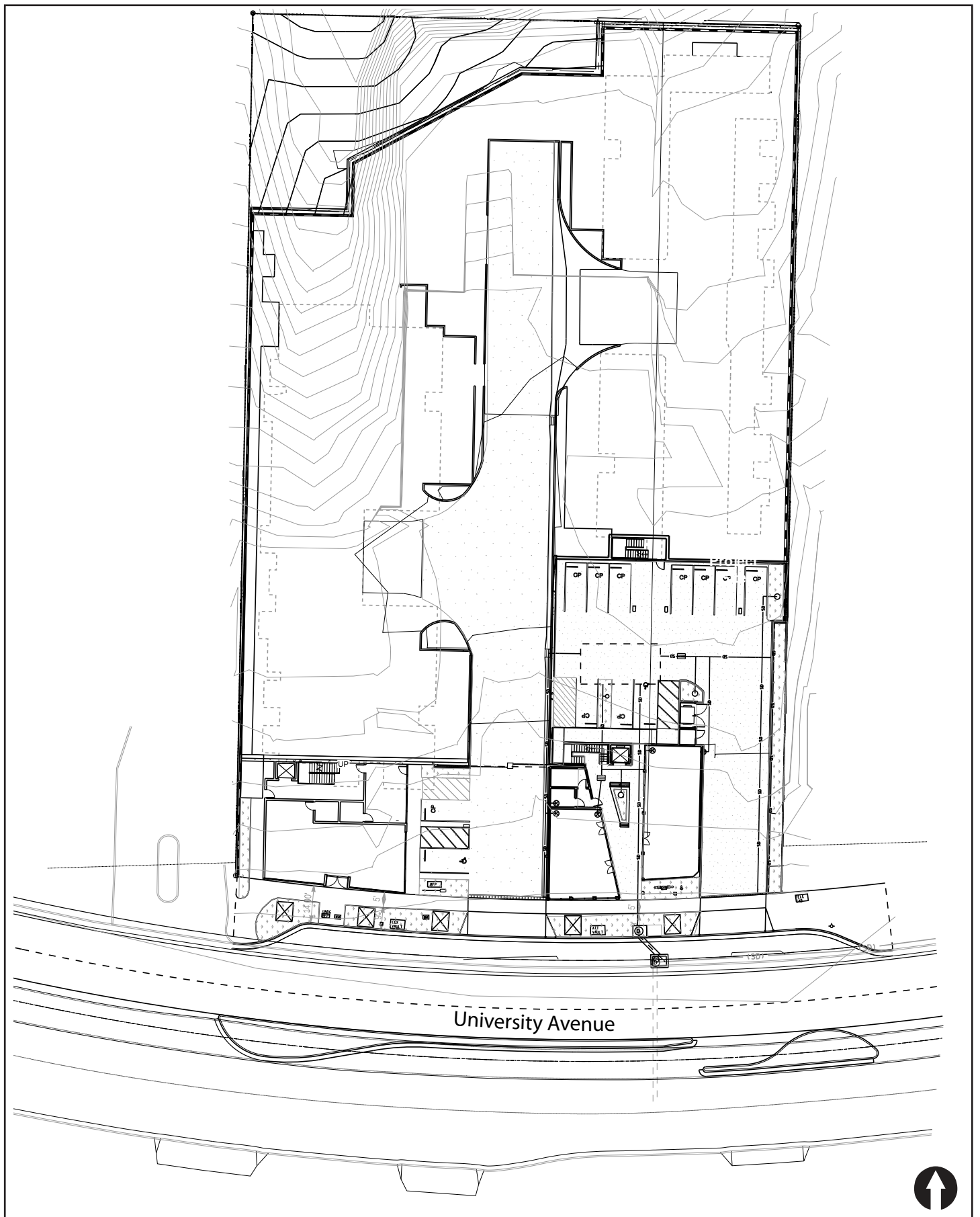


Figure 8

## Project Frontage

UNIVERSITY MANOR

## **APPENDICES**

- APPENDIX A     INTERSECTION AND SEGMENT COUNT SHEETS**
- APPENDIX B     PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS**
- APPENDIX C     CITY OF LOS ANGELES DRIVEWAY DESIGN (FEBRUARY 2003)**

## **APPENDIX A**

### **INTERSECTION AND SEGMENT COUNT SHEETS**



# Turn Count Summary

Accurate Video Counts Inc  
info@accuratevideocounts.com  
(619) 987-5136



**Location:** University Avenue @ 54th Street

**Date of Count:** Thursday, March 30, 2017

**Analysts:** LV/CD

**Weather:** Sunny

**AVC Proj No:** 17-0652





# Vehicular Count

Accurate Video Counts Inc  
info@accuratevideocounts.com  
(619) 987-5136



**Location:** University Avenue @ 54th Street

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	10	58	24	95	56	5	6	162	46	10	29	18	519
7:15 AM	6	55	31	80	91	17	1	178	45	16	45	12	577
7:30 AM	15	60	40	82	92	11	6	176	42	36	56	12	628
7:45 AM	19	59	38	56	70	7	3	170	51	20	66	15	574
8:00 AM	23	50	50	84	77	9	9	132	45	18	47	18	562
8:15 AM	15	40	37	78	89	7	6	123	49	25	74	19	562
8:30 AM	15	61	47	79	61	17	8	113	43	25	55	20	544
8:45 AM	18	67	44	55	65	6	12	133	53	17	72	17	559
Total	121	450	311	609	601	79	51	1,187	374	167	444	131	4,525

AM Intersection Peak Hour : **7:15 AM - 8:15 AM**

Intersection PHF : **0.93**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	63	224	159	302	330	44	19	656	183	90	214	57	2,341
PHF	0.68	0.93	0.80	0.90	0.90	0.65	0.53	0.92	0.90	0.63	0.81	0.79	0.93
Movement PHF		0.91			0.90			0.96			0.87		0.93

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	14	197	95	46	82	21	7	88	35	35	85	21	726
4:15 PM	31	162	95	63	90	27	15	89	62	29	104	32	799
4:30 PM	23	175	108	59	82	23	15	102	47	41	95	32	802
4:45 PM	21	176	120	79	88	19	2	93	46	28	125	21	818
5:00 PM	27	203	111	52	87	25	15	97	50	33	90	36	826
5:15 PM	23	158	99	70	91	18	15	92	74	56	123	30	849
5:30 PM	24	190	110	67	63	12	5	105	68	46	102	9	801
5:45 PM	25	153	119	70	112	13	16	90	56	26	101	22	803
Total	188	1414	857	506	695	158	90	756	438	294	825	203	6,424

PM Intersection Peak Hour : **4:30 PM - 5:30 PM**

Intersection PHF : **0.97**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	94	712	438	260	348	85	47	384	217	158	433	119	3295
PHF	0.87	0.877	0.913	0.823	0.956	0.85	0.783	0.941	0.733	0.705	0.866	0.826	0.97
Movement PHF		0.91			0.93			0.90			0.85		0.97

# Turn Count Summary

Accurate Video Counts Inc  
info@accuratevideocounts.com  
(619) 987-5136



**Location:** University Avenue @ 58th Street

**Date of Count:** Thursday, March 30, 2017

**Analysts:** LV/CD

**Weather:** Sunny

**AVC Proj No:** 17-0652



# Vehicular Count

Accurate Video Counts Inc  
info@accuratevideocounts.com  
(619) 987-5136



**Location:** University Avenue @ 58th Street

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	7	2	1	5	123	4	17	1	54	14	42	7	277
7:15 AM	16	0	10	5	129	1	22	4	62	21	69	2	341
7:30 AM	18	0	3	7	203	4	29	2	36	18	119	1	440
7:45 AM	15	3	7	5	150	6	16	2	39	27	123	9	402
8:00 AM	10	2	10	5	117	7	21	4	51	32	72	5	336
8:15 AM	12	11	15	7	136	9	36	18	82	44	121	11	502
8:30 AM	15	5	10	8	137	5	20	5	63	24	122	9	423
8:45 AM	14	0	7	9	125	11	28	4	47	31	143	7	426
Total	107	23	63	51	1,120	47	189	40	434	211	811	51	3,147

AM Intersection Peak Hour : **8:00 AM - 9:00 AM**

Intersection PHF : **0.84**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	51	18	42	29	515	32	105	31	243	131	458	32	1,687
PHF	0.85	0.41	0.70	0.81	0.94	0.73	0.73	0.43	0.74	0.74	0.80	0.73	0.84
Movement PHF		0.73			0.95			0.70			0.86		0.84

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	11	10	19	7	167	14	14	5	54	65	196	15	577
4:15 PM	10	6	8	10	178	15	13	3	63	70	273	16	665
4:30 PM	14	6	14	17	163	18	13	2	61	73	243	16	640
4:45 PM	14	7	13	15	183	9	19	7	55	68	259	15	664
5:00 PM	17	6	16	9	156	25	32	4	48	58	240	20	631
5:15 PM	10	6	7	11	198	12	23	12	47	56	282	17	681
5:30 PM	9	5	17	8	208	19	31	13	60	93	274	28	765
5:45 PM	16	6	8	9	178	15	29	9	65	70	207	23	635
Total	101	52	102	86	1,431	127	174	55	453	553	1,974	150	5,258

PM Intersection Peak Hour : **4:45 PM - 5:45 PM**

Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	50	24	53	43	745	65	105	36	210	275	1055	80	2741
PHF	0.74	0.857	0.779	0.717	0.895	0.65	0.82	0.692	0.875	0.739	0.935	0.714	0.90
Movement PHF		0.81			0.91			0.84			0.89		0.90

# 24 Hour Segment Count

Accurate Video Counts Inc  
info@accuratevideocounts.com  
(619) 987-5136



**Location:** B. University Avenue Just East of 54th Street

**Orientation:** East-West

**Date of Count:** Thursday, March 30, 2017

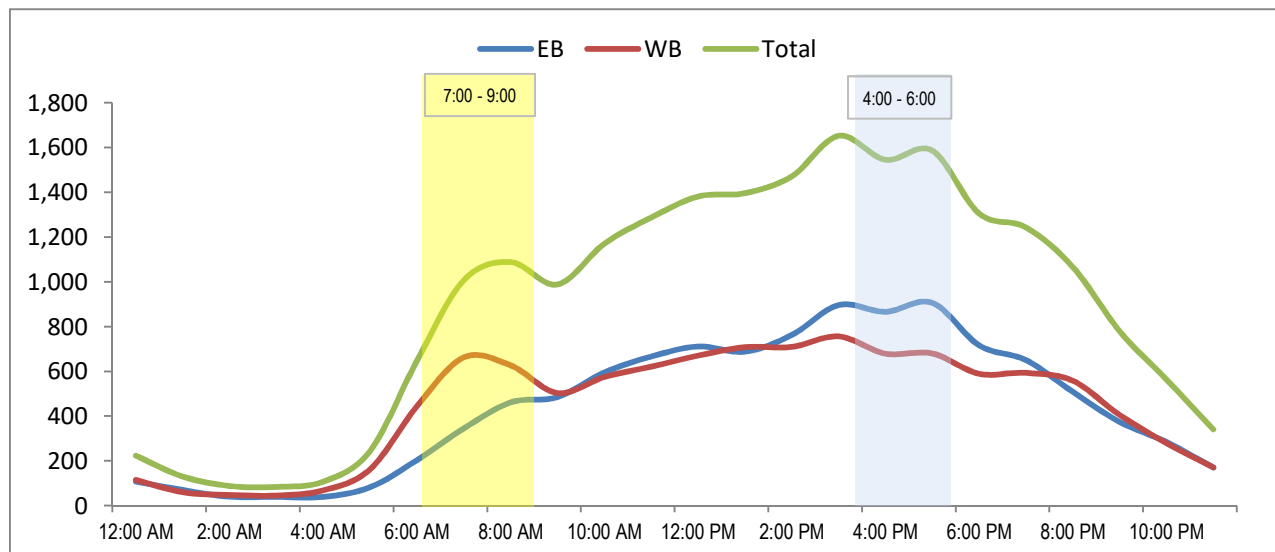
**Analysts:** DASH

**Weather:** Sunny

**AVC Proj. No:** 17-0652

24 Hour Segment Volume							21,391			
Time		Hourly Volume				Time		Hourly Volume		
		EB	WB	Total				EB	WB	Total
12:00 AM	- 1:00 AM	108	115	223		12:00 PM	- 1:00 PM	711	670	1,381
1:00 AM	- 2:00 AM	70	60	130		1:00 PM	- 2:00 PM	688	708	1,396
2:00 AM	- 3:00 AM	40	48	88		2:00 PM	- 3:00 PM	762	709	1,471
3:00 AM	- 4:00 AM	39	45	84		3:00 PM	- 4:00 PM	896	756	1,652
4:00 AM	- 5:00 AM	39	68	107		4:00 PM	- 5:00 PM	866	679	1,545
5:00 AM	- 6:00 AM	82	162	244		5:00 PM	- 6:00 PM	906	680	1,586
6:00 AM	- 7:00 AM	203	444	647		6:00 PM	- 7:00 PM	716	589	1,305
7:00 AM	- 8:00 AM	345	662	1,007		7:00 PM	- 8:00 PM	650	593	1,243
8:00 AM	- 9:00 AM	461	627	1,088		8:00 PM	- 9:00 PM	508	558	1,066
9:00 AM	- 10:00 AM	485	503	988		9:00 PM	- 10:00 PM	374	405	779
10:00 AM	- 11:00 AM	595	575	1,170	10:00 PM	- 11:00 PM	284	279	563	
11:00 AM	- 12:00 PM	666	621	1287	11:00 PM	- 12:00 AM	170	171	341	
Total		3,133	3,930	7,063	Total		7,531	6,797	14,328	

<b>24-Hour</b>	<b>EB</b>	<b>Volume</b>	<b>10,664</b>	<b>24-Hour</b>	<b>WB</b>	<b>Volume</b>	<b>10,727</b>
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## City of San Diego

<u>Primary Street</u>	<u>1st Cross Street</u>	<u>2nd Cross Street</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
UNIVERSITY AVE	5TH AVE	6TH AVE	28300	28300	28300 N	29000	29000 N
UNIVERSITY AVE	6TH AVE	ROUTE 163	25100 N	25100 E	25100 N	25300	21200
UNIVERSITY AVE	ROUTE 163	RICHMOND ST	25200 N	23500 E	23500 N	22000	22000 N
UNIVERSITY AVE	RICHMOND ST	PARK BLVD	21100 N	20700 E	20700 N	20700 N	18800
UNIVERSITY AVE	PARK BLVD	FLORIDA ST	18300 N	18300	20100	20100 N	20100 N
UNIVERSITY AVE	FLORIDA ST	TEXAS ST	19400 N	20300	20300 N	19100	15800
UNIVERSITY AVE	TEXAS ST	UTAH ST	21000 N	19000	19000 N	19000 N	19000 N
UNIVERSITY AVE	UTAH ST	30TH ST	17100 N	19700	19700 N	19700 N	17800
UNIVERSITY AVE	30TH ST	32ND ST	22100 N	21300	21300 N	21600	21600 N
UNIVERSITY AVE	32ND ST	INTERSTATE 805	22700 N	22700	22700 N	22700 N	22700 N
UNIVERSITY AVE	INTERSTATE 805	SWIFT AVE	24900 N	24700	24700 N	25700	24600
UNIVERSITY AVE	SWIFT AVE	35TH ST	15600 N	15600 N	14300	14300 N	14300 N
UNIVERSITY AVE	35TH ST	40TH ST	15900 N	17400 E	17400 N	17400	17400 N
UNIVERSITY AVE	40TH ST	43RD ST	27100 N	26300 E	26300 N	24500	22700
UNIVERSITY AVE	43RD ST	FAIRMOUNT AVE	25600 N	23600	23600 N	23600 N	22200
UNIVERSITY AVE	FAIRMOUNT AVE	EUCLID AVE	20400 N	21100	21100 N	20200	21300
UNIVERSITY AVE	EUCLID AVE	54TH ST	19800 N	19800	19800 N	19600	20300
UNIVERSITY AVE	54TH ST	CHOLLAS PKWY	22600	22600	22600 N	21000	21000 N
UNIVERSITY AVE	CHOLLAS PKWY	COLLEGE AVE	25800 N	23500 E	23500 N	23600	26200
UNIVERSITY AVE	COLLEGE AVE	ARAGON DR	17000 N	15900 E	15900 N	15900 N	14800
UNIVERSITY AVE	ARAGON DR	69TH ST	20100 N	14800	14800 N	14400	14400 N
UPAS ST	ALABAMA ST	TEXAS ST	6000 N	6000	6000 N	6000 N	6000 N
UPAS ST	TEXAS ST	PERSHING DR	6700 N	6700	6700 N	6700 N	6700 N
UPAS ST	PERSHING DR	UTAH ST	9400 N	9900	9900 N	9900 N	10500
UPAS ST	UTAH ST	30TH ST (W)	8000 N	9100	9100 N	9100 N	9600
UPAS ST	30TH ST (W)	30TH ST (E)	12800	12800	12800 N	12600	12600 N
UPAS ST	30TH ST (E)	32ND ST	4300 N	4400	4400 N	4400 N	4300
UPAS ST	32ND ST	BOUNDARY ST	2600 N	2600	2600 N	2600 N	2600 N
UTAH ST	ADAMS AVE	EL CAJON BLVD	2400 N	2400	2400 N	2400 N	2400 N
UTAH ST	EL CAJON BLVD	HOWARD AVE	3300 N	4100	4100 N	4100 N	3400
UTAH ST	HOWARD AVE	LINCOLN AVE	3700 N	2400	2400 N	2400 N	2400 N
UTAH ST	LINCOLN AVE	UNIVERSITY AVE	2600 N	2600	2300	2300 N	2300 N

N = Link not counted in that year. Previous year's count carried forward.

























E = No actual count. ADT was estimated by the reporting jurisdiction.

