Priority Development Project (PDP)
Storm Water Quality Management Plan (SWQMP)

VetPowered

CDP-_____ NDP_____

[Insert Drawing Number (if applicable) and Internal Order Number (if applicable)]

☐ **Check if electing for offsite alternative compliance**

Engineer of Work:

_____

Bryan Nord, PE 87326

Provide Wet Signature and Stamp Above Line

Prepared For:

VetPowered

3030 Main Street

San Diego, CA 92113

619.269.7116

Prepared By:

Kimley-Horn

401 B Street, Suite 600, San Diego CA 92101

San Diego, CA 92121

619-452-2203

Date:

10/21/2021

_____

Approved by: City of San Diego Date

The City of SAN DIEGO

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Project Name: VetPowered

Table of Contents

- Attachment 3: Structural BMP Maintenance Plan
    - Maintenance Agreement (Form DS-3247) (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

Acronyms

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

Certification Page

Project Name:
Permit Application

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

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

Engineer of Work's Signature

87326 — PE#

September 30, 2021 — Expiration Date

Bryan Nord

Print Name

Kimley-Horn

Company

08/13/2021

Date

Engineer's Stamp

Project Name: VetPowered

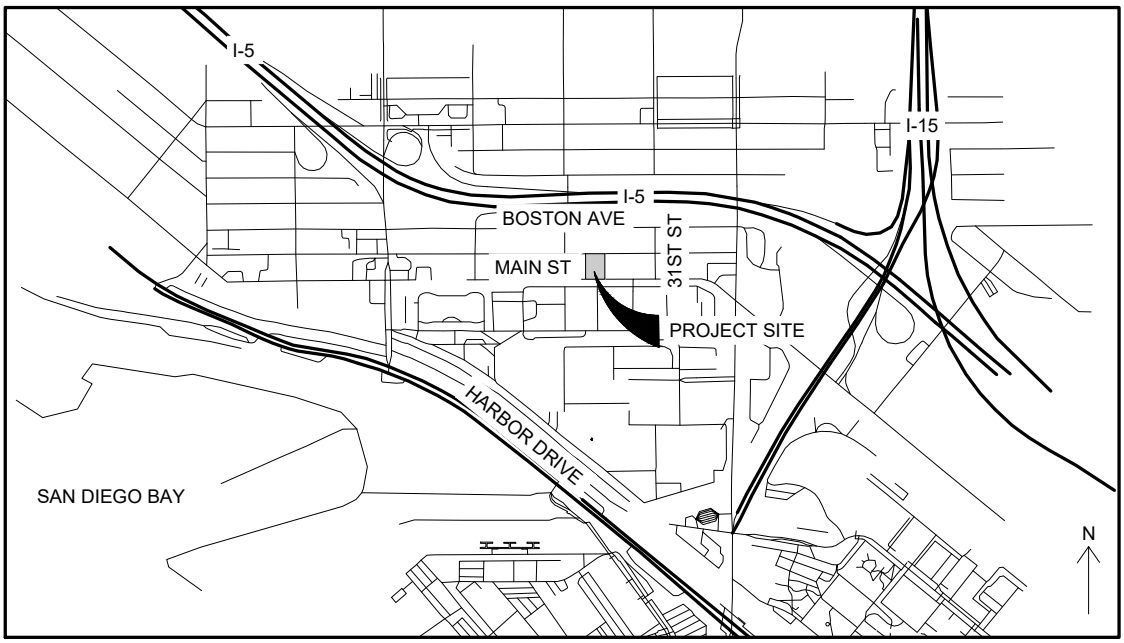
Submittal Record

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

Submittal Number	Date	Project Status	Changes
1	12/18/2020	☑ Preliminary Design/Planning/CEQA ☐ Final Design	Initial Submittal
2	5/7/2021	☑ Preliminary Design/Planning/CEQA ☐ Final Design	2nd CDP/NDP Submittal
3	8/17/2021	☑ Preliminary Design/Planning/CEQA ☐ Final Design	3rd CDP/NDP Submital
4		☐ Preliminary Design/Planning/CEQA ☐ Final Design	

Project Vicinity Map

Project Name: VetPowered
Permit Application



VICINITY MAP

1"=1000'

City of San Diego Form DS-560 Storm Water Requirements Applicability Checklist

Attach DS-560 form.

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

Storm Water Requirements Applicability Checklist

FORM
DS-560
November 2018

Project Address: 3030 & 3032 Main St, San Diego, CA 92113	Project Number: 686230

SECTION 1. Construction Storm Water BMP Requirements:

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

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

PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

☐ Yes; SWPPP required, skip questions 2-4 ☒ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity resulting in ground disturbance and/or contact with storm water?

☒ Yes; WPCP required, skip questions 3-4 ☐ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)

☐ Yes; WPCP required, skip question 4 ☒ No; next question

4. Does the project only include the following Permit types listed below?

- Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
- Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
- Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb and gutter replacement, and retaining wall encroachments.

☒ Yes; no document required

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

☐ If you checked "Yes" for question 1, **a SWPPP is REQUIRED. Continue to PART B**

☒ If you checked "No" for question 1, and checked "Yes" for question 2 or 3, **a WPCP is REQUIRED.** If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

☐ If you checked "No" for all questions 1-3, and checked "Yes" for question 4 PART B **does not apply and no document is required. Continue to Section 2.**

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

PART B: Determine Construction Site Priority

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

Complete PART B and continued to Section 2

1. ☐ **ASBS**

a. Projects located in the ASBS watershed.

2. ☐ **High Priority**

a. Projects that qualify as Risk Level 2 or Risk Level 3 per the Construction General Permit (CGP) and not located in the ASBS watershed.

b. Projects that qualify as LUP Type 2 or LUP Type 3 per the CGP and not located in the ASBS watershed.

3. ☐ **Medium Priority**

a. Projects that are not located in an ASBS watershed or designated as a High priority site.

b. Projects that qualify as Risk Level 1 or LUP Type 1 per the CGP and not located in an ASBS watershed.

c. WPCP projects (>5,000sf of ground disturbance) located within the Los Penasquitos watershed management area.

4. ☒ **Low Priority**

a. Projects not subject to a Medium or High site priority designation and are not located in an ASBS watershed.

SECTION 2. Permanent Storm Water BMP Requirements.

Additional information for determining the requirements is found in the Storm Water Standards Manual.

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

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

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

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

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

Clear Page 2

PART D: PDP Exempt Requirements.

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

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

If "no" was checked for all questions in Part D, continue to Part E.

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

   ☐ Yes; PDP exempt requirements apply ☒ No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

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

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

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

If "yes" is checked for any number in PART E, continue to PART F and check the box labeled "Priority Development Project".

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

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

Clear Page 3

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). ☐ Yes ☒ No

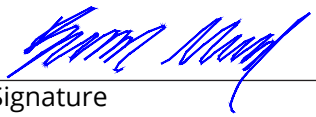
8. **New development or redevelopment projects of a retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. ☐ Yes ☒ No

9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ☐ Yes ☒ No

10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces. ☐ Yes ☒ No

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

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

Bryan Nord	Civil Engineer
Name of Owner or Agent *(Please Print)*	Title
	08/13/2021
Signature	Date

Clear Page 4

Clear Form

Applicability of Permanent, Post-Construction Storm Water BMP Requirements	Form I-1

Project Identification

Project Name: VetPowered

Permit Application Number: CDP-_____ NDP_____ | Date: 8/13/2021

Determination of Requirements

The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with **Step 1** and progressing through each step until reaching "Stop". Refer to the manual sections and/or separate forms referenced in each step below.

Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	Go to **Step 2**.
	☐ No	**Stop**. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.

Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building):

N/A

Step 2: Is the project a Standard Project, PDP, or PDP Exempt? To answer this item, see Section 1.4 of the manual in its entirety for guidance AND complete Form DS-560, Storm Water Requirements Applicability Checklist.	☐ Standard Project	**Stop.** Standard Project requirements apply
	☑ PDP	PDP requirements apply, including PDP SWQMP. Go to **Step 3**.
	☐ PDP Exempt	**Stop.** Standard Project requirements apply. Provide discussion and list any additional requirements below.

Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:

N/A

Project Name: VetPowered

Form I-1 Page 2 of 2		
Step	**Answer**	**Progression**
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to **Step 4**.
	☑ No	BMP Design Manual PDP requirements apply. Go to **Step 4**.
Discussion / justification of prior lawful approval, and identify requirements (not required if prior lawful approval does not apply): N/A		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to **Step 5**.
	☑ No	**Stop**. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do not apply: Project Discharges to the Public Storm Drain system which in turn discharges to an exempt body, the San Diego Bay. Please see hydromodification exemption study document prepared in attachment #2.		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). **Stop**.
	☑ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. **Stop**.
Discussion / justification if protection of critical coarse sediment yield areas does not apply: N/A		

Project Discharges to the Public Storm Drain system which in turn discharges to an exempt body, the San Diego Bay. Please see hydromodification Exemption Exhibit

HMP Exemption Exhibit

Attach a HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information and exempt waterbody. Reference applicable drawing number(s).

Exhibit must be provided on 11"x17" or larger paper.

It has been determined that the system discharges to an exempt waterbody via a hardened conveyance. There are two possible hardened conveyances that depend on the existing downstream topography that cannot exactly be determined at this time. A Down steam exhibit has been provided that documents the two exempt routes. Project will determine the exact route in the Final SWQMP prior to grading permit issuance.

LEGEND

FLOW DIRECTION

PROPERTY LINE

ROAD CENTERLINE

STORM DRAIN PIPE

PUBLIC STORM DRAIN INLET

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

Kimley»Horn

DOWNSTREAM DRAINAGE EXHIBIT

VETPOWERED - SAN DIEGO

10/21/2021

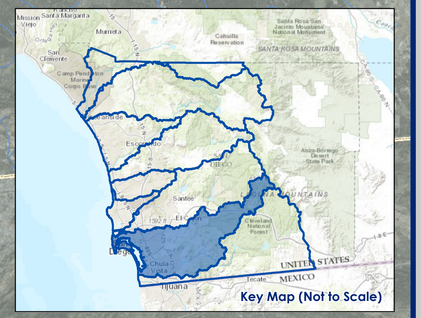
San Diego Bay Watershed Management Area
HU 908.00, 909.00, & 910.00, 441 mi2

Legend

- Watershed Boundaries
- Municipal Boundaries
- Regional WMAA Streams
- **Exempt Bodies:** Water Storage Reservoirs, Lakes, Enclosed Embayments, Pacific Ocean, Buena Vista Lagoon
- **Exempt River Reaches:** Reaches of San Luis Rey River, San Dieguito River, San Diego River, Forester Creek, Sweetwater River, Otay River
- **Exempt Conveyance Systems:** Existing underground storm drains or conveyance channels whose bed and bank are concrete-lined, discharging directly to exempt water bodies, exempt rivers, or localized areas of Agua Hedionda Lagoon and Batiquitos Lagoon

S.D. COUNTY
Los Penasquitos Creek
Carroll Canyon Creek
Rose Creek
Sycamore Creek
SANTEE
San Diego River
LAKE JENNINGS
SAN DIEGO
Forester Creek
S.D. COUNTY
San Diego River
LA MESA
LEMON GROVE
Chollas Creek
PROJECT SITE
NATIONAL CITY
Sweetwater River
Dulzura Creek
CHULA VISTA
Jamul Creek
Otay River
Otay River
Cottonwood Creek
Tijuana River

Aerial Imagery Source: DigitalGlobe, 06/2012



Key Map (Not to Scale)

0 4 8 16 Miles

NORTH

Receiving Waters and Conveyance Systems Exempt from Hydromodification Management Requirements

