



WATER QUALITY TECHNICAL REPORT
CANYON OAKS

San Dimas, California

Prepared For
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OWNER CERTIFICATION

STANDARD URBAN STORMWATER MITIGATION PLAN

This Standard Urban Stormwater Mitigation Plan has been prepared for NJD Limited by FUSCOE ENGINEERING, INC. It is intended to comply with the requirements of the County of Los Angeles National Pollution Discharge Elimination Permit (Order No. 01-182, NPDES Permit No. CAS004001) issued by the Los Angeles Regional Water Quality Control Board. The undersigned is authorized to approve implementation of the provisions of this plan as appropriate and will strive to have the plan carried out by successors consistent with the County of Los Angeles SUSMP for Stormwater Management and the intent of the NPDES storm water program requirements.

Signature

Richard K. Jemison, Sr.

Name

NJD Limited
26152 Oroville Place
Laguna Hills, CA 92653

Date

General Partner

Title

I. INTRODUCTION

Prior to issuance of any grading permits, the applicant shall submit a Stormwater Pollution Prevention Plan (SWPPP) program acceptable to the City Engineer to comply with the latest National Pollutant Discharge Elimination System (NPDES) Stormwater Regulations. The project shall incorporate both construction and operational Best Management Practices to minimize construction and urban pollutants in stormwater runoff. If required, the applicant shall obtain a State Water Resources Board General Construction Activities Storm Water Permit. The Engineering Department shall monitor compliance.

This SUSMP covers the post-construction operations on Canyon Oaks, in the City of San Dimas, California (see Figure 1, Vicinity Map). It has been developed as required under State Water Resources Control Board (SWRCB) Municipal NPDES Storm Water Permit for the County of Los Angeles and the Incorporated Cities of Los Angeles County, and in accordance with good engineering practices.

This SUSMP shall identify, at a minimum, the routine resources specified in the Countywide Development Planning for Stormwater Management, which details implementation of BMP's whenever they are applicable to a project; the assignment of long-term maintenance responsibilities; and show the Design Plan that will be implemented in order to mitigate post-construction stormwater runoff pollution.

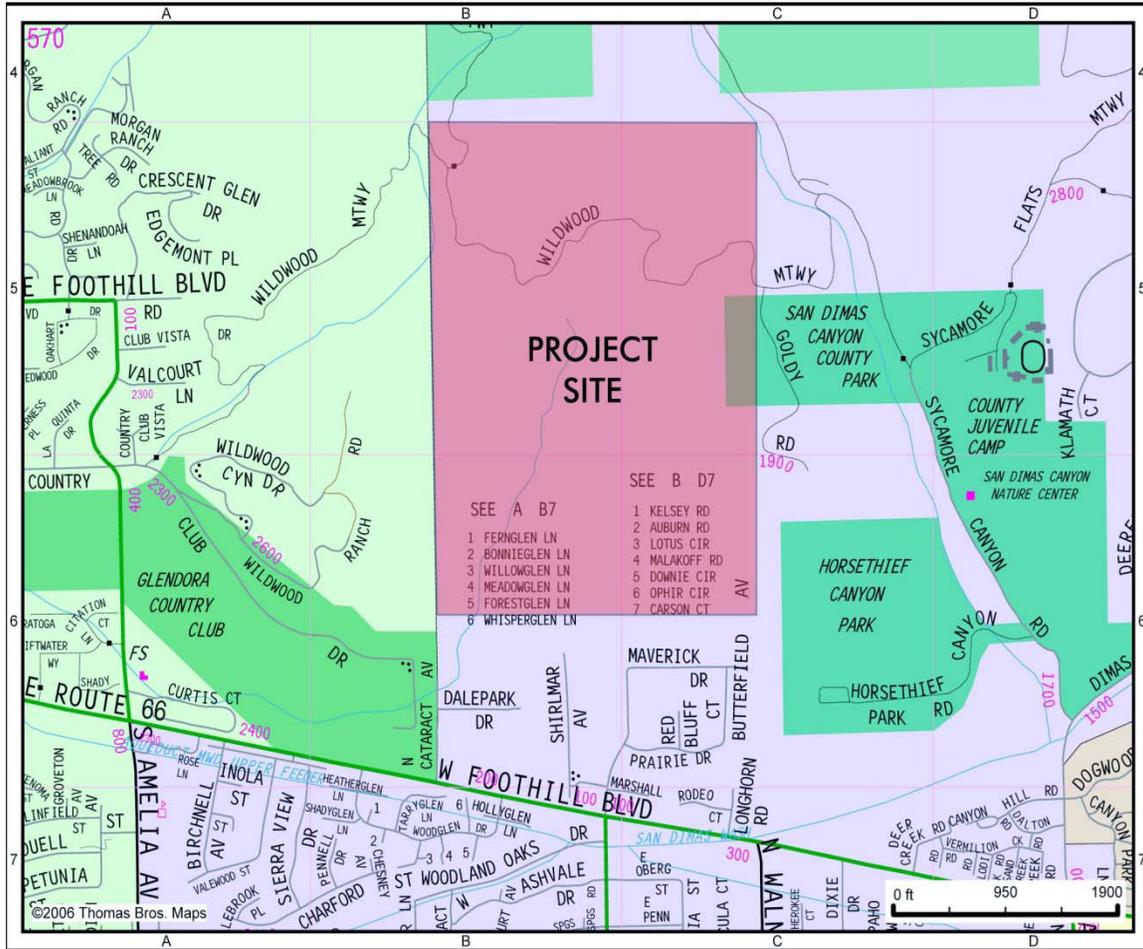


Figure 1 Vicinity Map

II. EXISTING SITE DESCRIPTION

The proposed Canyon Oaks project site is a 318.48-acre parcel located in the City of San Dimas, CA. The project site is bounded by open space within the City of Glendora on the west, the Angeles National Forest to the north, open space within the City of San Dimas to the east and residential lots north of Maverick Drive and Dalepark Drive to the south.

The project site is located within the San Gabriel River watershed. The San Gabriel River watershed is located in the eastern portion of Los Angeles County. It is bound by the San Gabriel Mountains to the north, most of San Bernardino/Orange County to the east, the division of the Los Angeles River from the San Gabriel River to the west, and the Pacific Ocean to the south. The watershed is composed of approximately 640 square miles of land spanning over 37 cities with 26% of its total area developed.

The watershed drains into the San Gabriel River from the San Gabriel Mountains flowing 58 miles south until its confluence with the Pacific Ocean. Major tributaries to the San Gabriel River include Walnut Creek, San Jose Creek, Coyote Creek, and numerous storm drains entering from the 19 cities that the San Gabriel River passes through. Channel flows pass through different sections in the San Gabriel River, diverting from the riverbed into four different spreading grounds, held behind several rubber dams for controlled flow and ground water recharge, and controlled through 10 miles of concrete channel bottom from below Whittier Narrows Dam to past Coyote Creek.

Under existing conditions, the project site is undeveloped open space for the most part. There are equestrian uses on site. Adjacent land uses include open space to the east and west, the Angeles National Forest to the north and single family residential to the south.

Current land use is as single family very low estate with a density of 0 to 0.2 per acre. Zoning is SP-25 or specific plan.

Soil type is type 080 per County of Los Angeles soil type maps.

Prior to construction, 1% of the site is impervious, being mostly undeveloped. There are no on-site drainage facilities. The northern portion of the site drains to the west into the City of Glendora. The southeasterly portion of the site drains southerly into a drainage easement for the City of San Dimas where it flows southerly until it is picked up in catch basins on San Dimas Avenue near its intersection with Prairie Drive. The remainder of the site flows southwesterly down Shuler Canyon until it flows into the end of Cataract Street and is picked up by two catch basins and transported onto the Glendora Golf Course in the City of Glendora.