**APPENDIX B**  
**PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS**



Ex AM  
1: 54th Street & University Avenue

University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	214	90	44	330	302	183	656	19	159	224	63
Future Volume (veh/h)	57	214	90	44	330	302	183	656	19	159	224	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.97	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	230	97	47	355	325	197	705	20	171	241	68
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	78	1105	467	59	1067	460	235	1161	492	253	952	405
Arrive On Green	0.04	0.31	0.31	0.03	0.30	0.30	0.13	0.33	0.33	0.07	0.27	0.27
Sat Flow, veh/h	1781	3554	1503	1781	3554	1531	1781	3554	1505	3456	3554	1511
Grp Volume(v), veh/h	61	230	97	47	355	325	197	705	20	171	241	68
Grp Sat Flow(s),veh/h/ln	1781	1777	1503	1781	1777	1531	1781	1777	1505	1728	1777	1511
Q Serve(g_s), s	2.7	3.8	3.7	2.1	6.1	14.9	8.5	13.1	0.7	3.8	4.2	2.7
Cycle Q Clear(g_c), s	2.7	3.8	3.7	2.1	6.1	14.9	8.5	13.1	0.7	3.8	4.2	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	78	1105	467	59	1067	460	235	1161	492	253	952	405
V/C Ratio(X)	0.78	0.21	0.21	0.80	0.33	0.71	0.84	0.61	0.04	0.68	0.25	0.17
Avail Cap(c_a), veh/h	201	1442	610	115	1253	540	251	1325	561	416	1217	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	20.0	20.0	37.8	21.4	24.5	33.4	22.3	18.1	35.6	22.7	22.1
Incr Delay (d2), s/veh	6.2	0.1	0.3	8.7	0.2	3.7	19.2	0.8	0.0	1.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.5	1.3	1.0	2.5	5.6	4.8	5.3	0.2	1.6	1.7	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.5	20.1	20.3	46.5	21.6	28.2	52.6	23.1	18.2	36.8	22.8	22.3
LnGrp LOS	D	C	C	D	C	C	D	C	B	D	C	C
Approach Vol, veh/h		388			727			922			480	
Approach Delay, s/veh		23.9			26.2			29.3			27.7	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.0	29.8	14.8	27.2	7.9	29.0	10.2	31.8				
Change Period (Y+Rc), s	4.4	* 5.3	4.4	6.1	4.4	5.3	4.4	* 6.1				
Max Green Setting (Gmax), s	5.1	* 32	11.1	27.0	8.9	27.8	9.5	* 29				
Max Q Clear Time (g_c+I1), s	4.1	5.8	10.5	6.2	4.7	16.9	5.8	15.1				
Green Ext Time (p_c), s	0.0	2.5	0.0	1.8	0.0	3.0	0.1	5.5				

Intersection Summary


























HCM 6th Ctrl Delay	27.3
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Ex AM  
4: 58th Street & University Avenue

University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Traffic Volume (veh/h)	32	458	131	32	515	29	243	31	105	42	18	51
Future Volume (veh/h)	32	458	131	32	515	29	243	31	105	42	18	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	0.99		0.99	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	545	156	38	613	35	289	37	125	50	21	61
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	49	2322	713	49	1616	698	391	42	141	239	111	253
Arrive On Green	0.03	0.45	0.45	0.03	0.45	0.45	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1781	5106	1568	1781	3554	1535	915	117	396	517	311	711
Grp Volume(v), veh/h	38	545	156	38	613	35	451	0	0	132	0	0
Grp Sat Flow(s),veh/h/ln	1781	1702	1568	1781	1777	1535	1428	0	0	1539	0	0
Q Serve(g_s), s	1.9	5.9	5.4	1.9	10.2	1.1	21.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.9	5.9	5.4	1.9	10.2	1.1	26.6	0.0	0.0	5.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.64		0.28	0.38		0.46
Lane Grp Cap(c), veh/h	49	2322	713	49	1616	698	574	0	0	602	0	0
V/C Ratio(X)	0.78	0.23	0.22	0.78	0.38	0.05	0.79	0.00	0.00	0.22	0.00	0.00
Avail Cap(c_a), veh/h	131	2322	713	131	1616	698	793	0	0	827	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	43.5	15.0	14.9	43.5	16.2	13.7	27.0	0.0	0.0	20.3	0.0	0.0
Incr Delay (d2), s/veh	23.3	0.2	0.7	23.3	0.7	0.1	3.6	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.2	2.0	1.1	4.1	0.4	9.2	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.8	15.2	15.6	66.8	16.8	13.8	30.6	0.0	0.0	20.5	0.0	0.0
LnGrp LOS	E	B	B	E	B	B	C	A	A	C	A	A
Approach Vol, veh/h		739			686			451			132	
Approach Delay, s/veh		17.9			19.5			30.6			20.5	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	46.2		36.9	6.9	46.2		36.9				
Change Period (Y+Rc), s	4.4	5.3		4.9	4.4	5.3		4.9				
Max Green Setting (Gmax), s	6.6	22.7		46.1	6.6	22.7		46.1				
Max Q Clear Time (g_c+I1), s	3.9	7.9		7.1	3.9	12.2		28.6				
Green Ext Time (p_c), s	0.0	3.7		0.9	0.0	3.1		2.9				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			21.5									
HCM 6th LOS			C									

Ex PM  
1: 54th Street & University Avenue


























University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	433	158	85	348	260	217	384	47	438	712	94
Future Volume (veh/h)	119	433	158	85	348	260	217	384	47	438	712	94
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.95	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	123	446	163	88	359	268	224	396	48	452	734	97
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	153	1065	446	112	983	418	259	912	400	523	933	414
Arrive On Green	0.09	0.30	0.30	0.06	0.28	0.28	0.15	0.26	0.26	0.15	0.26	0.26
Sat Flow, veh/h	1781	3554	1487	1781	3554	1511	1781	3554	1557	3456	3554	1578
Grp Volume(v), veh/h	123	446	163	88	359	268	224	396	48	452	734	97
Grp Sat Flow(s),veh/h/ln	1781	1777	1487	1781	1777	1511	1781	1777	1557	1728	1777	1578
Q Serve(g_s), s	6.0	8.9	7.6	4.3	7.2	13.7	10.8	8.2	2.1	11.3	16.9	4.3
Cycle Q Clear(g_c), s	6.0	8.9	7.6	4.3	7.2	13.7	10.8	8.2	2.1	11.3	16.9	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	153	1065	446	112	983	418	259	912	400	523	933	414
V/C Ratio(X)	0.80	0.42	0.37	0.78	0.37	0.64	0.86	0.43	0.12	0.86	0.79	0.23
Avail Cap(c_a), veh/h	160	1315	550	113	1206	513	281	1170	513	541	1134	503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	24.7	24.3	40.7	25.6	28.0	36.8	27.4	25.1	36.5	30.2	25.5
Incr Delay (d2), s/veh	22.1	0.4	0.7	26.7	0.3	2.1	20.7	0.5	0.2	12.7	3.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	3.7	2.7	2.7	3.0	5.1	6.1	3.5	0.8	5.6	7.4	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.6	25.1	24.9	67.4	25.9	30.1	57.5	27.9	25.3	49.2	33.4	25.8
LnGrp LOS	E	C	C	E	C	C	E	C	C	D	C	C
Approach Vol, veh/h		732			715			668			1283	
Approach Delay, s/veh		31.2			32.6			37.6			38.4	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	31.7	17.2	29.2	12.0	29.7	17.7	28.7				
Change Period (Y+Rc), s	4.4	* 5.3	4.4	6.1	4.4	5.3	4.4	* 6.1				
Max Green Setting (Gmax), s	5.6	* 33	13.9	28.1	7.9	29.9	13.8	* 29				
Max Q Clear Time (g_c+I1), s	6.3	10.9	12.8	18.9	8.0	15.7	13.3	10.2				
Green Ext Time (p_c), s	0.0	4.7	0.0	3.8	0.0	3.2	0.1	3.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			35.5									
HCM 6th LOS			D									
<b>Notes</b>												

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Ex PM  
4: 58th Street & University Avenue

University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Traffic Volume (veh/h)	80	1055	275	65	745	43	210	36	105	53	24	50
Future Volume (veh/h)	80	1055	275	65	745	43	210	36	105	53	24	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.99		0.97	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	1172	306	72	828	48	233	40	117	59	27	56
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	2544	764	93	1729	746	315	45	130	220	106	180
Arrive On Green	0.06	0.50	0.50	0.05	0.49	0.49	0.32	0.31	0.31	0.32	0.31	0.31
Sat Flow, veh/h	1781	5106	1533	1781	3554	1533	838	144	421	552	342	582
Grp Volume(v), veh/h	89	1172	306	72	828	48	390	0	0	142	0	0
Grp Sat Flow(s),veh/h/ln	1781	1702	1533	1781	1777	1533	1403	0	0	1476	0	0
Q Serve(g_s), s	5.1	15.5	13.0	4.2	16.2	1.7	20.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.1	15.5	13.0	4.2	16.2	1.7	27.4	0.0	0.0	7.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.60		0.30	0.42		0.39
Lane Grp Cap(c), veh/h	114	2544	764	93	1729	746	501	0	0	518	0	0
V/C Ratio(X)	0.78	0.46	0.40	0.78	0.48	0.06	0.78	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	200	2544	764	170	1729	746	673	0	0	692	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	48.0	17.0	16.4	48.7	17.9	14.2	34.1	0.0	0.0	27.0	0.0	0.0
Incr Delay (d2), s/veh	11.1	0.6	1.6	12.9	1.0	0.2	4.1	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.0	4.8	2.2	6.7	0.6	9.6	0.0	0.0	2.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.1	17.6	17.9	61.6	18.8	14.3	38.2	0.0	0.0	27.3	0.0	0.0
LnGrp LOS	E	B	B	E	B	B	D	A	A	C	A	A
Approach Vol, veh/h		1567			948			390			142	
Approach Delay, s/veh		20.0			21.8			38.2			27.3	
Approach LOS		C			C			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	57.1		37.1	11.0	55.9		37.1				
Change Period (Y+Rc), s	4.4	5.3		4.9	4.4	5.3		4.9				
Max Green Setting (Gmax), s	9.9	34.7		44.8	11.7	32.9		44.8				
Max Q Clear Time (g_c+I1), s	6.2	17.5		9.1	7.1	18.2		29.4				
Green Ext Time (p_c), s	0.0	9.0		0.9	0.1	5.2		2.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			23.2									
HCM 6th LOS			C									

Ex + Proj AM  
1: 54th Street & University Avenue





University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	231	90	58	350	302	183	656	19	159	224	63
Future Volume (veh/h)	57	231	90	58	350	302	183	656	19	159	224	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.97	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	248	97	62	376	325	197	705	20	171	241	68
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	78	1066	450	79	1069	460	235	1160	491	253	951	404
Arrive On Green	0.04	0.30	0.30	0.04	0.30	0.30	0.13	0.33	0.33	0.07	0.27	0.27
Sat Flow, veh/h	1781	3554	1501	1781	3554	1531	1781	3554	1505	3456	3554	1510
Grp Volume(v), veh/h	61	248	97	62	376	325	197	705	20	171	241	68
Grp Sat Flow(s),veh/h/ln	1781	1777	1501	1781	1777	1531	1781	1777	1505	1728	1777	1510
Q Serve(g_s), s	2.7	4.1	3.8	2.7	6.5	14.9	8.5	13.2	0.7	3.8	4.2	2.7
Cycle Q Clear(g_c), s	2.7	4.1	3.8	2.7	6.5	14.9	8.5	13.2	0.7	3.8	4.2	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	78	1066	450	79	1069	460	235	1160	491	253	951	404
V/C Ratio(X)	0.78	0.23	0.22	0.78	0.35	0.71	0.84	0.61	0.04	0.68	0.25	0.17
Avail Cap(c_a), veh/h	201	1441	609	115	1252	539	251	1324	561	416	1216	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	20.8	20.7	37.3	21.6	24.5	33.4	22.3	18.1	35.7	22.7	22.2
Incr Delay (d2), s/veh	6.2	0.1	0.3	11.1	0.2	3.6	19.2	0.8	0.0	1.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.7	1.3	1.4	2.6	5.6	4.8	5.4	0.2	1.6	1.7	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.5	20.9	21.0	48.4	21.8	28.1	52.6	23.2	18.2	36.8	22.8	22.4
LnGrp LOS	D	C	C	D	C	C	D	C	B	D	C	C
Approach Vol, veh/h		406			763			922			480	
Approach Delay, s/veh		24.3			26.7			29.4			27.8	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	29.0	14.8	27.2	7.9	29.0	10.2	31.9				
Change Period (Y+Rc), s	4.4	* 5.3	4.4	6.1	4.4	5.3	4.4	* 6.1				
Max Green Setting (Gmax), s	5.1	* 32	11.1	27.0	8.9	27.8	9.5	* 29				
Max Q Clear Time (g_c+I1), s	4.7	6.1	10.5	6.2	4.7	16.9	5.8	15.2				
Green Ext Time (p_c), s	0.0	2.6	0.0	1.8	0.0	3.1	0.1	5.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			27.5									
HCM 6th LOS			C									
<b>Notes</b>												

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.


























Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Traffic Vol, veh/h	0	396	686	6	0	24
Future Vol, veh/h	0	396	686	6	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	430	746	7	0	26
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	377
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	621
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	621
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		11.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	621		
HCM Lane V/C Ratio	-	-	-	0.042		
HCM Control Delay (s)	-	-	-	11.1		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.1		



Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	406	678	8	0	10
Future Vol, veh/h	17	406	678	8	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	80	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	441	737	9	0	11
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	746	0	-	0	-	373
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	858	-	-	-	0	624
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	858	-	-	-	-	624
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		10.9		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	858	-	-	-	-	624
HCM Lane V/C Ratio	0.022	-	-	-	-	0.017
HCM Control Delay (s)	9.3	-	-	-	-	10.9
HCM Lane LOS	A	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

























Ex + Proj AM  
4: 58th Street & University Avenue

University Manor  
04/25/2018





												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Traffic Volume (veh/h)	32	472	131	32	525	29	243	31	105	42	18	51
Future Volume (veh/h)	32	472	131	32	525	29	243	31	105	42	18	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	0.99		0.99	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	562	156	38	625	35	289	37	125	50	21	61
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	49	2324	714	49	1618	699	391	42	141	239	111	253
Arrive On Green	0.03	0.46	0.46	0.03	0.46	0.46	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1781	5106	1568	1781	3554	1535	915	117	396	517	311	711
Grp Volume(v), veh/h	38	562	156	38	625	35	451	0	0	132	0	0
Grp Sat Flow(s),veh/h/ln	1781	1702	1568	1781	1777	1535	1428	0	0	1539	0	0
Q Serve(g_s), s	1.9	6.1	5.4	1.9	10.5	1.1	21.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.9	6.1	5.4	1.9	10.5	1.1	26.6	0.0	0.0	5.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.64		0.28	0.38		0.46
Lane Grp Cap(c), veh/h	49	2324	714	49	1618	699	573	0	0	602	0	0
V/C Ratio(X)	0.78	0.24	0.22	0.78	0.39	0.05	0.79	0.00	0.00	0.22	0.00	0.00
Avail Cap(c_a), veh/h	131	2324	714	131	1618	699	777	0	0	812	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	43.5	15.0	14.8	43.5	16.2	13.7	27.1	0.0	0.0	20.3	0.0	0.0
Incr Delay (d2), s/veh	23.3	0.2	0.7	23.3	0.7	0.1	3.8	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.3	2.0	1.1	4.2	0.4	9.3	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.8	15.3	15.5	66.8	16.9	13.8	30.9	0.0	0.0	20.5	0.0	0.0
LnGrp LOS	E	B	B	E	B	B	C	A	A	C	A	A
Approach Vol, veh/h		756			698			451			132	
Approach Delay, s/veh		17.9			19.5			30.9			20.5	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	46.3		36.9	6.9	46.3		36.9				
Change Period (Y+Rc), s	4.4	5.3		4.9	4.4	5.3		4.9				
Max Green Setting (Gmax), s	6.6	23.7		45.1	6.6	23.7		45.1				
Max Q Clear Time (g_c+I1), s	3.9	8.1		7.1	3.9	12.5		28.6				
Green Ext Time (p_c), s	0.0	3.9		0.9	0.0	3.3		2.8				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			21.5									
HCM 6th LOS			C									

Ex + Proj PM  
1: 54th Street & University Avenue

University Manor  
04/25/2018






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	451	158	96	365	260	217	384	47	438	712	94
Future Volume (veh/h)	119	451	158	96	365	260	217	384	47	438	712	94
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.95	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	123	465	163	99	376	268	224	396	48	452	734	97
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	1062	444	124	1002	426	258	908	398	520	927	412
Arrive On Green	0.09	0.30	0.30	0.07	0.28	0.28	0.15	0.26	0.26	0.15	0.26	0.26
Sat Flow, veh/h	1781	3554	1487	1781	3554	1513	1781	3554	1557	3456	3554	1578
Grp Volume(v), veh/h	123	465	163	99	376	268	224	396	48	452	734	97
Grp Sat Flow(s),veh/h/ln	1781	1777	1487	1781	1777	1513	1781	1777	1557	1728	1777	1578
Q Serve(g_s), s	6.1	9.4	7.7	4.9	7.6	13.8	11.0	8.3	2.1	11.4	17.2	4.3
Cycle Q Clear(g_c), s	6.1	9.4	7.7	4.9	7.6	13.8	11.0	8.3	2.1	11.4	17.2	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	154	1062	444	124	1002	426	258	908	398	520	927	412
V/C Ratio(X)	0.80	0.44	0.37	0.80	0.38	0.63	0.87	0.44	0.12	0.87	0.79	0.24
Avail Cap(c_a), veh/h	205	1280	536	124	1101	469	273	1153	505	526	1117	496
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	25.3	24.7	41.0	25.8	28.0	37.4	27.9	25.6	37.1	30.8	26.0
Incr Delay (d2), s/veh	11.0	0.4	0.7	28.3	0.3	2.5	22.2	0.5	0.2	13.8	3.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.9	2.7	3.1	3.2	5.2	6.3	3.5	0.8	5.7	7.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.1	25.7	25.4	69.3	26.0	30.5	59.5	28.4	25.8	50.9	34.2	26.3
LnGrp LOS	D	C	C	E	C	C	E	C	C	D	C	C
Approach Vol, veh/h		751			743			668			1283	
Approach Delay, s/veh		29.8			33.4			38.6			39.5	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	32.0	17.4	29.4	12.1	30.5	17.9	28.9				
Change Period (Y+Rc), s	4.4	* 5.3	4.4	6.1	4.4	5.3	4.4	* 6.1				
Max Green Setting (Gmax), s	6.2	* 32	13.7	28.1	10.3	27.7	13.6	* 29				
Max Q Clear Time (g_c+I1), s	6.9	11.4	13.0	19.2	8.1	15.8	13.4	10.3				
Green Ext Time (p_c), s	0.0	4.9	0.0	3.7	0.0	3.1	0.0	3.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			35.9									
HCM 6th LOS			D									
<b>Notes</b>												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Traffic Vol, veh/h	0	925	711	24	0	10
Future Vol, veh/h	0	925	711	24	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1005	773	26	0	11
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	400
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	600
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	600
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		11.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	600		
HCM Lane V/C Ratio	-	-	-	0.018		
HCM Control Delay (s)	-	-	-	11.1		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	929	703	3	0	18
Future Vol, veh/h	18	929	703	3	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	80	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	1010	764	3	0	20
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	767	0	-	0	-	384
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	842	-	-	-	0	614
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	842	-	-	-	-	614
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		11.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	842	-	-	-	-	614
HCM Lane V/C Ratio	0.023	-	-	-	-	0.032
HCM Control Delay (s)	9.4	-	-	-	-	11.1
HCM Lane LOS	A	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

Ex + Proj PM  
4: 58th Street & University Avenue

























University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	1066	275	65	758	43	210	36	105	53	24	50
Future Volume (veh/h)	80	1066	275	65	758	43	210	36	105	53	24	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.99		0.97	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	1184	306	72	842	48	233	40	117	59	27	56
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	2544	764	93	1729	746	315	45	130	220	106	180
Arrive On Green	0.06	0.50	0.50	0.05	0.49	0.49	0.32	0.31	0.31	0.32	0.31	0.31
Sat Flow, veh/h	1781	5106	1533	1781	3554	1533	838	144	421	552	342	582
Grp Volume(v), veh/h	89	1184	306	72	842	48	390	0	0	142	0	0
Grp Sat Flow(s),veh/h/ln	1781	1702	1533	1781	1777	1533	1403	0	0	1476	0	0
Q Serve(g_s), s	5.1	15.8	13.0	4.2	16.6	1.7	20.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.1	15.8	13.0	4.2	16.6	1.7	27.4	0.0	0.0	7.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.60		0.30	0.42		0.39
Lane Grp Cap(c), veh/h	114	2544	764	93	1729	746	501	0	0	518	0	0
V/C Ratio(X)	0.78	0.47	0.40	0.78	0.49	0.06	0.78	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	200	2544	764	170	1729	746	673	0	0	692	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	48.0	17.0	16.4	48.7	18.0	14.2	34.1	0.0	0.0	27.0	0.0	0.0
Incr Delay (d2), s/veh	11.1	0.6	1.6	12.9	1.0	0.2	4.1	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.1	4.8	2.2	6.8	0.6	9.6	0.0	0.0	2.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.1	17.7	17.9	61.6	19.0	14.3	38.2	0.0	0.0	27.3	0.0	0.0
LnGrp LOS	E	B	B	E	B	B	D	A	A	C	A	A
Approach Vol, veh/h		1579			962			390			142	
Approach Delay, s/veh		20.0			21.9			38.2			27.3	
Approach LOS		C			C			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	57.1		37.1	11.0	55.9		37.1				
Change Period (Y+Rc), s	4.4	5.3		4.9	4.4	5.3		4.9				
Max Green Setting (Gmax), s	9.9	34.7		44.8	11.7	32.9		44.8				
Max Q Clear Time (g_c+I1), s	6.2	17.8		9.1	7.1	18.6		29.4				
Green Ext Time (p_c), s	0.0	9.0		0.9	0.1	5.2		2.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			23.3									
HCM 6th LOS			C									



