2015 STORMWATER MANAGEMENT PLAN

HONOLULU HARBOR (HI 03KB482)

KALAELOA BARBERS POINT HARBOR (HI 03KB488)



Hawaii Department of Transportation
Harbors Division

March 2015

MĀLAMA I KE KAI - Protect Our Harbor Waters

2015 Stormwater Management Plan

Honolulu Harbor (HI 03KB482)
Kalaeloa Barbers Point Harbor (HI 03KB488)

Prepared for:

State of Hawaii
Department of Transportation
Harbors Division

Prepared by

March 2015

"I certify under penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that this document and its attachments were prepared either by me personally or under my direction or supervision in a manner designed to ensure that qualified and knowledgeable personnel properly gather and present the information contained therein. I further certify, based on my personal knowledge or on my inquiry of those individuals immediately responsible for obtaining the information, that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowingly and willfully submitting a materially false statement."

Signature

MAR 2 0 2015
Date

FORD N. FUCHIGAMI
Responsible Officer of HDOT

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LIST OF ACRONYMS AND ABBREVIATIONS

ACR	Annual Compliance Report
AMS	Asset Management System
BMP	Best Management Practice
CCH	City and County of Honolulu
CD	Consent Decree
CFR	Code of Federal Regulations
CSRCP	Construction Site Runoff Control Program
CWA	Clean Water Act
CWB	Clean Water Branch
ERP	Enforcement Response Plan
GIS	Geographic Information Systems
HAR	Hawaii Administrative Rules
HAR, Harbors	Harbors Division
HAR-E	Harbors Division Engineering Branch
HAR-EC	Harbors Division Engineering Branch Construction Section
HAR-EE	Harbors Division Engineering Branch Environmental Section
HAR-EM	Harbors Division Engineering Branch Maintenance Section
HAR-EP	Harbors Division Engineering Branch Planning Section
HAR-O	Harbors Division Oahu District
HAR-OC	Harbors Division Oahu District Operations Section
HAR-OE	Harbors Division Oahu District Enforcement Section
HAR-OM	Harbors Oahu District Maintenance Section
HAR-PM	Harbors Division Property Management
HAR-SI	Harbors Management Information Systems
HDOH	Hawaii Department of Health
HDOT	Hawaii Department of Transportation
HRS	Hawaii Revised Statutes
IDDE	Illicit Discharge Detection and Elimination
KBPH	Kalaeloa Barbers Point Harbor
MARAD	US Maritime Administration
MOA	Memorandum of Agreement

LIST OF ACRONYMS AND ABBREVIATIONS (CONT.)

MCS	Marine Cargo Specialist
MS4	Municipal Separate Storm Sewer System
NA	Not Applicable
NGPC	Notice of General Permit Coverage
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O&M	Operations & Maintenance
ORIIP	ORI and Inspection Program
Post-Construction Manual	Post-Construction Stormwater Management Program Manual
SHOT	Stormwater Hotline Occurrence Tracking Form
SSS O&M Program	Storm Sewer System Operations & Maintenance Program
sVGP	Small Vessel General Permit
SWMP	Stormwater Management Plan
TEMY	Tenant Environmental Manager of the Year
TIM	Harbors Tenant Inspection Manual
TIP	Tenant Inspection Program
TRP	Tenant Revocable Permit
US	United States
USACE	US Army Corps of Engineers
USCG	US Coast Guard
USEPA	US Environmental Protection Agency
VGP	Vessel General Permit
WESTON	Weston Solutions, Inc.

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CONTACT PHONE NUMBERS

Department of Transportation, Harbors Division

Stormwater Hotline/HAR-EE…… 808-587-1962

Traffic Control Unit (available 24 hours)…….. 808-587-2076

State of Hawaii, Department of Health

Clean Water Branch……... 808-586-4309

Hazard Evaluation & Emergency Response…….. 808-586-4249

Solids and Hazardous Waste Branch……. 808-586-4226

City and County of Honolulu

Environmental Concern Line……. 808-768-3300

Storm Drain Permit Connection…… 808-768-8106

Industrial Discharges to Sanitary Sewer…… 808-768-8210

Sanitary Sewer Spills/Trouble……... 808-768-7272

U.S. Coast Guard Marine Safety Office…… 808-535-3222

U.S. Environmental Protection Agency, Region 9…… 415-947-8000

Section A

Stormwater Management Program Overview
Public Education and Outreach Program
Public Involvement/Participation Program

Stormwater Management Plan
Honolulu Harbor
and Kalaeloa Barbers Point Harbor

Prepared for:
State of Hawaii
Department of Transportation
Harbors Division

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1.0 INTRODUCTION

1.1 BACKGROUND

Hawaii's residents and businesses are heavily dependent on ocean commerce for their everyday needs. Eighty percent of all consumer goods, including food and fuel, are imported to the State of Hawaii, with 98 percent of these goods received and processed through its commercial ports. The delivery of goods via ocean transportation supports every facet of Hawaii's economy, including tourism, construction, national defense, agriculture, and all other industries.

Hawaii's commercial harbors operate as a "hub and spoke" system where all imported goods destined for the Neighbor Islands are first received at the state's main port-of-entry, Honolulu Harbor, located on the south shore of the Island of Oahu, before being redirected with tug-and-barge operations to any of the other commercial ports in the State.

Honolulu Harbor is one of the largest container handling ports in the United States (US) with over 8 million short tons of cargo handled annually. Honolulu Harbor provides facilities for passenger, excursion, research and fishing vessels and supports numerous tenants engaged in commercial fishing and other maritime-related activities.

Kalaeloa Barbers Point Harbor (KBPH), also located on the south shore of Oahu, is approximately 21 miles west of Honolulu Harbor. It is the most recently constructed Hawaii commercial harbor and primarily handles liquid such as petroleum products and dry-bulk cargos such as coal, cement and scrap metal, along with lesser amounts of miscellaneous general cargo and containers. Commercial ship maintenance and repair facilities are also located there.

Honolulu Harbor and Kalaeloa Barbers Point Harbor (KBPH) located on Oahu, Hawaii, are properties owned by the Hawaii Department of Transportation (HDOT) Harbors Division (Harbors) along with the other eight commercial harbors serving the outer islands of Hawaii, Kauai, Maui, Molokai and Lanai.

Stormwater flowing over Harbors property into storm drains enters the small municipal separate stormwater sewer systems (MS4) at each harbor, which empties directly into the ocean waters. Honolulu Harbor and KBPH fall under the U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) regulations (40 Code of Federal Regulations [CFR] 122) as they are in urbanized areas. Stormwater and certain non-stormwater discharges entering the harbors are authorized by the Hawaii Department of Health (HDOH) Clean Water Branch (CWB) through two separate Notices of General Permit Coverage (NGPCs) for Honolulu Harbor and KBPH. The NGPC is subject to Harbors' compliance under Hawaii Administrative Rules (HAR) Chapter 11-55 Appendix K, Appendix A, and HAR Sections 11-55-34.04(a), 11-55-34.07, 11-55-34.11, 1-55-34.12, and any other applicable Sections of HAR, Chapters 11-55.

NGPCs for the storm drain systems (File Numbers HI 03KB482 and HI 03KB488) were granted by the HDOH in two letters dated May 19, 2003. Coverage for both harbors was extended by HDOH administrative extension until December 9, 2013, at which time HDOH renewed NGPCs for both Harbors. NGPCs for Honolulu Harbor and KBPH will expire on December 5, 2016.

Despite Harbors' efforts to comply with the NGPCs, the USEPA initiated regulatory actions to increase awareness, improve the stormwater program, and to ensure compliance. On November 5, 2014 HDOT entered into a Consent Decree (CD), which requires Harbors to comply with the Clean Water Act (CWA) by meeting specific requirements. These requirements, along with the requirements set forth by the NGPC, have been integrated into this Stormwater Management Plan (SWMP).

1.2 PURPOSE

The purpose of the SWMP is to support Harbors' vital ocean commerce role by ensuring that applicable environmental protection requirements are met at both Honolulu Harbor and KBPH in accordance with the requirements of the NGPCs and CD for both harbors. The SWMP is intended to define specific actions, metrics, milestones, timelines, roles, and responsibilities across Harbors Sections. The SWMP utilizes the six minimum control measures established by the USEPA and required by HAR 11-55 Appendix K.

The SWMP is intended to be a public document. As such, a review period will be held to allow the public to read and comment on the Draft SWMP. Details of the public involvement program can be found in Section A, Subsection 4.0 (A.4). The SWMP will be implemented no later than the close of the public comment period, which will be 45 days after posting the SWMP on Harbors' website at http://hidot.hawaii.gov/harbors/library/storm-water-management/ as required by Paragraph 11 of the CD.

1.3 DOCUMENT FORMAT

The format of this SWMP was adopted to follow the six minimum control measures while improving readability for Harbors personnel and regulators. Each minimum control measure and the goals associated with it are discussed separately. The discussion identifies the minimum control measure, a rationale for each measure, a schedule for implementation including measurable goals, milestones, and strategies for implementing relevant Best Management Practices (BMPs).

In order to assess progress for each minimum control measure, the SWMP contains BMP tables in Section A.2 that track activities that are either occurring or will be implemented in the future to ensure each of the minimum control measures are being implemented. Each BMP activity is assigned a specific evaluation indicator, milestone, time frame/due date, and responsible party. These performance metrics will be assessed in an Annual Compliance Report (ACR) to provide a detailed accounting of SWMP accomplishments.

Following each major section in Section A.2, a checklist has been provided to clearly summarize Harbors' compliance with specific requirements of the NGPC and the CD. The compliance checklist includes the SWMP section or item, the origin of the requirement, a summary of the requirement, and a checkbox indicating whether or not the item has been completed.

The format of the SWMP is outlined below:

A. Section 2.0 - Stormwater Management Program Overview

    a. Includes a brief introduction of each minimum control measure,

b. BMP Tables, and

c. Compliance Checklists for each section.

Section 3.0 - Public Education and Outreach Program

Section 4.0 – Public Involvement/Participation Program

B. Illicit Discharge Detection and Elimination Program

a. Tenant Inspection Program (TIP)

b. Outfall Reconnaissance Inventory and Inspection Program (ORIIP)

c. Site Assessment Program

d. Enforcement Response Program (ERP)

C. Construction Site Runoff Control Program (CSRCP)

D. Post-Construction Stormwater Management Program

E. Pollution Prevention and Good Housekeeping Program

a. Storm Sewer System Operation & Maintenance (SSS O&M) Program

1.4 AUTHORIZATION AND LIMITATIONS

In compliance with the CWA, as amended; Chapter 342D, Hawaii Revised Statutes (HRS); and Chapters 11-54 and 11-55, HAR, State of Hawaii, Harbors is authorized to discharge stormwater runoff and certain non-stormwater discharges as identified in the NGPCs.

The NGPCs require that Harbors effectively prohibit non-stormwater discharges through its system into State waters. Flows exempted from this prohibition by the NGPCs include:

1. Water line flushing;
2. Landscape irrigation;
3. Diverted stream flows;
4. Rising ground waters;
5. Uncontaminated ground water infiltration as defined in Title 40, Code of Federal Regulations (40 CFR) 35.2005(20);
6. Uncontaminated pumped groundwater;
7. Discharges from potable water sources and foundation drains;
8. Air conditioning condensate;

9. Irrigation water;
10. Springs;
11. Water from crawl space pumps and footing drains;
12. Lawn watering runoff;
13. Water from individual residential car washing;
14. Flows from riparian habitats and wetlands;
15. Dechlorinated swimming pool discharges;
16. Residual street wash water; and
17. Discharges or flows from firefighting activities.

In addition, exempted discharges must not cause or contribute to any violation of water quality standards as stated in HAR 11-55 Appendix K.

1.5 ROLES AND RESPONSIBILITIES

The Director of Transportation is responsible for the care and control of the commercial harbors and homesteads. The Director confers responsibility to each manager, supervisor, and employee to balance the industrial and commercial activities at Honolulu Harbor and KBPH with environmental compliance and the need to be good, steadfast environmental stewards of Harbor land and waters. The Director's Environmental Policy Statement is:

> *It is the policy of the Hawaii Department of Transportation to manage our facilities and programs in a manner that protects the environment, the safety of our employees, and the public health, while fulfilling our mission to deliver and operate a safe and effective statewide multi-modal transportation system.*

As stewards, Harbors employees are responsible for the following three objectives:

- ✓ Train Harbors employees and tenants to observe, educate, report, and assist with enforcing BMPs in and around the Harbors communities educate tenants on "Dump No Waste";
- ✓ Prevent and mitigate oil, debris, silt, and other potential pollutants from entering our ocean waters by implementing BMPs; and
- ✓ Encourage voluntary compliance and support enforcement actions, when necessary, to correct behavior.

The stormwater management team organization is shown in Figure 1-1. The responsibilities of key roles as they are related to stormwater management are described in Table 2-1.

Figure 1-1 Harbors Administrative Organizational Chart

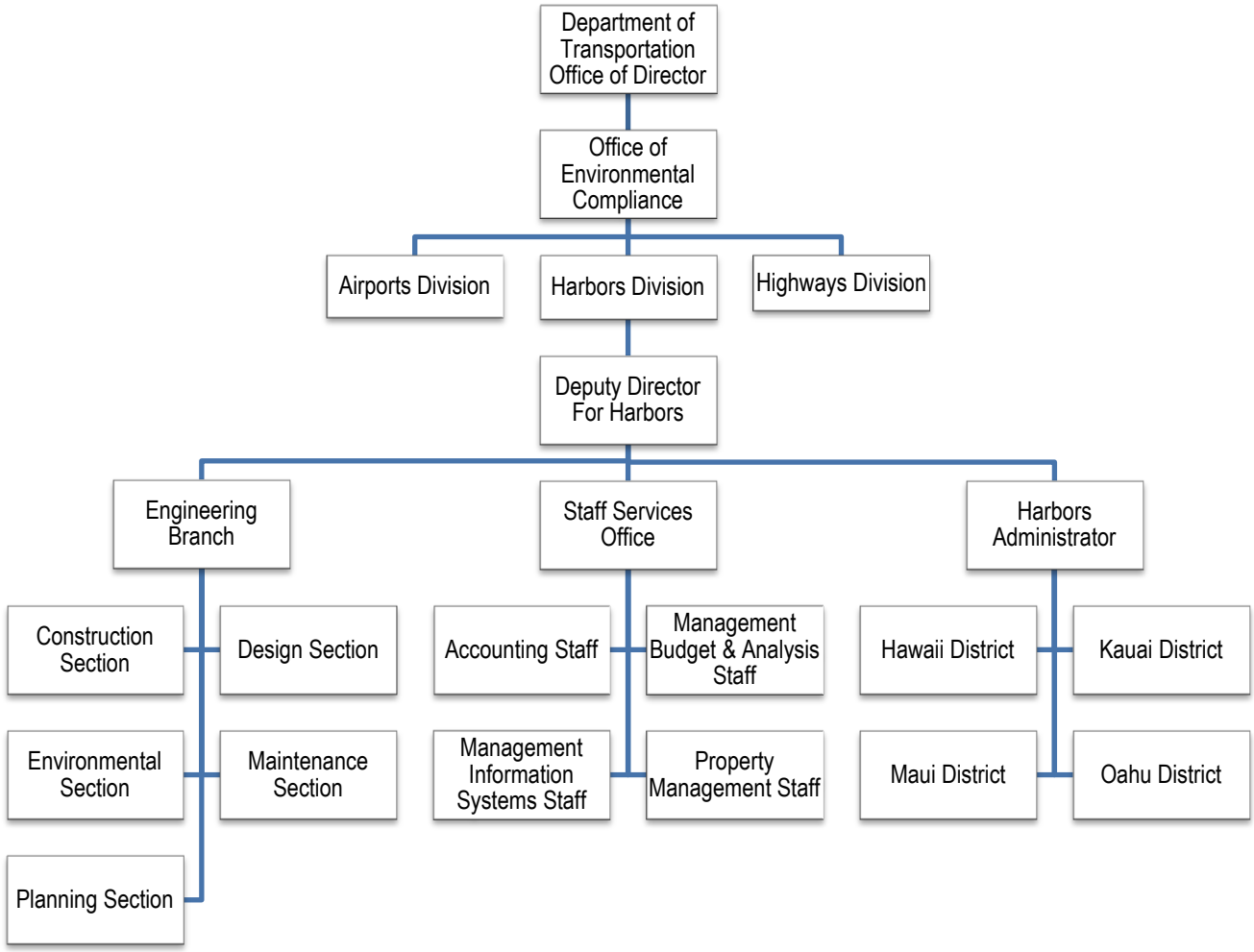


Table 1-1 Roles and Responsibilities

Role	Responsibility
HDOT Director	The program authority is maintained solely by the Director, who maintains direct oversight of all HDOT staff. The Director is responsible for the care and control of the commercial Harbors and homesteads.
Office of Environmental Compliance	Coordinates with all divisions of HDOT to achieve and maintain compliance with all environmental regulations and permits. The Office of Environmental Compliance has the authority and responsibility to oversee compliance with all environmental requirements relating to small MS4 compliance. Reports to the Director.
Deputy Director for Harbors	Program authority is conferred from the Director through the Deputy who maintains direct oversight of all Harbors staff.
Harbors Administrator	The stormwater program funding and staffing is managed by the Harbors Administrator.
Engineering Branch (HAR-E)	Provides engineering management and stormwater program oversight in coordination with HAR-O. HAR-E is responsible for ensuring the construction site runoff control and post-construction programs are implemented.
Engineering Branch Planning Section (HAR-EP)	Develops Harbor Master Plans, six-year capital project budget plan, and capital project biennial budget for new development and redevelopment projects.
Engineering Branch Design Section	Responsible for the preparation of construction plans and specifications for new development and redevelopment projects.
Engineering Branch Construction Section (HAR-EC)	Responsible for the implementation of construction plans and specifications for new development and redevelopment projects.
Engineering Branch Environmental Section (HAR-EE)	Oversees permit compliance (including this SWMP) as well as compliance with all relevant environmental regulations. HAR-EE assists with enforcement where necessary. HAR-EE consists of one supervisor and several staff environmental health specialists and/or environmental engineers.*
Engineering Branch Maintenance Section (HAR-EM)	Responsible for the preparation of construction plans and specifications for special maintenance and repair projects.
Oahu District (HAR-O)	Honolulu Harbor and KBPH fall under the operational management and oversight of HAR-O. HAR-O is also responsible for placing stormwater signs, stenciling, cleaning storm drains, noting illicit discharges, and maintaining BMPs.
Oahu District Operations Section (HAR-OC)	Oversees Harbor operations including vessel scheduling and berthing, monitoring of operations, street and yard sweeping, and trash collection and disposal.

Table 1-1 Roles and Responsibilities (Cont.)

Role	Responsibility
Oahu District Maintenance Section (HAR-OM)	HAR-OM personnel conduct daily maintenance functions at the piers and tenant areas in the cargo yards. OM personnel are expected to report observations of potential illicit discharges to Aloha Tower or immediate supervisor.
Oahu District Enforcement Section (HAR-OE)	HAR-OE is responsible for conducting field patrols and enforcing HARs. Marine Cargo Specialists and Harbors Agents are part of HAR-OE and are responsible for conducting Site Assessments of tenant activities in their assigned piers for: damage, pier use by cargo operators, and to inspect, monitor, observe, and correct tenant activities that have potential sources of illicit discharges. MCSs and HAs also conduct quarterly storm drain inspections to determine if storm drain cleaning is needed.
Property Management Section (HAR-PM)	Responsible for overseeing and enforcing the requirements of tenant leases and TRPs including those related to the environment. Assists HAR-EE in ensuring that tenants implement proper BMPs.
Information Systems Section (HAR-SI)	Responsible for maintaining and updating the Harbors computer systems and website.

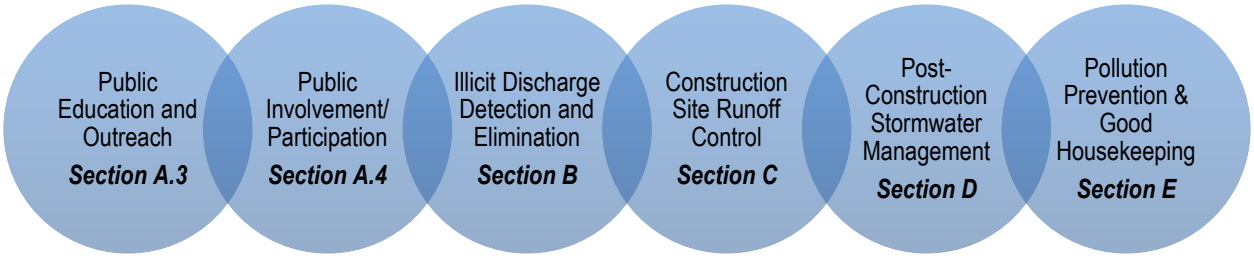
Note: *A full time position has been assigned per the CD whose duties include inspection erosion and sediment control. Harbors will reorganize HAR-EE and request legislative and Governor approval to fund and establish a permanent full time position. The section's functional statement and duties will require the positions to have the additional responsibilities to inspect erosion and sediment control and will include routine and event-driven inspections of construction projects for compliance with stormwater requirements. Harbors will also supplement resources and technical expertise through the use of professional consultant services.

Table 1-2 SWMP Overview Compliance Checklist

Requirement	Relevant SWMP Section	Remarks	Requirement Included in SWMP
NGPC Section 1, Honolulu Harbor and KBPH - General Requirements	Page i	The certification required by the NGPC is superseded by CD Paragraph 9 (CD 9).	☑
NGPC Section 2, Honolulu Harbor and KBPH - Discharge Monitoring Requirements	A.1.4	The SWMP prohibits non-stormwater discharges (excluding those listed in 2.b of the NGPC).	☑
NGPC Section 3, Honolulu Harbor and KBPH - Reporting Requirements	A.1	Harbors has developed and is currently implementing and enforcing its SWMP (Sections 3.a-c, f). 3.d-e will be covered by the ACR.	☑
CD 9 - Certification of Reports	Section A, Page i	The SWMP has been certified in accordance with the CD.	☑
CD 10 – HDOT Organization Structure	A.1.5	The organization structure required by CD 10 has been updated and is shown in this SWMP.	☑
CD 11.a.i - Modification of SWMP Elements	A.1	The 2009 SWMP has been revised in this SWMP for both Honolulu Harbor and KBPH and submitted prior to Feb 3, 2015.	☑
CD 11.a.ii – Public Comment of SWMP	A.4	Public comment will be solicited per the CD. See Section A.4	☑
CD 12 – Implementation Timeline	A.1	The SWMP will be implemented no later than the close of public comment period.	☑
CD 13 – Annual Compliance Report	A.2.9	The ACR will include a qualitative SWMP implementation assessment.	☑

2.0 STORMWATER MANAGEMENT PROGRAM OVERVIEW

Figure 2-1 Stormwater Management Program Elements



An effective stormwater management program approaches the issue of reducing pollutant discharges through the six elements shown in Figure 2-1. The public education element targets the following users: Harbors tenants, the general public including visitors to our islands, employees of Harbors, vessel operators, and general contractors performing construction on Harbors property. The SWMP describes Harbors' plan to prevent generation of potential pollutants by educating them in stormwater awareness and pollution prevention, getting them involved in developing the stormwater management program, inspecting and enforcing responsible practices at construction sites and tenant properties, and requiring the implementation of long-term engineering solutions and BMPs.

This section contains a high level description of each of the stormwater management program elements. The relevant requirements of the NGPCs and the CD have been addressed in this SWMP in Sections A through E.

Following each section below, a BMP Table containing the specific requirement, metrics, milestones, due dates, and outputs for each activity is included. The items in this table will be reported upon in the ACR each year.

A Compliance Checklist is included following the BMP Table, which is intended to facilitate review by regulators and other stakeholders. The checklists contain each relevant requirement and a reference to the SWMP section in which the requirement is addressed.

2.1 PUBLIC EDUCATION AND OUTREACH PROGRAM

Public education aims to create and promote awareness and prompt behavioral changes in the community. The responsibility for tenants and public education of users of the small MS4s falls under HAR-EE. This section contains an overview of The Public Education and Outreach Program, contained in Section A.3. For further details, please refer to Section A.3.

For education and outreach purposes the public can be divided into four categories: the general public; Harbors tenants, Harbors employees, consultants, and contractors; and vessel owners/operators. Harbors has developed approaches to increase stormwater awareness in each of these groups. Outreach to Harbor employees, consultants, and contracts is discussed in later sections as they relate to specific activities.

2.1.1 General Public Education and Outreach

General Public

- Awareness message
- Newspaper ad
- Social Media
- Hotline
- Volunteer Activities
- Website
- Signage
- Stenciling

Harbors Tenants

- Updated leases and TRPs
- Educational Materials
- Annual Training
- TEMY Award
- Tenant Inspections

Vessel Owners and Operators

- Educational Materials
- Website

The general public education and outreach effort is centered around the phrase *mālama i ke kai*, which can be translated to *protect our harbor waters*. This phrase is designed to be simple, memorable, and to convey the need and importance of stormwater awareness as well as to reflect our Hawaii places and their host culture. This message will be used as a branding tool and will be prominently displayed in or on: the Harbors website, signage and stenciling, information given to new tenants, educational flyers, newspaper ads, and other related outreach materials. Harbors will use at least three methods of disseminating additional stormwater awareness information including the Honolulu Star-Advertiser, web-based media, and volunteer activities.

Other means of communicating and engaging the public include a stormwater hotline, reachable during work hours by dialing 808-587-1962 or 24 hours a day through the Traffic Control Unit at 808-587-2076, or the Harbors website (http://hidot.hawaii.gov/harbors/library/storm-water-management/). The hotline can be used to report observations of potential illicit discharges or for general environmental inquiries. The website provides information about water quality issues, emergency reporting numbers, and links to useful sections of the USEPA website.

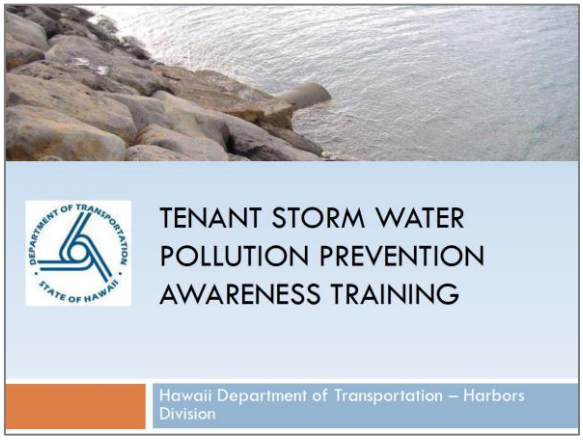
Signs will be installed that include information about illicit discharges, the stormwater awareness message, and the stormwater hotline for reporting stormwater issues. Harbors will stencil or label all inlets and open channels on Honolulu Harbor and KBPH to promote stormwater awareness and reduce non-stormwater discharges into harbor waters. The locations of signs and stencils will be tracked using Geographic Information Systems (GIS) software to facilitate evaluation of where future signs and stencils should be placed.

2.1.2 Tenant Education and Outreach

Tenants are required to reduce or eliminate potential pollution in stormwater discharges and effectively prohibit unauthorized non-stormwater discharges into the small MS4s. Harbors includes language to this effect in new leases and tenant revocable permits (TRPs). Additionally, Harbors has developed a New Tenant Information Package, which is provided to new tenants to make them aware of the stormwater requirements and understand how to identify and report illicit discharges. The New Tenant Information Package includes the stormwater awareness message, information on minimum BMPs, and educational materials describing the responsibilities of the Tenant and resources for obtaining additional information regarding stormwater pollution.

An inventory of all tenants at Honolulu Harbor and KBPH is kept on file at HAR-EE. HAR-PM will continuously update the inventory and notify HAR-EE of new tenants at Honolulu Harbor and KBPH. The inventory includes tenant contact information, which enables Harbors to

provide tenants with educational materials by mail and to inform tenants of annual training workshops.



Harbors holds tenant stormwater awareness trainings annually and tracks whether or not tenants attend. A questionnaire is given to assess tenant knowledge regarding stormwater awareness. The questionnaire also includes a feedback section, which is used to determine how improvements to the training can be made. A Tenant Environmental Manager of the Year award is given to the tenant environmental manager who has implemented exemplary environmental and safety practices and fosters an exceptional company environmental culture. The award provides positive incentive for other tenant environmental managers and provides concrete examples of solutions that are realistic and affordable. The award is presented with a letter that is signed by the Governor of the State of Hawaii.

The Tenant Inspection Program (TIP) is part of the Illicit Discharge Detection and Elimination (IDDE) program discussed in Section B; however, the TIP contains tenant outreach opportunities, which include:

- ✓ Ensuring that tenants are aware of their environmental responsibilities;
- ✓ Providing outreach materials such as informational sheets, BMP fliers, schedules of upcoming training to tenants;
- ✓ Gathering data to be used to update outreach materials based on observations in the field; and
- ✓ Provide immediate feedback to tenants regarding successful BMPs and BMPs that should be implemented.

2.1.3 Vessel Operators Educational Program


Controlling Vessel Discharges
BEST MANAGEMENT PRACTICES
Small Vessel Maintenance Activities

Debris from small vessel maintenance taking place over water can result in detergents, heavy metals, oils and greases, toxic substances, sediments, and other pollutants that fall directly into pristine Hawaiian waters.

Releasing pollutants directly or indirectly into the harbor during hull maintenance activities is a violation of the Clean Water Act. Proper employee training, implementation of best management practices (BMPs), and pollution prevention methods are necessary. Such maintenance activities include:

- Painting
- Grinding and chipping
- Using chemicals for rust and paint removal
- Washing exterior surfaces (with or without chemicals)
- Engine repair

How to Comply (and Implement Best Management Practices):

Preferred: Perform vessel maintenance while vessel is in dry dock, slipway or haul-out facility, or beyond waters under the jurisdiction of the State of Hawaii.

When haul-out or drydock is not possible:

- Wash exterior surfaces with fresh water only; low pressure (<100psi) only. Wet sponges are preferred to rinsing.
- Clean with dry methods (sweeping, vacuuming, or damp mopping).
- Never use detergents or other chemicals.
- Painting to be performed on pier side of vessel only.
- Install a tarp or other containment device underneath all painting, grinding, or chipping. Magnets and poles work well to secure the tarps. Properly dispose of all captured debris removed from hull.
- Use anti-foulant paints with less toxic ingredients and never those with Tributyltin (TBT). Anti-foulant paints and other compounds containing TBT are prohibited for use throughout the United States.
- Never use chemicals, such as Naval Jelly (Phosphoric Acid) for rust or paint removal while vessel is still afloat.
- Never use any compounds that contain Tetrachloroethylene (TCE) for hull maintenance.

*The EPA issued a **Small Vessel General Permit (sVGP)** authorizing discharges incidental to the normal operation of **non-military and non-recreational vessels less than 79 feet in length and commercial fishing vessels.***

*The permit specifies best management practices for such categories as: **fuel management, engine and oil control, solid and liquid maintenance, gray water management, fish hold effluent management, and ballast water management.***

A separate Vessel General Permit (VGP) addresses NPDES permit coverage for commercial vessels over79'.

Harbors' efforts towards tenants owning or operating vessels are focused toward vessel operations conducted on land. These tenants are otherwise subject to requirements of the Vessel General Permit (VGP) and small VGP (sVGP) by the USEPA and regulations of the US Coast Guard (USCG).

HAR-OE Marine Cargo Specialists (MCSs) monitor loading and unloading procedures for the major vessels in the Harbor. Their duties include tracking compliance with various aspects of the process including stormwater pollution control compliance. Educational sheets developed by HAR-EE for small vessel maintenance activities are distributed by MCSs to vessel agents and owners when they receive hot work permits.

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BMP Table 2-1 Public Education and Outreach

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Identify and implement no less than three forms of disseminating stormwater awareness information to tenants and the public.	CD 14.a.ii SWMP A.3.1	Number of forms of dissemination.	At least three	Annually	HAR-EE	ACR
Integrate and promote the message: *Malama i ke kai – Protect Our Harbor Waters.*	CD 14.a.i SWMP A.3.1.1	Percentage of printed and electronic communications with tenants with message integrated. Percentage of staff, and public training materials with message integrated.	100%	Nov 5, 2014, then annually	HAR-EE	ACR
Post public awareness advertisement in local newspaper to educate the general public on stormwater pollution control.	CD 14.a.ii SWMP A.3.1.2	Number of advertisements sponsored.	Once per year	Annually	HAR-EE	ACR, local newspaper
Post advertisement in a local newspaper describing Harbors' efforts to protect and improve stormwater quality.	CD 14.a.iii SWMP A.3.1.2	Number of times per year advertisement is posted.	Once per year	Annually	HAR-EE	ACR, local newspaper
Maintain a web-based media as a means to disseminate stormwater awareness information.	CD 14.a.ii SWMP A.3.1.3	Number of users who "follow" the Harbors social media page/account.	Increased from previous year	Annually	HAR-EE	ACR

BMP Table 2-1 Public Education and Outreach (Cont.)

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Set up and solicit a volunteer cleanup or storm drain stenciling activity.	CD 14.a.ii SWMP A.3.1.4	Number of activities.	At least one	Annually	HAR-EE, tenants, public	ACR
		Number of participants in each activity.	Increase participation from previous year if less than 50	Annually	HAR-EE, tenants, public	ACR
Maintain Stormwater Hotline Occurrence Tracking (SHOT) database to track informational inquiries and reports placed to the hotline and follow-up activities.	SWMP A.3.1.5	Number of informational inquiries and reports received.	Increased from previous year	Annually	HAR-EE	ACR, SHOT Database
		Duration from when call is received until response.	Respond to all inquiries and reports within 24 hours to minimize water quality impacts	Annually	HAR-EE	ACR, SHOT Database
Educate the public and Honolulu Harbor and KBPH tenants in stormwater issues via Harbors website.	CD 14.b.i SWMP A.3.1.6	Items described in Section 2.1.6 are updated to keep website useful and relevant.	As needed	Ongoing	HAR-EE	ACR
		Percentage of website pages where stormwater awareness message is prominently displayed.	100%	Ongoing	HAR-EE, HAR-SI	ACR

BMP Table 2-1 Public Education and Outreach (Cont.)

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
(continued from previous)		Link to Harbors website is prominent featured on the main HDOT website.	Yes	Ongoing	HAR-EE, HAR-SI	ACR
		Number of visitors to Harbors stormwater management website.	Increased from previous year	Annually	HAR-EE, HAR-SI	ACR
Install signage at visible public areas and stencil storm drain inlets to reduce non-stormwater discharges into Harbors waters.	CD 14.c.i SWMP A.3.1.7	Number of locations identified suitable for signs and number of locations where signage installed.	At least 50	November 5, 2014	HAR-EE, HAR-O	ACR
	CD 14.c.ii SWMP A.3.1.7	Percentage of storm drain inlets/open channels with stenciling.	100%	February 3, 2015	HAR-EE, HAR-O	ACR
	CD 14.c.ii SWMP A.3.1.7	Percent of stencils/labels inspected prior to the wet season. Percentage of illegible stencils rectified.	100%	Annually	HAR-EE, HAR-O	ACR
Update tenant lease agreements TRPs, and other materials upon renewal to reference or include minimum BMPs and require their implementation.	CD 14.d.ii SWMP A.3.2.1	Percent of new/renewed tenants with modified language in their leases or TRPs.	100%	Ongoing	HAR-PM, HAR-O, HAR-EE	ACR, leases and TRPs

BMP Table 2-1 Public Education and Outreach (Cont.)

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Develop and update a New Tenant Information Package to ensure new tenants are aware of stormwater requirements.	CD 14.h.i SWMP A.3.2.1	Percentage of materials relevant.	100%	Once, then ongoing	HAR-EE	ACR, New Tenant Information Package
Maintain an electronic tenant inventory and update in accordance with the TIM.	CD 14.e.i SWMP A.3.2.2 TIM	Percentage of current tenants with accurate information based on most recent inspection.	100%	Ongoing	HAR-EE, HAR-PM	ACR
Develop a comprehensive list of information sheets (BMP Flyers).	CD 14.d.i SWMP A.3.2.3	Percentage of information sheets included on the list.	100%	Annually	HAR-EE	SWMP, ACR
Provide educational outreach to tenants to proactively mitigate activities that could result in pollution via educational mailers and training workshops	CD 14.g.i SWMP A.3.2.3-4	Number of times per year tenants received educational materials to include requirements listed in A.3.2.3.	Twice per year	Annually	HAR-EE	ACR

BMP Table 2-1 Public Education and Outreach (Cont.)

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
(continued from previous)	CD 14.a.ii.1 SWMP A.3.2.4	Percentage of tenants that attended the annual stormwater awareness training plus percentage of tenants that attended the online training.	At least 80%	Annually	HAR-EE	ACR
	SWMP A.3.2.4	Percentage of training attendees that gave positive feedback about the training.	50%	Annually	HAR-EE	ACR
	CD 14.f.i, 14.f.ii SWMP A.3.2.4	Percentage of all tenants that responded to the questionnaire.	60%	Annually	HAR-EE	ACR
	CD 14.f.ii SWMP A.3.2.4	Training materials updated to reflect information about most frequently missed question on the previous year's tenant questionnaire.	Yes	Annually	HAR-EE	ACR
Develop and distribute information sheets describing recommended BMPs for Vessel Operators.	CD 14.d.iii SWMP A.3.3.1	Number of BMP sheets created for vessel operators.	At least one	Annually	HAR-EE, HAR-O	ACR, Harbors website

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Table 2-1 Public Education and Outreach Compliance Checklist

Requirement	Relevant SWMP Section	Remarks	Requirement Included in SWMP
NGPC Section 3.a	A.3	Harbors' Public Education and Outreach Program is contained in this SWMP.	☑
CD 14.a.i	A.3.1.1	Harbors has developed a stormwater awareness message, *malama i ke kai*, and implementation strategy.	☑
CD 14.a.ii	A.3.1.1	Harbors will disseminate stormwater awareness through a local newspaper, web-based media, and volunteer activities.	☑
CD 14.a.ii.1	A.3.2.4	Harbors will continue to hold its annual stormwater awareness training and use tenant risk ranking as incentive to achieve 80% attendance.	☑
CD 14.a.iii	A.3.1.2	Harbors will place an ad in a local newspaper once per year describing its stormwater efforts.	☑
CD 14.b.i	A.3.1.6	Harbors will update its website to contain the items listed in the CD and prominently display the stormwater awareness message.	☑
CD 14.b.ii	A.3.1.6	The HDOT division websites will be linked to each other.	☑
CD 14.b.iii	A.3.1.6	The HDOT website will feature a prominent link to the HDOT Harbors website. The number of visitors will be tracked.	☑
CD 14.c.i	A.3.1.7	Harbors has identified 50 locations for sign placement and will install signs by February 3, 2015.	☑
CD 14.c.ii	A.3.1.7	Harbors will stencil all storm drain inlets by February 3, 2015 and begin a stencil inspection schedule.	☑
CD 14.d.i	A.3.2.3	Information sheets for tenant activities have been developed.	☑
CD 14.d.ii	A.3.2.1	Tenant lease agreements have been updated to require the implementation of Minimum BMPs.	☑
CD 14.d.iii	A.3.3.1	An information sheet for Vessel Operators has been developed and is available on the Harbors website.	☑

Table 2-1 Public Education and Outreach Compliance Checklist (Cont.)

Requirement	Relevant SWMP Section	Remarks	Requirement Included in SWMP
CD 14.e.i	A.3.2.2	Harbors maintains an electronic inventory of tenants. The system will be made compatible with GIS.	☑
CD 14.f.i	A.3.2.4	Harbors mails and distributes during the annual training a tenant questionnaire to assess their stormwater awareness and pollution prevention knowledge.	☑
CD 14.f.ii	A.3.2.4	Harbors uses the results of the questionnaire to update materials. Harbors uses its best efforts to ensure at least 60% of tenants respond to survey. The results are included in the next ACR following the training.	☑
CD 14.g.i	A.3.2.3-4	Harbors provides educational materials to tenants at least twice per calendar year.	☑
CD 14.h.i	A3.2.1	Harbors has developed a New Tenant Information Package.	☑

2.2 PUBLIC INVOLVEMENT/PARTICIPATION PROGRAM

Public involvement brings the public into the development, implementation and review of a small MS4's stormwater management program. Harbors will involve the public in developing its SWMP to raise consciousness of water quality issues, to create a sense of responsibility for water quality, and to lessen the likelihood that members of the public will commit actions that may lead to water quality degradation. The SWMP will be posted to the Harbors website for a 45-day public comment period. Concurrently, a notice published in the *Honolulu Star-Advertiser* will advise the general public that the SWMP is available for review on the Harbors website and that comments are being solicited. The comments received will be tracked, incorporated in the final SWMP as appropriate and implemented where necessary.

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BMP Table 2-2 Public Involvement/Participation

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Solicit comments from Harbors tenants and the public to increase public awareness of stormwater management efforts and improve quality of SWMP.	CD 11.a.ii SWMP A.4	Modified SWMP posted to the Harbors website	Yes	February 3, 2015	HAR-EE, HAR-SI	ACR, Harbors Website
		Advertisement placed in local newspaper	Yes	February 3, 2015	HAR-EE, HAR-SI	ACR, local newspaper
Track comments submitted by Harbors tenants and the public and the changes prompted by comments, if any.	CD 11.a.ii SWMP A.4	Number of comments received from Harbors Tenants and the public	At least one	45 days after posting SWMP	HAR-EE	ACR
		Number of comments resulting in revision of Modified SWMP	At least one	45 days after posting SWMP	HAR-EE	ACR

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Table 2-2 Public Involvement/Participation Compliance Checklist

Requirement	Relevant SWMP Section	Remarks	Requirement Included in SWMP
NGPC Section 3.a	A.4	Harbors' Public Involvement/Participation Program is contained in this SWMP.	☑
CD 11.a.ii	A.4	The SWMP will be posted to the Harbors website on February 3, 2015 and public involvement will be solicited.	☑

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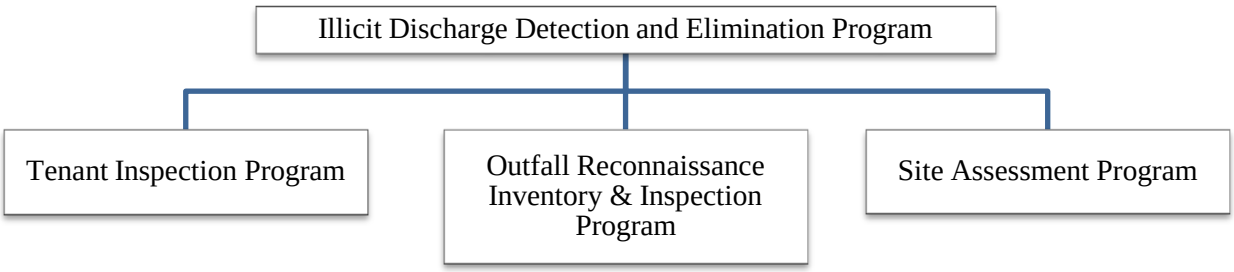
2.3 ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Harbors IDDE Program's purpose is to identify and eliminate illicit discharges and spills to the small MS4s at Honolulu Harbor and KBPH. It is comprised of three major components: the TIP, the ORIIP, and Site Assessments, which are shown in Figure 2-2. The three programs shown below are three approaches to reducing potential pollutants from entering Harbors waters.

Figure 2-2 IDDE Program Organization



Harbors has created an improved definition of illicit discharge to be used in the IDDE Program and for education and outreach. An illicit discharge will be defined as: *any non-stormwater discharge that poses a risk to the environment.*

2.3.1 Tenant Inspection Program

The TIP, described in the Tenant Inspection Manual (TIM), involves recurring inspections of tenant facilities with frequencies determined by the relative risks associated with each tenant facility. This tenant inspection process is mostly preventive in nature in that it identifies potential sources of pollutants such as stored materials or tenants operations and evaluates BMPs and facility layouts to determine if they are effective at stopping illicit discharges before they happen. The six types of inspections include:

- ✓ Initial Site Inspection/New Tenant Inspection;
- ✓ Routine Tenant Inspection;
- ✓ Reconnaissance Inspection;
- ✓ Final Site Inspection;
- ✓ Follow-up Inspection; and
- ✓ Investigation Inspection.

HAR-EE is responsible for implementing the TIP. Further information on this program can be found in Section B.2.

2.3.2 Outfall Reconnaissance Inventory and Inspection Program

The ORIIP consists of conducting inspections during dry weather and wet weather conditions to determine structural conditions of the outfalls, if illicit discharges are occurring, and if existing BMPs are sufficient. Further information on this program can be found in Section B.3.

During dry weather inspections, illicit discharges will be observed from the ocean as no stormwater should be discharging from the outfalls. When flows are observed, ORIIP personnel will attempt to determine the source of the flow with a quick visual inspection. If further investigation is needed, HAR-EE will follow up, identify the source, and contact the responsible party and appropriate regulatory agency.

Wet weather inspections are from the pier and allow inspectors to observe outfall flow and sheet flow from the pier. Inspectors evaluate the quality of the flow, looking for oil sheen, discoloration, trash and debris, and other indicators that BMPs are not functioning correctly.

The results of both types of inspections are recorded and managed in a database. The ORIIP includes an inventory of all outfalls at Honolulu Harbor and KBPH that is updated after every inspection event. The data collected during inspections help to create a more complete picture of the potential illicit discharges that exist.

2.3.3 Site Assessment Program

HAR-OE is responsible for the third component of the IDDE program which is Site Assessment (i.e., harbor patrol), and it will be carried out by Marine Cargo Specialists and Harbor Police. High risk areas will be observed in accordance with the TIP and ORIIP in order to identify active or recent illicit discharges, to increase the field presence of Harbors personnel and thus deter illicit discharges, and to identify areas that would benefit from the installation of signs. If violations are identified during Site Assessments, Harbors will initiate enforcement in accordance with the appropriate enforcement process including the ERP (see Section B), if necessary.

Harbors will also provide outreach activities during Site Assessments such as distributing BMP fliers, a schedule of upcoming trainings, or other materials.

2.3.4 Enforcement

The primary objectives of Harbors environmental enforcement program are to: ensure tenants comply with the environmental regulations, lease agreements, and/or TRPs; correct any violation(s); and require tenants to operate their facilities in accordance with Harbors environmental policy and applicable BMPs. The full scope of Harbors' enforcement program is described in the TIM, Construction manuals, and ERP (Section B).

Harbors is in the process of entering into a Memorandum of Agreement (MOA) with HDOH, CWB for the purpose of coordinating enforcement actions against violators of water quality laws. With this MOA in place, the ERP will be more effective at deterring tenants and the public from actions that could allow illicit discharges to enter the harbors.

2.3.5 Employee Training

Harbors requires all Harbors employees with IDDE responsibilities to attend an annual IDDE training to teach each employee the fundamentals of environmental stewardship and associated responsibilities. Employees with specific tenant inspection or ORIIP responsibilities will be provided appropriate training on the TIM and ORIIP, respectively.

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BMP Table 2-3 Illicit Discharge Detection and Elimination

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Harbors will inspect all tenants at frequencies appropriate to their environmental risk.	CD 14.h.ii TIM Section 2	Percentage of new tenants having initial site inspection/new tenant inspection completed.	100%	Within three months	HAR-EE	ACR
	CD 16.e.i TIM Section 4.3	Percentage of all tenants having risk ranking updated per the TIM.	100%	Annually	HAR-EE	ACR; database
	SWMP B.2 - TIM	Percentage of follow-up inspections completed within 7 days following the discovery of an illicit discharge or potential violation.	100%	Annually	HAR-EE	ACR; database
	CD 16.e.iii	Percentage of follow-up inspections completed within 30 days following a substantive change to a facility's operation, size, or activities.	100%	Annually	HAR-EE	ACR; database
	SWMP B.2 - TIM	Percentage of investigative inspections performed by next working day after receipt of a complaint.	100%	Annually	HAR-EE	ACR; database

BMP Table 2-3 Illicit Discharge Detection and Elimination (Cont.)

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Harbors will manage an outfalls database that will track locations of outfalls and previous inspections in order to create a more complete picture of potential illicit discharges.	CD 16.c.i.1 CD 16.c.i. SWMP B.3 - ORIIP Section 2.0	Re-prioritize outfalls	100%	Annually	HAR-EE	ACR; database
		Inspect outfalls according to their ranking.	100%	Ranked Unlikely – biennially. Ranked Potential, suspect, or obvious-annually.	HAR-EE	ACR, database
	CD 16.c.ii CD 16.d SWMP B.3 - ORIIP Section 3.3	Number of illicit discharges identified through dry weather inspections that are properly addressed.	100% of illicit discharges addressed	As determined by inspector	HAR-EE	ACR; database
	CD 16.c.i.2 CD 16.c.ii SWMP B.3 - ORIIP Section 3.4	Number of BMPs identified through wet weather inspections requiring improvement that are properly addressed.	100% of BMPs needing improvement addressed	As determined by inspector	HAR-EE	ACR; database
Perform site assessments to identify active or recent illicit discharges and increase the field presence of Harbors personnel.	CD 16.b.i CD 16.b.iii SWMP B.4	Percentage of incidents tracked where illicit discharges were identified/prevented. Respond to violations in accordance with the ERP.	100%	Begin within 30 days of CD entry; then annually	HAR-OE	ACR; database
Identify areas that would benefit from signs.	CD 16.b.ii SWMP B.4	Number of areas identified.	As needed	Ongoing	HAR-EE; HAR-O	ACR

BMP Table 2-3 Illicit Discharge Detection and Elimination (Cont.)

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Provide effective educational materials to employees to increase their knowledge of Harbors stormwater pollution prevention program through training.	CD 15.a.ii SWMP B.6.1	Percentage of employees receiving information about stormwater pollution prevention.	100%	Annually	HAR-EE	ACR
	CD 15.a.i SWMP B.6.1	Percentage of employees receiving stormwater awareness and pollution prevention questionnaire.	100% receive; 80% respond	Annually	HAR-EE	ACR
	CD 15.b.i SWMP B.6.1	Percentage of Marine Cargo Specialists, Harbor Police, and Grounds Supervisors receiving training on IDDE procedures.	100%	Annually	HAR-EE	ACR
	CD 15.b.ii SWMP B.6.2	Percentage of staff whose job duties include implementing the TIP receiving training specified in the TIM.	100%	Annually	HAR-EE	ACR
	CD 15.b.iii SWMP B.6.3	Percentage of staff whose job duties include implementing the ORIIP receiving training specified in the ORIIP manual.	100%	Annually	HAR-EE	ACR

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Table 2-3 Illicit Discharge Detection and Elimination Compliance Checklist

Requirement	Relevant SWMP Section	Remarks	Requirement Included in SWMP
NGPC Section 3.a	B	Harbors' Illicit Discharge Detection and Elimination Program is contained in this SWMP.	☑
CD 14.h.ii	B.2	Inspections of new tenants are conducted as described in the TIM.	☑
CD 15.a.i	B.6.1	Harbors surveys all employees to assess their knowledge regarding stormwater awareness and pollution prevention.	☑
CD 15.a.ii	B.6.1	Harbors provides stormwater pollution prevention information to all employees.	☑
CD 15.b.i	B.2, B.3, B.6	Harbors conducts its IDDE program in accordance with the TIP, Section B.2, and ORIIP, Section B.3. Harbors will train Marine Cargo Specialists and Ground Supervisors per Section B.6.	☑
CD 15.b.ii	B.6.2	Training will be provided to employees responsible for the TIP implementation.	☑
CD 15.b.iii	B.6.3	Training is provided to employees responsible for the ORIIP implementation.	☑
CD 16.a	B.1.1	An improved definition of "illicit discharge" and examples have been developed and is included in the SWMP.	☑
CD 16.b.i	B.4	Site Assessments are conducted in accordance with the TIM and ORIIP.	☑
CD 16.b.ii	B.4	Outreach materials are provided during Site Assessments.	☑
CD 16.b.iii	B.4	Harbors will respond to violations witnessed during Site Assessments in accordance with the ERP.	☑
CD 16.c.i	B.3	Harbors has implemented the ORIIP to identify illicit discharges, assessment BMP performance, and assess system integrity.	☑
CD 16.c.i.2	ORIIP	Wet weather inspections are conducted in accordance with the ORIIP.	☑
CD 16.c.ii	TIM, ORIIP, ERP	Records of all dry and wet weather observations and investigations are recorded.	☑

Table 2-3 Illicit Discharge Detection and Elimination Compliance Checklist (Cont.)

Requirement	Relevant SWMP Section	Remarks	Requirement Included in SWMP
CD 16.d	ORIIP	Harbors conducts source identification in accordance with the ORIIP.	☑
CD 16.e.i	TIM Sections 2, 4.3	Harbors will implement inspections and update risk rankings per the TIM.	☑
CD 16.e.ii	TIM Section 4.3, ERP	Harbors inspects tenants at appropriate frequencies per the TIM and conducts enforcement per the ERP.	☑
CD 16.e.ii.1	TIM Attachment 10	Harbors provides outreach to tenants during inspections, as needed.	☑
CD 16.e.iii	TIM Section 2.0	Inspections are conducted within 30 days of a reconnaissance inspection to update tenant risk ranking.	☑
CD 18.g.ii	ERP	Harbors undertakes enforcement action in accordance to the ERP, as appropriate.	☑
CD 19	B.5 ERP	Harbors has implemented the ERP and included it in the SWMP.	☑
CD 19.a	ERP	Harbors will obtain compliance and deter non-compliance by utilizing the full extent of Harbors' authority, including the authority to issue civil fines and incorporating Class I and Class II violations.	☑
CD 19.a.i.1	ERP	Harbors has incorporated the definition of a Class I violation.	☑
CD 19.a.i.2	ERP	Harbors has incorporated the definition of a Class II violation.	☑
CD 19.b	B.5.1	HDOT will enter into an MOA with HDOH to refer violations for escalated enforcement.	☑

2.4 CONSTRUCTION SITE STORMWATER RUNOFF CONTROL PROGRAM

The Harbors Construction Site Runoff Control Program (CSRCP) is an element of the Harbors stormwater management program that seeks to limit the impact of active construction sites on the stormwater conveyance systems and receiving water bodies. The CSRCP document, which details the program, is included in Section C. Post-Construction Stormwater Management Program has been developed to be complementary to the CSRCP and is included in Section D.

All construction projects at Honolulu Harbor and KBPH are subject to the CSRCP including documented project review and construction site inspection requirements unless explicitly exempted under the following conditions: they do not impact the storm drainage system and disturb less than one acre.

The following exempted sites, however, receive oversight under the IDDE program:

- ✓ Minor land disturbance activities performed by a property owner or employee on a single lot (such as minor landscaping activities and interior improvements);
- ✓ Post, pole, sign, and fencing installation;
- ✓ Utility repair work;
- ✓ Parking lot, driveway, and other paved surfaces repair; and
- ✓ Repair and maintenance activities.

Harbors' oversight of non-exempt construction projects is divided into two major categories: Harbors construction projects and tenant improvement projects. Each of these categories is managed through a process of design review, inspections, and enforcement. Although the process is similar, the specific procedures and responsible parties vary between programs.

Harbors has adopted the City and County of Honolulu (CCH) BMP Manual for Construction Sites as a Construction BMP Field Manual to guide both Harbors construction projects and tenant improvement projects. The CCH BMP Manual for Construction Sites can be accessed at the following link:

http://www.cleanwaterhonolulu.com/storm/learning_center/BMP_manual_2011-11.pdf

2.4.1 Training

Training will be provided to Harbors staff, contractors, and consultants who have construction stormwater responsibilities. The training will provide a detailed review of stormwater pollution prevention concepts and practices, and a discussion of the procedures and protocols of the Harbors CSRCP.

Harbors provides outreach to construction contractors and consultants to raise their awareness and understanding of the issues and causes of stormwater pollution and to explain their responsibilities. This outreach is conducted through informational exchanges between the Harbor PM, CM, and their contractors.

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BMP Table 2-4 Construction Site Stormwater Runoff Control Plan

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Harbors will maintain oversight of all non-exempt Harbors construction projects for compliance with the CSRCP.	CD 17.b.iv SWMP C – CSRCP	Number of construction projects reviewed using the *Construction Site Design Review Checklist*.	100% of projects	Ongoing	All sections of HAR-E	ACR
	SWMP C - CSRCP	Number of non-exempt projects less than one acre that submitted *HAR-EE Form SD<1_NF*.	100% of projects	Ongoing	All sections of HAR-E	ACR
	SWMP C - CSRCP	Percentage of contractor SWPPPs, NOI, and discharge permit applications reviewed.	100% of applications	Ongoing	HAR-E; HAR-EE	ACR
	CD 17.b.i SWMP C - CSRCP	Percentage of construction site inspection records entered into database (*Construction Site BMP Inspection Checklist*).	100% of records	Ongoing	HAR-EC	ACR
Harbors will maintain oversight of all non-exempt tenant construction projects for compliance with the CSRCP.	CD 17.b.i CD 17.b.iv SWMP C - CSRCP	Number of construction projects reviewed for necessary BMPs.	100% of projects	Ongoing	HAR-PM; HAR-EE	ACR
	SWMP C - CSRCP	Number of non-exempted projects less than one acre that submitted *HAR-EE Form SD<1_NF*.	100% of projects	Ongoing	HAR-PM; HAR-EE	ACR

BMP Table 2-4 Construction Site Stormwater Runoff Control Plan (Cont.)

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
(Continued from previous page)	CD 17.b.i SWMP C - CSRCP	Percentage of tenant site inspection records entered into database (*Construction Site BMP Inspection Checklist*).	100% of records	Ongoing	HAR-PM; HAR-EE	ACR
Ensure illicit discharges from Harbors construction projects and tenant improvement projects are prevented by inspection and enforcement.	CD 17.b.i SWMP C - CSRCP Sections 3.4, 4.4	Percentage of completed enforcement actions recorded in construction project database.	100%	Annually	HAR-EE	ACR
Provide training and resources for Harbors employees, consultants, tenants, and construction contractors regarding construction BMPs.	SWMP C - CSRCP Section 6	Percentage of contractors that receive *Construction BMP Field Manual.*	100%	Ongoing	HAR-E; HAR-EE	ACR
	CD 15.c.i SWMP C - CSRCP Section 5.1	Percentage of personnel whose primary job duties are related to implementing the CSRCP have received training.	100%	Annually	HAR-E; HAR-EE	ACR
	SWMP C - CSRCP Section 5	Training materials updated to reflect information about most frequently missed question on the previous year's questionnaire.	Yes	Annually	HAR-EE	ACR
	SWMP C - CSRCP Section 5.2	Percentage of attendees that gave positive feedback about training.	Increased from previous year (85% goal)	Annually	HAR-EE	ACR

BMP Table 2-4 Construction Site Stormwater Runoff Control Plan (Cont.)

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
List the City and County of Honolulu Stormwater BMP Manual for Construction on the Harbors website along with the Construction Plan Review Checklist, in construction specifications, and in the permit applications for connection and/or discharge.	CD 17.a.i	Materials available on website.	Yes	Once	HAR-EE	ACR, Harbors website

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Table 2-4 Construction Site Runoff Control Program Compliance Checklist

Requirement	Relevant SWMP Section	Remarks	Requirement Included in SWMP
NGPC Section 3.a	C	Harbors' Construction Site Runoff Control Program is contained in this SWMP.	☑
CD 15.c.i	CSRCP Section 5	Harbors will conduct training of staff and consultants whose primary job duties are related to implementing the CSRCP.	☑
CD 17	C	Harbors will implement the CSRCP.	☑
CD 17.a	CSRCP Section 8	The use of the *City and County of Honolulu Stormwater BMP Manual for Construction* is required for all construction sites and paving projects.	☑
CD 17.a.i	A.2.4	The Harbors website lists the above BMP Field Manual, the Construction Plan Review Checklist, construction specifications, and permit applications for connection and/or discharge.	☑
CD 17.a.ii	CSRCP Section 8	All construction sites on Harbors property are required to comply with the above BMP Field Manual.	☑
CD 17.b.i	CSRCP Section 3.4, 4.4	Inspections and enforcement actions for all active construction sites are kept in an electronic database. The database will be compatible with the Asset Management System (AMS), to be developed.	☑
CD 17.b.ii	A.1.5	A full-time position has been assigned whose duties include inspection erosion and sediment control.	☑
CD 17.b.iii	A.1.5	HAR-EE will reorganize and seek funding for an additional full-time position, as well as utilize a professional consultant service.	☑
CD 17.b.iv	CSRCP Sections 3, 4	The position designated to inspect erosion and sediment controls will review BMPs and Harbors will inspect every construction site per the CSRCP.	☑
CD 17.b.v	CSRCP Section 7, ERP	Harbors will undertake enforcement actions per the ERP.	☑

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2.5 POST-CONSTRUCTION STORMWATER MANAGEMENT PROGRAM

Post-Construction BMPs address stormwater runoff after construction activities have concluded and the project improvements have been accepted. Harbors has developed a *Post-Construction Stormwater Management in New Development and Redevelopment (Post-Construction Program) Manual* for use by staff tasked with reviewing Harbors capital projects and tenant improvement projects, construction oversight, and ongoing inspection and maintenance of post-construction BMPs. It is also available for reference purposes by the development community including engineers and architects tasked with creating and submitting construction plans for approval. The program manual is included in Section D and is summarized in this section. This program is intended to be complementary to the Harbors CSRCP (see Section C).

New development and redevelopment projects that result in a land disturbance of one acre or more are considered regulated projects and are subject to this program. All regulated projects must implement post-construction BMPs unless the project is exempted because it poses minimal risk of stormwater pollution including but not limited to:

- ✓ Maintenance activities such as top-layer grinding, repaving (where all pavement is not removed) and reconfiguring surface parking lots;
- ✓ Reroofing;
- ✓ Interior remodeling and improvement;
- ✓ Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility;
- ✓ Trenching and resurfacing associated with utility work;
- ✓ Replacement of damaged pavement; and
- ✓ Emergency construction activities required to immediately protect public health and safety.

Harbors' oversight of regulated projects is divided into two major categories: Harbors capital projects and tenant improvement projects. Each of these categories is managed through a process of design, construction inspections, long-term maintenance, and enforcement. Although the process is similar, the specific procedures and responsible parties vary between programs.

2.5.1 Training

Appropriate Harbors staff whose job duties are related to implementing post-construction BMPs will be trained to have a clear understanding of their responsibilities. The post-construction BMPs training will consist of overall program goals and implementation.

2.5.2 Retrofit Study of Construction Projects

A retrofit study will be performed on new development and redevelopment projects that have been constructed or for which grading or land disturbance permits have been issued since May 19, 2003. The scope of the study will be reviewed and approved by the EPA and HDOH. The scope will detail a ranking system for evaluating potential retrofits which will include things such as water quality improvements, suitability, economic value, and cost. The scope will be submitted to the USEPA and HDOH within 270 days of entry of the CD. Harbors will conduct

the post-construction BMP retrofit study within 240 days of USEPA and HDOH approval of the scope.

No later than four years after USEPA approval of the final feasibility study, Harbors will start the construction of retrofits of the three highest ranked projects. Any potential for delays beyond Harbors control will be reported to USEPA and HDOH with a revised schedule.

BMP Table 2-5 Post-Construction Stormwater Management Program

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Harbors will manage all non-exempt Harbors capital projects that disturb one acre or more of land for compliance with the Post-Construction Stormwater Management Program.	CD 18.a.i SWMP E - Post-Construction Program Manual Section 5.4	Retrofit Feasibility Study has been completed to include project since May 19, 2003.	100% of applicable projects	February 3, 2015; then ongoing	HAR-E; HAR-EE	ACR; Post-Construct-ion Project Database
	CD 18.b.i	Percentage of non-exempt projects reviewed in design phase for necessary BMPs using the *Post-Construction BMP Plan Checklist.*	100% of projects	Ongoing	All sections of HAR-E	ACR
	CD 18.f.i	Number of projects for which O&M Plans have been reviewed.	100% of projects	Ongoing	HAR-EE	ACR
	CD 18.e SWMP E - Post-Construction Program Manual Sections 1.1, 5.4	Percentage of Post-Construction BMP inspections records entered in a database in a format compatible with GIS.	100% of inspection records entered into database	Ongoing	HAR-E; HAR-EE	ACR

BMP Table 2-5 Post-Construction Stormwater Management Program (Cont.)

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Harbors will manage all tenant improvement projects for compliance with the Post-Construction Stormwater Management Program.	CD 18.b.i	Number of non-exempt tenant projects reviewed in design phase for necessary BMPs using the *Post-Construction BMP Plan Checklist.*	100% of applications	Annually	HAR-E; HAR-EE	ACR
	CD 18.f.ii	Percentage of tenant facilities with permanent BMPs that have an updated revocable permit or lease language requiring an operation and maintenance plan.	As required	Annually	HAR-EE, HAR-PM	ACR
	CD 18.f.ii	Percentage of projects for which required annual Post-Construction BMP inspections were conducted by tenants and reported to Harbors.	100% of required projects	Annually	HAR-EE, HAR-PM	ACR
	CD 18.d, CD 18.g.i	Percentage of Post-Construction BMP inspections conducted by Harbors, including those conducted during regular tenant inspections.	As required	Annually	HAR-EE	ACR

BMP Table 2-5 Post-Construction Stormwater Management Program (Cont.)

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Ensure illicit discharges from improperly managed Post-Construction BMPs are mitigated by inspection and enforcement.	CD 18.g.ii	Percentage of enforcement actions recorded in project database.	100%	Annually	HAR-EE	ACR
Provide training and resources for Harbors employees, consultants, and contractors regarding Post-Construction BMPs.	CD 15.d.i SWMP E - Post-Construction Program Manual Section 7	Percentage of personnel whose primary job duties are related to implementing the Post-Construction BMP program have received training.	100%	Ongoing	HAR-E; HAR-EE	ACR
Evaluate the feasibility of retrofitting all projects on the inventory with adequate Post-Construction BMPs.	CD 18.a.iii SWMP 2.5.1	Percent of projects on Retrofit Study inventory evaluated.	100%	270 days after CD entry	HAR-EE	ACR
	CD 18.a.iv SWMP 2.5.1	Number of top ranked projects in Retrofit Study inventory having started construction.	3	Four years after USEPA approval of final feasibility study.	HAR-E	ACR

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Table 2-5 Post-Construction Stormwater Management Compliance Checklist

Requirement	Relevant SWMP Section	Remarks	Requirement Included in SWMP
NGPC Section 3.a	D	Harbors' Post-Construction Storm Water Management in New Development and Redevelopment Program is contained in this SWMP.	☑
CD 15.d.i	Post-Construction Program Manual Section 7	Harbors will provide training to all staff whose primary job duties are related to implementing the Post-Construction Stormwater Management Program.	☑
CD 18.a.i	Post-Construction Program Manual Section 5.4	Harbors has created an inventory of New Development and Redevelopment Projects that have been constructed.	☑
CD 18.a.ii	Post-Construction Program Manual Section 5.4	The inventory will include the attributes listed in the CD.	☑
CD 18.a.iii	A.2.5.2	The plan for retrofitting all projects on the inventory with Post-Construction BMPs is included in the SWMP.	☑
CD 18.a.iv	A.2.5.2	The plan for starting construction on the three highest ranked Post-Construction BMP retrofits is included in the SWMP.	☑
CD 18.b.i	Post-Construction Program Manual	Harbors now requires all New Development and Redevelopment Projects to comply with the Post-Construction Stormwater Management Plan.	☑
CD 18.c	Post-Construction Program Manual	Harbors has adopted new BMP Standards and Technical Specifications.	☑
CD 18.d	Post-Construction Program Manual	Harbors will conduct inspections for future New Development and Redevelopment Projects.	☑
CD 18.e	Post-Construction Program Manual	A tracking database compatible with GIS has been implemented.	☑

Table 2-5 Post-Construction Stormwater Management Compliance Checklist (Cont.)

Requirement	Relevant SWMP Section	Remarks	Requirement Included in SWMP
CD 18.f.i	Post-Construction Program Manual	Harbors verifies that New Development and Redevelopment projects have an Operations & Maintenance (O&M) Plan, monitoring plan where applicable, and a process for verification of ongoing maintenance of installed controls.	☑
CD 18.f.ii	Post-Construction Program Manual	Written conditions are placed in the TRPs or lease agreements upon renewal, which require Tenants to assume responsibility for the implementation of the O&M Plan, including an annual inspection.	☑
CD 18.g.i	Post-Construction Program Manual	Harbors conducts an annual inspection of all Post-Construction BMP measures to determine if controls and BMPs are in place, working properly, and if the O&M plan has been successfully implemented.	☑
CD 18.g.ii	Post-Construction Program Manual	Harbors undertakes enforcement action in accordance with the ERP, as appropriate.	☑

2.6 POLLUTION PREVENTION AND GOOD HOUSEKEEPING PROGRAM

Harbors' Pollution Prevention and Good Housekeeping Program includes a Storm Sewer Operation & Maintenance (SSS O&M) Program, general maintenance and housekeeping practices, and reviews and on-site inspections of wash areas, dry wells, and infiltration sinks. Harbors employees are trained in these areas in order to minimize the generation of potential pollutants that could impact water quality. The Pollution Prevention and Good Housekeeping Program is included in Section E.

2.6.1 Maintenance and Housekeeping

Maintenance activities at Harbors facilities include emptying and maintaining dumpsters, removing and disposing of discarded objects, machinery or equipment, repair of public facilities, using fertilizer and herbicide in a responsible manner, and cleaning of stains, spills, and oil spots.

An essential task of Harbors maintenance is sweeping common areas and select tenant facilities. Pollutants on the streets are prevented from entering the storm sewer by regular sweeping, performed by HAR-OM.

Waste from drop off areas, illegal dumping, and sweeping activities are disposed of with the appropriate waste contractors. The destination of each type of waste will be reported in the ACR.

2.6.2 Review and Inspection of Wash Areas, Dry Wells, and Infiltration Sinks

Washing activities are crucial to the business operations of some tenants. Washing practices that are improperly performed generate illicit discharges and are prohibited. Harbors requires tenants to formally submit applications to perform permitted washing activities so that Harbors can determine whether or not the washing operation should be authorized. Authorization may be provided in a formal letter of approval once certain conditions are met.

Similarly, dry wells and sinks have the potential to allow pollutants onto the ground surface, which can potentially migrate into the nearest storm drain during the next rain event. Tenants will be prohibited from using unapproved sinks until Harbors verifies that the sinks do not create a potential hazard to receiving waters. Harbors may issue a formal letter of approval once certain conditions are met.

2.6.3 Training

Tenants will be educated regarding pollution prevention and good housekeeping practices at the Annual Tenant Stormwater Awareness Training. Harbors will provide information to all employees about its stormwater pollution prevention program on an annual basis. In addition, Harbors will provide annual IDDE and awareness training to employees including Marine Cargo Specialists and Grounds Supervisors. Slides depicting examples of proper and improper BMPs will be presented to illustrate acceptable procedures.

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BMP Table 2-6 Pollution Prevention and Good Housekeeping

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Ensure the small MS4 conveys water to the harbor without obstructions or adding pollutants by performing initial and recurring cleaning.	CD 20	Percentage accessible features specified by SSS O&M Plan that were cleaned.	100%	Annually	HAR-O	ACR
	CD 20.c	Percentage of feature inspections recorded in database.	100%	Annually	HAR-O, HAR-EE	ACR
	CD 20.d.i	Percentage of hot spots identified for which BMPs were implemented or modified.	100%	Ongoing	HAR-O; HAR-EE	ACR
Require tenant at KBPH to develop and implement a sweeping schedule for routine cleaning of rail tracks.	CD 20.d.ii	Sweeping schedule received.	Yes	As required	HAR-O, Tenants	ACR
Designate appropriate drainage system maintenance and perform maintenance according to inspection results.	CD 20.d	Percentage of drainage features that have been cleaned.	100%	Every 5 years after initial cleaning	HAR-O	ACR
Review applications for vehicle wash areas for stormwater concerns.	SWMP E.3.1	Percentage of washing activities found that have submitted applications for approval.	100%	Ongoing	HAR-EE	ACR

BMP Table 2-6 Pollution Prevention and Good Housekeeping

Activity	Reference	Evaluation Metric	Milestones	Due Date	Responsible Party	Output
Review applications for dry wells and infiltration sinks.	SWMP E.3.2	Percentage of submitted applications for dry wells and sinks that were reviewed.	100%	Ongoing	HAR-EE	ACR
Provide general instructions for Pollution Prevention and Housekeeping to tenants.	SWMP A.3.2	Percentage of tenants to which educational materials have been provided.	100%	Ongoing	HAR-EE	ACR
Provide Training to Employees on Pollution Prevention and Housekeeping Practices.	SWMP B.6.1	Percentage of employees to whom training has been provided.	100%	Annually	HAR-EE	ACR

Table 2-6 Pollution Prevention and Good Housekeeping Compliance Checklist

Requirement	Relevant SWMP Section	Remarks	Requirement Included in SWMP
NGPC Section 3.a	E	Harbors' Pollution Prevention and Good Housekeeping is contained in this SWMP.	☑
CD 20	SSS O&M Plan	Harbors submitted the SSS O&M Plan within 30 days of CD entry.	☑
CD 20.a	SSS O&M Plan Appendix 1	Harbors will create and submit a comprehensive storm sewer system map that identifies all Harbors assets. The map and the associated GIS will provide foundation data for the AMS.	☑
CD 20.b	A.2.7	The AMS will be fully implemented by December 31, 2015 or within 180 days of completion of the Storm Sewer System Mapping.	☑
CD 20.c	SSS O&M Plan	Harbors will conduct physical inspections of the storm sewer systems and areas where Harbor Property discharges directly into the harbors or their tributaries and are at risk for flooding.	☑
CD 20.d	SSS O&M Plan	The SSS O&M Plan will include a cleaning schedule for the storm sewer systems.	☑
CD 20.d.i	SSS O&M Plan	Harbors will specify hot spots in the cleaning schedule and implement appropriate BMPs, including more frequent cleaning and maintenance.	☑
CD 20.d.ii	SSS O&M Plan	Harbors requires the tenant to develop and implement a schedule for routine cleaning of rail tracks at KBPH.	☑

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2.7 ASSET MANAGEMENT SYSTEM

With the assistance of the US Maritime Administration (MARAD) and the US Army Corps of Engineers (USACE), Harbors is currently in the process of developing an AMS that will be integrated with its GIS. When completed (anticipated in early 2016), the AMS will not only have access to a complete inventory of the stormwater infrastructure features, but will also have capabilities to schedule recurring inspections, cleaning activities, other maintenance, as well as assist with MS4 project planning, design and construction. The AMS will generate and track work orders for inspection, cleaning, and other maintenance and assist Harbors with the execution and prioritization of capital improvement projects.

2.8 SWMP REVISIONS

As required by the NGPCs, the SWMP will be revised if any discharge limitation or water quality standards established in HAR, Section 11-54-04 for marine waters are exceeded. The revisions shall include BMPs and/or other measures to reduce the amount of pollutants found to be in exceedance from entering State waters.

Furthermore, in accordance with paragraph 13 of the CD, a qualitative assessment of the SWMP will be included in the first ACR due after November 5, 2014.

2.9 ANNUAL COMPLIANCE REPORT AND EFFECTIVENESS EVALUATION

HAR Chapter 11-55 Appendix K Part 9(a) requires the submittal of an annual compliance report to HDOH by January 28th of the following year. The ACR will include:

- ✓ Status of compliance with conditions of both Honolulu Harbor and KBPH permits;
- ✓ Assessment of the SWMP, including progress towards implementing each minimum control measure;
- ✓ Modifications made to the SWMP and implementation schedule during that calendar year, including justification;
- ✓ Summary of the stormwater activities planned to be undertaken during the next calendar year; and
- ✓ Major modifications made to the small MS4, including, but not limited to, addition and removal of outfalls, drainage lines, and treatment facilities.

All reports submitted will be signed by a Responsible Officer of HDOT and shall include the following statement:

> *"I certify under penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that this document and its attachments were prepared either by me personally or under my direction or supervision in a manner designed to ensure that qualified and knowledgeable personnel properly gather and present the information contained therein. I further certify, based on my personal knowledge or on my inquiry of those individuals immediately responsible for obtaining the information, that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the*

possibility of fines and imprisonment for knowingly and willfully submitting a materially false statement."

A qualitative assessment of the SWMP will be included in the first ACR due after November 5, 2014 that will include:

- ✓ Whether implementation timelines have been met;
- ✓ Whether metrics tracked by Harbors are effective in measuring specific activities;
- ✓ Whether specific activities have been effective in reducing the discharge of pollutants from the small MS4s;
- ✓ Water quality monitoring data, where available, or where not available, an evaluation of the need for water quality monitoring in determining SWMP effectiveness; and
- ✓ A budget broken down by major components of the SWMP.

The ACR will also include a discussion of changes to the SWMP to incorporate new activities, modify existing activities, or reflect changes to the small MS4s.

3.0 PUBLIC EDUCATION AND OUTREACH PROGRAM

3.1 GENERAL PUBLIC EDUCATION AND OUTREACH

Public education aims to create awareness and prompt behavioral changes in the community. Equipped with information, the public will be less likely to contribute to water pollution as they will be able to make informed choices. Educating the public with this knowledge and contact information for appropriate authorities will increase the likelihood that a violation or accidental release will be reported. The responsibility for tenant and public education of users of the small MS4 falls under HAR-EE. This section describes the activities Harbors will pursue to educate the public about stormwater compliance.

Harbors has identified the Honolulu Star-Advertiser, web-based media, and volunteer activities as three forms of disseminating stormwater awareness information to tenants and the public. Other options for dissemination include workshops, public presentations, brochures, trade shows, expos, advertisements through various media, volunteer opportunities, and multi-agency events.

3.1.1 Stormwater Awareness Message

Harbors has developed the message, *Malama i ke kai – Protect our Harbor Waters,* which conveys the importance of stormwater awareness. The message promotes responsible environmental behavior in order to protect the harbors for *our own use, for the local economy, and to protect the environment*. Harbors will integrate and promote this awareness by prominently displaying this message on all printed and electronic communication with tenants, staff, and the public during training.

3.1.2 Public Awareness Ads through a Local Newspaper

An annual public awareness advertisement will be posted in the local newspaper, the *Honolulu Star-Advertiser*, or other newspaper/magazine to educate the general public on stormwater pollution control. The message will be focused on a topic that Harbors has identified as one that requires further dissemination. In the past, Harbors has advertised statistics gathered from a volunteer cleanup activity at Honolulu Harbor.

The advertisement will also describe Harbors' efforts to protect and improve stormwater quality, to work with other agencies, volunteers, and community organizations regarding stormwater awareness, and contact numbers for the public to report stormwater problems. The advertisement will prominently display Harbors' stormwater awareness message.

3.1.3 Public Awareness through Social Media

Social media is an instantaneous method of disseminating information that is increasingly growing in use and popularity. Harbors will use its web-based media account(s) to post stormwater awareness information or solicit volunteers from the community for volunteer activities.

3.1.4 Volunteer Activities

Outreach efforts will focus on recruiting Harbors tenants and general public as volunteers to foster a sense of responsibility towards Honolulu Harbor and KBPH. In the past, Harbors has participated in an annual trash pick-up and stenciling event called the *Great American Cleanup*. As part of this activity, valuable data were collected about the origins and type of trash picked up during the activity, which was used in the public awareness advertisement described in Section A.3.1.2. Other upcoming activities include *Get the Drift and Bag It!* and a tenant-lead *Adopt-A-Harbor* program. Harbors will continue to participate in at least one of these or a similar activity annually.

3.1.5 Stormwater Hotline

Harbors has maintained a hotline for stormwater information and discharge reporting since October 22, 2009. The hotline is reachable by dialing (808)-587-1962, a direct line to HAR-EE. HAR-EE will maintain records of calls, follow-up inspection dates and findings, enforcement actions taken, and resolutions using the HAR-EE SHOT Form. A blank copy of this form is included in the TIM (Section B). SHOT form entries are compiled into a SHOT Database, which is maintained at the HAR-EE office. The public may also call the Traffic Control Unit (808-587-2076), which is reachable 24 hours a day, 7 days a week.

3.1.6 Harbors Division Website

The Harbors stormwater website provides information about water quality issues, emergency reporting numbers, and links to useful sections of the USEPA website. The website will be reachable via a prominent link on the HDOT, HDOT Airports, and HDOT Highways websites. The website will include at least:

- ✓ Links to its National Pollutant Discharge and Elimination System (NPDES) permits and the final Consent Decree;
- ✓ This SWMP;
- ✓ Contact information for public comments on the SWMP,
- ✓ ACRs;
- ✓ Staff;
- ✓ Tenant stormwater training materials;
- ✓ Inspection forms and risk ranking criteria;
- ✓ Vehicle and equipment wash applications;
- ✓ BMP fliers and other BMP resources appropriate for various types of tenants, including minimum BMPs;
- ✓ Spill prevention control and countermeasures guidance;
- ✓ Contacts for reporting stormwater violations to Harbors, HDOH, and USEPA;
- ✓ Tenant recognition award information; and
- ✓ USEPA's and the CCH stormwater websites.

The website prominently displays Harbors' stormwater awareness message. The website can be accessed at http://hidot.hawaii.gov/harbors/library/storm-water-management/. Harbors will track the number of visits to the website to measure its effectiveness in disseminating information.

3.1.7 Signage and Stenciling

Harbors will install signs that prohibit dumping or discarding pollutants at no less than 50 suitable locations on Harbor property. Suitable areas include visible public locations, high traffic tenant areas or areas with a history of illicit discharges, and locations at wharfs and piers. The future signs will also include information about illicit discharges, the Harbors stormwater awareness message, and the stormwater hotline for reporting stormwater issues. The selected locations are shown on the Figures in Attachment 1.

Harbors will stencil or label all inlets and open channels on Honolulu Harbor and KBPH to promote stormwater awareness and reduce non-stormwater discharges into harbor waters by February 3, 2015. Three types of labels will be available for installation depending on the surface conditions: aluminum stencils will be used to paint rough surfaces, duracast hi-visibility placards will be installed on curbs in public areas, and metal medallions will be installed on grates or where the first two stencil types are not feasible. Harbors will track the locations of existing and newly installed stencils/signage using GIS geodatabase software. The installation of signage and stenciling is a preventive approach to mitigating pollution; however, if areas are identified with frequent public dumping, installation at additional locations will be considered.

Harbors will inspect the legibility of the stencil or label nearest each inlet prior to the wet season every year, recording all inlets with illegible stencils and re-stenciling or re-labeling the inlet 60 days after inspection.

3.2 TENANT EDUCATION AND OUTREACH

Harbors requires tenants to reduce pollution in stormwater discharges and effectively prohibit unauthorized non-stormwater discharges into the small MS4s through its tenant lease agreements and TRP, which are located in the TIM.

3.2.1 New Tenants

All new tenant leases and TRPs will reference or include the minimum BMPs (Section A.3.2.3) and require their implementation and maintenance. New tenants will be provided with a New Tenant Information Package, contained within the TIM to ensure that they are aware of the stormwater requirements in the tenant lease agreements and TRPs, apply required BMPs based on activities at the site, and understand how to identify and report illicit discharges. The New Tenant Information Package will include the stormwater awareness message, information on minimum BMPs, and educational materials describing the responsibilities of the Tenant and resources for obtaining additional information regarding stormwater pollution.

3.2.2 Enhanced Tenant Inventory

An electronic inventory of tenants at Honolulu Harbor and KBPH is kept on file at HAR-EE and will be continuously updated to include all tenants at Honolulu Harbor and KBPH. A listing of current tenants at the Honolulu Harbor and KBPH and their facility locations will be provided in the ACR.

The tenant inventory will contain information required in the TIM and will be continually updated and be compatible with GIS. Personnel identified in the inventory will be deemed responsible for implementation of stormwater protection measures and BMP requirements at their facility.

3.2.3 Distribution of Educational Materials and Minimum BMPs to Tenants

Harbors has been distributing educational materials and notifications for tenant training since 2009 through mail as a proactive measure to mitigate tenant activities that cause pollution. Harbors will update educational materials as problem areas are identified. Educational materials will be distributed at least twice per year to tenants by mail, at the Annual Tenant Stormwater Awareness Training, or during tenant inspections. The materials will include:

- ✓ A brief description of responsibilities of the Harbor Tenants regarding stormwater pollution prevention;
- ✓ A fact sheet and/or brochures describing Harbors endorsed minimum BMPs;
- ✓ Where applicable, a description of where lease, TRP, tariff and/or wharfage provisions related to stormwater management can be found;
- ✓ The purpose, scope, and potential ramifications of Harbors recurring inspections and the availability of the TIM for tenant review;
- ✓ A concise a readily understandable definition of illicit discharges as well as procedures for reporting illicit discharges via the Harbors stormwater hotline; and
- ✓ Resources for obtaining additional information regarding stormwater pollution prevention.

Below is a comprehensive list of minimum BMPs for common tenant activities that Harbors has developed, which are available on the Harbors website and in the TIM.

Tenant Minimum BMPS:

- ✓ Vehicle and Equipment Washing;
- ✓ Vehicle and Equipment Fueling;
- ✓ Material Storage;
- ✓ Common Businesses;
- ✓ Solid and Hazardous Waste Management;
- ✓ Material Delivery and Handling;
- ✓ Building and Remodeling;
- ✓ Vehicle/Vessel Maintenance Activities;
- ✓ Building Power Washing;
- ✓ Sidewalk and Walkway Power Washing; and
- ✓ Storm Drain Inlet Protection.

3.2.4 Annual Tenant Stormwater Awareness Training

Harbors will hold tenant stormwater awareness trainings annually. Harbors will track whether or not tenants attend and will use its best effort to ensure that at least 80% of tenants attend this training. Failure to attend training will impact a Tenant's risk ranking. This annual training will include a discussion on issues related to stormwater pollution awareness including regulatory background, NPDES program requirements, general permit allowable discharges, IDDE program, construction site run-off control, post construction run-off control, stormwater drainage system protection, fueling activities, waste management, spill prevention and response, recommended BMPs, common sources of stormwater pollution, common operations causing potential illicit discharges, pollution prevention and good housekeeping, tenant inspections, ERP, and other environmental compliance measures applicable to Harbors. Attendee feedback will continue to be received through a training evaluation form provided to all attendees.

A questionnaire will be used to assess tenant knowledge regarding stormwater awareness. The questionnaire will be mailed to all tenants and distributed at tenant training events. The questionnaire is included in Attachment 2. The results of the questionnaire will be provided in the ACR.

The presentation, tenant attendance record, and the results of both the completed questionnaire and the training evaluation will be recorded and included in the ACR. Harbors will evaluate the effectiveness of the training, as well as the overall tenant outreach effort, and make improvements including revisions to the presentation to reinforce subject areas that are not well understood by tenants.

Since 2011, Harbors has set up a Tenant Environmental Manager of the Year (TEMY) award program to recognize the tenant environmental manager who has implemented exemplary environmental and safety practices, and fosters an exceptional company environmental culture. The award provides positive incentive for tenant environmental managers to create positive change within their organizations. Not only does it create positive reinforcement for the organization and individual receiving the award, it demonstrates to the remaining tenants that positive change is achievable and provides concrete examples of solutions that are realistic and affordable for other tenants to reference. The award is presented with a letter that is signed by the Governor of the State of Hawaii. The criteria used to assess potential TEMY award recipients are provided in the list below:

- ✓ Did the tenant manager or representative attend the stormwater training?
- ✓ Did the tenant manager or representative respond quickly to identified deficiencies from the inspection report?
- ✓ Did deficiencies return upon follow up inspection?
- ✓ Did the tenant manager or representative implement additional BMPs above and beyond what was required?
- ✓ Did the tenant manager or representative have all the necessary permits onsite for review during the inspection and were they current?
- ✓ Was the tenant manager or representative easy to work with and courteous during the inspections?

- ✓ Does the tenant manager or representative have sufficient influence and budget to implement changes?
- ✓ Does the tenant environmental manager or representative provide Storm Water Awareness or Environmental Training for all employees (i.e. Review BMP Fliers)?
- ✓ Has the tenant manager or representative taken steps to reduce the environmental risk of the activities of the company?

3.2.5 Outreach through Tenant Inspection Program

The TIP was developed as a component within the Harbors' environmental program designed to eliminate polluted discharges to its small MS4s and State waters from Harbors tenants. It is one of three parts of the greater IDDE program (further discussed in Section B). The TIM is for use by HAR-EE and others associated with the TIP and contains training requirements and field implementation and enforcement procedures for Harbors staff. The inspection program, in place since 2009 as part of the IDDE program, will continue to be yet another opportunity to provide outreach to tenants. Outreach efforts during inspections include:

- ✓ Ensuring that tenants are aware of their environmental responsibilities;
- ✓ Providing outreach materials such as informational sheets, BMP fliers, schedules of upcoming training to tenants;
- ✓ Gathering data to be used to update outreach materials; and
- ✓ Provide immediate feedback to tenants regarding successful BMPs and BMPs that should be implemented.

The most up-to-date risk designation of each tenant determines the frequency of routine tenant inspections. Detailed information is provided in Section 4.3 of the TIM. Harbors will respond to violations observed during these inspections in accordance with the Enforcement section of the TIM.

3.3 VESSEL OPERATORS EDUCATIONAL PROGRAM

Harbors tenants owning or operating vessels may be subject to requirements of the VGP and sVGP regulated by the USEPA. In addition, any vessel maintenance, repair, washing, and fueling activities must be conducted following USCG regulations. Harbors' outreach efforts are focused toward vessel operations conducted on land.

MCSs monitor loading and unloading procedures for the major vessels in the Harbor. Their duties include tracking compliance with various aspects of the process including stormwater pollution control compliance.

3.3.1 Distribution of Educational Materials to Vessel Operators

Information sheets describing recommended BMPs for vessel operators have been developed. The *BMP for Small Vessel Maintenance Activities* information sheet is available on the Harbors website and is distributed to vessel agents and owners when they receive hot work permits.

4.0 PUBLIC INVOLVEMENT/PARTICIPATION

Public participation is intended to raise public consciousness of water quality issues, to create a sense of responsibility for water quality, and to lessen the likelihood that members of the public will commit actions that may lead to water quality degradation.

Public awareness of stormwater quality issues is targeted to solicit comment by informed members, which may lead to a better and more effective plan and implementation. Harbors has invited public involvement and participation during the previous NGPC term by posting the SWMP to the Harbors website and notifying tenants during training.

Concurrent with its submittal to HDOH and USEPA, Harbors will post the Modified SWMP for both Honolulu Harbor and KBPH on its website by February 3, 2015. Harbors will solicit public comment by advertisement in the *Honolulu Star-Advertiser*. The advertisement will include a schedule for the receipt of comments not to exceed 45 days in the advertisement. Received comments will be tracked and changes will be incorporated into the Modified SWMP as appropriate.

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5.0 REFERENCES

C&C Honolulu, 2011. Final Storm Water Best Management Practice Manual, Construction. November, 2011. http://www.cleanwaterhonolulu.com/storm/learning_center/BMP_manual_2011-11.pdf

Hawaii Revised Statutes, 11-55, Appendix K, National Pollutant Discharge Elimination System General Permit Authorizing Discharges of Storm Water and Certain Non-Storm Water Discharges from Small Municipal Separate Storm Sewer Systems.

HAR, 2012, Title 11 Department of Health, Chapter 55 Water Pollution Control. October 11, 2012.

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HRS, 2012, Section 266-25 Department of Transportation, Harbors, Violation of rules; penalty. http://www.capitol.hawaii.gov/hrscurrent/Vol05_Ch0261-0319/HRS0266/HRS_0266-0025.htm. Accessed 16 January 2015.

USEPA, 2012, National Menu of Stormwater Best Management Practices. http://water.epa.gov/polwaste/npdes/swbmp/. Accessed 16 January 2015.

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ATTACHMENT 1
SIGN LOCATIONS

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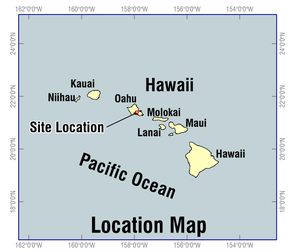

Legend

- Sign Location
- Outfall
- Drain Box
- Trash Dumpster
- Structure Footprint
- Catch Basin
- Storm Drain Piping - from onsite
- Storm Drain Piping - from offsite
- Non-HDOT Property
- Harbors TMK

N E S W

0 450 900
Feet
1 inch = 450 feet

HDOT Honolulu Harbor Suggested Sign Locations

Hawaii Department of Trasportation
Harbors Division

FIGURE
1

WESTON SOLUTIONS
841 BISHOP STREET SUITE 2301 HONOLULU, HAWAII 96813 808.585.0448

DRAWN:	DATE:	CONTRACT NO:
AD	2013-JUN	XXXXXX-XX-X-XXXX
CHKD:	CHCK DATE:	WORK ORDER NUMBER:
M. AMBLER	2013-JUN	13682.004.002.4000.00

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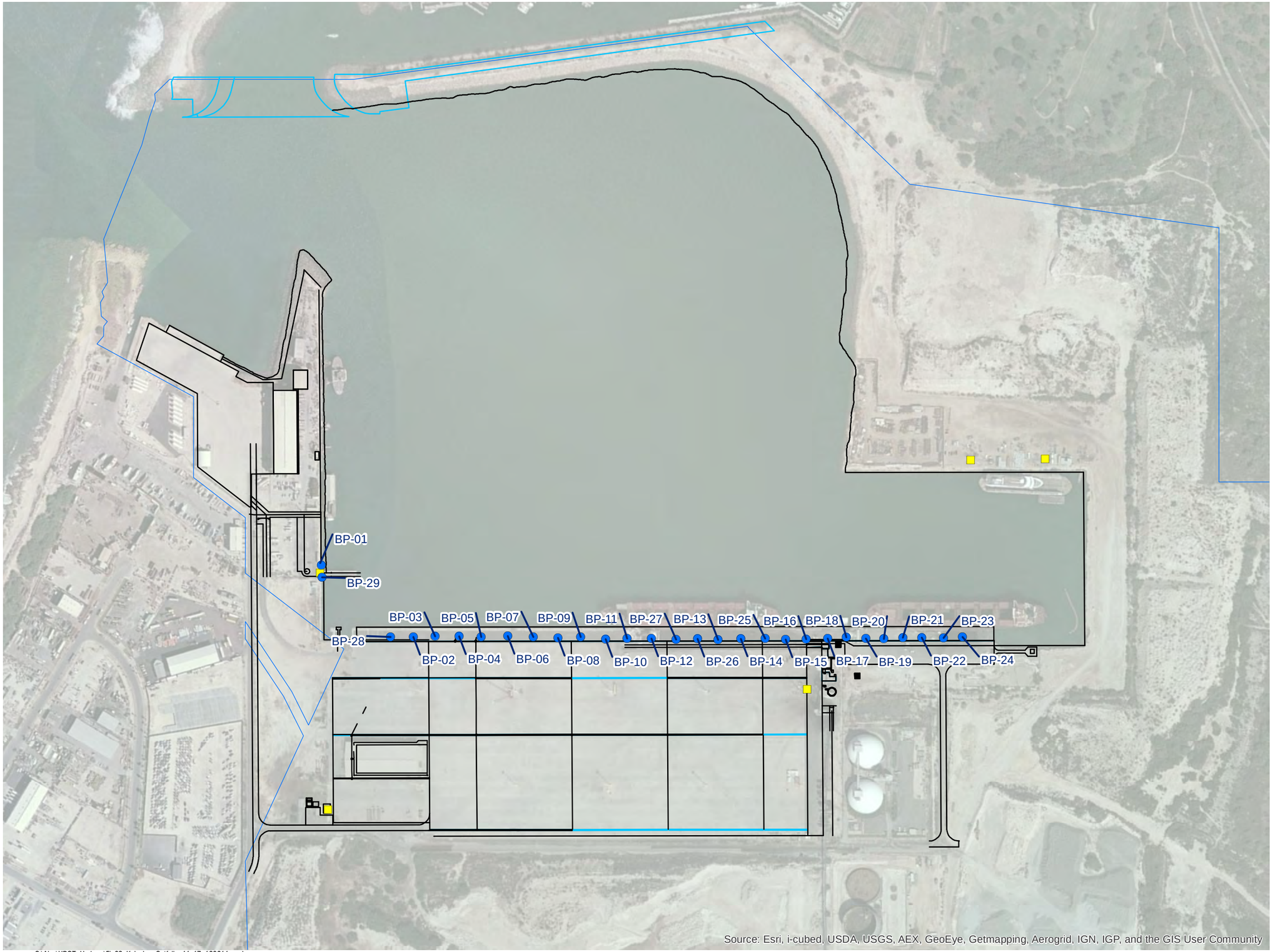

Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

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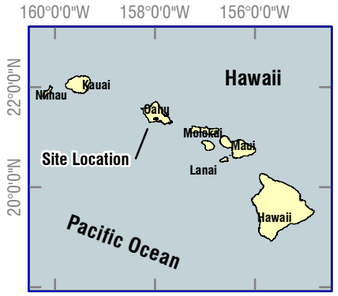

Location Map

Legend

- ORI Outfalls
- Sign Location
- Structure Footprint
- Storm Drain Piping
- Harbors TMK

0 200 400
Feet
1 inch = 400 feet

HDOT Kalaeloa Harbor Suggested Sign Locations

Hawaii Department of Transportation
Harbors Division

FIGURE 2

WESTON SOLUTIONS
841 BISHOP STREET SUITE 2301 HONOLULU, HAWAII 96813 808.275.2500

DRAWN BY:	DATE:	CONTRACT NO:
AD	2013-JUN	XXXXXX-XX-X-XXXX
CHECKED BY:	CHECKED DATE:	WORK ORDER NUMBER:
M. AMBLER	2013-JUN	13682.004.002.4000.00

ATTACHMENT 2
TENANT QUESTIONNAIRE

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2014 DOT Harbors Tenant Training Questionnaire

Name:_____ **Company:** _____ **Date:** _____

1. Where does storm water runoff go after it enters the storm drain?
   a. The wastewater treatment plant.
   b. Through the storm drain system and into the harbor without treatment.
   c. EPA's front door.
   d. None of the above.

2. Which of the following activities can generate stormwater pollutants?
   a. Fueling without spill containment.
   b. Hand washing if sink or washwater is not contained.
   c. Uncontained material storage.
   d. All of the above.

3. Which of the following are permitted to be discharged into the storm drain?
   a. Detergents and equipment wash water.
   b. Petroleum products such as oil, diesel, and gasoline.
   c. Paint.
   d. Rainwater.

4. What is the definition of an illicit discharge?
   a. A non-stormwater discharge that poses a risk to the environment.
   b. A stolen discharge.
   c. Stormwater entering the storm drain.
   d. None of the above.

5. Is the picture below an example of a GOOD Best Management Practice (BMP) for material storage?
   a. Yes.
   b. No.



6. True or False? A written consent is required from DOT Harbors to conduct washing activities at a tenant space.
   a. True.
   b. False.

7. Which of the following are good examples of BMPs for vessel maintenance activities?
   a. Washing salt off vessel exterior using clean water only.
   b. Perform maintenance while vessel is out of the water, such as in dry dock.
   c. Use a tarp or other containment device to capture drips/chips from painting or grinding operations.
   d. All of the above.

8. True or False? Every tenant should have a spill kit on-site to promptly respond to spills that may occur.
   a. True.
   b. False.

9. If construction activities are planned for a tenant space at Honolulu Harbor or Kalaeloa Harbor, what is required?
   a. Contractor may begin working with no plan review.
   b. Construction plans must be submitted to DOT Harbors in accordance with the Construction Site Runoff Control Manual.
   c. Obtain an NPDES permit from the Department of Health if the work will disturb more than one acre.
   d. B & C.

10. True or False? According to the Hawaii Revised Statutes Title 15 Chapter 266, fines of $10,000 per violation per day **CANNOT** be issued for environmental violations.
    a. True.
    b. False.

Comments:

Section B

Illicit Discharge Detection and Elimination

Stormwater Management Plan
Honolulu Harbor
and Kalaeloa Barbers Point Harbor



Prepared for:
State of Hawaii
Department of Transportation
Harbors Division

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Attachment 4 Enforcement Response Plan

Attachment 5 Employee Fact Sheet

Attachment 6 Employee Survey

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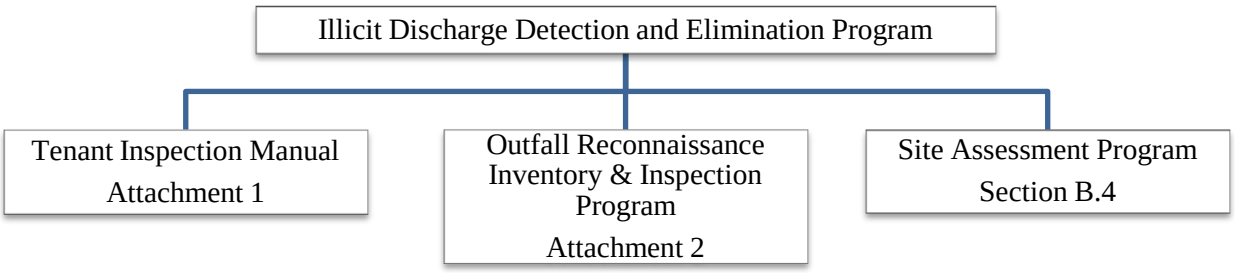
1.0 INTRODUCTION

The Harbors Illicit Discharge Detection and Elimination (IDDE) Program is comprised of three major components: the Tenant Inspection Program (TIP), the Outfall Reconnaissance Inventory and Inspection Program (ORIIP), and Site Assessment Program, which are shown in Figure 1-1. The three programs shown below are three approaches to reducing potential pollutants from entering waters at Honolulu Harbor and Kalaeloa Barbers Point Harbor (KBPH).

Figure 1-1 IDDE Program Organization



The TIP is described in the Tenant Inspection Manual (TIM), included as Attachment 1. The ORIIP is included as Attachment 2. The description of the Site Assessment Program is contained herein as Section B.4.

1.1 IMPROVED DEFINITION OF ILLICIT DISCHARGE

Harbors has created an improved definition of an illicit discharge, a list of examples of illicit discharges that are considered to be significant contributors of pollutants, and a list of conditionally authorized discharges.

For the purposes of education and outreach, an illicit discharge is defined as: *any non-stormwater discharge that poses a risk to the environment.* Examples of illicit discharges that are considered to be significant contributors of pollutants as well as those that are conditionally authorized are provided in Table 1-1.

Table 1-1 Examples of Illicit and Conditionally Authorized Discharges

Examples of Illicit Discharges	Conditionally Authorized Discharges[1]
• Fuel spills; • Leaking vehicles or equipment where a sheen is visible on the ground; • Washwater from hand washing or vehicle washing activities that is not contained; • Paint chips from sanding and grinding operations that are not contained; • Materials stored improperly outdoors; • Leaking trash bins; and • Sediment-laden water from construction activities that is not contained.	• Water line flushing; • Landscape irrigation; • Diverted stream flows; • Rising ground waters; • Uncontaminated ground water infiltration (as defined in Title 40, Code of Federal Regulations (40 CFR) 35.2005 (20)); • Uncontaminated pumped ground water; • Discharges from potable water sources and foundation drains; • Air conditioning condensate; • Irrigation water; • Springs; • Water from crawl space pumps and footing drains; • Lawn watering runoff; • Water from individual residential car washing; • Flows from riparian habitats and wetlands; • Dechlorinated swimming pool discharges • Residual street wash water; and • Discharges or flows from fire-fighting activities.

1 – Source: NGPC, NPDES, Honolulu Harbor Small MS4, Honolulu, Oahu, Hawaii, File No. HI 03KB482 and KBPH Small MS4, File No. HI 03KB488

2.0 TENANT INSPECTION PROGRAM

Harbors has developed a TIM to assist Harbors personnel tasked with the responsibility of environmental compliance. The TIM contains the policies and procedures of the TIP created for the purpose of improved allocation of environmental oversight to those areas of harbor operations where environmental impacts are highest, as well as to provide an objective assessment of tenant activities at their facilities. The TIM applies to tenants at Honolulu Harbor and KBPH. HAR-EE is responsible for the implementation of this program.

Please see Attachment 1 for the Tenant Inspection Manual.

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3.0 OUTFALL RECONNAISSANCE INVENTORY AND INSPECTION PROGRAM

The ORIIP consists of maintaining an outfall inventory and conducting dry and wet weather inspections at Harbors' stormwater discharge points as well as source tracking and elimination of potential illicit discharges. The goals of the ORIIP are to identify illicit discharges, assess Best Management Practice (BMP) performance, and assess system integrity. By tracking illicit discharges upstream, Harbors is able to track and identify any upstream BMPs needing improvement.

The results of inspections conducted as part of this program will be used to eliminate polluted discharges and to help guide future outfall monitoring and pollution prevention efforts. This program covers Honolulu Harbor and KBPH and will be overseen by HAR-EE. The program is fully described in the ORIIP. Maps of the outfalls at Honolulu Harbor and KBPH are included in Attachment 3.

Please see Attachment 2 for the Outfall Reconnaissance Inventory and Inspection Program.

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4.0 SITE ASSESSMENT

The third component of the IDDE program is Site Assessment (i.e., harbor patrol), which will be carried out by Marine Cargo Specialists (MCSs) and Harbor Police, which are part of HAR-OC. High risk areas will be inspected in accordance with the TIP or ORIIP in order to identify active or recent illicit discharges, to increase the field presence of Harbors personnel and thus deter illicit discharges, and to identify areas that would benefit from the installation of signs. If violations are identified during Site Assessments, Harbors will initiate enforcement in accordance with the appropriate enforcement process included in the ERP (see Attachment 4), as necessary.

Harbors will also provide outreach activities during Site Assessments such as distributing BMP fliers, a schedule of upcoming trainings, and other SWMP-related materials.

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5.0 ENFORCEMENT

The primary objectives of Harbors environmental enforcement program are to: ensure tenants comply with the environmental regulations, lease agreements, and/or tenant revocable permits (TRPs); correct any violation(s); and require tenants to operate their facilities in accordance with Harbors environmental policy and applicable BMPs.

The enforcement options available to Harbors range from administration actions to the issuance of citations and a district court verdict of a misdemeanor or fine.

The full scope of Harbors' enforcement program is described in the TIM, Construction manuals, and ERP. Specific enforcement actions and documentation procedures following both tenant inspections and ORIIP can be found in Section 5.0 of the TIM (Attachment 2).

Please see Attachment 4 for the Enforcement Response Plan.

5.1 MEMORANDUM OF AGREEMENT WITH HDOH

Harbors is in the process of entering into a Memorandum of Agreement (MOA) with HDOH CWB for the purpose of referring violations for escalated enforcement. The agreement details the obligations of both departments with respect to Hawaii Department of Transportation's (HDOT's) pursuit of enforcement actions for the protection of water quality within Harbors' jurisdiction. The arrangement will enable the coordinated issuance of enforcement notices against violators of water pollution laws and rules.

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6.0 EMPLOYEE TRAINING

6.1 ANNUAL EMPLOYEE STORMWATER AWARENESS TRAINING AND MAILERS

Harbors will require all Harbors employees with IDDE responsibilities (Marine Cargo Specialists, Harbor Police, and Grounds Supervisors) to attend an annual IDDE Training to give each employee a foundation for environmental responsibility. The training will contain information about Harbors' stormwater pollution prevention program, including:

- ✓ An explanation of Harbors' organizational structure including the responsibilities of Harbor employees regarding stormwater pollution prevention;
- ✓ Harbors' endorsed minimum BMPs; and
- ✓ A concise and readily understandable definition of illicit discharges, as well as procedures for reporting illicit discharges via the Harbors stormwater hotline.

Harbors will use posters, mailings, group emails or workshops to convey stormwater pollution prevention information to all Harbors employees, such as the Employee Fact Sheet (Attachment 5). Additionally, all Harbors employees will be surveyed by questionnaire to assess their knowledge regarding stormwater awareness and pollution prevention. A sample of the survey is included as Attachment 6. The results of the survey will be used to update employee training materials and future informational briefings.

6.2 TENANT INSPECTION TRAINING

All inspectors responsible for implementation of the TIP must read and be familiar with the TIM. New inspectors are required to complete no less than 24 hours of on-the-job training with experienced inspectors. Tenant inspection training materials are found in the TIM (Attachment 1) and includes:

- ✓ Types of Inspections;
- ✓ Risk rankings based on Compliance, BMP and Pollution Prevention information; and
- ✓ Tenant Environmental Asset Inventory.

6.3 ORIIP TRAINING

All personnel responsible for conducting outfall inspections will be made aware of the process and safety precautions required during the inspections through training. The training will include a pre-mobilization meeting where photos, documents, and schedules are reviewed. The pre-mobilization meeting will include:

- ✓ Procedures to be used when observing outfalls;
- ✓ Procedures to be used to track non-stormwater discharges to their source; and
- ✓ Harbors illicit discharge definition.

In addition to attending the pre-mobilization meeting, new inspectors will gain inspection experience by spending at least one work day on the job conducting outfall inspections with experienced inspectors.

Attendance at the pre-mobilization meeting will be documented using the Site Specific Health and Safety Plan signature sheet found in the ORIIP (Attachment 2). On the job training will be documented using the ORIIP Form located in the ORIIP during the outfall inspections by listing both the experienced mentor and the trainee in the "Investigators" section of the form.

ATTACHMENT 1
TENANT INSPECTION MANUAL

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Final

Harbors Tenant Inspection Manual



State of Hawaii
Department of Transportation
Harbors Division
79 South Nimitz Highway
Honolulu Hawaii 96813-5898

August 2014

Version 9.0

Final

Harbors Tenant Inspection Manual

State of Hawaii
Department of Transportation
Harbors Division
79 South Nimitz Highway
Honolulu, Hawaii 96813-4898

August 2014

Version 9.0

Record of Revision

Revision No.	Revision Date	Description	Sections Revised
1.0	November 2009	Initial Release	All
2.0	November 2012	Second Revision	All
3.0	June 2013	Third Revision	3.0, 4.0, and 5.0
4.0	July 2013	Fourth Revision	3.0, 4.0, and 5.0
5.0	December 2013	Fifth Revision	All
6.0	February 2014	Sixth Revision	2.0, 3.0, 4.0, and 5.0
7.0	April 2014	Seventh Revision	2.0 and 5.0
8.0	May 2014	Eighth Revision	2.0, 4.0, and 5.0
9.0	August 2014	Ninth Revision	1.0

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2	HDOT Harbors Rules and Regulations and Examples of Tenant Lease Agreement and Revocable Permit
3	Best Management Practices
4	Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants
5	Stormwater Hotline Occurrence Tracking Form
6	Low-Risk Tenant Reconnaissance Inspection Form
7	Suspected Illicit Discharge Reporting Form
8	List of Alternative Products for Cleaning
9	List of Major Environmental Regulations
10	Training Materials for Inspector
11	New Tenant Information Package
12	Summary of VGP Requirement on Incidental Discharges from Vessels

List of Acronyms

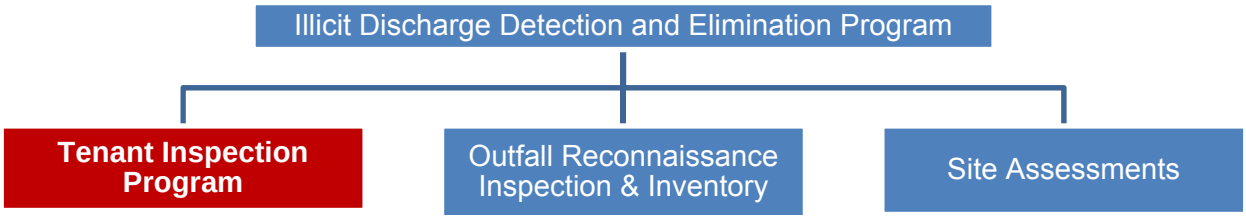
AFFF	Aqueous Film Forming Foam
AST	Aboveground Storage Tank
BMP	Best Management Practice
CCH	City and County of Honolulu
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWB	Clean Water Branch
DLNR	Department of Land and Natural Resource
ECO	Environmental Compliance Officer
EHS	Extremely Hazardous Substance
EMS	Environmental Management System
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Enforcement Response Plan
ºF	Degree of Fahrenheit
FWPCA	Federal Water Pollution Control Act
HAR	Hawaii Administrative Rules
HAZCOM	Hazard Communication
HCDA	Hawaii Community Development Authority
HDOH	State of Hawaii, Department of Health
HDOT	State of Hawaii, Department of Transportation
HEPCRA	Hawaii Emergency Planning and Community Right-to-Know Act
HERL	Hawaii Environmental Response Law
HRS	Hawaii Revised Statutes
HSERC	Hawaii Emergency Response Commission
IDDE	Illicit Discharge Detection and Elimination
LEPC	Local Emergency Planning Committees
LQG	Large Quantity Generator
MS4	Municipal Separate Storm Sewer System
MSDS	Material Safety Data Sheet
NAICS	North American Industrial Classification System
NAV	Notice of Apparent Violation
NCP	National Contingency Plan
NFVO	Notice and Finding of Violation Order
NGPC	Notice of General Permit Coverage
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRC	National Response Center
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration

OWS	Oil/Water Separator
P2	Pollution Prevention
PCB	Polycyclic Chlorinated Biphenyls
psi	pound-force per square inch
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
SCP	State Contingency Plan
SHOT	Stormwater Hotline Occurrence Tracking
SHWB	Solid and Hazardous Waste Branch
SIC	Standard Industrial Code
SPCC	Spill Prevention, Control, and Countermeasure
SQG	Small Quantity Generator
sVGP	Small Vessel General Permit
SWDA	Solid Waste Disposal Act
SWMP	Storm Water Management Plan
SWPC	Storm Water Pollution Control
TIM	Tenant Inspection Manual
TPQ	Threshold Planning Quantity
TSCA	Toxic Substance Control Act
USC	United States Code
USCG	United States Coast Guard
UST	Underground Storage Tank
VGP	Vessel General Permit

1.0 TENANT INSPECTION MANUAL

This Tenant Inspection Manual [TIM] is a component within the State of Hawaii Department of Transportation [HDOT], Harbors Division's environmental program, designed to eliminate polluted discharges to its storm drain system and State waters from Harbor's tenants. The TIM is also a part of the greater Illicit Discharge Detection and Elimination [IDDE] program implemented by HDOT Harbors Division (hereinafter referred to as "Harbors"). This manual is for Harbors personnel tasked with the responsibility of environmental compliance. As part of the TIM, Harbors has implemented a stormwater risk ranking system for all Harbors tenants that allows for improved allocation of environmental oversight to those areas of harbor operations where environmental impacts are highest, as well as to provide an objective assessment of tenant activities at their facilities.

Figure 1-1 IDDE Structure Chart



"Tenant" shall mean a person, group, partnership, corporation, or any other entity that has an executed lease, revocable permit or disposition instrument under chapter 171, Hawaii Revised Statutes [HRS] to use or occupy land, a building, structure, or other property owned by Harbors. This term also includes Harbors' approved sub-tenants and entities using container or terminal facilities.

1.1 HDOT Harbors Division Environmental Organization

Harbors environmental organization is centralized within the Engineering Branch at the Hale Awa Ku Moku Building, located at 79 South Nimitz Highway, Honolulu Hawaii 96813. The Environmental Section Supervisor reports to the Engineering Program Manager. The Engineering Program Manager reports to Deputy Director, who in turn reports to the Director of Transportation.

Harbors Environmental Section consists of one supervisor and several staff environmental health specialists and/or environmental engineers. The Environmental Section Supervisor continuously evaluates workloads and assigns new tasks based on location, technical expertise, and current workload. This management structure allows for immediate access to the Environmental Section by Harbors Districts, while maximizing utilization and therefore spreading the workload more evenly.

The Harbors TIM is overseen by the Harbors Environmental Section. This manual is for use by

the Harbors Environmental Section and others associated with the Tenant Inspection Program. One copy of *HDOT Harbors Division Administrative Organizational Chart* is enclosed in Attachment 1 with Environmental Section highlighted in green.

1.2 Applicability

Harbors implements this Tenant Inspection Program at the following harbors:

- Honolulu Harbor (Oahu District)
- Kalaeloa Barbers Point Harbor (Oahu District)

These two harbors operate under small Municipal Separate Storm Sewer System [MS4] permits. The Permit File Numbers are ***HI 03KB482*** for Honolulu Harbor and ***HI 03KB488*** for Kalaeloa Barbers Point Harbor. This program applies to all active tenants inventoried in the database as well as new tenants to-be-added to the database.

Inspection and risk ranking criteria (covered in this manual) are related to vessel operations conducted solely on-land.

1.3 Tenant Requirements

All Harbors tenant lease agreements and revocable permits include language stating that the tenant is responsible for compliance with all environmental laws and regulations. For example, tenants conducting industrial activities within their exclusive areas must seek separate National Pollutant Discharge Elimination System [NPDES] permit coverage from the State of Hawaii Department of Health [HDOH], if required. Environmental Protection Agency [EPA] regulated hazardous substances and marine pollutants are not allowed to be used, treated, stored, or disposed, unless they are incidental to normal operations of the tenant's business.

All new tenant lease agreements and revocable permits require that, prior to bringing any EPA regulated hazardous substance or chemical on site, the tenant must obtain Harbors consent. Details of the lease agreements and revocable permits are included in Attachment 2. Summaries of a list of major pertinent environmental regulations are enclosed in Attachment 9.

Failure to comply with clauses specified in the lease agreement or revocable permit may result in civil/criminal penalties or termination of the lease or revocable permit. Severe environmental violations are to be reported to HDOH, EPA or other appropriate regulatory agency for escalated enforcement.

Tenants desiring to develop improvement projects on Harbors property must obtain approval from Harbors prior to initiation of the project. The tenants are responsible for obtaining permits from appropriate regulatory agencies and for furnishing proof to Harbors before commencing with construction activities. These permits include, but are not limited to, NPDES permits,

building permits, grading permits, dredging permits, special management area [SMA] permits, permits to discharge into the State Harbors Drainage System, and permits for discharging/connection to the State Harbors Drainage System. For a project requiring an NPDES permit during construction, required BMPs should be implemented to minimize the discharge of pollutants. Harbors will inspect the tenant project BMPs on a regular basis. Violations observed during inspections will be documented, and enforcement actions will be taken following the procedures in Enforcement Response Plan [ERP] (Harbors, 2014). A comprehensive list of BMPs related to construction is documented in *Construction Site Runoff Control Program* (Harbors, 2013).

1.4 Vessel Owners Responsibility

Harbors tenants owning or operating vessel(s) are subject to requirements of the Vessel General Permit [VGP] regulated by EPA. In addition, any vessel maintenance, repair, washing, and fueling activities must be conducted following United States Coast Guard [USCG] regulations. Inspection and risk ranking criteria (covered in this manual) are related to vessel operations conducted solely on-land. Details of the pertinent VGP are included in Attachment 12.

2.0 TENANT INSPECTIONS

2.1 Overview

Harbors conducts various types of inspections of its tenants to prevent the discharge of pollutants to its storm drain system and State waters. Tenant inspection types include: **new inspections**, conducted within three months of new tenant occupancy; **routine inspections**, conducted at frequencies based on a tenant's risk ranking; **investigation inspections**, when a suspected illicit discharge is observed; **annual reconnaissance inspections**, conducted for low-risk ranked tenants; **follow-up inspections** which may be required when corrective actions must be confirmed; or **final inspections**, which are conducted prior to lease termination.

Note that tenants areas, occupying or using subsurface or submerged land (e.g., easement holders), are excluded from the TIM. To date, Harbors has inspected and risk-ranked each tenant. Each tenant has been assigned a risk designation of high, medium, or low, based on the results of the inspections and risk ranking procedures. The most up-to-date risk designation of each tenant determines the frequency of routine tenant inspections.

Harbors Environmental Section maintains a tenant database that includes information such as company name, harbor, contact information (primary and alternative if available), mailing address, email address if available, and risk ranking. In addition, the database includes other information such as tenant general information (major operations conducted at the site), inspection results (e.g., inspection dates, materials stored on site, list of potential pollution sources, etc.), risk ranking, NPDES permit number (if any), and enforcement actions (e.g., required corrective actions).

2.2 Inspection Types

2.2.1 Initial Site Inspection/New Tenant Inspection

The initial site inspection (or new tenant inspection) is conducted within three months of the new tenant occupying an existing facility, or the tenant's completion, construction, and occupancy of a newly constructed facility. The purpose of the new tenant inspection is to identify any environmental asset, initiate and assign a risk ranking, and to convey the applicable environmental regulations contained in the Harbors SWMP program for the new tenant. In addition, it can also help identify applicable BMPs for the new tenant.

This type of inspection will use *Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants* (enclosed in Attachment 4) as a primary tool. Information obtained from the inspection will be recorded in the database and a risk ranking will be properly assigned for the new tenant.

Ongoing coordination with Harbors Property Management Section enables site inspections of

new tenant operations. Notification of a new lease or revocable permit will trigger a new tenant inspection. If necessary (e.g., significant operational or exclusive use area changes occur for an existing tenant), a new tenant inspection will be conducted within three months at an existing tenant's facility when a lease or revocable permit is replaced with a new one. If a violation is observed during the inspection, HDOT will 1) document the violation in the inspection report, 2) disclose and explain the violation to the tenant and/or responsible party at the time of inspection, and 3) follow-up in accordance with the steps described in *Section 5.0 – Enforcement*, and the inspection report will be completed within 20 days.

2.2.2 Routine Tenant Inspection

Routine tenant inspections are required under Harbors storm water management program and will utilize the revised *Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants* (enclosed in Attachment 4) as a primary tool. The primary purpose of the inspection is to evaluate whether the facility causes or contributes to water pollution, how facility operations comply with Harbors storm water management program, major environmental laws, applicable BMPs, pollution prevention [P2], and relevant clauses contained within a lease agreement (or revocable permit). The tenants are inspected and evaluated based on risk ranking criteria discussed in *Section 4.3 – Risk Ranking Criteria*. Information obtained through inspection is recorded in the database. The frequency of routine tenant inspections is based on the risk ranking designation of each tenant.

Tenants with a "High Risk" designation are inspected every six months, tenants with a "Medium Risk" designation are inspected annually, and tenants with a "Low Risk" designation are inspected every five years. In the meantime, tenants with a "Low Risk" designation are subject to an annual reconnaissance inspection as described in Section 2.2.3.

Updated risk rankings for the tenants are maintained in the database (i.e. *Harbors_Tenants.mdb*) by Harbors Engineering Branch Environmental Section. The database will be updated using the information gathered on a regular basis (e.g., monthly). Some tenants may have more than one facility. It is possible that each of their facilities is on a separate inspection schedule based on their physical locations, drainage area, and risk ranking.

If a potential violation is observed during the inspection, the inspector is to issue a verbal warning on the spot and record the warning as part of the inspection report. A copy of inspection report will be provided to the tenant upon completion. If necessary, a follow-up inspection will be conducted, see Section 2.2.6.

If a violation is observed during the inspection, HDOT will 1) document the violation in the inspection report, 2) disclose and explain the violation to the tenant and/or responsible party at the time of inspection, and 3) follow-up in accordance with the steps described in *Section 5.0 – Enforcement*, and the inspection report will be completed within 20 days.

2.2.3 Reconnaissance Inspections for "Low Risk" Tenants

Tenants with "Low" risk ranking designations are subject to annual reconnaissance inspections. Reconnaissance inspections are conducted to ensure that tenants have not changed his/her activities or operations such that a new risk assessment is warranted. This type of inspection includes driving a state-marked vehicle to observe low-risk rank tenants based on their previous year's evaluation. *Low-Risk Tenant Reconnaissance Inspection Form* (enclosed in Attachment 6) will be utilized as a primary tool.

If a reconnaissance inspection identifies a substantive change to a facility's operation, size or activities, HDOT-Harbors shall conduct an inspection within 30 days of the reconnaissance inspection to determine if the facility's risk ranking needs to change.

If a violation is observed during the inspection, HDOT will 1) document the violation in the inspection report, 2) disclose and explain the violation to the tenant and/or responsible party at the time of inspection, and 3) follow-up in accordance with the steps described in *Section 5.0 – Enforcement*, and the inspection report will be completed within 20 days.

2.2.4 Final Site Inspection

Final inspections are necessary to identify potential environmental issues needing resolution prior to lease termination. This type of inspection will use *Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants* (enclosed in Attachment 4) as a primary tool. Tenants with environmental assets such as fuel tanks, maintenance areas, or hazardous materials and/or waste storage activities pose a potential risk to the environment and public, which subsequently place Harbors as the landowner in a vulnerable position. Prior to terminating leases (or revocable permits) for these tenants, past inspection records shall be reviewed.

Examples of potential environmental issues include environmental site assessments related to Underground Storage Tank [UST] closure, disposal of solid and hazardous wastes, and removal of contaminated oil. In addition, tenants can be required to conduct appropriate environmental investigations, assessments, and remediation to ascertain the presence and extent of environmental contamination resulting from their operations.

If a violation is observed during the inspection, HDOT will 1) document the violation in the inspection report, 2) disclose and explain the violation to the tenant and/or responsible party at the time of inspection, and 3) follow-up in accordance with the steps described in *Section 5.0 – Enforcement*, and the inspection report will be completed within 20 days.

2.2.5 Investigation Inspection

Whenever a pollution complaint or suspected illicit discharge regarding a tenant is observed and/or reported to Harbors, a formal investigation inspection, if necessary, will be started by the

next working day. The investigation will be documented using *Stormwater Hotline Occurrence Tracking [SHOT] Form* (enclosed in Attachment 5) by Harbors Environmental Section within seven days after the inspection. The inspector is to verify whether or not an illicit discharge has occurred. If one has occurred, the source of the pollutants is to be identified and, as applicable, a verbal and/or written warning (e.g., *Notice of Apparent Violation*) is issued to the violator. The illicit discharge must be eliminated and follow-up inspections shall be conducted as necessary.

If a violation is observed during the inspection, HDOT will 1) document the violation in the inspection report, 2) disclose and explain the violation to the tenant and/or responsible party at the time of inspection, and 3) follow-up in accordance with the steps described in *Section 5.0 – Enforcement*, and the inspection report will be completed within 20 days.

Written investigation records will be kept as part of the environmental compliance program. If the source is traced to a tenant, the tenant's risk ranking will be re-evaluated.

2.2.6 Follow-up Inspection

When an illicit discharge or (potential) violation from a tenant facility or activity is discovered, a follow-up inspection will be conducted. The follow-up inspection will be scheduled to correspond to dates outlined in the enforcement letter issued to the responsible party to ensure that proper corrective actions are taken. (See *Section 5.0 – Enforcement* for a description of the enforcement letter.) This type of inspection will be conducted utilizing the applicable sections of the *Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants* (enclosed in Attachment 4).

A follow-up inspection report will be completed within seven days after the inspection. Uncorrected violations identified in the inspection will be addressed according to the steps described in *Section 5.0 – Enforcement*.

3.0 TRAINING

Inspector, tenant, and employee training are designed to ensure that stormwater pollution prevention requirements and responsibilities are clearly shared and understood by all personnel responsible for preventing stormwater pollution at Harbors.

3.1 Harbors Inspector Training

All inspectors responsible for TIM implementation must read and be familiar with this manual. In addition, new inspectors are required to complete no less than 24 hours on-the-job training with experienced inspectors. During the inspections, the new inspectors will observe how the experienced inspectors conduct tenant inspections as well as conduct their own inspections with assistance from the experienced ones. New inspectors will continue to have frequent interactions with the experienced inspectors to discuss inspection issues as they arise. See Attachment 10 for training materials for the Inspector.

3.2 Harbors Tenant Training

Tenant Annual Storm Water Pollution Prevention Awareness Training will be provided to Harbors tenants. This annual training will discuss issues related to stormwater pollution awareness including regulatory background, NPDES program requirements, general permit allowable discharges, illicit discharge detection and elimination program, construction site run-off control, post construction run-off control, stormwater drainage system protection, fueling activities, waste management, spill prevention and response, recommended best management practices, common sources of stormwater pollution, common operations causing potential illicit discharges, low-impact development, pollution prevention and good housekeeping, tenant inspections, enforcement response program, and other environmental compliance measures applicable to Harbors.

New tenants will be provided with a *New Tenant Information Package* (enclosed in Attachment 11) along with their lease agreement and/or revocable permit so that they are aware of the environmental requirements and responsibilities prior to their tenancy with Harbors. The *New Tenant Information Package* will include educational materials describing the responsibilities of the tenant and resources for obtaining additional information regarding stormwater pollution (e.g., stormwater awareness message, information on pollution prevention and good housekeeping, etc.). This package ensures that new tenants are aware of the stormwater requirements in the tenant lease agreements and/or revocable permit, apply appropriate BMPs based on activities to be conducted on the premises, and understand how to identify and report illicit discharges.

Harbors will provide a questionnaire annually to all tenants to assess their knowledge regarding stormwater awareness and pollution prevention. Additionally, Harbors will provide tenants educational materials, at least twice per calendar year, to educate them on stormwater

awareness issues and terms and conditions of their lease or revocable permit, tariff and/or wharfage provisions related to stormwater management.

4.0 FIELD IMPLEMENTATION

Harbors Environmental Section will be responsible for overseeing, implementing, and updating the TIM. Status, results and summaries from the TIM will be reported annually in the ACR.

4.1 Inspection Basics

TIM inspections are scheduled with tenant representatives prior to the inspection date. The inspections cover the general areas of interest encompassed by the first three pages of the *Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants* (enclosed in Attachment 4). Inspectors responsible for TIM implementation are to be trained in accordance with Section 3 of this manual. Inspectors must consider allowable non-stormwater discharges, prohibited stormwater discharges, all risk ranking categories and implementation of stormwater BMPs. TIM inspection reports will be drafted within 30 days of the tenant inspection and finalized within 30 days, unless a different schedule is described in this manual.

4.2 Allowable non-Stormwater Discharges

The overall inspection objective of this Tenant Inspection Program is elimination of illicit and polluted discharges to the stormwater drainage system and State waters. However, certain non-stormwater discharges are permitted by regulations. The following non-stormwater discharges may be discharged into Harbors stormwater drainage system, provided that such discharges do not contain pollutants in amounts that will cause or contribute to a violation of an applicable water quality standard.

- Water line flushing;
- Landscape irrigation;
- Diverted stream flows;
- Rising ground waters;
- Uncontaminated ground water infiltration;
- Uncontaminated pumped ground water;
- Discharges from potable water sources and foundation drains;
- Air conditioning condensate;
- Irrigation water;
- Springs;
- Water from crawl space pumps and footing drains;
- Lawn watering runoff;
- Water from individual residential car washing;
- Flows from riparian habitats and wetlands;
- Dechlorinated swimming pool discharges;
- Residual street wash water;
- Discharges or flows from fire fighting activities.

The risk ranking is determined based on the information obtained through existing facility inventories as well as knowledge from previous tenant inspections. The risk ranking determinations are compiled into Table *Harbors Tenant Inspection Tracking List* contained in the database (i.e., *Harbors_Tenants.mdb*).

4.3 Risk Ranking Criteria

Harbors tenant facilities will be ranked as high, medium or low as determined by a cumulative score of the 14 individual risk criteria listed in this section. Harbors Environmental Section will assign individual risk scores for each of the 14 risk criteria based on visual observation, activity evaluation, discharge potential to Harbors storm drain system and nation's waters nearby, and applicability of necessary BMPs. Based on the observations and activity evaluation, Environmental Section will assign an evaluation score from zero to five in each category with the exception of one category (related to training attendance records) which ranges from negative two to four. Certain individual criteria include a trigger for automatic designation of high risk ranking, regardless of the cumulative score. Description of each risk criteria is discussed in this section. Risk rankings are defined as follows:

- **Low**: Score of 5 or less (inspected every five years and subject to annual reconnaissance inspection)
- **Medium**: Score from 6 through 16 (inspected annually)
- **High**: Score more than 16 or a 5 in certain individual criteria (inspected semiannually)

Subsequent confirmation or reclassification of the risk ranking will be conducted as part of the routine and reconnaissance inspections. Following inspections, Harbors environmental inspectors will re-evaluate each tenant based on the ranking criteria, determine if the current risk ranking classification is adequate, and make changes if warranted.

4.3.1 Vessel Maintenance and Repair (VM)

Tenant facilities are ranked based on the vessel maintenance and repair activities. Vessel maintenance and repair activities include parts replacement, washing, removing and/or replacement of fluids and greases, dismantling, sandblasting, sanding, and painting.

0 Neither maintenance nor repair activities are conducted on-site.

1 Maintenance and repair activities on any size vessel are conducted entirely indoors (with proper dust control BMPs), with no or minimal potential for discharge of pollutants.

2 Minor maintenance and repair for small vessels is conducted (with proper dust control BMPs) with minimal potential for discharge of pollutants.

3 Maintenance activities on large vessels are conducted outdoors and out of the water (with proper dust control BMPs), with minimal potential for discharge of pollutants.

4 Major maintenance and repair activities on any size vessel are conducted in a partially confined or unconfined area with moderate potential for discharge of pollutants.

5 Maintenance and repair activities on any size vessel are conducted in an unconfined area or in an area with significant potential for discharge of pollutants (e.g., within 50 feet of nearest storm drain inlet or surface water).
(Automatic trigger to high risk designation)

4.3.2 Vessel Fueling (VF)

Tenant facilities are ranked based upon the type and method of vessel fueling. Vessel fueling includes transferring fuel between vessels as well as transferring fuel from a mobile fuel truck or a stationary aboveground storage tank to a vessel through hoses.

0 No fuel transfer activities are conducted on-site.

1 Fueling of small vessel is conducted by a fueling company with proper spill containment and diversion.

2 Fueling of small vessels are conducted with spill containment and diversion.

3 Fueling of large vessels are conducted in designated area with spill containment and diversion.

4 Fueling of small vessels are conducted in areas WITHOUT spill containment and diversion.

5 Fueling of large vessels are conducted in areas WITHOUT spill containment or diversion. (***Automatic trigger to high risk designation***)

4.3.3 Vessel Rinsing (VR)

Tenant facilities are ranked based upon vessel rinsing activities. Vessel rinsing activities include the removal of salt, sediment, and sea life from the exterior of a vessel using water, detergent, and/or mechanical devices. Harbors permits vessel rinsing without any necessary containment, ONLY for the removal of salt from the exterior of the vessel using fresh water with low power (<100 pound-force per square inch [psi]). Other rinsing activities must be properly contained, and the rinse water must be properly disposed of in a shore-based sanitary sewer.

0 No vessel rinsing is conducted on-site.

1 Vessel rinsing is conducted in an area designed to contain wash water and debris, with no or minimal potential discharge of pollutants.

2 Vessel rinsing is conducted in an uncontained area with no direct connection to Harbors storm drainage system, with a minimal potential for discharge of pollutants.

3 Vessel rinsing is conducted in an uncontained area with no direct connection to Harbors storm drainage system, but having a moderate potential for discharge of pollutants.

4 Vessel rinsing is conducted in an uncontained area directly connected to Harbors storm drainage system, and has a moderate potential for discharge of pollutants.

5 Vessel rinsing is conducted in an uncontained area directly connected to Harbors storm drainage system and has a significant potential for discharge of pollutants. (***Automatic trigger to high risk designation***)

4.3.4 Equipment and/or Vehicle Maintenance and Repair (EM)

Tenant facilities are ranked based on equipment and/or vehicle maintenance and repair activities. Vehicle and/or equipment maintenance and repairs include activities including, but not limited to, parts replacement, parts washing, removal and/or replacement of fluids or greases, dismantling, sandblasting, sanding, and painting.

0 No equipment/vehicle maintenance and/or repair activities are conducted on-site.

1 Maintenance/repair activities are conducted entirely indoors, on a small scale, with minimal potential for discharge of pollutants.

2 Maintenance/repair activities are conducted entirely indoors, on a large scale, with minimal potential for discharge of pollutants.

3 Maintenance/repair activities are conducted in a covered area with minimal to moderate potential for discharge of pollutants.

4 Maintenance/repair activities are conducted outdoors within containment or in an area with moderate potential for discharge of pollutants.

5 Maintenance/repair activities are conducted outdoors or in an area with significant potential for discharge of pollutants. (***Automatic trigger to high risk designation***)

4.3.5 Equipment and/or Vehicle Fueling (EF)

Tenant facilities are ranked based on the amount of fueling and the containment and/or diversion structures available. Fueling refers to the fuel dispensing from a tank truck, aboveground storage tank [AST], UST, or portable container to equipment and vehicles, or the fueling from an AST loading rack. Small scale fueling is limited to less than 25 gallons per fueling).

0 No equipment/vehicle fueling activities are conducted on-site.

1 Equipment/vehicle fueling is conducted by a fueling company with spill containment and diversion.

2 Equipment/vehicle fueling is conducted on a small scale (i.e., less than 25 gallons per fueling) in areas with spill containment and diversion.

3 Equipment/vehicle fueling is conducted on a large scale in areas with spill containment and diversion.

4 Equipment/vehicle fueling is conducted on a small scale WITHOUT spill containment and diversion, but not in areas adjacent to Harbors storm drainage system and nation's water.

5 Equipment and/or vehicle fueling is conducted on a large scale in areas WITHOUT spill containment and diversion, or on any scale in areas adjacent to Harbors storm drainage system and nation's waters WITHOUT spill containment and diversion. (***Automatic trigger to high risk designation***)

4.3.6 Equipment and/or Vehicle Washing (EW)

Tenant facilities are ranked based on the methods used for equipment and/or vehicle washing. All washing activities must obtain consent from the Harbors and take place in approved and designated areas. This category includes the water washing of ground service equipment, maintenance equipment, company vehicles, and rental cars.

0 No equipment/vehicle washing is conducted on-site.

1 Equipment/vehicle washing is consented by the Harbors and conducted in a covered wash area following an approved method, with no or minimal potential discharge of pollutants.

2 Equipment/vehicle washing is consented by the Harbors and conducted in an

uncovered wash area following an approved method, with minimal potential discharge of pollutants.

3 Equipment/vehicle washing is consented by the Harbors and conducted in an uncovered wash area following an approved method, with moderate potential discharge of pollutants (e.g., adjacent to Harbors storm drainage system or nation's water).

4 Equipment/vehicle washing is contained and in an area with no direct connection to Harbors storm drainage system and nation's water, but conducted WITHOUT Harbors consent.

5 Equipment/vehicle washing is not contained, conducted WITHOUT Harbors consent, or in an area that directly discharges to Harbors storm drainage system and nation's waters. (***Automatic trigger to high risk designation***)

4.3.7 Aboveground Oil Storage (size of container ≥ 55 gallons ONLY) (OS)

According to 40 CFR 112, oil is defined as "oil of any kind of in any form, including, but not limited to: fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oil, including oils from seeds, nuts, fruits, or kernels; and other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil." These oils are commonly stored in ASTs and 55-gallon drums. Oil stored in containers with capacity less than 55 gallons are evaluated under Section 3.2.8 – Container Storage. Note that tenants shall not install an AST without first obtaining a written consent from the Harbors.

The term "properly stored" indicates that ASTs and drums meet the SPCC requirements for secondary containment, including: containers are clearly labeled; container material and construction are compatible with the stored material; secondary containment is sufficient to contain the entire capacity of the largest single container plus sufficient freeboard to contain precipitation; the bypass valve is sealed and retained stormwater is properly managed; container integrity is appropriately tested; and drums are in good condition, neatly organized, and sealed when not in use.

Tenant facilities are ranked based on the oil storage protocols employed at the facilities.

0 No oil product is stored on-site.

1 Less than 1,320 gallons of oil is properly stored in a covered area and has no or minimal potential for discharge of pollutants.

2 Less than 1,320 gallons of oil is properly stored in an uncovered area and has minimal potential for discharge of pollutants.

3 More than 1,320 gallons of oil is properly stored with minimal potential for discharge of pollutants, and the facility has an SPCC Plan.

4 More than 1,320 gallons of oil is properly stored with minimal to moderate potential for discharge of pollutants, but the facility does not have a SPCC Plan.

5 Oil is improperly stored and/or managed and has a significant potential for discharge of pollutants. (***Automatic trigger to high risk designation***)

4.3.8 Container Storage (size of container < 55 gallons ONLY) (CS)

Tenant facilities are ranked based on the container storage methods employed and the toxicity of materials stored. This category includes materials such as chemical products, new oil, and used oil stored in containers with capacity less than 55-gallon.

Storage methods are evaluated to ensure that materials are properly stored and managed. The term "properly stored" indicates that containers are correctly labeled, not passed their expiration date, in good condition, sealed when not in use, neatly organized, and compatible with other materials stored in the same area.

0 No containers are stored on-site.

1 All containers are properly managed and stored entirely indoors and have no or minimal potential for discharge of pollutants.

2 All containers are properly managed and stored under the cover, and have minimal potential for discharge of pollutants.

3 Containers are properly managed and stored outdoors with minimal potential for discharge of pollutants (e.g., distance from site to the nearest storm drain inlet or surface water is greater than 100 feet or 30 meters).

4 Containers are improperly managed but stored indoors or under the cover with moderate potential for discharge of pollutants.

5 Containers are improperly managed and stored outdoors with significant potential for discharge of pollutants. (***Automatic trigger to high risk designation***)

4.3.9 Waste Handling and Disposal (excluding Used Oil) (WH)

Tenant facilities are ranked based on municipal, solid, or hazardous waste handling and

disposal. Waste handling may include making a hazardous waste determination and proper management. If the waste is characterized as a hazardous waste, the accumulation start date shall be added to the labeling. Additionally, the facility shall ensure that the waste is properly disposed of within the regulated accumulation time, which depends upon the facility waste classification detailed in 40 CFR 262.

0 No waste is stored on-site.

1 All wastes are non-hazardous and stored indoors or outdoors in covered areas, and have no or minimal potential for discharge of pollutants.

2 All wastes are non-hazardous and stored outdoors uncovered, and have moderate potential for discharge of pollutants.

3 Hazardous wastes are generated and tenant is classified as a CESQG[1]. Hazardous wastes are properly managed, stored, and disposed of. Storage areas have no or minimal potential for discharge of pollutants.
[1] Please refer to Attachment 9 (3. Waste Management Regulations, Item B).

4 Hazardous wastes are generated and the tenant is classified as a SQG[2] or LQG[3]. Hazardous wastes are properly managed, stored and/or disposed of. Storage areas have no or minimal potential for discharge of pollutants.
[2] Please refer to Attachment 9 (3. Waste Management Regulations, Item B).
[3] Please refer to Attachment 9 (3. Waste Management Regulations, Item B).

5 Hazardous wastes are generated and the tenant is classified as a CESQG, SQG, or LQG. Hazardous wastes are improperly managed, stored, and/or disposed of. Storage areas have significant potential for discharge of pollutants. (***Automatic trigger to high risk designation***)

4.3.10 Spill History (SH)

Tenant facilities are ranked based on past oil and/or chemical spills at their facilities and/or inspection and investigation report.

0 No history of oil/chemical spills on-site.

1 One to three oil/chemical spills in minimal quantity (e.g., less than five gallons for oil) in the past three years.

2 One to three oil/chemical spills in moderate quantity (e.g., oil spill greater than 5 gallons but less than 25 gallons; for all other chemicals please refer to 40 CFR 302.4) in the past three years.

3 One to three oil/chemical spills greater than the reportable quantity (see 40 CFR 302.4) in the past three years and spill kit is onsite.

4 One to three oil/chemical spills greater than the reportable quantity (see 40 CFR 302.4) in the past three years and no spill kit is onsite.

5 More than two oil/chemical spills entered into Harbors storm drainage system. Or more than five oil/chemical spills of any quantity in one calendar year. (***Automatic trigger to high risk designation***)

4.3.11 Enforcement History (EH)

Tenants are ranked based on the history of past compliance with environmental regulations (including federal, state, and local), and the corresponding response actions taken by the tenant following a Notice of Apparent Violation [NAV], any verbal warning, or inspection. Class II enforcement actions include deficiencies and/or potential violations identified during any type of inspection (e.g., not following applicable BMPs during operations). Class I enforcement actions include violation of environmental law or regulations and HDOT Harbors rules that results in an NAV. A tenant is considered "taking corrective action immediately" to the warnings/violations, if responding to a Class II enforcement action within 20 days, or a Class I enforcement action within 14 days.

0 No verbal or written warnings were issued in the past two years.

1 Class II violations (such as verbal/written warnings and potential violations identified in an inspection report) were issued in the past two years and corrective actions were immediately taken by the tenant.

2 Class I violations (identified in an inspection report and/or documented in an NAV) were issued in the past two years and corrective actions were taken by the tenant.

3 Class II violations were issued in the past two years, but corrective actions were NOT immediately taken by the tenant.

4 Class I violations were issued in the past two years, but corrective actions were NOT immediately taken by the tenant.

5 Civil penalties or administrative actions were assessed for non-compliance in the past two years. (***Automatic trigger to high risk designation***)

4.3.12 Training Attendance History (TH)

Tenants are ranked based on the past training attendance. Harbors requires tenants to reduce the discharge of pollutants to the MEP, and prohibit unauthorized non-stormwater discharges into Harbors stormwater drainage system and nation's waters. In order to achieve these goals, Harbors has been providing *Annual Storm Water Pollution Prevention Awareness Training* to the tenants, with the topics focusing on stormwater management, pollution prevention, good housekeeping, and commonly recommended BMPs. This annual awareness training is one of measures pertinent to public education and outreach program.

-2 The tenant has attended all annual trainings during its tenancy.

-1 The tenant has attended the most recent training.

2 The tenant has not attended the most recent training.

4 The tenant has never attended the training and has been found to be non-compliant.

4.3.13 Site Condition and General Housekeeping

Tenants are ranked based on physical condition where on-site activities take place (i.e., indoors or outdoors), the general housekeeping condition, and implementation of BMPs to minimize the discharge of pollutants and to prevent soil and debris from entering Harbors stormwater conveyance system. The term "indoors" refers to operations situate, conduct, or carry out in the interior of a building or under cover.

0 All activities are conducted indoors and have no or minimal potential for discharge of pollutants. General housekeeping and grounds are in good condition.

1 All activities are conducted indoors and have minimal potential for discharge of pollutants. General housekeeping and grounds are in average or fair condition.

2 Activities are conducted indoors and outdoors, and general housekeeping and grounds are in good condition (e.g., sources of pollutants are properly managed).

3 Activities are conducted indoors and outdoors and have minimal to moderate potential for discharge of pollutants. General housekeeping and grounds are in fair and above average condition.

4 Activities are conducted outdoors and have moderate potential for discharge of pollutants. General housekeeping and grounds are in fair condition.

5 Activities are conducted outdoors and pose a significant threat to the environment. (***Automatic trigger to high risk designation***)

4.3.14 Lease Agreement and/or Revocable Permit Requirements (RP)

Tenants are ranked based on the history of past compliance with lease agreement and/or revocable permit and the corresponding response actions taken by the tenant following an inspection, action letter, and verbal warning. Examples of the tenant *Lease Agreement* and *Revocable Permit* are included in Attachment 2. A tenant is considered "taking corrective action immediately" to the warnings/violations, if responding to a Class II enforcement action within 20 days, or a Class I enforcement action within 14 days.

Violations of any item below will ***automatically trigger a tenant to a high risk designation***, if described in tenant Lease Agreement and/or Revocable Permit.

- The tenant shall not use, store, treat, dispose, discharge, release, generate, create, or otherwise handle any hazardous substance, or allow the same by any third person, on the premises without first obtaining the written consent of Harbors.
- The tenant shall not conduct illegal activities at the premises.
- The tenant shall not conduct any act which results or may result in the creation, commission or maintenance of a nuisance on the premises.
- The tenant shall not conduct permanent lodging or sleeping quarters at the premises. However, a rest area for the comfort and convenience of employees during working hours is allowed.
- The tenant shall not install an UST/AST without first obtaining the written consent of Harbors.
- Except for materials that are lawfully sold in the ordinary course of the tenant's business and for which the tenant has obtained all required authorizations from appropriate authorities including the prior written permission of Harbors, the tenant shall cause any hazardous substances to be removed from the premises for disposal.
- The tenant shall maintain the premises in a strictly clean, neat, safe, orderly and sanitary condition, free of waste, rubbish and debris and shall provide for the safe and sanitary handling and disposal of all trash, garbage and other refuse from the premises.
- The tenant shall not sell, transfer, assign, lease, mortgage, and sublease premises whatsoever.
- Consumption of any intoxicating beverage, unless under an operation licensed by appropriate government agencies, is not allowed in the premises.
- The tenant shall keep Harbors fully informed at all times regarding all environmental law related matters affecting the tenant or the premises.
- The tenant shall obtain an NPDES permit from HDOH, if applicable.

4.4 Routine Inspection Frequency Based on Risk Ranking

All tenants shall be inspected by the Environmental Section or its representative in accordance with this Section. The frequency of tenant inspections will be determined by tenant risk ranking designation of high, medium, or low threat. At a minimum, Harbors will inspect each tenant in each ranking class as follows:

- **Low** ranked tenants shall be inspected at least **once every five years and are subject to an annual reconnaissance inspection**.
- **Medium** ranked tenants shall be inspected **at least annually**; and
- **High** ranked tenants, shall be inspected **at least semiannually**;

4.5 Tenant Risk Ranking Re-evaluation

Tenant risk ranking is re-evaluated using tenant routine and reconnaissance inspection results as applicable. When a violation is observed or reported, and if the source is traced to a tenant, the tenant's risk ranking will be re-evaluated. Environmental Section will prepare an inspection schedule based on the results of the risk ranking re-evaluation. The inspection schedules is maintained and updated by Environmental Section in the database.

5.0 ENFORCEMENT

The primary objective of Harbors environmental enforcement program is to: a) ensure tenants comply with the environmental regulations, lease agreements, and/or revocable permits; b) correct any violation(s); and c) require tenants to operate their facilities in accordance with Harbors environmental policy and applicable BMPs.

5.1 Scope of Authority

The enforcement options available to Harbors range from administrative actions (including verbal/written warnings, eviction notices, and penalties) to the issuance of citations and a district court verdict of a misdemeanor or fine. Three general areas of the environmental enforcement are enclosed in Attachment 2 as following:

- HRS Title 15 Chapter 266 authorizes Harbors to issue citations and summons for violations of its rules and have its actions enforced through the district courts by verdict of a misdemeanor or fine.
- HAR Title 19 Chapters 41 to 44 establishes uniform safety measures, operational standards and requirements, and the conduct for all tenants at State of Hawaii harbors.
- The tenant lease agreement or revocable permit that provides Harbors with the right of entry to conduct inspection and authority to terminate the permit or lease.

For suspected illicit discharges and pollution concern, which need immediate response, the inspector will call the Harbors Traffic Control at (808) 587-2076 upon discovery. However, individual inspectors (such as Environmental Section personnel or their designees) may not have the authority to pursue all areas of enforcement and would follow ERP for appropriate actions (e.g., refer cases to the appropriate individuals or agencies when necessary).

There are two types of violations – Class I Violation and Class II Violation, which are based on potential to discharge or cause environmental harm, magnitude of the violation (e.g., failure to apply for Industrial General Permit Coverage), duration of the violation, and violator's compliance history.

- Class I Violations: violations which are related to submittal of permit applications, BMP failure due to lack of maintenance, ongoing or imminent discharges of pollutants, other activities capable of causing imminent impact to the environment, or where the violator has a previous history of non-compliance.
- Class II Violations: violations that pose no significant impact on the environment which are easily preventable, or administrative in nature. Class II violations include record keeping, reporting, BMP maintenance or installation problems, or other activities when there is ample time for correction prior to the discharge of pollutants, and where the violator has not had a previous history of non-compliance.

5.2 Enforcement Actions and Documentation

The levels of enforcement actions to be utilized by inspectors, in order of increasing severity, are as follows:

- Oral or Verbal Warning
- Written Warning (e.g., Tenant Inspection Report or Letter with Tenant Inspection Report)
- Notice of Apparent Violation [NAV]
- Issuance of Summons or Citation
- Notice and Finding of Violation Order ([NFVO], see ERP for detailed description)

The following sections contain brief descriptions of each level of enforcement action and procedures for implementation.

5.2.1 Oral or Verbal Warning

An oral or verbal warning is a spoken reprimand or a disciplinary measure, which will be issued verbally to a tenant where the finding is a minor discrepancy with one or two BMPs. It could also serve the purpose of outreach to the tenants. In most cases, oral or verbal warnings provide a more efficient way for the tenant to take corrective actions.

5.2.2 Written Warning

A written warning will be issued to a tenant where the finding is limited to conditions that do not pose an imminent threat to the environment and/or the public. Conditions that warrant a written warning may include but not limited to:

- Improper storage of batteries
- Improper waste management
- Lack of or out-of-date spill plans
- Lack of good housekeeping
- Lack of proper labeling on drums
- Lack of placing drip pans or absorbent sheets beneath a vehicle

For any deficiency observed during an inspection, a recommended corrective action will be identified in the *Tenant Inspection Report*, which could be served as a written warning. A copy of the *Tenant Inspection Report* will be mailed/emailed or otherwise delivered to the tenant upon completion. If (potential) violation is observed during inspection, an enforcement letter combined with the *Tenant Inspection Report* will be mailed to the tenant with a compliance deadline (typically within 20 calendar days). These documents will become a part of the permanent tenant file.

When necessary, a follow-up inspection will be conducted to verify that the infractions were

corrected. If the tenant does not respond to the written warning by the deadline, the Environmental Section will issue an NAV and follow the steps described in the ERP for further enforcement (e.g., report the case to the State Attorney General). Meanwhile, a copy of the *Tenant Inspection Report*, together with the inspection checklist, would be forwarded to corresponding agencies and offices when necessary.

5.2.3 Notice of Apparent Violation

An NAV letter will be issued to a tenant in the circumstance of a Class I or II violation. It is used to send a stronger message than a written warning. It documents Harbors efforts to have the tenant voluntarily come into compliance with the environmental laws and implementing applicable BMPs. It also serves as a basis for future penalties, should the occurrence of violations continue or even increase. The NAV shall be sent to the tenant by certified mail with a compliance deadline (typically within 20 calendar days), when necessary. The NAV will become part of the tenant's permanent file.

5.2.4 Issuance of Summons/Citation

The issuance of the Summons/Citation by Harbors requires that the tenant appear before a District Judge to address the violation and corrective action. This action may lead to fines and/or a criminal penalty and is utilized in severe cases where negligent non-compliance is repeated and/or significant harm to property or environment has occurred. Situations which call for summons or citation will be referred to the appropriate State Attorney General Representative for implementation. Harbors and its designees will function as documentation and witness to actions requiring this level of response. Therefore, it is essential to accurately and thoroughly record actions that might escalate to this level.

5.2.5 Notice and Finding of Violation Order and Further Action

A detailed discussion is included in ERP.

5.3 Description of Enforcement Steps

The goal of Harbors environmental enforcement program is to motivate tenants to voluntarily comply with their environmental obligations. The designated staff (e.g., Environmental Section staff, Harbor Police, Marine Cargo Specialists, Property Management Section staff) at Harbors will assist tenants, without being prescriptive, on how the tenant can achieve environmental compliance. Such assistance includes suggesting that the tenant consult a professional if needed. Tenant's risk ranking will be re-evaluated at least annually.

In the event that an enforcement action is required, the designated staff will identify the appropriate enforcement response to achieve compliance. If the tenant cannot achieve compliance by implementing the appropriate corrective action, the designated staff will

"escalate" the enforcement response by issuing a more severe action. Harbors has developed a tiered approach of escalating enforcement actions based on the severity of the violation and the tenant's compliance response history. A description of the different levels of enforcement action is included in Section 5.2.

For potential violation observed during routine tenant inspection, the designated staff will record the potential violation, observed during routine tenant inspection, on Harbors revised *Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants*. Potential violation, reported to the Environmental Section (e.g., using *Suspected Illicit Discharge Reporting Form*). These potential violations will be evaluated (through follow-up inspection if warranted) and classified as Class I or Class II violation, if applicable.

The following is a step-by-step progression of a general enforcement action if a potential violation or illicit discharge is observed. The process is also depicted in Figure 5-1. The indicated timeframes may be amended through an extension granted by Harbors, if requested by the tenant. The enforcement actions proceed along two separate courses depending upon whether the violation is considered Class I or Class II violation. All noncompliance findings will be documented and kept on file by the Harbors Environmental Section.

- If the potential violation is considered Class II, the tenant will be issued with an oral or verbal warning and provided a copy of *Tenant Inspection Report* upon completion. The designated staff will re-inspect the tenant within 20 calendar days of observation, if warranted, to ensure that the violation has been corrected.
  - If the tenant fails to take corrective action, the designated staff will issue a written warning letter to the tenant, requiring an Action Plan within 20 calendar days upon receipt of the letter. The Action Plan shall denote the tasks that the tenant is required to complete to come into compliance within reasonable timeframe.
  - If the tenant fails to take any corrective action and is not able to submit the Action Plan to the Harbors within 20 calendar days, other appropriate actions will be implemented (e.g., issuing fines, terminating the lease or revocable permit, etc.).

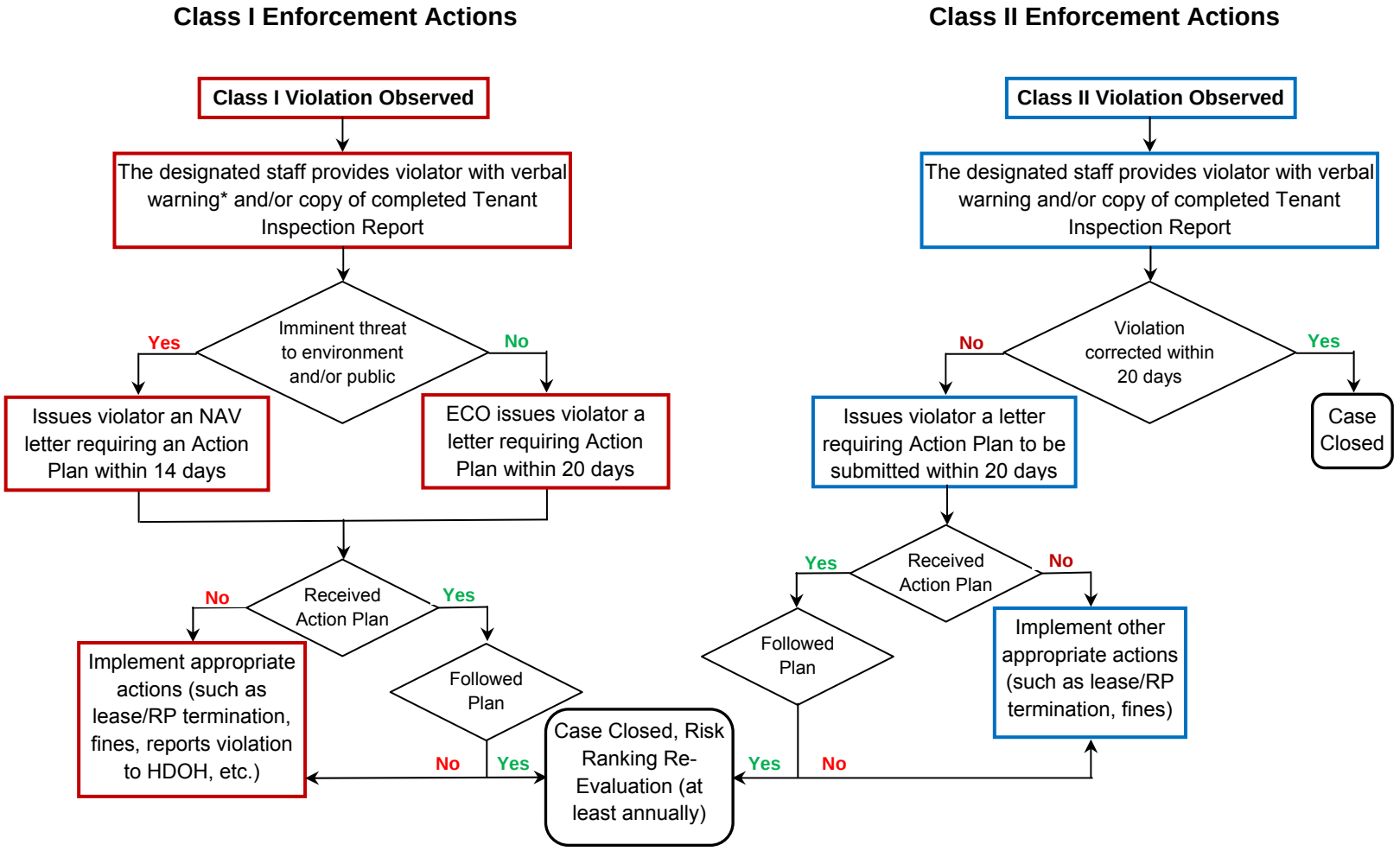
- If the potential violation is considered Class I but not posing imminent threat to the environment or the public, the designated staff will issue an oral or verbal warning to the tenant and then provide a written warning letter requiring corrective action or an Action Plan to be submitted within 20 calendar days upon receipt of the letter. The Action Plan shall denote the tasks that the tenant is required to complete to come into compliance within reasonable timeframe.
  - If the tenant fails to take corrective action and is not able to provide an Action Plan within 20 calendar days, other appropriate actions will be implemented (e.g., issuing fines, terminating the lease or revocable permit, etc.).

- If the potential violation is considered Class I and poses an imminent threat to the environment or the public, the designated staff will provide an oral/verbal warning and

direct the responsible party to stop the activity relating the imminent threat immediately. Additionally, the designated staff will draft a letter that will require the tenant to correct action or submit an Action Plan immediately to correct the violation within 7 calendar days upon receipt of the letter.

- If the tenant fails to take any corrective action and is not able to submit an Action Plan correcting the violation within 7 calendar days, the violation will be escalated to appropriate agencies and offices in accordance with the ERP. In addition, the designated staff can also implement other appropriate actions such as termination of the lease or revocable permit.

Figure 5-1 HDOT Harbors Tenant Enforcement Action Flow Chart



* If there is an imminent threat to the environment or public health, the designated staff will inform violator to cease activity related to imminent threat immediately.

6.0 REFERENCES

Airports 2011, NPDES Inspection and Enforcement Manual: State of Hawaii Department of Transportation, Airport Division, Version 5.0, June 2011.

Caltrans 2003, *Storm Water Management Enforcement Guidance Manual*: State of California Department of Transportation, Division of Construction, CTSW-RT-03-110.31.30-1, December 2003.

CCH 2011, *Storm Water Best Management Practice Manual for Construction*: State of Hawaii, City and County of Honolulu, Department of Environmental Services, November 2011.

CCH 2012, *Storm Water Management Program Plan*: State of Hawaii, City and County of Honolulu, Department of Environmental Services, June 22, 2012.

EPA 1989, *Guidance for Developing Control Authority Enforcement Response Plans*: Office of Water Enforcement and Permits. September 1989.

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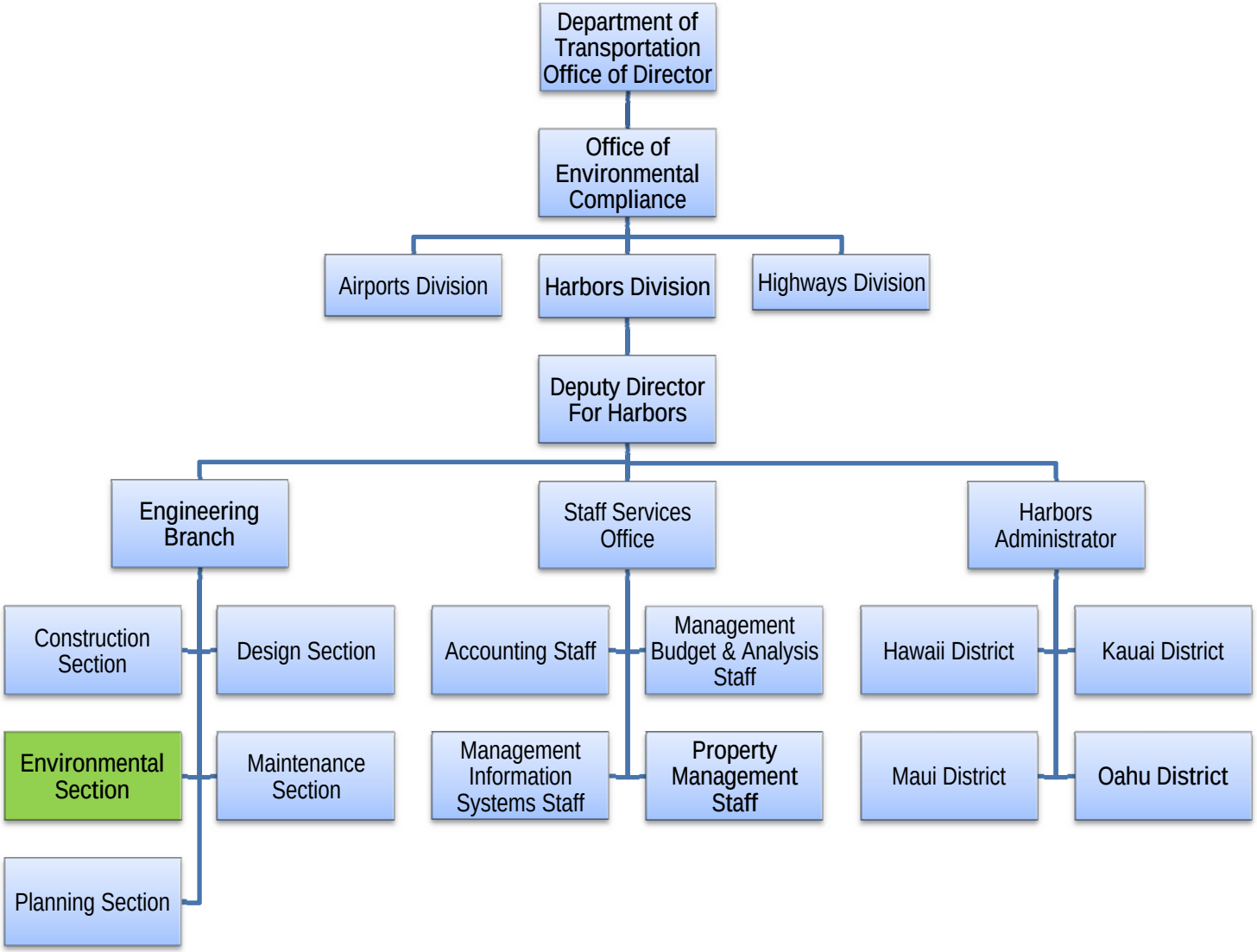
Harbors 2014, Enforcement Response Plan: State of Hawaii Department of Transportation, Harbors Division, January 2014.

NOAA 2005, *Managing Boat Wastes – A Guide for Hawaii Boaters:* National Oceanic and Atmospheric Administration, UH Sea Grant College Program and SOEST, Project #A/AS-1, under Institutional Grant No. NA050AR4171048, December 2005.

Attachment 1

HDOT Harbors Division Administrative Organizational Chart

State of Hawaii Department of Transportation, Harbors Division
Administrative Organizational Chart



Attachment 2

HDOT Harbors Rules and Regulations and Examples of Tenant Lease Agreement and Revocable Permit

HARBORS RULES AND REGULATIONS FOR ENVIRONMENTAL COMPLIANCE

The Harbors environmental inspectors have been given enforcement actions that include verbal warnings, written citations, and potential tenant eviction.

Hawaii Revised Statutes Title 15 Chapter 266

HRS 266-2 describes the powers and duties of the State of Hawaii Department of Transportation Harbors Division. **HRS 266-3** establishes the Director of Transportation authority to establish and enforce rules to control and manage all commercial harbors and roadsteads, all commercial harbor improvements, and all vessels and shipping within the commercial harbors and roadsteads. The Harbors then relies on **HRS 266-24**, which permits the Director of Transportation the authority to designate persons to enforce Chapter 266 and all rules and orders issued pursuant thereto and of all other laws of the state.

Such officers, employee's agents, and representatives of Harbors have police powers to serve and execute warrants and arrest offenders, and the power to serve notices and orders. When arresting or issuing a citation to a purported violator of any provision of Chapter 266, the Director of Transportation's designee, hereinafter referred to as "enforcement officer" can issue a summons or citation (similar to a traffic ticket) warning or directing the violator to appear and answer the charge before a district judge, or take the purported violator without delay before a district judge.

Penalties for violating the provision of Chapter 266 or rules or orders issued pursuant to Chapter 266 are issued by the district court and includes a finding or guilty or not guilty verdict of a misdemeanor and a fine. Fines arising from environmental protection violations include reimbursing the HDOT for the entire amount of the HDOH or EPA fine under HRS **§266-28** and can include an additional amount of not more than $10,000 for each day of violation under HRS **§266-25**.

Hawaii Administrative Rules Title 19 Chapters 41 to 44

HDOT adopted these chapters to regulate operations at the state harbors. **Chapter 42-126 and 42-127** specifically apply to environmental regulation. These rules require that no litter be left within a state harbor, except in properly marked bins. In addition, oil, oily refuse, sludge, chemicals, or other hydrocarbons should only be deposited in designated collection points. Specifically, Chapter 42-127 can be applied to activities such as maintenance or washing that has the potential to generate pollutants to be discharged into state waters. Below is an excerpt from Chapter 42-127:

> *"No person shall place, throw, deposit, or discharge, or cause to be placed, thrown, deposited, or discharged into the waters of any harbor, river or shore waters of the State any litter, or other gaseous, liquid or solid materials which render the water unsightly, noxious or otherwise unwholesome so as to be detrimental to the public health and welfare or a navigational hazard. No person shall discharge oil sludge, oil refuse, fuel oil*

or molasses either directly or indirectly, or pump bilges or ballast tanks containing other than clean water into the waters of any harbor, river or into any shore waters in the State."

In addition, Chapter 42 contains language on storage, usage, and/or handling requirements for hazardous materials or other regulated potential pollutants or hazardous substances. These chapters detail specific environmental practices where enforcement is implemented through arrest or citation and presented before the district judge. The major components of Chapter 42, related to enforcement, inspection, safety, cleanliness, use of facilities, and construction, are summarized below.

Chapter 42-15 – Compliance with Federal, State, and County Laws, Ordinances and Rules

- Use of state harbors and harbors facilities is subject to compliance with all applicable federal, state, and county laws, ordinances, rules and regulations. Particular attention is directed to:
    - Rules of the United States Public Health Service and of the state department of health, relating to the use of rat guards and other measures to prevent rodents from leaving the vessel.
    - Rules of the state department of health pertaining to air and water pollution.
    - Rules of the fire department of each county.

Chapter 42-16 – Citation for Violation

- Citations issued, pursuant to HRS 266-24.1, to a commercial firm for violation of this part may be issued to any agent, officer, or manager of the firm.

Chapter 42-50 – <u>Inspection</u>

All small craft and smaller commercial vessels moored or berthed at a state-owned or controlled pier, wharf, quay, bulkhead, landing dolphin, anchorage, mooring, or other facilities located in the shore waters, navigable streams, harbors, ports, and roadsteads of the State shall be subject to inspection by the department or any peace officer of the State or its political subdivisions at any time where necessary and proper for the purpose of enforcing these rules.

Chapter 42-52 - Small Craft and Smaller Commercial Vessel Repairs, Reconstruction or Major Modification

- Minor repairs to small craft and smaller commercial vessels may be made at the assigned berth and shall be completed within thirty days.
- If repairs are estimated to, or actually do, require that the vessel be out of service for more than thirty days, prior approval shall be sought from the department to initiate or complete the repairs in the harbor.
- Prior approval shall be sought from the department for any repairs requiring the use of cranes, lifts, and any similar devices within the harbor.
- Repair, reconstruction or major modification that would interfere with the free flow of other vessels, pedestrian, or vehicle traffic shall only be accomplished in an area

designated by the department. Failure to seek approval as required by this section shall be grounds for the revocation of the use permit.

Chapter 42-103 Vessel Loaded with Explosives

- No vessel containing more than five hundred founds of Class A, one tone of Class B, and/or ten tons of Class C explosives (net explosive content) shall enter or be loaded in any harbor in the State except on prior written permission of the harbor master of the district concerned, or the director.
- No Class A explosives, as defined by the United States Coast Guard in its regulations in existence as of June 1, 1993, will be admitted in any harbor in quantities in excess of the limitations established by the USCG for the various harbors unless otherwise authorized by the director in writing. Other cargos may not be moved concurrently with Class A explosive cargo.

Chapter 42-104 Handing of Explosives

- All handling and loading or unloading of explosives shall be done in a safe and careful manner and shall be accordance with the federal regulations pertinent thereto in force at the time. Explosives shall be off-loaded prior to the off-loading of any other cargo.

Chapter 42-105 Hauling of Explosives

- All hauling of explosives away from or to the pier shall be done in a safe and careful manner and shall be in accordance with rules of the state department of labor and industrial relations.

Chapter 42-106 – Containers for Flammable Liquids

- No empty containers which have been used to hold flammable liquids shall be delivered onto any wharf or structure under control of the department unless the same are securely closed with metal screw plugs.
- Any such containers shall be delivered onto a wharf or structure only at such times as a carrier is prepared to take immediately delivery.

Chapter 42-107 – Nitrate of Soda, Nitrate of Ammonia, Sulfur, and Other Similar Materials

- No nitrate of soda, nitrate of ammonia, sulfur, or other similar material shall be stored or left upon any wharf for more than four hours unless packed in sound and non-leaking containers. Such material shall be under the continuous care of a competent guard satisfactory to the harbor master until removed.
- Masters, owners, or agents of vessels or consignees of cargoes of nitrate of soda, sulfur, or other similar materials during the process of loading, unloading, and removing such cargoes, must at all times keep the wharf swept clean and free of such materials.
- If loose nitrate of soda, sulfur, or other similar material is to be discharged onto or loaded from any wharf or structure at any harbor, it shall be placed directly into the carrier and immediately removed. A protective device approved by the harbor master shall be used

during the period of loading or unloading to prevent the material being handled from falling upon the wharf structure.

- During the process of handling nitrate of soda, sulfur, or other similar material on any wharf at any harbor under control of the department, it shall be obligatory on the part of the master, owners, or agents of a vessel to provide containers of not less than 50 gallons capacity filled with a solution of nitrate of soda and water at distances of not more than 50 feet apart, with suitable buckets placed alongside each container, for the purpose of fighting any fire which may occur in such cargo.

Chapter 42-108 – Dangerous Acids; Electric Storage Batteries

- Acids of a dangerous character such as sulfuric, muriatic, and nitric acids shall be removed from the wharf immediately upon discharge from any vessel and no such acid shall be put upon a wharf under control of the department for shipment until the carrier is ready to receive it. Prior permission of the harbor master shall be secured in the event it becomes necessary to handle such cargo at other times.
- Electric storage batteries containing electrolyte or corrosive battery fluid of non-spillable type, protected against short circuits and completely and securely boxed, shall be exempt from this provision.

Chapter 42-109 – Flammable Substances; Leaky Containers

- No gasoline, distillate, kerosene, benzene, naphtha, turpentine, paints, oils, or other flammable substances in leaky containers shall be delivered onto any wharf under control of the department for shipment.
- All such substances unloaded from any vessel in leaky containers shall be removed immediately.

Chapter 42-110 – Heating Combustibles on Vessels

- No combustible material such as pitch, tar resin, or oil shall be flame heated on board any vessel within the harbors or streams of the State without the permission of a harbor master.

Chapter 42-111 – Fumigation of Vessel

- No vessel shall be fumigated or smoked at any wharf under control of the department without the prior permission in writing from the director, the chief, or the harbor master.
- If fumigation is to be with cyanogen products or hydrocyanic acid gas in any form, however generated, the applicant or applicant's agent shall be in possession of a permit as required by HDOH rules and shall have a guard on duty so long as any danger exists, in order that no one, unless properly entitled to do so, be allowed to board such vessel.

Chapter 42-112 – Use of Fuel Burning Steam Generating Appliances

- All fuel burning steam generating appliances when used on any wharf under control of the department or on any scow, pile driver, or other vessel working alongside or near

any wharf under control of the department shall be equipped with spark arresters satisfactory to the harbor master.

- At the close of each day's work, all ashes, cinders, waste, or other deposits caused by such appliances upon any wharf shall be promptly removed and shall not be disposed of in or upon any waters of the harbor.

Chapter 42-113 – Repair, Manufacturing, Construction, or Maintenance Work on Wharf

- No person shall make any repair or do any kind of manufacturing, construction, or maintenance work on any wharf without the permission of the harbor master.

Chapter 42-114 – Smoking Prohibited

- Smoking is positively prohibited at all times within any cargo shed, or upon any wharf apron, and during the time cargo is being loaded, unloaded, or stored on any unshedded pier under control of the department, and no person shall enter into, stand in, or under, or pass through any such wharf or structure with a lighted pipe, cigar, cigarette, match, fire, or any flame of whatever nature, excepting only within those areas designated by the harbor master and plainly marked "Smoking Area."
- No smoking or lighting of a match or any other fire-creating device shall be permitted within 50 feet of any fueling operation.

Chapter 42-115 – Use of Explosives

- The use of explosives on land, on any wharf, or in a shed or other structure under control of the department, or in the water in the immediate vicinity of the same, without the written approval of the harbor master is strictly prohibited.

Chapter 42-116 – Keeping Wharf in Sanitary Condition and Clear of Fire Hazard

- Vessel owners, charterers, agents, or private terminal operators utilizing wharves and sheds under the control of the department for the handling of merchandise shall keep such wharves and sheds in a clean and sanitary condition, clear of materials which create a fire hazard and shall ensure that passageways and established fire lanes are not obstructed.

Chapter 42-117 – Standards of Cleanliness

- All vessels moored at a state-owned mooring or berthing facility shall be kept, at all times, in a condition of reasonable cleanliness and sanitation so as not to constitute a common nuisance or potential source of danger to public health.

Chapter 42-118 – Charges for Cleaning Wharves

- In cases where the department takes over the cleaning of wharves the charge therefore shall be assessed against the vessel which is responsible for the necessary of cleaning.

Chapter 42-119 – Identification of Mobile Equipment

- All mobile equipment used on any property under the control of the department in connection with the handling of cargo or shipping containers, such as folk lifts, cranes, tractors, and straddle trucks, shall be clearly identified as to the owner thereof.

Chapter 42-121 – Fowl, Animal, or Livestock

- No fowl, animal, or livestock of any kind shall be allowed to remain on any wharf under control of the department for a period longer than six hours without being properly fed and watered. After any fowl, animal, or livestock unloaded on a state wharf, it shall be removed from the same wharf within twenty-four hours.
- No shipment of such fowl, animal, or livestock subject to quarantine shall be unloaded on a state wharf by any shipping company or its agents unless first passed by the state department of agriculture or unless arrangement have been made of acceptance of quarantine. All such fowl, animal, or livestock requiring quarantine shall be removed from the wharf within eighteen hours.
- All expenses incurred in the care and maintenance of such fowl, animal, or livestock while on a state wharf shall be paid by the consignee thereof and shall constitute a lien upon the same until such charges are paid.

Chapter 42-122 – Private Use of State Harbor Property or Facilities; Business Activities; Signs

- No regular or extensive use of any state harbor property or facility for private gain or purpose shall be permitted without corresponding and reasonable benefits and returns to the public.
- No person shall engage in any business or commercial activity at any state harbor without the prior written approval of the department. Without limiting its generality, the term “engage in any business or commercial activity” as used in this section includes (1) solicitation, and (2) distribution of advertisement or circulars, intended for private gain or purpose.
- No person shall post or display any signs at any state harbor without the prior written approval of the department, except that approval will not be required for the posting or displaying of any sign on a vessel which relates solely to the sale of such vessel if the maximum dimension of such sign does not exceed three feet.

Chapter 42-123 – Placement of Goods and Equipment

- Any person handling goods or using equipment on a wharf or within a shed under control of the department or bringing goods whereon or therein for shipment, shall place, store, or stack such goods or equipment in such a way as not to be an impediment to the approaches to same nor an obstacle to the removal of other goods, not to cause damage to the shed or wharf.
- No goods shall be so placed as to restrict or prevent the use of mooring bitts, cleats, or any other device used for mooring purposes.
- No goods shall be so placed as to restrict or prevent the use of tracks, water connections, fire hydrants, gutters, liquid connections or drains, telephone or electric connections.

Chapter 42-124 – Closing of Wharves for Safety Reasons

- The harbor master may close the wharves or any portion thereof and regulate and control the use of the same whenever in the harbor master's opinion it is advisable to do so for reasons of safety, fire prevention, or probable interference with cargo handling or vessel operations.
- No person shall enter upon any wharf so closed without the permission of the harbor master.

Chapter 42-125 – Liability for Damage to or Loss of Merchandise and Cargo

- The department shall not be liable for any damage to or loss of merchandise or other property on any wharf under its control.
- It shall be the responsibility of shipping concerns or their agents to exert every effort to protect cargo from the effect of weather conditions while same is stored on state wharves. This responsibility shall include the proper closing of all openings such as outside doors and windows, and the placing of cargo on pallets or dunnage so that it will not be damaged by moisture from the shed floors. Unless the above precautions are taken and unless carelessness on the part of department employees can be shown, no claim for damaged cargo due to inclement weather shall be considered.

Chapter 42-126 – Littering or Polluting Land Areas Prohibited

- No person shall throw, place, leave, deposit, abandon, or cause or permit to be thrown, placed, left, deposited or abandoned any litter within a state harbor, except in receptacles designated by the department for the disposal of such materials. "Litter" as used in this section includes any and all types of debris and substances, whether liquid or solid, and materials such as garbage, refuse, rubbish, glass, cans, bottles, paper, wrappings, fish or animal carcasses or any other substances which render harbor lands or facilities unsightly, noxious or otherwise unwholesome to the detriment of the public health and welfare and effective and safe operation of the harbor.
- No person shall deposit oil, oily refuse, sludge, chemicals, or other hydrocarbons on state property except in specially designated collection points. These items may not be left in or near standard refuse containers or anywhere else on harbors property. Penalties, including but not limited to the revocation of mooring permits and the right to use the facilities, may be invoked.

Chapter 42-127 – Littering or Polluting of Water Prohibited

- No person shall place, throw, deposit, or discharge, or cause to be place, thrown, deposited, or discharges into the waters of any harbor, river or shore waters of the State any litter, or other gaseous, liquid or solid materials which render the water unsightly, noxious or otherwise unwholesome so as to be detrimental to the public health and welfare or a navigational hazard.

- No person shall discharge oil sludge, oil refuse, fuel oil, or molasses either directly or indirectly, or pump bilges or ballast tanks containing other than clean water into the waters of any harbor, river or into any shore waters in the State.

Chapter 42-128 – Disposal of Salvage of Derelict Craft

- When any owner, agent, or individual contemplates or plans the disposal or salvage of a derelict craft, vessel or other object of any size, type or description, by transporting across, within or on navigable waters, whether a part or whole craft or whether a floating or suspended object of any sort which might, if sunk, lost or abandoned in the harbors, channels or shore waters, become a hazard to navigation, to dredging or to other operation of state or federal government, or the public in those waters, that person shall obtain the written permission of the harbor master before taking such action.

Chapter 42-129 – Duty of Persons Who Lose, Drop, or Abandon Any Floating or Sinking Object

- Should any owner, operator, charter, agent, or individual, without permission of the harbor master, lose, sink, drop, or abandon any floating or sinking object in or on the navigable waters and shore waters of the State, that person shall immediately notify the harbor master and shall immediately take such action as is necessary for removal of the object.
- Upon failure on the part of the owner, operator, charterer, agent or individual to remove such object the department will take such actions through federal or commercial channels as are necessary for such removal and will charge all costs incurred by the department in effecting the necessary removal to the owner. The harbor master may require the posting of a bond to assure payment.

Chapter 42-130 – Approved Backflow Prevention Device Required for Water Supply System

- No person shall connect a vessel's water supply system, siphon or other water water-operated device, equipment or mechanism connected to the water supply system or operate any water-operated device, equipment or mechanism connected to the water supply system, unless an approved backflow prevention device has been installed at the faucet or other point of connection. An "approved backflow prevention device" means a backflow prevention device that meets the requirements contained in Standard 1001, American Society of Sanitary Engineers as it existed on June 1, 1993, or the Uniform Plumbing Code adopted by the International Association of Plumbing and Mechanical Officials.

Chapter 42-131 – Dumping of Materials at Sea

- When any owner, agent or individual contemplates the dumping of sinkable materials at sea by hauling across, within or on the navigable and/or shore waters of the State that person shall notify and obtain the permission of the department as specified in §19-42-161 and §19-42-162 prior to movement and shall not fail to perform any duty imposed thereby. All dumping at sea of sinkable objects or materials shall be done in the areas

designated by the Secretary of the Army for such disposal and in accordance with the Corps of Engineers requirements and applicable state agency requirements.

- The dumping of floating objects is strictly prohibited.

Chapter 42-132 – Waste Outlets; Permit Required

- Notwithstanding the issuance of a permit pursuant to §19-42-161, no person shall do any of the following within a state commercial harbor without first having obtained a permit from the HDOH (not applicable to vessels):
    - Discharge any wastes from shore into the waters of a state commercial harbor so as to reduce the quality of the water below the standards of water quality adopted for such waters by the HDOH.
    - Construct, install, modify, alter, or operate any treatment works or part thereof or any extension of addition thereto which discharges from shore into the waters of a state commercial harbor.
    - Construct or use new outlet for the discharge of any wastes from shore into the waters of a state commercial harbor.

Chapter 42-133 – Loading or Unloading Flammable Liquids

- Loading or unloading of flammable liquids shall be in strict accordance with applicable federal laws and regulations.

Chapter 42-134 – Appliances and Electrical Wiring

- All cooking or heating appliances or any other machinery, equipment, utensils, or apparatus which are used by small craft or smaller commercial vessels at a state commercial harbor and could be the cause of fire shall be so constructed, installed, wired, situated, maintained, and used so as not to constitute a potential fire hazard. The failure to conform to any statute, rule, regulation, standard, or ordinance affecting fire safety may be considered by the department in determining any violation of this section.
- Particular attention is directed to the applicable provisions of the state boating rules of the Department of Land and Natural Resources. In addition, the approval of any machinery, equipment, utensils, or apparatus by Underwriter' Laboratories, Factory Mutual System, Marine Testing Institute, Inc., or any other nationally recognized electrical testing agency, may be considered by the department in determining compliance with this section.
- All electrical equipment must be properly grounded.

Chapter 42-135 – Fire Extinguishing Equipment for Small Craft

- Any small craft utilizing the waters of the state commercial harbor shall be provided with approved fire extinguishers as prescribed in the applicable provisions of the state boating rules of the DLNR. The fire extinguishers shall at all times be maintained in good and serviceable condition for immediate and effective use an shall be mounted on wall brackets so located as to be readily accessible. In addition, if any person is living aboard any small craft or contrivance, which is not a visiting small craft temporarily using the

harbor, the small craft or contrivance shall be equipped with at least one approved hand portable fire extinguisher containing ten pounds of dry chemicals placed on each separate level or floor of habitable living space. Each extinguisher shall be mounted on a wall bracket so placed as to be readily accessible.

Chapter 42-136 – Fueling

- All fueling operations shall be done in compliance with the stricter of any applicable federal, state, or county rules. The fueling of vessels at a state commercial harbor where a marine fueling station has been established, or where authorized tank trucks or tank trailers are available shall be accomplished only at a station, or by tank trucks or tank trailers with a state permit. A permit shall be issued only if:
    - Proper application has been submitted;
    - Established fees have been paid to the department by the applicant;
    - There exists a comprehensive general liability insurance policy or policies, or a certificate of insurance in lieu thereof evidencing that a policy has been issued and is in force with a combined single limit of not less than $500,000. The specification of limits contained in this section shall not be construed in any way to be a limitation on the liability of the permittee for any injury or damage proximately caused by it. The insurance shall (A) be issued by an insurance company or surety company authorized to do business in the State; (B) name the State as an additional insured; (C) provide that the department shall be notified at least thirty (30) days prior to any termination, cancellation, or material change in its insurance coverage; (D) cover all injuries, losses, or damages arising from, growing out of, or caused by any acts or omissions of the permittee, its officers, agents, employees, invitees, or licensees, in connection with the permittee's use or occupancy of the premises; and (E) be maintained and kept in effect at the permittee's own expense throughout the life of the permit. The permittee shall submit evidence to the department of renewals of other actions to indicate that the insurance policy remains in effect as prescribed in this section.
- Prior to fueling a vessel at a state commercial harbor, the operator shall:
    - Securely moor the vessel;
    - Stop all engines, motors, fans, and devices which could provide sparks;
    - Extinguish all fires;
    - Close all ports, windows, doors, and hatches; and
    - Clear the area of people not directly involved with the operation of the vessel or servicing of the vessel.
- Persons fueling a vessel at a state commercial harbor shall:
    - Refrain from smoking, striking matches, or throwing switches; and
    - Keep the nozzle of the fuel hose, or fuel can in continuous contact with fuel tank opening to guard against static sparks.
- After fueling is completed, the following action shall be taken:
    - Close fill openings;
    - Wipe up all spilled fuel;

- Open all ports, windows, doors, and hatches;
- Permit vessel to ventilate for at least five minutes; and
- Check that there are no fuel fumes in the vessel's bilges or below deck spaces before starting machinery or lighting fires.

- Fueling a vessel from a fuel barge or tanker barge shall be allowed only when it is down in accordance with operational procedures approved by the USCG.

Chapter 42-137 – Fishing Prohibited

- Fishing, as defined in HRS 187A-1 is prohibited from all piers, wharves, and bulkhead walls in Kewalo Basin and Honolulu Harbor except Piers 5, 6, and 7; and all piers and wharves in Barbers Point Harbor. Casting of fishing lines beyond the shallow marginal reef and into the boat channel is prohibited from the Waikiki side of the Kewalo Basin entrance channel. Fishing with nets is prohibited in the basin and channel areas of Kewalo Basin, Barbers Point Harbor, and Honolulu Harbor except for the use of hand-held scoop nets for landing hooked fish at Piers 5, 6, and 7 in Honolulu Harbor and the shallow marginal reef at the Waikiki side of the Kewalo Basin entrance channel and as provided in these rules and HAR 188-34.

Chapter 42-138 – Lifesaving Equipment Required

- Any small craft and smaller commercial vessel utilizing the waters of a state commercial harbor shall be equipped with lifesaving equipment as required by and approved by the USCG. Wearable PFDs must be readily accessible and throwable devices must be immediately available for use
    - Boats 16 feet or over in length shall carry one Type I, II, or III (wearable) PFD for each person on board and one Type IV (throwable) PFD in each boat.
    - Boats less than 16 feet in length and all canoes and kayaks shall carry one Type I, II, III, or IV PFD for each person on board.

Chapter 42-139 – Fire Signal for Small Craft or Smaller Commercial Vessel in Harbor

- Five prolonged blasts on a vessel's whistle, horn or other sound producing device indicates (1) a fire on board small craft or smaller commercial vessel not under way or (2) a fire at any facility to which the small craft or smaller commercial vessel may be moored. The words "prolonged blasts" used in this section shall mean a blast from four to six seconds duration. The fire signal shall not be used for other purposes in any state harbor.

Chapter 42-140 – Liquor Prohibited on State Piers and Waterfront Properties without Permit

- No person shall consume any liquor as defined in HRS 281-1, on any state pier or waterfront property not under lease except by prior permission from the department for each occasion.

Chapter 42-141 – Responsibility for Vessel Gangplanks

- It shall be the responsibility of the vessel to provide a reliable and safe means of access and egress to and from the vessel and the pier for crew members, passengers, and visitors to the vessel.

Chapter 42-161 – Dredging, Filling, and Construction

- Any person, firm, or corporation desiring to perform any dredging, filling, or erecting of any construction within commercial harbors and entrance channels belonging to or controlled by the State, shall first obtain a permit therefore from the department.
- The application for any dredging, filling, or construction shall be in the form prescribed by the department, accompanied by maps and drawings which shall clearly show the location, scope, character, and details of the proposed work, and shall be further accompanies by a fee of $50 to cover costs of the necessary investigation. This fee is not refundable whether or not a permit is granted.

Chapter 42-162 – Jurisdiction of Other Agencies

- The United States Army Corps of Engineers, the State Department of Health, and the Department of Land and Natural Resources may have certain jurisdiction over navigable waters.
- The approval of these agencies shall also be secured before performing work within their jurisdictions. When directed, the applicant shall notify the USCG of such work for publication of a “Notice to Mariners.”

Chapter 42-163 – Installation of Buoys

- Any person desiring to install mooring or anchorage buoys in any harbor under the jurisdiction of the department, shall apply to the department in writing for permission to install such buoys.
- Applications must be accompanied by comprehensive plans showing the exact proposed location of buoys and anchors, as well as plans and specifications of the type and size of buoy and anchoring equipment. The director may grant permission for the installation of moorings or buoys in any area under the department jurisdiction if, in the director’s judgment, it is advisable and will not be a menace to or interfere with navigation. The right is reserved by the director to revoke any license or permission for installation at any time, if the director’s opinion revocation is necessary or advisable. Upon revocation, the owner shall remove the moorings or buoys without delay.

Chapter 42-164 – Construction of Structures

- No buildings or structures of any nature shall be erected or constructed on state property, nor shall existing structures be modified, without obtaining the prior permission of the division and any other governmental agency as required by law. The division may require plans, specifications, and other pertinent data to accompany any request for construction or modification of state facilities. In General, approval shall be dependent on an agreement to return the property to its original state when vacating the property, if requested by the division.

Note: The majority of Chapter 42 deals with loading and unloading of hazardous materials and does not apply to storage of materials and waste that are used/stored at harbor tenant facilities or construction sites. In the case of improper use, manage, or storage of hazardous substances or wastes, Harbors will follow the terms and conditions contained in the tenant lease agreement or revocable permit, or construction contracts as stated below.

Enforcement Officers may issue penalties under HAR Title 19 for the following circumstances:

- A responsible party in violation of an environmental regulation, but where a Written Warning is not an effective tool.
- A responsible party in violation of a Harbors requirement, but not in violation of HDOH stormwater regulations.
- A transient vessel owner in violation of a Harbors requirement, BMP, or HDOH stormwater regulation, although not subject to a tenant lease agreement, revocable permit, construction contract.

Lease Agreement Addendum 1

Environmental Compliance - Lessee's Duties

ADDENDUM 1

ENVIRONMENTAL COMPLIANCE – LESSEE'S DUTIES

A. Definitions.

For purposes of this Lease, Lessee agrees and understands that the following terms shall have the following meanings:

"Environmental Laws" shall mean all federal, state and local laws of every nature including statutes, ordinances, rules, regulations, codes, notices, standards, directives of every kind, guidelines, permits, licenses, authorizations, approvals, interpretations of the foregoing by any court, legislative body, agency or official, judicial decisions, orders, rulings or judgments, or rules of common law which currently are in effect or which may come into effect through enactment, issuance, promulgation, adoption or otherwise, which in any way pertain to, relate to, or have any relevance to the environment, health or safety. These environmental laws include, but are not limited to, regulations and orders of the federal Environmental Protection Agency and of the State of Hawaii Department of Health.

"Hazardous Substance" shall mean and include any chemical, substance, organic or inorganic material, controlled substance, object, condition, waste, living organism, or combination thereof which is, may be, or has been determined by proper state or federal authority under any environmental law to be, hazardous to human health or safety or detrimental to the environment. This term shall include, but not be limited to, petroleum hydrocarbons, asbestos, radon, polychlorinated biphenyls (PCBs), methane, and other materials or substances that are regulated by state or federal authorities.

B. Lessee's Activities and Duties.

1. **Compliance with Environmental Laws.** Lessee agrees, at its sole expense and cost, to comply with all environmental laws that apply to the leased premises during the term of this lease, and Lessee's occupancy of, and activities on, the leased premises. This duty shall survive the expiration or termination of this lease which means that the Lessee's duty to comply with environmental laws shall include complying with all environmental laws, regulations and orders that may apply, or be determined to apply, to the occupancy and activities of the Lessee on the leased premises after the expiration or termination of this lease. Failure of the Lessee to comply with any environmental laws shall constitute a breach of this lease for which the Lessor shall be entitled, in its discretion, to terminate this lease and take any other action at law or in equity it deems appropriate. Lessee shall conform its operations with 49 CFR, Part 195 (Pipeline Safety), and shall install Time Domain Reflectivity (TDR) cable leak detection and monitoring equipment, which meet or exceed industry standards, adjacent to the fuel pipelines and related facilities, to provide an indication of any leak occurrence from any fuel pipeline or containment

device. In addition, the Lessee shall install a secondary containment wall/vaulting to prevent releases into the environment. The Lessee shall also develop, implement, and follow a written integrity management program that addresses the risks of each pipeline, and provides for periodic assessment of the integrity of each pipeline through internal inspection, pressure testing, or other equally effective assessment means, on a regular basis.

2. **Hazardous Substances.** Lessee shall not use, store, treat, dispose, discharge, release, generate, create, or otherwise handle any Hazardous Substance, or allow the same by any third person, on the leased premises (with the exception of the intended routine management of the petroleum products within the proposed pipeline) without first obtaining the written consent of the Lessor and complying with all environmental laws, including giving all required notices, reporting to, and obtaining permits from, all appropriate authorities, and complying with all provisions of this lease.

3. **Notice to Lessor.** Lessee shall keep Lessor fully informed at all times regarding all environmental law related matters affecting the Lessee or the leased premises. This duty shall include, without limited the foregoing duty, providing the Lessor with a current and complete list and accounting of all hazardous substances of every kind which are present on or about the leased premises and with evidence that the Lessee has in effect all required and appropriate permits, licenses, registrations, approvals and other consents that may be required of or by federal and state authorities under all environmental laws. This duty shall also include providing immediate written notice of any investigation, enforcement action, remediation, or other regulatory action, order of any type, or any legal action, initiated, issued, or any indication of an intent to do so, communicated in anyway to the Lessee by any federal or state authority, or individual, which relates in any way to any environmental law, or any hazardous substance, and the Lessee or the leased premises. As part of this written notice to the Lessor, the Lessee shall also immediately provide the Lessor with copies of all written communications from individuals, or state and federal authorities, including copies of all correspondence, claims, complaints, warnings, reports, technical data and any other documents received or obtained by the Lessee. At least thirty days prior to termination of this lease, or termination of the possession of the leased premises by Lessee, Lessee shall provide the Lessor with written evidence satisfactory to the Lessor that Lessee has fully complied with all environmental laws, including any orders issued by any governmental authority to the Lessee that relate to the leased premises.

4. **Notice to Authorities.** Lessee shall provide written notice to the Environmental Protection Agency and the State of Hawaii Department of Health at least sixty days prior to the termination of this lease, or sixty days prior to Lessee's termination of possession of the leased premises, whichever occurs first, that Lessee intends to vacate the leased premises and terminate its operations on those leased premises. Lessee shall allow the agents or representatives of said authorities access to the leased premises at any and all reasonable times for the purpose of inspecting the leased premises, and taking samples of any material for inspection or testing for compliance with any environmental laws. Lessee shall provide copies of said written notices to Lessor at the time said notices are provided to said authorities.

5. **Disposal/Removal.** Except for materials that are lawfully sold in the ordinary course of the Lessee's business, Lessee shall cause any hazardous substances to be removed from the leased premises for disposal, and to be transported from the leased premises solely by duly licensed hazardous substances transporters, to duly licensed facilities for final disposal as

required by all applicable environmental laws. Lessee shall provide Lessor with copies of documentary proof, including manifests, receipts, or bills of lading, which reflect that said hazardous substances have been properly removed and disposed of in accordance with all environmental laws.

6. **Environmental Investigations and Assessments**. The Lessee, at its sole cost and expense, shall cause to be conducted such investigations and assessments of the leased premises to determine the presence of any hazardous substance on, in, or under the leased premises as may be directed from time to time by the Lessor, in its sole discretion, or by any federal or state authority. The extent and number of any environmental investigations and assessments shall be determined by the Lessor or the federal or state authority directing said investigations and assessments to be conducted. Lessee shall retain a competent and qualified person or entity that is satisfactory to the Lessor or governmental authority, as the case may be, to conduct said investigations and assessments. Lessee shall direct said person or entity to provide the Lessor or governmental authority, if so requested, with testable portions of all samples of any soils, water, ground water, or other material that may be obtained for testing, and provide to the Lessor and the governmental authority written results of all tests on said samples upon completion of said testing.

7. **Remediation.** In the event that any hazardous substance is used, stored, treated, disposed on the premises, handled, discharged, released, or determined to be present on the leased premises, Lessee shall, at its sole expense and cost, remediate the leased premises of any hazardous substances, and dispose/remove said hazardous substance in accordance with paragraph 4. This duty to remediate includes strictly complying with all environmental laws and directives to the Lessee to remediate said hazardous substance from the Lessor. This duty to remediate shall include replacement of any materials, such as soils, so removed with material that is satisfactory to the Lessor and governmental authority, as the case may be. In the event Lessee does not remediate the leased premises to the same condition as it existed at the commencement of the lease, as determined by the Lessor, Lessee understands and agrees that Lessor may exercise its rights under the paragraph entitled Lessor's Right to Act, and until such time as the remediation is complete to the satisfaction of the Lessor, Lessee shall be liable for lease rent in the same manner and amount as if the lease had continued in effect during the period of remediation.

8. **Restoration and Surrender of Premises.** The Lessee hereby agrees to restore the leased premises, at its sole cost and expense, including the soil, water and structures on, in, or under the leased premises to the same condition as the premises existed at the commencement of this lease, fair wear and tear to the structures excepted. In the event Lessee does not restore the leased premises to the same condition as it existed at the commencement of the lease, as determined by the Lessor, Lessee understands and agrees that Lessor may exercise its rights under the paragraph entitled Lessor's Right to Act, and until such time as the restoration is complete to the satisfaction of the Lessor, Lessee shall be liable for lease rent in the same manner and amount as if the lease had continued in effect during the period of restoration.

