Cal Land Engineering, Inc.
dba Quartech Consultants
Geotechnical, Environmental, and Civil Engineering

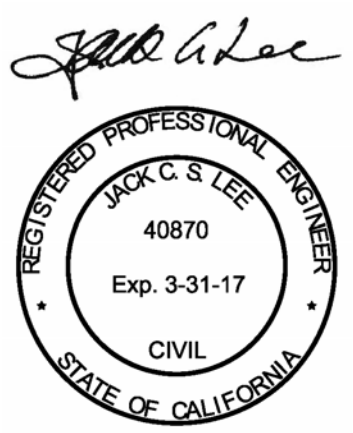
HYDROLOGY STUDY & DRAINAGE ANALYSIS

for

11640-11710 VALLEY BLVD.,
EL MONTE, CA 91732

Prepared for:

NEW S.W.S. SOUTHLAND REAL ESTATE, LLC /
MR. WYNN HUI
915 W. FOOTHILL BLVD.,
ARCADIA, CA 91007



Preparation Date

June 11, 2015

576 East Lambert Road, Brea, California 92821; Tel: 714-671-1050, fax: 714-671-1090

Introduction

The project site is located at the south side of Valley Blvd., City of El Monte, County of Los Angeles, State of California.

The project has an existing drainage pattern going north direction toward the street. Existing street drainage flow drains to west direction from east. There is no off-site drainage. The proposed development will follow the existing drainage pattern. Most of the storm water of will go through a catch basin and then thru the curb or parkway drain before it goes to the street.

	EXISTING	PROPOSED
Q (cfs)	6.92	6.86
Q (cu-ft)	52,042.54	48,510.79
Qpm (cfs)	0.43	0.39
Qpm (cu-ft)	6,245.18	5745.58

Peak Flow Hydrologic Analysis

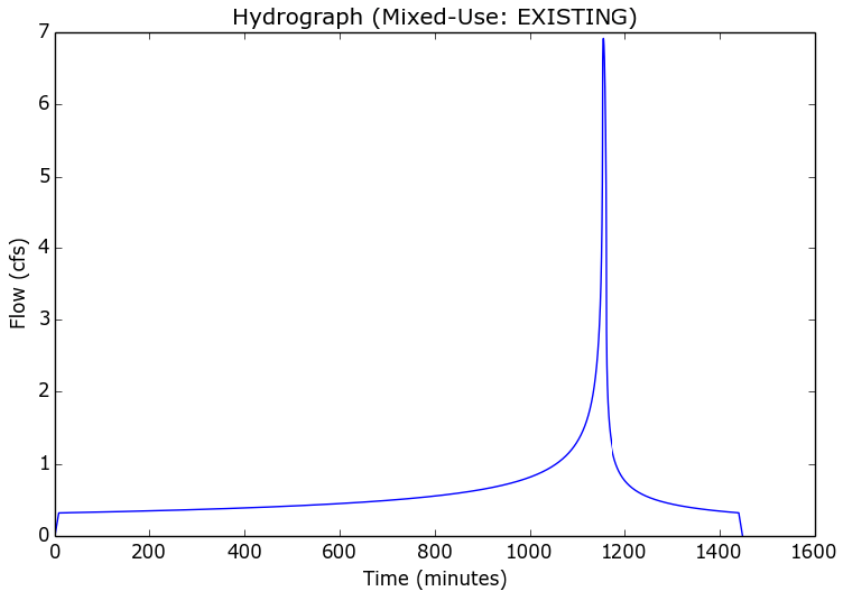
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - EXISTING.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	EXISTING
Area (ac)	2.57
Flow Path Length (ft)	610.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.25
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.25
Peak Intensity (in/hr)	2.9898
Undeveloped Runoff Coefficient (Cu)	0.8216
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	6.9155
Burned Peak Flow Rate (cfs)	6.9155
24-Hr Clear Runoff Volume (ac-ft)	1.1947
24-Hr Clear Runoff Volume (cu-ft)	52042.5419



Peak Flow Hydrologic Analysis

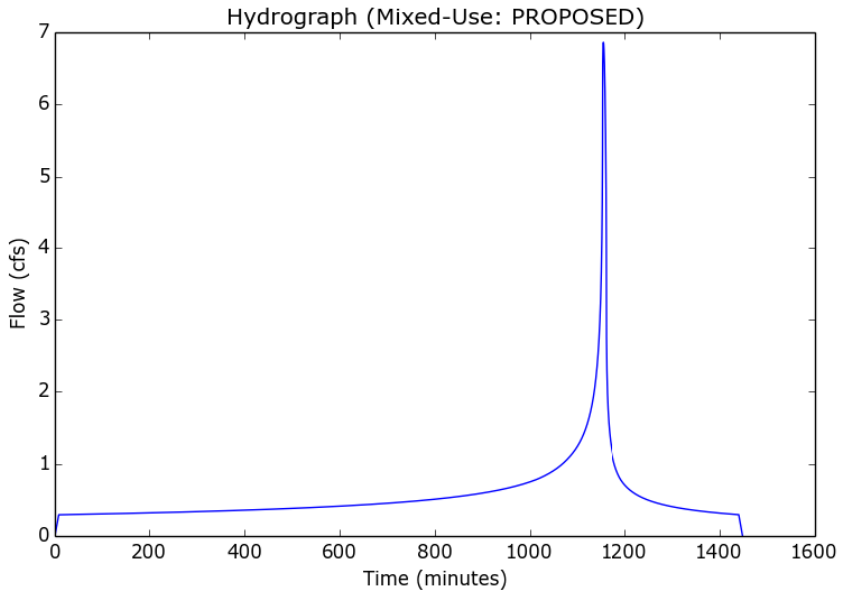
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - PROPOSED.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	PROPOSED
Area (ac)	2.57
Flow Path Length (ft)	610.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.25
Percent Impervious	0.91
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.25
Peak Intensity (in/hr)	2.9898
Undeveloped Runoff Coefficient (Cu)	0.8216
Developed Runoff Coefficient (Cd)	0.8929
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	6.8612
Burned Peak Flow Rate (cfs)	6.8612
24-Hr Clear Runoff Volume (ac-ft)	1.1137
24-Hr Clear Runoff Volume (cu-ft)	48510.7947



Peak Flow Hydrologic Analysis

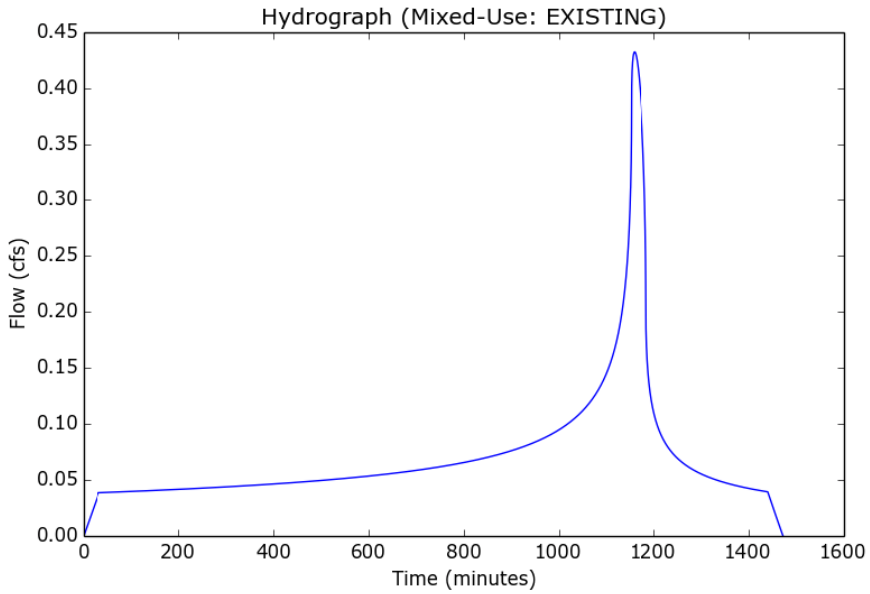
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - EXISTING (0.75).pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	EXISTING
Area (ac)	2.57
Flow Path Length (ft)	610.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.187
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	32.0
Clear Peak Flow Rate (cfs)	0.4325
Burned Peak Flow Rate (cfs)	0.4325
24-Hr Clear Runoff Volume (ac-ft)	0.1434
24-Hr Clear Runoff Volume (cu-ft)	6245.1817



Peak Flow Hydrologic Analysis

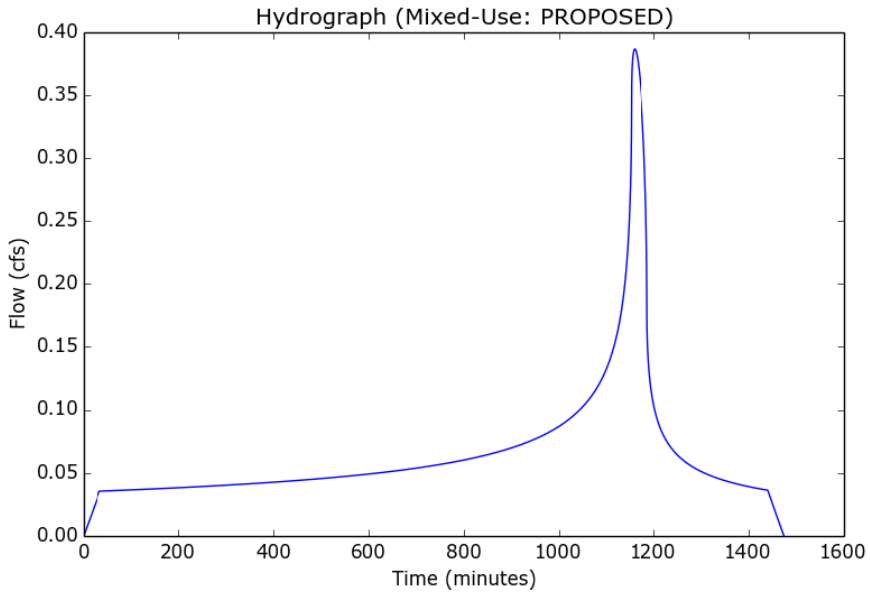
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - PROPOSED (0.75).pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	PROPOSED
Area (ac)	2.57
Flow Path Length (ft)	610.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.91
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1818
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	34.0
Clear Peak Flow Rate (cfs)	0.3868
Burned Peak Flow Rate (cfs)	0.3868
24-Hr Clear Runoff Volume (ac-ft)	0.1319
24-Hr Clear Runoff Volume (cu-ft)	5745.577



Peak Flow Hydrologic Analysis

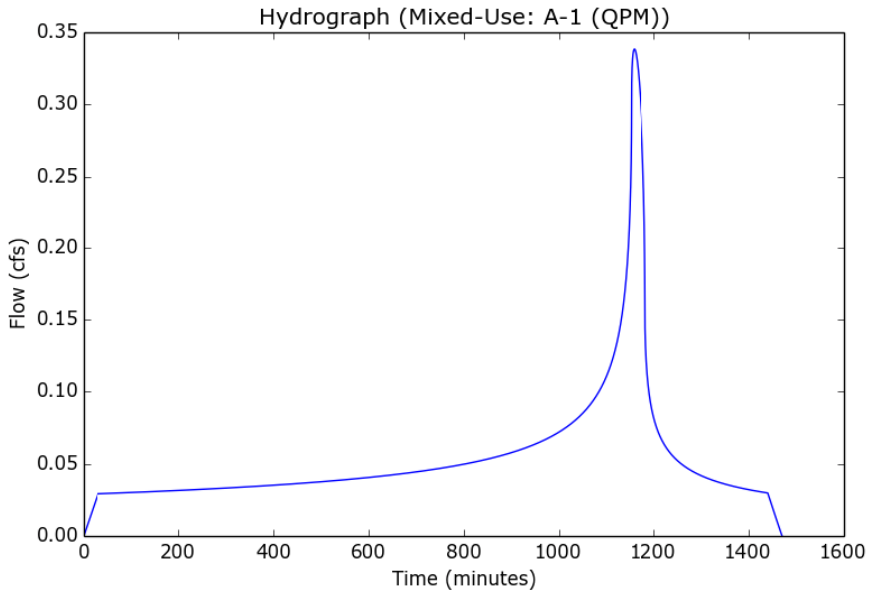
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - A-1 (QPM).pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	A-1 (QPM)
Area (ac)	2.1
Flow Path Length (ft)	505.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.92
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1928
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.836
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.3384
Burned Peak Flow Rate (cfs)	0.3384
24-Hr Clear Runoff Volume (ac-ft)	0.1088
24-Hr Clear Runoff Volume (cu-ft)	4740.1744



Peak Flow Hydrologic Analysis

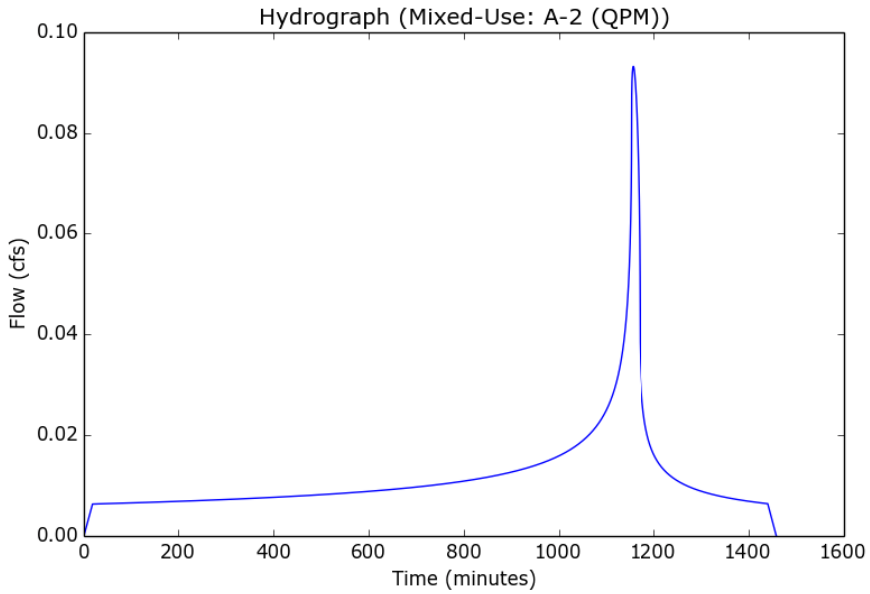
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - A-2 (QPM).pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	A-2 (QPM)
Area (ac)	0.478
Flow Path Length (ft)	210.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2451
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.796
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	0.0932
Burned Peak Flow Rate (cfs)	0.0932
24-Hr Clear Runoff Volume (ac-ft)	0.0236
24-Hr Clear Runoff Volume (cu-ft)	1027.3218