Opening Day AM  
1: 54th Street & University Avenue

University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	218	92	45	337	308	187	669	19	162	228	64
Future Volume (veh/h)	58	218	92	45	337	308	187	669	19	162	228	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.97	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	234	99	48	362	331	201	719	20	174	245	69
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	79	1107	468	60	1069	461	238	1160	491	255	947	402
Arrive On Green	0.04	0.31	0.31	0.03	0.30	0.30	0.13	0.33	0.33	0.07	0.27	0.27
Sat Flow, veh/h	1781	3554	1503	1781	3554	1531	1781	3554	1505	3456	3554	1510
Grp Volume(v), veh/h	62	234	99	48	362	331	201	719	20	174	245	69
Grp Sat Flow(s),veh/h/ln	1781	1777	1503	1781	1777	1531	1781	1777	1505	1728	1777	1510
Q Serve(g_s), s	2.7	3.9	3.9	2.1	6.3	15.3	8.8	13.6	0.7	3.9	4.3	2.8
Cycle Q Clear(g_c), s	2.7	3.9	3.9	2.1	6.3	15.3	8.8	13.6	0.7	3.9	4.3	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	79	1107	468	60	1069	461	238	1160	491	255	947	402
V/C Ratio(X)	0.78	0.21	0.21	0.79	0.34	0.72	0.84	0.62	0.04	0.68	0.26	0.17
Avail Cap(c_a), veh/h	200	1431	605	114	1243	536	249	1315	557	413	1208	513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	20.2	20.2	38.1	21.6	24.8	33.6	22.6	18.3	35.9	23.0	22.4
Incr Delay (d2), s/veh	6.1	0.1	0.3	8.4	0.2	4.1	20.3	0.9	0.0	1.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.6	1.3	1.1	2.6	5.8	5.0	5.6	0.2	1.6	1.8	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	20.3	20.5	46.5	21.8	28.9	53.9	23.5	18.3	37.1	23.1	22.6
LnGrp LOS	D	C	C	D	C	C	D	C	B	D	C	C
Approach Vol, veh/h		395			741			940			488	
Approach Delay, s/veh		24.0			26.6			29.9			28.0	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	30.0	15.0	27.3	7.9	29.2	10.3	32.0				
Change Period (Y+Rc), s	4.4	* 5.3	4.4	6.1	4.4	5.3	4.4	* 6.1				
Max Green Setting (Gmax), s	5.1	* 32	11.1	27.0	8.9	27.8	9.5	* 29				
Max Q Clear Time (g_c+I1), s	4.1	5.9	10.8	6.3	4.7	17.3	5.9	15.6				
Green Ext Time (p_c), s	0.0	2.5	0.0	1.8	0.0	3.0	0.1	5.6				

Intersection Summary

HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C






















Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Opening Day AM  
4: 58th Street & University Avenue

























University Manor

04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	470	134	33	528	30	248	32	107	43	18	52
Future Volume (veh/h)	33	470	134	33	528	30	248	32	107	43	18	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	0.99		0.99	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	560	160	39	629	36	295	38	127	51	21	62
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	49	2295	705	49	1597	690	395	42	142	243	110	257
Arrive On Green	0.03	0.45	0.45	0.03	0.45	0.45	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1781	5106	1567	1781	3554	1535	915	118	394	520	306	712
Grp Volume(v), veh/h	39	560	160	39	629	36	460	0	0	134	0	0
Grp Sat Flow(s),veh/h/ln	1781	1702	1567	1781	1777	1535	1426	0	0	1538	0	0
Q Serve(g_s), s	2.0	6.1	5.6	2.0	10.7	1.2	22.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.0	6.1	5.6	2.0	10.7	1.2	27.3	0.0	0.0	5.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.64		0.28	0.38		0.46
Lane Grp Cap(c), veh/h	49	2295	705	49	1597	690	580	0	0	610	0	0
V/C Ratio(X)	0.79	0.24	0.23	0.79	0.39	0.05	0.79	0.00	0.00	0.22	0.00	0.00
Avail Cap(c_a), veh/h	131	2295	705	131	1597	690	792	0	0	827	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	43.5	15.3	15.2	43.5	16.6	14.0	26.9	0.0	0.0	20.0	0.0	0.0
Incr Delay (d2), s/veh	23.8	0.3	0.7	23.8	0.7	0.1	3.9	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.3	2.1	1.2	4.3	0.4	9.5	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.3	15.6	15.9	67.3	17.3	14.1	30.8	0.0	0.0	20.2	0.0	0.0
LnGrp LOS	E	B	B	E	B	B	C	A	A	C	A	A
Approach Vol, veh/h		759			704			460			134	
Approach Delay, s/veh		18.3			19.9			30.8			20.2	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	45.8		37.4	6.9	45.8		37.4				
Change Period (Y+Rc), s	4.4	5.3		4.9	4.4	5.3		4.9				
Max Green Setting (Gmax), s	6.6	22.7		46.1	6.6	22.7		46.1				
Max Q Clear Time (g_c+I1), s	4.0	8.1		7.1	4.0	12.7		29.3				
Green Ext Time (p_c), s	0.0	3.8		0.9	0.0	3.1		2.9				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			21.8									
HCM 6th LOS			C									

Opening Day PM  
1: 54th Street & University Avenue

University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	442	161	87	355	265	221	392	48	447	726	96
Future Volume (veh/h)	121	442	161	87	355	265	221	392	48	447	726	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.95	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	125	456	166	90	366	273	228	404	49	461	748	99
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	155	1062	444	112	976	415	263	919	403	529	939	417
Arrive On Green	0.09	0.30	0.30	0.06	0.27	0.27	0.15	0.26	0.26	0.15	0.26	0.26
Sat Flow, veh/h	1781	3554	1487	1781	3554	1511	1781	3554	1557	3456	3554	1578
Grp Volume(v), veh/h	125	456	166	90	366	273	228	404	49	461	748	99
Grp Sat Flow(s),veh/h/ln	1781	1777	1487	1781	1777	1511	1781	1777	1557	1728	1777	1578
Q Serve(g_s), s	6.1	9.2	7.9	4.4	7.4	14.3	11.2	8.5	2.1	11.6	17.5	4.4
Cycle Q Clear(g_c), s	6.1	9.2	7.9	4.4	7.4	14.3	11.2	8.5	2.1	11.6	17.5	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	155	1062	444	112	976	415	263	919	403	529	939	417
V/C Ratio(X)	0.80	0.43	0.37	0.80	0.38	0.66	0.87	0.44	0.12	0.87	0.80	0.24
Avail Cap(c_a), veh/h	158	1300	544	112	1192	507	278	1156	507	535	1120	497
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.9	25.1	24.7	41.2	26.2	28.6	37.2	27.6	25.3	36.9	30.6	25.7
Incr Delay (d2), s/veh	23.3	0.4	0.7	31.2	0.3	2.5	22.1	0.5	0.2	13.9	3.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	3.8	2.8	2.9	3.1	5.3	6.4	3.6	0.8	5.8	7.7	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.2	25.5	25.4	72.5	26.4	31.1	59.3	28.1	25.5	50.8	34.1	26.1
LnGrp LOS	E	C	C	E	C	C	E	C	C	D	C	C
Approach Vol, veh/h		747			729			681			1308	
Approach Delay, s/veh		31.8			33.9			38.3			39.4	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	31.9	17.5	29.7	12.2	29.8	18.0	29.2				
Change Period (Y+Rc), s	4.4	* 5.3	4.4	6.1	4.4	5.3	4.4	* 6.1				
Max Green Setting (Gmax), s	5.6	* 33	13.9	28.1	7.9	29.9	13.8	* 29				
Max Q Clear Time (g_c+I1), s	6.4	11.2	13.2	19.5	8.1	16.3	13.6	10.5				
Green Ext Time (p_c), s	0.0	4.8	0.0	3.7	0.0	3.2	0.0	3.7				

Intersection Summary

HCM 6th Ctrl Delay	36.4
HCM 6th LOS	D


























Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Opening Day PM  
4: 58th Street & University Avenue

























University Manor

04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Traffic Volume (veh/h)	82	1081	281	66	765	44	214	37	107	54	24	51
Future Volume (veh/h)	82	1081	281	66	765	44	214	37	107	54	24	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.99		0.97	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	1175	305	72	832	48	233	40	116	59	26	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	2549	765	93	1732	747	315	45	129	222	103	178
Arrive On Green	0.06	0.50	0.50	0.05	0.49	0.49	0.32	0.31	0.31	0.32	0.31	0.31
Sat Flow, veh/h	1781	5106	1533	1781	3554	1533	842	145	419	560	334	579
Grp Volume(v), veh/h	89	1175	305	72	832	48	389	0	0	140	0	0
Grp Sat Flow(s),veh/h/ln	1781	1702	1533	1781	1777	1533	1406	0	0	1473	0	0
Q Serve(g_s), s	5.1	15.6	12.9	4.2	16.3	1.7	20.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.1	15.6	12.9	4.2	16.3	1.7	27.2	0.0	0.0	7.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.60		0.30	0.42		0.39
Lane Grp Cap(c), veh/h	114	2549	765	93	1732	747	501	0	0	516	0	0
V/C Ratio(X)	0.78	0.46	0.40	0.78	0.48	0.06	0.78	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	200	2549	765	170	1732	747	674	0	0	691	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	48.0	16.9	16.3	48.7	17.8	14.1	34.1	0.0	0.0	27.1	0.0	0.0
Incr Delay (d2), s/veh	11.1	0.6	1.6	12.9	1.0	0.2	4.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.0	4.7	2.2	6.7	0.6	9.5	0.0	0.0	2.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.1	17.5	17.8	61.6	18.8	14.3	38.1	0.0	0.0	27.3	0.0	0.0
LnGrp LOS	E	B	B	E	B	B	D	A	A	C	A	A
Approach Vol, veh/h		1569			952			389			140	
Approach Delay, s/veh		20.0			21.8			38.1			27.3	
Approach LOS		B			C			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	57.2		37.0	11.0	56.0		37.0				
Change Period (Y+Rc), s	4.4	5.3		4.9	4.4	5.3		4.9				
Max Green Setting (Gmax), s	9.9	34.7		44.8	11.7	32.9		44.8				
Max Q Clear Time (g_c+I1), s	6.2	17.6		9.0	7.1	18.3		29.2				
Green Ext Time (p_c), s	0.0	9.0		0.9	0.1	5.2		2.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			23.2									
HCM 6th LOS			C									

Opening Day + Proj AM  
1: 54th Street & University Avenue

University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	235	92	59	357	308	187	669	19	162	228	64
Future Volume (veh/h)	58	235	92	59	357	308	187	669	19	162	228	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.97	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	253	99	63	384	331	201	719	20	174	245	69
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	79	1068	451	81	1070	461	238	1159	491	255	946	402
Arrive On Green	0.04	0.30	0.30	0.05	0.30	0.30	0.13	0.33	0.33	0.07	0.27	0.27
Sat Flow, veh/h	1781	3554	1501	1781	3554	1531	1781	3554	1505	3456	3554	1510
Grp Volume(v), veh/h	62	253	99	63	384	331	201	719	20	174	245	69
Grp Sat Flow(s),veh/h/ln	1781	1777	1501	1781	1777	1531	1781	1777	1505	1728	1777	1510
Q Serve(g_s), s	2.7	4.3	3.9	2.8	6.7	15.3	8.8	13.6	0.7	3.9	4.3	2.8
Cycle Q Clear(g_c), s	2.7	4.3	3.9	2.8	6.7	15.3	8.8	13.6	0.7	3.9	4.3	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	79	1068	451	81	1070	461	238	1159	491	255	946	402
V/C Ratio(X)	0.78	0.24	0.22	0.78	0.36	0.72	0.84	0.62	0.04	0.68	0.26	0.17
Avail Cap(c_a), veh/h	199	1430	604	114	1242	535	249	1314	556	413	1206	513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	20.9	20.8	37.6	21.8	24.8	33.6	22.6	18.3	35.9	23.0	22.4
Incr Delay (d2), s/veh	6.1	0.2	0.3	12.5	0.2	4.1	20.4	0.9	0.0	1.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.7	1.4	1.5	2.7	5.8	5.0	5.6	0.2	1.7	1.8	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.7	21.1	21.1	50.0	22.0	28.8	54.0	23.6	18.3	37.1	23.1	22.6
LnGrp LOS	D	C	C	D	C	C	D	C	B	D	C	C
Approach Vol, veh/h		414			778			940			488	
Approach Delay, s/veh		24.5			27.2			30.0			28.1	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	29.2	15.0	27.3	7.9	29.3	10.3	32.0				
Change Period (Y+Rc), s	4.4	* 5.3	4.4	6.1	4.4	5.3	4.4	* 6.1				
Max Green Setting (Gmax), s	5.1	* 32	11.1	27.0	8.9	27.8	9.5	* 29				
Max Q Clear Time (g_c+I1), s	4.8	6.3	10.8	6.3	4.7	17.3	5.9	15.6				
Green Ext Time (p_c), s	0.0	2.7	0.0	1.8	0.0	3.1	0.1	5.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			27.9									
HCM 6th LOS			C									
<b>Notes</b>												

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Opening Day + Proj AM  
2: University Avenue & Residential Dwy





University Manor  
04/25/2018

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Traffic Vol, veh/h	0	407	703	6	0	24
Future Vol, veh/h	0	407	703	6	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	442	764	7	0	26
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	386
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	612
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	612
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		11.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	612		
HCM Lane V/C Ratio	-	-	-	0.043		
HCM Control Delay (s)	-	-	-	11.1		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.1		




























Opening Day + Proj AM  
3: University Avenue & Retail Dwy

University Manor  
04/25/2018

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	417	695	8	0	10
Future Vol, veh/h	17	417	695	8	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	80	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	453	755	9	0	11
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	764	0	-	0	-	382
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	845	-	-	-	0	616
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	845	-	-	-	-	616
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		SB	
HCM Control Delay, s	0.4		0		10.9	
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	845		-	-	-	616
HCM Lane V/C Ratio	0.022		-	-	-	0.018
HCM Control Delay (s)	9.4		-	-	-	10.9
HCM Lane LOS	A		-	-	-	B
HCM 95th %tile Q(veh)	0.1		-	-	-	0.1

























Opening Day + Proj AM  
4: 58th Street & University Avenue

University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Traffic Volume (veh/h)	33	484	134	33	538	30	248	32	107	43	18	52
Future Volume (veh/h)	33	484	134	33	538	30	248	32	107	43	18	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	0.99		0.99	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	576	160	39	640	36	295	38	127	51	21	62
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	49	2300	706	49	1600	691	395	42	142	242	110	256
Arrive On Green	0.03	0.45	0.45	0.03	0.45	0.45	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1781	5106	1567	1781	3554	1535	914	118	394	520	306	712
Grp Volume(v), veh/h	39	576	160	39	640	36	460	0	0	134	0	0
Grp Sat Flow(s),veh/h/ln	1781	1702	1567	1781	1777	1535	1426	0	0	1539	0	0
Q Serve(g_s), s	2.0	6.3	5.6	2.0	10.9	1.2	22.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.0	6.3	5.6	2.0	10.9	1.2	27.3	0.0	0.0	5.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.64		0.28	0.38		0.46
Lane Grp Cap(c), veh/h	49	2300	706	49	1600	691	579	0	0	609	0	0
V/C Ratio(X)	0.79	0.25	0.23	0.79	0.40	0.05	0.80	0.00	0.00	0.22	0.00	0.00
Avail Cap(c_a), veh/h	131	2300	706	131	1600	691	761	0	0	796	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	43.5	15.3	15.1	43.5	16.6	13.9	27.0	0.0	0.0	20.0	0.0	0.0
Incr Delay (d2), s/veh	23.8	0.3	0.7	23.8	0.7	0.1	4.4	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.4	2.1	1.2	4.4	0.4	9.6	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.3	15.6	15.9	67.3	17.3	14.1	31.3	0.0	0.0	20.2	0.0	0.0
LnGrp LOS	E	B	B	E	B	B	C	A	A	C	A	A
Approach Vol, veh/h		775			715			460			134	
Approach Delay, s/veh		18.2			19.9			31.3			20.2	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	45.8		37.3	6.9	45.8		37.3				
Change Period (Y+Rc), s	4.4	5.3		4.9	4.4	5.3		4.9				
Max Green Setting (Gmax), s	6.6	24.7		44.1	6.6	24.7		44.1				
Max Q Clear Time (g_c+I1), s	4.0	8.3		7.1	4.0	12.9		29.3				
Green Ext Time (p_c), s	0.0	4.1		0.9	0.0	3.5		2.7				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			21.8									
HCM 6th LOS			C									

Opening Day + Proj PM  
1: 54th Street & University Avenue

University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	460	161	98	372	265	221	392	48	447	726	96
Future Volume (veh/h)	121	460	161	98	372	265	221	392	48	447	726	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.95	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	125	474	166	101	384	273	228	404	49	461	748	99
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	155	1066	446	112	979	416	262	918	402	529	938	417
Arrive On Green	0.09	0.30	0.30	0.06	0.28	0.28	0.15	0.26	0.26	0.15	0.26	0.26
Sat Flow, veh/h	1781	3554	1487	1781	3554	1511	1781	3554	1557	3456	3554	1578
Grp Volume(v), veh/h	125	474	166	101	384	273	228	404	49	461	748	99
Grp Sat Flow(s),veh/h/ln	1781	1777	1487	1781	1777	1511	1781	1777	1557	1728	1777	1578
Q Serve(g_s), s	6.2	9.6	7.9	5.0	7.8	14.3	11.2	8.5	2.2	11.7	17.5	4.4
Cycle Q Clear(g_c), s	6.2	9.6	7.9	5.0	7.8	14.3	11.2	8.5	2.2	11.7	17.5	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	155	1066	446	112	979	416	262	918	402	529	938	417
V/C Ratio(X)	0.81	0.44	0.37	0.91	0.39	0.66	0.87	0.44	0.12	0.87	0.80	0.24
Avail Cap(c_a), veh/h	157	1296	542	112	1189	505	277	1153	505	534	1117	496
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	25.3	24.6	41.6	26.3	28.6	37.3	27.7	25.4	37.0	30.7	25.8
Incr Delay (d2), s/veh	23.5	0.4	0.7	55.3	0.3	2.5	22.2	0.5	0.2	14.0	3.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	4.0	2.8	3.9	3.3	5.3	6.4	3.6	0.8	5.9	7.8	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.5	25.7	25.3	96.9	26.6	31.1	59.5	28.2	25.6	51.0	34.3	26.1
LnGrp LOS	E	C	C	F	C	C	E	C	C	D	C	C
Approach Vol, veh/h		765			758			681			1308	
Approach Delay, s/veh		31.8			37.6			38.5			39.5	
Approach LOS		C			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	32.1	17.6	29.7	12.2	29.9	18.1	29.2				
Change Period (Y+Rc), s	4.4	* 5.3	4.4	6.1	4.4	5.3	4.4	* 6.1				
Max Green Setting (Gmax), s	5.6	* 33	13.9	28.1	7.9	29.9	13.8	* 29				
Max Q Clear Time (g_c+I1), s	7.0	11.6	13.2	19.5	8.2	16.3	13.7	10.5				
Green Ext Time (p_c), s	0.0	5.0	0.0	3.7	0.0	3.4	0.0	3.7				

Intersection Summary

HCM 6th Ctrl Delay	37.2
HCM 6th LOS	D

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.