9. **Lessor's Right to Act**. In the event Lessee fails for any reason to comply with any of its duties under this lease or under any environmental laws within the time set for doing so, or within a reasonable time as determined by the Lessor, Lessor shall have the right, but not the obligation, in its sole discretion, to perform those duties, or cause them to be performed. Lessee

hereby grants access to the leased premises at all reasonable hours to the Lessor, its agents, and anyone designated by the Lessor in order to perform said acts and duties. Any cost, expense, or liability of any type that may be incurred by the Lessor in performing said acts or duties shall be the sole responsibility of the Lessee, and Lessee hereby agrees to pay for those costs and expenses, and indemnify the Lessor for any liability incurred. This obligation shall extend to any costs and expenses incident to enforcement of Lessor's right to act, including litigation costs, attorneys fees, and the costs and fees for collection of said cost, expense or liability.

10. **Release and Indemnity**. Lessee hereby agrees to release the Lessor, its officers, agents, successors, and assigns from any liability of any kind, including, but not limited to, any liability for any damages, penalties, fines, judgments, or assessments that may be imposed or obtained by any person, agency, or governmental authority against the Lessee by reason of any hazardous substance that may be present by whatever means on, in or under the leased premises. The Lessee hereby agrees to indemnify, defend with counsel suitable to the Lessor, and hold harmless the Lessor from any liability that may arise in connection with, or by reason of, any occurrence involving any hazardous substance that may be alleged to be connected or related in any way with the leased premises, the Lessor's ownership of the premises, or this lease, including the presence of any hazardous substance on the leased premises.

11. **Surety/Performance Bond for Cleanup/Restoration**. At its sole cost and expense, Lessee shall provide the Lessor with a Bond, or other security satisfactory to Lessor, in the amount of $100,000.00 to assure removal of any hazardous substances, and the remediation and restoration of the leased premises during the term of, and at the conclusion of the lease so as to comply with the terms of this lease to the satisfaction of the Lessor, and in order to comply with environmental laws. Lessee shall provide written evidence that said Bond or security has been secured by the Lessee, which evidence shall indicate the term during which said Bond or other security shall irrevocably remain in effect.

12. **Insurance.** Effective at the commencement of this lease, Lessee shall obtain and keep in force a comprehensive liability and property damage policy of insurance issued by an insurer licensed to do business in the State of Hawaii, with limits of indemnity coverage no less than $1,000,000. Said policy of insurance shall provide coverage for personal injury or damage to property caused by hazardous substances or any occurrence that may constitute a violation of any environmental law by the Lessee. Said policy of insurance shall name the Lessor as an additional insured. Lessee shall provide proof of said insurance satisfactory to the Lessor which shall include, at a minimum, the coverage provided, and the term during which said policy shall be effective.

DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
79 South Nimitz Highway
Honolulu, Hawaii 96813

REVOCABLE PERMIT NO. H-12-XXXX

The STATE OF HAWAII, hereinafter called the "STATE," hereby grants to the "PERMITTEE" permission to enter, use and occupy on a month-to-month basis, the premises described in item 2, and designated on Exhibit "A," attached hereto and made a part hereof, for the purpose(s) specified in item 4; and the PERMITTEE agrees to pay the rental specified in item 5, and to perform all other obligations imposed upon it by the Terms and Conditions hereof.

1. PERMITTEE:

2. PREMISES: _____, as shown on attached Exhibit "A"

3. LOCATION:

4. PURPOSE:

5. RENTAL:

6. SECURITY DEPOSIT:

7. EFFECTIVE DATE:

Dated at Honolulu, Hawaii, _____

BOARD OF LAND AND NATURAL RESOURCES

By _____
Chairperson and Member

Approved by the Board
at its meeting held on

_____

STATE OF HAWAII

By _____
Harbors Administrator

By _____
Its

1. **TERM.** This Permit is granted on a month-to-month basis only, for a period not to exceed

one (1) year from the effective date hereof. Any renewal of this Permit shall be on a month-to-month basis for a period not to exceed one (1) year. Notice of renewal need not be reduced to writing, it
being agreed that such renewal shall be automatic unless a party hereto shall give the other party ten (10) working days' notice of its intention not to renew or unless the Board of Land and Natural Resources shall fail to approve the renewal. Further, this Permit will not be renewed, or a new Permit granted should the PERMITTEE not be current in its obligations to the STATE.

2. **PERMITTEE'S PRIOR INSPECTION.** The PERMITTEE warrants that it has inspected the Premises and all improvements thereon, knows the condition thereof, accepts the premises in an "as is" condition, including soil, water, structures, and fully assumes all risks incident to the use and enjoyment of the Premises, but excluding any Hazardous Substances that may be found to exist on the premises on the commencement date of this permit and which existing hazardous substance shall be governed by paragraph 26 of this permit.

3. **SECURITY DEPOSIT.** The PERMITTEE, upon execution of this Permit, shall deposit with the STATE in legal tender or in such other form as may be acceptable to the STATE an amount equal to two (2) months' rental as security for the faithful performance on its part of all the terms and conditions, including the special terms and conditions, if any, specified in paragraph 26 of this Permit. The said deposit will be returned, without interest, to the PERMITTEE upon the termination of this Permit only if it has faithfully performed said terms and conditions to the satisfaction of the STATE. In the event the PERMITTEE does not so perform, the STATE may declare the deposit forfeited or apply it as an offset to any amounts owed by the PERMITTEE to the STATE under this Permit or to any damages or loss to the STATE caused by the breach by the PERMITTEE of such terms and conditions. The exercise of this option is without prejudice to the right of the STATE to exercise its rights under the Environmental Compliance-Permittee's Duties provision below including, but not limited to, the requirement for obtaining a surety/performance bond and the STATE's rights thereunder. Furthermore, the exercise of the STATE's rights under this provision concerning Security deposit is without prejudice to the rights of the STATE to institute action for debt or damages against the PERMITTEE or to take any other or further action against the PERMITTEE provided by law for the enforcement of the rights of the STATE under this Permit.

4. **INSURANCE.** The PERMITTEE shall, concurrently with the execution of this Permit, deliver to the STATE, a Commercial Liability Insurance policy or policies, or a certificate of insurance in lieu thereof, evidencing that such policy has been issued and is in force, with a combined single limit of not less than $1,000,000.00 for bodily injury and damage to property per occurrence and $2,000,000.00 aggregate. The specification of limits contained herein shall not be construed in any way to be a limitation on the liability of the PERMITTEE for any injury or damage or for any rent, service charge or other charges under this Permit.

Such insurance shall (a) be issued by an insurance company or surety company authorized to do business in the State of Hawaii or approved in writing by the Director of Transportation; (b) name the State of Hawaii as an additional insured; (c) provide that the Department of Transportation shall be notified at least thirty (30) days prior to any termination, cancellation or material change in its insurance coverage; (d) cover all injuries, losses or damages arising from,

growing out of or

caused by any acts or omissions of the PERMITTEE, its officers, agents, employees, invitees or licenses, in connection with the PERMITTEE's use or occupancy of the Premises including any act or omission related to any Hazardous Waste; and (e) be maintained and kept in effect at the PERMITTEE's own expense throughout the life of this Permit, evidenced by furnishing the STATE without notice or demand a like certificate upon each renewal thereof.

Permittee will immediately provide written notice to the contracting department or agency should any of the insurance policies evidenced on its Certificate of Insurance form be cancelled, limited in scope, or not renewed upon expiration.

The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii.

It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contribute with, provided by this policy. **See also Environmental Compliance – Permittee's Duties below**.

5. **INDEMNITY.** The PERMITTEE shall at all times with respect to the Premises use due care for public safety and shall defend, hold harmless and indemnify the STATE, its officers, agents and employees from and against all claims or demands for damages, including claims for property damage, personal injury or death, (a) arising on the Premises, or by reason of any fire or explosion thereon; or (b) arising from, growing out of, or caused by any act or omission on the part of the PERMITTEE its officers, agents, employees, invitees or licenses in connection with the PERMITTEE'S use or occupancy of the Premises. **See also Environmental Compliance – Permittee's Duties below**.

6. **METHOD OF PAYMENT OF RENTAL AND SERVICE CHARGE ON DELINQUENT RENTALS AND OTHER CHARGES.** The monthly rental shall be payable in advance, without notice or demand, at the Harbors Division Fiscal Office on Oahu and at the appropriate District Office on Hawaii, Maui or Kauai, on the first (1st) day of each and every month during the life of this Permit.

Interest; Service Charge: Without prejudice to any other remedy available to the STATE, the PERMITTEE agrees without further notice or demand as follows: (a) To pay interest at the rate of one percent (1%) per month, compounded monthly on all delinquent payments; (b) To pay a service charge of $30.00 a month for all delinquent payments, or such other charge as may be prescribed by rules adopted by the STATE, provided that in no event shall a service charge in excess of $50.00 be levied under this Permit; and (c) That the term "delinquent payments" as used herein means fees, rents, service charges and other charges payable by the PERMITTEE to the STATE, which are not paid when due.

7. **ACCEPTANCE OF RENT NOT A WAIVER.** The acceptance of rent by the STATE shall not constitute a waiver of any breach by the PERMITTEE of any of the terms and conditions upon which this Permit is granted and to which the PERMITTEE agrees, or of the

STATE's right to terminate or revoke this Permit. Failure by the STATE to insist upon strict performance hereof by the PERMITTEE, or to exercise any option herein reserved, shall not be construed as a waiver or as a relinquishment of any of its rights under this Permit.

8. **RESERVATION OF RIGHT TO INCREASE OR DECREASE RENT.** The STATE reserves the right to increase or decrease the monthly rental at any time upon thirty (30) days' advance written notice.

9. **UTILITIES AND OTHER CHARGES.** The PERMITTEE shall be responsible for and pay all charges for water, electricity, telephone and other utilities and all charges for sewer, garbage and trash disposal; where any of such services are provided by the STATE at the request of the PERMITTEE, it shall pay the STATE's charges therefore.

10. **WASTE, STRIP AND NUISANCE; MAINTENANCE.** The PERMITTEE shall not make, permit or suffer any waste, strip, nuisance or any other unlawful, improper or offensive use of the Premises.

The PERMITTEE shall maintain the Premises, improvements thereon, all equipment and other personal property of the PERMITTEE upon the Premises in a strictly clean, neat, safe, orderly and sanitary condition, free of waste, rubbish and debris and shall provide for the safe and sanitary handling and disposal of all trash, garbage and other refuse from the Premises**. See also Environmental Compliance – Permittee's Duties below**.

11. **NOTICES.** All notices, demands and requests which may be given or which are required to be given by either Party to the other pursuant to this Agreement, shall be in writing and shall be deemed effective either: (a) on the date personally delivered to the address below, as evidenced by written receipt therefore, whether or not actually received by the person to whom addressed; (b) on the third (3rd) business day after being sent, by certified or registered mail, addressed to the intended recipient at the address specified below whether or not actually received by the person to whom addressed or any return receipt is executed; (c) on the first (1st) business day after being deposited into the custody of a nationally recognized overnight delivery service such as Federal Express Corporation, DHL, Emery or Purolator, addressed to such party at the address specified below, or (d) on the date of transmission by facsimile or electronic mail to the respective numbers or addresses specified provided that a "hard" copy is post-marked the same date by first-class certified mail or sent via nationally recognized overnight delivery service to the address specified below. All notices to a Party shall be made to the address below unless the Party gives notice of a change of name or address or number, and thereafter, notices to that Party shall be given as demanded in that notice:

a. If to Lessee/Permittee: Name: _____

_____

Address: _____

City: _____

Zip Code: _____

Phone: (808) _____

Fax: (808) _____

b. If to DOT: State of Hawaii Department of Transportation
869 Punchbowl Street, 5th Floor
Honolulu, Hawaii 96813-5097
Attn: Director
Phone: (808) 587-2150
Fax: (808) 587-2167

c. With a copy to: State of Hawaii Department of Transportation
Harbors Division
Property Management Section
79 South Nimitz Highway
Honolulu, HI 96813
Attn: Harbors Administrator
Phone: (808) 587-1940
Fax: (808) 587-2504

12. **ENTRY BY STATE.** The STATE or its agents and employees may enter the Premises at all reasonable hours to inspect the Premises and determine if the PERMITTEE is complying with the terms and conditions of this Permit or for any other proper purpose. The PERMITTEE shall not make any claim for damages or set off of rent, service charge or other charges by reason or on account of such entry.

13. **REPAIRS.** The PERMITTEE shall, at its own expense, keep and maintain the Premises in condition similar to that which existed on the effective date of this Permit, ordinary wear and tear and damage by acts of God excepted. **See also Environmental Compliance – Permittee's Duties below**.

14. **STRUCTURAL IMPROVEMENTS, ALTERATIONS OR ADDITIONS.** No substantial improvement, alteration or addition of a structural nature shall be made, installed or constructed on, under or within the Premises by the PERMITTEE unless it first submits its plans and specifications thereof to the STATE for its approval and unless said plans and specifications are in fact approved in writing by the STATE. A total of four (4) sets of the proposed plans, stamped by a licensed engineer authorized to conduct business in the State, shall be submitted to the State for its review and approval. Such plans and specifications shall not be submitted unless they are in full compliance with all applicable statutes and rules and regulations. Any improvements, alterations or additions shall be accomplished at the sole cost and risk of the PERMITTEE and the STATE shall not be responsible for any damage to or destruction of any such improvements, alterations or additions or any personal property on the Premises. The Permittee shall also provide notice to the responsible agencies, including the Office of Environmental Quality, and otherwise comply with H.R.S. Chapter 343 to determine if such improvement, alteration or addition requires environmental assessments or statements. **See Environmental Compliance – Permittee's Duties below**.

15. **REMOVAL OF IMPROVEMENTS OR ADDITIONS.** The PERMITTEE may remove, at its own cost and risk, any and all improvements or additions or any portions thereof, constructed or installed by it upon the Premises, at any time during the life of this Permit or within thirty (30) days after the termination or revocation hereof; provided that, the PERMITTEE shall give, prior to said termination or revocation, written notice of its intent to remove the same and that in the event of such removal, the Premises shall be restored by the PERMITTEE to a condition similar to that which existed immediately prior to the construction or installation thereof; ordinary wear and tear excepted and damage by acts of God excepted; provided further that, until such removal and restoration has been completed to the satisfaction of the STATE, the PERMITTEE shall continue to pay the rent set forth in item 5 herein. Failure of the PERMITTEE to give notice of intention to remove prior to termination or revocation shall be deemed to be an abandonment of said improvements or additions. **See also Environmental Compliance – Permittee's Duties below**.

16. **OPTION TO REQUIRE REMOVAL OF IMPROVEMENTS OR ADDITIONS.** The STATE, with respect to any improvements or additions or any portions thereof constructed or installed by the PERMITTEE on the Premises, reserves the right within twenty (20) working days after the date of termination or revocation of this Permit to require the PERMITTEE to remove the same at the PERMITTEE's cost and risk within thirty (30) days after said termination or revocation. Upon failure of the PERMITTEE to effect such removal within the specified time, the STATE may effect such removal, and restore the Premises to a condition similar to that which existed immediately prior to the construction or installation of the improvements or additions by its own employees or by an independent contractor and assess the PERMITTEE the total cost thereof.

17. **COMPLIANCE WITH LAWS; DISCRIMINATION PROHIBITED.** The PERMITTEE shall comply with all laws, ordinances and rules and regulations of all governmental agencies, applicable to the Premises or relating to and affecting any business or other commercial activity conducted on the Premises.

The use and enjoyment of the Premises shall not be in support of any policy which discriminates against anyone based upon race, creed, color, sex or national origin.

The PERMITTEE, for itself, its personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree as a covenant running with the land that in the event facilities are constructed, maintained, or otherwise operate on the said property described in this permit for a purpose for which a United States Department of Transportation program or activity is extended or for another purpose involving the provision of similar services or benefits. The PERMITTEE shall maintain and operate such facilities and services in compliance with all other requirements imposed pursuant to Title 49, Code A, Office of the Secretary, Part 21, Non-Discrimination in Federally-Assisted programs of the Department of Transportation-Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations may be amended.

That in the event of breach of any of the above non-discrimination covenants, the STATE shall have the right to terminate this permit and re-enter and repossess said land and the facilities thereon, and hold the same as if said permit had never been made or issued.

The PERMITTEE assures that it will undertake an affirmative action program as required by
14 CFR Part 152, Subpart E, to insure that no person shall on the grounds of race, creed, color, national origin, or sex, be excluded from participating in any employment activities covered in 14 CFR Part 152, Subpart E. The PERMITTEE assures that no person shall be excluded on these grounds from participating in or receiving the services or benefits of any program or activity covered by this subpart. The PERMITTEE assures that it will require that its covered suborganizations provide assurances to the STATE that they similarly will undertake affirmative action programs and that they will require assurances from their suborganizations as required by 14 CFR Part 152, Subpart E, to the same effect.

18. **TRANSFERABILITY.** This Permit and the Premises or any part thereof, inclusive of any and all rights or obligations accruing or arising under it, shall not be sold, transferred, assigned, leased, mortgaged, sublet or otherwise alienated or encumbered in any manner whatsoever.

19. **PROPERTY TAXES.** The PERMITTEE shall pay all real property taxes lawfully assessed against the Premises.

20. **TERMINATION AND REVOCATION.** This Permit may be terminated by either party without cause upon thirty (30) days advance written notice; provided that, in the event the PERMITTEE fails to pay any rental, service charge, fees or charges when due or otherwise breaches any of the terms and conditions, the STATE may revoke this Permit upon five (5) working days written notice.

21. **RIGHT TO RE-ENTER AND ASSUME POSSESSION.** The STATE reserves the right and PERMITTEE agrees that, upon breach of any one or more of the terms and conditions of this Permit and/or termination thereof under paragraph 19 herein, the STATE may without necessity of court action, enter upon and administratively take possession of the Premises from PERMITTEE.

22. **RESTORATION.** The PERMITTEE shall within thirty (30) days of the termination or revocation of this Permit, restore the Premises, at its own cost and risk to a condition similar to that which existed prior to the effective date of this Permit, reasonable and ordinary wear and tear and damage by acts of God excepted, and peacefully surrender possession thereof to the STATE. In the event the PERMITTEE fails to effect such restoration of the Premises, the STATE may accomplish the same by its own employees or by an independent contractor and assess the PERMITTEE the total cost thereof. **See also Environmental Compliance – Permittee's Duties below**.

23. **HOLD OVER TENANCY**. If the PERMITTEE does not vacate the Premises upon the revocation or termination of the Permit, the PERMITTEE shall pay the STATE hold over rent. The rent for each day, or part of a day, during which the PERMITTEE remains in possession will be the amount payable immediately prior to the revocation or termination of the Permit. During any hold over period, the PERMITTEE shall be deemed an illegal occupant and acceptance of such payment by the STATE shall not constitute a waiver of any of the terms and conditions of

this permit and shall not preclude the STATE from pursuing any other rights or remedies the STATE may be entitled to pursue under this Permit, including but not limited to assuming possession of the Premises as provided in paragraph 20 above or bringing an ejectment action for the recovery of Premises, without first giving notice to quit or making a demand for possession.

24. **COURT COSTS AND ATTORNEY'S FEES.** The PERMITTEE shall pay any and all court costs and attorney's fees incurred or paid by the STATE in collecting rents, penalties, service charges, fees or other charges due from or payable by the PERMITTEE under this Permit in removing from the Premises the PERMITTEE and any improvements or additions constructed or installed by it thereon, or in recovering any damages or losses caused by the PERMITTEE's breach of any of the terms or conditions of this Permit.

25. **INTERPRETATION.** The use of any gender shall include all genders, the use of the singular shall include the plural and the use of the plural shall include the singular, as the context may require.

26. **CONFLICTING TERMS AND CONDITIONS.** When an inconsistency exists between these Terms and Conditions and the Special Terms and Conditions, the Special Terms and Conditions shall govern.

27. **SPECIAL TERMS AND CONDITIONS.**

ENVIRONMENTAL COMPLIANCE – PERMITTEE'S DUTIES

A. Definitions.

For purposes of this Revocable Permit, Permittee agrees and understands that the following terms shall have the following meanings:

"Environmental Laws" shall mean all federal, state and local laws of every nature including statutes, ordinances, rules, regulations, codes, notices, standards, directives of every kind, guidelines, permits, licenses, authorizations, approvals, interpretations of the foregoing by any court, legislative body, agency or official, judicial decisions, orders, rulings or judgments, or rules of common law which currently are in effect or which may come into effect through enactment, issuance, promulgation, adoption or otherwise, which in any way pertain to, relate to, or have any relevance to the environment, health or safety. These environmental laws include, but are not limited to, regulations and orders of the federal Environmental Protection Agency and of the State of Hawaii Department of Health.

"Hazardous Substance" shall mean and include any chemical, substance, organic or inorganic material, controlled substance, object, condition, waste, living organism, or combination thereof which is, may be, or has been determined by proper state or federal authority under any environmental law to be, hazardous to human health or safety or detrimental to the environment. This term shall include, but not be limited to, petroleum hydrocarbons, asbestos, radon,

polychlorinated biphenyls (PCBs), methane, and other materials or substances that are regulated by state or federal authorities.

B. **Permittee's Activities and Duties**.

1. **Compliance with Environmental Laws**. Permittee agrees, at its sole expense and cost, to comply with all environmental laws that apply to the premises during the term of this Revocable Permit, and Permittee's occupancy of, and activities on, the premises. This duty shall survive the expiration or termination of this Revocable Permit which means that the Permittee's duty to comply with environmental laws shall include complying with all environmental laws, regulations and orders that may apply, or be determined to apply, to the occupancy and activities of the Permittee on the premises after the expiration or termination of this Revocable Permit. Failure of the Permittee to comply with any environmental laws shall constitutes a breach of this Revocable Permit for which the State shall be entitled, in its discretion, to terminate this Revocable Permit and take any other action at law or in equity it deems appropriate.

2. **Hazardous Substances**. Permittee shall not use, store, treat, dispose, discharge, release, generate, create, or otherwise handle any Hazardous Substance, or allow the same by any third person, on the premises without first obtaining the written consent of the State and complying with all environmental laws, including giving all required notices, reporting to, and obtaining permits from, all appropriate authorities, and complying with all provisions of this Revocable Permit.

3. **Notice to the State**. Permittee shall keep the State fully informed at all times regarding all

Environmental law related matters affecting the Permittee or the premises. This duty shall include, without limit to the foregoing duty, providing the State with a current and complete list and accounting of all hazardous substances of every kind which are present on or about the premises and with evidence that the Permittee has in effect all required and appropriate permits, licenses, registrations, approvals and other consents that may be required of or by federal and state authorities under all environmental laws. This duty shall also include providing immediate written notice of any investigation, enforcement action, remediation or other regulatory action, order of any type, or any legal action, initiated, issued, or any indication of an intent to do so, communicated in anyway to the Permittee by any federal or state authority or individual which relates in any way to any environmental law or any hazardous substance and the Permittee or the premises. This written notice to the State shall include the Permittee immediately providing the State with copies of all written communications from individuals or state and federal authorities, including copies of all correspondence, claims, complaints, warnings, reports, technical data and any other documents received or obtained by the Permittee. At least thirty (30) days prior to termination of this Revocable Permit, or termination of the possession of the premises by Permittee, which ever shall first occur, Permittee shall provide the State with written evidence satisfactory to the State that Permittee has fully complied with all environmental laws, including

any orders issued by any governmental authority to the Permittee that relate to the premises.

4. **Notice to Authorities**. Permittee shall provide written notice to the Environmental Protection Agency and the State of Hawaii Department of Health at least sixty (60) days prior to the termination of this Revocable Permit, or sixty (60) days prior to Permittee's termination of possession of the premises, whichever occurs first, the fact that Permittee intends to vacate the premises and terminate its operations on those premises. Permittee shall allow the agents or representatives of said authorities' access to the premises at any and all reasonable times for the purpose of inspecting the premises and taking samples of any material for inspection or testing for compliance with any environmental laws. Permittee shall provide copies of said written notices to the State at the time said notices are provided to said authorities.

5. **Disposal/Removal**. Except for materials that are lawfully sold in the ordinary course of the Permittee's business and for which the Permittee has obtained all required authorizations from appropriate authorities including the prior written permission of the State to have said substance on the premises, Permittee shall cause any hazardous substances to be removed from the premises for disposal. This duty shall include the transportation of said hazardous substance from the premises solely by duly licensed hazardous substance transporters to duly licensed facilities for final disposal as required by all applicable environmental laws. Permittee shall provide the State with copies of documentary proof, including manifests, receipts or bills of lading, which reflect that said hazardous substances have been properly removed and disposed of in accordance with all environmental laws.

6. **Environmental Investigations and Assessments**. The Permittee, at its sole cost and expense, shall cause to be conducted such investigations and assessments of the premises to determine the presence of any hazardous substance on, in, or under the premises as may be directed from time to time by the State, in its sole discretion, or by any federal or state authority. The extent and number of any environmental investigations and assessments shall be determined by the State or the federal or state authority directing said investigations and assessments to be conducted. Permittee shall retain a competent and qualified person or entity that is satisfactory to the State or governmental authority, as the case may be, to conduct said investigations and assessments. Permittee shall direct said person or entity to provide the State or governmental authority, if so requested, with testable portions of all samples of any soils, water, ground water or other material that may be obtained for testing and provide directly to the State and the governmental authority at the sole expense of the Permittee written results of all tests on said samples upon completion of said testing.

7. **Remediation**. In the event that any hazardous substance is used, stored, treated, disposed on the premises, handled, discharged, released, or determined to be present on the premises, or to have migrated from the premises, Permitteee shall, at its sole expense and cost, remediate the premises, or any location off the premises to which it is determined that the hazardous substance has migrated, of any hazardous substances. Said duty to remediate includes the removal and disposal of said hazardous substances in accordance with paragraph 5. This duty to remediate

includes strictly complying with all environmental laws and directives to remediate said hazardous substance issued from the State or any federal or State governmental authority charged with enforcing the
Environmental laws. This duty to remediate shall include replacement of any materials, such as soils, removed with material that is satisfactory to the State and governmental authority, as the case may be.

8. **Restoration and Surrender of Premises**. The Permittee hereby agrees to restore the premises, at its sole cost and expense, including the soil, water and structures on, in, or under the premises, to the same condition as the premises existed at the commencement of this Revocable Permit, fair wear and tear to the structures excepted. In the event Permittee does not restore the premises to the same condition as it existed at the commencement of the Revocable Permit, as determined by the State, the Permittee understands and agrees that the State may exercise its rights under the paragraph entitled State's Right to Act, and until such time as the restoration is complete to the satisfaction of the State, Permittee shall be liable for Revocable Permit rent in the same manner and amount as if the Revocable Permit had continued in effect during the period of restoration.

9. **State's Right to Act**. In the event the Permittee fails for any reason to comply with any
of its duties under this Revocable Permit or under any environmental laws within the time set for doing so, or within a reasonable time as determined by the State, the State shall have the right, but not the obligation, in its sole discretion, to perform those duties, or cause them to be performed. Permittee hereby grants access to the premises at all reasonable hours to the State, its agents and anyone designated by the State in order to perform said acts and duties. Any cost, expense or liability of any type that may be incurred by the State in performing said acts or duties shall be the sole responsibility of the Permittee and Permittee hereby agrees to pay for those costs and expenses and indemnify the State for any liability incurred. This obligation shall extend to any costs and expenses incident to enforcement of State's right to act, including litigation costs, attorneys' fees and the costs and fees for collection of said cost, expense or liability.

10. **Release and Indemnity**. Permittee hereby agrees to release the State, its officers, agents,
successors and assigns from any liability of any kind, including, but not limited to, any liability for any damages, penalties, fines, judgments or assessments that may be imposed or obtained by any person, agency or governmental authority against the State and/or the Permittee by reason of any hazardous substance that may be present by whatever means on, in or under the premises. The Permittee hereby agrees to indemnify, defend with counsel suitable to the State, and hold harmless the State from any liability that may arise in connection with, or by reason of, any occurrence involving any hazardous substance that may be alleged to be connected or related in any way with the premises, the State's ownership of the premises, or this Revocable Permit, including the presence of any hazardous substance on the premises. Permittee understands and agrees that any assessments, fines or penalties that may be assessed against the Permittee or the State by reason of any environmental law violation concerning the premises shall be paid, complied with, and in every way satisfied by the Permittee and not the State.

11. **Surety/Performance Bond for Cleanup/Restoration**. At its sole cost and expense, Permittee shall provide the State with a Bond, or other security satisfactory to State, in the amount of **$ N/A** to assure removal of any hazardous substances and the remediation and restoration of the premises during the term o f, and at the conclusion of the Revocable Permit so as to comply with the terms of this Revocable Permit to the satisfaction of the State and in order to comply with environmental laws. Permittee shall provide written evidence that said Bond or security has been secured by the Permittee which evidence shall indicate the term during which said Bond or other security shall irrevocably remain in effect.

12. **Insurance.** Effective at the commencement of this Revocable Permit, Permittee shall obtain and keep in force a comprehensive liability and property damage policy of insurance issued by an insurer licensed to do business in the State of Hawaii with limits of indemnity coverage no less than $1,000,000.00 per occurrence and $2,000,000.00 aggregate. Said policy of insurance shall provide coverage for personal injury and damage to property caused by hazardous substances or any occurrence that may constitute a violation of any environmental law by the Permittee or the State. Said policy of insurance shall name the State as an additional insured. Permittee shall provide proof of said insurance satisfactory to the State which shall include, at a minimum, the coverage provided and the term during which said policy shall be effective.

Permittee will immediately provide written notice to the contracting department or agency should any of the insurance policies evidenced on its Certificate of Insurance form be cancelled, limited in scope, or not renewed upon expiration.

The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii.

It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contribute with, provided by this policy.

28. **AMERICANS WITH DISABILTIES ACT**

A. The PERMITTEE shall comply with the rules and regulations relating to the Americans with Disabilities Act (ADA) 28 C.F.R. Part 36 entitled, "Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities." The ADA Title III Regulation prohibits discrimination on the basis of disability by public accommodations and requires places of public accommodation and commercial facilities to be designed, constructed, and altered in compliance with the accessibility standards established by 28 C.F.R Part 36. Plans to construct or alter the existing improvements shall be reviewed and preapproved by the STATE prior to any construction commencing. PERMITTEE's failure to comply with this provision shall be considered a breach of the terms and conditions of this agreement which may result in the revocation of this permit and termination of PERMITTEE's occupancy.

Attachment 3

Best Management Practices

Storm Water
BEST MANAGEMENT PRACTICES

Vehicle and Equipment Washing

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can generate dry weather runoff contaminated with detergents, heavy metals, oils and greases, toxic substances, sediments, and other pollutants.

Releasing pollutants directly or indirectly into the storm drain system or the harbor by vehicle or equipment washing is a violation of the Harbor Municipal Separate Storm Sewer System (MS4) General Permit. Proper employee training, BMP implementation, and pollution prevention methods are required for compliance with the Harbor's Storm Water Management Plan (SWMP).

BMP Implementation

Primary Option: Off-site Washing

Facilities with small fleets should consider contracting with a commercial car wash. Commercial car wash facilities often recycle their water or are required to treat their wash water discharge prior to release into the sanitary sewer system. Pressure cleaning and steam cleaning should be done off-site to avoid generating runoff with high pollutant concentrations.

Secondary Option: On-Site Washing

NOTE: ON-SITE WASHING IS ALLOWED ONLY AFTER WASHING PROCEDURES ARE SUBMITTED TO THE HDOT HARBORS DIVISION FOR FORMAL APPROVAL

Vehicle and equipment washing should be conducted only in designated areas specifically designed to collect and hold generated wash and rinse water.

"For small jobs, berm the area surrounding the vehicle and use a wet/dry vacuum to capture the wash water for discharge to the sanitary sewer. For larger jobs, use a combination of berms and a vacuum truck, such as those used to clean storm and sanitary sewer systems, to capture and safely dispose of wash water. If detergents are used, clean the pavement to prevent this material from being carried to the storm drain during the next rainstorm." [1]

The contained wash water effluent should be recycled, discharged to the sanitary sewer system (permit may be required) or collected for off-site disposal at a permitted facility. Additionally, designated wash areas should be paved and contained using berms and a sump. Use hose nozzles with automatic shut off and bio-degradable soaps where appropriate. Inspect paved surfaces within the wash area and clean periodically to remove buildup of particulate matter or other pollutants. Vehicle maintenance, chemical storage, and other activities that could release pollutants are prohibited in washing areas. Train employees on proper cleaning, maintenance, and wash water disposal procedures. Documentation of this training should include a list of attendees, the date, the topic covered, and signatures of attendees.

[1] EPA Municipal Vehicle and Equipment Washing BMP Fact Sheet

The State Department of Transportation, Harbors Division has developed the Storm Water Management Plan (SWMP) in compliance with the National Pollutant Discharge Elimination System (NPDES) and the State of Hawaii Municipal Separate Storm Sewer System (MS4) General Permit requirements.

The SWMP is administered by the Environmental Section under the Engineering Branch.

Phone: 808-587-1962

Website: http://hidot.hawaii.gov/harbors/library/storm-water-management/



Storm Water
BEST MANAGEMENT PRACTICES

Vehicle and Equipment Fueling

Transfer and storage of bulk petroleum products (i.e. gasoline, diesel fuel, and motor oil) have the potential to pollute storm water run-off. Implementation of BMPs is required to prevent or reduce petroleum pollutants from entering the storm water drainage system. Both administrative controls, such as employee training and inspections, and structural controls, such as an automatic shut-off device and secondary containment, are necessary for an effective pollution prevention program.

BMP Implementation

Primary Option: Off-site Fueling

Utilize off-site commercial fueling facilities whenever feasible.

Secondary Option: On-Site Fueling

Vehicle fueling should be conducted only in designated areas specifically designed to contain spills and prevent contact with storm water.

- Avoid positioning upstream or adjacent storm drainage features.
- Utilize impervious surfaces and containment designed to prevent storm water run-on/off.
- Ensure spill kits are available (immediately clean up and properly dispose of used absorbent materials).
- Equip dispensing nozzles with automatic shut-off controls.
- Utilize drip pans if remote or mobile fueling is required.

Secondary containment must be provided for aboveground storage tanks if the facility's aggregate shell capacity of containers 55 gallons or greater exceeds 1,320 gallons.

- Containment required to be 110% of largest tank capacity.
- Containment required to have locking drain valve.
- Record containment inspections and uncontaminated rain water discharges.
- Develop Spill Prevention, Control, and Countermeasures (SPCC) Plan required per Federal/State regulations.

Periodic inspections should be performed of petroleum handling equipment and other structural controls. Train employees (document) on proper fueling and spill response responsibilities. Report all spills in accordance with the Hawaii Department of Health's (HDOH) Spill Reporting and Emergency Response requirements and document response actions.

EPA Website for SPCC Guidance
http://www.epa.gov/oem/content/spcc/

HDOH Spill Reporting and Emergency Response website:
http://hawaii.gov/health/environmental/hazard/spill.html

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Phone: 808-587-1962

Website:
http://hidot.hawaii.gov/harbors/library/storm-water-management/



Storm Water
BEST MANAGEMENT PRACTICES

Outdoor Material Storage

Responsible storage of chemicals, such as paints, solvents, and cleaners can significantly reduce polluted storm water runoff. Containerized products (such as bottles, cans, and drums) and bulk material must be handled properly in all stages of storage, use, and disposal. In many cases, businesses can implement simple housekeeping practices in order to store materials more effectively. Proper storage practices reduce the likelihood of accidental spills or releases of hazardous materials during storm events. In addition, health and safety conditions at the facility will improve.

BMP Implementation

Outdoor material storage should be placed only in designated areas specifically designed to contain spills and prevent contact with storm water. Store liquids in an area where containers cannot be knocked over and releases can be contained.

- Avoid positioning upstream or adjacent to storm drainage features.
- Place bagged materials on pallets and under cover.
- Utilize impervious surfaces and containment devices (e.g., dikes, curbs) to contain possible leaks and prevent storm water run-on/off.
- Store all containers under cover to protect from rain and sun.
- Close and secure any opened containers, and utilize drip pans for dispensing from containers.
- Cover stockpiles with plastic or comparable material when not in use or at the end of each day.
- Provide physical diversion to protect stockpiles from concentrated runoff.
- As necessary, place silt fence, fiber filtration tubes, or straw wattles around stockpiles.

Appropriate spill response procedures, including notification, initial response and follow-up actions, should be developed and posted.

- Keep a spill kit appropriate for the materials in a readily accessible location, stocked, and ready for use (re-stock after each use).
- Clean up spills immediately using absorbent material or containment booms for liquid spills. Immediately sweep up and properly dispose of used absorbent materials.
- Always use dry methods to clean spills (sweeping) and never hose down the spill area.

Periodic inspections should be performed to verify that the conditions of containers, secondary containment devices, and other structural controls are acceptable. Train employees (document) on proper storage, handling and spill response responsibilities. Report all spills in accordance with the Hawaii Department of Health Spill Reporting and Emergency Response requirements (http://hawaii.gov/health/environmental/hazard/spill.html).

The State Department of Transportation, Harbors Division has developed the Storm Water Management Plan (SWMP) in compliance with the National Pollutant Discharge Elimination System (NPDES) and the State of Hawaii Municipal Separate Storm Sewer System (MS4) General Permit requirements.

The SWMP is administered by the Environmental Section under the Engineering Branch.

Phone: 808-587-1962

Website: http://hidot.hawaii.gov/harbors/library/storm-water-management/

Storm Water
BEST MANAGEMENT PRACTICES

General BMPs for Businesses

The storm drainage system at our harbor facilities collects rainfall from storm events and releases it directly, without treatment, into the harbor. As rainfall travels over surfaces such as roofs, roads, and parking lots, it picks up oils, metals, fertilizers, pesticides, sediments, and other contaminants before entering the harbor. Storm water pollution degrades our waters and reduces the quality of natural habitats for fish and wildlife.

Implementing Best Management Practices (BMPs) and good housekeeping practices will help maintain water quality in the harbors.

BMP Implementation

Cleaning

- Use non-toxic substitutes for chemicals whenever possible.
- Control litter by sweeping and picking up trash regularly.
- Dry sweep floors, processing and storage areas, access roads, parking lots, and sidewalks. Do not wash down with a hose.
- Properly contain and dispose of mop water and sweepings.

Maintenance

- Inspect vehicles and equipment for leaks regularly.
- When draining fluids, use a drip pan and/or funnel to prevent spills.

Landscaping

- Whenever possible, use environmentally safe alternatives or low-toxicity chemicals.
- Use landscaping pesticides and fertilizers in the smallest amounts necessary and never apply immediately before or during rainfall.

Spill Response

- Keep a spill kit appropriate for materials in-use readily available and stocked. Re-stock when used.
- Clean up spills immediately to minimize safety hazards and prevent spills from reaching a storm drain inlet.
- Use absorbent materials to clean small spills rather than hosing down the area. Remove the absorbents promptly and dispose of properly.

Train employees (document) on proper storage, handling and spill response requirements. Report all spills in accordance with the Hawaii Department of Health (HDOH) Spill Reporting and Emergency Response requirements and document response actions.

HDOH Spill Reporting and Emergency Response website:
http://hawaii.gov/health/environmental/hazard/spill.html

The State Department of Transportation, Harbors Division has developed the Storm Water Management Plan (SWMP) in compliance with the National Pollutant Discharge Elimination System (NPDES) and the State of Hawaii Municipal Separate Storm Sewer System (MS4) General Permit requirements.

The SWMP is administered by the Environmental Section under the Engineering Branch.

Phone: 808-587-1962

Website:
http://hidot.hawaii.gov/harbors/library/storm-water-management/

Storm Water
BEST MANAGEMENT PRACTICES

Solid and Hazardous Waste Management

Maintenance activities can generate a variety of hazardous waste that cannot be disposed as routine trash, garbage or other solid waste. Hazardous waste and other regulated material and debris shall be disposed in the proper manner and in accordance with all applicable federal and state laws. Examples of hazardous wastes are:

- Waste oil, used or spent hydraulic fluid, and other petroleum-based fluids.
- Waste paint and paint debris (used brushes, rollers, chips, rags).
- Used or spent paint thinners and other industrial solvents.
- Rags and other cleaning materials that are contaminated with grease, oil, paint, thinners, or other industrial chemicals.
- Discarded electronic equipment (may contain lead or mercury).

Arrangements must be made with a licensed vendor to remove these items prepare the necessary documentation for disposal, and to remove them from the piers and adjacent state property. Do not discard hazardous wastes and other regulated debris in state provided dumpers or anywhere else on state property. All tenants must provide documentation to Harbors Division demonstrating that prior arrangements have been made for the proper disposal of all generated hazardous waste.

Note: The only Hazardous Materials allowed to be used and stored on state property are those needed in the course of your business, in accordance with the terms and conditions of your lease or revocable permit and, if required, after review and approval from Harbors Division.

BMP Implementation

Primary Option:

- Schedule general maintenance activities on a more frequent basis to eliminate the need for large-scale maintenance, the use of large amounts of hazardous materials, and the generation of large amounts of hazardous waste.
- Only use recyclable items for maintenance and routine operations to reduce solid waste generation. Recycle such items as batteries, petroleum-based liquids (e.g., engine oil, gear lube, hydraulic fluid), cardboard, rags, glass and plastic containers, newspaper, and electronic devices.

Secondary Options:

- Only use environmentally friendly materials for maintenance to reduce the need for regulated disposal.
- Reduce the inventory of hazardous materials stored on site to avoid regulated disposal due to shelf-life expiration. **REMEMBER – If you do not need it, do not store it!**

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Storm Water
BEST MANAGEMENT PRACTICES

Material Delivery and Handling

Responsible management of material delivery and handling can significantly reduce pollution to storm water runoff. Bulk and containerized products (such as bottles, cans, and drums) must be handled properly in all stages of delivery, use and storage. Proper delivery and handling practices reduce the likelihood of accidental spills or releases of hazardous materials during storm events. Proper practices will also improve health and safety conditions at the facility.

BMP Implementation

Material delivery and handling should take place only in designated areas situated near warehouse entrances and staging/storage areas and distant from site drainage inlets and watercourses. The best locations for deliveries are where risks of accidents are reduced and any releases can be contained.

- Maintain accurate and up-to-date records of materials delivered and stored on-site.
- Minimize on-site inventory and handling of hazardous materials.
- Stage containers on pallets, under cover, and, when possible, in secondary containment.

Employees with emergency spill cleanup training should be present during unloading of dangerous materials or liquid chemicals. Appropriate spill response procedures should be developed and posted. Additionally:

- Keep a spill kit appropriate for the received materials readily available, stocked, and ready for use (re-stock after each use).
- Clean up spills immediately using absorbent material or containment booms for liquid spills. Immediately sweep up and properly dispose of used absorbent materials.
- Always use dry methods to clean spills (sweeping) and never hose down the spill area.

Periodic inspections should be performed to verify that the conditions of containers, stockpiles, secondary containment devices, and other structural controls are acceptable. Train employees (document) on proper material delivery, handling and spill response requirements. Report all spills in accordance with the Hawaii Department of Health's (HDOH) Spill Reporting and Emergency Response requirements and document response actions.

HDOH Spill Reporting and Emergency Response website:
http://hawaii.gov/health/environmental/hazard/spill.html

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Storm Water
BEST MANAGEMENT PRACTICES

Building and Remodeling

The storm drainage system at our harbor facilities collects rainfall from storm events and releases it directly, without treatment, into the harbor. Sediment is the pollutant of most concern during construction due to the removal of soil cover. Heavy metals and nutrients attach to soil particles that, if allowed to reach the storm drain, degrade water quality. Other items of concern include paints, thinners, mortars and construction rubble/debris.

Implementing Best Management Practices (BMPs) and good housekeeping practices will help maintain water quality in the harbor.

NOTE: SUBMITTAL OF BUILDING OR REMODELING PLANS TO THE HDOT HARBORS DIVISION FOR FORMAL APPROVAL IS REQUIRED

BMP Implementation

Soil Erosion and Sedimentation

- Minimize removal of existing vegetation.
- Reduce traffic on disturbed soils and divert runoff around them.
- Re-vegetate as soon as possible using native seed mix and mulch.
- Frequently sweep soil back from streets and sidewalks.
- Dry sweep paved surfaces rather than hosing down or using blowers.
- Use sediment control devices, including silt fences, inlet protection, diversion ditches, and swales to minimize off-site migration of soil.

Housekeeping During Work

- Properly store and dispose of materials such as paints and solvents.
- Properly contain and dispose of mop water, sweepings, and sediments.
- Use non-toxic substitutes for chemicals when possible.
- Inspect vehicles and equipment for leaks regularly and fix problems as soon as possible.
- Keep a spill kit of absorbent material, such as kitty litter or sand, and safety equipment, such as safety glasses and gloves, in case a spill does occur. Never hose down an area to clean up after a spill.
- Control litter by sweeping and picking up trash on a regular basis.
- Cover dumpsters and replace leaking ones.

Train employees (document) on proper materials storage, handling and spill response responsibilities. Report all spills in accordance with the Hawaii Department of Health's (HDOH) Spill Reporting and Emergency Response requirements found at the link below and document response actions.
http://hawaii.gov/health/environmental/hazard/spill.html

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Controlling Vessel Discharges
BEST MANAGEMENT PRACTICES

Vessel Maintenance Activities

Debris from vessel maintenance activities performed over unprotected water can result in detergents, heavy metals, oils and greases, toxic substances, sediments, and other pollutants that fall directly into Harbors water.

Releasing pollutants directly or indirectly into the harbor during hull maintenance activities is a violation of the Clean Water Act. Proper employee training, BMP implementation, and pollution prevention methods are required for compliance with the Clean Water Act and to protect waters under Harbors jurisdiction. Maintenance activities include:

- Painting
- Grinding and Chipping
- Using chemicals for rust and paint removal
- Washing exterior surfaces (with or without chemicals)
- Engine repair

BMP Implementation

Primary Option: Perform vessel maintenance activities while vessel is in dry dock, slipway or haul-out facility, or outside of waters under the jurisdiction of Harbors Division.

Secondary Options:

- Use anti-foulant paints with less toxic ingredients.
- Never use anti-foulant paint containing Tributyltin (TBT). Anti-foulant paints and other compounds containing TBT are prohibited for use throughout the United States.
- Install a tarpaulin or other containment device underneath all painting, grinding, or chipping activities. Properly dispose of all captured debris removed from hull.
- Never use chemicals such as Naval Jelly (Phosphoric Acid) for rust or paint removal while vessel is still afloat.
- Never use any compounds that contain Tetrachloroethylene (TCE) for hull maintenance.
- Maintain the hull and all exterior surfaces more frequently to prevent the build-up of rust, marine growth, and aquatic nuisance species (invasive species).
- Wash exterior surfaces with fresh water only. Contain all wash water and properly dispose in a shore-based sanitary sewer. Low pressure (<100psi) washing only. Never use detergents or other chemicals while washing.
- Cleaning with dry methods (sweeping, vacuuming, or damp mopping) is preferred.

*The EPA has issued a draft **Small Vessel General Permit**. If finalized, it would authorize discharges incidental to the normal operation of **non-military and non-recreational vessels less than 79 feet in length and commercial fishing vessels**. The draft permit specifies best management practices for several broad discharge management categories including **fuel management, engine and oil control, solid and liquid maintenance, gray water management, fish hold effluent management, and ballast water management**.*

Implementation Date: ***December 18, 2013***

Here is the website for more info: *http://cfpub.epa.gov/npdes/vessels/vgpermit.cfm#final*

Storm Water
BEST MANAGEMENT PRACTICES

Building Power Washing

Building power washing, using a high-pressure water system, generates wash water (wastewater), which could contain contaminants (such as detergents, oils, dirt, greases, paint chips, metals, and grime). The discharge of these contaminants into a storm drain is considered an "Illicit Discharge." No wastewater should be discharged into storm drains.

Detergents, even biodegradable ones, can be poisonous to fish. Phosphates, an ingredient in some detergents, are plant nutrients that can cause excessive growth of nuisance plants in the water. Building power washing also removes debris that, if discharged, can clog storm drain inlets and grates and reduce or even prevent storm water drainage to the collection system.

Note: Building power washing, without proper containment and prior written consent from HDOT Harbors Division, is prohibited. It is also NOT acceptable to let wastewater from washing sit in areas such as parking lots, driveways, or walkway to evaporate, because contaminants can accumulate and flow into storm drains or state waters during the next rainfall event.

BMP Implementation

Primary Option:

- Apply dry wash methods (e.g., wiping with wet rags, wet mopping) that do not generate wastewater or cause wastewater to flow freely to the ground. Rinse water must be disposed of properly (e.g., into the sanitary sewer).

Secondary Option:

- Power washing with a (portable) containment system to completely contain and capture the wastewater. The system must be adequately designed to prevent water from entering a storm drain or from running off-site. A containment pad, berms, and pump system can be used to capture wastewater and divert it to a holding tank for proper disposal (see below).

Other Things To-Be-Considered:

- Building power washing is allowed only after the BMPs are approved in writing by HDOT Harbors Division.
- When power washing old paint off a building, the wastewater will contain paint chips that need to be collected, evaluated, and disposed of properly. Old paint stripped off commercial buildings may contain heavy metals (such as Pb, Cr, Cd, or Hg), and may need to be disposed of as a hazardous waste.
- Options for wastewater disposal include: (1) obtaining permission to direct the wastewater to the City's publicly owned treatment works [POTW] through a sanitary sewer on-site; (2) collecting the wastewater from the site and arranging for disposal at a POTW or industrial waste disposal facility.

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Storm Water
BEST MANAGEMENT PRACTICES

Sidewalk and Walkway Power Washing

Unpainted concrete sidewalk/walkway power washing, using a high-pressure water system, generates wash water, which could contain contaminants (such as oils, dirt, greases, and grime). Power washing also removes debris that, if discharged, can clog storm drain inlets and grates and reduce or even prevent storm water drainage to the storm conveyance system. Therefore, wash water from sidewalk/walkway power washing must be properly handled.

Note: Before wash water enters storm conveyance system, the discharger must use appropriate Best Management Practices [BMPs] to reduce pollution associated with non-storm water discharges, to the Maximum Extent Practicable [MEP]. The discharger is responsible for complying with HDOT, City, State, and Federal rules and regulations.

BMP Implementation

Recommended Washing Procedure:

- Sweep and/or clean the surface of any visible pollutants and dispose of the collected material in trash containers. Clean surface oil with rags or absorbents. If using granular material (e.g., cat litter), thoroughly sweep and properly dispose of before washing.
- After visible pollutants are removed, use water ONLY to clean the area (i.e., no soap, acids, or other additives). Generated wash water should be properly drained or disposed of (e.g., directed to landscape or permeable areas within the premises, filtered through geotextile filter at the drain inlet then discharged into the storm drain).
- If any visible pollutants remain in the residual wash water, collect all water and pump into the City's publicly owned treatment works [POTW] through a sanitary sewer on-site. Approval by the City is required.

Other Things To-Be-Considered:

- If there is no storm drain system nearby and discharge on a paved lot or street will create a nuisance or hazardous condition, the effluent may be disposed of at a POTW or industrial waste disposal facility.
- Discharge to a POTW requires approval by the City.
- If sidewalk/walkway is painted and power washing has the potential to remove the paint, please refer to the **Building Power Washing BMP** flyer.

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Storm Water

BEST MANAGEMENT PRACTICES

Storm Drain Inlet Protection

Storm water runoff occurs naturally. As the runoff flows over land or impervious surfaces (such as paved streets, parking lots, and building rooftops), it can collect debris, chemicals, sediment and other pollutants that could adversely affect water quality if discharged untreated. Storm drain inlet protection measures prevent potential pollutants from entering inlets and eventually our coastal receiving waters.

Storm drain inlet protection can consist of an impounding area around or upstream of a storm drain inlet and/or a sediment filter. The impounding area temporarily ponds runoff to allow sediment to settle, before entering the storm drain. Sediment and debris can also be removed by filtering.

ONLY RAIN AND PERMITTED DISCHARGES ARE ALLOWED TO ENTER HARBORS STORM WATER CONVEYANCE SYSTEMS.

Harbors Tenants shall implement following BMPs for drain inlets located exclusively within the leased area.

- Stencil catch basins and inlets to warn against dumping of pollutants into the storm drainage system.
- Install fabric filter at each on-site storm drain inlet. The fabric should overlap the sides of the inlet.
- Clean on-site catch basins and storm drain inlets in high pollutant load areas as frequently as needed and before the wet season to remove sediment and debris.
- Notify Harbors Division if repairs are needed for deteriorated storm drains and their piping.
- For storm drain inlet protection as part of construction project, please refer to Harbors Construction Site Runoff Control Program.

Inspection and Maintenance:

- If the fabric becomes clogged, torn, or degraded, it should be replaced.
- Properly dispose of wastes collected from storm drain inlet cleaning activities.

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Attachment 4

Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants

State of Hawaii Department of Transportation Harbors Division
Environmental Compliance, BMP, and P2 Inspection Checklist for Tenant

Harbor: _____ Date/Time: _____
Inspector(s): _____ Weather Conditions: _____

Type of Inspection: ☐ Regular Inspection ☐ Follow-up Inspection ☐ Final Inspection
☐ New Tenant Inspection - Date of Occupancy:

Tenant Business Name: _____
Tenant Permit(s): _____
Facility Location: _____
Facility Mailing Address: _____
Tenant Representative: _____
Phone Number: _____ Mobile Number: _____
Fax Number: _____ E-mail Address: _____
EPA ID No. (if any): IWDP No. (if any):

Facility Description:

Site Drainage Description (including stenciling):

Any illicit discharge into Harbors storm water drainage system? ☐ Yes ☐ No ☐ N/A
If "Yes", please describe here:

Related Risk Ranking Criterion:

Operations:

- ☐ Vessel Maintenance
- ☐ Vessel Fueling
- ☐ Vehicle/Equipment Maintenance
- ☐ Petroleum Product Storage
- ☐ Hazardous Material Storage
- ☐ Waste Handling
- ☐ Vessel Washing
- ☐ Vehicle/Equipment Fueling
- ☐ Vehicle/Equipment Washing
- ☐ Material Storage
- ☐ Material Handling
- ☐ Building Maintenance

NPDES Compliance ☐ Yes ☐ No ☐ N/A If "Yes", please complete this section
NPDES Permit Number: _____ Expiration Date: _____
DMR Compliance: ☐ Yes ☐ No ☐ N/A Last round of sampling:
SPCC Compliance: ☐ Yes ☐ No ☐ N/A

- The facility maintains records of monitoring data for a minimum of five years? ☐ Yes ☐ No ☐ N/A
- The facility has a SWMP and/or SWPCP? ☐ Yes ☐ No ☐ N/A
- The facility has filed a Discharge/Connection Permit with Harbors? ☐ Yes ☐ No ☐ N/A
- Discharge points exhibit unusual characteristics (e.g., sheen, color) ☐ Yes ☐ No ☐ N/A

Material Inventory:

No.	Inspection Item	Yes	No	N/A	Remarks
	Storage				
1	**SPCC Compliance**: Facility with an aggregate shell capacity of 1,320 gallons or more of petroleum products.				
2	**AST Containment**: ASTs are situated over an impervious surface, have adequate secondary containment and integrity protection, and containment drain valves are kept locked.				
3	**AST Overflow Protection**: Bulk product ASTs are equipped with overflow protection alarms or automatic shutdown pumps.				
4	**AST Malfunction**: Visible piping, tanks, and hoses in good condition (e.g., no exhibit signs of leakage, wear, or malfunction).				
5	**Oily Equipment**: Oily or leaking equipment is stored under cover or with drip pans. Drip pans are emptied or replaced as needed.				
6	**Storm Water Management**: Storm water accumulation in secondary containment is minimized, managed, disposed correctly, and logged.				
7	**Salvaged Equipment/Vehicle**: Fluids and batteries are removed from salvaged equipment/vehicle before storage.				
8	**Outdoor Material Storage**: Outdoor storage areas have coverings that prevent contact of these items with storm water. Materials are kept above the ground higher than the level of runoff.				
9	**Labeling**: Containers are properly labeled.				
10	**Compatibility**: Containers are stored in an organized manner, compatible with other stored materials, labeled correctly, and not stored past allowable holding times.				
11	**EPCRA**: The facility is required to report chemical inventory (Tier II) and/or Toxic Release Inventory (TRI) report.				
	Fueling				
12	**Fueling BMPs**: Fueling area engineering controls and BMPs are effective in preventing storm water run on/off.				
13	**Fueling Inspections**: Equipment in fueling areas is in good condition (e.g., do not exhibit signs of leakage, wear, or malfunction). An inspection log is available for inspection.				
	Washing				
14	**Vessel/Vehicle/Equipment Washing**: Vehicle or equipment washing is conducted with approval from HDOT Harbors.				
15	**Hand Washing**: Hand or dish washing is conducted over a sink that is plumbed to sanitary sewer or is disposed of appropriately.				
	Vessel/Vehicle/Equipment Maintenance				
16	**Vessel/Vehicle/Equipment Maintenance Area**: Maintenance is conducted in a designated area, preferably covered.				
17	**Preventive Maintenance**: Preventive maintenance is performed on vehicles and equipment to prevent leaks. Vehicle and equipment are monitored periodically for leaks and drip pans are used.				
18	**Maintenance Logs**: Records are kept.				
19	**Parts Washer**: Parts washer fluid is disposed appropriately with an authorized disposal contractor.				
	Material Handling				
20	**Material Handling Area**: Loading areas are free of unattended stains or pavement in normal deteriorated condition that would indicate good material handling practices.				
	Spill Response				
21	**Spills and Stains** are cleaned thoroughly.				
22	**Spill Kits** are kept in all high risk areas and are refilled as needed.				
23	**Spill Recording**: Records are kept of spills and releases in the SWPCP or SPCC Spill and Discharge Log.				
24	**Harbors Environmental Hotline**: Emergency storm water contact numbers have been posted on site.				

No.	Inspection Item	Yes	No	N/A	Remarks
	Building Maintenance & Housekeeping				
25	**Sweeping**: Trash, debris, and dirt are swept up regularly.				
26	**Deck/Floor Washing**: Dry sweeping or mopping is conducted instead of spraying/hosing down.				
27	**Sumps and OWS Maintenance**: Structural controls such as containment sumps or OWSs are emptied and serviced regularly.				
28	**Cleanliness**: All work areas and storage areas are neat and clean.				
	Waste Handling				
30	**Trash Bins**: Trash bins are kept closed when not in use and are not overflowing.				
31	**Used Batteries**: Spent lead acid batteries are protected from contact with stormwater runoff and placed in secondary containment while awaiting disposal. Batteries are disposed in a timely manner.				
32	**EPA Generators**: Wastes are disposed properly, records are kept and hazardous waste generator status is known. Facility has an Environmental Protection Agency (EPA) hazardous waste generator identification number and follows appropriate regulations/requirements (CESQG, SQG, LQG).				
33	**Hazardous Waste Containment**: Hazardous waste and used oil storage areas have impermeable surfaces, adequate secondary containment, and integrity protection.				
34	**Chemical Toilets** are cleaned by contractors in a manner that does not allow chemicals (i.e. blue liquid) to enter the Harbor.				
	Training				
35	**HDOT Harbors Annual Training**: A representative has attended the most recent HDOT Harbors Storm Water Awareness Training.				If "No", the latest training attended:
36	**Material Handling Training**: Records of training are available for employees involved in material handling (e.g. forklift operators).				Most recent training date:
37	**Container Storage Training**: Records of training are available for employees involved in inspection of ASTs or chemical storage areas.				Most recent training date:
38	**Fueling Training**: Records of training are available for employees involved in large scale vehicle and equipment fueling.				Most recent training date:
39	**Hazardous Waste Training**: Records of training are available for employees involved hazardous/universal waste handling/disposal activities.				Most recent training date:
	General Observed BMPs				
40	General Housekeeping ☐ Excellent ☐ Good ☐ Average ☐ Fair ☐ Poor or Unacceptable				
41	Recordkeeping ☐ Excellent ☐ Good ☐ Average ☐ Fair ☐ Poor or Unacceptable ☐ Not Applicable				
42	All personnel are well-trained ☐ Excellent ☐ Good ☐ Average ☐ Fair ☐ Poor or Unacceptable				
43	Need follow-up inspection ☐ Yes ☐ No				

		Tenant Risk Ranking Criteria	Score
1	**Vessel Maintenance and Repair**		
	0	Neither maintenance nor repair activities are conducted on-site.	
	1	Maintenance and repair activities on any size vessel are conducted entirely indoors (with proper dust control BMPs), with no or minimal potential for discharge of pollutants.	
	2	Minor maintenance and repair (30 day or less duration) for small vessels is conducted in their berth (with proper dust control BMPs) with minimal potential for discharge of pollutants.	
	3	Maintenance and repair activities on large vessels are conducted outdoors and out of the water (with proper dust control BMPs), with minimal potential for discharge of pollutants.	
	4	Major maintenance and repair activities on any size vessel are conducted in a partially confined or unconfined area with moderate potential for discharge of pollutants.	
	5	Maintenance and repair activities on any size vessel are conducted in an unconfined area or in an area with significant potential for discharge of pollutants. (**Automatic trigger to high risk designation**)	
2	**Vessel Fueling**		
	0	No fuel transfer activities are conducted on-site.	
	1	Fueling of small vessel is conducted by a fueling company with proper spill containment and diversion.	
	2	Fueling of small vessel is conducted with spill containment and diversion.	
	3	Fueling of large vessel is conducted in designated area with spill containment and diversion.	
	4	Fueling of small vessel is conducted in areas WITHOUT spill containment and diversion.	
	5	Fueling of large vessels is conducted in areas WITHOUT spill containment or diversion. (**Automatic trigger to high risk designation**)	
3	**Vessel Rinsing**		
	0	No vessel rinsing is conducted on-site.	
	1	Vessel rinsing is conducted in an area designed to contain wash water and debris, with no or minimal potential discharge of pollutants.	
	2	Vessel rinsing is conducted in an uncontained area with no direct connection to Harbors stormwater drainage system, or having a minimal potential for discharge of pollutants.	
	3	Vessel rinsing is conducted in an uncontained area with no direct connection to Harbors storm drainage system, but having a moderate potential for discharge of pollutants.	
	4	Vessel rinsing is conducted in an uncontained area directly connected to Harbors storm drainage system, and has a moderate potential for discharge of pollutants.	
	5	Vessel rinsing is conducted in an uncontained area directly connected to Harbors storm drainage system, and has a significant potential for discharge of pollutants, or not in compliance with EPA VGP or sVGP. (**Automatic trigger to high risk designation**)	
4	**Vehicle and/or Equipment Maintenance and Repair**		
	0	No equipment/vehicle maintenance and/or repair activities are conducted on-site.	
	1	Maintenance/repair activities are conducted entirely indoors, on a small scale, with minimal potential for discharge of pollutants.	
	2	Maintenance/repair activities are conducted entirely indoors, on a large scale, with minimal potential for discharge of pollutants.	
	3	Maintenance/repair activities are conducted in a covered area with minimal to moderate potential for discharge of pollutants.	
	4	Maintenance/repair activities are conducted outdoors within containment or in an area with moderate potential for discharge of pollutants.	
	5	Maintenance/repair activities are conducted outdoors or in an area with significant potential for discharge of pollutants, or any time there is an illicit discharge present. (**Automatic trigger to high risk designation**)	
5	**Vehicle and/or Equipment Fueling**		
	0	No equipment and/or vehicle fueling activities are conducted on-site.	
	1	Equipment/vehicle fueling is conducted by a fueling company with spill containment and diversion.	
	2	Equipment/vehicle fueling is conducted on a small scale (i.e., less than 25 gallons per fueling) in areas with spill containment and diversion.	
	3	Equipment/vehicle fueling is conducted on a large scale in areas with spill containment and diversion.	
	4	Equipment/vehicle fueling is conducted on a small scale WITHOUT spill containment and diversion, but not in areas adjacent to Harbors storm drainage system and nation's water.	
	5	Equipment/vehicle fueling is conducted on large scale WITHOUT spill containment and diversion, or on any scale in areas adjacent to Harbors storm drainage system WITHOUT spill containment and diversion. (**Automatic trigger to high risk designation**)	
6	**Vehicle and/or Equipment Washing**		

		Tenant Risk Ranking Criteria	Score
	0	No equipment/vehicle washing is conducted on-site.	
	1	Equipment/vehicle washing is conducted with Harbors consent and in covered wash area following an approved method, with no or minimal potential discharge of pollutants.	
	2	Equipment/vehicle washing is conducted with Harbors consent and in uncovered wash area following an approved method with minimal potential discharge of pollutants.	
	3	Equipment/vehicle washing is conducted with Harbors consent and in uncovered wash area following an approved method with moderate potential discharge of pollutants (e.g., adjacent to Harbors storm drainage system or nation's water).	
	4	Equipment/vehicle washing is contained and in an area with no direct connection to Harbors storm drainage system and nation's water, but conducted WITHOUT Harbors consent.	
	5	Equipment/vehicle washing is not contained, conducted WITHOUT Harbors consent, and in an area directly discharging to Harbors storm drainage system and nation's waters. (**Automatic trigger to high risk designation**)	
7	**Aboveground Oil Storage (size of container ≥ 55-gallon ONLY)**		
	0	No oil product is stored on-site.	
	1	Less than 1,320 gallons of oil is properly stored in a covered area and has no or minimal potential for discharge of pollutants.	
	2	Less than 1,320 gallons of oil is properly stored in an uncovered area and has minimal potential for discharge of pollutants.	
	3	More than 1,320 gallons of oil is properly stored with minimal potential for discharge of pollutants, and the facility has an SPCC Plan.	
	4	More than 1,320 gallons of oil is properly stored with minimal to moderate potential for discharge of pollutants, but the facility does not have a SPCC Plan.	
	5	Oil is improperly stored and/or managed and has a significant potential for discharge of pollutants. (**Automatic trigger to high risk designation**)	
8	**Container Storage (size of containers < 55-gallon)**		
	0	No containers are stored on-site.	
	1	All containers are properly managed and stored entirely indoors and have no or minimal potential for discharge of pollutants.	
	2	All containers are properly managed and stored under cover, and have minimal potential for discharge of pollutants.	
	3	Containers are properly managed and stored outdoors with minimal potential for discharge of pollutants (e.g., distance from site to the nearest storm drain inlet or surface water is greater than 100 feet or 30 meters).	
	4	Containers are improperly managed but stored indoors or under the cover, with moderate potential for discharge of pollutants.	
	5	Containers are improperly managed and stored outdoors with significant potential for discharge of pollutants. (**Automatic trigger to high risk designation**)	
9	**Waste Handling and Disposal (excluding Used Oil)**		
	0	No waste is stored on-site.	
	1	All wastes are non-hazardous and stored indoors or outdoors in covered areas, and have no or minimal potential for discharge of pollutants.	
	2	All wastes are non-hazardous and stored outdoors uncovered, and have moderate potential for discharge of pollutants.	
	3	Hazardous wastes are generated and tenant is classified as a CESQG. Hazardous wastes are properly managed, stored, and disposed of. Storage areas have no or minimal potential for discharge of pollutants.	
	4	Hazardous wastes are generated and the tenant is classified as a SQG or LQG. Hazardous wastes are properly managed, stored and/or disposed of. Storage areas have no or minimal potential for discharge of pollutants.	
	5	Hazardous wastes are generated and the tenant is classified as a CESQG, SQG, or LQG. Hazardous wastes are improperly managed, stored, and/or disposed of. Storage areas have significant potential for discharge of pollutants. (**Automatic trigger to high risk designation**)	
10	**Spill History**		
	0	No history of oil/chemical spills on-site.	
	1	One to three oil/chemical spills in minimal quantity (e.g., less than five gallons for oil) in the past three years.	
	2	One to three oil/chemical spills in moderate quantity (e.g., oil spill of 5 gallons or greater but less than 25 gallons; for all other chemicals please refer to 40 CFR 302.4) in the past three years.	

		Tenant Risk Ranking Criteria	Score
	3	One to three oil/chemical spills greater than the reportable quantity (see 40 CFR 302.4) in the past three years.	
	4	More than three oil/chemical spills greater than reportable quantity in the past three years.	
	5	More than two oil/chemical spills entered into Harbors storm drainage system. Or more than five oil/chemical spills of any quantity in one calendar year. (**Automatic trigger to high risk designation**)	
11	**Enforcement History**		
	0	No verbal or written warnings were issued in the past two years.	
	1	Class II violations (such as verbal/written warnings and potential violations identified in an inspection report) were issued in the past two years and corrective actions were immediately taken by the tenant.	
	2	Class I violations (identified in an inspection report and/or documented in an NAV) were issued in the past two years and corrective actions were taken by the tenant.	
	3	Class II violations were issued in the past two years, but corrective actions were NOT immediately taken by the tenant.	
	4	Class I violations were issued in the past two years, but corrective actions were NOT immediately taken by the tenant.	
	5	Civil penalties were assessed for non-compliance in the past two years. (**Automatic trigger to high risk designation**)	
12	**Training Attendance History**		
	-2	The tenant has attended all annual trainings during its tenancy.	
	-1	The tenant has attended the most recent training.	
	2	The tenant has not attended the most recent training.	
	4	The tenant has never attended the training.	
13	**Site Condition and General Housekeeping**		
	0	All activities are conducted indoors and have no or minimal potential for discharge of pollutants. General housekeeping is in good condition.	
	1	All activities are conducted indoors and have minimal potential for discharge of pollutants. General housekeeping is in average or fair condition.	
	2	Activities are conducted indoors and outdoors, and general housekeeping is in good condition (e.g., sources of pollutants are properly managed).	
	3	Activities are conducted indoors and outdoors and have minimal to moderate potential for discharge of pollutants. General housekeeping is in fair or above average condition.	
	4	Activities are conducted outdoors and have moderate potential for discharge of pollutants. General housekeeping is in fair condition.	
	5	Activities are conducted outdoors and pose a significant threat to the environment. (***Automatic trigger to high risk designation***)	
14	**Lease Agreement and/or Revocable Permit Requirements**		
	0	Tenant appears to be in compliance with environmental requirements in their tenant lease or revocable permit.	
	5	Tenant is not in compliance with their revocable permit or lease. (**Automatic trigger to high risk designation**)	

Total Risk Ranking Score: 0

Tenant Risk Ranking Category: _____

Attachment 5

Stormwater Hotline Occurrence Tracking Form

Hawaii Department of Transportation – Harbors Division

Stormwater Hotline Occurrence Tracking (SHOT) Form

LINE ITEM	FORM FIELD		
Caller Information			
Caller Name			
Caller Company			
Telephone Number			
Email Address			
Date/Time Received			
Occurrence Information (Fill in Corresponding Section, if checked)			
☐ Information Request	☐ Discharge Reporting	☐ Complaint	☐ Commendation
Information Request			
Information Requested			
Actions Taken			
Additional Information			
Discharge Reporting			
Address or Location of Discharge			
Time/Date of Discharge			
Substance/Amount Discharged (if known)			
Media into which the discharge occurred: ☐ Air ☐ Water ☐ Natural Ground ☐ Concrete/Asphalt ☐ Stream ☐ Ocean Other:_____			
Responsible Party (if known)			
Cause of Discharge (if known)			
Clean-up Actions Taken (if applicable)			
Notifications Made/Actions Taken by Harbors Division			
Follow Information			

LINE ITEM	FORM FIELD
Complaint	
Nature of Complaint	
Complaint Details	
Notifications Made/Actions Taken by Harbors Division	
Commendation	
Commendation Details	
Notifications Made/Actions Taken by Harbors Division	

Points of Contact for Immediate Response

In the event of an emergency needing immediate response, call the numbers listed below:

Point of Contact	**Telephone Number**
Harbors Traffic Control Center	808-587-2076
Marine Cargo Specialist	808-587-2053
City and County of Honolulu Environmental Concern Hotline	808-768-3300
Department of Health, Clean Water Branch	808-586-4309
National Response Center (United States Coast Guard)	1-800-424-8802

Attachment 6

Low-Risk Tenant Reconnaissance Inspection Form

State of Hawaii Department of Transportation Harbors Division
Low-Risk Tenant Reconnaissance Inspection Form

Harbor: _____ Date/Time: _____
Inspector(s): _____ Weather Conditions: _____

Tenant Business Name:	
Tenant Permit(s):	
Facility Location:	
Facility Mailing Address:	
Tenant Representative:	
Phone Number:	Mobile Number:
Fax Number:	E-mail Address:
EPA ID No. (if any):	IWDP No. (if any):

Facility Description:

Site Drainage Description (including stenciling):

Any illicit discharge into Harbors storm water drainage system? ☐ Yes ☐ No ☐ N/A

If "Yes", please describe here: ☐ Please check here if a follow-up inspection is necessary.

Related Risk Ranking Criterion:

Remarks:

☐ No significant changes (Please check here if no status change. Otherwise, please specify any changes below)

Site Overview

Attachment 7

Suspected Illicit Discharge Reporting Form

Hawaii Department of Transportation – Harbors Division

Suspected Illicit Discharge Reporting Form

General Information: Use this form to report a suspected illicit discharge. If you are unsure, please contact your supervisor or HAR-EE. Examples of illicit discharges: uncontained vehicle/equipment/building/sidewalk washing, sink discharging directly to ground or storm drain inlet, petroleum spills/sheens, unpermitted vessel discharges, uncontained vessel painting/chipping/sandblasting/cleaning, etc.

Observer Information			
Name:			
Office Code:		Telephone Number:	
Report Date:			

Description of Suspected Illicit Discharge			
Address or Location:		Date and Time:	
Description: (Include Substance and Amount, if known)			

Media into which the discharge occurred:

☐ Air ☐ Natural Soil ☐ Concrete/Asphalt Pavement ☐ Stream ☐ Ocean ☐ Other:_____

Responsible Party: (if known)	
Cause of Discharge: (if known)	
Clean-up Actions: (if applicable)	
Notifications Made:	

Please forward completed form and/or picture(s) to HAR-EE office. Fax Number: (808) 587-1964

Point of Contact for Reporting	
Agency	**Telephone Number**
Harbor Traffic Control (Aloha Tower)	(808) 587-2076, (808) 368-5993 (Cellular)
Hawaii Department of Transportation Harbors Division, Engineering Environmental Section [HAR-EE]	(808) 587-1962, (808) 587-1976, (808) 587-1960

Additional Follow-up By HAR-EE (to be filled by HAR-EE):

Attachment 8

List of Alternative Products for Cleaning

Alternative Products for Cleaning

Battery Acid	Use baking soda to absorb a spill.
Bleach	As a substitute, try borax powder available at grocery stores.
Brass Cleaner	Use vinegar and a clean dry rag to remove tarnish.
Drain Opener	Pour ¼ cup baking soda down the drain, follow with ½ cup vinegar. Allow the effervescent mix to bubble for 30 minutes. Finish the job by flushing the drain with boiling water. For tough clogs, try using a plumber's snake.
Fiberglass Stain	Baking soda and water mixed into a paste works great on Formica.
Floor Cleaner	Use one cup of white vinegar in two gallons of water.
General Cleanser	Dissolve one teaspoon of borax in one quart of warm water. For tough jobs, use a ½ cup of borax and a splash of vinegar in water.
Hand Cleaner	Instead of paint thinner try washing soda (sodium bicarbonate), found in the laundry section of most grocery stores. Washing soda is caustic, so be sure to use plenty of water.
Mildew Remover	Mix equal parts of lemon juice and salt or vinegar and salt. Use a plastic spray bottle to spray on outside canvas.
Paper Towels	Use cloth rags that can be washed and re-used.
Scouring Powders	Baking soda with a plastic "bun" scrubber works great on porcelain head and shower tiles.
Shower Cleaner	Wet surface, sprinkle with baking soda, and scrub.
Soap	Use phosphate-free products available at most grocery and health food stores.
Wood Polish	For interior wood use one teaspoon lemon juice with two teaspoons vegetable oil. Apply mixture with a clean, dry cloth.

Attachment 9

List of Major Environmental Regulations

Major Environmental Regulations

Harbors has identified a major list of environmental regulations applicable to their activities and operations. The list includes stormwater management under the Clean Water Act [CWA]; petroleum products storage under the Spill Prevention, Control, and Countermeasure [SPCC] rule; waste management including hazardous waste, used oil, and universal waste; storage tank management; and hazardous substance/chemical storage under the Emergency Planning and Community Right-to-Know Act [EPCRA]. These regulations are reflected and implemented through using Harbors revised *Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants* (Attachment 4) during inspections.

1. Clean Water Act and National Pollutant Discharge Elimination System

The CWA (contained in 33 United States Code [USC] §§ 1251 to 1387) is the primary federal statute that addresses water pollution in the United States. It establishes the basic structure for regulating discharges of pollutants into waters of the United States and establishing quality standards for surface waters. It also establishes a number of programs designed to restore and protect the quality of nation's waters by eliminating the discharge of pollutants into surface waters. The CWA traces its roots to the Federal Water Pollution Control Act [FWPCA], which was originally enacted in 1948.

In 1972, congressional amendments to the FWPCA established the National Pollutant Discharge Elimination System [NPDES]. As authorized by the CWA, the NPDES program was established to control discharges of pollutants to navigable waters from point sources (e.g., industrial plants and municipal wastewater treatment facilities). Those discharges were authorized by permits issued under the program. The permits usually set numerical limitations on the authorized discharges (i.e., the composition and the concentration of pollutants in the effluent) and impose other conditions on the permittee. They give the permittee the right to discharge specified pollutants from specified outfalls for a limited period of time.

In 1987, the FWPCA was amended to include stormwater discharges as a significant source of water pollution. The NPDES program was also expanded to include non-point sources (e.g., stormwater runoff from construction sites, croplands, urban areas, etc.). Stormwater runoff is commonly transported through Municipal Separate Storm Sewer Systems [MS4s], and is often discharged directly into local water bodies without any treatment. To prevent harmful pollutants from being washed or dumped into an MS4, operators must submit a Notice of Intent [NOI] to seek coverage under NPDES program, and develop a stormwater management program to reduce the contamination of stormwater runoff and prohibit illicit discharges.

In 1990, the Environmental Protection Agency [EPA] promulgated regulations (contained in 40 Code of Federal Regulations [CFR] Parts 122, 123, and 124) to establish permit programs for stormwater discharges. It required medium and large cities or certain counties with populations of 100,000 or more, and construction activities disturbing five acres or more of land to obtain

NPDES permit coverage for their stormwater discharges. These regulations are referred to as the "Phase I Program." In 1999, the EPA published the Storm Water Phase II Final Rule and expended the Phase I Program by extending NPDES coverage to small MS4s in and/or outside the urbanized areas, and to construction activities that disturb between one and five acres of land to obtain NPDES permit coverage for their stormwater discharges (EPA, 2000).

Generally, coverage under NPDES program is required for any discharge of a pollutant from a point source to nation's waters. Individual homes that are connected to a municipal system, use a septic system, or do not discharge to any surface water do not need to apply for an NPDES permit. However, industrial, municipal, and other facilities must obtain permits if their discharges flow directly to surface waters. In addition, most stormwater discharges are considered point sources and require coverage under NPDES program. In most cases, the NPDES program is administered by authorized states.

For the State of Hawaii, the EPA has delegated authority to the HDOH Clean Water Branch [CWB], to administer the NPDES program including permit coverage issuance (to municipalities, industries, and construction projects), enforcement, program related regulatory & policy development, and other pertinent program elements. Meanwhile, the EPA continues to maintain overall enforcement authority. State water quality regulations have been codified in the Hawaii Administrative Rules [HAR] Title 11 Chapter 54 (Water Quality Standards) and HAR Title 11 Chapter 55 (Water Pollution Control). Hawaii Revised Statutes [HRS] Title 19 Chapter 342D provides the State with the procedures, rules, and regulations for the enforcement of the State's Clean Water Program.

A. 40 CFR Parts 122 to 124 – EPA Administered Permit Programs: The National Pollutant Discharge Elimination System

The regulatory provisions contained in these parts implement the NPDES program under sections 301, 318, 402, and 405 of the CWA. These parts cover the basic EPA permitting requirements (40 CFR Part 122) and minimum requirements for administering the approved state program (40 CFR Part 123); as well as procedures for EPA processing of permit applications and appeals (40 CFR Part 124). These provisions also establish the requirements for public participation in the EPA and state permit coverage issuance and enforcement and related variance proceedings, and in the approval of state NPDES programs.

B. HAR Title 11 Chapter 54 – Water Quality Standards

This chapter establishes water quality standards applicable for the state waters (defined in HAR 11-54-1 and HRS 342D-1) that shall be maintained and protected to ensure protection of human health. To ensure compliance, all state waters are subject to monitoring and to the numerical limitations for acute and chronic toxicity as established in this chapter. These regulations detail the following: definitions; general policy on water quality and anti-degradation; classification of state waters and water uses; basic water quality criteria applicable to all waters; uses and

specific criteria applicable to inland waters, marine waters, and recreational areas; zones of mixing; water quality certification and components; revisions; and severability.

C. HAR Title 11 Chapter 55 – Water Pollution Control

This chapter became effective on October 22, 2007. This chapter establishes the application of general and individual NPDES permits for facilities in the State of Hawaii. The NPDES permit conditions include, but are not limited to, basic water quality criteria, permit coverage, onshore/offshore construction, sampling requirements and definitions, duties to comply/reapply/mitigate, operation and maintenance, inspection and entry, monitoring and recordkeeping, signatory requirement, reporting requirements, modification, renovation, penalties, remediation, civil and criminal liability, oil and hazardous substance liability, hearings, appeals, severability, public interest, and field citations. HAR Title 11 Chapter 55 also establishes general permit conditions for specific activities with the potential to impact the stormwater, including industrial activities (HAR 11-55 Appendix B), construction activities (HAR 11-55 Appendix C), and construction activity dewatering (HAR 11-55 Appendix G).

2. Spill Prevention, Control and Countermeasure Rule

A. 40 CFR Part 112 – Oil Pollution Prevention

Originally published in 1973 under the authority of Section 311 of the CWA, the Oil Pollution Prevention regulation (40 CFR Part 112) sets forth requirements for prevention of, preparedness for, and response to oil discharges at specific non-transportation related facilities. To prevent oil from reaching navigable waters and adjoining shorelines, and to contain discharges of oil, the regulation requires these facilities to develop and implement SPCC plans and establishes procedures, methods, and equipment requirements (Subparts A, B, and C). On December 5, 2008, the Federal Register published EPA's final rule to amend the SPCC rule. This regulation includes requirements for facilities to prepare, amend, and implement SPCC plans to prevent discharges of oil to navigable waters and adjoining shorelines.

To determine if a facility is subject to the SPCC rule, it must meet three criteria:

- It must be non-transportation-related;
- It must have an aggregate aboveground storage capacity greater than 1,320 gallons or a completely buried underground storage capacity greater than 42,000 gallons; and
- There must be a reasonable expectation of a discharge into or upon navigable waters of the United States or adjoining shorelines.

When calculating oil storage capacity, the facility should not count containers less than 55 gallons; completely buried tanks that are subject to all of the technical requirements of the Underground Storage Tank [UST] Regulation (40 CFR Part 280) or all of the technical requirements of a state UST program (HAR 11-281) approved under 40 CFR Part 281;

containers that are permanently closed as defined in 40 CFR Part 112.2; or parts of the facility used exclusively for wastewater treatment and not used to satisfy any requirement of 40 CFR Part 112. Preparation of the SPCC plan is the responsibility of the facility owner or operator.

B. 40 CFR Part 110 – Discharge of Oil

The regulations of this part apply to the discharge of oil prohibited by Section 311(b) (3) of the CWA. For purposes of Section 311(b)(4) of the Act, discharges of oil in such quantities that the Administrator of the EPA has determined may be harmful to the public health or welfare or the environment of the United States include discharges of oil that:

Violate applicable water quality standards; or
Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

According to 40 CFR Part 110.6, “Any person in charge of a vessel or of an onshore or offshore facility shall, as soon as he or she has knowledge of any discharge of oil from such vessel or facility in violation of Section 311(b)(3) of the Act, immediately notify the National Response Center [NRC] (800-424-8802). If direct reporting to the NRC is not practicable, reports may be made to the United States Coast Guard [USCG] or EPA predesignated On-Scene Coordinator [OSC] for the geographic area where the discharge occurs. All such reports shall be promptly relayed to the NRC. If it is not possible to notify the NRC or the predesignated OSC immediately, reports may be made immediately to the nearest USCG unit, provided that the person in charge of the vessel or onshore or offshore facility notifies the NRC as soon as possible.” The procedures for such notice are set forth in USCG regulations (33 CFR 153, Subpart B) and in the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300, Subpart E).

3. Waste Management Regulations

The Resource Conservation and Recovery Act (42 USC §§ 6901), commonly referred to as RCRA, is the primary law governing the disposal of solid and hazardous waste in United States. Congress passed RCRA on October 21, 1976, which amended the Solid Waste Disposal Act [SWDA] of 1965. RCRA gives EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste (40 CFR Parts 260 through 272). RCRA also set forth a framework for the management of non-hazardous solid wastes (40 CFR Parts 273 through 279). The 1986 amendments to RCRA further address environmental problems that could result from underground tanks storing petroleum and other hazardous substances (40 CFR Parts 280 through 282).

RCRA set national goals for protecting human health and the environment from the potential hazards of waste disposal, conserving energy and natural resources, reducing the amount of waste generated, and ensuring that wastes are managed in an environmentally-sound manner. To achieve these goals, RCRA established three distinct programs as follows:

- The hazardous waste program regulated under RCRA Subtitle C.
- The solid waste program regulated under RCRA Subtitle D.
- The UST program regulated under RCRA Subtitle I.

For the State of Hawaii, the EPA has delegated authority to HDOH Solid and Hazardous Waste Branch [SHWB] to administer the solid and hazardous waste management control program including permit issuance, inspections, compliant response, enforcement, technical assistance & training, program related regulatory & policy development, and other pertinent program elements. Meanwhile, EPA continues to maintain overall enforcement authority.

State solid and hazardous waste management control regulations are codified in the HAR Title 11 Chapter 58.1 (Solid Waste Management Control, in draft), Chapters 260 through 271 and 280 (Hazardous Waste Management), Chapter 273 (Universal Waste Management), Chapter 279 (Management of Used Oil), Chapter 281 (Underground Storage Tanks), and Chapter 282 (Deposit Beverage Container Recycling). Functionally, the SHWB consists of three implementing sections (Hazardous Waste Section, Office of Solid Waste Management, and Underground Storage Tank Section), one support group (Pollution Prevention and Waste Minimization Program), and program administration.

A. Solid Waste Management Control - HAR Title 11 Chapter 58.1 (In Draft)

The purpose of this chapter is to establish minimum standards governing the design, construction, installation, operation, and maintenance of solid waste disposal, recycling, reclamation, and transfer systems. These standards are intended to prevent pollution of the drinking water supply or waters of the State of Hawaii; prevent air pollution; prevent the spread of disease and the creation of nuisances; protect the public health and safety; conserve natural resources; and preserve and enhance the beauty and quality of the environment.

These regulations detail the following: general provisions (Subchapter 1); requirements for solid waste disposal facilities (Subchapter 2); requirements for solid waste storage, handling, and processing facilities (Subchapter 3); requirements for solid waste reclamation facilities (Subchapter 4); requirements for special waste management (Subchapter 5); solid waste management responsibilities (Subchapter 6); penalties, remedies, and severability (Subchapter 7).

B. Hazardous Waste Regulations - 40 CFR Parts 260 through 272 and HAR Title 11 Chapters 260 through 271 & 280

Enforced by EPA, 40 CFR Parts 260 through 272 establishes regulations for hazardous waste management including identification and listing of hazardous waste; standards applicable for generators of hazardous waste; standards applicable to transporters of hazardous waste; standards for owners and operators of hazardous waste treatment, storage, and disposal facilities; standards for the management of specific hazardous wastes and specific types of hazardous waste management facilities; standards for owners and operators of hazardous waste facilities operating under a standardized permit; land disposal restrictions; EPA administered permit programs; and requirements for authorization and approval of state hazardous waste programs.

Enforced by HDOH, HAR Title 11 Chapters 260 through 271 and 280 establishes rules governing hazardous waste management in the State of Hawaii. HAR 11-260 through 11-270, are patterned after the regulations promulgated in 40 CFR 260 through 270, respectively. All references in tables and appendices to provisions of the CFR shall be construed to mean the state rule analogue of the referenced federal regulation (e.g., 40 CFR 260.1 shall be construed to mean section 11-260-1 of the HAR). The list of regulations applicable to Harbors is discussed below.

40 CFR Part 260 (HAR Title 11 Chapter 260) – Hazardous Waste Management System: General

This Part provides purpose, scope, applicability, definitions, references, general standards, and overview information applicable to the remainder of the hazardous waste rules.

40 CFR Part 261 (HAR Title 11 Chapter 261) – Identification and Listing of Hazardous Waste

These regulations can be used to determine whether the waste is a solid waste and then to determine if it is a hazardous waste based on the characteristics exhibited by the waste and listed wastes (i.e., ignitability, corrosivity, reactivity, and toxicity; 40 CFR Subpart C). List of hazardous wastes regulated by the EPA is contained in 40 CFR Subpart D. They also specify special requirements for hazardous waste generated by conditionally exempt small quantity generators [CESQG], residues of hazardous waste in empty containers, polychlorinated biphenyls [PCB] wastes regulated under Toxic Substance Control Act [TSCA], recyclable materials, and universal waste.

40 CFR Part 262 (HAR Title 11 Chapter 262) – Standards Applicable To Generators of Hazardous Waste

This Part establishes standards for generators of hazardous waste including but not limited to hazardous waste determination; EPA identification numbers; general requirements for hazardous waste manifest; pre-transportation requirements for hazardous waste packaging, labeling, marking, placarding, and accumulation time; recordkeeping and reporting; and imports/exports of hazardous waste.

These standards can be utilized to make a hazardous waste determination, identifying the operator's generator status based on quantity of hazardous waste generated per calendar month, and managing the hazardous waste in accordance with the requirements for different generators. The hazardous waste generators are classified into Large Quantity Generator [LQG], Small Quantity Generator [SQG], and CESQG. A generator's "status" is defined by the type of hazardous waste created and the quantity of waste that is generated and stored onsite. It is important that container weight and universal waste weight is not included in the total. Detailed discussion for each type of generator is listed below:

CESQGs generate 100 kilograms (220 pounds) or less of hazardous waste and 1 kilogram (2.2 pounds) or less of acutely hazardous waste in one calendar month. A CESQG must identify all the hazardous waste generated. CESQG cannot accumulate 1,000 kilograms (2,205 pounds) or more of hazardous waste and more than 1 kilogram (2.2 pounds) of acute hazardous waste at any time. A CESQG does not need to acquire an EPA RCRA identification number. Use of a Hazardous Waste Manifest form is not required but recommended.

SQGs generate more than 100 kilograms (220 pounds) and less than 1,000 kilograms (2,205 pounds) of hazardous waste and 1 kilogram (2.2 pounds) or less of acutely hazardous waste in one calendar month. An SQG may accumulate hazardous waste on site for 180 days without a permit (or 270 days if shipping a distance greater than 200 miles). A SQG cannot accumulate 6,000 kilograms (13,228 pounds) or more of hazardous waste and more than 1 kilogram (2.2 pounds) of acute hazardous waste at any time. An SQG needs to acquire an EPA RCRA identification number, and needs to use a Hazardous Waste Manifest form. There must always be at least one employee available to respond to an emergency. This employee is the emergency coordinator responsible for coordinating all emergency response measures. SQGs are not required to have detailed, written contingency plans.

LQGs generate 1,000 kilograms (2,205 pounds) or more of hazardous waste or 1 kilogram (2.2 pounds) or more of acute hazardous waste in one calendar month. An LQG does not have a limit on the amount of hazardous waste accumulated on site, but may store hazardous waste on-site for up to 90 days. An LQG needs to acquire an EPA RCRA ID Number, needs to use a Hazardous Waste Manifest form, and must submit a biennial hazardous waste report. There must always be at least one employee available to respond to an emergency. This employee is the emergency coordinator responsible for coordinating all emergency response measures. Furthermore, an LQG needs to comply with the requirements for personnel training, preparedness and prevention, detailed contingency plans and emergency procedures.

In addition, the generator must comply with the applicable requirements associated with the containment used to store hazardous waste. All generators must ensure that hazardous waste is delivered to a person or facility that is authorized to manage it.

40 CFR Part 263 (HAR Title 11 Chapter 263) – Standards Applicable To Transporters of Hazardous Waste

This Part establishes standards which apply to persons transporting hazardous waste within the United States if the transportation requires a manifest under 40 CFR Part 262 (or HAR 11-262). Note that these regulations do not apply to on-site transportation of hazardous waste by generators/owners/operators of permitted hazardous waste management facilities. A transporter of hazardous waste must also comply with other applicable Parts within 40 CFR (and/or HAR Title 11), where applicable. This Part also describes the standards for transporter; EPA identification numbers; transfer facility requirements; compliance with the manifest system and recordkeeping; and immediate action and clean up.

C. Universal Waste Management – 40 CFR Part 273 and HAR Title 11 Chapter 273

This Part establishes requirements for managing of acceptable universal wastes, including batteries, pesticides, mercury-containing equipment, and lamps (bulbs). This Part provides an alternative set of management standards in lieu of regulation under 40 CFR Parts 260 through 272. It lists definitions of universal waste; standards for small and large quantity handlers of universal waste (e.g., applicability, prohibitions, notification, waste management, labeling and marking, accumulation time limits, employee training, response to releases, off-site shipments, tracking universal waste shipments, exports, etc.); standards for universal waste transporters; standards for destination facilities; import requirements, and petitions to include other wastes under 40 CFR Part 273. The universal waste regulations discussed within this paragraph are not applicable to the conditionally exempt small quantity generators of hazardous waste (40 CFR Part 273.8).

D. Standards for the Management of Used Oil - 40 CFR Part 279 and HAR Title 11 Chapter 279

On July 30, 2003, EPA established standards for the management of recycled used oil. These standards were further corrected and published on July 14, 2006, as a final rule. This Part establishes used oil management requirements including definitions of used oil; applicability, specifications, prohibitions; standards for used oil generators, transporter and transfer facilities, processors, burners who burn off-specification used oil for energy recovery, fuel marketers (e.g., applicability, hazardous waste mixing, storage, on-site burning, off-site shipments, restrictions, notification, transportation, rebuttable presumption, storage, tracking, residue management, reporting); standards for used oil collection centers and aggregation points; standards for disposal of used oil; and used oil and used oil fuel permitting system.

E. UST Regulations - 40 CFR Part 280 and HAR Title 11 Chapter 281

This Part applies to all owners and operators of a UST system as defined in 40 CFR 280.12 except as otherwise provided in paragraphs (b), (c), and (d) of 40 CFR 280.10. This Part establishes UST regulations including:

- Program scope and interim prohibition (i.e., applicability, definitions, and interim prohibition for deferred UST systems);
- Design, construction, installation and notification (i.e., performance standards for new UST systems, upgrading of existing UST systems, and notification requirements);
- General operating requirements for spill and overfill control, operation and maintenance of corrosion protection, compatibility, repairs allowed, and reporting and recordkeeping;
- Release detection (i.e., general requirements for all UST systems, requirements for petroleum and hazardous substance UST systems, methods of release detection for tanks and piping, and release detection recordkeeping);
- Release reporting, investigation, and confirmation (reporting of suspected releases, investigation due to off-site impacts, release investigation and confirmation steps, and reporting and cleanup of spills and overfills);
- Release response and corrective action for UST systems containing petroleum or hazardous substances (i.e., initial response, initial abatement measures, initial site characterization, free product removal, investigations for soil and groundwater cleanup, corrective action plan, and public participation);
- Out-of-service UST systems and closure (i.e., temporary closure, permanent closure and change-in-service, assessing the site at closure or change-in-service, applicability to previously closed UST systems, and closure records); and
- Financial responsibility.

F. HAR Title 11 Chapter 104.1 - Management & Disposal of Infectious Waste

This chapter establishes minimum requirements for the management, treatment, transport, storage, and disposal of infectious waste and treated infectious waste in order to ensure practices that will protect the health and safety of persons living in the State of Hawaii. This chapter includes definition of infectious waste and storage, prohibited acts, categories of infectious waste; handling, transportation, and disposal requirements of untreated infectious waste within a generating facility; treatment and storage of treated infectious waste within a generating facility; transportation of infectious waste for treatment away from the generating facility and disposal of treated/untreated infectious waste, required elements of infectious waste management plan, exemption for placenta; and enforcement, penalties and severability.

4. Emergency Planning and Community Right-To-Know Act

The EPCRA of 1986 (42 USC §§ 11002 and 11003), a federal law, was created to help communities plan for emergencies involving hazardous substances. It establishes requirements for federal, state, local governments, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The EPCRA

provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment, States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment. There are four major provisions of EPCRA, including:

- Emergency Planning (EPCRA Sections 301 through 303; 40 CFR Part 355)
- Emergency and Accidental Release Notification (EPCRA Section 304; 40 CFR Part 355)
- Hazardous Chemical Storage Reporting (EPCRA Sections 311 and 312 (Tier II); 40 CFR Part 370)
- Toxic Chemical Release Inventory (commonly referred to as TRI or Form R; EPCRA Section 313; 40 CFR Part 372)

In 1993, the Hawaii Emergency Planning and Community Right-to-Know Act [HEPCRA] became law (HRS 128E). It promulgated the federal EPCRA requirements in the State of Hawaii. This statute establishes planning, reporting, emergency notification, and public information access requirements related to hazardous chemicals. It also creates the Hawaii State Emergency Response commission [HSERC], which is established within the HDOH, as well as Local Emergency Planning Committees [LEPC], which are located in each county of Hawaii to implement emergency response planning and related actions. If a facility stores extremely hazardous substances [EHS] above threshold planning quantities [TPQs] published in 40 CFR 355 Appendices A and B, or if the facility stores 10,000 pounds or more of a hazardous material, the facility is subject to HEPCRA.

A. 40 CFR Part 355 – Emergency Planning and Notification

This Part establishes the list of EHS, TPQs, and facility notification responsibilities necessary for the development and implementation of state and local emergency response plans. These regulations include purpose, definition, emergency planning, emergency release notifications, penalties, and the regulated list of extremely hazardous substances and their TPQs.

B. 40 CFR Part 370 – Hazardous Chemical Reporting: Community Right-to-Know

This Part establishes reporting requirements which provide the public with important information on the hazardous chemicals in their communities for the purpose of enhancing community awareness of chemical hazards and facilitating development of state and local emergency response plans. These regulations include purpose, definitions, penalties; reporting requirements (i.e., applicability, material safety data sheets [MSDS] reporting, inventory reporting, and mixtures); public access and availability of information (i.e., request and provision for information; and inventory forms (i.e., Tier I emergency and hazardous chemical inventory form, and Tier II emergency and hazardous chemical inventory form).

C. 40 CFR Part 372 – Toxic Chemical Release Reporting: Community Right-to-Know

This Part sets forth requirements for the submission of information relating to the release of toxic chemicals under Section 313 of Title III of the Superfund Amendments and Reauthorization Act [SARA] of 1986. The information collected under this Part is intended to inform the general public and the communities surrounding covered facilities about releases of toxic chemicals, to assist research, to aid in the development of regulations, guidelines, and standards, and for other purposes. These regulations also set forth requirements for suppliers to notify persons to whom they distribute mixtures or trade name products containing toxic chemicals that they contain such chemicals.

These regulations include scope and purpose, definitions, persons subject to this part, recordkeeping, and compliance and enforcement; reporting requirements (i.e., covered facilities for toxic chemical release reporting, and North American Industry Classification System [NAICS] codes (also refers to as Standard Industrial Codes [SIC]) to which this Part applies, thresholds for reporting, alternate thresholds and certification, lower thresholds for chemicals of special concern, reporting requirements and schedule for reporting, and exemptions); supplier notification requirements (i.e., notification about toxic chemicals); specific toxic chemical listings; and toxic chemical release reporting forms and instructions.

D. HAR Title 11 Chapter 451 – State Contingency Plan

Adopted on August 2, 1995, this chapter establishes the Hawaii State Contingency Plan [SCP] in order to implement, administer, and enforce the HRS chapter 128D (Hawaii Environmental Response Law [HERL]). These regulations are based on the National Contingency Plan [NCP] (administrative rules under Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA], which is also known as “Superfund”). The SCP identifies hazardous substances, pollutants, or contaminants, which are subject to the requirements and procedure. It also designates any release of hazardous substances, pollutants, or contaminants in quantities equal to or exceeding their reportable quantities, or any threat of release of hazardous substances, pollutants, or contaminants which poses or which may pose a substantial endangerment to public health or welfare, the environment, or natural resources, and all action taken pursuant to HRS chapter 128D, or these rules. The SCP details notification of releases, hazardous substance response, natural resources, activities by other persons, administrative records, and entry and access.

Attachment 10

Training Materials for Inspector

INSPECTION DESCRIPTION

The risk ranking process determines the list of tenants to be inspected and appropriate inspection frequency. The primary purpose of the inspection is to evaluate how facility operations comply with Harbors stormwater management program, major environmental laws, applicable BMPs, pollution prevention [P2], and relevant clauses contained within a lease agreement (or revocable permit). Environmental compliance, BMP, and P2 information for each of the fourteen inspection criteria are discussed in Section I.

The second purpose for the inspection is to develop and maintain an accurate inventory of environmental assets owned and/or operated by each tenant. These assets are discussed in Section II. The third purpose for the inspection is to confirm compliance with environmental laws regulated by EPA, HDOH, HDOT, and other agencies. In addition, these routine inspections will identify any potential violation and assist in providing any corrective action, if necessary. Inspections are conducted under the following circumstances:

- **Routine Inspections** are required under stormwater management program and based on individual tenant's risk ranking;
- **Follow-up Inspections** are to be conducted, after investigation inspection, to verify that necessary corrective actions are implemented;
- **Initial Site Inspections** or **New Tenant Inspections** are conducted to evaluate new tenant operations;
- **Final Site Inspections** are conducted to evaluate environmental conditions in tenant areas subject to lease (or revocable permit) termination.
- **Reconnaissance Inspections** are conducted at low risk-ranked tenant facilities as an annual evaluation tool.
- **Investigation Inspections** are to investigate reported illicit discharges to receiving water and/or Harbors stormwater drainage system;

Other inspections include **Joint Inspections**, which are conducted jointly with HDOH and/or EPA representatives. The above-listed inspections are further discussed below.

Section I - Compliance, BMP, and P2 Information

Compliance is the state of being in accordance with the relevant federal and regional authorities and their requirements. In order to assist tenants to remain in compliance with Harbor's stormwater management program, major environmental laws, and relevant clauses (or Terms and Conditions) contained within lease agreement and/or revocable permit, Harbors has identified and implemented several means of disseminating related information to tenants. These means include, but are not limited to, providing *Annual Storm Water Pollution Prevention Awareness Training*, sending out informative brochures, providing technical support and assistance during inspections, and mailing out the inspection reports to keep tenants informed of their compliance status.

BMPs are defined as a schedule or schedules of activities, prohibitions or designations of practices, maintenance procedures, and other management practices to prevent or reduce the pollution to receiving water and/or Harbors stormwater drainage system. BMPs include treatment requirements, operating procedures, and practices to control runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

BMPs related to treatment control utilize physical devices or systems that remove pollutants from stormwater. BMPs related to operational practices intend to prevent pollutants from entering surface waters and/or Harbors stormwater drainage system, by altering activities to eliminate and minimize the pollution. BMPs related to spill response rely on a combination of structural controls, employee awareness, and relevant training to be effective methods for protection of environment.

Harbors always encourages the tenants to implement applicable BMPs and P2 measures to further aid in preventing discharge of pollutants. The tenants should be aware of the requirements of the inspection checklist and understand how their operations could impact the environment. Applicable BMPs associated with the fifteen inspection criteria are included in Attachment 3. Some of them are based on the November 2011 City and County of Honolulu [CCH] publication (CCH, 2011), "*Storm Water Best Management Practice Manual for Construction*." Brief descriptions of typical operations and the accompanying key inspection criteria are discussed below.

1. Elimination of Non-Stormwater Discharges to Stormwater Drainage System

This is a general BMP applicable to all tenants. Non-stormwater discharges can be classified as 1) activity-based (subtle) or 2) overt (hard-pipe connection). Activity-based non-stormwater discharges may include wash water, tank overflows, and spillage. Overt non-stormwater discharges are flows piped to Harbors stormwater drainage system. These flows may include processed wastewater, treated cooling water, and treated sanitary wastewater. Non-stormwater discharges can be detected during storm drains and tenant routine inspection. In addition, overt connections can also be detected during the outfall reconnaissance inspection and engineering plan review process. The key inspection criteria for activity-based and overt discharges are listed in Table 1.

Certain non-stormwater discharges are permitted by regulations, and therefore, exempted from the program. The discharge of pollutants to Harbors stormwater drainage system shall be reduced to the MEP. The following non-stormwater discharges may be discharged into Harbors stormwater drainage system, provided that such discharges do not contain pollutants in amounts that will cause or contribute to a violation of an applicable water quality standard.

- Water line flushing;
- Landscape irrigation;

- Diverted stream flows;
- Rising ground waters;
- Uncontaminated ground water infiltration;
- Uncontaminated pumped ground water;
- Discharges from potable water sources and foundation drains;
- Air conditioning condensate;
- Irrigation water;
- Springs;
- Water from crawl space pumps and footing drains;
- Lawn watering runoff;
- Water from individual residential car washing;
- Flows from riparian habitats and wetlands;
- Dechlorinated swimming pool discharges;
- Residual street wash water;
- Discharges flows resulted from firefighting activities.

Table 1
Elimination of Non-Stormwater Discharges to Stormwater Drainage System

Subject	Key Inspection Criteria
Activity-based	• Identify facility areas exposed to stormwater which are wet during dry weather, or are stained. • Inspect discharge points to the stormwater drainage system to identify uncharacteristic volume, color, turbidity, odor, floatables, or foaming.
Overt	• Inspect each discharge point to the stormwater drainage system during dry weather. • Ask the tenant to identify the discharge pathway of all floors and drains. Review as-built drawings as needed to verifying piping schematics.

2. Vessel, Equipment, and Vehicle Maintenance and Repair

The outstanding features of Hawaii's climate include mild temperatures throughout the year (70s to 90s degrees of Fahrenheit [ºF]), moderate humidity, persistence of northeasterly trade winds, significant differences in rainfall within short distances, and infrequent severe storms. Generally, weather in Hawaii is very consistent, with only minor changes in temperature throughout the year. For the majority of Hawaii, there are only two seasons – summer (from May to October) and winter (from November to April).

Due to the mild climate in Hawaii, vessel, equipment, and vehicle maintenance and repair activities are usually conducted in uncovered areas. Accordingly, the potential for discharge of pollutants to the environment from these activities is very high. Therefore, conducting maintenance and repair activities in authorized areas are critical to the success of this BMP.

Additional state and federal regulations apply to some aspects of maintenance operations. These include, but are not limited to, federal and state solid and hazardous waste regulations, sewer use ordinances, and the Uniform Fire Code. Issues related to maintenance areas can be addressed with a combination of these regulatory tools. The key inspection criteria related to vessel (dry-docked or on-land ONLY), equipment, and vehicle maintenance and repair are listed in Table 2.

Table 2
Vessel, Equipment, and Vehicle Maintenance and Repair

Subject	Key Inspection Criteria
Work Area	• Verify that maintenance/repair works occur in an authorized area. • Verify that storm drain inlets are protected from potential discharge of pollutants, and cleaned on a regular basis. • Verify that maintenance/repair areas are not hosed down; instead, the areas are cleaned using dry methods.
Equipment	• Verify that greasy and leaking equipment are stored under cover with oil drip pans or other secondary containment. • Verify that all fluids are drained and batteries are removed from salvage vessels, vehicles, and equipment.
Materials	• Evaluate hazardous materials (potentially hazardous substances) utilized and make suggestions for substitutions with recycled or less toxic products. • Verify recycling or proper disposal of grease, oils, antifreeze, brake fluid, cleaning solutions, hydraulic and transmission fluids, solvents, paints, batteries, and filters.
Training	• Verify that maintenance/repair employees have received proper awareness training on stormwater BMPs and a hazard communication [HAZCOM] course.

3. Vessel, Equipment, and Vehicle Fueling

Fuel transfer activities at Harbors tenant facilities occur at various locations and circumstances. Designated fueling areas are designed to prevent the run-on of stormwater and the run-off of spills. Certain fuel oil storage and transfer operations are regulated under 40 CFR Part 112 (Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities, commonly known as the SPCC Program). USTs used for fuel oil storage are regulated under HAR Title 11 Chapter 281. Furthermore, it is very common that vessel fueling operations occur while the vessel is still in the water. Due to the great potential of release to immediate receiving waters, fueling operations in water must adhere to USCG regulations, which is not discussed in this section.

Some Harbors tenants are subject to 40 CFR Part 112 and will need to develop and implement

a SPCC plan, which is further discussed in Section 4.1.11 (*Emergency Spill Cleanup Plan*). The key components of the BMPs related to fueling activities address some practical measures that should be followed independently and/or in conjunction with the tenant's SPCC plan. The key inspection criteria related to vessel (dry-docked or on-land ONLY), equipment, and vehicle fueling are listed in Table 3.

Table 3
Vessel, Equipment, and Vehicle Fueling

Subject	Key Inspection Criteria
Fueling Area	• Ensure that the spill kits are readily available. • Assess fueling area design, and make recommendations for installing a cover, dead-end sump, berms, or impervious surfacing if appropriate. • Inspect sump or oil/water separator and query tenant on maintenance schedule. • Query tenant on fueling location of mobile equipment.
Operations	• Check for staining in fueling areas, and evaluate whether adequate spill cleanup methods are routinely implemented. • Evaluate cleanup practices (i.e., spent absorbent should be picked up and stored in an appropriate container, fueling areas should not be hosed down, and employees should be trained on fueling, spill cleanup practices, release notifications, and informed of SPCC plan if there is one).
Equipment	• Evaluate secondary containment devices (either portable or permanent used during fueling operations). • Inspect visible piping, tanks, and hoses for signs of leakage, wear, or malfunction.

4. Vessel, Equipment, and Vehicle Washing

Most of Harbors tenants are located in close proximity to the ocean, which would cause a relatively high rate of corrosion on metals. Therefore, there is an increased need to remove accumulated sediment from vessel (dry-docked or on-land), equipment, and vehicle. Wash racks equipped with oil/water separators and containment devices should be utilized for all washing operations on land, except for removal of salt from the exterior of the vessel using fresh water with low power, as noted in ***Tenant Inspection Manual - Section 4.3.3***.

Prior to conducting any vessel, equipment, or vehicle washing activity on site, the tenant must obtain a written consent from the Harbors. Unauthorized washing on Harbors property would result in an NAV or more severe enforcement.

All washing operations should be conducted in a manner that will contain potential pollutants. This can be accomplished through prohibiting the use of surfactants, using minimal water, utilizing secondary containments, and/or use less hazardous and more biodegradable materials.

A list of alternative products is included in Attachment 8 (NOAA, 2005). If possible, after necessary pretreatment, wash water should be discharged to sanitary sewer through a permitted connection or to a permitted underground injection well. The key inspection criteria related to vessel (on-land ONLY), equipment, and vehicle washing are listed in Table 4.

Table 4
Vessel, Equipment, and Vehicle Washing

Subject	Key Inspection Criteria
Washing Area	• Evaluate area for optimal characteristics including cover, containment, surface integrity, slope, and run-on/run-off.
Wash Water Treatment	• Assess maintenance, cleaning, and disposal of materials from sumps and oil/water separators.
Equipment	• Inspect wash water collection, pretreatment, and reclamation system components for potential discharges. • Evaluate storage and use of cleaning agents.
Permits	• Evaluate whether vessel or vehicle washing activity and related washing method is authorized by Harbors. • Evaluate whether discharges to the sanitary sewer or an underground injection well are authorized.
Operations	• Evaluate whether all washing operations take place in approved areas.

5. Container Storage

Storage of chemical products and new/used oil on-site is subject to federal (EPCRA; 40 CFR Part 355, 370, and 372) and state regulations (HAR Title 11 Chapter 451). In addition, storage of used oil is subject to specific management standards under 40 CFR Part 279 and HAR Title 11 Chapter 279.

The SPCC regulations (40 CFR Part 112) specify certain secondary containment requirements for aboveground storage of oil. This BMP extends the secondary containment requirement to all containers used for storage of oil and potentially hazardous substances outdoors. Waste handling and disposal is discussed in 7 - *Waste Handling and Disposal*. The key inspection criteria related to container storage are listed in Table 5.

Table 5
Container Storage

Subject	Key Inspection Criteria
Storage Area	• Evaluate adequacy of secondary containment so that it is sufficient to hold the volume of the largest container plus additional 10% or greater capacity for accommodating precipitation. • Evaluate containers, aboveground tanks, and piping for protection guards, such as bollards, to prevent vehicle or forklift damage.
Equipment	• Verify that aboveground oil tanks are equipped with overflow protection devices, which will shut down transfer pumps automatically, and relevant warning signs for operators. • Inspect container integrity for signs of failure.
Operations	• Verify that all containers are clearly labeled to prevent misuse or accidental release. • Evaluate management of secondary containment structures to prevent accumulation of stormwater and/or free product, and verify that tenant maintains the log for discharge of uncontaminated stormwater from secondary containment.

6. Material Storage and Handling

This BMP related to the loading/unloading and temporary storage of non-petroleum materials and cargo. Fuel oil loading/unloading activities are covered in 3 - *Vessel, Equipment, and Vehicle Fueling*. Oil and potentially hazardous substance storage is covered in 5 - *Container Storage*.

Material storage and handling operations at a tenant's facility can include bilge servicing, sewage transfer, fire suppressant loading, cargo handling, neo-bulk cargo staging (e.g., construction materials such as lumber), dry-bulk handling (e.g., sand, aggregate, coal, scrap metal, Portland cement, etc.), other break-bulk cargo handling (e.g., miscellaneous general cargo), and associated temporary storage. Additionally, this BMP can also address pumping operations affiliated with the cleaning of tanks, sumps, piping, or pier areas. The key inspection criteria related to material storage and handling are listed in Table 6.

Table 6
Material Storage and Handling

Subject	Key Inspection Criteria
Loading Area	• Evaluate design and identify opportunities to improve cover, grading, berms, downspout and storm drain locations, and parking orientation. • Evaluate non-structural loading areas in proximity to storm drains, stains, or pavement degradation.
Bulk Storage	• Inspect all temporary storage areas and maintain good housekeeping in the areas.
Equipment	• Verify that adequate supplies of cleanup materials are readily available at material handling locations.
Operations	• Verify that leaks from transferring operation and spillage from hose disconnections are contained, absorbed, and disposed of properly. • Review written operation plans and/or emergency spill cleanup plans.
Training	• Query tenant on spill prevention and response training of employees. • Forklift drivers must receive proper training (Occupational Safety and Health Administration [OSHA] federal regulation 29 CFR 1910.178).

7. Waste Handling and Disposal

Solid waste storage and management is regulated under HAR Title 11 Chapter 58.1 (in draft). Storage of hazardous waste is subject to specific management standards under the federal RCRA (40 CFR Parts 260 to 272) and state regulations (HAR Title 11 Chapters 260 through 271 and 280). These standards include the requirement for secondary containment of all hazardous waste containers as a spill prevention measure. Universal waste management is regulated under 40 CFR Part 273 and HAR Title 11 Chapter 273. Management and disposal of infectious waste is regulated under HAR Title 11 Chapter 104.1.

This BMP is intended to prevent or reduce the discharge of pollutants to the environment from waste handling activities by tracking waste from generation and storage to disposal. It also intends to reduce waste generation and disposal through source control (i.e., reduction, reuse, and recycling). In addition, this BMP aims on preventing run-on and run-off at waste management areas.

Waste handling and disposal related activities are regulated by both federal and state laws (see 5 – *Container Storage*). The high cost and regulation pertaining to waste handling and disposal provide incentives for reducing waste generation and identifying opportunities for reuse and recycling. Components of this BMP target both the required waste management activities and waste reduction efforts. The key inspection criteria related to waste handling and disposal are listed in Table 7.

Table 7
Waste Handling and Disposal

Subject	Key Inspection Criteria
Storage Area	• Inspect all used oil and hazardous waste storage areas to assess integrity of secondary containment. • Inspect all waste storage areas to ensure that dumpsters are covered and not leaking. • Ensure that sediments and wastes are not tracked off site;
Operations	• Inspect all waste storage areas to ensure that incompatible wastes (such as acids and bases) are segregated and that all waste containers are labeled/marked and dated properly (refer to HAR Title 11 Chapters 260 through 280: Hazardous Waste Management for labeling requirements); • Inspect waste storage containers for integrity (must be covered when not being filled as well as rust and dent-free). • Inspect waste storage areas for signs of leaks or spills. • Verify that all wastes are disposed of properly, and if applicable, query tenants on their hazardous waste generator status (CESQG, SQG, or LQG), obtain related EPA identification number, and verify that records related to waste generation and disposal are being kept. • Evaluate training of employees handling waste.
Waste Reduction	• Maintain minimal inventory of chemical products to reduce potential spill and waste generation. • Identify less toxic chemical substitutes to reduce hazardous waste generation. • Reuse or recycle materials whenever possible. • Evaluate processes generating wastes to identify modifications (e.g. double cleaning of parts, material substitutions or eliminations, etc.) that would minimize wastes.

8. Pier, Building, and Ground Maintenance

Pier maintenance includes pier and marine structure repairing, and routine maintenance works (i.e., painting, carpentry, plumbing, and cleaning of operational areas). Building maintenance includes activities such as painting, roofing, pressure washing, and construction of a building. Ground maintenance includes cleaning of operational areas and application of fertilizers, biocides, herbicides, and pesticides. It also includes maintenance of the stormwater drainage system. These activities generate debris and pollutants that could come into contact with stormwater run-on and run-off. The key inspection criteria related to pier, building, and ground maintenance are listed in Table 8.

Table 8
Pier, Building, and Ground Maintenance

Subject	Key Inspection Criteria
Pier Maintenance	• Evaluate temporary controls (such as tarps, booms, restricted use of wash water, and storm drain covers) to contain debris and pollutants. • Evaluate cleaning methods for paved surfaces (such as sweeping over washing, and proper storage and disposal of sweeper debris). • Evaluate cleaning schedule for the stormwater drainage system.
Building Maintenance	• Evaluate temporary controls (such as tarps, booms, restricted use of wash water, and storm drain covers) to contain debris and pollutants.
Ground Maintenance	• Evaluate cleaning methods for paved surfaces (such as sweeping over washing, and proper storage and disposal of sweeper debris). • Encourage conservative utilization of fertilizers, biocide, herbicides, and pesticides with intention of maximizing absorption and minimizing run-off to stormwater drainage system. • Recommend leaving or planting native vegetation to reduce irrigation, fertilizer, biocide, herbicide, and pesticide needs. When applying biocide, herbicide, or pesticide, follow the manufacturer's recommendations and instructions, and avoid spray in high winds or when rainfall is imminent to reduce overspray and run-off. • Encourage collecting and composting of green waste to prevent blockages in the stormwater drainage system. • Evaluate cleaning schedule for the stormwater drainage system.

9. Stormwater Pollution Prevention Education and Outreach

The SWMP has been developed and implemented for harbors covered under the NPDES program. The plan includes sections on tenant education and outreach related to stormwater pollution prevention and good housekeeping. Tenants covered under their own NPDES permit are required to have their own Storm Water Pollution Control [SWPC] or similar plan and to provide training for their employees, which is often a part of their corporate policy. In addition, Harbors provides *Annual Storm Water Pollution Prevention Awareness Training* to the tenants. The tenants are required to attend this annual training, share the information with their employees, and provide feedback.

This section identifies potential components of stormwater pollution prevention training programs. Inspection criteria would be limited to confirmation of employee training and review of stormwater training materials and recordkeeping. The key inspection criteria related to stormwater pollution prevention education and outreach are listed in Table 9.

Table 9
Stormwater Pollution Prevention Education and Outreach

Subject	Key Inspection Criteria
Education	• Increase awareness of what is (or is not) allowed to enter the storm drains. • Increase awareness of the detrimental environmental impacts resulted from fuel, antifreeze, lubricants, pesticides, detergents, paint, and waste residue. • Identify stormwater collection system components.
BMP	• Encourage labeling/stenciling of storm drains to discourage illicit discharges or illegal dumping. • Promote the proper storage, use, and disposal of potentially harmful chemicals. • Promote the proper storage and disposal of wastes. • Encourage acquisition of alternative and less toxic chemicals (such as short shelf-life pesticides, non-chlorinated solvents, water-based paints, and non-aerosol products). • Encourage waste minimization and recycling. • Provide mechanism for reporting of apparent violations and enhance awareness of possible penalties affiliated with illicit discharge/dumping. • Encourage efficient and safe BMPs in areas with industrial activity.

10. Oil/Water Separator

An oil/water separator [OWS] is a device designed to separate gross amounts of oil and suspended solids from stormwater or wastewater effluents (from restaurants, oil refineries, petrochemical plants, chemical plants, natural gas processing plant, or other industrial sources). It is installed as a pretreatment device for wastewater, prior to discharge to a sanitary sewer, cesspool, recycling system, treatment plant, or other collection points. OWS can also be installed at locations with high fuel recovery potential, such as fuel truck loading areas where spilled product can be recovered for proper use or disposal.

In terms of stormwater, an OWS is typically installed in operational areas prone to frequent small spills and drips that have a significant cumulative impact on stormwater quality. The stormwater OWS is utilized as a flow-through polishing device rather than a reclamation device.

The OWS comes in a range of sizes and designs, depending on the volume of flow and characterization of the influent. All OWSs warrant regular maintenance in order to be effective and efficient in wastewater treatment. The key inspection criteria related to OWS are listed in Table 10.

Table 10
Oil/Water Separator

Subject	Key Inspection Criteria
Performance	• Regularly inspect effluent from OWS for sheen, odor, clarity, floatables, and/or other abnormal observations
Operations	• Query tenant on OWS inspection, cleaning frequency, and waste disposal. • Query tenant on major maintenance activities or routine parts replacement. • Query tenant on employee training, particularly with OWS that requires valves or switches.
Permits	• Evaluate whether discharges to the sanitary sewer is authorized.
Document Review	• Review the permit for basic components, including expiration date, permit conditions, discharge limits, and general provisions contained in the permit. • Verify that permit is renewed as necessary. • Review the Operation and Maintenance Records.

11. Emergency Spill Cleanup Plan

An Emergency Spill Cleanup Plan is developed in support of other BMPs, including those that are focused on maintenance and repair, fueling, washing, outdoor material storage and handling, outdoor container storage, and waste handling and disposal (see 2 to 7). Owners and operators of facilities, which store/process petroleum or petroleum-based products in certain quantities, may be subject to 40 CFR Part 112 and will need to develop and implement an SPCC plan (see 2 – *Oil Pollution Prevention*).

For tenants that store use oil in quantities under the threshold (not subject to SPCC regulations) and conduct operations with high potential of spilling any potentially hazardous substances, an Emergency Spill Cleanup Plan should be developed, which is tailored to the activities conducted by the tenants as a pollution prevention tool. The key inspection criteria related to an Emergency Spill Cleanup Plan are listed in Table 11.

Table 11
Emergency Spill Cleanup Plan

Subject	Key Inspection Criteria
Program Evaluation	• Evaluate whether or not the tenant is subject to the SPCC program; if so, verify that they have submitted a copy of the current SPCC plan to Harbors. • Evaluate whether or not the tenant conducts operations which would warrant an Emergency Spill Cleanup Plan, and make recommendations.
Document Review	• Review the existing plan for basic components, including facility description, site plan, notification procedures, cleanup instructions, cleanup materials, and responsible parties. • Review spill response records, if there are any. • Verify that contingencies (such as spill kits) identified in the plan are present and stocked. • Verify that employees are trained in Emergency Spill Cleanup Plan components.
Training	• Query tenant on spill prevention and response training of employees. • Query tenant's employee on emergency spill cleanup.

Section II - Environmental Asset Inventory

The environmental asset consists of natural environment and built environment. The natural environment encompasses all living and non-living things occurring naturally on Earth or some region thereof. It can be distinguished by components, including complete ecological units, which function as natural systems without massive human intervention, and universal natural resources and physical phenomena that lack clear-cut boundaries (such as air, water, and climate). The built environment comprises the areas and components that are strongly influenced by humans.

During tenant routine inspections, an inventory of environmental assets will be verified and updated. A tenant database has been developed and maintained, in which operations and equipment having environmental significance are assessed and documented. Key environmental asset categories include aboveground storage tanks, mobile storage tanks, underground storage tanks, hazardous material storage areas, spill kits, waste storage areas, paint booths, paint shops, vehicle wash areas, pre-treatment systems, and maintenance areas for vessels, equipment, and vehicles.

Tracking environmental assets allows for a comprehensive evaluation of operations at each harbor, and more effective communication with tenants regarding changes in applicable regulations or policies. Database queries generate reports containing environmental assets are used during routine inspections, illicit discharge investigations, enforcement actions, and lease (or revocable permit) termination proceedings. Therefore, verifying and updating electronic records of environment assets is an essential component.

INSPECTION PROCEDURES

Inspection procedures are designed to maintain compliance with the applicable environmental regulations at Harbors.

Step 1: Pre-inspection Preparation

Prior to conducting routine inspections, inspectors (Environmental Section personnel or their designees) shall collect and analyze available background information of the tenant to be inspected. Pre-inspection preparation begins by generating a tenant profile from the database (i.e. *Harbors_Tenants.mdb*), which lists all known environmental assets affiliated with the tenant as well as past inspection records. Prior to inspection, relevant property management files and layout maps, identifying leased areas, should be reviewed. In addition, other applicable files such as SPCC plans, SWPC plans, past enforcement actions, facility plans for improvement projects, and correspondence should be reviewed.

The key reviewing criteria include, but not limited to, the following:

- Compare facility diagrams with drainage maps for that area of the harbor to identify potential drainage pathways at and around the facility.
- Pay attention to changes that have occurred at the tenant's facility (either operations or the facility structures).
- Pay attention to changes in Harbors environmental policies since the previous inspection.
- Identify and review the BMPs that are applicable to the tenant's operations.
- Identify any special safety consideration and inspection scheduling limitations prior to contacting the tenant to arrange the inspection.

Upon finishing reviewing of background information, the inspectors should develop an inspection plan to highlight the key components of the inspection. The major purpose of the tenant inspection is to identify potential environmental concerns and provide outreach if necessary. In addition, the inspection also serves the purpose of acquiring specific information from the tenant (e.g., copies of permits, plans, and training records) and conveying specific information to the tenant in a direct fashion. The inspection plan should include following components at least:

1. Objectives - Define purpose of inspection and intended accomplishments.
2. Tasks - Identify specific tasks and information to be collected and/or reviewed.
3. Procedures - Identify any special procedure to be used.
4. Resources - Establish personnel and equipment needs.
5. Schedule - Given the inspection frequency, assess how much time will be needed.
6. Coordination - Determine whether this inspection warrants coordination with other Harbors personnel or regulatory agencies.

Step 2: Entry

Leases and revocable permits, issued by Harbors, provide inspectors the right to enter tenant's facility for the purpose of inspection. Even though advanced notification of tenants to-be-inspected is not required, it does give tenants enough time to gather necessary records, make sure at least one tenant representative available to accompany the inspector, and prepare them to discuss environmental concerns or questions. Unannounced inspections could provide a more accurate sense of day-to-day operations, and are generally utilized when inappropriate corrective actions warrant a higher level of enforcement. The tenant inspections usually serve the dual purpose of environmental outreach and compliance. Therefore, scheduling the inspection a few days in advance may foster a more productive working relationship with Harbors tenants.

Usually, the inspection begins by the inspector introducing themselves to reception and asking for the point of contact with the tenant. When more than one inspector on site (either from Harbors, a combination of Harbors and their designees, or a combination of Harbors and HDOH/EPA representatives), the inspectors should identify their respective roles in the inspection, as well as who will be leading the inspection for the team. This will ensure efficient communication between the tenant and the inspection team.

In the rare instance, when access to a tenant facility is denied, the inspector should notify Harbors Environmental Section supervisor and obtain a copy of the relevant lease agreement or revocable permit from Property Management Section, highlighting the *Inspection of Premises* section (contained within lease agreement) or *Entry by State* section (contained within revocable permit).

Lease language typically states:

"The LESSEE shall permit the LESSOR and its employees, representatives and agents, at all reasonable times during the said term of this lease, to enter the Premises for any governmental purpose, including, without limitation, examining the state of repair and condition."

Revocable permit language typically states:

"The STATE or its agents and employees may enter the Premises at all reasonable hours to inspect the Premises and determine if the PERMITTEE is complying with the terms and conditions of this Permit or for any other proper purpose. The PERMITTEE shall not make any claim for damages or set off of rent, service charge or other charges by reason or on account of such entry."

If the tenant exhibits hostile behavior, inspectors should request Harbor Police to provide escort during the inspection. At no time should an inspector feel compelled to conduct the inspection in

an unsafe environment. Some tenant facilities may pose safety concerns and have specific safety protection requirements. Hence, the inspector should refrain from inspecting operational areas until a tenant representative could provide accompaniment.

Step 3: Tenant Conference

Depending on the size of the tenant's facility to-be-inspected, a tenant conference could be conducted onsite prior to the start and/or the end of the inspection if plausible. It may consist merely of the inspector describing the purpose and order of the inspection to the tenant representative. This will allow the tenant representative to locate additional documents or key personnel necessary to fulfill the objectives of the inspection. Pre-inspection preparation may have identified key areas and relevant issues. If so, the inspector should convey these concerns to the tenant representative to ensure that they are reviewed.

It is imperative that a tenant representative accompanies the inspector during the entire inspection to describe operations and answer questions, as well as address considerations related to safety, environment, and liability. Often the tenant representative will include other employees with specialized roles during specific portions of the inspection.

Records, such as monitoring results, waste disposal manifests, or SPCC documentation, may be reviewed before, during, or after the tenant inspection. Sometimes, a tenant inspection may result in one or more follow-up activities. Therefore, prior to the end of the inspection, it will be helpful to take a few minutes to review relevant records and recap any deficiency, violation, or concern, which may require follow-up by either the inspector or the tenant representative.

Step 4: Inspection

Conducting an effective inspection requires observing operations that have the potential to impact the environment, posing questions to the tenant as necessary to gain a clear picture of whether or not the operations are complying with relevant environmental regulations, and recording observations for future use.

The inspector should use the pre-inspection preparation to identify areas of concern requiring the most attention for each tenant, and communicate the inspection plan with the tenant representative. As each area is observed, the inspector should evaluate how operations conform to Harbors revised *Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants* (Attachment 4) and note deficiencies observed. In addition, the inspector should provide an oral guidance to the tenants concerning possible environmental improvements that may suit their operations (e.g., storage techniques, product substitutions, labeling requirements, or proper housekeeping protocols).

The tenant inspection provides an opportunity for the inspector to convey information to the tenants in the context of their operation, as well as a time for the tenants to ask for guidance on

particular environmental concerns. Sometimes, follow-up activities are necessary following the tenant inspection, for both the inspector and the tenant, which contribute to the goal of achieving environmental compliance in tenant operations.

Step 5: Documentation and Recordkeeping

Accurate inspection documentation and recordkeeping are critical to the success of Harbors environmental program. Photo documentation provides a simple and straightforward method to illustrate whether environmental compliance has been achieved and is essential in follow-up activities. If conducting mulTIMle inspections on one day, the inspection should begin the photo documentation with a picture of an overview of tenant facility or an area where the operator of the facility can be easily identified. The inspector should record photo numbers on Harbors revised *Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants* (Attachment 4).

Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants

Harbors revised *Environmental Compliance, BMP, and P2 Inspection Checklist for Tenants* is the primary recordkeeping tool utilized during the inspection (Attachment 4). Inspectors may find it helpful to fill out portions of the form in advance, such as the tenant contact information and notes within each relevant section on the environmental assets or issues of concern. Additionally, some information collected during the inspection may be helpful for other Harbors sections, such as Property Management Section, to update their database.

As reviewing listed sections (e.g., Stormwater, Maintenance and Repair, Fueling, Washing, etc.), the inspector should take time to complete each section with comments and observations. Each lined item should be checked whether the item is “Y” (for yes), “N” (for no), or “N/A” (for not applicable). Any item checked with “N” require at a minimum comments, explanation, and/or further investigation. A copy of the inspection report will be sent to the tenant upon completion. It will become a part of the permanent Harbors tenant file.

Attachment 11

New Tenant Information Package

PROTECT
OUR OCEAN WATER
MALAMA I KE KAI

We are all responsible to make sure that pollutants don't end up in our ocean. To prevent "Illicit Discharges" into the storm water drainage system, there are Good Housekeeping activities and/or **Best Management Practices** (BMPs) that must be incorporated into your operations.

Sweep, Rake, Vacuum & Mop vs. Washing
Do NOT hose off sidewalks, parking areas and garages. Sweep, Rake, Vacuum & Mop and properly dispose of debris.



Use Non-Toxic Products
Choose non-toxic products over toxic ones. If needed, use them sparingly and properly dispose of unused portions. Minimize quantities stored on site.

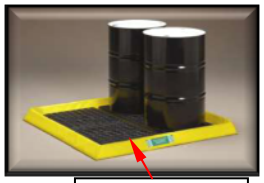
NO Vehicle Washing
Unless authorized in writing by DOT Harbors. When washing vehicles, use soap sparingly and divert water runoff to landscaping or the sanitary sewer. Wash water should be collected in a bucket and poured in a sink. Do not allow soapy water to go onto the ground or into storm drains.

Reduce Use of Landscape Chemicals
Minimize the use of lawn and garden products, pesticides, herbicides, fertilizers and other chemicals. Avoid over-irrigating.

In general, **BMP's** can be followed by incorporating the **4 C's**:

CONTAIN IT, CONTROL IT, CAPTURE IT & COMMUNICATE IT

Contain It: Isolate your work area to prevent any potential flow or discharge from leaving the area.



Spill Containment

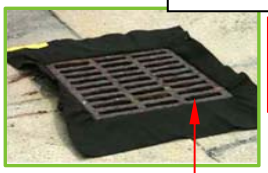


Wash Containment



Control It: Locate the nearest storm drain(s) and take measures to prevent pollutants from entering or discharging into them.

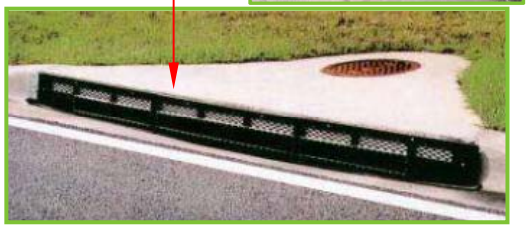
Stenciling





Protect Drains Properly





Capture It: Be prepared with clearly marked spill kits in appropriate areas to contain spills. Capture debris from rainwater runoff, cover trash, sweep, rake, vacuum and mop versus wash. Properly dispose of debris in trash receptacles.





Capture Oil



Be Prepared



Keep Receptacles Covered

Communicate It: Report illicit discharges, suspected discharges, and pollution concerns to Harbors Environmental at **(808) 587-1962** or to contacts listed in the **REPORT ILLICIT DISCHARGES** box. (BACK PAGE)

Best Management Practices (BMPs) for your industry can be found on the DOT Website:





http://hidot.hawaii.gov/harbors/library/storm-water-management/

Select Harbors Division **SCROLL DOWN** the webpage and find **BMP Flyers** under:

Harbors Best Management Practices (BMP) Fliers

- General BMPs

1. BMPs for Building and Remodeling
2. BMPs for Vehicle and Equipment Fueling
3. BMPs for Solid and Hazardous Waste Management
4. BMPs for Material Delivery and Handling
5. BMPs for Material Storage
6. BMPs for Vehicle Washing
7. BMPs for Vessel Maintenance Activities

- National Menu of Stormwater BMPs:
- EPA Construction BMPs:
- EPA Post-construction BMPs:

SCROLL DOWN further to find "**Spill Prevention Control & Counter Measures (SPCC)".**

Spill Prevention Control and Counter Measures (SPCC)

Environmental Protection Agency's (EPA's) main website for SPCC guidance.

- Tier 1 Qualified Facility SPCC Plan Template
  For facilities meeting the Tier I facility definition per 40 CFR 112.3(g)(1) and (2)of the SPCC rule. Contains SPCC Plan template in editable Microsoft Word format.
- SPCC Plan, Qualified Facilities Applicability
  Find out of your facility is subject to the SPCC Rule and if it meets the requirements of a Tier I or Tier II facility.

Addition information can be accessed from links at the bottom of the web-page.

Contact the **Department of Health Clean Water Branch** to see if your operation requires an **NPDES Permit.**

HARBORS DIVISION Aloha

Questions:
Call (808) 587-1962

ENVIRONMENTAL COMPLIANCE IS REQUIRED IN YOUR REVOCABLE PERMIT OR LEASE

ALL tenants are **REQUIRED** to comply with **ALL** Local, State and Federal **ENVIRONMENTAL LAWS** applicable to the activities on the permitted or leased Premises during and/or after the expiration or termination of the Revocable Permit or Lease. Failure of tenant to comply with ANY Environmental Laws constitutes a breach of the agreement, which may result in **TERMINATION** of the Revocable Permit or Lease and **LEGAL REMEDIES**, including, but not limited to, remediating at tenant's sole cost. Questions Call: (808) 587-1944.

Non-Compliance could result in **CITATIONS** and **FINES** issued by the Hawaii State Department of Health **(DOH)** and/or the Environmental Protection Agency **(EPA).** Let's work together to keep our environment clean.

REPORT ILLICIT DISCHARGES

Harbors Environmental: (M-F 8:00 AM to 4:30 PM)	(808) 587-1962
Harbors Traffic Control (24/7):	(808) 587-2076
U.S. Coast Guard:	(808) 842-2600
Hawaii Department of Health, Clean Water Branch:	(808) 586-4309
USEPA:	(808) 541-2721

HARBORS DIVISION Aloha

PROTECT OUR OCEAN WATER
MĀLAMA I KE KAI

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION

Storm water pollution affects us all. Storm drains are not connected to the wastewater treatment plant *(sewer system),* **so everything flowing into the storm drain goes directly into our ocean UNTREATED!**

Storm water pollution comes from a variety of sources including:

- Oil, fuel, machinery fluids, etc.
- Litter, pesticides, fertilizers, etc.
- Construction materials, i.e., Cement, paints, solvents, cleaners, detergents, metal, insulation, wood, etc.
- Bacteria from human and animal waste.
- Wash water from sinks, laundry, showers, vehicle washing, etc.



For More Information Call:

(808) 587-1962

Attachment 12

VGP Requirement on Incidental Discharges from Vessels

The EPA's NPDES vessel program regulates incidental discharges from the normal operation of all non-recreational, non-military vessels of 79 feet or greater in length which discharge in waters of the United States through the Vessel General Permit [VGP]. In addition, the ballast water discharge provisions apply to any non-recreational vessel of less than 79 feet or commercial fishing vessels of any size. Military vessels or recreational vessels are regulated by other EPA programs under CWA Section 312.

The EPA has promulgated 2013 VGP (effective on December 19, 2013 and expiring at midnight December 19, 2018) and is still in the process of finalizing the Small Vessel General Permit (sVGP) to authorize discharges incidental to the normal discharges of commercial vessel operations. According to the VGP, vessels, greater than or equal to 300 gross tons or having the capacity to hold or discharge more than 8 cubic meters (2,113 gallons) of ballast water, must submit a signed and certified, complete and accurate Notice of Intent [NOI] to the EPA to obtain coverage, which permits discharges incidental to the normal operation of a vessel including, but not limited to:

- Deck washdown and runoff and above water line hull cleaning
- Bilgewater/Oily water separator effluent
- Ballast water
- Anti-fouling hull coatings/hull coating leachate
- Aqueous film forming foam [AFFF]
- Boiler or economizer blowdown
- Cathodic protection
- Chain locker effluent
- Controllable pitch propeller and thruster hydraulic fluid and other oil sea interfaces including lubrication discharges from paddle wheel propulsion, stern tubes, thruster bearings, stabilizers, rudder bearings, azimuth thrusters, and propulsion pod lubrication, and wire rope and mechanical equipment subject to immersion
- Distillation and reverse osmosis brine
- Elevator pit effluent
- Firemain systems
- Freshwater layup
- Gas turbine washwater
- Graywater
- Motor gasoline and compensating discharge
- Non-oily machinery wastewater
- Refrigeration and air condensate discharge
- Seawater cooling overboard discharge (including non-contact engine cooling water; hydraulic system cooling water, refrigeration cooling water)
- Seawater piping biofouling prevention
- Boat engine wet exhaust
- Sonar dome discharge
- Underwater ship husbandry

ATTACHMENT 2
OUTFALL RECONNAISSANCE INVENTORY AND INSPECTION PROGRAM

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Outfall Reconnaissance Inventory and Inspection Program

FINAL

Stormwater Best Management Practices
Honolulu and Kalaeloa Barbers Point Harbors, Hawaii

Prepared for
Hawaii Department of Transportation
Harbors Division

Prepared by

Weston Solutions, Inc.
841 Bishop Street, Suite 2301
Honolulu, HI 96813

April 2014

Storm Water Best Management Practices
Honolulu and Kalaeloa Barbers Point Harbors, Hawaii

I understand, agree to, and will conform to the information set forth in this Outfall Reconnaissance Inventory and Inspection Program. Conformance to these plans is required of all personnel conducting inspections.

Name	Signature	Date

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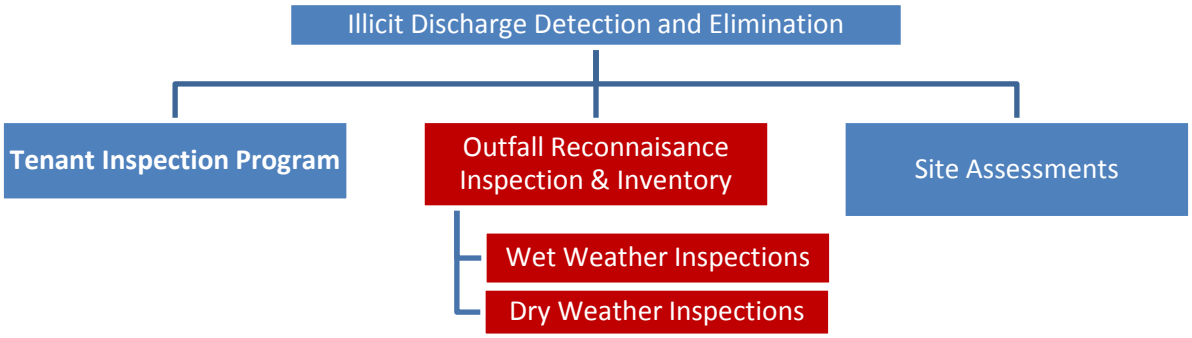
LIST OF ACRONYMS AND ABBREVIATIONS

ACR	Annual Compliance Report
amsl	Above Mean Sea Level
BMP	Best Management Practice
CAC	Common Access Card
CB	Citizens' Band
DHS	U.S. Department of Homeland Security
DOT – Harbors	Hawaii Department of Transportation – Harbors Division
HASP	Health and Safety Plan
HDOH	Hawaii Department of Health
IDDE	Illicit Discharge Detection and Elimination
NIOSH	National Institute for Occupational Safety and Health
ORIIP	Outfall Reconnaissance Inventory and Inspection Program
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
SSHSP	Site Specific Health and Safety Plan
TWIC	Transportation Worker Identification Card
WESTON	Weston Solutions, Inc.

1.0 INTRODUCTION

The Outfall Reconnaissance Inventory and Inspection Program (ORIIP) is an element of the Harbors Illicit Discharge Detection and Elimination (IDDE) Program. This program includes maintaining an outfall inventory and conducting dry and wet weather inspections at Harbors' storm water discharge points. The original ORIIP was designed to fix the geospatial location and record basic physical characteristics of individual storm drain outfalls and evaluate outfalls for illicit discharges. This ORIIP is an evolution of the original ORIIP program and includes dry and wet weather inspections as well as source tracking and elimination of potential illicit discharges. The results of inspections conducted as part of this program will be used to eliminate polluted discharges and will be used to help guide future outfall monitoring and pollution prevention efforts. Figure 1-1 shows the IDDE Program structure and highlights the ORRIP.

Figure 1-1 IDDE Structure Chart



This ORIIP establishes a framework for completing outfall and sheet flow inspections in the Honolulu and Kalaeloa Barbers Point Harbors, located on the island of Oahu, Hawaii. It includes wet and dry weather inspection procedures, training and equipment needs for field personnel, illicit discharge[1] detection and notification guidelines, documentation and tracking procedures, the relationship to the enforcement response plan, and other stormwater management related information.

1.1 APPLICABILITY

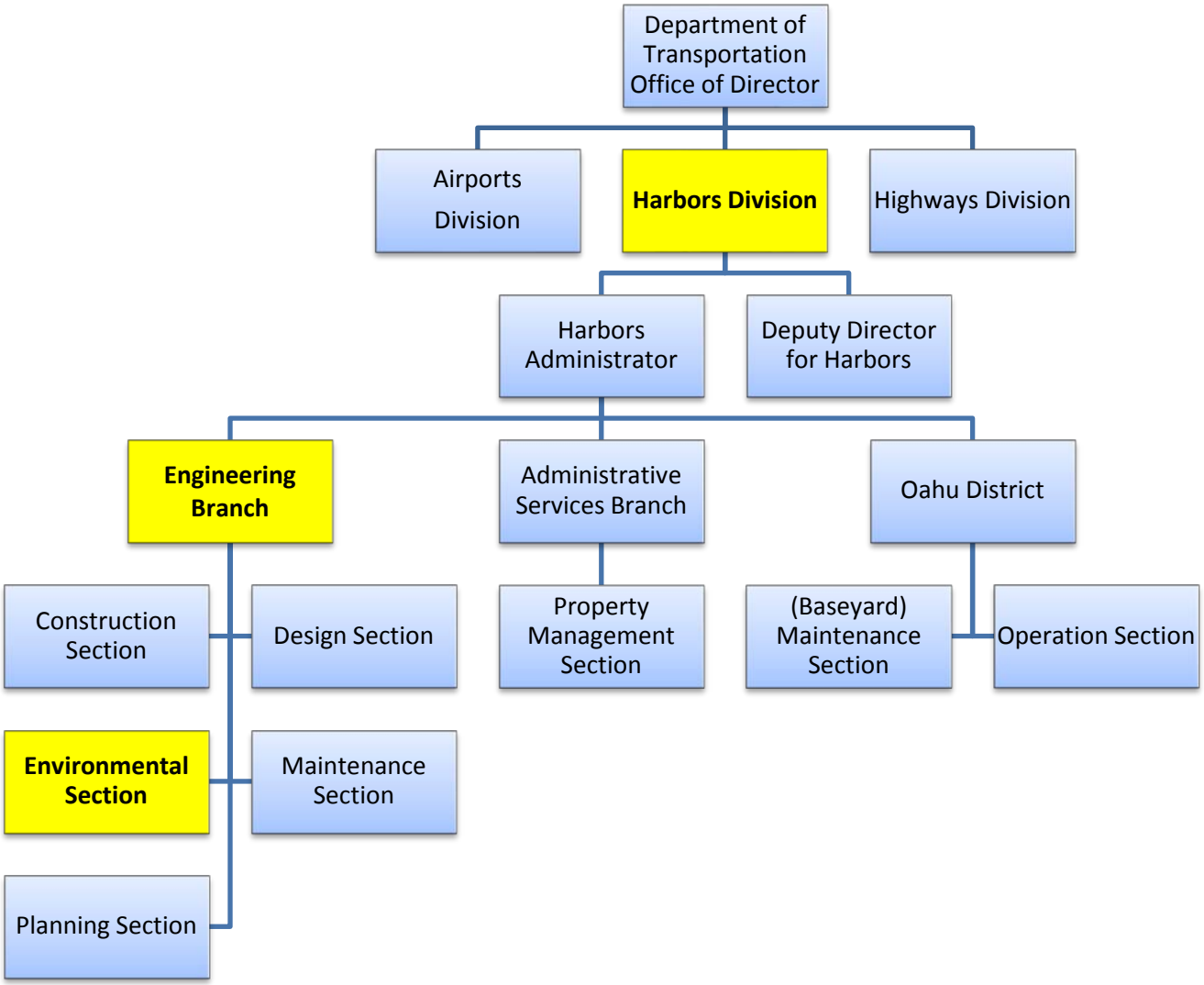
The ORIIP is implemented at Honolulu and Kalaeloa Barbers Point Harbors as well as the adjacent Harbors' properties associated with the Harbors' National Pollutant Discharge Elimination System (NPDES) regulated storm drain system. All outfalls are located at Honolulu

[1] Illicit Discharge shall mean any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from firefighting activities. 40 C.F.R. § 122.26(b)(2).

Harbor and Kalaeloa Barbers Point Harbor, Hawaii or adjacent areas. Maps of the Harbors' Honolulu and Kalaeloa Barbers Point NPDES regulated storm drain systems are provided in Figures 1 and 2, respectively. A list of all the outfalls, current characterization, pictures, and construction details are provided as Appendix C.

The ORIIP is to be implemented under the direction of the Harbors Environmental Section. The following organizational chart highlights the groups involved with the ORIIP.

ORGANIZATIONAL CHART FOR ORIIP IMPLEMENTATION



2.0 OUTFALL INVENTORY

As part of the ORIIP, Harbors maintains a complete inventory of all storm water outfalls at the Honolulu and Kalaeloa Barbers Point Harbors. The database is maintained by Harbors Environmental Section and includes the following information associated with each outfall: type of material, size, condition, and date of installation (if known).

The database is updated annually by the Harbors Environmental Section if changes are required. The inventory and database is used to support cleaning schedules for the Oahu District drain cleaning program. Details of the drain cleaning program are further detailed in the Operations and Maintenance Program Manual.

The data collected during wet and dry weather inspections help to create a more complete picture of the potential illicit discharges that exist with an existing stormwater system. The data will allow stormwater personnel to focus on problem areas and improve stormwater management efforts. Prioritized inspection areas will be developed on an annual basis to take into account previous annual outfall inspections, tenant activities, construction, and the likelihood that illicit discharges will be present. This will allow for field personnel to complete manageable areas of the Harbors. The prioritized inspection areas will be reported in the Annual Compliance Report.

The ORIIP Form is attached to this document as Appendix B. Section 4 and 5 of the ORIIP form present potential indicators of illicit discharges and Section 6 identifies the outfall characterization based on those indicators. A characterization of “Potential” is selected with the presence of two or more indicators. A characterization of “Suspect” is selected with one or more indicators with a severity of 3. An “Obvious” characterization is selected when an illicit discharge is determined to exist.

A database of tenants with contact information is maintained by Harbors Environmental Section. Some tenants may require notice prior to inspections (in certain locations to coordinate safely with site activities). ORIIP personnel shall familiarize themselves with the tenants’ notification requirements to ensure field schedules are maintained.

3.0 ORIIP INSPECTIONS

The following section provides procedures and reference information planning, scheduling and safely performing dry and wet weather outfall inspections at the applicable Harbors. Harbors Environmental Section will conduct dry and wet weather observations of outfalls, as described below. A flowchart presenting the ORIIP process is attached as Appendix E.

3.1 PREPARATORY PROCEDURES

The following procedure is to be followed for gaining access for dry weather inspections at Honolulu and Kalaeloa Barbers Point Harbor. Harbors Environmental Section will schedule the outfall inspection based on the environmental conditions required. Harbors Environmental Section will confirm that all field personnel have access to the Harbor, and have applied and been approved for a Transportation Worker Identification Credential (TWIC) card or a Common Access Card (CAC). Access to these restricted areas is enforced by Department of Transportation (DOT) Harbors, Department of Homeland Security, and the United States Coast Guard. Field personnel should have documentation and identification available upon request while in these restricted areas. It is common for the Coast Guard to approach personnel and ask questions about field activities. Large commercial shipping vessels and tug boat operators often notify the Harbors Traffic Control about ORIIP personnel's presence in the harbor.

Harbors Environmental Section will verify that there are no conflicts with the various commercial fueling activities in the harbor. They will also notify the Harbors Traffic Control of when the ORIIP activities will be implemented.

3.1.1 PREPARING FIELD EQUIPMENT

The challenges presented by the tidal fluctuation can complicate inspection scheduling and add another dimension to jobsite safety. For this reason, field personnel need to ensure that all of the equipment that will be used during ORIIP activities has been inspected for defects and is in full working order prior to field work. The following sections describe the equipment and resources required to complete the ORIIP.

3.1.2 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) is essential for the safe completion of ORIIP. Appendix D attached to this ORIIP contains the equipment required to safely complete field activities. Field personnel shall familiarize themselves with the proper operation and maintenance of all equipment needed to complete the ORIIP.

3.1.3 INSPECTION EQUIPMENT

Field activities will require a variety of equipment. Wet and dry weather require different equipment and different levels of effort. Appendix A attached to this ORIIP contains the equipment required to complete field activities.

3.2 FIELD LOGISTICS

This section describes the procedures that field personnel should observe during field activities. All inspections should follow these procedures. Unexpected situations may arise in the harbor due to weather, other vessel movements, etc. that require deviations from procedures. In such cases, the Site Manager will assess the situation and use discretion with safety of all field personnel in mind. Communication should be maintained between crew members and the Harbors Traffic Control (during activities in Harbor waters).

3.2.1 PERSONNEL

All operations and personnel having the potential for exposure to site hazards are subject to the requirements of this ORIIP and the Site Specific Health and Safety Plan (SSHSP). The Site Manager will be identified prior to mobilization and will be the highest ranking personnel in the field. The Site Manager will serve as the Site Safety Officer (SSO) for the activities and will be responsible for implementation of the ORIIP Plan and oversight of the field personnel. The Site Manager will be selected by Harbors Environmental Section prior to mobilization.

The Site Manager working under the task is responsible for the following:

1) Providing field personnel with appropriate training, medical certification, and ensuring that personnel have read, understand, and will comply with this ORIIP;
2) Providing equipment that is safe for operations and free from any obvious hazards;
3) Providing and documenting inspections of equipment and tasks, as necessary, to comply with applicable regulations;
4) Providing documentation that field personnel have appropriate training and medical certification and ensuring that personnel have read, understand, and will comply with this ORIIP;
5) Overseeing field personnel with respect to ensuring a safe work environment and that work practices are consistent with the provisions of this ORIIP, the Occupational Safety and Health Administration (OSHA), and standard industry practices; and
6) Conducting an initial project briefing and daily “tailgate” safety meetings.

Personnel will pre-notify impacted parties, mobilize the required equipment, and conduct the inspections. ORIIP personnel will need to coordinate the loading and transportation of the kayak and other gear to one of the boat launch locations.

Inspections performed from the water must be supported by an on-shore crew. All movements through the harbor waters will be coordinated with the Harbors Traffic Control. Communication between the kayak and off-shore crews shall be maintained whenever possible to ensure the safety of all personnel. Kayak personnel will inspect each outfall and complete the ORIIP Form for each location, as described by Section 3.3. As described in more detail in Section 3.3.2, and the Enforcement Response Plan, upstream nodes will be observed by the on-shore crew when an illicit discharge is suspected and personnel will use their best efforts to identify the source and contact the responsible party and/or the appropriate regulatory agencies. Harbors Environmental Section will follow up where necessary, as described by the Enforcement Response Plan.

3.2.2 HARBORS TRAFFIC CONTROL COMMUNICATION

The ORIIP Site Manager shall coordinate with DOT Harbors District Office to notify the Harbors Traffic Control prior to inspections and any movement in the Harbor waters. Citizens' Band (CB) radios are used by field personnel to communicate with the Harbors Traffic Control (Channel 12). Specific vernacular are used during these communications. ORIIP personnel will notify the Harbors Traffic Control of their plans to change location and to request a no wake zone. Wakes can be a danger to inspection personnel.

Typical communications about a change of location in the harbors are as follows:

ORIIP personnel: *"Aloha Tower, this is Harbors Engineering."*
Harbors Traffic Control: *"Harbors Engineering, this is Aloha Tower."*
ORIIP personnel: *"Aloha Tower, Harbors Engineering would like to request to move from current location (e.g., Pier #51) to future location (e.g., Pier #38).*
Harbors Traffic Control: *Their response varies depending on other vessels' movements (i.e., "Okay, Harbors Engineering, proceed to Pier #38).*

3.2.3 MOBILIZATION

Mobilizing the equipment to the various sites around the harbor will require personnel with a working knowledge of pier locations and restricted area locations. Personnel will have TWIC or CAC cards available and all required PPE and equipment. Dry weather inspections will require a much higher level of effort.

Boat launch locations for Honolulu Harbor are located at Piers 5, 23, 36, and at the Sand Island launch ramp adjacent to the Hawaiian Marine Educational and Training Center. Honolulu Harbor locations are located near Revetments P05-01, P23-03, and P36-01 (see Figure 1 for details). If necessary, Kalaeloa boat launch locations are located at the Kalaeloa Barbers Point Harbor Revetments BP-01 and BP-24 (see Figure 2 for details).

3.3 DRY WEATHER OUTFALL INSPECTIONS

Dry weather inspections are conducted for illicit discharge detection and assessment of the outfall structures. For the ORIIP, dry weather is considered when there is less than 0.1" of rain during a 72 hour period preceding an inspection. Dry weather inspections are to be conducted annually on outfalls with an overall outfall characterization of potential, suspect or obvious as determined by the previous year's inspection findings. All outfalls (including those with an overall outfall characterization of unlikely, see section 6 of the ORIIP form in Appendix B) are to be inspected every 2 years.

Dry weather inspections should coincide with low-tide conditions to increase probability that the outfall will be exposed. Field events should be scheduled such that field personnel can safely enter areas beneath the piers, inspect outfall conditions, and exit said areas during tidal periods corresponding to water levels



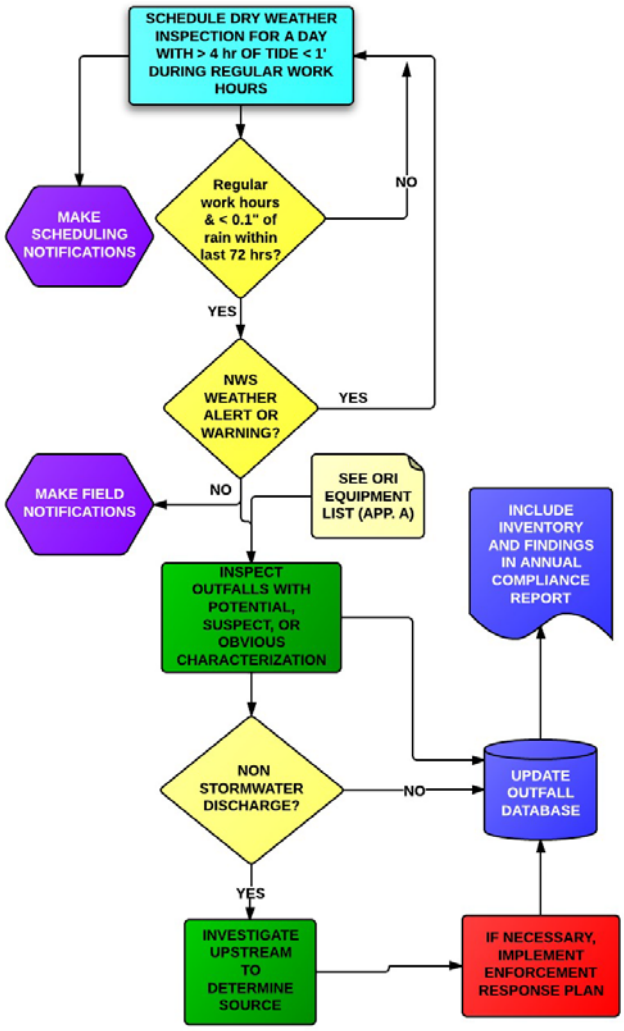
below 1-foot above mean lower low water (mllw). Areas that have been determined to be too dangerous to enter have been identified on the maps provided in Figures 1 and 2. Observations of these outfalls must be conducted at an upstream node or in way that does not require personnel to enter beneath the pier. At no time, regardless of tidal conditions, will personnel be allowed to enter under the pier in these areas.

In addition to the identified areas, water levels higher than 1-foot mllw are considered too dangerous for personnel to be under any piers. Schedules should indicate time frames where inspections of outfalls beneath the piers can take place and field crews should plan accordingly to efficiently complete the ORIIP. Equipment should be inspected prior to field activities to maximize operations during extreme low tide.

Inspections cannot be scheduled in areas where vessels are being actively fueled. DOT Harbors District Office needs to be contacted once a draft schedule has been produced (based on tidal considerations), so fueling schedules can be reconciled with ORIIP activities.

Inspections should all be accomplished during daylight hours. Other harbor activity can affect the schedule, including loading and unloading of cargo ships, storms, high surf, etc. These and other factors all need to be considered during the scheduling production.

Field personnel need to be able to recognize scheduling conditions that could pose a safety threat during inspections. ORIIP activities should be postponed if any situation arises that poses an unacceptable safety threat to field personnel (e.g., tsunami warning, hurricane warning, etc.). Field personnel should make real time decisions about the conditions in the water, to ensure timely, but safe inspections. The Harbors Environmental Section will be responsible for postponing and rescheduling any ORIIP inspection.



Outfall inspections are conducted using the ORIIP Form, attached as Appendix B. The form has seven sections that cover both wet and dry inspection scenarios. Field personnel will use the form to describe flow conditions using physical factors like odor, turbidity, color, and the presence of floatables or sheen in order to recognize illicit discharges. Information required to complete the ORIIP Form includes background data, outfall description, quantitative flow

characterization, and physical indicators of flowing and non-flowing outfalls. The current list of outfalls is attached as Appendix C.

3.3.1 OBSERVATION OF FLOWS

Potential problems are indicated by outfalls that are flowing in dry weather and/or foul odors or discolored water in or around the outfall pipe. Common illicit discharges observed during dry weather include discharges of wash water, process water, sewage, contaminated condensate runoff, or other forms of waste. Not all non-stormwater discharges are illicit. For example, non-contaminated landscape irrigation runoff or air conditioner condensate discharges are allowable non-stormwater discharges. As described below, any dry weather discharge should be documented.

When flows are observed, ORIIP personnel will attempt to first determine the source of the flow, while considering groundwater or tidal influence. Field crews will photograph and/or video the discharge, estimate the flow volume, and, if necessary, collect a sample. Field crews will document the source after conducting a quick visual inspection of the surrounding area. If the source cannot be easily observed, field crews should follow the procedure described in Section 3.3.2. If further investigation is needed, Harbors Environmental Section will follow up, identify the source and contact the responsible party and the appropriate regulatory agencies where necessary, as described by the Enforcement Response Plan.

3.3.2 SOURCE IDENTIFICATION

This section outlines the basic tools to be used to trace the source of a suspected illicit discharge. Source tracing begins when an unknown dry weather flow is identified through the ORIIP, field assessment/testing, or a complaint call. When the source of the non-stormwater discharge is not known, one of two primary methods will be used to locate the source of an illicit discharge: Method A – Drainage Area Investigations or Method B – Storm Drain Network Investigations. The method used will depend on the type of information collected or reported, level of understanding of the drainage network, and existing knowledge of operations and activities on the surrounding properties.

<u>Method A – Drainage Area Investigations</u>
The source of some illegal discharges can be determined through a survey or analysis of the drainage area of the problem outfall. Drainage area investigations are particularly useful when the discharge observed at the outfall has a distinct or unique characteristic that can allow field crews to quickly determine the type of activity or non-point source that is generating the discharge. One-time illegal discharges (such as a surface spill or intentional dumping into the storm drain system) are usually best investigated using Method A, given the short-term nature of the discharge.

Drainage area investigations should begin with a discussion between the field crews, inspectors, engineers, and other knowledgeable staff to identify the type of site most likely to produce the observed discharge. The following table shows some of the activities or land uses most likely associated with specific discharge problems.

COMMON DISCHARGES AND POTENTIAL SOURCES	OBSERVED DISCHARGE POTENTIAL CAUSES
Sediment	Construction activity without proper erosion and sediment controls Outdoor work areas or material storage areas
Oil	Fueling operations Vehicle or machinery maintenance activities
Sudsy discharge	Power washing of buildings Vehicle or equipment washing operations Mobile cleaning crew dumping Laundry or Cleaner greywater discharge
Grease	Restaurant sink drain connection to stormwater system
Sewage	Failing or leaking septic systems

Staff will make a list of likely discharge sources and then field crews will conduct a windshield survey of the drainage area to confirm and identify potential sources of the discharge. Once potential discharge sites are identified, staff will conduct individual site inspections to locate the specific source of the illegal discharge. In some cases, dye testing may be needed to confirm that a suspected activity is actually draining into the storm drain network. All drainage area investigations will be documented on the ORIIP Form in Appendix B.

Method B – Storm Drain Network Investigations

The source of some illicit connections or discharges can be located by systematically isolating the area from which the polluted discharge originates. This method involves progressive investigation at manholes in the storm drain network to narrow down the location where the illegal discharge is entering the drainage system. Field crews should work progressively upstream from the outfall and inspect manholes until indicators reveal the discharge is no longer present. Manhole observations can be time consuming, but they are generally a necessary step before conducting other tests.

Storm drain network investigations include the following steps: 1. Consult the drainage system map and identify the major branches. If the drainage map is incomplete, sketches of the system shall be made and the system shall be identified for adding to DOT Harbor's drainage system map. 2. Starting from the outfall, observe the next upstream manhole or junction to see if there is evidence of polluted discharge. As with the ORIIP inspections, field crews are looking for the presence of flow during dry weather, foul odors, colors or stained deposits, oily sheen, floatable

materials, and/or other unusual observations. 3. Repeat observations at each upstream manhole or junction until a junction is found with no evidence of discharge; the discharge source is likely located between the junction with no evidence of discharge and the next downstream junction. 4. Work downstream from the "clean" manhole or junction to isolate the location where the polluted discharge is entering the storm drain system. 5. Document all findings.

If the flow is illicit and originates within the Harbors property DOT Harbors shall ensure the connection is disconnected or flow from the source is identified. If the flow originates outside of DOT Harbors' or DOT's property, DOT Harbors will inform the adjoining jurisdiction or property owner in writing that the flow is entering DOT Harbors small Municipal Separate Storm Sewer System (MS4) and copy the Hawaii Department of Health (HDOH).

When visual inspections are not enough to isolate the source of the illegal discharge, a number of additional field tests can be performed. These include: Dye testing, Video Testing/Camera-ing/TVing, smoke testing. When a dry weather flow is observed and the source of the flow is not determined via Method A or B above, DOT Harbors will pursue alternative methods necessary to identify the source of the dry weather flow within 90 days.

Forms and information will be included in the Annual Compliance Report as well as reviewed prior to the following ORIIP event. Any illicit discharges which are determined to be coming from a tenant or construction site will initiate a re-evaluation of the tenant or construction site in accordance with the Tenant Inspection Manual or the Construction Site Runoff Control Program.

3.4 WET WEATHER OUTFALL INSPECTIONS

The goal for wet weather inspections is to assess HDOT Harbors' Best Management Practice (BMP) performance. Wet weather inspections are only conducted during regular business hours when rainfall greater than 0.1" per hour is recorded. Personnel must field verify that adequate precipitation has occurred to initiate sufficient flow through the drainage system to make useful observations.

The weather station located at Honolulu International Airport (Station ID 91182, PHNL) as reported by the National Oceanic and Atmospheric Administration (NOAA) is in proximity of Honolulu Harbor but could potentially not be representative of the actual rainfall. Field observations must be conducted to support PHNL rainfall data.

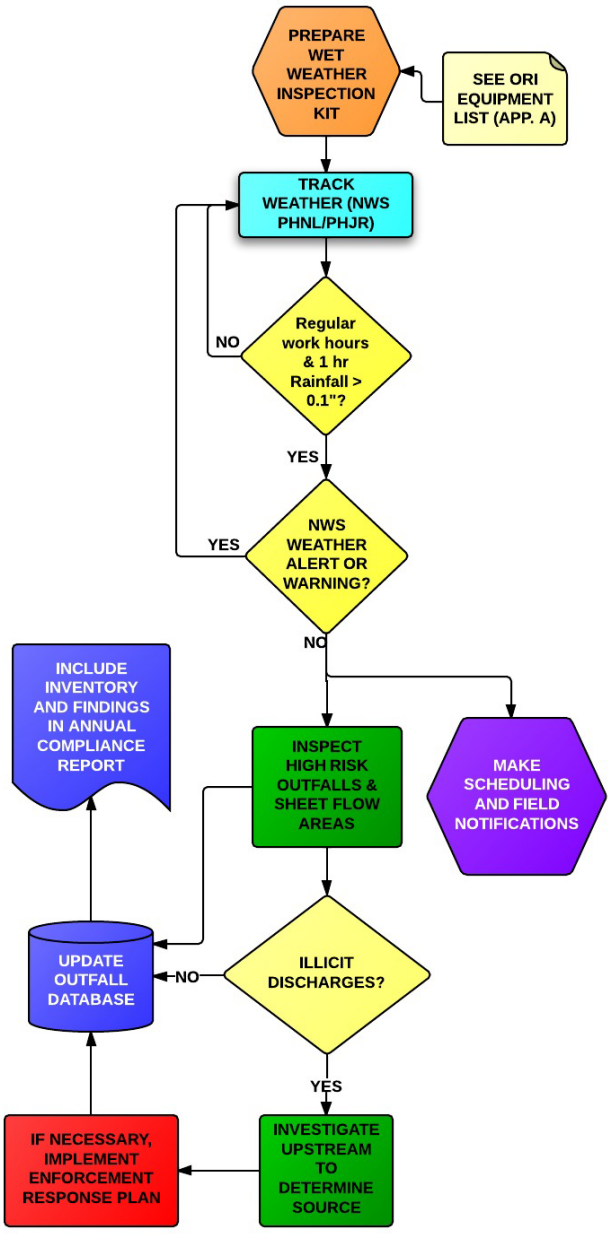
The weather station located at Kalaeloa Airport (PHJR) as reported by NOAA is in proximity of Kalaeloa Barbers Point Harbor but could potentially not be representative of the actual rainfall. Field observations must be conducted to support PHJR rainfall data.

Harbors Environmental Section will conduct wet weather ORIIP inspections of the identified high risk outfalls each year, provided appropriate wet weather events occur during regular business hours. High risk outfalls are those associated with drainage from high risk tenants or those that drain from areas under construction.

Wet weather inspections must be completed from the pier side. Due to high hazard safety conditions under the piers, no personnel shall attempt to conduct under pier inspections during wet weather. These inspections need to be completed during rain events, so scheduling the event ahead of time is not practical. Inspection personnel need to be flexible based on weather conditions.

Inspections will not be conducted at night, on weekends, or on holidays. Wet weather inspections will not be conducted during emergency situations such as hurricanes, tsunamis, or during severe storm conditions that may cause risk to field personnel.

During a rain event, field personnel will notify impacted parties, mobilize required equipment, and conduct a wet weather inspection using the ORIIP Form (Appendix B). If criteria such as rainfall intensity, duration, and occurrence during regular work hours are met, Harbors Environmental Section will conduct wet weather inspections at the identified high risk outfalls each year.



Wet weather observation of sheet flows over the pier edge and from undeveloped areas will also be conducted. Field personnel will be standing on the pier or nearest landside location. Upstream nodes will be observed if necessary. The annual wet weather inspection shall include visual inspection of color, odor, clarity, solids, foam, oil sheen and other signs of non-stormwater discharges. Photo and/or video documentation shall be collected for each outfall. If an illicit discharge is observed, investigative techniques detailed in Section 3.3.2 will be used to track down and eliminate the source.

4.0 ENFORCEMENT

Enforcement will be conducted upon discovery of an illicit discharge and will follow different paths depending on the source of the discharge.

4.1 TENANTS

Tenant enforcement will follow the procedures and guidelines as detailed in the Harbors Tenant Inspection Manual. Per the manual, if enforcement procedures do not result in timely corrective actions, the staff will follow procedures described in the Enforcement Response Plan.

4.2 NON-TENANT INCLUDING OUTSIDE AGENCY

If there is an illicit discharge from public or other non-tenant/non-construction/non-agency entity, the inspector will attempt to find out if the person or source is associated with a group maintaining any type of contract with Harbors. If they have no contractual affiliation with Harbors, the staff will follow procedures described in the Enforcement Response Plan.

4.3 CONSTRUCTION SITE

If the source of an illicit discharge is a construction site, Harbors will respond as detailed in the Construction Site Runoff Control Program and the Enforcement Response Plan.

4.4 OPERATIONS AND MAINTENANCE

If an illicit discharge is observed due to accumulated sediment, trash or other pollutant related to drainage system cleaning, response will be conducted as detailed in the Oahu District Operations and Maintenance Plan.

5.0 TRAINING

Inspector training is designed to provide that all personnel responsible for conducting outfall inspections are aware of the process and safety precautions required during the inspections. The training starts with a pre-mobilization meeting where photos, documents, and schedules are reviewed and all field personnel have the opportunity to ask questions about this ORIIP and the SSHSP. The pre-mobilization meeting will include 1) procedures to be used when observing outfalls; 2) procedures to be used to track non-stormwater discharges to their source; and 3) DOT Harbors' illicit discharge definition.

5.1 ON THE JOB TRAINING

In addition to attending the pre-mobilization meeting, new inspectors will gain inspection experience by spending at least one work day on the job conducting outfall inspections with experienced inspectors. During the inspection, the new inspectors will observe how the experienced inspectors conduct outfall inspections as well as conduct their own inspections with assistance from the experienced personnel. New inspectors will continue to have frequent interactions with the experienced inspectors to discuss inspection issues as they arise.

5.2 DOCUMENTATION

Attendance at the pre-mobilization meeting will be documented using the signature pages at the front of this document and the SSHSP. On the job training will be documented using the ORIIP form (in Appendix B) during the outfall inspections by listing both the experienced mentor and the trainee in the "Investigators" section of the form.

6.0 HEALTH AND SAFETY

The safety of ORIIP personnel is of the highest priority. All personnel performing field work related to the ORIIP shall familiarize themselves with the SSHSP. All project activities shall be performed in accordance to the SSHSP, applicable local policies and procedures, and OSHA regulations. Unforeseeable site conditions or changes in the scope of work may warrant a reassessment of protection levels and controls stated.

The SSHSP has been attached to this document as Appendix D.

7.0 REFERENCES

C&C Honolulu. 2011. Final Storm Water Best Management Practice Manual, Construction. November, 2011. http://www.cleanwaterhonolulu.com/storm/learning_center/BMP_manual_2011-11.pdf

Hawaii Revised Statutes. 11-55, Appendix K, National Pollutant Discharge Elimination System General Permit Authorizing Discharges of Storm Water and Certain Non-Storm Water Discharges from Small Municipal Separate Storm Sewer Systems.

HAR. 2012. Title 11 Department of Health, Chapter 55 Water Pollution Control. October 11, 2012.

HAR. 2012. Title 19 Department of Transportation.

HDOT Harbors Division. 2009. Storm Water Management Plan. December, 2009.

HDOT Harbors Division Website. Storm Water Management | Harbors. http://hidot.hawaii.gov/harbors/library/storm-water-management/. Accessed 22 January 2013.

HRS. 2012. Section 266-25 Department of Transportation, Harbors, Violation of rules; penalty. http://www.capitol.hawaii.gov/hrscurrent/Vol05_Ch0261-0319/HRS0266/HRS_0266-0025.htm. Accessed 21 January 2012.

USEPA. 2012. National Menu of Stormwater Best Management Practices. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/. Accessed 22 January 2013.

Figure 1 – Honolulu Harbor

Please see Attachment 3 of Section B for Figures

Figure 2 – Kalaeloa Barbers Point Harbor

Please see Attachment 3 of Section B for Figures

ORIIP APPENDIX A

ORIIP EQUIPMENT LIST

Checklist for ORI inspection

Item	Quantity	Notes
Tablet PC[1]	1	Power cord Car Adapter Make sure batteries are fully charged before use
Camera[1]	2	Make sure batteries are fully charged before use
GPS unit[1]	1	
Video Camera[1]	2	Gopros for post inspection review
Kayak	1	
Flow measurement devices[2]	1	Include a graduated cylinder, a tape measure, ping pong balls and a watch
Temperature gauge	1	Use the weather station
Metal clipboard	1	
Rope	1	100' for rescue operations
Personal Floatation Devices	2	Personnel in kayak
CB Radio[1]	1	For communication with tower
2 way radio	2	For communication shore to kayak
Rigid Pipe[1]	1	Open manhole covers
Wrecking bar[1]	1	
Hammer[1]	1	
Air Horn	1	Store on person in kayak
Muti-Gas Meter	1	Confined Space Entry check near fueling ops
Sunscreen	2	
Gloves[1]	2	
Field notebook[1]	1	
Rain gauge[1]	1	
Outfall location maps[1]	1	
ORI binder[1]	1	Content: a) ORI Plan b) Table of outfalls inspected previous year c) Summary of dry weather flows previous year d) Summary of previous year ORI results e) Pictures of outfalls inspected in previous year f) ORI field sheets g) Copy of float plan h) Health and Safety Plan i) Boat inspection form j) Confined space entry form

[1] Items needed for wet weather inspection.
[2] To calculate the flowrate, dimensions of the outfall with a flow should be measured.

ORIIP APPENDIX B

ORIIP FORM

OUTFALL RECONNAISSANCE INVENTORY FORM

Section 1: Background Data

Outfall ID:		Today's date / Time (Military):	
Investigators:			
Temperature (°F):	Rainfall (in.): Last 24 hours: _____	Last 72 hours: _____	
Latitutde:	Longitude:	GPS Unit:	GPS Landmark:
Camera:		Photo #s:	

Land Use in Drainage Area (Check all that apply):

☐ Industrial

☐ Commercial

Other: _____

Known Industries: _____

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☐ **Closed Pipe**	☐ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: _____	☐ Single ☐ Double ☐ Triple ☐ Other: _____	Diameter/Dimensions: _____	In Water: ☐ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: _____	☐ Trapezoid ☐ Parabolic ☐ Other: _____		Depth: _____ Top Width: _____ Bottom Width: _____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☐ Yes ☐ No	***If No, Skip to Section 5***			
Flow Description (If present)	Constant: ☐ Trickle ☐ Moderate ☐ Substantial Tidal: ☐ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☐Flow #1	Volume			
	Time to fill			
☐Flow #2	Flow depth		In	
	Flow width	0' "	Ft, In	
	Measured length	0' "	Ft, In	
	Time of travel		Sec	

Outfall Reconnaissance Inventory Form

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☐ No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)
Upstream Investigation	☐	Description of discharge source:			☐ Illicit Discharge (Trigger to Obvious)
Other Observations					

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☐ Yes ☐ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Sediment ☐ Trash ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	
Other Observations			

Section 6: Overall Outfall Characterization

☐ Unlikely ☐ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious

Section 7: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

ORIIP APPENDIX C

OUTFALL INVENTORY

OUTFALL CHARACTERIZATION

IDENT	LAT	LONG_	Characterization
18" Outfall	21.30298080790	-157.86416931700	Unlikely
24" Outfall	21.30271146810	-157.86440754500	Unlikely
P01-01	21.29616499960	-157.86914800000	Unlikely
P02-05	21.30001468090	-157.86667865500	Unlikely
P02-06	21.30020248880	-157.86653049100	Unlikely
P02-11	21.30108431700	-157.86580222900	Unlikely
P02-13	21.30138333630	-157.86554475600	Unlikely
P03-02	21.30259485750	-157.86450800300	Unlikely
P04-00	21.30344429410	-157.86359695600	Unlikely
P04-01	21.30367337560	-157.86362402300	Unlikely
P04-BOX	21.30374728890	-157.86362955000	Unlikely
P05-01	21.30385827500	-157.86394188000	Unlikely
P05-02	21.30384492440	-157.86434603100	Unlikely
P05-03	21.30459493210	-157.86473701100	Unlikely
P05-HECO1	21.30527213230	-157.86405112600	Unlikely
P05-HECO2	21.30547500000	-157.86416900000	Potential
P05-HECO3	21.30552606890	-157.86421213700	Potential
P05-HECO4	21.30555995300	-157.86423393300	Unlikely
P05-HECO5	21.30625400020	-157.86465900000	Potential
P05-UT	21.30495130870	-157.86450755700	Unlikely
P05-UT2	21.30502708370	-157.86439448500	Unlikely
P05-UT3	21.30508263030	-157.86428836100	Unlikely
P07-03	21.30637890590	-157.86474748400	Unlikely
P08-01	21.30644148820	-157.86481404600	Unlikely
P08-02	21.30641343110	-157.86485809100	Unlikely
P08-03	21.30639400000	-157.86491300000	Unlikely
P08-04	21.30626247570	-157.86514509400	Unlikely
P08-05	21.30624705200	-157.86518550400	Potential
P08-06	21.30622421920	-157.86523226800	Unlikely
P08-07	21.30616940780	-157.86531660300	Unlikely
P08-08	21.30609208200	-157.86545519000	Unlikely
P08-09	21.30599937860	-157.86561524100	Potential
P08-10	21.30588301170	-157.86583189500	Unlikely
P08-11	21.30577678640	-157.86603162800	Unlikely
P08-12	21.30567149850	-157.86622593300	Unlikely
P09-01	21.30585368470	-157.86625402500	Unlikely
P09-02	21.30630207600	-157.86632057800	Unlikely
P09-03	21.30593939640	-157.86626790000	Potential
P09-04	21.30662917780	-157.86636783600	Unlikely
P09-05	21.30723858780	-157.86628225500	Unlikely
P10-01	21.30766077950	-157.86607590600	Unlikely
P10-02	21.30775201860	-157.86596485500	Unlikely
P10-03	21.30810707980	-157.86555325300	Unlikely
P11-01	21.30820859470	-157.86540472200	Unlikely
P11-02	21.30826423690	-157.86533710100	Unlikely
P11-03	21.30832198590	-157.86526691900	Unlikely

P11-04	21.30837913030	-157.86519747200	Potential
P11-05	21.30842519180	-157.86514149400	Unlikely
P11-06	21.30846018290	-157.86509897000	Potential
P11-07	21.30849430240	-157.86505750500	Unlikely
P11-08	21.30854574160	-157.86499499100	Potential
P11-09	21.30860019700	-157.86492881200	Potential
P11-10	21.30863997210	-157.86488047300	Potential
P11-11	21.30867650160	-157.86483607900	Unlikely
P11-12	21.30873004840	-157.86477100500	Unlikely
P11-13	21.30877101080	-157.86472122300	Unlikely
P11-14	21.30881170710	-157.86467176600	Unlikely
P11-15	21.30884641930	-157.86462958000	Potential
P11-16	21.30889487880	-157.86457068600	Unlikely
P11-17	21.30894256510	-157.86451273400	Unlikely
P11-18	21.30900843530	-157.86443268200	Unlikely
P11-19	21.30907234820	-157.86442761100	Unlikely
P11-20	21.30918627280	-157.86446175800	Unlikely
P12-01	21.30940435510	-157.86462800300	Unlikely
P12-02	21.30938269510	-157.86469421700	Unlikely
P12-03	21.30943230390	-157.86480995500	Unlikely
P12-04	21.30959859750	-157.86473528100	Unlikely
P12-05	21.30962371930	-157.86464765500	Unlikely
P12-06	21.30978346530	-157.86446591600	Unlikely
P12-07	21.30991211830	-157.86449835300	Unlikely
P12-08	21.31014451890	-157.86460537200	Unlikely
P15-01	21.31178100010	-157.86543100000	Unlikely
P19-01	21.31337899970	-157.86709300000	Suspect
P19-02	21.31212239620	-157.86731921200	Unlikely
P19-03	21.31196742920	-157.86734118600	Unlikely
P19-04	21.31179885090	-157.86735928100	Unlikely
P19-05	21.31166861270	-157.86738441200	Unlikely
P19-06	21.31226624650	-157.86729796000	Unlikely
P19-07	21.31243900030	-157.86726400000	Unlikely
P19-08	21.31286865590	-157.86717785400	Unlikely
P20-01	21.31158900020	-157.86740600000	Unlikely
P21-01	21.31025246390	-157.86806006100	Unlikely
P21-02	21.31021551050	-157.86818811700	Unlikely
P21-03	21.31009847330	-157.86861326100	Unlikely
P21-04	21.31012477510	-157.86886496100	Unlikely
P21-05	21.31008093450	-157.86903607400	Unlikely
P21-06	21.31013851630	-157.86881547900	Unlikely
P21-07	21.31027342480	-157.86798742900	Unlikely
P22-01	21.31044999970	-157.86925400000	Unlikely
P23-01	21.31242601660	-157.87008525300	Unlikely
P23-02	21.31241399960	-157.87022300000	Unlikely
P23-03	21.31227799960	-157.87062000000	Unlikely
P24-01	21.31222061860	-157.87062067400	Unlikely

P25-01	21.31081799990	-157.87016200000	Unlikely
P25-02	21.31077925640	-157.87013985200	Unlikely
P26-01	21.31088351870	-157.87144579300	Unlikely
P26-02	21.31062783750	-157.87159036700	Unlikely
P27-01	21.31055069190	-157.87152917700	Unlikely
P29-02	21.31003400040	-157.87203200000	Unlikely
P29-03	21.31102300030	-157.87340900000	Unlikely
P31-01	21.31160157280	-157.87452860300	Unlikely
P31-02	21.31183634410	-157.87489273700	Potential
P31-03	21.31204943420	-157.87522324400	Unlikely
P32-01	21.31222495260	-157.87549547800	Unlikely
P32-02	21.31237818540	-157.87573314500	Unlikely
P32-03	21.31279500030	-157.87639800000	Unlikely
P32-04	21.31303468380	-157.87675139300	Potential
P33-01	21.31326941770	-157.87711545500	Unlikely
P33-02	21.31351633040	-157.87749844300	Unlikely
P34-01	21.31398312820	-157.87788914500	Unlikely
P34-02	21.31429320470	-157.87772287500	Unlikely
P34-03	21.31447349770	-157.87761829000	Unlikely
P34-04	21.31473480510	-157.87747207200	Unlikely
P34-05	21.31491813060	-157.87736729100	Unlikely
P34-06	21.31509200220	-157.87725707600	Unlikely
P34-07	21.31523090700	-157.87716770100	Unlikely
P34-08	21.31574298660	-157.87688070000	Unlikely
P34-09	21.31559710000	-157.87696347900	Unlikely
P34-10	21.31548882360	-157.87703394800	Unlikely
P34-11	21.31536187980	-157.87710139900	Unlikely
P35-01	21.31588171970	-157.87679882600	Unlikely
P35-02	21.31652599970	-157.87642500000	Unlikely
P35-03	21.31698257620	-157.87625756300	Unlikely
P35-04	21.31711738530	-157.87651184300	Unlikely
P35-05	21.31726499970	-157.87680500000	Unlikely
P36-01	21.31726339730	-157.87772203800	Unlikely
P37-01	21.31701507500	-157.87818623600	Unlikely
P37-02	21.31647199990	-157.87851200000	Unlikely
P38-01	21.31675794490	-157.87942203400	Unlikely
P38-02	21.31793745810	-157.87888014800	Unlikely
P38-03	21.31881992570	-157.87828523300	Unlikely
P38-04	21.31899694940	-157.87802239700	Potential
P38-05	21.31974499970	-157.87756300000	Unlikely
P38-Outfall	21.31986288010	-157.87726994700	Unlikely
P39-Outfall	21.32014205360	-157.87767625200	Unlikely
P41-01	21.31975993680	-157.88270345000	Unlikely
P41-02	21.31887400020	-157.88281700000	Potential
P41-03	21.31990700020	-157.88255200000	Potential
P42-01	21.31723472790	-157.88332439200	Unlikely
P42-PSI	21.31701343020	-157.88334616500	Unlikely

P44/45-01	21.31558400000	-157.88717900000	Unlikely
P44/45-02	21.31566467580	-157.88690645300	Unlikely
P44/45-03	21.31677423110	-157.88622608900	Unlikely
P44/45-04	21.31711503390	-157.88609087700	Unlikely
P44/45-05	21.31648800020	-157.88440800000	Suspect
P51A-01	21.31383000090	-157.88658491900	Unlikely
P51A-02	21.31330614110	-157.88309714500	Unlikely
P51A-03	21.31320934700	-157.88251433300	Unlikely
P51A-04	21.31352153570	-157.88439407400	Unlikely
P51A-05	21.31362557370	-157.88505981700	Unlikely
P51A-06	21.31367533670	-157.88532278700	Unlikely
P51A-07	21.31373484490	-157.88561263300	Unlikely
P51A-08	21.31377534410	-157.88586645600	Unlikely
P51B-02	21.31348469600	-157.88417225000	Unlikely
P51B-03	21.31345339660	-157.88398378300	Unlikely
P51B-04	21.31318816690	-157.88238680400	Unlikely
P51B-05	21.31323319360	-157.88265790600	Unlikely
P51B-06	21.31332955360	-157.88323809500	Unlikely
P51B-07	21.31342833950	-157.88383290600	Unlikely
P51C-01	21.31309491410	-157.88182530400	Unlikely
P51C-02	21.31294569790	-157.88092684000	Unlikely
P51C-03	21.31288555500	-157.88061034400	Unlikely
P51C-04	21.31298474870	-157.88116196700	Unlikely
P51C-05	21.31302657730	-157.88141383000	Unlikely
P51C-06	21.31306597620	-157.88166460900	Unlikely
P52-01	21.31246183560	-157.87953865000	Unlikely
P52-02	21.31121747280	-157.87763551200	Unlikely
P52-03	21.31162131580	-157.87822137900	Unlikely
P52-04	21.31200359850	-157.87882055600	Unlikely
P52-05	21.31271807110	-157.87988403300	Unlikely
P53-01	21.31002140380	-157.87575785000	Unlikely
P53-02	21.31044972730	-157.87642071100	Unlikely
P53-03	21.31084879700	-157.87704022300	Unlikely
BP-01	21.32095751000	-158.11665704000	Unlikely
BP-02	21.32112457000	-158.11521837000	Unlikely
BP-03	21.32130711000	-158.11503544000	Unlikely
BP-04	21.32150734000	-158.11482397000	Unlikely
BP-05	21.32168272000	-158.11462778000	Unlikely
BP-06	21.32190778000	-158.11440102000	Unlikely
BP-07	21.32211327000	-158.11416865000	Unlikely
BP-08	21.32230633000	-158.11394392000	Unlikely
BP-09	21.32250129000	-158.11375334000	Unlikely
BP-10	21.32268719000	-158.11351535000	Unlikely
BP-11	21.32286973000	-158.11333242000	Unlikely
BP-12	21.32306995000	-158.11312094000	Unlikely
BP-13	21.32360850000	-158.11252472000	Unlikely
BP-14	21.32380346000	-158.11233414000	Unlikely

BP-15	21.32416663000	-158.11193410000	Unlikely
BP-16	21.32433675000	-158.11175881000	Unlikely
BP-17	21.32451928000	-158.11157587000	Unlikely
BP-18	21.32468413000	-158.11142147000	Unlikely
BP-19	21.32483466000	-158.11124055000	Unlikely
BP-20	21.32497993000	-158.11108054000	Unlikely
BP-21	21.32514478000	-158.11092614000	Unlikely
BP-22	21.32530247000	-158.11075848000	Unlikely
BP-23	21.32547785000	-158.11056228000	Unlikely
BP-24	21.32564270000	-158.11040788000	Unlikely
BP-25	21.32400368000	-158.11212266000	Unlikely
BP-26	21.32344555000	-158.11271327000	Unlikely
BP-27	21.32326301000	-158.11289621000	Unlikely
BP-28	21.32093677000	-158.11542220000	Unlikely
BP-29	21.32086439000	-158.11654396000	Unlikely

Outfall Properties

Outfall ID	BP-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	
Dimensions	072 x 18
Submerged	Partially in water



Outfall ID	BP-02
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



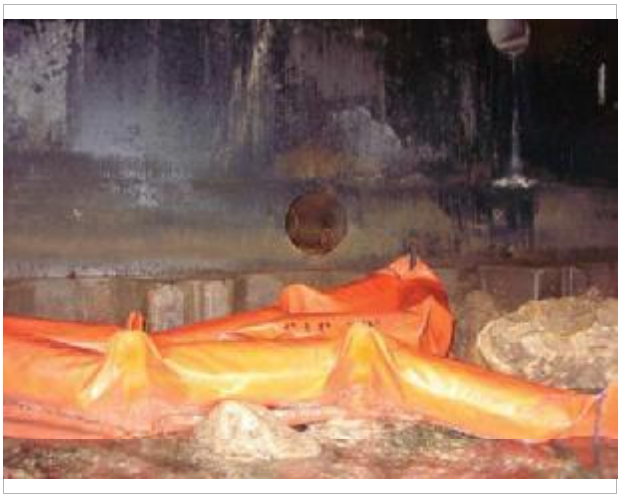
Outfall ID	BP-03
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	Partially in water



Outfall ID	BP-04
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-05
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-06
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	Partially in water



Outfall ID	BP-07
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-08
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-09
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	Partially in water



Outfall ID	BP-10
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-11
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-12
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	Partially in water

Outfall ID	BP-13
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-14
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	Partially in water



Outfall ID	BP-15
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-16
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-17
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	Partially in water



Outfall ID	BP-18
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	Partially in water



Outfall ID	BP-19
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-20
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-21
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-22
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-23
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-24
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-25
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-26
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-27
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-28
LandUse	Industrial
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	BP-29
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	Partially in water



Outfall ID	P01-01
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P02-05
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	16
Submerged	No



Outfall ID	P02-06
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	Partially in water



Outfall ID	P02-11
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	Partially in water



Outfall ID	P02-13
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	Partially in water



Outfall ID	P03-02
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	Partially in water



Outfall ID	P04-00
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	Partially in water



Outfall ID	P04-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	No



Outfall ID	P04-BOX
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	Single
Dimensions	096 x 48
Submerged	Partially in water



Outfall ID	P05-01
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	No



Outfall ID	P05-02
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	No



Outfall ID	P05-03
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	16
Submerged	No



Outfall ID	P05-HECO2
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	No



Outfall ID	P05-HECO3
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Semicircle
Grouping	Single
Dimensions	36
Submerged	Partially in water



Outfall ID	P05-HECO4
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	



Outfall ID	P05-HECO5
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	Partially in water



Outfall ID	P05-UT
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Quadruple
Dimensions	
Submerged	No



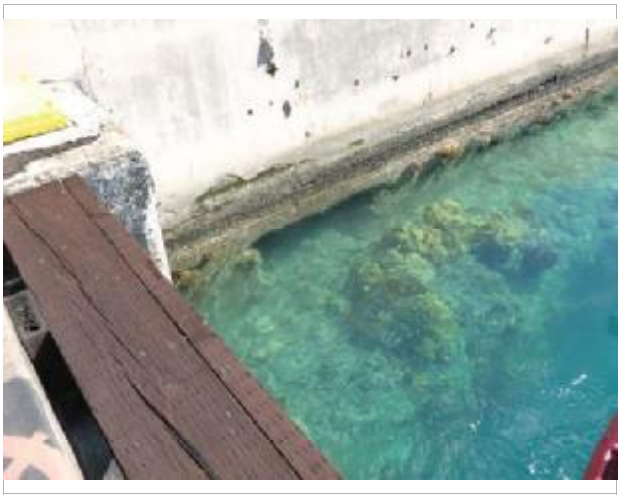
Outfall ID	P05-UT2
LandUse	Commercial
Type	
Material	
Shape	
Grouping	
Dimensions	
Submerged	



Outfall ID	P05-UT3
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	3
Submerged	No



Outfall ID	P07-03
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	
Dimensions	096 x 36
Submerged	Fully in water



Outfall ID	P08-01
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P08-02
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P08-03
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	



Outfall ID	P08-04
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	1
Submerged	No



Outfall ID	P08-05
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P08-06
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	No



Outfall ID	P08-07
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	Single
Dimensions	024 x 24
Submerged	No



Outfall ID	P08-08
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	No



Outfall ID	P08-09
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	2
Submerged	No



Outfall ID	P08-10
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Triple
Dimensions	006, 4, 3
Submerged	No



Outfall ID	P08-11
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Double
Dimensions	012, 8
Submerged	No



Outfall ID	P08-12
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	



Outfall ID	P09-01
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P09-02
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P09-03
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	



Outfall ID	P09-04
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	



Outfall ID	P09-05
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	



Outfall ID	P10-01
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P10-02
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P10-03
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	



Outfall ID	P11-01
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	012, 6
Submerged	



Outfall ID	P11-02
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	No



Outfall ID	P11-03
LandUse	
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	6
Submerged	No

Outfall ID	P11-04
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	012, 6
Submerged	



Outfall ID	P11-05
LandUse	
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	No



Outfall ID	P11-06
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	No



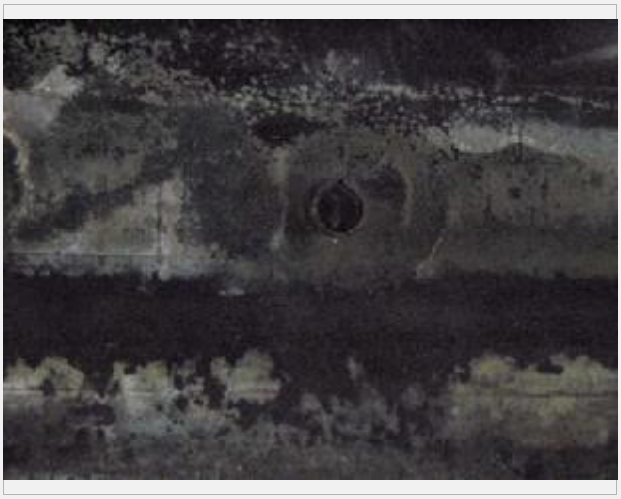
Outfall ID	P11-07
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	



Outfall ID	P11-08
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	No



Outfall ID	P11-09
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	



Outfall ID	P11-10
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	



Outfall ID	P11-11
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	No



Outfall ID	P11-12
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	



Outfall ID	P11-13
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	No



Outfall ID	P11-14
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	



Outfall ID	P11-15
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	Partially in water



Outfall ID	P11-16
LandUse	Commercial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	



Outfall ID	P11-17
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	



Outfall ID	P11-18
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	Partially in water



Outfall ID	P11-19
LandUse	
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P11-20
LandUse	
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	036 x 6, 3 x 1
Submerged	No



Outfall ID	P12-01
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	6
Submerged	No



Outfall ID	P12-02
LandUse	
Type	Closed Pipe
Material	Clay
Shape	Circular
Grouping	Single
Dimensions	6
Submerged	No



Outfall ID	P12-03
LandUse	
Type	Closed Pipe
Material	Clay
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	Fully in water



Outfall ID	P12-04
LandUse	
Type	Closed Pipe
Material	Clay
Shape	Circular
Grouping	Single
Dimensions	6
Submerged	



Outfall ID	P12-05
LandUse	
Type	Closed Pipe
Material	Clay
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	



Outfall ID	P12-06
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	Partially in water



Outfall ID	P12-07
LandUse	
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	



Outfall ID	P12-08
LandUse	
Type	Closed Pipe
Material	Clay
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P15-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	8
Submerged	No



Outfall ID	P19-01
LandUse	
Type	Closed Pipe
Material	RCP
Shape	
Grouping	
Dimensions	30
Submerged	No



Outfall ID	P19-02
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	Partially in water



Outfall ID	P19-03
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P19-04
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P19-05
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P19-06
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	No



Outfall ID	P19-07
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	Partially in water



Outfall ID	P19-08
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	



Outfall ID	P20-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	
Dimensions	18
Submerged	Partially in water



Outfall ID	P21-02
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P21-03
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	Single
Dimensions	048 x 30
Submerged	No



Outfall ID	P21-04
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	Partially in water



Outfall ID	P21-05
LandUse	
Type	
Material	
Shape	
Grouping	
Dimensions	
Submerged	



Outfall ID	P21-06
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	Single
Dimensions	010 x 10
Submerged	No



Outfall ID	P21-07
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P22-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	Partially in water



Outfall ID	P23-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P23-02
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P23-03
LandUse	
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P24-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	Partially in water



Outfall ID	P25-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P25-02
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	6
Submerged	No



Outfall ID	P26-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	No



Outfall ID	P26-02
LandUse	
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	9
Submerged	No



Outfall ID	P27-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	Partially in water



Outfall ID	P29-02
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	No



Outfall ID	P29-03
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	Single
Dimensions	060 x 24
Submerged	No



Outfall ID	P31-01
LandUse	Industrial
Type	
Material	
Shape	
Grouping	
Dimensions	
Submerged	



Outfall ID	P31-02
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P31-03
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P32-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	No



Outfall ID	P32-02
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P32-03
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	No



Outfall ID	P32-04
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	9
Submerged	



Outfall ID	P33-01
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P33-02
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	No



Outfall ID	P34-01
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P34-02
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P34-03
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	No



Outfall ID	P34-04
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P34-05
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P34-06
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	042 x 2
Submerged	Partially in water



Outfall ID	P34-07
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P34-08
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P34-09
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	



Outfall ID	P34-10
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P34-11
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P35-01
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	018, 12
Submerged	No



Outfall ID	P35-02
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P35-03
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	



Outfall ID	P35-04
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	Partially in water



Outfall ID	P35-05
LandUse	Commercial
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	No



Outfall ID	P36-01
LandUse	Commercial
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P37-01
LandUse	
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	



Outfall ID	P37-02
LandUse	Commercial
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P38-01
LandUse	Commercial
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	



Outfall ID	P38-02
LandUse	Commercial
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	Partially in water



Outfall ID	P38-03
LandUse	Commercial
Type	
Material	
Shape	
Grouping	
Dimensions	
Submerged	



Outfall ID	P38-04
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	Partially in water



Outfall ID	P38-05
LandUse	Commercial
Type	Open Drainage
Material	Earthen
Shape	Parabolic
Grouping	
Dimensions	360in wide on top and bottom,
Submerged	



Outfall ID	P38-OUTFALL
LandUse	Commercial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	No



Outfall ID	P39-OUTFALL
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	No



Outfall ID	P41-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	Partially in water



Outfall ID	P41-02
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P41-03
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	Single
Dimensions	108 x 96
Submerged	Partially in water



Outfall ID	P42-01
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	24
Submerged	No



Outfall ID	P42-PSI
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	3
Submerged	No



Outfall ID	P44/45-01
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P44/45-02
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	
Dimensions	36
Submerged	No



Outfall ID	P44/45-03
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	Partially in water



Outfall ID	P44/45-04
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	Partially in water



Outfall ID	P44/45-05
LandUse	
Type	Open Drainage
Material	Earthen
Shape	Other
Grouping	
Dimensions	012in top width, 1/4in deep
Submerged	



Outfall ID	P51A-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	30
Submerged	Partially in water



Outfall ID	P51A-02
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	Partially in water



Outfall ID	P51A-03
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Double
Dimensions	9
Submerged	No



Outfall ID	P51A-04
LandUse	Industrial
Type	Closed Pipe
Material	RCP, cardboard fiber
Shape	
Grouping	
Dimensions	018in x 1, 2 x 12in
Submerged	No



Outfall ID	P51A-05
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	36
Submerged	Partially in water



Outfall ID	P51A-06
LandUse	
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	9
Submerged	No



Outfall ID	P51A-07
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P51A-08
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Double
Dimensions	9
Submerged	No



Outfall ID	P51B-04
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P51B-05
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P51B-06
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	9
Submerged	No



Outfall ID	P51B-07
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	18
Submerged	No



Outfall ID	P51C-02
LandUse	
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	6
Submerged	No



Outfall ID	P51C-03
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	6
Submerged	No



Outfall ID	P51C-04
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	6
Submerged	No



Outfall ID	P51C-05
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	6
Submerged	No



Outfall ID	P51C-06
LandUse	Industrial
Type	Closed Pipe
Material	Steel
Shape	Circular
Grouping	Single
Dimensions	6
Submerged	No



Outfall ID	P52-02
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	Single
Dimensions	96
Submerged	Partially in water



Outfall ID	P52-03
LandUse	Industrial
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P52-04
LandUse	Industrial
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P52-05
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Box
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P53-01
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	No



Outfall ID	P53-02
LandUse	Industrial
Type	Closed Pipe
Material	RCP
Shape	Circular
Grouping	Single
Dimensions	036,12
Submerged	Partially in water



Outfall ID	P53-03
LandUse	Industrial
Type	Closed Pipe
Material	PVC
Shape	Circular
Grouping	Single
Dimensions	12
Submerged	



ORIIP APPENDIX D

SITE SPECIFIC HEALTH AND SAFETY PLAN

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Honolulu and Kalaeloa Barbers Point Harbors
Outfall Reconnaissance Inventory

Prepared By:
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ETC Project No. 13-6009

March 2013

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1.0 INTRODUCTION

The Outfall Reconnaissance Inventory and Inspection Program (ORIIP) is an element of the Hawaii Department of Transportation, Harbors Divisions (Harbors) illicit Discharge Detection and Elimination (IDDE) Program. The ORIIP requires a visual inspection of Harbors outfalls to be performed annually during dry weather conditions (less than 0.1" of rain during a 72 hour period). The dry weather outfall reconnaissance inventory (ORI) will be conducted during low tide and will describe each outfall's conditions, flow characteristics, and descriptions of the surrounding areas. Records of the ORI will be kept for inclusion in the Annual Compliance Report (ACR).