III. PROJECT DESCRIPTION

The proposed project includes the development of 61 low-density residential lots ranging in size from 0.44 ac to 17.8 acre lots, with an average lot size of 2 acres. Additional utilities, drainage improvements, and landscaping is also proposed. Debris basins will be located around the development areas to capture off-site runoff and divert it through the project site, and on-site water quality basins are proposed to provide treatment of runoff from the development areas. In addition, one large debris basin is proposed at the downstream end to provide detention of storm flows and additional water quality treatment.

Overall, the existing drainage patterns will be maintained. Off-site runoff will be routed through the site via separate storm drain lines, and discharged at multiple locations to maintain the existing flowpaths of the canyons. Energy dissipaters are proposed to reduce potential for erosion and scour within the existing flowpaths. On-site runoff will be collected by a separate storm drain system and routed to water quality basins for treatment of low-flow and first-flush runoff. Two water quality basins are proposed, located in the southern portions of the site. Refer to the Proposed Hydrology Map included in Appendix 3 for locations of the major drainage facilities.

The topography of the site precludes the use of swales, being much too steep for any effective treatment. Infiltration basins would not be feasible due to the topography and the proximity of fill slopes. Further details on the selection of treatment control BMPs is provided in Section IV.

The proposed project will disturb approximately 80 acres of the 318 acre site. The 80 acres will become 21% (LA County Hydrology – single family homes estate) impervious instead of the 1% impervious of the undeveloped site.

IV. SUSMP PROJECT CATEGORIES

Listed in the table below are the project categories subject to SUSMP requirements. Those categories that apply to the proposed project are indicated by a check mark on the left-hand column.

CHECK BELOW (IF APPLICABLE)	PROJECT CATEGORIES
✓	1. Single Family Hillside Residences*
✓	2. Housing Developments (including, but not limited to, single-family homes, multi-family homes, condominiums, and apartments) of ten or more units
	3. Industrial/commercial developments of one acre or more of impervious surface area
	4. Automotive service facilities (SIC 5013, 5014, 5541, 7532-7534, 7536-7539)**
	5. Retail Gasoline Outlets**
	6. Restaurants (SIC 5812)**
	7. Parking Lots with 5,000 square feet or more of surface area, including accessory driveways, or with 25 or more parking spaces, and potentially exposed to stormwater runoff.
	8. Projects located in, directly adjacent to, or discharging directly to a designated ESA
*	Single-family hillside residential developments with less than one acre of impervious surface area are excluded from the numerical Structural and Treatment Control BMP design standard requirements.
**	Projects in these categories with less than 5,000 sq. ft. of impervious surface area are excluded from the numerical Structural and Treatment Control BMP design standard requirements.

The proposed project consists of 10 or more single family hillside residential lots. The proposed project, therefore, qualifies as the following project Categories: 1 and 2.

BMP SELECTION

The BMP matrix provided on the following page lists the project categories in the SUSMP that are applicable to the project site. Based on the pollutants that are anticipated to be generated when the Canyon Oaks Project is completed and in use, applicable, required, or suggested treatment and source control BMPs are correspondingly listed for each category. This report is responsible for determining, evaluating, and selecting the appropriate and applicable measures to treat the targeted pollutants to the MEP standard. One or a combination of two or more suggested treatment control BMPs can be selected as deemed applicable.

The proposed project is a hillside housing development (1 & 2). The anticipated pollutants for the project include nutrients, trash, debris, O&G, nutrients, metals and sediment.

BMP MATRIX FOR SUSMP PROJECT CATEGORIES (Excerpted from City of LA WPD's BMP Handbook)

PROJECT CATEGORY	ANTICIPATED POLLUTANT GENERATED	SUSMP PROVISIONS AND REQUIREMENTS														
		SOURCE CONTROL BMPs(a)														TREATMENT CONTROL BMPs (b) (c)
		Peak Stormwater Runoff Discharge Rates	Conserve Natural Areas	Minimize Stormwater Pollutants of Concern	Protect Slopes & Channels	Provide Storm Drain System Stenciling & Signage	Properly Design Outdoor Material Storage Areas	Properly Design Trash Storage Areas	Provide Proof of Ongoing BMP Maintenance	Properly Design Loading/Unloading Dock Areas	Properly Design Repair/Maintenance Bays	Properly Design Vehicle/Equipment/Accessory Wash Areas	Properly Design Fueling Area	Properly Design Parking Area	Properly Design to Limit Oil Contamination and Perform Maintenance	Design Standards for Treatment Control BMP(a) (b)
7. Home Subdivision (10 or more units)	Nutrients, trash, debris, O&G, nutrients, metals, sediment	R	R	R	R	R	R	R	R						R	S
8. Single-Family Hillside Residences (≥ 1 acre)	Nutrients, trash, debris, O&G, nutrients, metals, sediment	R	R	R	R	R	R	R	R						R	S

BMPs – Best Management Practices
 S – Select one or more applicable and appropriate treatment control BMPs from this list.
 SUSMP – Standard Urban Stormwater Mitigation Plan
 sf – square feet
 (a) Refer to Appendix B of the BMP Handbook for detailed information.
 (b) Refer to Appendix G of the BMP Handbook for design standards to be used for treatment control BMPs.

R – Required if applicable
 HC – Hydrocarbons
 O&G – Oil & Grease
 * Case by case basis for use in San Fernando Valley Watershed
 (c) Plumbing permits will be required for BMPs such as grease traps, sump pumps, and clarifiers.
 (d) Refer to Appendix D of the BMP Handbook for detailed information.

SOURCE CONTROL BMPS

Source control BMPs are required to be incorporated in all new development and redevelopment projects unless not applicable. The table below indicates all BMPs to be incorporated in the project. For those designated as not applicable (N/A), a brief explanation why is provided.

The specific source control BMPs for the Canyon Oaks Project include:

INCORPORATED SOURCE CONTROL BMP:	YES	N/A	DESCRIPTION
Peak Stormwater Runoff Discharge Rates	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Because of downstream constraints, the storm peaks will be attenuated using debris/detention basin at the southwesterly discharge point. This is in addition to smaller water quality and debris basins located throughout the project site to further reduce peak runoff rates.
Conserve Natural Areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The site will be designed to conserve natural areas. An environmental consultant has been engaged for this purpose.
Minimize Stormwater Pollutants of Concern	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Water quality basins have been recommended as the selected BMP for this project (subject to approval of the soils engineer/geologist and verification of appropriate percolation rates.)
Protect Slopes & Channels	<input checked="" type="checkbox"/>	<input type="checkbox"/>	All manufactured slopes will be re-vegetated. All areas where flows are re-introduced to channels will be armored with appropriate rip-rap pads.
Provide Storm Drain System Stenciling & Signage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	All storm drain inlets will be stenciled or signed per LA County standards.
Properly Design Outdoor Material Storage Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None proposed for site project.
Properly Design Trash Storage Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	There will be no central trash storage areas. Single family homes will be responsible for trash can storage on individual lots.
Provide Proof of Ongoing BMP Maintenance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	An HOA will be formed once the project has been completed. Until such time, the owner/developer will be responsible for BMP maintenance.
Properly Design Loading/Unloading Dock Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None proposed for site project.
Properly Design Repair/Maintenance Bays	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None proposed for site project.
Properly Design Vehicle/ Equipment/ Accessory Wash Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None proposed for site project.

INCORPORATED SOURCE CONTROL BMP:	YES	N/A	DESCRIPTION
Design Standards for Treatment Control BMPs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	County of LA standards are to be followed for design. Details are provided in Appendix 3.