Opening Day + Proj PM  
2: University Avenue & Residential Dwy

University Manor  
04/25/2018

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Traffic Vol, veh/h	0	948	730	24	0	10
Future Vol, veh/h	0	948	730	24	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1030	793	26	0	11
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	410
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	591
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	591
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		11.2		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	591		
HCM Lane V/C Ratio	-	-	-	0.018		
HCM Control Delay (s)	-	-	-	11.2		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.1		


























Opening Day + Proj PM  
3: University Avenue & Retail Dwy

University Manor  
04/25/2018

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	952	722	3	0	18
Future Vol, veh/h	18	952	722	3	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	80	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	1035	785	3	0	20
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	788	0	-	0	-	394
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	827	-	-	-	0	605
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	827	-	-	-	-	605
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		11.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	827	-	-	-	-	605
HCM Lane V/C Ratio	0.024	-	-	-	-	0.032
HCM Control Delay (s)	9.5	-	-	-	-	11.1
HCM Lane LOS	A	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

Opening Day + Proj PM  
4: 58th Street & University Avenue

University Manor  
04/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Traffic Volume (veh/h)	82	1092	281	66	778	44	214	37	107	54	24	51
Future Volume (veh/h)	82	1092	281	66	778	44	214	37	107	54	24	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.99		0.97	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	91	1213	312	73	864	49	238	41	119	60	27	57
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	116	2520	756	94	1710	738	318	45	131	223	105	183
Arrive On Green	0.07	0.49	0.49	0.05	0.48	0.48	0.32	0.31	0.31	0.32	0.31	0.31
Sat Flow, veh/h	1781	5106	1533	1781	3554	1533	838	144	419	555	337	584
Grp Volume(v), veh/h	91	1213	312	73	864	49	398	0	0	144	0	0
Grp Sat Flow(s),veh/h/ln	1781	1702	1533	1781	1777	1533	1402	0	0	1475	0	0
Q Serve(g_s), s	5.2	16.4	13.5	4.2	17.3	1.8	20.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	16.4	13.5	4.2	17.3	1.8	28.0	0.0	0.0	7.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.60		0.30	0.42		0.40
Lane Grp Cap(c), veh/h	116	2520	756	94	1710	738	507	0	0	524	0	0
V/C Ratio(X)	0.78	0.48	0.41	0.78	0.51	0.07	0.79	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	200	2520	756	170	1710	738	672	0	0	692	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	47.9	17.5	16.7	48.6	18.5	14.5	33.9	0.0	0.0	26.7	0.0	0.0
Incr Delay (d2), s/veh	11.0	0.7	1.7	12.7	1.1	0.2	4.5	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	6.4	5.0	2.2	7.2	0.6	9.8	0.0	0.0	2.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.8	18.2	18.4	61.4	19.6	14.6	38.4	0.0	0.0	27.0	0.0	0.0
LnGrp LOS	E	B	B	E	B	B	D	A	A	C	A	A
Approach Vol, veh/h		1616			986			398			144	
Approach Delay, s/veh		20.5			22.4			38.4			27.0	
Approach LOS		C			C			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	56.6		37.5	11.2	55.3		37.5				
Change Period (Y+Rc), s	4.4	5.3		4.9	4.4	5.3		4.9				
Max Green Setting (Gmax), s	9.9	34.7		44.8	11.7	32.9		44.8				
Max Q Clear Time (g_c+I1), s	6.2	18.4		9.2	7.2	19.3		30.0				
Green Ext Time (p_c), s	0.0	9.0		0.9	0.1	5.2		2.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			23.7									
HCM 6th LOS			C									



**APPENDIX C**  
**CITY OF LOS ANGELES DRIVEWAY DESIGN (FEBRUARY 2003)**

PAGE 8	DATE 02/2003	SECTION 321	SUBJECT DRIVEWAY DESIGN	Department of Transportation MANUAL OF POLICIES & PROCEDURES
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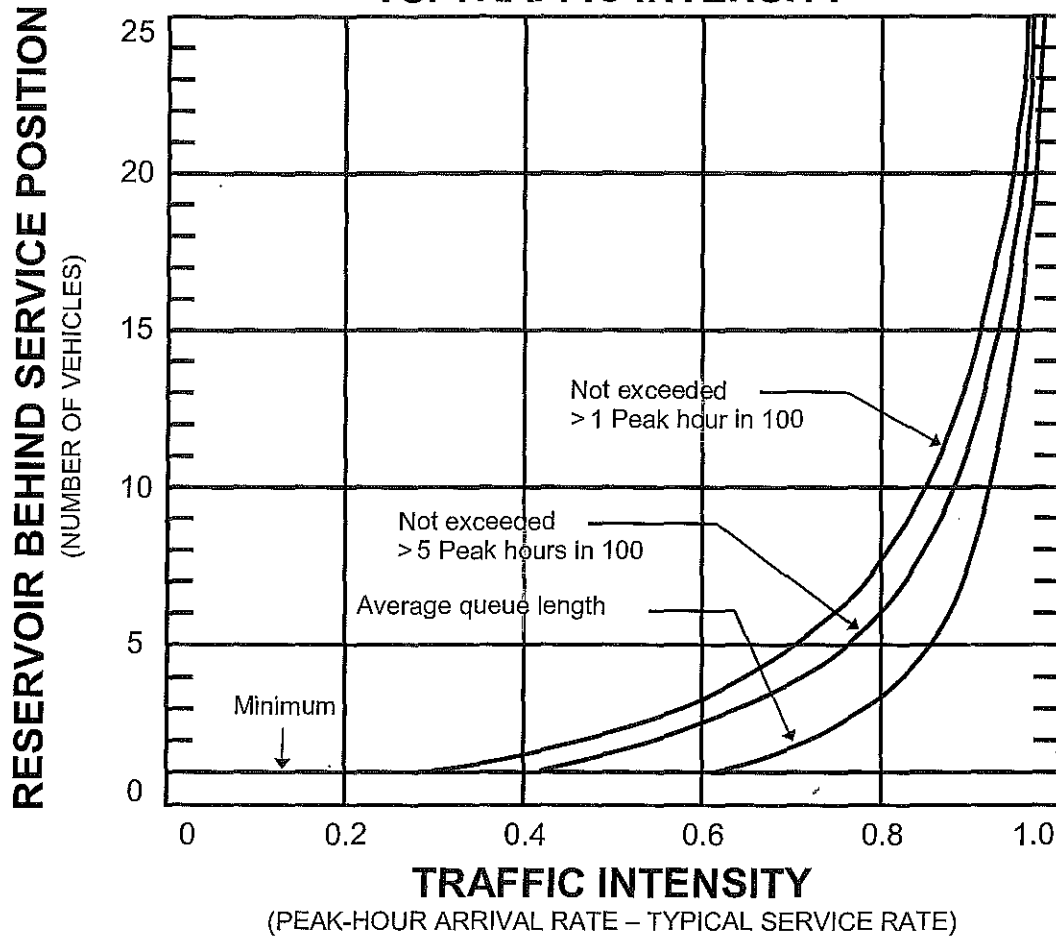
## APPENDIX A – PARKING CONTROL SERVICE RATE

Type of Control	<u>Typical Service Rates Per Lane<sup>4</sup></u>	
	Average Headway (Sec/Veh)	Capacity (Veh/Hr)
Entering:		
Clear aisle, no control	3.6	1,000
Ticket dispenser, no gate	5.0	720
Time stamp and handed to driver	8.5	425
Coded-card operated gate	8.9	405
Cashier, flat fee, no gate		
No information given	9.2	390
Direction-info needed	14.8	250
Ticket dispenser with gate		
Sharp turn @ approach	9.5	380
Easy direct approach	5.5	650
Coin-operated gate	20.4	175
Internal:		
Clear aisle or ramp, no parking	2.0	1,800
Straight ramp w/bend @ end	2.2	1,650
Circular ramp, 30' R @ C/L	2.2	1,650
Aisle with adjacent 9' x 18' stalls		
Inbound	3.5	1,040
Outbound	8.6	420
Exiting:		
Light street congestion	7.2	500
Moderate street congestion	9.0	400
Coded card/token-operated gate	9.0	400
Cashier, flat fee with gate	13.4	270
Cashier, variable fee with gate	19.5	185
Coin operated gate	20.4	175

<sup>4</sup> Assumes no significant interference by pedestrians, other traffic, etc.

## APPENDIX B

### RESERVOIR NEEDS VS. TRAFFIC INTENSITY



Assumptions: Arrivals follow a Poisson Distribution.  
Service rate can be represented by an exponential probability function.  
Flow is equally divided between each line if more than one if available.

#### Notes:

1. To obtain total reservoir length, use 20 feet per vehicle + 20 feet for the service position (or 12 feet to the driver of the vehicle in the service position).
2. For peak-hour arrival rate contact City-Wide Planning Coordination Section at (213) 482-7024.
3. See Appendix A for parking control service rate.

# MEMORANDUM



To: Mr. Mark Gottschlich  
University Avenue Manas, LLC

Date: July 16, 2018

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From: Hung Q. Luong  
John P. Keating, P.E.  
LLG, Engineers

LLG Ref: 3-17-2740

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Subject: REVISED - Sight Distance Analysis – University Manor Mixed-Use

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Engineers & Planners  
Traffic  
Transportation  
Parking

Linscott, Law &  
Greenspan, Engineers  
4542 Ruffner Street  
Suite 100  
San Diego, CA 92111  
858.300.8800 T  
858.300.8810 F  
www.llgengineers.com

Pasadena  
Irvine  
San Diego  
Woodland Hills

Dear Mark,

Linscott, Law and Greenspan, Engineers (LLG) has prepared a review of the sight distance along University Avenue for the University Manor Mixed Use project at 5556 University Avenue. The project proposes two access points on the north side of University Avenue between 54<sup>th</sup> St and 58<sup>th</sup> St. The westerly driveway is proposed for residents only and the easterly driveway is proposed for commercial use only. The project also proposes an eastbound left-turn movement into the project site. See **Figure 1**.

The posted speed limit on University Avenue is 40 mph. However, LLG conducted a speed survey on September of 2017 and determined that the 85<sup>th</sup> percentile speed is 43 mph in both the westbound and eastbound directions. See **Exhibit 1**. The proposed driveways will prohibit left-turns out, therefore LLG reviewed the available sight distance for right turns out of the driveways to see drivers approaching from the westbound direction. In addition, LLG also reviewed the available sight distance for vehicles turning left from eastbound University Ave into the project site.

## Intersection Sight Distance Guidelines

The intersection sight distance is reviewed for this project as required by the City of *San Diego's Street Design Manual (Section 6.1.3, paragraph 8a)*. The minimum corner sight distance at an intersection of a multiple dwelling residential/commercial/industrial driveway with a collector or higher classification street shall be in conformance with the American Association of State Highway and Transportation Officials (AASHTO) standards. AASHTO's standards are in reference to the *Geometric Design of Highways and Street Manual (The Greenbook)*, particularly Chapter 9: Intersections. Per this chapter, two design cases are applicable to this project's sight distance analysis including Case B2 (right turns from the minor road with stop control), and Case F (left turns from the major road.) AASHTO provided the formula for determination the intersection sight distance. See **Exhibit 2**. This formula has variables which are dependent on the design speed (V) and expected maneuver time (t) pertaining to each specific turning movement. AASHTO recommends adjusting the design speed accordingly only for approaches with vertical grades exceeding -3% or +3%. In addition, AASHTO does not recommend adjustment of the intersection sight distance values for the major-road grade for Case B2 unless heavy trucks are expected (2011 Greenbook, page 9-38, paragraph 3). In situations where the minor approach grades "is an upgrade that exceeds 3 percent," AASHTO

recommends adding 0.1 seconds for each percent of upgrade. The proposed driveways both have a downgrade of -6.4%. Since the downgrade slope will help improve the vehicle's acceleration, no adjustment is needed.

Per the above guidelines, it is determined that the intersection sight distance for Case B2 (right-turns out) is **415 feet**. The adjusted t value for this case is 6.5 seconds (2011 Greenbook, page 9-40, paragraph 4). See **Exhibit 3**. The intersection sight distance for Case F (left turn from University Avenue into easterly project driveway) is **380 feet**. The t value is 6 seconds and has been adjusted to reflect 2 through lanes per AASHTO's recommendation. See **Exhibit 3**. Note that the grade for the westbound approach is 0.9% and according to AASHTO, this grade is not significant enough to warrant an adjustment of the design speed.

### **Intersection Sight Distance Field Review**

LLG performed a field survey to determine whether or not the intersection sight distances as recommended by AASHTO can be achieved. According to AASHTO, the distance measured from the front of the vehicle to the driver's eye is always nearly 8 feet or less and field observations found that, where needed, drivers will stop with the front of their vehicle 6.5 feet or less from the edge of the major-road travel way to achieve the required intersection sight distance (2011 Greenbook, page 9-36, paragraph 5). As such, a constant driver's eyes to front bumper distance of 8 feet should be used, and the vehicle setback from the edge of travel way should be between 0 foot to 6.5 feet. For this analysis, a vehicle setback of 5.5 feet is used for an overall driver's eyes to edge of travel way distance of 13.5 feet. The point of observation is also offset 2 feet from the center of the driveway. Both driveways are stop-controlled with limit lines installed at 24 feet beyond the proposed edge of travel way. Drivers are required to stop at the stop bar, proceed to an observation point of 13.5-ft back from the edge of travel way, and inch forward closer to the edge of travel way to acquire the necessary sight distance as outlined by the California Vehicle Code (CVC). Section 22450 of the CVC requires that "the driver of any vehicle approaching a stop sign at the entrance to, or within, an intersection shall stop at a limit line, if marked, otherwise before entering the crosswalk on the near side of the intersection. If there is no limit line or crosswalk, the driver shall stop at the entrance to the intersection roadway." Section 21802 of the CVC requires that "the driver of any vehicles approaching stop sign... stop as required by Section 22450. The driver shall then yield the right-of-way to any vehicles which have approached from another highway, or which are approaching so closely as to constitute an immediate hazard, and shall continue to yield the right-of-way to those vehicles until he or she can proceed with reasonable safety."

The driver's eyes are measured at 3.5 feet from the ground surface, and the object to be observed is also 3.5 feet from the ground (2011 Greenbook, page 9-31, paragraph 5). The location of the object to be observed is located in the middle of the travel lane as shown in AASHTO's Exhibit 9-50. Since there are 2 approach lanes, measurements

are taken from the center of the inner lane (closer to curb face) because this will produce the larger and more significant sight triangle.

The currently available sight distance for the westerly residential driveway is 385 feet, less than the desired 415 feet. The desired sight distance would require removal of obstruction within the sight distance triangle. See **Figure 2**.

The currently available sight distance for the easterly driveway (commercial) is 325 feet, less than the desired 415 feet. The desired sight distance would require removal of obstruction within the sight distance triangle. See **Figure 3**.

The intersection sight distance for the eastbound left turn onto the project driveways is readily available at 380 feet. See **Figure 4**.

### **Discussion of Results**

The sight distance results above show inadequacies in the intersection sight distance values as required by the City of San Diego and AASHTO. The required intersection sight distance for exiting the project driveways is blocked by obstructions that are located within the public right-of-way. As such, AASHTO's guidelines recommend that "any object at a height above the elevation of the adjacent roadways that would obstruct the driver's view should be removed or lowered, if practical. Such objects may include buildings, parked vehicles, highway structures, roadside hardware, hedges, trees, bushes, unmowed grass, tall crops, walls, fences, and the terrain itself." (2011 Greenbook, page 9-31, paragraph 4) Some of these obstructions are identified in **Figures 5**. The obstructions include utility equipment, parked vehicles, a street light pole, trees, shrubs, a bus bench, and street sign posts. Best engineering practices suggest that any obstructions large enough to obstruct a significant portion of the sight triangle should be removed or made lower than the driver's perspective (3.5 feet). LLG recommends prohibiting on-street parking spaces within the sight triangle, removing trees, and maintaining the smaller vegetation within the sight triangle to be no more than 3.5 feet tall at all times.

For the westerly driveway (Case B2), the improvements required to maintain an adequate sight triangle fall completely within the existing public right-of-way. This information is based on available topographic and right-of-way data. See **Figure 5**.

For the easterly driveway (Case B2), the improvements required to maintain an adequate sight triangle fall completely within the existing public right-of-way. This information is based on available topographic and right-of-way data. See **Figure 5**.

There is an existing bus stop located approximately 275 feet east of the project frontage, and LLG recommends keeping the bus stop at its current location. Bus stops are temporary and short-term obstructions that will not be present for the majority of the time, unlike curbside parking spaces. Furthermore, MTS has recently upgrade the bus



benches to metallic-type that result in very little foot-print within the sight triangle. These benches can be seen through in manners similar to street sign posts. See **Exhibit 4**. If required by the City Engineer, this bench can be potentially be removed per coordination with MTS.

There are two other bus stops located approximately 1,100 feet west of the current bus stop, and another one just 700 feet to east. Due to its close proximity to other bus stops, and the numerous existing driveways located along the north side of University Ave, there is not an ideal location to relocate this bus stop to. LLG's preferred solution is to leave the bus stop as is because it is only a temporary obstruction or remove the existing bus stop location altogether. Per Section 6.1.3-9 and 10, the City Engineer reserves the right to determine the appropriate action based on our recommendation as presented above.

For the eastbound left-turn movement (Case F), the intersection sight distance is readily available. The required intersection sight distance triangle does not require improvement.

### **Conclusions**

The minimum sight distances can be achieved for all cases by removing obstructions as described above. The intersection sight distance is readily available for the eastbound left turn lane. The intersection sight distance for both the westerly and easterly driveways will be available once the sight triangle has been improved within the public right-of-way.

All obstructions to be removed or relocated to achieve the intersection sight distance or stopping sight distance are located within the public right-of-way. The University Manor Mixed-Use project should be responsible for removal or relocation of obstructions existing within the required sight triangles to the satisfaction of the City Engineer.