The purpose of the ORI is to detect illicit discharges and illegal connections to the Harbors Small Municipal Separate Storm Sewer System (MS4) and to produce a greater understanding of the site specific conditions at the Harbors. Non-stormwater discharges will be tracked upstream in an attempt to determine the source. Illicit runoff conditions will be reported and, where a violation is identified, a warning or citation will be issued, recorded and included in the ACR.

1.1 Project Location

The project is located at the Honolulu Harbor on the southern central portion of the island of Oahu in the State of Hawaii.

1.2 Purpose and Objectives

The purpose of this Health and Safety Plan is to establish standard safety and health procedures for EnviroServices & Training Center (ETC) personnel and any other personnel involved in the performance of ORI activities. All project activities shall be performed in accordance with this Health and Safety Plan. Specific hazard control methodologies have been evaluated and selected in an effort to minimize the potential for accident or injury. This Health and Safety Plan is a dynamic document and is subject to change based on review and implementation of additional tasks.

All site activities will be performed in accordance with this Health and Safety Plan, applicable ETC policies and procedures, and the Occupational Safety and Health Administration (OSHA) guidelines. The levels of personal protection and the procedures specified in this Health and Safety Plan are based on the best information available from reference documents and current site data; therefore, these recommendations represent the minimum health and safety requirements to be observed by all personnel engaged in this project. Unforeseeable site conditions or changes in the scope of work may warrant a reassessment of protection levels and controls stated. All adjustments to this Health and Safety Plan must be approved by ETC's on-site Safety Officer.

1.3 Regulations and Guidelines

The regulations listed in this section provide the employers and employees with the minimum information and indicate the minimum training necessary to accomplish the purpose and objectives of this Health and Safety Plan. All on-site personnel will adhere to the following requirements and regulations:

1) 29 Code of Federal Regulations (CFR) 1910;
2) 29 CFR 1926; and
3) ETC's Health and Safety Program.

1.4 Personnel

All operations and personnel having the potential for exposure to site hazards are subject to the requirements of this Health and Safety Plan. The Project Manager will serve as the Site Safety Officer (SSO) and will be responsible for the implementation of the Health and Safety Plan and oversight of the on-site personnel. Table 1 provides a list of key participants, including organization names and telephone numbers.

TABLE 1: KEY PARTICIPANTS

TITLE	NAME	ORGANIZATION	PHONE NUMBER
Environmental Manager	Mr. Randal Leong	HDOT Harbors	(808) 587-1962
Environmental Health Specialist	Mrs. Ying Zhang	HDOT Harbors	(808) 587-1960
EH&S Manager	Mr. Jim Galariada	HDOT Harbors	(808) 587-1976
Office Health and Safety Manager	Mr. Damon Hamura	ETC	(808) 839-7222 ext 230
Project Manager / Site Safety Officer	Mrs. Katie Davis	ETC	(808) 839-7222 ext 224 (office) (808) 226-0728 (mobile)

2.0 HAZARD IDENTIFICATION

This section of the Health and Safety plan addresses chemical, physical, and biological hazards anticipated during field activities. The following subsections identify the site specific hazards of concern. Safety procedures to mitigate each identified risk are outlined in Section 4.0.

2.1 Chemical Hazards

ORI activities may expose personnel to hazardous chemicals either in the actual stormwater discharge or the chemicals placed in sample containers for sample preservation. Therefore, direct contact with stormwater and preservatives should be avoided. The constituents of concern for ORI activities include: carbon monoxide (CO), sulfuric acid (H_2SO_4), hydrogen sulfide (H_2S). The potential modes of exposure to these chemicals are ingestion, absorption, and inhalation. The chemical data sheets for these potential hazards, which include chemical specific hazard information (exposure limits, physical descriptions, etc.) obtained from published sources (OSHA, National Institute for Occupational Safety and Health [NIOSH]) are included in Appendix I. The exposure limits, acute hazards, and symptoms of exposure have been summarized in Table 2 below.

TABLE 2: EXPOSURE LIMITS AND SYMPTOMS TO EXPOSURE

Compound	PEL[a]	TLV[b]	STEL[c]	IDLH[d]	Acute Hazards/Symptoms
Carbon Monoxide	50 ppm	25 ppm	NA	1200 ppm	**Inhalation:** Headache. Confusion. Dizziness. Nausea. Weakness. Unconsciousness.
Hydrogen Sulfide	20 ppm	10 ppm	15 ppm	100 ppm	**Inhalation:** Headache. Dizziness. Cough. Sore throat. Nausea. Labored breathing. Unconsciousness. Symptoms may be delayed.
					Skin: Irritation.
					Eyes: Irritation.
Sulfuric Acid	1 mg/m^3	0.2 mg/m^3	NA	15 mg/m^3	**Inhalation:** Corrosive. Burning sensation. Sore throat. Cough. Labored breathing. Shortness of breath. Symptoms may be delayed.
					Skin: Corrosive. Redness. Pain. Blisters. Serious skin burns.
					Eyes: Pain. Severe deep burs.
					Ingestion: Burning sensation. Shock or collapse.

[a]PEL – An 8-hour time-weighted average or ceiling concentration above which unprotected workers may not be exposed.
[b]TLV – The time-weighted average concentration for a normal 8-hour work day to which workers may be exposed without adverse effect.
[c]STEL – A 15-minute time-weighted average exposure that should not be exceeded at any time during the workday.
[d]IDLH – The maximum level from which a worker could escape without any escape-impairing symptoms or any irreversible health effects.
NA – Not available.

2.2 Physical Hazards

ORI personnel should be aware of a number of physical hazards including but not limited to traffic hazards, sharp edges, falling objects, slippery footing, inclement weather, working in water, and lifting injuries from removing manhole covers.

Hazardous weather conditions associated with ORI activities may include wind, lightning, flooding, heightened wave activity, etc. Common sense should dictate whether ORI activities be conducted during inclement weather.

Working over water presents the risk of drowning, being struck by a boat, being struck or cut by pier surfaces, and other water based hazards. Personal protective equipment (PPE) and the buddy system should be implemented at all times to mitigate this risk.

2.3 Biological Hazards

ORI personnel may come into contact with biological hazards such as rodents or insects such as mosquitoes, bees, and wasps. Work over water also introduces the risk of exposure to ocean organisms such as algae, urchins, jellyfish, and sharks. Care should be taken to avoid areas known to be inhabited by dangerous organisms.

Persons with any insect allergies should inform his or her supervisor prior to work and have the appropriate treatment on hand at all times.

Bloodborne pathogens are a potential concerns during first aid procedures and ORI activities. Illicit discharges to the stormwater system may exist from overflow or cross contamination of the sanitary sewer system. Personnel should don the proper PPE (e.g. gloves, goggles, and aprons) to mitigate this concern.

3.0 FIELD ACTIVITIES

The field activities associated with this project are specifically laid out in Section 3 of the February 2014, Department of Transportation Harbors Divisions, *Outfall Reconnaissance Inventory and Inspection Program,* which has been attached to this document as Appendix II.

4.0 JOB HAZARD ANALYSIS

The job hazard analysis is an ongoing process from the initiation of the Health and Safety Plan preparation through the implementation and completion of the project. Modifications should be made in the field by the Site Safety Officer to account for changes in site conditions or the discovery of new hazards. The initial site specific job hazard analysis is presented in Table 3.

TABLE 3: JOB HAZARD ANALYSIS

DATE PREPARED: March 2014	**PREPARED BY:** Bryan Starks		**JOB DESCRIPTION:** Outfall Reconnaissance Inventory
STEP/TASK	**HAZARDS**		**HAZARD CONTROLS**
Mobilization/ Demobilization	Vehicle/Object Collision		• Ensure vehicle has sufficient fuel. • Drive defensively. • Use turn indicators and hazard lights if necessary. • Carry cell phone in case of emergencies. • Do **not** use cell phone while operating the vehicle.
	Parking On-Site		• Safely park off roadways and use traffic cones to warn oncoming traffic (if not in marked spot). • Use turn indicators and hazard lights if necessary.
	Loading/Unloading Vehicle		• Request assistance with lifting heavy objects.
ORI	**Chemical Hazards**	Unknown Illicit Discharges	• The substances that personnel may encounter in manholes, drains, or outfalls are unknown. Proper protection for the worst case scenario should be taken. • Avoid direct contact with unknown substances.
		Potential Hazardous Liquids (Including Sulfuric Acid)	• Proper PPE should be worn to prevent exposure to potentially hazardous chemicals. • Always use gloves and safety goggles with splash protection when handling Hazardous chemicals. • Sample preservatives (sulfuric acid) should be added to sample jars on land after collection so boat personnel are not exposed to unnecessary risk associated with preservation chemicals.
		Potential Hazardous Gases	• Personnel should be equipped with gas meter and take regular readings. • Personnel should be alert to odors and symptoms such as headache, nausea, dizziness, and central nervous deprecation. • If any suspicion of hazardous gas should arise, relocate to a safe, well ventilated area. • Carbon monoxide and hydrogen sulfide are two gases known to be in manholes. • Carbon monoxide is a colorless, odorless gas that is also poisonous and flammable. Inhalation causes headache, dizziness, weakness of limbs, confusion, nausea, unconsciousness and finally death. If a person breaths large amounts of this chemical, move the exposed person to fresh air immediately. If breathing has stopped perform mouth to mouth resuscitation. Keep affected person warm and at rest. Get

DATE PREPARED: March 2014	**PREPARED BY:** Bryan Starks		**JOB DESCRIPTION:** Outfall Reconnaissance Inventory
STEP/TASK	**HAZARDS**		**HAZARD CONTROLS**
ORI Continued	**Chemical Hazards Continued**	Potential Hazardous Gases Continued	medical attention as soon as possible. • Hydrogen sulfide is a colorless gas having the odor of rotten eggs. It is flammable and poisonous. Causes of olfactory fatigue, causing the sense of smell to be an unreliable indication of presence. Exposure to very high concentrations causes immediate death. Also death or permanent injury may occur after very short exposure in small quantities. It acts directly upon the nervous system resulting in paralysis of respiratory centers. If inhaled, move victim to fresh air. If no pulse is detected, provide CPR. If not breathing provide artificial respiration. Seek medical assistance. • If oxygen concentration is less than 19% or over 23.5% it is considered a hazardous atmosphere and should not be entered without a permit.
	Physical Hazards	High Traffic Areas	• Check traffic before crossing roads. • Use proper PPE, including steel toed shoes & reflective safety vest. • All traffic rules and regulations should be obeyed.
		Slip/Trip/Fall Sharp Edges	• Do not enter manholes, pipes, and other confined spaces unless certified. • Survey conditions before entering site. • Wear proper shoes to avoid slip and fall. • Be aware of your surroundings. • Do not lean over edge of pier. • Always conduct outfall investigation in pairs.
		Inclement Weather	• Site Safety Officer will determine if conditions are safe to conduct ORI.
		Lifting Injuries	• Request help lifting or moving heavy objects such as manhole covers.
		Drowning	• Conduct all ORI activities in pairs. • Personnel working over or near water shall be provided with USCG-approved personal flotation device, which shall be worn whenever there is a potential drowning hazard.
		Confined Spaces	• A confined space is any space that is large enough for a work to enter and perform work, not designed for continuous worker occupancy and is difficult to enter or exit. • A confined space that has one or more of the following characteristic: contains or has the potential to contain a hazardous atmosphere; contains a material that has the potential to engulf an entrant; or contains any other recognized safety or health hazard, such as unguarded machinery, exposed live wires, or heat stress, requires a permit before entry. DO NOT enter if any of these hazards are present. Entry is only permitted after obtaining permit and wearing Level B PPE. • Confined spaces can subject personnel to accumulation of toxic or flammable contaminates, contain physical hazards, or have an oxygen-deficient atmosphere.

DATE PREPARED: March 2014	**PREPARED BY:** Bryan Starks		**JOB DESCRIPTION:** Outfall Reconnaissance Inventory
STEP/TASK	**HAZARDS**		**HAZARD CONTROLS**
ORI Continued	**Physical Hazards Continued**	Confined Spaces Continued	• Any entrant and entry supervisor must be present and properly trained. • Entrants should be familiar with specific duties required of them. • Know and understand the hazards of the specific confined space (all confined spaces are different and complex). • Use the equipment required for safe entry. • Communicate with attendant as necessary and/or required. • Alert the attendant immediately if any warning signs or symptoms of exposure are detected, or any condition not allowed by the permit is detected. • Exit from the space immediately if any order to evacuate is given by the attendant or entry supervisor, the entrant recognizes any warning signs or symptoms of exposure, the entrant detects a prohibited condition, or an evacuation alarm is activated. • No task involving a confined space may begin until an initial evaluation is made of the hazards including: o An evaluation of oxygen content, flammable/explosive atmosphere, and potential or known contaminates. o An evaluation of potential sources of engulfment, internal configurations or conditions that could trap or asphyxiate entrants, or other recognizable safety or health hazards. • ORI personnel will take atmospheric reading using a gas meter outside of the pier, at the midpoint, and at the outfall. • ORI personnel will record gas monitor readings on the confined space permit.
	Biological Hazards	Animals	• Personnel should be aware of organisms in their area. • Do not touch organisms growing on piers. Pier based organisms can cut the skin, secrete irritants and toxins and cause other harm to personnel.
		Insects	• Inform Site Safety Officer of any allergies. • Be aware of surroundings and inspect area around storm drains before approaching.
		Illicit Discharge (Sewage)	• Wear proper PPE. • Avoid contact with unknown illicit discharge.

APPENDIX I

NIOSH Chemical Safety Sheets

International Chemical Safety Cards

HYDROGEN SULFIDE

ICSC: 0165

Sulfur hydride
H_2S
Molecular mass: 34.1
(cylinder)

ICSC # 0165
CAS # 7783-06-4
RTECS # MX1225000
UN # 1053
EC # 016-001-00-4
April 10, 2000 Validated



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Extremely flammable.	NO open flames, NO sparks, and NO smoking.	Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out; in other cases extinguish with water spray, powder, carbon dioxide.
EXPLOSION	Gas/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding) if in liquid state. Do NOT use compressed air for filling, discharging, or handling.	In case of fire: keep cylinder cool by spraying with water.
EXPOSURE		AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
• **INHALATION**	Headache. Dizziness. Cough. Sore throat. Nausea. Laboured breathing. Unconsciousness. Symptoms may be delayed (see Notes).	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Half-upright position. Artificial respiration may be needed. No mouth-to-mouth artificial respiration. Refer for medical attention.
• **SKIN**	ON CONTACT WITH LIQUID: FROSTBITE.	Cold-insulating gloves.	ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention.
	Redness. Pain. Severe deep	Safety goggles, or eye protection	First rinse with plenty of water for

• EYES	burns.	in combination with breathing protection.	several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work.	

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Consult an expert! Remove all ignition sources. Ventilation. Remove gas with fine water spray. Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus.	Fireproof. Separated from strong oxidants. Cool. Keep in a well-ventilated room. Install continous monitoring system with alarm.	F+ symbol T+ symbol N symbol R: 12-26-50 S: 1/2-9-16-36-38-45-61 UN Hazard Class: 2.3 UN Subsidiary Risks: 2.1

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0165

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

HYDROGEN SULFIDE

ICSC: 0165

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS COMPRESSED LIQUEFIED GAS , WITH CHARACTERISTIC ODOUR OF ROTTEN EGGS.

PHYSICAL DANGERS:
The gas is heavier than air and may travel along the ground; distant ignition possible. As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
Heating may cause violent combustion or explosion. The substance decomposes on burning producing toxic gases (sulfur oxides). Reacts violently with strong oxidants, causing fire and explosion hazard. Attacks many metals and some plastics.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 10 ppm as TWA; 15 ppm as STEL; (ACGIH 2004).
MAK: 5 ppm, 7.1 mg/m³;
Peak limitation category: I(2); Pregnancy risk group: C;
(DFG 2006).
OSHA PEL‡: C 20 ppm 50 ppm 10-minute maximum peak
NIOSH REL: C 10 ppm (15 mg/m^3) 10-minute

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation.

INHALATION RISK:
A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes and the respiratory tract . The substance may cause effects on the central nervous system . Exposure may result in unconsciousness. Exposure may result in death. Inhalation of gas may cause lung oedema (see Notes). The effects may be delayed. Medical observation is indicated. Rapid evaporation of the liquid may cause frostbite.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:

	NIOSH IDLH: 100 ppm See: 7783064
PHYSICAL PROPERTIES	Boiling point: -60°C Melting point: -85°C Solubility in water, g/100 ml at 20°C: 0.5 Relative vapour density (air = 1): 1.19 Flash point: Flammable Gas Auto-ignition temperature: 260°C Explosive limits, vol% in air: 4.3-46
ENVIRONMENTAL DATA	The substance is very toxic to aquatic organisms. 

NOTES

The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available. The substance blocks the sense of smell. The odour warning when the exposure limit value is exceeded is insufficient. Card has been partly updated in October 2004: see sections Occupational Exposure Limits, EU classification, Emergency Response. Card has been partly updated in October 2006: see sections Occupational Exposure Limits.

Transport Emergency Card: TEC (R)-20G2TF or 20S1053

NFPA Code: H4; F4; R0;

ADDITIONAL INFORMATION

ICSC: 0165 **HYDROGEN SULFIDE**

(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE: Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

CARBON MONOXIDE

ICSC: 0023

Carbon oxide
Carbonic oxide
CO
Molecular mass: 28.0
(cylinder)

ICSC # 0023
CAS # 630-08-0
RTECS # FG3500000
UN # 1016
EC # 006-001-00-2
April 19, 2007 Validated



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Extremely flammable. Heating will cause rise in pressure with risk of bursting.	NO open flames, NO sparks, and NO smoking.	Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out; in other cases extinguish with carbon dioxide, water spray, powder.
EXPLOSION	Gas/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Use non-sparking handtools.	In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.
EXPOSURE		AVOID EXPOSURE OF (PREGNANT) WOMEN!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Headache. Confusion. Dizziness. Nausea. Weakness. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention. See Notes.
•SKIN			
•EYES			
•INGESTION			

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Remove all ignition sources. Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation.	Fireproof. Cool. Keep in a well-ventilated room.	Note: E F+ symbol T symbol R: 12-23-48/23-61

		S: 53-45 UN Hazard Class: 2.3 UN Subsidiary Risks: 2.1 Signal: Danger Flame-Cylinder-Skull-Health haz Extremely flammable gas Contains gas under pressure; may explode if heated Fatal if inhaled May damage fertility or the unborn child if inhaled Causes damage to blood if inhaled Causes damage to blood and central nervous system through prolonged or repeated exposure if inhaled

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0023	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

CARBON MONOXIDE

ICSC: 0023

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** ODOURLESS, TASTELESS, COLOURLESS COMPRESSED GAS. **PHYSICAL DANGERS:** The gas mixes well with air, explosive mixtures are easily formed. The gas penetrates easily through walls and ceilings. **CHEMICAL DANGERS:** May react vigorously with oxygen, acetylene, chlorine, fluorine, nitrous oxide. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 25 ppm as TWA BEI issued (ACGIH 2006). MAK: 30 ppm 35 mg/m³ Peak limitation category: II(1); Pregnancy risk group: B; BAT issued; (DFG 2008). OSHA PEL†: TWA 50 ppm (55 mg/m^3) NIOSH REL: TWA 35 ppm (40 mg/m^3) C 200 ppm (229 mg/m^3) NIOSH IDLH: 1200 ppm See: 630080	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation. **INHALATION RISK:** A harmful concentration of this gas in the air will be reached very quickly on loss of containment. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance may cause effects on the blood , resulting in carboxyhaemoglobinemia and cardiac disorders . Exposure at high levels may result in death. Medical observation is indicated. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The substance may have effects on the cardiovascular system and central nervous system . May cause toxicity to human reproduction or development.
PHYSICAL PROPERTIES	Boiling point: -191°C Melting point: -205°C Solubility in water, ml/100 ml at 20°C: 2.3 Relative vapour density (air = 1): 0.97	Flash point: Flammable Gas Auto-ignition temperature: 605°C Explosive limits, vol% in air: 12.5-74.2

ENVIRONMENTAL DATA	

NOTES

Carbon monoxide is a product of incomplete combustion of coal, oil, wood. It is present in vehicle exhaust and tobacco smoke. Depending on the degree of exposure, periodic medical examination is suggested. No odour warning if toxic concentrations are present. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available.

Transport Emergency Card: TEC (R)-20S1016 or 20G1TF

NFPA Code: H3; F4; R0

Card has been partially updated in November 2008: see Occupational Exposure Limits.

ADDITIONAL INFORMATION

ICSC: 0023 **CARBON MONOXIDE**

(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE:	Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

SULFURIC ACID

ICSC: 0362

Sulfuric acid 100%
Oil of vitriol
H_2SO_4
Molecular mass: 98.1

ICSC # 0362
CAS # 7664-93-9
RTECS # WS5600000
UN # 1830
EC # 016-020-00-8
February 10, 2000 Validated



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire.	NO contact with flammable substances. NO contact with combustibles .	NO water. In case of fire in the surroundings: powder, foam, carbon dioxide
EXPLOSION	Risk of fire and explosion on contact with base(s) , combustible substances , oxidants , reducing agents or water .		In case of fire: keep drums, etc., cool by spraying with water but NO direct contact with water.
EXPOSURE		PREVENT GENERATION OF MISTS! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
• **INHALATION**	Corrosive. Burning sensation. Sore throat. Cough. Laboured breathing. Shortness of breath. Symptoms may be delayed (see Notes).	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer for medical attention.
• **SKIN**	Corrosive. Redness. Pain. Blisters. Serious skin burns.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
• **EYES**	Corrosive. Redness. Pain. Severe deep burns.	Face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
	Corrosive. Abdominal pain.	Do not eat, drink, or smoke	Rinse mouth. Do NOT induce

• INGESTION	Burning sensation. Shock or collapse.	during work.	vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Consult an expert! Evacuate danger area! Do NOT absorb in saw-dust or other combustible absorbents. Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment.	Separated from combustible and reducing substances, strong oxidants, strong bases, food and feedstuffs , incompatible materials . See Chemical Dangers. May be stored in stainless steel containers. Store in an area having corrosion resistant concrete floor.	Unbreakable packaging; put breakable packaging into closed unbreakable container. Do not transport with food and feedstuffs. Note: B C symbol R: 35 S: 1/2-26-30-45 UN Hazard Class: 8 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0362

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

SULFURIC ACID

ICSC: 0362

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS , OILY , HYGROSCOPIC LIQUID , WITH NO ODOUR.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
The substance is a strong oxidant and reacts violently with combustible and reducing materials. The substance is a strong acid, it reacts violently with bases and is corrosive to most common metals forming a flammable/explosive gas (hydrogen - see ICSC 0001). Reacts violently with water and organic materials with evolution of heat (see Notes). Upon heating, irritating or toxic fumes (or gases) (sulfur oxides) are formed.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 0.2 mg/m³
Thoracic fraction
A2 (suspected human carcinogen);
(sulfuric acid contained in strong inorganic acid mists)
(ACGIH 2005).
MAK: (Inhalable fraction) 0.1 mg/m³;
Peak limitation category: I(1); Carcinogen category: 4; Pregnancy risk group: C;
(DFG 2004).
OSHA PEL: TWA 1 mg/m^3

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly on spraying.

EFFECTS OF SHORT-TERM EXPOSURE:
Corrosive. The substance is very corrosive to the eyes, the skin and the respiratory tract. Corrosive on ingestion. Inhalation of an aerosol of this substance may cause lung oedema (see Notes).

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Lungs may be affected by repeated or prolonged exposure to an aerosol of this substance. Risk of tooth erosion upon repeated or prolonged exposure to an aerosol of this substance. Strong inorganic acid mists containing this substance are carcinogenic to humans.

	NIOSH REL: TWA 1 mg/m^3 NIOSH IDLH: 15 mg/m^3 See: 7664939
PHYSICAL PROPERTIES	Boiling point (decomposes): 340°C Melting point: 10°C Relative density (water = 1): 1.8 Solubility in water: miscible Vapour pressure, kPa at 146°C: 0.13 Relative vapour density (air = 1): 3.4
ENVIRONMENTAL DATA	The substance is harmful to aquatic organisms. 

NOTES

The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. NEVER pour water into this substance; when dissolving or diluting always add it slowly to the water. Other UN numbers: UN1831 Sulfuric acid, fuming, hazard class 8, subsidiary hazard 6.1, pack group I; UN1832 Sulfuric acid, spent, Hazard class 8, Pack group II. Card has been partly updated in October 2005. See sections Occupational Exposure Limits, Emergency Response.

Transport Emergency Card: TEC (R)-80S1830 or 80GC1-II+III

NFPA Code: H 3; F 0; R 2; W

Card has been partially updated in January 2008: see Fire fighting.

ADDITIONAL INFORMATION

ICSC: 0362 **SULFURIC ACID**

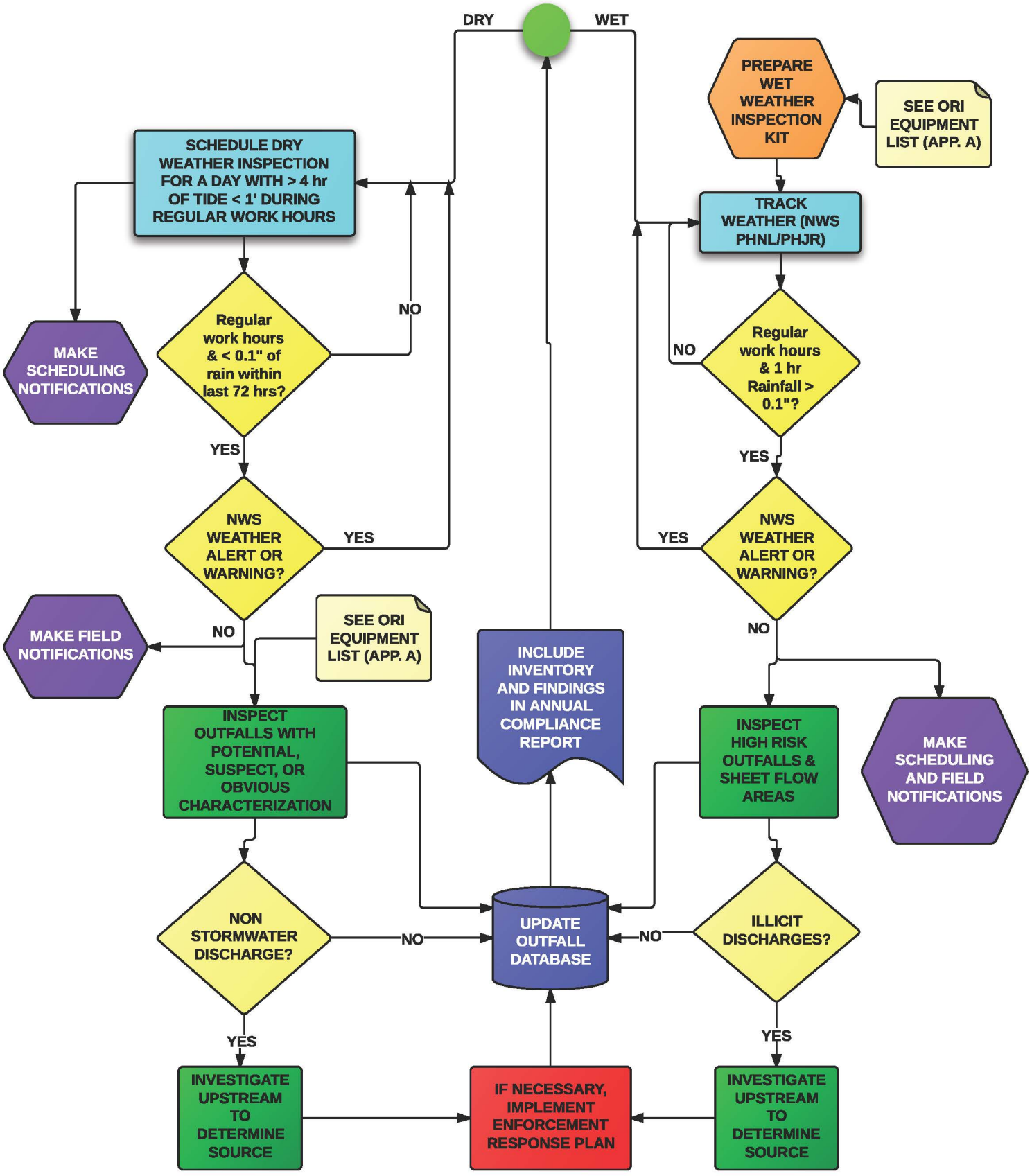
(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE:	Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

ORIIP APPENDIX E

ORIIP PROCESS FLOWCHART

ORI Process Flow Chart



ATTACHMENT 3
OUTFALL MAPS

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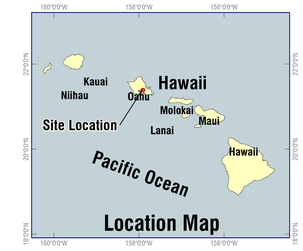
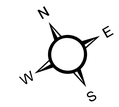


Legend

- ORI Outfalls
- Drain Box
- Dumpster
- Boat Launch Point
- Structure Footprint
- Catch Basin
- Storm Drain Piping - from onsite
- Storm Drain Piping - from offsite
- Harbors TMK
- Too Dangerous For Dry Weather ORI



0 450 900
Feet
1 inch = 450 feet

HDOT Honolulu Harbor Outfall Location Map

Hawaii Department of Trasportation
Harbors Division

FIGURE
1

WESTON SOLUTIONS
841 BISHOP STREET SUITE 2301 HONOLULU, HAWAII 96813 808.585.0448

DRAWN:	DATE:	CONTRACT NO:
A.D	2013-DEC	XXXXXX-XX-X-XXXX
CHECKED:	CHECK DATE:	WORK ORDER NUMBER:
M. AMBLER	2013-DEC	13682.004.001.1000.00

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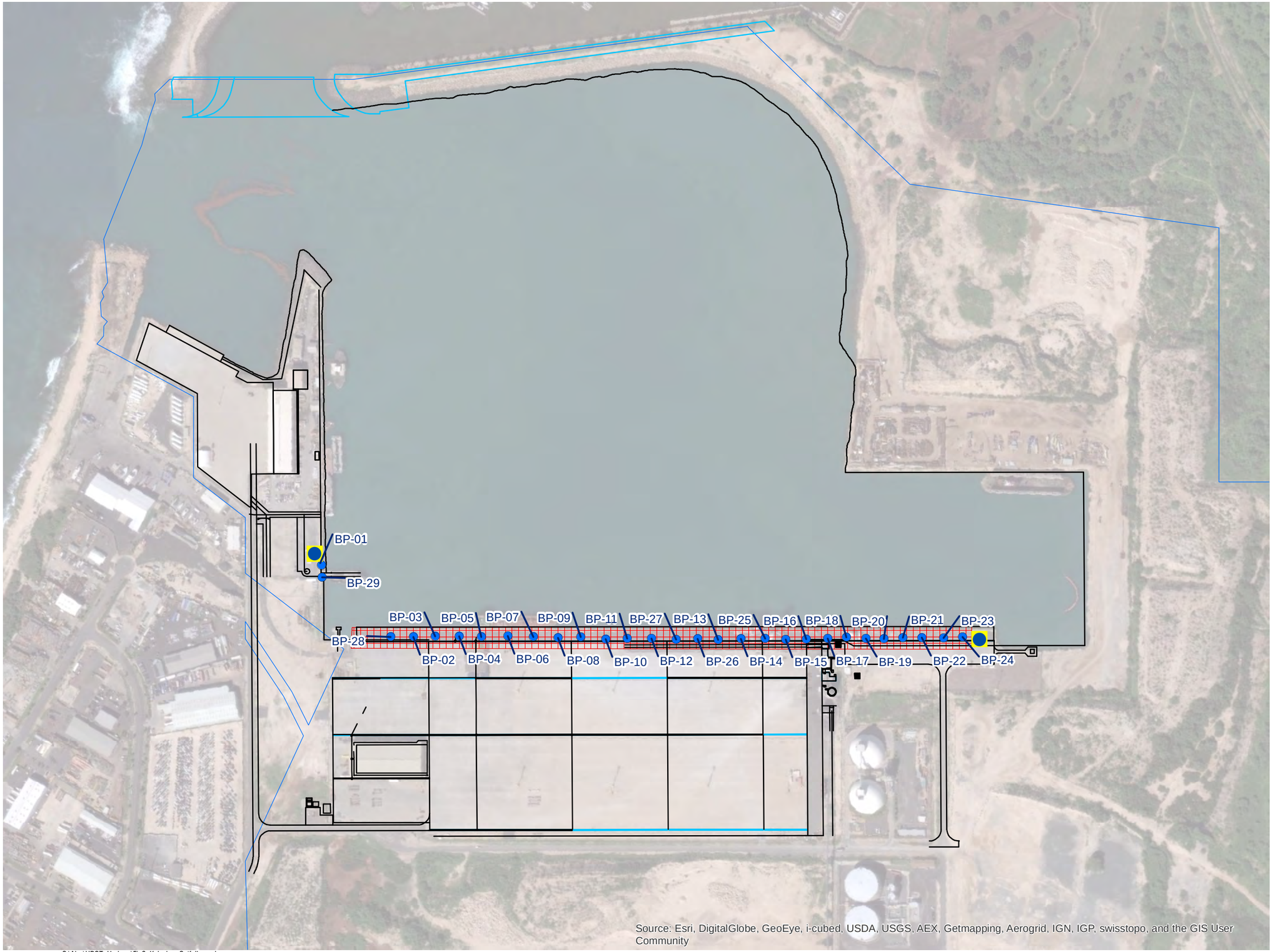

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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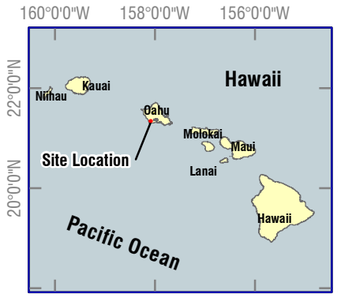

Location Map

Legend

- ORI Outfalls
- Structure Footprint
- Storm Drain Piping
- Harbors TMK
- Boat Launch Point
- Too Dangerous for Dry Weather ORI

0 200 400
Feet
1 inch = 400 feet

HDOT Kalaeloa Harbor Outfall Location Map

Hawaii Department of Transportation
Harbors Division

FIGURE 2

WESTON SOLUTIONS
841 BISHOP STREET SUITE 2301 HONOLULU, HAWAII 96813 808.275.2500

DRAWN	DATE	CONTRACT NO.
AD	2013-DEC	XXXXXX-XX-X-XXXX
CHECKED	CHECK DATE	WORK ORDER NUMBER
M. AMBLER	2013-DEC	13682.004.001.1000.00

ATTACHMENT 4
ENFORCEMENT RESPONSE PLAN

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State of Hawaii Department of Transportation
Harbors Enforcement Response Plan



State of Hawaii
Department of Transportation
Harbors Division
79 South Nimitz Highway
Honolulu Hawaii 96813-5898

December 2014

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2. POLICY OF ESCALATING ENFORCEMENT **3**

3. SCOPE OF AUTHORITY **3**

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7. TEMPLATES AND EXAMPLES **11**

1. Purpose

This Enforcement Response Plan (ERP) specifies how The State of Hawaii Department of Transportation Harbors Division (HDOT-Harbors) will respond to instances of noncompliance with HDOT-Harbors' rules and regulations. The intent of this ERP is to ensure that enforcement is conducted in an equitable and consistent manner. Enforcement of HDOT-Harbors' rules, regulations, and lease provisions is important to protect public health, public safety, the environment, HDOT-Harbors' investment in infrastructure, and the municipal separate storm sewer system.

2. Policy of Escalating Enforcement

The HDOT-Harbors requires compliance from its tenants and their activities to protect State waters and to comply with its MS4 permit. It is the policy of the HDOT-Harbors to apply enforcement actions expeditiously and equitably. Where compliance with water pollution regulations is most effectively achieved through informal enforcement actions (verbal warnings or administrative warning letters), it is the policy of the HDOT-Harbors to pursue the appropriate level of enforcement to achieve timely compliance. However, if informal enforcement actions do not achieve timely compliance, violations of water pollution regulations are a threat to human or environmental health, or threaten to cause a violation of HDOT-Harbors small MS4 permits, formal enforcement actions will be pursued with the assistance of the Office of the Attorney General, including stop work orders, administrative or civil penalties, injunctive relief or eviction (lease or revocable permit termination)

The enforcement actions to be utilized by HDOT-Harbors, in order of increasing severity, are as follows:

a. Oral or Verbal Warning
b. Written Warning
c. Notice of Apparent Violation (NAV)
d. Notice and Finding of Violation Order (NFVO)
e. Assessment of Civil Penalties in a Notice of Harbor Civil Violation (NHCV)
f. Stop Work Orders (as applicable)
g. Issuance of Summons or Citation, including fines
h. Lease or revocable permit termination

These enforcement actions are not exclusive to any one situation and may be used concurrently with one another.

3. Scope of Authority

The enforcement options available to HDOT-Harbors range from administrative actions (including verbal/written warnings, eviction notices, and civil penalties) to the issuance of criminal citations to be adjudicated and sentenced by the State of Hawaii District Court, potentially resulting in a fine or imprisonment. HDOT-Harbors' authority is found in:

a. HRS Title 15 Chapter 266 authorizes Harbors to issue a summons or citation for violations of its rules and have its actions enforced through the district courts by verdict and sentencing of imprisonment and/or fines.
b. HAR Title 19 Chapters 41 to 44 establishes uniform safety measures, operational standards and requirements, and the conduct for all tenants at State of Hawaii harbors.
c. The tenant lease agreement or revocable permit that provides HDOT-Harbors with the right of entry to conduct inspection and authority to terminate the revocable permit or lease.
d. The Construction Contract that provides HDOT-Harbors with the right of entry to conduct inspection and authority to issue a Stop Work Order and to withhold a contractor's payment.

4. Roles and Responsibilities

Inspections and investigations will proceed according to the processes described in the Tenant Inspection Program Manual, Construction Site Runoff Control Program Manual, Post-Construction Stormwater Program Manual, and the Outfall Reconnaissance Inventory and Inspection Program Manual.

This ERP only covers situations where activities originate within HDOT-Harbors' small MS4 jurisdiction. If activities outside HDOT-Harbors' small MS4 jurisdiction contribute pollutants to HDOT-Harbors' small MS4, HDOT-Harbors will contact the up stream jurisdiction (e.g. City and County of Honolulu or HDOT-Highways) in writing, informing them of the circumstances and copy Hawaii Department of Health (HDOH) on the communication.

Where violations or instances of non-compliance are observed and/or reported to HDOT Harbors, the report will be forwarded to HDOT Harbors Engineering Branch Environmental Section or, if applicable, to the project Construction Manager (CM). The Environmental Section or the CM may issue verbal or written warnings or a Notice of Apparent Violation (NAV). If a CM issues an NAV it will forward a copy to the Environmental Section. The Environmental Section will forward a copy of all NAVs to the HDOH, along with a Construction Site BMP Inspection Report, where applicable. Notice and Finding of Violation Orders (NFVOs) may be issued by HDOH, along with suitable fines. Stop Work Orders will be drafted by CM or Environmental Section, reviewed by the Engineering Branch Program Manager, and signed by the Deputy Director of the Harbors Division. Where appropriate, HDOT-Harbors Environmental Section may call a law enforcement officer of appropriate jurisdiction to investigate and issue a citation and summons. Where HDOT-Harbors deems a HDOT-Harbors tenant lease or revocable permit must be terminated, the HDOT-Harbors Property Management Section will draft the termination documents, and the notice of termination will be signed by the Deputy Director of the Harbors Division. HDOT may consult the State of Hawaii Department of the Attorney General for legal advice and counsel in any of the noted processes.

5. Types of Violations

There are two types of violations – Class I and Class II, which are based on potential to discharge

or cause environmental harm, magnitude of the violation, duration of the violation, and violator's compliance history.

a. Class I Violations: Violations which are related to submittal of permit applications, BMP failure due to lack of maintenance, ongoing or imminent discharges of pollutants, other activities capable of causing imminent impact to the environment, or where the violator has a previous history of non-compliance.

b. Class II Violations: Violations posing no significant impact on the environment, which are easily. preventable, or administrative in nature. Class II violations include record keeping, reporting, BMP maintenance or installation problems, or other activities when there is ample time for correction prior to the discharge of pollutants, and where the violator has not had a previous history of non-compliance

If the potential violation is considered Class I, the designated staff will provide an oral/verbal warning and direct the responsible party to stop the activity relating the imminent threat immediately. Additionally, the designated staff will draft a letter that will require the responsible party to correct action or submit an Action Plan immediately to correct the violation within 7 calendar days upon receipt of the letter. If the responsible party fails to take any corrective action and is not able to submit an Action Plan correcting the violation within 7 calendar days, HDOT-Harbors' response will escalate as described below and in the Manuals. In addition, the designated staff can also implement other appropriate actions such as termination of the lease or revocable permit.

If the potential violation is considered Class II, not posing imminent threat to the environment or the public, the designated staff will issue an oral or verbal warning to the responsible party and then provide a written warning letter requiring corrective action or an Action Plan to be submitted within 20 calendar days upon receipt of the letter. The Action Plan shall denote the tasks that the responsible party is required to complete to come into compliance within reasonable timeframe. If the responsible party fails to take corrective action and is not able to provide an Action Plan within 20 calendar days, other appropriate actions will be implemented as described below and in the Manuals.

a. Permit Compliance Activities – Non-compliances may be discovered through Permit-required inspections or monitoring, including construction site inspections, tenant facility inspections, and dry weather screening,
b. Contractor Compliance Activities – A construction contractor's failure to comply with administrative requirements such as conducting and submitting inspection reports, obtaining annual certifications, preparing and implementing Stormwater Pollution Prevention Plans (SWPPPs).
c. Contractor or Tenant Self-Reporting - DOT Harbors Contractors and/or Tenants may discover discharges or instances of non compliance, either as a part of their own inspection, or by chance discovery. These reports may come directly to DOT Harbors or through other local, state or federal government agencies.
d. Reports from the Public – Public complaints may come directly to DOT Harbors or through other

local, state or federal government agencies.

6. Methods of Enforcement

The following sections contain brief descriptions of each level of enforcement action and procedures for implementation.

a. Oral or Verbal Warning (informal)

An oral or verbal warning is a spoken reprimand or a disciplinary measure, which will be issued verbally to a responsible party where the finding is a minor discrepancy with one or two BMPs, not leading to an immediate discharge (i.e. Class II violations). It could also serve the purpose of outreach. In most cases, oral or verbal warnings provide a more efficient way for the responsible party to take corrective actions. Most verbal warnings will be given after an inspection and the inspector will make a record of the verbal warning on the inspection report. Inspectors will also give verbal warnings when Class I violations are observed in order to have the situation quickly remedied, however, all Class I violations will be addressed through NAVs as described below.

b. Written Warning (informal)

Warning letters typically cite minor or potential violations of environmental rules observed during a field visit or inspection. Warning letters describe measures the business or individual may take to remedy the situation. A written warning will be issued to a tenant where the finding is limited to conditions that do not pose an imminent threat to the environment and/or the public (i.e. Class II violations). In many cases it may follow when a verbal warning was not timely acted upon. If (potential) violation is observed during inspection, and a verbal warning is not appropriate (for example, the responsible party has a history of ignoring verbal warnings), a written warning letter will be mailed with the inspection report with a compliance deadline (as described in each Manual).

The written warnings may be signed by HDOT-Harbors section heads, the Harbors Administrator, the Deputy Director or Director. In all cases, copies of all written warning will be provided to the HDOT-Harbors Engineering Branch Environmental Section. HDOT-Harbors will maintain enforcement files on each responsible party where a written warning has been issued.

c. Notice of Apparent Violation or Notice of Violation (formal)

A Notice of Apparent Violation or Notice of Violation officially informs the recipient that they

have violated or pose the potential to violate environmental laws. Notices may not be appealed. An NAV letter will be issued to a responsible party when a written warning is not effective or when the tenant has a history of ignoring written warnings or failing to meet compliance deadlines. HDOT-Harbors will also issue NAVs whenever a Class I violation is discovered. The NAV documents Harbors efforts to have the tenant return to compliance with the environmental laws and implementing applicable BMPs. It also serves as a basis for future penalties, should the occurrence of violations continue or increase. The NAV shall be sent to the tenant by certified mail with a compliance deadline (as described in the relevant manual).

Notices of Apparent Violation will be signed by either the Harbors Administrator, the Deputy Director or Director. In all cases, copies of all NAVs will be provided to the HDOT-Harbors Engineering Branch Environmental Section. HDOT-Harbors will maintain enforcement files on each responsible party where an NAV has been issued.

d. Notice and Finding of Violation and Order for Compliance (NFVO)

An NFVO is typically a unilateral directive requiring a responsible party to take steps to correct violations of environmental laws. Administrative orders are authorized by statute, and most orders can be appealed. An NFVO may also be accompanied by an assessment of civil penalties in a Notice of Harbor Civil Violation.

e. Assessment of Civil Penalties in a Notice of Harbor Civil Violation (NHCV)

When HDOT Harbors issues civil penalties, they will be assessed in a Notice of Harbor Civil Violation (NHCV) provided to the violator. To collect civil penalties, HDOT-Harbors must establish that a violation occurred. Civil penalties are not "punitive." HDOT-Harbors uses them to secure correction of environmental regulatory violations and to deter future violations. Under HRS Title 15, Chapter 266.30, HDOT-Harbors is authorized to assess civil fines of up to $10,000 per day. Civil penalties can be appealed. HDOT-Harbors Deputy Director will determine the appropriate penalty amount based on information and recommendations by the Engineering Branch Environmental Section, and the HDOT Harbors Administrator. HDOT-Harbors will consider several factors when determining the appropriate penalty amount to assess:

i. The nature of the violation, such as:
   (1) Severity of the violation (public health and/or environmental effect);
   (2) Magnitude of the violation (amount and type of pollution);
   (3) Whether the violation was due to negligence, recklessness or was intentional; and
   (4) Precautions taken to prevent the violation.

ii. The prior behavior of the violator, such as:

(1) Record of similar violations or a pattern of violations; and
(2) Multiple notices of the violation and applicable corrective actions.

iii. Actions taken by the violator to correct the problem, such as:
(1) Degree of cooperation in working toward compliance;
(2) Timeliness and appropriateness of corrective actions taken; and
(3) Compensation paid or agreed to for damages to public resources.

HDOT-Harbors will make every effort to effectively and efficiently recover the final penalty assessment. Failing to pay a penalty will result in a referral to the state Attorney General's Office. The Attorney General's Office determines the appropriate action to be taken, such as seeking a judgment in court or the services of a collections agency.

The NHCV will provide the offender the following information:

iv. The respondent's name and current address if available;
v. A statement that the notice is being issued pursuant to chapter 266, HRS;
vi. A citation of the specific harbor civil violation, including a brief statement of the facts for which the notice is issued and a citation to the law that has been violated;
vii. An assessment of all the administrative sanctions upon the respondent and the governing legal authorities;
viii. A statement of the options provided herein for answering the notice and the procedures necessary to exercise the options;
ix. A summons to the respondent to answer the notice within twenty-one days of the service of the notice;
x. Name and signature of the HDOT-Harbors officer or employee who issues the notice;
xi. Date of the issuance of the notice;
xii. A statement that all citations made and sanctions assessed by the department in the notice are final unless contested by the respondent within twenty-one days of service of the violation notice;
xiii. A statement that failure to timely answer the violation notice and comply with all sanctions assessed by the department may result in the entry of a default decision for the department and additional penalty as specified in the violation notice for the past due compliance;
xiv. A statement that a request for mitigation without contesting the notice will be examined and decided by a hearing officer without holding any hearing, and that the hearing officer's decision will be final and not subject to any subsequent administrative or judicial review.
xv. A statement that any administrative action against the respondent for any civil resource violation shall not preclude the state from pursuing a separate criminal prosecution in a court of law for an offense committed in the same course of conduct; and
xvi. A space for the respondent's statement and signature.

A respondent who receives a NHCV will be required to respond within twenty-one days of the service of the Notice. HDOT Harbors may assess a higher administrative fine for a harbors civil

violation if the NHCV is not answered or any sanctions assessed therein are not complied with by the end of the twenty-one day period As provided in the notice, the Respondent may answer one of three ways, as follows:

i. Waive any contest to the NHCV, and comply with all the monetary and non-monetary sanctions assessed therein;
ii. Waive any contest to the NHCV, but request mitigation of sanctions based on written justifications; or
iii. Contest the NHCV

If a respondent requests mitigation of sanctions, the HDOT Harbors' Administrator will assign the case to a hearing officer. HDOT will provide to the hearing officer a position statement, along with all collected evidence, documentation, and the respondents mitigation statement. The hearing officer will examine the mitigating circumstances and decide on the mitigation request.

If a respondent contests the NHCV, the HDOT Harbors Administrator will arrange for a contested case hearing, assign the case to a hearing officer, provide to the hearing officer all collected evidence and documentation, and notify the Department of the Attorney General. In the contested case hearing the respondent and HDOT Harbors will present evidence. The presiding hearing officer will make a final written ruling following the hearing.

If a respondent fails to answer or fails to attend a contested case hearing after proper service of notice, or otherwise fails to defend against an NHCV, the hearing officer may:

i. Deem the respondent to have waived the right to contest the NHCV
ii. Enter the respondent's default.
iii. Enter a finding of a violation and impose any sanctions for the violation not to exceed those that have been assessed in the NHCV; and
iv. Enter a decision by default, which shall be final.

f. Stop Work Orders (formal)

Stop Work Orders are generally appropriate where the responsible party has not responded appropriately to written warnings and issuance of an NAV by HDOT-Harbors, or where there is an ongoing violation and/or significant harm to public health, property, or the environment has occurred. The issuance of a Stop Work Order by HDOT-Harbors will be documented with a formal letter and will require the responsible party to stop any activity upon receipt of the order, and rectify any deficiency and/or violation noted in the letter as soon as possible. For HDOT-Harbors' construction projects, and in accordance with associated contracts, HDOT-Harbors will withhold payment to the contractor until the contractor rectifies the noted deficiencies/violations. In appropriate cases, HDOT-Harbors will also pursue fines and/or penalties as described below.

Stop Work Orders will be signed by the HDOT-Harbors Deputy Director. HDOT-Harbors will

maintain enforcement files on each responsible party where a Stop Work Order has been issued.

Stop work orders will cite the prior warnings issued by HDOT, the ongoing violation and/or the occurrence causing significant harm, and the HDOT contract clauses enabling the work stoppage.

g. Issuance of Summons/Citation, including fines (formal)

The issuance of the Summons/Citation by Harbors requires that the alleged violator appear before a District Judge to address the violation and corrective action. This action may lead to fines and/or a criminal penalty and is utilized in severe cases where negligent non-compliance is repeated and/or significant harm to property or environment has occurred. If Harbors believes a situation calls for summons or citation, Harbors will collect evidence, relevant information, and documentation and will refer to the Hawaii Department of the Attorney General for advice on issuance of a citation/summons. Harbors and its designees will first function to document and act as witness to actions requiring this level of response. Harbor Police may issue Citations/summons in specific circumstances pursuant to Section 803-6 of the Hawaii Revised Statutes, in such cases, Harbor Police will refer a copy of the citation to the County Prosecutor and will provide a copy of the report to Harbors Engineering Environmental Section.

h. Lease and Revocable Permit Termination (formal)

Lease and Revocable Permit Terminations are generally appropriate for the following:

i. The responsible party has not responded appropriately to written warnings and issuance of an NAV, NFVO, and/or NHCV by HDOT-Harbors;
ii. Where there is an ongoing violation, and/or
iii. Where significant harm to public health, property, or the environment has occurred.

Lease and revocable permit terminations by HDOT-Harbors will be documented with a formal letter and will require the tenant to stop any activity deemed in violation upon receipt of the order and rectify any deficiency noted in the letter as soon as possible. Lease termination will document the laws and/or rules the tenant is violating, the provisions of the lease under which the tenant is in default, and the date the tenant is expected to vacate the property. In appropriate cases, HDOT-Harbors will also pursue fines and/or penalties as described under other enforcement measures. Lease terminations will be signed by the HDOT-Harbors Deputy Director or Director.

7. Templates and Examples

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

NOTICE OF STATE HARBORS CIVIL VIOLATION

Notice No. HCVS 12 ⁜ A ⁜ **Date: ,**

TO RESPONDENT: Any administrative proceedings instituted pursuant to this Notice shall not preclude the State from pursuing separate criminal prosecution against you for an offense committed in the same course of conduct.

COMPLAINT: The undersigned official/officer of the Department of Transportation (DOT) states that the named respondent did commit the civil violation(s) noted below.

A. RESPONDENT INFORMATION				
Last Name / Company Name	First Name, M.I.	Sex	Date of Birth	
Street Address	City	State & ZIP (Country)		
ID Type	Issued By	ID No.	Juvenile	Phone

B. VEHICLE / VESSEL INFORMATION (If applicable)			
☐ Vehicle	License Plate No., VIN / Vessel Type, ID, Name	License State	Year / Make / Model / Color

C. STATEMENT OF FACTS		
Date	Time ☐ a.m.	Violation Site: Island / Location / TMK
DESCRIPTION: (Specify any witness, evidence, damage, injury and seizure. Attach additional sheet if needed.)		

D. CITATION(S)			E. FINES ASSESSED	
No.	Authority	State Harbors Civil Violation	Comply in 21 days	After 21 days
1	§		$	$
2	§		$	$
3	§		$	$
		TOTAL ADMINISTRATIVE FINE ASSESSED >>>	**$**	**$**

F. OTHER SANCTIONS AND REQUIREMENTS
TO RESPONDENT: In addition to any fines assessed in Section E, you must comply with the following sanctions and/or requirements within 21 days of the service of this Notice, unless a different period is provided in this section below:

G. ISSUANCE AND SERVICE		
F.I. & Last Name	Office	Signature
Service: ☐ Unoccupied vehicle/vessel ☐ Personal ☐ Certified Mail ☐ First-Class Mail		Issued by APO:

H. ACKNOWLEDGEMENT
I acknowledge the receipt of this Notice. This is not an admission of responsibility.
Respondent Signature

Pursuant to §266-__, HRS, and §_____, HAR, you are hereby summoned and required to submit an answer to this Notice within twenty-one (21) days from the date of service of this Notice. Submit your answer, payment, statement and/or evidence to **DOT/APO, 869 Punchbowl Street, Honolulu, Hawaii 96813**, or at **www.hawaii.gov/dot/apo**. If you fail to answer within 21 days after receiving this Notice, a default decision for the relief demanded in this Notice will be entered against you.

J. ANSWER BY RESPONDENT (Required)

INSTRUCTIONS:

1. You have three options in answering this Notice. CHOOSE ONLY ONE and check the corresponding box below. Sign and date your answer and return it to the DOT Administrative Proceedings Office (DOT/APO) at the address listed above. **You may also submit your answer and payment online at www.hawaii.gov/dot/apo.**

2. If you choose Option 1, include with your answer payment in the amount stated in the first column of Section E if you are answering within 21 days of receiving this Notice or in the amount stated in the second column if after 21 days. Make your check payable to DOT Harbor Special Fund. For credit/debit card payment, see Section K below. You are also required to comply with all sanctions and requirements in Section F. Your case will be concluded.

3. If you choose Option 2, include with your answer a statement and evidence showing the mitigating circumstances. A hearing officer will review your request and render a decision without holding a hearing, and may adopt, modify or reverse any sanctions assessed in this Notice. This decision is final and may not be contested or appealed.

4. If you choose Option 3, include with your answer a statement and evidence showing the reasons of your contest. A Notice of Administrative Hearing will be mailed to you within 30 days after your answer is received.

5. If answer by mail, return this original page to DOT/APO. Retain a copy of everything you submit for your record. For inquiries, contact DOT/APO at (808) 587-____, DOT.CO.APO@hawaii.gov or www.hawaii.gov/dot/apo.

☐ **Option 1: Comply**	☐ **Option 2: Request Mitigation**	☐ **Option 3: Contest**
I DO NOT contest this Notice, and have complied with all sanctions assessed herein.	**I DO NOT contest this Notice, but request mitigation in the assessed sanctions.**	**I DO contest this Notice, and request an administrative contested case hearing.**

STATEMENT OF RESPONDENT: (Please type or write legibly. Use additional sheet if necessary.)

Print your name:	**Signature:**	**Date:**

K. CREDIT/DEBIT CARD PAYMENT		
Card Type ☐ VISA ☐ MasterCard	Card Number	Exp. Date (MM/YYYY)
Name (as shown on card)	Billing Address (if different from Section A)	
Payment Amount	Phone No.	Signature

ATTACHMENT 5
EMPLOYEE FACT SHEET

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HDOT Harbors Employee Stormwater Awareness Fact Sheet

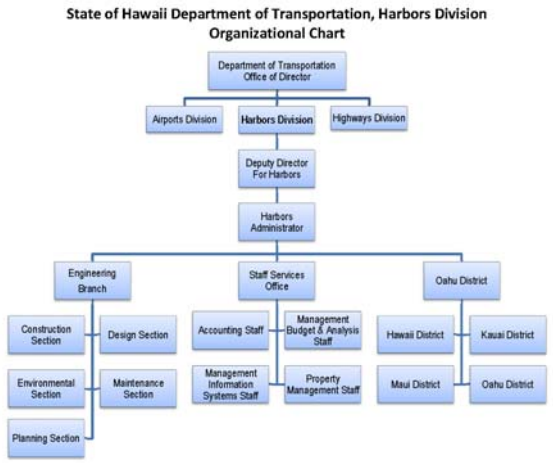
The basics about the HDOT Harbors Division Stormwater Management Plan [SWMP] for **Honolulu Harbor and Kalaeloa Barbers Point Harbor**.

Why are we concerned about stormwater?



- Urban runoff becomes polluted by litter, pesticides, fertilizers, sediment from construction, bare soil, oil spills, pet waste, grass clippings and leaves, on its way to storm drains. Additionally, human activities (e.g., vehicle washing) can also be the source of polluted runoff.
- This polluted runoff can impact the aquatic environment, harm wildlife, damage coral reef systems, and make the water unsafe for use.
- The SWMP is designed to reduce the potential pollutants that can impact the runoff.

Harbors Organizational Chart



For a detailed description of responsibilities contact: Randal Leong, Environmental Section Supervisor at (808) 587-1962.

- **<u>Every Harbors Division employee</u>** has a responsibility to protect the environment and prevent violations of water quality.
  - Implement Best Management Practices [BMPs].
  - Report suspected illicit discharges.
- Oahu District is responsible for placing stormwater signs, stenciling and cleaning storm drains, noting illicit discharges, and maintaining BMPs.
- Property Management Section assists the Environmental Section to ensure that tenants implement proper BMPs.
- Engineering Branch is responsible for ensuring the construction and post-construction programs are implemented.
- Information Technology Personnel assist with updating the Harbors website.
- Environmental Section will provide oversight for the SWMP, conduct required activities, and assist with enforcement where necessary.

Best Management Practices



- BMP is a control or practice used to mitigate the generation of potential pollutants during required work activities.
- Specific BMP fact sheets are available online: http://hidot.hawaii.gov/harbors/library/storm-water-management/
  - Vehicle and equipment maintenance.
  - Vehicle and equipment fueling.
  - Vehicle and equipment washing.
  - Material storage and handling.
  - Solid waste management.
  - Building and sidewalk washing.
- Construction activities conducted at Honolulu Harbor and Kalaeloa Barbers Point Harbor should adhere to Harbors **Construction Site Runoff Control Program**: http://hidot.hawaii.gov/harbors/library/storm-water-management/.

What are illicit discharges?





- ❖ **Any non-stormwater discharge that poses a risk to the environment.**
- ❖ Examples:
  - Fuel spills.
  - Leaking vehicles or equipment where a sheen is visible on the ground.
  - Washwater from handwashing or vehicle washing activities that is not contained.
  - Paint chips for sanding or grinding operations that is not contained.
  - Materials stored improperly outdoors.
  - Leaking trash bins.
  - Sediment laden water from construction activities that is not contained.
- ❖ What is required if an illicit discharge is suspected at Honolulu Harbor or Kalaeloa Barbers Point Harbor?
  - Call the Stormwater Reporting Hotline: (808) 587-1962 (working hours only)
  - Call Harbor Traffic Control Unit: (808) 587-2076 (24/7)

☆ Tip: Click here to find out how you can help at home to keep our ocean clean.

ATTACHMENT 6
EMPLOYEE SURVEY

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Reset Survey Print Survey

2014 HDOT Harbors Employee Stormwater Awareness Survey

*Please complete this survey and email it to Ms. Ying "Joy" Zhang of Harbors Engineering Branch Environmental Section at ying.j.zhang@hawaii.gov by **August 29, 2014**. MAHALO NUI LOA!*

Note: One correct answer per question.

Name:_____ **Office Code:** _____ **Date:** _____

1. Where does storm water runoff go after it enters the storm drain?
   a. The wastewater treatment plant.
   b. Through the storm drain system and into the ocean without treatment.
   c. EPA's front door.
   d. None of the above.

2. Which of the following activities can generate stormwater pollutants?
   a. Fueling without spill containment.
   b. Hand washing if sink or washwater is not contained.
   c. Uncontained material storage.
   d. All of the above.

3. What is the definition of an illicit discharge?
   a. A non-stormwater discharge that poses a risk to the environment.
   b. A stolen discharge.
   c. Stormwater entering the storm drain.
   d. None of the above.

4. What is required if an illicit discharge is suspected at Honolulu Harbor or Kalaeloa Barbers Point Harbor?
   a. Call Harbor Traffic Control Unit.
   b. Call the Stormwater Reporting Hotline.
   c. Stand and watch the discharge.
   d. A or B.

5. Which of the following are examples of BMPs?
   a. Pick up litter on the ground.
   b. Promptly responding to a spill.
   c. Using a drip pan for a leaking vehicle until maintenance can be completed.
   d. All of the above.

6. True or False? Grass clippings and other green waste should not enter the storm drain system after cutting.
   a. True.
   b. False.

7. What is the proper disposal method for pet "poop"?
   a. Bag it and place it in a covered trash can.
   b. Flush it down the toilet.
   c. Put it in the storm drain.
   d. A & B.

8. Which of the following guidelines apply to the storage and use of fertilizer and pesticide?
   a. Store in covered area in closed containers.
   b. Do not apply when it is raining.
   c. Follow the manufacturer's instructions.
   d. All of the above.

9. True or False? Mud and dirt on the sidewalk/driveway should be washed onto the street using a water hose.
   a. True.
   b. False.

10. Which of the following is a BMP that can be implemented at home to capture and re-use storm water runoff?
    a. Wash your vehicle on the street.
    b. Connect roof downspouts directly to the storm drain system.
    c. Connect roof downspouts to a landscaped area.
    d. None of the above.

Comments:

Section C

Construction Site Runoff Control Program

Stormwater Management Plan
Honolulu Harbor
and Kalaeloa Barbers Point Harbor



Prepared for:
State of Hawaii
Department of Transportation
Harbors Division

Final

Construction Site Runoff Control Program



State of Hawaii
Department of Transportation
Harbors Division
Hale Awa Ku Moku Building
79 South Nimitz Highway
Honolulu Hawaii 96813-5898

August 2014

Version 10.0

Final

Construction Site Runoff Control Program

State of Hawaii
Department of Transportation
Harbors Division
Hale Awa Ku Moku Building
79 South Nimitz Highway
Honolulu, Hawaii 96813-4898

“MĀLAMA I KE KAI”
Protect Our Ocean Water

August 2014

Version 10.0

Record of Revision

Revision	Date	Description	Sections Affected
1.0	December 2012	Initial Release	All
2.0	January 2013	Version 2.0	Most
3.0	February 2013	Version 3.0	Most
4.0	June 2013	Version 4.0	3, 4, and 5
5.0	July 2013	Version 5.0	4, 5, 6, and 7
6.0	October 2013	Version 6.0	All
7.0	February 2014	Version 7.0	All
8.0	May 2014	Version 8.0	All
9.0	May 2014	Version 9.0	3, 4, and 5
10.0	August 2014	Version 10.0	1

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List of Acronyms and Abbreviations

%	Percent
ACR	Annual Compliance Report
ASCE	American Society of Civil Engineers
BMP	Best Management Practice
CCH	City and County of Honolulu
CFR	Code of Federal Regulations
CGP	Construction General Permit
CM	Construction Manager
CWA	Clean Water Act
CWB	Clean Water Branch
CZM	Coastal Zone Management
DA	Department of Army
ECO	Environmental Compliance Officer
EPA	Environmental Protection Agency
HAR	Hawaii Administrative Rules
HDOH	State of Hawaii, Department of Health
HDOT	State of Hawaii, Department of Transportation
MS4	Municipal Separate Storm Sewer System
NAV	Notice of Apparent Violation
NFVO	Notice and Finding of Violation Order
NGPC	Notice of General Permit Coverage
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NTP	Notice to Proceed
NWP	Nationwide Permit 33
PM	Project Manager
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
WEF	Water Environment Federation
WQC	Water Quality Certification

Definitions of Key Terms

Best Management Practices (BMPs): According to Title 40 of the Code of Federal Regulations [CFR] 122.2, they are defined as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Clean Water Act: The Clean Water Act is an act passed by the U.S. Congress to control water pollution. It was formerly referred to as the Federal Water Pollution Control Act of 1972 or Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), 33 U.S.C. 1251 et seq., as amended by Public Law 96-483, Public Law 97-117, and Public Laws 95-217, 97-117, 97-440, and 100-04.

Code of Federal Regulations: The document that codified all rules of the executive departments and agencies of the federal government. It is divided into fifty volumes, known as titles. Title 40 of the CFR (referenced as 40 CFR) lists all environmental regulations.

Disturbance of Land: Refers to the penetration, turning, or moving of soil or resurfacing of pavement or the exposure of bare soil or ground surface, including the land surface exposed by construction roads, baseyards, headquarters, and parking areas. It does not include grass or weed cutting, bush or tree trimming that leaves the soil or ground intact. It includes grubbing in its normal meaning of the use of equipment to knock down and push vegetation out of the way, typically uprooting vegetation and disturbing the ground surface.

Harbors Enforcement Officer: A Harbors Division employee authorized to issue criminal citations related to environmental compliance.

Large Common Plan of Development or Sale: It means a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan. "Common Plan" is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot.

Maximum Extent Practicable: It means economically achievable measures for the control of the addition of pollutants from existing and new categories of point sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available point source pollution control practices, technologies, processes, siting criteria, operating methods or other alternatives.

New Development: shall mean new construction or installation of a building or structure or the creation of impervious surfaces that disturb greater than or equal to one acre, or less than one acre if it is part of a larger common plan of development or sale that would disturb one acre or more.

Qualified Inspector: Personnel who have met the training requirements in this document.

Redevelopment: shall mean development that would create or add impervious surface area on an already developed site. Redevelopment includes, but is not limited to any construction project that requires demolition or complete removal of existing structures or impervious surfaces at a site and replacement with new impervious surfaces. Maintenance activities such as top-layer grinding, repaving (where all pavement is not removed), and reroofing are not considered to be redevelopment. Interior remodeling projects and improvements are also not considered to be redevelopment.

Storm Water Pollution Prevention Plan (SWPPP): Hawaii Administrative Rules (HAR) 11-55, Appendix C, Section 7 requires the implementation of a SWPPP. It is a site-specific, written document that, among other things: (1) identifies potential sources of storm water pollution t the construction site; (2) describes storm water control measures to reduce or eliminate pollutants in storm water discharges from the construction site; and (3) identifies procedures the permittee will implement to comply with the terms and conditions of Notice of General Permit Coverage.

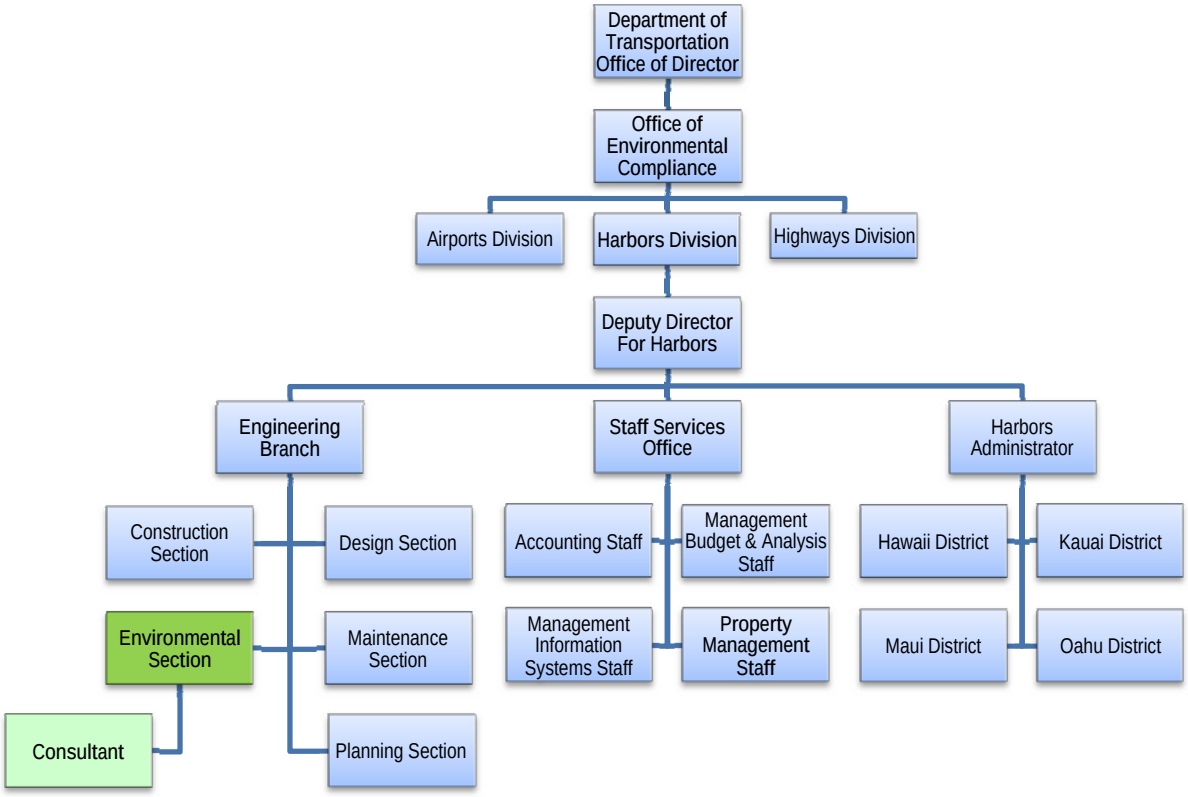
State Waters: It means all waters, fresh, brackish, or salt, around and within the State of Hawaii, including, but not limited to, coastal waters, streams, rivers, drainage ditches, ponds, reservoirs, canals, ground waters, and lakes; provided that drainage ditches, ponds, and reservoirs required as a part of a water pollution control system are excluded.

Stormwater: Stormwater runoff, snow melt runoff, and surface runoff and drainage.

Tenant Improvement Projects: Projects on Harbors' property undertaken by entities including tenants and easement holders who have leases or revocable permits that authorize the use of the property, or a project by any other entity with permission to construct the project on Harbors Division property.

1.0 INTRODUCTION

The Harbors **Construction Site Runoff Control Program** is an element of the Harbors MS4 program. This **Construction Site Runoff Control Program** seeks to limit the impact of construction activities on the storm water conveyance system and receiving water bodies. The program consists of a pre-construction design process; a during-construction inspection process; a compliance and enforcement process; a training program and a Construction Best Management Practices [BMP] field manual. This program is designed to guide Harbors personnel tasked with the responsibility of ensuring that construction projects discharging into Harbors' MS4 comply with Harbors' rules in order to protect Hawaii's ocean water from pollution.



This program is intended to be used by contractors, designers, tenants, developers, to comply with the Harbors' rules and regulations, HDOH NPDES permit requirements, and all other State, local, and Federal laws, rules and regulations through the use of the following attachments:

Attachment 1	Construction Process Flow Charts
Attachment 2	Application for a Private Storm Drain Connection and/or Discharge Permit to the State of Hawaii Harbors Division Storm Drain System
Attachment 3	Construction Design Review Checklist

Attachment 4	Construction Site Best Management Practices Inspection Checklist
Attachment 5	Notification Forms for Project Less Than One Acre
Attachment 6	List of City and County of Honolulu BMPs for Construction
Attachment 7	Temporary Stormwater Pollution, Dust, and Erosion Control Specifications
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Attachment 9	Suspected Illicit Discharge Reporting Form
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2.0 CONSTRUCTION PROJECT DEFINITIONS AND GENERAL REQUIREMENTS

Construction projects are defined as activities that result in the disturbance of the land, including clearing, grading, excavating, and other similar activities. It also includes construction related activities that support the construction projects such as stockpiles, borrow areas, concrete truck washouts, fueling areas, material storage areas, and equipment storage areas (EPA, 2007). Construction activities that do not disturb land, such as interior remodeling (with no outside exposure of construction materials or construction waste to storm water), are not subject to the Harbors **Construction Site Runoff program**.

2.1 Applicability

Harbors implements this **Construction Site Runoff Control Program** at the following harbors:

- Honolulu Harbor (Oahu District)
- Kalaeloa Barbers Point Harbor (Oahu District)

These two harbors operate under small Municipal Separate Storm Sewer System [MS4] permits. The Permit File Numbers are ***HI 03KB482*** for Honolulu Harbor and ***HI 03KB488*** for Kalaeloa Barbers Point Harbor.

All construction projects are subject to the Harbors **Construction Site Run off Control Program** unless explicitly exempted under the conditions in 2.2. The Construction Site Runoff Control program requirements for Harbors and tenant construction projects are depicted in Figure 2-1.

Construction projects at Harbors are managed in two ways: 1) HDOT Harbors projects, which are managed by Division personnel, or 2) Tenant Improvement projects, which are managed by the entity authorized to undertake the project. Each of these types of projects is subject to the Harbors **Construction Site Runoff Control Program**.

Overall control of HDOT Harbors projects is by Harbors Engineering Branch. Specific responsibilities assigned to sections within the Harbors Engineering Branch implement the Harbors Construction Program as shown in Table 2-1.

2.2 Exempted Projects Less Than One Acre

The following activities, provided they do not impact the storm drainage system and disturb less than one acre, are exempt from any documented project review and construction site inspection requirements under the Harbors **Construction Site Runoff Control Program**. These sites will, however, be included in the *Illicit Discharge Detection and Elimination Program* including site assessment inspections:

- Minor land disturbance activities performed by a property owner or employee on a single lot (such as minor landscaping activities and interior improvements).
- Post, pole, sign and fencing installation.
- Utility repair work.
- Parking lot, driveway, and other paved surfaces repair.
- Repair and maintenance activities.

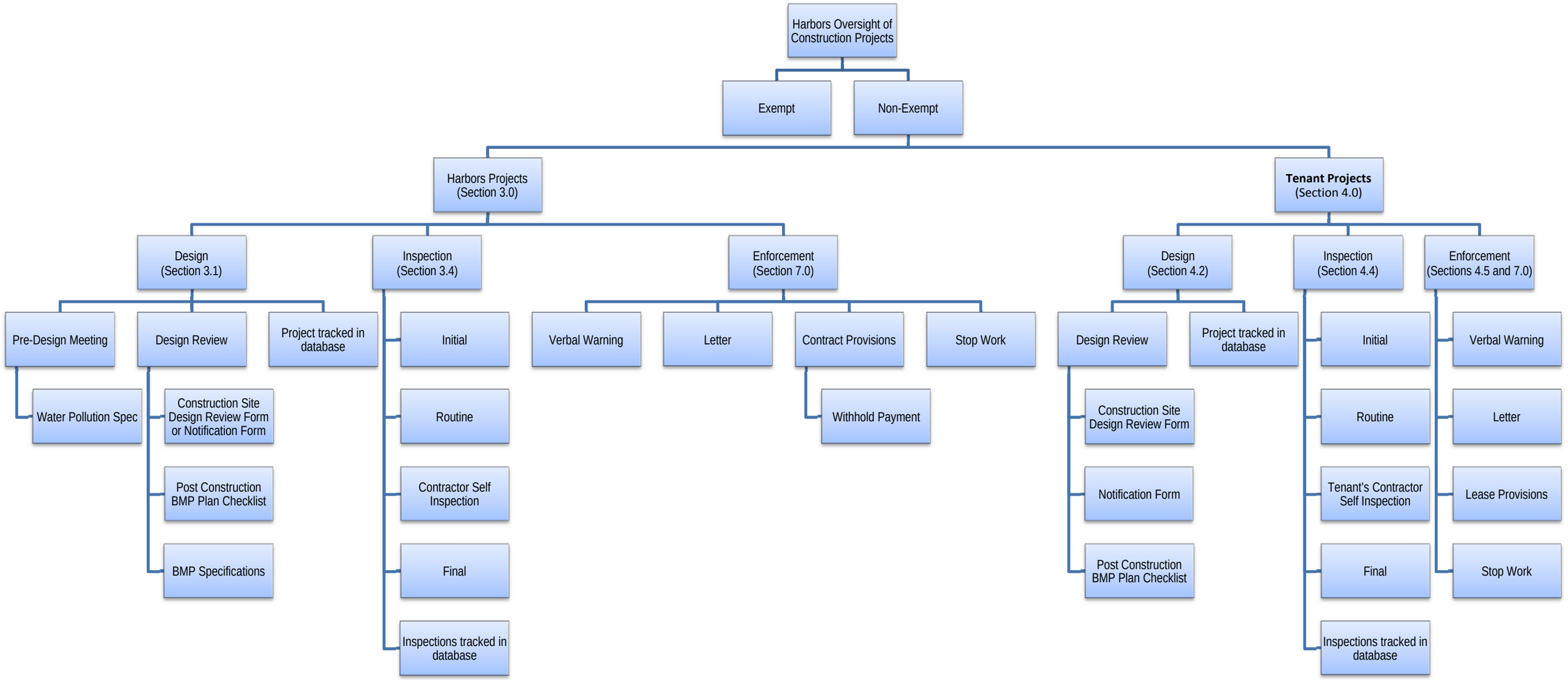
Table 2-1 Harbors Functional Groups for Harbors Projects

Functional Group	Area of Responsibility
Environmental Section and Consultant	Responsible for overall implementation of the **Construction Site Runoff Control Program** including plan review, site inspection, and enforcement.
Planning Section, Design Section, Maintenance Section,	Responsible for development of BMPs through the project design and planning phase.
Construction Section	Responsible for development and implementation of BMPs through the project construction phase (from the award stage to completion). Authority includes enforcement of construction contract terms.

Table 2-2 Harbors Functional Groups for Tenant Projects

Functional Group	Area of Responsibility
Environmental Section and Consultant	Responsible for overall implementation of the Construction Site Runoff Control Program including plan review, site inspection, enforcement
Property Management Section	Responsible for implementation of land use agreement (e.g. lease, revocable permit, construction right of entry) including enforcement

Figure 2-1: Construction Site Runoff Control Program Overview



3.0 HDOT HARBORS CONSTRUCTION PROJECTS

HDOT Harbors' construction projects are those that are developed with state funding to improve facilities managed by the Harbors. These projects are typically assigned to a Harbors Project Manager [PM] who oversees the project during the design phase and a different Construction Manager [CM] during the construction phase. Harbors PM and CM are typically employees from the Engineering Branch. Construction projects subject to the Harbors **Construction Site Runoff Control Program** must be managed according to the program requirements.

3.1 Pre-Design Meeting

The Harbors PM shall convene a Pre-Design meeting with Environmental Section at the Preliminary Design Phase to discuss the *Construction Site Design Review Checklist* (Attachment 3), as well as the *Permanent Post-Construction BMP Plan Checklist* if applicable, which is contained in Appendix B of the ***Post-Construction Storm Water Management in New Development and Redevelopment***. The *Construction Design Review Checklist* discussions may also continue into the Design Phase. These discussions and meetings will allow the Harbors PM and Environmental Section to discuss the project during the design phase for applicable site-specific and post-construction BMPs.

3.2 Project Review During Design

All projects must be reviewed by the Harbors PM, CM, and Environmental Section before construction activities commence. The process is presented in *Construction Process Flow Chart for HDOT Harbors Project* (Attachment 1).

3.2.1 Projects Less Than One Acre

For non-exempt Harbors' projects (see section 2.2) which disturb less than one acre of land, the summary of design phase submittal requirements is listed below.

- One (1) complete *Notification Form for Project Less Than One Acre* (HDOT HAR-EE Form SD<1_NF; Attachment 5). The Notification Form must be signed and dated by the PM and Harbors Environmental Section.

These projects are also subject to initial, recurring, and final BMP inspections.

3.2.2 Projects Subject to NPDES (NOI-C) Program

The Construction Design Review Checklist (Attachment 3) and Permanent Post-Construction BMPs Plan Checklist (contained in Appendix B of the **Post-Construction Storm Water Management in New Development and Redevelopment**) will be prepared by the Harbors

Engineering Branch with each design submittal phase. Plan sheets showing Construction Site BMPs and Post-Construction BMPs will be included in the construction drawings. All projects will be required to have Post-Construction BMPs unless it is determined by the Harbors PM and Environmental Section that these are not feasible for the project.

During the Design Phase, a project review package containing the items listed below will be submitted from the PM to the Harbors Environmental Section if it applies to the project:

- Completed Construction Design Review Checklist;
- Permanent Post-Construction BMPs Plan Checklist;
- Completed NPDES permit applications for Harbors projects;
- Construction Site BMPs and Post-Construction BMPs plan sheets and BMP installation details;
- Post-Construction Stormwater Mitigation Plan [PSMP]; and
- Storm Water Pollution Prevention Plan [SWPPP].

The Harbors Environmental Section will review the project plans to ensure that the plans meet the requirements of the Harbors **Construction Site Runoff Control Program**. If it is determined that the environmental impacts of the construction activities have not been adequately addressed, the project review package must be revised and resubmitted until concurrence is received from the Environmental Section. Upon concurrence, the project will be advertised, bids opened and the contract awarded.

3.3 Project Review after Contract Award

The contractor awarded the project will submit an SWPPP to the CM for inclusion in the project review package following the review procedures as outlined in the flowchart in Attachment 1. The Environmental Section will notify the CM when the project review package has conformed to environmental rules, regulations, and policies utilizing an interoffice memorandum. Following approval, the Harbors Division will issue a **Notice to Proceed** [NTP] to the contractor, with a copy to the PM and the Environmental Section. The NTP will indicate the following:

- As the first order of work, the contractor shall install all site-specific BMPs within a designated number of calendar days, which is to be determined by the Harbors CM.
- Before the contractor will be allowed to commence with any construction activity, the site-specific BMPs shall be subject to an initial inspection to ensure conformance with approved plans.

3.4 Construction Site Best Management Practice Inspections

Several different types of inspections are performed as a part of the Harbors **Construction Site Runoff Control Program**. These inspections include documented inspections held prior to,

during, and at the conclusion of construction, and contractor self-inspections triggered by the CGP. The *Construction Site Best Management Practices Inspection Checklist* (Attachment 4) will be employed during documented inspections. Inspection records will be kept at the Environmental Section for at least three years, and inspection results will be recorded in a database maintained by the Environmental Section.

Documented BMP inspections must be completed (using the form found in Attachment 4) by qualified inspectors, including the Harbors CM, Harbors Construction Inspector, Environmental Section, or an authorized consultant.

3.4.1 Initial Inspection

After the issuance of the NTP, an initial inspection will be conducted by a qualified inspector using *Construction Site Best Management Practices Inspection Checklist* (Attachment 4) prior to the beginning of construction activities to ensure that site-specific BMPs have been properly installed. The contractor will be notified whether the site-specific BMPs are (or are not) installed in accordance with the SWPPP (or other similar documented plans, e.g., BMP Plan) and in compliance with the Harbors SWMP. No construction activities involving ground disturbance shall commence until the site-specific BMPs are determined to be in full compliance.

3.4.2 Recurring BMP Inspection

A qualified inspector will conduct BMP inspections at the construction site no less than once every two weeks between the months of October through March, and once every two months, otherwise. Any observed non-compliance will be addressed under the procedures defined in Section 7.0. Within five (5) calendar days, the Inspector will provide the contractor and the Harbors Environmental Section with a copy of the completed checklist and a short summary of non-compliant items.

The Inspector may suspend recurring inspections until the final inspection only if the following conditions are met.

- Construction is currently inactive ("inactive" means that no construction activity will occur for a period of 30 days or longer); and
- Exposed soil has been stabilized; and
- Remaining construction activities before completion will have minimal or no adverse impact to storm water management.

This determination will be dependent on the construction project and site conditions. Justification for suspending inspections will be documented on the final inspection form in the *"Additional Notes"* section. The Inspector should continue to monitor the site to ensure that such activities have not changed to warrant the resumption of inspections.

3.4.3 Final Inspection

Once the contractor has completed all construction activities, a final inspection will be conducted at the site. This inspection will be conducted simultaneously, if applicable, with a post-construction BMP final inspection to ensure that the soil is stabilized, site-specific BMPs have been removed, and post-construction BMPs are properly installed. The Harbors PM, CM, and Environmental Section will conduct the inspection in conjunction with the final inspection of the project for compliance with the contract documents. Deficiencies noted during the final inspection must be corrected, and then the CM can issue the project final acceptance and make final payment.

3.4.4 Contractor Self-Inspection Requirements

The contractor has the primary responsibility for inspection and maintenance of their site-specific BMPs in order to ensure that the BMPs are properly implemented, functioning effectively, and to make appropriate maintenance and repairs as needed (e.g., deteriorated fabric filter replacement). All changes to the original BMPs are required to be documented on the facilities' site-specific BMP plans or similar documents.

For projects that require a NPDES permit: the Contractor shall keep their Construction BMP Inspection Checklists on-site and made available to the Inspector for review when requested, and shall perform self-inspections at a frequency according to the following or according to their HDOH administered CGP:

- Weekly;
- Within 24 hours of any rainfall of 0.25 inches or greater; daily during periods of prolonged rainfall; and within 24 hours after the end of the rainfall.

In addition, the Contractor shall not cause or contribute to a violation of the basic water quality criteria, specified in HAR 11-54-4, and shall timely inspect the receiving waters, storm water runoff and control measures and BMPs to detect violations of and conditions (e.g., storm water discharges and receiving waters for turbidity, color, floating oil and grease, floating debris and scum, materials that will settle, substances that will produce taste in the water or detectable off-flavor in fish, and inspect for items that may be toxic or harmful to human or environmental health) which may cause violations of the basic water quality criteria.

4.0 TENANT IMPROVEMENT PROJECTS

Tenant improvement projects are those that are developed by tenants, easement holders or other authorized entities on Harbors property. These projects are typically managed by tenant(s) with concurrence from Harbors Property Management Section and Harbors Engineering Branch.

4.1 Regulatory Programs

In addition to Harbors' **Construction Site Runoff Control Program**, tenants are required to ensure their own compliance with all other County, State, and Federal rules and regulations. A specific construction project may require additional permits beyond those described herein. It will be the responsibility of the tenant to determine which permits may be required for a specific activity. HDOT Harbors and the HDOH may be contacted to aid in the determination of regulations regarding a specific project.

4.1.1 NPDES Permit for Construction Sites

The CWA established the NPDES program for construction sites that disturb one acre or greater of land, which includes activities that disturb less than one acre of land if they are a part of a larger common plan of development or sale that will ultimately disturb one acre or more of total land area. Construction projects which fall under the NPDES program require the submittal of a NOI to HDOH CWB at least 30 calendar days prior to the start of construction activities. Permitting forms are available at the HDOH e-Permitting portal. Upon issuing of Notice of General Permit Coverage [NGPC] by the HDOH, the permit becomes effective within 30 days. Additionally, the tenant must notify the HDOH one week prior to the start of construction activities.

> HDOH website address for the e-Permitting portal:
> https://eha-cloud.doh.hawaii.gov/epermit/View/home.aspx

Tenants will be responsible for obtaining NPDES permits for their construction projects and shall provide proof to Harbors Engineering Branch before commencing with construction activities.

4.1.2 NPDES for Dewatering

Due to their proximity to the ocean, the groundwater level at Harbors properties are relatively high and are significantly influenced by tidal activity. Dewatering operations may be required during the course of a construction project. These activities are regulated by the HDOH under HAR 11-55 Appendix G. Refer to these rules for application submittal requirements.

Construction projects which require dewatering fall under the NPDES program and an NOI must be filed at least 30 calendar days prior to the start of dewatering activities. After the NOI has been submitted to the HDOH, the permit becomes effective within 30 days. Additionally, the applicant must notify the HDOH one week prior to the start of construction activities.

The tenant shall be responsible for obtaining the NPDES permit for dewatering operations and shall provide proof to the Harbors Engineering Branch before commencing with dewatering activities. Additionally, tenants engaging in dewatering activities that discharge into Harbors small MS4s need to submit an application for a *Private Storm Drain Connection and/or Discharge Permit* to the Harbors Engineering Branch, for the issuance of a permit (Attachment 2).

4.2 Project Review During Design

Non-exempt tenant projects must be reviewed by the Harbors Engineering Branch prior to commencing any construction activities. The process is demonstrated in *Construction Process Flow Chart for Tenant Improvement Project* in Attachment 1.

4.2.1 Projects Less Than One Acre

For non-exempt tenant projects (see section 2.2) disturbing less than one acre of land, the summary of design phase submittal requirements is listed below.

- One (1) complete *Notification Form for Project Less Than One Acre* (HDOT HAR-EE Form SD<1_NF; Attachment 5). The Notification Form must be signed and dated by the Project Owner/Operator.
- Two (2) copies of a sketched plan outlining the anticipated activities and the location of all proposed sediment and erosion control devices.
- The sketched plan is not required to be prepared by a licensed engineer, surveyor, or architect. If an individual with one of these licenses prepares the plan, they must sign and seal the plans. Provide one (1) copy of the plan/sketch if e-mailed, and two (2) copies if submitted as hardcopy.
- The sketched plan should include: (i) A site location drawing of the proposed project, indicating the location of the proposed project in relation to roadways, jurisdictional boundaries, streams and rivers; (ii) The boundary lines of the site on which the work is to be performed; (iii) The location of temporary and/or permanent vegetative and structural storm water management and sediment control measures; and (iv) A topographic map of the site. If feasible, the required information may be combined onto one sketch plan.
- A narrative description of the storm water management and sediment control plan to be used during land disturbing activities. Note: This may be included on the plans instead of in a written narrative. Include a general description of topographic and soil conditions of the property. Include a general description of adjacent property and a description of

existing structures, buildings, and other fixed improvements on surrounding properties.

4.2.2 Projects Subject to NPDES (NOI-C) Program

The tenant or its authorized representative shall submit the Construction Design Review Checklist (Attachment 3) and Permanent Post-Construction BMPs Plan Checklist (contained in Appendix B of the ***Post-Construction Storm Water Management in New Development and Redevelopment*** manual) with each design submittal phase. The tenant or its authorized representative shall include plan sheets specifically titled "Site-Specific BMPs" and "Post-Construction BMPs" in their design.

At the end of the Design Phase, the tenant or its authorized representative shall submit copies of the project review package to the Harbors Engineering Branch for review. The number of copies will be determined by the Engineering Program Manager. The project review package to be submitted shall contain the following:

- Project location information;
- Project schedule;
- Completed *Construction Design Review Checklist* and *Permanent Post-Construction BMPs Plan Checklist*;
- Completed proof of permits;
- SWPPP and Post-Construction Stormwater Mitigation Plan;
- Contact information to allow the reviewer to obtain additional information if necessary.

4.3 Project Review

The Harbors Engineering Branch Environmental Section will review the plans to ensure that the environmental impact of the construction project has been limited to the maximum extent practicable. If it is determined that the environmental impacts of the construction have not been adequately addressed, the tenant or their authorized representative shall revise and resubmit the project review package until consent is granted by the Harbors.

The Harbors Engineering Branch will notify the tenant or their authorized representative to proceed with the following caveats when the project review package has been evaluated and accepted:

- The tenant's Contractor, as the first order of work and prior to performing construction activities involving ground disturbance, shall install all site-specific BMPs and inform the Harbors Engineering Branch.
- Before the tenant contractor will be allowed to commence with any construction activity, the site-specific BMPs shall be subject to an initial inspection to ensure conformance and compliance with approved plans and permits.

4.4 Construction Site BMP Inspections

A critical part of the oversight process is the requirement for inspection of the BMPs. Several different types of inspections are performed as a part of the Harbors **Construction Site Runoff Control Program**, including documented BMP inspections held prior to, during, and at the conclusion of construction, and contractor self-inspections required by the CGP. *Construction Site Best Management Practices Inspection Checklists* (Attachment 4) will be employed during documented BMP inspections and will be recorded in a database.

Documented BMP inspections must be completed by qualified inspectors, including the Environmental Section or an authorized consultant.

4.4.1 Initial Inspections

After the consent is granted for the project, Harbors will conduct an initial inspection prior to commencement of construction activities to ensure that the site-specific BMPs have been properly installed. The Tenant shall be notified whether the site-specific BMPs are (or are not) in full compliance with the Harbors SWMP. No construction activities shall commence until the site-specific BMPs are determined by Harbors to be in full compliance.

4.4.2 Recurring BMP Inspections

The Harbors Engineering Branch Environmental Section will conduct regular site inspections following the initial inspection (biweekly from October to March and bimonthly otherwise). Any instance of non-compliance observed will be documented with photographs as well as on the *Construction Site Best Management Practices Inspection Checklist* (Attachment 4). The Environmental Section will provide Tenant warnings in conformance with the Enforcement Response Plan.

If the inspector determines that project construction has reached to a point where exposed soil has been stabilized and any remaining construction activities prior to project completion would have negligible storm water impact, the Environmental Section has the discretion to suspend further inspections until the final inspection. However, the Environmental Section will continue to monitor the project site to ensure that such activities have not changed so as to warrant the resumption of regular inspections.

4.4.3 Final Inspections

Once the Tenant has completed all construction activities associated with a particular project, a final inspection must be conducted at the site. This inspection will be conducted simultaneously with a post-construction BMP final inspection, if applicable, to ensure that the soil is stabilized,

site-specific BMPs have been removed, and post-construction BMPs are properly installed.

The Environmental Section shall be notified of the completion of construction activities and a final inspection shall be scheduled. Any deficiencies noted during the final inspection must be rectified and re-inspected prior to the ending of the project. Final concurrence of the project by the Harbors will be dependent upon a satisfactory final inspection.

4.4.4 Tenant Self-Inspection Required by the CGP

Site-specific BMPs are usually temporary measures that require frequent maintenance to keep up their effectiveness and may require relocation and re-installation, particularly as the construction project progresses. Therefore, the Tenant (or the Tenant's Contractor) has the primary responsibility for inspection and maintenance of their site-specific BMPs in order to ensure that the BMPs are properly implemented, functioning effectively, and to make appropriate maintenance and repairs as needed (e.g., sediment removal). All changes to the original BMPs should be documented within the site plans.

The contractor shall keep their Construction BMP Inspection Checklists on-site and made available to the Harbors for review upon request. The Contractor shall perform self-inspections for projects that are subject to NPDES program according to following schedule.

- Weekly;
- Within 24 hours of any rainfall of 0.25 inches or greater; daily during periods of prolonged rainfall; and within 24 hours after the end of the rainfall.

In addition, the contractor shall not cause or contribute to a violation of the basic water quality criteria, specified in HAR 11-54-4, and shall timely inspect the receiving waters, storm water runoff and control measures and BMPs to detect violations of and conditions (e.g., storm water discharges and receiving waters for turbidity, color, floating oil and grease, floating debris and scum, materials that will settle, substances that will produce taste in the water or detectable off-flavor in fish, and inspect for items that may be toxic or harmful to human or environmental health) which may cause violations of the basic water quality criteria.

4.5 Enforcement

A detailed discussion on enforcement is presented in Harbors ***Enforcement Response Plan***. Enforcement of tenant construction projects will be undertaken by the Environmental Section and/or other staff who possess enforcement authority through established policies and procedures as described in Harbors ***Enforcement Response Plan***. There are several enforcement mechanisms and penalties to ensure compliance with local ordinances, permits, and contract documents. The enforcement actions proceed along different routes depending upon whether the project is a Harbors project or a Tenant Improvement Project (Attachment 1).

5.0 TRAINING PROGRAM

Training is one of the essential keys to a successful storm water program. The Harbors Division's policy and practice is to provide education and training to ensure that all of its employees have the knowledge and skills necessary to perform their functions effectively and efficiently.

Harbors engineers, inspectors, and consultants whose job duties are related to implementing this program receive annual training directly pertinent to their responsibilities associated with the program. Harbors engineers and inspectors who have attended the annual training are considered qualified inspectors. See Tables 2-1 and 2-2 for a description of Harbors staff responsibilities for Harbors and Tenant Projects respectively.

The Environmental Section staff includes an Erosion and Sediment Control Engineer working alongside a Consultant assigned to assist with and coordinate the overall Storm Water Program.

5.1 Training for Harbors Staff and Consultants

Harbors engineers, inspectors, and consultants who have construction storm water responsibilities will receive initial and annual refresher training provided by a qualified trainer. In calendar years 2014, 2015 and 2016, the qualified trainer will be a consultant approved by EPA and HDOH. (After 2016, Harbors may use its own experienced employees to train new employees.) These training sessions will provide a detailed review of storm water pollution prevention concepts and practices; and a discussion of the procedures and protocols of the Harbors **Construction Site Runoff Control Program**, as described below.

All participants will be required to sign in and information regarding how many employees attend the training will be reported in the Annual Compliance Report [ACR].

After 2016, Harbors will hold annual refresher training which will include a review of storm water pollution prevention concepts and practices, a review of the Harbors **Construction Site Runoff Control Program**, relevant highlights over the past year, issues/problems encountered during the implementation of the program, and suggestions for improvements to the program. Input from training participants will be evaluated and any necessary program amendments included in the ACR.

5.2 Initial Training Content

In calendar years 2014, 2015, and 2016, Harbors will use an approved consultant to provide an initial training to Harbors engineers, inspectors, and their consultants who have construction storm water responsibilities. After that time period, Harbors can provide the training itself to new employees. The initial training will cover the following:

- **General Program Management**. This portion will consist of overall program administration and implementation and be administered to the Construction, Design, Maintenance, and Planning Sections. The content of the training will include:
    - Goals and objectives of the Construction Site Runoff Control Program;
    - Regulatory Background;
    - Inventory of Construction Sites;
    - The ***City and County of Honolulu Best Management Practice Manual for Construction*** (CCH, 2011);
    - Hawai'i's Construction General Permit Stormwater Pollution Control Plan requirements;
    - Plan Review including the use of the Construction Design Review Checklist (Attachment 3) and Permanent Post-Construction BMPs Plan Checklist (contained in Appendix B of the Post-Construction Storm Water Management in New Development and Redevelopment); and Concurrence;
    - The roles and responsibilities of Harbors staff regarding implementation of the Construction Site Runoff Control Program to achieve compliance;
    - Proper installation and maintenance of BMPs for Construction Sites; and
    - Overview of the Inspection Program and Enforcement Requirements.

- **Construction Site BMP Inspections**. In addition to the above training, construction site inspectors will receive training that consists of construction site inspection procedures including the procedures developed by HDOH and EPA, use of the *Construction Site Best Management Practices Inspection Checklist* (Attachment 4), enforcement procedures and formalized on-the-job instruction. To support implementation of the **Construction Site Runoff Control Program**, new inspectors will gain inspection experience by conducting at least three construction site BMP inspections with the experienced Erosion and Sediment Control Engineer and/or the Consultant. During the inspections, the new inspectors will observe how the experienced inspectors conduct the inspections as well as conduct their own inspections with assistance from the experienced ones. New inspectors will continue to have frequent interactions with experienced inspectors to discuss inspection issues as they arise. Training inspections will be noted on the inspection report and tracked to ensure that new employees conduct at least three inspections with an experienced inspector.

Training effectiveness will be evaluated through a survey of the participants. All participants will be required to sign in and information regarding how many employees attend the training will be reported in ACR. Input from the survey will be evaluated and used for the development of future training sessions. Additionally, the evaluation findings and any necessary program improvements will be included in the ACR.

6.0 OUTREACH TO CONSTRUCTION CONTRACTORS

Harbors provides outreach to construction contractors and consultants to raise their awareness and understanding of the issues and causes of storm water pollution and to explain their responsibilities. This outreach is conducted primarily through informational exchanges between the Harbors PM, CM, and their contractors. The informational exchanges cover the following topics:

- The provisions, conditions, and requirements of the Program that apply to their projects;
- The availability of guidance material prepared by Harbors and other agencies for construction contractors and consultants; including the Harbors Construction Site Design Review Checklist, the EPA Construction BMP library, the EPA Post-construction BMP library, and the City and County of Honolulu Best Management Practices Manual for Construction; and
- General responsibilities of construction contractors regarding implementation of the Harbors Construction Site Runoff Control Program, and the preparation and requirements of their SWPPP.

6.1 Informational Exchange Sessions

Harbors utilizes three types of informational exchange sessions, as needed, to provide outreach to construction contractors on storm water pollution prevention concepts and practices and preparation of SWPPP (or other similar documents) for construction activities.

- Pre-Bid Meeting, Storm Water Permit Compliance Requirements: Pre-bid meetings may be conducted to discuss a given upcoming construction project. The Harbors PM provides general information to construction contractors regarding the requirements in the Permit(s) and the Harbors Construction Site Runoff Control Program, which apply to the project. This information generally includes a discussion of the need for the developing a project-specific SWPPP (or other similar documents).
- Pre-Construction Meeting, Storm Water Permit Compliance Requirements: The Harbors CM provides project-specific guidance to construction contractors on topics such as SWPPP (or other similar documents) preparation, selection of BMPs, BMP inspections, and relevant operation and maintenance.
- Additional Informational Exchanges: The Harbors PM, CM, Environmental Section will hold informal training sessions with construction contractors, as needed, during the course of construction projects.

The topics covered in informational exchanges will be updated as needed to reflect modification to the Harbors Construction Site Runoff Control Program.

6.2 Harbors SWMP Website

Harbors prepares and posts key Construction Site Runoff Control Program related forms and documents at its website at: http://hidot.hawaii.gov/harbors/library/storm-water-management/.

7.0 ENFORCEMENT

Enforcement of construction projects will be undertaken by the Harbors Qualified Inspector, Environmental Section and/or other staff who have internal enforcement authority through established policies and procedures as detailed in the Enforcement Response Plan and this document. There are several enforcement mechanisms and penalties to ensure compliance with local ordinances, permits, and contract documents. The enforcement actions proceed along different routes depending upon whether the project is a Harbors Project or a Tenant Improvement Project.

7.1 Scope of Authority

The enforcement options available to Harbors range from administrative actions (including written warnings and **Stop Work Orders**) to the issuance of citations, a district court verdict of a misdemeanor or fine, withholding of contractor's payment, and lease / revocable permit termination. Three general areas authorizing environmental enforcement are enclosed in Attachment 8 as follows:

- HRS Title 15 Chapter 266 authorizes Harbors to issue citations and summons for violations of its rules and have its actions enforced through the district courts by verdict of a misdemeanor or fine.
- HAR Title 19 Chapters 41 to 44 establishes uniform safety measures, operational standards and requirements, and the conduct for a responsible party at State of Hawaii harbors.
- The Construction Contract that provides Harbors with the right of entry to conduct inspection and authority to issue a **Stop Work Order** and to withhold a contractor's payment.

7.2 Harbors Construction Enforcement

Enforcement at construction projects will be undertaken by the Harbors Qualified Inspector in accordance with the terms of the construction contract. Non-compliance with the BMP Plan discovered during BMP inspections will be immediately corrected by the contractor.

There are four possible enforcement outcomes from construction site inspections. Oral or verbal warnings, written warnings, stop work orders, and summons or citations. If no corrective actions are taken, the Harbors Inspector has the authority to issue a stop work order, depriving the contractor of the basis to request payment. If necessary, further actions in accordance with the Enforcement Response Plan may be taken.

Any illicit discharge originating from the construction site will be investigated and appropriate actions taken in accordance with Harbors ***Enforcement Response Plan***.

7.2.1 Oral or Verbal Warning

An oral or verbal warning is a spoken reprimand or a disciplinary measure, which will be issued verbally to a responsible party where the finding is a minor discrepancy with one or two BMPs, not leading to an imminent discharge. It could also serve the purpose of outreach. In most cases, oral or verbal warnings provide a more efficient way for the responsible party to take corrective actions. For more significant threats, oral/verbal warnings will generally be given prior to and in addition to issuance of a written warning.

7.2.2 Written Warning

A written warning will be issued to a responsible party where the finding is limited to conditions that do not pose an imminent threat to the environment and/or the public. Conditions that warrant a written warning may include, but are not limited to:

- Improper storage of potentially hazardous substances
- Improper waste management
- Lack of construction site runoff control BMPs
- Lack of good housekeeping

For any discrepancy observed during an inspection, a recommended corrective action will be identified in the *Construction Site BMP Inspection Report*, which will serve as a written warning. One copy of the Construction Site BMP Inspection Report will be sent to the responsible party within five calendar days. If any major discrepancy is observed during inspection, a warning letter combined with the *Construction Site BMP Inspection Report* will be sent to the responsible party with a compliance deadline (typically within seven calendar days). These documents will become a part of the SWMP ACR.

When necessary, a follow-up inspection will be conducted to verify that the infractions were corrected. If the responsible party does not respond to the written warning by the deadline in the above warning letter, the CM or Environmental Section will issue a Notice of Apparent Violation [NAV] and proceed with escalated enforcement as described below and Harbors ***Enforcement Response Plan***, if necessary. A copy of the NAV and the *Construction Site BMP Inspection Report* will also be forwarded to the HDOH. Habitual warnings at a site may lead to escalation.

7.2.3 Issuance of Stop Work Order and Summons/Citation

The issuance of a **Stop Work Order** by Harbors will be documented with a formal letter and will require the responsible party to stop any construction activity upon receiving of the order, and rectify any deficiency noted in the letter as soon as possible. In the meantime, Harbors will withhold the payment to the contractor for a Harbors project. **Stop Work Order** is generally appropriate where the responsible party has not responded properly to written warnings and

issuance of an NAV by Harbors, or where there is an ongoing violation and/or significant harm to public health, property, or the environment has occurred. In appropriate cases, Harbors will also pursue fines and/or penalties as described below.

The issuance of Summons/Citations by Harbors requires that the responsible party appear before a District Judge to address the violation and corrective action. This action may lead to fines and/or a criminal penalty and is utilized in severe cases where negligent non-compliance is repeated and/or significant harm to public health, property, or the environment has occurred. Situations which call for summons or citation will be referred to the appropriate State Attorney General Representative for implementation. Harbors and its designees will function as documentation and witness to actions requiring this level of response. Therefore, it is essential to accurately and thoroughly record actions that might escalate to this level.

7.3 Harbors Tenant Construction Enforcement

Enforcement at tenant construction projects will be undertaken by the Harbors Qualified Inspector in accordance with the terms of the lease, revocable permit or construction right-of-entry, as applicable. Non-compliance with the BMP Plan discovered during BMP inspections will be immediately corrected by the contractor. If no corrective actions are taken, the Harbors Inspector has the authority to issue a written warning (refer to Section 7.2.2), a NAV (refer to Section 7.2.2), and/or stop work order (refer to Section 7.2.3), stopping the tenant project and depriving its contractor of the basis to request payment. If necessary, further actions in accordance with the Enforcement Response Plan may be taken.

Any illicit discharge originating from the construction site will be investigated and appropriate actions taken in accordance with the Enforcement Response Plan.

8.0 CONSTRUCTION BMP FIELD MANUAL

The Harbors adopts the ***City and County of Honolulu Best Management Practice Manual for Construction*** (CCH, 2011) as a Construction BMP Field Manual to guide both Harbors' construction projects and tenant improvement projects. Harbors will periodically evaluate whether updates to the manual are necessary and revise as needed.

> Website address to download City and County of Honolulu Best Management Practice manual for Construction:
> http://www.cleanwaterhonolulu.com/storm/learning_center/BMP_manual_2011-11.pdf

The purpose of the Construction BMP Field Manual is to provide guidance on the installation and maintenance of BMPs that address construction activities. Each BMP identified in the manual includes a general description, application, limitations, installation and implementation requirements, and maintenance and inspections.

8.1 BMP Selection

The Designer and the Contractor shall evaluate which BMPs will be applicable for a particular construction project. The first step in the selection process will be to determine which construction activities may result in potential pollutants. Once those activities are identified, the BMPs can be chosen according to the CCH "*Rules Relating to Soil Erosion Standards and Guidelines* (CCH, 1999)," which can be downloaded from their website. Although projects conducted at Honolulu and Kalaeloa Barbers Point Harbors may not be required to obtain grading permits, the projects may still be classified following CCH methods based on size. Small projects that disturb less than one acre of land, will follow Figure 3 of the CCH document (CCH, 1999), and projects greater than one acre will follow Figure 4 of the same document.

> Website address to download **Rules Relating to Soil Erosion Standards and Guidelines** issued by City and County of Honolulu: http://www.usspecbook.com/HI/specs/646

9.0 REFERENCES

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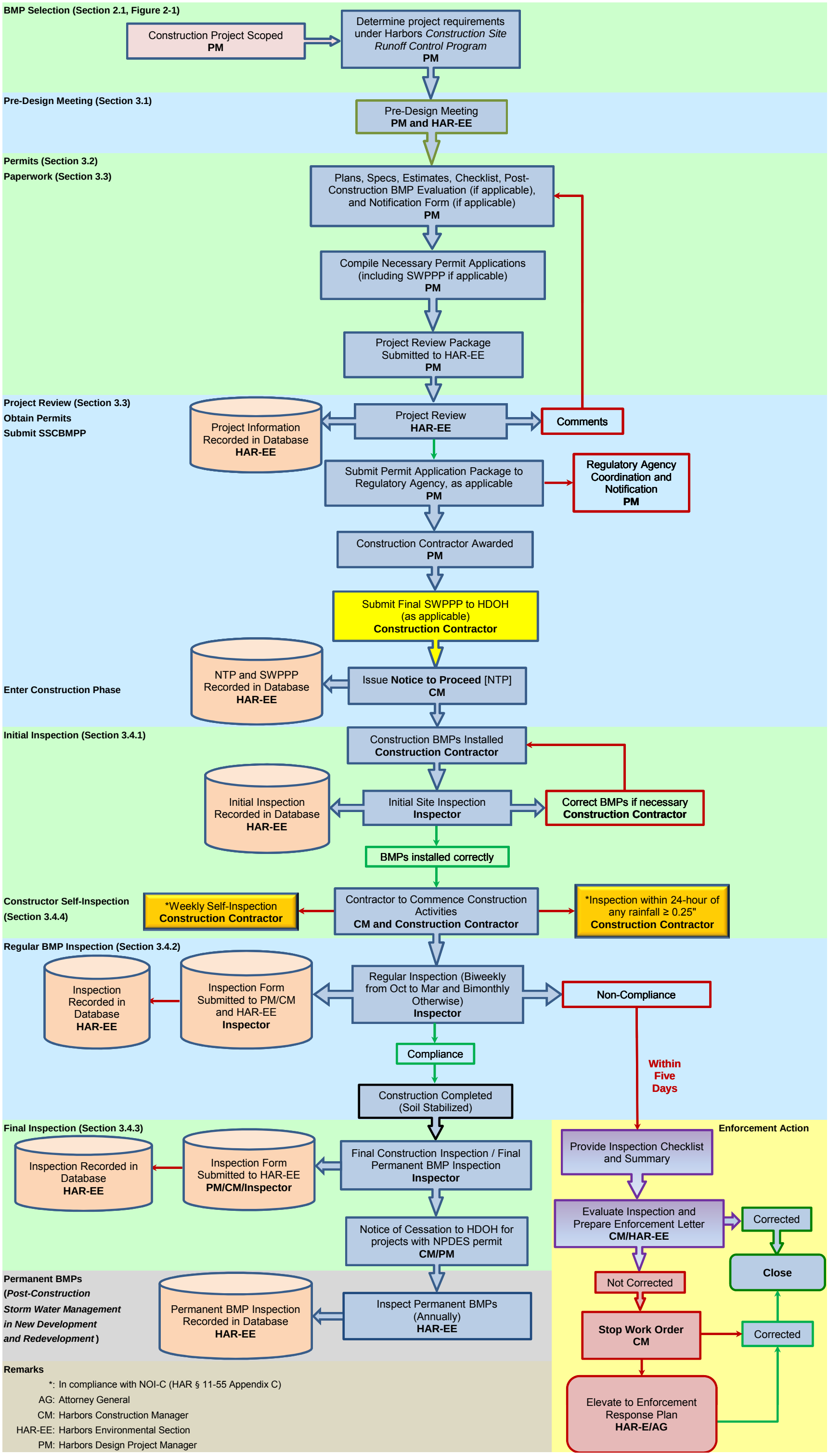
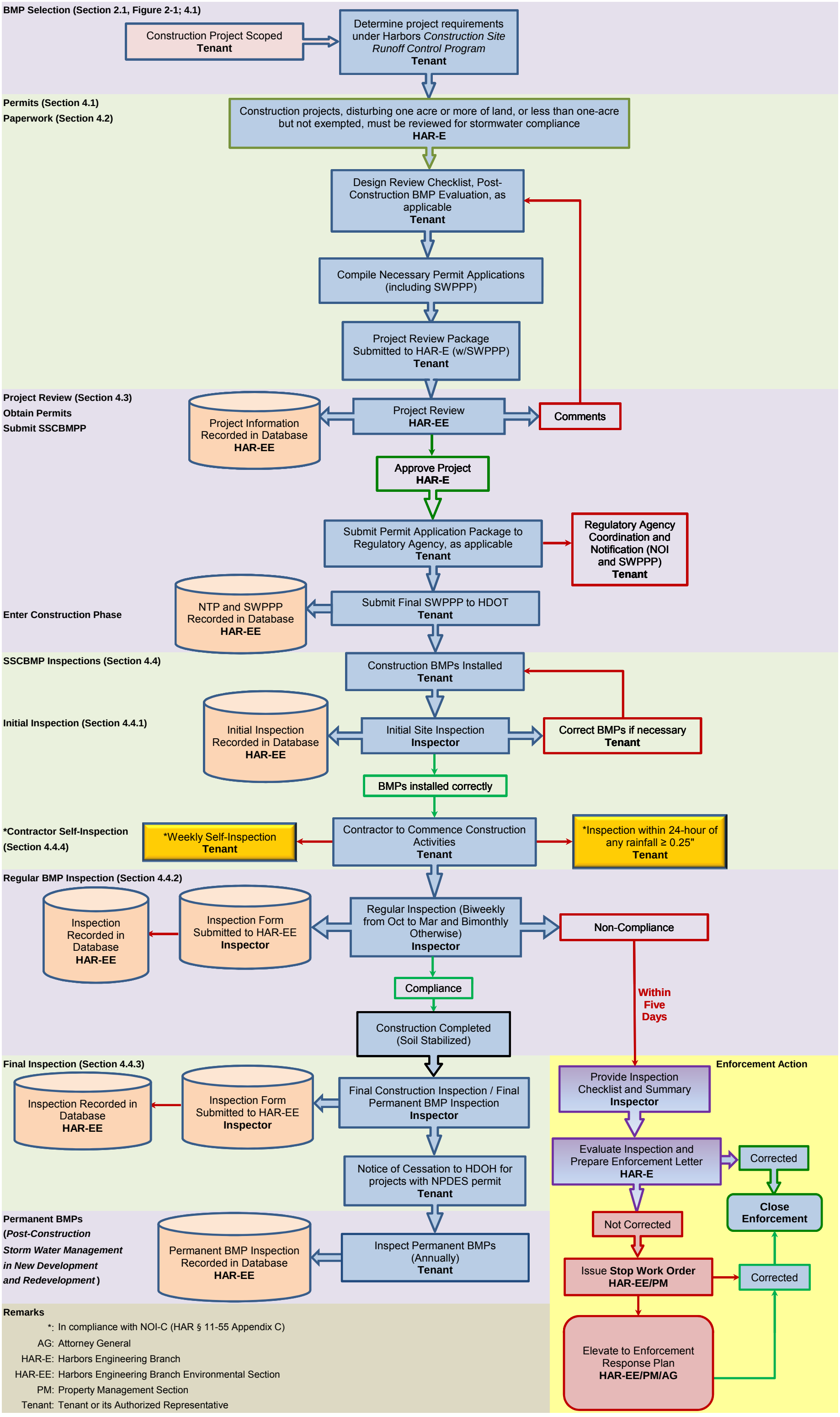
Attachment 1

Construction Process Flow Charts

Construction Process Flow Chart for HDOT Harbors Project



Construction Process Flow Chart for HDOT Tenant Improvement Project



Attachment 2

Application for a Private Storm Drain Connection and/or Discharge Permit to the State of Hawaii Harbors Division Storm Water System

FOR OFFICE USE ONLY		
Harbors. I.D. No.: _____	Harbor: _____	HDOH NPDES File No. (if applicable) _____

Permit for Connection to the State Harbors Drainage System

Application Date:_____

Note: This form is to be used for connection to Harbors small MS4 system. Permanent structure(s) will be constructed at the location(s) below if approved. Otherwise, please use ***Permit to Discharge into the State Harbors Drainage System*** form.

Pursuant to Hawaii Administrative Rules, Chapter 11-55, application is hereby made to connect to the State Harbors drainage system at the location(s) specified below and at no other place.

1. Name of Harbor: _____
2. Tax Map Key No: _____
3. Location: _____
4. Description of Connection(s): _____

Licensee*, the undersigned, hereby agrees to the following:

1. That the Licensee shall bear the entire cost of engineering, construction, and maintenance of the private drainage system.
2. That the Licensee shall indemnify and hold the State free and harmless from all suits and actions caused by the Licensee's acts or failure to act in connection with engineering construction and maintenance of the Licensee's private drainage system and its connection to the State Harbors Division's drainage system.
3. That the construction of the drainage system shall be made in accordance with plans and specifications approved by the Harbors Division, and subject to compliance with all applicable statutes, ordinances, and rules and regulations of Federal, State or City agencies having the effect of the law. If a National Pollutant Discharge Elimination System (NPDES) Permit is warranted, the Licensee shall obtain the permit as required by the State Department of Health and submit a copy to the State Department of Transportation Harbors Division with this form.
4. That prior to any construction work, the Licensee shall obtain permission to perform work on State Harbors from the Engineering Program Manager, Harbors Division, and comply with Harbors *Construction Site Runoff Control Program* and *Post-Construction Storm Water Management in New Development and Redevelopment*.
5. That in the event any portion of the State Harbor drainage system is damaged or destroyed during the construction of the private drain connection, the Licensee shall bear the entire cost of engineering and construction, or replacement of the damaged system.
6. That no additions or alterations to the private drainage system will be made without the prior written consent of the Harbors Division.
7. That the private drainage system shall remain at the Licensee's property and that the Licensee will be solely responsible for its maintenance and upkeep.
8. That in the event, the private drainage system within the State right-of-way shall at any time interfere with any public use, the Licensee will relocate the private drainage system at the Licensee's sole expense.
9. That any time the private drainage system discharges pollutants or other objectionable material into

the State Harbors drainage system which exceeds applicable water quality standards of the State of Hawaii as identified in Section 11-54-4, Hawaii Administrative Rules, or otherwise misuses the system, or causes a violation of any provisions of the State's NPDES permit, the State, by written notice, may terminate this licensee and have the system removed at the Licensee's expense. In addition, the Licensee shall be liable for any and all penalties as a result of discharges from the Licensee's system.

10. That discharge into the State Harbors drainage system shall be composed entirely of storm water, or other discharges permitted by the Harbors Small Municipal Separate Storm Sewer System (MS4) permit. In the event the discharge into the State Harbors drainage system includes storm water associated with industrial activity as defined by Federal regulations, the Licensee shall obtain appropriate NPDES permit(s) and shall provide data on the characterization of the constituents, quantity of the effluent and discharge at the Licensee's expense within one (1) year after the date of connection, and annually thereafter or as the need may arise as determined by the Harbors Division.
11. That the Harbors Division, or its authorized representative, may during reasonable hours and upon notification to the Licensee, enter any building or premises to inspect or investigate, measure or test any effluent that is discharged directly or indirectly to the State Harbors drainage system.
12. That the Licensee will notify the Harbors Environmental Section (587-1962) at least 24 hours before commencing construction work, to arrange for necessary inspectional services.
13. That the Licensee shall require this permit to be part of the contract with its construction contractor.
14. That this agreement shall be made a condition of any subsequent transfer of property ownership.

Print Name of Licensee	Company Name
Licensee's Title	Company Address
	City, State, Zip Code
Signature of Licensee Date	E-mail Address
Telephone No.	Fax No.

Reviewed By:

Environmental Section — Date

Approved By:

Engineering Program Manager — Date

CONSTRUCTION DATA

Work Started: _____

Work Completed: _____

Inspector:

*Licensee shall be the authorized representative of the party seeking to connect and discharge to the Harbors Small MS4 under this permit.

Attach: Drain Connection Plan (3 sets)

Drain Connection Worksheet

If "**No**" is checked, please provide justification beneath each item.

Item	Yes	No
1. Site Map showing subject discharge point(s) to Harbors drainage system in NAD 83 Geographic coordinates (latitude, longitude) is attached.	☐	☐
2. Storm Water Flow Map is attached.	☐	☐
3. Quantity of storm water and site process water entering Harbors drainage system is attached.	☐	☐
4. Description of Best Management Practices and location(s) are attached.	☐	☐
5. Drain Construction/Structure Plan is attached.	☐	☐
6. Type of Discharge and copy of NPDES permit issued by HDOH (if applicable).	☐	☐

Please refer to *City and County of Honolulu Storm Water Best Management Practice Manual – Construction, November 2011,* for more information.

FOR OFFICE USE ONLY		
Harbors. I.D. No.: _____	Harbor: _____	HDOH NPDES File No._____

Permit to Discharge into the State Harbors Drainage System

Application Date:_____

Note: This form is to be used for discharge to Harbors small MS4 system ONLY. No permanent structure will be constructed at the location(s) specified below. Otherwise, please use ***Permit for Connection to the State Harbors Drainage System*** form.

Pursuant to Hawaii Administrative Rules, Chapter 11-55, application is hereby made to discharge into the State Harbors drainage system at the location(s) specified below and at no other place.

1. Name of Harbor: _____
2. Tax Map Key No: _____
3. Location: _____

4. Type of Discharge
   - ☐ Storm water associated with industrial activities
   - ☐ Storm water associated with construction activities
   - ☐ Others (Specify):
   - ☐ Hydrotesting water
   - ☐ Dewatering

5. Complete the *Drain Discharge Worksheet* on Page 3.

Licensee*, the undersigned, hereby agrees to the following:

1. That the Licensee shall indemnify and hold the State free and harmless from all suits and actions resulting from the licensee's discharge operations.
2. That the Licensee shall provide appropriate best management practices and/or treatment devices for the removal of soil particles, and/or other pollutant(s) in the discharge, and such discharge shall meet the basic water quality criteria applicable to all waters, as identified in Section 11-54-4, and any other applicable sections in Chapter 11-54, Hawaii Administrative Rules, at the point of discharge into State waters.
3. That the Licensee shall obtain National Pollutant Discharge Elimination System (NPDES) permit as required by the State Department of Health and submit a copy to the State Department of Transportation Harbors Division with this form, if necessary.
4. That a copy of any effluent monitoring required by the NPDES permit shall be furnished to the State Department of Transportation Harbors Division.
5. That the Licensee shall make all restoration to any State Harbors property damaged during the Licensee's discharge operations in accordance with the State Department of Transportation Harbors Division requirements.
6. That the Licensee shall discontinue the discharge, should the State Department of Health determine that the receiving waters are being polluted, or the discharge does not meet the effluent requirements of the NPDES permit, or the Licensee's operations are not in the best interest of the general public. In addition, the Licensee shall be liable for any and all penalties as a result of discharges from the Licensee's system.
7. That if the State Department of Transportation Harbors Division determines that any material or substance from the Licensee's discharge operations have settled into any storm sewer, the

Licensee shall immediately remove and clear any material and substance to the satisfaction of the State Department of Transportation Harbors Division.

8. That the Licensee shall comply with Harbors *Construction Site Runoff Control Program* and *Post-Construction Storm Water Management in New Development and Redevelopment*, and inspect and clean the Harbors drainage system prior to discharging.
9. That the Licensee shall notify the Harbors Environmental Section (587-1862) at least 24 hours before commencing discharge and at the conclusion of the discharge operation to arrange for necessary inspectional services.
10. That the Licensee shall require this permit to be part of the contract with its construction contractor.

Print Name of Licensee	Company Name
Licensee's Title	Company Address
	City, State, Zip Code
Signature of Licensee Date	E-mail Address
Telephone No.	Fax No.

Reviewed By:

Environmental Section — Date

Approved By:

Engineering Program Manager — Date

CONSTRUCTION DATA

Work Started: _____

Work Completed: _____

Inspector:

*Licensee shall be the authorized representative of the party seeking to discharge into the Harbors Small Municipal Separate Storm Sewer System (MS4) under this permit.

Attach: Drain Discharge Plan (3 sets)

Drain Discharge Worksheet

If "**No**" is checked, please provide justification beneath each item.

Item	Yes	No
1. Site Map showing subject discharge point(s) to Harbors drainage system in NAD 83 Geographic coordinates (latitude, longitude) is attached.	☐	☐
2. Storm Water Flow Map is attached.	☐	☐
3. Quantity of storm water and site process water entering Harbors drainage system is attached.	☐	☐
For Construction Project (Please refer to *City and County of Honolulu Storm Water Best Management Practice Manual – Construction, November 2011,* for more information)		
4. Description of erosion controls and location(s) are attached.	☐	☐
5. Project schedule is attached.	☐	☐

Attachment 3

Construction Site Design Review Checklist

Hawaii Department of Transportation – Harbors Division

Construction Site Design Review Checklist

Project Description	
Project Title:	
Project Job No:	Acreage of Site:
Name of Design Firm:	
Projected Construction Timeframe:	
Description of Project:	

Site Information			
Construction Site Location:			
Latitude:		Longitude:	
Tax Map Key No(s).:			
Disturbed Area (to nearest tenth of an acre):		Total Project Area (to nearest tenth of an acre):	
Existing Percentage of Impervious Area:		Percentage of Impervious Area After Completion:	

Nearest Water Body Information	
Name of Nearest Receiving Water Body(s) and Distance:	
Any New or Modified Storm Drain Connections:	
Description of Existing Storm Drains On or Adjacent to Project Area:	

Design Submittal (Check one):		
☐ Preliminary Design	☐ Semi-Final Design	☐ Final Design

Signature and Certifications	
Designer: I certify that the design is complete, accurate, and addresses the items on this checklist to the best of my knowledge.	
Print Name:	Job Title:
Signature:	Date:
Review: HDOT Harbors Project Manager and Environmental Section.	
Harbors Project Manager Signature:	Print Name: Date:
Harbors Environmental Section Signature:	Print Name: Date:

Existing and Proposed Site Features	Yes	No	N/A
1. The following site features should be included on the plans, if deemed necessary based on project type, size, and scope.			
• Existing and proposed topography, features, and storm water flow paths	☐	☐	☐
• Preliminary location, size in square feet, and limits of disturbance	☐	☐	☐
• Locations of existing and proposed roads, curbs, gutters, storm drains, inlets, buildings, signs, sidewalks, traffic signals, light standards, guardrails, and other structures	☐	☐	☐
• Location of internal swales and ditches, and other drainage facilities	☐	☐	☐
• Maps of predominant soils from USDA soil surveys	☐	☐	☐
• Boundaries of existing predominant vegetation and proposed limits of clearing and grubbing	☐	☐	☐
• Existing and proposed utilities and easements	☐	☐	☐
• Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings	☐	☐	☐
2. If the project or site includes, is adjacent to, or otherwise may impact any of the following, they should be included on the plans.			
• Perennial and intermittent streams or other surface water	☐	☐	☐
• Location and boundaries of resource protection areas such as wetlands, lakes, ponds, and other setbacks (e.g., stream buffers, drinking water well setbacks, septic setbacks)	☐	☐	☐
• Location of floodplain/floodway limits and relationship of site to upstream and downstream properties and drainages	☐	☐	☐
• The limits of the existing and proposed maps and plans shall extend past the project limits if any existing condition has an impact to the project. Include future projects that have the potential to start prior to the subject project.	☐	☐	☐
• Stream flow velocity for stream work	☐	☐	☐
3. Identify potential pollutants related to non-storm water on site.	☐	☐	☐

Scheduling	Yes	No	N/A
1. Include sequencing of construction activities with the implementation of construction site BMPs is provided?	☐	☐	☐
2. Show how the rainy season relates to soil-disturbing and re-stabilization activities?	☐	☐	☐
3. Include detail on the implementation and deployment of soil stabilization, sediment control, non-storm water management, construction material management, waste management, pollution control, spill control practices, and inspection and maintenance BMPs?	☐	☐	☐
4. If the project is performed in multiple phases, are the phase-specific BMPs that take into account relevant potential pollutants?	☐	☐	☐

Construction Site BMPs (Please refer to *City and County of Honolulu Storm Water BMP Manual – Construction, November 2011,* for more information)	Yes	No	N/A
1. Soil Stabilization Practices (Plans address or include the following practices and situations?)			
• Preservation of existing vegetation	☐	☐	☐
• Stabilization of construction entrance	☐	☐	☐
• Protection of stockpiles	☐	☐	☐
• Bank stabilization	☐	☐	☐
• Topsoil management	☐	☐	☐
• Mulching, seeding, and/or planting with installation/application procedures and requirements	☐	☐	☐
• Velocity reduction devices in storm water flow paths	☐	☐	☐
• Geotextiles, plastic covers, turf reinforce mats, and/or erosion control blankets/mats, with installation/application procedures and requirements	☐	☐	☐
• Temporary drains, swales, earth dikes, and/or lined ditches	☐	☐	☐

• Slope drains, subsurface drains	☐	☐	☐
• Top and toe of slope diversion ditches/berms	☐	☐	☐
2. Sediment Control Practices (Plans address or include the following practices and situations?)			
• Location of potential sediment sources	☐	☐	☐
• Does on-site drainage enter into off-site drainage	☐	☐	☐
• Dust/Silt fence, wattles, perimeter socks, and matting rolls	☐	☐	☐
• Watering	☐	☐	☐
• Soil binders, including acrylic polymers	☐	☐	☐
• Storm drain inlet protection	☐	☐	☐
• Temporary sediment basin	☐	☐	☐
• Sediment trap	☐	☐	☐
• Flared culvert end sections	☐	☐	☐
• Outlet protection	☐	☐	☐
• Temporary stream crossing	☐	☐	☐
• Ingress/Egress sediment control	☐	☐	☐
• Slope roughening/terracing/rounding	☐	☐	☐
• Sand bag barrier	☐	☐	☐
• Brush or rock filter	☐	☐	☐
• Shoveling, sweeping, and disposing	☐	☐	☐
3. Non-Storm Water Management Practices (Plans address or include the following practices and situations?)			
• Employee training	☐	☐	☐
• Vehicle and equipment cleaning, refueling, and maintenance	☐	☐	☐
• Dewatering operations	☐	☐	☐
• Paving operations	☐	☐	☐
• Concrete washout procedure	☐	☐	☐
• Structure construction and painting	☐	☐	☐
• Water conservation	☐	☐	☐
• Good housekeeping practices	☐	☐	☐
4. Construction Material Management, Waste Management and Spill Control Practices (Plans address or include the following practices and situations?)			
• Material delivery, use, and storage	☐	☐	☐
• Spill prevention control, spill kit	☐	☐	☐
• Hazardous waste properly stored in designated areas	☐	☐	☐
• Sanitary/Septic waste management	☐	☐	☐
• Liquid waste managed with storage containment devices	☐	☐	☐
• Contaminated soil management	☐	☐	☐
• Concrete waste management	☐	☐	☐
• Fertilizer, pesticide, herbicide, fungicide, and biocide management	☐	☐	☐

Inspection and Maintenance Responsibility	Yes	No	N/A
(Plans address or include the following practices and situations?)			
1. Long-term inspection entity, operation, and maintenance identified	☐	☐	☐
2. Minimum maintenance frequency identified	☐	☐	☐
3. Recordkeeping	☐	☐	☐
4. Schedule and/or triggers for inspection of BMP measures	☐	☐	☐
5. Rain gauge monitoring	☐	☐	☐
6. Incident report	☐	☐	☐

Permits, Reports, and Plans	Yes	No	N/A
Assess if the project requires any of the following that may include or impact BMPs. If not required, check N/A.			
1. NPDES Form C for Construction Activities is provided, if required.	☐	☐	☐
2. NPDES Form F for Hydrotest waters discharge is provided, if required.	☐	☐	☐
3. NPDES Form G for Dewatering discharge is provided, if required.	☐	☐	☐

4. 401 Water Quality Certification is provided, if required.	☐	☐	☐
5. 404 Department of Army Permit is provided, if required.	☐	☐	☐
6. Coastal Zone Management Permit is provided, if required.	☐	☐	☐
7. Special Management Area Permit is provided, if required.	☐	☐	☐
8. Post-construction Stormwater Mitigation Plan is provided, if required.	☐	☐	☐
9. Grading Permit with temporary erosion control plan is provided. (if project requires City and County approval and meets requirements)	☐	☐	☐
10. Permit for Connection to the State Harbors Drainage System (if applicable)	☐	☐	☐
11. Permit to Discharge into the State Harbors Drainage System (if applicable)	☐	☐	☐
12. If multiple permits or approvals are required for the project, BMPs are consistent in all permits and plans.	☐	☐	☐

Attachment 4

Construction Site Best Management Practices Inspection Checklist

Construction Site Best Management Practices Inspection Checklist

Date of Inspection:		**Project Title:**							
Contractor:		**Project Job No.:**						**NGPC No.:**	
Inspector:		**SWPPP Updated and Onsite:** ☐ Yes ☐ No						**Photographs Attached:** ☐ Yes ☐ No	
Weather:			**Control Device(s)**		**Require Maintenance**				
AC: Adequate **C**ontainment **ACoC: A**dequate **C**over **o**r **C**ontainment		**N/A**	**Yes**	**No**	**Yes**	**No**	**Description of Any Deficiency**	**Date Corrective Actions Taken**	**Notes**
1.	Stabilized Construction Ingress/Egress?	☐	☐	☐	☐	☐			
	Vehicular Tracking	☐	☐	☐	☐	☐			
2.	Erosion Control Device(s) - Slopes/Exposed Area	☐	☐	☐	☐	☐			
	Sediment Control (Silt fence, Perimeter sock)	☐	☐	☐	☐	☐			
	Storm Drain Inlet Protection (Fabric filter, Witch's hat)	☐	☐	☐	☐	☐			
3.	Dust Control/Suppressant - Sawcutting/Demolition	☐	☐	☐	☐	☐			
	Concrete Washout Area (AC)	☐	☐	☐	☐	☐			
4.	Vehicle/Equipment Maintenance Area (ACoC)	☐	☐	☐	☐	☐			
	Vehicle/Equipment Cleaning Area (AC)	☐	☐	☐	☐	☐			
	Vehicle/Equipment Fueling Area (AC)	☐	☐	☐	☐	☐			
	Vehicle/Equipment Storage Area (AC)	☐	☐	☐	☐	☐			
5.	Construction Material Storage Area (ACoC)	☐	☐	☐	☐	☐			
	Stockpiles of Aggregate (ACoC)	☐	☐	☐	☐	☐			
6.	Flammable/Fuel Storage Area (ACoC)	☐	☐	☐	☐	☐			
	Hazardous Material Storage (ACoC)	☐	☐	☐	☐	☐			
	Waste Storage Area (ACoC)	☐	☐	☐	☐	☐			
7.	Good Housekeeping Practices (Is project generally free of litter, sediment, etc.?)	☐	☐	☐	☐	☐			
8.	Spill Prevention/Control - Spill Kit	☐	☐	☐	☐	☐			

Major Site Activities (please check any if applicable):

☐ Demolition ☐ Paving ☐ Excavation ☐ Hauling Materials ☐ Concrete Pouring ☐ Other, please specify:

If any of the item listed below checked "Yes", please provide detailed information under Additional Notes.

A. Is contaminated soil present? ☐ Yes ☐ No **B.** Is sediment basin(s) present? ☐ Yes ☐ No

C. Is any illicit discharge present? ☐ Yes ☐ No

D. Dewatering and/or Hydrotesting - Is this project in compliance with these NPDES storm water permitting requirements? ☐ Yes ☐ No ☐ N/A

Verified By (HDOT Project Inspector/Engineer's Signature) **Date**

Construction Site Best Management Practices Inspection Checklist

Permanent Post-Construction BMP Inspection					
Please indicate inspection status here:	☐ Inspection During Construction Phase	☐ Final Inspection after Installation	☐ Other		
Permanent post-construction BMPs are installed in accordance with construction plans.			☐ Yes	☐ No	☐ N/A
Notes:					

Additional Notes:

A. Management of Contaminated Soil:

B. Control and Maintenance Related to Sediment Basin(s):

C. Evidence of Discharge of Pollutant(s) to State Receiving Waters:

D. Summary of Dewatering and/or Hydrotesting Activity (please list permit numbers and verify compliance):

E.

F.

G.

Remarks: This checklist is to be completed before commencement of grading or site-work and then every two weeks from October through March, otherwise, bimonthly. Harbors Division will not allow construction activities to commence until the project engineer or qualified project inspector have inspected the construction site to determine if the site-specific BMPs and pollution prevention devices are implemented correctly and in the appropriate locations.

State of Hawaii
Department of Transportation
Harbors Division

Attachment 5

Notification Forms for Project Less Than One Acre

Hawaii Department of Transportation – Harbors Division

Notification Form for Project Sites Disturbing Less Than One Acre

(To be used for Harbors Project)

Project Description			
Project Title:			
Project Job No:		Acreage of Site:	
Name of Design Firm:			
Projected Construction Timeframe:			
Description of Project:			

Site Information			
Construction Site Location:			
Tax Map Key No(s).:			
Disturbed Area (to nearest tenth of an acre):		Total Project Area (to nearest tenth of an acre):	
Existing Percentage of Impervious Area:		Percentage of Impervious Area After Completion:	

Nearest Water Body Information	
Name of Nearest Receiving Water Body(s) and Distance:	
Any New or Modified Storm Drain Connections:	
Description of Storm Drains On or Adjacent to Project Area (e.g., location or ID#):	

Review: HDOT Harbors Project Manager and Environmental Section.	
	Print Name:
Harbors Project Manager Signature:	Date:
	Print Name:
Harbors Environmental Section Signature:	Date:

Notes:

1. This form is for the use on non-exempt projects that will disturb less than 1 acre and are not a part of Larger Common Plan (LCP) for development. **If this project is part of a LCP for sale or development this form may not be used.**

2. You must type or print legibly. You must include the original, signed notification form and two (2) copies of a sketched plan outlining the anticipated activities and the location of all proposed sediment and erosion control devices.

3. The following activities, if they do not affect the Harbors storm drainage system, are exempt from any formal project review and construction site-inspection requirements under the ***Harbors Construction Site Runoff Control Program***.

- Minor land disturbance activities performed by a property owner or employee on a single lot (such as minor landscaping activities). Activities must disturb no more than 10 cubic yards or ¼ acre.
- Post and pole installation (less than 2 cubic yards excavation at any one contiguous project location).
- Utility repair work (less than 2 cubic yards excavation at any one contiguous project location).
- Parking lot, driveway, and other paved surfaces repair (less than ¼ acre disturbed and no sediment leaves the property.
- All repair and maintenance activities.

Hawaii Department of Transportation – Harbors Division

Notification Form for Project Sites Disturbing Less Than One Acre

(To be used for Tenant Improvement Project)

Project Description			
Project Title:			
Project Job No:		Acreage of Site:	
Name of Design Firm:			
Projected Construction Timeframe:			
Description of Project:			

Site Information			
Construction Site Location:			
Tax Map Key No(s).:			
Disturbed Area (to nearest tenth of an acre):		Total Project Area (to nearest tenth of an acre):	
Existing Percentage of Impervious Area:		Percentage of Impervious Area After Completion:	

Project Information			
Tenant			
Business Name			
Project Point of Contact:			
(Note: Must be tenant or tenant representative with signatory authority)			
Mailing Address:			
Phone:		Email Address:	
Engineering/Design Company			
Company Name			
Project Point of Contact:			
Mailing Address:			
Phone:		Email Address:	
Construction Contractor			
Company Name			
Project Point of Contact:			
Mailing Address:			
Phone:		Email Address:	

Nearest Water Body Information	
Name of Nearest Receiving Water Body(s) and Distance:	
Any New or Modified Storm Drain Connections:	
Description of Storm Drains On or Adjacent to Project Area (e.g., location or ID#):	

Signature and Certifications	
Project Owner/Operator: Per my signature below, I hereby certify that this project is not part of a Larger Common Plan (LCP) for Development. I understand that additional construction activities at this site may require permit coverage and I am responsible for obtaining any federal, state, or local permits that may be required for this project. I certify that all land-disturbing construction and associated activity pertaining to this site shall be accomplished pursuant to and in keeping with the terms and conditions of all relevant regulations including, but not limited to, the Federal Clean Water Act (33 USC 1251), Hawaii Revised Statutes 342D, Hawaii Administrative Rules §11-54 and §11-55, Honolulu Harbor and Kalaeloa Barbers Point Harbor's Small Municipal Storm Water Sewer System (Small MS4) National Pollutant Discharge Elimination System Permits (NPDES Permit Nos. HI 03KB482 and HI 03KB488), and Harbors Storm Water Management Plan. Failure to do so may result in penalties. I hereby acknowledge that personnel from the Hawaii Department of Transportation Harbors Division or Hawaii Department of Health has the right of access to the site at all times for the purpose of on-site inspections during the course of construction and to perform inspections following the project completion. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.	
Print Name:	Job Title:
Signature:	Date:
Review: HDOT Harbors Engineering Branch Environmental Section.	
	Print Name:
Harbors Environmental Section Signature:	Date:

Notes:

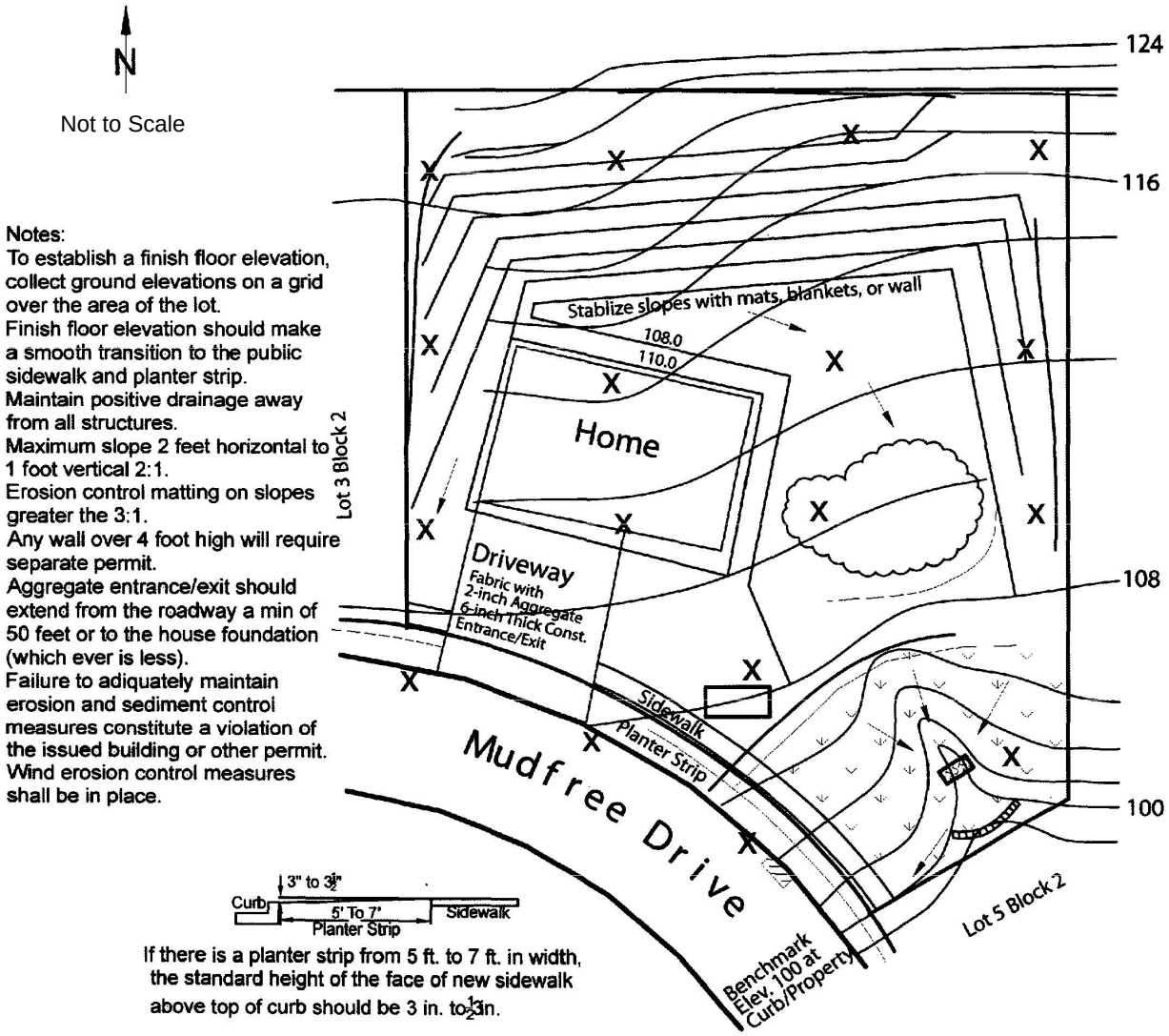
1. This form is for the use on non-exempt projects that will disturb less than 1 acre and are not a part of Larger Common Plan (LCP) for development. **If this project is part of a LCP for sale or development this form may not be used.**

2. You must type or print legibly. You must include the original, signed notification form and two (2) copies of a sketched plan outlining the anticipated activities and the location of all proposed sediment and erosion control devices.

3. The following activities, if they do not affect the Harbors storm drainage system, are exempt from any formal project review and construction site-inspection requirements under the ***Harbors Construction Site Runoff Control Program***.

- Minor land disturbance activities performed by a property owner or employee on a single lot (such as minor landscaping activities). Activities must disturb no more than 10 cubic yards or ¼ acre.
- Post and pole installation (less than 2 cubic yards excavation at any one contiguous project location).
- Utility repair work (less than 2 cubic yards excavation at any one contiguous project location).
- Parking lot, driveway, and other paved surfaces repair (less than ¼ acre disturbed and no sediment leaves the property.
- All repair and maintenance activities.

Figure 1: Sample Small Project Erosion and Sediment Control Plan Drawing



- Legend & Symbols -

- Property (Boundary) Line
- Limits of Grading
- Fiber Roll Barrier
- Sediment Barrier
- Natural Contour — 112
- Finished Grade
- Stock Pile
- Natural ground elevation shots — X
- Concrete Washout Area
- Check Dam or Rip Rap
- Final Drainage Path (grade to drain)
- Undisturbed Vegetative Cover
- Storm Water Inlet Protection

- Required Information -

City of Pocatello Erosion and Sediment Control

Certified Person:_____

Certification #_____ Exp. Date:_____

Company:_____

Address:_____

Telephone Number:_____

Signature:_____

Attachment 6

List of City and County of Honolulu BMPs for Construction

Serial #	Erosion Control (EC) Fact Sheets
EC-0	Employee/Subcontractor Training
EC-1	Scheduling
EC-2	Preservation of Existing Vegetation
EC-3	Hydraulic Mulch
EC-4	Hydroseeding
EC-5	Soil Binders
EC-7	Geotextiles and Mats
EC-8	Wood Mulching
EC-9	Earth Dikes and Drainage Swales
EC-10	Velocity Dissipation Devices
EC-11	Slope Drains
EC-12	Streambank Stabilization
EC-14	Seeding, Planting and Sodding
EC-15	Slope Roughening/Terracing
EC-16	Topsoil Management
Serial #	**Sediment Control (SE) Fact Sheets**
SE-1	Silt Fence
SE-2	Sediment Basin
SE-3	Sediment Trap
SE-4	Check Dams
SE-5	Fiber Rolls
SE-6	Gravel Bag Berm
SE-7	Street Sweeping and Vacuuming
SE-8	Sandbag Barrier
SE-10	Storm Drain Inlet Protection
SE-11	Chemical Treatment
SE-12	Location of Potential Sources of Sediment
SE-13	Level Spreader
SE-14	Rip-Rap & Gabion Inflow Protection
SE-15	Vegetated Buffer Strips and Channels
SE-16	Compost Socks and Berms
Serial #	**Wind Erosion Control (WE) Fact Sheets**
WE-1	Wind Erosion Control
Serial #	**Tracking Control (TR) Fact Sheets**
TR-1	Stabilized Construction Entrance/Exit
TR-2	Stabilized Construction Roadway
TR-3	Entrance/Outlet Tire Wash

Serial #	Non-Storm Water management (NS) Fact Sheets
NS-1	Water Conservation Practices
NS-2	Dewatering Operations
NS-3	Paving and Grinding Operations
NS-4	Temporary Stream Crossing
NS-5	Clear Water Diversion
NS-6	Illicit Connection/Discharge
NS-7	Potable Water/Irrigation
NS-8	Vehicle and Equipment Cleaning
NS-9	Vehicle and Equipment Fueling
NS-10	Vehicle and Equipment Maintenance
NS-11	Pile Driving Operations
NS-12	Concrete Curing
NS-13	Concrete Finishing
NS-14	Material over Water
NS-15	Demolition Adjacent to Water
NS-16	Temporary Batch Plants

Serial #	Waste Management (WM) and Materials Pollution Control Fact Sheets
WM-1	Material Delivery and Storage
WM-2	Material Use
WM-3	Stockpile Management
WM-4	Spill Prevention and Control
WM-5	Solid Waste Management
WM-6	Hazardous Waste Management
WM-7	Contaminated Soil Management
WM-8	Concrete Waste Management
WM-9	Sanitary/Septic Waste Management
WM-10	Liquid Waste Management

Attachment 7

Temporary Water Pollution, Dust, and Erosion Control Specifications

ARTICLE XXX – TEMPORARY STORMWATER POLLUTION, DUST, AND EROSION CONTROL
For Project NOT Subject to NPDES NOI-C Permit

XXX.XX Description. This section is required for all work, including the Contractor's storage sites. It describes the following:

(A) A detailed site-specific Best Management Practice (BMP) Plan including diagrams and narratives; constructing, maintaining, and repairing temporary stormwater pollution, dust, and erosion control measures at the project site including local material sources, work areas and access roads; removing and disposing of wastes and hazardous wastes; and control of fugitive dust (defined as uncontrolled emission of solid airborne particulate matter from any source other than combustion). Additionally, all projects at Honolulu and Kalaeloa Barbers Point Harbors are subject to State of Hawaii, Department of Transportation (HDOT) Harbors Division, Storm Water Management Plan (SWMP) requirements, unless exempted, and are subject to Harbors BMP inspections. If any requirement conflicts with those administered by State of Hawaii, Department of Health (HDOH), the contractor shall follow the more stringent requirement.

(B) Compliance with applicable federal and other state permit conditions.

(C) Work associated with dewatering and hydrotesting activities and compliance with conditions of the NPDES general permit coverage authorizing discharges associated with construction activity dewatering and hydrotesting.

XXX.XX General Requirements. In order to provide for the control of water pollution, dust, and erosion arising from the construction activities of the Contractor and his subcontractors in the performance of this contract, the work performed shall comply with all applicable federal, state, and local laws and regulations concerning water pollution control including, but not limited to, the following regulations:

(A) State of Hawaii, HDOH, Hawaii Administrative Rules (HAR) Chapter 11-54 – Water Quality Standards and Chapter 11-55 – Water Pollution Control.

(B) For Oahu projects ONLY, HDOT Harbors Division, Storm Water Management Plan.

(C) For Oahu projects ONLY, City and County of Honolulu (CCH), Rules Relating to Soil Erosion Standards and Guidelines.

(D) For Oahu projects ONLY, CCH, Storm Water BMP Manual for Construction.

(E) 40 CFR Part 110, Environmental Protection Agency (EPA), Discharge of Oil.

(F) 40 CFR Part 117, EPA, Determination of Reportable Quantities for Hazardous Substances.

(G) 40 CFR Part 261, EPA, Identification and Listing of Hazardous Waste.

(H) 40 CFR Part 302, EPA, Designation, Reportable Quantities, and Notification.

(I) 49 CFR Part 171, U.S. Department of Transportation, Hazardous Materials Regulations.

XXX.XX Materials. Materials shall conform to the following when applicable:

(A) Slope Drains. Slope drains may be constructed of pipe, fiber, mats, erosion control fabric, geotextiles, rubble, Portland cement concrete, bituminous concrete, plastic sheets, or other materials acceptable to the Construction Engineer.

(B) Grass. Grass shall be quick growing species such as rye grass, Italian grass, or cereal grasses. Grass shall be suitable to the area and provide a temporary cover that will not compete later with permanent cover. Alternative grasses are allowable if acceptable to the Construction Engineer.

(C) Fertilizer and Soil Conditions. Fertilizer and soil conditioners shall be a standard commercial grade acceptable to the Construction Engineer.

(D) Silt Fences. Silt fences shall be synthetic filter fabric mounted on posts and embedded in compacted ground in compliance with American Society for Testing and Materials (ASTM) D6462-03, Standard Practice for Silt Fence Installation.

(E) Berms. Berms shall be gravel or sand wrapped with geotextile material. Alternate materials are allowable if acceptable to the Construction Engineer.

(F) Alternate materials or methods to control, prevent, remove, and dispose of pollution are allowable if acceptable to the Construction Engineer.

XXX.XX Construction.

(A) Preconstruction Requirements.

(1) Temporary Stormwater Pollution, Dust, and Erosion Control Meeting. The contractor shall be required to submit a site-specific BMP Plan to the Construction Engineer and address all comments by the Construction Engineer. After the Plan is accepted in writing by the Construction Engineer, the Contractor shall schedule a meeting with the Construction Engineer before the start of construction work to discuss the sequence of work, and plans and proposals for stormwater pollution, dust, and erosion control.

(2) Temporary Stormwater Pollution, Dust, and Erosion Control Submittals. The Contractor shall submit the site-specific BMP Plan for acceptance by the Construction Engineer prior to the start of work.

(a) Written site-specific BMP Plan shall include the following as applicable:

1. Identification of potential pollutants and their sources and other factors that may cause stormwater pollution, dust, and erosion.

2. A list of all material and heavy equipment to be used during construction. Vehicles and equipment shall be well maintained and free from any type of fluid leaks.

3. Construction schedule.

4. Name(s) of specific individual(s) designated responsible for stormwater pollution, dust and erosion controls on the project site. Include home, business, and cellular telephone numbers, fax numbers, and e-mail addresses.

5. Descriptions of the methods and devices used to eliminate certain pollutants (e.g., wastewater, fuels, solvents, detergents, toxic or hazardous substances) from discharging into state waters and drainage systems, and provide details of BMP to be installed or utilized. Indicate approximate dates when BMP will be installed and removed.

6. Description of maintenance and subsequent removal of any erosion or siltation control devices.

7. Method(s) of removal and disposal of solid and regulated hazardous wastes encountered or generated during construction. The Contractor is advised to procure regulated hazardous materials on an as-needed basis, as feasible. All excess regulated hazardous materials at the conclusion of this project shall remain the property of the Contractor and shall be removed from HDOT Harbors Division property upon the completion of the project.

8. Method(s) of removing and disposing concrete and asphalt pavement cutting slurry, concrete curing water, and hydrodemolition water.

9. Method(s) of containing, removing and disposing of demolition dust and debris to minimize the discharge of these pollutants into state waters and drainage systems.

10. Spill kit contents and location.

11. Fugitive dust control, including dust from grinding, sweeping, or brooming off operations or combination thereof.

12. Method(s) of storing and handling of regulated hazardous materials (e.g. oils, paints) and other products used for the project. Safety Data Sheets (SDS) for all regulated hazardous materials used during construction activities shall be kept on-site throughout the duration of the project and readily available upon inspection. All containers of regulated hazardous materials should be provided with secondary containment during storage. Regulated hazardous materials not specifically needed in the execution of this project shall not be brought or stored on site. As feasible, the Contractor is encouraged to use products that do not contain any regulated constituents. The use of green products is encouraged.

13. Method(s) of concrete washout/waste control.

14. Method(s) of managing material stockpiles to minimize erosion and dust.

15. Good housekeeping practices.

a. Minimize tracking of sediment offsite from project entrances and exits.

b. Litter management. The Contractor shall have a comprehensive housekeeping policy and shall actively enforce housekeeping requirements. Housekeeping items include, but are not limited to, cups, cans, bottles and other forms of lightweight litter, unattended containers of hazardous materials, concrete debris (e.g. dust, chips, and other sweepings), and discarded articles of disposable Personal Protective Equipment (e.g., earplugs, dust masks, and gloves). Employees who are specifically tasked with housekeeping duties shall be identified by name.

c. The Contractor should provide and maintain covered waste receptacles. No construction debris or other refuse that is generated as a result of project activities is to be disposed in HDOT Harbors Division-owned waste receptacles.

16. Provide plan(s)/drawing(s) showing location of followings when applicable:

a. Boundaries of the property and the locations where construction activities will occur, including:

i. Locations where earth-disturbing activities will occur (noting any sequencing of construction activities);

ii. Approximate slopes and drainage patterns with flow arrows before and after the construction;

iii. Locations where sediment, soil, or other construction materials will be stockpiled;

iv. Locations of any contaminated soil or contaminated soil stockpiles;

v. Locations of any crossings of state waters;

vi. Designated points on the site where vehicle will exit onto paved roads;

vii. Locations of structures and other impervious surfaces upon completion of construction; and

viii. Locations of construction support activity areas covered by the permit.

b. Locations of all state waters, including wetlands and indicate which water bodies are listed as impaired.

c. The boundary lines of any natural buffers.

d. Topography of the site, existing vegetative cover, and features (e.g., forest, pasture, pavement,

structures), and drainage pattern(s) of storm water onto, over, and from the site property before and after major grading activities.

e. Storm water discharge locations, including locations of any storm drain inlets on-site and in the immediate vicinity of the site to receive storm water runoff from the project; and locations where storm water will be discharging to state waters (including wetlands).

f. Locations of all potential pollutant-generating activities.

g. Locations of storm water control measures; and

h. Locations where chemicals will be used and stored.

17. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Parts 110, 117, or 302, occurs during a 24-hour period. Contact information must be in locations that are readily accessible and available.

18. The Contractor shall date and sign the site-specific BMP Plan.

(b) The Contractor shall keep the approved Plan on-site or an easily accessible location throughout the duration of the project. Revisions to the Plan shall be included with the original plan. Modify contract documents to conform to revisions. Include actual date of installation and removal of BMP. Obtain written acceptance by the Construction Engineer before revising BMP. An updated Plan shall be kept on-site throughout the remainder duration of the project.

The Contractor shall follow guidelines in the "*The City and County of Honolulu Storm Water Best Management Practice Manual – Construction*," (dated November 2011) in developing, installing, and maintaining BMP for the project. Additionally, the Contractor shall follow City and County of Honolulu *Rules Relating to Soil Erosion Standards and Guidelines* (dated April 1999) **for all projects on Oahu**, and use respective Soil Erosion Guidelines for

Maui, Kauai and Hawaii County projects. Information can be found at the respective County websites.

(B) Construction Requirements are as follows.

(1) No work shall be allowed to begin until submittals detailed in Subsection XXX.XX A.2 – Temporary Stormwater Pollution, Dust, and Erosion Control Submittals are completed and accepted in writing by the Construction Engineer. The Contractor shall prevent pollutants from entering state waters. These efforts shall address areas such as those that drain to water, are over water, or drain to storm drains in the area of the project site. The Contractor shall design, operate, implement, and maintain the Plan to ensure that storm water discharges associated with construction activities will not cause or contribute to a violation of applicable state water quality standards.

(2) All projects at Honolulu and Kalaeloa Barbers Point Harbors are subject to HDOT Harbors Division SWMP requirements for construction at those harbors unless the project meets a specified exemption class. The requirements include, but are not limited to, construction site BMP initial, recurring (i.e. every two weeks from October through March and every two months otherwise), and final inspections at the frequencies outlined in the SWMP. No grading or land disturbance activities are allowed until the initial BMP inspection is completed and required BMPs are found to be properly installed.

(3) Address all comments received from the Construction Engineer.

(4) Modify and resubmit plans and construction schedules to correct conditions that develop during construction which were unforeseen during the design and pre-construction stages.

(5) Coordinate temporary control provisions with permanent control features throughout the construction and post-construction period.

(6) BMP shall be in place and operational until the construction is completed and accepted by Harbors.

(7) Install and maintain either or both stabilized construction entrances and wheel washes to minimize tracking of dirt and mud onto roadways. Restrict traffic to stabilized construction areas only. Clean dirt, mud, or other material tracked onto the road immediately. Modify stabilized construction entrances to prevent mud from being tracked onto roadways.

(8) Chemicals may be used as soil stabilizers for either or both erosion and dust control if acceptable to the Construction Engineer.

(9) Cover exposed surface of materials completely with tarpaulin or similar device when transporting aggregate, soil, excavated material or material that may be a source of fugitive dust.

(10) Cleanup and remove any pollutant that can be attributed to the Contractor.

(11) Install or modify BMP due to change in the Contractor's means and methods, or for omitted condition that should have been allowed for in the accepted site-specific BMP Plan or a BMP that replaces an accepted site-specific BMP that is not satisfactorily performing.

(12) Properly maintain BMP.

(13) Remove, replace or relocate any BMP that must be removed, replaced or relocated due to potential or actual flooding, or potential danger or damage to the project or public.

(14) The Contractor's designated representative specified in Subsection XXX.XX A.2.a.4 shall address any BMP concerns brought up by the Construction Engineer within 24 hours of notification, including weekends and holidays. Should the Contractor fail to satisfactorily address these concerns, the Construction Engineer reserves the right to employ outside assistance or use the Construction Engineer's own labor forces to provide necessary corrective measures. The Construction Engineer will charge the Contractor such incurred costs plus any associated project engineering costs. The Construction Engineer will make appropriate deductions from the Contractor's monthly progress estimate. Failure to apply BMP shall result in either or both the establishment and increase in the amount of retainage due to unsatisfactory progress or withholding of monthly progress payment. Continued failure to apply BMP may result in one or more of the following: the Contractor being fully responsible for all additional costs incurred by HDOT Harbors Division including any fines levied by HDOH, suspension of the Contract, or cancellation of the Contract.

(C) **Hydrotesting Activities**. If work includes removing, relocation or installing waterlines, and the Contractor elects to flush waterline or discharge hydrotesting effluent into state waters or drainage systems, obtain a Notice of General Permit Coverage (NGPC) authorizing discharges associated with hydrotesting waters from the HDOH Clean Water Branch (CWB). If a permit is required, prepare and submit permit application (CWB-Notice of Intent (NOI) Form F) to the HDOH CWB.

Do not begin hydrotesting activities until the HDOH CWB has issued a NGPC. Hydrotesting operations shall be in accordance with conditions in the NGPC.

Submit a copy of the NPDES Hydrotesting Waters Application and Permit to the Construction Engineer.

(D) **Dewatering Activities**. If excavation of backfilling operations require dewatering, and the Contractor elects to discharge dewatering effluent into state waters or existing drainage systems, obtain an NGPC authorizing discharges associated with construction activity dewatering from the HDOH CWB. If a permit is required, prepare and submit permit application (CWB-NOI Form G) to the HDOH CWB.

Do not begin dewatering activities until the HDOH-CWB has issued an NGPC. Conduct dewatering operations in accordance with the conditions in the NGPC. Submit a copy of the NPDES Dewatering Application and Permit to the Construction Engineer.

XXX.XX Measurement.

(A) Installation, maintenance, monitoring, and removal of the BMP will be paid on a lump sum basis. Measurement for payment will not apply.

(B) The Construction Engineer will only measure additional water pollution, dust and erosion control required and requested by the Construction Engineer on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation of the *Hawaii Standard Specifications for Road and Bridge Construction, 2005*.

XXX.XX **Payment**. The Construction Engineer will pay for accepted pay items listed below at contract price per pay unit, as shown in the proposed schedule. Payment will be full compensation for work prescribed in this section and contract documents.

The Construction Engineer will pay for the following pay item when included in the proposed schedule:

Pay Item	**Pay Unit**
Installation, Maintenance, Monitoring, and Removal of BMP	Lump Sum

No progress payment will be authorized until the Construction Engineer accepts in writing the site-specific BMP Plan or when the Contractor fails to maintain the project site in accordance with the accepted BMP Plan.

The Contractor shall reimburse the State of Hawaii within 30-day for the full amount of all outstanding costs incurred by the State of Hawaii for all citations or fines received as a result of the Contractor's non-compliance with regulations.

ARTICLE XXX – TEMPORARY STORMWATER POLLUTION, DUST, AND EROSION CONTROL
For Project Subject to NPDES NOI-C Permit

XXX.XX Description. This section is required for all work, including the Contractor's storage sites. It describes the following:

(A) A detailed Storm Water Pollution Prevention Plan (SWPPP) required by a National Pollutant Discharge Elimination System (NPDES) Appendix C General Permit from the State of Hawaii Department of Health (HDOH) and prepared according to Section 7 of Appendix C, Hawaii Administrative Rules (HAR) Chapter 11-55, will satisfy this requirement. Additionally, all projects at Honolulu and Kalaeloa Barbers Point Harbors are subject to State of Hawaii, Department of Transportation (HDOT) Harbors Division, Storm Water Management Plan (SWMP) requirements, and are subject to Harbors Best Management Practice (BMP) inspections. If any requirement conflicts with those administered by HDOH, the contractor shall follow the more stringent requirement.

(B) Compliance with applicable federal and other state permit conditions.

(C) Work associated with dewatering and hydrotesting activities and compliance with conditions of the NPDES general permit coverage authorizing discharges associated with construction activity dewatering and hydrotesting.

XXX.XX General Requirements. In order to provide for the control of temporary stormwater pollution, dust, and erosion arising from the construction activities of the Contractor and his subcontractors in the performance of this contract, the work performed shall comply with all applicable federal, state, and local laws and regulations concerning water pollution control including, but not limited to, the following regulations:

(A) State of Hawaii, HDOH, HAR Chapter 11-54 – Water Quality Standards and Chapter 11-55 – Water Pollution Control.

(B) For Oahu projects ONLY, HDOT Harbors Division, Storm Water Management Plan.

(C) For Oahu projects ONLY, City and County of Honolulu (CCH), Rules Relating to Soil Erosion Standards and Guidelines.

(D) For Oahu projects ONLY, CCH, Storm Water BMP Manual for Construction.

(E) 40 CFR Part 110, Environmental Protection Agency (EPA), Discharge of Oil.

(F) 40 CFR Part 117, EPA, Determination of Reportable Quantities for Hazardous Substances.

(G) 40 CFR Part 261, EPA, Identification and Listing of Hazardous Waste.

(H) 40 CFR Part 302, EPA, Designation, Reportable Quantities, and Notification.

(I) 49 CFR Part 171, U.S. Department of Transportation, Hazardous Materials Regulations.

XXX.XX Materials. Materials shall conform to the following when applicable:

(A) Slope Drains. Slope drains may be constructed of pipe, fiber, mats, erosion control fabric, geotextiles, rubble, Portland cement concrete, bituminous concrete, plastic sheets, or other materials acceptable to the Construction Engineer.

(B) Grass. Grass shall be quick growing species such as rye grass, Italian grass, or cereal grasses. Grass shall be suitable to the area and provide a temporary cover that will not compete later with permanent cover. Alternative grasses are allowable if acceptable to the Construction Engineer.

(C) Fertilizer and Soil Conditions. Fertilizer and soil conditioners shall be a standard commercial grade acceptable to the Construction Engineer.

(D) Silt Fences. Silt fences shall be synthetic filter fabric mounted on posts and embedded in compacted ground in compliance with American Society for Testing and Materials (ASTM) D6462-03, Standard Practice for Silt Fence Installation.

(E) Berms. Berms shall be gravel or sand wrapped with geotextile material. Alternate materials are allowable if acceptable to the Construction Engineer.

(F) Alternate materials or methods to control, prevent, remove, and dispose of pollution are allowable if acceptable to the Construction Engineer.

XXX.XX Construction.

(A) Preconstruction Requirements.

(1) Temporary Stormwater Pollution, Dust, and Erosion Control Meeting. The contractor shall be required to submit a SWPPP to the Construction Engineer and address all comments by the Construction Engineer. After the SWPPP is accepted in writing by the Construction Engineer, the Contractor shall schedule a meeting with the Construction Engineer before the start of construction work to discuss the sequence of work, and plans and proposals for stormwater pollution, dust, and erosion control.

(2) Temporary Stormwater Pollution, Dust, and Erosion Control Submittals. The Contractor shall submit the SWPPP for acceptance by the Construction Engineer prior to the start of work.

(a) The following information shall be described in the SWPPP as specified in Section 7 of Appendix C, HAR 11-55, at a minimum:

1. **Storm water team** (by name or position), which is responsible for the development of the SWPPP, any later modifications to it, and for compliance with the requirements in the NPDES permit. The SWPPP must identify the personnel that are part of the storm water team as well as their individual responsibilities.

2. **Nature of construction activities** including the size of the project site (in acres) and the total area expected to be disturbed by the construction activities (in acres), construction support activity areas covered by permit, and the maximum area expected to be disturbed at any one time.

3. **Emergency-related projects** in response to a public emergency (e.g., natural disaster, extreme flooding conditions). If this applies to the project, documentation of the cause of the public emergency, information substantiating its occurrence, and a description of the construction necessary to re-establish affected public services shall be included in the SWPPP. The proclamation of a civil defense emergency or similar proclamation is required to be from the President of the United States or State Governor.

4. **Identification of other site contractors** (e.g., sub-contractors) who will be engaged in construction activities at the site, and the areas of the site over which each contractor has control. If this piece of information is not available at the time the SWPPP is submitted, the plan must be amended to include the information prior to the start of construction activities.

5. **Sequence and estimated dates of construction activities** including a schedule of the estimated start dates and the duration of the following activities, according to Section 7.2.5 of Appendix C, HAR 11-55:

a. Installation of storm water control measures.

b. Commencement and duration of earth-disturbing activities.

c. Cessation, temporarily or permanently, of construction activities on-site, or in designated portions of the project site.

d. Final or temporary stabilization of areas of exposed soil.

e. Removal of temporary storm water conveyances/channels and other storm water control measures, removal of construction equipment and vehicles, and cessation of any pollution-generating activities.

6. **Site map or series of maps**, showing the following features of the project, according to Section 7.2.6 of Appendix C, HAR 11-55:

a. Boundaries of the property and the locations where construction activities will occur, including:

i. Locations where earth-disturbing activities will occur (noting any sequencing of construction activities);

ii. Approximate slopes and drainage patterns with flow arrows before and after construction;

iii. Locations where sediment, soil, or other construction materials will be stockpiled;

iv. Locations of any contaminated soil or contaminated soil stockpiles;

v. Locations of any crossings of state waters;

vi. Designated points on the site where vehicle will exit onto paved roads;

vii. Locations of structures and other impervious surfaces upon completion of construction; and

viii. Locations of construction support activity areas covered by the permit.

b. Locations of all state waters, including wetlands and indicate which water bodies are listed as impaired.

c. The boundary lines of any natural buffers.

d. Topography of the site, existing vegetative cover, and features (e.g., forest, pasture, pavement, structures), and drainage pattern(s) of storm water onto, over, and from the site property before and after construction.

e. Storm water discharge locations, including locations of any storm drain inlets on-site and in the immediate vicinity of the site to receive storm water runoff from the project; and locations where storm water will be discharging to state waters (including wetlands).

f. Locations of all potential pollutant-generating activities.

g. Locations of storm water control measures; and

h. Locations where chemicals will be used and stored.

7. **Construction site pollutants generated by on-site activities.** For each pollutant-generating activity, an inventory of pollutants or pollutant constituents (e.g., sediment, fertilizers and/or pesticides, paints, solvents, fuels) associated with that activity, which could be exposed to rainfall and could be discharged from the construction site (include potential spills and leaks).

A list of all material and heavy equipment to be used during construction. Vehicles and equipment shall be well maintained and free from any type of fluid leaks.

8. **Sources of non-storm water**, including, but not limited to, the design, installation, and maintenance of the control measures to prevent its discharge.

9. **Buffer documentation**. When a State water is located within 50 feet of the project's earth disturbances, the Contractor shall describe which compliance alternative has been selected for the site, and comply with Section 5.1.2.1 of Appendix C, HAR 11-55, Appendix C.

10. **Description of storm water control measures** to be used during construction activity including information on:

    a. Type of storm water control measure to be installed and maintained, including design information;

    b. Specific sediment controls to be installed and operated prior to earth-disturbing activities, control measures to either prevent the contact of storm water with contaminated soil (if it exists) or prevent the discharge of any storm water runoff which has contacted contaminated soil (or stockpiles);

    c. Stabilization practices/techniques and additional controls planned to be used to remove sediment prior to vehicle exit;

    d. For linear projects, where the Contractor has determined that the use of perimeter controls in portions of the site is impracticable, document justification.

    e. Stabilization practices including specific vegetative and/or non-vegetative practices.

    f. Post-construction measures that will minimize the discharge of pollutants via storm water discharges after construction operations have been finished.

11. **Pollution prevention procedures.**

    a. Spill prevention and response procedures, including:

        i. Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks;

ii. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Parts 110, 117, or 302, occurs during a 24-hour period. Contact information must be in locations that are readily accessible and available.

b. Waste management procedures on handling and disposing of all wastes generated at the site, including, but not limited to, clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste.

The Contractor is advised to procure regulated hazardous materials on an as-needed basis, as feasible. All excess regulated hazardous materials at the conclusion of this project shall remain the property of the Contractor and shall be removed from HDOT Harbors Division property upon the completion of the project.

12. Procedures for inspection, maintenance, and corrective action to be followed for conducting site inspections, maintaining the storm water control measures, and, where necessary, taking corrective actions. Additionally, include following information in the SWPPP:

a. Personnel responsible for conducting inspections;

b. Inspection schedule. Contractor's Self-Inspections shall be conducted at applicable schedules listed below.

i. **Inspection Frequency for sites discharging to impaired waters[1]**. For any

[1] "Impaired waters" are waters identified as impaired on the State Clean Water Act Section 303(d) list, and waters with a State-established and EPA-approved Total Maximum Daily Load (TMDL). The construction site will be considered to discharge to an impaired water if the first State water to which the discharge enters is to a water on the section 303(d) list or one with a State established and EPA-approved TMDL. For a discharge that enters a storm water drainage system prior to discharge, the first State water to which discharge occurs is the water body that receives the storm water discharge from the storm water drainage system.

portion of the site that discharges to an impaired water, the inspection shall be conducted at the following intervals:

(a) Once every seven (7) calendar days; and

(b) Within 24 hours of the first day of a storm event of 0.25 inches or greater and within 24 hours after the end of the storm.

(c) Daily during periods of a prolonged storm event of 0.25 inches or greater.

ii. **Inspection Frequency for sites NOT discharging to impaired waters**. At a minimum, the inspection shall be conducted in accordance with one of the two schedules listed below:

(a) At least weekly; or

(b) Biweekly (once every 14 calendar days), and within 24 hours of the first day of a storm event of 0.25 inches or greater, daily during periods of a prolonged storm of 0.25 inches or greater, and within 24 hours after the end of the storm.

iii. **Reductions in inspection frequency**. For stabilized areas, the Contractor may reduce the frequency of inspections to monthly (once per month) in any area of the site where the stabilization steps have been completed as follows:

(a) For vegetative stabilization, all activities necessary to initially seed or plant the area to be stabilized; and/or

(b) For non-vegetative stabilization, the installation or application of all such non-vegetative measures.

Note that inspections are only required during the project's normal working hours.

c. Any inspection or maintenance checklists or other forms that will be used.

Contractor shall either keep a properly maintained rain gauge in a secure location to monitor rainfall at the project site, or obtain the storm event information from a weather station that is representative of the location. If a rain gauge is to be utilized to determine if a storm event of 0.25 inches or greater has occurred on the site, it must have a tolerance of at least 0.05 inches of rainfall, and an opening of at least 1-inch diameter. Install the rain gauge on the project site in an area that will not deter rainfall from entering the gauge opening. Maintain the rain gauge and replace the gauge if stolen, it does not function properly or accurately, is worn out, or needs to be relocated. Do not begin fieldwork until the rain gage is installed and the SWPPP is in place. For any day of rainfall during normal business hours that measures 0.25 inches or greater, the Contractor shall record the total rainfall measured for that day.

13. **Staff training documentation** that the required personnel were trained in accordance with Section 7.2.13 of Appendix C, HAR 11-55, to ensure that all activities on the site comply with the requirements of the issued permit. The list of major required personnel are as listed below:

a. Personnel responsible for the design, installation, maintenance, and/or repair of storm water controls (including pollution prevention measures);

b. Personnel responsible for the application and storage of chemicals (if applicable);

c. Personnel responsible for conducting BMP inspections;

d. Personnel responsible for taking corrective actions

At a minimum, personnel must be trained to understand the following, if related to the scope of their job duties (e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections):

a. The location of all storm water controls on the site required by the issued permit, and how they are to be maintained;

b. The proper procedures to follow with respect to the permit's pollution prevention requirements; and

c. When and how to conduct inspections, record applicable findings, and take corrective actions.

The Contractor is not required to provide or document formal training for subcontractor or other outside service providers, but must ensure that such personnel understand any requirements of the permit that may be affected by the work they are subcontracted to perform. Detailed discussion is provided in Section 7.2.13.2 of Appendix C, HAR 11-55.

14. Documentation of compliance with Safe Drinking Water Act Underground Injection Control (UIC) requirements for certain subsurface storm water controls, if using any of the following storm water controls at the project site**:**

a. Infiltration trench (if storm water is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system);

b. Commercially manufactured precast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate storm water flow; and

c. Drywells, seepage pits, or improved sinkholes (if storm water is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system).

15. Other information listed below.

a. Contractor information (general and subcontractors) including legal name, street address, contact person’s name and position title, telephone number, and email address.

b. Other state, federal, or county permits including:

i. Copy of the drainage system owner's approval allowing the discharge to enter their drainage system (if applicable);

ii. Copy of the Department of the Army permit and Section 401 water quality certification (if applicable); and

iii. A list of other permits (if applicable).

16. Any other information as requested by the Director of HDOH and/or HDOT.

17. **SWPPP certification.** The owner or its duly authorized representative must certify, sign, and date the Plan in accordance with Section 15 of Appendix A, HAR 11-55.

(b) The Contractor shall keep the approved SWPPP on-site or at an easily accessible location throughout the duration of the project. Revisions to the Plan shall be included with the original plan. Modify contract documents to conform to revisions. Include actual date of installation and removal of BMP. Obtain written acceptance by the Construction Engineer before revising SWPPP. Additionally, the planned modifications to the BMP meeting the conditions listed in Section 7.4.1 of Appendix C, HAR 11-55, shall be documented and updated in the SWPPP according to Section 7.4 of Appendix C, HAR-55. An updated Plan shall be kept on-site throughout the remainder duration of the project.

The Contractor shall follow guidelines in the "*The City and County of Honolulu Storm Water Best Management Practice Manual – Construction*," (dated November 2011) in developing, installing, and maintaining BMP for the project. Follow CCH *Rules Relating to Soil Erosion Standards and Guidelines* (dated April 1999) for all projects on Oahu. Use respective Soil Erosion Guidelines for Maui, Kauai and Hawaii County projects. Information can be found at the respective County websites.

(B) Construction Requirements are as follows.

(1) No work shall be allowed to begin until submittals detailed in Subsection XXX.XX A.2 – Temporary Stormwater Pollution, Dust, and Erosion Control Submittals are completed and accepted in writing by the

Construction Engineer. The Contractor shall prevent pollutants from entering state waters. These efforts shall address areas such as those that drain to water, are over water, or drain to storm drains in the area of the project site. The Contractor shall design, operate, implement, and maintain the Plan to ensure that storm water discharges associated with construction activities will not cause or contribute to a violation of applicable state water quality standards.

(2) All projects at Honolulu and Kalaeloa Barbers Point Harbors are subject to HDOT Harbors Division SWMP requirements for construction at those harbors. The requirements include, but are not limited to, construction site BMP initial, recurring (i.e. every two weeks from October through March and every two months otherwise), and final inspections at the frequencies outlined in the SWMP. No grading or land disturbance activities are allowed until the initial BMP inspection is completed and required BMPs are found to be properly installed.

(3) Address all comments received from the Construction Engineer.

(4) Modify and resubmit plans and construction schedules to correct conditions that develop during construction which were unforeseen during the design and pre-construction stages.

(5) Coordinate temporary control provisions with permanent control features throughout the construction and post-construction period.

(6) BMP shall be in place and operational until the construction is completed and accepted by Harbors.

(7) Install and maintain either or both stabilized construction entrances and wheel washes to minimize tracking of dirt and mud onto roadways. Restrict traffic to stabilized construction areas only. Clean dirt, mud, or other material tracked onto the road immediately. Modify stabilized construction entrances to prevent mud from being tracked onto roadways.

(8) Chemicals may be used as soil stabilizers for either or both erosion and dust control if acceptable to the Construction Engineer.

(9) Cover exposed surface of materials completely with tarpaulin or similar device when transporting aggregate, soil, excavated material or material that may be a source of fugitive dust.

(10) Cleanup and remove any pollutant that can be attributed to the Contractor.

(11) Install or modify BMP due to change in the Contractor's means and methods, or for omitted condition that should have been allowed for in the

accepted SWPPP or a BMP that replaces an accepted one that is not satisfactorily performing.

(12) Properly maintain BMP. For projects that require an NPDES Appendix C General Permit from the HDOH, inspect, prepare a **monthly compliance report,** and make repairs to BMP on a timely basis. Maintain records of BMP inspections for the duration of the project. Submit copies of the inspection reports to the Construction Engineer upon request.

(13) Remove, replace or relocate any BMP that must be removed, replaced or relocated due to potential or actual flooding, or potential danger or damage to the project or public.

(14) The Contractor's designated representative specified in Subsection XXX.XX A. 2.a.1 shall address any BMP concerns brought up by the Construction Engineer within 24 hours of notification, including weekends and holidays. Should the Contractor fail to satisfactorily address these concerns, the Construction Engineer reserves the right to employ outside assistance or use the Construction Engineer's own labor forces to provide necessary corrective measures. The Construction Engineer will charge the Contractor such incurred costs plus any associated project engineering costs. The Construction Engineer will make appropriate deductions from the Contractor's monthly progress estimate. Failure to apply BMP shall result in either or both the establishment and increase in the amount of retainage due to unsatisfactory progress or withholding of monthly progress payment. Continued failure to apply BMP may result in one or more of the following: the Contractor being fully responsible for all additional costs incurred by HDOT Harbors Division including any fines levied by HDOH, suspension of the Contract, or cancellation of the Contract.

(15) The owner or its duly authorized representative shall be responsible for fulfilling the reporting requirements (e.g., state of construction activities, incident notification) according to Section 12 of Appendix C, HAR 11-55, and submittal requirements (e.g., monthly compliance report, Notice of Cessation form) according to Section 13 of Appendix C, HAR 11-55.

(C) **Hydrotesting Activities**. If work includes removing, relocation or installing waterlines, and the Contractor elects to flush waterline or discharge hydrotesting effluent into state waters or drainage systems, obtain a Notice of General Permit Coverage (NGPC) authorizing discharges associated with hydrotesting waters from the HDOH Clean Water Branch (CWB). If a permit is required, prepare and submit permit application (CWB-Notice of Intent (NOI) Form F) to the HDOH CWB.

Do not begin hydrotesting activities until the HDOH CWB has issued a NGPC. Hydrotesting operations shall be in accordance with conditions in the NGPC. Submit a copy of the NPDES Hydrotesting Waters Application and Permit to the Construction Engineer.

(D) **Dewatering Activities**. If excavation of backfilling operations require dewatering, and the Contractor elects to discharge dewatering effluent into state waters or existing drainage systems, obtain an NGPC authorizing discharges associated with construction activity dewatering from the HDOH CWB. If a permit is required, prepare and submit permit application (CWB-NOI Form G) to the HDOH CWB.

Do not begin dewatering activities until the HDOH-CWB has issued an NGPC. Conduct dewatering operations in accordance with the conditions in the NGPC. Submit a copy of the NPDES Dewatering Application and Permit to the Construction Engineer.

XXX.XX Measurement.

(A) Installation, maintenance, monitoring, and removal of the BMP will be paid on a lump sum basis. Measurement for payment will not apply.

(B) The Construction Engineer will only measure additional water pollution, dust and erosion control required and requested by the Construction Engineer on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation of the *Hawaii Standard Specifications for Road and Bridge Construction, 2005*.

XXX.XX **Payment**. The Construction Engineer will pay for accepted pay items listed below at contract price per pay unit, as shown in the proposed schedule. Payment will be full compensation for work prescribed in this section and contract documents.

The Construction Engineer will pay for the following pay item when included in the proposed schedule:

Pay Item	**Pay Unit**
Installation, Maintenance, Monitoring, and Removal of BMP	Lump Sum

No progress payment will be authorized until the Construction Engineer accepts in writing the SWPPP or when the Contractor fails to maintain the project site in accordance with the accepted SWPPP.

The Contractor shall reimburse the State of Hawaii within 30-day for the full amount of all outstanding costs incurred by the State of Hawaii for all citations or fines received as a result of the Contractor's non-compliance with regulations.

Attachment 8

HDOT Harbors Rules and Regulations for Construction Site

HARBORS RULES AND REGULATIONS FOR ENVIRONMENTAL COMPLIANCE

The Harbors environmental inspectors have been given authority to initiate enforcement actions including verbal warnings, written citations, and potential tenant eviction.

Hawaii Revised Statutes Title 15 Chapter 266

HRS 266-2 describes the powers and duties of the State of Hawaii Department of Transportation Harbors Division. **HRS 266-3** establishes the Director of Transportation authority to establish and enforce rules to control and manage all commercial harbors and roadsteads, all commercial harbor improvements, and all vessels and shipping within the commercial harbors and roadsteads. The Harbors then relies on **HRS 266-24**, which permits the Director of Transportation the authority to designate persons to enforce Chapter 266 and all rules and orders issued pursuant thereto and of all other laws of the state.

Such officers, employee's agents, and representatives of Harbors have police powers to serve and execute warrants and arrest offenders, and the power to serve notices and orders. When arresting or issuing a citation to a purported violator of any provision of Chapter 266, the Director of Transportation's designee, hereinafter referred to as "enforcement officer" can issue a summons or citation (similar to a traffic ticket) warning or directing the violator to appear and answer the charge before a district judge, or take the purported violator without delay before a district judge.

Penalties for violating the provision of Chapter 266 or rules or orders issued pursuant to Chapter 266 are issued by the district court and includes a finding or guilty or not guilty verdict of a misdemeanor and a fine. Fines arising from environmental protection violations include reimbursing the HDOT for the entire amount of the HDOH or EPA fine under HRS **§266-28** and can include an additional amount of not more than $10,000 for each day of violation under HRS **§266-25**.

Hawaii Administrative Rules Title 19 Chapters 41 to 44

HDOT adopted these chapters to regulate operations at the state harbors. **Chapter 42-126 and 42-127** specifically apply to environmental regulation. These rules require that no litter be left within a state harbor, except in properly marked bins. In addition, oil, oily refuse, sludge, chemicals, or other hydrocarbons should only be deposited in designated collection points. Specifically, Chapter 42-127 can be applied to activities such as maintenance or washing that has the potential to generate pollutants to be discharged into state waters. Below is an excerpt from Chapter 42-127:

> *"No person shall place, throw, deposit, or discharge, or cause to be placed, thrown, deposited, or discharged into the waters of any harbor, river or shore waters of the State any litter, or other gaseous, liquid or solid materials which render the water unsightly, noxious or otherwise unwholesome so as to be detrimental to the public health and welfare or a navigational hazard. No person shall discharge oil sludge, oil refuse, fuel oil*

or molasses either directly or indirectly, or pump bilges or ballast tanks containing other than clean water into the waters of any harbor, river or into any shore waters in the State."

In addition, Chapter 42 contains language on storage, usage, and/or handling requirements for hazardous materials or other regulated potential pollutants or hazardous substances. These chapters detail specific environmental practices where enforcement is implemented through arrest or citation and presented before the district judge. The major components of Chapter 42, related to enforcement, inspection, safety, cleanliness, use of facilities, and construction, are summarized below.

Chapter 42-15 – Compliance with Federal, State, and County Laws, Ordinances and Rules

- Use of state harbors and harbors facilities is subject to compliance with all applicable federal, state, and county laws, ordinances, rules and regulations. Particular attention is directed to:
    - Rules of the United States Public Health Service and of the state department of health, relating to the use of rat guards and other measures to prevent rodents from leaving the vessel.
    - Rules of the state department of health pertaining to air and water pollution.
    - Rules of the fire department of each county.

Chapter 42-16 – Citation for Violation

- Citations issued, pursuant to HRS 266-24.1, to a commercial firm for violation of this part may be issued to any agent, officer, or manager of the firm.

Chapter 42-50 – <u>Inspection</u>

All small craft and smaller commercial vessels moored or berthed at a state-owned or controlled pier, wharf, quay, bulkhead, landing dolphin, anchorage, mooring, or other facilities located in the shore waters, navigable streams, harbors, ports, and roadsteads of the State shall be subject to inspection by the department or any peace officer of the State or its political subdivisions at any time where necessary and proper for the purpose of enforcing these rules.

Chapter 42-52 - Small Craft and Smaller Commercial Vessel Repairs, Reconstruction or Major Modification

- Minor repairs to small craft and smaller commercial vessels may be made at the assigned berth and shall be completed within thirty days.
- If repairs are estimated to, or actually do, require that the vessel be out of service for more than thirty days, prior approval shall be sought from the department to initiate or complete the repairs in the harbor.
- Prior approval shall be sought from the department for any repairs requiring the use of cranes, lifts, and any similar devices within the harbor.
- Repair, reconstruction or major modification that would interfere with the free flow of other vessels, pedestrian, or vehicle traffic shall only be accomplished in an area

designated by the department. Failure to seek approval as required by this section shall be grounds for the revocation of the use permit.

Chapter 42-103 Vessel Loaded with Explosives

- No vessel containing more than five hundred founds of Class A, one tone of Class B, and/or ten tons of Class C explosives (net explosive content) shall enter or be loaded in any harbor in the State except on prior written permission of the harbor master of the district concerned, or the director.
- No Class A explosives, as defined by the United States Coast Guard in its regulations in existence as of June 1, 1993, will be admitted in any harbor in quantities in excess of the limitations established by the USCG for the various harbors unless otherwise authorized by the director in writing. Other cargos may not be moved concurrently with Class A explosive cargo.

Chapter 42-104 Handing of Explosives

- All handling and loading or unloading of explosives shall be done in a safe and careful manner and shall be accordance with the federal regulations pertinent thereto in force at the time. Explosives shall be off-loaded prior to the off-loading of any other cargo.

Chapter 42-105 Hauling of Explosives

- All hauling of explosives away from or to the pier shall be done in a safe and careful manner and shall be in accordance with rules of the state department of labor and industrial relations.

Chapter 42-106 – Containers for Flammable Liquids

- No empty containers which have been used to hold flammable liquids shall be delivered onto any wharf or structure under control of the department unless the same are securely closed with metal screw plugs.
- Any such containers shall be delivered onto a wharf or structure only at such times as a carrier is prepared to take immediately delivery.

Chapter 42-107 – Nitrate of Soda, Nitrate of Ammonia, Sulfur, and Other Similar Materials

- No nitrate of soda, nitrate of ammonia, sulfur, or other similar material shall be stored or left upon any wharf for more than four hours unless packed in sound and non-leaking containers. Such material shall be under the continuous care of a competent guard satisfactory to the harbor master until removed.
- Masters, owners, or agents of vessels or consignees of cargoes of nitrate of soda, sulfur, or other similar materials during the process of loading, unloading, and removing such cargoes, must at all times keep the wharf swept clean and free of such materials.
- If loose nitrate of soda, sulfur, or other similar material is to be discharged onto or loaded from any wharf or structure at any harbor, it shall be placed directly into the carrier and immediately removed. A protective device approved by the harbor master shall be used

during the period of loading or unloading to prevent the material being handled from falling upon the wharf structure.

- During the process of handling nitrate of soda, sulfur, or other similar material on any wharf at any harbor under control of the department, it shall be obligatory on the part of the master, owners, or agents of a vessel to provide containers of not less than 50 gallons capacity filled with a solution of nitrate of soda and water at distances of not more than 50 feet apart, with suitable buckets placed alongside each container, for the purpose of fighting any fire which may occur in such cargo.

Chapter 42-108 – Dangerous Acids; Electric Storage Batteries

- Acids of a dangerous character such as sulfuric, muriatic, and nitric acids shall be removed from the wharf immediately upon discharge from any vessel and no such acid shall be put upon a wharf under control of the department for shipment until the carrier is ready to receive it. Prior permission of the harbor master shall be secured in the event it becomes necessary to handle such cargo at other times.
- Electric storage batteries containing electrolyte or corrosive battery fluid of non-spillable type, protected against short circuits and completely and securely boxed, shall be exempt from this provision.

Chapter 42-109 – Flammable Substances; Leaky Containers

- No gasoline, distillate, kerosene, benzene, naphtha, turpentine, paints, oils, or other flammable substances in leaky containers shall be delivered onto any wharf under control of the department for shipment.
- All such substances unloaded from any vessel in leaky containers shall be removed immediately.

Chapter 42-110 – Heating Combustibles on Vessels

- No combustible material such as pitch, tar resin, or oil shall be flame heated on board any vessel within the harbors or streams of the State without the permission of a harbor master.

Chapter 42-111 – Fumigation of Vessel

- No vessel shall be fumigated or smoked at any wharf under control of the department without the prior permission in writing from the director, the chief, or the harbor master.
- If fumigation is to be with cyanogen products or hydrocyanic acid gas in any form, however generated, the applicant or applicant's agent shall be in possession of a permit as required by HDOH rules and shall have a guard on duty so long as any danger exists, in order that no one, unless properly entitled to do so, be allowed to board such vessel.

Chapter 42-112 – Use of Fuel Burning Steam Generating Appliances

- All fuel burning steam generating appliances when used on any wharf under control of the department or on any scow, pile driver, or other vessel working alongside or near

any wharf under control of the department shall be equipped with spark arresters satisfactory to the harbor master.

- At the close of each day's work, all ashes, cinders, waste, or other deposits caused by such appliances upon any wharf shall be promptly removed and shall not be disposed of in or upon any waters of the harbor.

Chapter 42-113 – Repair, Manufacturing, Construction, or Maintenance Work on Wharf

- No person shall make any repair or do any kind of manufacturing, construction, or maintenance work on any wharf without the permission of the harbor master.

Chapter 42-114 – Smoking Prohibited

- Smoking is positively prohibited at all times within any cargo shed, or upon any wharf apron, and during the time cargo is being loaded, unloaded, or stored on any unshedded pier under control of the department, and no person shall enter into, stand in, or under, or pass through any such wharf or structure with a lighted pipe, cigar, cigarette, match, fire, or any flame of whatever nature, excepting only within those areas designated by the harbor master and plainly marked "Smoking Area."
- No smoking or lighting of a match or any other fire-creating device shall be permitted within 50 feet of any fueling operation.

Chapter 42-115 – Use of Explosives

- The use of explosives on land, on any wharf, or in a shed or other structure under control of the department, or in the water in the immediate vicinity of the same, without the written approval of the harbor master is strictly prohibited.

Chapter 42-116 – Keeping Wharf in Sanitary Condition and Clear of Fire Hazard

- Vessel owners, charterers, agents, or private terminal operators utilizing wharves and sheds under the control of the department for the handling of merchandise shall keep such wharves and sheds in a clean and sanitary condition, clear of materials which create a fire hazard and shall ensure that passageways and established fire lanes are not obstructed.

Chapter 42-117 – Standards of Cleanliness

- All vessels moored at a state-owned mooring or berthing facility shall be kept, at all times, in a condition of reasonable cleanliness and sanitation so as not to constitute a common nuisance or potential source of danger to public health.

Chapter 42-118 – Charges for Cleaning Wharves

- In cases where the department takes over the cleaning of wharves the charge therefore shall be assessed against the vessel which is responsible for the necessary of cleaning.

Chapter 42-119 – Identification of Mobile Equipment

- All mobile equipment used on any property under the control of the department in connection with the handling of cargo or shipping containers, such as folk lifts, cranes, tractors, and straddle trucks, shall be clearly identified as to the owner thereof.

Chapter 42-121 – Fowl, Animal, or Livestock

- No fowl, animal, or livestock of any kind shall be allowed to remain on any wharf under control of the department for a period longer than six hours without being properly fed and watered. After any fowl, animal, or livestock unloaded on a state wharf, it shall be removed from the same wharf within twenty-four hours.
- No shipment of such fowl, animal, or livestock subject to quarantine shall be unloaded on a state wharf by any shipping company or its agents unless first passed by the state department of agriculture or unless arrangement have been made of acceptance of quarantine. All such fowl, animal, or livestock requiring quarantine shall be removed from the wharf within eighteen hours.
- All expenses incurred in the care and maintenance of such fowl, animal, or livestock while on a state wharf shall be paid by the consignee thereof and shall constitute a lien upon the same until such charges are paid.