Exhibit Date: Sept. 8, 2014
Revised Date: May 22, 2017

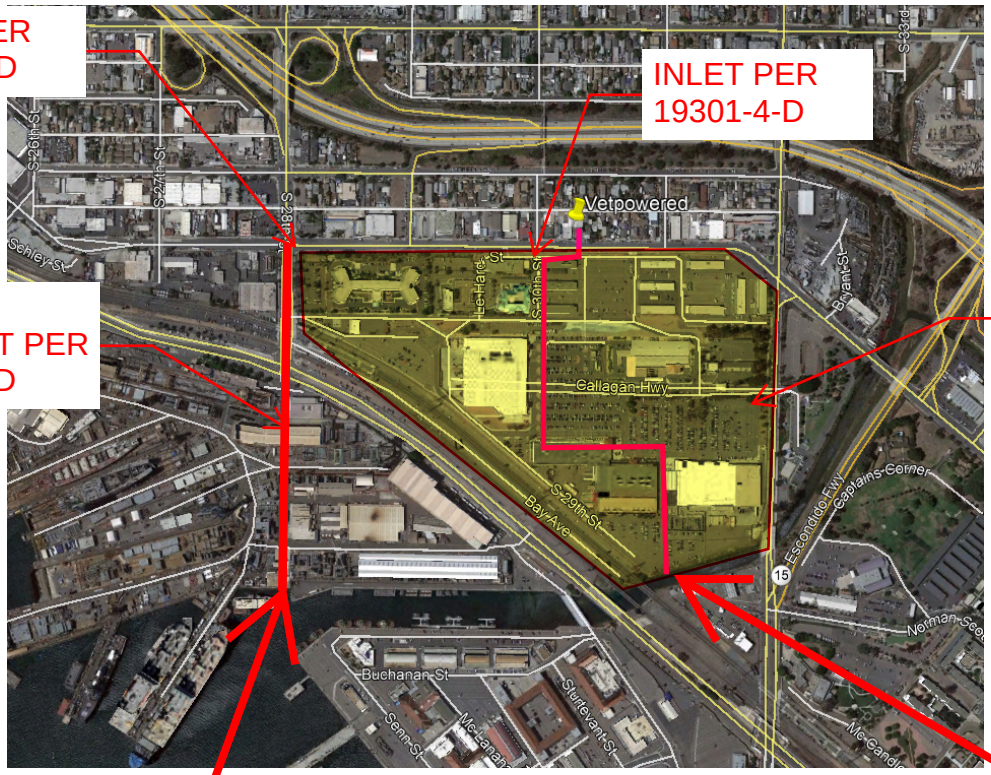
Geosyntec consultants | RICK ENGINEERING COMPANY

INLET PER
11653-2-D

INLET PER
19301-4-D

RC BOX
CULVERT PER
11653-3-D

MILITARY SITE PER
192-1728



MILITARY SITE
DISCHARGE
LOCATION #2

MILITARY SITE
DISCHARGE
LOCATION #1

HYDROMODIFICATION EXEMPT, HARDENED
CONVEYANCE PATH EXHIBIT

194 N

93 N

REED & HUBBELL'S ADDITION RESUBDIVISION NO. 1 MAP 483 OCT. 1922

BLK 6 · BLK 7 · BLK 8 · BLK 9 · BLK 10 · BLK 14 · BLK 15 · BLK 16 · BLK 17 · BLK 18 · BLK 19

H.P. WHITNEY'S ADD. BLK 42 · J.U. LONGS BLK 43 · T.K. SMITH'S ADD. BLK 41 · BLK 40 · BLK 37 · H.E. WHITNEY'S

MAP 168 · MAP 5679 DURKIN TRACT · REED & HUBBELL'S · ADDITION MAP NO. 327 · PM 7927 · PM 803 · PM 14877 · PM 13223

STREET · AVENUE · NATIONAL · MAIN · NEWTON AVE · NEWTON · BOSTON

28th · 29th · 30th · 31st · 32nd · 28TH · 29TH

INTERSTATE 5 · OVERPASS · PEDESTRIAN OVERPASS

48"RCP · 30"RCP · 54"RCP · 24"RCP · 18"RCP · 12" · 10604-L · 7495-L · 11653-2D · 11653-3D · 11653-30 · 19301-2-D · 19301-4-D · 3806-L · 18"CMP 3041-L

SAN DIEGO & ARIZONA EASTERN · ATCHISON TOPEKA & SANTA FE · 20' SEWER EASEMENT · HARBOR DRIVE

UNITED STATES GOVERNMENT PROPERTY

1728 · 1729 E · 1730 E · 1731

OVERLAYS AVAILABLE

ASSO.	
SEWER	
WATER	X
PLANNING	X
EASE.	X

EASE MAP

DRAINAGE MAP
DRAWN-7-21-64
FIELD CHECKED
REVISED

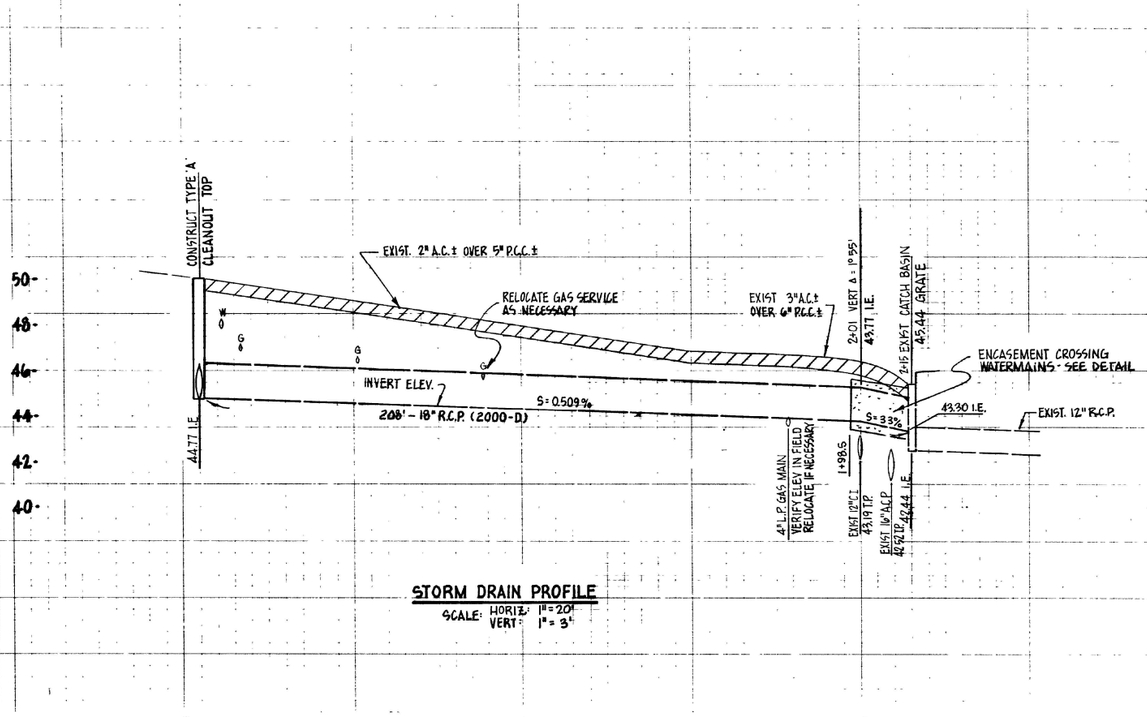
CITY OF SAN DIEGO, CALIFORNIA

SCALE: 1 INCH = 100 FEET
DATUM IS MEAN SEA LEVEL

DRAINAGE MAP
192-1728

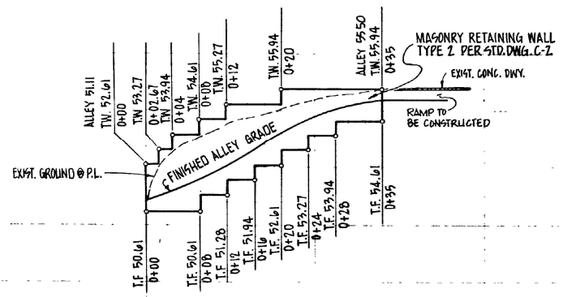
	194-1728	
192-1723		192-1731
	190-1728	

192-1728



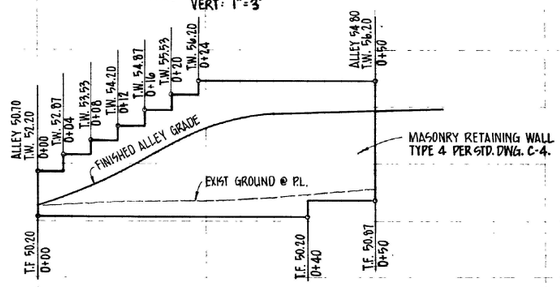
STORM DRAIN PROFILE

SCALE: HORIZ: 1" = 20'
VERT: 1" = 3'



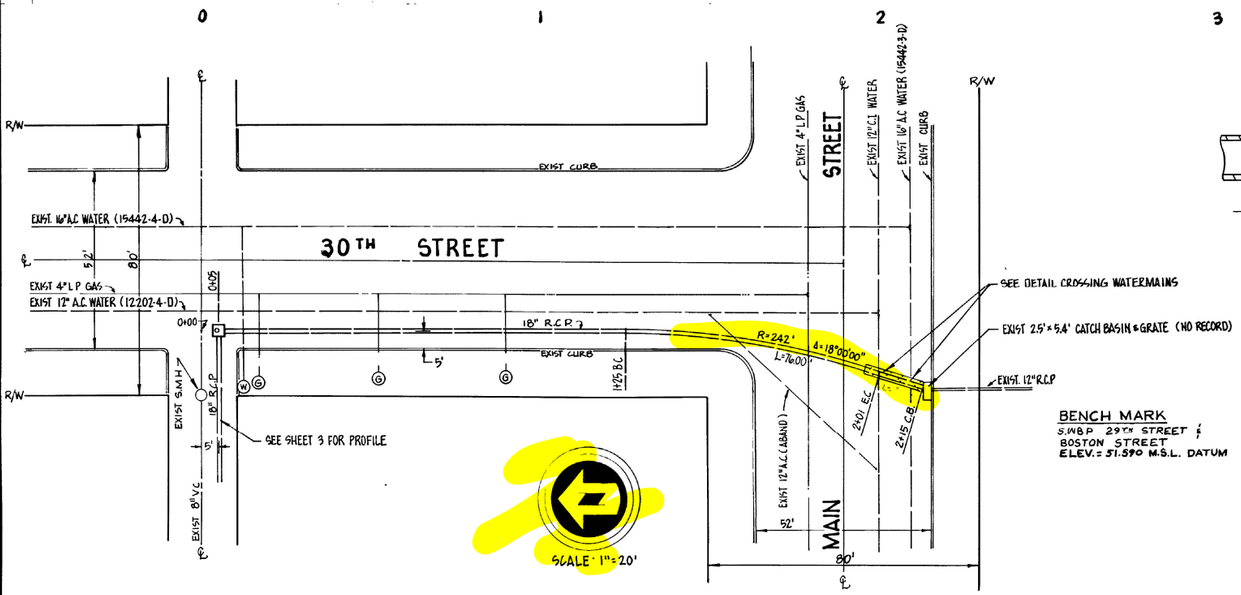
DETAIL - N'LY RETAINING WALL (SHEET 3)

SCALE: HORIZ: 1" = 10'
VERT: 1" = 3'



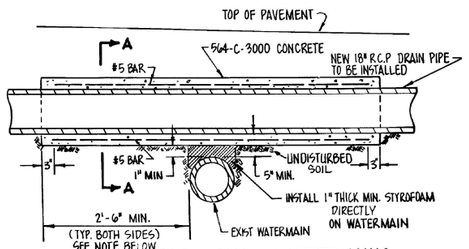
DETAIL - S'LY RETAINING WALL (SHEET 3)

SCALE: HORIZ: 1" = 10'
VERT: 1" = 3'



BENCH MARK

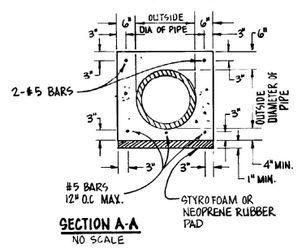
S.W.B.P. 29TH STREET & BOSTON STREET
ELEV. = 51.590 M.S.L. DATUM



DETAIL - CROSSING WATERMAINS

NO SCALE

NOTE ENCASEMENT SHALL EXTEND TO FIRST JOINT BEYOND 2'-6" (BOTH SIDES, SEE ABOVE) OR TO A DISTANCE OF 4 FEET WHICHEVER IS LESS.