EQUESTRIAN RELATED BMPS

Due to the equestrian activities proposed for the project site, additional source control BMPs will be implemented to minimize the generation of bacteria, sediment, and nutrients in storm water runoff. Potential impacts from equestrian activities will be controlled through facility design, collection and storage of manure, and grooming (i.e. washwater management). The BMPs for equestrian activities are summarized below.

- Use designated trails for horse riding. Restrict horse access within creek, utilizing bridges for crossing.
- All unpaved and paved surfaces shall be swept and cleaned regularly to assure regular manure removal and disposal. Manure shall be removed from trails, corrals, arenas and other exposed areas on a daily basis.
- Manure shall be removed daily, or kept in a covered manure storage area that is located away from drainage courses. Manure storage area will be graded to minimize contact with runoff, stored on an impervious surface, and shall be covered to minimize contact with precipitation. Manure shall not be kept on-site for more than one week.
- Within the stable areas where horses are kept, bedding will be provided to capture as much urine as possible, which will be disposed of in a trash storage area that is covered and elevated to protect urine from rainfall and potential surface runoff.
- Ensure that chemicals and other contaminants handled on-site are not disposed of in any manure, litter, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants

The Project Owner will be responsible for maintaining the BMPs listed above to ensure adequate protection of receiving waters from pollutants associated with equestrian activities. Proof of on-going maintenance is required in accordance with LA County SUSMP requirements, including but not limited to, inspection, documentation, and reporting requirements, where applicable.

TYPICAL WATER QUALITY SITE DESIGN & MAINTENANCE MEASURES FOR EQUESTRIAN AREAS

Note: Features are typical for a medium-sized concentrated animal feeding operation (CAFO) horse facilities per EPA regulations. Source: "Equestrian Related Best Management Practices." Prepared by the County of Orange, June 2004.

Trails & Access to Water Bodies

- Provide bridges over water bodies, or designate access points to reduce erosion
- Trail should meander along slope to avoid erosion
- Construct berms to direct water away from trail
- Water should sheet flow across trail to buffer zones, not parallel and not accept run-on
- Provide buffer area between trails and water

The following source control BMP fact sheets are provided in Appendix 9 of this report as a reference to the design plans and/or specifications for the Canyon Oaks Project:

- SD-10 Site Design & Landscape Planning
- SD-11 Roof Runoff Controls
- SD-12 Efficient Irrigation
- SD-13 Storm Drain Signage

SITE DESIGN BMPs

The following table describes the site design BMPs used in this project and the methods used to incorporate them. Careful consideration of site design is a critical first step in storm water pollution prevention from new developments and redevelopments.

SITE DESIGN CONCEPT 1: MINIMIZE STORM WATER RUNOFF, MINIMIZE PROJECT'S IMPERVIOUS FOOTPRINT, AND CONSERVE NATURAL AREAS			
DESIGN CONSIDERED: SPECIFIC BMP	YES	NO	DESCRIPTION
Maximize permeable area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Approximately 25% of the site will be disturbed. The other portion will be preserved in its natural state.
Conserve natural areas.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Approximately 25% of the site will be disturbed. The other portion will be preserved in its natural state.
Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets, and other low-traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The project is to produce lots for sale for single family homes. Purchasers will be provided with materials encouraging the use of pervious materials for landscape/hardscape.
Construct streets, sidewalks, and parking lot aisles to the minimum widths necessary, provided that public safety and a pedestrian friendly environment are not compromised ¹ . Incorporate landscaped buffer areas between sidewalks and streets.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Proposed streets are to be the minimum width approved by the City of San Dimas.
Reduce widths of street where off-street parking is available ² .	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Proposed streets are to be the minimum width approved by the City of San Dimas.
Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought-tolerant trees and large shrubs.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Approximately 75% of the existing site will be left in its natural state. The environmental consultant will advise on any needed mitigation.
Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The project is to produce lots for sale for single family homes. Purchasers will be provided with materials encouraging the use of pervious materials for landscape/hardscape.
Use of natural drainage systems.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Existing drainage pathways will be preserved for off-site runoff. In addition, water quality basins are proposed to provide treatment of runoff.

SITE DESIGN CONCEPT 1: MINIMIZE STORM WATER RUNOFF, MINIMIZE PROJECT'S IMPERVIOUS FOOTPRINT, AND CONSERVE NATURAL AREAS			
DESIGN CONSIDERED: SPECIFIC BMP	YES	NO	DESCRIPTION
Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration ³ .	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The project is to produce lots for sale for single family homes. Purchasers will be provided with materials encouraging the use of pervious materials for landscape/hardscape.
Construct on-site ponding areas, rain gardens, or retention facilities to increase opportunities for infiltration, while being cognizant of the need to prevent the development of vector breeding areas.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Both debris basins and water quality basins will provide opportunities for infiltration.
Other comparable site design options that are equally effective.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None proposed.
1. Sidewalk widths must still comply with Americans with Disabilities Act regulations and other life safety requirements. 2. However, street widths must still comply with life safety requirements for fire and emergency vehicle access. 3. However, projects must still comply with hillside grading ordinances that limit or restrict infiltration of runoff. Infiltration areas may be subject to regulation as Class V injection wells and may require a report to the US EPA.			

SITE DESIGN CONCEPT 2: MINIMIZE DIRECTLY CONNECTED IMPERVIOUS AREAS			
DESIGN CONSIDERED: SPECIFIC BMP	YES	NO	DESCRIPTION
Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm drain.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The project is to produce lots for sale for single family homes. Purchasers will be provided with materials encouraging the use of pervious materials for landscape/hardscape.
Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The project is to produce lots for sale for single family homes. Purchasers will be provided with materials encouraging the use of pervious materials for landscape/hardscape.
Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The project is to produce lots for sale for single family homes. Purchasers will be provided with materials encouraging the use of pervious materials for landscape/hardscape.
USE ONE OR MORE OF THE FOLLOWING:			
Rural Swale System: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The site is too steep to utilize a swale system effectively.
Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/ biofilter.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The site is too steep to utilize a swale system effectively.

SITE DESIGN CONCEPT 2: MINIMIZE DIRECTLY CONNECTED IMPERVIOUS AREAS			
DESIGN CONSIDERED: SPECIFIC BMP	YES	NO	DESCRIPTION
Dual drainage system: first flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to municipal storm drain systems.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The site is too steep to utilize a swale system effectively.
Other comparable design concepts that are equally effective.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Water quality basins are proposed to provide treatment of storm water runoff.
USE ONE OR MORE OF THE FOLLOWING FOR THE DESIGN OF DRIVEWAYS AND PRIVATE RESIDENTIAL PARKING AREAS:			
Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the municipal storm drain system.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Where possible, shared driveways are proposed. Due to the topography, that is not always possible.
Uncovered temporary or guest parking on private residential lots may be paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the municipal storm drain system.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Individual lot design is to be per separate permit. Finished pad only is provided.
Other comparable design concepts that are equally effective.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Individual lot design is to be per separate permit. Finished pad only is provided.
USE ONE OR MORE OF THE FOLLOWING FOR THE DESIGN OF PARKING AREAS:			
Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No parking areas are proposed.
Overflow parking (parking stalls provided in excess of the minimum parking requirements) may be constructed with permeable paving.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No parking areas are proposed
Other comparable design concepts that are equally effective.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No parking areas are proposed

TREATMENT CONTROL BMPS

The following table describes County of Los Angeles approved treatment control BMPs that will be incorporated into this project. The treatment BMPs in this table are included in the project design to mitigate any pollutants of concern that were identified in the water quality planning process. If necessary, details describing the design of the BMPs will be provided below.