Chapter 42-122 – Private Use of State Harbor Property or Facilities; Business Activities; Signs

- No regular or extensive use of any state harbor property or facility for private gain or purpose shall be permitted without corresponding and reasonable benefits and returns to the public.
- No person shall engage in any business or commercial activity at any state harbor without the prior written approval of the department. Without limiting its generality, the term “engage in any business or commercial activity” as used in this section includes (1) solicitation, and (2) distribution of advertisement or circulars, intended for private gain or purpose.
- No person shall post or display any signs at any state harbor without the prior written approval of the department, except that approval will not be required for the posting or displaying of any sign on a vessel which relates solely to the sale of such vessel if the maximum dimension of such sign does not exceed three feet.

Chapter 42-123 – Placement of Goods and Equipment

- Any person handling goods or using equipment on a wharf or within a shed under control of the department or bringing goods whereon or therein for shipment, shall place, store, or stack such goods or equipment in such a way as not to be an impediment to the approaches to same nor an obstacle to the removal of other goods, not to cause damage to the shed or wharf.
- No goods shall be so placed as to restrict or prevent the use of mooring bitts, cleats, or any other device used for mooring purposes.
- No goods shall be so placed as to restrict or prevent the use of tracks, water connections, fire hydrants, gutters, liquid connections or drains, telephone or electric connections.

Chapter 42-124 – Closing of Wharves for Safety Reasons

- The harbor master may close the wharves or any portion thereof and regulate and control the use of the same whenever in the harbor master's opinion it is advisable to do so for reasons of safety, fire prevention, or probable interference with cargo handling or vessel operations.
- No person shall enter upon any wharf so closed without the permission of the harbor master.

Chapter 42-125 – Liability for Damage to or Loss of Merchandise and Cargo

- The department shall not be liable for any damage to or loss of merchandise or other property on any wharf under its control.
- It shall be the responsibility of shipping concerns or their agents to exert every effort to protect cargo from the effect of weather conditions while same is stored on state wharves. This responsibility shall include the proper closing of all openings such as outside doors and windows, and the placing of cargo on pallets or dunnage so that it will not be damaged by moisture from the shed floors. Unless the above precautions are taken and unless carelessness on the part of department employees can be shown, no claim for damaged cargo due to inclement weather shall be considered.

Chapter 42-126 – Littering or Polluting Land Areas Prohibited

- No person shall throw, place, leave, deposit, abandon, or cause or permit to be thrown, placed, left, deposited or abandoned any litter within a state harbor, except in receptacles designated by the department for the disposal of such materials. "Litter" as used in this section includes any and all types of debris and substances, whether liquid or solid, and materials such as garbage, refuse, rubbish, glass, cans, bottles, paper, wrappings, fish or animal carcasses or any other substances which render harbor lands or facilities unsightly, noxious or otherwise unwholesome to the detriment of the public health and welfare and effective and safe operation of the harbor.
- No person shall deposit oil, oily refuse, sludge, chemicals, or other hydrocarbons on state property except in specially designated collection points. These items may not be left in or near standard refuse containers or anywhere else on harbors property. Penalties, including but not limited to the revocation of mooring permits and the right to use the facilities, may be invoked.

Chapter 42-127 – Littering or Polluting of Water Prohibited

- No person shall place, throw, deposit, or discharge, or cause to be place, thrown, deposited, or discharges into the waters of any harbor, river or shore waters of the State any litter, or other gaseous, liquid or solid materials which render the water unsightly, noxious or otherwise unwholesome so as to be detrimental to the public health and welfare or a navigational hazard.

- No person shall discharge oil sludge, oil refuse, fuel oil, or molasses either directly or indirectly, or pump bilges or ballast tanks containing other than clean water into the waters of any harbor, river or into any shore waters in the State.

Chapter 42-128 – Disposal of Salvage of Derelict Craft

- When any owner, agent, or individual contemplates or plans the disposal or salvage of a derelict craft, vessel or other object of any size, type or description, by transporting across, within or on navigable waters, whether a part or whole craft or whether a floating or suspended object of any sort which might, if sunk, lost or abandoned in the harbors, channels or shore waters, become a hazard to navigation, to dredging or to other operation of state or federal government, or the public in those waters, that person shall obtain the written permission of the harbor master before taking such action.

Chapter 42-129 – Duty of Persons Who Lose, Drop, or Abandon Any Floating or Sinking Object

- Should any owner, operator, charter, agent, or individual, without permission of the harbor master, lose, sink, drop, or abandon any floating or sinking object in or on the navigable waters and shore waters of the State, that person shall immediately notify the harbor master and shall immediately take such action as is necessary for removal of the object.
- Upon failure on the part of the owner, operator, charterer, agent or individual to remove such object the department will take such actions through federal or commercial channels as are necessary for such removal and will charge all costs incurred by the department in effecting the necessary removal to the owner. The harbor master may require the posting of a bond to assure payment.

Chapter 42-130 – Approved Backflow Prevention Device Required for Water Supply System

- No person shall connect a vessel's water supply system, siphon or other water water-operated device, equipment or mechanism connected to the water supply system or operate any water-operated device, equipment or mechanism connected to the water supply system, unless an approved backflow prevention device has been installed at the faucet or other point of connection. An "approved backflow prevention device" means a backflow prevention device that meets the requirements contained in Standard 1001, American Society of Sanitary Engineers as it existed on June 1, 1993, or the Uniform Plumbing Code adopted by the International Association of Plumbing and Mechanical Officials.

Chapter 42-131 – Dumping of Materials at Sea

- When any owner, agent or individual contemplates the dumping of sinkable materials at sea by hauling across, within or on the navigable and/or shore waters of the State that person shall notify and obtain the permission of the department as specified in §19-42-161 and §19-42-162 prior to movement and shall not fail to perform any duty imposed thereby. All dumping at sea of sinkable objects or materials shall be done in the areas

designated by the Secretary of the Army for such disposal and in accordance with the Corps of Engineers requirements and applicable state agency requirements.

- The dumping of floating objects is strictly prohibited.

Chapter 42-132 – Waste Outlets; Permit Required

- Notwithstanding the issuance of a permit pursuant to §19-42-161, no person shall do any of the following within a state commercial harbor without first having obtained a permit from the HDOH (not applicable to vessels):
    - Discharge any wastes from shore into the waters of a state commercial harbor so as to reduce the quality of the water below the standards of water quality adopted for such waters by the HDOH.
    - Construct, install, modify, alter, or operate any treatment works or part thereof or any extension of addition thereto which discharges from shore into the waters of a state commercial harbor.
    - Construct or use new outlet for the discharge of any wastes from shore into the waters of a state commercial harbor.

Chapter 42-133 – Loading or Unloading Flammable Liquids

- Loading or unloading of flammable liquids shall be in strict accordance with applicable federal laws and regulations.

Chapter 42-134 – Appliances and Electrical Wiring

- All cooking or heating appliances or any other machinery, equipment, utensils, or apparatus which are used by small craft or smaller commercial vessels at a state commercial harbor and could be the cause of fire shall be so constructed, installed, wired, situated, maintained, and used so as not to constitute a potential fire hazard. The failure to conform to any statute, rule, regulation, standard, or ordinance affecting fire safety may be considered by the department in determining any violation of this section.
- Particular attention is directed to the applicable provisions of the state boating rules of the Department of Land and Natural Resources. In addition, the approval of any machinery, equipment, utensils, or apparatus by Underwriter' Laboratories, Factory Mutual System, Marine Testing Institute, Inc., or any other nationally recognized electrical testing agency, may be considered by the department in determining compliance with this section.
- All electrical equipment must be properly grounded.

Chapter 42-135 – Fire Extinguishing Equipment for Small Craft

- Any small craft utilizing the waters of the state commercial harbor shall be provided with approved fire extinguishers as prescribed in the applicable provisions of the state boating rules of the DLNR. The fire extinguishers shall at all times be maintained in good and serviceable condition for immediate and effective use an shall be mounted on wall brackets so located as to be readily accessible. In addition, if any person is living aboard any small craft or contrivance, which is not a visiting small craft temporarily using the

harbor, the small craft or contrivance shall be equipped with at least one approved hand portable fire extinguisher containing ten pounds of dry chemicals placed on each separate level or floor of habitable living space. Each extinguisher shall be mounted on a wall bracket so placed as to be readily accessible.

Chapter 42-136 – Fueling

- All fueling operations shall be done in compliance with the stricter of any applicable federal, state, or county rules. The fueling of vessels at a state commercial harbor where a marine fueling station has been established, or where authorized tank trucks or tank trailers are available shall be accomplished only at a station, or by tank trucks or tank trailers with a state permit. A permit shall be issued only if:
    - Proper application has been submitted;
    - Established fees have been paid to the department by the applicant;
    - There exists a comprehensive general liability insurance policy or policies, or a certificate of insurance in lieu thereof evidencing that a policy has been issued and is in force with a combined single limit of not less than $500,000. The specification of limits contained in this section shall not be construed in any way to be a limitation on the liability of the permittee for any injury or damage proximately caused by it. The insurance shall (A) be issued by an insurance company or surety company authorized to do business in the State; (B) name the State as an additional insured; (C) provide that the department shall be notified at least thirty (30) days prior to any termination, cancellation, or material change in its insurance coverage; (D) cover all injuries, losses, or damages arising from, growing out of, or caused by any acts or omissions of the permittee, its officers, agents, employees, invitees, or licensees, in connection with the permittee's use or occupancy of the premises; and (E) be maintained and kept in effect at the permittee's own expense throughout the life of the permit. The permittee shall submit evidence to the department of renewals of other actions to indicate that the insurance policy remains in effect as prescribed in this section.
- Prior to fueling a vessel at a state commercial harbor, the operator shall:
    - Securely moor the vessel;
    - Stop all engines, motors, fans, and devices which could provide sparks;
    - Extinguish all fires;
    - Close all ports, windows, doors, and hatches; and
    - Clear the area of people not directly involved with the operation of the vessel or servicing of the vessel.
- Persons fueling a vessel at a state commercial harbor shall:
    - Refrain from smoking, striking matches, or throwing switches; and
    - Keep the nozzle of the fuel hose, or fuel can in continuous contact with fuel tank opening to guard against static sparks.
- After fueling is completed, the following action shall be taken:
    - Close fill openings;
    - Wipe up all spilled fuel;

- Open all ports, windows, doors, and hatches;
- Permit vessel to ventilate for at least five minutes; and
- Check that there are no fuel fumes in the vessel's bilges or below deck spaces before starting machinery or lighting fires.

- Fueling a vessel from a fuel barge or tanker barge shall be allowed only when it is down in accordance with operational procedures approved by the USCG.

Chapter 42-137 – Fishing Prohibited

- Fishing, as defined in HRS 187A-1 is prohibited from all piers, wharves, and bulkhead walls in Kewalo Basin and Honolulu Harbor except Piers 5, 6, and 7; and all piers and wharves in Barbers Point Harbor. Casting of fishing lines beyond the shallow marginal reef and into the boat channel is prohibited from the Waikiki side of the Kewalo Basin entrance channel. Fishing with nets is prohibited in the basin and channel areas of Kewalo Basin, Barbers Point Harbor, and Honolulu Harbor except for the use of hand-held scoop nets for landing hooked fish at Piers 5, 6, and 7 in Honolulu Harbor and the shallow marginal reef at the Waikiki side of the Kewalo Basin entrance channel and as provided in these rules and HAR 188-34.

Chapter 42-138 – Lifesaving Equipment Required

- Any small craft and smaller commercial vessel utilizing the waters of a state commercial harbor shall be equipped with lifesaving equipment as required by and approved by the USCG. Wearable PFDs must be readily accessible and throwable devices must be immediately available for use
    - Boats 16 feet or over in length shall carry one Type I, II, or III (wearable) PFD for each person on board and one Type IV (throwable) PFD in each boat.
    - Boats less than 16 feet in length and all canoes and kayaks shall carry one Type I, II, III, or IV PFD for each person on board.

Chapter 42-139 – Fire Signal for Small Craft or Smaller Commercial Vessel in Harbor

- Five prolonged blasts on a vessel's whistle, horn or other sound producing device indicates (1) a fire on board small craft or smaller commercial vessel not under way or (2) a fire at any facility to which the small craft or smaller commercial vessel may be moored. The words "prolonged blasts" used in this section shall mean a blast from four to six seconds duration. The fire signal shall not be used for other purposes in any state harbor.

Chapter 42-140 – Liquor Prohibited on State Piers and Waterfront Properties without Permit

- No person shall consume any liquor as defined in HRS 281-1, on any state pier or waterfront property not under lease except by prior permission from the department for each occasion.

Chapter 42-141 – Responsibility for Vessel Gangplanks

- It shall be the responsibility of the vessel to provide a reliable and safe means of access and egress to and from the vessel and the pier for crew members, passengers, and visitors to the vessel.

Chapter 42-161 – Dredging, Filling, and Construction

- Any person, firm, or corporation desiring to perform any dredging, filling, or erecting of any construction within commercial harbors and entrance channels belonging to or controlled by the State, shall first obtain a permit therefore from the department.
- The application for any dredging, filling, or construction shall be in the form prescribed by the department, accompanied by maps and drawings which shall clearly show the location, scope, character, and details of the proposed work, and shall be further accompanies by a fee of $50 to cover costs of the necessary investigation. This fee is not refundable whether or not a permit is granted.

Chapter 42-162 – Jurisdiction of Other Agencies

- The United States Army Corps of Engineers, the State Department of Health, and the Department of Land and Natural Resources may have certain jurisdiction over navigable waters.
- The approval of these agencies shall also be secured before performing work within their jurisdictions. When directed, the applicant shall notify the USCG of such work for publication of a “Notice to Mariners.”

Chapter 42-163 – Installation of Buoys

- Any person desiring to install mooring or anchorage buoys in any harbor under the jurisdiction of the department, shall apply to the department in writing for permission to install such buoys.
- Applications must be accompanied by comprehensive plans showing the exact proposed location of buoys and anchors, as well as plans and specifications of the type and size of buoy and anchoring equipment. The director may grant permission for the installation of moorings or buoys in any area under the department jurisdiction if, in the director’s judgment, it is advisable and will not be a menace to or interfere with navigation. The right is reserved by the director to revoke any license or permission for installation at any time, if the director’s opinion revocation is necessary or advisable. Upon revocation, the owner shall remove the moorings or buoys without delay.

Chapter 42-164 – Construction of Structures

- No buildings or structures of any nature shall be erected or constructed on state property, nor shall existing structures be modified, without obtaining the prior permission of the division and any other governmental agency as required by law. The division may require plans, specifications, and other pertinent data to accompany any request for construction or modification of state facilities. In General, approval shall be dependent on an agreement to return the property to its original state when vacating the property, if requested by the division.

Note: The majority of Chapter 42 deals with loading and unloading of hazardous materials and does not apply to storage of materials and waste that are used/stored at harbor tenant facilities or construction sites. In the case of improper use, manage, or storage of hazardous substances or wastes, Harbors will follow the terms and conditions contained in the tenant lease agreement or revocable permit, or construction contracts as stated below.

Enforcement Officers may issue penalties under HAR Title 19 for the following circumstances:

- A responsible party in violation of an environmental regulation, but where a Written Warning is not an effective tool.
- A responsible party in violation of a Harbors requirement, but not in violation of HDOH storm water regulations.
- A transient vessel owner in violation of a Harbors requirement, BMP, or HDOH storm water regulation, although not subject to a tenant lease agreement, revocable permit, construction contract.

Attachment 9

Suspected Illicit Discharge Reporting Form

Hawaii Department of Transportation – Harbors Division

Suspected Illicit Discharge Reporting Form

General Information: Use this form to report a suspected illicit discharge. If you are unsure, please contact your supervisor or HAR-EE. Examples of illicit discharges: uncontained vehicle/equipment/building/sidewalk washing, sink discharging directly to ground or storm drain inlet, petroleum spills/sheens, unpermitted vessel discharges, uncontained vessel painting/chipping/sandblasting/cleaning, etc.

Observer Information			
Name:			
Office Code:		Telephone Number:	
Report Date:			

Description of Suspected Illicit Discharge			
Address or Location:		Date and Time:	
Description: (Include Substance and Amount, if known)			

Media into which the discharge occurred:

☐ Air ☐ Natural Soil ☐ Concrete/Asphalt Pavement ☐ Stream ☐ Ocean ☐ Other:_____

Responsible Party: (if known)	
Cause of Discharge: (if known)	
Clean-up Actions: (if applicable)	
Notifications Made:	

Please forward completed form and/or picture(s) to HAR-EE office. Fax Number: (808) 587-1964

Point of Contact for Reporting	
Agency	**Telephone Number**
Harbor Traffic Control (Aloha Tower)	(808) 587-2076, (808) 368-5993 (Cellular)
Hawaii Department of Transportation Harbors Division, Engineering Environmental Section [HAR-EE]	(808) 587-1962, (808) 587-1976, (808) 587-1960

Additional Follow-up By HAR-EE (to be filled by HAR-EE):

Attachment 10

Training Materials

STORM WATER RUNOFF AND ITS IMPACTS

Storm water runoff is rain or snowmelt that flows over land and does not percolate into the soil (EPA, 2007). Storm water runoff occurs naturally, in small amounts, from almost any type of land surface, especially during larger storm events. Impervious surfaces, such as buildings, homes, roads, sidewalks, and parking lots can significantly alter the natural hydrology of the land by increasing the volume, velocity, and temperature of runoff and by decreasing its infiltration capacity. Increasing the volume and velocity of storm water runoff can cause severe stream bank erosion, flooding, and degrade the biological habitat of these streams. Reducing infiltration can lower groundwater levels and affect drinking water supplies.

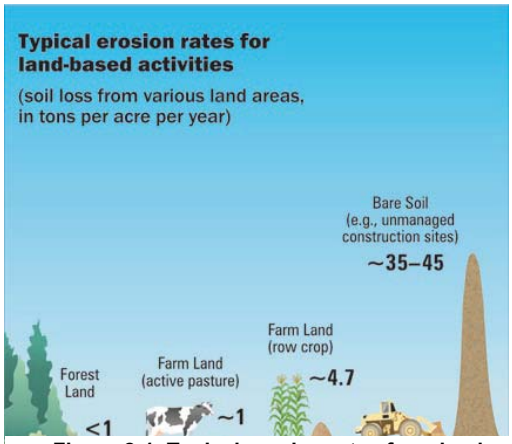


Figure 2-1. Typical erosion rates from land-based activities.

In addition, as storm water runoff moves across surfaces, it picks up trash, debris, and pollutants such as sediment, oil and grease, pesticides, and other toxics. Changes in ambient water temperature, sediment, and pollutants from storm water runoff can be detrimental to aquatic life, wildlife, habitat, and human health. Soil exposed by construction activities is especially vulnerable to erosion. Runoff from an un-stabilized construction site can result in the loss of approximately 35 to 45 tons of sediment per acre each year, compared to less than one ton in forested land (American Society of Civil Engineers [ASCE] and Water Environment Federation [WEF], 1992; Figure 2-1). Even during a short period of time, construction sites can contribute more sediment to streams that would be deposited naturally over several decades. Excess sediment can cloud the water reducing the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in waterways.

Importance of Construction Site Runoff Control Program

This **Construction Site Runoff Control Program** has been developed to address the potential pollutants that are generated as a result of construction activities conducted at Harbors. These potential pollutants pose a risk to Harbors Small MS4 and the receiving water bodies through storm water runoff. Uncontrolled storm water runoff from construction sites can significantly impact our ocean water.

Construction Impacts

Construction activities can impact the environment through several different processes. The primary storm water pollutant at a construction site is sediment, a common result of erosion.

Erosion and Sedimentation

Excessive erosion and sedimentation are the most visible water quality impacts. Erosion is the

process by which the soil and rock are removed from the earth's surface by the action of water, wind, and gravity, and then transported and deposited in other locations. Sedimentation is the movement and settling out of suspended soil particles. It is usually easier and less expensive to prevent erosion than it is to control sediment from leaving a construction site. To control erosion at a construction site, it is important to understand the different types of erosion that can occur.

Water Erosion

In Hawaii, water erosion is typically occurring in six different forms (i.e., raindrop erosion, sheet erosion, rill erosion, gully erosion, stream-bank erosion, and coastal erosion). Raindrop erosion involves the dislodging of soil particles by raindrops. Once the rate of rainfall is faster than the rate of infiltration into the soil, surface runoff occurs and carries the loosened soil particles down slopes. Sheet erosion is the transport of loosened soil particles by surface runoff that is flowing downhill in thin sheets. Rill erosion removes soil through the formation of concentrated runoff that creates many small channels. Gully erosion is the result of highly concentrated runoff that cuts down into the soil along the line of flow. Stream-bank erosion occurs when flowing water erodes unstable stream-banks. Coastal (or shoreline) erosion primarily occurs on both exposed and sheltered coasts through the action of currents, waves, and tidal change.

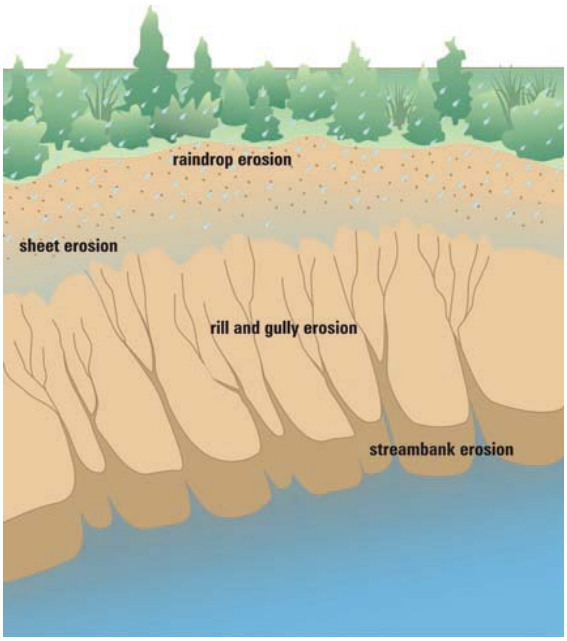


Figure 2-2. Types of Erosion.

Generally, water erosion begins when raindrops break down the soil structure and dislodge soil particles. Runoff carrying the soil particles becomes sheet erosion, which eventually forms smaller rills and larger gullies (Figure 2-2). The best way to stop water erosion is to keep the soil in place through vegetation, erosion control blankets, or other methods that prevent the soil from becoming dislodged during rain events.

Wind Erosion

Wind erosion is of two primary varieties (i.e., deflation and abrasion; Blanco & Lal, 2010). Deflation occurs when the wind picks up and carries loose soil particles, and abrasion occurs when the surfaces are worn down as they are struck by airborne particles carried by wind. Deflation is divided into three categories, including surface creep, saltation, and suspension (Figure 2-3). Surface creep occurs when larger heavier particles slide or roll along

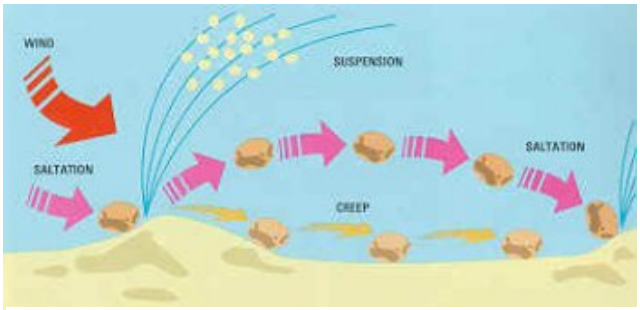


Figure 2-3. Wind Erosion.

the ground. Saltation occurs when particles are lifted a short height into the air and bounce and saltate across the surface of the soil. Suspension is a phenomenon when very small and light particles are lifted into the air by the wind and are carried for long distances. Saltation is responsible for the majority (50 to 70 percent [%]) of wind erosion, followed by suspension (30 to 40 %), and then surface creep (5 to 25 %; Blanco & Lal, 2010). Wind erosion is much more severe in arid areas, and during times of drought.

Wind erosion is another potential hazard at construction sites and is commonly referred to as dust. Dust is defined as solid particles or particulate matter predominantly large enough to eventually settle out from the air but small enough to remain temporarily suspended in the air for an extended period. Common sources of dust at construction sites include vehicle and equipment use, exposed areas of soil, and contractor activities such as land clearing, drilling, and demolition.

Gravitational Erosion

Gravitational erosion, or mass movement, is the downward and outward movement of rock and sediments on a sloped surface, mainly due to the force of gravity (Gray & Sotir, 1996; Norris *et al.*, 2008). Gravitational erosion is often the first stage in the breakdown and transport of weathered material in sloped areas. It moves material from a higher elevation to a lower elevation. This type of erosion occurs continuously on all slopes (some act very slowly, while others occur very suddenly with disastrous results).

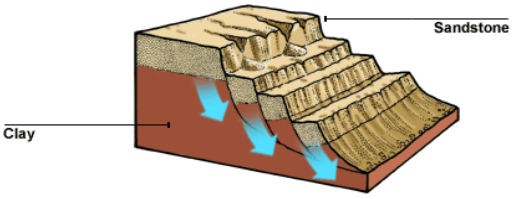


Figure 2-4: Landslide.

Any perceptible downward movement of rock or sediment is often referred to in general terms as a "landslide." However, landslides can be classified in a much more detailed way that reflects the mechanisms responsible for the movement and the velocity at which the movement occurs (Figure 2-4). One of the visible topographical manifestations of a very slow form of such erosion is a scree slope (Figure 2-5).

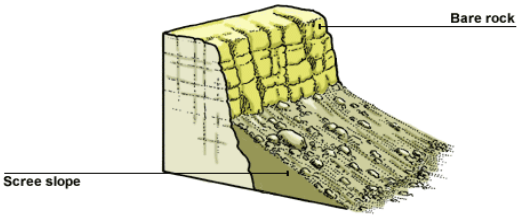


Figure 2-5: Scree Slope.

Slumping happens on steep hillsides (Figure 2-6). It occurs along distinct fracture zones, often within soil materials like clay that may move quite rapidly downhill upon being released. In some cases, slumping is caused by water beneath the slope weakening it. In many cases, it is

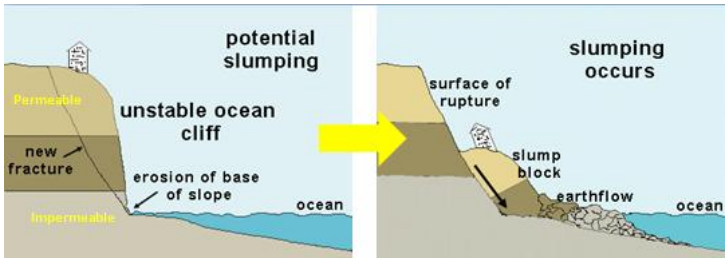


Figure 2-6: Slumping.

simply the result of poor engineering control or measurement. Surface creep is the slow movement of soil and rock by gravity, which is usually not perceptible except through extended observation. It can also describe the rolling of dislodged soil particles 0.5 to 1.0 millimeters in diameter by wind along the soil surface.

Factors Affecting Erosion

The erosion process is typically influenced by climate, topography, soils, and vegetative cover. Understanding how these factors influence erosion, will help with selection, design, and implementation of appropriate controls to minimize erosion from the construction site (EPA, 2007).

Climate: The frequency, intensity, and duration of rainfall are the principal factors influencing erosion from a construction site. Know the weather patterns in the area and, if possible, plan soil disturbance activities for periods of dry weather. The mean annual rainfall in the areas of Honolulu and Kalaeloa Barbers Point Harbors is 23.6 inches (Giambelluca *et al.,* 2011). Generally, weather in Hawaii is very consistent, with only minor changes in temperature throughout the year. For the majority of Hawaii, there are only two seasons – summer/dry (from April to September) and winter/wet (from October to March), based on the rainfall data presented at The Weather Channel website (The Weather Channel, 2013) and U.S. Climate Data website (The US Climate Data, 2013).

Topography: The longer and steeper a slope, the greater the potential there is for erosion from the slope. Use practices such as diversions or fiber rolls to break up long slopes. Consider minimizing soil disturbance activities on steeper slopes.

Soils: Soil type can also impact erosion. Soil texture, structure, organic matter content, compaction, and permeability can all influence erosion rates.

Vegetative Cover: Vegetative cover provides a number of critical benefits in preventing erosion. It absorbs the energy of raindrops, slows velocity of runoff, increases infiltration, and helps bind the soil. Soil erosion can be greatly reduced by maximizing vegetative cover at construction site.

Other Common Pollutants

In addition to sedimentation, other common pollutants, which have the potential to impact water quality, including nutrients, trace metals, pesticides, oil and grease, fuels, and other toxic chemicals. Nutrients, including nitrogen and phosphorus, are often used in fertilizers and, can cause excessive algae growth. Bacteria and viruses can contaminate storm water from animal excrement or sanitary sewer overflows. Oil and grease includes a wide array of petroleum hydrocarbons from various sources, such as leaks from vehicles and equipment and used oil disposal. Metals can enter the storm water after impact with corroded equipment. It is important to note that over half of the trace metal load carried in storm water is associated with sediments. Organics can contaminate the storm water as a result of spilled or improperly disposed cleaners

and solvents.

Each construction site should be assessed to determine which pollutants may present a potential hazard, and select and implement BMPs to reduce the potential contaminants..

Site Specific Construction Best Management Practices Plan

An SSCBMPP is a site-specific written document that identifies potential sources of storm water pollution at the construction site. It describes practices to reduce pollutants in storm water discharges from the construction site. Reduction of pollutants is often achieved by controlling the volume of storm water runoff (e.g., taking steps to allow storm water to infiltrate into the soil). In addition, it identifies procedures that the operator will implement to comply with the terms and conditions of a construction general permit.

An effective SSCBMPP is the primary key to prevent or reduce storm water pollution resulted from a construction site. If sediment and erosion controls and good housekeeping practices are followed, construction activity can result in the discharge of significantly less sediment and other common pollutants.

Section D

Post-Construction Stormwater Management in New Development and Redevelopment

Stormwater Management Plan
Honolulu Harbor
and Kalaeloa Barbers Point Harbor



Prepared for:
State of Hawaii
Department of Transportation
Harbors Division

FINAL

Post-Construction Stormwater Management in New Development and Redevelopment Honolulu and Kalaeloa Barbers Point Harbors

Small Municipal Separate Storm Sewer Systems File Nos. HI 03KB482 and HI 03KB488

Prepared For:

State of Hawaii
Department of Transportation
Harbors Division
79 South Nimitz Highway
Honolulu, Hawaii 96813

May 2014

Version 7.0

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4.0	December 2013	Version 4.0	All
5.0	February 2014	Version 5.0	All
6.0	May 2014	Version 6.0	All
7.0	May 2014	Version 7.0	5

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Appendix D	CCH Rules Relating to Storm Drainage Standards
Appendix E	A Sample of CDS Unit Operation and Maintenance Guideline

LIST OF ACRONYMS AND ABBREVIATIONS

%	Percent
ACR	Annual Compliance Report
BMP	Best Management Practice
CASQA	California Stormwater Quality Association
CCH	City and County of Honolulu
DA	Drainage Area
EPA	U.S. Environmental Protection Agency
HAR	Hawaii Administrative Rules
HAR-E	Harbors Division Engineering Branch
HAR-EC	Harbors Division Engineering Branch Construction Section
HAR-ED	Harbors Division Engineering Branch Design Section
HAR-EE	Harbors Division Engineering Branch Environmental Section
HAR-EM	Harbors Division Engineering Branch Maintenance Section
HAR-EP	Harbors Division Engineering Branch Planning Section
HAR-PM	Harbors Division Property Management Section
HDOT	State of Hawaii Department of Transportation
HRS	Hawaii Revised Statutes
LID	Low Impact Development
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O&M	Operation and Maintenance
PM	Harbors Division Project Manager
POPC	Pollutants of Potential Concern
PSWP	Post-Construction Stormwater Mitigation Plan
TMDL	Total Maximum Daily Loads
WQF	Water Quality Flow Rate
WQV	Water Quality Volume

DEFINITIONS OF KEY TERMS

Best Management Practices (BMPs): refers to those methods that are the most effective, practical means of preventing or reducing pollution from stormwater runoff. These include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States.

Clean Water Act: The Clean Water Act is an act passed by the U.S. Congress to control water pollution. It was formerly referred to as the Federal Water Pollution Control Act of 1972 or Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), 33 U.S.C. 1251 et seq., as amended by Public Law 96-483, Public Law 97-117, and Public Laws 95-217, 97-117, 97-440, and 100-04.

Code of Federal Regulations: The document that codified all rules of the executive departments and agencies of the federal government. It is divided into fifty volumes, known as titles. Title 40 of the CFR (referenced as 40 CFR) lists all environmental regulations.

Disturbance of Land: refers to the penetration, turning, or moving of soil or resurfacing of pavement with exposure of the base course or the exposure of bare soil or ground surface, including the land surface exposed by construction of roads, buildings, utilities, baseyards, staging areas, demolition, headquarters, and parking areas. It does not include grass or weed cutting, bush or tree trimming or felling that leaves soil or ground intact. It includes “grubbing” in its normal meaning of the use of equipment to knock down and push vegetation out of the way, typically uprooting vegetation and disturbing the ground surface.

LID Site Design Strategy: combines a hydrologically functional site design with pollution prevention measures to compensate for land development impacts on hydrology and water quality. They mimic the predevelopment site hydrology by using site design techniques that store, infiltrate, evaporate, and detain runoff to reduce off-site runoff and ensure adequate groundwater recharge.

MS4: EPA categorizes MS4s as either “small,” “medium,” or “large.” The Phase I Storm Water Rule covers medium and large MS4s. A medium MS4 is an MS4 located in an incorporated place or county with a population of 100,000-249,000 (according to the 1990 Census). A large MS4 is an MS4 located in an incorporated place or county with a population of at least 250,000. A small MS4 is one that is not already defined as medium or large. The Phase II Storm Water Rule covers a subset of small MS4s that are called “regulated small MS4s.” Regulated small MS4s are automatically designated if they are located in “urbanized area” (as defined by the Bureau of the Census). Other small MS4s located outside urbanized areas may be designated on a case-by-case basis by the NPDES permitting authority.

New Development: shall mean new construction or installation of a building or structure or the creation of impervious surfaces that disturb greater than or equal to one acre, or less than one acre if it is part of a larger common plan of development or sale that would disturb one acre or more.

Post-Construction BMP: refers to practices or control measures used to mitigate stormwater impacts from new development and redevelopment site. It includes LID site design strategies, source control BMPs, and treatment control BMPs. These practices treat, store, or infiltrate runoff onsite before it can affect water bodies downstream. Innovative site designs that reduce imperviousness and smaller-scale low impact development practices dispersed throughout a site are also ways to achieve the goals of reducing flows and improving water quality.

Redevelopment: shall mean development that would create or add impervious surface area on an already developed site. Redevelopment includes, but is not limited to any construction project that requires demolition or complete removal of existing structures or impervious surfaces at a site and replacement with new impervious surfaces. Maintenance activities such as top-layer grinding, repaving (where all pavement is not removed), and reroofing are not considered to be redevelopment. Interior remodeling projects and improvements are also not considered to be redevelopment.

Source Control: Means measures to prevent pollutants from coming into contact with stormwater runoff or preventing polluted runoff from discharging into small MS4.

Treatment Control: means measures that treat stormwater and non-stormwater that has come into contact with pollutants.

1.0 INTRODUCTION

The Post-Construction Stormwater Management Program is intended for the following audiences: (1) State of Hawaii Department of Transportation [HDOT] Harbors Division (hereinafter referred to as the "Harbors") staff tasked with plan review and approval for Harbors capital projects (hereinafter referred to as the "Harbors Project") and Tenant[1] Improvement projects (hereinafter referred to as the "Tenant Project," (2) Harbors staff tasked with construction oversight, (3) Harbors staff tasked with ongoing inspection and maintenance of post-construction Best Management Practices [BMPs], and (4) the development community including engineers and architects tasked with creating and submitting construction plans for approval.

This program is complementary to Harbors ***Construction Site Runoff Control Program*** in that post-construction BMPs are required by Harbors National Pollutant Discharge Elimination System [NPDES] permit, and therefore will be incorporated into site-specific construction BMP plans consistent with this manual. This manual defines requirements and provides guidance for the project specific planning, selection, and design of post-construction BMPs to minimize pollutants in post-construction runoff and to minimize the amount of polluted runoff leaving the site.

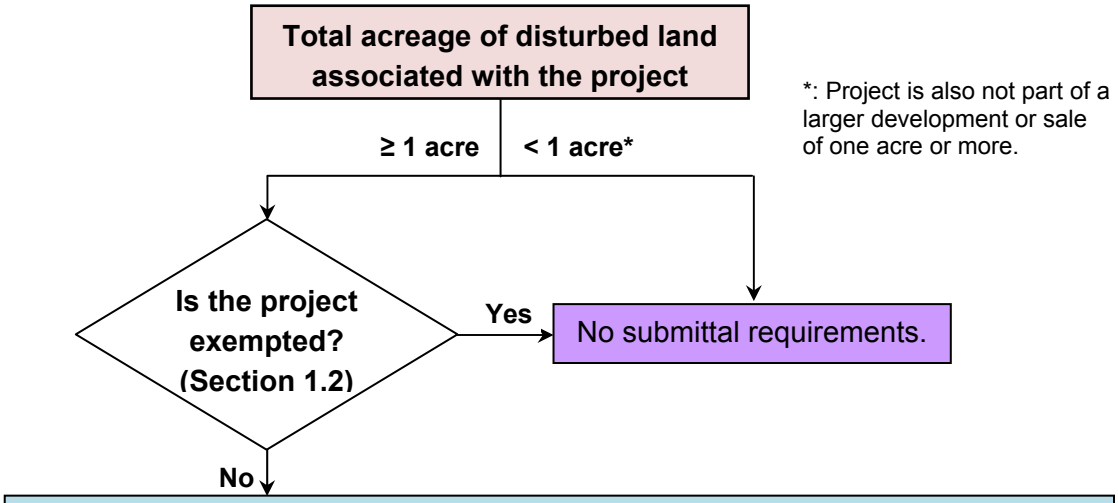
New development and redevelopment projects (hereinafter referred to as "Regulated Project") that result in a land disturbance of one (1) acre or more, are subject to Harbors **Post-Construction Stormwater Management Program**. All Regulated Projects must implement post-construction BMPs, unless the project is exempted as described in Section 1.2. BMPs shall be designed and installed accordance with the criteria, guidelines, and design standards described in this manual. Harbors has adopted City and County of Honolulu [CCH] ***Storm Water BMP Guide*** (CCH, 2012; Appendix C) and ***Rules Relating to Storm Drainage Standards*** (effective June 2013, CCH, 2000; Appendix D) to guide both Harbors and Tenant Projects.

1.1 Component Overview

Sections 2 to 5 of this manual describe the planning, design, construction, inspection, and long-term maintenance requirements for post-construction BMPs. The post-construction general requirements for Harbors and Tenant Projects are depicted in Figure 1-1. General requirements for Harbors reviewers and inspectors are depicted in Attachment 1 of ***Construction Site Runoff Control Program*** manual.

[1] "Tenant" shall mean a person, group, partnership, corporation, or any other entity that has an executed lease, revocable permit or disposition instrument under chapter 171, Hawaii Revised Statutes [HRS] to use or occupy land, a building, structure, or other property owned by Harbors. This term also includes Harbors' approved sub-tenants and entities using container or terminal facilities.

Figure 1-1:
General Post-Construction Project Requirements Flow Chart



In **Design** Phase:

1. Incorporate post-construction BMP into project design – Section 2.0 and **CCH Storm Water BMP Guide**
2. Submit *Permanent Post-Construction BMP Plan Checklist* – Appendix B
3. Apply for necessary permits (consult with appropriate agencies) – Attachments 1 and 2 of **Construction Site Runoff Control Program**
4. Submit plans including PSMP for review – Section 3.0
5. Submit O&M Plan, if applicable, for review – Section 5.1
6. Wait for concurrence and **Notice to Proceed**.

In **Construction** Phase:

1. Install Post-Construction BMP according to approved PSMP – Section 3.0
2. Monitor installation and inventory – Attachment 4 of **Construction Site Runoff Control Program**
3. Enforcement if necessary – Section 7.0 of **Construction Site Runoff Control Program**
4. Submit O&M Plan for review – Section 5.1

In **Post-Construction** Phase:

1. Conduct long-term O&M of post-construction BMP, If applicable – Section 5.0
2. Inspect post-construction BMP regularly – Section 5.3
3. For Tenant Project, tenant must submit annual O&M and inspection report to Harbors, if applicable – Section 5.2
4. Enforcement if necessary – Section 6.0

The following lists the major components covered under the Harbors **Post-Construction Stormwater Management Program.**

- BMP requirements for Regulated Projects, including Low Impact Development [LID] Site Design Strategies, Source Control, and Treatment Control BMPs. These BMPs are to be included and described in a required Post-Construction Stormwater Mitigation Plan [PSMP].

- CCH Rules Relating to Storm Drainage Standards (effective June 2013; CCH, 2000).

- Plan and permit application review to ensure that a Regulated Project is incorporating post-construction BMPs in accordance with the program.

- BMP inspections to ensure that post-construction BMPs are installed and maintained properly.

- Enforcement where BMPs are not installed or maintained properly.

- Database and references under development to support and facilitate compliance with the program, including, but not limited to:
  - ***Stormwater BMP Guide*** (CCH, 2012), providing the minimum requirements needed to achieve compliance with LID Site Design Strategies, Source Control BMPs, and Treatment Control BMPs.
  - Post-Construction BMP GIS and database to keep track of all publicly and privately constructed post-construction stormwater BMPs.
  - Training for plan and permit application reviewers, inspectors, maintenance personnel, and Oahu District personnel.
  - Education for project applicants, contractors, developers, designers, and other responsible parties.

1.2 Exemptions

HDOT Harbors may exempt certain types of projects from this program that pose a minimum risk of stormwater pollution, including, but not limited to:

- Maintenance activities such as top-layer grinding, repaving (where all pavement is not removed) and reconfiguring surface parking lots.
- Reroofing.
- Interior remodeling and improvement.
- Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility.
- Trenching and resurfacing associated with utility work.
- Replacement of damaged pavement.

- Emergency construction activities required to immediately protect public health and safety.

2.0 IMPLEMENTATION PROCESS

All new and redevelopment projects under Harbors jurisdiction undergo an environmental review during planning phase. The project review and approval process is a critical point at which the Harbors can impose conditions or standards that will minimize the impacts of urban runoff on local water resources. Therefore, project developers must address the potential impacts of stormwater discharges associated with development activities early in the project planning and design process. Regulated Projects that have the potential to discharge pollutants to the Honolulu and Kalaeloa Barbers Point Harbors Small MS4s, will be required to identify post-construction BMPs that will be included in the project design, constructed as part of the project, and implemented and maintained in the long-term.

Harbors will not approve construction activities, unless both PSMP and the *Permanent Post-Construction BMP Plan Checklist* (Appendix B) have been included in the submittal package and completed properly for the project during design phase.

Development projects are segregated by two major categories of project proponents – (1) Harbors Projects and (2) Tenant Projects. The Harbors has different project review and approval processes for Harbors Projects (Section 2.1) and Tenant Projects (Section 2.2). Personnel responsibilities for design, plan review, and approval of PSMP are outlined in Section 2.3 (Tables 2-1 and 2-2).

2.1 Harbors Project

Personnel from Harbors Engineering Branch Environmental Section [HAR-EE] initiates the review process by evaluating whether post-construction requirements apply to the projects. The key criteria for determining the need for post-construction BMPs are (a) the acreage of the project and (b) whether it is exempt.

Where post-construction requirements apply, as described in Section 3.1 of the ***Construction Site Runoff Control Program*** Manual, the Harbors Division Project Manager [PM] shall convene a Pre-Design meeting with HAR-EE at the **Preliminary Design Phase** to discuss the *Construction Site Design Review Checklist* (HDOTa, 2014), as well as the *Permanent Post-Construction BMP Plan Checklist* (include in Attachment B) if applicable. *Construction Design Review Checklist* discussions may also continue into the **Design Phase**. These discussions and meetings will allow the PM and HAR-EE to discuss the project during the design phase for applicable site-specific post-construction BMPs.

HAR-EE will advise PM that a PSMP, describing how the project will meet Harbors **Post-Construction Stormwater Management** program requirements, must be submitted during design phase. At this stage, project environmental mitigation measures are developed and a submittal package (including plans, specifications, designs, and PSMP) is forwarded to HAR-EE for review and comment.

HAR-EE review the PSMP document and final design plans to verify that post-construction program requirements are met. HAR-EE will notify PM when the PSMP is complete and contains proper required BMPs (refer to Sections 3.2 to 3.4), utilizing an interoffice memorandum. Once this memo has been issued (and placed in the project file), Harbors can proceed with putting the project out for bid. This process ensures that Harbors Post-Construction Stormwater Management program requirements are incorporated into the project design and shown on the plans prior to bidding for construction contractors or completion of construction work by Harbors itself. The step-wise process for Harbors plan reviewers is depicted in Attachment 1 of ***Construction Site Runoff Control Program*** manual.

2.2 Tenant Project

Harbors tenants who wish to perform new construction, reconstruction, modification, or demolition, must submit a request to HDOT or Harbors for review and approval. As described in Section 4.2.2 of the ***Construction Site Runoff Control Program*** manual, HAR-EE will review the request received from the tenant, and determine whether the tenant project is subject to Harbors **Post-Construction Stormwater Management** program requirements. If post-construction requirements apply, HAR-EE will advise Harbors Property Management Section [HAR-PM] of the determination and require that the tenant prepare and submit a PSMP during the design phase. At this stage, project environmental mitigation measures are developed and submittal package (including plans, specifications, designs, and PSMP) is forwarded to HAR-EE for review and comment.

HAR-EE reviews the PSMP document and final design plans to verify that PSMP requirements are met. HAR-EE will notify the HAR-PM when the PSMP is complete and contains proper required BMPs (refer to Sections 3.2 to 3.4), utilizing an interoffice memorandum. Once this memo has been issued (and placed in the project file), the HAR-PM can notify the tenant the project is approved.

This process ensures that Harbors **Post-Construction Stormwater Management** program requirements are incorporated into the project design and shown on the plans prior to approval. The approval of project becomes part of the lease or revocable permit issued to the tenant. Any mitigation measures required by the environmental review process, such as implementation and maintenance of post-construction BMPs, become part of the lease or revocable permit and are inspected by tenants regularly as outlined in the PSMP.

2.3 Responsibilities

General responsibilities involved in the implementation of Harbors **Post-Construction Stormwater Management** program are listed in Table 2-1 for Harbors Projects and Table 2-2 for Tenant Projects. Harbors Engineering Branch consists of Construction Section [HAR-EC], Design Section [HAR-ED], Environmental Section [HAR-EE], Maintenance Section [HAR-EM],

and Planning Section [HAR-EP]. A *Harbors Environmental Group Organization Chart* is enclosed in Attachment A.

For Harbors Projects, HAR-EP initiates the planning of the project. HAR-ED, HAR-EE, and HAR-EM each review project plans and specifications on different aspects. Additionally, HAR-EE reviews the submitted PSMP. The inspectors from HAR-EC conduct inspections during construction phase to ensure structural post-construction BMPs installed according to approved plans. HAR-EE also verifies that the post-construction BMPs proposed in the PSMP are installed according to approved plans. Harbors Oahu District staff is responsible for the proper operation and maintenance of the installed post-construction BMPs.

For Tenant Projects, HAR-PM will forward construction plans, specifications, and PSMP to HAR-E for review and comment. Each section under HAR-E will provide their comments, if any. During the construction phase, HAR-EE will inspect and verify that the post-construction BMPs proposed in the PSMP are installed properly. Tenants will be responsible for long-term operation and maintenance [O&M] of the installed post-construction BMPs. HAR-EE will inspect these BMPs during regular tenant inspections, at the frequency identified in Harbors ***Tenant Inspection Manual*** (HDOTc, 2014).

Table 2-1
Responsibilities for Post-Construction Program Implementation
- Harbors Project

	Harbors Engineering Branch					Oahu
	EC	**ED**	**EE**	**EM**	**EP**	
Harbors Project Planning					X	
Harbors Project Design		X				
Harbors Project Review		X	X	X		X
Harbors Project Approval	X					
PSMP Review and Approval			X			
Inspection during Construction	X		X			
Inspection after Construction			X			
Harbors Project O&M						X
Provide Training			X			
Enforcement	X		X			

Table 2-2
Responsibilities for Post-Construction Implementation
- Tenant Project

	Tenant	Harbors Engineering Branch					PM
		EC	ED	EE	EM	EP	
Tenant Project Planning	X						X
Tenant Project Review			X	X			
PSMP Review and Approval				X			
Tenant Project Approval							X
Inspection during Construction				X			
Inspection after Construction				X			
Tenants Project O&M	X						
Provide Training				X			
Enforcement				X			X

3.0 BMP REQUIREMENTS AND SELECTION PROCEDURE

To comply with its NPDES permit requirements and to minimize water quality impacts from new development and redevelopment, all Regulated Projects shall consider and apply post-construction BMPs, as appropriate.

This section provides a procedure for selecting post-construction BMPs for Regulated Projects. It includes identifying a list of pollutants of potential concern [POPC] and developing a PSMP to minimize water quality impacts through LID Site Design, Source Control, and Treatment Control BMPs. The procedure for determining the combination of these BMPs and their respective sizing is based on the ***CCH Rules Relating to Storm Drainage Standards***. It is also recommended that ***CCH Storm Water BMP Guide*** be used as a guide for post-construction BMP design and implementation (CCH, 2012). A flow chart summarizing the BMP selection procedure is depicted in Figure 3-1.

Figure 3-1
Post-Construction BMP Selection Procedure Flow Chart



3.1 Identifying Pollutants of Potential Concern and Receiving Water Bodies

Two major water bodies within Harbors jurisdiction are Honolulu Harbor and Kalaeloa Barbers Point Harbor. Hawaii Department of Health (HDOH) lists Honolulu Harbor as impaired water for nutrients, trash, turbidity, and NH4 (HDOH, 2013). Kalaeloa Barbers point Harbor has not been fully assessed, yet. No state Total Maximum Daily Loads [TMDL] have been established for either harbor.

Urban runoff from a developed site has the potential to contribute pollutants, including trash, oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system and receiving waters. The pollutants that may be generated at a site are related to land use. A list of POPC is provided in Table 3-1. The ***CCH Storm Water BMP Guide*** provides a general guideline for a list of post-construction BMPs and targeted POPC.

Table 3-1
Pollutants of Potential Concern

Priority Project Categories	General Pollutant Categories								
	Sediment	Trash & Debris	Metals	Organic Compounds	Nutrients	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Commercial Development > 1 acre	P[1]	P	P	P[2]	P[1]	P[5]	P	P[3]	P[5]
(Heavy) Industry Development	P	P	P	P		P	P		
Automotive Repair Shops		P	P	P[4,5]			P		
Restaurants		P				P	P	P	P[1]
Parking Lots	P[1]	P	P		P[1]	P[1]	P		P[1]
Fueling Facility		P	P	P		P	P		
Driveways	P	P	P	P[4]	P[1]	P[5]	P		P[1]

P: Potential

1: A potential pollutant if landscaping exists on-site.

2: A potential pollutant if the project includes uncovered parking areas.

3: A potential pollutant if land use involves food or animal waste projects.

4: Including petroleum hydrocarbons.

5: Including solvents.

3.2 Drainage Study and Identification of Conditions of Concern

Common impacts to the regional hydrology resulting from development typically include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peak; faster time to reach peak flow; and water quality degradation. These changes have the potential to permanently impact receiving water bodies, habitat integrity, and downstream channels (if any). A change to Regulated Project site's hydrology would be considered a condition of concern. To mitigate these potential impacts, the project proponent must prepare the following supporting documentation:

- **Evaluate the project's conditions of concern in a drainage study as part of the PSMP**. The drainage study and the PSMP shall be prepared by a registered civil engineer in the State of Hawaii, with experience in drainage design and water resources

management. The report shall consider the project location (from the larger watershed perspective), topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, wet season groundwater depth, and any other relevant hydrologic and environmental factors to be protected specific to the nearest watershed.

- **Field reconnaissance including observations of the site and upstream and downstream conditions.** Existing conditions, such as undercutting erosion, slope stability, vegetative stress, and areas susceptible to erosion and/or habitat alteration as a result of altered flow regimes should be pointed out.

- **Existing hydrologic conditions** including description of the location, type, and percent cover of onsite vegetation, description of existing impervious features, description of existing stormwater conveyance features, description of distance to downstream water bodies, description of soil type (Natural Resources Conservation Service [NRCS] hydrologic soil classification and types), description of depth to groundwater during the wet season, description of offsite vegetation types, location, and percent cover.

- **Drainage study** information including, at a minimum, existing and post-construction descriptions of impervious area and percentages, rainfall intensities, geotechnical conditions regarding any planned uses of infiltration techniques (slope stability, expansive soils, compressive soils, seepage, groundwater depth, loss of foundation or pavement sub-grade strength), site constraints (impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, high-intensity land use, vehicular traffic, restricted right-of-way, or safety concerns), flow rates, velocities, and/or durations for a peak rainfall intensity of 0.4 inches per hour and Water Quality Volume of one (1) inch. The drainage study must also include an analysis of proposed post-construction LID Site Design Strategies, Source Control, and/or Treatment Control BMPs to mitigate (downstream) impacts and attempt to maintain or improve pre-project hydrologic conditions.

3.3 Post-Construction Stormwater BMP Selection

Post-construction BMPs shall be considered during the planning and design phases of a project. Each applicable project shall provide an account of how each drainage area's runoff is managed and treated. The entire project area can be divided into individual/discrete Drainage Areas [DA]. Examples of how to account for individual DA on a site is provided in ***CCH Examples Illustrating Application of Rules Relating to Storm Drainage Standards*** (CCH, 2013).

Post-construction BMPs include LID Site Design Strategies, Source Control, and Treatment Control BMPs.

Table 3-2
Post-Construction Best Management Practices

Element		Description
LID Site Design Strategies		Reducing the hydrologic impact of development and incorporating techniques that maintain or restore the site's hydrologic and hydraulic functions.
Source Control		Preventing pollutants from coming in contact with runoff and preventing polluted runoff from discharging into small MS4.
Treatment Control	LID Retention	Retaining runoff on-site with no off-site discharge by infiltration, evapotranspiration, and harvesting/reuse.
	LID Biofiltration	Removing pollutants from runoff by filtering stormwater through vegetation and soils.
	Other Treatment	Removing pollutants from runoff by detention, settling, filtration, and vortex separation.

To comply with this manual and be consistent with the ***CCH Rules Relating to Storm Drainage Standards***, the criteria shall be met for all Regulated Projects as follow:

1. Incorporate appropriate LID Site Design Strategies - Either retain on-site the Water Quality Volume with appropriate ID Retention Treatment Control BMPs, or biofilter the Water Quality Volume with appropriate LID Biofiltration Treatment Control BMPs, or a combination of the two, unless determined to be infeasible due to infiltration issues.
2. Incorporate appropriate Source Control BMPs.
3. If it is determined to be infeasible to retain and/or biofilter the Water Quality Volume then treat and discharge with appropriate Treatment Control BMPs any portion of the water that is not retained on-site or biofiltered using the CCH guidance in Section 1-5.2 Part II B of the ***Rules Relating to Storm Drainage Standards***, unless a waiver is granted based on the infeasibility of all Treatment Control BMPs.

Consistent with the ***CCH Storm Water BMP Guide*** and based on collected precipitation data, **1 inch is the depth for all volume-based BMPs and a peak rainfall intensity of 0.4 inches per hour shall be used for flow-based BMPs.** A flow chart summarizing the BMP selection process is provided in Figure 3-2 below.

LID Retention BMPs rely on the soil's ability to infiltrate stormwater runoff. Due to its proximity to ocean water, groundwater underneath Harbors property is relatively shallow and tidally influenced. Therefore, it is recognized that LID Retention BMPs may prove infeasible for majority of Regulated Projects. However, broader LID Site Design Strategies must be considered. For a detailed discussion on infiltration requirements, please refer to General Infiltration Requirements outlined in Section 3 of ***CCH Storm Water BMP Guide***.

Selection of Treatment Control BMPs must prioritize and maximize the removal of pollutants of potential concern. Treatment Control BMP design must also consider any impacts caused by tidal influence, which is particularly relevant to subsurface filtration systems, hydrodynamic separator systems, detention or infiltration basins, and wet ponds/wetlands.

Figure 3-2
BMP Selection Process for Pollutants of Potential Concern

Implement LID Site Design Strategies

- Conserve natural areas, soils and vegetation – retain functions of predevelopment hydrology, including rainfall interception, evapotranspiration, and infiltration and therefore reduce runoff.
- Minimize disturbances to natural drainages and optimize the site layout – preserve natural drainage features and design buildings and circulation to minimize the amount of roofs and paving.
- Minimize Soil Compaction – retain existing beneficial hydrologic function.
- Minimize Impervious Surface – allow natural processes to filter and reduce non-point sources of pollution.
- Direct runoff to landscaped or pervious surfaces – move runoff from impervious surfaces on to adjacent pervious surfaces (e.g., direct a roof downspout to disperse runoff onto a lawn).

⇩

Implement Source Control BMPs at these Areas

- Landscaped areas
- Automatic irrigation systems
- Storm drain inlets (stenciling and signage)
- Vehicle/equipment fueling
- Vehicle/equipment maintenance/repair
- Vehicle/equipment washing/cleaning
- Loading docks
- Outdoor trash storage
- Outdoor material storage
- Outdoor work areas
- Outdoor process equipment operations
- Parking areas

⇩

Implement Treatment Control BMPs that Maximize Removal of Project Pollutant(s) of Potential Concern

Considering Numeric Sizing Criteria and General Infiltration Requirements for:

- Infiltration basin
- Biorentention filter
- Subsurface infiltration
- Dry well
- Rain barrel
- Downspout Dispersion
- Vegetated swale
- Detention basin
- Sand filter
- Infiltration trench
- Bioretention basin
- Permeable pavement
- Dry swale
- Green roof
- Tree box filter
- Vegetated buffer strip
- Manufactured treatment device

3.4 Post-Construction Stormwater Mitigation Plan Development

In order to ensure that a PSMP is adequately designed and integrated into each Regulated Project, project proponents are required to prepare a PSMP by a licensed civil engineer, registered in State of Hawaii. In general, the PSMP must clearly convey the process used to identify pollutants of potential concern, conditions of concern, selected BMPs for the project as well as identifying BMP long-term maintenance requirements. The fundamental steps in preparation of PSMP are provided in Table 3-4. The CCH Storm Water BMP Guide provides a more complete list of LID Site Design Strategies, Source Control BMPs, and Treatment Control BMPs and must be utilized by project proponents. Additionally, project proponents must comply with all applicable requirements by Harbors **Post-Construction Stormwater Management Program** and not rely solely on the outline in Table 3-4.

PSMPs must contain a table of contents to assist reviewers in finding required parts of the document. PSMPs must contain a vicinity map (in scale) containing major roadways, geographic features or landmarks, the project site perimeter, general topography, downstream receiving water body, and north arrow. In addition, PSMPs must also contain a site map (including the entire property on one map or using a key map if multiple sheets are required), scale, north arrow, and legend, impervious features (including location of proposed impervious areas such as paved areas, buildings, covered areas, etc.), potential pollutant source areas (such as fueling area, garage, outdoor storage area, waste container area, wash-rack, potentially hazardous substance storage area). PSMP shall contain the information specified in Table 3-3.

Table 3-3
Required Components of a Post-Construction Stormwater Mitigation Plan for Regulated Project

Major Components	Descriptions
Organization & Content	• Table of contents • Vicinity map • Project description • Narrative of project activities
Site Map	• Entire property included on one map (use key map if multi-sheets) • Drainage areas and direction of stormwater flow • Private storm drain system(s) • Nearby water bodies and other municipal storm drain inlets • Location of stormwater conveyance systems (ditches, inlets, storm drains, etc.) • Location of existing and proposed stormwater controls • Location of “impervious” areas (i.e., paved areas, buildings, and covered areas) • Locations where materials would be directly exposed to stormwater

Major Components	Descriptions
	• Location of building and activity areas (e.g., fueling area, garages, waste container area, wash racks, potential hazardous substance storage areas, etc.) • Areas of potential soil erosion (including areas downstream of project)
Pollutants of Potential Concern	• Pollutants based upon land use • Impaired water bodies downstream of the project
Drainage Study and Conditions of Concern (refer to ***CCH Rules Relating to Storm Drainage Standards*** and ***CCH Storm Water BMP Guide***)	• Site-specific drainage analysis indicating pre- and post-development runoff calculations. • Impacts to hydrologic regime (hydromodification evaluation, as applicable)
Types of Post-Construction BMPs (refer to ***CCH Rules Relating to Storm Drainage Standards***)	*Example LID and Site Design BMPs* • Conserve natural areas, soils, and vegetation • Minimize impervious surface • Direct runoff to landscaped areas *Example Source Control BMPs* • Covered trash storage • Covered and bermed vehicle wash areas • Automatic irrigation system, timed to prevent discharge *Example Treatment Control BMPs* • Infiltration basin • Subsurface infiltration • Manufactured treatment device
Post-Construction BMP Maintenance	• O&M Plan • Access Agreement

3.4.1 Introduction of Low Impact Development

LID is a stormwater management strategy concerned with maintaining or restoring the natural hydrologic functions of a site to achieve natural resource protection objectives and fulfill environmental regulatory requirements (CCH, 2012). It utilizes a variety of natural and built features that reduce the rate of runoff, filter out its pollutants, and facilitate the infiltration of water into the ground. By reducing water pollution and increasing groundwater recharge, it helps improve the quality of receiving waters and stabilize the flow rates of nearby surface waters. The goal of LID site design is to reduce the hydrologic impact of development and to incorporate techniques that maintain or restore the site's hydrologic and hydraulic functions. The optimal LID site design minimizes runoff volume and preserves existing flow paths.

LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater **as a resource rather than a waste product**. Many practices have been used to adhere to these principles such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. By implementing LID principles and practices, water can be managed in a way that reduces the impact of developed areas and promotes the natural movement of water within an ecosystem or watershed. The Harbors approach will consist of specific elements that are represented in Table 3-3.

3.4.2 LID Site Design Strategies

Consideration of LID Site Design Strategies are required for each Regulated Project. A Regulated Project shall be designed so as to minimize directly connected impervious surfaces and to promote infiltration using LID techniques. A Regulated Project shall minimize the introduction of POPCs generated from site runoff to the stormwater conveyance system. A Regulated Project can address these objectives through the creation of a hydrologically functional project design that attempts to mimic the natural hydrologic regime. These techniques are outlined in Section 1 of ***CCH Storm Water BMP Guide***.

Mimicking a site's natural hydrologic regime can be pursued by:

- Reducing imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the stormwater conveyance system, and minimizing clearing and grading.
- Providing runoff storage measures dispersed throughout a site's landscape with the use of bioretention facilities and detention, retention, and infiltration practices.
- Implementing on-lot hydrologically functional landscape design and management practices.

These design principles offer an innovative approach to urban stormwater management, one that does not rely on the conventional end-of-pipe or in-the-pipe structural methods but instead uniformly or strategically integrates stormwater controls throughout the urban landscape.

The following five LID components, taken from ***CCH Storm Water BMP Guide***, must be considered for each Regulated Project (CCH, 2012).

Conserve Natural Areas, Soils, and Vegetation

This design strategy helps retain numerous functions of predevelopment hydrology, including rainfall interception, evapotranspiration, and infiltration. Maximizing these functions will thereby reduce the amount of runoff that must be treated. Protection of mature trees and vegetation provides habitat, prevents erosion, captures significant rainfall, provides summer shading, and reduces runoff volume and velocity, which protects and enhances downstream water quality.

Minimize Disturbances to Natural Drainages

Natural drainages offer a benefit to stormwater management as the soils and habitat already function as a natural filtering/infiltrating swale. Minimizing disturbances to natural drainage patterns preserves the predevelopment timing, rate, and duration of runoff as well as preserving streamside habitats. When determining the development footprint of the site, natural drainages should be avoided. By keeping the development envelope set back from natural drainages, the drainage can retain its water quality benefit to the watershed.

Minimize Soil Compaction

Clearing, grading, and compaction by construction traffic reduces the natural absorption and infiltration capacities of the native soils. Soil compaction damages soil structure, reduces infiltration rates, limits root growth and plant survivability, and destroys soil organisms. Subsequent tilling and/or addition of soil amendments such as compost can help, but may not restore the original infiltration capacity of the soils. By protecting native soils and vegetation in appropriate areas during the clearing and grading phase of development, the site can retain some of its existing beneficial hydrologic function.

Minimize Impervious Surfaces

The increased volume, increased velocity, and discharge duration of stormwater runoff from developed areas has the potential to accelerate downstream erosion and impair stream habitat in natural drainages. Studies have demonstrated a direct correlation between the degree of imperviousness of an area and the degradation of its receiving waters. Impervious surfaces (such as pavement and concrete) can neither absorb water nor remove pollutants, and thus the natural purification characteristics are lost. Reducing impervious surfaces to the minimum amount needed retains the permeability of the project site, allowing natural processes to filter and reduce non-point sources of pollution.

Direct Runoff to Landscaped Areas

Any impervious surface that drains into a catch basin, area drain, or other conveyance structure is a “directly connected impervious area.” As stormwater runoff flows across parking lots, roadways, and paved areas, the oils, sediments, metals, and other pollutants are collected and concentrated. If this runoff is collected by a drainage system and carried directly along impervious gutters or in closed underground pipes, it has no opportunity for filtering by plant material or infiltration into the soil. It also increases in speed and volume, which may cause higher peak flows downstream, and may require larger capacity storm drain systems, increasing flood and erosion potential. Solutions that reduce “directly connected impervious areas” prevent runoff, detain or retain surface water, attenuate peak runoff rates, benefit water quality and convey stormwater.

3.4.3 Source Control BMPs

Source control BMPs are required for each Regulated Project. Proactively controlling POPC at their source is fundamental to effective stormwater quality management. Design of BMPs to minimize or prevent pollutant generation is guided by two general principles:

- Prevent stormwater from contacting operation and storage areas. These areas should be designed to prevent stormwater runoff from passing through shipping areas, vehicle maintenance yards, and other work places before it reaches storm drains. The objective is to prevent the discharge of water laden with grease, oil, heavy metals and process fluids to surface waters or sensitive resource areas.
- Prevent pollutants from contacting surfaces that come into contact with stormwater runoff. Precautionary measures should be employed to keep POPC from coming into contact with storm or wash water runoff.

In preparation of PSMP, following items need to be provided:

- All potential sources of stormwater pollutants that will be generated at the site.
- Corresponding post-construction BMPs that need to be shown on the site map included in the PSMP.
- A brief narrative description of the source control BMPs to be used including a discussion of the project applicant will ensure their continued operation.

Justification of why a particular source control could not be implemented for this project because of any special condition or situation, shall also be provided. Fact Sheets for applicable source control BMPs may be obtained from Section 2 of the ***CCH Storm Water BMP Guide*** (CCH, 2012) and/or the ***California Stormwater Quality Association [CASQA] Stormwater Quality Handbooks*** (CA, 2003). Descriptions of each Source Control Category (taken from CCH ***Storm Water BMP Guide***) are summarized in Table 3-4.

Table 3-4
List of Source Control Categories
(taken from CCH Storm Water BMP Guide)

Source Control Category	General Description/Approach
Landscaped Areas	Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the maximum extent possible, maximize natural water storage and infiltration opportunities, and minimized project slopes and channels.
Automatic Irrigation Systems	Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into storm water drainage systems.

Source Control Category	General Description/Approach
	Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the storm water conveyance system.
Storm Drain Inlets	Storm drain signs and stencils are highly visible source controls that are placed directly adjacent to storm drain inlets. The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Stencils and signs alert the public to the destination of pollutants discharged to the storm drain.
Vehicle/Equipment Fueling	Fueling areas have the potential to discharge oil and grease, solvents, car battery acid, coolant and gasoline to the storm drain. Spills can be a significant source of pollution because fuels contain toxic materials and heavy metals that are not easily removed by storm water treatment devices.
Vehicle/Equipment Repair	Several measures can be taken to prevent operations at maintenance bays from contributing a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the storm water conveyance system. In designs for maintenance bays containment is encouraged. Preventive measures include overflow containment structures are dead-end sumps.
Vehicle/Equipment Washing & Cleaning	Vehicle/equipment washing, and steam cleaning may contribute high concentrations of pollutants to wash waters that drain to storm water conveyance systems. Wash water may not be conveyed to a sewer without a sewer connection permit.
Loading Docks	Several measures can be taken to prevent operations at loading docks from contributing a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the storm water conveyance system. In designs for loading docks, containment is encouraged. Preventive measures include overflow containment structures and dead-end sumps.
Outdoor Trash Storage	Storm water runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or streams. Preventive measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.
Outdoor Material Storage	Proper design of outdoor storage areas for materials reduces opportunity for pollutants to enter the storm water conveyance system. Materials may be in the form of raw products, by-products, finished products, and waste products. In outdoor storage areas,

Source Control Category	General Description/Approach
	infiltration is discouraged and containment is encouraged.
Outdoor Work Areas	Proper design of outdoor work areas (grinding, painting, coating, sanding, parts cleaning, etc.) reduces opportunity for pollutants to enter the storm water conveyance system. In outdoor work areas, infiltration and discharge to the storm drain are discouraged; collection and conveyance to the sanitary sewer are encouraged.
Outdoor Process Equipment Operation	Outdoor process equipment operations such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, may contribute a variety of pollutants to the storm conveyance system. In outdoor process equipment areas, infiltration is discouraged and containment is encouraged, accompanied by collection and conveyance.
Parking Areas	Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through storm water runoff or non-storm water discharge. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas.

3.4.4 Treatment Control BMPs

When a site cannot retain all or portion of the Water Quality Volume on-site, the remaining portions of the water must be treated using Treatment Control BMPs specified in *Section 1-5.2 Part II* B of the ***CCH Rules Relating to Storm Drainage Standards***. Treatment Control BMPs are engineered technologies designed to remove pollutants from storm water runoff prior to discharge to the storm drain system or receiving waters. Details on BMP numeric sizing criteria and general requirements for infiltration BMPs are further discussed in Sections 3.4.5. Individual fact sheets for various treatment control BMPs may be obtained from Section 3 of the ***CCH Storm Water BMP Guide*** and/or ***CASQA Stormwater Quality Handbooks***.

Engineering details and specifications shall be included in the PSMP for the selected Treatment Control BMPs. Alternative post-construction BMPs not identified in the ***CCH Storm Water BMP Guide*** may be approved at the discretion of the Harbors, provided the alternative BMP is as effective in removal of pollutants of concern as other feasible BMPs.

3.4.5 Numeric Sizing Criteria

This section presents the methodology for calculating the Water Quality Volume [WQV] and Water Quality Flow Rate [WQF], which are used to size the majority of the Treatment Control BMPs.

Water Quality Volume

The *WQV* is calculated using this equation: *WQV = PCA x 3630*, where:

WQV = water quality design volume (in cubic feet)
P = design storm runoff depth (in inches)
C = volumetric runoff coefficient
A = total drainage area (in acres)

As specified in the CCH's Rules (CCH, 2000), a design storm runoff depth of **one inch** shall be used. The volumetric runoff coefficient shall be calculated using the following equation as developed by EPA for smaller storms in urban areas: *C = 0.05 + 0.009I*, where:

C = volumetric runoff coefficient
I = percent of impervious cover (expressed as a percentage)

Water Quality Flow Rate

The *WQF* is calculated using this equation: *WQF = CiA*, where:

WQF = water quality design flow rate (in cubic feet per second)
C = volumetric runoff coefficient
i = peak rainfall intensity (in inches per hour)
A = total drainage area (in acres)

As specified in the CCH's Rules (CCH, 2000), a peak rainfall intensity of **0.4 inches per hour** shall be used. The runoff coefficient shall be determined from Table 3-5 below, based on the drainage area, and shall be, at a minimum, the midpoint of the given range of values. The higher value should be used if soil conditions indicate that pervious areas will have little infiltration/interception potential. For drainage areas containing multiple land uses, the following formula may be used to compute a composite weighted runoff coefficient:

$C_C = (\sum_{i=1}^{n} C_i A_i)/A_t$, where:

C_c = composite weighted runoff coefficient
$C_{1,2,\ldots,n}$ = runoff coefficient for each land use cover type
$A_{1,2,\ldots,n}$ = drainage area of each land use cover type (in acres)
A_t = total drainage area (in acres)

Table 3-5
Runoff Coefficients for Water Quality Flow Calculations
(taken from CCH Storm Water BMP Guide)

Type of Drainage Area	Runoff Coefficient (*C*)
Industrial	
Light areas	0.50 ~ 0.80
Heavy areas	0.60 ~ 0.90
Unimproved areas	0.10 ~ 0.30
Lawns	
Sandy soil, flat, ≤ 2%	0.05 ~ 0.10
Sandy soil, average 2~7%	0.10 ~ 0.15
Sandy soil, steep ≥ 7%	0.15 ~ 0.20
Heavy soil, flat, ≤ 2%	0.13 ~ 0.17
Heavy soil, average 2~7%	0.18 ~ 0.22
Heavy soil, steep ≥ 7%	0.25 ~ 0.35
Streets	
Asphaltic	0.70 ~ 0.95
Concrete	0.70 ~ 0.95
Brick	0.75 ~ 0.85
Roofs	0.75 ~ 0.95

Drainage Areas

The entire area of applicable project shall be divided into individual, discrete DAs and clearly presented in a site map. DAs may be defined using grade breaks and roof ridge lines. Separate DAs shall be used for each surface type (e.g., landscaping, pervious paving, or roofs). Each type of DA surface has a unique runoff factor that estimates how much rainfall will produce effective rainfall, or runoff from that drainage area. A list of runoff factors for surfaces draining to BMPs is included in Table 3-5 of this document and Table 4 of the CCH, ***Rules Relating to Storm Drainage Standards*** (CCH, 2000; Appendix D).

4.0 POST-CONSTRUCTION BMP INSTALLATION

4.1 Installation Inspection during Construction Phase

Inspections will be conducted at multiple stages of construction to ensure the proper installation of all LID Site Design Strategies, Source and Treatment Control BMPs. For Harbors Projects, these inspections shall coincide with the site-specific construction site BMP inspections described in Sections 3.4.1 to 3.4.3 of Harbors ***Construction Site Runoff Control Program*** manual. For Tenant projects, these inspections shall coincide with the site-specific construction site BMP inspections described in Sections 4.4.1 to 4.4.3 of Harbors ***Construction Site Runoff Control Program*** manual. In either case, inspections shall include:

- Initial Inspection prior to commencement of construction;
- Recurring BMP Inspection during active construction to ensure construction is occurring in accordance with approved plan; and
- Final Inspection upon completion of construction to ensure proper installation and maintainability.

The inspections may be combined with other inspections provided they will be conducted by trained personnel, as identified in Section 7. The findings of these inspections will be recorded on the *Construction Site Best Management Practices Inspection Checklist* contained in Attachment 4 of the ***Construction Site Runoff Control Program***. Each inspection will be reported in the Annual Compliance Report [ACR] and shall be clearly linked to the referenced project and note the stage of the project and the dates of inspections.

5.0 POST-CONSTRUCTION BMP MAINTENANCE, INVENTORY AND RECORDKEEPING

Once built, post-construction stormwater BMPs must be properly maintained to make sure they are operating as designed and managing post-construction runoff as intended.

For Tenant projects, O&M and inspection requirements are documented in an O&M plan that must be submitted to the Harbors prior to completion of construction. All O&M activities will be the responsibility of the tenant and shall be in accordance with the Tenant O&M plan that was submitted and approved as part of the project review and approval process and recorded with the lease, revocable permit, or other contractual document provisions. The tenant O&M plan shall be consistent with the requirements in Section 5.1 below.

For Harbors project, O&M will be provided by Oahu District and/or HAR-EM consistent with the projects O&M plan that was submitted and approved as part of the project review and approval process.

Harbors will verify that appropriate mechanisms, including O&M plans, are in-place for all projects on Harbors' property that have post-construction BMPs. Maintenance requirements identified below are required by Harbors **Post-Construction Stormwater Management Program**.

5.1 Maintenance Requirements

Operation & Maintenance Plan:

For a Regulated Project, Harbors will require that a copy of a satisfactory O&M plan, monitoring plan where applicable (for example, sediment accumulation in a CDS unit; a sample O&M Guideline is enclosed in Appendix E), and a process of verification of ongoing maintenance of installed controls be included in the design submittal package. The O&M Plan must contain following major components:

- The designated responsible party to manage the post-construction stormwater BMP(s).
- Post-Construction operating schedule, maintenance frequency, specific maintenance activities.
- Any necessary employee training and duties.
- Recordkeeping and reporting on inspection and servicing of all post-construction BMPs (on source/treatment control) at least on an annual basis, which uses a project-specific inspection form submitted with the O&M plan.

Access Agreement: The Harbors maintains rights to access tenant properties as part of lease or revocable permit provisions. These rights extend to any access required related to

post-construction BMPs. An example of the access agreement is included in Attachment 2 of Harbors ***Tenant Inspection Manual***.

5.2 Verification Mechanisms

Annual written verification of effective O&M of each approved post-construction BMP by the responsible party (e.g., contractor, consultant, or tenant) is required to be submitted to Harbors.

- For Harbors Projects, HAR-EC and HAR-EE will verify that post-construction BMPs reflected in the approved PSMP be implemented at the completion of construction. District office will be responsible for long-term O&M of post-construction BMPs and related recordkeeping. Records will be reported in the ACR.
- For Tenant Project, HAR-EE and HAR-PM will verify that post-construction BMPs in the approved PSMP be implemented at the completion of construction. The tenant will be responsible for long-term O&M of post-construction BMPs by conducting routine inspections, documenting all maintenance requirements, submitting annual reports (to Harbors), and retaining records for at least five years. These documents shall be made available to Harbors for inspection upon request at any time.

5.3 Post-Construction BMP Inspection

To ensure that post-construction stormwater BMPs are being operated and maintained in accordance with the approved O&M plan, all LID Site Design, Source and Treatment Control BMPs in the O&M plan will be inspected no less than once a year. Additionally, some BMPs may be inspected more frequently as recommended in ***CCH Storm Water BMP Guide*** (CCH, 2012; Appendix C) or manufacturer's manual, or because they are located on a tenant site which is inspected more frequently as part of the Tenant Inspection Program. When possible, inspections shall occur after a storm event to allow an evaluation of the effectiveness of the BMPs, identification of any damage that may have occurred, and a determination if any additional maintenance may be required as a result of the storm event. Specifically, O&M inspections shall be performed and documented as following:

- For Harbors Projects, inspectors from the Oahu District will inspect the post-construction stormwater BMPs as specified in the O&M plan but no less than annually.
- For Tenant Projects, the tenant is required to conduct inspections per the approved O&M plan and submit an annual report to Harbors by the annual tenant stormwater awareness training demonstrating proper O&M. HAR-EE inspectors will conduct inspections of post-construction BMP O&M records at a frequency determined by Harbors ***Tenant Inspection Program*** (i.e., every six months, annually, or every five years).
- Each Harbor and Tenant inspection shall be documented using the Inspection Checklist submitted as part of the O&M plan. HAR-EE will retain copies of all completed inspection reports and the inspection findings will be documented in the electronic Post-

Construction BMP inventory (e.g., database). All deficiencies noted during Harbors and Tenant inspections shall be conveyed to the responsible party in writing and HAR-EE shall conduct timely follow-up to ensure deficiencies are rectified.

5.4 Post-Construction BMP Inventory and Recordkeeping

Harbors has developed an electronic inventory to keep track of post-construction BMPs (i.e., LID Site Design Strategies, Source Control, and Treatment Control BMPs) and the pertinent frequency of inspection and O&M. This inventory includes the BMPs for both Harbors and Tenant projects that discharge into the Honolulu and Kalaeloa Barbers Point Harbors Small Municipal Separate Storm Sewer Systems [MS4s]. Approved Post-Construction BMPs, as identified in the PSMP, will be recorded in the database by HAR-EE. Future records associated with inspection and long-term O&M will be documented in the database. The electronic inventory serves as the basis for the maintenance, inspection, enforcement, and reporting elements of the program.

All existing post-construction BMPs at Honolulu and Kalaeloa Barbers Point Harbors have been logged into the electronic inventory. All new post-construction BMPs, as reflected in the approved PSMP will be logged in the electronic inventory, by HAR-EE during PSMP review and approval phase. The inventory and information for each BMP will be updated at project acceptance, if needed, or based on information obtained from future inspections and maintenance activities. The construction project review, submittal requirements, and procedures, detailed in Section 4.3 of the ***Construction Site Runoff Control Program***, provide information about new post-construction BMPs entered into the database. General relevant site information includes:

- Project Identifier, Owner Information
- Project Location (Harbor, Pier Number, Tax Map Key Number, Latitude/Longitude coordinates)
- Acreage
- Control Type and Description of post-construction BMPs
- Photographs of BMPs during construction (if available) and at acceptance
- Date of Acceptance/Construction
- Date of Agreement
- O&M plan
- Maintenance Records
- Inspection Dates and Summary
- Corrective Actions
- Replacement or Repair Date

HAR-EE is responsible for maintaining the post-construction BMP inventory and keeping it current in regards to BMPs, inspections, and maintenance.

6.0 ENFORCEMENT

A detailed discussion on enforcement is presented in the Enforcement Response Plan. Enforcement of tenant construction projects will be undertaken by the HAR-EE and/or other staff who possess enforcement authority through established policies and procedures as described in Harbors Enforcement Response Plan. There are several enforcement mechanisms and penalties to ensure compliance with local ordinances, permits, and contract documents. The enforcement actions proceed along different routes depending upon whether the project is a Harbors Project or a Tenant Project.

The remainder of this Section is focused on enforcement of Tenant Projects during post-construction installation and its long-term O&M by the tenant. When post-construction stormwater BMP inspections reveal improper installation or maintenance, Harbors will undertake appropriate enforcement action. The level of enforcement (summarized in Section 6.2) and associated penalty are typically issued by designated personnel after considering all relevant circumstances regarding the violation. Records of all inspections and follow-up activities for deficiencies are to be retained for a minimum of five years.

6.1 Scope of Authority

The enforcement options available to Harbors range from administrative actions (including verbal/written warnings, eviction notices, and penalties) to the issuance of citations and a criminal fine. Three general areas of the environmental enforcement are listed below:

- Hawaii Revised Statutes [HRS] Chapter 266 authorizes Harbors to issue citations and summons for violations of its rules and have its actions enforced through the district courts by verdict of a misdemeanor or fine.
- Hawaii Administrative Rules [HAR] Title 19 Chapters 41 to 44 establishes uniform safety measures, operational standards and requirements, and the conduct for all tenants at State of Hawaii harbors.
- The tenant lease agreement or revocable permit that provides Harbors with the right of entry to conduct inspection and authority to terminate the permit or lease.

6.2 Enforcement Actions

The levels of enforcement actions to be utilized by inspectors, in order of increasing severity, are as follows:

- Oral or Verbal Warning
- Written Warning (e.g., Tenant Inspection Report or Letter with Tenant Inspection Report)
- Notice of Apparent Violation [NAV]
- Issuance of Summons or Citation
- Notice and Finding of Violation Order ([NFVO], see ERP for detailed description)

Detailed discussion of these enforcement actions could be found at Harbors ***Construction Runoff Control Program*** (HDOTa, 2014), ***Tenant Inspection Manual*** (HDOTc, 2014) and the ***Enforcement Response Manual*** (HDOTb, 2014).

As defined in Harbors ***Construction Site Runoff Control Program*** and ***Tenant Inspection Manual***. There are two types of violations – Class I Violation and Class II Violation, which are based on potential to discharge or cause environmental harm, magnitude of the violation (e.g., failure to apply for Industrial General Permit Coverage), duration of the violation, and violator's compliance history. A range of issues, which could result in enforcement (either informal or formal) in terms of post-construction BMP, includes:

- Failure to maintain a BMP specified in the submitted PSMP,
- Failure to maintain a BMP consistent with O&M Plan,
- Failure to address deficiencies,
- Failure to conduct annual inspection,
- Failure to submit required inspection documentation.

In the event that an enforcement action is required, the designated staff will identify the appropriate enforcement response to achieve compliance. If the tenant cannot achieve compliance by implementing the appropriate corrective action, the designated staff will "escalate" the enforcement response as outlined in Harbors ***Enforcement Response Manual***.

7.0 TRAINING

Training is a major component of any successful stormwater program. Harbors will adopt ***CCH Rules Relating to Storm Drainage Standards*** and ***CCH Storm Water BMP Guide*** as a reference for those parties who apply for project approvals on selection, design, installation, O&M of stormwater BMPs via the state website and handouts.

Harbors provides training so that employees have the knowledge and skills necessary to perform their functions effectively and efficiently. Training courses provide a comprehensive review of post-construction stormwater BMPs, introduce LID practices, and provide updates on the relevant requirements of the Harbors SWMP.

Appropriate Harbors staff whose job duties are related to implementing post-construction BMPs will be trained to have a clear understanding of their responsibilities. The post-construction BMPs training will consist of overall program goals and implementation. The content of the training will include:

- Post-Construction Technical Standards and use of the *Post-Construction BMP Checklist* including the existing and ***CCH Rules Relating to Storm Drainage Standards*** and ***CCH Storm Water BMP Guide***
- Content and Requirements of PSMP and O&M Plans
- Inspection Procedures
- Implementing the Enforcement Response Plan
- Post-construction BMP Inventory database use and maintenance

Training for Designers and Plans Reviewers

This annual course, required for HAR-ED, HAR-EE, HAR-EM, and HAR-EP and available to other Harbors employees and consulting engineers, will cover planning and design considerations for the proper selection, design, installation, operation, and maintenance of post-construction BMPs. It also includes an introduction to LID stormwater management practices.

Training for Inspectors, Construction Managers, and Contractors

This annual course, required for HAR-EC, HAR-EE, HAR-EM, and HAR-PM and available to other Harbors employees, consultant construction managers, and contractors on Harbors' projects, will cover installation, O&M, and inspection considerations for post-construction stormwater BMPs. It also includes an introduction to LID stormwater management practices.

Training for Operations and Maintenance

This course, required for Oahu District and available to other Harbors employees, will cover proper O&M of post-construction BMPs owned and operated by Harbors.

Training effectiveness will be evaluated through a survey of the participants. All participants will be required to sign in and information regarding how many employees attend the initial training will be reported in the ACR. Input from the survey will be evaluated and used for the development of future training session. The evaluation findings and any necessary program improvements will be included in the ACR.

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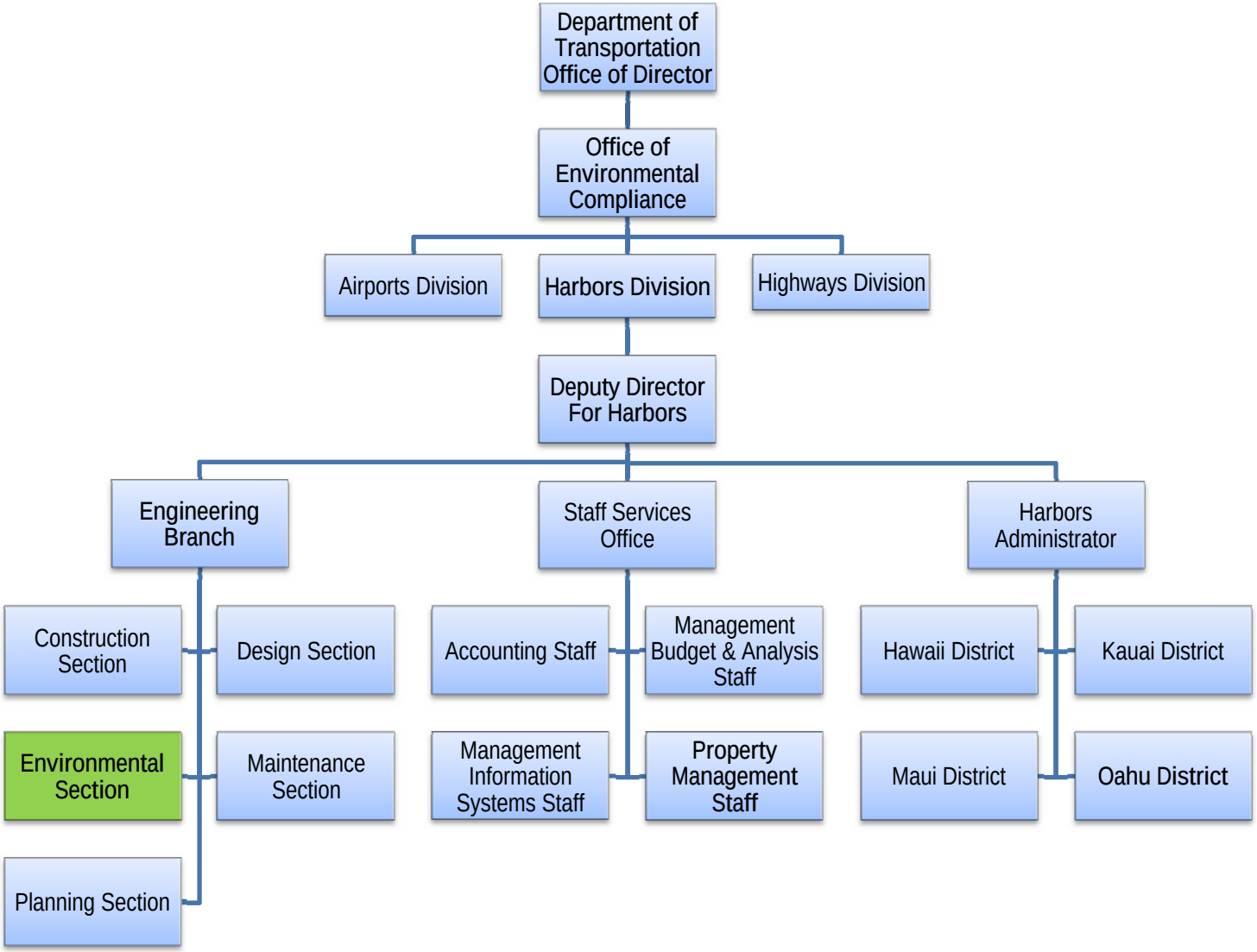
Appendix A

HDOT Harbors Division Administrative Organizational Chart

State of Hawaii Department of Transportation, Harbors Division
Administrative Organizational Chart



Appendix B

Permanent Post-Construction Best Management Practices Plan Checklist

Hawaii Department of Transportation – Harbors Division

Permanent Post-Construction Best Management Practice Plan Checklist

For a Harbors Project, please fill in this section	
Project Title:	
Project Location:	
Acreage of Site:	Harbors Project No.:
Name of Design Firm:	
Email:	Phone No.:

For a Tenant Improvement Project, please fill in this section	
Tenant Business Name:	Date:
Project Title:	
Project Location:	
Acreage of Site:	TMK No. (if any):
Applicant Name:	Job Title:
Email:	Phone No.:

Signature and Certifications	
Designer: I certify that the design is complete, accurate, and addresses the items on this checklist to the best of my knowledge.	
Print Name:	Job Title:
Signature:	Date:
Review: HDOT Harbors Project Manager and Environmental Section.	
Harbors Project Manager Signature:	Print Name:
	Date:
Harbors Environmental Section Signature:	Print Name:
	Date:

Part One - Low Impact Development Site Design Strategies

The following checked strategies will be incorporated and area(s) is denoted on the map:

- ☐ Conserve natural areas, soils, and vegetation
- ☐ Minimize soil compaction
- ☐ Minimize disturbances to natural drainages
- ☐ Minimize impervious surface
- ☐ Direct Runoff to Landscaped Areas
- ☐ None (all infeasible)

If "None" is checked, please provide justification here:

Part Two – Source Control

The following checked Source Control BMP(s) will be incorporated and area(s) is denoted on the map:

- ☐ Automatic irrigation systems
- ☐ Landscaped areas
- ☐ Loading docks
- ☐ Vehicle/Equipment fueling
- ☐ Vehicle/Equipment repair
- ☐ Vehicle/Equipment washing
- ☐ Outdoor work areas
- ☐ Outdoor material storage
- ☐ Outdoor trash storage
- ☐ Outdoor process operations
- ☐ Parking areas
- ☐ Others

If "Others" is checked, please describe here (attach separate sheets if needed):

Part Three – Treatment Control

The following checked Treatment Control BMP(s) will be incorporated and area(s) is denoted on the map:

- ☐ Infiltration basin
- ☐ Infiltration trench
- ☐ Subsurface Infiltration
- ☐ Dry well
- ☐ Bioretention basin
- ☐ Permeable pavement
- ☐ Green roof
- ☐ Bioretention filter
- ☐ Dry swale
- ☐ Downspout dispersion
- ☐ Vegetated swale
- ☐ Vegetated buffer strip
- ☐ Tree box filter

Alternative Compliance. The following alternative compliance is proposed and area(s) is denoted on the map:

- ☐ Incorporate the following alternative Treatment Control BMP(s):
  - ☐ Detention basin
  - ☐ Sand filter
  - ☐ Rain barrel
  - ☐ Manufactured treatment device
- ☐ Other (specify):

- ☐ Source Control BMPs are designed with reference to the City and County of Honolulu Storm Water BMP Guide.
- ☐ Treatment Control BMPs are designed with reference to the City and County of Honolulu Storm Water BMP Guide.

Appendix C

CCH Storm Water BMP Guide

Storm Water BMP Guide

DRAFT

June 2012
[Revision date: July 2012]

By:
City and County of Honolulu
Department of Planning and Permitting

E Mālama I Ka Wai Ola
Protect our waters...
FOR LIFE

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Acronyms and Abbreviations

BMP	Best Management Practice
cfs	cubic feet per second
cu-ft	cubic feet
ENV	Department of Environmental Services, City and County of Honolulu
EPA	Environmental Protection Agency, United States
ft	feet
hr	hour
in	inches
LID	Low Impact Development
min	minutes
sec	seconds
SPCC	Spill Prevention Control and Countermeasure
sq-ft	square feet
WQF	Water Quality Flow
WQV	Water Quality Volume

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INTRODUCTION

The City and County of Honolulu Rules Relating to Storm Drainage Standards (*Rules*) specifies that regulated new development and redevelopment projects include Low Impact Development (LID) Site Design Strategies, Source Control Best Management Practices (BMPs), and Post-Construction Treatment Control BMPs to meet water quality criteria. This Storm Water BMP Guide provides general guidelines to support their implementation. More detailed information may be found in the *City and County of Honolulu Storm Water BMP Manual, New Development and Redevelopment*, which may be found on the City's website.

Document Organization

Chapter 1 provides descriptions of the five site design strategies that must be considered for regulated projects if applicable

Chapter 2 provides the minimum requirements for the 12 source control BMPs that must be considered for regulated projects if applicable.

Chapter 3 provides design guidelines for those Treatment Control BMPs which are considered most appropriate for the City and County of Honolulu. It includes numeric sizing criteria to calculate the Water Quality Volume (WQV) and Water Quality Flow Rate (WQF), general design requirements for all Treatment Control BMPs that include infiltration as a pollutant removal/treatment mechanism, and specific BMP design and sizing information.

Reference are provided at the end of the document.

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1. SITE DESIGN STRATEGIES

Low Impact Development (LID) is a storm water management strategy concerned with maintaining or restoring the natural hydrologic functions of a site to achieve natural resource protection objectives and fulfill environmental regulatory requirements. LID employs a variety of natural and built features that reduce the rate of runoff, filter out its pollutants, and facilitate the infiltration of water into the ground. By reducing water pollution and increasing groundwater recharge, LID helps to improve the quality of receiving surface waters and stabilize the flow rates of nearby streams.

The goal of LID site design is to reduce the hydrologic impact of development and to incorporate techniques that maintain or restore the site's hydrologic and hydraulic functions. The optimal LID site design minimizes runoff volume and preserves existing flow paths. On the following pages are presented the five strategies considered applicable for new development and redevelopment projects.

CONSERVE NATURAL AREAS, SOILS, AND VEGETATION

The conservation of natural areas, soils, and vegetation helps to retain numerous functions of predevelopment hydrology, including rainfall interception, evapotranspiration, and infiltration. Maximizing these functions will thereby reduce the amount of runoff that must be treated. Protection of mature trees and vegetation provides habitat, prevents erosion, captures significant rainfall, provides summer shading, and reduces runoff volume and velocity which protects and enhances downstream water quality. Specific measures are:

- Preserve/protect riparian buffers
- Preserve/protect wetlands
- Preserve/protect natural flow pathways
- Preserve/protect steep slopes
- Preserve/protect sensitive environmental areas.
- Preserve/protect undisturbed vegetated areas/corridors.
- Preserve native trees and restrict disturbance of soils beneath tree canopies.
- Limit construction activities and disturbances to areas with previously disturbed soils.
- Avoid disturbing vegetation and soil on slopes and near surface waters.
- Leave an undisturbed buffer along both sides of natural streams.



Waaloa Way

MINIMIZE DISTURBANCES TO NATURAL DRAINAGES

Natural drainages offer a benefit to storm water management as the soils and habitat already function as a natural filtering/infiltrating swale. Minimizing disturbances to natural drainage patterns preserves the predevelopment timing, rate, and duration of runoff as well as preserving streamside habitats. When determining the development footprint of the site, natural drainages should be avoided. By keeping the development envelope set back from natural drainages, the drainage can retain its water quality benefit to the watershed. Specific measures are:

- Limit site disturbance, clearing, and grading to the smallest areas necessary
- Maintain surface flow patterns of undeveloped sites.
- Maintain existing water body alignments, sizes, and shapes.
- Minimize and control construction traffic areas
- Minimize and control construction stockpiling and storage areas
- Use construction fencing to mark where no disturbances will be allowed.



Waimanalo Stream

MINIMIZE SOIL COMPACTION

Clearing, grading and compaction by construction traffic reduces the natural absorption and infiltration capacities of the native soils. Soil compaction damages soil structure, reduces infiltration rates, limits root growth and plant survivability, and destroys soil organisms. Subsequent tilling and/or addition of soil amendments such as compost can help, but will not restore the original infiltration capacity of the soils. By protecting native soils and vegetation in appropriate areas during the clearing and grading phase of development the site can retain some of its existing beneficial hydrologic function. Specific measures are:

- Protect soils against compaction and rutting in areas where traffic is unavoidable.
- Minimize the size of construction easements and material storage areas.
- Limit areas of heavy equipment
- Prohibit working on wet soils with heavy equipment.
- Restore compacted open space areas with tilling and soil amendments.
- Avoid extensive and unnecessary clearing and stockpiling of topsoil
- Avoid/minimize soil compaction in open space, landscaped, and proposed LID BMP areas
- Prepare soil amendments off-site



???

MINIMIZE IMPERVIOUS SURFACES

The increased volume, increased velocity, and discharge duration of storm water runoff from developed areas has the potential to accelerate downstream erosion and impair stream habitat in natural drainages. Studies have demonstrated a direct correlation between the degree of imperviousness of an area and the degradation of its receiving waters. Impervious surfaces (such as pavement and concrete) can neither absorb water nor remove pollutants, and thus the natural purification characteristics are lost. Reducing impervious surfaces to the minimum amount needed retains the permeability of the project site, allowing natural processes to filter and reduce non-point sources of pollution. Specific measures are:

- Use open space or hybrid street plan instead of grid and curvilinear
- Reduce sidewalk widths
- Maximize utilization of compact car spaces in parking areas
- Reduce parking stalls in areas near Transit Centers
- Incorporate shared parking areas and driveways
- Reduce driveway sizes
- Consider clustering buildings that require less driveways and pathways;



Fasi Municipal Building Green Roof

DIRECT RUNOFF TO LANDSCAPED AREAS

Any impervious surface that drains into a catch basin, area drain, or other conveyance structure is a "directly connected impervious area (DCIA)." As storm water runoff flows across parking lots, roadways, and paved areas, the oils, sediments, metals and other pollutants are collected and concentrated. If this runoff is collected by a drainage system and carried directly along impervious gutters or in closed underground pipes, it has no opportunity for filtering by plant material or infiltration into the soil. It also increases in speed and volume, which may cause higher peak flows downstream, and may require larger capacity storm drain systems, increasing flood and erosion potential. Solutions that reduce DCIA prevent runoff, detain or retain surface water, attenuate peak runoff rates, benefit water quality and convey storm water. Specific measures are:

- Design roof drains to flow to vegetated areas
- Direct flow from paved areas to stabilized landscaped/vegetated areas
- Grade paved areas to achieve sheet flow to landscaped areas
- Break up flow directions from large paved surfaces



Local Church

2. SOURCE CONTROL BMPS

Proactively controlling pollutants at their source is fundamental to effective stormwater quality management. There are a number of items that can be routinely designed into a project that function as source controls once a project is completed. They include such items as marking new drain inlets and posting informational signs; improving landscape planning and efficient irrigation methods; using water quality friendly building materials; properly designing outdoor material and trash storage areas; and permanently protecting slopes and channels from erosion. They also include design features for specific workplace or other activity areas such as vehicle washing areas, outdoor processing areas, maintenance bays, and fueling areas.

Design of BMPs to control workplace exposure to pollutants is guided by two general principles:

- Prevent storm water from contacting work areas. Work and storage areas should be designed to prevent storm water runoff from passing through shipping areas, vehicle maintenance yards, and other work places before it reaches storm drains. The objective is to prevent the discharge of water laden with grease, oil, heavy metals and process fluids to surface waters or sensitive resource areas.
- Prevent pollutants from contacting surfaces that come into contact with storm water runoff. Precautionary measures should be employed to keep pollutants from contacting surfaces that come into contact with runoff. This means controlling spills and reviewing operational practices and equipment to prevent pollutants from coming into contact with storm or wash water runoff.

The most common Source Control BMPs are the following, and are presented herein:

- Landscaped areas
- Automatic irrigation systems
- Storm drain Inlets
- Vehicle/equipment fueling
- Vehicle/equipment repair
- Vehicle/equipment washing/cleaning
- Loading docks
- Outdoor trash storage
- Outdoor material storage
- Outdoor work areas
- Outdoor process equipment operations
- Parking areas

The following information is provided for each of the above-listed BMPs:

- Brief description/approach
- Minimum (mandatory) design requirements
- Minimum (mandatory) operations and maintenance requirements

LANDSCAPED AREAS



Description / Approach

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

Design Guidelines

- Conserve Natural Areas to the extent possible
- Maximize Natural Water Storage and Infiltration Opportunities to the extent possible
- Protect Slopes and Channels

O&M Recommendations

- Do not use pesticides and fertilizers during wet weather or when rain is forecast, and minimize their use during dry weather.
- Do not blow or rake leaves, grass, or garden clippings into the street, gutter, or storm drain.
- Do not apply any chemicals (insecticide, herbicide, or fertilizer) directly to surface waters, unless the application is approved and permitted by the state.
- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.
- Check irrigation schedules so pesticides will not be washed away and to minimize non-storm water discharge.

AUTOMATIC IRRIGATION SYSTEMS



Description / Approach

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

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

Design Guidelines

- Design irrigation systems to each landscape area's specific water requirements.
- Implement landscape plans consistent with City water conservation resolutions, which may include provision of drip irrigation, water sensors, programmable irrigation times (for short cycles), etc.
- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration.

O&M Recommendations

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring.
- Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.

STORM DRAIN INLETS



Description / Approach

Storm drain signs and stencils are highly visible source controls that are placed directly adjacent to storm drain inlets. The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Stencils and signs alert the public to the destination of pollutants discharged to the storm drain.

Design Guidelines

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. ENV Storm Water Branch has approved specific signage and/or storm drain message placards for use.
- Place the marker in clear sight facing toward anyone approaching the inlet from either side
- Be aware that signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.
- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

O&M Recommendations

- Inspect signage regularly and maintain as appropriate to ensure legibility.
- Inspect regularly, at least annually, for structural deterioration or significant build-up of debris or sediment.

VEHICLE/EQUIPMENT FUELING



Description / Approach

Fueling areas have the potential to discharge oil and grease, solvents, car battery acid, coolant and gasoline to the storm drain. Spills can be a significant source of pollution because fuels contain toxic materials and heavy metals that are not easily removed by storm water treatment devices.

Design Guidelines

- ***Covering.*** Include an overhanging roof structure or canopy over fuel dispensing areas. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. If fueling large equipment or vehicles that prohibit the use of covers or roofs, the fueling island should be designed to accommodate the larger vehicles and equipment and to prevent storm water run-on and runoff.
- ***Surfacing.*** Pave fuel dispensing areas with Portland cement concrete (or equivalent smooth impervious surface). Extend the paved area a minimum of 6.5 ft from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 ft, whichever is less. The use of asphalt concrete is prohibited. Use asphalt sealant to protect asphalt paved areas surrounding the fueling area.
- ***Grading/Contouring.*** Slope the dispensing areas to prevent ponding, and separate it from the rest of the site by a grade break that prevents run-on. Grade the fueling areas to drain toward a dead-end sump or vegetated/landscaped area. Direct runoff from downspouts/roofs away from fueling areas towards vegetated/landscaped areas if possible.
- ***Drains.*** Label all drains within facility boundaries using paint or stencil, to indicate whether flow is to the storm drain, sewer, or oil/water separator

O&M Recommendations

- Maintain clean fuel-dispensing areas using dry cleanup methods such as sweeping, or use of rags and absorbents for leaks and spills.
- If you clean by washing, place a temporary plug in the downstream drain and pump out the accumulated water. Properly dispose the water.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank. Cover storm drains in the vicinity during transfer.
- Post signs at the fuel dispenser or fuel island warning vehicle owners/operators against "topping off" of vehicle fuel tanks.
- Develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan.

VEHICLE/EQUIPMENT REPAIR



Description / Approach

Several measures can be taken to prevent operations at maintenance bays from contributing a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the storm water conveyance system. In designs for maintenance bays containment is encouraged. Preventive measures include overflow containment structures and dead-end sumps

Design Guidelines

Design requirements for vehicle maintenance and repair are governed by Building and Fire Codes, and by current local agency ordinances, and zoning requirements. The design requirements described hereon are meant to enhance and be consistent with these code requirements.

- Locate repair/maintenance bays indoors; or design them to preclude run-on and runoff.
- Pave repair/maintenance floor areas with Portland cement concrete (or equivalent smooth impervious surface).
- Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around repair bays to prevent spilled materials and wash-down waters from entering the storm drain system. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited.
- Label all drains within facility boundaries using paint or stencil, to indicate whether flow is to the storm drain, sewer, or oil/water separator.

O&M Recommendations

- Avoid hosing down work areas. If work areas are washed, collect and direct wash water to sanitary sewer.
- Do not pour liquid waste down floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- Do not dispose of used or leftover cleaning solutions, solvents, and automotive fluids and oil in the sanitary sewer.
- Keep drip pans or containers under vehicles or equipment that may drip during repairs.
- When steam cleaning or pressure washing parts, the wastewater must be discharged to an on-site oil water separator that is connected to a sanitary sewer or blind sump.
- Develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan.

VEHICLE/EQUIPMENT WASHING & CLEANING



Description / Approach

Vehicle washing, equipment washing, and steam cleaning may contribute high concentrations of pollutants to wash waters that drain to storm water conveyance systems. Wash water may not be conveyed to a sewer without a sewer connection permit.

Design Guidelines

Incorporate at least one of the following features for equipment washing/steam cleaning:

- Be self-contained and/or covered with a roof or overhang
- Be equipped with a clarifier or other pretreatment facility
- Have a proper connection to a sanitary sewer
- Install sumps or drain lines to collect wash water. Divert wash water to the sanitary sewer, an engineered infiltration system, or an equally effective alternative.
- Direct and divert surface water runoff away from the exposed area around the wash pad, and wash pad itself to alternatives other than the sanitary sewer.
- Cover areas used for regular washing of vehicles, trucks, or equipment, surround them with a perimeter berm, and clearly mark them as a designated washing area.
- Label all drains within facility boundaries using paint or stencil, to indicate whether flow is to the storm drain, sewer, or oil/water separator.

O&M Recommendations

- Mark the area clearly as a wash area.
- Post signs stating that only washing is allowed in wash area.
- Provide trash container with lids in wash area.
- Recycle, collect or treat wash water effluent prior to discharge to the sanitary sewer system.
- Do not conduct oil changes and other engine maintenance in the designated washing area. Perform these activities in a place designated for oil change and maintenance activities.
- Cover the wash area when not in use to prevent contact with rain water.
- Do not permit steam cleaning wash water to enter the storm drain.
- Develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan.

LOADING DOCKS



Description / Approach

Several measures can be taken to prevent operations at loading docks from contributing a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the storm water conveyance system. In designs for loading docks, containment is encouraged. Preventive measures include overflow containment structures and dead-end sumps.

Design Guidelines

Design requirements for vehicle maintenance and repair are governed by Building and Fire Codes, and by current local agency ordinances, and zoning requirements. The design requirements described hereon are meant to enhance and be consistent with these code requirements.

- Cover all loading dock areas, or design them to preclude run-on and runoff.
- Do not allow runoff from depressed loading docks (truck wells) to discharge into storm drains.
- Drain below-grade loading docks from grocery stores and warehouse/distribution centers of fresh food items through water quality inlets, an engineered infiltration system, or an equally effective alternative.
- Grade and/or berm the loading/unloading area to a drain that is connected to a dead-end.
- Pave loading areas with concrete instead of asphalt.

O&M Recommendations

- Develop an operations plan that describes procedures for loading and/or unloading.
- Conduct loading and unloading in dry weather if possible.
- Load and unload all materials and equipment in covered areas if feasible.
- Load/unload only at designated loading areas.
- Check loading and unloading equipment regularly for leaks.
- Look for dust or fumes during loading or unloading operations.
- Develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan.

OUTDOOR TRASH STORAGE



Description / Approach

Storm water runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or streams.

Preventive measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Design Guidelines

- Hazardous waste must be handled in accordance with legal requirements established in *Hawaii Administrative Rules Title 11 Chapter 58.1 Solid Waste Management Control,* and enforcement by the *State of Hawaii Department of Health solid and Hazardous Waste Branch.*
- Berm trash storage areas to prevent run-on from adjoining roofs and pavement, or grade areas towards vegetated/landscaped areas.
- Reduce/prevent leaking of liquid waste by incorporating at least one of the following:
  - Lined bins or dumpsters
  - Low containment berm around the dumpster area
  - Drip pans underneath dumpsters
- Prevent rainfall from entering containers with roofs, awnings, or attached lids.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on dumpsters indicating that hazardous material are not to be disposed of therein.

O&M Recommendations

- Spot clean leaks and drips routinely to prevent runoff of spillage
- Post “no littering” signs
- Use only watertight waste receptacle(s) and keep the lid(s) closed
- Do not overfill or fill with any liquid. Keep lid closed at all times.
- Periodically inspect for leaks. If found contact the leasing company immediately.
- Never wash down or rinse with a hose. Contact leasing company for cleaning.
- Develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan.

OUTDOOR MATERIAL STORAGE



Description / Approach

Proper design of outdoor storage areas for materials reduces opportunity for pollutants to enter the storm water conveyance system. Materials may be in the form of raw products, by-products, finished products, and waste products.

In outdoor storage areas, infiltration is discouraged and containment is encouraged.

Design Guidelines

Design requirements for material storage areas are governed by Building and Fire Codes, and by current City ordinances and zoning requirements. Control measures are site specific, and must meet local agency requirements.

- Materials with the potential to contaminate storm water must either be placed in an enclosure that prevents contact with runoff or spillage to the storm water conveyance system, or protected by secondary containment structures such as berms, dikes, or curbs.
- Pave the storage area with Portland cement concrete (or equivalent smooth impervious surface) to contain leaks and spills.
- Slope the storage area towards a dead-end sump to contain spills.
- Direct runoff from downspouts/roofs away from storage areas.
- Cover the storage area with an awning that extends beyond the storage area to minimize collection of storm water within the secondary containment area. A manufactured storage shed may be used for small containers.

O&M Recommendations

- Protect materials from rainfall, run-on, runoff, and wind dispersal.
- Employ safeguards against accidental releases.
- Inspect storage areas regularly for leaks or spills.
- Keep storage areas clean and dry.
- Keep containers in good condition without corrosion or leaky seams.
- Cover and contain stockpiles of raw materials to prevent storm water run-on. If infeasible, implement erosion control practices around site perimeter and catch basins.
- Develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan.

OUTDOOR WORK AREAS



Description / Approach

Proper design of outdoor work areas (grinding, painting, coating, sanding, parts cleaning, etc.) reduces opportunity for pollutants to enter the storm water conveyance system.

In outdoor work areas, infiltration and discharge to the storm drain are discouraged; collection and conveyance to the sanitary sewer are encouraged.

Design Guidelines

Design requirements for outdoor work areas are governed by Building and Fire Codes, and by current City ordinances, and zoning requirements.

- Create an impermeable surface such as concrete or asphalt, or a prefabricated metal drip pan, depending on the use.
- Cover the area with a roof to prevent rain from falling on the work area and becoming polluted runoff.
- Berm or perform mounding around the perimeter of the area to prevent water from adjacent areas from flowing on to the surface of the work area.
- Directly connect runoff to the sanitary sewer or other specialized containment system(s). This allows the more highly concentrated pollutants from these areas to receive special treatment that removes particular constituents. Approval for this connection must be obtained from the City.
- Locate the work area away from storm drains or catch basins.

O&M Recommendations

- Dry clean the work area regularly.
- Inspect storage areas regularly for leaks or spills.
- Develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan.

OUTDOOR PROCESS EQUIPMENT OPERATIONS



Description / Approach

Outdoor process equipment operations such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, may contribute a variety of pollutants to the storm conveyance system.

In outdoor process equipment areas, infiltration is discouraged and containment is encouraged, accompanied by collection and conveyance.

Design Guidelines

Design requirements for outdoor processing areas are governed by Building and Fire codes, and by current local agency ordinances, and zoning requirements.

- Cover or enclose areas that would be the most significant source of pollutants; or slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.
- Grade or berm area to prevent run-on from surrounding areas.
- Do not install storm drains in areas of equipment repair.
- Provide secondary containment structures (not double wall containers) where wet material processing occurs (e.g., electroplating), to hold spills resulting from accidents, leaking tanks, or equipment, or any other unplanned releases (Note: if these are plumbed to the sanitary sewer, they must be with the prior approval of the City.)

O&M Recommendations

- Dry clean the work area regularly.
- Inspect storage areas regularly for leaks or spills.
- Develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan.

PARKING AREAS



Description / Approach

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through storm water runoff or non-storm water discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas.

Design Guidelines

- Direct pavement runoff towards vegetated/landscaped areas if possible.

O&M Recommendations

- Clean leaves, trash, sand, and other debris regularly
- Routinely sweep, shovel, and dispose of litter in the trash. Sweep entire parking lot at least once before the onset of the wet season.
- Provide an adequate number of covered trash receptacles. Clean out frequently.
- Re-seal or pave only on dry days, and stop immediately before rainfall.
- Pre-heat, transfer or load hot bituminous material away from storm drain inlets.
- Do not allow any solids, liquids, or slurries to enter storm drains
- Use dry clean-up methods (absorbents) on auto spills and/or drips.
- Do not hose down unless absolutely necessary. If you must pressure wash, discharge wash water to the sanitary sewer or a vegetated area. Do not allow wash water to enter storm drains.

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3. TREATMENT CONTROL BMPS

Treatment Control BMPs are engineered technologies designed to remove pollutants from storm water runoff prior to discharge to the storm drain system or receiving waters. This chapter addresses BMP numeric sizing criteria, general requirements for infiltration BMPs, and individual BMP fact sheets.

NUMERIC SIZING CRITERIA

This section presents the methodology for calculating the Water Quality Volume (WQV) and Water Quality Flow Rate (WQF), which are used to size the majority of the Treatment Control BMPs.

Water Quality Volume

The Water Quality Volume (WQV) is calculated using the following equation:

$$WQV = PCA \times 3630$$

Where:
- WQV = water quality design volume (cubic feet)
- P = design storm runoff depth (inches)
- C = volumetric runoff coefficient
- A = total drainage area (acres)

As specified in the *Rules*, a design storm runoff depth of 1 inch shall be used. The volumetric runoff coefficient shall be calculated using the following equation as developed by EPA for smaller storms in urban areas:

$$C = 0.05 + 0.009I$$

Where:
- C = volumetric runoff coefficient
- I = percent of impervious cover, expressed as a percentage

A graph presenting the relationship between the percent of impervious cover and the unit water quality design volume for a 1-inch runoff depth is shown in Figure 1.

Water Quality Flow

The design water quality flow rate (WQF) is calculated using the Rational Formula:

$$WQF = CiA$$

Where:
- WQF = water quality design flow rate (cubic feet per second)
- C = runoff coefficient
- i = peak rainfall intensity (inches per hour)
- A = total drainage area (acres)

As specified in the *Rules*, a peak rainfall intensity of 0.4 inches per hour shall be used. The runoff coefficient shall be determined from Table 1 below, based on the drainage area, and shall be, at a minimum, the midpoint of the given range of values. The higher value should be used if

soil conditions indicate that pervious areas will have little infiltration/interception potential. For drainage areas containing multiple land uses, the following formula may be used to compute a composite weighted runoff coefficient:

$$C_c = \left(\sum_{i=1}^{n} C_i A_i \right) \Big/ A_t$$

Where: C_c = composite weighted runoff coefficient
$C_{1,2,...n}$ = runoff coefficient for each land use cover type
$A_{1,2,...n}$ = drainage area of each land use cover type (acres)
A_t = total drainage area (acres)

Table 1: Runoff Coefficients for Water Quality Flow Calculations

Type of Drainage Area	Runoff Coefficient
Business	
Downtown areas	0.70 – 0.95
Neighborhood areas	0.50 – 0.70
Residential	
Single-family areas	0.30 – 0.50
Multi-units, detached	0.40 – 0.60
Multi-units, attached	0.60 – 0.75
Suburban	0.25 – 0.40
Apartment dwelling areas	0.50 – 0.70
Industrial	
Light areas	0.50 – 0.80
Heavy areas	0.60 – 0.90
Parks, cemeteries	0.10 – 0.25
Playgrounds	0.20 – 0.40
Railroad yards	0.20 – 0.35
Unimproved areas	0.10 – 0.30
Lawns	
Sandy soil, flat, ≤ 2%	0.05 – 0.10
Sandy soil, average 2-7%	0.10 – 0.15
Sandy soil, steep ≥ 7%	0.15 – 0.20
Heavy soil, flat, ≤ 2%	0.13 – 0.17
Heavy soil, average 2-7%	0.18 – 0.22
Heavy soil, steep ≥ 7%	0.25 – 0.35
Streets	
Asphaltic	0.70 – 0.95
Concrete	0.70 – 0.95
Brick	0.75 – 0.85
Drives and walks	0.75 – 0.95
Roofs	0.75 – 0.95

A graph presenting the relationship between the weighted runoff coefficient and the unit water quality design flow rate is shown in Figure 2.

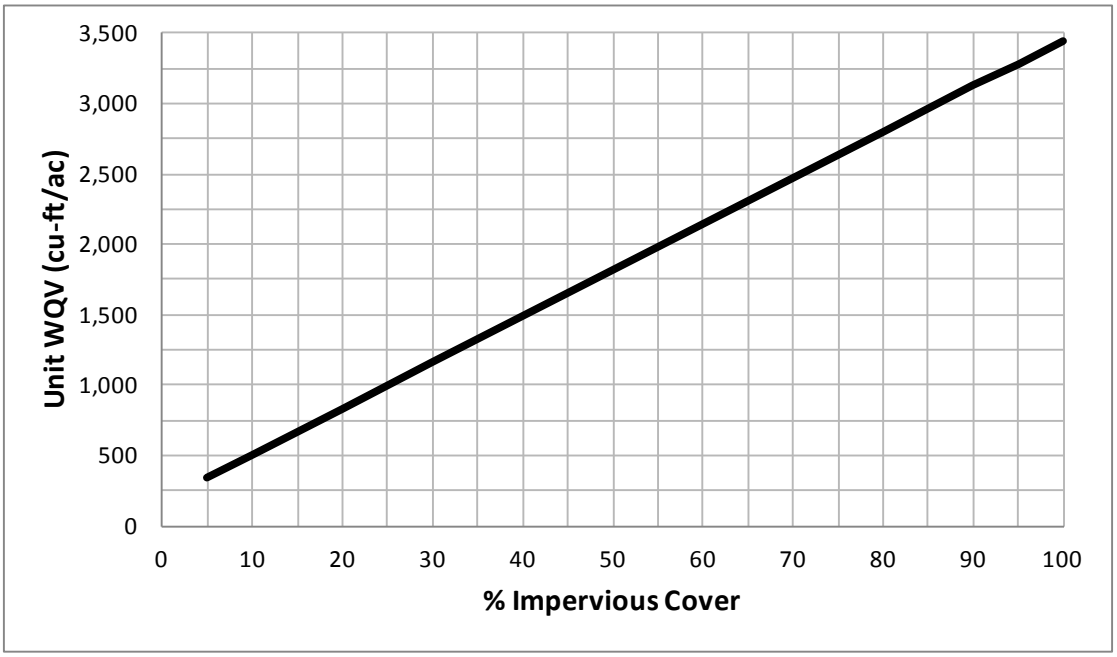


Figure 1: Unit Water Quality Volume for 1 inch Runoff Depth

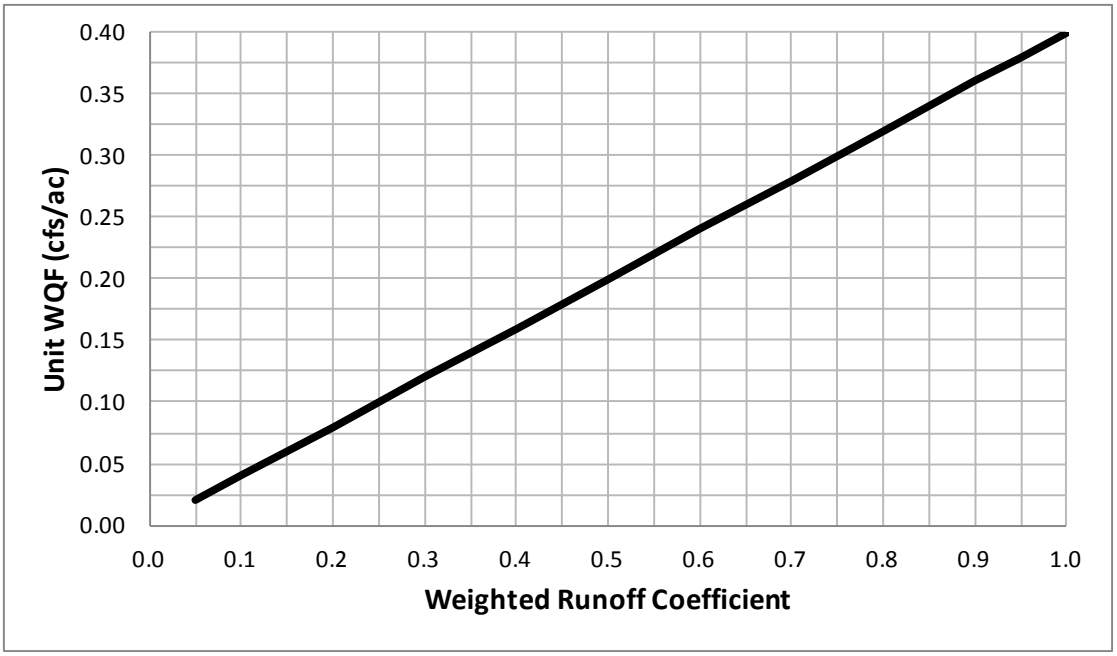


Figure 2: Unit Water Quality Flow

GENERAL INFILTRATION REQUIREMENTS

LID Retention BMPs rely on the soil's ability to infiltrate storm water runoff. This section outlines the design requirements applicable to all infiltration facilities.

Soil Types and Textures

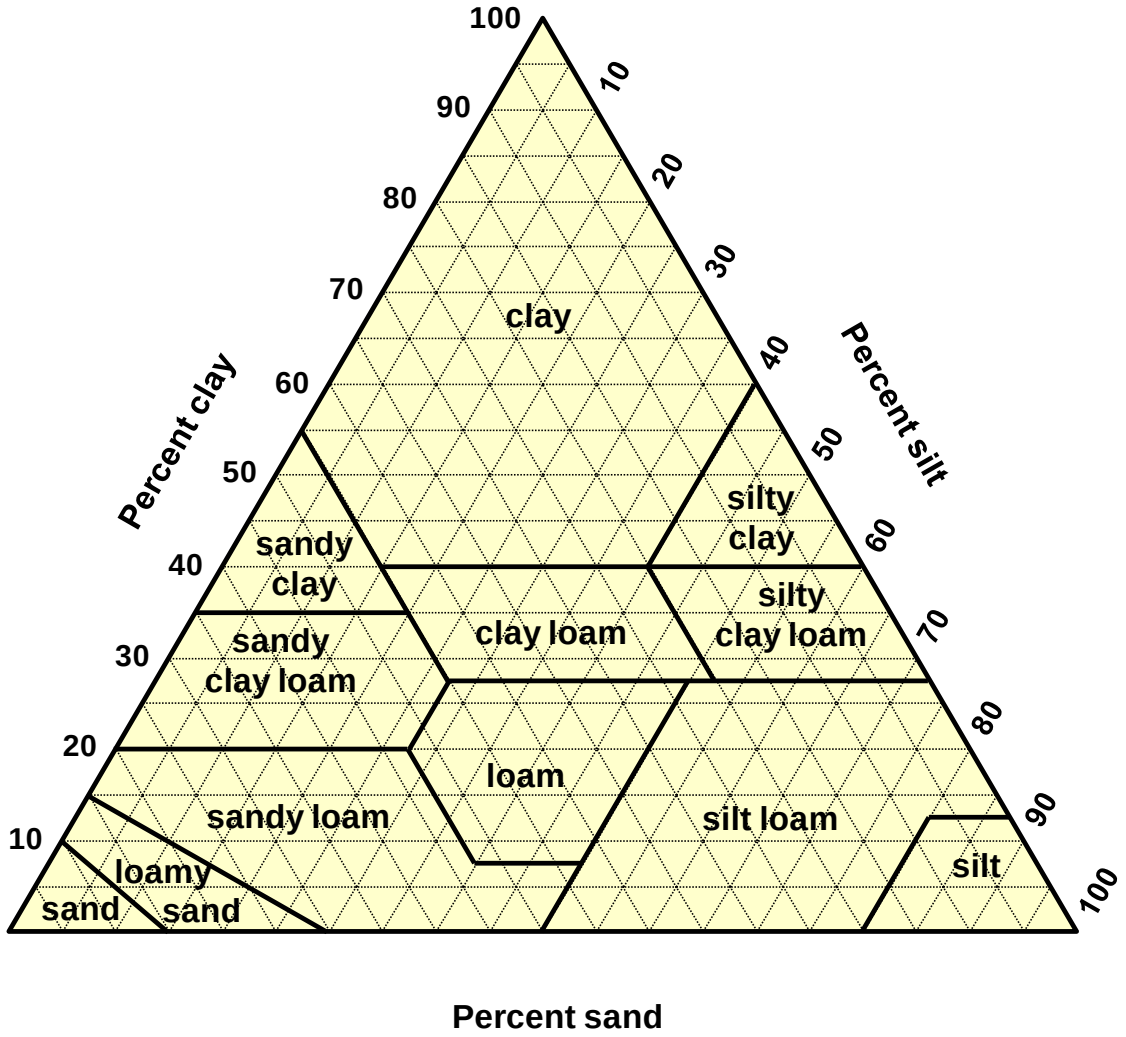
The soil types within the subsoil profile, extending a minimum of 3 feet below the bottom of the proposed facility, should be identified to verify the infiltration rate or permeability of the soil. The infiltration rate, or permeability, measured in inches per hour, is the rate at which water passes through the soil profile during saturated conditions. Although the units of infiltration rate and hydraulic conductivity of soils are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions are known, such as hydraulic gradient and the extent of lateral flow of water, or can be reliably estimated. Minimum and maximum infiltration rates establish the suitability of various soil textural classes for infiltration. Each soil texture and corresponding hydrologic properties within the soil profile are identified through analysis of a gradation test of the soil boring material. Table 2 presents a list of the infiltration rates for the soil textures of the U.S. Department of Agriculture Textural Triangle, presented in Figure 3.

Table 2: Typical Soil Infiltration Rates

Texture Class	Hydrologic Soil Group[a]	Infiltration Rate (in/hr)[b]	Infiltration Rate (in/hr)[c]
Sand	A	8.27	8.00
Loamy sand	A	2.41	2.00
Sandy loam	A	1.02	1.00
Loam	B	0.52	0.50
Silt loam	B	0.27	0.25
Sandy clay loam	C	0.17	0.15
Clay loam	D	0.09	0.09
Silty clay loam	D	0.06	0.09
Sandy clay	D	0.05	
Silty clay	D	0.04	
Clay	D	0.02	0.05

[a] Source: U.S. Soil Conservation Service, 1986
[b] Source: Rawls, Brakensiek and Saxton, 1982
[c] Source: ASCE, 1998

Figure 3: USDA Soils Textural Triangle



Soil textures acceptable for use with infiltration systems include those with infiltration rates equal to or above 0.50 inches per hour (a soil texture indicative of loam). Soil textures with rates less than 0.50 inches per hour are not suitable as it increases the risk of the BMP not draining properly and creating localized areas of standing water. It is important to note however, that Hydrologic Soil Group (HSG) "D" soils (e.g., clay loam, silty clay loam, and silty clay) in Oahu have been shown to perform better than their counterparts in the Continental United States, as is presented for a representative group of soils in Table 4. As a result, locations with HSG "D" soils should not be prematurely rejected as candidate sites for infiltration BMPs, and field tests should be performed to determine actual infiltration rates.

Table 3: Typical Oahu Soil Infiltration Rates[a]

Soil Name	Depth (in)	USDA Texture	Saturated Hydraulic Conductivity (in/hr)
Kapaa	0 – 14	Silty clay	0.6 – 6.0
	14 – 60	Clay loam	0.2 – 2.0
Kunia	0 – 22	Silty clay	0.2 – 2.0
	22 – 47	Silty clay	0.06 – 0.6
	47 - 74	Silty clay loam	0.2 – 0.6
Waialua	0 – 12	Silty clay	0.2 – 2.0
	12 - 60	Clay, Silty clay	0.2 – 0.6
Waikane	0 – 8	Silty clay	0.6 – 2.0
	8 – 60	Silty clay	0.06 – 0.6

[a] Source: USDA Natural Resources Conservation Service, 2006

Field Investigations

Infiltration testing, soil logs, and the written opinion of a licensed geotechnical engineer are required for the construction of an infiltration facility.

Soil Lithology and Depth to Groundwater

An initial soil investigation should be performed to adequately evaluate soil lithology and determine if there are potential problems in the soil structure that would inhibit the rate or quantity of infiltration desired; or if there are potential adverse impacts to structures, slopes or groundwater that could result from locating the device nearby.

Geotechnical test pits or borings shall be dug to a minimum of 5 ft deep below the proposed device invert. A test pit allows visual observation of the soil horizons and overall soil conditions both horizontally and vertically in that portion of the site. Although the use of soil borings is permitted at the recommendation of a geotechnical professional, it is discouraged as a substitute for test pits as visual observation is narrowly limited in a soil boring and the soil horizons cannot be observed in-situ, but must be observed from the extracted borings.

The soil profiles should be carefully logged to determine variations in the subsurface profile. The number of requisite test pits/borings is provided in Table 5. Samples should be collected from the soil profiles at different horizons and transported to a laboratory for soil indices testing, plasticity, and chemical testing. In addition, the test pits or samples from borings should be examined for other characteristics that may adversely affect infiltration. These include evidence of significant mottling (indicative of high groundwater), restrictive layer(s), and significant variation in soil types, either horizontally or vertically.

Table 4: Test Pit/Boring Requirements for Infiltration

Facility	Size	Min. No. of Test Pits/Borings
Infiltration Basin, Subsurface Infiltration, Dry Well, Bioretention Basin, Permeable Pavement	< 2,500 sq-ft	1
	2,500 – 20,000 sq-ft	2
	20,000 – 30,000 sq-ft	3
	30,000 – 40,000 sq-ft	4
	> 40,000 sq-ft	1 test per 10,000 sq-ft
Infiltration Trench	< 100 ft	1
	100 – 200 ft	2
	200 – 300 ft	3
	> 300 ft	1 test per 100 ft

An initial indication of the seasonal high groundwater water table elevation shall be determined by using a piezometer or other accepted geotechnical means. The piezometer should be installed to a depth of at least 20 ft below the proposed device invert using the direct push or other suitable method. Initial groundwater levels shall be recorded at least 24 hours after installation. The geotechnical professional will make a determination whether the groundwater elevation determined after 24 hours can be considered to be a reasonable indication of the seasonal high water table for the site.

Permeability Testing

Infiltration rate tests are used to help estimate the maximum sub-surface vertical infiltration rate of the soil below a proposed infiltration facility (e.g., infiltration trench or infiltration basin). The tests are intended to simulate the physical process that will occur when the facility is in operation; therefore a saturation period is required to approximate the soil moisture conditions that may exist prior to the onset of a runoff event. Laboratory tests are strongly discouraged, as a homogeneous laboratory sample does not represent field conditions. Infiltration tests should be conducted in the field. Tests should not be conducted in the rain or within 24 hours of significant rainfall events (greater than 0.5 inches).

For the purposes of determining a field infiltration rate, a saturated hydraulic conductivity test should be performed at the bottom of the proposed infiltration facility. The measured infiltration rate of the underlying soil shall be determined using either the Falling Head Percolation Test or the Double-Ring Infiltrometer Test. There are differences between the two methods. A Double-Ring Infiltrometer test estimates the vertical movement of water through the bottom of the test area. The outer ring helps to reduce the lateral movement of water in the soil. A percolation test allows water movement through both the bottom and sides of the test area. For this reason, it is advised that tests for infiltration basins be carried out with an infiltrometer (not percolation test) to determine the saturated hydraulic conductivity rate. This precaution is taken to account for the fact that only the surface of the basin functions to infiltrate, as measured by the test. The number of requisite permeability tests is provided in Table 6.

Table 5: Permeability Test Requirements for Infiltration

Facility	Size	Min. No. of Permeability Tests
Infiltration Basin, Subsurface Infiltration, Dry Well, Bioretention Basin, Permeable Pavement	no manmade soils present	1 test per 2,500 sq-ft
	manmade soils present	1 test per 1,000 sq-ft
Infiltration Trench	no manmade soils present	1 test per 100 ft
	manmade soils present	1 test per 50 ft

Design Infiltration Rates

To account for uncertainties and inaccuracies in testing, a correction (i.e., safety) factor shall be applied to the measured infiltration rate to produce a design infiltration rate for BMP sizing calculations. Minimum safety factors shall be as follows:

Table 6: Infiltration Rate Factors of Safety

Method	Min. Factor (F_s)
Without minimum Test Pits or minimum Permeability Tests	5
With minimum Test Pits only	4
With minimum Permeability Tests only	3
With minimum Test Pits and minimum Permeability Tests	2

On the following pages are fact sheets for each Treatment Control BMP specified in the *Rules*. The following information is provided for each BMP:

- Brief description
- BMP category
- Expected pollutant removals
- Minimum design criteria
- Feasibility criteria
- Step-by-step sizing procedure
- Pretreatment considerations
- Area requirements
- Sizing example
- Other design considerations
- Typical schematic

The sizing procedures are based on simple dynamic and static principles and therefore may result in larger BMPs than are necessary. More rigorous sizing methods (such as detailed routing methods or continuous simulation models) may be used with City approval. Also, the information in the typical schematics may not coincide with the BMP's minimum design criteria. In those instances, the minimum design criteria prevails.

BMPs not included herein, such as Stormwater Wetlands, Wet Ponds, and proprietary devices, may be used with written City approval.

To facilitate comparison of the BMP characteristics, a summary of the BMP categories and expected pollutant removals is presented in Tables 7 and 8, respectively.

To assist with determining infeasibility, a summary of infeasibility criteria for LID Retention BMPs and LID Biofiltration BMPs is presented in Tables 9 and 10, respectively.

Table 7: Treatment Control BMP Categories

BMP	Retention	Biofiltration	Other
Infiltration Basin	●		
Infiltration Trench	●		
Subsurface Infiltration	●		
Dry Well	●		
Bioretention Basin	●		
Permeable Pavement	●		
Harvesting / Reuse	●		
Green Roof		●	
Bioretention Filter		●	
Dry Swale		●	
Downspout Disconnection		●	
Vegetated Swale		●	
Vegetated Buffer Strip		●	
Tree Box Filter		●	
Detention Basin			●
Manufactured Treatment Device			●
Sand Filter			●

Table 8: Treatment Control BMP Expected Pollutant Removals

BMP	Nutrients	Sediment	Trash	Pathogens	Pesticides	Oil & Grease	Metals	Organic Compounds
Infiltration Basin	H	H	H	H	H	H	H	H
Infiltration Trench	H	H	H	H	H	H	H	H
Subsurface Infiltration	H	H	H	H	H	H	H	H
Dry Well	H	H	H	H	H	H	H	H
Bioretention Basin	H	H	H	H	H	H	H	H
Permeable Pavement	H	H	L	H	H	H	H	H
Harvesting / Reuse	H	H	L	H	H	H	H	H
Green Roof	M	H	H	M	M	H	M	M
Bioretention Filter	M	H	H	M	U	H	H	H
Dry Swale	M	H	H	U	U	M	M	U
Downspout Disconnection	L	M	M	M	U	M	M	U
Vegetated Swale	L	M	L	L	U	M	M	U
Vegetated Buffer Strip	L	M	M	L	U	M	M	M
Tree Box Filter	M	H	H	M	U	H	H	H
Detention Basin	L	M	H	L	U	M	L/M	U
Manufactured Treatment Device	L	M/H	H	L	L	M/H	L	L
Sand Filter	L/M	H	H	M	U	H	M/H	M/H

H = High, M = Medium, L = Low, U = Unknown

Table 9: Infeasibility Criteria for LID Retention BMPs

Exemption Criteria	Infiltration Basin	Infiltration Trench	Subsurface Infiltration	Dry Well	Bioretention Basin	Permeable Pavement	Harvesting Reuse
Soils beneath basin invert have measured infiltration rates less than 0.5 in/hr	●	●	●	●	●	●	
Unable to maintain a distance of at least 3 ft from BMP invert to seasonally high groundwater table	●	●	●	●	●	●	
Site has known man-made plumes or contaminated soils	●	●	●	●	●	●	
Site has high potential for concentrated pollutant/chemical spills	●	●	●	●	●	●	
Site is up-gradient of ephemeral streams (i.e. habitat type change downstream)	●	●	●	●	●	●	
Site is up-gradient of known shallow landslide-prone area	●	●	●	●	●	●	
Unable to maintain a distance of at least 50 ft to the nearest groundwater well used for drinking water	●	●	●	●	●	●	
Unable to maintain a distance of at least 35 ft to the nearest septic system	●	●	●	●	●	●	
Unable to maintain a distance of at least 10 ft from cistern/barrel to the nearest septic tank							●
Unable to maintain a distance of at least 20 ft to the nearest building foundation	●	●	●		●		
Unable to maintain a distance of at least 10 ft to the nearest building foundation				●			
Unable to maintain a distance of at least 5 ft from cistern/barrel to the nearest building foundation							●
Unable to maintain a distance of at least 100 ft to the nearest down-gradient building foundation	●	●	●	●	●		
Unable to maintain a distance of at least 10 ft to the nearest property line	●	●	●	●	●		
Unable to divert flows in excess of WQDS around BMP, and unable to create safe overflow mechanism for flows in excess of WQDS	●	●	●		●		
Excavation would disturb iwi kupuna or other archaeological resources	●	●	●		●		
Unable to maintain a distance of at least 5 ft from cistern/barrel to the nearest property line							●
Site has high potential for oil and/or grease spills						●	
Site has high potential to receive sand and/or sediment loads						●	
Unable to maintain a pavement slope no greater than 5%						●	
Pavement would be above a utility vault						●	
Pavement is expected to receive more than 1,000 average daily trips						●	
Project is for a single family residential dwelling							●
Cistern restricts access to underground utilities							●
Harvested runoff creates a conflict with reclaimed water use							●
Other justification for an exemption proposed by the developer/agent and is acceptable to the City	●	●	●	●	●	●	●

Table 10: Infeasibility Criteria for LID Biofiltration BMPs

Exemption Criteria	Bioretention Filter	Green Roof	Dry Swale	Downspout Disconnect	Vegetated Swale	Vegetated Filter Strip
Unable to divert flows in excess of WQDS around BMP, and unable to create safe overflow mechanism for flows in excess of WQDS	●		●		●	●
Excavation would disturb iwi kupuna or other archaeological resources	●		●		●	●
Invert of underdrain layer is below seasonally high groundwater table	●		●			
Site does not receive enough sunlight to support vegetation	●				●	●
Site lacks sufficient hydraulic head to support BMP operation by gravity	●		●			
Roof is for a single family residential dwelling		●				
Space is unavailable due to renewable energy, electrical, and mechanical systems		●				
Slope on roof exceeds 20% (11 degrees)		●				
Slope of receiving vegetated area exceeds 5%				●		
Diverted runoff drains within 10 feet of a retaining wall				●		
Diverted runoff drains within 10 feet of property line				●		
Concentrated flow cannot be established naturally					●	
Sheet flow cannot be established naturally						●
Other justification for an exemption proposed by the developer/agent and is acceptable to the City	●	●	●	●	●	●

INFILTRATION BASIN

Description

An infiltration basin is a shallow impoundment with no outlet, where storm water runoff is stored and infiltrates through the basin invert and into the soil matrix.

BMP Category	
Retention	●
Biofiltration	○
Other	○



Halawa District Park

Expected Pollutant Removals	
Nutrients	High
Sediment	High
Trash	High
Pathogens	High
Pesticides	High
Oil & Grease	High
Metals	High
Organic Compounds	High

Minimum Design Criteria

Design Parameter	Units	Value
Invert Slope	%	0
Maximum Interior Side Slope (length per unit height)		3:1
Drawdown (drain) Time	hours	48
Minimum Soil Infiltration Rate	inches/hr	0.5
Minimum Freeboard	feet	1.0
Minimum Depth from basin invert to groundwater table	feet	3

Feasibility Criteria

See Table 9.

Sizing Procedure

1. Use the procedure presented previously to compute the Volumetric Runoff Coefficient and Water Quality Volume.

2. Calculate the maximum allowable water storage depth (d_{max}) using the underlying soil infiltration rate (k) and the required drawdown time (t):

$$d_{max} = kt/(F_s \times 12)$$

Where: d_{max} = Maximum storage depth (ft)
k = Soil infiltration rate (in/hr)
t = Drawdown (drain) time (hrs)
F_s = Infiltration rate Factor of Safety (see Chapter 4)

3. Select a design ponding depth no greater than the maximum allowable depth calculated in Step 2.

$$d_p \leq d_{max}$$

Where: d_p = Design Ponding Depth (ft)
d_{max} = Maximum storage depth from step 2 (ft)
k = Soil infiltration rate (in/hr)

4. Calculate the basin bottom surface area (A_b):

$$A_b = WQV/\left(d_p + kT/12F_s\right)$$

Where: A_b = Bottom surface area (sq-ft)
WQV = Water Quality Volume from Step 1(cu-ft)
d_p = Design ponding Depth from Step 3 (ft)
k = Soil infiltration rate (in/hr)
T = Fill time (time for the BMP to fill with water, hrs)
F_s = Infiltration rate Factor of Safety (see Chapter 4)

5. Select a basin bottom width (w_b), and calculate the basin bottom length (l_b):

$$l_b = A_b/w_b$$

Where: l_b = Bottom length (ft)
A_b = Bottom surface area from Step 4 (sq-ft)
w_b = Bottom width (ft)

6. Calculate the total area occupied by the BMP excluding pretreatment (A_{BMP}) using the basin bottom dimensions, embankment side slopes, and freeboard:

$$A_{BMP} = \left[w_b + 2z\left(d_p + f\right)\right] \times \left[l_b + 2z\left(d_p + f\right)\right]$$

Where: A_{BMP} = Area occupied by BMP excluding pretreatment (sq-ft)
w_b = Bottom width from Step 5 (ft)
z = Basin interior side slope (length per unit height)
d_p = Design Ponding Depth from Step 3 (ft)
f = Freeboard (ft)
l_b = Bottom length from Step 5 (ft)

If the calculated area does not fit in the available space, either reduce the drainage area, increase the ponding depth (if it's not already set to the maximum depth), and/or reduce the Infiltration rate factor of safety (if minimum number of test pits and permeability tests have not been performed) and repeat the calculations.

Pretreatment Considerations

Infiltration facilities are highly susceptible to clogging and premature failure from sediment, trash, and other materials. Suitable pretreatment systems maintain the infiltrate rate of the device without frequent and intensive maintenance. For measured soil infiltration rates below 3 in/hr, pretreatment is strongly recommended, and the pretreatment device should be sized for at least 25% of the WQV. For measured soil infiltration rates greater than 3 in/hr, pretreatment is

mandatory to minimize groundwater contamination risks, and the pretreatment device must be sized for at least 50% of the WQV if the measured soil infiltration rate is below 5 in/hr and 100% of the WQV if the measured soil infiltration rate is greater than 5 in/hr. Pretreatment may be achieved with vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes, and manufactured treatment devices.

Area Requirements

An infiltration basin requires a footprint equivalent to 7% - 20% of its contributing impervious drainage area, excluding pretreatment. The lower value reflects the maximum allowable infiltration rate and minimum allowable factor of safety, while the upper value reflects the minimum allowable infiltration rate and maximum allowable factor of safety.

Sizing Example

Calculate the size of an infiltration basin serving a 1-acre residential development. Assume the following design parameters:

Design Parameter	Units	Value
Percent Impervious Cover, I	%	70
Design Storm Depth, P	inches	1
Basin Fill Time, T	hours	2
Drawdown (drain) Time, t	hours	48
Basin Interior Side Slope (length per unit height), z		3
Soil Infiltration Rate, k	inches/hr	1.0
Infiltration Rate Factor of Safety, F_s		2
Freeboard, f	ft	1

1. Calculate the volumetric runoff coefficient (C) and Water Quality Volume (WQV):

$$C = 0.05 + 0.009I$$
$$C = 0.05 + 0.009 \times 70$$
$$C = 0.68$$

$$WQV = PCA \times 3630$$
$$WQV = 1 \times 0.68 \times 1 \times 3630$$
$$WQV = 2{,}468\ cubic\ feet$$

2. Calculate the maximum allowable water storage depth in the basin (d_m):

$$d_{max} = kt/12F_s$$
$$d_{max} = 1.0 \times 48/(12 \times 2)$$
$$d_{max} = 2.0\ feet$$

3. Select a design ponding depth (d_p) no greater than the maximum allowable depth:

$$\boldsymbol{d_p = 2.0\ feet}$$

4. Calculate the basin bottom surface area (A_b):

$$\boldsymbol{A_b = WQV/(d_d + kT/12F_s)}$$
$$\boldsymbol{A_b = 2,468/[2.0 + 1.0 \times 2.0/(12 \times 2)]}$$
$$\boldsymbol{A_b = 1,185\ square\ feet}$$

5. Set the basin bottom width (w_b) to 25 feet, and calculate the basin bottom length (l_b):

$$\boldsymbol{l_b = A_b/w_b}$$
$$\boldsymbol{l_b = 1,185/25}$$
$$\boldsymbol{l_b = 47.4\ feet}$$

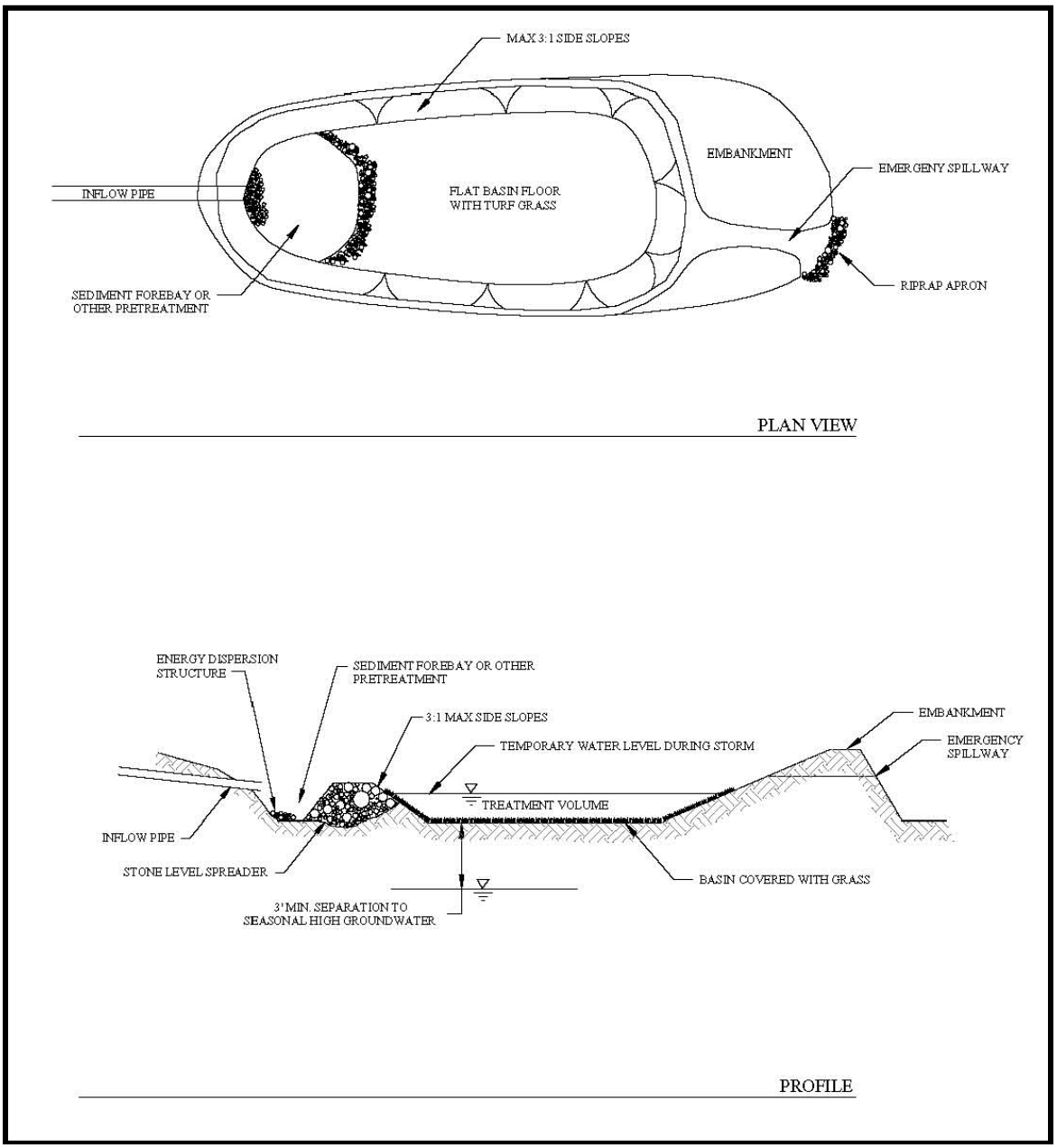
6. Calculate the total area excluding pretreatment (A_{BMP}):

$$\boldsymbol{A_{BMP} = [w_b + 2z(d_p + f)] \times [l_b + 2z(d_p + f)]}$$
$$\boldsymbol{A_{BMP} = [25 + 2 \times 3(2 + 1)] \times [47.4 + 2 \times 3(2 + 1)]}$$
$$\boldsymbol{A_{BMP} = 2,812\ square\ feet}$$

Other Design Considerations

- If a temporarily-filled pond creates a potential public safety issue, perimeter fencing may be considered. A vegetative screen around the basin to restrict direct view from adjacent properties may improve the aesthetics of the site and public acceptance of the facility.
- If feasible, include vehicle access to the basin invert for maintenance.
- If the area around the basin has a recreational use, a safety shelf around the perimeter of the basin can be included for times when the basin is flooded.
- The infiltration basin should be designed with an outlet structure to pass peak flows during a range of storm events, as well as with an emergency spillway to pass peak flows around the embankment during extreme storm events that exceed the combined infiltration capacity and outlet structure capacity of the facility.
- To help ensure maintenance of the design permeability rate over time, a 6 inch layer of sand may be placed on the bottom of an infiltration basin. This sand layer can intercept silt, sediment, and debris that could otherwise clog the top layer of the soil below the basin. The sand layer will also facilitate silt, sediment, and debris removal from the basin and can be readily restored following removal operations.
- Observation wells are recommended. They will indicate how quickly the basin dewaters following a storm and it will provide a method of observing how quickly the basin fills up with sediments.

Figure 4: Schematic of an Infiltration Basin



Stormwater Management for Maine, Vol III, BMPs Technical Design Manual. 2006.

INFILTRATION TRENCH

Description

An infiltration trench is a rock-filled trench with no outlet, where storm water runoff is stored in the void space between the rocks and infiltrates through the bottom and into the soil matrix.

BMP Category	
Retention	●
Biofiltration	○
Other	○



Kauai Federal Credit Union (courtesy Group 70)

Expected Pollutant Removals	
Nutrients	High
Sediment	High
Trash	High
Pathogens	High
Pesticides	High
Oil & Grease	High
Metals	High
Organic Compounds	High

Minimum Design Criteria

Design Parameter	Units	Value
Maximum Trench Depth	feet	8
Maximum Trench Width	feet	25
Maximum Top Backfill Layer Thickness	inches	6
Maximum Bottom Sand Layer Thickness	inches	12
Drawdown (drain) Time	hours	48
Minimum Soil Infiltration Rate	inches/hr	0.5
Trench Rock Size	inches	1.5 – 3.0
Minimum Depth from trench invert to Water Table	feet	3

Feasibility Criteria

See Table 9.

Sizing Procedure

1. Use the procedure presented previously to compute the Volumetric Runoff Coefficient and Water Quality Volume.

2. Calculate the maximum allowable water storage depth (d_{max}) using the underlying soil infiltration rate (k) and the required drawdown time (t):

$$\boldsymbol{d_{max} = kt/(F_s \times 12)}$$

Where:
- d_{max} = Maximum storage depth (ft)
- k = Soil infiltration rate (in/hr)
- t = Drawdown (drain) time (hrs)
- F_s = Infiltration rate Factor of Safety (see Chapter 4)

3. Select a ponding depth (optional), trench rock (or alternative material) depth, and sand layer depth (optional) such that the total effective storage depth is no greater than the maximum allowable depth calculated in Step 2:

$$\boldsymbol{d_t = d_p + l_b n_b + l_s n_s \leq d_{max}}$$

Where:
- d_t = Total effective water storage depth (ft)
- d_p = Ponding depth (ft)
- l_b = Backfill material thickness (depth) (ft)
- n_b = Backfill material porosity
- l_s = Sand layer thickness (depth) (ft)
- n_s = Sand porosity
- d_{max} = Maximum storage depth from Step 2 (ft)

4. Calculate the trench surface area (A_{BMP}):

$$\boldsymbol{A_{BMP} = WQV/(d_t + kT/12F_s)}$$

Where:
- A_{BMP} = BMP surface area excluding pretreatment (sq-ft)
- WQV = Water Quality Volume from Step 1(cu-ft)
- d_t = Total effective water storage depth from Step 3 (ft)
- k = Soil infiltration rate (in/hr)
- T = Fill time (time for the BMP to fill with water, hrs)
- F_s = Infiltration rate Factor of Safety (see Chapter 4)

If the calculated area does not fit in the available space, either reduce the drainage area, increase the ponding depth or trench rock depth or sand layer depth (if the total effective depth is not already equal to the maximum depth), and/or reduce the Infiltration rate factor of safety (if minimum number of test pits and permeability tests have not been performed) and repeat the calculations.

Pretreatment Considerations

Infiltration facilities are highly susceptible to clogging and premature failure from sediment, trash, and other materials. Suitable pretreatment systems maintain the infiltrate rate of the device without frequent and intensive maintenance. For measured soil infiltration rates below 3 in/hr, pretreatment is strongly recommended, and the pretreatment device should be sized for at least 25% of the WQV. For measured soil infiltration rates greater than 3 in/hr, pretreatment is mandatory to minimize groundwater contamination risks, and the pretreatment device must be sized for at least 50% of the WQV if the measured soil infiltration rate is below 5 in/hr and 100% of the WQV if the measured soil infiltration rate is greater than 5 in/hr. Pretreatment may

be achieved with vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes, and manufactured treatment devices.

Area Requirements

An infiltration trench requires a footprint equivalent to 2% - 20% of its contributing impervious drainage area, excluding pretreatment. The lower value reflects the maximum allowable infiltration rate, minimum allowable factor of safety, and minimal ponding, while the upper value reflects the minimum allowable infiltration rate, maximum allowable factor of safety, and no ponding.

Sizing Example

Calculate the size of an infiltration basin serving a 1-acre residential development. Assume the following design parameters:

Design Parameter	Units	Value
Percent Impervious Cover, I	%	70
Design Storm Depth, P	inches	1.0
Trench Fill Time, T	hours	2
Drawdown (drain) Time, t	hours	48
Backfill porosity, n_b		0.35
Sand porosity, n_s		0.40
Soil Infiltration Rate, k	inches/hr	1.0
Infiltration Rate Factor of Safety, F_s		2

1. Calculate the volumetric runoff coefficient (C) and Water Quality Volume (WQV):

$$\boldsymbol{C = 0.05 + 0.009I}$$
$$\boldsymbol{C = 0.05 + 0.009 \times 70}$$
$$\boldsymbol{C = 0.68}$$

$$\boldsymbol{WQV = PCA \times 3630}$$
$$\boldsymbol{WQV = 1 \times 0.68 \times 1 \times 3630}$$
$$\boldsymbol{WQV = 2{,}468\ cubic\ feet}$$

3. Calculate the maximum allowable water storage depth of the infiltration trench (d_m):

$$\boldsymbol{d_{max} = kt/12F_s}$$
$$\boldsymbol{d_{max} = 1.0 \times 48/(12 \times 2)}$$
$$\boldsymbol{d_{max} = 2.0\ feet}$$

4. Select a ponding depth (d_p), trench rock depth (d_r), and optional sand layer depth (d_s) such that the total effective storage depth (d_t) is no greater than the maximum allowable depth:

$$d_p = 0.0\ feet$$
$$l_b = 5.0\ feet$$
$$l_s = 0.5\ feet$$

$$d_t = d_p + l_b n_b + l_s n_s$$
$$d_t = 0.0 + 5.0 \times 0.35 + 0.5 \times 0.40$$
$$d_t = 1.95\ feet$$

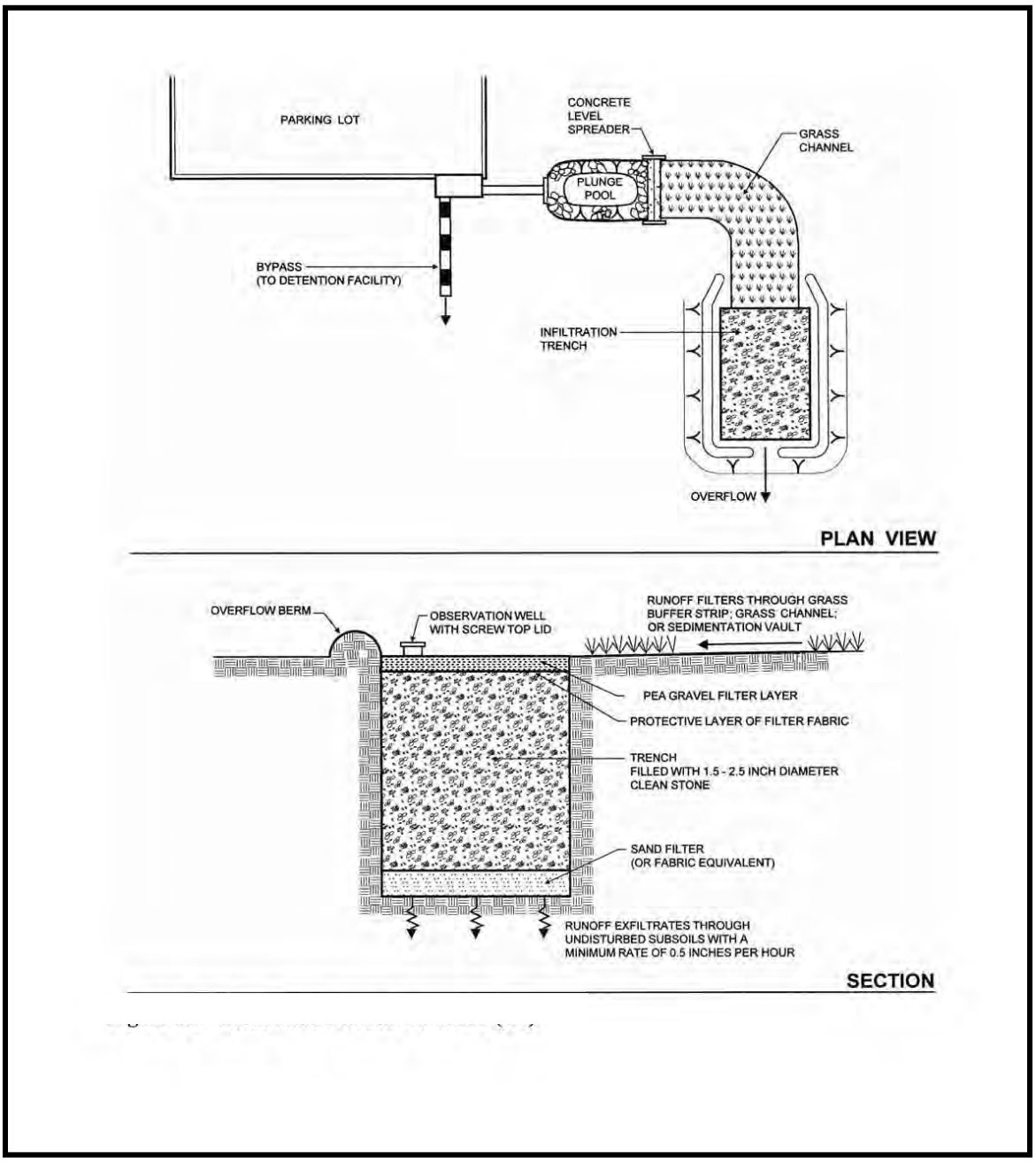
5. Calculate the BMP surface area excluding pretreatment (A_{BMP}):

$$A_{BMP} = WQV/(d_t + kT/12F_s)$$
$$A_{BMP} = 2,468/[1.95 + 1.0 \times 2.0/(12 \times 2)]$$
$$A_{BMP} = 1,214\ square\ feet$$

Other Design Considerations

- Observation wells are recommended at 50 foot intervals over the length of the infiltration trench. They will indicate how quickly the trench dewaters following a storm and it will provide a method of observing how quickly the trench fills up with sediments.
- Infiltration trenches should not be deeper than the longest surface area dimension. Otherwise, they meet the EPA definition of Class V Injection Wells under the federal Underground Injection Control (UIC) Program, and are subject to applicable federal and state requirements.
- Vegetation may be planted over the infiltration trench provided that adequate soil media is provided above the trench.
- There must be an overflow route for storm water flows that overtop the facility or in case the infiltration facility becomes clogged.

Figure 5: Schematic of an Infiltration Trench



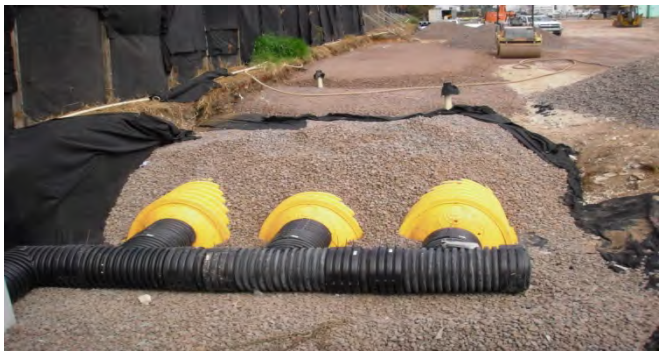
Low Impact Development, A Practitioner's Guide, Hawaii. 2006.

SUBSURFACE INFILTRATION

Description

An subsurface infiltration system is a rock storage (or alternative pre-manufactured material) bed below other surfaces such as parking lots, lawns and playfields for temporary storage and infiltration of runoff.

BMP Category	
Retention	●
Biofiltration	○
Other	○



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Expected Pollutant Removals	
Nutrients	High
Sediment	High
Trash	High
Pathogens	High
Pesticides	High
Oil & Grease	High
Metals	High
Organic Compounds	High

Minimum Design Criteria

Design Parameter	Units	Value
Drawdown (drain) Time	hours	48
Minimum Soil Infiltration Rate	inches/hr	0.5
Minimum depth from invert to water table	feet	3
Any applicable manufacturer's criteria		

Feasibility Criteria

See Table 9.

Sizing Procedure

Follow the manufacturer's guidelines for appropriate sizing calculations and selection of appropriate device/model.

Pretreatment Considerations

Infiltration facilities are highly susceptible to clogging and premature failure from sediment, trash, and other materials. Suitable pretreatment systems maintain the infiltrate rate of the device without frequent and intensive maintenance. For measured soil infiltration rates below 3 in/hr, pretreatment is strongly recommended, and the pretreatment device should be sized for at least 25% of the WQV. For measured soil infiltration rates greater than 3 in/hr, pretreatment is mandatory to minimize groundwater contamination risks, and the pretreatment device must be sized for at least 50% of the WQV if the measured soil infiltration rate is below 5 in/hr and 100% of the WQV if the measured soil infiltration rate is greater than 5 in/hr. Pretreatment may

be achieved with vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes, and manufactured treatment devices.

Area Requirements

The below-grade footprint requirements for commercially-available infiltration chambers vary by manufacturer. However, similarly to above-grade non-proprietary systems, the space will be minimized for sites with higher infiltration rates and lower infiltration rate factors of safety.

Sizing Example

No example is provided as sizing procedures vary by manufacturer, and presenting any specific product might be interpreted as an endorsement.

Other Design Considerations

Refer to manufacturer guidelines.

DRY WELL

Description

A dry well is a subsurface aggregate-filled or prefabricated perforated storage facility, where roof runoff is stored and infiltrates into the soil matrix.

BMP Category	
Retention	●
Biofiltration	○
Other	○



Courtesy www.brickstoremuseum.org

Expected Pollutant Removals	
Nutrients	High
Sediment	High
Trash	High
Pathogens	High
Pesticides	High
Oil & Grease	High
Metals	High
Organic Compounds	High

Minimum Design Criteria

Design Parameter	Units	Value
Drawdown (drain) Time	hours	48
Minimum Soil Infiltration Rate	inches/hr	0.5
Aggregate Size (if used)	inches	1.0 – 3.0
Minimum Depth from well invert to Water Table	feet	3

Feasibility Criteria

See Table 9.

Sizing Procedure

1. Use the procedure presented previously to compute the Volumetric Runoff Coefficient and Water Quality Volume.

2. Calculate the maximum allowable water storage depth (d_{max}) using the underlying soil infiltration rate (k) and the required drawdown time (t):

$$d_{max} = kt/(F_s \times 12)$$

Where:
- d_{max} = Maximum storage depth (ft)
- k = Soil infiltration rate (in/hr)
- t = Drawdown (drain) time (hrs)
- F_s = Infiltration rate Factor of Safety (see Chapter 4)

3. Select a ponding depth (optional) and dry well backfill material depth such that the total effective storage depth is no greater than the maximum allowable depth calculated in Step 2:

$$d_t = d_p + l_b n_b \leq d_{max}$$

Where:
- d_t = Total effective water storage depth (ft)
- d_p = Ponding depth (ft)
- l_b = Backfill material thickness (depth) (ft)
- n_b = Backfill material porosity
- d_{max} = Maximum storage depth from Step 2 (ft)

4. Calculate the BMP surface area (A_{BMP}):

$$A_{BMP} = WQV/(d_t + kT/12F_s)$$

Where:
- A_{BMP} = BMP surface area (sq-ft)
- WQV = Water Quality Volume from Step 1(cu-ft)
- d_t = Total effective water storage depth from Step 3 (ft)
- k = Soil infiltration rate (in/hr)
- T = Fill time (time for the BMP to fill with water, hrs)
- F_s = Infiltration rate Factor of Safety (see Chapter 4)

If the calculated area does not fit in the available space, either reduce the drainage area, increase the ponding depth or rock depth (if the total effective depth is not already equal to the maximum depth), and/or reduce the infiltration rate factor of safety (if minimum number of test pits and permeability tests have not been performed) and repeat the calculations.

Pretreatment Considerations

Roof gutter guards or leaf gutter screens are required for roof runoff to reduce dry well clogging from sediment, leaves, and other organic material. If the dry well receives non-roof runoff, pretreatment must be provided by vegetated swales, vegetated filter strips, or manufactured treatment devices.

Area Requirements

A dry well requires a footprint equivalent to 2% - 20% of its contributing impervious drainage area. The lower value reflects the maximum allowable infiltration rate, minimum allowable factor of safety, and minimal ponding, while the upper value reflects the minimum allowable infiltration rate, maximum allowable factor of safety, and no ponding.

Sizing Example

Calculate the size of a dry well serving the roof runoff from a 3,000 square-foot commercial building. Assume the following design parameters:

Design Parameter	Units	Value
Percent Impervious Cover, I	%	100
Design Storm Depth, P	inches	1.0
Dry well Fill Time, T	hours	2
Drawdown (drain) Time, t	hours	48
Backfill material porosity, n_b		0.35
Soil Infiltration Rate, k	inches/hr	1.0
Infiltration Rate Factor of Safety, F_s		2

1. Calculate the volumetric runoff coefficient (C) and Water Quality Volume (WQV):

$$\boldsymbol{C = 0.05 + 0.009I}$$
$$\boldsymbol{C = 0.05 + 0.009 \times 100}$$
$$\boldsymbol{C = 0.95}$$

$$\boldsymbol{WQV = PCA \times 3630}$$
$$\boldsymbol{WQV = 1 \times 0.95 \times (3{,}000/43{,}560) \times 3630}$$
$$\boldsymbol{WQV = 238\ cubic\ feet}$$

3. Calculate the maximum allowable water storage depth of the dry well (d_{max}):

$$\boldsymbol{d_{max} = kt/12F_s}$$
$$\boldsymbol{d_{max} = 1.0 \times 48/(12 \times 2)}$$
$$\boldsymbol{d_{max} = 2.0\ feet}$$

4. Select a ponding depth (d_p) and backfill material depth (l_b) such that the total effective storage depth (d_t) is no greater than the maximum allowable depth:

$$\boldsymbol{d_p = 0.0\ feet}$$
$$\boldsymbol{l_b = 5.5\ feet}$$

$$\boldsymbol{d_t = d_p + l_b n_b}$$
$$\boldsymbol{d_t = 0.0 + 5.5 \times 0.35}$$
$$\boldsymbol{d_t = 1.925\ feet}$$

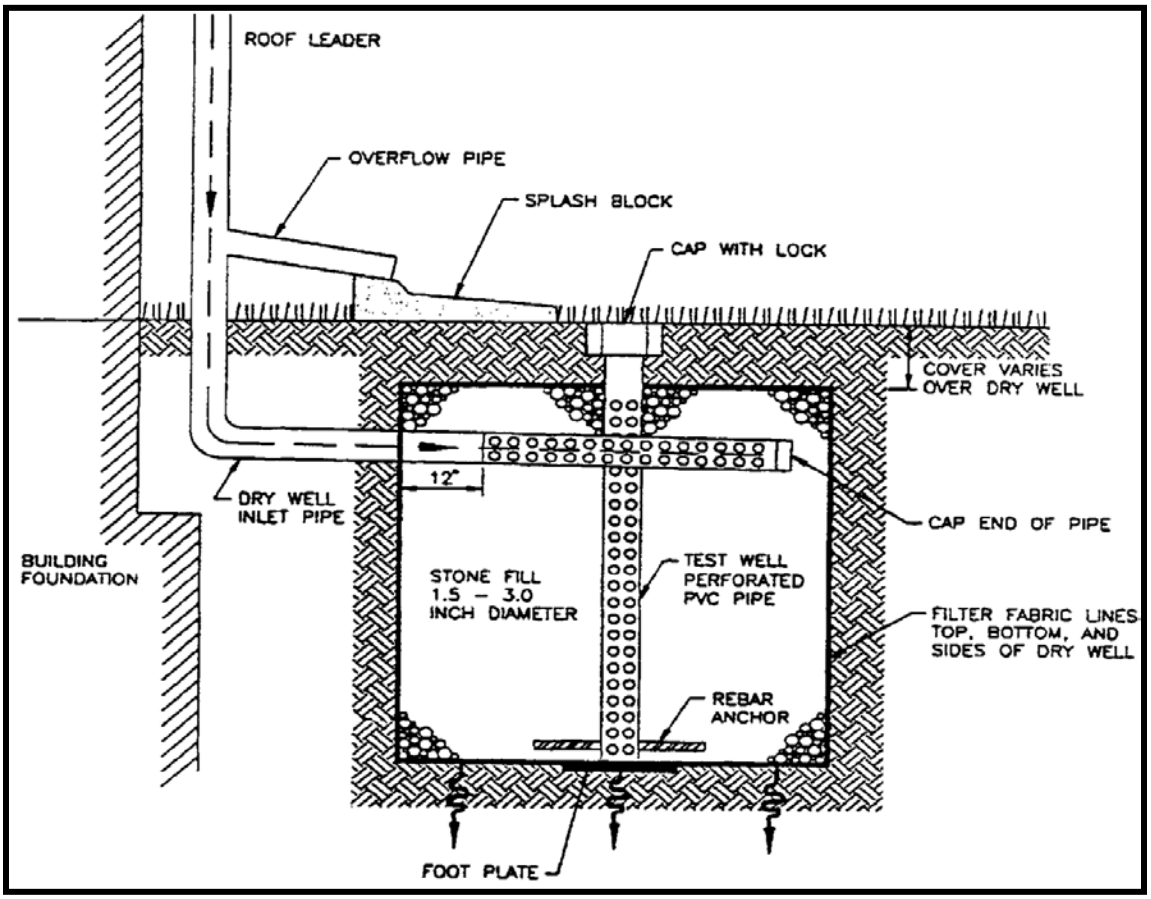
5. Calculate the BMP surface area:

$$\boldsymbol{A_{IMP} = WQV/(d_t + kT/12F_s)}$$
$$\boldsymbol{A_{IMP} = 238/[1.925 + 1.0 \times 2.0/(12 \times 2)]}$$
$$\boldsymbol{A_{IMP} = 118\ square\ feet}$$

Other Design Considerations

- Dry wells are typically deeper than they are wide or long, and therefore meet the EPA definition of Class V Injection Wells under the federal Underground Injection Control (UIC) Program, and are subject to applicable federal and state requirements.
- The dry well must be able to safely convey overflows to either vegetated areas or the storm drain system.
- The design may include an intermediate box with an outflow higher to allow sediments to settle out. Water would then flow through a mesh screen and into the dry well.
- Trees and other large vegetation should be planted away from drywells such that drip lines do not overhang infiltration beds

Figure 6: Schematic of a Dry Well



New Jersey Stormwater Best Management Practices Manual. 2004.

BIORETENTION BASIN

Description

Sometimes referred to as a Rain Garden, a Bioretention Basin is an engineered shallow depression that collects and filters storm water runoff using conditioned planting soil beds and vegetation. The filtered runoff infiltrates through the basin invert and into the soil matrix.

BMP Category	
Retention	●
Biofiltration	○
Other	○



Kauai Federal Credit Union (Courtesy Group 70)

Expected Pollutant Removals	
Nutrients	High
Sediment	High
Trash	High
Pathogens	High
Pesticides	High
Oil & Grease	High
Metals	High
Organic Compounds	High

Minimum Design Criteria

Design Parameter	Units	Value
Mulch Thickness	inches	2 – 4
Planting Soil Depth	feet	2 – 4
Drawdown (drain) Time	hours	48
Maximum Interior Side Slope (length per unit height)		3:1
Maximum Ponding Depth	inches	12
Minimum depth from basin invert to water table	feet	3
Minimum Freeboard	feet	1.0
Minimum Soil Infiltration Rate	inches/hr	0.5

Feasibility Criteria

See Table 9.

Sizing Procedure

1. Use the procedure presented previously to compute the Volumetric Runoff Coefficient and Water Quality Volume.

2. Calculate the maximum allowable water storage depth (d_{max}) using the underlying soil infiltration rate (k) and the required drawdown time (t):

$$d_{max} = kt/(F_s \times 12)$$

Where: d_{max} = Maximum storage depth (ft)
k = Soil infiltration rate (in/hr)
t = Drawdown (drain) time (hrs)
F_s = Infiltration rate Factor of Safety (see Chapter 4)

3. Select a ponding depth, planting media thickness (depth), and reservoir layer thickness (depth, optional) such that the total effective storage depth is no greater than the maximum allowable depth calculated in Step 2:

$$d_t = d_p + l_m n_m + l_r n_r \leq d_{max}$$

Where: d_t = Total effective water storage depth (ft)
d_p = Ponding depth (ft)
l_m = Planting media thickness (depth) (ft)
n_m = Planting media porosity
l_r = Reservoir layer thickness (depth) (ft)
n_r = Reservoir layer porosity
d_{max} = Maximum storage depth from Step 2 (ft)

4. Calculate the basin bottom surface area (A_b):

$$A_b = WQV/(d_t + kT/12F_s)$$

Where: A_b = Bottom surface area (sq-ft)
WQV = Water Quality Volume from Step 1(cu-ft)
d_t = Total effective water storage depth from Step 3 (ft)
k = Soil infiltration rate (in/hr)
T = Fill time (time for the BMP to fill with water, hrs)
F_s = Infiltration rate Factor of Safety (see Chapter 4)

5. Select a basin bottom width (w_b), and calculate the basin bottom length (l_b):

$$l_b = A_b/w_b$$

Where: l_b = Bottom length (ft)
A_b = Bottom surface area from Step 4 (sq-ft)
w_b = Bottom width (ft)

6. Calculate the total area occupied by the BMP excluding pretreatment (A_{BMP}) using the basin bottom dimensions, embankment side slopes, and freeboard:

$$A_{BMP} = [w_b + 2z(d_p + f)] \times [l_b + 2z(d_p + f)]$$

Where: A_{BMP} = Area occupied by BMP excluding pretreatment (sq-ft)
w_b = Bottom width from Step 5 (ft)
z = Basin interior side slope (length per unit height)
d_p = Design Ponding Depth from Step 3 (ft)
f = Freeboard (ft)
l_b = Bottom length from Step 5 (ft)

If the calculated area does not fit in the available space, either reduce the drainage area, increase the ponding depth or planting soil depth or gravel depth (if the total effective depth is not already equal to the maximum depth), and/or reduce the Infiltration rate factor of safety (if minimum number of test pits and permeability tests have not been performed) and repeat the calculations.

Pretreatment Considerations

Infiltration facilities are highly susceptible to clogging and premature failure from sediment, trash, and other materials. Suitable pretreatment systems maintain the infiltrate rate of the device without frequent and intensive maintenance. For measured soil infiltration rates below 3 in/hr, pretreatment is strongly recommended, and the pretreatment device should be sized for at least 25% of the WQV. For measured soil infiltration rates greater than 3 in/hr, pretreatment is mandatory to minimize groundwater contamination risks, and the pretreatment device must be sized for at least 50% of the WQV if the measured soil infiltration rate is below 5 in/hr and 100% of the WQV if the measured soil infiltration rate is greater than 5 in/hr. Pretreatment may be achieved with vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes, and manufactured treatment devices.

Area Requirements

A bioretention basin requires a footprint equivalent to 4% - 13% of its contributing impervious drainage area, excluding pretreatment. The lower value reflects the maximum allowable infiltration rate and minimum allowable factor of safety, while the upper value reflects the minimum allowable infiltration rate and maximum allowable factor of safety.

Sizing Example

Calculate the size of a bioretention basin serving a 1-acre residential development. Assume the following design parameters:

Design Parameter	Units	Value
Percent Impervious Cover, I	%	70
Design Storm Depth, P	inches	1.0
Basin Fill Time, T	hours	2
Drawdown (drain) Time, t	hours	48
Basin Interior Side Slope (length per unit height), z		3
Planting Media Porosity, n_m		0.25
Reservoir layer porosity, n_r		0.30
Soil Infiltration Rate, k	inches/hr	1.0
Freeboard, f	ft	1.0
Infiltration Rate Factor of Safety, F_s		2

1. Calculate the volumetric runoff coefficient (C) and Water Quality Volume (WQV):

$$C = 0.05 + 0.009I$$

$$C = 0.05 + 0.009 \times 70$$
$$C = 0.68$$

$$WQV = PCA \times 3630$$
$$WQV = 1 \times 0.68 \times 1 \times 3630$$
$$WQV = 2,468\ cubic\ feet$$

2. Calculate the maximum allowable water storage depth in the basin (d_{max}):

$$d_{max} = kt/12F_s$$
$$d_{max} = 1.0 \times 48/(12 \times 2)$$
$$d_{max} = 2.0\ feet$$

3. Select a ponding depth (d_p), planting media depth (l_m), and optional reservoir layer depth (l_r) such that the total effective storage depth (d_t) is no greater than the maximum allowable depth:

$$d_p = 0.67\ feet$$
$$l_m = 4.0\ feet$$
$$l_r = 1.0\ feet$$

$$d_t = d_p + l_m n_m + l_r n_r$$
$$d_t = 0.67 + 4.0 \times 0.25 + 1.0 \times 0.30$$
$$d_t = 1.97\ feet$$

4. Calculate the basin bottom surface area (A_b):

$$A_b = WQV/(d_t + kT/12F_s)$$
$$A_b = 2,468/[1.97 + 1.0 \times 2.0/(12 \times 2)]$$
$$A_b = 1,204\ square\ feet$$

5. Set the basin bottom width (w_b) to 25 feet, and calculate the basin bottom length (l_b):

$$l_b = A_b/w_b$$
$$l_b = 1,204/25$$
$$l_b = 48.2\ feet$$

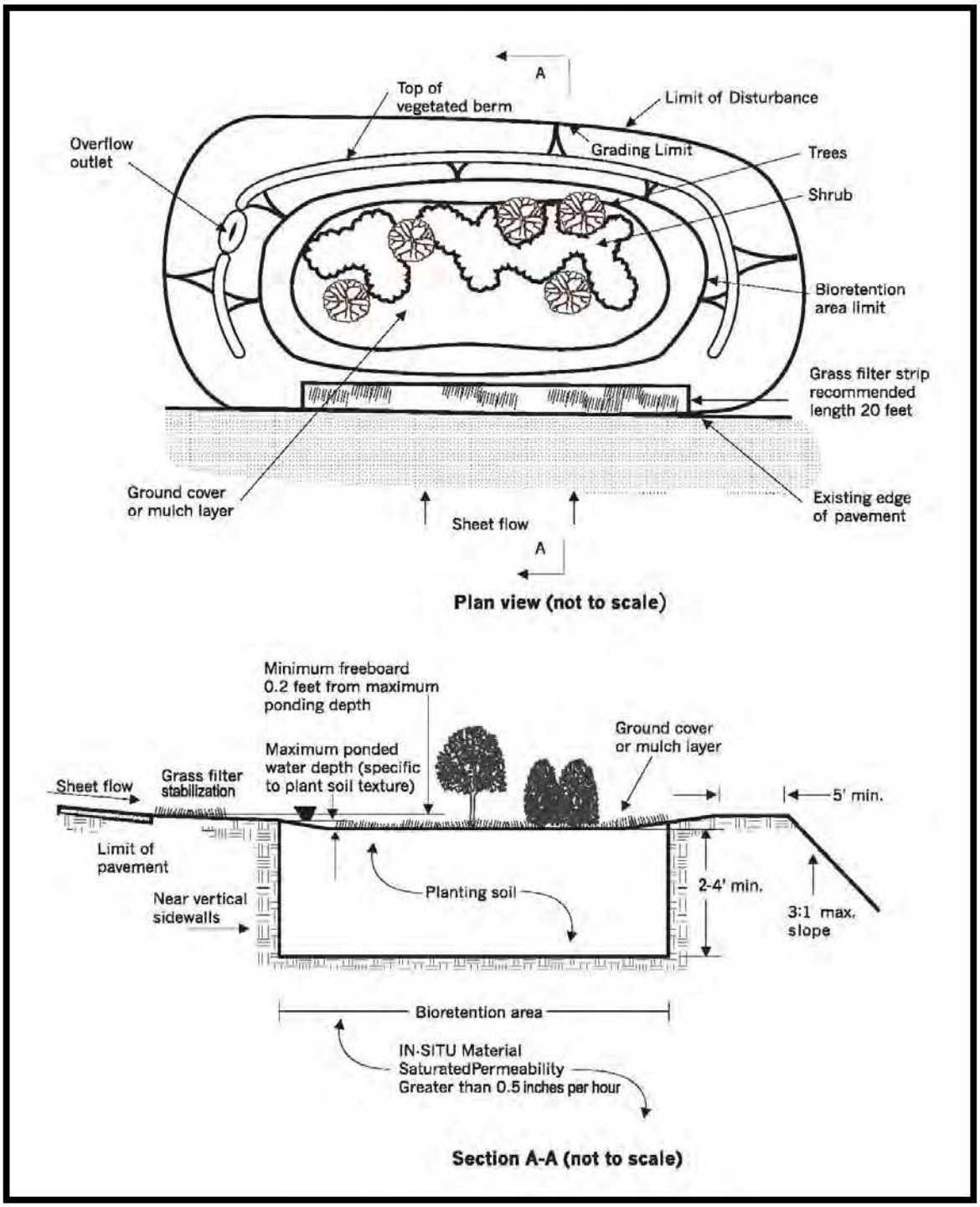
6. Calculate the total area excluding pretreatment (A_{BMP}):

$$A_{BMP} = [w_b + 2z(d_p + f)] \times [l_b + 2z(d_p + f)]$$
$$A_{BMP} = [25 + 2 \times 3(0.67 + 1)] \times [48.2 + 2 \times 3(0.67 + 1)]$$
$$A_{BMP} = 2,037\ square\ feet$$

Other Design Considerations

- The plantings should emulate a terrestrial forest community ecosystem. Native species that are tolerant to pollutant loads and varying soil moisture should be selected. The trees should be smaller ones similar to those found in the forest understory, since it is more difficult to perform maintenance with the tall trees that are normally part of the forest canopy. Ground cover, such as grasses or legumes, should be planted after the trees and shrubs are in place.
- An overflow device (e.g., domed riser, spillway) must be included to safely convey runoff from large storm events when the surface/subsurface capacity is exceeded.
- If a mulch layer is used on the surface of the planting bed, consideration should be given to problems caused by flotation during storm events.
- Observation wells are recommended. They will indicate how quickly the basin dewaters following a storm and it will provide a method of observing how quickly the basin fills up with sediments.

Figure 7: Schematic of a Bioretention Basin



Prince George's County Low Impact Development: An Integrated Design Approach. 1999.

PERMEABLE PAVEMENT

Description

Sometimes referred to as pervious pavement or porous pavement, permeable pavement refers to any porous, load-bearing surface that allows for temporary rainwater storage in an underlying aggregate layer until it infiltrates into the soil matrix. It includes pervious concrete, porous asphalt, interlocking paver blocks, and reinforced turf and gravel filled grids.

BMP Category	
Retention	●
Biofiltration	○
Other	○

Expected Pollutant Removals	
Nutrients	High
Sediment	High
Trash	Low
Pathogens	High
Pesticides	High
Oil & Grease	High
Metals	High
Organic Compounds	High



UH Hale Wainani Dormitory (www.honoluluadvertiser.com)

Minimum Design Criteria

Design Parameter	Units	Value
Maximum Depth of Reservoir Layer	feet	3
Drawdown (drain) Time	hours	48
Minimum depth from reservoir invert to water table	feet	3
Minimum Soil Infiltration Rate	inches/hr	0.5

Feasibility Criteria

See Table 9.

Sizing Procedure

1. Use the procedure presented previously to compute the Volumetric Runoff Coefficient and Water Quality Volume.

2. Calculate the maximum allowable water storage depth (d_{max}) using the underlying soil infiltration rate (k) and the required drawdown time (t):

   $$d_{max} = kt/(F_s \times 12)$$

   Where: d_{max} = Maximum storage depth (ft)

k = Soil infiltration rate (in/hr)
t = Drawdown (drain) time (hrs)
F_s = Infiltration rate Factor of Safety (see Chapter 4)

3. Select a pavement course thickness (l_p) and reservoir course thickness (l_r) such that the total effective storage depth (d_t) is no greater than the maximum allowable depth:

$$\boldsymbol{d_t = (l_p n_p + l_r n_r)/12 \ \leq d_{max}}$$

Where:
d_t = Total effective water storage depth (ft)
l_p = Pavement course thickness (in)
n_p = Pavement course porosity
l_r = Reservoir course thickness (in)
n_r = Reservoir course porosity
d_{max} = Maximum storage depth from Step 2 (ft)

4. Calculate the BMP surface area (A_{BMP}):

$$\boldsymbol{A_{BMP} = WQV/(d_t + kT/12F_s)}$$

Where:
A_{BMP} = BMP surface area (sq-ft)
WQV = Water Quality Volume from Step 1(cu-ft)
d_t = Total effective water storage depth from Step 3 (ft)
k = Soil infiltration rate (in/hr)
T = Fill time (time for the BMP to fill with water, hrs)
F_s = Infiltration rate Factor of Safety (see Chapter 4)

If the calculated area does not fit in the available space, either reduce the drainage area, increase the pavement course depth or reservoir course depth or gravel depth (if the total effective depth is not already equal to the maximum depth), and/or reduce the Infiltration rate factor of safety (if minimum number of test pits and permeability tests have not been performed) and repeat the calculations.

Pretreatment Considerations

Pretreatment is not required as long as the permeable pavement does not receive run-on from other surfaces. If it does, pretreatment is necessary to prevent premature failure due to clogging with fine sediment, and may be achieved with gravel filter strips, vegetated buffer strips, or vegetated swales.

Area Requirements

Permeable pavement requires a footprint equivalent to 5% - 18% of its contributing impervious drainage area. The lower value reflects the maximum allowable infiltration rate and minimum allowable factor of safety, while the upper value reflects the minimum allowable infiltration rate and maximum allowable factor of safety.

Sizing Example

Calculate the size of a section of permeable pavement serving the runoff from a 1-acre parking lot. Assume the following design parameters:

Design Parameter	Units	Value
Percent Impervious Cover, I	%	100
Design Storm Depth, P	inches	1.0
Reservoir Layer Fill Time, T	hours	2
Drawdown (drain) Time, t	hours	48
Pavement Course Porosity, n_p		0.15
Reservoir Course Porosity, n_r		0.35
Soil Infiltration Rate, k	inches/hr	1.0
Infiltration Rate Factor of Safety, F_s		2

1. Calculate the volumetric runoff coefficient (C) and Water Quality Volume (WQV):

$$\boldsymbol{C = 0.05 + 0.009I}$$
$$\boldsymbol{C = 0.05 + 0.009 \times 100}$$
$$\boldsymbol{C = 0.95}$$

$$\boldsymbol{WQV = PCA \times 3630}$$
$$\boldsymbol{WQV = 1 \times 0.95 \times 1 \times 3630}$$
$$\boldsymbol{WQV = 3{,}449\ cubic\ feet}$$

2. Calculate the maximum allowable water storage depth (d_{max}):

$$\boldsymbol{d_{max} = kt/12F_s}$$
$$\boldsymbol{d_{max} = 1.0 \times 48/(12 \times 2)}$$
$$\boldsymbol{d_{max} = 2.0\ feet}$$

3. Select a pavement course thickness (l_p) and reservoir course thickness (l_r) such that the total effective storage depth (d_t) is no greater than the maximum allowable depth:

$$\boldsymbol{l_p = 12.0\ inches}$$
$$\boldsymbol{l_r = 24.0\ inches}$$

$$\boldsymbol{d_t = (l_p n_p + l_r n_r)/12}$$
$$\boldsymbol{d_t = (12 \times 0.15 + 24 * 0.35)/12}$$
$$\boldsymbol{d_t = 0.85\ feet}$$

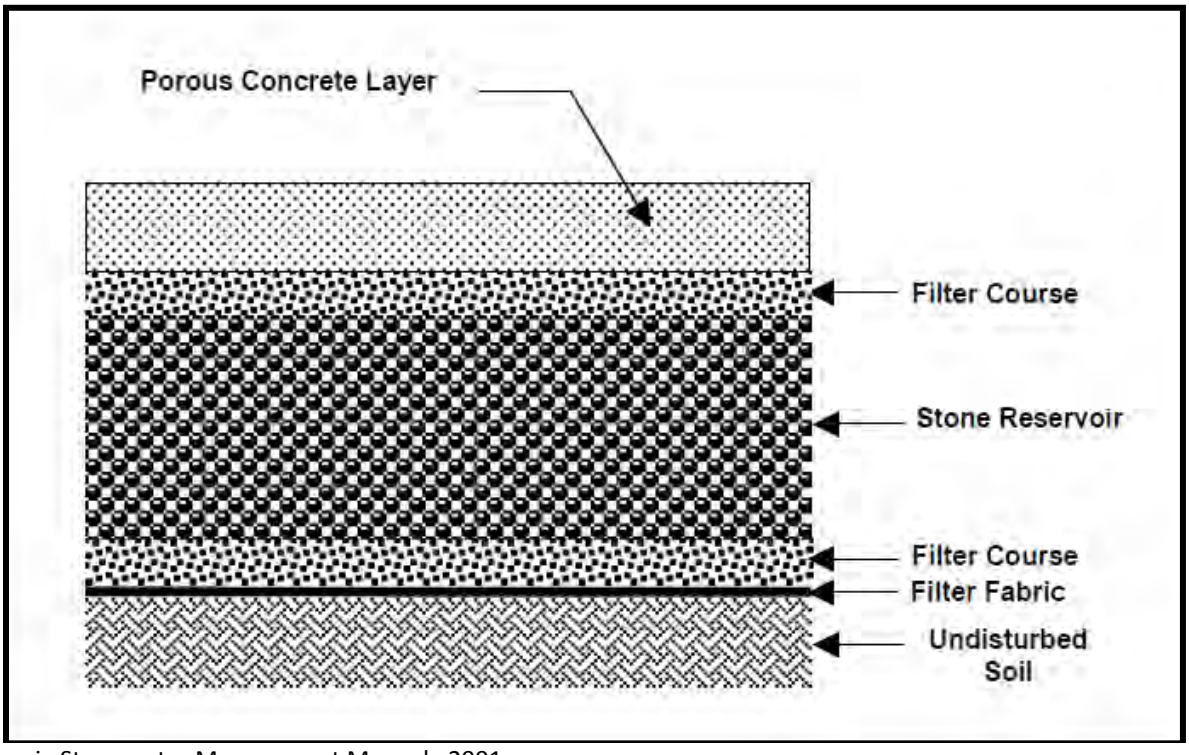
4. Calculate the pavement surface area:

$$\boldsymbol{A_{IMP} = WQV/[d_t + (kT/12F_s)]}$$
$$\boldsymbol{A_{IMP} = 3{,}449/[0.85 + (1.0 \times 2/12 \times 2)]}$$
$$\boldsymbol{A_{IMP} = 3{,}695\ square\ feet}$$

Other Design Considerations

- All porous paving and permeable paver with storage bed systems must include measures that will allow runoff from the design storm to enter the storage bed in the event that the porous or permeable paver surface course becomes clogged or otherwise incapable of conveying the maximum design storm runoff to the bed.
- Additional design details on specific pavement systems are provided by the National Asphalt Pavement Association, the National Ready Mix Concrete Association, the Interlocking Concrete Pavement Institute, and the American Association of State Highway and Transportation Officials.
- Perforated pipes along the bottom of the bed may be used to evenly distribute runoff over the entire bed bottom. Pipes should lay flat along the bed bottom and provide for uniform distribution of water. Depending on size, these pipes may provide additional storage volume.
- Flows in excess of the design capacity of the permeable pavement system will require an overflow system connected to a downstream conveyance or other storm water runoff BMP.

Figure 8: Schematic of a Permeable Pavement



Georgia Stormwater Management Manual. 2001.

HARVESTING / REUSE

Description

Sometimes referred to as Capture/Reuse or Rainwater Harvesting, is the collection and temporary storage of roof runoff in rain barrels or cisterns for subsequent non-potable outdoor use (landscape irrigation, vehicle washing).

BMP Category	
Retention	●
Biofiltration	○
Other	○



Hawaii Baptist Academy (Courtesy Group 70)

Expected Pollutant Removals	
Nutrients	High
Sediment	High
Trash	Low
Pathogens	High
Pesticides	High
Oil & Grease	High
Metals	High
Organic Compounds	High

Minimum Design Criteria

Design Parameter	Units	Value
Minimum overall runoff capture efficiency	%	80
Minimum overall demand met efficiency	%	80

Feasibility Criteria

See Table 9.

Sizing Procedure

1. Define the reuse demand by selecting values for the irrigation area (A_i), pan evaporation coefficient (K_p), landscape coefficient (K_l), irrigation system efficiency (e), and non-irrigation demand (D_o). Unless specific data is available, use a value of 0.80 for K_p (*Guidelines for the Reuse of Gray Water*), 0.60 for K_l (warm season turfgrass, *A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California*), and 0.90 for e (well-designed system, *Estimating Irrigation Water Needs of Landscape Plantings in California*).

2. Define the runoff available for reuse by selecting values for the drainage (i.e., roof) area (A_d), percent of impervious cover (I), and cistern size (C).

3. Identify the project's nearest reference point (Makakilo City, Waimanalo, Waialua, Village Park, Waianae, UH Mauka, Mililani, Opaeula, Maunawili, and Kalihi Valley) and use the corresponding monthly rainfall rates and monthly pan evaporation rates (E_{pan}).

4. Perform a month-to-month analysis, starting with January and ending with December. Set the beginning cistern volume in January to 0.

   4a. Calculate the reference evapotranspiration rate for the month using the pan evaporation rate and the pan evaporation coefficient:

   $$\boldsymbol{ET_0 = E_{pan} \times K_p}$$

   Where: ET_0 = Reference evapotranspiration rate for the month (in)
   E_{pan} = Pan evaporation rate for the month (in) from Step 3
   K_p = Pan evaporation coefficient from Step 1

   4b. Calculate the actual evapotranspiration rate for the month using the reference evapotranspiration rate and the landscape coefficient:

   $$\boldsymbol{ET_a = ET_0 \times K_l}$$

   Where: ET_a = Actual evapotranspiration rate for the month (in)
   ET_0 = Reference evapotranspiration rate from Step 4a
   K_l = Landscape coefficient from Step 1

   4c. Calculate the total demand for the month by multiplying the irrigation area by the difference between the actual evapotranspiration rate and the rainfall, and adding the non-irrigation demand:

   $$\boldsymbol{D_t = 7.48 \times A \times (ET_a - r)/(12 \times e) + D_o}$$

   Where: D_t = Total demand for the month (gal)
   A = Irrigation area from Step 1 (sq-ft)
   ET_a = Actual evapotranspiration rate from Step 4b (in)
   r = Total rainfall for the month (in) from Step 3
   e = Irrigation system efficiency from Step 1
   D_o = Other non-irrigation demand for the month (gal) from Step 1

   If the total demand for the month is negative (because the rainfall amount exceeds the evapotranspiration rate and there is no non-irrigation demand), set the total demand to 0.

   4d. Calculate the amount of runoff generated for the month by multiplying the drainage area by the rainfall by the volumetric runoff coefficient:

   $$\boldsymbol{R_g = 7.48 \times A_d \times r \times (0.05 + 0.009 \times I)/12}$$

   Where: R_g = Runoff generated for the month (gal)
   A_d = Drainage area from Step 2 (sq-ft)
   r = Total rainfall for the month (in) from Step 3
   I = Percent of impervious cover from Step 2 (expressed as %)

   4e. Compare the total demand (D_t) to the amount of runoff in the cistern at the beginning of the month (C_b) plus the runoff generated during the month (R). If the monthly demand

is greater, set the amount of runoff reused (R_u) to the sum of C_b and R. If the monthly demand is less, set the amount of runoff reused to D_t.

4f. Compare the Cistern capacity (C) to the amount in the cistern at the beginning of the month (C_b) plus the Runoff generated during the month (R_g) minus the amount of runoff used (R_u). Set the amount of runoff in the cistern at the end of the month (C_e) to the lower of the two values.

4g. Calculate the amount of cistern overflow by the following:

$$\boldsymbol{O = C_b + R_g - D_t - C_e}$$

Where: O = Total Cistern overflow for the month (gal)
C_b = Amount of runoff in cistern at beginning of month (gal)
R_g = Runoff generated for the month (gal)
D_t = Total demand for the month (gal)
C_e = Amount of runoff in cistern at end of month (gal)

If the overflow is negative (because the amount of runoff in the cistern at the end of the month is less than the cistern capacity), set the overflow to 0.

4h. Calculate the amount of runoff captured in the cistern by subtracting the Overflow from the amount of runoff generated:

$$\boldsymbol{R_c = R_g - O}$$

Where: R_c = Runoff captured in the cistern for the month (gal)
R_g = Runoff generated for the month (gal)
O = Total cistern overflow for the month (gal)

4i. Set the beginning cistern amount for the next month equal to the ending cistern amount for the current month. Repeat steps 5 through 13 for each subsequent month. Continue on to step 5 after Steps 4a through 4i have been performed for all 12 months.