SECTION A-A

NO SCALE

RAYMOND F. HALL R.C.E. 8629

W.O. 10129

HALL Engineering PLANNING CIVIL ENGINEERING LAND SURVEYING
2802 JUAN STREET • SAN DIEGO • CALIFORNIA • 92110 • (714) 298-6183

CITY CONTRACT

IMPROVEMENT PLANS FOR
STORM DRAIN IN 30TH STREET

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 4 OF 4 SHEETS

W.O. NO 117890

DEPUTY DIRECTOR — 5/5/82 DATE

PROJECT MANAGER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	K.M.			
AS BUILT HALL ENGRS	B A S	Redlines	1-83	

SECTION HEAD

CONTROL CERTIFICATION

LAMBERT COORDINATES 192-1728

CONTRACTOR CASS CONST. DATE STARTED 12-9-82
INSPECTOR J C Heaney DATE COMPLETED 2-28-83

19301-4-D

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Project Name: VetPowered

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	VetPowered
Project Address	3030 Main Street, San Diego, 92113
Assessor's Parcel Number(s) (APN(s))	5502501800, 5502503100
Permit Application Number	CDP-_____ NDP_____
Project Watershed	Select One: ☐ San Dieguito River ☐ Penasquitos ☐ Mission Bay ☐ San Diego River ☑ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	San Diego Mesa, 908.22
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	0.32 Acres (13896 Square Feet)
Area to be disturbed by the project (Project Footprint)	0.32 Acres (13896 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	0.297 Acres (12925 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0.022 Acres (971 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition	7 % DECREASE

Form I-3B Page 2 of 11

Description of Existing Site Condition and Drainage Patterns

Current Status of the Site (select all that apply):

- [x] Existing development
- [ ] Previously graded but not built out
- [ ] Agricultural or other non-impervious use
- [ ] Vacant, undeveloped/natural

Description / Additional Information:

The existing site is a fully developed site with existing buildings and sidewalks. The site drains from North to South and discharges via sheetflow to the gutter located on the north side of Main Street.

Existing Land Cover Includes (select all that apply):

- [ ] Vegetative Cover
- [ ] Non-Vegetated Pervious Areas
- [x] Impervious Areas

Description / Additional Information:

The existing land cover consists of concrete walkways and roofs.

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):

- [ ] NRCS Type A
- [ ] NRCS Type B
- [ ] NRCS Type C
- [x] NRCS Type D

Approximate Depth to Groundwater:

- [ ] Groundwater Depth < 5 feet
- [ ] 5 feet < Groundwater Depth < 10 feet
- [x] 10 feet < Groundwater Depth < 20 feet
- [ ] Groundwater Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):

- [ ] Watercourses
- [ ] Seeps
- [ ] Springs
- [ ] Wetlands
- [x] None

Description / Additional Information:

There are no existing Natural Hydrologic Features present on site or conveyed through the site.

Form I-3B Page 3 of 11

Description of Existing Site Topography and Drainage

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

1. Whether existing drainage conveyance is natural or urban;
2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site;
3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels;
4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Descriptions/Additional Information

The existing drainage conveyance system is an urban developed site that flows generally north to south. Offsite runoff is not conveyed through the site. The existing site does not contain a drainage conveyance network, stormwater treatment facilities, or natural or constructed channels. The existing site discharges runoff at the south property line to the northern gutter of Main Street. The gutter carries drainage west to the intersection of 30th Street. There are two possible hardened conveyance routes that depend on the existing downstream topography. Drainage either sheet flows to the grate inlet on the southern gutter of Main Street at the intersection of 30th, or it crosses 30th and 29th in the gutter and is collected in the curb inlet on the north east corner of Main and 28th.

Project will determine the exact route in the Final SWQMP prior to grading permit issuance.

Basin	Soil Type	Total	Imperv	perv	% imp	% perv	C-value	I (in/hr)	Q (CFS)
Pre-Dev A	D	13896.00	13896.00	0.00	1.00	0.00	0.90	6	1.723

Form I-3B Page 4 of 11

Description of Proposed Site Development and Drainage Patterns

Project Description / Proposed Land Use and/or Activities:

The Proposed project consists of the demolition of the existing onsite building, and construction of a new building, parking spaces, landscaping, and bioretention raised planter BMPs.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):

Proposed impervious features include new parking areas, building, and sidewalks.

List/describe proposed pervious features of the project (e.g., landscape areas):

Proposed pervious features of the project include new landscape along the sides of the building, two bioretention raised planters, and two small at grade planters between the building and the sidewalk on Main Street.

Does the project include grading and changes to site topography?

☑ Yes

☐ No

Description / Additional Information:

While existing drainage patterns will remain, the entire site will be excavated for a new building with a halt-basement on the north side.

Form I-3B Page 5 of 11

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

☑ Yes

☐ No

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

Description / Additional Information:

Runoff from the new parking area will be collected by a ribbon gutter and directed to a grated inlet at the northwest corner of the site. The grated inlet will discharge to BMP #1, a biofiltration raised planter, on the west side of the building. Storm water from the proposed building roof will split runoff to the two raised planters BMPs via roof drains. The raised planter BMPs will discharge to the gutter in Main Street via curb outlets.

Proposed improvements include the removal of existing impervious area and the construction of new pervious area for a net decrease of impervious area of approximately 7%. Peak runoff flowrates are not anticipated to increase as a result of the project. See below for a summary of pre- and post-project drainage analysis:

Form I-3B Page 6 of 11

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

- [x] Onsite storm drain inlets
- [ ] Interior floor drains and elevator shaft sump pumps
- [ ] Interior parking garages
- [ ] Need for future indoor & structural pest control
- [ ] Landscape/outdoor pesticide use
- [ ] Pools, spas, ponds, decorative fountains, and other water features
- [ ] Food service
- [ ] Refuse areas
- [ ] Industrial processes
- [ ] Outdoor storage of equipment or materials
- [ ] Vehicle and equipment cleaning
- [x] Vehicle/equipment repair and maintenance
- [ ] Fuel dispensing areas
- [ ] Loading docks
- [x] Fire sprinkler test water
- [ ] Miscellaneous drain or wash water
- [x] Plazas, sidewalks, and parking lots

Description/Additional Information:

N/A

Form I-3B Page 7 of 11

Identification and Narrative of Receiving Water

Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable)

Runoff from the project will be discharged to the northern gutter in Main Street. The northern gutter has two possible hardened conveyance routes that depend on the existing downstream topography. Drainage either sheet flows to the grate inlet on the southern gutter of Main Street at the intersection of 30th, or it crosses 30th and 29th in the gutter and is collected in the curb inlet on the north east corner of Main and 28th. From these collection points, storm water is carried in the public storm drain system and discharges directly to the San Diego Bay, and then the Pacific Ocean.

Project will determine the exact route in the Final SWQMP prior to grading permit issuance.

Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations

Industrial Service Supply, Rare, Threatened or Endangered Species, Water Contact Recreation, Non-Contact Water Recreation, Wildlife Habitat, Marine Habitat, Preservation of Biological Habitats, Shellfish Harvesting

Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations

None.

Provide distance from project outfall location to impaired or sensitive receiving waters

The project site is approximately 0.5 miles from the San Diego Bay.

Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands

The project site is not located in an MHPA or in environmentally sensitive lands.

Form I-3B Page 8 of 11

Identification of Receiving Water Pollutants of Concern

List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body (Refer to Appendix K)	Pollutant(s)/Stressor(s) (Refer to Appendix K)	TMDLs/WQIP Highest Priority Pollutant (Refer to Table 1-4 in Chapter 1)
San Diego Bay	Mercury, PAHs, PCBs, Sediment Toxicity, Benthic Community Effects	Indicator Bacteria; Dissolved Copper; Lead; and Zinc (wet weather)

Identification of Project Site Pollutants*

*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated)

Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see Appendix B.6):

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	☐	☐	☐
Nutrients	☐	☐	☐
Heavy Metals	☐	☐	☐
Organic Compounds	☐	☐	☐
Trash & Debris	☐	☐	☐
Oxygen Demanding Substances	☐	☐	☐
Oil & Grease	☐	☐	☐
Bacteria & Viruses	☐	☐	☐
Pesticides	☐	☐	☐

NOT APPLICABLE

Form I-3B Page 9 of 11

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6)?

☐ Yes, hydromodification management flow control structural BMPs required.

☑ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

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

N/A

Note: If "No" answer has been selected the SWQMP must include an exhibit that shows the storm water conveyance system from the project site to an exempt water body. The exhibit should include details about the conveyance system and the outfall to the exempt water body.

Critical Coarse Sediment Yield Areas*
*This Section only required if hydromodification management requirements apply

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

☐ Yes

☑ No

Discussion / Additional Information:

Form I-3B Page 10 of 11
Flow Control for Post-Project Runoff*   ***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.   N/A
Has a geomorphic assessment been performed for the receiving channel(s)?   ☑ No, the low flow threshold is $0.1Q_2$ (default low flow threshold)   ☐ Yes, the result is the low flow threshold is $0.1Q_2$ ☐ Yes, the result is the low flow threshold is $0.3Q_2$ ☐ Yes, the result is the low flow threshold is $0.5Q_2$ If a geomorphic assessment has been performed, provide title, date, and preparer: N/A
Discussion / Additional Information: (optional)   N/A

Form I-3B Page 11 of 11

Other Site Requirements and Constraints

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

The project is constrained by the existing grades of Main Street, the existing grades of the neighboring property with zero foot setbacks, and the existing public sideway along Main Street.

Optional Additional Information or Continuation of Previous Sections As Needed

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

The existing site discharges runoff at the south property line to the northern gutter of Main Street. The gutter carries drainage west to the intersection of 30th Street. There are two possible hardened conveyance routes that depend on the existing downstream topography. Drainage either sheet flows to the grate inlet on the southern gutter of Main Street at the intersection of 30th, or it crosses 30th and 29th in the gutter and is collected in the curb inlet on the north east corner of Main and 28th.

Project will determine the exact route in the Final SWQMP prior to grading permit issuance.

Project Name: VetPowered

Source Control BMP Checklist for PDPs	Form I-4B

Source Control BMPs

All development projects must implement source control BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
4.2.1 Prevention of Illicit Discharges into the MS4	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.3 not implemented:			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.4 not implemented:			
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.5 not implemented:			

Project Name: VetPowered

Form I-4B Page 2 of 2			
Source Control Requirement	**Applied?**		
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☑ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☐ Yes	☐ No	☑ N/A
Interior parking garages	☑ Yes	☐ No	☐ N/A
Need for future indoor & structural pest control	☐ Yes	☐ No	☑ N/A
Landscape/Outdoor Pesticide Use	☐ Yes	☐ No	☑ N/A
Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☑ N/A
Food service	☐ Yes	☐ No	☑ N/A
Refuse areas	☐ Yes	☐ No	☑ N/A
Industrial processes	☐ Yes	☐ No	☑ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☑ N/A
Vehicle/Equipment Repair and Maintenance	☑ Yes	☐ No	☐ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☑ N/A
Loading Docks	☐ Yes	☐ No	☑ N/A
Fire Sprinkler Test Water	☑ Yes	☐ No	☐ N/A
Miscellaneous Drain or Wash Water	☐ Yes	☐ No	☑ N/A
Plazas, sidewalks, and parking lots	☑ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☑ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☑ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☑ N/A
SC-6D: Automotive Facilities	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.			
N/A			

Project Name: VetPowered

Site Design BMP Checklist for PDPs	Form I-5B

Site Design BMPs

All development projects must implement site design BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

A site map with implemented site design BMPs must be included at the end of this checklist.

Site Design Requirement	Applied?		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.1 not implemented: There are no natural drainage pathways to maintain.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐ Yes	☐ No	☑ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☑ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.2 not implemented: The entire site is developed.			