BIOFILTRATION CALCULATION:

For Q-1

SWQDv = 4,740.17 CF

V_B = 1.5 x (SWQDv – V_R)
= 7,110.26 cf

Proposed Modular Wetland System:
Model no. MWS-L-4-15
Treatment Capacity @ 48-hr. Drain Down = **7,623 cf > 7,110.26 cf ….OK**

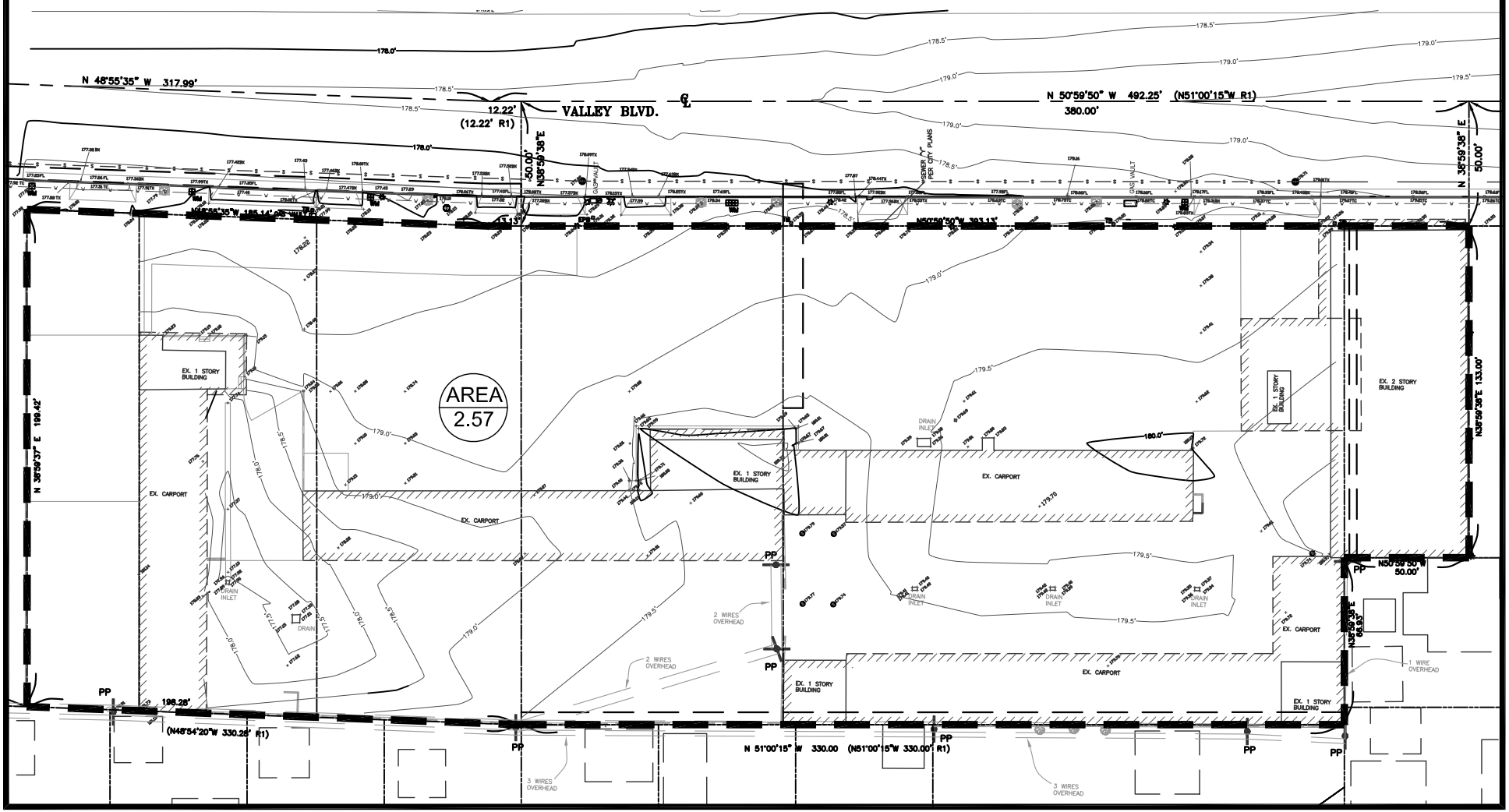
For Q-2

SWQDv = 1,027.32 CF

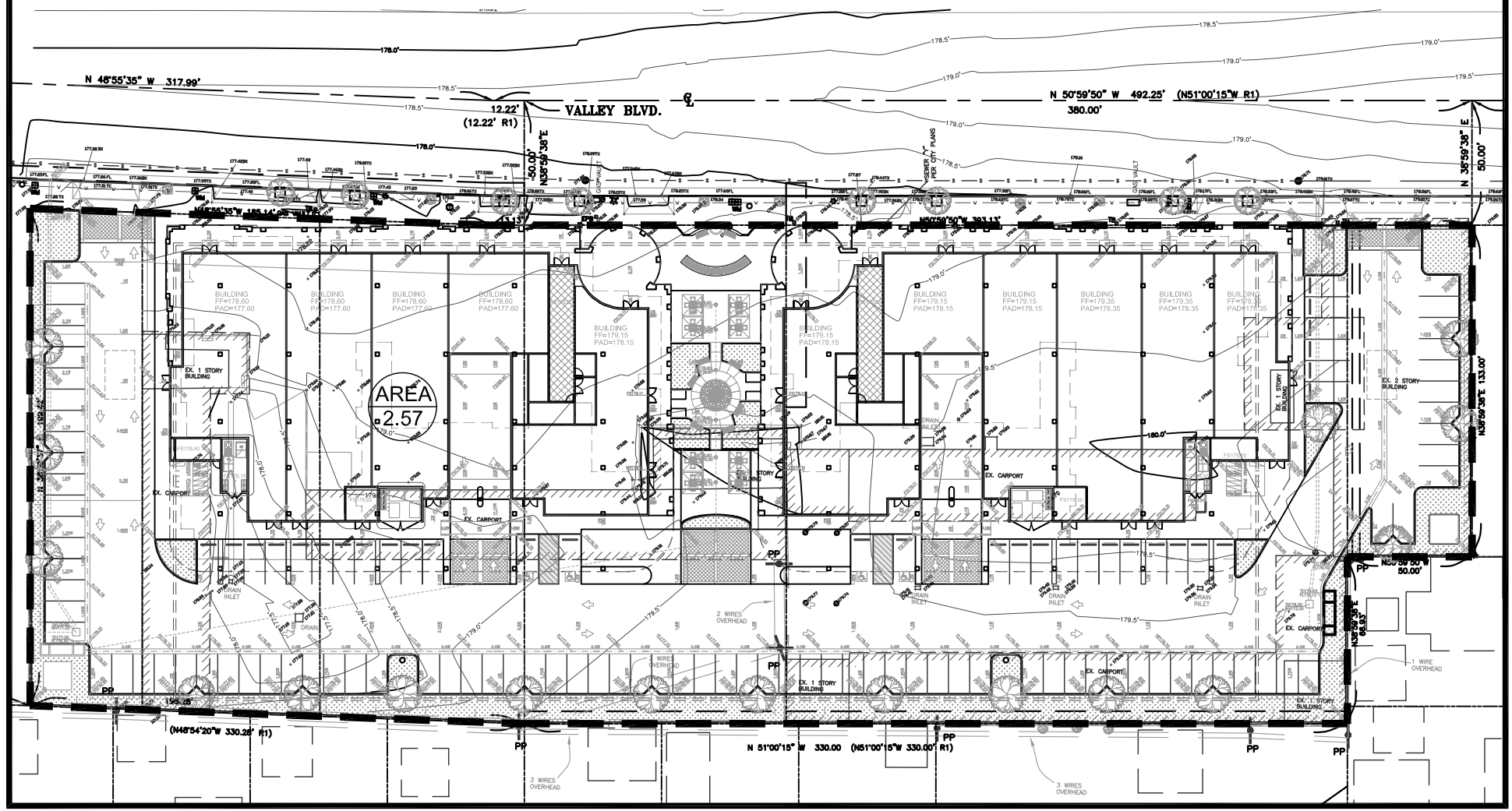
V_B = 1.5 x (SWQDv – V_R)
= 1,540.98 cf

Proposed Modular Wetland System:
Model no. MWS-L-4-4
Treatment Capacity @ 48-hr. Drain Down = **2,280 cf > 1,540.98 cf ….OK**

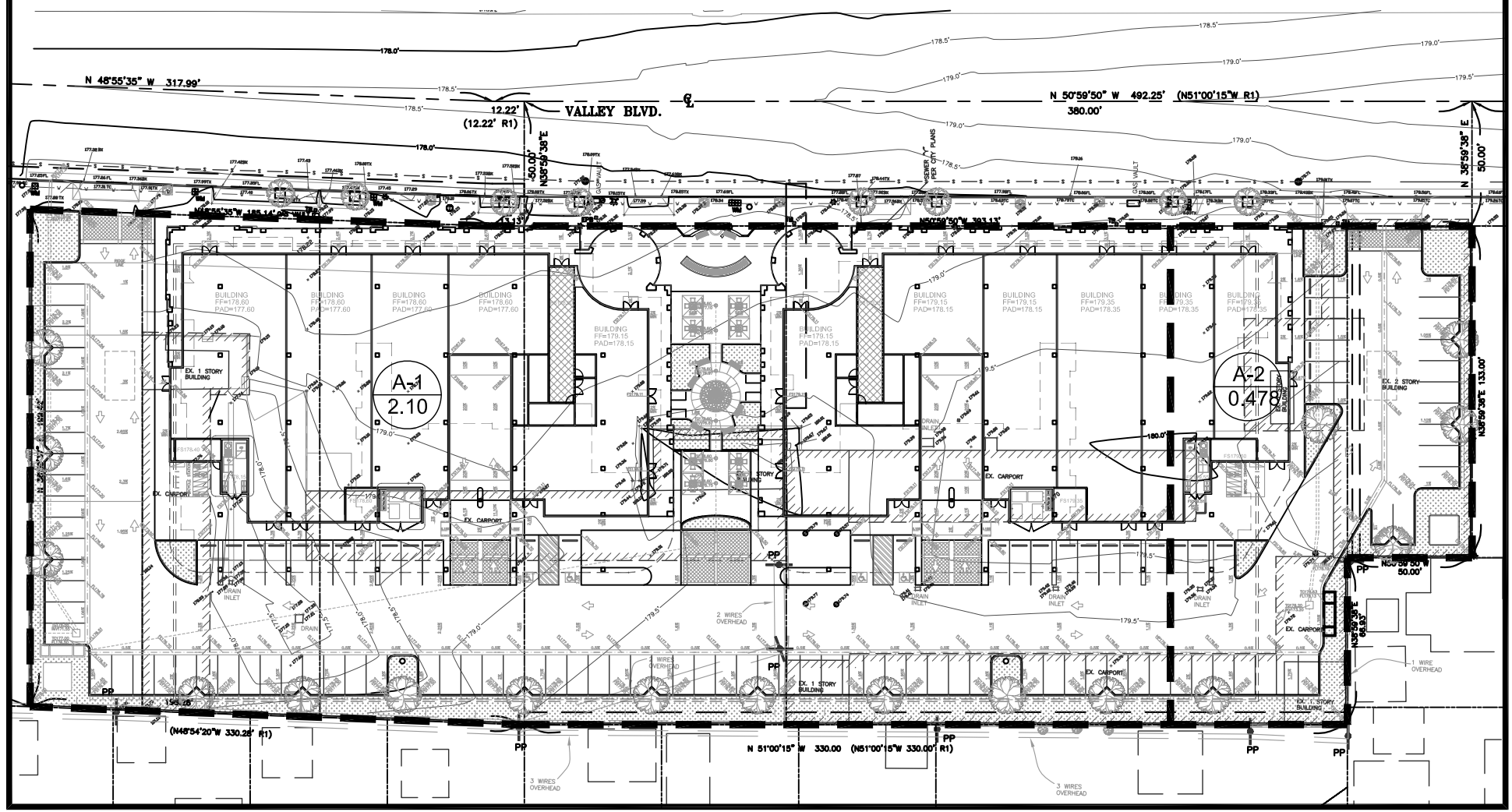
EXISTING HYDROLOGY MAP



PROPOSED HYDROLOGY MAP



PROPOSED HYDROLOGY MAP



STANDARD URBAN STORMWATER MITIGATION PLAN

(SUSMP)

For:

MIXED USED DEVELOPMENT

11640-11710 VALLEY BLVD.,
EL MONTE, CA 91732

Prepared For:

NEW S.W.S. SOUTHLAND REAL ESTATE, LLC
/ MR. WYNN HUI
915 W. FOOTHILL BLVD.,
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(626) 373-3590

Prepared By:

JACK C. LEE, PE, GE, LS
CAL LAND ENGINEERING, INC.
576 E. LAMBERT ROAD
BREA, CA 92821
(714) 671-1050

June 19, 2015

OWNER'S CERTIFICATION

Standard Urban Stormwater Mitigation Plan
for
MIXED USED DEVELOPMENT

This Standard Urban Stormwater Mitigation Plan (SUSMP) for New Mixed Used Development has been prepared for New S.W.S. Southland Real Estate, LLC / MR. Wynn Hui by Cal Land Engineering, Inc. The SUSMP is intended to comply with the requirements of the City of El Monte, County of Los Angeles, requiring the preparation of a project specific SUSMP.

I Certify under penalty of law that this document and all attachments were prepared under my jurisdiction 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 gathered 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.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Los Angeles County Stormwater Quality Management Plan (SQMP), and the intent of the stormwater and urban run-off NPDES Permit and Waste Discharge Requirements for the County of Los Angeles, Los Angeles County Flood Control District and the incorporated Cities of Los Angeles County under the jurisdiction of the Los Angeles Regional Water Quality Board. A copy of this SUSMP will be maintained at the project site/office.

This SUSMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party having responsibility for implementing portions of this SUSMP. At least one copy of the approved and certified copy of this SUSMP shall be available on the subject property in perpetuity. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the SUSMP.