5. Calculate the overall runoff capture efficiency by dividing the cumulative runoff captured by the cumulative runoff generated:

$$\boldsymbol{E_c = 100 \times \sum_{1}^{12} R_c \Big/ \sum_{1}^{12} R_g}$$

Where: E_c = Overall runoff capture efficiency (%)
R_c = Runoff captured from each month (gal)
R_g = Runoff generated from each month (gal)

If the calculated efficiency is below the minimum design criteria value, revise one or more of the following parameters and return to Step 3: drainage area (A_d), cistern size (C), irrigation area (A_i), and other non-irrigation demand (D_o).

6. Calculate the overall demand met efficiency by dividing the cumulative runoff used by the cumulative demand:

$$E_d = 100 \times \sum_{1}^{12} R_u \Big/ \sum_{1}^{12} D_t$$

Where: E_d = Overall demand met efficiency (%)
R_u = Runoff used from each month (gal)
D_t = Total demand from each month (gal)

If the calculated efficiency is below the minimum design criteria value, revise one or more of the following parameters and return to Step 3: drainage area (A_d), cistern size (C), irrigation area (A_i), and other non-irrigation demand (D_o).

Pretreatment Considerations

Roof gutter guards or leaf gutter screens are required for roof runoff to reduce dry well clogging from sediment, leaves, and other organic material.

Area Requirements

Rain barrel / cistern sizes can vary greatly depending on the project area, roof size, and irrigation area. The size can be anywhere from less than 1,000 gallons to more than 10,000 gallons per 1,000 square feet of roof area.

Sizing Example

Calculate the size of a cistern serving the roof runoff from an 800 square-foot auto repair shop in Kapolei. Assume the following design parameters:

Design Parameter	Units	Value
Minimum overall runoff capture efficiency, E_c	%	80
Minimum overall demand met efficiency, E_d	%	80

1. Select initial demand values for the Irrigation Area (A_i), pan evaporation coefficient (K_p), landscape coefficient (K_l), irrigation system efficiency (e), and non-irrigation demand (D_o):

$$A_i = 115 \; square \; feet$$

$$K_p = 0.80$$

$$K_l = 0.60$$

$$e = 0.90$$

$$D_o = 0$$

2. Select initial values for the drainage area (A_d), percent of impervious cover (I), and cistern size (C):

$$\boldsymbol{A_d = 800\ square\ feet}$$

$$\boldsymbol{I = 100\%}$$

$$\boldsymbol{C = 5{,}000\ gal}$$

3. The nearest reference point to Kapolei is Makakilo City.

4a. Calculate the monthly reference evapotranspiration rates (ET_0). The calculation for January is as follows, and the results for the entire year are provided in the table below.

$$\boldsymbol{ET_0 = E_{pan} \times K_p}$$

$$\boldsymbol{ET_0 = 5.46 \times 0.8}$$

$$\boldsymbol{ET_0 = 4.37\ in}$$

4b. Calculate the actual evapotranspiration rates (ET_a). The calculation for January is as follows, and the results for the entire year are provided in the table below.

$$\boldsymbol{ET_a = ET_0 \times K_l}$$

$$\boldsymbol{ET_a = 4.37 \times 0.6}$$

$$\boldsymbol{ET_a = 2.62\ in}$$

4c. Calculate the total demand (D_t). The calculation for January is as follows, and the results for the entire year are provided in the table below.

$$\boldsymbol{D_t = 7.48 A_i (ET_a - r)/(12e) + D_o}$$

$$\boldsymbol{D_t = 7.48 \times 115 \times (2.62 - 2.58)/(12 \times 0.9) + 0 = 3}$$

$$\boldsymbol{D_t = 3\ gal}$$

Month	Rainfall (in)	P (in)	ET_0 (in)	ET_a (in)	D_t (gal)
January	2.58	5.46	4.37	2.62	3
February	3.05	5.75	4.60	2.76	0
March	1.87	7.12	5.70	3.42	123
May	1.12	7.75	6.20	3.72	207
May	0.86	8.41	6.73	4.04	253
June	0.55	8.99	7.19	4.32	300
July	0.58	9.74	7.79	4.68	326
August	0.48	9.65	7.72	4.63	331
September	0.74	8.48	6.78	4.07	265
October	2.00	7.54	6.03	3.62	129
November	2.06	6.29	5.03	3.02	76
December	2.69	5.59	4.47	2.68	0

4d. Calculate the generated roof runoff (R_g). The calculation for January is as follows, and the results for the entire year are provided in the table below:

$$R_g = 7.48 A_d r (0.05 + 0.009 I)/12$$
$$R_g = 7.48 \times 800 \times 2.58\,(0.05 + 0.009 \times 100)/12$$
$$R_g = 1,222\ gal$$

4e. Calculate the runoff used (R_u) by comparing the total demand (D_t) to the amount of runoff in the cistern at the beginning of the month (C_b) plus the runoff generated during the month (R). The calculation for January is as follows, and the results for the entire year are provided in the table below:

$$C_b = 0\ gal$$
$$R_u = D_t = 3\ gal\ [since\ R_g + C_b > D_t]$$

4f. Calculate the amount of runoff in the Cistern at the end of the month (C_e) by setting it to the lower value of the amount of runoff in the Cistern at the beginning of the month (C_b) plus the runoff generated (Rg) minus the runoff used (R_u), and the cistern capacity (C). The calculation for January is as follows, and the results for the entire year are provided in the table below:

$$C_e = min(C_b + R_g - R_u, C)$$
$$C_e = min(0 + 1222 - 3, 5000)$$
$$C_e = 1,219\ gal$$

4g. Calculate the Cistern overflow (O). The calculation for January is as follows, and the results for the entire year are provided in the table below:

$$O = C_b + R_g - D_t - C_e$$
$$O = 0 + 1,222 - 3 - 1,219$$
$$O = 0\ gal$$

4h. Calculate the runoff captured in Cistern (R_c). The calculation for January is as follows, and the results for the entire year are provided in the table below:

$$R_c = R_g - O$$
$$R_c = 1,222 - 0 = 1,222\ gal$$

4i. Set C_b for the next month equal to C_e of the previous month and repeat the calculations.

Month	r (in)	D_t (gal)	R_g (gal)	C_b (gal)	C_e (gal)	R_u (gal)	O (gal)	R_c (gal)
January	2.58	3	1,222	0	1,219	3	0	1,222
February	3.05	0	1,445	1,219	2,664	0	0	1,445
March	1.87	123	886	2,664	3,426	123	0	886
May	1.12	207	531	3,426	3,750	207	0	531
May	0.86	253	407	3,750	3,904	253	0	407
June	0.55	300	261	3,904	3,865	300	0	261
July	0.58	326	275	3,865	3,814	326	0	275
August	0.48	331	227	3,814	3,710	331	0	227
September	0.74	265	351	3,710	3,796	265	0	351
October	2.00	129	947	3,796	4,614	129	0	947
November	2.06	76	976	4,614	5,000	76	514	462
December	2.69	0	1,274	5,000	5,000	0	1,274	0
Total	**18.58**	**2,014**	**8,802**			**2,014**	**1,788**	**7,014**

5. Calculate the overall runoff capture efficiency (E_c) and overall demand efficiency (E_d):

$$\boldsymbol{E_c = 100 \times \sum_{1}^{12} R_c \Big/ \sum_{1}^{12} R_g = 100 \times 7,014/8,802 = 80\%}$$

$$\boldsymbol{E_d = 100 \times \sum_{1}^{12} R_u \Big/ \sum_{1}^{12} D_t = 100 \times 2,014/2,014 = 100\%}$$

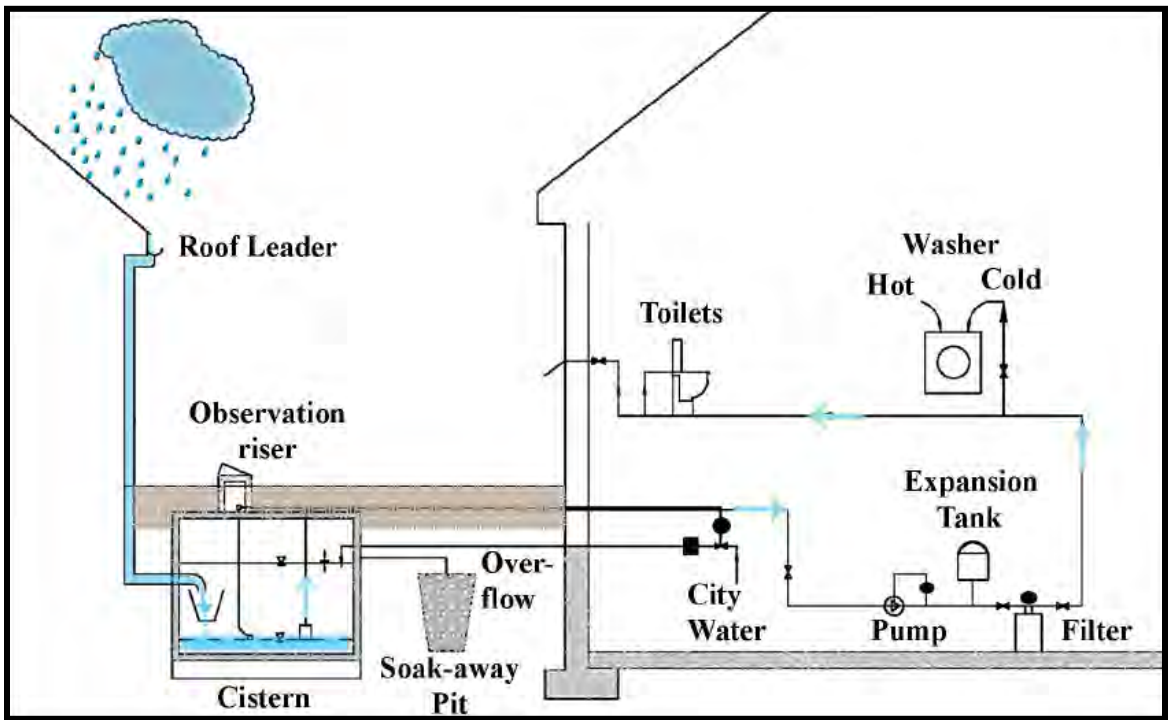
6. Calculate the Water Quality Volume (WQV) for which credit is received:

$$\boldsymbol{WQV = PCA \times 3630}$$
$$\boldsymbol{WQV = 1 \times (0.05 + 0.009 \times 100) \times (800/43,560) \times 3630}$$
$$\boldsymbol{WQV = 63\ cubic\ feet}$$

Other Design Considerations

- Local pan evaporation and rainfall data may be used if available.
- Tanks should have tight fitting covers to exclude contaminants and animals, and above ground tanks should not allow penetration of sunlight to limit algae growth
- In areas where the tank is to be buried partially below the water table, special design features must be employed to keep it from "floating".

Figure 9: Schematic of a Harvesting / Reuse System



Pennsylvania Stormwater Best Management Practices Manual. 2006.

GREEN ROOF

Description

Sometimes referred to as a Vegetated Roof or Eco-roof, a green roof is a roof that is entirely or partially covered with vegetation and soils for the purpose of filtering, absorbing, evapotranspirating, and retaining/ detaining the rain that falls upon it.

BMP Category	
Retention	○
Biofiltration	●
Other	○



Fasi Municipal Building

Expected Pollutant Removals	
Nutrients	Medium
Sediment	High
Trash	High
Pathogens	Medium
Pesticides	Medium
Oil & Grease	High
Metals	Medium
Organic Compounds	Medium

Minimum Design Criteria

Design Parameter	Units	Value
Minimum Depth of Soil Media	inches	2
Minimum Depth of Drainage Layer	inches	2
Maximum slope on roof	%	25

Feasibility Criteria

See Table 10.

Sizing Procedure

1. Use the procedure presented previously to compute the Volumetric Runoff Coefficient and Water Quality Volume.

2. Select initial values for the soil media thickness (l_m), drainage layer thickness (l_d), and allowable ponding depth (d_p).

3. Calculate the total effective storage depth based on the instantaneous storage capacity using the void space in the soil media and drainage layer, and the allowable ponding:

$$\boldsymbol{d_t = (d_p + l_m n_m + l_d n_d)/12}$$

Where: d_t = Total effective water storage depth (ft)
d_p = Ponding depth (in)

l_m = Planting media thickness (in)
n_m = Planting media porosity
l_d = Drainage layer thickness (in)
n_d = Drainage layer porosity

4. Calculate the area required (A_{BMP}) based on the instantaneous storage capacity:

$$A_{BMP} = WQV / d_t$$

Where: A_{BMP} = BMP area (sq-ft)
WQV = Water Quality Volume from Step 1 (cu-ft)
d_t = Total effective water storage depth from Step 3 (ft)

If the calculated area does not fit in the available space, either reduce the tributary area and/or increase one or more of the design depths (ponding, soil media, drainage layer), and repeat the calculations.

Pretreatment Considerations

Green roofs do not require pretreatment.

Area Requirements

A green roof requires a footprint equivalent to 11% - 100% of the contributing roof drainage area. The lower value corresponds to 4 inches of ponding and maximum depths for both the planting media and drainage layer depths, while the higher value corresponds to no ponding and minimum planting media and drainage layer depths.

Sizing Example

Calculate the size of a green roof serving the roof runoff from a 1,500 square-foot fast food restaurant. Assume the following design parameters:

Design Parameter	Units	Value
Percent Impervious Cover, I	%	100
Design Storm Depth, P	inches	1.0
Soil Media Porosity, n_m		0.20
Drainage Layer Porosity, n_d		0.25

1. Calculate the volumetric runoff coefficient (C) and Water Quality Volume (WQV):

$$C = 0.05 + 0.009I$$
$$C = 0.05 + 0.009 \times 100$$
$$C = 0.95$$

$$WQV = PCA \times 3630$$
$$WQV = 1 \times 0.95 \times (1,500/43,560) \times 3630$$
$$WQV = 119 \; cubic \; feet$$

2. Select initial values for the soil media depth (d_m), drainage layer depth (d_d), and ponding depth (d_p):

$$\boldsymbol{d_m = 3\ in}$$
$$\boldsymbol{d_d = 2\ in}$$
$$\boldsymbol{d_p = 0.5\ in}$$

3. Calculate the total effective storage depth:

$$\boldsymbol{d_t = \left(d_p + l_m n_m + l_d n_d\right)/12}$$
$$\boldsymbol{d_t = (0.5 + 3 \times 0.20 + 2 \times 0.25)/12}$$
$$\boldsymbol{d_t = 0.133\ feet}$$

4. Calculate the area (A_{BMP}):

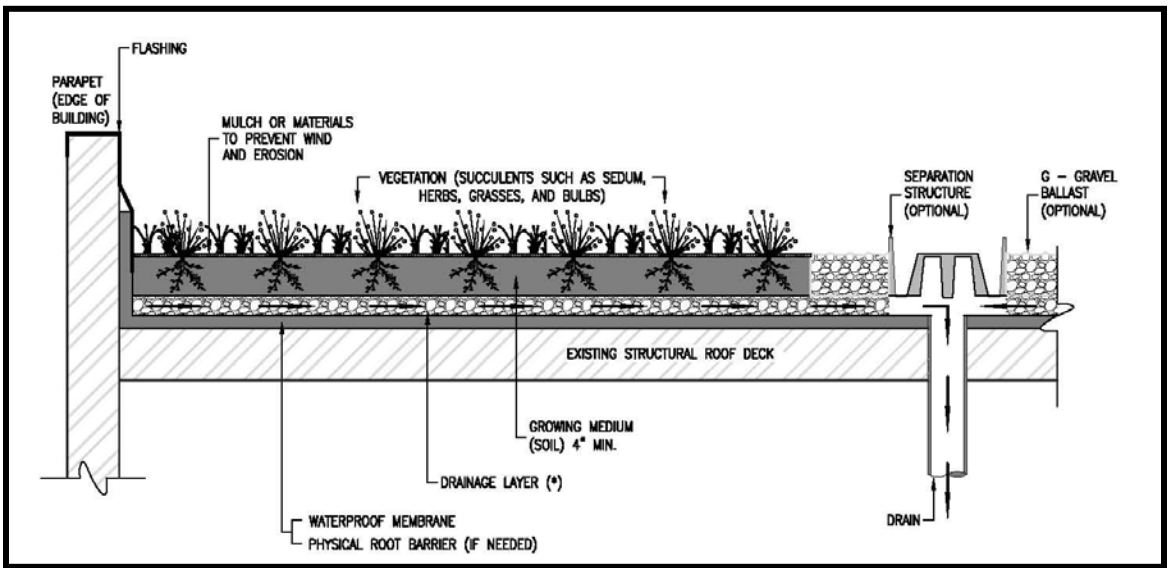
$$\boldsymbol{A_{BMP} = WQV/d_t}$$
$$\boldsymbol{A_{BMP} = 119/0.133}$$
$$\boldsymbol{A_{BMP} = 891\ square\ feet}$$

$$\boldsymbol{891\ square\ feet\ is\ available, so\ design\ is\ ok}$$

Other Design Considerations

- Safety measures against wind uplift must be taken into account during design, especially for areas susceptible to high winds during the summer trade-wind period.
- The maximum load bearing capacity of the roof construction must be considered when installing vegetated roofs. The water saturated weight of the green roof system, including vegetation must be calculated as permanent load. Generally, vegetated roofs weigh between 15 and 30 lb/sq.ft. depending on the thickness of the vegetated roof system. In addition, construction elements such as pergolas and walkways cause high point loads and, therefore, have to be calculated accordingly.
- The design must include adequate roof access for delivery of construction materials and for routine maintenance.

Figure 10: Schematic of a Green Roof



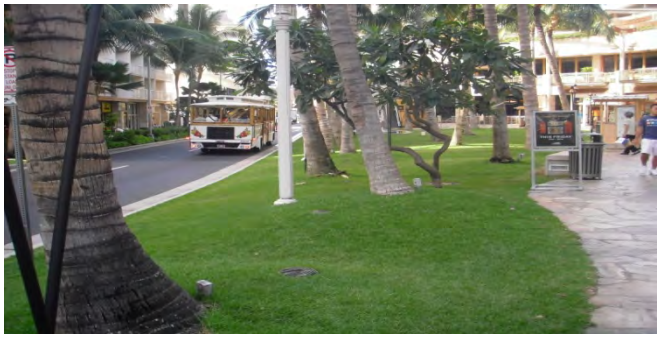
Portland Stormwater Management Manual. 2008.

BIORETENTION FILTER

Description

Sometimes referred to as a Rain Garden or Planter Box, a Bioretention Filter is an engineered shallow depression that collects and filters storm water runoff using conditioned planting soil beds and vegetation. The filtered runoff discharges through an underdrain system.

BMP Category	
Retention	○
Biofiltration	●
Other	○



???

Expected Pollutant Removals	
Nutrients	Medium
Sediment	High
Trash	High
Pathogens	Medium
Pesticides	Unknown
Oil & Grease	High
Metals	High
Organic Compounds	High

Minimum Design Criteria

Design Parameter	Units	Value
Planting Soil Coefficient of Permeability	feet/day	1.0
Mulch Thickness	inches	2 – 4
Planting Soil Depth	feet	2 – 4
Drawdown (drain) Time	hours	48
Maximum Ponding Depth	inches	12
Minimum Underdrain Diameter	inches	6

Feasibility Criteria

See Table 10.

Sizing Procedure

1. Use the procedure presented previously to compute the Volumetric Runoff Coefficient and Water Quality Volume.

2. Select values for the planting media depth (l_m) and maximum ponding depth (d_p).

3. Use Darcy's Law to calculate the required Filter Bed Surface Area:

$$A_b = \frac{WQV \times l_m}{k(l_m + d_p/24)(t/24)}$$

Where:
- A_b = Filter bed surface area (sq-ft)
- WQV = Water Quality Volume from Step 1 (cu-ft)
- l_m = Planting media depth from step 2 (ft)
- k = Planting media permeability coefficient (ft/day)
- d_p = Maximum ponding depth, from Step 2 (in)
- t = Filter bed drain time (hr)

4. Select a filter bed width (w_b), and calculate the filter bed length (l_b):

$$l_b = A_b / w_b$$

Where:
- l_b = Filter bed length (ft)
- A_b = Filter bed surface area from Step 3 (sq-ft)
- w_b = Filter bed width (ft)

5. Calculate the total area occupied by the BMP excluding pretreatment (A_{BMP}) using the filter bed dimensions, embankment side slopes, and freeboard:

$$A_{BMP} = [w_b + 2z(d_p + f)] \times [l_b + 2z(d_p + f)]$$

Where:
- A_{BMP} = Area occupied by BMP excluding pretreatment (sq-ft)
- w_b = Filter bed width from Step 4 (ft)
- z = Filter bed interior side slope (length per unit height)
- d_p = Maximum Ponding Depth from Step 2 (ft)
- f = Freeboard (ft)
- l_b = Filter bed length from Step 4 (ft)

If the calculated area does not fit in the available space, either reduce the drainage area, reduce the planting soil depth (if it's not already set to the minimum), and/or increase the ponding depth (if it's not already set to the maximum depth), and repeat the calculations.

Pretreatment Considerations

Pretreatment should be provided where sediments or trash may cause a concern or decreased BMP functionality, and when space permits. Pretreatment may be achieved with vegetated swales, vegetated buffer strips with pea gravel or stone diaphragm, or manufactured treatment device.

Area Requirements

A bioretention filter requires a footprint equivalent to 3.3% - 3.8% of its contributing impervious drainage area, excluding pretreatment. The lower value reflects the minimum planting media depth and maximum ponding depth, while the upper value reflects the maximum planting media depth and minimum ponding depth.

Sizing Example

Calculate the size of a bioretention filter serving a 1-acre residential development. Assume the following design parameters:

Design Parameter	Units	Value
Percent Impervious Cover, I	%	70
Design Storm Depth, P	inches	1.0
Planting Soil Coefficient of Permeability, k	feet/day	1.0
Drawdown (drain) Time, t	hours	48
Interior Side Slope (length per unit height), z		0
Freeboard, f	ft	0.5

1. Calculate the volumetric runoff coefficient and Water Quality Volume (WQV):

$$C = 0.05 + 0.009I$$
$$C = 0.05 + 0.0039 \times 70$$
$$C = 0.68$$

$$WQV = PCA \times 3630$$
$$WQV = 1 \times 0.68 \times 1 \times 3630$$
$$WQV = 2{,}468\ cubic\ feet$$

2. Select a planting soil depth (d_s) and ponding depth (d_p):

$$d_s = 2.0\ ft$$
$$d_p = 6\ in$$

3. Calculate the Filter Bed Surface Area (A_{BMP}):

$$A_{BMP} = WQV \times d_s / \left[k\left(d_s + \left(d_p/24\right)\right)(t/24)\right]$$
$$A_{BMP} = 2{,}468 \times 2 / \left[1\left(2 + (6/24)\right)(48/24)\right]$$
$$A_{BMP} = 1{,}097\ square\ feet$$

4. Set the bottom width (w_b) to 6 feet, and calculate the bottom length (l_b):

$$l_b = A_b / w_b$$
$$l_b = 1{,}097/6$$
$$l_b = 182.8\ feet$$

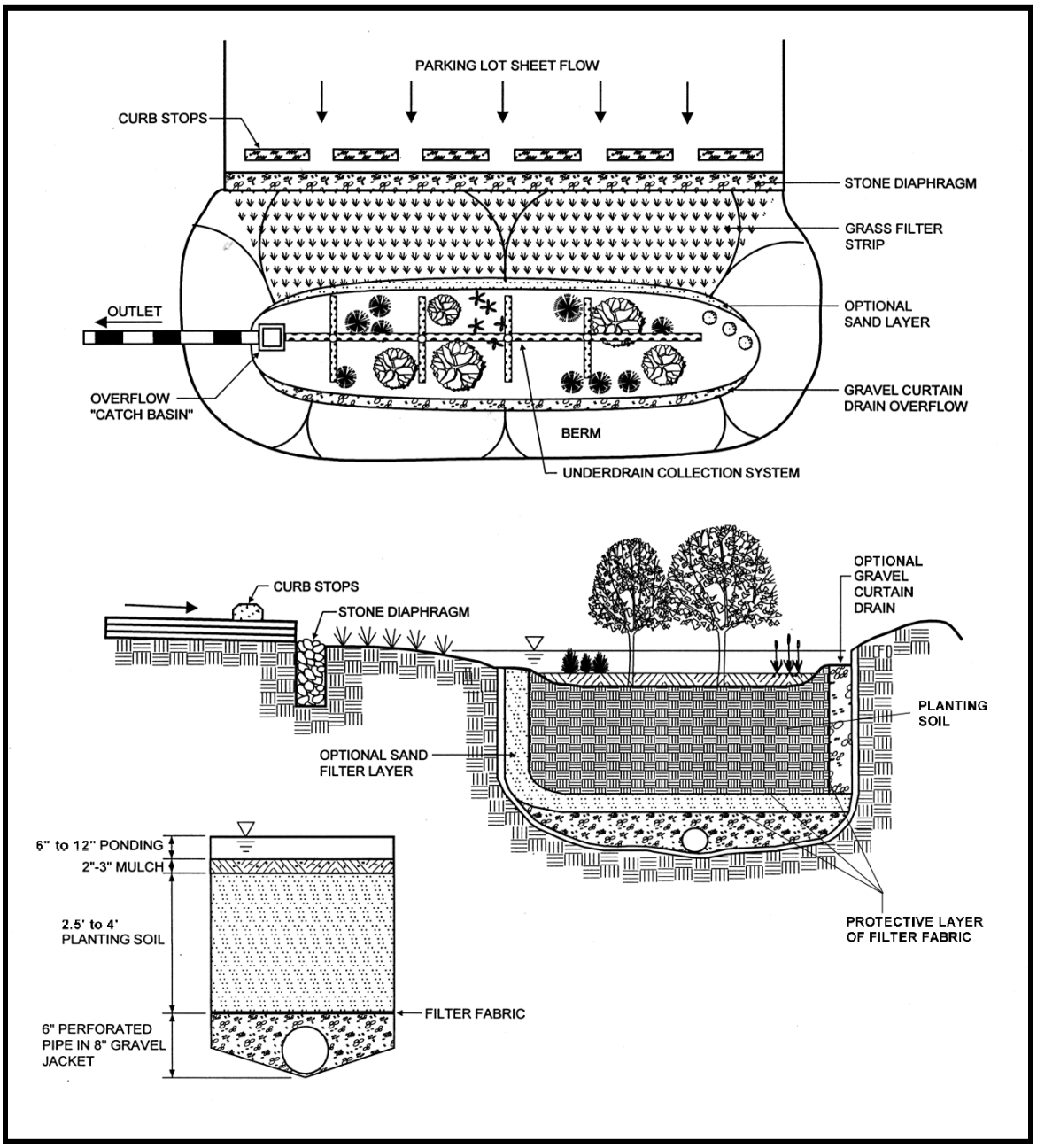
5. Calculate the total area excluding pretreatment (A_{BMP}):

$$A_{BMP} = [w_b + 2z(d_p + f)] \times [l_b + 2z(d_p + f)]$$
$$A_{BMP} = [6 + 2 \times 0(0.5 + 0.5)] \times [182.8 + 2 \times 0(0.5 + 0.5)]$$
$$A_{BMP} = 1{,}097 \; square \; feet$$

Other Design Considerations

- An overflow device (e.g., domed riser, inlet structure) must be included to safely convey runoff from large storm events when the surface/subsurface capacity is exceeded.
- If a mulch layer is used on the surface of the planting bed, consideration should be given to problems caused by flotation during storm events.
- A cleanout pipe should be tied into the end of all underdrain pipe runs

Figure 11: Schematic of a Bioretention Filter



Prince George's County Bioretention Manual. 2007.

DRY SWALE

Description

Sometimes referred to as a Bioretention Swale or Enhanced Swale, a Dry Swale is a shallow linear channel with a planting bed and covered with turf or other surface material (other than mulch or plants). Runoff filters through a planting bed, is collected in an underdrain system, and discharged at the downstream end of the swale.

BMP Category	
Retention	○
Biofiltration	●
Other	○

Expected Pollutant Removals	
Nutrients	Medium
Sediment	High
Trash	High
Pathogens	Unknown
Pesticides	Unknown
Oil & Grease	Medium
Metals	Medium
Organic Compounds	Unknown



Georgia Stormwater Management Manual. 2001.

Minimum Design Criteria

Design Parameter	Units	Value
Maximum Interior Side Slope (length per unit height)		3:1
Bottom width	feet	2 - 8
Maximum Longitudinal Slope w/o check dams	%	2
Maximum Longitudinal Slope w/ check dams	%	5
Maximum check dam height	inches	12
Maximum Ponding Depth at downstream end	inches	18
Media depth	inches	18 - 36
Maximum Velocity	feet/sec	3
Minimum Freeboard	inches	6
Maximum Underdrain Diameter	inches	6

Feasibility Criteria

See Table 10.

Sizing Procedure

1. Use the procedure presented previously to compute the Volumetric Runoff Coefficient and Water Quality Volume.

2. Select values for the planting media thickness, drainage layer thickness, planting media porosity, drainage layer porosity, maximum surface ponding depth (if check dams are used), bottom width, and interior side slope (length per unit height).

3. Calculate the total effective storage depth based on the instantaneous storage capacity using the void space in the planting media and drainage layer, and the average ponding depth (assumed to be one-half the maximum ponding depth):

$$\boldsymbol{d_t = \left[\left(d_p/2\right) + l_m n_m + l_d n_d\right]/12}$$

Where:
- d_t = Total effective water storage depth (ft)
- d_p = Maximum ponding depth from Step 2 (in)
- l_m = Planting media thickness from Step 2 (in)
- n_m = Planting media porosity, typically around 0.25
- l_d = Drainage layer thickness from Step 2 (in)
- n_d = Drainage layer porosity, typically around 0.40

4. Calculate the swale invert area required (A_b) based on the instantaneous storage capacity (neglecting the additional ponding capacity due to the shape of the swale sides):

$$\boldsymbol{A_b = WQV/d_t}$$

Where:
- A_b = Bottom surface area (sq-ft)
- WQV = Water Quality Volume from Step 1 (cu-ft)
- d_t = Total effective water storage depth from Step 3 (ft)

5. Calculate the total area required (A_{BMP}) taking into account the side slopes along the length of the swale:

$$\boldsymbol{A_{BMP} = \left[b + 2 \times z \times \left(d_p + f\right)/12\right] \times \left(A_b/b\right)}$$

Where:
- A_{BMP} = Total surface area (sq-ft)
- b = Swale bottom width from Step 2 (ft)
- z = Interior swale side slope (length per unit height) from Step 2
- d_p = Ponding depth from Step 2 (in)
- f = Freeboard (in)
- A_b = Bottom surface area from Step 4 (sq-ft)

If the minimum surface area is larger than the available space, reduce the tributary area and/or increase one or more design depths (media, gravel, ponding), and repeat the calculations.

Pretreatment Considerations

Pretreatment for dry swales is provided by a shallow sediment forebay at the initial point of the channel. The volume of this forebay should be equal to at least 0.05 in. per impervious acre of drainage. A pea gravel diaphragm can be used along the top of the channel to provide pretreatment for lateral flows entering the swale.

Area Requirements

A dry swale requires a footprint equivalent to 8% - 40% of its contributing impervious drainage area. The lower value corresponds to the maximum allowable values for the mentioned dependent variables, while the upper value reflects the minimum allowable values for all specified parameters.

Sizing Example

Calculate the size of a dry swale serving a 1-acre residential development. Assume the following design parameters:

Design Parameter	Units	Value
Percent Impervious Cover, I	%	70
Design Storm Depth, P	inches	1.0
Media porosity, n_m		0.25
Drainage layer porosity, n_d		0.40
Freeboard, f	inches	6
Drawdown (drain) Time, t	hours	48

1. Calculate the volumetric runoff coefficient and Water Quality Volume (WQV):

$$\boldsymbol{C = 0.05 + 0.009I}$$
$$\boldsymbol{C = 0.05 + 0.0039 \times 70}$$
$$\boldsymbol{C = 0.68}$$

$$\boldsymbol{WQV = PCA \times 3630}$$
$$\boldsymbol{WQV = 1 \times 0.68 \times 1 \times 3630}$$
$$\boldsymbol{WQV = 2{,}468\ cubic\ feet}$$

2. Select a media thickness (l_m), drainage layer thickness (l_d), ponding depth (d_p), bottom width (b), and interior side slope (z):

$$\boldsymbol{l_m = 18\ in}$$
$$\boldsymbol{l_d = 6\ in}$$
$$\boldsymbol{d_p = 12\ in}$$
$$\boldsymbol{b = 8\ ft}$$
$$\boldsymbol{z = 3}$$

3. Calculate the total effective storage depth:

$$d_t = [(d_p/2) + l_m n_m + l_d n_d]/12$$
$$d_t = (6 + 18 \times 0.25 + 6 \times 0.40)/12$$
$$d_t = 1.075 \; feet$$

4. Calculate the minimum invert area (A_b) needed for the WQV and depths:

$$A_b = WQV/d_t$$
$$A_b = 2,468/1.075$$
$$A_b = 2,296 \; square \; feet$$

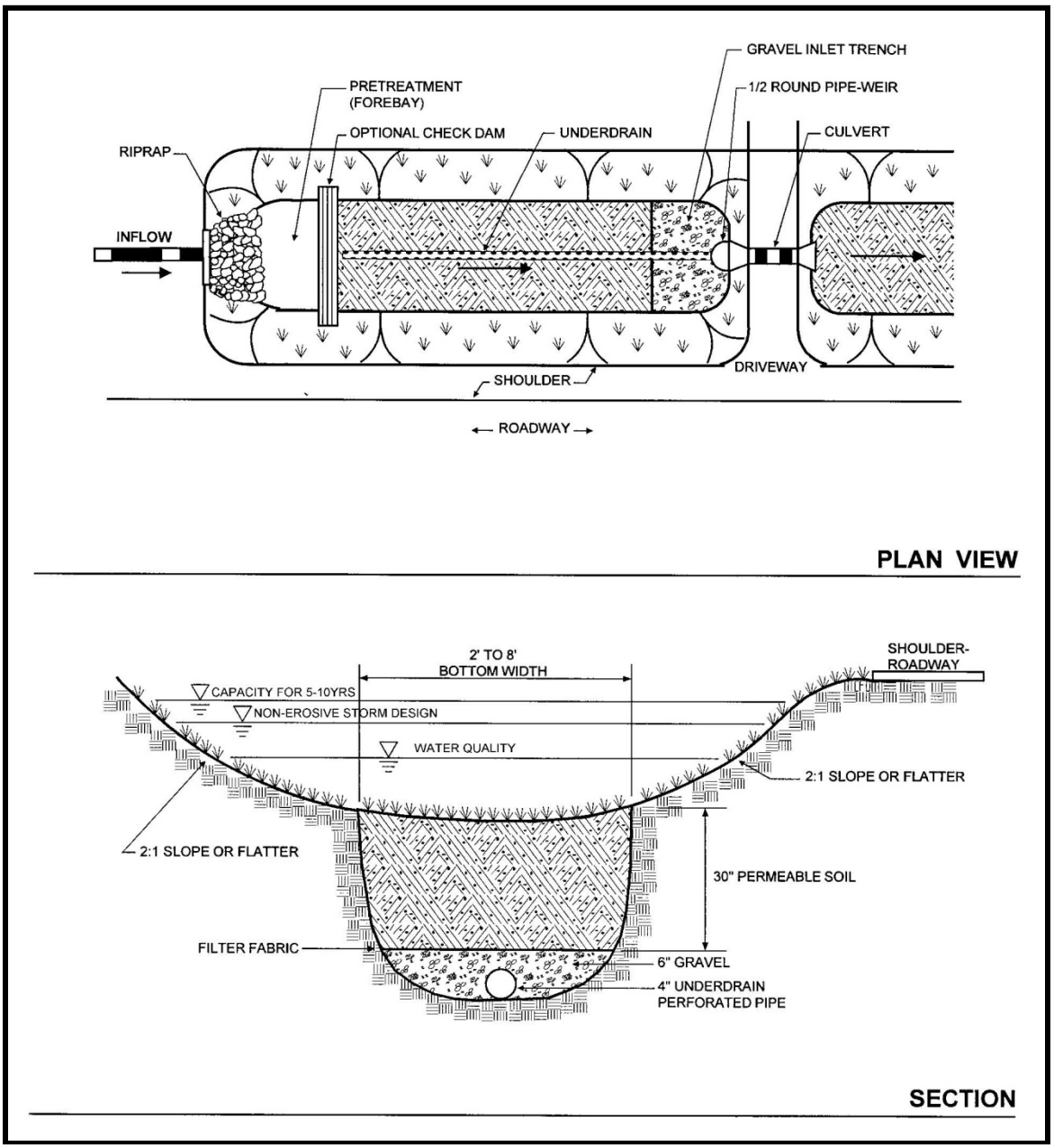
5. Calculate the total area required (A_{BMP}):

$$A_{BMP} = [b + 2 \times z \times (d_p + f)/12] \times (A_b/b)$$
$$A_{BMP} = [8 + 2 \times 3 \times (12 + 6)/12] \times (2,296/8)$$
$$A_{BMP} = 4,879 \; square \; feet$$

Other Design Considerations

- Landscape design should specify proper grass species based on specific site, soils and hydric conditions present along the channel. Vegetation should be designed for regular mowing, like a typical lawn, or less frequently (annually or semi-annually).
- Dry swales must be adequately designed to safely pass flows that exceed the design storm flows.

Figure 12: Schematic of a Dry Swale



Vermont Stormwater Management Handbook, Technical Support Document, Public Review Draft. 2000.

DOWNSPOUT DISCONNECTION

Description

Sometimes referred to as Rooftop Disconnection or Downspout Dispersion, is the redirection of roof runoff to a vegetated area in a dispersed manner.

BMP Category	
Retention	○
Biofiltration	●
Other	○



New York State Stormwater Management Design Manual. 2010.

Expected Pollutant Removals	
Nutrients	Low
Sediment	Medium
Trash	Low
Pathogens	Low
Pesticides	Unknown
Oil & Grease	Medium
Metals	Medium
Organic Compounds	Unknown

Minimum Design Criteria

Design Parameter	Units	Value
Minimum vegetated area to roof area ratio		0.1:1
Minimum vegetated flow path to roof flow path ratio		1:1

Feasibility Criteria

See Table 10.

Sizing Procedure

1. Calculate size of the vegetated area (A_v) using 10% of the roof drainage area (A_r):

$$\boldsymbol{A_v = 0.10A_r}$$

Where: A_v = Vegetated area (sq-ft)
A_r = Roof drainage area (sq-ft)

2. Use the procedure presented previously to compute the Water Quality Volume (WQV) for which credit is received.

Pretreatment Considerations

Downspout disconnections do not require pretreatment.

Area Requirements

A downspout disconnection requires a footprint equivalent to at least 10% of its contributing impervious drainage area.

Sizing Example

Calculate the size of a vegetated area serving the runoff from a 1,000 square foot roof. Assume the following design parameters:

Design Parameter	Units	Value
Percent Impervious Cover, I	%	100
Design Storm Depth, P	inches	1.0

1. Calculate size of the vegetated area (A_v) using 10% of the roof drainage area (A_r):

$$A_v = 0.10 A_r$$
$$A_v = 0.10 \times 1{,}000$$
$$A_v = 100\ sq-ft$$

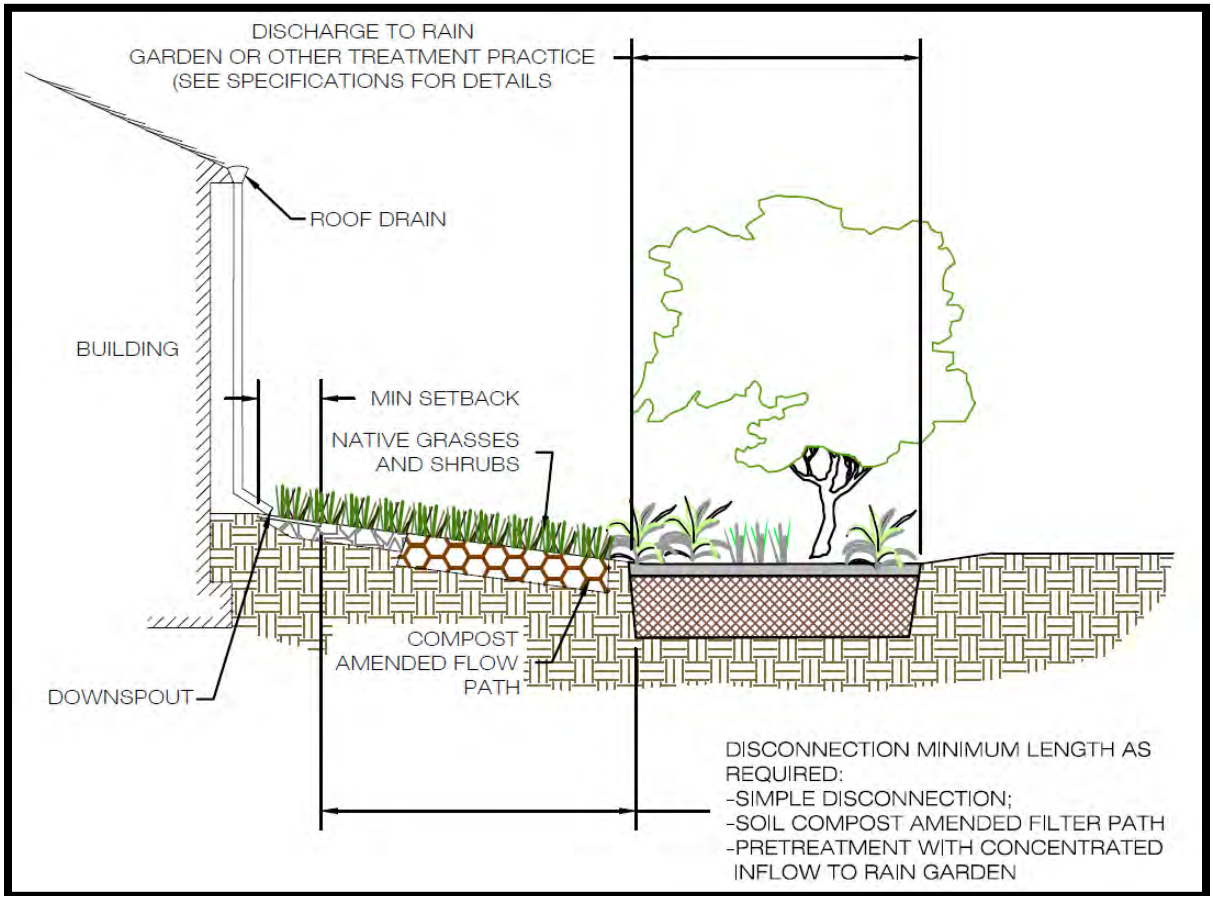
2. Calculate the Water Quality Volume (WQV) for which credit is received:

$$WQV = PCA \times 3630$$
$$WQV = 1 \times (0.05 + 0.009 \times 100) \times (1{,}000/43{,}560) \times 3630$$
$$WQV = 79\ cubic\ feet$$

Other Design Considerations

- Disconnected runoff can also be directed to rain barrels, cisterns, rain gardens, dry wells, or other BMPs.
- Disconnections over impervious soils (Hydrologic Soil Group "C" or "D") is discouraged, unless the soil is compost-amended.
- Use splash pads or level spreaders as required to distribute runoff to designated areas with infiltration capacity.
- Runoff must not flow toward building foundations or onto adjacent private property

Figure 13: Schematic of a Downspout Disconnection



Virginia DCR Stormwater Design Specification No. 1. 2011.

VEGETATED SWALE

Description

Sometimes referred to as a Grass Swale, Grass Channel, or Biofiltration Swale, a vegetated swale is a broad shallow earthen channel vegetated with erosion resistant and flood tolerant grasses. Runoff typically enters the swale at one end and exits at the other end.

BMP Category	
Retention	○
Biofiltration	●
Other	○



Kaneohe

Expected Pollutant Removals	
Nutrients	Low
Sediment	Medium
Trash	Low
Pathogens	Low
Pesticides	Unknown
Oil & Grease	Medium
Metals	Medium
Organic Compounds	Unknown

Minimum Design Criteria

Design Parameter	Units	Value
Maximum Interior Side Slope (length per unit height)		3:1
Manning's n value	-	0.20
Maximum Flow Velocity	feet/sec	1
Maximum Water Depth	inches	4
Minimum Hydraulic Residence Time	minutes	7
Maximum Bottom Width	feet	10
Minimum Freeboard	inches	6

Feasibility Criteria

See Table 10.

Sizing Procedure

1. Use the procedure presented previously to compute the Water Quality Flow Rate.

2. Select initial values for swale bottom width (b), depth of flow (y), swale side slope (z), swale longitudinal slope (s), and hydraulic residence time (T):

3. Calculate the cross-sectional area (A), wetted perimeter (WP), and hydraulic radius (R) using the dimensions established in Step 2:

$$A = (by/12) + (zy^2/144)$$

$$WP = b + (2y/12)\sqrt{1 + z^2}$$

$$R = A/WP$$

Where:
- A = Cross sectional area (sq-ft)
- WP = Wetted perimeter (ft)
- R = Hydraulic radius (ft)
- b = Swale bottom width from Step 2 (ft)
- y = depth of flow for WQF from Step 2 (in)
- z = Swale side slope (length per unit height) from Step 2

4. Calculate the design flow rate in the swale using the selected dimensions and Manning's Equation:

$$Q = \frac{1.49AR^{2/3}s^{1/2}}{n}$$

Where:
- Q = Design flow rate (cfs)
- A = Cross Sectional area from Step 3 (sq-ft)
- R = Hydraulic radius from Step 3 (ft)
- s = Longitudinal Slope from Step 2 (%)
- n = Manning's n value

Note that the Manning's n value for water quality calculations is significantly higher than the Manning's n value typically used for flood control calculations (0.035). If the calculated flow rate is not equal to or greater than the WQF from Step 1, decrease the tributary area and/or increase one or more swale dimensions (bottom width, depth of flow, side slope, or longitudinal slope) and repeat the calculations.

5. Once an appropriate design flow rate is achieved, calculate the design flow velocity using the flow continuity equation:

$$V = Q/A$$

Where:
- V = Design flow velocity (ft/sec)
- Q = Design flow rate from Step 4 (cfs)
- A = Cross sectional area from Step 3 (sq-ft)

If the design flow velocity is greater than the maximum allowed velocity, either include check dams with vertical drops of no more than 12 inches, or revise one or more swale dimensions and repeat the calculations.

6. Multiply the velocity by the hydraulic residence time to determine the length:

$$L = 60VT$$

Where: L = Swale length (ft)
T = Hydraulic residence time from Step 2 (min)
V = Design flow velocity from Step 5 (ft/sec)

7. Calculate the total area required (A_{BMP}) taking into account the side slopes along the length of the swale and the freeboard:

$$A_{BMP} = [b + 2z\,(y + f)/12] \times L$$

Where: A_{BMP} = Total surface area (sq-ft)
b = Swale bottom width from Step 2 (ft)
z = Interior swale side slope (length per unit height) from Step 2
y = depth of flow for WQF from Step 2 (in)
f = Freeboard (in)
L = Swale length from Step 6 (ft)

If the calculated are does not fit in the available area, reduce the drainage area, reduce the hydraulic residence time (if it is longer than the minimum), and/or revise one or more swale dimensions, and repeat the calculations.

Pretreatment Considerations

Vegetated swales do not require pretreatment.

Area Requirements

A vegetated swale requires a footprint equivalent to 2% - 4% of its contributing impervious drainage area. The lower value corresponds to maximizing the flow depth and slope, while the upper value corresponds to maximizing the bottom width and slope.

Sizing Example

Calculate the size of a grass swale serving the runoff from a one acre parking lot. Assume the following design parameters:

Design Parameter	Units	Value
Weighted Runoff Coefficient, C		0.95
Rainfall Intensity, i	inches/hr	0.4
Interior Side Slope (length per unit height)		3
Manning's n value	-	0.20
Longitudinal Slope, s		0.016
Hydraulic Residence Time, T	minutes	7
Freeboard, f	inches	6

1. Calculate the Water Quality Flow Rate (WQF):

$$\boldsymbol{WQF = CiA}$$
$$\boldsymbol{WQF = 0.95 \times 0.4 \times 1.0}$$
$$\boldsymbol{WQF = 0.38\ cubic\ feet\ per\ second}$$

2. Select initial values for swale bottom width (b), depth of flow (y), swale side slope length per unit height (z), swale longitudinal slope (s), and hydraulic residence time (T):

$$\boldsymbol{b = 2.75\ ft}$$
$$\boldsymbol{y = 3.5\ in}$$
$$\boldsymbol{z = 3}$$
$$\boldsymbol{s = 0.017}$$
$$\boldsymbol{T = 7\ min}$$

3. Calculate the cross-sectional area (A), wetted perimeter (WP), and hydraulic radius (R):

$$\boldsymbol{A = (by/12) + \left(zy^2/144\right)}$$
$$\boldsymbol{A = (2.75 \times 3.5/12) + (3 \times 3.5 \times 3.5/144)}$$
$$\boldsymbol{A = 1.06\ square\ feet}$$

$$\boldsymbol{WP = b + (2y/12)\sqrt{1 + z^2}}$$
$$\boldsymbol{WP = 2.75 + (2 \times 3.5/12)\sqrt{1 + 3 \times 3}}$$
$$\boldsymbol{WP = 4.59\ feet}$$

$$\boldsymbol{R = A/WP}$$
$$\boldsymbol{R = 1.06/4.59}$$
$$\boldsymbol{R = 0.23\ feet}$$

4. Calculate the design flow rate (Q):

$$\boldsymbol{Q = 1.49AR^{2/3}s^{1/2}/n}$$
$$\boldsymbol{Q = 1.49 \times 1.06 \times 0.23^{0.667} \times 0.017^{0.5}/0.20}$$
$$\boldsymbol{Q = 0.39\ cfs}\ [\geq \boldsymbol{WQF, OK}]$$

5. Calculate the velocity in the swale (V):

$$\boldsymbol{V = Q/A}$$
$$\boldsymbol{V = 0.39/1.06}$$
$$\boldsymbol{V = 0.36\ fps}\ [< 1\ fps, OK]$$

6. Calculate the minimum length of the swale (L):

$$\boldsymbol{L = 60 \times V \times T}$$
$$\boldsymbol{L = 60 \times 0.36 \times 7}$$
$$\boldsymbol{L = 153\ feet}$$

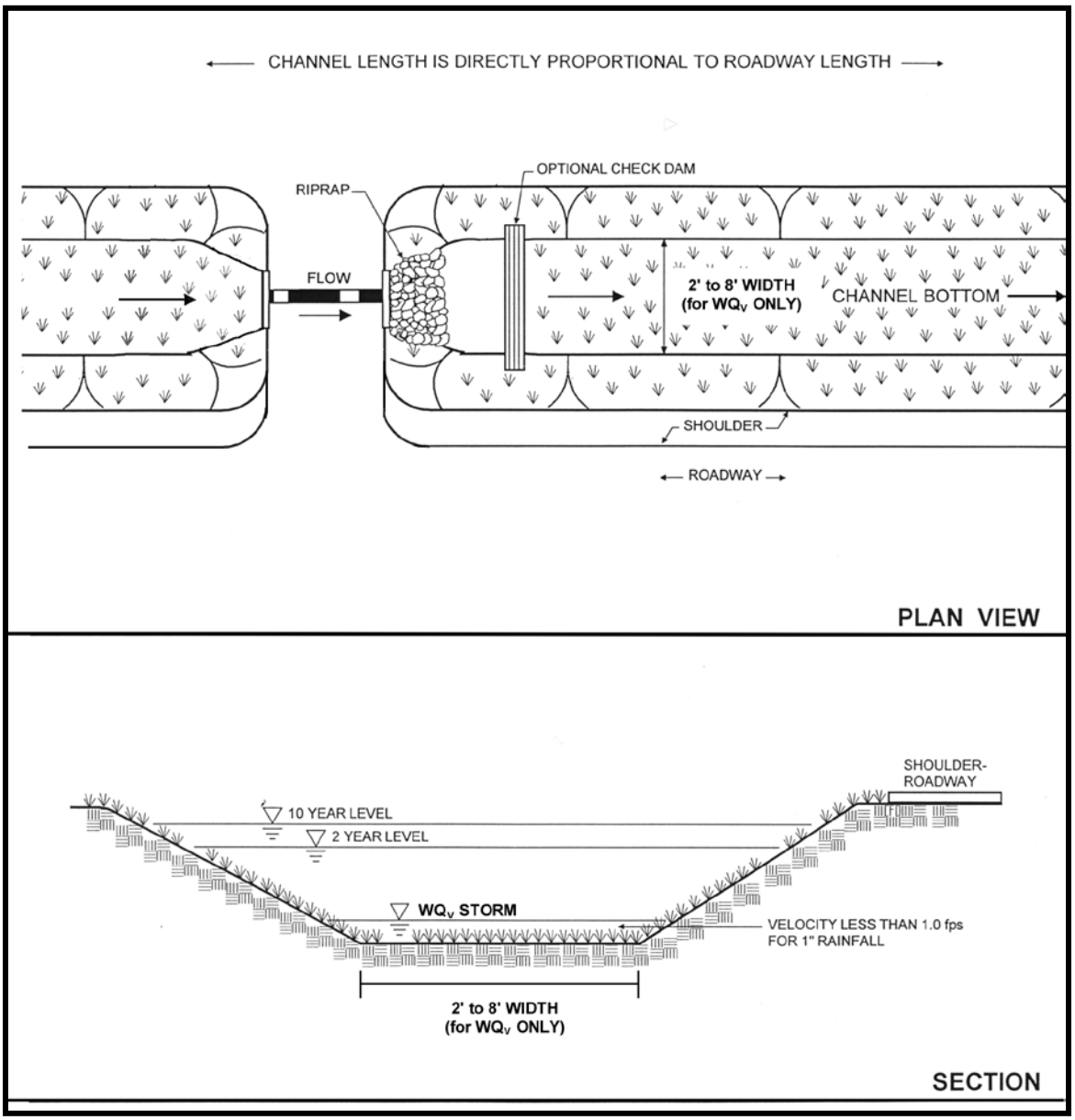
7. Calculate the total area required (A_{BMP}):

$$\boldsymbol{A_{IMP} = [b + 2z\,(y + f)/12] \times L}$$
$$\boldsymbol{A_{IMP} = [2.75 + 2 \times z \times (3.5 + 6)/12] \times 153}$$
$$\boldsymbol{A_{IMP} = 1,148\ square\ feet}$$

Other Design Considerations

- Credit for partial infiltration may be given if the soil beneath the BMP is amended by incorporating 6 inches of compost/amendments and tilled up to 8 inches.
- In cases where a vegetated swale is located on-line, it should be sized as a treatment facility and as a conveyance system per the City and County's standards for flood control.
- Vegetate the swale with dense turf grass to promote sedimentation, filtration, and nutrient uptake, and to limit erosion through maintenance of low flow velocities.
- Check dams may be used to achieve flow velocity requirements. They are often employed to enhance infiltration capacity, decrease runoff volume, rate, and velocity, and promote additional filtering and settling of nutrients and other pollutants

Figure 14: Schematic of a Vegetated Swale



Maryland Stormwater Design Manual. 2000.

VEGETATED BUFFER STRIP

Description

Sometimes referred to as a Vegetated Filter Strip or Biofiltration Strip, a vegetated buffer strip is a grassy slope vegetated with turf grass that is designed to accommodate sheet flow. They may resemble natural ecological communities and remove pollutants by vegetative filtration.

BMP Category	
Retention	○
Biofiltration	●
Other	○



Virginia DCR Stormwater Design Specification No. 2. 2011.

Expected Pollutant Removals	
Nutrients	Low
Sediment	Medium
Trash	Medium
Pathogens	Low
Pesticides	Unknown
Oil & Grease	Medium
Metals	Medium
Organic Compounds	Medium

Minimum Design Criteria

Design Parameter	Units	Value
Manning's n value	-	0.25
Maximum Flow Velocity	feet/sec	1
Maximum Upstream Area Flow Length	feet	75
Minimum Length	feet	15
Maximum Flow Depth	inches	1

Feasibility Criteria

See Table 10.

Sizing Procedure

1. Use the procedure presented previously to compute the Water Quality Flow Rate.

2. Select values for the buffer strip width (w) and buffer strip longitudinal slope (s). Note that if a strip width is selected that is not the same as the width of the upstream flow path, a transition structure will be necessary to capture all the runoff and/or establish uniform sheet flow across the entire strip width.

3. Compute the design flow depth for the WQF using a simplified form of Manning's Equation assuming a shallow flow depth:

$$y = 12 \times \left(\frac{nQ}{1.49w\sqrt{s/100}} \right)^{0.6}$$

Where:
- y = Design flow depth for WQF (in)
- n = Manning's n value
- Q = Water Quality Flow Rate from Step 1 (cfs)
- w = Design width from Step 2 (ft)
- s = Longitudinal slope from Step 2 (%)

Note that the Manning's n value for water quality calculations is significantly higher than the Manning's n value typically used for flood control calculations (0.035). If the calculated depth is greater than the maximum allowed depth, reduce the tributary area, increase the design width, or increase the longitudinal slope, and repeat the calculation.

4. Calculate the Design flow velocity across the strip using the flow continuity equation:

$$V = 12Q/wy$$

Where:
- V = Design flow velocity (ft/sec)
- Q = Water Quality Flow Rate from Step 1 (cfs)
- w = Design width from Step 2 (ft)
- d = Design flow depth from Step 3 (in)

If the design flow velocity is greater than the maximum allowed velocity, revise one or more design parameters and repeat the calculations.

5. Select a design buffer strip length (L) equal to or greater than the minimum length, and calculate the total BMP area:

$$L = 20.0\ ft$$

$$A_{BMP} = L \times w$$

Where:
- A_{BMP} = Vegetated buffer strip area (sq-ft)
- L = Design length (ft)
- w = Design width from Step 2 (ft)

Pretreatment Considerations

Vegetated Buffer Strips do not require pretreatment.

Area Requirements

A vegetated buffer strip requires a footprint equivalent to no less than 0.4% of its contributing impervious drainage area. While there is no upper value because there is no maximum design width or design length, the minimum footprint corresponds to the minimum length and the maximum slope and minimum width combination that provide the maximum allowable design depth.

Sizing Example

Calculate the size of a vegetated buffer strip serving the runoff from a one acre parking lot. Assume the following design parameters:

Design Parameter	Units	Value
Weighted Runoff Coefficient, C		0.95
Rainfall Intensity, i	inches/hr	0.4
Manning's n value	-	0.25
Longitudinal Slope		0.06

1. Calculate the Water Quality Flow Rate (WQF):

$$\boldsymbol{WQF = CiA}$$
$$\boldsymbol{WQF = 0.95 \times 0.4 \times 1.0}$$
$$\boldsymbol{WQF = 0.38\ cubic\ feet\ per\ second}$$

2. Select a design buffer strip width (w) and longitudinal slope (s):

$$\boldsymbol{w = 20.0\ ft}$$
$$\boldsymbol{s = 0.06}$$

3. Calculate the depth of flow for the WQF (y):

$$\boldsymbol{y = 12 \times \left(WQF \times n / 1.49 w \sqrt{s}\right)^{0.6}}$$
$$\boldsymbol{y = 12 \times \left(0.38 \times 0.25 / 1.49 \times 20 \sqrt{0.06}\right)^{0.6}}$$
$$\boldsymbol{y = 0.89\ inches\ [\leq 1\ inch, OK]}$$

3. Calculate the velocity across the buffer strip (V):

$$\boldsymbol{V = 12 \times WQF / (y \times w)}$$
$$\boldsymbol{V = 12 \times 0.38 / (0.89 \times 20.0)}$$
$$\boldsymbol{V = 0.26\ fps\ [\leq 1\ fps, OK]}$$

4. Select a design buffer strip length (L) at least equal to the minimum required length, and calculate the total BMP area (A_{BMP}):

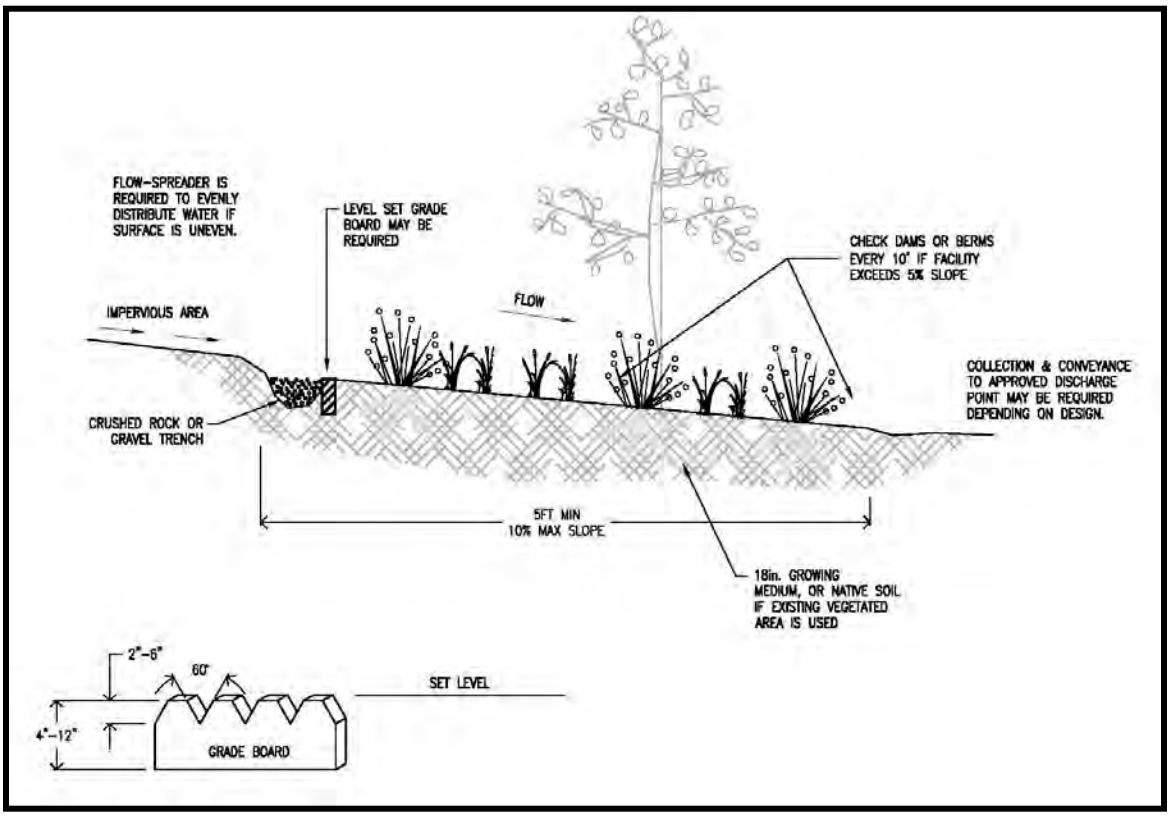
$$\boldsymbol{L = 20.0\ ft}$$

$$\boldsymbol{A_{BMP} = L \times W_d}$$
$$\boldsymbol{A_{BMP} = 20 \times 20}$$
$$\boldsymbol{A_{BMP} = 400\ square\ feet}$$

Other Design Considerations

- Credit for partial infiltration may be given if the soil beneath the BMP is amended by incorporating 6 inches of compost/amendments and tilled up to 8 inches.
- A pea gravel diaphragm or engineered level spreader should be provided at the upper edge of the BMP when the width of the contributing drainage area is greater than that of the filter. Level spreader options include porous pavement strips, stabilized turf strips, slotted curbing, rock-filled trench, or concrete sills.
- The selection of plants should be based on their compatibility with climate conditions, soils and topography, and their ability to tolerate urban stresses from pollutants, variable soil moisture conditions and ponding fluctuations.

Figure 15: Schematic of a Vegetated Buffer Strip



Portland Stormwater Management Manual. 2008.

TREE BOX FILTER

Description

Sometimes referred to as biofiltration boxes, a tree box filter is a proprietary water quality structure utilizing settling, filtration, adsorptive/absorptive materials, vegetative components, or other appropriate technology to remove pollutants from storm water runoff.

BMP Category	
Retention	○
Biofiltration	●
Other	○

Expected Pollutant Removals	
Nutrients	Medium
Sediment	High
Trash	High
Pathogens	Medium
Pesticides	Unknown
Oil & Grease	High
Metals	High
Organic Compounds	High



www.filterra.com

Minimum Design Criteria

Design Parameter	Units	Value
Any applicable manufacturer's criteria		

Feasibility Criteria

See Table 10.

Sizing Procedure

Follow the manufacturer's guidelines for appropriate sizing calculations and selection of appropriate device/model.

Pretreatment Considerations

No pretreatment is required.

Area Requirements

The footprint requirements for proprietary tree box filters vary by manufacturer.

Sizing Example

No example is provided as sizing procedures vary by manufacturer, and presenting any specific product might be interpreted as an endorsement.

Other Design Considerations

- All tree box filters must be able to safely overflow or bypass flows in excess of the storm water quality design storm to downstream drainage systems.

DETENTION BASIN

Description

Sometimes referred to as a Dry Extended Detention Basin, a detention basin is a shallow man-made impoundment intended to provide for the temporary storage of storm water runoff to allow particles to settle. It does not have a permanent pool and is designed to drain between storm events.

BMP Category	
Retention	○
Biofiltration	○
Other	●

Expected Pollutant Removals	
Nutrients	Low
Sediment	Medium
Trash	High
Pathogens	Low
Pesticides	Unknown
Oil & Grease	Medium
Metals	Low/Med
Organic Compounds	Unknown



Mililani Mauka

Minimum Design Criteria

Design Parameter	Units	Value
Maximum Interior Side Slope (length per unit height)		3:1
Minimum length to width ratio		2:1
Maximum depth	ft	8
Drawdown (drain) time for WQV	hours	48
Drawdown (drain) time for 50% of WQV	hours	24-36
Basin invert slope	%	1-2
Minimum outlet size	inches	4
Minimum freeboard	feet	1

Feasibility Criteria

Detention Basins are considered infeasible for any of the following conditions:

- Basin invert would be below seasonally high groundwater table
- Unable to operate off-line and unable to operate in-line w/ safe overflow mechanism
- Excavation would disturb iwi kupuna or other archaeological resources
- Unable to meet minimum length to width ratio design criteria naturally or artificially

Sizing Procedure

Detention Basins are sized using detailed routing calculations to demonstrate that the storage volume is adequate. However, a reasonable first estimate can be determined using the following simple routing method which assumes triangular hydrographs for the inflow and outflow.

1. Use the procedure presented previously to compute the pre-project (i.e., undeveloped) and post-project (i.e., developed) weighted runoff coefficients.

2. Compute the peak inflow rate using the Rational Method:

$$q_i = C_a i A$$

Where: q_i = Peak inflow rate into basin (cfs)
C_a = Post-project weighted runoff coefficient
i = Peak rainfall intensity (in/hr)
A = Drainage area (ac)

3. Compute the peak outflow rate using the pre-project runoff coefficient, which effectively forces the detention basin to maintain pre-project discharge rates:

$$q_o = C_b i A$$

Where: q_o = Peak outflow rate leaving basin (cfs)
C_b = Pre-project weighted runoff coefficient
i = Peak rainfall intensity (in/hr)
A = Drainage area (ac)

4. Calculate the estimated basin storage volume:

$$s = 3630 \times PA[1 - (q_o/q_i)]$$

Where: s = Storage volume in the basin (cu-ft)
P = design storm runoff depth (in)
A = Drainage area (ac)
q_o = Peak outflow rate from Step 3 (cfs)
q_i = Peak inflow rate from Step 2 (cfs)

5. Select initial values for the detention basin total width (w_t), total length (l_t), and depth (d) based on space availability, topography and existing drainage facilities. Also select values for the interior side slopes (z) and required freeboard (f). Calculate the basin invert width and invert length:

$$w_b = w_t - 2z(d + f)$$

$$l_b = l_t - 2z(d + f)$$

Where: w_b = Basin bottom width (ft)
l_b = Basin bottom length (ft)
w_t = Basin total width (ft)
l_t = Basin total length (ft)
z = Basin interior side slope (length per unit height)
d = Depth of flow for Storage Volume (ft)
f = Freeboard (ft)

6. Calculate the resulting storage volume using the prismoidal formula for trapezoidal basins:

$$V = w_b l_b d + (w_b + l_b) z d^2 + 4 z^2 d^3 / 3$$

Where:
- V = Volume of trapezoidal basin (cu-ft)
- w_b = Basin bottom width from Step 5 (ft)
- l_b = Basin bottom length from Step 5 (ft)
- d = Depth of flow for Storage Volume from Step 5 (ft)
- z = Basin interior side slope from Step 5

Compare the calculated volume (V) to the required volume (s) from Step 4. If the calculated volume is greater than or equal to the required volume, the selected dimensions (w_t and l_t) and depth (d) are adequate for preliminary design. If the calculated volume is less than the required volume, increase one or both of the dimensions and/or the depth (d) and repeat Steps 5 and 6. If the footprint area and depth are set to maximum allowable values based on site characteristics and the calculated volume is still less than the required volume, reduce the drainage area (A) and repeat Steps 2 through 6.

Pretreatment Considerations

If significant amounts of sediment or sand are anticipated at the site, sediment forebays should be located at each major inlet to provide pretreatment, preserve the capacity of the basin, and reduce maintenance requirements in the basin. The forebay consists of a separate cell that drains into the main basin, formed by an acceptable barrier, such as an earthen berm or gabion baskets, etc.). If used, the total volume of all forebays should be at least 5% of the total WQV.

Area Requirements

A detention basin requires a footprint equivalent to 1% - 9% of its contributing impervious drainage area. The actual value is dependent on a number of variables, including the drainage area, pre-project and post-project runoff coefficients, and basin depth. Footprints at the lower range reflect deep basins (e.g., 8 feet) serving large drainage areas (e.g., 50 acres), while footprints at the upper range reflect shallow basins (e.g., 1 foot) serving small drainage areas (e.g., 1 acre).

Sizing Example

Calculate the preliminary size of a detention basin serving the runoff from a one acre parking lot. Assume the following design parameters:

Design Parameter	Units	Value
Rainfall Intensity, i	inches/hr	0.4
Runoff Volume, Q	inches	1
Basin Interior Side Slope (length per unit height), z		3
Freeboard, f	ft	1

1. Compute the pre-project (i.e., undeveloped) and post-project (i.e., developed) weighted runoff coefficients:

   $$C_b = 0.20$$
   $$C_a = 0.95$$

2. Compute the peak inflow rate:

   $$q_i = C_a i A$$
   $$q_i = 0.95 \times 0.40 \times 1$$
   $$q_i = 0.38\ cfs$$

3. Compute the peak outflow rate:

   $$q_o = C_b i A$$
   $$q_o = 0.20 \times 0.40 \times 1$$
   $$q_o = 0.08\ cfs$$

4. Calculate the estimated basin storage volume:

   $$s = 3630 \times PA[1 - (q_o/q_i)]$$
   $$s = 3630 \times 1 \times 1 \times [1 - (0.08/0.38)]$$
   $$s = 2,866\ cubic\ feet$$

5. Select initial values for the detention basin total width (w_t), total length (l_t), depth (d), interior side slopes (z) and required freeboard (f):

   $$w_t = 38\ feet$$
   $$l_t = 53\ feet$$
   $$d = 3.5\ feet$$
   $$z = 3$$
   $$f = 1.0\ foot$$

   Calculate the basin bottom width and length:

   $$w_b = w_t - 2z(d + f)$$
   $$w_b = 38 - 2 \times 3(3.5 + 1)$$
   $$w_b = 11\ feet$$

   $$l_b = l_t - 2z(d + f)$$
   $$l_b = 53 - 2 \times 3(3.5 + 1)$$
   $$l_b = 26\ feet$$

6. Calculate the resulting storage volume using the prismoidal formula for trapezoidal basins:

$$V = w_b l_b d + (w_b + l_b) z d^2 + 4 z^2 d^3 / 3$$

$$V = 11 \times 26 \times 3.5 + (11 + 26) \times 3 \times 3.5^2 + 4 \times 3^2 \times 3.5^3 / 3$$

$$V = 2,875 \; cubic \; feet$$

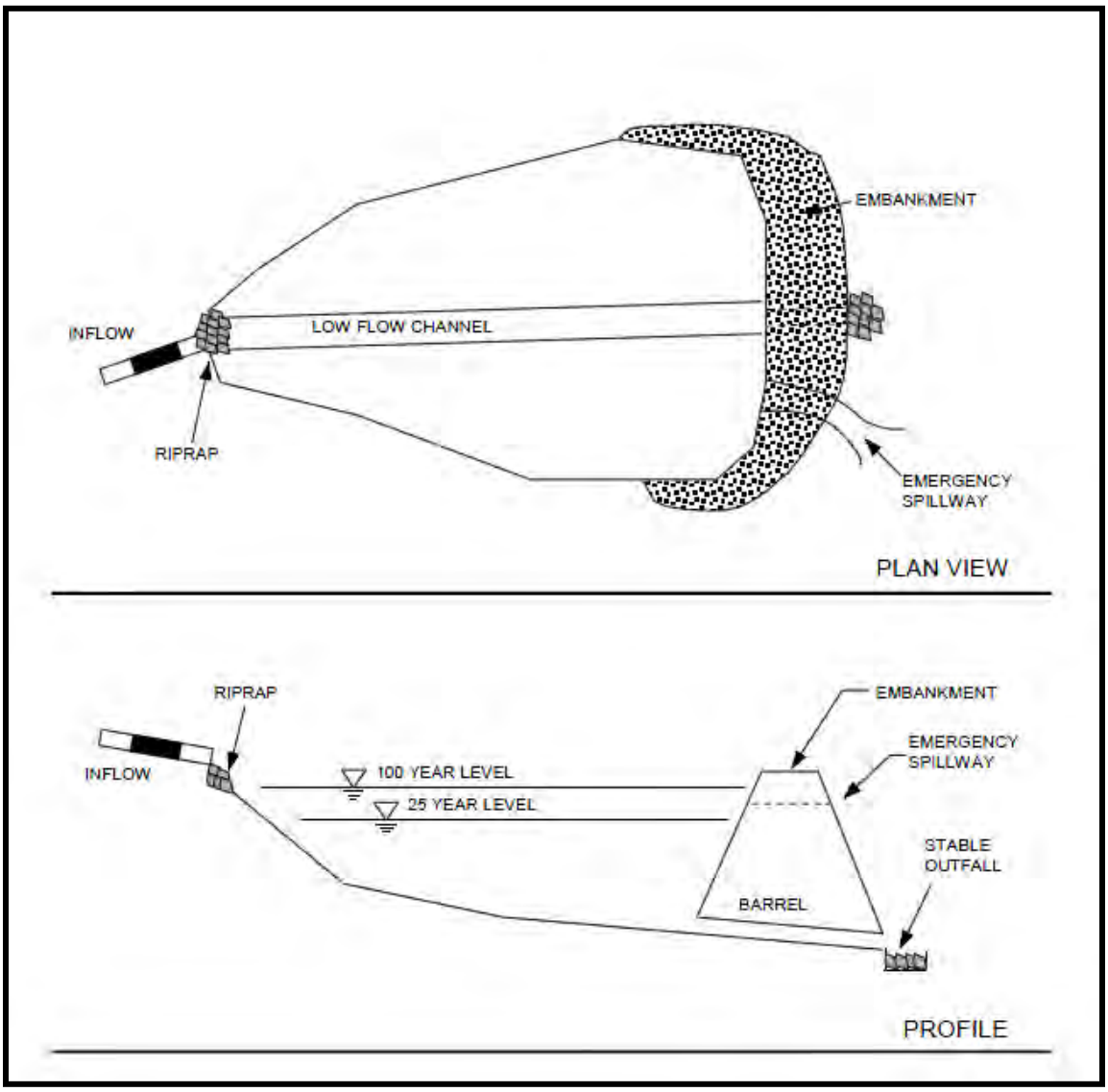
The calculated volume is greater than the required volume, so the preliminary design is ok.

Other Design Considerations

- Credit for infiltration may be given if the soils beneath the detention basin invert have a measured infiltration rate of at least 0.5 inches per hour and none of the infeasibility criteria for infiltration basins are applicable. However, low flow channels should not be included if infiltration is expected.
- If a temporarily-filled pond creates a potential public safety issue, perimeter fencing may be considered. Warning signs should be used wherever appropriate
- In order to meet designs storm requirements, detention basins should have a multistage outlet structure. Three elements are typically included in this design:
  1. A low-flow outlet that controls the extended detention and functions to slowly release the water quality design storm.
  2. A primary outlet that functions to attenuate the peak of larger design storms.
  3. An emergency overflow outlet/spillway

  Design methodology options are provided in manuals included in the References, including the Georgia Stormwater Management Manual, the Urban Storm Drainage Criteria Manual, and the EPA Stormwater Best Management Practice Design Guide.

Figure 16: Schematic of a Detention Basin



Georgia Stormwater Management Manual. 2001.

MANUFACTURED TREATMENT DEVICE

Description

Sometimes referred to as hydrodynamic or vortex separators, a manufactured treatment device is a proprietary water quality structure utilizing settling, filtration, adsorptive/absorptive materials, vortex separation, vegetative components, or other appropriate technology to remove pollutants from storm water runoff.

BMP Category	
Retention	○
Biofiltration	○
Other	●

Expected Pollutant Removals	
Nutrients	Low
Sediment	Med/High
Trash	High
Pathogens	Low
Pesticides	Low
Oil & Grease	Med/High
Metals	Low
Organic Compounds	Low



???

Minimum Design Criteria

Design Parameter	Units	Value
Minimum TSS Removal	%	80

Feasibility Criteria

Manufactured treatment devices are considered infeasible for any of the following conditions:

- Bottom of BMP is below seasonally high groundwater table
- Unable to operate off-line and unable to operate in-line w/ safe overflow mechanism
- Excavation would disturb iwi kupuna or other archaeological resources

Sizing Procedure

Follow the manufacturer's guidelines for appropriate sizing calculations and selection of appropriate device/model.

Pretreatment Considerations
No pretreatment is required.

Area Requirements
The footprint requirements for proprietary manufactured treatment devices vary by manufacturer.

Sizing Example
No example is provided as sizing procedures vary by manufacturer, and presenting any specific product might be interpreted as an endorsement.

Other Design Considerations
- The device must provide a TSS removal rate of 80%, verified by a Technology Acceptance and Reciprocity Partnership (TARP) state or by other third party testing organizations, provided that such verification is conducted in accordance with the protocol "Stormwater Best Management Practices Demonstration Tier II Protocol for Interstate Reciprocity".
- All manufactured treatment devices must be able to safely overflow or bypass flows in excess of the storm water quality design storm to downstream drainage systems.

SAND FILTER

Description

A sand filter is an open chambered structure that captures, temporarily stores, and treats storm water runoff by passing it through an engineered media (e.g., sand).

BMP Category	
Retention	○
Biofiltration	○
Other	●



Portland Stormwater Management Manual. 2004.

Expected Pollutant Removals	
Nutrients	Low/Med
Sediment	High
Trash	High
Pathogens	Med
Pesticides	Unknown
Oil & Grease	High
Metals	Med/High
Organic Compounds	Med/High

Minimum Design Criteria

Design Parameter	Units	Value
Sand Coefficient of Permeability	feet/day	3.5
Filter media depth	inches	18
Drawdown (drain) Time	hours	48
Maximum Interior Side Slope if earthen (length per unit height)		3:1
Minimum Underdrain Diameter	inches	6

Feasibility Criteria

Sand filters are considered infeasible for any of the following conditions:

- Bottom of BMP is below seasonally high groundwater table
- Unable to operate off-line and unable to operate in-line w/ safe overflow mechanism
- Excavation would disturb iwi kupuna or other archaeological resources
- Site lacks sufficient hydraulic head to support BMP operation by gravity

Sizing Procedure

1. Use the procedure presented previously to compute the Volumetric Runoff Coefficient and Water Quality Volume.

2. Select values for the filter media depth (l_m) and maximum ponding depth (d_p).

3. Use Darcy's Law to calculate the required Filter Bed Surface Area:

$$A_{fb} = \frac{WQV \times l_m}{k(l_m + d_p/24)(t/24)}$$

Where:
- A_{fb} = Filter bed surface area (sq-ft)
- WQV = Water Quality Volume from Step 1 (cu-ft)
- l_m = Filter media depth from step 2 (ft)
- k = Filter media permeability coefficient (ft/day)
- d_p = Maximum ponding depth, from Step 2 (in)
- t = Filter bed drain time (hr)

4. Calculate the total area occupied by the BMP (A_{BMP}) using the embankment side slopes and assuming a square basin:

$$A_{BMP} = \left[\sqrt{A_{fb}} + 2z(d_p/12 + f)\right]^2$$

Where:
- A_{BMP} = Area occupied by BMP (sq-ft)
- Af_b = Filter bed surface area from Step 3 (sq-ft)
- z = Filter bed interior side slope (length per unit height)
- d_p = Maximum ponding depth from Step 2 (in)
- f = Freeboard (ft)

If the calculated area does not fit in the available space, either reduce the drainage area, increase the ponding depth, and/or increase the interior side slope (if it's not already set to the maximum) and repeat the calculations.

Pretreatment Considerations

Pretreatment is required for sand filters in order to reduce the sediment load entering the sand bed, prevent premature clogging, and ensure filter longevity. The pretreatment device must be sized for at least 25% of the WQV, and may be achieved with vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes, and manufactured treatment devices. The typical method is a sedimentation basin that has a length to width ratio of 2:1, and is sized using the Camp-Hazen equation.

Area Requirements

A sand filter requires a footprint equivalent to 1.5% - 3% of its contributing impervious drainage area, excluding pretreatment. The lower value reflects minimum filter media and ponding depths, while the upper value reflects higher filter media and ponding depths.

Sizing Example

Calculate the size of a sand filter serving a 1-acre residential development. Assume the following design parameters:

Design Parameter	Units	Value
Percent Impervious Cover, I	%	70
Design Storm Depth, P	inches	1.0
Sand Coefficient of Permeability, k	feet/day	3.5
Interior Side Slope (length per unit height)		3:1
Freeboard	ft	0.5
Drawdown (drain) Time, t	hours	48

1. Calculate the volumetric runoff coefficient and Water Quality Volume (WQV):

$$\boldsymbol{C = 0.05 + 0.009I}$$
$$\boldsymbol{C = 0.05 + 0.0039 \times 70}$$
$$\boldsymbol{C = 0.68}$$

$$\boldsymbol{WQV = PCA \times 3630}$$
$$\boldsymbol{WQV = 1 \times 0.68 \times 1 \times 3630}$$
$$\boldsymbol{WQV = 2{,}468\ cubic\ feet}$$

2. Select a filter media depth (l_m) and maximum ponding depth (d_p):

$$\boldsymbol{l_m = 1.5\ ft}$$
$$\boldsymbol{d_p = 24\ in}$$

3. Calculate the Filter Bed Surface Area (A_{fb}):

$$\boldsymbol{A_{fb} = WQV \times l_m / \left[k\left(l_m + \left(d_p/24\right)\right)\left(t/24\right)\right]}$$
$$\boldsymbol{A_{BMP} = 2{,}468 \times 1.5 / \left[3.5\left(1.5 + \left(24/24\right)\right)\left(48/24\right)\right]}$$
$$\boldsymbol{A_{BMP} = 212\ square\ feet}$$

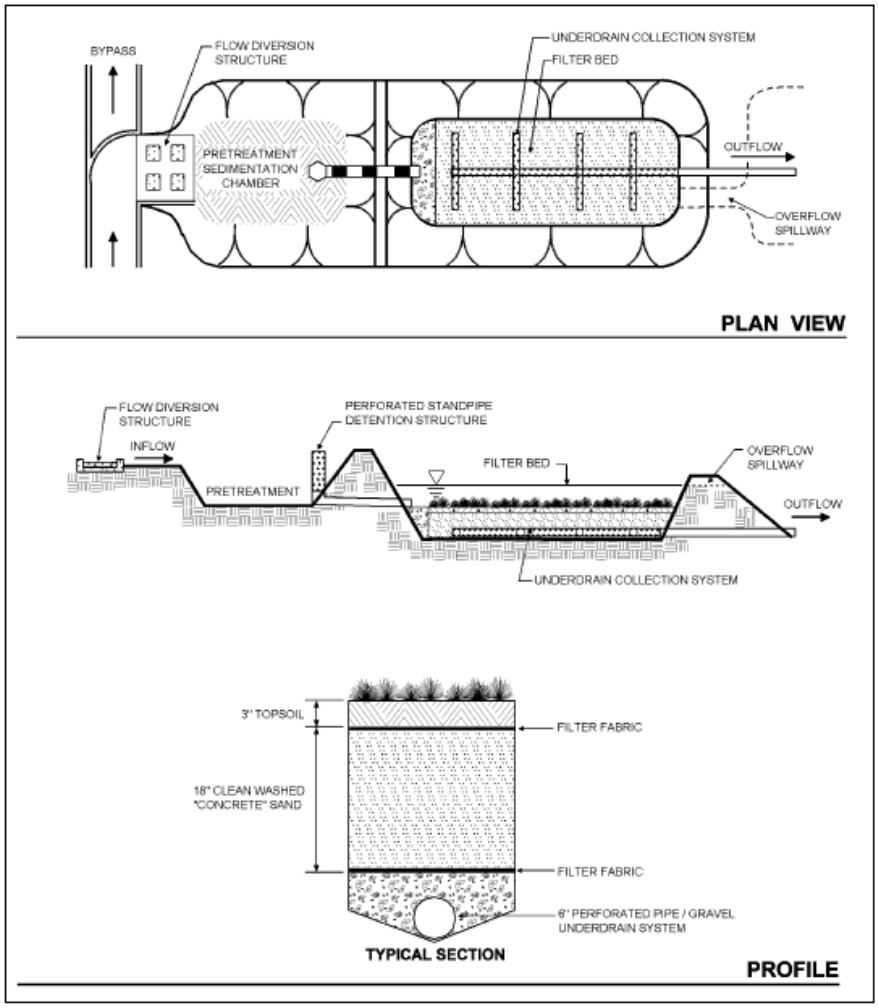
4. Calculate the total area occupied by the BMP (A_{BMP}):

$$\boldsymbol{A_{BMP} = \left[\sqrt{A_{fb}} + 2z\left(d_p/12 + f\right)\right]^2}$$
$$\boldsymbol{A_{BMP} = \left[\sqrt{212} + 2 \times 3\left(24/12 + 0.5\right)\right]^2}$$
$$\boldsymbol{A_{BMP} = 873\ square\ feet}$$

Other Design Considerations

- A flow spreader should be installed at the inlet along one side of the filter to evenly distribute incoming runoff across the filter and to prevent erosion of the filter device
- A cleanout pipe should be tied into the end of all underdrain pipe runs

Figure 17: Schematic of a Sand Filter



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Appendix D

CCH Rules Relating to Storm Drainage Standards

RULES RELATING TO STORM DRAINAGE STANDARDS

JANUARY 2000

Department of Planning and Permitting
City and County of Honolulu
Honolulu, Hawaii

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Department of Planning and Permitting
City and County of Honolulu

RULES RELATING TO

STORM DRAINAGE STANDARDS

Adopted October 4, 1999
Effective January 1, 2000

Amended Section 1-4 and
Plates 1, 2, and 6
November 27, 2010
Effective May 1, 2011

Amended Page ii,
Sections 1-1, 1-2, 1-3 and
Section 1-5
December 12, 2012
Effective June 1, 2013

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DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

RULES RELATING TO STORM DRAINAGE STANDARDS

§1-1 PURPOSE

§1-2 MODIFICATIONS

§1-3 DEFINITIONS

§1-4 SECTION I – STANDARDS FOR FLOOD CONTROL

- **§1-4.1 PART I – HYDROLOGIC CRITERIA**
- **§1-4.2 PART II – DESIGN STANDARDS**
- **§1-4.3 DESIGN CHARTS**

§1-5 SECTION II – STANDARDS FOR STORM WATER QUALITY

- **§1-5.1 PART I – WATER QUALITY CRITERIA**
- **§1-5.2 PART II – WATER QUALITY DESIGN STANDARDS**

§1-6 REPEAL

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RULES OF THE DEPARTMENT OF PLANNING AND PERMITTING RELATING TO STORM DRAINAGE STANDARDS

§1-1 PURPOSE

These Rules address requirements for both storm runoff quantities for flood control as well as storm runoff quality and reflect the [most] recent changes to Federal, State, and County requirements related to the quality of storm water discharges. By establishing criteria to address water quality, the City and County of Honolulu continues its efforts in complying with Federal Regulatory requirements to control the discharge of pollutants in storm water as specified in the Clean Water Act as amended by the Water Quality Act of 1987.

These standards are not intended to limit the initiative and resourcefulness [of the engineer] in developing drainage plans, or be viewed as maximum limits in design criteria. More stringent criteria should be used where reasonable.

[Eff: June 1, 2013] (*Auth: Sec 14-12.31, ROH) (Imp: Sec14-12.31, ROH)*

§1-2 MODIFICATIONS

A. The Director may modify provisions of these rules whenever:

   1. Full conformance to these rules is not achievable because of the size and shape, location or geological or topographical conditions, or land uses.

   2. The project provides for adequate storm water controls to mitigate adverse downstream impacts related to runoff flows and water quality; complies with Subdivision Rules and Regulations and the Land Use Ordinance; and covenants or other legal provisions are provided as needed, to ensure continued conformity to and achievement of mitigation measures; and

   3. The modification is reasonably necessary and not contrary to the intent and purpose of these rules.

B. Modification requests must be in writing and substantiated by facts presented with the request.

C. Before granting any modification, the Director may consult with the Departments of Design and Construction, Environmental Services, Facilities Maintenance, Parks and Recreation, Transportation Services, Board of Water Supply or any other appropriate agency for review and recommendation.

[Eff: June 1, 2013] (Auth: Sec 14-12.31, ROH) (Imp: Sec14-12.31, ROH)

§1-3 DEFINITIONS

As used in these Rules, the following definitions shall apply unless the context indicates otherwise:

"Best Management Practices" or "BMPs" means pollution control measures, applied to nonpoint sources, on-site or off-site, to control erosion and the transport of sediments and other pollutants, which have an adverse impact on waters of the state. BMPs may include a schedule of activities, the prohibition of practices, maintenance procedures, treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, or drainage from raw material storage.

"Biofiltration" means the simultaneous process of filtration, adsorption and biological uptake of pollutants in stormwater that takes place when shallow-depth runoff flows slowly over and through vegetated areas.

"City" means the City and County of Honolulu.

"Department" means the Department of Planning and Permitting, City and County of Honolulu.

"Department of Health" or "DOH" means the Clean Water Branch, Department of Health, State of Hawaii, the water pollution regulatory agency of the state.

"Design Engineer" means a licensed civil engineer in the State of Hawaii.

"Development" means land which is being developed or developed lands.

"Director" means the Director of the Department of Planning and Permitting.

"Disturbed Area" means the area of the project that is expected to undergo any disturbance, including, but not limited to excavation, grading, clearing, demolition, uprooting of vegetation, equipment staging, and storage areas. Areas which are cleared, graded, and/or excavated for the sole purpose of landscape renovation or growing crops are not included in the disturbed area quantity. This exemption does not extend to the construction of buildings and roads of agriculture-related operations that disturb one (1) acre or more.

"Engineering Control Facility" means any drainage device such as a basin, well, pond, ditch, dam, or excavation used for the temporary or permanent storage of storm water by means of detention, retention, divergence, or infiltration for the purpose of reducing storm water volume and/or peak storm discharge flows, and which may provide gravity settling of particulate pollutants. It includes, but is not limited to, detention ponds, retention ponds, infiltration wells or ditches, holding tanks, diversion ditches or swales, drainpipes, check dams, and debris basins.

"EPA" means United States Environmental Protection Agency.

"Evapotranspiration" means the combined loss of water into the atmosphere by evaporation (water changing from a liquid to a vapor from soil, water, or plant surfaces) and transpiration (water that is taken up by plant roots and transpired through plant tissue and leaves).

"Flood" or "flooding" means the inundation to a depth of three inches or more of any property not ordinarily covered by water. The terms do not apply to inundation caused by tsunami wave action.

“Impervious Surface” means a surface covering or pavement of a developed parcel of land that prevents the land’s natural ability to absorb and infiltrate rainfall/storm water.

“Infiltration” means the downward migration of surface water (i.e., runoff) through the planting soil (if present) and into the surrounding *in situ* soils and ultimately into groundwater.

“Low Impact Development, or LID” means a storm water management strategy that seeks to maintain or restore the natural hydrologic character of the site, reduce off-site runoff, improve water quality, provide groundwater recharge, and mitigate the impacts of increased runoff and storm water pollution. LID comprises a set of site design approaches and integrated management techniques that promote the use of natural systems for infiltration, evapotranspiration, treatment, and use of rainwater.

“Maximum Extent Practicable” or "MEP" means economically achievable measures for the control of the addition of pollutants from existing and new categories of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint source pollution control practices, technologies, processes, siting criteria, operating methods or other alternatives.

“National Pollutant Discharge Elimination System permit” or “NPDES permit” means the permit issued to the City pursuant to *Title 40, Code of Federal Regulations, Part 122,* Subpart B, Section 122.26(a) (1) (iii), for storm water discharge from the City’s separate storm sewer systems; or the permit issued to a person or property owner for a storm water discharge associated with industrial activity pursuant to *Title 40, Code of Federal Regulations, Part 122*, Subpart B, Section 122.26(a) (1) (ii), or other applicable section of Part 122; or the permit issued to a person or property owner for the discharge of any pollutant from a point source into the state waters through the City's separate storm sewer system pursuant to *Hawaii Administrative Rules*, Chapter 11-55, "Water Pollution Control".

“New Development” means land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces; and land subdivision.

“Redevelopment” means development that would create or add impervious surface area on an already developed site.

“Site Design Strategies” means LID design techniques that are intended to maintain or restore the site’s hydrologic and hydraulic functions with the intent of minimizing runoff volume and preserving existing flow paths.

“Source Control BMPs” means low-technology practices designed to prevent pollutants from contacting storm water runoff or to prevent discharge of contaminated runoff to the storm drainage system.

"Storm water" means storm water runoff, surface runoff, street wash, or drainage and may include discharges from fire fighting activities.

“Treatment Control BMPs” means engineered technologies designed to remove pollutants from storm water runoff prior to discharge to the storm drain system or receiving waters.

[Eff: June 1, 2013] (Auth: Sec 14-12.31, ROH) (Imp: Sec14-12.31, ROH)

§1-4 SECTION I - STANDARDS FOR FLOOD CONTROL

Standards and regulations for flood control are adopted to protect life and property during intense storms. Small storms that occur frequently usually do not cause significant property damages or loss of life, therefore, peak runoff from large storms are regulated for flood control.

The data from *85* U.S. Geological Survey (USGS) *stream flow gauges on the Island of Oahu* form the basis for Plate 6, "Design Curves for Peak Discharge vs. Drainage Area". The rainfall data on Plates 1 and 2 are from the *National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Silver Spring, Maryland, 2009*. Rainfall data on Plates 1, 2 and 6 will be updated periodically and such updates will automatically be incorporated into these rules when the updates are adopted by the Department. *[Eff:* *] (Auth: Sec 14-12.31,ROH) (Imp: Sec 14-12.31.ROH)*

APR 0 8 2011

§1-4.1 PART I - HYDROLOGIC CRITERIA

A. RECURRENCE INTERVAL

1. For drainage areas of 100 acres or less, Tm (recurrence interval) = 10 years, unless otherwise specified.

2. For drainage areas of 100 acres or less with sump, or tailwater effect and for the design of roadway culverts and bridges, Tm (recurrence interval) = 50 years.

3. For drainage areas greater than 100 acres and all streams, design curves based upon the U.S. Geological Survey data on flood magnitude and frequency, Tm (recurrence interval) = 100 years.

4. Interim measures for areas where downstream facilities are inadequate shall be reviewed on a case-by-case basis.

B. RUNOFF QUANTITY

1. For drainage areas of 100 acres or less, the rational method shall be used.

2. For drainage areas greater than 100 acres:

   a. Plate 6 titled, "Design Curves for Peak Discharge vs. Drainage Area" should be used to determine the 100-year peak discharge.

   b. Modifications from the Plate 6 peak discharge values may be used if the Design Engineer can justify more acceptable values and it is approved by the Director.

   [Eff: APR 0 8 2011 *] (Auth: Sec 14-12.31,ROH) (Imp: Sec 14-12.31.ROH)*

3. For drainage areas where downstream capacities are inadequate to accommodate runoff quantity identified above, runoff shall be limited to pre-development conditions or as specified in the General Conditions.

C. RATIONAL METHOD

The formula $Q = CIA$ shall be used to determine quantities of flow rate, in which

- Q = flow rate in cubic feet per second;
- C = runoff coefficient;
- I = rainfall intensity in inches per hour for a duration equal to the time of concentration; and
- A = drainage area in acres.

1. RUNOFF COEFFICIENT

The runoff coefficient shall be determined from Table 1 for agricultural and open areas and from Table 2 for built-up areas. It shall be based on the ultimate use of the project drainage area. For distinctive composite drainage areas, a weighted value of runoff coefficient shall be used.

For interim drainage measures, existing upstream land use conditions may be used to size interim measures as long as ultimate drainage requirements can be met when downstream restrictions are removed.

2. TIME OF CONCENTRATION

a. Determine overland flow time from Plate 3 generally for paved, bare soil and grassed areas.

b. Determine flow time over small agricultural areas with well-defined divides and drainage channels from Plate 5.

1) Use upper curve for well-forested areas, representing

$$\mathbf{Tc = 0.0136\ K^{0.77}}$$

2) Use lower curve for areas with little or no cover, representing

$$\mathbf{Tc = 0.0078\ K^{0.77}}$$

c. In case of uncertainty, check the time of concentration by dividing the estimated longest route of runoff by the appropriate runoff velocity from Table 3.

3. RAINFALL INTENSITY

The design rainfall intensity of a drainage area shall be determined by the following procedure:

a. Select the appropriate 1-hour rainfall value from Plate 1 or Plate 2 for the design recurrence interval.

b. Enter Plate 4 with the rainfall intensity duration equal to the required time of concentration, select the corresponding correction factor, and multiply the 1-hour rainfall value by the factor to obtain the design rainfall intensity.

D. HYDROLOGIC STUDIES

Since 1959, the City and County of Honolulu and the U.S. Geological Survey have participated in a cooperative program for the collection of special stream flow data. This program included the installation of additional stream gaging stations and crest-stage gages. With the additional hydrologic data supplementing the data from the existing gaging stations, it was anticipated that more would be known of the effects of exposure, altitude, basin slope, basin shape and degree of urbanization on stream runoff on Oahu.

The U.S. Geological Survey developed flood-frequency curves for 74 gaging stations on Oahu by using the log Pearson Type III distribution (U.S. Water Resources Council, 1977, Bulletin 17A). The length of record for the individual stations ranged from 10 to 60 years. In order to furnish data at ungaged sites, they attempted to regionalize the available data by the use of multiple-regression techniques. In the study, a regional analysis was made by using these techniques to relate floodflows to basin and climatic characteristics. The results are contained in the *U.S. Geological Survey Water-Resources Investigations 80-45 Report, An Analysis of the Magnitude and Frequency of Floods on Oahu, Hawaii,* dated June 1980. The results were subsequently updated.

The U.S. Geological Survey and City have further extended the data to facilitate the determination of peak discharge values for the design of drainage facilities by developing Plate 6, Design Curves for Peak Discharge vs. Drainage Area. The curves are based upon the 100-year recurrence interval data. For clarification, the boundaries between the groups shown on Plate 6 are as follows:

Group Boundary	**Location**
A and B	Between Oio Stream and Malaekahana Stream and along Koolau Range Ridge.
B and C	Between Honouliuli Stream and Waikele Stream, along Waianae Range Ridge, and between Makaleha Stream and Kaukonahua Stream.

The rainfall data shown on Plates 1 and 2 have been updated from the *Rainfall Frequency Study for Oahu*, Department of Land and Natural Resources, Division of Water and Land Development, State of Hawaii, dated 1984.

§1-4.2 PART II - DESIGN STANDARDS

A. GENERAL CONDITIONS

The design and capacity of a drainage system shall be predicated on the following conditions:

1. On the basis of the runoff resulting from the selected design storm, the system shall dispose of surface runoff and subsurface water without damage to street facilities, structures or ground and cause no serious interruption of normal vehicular traffic.

2. Runoff exceeding the design storm must be disposed of with the least amount of interruption to normal traffic and minimum amount of damage to surrounding property.

3. System must have maximum reliability of operation with minimum maintenance and upkeep requirements.

4. System must be adaptable to future expansion, if necessary, with minimum additional cost.

5. Where sump conditions exist, a safety measure such as an overflow swale shall be provided to prevent flooding of adjacent lots in the event the design capacity of the closed conduit is exceeded. Floor levels of homes adjoining sumps shall be a minimum of 3 feet above the low point on roadway.

6. Lots abutting streams and open channels may be graded to drain towards the waterway.

7. In general, natural gullies, waterways, streams and tributaries shall not be replaced with a closed system except at roadway crossings.

8. Roadway culverts and bridges shall be designed to pass the design flow under open channel hydraulic analysis with a minimum freeboard as specified in the attached freeboard chart. Multiple span road crossings shall have minimum clear spans of 30 feet, unless otherwise permitted by the Director. Where possible, the roadway shall be designed to form a sag vertical curve with a low point at the waterway crossing with minimum grades to confine and control overflow at the crossing. Whenever the difference in elevations of the roadway and water surface is such that there could be a deep fill, the roadway culvert or bridge shall be designed to include available headroom up to five feet from the water surface to the soffit of the culvert or bridge. After this headroom requirement is fulfilled, fill material may be used to meet roadway elevations.

9. Outlets for enclosed drains emptying into open channels shall be designed to point downstream at an angle of 45 degrees.

10. Where groundwater is encountered, or may be present during wet weather, subsurface drains shall be installed wherever recommended by the Design Engineer, or the Director.

11. New developments shall provide adequate drainage capacity to accommodate the offsite design storm entering the development site.

12. When downstream drainage systems cannot accommodate peak runoff rates from design storms, runoff rates discharged downstream from new developments will be limited to predevelopment values unless improvements to the downstream system are made.

13. Runoff volume from the design storm shall be limited to predevelopment values unless it can be shown that the runoff can be safely conveyed through existing or planned conveyances, the increased volume would not have adverse impacts downstream, and provided further that the final receiving waters are open coastal waters.

B. DESIGN COMPUTATIONS

The following data shall be submitted to the Director by the Design Engineer.

1. HYDRAULIC DESIGN DATA

a. Computations for runoff, conduit and channel sizes, slopes, losses, hydraulic gradient and other hydraulic characteristics and information pertinent to the system. Computations shall be properly arranged and presented in such a manner that they may be readily checked.

b. The following data shall be shown on the construction plans.

1) Design flow (Q), watershed area (A), roughness coefficient (n), and velocity (v), for all conduits and channels.

2) Hydraulic grade lines, including water surface elevation at each manhole and catch basin.

3) Building setback lines, where required.

4) Floodway/flood fringe boundary, as applicable.

c. When interim drainage measures are required due to restrictions in the downstream drainage systems, the following additional data shall also be provided:

1) Runoff rate using the design storm for existing upstream land use conditions.

2) Runoff volume using the design storm for existing upstream land use conditions.

3) Detention volume and discharge rate.

4) If necessary, capacity of downstream drainage systems.

2. STRUCTURAL DESIGN DATA

a. Structural design computations for all drainage structures other than pipes used within the limits of current loading tables and structures shown in the *"Standard Details for Public Works Construction"* for the City and County of Honolulu.

b. Information pertinent to the design, such as boring data, soils report, etc.

c. Upon the completion of construction of major structures, submit pertinent data such as pile driving logs, pile tip elevations, etc.

C. CLOSED CONDUITS

1. SIZES AND GRADIENTS

a. The size and gradient will be determined by the Manning Formula:

$$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$$

Q = flow, in cfs
A = area, in sq. ft.
R = hydraulic radius in ft.
S = slope, in ft./ft.
n = roughness coefficient (Manning)

Charts enabling direct solution of Manning formula are found on Plates 8 to 16.

b. The following limitations apply -

1) Minimum size pipe: 18 inches inside diameter

2) Minimum velocity: 2-1/2 feet per second

3). Pipe sizes should not decrease in the direction of the flow.

2. MATERIALS AND "n" VALUES

The following pipes are acceptable for storm drain construction together with the roughness coefficient to be used in the solution of the Manning Formula.

Materials	n
Concrete	0.013
Cast Iron	0.013
Corrugated metal pipe (CMP) *	
Unpaved	0.024
25% paved invert	0.021
Lower 50% paved	0.018
100% paved	0.013
High Density Polyethylene (HDPE) *	0.015

*Use of CMP or HDPE shall be permitted only when specifically approved for an installation by the Director in writing.

3. LOADING

a. Reinforced Concrete Pipes: Reinforced concrete pipes shall be constructed to American Society for Testing and Materials (ASTM) Specifications.

1) Minimum pipe cover in roadways, driveways and other areas with vehicular traffic shall be two feet.

Should there be a need for a pipe cover of less than 2 feet or should the design or construction method deviate from the Standards of the Department of Planning and Permitting, City and County of Honolulu, the Design Engineer shall submit a structural design for review and approval. The decision to allow such design will be made by the Director.

2) Minimum pipe cover in easement areas without vehicular traffic shall be 1'- 0".

3) Maximum permissible pipe cover will be determined from current loading tables in pipe handbooks for the respective pipes, using 120 lbs. per cu. ft. as the weight of earth.

4) All pipes shall be installed using a first class bedding trench condition. Proper foundations shall be provided for pipes. Pipes on unstable ground or fresh fill shall be supported by a method acceptable to the Director.

5) Drain pipes installed along the longitudinal axis of the roadway shall be located in the pavement area between curbs.

b. Other Closed Conduits. There shall be no minimum cover or maximum permissible depth requirements for closed conduits other than pipes except that such structures, shall be designed to support all loads that it shall be subjected to.

4. MANHOLES AND INLETS

a. Manholes:

1) Location. Manholes shall be located at all changes in pipe size and changes in alignment or grade and at all junction points.

2) Spacing. Maximum manhole spacing shall be 250 feet for pipes 36 inches or less in diameter, or box drains with the smallest dimension less than 36 inches. Maximum manhole spacing for larger pipes and box drains shall be 500 feet.

3) Special Details. Bottoms of manholes and inlets serving as manholes shall be shaped to channelize flow and sloped with slope of pipe as shown in the "Standard Details" of the Department of Planning and Permitting, City and County of Honolulu.

b. Inlets (Catch Basins):

1) Location. Inlets shall be located at the upstream side of intersections, in sumps and where required by quantity of flow.

2) Spacing. Maximum spacing shall be 500 feet.

3) Types. For gutter grades up to 4 percent, standard 10-foot curb inlets with a depressed gutter shall be used. For grades 4 percent and greater, 10-foot long deflector inlets shall be used.

4) Capacity. Inlet capacities as follows, are acceptable:

	Type	Gutter Grade	cfs
a.	Std. depressed	0.4%	6
	gutter inlet	4.0%	4
		sump	10
b.	Deflector inlet	4.0%	4.5
		12.0%	5.5
	Greater than	12.0%	6 max

5) Gutter Flow. The gutter flow shall not exceed a width of 8 feet.

5. PIPE SYSTEM ANALYSIS

Generally speaking, the pipe system shall be analyzed by sections, that is, outlet-to-manhole, manhole-to-manhole or manhole-to-inlet. The analysis shall start at the lowest point of flow and continued upstream. The design flow shall be used in determining whether the pipe will flow full or partially full. Full consideration of the tailwater, entrance and critical flow conditions shall be made.

a. Pipe Flowing Full. If the conditions show that the pipe section will flow full, the principles of flow of water in closed conduits shall be used. The water surface elevation of the upstream manhole is determined by adding the pipe friction and manhole losses to the water surface elevation of the downstream manhole or the beginning elevation as previously stated.

b. Pipe Flowing Partially Full. If the conditions show that the pipe section will flow partially full, the principles of flow water in open channels shall be used. The pipe partially full condition may be determined from the *Pipe Flow Charts* on Plates 8 to 16. The tailwater condition must also be considered in this determination.

c. Manhole Losses.

1. For junction conditions such as drop manholes, or where the outflow line deflects more than 10 degrees with any inflow line, the hydraulic grade shall be determined by applying the "Entrance Control loss" and "C & D losses" (where applicable), or "A, B, C & D losses", whichever is greater.

2. For junction conditions where the outflow line deflects 10 degrees or less with the inflow line, the hydraulic grade shall be determined by applying the "A, B, C & D losses".

6. HYDRAULIC GRADIENT COMPUTATIONS

The hydraulic gradient is: (1) a line connecting points to which water will rise in manholes and inlets throughout the system during the design flow; or (2) the level of flowing water at any point along an open channel.

It shall be determined starting at the downstream end of the proposed drainage system and proceeding upstream by adding the friction losses and manhole losses of the system.

The hydraulic gradient for the design flow shall be at least 1 foot below the top of the manhole cover, or 1 foot below the invert of catch basin inlet opening.

a. Beginning Elevation. The elevation of the hydraulic gradient at the downstream end shall be selected according to the following conditions:

1) Connection to existing drainage system - determined from the hydraulic gradient computations of the existing drain;

2) Discharge into a stream - determined from the flow conditions of the stream;

3) Submerged tailwater condition - begin at the tailwater elevation; and

4) Freefall condition (conduit) - begin at the crown of the proposed drain.

b. Friction Loss.

$h_f = S_f(L)$, where:

h_f = head loss due to friction

S_f = friction slope from Manning Formula

$$= \frac{(nv)^2}{2.208\ R^{4/3}},$$

L = length of pipe or channel

The friction loss shall be calculated for the condition of the design flow, that is, pipe flowing full or partially full.

c. Manhole Losses.

Manhole losses shall be as shown on the charts, *Head Losses in Manholes* (Plates 17 and 18). The losses shall be evaluated with pipes flowing full in the vicinity of the manholes; and therefore the velocity shall be for the pipe flowing full. The curves on the charts show the various losses:

1) A curve - loss due to entrance and exit

2) B curve - velocity head

   a. Where the downstream velocity exceeds the upstream velocity, the head loss shall be difference in velocity heads.

b. Where the downstream velocity is less than the upstream velocity, the velocity head loss shall be zero.

3) C curve - loss due to change in direction, taking the worst case for branches at a manhole.

4) D curve - loss due to incoming volume.

7. SPECIAL DETAILS

The following structures shall be installed where required:

a. Headwalls, aprons and cut-off walls at drain inlets and outlets.

b. Energy dissipators at outlets.

c. Debris and boulder control structures.

d. Guard rails or fences on channel walls, headwalls and inlets, where they present a hazard to vehicular traffic or pedestrians.

D. OPEN CHANNELS

1. CHANNEL SIZE

Use the Manning Formula to determine the required waterway areas where uniform flow can be assumed.

$$Q = AV \text{ and } V = \frac{1.486\, R^{2/3}\, S^{1/2}}{n}$$

A= area of flow, in square feet
V= velocity, in feet per second
n = roughness coefficient (Manning)
R= hydraulic radius, in feet
S= slope of the energy gradient, in feet per feet

The channel depth shall include design water depth and minimum freeboard allowances. Design water depth shall include rise in water surface caused by curves and junctions.

2. CHANNEL RIGHT-OF-WAY

The channel width shall be sufficient to provide the required waterway area for the design storm as determined by these standards. The total right-of-way shall include a 15-foot wide maintenance road along both banks where the top width of channel exceeds 50 feet, and along one bank where the top width is 50 feet or less. The maintenance road along the channel shall be topped with 6 inches of Asphalt Treated Basecourse (ATB) or Asphalt Concrete (AC). In lieu of a maintenance road, for normally dry channels, access ramps or other suitable alternative measures to facilitate maintenance may be provided.

3. PERMISSIBLE VELOCITIES AND "n" VALUES

Following is a list of "n" values for open channels and maximum permissible velocities. Maximum velocities shall be based upon design flow quantities.

Unlined Channel	Manning "n"	Maximum Velocity (fps)
Rock	0.030	10
Ledge coral or limestone	0.025	10
Earth with vegetation (grassed)	0.035	5
Lined Channels		
Conc. (trowel finish)	0.013	No limitation
Conc. (smooth wood forms)	0.015	No limitation
Gunite	0.020	20
Grouted Rip-rap & CRM (Cement Rubble Masonry)	0.025	20
Asphaltic Concrete	0.015	20
Corrugated Metal Flumes (Part-circle Sections)	0.021	25

Note: Use of CMP shall be permitted only when specifically approved for an installation by the Director in writing.

a. Maximum design velocity for channels cut in earth shall not exceed 5 feet per second. The velocity shall be determined by using the natural existing slope of the waterway without utilizing grade transition structures to control the maximum slope for a given unlined channel cross-section and design flow.

b. Velocities between 5 feet per second and 10 feet per second will be permitted in materials, such as cemented gravel, hard pan, or mud rock, depending upon its hardness and resistance to scouring. Borings and samples shall be submitted for evaluation before velocities exceeding 5 feet per second will be permitted.

4. CHANNEL LINING

a. Earth channel shall be fully lined when velocities exceed 5 feet per second, unless otherwise permitted as previously noted above in Section D.3.b of §1-4.2 Part II - Design Standards.

b. All fill sections shall be lined. This lining shall be a complete lining including side slopes and invert with appropriate cut-off walls. If the invert of the channel is in a cut section, the invert slab may be omitted and appropriate cut-off walls provided at the toe of the side slope lining.

c. Where linings are required or used, the linings, shall be continuous. Lining of fill sections without continuing the lining out through cut sections in a channel will not be allowed unless adequate provisions are made to reduce the velocity from the lined section to meet the allowable velocity for the unlined section.

d. Total depth of channel lining will include design water depth and freeboard.

e. Attention shall be given to construction details of linings, such as thickness, reinforcement, expansion and construction joints, cut-off walls, watertight joints, and placement of reinforcement, etc. Where the channel discharges into streams or other channels outside of the limits of a development, velocity reducing and transition structures shall be constructed to minimize erosion and overtopping of banks and subsequent flooding of downstream areas.

f. Where velocities are supercritical, rectangular channels shall be used, unless otherwise permitted by the Director.

g. Earth channels shall be planted with vegetation, such as grass of a species not susceptible to rank growth.

5. FREEBOARD

In designing open channels, freeboard must be provided to allow for surface roughness, wave action, air bulking, and splash and spray. These phenomena depend on the energy content of flow. For water flowing at velocity **v** and depth **d,** the energy per foot of width per second is equal to $\mathbf{(wvd)\ (v^2/2g) = wdv^3/2g,}$ where **w** is the unit weight of water.

Thus, this kinetic energy can be converted to potential energy to lift the water surface when flow is stopped or changing direction as a function of depth and velocity of flow. The U.S. Bureau of Reclamation has developed an empirical expression to express a reasonable indication of desirable freeboard in terms of depth and velocity as follows:

$$\text{Freeboard in feet} = 2.0 + 0.025\ v\ (d)^{1/3}$$

where **v** is the velocity in feet per second and **d** is the depth of flow in feet. The velocity of flow can be computed by dividing the design discharge by the cross-sectional area of flow. For convenience of application, the above expression is shown graphically in Plate 7.

6. JUNCTIONS

Junctions shall be designed to channel both flows as nearly parallel as possible to reduce velocity and momentum components, deposition of debris and erosion of banks.

7. BENDS AND SUPERELEVATIONS

Changes in the direction of flow shall be made with smoothly curved channel walls allowing for superelevation in water surface. Curves will nearly always require additional depth. Trapezoidal channels for supercritical velocities are not permitted. Curve radii should be sufficiently great to limit superelevation of the water surface to one foot above computed depth of flow or 10 percent of water surface width, whichever is the least. The amount of superelevation for simple curves may be determined as follows:

a. Trapezoidal Channels:

Subcritical velocity:

$$e = \frac{V^2(b + 2zd)}{(gR - 2zV^2)}$$

b. Rectangular Channel:

Subcritical velocity:

$$e = \frac{V^2 b}{gR}$$

Supercritical velocity:

$$e = \frac{2V^2 b}{gR}$$

Supercritical velocity - compound curve:

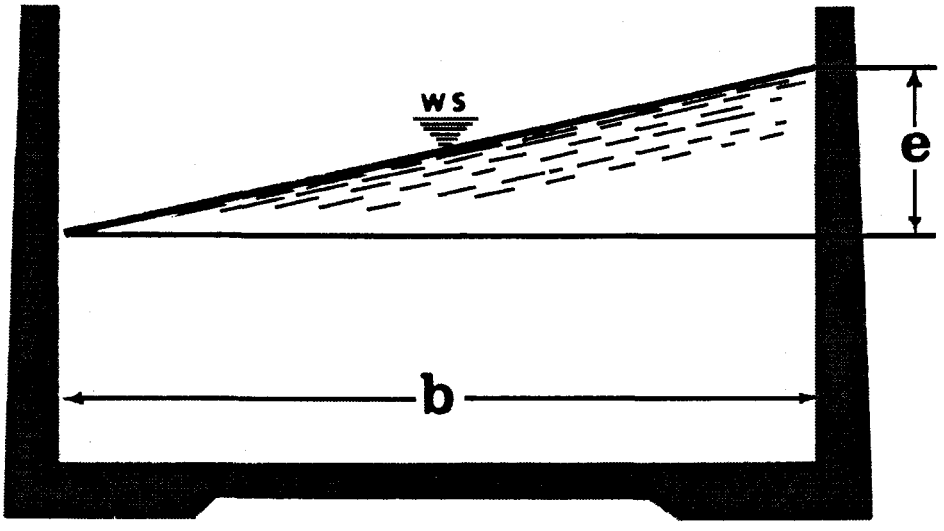
$$e = \frac{V^2 b}{gR}$$

The compound curve is a simple curve of radius R preceded and followed by a section of simple curve with radius of 2R and length of

$$\frac{b}{\tan \beta}, \text{ where } \sin \beta = \frac{(gd_m)^{1/2}}{V}$$

Where,

b	=	channel bottom width (ft)
d	=	normal depth (ft)
d_m	=	mean depth (ft)
e	=	maximum difference in elevation of water surface between channel sides (ft)
g	=	acceleration due to gravity (fps^2)
R	=	radius of curve to centerline (ft)
V	=	normal velocity (fps)
z	=	co-tangent of bank slopes



Water Surface Superelevation Showing, "e"

8. TRANSITIONS

a. The maximum angle between channel centerline and transition walls should be 12.5 degrees.

b. Sharp angles in alignment of transition structures should be avoided.

9. DEBRIS BARRIERS

Debris barriers should be provided upstream of the intake to prevent clogging.

10. DEBRIS BASINS

Where required by the Director, debris basins shall be provided upstream of the debris barrier. Debris basins shall also be provided at the intake of a drainage system when the upstream drainage area is undeveloped.

The volume of debris to be impounded shall be estimated based on the existing upstream land uses.

The basin design shall include an access ramp to the bottom of the basin for maintenance purposes.

11. ENERGY DISSIPATORS

Energy dissipators shall be used to dissipate energy where necessary, and to transition the flow from a lined channel to a normal flow in an unlined channel.

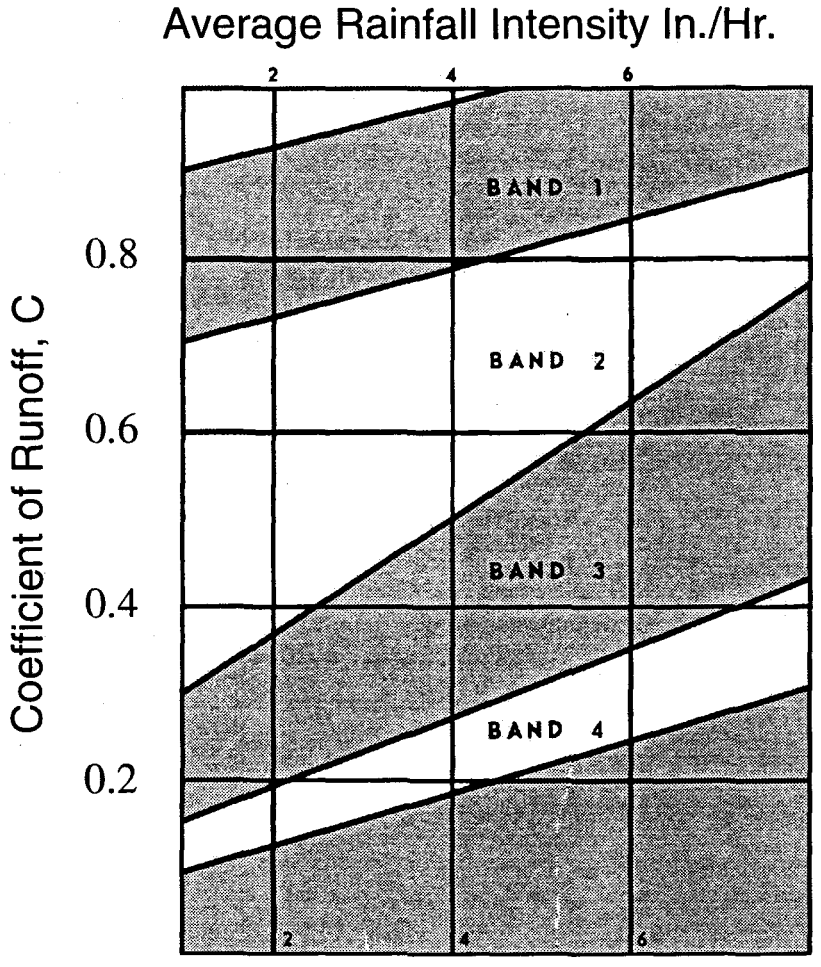
Energy dissipators may be any of the following types, such as the SAF basin, baffled chute, dentated sills, buckets, impact, hydraulic jump, or other approved designs.

[Eff: JAN 01 2000 *] (Auth: Sec 14-12.31, ROH) (Imp: Sec14-12.31, ROH)*

§1-4.3 DESIGN CHARTS

Table 1

RUNOFF COEFFICIENT FOR AGRICULTRUAL AND OPEN AREAS



Band 1	Steep, barren, impervious surfaces
Band 2	Rolling barren in upper band values, flat barren in lower part of band, steep forested and steep grass meadows
Band 3	Timber lands of moderate to steep slopes, mountainous, farming
Band 4	Flat pervious surface, flat farmlands, wooded areas and meadows

Table 2

MINIMUM RUNOFF COEFFICIENTS FOR BUILT-UP AREAS

RESIDENTIAL AREAS:	C	= 0.55 to 0.70
HOTEL-APARTMENT AREAS:	C	= 0.70 to 0.90
BUSINESS AREAS:	C	= 0.80 to 0.90
INDUSTRIAL AREAS:	C	= 0.80 to 0.90

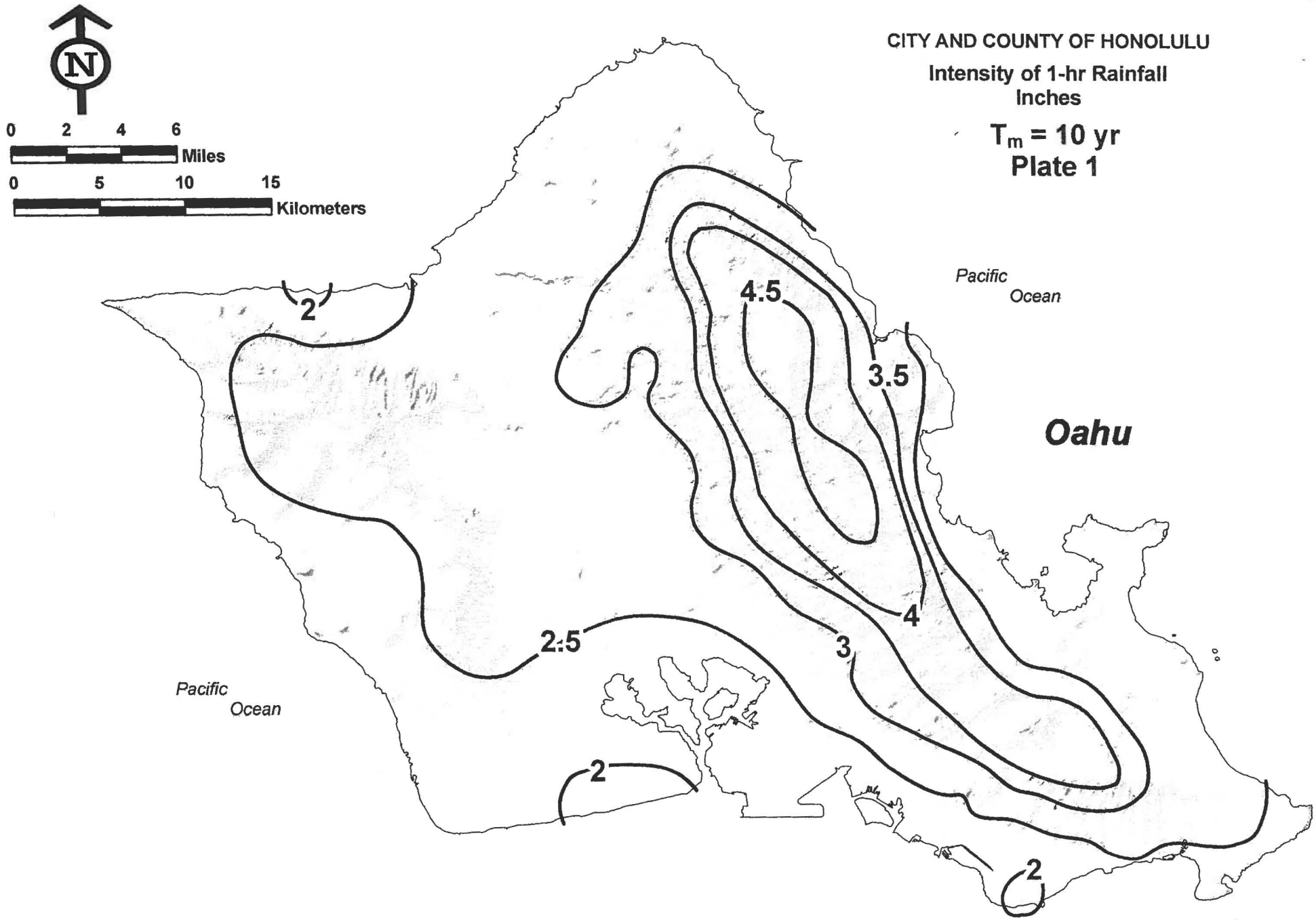
The type of soil, the type of open space, and ground cover and the slope of the ground shall be considered in arriving at reasonable and acceptable runoff coefficients.

Table 3

APPROXIMATE AVERAGE VELOCITIES OF RUNOFF
FOR CALCULATING TIME OF CONCENTRATION

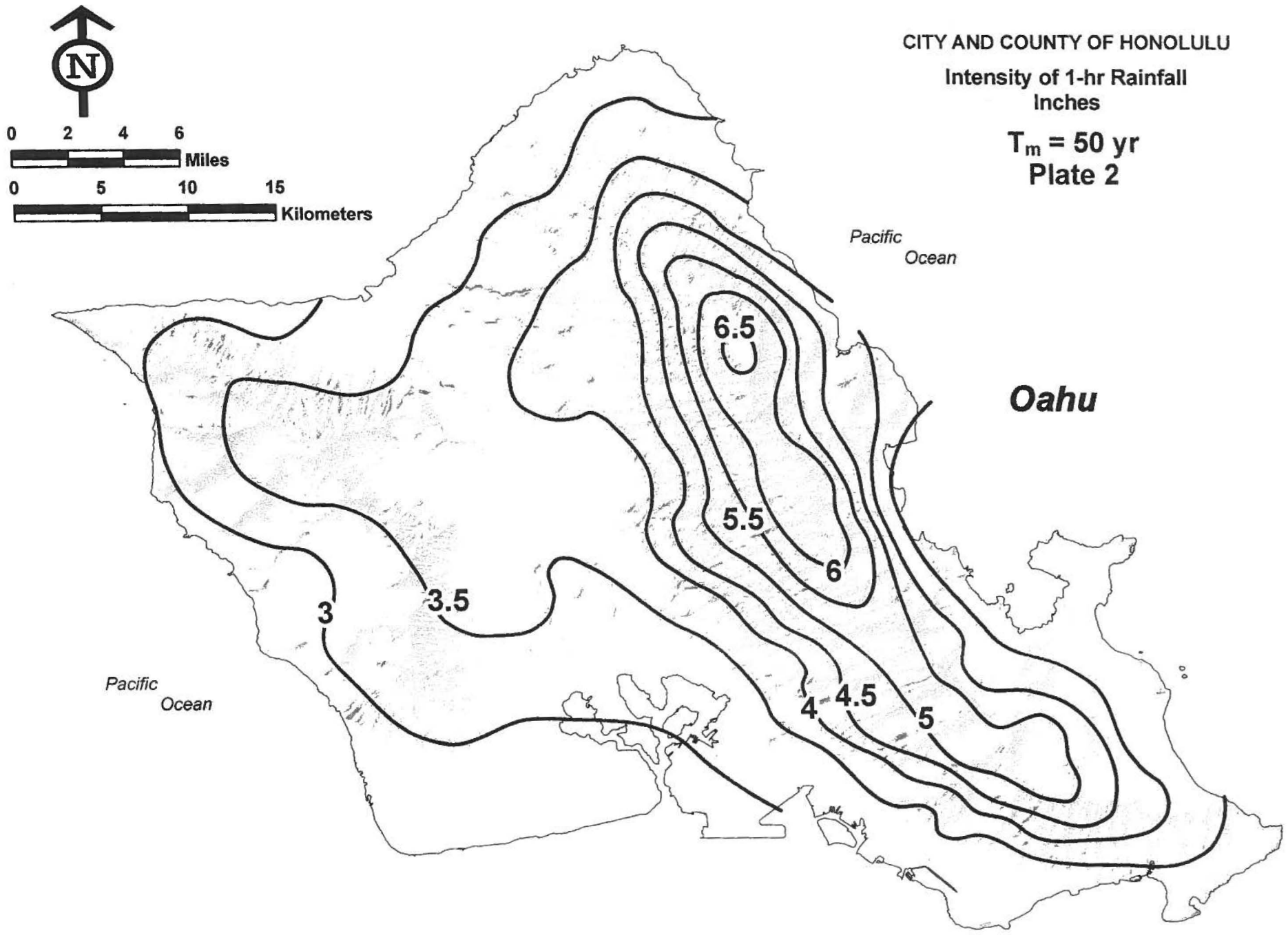
TYPE OF FLOW	VELOCITY IN fps FOR SLOPES (in percent) INDICATED			
	0-3%	4-7%	8-11%	12-15%
OVERLAND FLOW:				
Woodlands	1.0	2.0	3.0	3.5
Pastures	1.5	3.0	4.0	4.5
Cultivated	2.0	4.0	5.0	6.0
Pavements	5.0	12.0	15.0	18.0
OPEN CHANNEL FLOW:				
Improved Channels	Determine Velocity by Manning Formula			
Natural Channel* (not well defined)	1.0	3.0	5.0	8.0

* *These values vary with the channel size and other conditions so that the ones given are averages of a wide range. Wherever possible, more accurate determinations should be made for particular conditions by Manning Formula or from Plate 5.*



[Eff: APR 08 2011] (Auth: Sec 14-12.31, ROH) (Imp: Sec 14-12.31, ROH)

Source: National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Silver Spring, Maryland, 2009

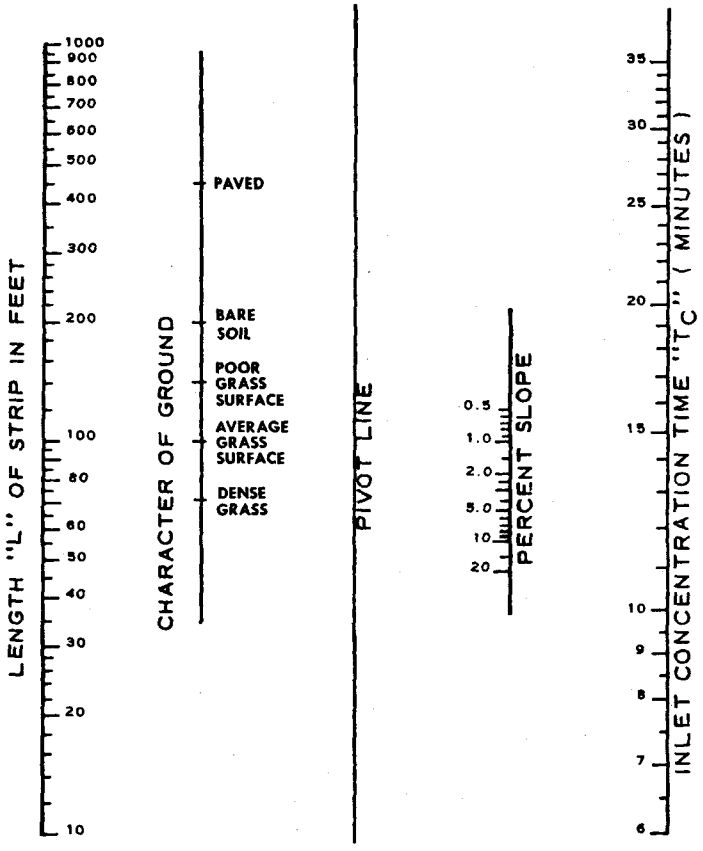


[Eff: APR 0 8 2011] (Auth: Sec 14-12.31, ROH) (Imp: Sec 14-12.31, ROH)

Source: National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Silver Spring, Maryland, 2009

Plate 3

Overland Flow Chart



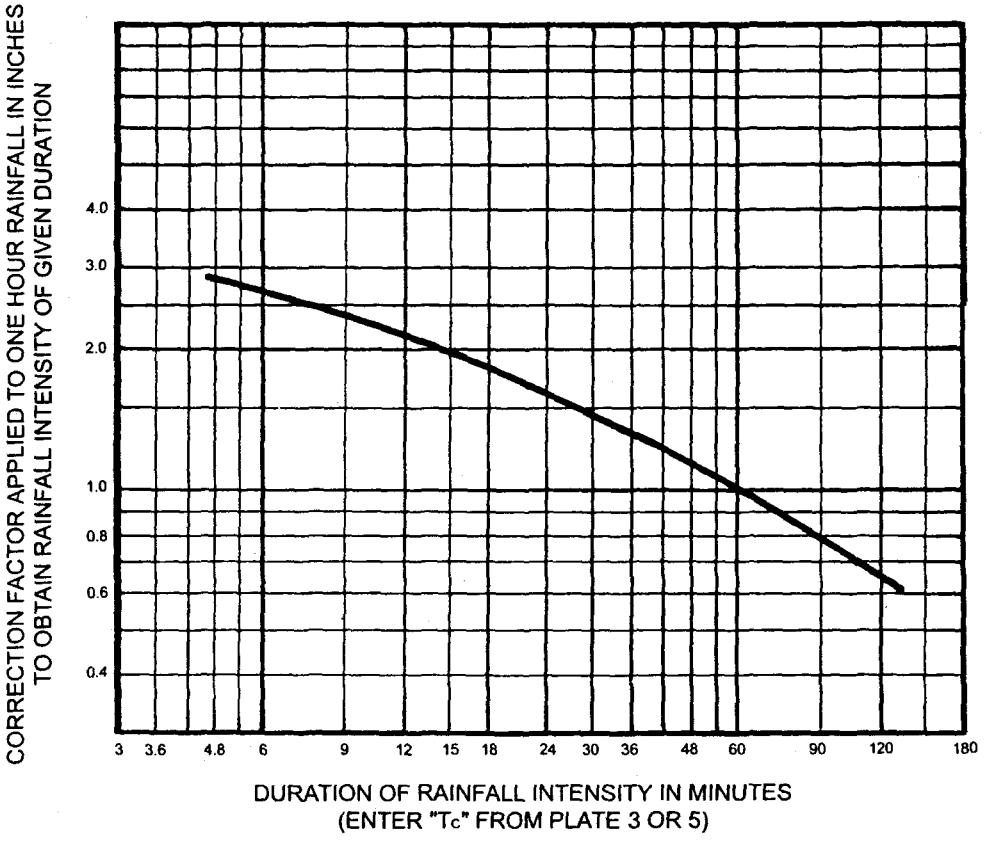


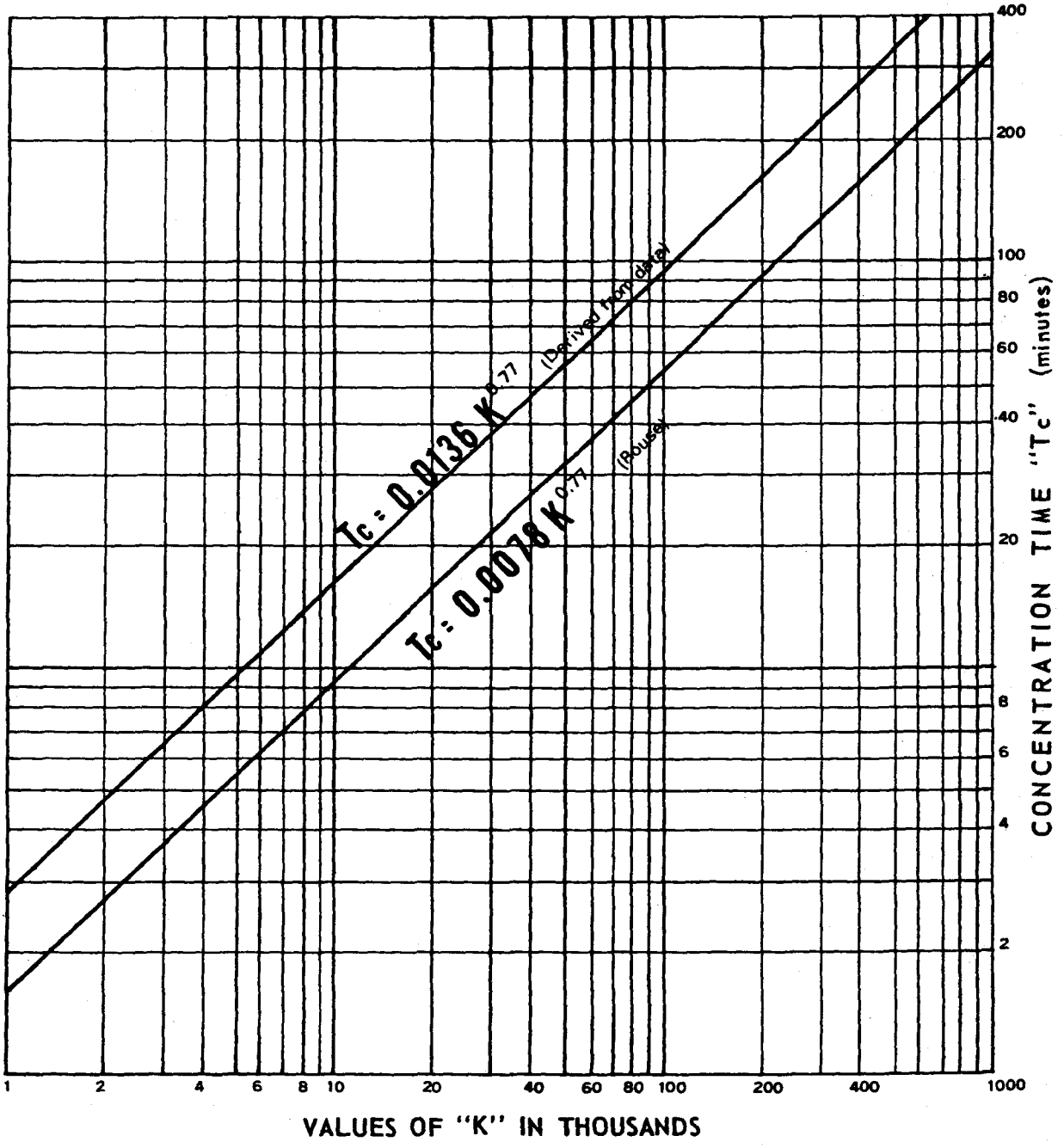
Plate 4

CORRECTION FACTOR

FOR CONVERTING 1 HR. RAINFALL
TO RAINFALL INTENSITY
OF VARIOUS DURATIONS

TO BE USED FOR AREA
LESS THAN 100 ACRES

(See Plate 6 for area
more than 100 acres)



L = Maximum length of travel in feet

H = Difference in elevation between most remote point and outlet in feet.

S = Slope H/L

$$K = \frac{L}{\sqrt{S}} = \sqrt{\frac{L^3}{H}}$$

Use upper curve for well forested areas

Use lower curve for areas with little or no cover.

SOURCE: CITY PLANNING COMMISSION
graph from Hunter Rouse "Engineering Hydraulics."

NOTE: Use 5 minutes if Tc is 5 minutes or less.

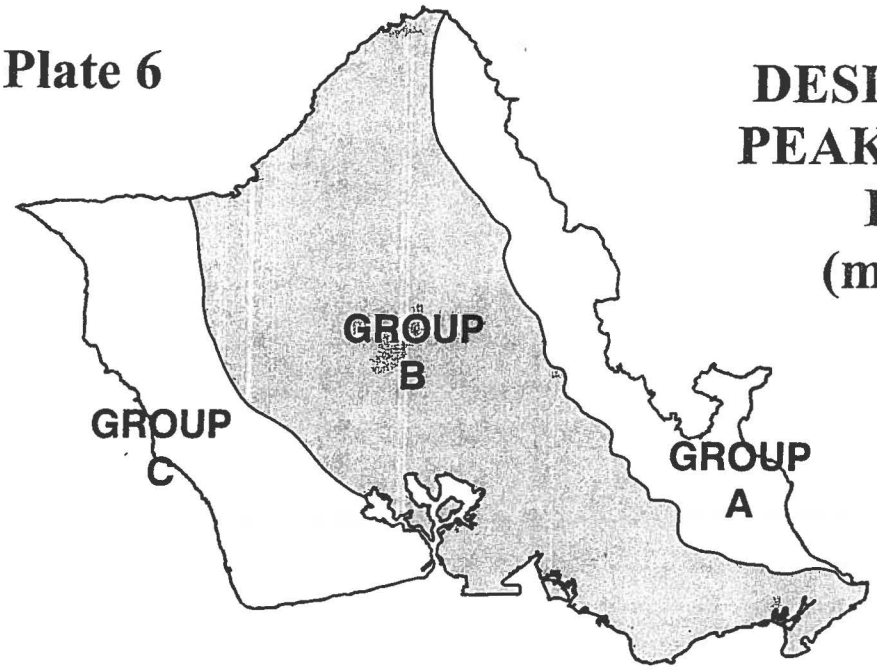
Plate 5

Time of Concentration

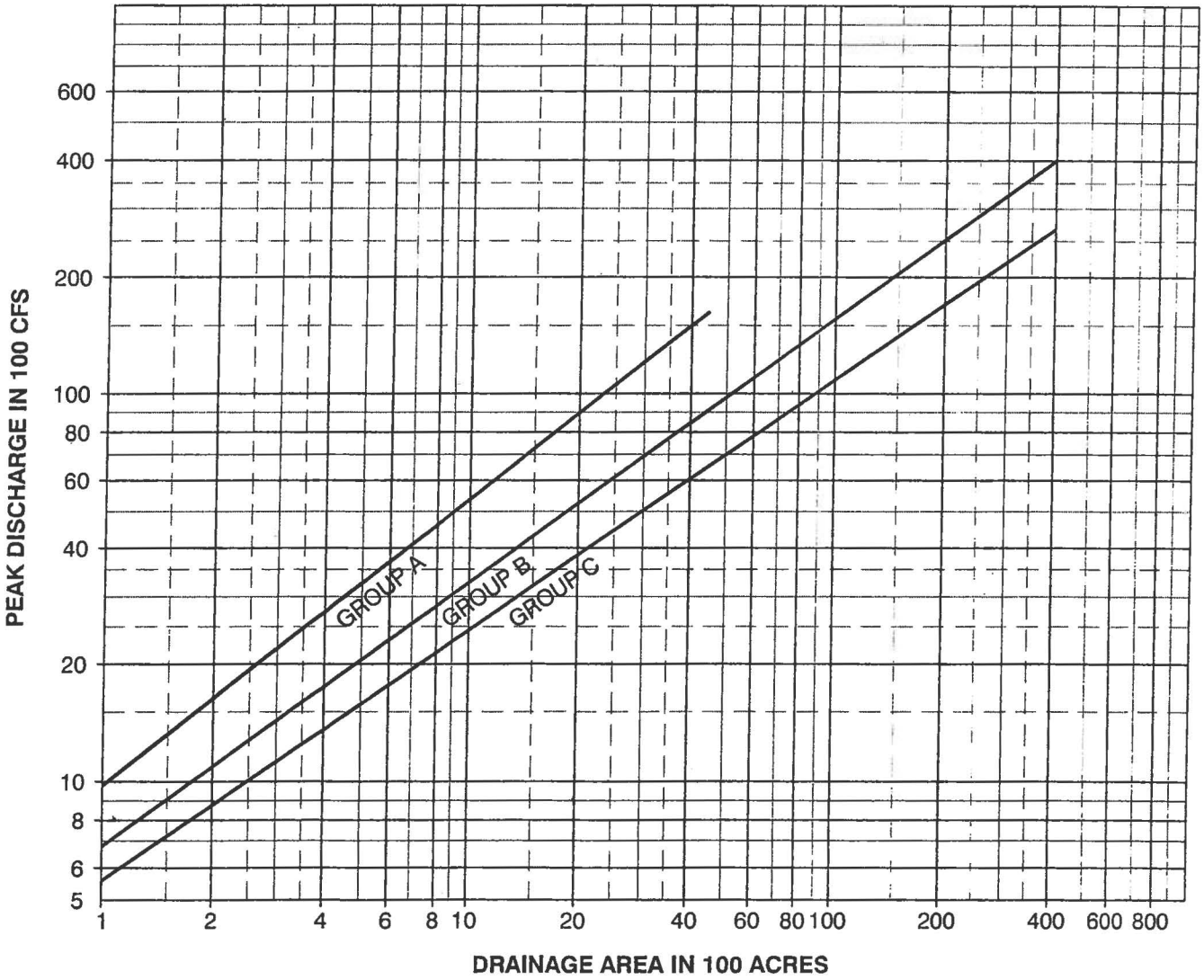
(OF SMALL AGRICULTURAL DRAINAGE BASIN)

Plate 6

DESIGN CURVES FOR PEAK DISCHARGE VS. DRAINAGE AREA (more than 100 acres)



● CURVES ARE FOR STREAM CHANNELS AND DRAINAGE STRUCTURES.



SOURCE: DATA FROM U.S. GEOLOGICAL SURVEY
REV. FEB 2003.

jsb - D:\PROJECTS\26537218_000B1\DC-DA.DWG - Mon, 21 Jun 2010

[Eff: APR 08 2011] (Auth: Sec 14-12.31, ROH) (Imp: Sec 14-12.31, ROH)

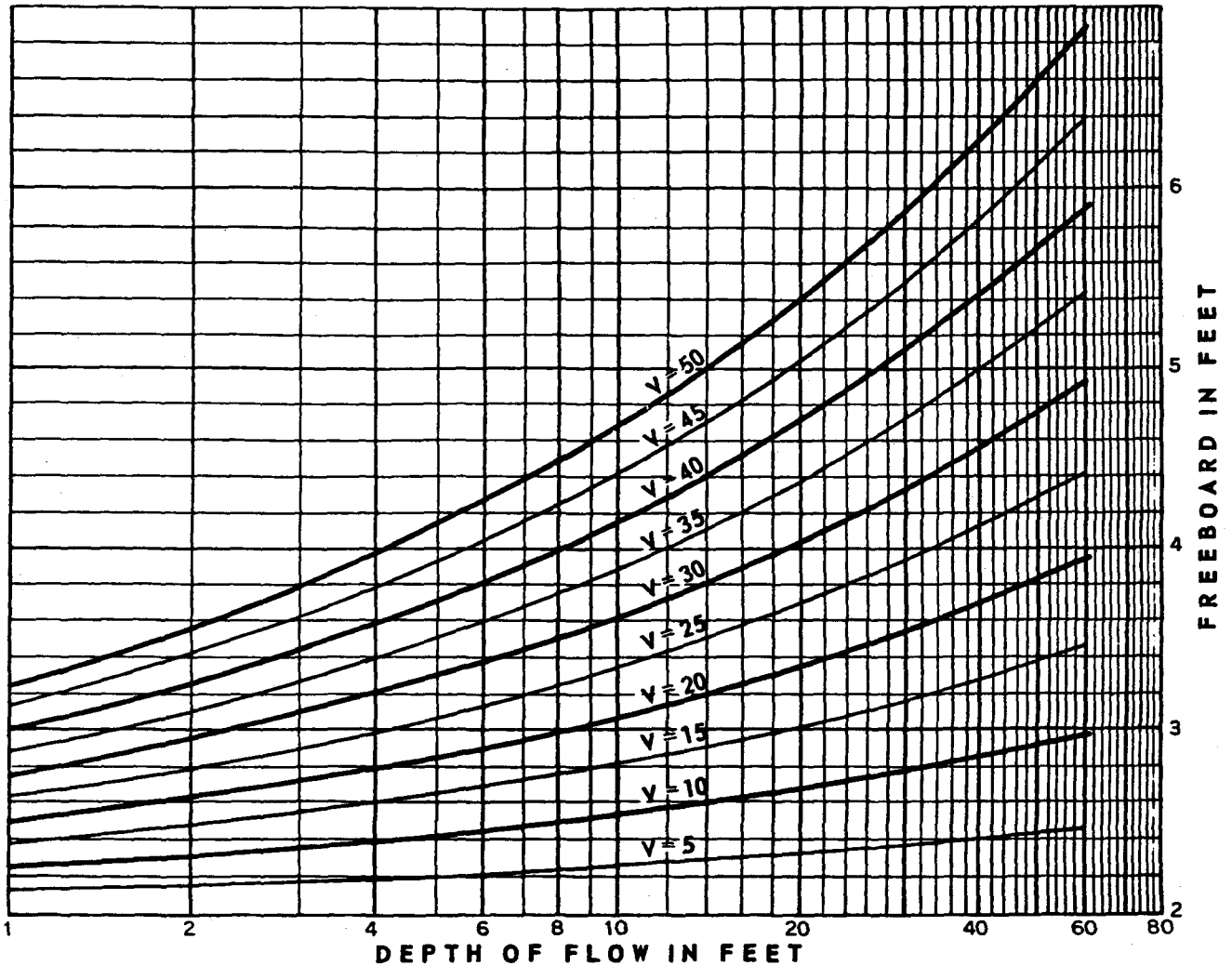
FREEBOARD ALLOWANCES Plate 7

FREEBOARD IN FEET:

$$2.0 + 0.025\, V \sqrt[3]{d}$$

Where V = Velocity, in feet per second

d = Depth of flow, in feet



Pipe Flow Charts

The following pipe flow charts have been derived by the *U.S. Public Roads Administration, Division Two, Washington, D.C.* These charts are designed to enable direct solution of the Manning formula for circular pipes flowing full and for uniform part-full flow in circular pipes. The "n" scales of 0.013 and 0.024 have been inserted to facilitate the use of these charts for storm drainage systems in Honolulu. The following examples help explain the use of the pipe flow charts.

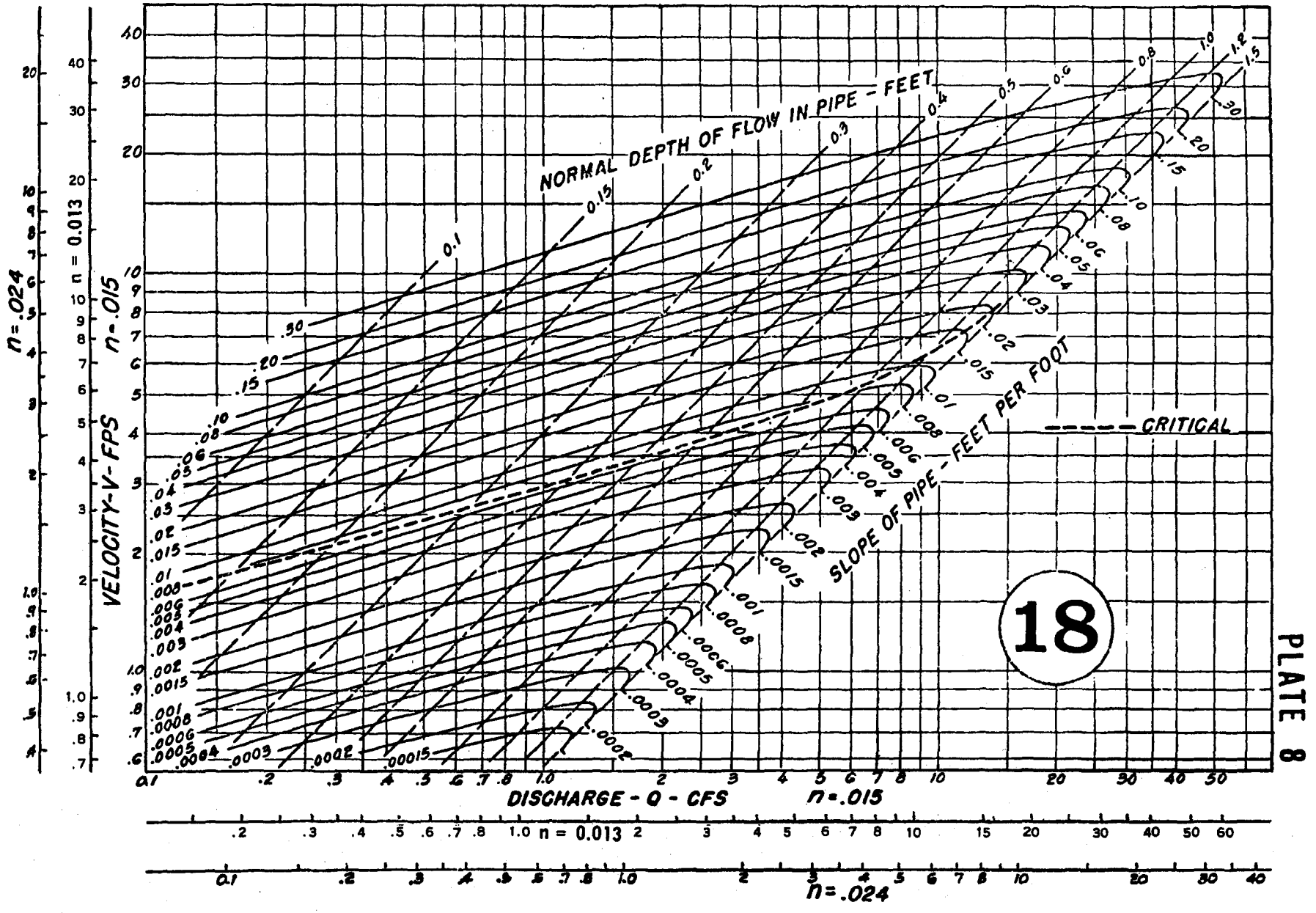
EXAMPLES

A. Determine the depth and velocity of flow in a long 30-inch pipe, n = 0.013, on a 0.5 percent slope ($S_o = 0.005$) discharging 25 cfs. Enter the 30-inch diameter chart at Q = 25 on n = 0.013 scale, follow up to intersection with the line for slope $S_o = 0.005$, and read normal depth $d_n = 1.8$ feet and normal velocity V = 6.7 fps.

To find critical depth, enter chart Q = 25 and n = 0.015 scale , and read critical depth $d_c = 1.7$ feet at intersection with dotted critical curve. Also critical velocity $V_c = 7.0$ fps. (Note: Critical depth and velocity would be the same, regardless of pipe roughness).

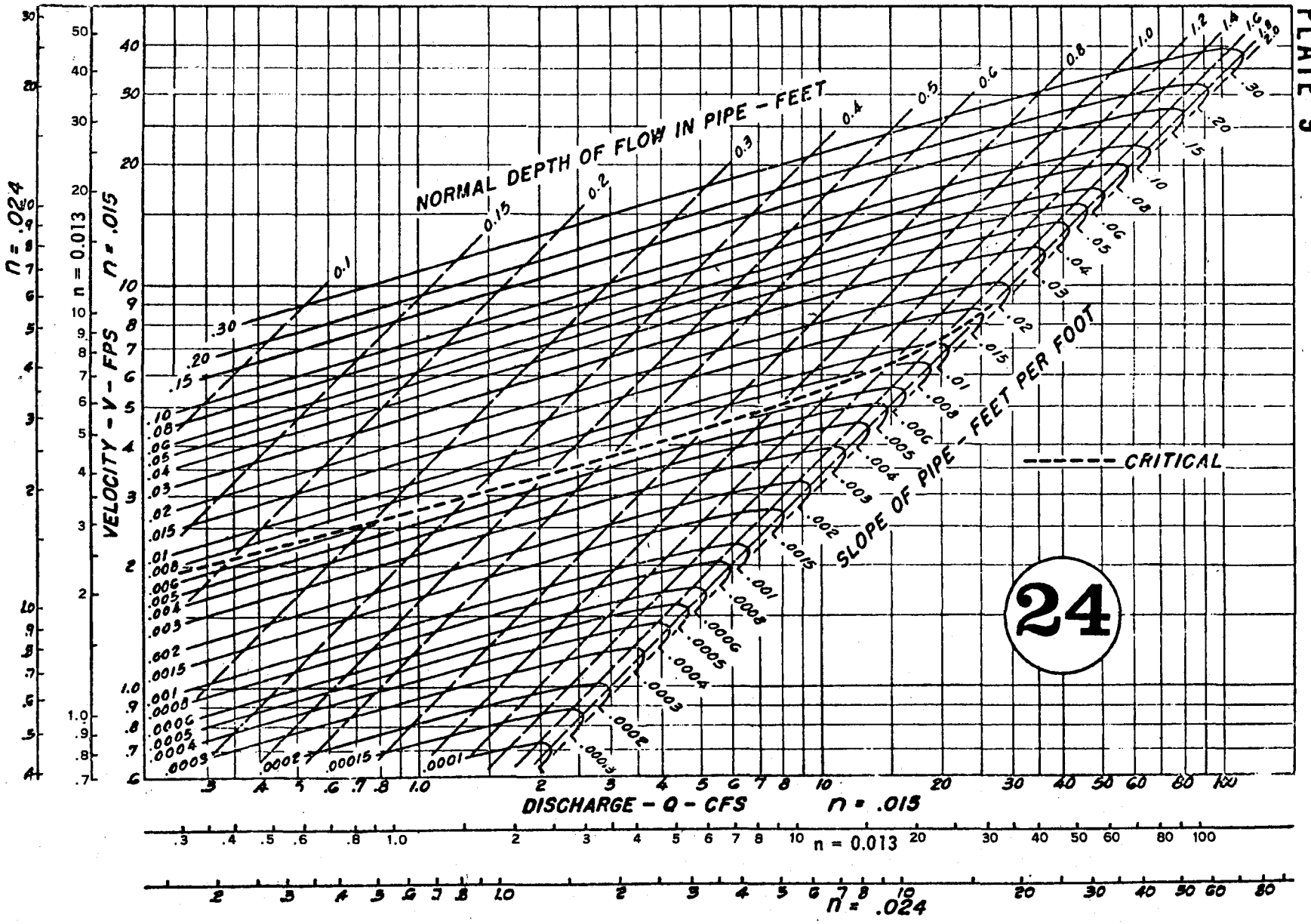
B. Determine friction slope for a 30-inch corrugated metal pipe, n = 0.024, on a slope $S_o = 0.008$ ft/ft with a discharge Q = 25 cfs. Enter the 30-inch diameter chart at Q = 25 on n = 0.024 scale. Note that this ordinate falls to the right of the 0.008 slope line, therefore, the pipe will flow full. Read friction slope $S_f = 0.012$ at the line for depth equal to pipe diameter.

$$\text{Note } Q = 25 \times \frac{0.024}{0.015} = 40 \text{ cfs on the Q-scale for n = 0.015)}$$



Pipe Flow Chart 18 inch Diameter

PLATE 9



Pipe Flow Chart 24 inch Diameter

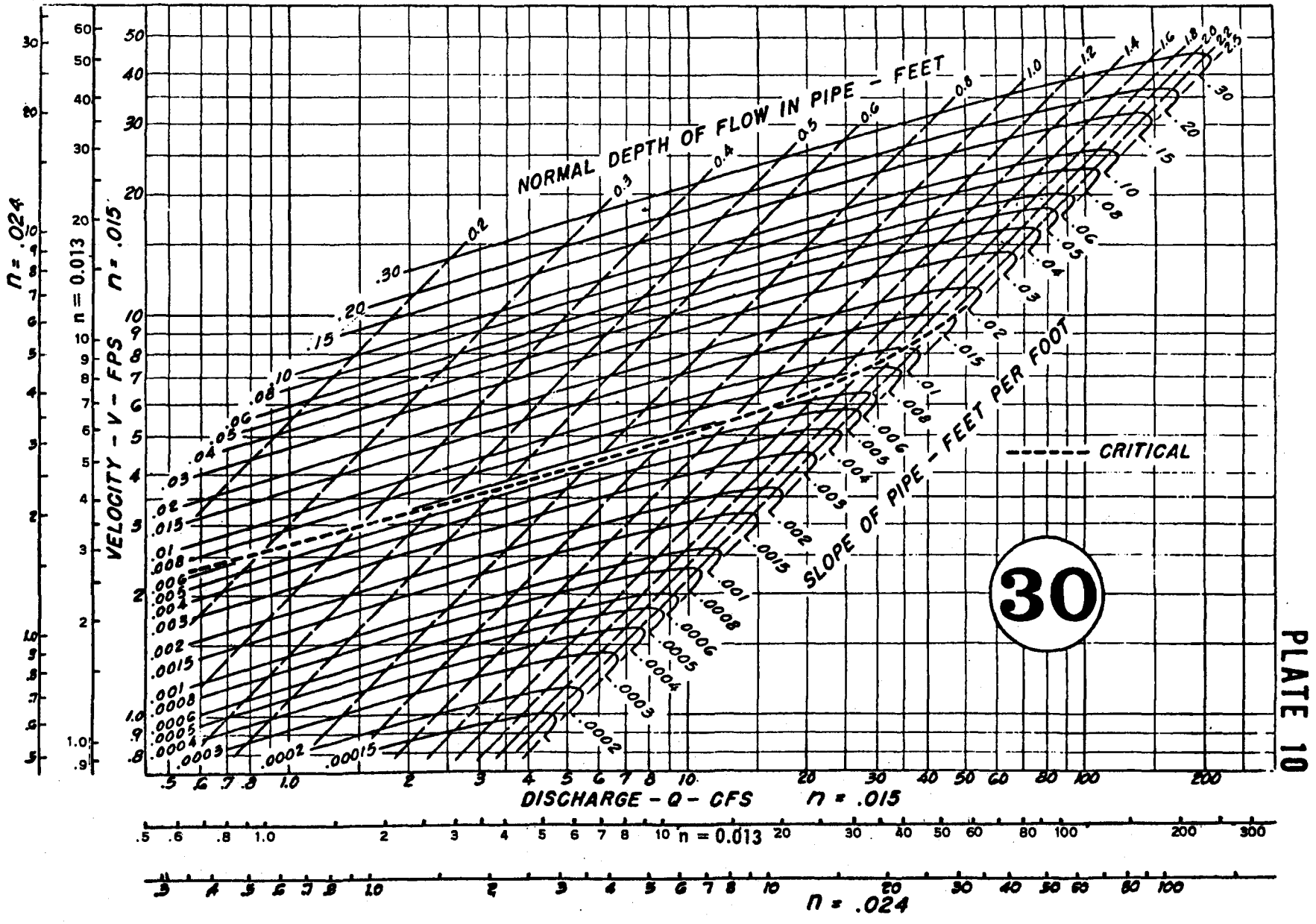
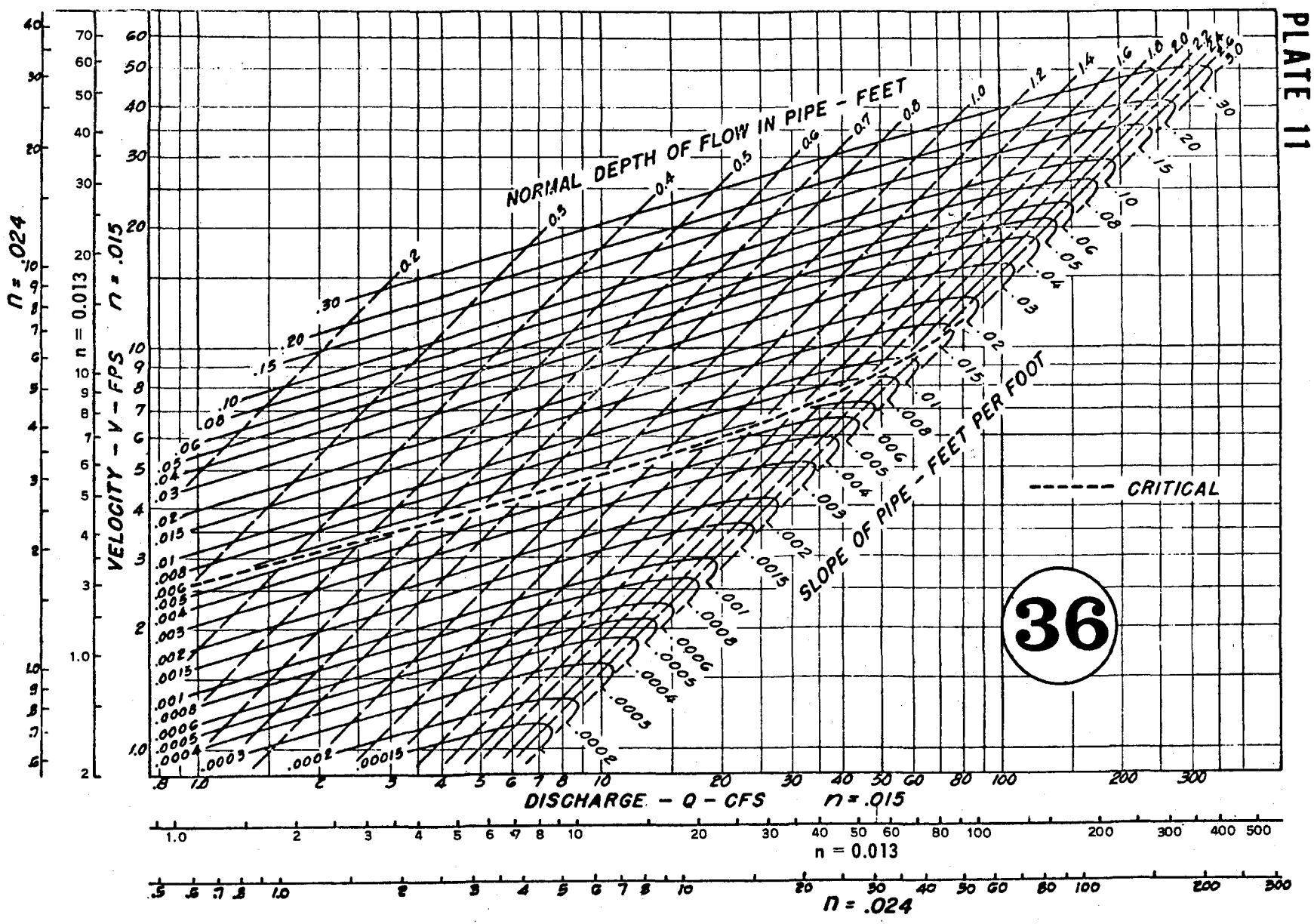


PLATE 10

Pipe Flow Chart 30 inch Diameter

PLATE 11



Pipe Flow Chart 36 inch Diameter

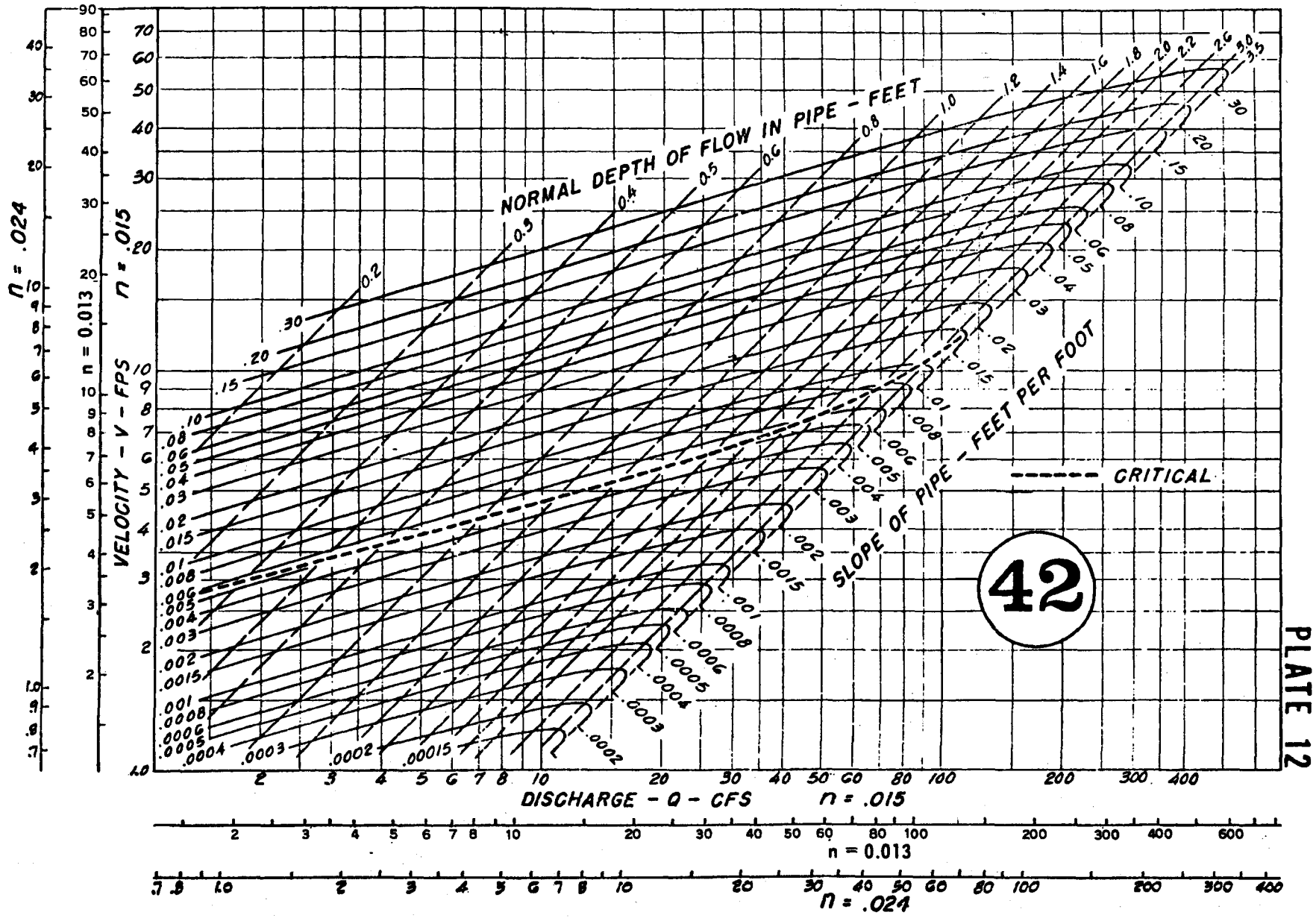
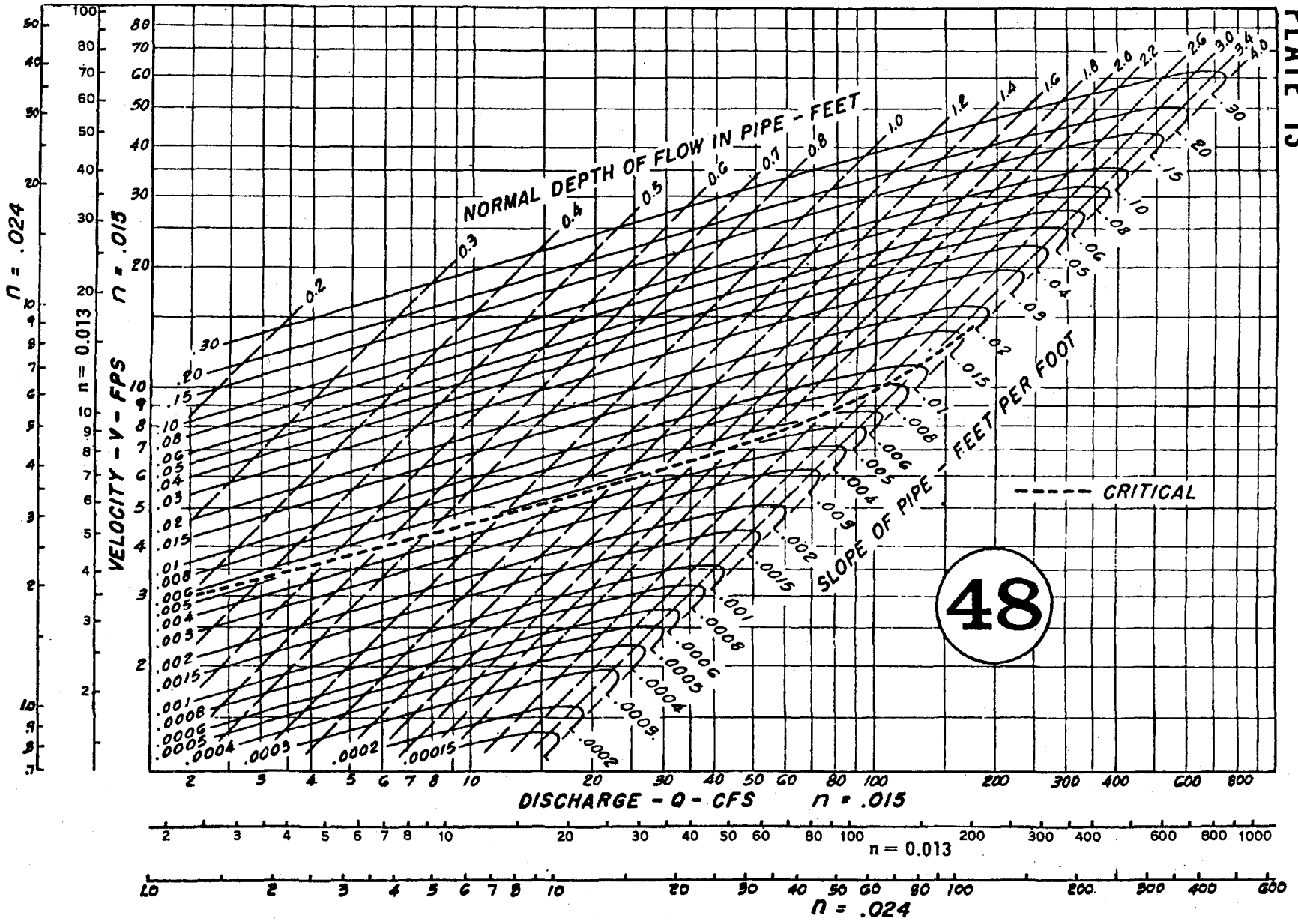


PLATE 12

Pipe Flow Chart 42 inch Diameter

PLATE 13



Pipe Flow Chart 48 inch Diameter

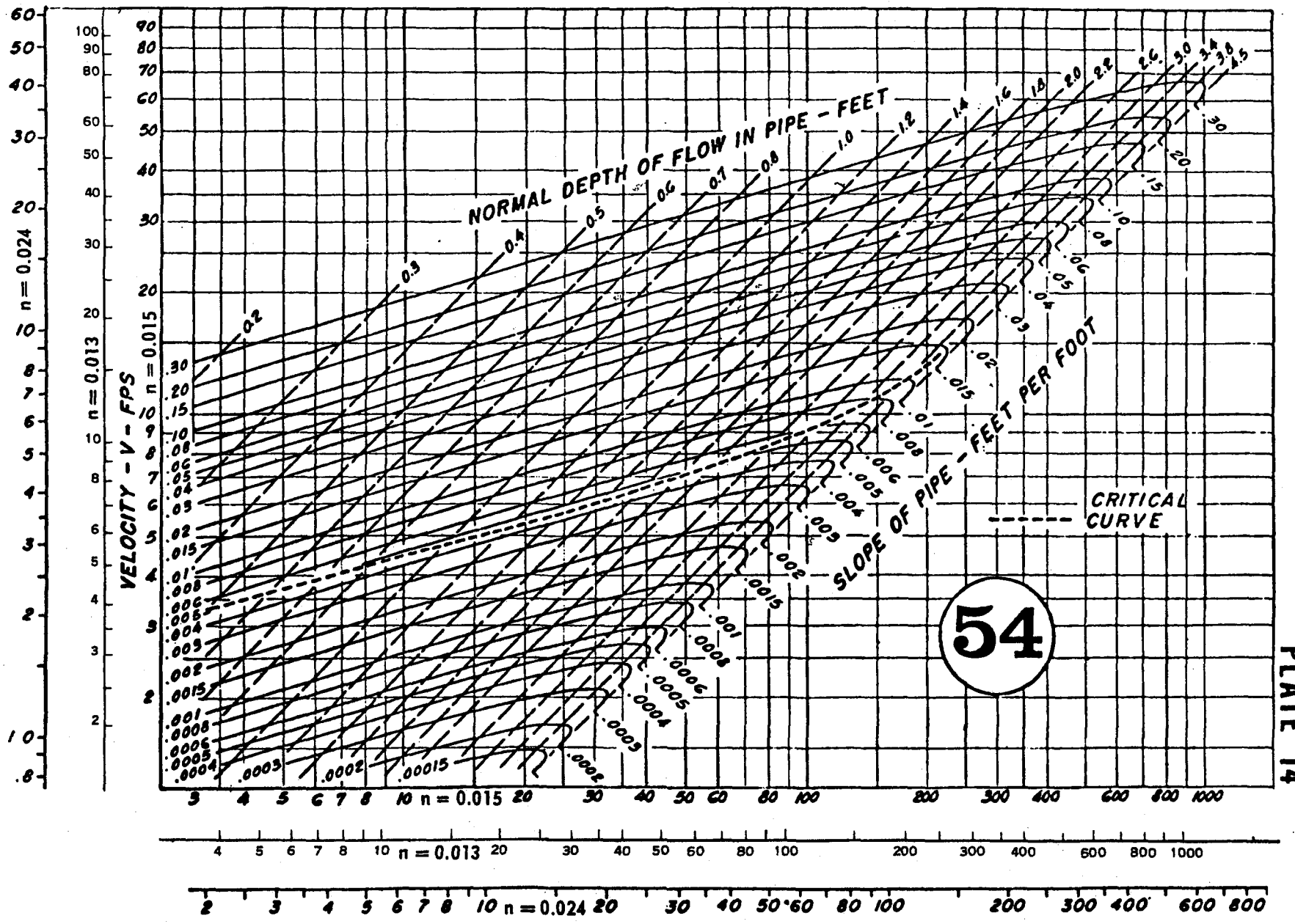
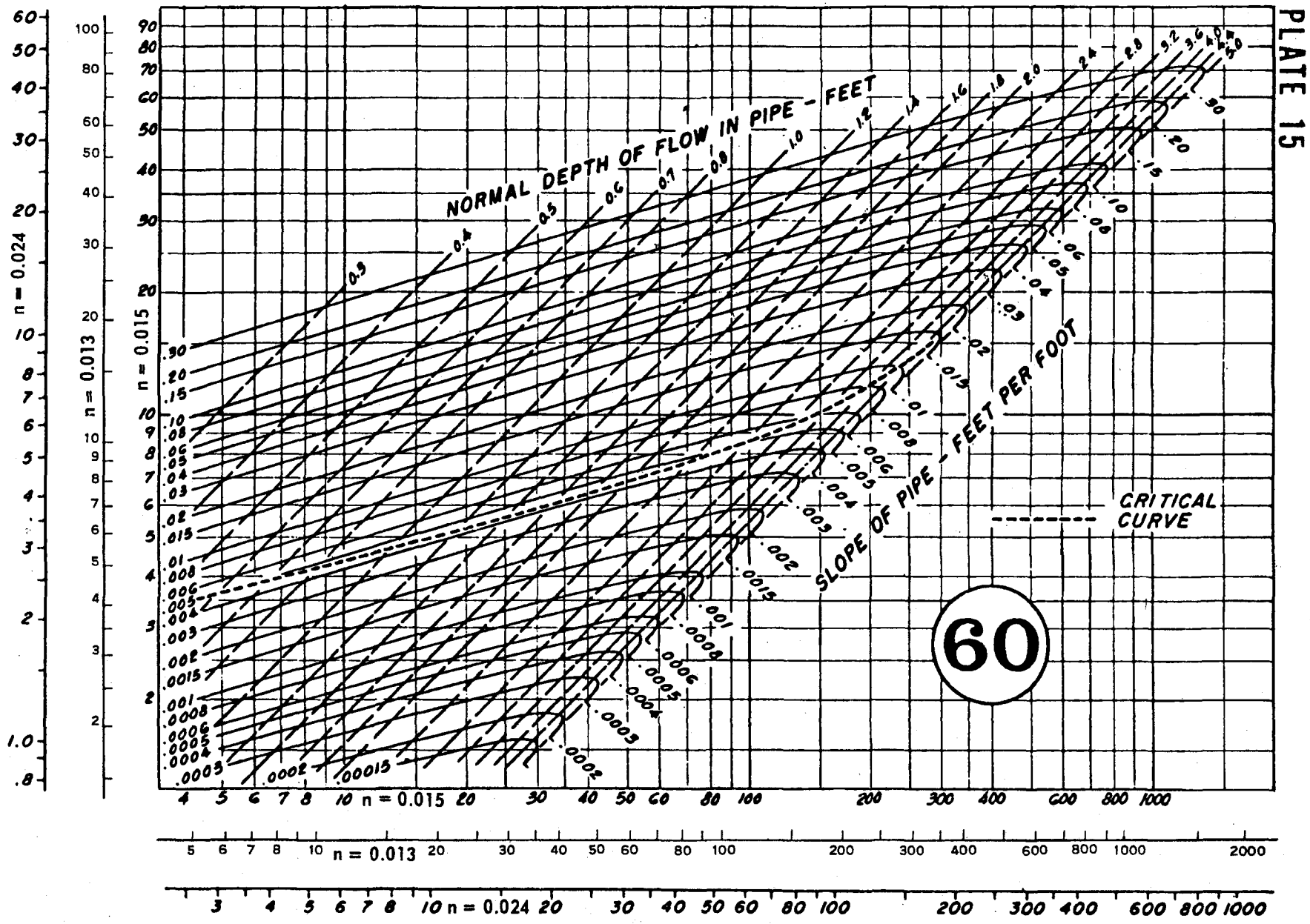


PLATE 14

Pipe Flow Chart 54 inch Diameter

PLATE 15



Pipe Flow Chart **60** inch Diameter

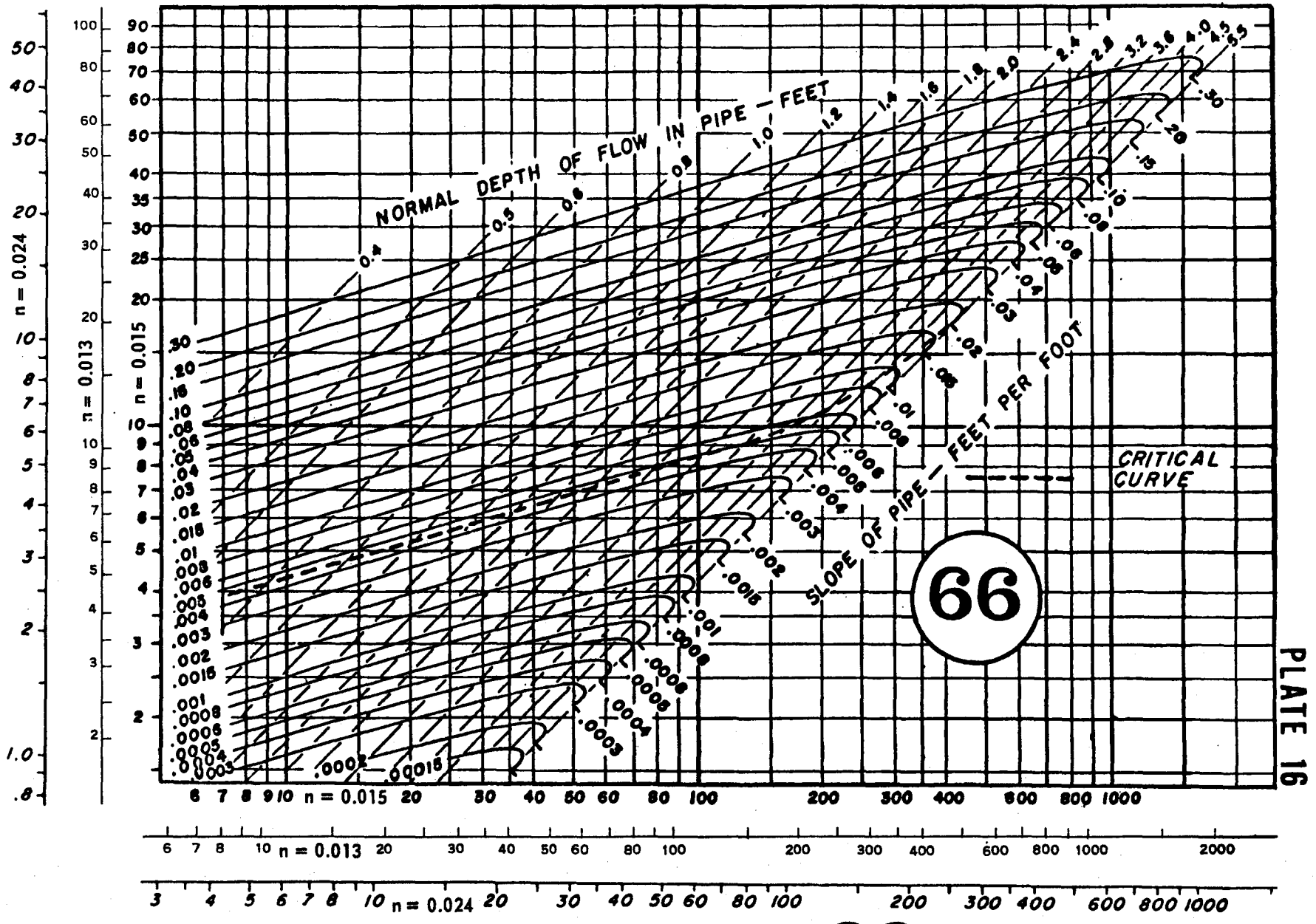
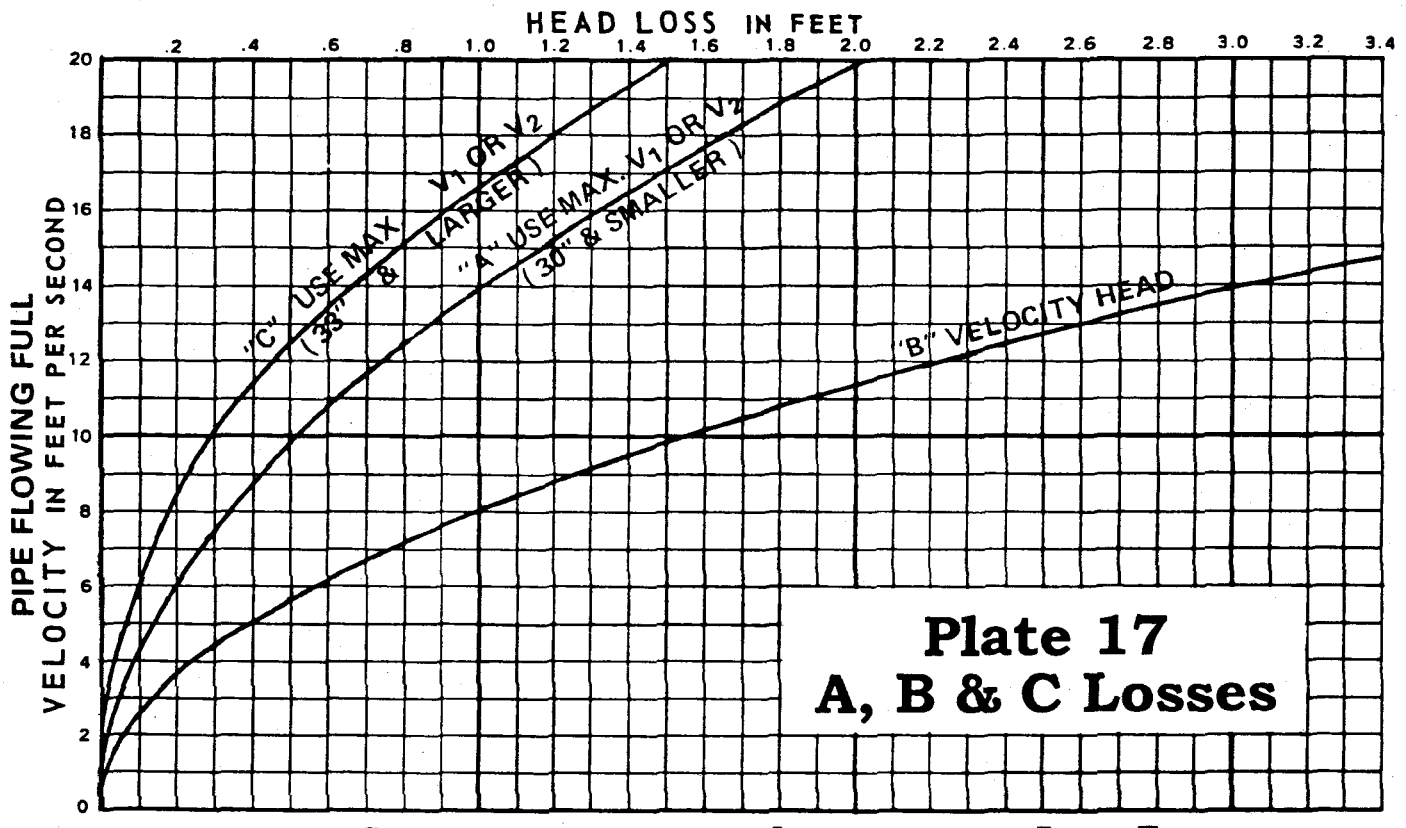
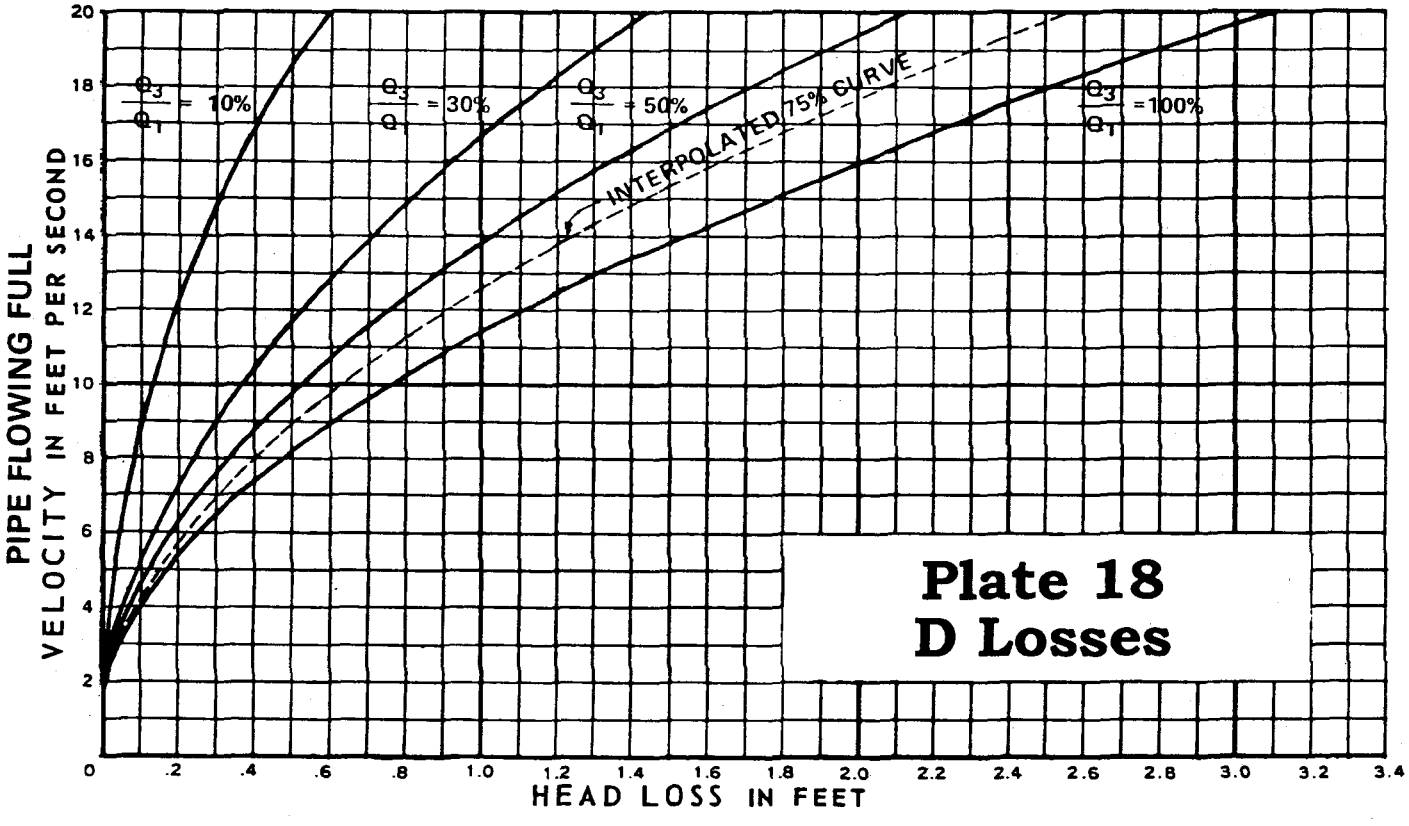


PLATE 16

Pipe Flow Chart 66 inch Diameter



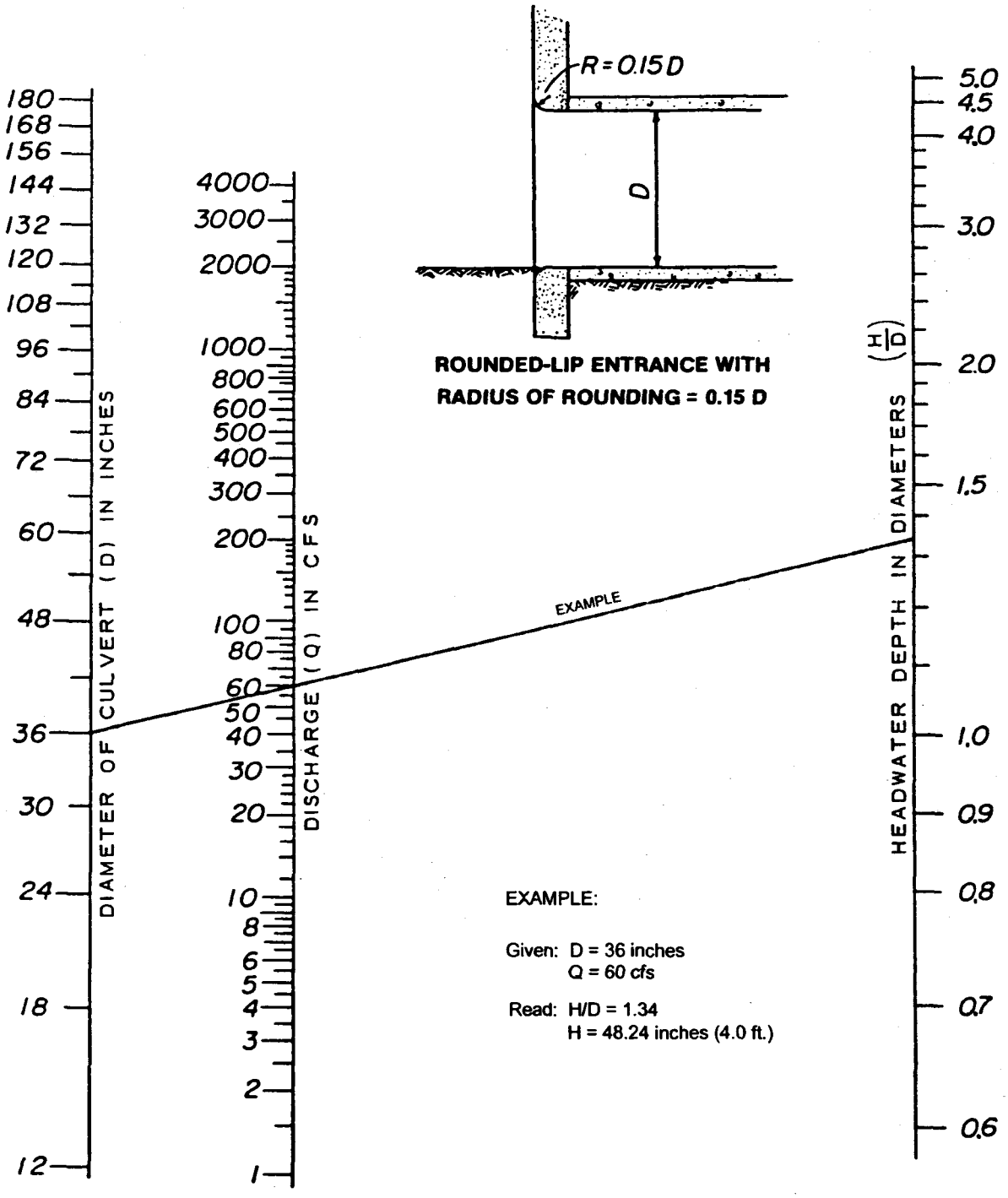
Head Losses in Manholes



SOURCE: BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS

NOMOGRAPH FOR PIPE CULVERTS WITH ENTRANCE CONTROL

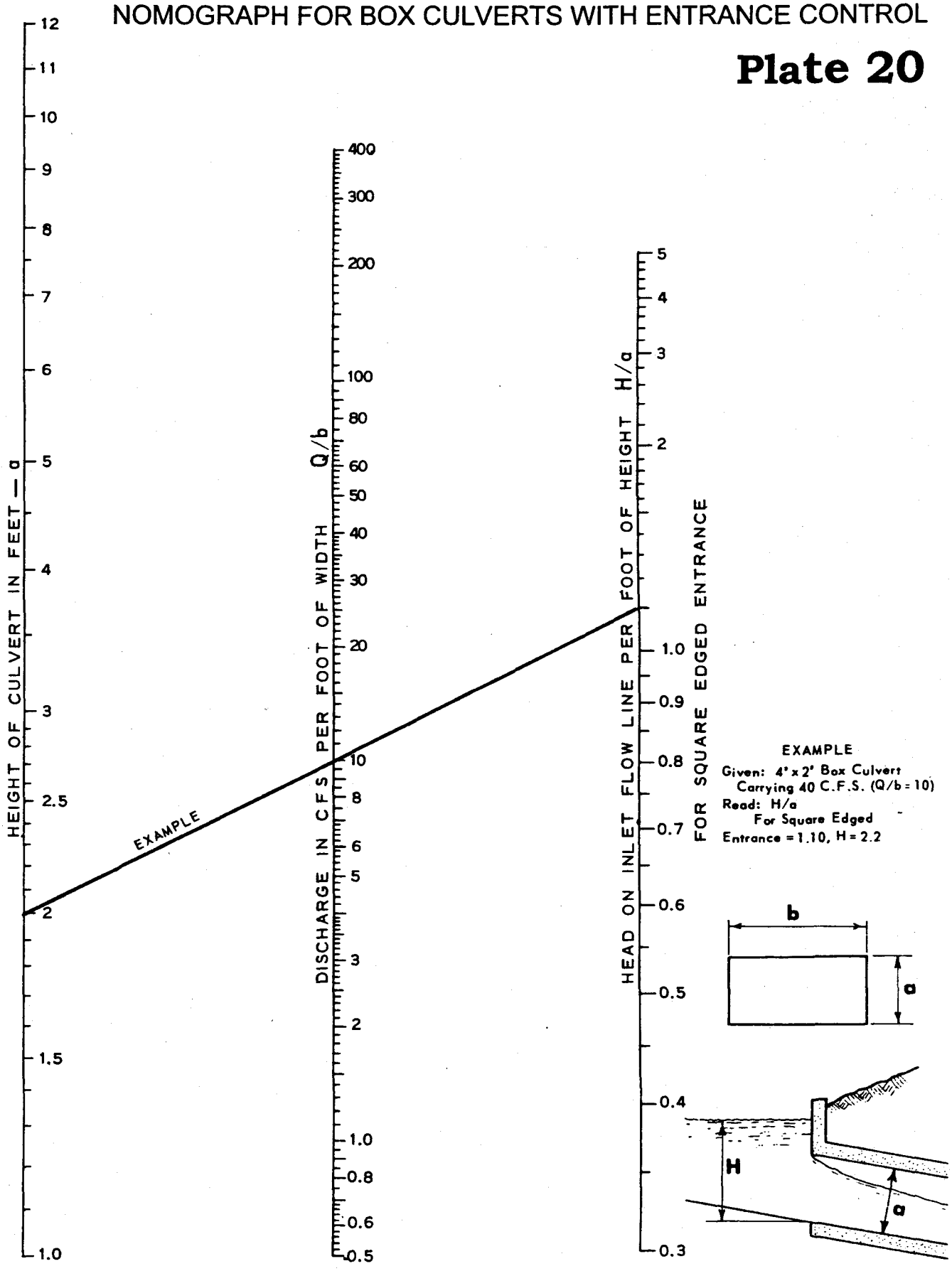
Plate 19



SOURCE: HANDBOOK OF CONCRETE CULVERT PIPE HYDRAULICS

NOMOGRAPH FOR BOX CULVERTS WITH ENTRANCE CONTROL

Plate 20



§1-5 SECTION II – STANDARDS FOR STORM WATER QUALITY

In response to the requirements of the City's NPDES permit, the City Council passed Ordinance 96-34 addressing the need to regulate storm runoff design criteria for flood control and water quality. This includes establishing controls on the timing and rate of discharge of storm water runoff to reduce storm water runoff pollution to the maximum extent practicable through the implementation of best management practices and engineering control facilities designed to reduce the generation of pollutants.