TREATMENT CONTROL BMPS			
INCORPORATED BMP	YES	N/A	DESCRIPTION
CATCH BASIN INSERT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
CATCH BASIN SCREENS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
INFILTRATION TRENCH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
INFILTRATION BASIN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
EXTENDED/DRY DETENTION BASIN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Two water quality basins are proposed to treat runoff from the development areas of the project site. In addition, one large detention basin is proposed at the downstream portion of the site to detain peak flows and provide additional treatment.
WET PONDS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
DRY WELL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
CISTERNS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VEGETATED SWALES AND STRIPS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
CONSTRUCTED WETLANDS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
BIORETENTION FACILITY	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
CONTINUOUS SEPARATION SYSTEMS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VORTEX/HYDRODYNAMIC SYSTEMS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
MEDIA FILTRATION	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
ON-LINE FILTRATION SYSTEMS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

TREATMENT CONTROL BMPS			
INCORPORATED BMP	YES	N/A	DESCRIPTION
CLARIFIERS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
OIL WATER SEPARATORS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
PRIMARY WASTEWATER TREATMENT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
OFF-LINE STORAGE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
RAIN DIVERSION SYSTEM	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
POROUS PAVEMENTS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
END-OF-PIPE SYSTEMS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Three water quality basins are proposed to treat runoff from the residential areas of the project. These basins will be located adjacent to Lot 48 and Lot 61, as well as in the downstream portion of the site. In addition, one detention basin is proposed at the downstream end of the project located along the main access road to the site. Water quality and detention basins are areas where excess storm water is stored or held temporarily and then slowly drains via infiltration, evaporation, and via a controlled outlet. As site runoff collects in the basin, contaminants such as nutrients, trash, and metals are settled or filtered out via infiltration, creating added benefit. The basin will have a water quality storage depth of 3 feet, and may be vegetated with drought tolerant species such as alkali heath, saltgrass, alkali mallow, and saltbush shrubs. If planted, temporary irrigation would likely be utilized to establish the vegetation due to long periods without rainfall. See Appendix 2 for further details on water quality and detention basins.

DESIGN STANDARDS FOR TREATMENT CONTROL BMPS

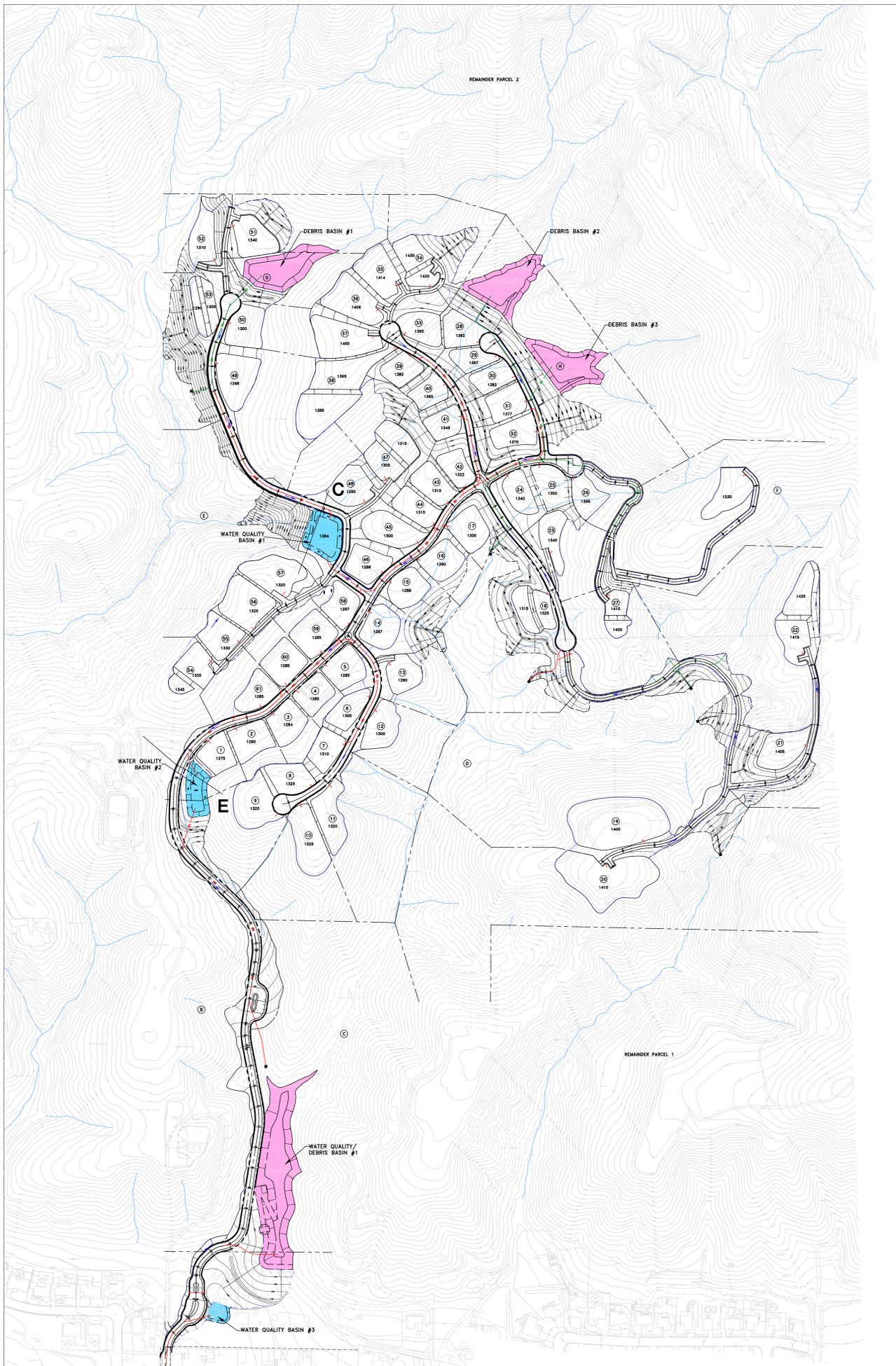
Treatment Control BMPs must incorporate, at a minimum, either a volumetric or flow based treatment control design standard, or both, to mitigate (infiltrate, filter, or treat) stormwater runoff. For the proposed treatment control BMPs selected for the project site, a volume-based design standard was utilized. Each of the selected treatment control BMPs have the capacity to treat:

THE VOLUME PRODUCED FROM 0.75 INCHES OF RAINFALL

Detailed volume calculations for the Canyon Oaks filtration basins are provided in Appendix 3 of this report. As illustrated in the table below, all treatment control BMPs selected for the project site meet the required minimum treatment flow rate for each of their respective

drainage areas. Refer to the SUSMP Exhibit on the following page for locations of the water quality basins.