Sincerely,

**Linscott, Law & Greenspan, Engineers**

John P. Keating, P.E.  
Principal



# 24 Hour Speed Survey

Accurate Video Counts Inc  
info@accuratevideocounts.com  
(619) 987-5136



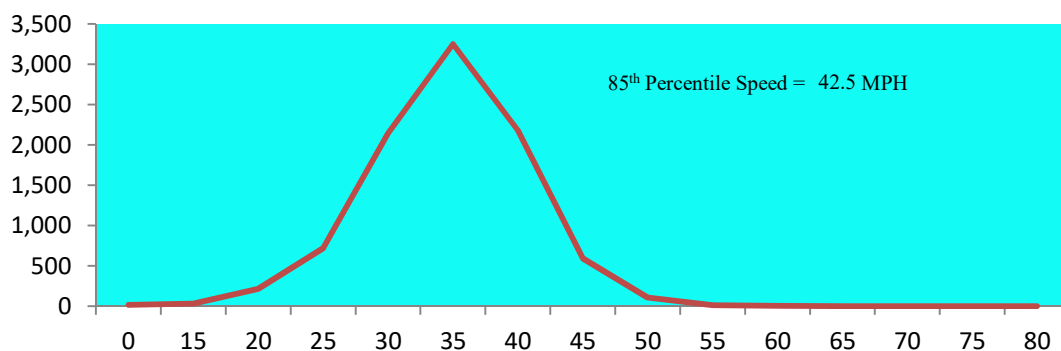
**Location:** A. EB University Avenue: East of 54th Street

**Direction:** Eastbound

**Date:** Thursday, September 28, 2017

**Proj. No:** 17-0760

85 <sup>th</sup> Percentile Speed = 42.5 MPH																
Time	0 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 74	75 79	80 99	Total
0:00 - 1:00	-	-	1	2	16	47	30	12	7	-	-	-	-	-	-	115
1:00 - 2:00	-	-	-	4	10	26	25	7	-	1	-	-	-	-	-	73
2:00 - 3:00	-	-	2	4	13	8	16	3	-	-	-	-	-	-	-	46
3:00 - 4:00	-	-	1	1	6	6	13	6	2	-	-	-	-	-	-	35
4:00 - 5:00	-	-	-	4	5	9	10	7	1	-	-	-	-	-	-	36
5:00 - 6:00	1	1	1	4	14	24	26	13	5	1	1	-	-	-	-	91
6:00 - 7:00	-	-	3	9	29	60	65	22	8	1	-	-	-	-	-	197
7:00 - 8:00	2	1	6	29	63	112	105	33	5	-	-	-	-	-	-	356
8:00 - 9:00	-	1	6	28	102	170	119	20	3	-	-	-	-	-	-	449
9:00 - 10:00	-	-	9	42	107	153	100	32	6	-	-	-	-	-	-	449
10:00 - 11:00	-	2	15	33	120	152	107	25	8	-	-	-	-	-	-	462
11:00 - 12:00	1	1	12	55	107	204	108	25	8	2	-	-	-	-	-	523
12:00 - 13:00	-	2	12	40	121	201	133	40	3	-	-	-	-	-	-	552
13:00 - 14:00	1	2	10	35	116	182	119	46	4	2	-	-	-	-	-	517
14:00 - 15:00	1	2	14	43	143	226	127	47	6	-	1	-	-	-	-	610
15:00 - 16:00	1	3	15	57	169	257	150	51	5	-	1	-	-	-	-	709
16:00 - 17:00	6	1	14	62	153	243	178	36	5	1	-	-	-	-	-	699
17:00 - 18:00	3	4	21	60	188	258	170	29	12	-	-	-	-	-	-	745
18:00 - 19:00	-	1	17	49	181	274	144	32	3	1	-	-	-	-	-	702
19:00 - 20:00	-	3	13	54	199	199	122	20	6	-	1	-	-	-	-	617
20:00 - 21:00	1	2	12	40	120	136	105	17	4	1	-	-	-	-	-	438
21:00 - 22:00	2	1	15	32	95	143	82	37	3	2	-	-	-	-	-	412
22:00 - 23:00	-	4	12	24	38	96	70	18	5	-	-	-	-	-	-	267
23:00 - 0:00	-	1	6	7	29	61	54	15	-	-	-	1	-	-	-	174
<b>Total</b>	<b>19</b>	<b>32</b>	<b>217</b>	<b>718</b>	<b>###</b>	<b>###</b>	<b>###</b>	<b>593</b>	<b>109</b>	<b>12</b>	<b>4</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>9,274</b>
<b>Percentage</b>	<b>0%</b>	<b>0%</b>	<b>2%</b>	<b>8%</b>	<b>23%</b>	<b>35%</b>	<b>23%</b>	<b>6%</b>	<b>1%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>				<b>100%</b>
<b>Average Speed = 38.6 MPH      50<sup>th</sup> Percentile Speed = 36.3 MPH</b>																





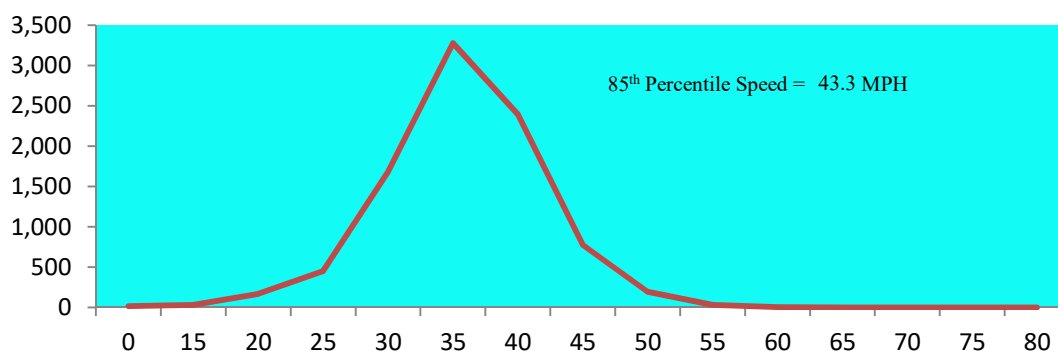
# 24 Hour Speed Survey

Accurate Video Counts Inc  
info@accuratevideocounts.com  
(619) 987-5136



**Location:** B. WB University Avenue: East of 54th Street  
**Direction:** Westbound  
**Date:** Thursday, September 28, 2017  
**Proj. No:** 17-0760

85 <sup>th</sup> Percentile Speed = 43.3 MPH																
Time	0 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 74	75 79	80 99	Total
0:00 - 1:00	-	-	3	5	15	29	30	10	2	2	-	-	-	-	-	96
1:00 - 2:00	-	-	1	2	5	19	14	8	5	-	1	-	-	-	-	55
2:00 - 3:00	-	-	-	-	6	14	17	5	1	-	-	-	-	-	-	43
3:00 - 4:00	-	-	-	1	3	13	15	5	1	-	-	-	-	-	-	38
4:00 - 5:00	-	-	1	2	-	19	28	16	5	3	-	-	-	-	-	74
5:00 - 6:00	-	-	1	4	15	34	51	46	14	5	-	-	-	-	-	170
6:00 - 7:00	2	3	3	13	44	132	137	72	23	6	1	-	-	-	-	436
7:00 - 8:00	1	2	7	16	116	252	214	77	14	-	-	-	-	-	-	699
8:00 - 9:00	-	1	12	42	111	239	150	51	16	1	-	-	-	-	-	623
9:00 - 10:00	2	-	5	14	66	200	143	45	11	-	-	-	-	-	-	486
10:00 - 11:00	1	1	6	24	94	160	125	26	11	1	-	-	-	-	-	449
11:00 - 12:00	-	2	6	18	102	203	135	34	11	2	-	-	-	-	-	513
12:00 - 13:00	1	1	14	37	96	195	127	35	7	2	-	-	-	-	-	515
13:00 - 14:00	1	-	12	17	87	187	129	37	11	3	1	-	-	-	-	485
14:00 - 15:00	3	4	22	33	96	208	131	40	6	1	2	-	-	-	-	546
15:00 - 16:00	1	4	14	38	120	193	120	34	6	1	-	-	-	-	-	531
16:00 - 17:00	1	1	8	27	90	202	134	40	3	2	-	-	-	-	-	508
17:00 - 18:00	1	6	16	26	121	201	126	40	9	-	-	-	-	-	-	546
18:00 - 19:00	-	2	16	55	152	176	103	27	6	1	-	-	-	-	-	538
19:00 - 20:00	2	1	4	31	137	182	117	31	11	1	-	-	-	-	-	517
20:00 - 21:00	1	2	5	26	102	168	112	23	5	1	-	-	-	-	-	445
21:00 - 22:00	1	2	2	14	49	120	89	30	5	1	-	-	-	-	-	313
22:00 - 23:00	-	1	7	3	41	81	84	21	5	-	1	-	-	-	-	244
23:00 - 0:00	-	-	3	3	9	51	59	20	9	1	-	-	-	-	-	155
<b>Total</b>	<b>18</b>	<b>33</b>	<b>168</b>	<b>451</b>	<b>###</b>	<b>###</b>	<b>###</b>	<b>773</b>	<b>197</b>	<b>34</b>	<b>6</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>9,025</b>
<b>Percentage</b>	<b>0%</b>	<b>0%</b>	<b>2%</b>	<b>5%</b>	<b>19%</b>	<b>36%</b>	<b>26%</b>	<b>9%</b>	<b>2%</b>	<b>0%</b>	<b>0%</b>					<b>100%</b>
<b>Average Speed = 39.8 MPH      50<sup>th</sup> Percentile Speed = 37.3 MPH</b>																



## Exhibit 2

Metric	US Customary
$ISD = 0.278 V_{major} t_g$	$ISD = 1.47 V_{major} t_g$ (9-1)
where:	where:
$ISD$ = intersection sight distance (length of the leg of sight triangle along the major road) (m)	$ISD$ = intersection sight distance (length of the leg of sight triangle along the major road) (ft)
$V_{major}$ = design speed of major road (km/h)	$V_{major}$ = design speed of major road (mph)
$t_g$ = time gap for minor road vehicle to enter the major road (s)	$t_g$ = time gap for minor road vehicle to enter the major road (s)

2011 Greenbook, page 9-37

## Exhibit 3

### Intersection Sight Distance Calculations

$$ISD = 1.47V_{major}t_g$$

Where:

ISD=Intersection sight distance (feet)

$V_{major}$ =Design speed of major road (mph)

$t_g$ =Time gap for minor road vehicle to enter the major road (seconds)

#### ISD for westerly and easterly driveways

$$ISD = 1.47(43)(6.5)$$

$$ISD = 410.865 \text{ feet}$$

**Use ISD = 415 feet,**

#### ISD for left-turn lane

$$ISD = 1.47(43)(6)$$

$$ISD = 379.26 \text{ feet}$$

**Use ISD = 380 feet**



REV. 07/17/2018  
N:\2740\DESIGN\FIGURES\18-1-27\EXHIBIT 4.DWG



NOT TO SCALE

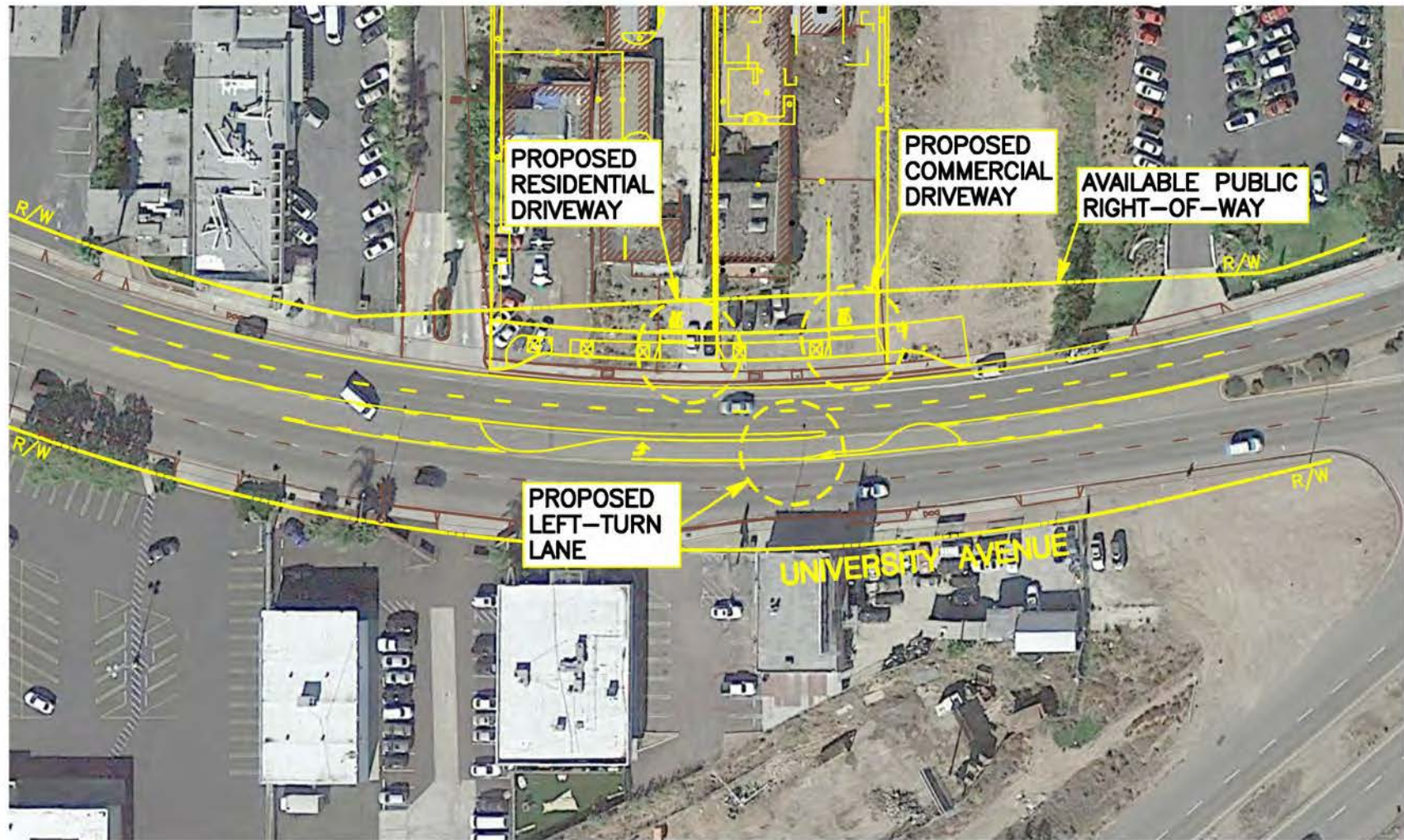
LINSCOTT  
LAW &  
GREENSPAN  
engineers

## Exhibit 4

### New Bus Bench

UNIVERSITY AVENUE MIXED USE





REV. 01/29/2018  
N:\2740\DESIGN\FIGURES\18-1-27\FIGURE 1.DWG



SCALE: 1"=80'

LINSCOTT  
LAW &  
GREENSPAN  
engineers

Figure 1

Proposed Driveway Locations

UNIVERSITY AVENUE MIXED USE



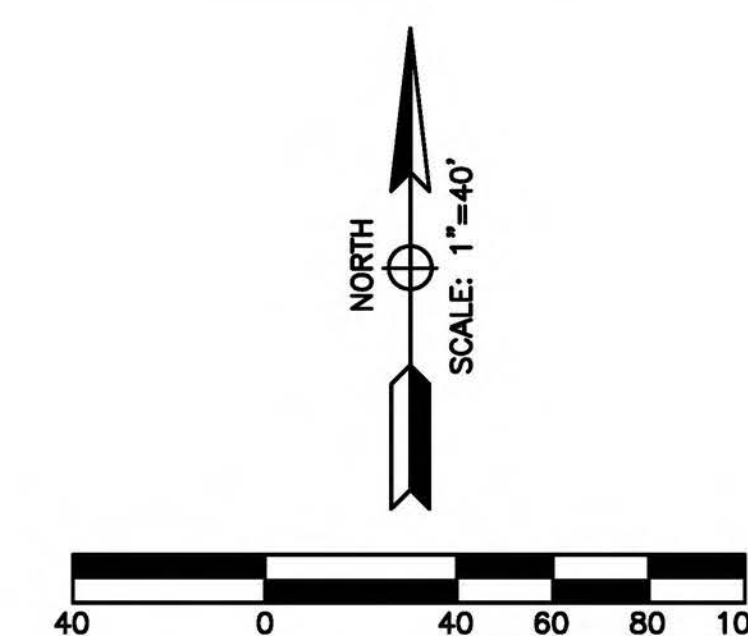
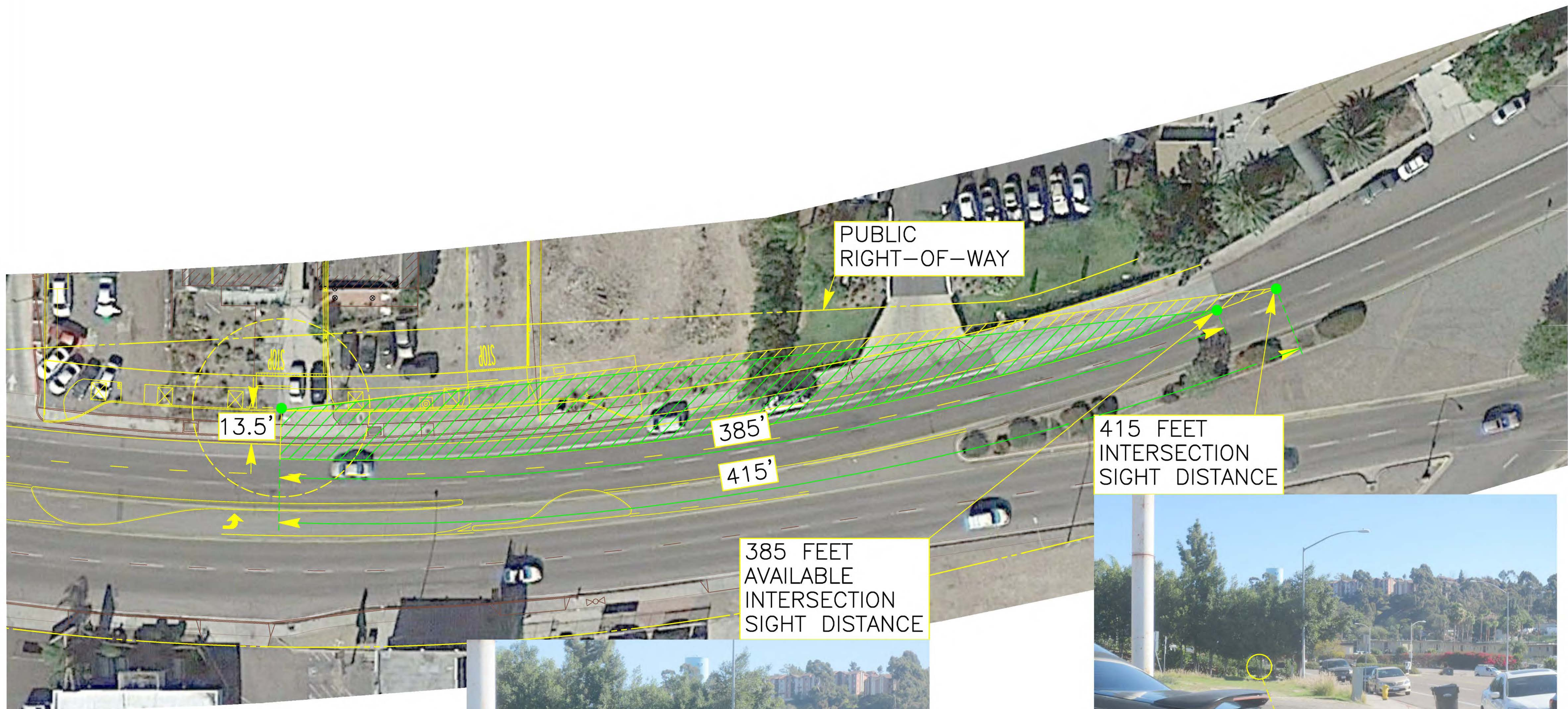


FIGURE 2

LINSCOTT  
LAW &  
GREENSPAN  
engineers

LINSCOTT, LAW & GREENSPAN, ENGINEERS  
4542 Ruffner Street, Suite 100  
San Diego, Ca 92111  
(858)300-8800

(858)300-8810 (FX)

LLG 3-172740.1	FIGURE 2.DWG	1/24/18
Designed By: HQL	Drawn By: DVS	Checked By: JPK