Long-term water quality is impacted by the volume and frequency of discharged pollutants.

Water quality is also impacted by the modification of a stream's hydrograph caused by increases in flows and durations that result when land is developed (e.g., made more impervious). This phenomenon known as hydromodification, effectively reduces stream base-flow (groundwater flow into streams) and increases overland or storm-flow which causes reduced groundwater recharge and increased peak discharge rates into streams. Hydromodification may result in stream channel instability, streambank or shoreline erosion, loss of habitat, increased sediment transport and deposition, and increased flooding. Consequently, water quality measures for a development should also be designed to include LID BMPs to manage and control hydromodification.

§1-5.1 PART I - WATER QUALITY CRITERIA

A. OBJECTIVES OF WATER QUALITY CRITERIA

The purpose of the water quality criteria is to reduce the pollution associated with storm water runoff from new development and redevelopment. By establishing these criteria, the City and County of Honolulu is satisfying Federal regulatory requirements to control the discharge of pollutants in storm water as specified in the Clean Water Act Amendments of 1987 and its NPDES permit for discharges from the Municipally Owned and Operated Separate Storm Sewer System issued by the Hawaii Department of Health (DOH) under the authority by the United States Environmental Protection Agency (EPA). Under the NPDES program, the City is required to reduce the discharge of pollutants to receiving waters to the "maximum extent practicable" (MEP).

B. REQUIREMENT APPLICABILITY

1. DEVELOPMENT AND REDEVELOPMENT INCLUDED

Applicable new development and redevelopment projects as defined in B.2a of §1-5.1 Part I Water Quality Criteria must address storm water quality to the MEP through the use of Low Impact Development (LID) Site Design Strategies, Source Control Best Management Practices (BMPs), LID Post-Construction Treatment Control BMPs, and Other Post-Construction Treatment Control BMPs.

For redevelopment projects, the requirements presented in B.6 of §1-5.1 Part I Water Quality Criteria apply only to the addition, and not to the entire development. Redevelopment includes, but is not limited to expansion of a building footprint; addition to or replacement of a structure; replacement of an impervious surface that is

not part of a routine maintenance activity; land disturbing activities related to structural or impervious surfaces. Redevelopment does not include routine maintenance activities that are conducted to maintain original hydraulic capacity, original purpose of facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways which does not disturb additional area is considered a routine maintenance activity. Redevelopment does not include the repaving of existing roads.

Projects cannot be subdivided or phased to avoid complying with these requirements. Development and redevelopment of the same or adjacent property (ies) permitted within 5 years may be considered together for purposes of assessing the above criteria. The sizing of water quality facilities and drainageways shall be based upon the ultimate use of the drainage area, unless the water quality feature will be re-built/sized during subsequent phases of construction.

2. REGULATED PROJECTS

For purposes of meeting the objectives presented in A of §1-5.1 Part I Water Quality Criteria, projects shall be regulated as follows[1]:

a. Priority A Projects. New development and redevelopment projects that disturb at least 1 acre of land and that are not required to obtain a separate industrial NPDES storm water permit from DOH for long term storm water discharges. Projects at least 5 acres in size are classified as A1, and all others are classified as A2.

b. Priority B Projects. New development and redevelopment projects that do not meet the criteria of a Priority A project but meet any of the following criteria:

   1) Retail Gasoline Outlet with at least 10,000 square feet of total impervious surface area;

   2) Automotive Repair Shop with at least 10,000 square feet of total impervious surface area;

   3) Restaurant with at least 10,000 square feet of total impervious surface area;

   4) Parking lot with at least 10,000 square feet of total impervious surface area

   Impervious surfaces include, but are not limited to, rooftops; walkways; patios; driveways; parking lots; storage areas; impervious concrete and asphalt; and any other continuous watertight pavement or covering. Landscaped soil and pervious pavement, underlain with pervious soil or pervious storage material, are not impervious surfaces.

3. PROJECT APPLICABILITY

These rules shall be effective as of June 1, 2013. The Director may exempt projects from the application of these rules if projects are determined to have submitted

[1] Criteria for Regulated Projects may be revised as necessary by the Department (as described in B.7 of §1-5.1 Part I Water Quality Criteria)

completed construction drawings and completed site-specific drainage reports prior to June 1, 2013.

4. OFF-SITE RUNOFF APPLICABILITY

   These criteria are required to be applied to runoff arising from a site and not from off-site runoff, unless the off-site runoff is entering the site as overland flow, and/or will not be separated from on-site runoff. If off-site runoff is to be conveyed through a water quality facility, then the facility must be designed to meet the requirements as described below for the combined on-site and off-site runoff volumes and/or rates.

5. JURISDICTIONAL APPLICABILITY

   These requirements apply to projects that drain to City and County drainage facilities and all natural drainage ways that the City and County has ownership and/or responsibility for. Developments that are located in areas that do not drain to the above facilities may be required to meet other DOH requirements.

6. MANAGEMENT PRACTICES TO MEET CRITERIA

   a. Priority A1 Projects

      The criteria shall be met for Priority A1 projects as follows:

      i. Incorporate appropriate LID Site Design Strategies to the MEP.

      ii. Incorporate appropriate Source Control BMPs to the MEP.

      iii. Unless determined to be infeasible, retain on-site by infiltration or evapotranspiration, the Water Quality Volume or "WQV" with appropriate LID Retention Post-Construction Treatment Control BMPs. The WQV is defined in A of §1-5.2 Part II, Water Quality Design Standards.

      iv. Unless determined to be infeasible, biofilter any portion of the Water Quality Volume that is not retained on-site with appropriate LID Biofiltration Post-Construction Treatment Control BMPs.

      "Infeasible" means conditions at the site make the implementation of a specific Low Impact Development Best Management Practice technically infeasible. Infeasibility criteria are defined in E of §1-5.2 Part II, Water Quality Design Standards. If it is demonstrated to be infeasible to retain and/or biofilter the Water Quality Volume, one of the following alternative compliance measures is required:

      - Either harvest/reuse, or treat (by detention, filtration, settling, or vortex separation) and discharge with appropriate Other Post-Construction Treatment Control BMPs, any portion of the Water Quality Volume that is not retained on-site or biofiltered.

      - Retain or biofilter at an offsite location, the volume of runoff equivalent to the difference between the project's WQV and the amount retained on-site or biofiltered. Offsite mitigation projects must be submitted for City approval.

b. Priority A2 Projects

The criteria shall be met for Priority A2 projects as follows:

i. Incorporate appropriate LID Site Design Strategies to the MEP.

ii. Incorporate appropriate Source Control BMPs to the MEP.

iii. Unless determined to be infeasible, either retain on-site by infiltration or evapotranspiration, the Water Quality Volume with appropriate LID Retention Post-Construction Treatment Control BMPs, or biofilter the Water Quality Volume with appropriate LID Biofiltration Post-Construction Treatment Control BMPs, or a combination of the two.

Infeasibility criteria are defined in E of §1-5.2 Part II, Water Quality Design Standards. If it is demonstrated to be infeasible to retain and/or biofilter the Water Quality Volume, one of the following alternative compliance measures is required:

- Either harvest/reuse, or treat (by detention, filtration, settling, or vortex separation) and discharge with appropriate Other Post-Construction Treatment Control BMPs, any portion of the Water Quality Volume that is not retained on-site or biofiltered.
- Retain or biofilter at an offsite location, the volume of runoff equivalent to the difference between the project's WQV and the amount retained on-site or biofiltered. Offsite mitigation projects must be submitted for City approval.

c. Priority B Projects

The criteria shall be met for Priority B projects as follows:

i. Consider appropriate LID Site Design Strategies.

ii. Incorporate appropriate Source Control BMPs to the MEP.

Documents providing details and recommendations on LID Site Design Strategies, Source Control BMPs, and Treatment Control BMPs may be found on the City's website.

7. ADDITIONAL REQUIREMENTS

The criteria identified in B.6 of §1-5.1 Part I, Water Quality Criteria are minimum requirements. If the department determines that additional controls and/or lower thresholds for developments are required to meet the specific water quality needs in watersheds that drain to sensitive receiving waters (as defined by the Hawaii State Department of Health Water Quality Limited Segments [WQLS], or Class 1 Inland Waters, or Class AA Marine Waters), additional requirements may be imposed. These may include design requirements that result in larger facilities as well as additional types of structural or non-structural controls. The design solution will be contingent upon the pollutants that are found to be impacting such water bodies and the regulatory status of the water body.

8. DEDICATION OF FACILITIES TO CITY AND COUNTY

   Water Quality facilities may be dedicated to the City. Application for dedication to the City must be approved prior to preparing subdivision maps and construction plans.

9. WATER QUALITY FACILITIES WITHIN PARKS

   Parks may be utilized to satisfy water quality facility requirements, with concurrence of the appropriate City agencies, if such parks meet the intent and requirements of the park dedication ordinance and rules.

10. STORM WATER QUALITY FACILITIES REVIEW

    The incorporation of storm water quality considerations is encouraged early in the development process as early design considerations will likely lead to more cost-effective projects. Storm water quality management strategies for Priority A1 projects shall be documented in a Storm Water Quality Report (SWQR). Storm water quality management strategies for Priority A2 and Priority B projects shall be documented in a Storm Water Quality Checklist (SWQC). A Storm Water Quality Report Preparation Manual, Storm Water Quality Checklist Preparation Manual, Storm Water Quality Report Template, and Storm Water Quality Checklist Templates may be found on the City's website to assist with and facilitate the preparation of SWQRs and SWQCs.

    a. Submittal Requirements

       Storm Water Quality Reports or Storm Water Quality Checklists shall be submitted for City review as follows:

       1) For Priority A1 and Priority A2 projects, the project's Storm Water Quality Report or Storm Water Quality Checklist shall accompany construction plan approvals.

       2) For Priority B projects, the project's Storm Water Quality Checklist shall accompany applications for applicable building and grading permits.

       A narrative explaining the project's water quality management strategy must be included in the project's Master Plan, discretionary land use permit, or Environmental Assessment/Environmental Impact Statement.

       Storm Water Quality Reports and Storm Water Quality Checklists shall be signed by the owner/developer certifying that the management practices will be implemented and maintained, and signed and stamped by a Professional Engineer licensed and registered to practice in the state of Hawaii, stating that the management practices are in accordance with these Rules and are consistent with the information presented in the construction plans.

11. MAINTENANCE

    All storm water quality facilities, including those constructed offsite per B.6 of §1-5.1 Part I, will require regular maintenance by the owner/developer or authorized representative to ensure they operate as designed and to prevent resuspension of previously captured particles. Necessary information, such as inspection/maintenance

frequencies, activities, and responsible individuals shall be documented in the Storm Water Quality Report or Storm Water Quality Checklist as applicable. In addition to regular maintenance, annual inspections must be performed for all Post-Construction BMPs by the owner/developer or authorized representative, including inspection and performance of any required maintenance in the late summer/early fall, prior to the start of the rainy season. A log of inspection and maintenance activities must be kept for a minimum of 5 (five) years and be made available to the City upon request.

For facilities that will be dedicated to the City, the City reserves the right to alter the maintenance plan to conform to its practices.

§1-5.2 PART II - WATER QUALITY DESIGN STANDARDS

A. VOLUME BASED STORM WATER QUALITY CONTROL FACILITIES

Volume based storm water quality facilities include Infiltration Basins, Infiltration Trenches, Subsurface Infiltration Systems, Dry Wells, Bioretention Basins, Permeable Pavement, Green Roofs, Vegetated Bio-Filters, Enhanced Swales, Detention Basins, and Sand Filters.

Volume based storm water quality facilities shall be sized as determined in B.6 of §1-5.1 Part I, Water Quality Criteria. The WQV is calculated as follows:

$$\boldsymbol{WQV = PCA \times 3630}$$

Where:
- WQV = water quality volume (cubic feet)
- P = design storm runoff depth (inches)
- C = volumetric runoff coefficient
- A = total drainage area (acres)

A design storm runoff depth of 1 inch shall be used. The volumetric runoff coefficient shall be calculated using the following equation as developed by EPA for smaller storms in urban areas:

$$\boldsymbol{C = 0.05 + 0.009I}$$

Where:
- C = volumetric runoff coefficient
- I = percent of impervious cover, expressed as a percentage

Infiltration Basin. An infiltration basin is a shallow impoundment with no outlet, where storm water runoff is stored and infiltrates through the basin invert and into the soil matrix. Infiltration Basins shall have a flat invert, interior side slopes (length per unit height) no steeper than 3:1 unless approved by a licensed professional engineer with geotechnical expertise, and at least 3 feet from the basin invert to the seasonally high groundwater table. The soil infiltration rate below the basin invert shall be at least 0.5 inches per hour, and drain completely in 48 hours.

Infiltration Trench. An infiltration trench is a rock-filled trench with no outlet, where storm water runoff is stored in the void space between the rocks and infiltrates through the bottom and into the soil matrix. Infiltration Trenches shall have no more than 6 inches of a top backfill layer, no more than 12 inches of a bottom sand layer, and 1.5-3.0 inch diameter trench rock. The soil infiltration rate below the trench invert shall be at least 0.5 inches per hour, the depth from the trench invert to the seasonally high groundwater table shall be at least 3 feet, and the trench shall completely drain in 48 hours. The depth of the infiltration trench shall not exceed the greater of the trench width and trench length to avoid classification as a Class V injection well.

Subsurface Infiltration System. A subsurface infiltration system is a rock (or alternative pre-manufactured material) storage bed below other surfaces such as parking lots, lawns and playfields for temporary storage and infiltration of runoff. In addition to applicable manufacturer's guidelines, the soil infiltration rate below the system invert shall be at least 0.5 inches per hour, the depth from the system invert to the seasonally high groundwater table shall be at least 3 feet, and the system shall completely drain in 48 hours. The depth of the subsurface infiltration system storage bed shall not exceed the greater of the storage bed's width and storage bed's length to avoid classification as a Class V injection well.

Dry Well. A dry well is a subsurface aggregate-filled or prefabricated perforated storage facility, where roof runoff is stored and infiltrates into the soil matrix. The soil infiltration rate below the dry well invert shall be at least 0.5 inches per hour, the depth from the dry well invert to the seasonally high groundwater table shall be at least 3 feet, and the dry well shall completely drain in 48 hours. If the dry well is aggregate-filled, 1.0-3.0 inch aggregate shall be used unless an alternative is approved by a licensed professional engineer with geotechnical expertise. The depth of the dry well shall not exceed the diameter to avoid classification as a Class V injection well.

Bioretention Basin. Sometimes referred to as a Rain Garden, a Bioretention Basin is an engineered shallow depression that collects and filters storm water runoff using conditioned planting soil beds and vegetation. The filtered runoff infiltrates through the basin invert and into the soil matrix. Bioretention Basins shall have a flat invert, interior side slopes (length per unit height) no steeper than 1:1 for single family residential installations and no steeper than 3:1 for all other installations unless approved by a licensed professional engineer with geotechnical expertise, and at least 3 feet from the basin invert to the seasonally high groundwater table. The ponding depth shall be no greater than 12 inches, the mulch thickness shall be 2-4 inches, and the planting soil depth shall be 2-4 feet. The soil infiltration rate below the basin invert shall be at least 0.5 inches per hour, and the basin shall drain completely in 48 hours.

Permeable Pavement. Sometimes referred to as pervious pavement or porous pavement, permeable pavement refers to any porous, load-bearing surface that allows for temporary rainwater storage in an underlying aggregate layer until it infiltrates into the soil matrix. It includes pervious concrete, porous asphalt, interlocking paver blocks, and reinforced turf and gravel filled grids. Permeable pavement shall have a reservoir layer no thicker than 3 feet and have at least 3 feet from the reservoir invert to the seasonally high groundwater table. The soil beneath the reservoir layer invert shall have an infiltration

rate of at least 0.5 inches per hour, and the reservoir layer shall drain completely in 48 hours.

Green Roof. Sometimes referred to as a Vegetated Roof or Eco-roof, a green roof is a roof that is entirely or partially covered with vegetation and soils for the purpose of filtering, absorbing, evapotranspirating, and retaining/ detaining the rain that falls upon it. Green roofs shall have a slope no greater than 20 percent, at least 2 inches of soil media, and at least 2 inches of drainage layer.

Vegetated Bio-Filter. Sometimes referred to as a Bioretention Filter, Stormwater Curb Extension, or Planter Box, a Vegetated Bio-Filter is an engineered shallow depression that collects and filters storm water runoff using conditioned planting soil beds and vegetation. The filtered runoff discharges through an underdrain system. Vegetated Bio-Filters shall have a relatively flat invert, the ponding depth shall be no greater than 12 inches, the mulch thickness shall be 2-4 inches, and the planting soil depth shall be 2-4 feet. The planting soil shall have a coefficient of permeability equal to at least 1.0 foot per day, and the WQV shall drain completely in 48 hours.

Enhanced Swale. Sometimes referred to as a Bioretention Swale or Dry Swale, an Enhanced Swale is a shallow linear channel with a planting bed and covered with turf or other surface material (other than mulch or plants). Runoff filters through a planting bed, is collected in an underdrain system, and discharged at the downstream end of the swale. Enhanced Swales shall have interior side slopes (length per unit height) no steeper than 3:1 unless approved by a licensed professional engineer with geotechnical expertise, a bottom width between 2-8 feet, and a longitudinal slope no greater than 2 percent without check dams or 5 percent with check dams. If used, check dams shall be no higher than 12 inches. The maximum ponding depth is 18 inches and the minimum media depth is 18 inches.

Detention Basin. Sometimes referred to as a Dry Extended Detention Basin, a detention basin is a shallow man-made impoundment intended to provide for the temporary storage of storm water runoff to allow particles to settle. It does not have a permanent pool and is designed to drain between storm events. Detention Basins shall have an invert sloped between 1-2 percent, interior side slopes (length per unit height) no steeper than 3:1 unless approved by a licensed professional engineer with geotechnical expertise, a minimum length to width ratio of 2 to 1, and a maximum depth of 8 feet. With outlets no smaller than 4 inches in diameter, the basin shall drain completely in 48 hours when full and 24-36 hours when half full.

Sand Filter. A sand filter is an open chambered structure that captures, temporarily stores, and treats storm water runoff by passing it through an engineered media (e.g., sand). Sand filter beds shall have at least 18 inches of sand with a coefficient of permeability of at least 3.5 feet per day, and shall drain completely in 48 hours.

B. FLOW BASED STORM WATER QUALITY CONTROL FACILITIES

Flow-through based storm water quality facilities include Vegetated Swales, Vegetated Filter Strips, and Manufactured Treatment Devices.

Flow-through based storm water quality facilities shall be sized for the Water Quality Flow Rate (WQF), which is calculated using the Rational Formula as follows:

$$\boldsymbol{WQF = CiA}$$

Where: WQF = water quality flow rate (cubic feet per second)
C = runoff coefficient
i = peak rainfall intensity (inches per hour)
A = total drainage area (acres)

A peak rainfall intensity of 0.4 inches per hour shall be used. The runoff coefficient shall be determined from Table 4. The runoff coefficient shall be, at a minimum, the midpoint of the given range of values. The higher value shall be used if soil conditions indicate that pervious areas will have little infiltration/interception potential.

For drainage areas containing multiple land uses the following formula may be used to compute a composite weighted runoff coefficient:

$$\boldsymbol{C_c = \left(\sum_{i=1}^{n} C_i A_i\right) \Big/ A_t}$$

Where: C_c = composite weighted runoff coefficient
$C_{1,2,\ldots n}$ = runoff coefficient for each land use cover type
$A_{1,2,\ldots n}$ = drainage area of each land use cover type (acres)
A_t = total drainage area (acres)

The calculated WQF for Vegetated Swales and Vegetated Filter Strips may be reduced by 25% if the soil beneath the BMP is classified as Hydrologic Soils Group (HSG) "A" or "B", as reported by the USDA Natural Resources Conservation Service (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm), or if the soil beneath the BMP is amended by incorporating 6 inches of compost/amendments and tilled up to 8 inches.

Vegetated Swale. Sometimes referred to as a Grass Swale, Grass Channel, or Biofiltration Swale, a vegetated swale is a broad shallow earthen channel vegetated with erosion resistant and flood tolerant grasses. Runoff typically enters the swale at one end and exits at the other end. Vegetated Swales shall have interior side slopes (length per unit height) no steeper than 3:1 unless approved by a licensed professional engineer with geotechnical expertise, a bottom width no greater than 10 feet, and a water depth no greater than 4 inches. The velocity in the swale shall not exceed 1 foot per second, and the hydraulic residence time shall be at least 7 minutes.

Vegetated Buffer Strip. Sometimes referred to as a Vegetated Filter Strip or Biofiltration Strip, a vegetated buffer strip is a grassy slope vegetated with turf grass that is designed to accommodate sheet flow. They may remove pollutants by vegetative filtration. Vegetated Buffer Strips shall have a length (in the direction of flow) no less than 15 feet, the depth of flow shall not exceed 1 inch, and the velocity shall not exceed 1 foot per

second. The flow length of the tributary area discharging onto the strip shall not exceed 75 feet.

Manufactured Treatment Device. Sometimes referred to as hydrodynamic or vortex separators, a manufactured treatment device is a proprietary water quality structure utilizing settling, filtration, adsorptive/absorptive materials, vortex separation, vegetative components, or other appropriate technology to remove pollutants from storm water runoff. These devices must provide a TSS removal rate of 80%, verified by a Technology Acceptance and Reciprocity Partnership (TARP) state or other third party testing organization, provided that such verification is conducted in accordance with the protocol "Stormwater Best Management Practices Demonstration Tier II Protocol for Interstate Reciprocity" (which may be found at http://www.dep.state.pa.us/dep/deputate/pollprev/techservices/tarp/).

C. AREA BASED STORM WATER QUALITY CONTROL FACILITIES

Area based storm water quality facilities include Downspout Disconnection.

Downspout Disconnection. Sometimes referred to as Rooftop Disconnection or Downspout Dispersion, is the redirection of roof runoff to a vegetated area in a dispersed manner. Downspout disconnection facilities shall be sized such that the size of the vegetated area receiving the roof runoff is at least 10% of the size of the roof area that drains to the downspout, or the flow path of the vegetated area receiving the roof runoff is at least as long as the flow path of the roof area that drains to the downspout.

D. DEMAND BASED STORM WATER QUALITY CONTROL FACILITIES

Demand based storm water quality facilities include Harvesting / Reuse.

Harvesting/Reuse. Sometimes referred to as Capture/Reuse or Rainwater Harvesting, is the collection and temporary storage of roof runoff in rain barrels or cisterns for subsequent non-potable outdoor use (landscape irrigation, vehicle washing). Harvesting / Reuse facilities shall be sized such that at least 80% of the total annual runoff is captured, and at least 80% of the total annual reuse demand is met.

E. INFEASIBILITY CRITERIA

Table 5 lists exemption criteria for Low Impact Development (LID).

[Eff: June 1, 2013] (Auth: Sec 14-12.31, ROH) (Imp: Sec14-12.31, ROH)

TABLE 4: RUNOFF COEFFICIENTS FOR WATER QUALITY FLOW CALCULATIONS

Type of Drainage Area	Runoff Coefficient
Business	
Downtown areas	0.70 – 0.95
Neighborhood areas	0.50 – 0.70
Residential	
Single-family areas	0.30 – 0.50
Multi-units, detached	0.40 – 0.60
Multi-units, attached	0.60 – 0.75
Suburban	0.25 – 0.40
Apartment dwelling areas	0.50 – 0.70
Industrial	
Light areas	0.50 – 0.80
Heavy areas	0.60 – 0.90
Parks, cemeteries	0.10 – 0.25
Playgrounds	0.20 – 0.40
Railroad yards	0.20 – 0.35
Unimproved areas	0.10 – 0.30
Lawns	
Sandy soil, flat, ≤ 2%	0.05 – 0.10
Sandy soil, average 2-7%	0.10 – 0.15
Sandy soil, steep ≥ 7%	0.15 – 0.20
Heavy soil, flat, ≤ 2%	0.13 – 0.17
Heavy soil, average 2-7%	0.18 – 0.22
Heavy soil, steep ≥ 7%	0.25 – 0.35
Streets	
Asphaltic	0.70 – 0.95
Concrete	0.70 – 0.95
Brick	0.75 – 0.85
Drives and walks	0.75 – 0.95
Roofs	0.75 – 0.95

TABLE 5: EXEMPTION CRITERIA FOR LOW IMPACT DEVELOPMENT

Exemption Criteria	Infiltration Basin	Infiltration Trench	Subsurface Infiltration	Dry Well	Bioretention Basin	Permeable Pavement
Soils beneath basin invert have measured infiltration rates less than 0.5 in/hr	●	●	●	●	●	●
Unable to maintain a distance of at least 3 ft from BMP invert to seasonally high groundwater table	●	●	●	●	●	●
Site has known man-made plumes or contaminated soils	●	●	●	●	●	●
Site has high potential for concentrated pollutant/chemical spills	●	●	●	●	●	●
Site is up-gradient of ephemeral streams (i.e. habitat type change downstream)	●	●	●	●	●	●
Site is up-gradient of known shallow landslide-prone area	●	●	●	●	●	●
Unable to maintain a distance of at least 50 ft to the nearest groundwater well used for drinking water	●	●	●	●	●	●
Unable to maintain a distance of at least 35 ft to the nearest septic system	●	●	●	●	●	●
Unable to maintain a distance of at least 20 ft to the nearest building foundation	●	●	●		●	
Unable to maintain a distance of at least 10 ft to the nearest building foundation				●		
Unable to maintain a distance of at least 100 ft to the nearest down-gradient building foundation	●	●	●	●	●	
Unable to maintain a distance of at least 10 ft to the nearest property line	●	●	●	●	●	
Unable to divert flows in excess of WQDS around BMP, and unable to create safe overflow mechanism for flows in excess of WQDS	●	●	●		●	
Excavation would disturb iwi kupuna or other archaeological resources	●	●	●		●	
Site has high potential for oil and/or grease spills						●
Site has high potential to receive sand and/or sediment loads						●
Unable to maintain a pavement slope no greater than 5%						●
Pavement would be above a utility vault						●
Pavement is expected to receive more than 1,000 average daily trips						●
Other justification for an exemption proposed by the developer/agent and is acceptable to the City	●	●	●	●	●	●

TABLE 5: EXEMPTION CRITERIA FOR LOW IMPACT DEVELOPMENT (continued)

Exemption Criteria	Vegetated Bio-Filter	Green Roof	Enhanced Swale	Downspout Disconnect	Vegetated Swale	Vegetated Filter Strip	Tree Box Filter
Unable to divert flows in excess of WQDS around BMP, and unable to create safe overflow mechanism for flows in excess of WQDS	●		●		●	●	
Excavation would disturb iwi kupuna or other archaeological resources	●		●		●	●	●
Invert of underdrain layer is below seasonally high groundwater table	●		●				
Site does not receive enough sunlight to support vegetation	●				●	●	
Site lacks sufficient hydraulic head to support BMP operation by gravity	●		●				●
Roof is for a single family residential dwelling		●					
Space is unavailable due to renewable energy, electrical, and mechanical systems		●					
Slope on roof exceeds 20% (11 degrees)		●					
Slope of receiving vegetated area exceeds 5%				●			
Diverted runoff drains within 10 feet of a retaining wall				●			
Diverted runoff drains within 10 feet of property line				●			
Concentrated flow cannot be established naturally					●		
Sheet flow cannot be established naturally						●	
Entrance at surface not possible							●
Residential and no planting strip							●
No curb and gutter							●
Other justification for an exemption proposed by the developer/agent and is acceptable to the City	●	●	●	●	●	●	●

● denotes that the BMP is considered infeasible if the exemption criteria is applicable

[Eff: June 1, 2013] (Auth: Sec 14-12.31, ROH) (Imp: Sec14-12.31, ROH)

§1-6 REPEAL

The City and County of Honolulu's Storm Drainage Standards, revised printing dated May 1988, is repealed in its entirety.

[Eff: JAN 01 2000 *] (Auth: Sec 14-12.31, ROH) (Imp: Sec14-12.31, ROH)*

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

These rules were adopted on October 4, 1999, following public hearing held on July 23, 1999, after public notice was given on June 21, 1999, in the Hawaii State and County Public Notices, Honolulu City and County.

These rules shall take effect on January 1, 2000.

JAN NAOE SULLIVAN
Director
Department of Planning and Permitting

APPROVED:

JEREMY HARRIS ACTING MAYOR
Mayor
City and County of Honolulu

Dated: October 18, 1999

APPROVED AS TO FORM
AND LEGALITY:

Deputy Corporation Counsel

FILED:

Given unto my hand and affixed with the
Seal of the City and County of Honolulu this
19th day of October, 1999.

GENEVIEVE G. WONG, City Clerk

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

These amendments to the rules were adopted on November 27, 2010, following a public hearing held on November 17, 2010, after public notice was given on October 14, 2010, in the Hawaii State and County Public Notices, Honolulu City and County.

These amendments to the rules shall take effect on May 1, 2011.

DAVID K. TANOUE
Director
Department of Planning and Permitting

APPROVED:

PETER B. CARLISLE
Mayor
City and County of Honolulu

Dated: MAR 16 2011

APPROVED AS TO FORM
AND LEGALITY:

Corporation Counsel

FILED

Given unto my hand and affixed with the
Seal of the City and County of Honolulu this
29 day of March, 2011.

BERNICE K. N. MAU, City Clerk

These amendments to the rules were adopted on December 12, 2012, following a public hearing held on November 27, 2012, after public notice was given on October 26, 2012, in the Hawaii State and County Public Notices, Honolulu City and County.

These amendments to the rules shall take effect on June 1, 2013.

JIRO A. SUMADA
Acting Director
Department of Planning and Permitting

APPROVED:

PETER B. CARLISLE
Mayor
City and County of Honolulu

Dated: 12/28/12

APPROVED AS TO FORM
AND LEGALITY:

Deputy Corporation Counsel

FILED:

Given unto my hand and affixed with the
Seal of the City and County of Honolulu this
02 day of January, 2013.

BERNICE K.N. MAU, City Clerk

Examples Illustrating Applications of Rules Relating to Storm Drainage Standards

FINAL

December 2012

By:
City and County of Honolulu
Department of Planning and Permitting

E Mālama I Ka Wai Ola
Protect our waters...
FOR LIFE

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A. Introduction

This booklet contains examples, which are intended to illustrate some of the more important aspects of the application of the "Rules Relating to Storm Drainage Standards" of the Department of Planning and Permitting, City and County of Honolulu. They are not intended to be complete examples of what must be submitted to the City and County of Honolulu. All designs must be completed per City and County requirements.

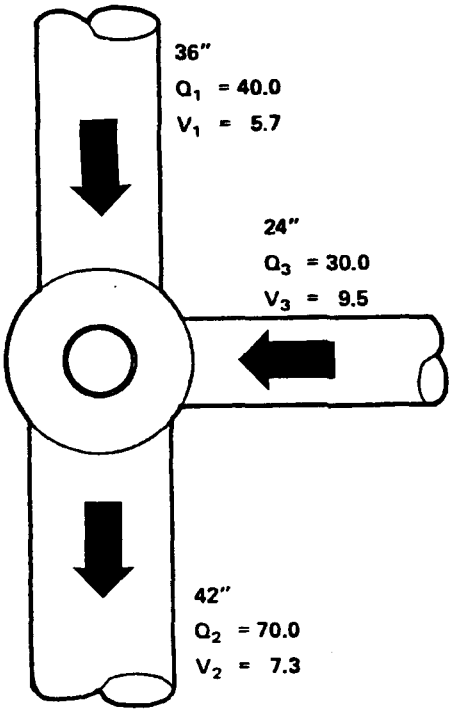
The information is brief and subject to change. The user is encouraged and invited to consult with the appropriate staff of the Department of Planning and Permitting for discussions on site-specific best management practices ("BMPs") and to consult with design guidance that has been developed by other agencies on the design of BMPs. For a list of other design guidance manuals, please consult the City and County of Honolulu, Department of Planning and Permitting.

B. Flood Control Design

Example #1: Analysis & Solution for Manhole Losses

NOTE: in lieu of the following analysis, an analysis based upon the Bernoulli's Energy Theorem, such as the pressure-momentum method, will be acceptable.

GIVEN: Pipe size, Q, pipe flowing full, velocity and direction of flow.



LEGEND

Q_1 = Upstream Volume, cfs
Q_2 = Downstream Volume, cfs
Q_3 = Incoming Volume, cfs
V_1 = Upstream Velocity, fps
V_2 = Downstream Velocity, fps
V_3 = Upstream Branch Velocity, fps
h = Head Loss, in ft.

SOLUTION

"A" LOSS (ENTRANCE & EXIT LOSS)

1. Determine higher velocity between V_1 and V_2
2. Use Curve **"A"** or **"C"** depending on pipe size and determine h_A (Ex. Prob. h_A = 0.15)

"B" LOSS (VELOCITY HEAD LOSS)

1. Use Curve **"B"** and determine h_V for V_1 and V_2

   a. If V_2 is lower than V_1, then h_B shall be **0**
   b. If V_2 is higher than V_1, then h_B shall be $h_{B_2} - h_{B_1}$

   Ex. Prob. $h_{B_2} = 0.83$ and $h_{B_1} = 0.50$
   $h_B = 0.83 - 0.50 = 0.33$

"C" LOSS (DIRECTIONAL CHANGE LOSS)

1. Use worst case and determine degree of bend.
2. With higher V_1 or V_2, use Curve **"C"** and determine head loss (**h**).

   a. For **0°** to **22½°** bends, h_C shall be **0.67** times **h.**
   b. For **22½°** to **45°** bends, h_C shall be **1.00** times **h.**
   c. For **45°** to **90°** bends, h_C shall be **2.00** times **h.**

   Ex. Prob. $h = 0.15$
   $h_C = 2 \times 0.15 = 0.30$

"D" LOSS (LOSS DUE TO INCOMING VOLUME)

1. Add total branch volume and determine ratio of branch volume to upstream volume.
2. Use appropriate curve and determine h_D with higher V_1 or V_3.

   Ex. Prob. $Q_3/Q_1 = 30/40 = 75\%$,
   $h_D = 0.56$

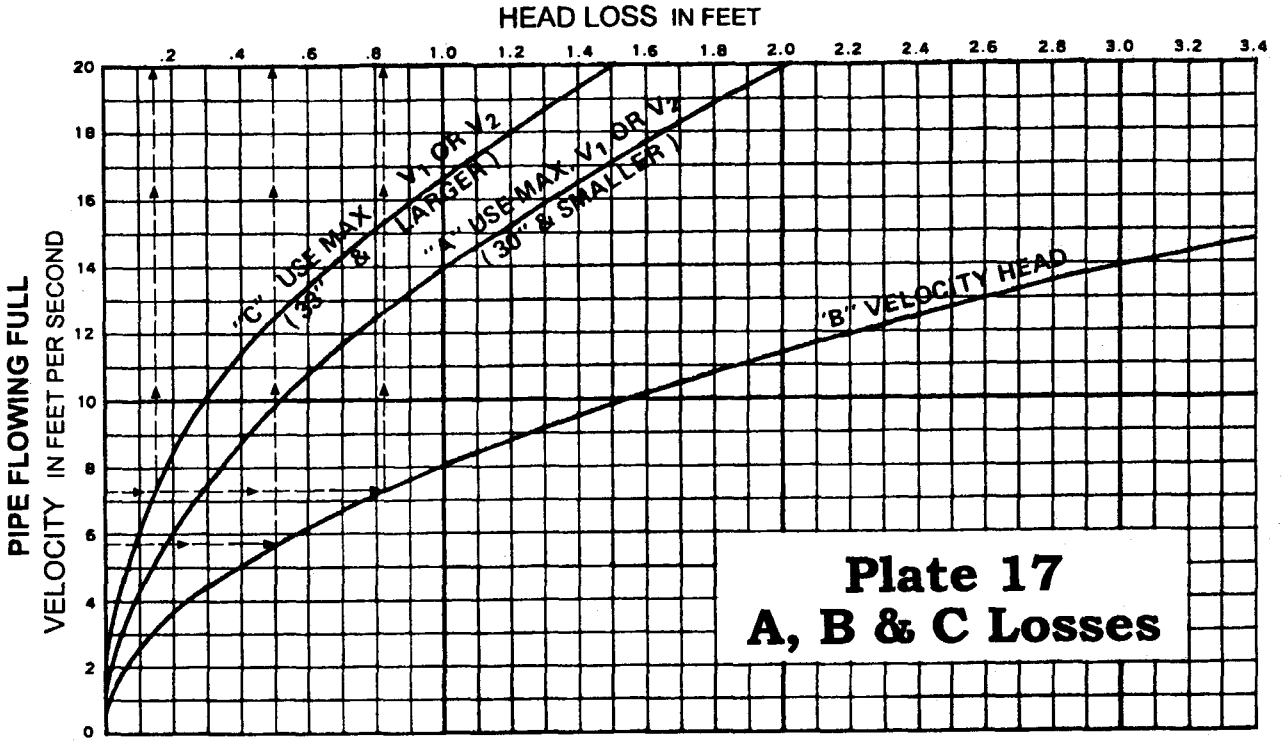
TOTAL LOSS:

1. Add h_A, h_B, h_C, and h_D

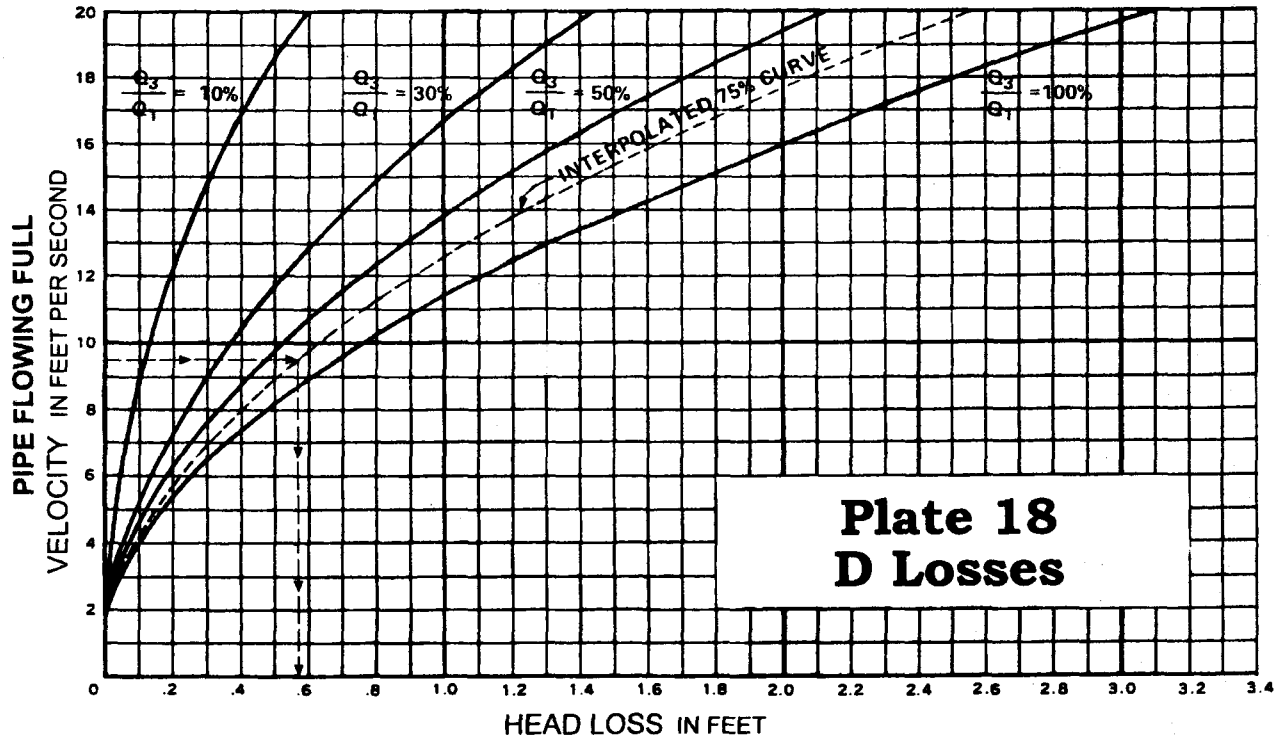
   Ex. Prob. $h_T = 0.15 + 0.33 + 0.30 + 0.56$
   $h_T = 1.34$

Losses

A		= 0.15
B	0.83 – 0.50	= 0.33
C	2(0.15)	= 0.30
D		= 0.56
Total Loss		= **1.34 ft.**



Head Losses in Manholes



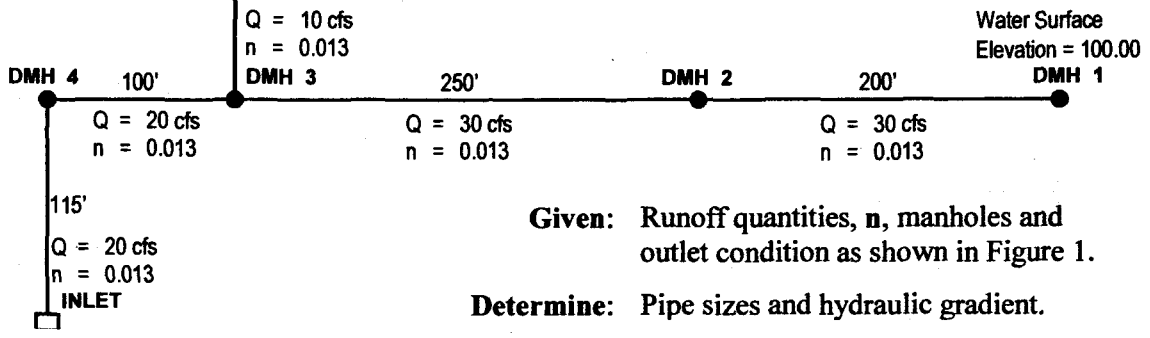
SOURCE: BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS

C. Flood Control Design

Example #2: Pipe System Analysis

Figure 1

EXAMPLE OF COMPUTATION



Given: Runoff quantities, **n**, manholes and outlet condition as shown in Figure 1.

Determine: Pipe sizes and hydraulic gradient.

SOLUTION

USE PLATES 8 TO 20 AS AID TO ANALYSIS.

Make preliminary determination of pipe sizes for the data given using pipe flow charts. This is shown in Figure 2.

Using the pipe sizes and slopes of pipes as determined above, compute hydraulic gradient for the system. This is shown in Figure 3.

1. Controlling grade at DMH1 is 100.00 as shown in Figure 3.

   Study conditions of flow between manholes or inlets to determine if entrance control or losses govern hydraulic gradient.

2. With the selected pipe size between DMH 1 and DMH 2, 24" diameter pipe at S = 0.010, compute the head loss in the pipe by the formula $h = SL$ or $h_f = S_fL$, whichever controls.

   h = elevation head loss
   h_f = friction head loss
   S = slope of pipe
   S_f = friction slope (used when pipe flowing full)
   L = length of the pipe or channel

   Since the pipe is flowing full, as determined by the pipe flow chart using 24" diameter, the friction slope 0.018 must be used. The head loss in the pipe is:

   $h_f = S_fL$
   $h_f = (0.018)\ (200) = 3.60$ feet

The downstream hydraulic gradient at DMH 2 is equal to the controlling grade at DMH 1 plus the head loss or

100.00 + 3.60 = 103.60

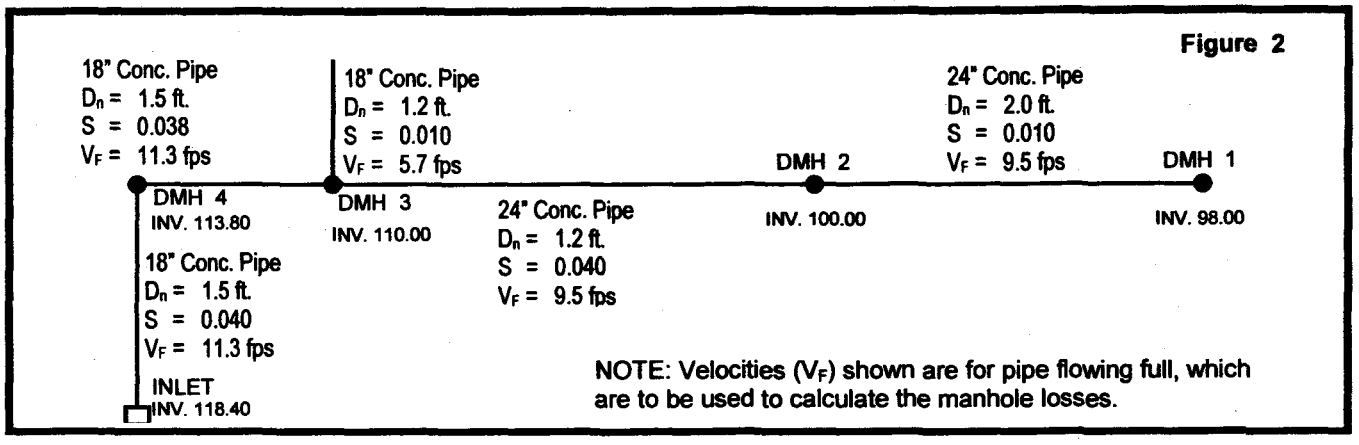


Figure 2

3. Since the pipe is flowing full, and there are no bends or drops, compute the upstream hydraulic gradient at DMH 2 by adding the manhole losses to the downstream hydraulic gradient at DMH 2. These values are obtained from charts on manhole losses. From the charts:

A = 0.47
B = 0.00 (since the velocities are equal)
C = 0.00
D = 0.00
0.47 ft. (Total DMH losses)

The upstream hydraulic gradient at DMH 2 is:

103.60 + 0.47 = 104.07

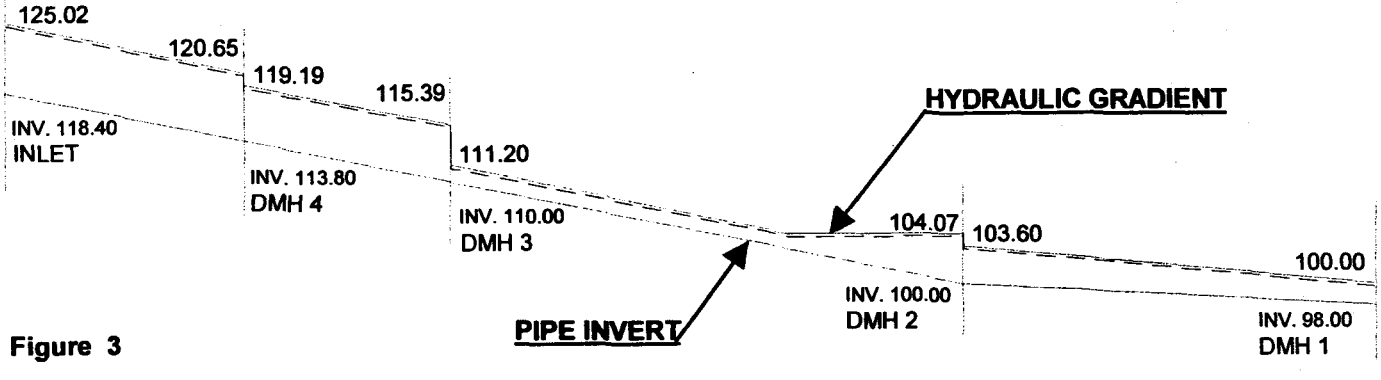


Figure 3

4. With the selected pipe size between DMH 2 and DMH 3, 24" diameter pipe at S = 0.040, compute the head loss elevation in the pipe:

   $h = SL$
   $h = (0.040)(250) = 10.00$ feet

   Since the pipe is not flowing full as determined by the pipe flow chart, the elevation head loss and the normal depth must be added to the invert of DMH 2. Therefore, the downstream hydraulic gradient at DMH 3 is

   100.00 + 10.00 + 1.20 = 111.20

5. Compute the upstream hydraulic gradient at DMH 3 by adding to the invert elevation the manhole losses and entrance control losses for open channel flow. Only manhole losses "C" and "D" need be considered.

   From the charts:

   C = 2(0.40) = 0.80 (90° Bend)
   D = 0.69
   1.49 ft. (Total DMH losses)

   Entrance control loss for Q = 30 cfs, D = 24" is:

   H/D = 1.95, From Plate 19
   H = 3.90 feet

   The upstream hydraulic gradient at DMH 3 is:

   110.00 + 1.49 + 3.90 = 115.39

6. With selected pipe size between DMH 3 and DMH 4, 18" diameter pipe at S = 0.038, compute the head loss in the pipe:

   $h_f = S_f L$
   $h_f = (0.038)(100) = 3.80$ feet

   The downstream hydraulic gradient at DMH 4 is:

   115.39 + 3.80 = 119.19

   since the tailwater condition of the pipe is submerged.

7. Since there is a bend greater than 10° at DMH 4, compare losses and use the higher HGL.

A = 0.66	**C = 0.80**
B = 0.00	**D = 0.00**
C = 0.80 (0.40 x 2)	**0.80**
D = 0.00	
1.46	

Entrance control loss for Q = 20 cfs, D = 18" is:

H/D = 3.0 From Plate 19
H = 4.50
119.19 + 1.46 = 120.65 > 113.80 + 4.50 + 0.80 = 119.10

The upstream hydraulic gradient at DMH 4 is 120.65.

8. Since the pipe is flowing full, the downstream hydraulic gradient at the inlet is determined by friction loss in the length of pipe.

$h_f = S_f L$
h_f = (0.038) (115) = 4.37 feet
120.65 + 4.37 = 125.02

Entrance control loss at the inlet for Q = 20 cfs, D = 18" is:

H/D = 3.0 From Plate 19
H = 4.50
118.40 + 4.50 = 122.90

Since the hydraulic gradient is higher, the top of headwall must be at least 125.02 + 1 foot = 126.02.

Adjust pipe sizes if warranted by the hydraulic gradient as computed above.

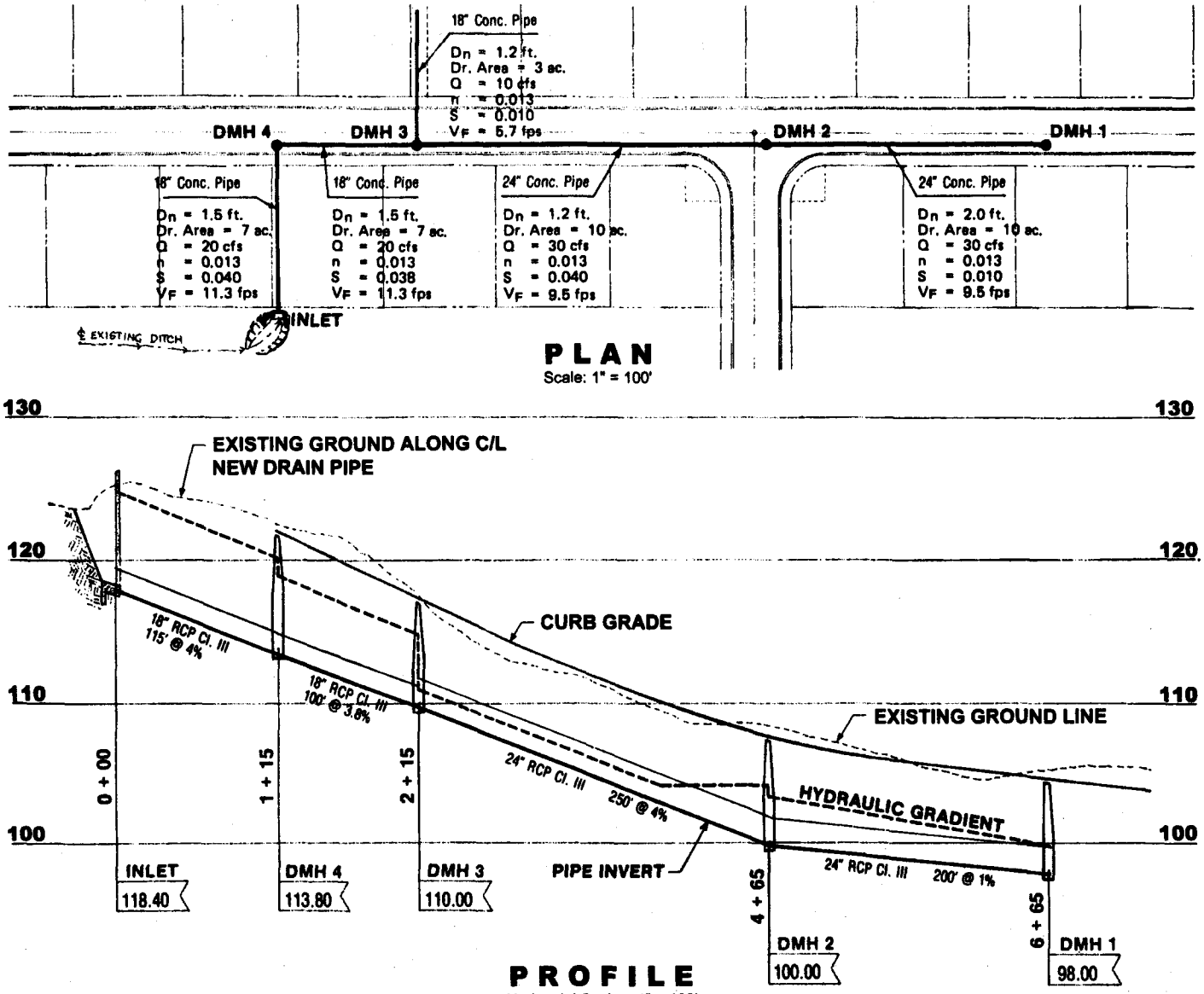
PROJECT: XYZ Subdivision
DRAIN LINE A

DRAINAGE DESIGN DATA

DATE: 10/28/85
COMPUTED BY: TM
CHECKED BY: LW

Inlet	T_c	C	I / i	Drain Area	Q Runoff / Accum. Q	d_n	V_F	Size of Pipe	Length of Seg.	S_f	S	Invert Elevation	H_f	Manhole Losses A	Manhole Losses B	Manhole Losses C	Manhole Losses D	Ent. Cont.	Hydraulic Grade Elev. Down	Hydraulic Grade Elev. Up	Finished Grade Elevation	Remark
DMH 1												98.00								100.00		
				10	30	2.0	9.5	24	200	.018	.010		3.60						103.60			
DMH2												100.00		.47	0	0	0	3.80		104.07		
				10	30	1.2	9.5	24	250	.018	.040		4.50						111.20			
DMH3												110.00		.66	0	.80	.69	3.90		115.39		
				7	20	1.5	11.3	18	100	.038	.038		3.80						119.19			
DMH 4												113.80		.66	0	.80	0	4.35		120.65		
				7	20	1.5	11.3	18	115	.038	.040		4.37						125.02			
INLET												118.40										

Suggested layout of tabulated computation form for DRAINAGE DESIGN DATA to be submitted for approval



Drainage Plan Showing Design Data to be Submitted on Drawing

EXAMPLE 1, 6.22 ACRE RESIDENTIAL DEVELOPMENT

A 6.22-acre site will be developed for the future construction of 22 single family residential houses. The site is divided into two drainage areas, as shown in Figure 1.

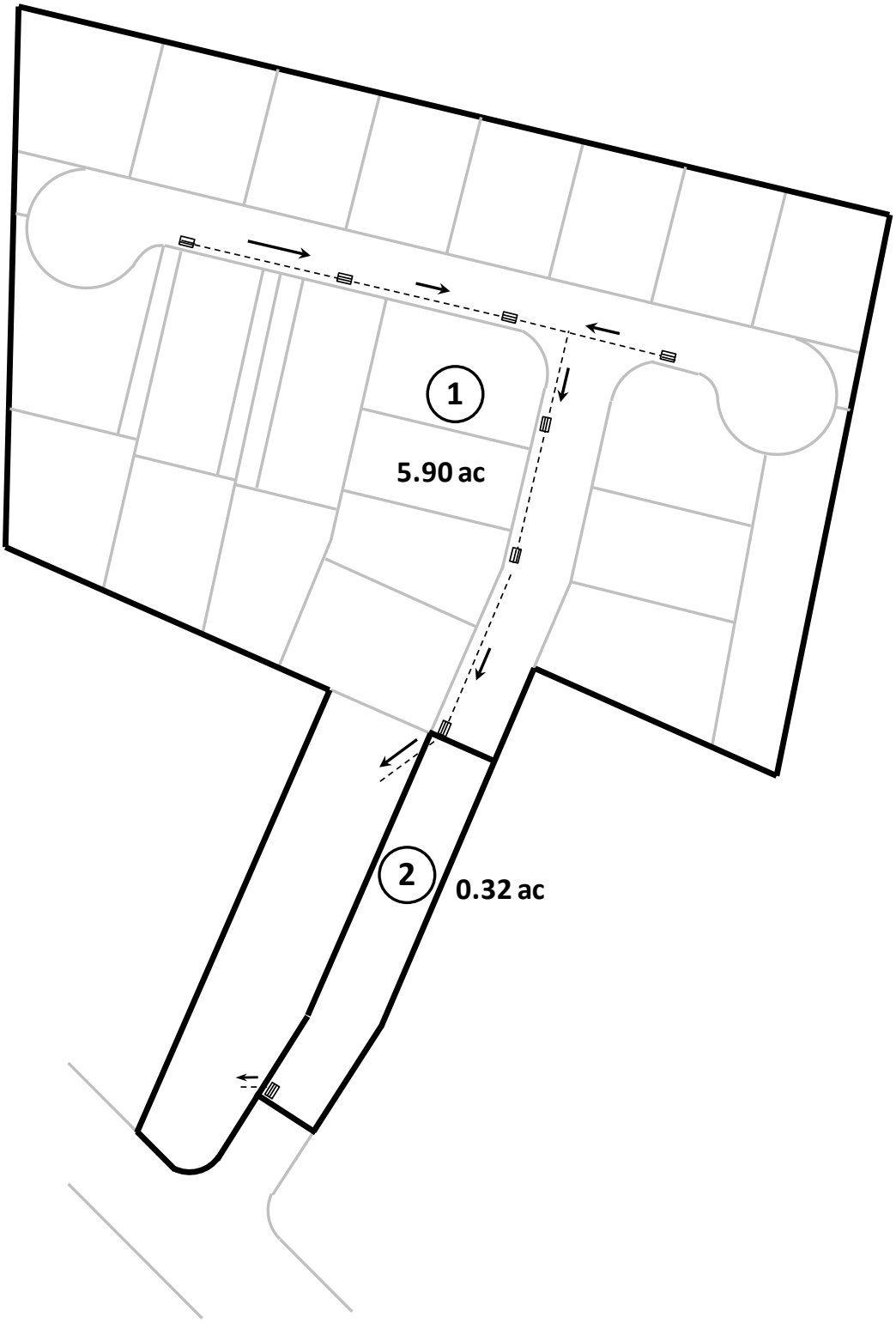


FIGURE1: EXAMPLE 1 DEVELOPMENT PLAN

Based on the size, the project meets the criteria of a Priority A1 new development project and requires preparation of a storm water quality report (SWQR). As specified in Section B.6 of §1-5.1 Part I, water quality criteria shall be achieved with LID Site Design, Source Control, LID Retention, LID Biofiltration (if LID Retention is infeasible), and Alternative Compliance (if LID Retention and LID Biofiltration are infeasible). Implementation of each of these five elements for this example is presented below.

A. LID SITE DESIGN

The *City and County of Honolulu Storm Water BMP Guide* (*BMP Guide*) identifies 5 LID Site Design Strategies for new development and redevelopment projects. Those that are applicable to this project will be implemented.

B. SOURCE CONTROL

The *BMP Guide* identifies 12 Source Control BMPs for new development and redevelopment projects. Those that are applicable to this project will be implemented.

C. LID RETENTION

Assume for purposes of this example that retention is feasible. Although many, if not all, of the 7 LID Retention BMPs identified in the *BMP Guide* may be implemented, details for an Infiltration Basin are presented below.

Assume that a single Infiltration Basin will be used for both drainage areas (see Figure 2). The sizing of the Infiltration Basin is accomplished using the City's BMP sizing worksheet, which is consistent with the Step-by-Step Sizing Procedure provided in the *BMP Guide*. The sizing worksheet is presented in Figure 3, and the calculations are summarized as follows:

1. Water Quality Volume (WQV). For purposes of this example, assume 70% impervious cover. Using a 1-inch design storm depth, the WQV for 6.22 acres is calculated to be 15,353 cubic feet.
2. Maximum allowable storage depth. For purposes of this example, assume a soil infiltration rate of 1.5 in/hr and an infiltration rate safety factor of 2. Using a drawdown time of 48 hours, the maximum allowable storage depth is calculated to be 3.0 feet.
3. Design storage depth. The ponding depth is set to 3 feet, which is equal to or less than the maximum allowable storage depth.
4. Basin invert footprint. Using a basin fill time of 2 hours (industry accepted practice), the required invert surface area is calculated to be 4,913 square feet.
5. BMP area requirements. The invert width is set to 25 feet, and the invert length is calculated to be 196.5 feet. Using a side slope of 3:1 and a freeboard depth of 1 foot (actual free board requirements must be determined for flood design storm), the top width and top length are calculated to be 49 feet and 220.5 feet, respectively. The total area, excluding pretreatment, is calculated to be 10,806 square feet.

The BMP layout and BMP details are presented in Figures 2 and 4, respectively. The Infiltration Basin will have two inlet points; one at the eastern end capturing 5.90 acres of roadway and residential lot runoff, and one at the western end capturing 0.32 acres of roadway runoff.

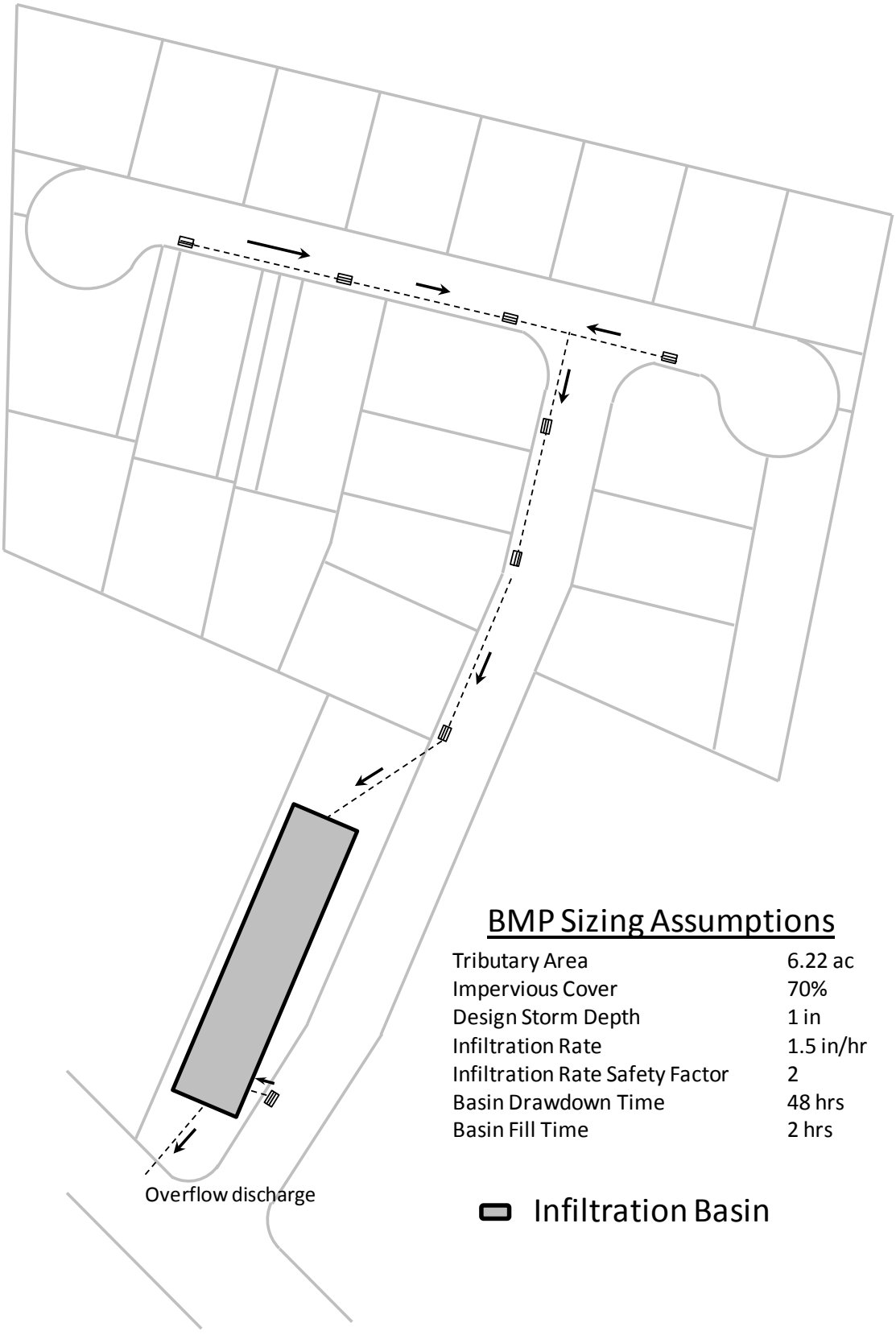


FIGURE 2: BMP LAYOUT, RETENTION

BMP Sizing Worksheet: Infiltration Basin

Project: 6.22 ac Residential Development **Date:** July 2012

1. Water Quality Volume		
a. BMP Tributary Drainage Area, **A**	6.22	ac
b. % Impervious Area, **I**	70	%
c. Water Quality Design Storm Depth, **P**	1.0	in
d. Volumetric Runoff Coefficient, **C**	0.68	
e. Water Quality Volume, **WQV**	15,353	cu-ft
2. Maximum Storage Depth		
a. Soil Infiltration Rate, **k** (0.5 min)	1.5	in/hr
b. Infiltration Rate Safety Factor (2 - 5), $\mathbf{F_s}$	2	
c. Drawdown Time, **t**	48	hrs
d. Max. Storage Depth, $\mathbf{d_{max}}$	3.0	ft
3. Design Storage Depth		
a. Ponding Depth, $\mathbf{d_p}$	3.00	ft
4. Basin Invert Footprint		
b. Reservoir Fill Time, **T**	2	hrs
c. Min. Bottom Surface Area, $\mathbf{A_b}$	4,913	sq-ft
5. BMP Area Requirements		
a. Side Slopes (length per unit height), **z** (3.0 min)	3	
b. Freeboard, **f** (1.0 min)	1	ft
c. Invert Width, $\mathbf{w_b}$	25.0	ft
d. Invert Length, $\mathbf{l_b}$	196.5	ft
e. Top Width, $\mathbf{w_t}$	49.0	ft
f. Top Length, $\mathbf{l_t}$	220.5	ft
g. Min. Top Surface Area excluding pretreatment, $\mathbf{A_{BMP}}$	10,806	sq-ft

FIGURE 3: INFILTRATION BASIN SIZING WORKSHEET

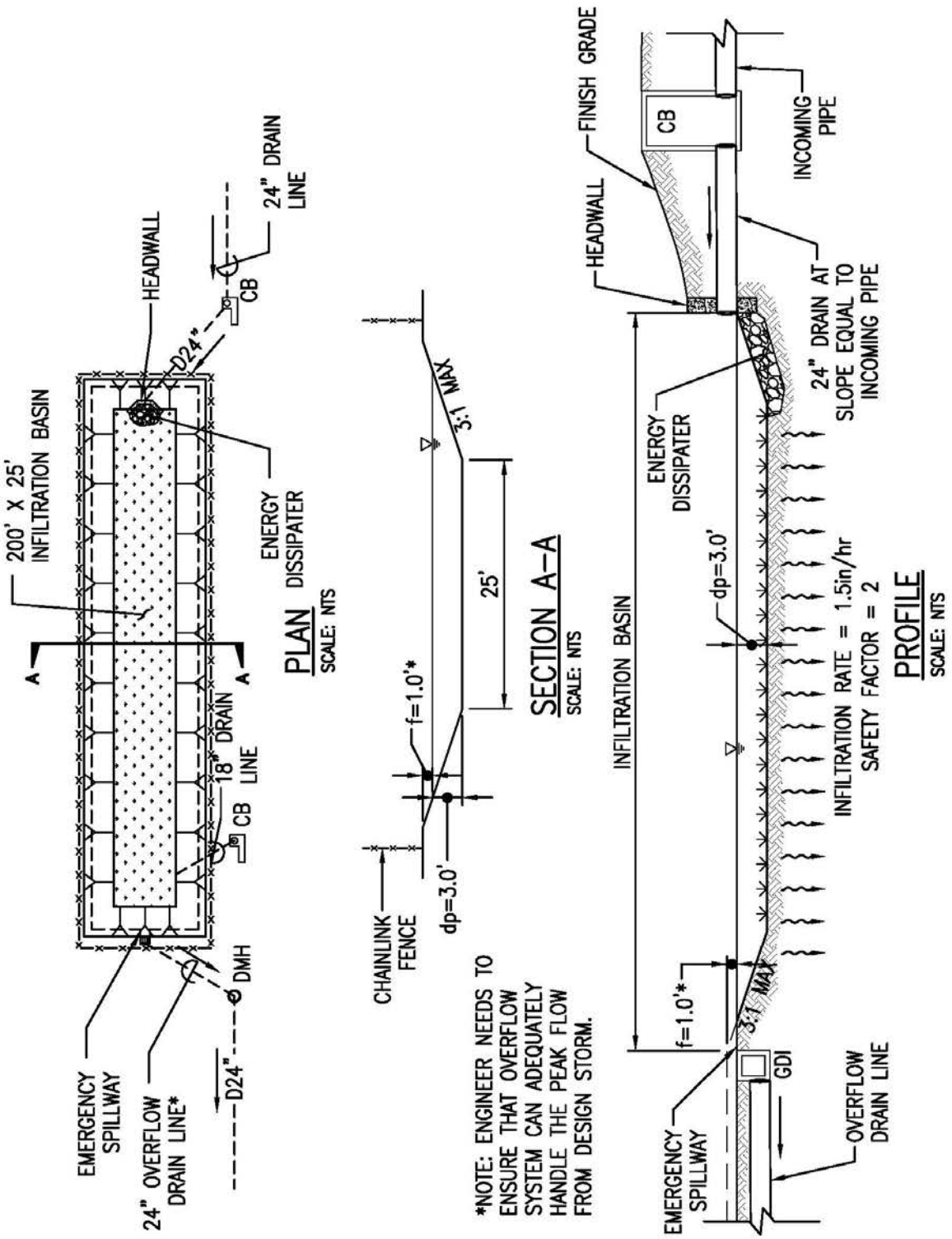


FIGURE 4: BMP DETAILS, RETENTION

D. LID BIOFILTRATION

For purposes of this example, assume that retention is determined to be infeasible, but biofiltration is feasible. Of the 7 LID Biofiltration BMPs identified in the *BMP Guide*, the water quality criteria may be met by biofiltering the runoff from both drainage areas with a Vegetated Swale. See Figure 5 for the proposed layout.

The sizing of the Vegetated Swale is accomplished using the City's BMP sizing worksheet, which is consistent with the Step-by-Step Sizing Procedure provided in the *BMP Guide*. The sizing worksheet is presented in Figure 6, and the calculations are summarized as follows:

1. Water Quality Flow Rate (WQF). For purposes of this example, assume a weighted runoff coefficient of 0.7. Using a rainfall intensity of 0.4 in/hr, the WQF for 6.22 acres is calculated to be 1.74 cfs.
2. Swale geometry. The bottom width, depth of flow, side slope, longitudinal slope, and Manning's roughness coefficient are set to 7 feet, 4 inches, 3, 4%, and 0.20, respectively.
3. Swale hydraulic capacity. Using the dimensions from step 2, the cross sectional area, wetted perimeter, and hydraulic radius are calculated to be 2.67 sq-ft, 9.11 ft, and 0.29 ft. The design flow rate is calculated to be 1.75 cfs, which is equal to or greater than the WQF.
4. Design flow velocity. The design flow velocity is calculated to be 0.66 feet per second, which is less than the minimum allowed velocity of 1 foot per second.
5. Swale length. Using a hydraulic residence time of 7 minutes, the swale length is calculated to be 276 feet.
6. BMP area requirements. Using 6 inches of freeboard, the required total surface area is calculated to be 3,310 sq-ft. At 276 feet long, this equates to a top width of 12 feet.

The vegetated swale does not require pretreatment, as specified in the *BMP Guide*. The BMP details for the vegetated swale are presented in Figure 7.

E. ALTERNATIVE COMPLIANCE

If LID Retention and LID Biofiltration are determined to be infeasible, alternative compliance would be required. Options include treating the runoff with Other Treatment Control BMPs identified in the BMP Guide (detention basin, manufactured treatment device, sand filter, etc.).

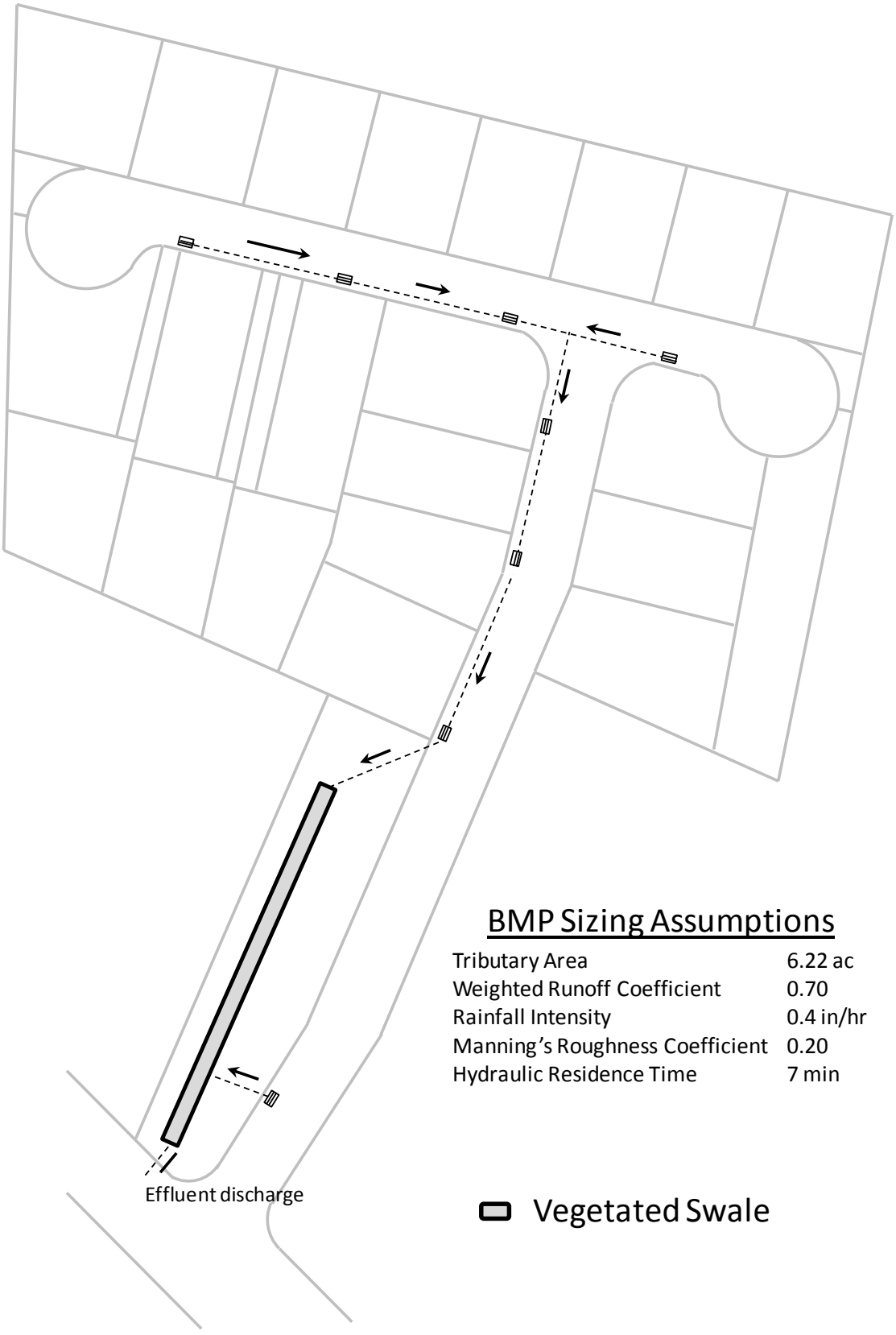


FIGURE 5: BMP LAYOUT, BIOFILTRATION

BMP Sizing Worksheet: Vegetated Swale

Project: 6.22 ac Residential Development **Date:** July 2012

1. Water Quality Flow Rate		
a. BMP Tributary Drainage Area, **A**	6.22	ac
b. Weighted Runoff Coefficient, **C**	0.7	
c. Rainfall Intensity, **i**	0.4	in/hr
d. Water Quality Flow Rate, **WQF**	1.74	cfs
2. Swale Geometry		
a. Bottom Width, **b** (10.0 ft max)	7.00	ft
b. Flow Depth, **y** (4.0 in max)	4.0	in
c. Side Slopes (length per unit height), **z** (3.0 max)	3	ft/ft
d. Longitudinal Slope, **s**	4.0	%
e. Manning's Roughness Coefficient, **n**	0.20	
3. Swale Hydraulic Capacity		
a. Cross-sectional Area @ Flow Depth, **A**	2.67	sq-ft
b. Wetted Perimeter, **WP**	9.11	ft
c. Hydraulic Radius, **R**	0.29	ft
d. Calculated Flow Rate, **Q**	1.75	cfs
4. Design Flow Velocity		
a. Design Flow Velocity, **V** (1.0 fps max)	0.66	fps
5. Swale Length		
a. Hydraulic Residence Time, **T** (7.0 min)	7	min
b. Minimum Length, **L**	276	ft
6. BMP Area Requirements		
a. Freeboard, **f** (6 min)	6	in
b. Embankment Top Surface Area, $\mathbf{A_{BMP}}$	3,310	sq-ft

FIGURE 6: VEGETATED SWALE SIZING WORKSHEET

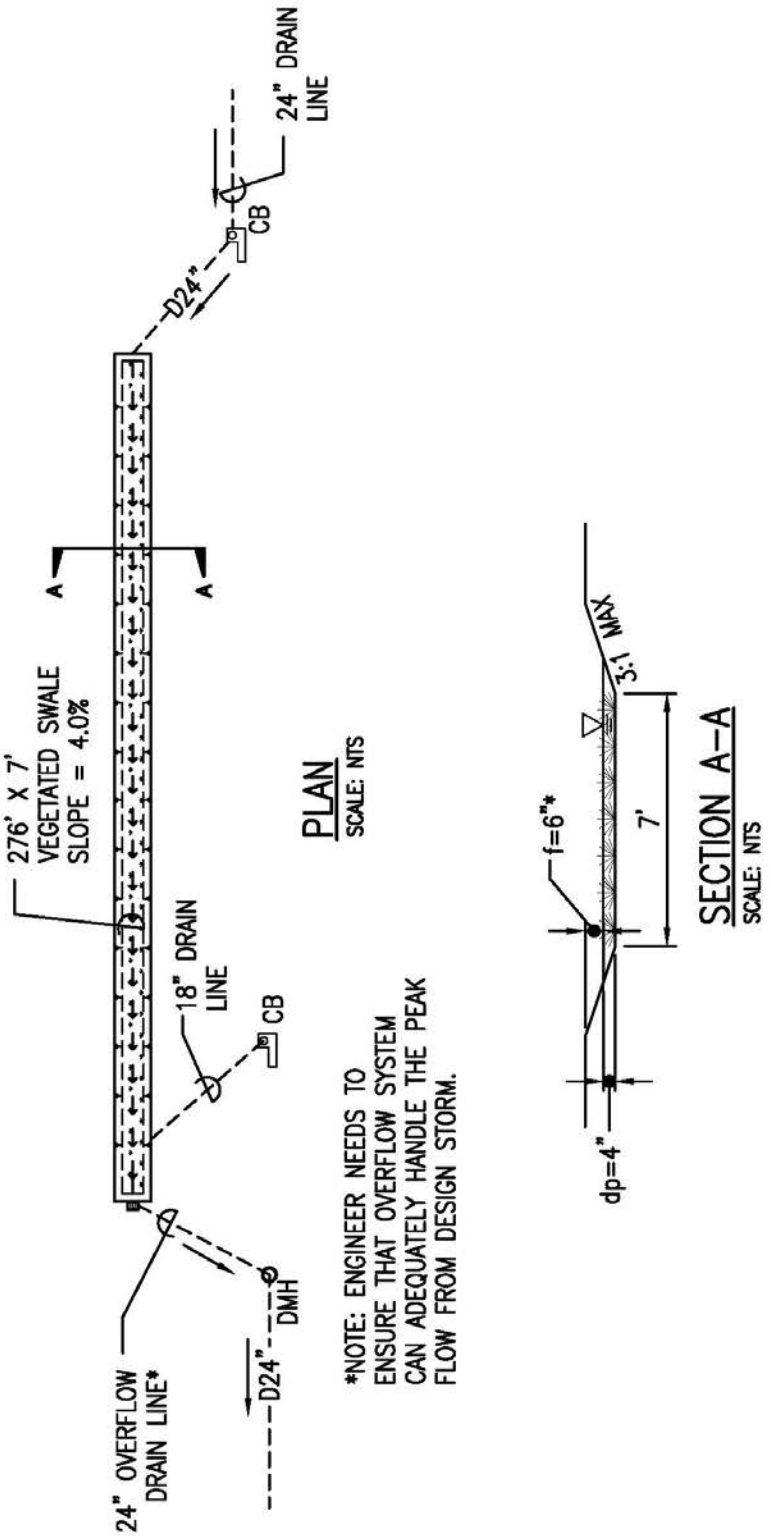


FIGURE 7: BMP DETAILS, BIOFILTRATION

EXAMPLE 2, 3.44 ACRE COMMERCIAL DEVELOPMENT

A 3.44-acre site will be developed for the construction of a commercial development of 4 retail establishments. The site is divided into 7 drainage areas, as shown in Figure 1.

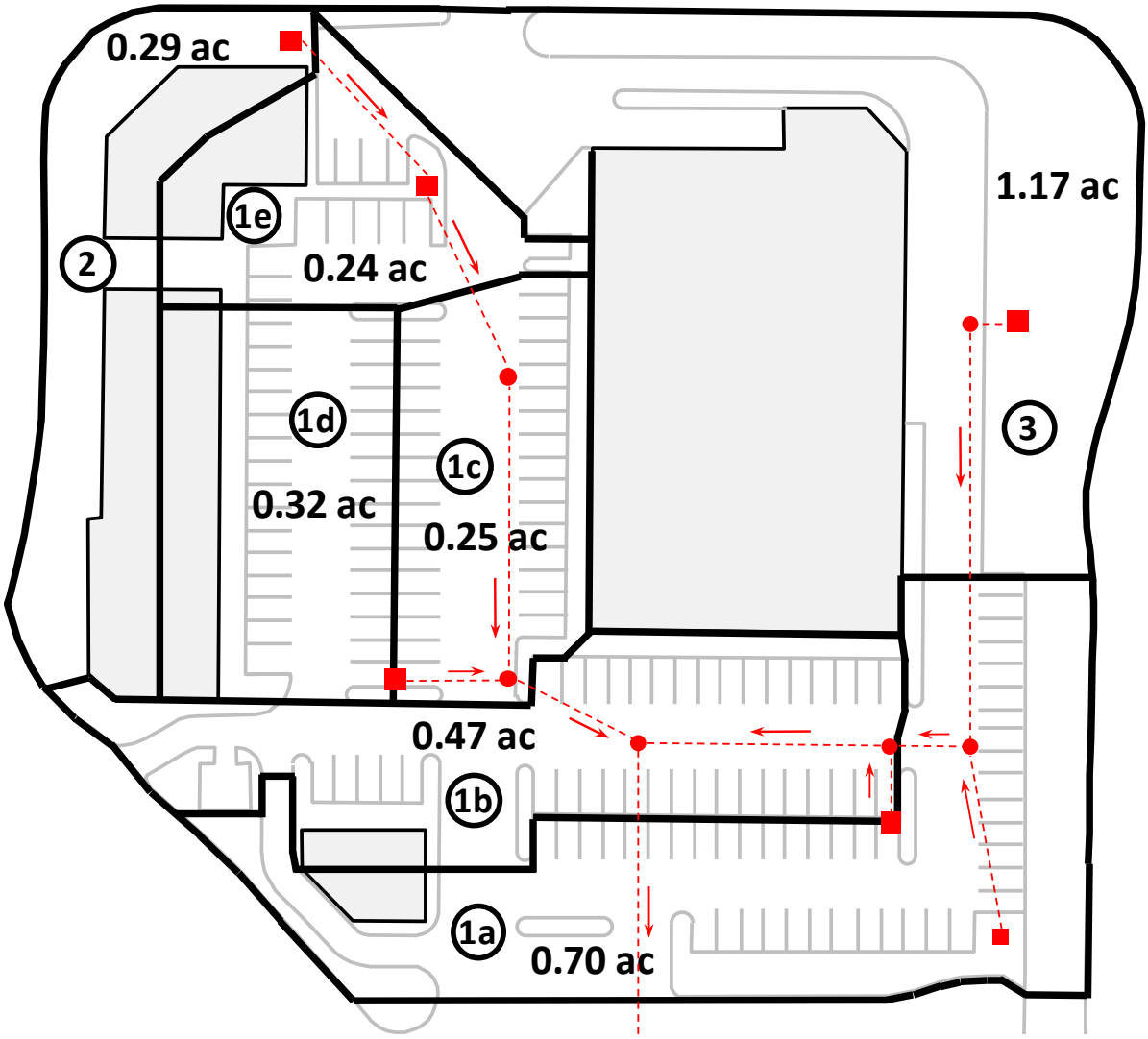


FIGURE 1: EXAMPLE 2 DEVELOPMENT PLAN

Based on the size, the project meets the criteria of a Priority A2 new development project and requires preparation of a storm water quality checklist (SWQC). As specified in Section B.6 of §1-5.1 Part I, water quality criteria shall be achieved with LID Site Design, Source Control, LID Retention or LID Biofiltration, and Alternative Compliance (if necessary). Implementation of each of these four elements for this example is presented below. References to specific proprietary products should not be interpreted as an endorsement of those products.

A. LID SITE DESIGN

The *City and County of Honolulu Storm Water BMP Guide* (*BMP Guide*) identifies 5 LID Site Design Strategies for new development and redevelopment projects. Those that are applicable to this project will be implemented.

B. SOURCE CONTROL

The *BMP Guide* identifies 12 Source Control BMPs for new development and redevelopment projects. Those that are applicable to this project will be implemented.

C. LID RETENTION OR BIOFILTRATION

Retention or biofiltration requirements are presented for each drainage area individually, as each drainage area has its own characteristics and options.

C.1 Drainage Area 1

Drainage Area 1 is composed of 5 subareas as shown in Figure 1. The runoff from each subarea may be retained with permeable pavement if retention is feasible (see Figure 2), or biofiltered with a vegetated bio-filter (see Figure 3). The sizing of both BMPs is accomplished using the City's BMP sizing worksheets, which are consistent with the Step-by-Step Sizing Procedures provided in the *BMP Guide*.

Permeable Pavement. The BMP sizing worksheet for Drainage Area 1a is presented in Figure 4, and the calculations are summarized as follows:

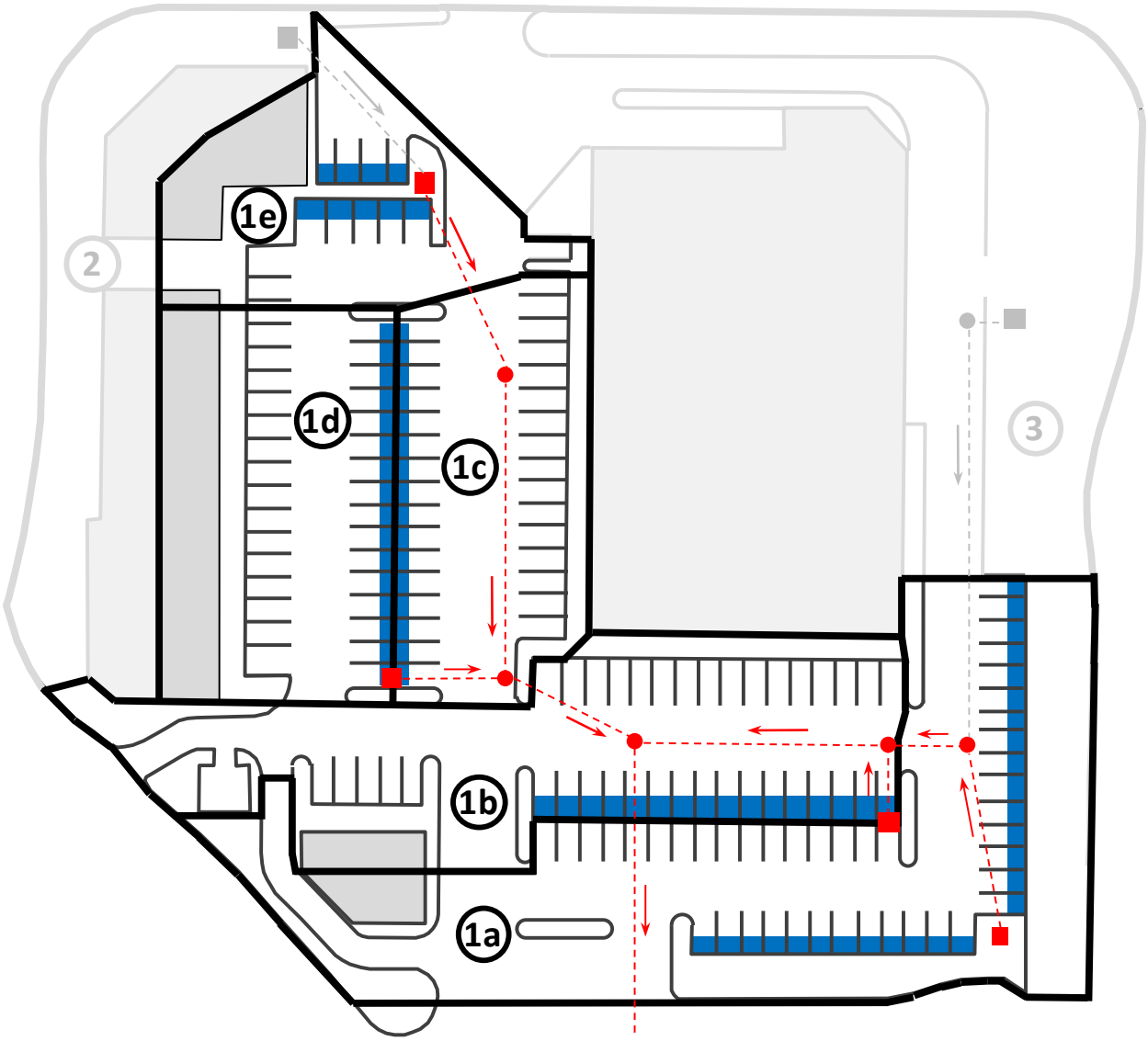
1. Water Quality Volume (WQV). Assuming 70% impervious cover, and using a 1-inch design storm depth, the WQV is calculated to be 1,957 cubic feet.
2. Maximum allowable storage depth. For illustration purposes, assume a soil infiltration rate of 1.5 in/hr and an infiltration rate factor of safety of 2. Using a drawdown time of 48 hours, the maximum allowable storage depth is calculated to be 3.0 feet.
3. Design depths. The pavement course and reservoir course are set to 7 inches and 36 inches, respectively. Using a pavement course porosity of 0.15 and a reservoir course porosity of 0.35, the total effective water storage depth is calculated to be 1.14 feet, which is equal to or less than the maximum allowable storage depth.
4. Pavement surface area. Using a fill time of 2 hours, the required surface area is calculated to be 1,550 square feet.

The length of the permeable pavement is set to the length of the corresponding parking area, and the width is then calculated using the required surface area. This results in a width of 6.48 feet. The necessary length will achieved with two sections, one for each parking area.

The calculations for the other 4 subareas follow the same steps using the same design parameters for constructability and consistency. A summary is as follows:

Subarea ID	Drainage Area (ac)	% Impervious Cover	WQV (cu-ft)	Surface Area (sq-ft)	Length (ft)	Width (ft)
1a	0.70	70%	1,957	1,550	239	6.48
1b	0.47	95%	1,544	1,223	140	8.74
1c	0.25	95%	821	651	140	4.65
1d	0.32	95%	1,051	833	140	5.95
1e	0.24	90%	749	593	87	6.82

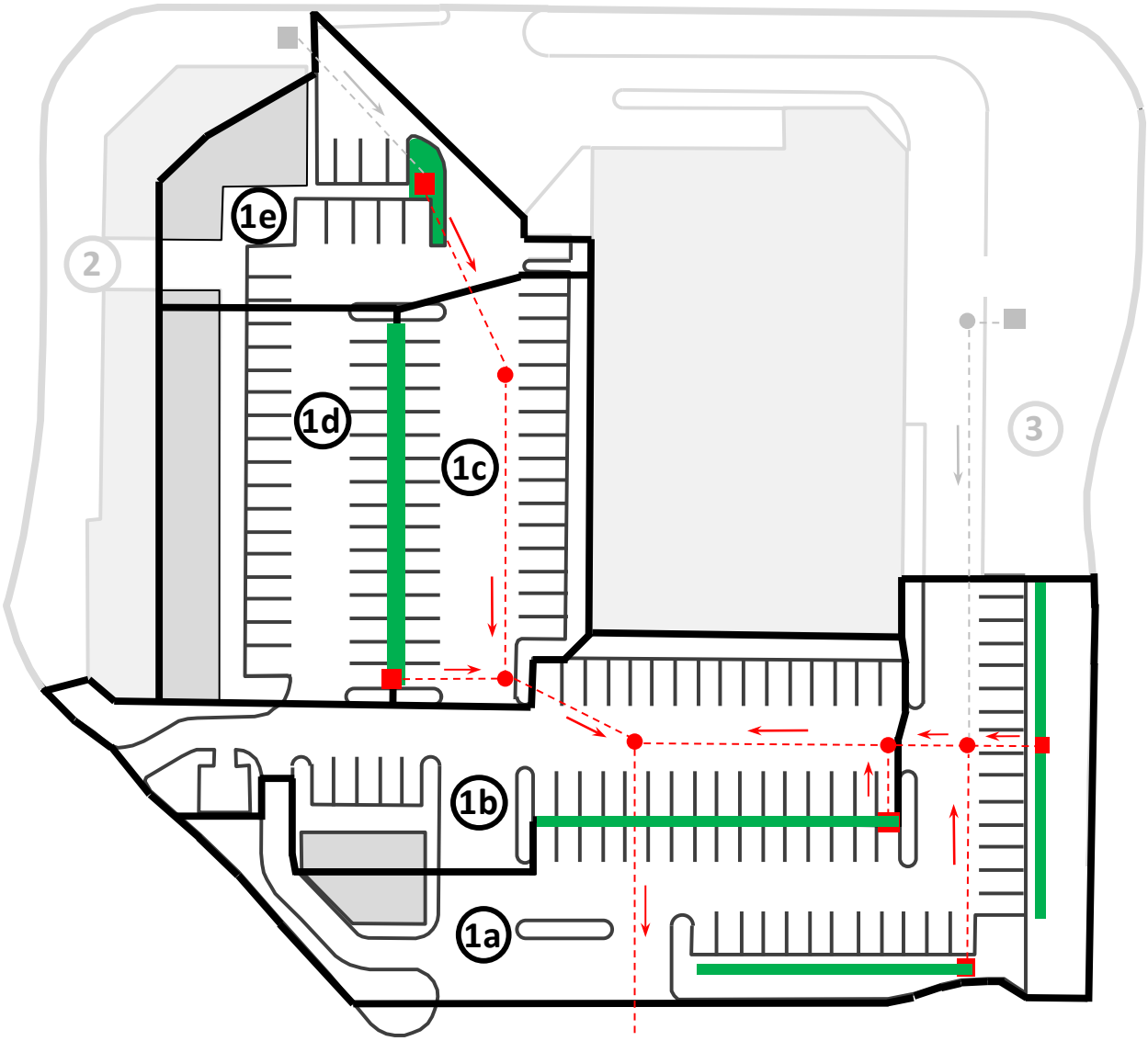
BMP Details are presented in Figure 5.



Permeable Pavement Design Parameters

Design Storm Depth	1 in
Infiltration Rate	1.5 in/hr
Infiltration Rate Safety Factor	2
Drawdown Time	48 hrs
Pavement Course Thickness	7 in
Reservoir Course Thickness	36 in

FIGURE 2: BMP LAYOUT 1, DRAINAGE AREA 1



Vegetated Bio-Filter Design Parameters

Design Storm Depth	1 in
Planting Media Thickness	2 ft
Maximum Ponding Depth	4 in
Filter Bed Drain Time	48 hrs

FIGURE 3: BMP LAYOUT 2, DRAINAGE AREA 1

1. Water Quality Volume		
a. BMP Tributary Drainage Area, **A**	0.70	ac
b. % Impervious Area, **I**	80	%
c. Water Quality Design Storm Depth, **P**	1.0	in
d. Volumetric Runoff Coefficient, **C**	0.77	
e. Water Quality Volume, **WQV**	1,957	cu-ft
2. Maximum Storage Depth		
a. Soil Infiltration Rate, **k** (0.5 min)	1.5	in/hr
b. Infiltration Rate Safety Factor (2 - 5), $\mathbf{F_s}$	2	
c. Drawdown Time, **t**	48	hrs
d. Max. Storage Depth, $\mathbf{d_{max}}$	3.0	ft
3. Design Storage Depths		
a. Pavement Course Thickness, $\mathbf{l_p}$	7.0	in
b. Reservoir Course Thickness, $\mathbf{l_r}$	36.0	in
c. Pavement Course Porosity, $\mathbf{n_p}$	0.15	
d. Reservoir Course Porosity, $\mathbf{n_r}$	0.35	
e. Total Effective Storage Depth, $\mathbf{d_t}$	1.14	ft
4. BMP Area Requirements		
a. Fill Time, **T**	2	hrs
b. Min. Surface Area, $\mathbf{A_{BMP}}$	1,550	sq-ft

FIGURE 4: PERMEABLE PAVEMENT SIZING WORKSHEET (DA 1A)

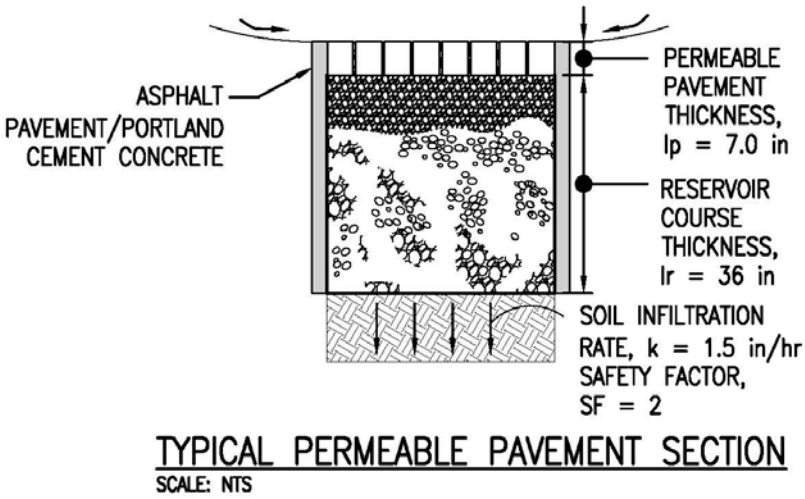


FIGURE 5: PERMEABLE PAVEMENT DETAILS

Vegetated Bio-Filter. The BMP sizing worksheet for Drainage Area 1a is presented in Figure 6, and the calculations are summarized as follows:

1. Water Quality Volume (WQV). The WQV is the same as that given above for the permeable pavement option.
2. Design depths. The planting media depth and maximum ponding depth are set to 2 feet and 4 inches, respectively.
3. Filter bed surface area. Using a planting media permeability coefficient of 1 ft/day and a filter bed drain time of 48 hours, the required filter bed surface area, excluding pretreatment, is calculated to be 903 square feet.
4. Filter bed dimensions. The width of the filter bed is set such that the resulting length occupies the length of the respective parking areas. Using this approach, the filter bed width is set to 3.75 feet.
5. Total Area. Using an embankment side slope of 0 and 3 inches of freeboard, the total BMP areas are the same as the filter bed surface area. Similarly to the retention option, the Vegetated Bio-Filter will be divided into two sections.

The calculations for the other 4 subareas follow the same steps using the same design parameters for constructability and consistency. A summary of all 5 subareas is as follows:

Subarea ID	Drainage Area (ac)	% Impervious Cover	WQV (cu-ft)	Surface Area (sq-ft)	Length (ft)	Width (ft)
1a	0.70	70%	1,957	903	239	3.78
1b	0.47	95%	1,544	713	140	5.09
1c	0.25	95%	821	379	140	2.71
1d	0.32	95%	1,051	485	140	3.47
1e	0.24	90%	749	346	37	13

Not that for Drainage Area 1e, the length and width given above represent maximum values since the BMP area is an irregular shape (i.e., not rectangular). For this reason, the length times the width does not equal the required surface area. BMP details are presented in Figure 7.

1. Water Quality Volume		
a. BMP Tributary Drainage Area, **A**	0.70	ac
b. % Impervious Area, **I**	80	%
c. Water Quality Design Storm Depth, **P**	1.0	in
d. Volumetric Runoff Coefficient, **C**	0.77	
e. Water Quality Volume, **WQV**	1,957	cu-ft
2. Filter Bed Surface Area		
a. Planting Media Depth, l_m (2.0 - 5.0 ft)	2.0	ft
b. Maximum Ponding Depth, d_p (12 in)	4.0	in
c. Planting Media Coefficient of Permeability, **k**	1	ft/day
d. Filter Bed Drain Time, **t**	48	hrs
e. Filter Bed Surface Area, A_{BMP}	903	sq-ft
3. BMP Area		
a. Side Slopes (length per unit height), **z**	0	
b. Freeboard, **f**	0.25	ft
c. Filter Bed Width, w_b	3.78	ft
d. Filter Bed Length, l_b	239	ft
e. Top Width, w_t	3.78	ft
f. Top Length, l_t	239	ft
g. Min. Top Surface Area excluding pretreatment, A_{BMP}	903	sq-ft

FIGURE 6: VEGETATED BIO-FILTER SIZING WORKSHEET (DA 1A)

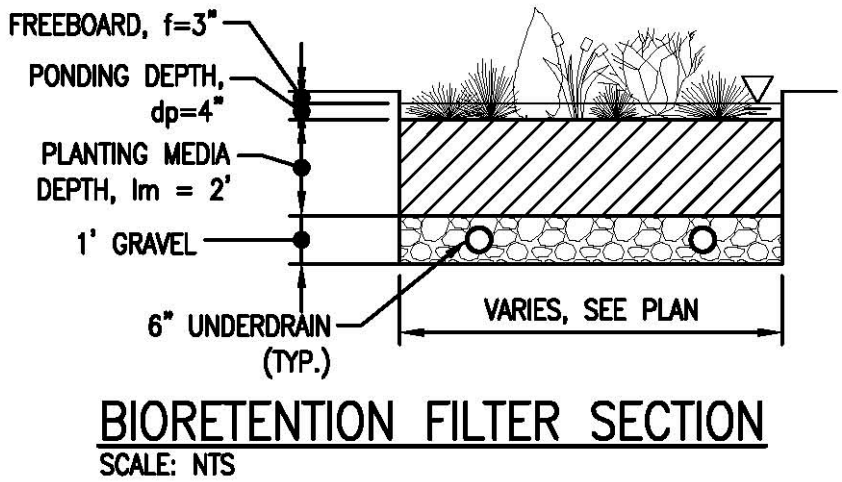


FIGURE 7: VEGETATED BIO-FILTER DETAILS

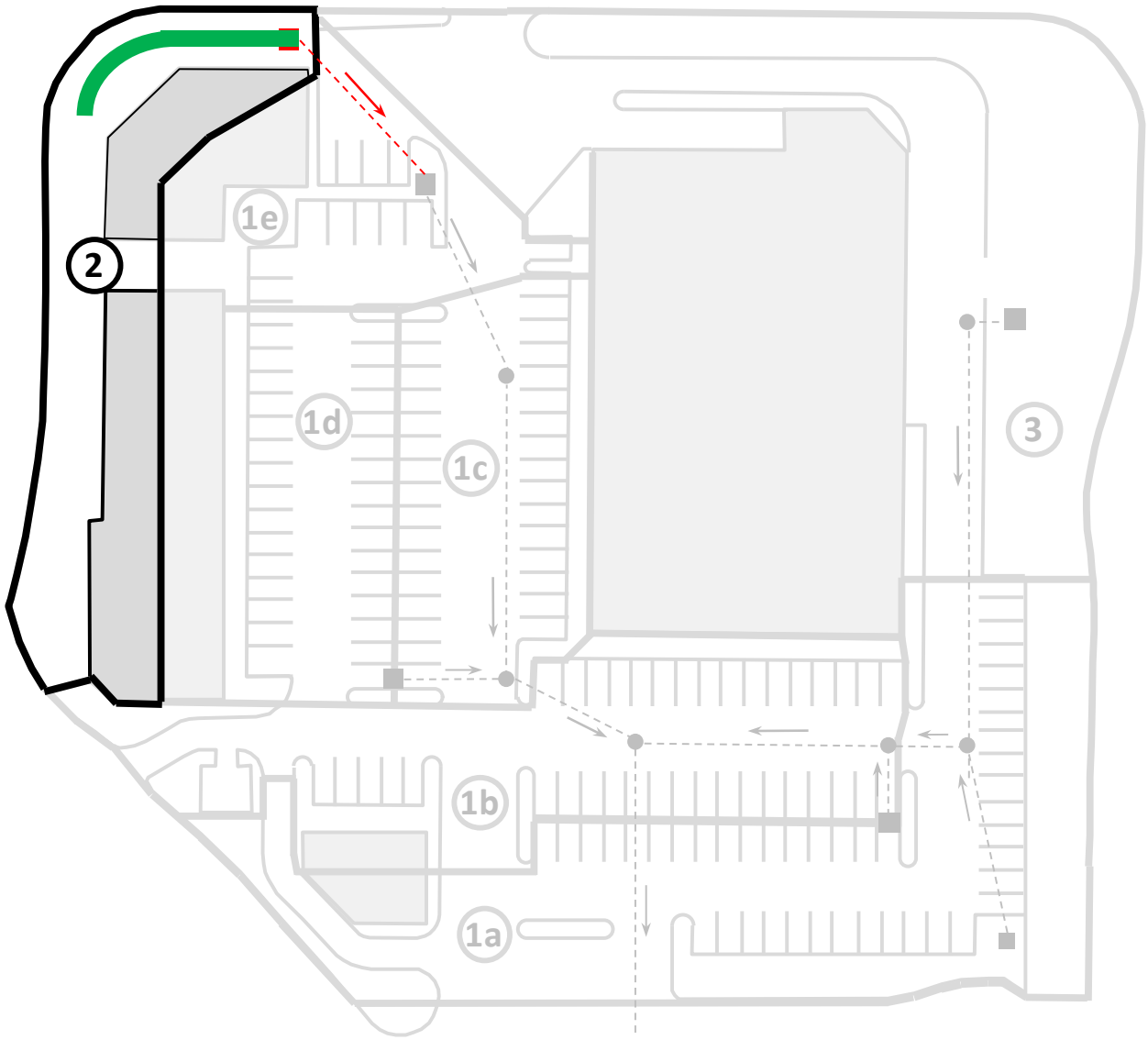
C.2 Drainage Area 2

The 0.29 acres of runoff from Drainage Area 2 may not be retained because there is not enough space to meet the building setback criterion (20 feet). It may be biofiltered with either a vegetated swale (see Figure 8) or vegetated bio-filter (see Figure 9). The sizing of the BMPs is accomplished using the City's BMP sizing worksheets, which are consistent with the Step-by-Step Sizing Procedure provided in the *BMP Guide*.

Vegetated Swale. The BMP sizing worksheet is presented in Figure 10, and the calculations are summarized as follows:

1. Water Quality Flow Rate (WQF). Assuming a weighted runoff coefficient of 0.50, and using a rainfall intensity of 0.4 in/hr, the WQF is calculated to be 0.058 cfs.
2. Swale geometry. The bottom width, depth of flow, side slope, longitudinal slope, and Manning's roughness coefficient are set to 3 feet (to minimize the length), 1.25 inches, 3:1, 2%, and 0.20, respectively.
3. Swale hydraulic capacity. The cross sectional area, wetted perimeter, and hydraulic radius are calculated to be 0.35 sq-ft, 3.66 ft, and 0.09 ft, respectively. The design flow rate is calculated to be 0.075 cfs, which is equal to or greater than the WQF.
4. Design flow velocity. The design flow velocity is calculated to be 0.22 feet per second, which is less than the maximum allowed velocity of 1 foot per second.
5. Swale length. Using a hydraulic residence time of 7 minutes, the swale length is calculated to be 92 feet.
6. BMP area requirements. Using 6 inches of freeboard, the required total surface area is calculated to be 607 sq-ft. At 92 feet long, this equates to a top width of 6.6 feet.

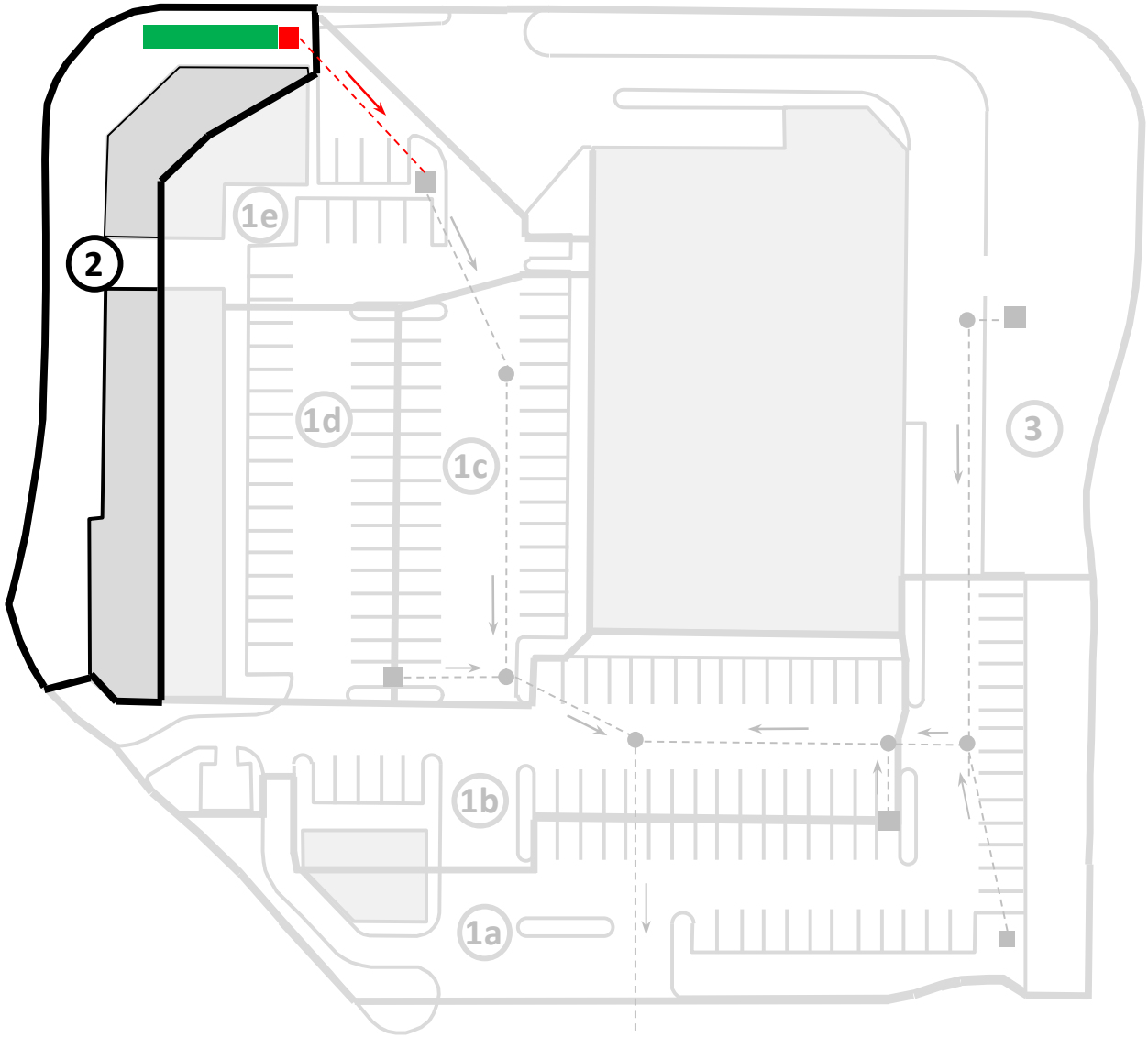
BMP details are presented in Figure 11.



Vegetated Swale Design Parameters

Weighted Runoff Coefficient	50%
Rainfall Intensity	0.4 in/hr
Manning's Roughness Coeff.	0.20
Hydraulic Residence Time	7 min

FIGURE 8: BMP LAYOUT 1, DRAINAGE AREA 2



Vegetated Bio-Filter Design Parameters

Design Storm Depth	1 in
Planting Media Thickness	2 ft
Maximum Ponding Depth	4 in
Filter Bed Drain Time	48 hrs

FIGURE 9: BMP LAYOUT 2, DRAINAGE AREA 2

1. Water Quality Flow Rate		
a. BMP Tributary Drainage Area, **A**	0.29	ac
b. Weighted Runoff Coefficient, **C**	0.5	
c. Rainfall Intensity, **i**	0.4	in/hr
d. Water Quality Flow Rate, **WQF**	0.058	cfs
2. Swale Geometry		
a. Bottom Width, **b** (10.0 ft max)	3.00	ft
b. Flow Depth, **y** (4.0 in max)	1.25	in
c. Side Slopes (length per unit height), **z** (3.0 max)	3	ft/ft
d. Longitudinal Slope, **s**	2.0	%
e. Manning's Roughness Coefficient, **n**	0.20	
3. Swale Hydraulic Capacity		
a. Cross-sectional Area @ Flow Depth, **A**	0.35	sq-ft
b. Wetted Perimeter, **WP**	3.66	ft
c. Hydraulic Radius, **R**	0.09	ft
d. Calculated Flow Rate, **Q**	0.075	cfs
4. Design Flow Velocity		
a. Design Flow Velocity, **V** (1.0 fps max)	0.22	fps
5. Swale Length		
a. Hydraulic Residence Time, **T** (7.0 min)	7	min
b. Minimum Length, **L**	92	ft
6. BMP Area Requirements		
a. Freeboard, **f** (6 min)	6	in
b. Embankment Top Surface Area, $\mathbf{A_{BMP}}$	607	sq-ft

FIGURE 10: VEGETATED SWALE SIZING WORKSHEET (DA 2)

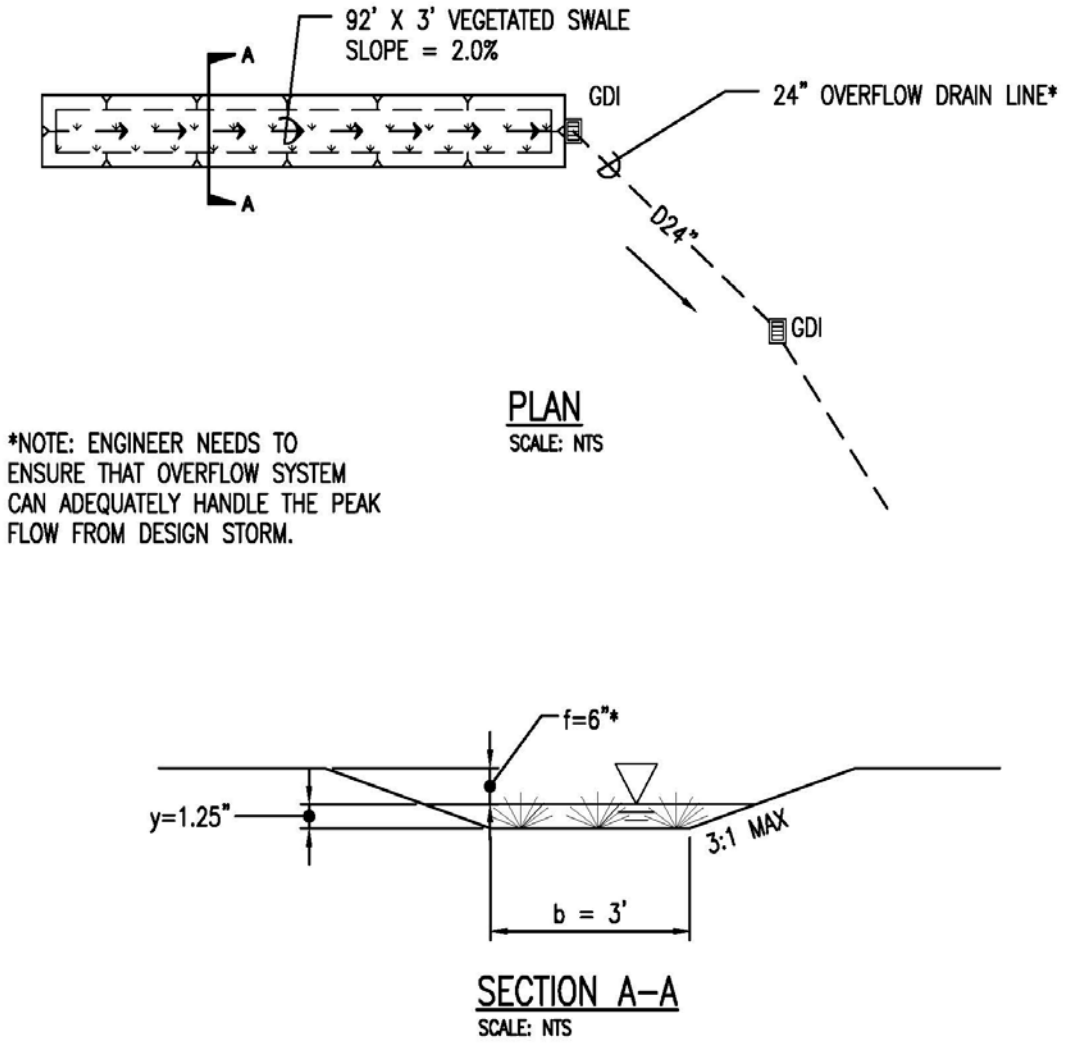


FIGURE 11: VEGETATED SWALE DETAILS

Vegetated Bio-Filter. The BMP sizing worksheet is presented in Figure 12, and the calculations are summarized as follows:

1. Water Quality Volume (WQV). Assuming 50% impervious cover, and using a 1-inch design storm depth, the WQV is calculated to be 526 cubic feet.
2. Design depths. For constructability and consistency, the planting media depth and maximum ponding depth used for Drainage Area 1 are used here.
3. Filter bed surface area. Using the same parameters as those presented for Drainage Area 1, the required filter bed surface area is calculated to be 243 square feet.
4. Filter bed dimensions. The width and length of the filter bed are set to 5 feet and 49 feet, respectively, which are based on available space and drainage area characteristics.

5. Total Area. Using an embankment side slope of 3:1 and 3 inches of freeboard, the top width, top length, and total BMP area are calculated to be 8.5 feet, 52.1 feet, and 443 square feet, respectively.

BMP details are presented in Figure 7.

1. Water Quality Volume		
a. BMP Tributary Drainage Area, **A**	0.29	ac
b. % Impervious Area, **I**	50	%
c. Water Quality Design Storm Depth, **P**	1.0	in
d. Volumetric Runoff Coefficient, **C**	0.5	
e. Water Quality Volume, **WQV**	526	cu-ft
2. Filter Bed Surface Area		
a. Planting Media Depth, l_m (2.0 - 5.0 ft)	2.0	ft
b. Maximum Ponding Depth, d_p (12 in)	4.0	in
c. Planting Media Coefficient of Permeability, **k**	1	ft/day
d. Filter Bed Drain Time, **t**	48	hrs
e. Filter Bed Surface Area, A_{BMP}	243	sq-ft
3. BMP Area		
a. Side Slopes (length per unit height), **z**	3	
b. Freeboard, **f**	0.25	ft
c. Filter Bed Width, w_b	5.0	ft
d. Filter Bed Length, l_b	49	ft
e. Top Width, w_t	8.5	ft
f. Top Length, l_t	52.1	ft
g. Min. Top Surface Area excluding pretreatment, A_{BMP}	443	sq-ft

FIGURE 12: VEGETATED BIO-FILTER SIZING WORKSHEET (DA 2)

C.3 Drainage Area 3

The 1.17 acres of runoff from Drainage Area 3 may be retained with an infiltration basin if retention is feasible (See Figure 13), or biofiltered with a vegetated bio-filter (see Figure 14). The sizing of both BMPs is accomplished using the City's BMP sizing worksheets, which are consistent with the Step-by-Step Sizing Procedure provided in the *BMP Guide*.

Infiltration Basin. The BMP sizing worksheet is presented in Figure 15, and the calculations are summarized as follows:

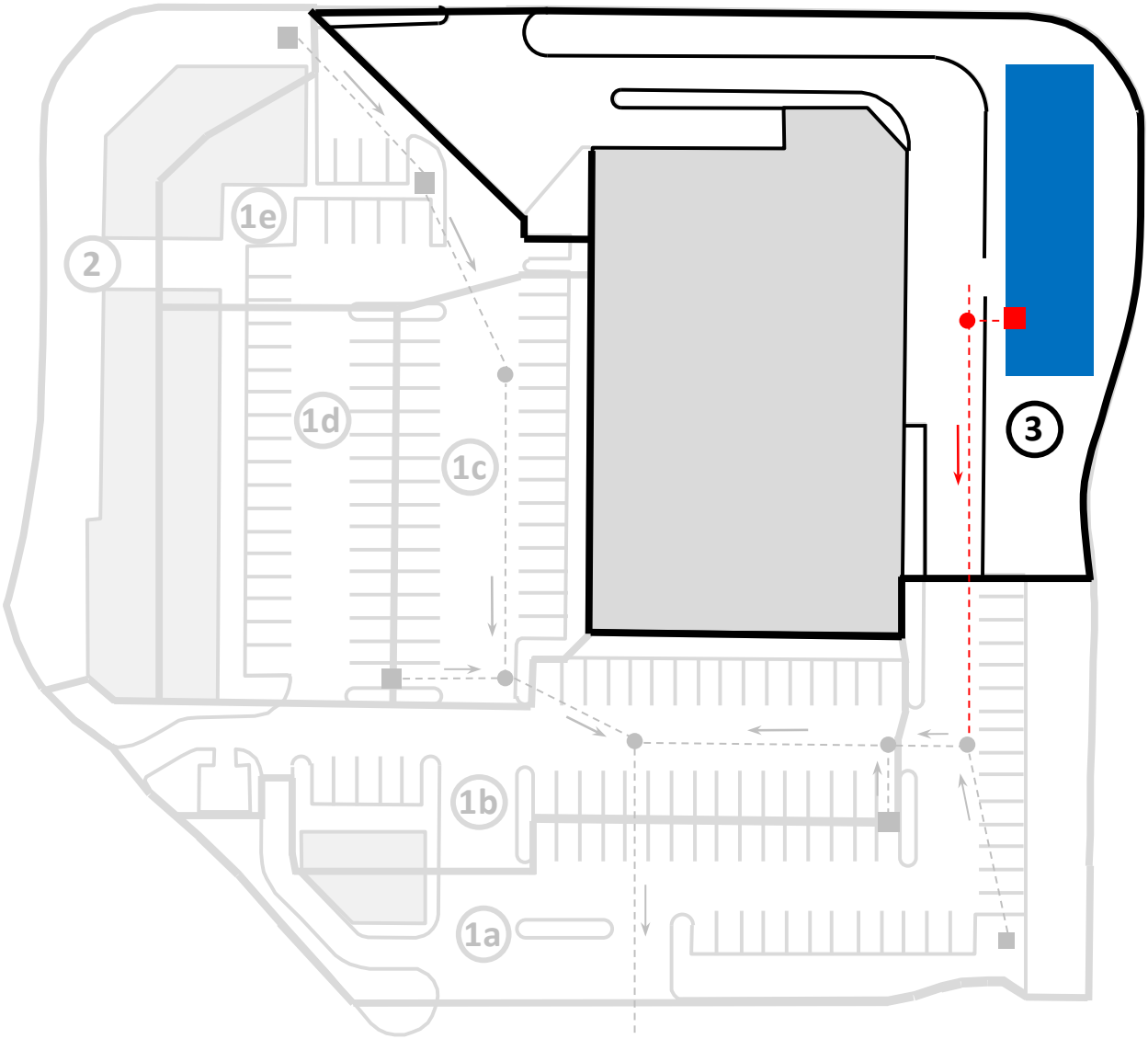
1. Water Quality Volume (WQV). Assuming 75% impervious cover, and using a 1-inch design storm depth, the WQV is calculated to be 3,079 cubic feet.
2. Maximum allowable storage depth. Using the same parameters as those presented for Drainage Area 1, the maximum allowable storage depth is calculated to be 3.0 feet.
3. Design storage depth. The ponding depth is set to 3 feet, which is equal to or less than the maximum allowable storage depth.
4. Basin invert footprint. Using a basin fill time of 2 hours (industry accepted practice), the required invert surface area is calculated to be 985 square feet.
5. BMP area requirements. Based on available space, the invert width is set to 10 feet, and the invert length is calculated to be 98.5 feet. Using a side slope of 3:1 and a freeboard depth of 1 foot (actual free board requirements must be determined for flood design storm), the top width and top length are calculated to be 34 feet and 122.53 feet, respectively. The total footprint is calculated to be 4,166 square feet.

BMP details are presented in Figure 16.

Vegetated Bio-Filter. The BMP sizing worksheet is presented in Figure 17, and the calculations are summarized as follows:

1. Water Quality Volume (WQV). The WQV is the same as that given above for the infiltration basin (3,079 cubic feet).
2. Design depths. For constructability and consistency, the planting media depth and maximum ponding depth used for Drainage Area 1 are used here.
3. Filter bed surface area. Using the same parameters as those presented for Drainage Area 1, the required filter bed surface area is calculated to be 1,421 square feet.
4. Filter bed dimensions. Based on available space, the invert width is set to 20 feet, and the invert length is calculated to be 71 feet.
5. Total Area. Using an embankment side slope of 3:1 and 3 inches of freeboard, the top dimensions are calculated to be 24 feet by 75 feet, and the total BMP area is calculated to be 1,752 square feet.

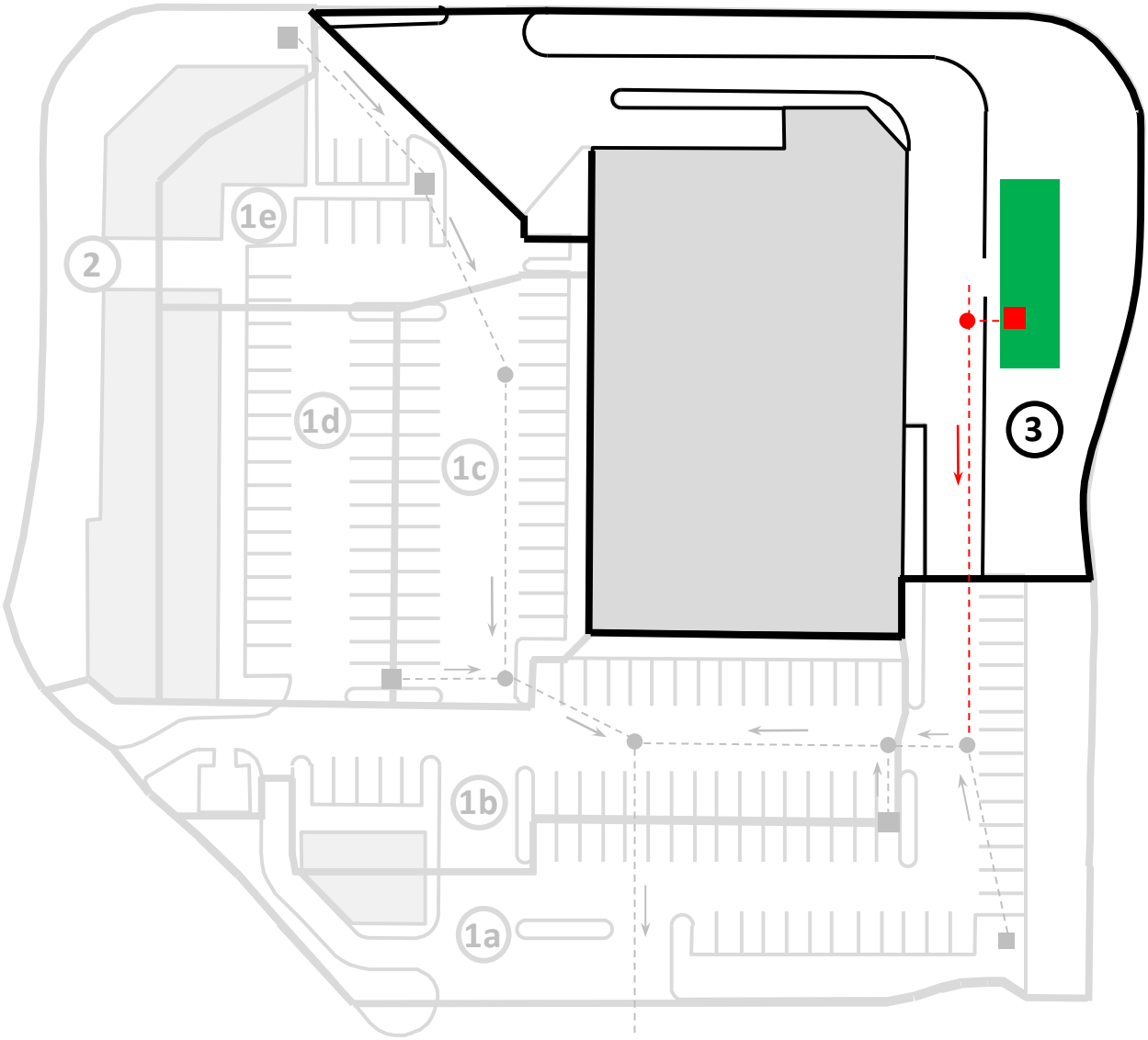
BMP details are presented in Figure 7.



Infiltration Basin Design Parameters

Design Storm Depth	1 in
Infiltration Rate	1.5 in/hr
Infiltration Rate Safety Factor	2
Drawdown Time	48 hrs
Basin Fill Time	2 hrs

FIGURE 13: BMP LAYOUT 1, DRAINAGE AREA 3



Vegetated Bio-Filter Design Parameters

Design Storm Depth	1 in
Planting Media Thickness	2 ft
Maximum Ponding Depth	4 in
Filter Bed Drain Time	48 hrs

FIGURE 14: BMP LAYOUT 2, DRAINAGE AREA 3

1. Water Quality Volume		
a. BMP Tributary Drainage Area, **A**	1.17	ac
b. % Impervious Area, **I**	75	%
c. Water Quality Design Storm Depth, **P**	1.0	in
d. Volumetric Runoff Coefficient, **C**	0.725	
e. Water Quality Volume, **WQV**	3,079	cu-ft
2. Maximum Storage Depth		
a. Soil Infiltration Rate, **k** (0.5 min)	1.5	in/hr
b. Infiltration Rate Safety Factor (2 - 5), $\mathbf{F_s}$	2	
c. Drawdown Time, **t**	48	hrs
d. Max. Storage Depth, $\mathbf{d_{max}}$	3.0	ft
3. Design Storage Depth		
a. Ponding Depth, $\mathbf{d_p}$	3.00	ft
4. Basin Invert Footprint		
b. Reservoir Fill Time, **T**	2	hrs
c. Min. Bottom Surface Area, $\mathbf{A_b}$	985	sq-ft
5. BMP Area Requirements		
a. Side Slopes (length per unit height), **z** (3.0 min)	3	
b. Freeboard, **f** (1.0 min)	1	ft
c. Invert Width, $\mathbf{w_b}$	10.0	ft
d. Invert Length, $\mathbf{l_b}$	98.5	ft
e. Top Width, $\mathbf{w_t}$	34.00	ft
f. Top Length, $\mathbf{l_t}$	122.53	ft
g. Min. Top Surface Area excluding pretreatment, $\mathbf{A_{BMP}}$	4,166	sq-ft

FIGURE 15: INFILTRATION BASIN SIZING WORKSHEET (DA 3)

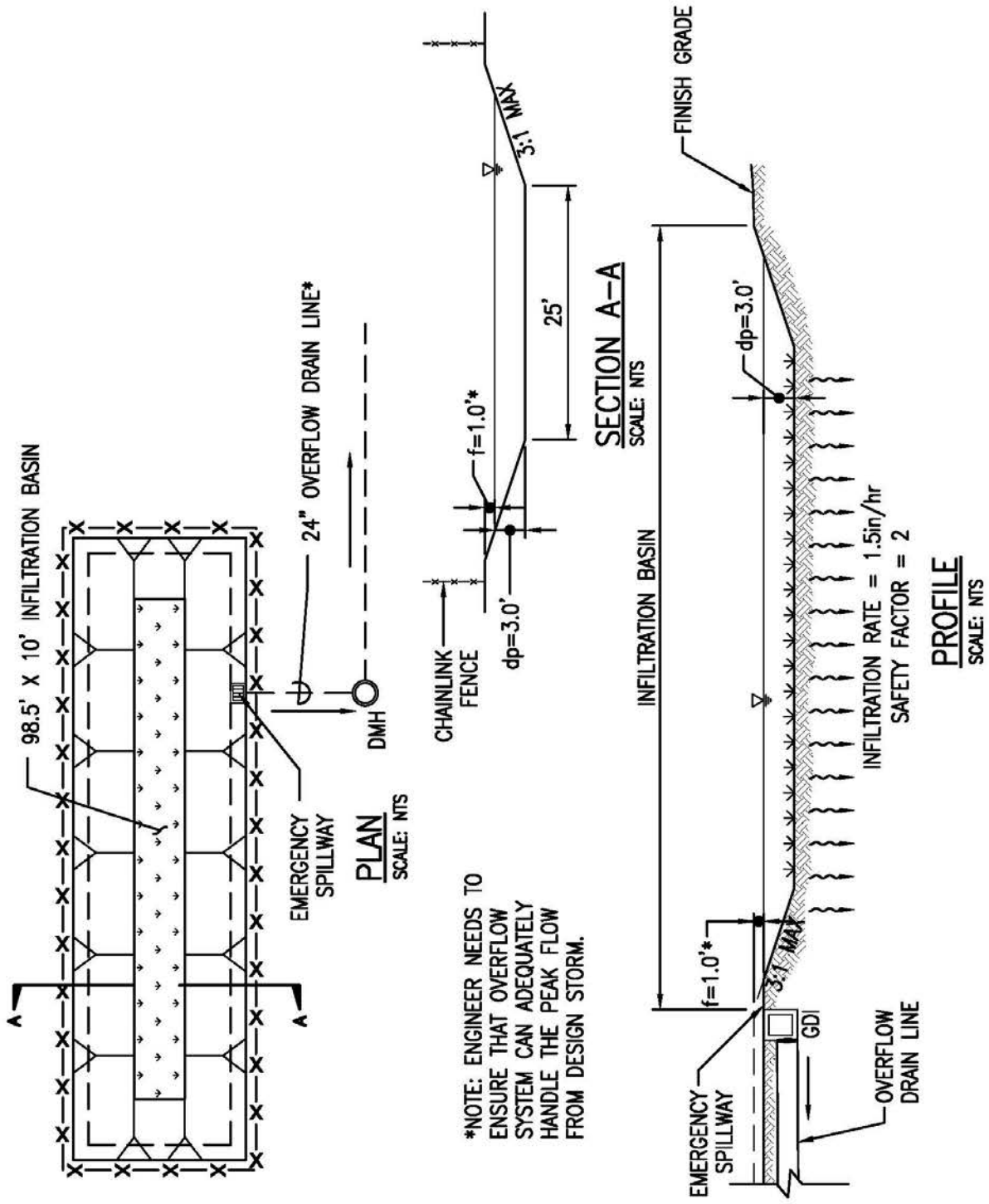


FIGURE 16: INFILTRATION BASIN DETAILS

1. Water Quality Volume		
a. BMP Tributary Drainage Area, **A**	1.17	ac
b. % Impervious Area, **I**	75	%
c. Water Quality Design Storm Depth, **P**	1.0	in
d. Volumetric Runoff Coefficient, **C**	0.725	
e. Water Quality Volume, **WQV**	3,079	cu-ft
2. Filter Bed Surface Area		
a. Planting Media Depth, l_m (2.0 - 5.0 ft)	2.0	ft
b. Maximum Ponding Depth, d_p (12 in)	4.0	in
c. Planting Media Coefficient of Permeability, **k**	1	ft/day
d. Filter Bed Drain Time, **t**	48	hrs
e. Filter Bed Surface Area, A_{BMP}	1,421	sq-ft
3. BMP Area		
a. Side Slopes (length per unit height), **z**	3	
b. Freeboard, **f**	0.25	ft
c. Filter Bed Width, w_b	20	ft
d. Filter Bed Length, l_b	71.06	ft
e. Top Width, w_t	23.50	ft
f. Top Length, l_t	74.56	ft
g. Min. Top Surface Area excluding pretreatment, A_{BMP}	1,752	sq-ft

FIGURE 17: VEGETATED BIO-FILTER SIZING WORKSHEET (DA 3)

D. ALTERNATIVE COMPLIANCE

If LID Retention and LID Biofiltration are determined to be infeasible, alternative compliance would be required. Options include treating the runoff with Other Treatment Control BMPs identified in the BMP Guide (detention basin, manufactured treatment device, sand filter, etc.).

EXAMPLE 3, 0.74 ACRE COMMERCIAL DEVELOPMENT

A restaurant is being constructed on a 0.74-acre site. The layout is presented in Figure 1, and includes more than 10,000 square feet of impervious surface.

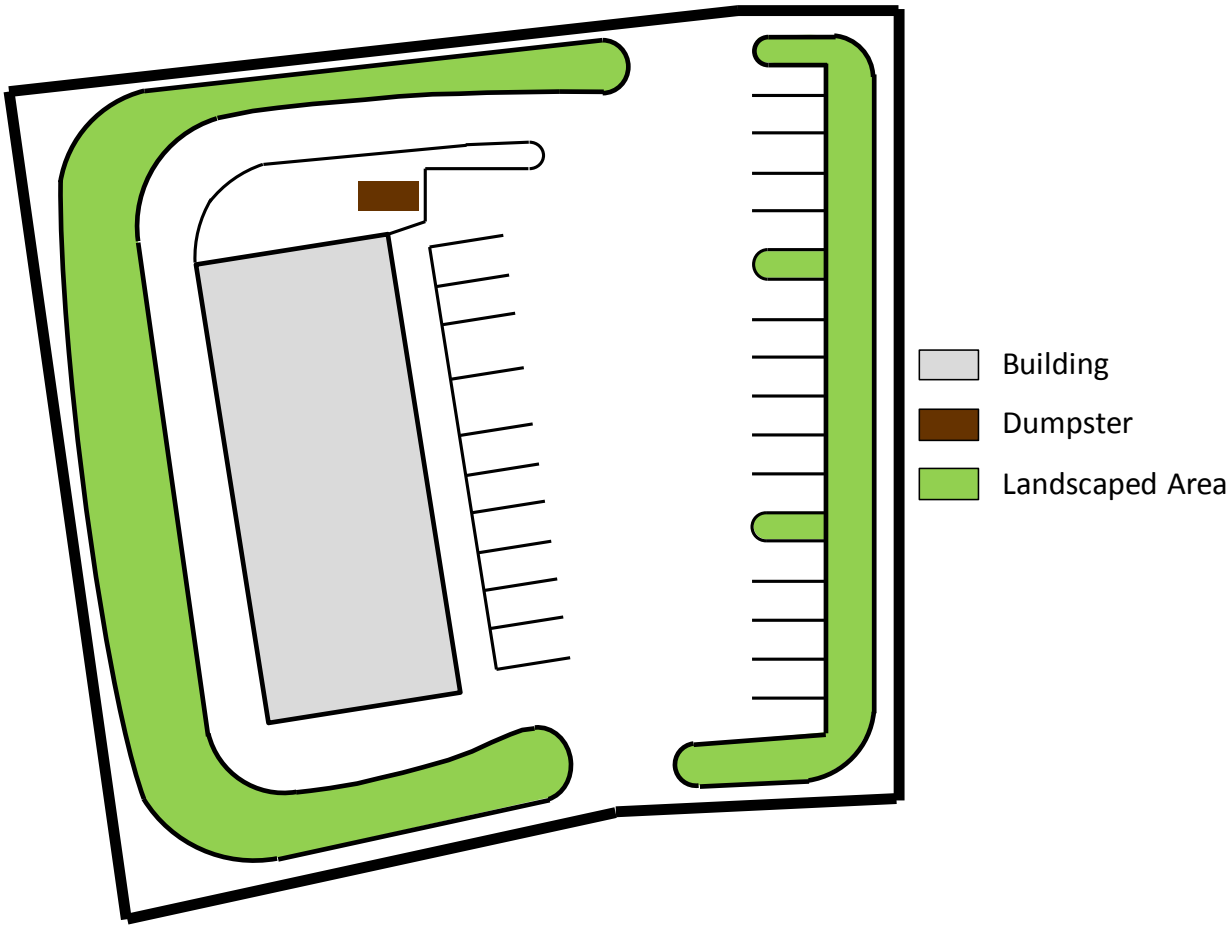


FIGURE1: EXAMPLE 3 DEVELOPMENT PLAN

The project meets the criteria of a Priority B new development project and requires the preparation of a Storm Water Quality Checklist (SWQC). As specified in Section B.6 of §1-5.1 Part I, water quality criteria shall be achieved by considering LID Site Design and implementing appropriate Source Control. Each of these elements is presented below.

A. LID SITE DESIGN

All 5 LID Site Design Strategies specified in the *City and County of Honolulu Storm Water BMP Guide* (*BMP Guide*) were considered. The strategy "Direct Runoff to Landscaped Areas" will be implemented by directing all pavement runoff to the surrounding landscaped areas, and directing roof runoff to the adjacent landscaped area using roof drains. Details are shown in Figure 2.

B. SOURCE CONTROL

The *BMP Guide* identifies 12 Source Control BMPs for new development and redevelopment projects. The following ones will be implemented:

- Automatic Irrigation Systems
    - Irrigation system will be designed to each landscape area's specific water requirements.
    - Irrigation system will be designed to minimize the runoff of excess irrigation water into the storm water drainage system.
    - Plants with similar water requirements will be grouped together in order to reduce excess irrigation runoff and promote surface filtration.
- Storm Drain Inlets
    - All storm drain inlets and catch basins within the project area will be stenciled with appropriate signage.
- Outdoor Trash Storage
    - Dumpster area will be graded towards vegetated/landscaped area.
    - Drip pans will be placed underneath dumpster to reduce/prevent leaking of liquid wastes.
    - Dumpster with attached lids will be used to prevent rainfall from entering container.
    - Dumpster area will be paved with an impervious surface to mitigate spills.
    - Signs will be posted indicating that hazardous material are not to be disposed of therein.
- Parking Areas
    - Pavement runoff will be directed towards vegetated/landscaped areas.

Details are shown in Figure 2.

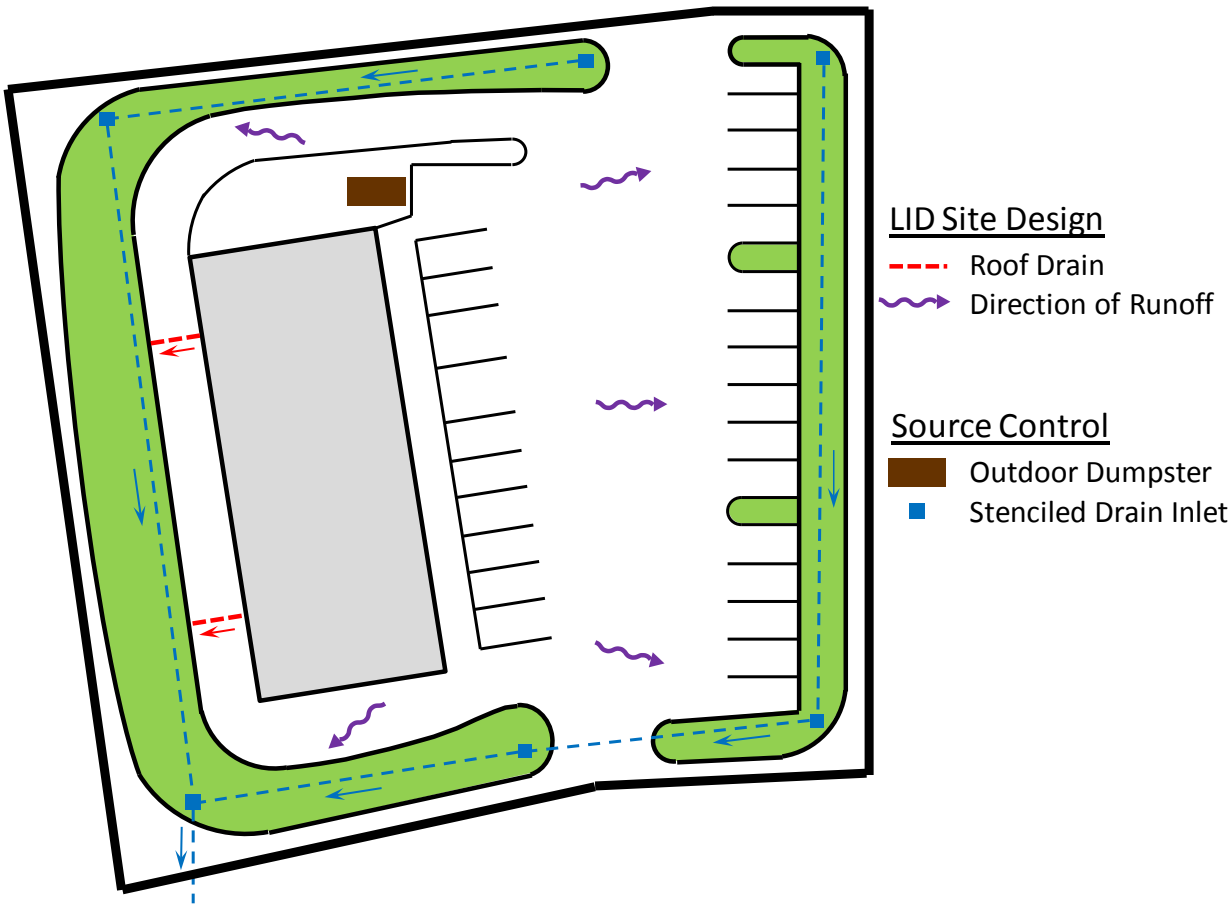


FIGURE2: LID SITE DESIGN AND SOURCE CONTROL PLAN

Appendix E

A Sample of CDS Unit Operation and Maintenance Guideline

OPERATIONS AND MAINTENANCE GUIDELINES

CDS Stormwater Treatment Unit

INTRODUCTION

The CDS unit is an important and effective component of your storm water management program and proper operation and maintenance of the unit are essential to demonstrate your compliance with local, state and federal water pollution control requirements.

The CDS technology features a patented non-blocking, indirect screening technique developed in Australia to treat water runoff. The unit is highly effective in the capture of suspended solids, fine sands and larger particles. Because of its non-blocking screening capacity, the CDS unit is un-matched in its ability to capture and retain gross pollutants such as trash and debris. In short, CDS units capture a very wide range of organic and in-organic solids and pollutants that typically result in tons of captured solids each year such as: Total suspended solids (TSS) and other sedimentitious materials, oil and greases, trash, and other debris (including floatables, neutrally buoyant, and negatively buoyant debris). These pollutants will be captured even under very high flow rate conditions.

CDS units are equipped with conventional oil baffles to capture and retain oil and grease. Laboratory evaluations show that the CDS units are capable of capturing up to 70% of the free oil and grease from storm water. CDS units can also accommodate the addition of oil sorbents within their separation chambers. The addition of the oil sorbents can ensure the permanent removal of 80% to 90% of the free oil and grease from the storm water runoff.

OPERATIONS

The CDS unit is a non-mechanical self-operating system and will function any time there is flow in the storm drainage system. The unit will continue to effectively capture pollutants in flows up to the design capacity even during extreme rainfall events when the design capacity may be exceeded. Pollutants captured in the CDS unit's separation chamber and sump will be retained even when the units design capacity is exceeded.

CDS UNIT INSPECTION

Access to the CDS unit is typically achieved through two manhole access covers – one allows inspection (and clean out) of the separation chamber (screen/cylinder) & sump and another allows inspection (and cleanout) of sediment captured and retained behind the screen.

The unit should be periodically inspected to determine the amount of accumulated pollutants and to ensure that the cleanout frequency is adequate to handle the predicted pollutant load being processed by the CDS unit. The unit should be periodically inspected for indications of vector infestation, as well. The recommended cleanout of

solids within the CDS unit's sump should occur at 75% to 85% of the sump capacity. However, the sump may be completely full with no impact to the CDS unit's performance.

CONTECH Stormwater Solutions (previously CDS Technologies) recommends the following inspection guidelines: For new initial operation, check the condition of the unit after every runoff event for the first 30 days. For ongoing operations, the unit should be inspected after the first six inches of rainfall at the beginning of the rainfall season and at approximately 30-day intervals. The visual inspection should ascertain that the unit is functioning properly (no blockages or obstructions to inlet and/or separation screen), evidence of vector infestation, and to measure the amount of solid materials that have accumulated in the sump, fine sediment accumulated behind the screen, and floating trash and debris in the separation chamber. This can be done with a calibrated dipstick, tape measure or other measuring instrument so that the depth of deposition in the sump can be tracked.

CDS UNIT CLEANOUT

The frequency of cleaning the CDS unit will depend upon the generation of trash and debris and sediments in your application. Cleanout and preventive maintenance schedules will be determined based on operating experience unless precise pollutant loadings have been determined.

Access to the CDS unit is typically achieved through two manhole access covers – one allows cleanout of the separation chamber (screen/cylinder) & sump and another allows cleanout of sediment captured and retained behind the screen. For units possessing a sizable depth below grade (depth to pipe), a single manhole access point would allow both sump cleanout and access behind the screen.

CONTECH Stormwater Solutions Recommends The Following:

> NEW INSTALLATIONS: Check the condition of the unit after every runoff event for the first 30 days. The visual inspection should ascertain that the unit is functioning properly (no blockages or obstructions to inlet and/or separation screen), measuring the amount of solid materials that have accumulated in the sump, the amount of fine sediment accumulated behind the screen, and determining the amount of floating trash and debris in the separation chamber. This can be done with a calibrated "dip stick" so that the depth of deposition can be tracked. Refer to the "Cleanout Schematic" **(Appendix B) f**or allowable deposition depths and critical distances. Schedules for inspections and cleanout should be based on storm events and pollutant accumulation.
>
> ONGOING OPERATION: During the rainfall season, the unit should be inspected at least once every 30 days. The floatables should be removed and the sump cleaned when the sump is 75-85% full. If floatables accumulate more rapidly than the settleable solids, the floatables should be removed using a vactor truck or dip net before the layer thickness exceeds approximately one foot.
>
> Cleanout of the CDS unit at the end of a rainfall season is recommended because of the nature of pollutants collected and the potential for odor generation

from the decomposition of material collected and retained. This end of season cleanout will assist in preventing the discharge of pore water from the CDS ® unit during summer months.

USE OF SORBENTS –The addition of sorbents is **not a requirement** for CDS units to effectively control oil and grease from storm water. The conventional oil baffle within a unit assures satisfactory oil and grease removal. However, the addition of sorbents is a unique enhancement capability unique to CDS units, enabling increased oil and grease capture efficiencies beyond that obtainable by conventional oil baffle systems.

Under normal operations, CDS units will provide effluent concentrations of oil and grease that are less than 15 parts per million (ppm) for all dry weather spills where the volume is less than or equal to the spill capture volume of the CDS unit. During wet weather flows, the oil baffle system can be expected to remove between 40 and 70% of the free oil and grease from the storm water runoff.

CONTECH Stormwater Solutions only recommends the addition of sorbents to the separation chamber if there are specific land use activities in the catchment watershed that could produce exceptionally large concentrations of oil and grease in the runoff, concentration levels well above typical amounts. If site evaluations merit an increased control of free oil and grease then oil sorbents can be added to the CDS unit to thoroughly address these particular pollutants of concern.

Recommended Oil Sorbents

Rubberizer® Particulate 8-4 mesh or OARS ™ Particulate for Filtration, HPT4100 or equal. Rubberizer is supplied by Haz-Mat Response Technologies, Inc. 4626 Santa Fe Street, San Diego, CA 92109 (800) 542-3036. OARS is supplied by AbTech Industries, 4110 N. Scottsdale Road, Suite 235, Scottsdale, AZ 85251 (800) 545-8999.

The amount of sorbent to be added to the CDS separation chamber can be determined if sufficient information is known about the concentration of oil and grease in the runoff. Frequently the actual concentrations of oil and grease are too variable and the amount to be added and frequency of cleaning will be determined by periodic observation of the sorbent. As an initial application, CDS recommends that approximately 4 to 8 pounds of sorbent material be added to the separation chamber of the CDS units per acre of parking lot or road surface per year. Typically this amount of sorbent results in a ½ inch to one (1") inch depth of sorbent material on the liquid surface of the separation chamber. The oil and grease loading of the sorbent material should be observed after major storm events. Oil Sorbent material may also be furnished in pillow or boom configurations.

The sorbent material should be replaced when it is fully discolored by skimming the sorbent from the surface. The sorbent may require disposal as a special or hazardous waste, but will depend on local and state regulatory requirements.

CLEANOUT AND DISPOSAL

A vactor truck is recommended for cleanout of the CDS unit and can be easily accomplished in less than 30-40 minutes for most installations. Standard vactor operations should be employed in the cleanout of the CDS unit. Disposal of material from the CDS unit should be in accordance with the local municipality's requirements. Disposal of the decant material to a POTW is recommended. Field decanting to the storm drainage system is not recommended. Solids can be disposed of in a similar fashion as those materials collected from street sweeping operations and catch-basin cleanouts.

MAINTENANCE

The CDS unit should be pumped down at least once a year and a thorough inspection of the separation chamber (inlet/cylinder and separation screen) and oil baffle performed. The unit's internal components should not show any signs of damage or any loosening of the bolts used to fasten the various components to the manhole structure and to each other. Ideally, the screen should be power washed for the inspection. If any of the internal components is damaged or if any fasteners appear to be damaged or missing, please contact CONTECH at 800.338.2211 to make arrangements to have the damaged items repaired or replaced.

The screen assembly is fabricated from Type 316 stainless steel and fastened with Type 316 stainless steel fasteners that are easily removed and/or replaced with conventional hand tools. The damaged screen assembly should be replaced with the new screen assembly placed in the same orientation as the one that was removed.

CONFINED SPACE

The CDS unit is a confined space environment and only properly trained personnel possessing the necessary safety equipment should enter the unit to perform particular maintenance and/or inspection activities beyond normal procedure. Inspections of the internal components can, in most cases, be accomplished by observations from the ground surface.

VECTOR CONTROL

Most CDS units do not readily facilitate vector infestation. However, for CDS units that may experience extended periods of non-operation (stagnant flow conditions for more than approximately one week) there may be the potential for vector infestation. In the event that these conditions exist, the CDS unit may be designed to minimize potential vector habitation through the use of physical barriers (such as seals, plugs and/or netting) to seal out potential vectors. The CDS unit may also be configured to allow drain-down under favorable soil conditions where infiltration of storm water runoff is permissible. For standard CDS units that show evidence of mosquito infestation, the

application of larvicide is one control strategy that is recommended. Typical larvicide applications are as follows:

SOLID B.t.i. LARVICIDE: ½ to 1 briquet (typically treats 50-100 sq. ft.) one time per month (30-days) or as directed by manufacturer.

SOLID METHOPRENE LARVICIDE (not recommended for some locations): ½ to 1 briquet (typically treats 50-100 sq. ft.) one time per month (30-days) to once every 4-½ to 5-months (150-days) or as directed by manufacturer.

RECORDS OF OPERATION AND MAINTENANCE

CONTECH Stormwater Solutions recommends that the owner maintain annual records of the operation and maintenance of the CDS unit to document the effective maintenance of this important component of your storm water management program. The attached **Annual Record of Operations and Maintenance** form (see **Appendix A**) is suggested and should be retained for a minimum period of three years.

APPENDIX A

ANNUAL RECORDS OF OPERATIONS & MAINTENANCE AND INSPECTION CHECKLISTS

ANNUAL RECORD OF
OPERATION AND MAINTENANCE

OWNER _____
ADDRESS_____
OWNER REPRESENTATIVE_____**PHONE**_____

INSTALLATION:
MODEL DESIGNATION_____ **DATE** _____
SITE LOCATION_____

INSPECTIONS:

DATE/ INSPECTOR	SCREEN/INLET INTEGRITY	FLOATABLES DEPTH	DEPTH TO SEDIMENT (inches)	SEDIMENT VOLUME* (CUYDS)	SORBENT DISCOLORATION

DEPTH FROM COVER TO BOTTOM OF SUMP (SUMP INVERT) _____

DEPTH FROM COVER TO SUMP @ 75% FULL _____

VOLUME OF SUMP @ 75% FULL =_____**CUYD**

VOLUME/INCH DEPTH _____**CUFT/IN OF SUMP**

VOLUME/FOOT DEPTH_____**CUYD/FT OF SUMP**

***Calculate Sediment Volume = (Depth to Sump Invert – Depth to Sediment)*(Volume/inch)**

OBSERVATIONS OF FUNCTION: _____
_____
_____

CLEANOUT:

DATE	VOLUME FLOATABLES	VOLUME SEDIMENTS	METHOD OF DISPOSAL OF FLOATABLES, SEDIMENTS, DECANT AND SORBENTS

OBSERVATIONS:
_____
_____
_____
_____

SCREEN MAINTENANCE:
DATE OF POWER WASHING, INSPECTION AND OBSERVATIONS:
_____
_____

CERTIFICATION:_____ **TITLE:**_____ **DATE:**_____

INSPECTION CHECKLIST

1. During the rainfall season, inspect and check condition of unit at east once every 30 days ☐
2. Ascertain that the unit is funcioning properly (no blockages or obstructions to inlet and/or separation screen) ☐
3. Measure amount of solid material s that have accumulated in the sump (Unit should be cleaned when the sump is 75-85% full) ☐
4. Measure amount of fine sediment accumulated behind the screen ☐
5. Measure amount of floating trash and debris in the separation chamber ☐

MAINTENANCE CHECKLIST

1. Cleanout unit at the end and beginning of the rainfall season ☐
2. Pump down unit (at least once a year) and thoroughly inspect separation chamber, separation screen and oil baffle ☐
3. No visible signs of damage or loosening of bolts to internal components observed * ☐

*** If there is any damage to the internal components or any fasteners are damaged or missing please contact CONTECH (800.338.1122).**

CD Deliverable

12.0006

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, HONOLULU DISTRICT
TECHNICAL INTEGRATION BRANCH
BLDG. 230, ROOM 209
FORT SHAFTER, HI 96858

State of Hawaii DOT Harbors
Planning Assistance to States
REVISED SCOPE OF WORK

31 May 2011

I. PROJECT NAME: Development of Geographic Information System (GIS) Layers for State of Hawaii, Department of Transportation, Harbors Division.

II. PROJECT AUTHORITY: Planning Assistance to States (PAS), Section 22, Water Resources Development Act (WRDA) of 1974.

III. PURPOSE: The Harbors Division desires to develop a comprehensive broad spectrum of GIS layers that it has deemed essential for the implementation of an effective GIS to help Harbors in the development, utilization, and management of the port resources in Hawaii. The work to be accomplished under this amendment will build off the Pilot GIS work (Phase I) that was undertaken in the initial PAS agreement between the U.S. Army Corps of Engineers (USACE) and the State of Hawaii, Department of Transportation, Harbors Division on 18 May 2009. The work to be accomplished in Phase II and Phase III includes the development of the GIS layers which were identified in Phase I and prioritized by the Harbors Division in the order in which they are presented in Table 1 below and described in greater detail in Section IV.D. of this Amendment-1, respectively. Order of magnitude cost estimates associated with the development of each respective GIS layer is also presented in the aforementioned table. The total cost to develop the entire spectrum of GIS layers on Oahu is $513,690. The total cost will be shared 50% Federal and 50% non-Federal. The project will focus on completing the layers for Oahu. The remaining work on neighbor islands will be pursued at a later time as Federal and non-Federal funding become available.

This broad spectrum of GIS layers represent myriad types of data that the Harbors Division deemed essential for sharing within its organization, as well as with other government agencies in a uniform, consistent, and efficient manner via its GIS. Such data would be utilized to plan for and/or address various issues it faces daily which include, but are not limited to, environmental compliance, operations, property management, and engineering. Despite the shortfall in funding to realize the entire spectrum of GIS layers, it desires to enter into this Amendment 1 to begin the development of the highest priority GIS layer, "(U02) Storm Drain System", first with the intent to develop the next higher priority GIS layer as funding becomes available under a subsequent amendment.

IV. DEVELOPMENT OF GIS LAYERS

A. It is recognized that Harbors Division's priorities may change as the project develops. At the time of scope development, Oahu harbors took precedent over Neighbor Island harbors.

B. The following table shows the list of highest priority layers identified by Harbors Division. The storm drain system (pipes, open channels, inlets, outlets, junctions) around Honolulu Harbor has been built and modified by many projects and has resulted in a complex system which will take up the bulk of the time. The priorities identified by Harbors Division are listed in the table below along with the cost associated to fully develop each GIS layer.

Table 1

Data Layers Description	Oahu	Phase
Storm drain system	200,000	Phase II
Executive orders	43,720	Phase III
Aerial photos	0	Phase III
Foot markers	31,816	Phase III
Pier Footprints	3,616	Phase III
Permits	58,937	Phase III
Leases, subleases, and easements	100,869	Phase III
Boilards, cleats, capstans	40,337	Phase III
H.C. numbers (CIP/Maintenance)	0	Phase III
Bid tabulations	2,687	Phase III
Entrance channels & turning basins	19250	Phase III
Berthing areas	3,475	Phase III
HRS 343 documents	8,983	Phase III
Total	513,691	

C. The layers with the greatest ease to develop will be converted first. This is dependent upon the level of support and input provided by the various Harbors offices. Geospatial data development requires Harbors staff to help with input and data availability. The USACE will strive to provide data in each layer and strive to complete all layers if possible within the funding and time constraints. The Phase II will focus on completion of the data layers for the storm drain system on Oahu. The storm drain data layers on the neighbor islands will be covered in future phases.

D. DESCRIPTION OF HIGH PRIORITY LAYERS:

1. Storm Drain System (IPD U02)
   a. Map and identify the components (eg. outlets, inlets, manholes, pipes, open channels) of the storm drain system.
   b. Provide naming/numbering scheme for each feature.
   c. Gather attribute information for each feature (eg. material, sizes, applicable asbuilt drawings, etc.)
   d. Photo document outlets, inlets, manholes

2. Executive Orders (IPD LU06)
   a. Layer should provide clear boundary lines and maps for Harbors' properties.
   b. Map for each harbor should clearly show the EO's and subunits.
   c. Should be able to query the layer by attributes or through maps.
   d. This activity was started for Oahu under the Pilot Project and will be completed in Phase III.

3. Aerial Photos (IPD DU07)
   a. As part of the pilot project aerial photos for both Honolulu Harbor and KBPH were obtained from Harbors, COE, USGS, USDA, and University of Hawaii. These images were processed and input into the GIS. This activity was started for Oahu under the Pilot Project.
   b. Aerial photography collections for the neighbor island harbors need to be converted, consolidated, and documented similar to the Oahu harbors. All remaining hardcopy photos from Harbors Division should be located, scanned, georeferenced and metadata authored. Imagery from other agencies will be added as available.

4. Foot Markers (IPD TM05)
   a. Identify and GPS beginning and endpoints of each marker.
   b. Extrapolate markers at intervals to match ground markers
   c. Create GIS points and attributes
   d. Create GeoPDF maps over aerial imagery for use by Harbors staff.

5. Pier Footprints (IPD LU13)
   Split each harbor geographically by piers or other designations to provide a name for each area. The purpose is to establish a name for each area of the harbor so everyone can use the same language. Honolulu Harbor was completed as part of the pilot program but KBPH and the neighbor islands needs to be analyzed and completed.

6. Permits (IPD LU01)
   a. Tie an export file of the Property Management database (Comprehensive Information Database System (CIDS)) to maps
   b. Identify areas that are already permitted or encumbered by permits
   c. Search database geographically to identify Property Management data
   d. This activity was started for Oahu under the Pilot Project and will be completed in Phase III.

7. Leases, Subleases, and Easements (IPD LU02 and IPD LU03)
   a. Tie an export file of the Property Management database (Comprehensive Information Database System (CIDS)) to maps
   b. Identify areas that are already leased or available to be leased.
   c. Identify easements
   d. Search database geographically to identify Property Management data
   e. Identify tenants

f. This activity was started for Oahu under the Pilot Project and will be completed in Phase III.

8. Bollards, Cleats, Capstans (IPD LU13)
   a. While digitizing storm drain features, digitize all anchor points. Also digitize from HAR-EM *Bollard Capacities Survey* (Jan 22, 1999)
   b. GPS each anchor point during field inspection of storm drain features
   c. Add attributes to match survey (type, capacity (only if available from survey and type matches field verification), bent location.)

9. H.C. Numbers (IPD DU08)
   a. Create a polygon for each project with an H.C. Number. Add attributes to allow queries by funding source, zone or area (eg. Commercial Fishing Village), piers, or funding source (CIP vs Maintenance)
   b. Use the H.C. number to hyperlink studies, reports, contract documents, and all types of documents.
   c. Develop a network folder system to provide a home for sharing and archiving documents.
   d. This activity was started for Oahu under the Pilot Project and will be completed in Phase III.

10. Bid Tabulations (IPD DU04)
    a. Using the footprints developed by the H.C. numbers, bid tabulations will be hyperlinked geographically or through its attributes.
    b. This activity was started for Oahu under the Pilot Project and will be completed under Phase III.

11. Entrance Channels (IPD TM02) and Turning Basins (IPD TM03)
    a. The entrance channels for KBPH and the main channel at Honolulu have been mapped. Need to find the asbuilt drawings for Kalihi Channel and input into the GIS.
    b. Turning basins for KBPH and Honolulu Harbor have been input during the Pilot Project (Phase I).
    c. This activity was started for Oahu under the Pilot Project and will be completed under Phase III.

12. Berthing Areas (IPD TM04)
    a. Berthing areas are required to be maintained (dredged) by Harbors Division. This is the area between the Federal Project Line (turning basin) and the piers.
    b. Need to verify the extents of the berthing areas and determine if there are areas maintained by tenants.

13. HRS 343 Documents (Neg Decs/EA/EIS/exemptions) (IPD DU06)
    a. Obtain all available HRS 343 documents on or within 1000 feet from Harbors' boundaries. Scan hard copies if necessary.

b. Utilize polygons from H.C. Numbers or develop polygon footprints as necessary for each document.
c. Fill out attributes (title, proponent, year, Harbor, H.C. number(s), Encumbrance number(s) etc. to allow logical search)
d. Hyperlink to document.
e. This activity was started for Oahu under the Pilot Project and will be completed under Phase III.

IV. RESPONSIBILITIES AND EXPECTATIONS:

A. U.S. Army Corps of Engineers (COE):
1. The COE will assign an experienced staff member in developing and checking the GIS data.
2. Where practicable and not detrimental to the project schedule, the COE will assist Harbors Division in GIS related matters such as data exchanges among external agencies, and review of GIS related contracts.
3. As needed, the COE will provide training in using the GIS.
4. The COE will conduct presentations and attend meetings as requested by the Harbors Coordinator.
5. All geospatial data created for this project will have Federal Geographic Data Committee (FGDC) compliant metadata authored in conformity with Executive Order 12906.
6. All geospatial data produced will be delivered to Harbors at the completion of the project.

B. Hawaii DOT, Harbors Division:
1. To complete the implementation plan, each of the product descriptions must have a technical POC. Harbors Division will assign a technical person for each product description which identifies the GIS layers to be created. The COE will not perform any further work on that layer until a POC is assigned. This is to ensure that the work is being carried out for someone who intends to use the data and that someone in Harbors Division will understand why the data was created and how it is supposed to be used.
2. Harbors Division will appoint a Coordinator to be responsible for interfacing with the COE and making decisions with authority from Harbors Division.
3. Where possible, the Coordinator will obtain the Harbors data that will be assessed for utilization in the conversion stage of this project.
4. If data or information is required of specific Harbors offices, the Coordinator will obtain the information if the COE is unable to obtain the information or commitment directly from the office.
5. The Coordinator will provide access to field or technical staff when Harbors expertise or assistance is required. The coordinator will also arrange for COE access to Harbors facilities as required.
6. Harbors Division will arrange access to Harbors facilities as required by the COE.

C. Storm Drain System (IPD U02)

1. Engineering Branch to provide a POC responsible for working with the Corps and provide the data and information needed to create the layers. This will include scans of the as-built drawings, shop submittals, specifications, reports, etc.
2. As soon as possible, the storm drain system needs to be discussed among the COE and Harbors users to ensure that the correct features and attributes are collected for the different uses of this data. The Coordinator will be responsible for setting up the meeting and inviting all of the potential Harbors users to make sure their needs are met.
3. The Harbors POC needs to be capable of making decisions relating to this system such as identifying the necessary attributes and development of the naming/numbering schemes.
4. The Corps will not perform any on water or under pier surveys. .

E. Executive Orders (IPD LU06)
1. Other than what has been provided during the Pilot Project, the quantity of Executive Orders which have to be scanned or will be available is unknown.
2. The Property Management Section is expected to provide input, guidance and data to develop these layers.
3. Some of the documents have bad or no control points and have to be placed based on professional judgment. These will be called out in the attributes.

F. Aerial Photos (IPD DU07)
1. It is unknown how many remaining aerial photos require conversion.
2. It is assumed that the Harbors Coordinator will check with all Harbors staff to ensure that all available aerial photos are collected.
3. If numbers are small, COE will scan hardcopy photos.
4. Commercial or copyrighted imagery will not be shared outside of the COE and Harbors without written consent by the owning party.

G. Foot Markers (IPD TM05)
1. Presume that access will be provided to GPS the beginning and end points of the foot markers. To avoid unnecessary fieldwork, these features could be collected while collecting features for storm drainage system on Oahu.
2. Travel costs to the neighbor islands should be combined with the bollards and any other features that need collecting.

D. Pier Footprints (IPD LU13)
It is assumed that the harbor agent, and operations personnel will be available to agree on the geographical breakdown of the piers at each harbor. For neighbor islands, this task will be done from Oahu, unless other IPD's are funded that would allow an on island meeting with the harbor agent and staff. Coordination with the neighbor islands would be through phone calls and email.

H. Permits (IPD LU01), Leases (IPD LU02), Easements (IPD LU03)
1. It is unlikely that access will be provided to connect to the Comprehensive Information Database System (CIDS). If access is not possible, then periodic exports and conversions will be required to keep the system up to date.

2. Other than what has been provided during the Pilot Project, the quantity of encumbrances which have to be scanned or will be provided for conversion is unknown.
3. The Property Management Section is expected to provide input, guidance and data to develop these layers.
4. Some of the documents have bad or no control points (permits) and have to be placed based on professional judgment. These will be called out in the attributes and/or the metadata.

I. Bollards, Cleats, Capstans (IPD LU13)
1. Presume that access will be provided to GPS the beginning and end points of the foot markers. To avoid unnecessary fieldwork, these features will be collected while collecting features for storm drainage system.
2. Structural analysis will not be performed.
3. For anchor points collected outside of the existing bollard survey, the bent numbers will not be input into the attributes.
4. Need a Harbors POC to agree on the type classification when attributing the features.
5. Travel costs to the neighbor islands should be combined with the foot markers and any other features that need collecting.

J. H.C. Numbers (IPD DU08)
Per telephone conversations with Arnold Liu, no asbuilt drawings have been scanned for the neighbor islands so this IPD will not be populated at this time.

K. Bid Tabulations (IPD DU04)
Using the footprints developed by the H.C. numbers, bid tabulations will be hyperlinked geographically or through its attributes.

L. Entrance Channels (IPD TM02) Turning Basins (IPD TM03)
Need to find the asbuilt drawings for Neighbor island features and input into the GIS.

M. HRS 343 Documents (Neg Decs/EA/EIS/exemptions) (IPD DU06)
1. Other than what has been provided during the Pilot Project, the quantity of HRS343 documents which have to be scanned or will be available is unknown
2. Need to do a comprehensive search and download on the OEQC website to identify neighbors. Quantity is unknown.

V. DELIVERABLES:
GIS layers and attachments (eg. Photos, reports, reference data, all GIS data)
Data dictionary (documents purpose, structure, attributes)
Metadata (describes the GIS layers and how they were created)

The Corps will deliver an ESRI geodatabase that is compatible with Harbors Division's existing GIS software. The geodatabase shall contain all the GIS data developed for this project. Photos, maps, reports and other documents referenced in the GIS development shall also be delivered. All data shall be accompanied by metadata which will document each GIS layer. A data

dictionary shall also be provided which should document the project purposes, database structure and attributes.

VII. SCHEDULE: The project is anticipated to take 36 months beginning with the receipt of funding. The timeline below shows the intermediate checkpoints based on the start date of Phase II. Phase III will commence upon completion of Phase II and receipt of funding.

Phase II	
Harbors to provide names and contact info for Coordinator and Technical POC's	2 wks
Kickoff meeting (if required)	1 mo
Input on current features, attributes, limitations	
Discuss attributes, features, limitations	
COE begins digitizing as-built drawings	1 mo
Interviews with technical POC's for specific layers	2 mo
1st submittal of draft layers for Harbors feedback	3 mo
Revise data structure based on Harbors input	4 mo
2nd submittal of draft storm drain layers for Harbors feedback	10 mo
Final review of storm drainage layers	12 mo
Prepare maps for storm drain system (if required)	13 mo
3rd submittal of draft layers (non storm drainage)	14 mo
Final review of layers	15 mo
Delivery of Storm Drain layers to Harbors	16 mo
Phase III	
Kickoff meeting (if required)	16 mo
Input on current features, attributes, limitations	
Discuss attributes, features, limitations	
COE begins digitizing as-built drawings	16 mo
Interviews with technical POC's for specific layers	18 mo
1st submittal of draft layers for Harbors feedback	21 mo
Revise data structure based on Harbors input	24 mo
2nd submittal of draft layers for Harbors feedback	28 mo
Final review of layers	30 mo
Prepare maps for layers (if required)	32 mo
3rd submittal of draft layers (non storm drainage)	34 mo
Final review of layers	35 mo
Project Closeout	36 mo

VIII. COST ESTIMATE: **$513,690**

The estimated total cost of the study is $513,690. The cost of the PAS study will be cost shared at 50% Federal and 50% non-Federal.

IX. PROJECT DELIVERY TEAM (PDT):

Arnold Liu, Harbors Division, Planning Section
Deborah Solis, Project Manager, USACE, Civil and Public Works Branch
Benton Ching, P.E., Hydraulic Engineer, USACE, Technical Integration Branch

Section E

Pollution Prevention and Good Housekeeping Program

Stormwater Management Plan
Honolulu Harbor
and Kalaeloa Barbers Point Harbor

Prepared for:
State of Hawaii
Department of Transportation
Harbors Division

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APPENDICES

Attachment 1 – Storm Sewer System Operation & Maintenance Program

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1.0 STORM SEWER SYSTEM OPERATION AND MAINTENANCE PROGRAM

Harbors has developed a Storm Sewer System Operation & Maintenance (SSS O&M) Program that covers inspection and cleaning procedures for the small Municipal Storm Sewer Systems (MS4s) at Honolulu Harbor and Kalaeloa Barbers Point Harbor (KBPH). The SSS O&M Program is included as Attachment 1 and is summarized in this section.

HAR-O will perform an initial cleaning of all inlets, pipes (as necessary), drainage features, and outfalls (as necessary) by removing accumulated debris, trash, and sediment. Following the initial cleaning, recurring cleaning will be performed.

The goal of the program is to identify structural defects, trash, debris, and other issues that have the potential to limit the flow of stormwater. Harbors Division Oahu District (HAR-O) regularly cleans storm drains at Honolulu Harbor and KBPH. Harbors will inspect drains concurrently with cleaning activities and track results of the inspections in a database. This data will be tracked in an Asset Management System (AMS), currently under development, when it becomes available. A storm sewer drain is determined to need cleaning when a visual inspection or "stick test" determines accumulated soil, wet organic material, and debris have accumulated to certain threshold measurements. If matter has accumulated beyond six inches but less than 12 inches then the drain will be cleaned within 30 working days. If matter has accumulated beyond 12 inches then the drain will be cleaned within 10 working days.

Harbors will identify "hot spots" where there is a greater risk for potential discharges of pollutants to the storm sewer system. A hot spot is defined as: *a storm drain where more than 12 inches of accumulated soil, wet organic material, or debris were observed within two consecutive inspection cycles.*

Appropriate BMPs, including more frequent cleaning and maintenance to minimize potential discharges of pollutants will be implemented at hot spot locations. If an illicit discharge is observed due to accumulated sediment, trash or other pollutant related to drainage system cleaning, response will be conducted as detailed in the SSS O&M Program document.

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2.0 MAINTENANCE AND HOUSEKEEPING PRACTICES

Maintenance is on-going at tenant and Harbors facilities. The following maintenance activities will be conducted:

- ✓ Emptying dumpsters, removing and disposing of discarded objects, machinery or equipment;
- ✓ Prompt repair/replacement of malfunctioning dumpsters;
- ✓ General maintenance and repair of public facilities will be conducted in-house, while a contractor will be used for most large projects;
- ✓ Personnel will use fertilizer or herbicides in accordance with the manufacturer's instructions and in a manner that eliminates potential for runoff into the gutters, or storm drain system;
- ✓ Pier and apron cleanliness will be assessed for debris and staining, and responsible parties will be required to keep these areas clean;
- ✓ Tenants having rail tracks will be required to conduct routine maintaining and cleaning;
- ✓ Operators with leaking vehicles are required to park vehicles and equipment indoors/under cover, provide drip pans and repair leaks;
- ✓ Vehicle and equipment washing on Harbors property is prohibited unless performed in an approved wash facility and properly contained; and
- ✓ Clean up stains, spills, oil spots using dry cleanup methods.

2.1 SWEEPING COMMON AREAS AND SELECT TENANT FACILITIES

Sweeping prevents microscopic pollutants from entering the harbors by removing them before they flow into the storm sewer. Regular sweeping will be performed by Harbors Oahu District Maintenance Section (HAR-OM). HAR-OM has four sweepers dedicated to Honolulu Harbor and KBPH. Sweeping will included all common areas and certain areas on tenant facilities where cleaning is requested. Sweeping will be performed according to the following schedule presented in Table 2-1.

Table 2-1 Grounds Maintenance Sweeping Schedule

Location	Frequency	Duration (Hours)
Young Brothers	M, Th	2.5
Matson	Tu, F	2.75
Horizon Lines Terminal	W	3
Aloha Cargo Pier 1	Once per month	2.5
Piers 10, 11	M, F	1
Sand Island Base Yard	T, W	1
Fishing Village Parking Lot and Road Ways, Pier 35	Once per week	1.5
Piers 30, 31, 32 and Shed Areas	Twice per week	1.5
Piers 27, 28, 29	Twice per week	1.5
Piers 18, 19, 23, 24	Twice per week	1.5
Channel Street, Pier 2 Outside and Inside of Shed Areas	M, F	3
Pier 1 Entrance	Twice per week	1
Piers 1, 2 Common Roadways	Twice per week	1
KBPH Common Roadways & Apron	Twice per month	4

All waste from Honolulu Harbor and KBPH will be combined and disposed of through the appropriate disposal contractors.

2.2 WASTE COLLECTION

HAR-OM picks up and disposes of other potential pollutants left in drop off areas or discarded illegally by the public in order to minimize and/or prevent pollution to the environment. This includes automobile, boat, and motorcycle lead acid batteries, scrap steel, discarded used tires, and construction debris. Waste from drop off areas, illegal dumping, and sweeping activities are disposed of with the appropriate waste contractors. The destination of each type of waste will be reported in the Annual Compliance Report (ACR).

3.0 REVIEW OF WASH AREAS, DRY WELLS, AND INFILTRATION SINKS

3.1 WASH AREAS

Washing activities are crucial to the business operations of some tenants. Washing practices that are improperly performed generate illicit discharges and are prohibited. Harbors requires tenants to formally submit applications to perform permitted washing activities so that Harbors can determine whether or not the washing operation should be authorized.

The United States (US) Environmental Protection Agency (USEPA) S*tormwater Best Management Practices (BMPs) for Municipal Vehicle and Equipment Washing* states the following:

> *"If a vehicle must be washed outside of a facility plumbed to the sanitary sewer, take precautions to avoid wash water discharges to the storm drain system. For small jobs, berm the area surrounding the vehicle and use a wet/dry vacuum to capture the wash water for discharge to the sanitary sewer. For larger jobs, use a combination of berms and a vacuum truck, such as those used to clean storm and sanitary sewer systems, to capture and safely dispose of wash water. If detergents are used, clean the pavement to prevent this material from being carried to the storm drain during the next rainstorm."*
>
> -USEPA Website Reference: http://cfpub.epa.gov/npdes/stormwater/menuofbmps

Harbors will require that applications for washing include the following information:

- ✓ What the tenant intends to wash;
- ✓ Equipment used (i.e. pressure sprayer, hose, etc.) and flow rate;
- ✓ What type of detergent the tenant intends to use (biodegradable detergent is prefered)
- ✓ Wash water containment method (permanent wash rack, temporary berm, etc.);
- ✓ Wash water capture method (vacuum truck, evaporation, etc.);
- ✓ Wash water collection container capacity; and
- ✓ Wash water disposal method.

Tenants will be prohibited from washing equipment and vehicles until Harbors verifies that these washing activities do not create a potential hazard to the receiving waters. Harbors will issue a formal letter of approval once these conditions are met. The application and review process will be tracked on an annual basis.

If the washing facility discharges to the CCH sanitary sewer, an Industrial Wastewater Discharge Permit will be required. It is the tenant's responsibility to apply for and meet the requirements of the CCH permit.

3.2 DRY WELLS AND INFILTRATION SINKS

Harbors will require that applications for sinks or drains that are not connected to the sanitary sewer include the following information:

- ✓ The intended use of the sink;
- ✓ A list of substances that may be washed into the sink (e.g. bio-degradable soaps and dirt);
- ✓ Construction drawings for the sink;
- ✓ Proposed treatment of the water (filtration fabric, sand, carbon filters, oil-absorbent material, etc.);
- ✓ Final destination of wash water; and
- ✓ Routine maintenance schedule for the sink (replacement of filtration material).

Tenants will be prohibited from using unapproved sinks until Harbors verifies that the sinks do not create a potential hazard to receiving waters. Harbors may issue a formal letter of approval once these conditions are met. The application and review process will be tracked on an annual basis.

4.0 TENANT EDUCATION AND EMPLOYEE TRAINING

Tenants will be educated regarding pollution prevention and good housekeeping practices at the Annual Tenant Stormwater Awareness Training. Harbors will provide information to all employees about its stormwater pollution prevention program on an annual basis. In addition, Harbors will provide annual Illicit Discharge Detection and Elimination (IDDE) and awareness training to employees including Marine Cargo Specialists and Grounds Supervisors. Slides depicting examples of proper and improper BMPs will be presented to illustrate acceptable procedures.

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ATTACHMENT 1
STORM SEWER SYSTEM OPERATION & MAINTENANCE PROGRAM

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STORM SEWER SYSTEM OPERATION & MAINTENANCE PROGRAM



Prepared For:

State of Hawaii
Department of Transportation
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79 South Nimitz Highway
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November 20, 2014

Version 10.0

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3.0	June 14, 2013	Third Revision
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6.0	October 26, 2013	Sixth Release
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9.0	November 7, 2014	Ninth Revision
10.0	November 20, 2014	Tenth Revision

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Introduction

Aloha,

Pursuant to Chapter 266, Hawaii Revised Statutes, the Director of Transportation is responsible for the care and control the commercial harbors and homesteads. Honolulu and Kalaeloa Barbers Point Harbors is vital to the economic security of the State of Hawaii. Cargo that flows through our commercial ports means jobs; it is a magnet for business and business owners in that community; it means taxes get paid; and people employed.

By appointment to your position, the Director confers the responsibility to each manager, supervisor, and employee to balance the industrial activity with environmental compliance. In realizing our responsibility, each manager, supervisor, and employee is an economic and environmental steward of our Harbor lands and waters. Therefore, the "Malama I Ke Kai" theme has been adopted to embody our values in protecting our ocean waters for the economic welfare of state and the environment.

Storm Sewer System Operation & Maintenance Program

Honolulu and Kalaeloa Barbers Point Harbors are working harbors, busy with industrial activity that includes the use and maintenance of: heavy diesel equipment, delivery vehicles, construction projects, container operations, fresh fish operations, and various tenant operations. Storm water flowing over harbor lands into storm drains and empties into ocean waters. This flow requires the adoption and implementation of best management practices to mitigate and prevent oil, debris, silt, and other potential pollutants from entering our ocean waters.

Historically, the infrastructure design and construction of drainage systems throughout Honolulu and Kalaeloa Barbers Point Harbors, as well as the County of Honolulu, did not provide for specialized storm drain systems to mitigate regulated material that may be carried by storm water and discharged into the ocean waters of the state. The general belief was storm water discharging into the ocean was a natural occurrence because storm water flows naturally from the mountains to the ocean.

However, improved science and our understanding now tells us that storm water flows can transport unwanted pollutants from the land into the ocean through storm drains, swales, or other uncontrolled access points across our piers. To protect the environment, Federal and State environmental laws were adopted to ensure land owners and tenants control the discharge of pollutants into the ocean.

In complying with environmental laws, the Harbors Division prepared and obtained a storm water permit (commonly referred to as a Small Municipal Storm Water Sewer System (MS4) from the Hawaii Department of Health (DOH). Included in the DOH permit were *conditions* that the Harbors Division agreed to comply with regarding the adoption of best management practices in order to mitigate and prevent oil, debris, silt, and other potential pollutants.

Despite those efforts, however, the U.S. Environmental Protection Agency (EPA) initiated regulatory actions to increase our awareness, improve the program, and to ensure compliance. On November 5, 2014, the US District Court entered a Consent Decree ordering the Harbors Division to comply with specific requirements. The EPA and the Department of Justice required the Harbors Division to prepare and submit a Storm Sewer System Operation and Maintenance Program (SSSOMP) manual, which included a requirement for a recurring schedule to: inspect and clean the storm sewer system; address the range of operation and maintenance activities to be performed; and describe actions by personnel responsible.

1.0. Roles and Responsibilities

As stewards who are conferred with the responsibility to care for our harbors and our ocean waters, we have the following three objectives:

1) *Educate* Harbors' employees to observe, educate, report, and assist with enforcing best management practices in and around our harbor community to ensure that

tenants adhere to the "Dump No Waste" mantra. These pollutants ultimately may enter storm drains and carry pollutants into our seas.

2) *Prevent* and mitigate oil, debris, silt, and other potential pollutants from entering our ocean waters, by implementing best management practices; and,

3) Encourage voluntary compliance and support *enforce*ment action to correct behavior.

1.1. Defining Our Role and Others.

The following has been prepared to define and help with understanding our role as stewards of the commercial ports and in meeting the three objectives.

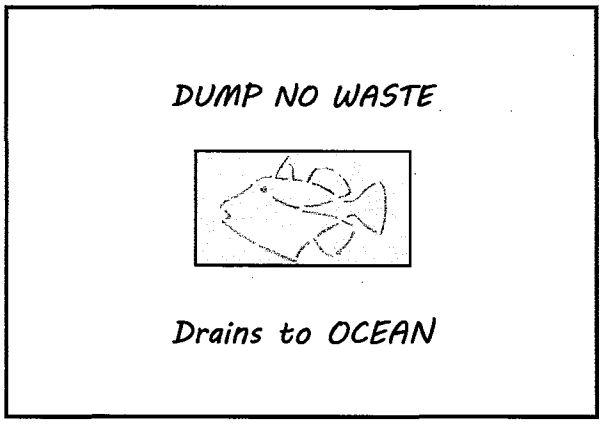
1.1.1. Educating Tenants and Harbor Division Employees

Stencils and Signage. Stenciling is the first step in a series of an awareness and educational campaign to change tenant and employee behavior and adopt best management practices. Stencils at each drain inlet and Signage is a reminder to tenants and Harbors Division employees to "Dump No Waste" onto the ground because storm water will transport pollutants and "Drains to Ocean." The Oahu Harbor District is tasked with stenciling non-public areas/non-secured areas and secured areas of the pier facilities; and, also to re-stencil stencils that are illegible. At least yearly, the Oahu Harbor District will review the effectiveness of the stencils and consider the use of medallions or permanent inlet markers in lieu of a stencil, if warranted.

1.1.1.1. Stencils.

The stenciling program is to promote awareness. There are 525 known drain inlets/catch basins and 21,921 linear feet of trench drains/ open channel/ throughout Honolulu and Kalaeloa Barbers Point Harbors (See Appendix 1 - Storm Water Drain Identity and Location Maps.) Each box drain and open channel/trench drains will be stenciled with "Dump No Waste, Drains to Ocean" with the picture of the *Humuhumunukunukuapua`a*, the State of Hawaii fish (See Figure 1.)

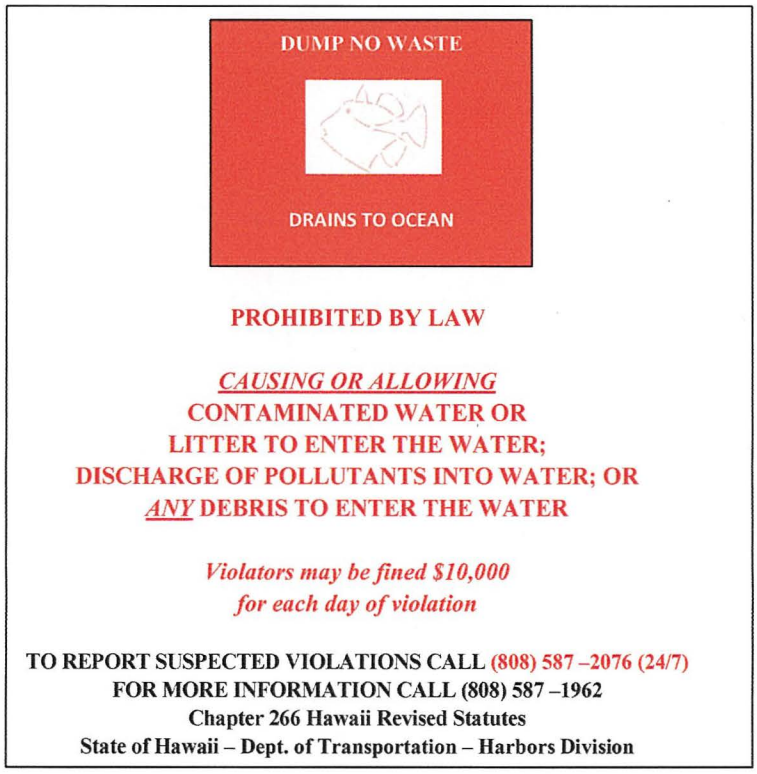
Figure 1
Storm Drain Stencils



1.1.1.2 Signage.

Signage promotes awareness and provides notice to tenants that dumping waste is subject to fines up to $10,000 (See Figure 2 - Storm Water Signage). Over 60 signs have been posted at Honolulu and Kalaeloa Barbers Point Harbor of the consequences of behavior that negatively impacts the environment. The signage incorporates the "Dump No Waste, Drains to Ocean" theme as follows (See Appendix 2 - Signs and Stencils.) The Oahu Harbor District reviews the effectiveness in the placement of the signs while taking into account changing Tenant use patterns at the Harbors.

Figure 2
Storm Water Signage



1.2 Educating Harbor Tenants and Harbors Division Employees.

Through the Harbors Engineering Environmental Section (HAR-EE), the Harbors Division is responsible for educating harbor tenant and Oahu Harbor employees regarding tenant activities. Training material and slides can be found on the DOT-Harbors website at:

http://hawaii.gov/dot/harbors/library/storm-management-plan

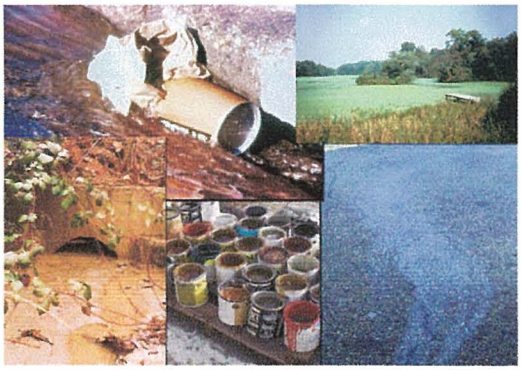
1.3 Prevent and mitigate potential violations

1.3.1 Inspections – District.

There are three Harbor Division sections that conduct inspections of harbor facilities. The Property Management Section (HAR-PM) inspects and enforces Tenants issued a lease, revocable permit, license, or right of entry. The Harbors Engineering Branch (HAR-E) is responsible for inspections of right of entry to contractors and tenant and Harbor Division construction sites. The Oahu Harbor District (HAR-O) inspects, monitors, observe, and correct tenant activities that have the potential sources of illicit discharges.

Inspections align with the most common sources of illicit discharges, as follows:

- √ Wash water from operations such as fleet car washings
- √ Floor washing to shop drains discharging to stormwater drains
- √ Spraying down dirt off driveways
- √ Pumping out accumulated rain water that has sheen into storm drain
- √ Liquid wastes containing oil or paint that have leaked onto a drainage path
- √ Trash dumped into the storm drain

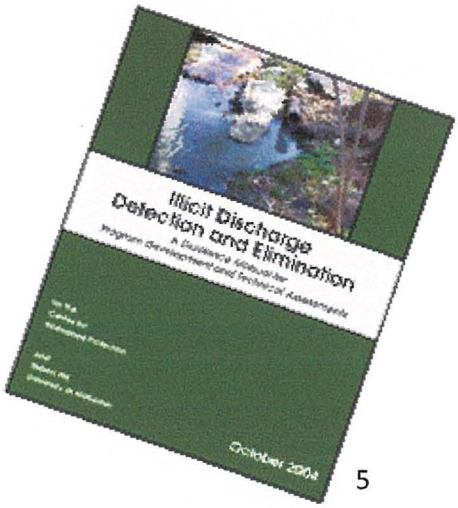


Examples of illicit discharges are:

- √ Uncovered outdoor petroleum storage
- √ Overflowing trash bins
- √ Leaking drums or roll-offs
- √ Outdoor sink without capture
- √ Vehicle washing without capture
- √ Building washing without capture

Understanding the source, vehicle, and route of storm drain pollution is important to inspection:

- √ Source: Leaking container, building material, spills
- √ Vehicle/Carrier: Irrigation waters, wash water, rainfall, etc.
- √ Route: Swale, storm drains



Allowable discharges include:

- √ Water Line Flushing
- √ Landscape Irrigation
- √ Diverted Stream Flows
- √ Rising Ground Water
- √ Uncontaminated Ground Water Infiltration
- √ Uncontaminated Pumped Ground Water
- √ Discharges from Potable Water Sources
- √ Air Conditioning Condensate

√ Crawl Space Pumps and Footing Drains
√ De-chlorinated Swimming Pool Water
√ Discharges from Fire Fighting Activities

1.3.2 Responsibility for Inspections - Oahu District (HAR-O) Personnel.

The Oahu Harbor District has two types of inspection schedules. Marine Cargo Specialists (MCS) and Harbor Agents (HA) conduct daily inspections of tenant activities in their assigned piers for: damage; pier use by cargo operators; and to inspect, monitor, observe, and correct tenant activities that have the potential sources of illicit discharges. The other type of inspection are quarterly storm drain inspections to determine if a storm drain cleaning is needed.

> "Tenant Activities" means the recurring activities conducted by Tenants including but not limited to fish cleaning, equipment, vessel or vehicle cleaning, or equipment, vessel or vehicle maintenance.
>
> "Tenant" means a person, group, partnership, corporation or any other entity that has been executed a lease, revocable permit or disposition instrument under chapter 171, Hawaii Revised Statutes - Public Lands.
>
> "Vessel" shall mean any watercraft or other contrivance used as a means of transportation on water.

Oahu District personnel have primary responsibility for observing, reporting, and enforcing tenant activities in cargo yards surrounding a single tenant area, and common pier facilities with multi-cargo operators. The Marine Cargo Specialist and Harbor Agent have secondary responsibilities in support of the Property Management (HAR-PM) Section to observe environmental concerns on tenant property or to the Harbors Engineering (HAR-E) Branch, as described above. Environmental concerns are reported to the respective Property Manager or Harbors Engineering Branch engineer as provided in flow charts below.

The following are responsibilities of the specific job classification for inspections, and daily scheduled inspections of piers and facilities and the inspection of storm drains:

1.3.2.1 Harbor Operations Supervisors (HOS).

In the Oahu District, the HOS leads their respective operations sections. (See Appendix 3 - DOT/Harbors Organizational Chart Position Descriptions and Appendix 4 – Position Descriptions and Class Specifications of Selected Employees.) ***Environmental inspections are not a part of their normal day to day performance***; however, **attendance in environmental stormwater training *is required*** (e.g. prevention and best management

practices) to ensure that work by their employees is performed with the environment in mind (use of vehicles, observations and recognition of an illicit discharge or environmental concern). The HOS reviews the Oahu District Environmental Inspection Report (Appendix 5 – Oahu District Environmental Inspection Report, Appendix 6 - Delivery of Recyclables, Appendix 7 - Area Survey, Appendix 8 - Work Order, and Appendix 10 - Illicit Discharge Reporting Form, when provided.) Action items (e.g. Work Orders to Grounds Maintenance (HAR-OCG) for drain cleaning) are referred to the appropriate section for action and resolution. The HOS conducts follow up reviews at weekly section meetings.



During normal working hours, at the discretion of HOS and the level of experience and training, action and response to an incident may be resolved by the HOS or elevated to the Commercial Harbor Manager (CHM) or to the Oahu Harbor District Manager for assistance and response.



After normal working hours and weekends and holidays, incidents are referred to the appropriate Stand-by HOS or to a higher level manager for appropriate action and response in the following order: Commercial Harbor Manager, Oahu District Manager or Harbor Administrator. After normal working hours, if the Stand-by HOS is not able to respond to an incident in a timely manner (as the incident dictates the timeliness of the response), the Stand-by HOS will assign the highest ranking employee working that shift (e.g. Harbor Enforcement Officer) to be the on-site incident commander. The assigned highest ranking employee may be relieved as the ICS Incident Commander upon the arrival of the Stand-by HOS, Commercial Harbor Manager, or Oahu District Manager upon proper transition of command.



Reports prepared by Marine Cargo Specialists and Harbor Agents (Appendix 6 – Oahu District Environmental Inspection Report, Appendix 7 - Area Survey, Appendix 8 - Work Order, and Appendix 10 - Illicit Discharge Reporting Form), when provided) are reviewed by their appropriate supervisors, the Marine Cargo Specialist II and/or the HOS. Each HOS and/or the Marine Cargo Specialist II is responsible to review the reports of observations and reports of environmental issues prepared by the Marine Cargo Specialist and Harbor Agents and address non-emergency issue as soon practicable from the date of the receipt of the report.

1.3.2.2 General Professionals III and IV (GP).

1.3.2.3 At the Oahu District, the GPs are in charge of security and law enforcement, respectively (See Appendix 3 - DOT / Harbors Organizational Chart Position Descriptions and Appendix 4 – Position Descriptions and Class Specifications of Selected Employees.) ***Attendance in environmental stormwater training*** (e.g. prevention and best management practices) ***is required*** to ensure that work is performed with the environment in mind (use of patrol vehicles, observations and recognition of an illicit discharge or environmental

concern). The GP reviews Work Orders and Harbor Activity Reports prepared by the Harbor Enforcement Officers (Appendix 10 - Illicit Discharge Reporting Form) to ensure that the Harbor Enforcement Officer's observations and recognition of an illicit discharge or environmental concern are addressed by District Sanitation and Grounds Personnel (OCG) or the Harbors Engineering Environmental (HAR-EE) section.