Owner / Engineer of Record's Signature	Company
New S.W.S. Southland Real Estate, LLC / MR. Wynn Hui Printed name / Title	915 W. Foothill Blvd., Arcadia, CA 91007 Company Address
(626) 373-3590 Telephone No.	June 19, 2015 Date

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I. PROJECT DESCRIPTION

a. Project Information

- Name of Project Owner: New S.W.S. Southland Real Estate, LLC / Wynn Hui
- Add. of Project Owner: 915 W. Foothill Blvd., Arcadia, CA 91007
- Telephone for Project Owner: (626) – 373-3590
- New S.W.S. Southland Real Estate, LLC / Wynn Hui owns all of the land on which the project site is located and New S.W.S. Southland Real Estate, LLC / Wynn Hui will be responsible for maintaining the building and grounds of the site
- Project Site Address: 11640-11710 Valley Blvd., El Monte, CA 91732

b. Permits

This permit is for 11640-11710 Valley Blvd., El Monte, CA 91732. Other permits required are, grading plan, SWPPP.

City of El Monte Building Permit

City of El Monte Grading Permit

c. Project Description

The project site is approximately 112,159 square feet (2.57 acres). The proposed development of the site is to construct a New Mixed Used Development with parking lots.

Detailed development characteristics are as follows:

- Approximate 35,443 square feet of the Building
- Approximate 67,117 square feet of the Driveway and walkway
- Approximate 9,599 square feet of the landscape
-

During the construction period, material and products for construction use will be stored temporarily per Erosion Control Plan. Construction waste will be generated and will be collected by subcontractor or general contractor and to be disposed.

In order to connect sewer lateral to public sewer system, owner will connect to the existing sewer line.

d. Site Description

The project site is located at the south side of Valley Blvd., in the City of El Monte, County of Los Angeles and State of California. The site is currently has an existing Building and parking lot.

Los Angeles Regional Water Quality Control Board has jurisdiction over this project site and the site is located in San Gabriel River Watershed. The site

drains to San Gabriel Reach 3 (Whittier Narrows to Ramona), San Gabriel Reach 2 (Firestone to Whittier Narrows Dam), San Gabriel River Reach 1 (Estuary to Firestone) and then San Gabriel River Estuary. San Gabriel Reach Estuary, San Gabriel Reach 1 to 3 is currently listed in the Clean Water Act 303 (d) list due to impairment of Indicator Bacteria, Coliform Bacteria, Cyanide, Lead, pH, Copper, Dioxin, Nickel, and Oxygen, Dissolved. Stormwater Biolfiltration System will be installed on site to mitigate storm water before leaving the project site.

e. Drainage Characteristics

After the construction is finished, all of the storm water run off from the proposed development will be collected by catch basin with filter insert, downspout with filter insert and Biolfiltration System before it goes to the street.

f. Project Schedule

The proposed structures are anticipated to be constructed during November 2015 and completed the construction approximately November 2016.

Impervious Area Estimate

Based on the available information, the total site area is approximately 112,159 square feet. The site is has an existing building and parking lot. And has a approximate of 102,560 square feet of impervious area after the development.

Runoff Factor Determination (Existing Condition)

Total Site Area (Disturbed):	2.57	acres	(T)
Impervious Site Areas:	2.35	acres	(A)
Impervious Runoff Coefficient:	0.75		(B)
Previous Site Area:	0.22	acres	(C)
Previous Runoff Coefficient:	0.15		(D)

Existing Runoff Factor: ((AxB) + (CxD)) / T = 0.70

Runoff Factor Determination (Proposed Condition)

Total Site Area:	2.57	acres	(T)
Impervious Site Areas:	2.57	acres	(A)
Impervious Runoff Coefficient:	0.75		(B)
Previous Site Area:	0.00	acres	(C)
Previous Runoff Coefficient:	0.15		(D)

Proposed Runoff Factor: ((AxB) + (CxD)) / T = 0.75

In accordance with our calculations, it is concluded that the proposed development is less than the estimated runoff rate of the existing conditions.

Stormwater Quality Design Flow Calculation (SQDF)

Per Hydrology calculation
A = area of the site = 2.57 acres

Stormwater Quality Design Flow for BMP

$Q_{P, SQDF}$ = 0.39 cfs (see TC Calculator from Hydrology Report)

Per Hydrology Calculation
50-yrs Pre-Project Peak Stormwater runoff discharge rate = 6.92 cfs
50-yrs Post-Project Peak Stormwater runoff discharge rate = 6.86 cfs

G Pollutants of Concerns

Storm water runoff from the site has the potential to contribute primarily oil, grease and other vehicles fluids, bacteria, suspended solids, metals, trash, pesticide, nutrients, pathogen, and debris.

The site may expose storm water to oil & grease especially those on the driveway where motor vehicles will temporary parked. Oils & grease from the vehicle may leak on to the driveway and parking pavements. Also gasoline and trash & litter that are in the driveway and parking area maybe exposed to storm water. Pesticide, nutrients and pathogens will be considered since there are mostly be found on landscape area.

The proposed development has been designed to minimize the introduction of the pollutants of concerns generated from the site runoff to the storm water system.

H Mitigation

In an effort to mitigate the storm water flowing off of the site, all of the storm water will be collected by a Biofiltration System. The Biofiltration system is located at the west side and east side of the property. The sizing of the Biofiltration Sytem is based on the approved Hydrology report.

1 – Biofiltration System Model No. MWS-L-4-15 = 7,623 ft^3
1 – Biofiltration System Model No. MWS-L-4-4 = 2,280 ft^3

The project site require to mitigate the first ¾" of rainfall for a 50 year storm event. The first ¾" rainfall of the site will produce 0.39 cfs or 5,745.58 ft^3 of storm water. The project will install a Biofiltration System, model no. MWS-L-4-15 and MWS-L-4-4 to mitigate the first ¾" rainfall.

For Q1
V_B = 7,110.26 ft^3
MWS-L-4-15 = 7,623 ft^3 > 7,110.26 ft^3

For Q2
V_B = 1,540.98 ft^3
MWS-L-4-4 = 2,280 ft^3 > 1,540.98 ft^3

(See Hydrology Report)

II. BEST MANAGEMENT PRACTICES (BMPs)

This section discusses the best Management Practices (BMPs) identified for this project to reduce predictable pollutants in runoff entering storm drain systems that drain to the ocean.

Structural and non-structural BMPs are defined as follows:

- Structural BMPs – engineered facilities designed to function with and compliment the project drainage system and address treatment of urban pollutant problems.

- Non-structural BMPs – consist of educational programs, management practices, and regulatory approaches aimed at reducing pollutants in runoff entering storm drain systems that drain to the ocean.

A. Source Control BMPs

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

Routine Non-Structural BMPs

N1 Education for Property Owners and Occupants

Practical information material will be provided to the owner on general good housekeeping practices for each type of site occupancy that contributes to protection of storm water quality. Such information will include, but not be limited to the attachments provided at the end of this report. In addition to the attachments, the following resource can be contacted to obtain updated educational information and pertinent ordinances free of charge:

- American Oceans website – www.americanoceans.org/runoff/epa-bro.htm This website provides a listing of the brochures available from various State of California county and city agencies. The phone numbers of each of the agencies are also provided on this website.

N2 Activity Restrictions

The following is a list of activity restrictions for the project site:

- No car washing will be permitted on the premises.
- No changing of oil or other auto repairs will be permitted on the premises.
- Do not sweep grass clippings, dead leaves into catch basins, or other landscaping related debris into catch basins.
- Do not perform paint cleanup activities in paved areas or allow rinse water from these activities to enter the storm drain system. Clean brushes containing water-based paint in a sink that is connected to the sanitary sewer system.
- Do not use detergents or other chemical additives when washing concrete sidewalks or building exteriors, use potable water only and collect wash water runoff using a vacuum truck, for proper offsite disposal.
- Keep premises, as well as trash container areas, free of litter.

N3 Common Area Landscape Management

Management of landscaped areas shall be performed consistent with the following:

- "Management Guidelines for Use of Fertilizers and Pesticides" (DAMP Section 5.5);
- Items discussed in Structural BMPs; and
- The inspection and maintenance activities outlined in this SUSMP.

N4 BMP Maintenance

The responsible party (owner, agency name, phone number, and address) for implementation of each non-structural BMP and scheduled cleaning of all structural BMP controls shall be identified in this SUSMP.

N5 Title 22 CCR Compliance

Compliance with Title 22 of the California Code of Regulations and relevant sections of the California Health & Safety Code regarding hazardous waste management, to be enforced by the Los Angeles County Fire Hazardous Materials Division on behalf of the State.

N6 Local Water Quality Permit Compliance

The responsible party (owner) shall provide for clean storm water discharges from fuel dispensing areas, and requires permission to discharge industrial wastes to public properties.

N7 Spill Contingency Plan

A "Spill Contingency Plan" (Business Emergency/Contingency Plan Guidelines and Forms) shall be prepared by the owner/operator in accordance with Section 6.95 of the California Health and Safety Code. Spills will be immediately cleaned up according to the Spill Contingency Plan.

N9 Hazardous Materials Disclosure Compliance

Compliance with County and comparable City ordinances typically enforced by respective fire protection agency.

N10 Uniform Fire Code Implementation

The site shall comply with the Article 80 of the Uniform Fire Code enforced by the fire protection agency.

N11 Common Area Litter Control

Regular maintenance will be conducted, consisting, at a minimum of site-wide litter control, emptying of trash receptacles in common areas, and sweeping of dumpster enclosure areas in order to reduce the likelihood of polluting storm water runoff. Litter control maintenance shall be performed on the as-needed and regular basis.

N12 Employee Training

Copies of the educational information attached in Section VII shall be provided to the tenants/employees to educate them in the protection of storm water quality. Personnel shall be reminded on a regular basis that storm drains are intended to be for storm water only, and that employees are discouraged from discharging anything into the storm drain system.

N14 Common Area Catch Basin Inspection
For development with POAs or commercial property and privately maintained drainage systems, require the POA/owner to have privately owned catch basins (if applicable) cleaned and maintained, as frequently as necessary, to prevent sediment, garden waste, and trash, or other pollutants from entering the public streets and storm drain systems. Also, area drains will be inspected a minimum of once per year and cleaned if necessary

N15 Street Sweeping Private Streets and Parking Lots
Drive aisles and parking lots shall be swept on a regular basis using a vacuum sweeper to reduce the discharge of pollutants into the storm drain system from paved surfaces. Street sweeping shall be performed on the regular and as needed basis.

Routine Structural BMPs

The proposed development is a Mixed Used Development with parking lot. The site area is 2.57 acres and is located on the in the City of El Monte, California. The following presents the routine structural source control BMPs which may be applicable to the site.

SD-13 Storm Drain System Stenciling and Signage
The phrase "NO DUMPING – DRAINS TO OCEAN" or equally effective phrase shall be stenciled on catch basins in the parking lots to alert the public and employees to the destination of pollutants discharged into the storm drain system.

Catch basin stenciling shall be inspected and maintained on the regular and as needed basis.

SD-32 Trash Storage Area
Trash container (dumpster) areas shall have drainage from adjoining roofs and pavements diverted around the area(s), and: Dumpsters shall be leak proof and have attached workable covers.

Trash compactors shall be roofed and set on a concrete pad. The pad shall be a minimum of one foot larger all around than the trash compactor and sloped to drain to a sanitary sewer line.

SD-10 Site Design and Landscape Planning
Site Design will be used for allowing maximum pervious areas and landscaping..
Landscaping is proposed along the entire boundary fronting the street except driveway approach.

SD-11 Roof Runoff Control
Roof runoff should be diverted away from the paved areas and drained toward the landscaping areas. This will be incorporated into the site grading design and architectural design. Landscaping area is installed on the side of the building. Roof will drain in this direction to let storm water flow to the landscape area.

SD-12 Efficient Irrigation

Irrigation systems shall be installed and programmed to apply proper volume of water and avoid excess runoff. An Irrigation Management Plan shall be implemented to verify the following minimum:

- Water sensors are functioning properly (make adjustments as necessary);
- Irrigation heads are adjusted properly to eliminate over-spray to hardscape areas;
- Irrigation timing and cycle lengths are adjusted in accordance with water demands, time of year, weather, and day or nighttime temperatures; and
- Plants with similar water requirements are grouped together (BMP S3).

The irrigation system proposed is part of a landscape plan consistent with County Water Conservation Resolution. An Irrigation Management Plan shall be implemented to verify that plants are grouped according to similar water requirements in order to reduce excess irrigation runoff.

B. Site Design BMPs

All projection shall be designed to minimize the introduction of pollutants that may result in significant impacts, generated from site runoff to the municipal storm drain system. The proposed development of the site is a Mixed Used Development with parking lot. All roof drain shall drain toward the onsite suitable area then diverted toward the street.

The create reduced of "Zero Discharge' areas and minimize impervious areas is not applicable to this residential project.

The following non-structural BMPs from California Storm Water Quality Association: Construction Storm Water BMP Handbook, January 2003 are shall be implement at the site:

Fertilizers, herbicides, and pesticides from landscaping activities.

- **WM 1** - Material Delivery and Storage
  All chemical materials shall be accomplished in temporary containment facilities, such as a shed or locker that can be covered during non-work days and prior to rain events. Bagged and boxed materials shall be stored on pallets and covered during non-work days and prior to rain events. Keep all materials labeled and in the original containers.

- **WM 2** - Material Use
  Use materials only where and when needed to complete the activity. Mix paints and other materials in a containment area, and never clean brushes or containers into a street, gutter, storm drain, or watercourse. Latex paint, paint cans, used brushes, rages, absorbent materials, and drop cloths may be disposed of with other construction debris when thoroughly dry and no longer hazardous.

Water Conservation Practices

Water conservation practices ensure that non-storm water flows resulting from construction activities do not flow through the site causing erosion, and/or transport sediment offsite. The Owner shall utilize this measure to the extent possible as described in the following BMP:

- **NS 1** - Water Conservation Practices
  Water equipment should be kept in good working condition, inspected weekly, and leaks shall be promptly repaired. Paved construction areas shall be cleaned by sweeping or vacuuming rather than with water. Any construction runoff water should be directed to areas where it can soak into the ground.

- **NS 7** - Potable Water/Irrigation
  The water source to broken water lines, sprinklers, or valves shall be shut off as soon as possible. Irrigated areas within the site shall be inspected for excess watering. Watering times and schedules shall be adjusted to ensure that the appropriate amount of water is being used and to minimize runoff.

  The approved erosion control plan will be implemented during the construction. These items consist of:

  Temporary Gravel bags will be installed around the perimeter of the site during the rainy season. These Gravel bags are design to intercept and minimize the entry of sediment from the construction area to into the storm drain system along Valley Blvd..

  No large quantity of chemicals will be used for the on-site building construction. Any excavated soils and/or construction waste will be exported to approve areas.