Project Name: VetPowered

Form I-5B Page 2 of 4			
Site Design Requirement	**Applied?**		
4.3.3 Minimize Impervious Area	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.3 not implemented:			
4.3.4 Minimize Soil Compaction	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.5 not implemented:			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☐ Yes	☐ No	☑ N/A
5-2 Does the pervious area satisfy the design criteria in 4.3.5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☐ Yes	☐ No	☑ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

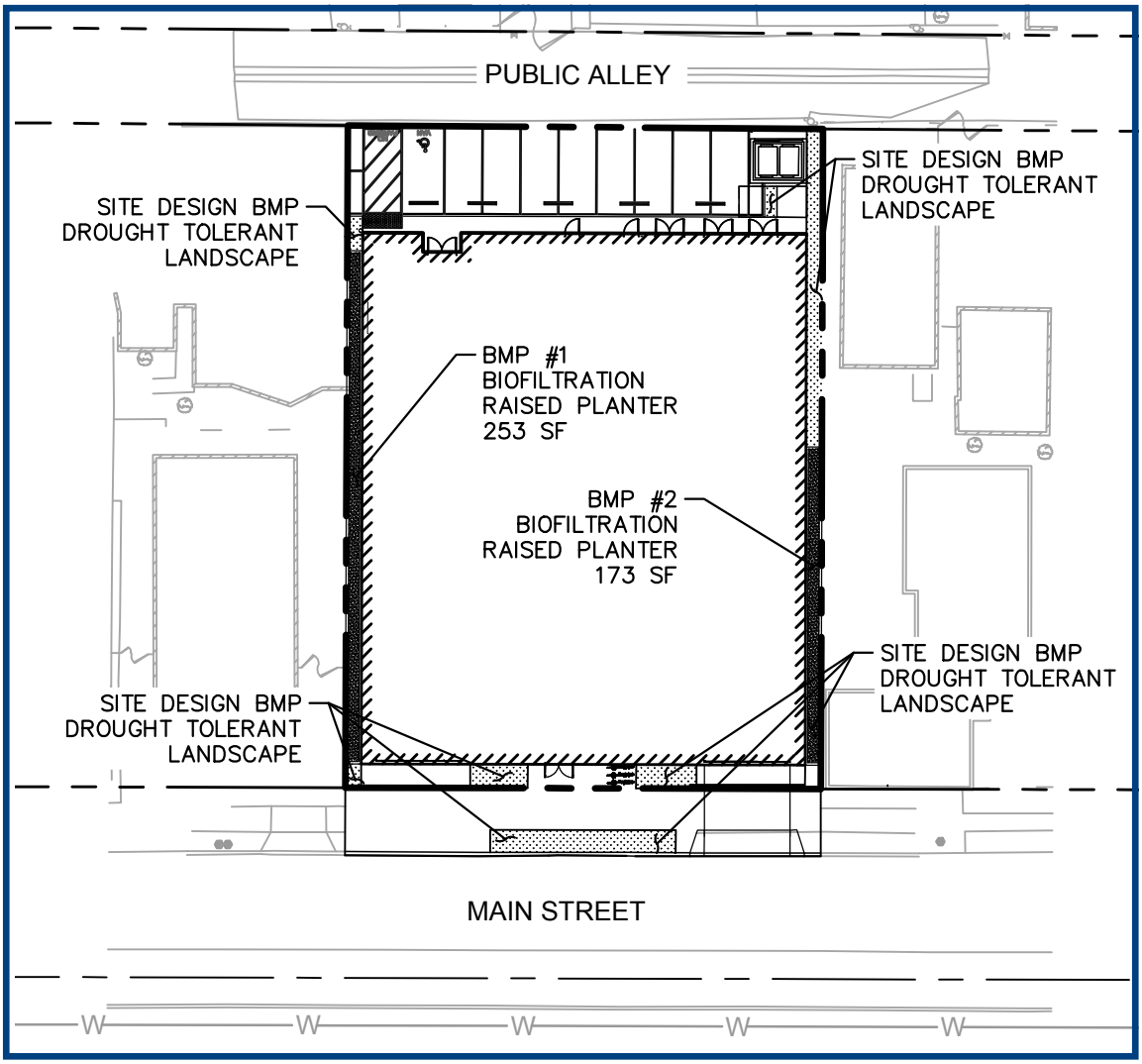
Project Name: VetPowered

Form I-5B Page 3 of 4			
Site Design Requirement	**Applied?**		
4.3.6 Runoff Collection	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.6 not implemented:			
6a-1 Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6a-2 Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6b-2 Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.7 Landscaping with Native or Drought Tolerant Species	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvest and Use Precipitation	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.8 not implemented: Irrigation demand is not sufficient for rainwater harvesting because drought tolerant landscape is proposed on the project site.			
8-1 Are rain barrels implemented in accordance with design criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
8-2 Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Project Name: VetPowered

Form I-5B Page 4 of 4

Insert Site Map with all site design BMPs identified:



Summary of PDP Structural BMPs	Form I-6

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual).

Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

The underlying soils on site are considered Hydrologic Soil Group 'D'. It is assumed the soils as well as the location of the BMPs (adjacent to the proposed building) do not allow for infiltration.BMPs have been designed accordingly.

Two biofiltration BMPs are proposed to treat the site's new impervious areas. The BMPs were sized for pollutant treatment using Worksheet B.5-1, see attachment 1. The project is exempt from hydromodification requirements. See hydromod exemption map in attachment 2.

(Continue on page 2 as necessary.)

Project Name: VetPowered

Form I-6 Page 2 of

(Continued from page 1)

Project Name: VetPowered

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP 1	
Construction Plan Sheet No. C1	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☑ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☑ Pollutant control only ☐ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Bryan C. Nord, PE 619-452-2203 bryan.nord@kimley-horn.com
Who will be the final owner of this BMP?	VetPowered
Who will maintain this BMP into perpetuity?	VetPowered
What is the funding mechanism for maintenance?	VetPowered

Project Name: VetPowered

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No. BMP 1
Construction Plan Sheet No. C1
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): See Attachment 1 for sizing criteria and calculations.

Project Name: VetPowered

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP 2	
Construction Plan Sheet No. C1	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☑ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☑ Pollutant control only ☐ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Bryan C. Nord, PE 619-452-2203 bryan.nord@kimley-horn.com
Who will be the final owner of this BMP?	VetPowered
Who will maintain this BMP into perpetuity?	VetPowered
What is the funding mechanism for maintenance?	VetPowered

Project Name: VetPowered

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No. BMP 2
Construction Plan Sheet No. C1
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): See Attachment 1 for sizing criteria and calculations.

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Attachment 1
Backup For PDP Pollutant Control BMPs

This is the cover sheet for Attachment 1.

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Project Name: VetPowered

Indicate which Items are Included:

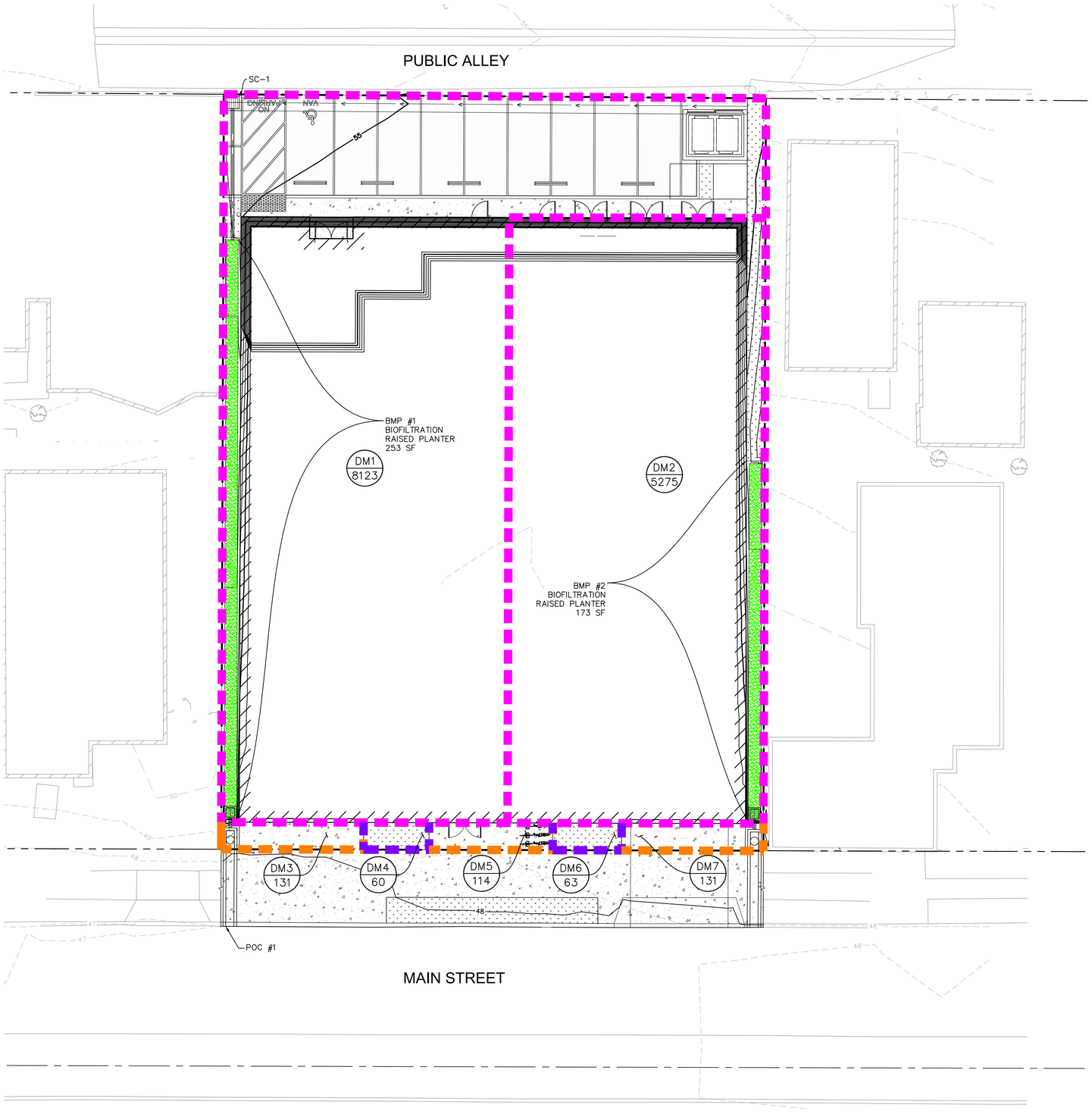
Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☐ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☑ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☑ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Infiltration Feasibility Information. Contents of Attachment 1d depend on the infiltration condition: • No Infiltration Condition: ○ Infiltration Feasibility Condition Letter (***Note: must be stamped and signed by licensed geotechnical engineer***) ○ Form I-8A (optional) ○ Form I-8B (optional) • Partial Infiltration Condition: ○ Infiltration Feasibility Condition Letter (***Note: must be stamped and signed by licensed geotechnical engineer***) ○ Form I-8A ○ Form I-8B • Full Infiltration Condition: ○ Form I-8A ○ Form I-8B ○ Worksheet C.4-3 ○ Form I-9 Refer to Appendices C and D of the BMP Design Manual for guidance.	☐ Included ☐ Not included because the entire project will use harvest and use BMPs ☒ TO BE PROVIDED IN FINAL DESIGN
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☑ Included

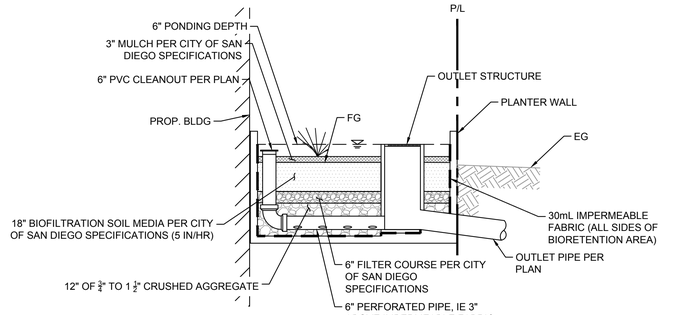
Project Name: VetPowered

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

The DMA Exhibit must identify:

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

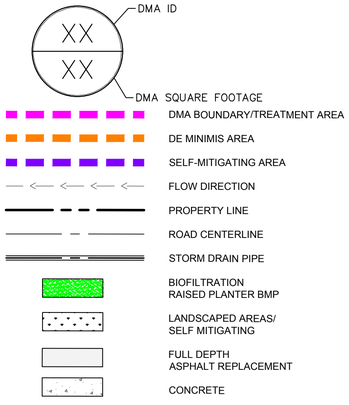




TYPICAL BIOFILTRATION PLANTER WITH UNDERDRAIN

NOT TO SCALE

LEGEND



SITE INFORMATION

HYDROLOGIC SOIL GROUP: TYPE D

DEPTH TO GROUNDWATER: GREATER THAN 20'

THERE ARE NO EXISTING HYDROLOGIC FEATURES ONSITE

THERE ARE NO CCYSA'S TO BE PROTECTED ONSITE

AREAS NOT SHOWN AS LANDSCAPE ARE IMPERVIOUS

BMP SUMMARY TABLE				
BMP ID	TYPE	AREA (SF)	REQ'D (SF)	PROVIDED (SF)
1	BIOFILTRATION RAISED PLANER	8123	210	253
2	BIOFILTRATION RAISED PLANER	5275	135	173
3	DE MINIMIS	131	—	—
4	SELF MITIGATING	60	—	—
5	DE MINIMIS	114	—	—
6	SELF MITIGATING	63	—	—
7	DE MINIMIS	131	—	—