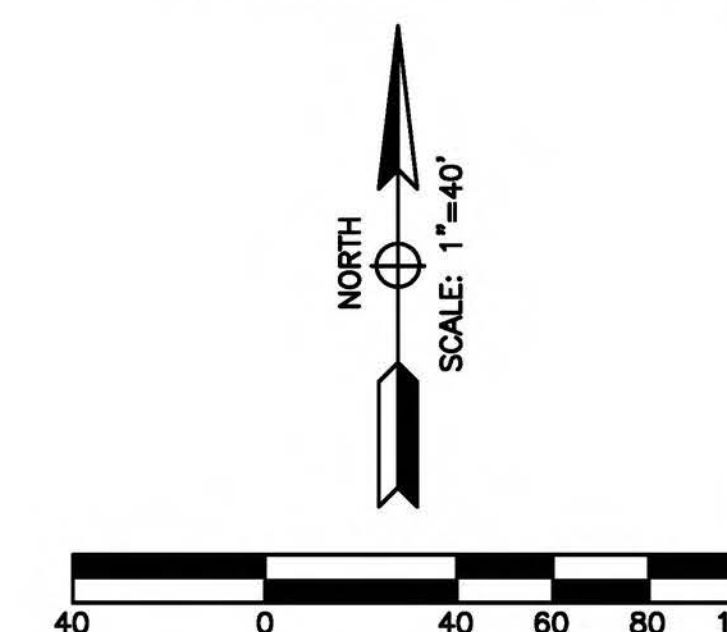
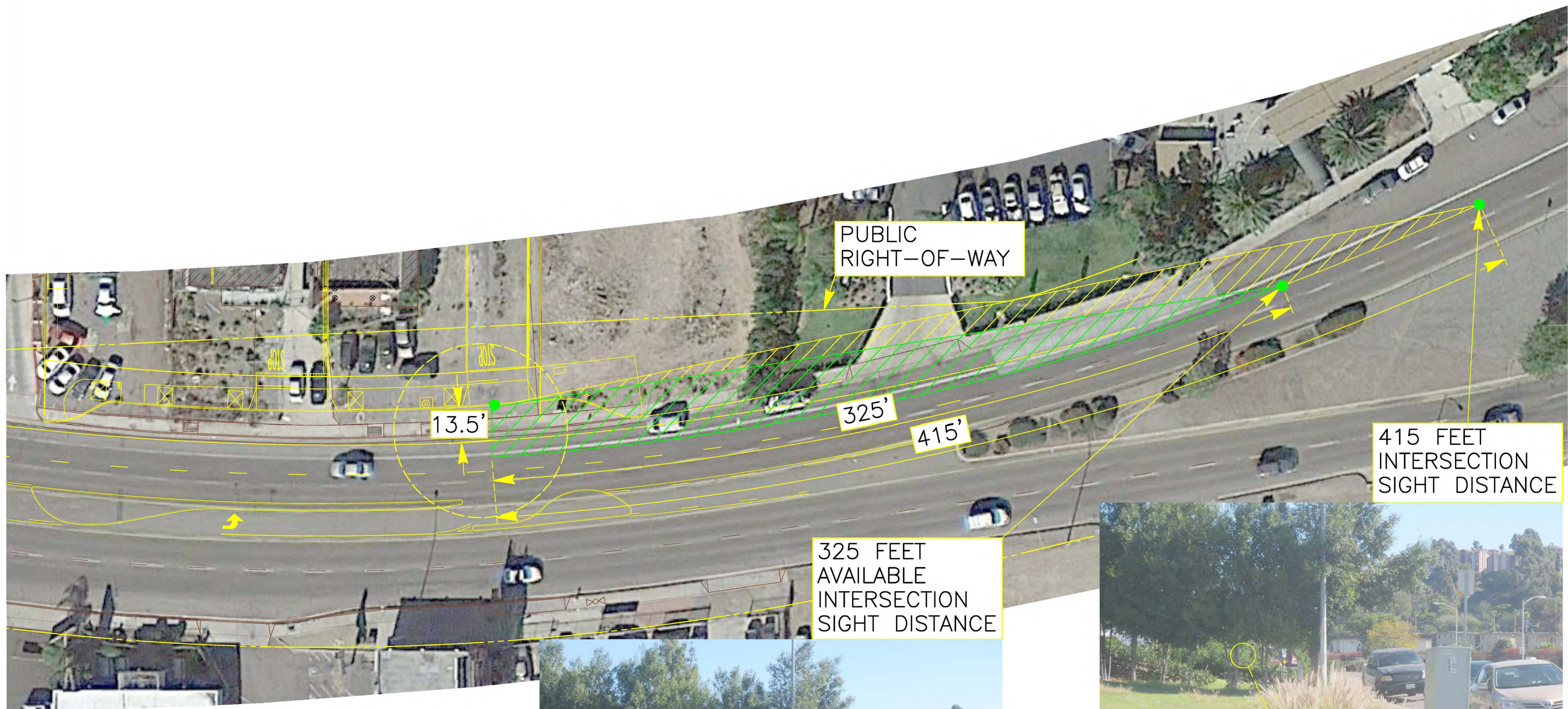


FIGURE 3

**LINSCOTT  
LAW &  
GREENSPAN  
engineers**

LINSCOTT, LAW & GREENSPAN, ENGINEERS  
4542 Ruffner Street, Suite 100  
San Diego, Ca 92111  
(858)300-8800

(858)300-8810 (FX)

LLG 3-172740.1	FIGURE 3.DWG	1/24/18
Designed By: HQL	Drawn By: DVS	Checked By: JPK



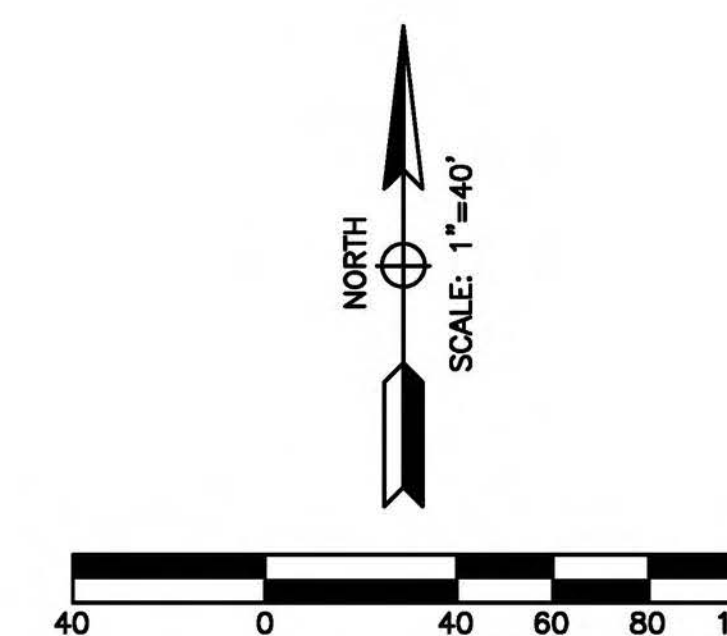


FIGURE 4

<b>LINSCOTT LAW &amp; GREENSPAN</b> <i>engineers</i>	<b>LINSCOTT, LAW &amp; GREENSPAN, ENGINEERS</b> 4542 Ruffner Street, Suite 100 San Diego, Ca 92111 (858)300-8800	
	LLG 3-172740.1 Designed By: HQL	FIGURE 4.DWG Drawn By: DVS Checked By: JPK

(858)300-8810 (FX)

1/24/18



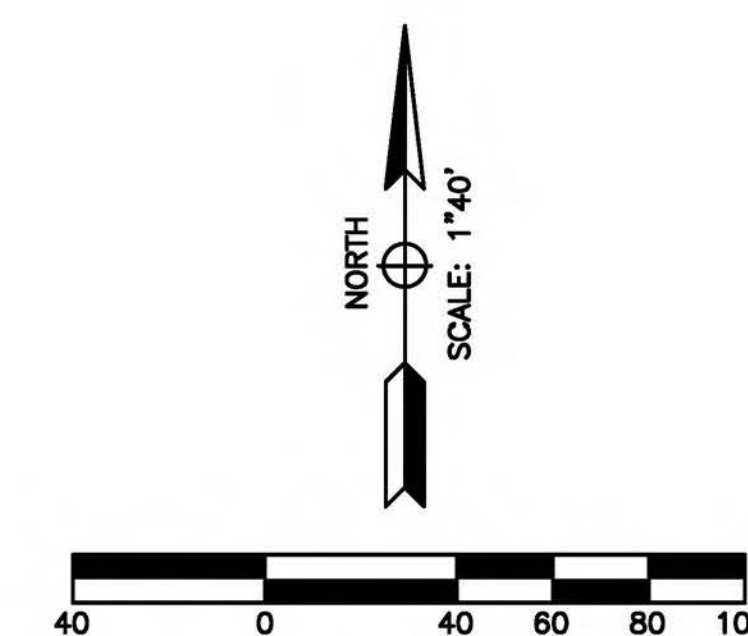


FIGURE 5

**LINSCOTT  
LAW &  
GREENSPAN  
engineers**

LINSCOTT, LAW & GREENSPAN, ENGINEERS  
4542 Ruffner Street, Suite 100  
San Diego, Ca 92111  
(858)300-8800

(858)300-8810 (FX)

LLG 3-172740.1	FIGURE 5.DWG	1/24/18
Designed By: HQL	Drawn By: DVS	Checked By: JPK



**WASTE MANAGEMENT PLAN**

**FOR**

---

**UNIVERSITY AVENUE MIXED-  
USE DEVELOPMENT**

**August 24, 2017**

---

*Prepared for:*  
University Manor, LLC

*Prepared by:*



John M. Cruikshank Consultants, Inc.

*Phone: (858) 751-0633 Fax: (858) 751-0634  
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## LIST OF ATTACHMENTS

APPENDIX 1:	CITY OF SAN DIEGO CONSTRUCTION & DEMOLITION (C&D) DEBRIS CONVERSION RATE TABLE
APPENDIX 2:	CONSTRUCTION & DEMOLITION RECYCLING FACILITIES DIRECTORY
APPENDIX 3:	REFUSE & RECYCLE STORAGE REGULATIONS
APPENDIX 4:	CONSTRUCTION & DEMOLITION DEBRIS DIVERSION PROGRAM

## **1.0 PURPOSE**

According to the City of San Diego, Development Services Department, California Environmental Quality Act (CEQA) Significance Determination Thresholds (January 2011), projects that include the demolition, construction, and/or renovation of 40,000 square feet or more of building space may generate approximately 60 tons of waste or more. This amount of waste is further identified as a potentially cumulative impacts on solid waste facilities. Cumulative impacts are mitigated by the implementation of a project-specific Waste Management Plan which reduces solid waste impacts to below a level of significance. The purpose of this Waste Management Plan (WMP), for the University Avenue Mixed Use Development, is to identify waste that will be generated by the project during Site Development, Demolition/Construction, and Occupancy and to identify measures to reduce the waste.

The following regulations apply to Site Development, Demolition/Construction phase and all the way to Occupancy to assure waste is being diverted from landfills. On December 9, 1997, the City of San Diego adopted Section 142.08 of the San Diego Municipal Code, Refuse and Recyclable Materials Storage Regulations (see Appendix 3). The ordinance requires the diversion of recyclable materials from landfill disposal to conserve the capacity and extend the useful life of the Miramar landfill, and reduce greenhouse gas emissions. Section 142.08 provides for permanent, adequate, and convenient space for the storage and collection of refuse and recyclable material to encourage recycling of solid waste. On November 13, 2007, the City of San Diego adopted a Recycling Ordinance. The ordinance requires recycling of plastic and glass bottles and jars, paper, newspaper, metal containers and cardboard at private residences, commercial buildings, and at special events requiring a City permit.

Effective January of 2008, the City of San Diego adopted a Construction and Demolition (C&D) Debris Diversion Deposit Ordinance (see Appendix 4). The ordinance requires that the majority of construction, demolition, and remodeling projects requiring building, combination, and demolition permits pay a refundable C&D Debris Recycling Deposit and divert at least 50% of their debris by recycling, reusing or donating usable materials. The C&D ordinance has a provision that would require 75% of construction and demolition waste be diverted once a certified facility within San Diego reaches a 75% diversion rate within 25 miles of 202 "C" Street. The ordinance is designed to keep C&D materials out of local landfills and ensure they get recycled. In 2011, California legislation increased the 50% waste reduction target established through Assembly Bill 989 to 75% through Assembly Bill 341.

## **2.0 PROJECT DESCRIPTION**

The University Avenue Mixed Use Development project is located at 5556-5592 University Ave. The project is within the City of San Diego. See Figure 1.

The project will require demolition including pavement, building, walls, roofing, and landscaping. The estimated tonnage was determined by using the City of San Diego C&D Debris Conversion Rate Table in Appendix 1 enclosed. Estimated quantities of material to be removed are outlined in Table 4.1 below.

The proposed project includes residential and commercial areas including retail and restaurants. The grading volume consists of 10,061.87 CYD of cut, and 2,785.15 CYD of fill. Total area lot is 64,061.65 Sq-ft and the total proposed area for construction is 61,460.93 Sq-Ft.

Land Use	Square Feet
Proposed Residential	54,894.27
Proposed Commercial	5,314.27

### 3.0 PRECONSTRUCTION

University Manor LLC will assign a Solid Waste Management Coordinator (SWMC) for the University Avenue Mixed Use Development project. The SWMC will have the authority to provide guidelines and procedures for contractor(s) and staff to implement waste reduction and recycling efforts. These responsibilities are, but not limited to, the following:

1. Review and understand the Waste Management Plan including responsibilities of SWMC.
2. Work with contractor(s) to estimate quantities of each type of material that will be salvaged, recycled, or disposed of as waste, then assist contractor(s) with documentation.
3. Review and update procedures as needed for material separation and verify availability of containers and bins needed to avoid delays.
4. Review and update procedures for periodic solid waste collection and transportation to recycling and disposal facilities.
5. Review and update solid waste management requirements for each trade.
6. Possess the Authority to issue Stop Work orders if proper procedures are not being followed.

From preconstruction to occupancy of the University Avenue Mixed Use Development project, the WMP will provide contractors and homeowners' guidelines to ensure the proper reduction, segregation, recycling, and disposal of demolition, construction, and on-going operational waste. Proper segregation of recyclable materials is required based on type of materials generated and the availability of recycling facilities able to accept those materials. This responsibility will be under the direction of the assigned University Avenue Mixed Use Development Plan SWMC.

The University Avenue Mixed Use Development Plan SWMC will coordinate with ESD and/or Mitigation Monitoring staff, including regular communication and invitations to the work site. An invitation shall be extended to an ESD representative at least 7 days prior to attend each pre-construction meeting of each phase of the development.

## VICINITY MAP



FIGURE 1

## 4.0 DEMOLITION AND CONSTRUCTION WASTE

In order to mitigate for any solid waste impacts identified for the University Avenue Mixed Use Development Plan project, offsite waste disposal shall target a minimum of 75% of all Construction, Demolition, and Land-Clearing waste to be diverted by weight from landfills.

**Contractor Requirements.** University Manor, LLC shall provide specific contract language for the University Avenue Mixed Use Development Plan project to implement this Waste Management Plan. The contract language will be made available to City personnel for verification. Contract language will require that:

- Specified demolition and construction materials will be reused or recycled onsite; others will be segregated for transport to specified recycling facilities.
- The contractor hired must determine the necessary capacity of dumpsters for each material type prior to obtaining the first demolition permit.
- The contractor(s) will be required to perform daily inspections of the demolition/construction site to ensure compliance with the requirements of the WMP and all other applicable laws and ordinances and report directly to the Union Tribune Master Plan SWMC.

- Daily inspections will include verifying the availability and number of dumpsters based on amount of debris being generated, assuring correct labeling of dumpsters, proper sorting and segregation of materials.
- No more than 10% by volume of contamination may occur in each dumpster.
- The contractors and subcontractors will coordinate and work closely with the SWMC to minimize the over-purchasing of construction materials to lower the amount of materials taken to recycling and disposal facilities. Ways in which the project will minimize over-purchasing is to purchase pre-cut materials, work closely amongst designers, contractors, and suppliers.

**Salvage.** Prior to demolition, the SW coordinator will clearly label all building materials targeted for reuse. When reuse of material is not possible, the materials will be deposited into clearly labeled, material specific containers for removal to an appropriate facility certified to achieve 100% diversion, as outlined in Table 4.1.

#### Segregation of Demolition Debris for Recycling.

**Table 4.1: Estimated Demolition Quantities & Tons Diverted**

Estimated Demolition Quantities & Tons Diverted By Material					
Material	Tonnage	Facility	Diversion Rate (%)	Tons Diverted	Tons Disposed
Asphalt	100	Hanson Aggregates West - Miramar	100	2,800	0
Brick	66	Vulcan Carol Canyon	100	66	0
Ceiling Tile	1.6	AMS San Diego	100	1	0
Drywall	12	EDCO Recovery & Transfer	71	8.5	3.5
Concrete	540	Hanson Aggregates West - Miramar	100	540	0
Building Material	1	Habitat for Humanity	100	1	0
Landscaping Debris	37	Miramar Greenery	100	37	0
Earth	507	Hanson Aggregates West	100	507	0

Metal Waste	46	Allan Company	100	46	0
Shingles	2.5	EDCO Recovery Transfer	70	2.5	105
<b>Total</b>	<b>1313</b>	Hanson Aggregate West		<b>1309.5</b>	<b>3.5</b>

**Construction Waste.** During the construction of Union Tribune Master Plan, the construction debris generated is expected to include the materials listed in Table 4.2. Materials shall be source separated as indicated in Table 4.2.

The City of San Diego ESD requires projects to estimate tonnage of expected construction waste. The University Avenue Mixed Use Development Plan project includes a total of 61,460.93 square feet of new construction. As provided by Environmental Services Department and for purposes of this Waste Management Plan, University Avenue Mixed Use Development Plan utilizes the Environmental Protection Agency (EPA), 3 pounds of waste per square foot for waste generation on new construction to calculate expected tonnage as follows:

$$61,460.93\text{sq. ft.} \times 3 \text{ lbs} = 93 \text{ tons}$$

The 93 tons is an assumption and is used as a place holder until further detail is provided and the hired contractor can accurately assess expected waste. Further, the exact quantity of each material is unknown at this time. As a place holder, the University Avenue Mixed Use Development Plan contractors shall source separate waste materials according to the material types in Table 4.2.

**Table 4.2: Estimated Construction Waste**

<b>Expected Bin Capacity Needed</b>	<b>Material Type</b>	<b>Generated (tons)</b>	<b>Handling</b>	<b>Diverted</b>	<b>Disposed</b>
One 40-yard bin, will require service about 5 times.	<b>Clean Wood</b> (Forming and framing lumber)	1	Inland Pacific or Miramar Greenery	1	0
One 40-yard bin, will require service about 3 times.	<b>Metals</b> (Pipes, rebar, flashing, steel, aluminum, copper, brass, stainless steel)	0.5	Pacific Steel, for example.	0.5	0
One 40-yard bin, will require service a couple of times.	<b>Polystyrene</b>	0.2	Cactus Recycling	0.2	0



Two 40-yard bins, will require weekly service.	<b>Blocks, bricks</b>	4.5	Enniss Incorporated, for example.	4.5	0
Two 40-yard bins, will require weekly service.	<b>Asphalt, concrete,</b>	4.5	Enniss Incorporated, for example.	4.5	0
Two 40-yard bins, will require weekly service.	<b>Trash (Treated wood)</b>	4.5	Miramar Landfill	0	4.5
One 40-yard bin, will require service about 4 times.	<b>Roofing</b>	1	LEED Recycling	1	0
At least four 40-yard bins, will require weekly service.	<b>Mixed Debris</b> (Insulation, vinyl, doors, floor tile, plastic pipes, film, broken glass, drywall)	76	SANCO/EDCO Recovery & Transfer Facility	52.4	23.6
One 40-yard bin, will require service a couple of times.	<b>Cardboard</b>	0.5	Cactus or IMS	0.5	0
One 40-yard bin, will require service about 5 times.	<b>Carpet/Carpet padding</b>	1	DFS Flooring, for example	1	0
		93		64.9	28.1

Based on these estimates, the project would accomplish 70% diversion of construction waste. When construction waste is considered together with demolition waste, 1,406 tons of demolition and construction waste would be generated, but approximately 98% is expected to be diverted from disposal. An estimated 31.6 tons would end up going to landfill disposal. To ensure this result, contractors will be required to comply with the following methods and procedures below:

1. Construction and Land-Clearing containers will be provided for waste that is to be recycled. Containers shall be clearly labeled, with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.
2. The collection containers for recyclable Construction and Land-Clearing waste must contain no more than 10% non-recyclable materials, by volume.