  Temporary designated area for building material storage and waste collection or car wash, It will be around front side, parking stall area during the construction period

C. Treatment BMPs

The Biofiltration System will be installed at the west side and east side of the curb. The flow of the water to be treated is 0.39 cfs or 5,745.58 ft^3

1 – Biofiltration System Model No. MWS-L-4-15 = 7,623 ft^3
1 – Biofiltration System Model No. MWS-L-4-4 = 2,280 ft^3

For Q1
V_B = 7,110.26 ft^3
MWS-L-4-15 = 7,623 ft^3 > 7,110.26 ft^3

For Q2
V_B = 1,540.98 ft^3
MWS-L-4-4 = 2,280 ft^3 > 1,540.98 ft^3

(Please see attach Hydrology Report)

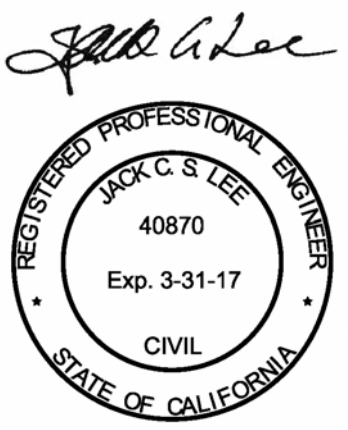
HYDROLOGY STUDY & DRAINAGE ANALYSIS

for

11640-11710 VALLEY BLVD.,
EL MONTE, CA 91732

Prepared for:

NEW S.W.S. SOUTHLAND REAL ESTATE, LLC /
MR. WYNN HUI
915 W. FOOTHILL BLVD.,
ARCADIA, CA 91007



Preparation Date

June 11, 2015

Introduction

The project site is located at the south side of Valley Blvd., City of El Monte, County of Los Angeles, State of California.

The project has an existing drainage pattern going north direction toward the street. Existing street drainage flow drains to west direction from east. There is no off-site drainage. The proposed development will follow the existing drainage pattern. Most of the storm water of will go through a catch basin and then thru the curb or parkway drain before it goes to the street.

	EXISTING	PROPOSED
Q (cfs)	6.92	6.86
Q (cu-ft)	52,042.54	48,510.79
Qpm (cfs)	0.43	0.39
Qpm (cu-ft)	6,245.18	5745.58

Peak Flow Hydrologic Analysis

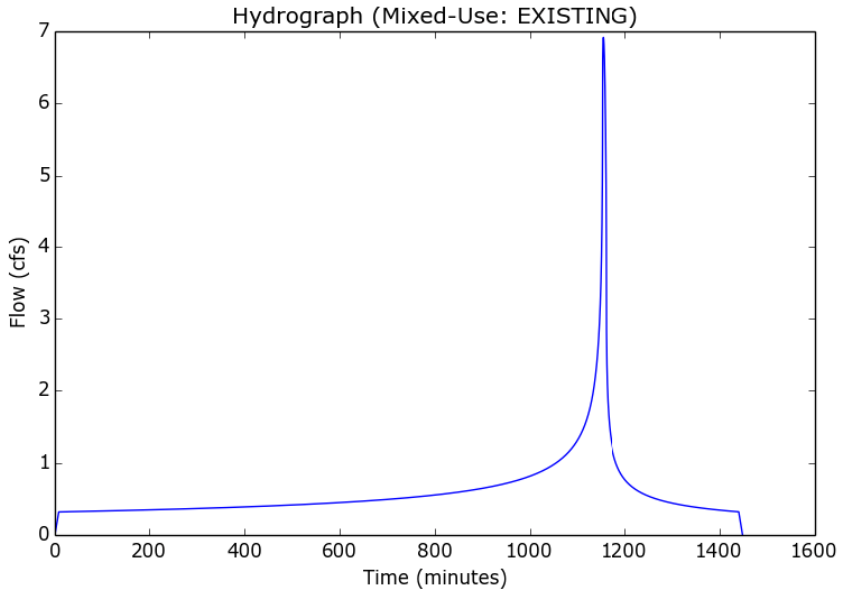
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - EXISTING.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	EXISTING
Area (ac)	2.57
Flow Path Length (ft)	610.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.25
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.25
Peak Intensity (in/hr)	2.9898
Undeveloped Runoff Coefficient (Cu)	0.8216
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	6.9155
Burned Peak Flow Rate (cfs)	6.9155
24-Hr Clear Runoff Volume (ac-ft)	1.1947
24-Hr Clear Runoff Volume (cu-ft)	52042.5419



Peak Flow Hydrologic Analysis

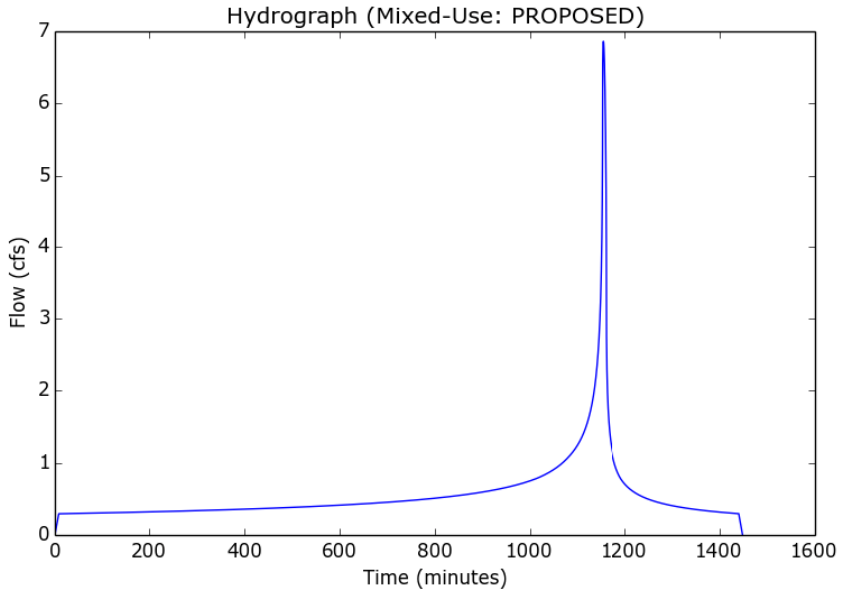
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - PROPOSED.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	PROPOSED
Area (ac)	2.57
Flow Path Length (ft)	610.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.25
Percent Impervious	0.91
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.25
Peak Intensity (in/hr)	2.9898
Undeveloped Runoff Coefficient (Cu)	0.8216
Developed Runoff Coefficient (Cd)	0.8929
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	6.8612
Burned Peak Flow Rate (cfs)	6.8612
24-Hr Clear Runoff Volume (ac-ft)	1.1137
24-Hr Clear Runoff Volume (cu-ft)	48510.7947



Peak Flow Hydrologic Analysis

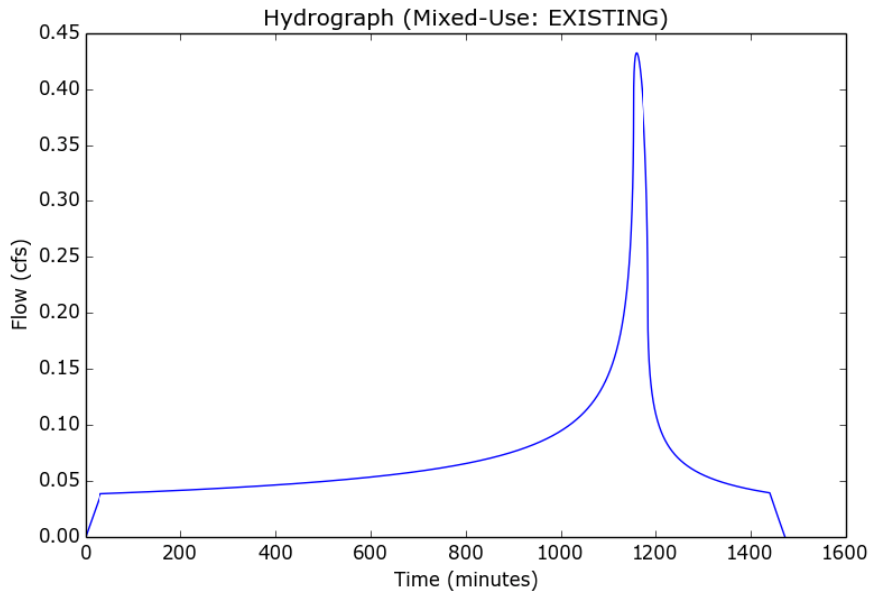
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - EXISTING (0.75).pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	EXISTING
Area (ac)	2.57
Flow Path Length (ft)	610.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.187
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	32.0
Clear Peak Flow Rate (cfs)	0.4325
Burned Peak Flow Rate (cfs)	0.4325
24-Hr Clear Runoff Volume (ac-ft)	0.1434
24-Hr Clear Runoff Volume (cu-ft)	6245.1817



Peak Flow Hydrologic Analysis

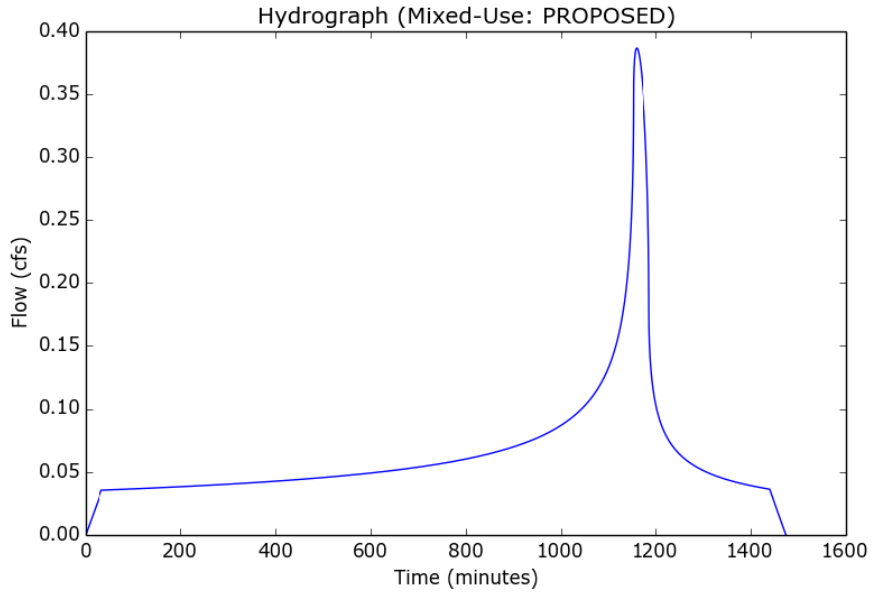
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - PROPOSED (0.75).pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	PROPOSED
Area (ac)	2.57
Flow Path Length (ft)	610.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.91
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1818
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	34.0
Clear Peak Flow Rate (cfs)	0.3868
Burned Peak Flow Rate (cfs)	0.3868
24-Hr Clear Runoff Volume (ac-ft)	0.1319
24-Hr Clear Runoff Volume (cu-ft)	5745.577



Peak Flow Hydrologic Analysis

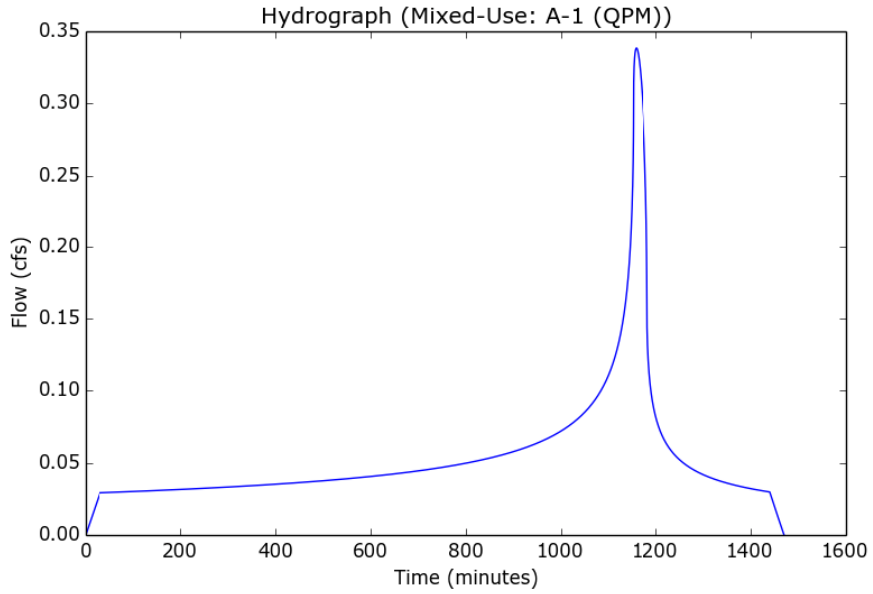
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - A-1 (QPM).pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	A-1 (QPM)
Area (ac)	2.1
Flow Path Length (ft)	505.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.92
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1928
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.836
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.3384
Burned Peak Flow Rate (cfs)	0.3384
24-Hr Clear Runoff Volume (ac-ft)	0.1088
24-Hr Clear Runoff Volume (cu-ft)	4740.1744



Peak Flow Hydrologic Analysis

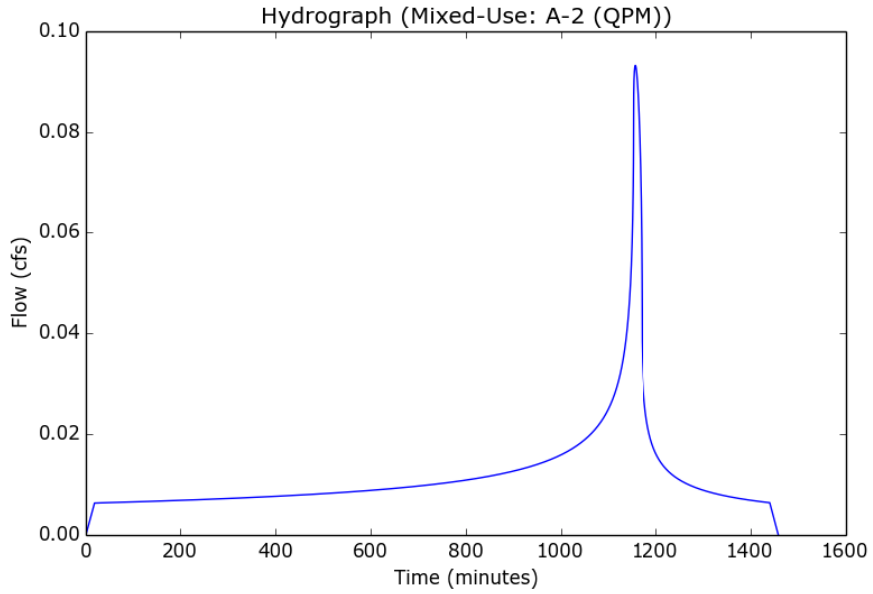
File location: C:/Documents and Settings/peter/Desktop/Mixed-Use - A-2 (QPM).pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Mixed-Use
Subarea ID	A-2 (QPM)
Area (ac)	0.478
Flow Path Length (ft)	210.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2451
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.796
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	0.0932
Burned Peak Flow Rate (cfs)	0.0932
24-Hr Clear Runoff Volume (ac-ft)	0.0236
24-Hr Clear Runoff Volume (cu-ft)	1027.3218