During normal working hours, at the discretion of the GP and level of experience and training, action and response to an incident may be resolved by the GP or elevated to the Commercial Harbor Manager or to the Oahu District Manager for assistance and response.



After normal working hours, incidents are managed by the appropriate Stand-by HOS or as referred by the Stand-by HOS to a higher level manager, such as the Commercial Harbor Manager, Oahu District Manager or Harbor Administrator for appropriate action and response. After normal working hours, if the Stand-by HOS is not able to respond to an incident in a timely as the incident dictates the timeliness of the response), the Stand-by HOS assigns the highest ranking employee working that shift (e.g. HEO) to be the on-site incident commander. The assigned highest ranking employee may be relieved as the (ICS) Commander upon the arrival of the Stand-by HOS, Commercial Harbor Manager, or Oahu District Manager upon proper transition of command.



As needed reports prepared by the Harbor Enforcement Officers (Appendix 10 - Illicit Discharge Reporting Form) are reviewed by the GP. It is the responsibility of each GP to review the reports of observations and reports of environmental issues made by the Harbor Enforcement Officers and to address the non emergency issues as soon as practicable from the date of the receipt of the report.

1.3.2.4 Harbor Enforcement Officers (HEO).

The Oahu District Harbor Enforcement Officers - also known as Harbor Police - are the District's law enforcement officers (See Appendix 3 - DOT / Harbors Organizational Chart Position Descriptions and Appendix 4 – Position Descriptions and Class Specifications of Selected Employees.) Attendance at environmental stormwater training (e.g. prevention and best management practices) ***is required*** to ensure that work is performed with the environment in mind (use of patrol vehicles, observations and recognition of an illicit discharge or environmental concern). ***A response to an on-scene event of environmental concern from the Harbor Traffic Controllers (Aloha Tower) or HOS is expected outside the normal business office hours (Monday through Friday, 7:45 am to 4:30 pm).*** In response to a call from the Harbor Traffic Controllers (Aloha Tower) or HOS outside the normal working hours, the highest ranking HEO upon arrival at the scene is the incident commander and performs ICS as described in the National Incident Management System (NIMS).



During normal working hours, at the discretion of the HEO and the level of experience and training dependent on the training the HEO received, the incident may be elevated to the HEO's supervisor for appropriate action in the following order: Sergeant, Lieutenant, GP IV, Commercial Harbor Manager, District Manager or Harbor Administrator. The HEO may be relieved as the ICS commander upon the arrival of the GP IV or higher level manager upon transition of command.



Reports prepared by the HEO (Appendix 10 Illicit Discharge Reporting Form) and Harbor File reports are reviewed by the HEO supervisors, the Lieutenant or Sergeant), and the GP IV. It is the responsibility of each HEO's supervisor (Lieutenant or Sergeant) and the GP IV to review the report to ensure that the observations and reporting of non emergency issues by the HEO are addressed as soon as practicable from the date of the receipt of the report.

1.3.2.5 Marine Cargo Specialist (MCS).

The MCS at Oahu Harbor District conducts daily inspections of the piers, and tenant activities in cargo yards and vessel operators (See Appendix 3 - DOT / Harbors Organizational Chart Position Descriptions and Appendix 4 – Position Descriptions and Class Specifications of Selected Employees.) ***Inspections are expected including observations for environmental compliance and are a part of normal day to day performance. Response to an on-scene event of environmental concern from the Harbor Traffic Controllers (Aloha Tower) is expected during normal business office hours or scheduled work hours; attendance in training is required*** to ensure tenant activities in cargo yards and vessel operators are in compliance with the Storm Water permit conditions (See section 1.3.4, Storm Drain Inspections.) Upon arrival at the scene, the MCS is the incident commander and performs ICS as described in the National Incident Management System (NIMS). The incident may be elevated to the HOS or higher level manager for appropriate action and response in the following order: HOS, Commercial Harbor Manager, District Manager or Harbor Administrator. The MCs shall be relieved as the ICS commander upon the arrival of the HOS, Commercial Harbor Manager, or Oahu District Manager upon proper transition of command.



Reports prepared by the MCS and submitted to the HOS (Appendix 6 – Oahu Harbor District Environmental Inspection Report, Appendix 7 - Area Survey, Appendix 8 - Work Order, and Appendix 10 - Illicit Discharge Reporting Form) are reviewed by the supervising MCS and the HOS to ensure that the observations and reporting of environmental issues by the MCS are addressed as soon as practicable from the date of the receipt of the report (See Figure 4 - Flow Chart (Process Map) for Marine Cargo Specialist & Harbor Agents).

The MCS at Oahu Harbor District conducts scheduled storm drain inspections on their assigned piers, and secured areas in the cargo yards. For the first two (2) years after the initial storm drain cleaning, storm drain inspections shall occur once a calendar quarter to monitor the drain system for hot spots as defined below. After the two (2) years, storm drain inspections shall occur at least every six (6) months.

1.3.2.6 Harbor Agent II and III (HA)

The HA at Oahu Harbor District conducts daily inspections of the piers, tenant areas in cargo yards. (See Appendix 3 - DOT / Harbors Organizational Chart Position Descriptions and Appendix 4 – Position Descriptions and Class Specifications of Selected Employees.) ***Inspections are expected including observations for environmental compliance and are a part of normal day to day performance. Response to an on-scene event of environmental concern from the Harbor Traffic Controllers (Aloha Tower) is expected during normal business office hours or scheduled work hours; attendance in training is required*** to ensure tenant activities in cargo yards and harbor user compliance with the Storm Water permit conditions (See section 1.1.13, Storm Drain Inspections.) Upon arrival at the scene, the HA assumes the role as incident commander and performs ICS as described in the National Incident Management System (NIMS). The incident may be elevated to the HOS or higher level manager such as the Commercial Harbor Manager, District Manager or Harbor Administrator (if the HOS cannot be contacted), for appropriate action and response. The HA may be relieved as ICS Incident Commander upon the arrival of the HOS, Commercial Harbor Manager, or Oahu District Manager, upon proper transition of command.

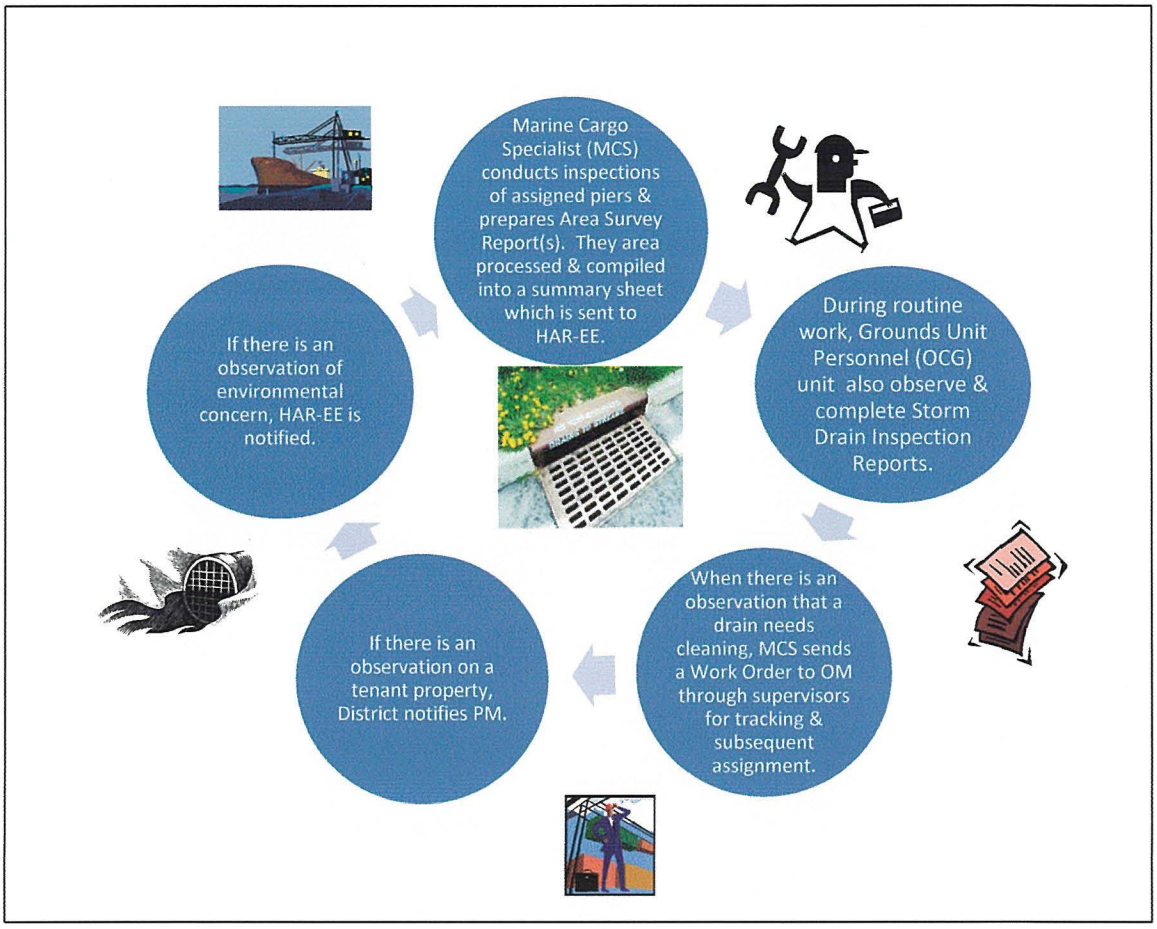


Reports prepared by the HA and submitted to the HOS (Appendix 6 – Oahu Harbor District Environmental Inspection Report, Appendix 7 - Area Survey, Appendix 8 - Work Order, and Appendix 10 - Illicit Discharge Reporting Form) is reviewed by the HOS to ensure that the observations and reporting of environmental issues by the HA are addressed as soon as practicable from the date of the receipt of the report. (See Figure 4, Flow Chart (Process Map) for Marine Cargo Specialist & Harbor Agents).

The HA at the Oahu Harbor District conduct scheduled storm drain inspections in their assigned piers, and tenant areas in the cargo yards. For the first two (2) years after the initial storm drain cleaning, storm drain inspections shall occur once a calendar quarter to monitor the drain system for hot spots as defined below. After the two (2) years, storm drain inspections shall occur at least every six (6) months.

Figure 3

Marine Cargo Specialist & Harbor Agents Honolulu Inspection Flowchart



1.3.2.7 District Utility and Maintenance Personnel (OM).

OM personnel conduct daily maintenance functions at the piers, and tenant areas in the cargo yards (See Appendix 3 - DOT / Harbors Organizational Chart – Utility Services (Chart page number 12, and Maintenance Section, Chart page numbers 15-18.) ***Environmental inspections are not a part of their normal day to day performance; however,*** **attendance in environmental stormwater training** ***is required. An observation by OM personnel for potential illicit discharges during the maintenance of the facilities is expected and it is a part of their normal day to day duties and responsibilities*** *as* stewards of our ocean. OM personnel shall report their observations to Aloha Tower or immediate supervisor regarding an illicit discharge or an environmental concern. ***OM personnel are expected to respond to a call from their supervisors regarding an environmental concern during normal business office hours;*** *provided* the OM personnel has received the proper OSHA training. The District has retained hazardous waste contractors to provide the appropriate OSHA training for OM personnel in responding to a call regarding an environmental concern. ***Attendance in environmental awareness training is required t***o obtain skills in identifying "illicit

discharges" and recognize whether a tenant activity is compliant with the Storm Water permit conditions as trained (See Appendix 3 - 2012 Tenant Storm Water Pollution Prevention Awareness Training *Malama I Ka Kai – Protect Our Ocean.*) Upon arrival at the scene, the highest pay ranking OM personnel shall serve as the ICS incident commander until relieved by a OM supervisor, Marine Cargo Specialist, HA, HOS, Commercial Harbor Manager or Oahu District Manager. The immediate role of the highest ranking OM personnel is to secure the site (i.e., placing barricades, etc.) as described in the National Incident Management System (NIMS). The supervisor of the OM personnel may elevate the incident to the HOS or higher, for appropriate action and response. The highest ranking OM personnel and or the supervisor of the OM personnel may be relieved as the ICS Incident Commander upon the arrival of the District Utility or Maintenance Supervisor, MCS, HA, HOS, Commercial Harbor Manager, or Oahu District Manager or Harbor Administrator), upon proper transition of command.

Reports prepared by OM and the Illicit Discharge Reporting Form (see Appendix 10) and submitted to the HOS for review to ensure that the observations and reporting by the HA of environmental issues are addressed as soon as practicable from the date of the receipt of the report (See Figure 4, Flow Chart (Process Map) for Marine Cargo Specialist & Harbor Agents).

1.3.2.8 District Sanitation and Grounds Personnel (OCG).

The OCG personnel conducts daily maintenance functions at the piers, and tenants areas in the cargo yards. (See Appendix 3 - Sanitation and Grounds Sub unit, Chart page number 14.) ***Environmental inspections are expected***; however, ***an observation by the OCG personnel for potential illicit discharges during the maintenance of the facilities is expected and it is a part of their normal day to day duties and responsibilities*** *as* stewards of our ocean. The OCG personnel complete reports of their observations and recognition of an illicit discharge or of environmental concern (Appendix 5 - Environmental Inspection Report, and Appendix 6 - Delivery of Recyclables.) ***The OCG personnel are expected to respond to a call from their supervisors regarding an environmental concern during normal business office hours;*** *provided* the OCG personnel has received the proper OSHA training. The District has retained hazardous waste contractors to provide the appropriate OSHA training for District Sanitation and Grounds Personnel in responding to a call regarding an environmental concern ***Attendance in environmental awareness training is required*** to obtain skills in identifying "illicit discharges" and recognize whether a tenant and harbor user compliance with the Storm Water permit conditions as trained (See Appendix 3 - 2012 Tenant Storm Water Pollution Prevention Awareness Training *Malama I Ka KAI – Protect Our Water.*) Upon arrival at the scene, the highest pay ranking District Sanitation and Grounds Personnel shall serve as the incident commander until relieved by the OCG supervisor, MCS, HA, HOS, Commercial Harbor Manager or Oahu District Manager. The immediate role of the highest

ranking OCG personnel is to secure the site by placing barricades, etc.), as described in the National Incident Management System (NIMS).

The supervisor of the OCG personnel may elevate the incident to the HOS or higher, for appropriate action and response. The highest ranking OCG personnel and or the supervisor of the OCG personnel shall be relieved as the ICS Incident Commander upon the arrival of the OCG supervisor, MCS, HA, HOS, Commercial Harbor Manager or Oahu District Manager or Harbor Administrator (if the HOS cannot be contacted), upon proper transition of command.



Reports prepared by the OCG personnel are reviewed by the OCG supervisors (Appendix 5 - Environmental Inspection Report, Appendix 6, Delivery of Recyclable items, and Appendix 10 -Illicit Discharge Reporting Form) as applicable. It is the responsibility of each OCG supervisor to review the report prepared by the OCG personnel to ensure that the observations and reporting of environmental issues by the OCG personnel are addressed as soon as practicable from the date of the receipt of the report.

1.3.3 Storm Drain Inspections.

1.3.3.1 Conducting Inspections.

As provided in section 1.3.1, Inspections, District personnel as stated above observe, report, and enforce tenant activities in cargo yards surrounding a single tenant area, and common pier facilities with multi-cargo operators. The MCS and HA observe conduct environmental compliance inspections of tenant activities in their assigned areas (See Figure 3) and report any illicit discharges as presented during employee training provided by the HAR-EE section (See section 1.2.) or other non-complying tenant activities to their supervisor, Property Management (HAR-PM), or Harbors Engineering Branch (HAR-E).

First Two Years. Two (2) years after the initial cleaning of the Storm Drains, the MCS and the HA will conduct storm drain inspections once a quarter of the calendar year beginning the first quarter following the initial cleaning; thereafter, inspections of storm drains (except hot spots) will be reduced to once every six (6) months.

Inspections After Two Years. The MCS and the HA will conduct the scheduled storm drain inspections and reports, as required, in their assigned piers, yards, and of tenant activities in cargo yards (See Figure 4) and complete a drain inspection report (See Appendix 9 - Storm Drain Inspection Cleaning Form for Honolulu Harbor, Storm Drain Inspection Cleaning Form for Honolulu Harbor (Open Channels - also called trench drains), Cleaning Form for Kalaeloa Barbers Point and Cleaning Form for Kalaeloa Barbers Point (Open Channels - also called trench drains.)

Inspections After A Significant Rain Event. Inspections shall occur after a significant rain event defined as three (3) inches or more in 24 hour period. As with current practice, the MCS or HA will inspect the storm sewer; submit an area survey; and prepare a Work Order if storm drains require cleaning in a timely manner as provided in the standard. Cleaning will be performed by the grounds maintenance crew.

To verify whether a rain event occurred, the HOS or the MCS II shall determine whether a significant rain event occurred as indicated by NOAA and National Weather Service Weather Forecast office at the following URL address:

1. http://www.prh.noaa.gov/hnl/pages/hydrology.php See and click Text file:

   Routine Products

   - Drought Information Statements *updated monthly as conditions warrant*
   - Hawai`i Rainfall Summary - issued every 3 hours

   → Text file

   90 day archive *updated several times daily*
   Graphical Rainfall Summary (includes station locations)

2. http://www.prh.noaa.gov/data/HFO/RRAHFO for rainfall over the last 24 hours.
   - Search the text document under Island ID (Oahu Harbor) and Location: ALOH1 : ALOHA TOWER (HI26) for 24 hour rainfall.

3. http://www.prh.noaa.gov/hnl/hydro/daily_archive/HRS_archive.php for rainfall over the last 90 days.

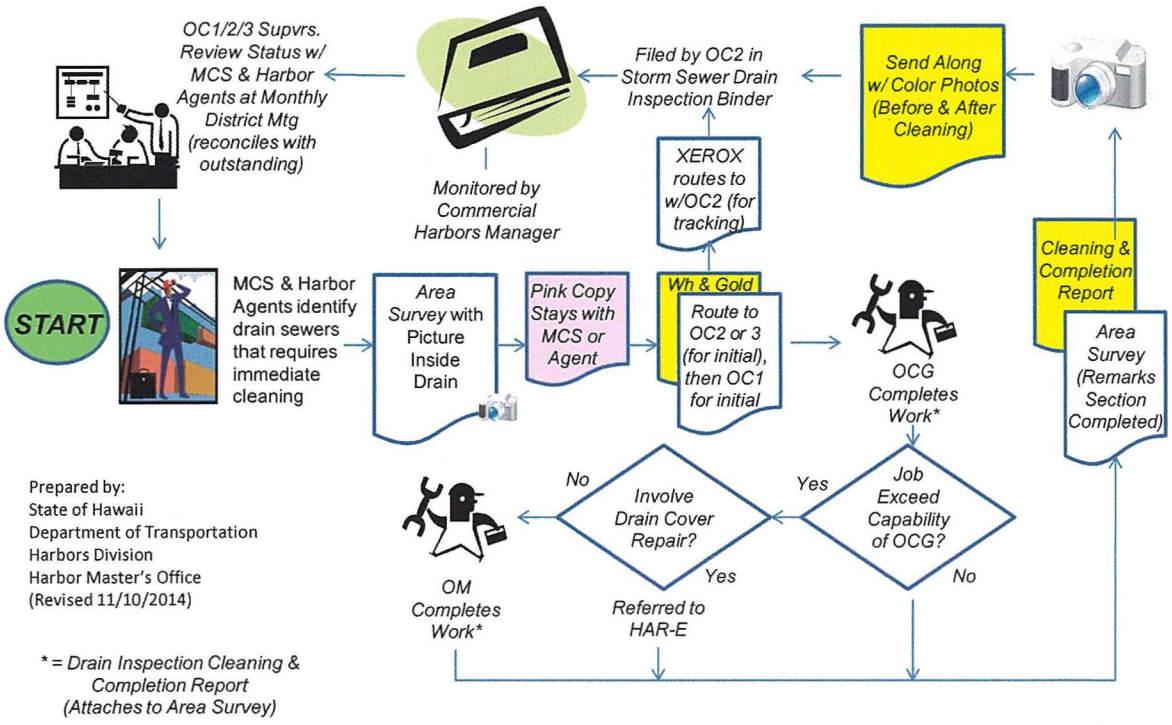
   - Search the Hawaii Rainfall Summary 90 Day Archive text document under Island ID (Oahu Harbor) and Location: ALOH1: ALOHA TOWER (HI26) for 24 hour rainfall.

1.3.3.2 Determining When A Storm Sewer Drain Needs Cleaning.



Reports prepared by the MCS and HA are submitted to the HOS (Appendix 7 – Area Survey or Oahu District Environmental Inspection Report, Appendix 5) are reviewed by the supervising MCS and the HOS to ensure that the observations and reporting of environmental issues by the MCS are addressed as soon as practicable from the date of the receipt of the report (See Figure 4, Flow Chart - Process Map).

Figure 4
Flow Chart (Process Map) for Marine Cargo Specialist & Harbor Agents



Legend: Marine Cargo Specialist (MCS). Harbor Operations Supervisors (also referred to as OC 1, OC2, OC3). District Sanitation and Grounds Personnel (OCG). District Utility and Maintenance Personnel (OM). Harbors Engineering (HAR-E).

The Storm Drain Inspection Cleaning Forms for Honolulu and Kalaeloa Barbers Point Harbors form (See Appendix 9) requests information for each GIS Unit Drain Inlet "Was Cleaning Necessary? (Yes/No)." To guide the MCS and HA in answering "Yes or No", the following Standard was developed as provided below:

Standard. The primary test to determining when a storm sewer drain needs cleaning will be visual observation using the standard below. However, if the MCS or HA cannot see the bottom of the drain, the determination whether a storm drain requires cleaning shall be based on the stick test for inspections of accumulated soil, wet organic material, and debris.

The measure shall be from the bottom of the drain structure to the height or depth of the organic material to determine if cleaning is required.



0" - 6" 6" - 12" >12"

Green - During the regular quarterly inspections and accumulated soil, wet organic material, and debris is observed or measured using the "stick test" of zero (0") inches to six (6") level inches cleaning is not required.

Yellow - During the regular inspections and accumulated soil, wet organic material, and debris is observed or measured using the "stick test" is greater than six (6") inches and less than twelve (12") level inches, the MCS and HA will complete the Area Survey (See Appendix 7) and a Work Order (See Appendix 8) to request cleaning within thirty (30) working days.

Red - During the regular inspections and accumulated soil, wet organic material, and debris is observed or measured using the "stick test" exceeds twelve (12") level inches, the MCS and HA will complete the Area Survey (See Appendix 7) and a Work Order (See Appendix 8) to request cleaning within ten (10) working days.

Storm Drain ID. Each storm drain has been identified by location on a pier, type of storm drain (box drain, trench train, etc.) on maps and the Storm Drain Inspection Cleaning Forms for Honolulu and Kalaeloa Barbers Point Harbors form provided in Appendix 9.

Schedule. After the initial cleaning of the storm drains, the MCS and the HA will conduct quarterly storm drain inspections beginning with the first calendar quarter following the Contractor's submission of the initial drain cleaning report. The quarterly inspections shall continue over two (2) calendar years; thereafter, inspections shall conducted twice each calendar year and once during each half of the calendar year.

1.3.3.3. Determining Hot Spots.

After the initial cleaning of the storm drains, the MCS will begin their quarterly inspections of the storm drains. The MCA and HA will apply the "standard" and prepare and submit Work Orders that meet the "yellow" or "red" standard. The Work Orders are submitted through the respective supervisors for the OCG to clean the storm drains. A "Hot Spot" is a storm drain where a storm drain location has a reported two (2) consecutive "red" standard or more than twelve (12) inches of accumulated soil, wet organic material, and debris were observed or measured within two consecutive inspection cycles. The Harbor Operations Supervisor, via the Commercial Harbor Manager, will report the Hot Spot to HAR-EE.

1.3.3.4 Reports

OCG personnel prepare regular reports (Appendix 5 - Environmental Inspection Report, Appendix 6 - Delivery of Recyclable Items, and Appendix 10 - Illicit Discharge Reporting Form); and MCS and HA prepare scheduled and as-needed reports (Appendix 6 – Oahu Harbor District Environmental Inspection Report, Appendix 7 - Area Survey, Appendix 8 - Work Order, and Appendix 10 - Illicit Discharge Reporting Form), of their environmental observations in and around the piers. The reports document findings, types of material left on the piers, and actions taken to dispose of the waste.

The completion of reports and types of reports are provided in the above sections regarding the responsibility of each classification to complete an assignment and to document the observation and response to correct a non-compliant tenant activity.

In addition, the District has requested the DOT to provide the MCS and the HA, and others as determined by the DOT, to provide portable computing devices or electronic tablets to document its storm drains reports and observations be incorporated into a new electronic reporting system. Electronic tablets will reduce the need for paper and manual filing system, and eliminate duplicative work of entering data into an electronic environmental data management system.

1.3.3.5 Follow up

Daily reports prepared by the OCG personnel, MCS, HA, and HEO are reviewed by their supervisors (See Appendix 3 - DOT / Harbors Organizational Chart Position Descriptions and Appendix 4 – Position Descriptions and Class Specifications of Selected Employees.) It is the responsibility of each supervisor reviewing the report to ensure that observations and reporting of environmental issues by the OCG personnel, MCS, HA, and HEO are addressed as soon as practicable from the date of the receipt of the report.

2.0. Witness Statements

Allegations of environmental violations are witnessed events. The witness may be the aforementioned District Personnel, another Harbors Division employee, a harbor user, tenant in cargo yards, or any person who observed the alleged environmental violation.

Events witnessed by District Personnel shall be completed by the District Personnel, reviewed by the supervisor for completeness, and signed by the District Personnel as the witness.
Events witnessed by a person other than the District Personnel shall be directed by the District Personnel to prepare the statement or be assisted by the District Personnel in the completion of the Witness Statement form (See Appendix 11 – Witness Statement Form.) Witness statements should be reviewed by the witness, and signed by the witness. Witness Statements shall be forwarded to the following for review and further enforcement action.

- ✓ For potential construction-related violations: Harbors Engineering (HAR-E) with a copy to the Deputy Director of Harbors and the HAR-EE.
- ✓ For potential tenant-related violations: Harbors Administrative Services (HAR-S), with a copy to the Deputy Director of Harbors and HAR-EE.
- ✓ For potential violations regarding tenant activities: Oahu District Manager (HAR-O), with a copy to the Harbors Administrator, the Deputy Director of Harbors, and HAR-EE.

3.0. Specialty Support.

3.1 Hazardous Waste and Used Petroleum Oil



The Oahu District of the Harbors Division executed Contract No. DOT-13-043 to provide for a three year contract to Pacific Environmental Company (PENCO). Notice to Proceed with work pursuant to the contract began March 1, 2013 for the removal of hazardous waste and used oil. The Contract remains in effect to February 28, 2016, with two, one-year extensions. The contract also provides for employee training in the safe handling of hazardous waste.

3.2 Drain Cleaning Contract

On November 27, 2012, the District obtained the Director's approval to proceed with the procurement of a multi-year contract. Bids for drain cleaning services were opened on June 27, 2013, but the Director cancelled the procurement due to a lack of funding. The District sought and received legislative appropriation to clean drains at Honolulu Harbor ($1,000,000) and Kalaeloa Barbers Point Harbor ($500,000) for the fiscal year ending June 30, 2015. On September 22, 2014, the District obtained Governor's approval to proceed with the procurement of a drain cleaning contract. The District completed the drain cleaning specifications, advertised the project for bid,

held its pre-bid meeting on November 6, 2014, and prepared for opening bids in late November 2014.

The scope of work requires an initial cleaning of 531 storm drains and 13,890 feet of trench drains in Honolulu Harbor; and 18 storm drains and 8,031 feet of trench drains in Kalaeloa Barbers Point Harbor. After the initial cleaning of storm drains, the Harbors will issue Task Orders to the Contractor to provide as needed drain cleaning services at "hot spots" Storm drain cleaning requested through a Task Order shall be completed within 30 calendar days from the date of the Task Order.

The District resolved a Union jurisdictional issue and the Oahu District personnel will work alongside the Contractor to clean drains. The District personnel will perform work opening drain covers, refurbish and replace filters, as needed, and close drain covers.

Bid specifications require the Contractor to have a Project Manager that is Certified Erosion Sediment and Storm Water Inspector (CESSWI), or equivalent, to ensure the work documenting the storm drains meets the Federal requirements, including the U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System definition of "Qualified Personnel" to storm water inspections. Under the contract, the Project Manager shall visually inspect the storm drain pipes and document the condition of the pipes, description, and obstructions that may affect the flow of storm water in the drain pipe. Contractors shall submit a written inspection report within forty-five (45) calendar days after the completion of the initial cleaning, and submit written inspection reports within forty-five (45) calendar days following the completion of any follow up drain cleaning issued by a Task Order. The Project Manager shall have two (2) years experience with collecting pertinent information necessary to preparing annual storm water reports for permitted facilities. Contractor or subcontractor is also required to use a large capacity commercial wet-dry vacuum truck, such as a Vactor 2100 model with water pump system, to moisten the debris for removal (Refer to Section 10.5A), or similar equipment with payload capacity of 15 to 22 cubic yard capacity or similar equipment to ensure that the work is completed in a timely manner.

4.0. Conclusion.

The Oahu Harbor District prepared the SSSOMP to identify the roles the Oahu District employees who are responsible for implementing the District's Program. In preparing the SSSOMP collaboratively with managers, supervisors, and employees, the program has improved awareness and the importance of stormwater compliance.

The SSSOMP provides the schedules of inspection and cleaning storm drains by creating the Standard for inspection; the operation and maintenance activities to be performed; the documentation and recording keeping of the activities; and the supervision and management of the SSSOMP.

The Program presented herein can be used as a training guide and reference for managers, supervisors, and Oahu District employees. The Program is open to suggestions and ideas from managers, supervisors, and to harbor employees to improve the SSSOMP through annual program review of the program implementation and to adopt the best practices in protecting our ocean waters.

1 APPENDIX 1

STORM WATER DRAIN IDENTITY AND LOCATION MAPS

2 APPENDIX 2

SIGNS AND STENCILS

3 APPENDDIX 3

DOT-HARBORS ORGANIZATIONAL CHART

4 APPENDIX 4
POSITION DESCRIPTIONS AND CLASS SPECIFICATIONS OF SELECTED EMPLOYEES

5 APPENDIX 5
OAHU HARBOR DISTRICT ENVIRONMENTAL INSPECTION REPORT/2 CU REFUSE CANS COLLECTION

6 APPENDIX 6

DELIVERY OF RECYCLABLES

7 APPENDIX 7

AREA SURVEY

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WORK ORDER

9 APPENDIX 9
STORM DRAIN INSPECTION CLEANING FORMS FOR HONOLULU & KALAELOA BARBERS POINT HARBORS FORM

10 APPENDIX 10

ILLICIT DISCHARGE REPORTING FORM

11 APPENDIX 11

WITNESS STATEMENT FORM

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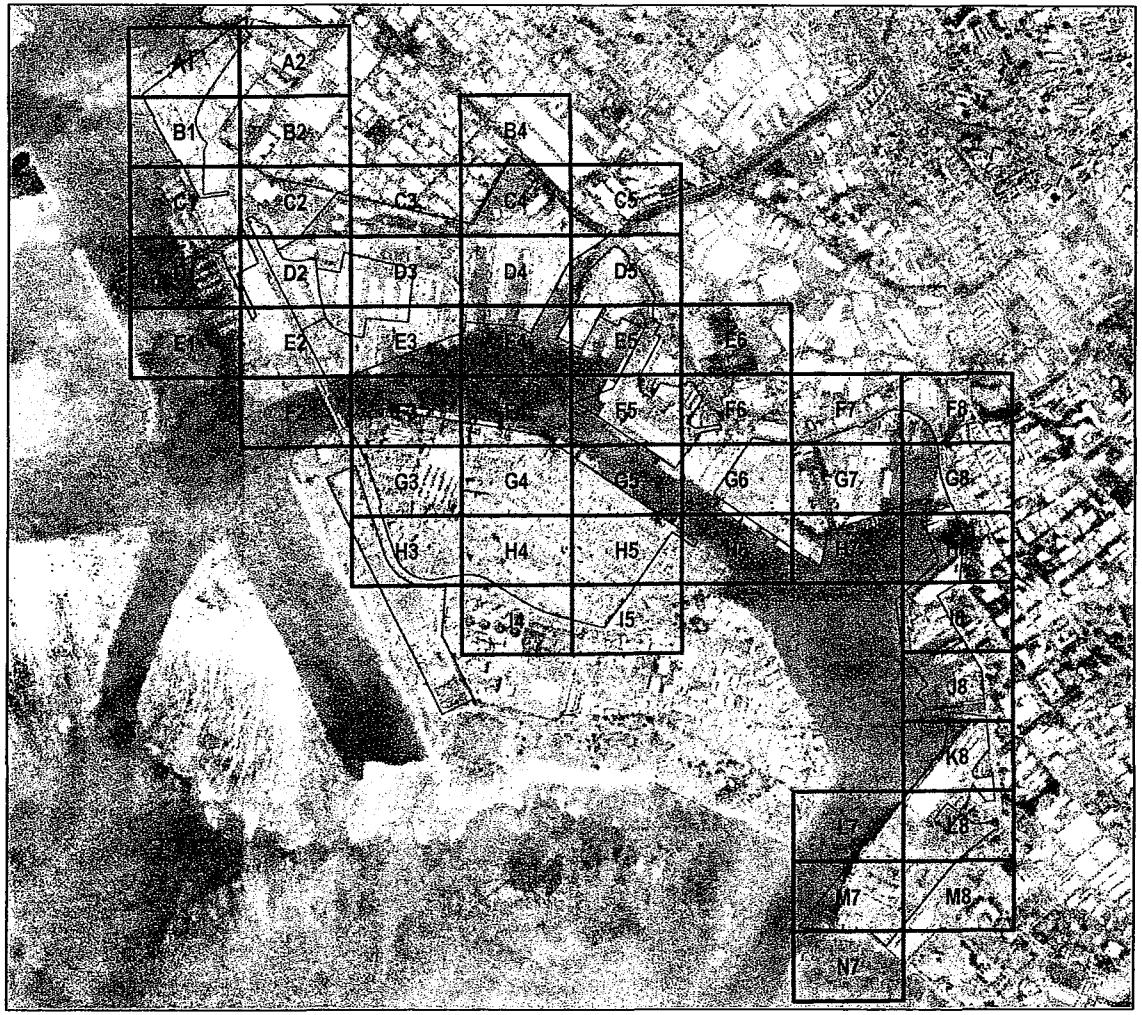
AVERY READY INDEX

Appendix 1 Storm Water Drain Identity and Location Maps



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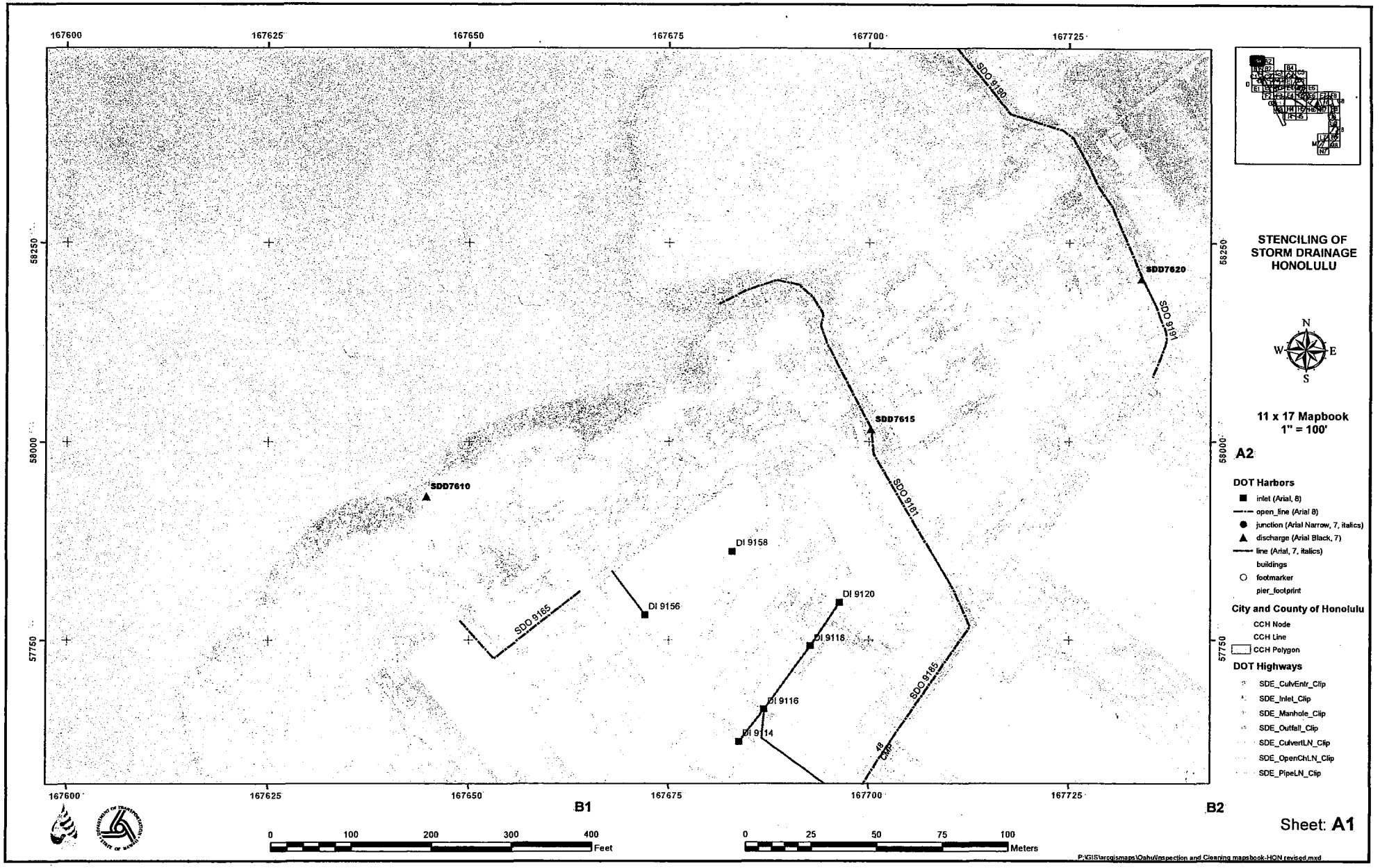
Map Book of Storm Drain Features
Honolulu

November 2014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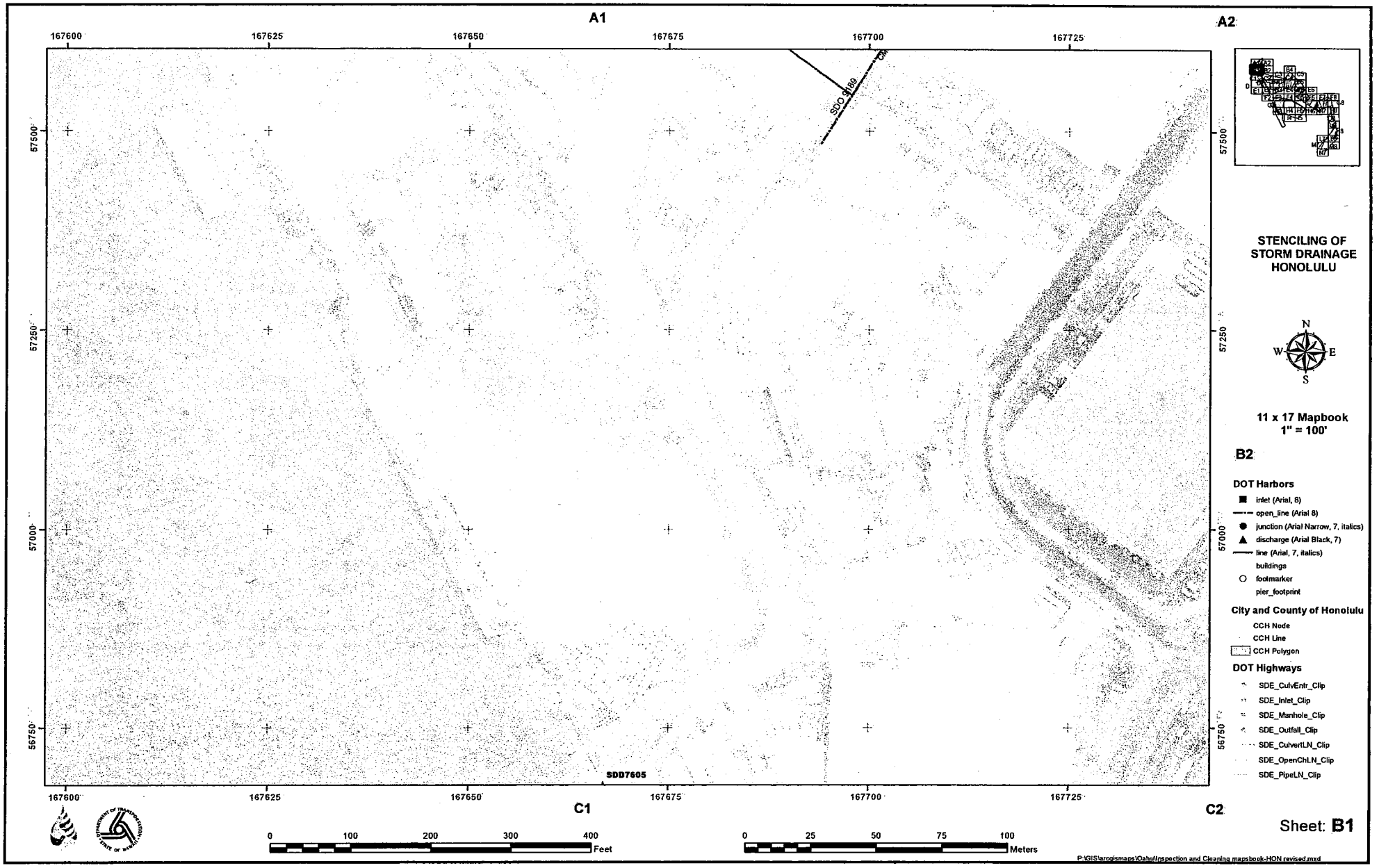
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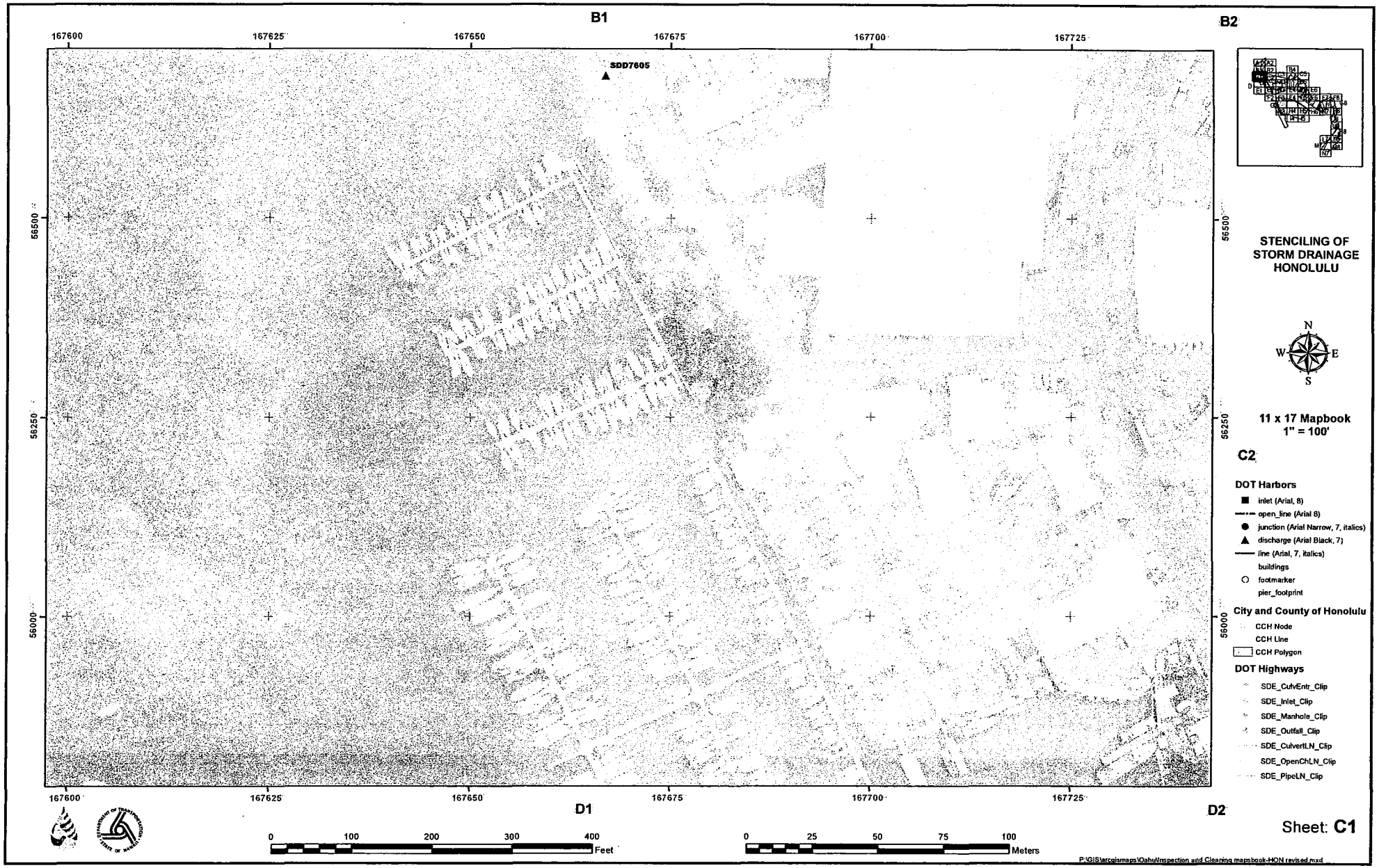
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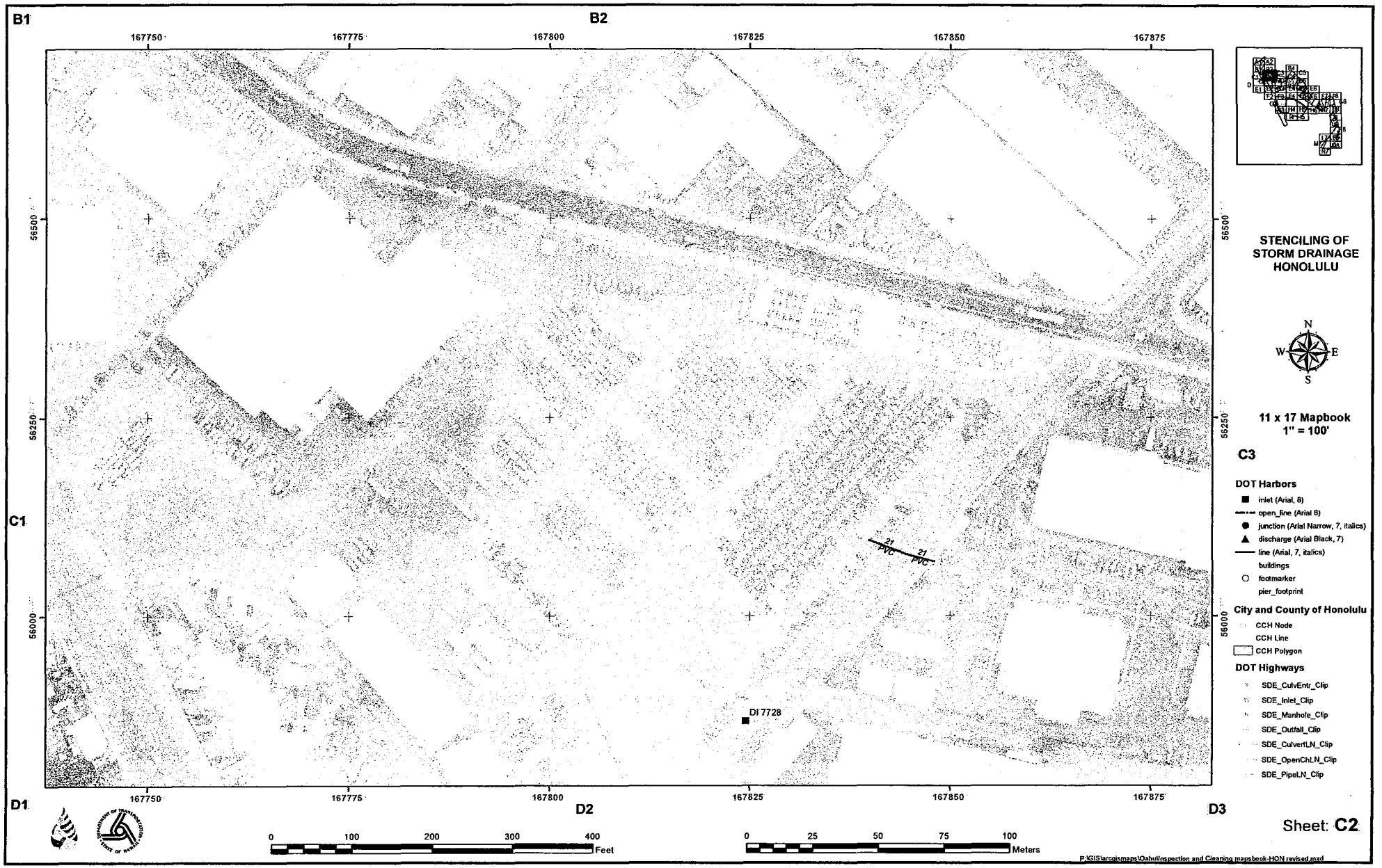
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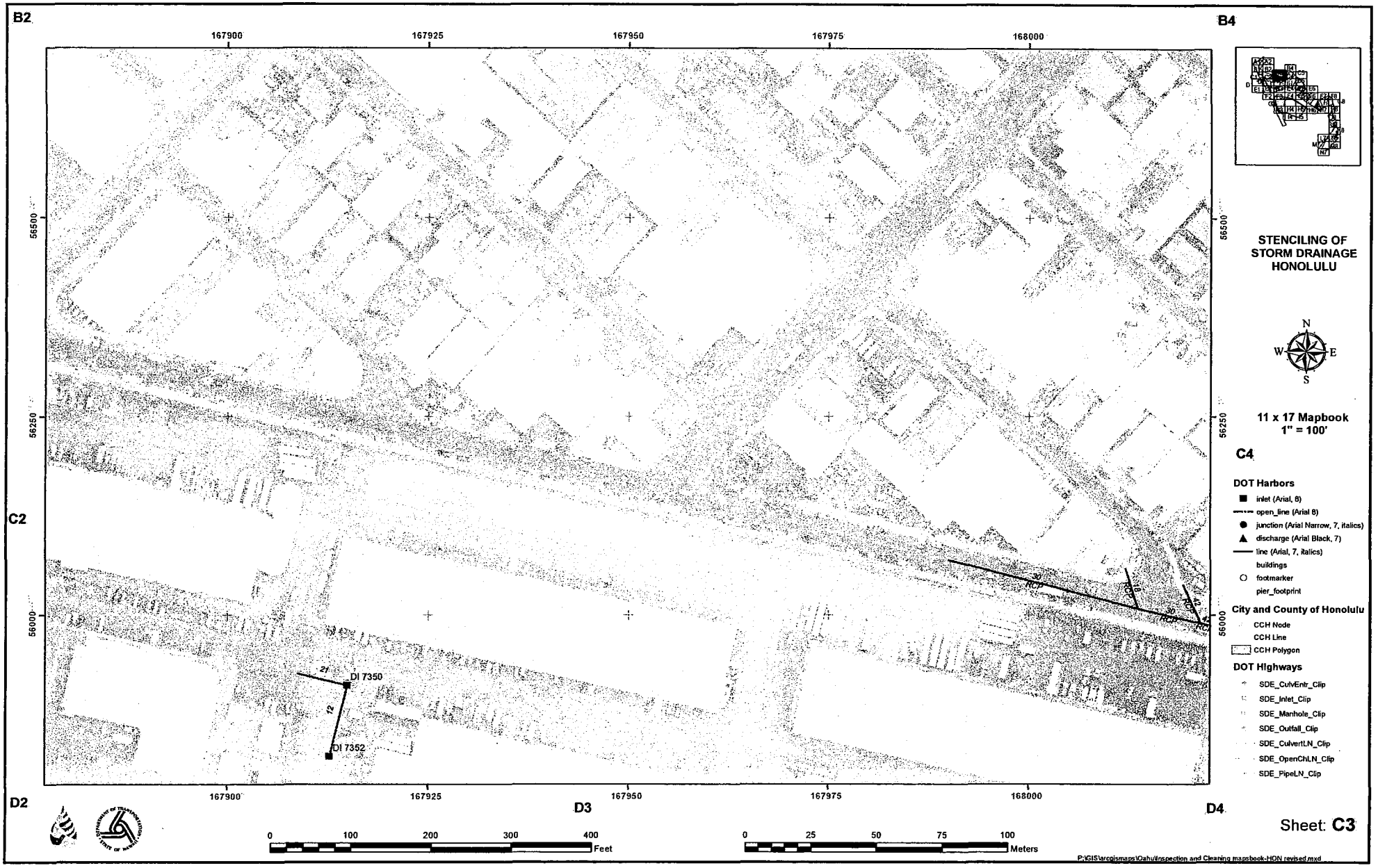
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167975
168000
56500
56250
56000
DI 7350
DI 7352
21
12
30
RCP
18
42
STENCILING OF STORM DRAINAGE HONOLULU
N
S
E
W
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0
100
200
300
400
Feet
0
25
50
75
100
Meters
Sheet: C3
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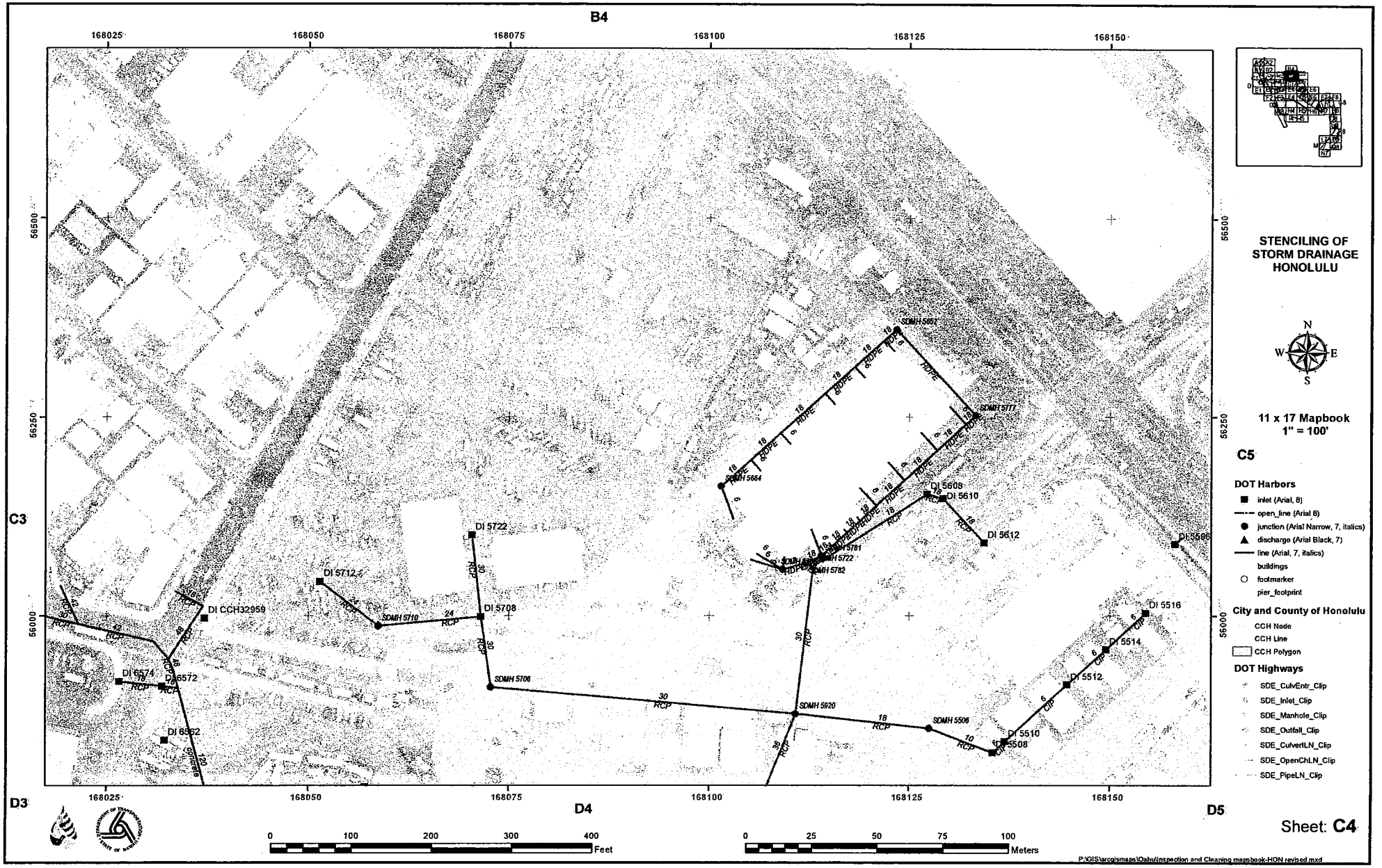
B4
168025
168050
168075
168100
168125
168150
56500
56250
56000
C3
D3
D4
D5
SDMH 5652
SDMH 5777
SDMH 5664
DI 5608
DI 5610
DI 5612
DI 5596
SDMH 5781
SDMH 5722
SDMH 5782
DI 5722
DI 5712
DI CCH32959
SDMH 5710
DI 5708
DI 6574
DI 6572
DI 6562
SDMH 5706
SDMH 5920
SDMH 5506
DI 5516
DI 5514
DI 5512
DI 5510
DI 5508
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
C5
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0
100
200
300
400
Feet
0
25
50
75
100
Meters
P:\GIS\arcgismaps\Oahu\Inspection and Cleaning mapsbook-HON revised.mxd
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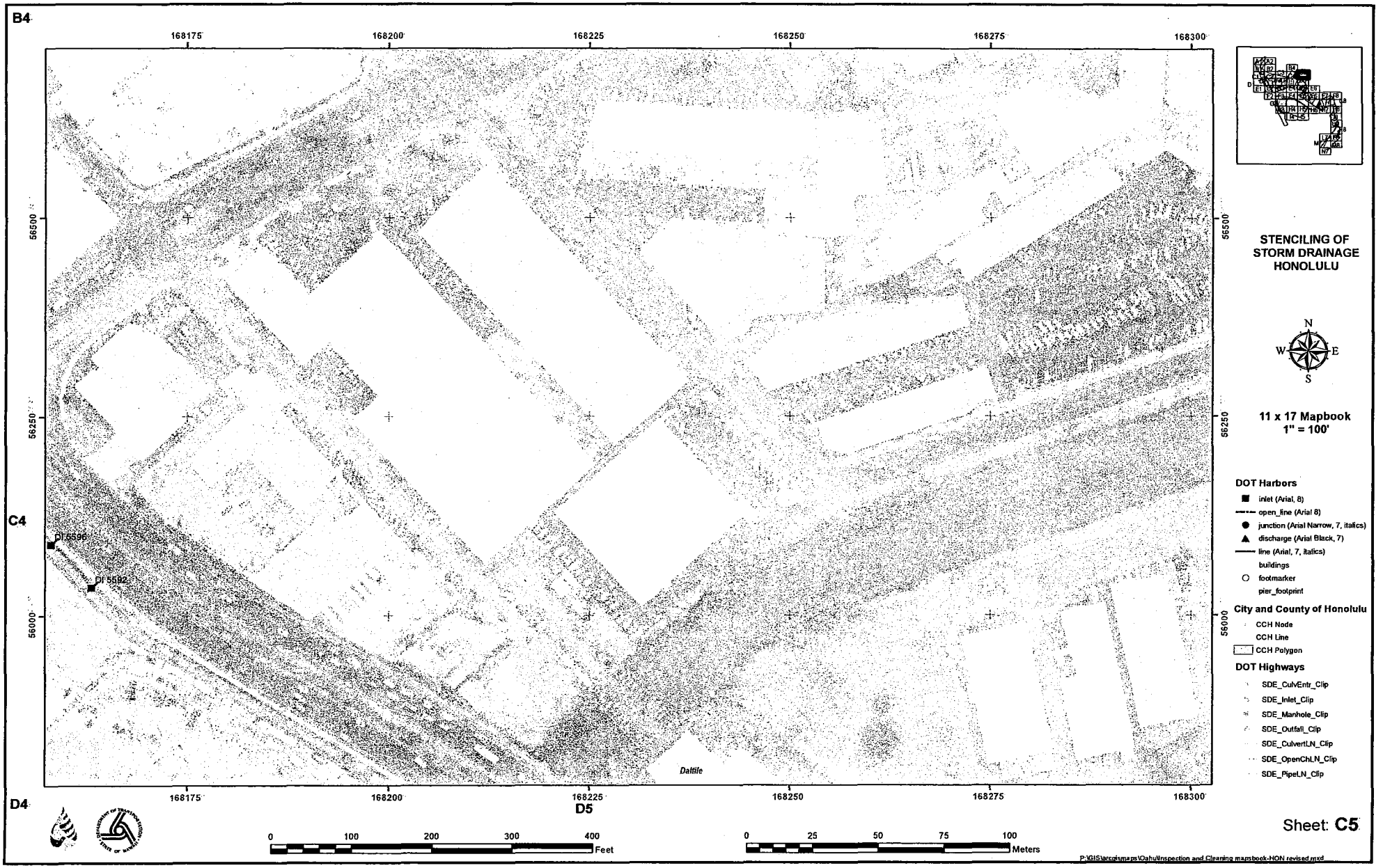
B4
168175
168200
168225
168250
168275
168300
56500
56250
56000
C4
D4
D5
DI 5596
DI 5592
Daltile
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0 100 200 300 400
Feet
0 25 50 75 100
Meters
Sheet: C5
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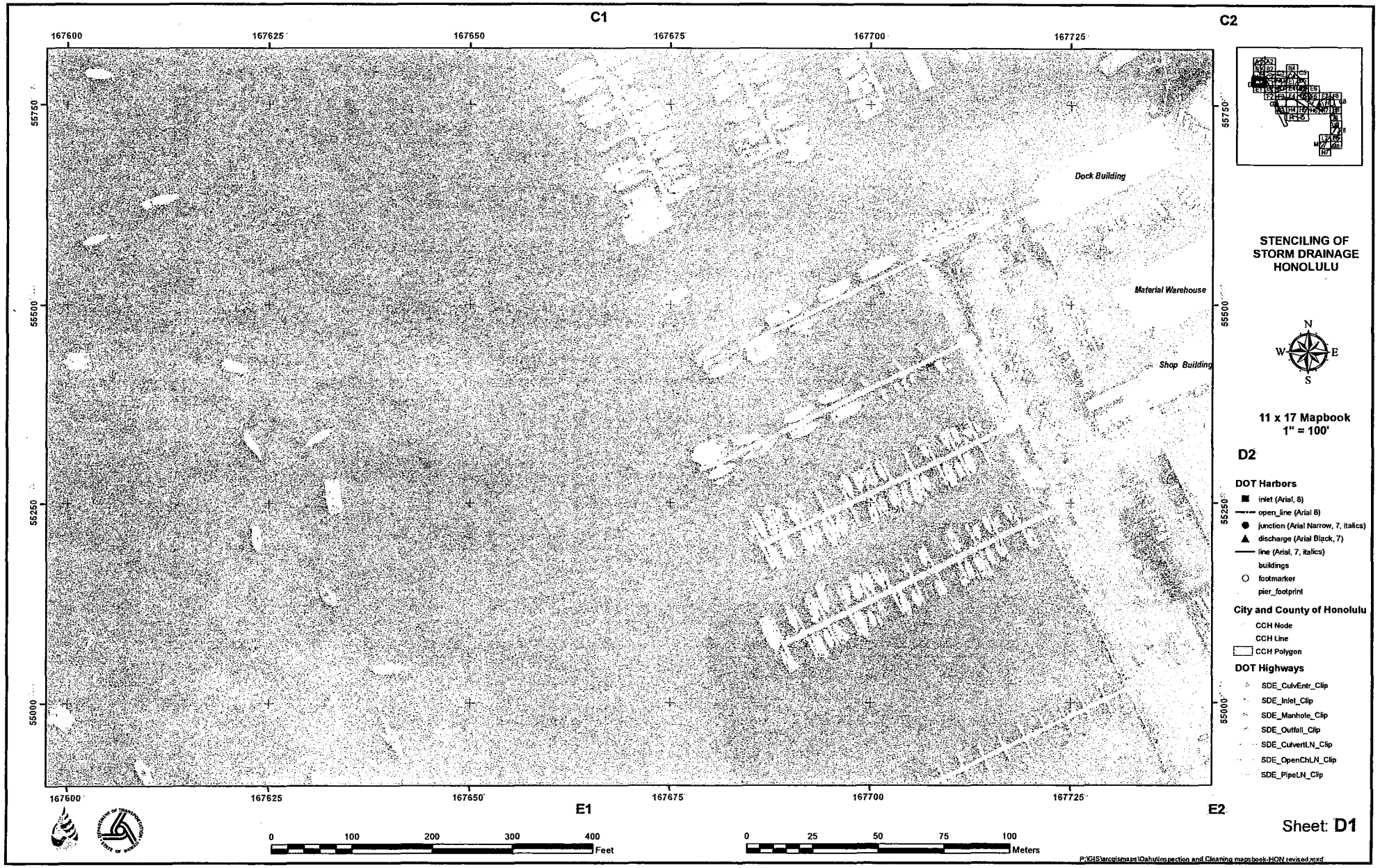

STENCILING OF STORM DRAINAGE HONOLULU

N
W E
S

11 x 17 Mapbook
1" = 100'

DOT Harbors

- inlet (Arial, 8)
- open_line (Arial 8)
- junction (Arial Narrow, 7, italics)
- discharge (Arial Black, 7)
- line (Arial, 7, italics)
- buildings
- footmarker
- pier_footprint

City and County of Honolulu

- CCH Node
- CCH Line
- CCH Polygon

DOT Highways

- SDE_CulvEntr_Clip
- SDE_Inlet_Clip
- SDE_Manhole_Clip
- SDE_Outfall_Clip
- SDE_CulvertLN_Clip
- SDE_OpenChLN_Clip
- SDE_PipeLN_Clip

Sheet: D1

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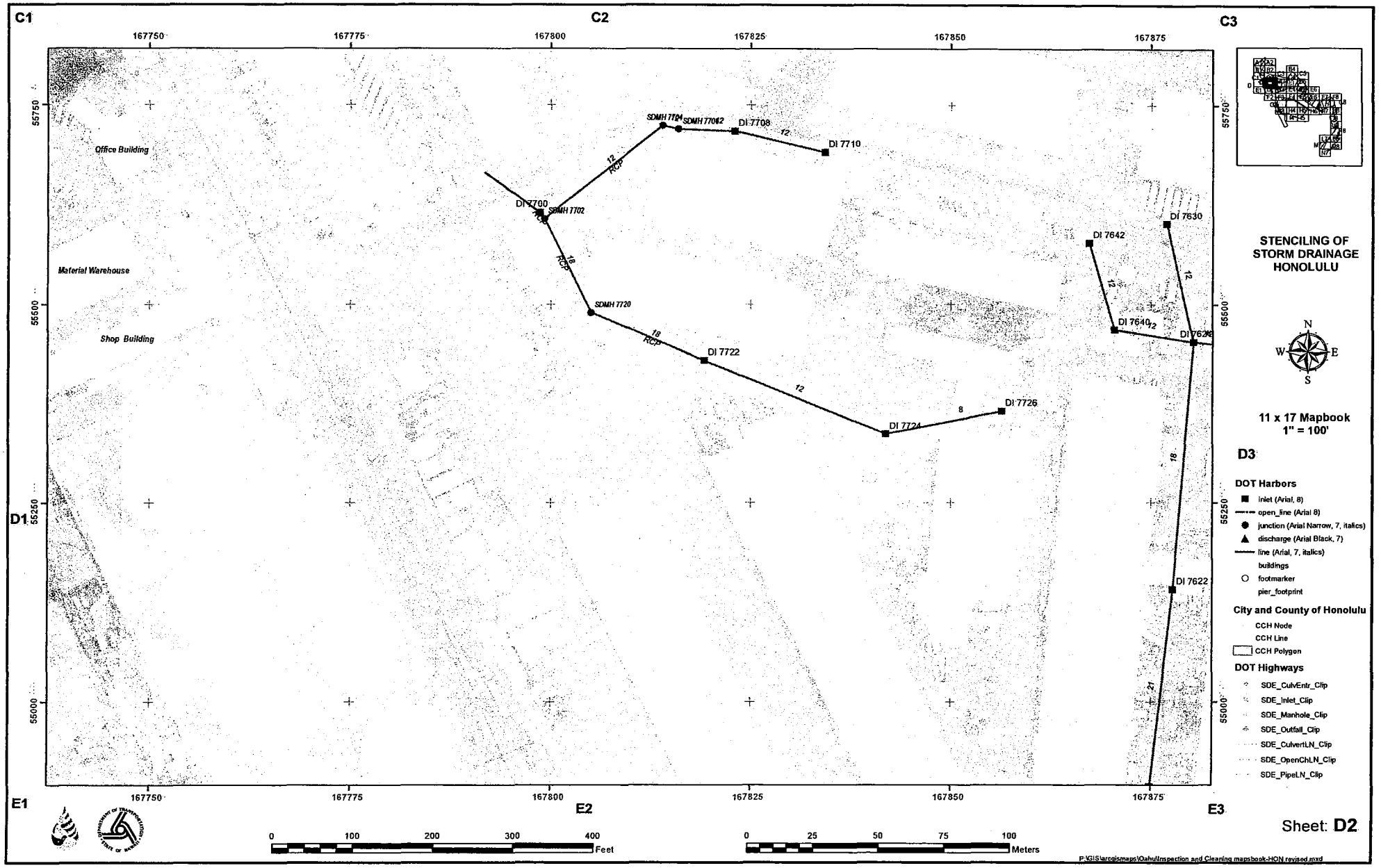
C1
C2
C3
D1
D3
E1
E2
E3
167750
167775
167800
167825
167850
167875
55750
55600
55250
55000
Office Building
Material Warehouse
Shop Building
SDMH 7704
SDMH 77042
DI 7708
DI 7710
12
RCP
DI 7700
SDMH 7702
18
RCP
SDMH 7720
18
RCP
DI 7722
12
DI 7724
8
DI 7726
DI 7642
DI 7630
12
12
DI 7640
12
DI 7626
18
DI 7622
12
STENCILING OF STORM DRAINAGE HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0
100
200
300
400
Feet
0
25
50
75
100
Meters
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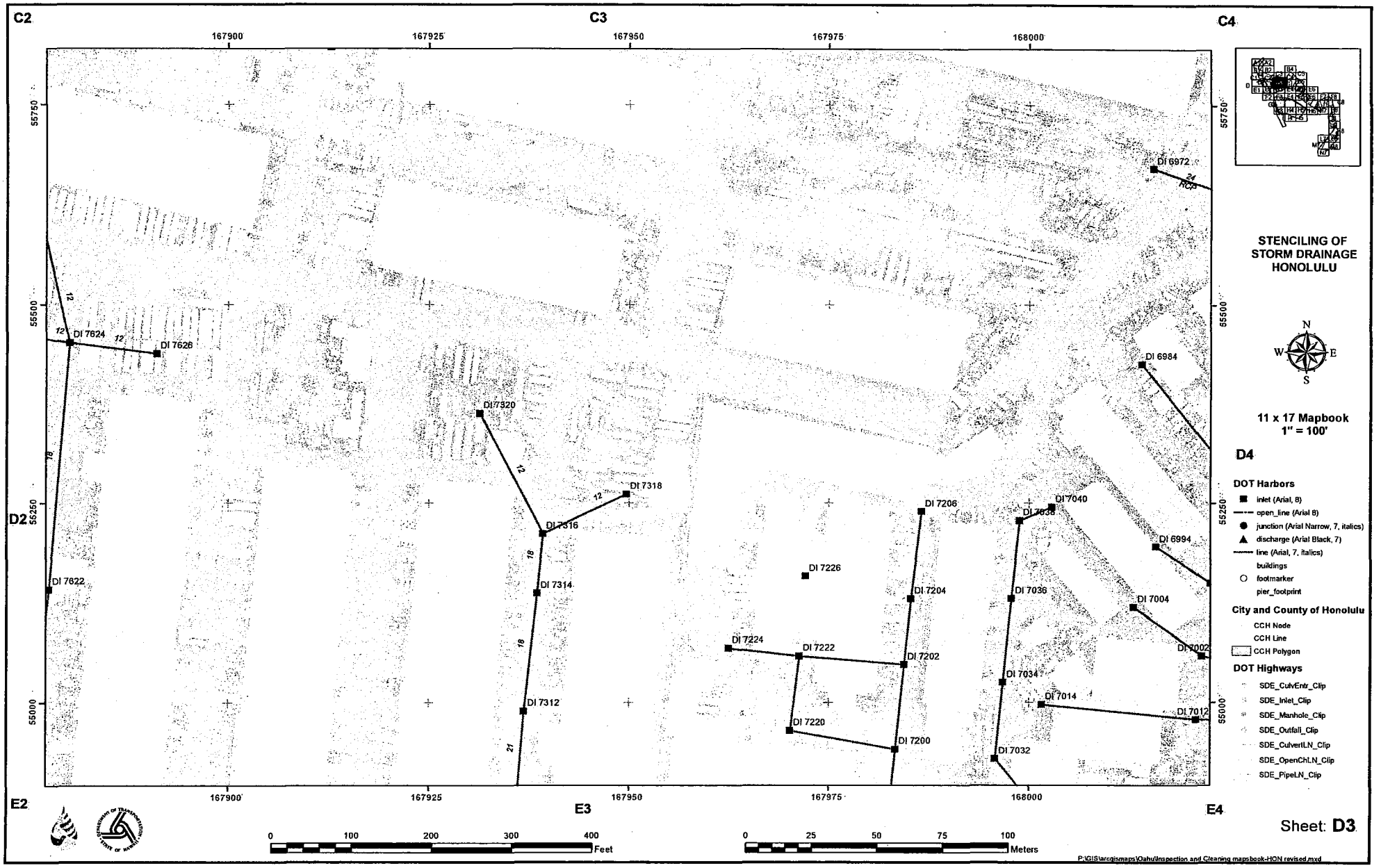
C2
C3
C4
167900
167925
167950
167975
168000
55750
55500
55250
55000
DI 6972
24 RCP
DI 6984
DI 6994
DI 7004
DI 7002
DI 7012
DI 7624
DI 7626
DI 7622
DI 7320
DI 7318
DI 7316
DI 7314
DI 7312
DI 7206
DI 7226
DI 7204
DI 7224
DI 7222
DI 7202
DI 7220
DI 7200
DI 7040
DI 7038
DI 7036
DI 7034
DI 7032
DI 7014
12
18
21
D2
E2
E3
E4
D4
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0
100
200
300
400
Feet
0
25
50
75
100
Meters
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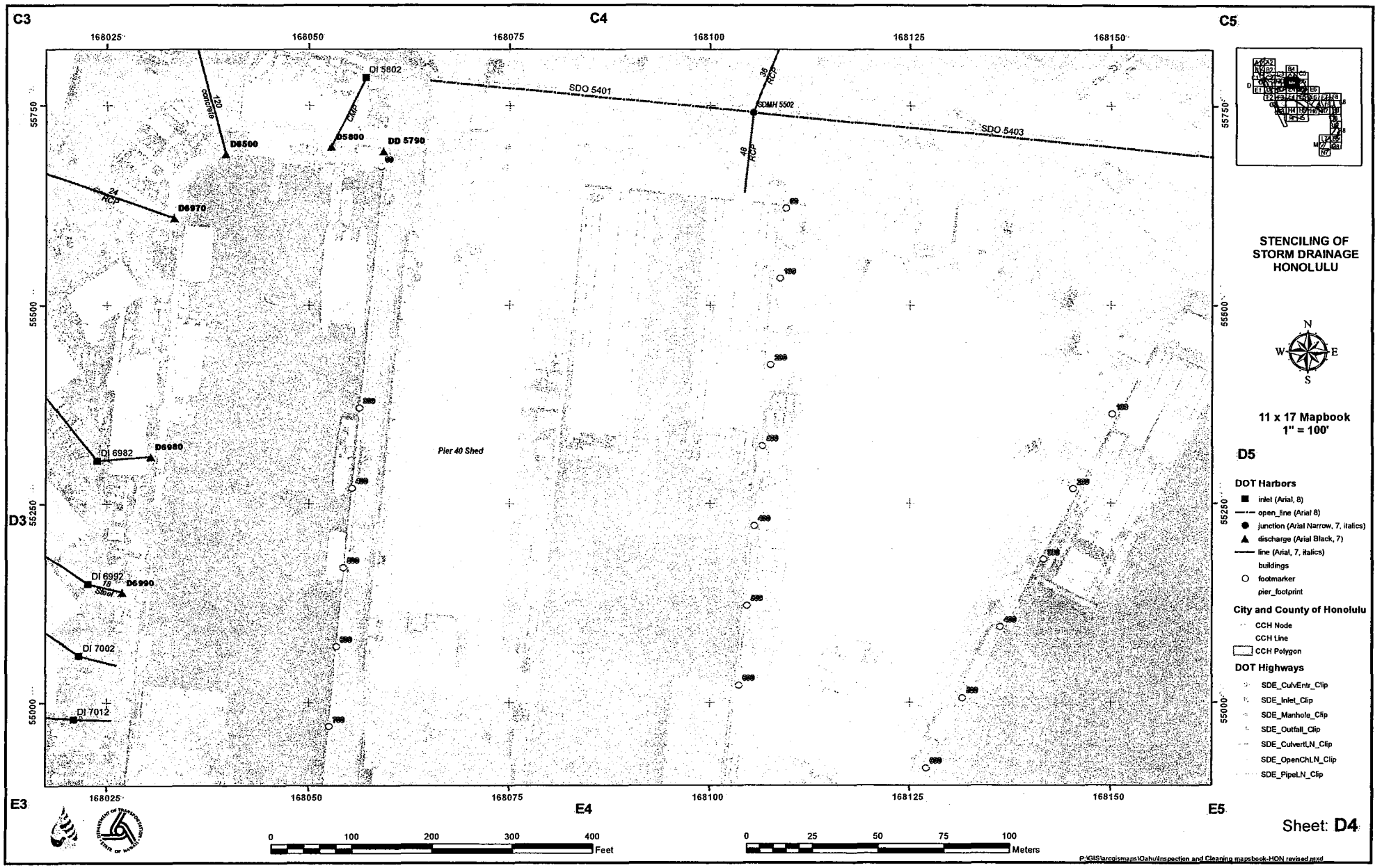
C3
C4
C5
D3
E3
E4
E5
168025
168050
168075
168100
168125
168150
55750
55500
55250
55000
DI 5802
SDO 5401
SDMH 5502
SDO 5403
36 RCP
48 RCP
120 Concrete
CMP
D5800
DD 5790
D6500
24 RCP
D6970
DI 6982
D6980
Pier 40 Shed
DI 6992
18 Steel
D6990
DI 7002
DI 7012
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
D5
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0
100
200
300
400
Feet
0
25
50
75
100
Meters
Sheet: D4
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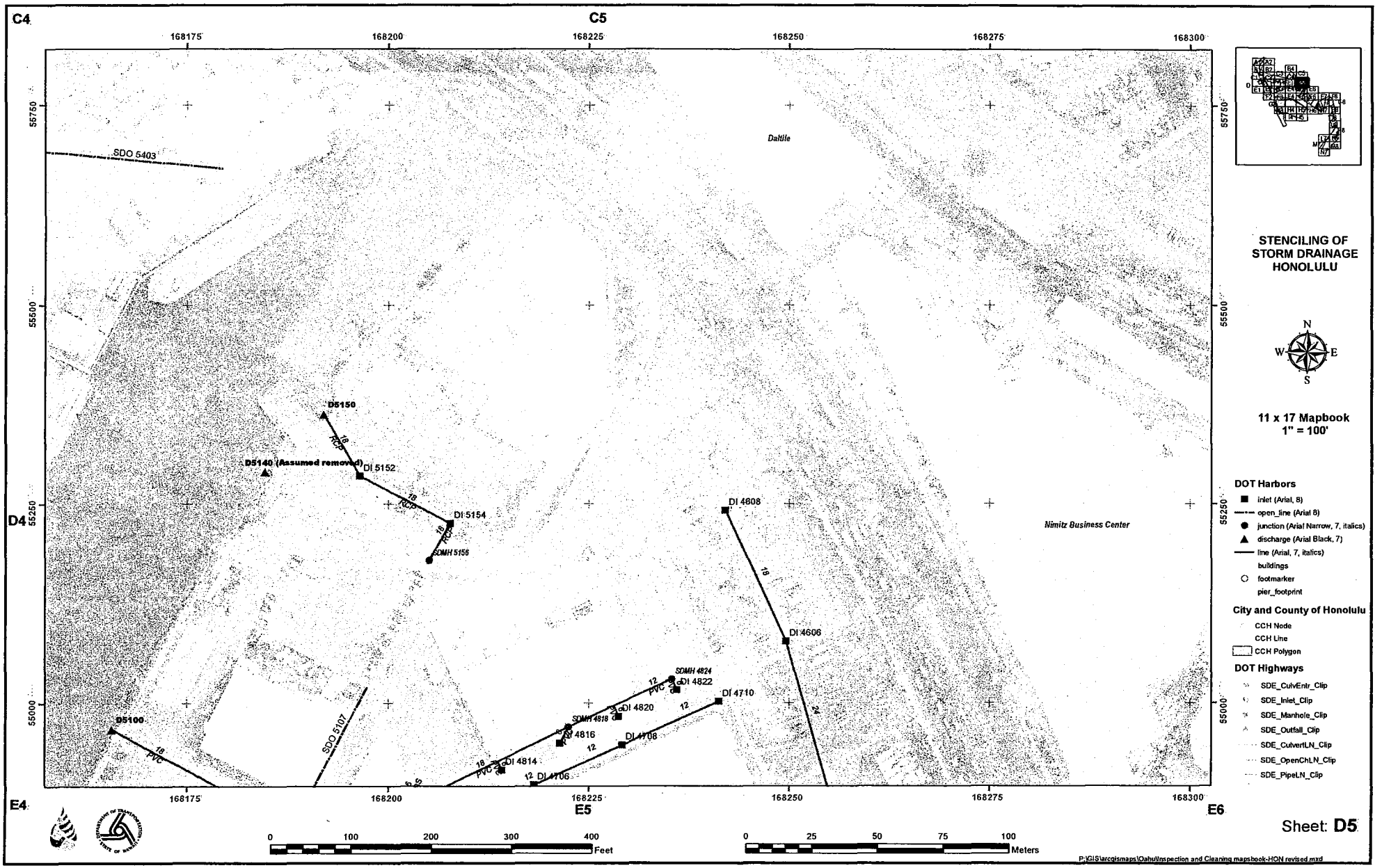
C4
C5
168175
168200
168225
168250
168275
168300
55750
55600
55500
55250
55000
D4
E4
E5
E6
SDO 5403
Daltile
Nimitz Business Center
D5150
D5140 (Assumed removed)
DI 5152
DI 5154
SDMH 5156
DI 4808
DI 4606
DI 4710
DI 4822
SDMH 4824
DI 4820
SDMH 4818
DI 4816
DI 4708
DI 4814
DI 4706
D5100
SDO 5107
18 RCP
18 PVC
12 PVC
24
12
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0 100 200 300 400 Feet
0 25 50 75 100 Meters
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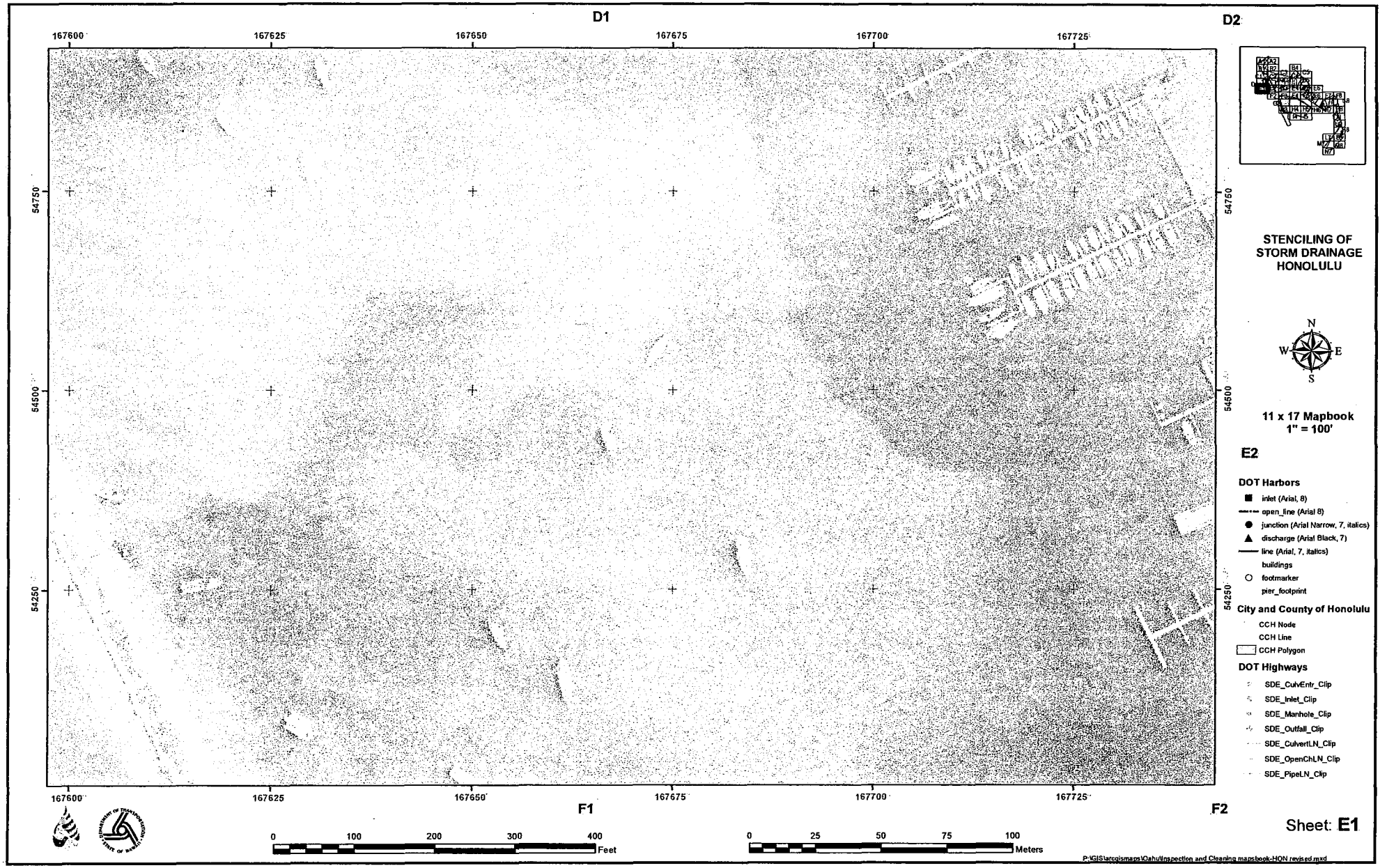
D1
D2
167600
167625
167650
167675
167700
167725
54750
54500
54250
F1
F2
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
E2
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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Feet
0 25 50 75 100
Meters
Sheet: E1
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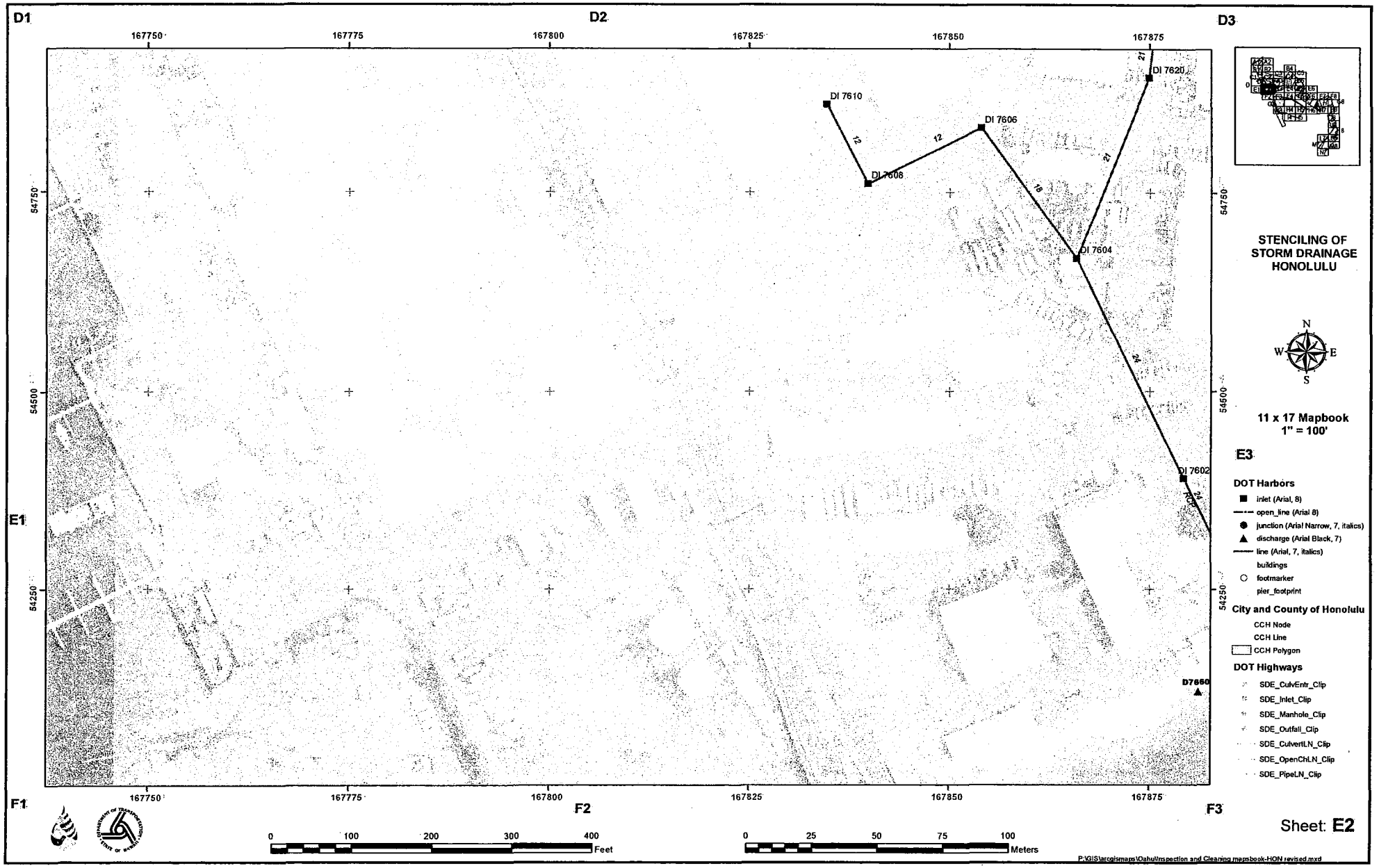
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D2
D3
E1
E2
E3
F1
F2
F3
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167875
54750
54500
54250
DI 7610
DI 7608
DI 7606
DI 7604
DI 7602
DI 7620
D7660
12
12
18
21
21
24
24
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0
100
200
300
400
Feet
0
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50
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100
Meters
Sheet: E2
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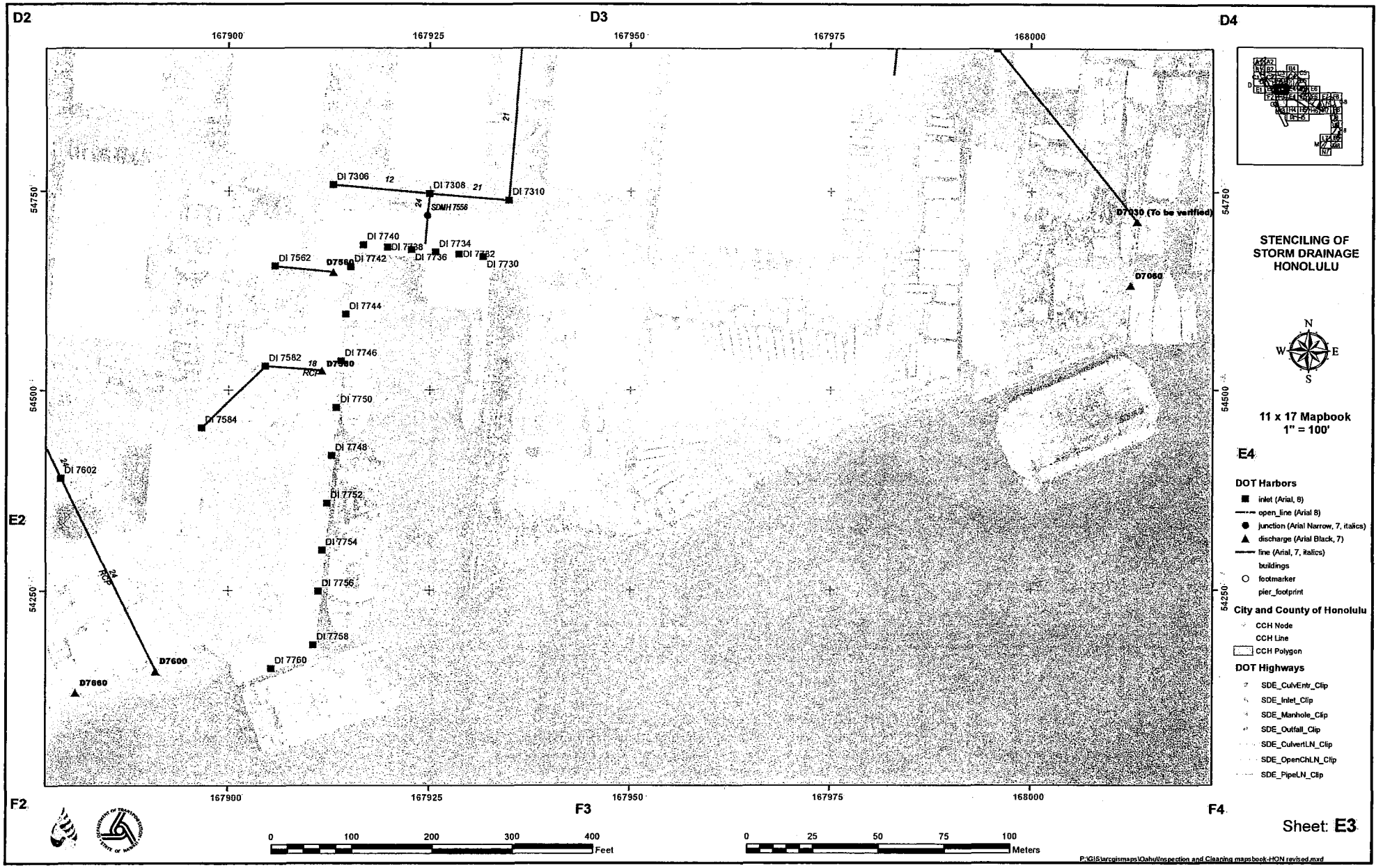
D2
D3
D4
E2
E4
F2
F3
F4
167900
167925
167950
167975
168000
54750
54500
54250
DI 7306
DI 7308
DI 7310
SDMH 7556
DI 7740
DI 7738
DI 7734
DI 7562
D7580
DI 7742
DI 7736
DI 7732
DI 7730
D7330 (To be verified)
D7060
DI 7744
DI 7582
DI 7746
D7640
DI 7750
DI 7584
DI 7748
DI 7602
DI 7752
DI 7754
DI 7756
DI 7758
D7600
DI 7760
D7660
STENCILING OF STORM DRAINAGE HONOLULU
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0 100 200 300 400 Feet
0 25 50 75 100 Meters
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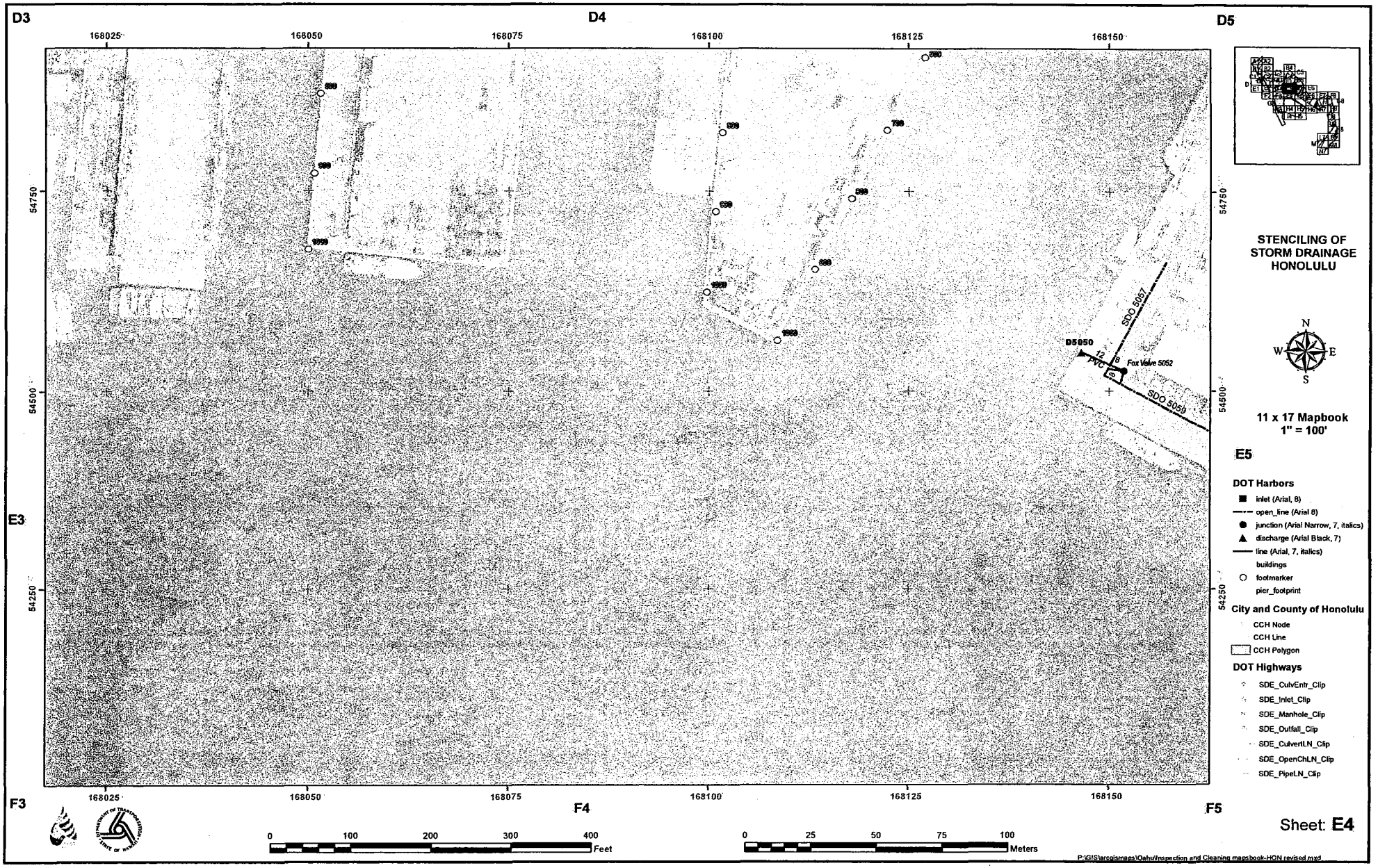
Sheet: E3


D3
D4
D5
E3
E5
F3
F4
F5
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168150
54750
54500
54250
SDO 5057
SDO 5059
D5050
Fox Valve 5052
PVC
12
8
STENCILING OF
STORM DRAINAGE
HONOLULU
N
S
E
W
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0
100
200
300
400
Feet
0
25
50
75
100
Meters
Sheet: E4
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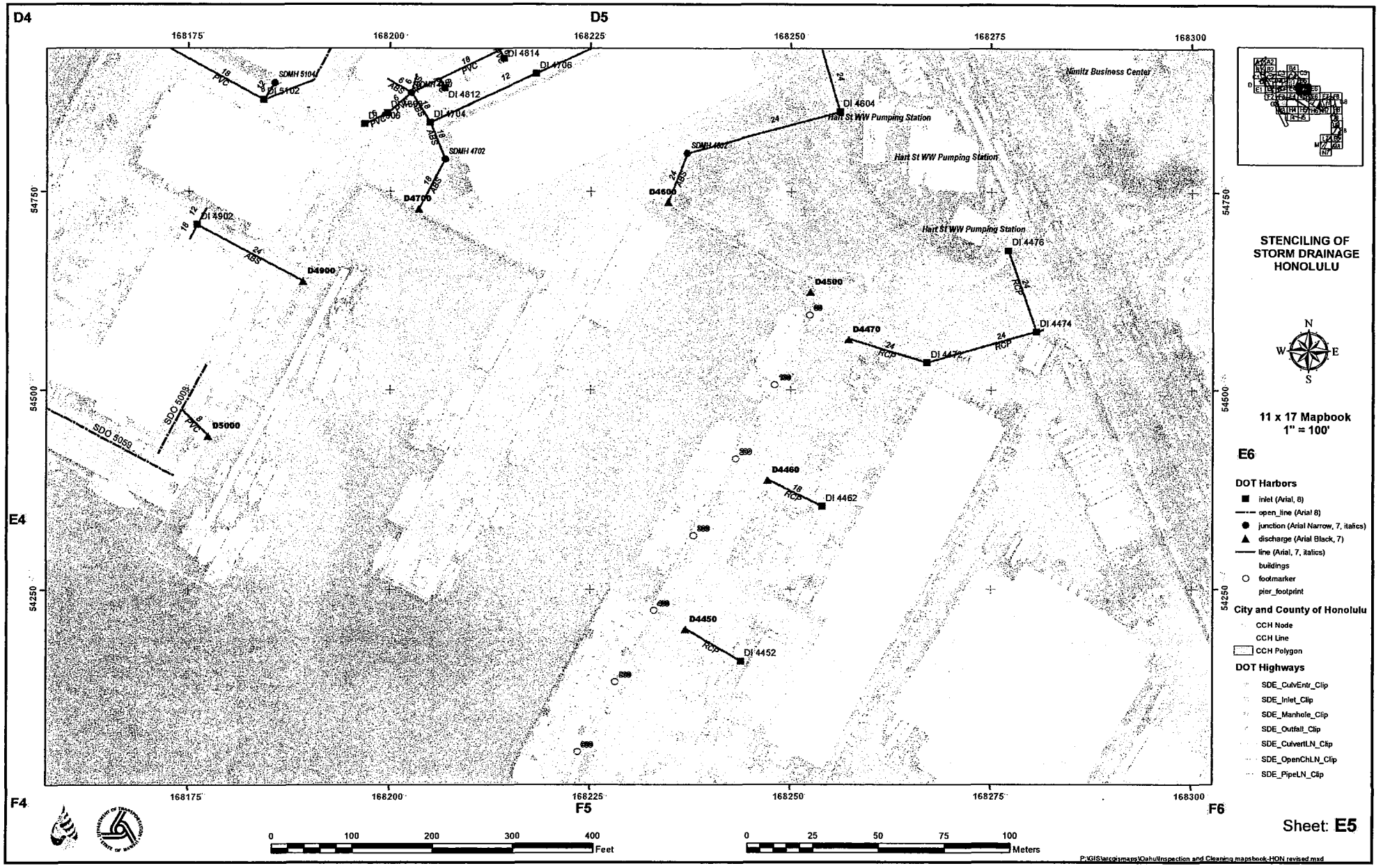
D4
D5
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168200
168225
168250
168275
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54750
54500
54250
SDMH 5104
DI 5102
DI 4814
DI 4706
DI 4812
DI 4704
SDMH 4702
D4700
DI 4902
D4900
SDO 5009
SDO 5059
D5000
Kinitz Business Center
DI 4604
Hart St WW Pumping Station
SDMH 4602
D4600
DI 4476
D4500
DI 4474
D4470
DI 4472
D4460
DI 4462
D4450
DI 4452
E4
E6
F4
F5
F6
STENCILING OF STORM DRAINAGE HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0 100 200 300 400 Feet
0 25 50 75 100 Meters
P:\GIS\arcgismaps\Oahu\Inspection and Cleaning mapsbook-HON revised.mxd
Sheet: E5


D5
168300
168325
168350
168375
168400
168425
54750
54500
54250
E5
F5
F6
F7
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0 100 200 300 400
Feet
0 25 50 75 100
Meters
Sheet: E6
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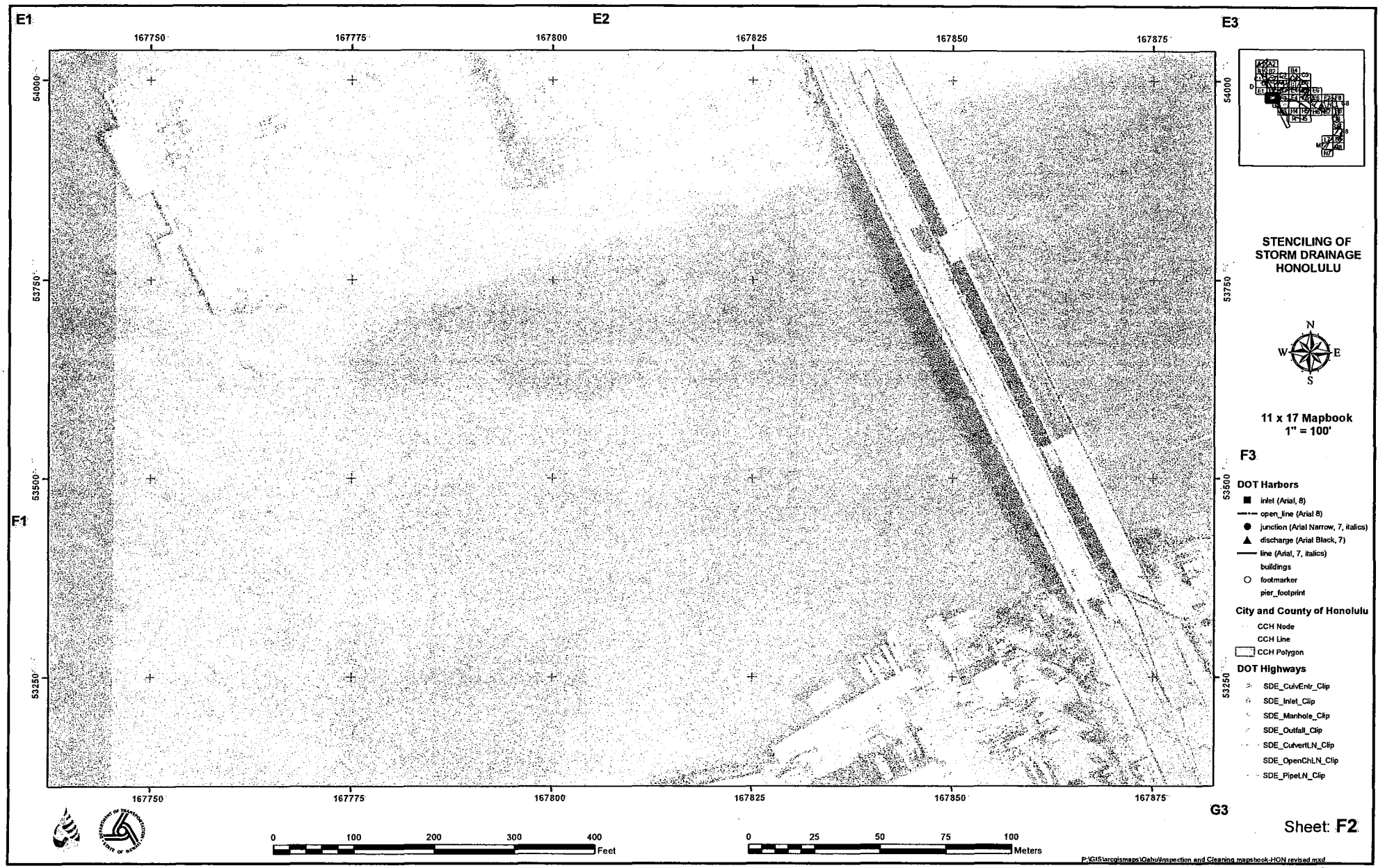
E1
E2
E3
F1
F3
G3
167750
167775
167800
167825
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167875
54000
53750
53500
53250
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0 100 200 300 400
Feet
0 25 50 75 100
Meters
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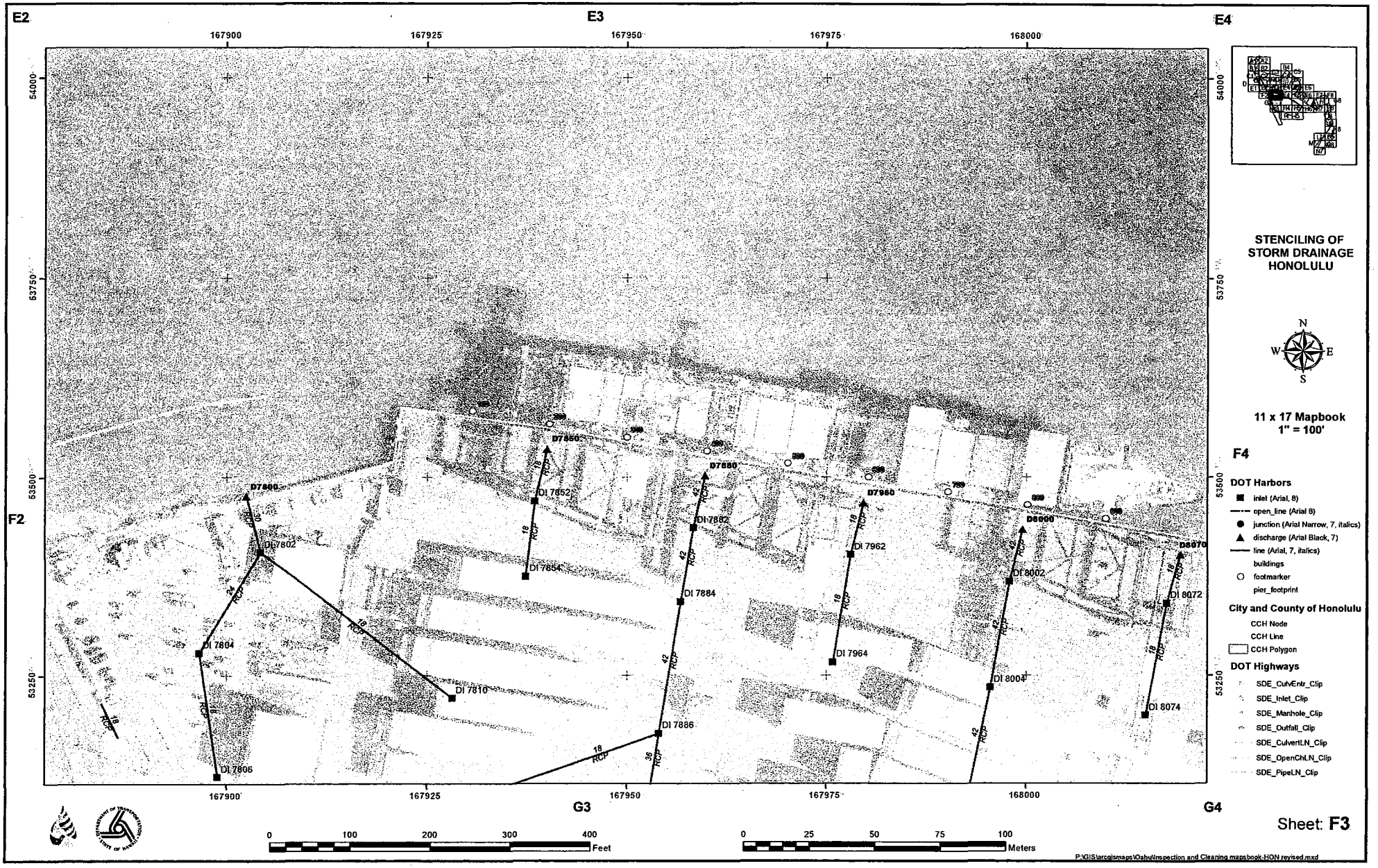
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STENCILING OF STORM DRAINAGE HONOLULU
N
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E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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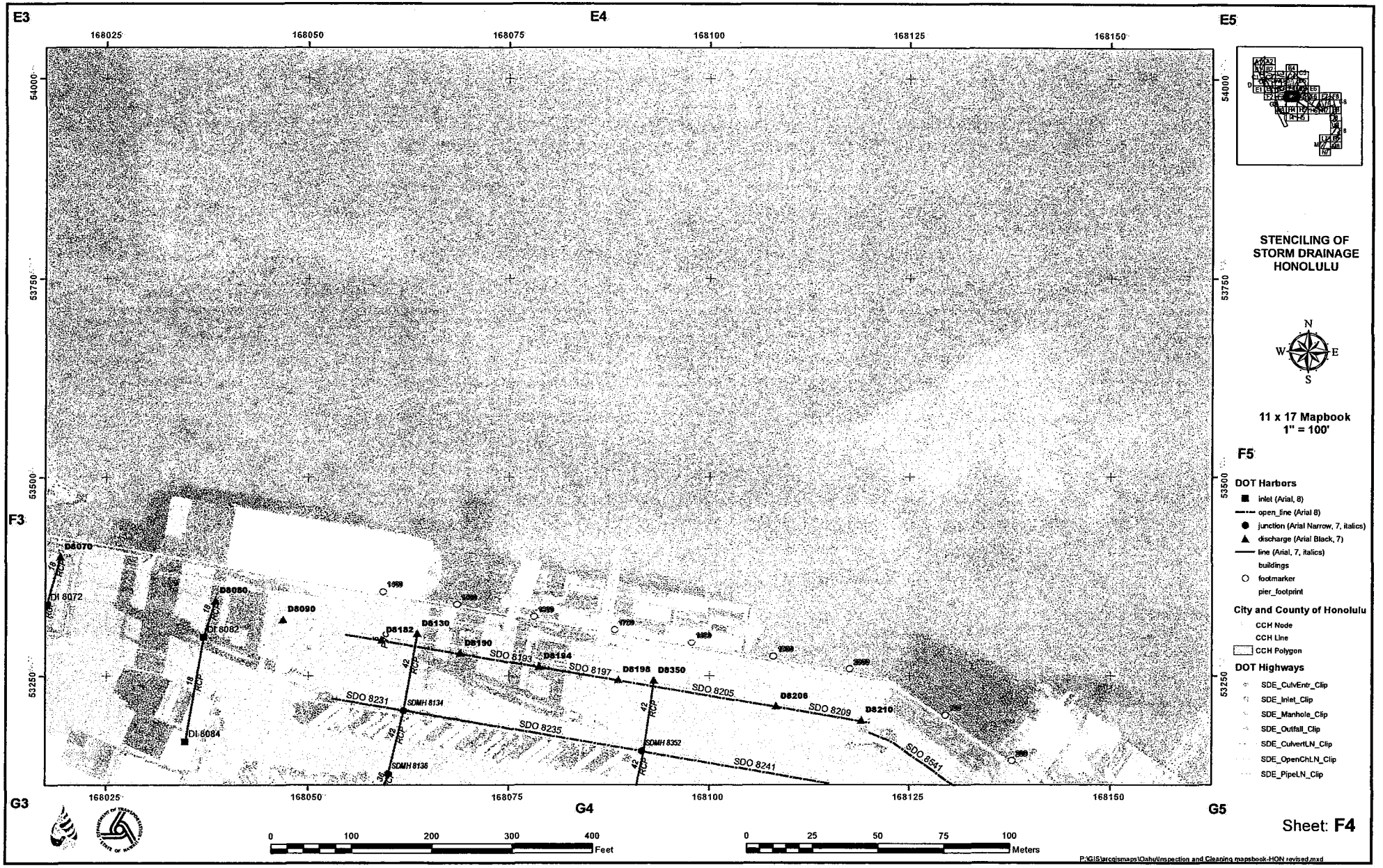
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SDMH 8134
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SDMH 8352
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
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S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
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SDE_Outfall_Clip
SDE_CulvertLN_Clip
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STENCILING OF STORM DRAINAGE HONOLULU
N
W
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S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
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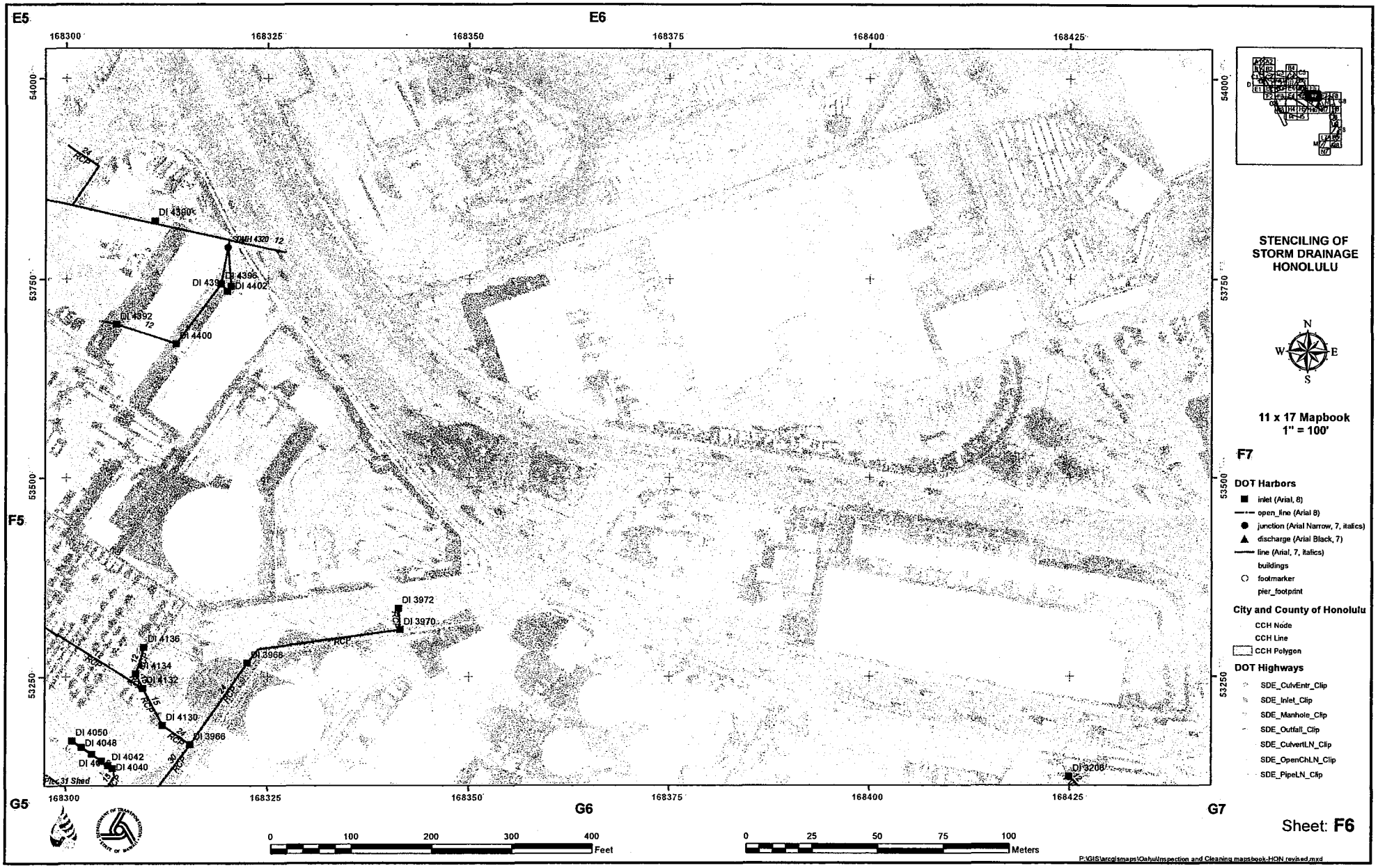
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Pier 31 Shed
RCP
STENCILING OF STORM DRAINAGE HONOLULU
N
W
E
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11 x 17 Mapbook
1" = 100'
DOT Harbors
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open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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Meters
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DI 3010
Ditches
STENCILING OF STORM DRAINAGE HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
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inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
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SDE_Outfall_Clip
SDE_CulvertLN_Clip
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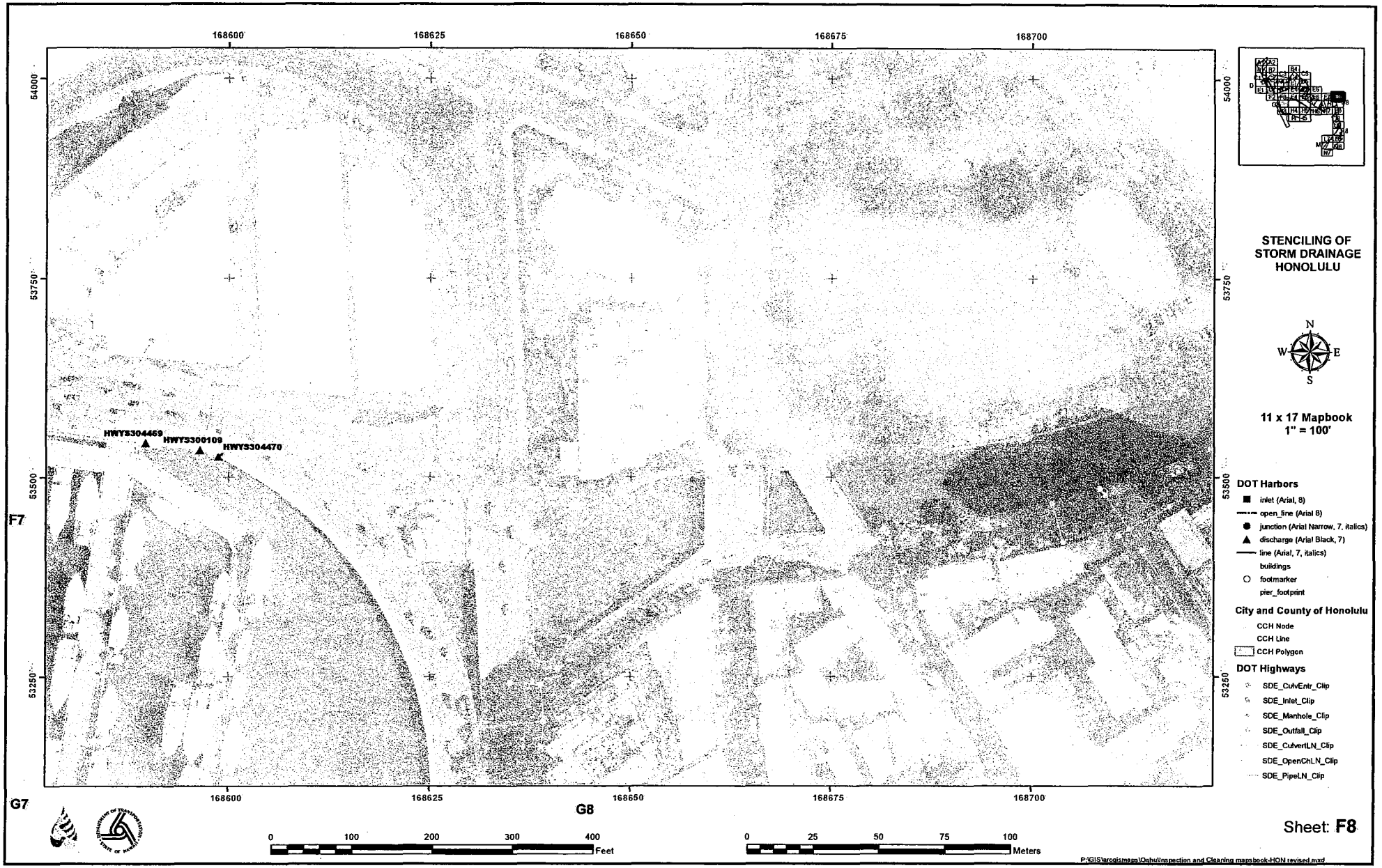
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STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
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11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
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SDE_Outfall_Clip
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SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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STENCILING OF STORM DRAINAGE HONOLULU
11 x 17 Mapbook 1" = 100'
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open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
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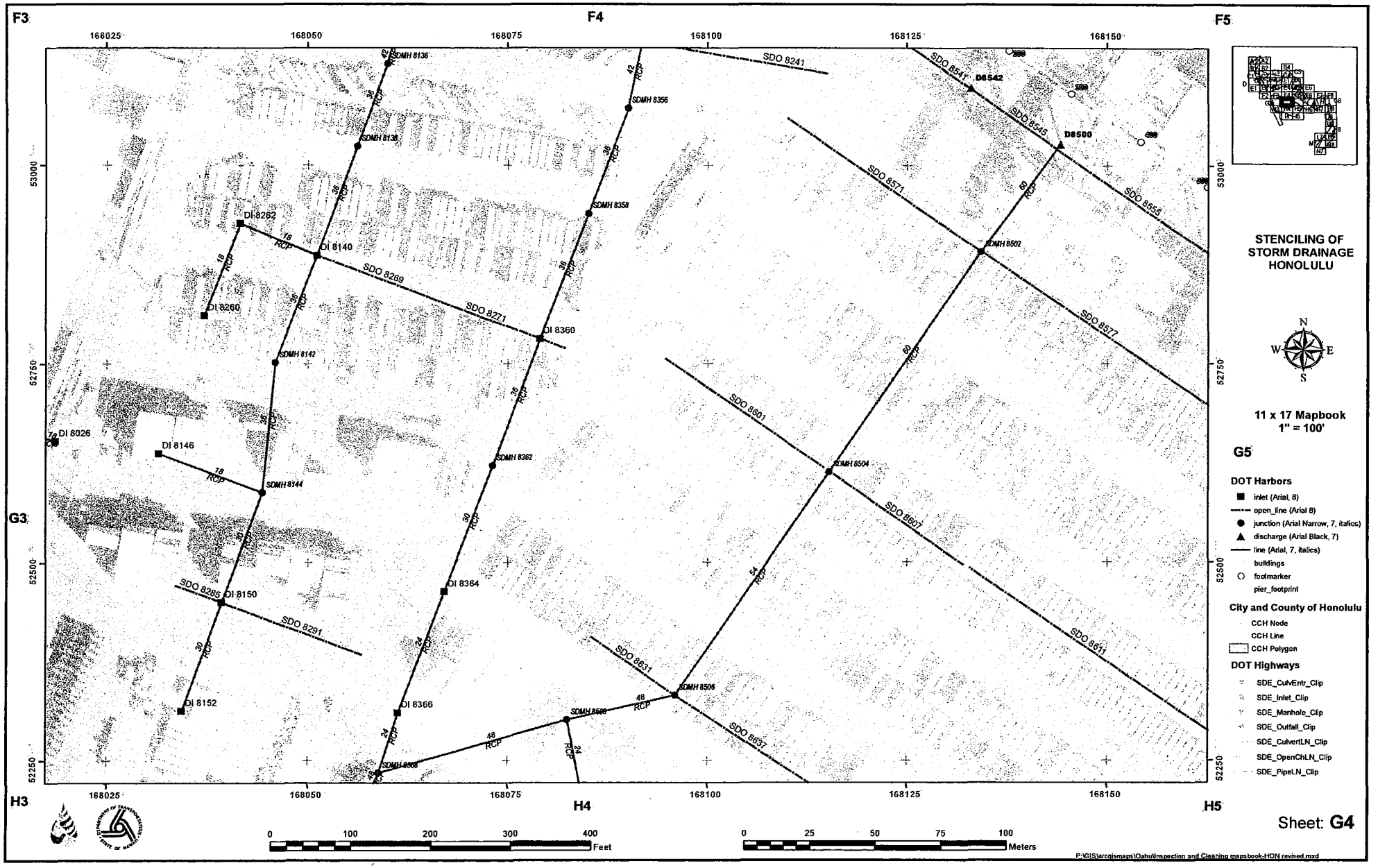
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SDO 8291
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
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SDE_Manhole_Clip
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SDE_CulvertLN_Clip
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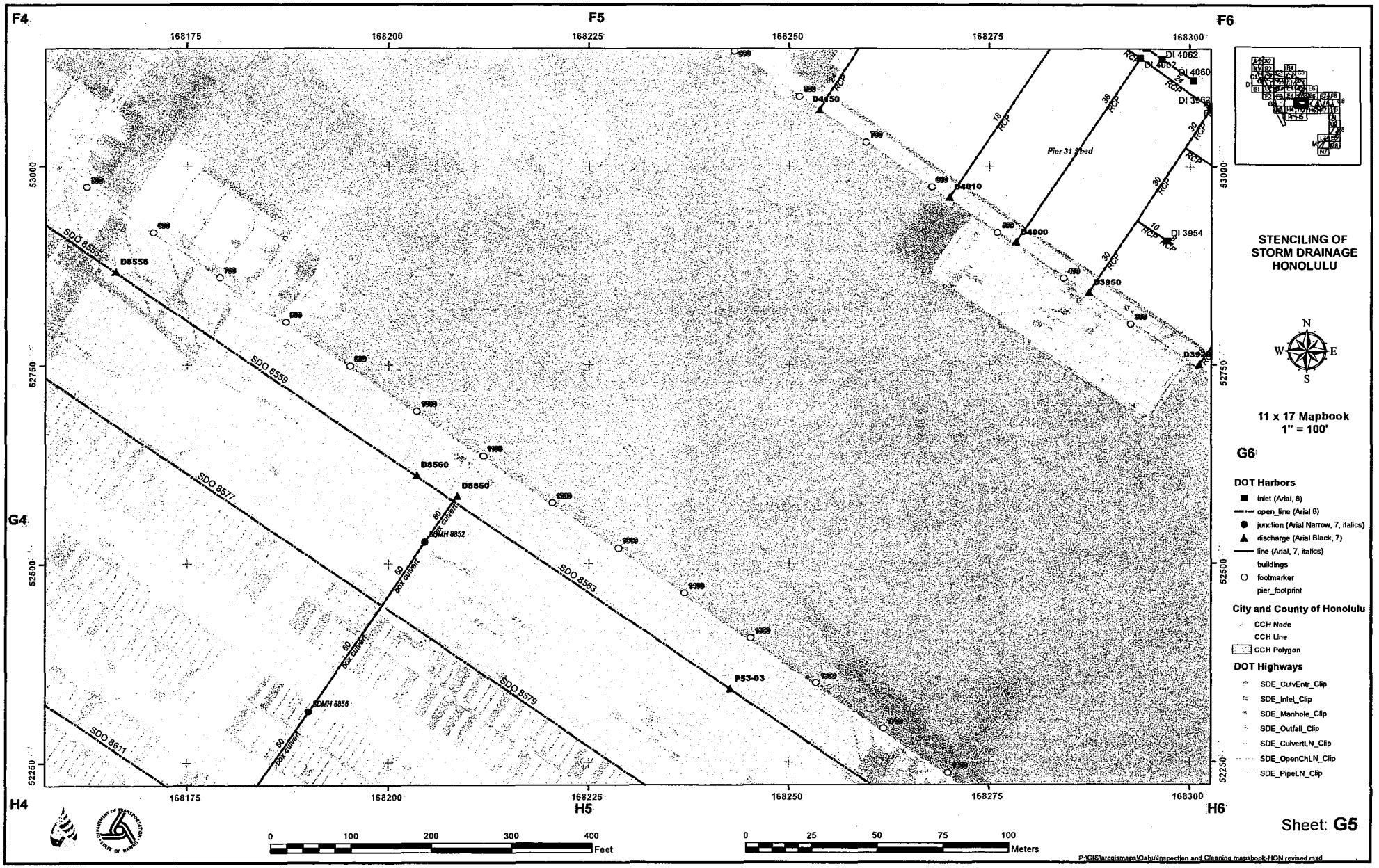
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SDO 8563
SDO 8579
SDO 8611
18 RCP
36 RCP
30 RCP
10 RCP
60 box culvert
STENCILING OF STORM DRAINAGE HONOLULU
N
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11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
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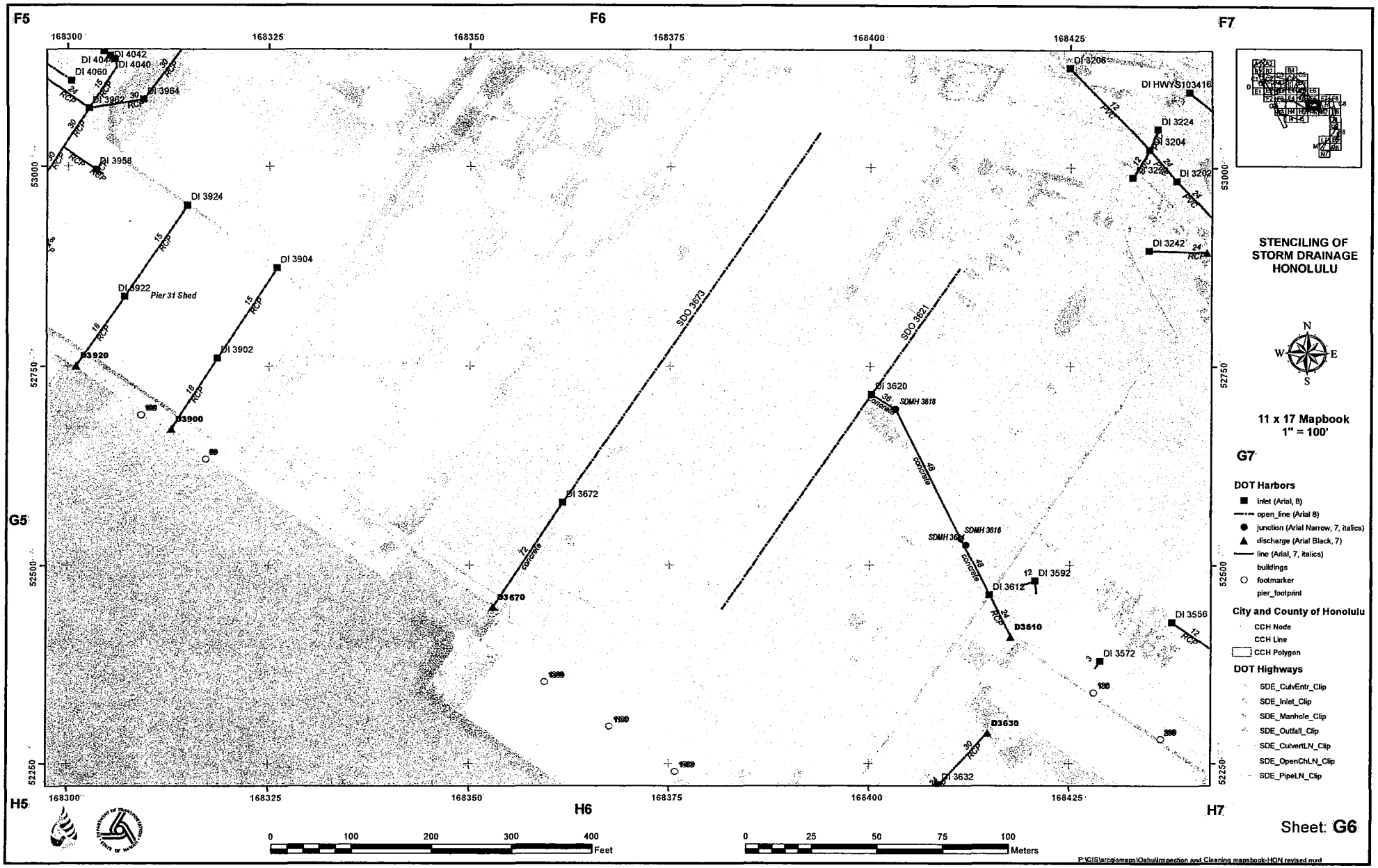
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STENCILING OF STORM DRAINAGE HONOLULU
N
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11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
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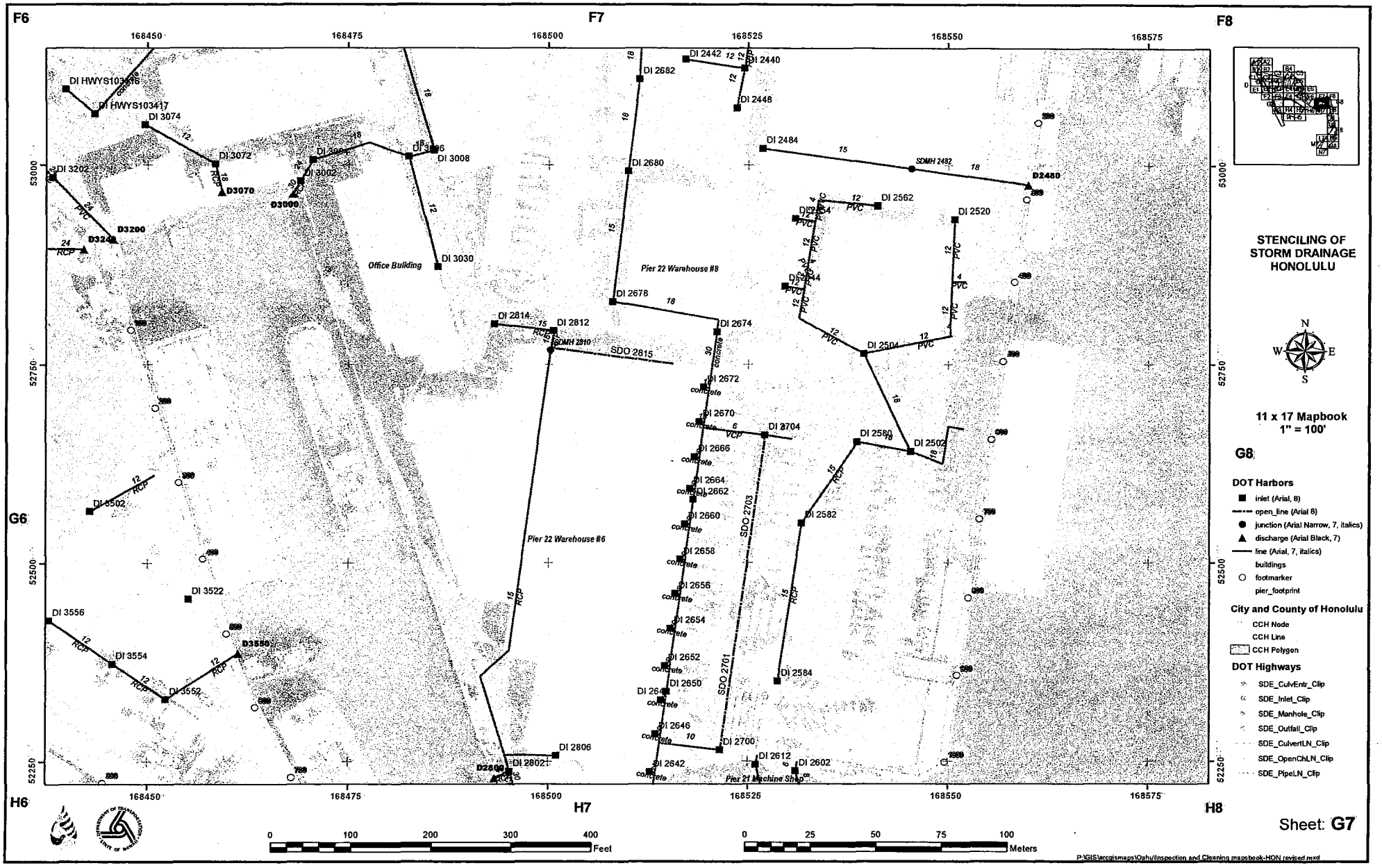

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Pier 22 Warehouse #6
Pier 21 Machine Shop
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SDO 2701
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STENCILING OF STORM DRAINAGE HONOLULU
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
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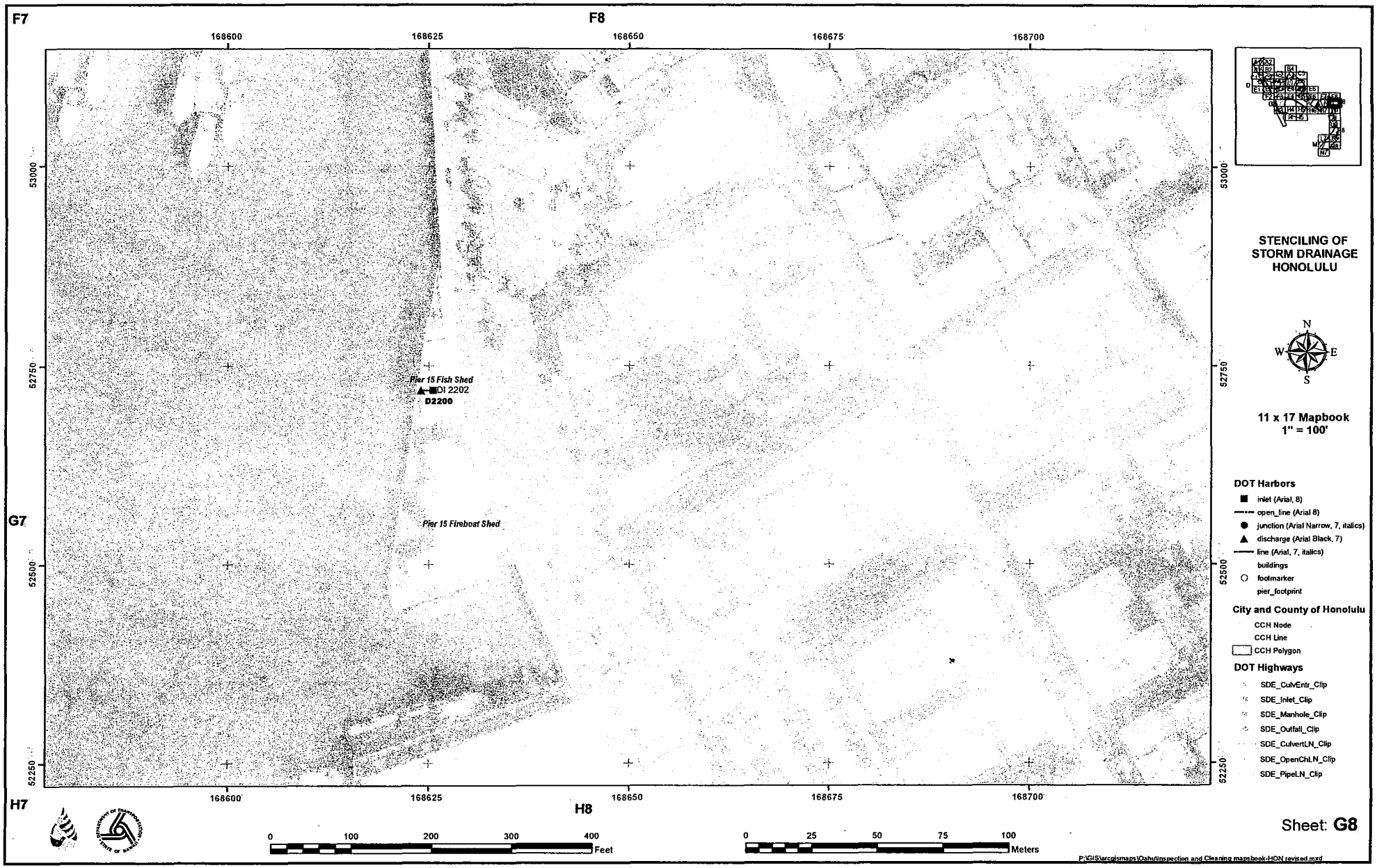
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G7
H7
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STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
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11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
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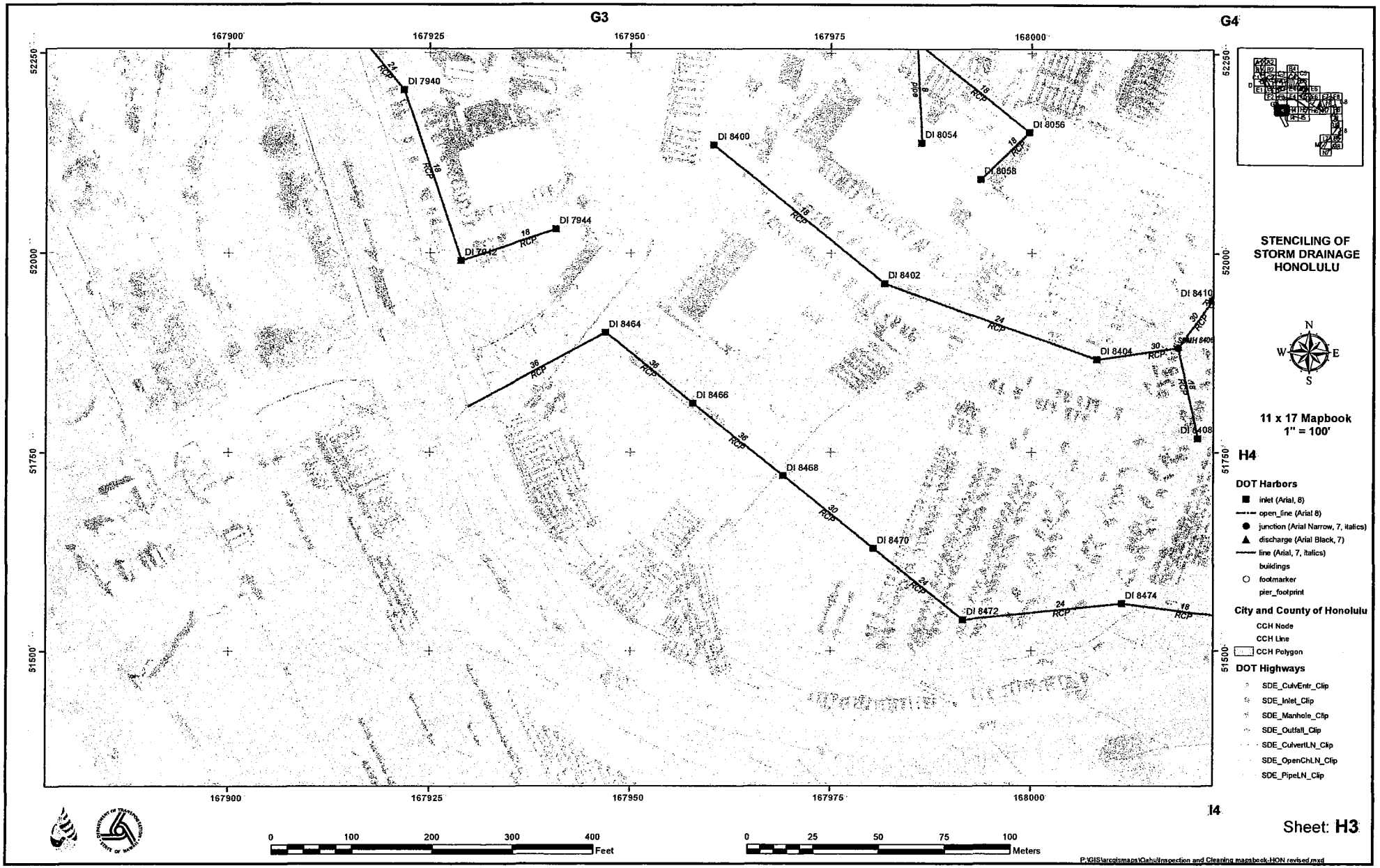
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STENCILING OF STORM DRAINAGE HONOLULU
11 x 17 Mapbook 1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
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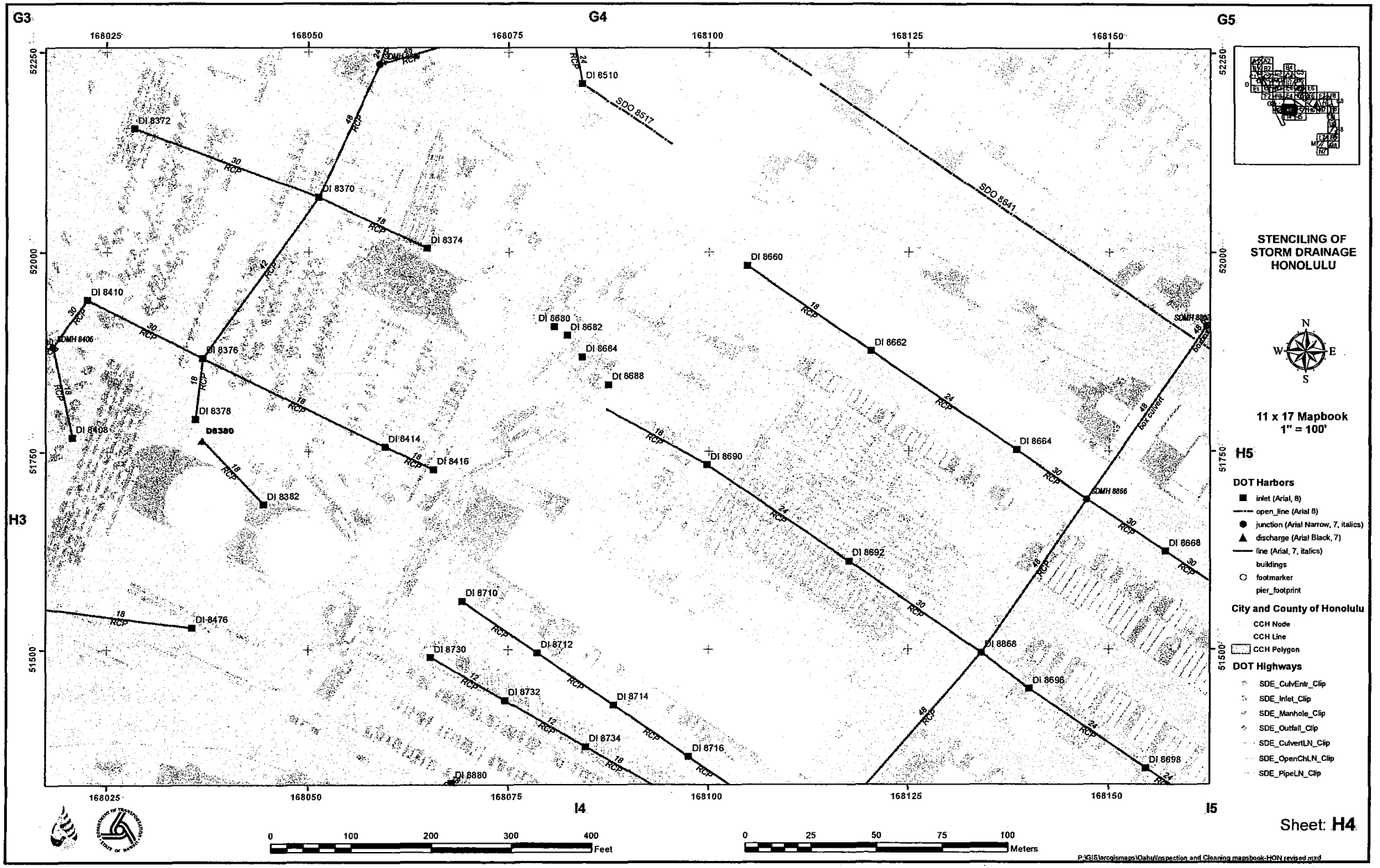
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DI 8684
DI 8688
DI 8690
DI 8692
SDMH 8866
DI 8668
DI 8866
DI 8696
DI 8698
DI 8476
DI 8710
DI 8712
DI 8714
DI 8716
DI 8730
DI 8732
DI 8734
DI 8880
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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Feet
0 25 50 75 100
Meters
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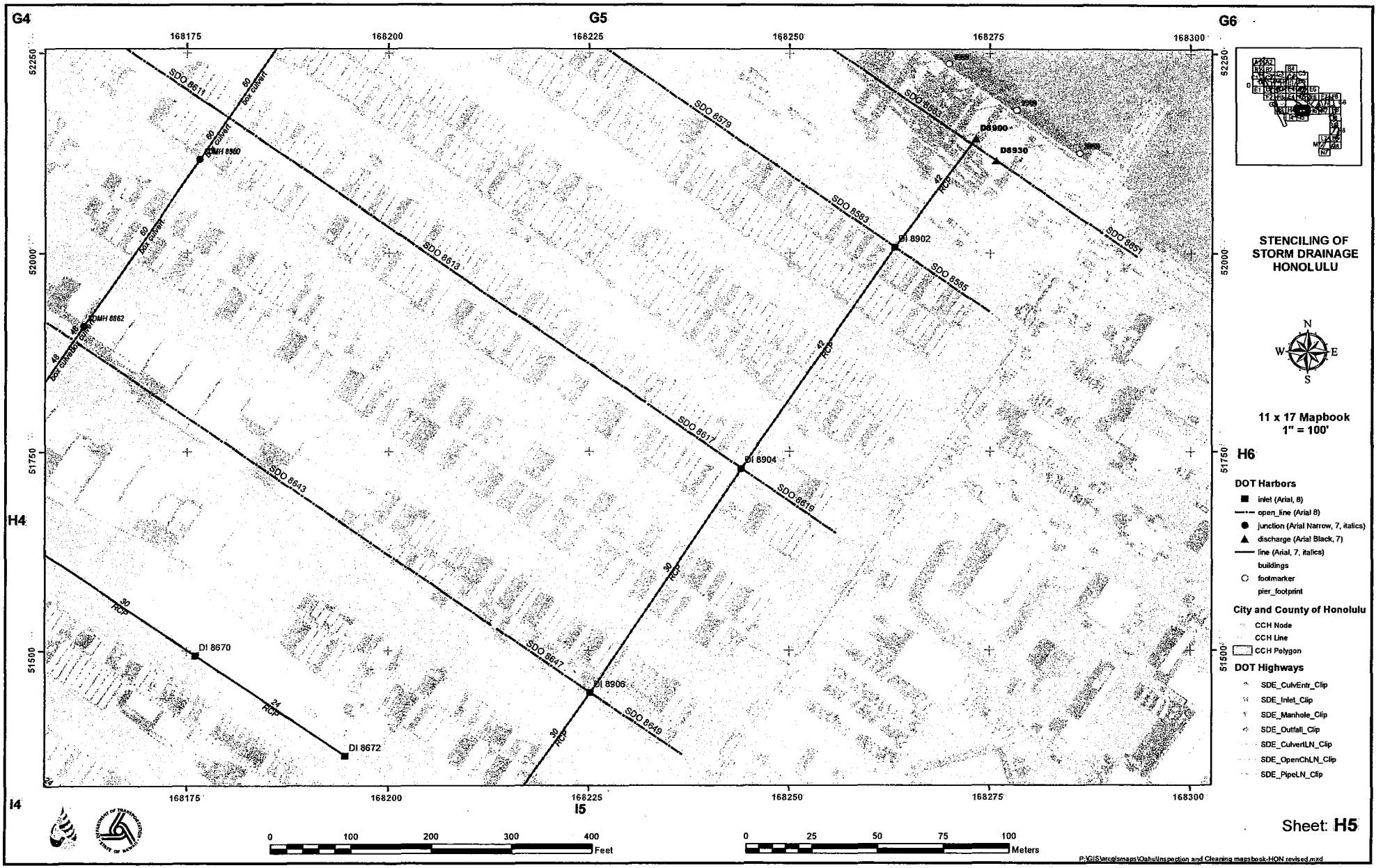
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G6
H4
H6
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I5
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51750
51500
SDO 8611
SDO 8613
SDO 8579
SDO 8583
SDO 8585
SDO 8587
SDO 8617
SDO 8619
SDO 8643
SDO 8647
SDO 8649
60 box culvert
48 box culvert
DMH 8860
DMH 8862
DI 8902
DI 8904
DI 8906
DI 8670
DI 8672
D8900
D8930
42 RCP
30 RCP
24 RCP
STENCILING OF STORM DRAINAGE HONOLULU
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
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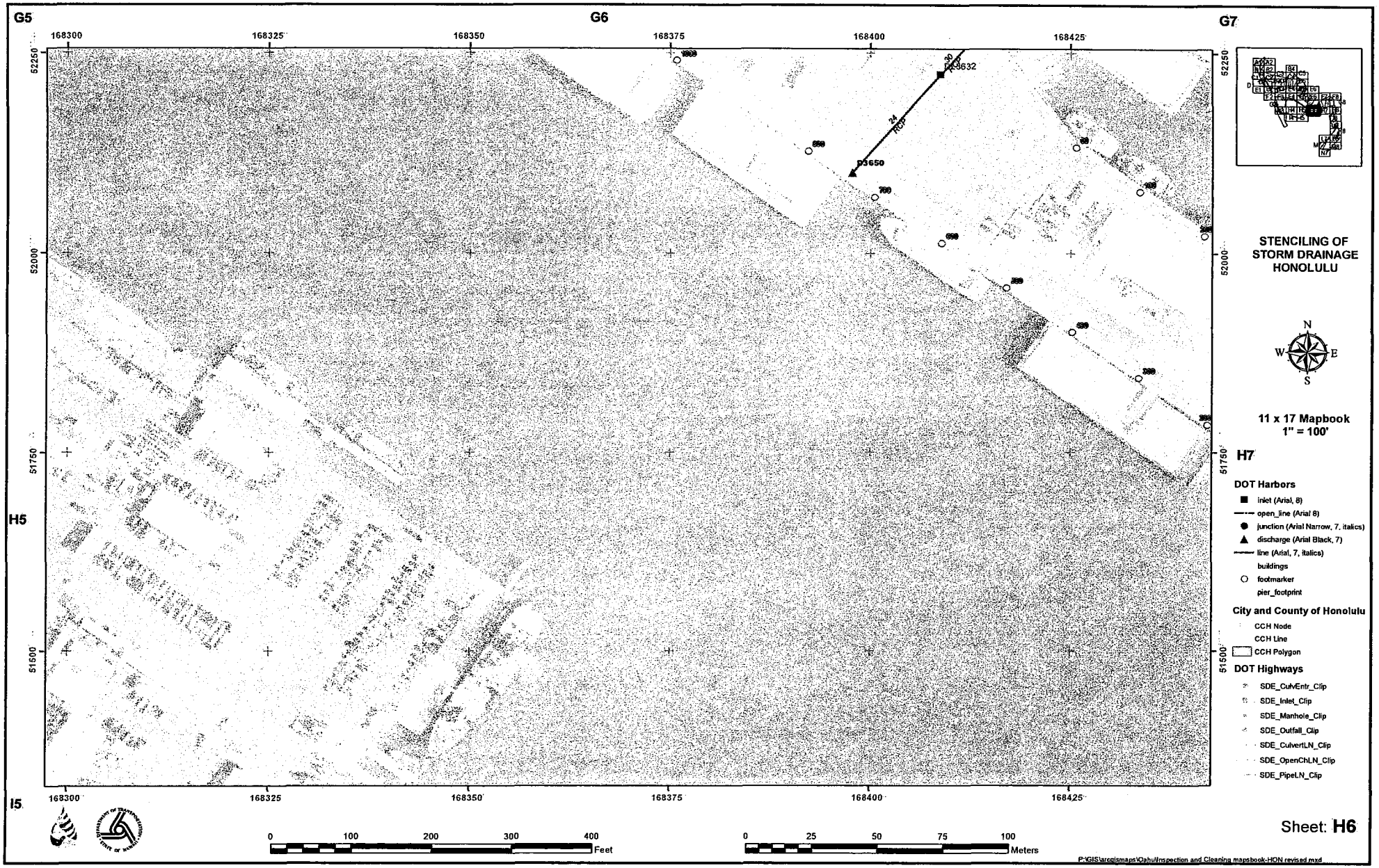
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51750
51500
D3632
D3650
24 RCP
STENCILING OF STORM DRAINAGE HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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Meters
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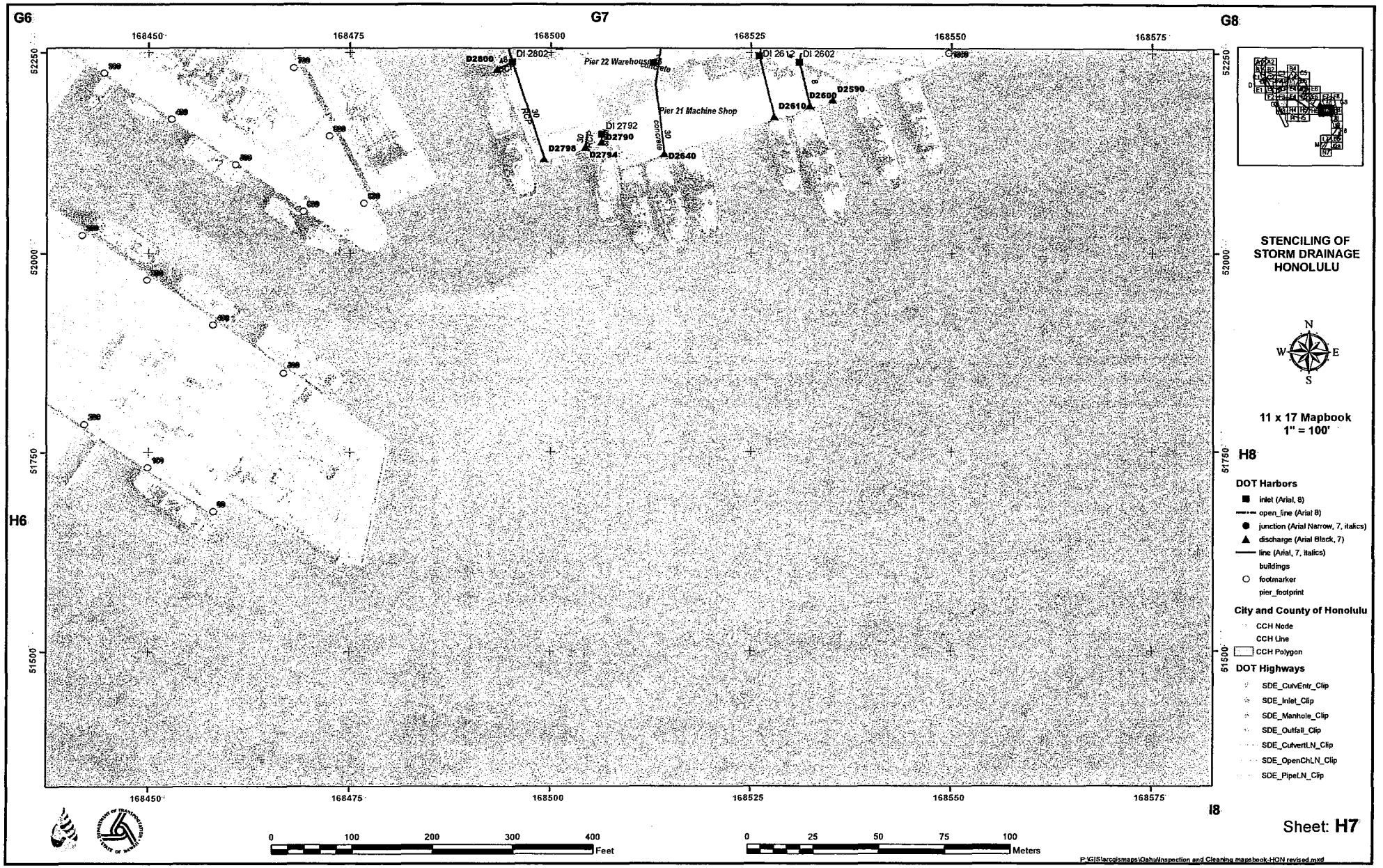
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G7
G8
H6
H8
I8
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168575
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52000
51750
51500
D2800
DI 2802
Pier 22 Warehouse
Concrete
DI 2612
DI 2602
D2590
D2600
D2610
Pier 21 Machine Shop
DI 2792
D2790
D2794
D2798
D2640
RCP
30
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0
100
200
300
400
Feet
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50
75
100
Meters
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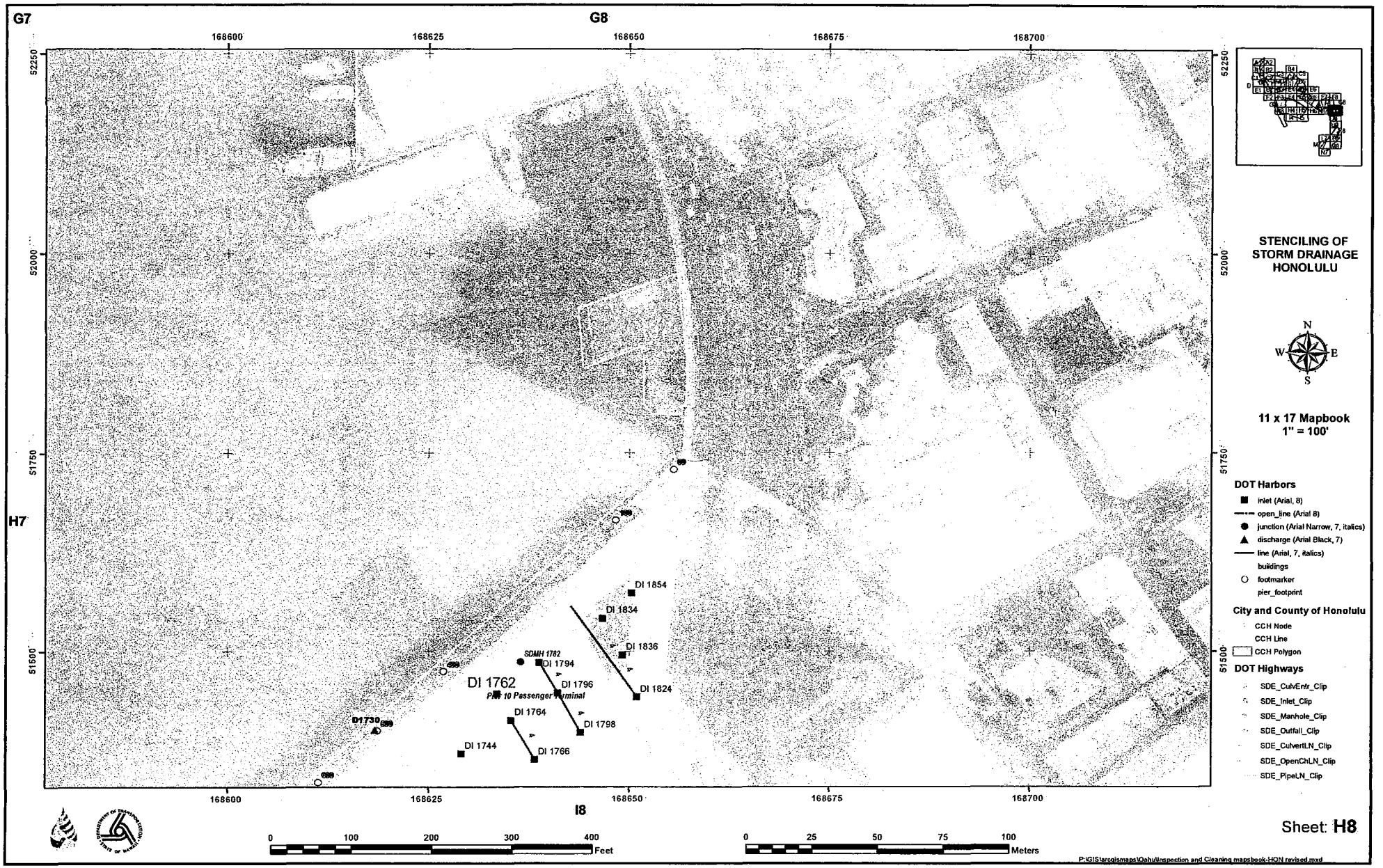
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168700
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52000
51750
51500
DI 1762
Pier 10 Passenger Terminal
SDMH 1782
DI 1794
DI 1796
DI 1764
DI 1798
DI 1744
DI 1766
DI 1730
DI 1854
DI 1834
DI 1836
DI 1824
STENCILING OF STORM DRAINAGE HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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0 25 50 75 100 Meters
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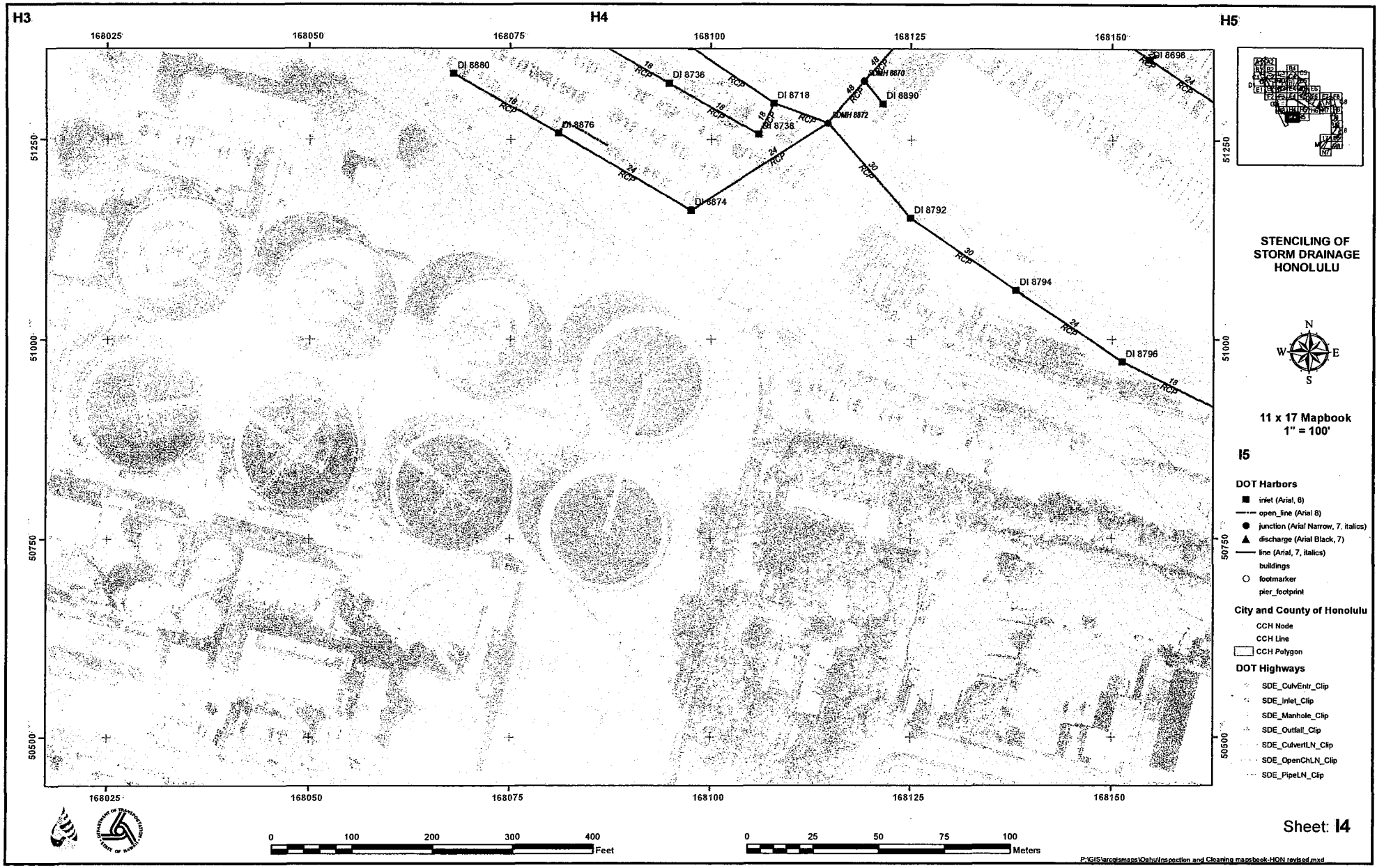
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DI 8738
DI 8718
DI 8698
DI 8890
DMH 8870
DMH 8872
DI 8792
DI 8794
DI 8796
18 RCP
24 RCP
30 RCP
48 RCP
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
I5
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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Feet
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Meters
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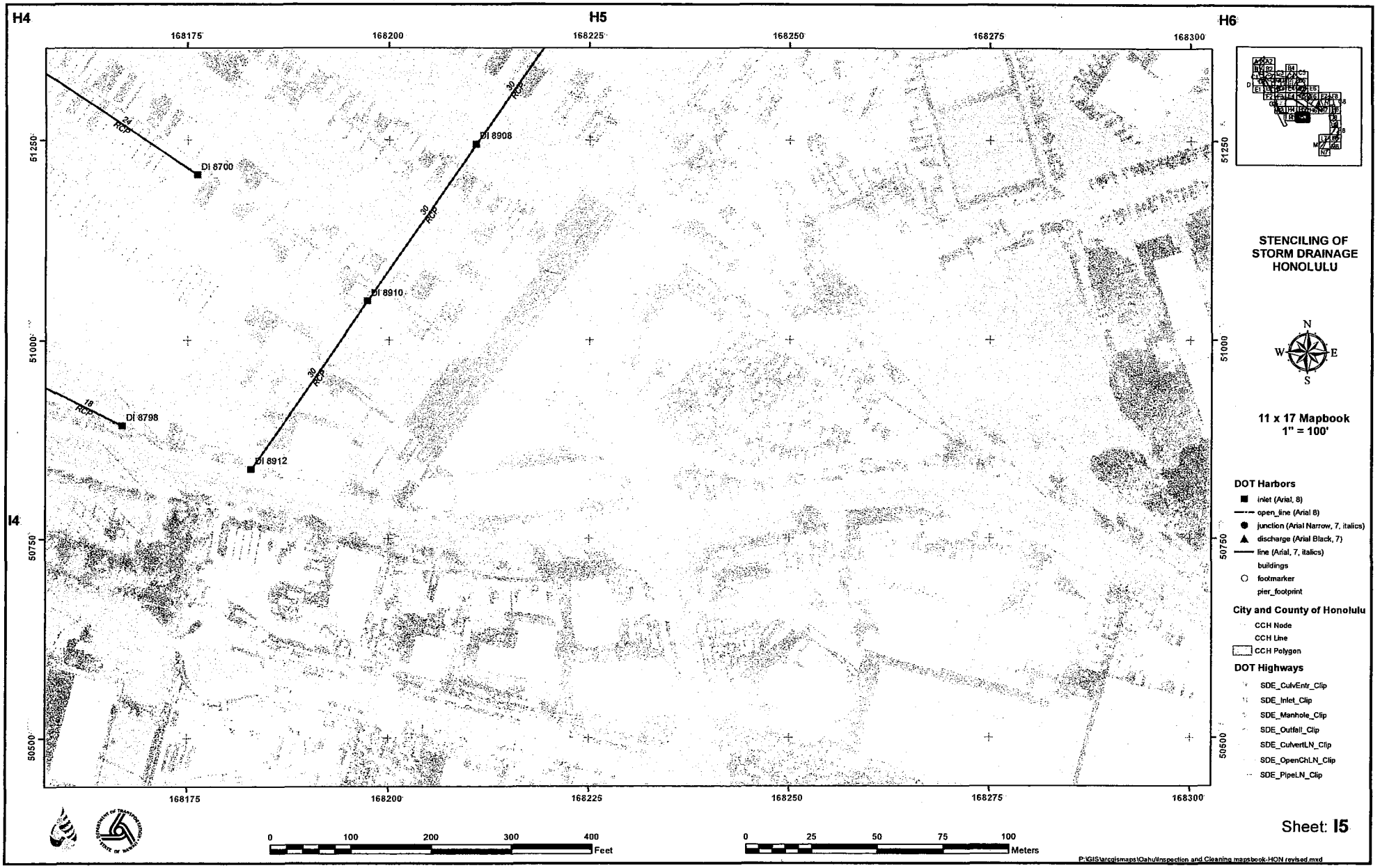
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H5
H6
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51000
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50500
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DI 8908
DI 8910
DI 8798
DI 8912
24 RCP
30 RCP
30 RCP
30 RCP
18 RCP
STENCILING OF STORM DRAINAGE HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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Feet
0 25 50 75 100
Meters
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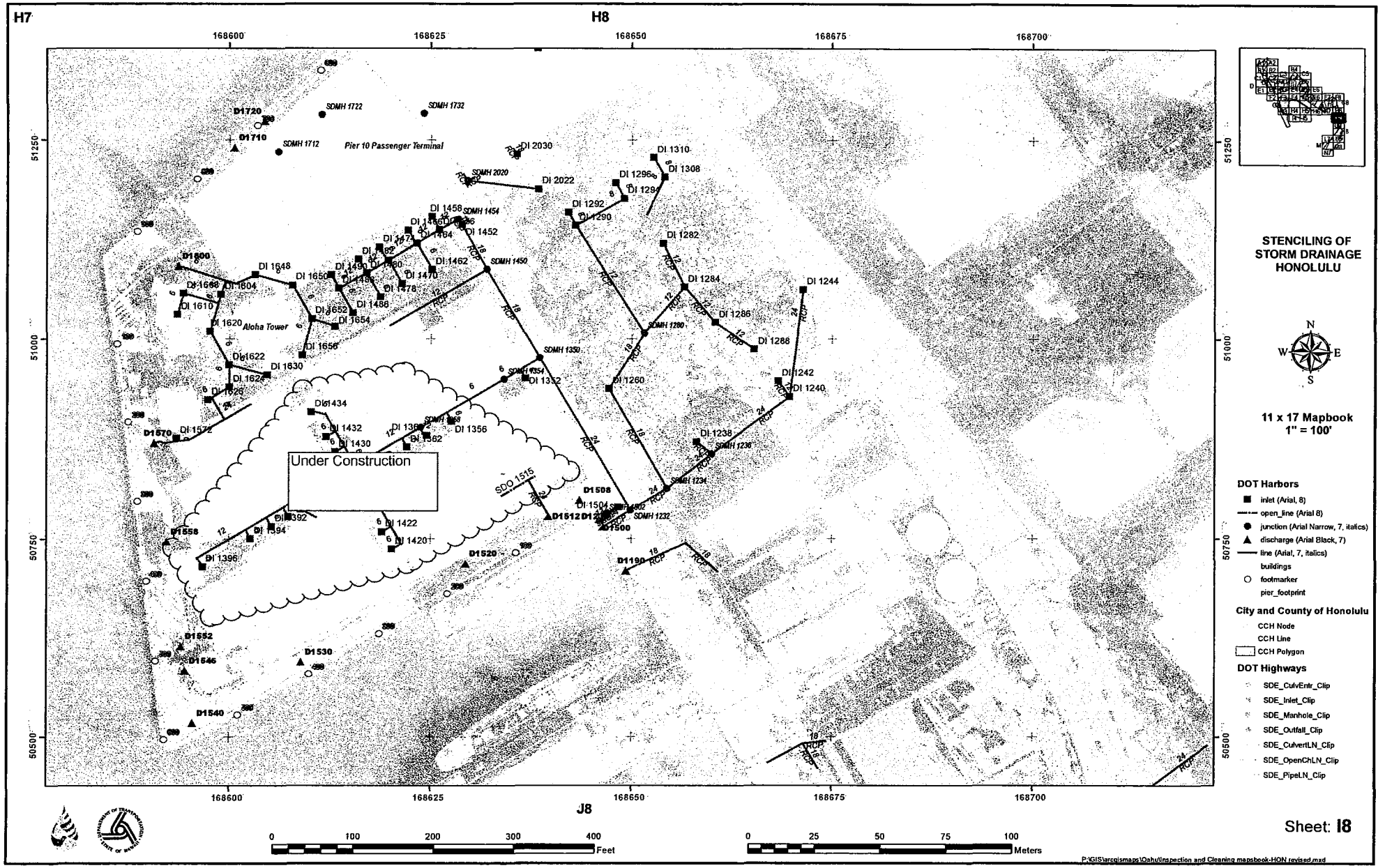
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H8
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168600
168625
168650
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50500
Pier 10 Passenger Terminal
Aloha Tower
Under Construction
SDMH 1722
SDMH 1732
SDMH 1712
SDMH 2020
SDMH 1454
SDMH 1450
SDMH 1350
SDMH 1354
SDMH 1358
SDMH 1280
SDMH 1236
SDMH 1234
SDMH 1232
SDO 1515
D1720
D1710
D1800
D1570
D1558
D1552
D1546
D1540
D1530
D1520
D1508
D1512
D1500
D1190
DI 2030
DI 2022
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DI 1308
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DI 1294
DI 1292
DI 1290
DI 1282
DI 1284
DI 1286
DI 1288
DI 1244
DI 1242
DI 1240
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DI 1454
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DI 1460
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DI 1478
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DI 1430
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DI 1352
DI 1392
DI 1394
DI 1396
DI 1422
DI 1420
DI 1504
RCP
0
100
200
300
400
Feet
0
25
50
75
100
Meters
STENCILING OF STORM DRAINAGE HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
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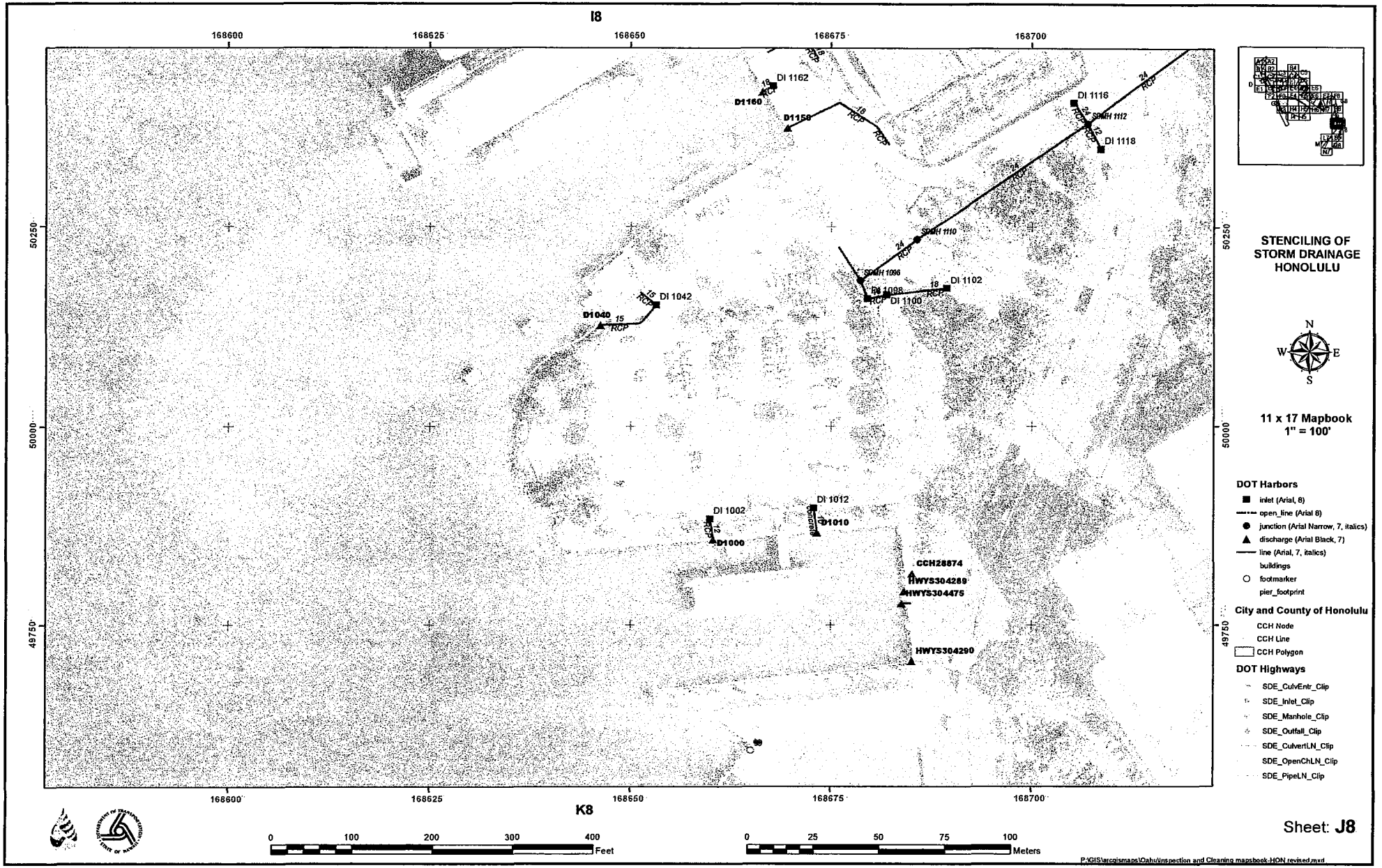
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SOUTH 1112
DI 1118
SOUTH 1110
SOUTH 1096
DI 1102
D1098
DI 1100
DI 1042
D1040
DI 1002
DI 1012
D1010
D1000
CCH28874
HWYS304289
HWYS304475
HWYS304290
STENCILING OF STORM DRAINAGE HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
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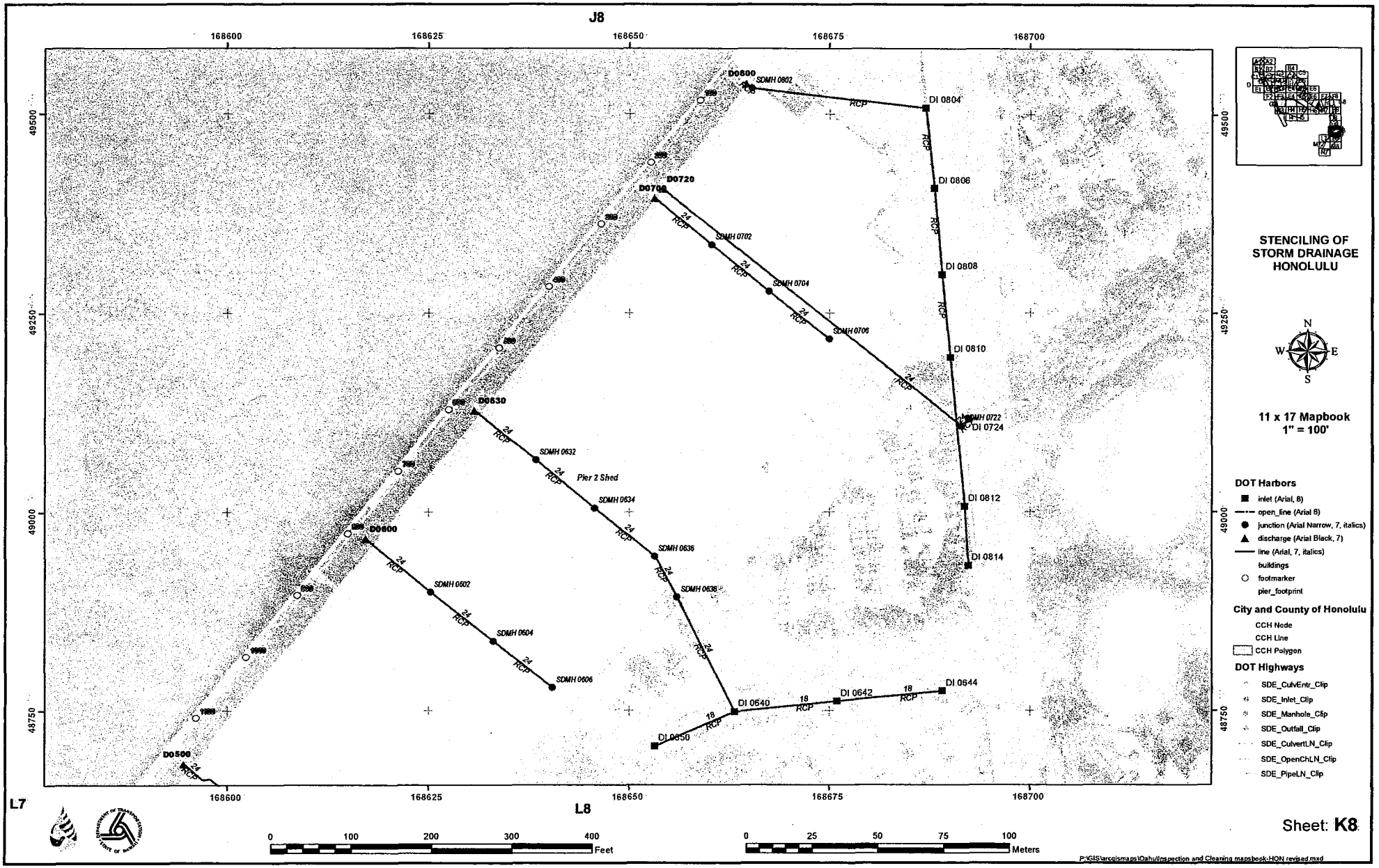
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SDMH 0702
SDMH 0704
SDMH 0706
DI 0808
DI 0810
SDMH 0722
DI 0724
D0630
SDMH 0632
Pier 2 Shed
SDMH 0634
SDMH 0636
SDMH 0638
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DI 0814
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SDMH 0606
DI 0640
DI 0642
DI 0644
DI 0650
D0500
RCP
24
18
STENCILING OF STORM DRAINAGE HONOLULU
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0
100
200
300
400
Feet
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Meters
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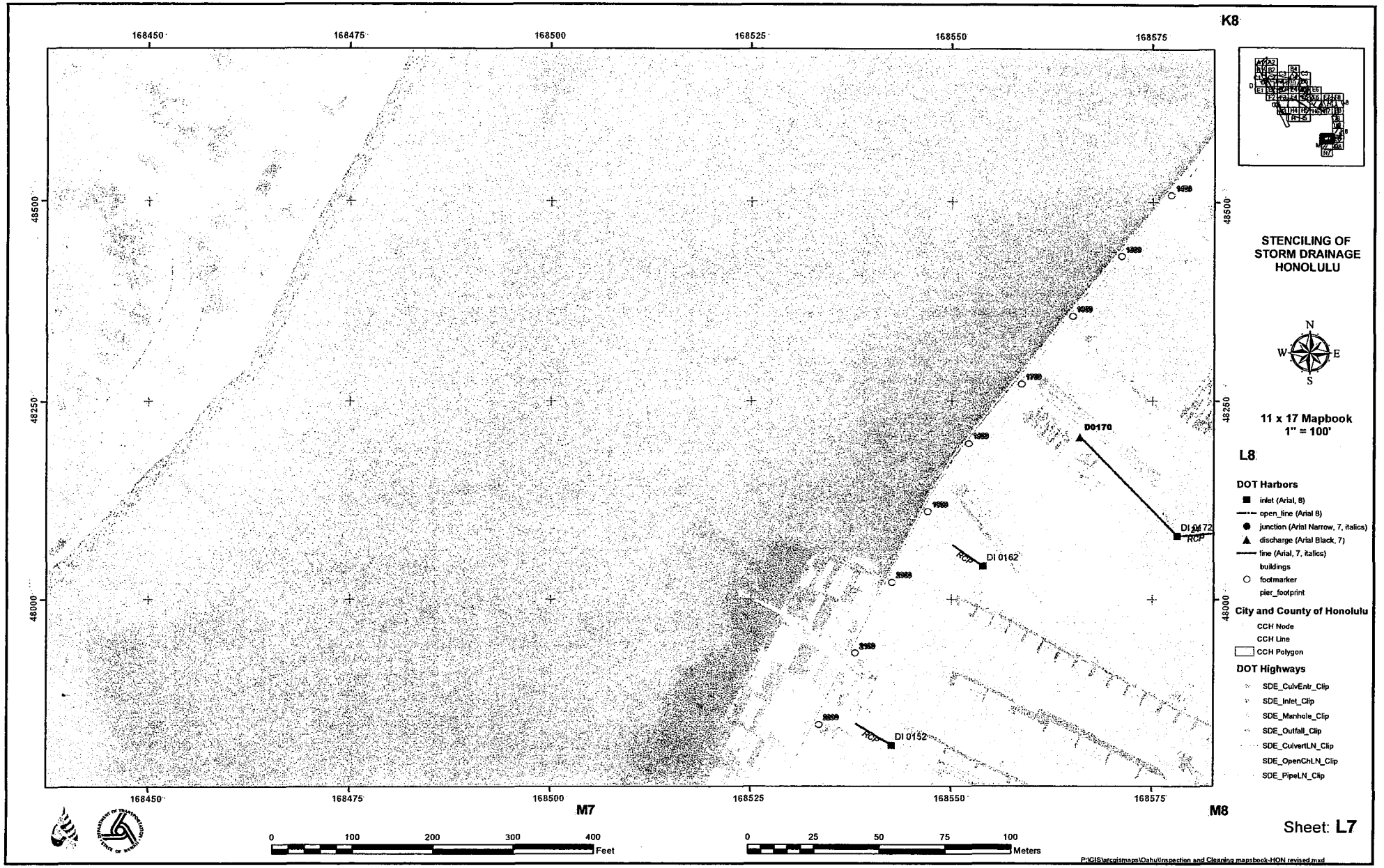
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DI 0162
RCP
DI 0152
RCP
M7
M8
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
L8
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
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Feet
0 25 50 75 100
Meters
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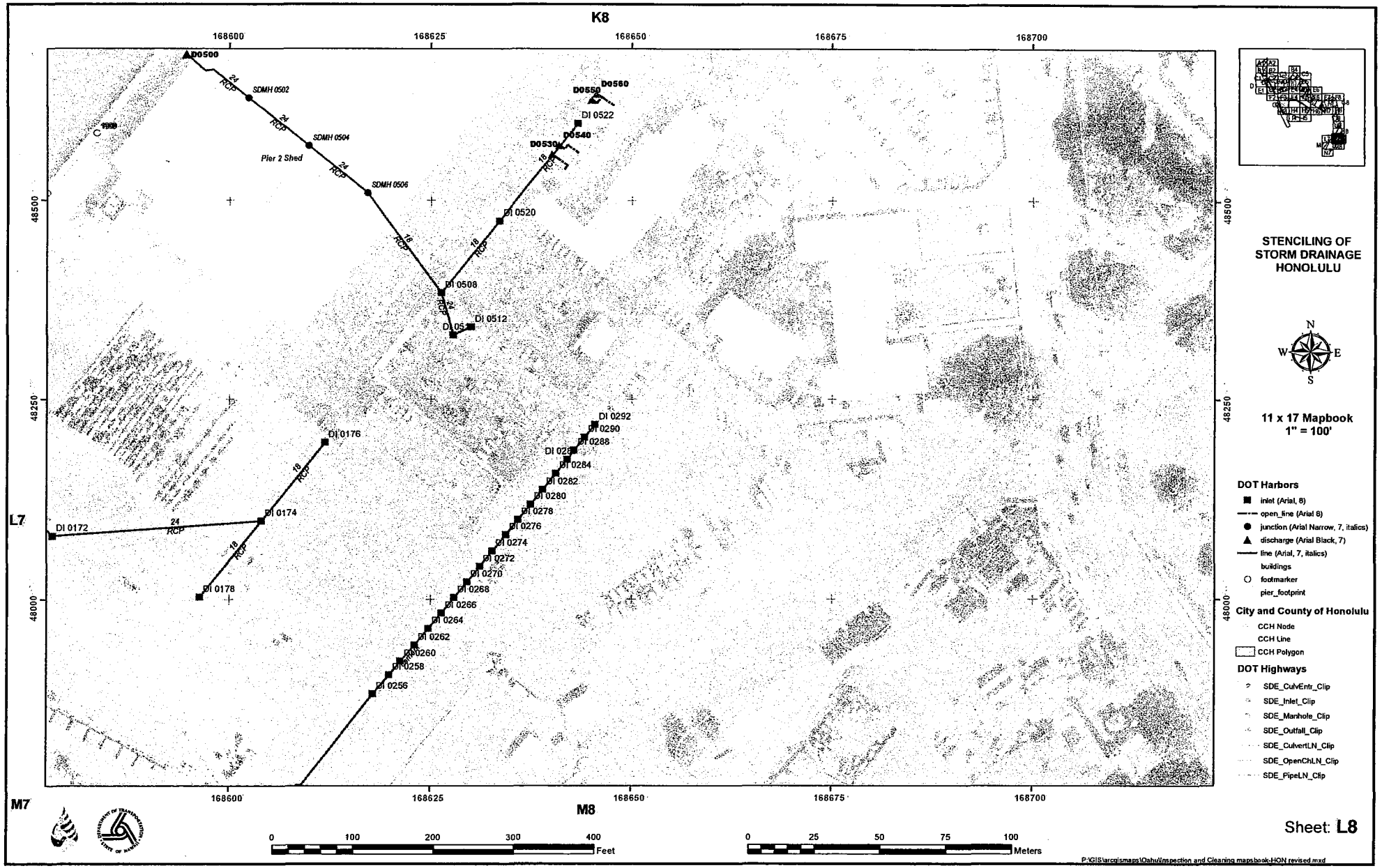
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SDMH 0504
Pier 2 Shed
SDMH 0506
D0550
D0560
D0540
D0530
DI 0522
DI 0520
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DI 0270
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DI 0266
DI 0264
DI 0262
DI 0260
DI 0258
DI 0256
24 RCP
18 RCP
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
0
100
200
300
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Feet
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Meters
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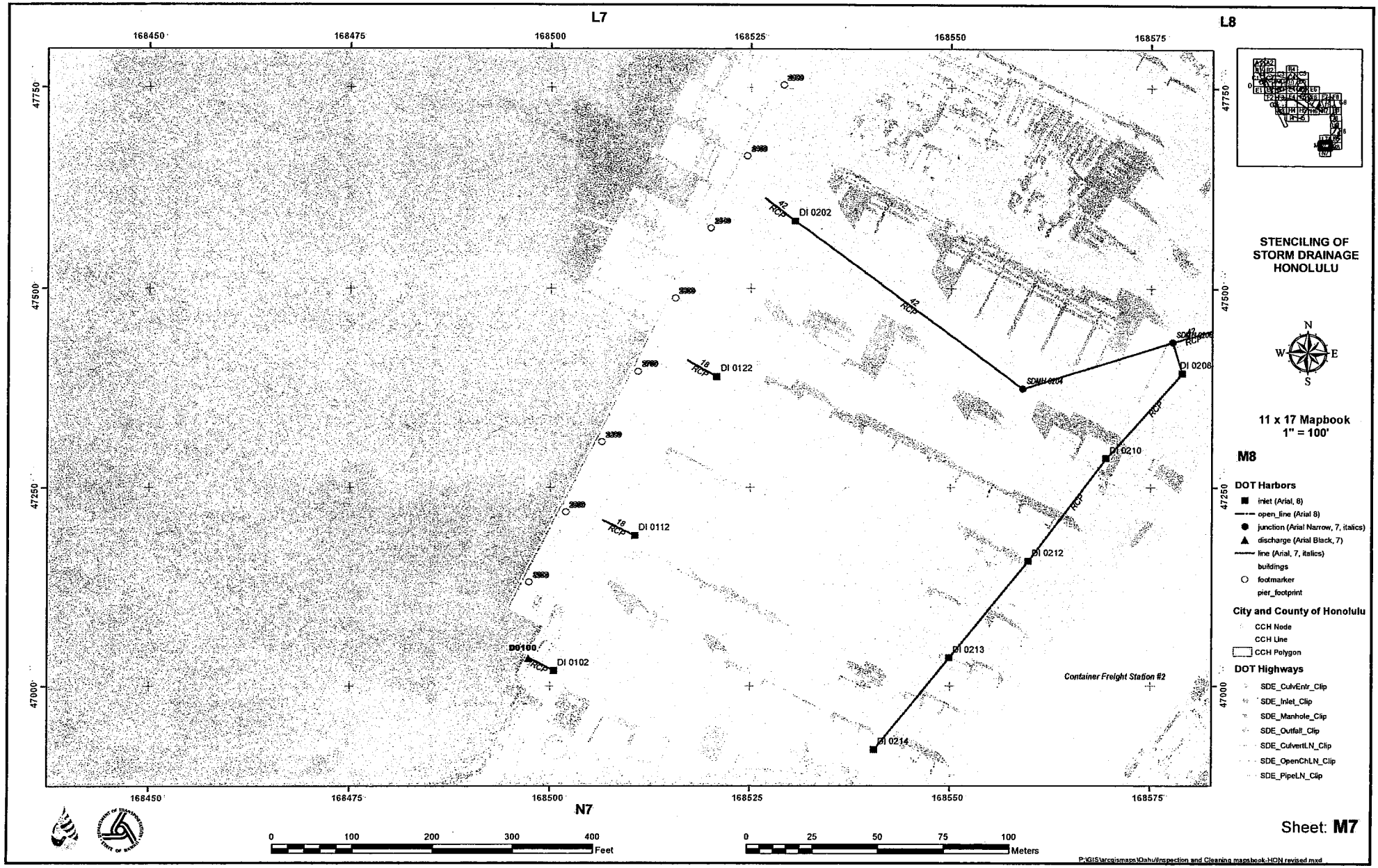
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DI 0208
DI 0210
DI 0212
DI 0213
DI 0214
DI 0122
DI 0112
DI 0102
D0100
SDMH-0204
42 RCP
18 RCP
Container Freight Station #2
STENCILING OF STORM DRAINAGE HONOLULU
N
S
E
W
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
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0 25 50 75 100 Meters
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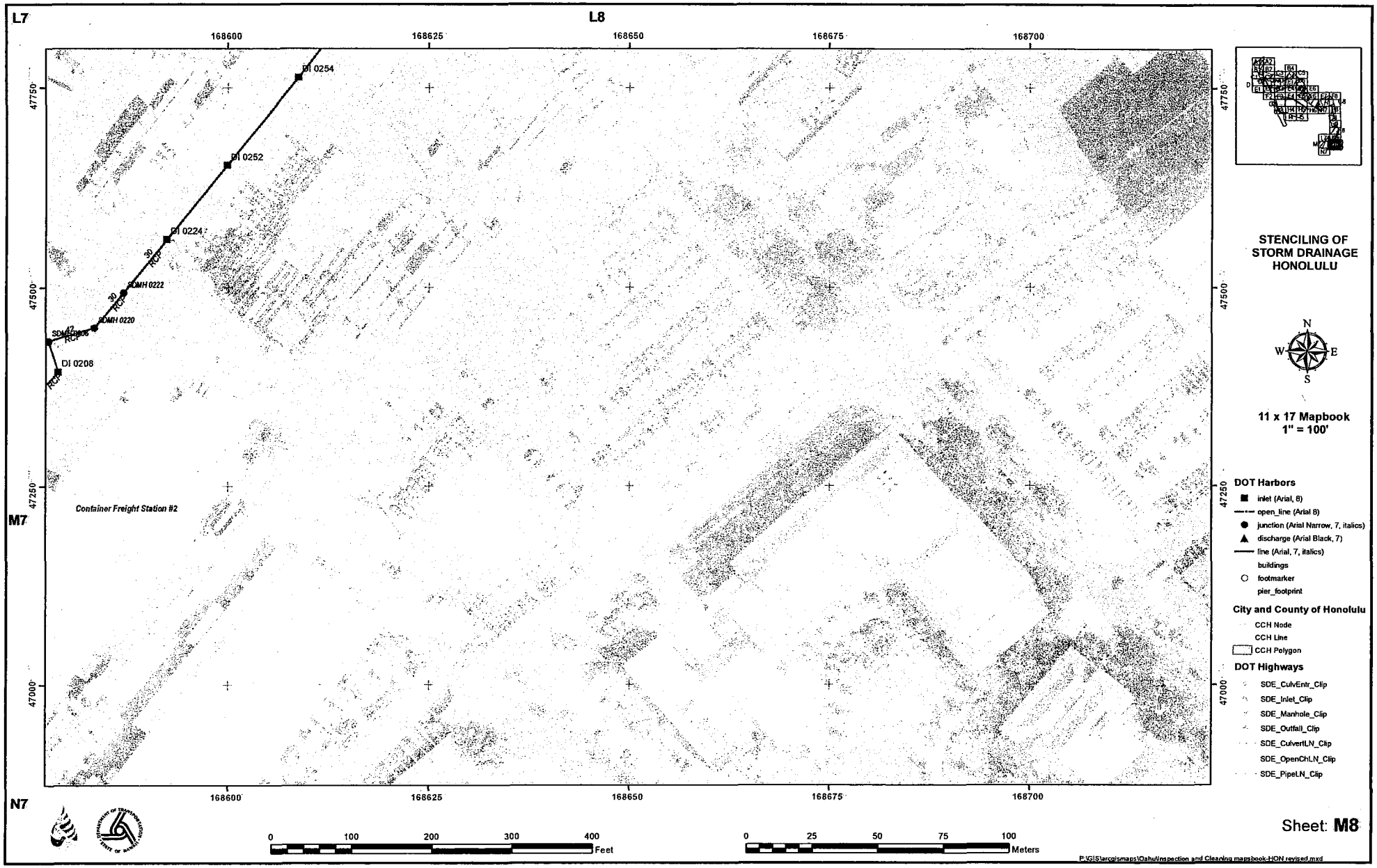
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DI 0224
DI 0208
SDMH 0222
SDMH 0220
30
RCP
Container Freight Station #2
STENCILING OF
STORM DRAINAGE
HONOLULU
N
W
E
S
11 x 17 Mapbook
1" = 100'
DOT Harbors
inlet (Arial, 8)
open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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100
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300
400
Feet
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Meters
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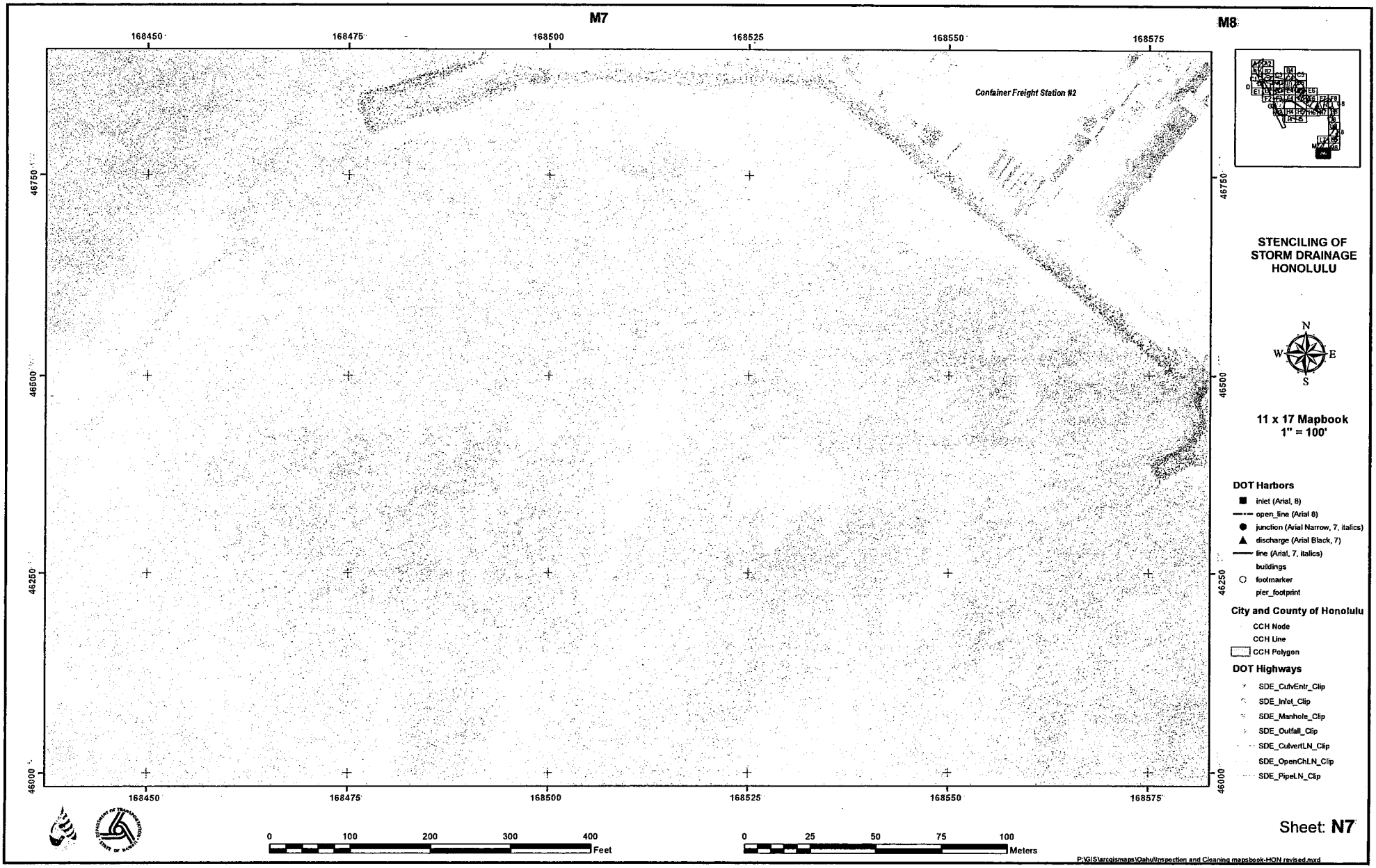
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46750
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Container Freight Station #2
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open_line (Arial 8)
junction (Arial Narrow, 7, italics)
discharge (Arial Black, 7)
line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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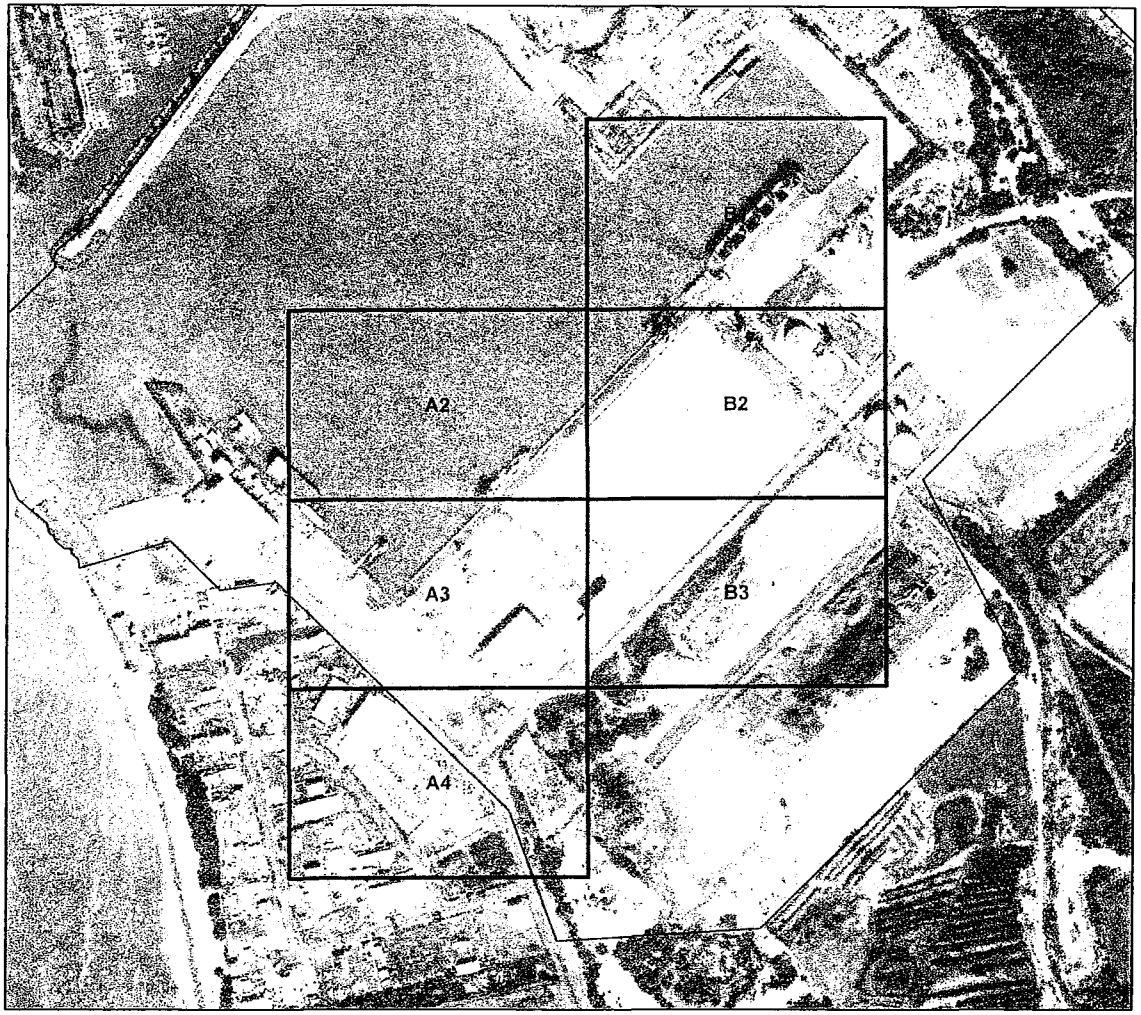

This grid represents the sheets used in this map book.