SOURCE CONTROL BMPS	
BMP ID	BMP DESCRIPTION
SC-1	PREVENT ILLICIT DISCHARGE INTO MS4 ---> ALL LANDSCAPE AREAS (TYP.)
SC-2	STORM DRAIN STENCILING AND SIGNAGE ---> ALL SD GRATED INLETS (TYP.)
SC-6	ADDITIONAL BMPS BASED ON POTENTIAL SOURCES OF RUNOFF POLLUTANTS
	ON-SITE STORM DRAIN INLETS
	LANDSCAPE / OUTDOOR PESTICIDE USE
	PLAZA, SIDEWALKS, PARKING LOTS

BMP 1

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.54	inches
2	Area tributary to BMP (s)	A=	0.19	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.86	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	314	cubic-feet

BMP 2

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.54	inches
2	Area tributary to BMP (s)	A=	0.12	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.85	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	202	cubic-feet

The City of SAN DIEGO	Project Name	VetPowered	
	BMP ID	1	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	8123	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.86	
3	85th percentile 24-hour rainfall depth	0.54	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	314	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	6	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	18	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	9	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	3	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	14.4	inches
15	Total Depth Treated [Line 13 + Line 14]	44.4	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	472	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	127	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	236	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	196	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	210	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	210	sq. ft.
23	Provided BMP Footprint	253	sq. ft.
24	Is Line 23 ≥ Line 22?	**Yes, Performance Standard is Met**	

The City of SAN DIEGO	Project Name	VetPowered	
	BMP ID	2	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	5275	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.85	
3	85th percentile 24-hour rainfall depth	0.54	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	202	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	6	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	18	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	9	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	3	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	14.4	inches
15	Total Depth Treated [Line 13 + Line 14]	44.4	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	303	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	82	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	151	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	126	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	135	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	135	sq. ft.
23	Provided BMP Footprint	173	sq. ft.
24	Is Line 23 ≥ Line 22?	**Yes, Performance Standard is Met**	

Harvest and Use Feasibility Checklist	Worksheet B.3-1 : Form I-7

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

☐ Toilet and urinal flushing
☐ Landscape irrigation
☐ Other:_____

No demand. Toilets and irrigated landscape are at a minimum and reclaimed water is not planned for use.

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.
[Provide a summary of calculations here]

ETWU = ETwet*((SUM(PF*HA)/IE)+SLA)*0.015
= 2.7x[[(0.2*957)/0.9)]+0.0]x0.015
ETWU = 8.613 cubic feet

3. Calculate the DCV using worksheet B-2.1.
DCV = 520 (cubic feet)
[Provide a summary of calculations here]
Calculations provided in this report.

3a. Is the 36-hour demand greater than or equal to the DCV?	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36-hour demand less than 0.25DCV?
☐ Yes / ☑ No ⇨ ⇩	☐ Yes / ☑ No ⇨ ⇩	☑ Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

Is harvest and use feasible based on further evaluation?
☐ Yes, refer to Appendix E to select and size harvest and use BMPs.
☑ No, select alternate BMPs.

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It has been determined that the system discharges to an exempt waterbody via a hardened conveyance. There are two possible hardened conveyances that depend on the existing downstream topography that cannot exactly be determined at this time. A Down steam exhibit has been provided that documents the two exempt routes. Project will determine the exact route in the Final SWQMP prior to grading permit issuance.

Attachment 2
Backup for PDP Hydromodification Control Measures

This is the cover sheet for Attachment 2.

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

Project Discharges to the Public Storm Drain system which in turn discharges to an exempt body, the San Diego Bay. Please see hydromodification Exemption Exhibit

Project Name: VetPowered

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☐ Included See Hydromodification Management Exhibit Checklist.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☐ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☐ Not Performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design and Structural BMP Drawdown Calculations (Required) Overflow Design Summary for each structural BMP See Chapter 6 and Appendix G of the BMP Design Manual	☐ Included ☐ Submitted as separate stand-alone document

Project Name: VetPowered

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

The Hydromodification Management Exhibit must identify:

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

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Attachment 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

TO BE PROVIDED IN FINAL SWQMP

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Project Name: VetPowered

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3	Maintenance Agreement (Form DS-3247) (when applicable)	☐ Included ☐ Not applicable

THE CITY OF SAN DIEGO

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

_____
_____
_____

(THIS SPACE IS FOR RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

APPROVAL NUMBER:	ASSESSOR'S PARCEL NUMBER:	PROJECT NUMBER:
_____	5502501800, 5502503100	_____

This agreement is made by and between the City of San Diego, a municipal corporation [City] and

VetPowered;

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

3030 Main Street, San Diego 92113
(PROPERTY ADDRESS)

and more particularly described as:

LOTS 29, 30, 31, & 32 IN BLOCK 37 OF H.P. WHITNEY'S ADDITION
(LEGAL DESCRIPTION OF PROPERTY)

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

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

Property Owner wishes to obtain a building/engineering/grading permit according to the Grading and/or Improvement Plan Drawing No(s) or Building Plan Project No(s): _____.

Continued on Page 2

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMPs, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): _____.

2. Property Owner shall install, maintain, and repair or replace all Permanent Storm Water BMPs within the property, according to the OMP guidelines as described in the attached exhibit(s), the project's SWQMP, and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s) _____.

3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

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

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

See Attached Exhibit(s): _____

_____
(PROPERTY OWNER SIGNATURE)

_____
(PRINT NAME AND TITLE)

_____
(COMPANY/ORGANIZATION NAME)

_____
(DATE)

THE CITY OF SAN DIEGO

APPROVED:

_____
(DEPUTY CITY ENGINEER SIGNATURE)

_____
(PRINT NAME)

_____
(DATE)

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

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

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

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

Attachment 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 4.

TO BE PROVIDED IN FINAL SWQMP

Project Name: VetPowered

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

The plans must identify:

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

Attachment 5
Drainage Report

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

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VetPowered

Preliminary Drainage Report

CITY OF SAN DIEGO

3030 MAINSTREET SAN DIEGO CA 92133

OCTOBER 2021 | VERSION 1

Prepared By:

KIMLEY-HORN AND ASSOCIATES, INC.
401 B STREET, SUITE 600
SAN DIEGO, CA 92101
(619)234-9411

Prepared By:

Kimley»Horn

This Drainage Study has been prepared by Kimley-Horn and Associates, Inc. under the direct supervision of the following Registered Civil Engineer. The undersigned attests to the technical data contained in this study, and to the qualifications of technical specialists providing engineering computations upon which the recommendations and conclusions are based.

10/22/2021

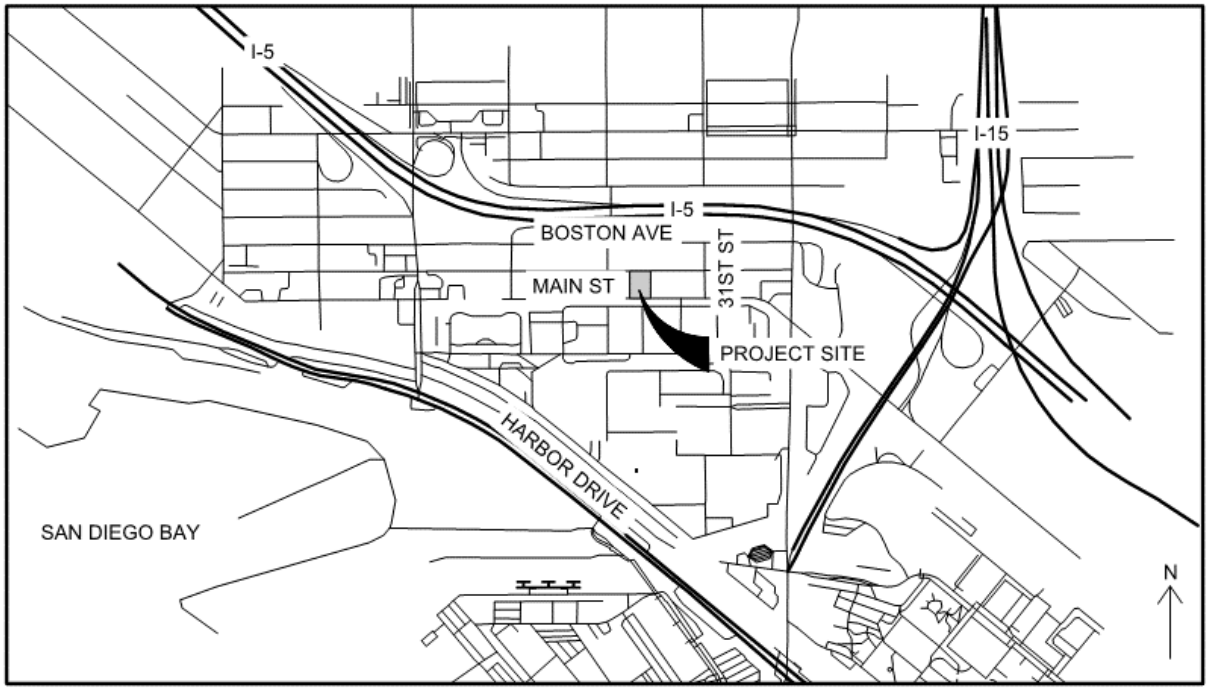
Bryan C. Nord R.C.E. 87326 Date

Contents

Figures

Appendices

Figure 1 Vicinity Map



VICINITY MAP

1 PROJECT DESCRIPTION

PURPOSE OF STUDY

The purpose of this study is to support the redevelopment of the site. The study will provide sizing of proposed preliminary drainage structures, confirm that post developed runoff will not exceed pre-developed peak flows, and ensure there will be no negative impacts to surrounding and downstream properties

PROJECT DESCRIPTION

The proposed project lies within the limits of the City of San Diego and is located generally south of I-5, West of I-15, and between 30th Street and 31st Street on Main Street. The parcel in which the project is located is approximately 0.32 acres, of which approximately 0.32 acres will be improved. Existing project site contains an existing building, and paved walkways. Proposed improvements include the construction of an educational building, parking spaces, sidewalks, minor drainage infrastructure, and stormwater treatment facilities.

2 DESCRIPTION OF WATERSHED

PRE-DEVELOPMENT DRAINAGE PATTERN

The project is located on a developed parcel, zoned Light Industry within the City of San Diego. The site is bound by a public alley to the North, existing buildings to the East, Main Street to the south, and existing buildings to the west.

The existing topography within the project parcel slopes from north to south between 2% and 5% and discharges to the gutter in Main Street at the point of compliance labeled POC-A. The gutter carries drainage west to the intersection of 30th Street. There are two possible conveyance routes that depend on the existing downstream topography. Drainage either sheet flows to the grate inlet on the southern gutter of Main Street at the intersection of 30th, or it crosses 30th and 29th in the gutter and is collected in the curb inlet on the north east corner of Main and 28th. From these collection points, storm water is carried in the public storm drain system and discharges directly to the San Diego Bay, and then the Pacific Ocean. The Project will determine the exact route in Final Design.

POST-DEVELOPMENT DRAINAGE PATTERN

The project proposes to grade the entire 0.32 acre parcel. The proposed drainage pattern follows historic and existing conditions and has been designed to convey runoff to the existing point of discharge, labeled as POC-A. The site has been designed and analyzed as two drainage basins due to the routing of runoff to storm water BMPs. Stormwater detention was not analyzed for this project because the project proposes a net decrease in impervious area and existing drainage patterns are followed causing the post-development peak runoff to decrease from the existing condition. The proposed site is designed to bypass the 100-year peak flow.

3 METHODOLOGY

DESIGN STANDARDS

The 2003 San Diego County Hydrology Manual and the City of San Diego Drainage Design Manual are used as guidance to design of drainage facilities within this project.

HYDROLOGY

Surface topography and material are analyzed to determine the runoff produced by the proposed development. Peak flow runoff rates were calculated in accordance with the San Diego County Hydrology Manual. 100-year peak flow runoff for Pre- & Post-development are calculated in accordance with the Hydrology Manual.

DETENTION

Stormwater detention was not analyzed for this project because the project proposes a net decrease in impervious area and existing drainage patterns are followed causing the post-development peak runoff to decrease from the existing condition.