BIOFILTRATION CALCULATION:

For Q-1

SWQDv = 4,740.17 CF

V_B = 1.5 x (SWQDv – V_R)
= 7,110.26 cf

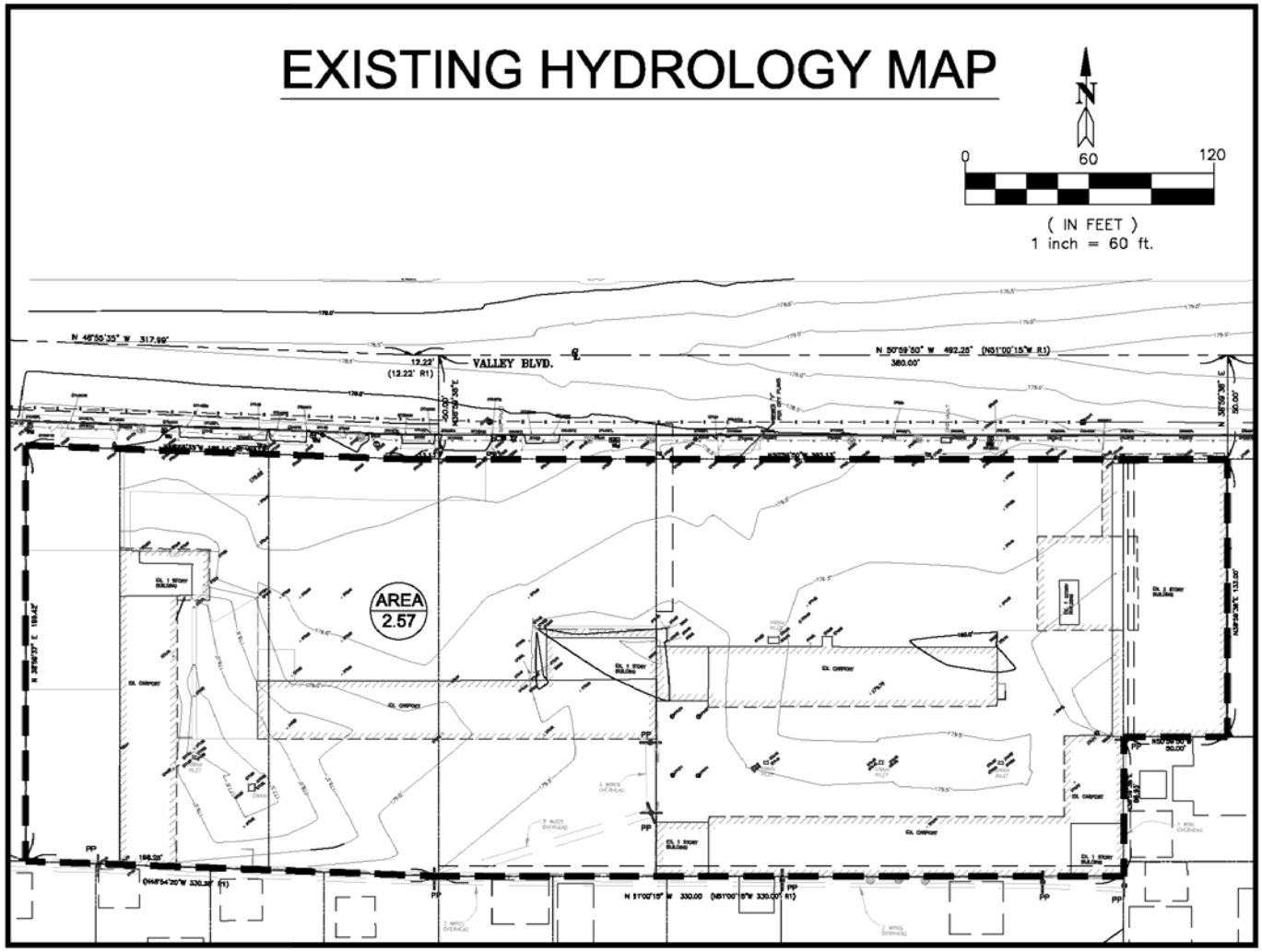
Proposed Modular Wetland System:
Model no. MWS-L-4-15
Treatment Capacity @ 48-hr. Drain Down **= 7,623 cf > 7,110.26 cf ….OK**

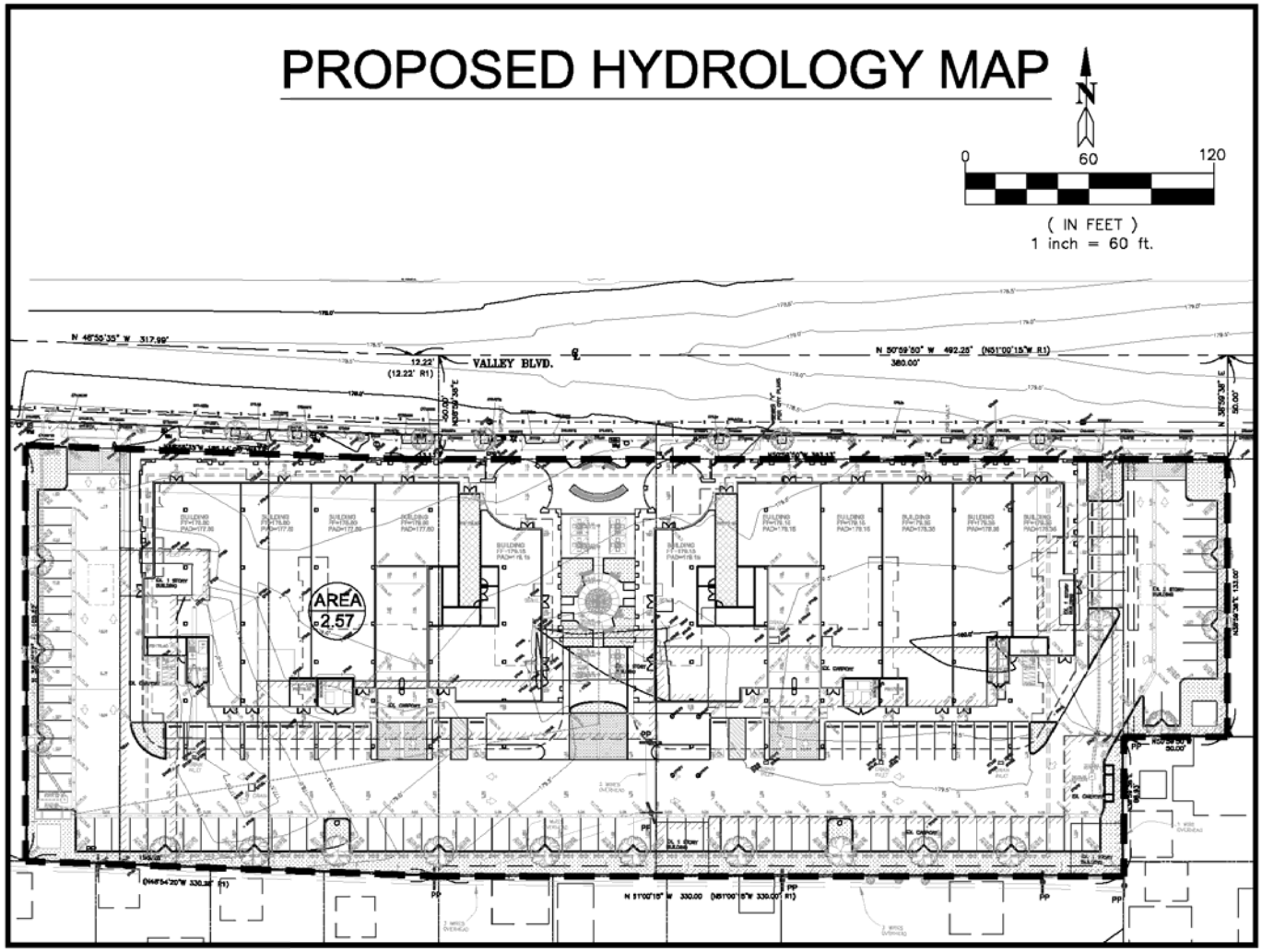
For Q-2

SWQDv = 1,027.32 CF

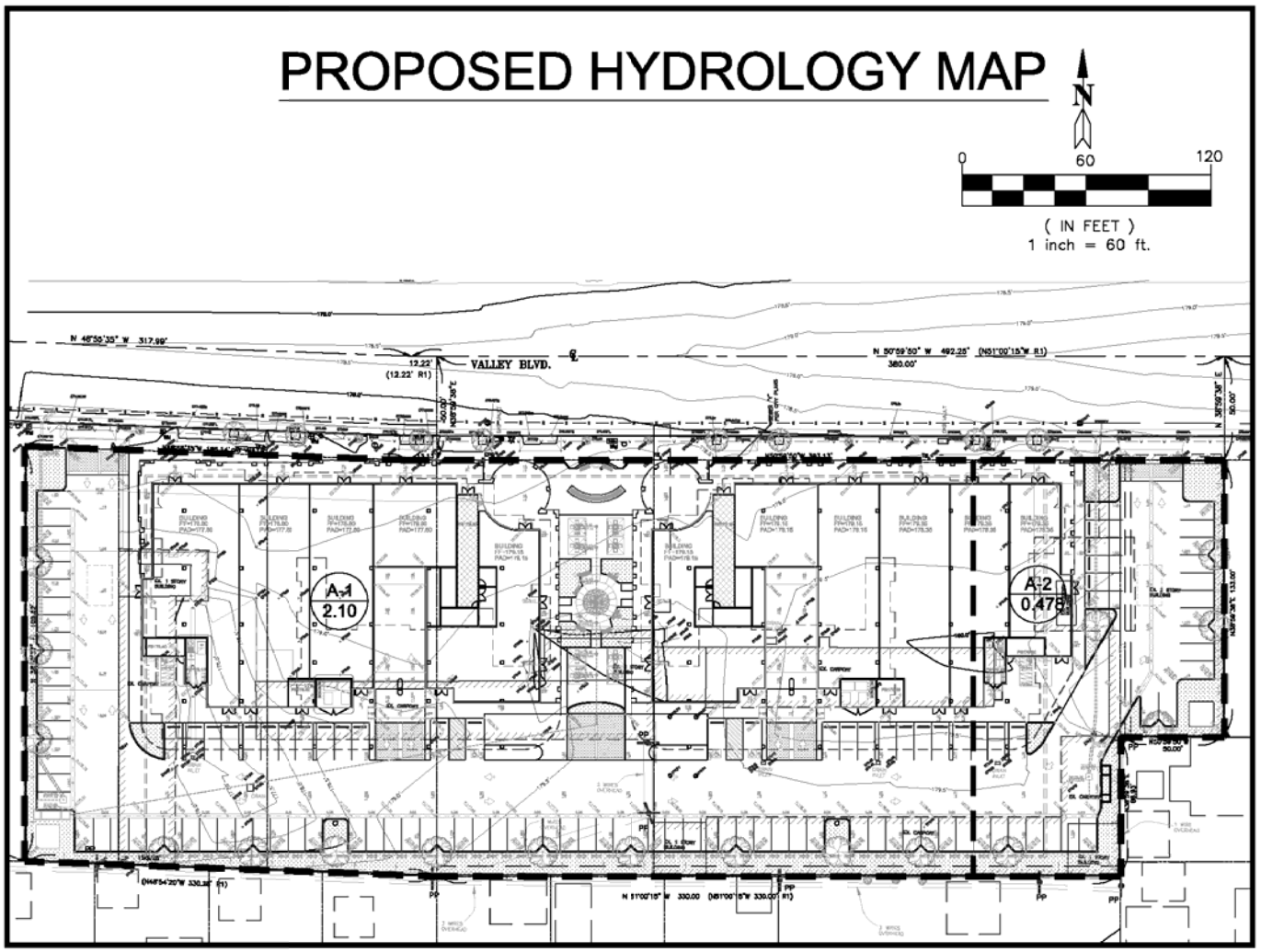
V_B = 1.5 x (SWQDv – V_R)
= 1,540.98 cf

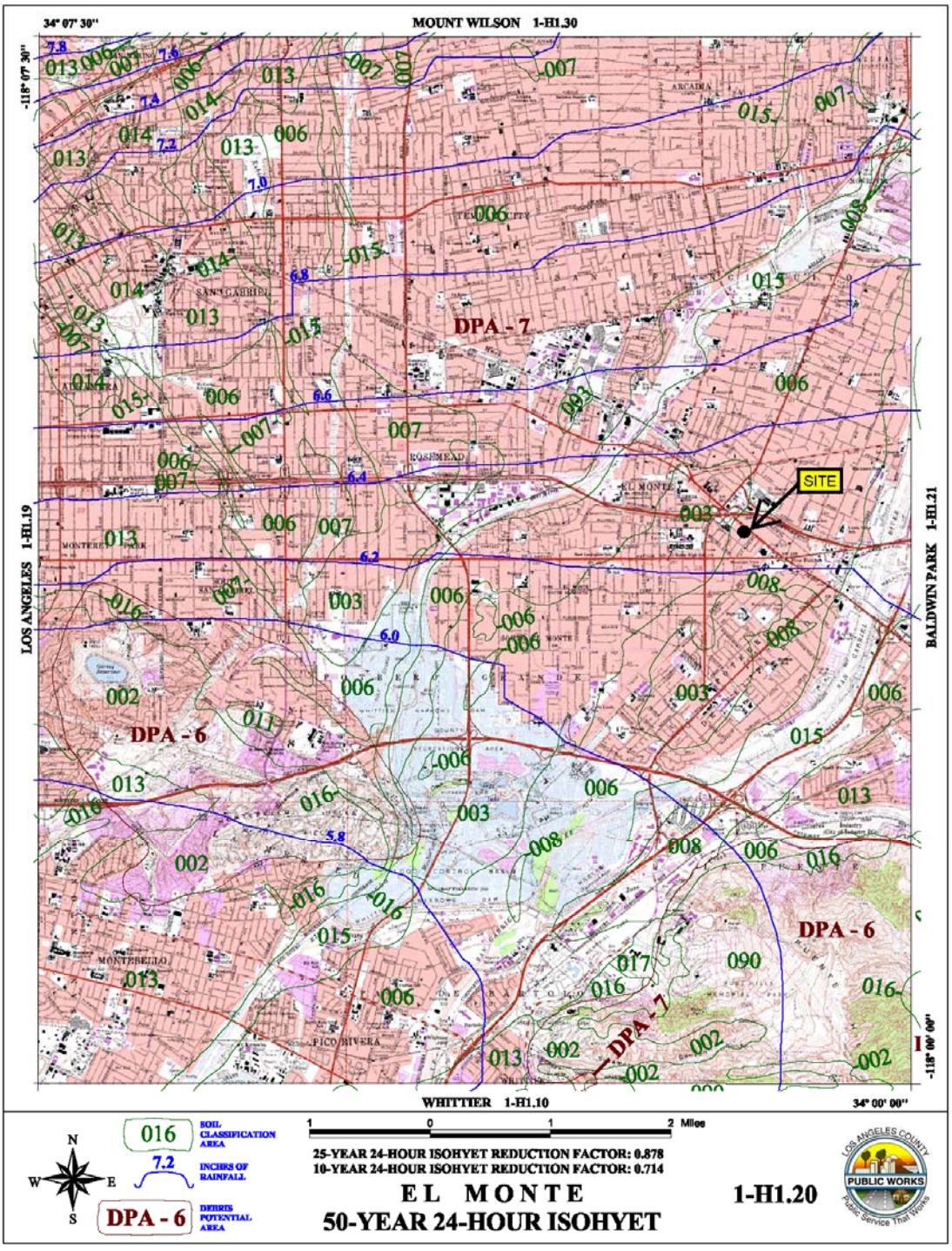
Proposed Modular Wetland System:
Model no. MWS-L-4-4
Treatment Capacity @ 48-hr. Drain Down **= 2,280 cf > 1,540.98 cf ….OK**