3. Use detailed material estimates to reduce risk of unplanned and potentially wasteful material cuts.
4. Conduct daily visual inspections of dumpsters and recycling bins to remove contaminants.
5. Remove demolition and construction waste materials from the project site at least once every week to ensure no over-topping of waste bins. The accumulation and burning of on-site Construction, Demolition, and Land-Clearing waste materials will be prohibited.

Furthermore, University Avenue Mixed Use Development project will be required to meet the following State law and City of San Diego Municipal Code requirements:

1. The City's C&D Debris Diversion Deposit Program which requires a refundable deposit based on the tonnage and value of the expected recyclable waste materials as part of the building permit requirements.
2. The City's C&D Recycling Ordinance which requires identification and sorting of demolition and construction waste materials to be diverted to the appropriate recycling facility.
3. The City's Recycling Ordinance which requires that collection of recyclable materials must be provided.
4. The City's Storage Ordinance which requires that areas for recyclable material collection must be provided.
5. This Waste Management Plan –The waste contractor will provide monthly reports regarding the amount of waste and recyclable materials to the Union Tribune Master Plan SWMC who will be responsible for compliance actions with the aforementioned guidelines and make adjustments as needed to maintain conformance. The name and contact information of the waste contractor and SWMC will be provided to ESD at least 10 days prior to the start of any work and updated within 5 days of any changes.

## **5.0 OCCUPANCY WASTE**

The University Avenue Mixed Use Development will be managed under University Manor, LLC. During the Occupancy Phase, it is estimated that 51.3 tons per year will be generated by the new development (Refer to Table 5.1). The expected waste generation was calculated using information obtained from CalRecycle as shown in Table 5.1.

**Table 5.1: Waste Generation – Occupancy Waste**

	<b>Square Footage/Units</b>	<b>Generation Factor</b>	<b>Tons Per Year</b>
Proposed Residential	63	4lb/unit/day	46
Proposed Commercial	5314.7	0.0055 sq.ft./day	5.3
<b>Total Proposed Estimated Tonnage Per Year</b>			<b>51.3</b>
* Generation factor for commercial area is an average of waste generation factors of commercial retail and restaurant as the precise areas for each are not known yet.			

The University Avenue Mixed Use Development project will be required to comply with City of San Diego Municipal Code section 142.0830 Refuse and Recyclable Material Storage Regulations for Residential and Non-Residential Development (Table 142.08B & 142.08C) as seen in Appendix 3. The minimum storage amount required can be found in Tables 5.2 and 5.3 below.

**Table 5.2: Minimum Exterior Refuse and Recyclable Material Storage Areas for Residential Development**

	Minimum Refuse Storage Area Per Development (Square Feet)	Minimum Recyclable Material Storage Area Per Development (Square Feet)	Total Storage Required (Square Footage)
Dwelling Units			
63	144	144	288

**Table 5.3: Minimum Exterior Refuse and Recyclable Material Storage Areas for Non-Residential Development**

	Minimum Refuse Storage Area Per Development (Square Feet)	Minimum Recyclable Material Storage Area Per Development (Square Feet)	Total Storage Required (Square Footage)
Gross Floor Area			
5,314.7	24	24	48

In order to continually reduce waste delivered to the landfill during the life of the project, trash, recycling, and green waste bins will be provided for each development. Information will be provided to residents to encourage recycling of all paper products, cardboard, glass, aluminum cans, recyclable plastics, and yard waste.

Compliance with the recycling ordinance, which requires the provision of educational materials and separate recycling bins, and with the storage ordinance, which requires that sufficient space for recycling bins be provided, is estimated to reduce waste by 40%. Thus 31 tons per year would still be destined for disposal. Additional measures often taken to help mitigate this quantity of trash include:

- Surpassing the 75% waste reduction target during demolition and construction.
- Providing recyclable materials collection in outdoor and parking areas.

## 6.0 CONCLUSION

The University Avenue Mixed Use Development project anticipates 1,313 tons of demolition waste and 93 tons of construction waste. The demolition of concrete, asphalt, landscape debris and materials specified in Table 4.1 are expected to be 99% diverted either by reuses or source separating and sent to the certified facilities mentioned in Chapter 4. University Manor, LLC uses several certified facilities; the facility used is subject to change at the discretion of the WMC, provided the facility used attains the same or better certified waste diversion rate. The goal of the University Avenue Mixed Use Development Plan development is to exceed the 75% diversion target for demolition and construction waste. This WMP estimates that of the 1,406 total tons of demolition and construction waste, approximately 96% will be diverted. These tonnages are only estimates based upon EPA assumptions and assuming depth of concrete and asphalt.

To ensure that waste is properly managed, University Manor, LLC shall establish waste management contract language ensuring:

- Sufficient number of bins are provided, properly used, and their contents taken to appropriate facilities.
- Daily inspections occur to prevent overflow, assuring correct labeling of dumpsters, and that no more than 10% by volume of contamination occurs in each bin.
- Over-purchasing of construction materials is minimized.

University Manor, LLC will ensure that the Environmental Services Department is included in the precon prior to demolition activities to verify these project features and contract language. Additionally, prior to occupancy, University Manor, LLC will ensure that the Environmental Services Department has an opportunity to review and approve the educational materials prepared for the tenants pursuant to the Recycling Ordinance.

University Manor, LLC is committed to establishing recycling guidelines throughout the Preconstruction, Construction, and Occupancy phases. A WMC will be assigned to the University Avenue Mixed Use Development Plan project. The Coordinator will ensure compliance with the San Diego Municipal Code, Recycling Ordinance, Refuse, Construction and Demolition Recycling Ordinance, and Recyclable Materials Storage Regulations and aim to exceed the 75% diversion goal for demolition and construction waste by providing appropriate salvage, segregation, and recycling.

APPENDIX 1

CONSTRUCTION & DEMOLITION DEBRIS

CONVERSION RATE TABLE





# CITY OF SAN DIEGO

## Construction & Demolition (C&D) Debris

### Conversion Rate Table

This worksheet lists materials typically generated from a construction or demolition project and provides formulas for converting common units (i.e. cubic yards, square feet, and board feet) to tons. It is a tool that should be used for preparing your Waste Management Form - Part I, which requires that quantities be provided in tons.

**Note: Weigh receipts are required for your refund request.**

**Step 1:** Enter the estimated quantity for each applicable material in Column I, based on units

**Step 2:** Multiply by Tons/Unit figure listed in Column II. Enter the result for each material in Column III.

If using Excel version, column III will automatically calculate tons.

**Step 3:** Enter quantities for each separated material from Column III on this worksheet into the corresponding section of your Waste Management Form - Part I.

Category	Material	Column I		Column II		Column III
		Volume	Unit	Tons/Unit	Tons	
Asphalt/Concrete	Asphalt (broken)	142	cy	x 0.70	=	99.4
	Concrete (broken)	450	cy	x 1.20	=	540
	Concrete (solid slab)		cy	x 1.30	=	
Brick/Masonry/Tile	Brick (broken)	94	cy	x 0.70	=	65.8
	Brick (whole, palletized)		cy	x 1.51	=	
	Masonry Brick (broken)		cy	x 0.60	=	
	Tile		sq ft	x 0.00175	=	
Building Materials (doors, windows, cabinets, etc.)		7	cy	x 0.15	=	1.05
Cardboard (flat)			cy	x 0.05	=	
Carpet	By square foot		sq ft	x 0.0005	=	
	By cubic yard		cy	x 0.30	=	
Carpet Padding/Foam			sq ft	x 0.000125	=	
Ceiling Tiles	Whole (palletized)	5303	sq ft	x 0.0003	=	1.5909
	Loose		cy	x 0.09	=	
Drywall (new or used)	1/2" (by square foot)	14904	sq ft	x 0.0008	=	11.9232
	5/8" (by square foot)		sq ft	x 0.00105	=	
	Demo/used (by cubic yd)		cy	x 0.25	=	
Earth	Loose/Dry		cy	x 1.20	=	
	Excavated/Wet	390	cy	x 1.30	=	507
	Sand (loose)		cy	x 1.20	=	
Landscape Debris (brush, trees, etc)		246	cy	x 0.15	=	36.9
Mixed Debris	Construction		cy	x 0.18	=	
	Earth		cy	x 1.19	=	
Scrap metal		90	cy	x 0.51	=	45.9
Shingles, asphalt		11.4	cy	x 0.22	=	2.508
Stone (crushed)			cy	x 2.35	=	
Unpainted Wood & Pallets	By board foot		bd ft	x 0.001375	=	
	By cubic yard		cy	x 0.15	=	
Garbage/Trash			cy	x 0.18	=	
Other (estimated weight)			cy	x estimate	=	
			cy	x estimate	=	
			cy	x estimate	=	
Total All						1312.0721

**APPENDIX 2**  
**CONSTRUCTION & DEMOLITION RECYCLING**  
**FACILITIES DIRECTORY**

## 2017 Certified Construction & Demolition Recycling Facility Directory

These facilities are certified by the City of San Diego to accept materials listed in each category. Hazardous materials are not accepted. The diversion rate for these materials shall be considered 100%, except mixed C&D debris which updates quarterly. The City is not responsible for changes in facility information. Please call ahead to confirm details such as accepted materials, days and hours of operation, limitations on vehicle types, and cost. For more information visit: [www.recyclingworks.com](http://www.recyclingworks.com).

<p><i>Please note: In order to receive recycling credit, Mixed C&amp;D Facility and transfer station receipts must:</i></p> <ul style="list-style-type: none"> <li>-be coded as construction &amp; demolition (C&amp;D) debris</li> <li>-have project address or permit number on receipt</li> <li>*Make sure to notify weighmaster that your load is subject to the City of San Diego C&amp;D Ordinance.</li> </ul> <p><i>Note about landfills: Miramar Landfill and other landfills do not recycle mixed C&amp;D debris.</i></p>	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
<b>EDCO Recovery &amp; Transfer</b> 3660 Dalbergia St, San Diego, CA 92113 619-234-7774   <a href="http://www.edcodisposal.com/public-disposal">www.edcodisposal.com/public-disposal</a>	71%											•					
<b>EDCO Station Transfer Station &amp; Buy Back Center</b> 8184 Commercial St, La Mesa, CA 91942 619-466-3355   <a href="http://www.edcodisposal.com/public-disposal">www.edcodisposal.com/public-disposal</a>	71%				•							•			•		
<b>EDCO CDI Recycling &amp; Buy Back Center</b> 224 S. Las Posas Rd, San Marcos, CA 92078 760-744-2700   <a href="http://www.edcodisposal.com/public-disposal">www.edcodisposal.com/public-disposal</a>	88%				•										•		
<b>Escondido Resource Recovery</b> 1044 W. Washington Ave, Escondido 760-745-3203   <a href="http://www.edcodisposal.com/public-disposal">www.edcodisposal.com/public-disposal</a>	71%																
<b>Fallbrook Transfer Station &amp; Buy Back Center</b> 550 W. Aviation Rd, Fallbrook, CA 92028 760-728-6114   <a href="http://www.edcodisposal.com/public-disposal">www.edcodisposal.com/public-disposal</a>	71%				•										•		
<b>Otay C&amp;D/Inert Debris Processing Facility</b> 1700 Maxwell Rd, Chula Vista, CA 91913 619-421-3773   <a href="http://www.sd.disposal.com">www.sd.disposal.com</a>	75%																
<b>Ramona Transfer Station &amp; Buy Back Center</b> 324 Maple St, Ramona, CA 92065 760-789-0516   <a href="http://www.edcodisposal.com/public-disposal">www.edcodisposal.com/public-disposal</a>	71%				•										•		
<b>SANCO Resource Recovery &amp; Buy Back Center</b> 6750 Federal Blvd, Lemon Grove, CA 91945 619-287-5696   <a href="http://www.edcodisposal.com/public-disposal">www.edcodisposal.com/public-disposal</a>	71%				•										•		
<b>All American Recycling</b> 10805 Kenney St, Santee, CA 92071 619-508-1155 (Must call for appointment)						•											
<b>Allan Company</b> 6733 Consolidated Wy, San Diego, CA 92121 858-578-9300   <a href="http://www.allancompany.com/facilities.htm">www.allancompany.com/facilities.htm</a>					•										•		
<b>Allan Company Miramar Recycling</b> 5165 Convoy St, San Diego, CA 92111 858-268-8971   <a href="http://www.allancompany.com/facilities.htm">www.allancompany.com/facilities.htm</a>					•										•		
<b>AMS</b> 4674 Cardin St, San Diego, CA 92111 858-541-1977   <a href="http://www.a-m-s.com">www.a-m-s.com</a>								•									

	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
<b>Armstrong World Industries, Inc.</b> 300 S. Myrida St, Pensacola, FL 32505 877-276-7876 (Press 1, Then 8) www.armstrong.com/commceilingsna								•									
<b>Cactus Recycling</b> 8710 Avenida De La Fuente, San Diego, CA 92154 619-661-1283   www.cactusrecycling.com					•								•		•		•
<b>DFS Flooring</b> 10178 Willow Creek Road, San Diego, CA 92131 858-630-5200   www.dfsflooring.com						•	•										
<b>Duco Metals</b> 220 Bingham Drive Suite 100, San Marcos, CA 92069 760-747-6330   www.ducometals.com															•		
<b>Enniss Incorporated</b> 12421 Vigilante Rd, Lakeside, CA 92040 619-443-9024   www.ennissinc.com		•	•						•	•							
<b>Escondido Sand and Gravel</b> 500 N. Tulip St, Escondido, CA 92025 760-432-4690   www.weirasphalt.com/esg		•															
<b>Habitat for Humanity ReStore</b> 10222 San Diego Mission Rd, San Diego, CA 92108 619-516-5267   www.sdhfh.org/restore.php				•													
<b>Hanson Aggregates West – Lakeside Plant</b> 12560 Highway 67, Lakeside, CA 92040 858-547-2141		•															
<b>Hanson Aggregates West – Miramar</b> 9229 Harris Plant Rd, San Diego, CA 92126 858-974-3849		•								•							
<b>HVAC Exchange</b> 2675 Faivre St, Chula Vista, CA 91911 619-423-1855   www.thehvacexchange.com															•		
<b>IMS Recycling Services</b> 2740 Boston Ave, San Diego, CA 92113 619-423-1564   www.imsrecyclingservices.com					•								•				
<b>IMS Recycling Services</b> 2697 Main St, San Diego, CA 92113 619-231-2521   www.imsrecyclingservices.com													•		•		
<b>Inland Pacific Resource Recovery</b> 12650 Slaughterhouse Canyon Rd, Lakeside, CA 92040 619-390-1418											•						
<b>Lamp Disposal Solutions</b> 1405 30 <sup>th</sup> Street, San Diego, CA 92154 858-569-1807   www.lampdisposalsolutions.com														•			
<b>Los Angeles Fiber Company</b> 4920 S. Boyle Ave, Vernon, CA 90058 323-589-5637   www.lafiber.com						•	•										

	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
<b>Miramar Greenery, City of San Diego</b> 5180 Convoy St, San Diego, CA 92111 858-694-7000   <a href="http://www.sandiego.gov/environmental-services/miramar/greenery.shtml">www.sandiego.gov/environmental-services/miramar/greenery.shtml</a>											•						
<b>Moody's</b> 3210 Oceanside Blvd., Oceanside, CA 92056 760-433-3316		•								•						•	
<b>Otay Valley Rock, LLC</b> 2041 Heritage Rd, Chula Vista, CA 91913 619-591-4717   <a href="http://www.otayrock.com">www.otayrock.com</a>		•															
<b>Reclaimed Aggregates Chula Vista</b> 855 Energy Wy, Chula Vista, CA 91913 619-656-1836		•														•	
<b>Reconstruction Warehouse</b> 3650 Hancock St., San Diego, CA 92110 619-795-7326   <a href="http://www.recowarehouse.com">www.recowarehouse.com</a>				•													
<b>Robertson's Ready Mix</b> 2094 Willow Glen Dr, El Cajon, CA 92019 619-593-1856		•								•						•	
<b>Romero General Construction Corp.</b> 8354 Nelson Wy, Escondido, CA 92026 760-749-9312   <a href="http://www.romerogc.com/crushing/nelsonway.htm">www.romerogc.com/crushing/nelsonway.htm</a>		•															
<b>SA Recycling</b> 3055 Commercial St., San Diego, CA 92113 619-238-6740   <a href="http://www.sarecycling.com">www.sarecycling.com</a>															•		
<b>SA Recycling</b> 1211 S. 32 <sup>nd</sup> St., San Diego, CA 92113 619-234-6691   <a href="http://www.sarecycling.com">www.sarecycling.com</a>															•		
<b>Universal Waste Disposal</b> 8051 Wing Avenue, El Cajon, CA 92020 619-438-1093   <a href="http://www.universalwastedisposal.com">www.universalwastedisposal.com</a>														•			
<b>Vulcan Carol Canyon Landfill and Recycle Site</b> 10051 Black Mountain Rd, San Diego, CA 92126 858-530-9465   <a href="http://www.vulcanmaterials.com">www.vulcanmaterials.com</a>		•	•							•						•	
<b>Vulcan Otay Asphalt Recycle Center</b> 7522 Paseo de la Fuente, San Diego, CA 92154 619-571-1945   <a href="http://www.vulcanmaterials.com">www.vulcanmaterials.com</a>		•															

**APPENDIX 3**

**REFUSE & RECYCLE**

**STORAGE REGULATIONS**



## Article 2: General Development Regulations

### Division 8: Refuse and Recyclable Materials Storage Regulations

*(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)*

#### §142.0801 Purpose of Refuse and Recyclable Materials Storage Regulations

The purpose of these regulations is to provide permanent, adequate, and convenient space for the storage and collection of refuse and *recyclable material*. The intent of these regulations is to encourage recycling of solid waste to reduce the amount of waste material entering landfills and to meet the recycling goals established by the City Council and mandated by the state of California.

*(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)*

#### §142.0805 When Refuse and Recyclable Materials Storage Regulations Apply

Refuse and recyclable materials storage shall be provided for the following types of *development* as indicated in Table 142-08A:

- (a) New residential *development* projects involving two or more *dwelling units*,
- (b) New nonresidential *development*, or
- (c) Additions to existing *multiple dwelling unit* residential, commercial or industrial *development* where the *gross floor area* would be increased by 30 percent or more.

**Table 142-08A**  
**Refuse and Recyclable Material Storage Regulations**  
**Applicability**

<b>Type of <i>Development</i> Proposal</b>	<b>Applicable Regulations</b>	<b>Required Permit Type/Decision Process</b>
<i>Development</i> - of a <i>single dwelling unit</i>	Exempt from this division	Exempt from this division
New residential <i>development</i> involving two or more <i>dwelling units</i>	Sections 142.0810 and 142.0820	No permit required by this division
<i>New nonresidential development</i>	Sections 142.0810 and 142.0830	No permit required by this division
Additions to existing <i>multiple dwelling unit</i> residential, commercial, or industrial <i>development</i> where the <i>gross floor area</i> would be increased by 30 percent or more	Sections 142.0810, 142.0820 and 142.0830	No permit required by this division

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

(Amended 11-13-08 by O-19799 N.S; effective 12-13-2008.)