BMP NAME	DIMENSIONS	MINIMUM TREATMENT REQUIREMENT	BMP TREATMENT CAPACITY
Water Quality Basin #1 (near Lot 48)	~24,500 ft ² top footprint 5 ft depth; 3:1 slopes 54.7 ac tributary area	50,633 ft ³	~96,600 ft ³
Water Quality Basin #2 (near Lot 61)	~17,670 ft ² top footprint 5 ft depth; 3:1 slopes 22.86 ac tributary area	21,160 ft ³	~60,800 ft ³
Water Quality Basin #3 (downstream)	~6,150 ft ² top footprint 2 ft depth, 3:1 slopes 2.95 ac tributary area	2,731 ft ³	~12,300
Off-Site Debris Basin #1	~39,400 ft ² top footprint Design Debris Event = 7,200 cy 20.81 ac tributary area		
Off-Site Debris Basin #2	~40,700 ft ² top footprint Design Debris Event = 3,360 cy 9.0 ac tributary area		
Off-Site Debris Basin #3	~39,400 ft ² top footprint Design Debris Event = 4,800 cy 12.14 ac tributary area		
Water Quality / Debris Basin #1	~86,600 ft ² top footprint Design Debris Event = 27,360 cy 92.36 ac tributary area		



LEGEND

- PROPOSED WATER QUALITY BASIN
- PROPOSED DEBRIS BASIN (OFF-SITE FLOW)
- RIPRAP/OUTLET PROTECTION
- PROPOSED OFF-SITE STORM DRAIN
- PROPOSED ON-SITE STORM DRAIN
- BMP DRAINAGE AREA
- EXISTING STREAM / NATURAL FLOWPATH
- DIRECTION OF FLOW (ON-SITE)

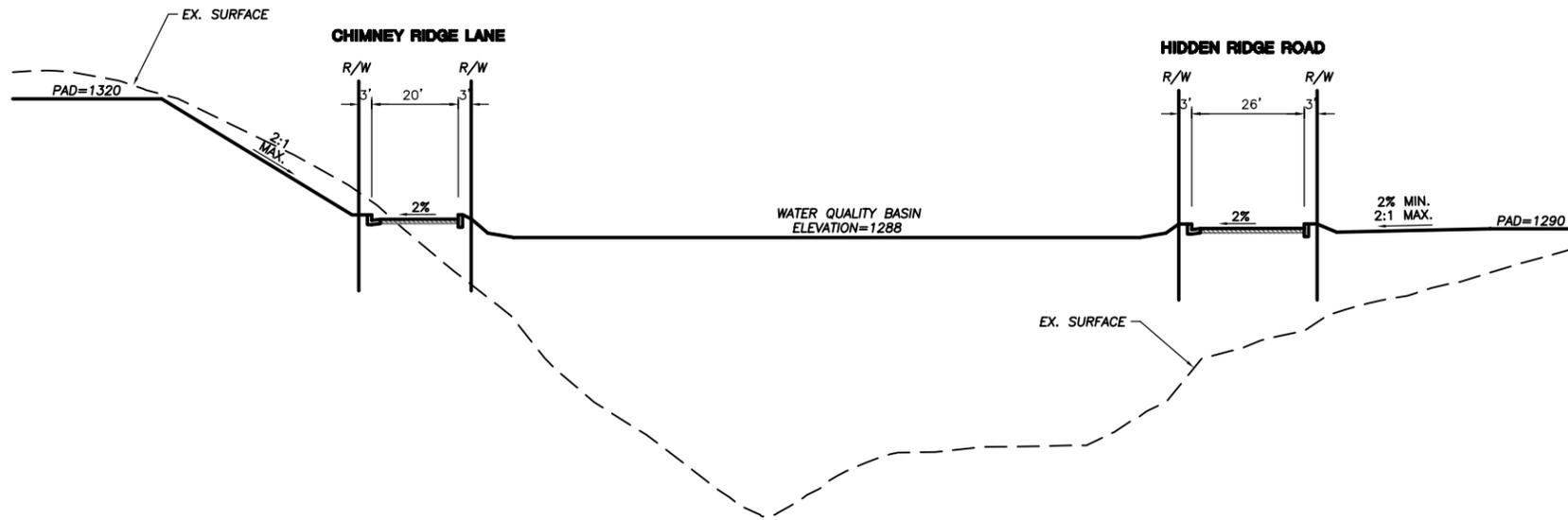
NORTH
SCALE: 1"=200'

FUSCOE
ENGINEERING
16795 Von Karman, Suite 100
Irvine, California 92616
Tel 949.474.1960 • Fax 949.474.5315
www.fuscoe.com

CANYON OAKS
TENTATIVE TRACT
PROPOSED SUSMP EXHIBIT

SHEET
1 of 1

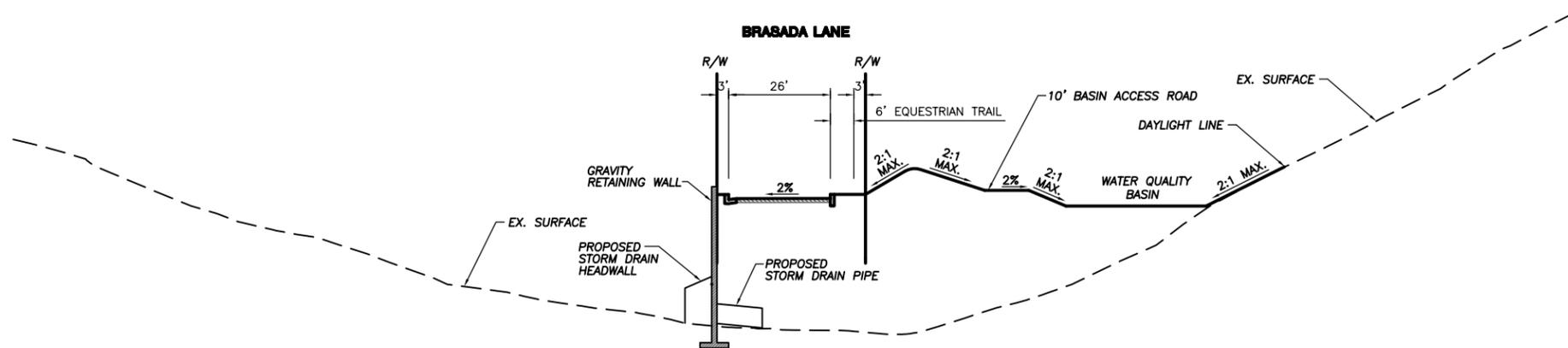
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CROSS SECTION 'C'
NTS



SAMPLE STORM DRAIN INLET STENCILING
NTS



CROSS SECTION 'E'
NTS

V. SITE SPECIFIC MITIGATION PLANS

In addition to SUSMP project categories, new development and redevelopment projects may have specific site characteristics that may cause or contribute to adverse impacts on stormwater quality. These areas must incorporate a site-specific plan to mitigate stormwater pollution. Below is a list of those site specific areas that the San Dimas has identified as requiring a design plan that incorporates appropriate stormwater mitigation measures, which details the source and treatment control BMP(s), and must also submit the O&M Plan for the treatment control BMPs.

CHECK BELOW (IF APPLICABLE)	AREAS OF CONCERN
	1. Vehicle or equipment fueling areas
	2. Vehicle or equipment maintenance areas
	3. Commercial or industrial waste handling or storage
	4. Outdoor handling and storage of hazardous materials
	5. Outdoor manufacturing areas
	6. Outdoor food handling or processing
	7. Outdoor animal care, confinement or slaughter
	8. Outdoor horticulture activities
	9. Major Transportation Projects

The proposed Canyon Oaks project does not include the above-listed site characteristics and does not require a site specific mitigation plan.

VI. INSPECTION/MAINTENANCE RESPONSIBILITY

It has been determined that NJD Limited shall assume all BMP inspection and maintenance responsibilities for the Canyon Oaks Project. NJD Limited will be responsible for maintenance of all storm drain inlets, collectors, v-ditches or any other related flood control or storm water control device. Furthermore, all interior streets and/or roadways, landscape, recreation areas, facilities and/or open space within the project limits will be maintained by NJD Limited. A Master Covenant and Agreement regarding on-site stormwater treatment devices maintenance shall be completed prior to completion and release of the Project by the City of San Dimas, Los Angeles County (see Appendix 5).