EXISTING HYDROLOGY MAP
N
0
60
120
(IN FEET)
1 inch = 60 ft.
VALLEY BLVD.
AREA
2.57


PROPOSED HYDROLOGY MAP
N
0
60
120
(IN FEET)
1 inch = 60 ft.
VALLEY BLVD.
AREA
2.57

PROPOSED HYDROLOGY MAP




34° 07' 30"
MOUNT WILSON 1-H1.30
-118° 07' 30"
LOS ANGELES 1-H1.19
BALDWIN PARK 1-H1.21
-118° 00' 00"
WHITTIER 1-H1.10
34° 00' 00"
DPA - 7
DPA - 6
DPA - 7
DPA - 6
SITE
ARCADIA
TEMPLE CITY
SAN GABRIEL
ROSEMEAD
EL MONTE
MONTEREY PARK
MONTEBELLO
PICO RIVERA
016 SOIL CLASSIFICATION AREA
7.2 INCHES OF RAINFALL
DPA - 6 DEBRIS POTENTIAL AREA
N
W
E
S
1 0 1 2 Miles
25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714
EL MONTE
50-YEAR 24-HOUR ISOHYET
1-H1.20
LOS ANGELES COUNTY
PUBLIC WORKS
Public Service That Works

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

Treatment Flow Sizing Table

Model #	Dimensions	Wetland Media Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	25 ft^2	0.052
MWS-L-4-6	4' x 6'	32 ft^2	0.073
MWS-L-4-8	4' x 8'	50 ft^2	0.115
MWS-L-4-13	4' x 13'	63 ft^2	0.144
MWS-L-4-15	4' x 15'	76 ft^2	0.175
MWS-L-4-17	4' x 17'	90 ft^2	0.206
MWS-L-4-19	4' x 19'	103 ft^2	0.237
MWS-L-4-21	4' x 21'	117 ft^2	0.268
MWS-L-8-8	8' x 8'	100 ft^2	0.230
MWS-L-8-12	8' x 12'	151 ft^2	0.346
MWS-L-8-16	8' x 16'	201 ft^2	0.462

Volume Based Sizing

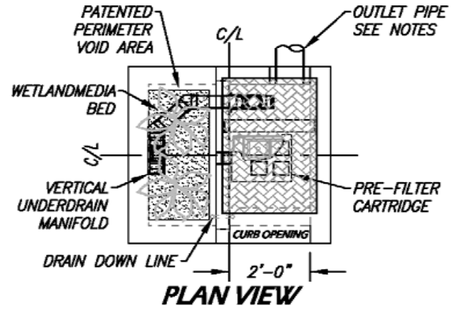
Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.

Treatment Volume Sizing Table

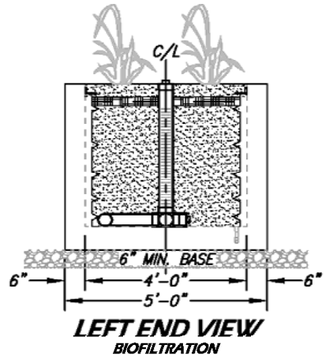
Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

SITE SPECIFIC DATA

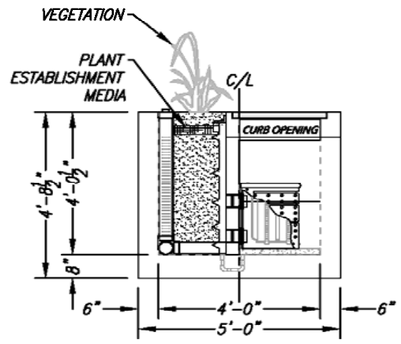
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	24" x 42"	N/A	N/A
WETLANDMEDIA VOLUME (CY)			0.83
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø1.03"
MAXIMUM PICK WEIGHT (LBS)			9000
NOTES:			



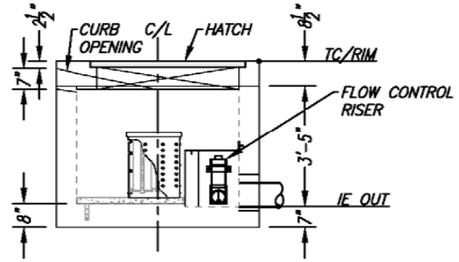
PLAN VIEW



LEFT END VIEW
BIOFILTRATION



ELEVATION VIEW



RIGHT END VIEW
PRETREATMENT/DISCHARGE

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

GENERAL NOTES

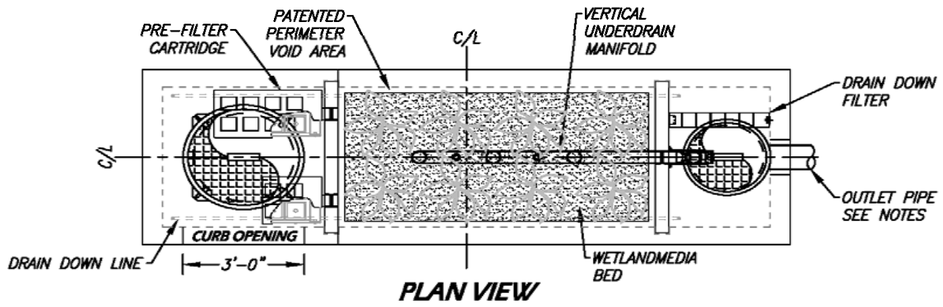
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.

TREATMENT FLOW (CFS)	0.052
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

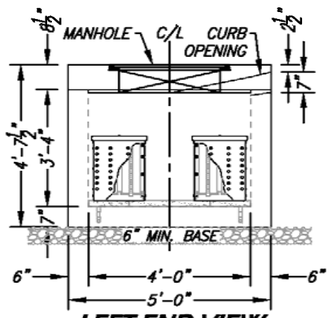
MODULAR WETLANDS
www.ModularWetlands.com | (855) 5MOD-WET

MWS-L-4-4-C
STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

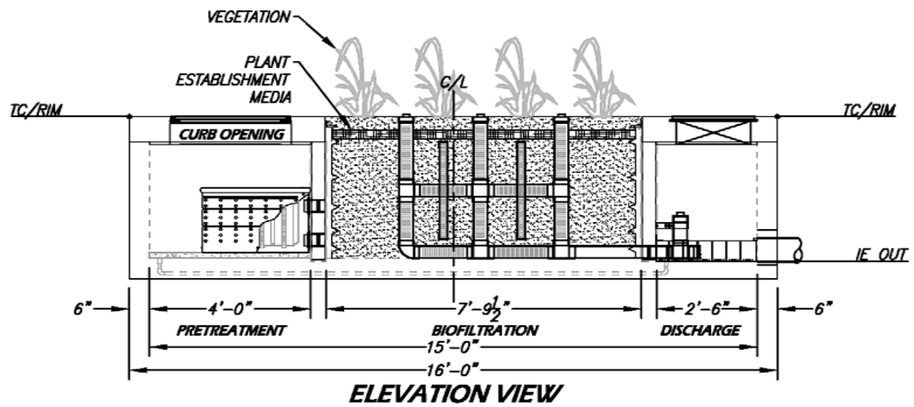
SITE SPECIFIC DATA			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			4.30
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø1.89"
MAXIMUM PICK WEIGHT (LBS)			31000
NOTES:			



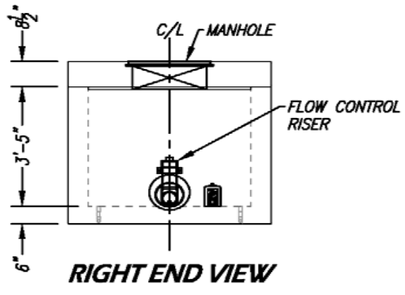
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

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TREATMENT FLOW (CFS)	0.175
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

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MWS-L-4-15-C
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

III. INSPECTION AND MAINTENANCE RESPONSIBILITY FOR BMP'S

The Entity Responsible for Maintenance

New S.W.S. Southland Real Estate, LLC / Wynn Hui is the property owner, see title page for name, address, phone no. and will serve as the property management team for the site and will be responsible for the inspection, implementation, and maintenance of the structural and non-structural BMP Maintenance. After which the property is sold, the responsibility will be transferred to the New Property Owner(s).

Provide Proof of Ongoing BMP Maintenance

Minimum frequency for inspection and maintenance to ensure the effectiveness of each structural source control BMP and each Treatment Control BMP. Please see attached operation and maintenance for frequency and procedure for Structural BMPs

To provide verification of maintenance provisions through appropriate means has been included, see "COVENANTS, CONDITIONS AND RESTRICTION", accepting responsibility for all structural and treatment control BMP maintenance until the time the property is transferred, The transfer of property to a private or public owner must have conditions requiring the recipient to assume responsibility for maintenance of any Structural or Treatment Control BMP to be included in the sales or lease agreement for that property. Structural or Treatment Control BMP are located within a public area proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriated public agency prior to its installation.

Appropriate mechanism for the long-term operation and maintenance shall be included in the condition of transfer that property owners conduct maintenance inspection of all Structural or Treatment Control BMP.

Please see page 31-34 of operation and maintenance for frequency and procedure for Structural BMPs

The following chart indicates the Source Control (Non-Structural) BMPs will be implemented at this site:

BMP I.D. #	BMP Description	Description of BMP and Method of Implementation	BMP Responsibility	Start Up Date
N1	Education for Property Owners, Tenant and Occupants	The owner will familiarize himself with the information included in Attachment of this report and will take responsibility for the implementation of the Best Management Practices outlined in the attachment. In addition to the attachments, the following resources can be contacted to obtain updated educational information and pertinent ordinances free of charge: • The City of Arcadia; and Provide educational materials upon close of sale	*Owners*[1]	Before Occupancy
N2	Activity restrictions	The following is a list of activity restrictions for the project site and will be listed in leasing agreement: • The following is a list of activity restrictions for the project site: • No changing of oil or other auto repairs will be permitted on the premises. • Do not sweep grass clippings, dead leaves into catch basins, or other landscaping related debris into catch basins. • Do not perform paint cleanup activities in paved areas or allow rinse water from these activities to enter the storm drain system. Clean brushes containing water-based paint in a sink that is connected to the sanitary sewer system. • Do not wash concrete or any other surfaces unless the rinsate is collected and properly disposed of. Dry Clean Method (Sweeping) are preferred for outdoor exterior surface cleaning. • Keep premises, as well as trash container areas, free of litter. • No Fuelling of vehicle will be permitted in premises • No Air/Water supply area drainage will be permitted in premises • No maintenance bays and docks are allowed in premises • No vehicle washing area will be permitted in premises • No outdoor material storage areas will be permitted in premises • No outdoor work areas will be permitted in premises • No outdoor processing areas will be permitted in premises • Wash water for food preparation will not be disposed to storm water drainage. • No hazardous material will be handle or generated in premises.	*Owners*[1]	During signing of lease agreement

1. Owner will be responsible for initial BMP operation and maintenance. As the property is sold, new property owner shall be responsible for operation and maintenance of each BMP's on his/her respective lot.

Owner: New S.W.S. Southland Real Estate, LLC / Wynn Hui
Address: 915 W. Foothill Blvd., Arcadia, CA 91007
Phone No.: (626) 373-3590

Post Construction Source Control (Non-Structural) BMP Implementation (continued)

Complete the following chart by indicating which Source Control (Non-Structural) BMPs will be implemented at this site:

BMP I.D. #	BMP Description	Description of BMP and Method of Implementation	BMP Responsibility	Start Up Date
N4	Common Area Catch Basin Inspection	Regular maintenance will be conducted, consisting, at a minimum of cleaning and/or inspection of the catch basin inserts. Detailed configuration of the approved catch basin is attached with this plan and should be incorporated into the site's drainage design. This cleaning/inspection should be conducted on a monthly basis and prior to any rainy season). This will be implemented upon occupancy	*Owners*[1]	Upon start of operation

1. Owner will be responsible for initial BMP operation and maintenance. As the property is sold, new property owner shall be responsible for operation and maintenance of each BMP's on his/her respective lot.

Owner: New S.W.S. Southland Real Estate, LLC / Wynn Hui
Address: 915 W. Foothill Blvd., Arcadia, CA 91007
Phone No.: (626) 373-3590

Post Construction Treatment (Structural) BMP Installation (cont.)

Complete the following chart by indicating which Structural BMPs will be installed at this site and provide (attach) a site map locating structural BMPs as well as a detail drawing of each BMP which will be constructed to reduce storm water pollution after construction is complete.