#### **§142.0810 General Regulations for Refuse and Recyclable Material Storage**

New residential *development* as indicated in Section 142.0805 shall provide on-site areas for the storage of refuse and *recyclable material* that meet the following standards:

- (a) Size of Material Storage Areas. The size of required material storage areas shall meet or exceed the minimum requirements in Tables 142-08B and 142-08C.
- (b) Location of Material Storage Areas
  - (1) Material storage areas may be located in a designated interior area that is not in a *dwelling unit*.

- (2) Material storage areas may be located outside a *structure* in required rear *yards* or in required side *yards*. Exterior material storage areas shall not be located in any front *yard*, street side yard, *street yard* area, parking area, landscaped area, or any other area required by the Municipal Code to be constructed or maintained unencumbered according to fire or other applicable building or public safety laws.
  - (3) Material storage areas shall be accessible to occupants and haulers.
  - (4) *Premises* served by an *alley* shall provide material storage areas that are directly accessible from the *alley*.
  - (5) One *sign* identifying the material storage area is required for each area and shall be posted on the exterior of the material storage area near the point of access. The maximum *sign copy area* permitted for each *sign* shall be one square foot.
  - (6) For commercial *development* on *premises* not served by an *alley*, material storage areas shall be located at least 25 feet from any *street* or sidewalk.
- (c) *Screening* of Material Storage Areas. Material storage areas located outside any *structure* shall be *screened* with a minimum 6-foot-high solid *screening* enclosure that is designed to be architecturally consistent with the primary *structure*. Refuse, *recyclable material*, and material storage containers shall not exceed the height of the solid *screening* enclosure.

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

(Amended 11-28-2005 by O-19444 N.S.; effective 2-9-2006.)

(Amended 11-13-08 by O-19799 N.S; effective 12-13-2008.)

**§142.0820 Refuse and Recyclable Materials Storage Regulations for Residential Development**

Applicable residential *development* in accordance with Section 142.0805, shall provide interior and exterior refuse and recycling storage areas as specified below:

- (a) Interior Refuse and *Recyclable Material* Storage. Each *dwelling unit* shall be equipped with an interior refuse and *recyclable material* storage area.
- (b) Exterior Refuse and *Recyclable Material* Storage. Each *structure* that contains *dwelling units* shall provide at least one exterior storage area. The total storage areas requirement is based on the number of *dwelling units* in the *development* as shown in Table 142-08B and includes the sum of all residential material storage areas located outside of individual *dwelling units*.

**Table 142-08B  
Minimum Exterior Refuse and  
Recyclable Material Storage Areas for  
Residential Development**

Number of Dwelling Units Per Development	Minimum Refuse Storage Area Per Development (Square Feet)	Minimum <i>Recyclable Material</i> Storage Area Per Development (Square Feet)	Total Minimum Storage Area Per Development (Square Feet)
2-6	12	12	24
7-15	24	24	48
16-25	48	48	96
26-50	96	96	192
51-75	144	144	288
76-100	192	192	384
101-125	240	240	480
126-150	288	288	576
151-175	336	336	672
176-200	384	384	768
201+	384 plus 48 square feet for every 25 dwelling units above 201	384 plus 48 square feet for every 25 dwelling units above 201	768 plus 96 square feet for every 25 dwelling units above 201

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

(Amended 3-1-2006 by O-19468 N.S.; effective 4-1-2006.)

(Amended 11-13-08 by O-19799 N.S; effective 12-13-2008.)

**§142.0830 Refuse and Recyclable Material Storage Regulations for Nonresidential Development**

- (a) All new nonresidential *development*, or additions to existing commercial or industrial *development* where the *gross floor area* would be increased by 30 percent or more, shall provide at least one exterior refuse and *recyclable material* storage area for each building. The total storage area requirement is based on the *gross floor area* of the nonresidential buildings on the *premises*, as shown in Table 142-08C and includes the sum of all nonresidential refuse and recyclable material storage areas.
- (b) Where a *development* includes residential as part of a mixed use project, the *development* shall provide refuse and *recyclable material* storage for the residential portion of the project in accordance with Table 142-08B, in addition to the storage areas required by Table 142-08C for the nonresidential *development*.

**Table 142-08C**  
**Minimum Exterior Refuse and Recyclable Material Storage Areas**  
**for Nonresidential Development**

<b>Gross Floor Area Per Development</b> (Square Feet)	<b>Minimum Refuse Storage Area Per Development</b> (Square Feet)	<b>Minimum <i>Recyclable</i> Material Storage Area Per Development</b> (Square Feet)	<b>Total Minimum Area Per Development</b> (Square Feet)
0-5,000	12	12	24
5,000-10,000	24	24	48
10,001-25,000	48	48	96
25,001-50,000	96	96	192
50,001-75,000	144	144	244
75,001-100,000	192	192	384
100,001+	192 plus 48 square feet for every 25,000 square feet of building area above 100,001	192 plus 48 square feet for every 25,000 square feet of building area above 100,001	384 plus 96 square feet for every 25,000 square feet of building area above 100,001

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)  
(Amended 11-13-08 by O-19799 N.S; effective 12-13-2008.)

# APPENDIX 4

CONSTRUCTION & DEMOLITION

DEBRIS DIVERSION PROGRAM



**Article 6: Collection, Transportation and Disposal of Refuse and Solid Waste****Division 6:****Construction and Demolition Debris Diversion Deposit Program**

*(“Construction and Demolition Debris Diversion Deposit Program” added 10-10-2005 by O-19420 N.S.; effective until a certified recycling facility which accepts mixed construction and demolition debris is operating in the City at a 50% diversion rate.)*

*(Amended 12-18-2007 by O-19694 N.S; effective 1-17-2008.)*

**§66.0601 Findings**

The Council of the City of San Diego finds and declares that:

- (a) The City operates the Miramar Landfill, which is currently the only municipal landfill in the City. The Miramar Landfill currently is expected to close between 2011 and 2013. Preserving landfill capacity at the Miramar Landfill in order to extend the useful life of the Miramar Landfill for the citizens of the City is a paramount concern.
- (b) The City has made and continues to make progress in meeting the waste *diversion* requirements imposed by AB 939, but additional efforts, particularly in the *diversion* of *construction and demolition debris*, will assist the City in continuing to meet the goal of *diverting* 50% of its waste from landfill *disposal*.
- (c) Studies show that approximately 35% of the waste generated in the City of San Diego delivered for *disposal* is *construction and demolition debris*, which could be *diverted* from landfill *disposal*.
- (d) Efforts by the City and the private sector to encourage voluntary *construction and demolition debris diversion* have not been as successful as the City had hoped and additional efforts are necessary to ensure continued compliance with AB 939 requirements.

(12-2007)

- (e) *Construction and demolition debris diversion* deposit programs in other jurisdictions in the State, similar to the one implemented by this Division, have proven successful in increasing *diversion of construction and demolition debris* and have been favorably received by the California Integrated Waste Management Board.

(Added 10-10-2005 by O-19420 N.S; effective 1-17-2008.)

(Amended 12-18-2007 by O-19694 N.S; effective 1-17-2008.)

#### **§66.0602 Purpose of Construction and Demolition Debris Diversion Deposit Program**

The purpose of this Division is to establish the Construction and Demolition Debris Diversion Deposit Program. This program is intended to increase the *diversion of construction and demolition debris* from landfill *disposal*, conserve the capacity and extend the useful life of the Miramar Landfill, and avoid the potential financial and other consequences to the City of failing to remain in compliance with AB 939 requirements.

(Added 10-10-2005 by O-19420 N.S; effective 1-17-2008.)

(Amended 12-18-2007 by O-19694 N.S; effective 1-17-2008.)

#### **§66.0603 Definitions**

All defined terms in this Division appear in *italics* and are found in sections 11.0210, 66.0102, and 113.0103 of this Code, except for the terms Building Permit and Demolition/Removal Permit which refer to those terms respectively as used in the Land Development Code and which, consistent with the Land Development Code, are not italicized in this Division. In addition, whenever the following words or phrases are used in this Division, they mean:

*AB 939* means the California Integrated Waste Management Act, codified at California Public Resources Code sections 40000 et seq.

*Certified recycling facility* means a recycling, composting, materials recovery or reuse facility which accepts *construction and demolition debris* and which has been certified by the *Director* pursuant to rules promulgated by the *Director*.

(12-2007)

*Construction and demolition debris* means the waste building materials, packaging, and rubble resulting from construction, remodeling, repair, alteration, and/or demolition operations on pavements, houses, commercial buildings, and other *structures* and may include, but is not limited to, concrete, asphalt, wood, metals, bricks, dirt, rocks, and other inert waste.

*Director* means the Director of the Environmental Services Department (and its successor) or the designee of the Director of the Environmental Services Department (and its successor).

*Disposal* means the final deposition of *solid waste* at a permitted landfill.

*Diversion* or *Divert* means the reduction or elimination of *solid waste* from landfill *disposal*.

*Hazardous waste* has the same meaning as set forth in section 66.0102 of this Code.

*Solid Waste* means all putrescible and nonputrescible solid, semisolid, and liquid wastes, including, but not limited to, garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, *construction and demolition debris*, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. *Solid Waste* does not include hazardous waste, hazardous substances or medical wastes, as those terms are defined in this Chapter 6 or in State or Federal law.

*Waste Management Form Part I* means the form prepared by the City Manager on which an *applicant* for a Building Permit or Demolition/Removal Permit shall provide information including, but not limited to, the types and amounts of *construction and demolition debris* the *applicant* anticipates the *development* will generate and the expected *construction and demolition debris diversion* the *applicant* expects to achieve for that *development*.

*Waste Management Form Part II* means the form prepared by the City Manager on which the *applicant* for a Building Permit or Demolition/Removal Permit shall provide information including, but not limited to, the name and address of the *person* to whom a deposit refund, if any, shall be issued, as well as documentary evidence in a form satisfactory to the *Director* demonstrating the *construction and demolition debris diversion* the *applicant* achieved for the *development*.

(Added 10-10-2005 by O-19420 N.S; effective 1-17-2008.)

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**§66.0604 Submittal of Waste Management Form and Diversion Deposit**

Beginning on the 45th day after the City has notified the public, in the manner described in section 66.0606(e), that a *certified recycling facility* which accepts mixed *construction and demolition debris* is operating at a 50% *diversion* rate, within 25 miles of the City Administration Building located at 202 “C” Street, San Diego, or beginning on July 1, 2008, whichever is later:

- (a) All *applicants* for a Building Permit or a Demolition/Removal Permit, including the City of San Diego, shall submit a properly completed *Waste Management Form Part I* with the Building Permit or Demolition/Removal Permit application, in accordance with the requirements set forth in the Land Development Manual; and
- (b) All *applicants*, including the City of San Diego, shall pay a refundable deposit at the time the Building Permit or Demolition/Removal Permit is issued; and
- (c) No Building Permit or Demolition/Removal Permit shall be issued unless the *applicant* has submitted a properly completed *Waste Management Form Part I* and paid the required deposit.

(Added 10-10-2005 by O-19420 N.S; effective 1-17-2008.)

(Amended 12-18-2007 by O-19694 N.S; effective 1-17-2008.)

**§66.0605 Establishment of Construction and Demolition Debris Diversion Deposits**

The City Council shall establish by resolution a schedule of *construction and demolition debris diversion* deposits applicable to Building Permits and to Demolition/Removal Permits. The schedule shall be reviewed and adjusted periodically to ensure the purposes of this Division are met.

(Added 10-10-2005 by O-19420 N.S; effective 1-17-2008.)

**§66.0606 Entitlement to Refund of Diversion Deposit**

- (a) An *applicant* is eligible for a refund of the deposit paid pursuant to Section 66.0604(b) provided the *applicant* submits the following directly to the *Director* within 180 days of the final inspection date for the *development* for which the deposit was paid:
  - (1) A properly completed *Waste Management Form Part II*, in accordance with the requirements set forth in the Land Development Manual, which demonstrates the *construction and demolition debris diversion* the *applicant* achieved for the *development*.
  - (2) Evidence satisfactory to the *Director* that the *construction and demolition debris* generated by the *development* was *diverted*, at the applicable *diversion* rate set forth in Section 66.0606(d) below, by one or more of the following methods:
    - (a) on-site reuse of the *construction and demolition debris*;
    - (b) acceptance of the *construction and demolition debris* by a *certified recycling facility*; or
    - (c) other donation or reuse of the *construction and demolition debris* acceptable to the *Director*.

For a commercial *development*, such as a shopping center, with a master developer which manages solid waste generated by the *development* as a whole and which has multiple commercial or retail tenants who may construct their own tenant improvements, the evidence satisfactory to the *Director* described in section 66.0606(a)(2) may include receipts from a *certified recycling facility(ies)* showing the cumulative weight or volume of *construction and demolition debris diverted* from the *development* within the 30 calendar days prior to the final inspection date referred to in section 66.0606(a).

- (b) *Construction and demolition debris* shall be measured by weight or by volume, whichever is most accurate and practicable. To the extent practicable, all *construction and demolition debris* shall be weighed on a scale.
  - (1) For *construction and demolition debris* which is weighed, the *applicant* shall use a scale which is in compliance with all federal, state, and local regulatory requirements for accuracy and maintenance of such scale.

- (2) For *construction and demolition debris* for which measurement by weight is not practicable, the *applicant* shall measure by volume and convert the volumetric measurements to weight using the standardized rates established in the City Construction and Demolition Debris Conversion Rate Tables.
- (3) The *Director* reserves the right, when appropriate, to establish standard weights for various types of *construction and demolition debris* items based upon accepted average weights for such items. These standard weights shall be listed in the City Construction and Demolition Debris Conversion Rate Tables.
- (c) Refunds will be based on proof, satisfactory to the *Director*, of the *construction and demolition debris diversion* the *applicant* achieved for the *development* for which the deposit was paid.
- (d) If the *Director* determines the applicant is entitled to a refund, the amount of the refund shall be in the same proportion to the deposit paid by the *applicant* as the *diversion* rate achieved for the *development* is to the applicable *diversion* rate set forth below:
- (1) For Building Permits or Demolition/Removal Permits issued on or after the actual effective date of Section 66.0604 through and including 180 calendar days from the actual effective date of Section 66.0604, the *diversion* rate shall be 50% by weight of the total *construction and demolition debris* generated by the *development*; and
- (2) For Building Permits or Demolition/Removal Permits issued after 180 calendar days from the actual effective date of Section 66.0604, the *diversion* rate shall be 75% by weight of the total *construction and demolition debris* generated by the *development*, provided that a *certified recycling facility* which accepts mixed *construction and demolition debris* is operating within 25 miles of the City Administration Building located at 202 "C" Street, San Diego, at a 75% *diversion* rate as of 181 calendar days from the actual effective date of Section 66.0604. If such a facility is not in operation as of 181 calendar days from the actual effective date of Section 66.0604, the *diversion* rate shall remain as set forth in Section 66.0606(d)(1) until 30 days after the City has notified the public that such a facility is available, at which time the *diversion* rate shall increase to 75% by weight of the total *construction and demolition debris* generated by the *development*



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- (e) Notice under this Division may be given by placing a display advertisement of at least one-eighth page in a newspaper of general daily circulation within the City.
- (f) The *Director* shall determine whether a *certified recycling facility* has reached a certain *diversion* rate.
- (g) The *Director* shall refund a deposit paid or collected in error.
- (h) If a Building Permit or Demolition/Removal Permit, for which a deposit has been paid, is subsequently cancelled, abandoned or expires before work on the *development* has commenced, the *Director* shall refund the deposit paid by the *applicant* upon the *applicant's* submittal to the *Director* of satisfactory proof of the cancellation, abandonment or expiration of the permit.
- (i) The *Director* shall issue the refund to the *applicant* within the time established by City Council resolution.
- (j) In no event shall the refund be in an amount greater than the deposit paid by the *applicant*.

(Added 10-10-2005 by O-19420 N.S; effective 1-17-2008.)

(Amended 12-18-2007 by O-19694 N.S; effective 1-17-2008.)

#### **§66.0607 Certified Recycling Facilities**

- (a) After at least one public hearing, the *Director* shall establish rules and regulations for certifying facilities inside or outside the City for purposes of this Division including, but not limited to, criteria for determining the *diversion* rate achieved by the facility and for verifying that the facility has obtained all applicable permits and licenses. The *Director* shall publish in the official City newspaper a notice of the adoption or amendment of these rules and regulations. The *Director* shall certify facilities in accordance with those rules and regulations.

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- (b) Within ten working days after publication of the notice adopting the proposed rules and regulations pursuant to Section 66.0607(a), any person in disagreement with the proposed rules and regulations may request in writing to the *Director* that proposed rules and regulations be considered by the City Manager or designee. The proposed rules and regulations shall be considered by the City Manager or designee, who shall issue a written decision respecting the proposed rules and regulations within thirty days of the *Director's* receipt of the written request. The decision of the City Manager or designee with respect to the rules and regulations shall be final.

(Added 10-10-2005 by O-19420 N.S; effective 1-17-2008.)

(Amended 12-18-2007 by O-19694 N.S; effective 1-17-2008.)

#### § 66.0608 Diversion Deposit Program Exemptions

- (a) The following activities, alone or in combination with one another, are exempt from this Division, except if the activity or activities is/are undertaken in conjunction with *development* which otherwise is subject to this Division:
- (1) Roofing projects that do not include the tear-off of the existing roof.
  - (2) Installation, replacement, or repair of a *retaining wall*.
  - (3) Installation, replacement, or repair of a carport, patio cover, balcony, trellis, or fireplace.
  - (4) Installation, replacement, or repair of a deck.
  - (5) Installation, replacement, or repair of a *fence*.
  - (6) Installation, replacement, or repair of a swimming pool or a spa.
  - (7) Installation, replacement, or repair of a pre-fabricated *sign* which does not require modification to the *structure* to which the *sign* is attached.
  - (8) Installation, replacement, or repair of storage racks.
  - (9) *Development* which requires only an electrical permit, only a plumbing permit, or only a mechanical permit.

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(b) The following activities are exempt from this Division:

- (1) *Development* which is expected to generate only *hazardous waste* and/or *hazardous substances*.
- (2) *Development* for which the *construction and demolition debris* deposit is less than \$200 as calculated by the Development Services Department or its successor.

(Added 10-10-2005 by O-19420 N.S; effective 1-17-2008.)

(Amended 12-18-2007 by O-19694 N.S; effective 1-17-2008.)

### **§66.0609 Unrefunded Diversion Deposits and Accrued Interest**

A deposit which is not refunded or claimed in accordance with this Division is the property of the City. For purposes of each and every deposit and all interest accrued thereon, the relationship between the *applicant* and the City is that of debtor-creditor, respectively. All interest accruing on each deposit is the property of the City, and the *applicant* shall have no claim upon the interest.

(Added 10-10-2005 by O-19420 N.S; effective 1-17-2008.)

### **§66.0610 Use of Diversion Deposits and Accrued Interest**

All deposits and accrued interest thereon shall be deposited into the Recycling Fund created pursuant to section 66.0135 of this Code. All deposits and accrued interest thereon shall be used solely and exclusively for the following purposes:

- (a) payment of deposit refunds, as determined by the *Director*;
- (b) payment of administrative costs of the Construction and Demolition Debris Diversion Program established by this Division;
- (c) payment of costs of programs designed to encourage *diversion* of *solid waste* from landfill *disposal*;
- (d) payment of costs of programs designed to develop or improve the infrastructure to *divert solid waste* from landfill *disposal*; or
- (e) payment of costs to develop or improve infrastructure to *divert solid waste* from landfill *disposal*.

(Added 10-10-2005 by O-19420 N.S; effective 1-17-2008.)