LONG-TERM FUNDING FOR BMP MAINTENANCE

Long term funding will be through HOA fees.

RESPONSIBLE PARTY CONTACT INFORMATION

Name: Richard K. Jemison, Sr.

Address: 26152 Oroville Place
Laguna Hills, CA 92653

Tel: 949.463.2921

VII. OPERATION & MAINTENANCE PLAN

Proper O&M is an important element of a stormwater mitigation plan to ensure BMPs remove pollution effectively. Routine maintenance or service also contributes to the efficiency and continuous operation of a system. The post development BMP maintenance responsibility and frequency matrix provided in this section detail the specific party to perform the inspection and maintenance of each BMP for the Canyon Oaks Project and details the maintenance and inspection activities to be performed, and the frequency with which each shall be performed. Further Operations and Maintenance details can be found in Appendix 7.

STRUCTURAL BMP	RESPONSIBLE PARTY	MAINTENANCE FREQUENCY
WATER QUALITY & DETENTION BASINS	NJD Limited (HOA Enforced)	Maintained in conjunction with regular landscaping activities, including removal of trash/debris/sediment, moving, weed control, and watering during drought conditions. Damaged or dead plant areas shall be repaired upon detection. <u>Frequency: 2x PER YEAR</u>

Operation and maintenance activities for the water quality detention basins would include site inspections, temporary irrigation system inspection and adjustment, minor vegetation removal and thinning, snag removal, and integrated pest/plan management. The treatment basins may periodically require major maintenance and possibly repairs to ensure that the basins operate at their maximum efficiency and treatment capacity. Major activities would include structural modifications and repairs, major vegetation removal and planting, and major sediment removal.

The water quality basins should be inspected at a minimum of twice per year, prior to the start of the storm season (October 1st) and at the end of the storm season. Basins should be inspected for standing water (in excess of 36 hours after a storm event), excess sediment, trash, and debris accumulation, possible vector harborage, and for the condition of safety features (such as fences and signs). Trash and debris should be removed in the basin and around the outlet during the inspections. In the water quality detention basins, weeding will be performed on a monthly basis during the first six months of the project, and quarterly during years 2 and 3 as directed by the professional biologist/restoration specialist employed for the inspections. Excess sediment shall be removed and disposed of properly when the debris component of the basin exceeds 10% of the basin volume. It is recommended that the professional biologist evaluate the water quality basin for plant survival, species coverage and species composition on an annual basis.

VIII. APPENDICES

Appendix 1:	SUSMP/Site Specific Plan Checklist
Appendix 2:	Treatment Control BMP Details
Appendix 3:	Volume and Flow Rate Calculations
Appendix 4:	Storm Water Observation Report Form
Appendix 5:	Master Covenant and Agreement
Appendix 6:	Master Termination of Covenant and Agreement (Sample)
Appendix 7:	Treatment Control BMP Operation & Maintenance Plan Supplement
Appendix 8:	Record of Inspections
Appendix 9:	Source Control BMP Fact Sheets
Appendix 10:	Public Education Materials
Appendix 11:	Soils/Geotechnical Letter

APPENDIX 1

SUSMP/SITE SPECIFIC PLAN CHECKLIST



**COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
BUILDING AND SAFETY DIVISION - DRAINAGE & GRADING SECTION**

**STANDARD URBAN STORMWATER MITIGATION PLAN (SUSMP)
REVIEW SHEET**

Urban and storm water runoff is considered to be one of the largest sources of pollution to both local waterways and coastal areas of the United States. Los Angeles County was issued a National Pollutant Discharge Elimination System permit for municipal stormwater and urban runoff discharges within the County of Los Angeles on December 13, 2001, by the Los Angeles Regional Water Quality Control Board. Under this permit, the County is required to prohibit the discharge of pollutants from private property developments. Preventing these pollutants from entering stormwater discharge system will be accomplished by requiring the installation and maintenance of post-construction treatment control Best Management Practices (BMPs) on qualifying projects.

PROJECT INFORMATION

_____ SITE ADDRESS	_____ CITY/LOCATION	_____ DISTRICT NO.	_____ GRADING/BUILDING PLAN CHECK NO.
_____ DESIGN ENGINEER/APPLICANT	_____ TELEPHONE NO.		
_____ OWNER/DEVELOPER	_____ TELEPHONE NO.		
_____ PLAN CHECKER	_____ ENTRY DATE		
_____ PROJECT DESCRIPTION/PROPOSED OCCUPANCY			

- The project as proposed is exempt from the requirements of the Development Construction provisions of the County NPDES permit.

The following is a list of new development and redevelopment projects/activities requiring the incorporation of Best Management Practices (BMPs) into the project plans. If the proposed new development or redevelopment and/or activity falls into one of these categories as indicated below, BMPs shall be incorporated into project plans to satisfy SUSMP requirements. Details of SUSMP provisions must be prepared and submitted as part of the project building or grading plans (see Section 106.4.3 of the Los Angeles County Building Code).

Project/Activities requiring BMPs under the SUSMP provisions:

- Single family hillside development. "Hillside" means property located in an area where the development contemplates grading on any natural slope that is twenty-five percent or steeper.
- Industrial/Commercial development that creates an area of one acre or more of impermeable area.
- Retail gasoline outlet, gas station, or fuel dispensing.
- Automotive repair shop, automotive and/or equipment maintenance areas.
- Restaurant, outdoor food handling or processing.
- Parking lot creating 5,000 square feet or more of surface area, or with 25 or more parking spaces and potentially exposed to stormwater runoff.
- Projects located within, directly adjacent to, or directly tributary to an environmentally sensitive area.

- ❑ Automotive or equipment washing or cleaning area(s).
- ❑ Outdoor hazardous material, waste handling or storage.
- ❑ Commercial or industrial waste.
- ❑ Outdoor manufacturing areas such as equipment or product fabrication including welding, cutting, sawing, metal fabrication, assembly, application of paints, coatings, or finishes, pre-cast concrete fabrication, equipment or machinery repair and/or maintenance, etc.
- ❑ Outdoor horticulture activities.
- ❑ Animal slaughtering, animal confinement, pet care facilities, stables, kennels, etc.
- ❑ Ten or more unit homes.

- **REDEVELOPMENT PROJECTS**

"Redevelopment" means land-disturbing activity that results in creation, addition or replacement of 5,000 square feet or more of impervious surface area on an already developed site. Redevelopment includes, but is not limited to, the expansion of a building footprint, addition or replacement of a structure; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces. It does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety. Where redevelopment results in an alteration to less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to these SUSMP requirements, the Design Standards apply only to the alteration, and not to the entire development. Where redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to the SUSMP requirements, the Design Standards apply to the entire project.

REDEVELOPMENT: Redevelopment projects covered under the project/activities categories indicated above may require BMPs under the SUSMP provisions. Your redevelopment project is:

- ❑ **Exempt:** (Impervious surface area replaced, added, or created is < 5,000 square feet) Proposed improvements are less than 5,000 square feet or maintain original line and grade and the original purpose of the facility. Project is, therefore, exempt from SUSMP requirements.
- ❑ **BMPs to meet SUSMP requirements must be incorporated into Design Plans:** (Impervious surface area replaced, added, or created is > 5,000 square feet.) Proposed improvements are greater than or equal to 5,000 square feet or do not maintain original line and grade. Project is, therefore, subject to SUSMP requirements.

Your redevelopment project requires the following:

- ❑ **BMPs must be incorporated in project plans for the newly developed area only.** Required when an alteration results in an increase of less than 50 percent of the impervious surfaces of the previously existing development, and the existing development was not subject to SUSMP requirements.
- ❑ **BMPs must be incorporated in project plans for the newly developed and existing areas.** Required when an alteration results in an increase of greater than 50 percent of the impervious surfaces of the previously existing development.