BMP I.D. #	BMP Description	Description of BMP including dimensions, details, make & model, etc.	Maintenance Responsibility	Funding Source For O & M	Maintenance Schedule	Start Up Date
S6	Trash Container Areas	Trash container area will have drainage from adjoining roofs and pavements diverted around the area. Dumpster shall be leak proof and have attached workable covers. Keep lid closed all the time and remove debris around the container and within enclosure every two weeks. This will be inspected every two weeks.	*Owners*[1]	*Owners*[1]	*On-going*	*During construction*
MP-52	Drain Insert	Remove trash or debris that may cause clogging to the catch basin and Downspout. A operation and maintenance manual attached with this report shall be used as the basis for the maintenance of the Filter inserts. Filter inserts must be replaced when broken or non-functional. See attach separate sheet.	*Owner*[1]	*Owner*[1]	*Monthly*	*Upon start of operation*

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Post Construction Treatment (Structural) BMP Installation (cont.)

Complete the following chart by indicating which Structural BMPs will be installed at this site and provide (attach) a site map locating structural BMPs as well as a detail drawing of each BMP which will be constructed to reduce storm water pollution after construction is complete.

BMP I.D. #	BMP Description	Description of BMP including dimensions, details, make & model, etc.	Maintenance Responsibility	Funding Source For O & M	Maintenance Schedule	Start Up Date
	Biofiltration System	1 – Biofiltration System Model No. MWS-L-4-15 = 7,623 ft^3 1 – Biofiltration System Model No. MWS-L-4-4 = 2,280 ft^3	*Owners*[1]	*Owners*[1]	*During Original installation and yearly*	*Upon start of operation*

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Owner: New S.W.S. Southland Real Estate, LLC / Wynn Hui
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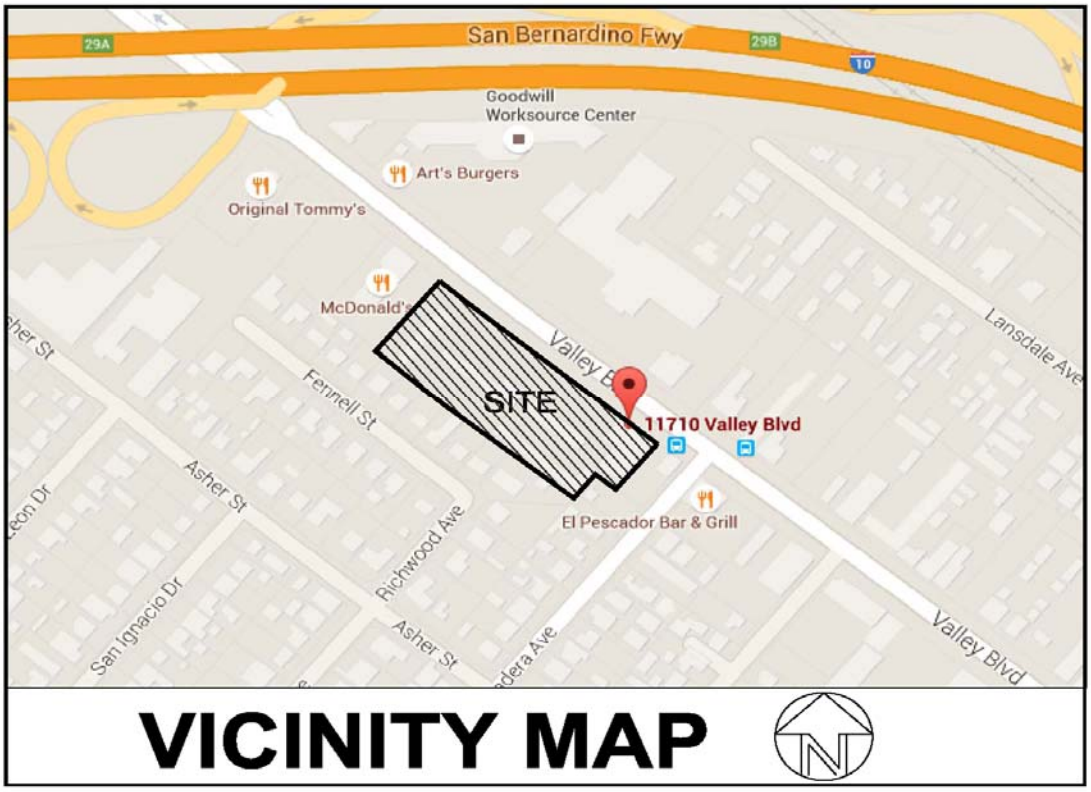
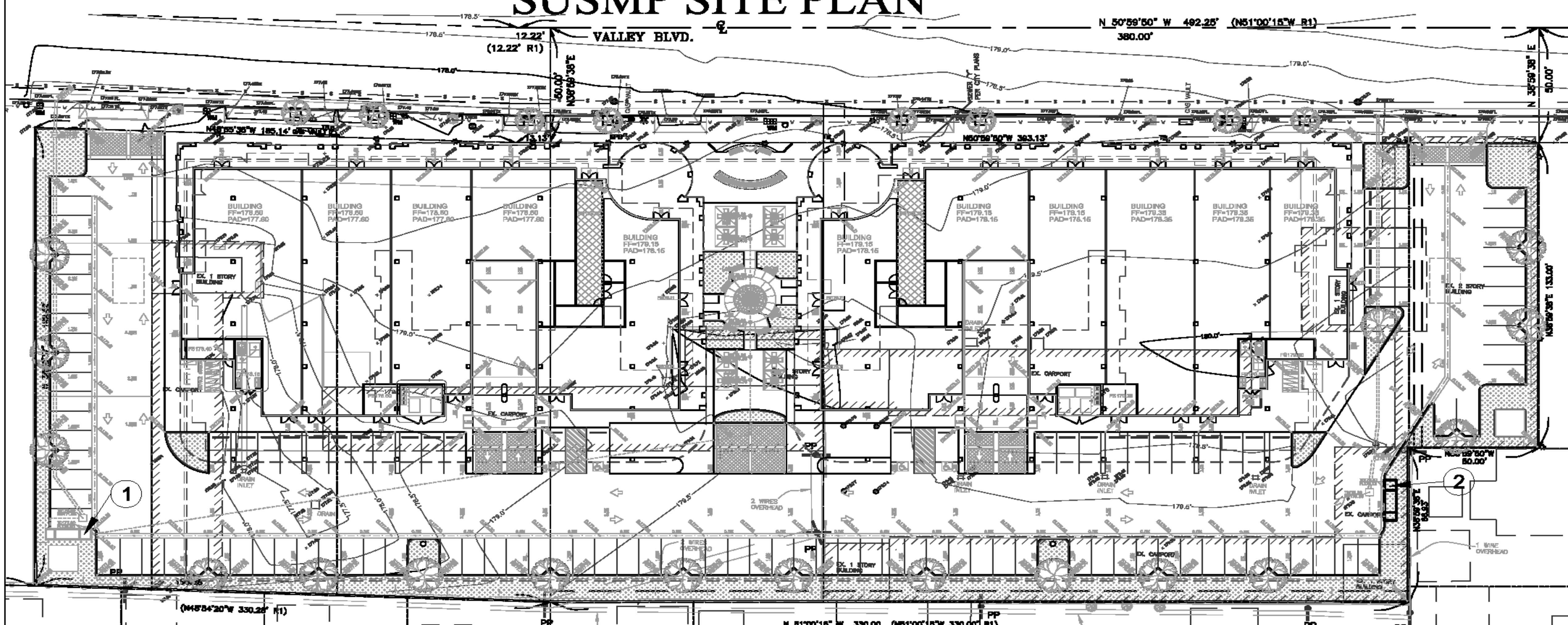
Phone No.: (626) 373-3590

IV. VICINITY MAP AND SUSMP SITE



SUSMP SITE PLAN



SITE SPECIFIC DATA

SITE SPECIFIC DATA			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	24" x 42"	N/A	N/A
WETLANDMEDIA VOLUME (CY)			0.83
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø1.03"
MAXIMUM PICK WEIGHT (LBS)			9000
NOTES:			

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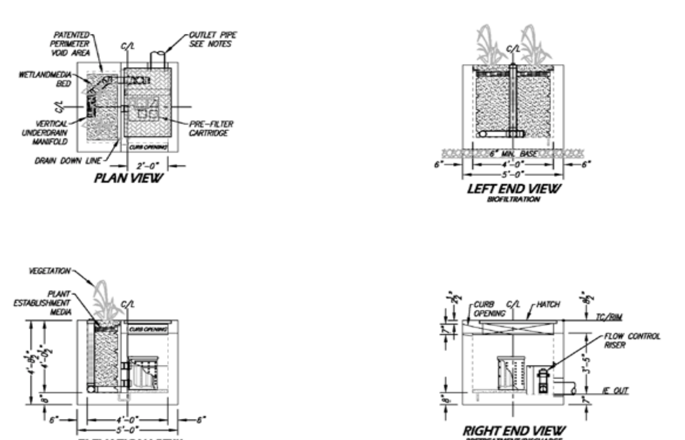

2

TREATMENT FLOW (CFS)	0.052
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

THE PRODUCT DESCRIBED MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MODULAR WETLANDS SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MODULAR WETLANDS SYSTEMS IS PROHIBITED.

MODULAR WETLANDS

MWS-L-4-4-C
STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

SITE SPECIFIC DATA

SITE SPECIFIC DATA			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			4.30
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø1.89"
MAXIMUM PICK WEIGHT (LBS)			31000
NOTES:			

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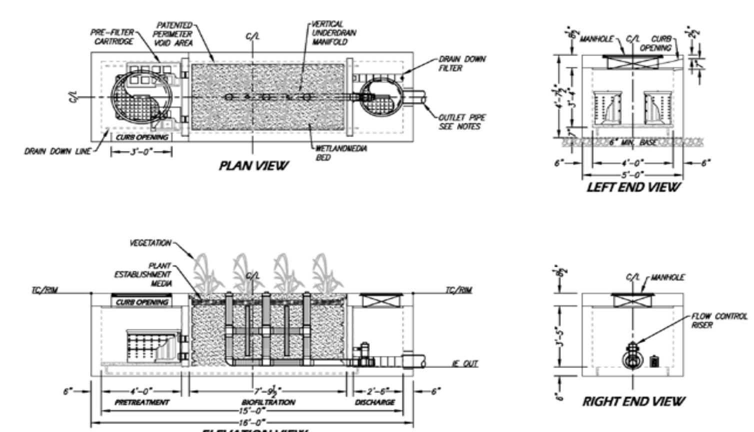

1

TREATMENT FLOW (CFS)	0.175
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

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MODULAR WETLANDS

MWS-L-4-15-C
STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

N

CALLAND ENGINEERING, INC.
dba QUARTECH CONSULTANTS
576 E. LAMBERT ROAD, BREA, CA 92821
TEL: (714) 671-1050 FAX: (714) 671-1090

CITY OF EL MONTE:
APPROVAL WITH RESPECT TO OFFSITE IMPROVEMENTS AND NPDES APPLICABLE LAWS

CITY ENGINEER DATE

PROJECT LOCATION:
11640-11710 VALLEY BLVD., EL MONTE, CA 91732

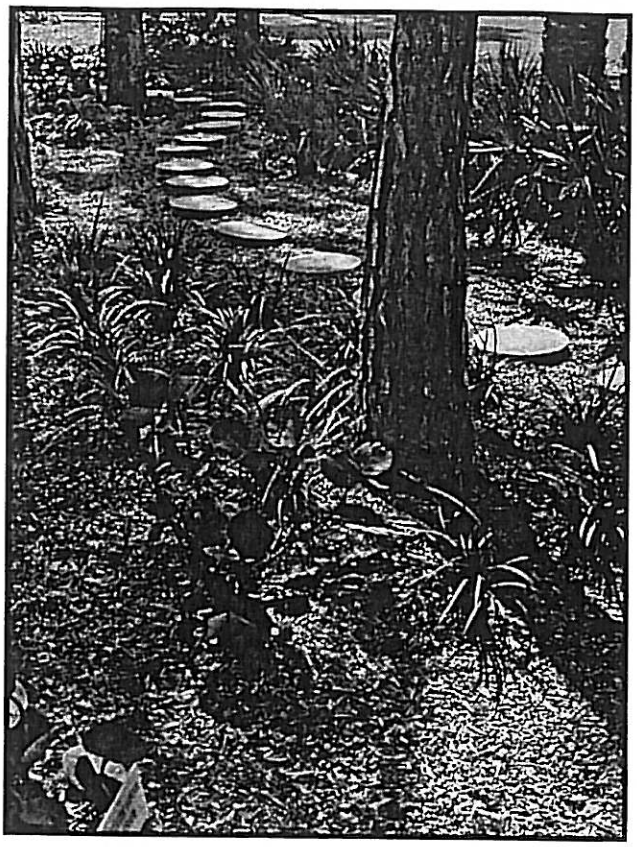
DRAWN: FS
CHECKED:
DATE: 06/11/2015
JOB. NO.:
SCALE: 1" = 10'
FILE NAME:

PG-1

SHEET 1 OF 2

V. EDUCATION MATERIALS

Site Design & Landscape Planning SD-10



Design Objectives

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

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- 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.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

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

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

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

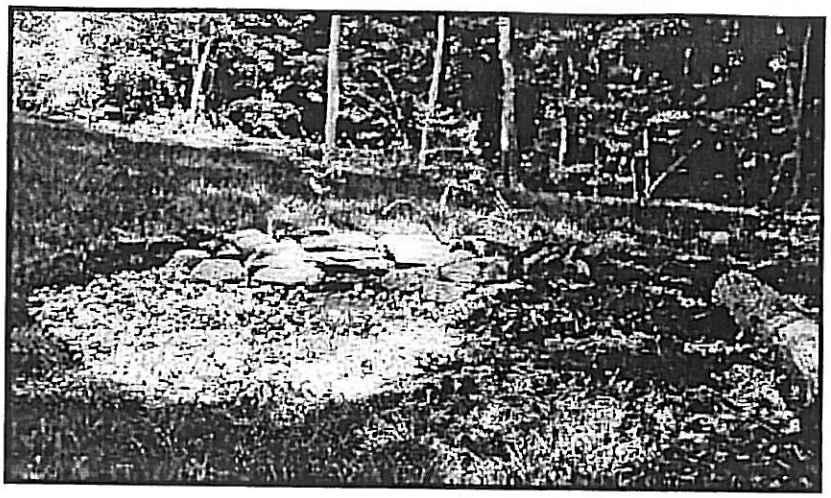
Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