HYDRAULICS

Resulting runoff calculations are utilized to analyze the hydraulic systems within this study. The proposed system was sized using the 2020 Hydraflow Storm Sewers extension.

4 CALCULATIONS

DETERMINATION OF WATERSHEDS WITHIN PROJECT LIMITS

To determine if the proposed design will have a negative impact to downstream facilities, the analysis ensures the contributing areas to the POC (Point of Compliance) remain approximately identical in pre & post development conditions and the resulting post-development runoff flows remain at or below the pre-development flows.

See Attachment 2 for the topographic maps.

CALCULATE RUNOFF COEFFICIENT

Per Web Soil Survey from the USDA, the project impact footprint lays within Hydraulic Soil Group “D”.

To determine the runoff coefficient “C” for the pre-development conditions, Table 3-1 of the Hydrology Manual was utilized. Per section 3.1.2, second paragraph, “impervious percentage (% Impervious) as given in Table 3-1 for any area, shall govern the selected value for C.” Thus, the C value is determined using the percent of impervious and soil type per equation found in section 3.1.2 to the Hydrology Manual:

$$C = 0.90 * (\%Impervious) + C\_p * (1 - \%Impervious)$$

PRE-DEVELOPMENT CALCS FOR DETERMINING "C"							
Basin	Soil Type	Total (sqft)	Imperv (sqft)	Perv (sqft)	Imp (%)	Perv (%)	C-value
A (total)	D	13896	13896	0.00	1.00	0.00	0.90

The ultimate C-value used for each basin is calculated by the weight average method

$$C = \frac{C_{Soil\,type} * Area_{Soil\,Type}}{Area_{Total}} + \frac{C_{Soil\,Type} * Area_{Soil\,Type}}{Area_{Total}}$$

PRE-DEVELOPMENT C-VALUE	
BASIN	C-VALUE
A (total)	0.90

Post-developed C-values were determined through the same process as the pre-developed:

POST-DEVELOPMENT CALCS FOR DETERMINING "C"							
Basin	Soil Type	Total (sqft)	Imperv (sqft)	Perv (sqft)	Imp (%)	Perv (%)	C-value
1	D	8123	7650	473	94%	6%	0.87
2	D	5275	4897	378	93%	7%	0.86
3	D	498	378	120	76%	24%	0.77

POST-DEVELOPMENT C-VALUE	
BASIN	C-VALUE
A	0.87
B	0.86
C	0.77

Attachment 2 shows impervious calculation for this project.

CALCULATE MANNING ROUGHNESS COEFFICIENT

Per Hydraulic Design Manual Appendix A, the average Manning Roughness Coefficient for asphalt pavement is 0.016 and concrete lined channel is 0.013. These values will be used for this study.

CALCULATE STORM FLOWS USING THE MODIFIED RATIONAL METHOD

One POC is identified to assist in comparison of the pre- & post-development conditions. The pre-project condition was analyzed as a single drainage area, labeled Basin A. The proposed basin was analyzed as three drainage area labeled as DA 1, 2, 3. All drainage areas discharge to POC 1, which is located at the southwest corner of the project.

Pre-developed flows are routed using topography that is a combination of aerial topo, precise survey, and County 2-foot contours provided by SanGIS.

See Attachment 2 for Pre- & Post-Development Basin Delineation.

Comparison of Pre and Post runoff are shown below:

	Area (acres)	Tc (min)	Runoff (cfs)	Discharge Velocity (FPS)
Pre	0.32	5.00	1.72	2.09
Post	0.32	5.00	1.65	4.78
		Reduction	0.07 CFS	

DESIGN / ANALYZE PROPOSED STORM DRAIN FACILITIES

The project is analyzed with direct runoff to the POC to ensure the discharge location has capacity for the 100-year peak flow. Onsite storm conveyance facilities were designed using Hydraflow Express.

Drainage basin A consists of the entire site and conveys runoff via sheet flow and curb and gutter to a proposed modular wetlands system to provide water quality treatment. Treated runoff from the raised planter BMPs are routed south where they discharge to the gutter within Mainstreet via curb outlets. The storm drain pipe network was designed to bypass and convey the 100-year storm event.

Detention was not considered in the analysis because peak runoff was not increased due to this project. The proposed site storm drain facilities were designed to bypass the 100-year peak flow.

See Attachment 4 for analysis and results.

5 CONCLUSIONS

This analysis has determined that POC-A will experience less runoff and no negative impacts will occur to existing facilities from the post-developed conditions. Detention was not considered in the analysis because peak runoff was not increased due to this project.

It is determined that the proposed onsite storm conveyance facilities have been adequately sized to convey the 100-year storm runoff.

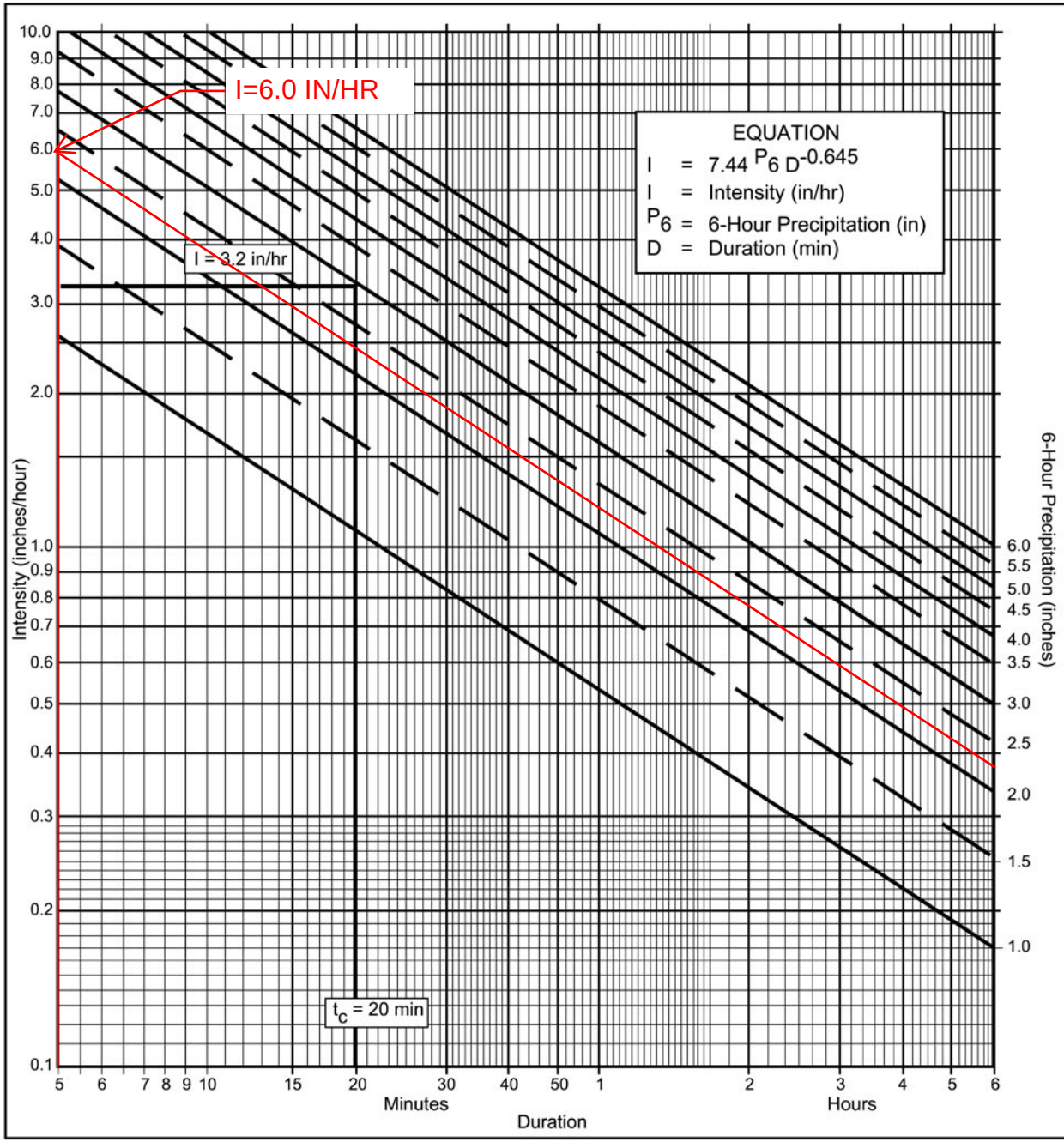
Because the project is not located within navigable waters, water of the United States, or Federal jurisdictional wetlands, as defined by the Clean Water Act, no 401/404 permit is required.

In conclusion, the project has met the City of San Diego and County of San Diego minimum requirements for the peak flow control.

APPENDICIES

APPENDIX A

FIGURES AND TABLES



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicable to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 50 year

(b) P_6 = 2.3 in., P_{24} = 3.8, $\frac{P_6}{P_{24}}$ = 61 %(2)

(c) Adjusted P_6(2) = 2.3 in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

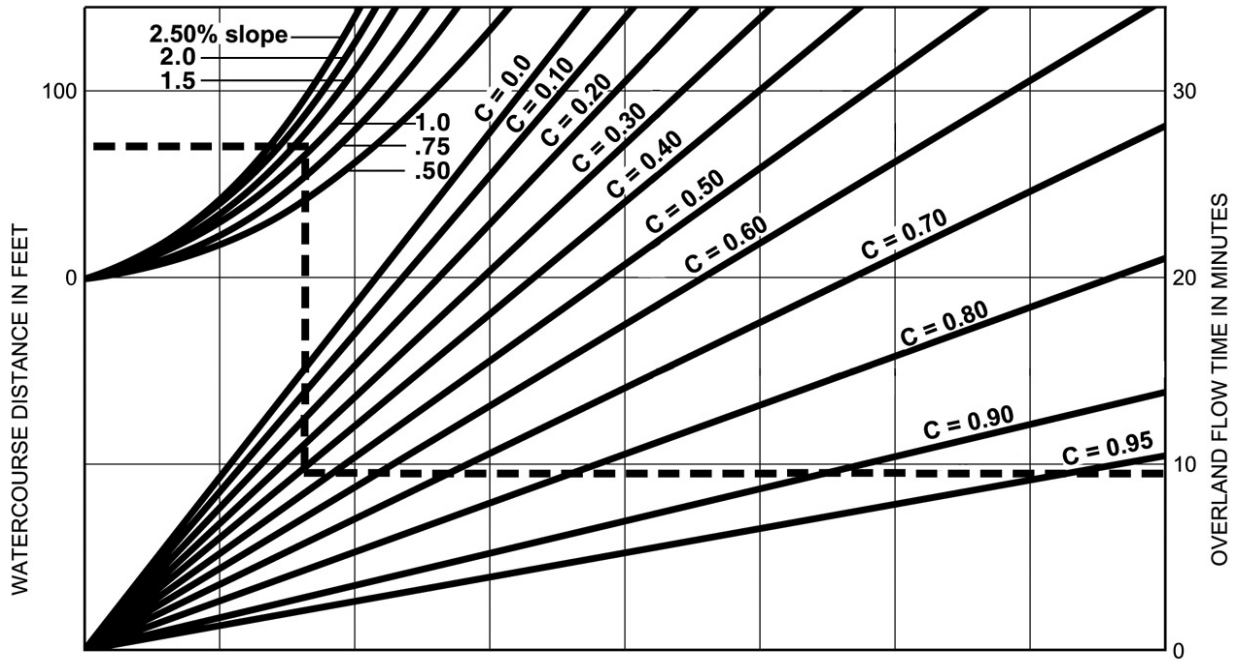
Intensity-Duration Design Chart - Example

FIGURE 3-2

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service



EXAMPLE:

Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

$$T = \frac{1.8\,(1.1-C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

FIGURE 3-3

Rational Formula - Overland Time of Flow Nomograph

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

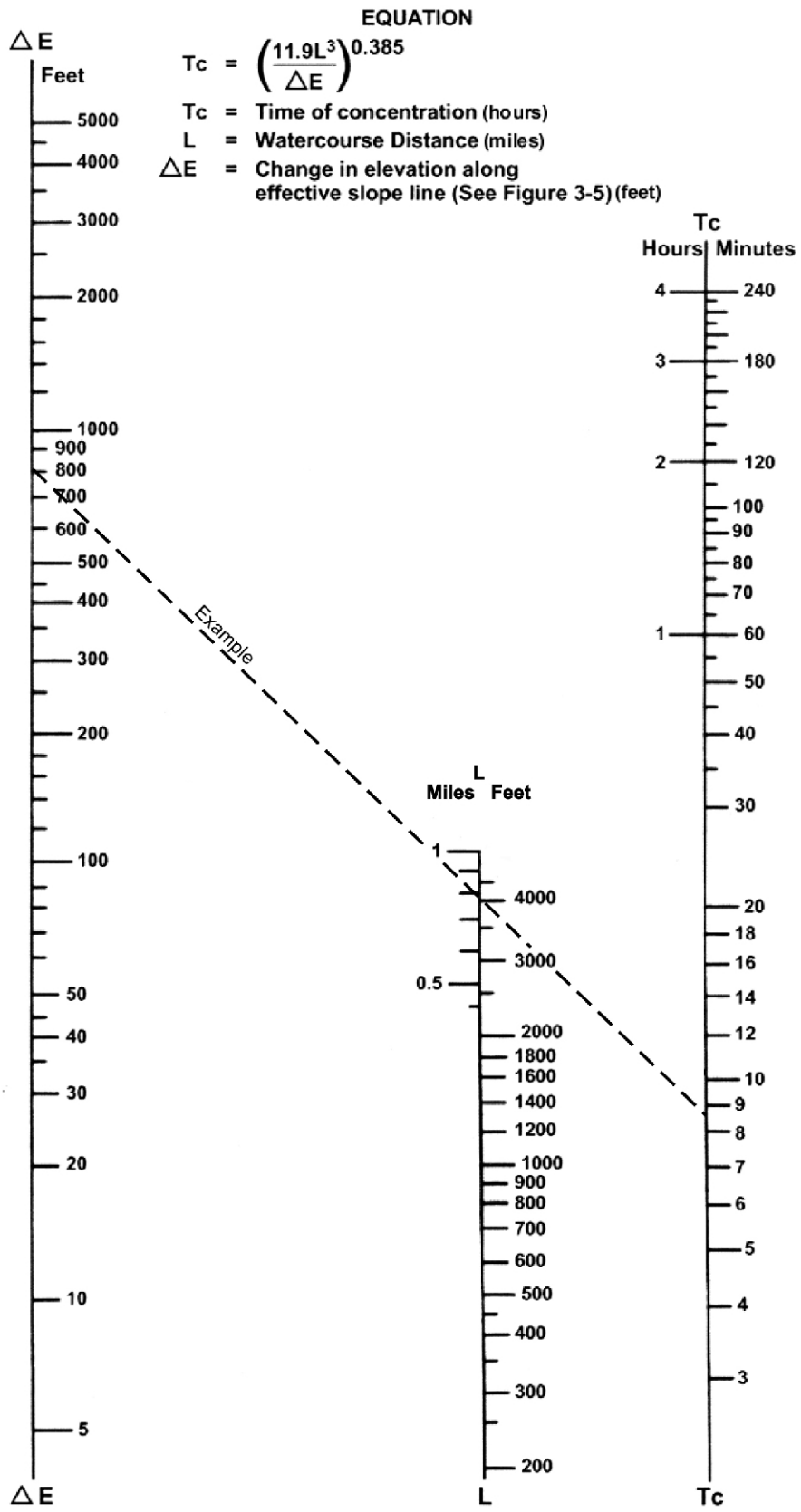
Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

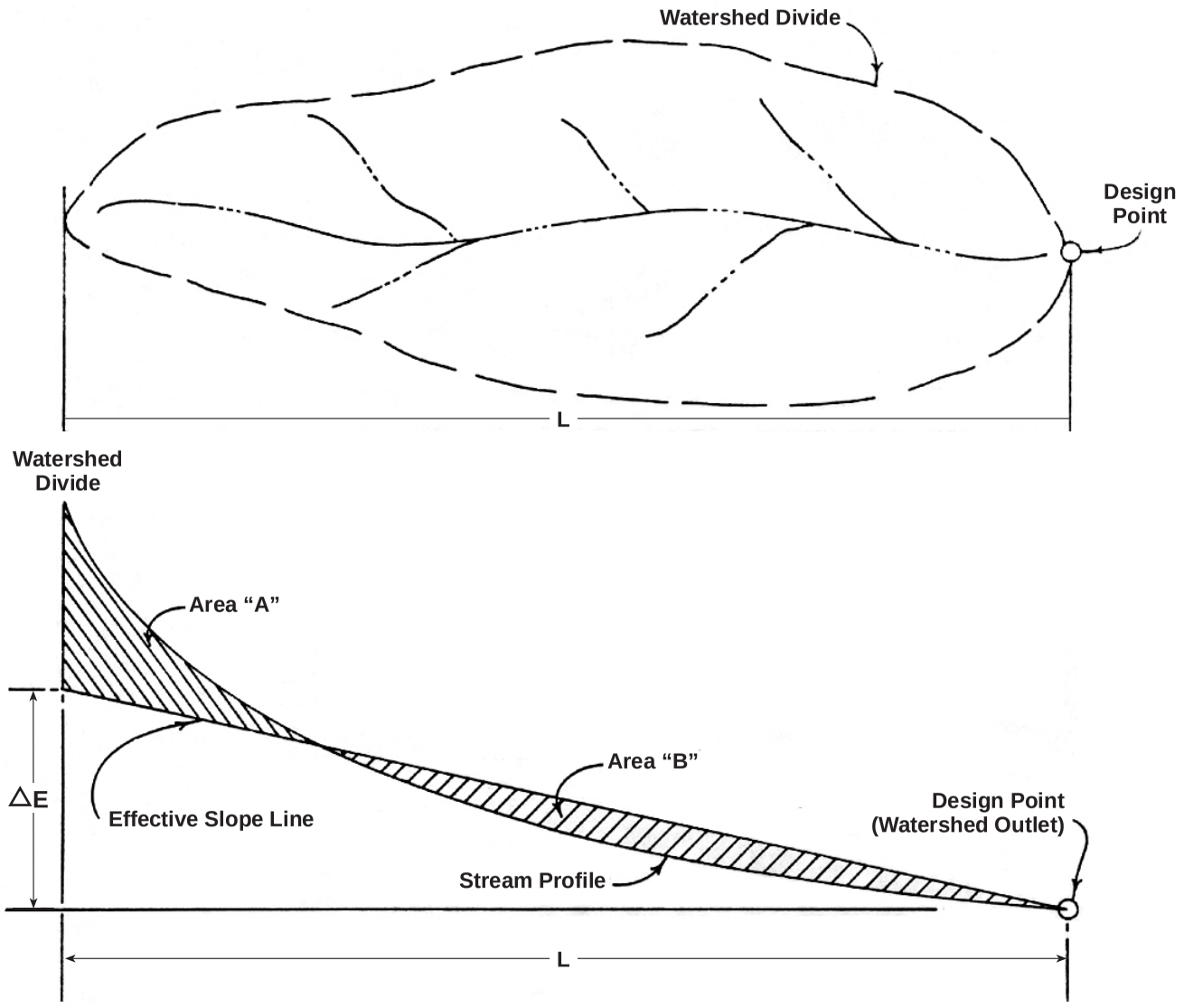
*See Table 3-1 for more detailed description



SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE 3-4

Nomograph for Determination of
Time of Concentration (Tc) or Travel Time (Tt) for Natural Watersheds



SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE

Computation of Effective Slope for Natural Watersheds

3-5

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

Orange County

Riverside County

Pacific Ocean

Imperial County

Mexico

SITE P6=2.3

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

N W E S

3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

SITE
P24=3.8

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
POWAY
S.D. COUNTY
DEL MAR
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'

33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
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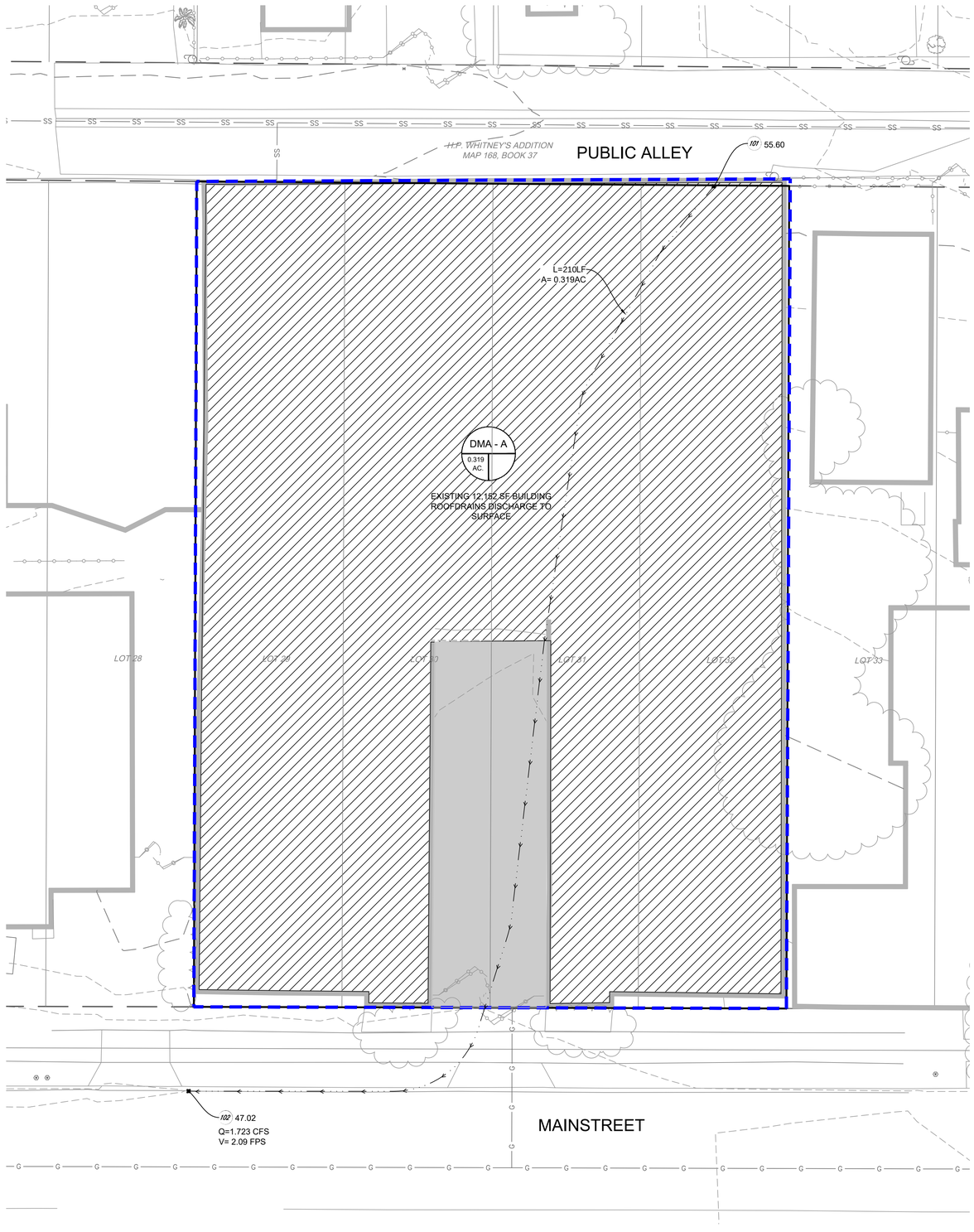
N W E S

3 0 3 Miles

APPENDIX B

WATERSHED INFORMATION

CAUTION: IF THIS SHEET IS NOT 24"x36" IT IS A REDUCED PRINT



LEGEND

PERVIOUS

IMPERVIOUS-ROOFS

IMPERVIOUS

DMA BOUNDARY

FLOW PATH

DMA-TABULAR SUMMARY					
DMA ID	AREA (ACRES)	AREA (SF)	PERVIOUS AREAS (SF)	IMPERVIOUS AREAS (SF)	IMPERVIOUS PERCENTAGE (%)
DMA-A	0.32	13896	0	13896	100%

NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

Kimley»Horn

VETPOWERED
3030 MAIN STREET
SAN DIEGO, CA 92113

EX. DRAINAGE MAP

NO.	DATE	REMARKS
##	##	
##	##	
##	##	
##	##	
##	##	
##	##	
##	##	
##	##	

PUBLIC ALLEY

PROPOSED GRATED INLET

ONSITE FLOW

PROPOSED 6" PVC STORM DRAIN @ 1%

PROPOSED 3' RIBBON BUTTER

6" PVC STORM
Q100 = 0.27 CFS
V100 = 0.2 fps

PROPOSED BIORETENTION RAISED PLANTER

DA1
8123

DA2
5275

PROPOSED BIORETENTION RAISED PLANTER

DA3
498

GB

SEE DOWNSTREAM DRAINAGE EXHIBIT FOR CONTINUATION

DRAINAGE AREA 1
DISCHARGE LOCATION
Q100 =0.97 CFS
V100 =4.4 FPS

POC#1
SITE TOTAL DISCHARGE
Q100 =1.65 CFS
V100 = 2.1 FPS

DRAINAGE AREA 3
DISCHARGE LOCATION
Q100 = 0.05 CFS
V100 = SHEET FLOW

DRAINAGE AREA 2
DISCHARGE LOCATION
Q100 =0.63 CFS
V100 =3.5 FPS

MAINSTREET

LEGEND

- DMA ID
- DMA SQUARE FOOTAGE
- DRAINAGE AREA BOUNDARY
- FLOW DIRECTION
- PROPERTY LINE
- ROAD CENTERLINE
- STORM DRAIN PIPE
- LANDSCAPED AREAS
- AC PAVEMENT
- CONCRETE PAVEMENT

NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

Kimley»Horn

PROPOSED DRAINAGE MAP

VETPOWERED - SAN DIEGO

10/20/2021

LEGEND

- FLOW DIRECTION
- PROPERTY LINE
- ROAD CENTERLINE
- STORM DRAIN PIPE
- PUBLIC STORM DRAIN INLET

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

Kimley»Horn

DOWNSTREAM DRAINAGE EXHIBIT

VETPOWERED – SAN DIEGO

10/21/2021

APPENDIX C

100-YEAR RATIONAL METHOD CALCULATIONS

100-year Pre-developed Flows

Basin	Soil Type	Total	Imperv	perv	% imp	% perv	C-value	I (in/hr)	Q (CFS)
Pre-Dev A	D	13896.00	13896.00	0.00	1.00	0.00	0.90	6.0	1.723

100-year Post-developed Flows

Basin	Soil Type	Total (SF)	Total (AC)	Imperv	perv	% imp	Impervious Runoff Factor	% perv	Pervious. Runoff Factor	C-Value	I (in/hr)	Q (CFS)
1	D	8123.00	0.19	7650.00	473.00	0.940	0.90	0.06	0.35	0.87	6.0	0.971
2	D	5275.00	0.12	4897.00	378.00	0.930	0.90	0.07	0.35	0.86	6.0	0.625
3	D	498.00	0.01	378.00	120.00	0.760	0.90	0.24	0.35	0.77	6.0	0.053
Total	D	13896.00	0.32	12925.00	971.00	2.63					18.00	1.65

APPENDIX D

HYDRAULIC ANALYSIS

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Aug 13 2021

POC 1 PROPOSED

Gutter

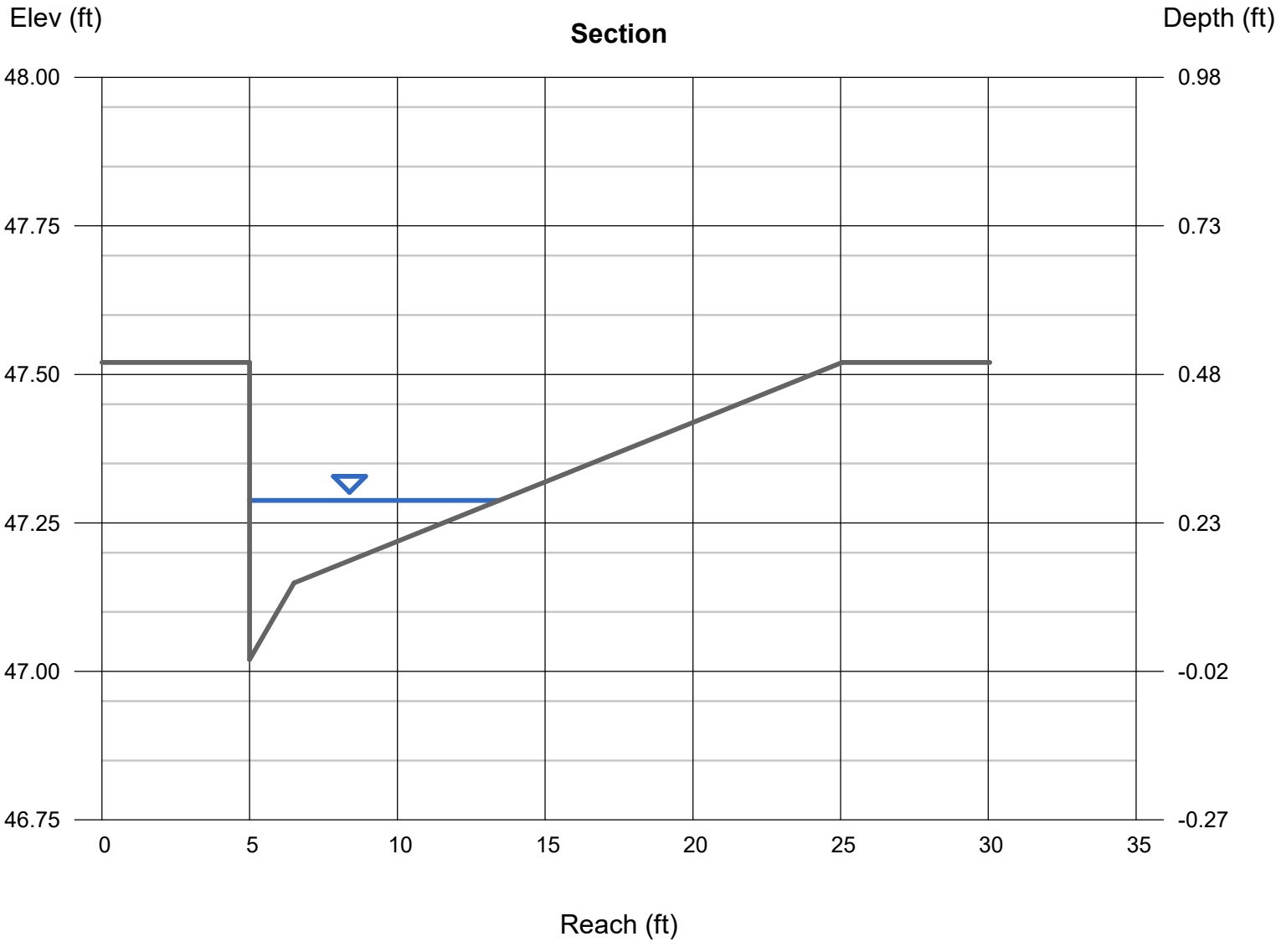
Cross Sl, Sx (ft/ft)	= 0.020
Cross Sl, Sw (ft/ft)	= 0.086
Gutter Width (ft)	= 1.50
Invert Elev (ft)	= 47.02
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.65

Highlighted

Depth (ft)	= 0.27
Q (cfs)	= 1.650
Area (sqft)	= 0.79
Velocity (ft/s)	= 2.09
Wetted Perim (ft)	= 8.72
Crit Depth, Yc (ft)	= 0.29
Spread Width (ft)	= 8.45
EGL (ft)	= 0.34



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Aug 13 2021

Drainage Area 1 Outlet

Rectangular

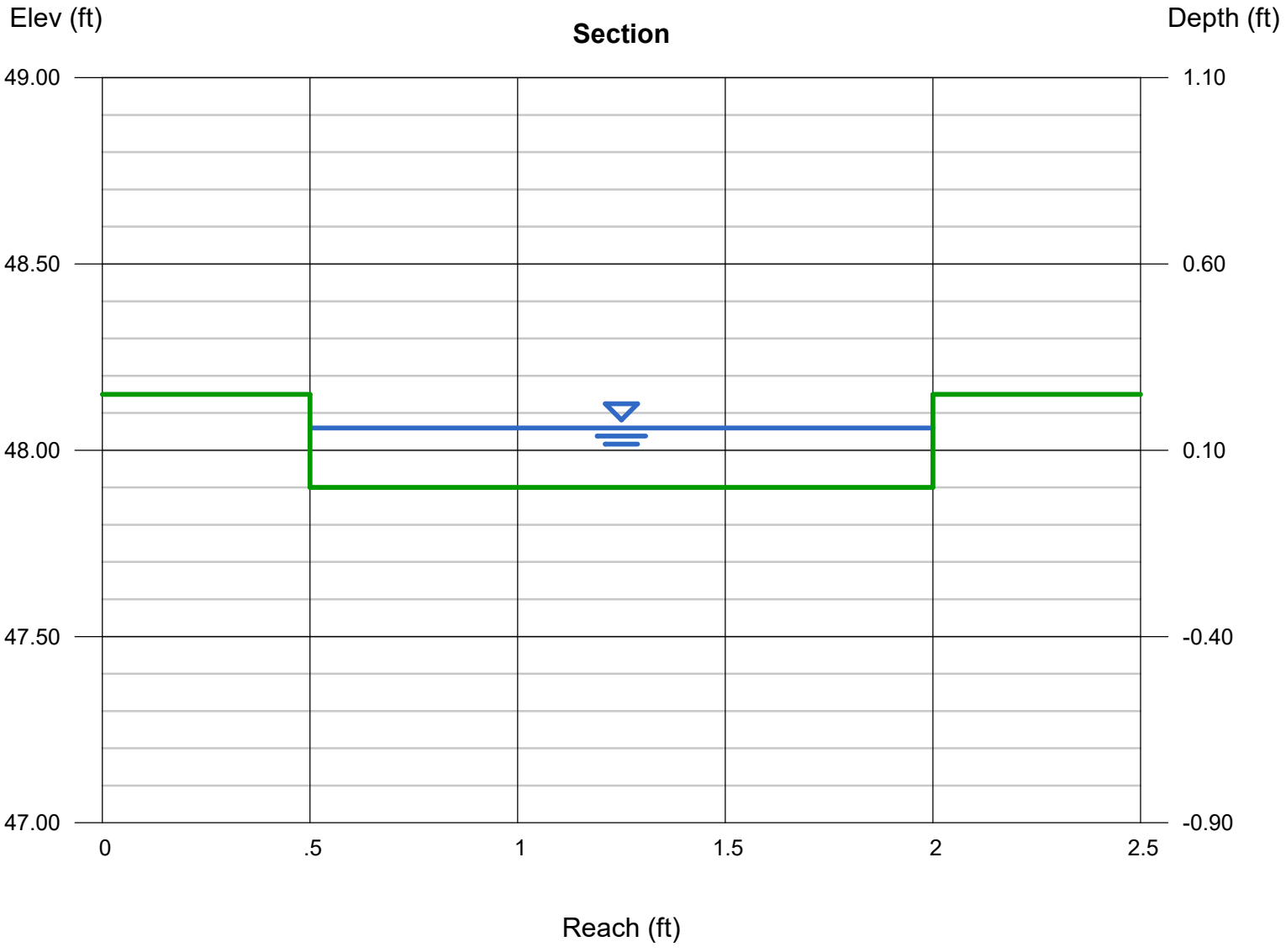
Bottom Width (ft)	= 1.50
Total Depth (ft)	= 0.25
Invert Elev (ft)	= 47.90
Slope (%)	= 2.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.97

Highlighted

Depth (ft)	= 0.16
Q (cfs)	= 0.970
Area (sqft)	= 0.24
Velocity (ft/s)	= 4.04
Wetted Perim (ft)	= 1.82
Crit Depth, Yc (ft)	= 0.24
Top Width (ft)	= 1.50
EGL (ft)	= 0.41



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Aug 13 2021

6 inch Storm Drain to Bioretention

Circular

Diameter (ft)	= 0.50
Invert Elev (ft)	= 50.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.27

Highlighted

Depth (ft)	= 0.25
Q (cfs)	= 0.270
Area (sqft)	= 0.10
Velocity (ft/s)	= 2.74
Wetted Perim (ft)	= 0.79
Crit Depth, Yc (ft)	= 0.27
Top Width (ft)	= 0.50
EGL (ft)	= 0.37