AGENCY REFERRALS

- ❑ Submit and obtain approval from Environmental Programs Division, Industrial Waste Unit, for all structural BMPs selected to treat onsite pollutants for the proposed non-residential project. An annual operating permit may be required. Environmental Programs Division, Industrial Waste Unit - 900 S. Fremont, Alhambra, Annex Building, 3rd floor, (626) 458-3517. Please contact Environmental Programs Division for required fees and minimum submittal requirements. Please note: prior to obtaining approval from Environmental Programs Division the location and the design flows for all BMPs must be shown on plans and approved by Building and Safety.
- ❑ Obtain an encroachment permit for the proposed construction and/or discharge of drainage in the road right of way. Construction Division, Permits Section - 900 S. Fremont, Alhambra, 8th Floor, (626) 458-3129.
- ❑ Obtain a connection permit or approval for the proposed connection to the Los Angeles County Flood Control District Drain_____. Construction Division, Permits Section, 900 S. Fremont, Alhambra, 8th Floor, (626) 458-3129.
- ❑ Obtain an encroachment/connection permit for the proposed construction/connection or discharge of drainage in road right of way. City of _____/Caltrans.

- ❑ This project is located within the City of _____. Obtain approval from the City for SUSMP requirements. (Required for all Cities that do not contract this service from the Los Angeles County Department of Public Works).

HYDRAULIC and HYDROLOGY REQUIREMENTS

- ❑ Provide a hydrology analysis to determine the design flow rate (Q_{PM}) or Volume (VM) for the first 3/4-inch of rainfall that must be treated. See Appendix 1 for calculation of Q_{PM} .
- ❑ Submit site specific hydraulic calculations along with the recommended structural BMP manufacturer's product specifications to verify the BMP will adequately handle the minimum design flow required for treatment. Note: The proposed project improvements must provide the required minimum level of flood protection.
- ❑ Provide Hydraulic analysis for the following: _____

- ❑ Outlet velocities from proposed drainage devices must be designed to minimize erosion. Energy dissipation is required for all devices. Calculations for the sizing of dissipaters must be provided. Soils analysis may be required to determine the site conditions and susceptibility to erosion.

GENERAL COMMENTS

- ❑ For building plans, all SUSMP requirements and associated details for the proprietary or non-proprietary BMPs shall be shown on the building site plan. (Plan scale shall be 1"=40' or better.)
- ❑ For grading plans, all SUSMP requirements and associated details for the proprietary or non-proprietary BMPs shall be shown on the grading plans.

- The project must mitigate the first 3/4-inch of rainfall for each storm event and be designed to minimize the introduction of pollutants from the site runoff into the stormwater conveyance system. (Reference 1)

In addition to those items required on the site grading and/or building drainage plans, the following SUSMP information shall be incorporated on the plans:

- Show the location of proposed BMPs on plans. All necessary manufacturer’s installation notes and construction requirements and/or details must be included on the plans for all treatment and holding facilities. This includes model, size, material type, dimensions, volumetric capacity, and manufacturer’s treatment capacity.
- For non-proprietary BMPs, in addition to the items indicated above, provide details of all organic materials including plants, filter materials and specifications. Planting and irrigation details for any vegetated BMP must be indicated on the plans.
- Specify all elevations for proposed BMPs, inverts or flow lines as applicable.
- Specify on the plans for each drainage device, the total design flow, Q_{total} , and the peak mitigation flow rate, Q_{PM} (See Reference 1 for additional information).
- Clearly show driveway/access road drainage and provide BMPs for treatment of driveway flows. Provide elevations, cross sections, or slopes as applicable.
- Show proposed drainage in paved areas. Provide spot elevations, slopes, and flow arrows to intended outlet(s). If offsite tributary flows are not included in onsite treatment, show how flows will be directed away from proposed BMPs. Provide topography, elevations, cross sections, slopes, and details as applicable.
- For commercial properties, all catch basins and inlets that discharge into an existing or proposed storm drain must be labeled to discourage illegal dumping of pollutants. See Appendix 3 for stencil information.
- Direct rooftop runoff to pervious areas such as yards, vegetated open channels, or areas where practical. Provide BMP solution for treatment of roof runoff.
- Add the following SUSMP NOTES to the site grading and/or building drainage plans.

SUSMP NOTES:

1. Determine and provide the pre and post development pervious and impervious areas created by the proposed development. Show the following table on Plans:
2. All structural BMPs shall be accessible for inspection and maintenance and shall bear a “No Dumping – Drains to Ocean” symbol in traffic rated paint per detail herein. Stencils are available at the local Building and Safety District office.
3. Prior to commencement of any work within the road right of way and/or connection to a County-maintained storm drain an encroachment permit from Construction Division is required. For more information call (626) 458-3129.
4. Prior to commencement of any work and/or discharge of drainage to a watercourse, a permit from both the California Department of Fish and Game and U.S. Army Corps of Engineers may be required.

<p>POST DEVELOPMENT Impervious Area _____ Acres, Pervious Area _____ Acres,</p> <p>PRE DEVELOPMENT Impervious Area _____ Acres, Pervious Area _____ Acres,</p>
--

5. STATEMENTS OF UNDERSTANDING

As the Architect/Engineer of the project, I have reviewed the Development Planning for Storm Water Management–A manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), and have proposed the implementation of the permanent Best Management Practices (BMPs) applicable to effectively minimize the negative impacts of the project’s stormwater runoff. The selected BMPs will be installed per the approved plans and as recommended by the product manufacturer as applicable.

Signature - Architect/Engineer of Record Date

CERTIFICATIONS AND PROOF OF ONGOING MAINTENANCE

- ❑ Project Civil Engineer/Architect must complete the **STATEMENTS OF UNDERSTANDING**, see SUSMP general note number 5 which must be signed and added to proposed plans.
- ❑ Project Civil Engineer/Architect must submit the **OPERATION AND MAINTENANCE GUIDELINES** for review and approval prior to recordation. The Operation and Maintenance Guidelines shall include the designated responsible party to manage the SUSMP devices, employee’s training program and duties, operating schedule, maintenance frequency, routine service schedule, specific maintenance activities, copies of resource agency permits, and any other necessary activities. At a minimum, maintenance shall require inspection and servicing of all SUSMP devices on an annual basis.
- ❑ Provide recorded and certified copies of the **MAINTENANCE COVENANT FOR SUSMP DEVICES** and **OPERATION AND MAINTENANCE GUIDELINES** to provide for ongoing operation and maintenance of SUSMP devices. Refer to Appendix 4 for Covenant.
- ❑ _____

DESIGN SUGGESTIONS

- Examples of BMPs can be found in Appendix 2.
- Wherever practical, use natural drainage areas/systems to convey flows.
- Utilize permeable materials for sidewalks, driveways, and parking lots where practicable.
- Employ the use of detention basins, infiltration basins, and infiltration trenches where applicable.
- Concentrate or cluster proposed developments on portions of site while leaving the greatest area of land in a natural undisturbed condition.
- Conserve natural areas by minimizing the amount of site clearing and grading of native vegetation required for development.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

AREAS OF SPECIAL ATTENTION

For commercial developments, the items indicated below are reviewed by Environmental Programs Division, Industrial Waste Unit. The following requirements are provided for reference only:

Properly Design Material Storage Areas:

- Provide a roof above the material storage area. If the roof structure does not include side walls, then the roof's overhang must extend a minimum of 20 percent of the roof's height. Elimination of roof cover will be reviewed on a case-by-case basis.
- The storage area must be paved and sufficiently impervious to contain leaks and spills. Provide and show on plans all storage areas for chemicals and/or waste materials stored at the subject facility, with a tank/drum schedule indicating tank capacities, materials of construction, and contents. Provision for spill containment is required where such materials may potentially enter the sewer system, storm drain, or contaminate the soil. Spill containment should be designed for the volume of the largest tank or 10 percent of the drum total (whichever is greater), plus 6 inches of rainfall over the containment area (if outdoors). Submit a typical detail of the containment curb and specify the materials of construction.
- All tanks containing incompatible materials such as acids, bases, reactive or flammable materials must have separate spill containment systems.
- Interior wall and floors within all spill containment areas shall be cleaned, repaired and sealed with an epoxy or equivalent type sealant which is compatible with the materials located within said areas. Provide manufacturer's literature of selected sealant and indicate on drawings areas to be sealed.
- The contact joint for spill containment walls or dikes constructed on existing concrete, masonry or asphalt shall be bonded to the existing surface. Provide manufacturer's literature of the selected bonding agent and indicate on drawings areas to be bonded.
- Materials collected in the spill containment area must be controlled until a determination is made regarding their quality and legal disposal method.

Properly Design Loading/Unloading Areas:

- Provide a roof above the loading dock area. If the roof structure doesn't include side walls, then the roof's overhang must extend a minimum of 20 percent of the roof's height. Elimination of the roof cover will be reviewed on a case-by-case basis.
- Design drainage to minimize stormwater runoff onto loading/unloading area.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

Properly Design Repair/Maintenance Bays:

- Repair/maintenance bays must be indoors or designed in such a way that does not allow stormwater runoff onto the wash bay.
- Design repair/maintenance bay drainage system to capture all wash water, leaks and spills. Show on plans all proposed drain connections for collection and disposal. Direct connection of the repair/maintenance bay outlet drain to the storm drain system is prohibited.
- If wastewater is generated, the person responsible for the discharge must file for an Industrial Waste Disposal Permit.

Properly Design Vehicle/Equipment Wash Areas:

- Vehicle/equipment wash areas are subject to Industrial Waste Discharge Permit plan review.
- Vehicle/equipment wash areas shall be provided with a clarifier and a sample box. The discharge must be routed to the sanitary sewer line. Details, as applicable, must be indicated on plans.
- Provide a roof above the vehicle/equipment wash area. If the roof structure does not include side walls, then the roof's overhang must extend a minimum of 20 percent of the roof's height. Elimination of the roof cover will be reviewed on a case-by-case basis.
- If a cover is not feasible, provide an approved rainwater diversion system along with a clarifier and a sample box (County Standard Plan 2043-0, enclosed). Diverted flow may require pretreatment, verification of pollutant removal and/or storage prior to discharge to the storm drain.

Properly Design Fueling Areas:

- The fuel dispensing area must be covered with a roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- Propose a spill collection and cleanup maintenance plan for the fueling area. Flows from washing-down of the fueling area entering the storm drain system are prohibited.

Properly Design Refuse Collection Areas:

- If drains are proposed in the refuse collection area, these shall be connected to the sanitary sewer with proper pretreatment facilities. Surrounding areas shall be graded to drain away from the refuse collection area.
- Drainage from adjoining roofs must be diverted away from the refuse collection area.
- Refuse collection areas must be screened or walled to prevent off-site transport of refuse.

Properly Design Parking Areas:

- Infiltration runoff that may potentially contaminate soil is not acceptable.
- Provide a pretreatment facility to treat stormwater flows prior to entering the storm drain system.

REFERENCES

1. Development Planning for Storm Water Management, A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works
2. California Stormwater Best Management Practices Handbook
3. Caltrans Stormwater Quality Handbook: Planning and Design Staff Guide
4. Manual for Stormwater Management in Washington State
5. The Maryland Stormwater Design Manual
6. Florida Development Manual: A Guide to Sound Land and Water Management
7. Denver Urban Storm Drainage Criteria Manual
8. USEPA Report No. EPA-840-B-92-002

APPENDICES

APPENDIX 1 3/4" PEAK MITIGATED FLOW RATE (Q_{PM})

This Appendix provides a step-by-step approach for calculating the 3/4" peak mitigated flow rate, Q_{PM} .

APPENDIX 2 EXAMPLES OF BMPs

This Appendix contains example BMPs and design suggestions that may be incorporated into the project to satisfy the requirement for minimizing the release of pollutants from each new development. Additional examples may be found in reference one on the enclosed list.

APPENDIX 3 STENCIL FOR LABELING OF INLETS INTO DRAINAGE SYSTEM

Inlets to closed storm drains must be clearly labeled to indicate dumping of improper materials into stormwater conveyance system is prohibited. The attached "No Dumping-This Drains to Ocean" graphical icon is acceptable for stenciling or labeling of drain inlets. Stencils may be purchased at the local Building and Safety District Office. Refer to fee code "CB" when purchasing the stencil.

APPENDIX 4 SUSMP MAINTENANCE COVENANT

The purpose of the SUSMP Maintenance Covenant and the Operation and Maintenance Guidelines is to ensure that all current and future owners of a development are made aware that the site contains SUSMP BMPs that must remain operational and be maintained. These documents shall be recorded against the subject property. **THE SUSMP MAINTENANCE COVENANT AND OPERATION AND MAINTENANCE GUIDELINES MUST BE SIGNED, NOTARIZED, AND RECORDED.** Applicant must provide copy of the recorded documents stamped by the County Recorder's office.

RECORDATION is the responsibility of the applicant. The main Recorder's office is located at 12400 Imperial Highway in the City of Norwalk. Additional branch offices for recording documents are available.

Information for the County Recorder's offices can be obtained on the Internet at <http://regrec.co.la.ca.us/main.htm> or by calling (562) 462-2125 for more information.

APPENDIX 1

DETERMINING THE 3/4 INCH PEAK MITIGATED FLOW RATE (Q_{PM}):

For compliance with SUSMP requirements, use the Modified Rational Method to calculate the peak mitigated flow rate (Q_{PM}). The Q_{PM} may be calculated by hand or by using the County of Los Angeles Department of Public Works' T_c Calculator. Both methods are described below.

T_c Calculator Method

The T_c Calculator may be downloaded from the following website:
dpw.lacounty.gov/wrd/publication/

The T_c Calculator calculates the full modified rational runoff method yielding peak runoff rates and volumes. The figure to the right shows the interface for the T_c calculator. To calculate the Q_{PM} , fill out the boxes in the upper left hand corner of the calculator under "Subarea Parameters Manual Input" and use 0.75 as the Rainfall Isohyet. Click on the "Calculate T_c " button in the lower right to display the results. To calculate multiple subareas simultaneously, the T_c calculator can also accept Excel spreadsheets as input files containing a number of subareas. Please refer to the Hydrology Manual for more information.

Hand Calculation Method

The Hydrology Manual may be downloaded from the following website:
dpw.lacounty.gov/wrd/publication/

By trial and error, determine the time of concentration (T_c), as shown below:

CALCULATION STEPS:

1. Determine subarea boundaries and then calculate flow path length, flow path slope, and area.

$$L = \text{_____} \text{ feet}$$

$$S = \text{_____} \text{ feet / feet}$$

$$A = \text{_____} \text{ acres}$$

2. Assume an initial value for T_c

$$T_c = \text{_____} \text{ minutes}$$

3. Using Table 1, look up the assumed T_c value and select the corresponding intensity, I_t

$$I_t = \text{_____} \text{ in/hr}$$