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

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

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

Roof Runoff Controls SD-11



Rain Garden

Design Objectives

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

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

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

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

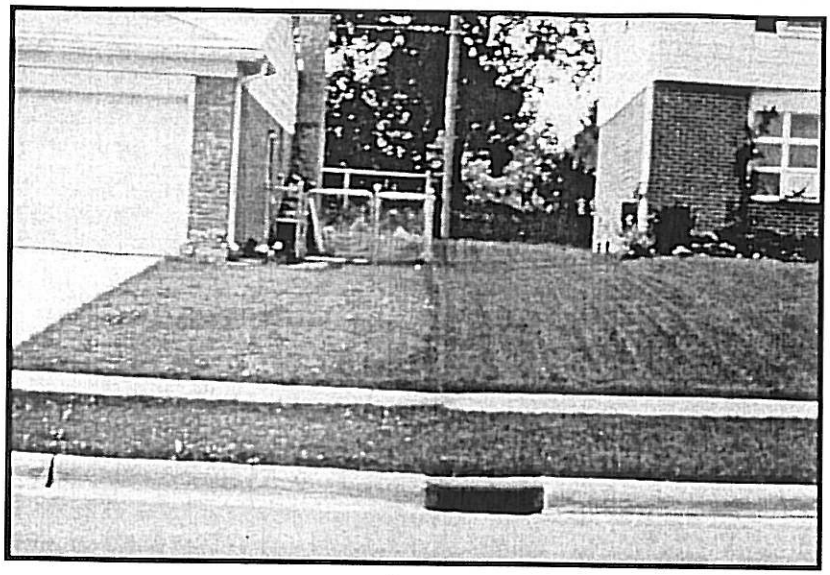
Other Resources

Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Efficient Irrigation SD-12



Design Objectives

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

Description

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

Approach

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

Suitable Applications

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

Design Considerations

Designing New Installations

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

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

- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

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

Other Resources

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

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

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

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

Trash Storage Areas SD-32

Description

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

Approach

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

Design Objectives

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

Suitable Applications

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

Design Considerations

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

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

Designing New Installations

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

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

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

Redeveloping Existing Installations

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

Additional Information

Maintenance Considerations

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

Other Resources

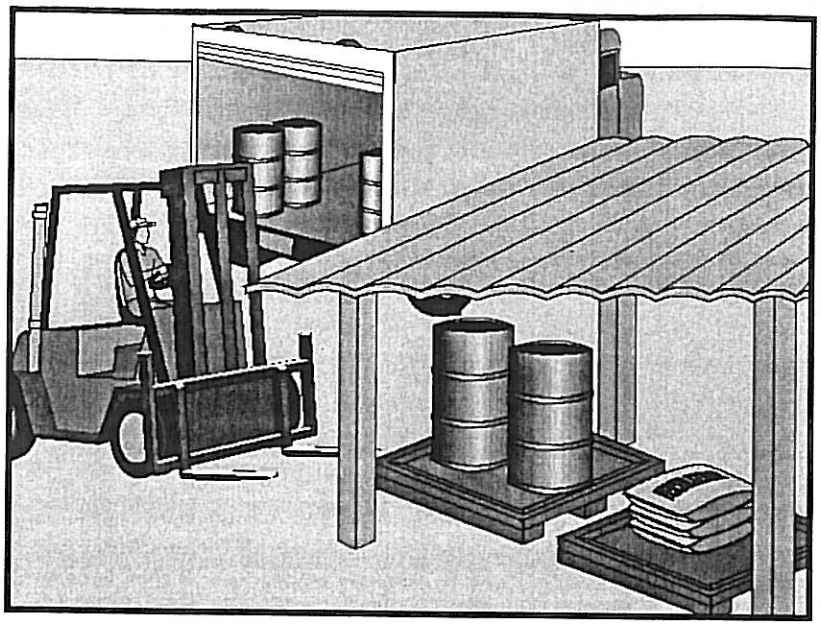
A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

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

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

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

Material Delivery and Storage WM-1



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease
- Asphalt and concrete components

- Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

Limitations

- Space limitation may preclude indoor storage.
- Storage sheds often must meet building and fire code requirements.

Implementation

The following steps should be taken to minimize risk:

- Temporary storage area should be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) should be supplied for all materials stored.
- Construction site areas should be designated for material delivery and storage.
- Material delivery and storage areas should be located near the construction entrances, away from waterways, if possible.
  - Avoid transport near drainage paths or waterways.
  - Surround with earth berms. See EC-9, Earth Dikes and Drainage Swales.
  - Place in an area which will be paved.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- An up to date inventory of materials delivered and stored onsite should be kept.
- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- During the rainy season, consider storing materials in a covered area. Store materials in secondary containments such as earthen dike, horse trough, or even a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, in secondary containment.

- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids to reduce corrosion. Domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.
- Chemicals should be kept in their original labeled containers.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquid chemicals are unloaded.
- If significant residual materials remain on the ground after construction is complete, properly remove materials and any contaminated soil. See WM-7, Contaminated Soil Management. If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

Material Storage Areas and Practices

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be overfilled. Containers and drums should be placed in temporary containment facilities for storage.
- A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest container within its boundary, whichever is greater.
- A temporary containment facility should be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids should be sent to an approved disposal site.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Throughout the rainy season, each temporary containment facility should be covered during non-working days, prior to, and during rain events.
- Materials should be stored in their original containers and the original product labels should be maintained in place in a legible condition. Damaged or otherwise illegible labels should be replaced immediately.

- Bagged and boxed materials should be stored on pallets and should not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials should be covered during non-working days and prior to and during rain events.
- Stockpiles should be protected in accordance with WM-3, Stockpile Management.
- Materials should be stored indoors within existing structures or sheds when available.
- Proper storage instructions should be posted at all times in an open and conspicuous location.
- An ample supply of appropriate spill clean up material should be kept near storage areas.
- Also see WM-6, Hazardous Waste Management, for storing of hazardous materials.

Material Delivery Practices

- Keep an accurate, up-to-date inventory of material delivered and stored onsite.
- Arrange for employees trained in emergency spill cleanup procedures to be present when dangerous materials or liquid chemicals are unloaded.

Spill Cleanup

- Contain and clean up any spill immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See WM-7, Contaminated Soil Management.
- See WM-4, Spill Prevention and Control, for spills of chemicals and/or hazardous materials.

Cost

- The largest cost of implementation may be in the construction of a materials storage area that is covered and provides secondary containment.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Keep an ample supply of spill cleanup materials near the storage area.
- Keep storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored.
- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

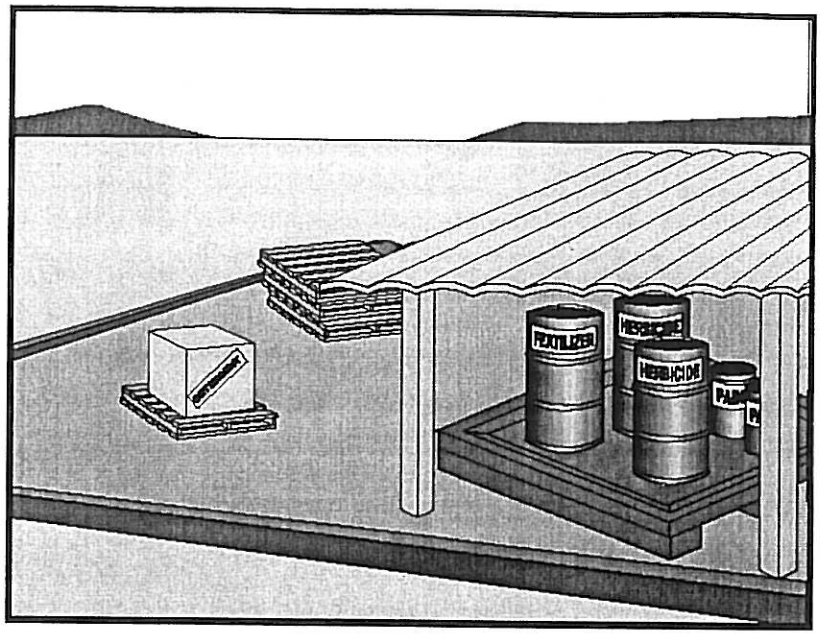
Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Material Use

WM-2



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

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

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

Limitations

Safer alternative building and construction products may not be available or suitable in every instance.

Implementation

The following steps should be taken to minimize risk:

- Minimize use of hazardous materials onsite.
- Follow manufacturer instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Train personnel who use pesticides. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct onsite inspections.
- Do not over-apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Unless on steep slopes, till fertilizers into the soil rather than hydro seeding. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried offsite by runoff. Do not apply these chemicals just before it rains.
- Train employees and subcontractors in proper material use.
- Supply Material Safety Data Sheets (MSDS) for all materials.
- Dispose of latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths, when thoroughly dry and are no longer hazardous, with other construction debris.
- Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
- Mix paint indoors or in a containment area. Never clean paintbrushes or rinse paint containers into a street, gutter, storm drain, or watercourse. Dispose of any paint thinners, residue, and sludge(s) that cannot be recycled, as hazardous waste.
- For water-based paint, clean brushes to the extent practicable, and rinse to a drain leading to a sanitary sewer where permitted, or into a concrete washout pit or temporary sediment trap. For oil-based paints, clean brushes to the extent practicable, and filter and reuse thinners and solvents.
- Use recycled and less hazardous products when practical. Recycle residual paints, solvents, non-treated lumber, and other materials.
- Use materials only where and when needed to complete the construction activity. Use safer alternative materials as much as possible. Reduce or eliminate use of hazardous materials onsite when practical.

- Require contractors to complete the "Report of Chemical Spray Forms" when spraying herbicides and pesticides.
- Keep an ample supply of spill clean up material near use areas. Train employees in spill clean up procedures.
- Avoid exposing applied materials to rainfall and runoff unless sufficient time has been allowed for them to dry.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two–week intervals in the non-rainy season to verify continued BMP implementation.
- Maintenance of this best management practice is minimal.
- Spot check employees and subcontractors throughout the job to ensure appropriate practices are being employed.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

- Direct construction water runoff to areas where it can soak into the ground or be collected and reused.
- Authorized non-stormwater discharges to the storm drain system, channels, or receiving waters are acceptable with the implementation of appropriate BMPs.
- Lock water tank valves to prevent unauthorized use.

Costs

The cost is small to none compared to the benefits of conserving water.

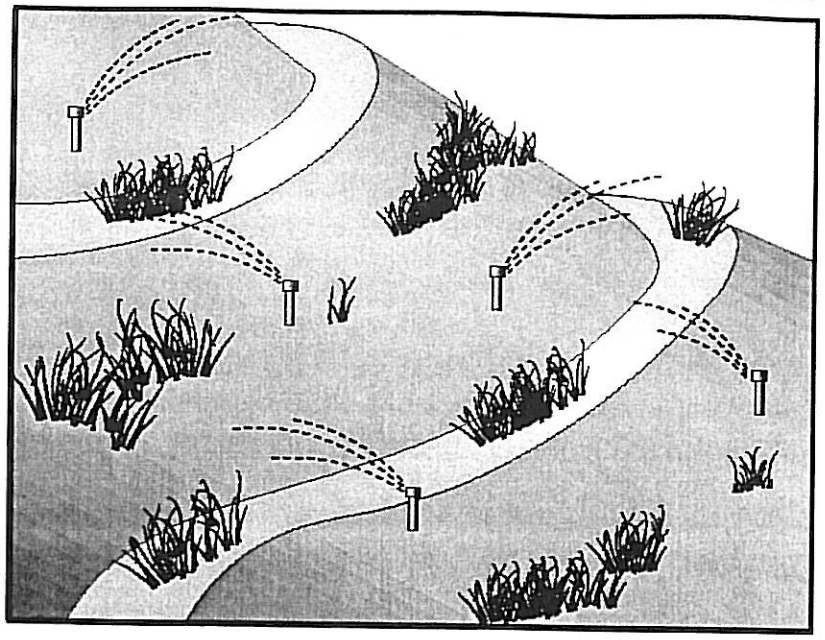
Inspection and Maintenance

- Inspect and verify that activity based BMPs are in place prior to the commencement of authorized non-stormwater discharges.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges are occuring.
- Repair water equipment as needed to prevent unintended discharges.
  - Water trucks
  - Water reservoirs (water buffalos)
  - Irrigation systems
  - Hydrant connections

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Potable Water/Irrigation NS-7



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	☑

Potential Alternatives

None

Description and Purpose

Potable Water/Irrigation consists of practices and procedures to manage the discharge of potential pollutants generated during discharges from irrigation water lines, landscape irrigation, lawn or garden watering, planned and unplanned discharges from potable water sources, water line flushing, and hydrant flushing.

Suitable Applications

Implement this BMP whenever potable water or irrigation water discharges occur at or enter a construction site.

Limitations

None identified.

Implementation

- Direct water from offsite sources around or through a construction site, where feasible, in a way that minimizes contact with the construction site.
- Discharges from water line flushing should be reused for landscaping purposes where feasible.
- Shut off the water source to broken lines, sprinklers, or valves as soon as possible to prevent excess water flow.
- Protect downstream stormwater drainage systems and watercourses from water pumped or bailed from trenches excavated to repair water lines.

Water Conservation Practices NS-1

Objectives		
EC	Erosion Control	☒
SE	Sediment Control	☒
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Water conservation practices are activities that use water during the construction of a project in a manner that avoids causing erosion and the transport of pollutants offsite. These practices can reduce or eliminate non-stormwater discharges.

Suitable Applications

Water conservation practices are suitable for all construction sites where water is used, including piped water, metered water, trucked water, and water from a reservoir.

Limitations

- None identified.

Implementation

- Keep water equipment in good working condition.
- Stabilize water truck filling area.
- Repair water leaks promptly.
- Washing of vehicles and equipment on the construction site is discouraged.
- Avoid using water to clean construction areas. If water must be used for cleaning or surface preparation, surface should be swept and vacuumed first to remove dirt. This will minimize amount of water required.

- Inspect irrigated areas within the construction limits for excess watering. Adjust watering times and schedules to ensure that the appropriate amount of water is being used and to minimize runoff. Consider factors such as soil structure, grade, time of year, and type of plant material in determining the proper amounts of water for a specific area.

Costs

Cost to manage potable water and irrigation are low and generally considered to be a normal part of related activities.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Repair broken water lines as soon as possible.
- Inspect irrigated areas regularly for signs of erosion and/or discharge.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

V. MAINTENANCE AND COVENANT