Map Book of Storm Drain Features
Honolulu

November 2014


160200
160225
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junction (Arial Narrow, 7, italics)
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line (Arial, 7, italics)
buildings
footmarker
pier_footprint
City and County of Honolulu
CCH Node
CCH Line
CCH Polygon
DOT Highways
SDE_CulvEntr_Clip
SDE_Inlet_Clip
SDE_Manhole_Clip
SDE_Outfall_Clip
SDE_CulvertLN_Clip
SDE_OpenChLN_Clip
SDE_PipeLN_Clip
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DI 7602
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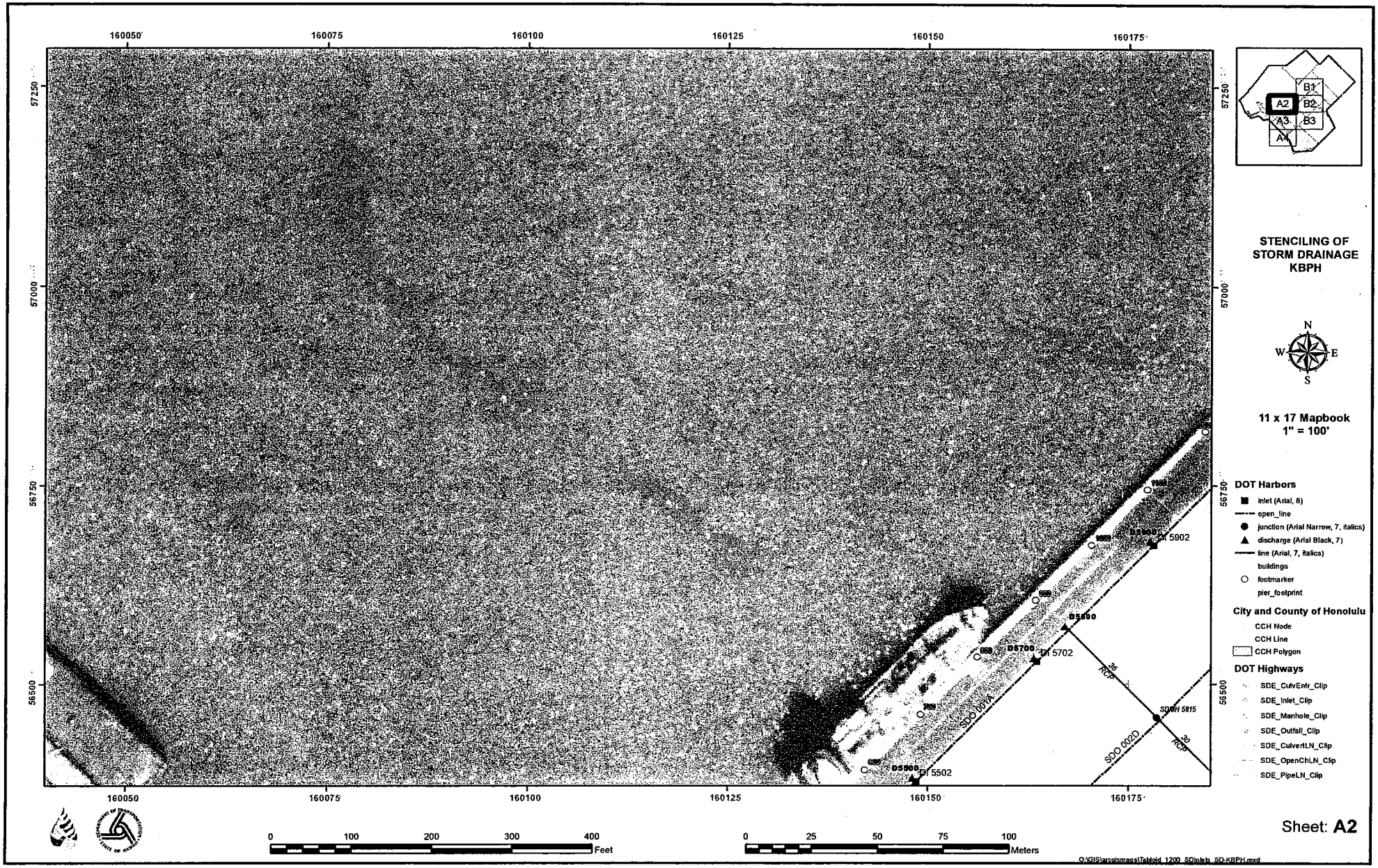
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STORM DRAINAGE
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1" = 100'
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pier_footprint
City and County of Honolulu
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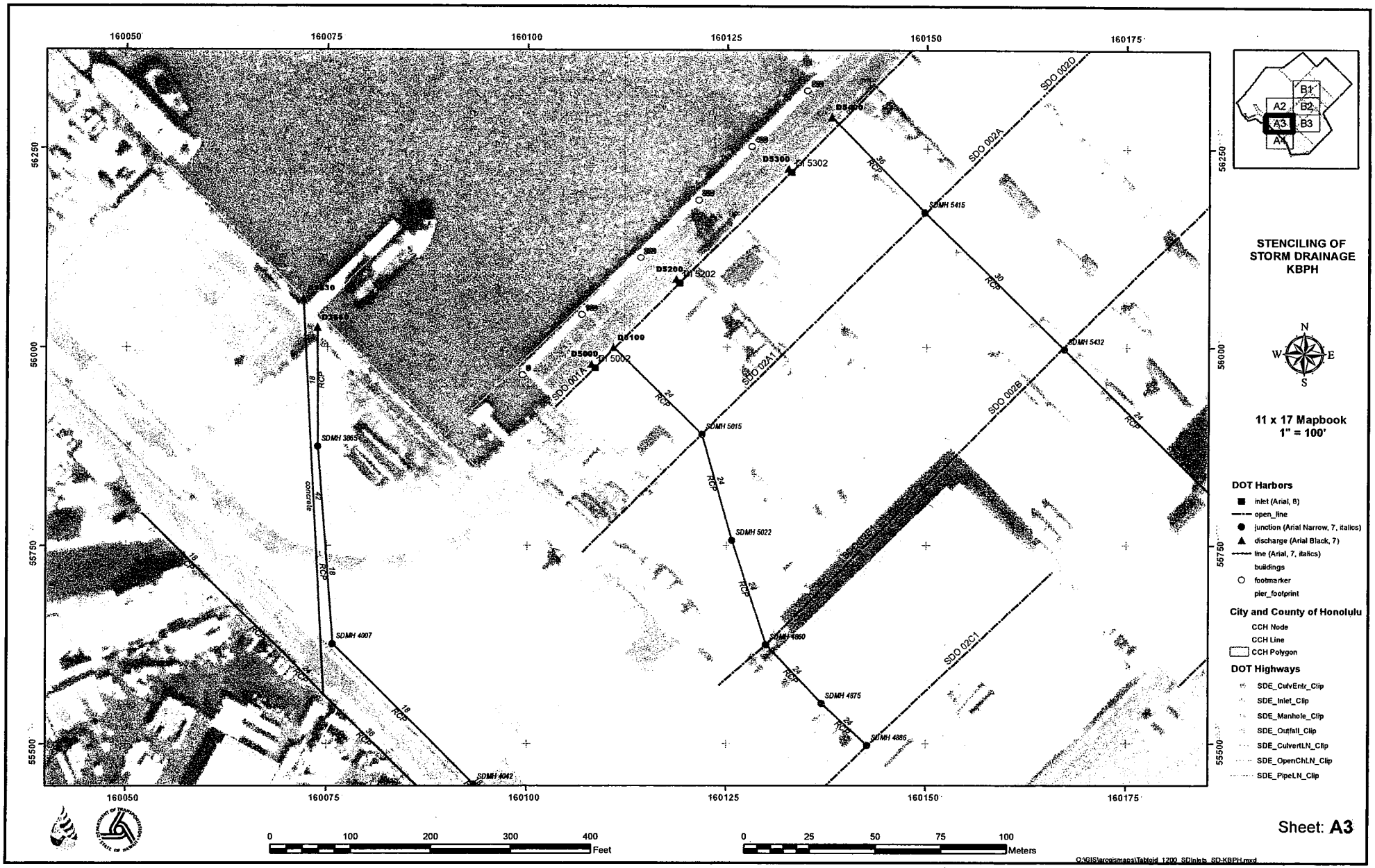
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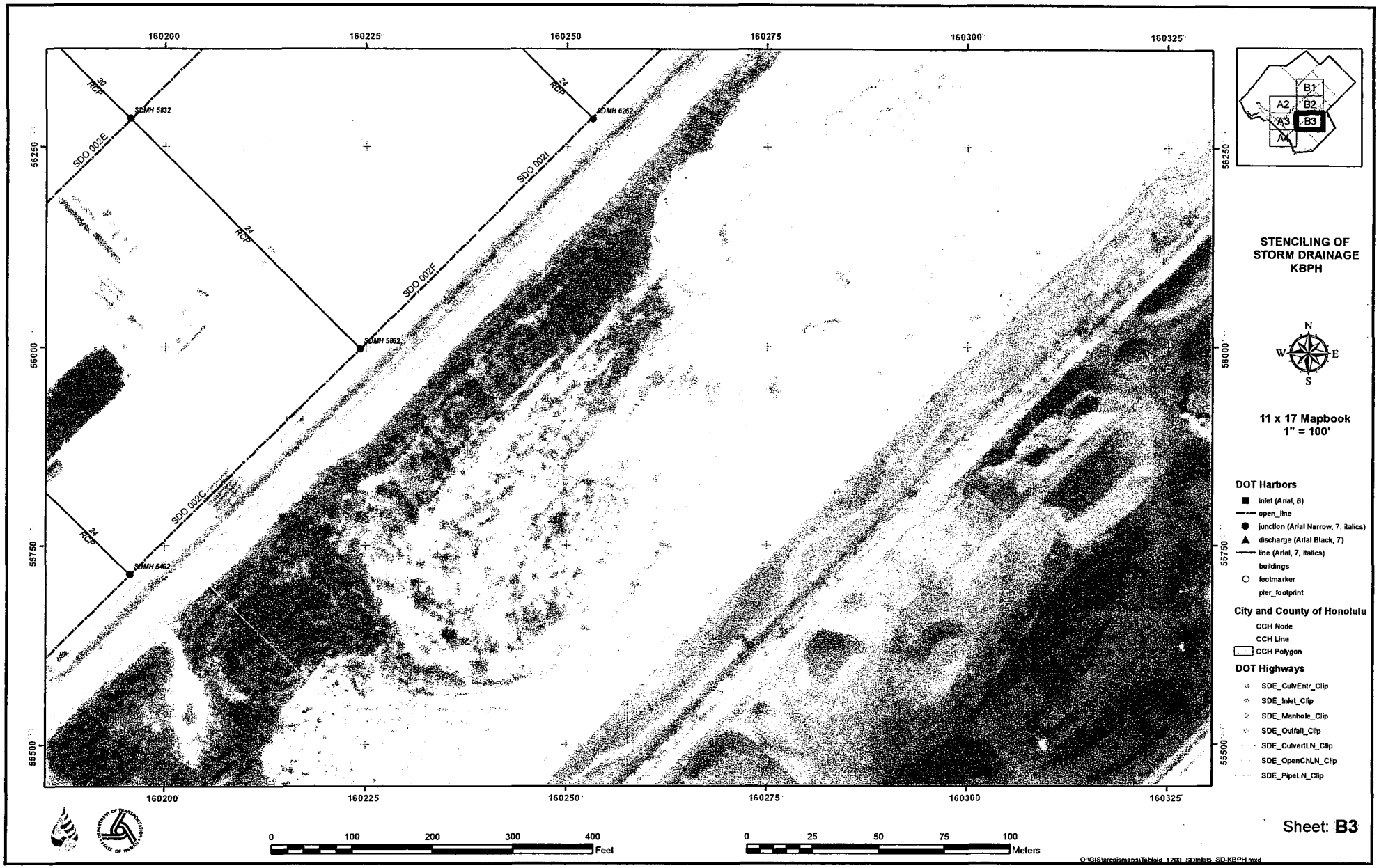
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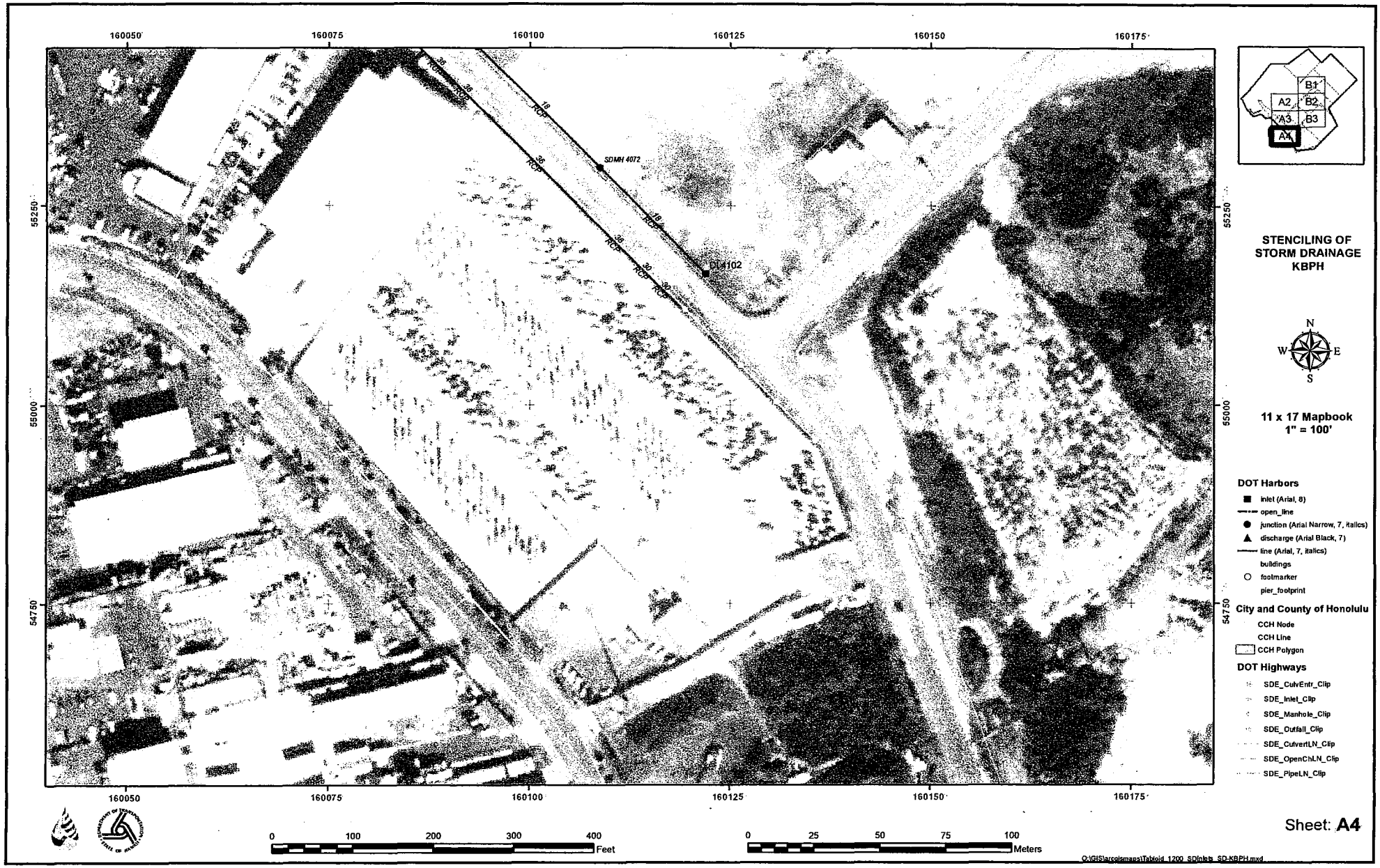
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STENCILING OF
STORM DRAINAGE
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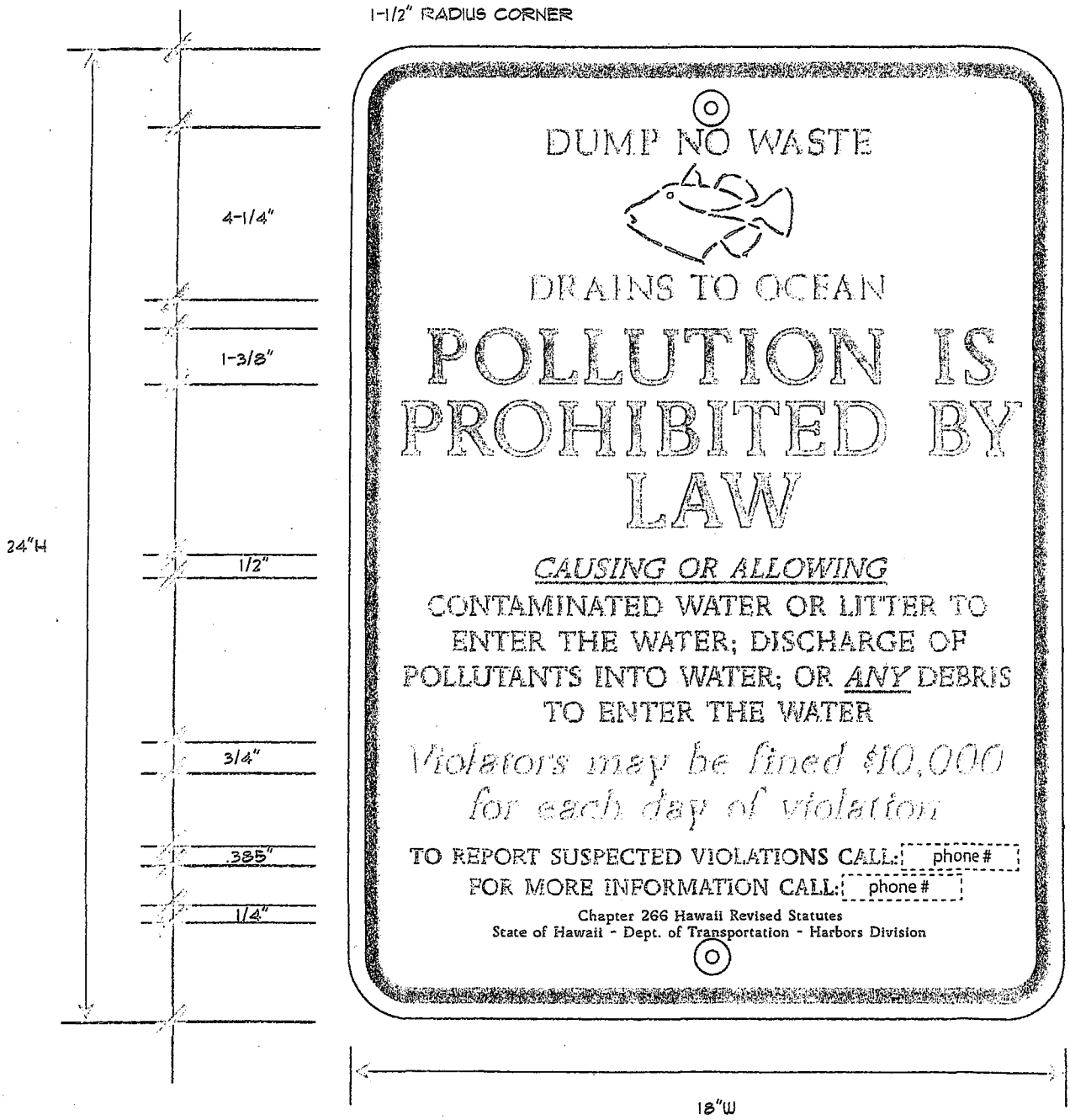
Appendix 2 Signs and Stencils



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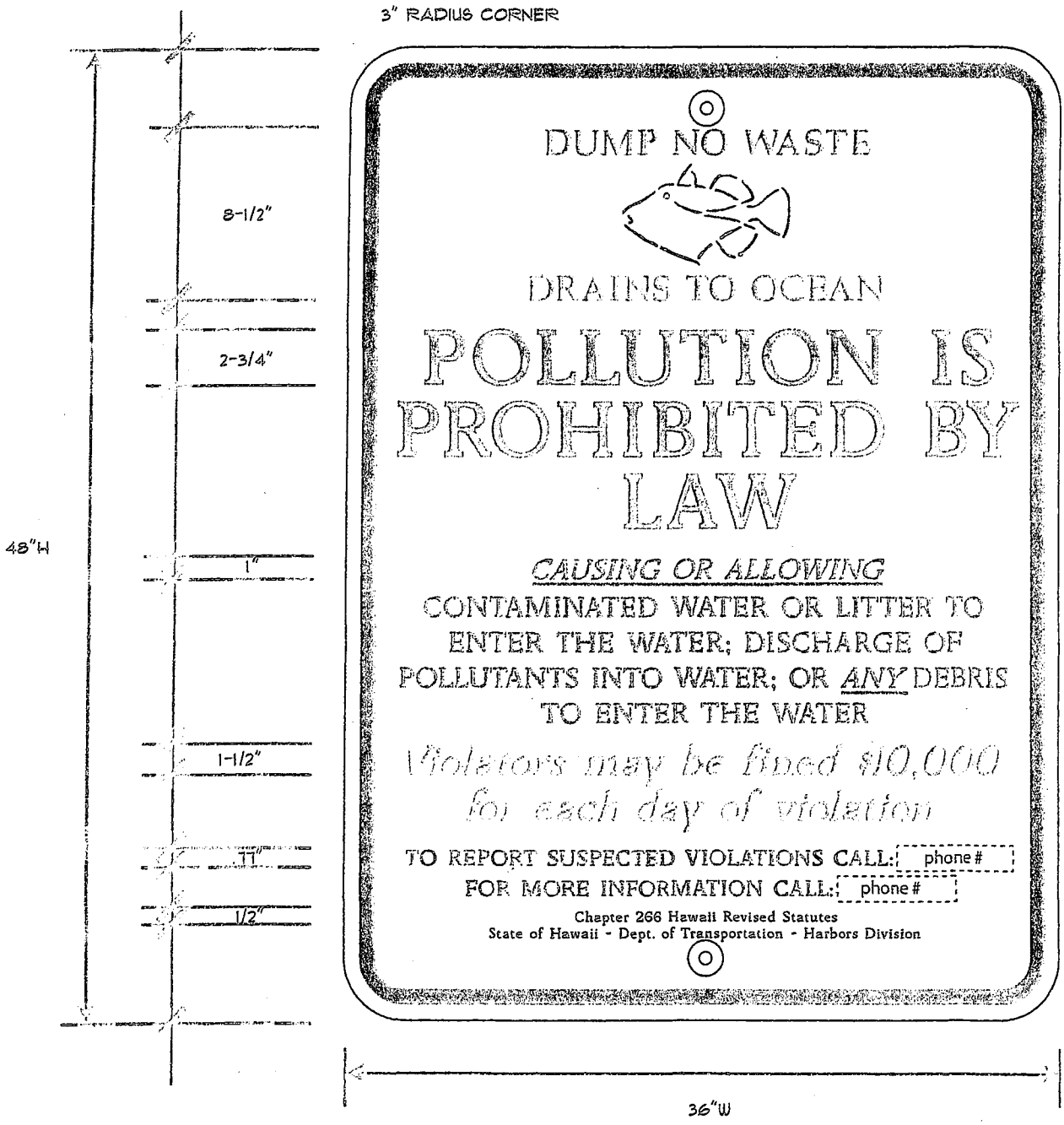
Honolulu Sign Co., Ltd.
ph 808-847-4047
fax 808-842-5796
Contact Jasmine Date 11/28/12

CLIENT State of HI - D.O.T Harbors Div.
WORK ORDER # 184131-JB
ART For Approval
PROD. ARTIST Cleto **PROD. C/B**

JOB TYPE screen on EG aluminum
FONTS Jenson Medium
PRINT COLOR Red, Black
BACKGROUND White e.g.

MATERIALS .063 alum with white e.g.
BORDER inset **CORNERS** 1-1/2" radius
PRINT SIDE surface **MOUNTING** holes
QUANTITY 50



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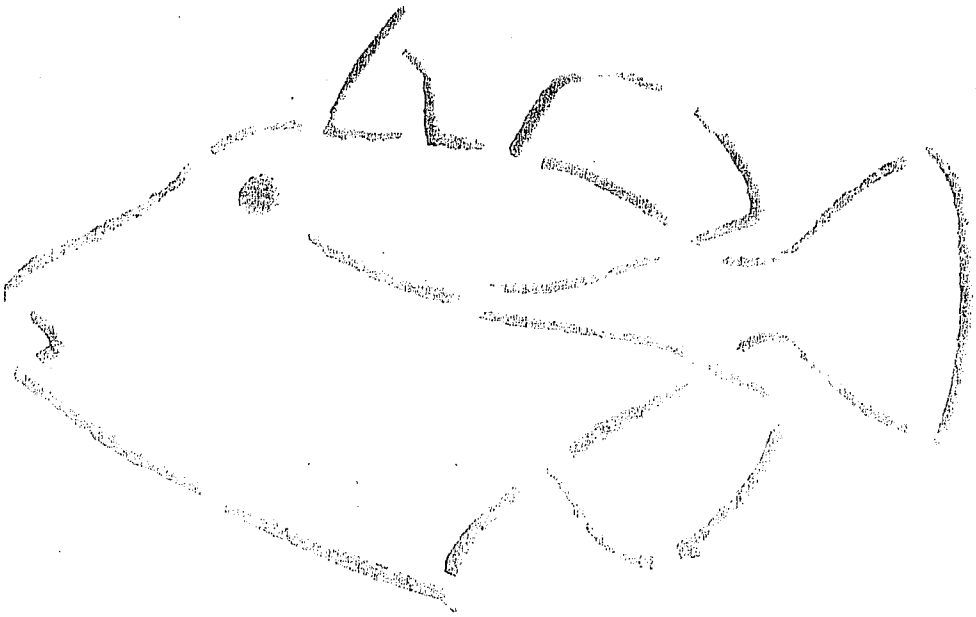
Honolulu Sign Co., Ltd.
ph 808-847-4047
fax 808-842-5796
Contact Jasmine Date 11/28/12

CLIENT State of HI - D.O.T. Harbors Div.
WORK ORDER # 184131-JB
ART For Approval
PROD. ARTIST Cleto PROD. C/B

JOB TYPE screen on EG aluminum
FONTS Jenson Medium
PRINT COLOR Red, Black
BACKGROUND White e.g.

MATERIALS .080 alum with white e.g.
BORDER inset CORNERS 3" radius
PRINT SIDE surface MOUNTING holes
QUANTITY 20

Dump No Waste



Drains to Ocean

Appendix 3 DOT-Harbors Organizational Chart

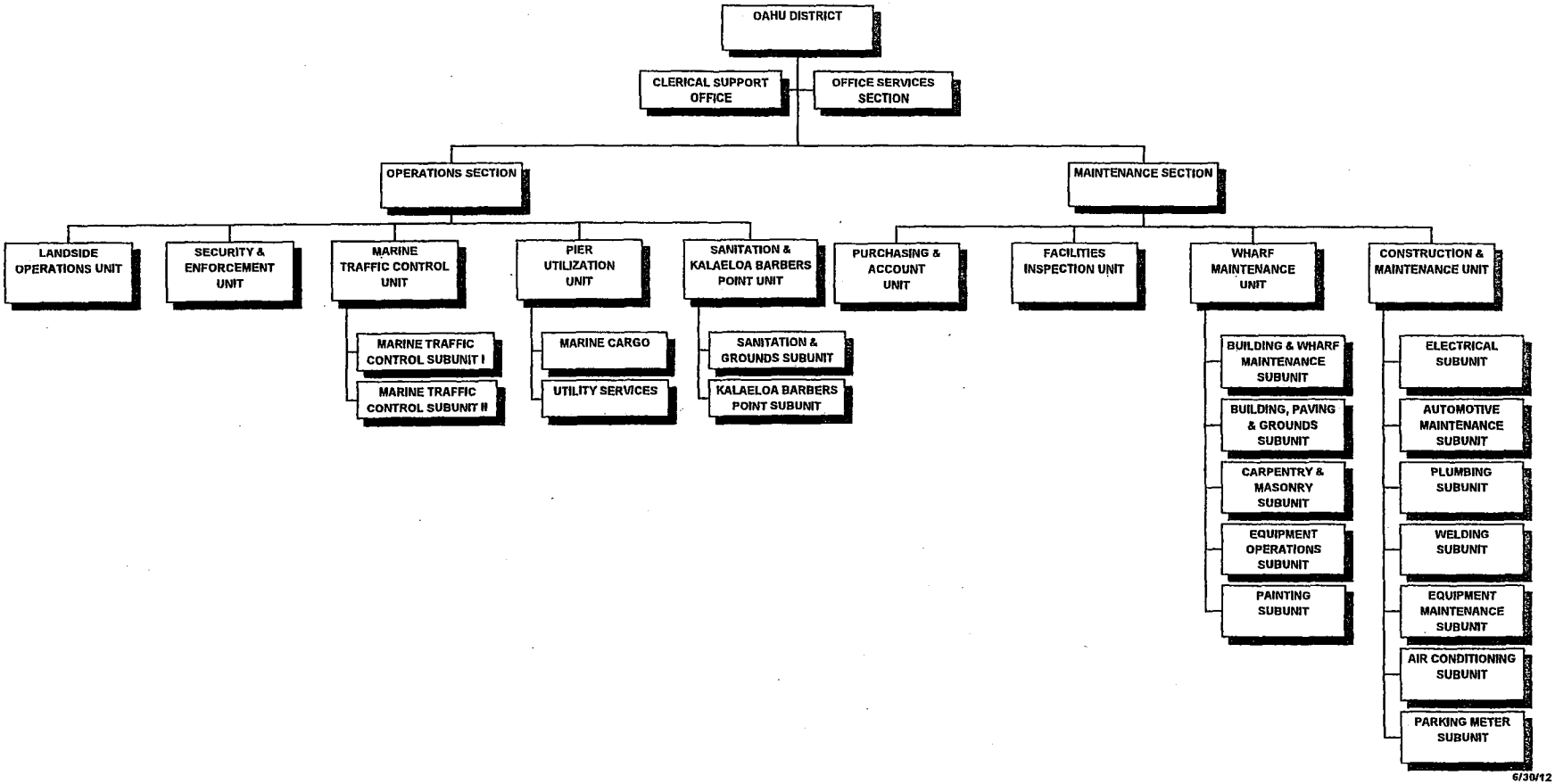
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION

ORGANIZATION CHARTS

JUNE 30, 2012

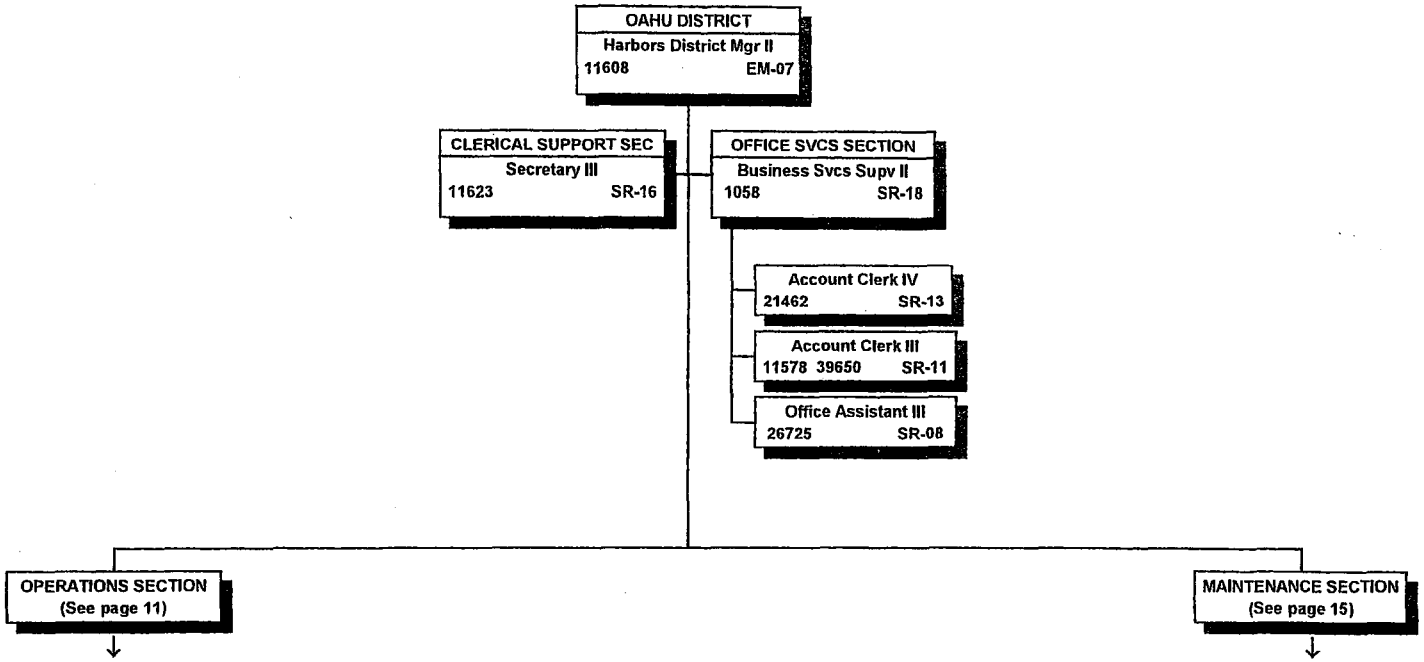
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
OAHU DISTRICT

ORGANIZATION CHART



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
OAHU DISTRICT

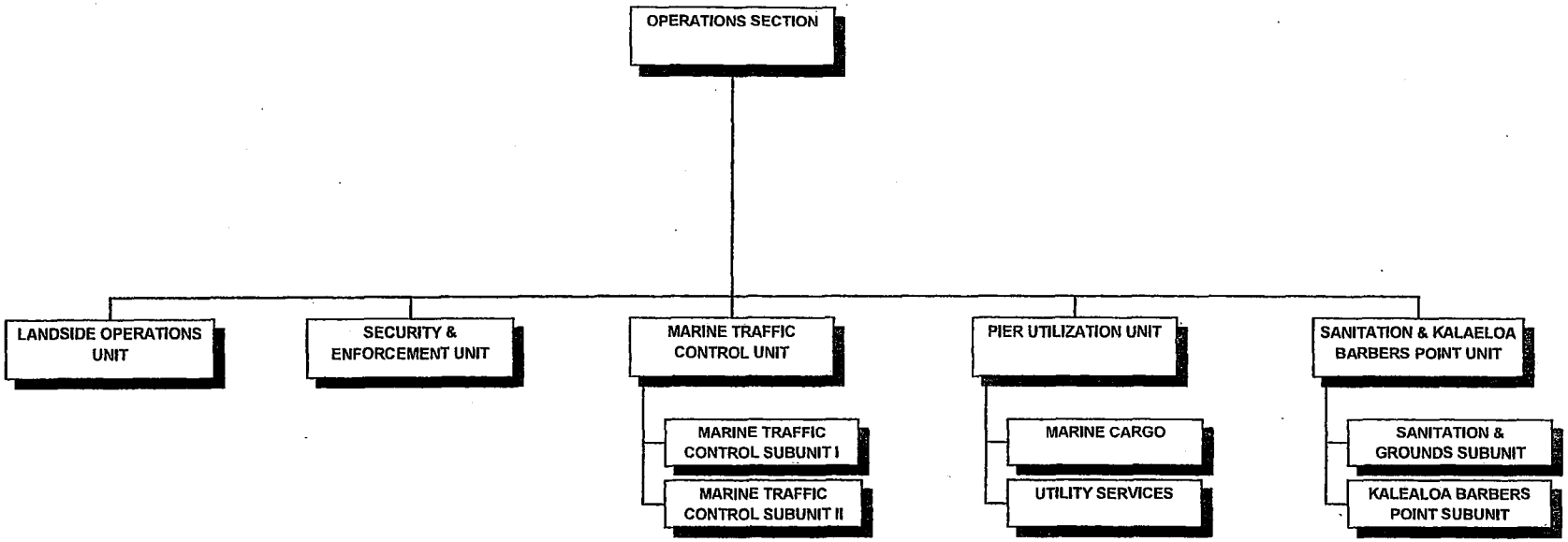
POSITION ORGANIZATION CHART



All special funded positions.

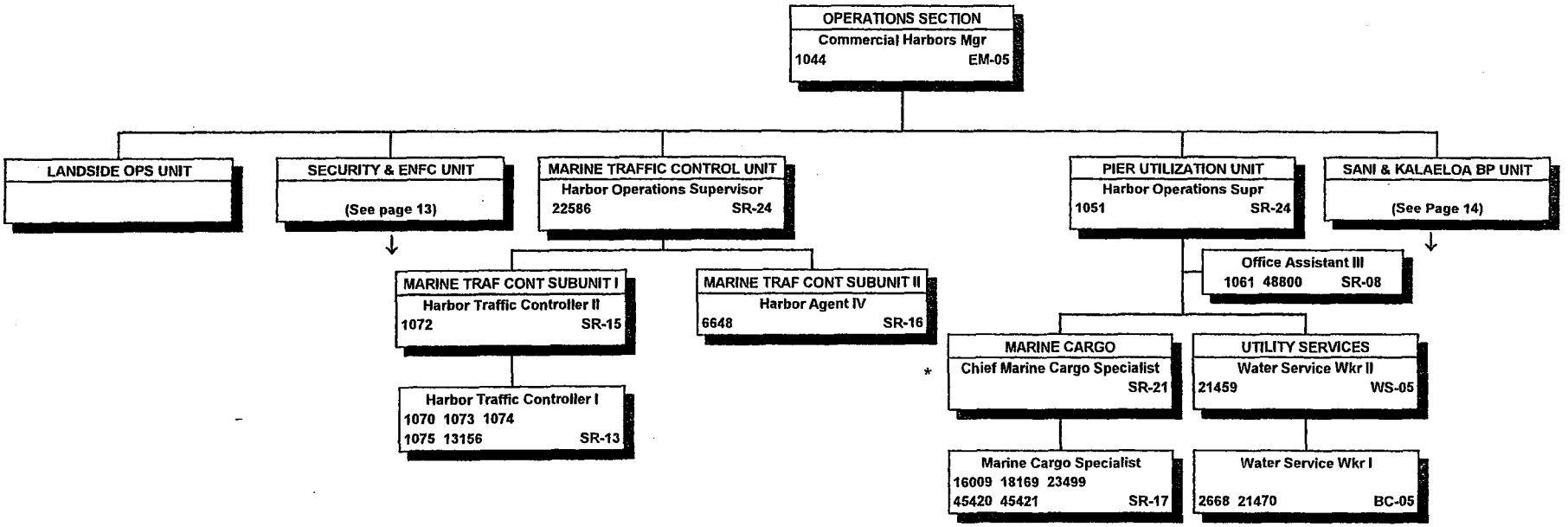
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
OAHU DISTRICT
OPERATIONS SECTION

ORGANIZATION CHART



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
OAHU DISTRICT
OPERATIONS SECTION

POSITION ORGANIZATION CHART

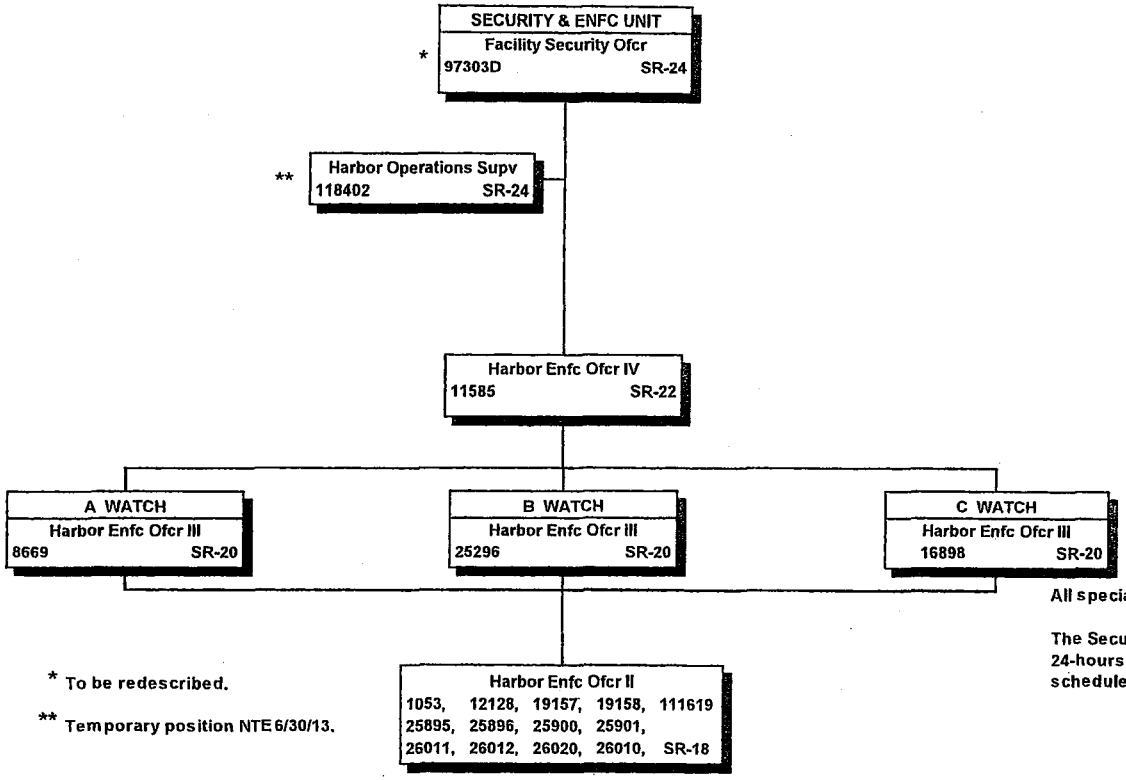


* One of the existing Marine Cargo Specialist positions to be reallocated to this supervisory position.

All special funded positions.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
OAHU DISTRICT
OPERATIONS SECTION
SECURITY & ENFORCEMENT UNIT

POSITION ORGANIZATION CHART



All special funded positions.

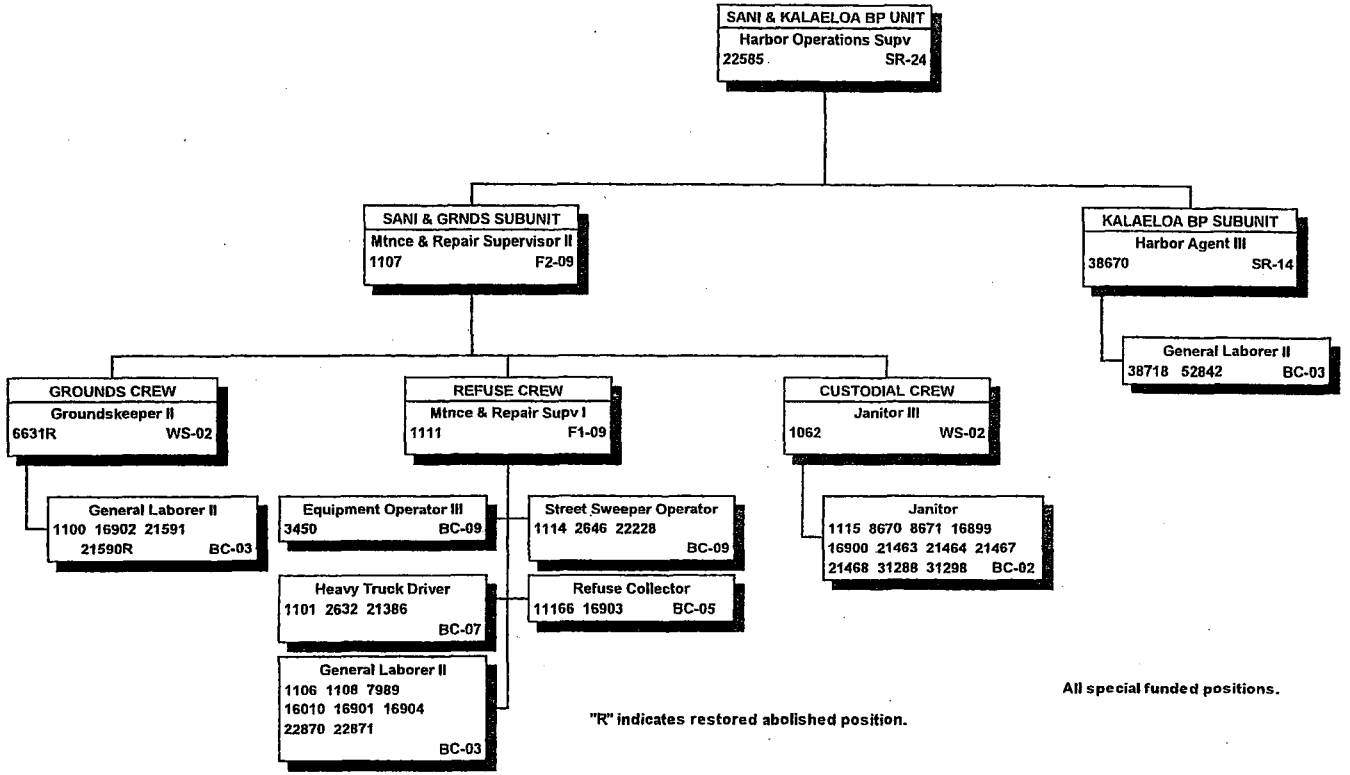
The Security & Enforcement Unit operates on a 24-hours-a-day, 3-shifts-a-day, 7-days-a-week, schedule in accordance with operational needs.

* To be redescribed.

** Temporary position NTE 6/30/13.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
OAHU DISTRICT
OPERATIONS SECTION
SANITATION & KALAELOA BARBERS POINT UNIT

POSITION ORGANIZATION CHART

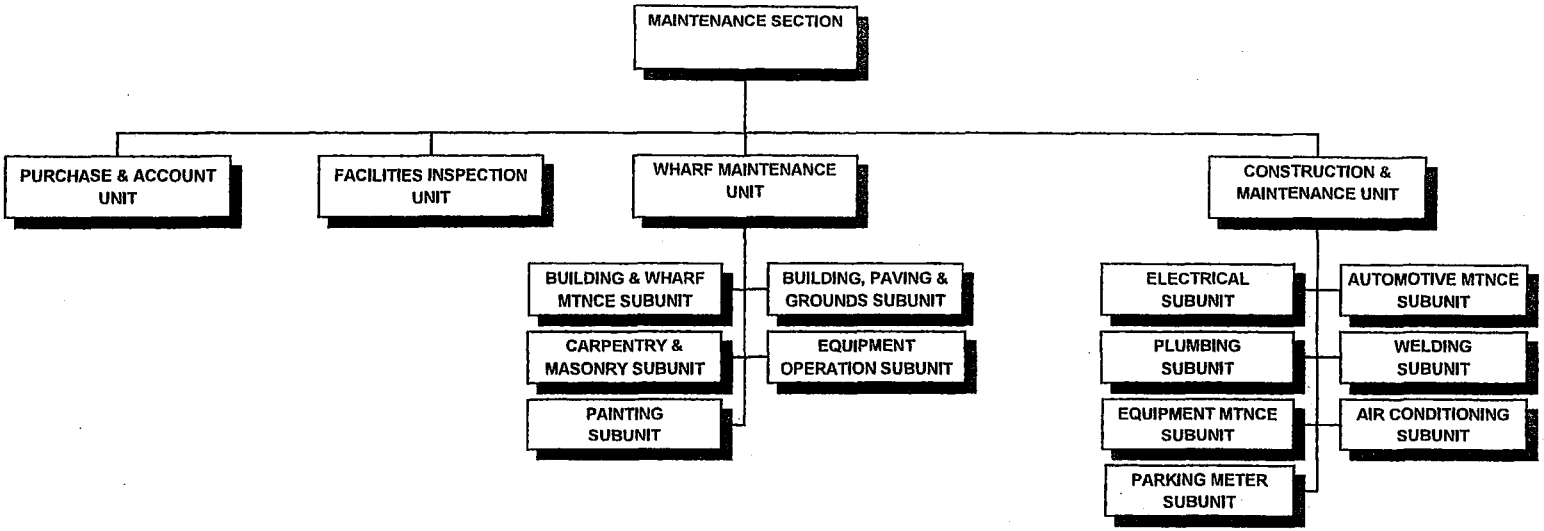


"R" indicates restored abolished position.

All special funded positions.

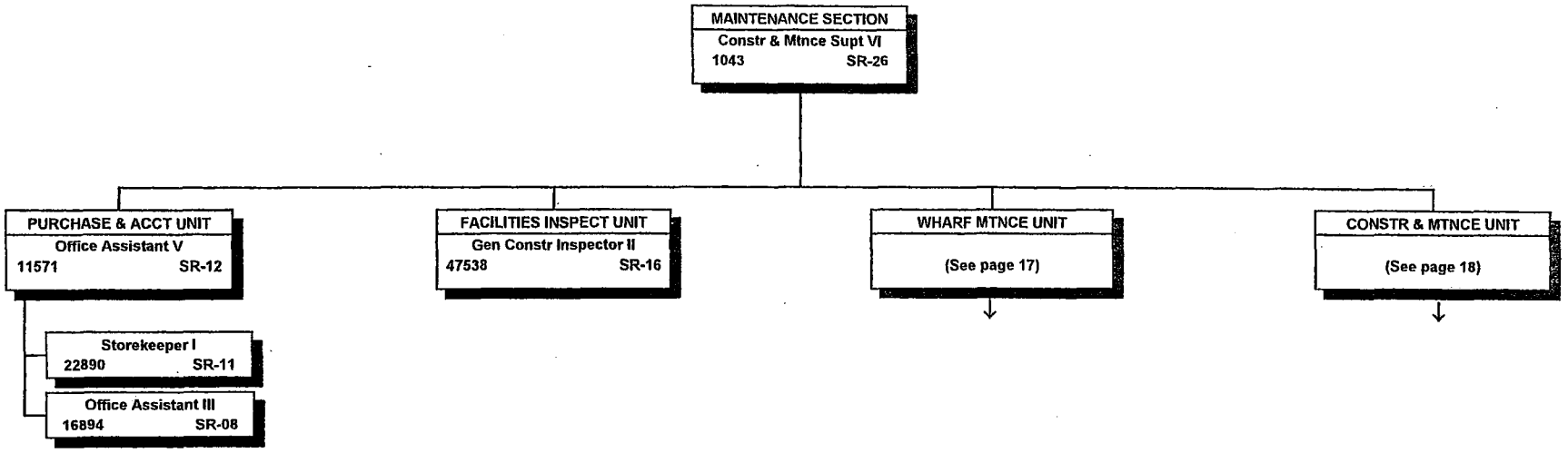
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
OAHU DISTRICT
MAINTENANCE SECTION

ORGANIZATION CHART



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
OAHU DISTRICT
MAINTENANCE SECTION

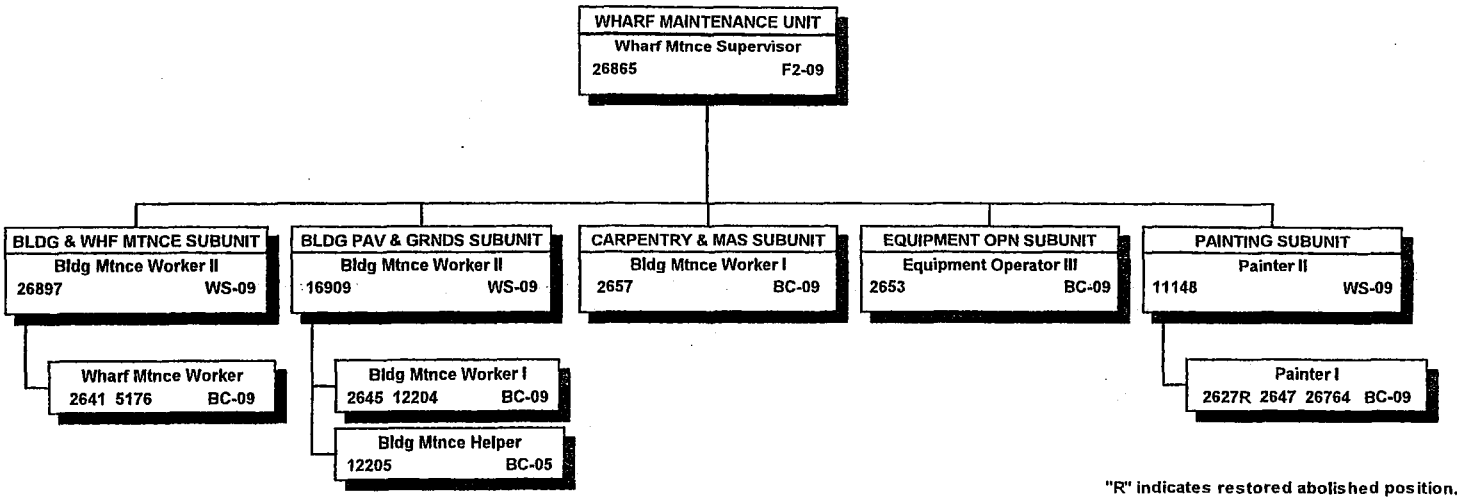
ORGANIZATION CHART



All special funded positions.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
OAHU DISTRICT
MAINTENANCE SECTION

POSITION ORGANIZATION CHART

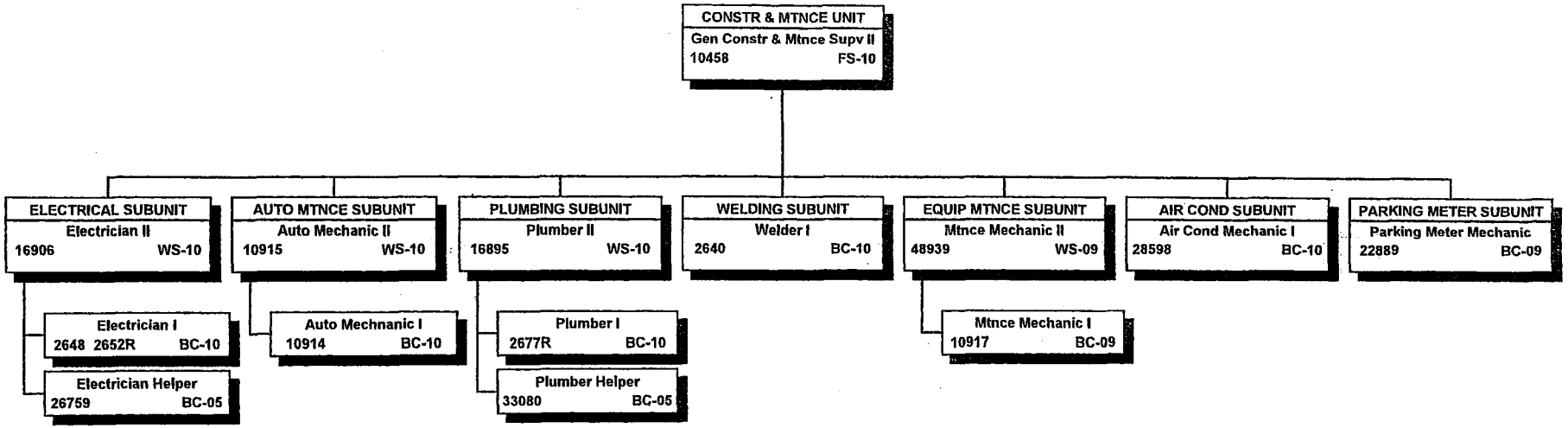


"R" indicates restored abolished position.

All special funded positions.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
OAHU DISTRICT
MAINTENANCE SECTION
CONSTRUCTION & MAINTENANCE UNIT

POSITION ORGANIZATION CHART

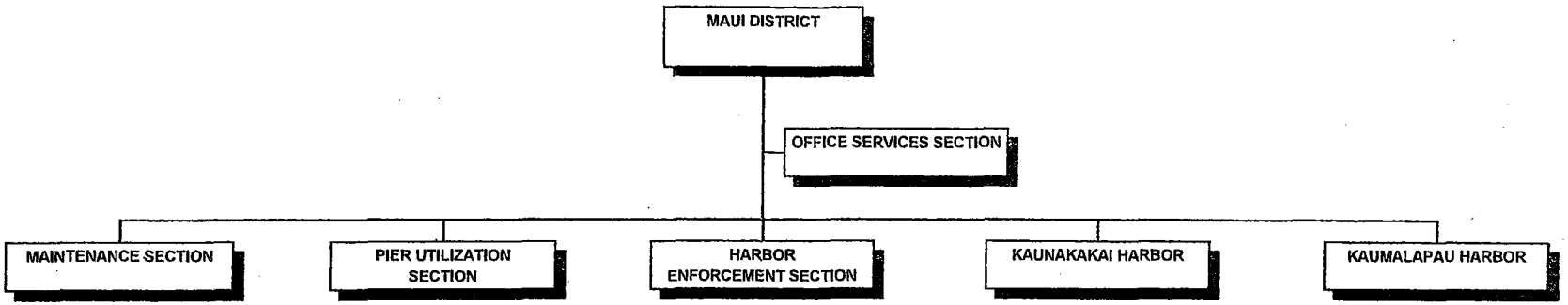


"R" indicates restored abolished position.

All special funded positions.

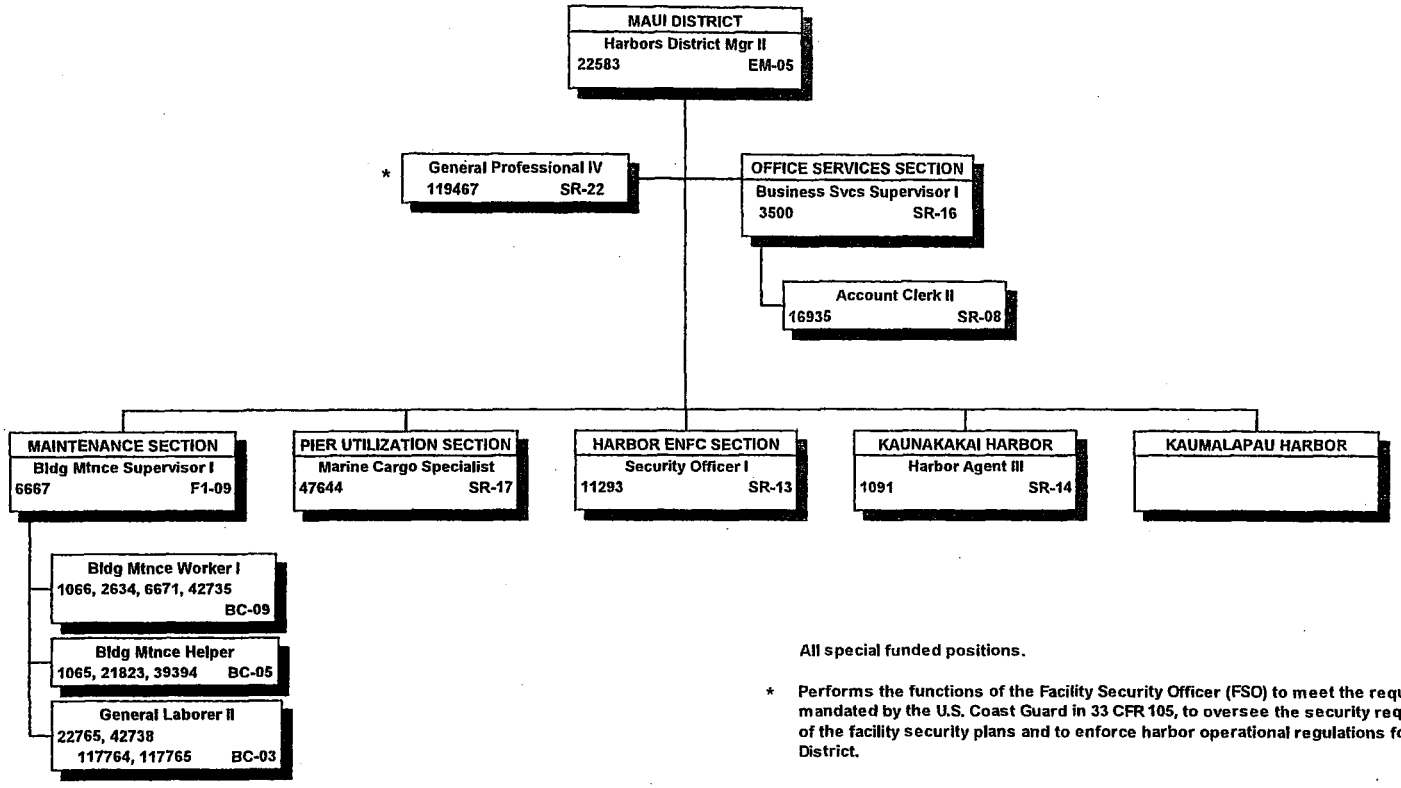
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
MAUI DISTRICT

ORGANIZATION CHART



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
MAUI DISTRICT

POSTION ORGANIZATION CHART

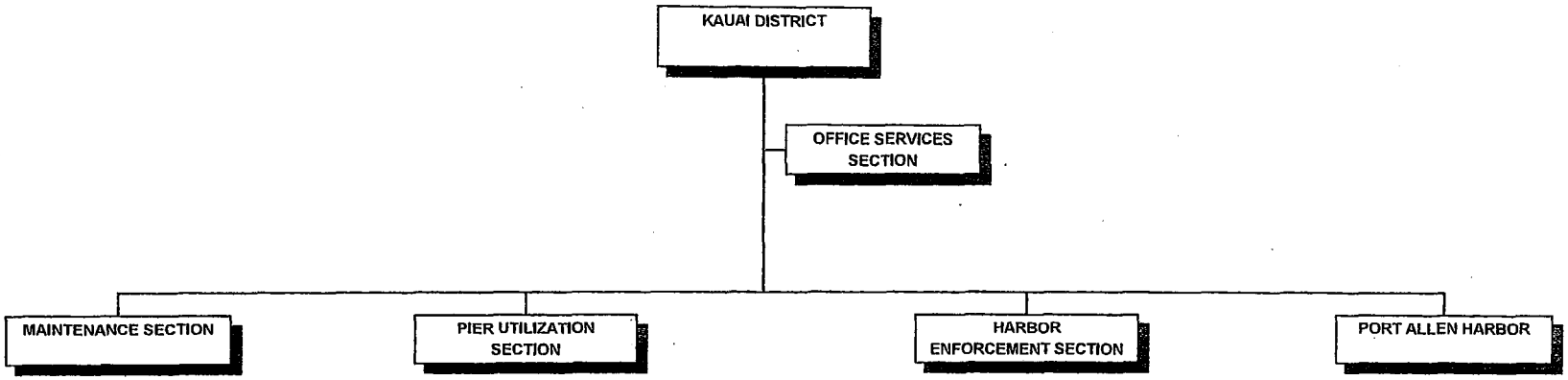


All special funded positions.

* Performs the functions of the Facility Security Officer (FSO) to meet the requirements mandated by the U.S. Coast Guard in 33 CFR 105, to oversee the security requirements of the facility security plans and to enforce harbor operational regulations for Maui District.

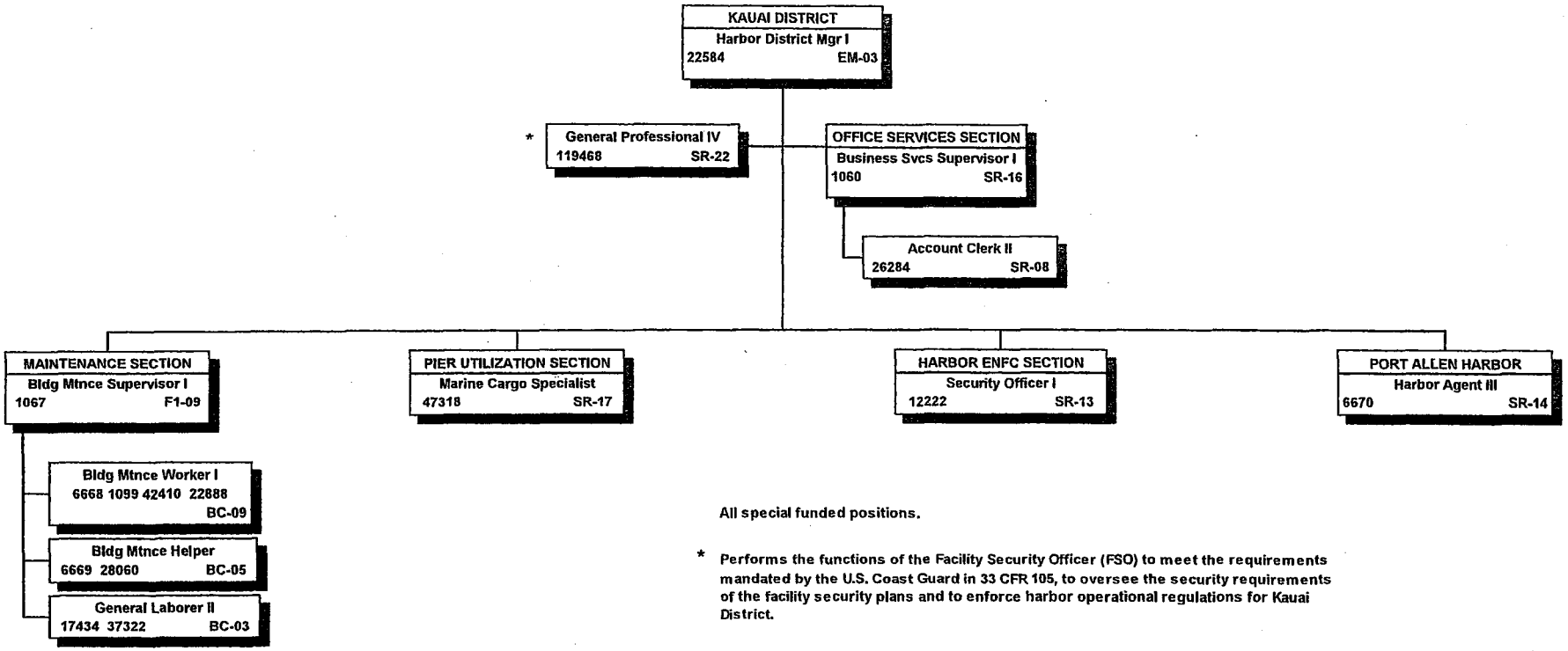
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
KAUAI DISTRICT

ORGANIZATION CHART



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
KAUAI DISTRICT

POSITION ORGANIZATION CHART

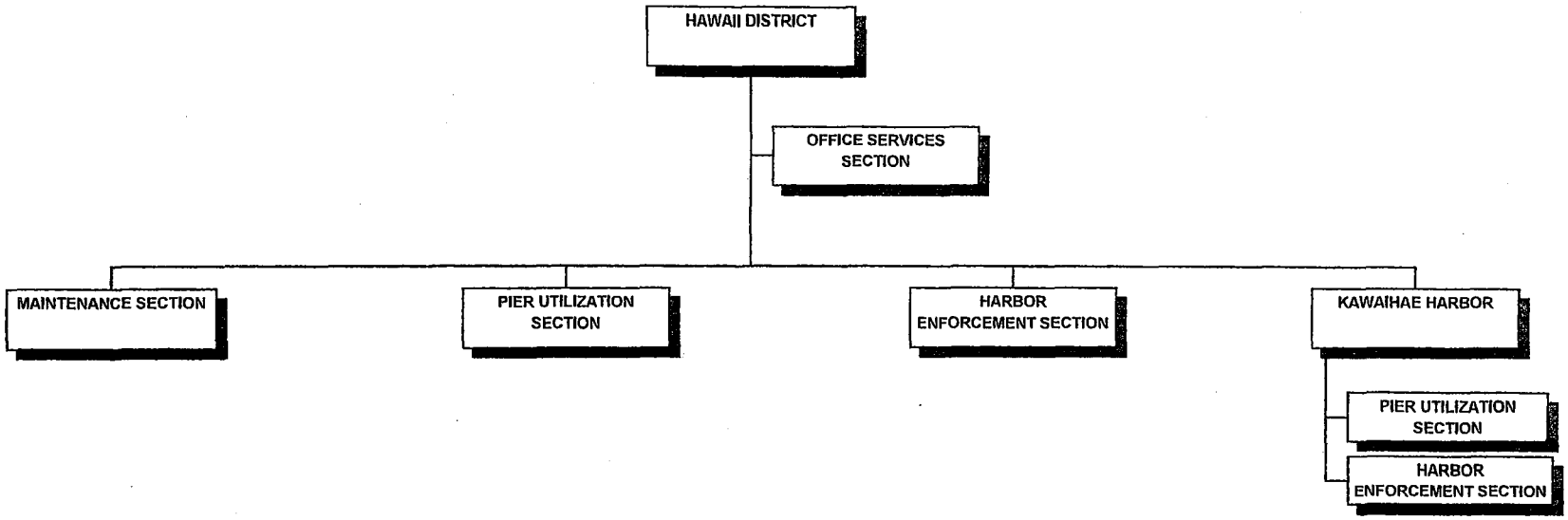


All special funded positions.

* Performs the functions of the Facility Security Officer (FSO) to meet the requirements mandated by the U.S. Coast Guard in 33 CFR 105, to oversee the security requirements of the facility security plans and to enforce harbor operational regulations for Kauai District.

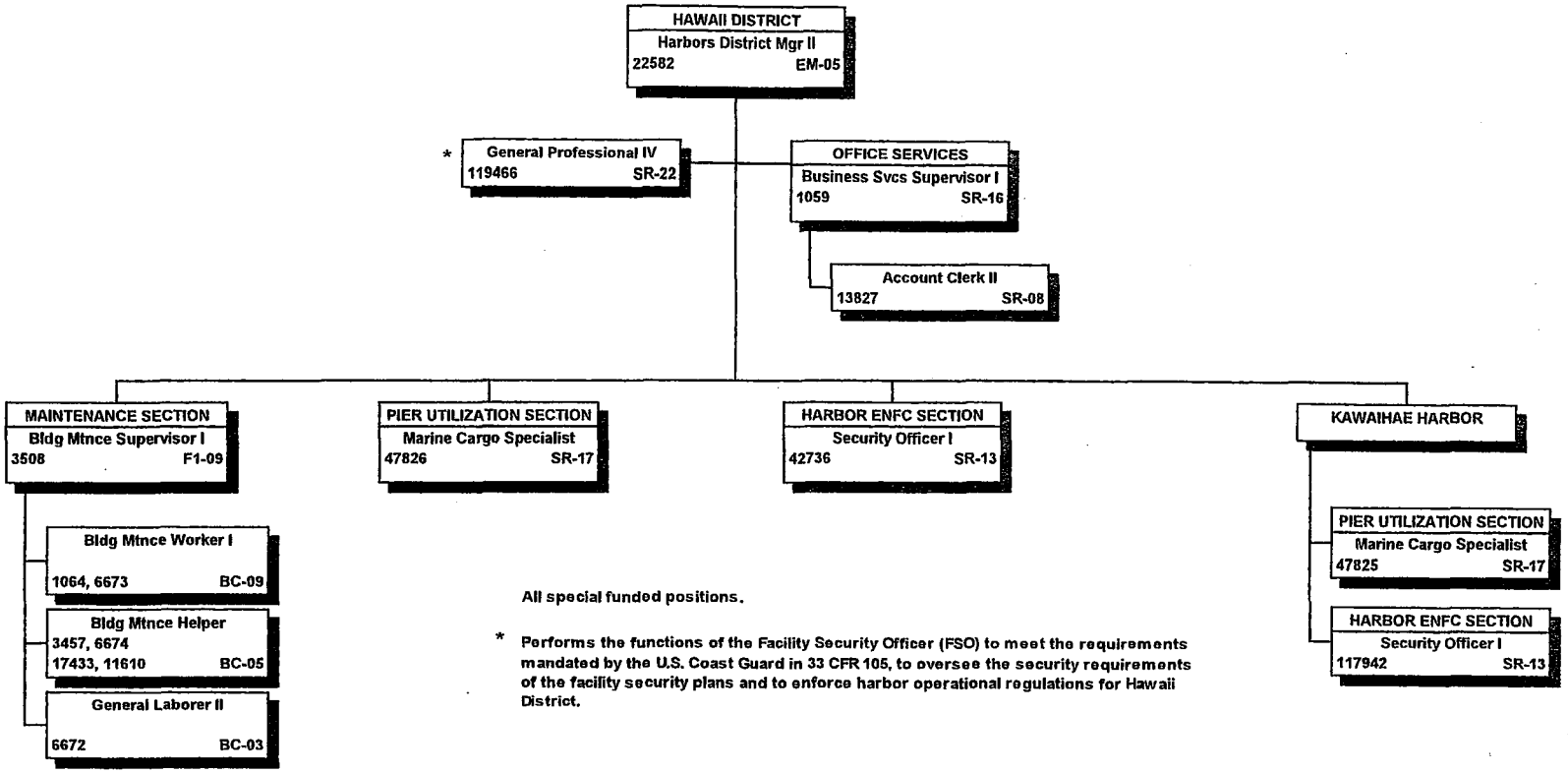
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
HAWAII DISTRICT

ORGANIZATION CHART



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
HAWAII DISTRICT

POSITION ORGANIZATION CHART



All special funded positions.

* Performs the functions of the Facility Security Officer (FSO) to meet the requirements mandated by the U.S. Coast Guard in 33 CFR 105, to oversee the security requirements of the facility security plans and to enforce harbor operational regulations for Hawaii District.

Appendix 4 Position Descriptions and Class Specifications of Selected Employees

PERSONNEL FILE COPY

DPS 206
Rev. 9/1/66

Date Received, DPS

STATE OF HAWAII
DEPARTMENT OF PERSONNEL SERVICES

POSITION CLASSIFICATION FORM

1. POSITION NO. 22585
2. TYPE OF POSITION:
   A. Permanent X
   B. Temporary ___
   C. Full-time X
   D. Part-time ___

3. Present Class Title, Salary Range BU 23
   Harbor Operations Supervisor, SR-24
4. Name of Incumbent
   Charles E. Scharsch
5. Geographic Location
   Honolulu, Hawaii
6. Organizational Location:
   A. Department
   Transportation
   B. Division
   Water Transportation Facilities
   C. Branch or Office
   Oahu District
   D. Section
   Commercial Harbors
   E. Unit
7. Recommended Class Title, Salary Range BU 23
   Harbor Operations Supervisor SR-24

8. Reason for Submittal:
   A. ☐ Initial Allocation
      1. ☐ Replaces Position No. ___
      2. ☐ Additional and Identical To Pos. No. ___
   B. ☐ Reallocation
   C. ☒ Other Reason (Specify)
   Annual Update

9. "I certify that the attached is a complete and accurate description of the duties and responsibilities of this position."

   A. Signature of Employee — Date 7/18/77
   B. Signature of Supervisor — Date 8/1/77
   C. Signature of Division Chief — Date SEP 9 1977
   D. Signature of Department Director — Date

10. Assigned Duties and Responsibilities:
Complete and attach a description of the duties and responsibilities assigned the position.

CLASSIFICATION ACTION TAKEN	
Class Title, Series Code and Salary Range.	Effective Date*
Harbor Operations Supervisor, 2.081, SR 24, BU:23	

Classifier

Date

Melvin N.C. Young
For Director of Personnel Services

9-16-77
Date

*This effective date applies only to the classification of the position. The incumbent, if any, must meet the qualifications now applicable to the position prior to effectuation of any payroll change. Should there be an incumbent, therefore, the originating department must submit the proper forms for approval of the qualifications of the incumbent within 10 days. In the event there has been a change of incumbent subsequent to the effective date for the classification action, the originating department should also determine whether the same duties and responsibilities have been assigned as when the description was submitted before requesting approval of the qualifications of a later incumbent.

Harbor Operations Supervisor
Position No. 22585

I. INTRODUCTION

The Harbor Operations Supervisor is responsible to the Harbor Master who heads the Commercial Harbors Section, Oahu District, Water Transportation Facilities Division. This office is charged with the responsibility for directing, planning, and controlling the placement and movement of all incoming/outgoing (domestic and foreign), inter-island and trans-shipment cargoes utilizing State owned facilities located within the Honolulu Commercial Harbor complex (Kewalo Basin through Sand Island) and collecting cargo data from the shipping agents/owners upon which to levy revenue assessments. Approximately 8 million tons of incoming and 2 million tons of outgoing cargoes generating in excess of 6 million dollars annually in State revenues are realized from wharfage, dockage (mooring fees), demurrage/storage fees, pier cleaning, parking and other related revenue producing services provided by the State. Principal sources of revenue are ship owners/agents, transportation truck companies, stevedore companies, private contractors performing work for the State or private industry who encroach on State property and individual consignees (shippers) of cargoes.

II. MAJOR DUTIES AND RESPONSIBILITIES

A. Control, Administration and Management of Oahu District Port Facilities and Commercial Harbors Section Personnel — 40%

1. Attend daily pier utilization meeting where dock assignments, pilotage needs and pier space allocations are confirmed with ship agents/owners.

2. When assigned, monitor and adjust harbor traffic and ship movements into, within and out of the commercial harbor through use of Marine Traffic Controllers who coordinate established movement requirements between ships agents/owners, harbor pilots and tug boats.

3. Enforce Department of Transportation, Water Transportation Facilities Division Rules and Regulations and Tariff and Federal regulations covering handling and storage of explosives, other dangerous cargoes and sensitive items, and general cargoes.

4. Approve explosives/dangerous cargo movement requests, hot work/burning permits and bridge/road transportation clearance permits in the absence of the Harbor Master.

5. Prepare correspondence incident to inquiries, complaints and/or requests for storage/demurrage of particular cargoes, mooring requests and applications, and other administrative matters.

6. Supervise and exercise operational control over:

   a. A State Security Guard Unit (Harbor Police) consisting of one lieuteuant, three sergeants and 19 patrolmen.

   b. A Parking Control Unit consisting of five parking control officers.

   c. A Grounds Maintenance and Building Custodial Unit consisting of two working foremen and 33 journeymen.

7. Monitor the care and use of five assigned police patrol cars, the grounds keeping and janitorial equipment and the heavy sweeping and trash removal equipment.

8. Insure assigned personnel receive adequate training to improve their performance on the job and to advance in their specialty.

B. Planning and Execution of Harbor Programs 10%

1. Assist the Harbor Master in preparing the Operating Budget by reviewing, interpreting and translating daily and future operational and administrative needs of the Commercial Harbors Program and interjecting these requirements into the budget.

2. Propose changes to rules and regulations and promulgate procedures to minimize or eliminate operational problems affecting ships agents, stevedore operators, transportation truck companies, tenants and State personnel.

3. Review and make recommendations to up-grade or eliminate certain programs that adversely affect the overall Harbor Programs.

C. Upkeep and Safety of Commercial Port Facilities 25%

1. Conduct daily inspections of assigned activities to ensure that housekeeping and maintenance standards are observed and maintained by tenants and grounds custodial personnel.

2. Insure that traffic flows easily and that Water Transportation Facilities Division facilities are secure by establishing frequent patrols by the Harbor Police.

3. Monitor the parking meters installed on Water Transportation Facilities Division Property by the parking control officers collecting coins and issuing citations to violators.

4. Review damage reports of pier storage areas, fender systems, pavement and structure damage, pier roofing and siding damage, water pipes and fire protection systems, damage to electrical connections and lighting systems and determine responsibility; prepare letters of notification to responsible parties to initiate corrective action or advise of billing for damages sustained.

5. Check adequacy of fire-fighting equipment and operational condition of fire alarm warning and water quenching systems through informal monthly inspections.

D. Coordination and Liaison with Civilian and Government Agencies 20%

1. Coordinate harbor activities with ship agents, transportation truck companies, stevedores, tenants, US Army, Navy and Coast Guard authorities, Department of Immigration, Customs, Public Health, Agriculture, and Foreign Trade personnel.

2. Promote maximum and efficient use of State facilities through contact with the maritime industry, the general public, and other users of harbor facilities; expedite the movement of persons and things across State piers/facilities and determining appropriate storage/demurrage charges against frustrated cargoes.

3. Maintain and promote cordial relations and effective liaison with the Honolulu Police Department both to assist in the processing of citations and guaranteeing backup help when needed by a patrolman.

E. Relief District Manager 5%

1. Relieve District Managers on Maui, Kauai and Hawaii as required.

III. CONTROLS OVER THE POSITION

Serves under the general direction of the Harbor Master, Oahu District (Position No. 01044 - SR-28); serves as Assistant Harbor Master in the Commercial Harbors Section. Assists the Harbor Master in the control and management of Honolulu Harbor and Kewalo Basin and State harbor facilities and properties thereat; assists in the supervision of the movement of vessels in, out and within Honolulu Harbor, Kewalo Basin, and shore waters surrounding Oahu; assists in the management and supervision of the use of State piers and waterfront properties and facilities by others and renders charges (fees) therefor; enforces rules and regulations; assists in the supervision of eight (8) separate activities responsible to the Harbor Master. Relieves District Managers on Maui, Kauai, and Hawaii as required. Forms the nucleus for the provision of seven-days-a-week harbor control and scheduling services to the shipping community.

IV. QUALIFICATION REQUIREMENTS OF THE WORK

Education Requirement:

Three years of progressively responsible experience in waterfront cargo handling or waterfront cargo layout and planning operations and graduation from an accredited college, university, or maritime academy; or, five years of maritime business experience in waterfront cargo handling or waterfront cargo layout and planning operations and graduation from high school;
Possession of a USCG Second Mate's license, and at least one year's experience at sea as a licensed officer in a seagoing vessel of not less than 2,000 gross tons may be substituted for five (5) years of maritime business experience.

General Experience:

The maritime experience must show knowledge of cargo loading/unloading shipboard activities and experience in marine terminal activities to include allocation of pier space to various consignees, cargo spotting, sorting and segregating techniques, ship and dock checker duties, cargo security measures and counter-measures.
This type of experience may be gained in such positions as ship checker, dock checker, leadingman stevedore, vessel timekeeper, boatswain, or junior deck officer.

Specialized Experience:

Three years of progressively responsible experience in one or a combination of the following activities:

(1). Preparation of preliminary marine cargo stowage plans; or,

(2). Overseeing marine loading, stowage, and discharge operations to ensure that these activities conform to the preliminary plans.

The experience must have included work involving vessels of not less than 5,000 deadweight tons. The experience must also clearly show possession of comprehensive knowledge of marine rules and regulations pertaining to cargo loading and movement.
In addition, incumbent must demonstrate possession of supervisory aptitude. Supervisory aptitude is the demonstration of potential for performance of supervisory duties through successful completion of regular or special assignments which involved exercise of supervisory responsibilities or aspects; by serving as a group or team leader, or in similar work in which opportunities for demonstrating supervisory capabilities exists; by completion of training courses in supervision accompanied by application of supervisory skills in work assignments; or by favorable appraisals by a supervisor indicating the possession of supervisory potential.

Substitution Allowed:

Training for General Experience:

(1). Graduation from a Deck Officer's course given by a Federal or State maritime school, or,

(2). Possession of a U.S.Coast Guard unlimited (any tonnage, any waters) license, may be substituted for the required three years of General Experience.

Specialized Experience for General Experience:

Excess experience of the type and quality described in Specialized Experience may be substituted for General Experience on a year-for-year basis.

Driver's License:

Possession of a valid Hawaii State Operator's license.

Physical Requirements:

Standard 3 e.g. Incumbent must be physically able to perform effectively the duties of the position. Good distant vision in one eye and ability to read without strain printed material the size of typewritten characters are required, glasses permitted. The ability to distinguish shades of colors is required. Ability to hear the conversational voice, with or without a hearing aid, is required. In most instances, an amputation of leg or foot will not disqualify for appointment, although it may be necessary that this condition be compensated by use of satisfactory prosthesis. Any physical condition which would cause the incumbent to be a hazard to himself or to others will disqualify him for appointment. In addition, must possess emotional and mental stability. A person with a handicap will be considered upon demonstration of ability to perform the required tasks or have the ability or means to compensate for his handicap sufficiently to perform the job.

COPY SENT TO HAR-OE 7/11/12 HAR-O 7/12/12
Attn: Dutch

HRD-1 (Rev. 6/7/10) POSITION ACTION FORM

1. Department/Division/Branch/Section/Unit		2. Position No.
TRANSPORTATION/HARBORS DIVISION/OAHU DISTRICT/OPERATIONS		118402
3. Auth Job Code: 2.081	4. Authorized Class Title, Pay Range, Pay Rate (Exempt Positions Only), BU, BU Exclusion Code(s) (if applicable): HARBOR OPERATIONS SUPERVISOR, SR24, BU:13	5. Pseudo No.
6. Curr Job Code: 2.081	7. Current Class Title: HARBOR OPERATIONS SUPERVISOR	8. Legal Authority

'12 JUL 11 P2:49

Requested Job Code, Class Title, Pay Range, Pay Rate (Exempt Positions Only), BU, BU Exclusion Code(s) (if applicable)
02.005, GENERAL PROFESSIONAL III, SR-20, BU:13

DEPT OF TRANS

10. "I certify that I have reviewed the duties and responsibilities assigned to this position."

VACANT
Signature of Incumbent — Date

Name of Incumbent

11. "I certify that the attached is a complete and accurate description of the duties and responsibilities of this position." I [illegible]

Signature of Supervisor — Date: 3/07/12

Supervisor's Position No. 119474

Signature of Division Chief — Date: 3-7-2012

12. Type of Action

a. ☐ New ☑ Redescriptn ☐ Conversn
Vicing for
Replaced Pos. No.
☐ Exempt to CS ☐ CS to Exempt

☐ Reclass - EE Qualifications (REE)

b. ☐ Reallocation for Recruitment (RFR)
☐ Temporary Reallocation
☐ Start ☐ Ext. ☐ Term
Eff Date
NTE Date

☐ Extension of Position
Eff Date 7/1/12
NTE Date 6/30/13

☐ Abolish
Abolish COB Dt
HRMS Eff Date

13. Position Characteristics

a. Type of Position ☑ Civil Service ☐ Exempt
Basis for Exemption From HRS, 76-16 ( ) ( )
To HRS, 76-16 ( ) ( )
Supporting Legal Authority

Project Title

Exemption NTE Date
b. Duration ☐ Permanent ☑ Temporary
Initial NTE Date
c. Budgeted ☑ Yes ☐ No
d. Authorized FTE From To 1.000
e. Current FTE From To 1.000
f. Employment Status ☐ Filled ☑ Vacant

14. Location/Other Characteristics

a. Org Code
b. Geographic Location Code
c. Island
d. ☐ Shift
e. ☐ FTE Share, w/Pos. No.
f. ☐ Shortage & Group
g. ☑ Selective Certification: specialized security exp
h. ☐ Consent Decree/Mandated Action
(Please specify)

15. Date Recvd in Personnel Office

☐ Change Characteristics (List them below)
Eff Date

Appropriation

Prgm Bud ID	MOF	UAC	%	Funded	Effective Date
	12				

Recommended Job Code, Class Title, Pay Range, Pay Rate (Exempt Positions Only), BU, BU Exclusion Code(s) (if applicable) (for PERS use only)

18. Department/Division/Branch/Section/Unit		19. Effective Date
20. Auth Job Code: 2.005	21. Authorized Class Title, Pay Range, Pay Rate (Exempt Positions Only), BU, BU Exclusion Code(s) (if applicable): General Professional III, SR-20, BU-13	22. Effective Date: 6/22/12
23. Curr Job Code	24. Current Class Title, Pay Range, Pay Rate (Exempt Positions Only), BU, BU Exclusion Code(s) (if applicable)	25. Effective Date

Employing Department Action ☒ Approved ☐ Disapproved

Signature of Department Head — Date: APR 12 2012

Human Resources Development Action ☒ Approved ☐ Disapproved

Director of Human Resources Development — Date: JUN 22 2012

COPY SENT TO HAR- OS HAR, -SMBA (Budget Anal) -SMBA (Mgmt Anal)

IIII 11 2010

DEPARTMENT OF HUMAN RESOURCES DEVELOPMENT 2.005
STATE OF HAWAII

Selective Certification Requirements

for

GENERAL PROFESSIONAL III
(Position No. 118402)

This position is located in the Department of Transportation, Harbors Division, Oahu District, Operations Section, Security and Enforcement Unit, and is responsible for assisting the Oahu District's Facility Security Officer (FSO) in complying with the Facility Security Plans and serving as alternate FSO for daily operational security matters. The position's duties and responsibilities include conducting inspections and audits of harbor facilities to ensure that operations are in compliance with the Facility Security Plans (FSP); auditing records to ensure that contracted security personnel provide services and meet training and qualification requirements in accordance with the terms and conditions of the contract, FSP and federal requirements; conducting inspections and reviewing documents at general berthing and passenger cruise ship facilities to determine whether vessels are in compliance when berthing in a secured facility; identifying security gaps and recommending actions to mitigate risk; and recommending the acquisition and installation, and evaluating the use of security technology and equipment in the Oahu District.

In order to perform the duties and responsibilities of the position, applicants must possess knowledge of security principles, practices, and recognized standards; security inspection, assessment and monitoring methods and techniques; and the ability to recognize security threats, respond to security incidents, and apply applicable security laws, rules, regulations, policies and/or procedures.

Therefore, certification of eligibles shall be restricted to only those applicants who meet the minimum qualification requirements for the class General Professional III, and whose work experience demonstrated the knowledge and abilities described above. Such experience may have been gained concurrently in meeting the minimum qualification requirements for the class General Professional III, or in a separate capacity.

DATE APPROVED: 6/22/12

Dawn M. Young

DAWN M. YOUNG, Chief
Classification Branch
Employee Classification & Compensation Division

I. IDENTIFYING INFORMATION

Position/Pseudo Number: 118402
Department: Transportation
Division (Office): Harbors Division
Branch: Oahu
Section: Operations
Unit: Security & Enforcement
Geographic Location: Oahu

II. INTRODUCTION

The Security and Enforcement Unit is responsible for meeting the requirements mandated by the US Coast Guard in 33 CFR 105; oversees the Security requirements of the facility security plans and to enforce harbor operational regulations for the Oahu District.

The primary purpose of this position is to advise and support the General Professional IV (primary Facility Security Officer) in complying with the requirements of the Facility Security Plan (FSP) mandated by United States Coast Guard in 33 CFR 105. The position works independently in overseeing that vessel operators, and tenants, comply with the security requirements of the facility security plans and to assist in all technological programs pertaining to security matters.

The position serves as the General Professional IV (primary Facility Security Officer) when the General Professional IV is not on duty or available. The position represents the District when the US Coast Guard conducts its inspections of the islands regulated facilities, investigates the cause of a security issue, and can be assigned to represent the District in resolving citations with the US Coast Guard. The position recommends changes to the FSPs, assists in the preparation of amendments to the FSP, and independently prepares all documents regarding security discrepancies with the implementation of the FSP. The position responds to any security incidents and reports to FSO and USCG, and reports any operational and environmental issues.

III. MAJOR DUTIES AND RESPONSIBILITIES:

A. Facility Security Officer 70%.

The position performs independently and exercises proper judgment in making decisions while serving as a Facility Security Officer when the General Professional IV is not on scene or is not available. The person in the position must meet the qualifications of an FSO as defined in 33 CFR 105.205. The position implements the FSP under the general supervision of the General Professional IV. As the alternate FSO, the position implements the FSP, ensures District compliance with the FSP; adheres to 33 CFR 101, 103, 104, 105 regarding rules requiring compliance with the FSP and the implementation of security measures; and follows the policy guidance issued by the US Coast Guard. The

position evaluates, monitors, and audits the training, qualifications of contract security personnel; and, ensures all personnel and harbors users are in compliance with the District's FSP.

The position is responsible for keeping abreast of recent security updates, threats, security guidance, policies and regulations form the US Coast Guard. The position assists the General Professional IV with compliance and insures that detailed records of the contract security guards assigned to operate within the regulated facilities are maintained including but not limited to inspection of training records, monitors and correct the performance of contract security, and assists the General Professional IV with enforcing the terms of the contract with company security managers, trainers, supervisors, screeners, and other security personnel. The position conducts inspections at the General Berthing, Cargo, and Passenger Cruise Ship facilities, meets with the Vessel Security Officer (VSO) regarding the VSO's declaration of security, reviews and determines whether the vessel is in compliance with its requirements when berthing in a secured facility.

In complying with the FSP, the position conducts and assists the General Professional IV with security audits of the facilities, may lead drills and exercises required by the FSP to promote maritime security awareness, address issues regarding access control, and various monitoring techniques and security assessments (the work of evaluating security gaps and developing recommendations to address the gap by implementing actions to mitigate the risk and potential civil fines and penalties by the US Coast Guard. Ensures that the District is in compliance with the FSP, US Coast Guard regulations, policies and guidance instructions.

B. Security and Technology 25%

The position is the "technology manager" of the security equipment at the District. The position assists the Division engineers or consultants/contractors with the use of handheld equipment or the installation of security systems to mitigate technological advancements to conduct surveillance, detects potential threats, card readers for access control, and other communication devices in mitigating the security risks. The position recommends the acquisition of technology to increase security and managing the system such as the District and Division employee credentials system; verifies the calibration and maintenance of the x-ray machines utilized by the passenger cruise ship security company, and recommends technological systems to continue enhancing security of the ports.

C. Other Duties as required 5%

CONTROLS EXERCISED OVER THE WORK:

A. Supervisor:

Position no: 119474 Class Title: General Professional IV

B. Nature of Supervisory Control Exercised Over the Work

Instructions are limited to general guidelines and directions to specify priorities and results expected. The position works independently with ensuring employee, tenant, and other harbor users' compliance with the FSP.

C. Nature of Available Guidelines Controlling the Work

1. Policy and procedural guidelines available:
Hawaii Revised Statutes
Hawaii Administrative Rules
Department of Transportation facility security plans and policies & procedures 33 CFR Parts 101, 103, 104, &105
Applicable Federal and State Laws

2. Use of Guidelines:
All duties, responsibilities and activities are performed in accordance with applicable State and Federal laws and Harbor rules and facility security plans and policies.

V. REQUIRED LICENSES, CERTIFICATES, ETC.

Must have had training and meets the requirements as an FSO as described in 33 CFR 105.205 prior to the start of work for the State.

Must possess a valid license to drive in the State of Hawaii.

Must have or be able to obtain a valid TWIC.

VI. RECOMMENDED QUALIFICATIONS

A. Knowledge:
- The principles and practices of maritime operations and security
- 33 CFR Parts 101, 103, 104, &105

Computer literate
Technical skills for programming systems

B. Skills/Abilities:

Ability to plan, organize and coordinate activities involving agencies from the private and government sectors; communicate effectively; write plans and procedures; interpret and translate reports; conduct meetings; train; and build

positive and constructive relationships with agencies from the private and governmental sectors.

Have experience with working with the use of and maintenance of advanced security equipment such as handheld wireless devices (TWIC readers, etc)

Skills: Demonstrate ability to solve complex problems and make sound decisions and recommendations in improving and enhancing security at the ports; and deal effectively and positively with people.

C. Education:

Graduation from an accredited four (4)-year college or university with a bachelors degree.

OR

Three (3) years of responsible professional work experience coordinating a complex security program.

OR

A combination of security experience and inspection experience as described above.

Substitution of Education for Experience

A bachelor's degree or a maritime-related field may be substituted for one (1) year of the required experience.

D. Experience:

Specialized experience: Three (3) years or more of harbor or transportation inter-modal systems (harbors, highways, or airports) in emergency/disaster/security responsibilities. Two years or more of passenger cruise ship operations and the current TWIC regulations. Two years or more of private security companies that work in the Maritime industry. Should have a working knowledge of Incident Command Systems (ICS), and other emergency, disaster, and security programs.

General experience: Experience in personnel matters, budgeting and program objectives.

VII. TOOLS, EQUIPMENT & MACHINES

Computer and telecommunications equipment.

Training in x-ray machines, hand-wanding, CCTV systems, ID machines, and TWIC readers.

Selective Certification Requirements
For

GENERAL PROFESSIONAL IV
(Position No. 119474)

2006

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DEPT OF TRANS
HARBORS DIVISION
OAHU DISTRICT

This position is located in the Department of Transportation, Harbors Division, Oahu District, Operations Section, Security and Enforcement Unit, and serves as the district's Facility Security Officer, and supervisor of the Security and Enforcement Unit. The duties and responsibilities of this position include supervising the unit's law enforcement operations to ensure compliance with federal and State laws, county ordinances, and departmental rules, policies and procedures; coordinating the development of tactics and contingency planning in providing law enforcement response and interdiction of threats to the commercial harbors; developing the unit's standard operating procedures, training, drills and exercises to test and improve readiness; implementing port facility security plans (FSPs) and ensuring compliance with federal and State maritime security laws.

In order to effectively perform the duties and responsibilities of the position, applicants must possess knowledge of principles, practices, concepts and recognized standards for law enforcement programs and operations; laws, rules, regulations and legal requirements relating to law enforcement programs; and the ability to implement law enforcement plans and standards; and analyze, solve and take corrective action on law enforcement program issues.

Therefore, certification of eligibles shall be restricted to those applicants who meet the minimum qualification requirements for the class General Professional IV and who possess one (1) year of professional work experience in coordinating, maintaining or implementing a law enforcement program which provided the knowledge and abilities described above. Such experience may have been gained concurrently or separately in meeting the minimum qualification requirements for the class General Professional IV.

DATE APPROVED: SEP 30 2010

Dawn M. Young
DAWN M. YOUNG
Employee Classification and
Compensation Division

'10 OCT -6 P3:52

PERSONNEL
DEPT OF TRANSPORTATION

10-07-10 Copy sent to HAR & HAR-0

POSITION DESCRIPTION

I. IDENTIFYING INFORMATION

Position/Pseudo Number: 97303D 11947A
Department: Transportation
Division (Office): Harbors Division
Branch: Oahu
Section: Operations
Unit: Security & Enforcement
Geographic Location: Oahu

MAR 1 9 09 AM '10
DEPT. OF TRANSPORTATION PERSONNEL STAFF

II. INTRODUCTION

The function of this organizational unit is to insure the requirements mandated by United States Coast Guard in 33 CFR 105 are met, oversees the security requirements of the facility security plans and to enforce harbor operational regulations for Oahu District.

The primary purpose of this position is to supervise the Security & Enforcement Unit and insure compliance with the requirements of the United States Coast Guard (USCG) and the enforcement of Chapter 266, Hawaii Revised Statutes, and rules relative to the control and management of the commercial harbors and the employees with police powers conferred upon them by the Director of Transportation (DOT).

The position supervises, plans, and implements/maintains the a) security program and law enforcement program to insure compliance with the federal and state mandates program to include, but not limited to, compliance with the District Facility Security Plans (FSPs) and enforcing the laws and rules governing the commercial harbors; and b) implements/maintains the state law enforcement unit to include, but not limited to, providing program support to the law enforcement unit of the District. The position insures employees in the unit maintain proper training and certifications in the performance of their duties, including certification to carry firearms, law enforcement training of Harbor Enforcement Officers at Honolulu and Kalaeloa Barbers Point Harbors.

The position advises the Commercial Harbors Manager (CHM) in all security and law enforcement compliance, preparedness and response matters.

III. MAJOR DUTIES & RESPONSIBILITIES

A. Administrative - 35%

Develops the District's security and law enforcement budget requirements. Authorizes all expenditures of unit's funds.

Formulates, develops, directs and evaluates the unit's overall strategy and response to security emergency situations, natural or human-made disasters; organizes and directs the District's total security preparedness program; develops and prepares guidance for the CHM.

The position supervises Position No. 118402 who shall serve as the first alternative Facility Security Officer when the position is not available. In the absence of Position No. 118402, the Harbor Enforcement Officer IV, Position No. 11585, shall serve as the second alternative Facility Security Officer.

The position prepares the work schedules of the Harbor Operations Supervisor (HOS), Position No. 118402, and Harbor Enforcement Officers (HEO) unit to insure the completion of the Declaration of Security (DoS) in accordance with the FSPs are conducted in a cost effective manner.

Position develops all standard operating procedures of the units, trainings, drills, and exercises to test and improve readiness, including standard operating procedures of equipment such as jet skis, boats, radios, and other equipment; insures employees obtain and maintain their certification and training in the operating of firearms, operating the boat, jet skis, radios, and other certifications required in the performance of their duties and responsibilities.

Prepares the contract specifications for the procurement of contract security and administers the security contracts on behalf of the District.

Assists the Division's security program specialist 1) in obtaining security grants that meets the security and law enforcement gaps as prescribed in the Harbor Security Master Plan; 2) with the preparation and development of the security contracts and port security grants, requests for additional security emergency funds at higher MARSEC levels, reviews, updates and develops contract security renewals.

Conducts and/or supervises investigations of incidents and activities and misconduct allegations and prepares appropriate reports to take corrective action.

Prepares job performance appraisals for subordinate supervisors.

Insures accurate record keeping of sick leave, vacation leave and maintains control of overtime.

B. Facility Security Operations – 30%

The position is the District's primary Facility Security Officer ((FSO). The position is responsible for all matters required under the maritime security laws for the District.

Assists in developing and implementing the requirements of the approved FSPs for insuring that private contract security implements security measures provided in the FSPs, for example, measures for passenger ship, fuel, and cargo vessel operations.

Conducts security surveys of the facility, taking into account relevant to the port facility security assessment. Conducts drills and exercises in accordance with the FSPs. Conducts security inspection of the facility to insure the continuation of appropriate security measures. Recommends modifications to the FSPs to correct deficiencies and updates the plans with relevant changes to the facilities and operations. Enhance security awareness and vigilance of port facility personnel. Insures adequate training has been provided to personnel responsible for the security of the port facility. Develops standard procedures for the reporting of occurrences that threaten the security of the port facility and maintenance of records.

Coordinates FSPs compliance with the appropriate Company and Vessel Security Officers.

May be assigned to assist the Security Contracts Manager (District Manager) in administering the contract security to insure that the terms and conditions of the contract meet the mission of security for the ports in a manner consistent with the FSPs and to avoid fines and civil penalties.

Insures that the District's security screening equipment are properly operating, tested, calibrated and maintained. Assists the Vessel Security Officers in confirming the identity of those seeking to board the ship when requested.

Assists with establishing a District policy in the handling of sensitive security-related information and communications that conforms to the USCG NAVIC 10-04. Insures contract security meets the minimum requirements for threat identification and recognition for all security levels. Is directly responsible for the execution of the DoS.

Manages the District's security identification badge program in accordance with the 33 CFR, specific guidance from the Division's Information Technology (IT) person, and the CHM to include the maintaining and updating of District policies and procedures. Directs the contract security for passenger ships when berthed before any operations can begin. Manages the contract security in insuring the access control requirements are in accordance with the FSPs and 33 CFR for both cargo and passenger ships.

C. Law Enforcement - 30%

Directs the law enforcement operations and the Harbor Enforcement Officers in law enforcement policies and procedures for implementation within the unit.

Insures that the District's law enforcement policies and procedures are in compliance with Federal, State, and County laws/rules/ordinances.

Directs the training, drills, and exercise of law enforcement response and interdiction of threats to the commercial harbors. Coordinates the development of tactics and the development of response and contingency planning in providing law enforcement response and interdiction of threats to the commercial harbors.

Insures that the communication systems and equipment are inter-operable with State law enforcement agencies.

D. Other Related Duties as Required – 5%

Supervises: Position No. 118402 - Harbor Operations Supervisor
Position No. 11585 - Harbor Enforcement Officer IV

Summary of Major Duties and Responsibilities

A.	Administrative	35%
B.	Facility Security Operations	30%
C.	Law Enforcement	30%
D.	Other Related Duties as Required	5%
		100%

IV. CONTROLS EXERCISED OVER THE WORK

A. Supervisor:

Direct Supervision:
Position No. 01044 Class Title: Commercial Harbors Manager

Program/Technical Supervision:
Position No. 97306D Class Title: Program Specialist V

B. Nature of Supervisory Control Exercised Over the Work

Instructions are limited to general guidelines and directions to specify priorities and results expected. The employee is required to plan and carry out the necessary work activities independently.

C. Nature of Available Guidelines Controlling the Work

1. Policy and procedural guidelines available:
Hawaii Revised Statutes
Hawaii Administrative Rules
Department of Transportation facility security plans and policies & procedures
33 CFR Parts 101, 103, 104, &105

Applicable Federal and State Laws

2. Use of Guidelines: All duties, responsibilities and activities are performed in accordance with applicable State and Federal laws and Harbor rules and facility security plans and policies.

V. REQUIRED LICENSES, CERTIFICATES, ETC.

Must have had training and meets the requirements as an FSO as described in 33 CFR 105.205 prior to the start of work for the state.

Must possess a valid license to drive in the State of Hawaii.

VI. RECOMMENDED QUALIFICATIONS

A. Knowledge:
- The principles and practices of maritime operations and security
- 33 CFR Parts 101, 103, 104, &105
- Budget and fiscal administration
- Report writing

B. Skills/Abilities:

Ability to plan, organize and coordinate activities involving agencies from the private and government sectors; communicate effectively; write plans and procedures; interpret and translate reports; conduct meetings; train; and build positive and constructive relationships with agencies from the private and governmental sectors.

Skills: Demonstrate ability to solve complex problems and make sound decisions and recommendations in improving and enhancing security at the ports; and deal effectively and positively with people.

C. Education:

Graduation from an accredited four (4)-year college or university with a baccalaureate degree.

Three (3) years of responsible professional work experience coordinating a security program or working for a law enforcement department with responsibility for conducting on-site inspection of facilities and operations for security shortfalls and for taking appropriate actions.

OR

Three (3) years of responsible professional work experience coordinating a complex security program.

OR

A combination of security experience and inspection experience as described above.

Supervisory aptitude.

Substitution of Education for Experience

A bachelor's degree in the law enforcement field, public administration or a maritime-related field may be substituted for one (1) year of the required experience.

D. Experience:

Specialized experience: Three (3) years or more of harbor or transportation inter-modal systems (harbors, highways, or airports) in emergency/disaster/security responsibilities. Should have a working knowledge of WMD, Incident Command System, and other emergency, disaster, and security programs. Familiar with the federal grant programs that support the DOT, specifically harbors.

General experience: Experience in personnel matters, budgeting and program objectives.

VII. TOOLS, EQUIPMENT & MACHINES

Computer, typewriter, calculating machines and telecommunications equipment.

DPS 206
Rev. 10/1/83

Date Received, DPS
DEPT OF TRANSPORTATION PERSONNEL STAFF
FEB 12 3 43 PM '01

STATE OF HAWAII
DEPARTMENT OF PERSONNEL SERVICES

POSITION CLASSIFICATION FORM

'00 SEP -1 P12:34

1. POSITION NO. 12222
2. TYPE OF POSITION:
   A. Permanent X
   B. Temporary ___
   C. Full-time X
   D. Part-time ___

HARBOR

3. Present Class Title, Pay Range, Bargaining Unit
   State Security Guard II SR15 BU03
4. Name of Incumbent
5. Geographic Location
   Kauai
6. Organizational Location:
   A. Department
      Transportation
   B. Division
      Harbors
   C. Branch or Office
      Kauai District
   D. Section
      Enforcement
   E. Unit
7. Recommended Class Title, Pay Range, Bargaining Unit
   Harbors Security/Operations Officer SR14 BU03

8. Reason for Submittal:
   A. ☐ Initial Allocation
      1. ☐ Replaces Position No. ___
      2. ☐ Additional and Identical To Pos. No. ___
   B. ☒ Reallocation
   C. ☐ Other Reason (Specify)

9. "I certify that the attached is a complete and accurate description of the duties and responsibilities of this position."

   VACANT

   A. Signature of Employee — Date
   B. Signature of Supervisor — Date 1/30/01
   C. Signature of Division Chief — Date 2/12/01
   For D. Signature of Department Director — Date

Assigned Duties and Responsibilities:
Complete and attach a description of the duties and responsibilities assigned the position.

CLASSIFICATION ACTION TAKEN

Class Title, Series Code, Pay Range and Bargaining Unit	Effective Date*
I* Security Officer, 8.665, SR-13, BU-03	02-16-01* ~~2/15/01~~

*Per Sarah, PER, correct date to 02-16-01 (02-20-01)
*Should be Security Officer I, per Sarah, PER (02-22-01)

C.M.
Classifier

Date

Patricia Adam
For Director of Personnel Services

2/15/01
Date

DEPT OF TRANSPORTATION PERSONNEL STAFF '01 FEB 16 P4:0

FEB 20 2001 COPY SENT TO HAR-K

The effective date applies only to the classification of the position. The incumbent, if any, must meet the qualifications now applicable to the position prior to effectuation of any payroll change. Should there be an incumbent, therefore, the originating department must submit the proper forms for approval of the qualifications of the incumbent within 10 days. In the event there has been a change of incumbent subsequent to the effective date for the classification action, the originating department should also determine whether the same duties and responsibilities have been assigned as when the description was submitted before requesting approval of the qualifications of a later incumbent.

I. IDENTIFYING INFORMATION

POSITION NUMBER:	12222
DEPARTMENT:	TRANSPORTATION
DIVISION:	HARBORS
BRANCH:	KAUAI DISTICT
SECTION:	ENFORCEMENT
GEOGRAPHIC LOCATION:	KAUAI

II. INTRODUCTION

The function of the organizational unit is to enforce the laws, rules and regulations pertaining to security and safety of cargo operations.

The primary purpose of this position is to enforce, coordinate and monitor all security functions and operational activities of the Harbors Division to ensure proper compliance with pertinent laws, rules, regulations, policies and procedures.

III. MAJOR DUTIES & RESPONSIBILITIES:

SECURITY: 60%

- Patrols areas within the Harbors Division jurisdiction to prevent loss of or damage to State facilities, property and equipment. Checks security of buildings, cargo, materials and equipment. Prevents acts of theft and vandalism.
- Reports all discrepancies and unsafe conditions for appropriate action.
- Investigates violations of rules, regulations and laws.
- Issues citations for infractions.
- Maintains required records, logs and other information.
- Acts as liaison with the local Police Department, other local or county enforcement agencies and contract security guard service, if applicable,.in all security and enforcement matters.
- Serves as district security officer to meet all passenger cruise vessels to discuss vessel and port security plans in compliance with the U.S. Coast Guard regulations governing cruise vessels.
- Acts as district representative in Civil Defense, Hazmat, Fire and other exercises.
- Testifies in court proceedings as required.
- Responds to emergencies, such as rendering first aid or other assistance to prevent injury or protect life and property.
- Conducts bomb and fire searches when required. Supervises evacuation procedures when directed.
- Maintains surveillance of demonstrations, strikes, protests, sit-ins, public rallies and marches, meetings and other gatherings on State facilities.
- Provides directions and information to the general public.

- Assists with the protection and transportation of funds and important documents.

HARBOR OPERATIONS: 35%

- Observes arrivals and departures of vessels, spots vessel to piers by pre-determining exact berth space availabilities and directing pilot to dock ship in exact position at berth and logging times.
- Assists in coordinating activities of receiving/shipping, storage/demurrage and movement of cargo, allocation of pier space as required; assesses demurrage/storage charges.
- Assists in preparing daily container storage report ; compiles report listing serial numbers, sizes, starting/ending date of storage, location and agency responsible for collecting storage/demurrage charges.
- Monitors mooring lines, damage to piers, fueling operations.
- Ensures that fire lanes, doors and traffic lanes are not blocked by cargo or equipment.
- Conducts fire and damage assessment inspections, prepares damage assessment reports and follows through on completion of repair performed by the State or by contract personnel hired by those responsible for the damages.
- Enforces vehicle and parking rules in the port area and issues citations for violations.
- Directs passenger and traffic control or special parking as required.
- Works with supervisor and staff seeking improvements in traffic patterns, parking, etc.
- Responds to operational requirements and assists Marine Cargo Specialists and other Harbors operations personnel.

OTHER DUTIES AS REQUIRED: 5%

IV. CONTROLS EXERCISED OVER THE WORK:

A Supervisor:

Position No.: 22584 Class Title: Harbors District Manager I

B Instructions Provided.

1. Instructions are limited to general guidance and direction to achieve the results expected. The employee is required to plan and carry out the necessary work activities independently.

2. Assistance Provided.

The employee works independently but is expected to inform the supervisor and seek assistance from supervisor with problems of an unusual nature or for unforeseen events or circumstances.

3. Review of Work.

The supervisor does not check the accuracy of individual work assignments but does check to ensure that goals and objectives are met.

C. Nature of Available Guidelines Controlling the Work.

1. Policy and Procedural Guides Available.

Hawaii Revised Statute
Hawaii Administrative Rules and Administrative Policies
Applicable Federal Laws, Rules and Regulations
DOT and Harbors Division Rules and Procedures

2. Use of Guidelines.

The employee is expected to apply laws, rules and regulations, policies and procedures, statutes, and other related guidelines in order to perform the duties of this position.

V. REQUIRED LICENSES, CERTIFICATES, ETC.

Possession of valid, State of Hawaii Drivers License, Class 3

VI. RECOMMENDED QUALIFICATIONS

A. Knowledge:

Applicable State and Federal laws, rules, regulations (See DHRD M.Q.'s)

B. Skills/Abilities:

Interpret and apply laws, rules, regulations and ordinances; understand and interpret departmental policies; follow instructions; deal courteously but firmly with the general public and maintain good community relations; be observant; take good notes; prepare reports; understand people; make sound decisions.

C. Education & Experience:
See DHRD M.Q.'s

VI. TOOLS, EQUIPMENT & MACHINES

Operates a motor vehicle, radio communication equipment, various self-defense equipment, fire extinguishers and related equipment and office machines (typewriter, computer, etc.)

DEPARTMENT OF PERSONNEL SERVICES
STATE OF HAWAII

DPS 219
Rev 11/30/90

DEPT. OF TRANSPORTATION PERSONNEL STAFF

FEB 12 3 42 PM '01

POSITION EVALUATION FORM
(Existing Position)

Date: January 29, 2001

1. POSITION NO., TITLE, PAY RANGE, BU:
POSITION NO. 12222 , STATE SECURITY GUARD II, SR-15, BU-03

2. ORGANIZATION: KAUAI DISTRICT, HARBORS DIVISION, DEPT. TRANSPORTATI
(Branch, Division, Department)

3. RECOMMENDED ACTION: Security Officer I, SR-13, BU-3
(Title, Pay Range, BU)

4. List new duties.

Additional harbor operations duties have been added such as assisting in coordinating activities of receiving/shipping, storage/demurrage and movement of cargo, assist in preparing daily container storage reports, monitors mooring lines, damage to piers and fueling operations, directs passenger and traffic control or special parking.

Due to the increase in harbor operations duties, the percentage of time spent on such duties have been increased.

The position will not carry firearms and will no longer have the power to arrest and detain. (These duties have been removed from the position description)

5. List only those duties which are characteristic of the requested class (illustrate general statements with specific examples).

The duties of subject position is not reflective of the class State Security Guard II in that position will no longer exercise regular police powers, the incumbents will not arrest and detain.

Duties are most reflective of the class Security Officer I in that the incumbent will partol the Harbors Division jurisdiction to enforce our rules and regulations for the protection and security of our property and tomaintain a safe environment. Incumbent willinvestigate violations, issue citations while performing duties.

6. If new duties have been reassigned from another position, show Pos. No._____, title_____
location _____,
and attach redescription of position.

Duties have not been reassigned from another position.

CHIEF MARINE CARGO SPECIALIST
Position No. 18169

I. INTRODUCTION

The Marine Cargo Specialist is located in the Commercial Harbors Section, Oahu District, Harbors Division, Department of Transportation. Incumbent schedules, assigns, instructs, reviews and evaluates subordinate Marine Cargo Specialists in the course of their duties facilitating the safe, efficient, and expeditious handling and movement of cargo within their assigned areas of Honolulu Harbor.

II. MAJOR DUTIES AND RESPONSIBILITIES

1. Supervises and exercise control over the Marine Cargo Sub-Unit whose function is to ensure the safe, efficient conduct of operations in Honolulu
20% Harbor including the movement and handling of cargo/passengers, timely submission of required reports, coordination of construction work schedules with operational needs for the piers, and identification of fire and safety hazards.

2. Maintain knowledge of status of cargo situated on harbors property. Ensure reports are filed in accordance with Harbors rules and regulations and the Tariff.

a. Advise Office Services Unit of commencement
20% date of demurrage.

b. Maintain knowledge of the current status of collections and the movement of demurrage cargo through contacts with shipping agents, Marine Cargo Specialists, consignees, and the Office Services Unit.

c. Through Marine Cargo Specialists, receive, review demurrage cargo reports and submit for payment.

3. Reviews daily account of storage reports and
5% requests for storage and submits for payment/billing.

4. Reviews and damage to state property reports for
5% accuracy and completeness and coordinates repair with responsible party.

5. Assists Office Services Unit in matter pertaining

5% to parking and electricity and water consumption by harbor users.

6. 5% Coordinates utility and cleaning services requested by harbor users. Submits billing charges for payment as required.

7. 10% Receives information on vessel movements, cargo operations and other activities and coordinates with other harbor users as deemed necessary. Maintains up-to-date charts, diagrams, and status boards pertaining to berthing assignments and cargo operations.

8. 5% Attends pre-construction conferences, maintains liaison with contractors to monitor progress and ascertain status of construction/rehabilitation. Participates in final acceptance inspection.

9. 5% Requires daily fire and safety inspections of harbor areas, ensuring fire fighting equipment and fire exit doors are operable and that fire lanes are not blocked by equipment or cargo.

10. 5% Conducts daily inspections of pier areas to ensure clean-up, housekeeping and minor maintenance work performed by groundskeeping, custodial, and maintenance crews is satisfactory.

11. 5% Prepares drafts of letters and/or reports as required, incident to the daily activities of the Commercial Harbors Section.

10% 12. Relieves the Harbor Operations Supervisor (Vessel Scheduling) as needed.

III. CONTROLS OVER THE POSITION

Serves under the general direction of the Harbor Operations Supervisor (Vessel Scheduling), Position No. 01051. Assists the Harbor Operations Supervisor in the control and management of pier facilities under the jurisdiction of the Harbors Division, Oahu District; enforces State rules and regulations and applicable federal maritime laws regarding the handling, storage and shipping/receiving of all types of cargo.

IV. QUALIFICATION REQUIREMENTS OF THE WORK

Applicant must have had a minimum of 6 years of general and specialized experience of which at least three years is specialized experience.

General Experience - Progressively responsible experience in waterfront cargo handling or cargo layout and planning operations. The experience must show knowledge of cargo loading aboard ships, and familiarity with marine terminal activities.

Specialized Experience - Progressively responsible experience is one or a combination of the following activities:

1) Preparation of preliminary marine cargo stowage plans.

2) Overseeing marine cargo loading, stowage, and discharge operations to make certain that these activities conform to preliminary plans.

In either case, the experience must have included work involving vessels of not less than 5000 deadweight tons. The experience must also clearly show possession of comprehensive knowledge of rules and regulations pertaining to cargo movement. A clear demonstration as to the possession of supervisory aptitude through successful completion of regular or special assignments which involved some supervisory responsibilities or aspects; by serving as a group or team leader, or in similar work in which opportunities for demonstrating supervisory capabilities existed; by completion of training courses in supervision accompanied by application of supervisory skills in work assignments; or by favorable appraisals by a supervisor indicating the possession of supervisory potential.

Substitution for Experience - Applicants may substitute graduation from a Deck Officer course given by a State or Federal Maritime School for the required three years of general experience. Possession of a Coast Guard license (unlimited; any tonnage; any waters) as Third Officer or higher meets the general experience requirement in full.

No substitution will be allowed for any portion of the required specialized experience.

Driver's License - Possession of a valid, current Hawaii State operator's license is required.

Physical Requirements - Incumbent must be physically able to perform effectively the duties of the position with or without reasonable accommodation. Good distant vision in one eye and the ability to read, without

strain, printed material the size of typewritten characters are required, glasses permitted. The ability to distinguish shade of color is required. Ability to hear the conversational voice, with or without a hearing aid, is required. In most instances, an amputation of a leg or foot will not disqualify for appointment, although it may be necessary to compensate for this condition by the use of a satisfactory prosthesis. Any physical condition which would cause the incumbent to be a hazard to himself or to others will disqualify him for appointment. In addition, must possess emotional and mental stability. A person with a handicap will be considered upon demonstration of ability to perform the required tasks or have the ability or means to compensate for the handicap sufficiently to perform the job.

PERSONNEL FILE COPY

DPS 208
Rev. 9/1/66

Date Received, DPS

STATE OF HAWAII
DEPARTMENT OF PERSONNEL SERVICES

POSITION CLASSIFICATION FORM

1. POSITION NO. 23499
2. TYPE OF POSITION:
   A. Permanent x
   B. Temporary ___
   C. Full-time x
   D. Part-time ___

3. Present Class Title, Salary Range
   Marine Cargo Specialist, SR 17 BU 3
4. Name of Incumbent
   Noboru Kawamoto
5. Geographic Location
   Honolulu, Hawaii
6. Organizational Location:
   A. Department
      Transportation
   B. Division
      Water Transportation Facilities
   C. Branch or Office
      Oahu District
   D. Section
      Commercial Harbors
   E. Unit
      Pier Utilization
7. Recommended Class Title, Salary Range
   Marine Cargo Specialist, SR 17 BU 3

8. Reason for Submittal:
   A. ☐ Initial Allocation
      1. ☐ Replaces Position No. ___
      2. ☐ Additional and Identical To Pos. No. ___
   B. ☐ Reallocation
   C. ☒ Other Reason (Specify)
      annual update

9. "I certify that the attached is a complete and accurate description of the duties and responsibilities of this position."

   Noboru Kawamoto 7/21/77
   A. Signature of Employee Date

   B. Signature of Supervisor Date

   FEB 1 1978
   C. Signature of Division Chief Date

   D. Signature of Department Director 2/7/78 Date

10. Assigned Duties and Responsibilities:
    Complete and attach a description of the duties and responsibilities assigned the position.

CLASSIFICATION ACTION TAKEN	
Class Title, Series Code and Salary Range.	Effective Date*
Marine Cargo Specialist, 2.088, SR 17, BU:03	

Classifier

Date

Melvin K.C. Young
For Director of Personnel Services

2-28-78
Date

*effective date applies only to the classification of the position. The incumbent, if any, must meet the qualifications now applicable to the position prior to effectuation of any payroll change. Should there be an incumbent, therefore, the originating department must submit the proper forms for approval of the qualifications of the incumbent within 10 days. In the event there has been a change of incumbent subsequent to the effective date for the classification action, the originating department should also determine whether the same duties and responsibilities have been assigned as when the description was submitted before requesting approval of the qualifications of a later incumbent.

Marine Cargo Specialist

Position No. 23499

I. INTRODUCTION

The Marine Cargo Specialist is located in the Commercial Harbors Section, Oahu District, Water Transportation Facilities Division, Department of Transportation. Incumbent directs, coordinates, controls and assigns incoming/outgoing cargoes to specifically designated cargo storage areas on State-owned properties in Honolulu Harbor. Employee develops and maintains person-to-person contact with various State, Federal government and civilian shipping agencies or firms.

II. MAJOR DUTIES AND RESPONSIBILITIES

1. Coordinates activities with civilian and government agencies regarding receiving/shipping, storage/demurrage, and movements of cargoes; allocates pier space as required; assesses demurrage/storage charges. 25%

2. Spots vessels to piers by pre-determining exact berth space availabilities and directing pilot to dock ship in exact position at berth. 10%

3. Conducts daily fire and damage assessment inspections of pier storage areas, open storage areas, buildings, pier aprons and fender systems, pavement, perimeter fencing; prepares damage assessment reports and follows through on completion of repairs performed by the State or by contractor personnel on hire by those responsible for the damages. 10%

4. Schedules clean-up, housekeeping and minor maintenance work to be performed by grounds maintenance custodial force; follows through on final accomplishments and inspects for satisfactory cleaning as required. 5%

5. Maintains daily updating of ship-berth availability at each pier facility complex in his assigned area of responsibility; provides status of progress of construction and/or rehabilitation of pier fenders, aprons, and cargo storage areas; fuel pipelines; waterlines. 5%

6. Prepares daily container storage report for assessment purposes; compiles 25%

report listing serial numbers, sizes, starting/ending date of storage, location and agency responsible for collecting storage/demurrage charges accruing to the benefit of the State.

7. Attends pre-construction conferences outlining facility areas required for storage of contractor equipment and material; provides status of progress of construction and/or rehabilitation of pier fenders, aprons, and cargo storage areas, fuel pipelines and waterlines. 5

8. Insures that fire lanes, fire fighting equipment and fire exit doors are operable and that fire trucks entering or leaving the pier facility are not blocked by equipment or cargo. 5

9. Prepares drafts of letters as required, incident to frustrated cargoes, damage to facilities, storage/demurrage charges. 5

10. Relieves the Harbor Operations Supervisor (Vessel Scheduling) during periods of leave as necessary. 5

III. CONTROLS OVER THE POSITION

Serves under the general direction of the Harbor Operations Supervisor (Vessel Scheduling), Position No. 01051. Assists the Harbor Operations Supervisor in the control and management of pier facilities under the jurisdiction of the Water Transportation Facilities Division, Oahu District; enforces rules and regulations and applicable maritime federal laws affecting the handling, storage and shipping/receiving of all types of cargoes. Relieves the Harbor Operations Supervisor (Vessel Scheduling) in an emergency or when the incumbent is on vacation.

IV. QUALIFICATION REQUIREMENTS OF THE WORK

Applicants must have had a minimum of 5 years of general and specialized experience of which 3 years is general experience and 2 years is specialized experience.

General experience - Applicants must have had progressively responsible

experience related to waterfront cargo handling of cargo layout and planning operations. This experience must show a knowledge of cargo loading and unloading aboard ships and a familiarity with marine terminal activities. This experience may have been gained in performing cargo handling operations aboard vessels or at a marine terminal, in such positions as Ship Checker, Dock Checker, Leadingman Stevedore, Vessel Timekeeper, Boatswain, or as a Junior Deck Officer.

Specialized experience - This experience must have been progressively responsible experience gained in (1) preparing preliminary cargo stowage plans and/or (2) overseeing loading, stowage, and discharge operations to make certain that they conform to preliminary plans or authorizing necessary changes thereto, and preparing final plans. This experience must have included work involved on vessels of not less than 5,000 deadweight tons. This experience must also clearly show, to a degree commensurate with the level of the position, a comprehensive knowledge of marine rules and regulations and the ability to plan, direct, organize, and coordinate cargo handling activities; to interpret and apply policies; to investigate operations and practices and resolve problems; and to establish and maintain effective work relationships.

Substitution for experience - Applicants may substitute graduation from a Deck Officer Course given by a State or Federal Maritime School for the required 3 years of general experience. Possession of a Coast Guard License (unlimited; any tonnage; any waters) as Third Officer or higher meets the general experience requirements in full.

No substitution will be allowed for any portion of the required specialized experience.

Driver's License - Possession of a valid, current Hawaii State operator's license is required.

Radiotelephone permit - A radiotelephone third-class operator permit or a restricted radiotelephone operator permit issued by the FCC is mandatory as a condition of employment.

Physical Requirements

Standard 3 e.g. Incumbent must be physically able to perform effectively the duties of the position. Good distant vision in one eye and ability to read without strain printed material the size of typewritten characters are required, glasses permitted. The ability to distinguish shades of colors is required. Ability to hear the conversational voice, with or without a hearing aid, is required. In most instances, and amputation of leg or foot will not disqualify for appointment, although it may be necessary that this condition be compensated by use of satisfactory prosthesis. Any physical condition which would cause the incumbent to be a hazard to himself or to others will disqualify him for appointment. In addition, must possess emotional and mental stability. A person with a handicap will be considered upon demonstration of ability to perform the required tasks or have the ability or means to compensate for his handicap sufficiently to perform the job.

38670

DPS 206
Rev. 9/1/66

Date Received, DPS

STATE OF HAWAII
DEPARTMENT OF PERSONNEL SERVICES

POSITION CLASSIFICATION FORM

1. POSITION NO. 96306 D
2. TYPE OF POSITION:
   A. Permanent X
   B. Temporary ___
   C. Full-time X
   D. Part-time ___

3. Present Class Title, Salary Range
   New

4. Name of Incumbent

5. Geographic Location
   Barbers Point Harbor

6. Organizational Location:
   A. Department
   Transportation
   B. Division
   Harbors
   C. Branch or Office
   Oahu District
   D. Section
   Commercial Harbors
   E. Unit
   Barbers Point

7. Recommended Class Title, Salary Range
   Harbor Agent III, SR-14, BU-03

8. Reason for Submittal:
   A. ☒ Initial Allocation
      1. ☐ Replaces Position No. ___
      2. ☐ Additional and Identical To Pos. No. ___
   B. ☐ Reallocation
   C. ☐ Other Reason (Specify)

9. "I certify that the attached is a complete and accurate description of the duties and responsibilities of this position."

   A. Signature of Employee — Date 4/30/87
   B. Signature of Supervisor — Date 5/8/87
   C. Signature of Division Chief — George S. Ogawa — Date 5/18/87
   D. Signature of Department Director — Date ___

10. Assigned Duties and Responsibilities:
    Complete and attach a description of the duties and responsibilities assigned the position.

CLASSIFICATION ACTION TAKEN

Class Title, Series Code and Salary Range.	Effective Date*
Harbor Agent III 8.690 SR 14 BU 03	5-25-87

Classifier

Date

for Director of Personnel Services

5-25-87
Date

*The effective date applies only to the classification of the position. The incumbent, if any, must meet the qualifications now applicable to the position prior to effectuation of any payroll change. Should there be an incumbent, therefore, the originating department must submit the proper forms for approval of the qualifications of the incumbent within 10 days. In the event there has been a change of incumbent subsequent to the effective date for the classification action, the originating department should also determine whether the same duties and responsibilities have been assigned as when the description was submitted before requesting approval of the qualifications of a later incumbent.

HARBOR AGENT III
POSITION NO.

I. INTRODUCTION

The Harbor Agent III, SR 14, Position No. is located in the Barbers Point Unit, Commercial Harbors Section, Oahu District, Harbors Division, Department of Transportation. The Barbers Point Unit is responsible for providing day-to-day on-scene supervision of Barbers Point Harbor.

The incumbent of this position serves as the supervisor of the unit and is responsible for the safe handling and smooth flow of cargo within the harbor. He checks loading, unloading and stowage activities for conformance with established requirements and is empowered with police powers to issue citations. He exercises supervision over one General Laborer II.

II. MAJOR DUTIES AND RESPONSIBILITIES

A. Administrative Duties 40%

1. Coordinates with Pier Utilization Unit, agents and stevedoring companies the receiving and shipping of cargo; and processes requests for cargo storage space as required.
2. Prepares storage and demurrage reports for assessment purposes.
3. Coordinates vessel bookings with Pier Utilization Unit. Provides information on vessel arrivals and departures.

4. Prepares pertinent fiscal reports for use in billing users for utilities, parking and other uses of facilities.
5. Receipts payments for the use of facilities and accounts for monies received.
6. Establishes and maintains adequate files and records.
7. Prepares and maintains personnel records for unit.
8. Supervises and evaluates the work of the incumbent in Position No. , General Laborer II.
9. Monitors joint use of Barbers Point Harbor Entrance Channel by transiting vessels from West Beach Marina. Contacts West Beach Marina representative to advise of scheduled commercial harbor traffic.

B. Policing Duties 30%

1. Enforces all laws, rules and regulations pertinent to the operation of Barbers Point Harbor.
2. Conducts frequent inspections of the harbor areas to check for illegal moorings, illegal

vehicle parking, unauthorized use of harbor property and other violations of the harbor rules and regulations. Issues citations when necessary.

3. Monitors lessees and other permittees to insure that they are within the confines of their rented areas and are observing the terms of their leases or revocable permits. Any discrepancies are reported to higher authority.
4. Insures that fire lanes are not blocked by equipment or cargo and similar safety regulations are observed.
5. Investigates reports of oil spillage and other pollution.
6. Reports to higher authority abandoned and/or derelict vessels and vehicles.

C. Maintenance Duties 20%

1. Conducts daily inspection of facilities for damages, sanitation and general overall condition. Prepares damage assessment report and follows through on completion of repairs.
2. Reports maintenance problems and follows progress to insure repairs are made.
3. Reads various utility meters.

D. Other Duties 10%

1. Answers questions from other government offices, tenants and the general public in person or by telephone.
2. Acts on miscellaneous orders and requests from the Harbor Master's Office.
3. Spots vessels by directing pilot and/or master of vessel to dock vessel in designated position at pier.
4. Attends pre-construction conferences for harbor projects outlining facility areas required for storage of contractor equipment and material.
5. Performs maintenance and custodial duties as required.

III. CONTROLS OVER THE POSITION

Serves under the supervision of the Commercial Harbor Manager, Position No. 1044. Receives specific instruction and training through a designated Harbor Operations Supervisor.

IV. QUALIFICATION REQUIREMENTS OF THE WORK

1. Four years of progressively responsible work experience of which one year shall have been in a supervisory, administrative, or management position, preferably in harbor operations and graduation from high school.

2. Knowledge of principles and practices of supervision; property management methods and practices; methods practice and techniques involving harbor operations.
3. Ability to plan, layout, assign, direct, supervise and review the work of others, acquire a good understanding of the laws, rules, regulations, policies and practices, governing the operation of a Commercial Harbor; establish and maintain effective working relationship with tenants, civic and public organizations, associations, officials, and the general public.

HARBOR AGENT I, II, III, IV, V

Series Definition:

This series includes all positions the duties of which primarily concern the operation and maintenance of harbors for light and medium draft vessels in the State of Hawaii. The positions are concerned with such functions as assigning berths; regulating movement of vessels in the harbor; providing for billing and collection of fees; enforcing traffic, boating and harbor regulations; inspecting boats; and inspecting and maintaining harbor facilities and equipment.

Small boat harbors are intended primarily for the berthing of recreational and fishing boats. However, at several small boat harbors, commercial activity is also permitted. Commercial activities at these harbors may include such ventures as tour boats, charter cruises, commercial fishing. Activities at medium draft harbors include the same type of commercial activities, as well as inter-island barge traffic and cargo handling.

The work described in this series does not reflect the operation of large State deep draft commercial harbor operations such as Honolulu Harbor, Nawiliwili Harbor, Kahului Harbor, or Hilo Harbor, which are concerned primarily with the movement of bulk and general cargo and the accommodation of large international ocean-going passenger liners.

It is not the intention of these specifications to draw fine distinctions between such terms as "harbors," "ports" or "marinas". For the purpose of these specifications, the terms "harbors" and "small boat harbors" shall be used and are intended to mean a body of water sheltered naturally or artificially against currents, waves and winds and deep enough to furnish berthing for ships and/or boats.

No attempt is made to make distinctions between "ships" and "boats". For the purpose of these specifications, the terms "boats" or "small boats" will also be used to identify all vessels which use the harbors covered in these specifications.

Classes in this series are distinguished on the basis of the following classification factors: 1) nature and variety of work, 2) nature of available guidelines, 3) nature of supervision received, 4) purpose and nature of interpersonal relationships required, 5) supervisory responsibilities, and 6) knowledge and abilities required. The interaction of these factors are

discussed at each level under two major headings: (1) the characteristics of the harbor, and (2) the nature and scope of responsibility.

(1) Characteristics of the harbor. This factor is critical in the classification of positions in this series. It deals with such considerations as the size and location of the harbor; number and types of users; intensity of operational and administrative activity; extraneous elements (e.g., proximity to tourist areas, vehicular and pedestrian traffic); and combinations thereof. Combinations of these considerations contribute toward making the operational activity of a harbor more intense and complex. Increasing intensity and complexity of harbor operations, in turn, makes the job of the harbor operations agent increasingly more difficult. For instance, the larger harbors have more tenants, increasing proportionately the number and impact of decisions which must be made and enforced. Multiple use harbors which service both recreational and commercial activity require enforcement of different rate structures for use of harbor facilities; increase the potential for conflicting interests among different groups of harbor users; and increase the kinds and amounts of harbor traffic. These factors in turn increase the number, kind and criticality of decisions which must be made and enforced. Proximity to major metropolitan, tourist and other recreational areas also increases the amount of shore traffic and congestion (vehicular and pedestrian) with which the harbor agent must contend.

While each harbor differs from any other according to particular characteristics of individual local conditions, common elements characterize certain harbors and such harbors are grouped in categories according to operational activity and complexity as follows:

a) Least active and complex

Harbors in this group are characterized by such factors as locations away from principal metropolitan and/or tourist areas; small number of berths (less than 50); little demand for temporary and permanent berthing; minimal harbor and shore activity.

b) Moderately active and complex

Harbors in this group are characterized by locations away from principal metropolitan and/or tourist areas, a large number of berths and harbor activity which is

moderately active and complex. Two groups of harbors fall into this category: (1) those larger harbors (50 to 300 berths) which primarily service recreational boating and/or fishing activities; and (2) multiple use harbors (recreational and commercial) in locations away from major tourist areas (i.e., Kawaihae and Kaunakakai) with commercial activity primarily concerned with periodic bulk and general cargo movement.

c) Significantly active and complex

Harbors in this group are characterized by such factors as locations in principal metropolitan or tourist areas; large number of berths (over 50) with long waiting periods for berthing space; frequent need to provide temporary berthing for transient boats; usually a mix of recreational and commercial boating activity; high intensity of vessel, vehicular and pedestrian traffic; and periodic special activities such as hosting local, national and international fishing and sailing events.

Proximity to major metropolitan and tourist areas increase the diversity of commercial activity. In addition to commercial and charter fishing boats, these harbors also berth passenger-carrying boats engaged in various tourist oriented boating activities (e.g., harbor cruises, glass bottom boat rides and sunset and dinner cruises).

d) Most active and complex

The Ala Wai Harbor system is the largest and most active and complex small boat harbor in the State (over 700 berths and moorings). Apart from size, the Ala Wai Harbor is characterized by its location in the principal city on the principal Island; its proximity to the major tourist destination in the State; large waiting list for permanent berths; the need to provide temporary berthing for transient boats; a significant population of "liveaboards"; high intensity of vessel, vehicular and pedestrian traffic (much of which is not harbor connected); and periodic special activities such as hosting prestigious international sailing

(2) Nature and Scope of Responsibility. This factor concerns the nature and extent of supervisory control received and exercised over the work of other employees.

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This is the first class specification for the new classes HARBOR AGENT I, II, III, IV & V which replaces Harbor Attendant I (8.692), approved on June 2, 1961, Harbor Attendant II & III (8.694 & 8.695) approved on February 24, 1964 and Harbor Superintendent (8.697) approved on July 15, 1955.

DATE APPROVED: 6/7/83

/s/ James H. Takushi
JAMES H. TAKUSHI
Director of Personnel Services

HARBOR AGENT I 8.688

Duties Summary:

Operates and maintains one or several small boat harbors representing harbor activities which are operationally the least active and complex; and performs other related duties as assigned.

Distinguishing Characteristics:

This class is distinguished by its responsibility for the operation and maintenance of one or several small boat harbors or other boating facilities representing harbor activities which are operationally the least active and complex, the scope of which are characteristic of the small boat harbor facilities at Manele Bay (Lanai), Nawiliwili (Kauai), and Port Allen (Kauai).

A position in this class is assigned to one or several small boat harbors and boat launching facilities which are located in more rural areas, have a small number of berths (less than 50), and which service a low level of commercial boating activities. The Harbor Agent I works alone with latitude for scheduling his daily activities. General supervision in these operations and maintenance activities is received from a higher level representative of harbors management who is located at the harbors district office. Matters outside of routine day-to-day operational and maintenance activities of the assigned harbor are referred to the harbors district office for guidance.

Examples of Duties:

Assigns and reassigns berths to permanent and visiting boaters; inspects boats for compliance with State laws and

requirements and makes reports concerning violations; performs minor electrical and plumbing repairs, rough carpentry and painting; makes recommendations for more extensive repairs or improvements; performs grounds keeping and custodial duties; keeps records necessary to bill tenants for use of moorings and other facilities; collects fees and charges; issues receipts; records and reports unsafe practices, damage to property, condition of harbor facilities, vessel counts, arrivals and departures; investigations and reports oil spillage or other pollution in the harbor; maintains order, enforces boating laws and harbor rules; issues citations when required; serves as liaison between the State Harbors Division, harbor tenants and the general public.

Knowledge and Abilities Required:

Knowledge of: Simple clerical procedures; simple arithmetic (addition, subtraction, multiplication, division); hand tools and their use.

Ability to: Establish and maintain effective working relationships with boaters and the general public; keep simple records and make simple reports; make arithmetic computations; learn and apply various rules and regulations; use simple hand tools used in minor repair and painting tasks; operate motor vehicles including small vans and pick-up trucks.

HARBOR AGENT II 8.689

Duties Summary:

Assists a higher level representative of harbors management in the operation and maintenance of one or several harbors representing harbor activities which are operationally, significantly active and complex, or the most active and complex; and performs other related duties as assigned.

Distinguishing Characteristics:

This class is distinguished by its responsibility for assisting a higher level representative of harbors management in the operation and maintenance of one or several harbors or other boating facilities representing harbors which are characterized, in these specifications, as operationally, significantly active and complex, such as the harbors at Kewalo Basin (Oahu), Lahaina (Maui), Kailua-Kona (Hawaii) or the small boat harbors program of the East and South Hawaii District, or the most active and complex, such as the harbor at Ala Wai.

A position in this class acts in an assistant capacity and performs most of the duties required to operate, and maintain, the assigned harbor facilities. Because of the complex and very active nature of the harbors' operations, the principal harbor agent and assistant positions share in the performance of most of the duties, although the principal position is the superior position and has authority over and responsibility for the activities.

Examples of Duties:

Assists a higher level representative of harbors management by performing all or most of the duties described below:

Interprets, explains and enforces all laws, rules and regulations pertinent to the operation of small boat and commercial harbors; issues citations for violations of small boat and commercial harbor rules and tariff; maintains order and insures that restricted areas are secured against entry by unauthorized vehicles and individuals; regulates and controls the movement and parking of vehicles; regulates the movement of vessels in the harbors; assigns berths; observes and assists in the docking and undocking of vessels; records vessel arrival and departure times; arranges for mooring of boats in the harbors; reports the arrival of out-of-state and foreign vessels to the proper authorities; maintains visitor log book; issues temporary moorings permits to transient boats; conducts initial and annual vessel inspections for compliance with State and Federal boating laws and to ensure boats are in good material and operating condition; maintains checking procedures for proper vessel registration and documentation; initiates action on abandoned and derelict vessels; conducts physical inventory of vessels in the harbor to ensure no unauthorized mooring and to determine availability of berths; maintains current waiting list for mooring and other harbor use permits; inspects the physical condition of harbor grounds and facilities; performs minor painting and simple repair work in the upkeep of harbor facilities; performs custodial duties to keep grounds and facilities clean, sanitary and in good working order; maintains inventory of office and janitorial supplies; processes maintenance and repair requests to appropriate agency; prepares periodic reports on facility condition; investigates and reports oil spillage and other pollution to proper authorities; maintains records necessary for the billing of wharfage, dockage, oil line usage and other related tariffs and fees; collects charges and furnishes receipts for demurrage and registration fees; prepares deposit slips and deposits daily receipts; prepares correspondence, reports and replies to queries; maintains harmonious relationships among the tenants and the

boating public; may testify and make recommendations on small boat and commercial harbors rules and tariff; may act as harbors representative to special events groups using the harbors as headquarters or designation.

Knowledge and Abilities Required:

Knowledge of: Simple clerical procedures; simple arithmetic (addition, subtraction, multiplication, division), hand tools and their use.

Ability to: Establish and maintain effective working relationships with boaters and the general public; keep simple records and make simple reports; make simple arithmetic computations; learn and apply various rules and regulations; use simple hand tools used in minor repair and painting tasks; operate motor vehicles up to small vans and pick-up trucks.

HARBOR AGENT III, IV, V

8.690
8.691
8.692

Duties Summary:

Operates and maintains one or several harbors; and performs other related duties as assigned.

Distinguishing Characteristics:

These classes represent responsibility for the operation and maintenance of assigned harbors. Positions in these classes are concerned with such functions as assigning berths; regulating movement of vessels in the harbors; providing for billing and collecting of fees from harbors users; enforcement of traffic, boating and harbor regulations; inspection of boats; inspection and maintenance of harbor facilities and equipment; and representing the operation to harbor users and the general public.

Harbor Agent III: This class is distinguished by its responsibility for the operation and maintenance of one or several harbors or other boating facilities representing harbor activities which are operationally moderately active and complex, such as the harbors at Keehi, Haleiwa, Waianae (all on Oahu); Maalaea (Maui); Kawaihae (Hawaii); and Kaunakakai (Molokai); acting as the senior on-site representative of harbors management at the assigned harbor complex; and interpreting and enforcing State laws, and rules governing small boat and commercial harbors and tariff; and,

usually, supervising one or two clerical or laborer positions.

Harbor Agent IV: This class is distinguished by its responsibility for overseeing, supervising and participating in the operation and maintenance of one or several harbors or boating facilities representing harbor activities which are operationally significantly active and complex, such as the harbors at Kewalo (Oahu); Lahaina (Maui); and the Kailua-Kona/Honokohau Complex (Hawaii); acting as the senior on-site representative of harbors management at the assigned harbor complex; interpreting and enforcing State laws, and rules governing small boat and commercial harbors; and supervising a lower level harbor agent.

Harbor Agent V: This class is distinguished by its responsibility for overseeing, supervising and participating in the operation and maintenance of the Ala Wai Boat Harbor, Ala Wai Canal and adjacent areas; the largest and operationally most active and complex small boat harbor in the State; acting as the senior on-site representative of harbors management at the assigned harbors; interpreting and enforcing State laws, rules and regulations governing small boat harbors; and supervising a lower level harbor agent, several clerical and several laborer positions.

Examples of Duties:

Interprets, explains and enforces all laws, rules and regulations pertinent to the operation of small boat and commercial harbors; issues citations for violations of harbor rules; maintains order and insures that restricted areas are secured against entry by unauthorized vehicles and individuals; regulates and controls the movement and parking of vehicles; regulates the movement of vessels in the harbors; assigns berths; observes and assists in the docking and undocking of vessels; records vessel arrival and departure times; arranges for mooring of boats in the harbors; reports the arrival of out-of-state and foreign vessels to the proper authorities; maintains visitor log book; issues temporary mooring permits to transient boats; conducts initial and annual vessel inspections for compliance with State and Federal boating laws and to ensure boats are in good material and operating condition; maintains checking procedures for proper vessel registration and documentation; initiates action on abandoned and derelict vessels; conducts physical inventory of vessels in the harbor to ensure no unauthorized mooring and to determine availability of berths; maintains current waiting list for mooring and other harbor use permits; inspects the physical condition of harbor grounds and facilities; maintains inventory of office and janitorial supplies; processes maintenance and repair requests to appropriate agency; prepare periodic reports on

facility condition; investigates and reports oil spillage and other pollution to proper authorities; maintain records necessary for the billing of fees; collects charges and furnishes receipts for registration fees; prepares deposit slips, deposits daily receipts; prepares correspondence and reports and replies to queries; maintains harmonious relationships among the tenants and the boating public; may testify and make recommendations on small boat and commercial harbor rules and tariff; may act as harbors representative to special events groups using the harbors as headquarters or destination; may plan, schedule and assign the work of others.

Knowledge and Abilities:

Knowledge of: Arithmetic; simple recordkeeping and reporting procedures. In addition, applicants for Harbor Agent IV and V must demonstrate knowledge of laws, rules and regulations pertaining to the operation of small boats; safety practices pertaining to the operation of small boats and the use of harbors and harbor facilities; property management and maintenance methods and practices; principles and practices of supervision.

Ability to: Keep simple records and prepare simple operational reports; make arithmetic computations; read, understand and enforce appropriate laws, rules and directives pertaining to the operation of small boats and small boat and commercial harbors; establish and maintain effective working relationships with boat owners and the general public; act authoritatively within assigned jurisdiction; operate vehicles up to vans and pick-up trucks.

In addition, applicants for Harbor Agent III, IV and V must be able to supervise the work of others.

HARBOR AGENT I, II, III, IV, V

Basic Education/Experience Requirement:

One year of full-time work experience which demonstrated the applicant's ability to read and understand oral and written instructions; write simply and directly; and make simple arithmetic computations (addition, subtraction, multiplication and division).

Graduation from high school with coursework in mathematics and English may be substituted for the foregoing basic experience requirements.

Experience Requirement:

In addition to the above, applicants must have had progressively responsible experience of the type and quality described in the paragraphs below and in the amounts shown in the following table:

Class Title	Spclzd Exp (Yrs)	Harbors Operations Exp (Yrs)	Total Exp (Yrs)
Harbor Agent I	1	0	1
Harbor Agent II	2	0	2
Harbor Agent III	2-1/2	1/2	3**
Harbor Agent IV	3	1*	4**
Harbor Agent V	3	2*	5**

Specialized Experience: Full-time experience which involved meeting and dealing effectively with people in a person-to-person work relationship. Such experience must have demonstrated the ability to: (1) establish and sustain positive relationships with people; (2) elicit and provide pertinent information; (3) read, understand and apply various rules and regulations; and (4) prepare clear and concise reports.

Examples of acceptable work experience include, but are not limited to: (1) managers, such as a Harbor Agent who, in operating and maintaining a project or project area, establishes

and maintains a continuing relationship with clients and users, applying various rules and regulations; and (2) professionals, para-professionals, or clerical and others who deal constantly with clients in eliciting and providing information and in providing advice/guidance.

Examples of non-acceptable work experience include, but are not limited to, experience as a sales clerk, office clerk, station attendant, counter worker or other such experience which may have involved much contact with people but only in a minimal context (such as in taking and filling an order).

Harbor Operations Experience: Work experience in harbor operations which included participation in such activities as the assignment of vessels to berths; direction and control of movement of vessels in the harbor; recording and reporting vessel arrivals and departures; preparation and collection of charges for use of harbor facilities; enforcement of harbor rules and regulations.

In order to be qualifying, the work must have involved substantive participation in harbor operation activities. Experience limited to peripheral supportive activities such as maintenance or grounds keeping functions will not qualify for Harbor Operations Experience.

Alternative Harbor Operations Experience:

1. Work and/or recreational experience (full-time or part-time) in the operation of small boats which demonstrates that the applicant has a good working knowledge of the laws, rules and regulations pertaining to the operation of small boats; safety practices relating to the operation of small boats and use of harbors and harbor facilities; seamanship; aids to navigation; and other activities related to the safe and proper operation of small boats and utilization of harbors and harbor facilities may be substituted for Harbor Operations Experience to a maximum of six months.

2. Clerical or security work experience performed at a small boat harbor facility in which the applicant actually participated in some aspects of harbor operations and which demonstrates that the applicant has a good working knowledge of the laws, rules and regulations relating to the use of harbors and harbor facilities may be substituted for Harbor Operations Experience to a maximum of six months.

*Applicants for Harbor Agent IV and V must have at least six months of experience comparable in scope and responsibility to that of the class Harbor Agent III or at least one year of experience comparable to the class Harbor Agent II in the State service.

**Supervisory Aptitude: Applicants for Harbor Agent III, IV and V must possess Supervisory Aptitude. Supervisory Aptitude is the demonstration of aptitude or potential for the performance of supervisory duties through successful completion of regular or special assignments which involve some supervisory responsibilities or aspects; by serving as a group or team leader, or in similar work in which opportunities for demonstrating supervisory capabilities exist; by completion of training courses in supervision accompanied by application of supervisory skills in work assignments or by favorable appraisals by a supervisor indicating the possession of supervisory potential.

Quality of Experience:

Possession of the required number of years of experience will not in itself be accepted as proof of qualification for a position. The applicant's overall experience must have been of such scope and level of responsibility as to conclusively demonstrate that he has the ability to perform the duties of the position for which he is being considered.

License Requirement:

Possession of a valid Hawaii State motor vehicle operator's license is required.

Selective Certification:

Specialized knowledge, skills and abilities may be required to perform the duties of some positions. In such positions, certification may be restricted to eligibles who possess the pertinent experience and/or training required to perform the duties of the position.

Agencies requesting selective certification must show the connection between the kind of training and/or experience on which they wish to base selective certification and the duties of the position to be filled.

Tests:

Applicants must qualify on the appropriate examination for the class. For non-competitive actions, the examination may be waived.

Physical and Medical Requirements:

Applicants must be physically able to perform, efficiently and effectively, the essential duties of the position which typically require the ability to read without strain printed material the size of typewritten characters, glasses permitted, and the ability to hear the conversational voice, with or without a hearing aid, or the ability to compensate satisfactorily. Handicaps in these or other areas will not automatically result in disqualification. Those applicants who demonstrate that they are capable of performing the essential functions of the position will not be disqualified under this section.

Any condition which would cause applicants to be a hazard to themselves or others is cause for disqualification.

Any disqualification under this section will be made only after a review of all pertinent information including the results of the medical examination, and requires the approval of the Director.

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This is the first minimum qualification specification for the new classes HARBOR AGENT I, II, III, IV, and V which replaces Harbor Attendant I (8.692), II (8.694), III (8.695) and Harbor Superintendent (8.697) approved on June 10, 1964.

Effective date: December 1, 1979

DATE APPROVED: 6/7/83

/s/ James H. Takushi
JAMES H. TAKUSHI
Director of Personnel Services

DEPARTMENT OF PERSONNEL SERVICES

POSITION CLASSIFICATION FORM

2. TYPE OF POSITION:
A. Permanent X
B. Temporary ___
C. Full-time X
D. Part-time ___

3. Present Class Title, Salary Range
Harbor Attendant III SR12 BU03

4. Name of Incumbent
Lawrence R. Costa

5. Geographic Location
Honolulu, Hawaii

6. Organizational Location:
A. Department
Transportation
B. Division
Water Transportation Facilities
C. Branch or Office
Oahu District
D. Section
Commercial Harbors
E. Unit
Kewalo Basin

7. Recommended Class Title, Salary Range

8. Reason for Submittal:
A. ☐ Initial Allocation
1. ☐ Replaces Position No. ___
2. ☐ Additional and Identical To Pos. No. ___
B. ☐ Reallocation
C. ☒ Other Reason (Specify)
DPS Request

9. "I certify that the attached is a complete and accurate description of the duties and responsibilities of this position."

A. Signature of Employee — Date 5/21/79

B. Signature of Supervisor — Date 5/21/79

C. Signature of Division Chief — Date 25

for Signature of Department Director — Date 11/28/79

10. Assigned Duties and Responsibilities:
Complete and attach a description of the duties and responsibilities assigned the position.

CLASSIFICATION ACTION TAKEN	
Class Title, Series Code and Salary Range.	Effective Date*
Harbor Agent IV, 8.691, SR-16, BU-03	12/1/79

Classifier

Date

for Director of Personnel Services

6/24/83
Date

*This effective date applies only to the classification of the position. The incumbent, if any, must meet the qualifications now applicable to the position prior to effectuation of any payroll change. Should there be an incumbent, therefore, the originating department must submit the proper forms for approval of the qualifications of the incumbent within 10 days. In the event there has been a change of incumbent subsequent to the effective date for the classification action, the originating department should also determine whether the duties and responsibilities have been assigned as when the description was submitted before requesting approval of the qualifications of a later incumbent.

6. Maintains a current and accurate waiting list register for the berthing of various size boats; maintains a system for timely notification of berth availability when vacancy exists.

7. Maintains constant checking procedures for the validity of Hawaii State vessel registration or U. S. Coast Guard documentation of boats.

8. Maintains cross reference card files by vessel and document or State registration numbers.

9. Exercises supervision over and administers the terms of existing leases or permits affecting the small boat harbor.

10. Issues warning memorandums to violators of WTFD Rules and Regulations. Reports habitual violators to Harbor Security Unit Supervisor for issuance of citations as necessary.

11. Provides information and data and assists the Attorney General, State of Hawaii, in preparing legal action required in the effective management of the Harbors.

12. Performs other related duties as required.

B. Financial 25%

Performs specific fiscal functions in accordance with Department of Accounting and General Services, Department of Transportation and WTFD policies and procedures.

1. Collects mooring, parking, rental, water use, locker, electricity and miscellaneous fees.

2. Prepares and issues billing requests (instructions) covering new accounts or changes to current accounts; makes account adjustments as necessary.

3. Prepares a daily summary of receipts and forwards same to the Division Fiscal Office for final billing and processing.

III. CONTROLS OVER THE POSITION

This position is under the general direction and supervision of the Harbor Master.

IV. QUALIFICATION REQUIREMENTS OF THE WORK

1. Six years of progressively responsible work experience of which one year shall have been in a supervisory, administrative, or management position, preferably in harbor operations and graduation from high school, or (2) any equivalent combination of experience and training.

2. Knowledge of principles and practices of supervision; property management methods and practices; methods practice and techniques involving harbor operations.

3. Ability to plan, layout, assign, direct, supervise and review the work of others, acquire a good understanding of the laws, rules, regulations, policies and practices, governing the operation of a Commercial Harbor; establish and maintain effective working relationship with tenants, civic and public organizations, associations, officials, and the general public.

4. Persons seeking appointment to positions in this class must meet the health and physical condition standard deemed necessary and proper for performance of the duties.

SPECIAL INFORMATION:

1. Kewalo Basin consists of 539,600 square feet of area, with 124 berths and 130 boats of all sizes. There is a boat waiting list consisting of over 100 boats of all sizes waiting to go on a commercial basis when berths are available. There is a comfort station facility with two heads and two showers.

2. Kewalo Basin Annex:

a. Pier 7 (Honolulu Harbor) consists of 40,825 square feet of area with berthing for one (1) large cruise boat (150' +) and four (4) smaller vessels engaged in cruise or charter business.

Position No. 6648
Harbor Attendant III SR-12

BREAKDOWN IN MONIES RECEIVED FROM THESE HARBOR FACILITIES (FY 1978):

Services:	
Wharfage	$ 10,573
Dockage	1,688
Mooring Charges	115,558
Other	250
Total	$129,239
Rentals:	
Wharf Space and Land	$136,172
Auto Parking (less meters)	27,194
Total Rentals	$163,336
Others:	
Sale of Utilities	$ 5,521
Permits to Vendors	162,645
Interest	526
Miscellaneous	1,646
Total Others	$170,338
Total Revenues	$462,913

NOTE: 1. Water charges do not include meters servicing Amfac Marine, U of H Marine Programs or National Marine Fisheries.

2. Automobile parking fees are for decals and permits issued and do not include revenues realized from parking meters.

DPS 206
Rev. 9/1/65

Date Received, DPS

STATE OF HAWAII
DEPARTMENT OF PERSONNEL SERVICES

POSITION CLASSIFICATION FORM

1. POSITION NO. 6648
2. TYPE OF POSITION:
   A. Permanent X
   B. Temporary ___
   C. Full-time X
   D. Part-time ___

3. Present Class Title, Salary Range
   Harbor Attendant III SR12 BU03
4. Name of Incumbent
   Lawrence R. Costa
5. Geographic Location
   Honolulu, Hawaii
6. Organizational Location:
   A. Department
   Transportation
   B. Division
   Water Transportation Facilities
   C. Branch or Office
   Oahu District
   D. Section
   Commercial Harbors
   E. Unit
   Kewalo Basin
7. Recommended Class Title, Salary Range

8. Reason for Submittal:
   A. ☐ Initial Allocation
      1. ☐ Replaces Position No. ___
      2. ☐ Additional and Identical To Pos. No. ___
   B. ☐ Reallocation
   C. ☒ Other Reason (Specify)
   DPS Request

9. "I certify that the attached is a complete and accurate description of the duties and responsibilities of this position."

   A. Signature of Employee — Date 5/21/79
   B. Signature of Supervisor — Date 5/21/79
   C. Signature of Division Chief — Date OCT 25 1979
   for Signature of Department Director — Date 11/28/79

Assigned Duties and Responsibilities:
Complete and attach a description of the duties and responsibilities assigned the position.

CLASSIFICATION ACTION TAKEN	
Class Title, Series Code and Salary Range.	Effective Date*
Harbor Agent IV, 8.691, SR-16, BU-03	12/1/79

Classifier

Date

for Director of Personnel Services

6/24/83
Date

* The effective date applies only to the classification of the position. The incumbent, if any, must meet the qualifications now applicable to the position prior to effectuation of any payroll change. Should there be an incumbent, therefore, the originating department must submit the proper forms for approval of the qualifications of the incumbent within 10 days. In the event there has been a change of incumbent subsequent to the effective date for the classification action, the originating department should also determine whether the same duties and responsibilities have been assigned as when the description was submitted before requesting approval of the qualifications of a later incumbent.

Position Description
Position No. 6648
Harbor Attendant III SR-12

I. INTRODUCTION

Under the general supervision of the Honolulu Harbor Master, Position No. 1044, Water Transportation Facilities Division (WTFD), manages, operates and maintains Kewalo Basin and Piers 7, 15, 17, and 18 (Honolulu Harbor). Supervises the activities of an assistant Harbor Attendant I (Position No. 30135). Provides for the receipt and deposit of various fees, and performs various clerical work attendant to the functioning of a commercial harbor. Performs other duties as required.

II. MAJOR DUTIES AND RESPONSIBILITIES

A. Management--Under the direction of the Honolulu Harbor Master, WTFD: 50%

1. Manages, operates and maintains the Kewalo Basin, an area consisting of 539,600 square feet; and Piers 7, 15, 17 and 18 (Honolulu Harbor) consisting of 137,000 square feet. Interprets and enforces WTFD Rules and Regulations pertinent to the operational efficiency of Kewalo Basin and Piers 7, 15, 17 and 18; provides pertinent administrative and operational services to boat owners, general public and all interested agencies leasing or occupying State-owned facilities or property within the confines of Kewalo Basin and Piers 7, 15, 17 and 18.

2. Exercises direct supervision over an assistant Harbor Attendant I. Provides guidance and direction in the accomplishment of day-to-day activities relative to the administration of Kewalo Basin and Piers 7, 15, 17 and 18 (Honolulu Harbor).

3. Prepares and submits a monthly watch schedule to provide for a seven-day a week presence of a WTFD representative at Kewalo Basin.

4. Develops and implements various local managerial policies, plans and procedures.

5. Maintains current assignments of berths through the preparation and typing of current and renewed mooring agreements.

6. Maintains a current and accurate waiting list register for the berthing of various size boats; maintains a system for timely notification of berth availability when vacancy exists.

7. Maintains constant checking procedures for the validity of Hawaii State vessel registration or U. S. Coast Guard documentation of boats.

8. Maintains cross reference card files by vessel and document or State registration numbers.

9. Exercises supervision over and administers the terms of existing leases or permits affecting the small boat harbor.

10. Issues warning memorandums to violators of WTFD Rules and Regulations. Reports habitual violators to Harbor Security Unit Supervisor for issuance of citations as necessary.

11. Provides information and data and assists the Attorney General, State of Hawaii, in preparing legal action required in the effective management of the Harbors.

12. Performs other related duties as required.

B. Financial 25%

Performs specific fiscal functions in accordance with Department of Accounting and General Services, Department of Transportation and WTFD policies and procedures.

1. Collects mooring, parking, rental, water use, locker, electricity and miscellaneous fees.

2. Prepares and issues billing requests (instructions) covering new accounts or changes to current accounts; makes account adjustments as necessary.

3. Prepares a daily summary of receipts and forwards same to the Division Fiscal Office for final billing and processing.

4. Prepares bank deposit slips and makes regular deposits to the State of Hawaii account using armored car service or making personal deposits.

C. General

1. Notifies all affected agencies of expected time of arrival (ETA) of vessels from foreign and domestic ports.

2. Logs actual arrival and departure times in Kewalo Basin of Hawaii State registered commercial boats home based on Neighbor Islands.

3. Maintains small craft advisory information for the boating and general public.

4. Reads, records and furnishes monthly water meter readings to Division Fiscal Office for reconciliation purposes.

5. Records and furnishes Division Fiscal Office with total tonnage of frozen fish unloaded from foreign vessels at Kewalo Basin; when requested, furnishes work accomplishment reports of participating stevedoring firms.

6. Maintains inventory of office and janitorial supplies and is responsible for their accountability and authorized use.

7. Maintains daily time log and submits attendance reports, time reports, and personal automobile mileage voucher reports on the 15th and the last day of each month as required. Insures assistant submits required personnel accounting reports as required.

8. Receives and processes inquiries from boat owners or interested parties requesting berthing information and questions pertaining to Rules and Regulations and Tariff No. 4.

9. Processes maintenance requirements through the Commercial Harbors Operations Office to the Maintenance Section.

10. Confers with Oahu District Manager, Harbor Master and Office Manager's Office when necessity arises.

III. CONTROLS OVER THE POSITION

This position is under the general direction and supervision of the Harbor Master.

IV. QUALIFICATION REQUIREMENTS OF THE WORK

1. Six years of progressively responsible work experience of which one year shall have been in a supervisory, administrative, or management position, preferably in harbor operations and graduation from high school, or (2) any equivalent combination of experience and training.

2. Knowledge of principles and practices of supervision; property management methods and practices; methods practice and techniques involving harbor operations.

3. Ability to plan, layout, assign, direct, supervise and review the work of others, acquire a good understanding of the laws, rules, regulations, policies and practices, governing the operation of a Commercial Harbor; establish and maintain effective working relationship with tenants, civic and public organizations, associations, officials, and the general public.

4. Persons seeking appointment to positions in this class must meet the health and physical condition standard deemed necessary and proper for performance of the duties.

SPECIAL INFORMATION:

1. Kewalo Basin consists of 539,600 square feet of area, with 124 berths and 130 boats of all sizes. There is a boat waiting list consisting of over 100 boats of all sizes waiting to go on a commercial basis when berths are available. There is a comfort station facility with two heads and two showers.

2. Kewalo Basin Annex:

a. Pier 7 (Honolulu Harbor) consists of 40,825 square feet of area with berthing for one (1) large cruise boat (150' +) and four (4) smaller vessels engaged in cruise or charter business.

b. Pier 15 (Honolulu Harbor) consists of 23,800 square feet of area with berthing for two (2) 80' steel hulled fishing vessels, 10-12 various sized sampan fishing boats all engaged as commercial fishing boats.

c. Piers 17 and 18 (Honolulu Harbor) encompass 72,500 square feet of area with loading/unloading facilities and berthing of over 1000 linear feet for mooring fishing vessels (approximately fifteen (15) boats of medium size.

BREAKDOWN IN MONIES RECEIVED FROM THESE HARBOR FACILITIES (FY 1978):

Services:	
Wharfage	$ 10,573
Dockage	1,688
Mooring Charges	115,558
Other	250
Total	$129,239
Rentals:	
Wharf Space and Land	$136,172
Auto Parking (less meters)	27,194
Total Rentals	$163,336
Others:	
Sale of Utilities	$ 5,521
Permits to Vendors	162,645
Interest	526
Miscellaneous	1,646
Total Others	$170,338
Total Revenues	$462,913

NOTE: 1. Water charges do not include meters servicing Amfac Marine, U of H Marine Programs or National Marine Fisheries.

2. Automobile parking fees are for decals and permits issued and do not include revenues realized from parking meters.

Appendix 5 Oahu Harbor District Environmental Inspection Report/ 2 CU Refuse Cans Collection

OAHU DISTRICT ENVIRONMENTAL INSPECTION REPORT

LOCATION:_____

DATE:_____ TIME:_____

ISSUE NUMBER/AMOUNT/REMARKS

_____

USED OIL SPILL_____
USED OIL BUCKETS_____
SCRAP METAL_____
APPLIANCES_____
BATTERIES_____
GAS CYLINDERS_____
PAINT_____
TIRES_____
MONOFILIMENT LINES_____
OTHERS_____

REPORTED BY:_____
ACTION ASSIGNED TO:_____
ACTION TAKEN:_____
STAGING AREA PIER 31:_____
STAGING AREA PIER 38:_____
OTHER:_____

2 CU. REFUSE CANS COLLECTION OAHU HARBOR DIVISION DATE: _____

CAN LOCATION (Can #)	OIL PR	ESENT	INSPECTED BY	TI	ME	REMARKS:
/EILDER SHOP						
BY-PLUMBER						
HRZ-PARKING LOT						
HRZ HEAVY MECH						
HRZ MECH MAKAI						
HRZ MECH MAUKA						
HRZ BREAK ROOM						
MATSON BREAK ROOM						
P. 37						
P. 36						
P. 31						
P. 33						
HARBOR PATROL						
P. 16 no cans						
HORIZON AUTO LOT						
P. 18						
CUSTODIAL						
F.)lid,lock bar & key.						
P.12 ADMIN.						
P. 11						
P. 2 OUTSIDE						
P. 2 INSIDE						
P. 1						
KALAELOA BACK						
KALAELOA FRONT						
PIER 18 OIL CONTAINMENT						
PIER 36 OIL CONTAINMENT						
PIER 19						

Document all abondon debris: Batteries, Tsuji, Metals, Oil , tanks, etc.

Appendix 6 Delivery of Recyclables

ON THIS DATE:_____ HAR/OCG

DELIVERED THE FOLLOWING TO:

RRR RECYCLING SERVICES HAWAII .
1130 SAND ISLAND ACCESS ROAD
HONOLULU, HAWAII 96819
PHONE # 808-682-5600 OR 808-371-0281

NUMBER OF T.V.'S_____

NUMBER OF COMPUTERS_____

NUMBER OF MONITORS _____

NUMBER OF PRINTERS _____

NUMBER OF LAP TOPS_____

REMARKS:

RECEIVED BY:_____

ON THIS DATE:_____

ON THIS DATE:_____ HAR/OCG

DELIVERED THE FOLLOWING BATTERIES TO:

MELROD COMPANY .
91-1085 ENTERPRISE AVENUE
KAPOLEI, HAWAII 96707

NUMBER OF CAR LEAD ACID
BATTERIES_____

NUMBER OF BOAT LEAD ACID
BATTERIES_____

NUMBER OF MOTOR CYCLE LEAD ACID
BATTERIES_____

REMARKS:

RECEIVED BY:_____

ON THIS DATE:_____

Appendix 7 Area Survey

Harbors Division

AREA SURVEY

☐ HAR-OC
☐ HAR-OC1
☐ HAR-OM
☐

FROM: ☐
☐

DATE: _____

LOCATION: _____

_____

DESCRIPTION/CONDITION:

☐
INITIATOR

ACTION TAKEN:

UNIT ASSIGNED TO: _____

ADDITIONAL INFO:

COMPLETION DATE: _____ SUPERVISOR _____

Appendix 8 Work Order

OM 5932

DOT 3-061
HAR-OM (REV. 1/00)

DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
MAINTENANCE SECTION

WORK ORDER

( ) CALL ( ) AREA SURVEY ( ) OTHER DATE: _____

☐ EMERGENCY ☐ RUSH ☐ SERVICE TIME: _____

REPORTED BY: _____ PHONE: _____

LOCATION: _____

_____

WORK DESCRIPTION: _____

_____

_____

TAKEN BY: SHOP ROUTING DATE

_____ 1. _____ _____

ASSIGNED BY: 2. _____ _____

_____ 3. _____ _____

DATE	LABOR	HOURS	RATE	COST
			LABOR COST	

DATE	MATERIAL/EQUIPMENT	QTY.	RATE	COST
			MATERIAL/EQUIPMENT COST	

Appendix 9 Storm Drain Inspection and Cleaning Forms for Honolulu and Kalaeloa Barbers Point Harbor/ Notes and Instructions

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID[1]	Drain Inlet Map Label[2]	Drain Inlet Type[3]	PhotoID Pre-Cleaning Location[4]	PhotoID Pre-Cleaning Detail[5]	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed[6]	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail[7]	Drain Inlet Structure Condition? (G/F/B)[8]	Are Repairs Required? (Yes/No)[9]	Inlet Pipe Material(s)[10]	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)[11]	Stenciled? (Yes/No)[12]	Other Inspection Notes
SDIHO010102	DI 0102														
SDIHO010112	DI 0112														
SDIHO010122	DI 0122														
SDIHO010152	DI 0152														
SDIHO010202	DI 0202														
SDIHO010208	DI 0208														
SDIHO010210	DI 0210														
SDIHO010212	DI 0212														
SDIHO010214	DI 0214														
SDIHO010224	DI 0224														
SDIHO010252	DI 0252														
SDIHO010254	DI 0254														
SDIHO010256	DI 0256														
SDIHO010258	DI 0258														
SDIHO010260	DI 0260														
SDIHO010262	DI 0262														
SDIHO010264	DI 0264														
SDIHO010266	DI 0266														
SDIHO010268	DI 0268														
SDIHO010270	DI 0270														
SDIHO010272	DI 0272														
SDIHO010274	DI 0274														
SDIHO010276	DI 0276														
SDIHO010278	DI 0278														
SDIHO010280	DI 0280														
SDIHO010282	DI 0282														
SDIHO010284	DI 0284														
SDIHO010286	DI 0286														
SDIHO010288	DI 0288														
SDIHO010290	DI 0290														
SDIHO010292	DI 0292														
SDIHO020508	DI 0508														
SDIHO020510	DI 0510														

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GIS Unique Drain Inlet ID[1]	Drain Inlet Map Label[2]	Drain Inlet Type[3]	PhotoID Pre-Cleaning Location[4]	PhotoID Pre-Cleaning Detail[5]	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed[6]	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail[7]	Drain Inlet Structure Condition? (G/F/B)[8]	Are Repairs Required? (Yes/No)[9]	Inlet Pipe Material(s)[10]	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)[11]	Stenciled? (Yes/No)[12]	Other Inspection Notes
SDIHO020512	DI 0512														
SDIHO020520	DI 0520														
SDIHO020522	DI 0522														
SDIHO020640	DI 0640														
SDIHO020642	DI 0642														
SDIHO020644	DI 0644														
SDIHO020650	DI 0650														
SDIHO020724	DI 0724														
SDIHO020804	DI 0804														
SDIHO020806	DI 0806														
SDIHO020808	DI 0808														
SDIHO020810	DI 0810														
SDIHO020812	DI 0812														
SDIHO020814	DI 0814														
SDIHO051002	DI 1002														
SDIHO051012	DI 1012														
SDIHO061042	DI 1042														
SDIHO061098	DI 1098														
SDIHO061100	DI 1100														
SDIHO061102	DI 1102														
SDIHO061116	DI 1116														
SDIHO061118	DI 1118														
SDIHO061162	DI 1162														
SDIHO081238	DI 1238														
SDIHO081240	DI 1240														
SDIHO081242	DI 1242														
SDIHO081244	DI 1244														
SDIHO081260	DI 1260														
SDIHO081282	DI 1282														
SDIHO081284	DI 1284														
SDIHO081286	DI 1286														
SDIHO081288	DI 1288														
SDIHO081504	DI 1504														

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO081506	DI 1506														
SDIHO091290	DI 1290														
SDIHO091292	DI 1292														
SDIHO091294	DI 1294														
SDIHO091296	DI 1296														
SDIHO091308	DI 1308														
SDIHO091310	DI 1310														
SDIHO091352	DI 1352														
SDIHO091356	DI 1356														
SDIHO091360	DI 1360														
SDIHO091362	DI 1362														
SDIHO091364	DI 1364														
SDIHO091384	DI 1384														
SDIHO091388	DI 1388														
SDIHO091390	DI 1390														
SDIHO091392	DI 1392														
SDIHO091394	DI 1394														
SDIHO091396	DI 1396														
SDIHO091420	DI 1420														
SDIHO091422	DI 1422														
SDIHO091424	DI 1424														
SDIHO091430	DI 1430														
SDIHO091432	DI 1432														
SDIHO091434	DI 1434														
SDIHO091452	DI 1452														
SDIHO091456	DI 1456														
SDIHO091458	DI 1458														
SDIHO091462	DI 1462														
SDIHO091464	DI 1464														
SDIHO091466	DI 1466														
SDIHO091470	DI 1470														
SDIHO091472	DI 1472														
SDIHO091474	DI 1474														

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(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID[1]	Drain Inlet Map Label[2]	Drain Inlet Type[3]	PhotoID Pre-Cleaning Location[4]	PhotoID Pre-Cleaning Detail[5]	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed[6]	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail[7]	Drain Inlet Structure Condition? (G/F/B)[8]	Are Repairs Required? (Yes/No)[9]	Inlet Pipe Material(s)[10]	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)[11]	Stenciled? (Yes/No)[12]	Other Inspection Notes
SDIHO091478	DI 1478														
SDIHO091480	DI 1480														
SDIHO091482	DI 1482														
SDIHO091486	DI 1486														
SDIHO091488	DI 1488														
SDIHO091490	DI 1490														
SDIHO091572	DI 1572														
SDIHO091604	DI 1604														
SDIHO091608	DI 1608														
SDIHO091610	DI 1610														
SDIHO091620	DI 1620														
SDIHO091622	DI 1622														
SDIHO091624	DI 1624														
SDIHO091626	DI 1626														
SDIHO091630	DI 1630														
SDIHO091648	DI 1648														
SDIHO091650	DI 1650														
SDIHO091652	DI 1652														
SDIHO091654	DI 1654														
SDIHO091656	DI 1656														
SDIHO092022	DI 2022														
SDIHO092030	DI 2030														
SDIHO111744	DI 1744														
SDIHO111764	DI 1764														
SDIHO111766	DI 1766														
SDIHO111794	DI 1794														
SDIHO111796	DI 1796														
SDIHO111798	DI 1798														
SDIHO111824	DI 1824														
SDIHO111834	DI 1834														
SDIHO111836	DI 1836														
SDIHO111854	DI 1854														
SDIHO152202	DI 2202														

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(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO182302	DI 2302														
SDIHO182304	DI 2304														
SDIHO182306	DI 2306														
SDIHO182308	DI 2308														
SDIHO182310	DI 2310														
SDIHO182320	DI 2320														
SDIHO182420	DI 2420														
SDIHO182422	DI 2422														
SDIHO182430	DI 2430														
SDIHO182432	DI 2432														
SDIHO182434	DI 2434														
SDIHO192410	DI 2410														
SDIHO192484	DI 2484														
SDIHO192504	DI 2504														
SDIHO192520	DI 2520														
SDIHO192544	DI 2544														
SDIHO192554	DI 2554														
SDIHO192562	DI 2562														
SDIHO202502	DI 2502														
SDIHO202580	DI 2580														
SDIHO202582	DI 2582														
SDIHO202584	DI 2584														
SDIHO202642	DI 2642														
SDIHO202646	DI 2646														
SDIHO202648	DI 2648														
SDIHO202650	DI 2650														
SDIHO202652	DI 2652														
SDIHO202654	DI 2654														
SDIHO202656	DI 2656														
SDIHO202658	DI 2658														
SDIHO202660	DI 2660														
SDIHO202662	DI 2662														
SDIHO202664	DI 2664														

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GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO202666	DI 2666														
SDIHO202670	DI 2670														
SDIHO202672	DI 2672														
SDIHO202674	DI 2674														
SDIHO202700	DI 2700														
SDIHO202704	DI 2704														
SDIHO212602	DI 2602														
SDIHO212612	DI 2612														
SDIHO212792	DI 2792														
SDIHO222802	DI 2802														
SDIHO222806	DI 2806														
SDIHO232438	DI 2438														
SDIHO232440	DI 2440														
SDIHO232442	DI 2442														
SDIHO232448	DI 2448														
SDIHO232678	DI 2678														
SDIHO232680	DI 2680														
SDIHO232682	DI 2682														
SDIHO232686	DI 2686														
SDIHO232812	DI 2812														
SDIHO232814	DI 2814														
SDIHO233002	DI 3002														
SDIHO233004	DI 3004														
SDIHO233006	DI 3006														
SDIHO233008	DI 3008														
SDIHO233010	DI 3010														
SDIHO233030	DI 3030														
SDIHO243072	DI 3072														
SDIHO243074	DI 3074														
SDIHO243202	DI 3202														
SDIHO243242	DI 3242														
SDIHO243502	DI 3502														
SDIHO243522	DI 3522														

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GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO263552	DI 3552														
SDIHO263554	DI 3554														
SDIHO263556	DI 3556														
SDIHO263572	DI 3572														
SDIHO263592	DI 3592														
SDIHO273632	DI 3632														
SDIHO293204	DI 3204														
SDIHO293206	DI 3206														
SDIHO293222	DI 3222														
SDIHO293224	DI 3224														
SDIHO293612	DI 3612														
SDIHO293620	DI 3620														
SDIHO293672	DI 3672														
SDIHO303810	DI 3810														
SDIHO303812	DI 3812														
SDIHO303814	DI 3814														
SDIHO303818	DI 3818														
SDIHO303820	DI 3820														
SDIHO303822	DI 3822														
SDIHO303824	DI 3824														
SDIHO303826	DI 3826														
SDIHO303842	DI 3842														
SDIHO303844	DI 3844														
SDIHO313902	DI 3902														
SDIHO313904	DI 3904														
SDIHO313922	DI 3922														
SDIHO313924	DI 3924														
SDIHO313954	DI 3954														
SDIHO313958	DI 3958														
SDIHO313962	DI 3962														
SDIHO313964	DI 3964														
SDIHO313966	DI 3966														
SDIHO313968	DI 3968														

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GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO313970	DI 3970														
SDIHO313972	DI 3972														
SDIHO314002	DI 4002														
SDIHO314012	DI 4012														
SDIHO314016	DI 4016														
SDIHO314040	DI 4040														
SDIHO314042	DI 4042														
SDIHO314044	DI 4044														
SDIHO314046	DI 4046														
SDIHO314048	DI 4048														
SDIHO314050	DI 4050														
SDIHO314060	DI 4060														
SDIHO314062	DI 4062														
SDIHO314064	DI 4064														
SDIHO314066	DI 4066														
SDIHO314068	DI 4068														
SDIHO314070	DI 4070														
SDIHO314072	DI 4072														
SDIHO314074	DI 4074														
SDIHO314076	DI 4076														
SDIHO314078	DI 4078														
SDIHO314080	DI 4080														
SDIHO314082	DI 4082														
SDIHO314100	DI 4100														
SDIHO314102	DI 4102														
SDIHO314104	DI 4104														
SDIHO314106	DI 4106														
SDIHO314108	DI 4108														
SDIHO314110	DI 4110														
SDIHO314112	DI 4112														
SDIHO314114	DI 4114														
SDIHO314116	DI 4116														
SDIHO314118	DI 4118														

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(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO314130	DI 4130														
SDIHO314132	DI 4132														
SDIHO314134	DI 4134														
SDIHO314136	DI 4136														
SDIHO314142	DI 4142														
SDIHO314152	DI 4152														
SDIHO314154	DI 4154														
SDIHO314160	DI 4160														
SDIHO314162	DI 4162														
SDIHO314390	DI 4390														
SDIHO314392	DI 4392														
SDIHO314396	DI 4396														
SDIHO314398	DI 4398														
SDIHO314400	DI 4400														
SDIHO314402	DI 4402														
SDIHO324182	DI 4182														
SDIHO324202	DI 4202														
SDIHO324204	DI 4204														
SDIHO324208	DI 4208														
SDIHO324232	DI 4232														
SDIHO324234	DI 4234														
SDIHO324236	DI 4236														
SDIHO324242	DI 4242														
SDIHO324244	DI 4244														
SDIHO324246	DI 4246														
SDIHO324260	DI 4260														
SDIHO324262	DI 4262														
SDIHO324264	DI 4264														
SDIHO324280	DI 4280														
SDIHO344302	DI 4302														
SDIHO344312	DI 4312														
SDIHO344322	DI 4322														
SDIHO344324	DI 4324														

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO344326	DI 4326														
SDIHO344328	DI 4328														
SDIHO344352	DI 4352														
SDIHO344362	DI 4362														
SDIHO344412	DI 4412														
SDIHO354452	DI 4452														
SDIHO354462	DI 4462														
SDIHO354472	DI 4472														
SDIHO354474	DI 4474														
SDIHO354476	DI 4476														
SDIHO364604	DI 4604														
SDIHO384606	DI 4606														
SDIHO384608	DI 4608														
SDIHO384704	DI 4704														
SDIHO384706	DI 4706														
SDIHO384708	DI 4708														
SDIHO384710	DI 4710														
SDIHO384806	DI 4806														
SDIHO384808	DI 4808														
SDIHO384812	DI 4812														
SDIHO384814	DI 4814														
SDIHO384816	DI 4816														
SDIHO384820	DI 4820														
SDIHO384822	DI 4822														
SDIHO384902	DI 4902														
SDIHO385102	DI 5102														
SDIHO385152	DI 5152														
SDIHO385154	DI 5154														
SDIHO395508	DI 5508														
SDIHO395510	DI 5510														
SDIHO395512	DI 5512														
SDIHO395514	DI 5514														
SDIHO395516	DI 5516														

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO395592	DI 5592														
SDIHO395596	DI 5596														
SDIHO395612	DI 5612														
SDIHO405608	DI 5608														
SDIHO405610	DI 5610														
SDIHO405708	DI 5708														
SDIHO405712	DI 5712														
SDIHO405722	DI 5722														
SDIHO405802	DI 5802														
SDIHO406562	DI 6562														
SDIHO416572	DI 6572														
SDIHO416574	DI 6574														
SDIHO416982	DI 6982														
SDIHO416984	DI 6984														
SDIHO416992	DI 6992														
SDIHO416994	DI 6994														
SDIHO417002	DI 7002														
SDIHO417004	DI 7004														
SDIHO417012	DI 7012														
SDIHO417014	DI 7014														
SDIHO426972	DI 6972														
SDIHO427032	DI 7032														
SDIHO427034	DI 7034														
SDIHO427036	DI 7036														
SDIHO427038	DI 7038														
SDIHO427040	DI 7040														
SDIHO427200	DI 7200														
SDIHO427202	DI 7202														
SDIHO427204	DI 7204														
SDIHO427206	DI 7206														
SDIHO427220	DI 7220														
SDIHO427222	DI 7222														
SDIHO427224	DI 7224														

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID[1]	Drain Inlet Map Label[2]	Drain Inlet Type[3]	PhotoID Pre-Cleaning Location[4]	PhotoID Pre-Cleaning Detail[5]	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed[6]	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail[7]	Drain Inlet Structure Condition? (G/F/B)[8]	Are Repairs Required? (Yes/No)[9]	Inlet Pipe Material(s)[10]	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)[11]	Stenciled? (Yes/No)[12]	Other Inspection Notes
SDIHO427226	DI 7226														
SDIHO427306	DI 7306														
SDIHO427308	DI 7308														
SDIHO427310	DI 7310														
SDIHO427312	DI 7312														
SDIHO427314	DI 7314														
SDIHO427316	DI 7316														
SDIHO427318	DI 7318														
SDIHO427320	DI 7320														
SDIHO427350	DI 7350														
SDIHO427352	DI 7352														
SDIHO427562	DI 7562														
SDIHO427582	DI 7582														
SDIHO427584	DI 7584														
SDIHO427602	DI 7602														
SDIHO427604	DI 7604														
SDIHO427606	DI 7606														
SDIHO427608	DI 7608														
SDIHO427610	DI 7610														
SDIHO427620	DI 7620														
SDIHO427622	DI 7622														
SDIHO427624	DI 7624														
SDIHO427626	DI 7626														
SDIHO427630	DI 7630														
SDIHO427640	DI 7640														
SDIHO427642	DI 7642														
SDIHO427700	DI 7700														
SDIHO427708	DI 7708														
SDIHO427710	DI 7710														
SDIHO427722	DI 7722														
SDIHO427724	DI 7724														
SDIHO427726	DI 7726														
SDIHO427728	DI 7728														

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO427730	DI 7730														
SDIHO427732	DI 7732														
SDIHO427734	DI 7734														
SDIHO427736	DI 7736														
SDIHO427738	DI 7738														
SDIHO427740	DI 7740														
SDIHO427742	DI 7742														
SDIHO427744	DI 7744														
SDIHO427746	DI 7746														
SDIHO427748	DI 7748														
SDIHO427750	DI 7750														
SDIHO427752	DI 7752														
SDIHO427754	DI 7754														
SDIHO427756	DI 7756														
SDIHO427758	DI 7758														
SDIHO427760	DI 7760														
SDIHO517802	DI 7802														
SDIHO517804	DI 7804														
SDIHO517806	DI 7806														
SDIHO517810	DI 7810														
SDIHO517852	DI 7852														
SDIHO517854	DI 7854														
SDIHO517882	DI 7882														
SDIHO517884	DI 7884														
SDIHO517886	DI 7886														
SDIHO517888	DI 7888														
SDIHO517890	DI 7890														
SDIHO517892	DI 7892														
SDIHO517894	DI 7894														
SDIHO517896	DI 7896														
SDIHO517898	DI 7898														
SDIHO517900	DI 7900														
SDIHO517902	DI 7902														

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO517926	DI 7926														
SDIHO517930	DI 7930														
SDIHO517932	DI 7932														
SDIHO517940	DI 7940														
SDIHO517942	DI 7942														
SDIHO517944	DI 7944														
SDIHO517962	DI 7962														
SDIHO517964	DI 7964														
SDIHO518002	DI 8002														
SDIHO518004	DI 8004														
SDIHO518010	DI 8010														
SDIHO518012	DI 8012														
SDIHO518026	DI 8026														
SDIHO518052	DI 8052														
SDIHO518054	DI 8054														
SDIHO518056	DI 8056														
SDIHO518058	DI 8058														
SDIHO518072	DI 8072														
SDIHO518074	DI 8074														
SDIHO518082	DI 8082														
SDIHO518084	DI 8084														
SDIHO518140	DI 8140														
SDIHO518146	DI 8146														
SDIHO518150	DI 8150														
SDIHO518152	DI 8152														
SDIHO518260	DI 8260														
SDIHO518262	DI 8262														
SDIHO518360	DI 8360														
SDIHO518364	DI 8364														
SDIHO518366	DI 8366														
SDIHO518370	DI 8370														
SDIHO518372	DI 8372														
SDIHO518374	DI 8374														

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID[1]	Drain Inlet Map Label[2]	Drain Inlet Type[3]	PhotoID Pre-Cleaning Location[4]	PhotoID Pre-Cleaning Detail[5]	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed[6]	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail[7]	Drain Inlet Structure Condition? (G/F/B)[8]	Are Repairs Required? (Yes/No)[9]	Inlet Pipe Material(s)[10]	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)[11]	Stenciled? (Yes/No)[12]	Other Inspection Notes
SDIHO518376	DI 8376														
SDIHO518378	DI 8378														
SDIHO518382	DI 8382														
SDIHO518400	DI 8400														
SDIHO518402	DI 8402														
SDIHO518404	DI 8404														
SDIHO518408	DI 8408														
SDIHO518410	DI 8410														
SDIHO518414	DI 8414														
SDIHO518416	DI 8416														
SDIHO518464	DI 8464														
SDIHO518466	DI 8466														
SDIHO518468	DI 8468														
SDIHO518470	DI 8470														
SDIHO518472	DI 8472														
SDIHO518474	DI 8474														
SDIHO518476	DI 8476														
SDIHO528510	DI 8510														
SDIHO528660	DI 8660														
SDIHO528662	DI 8662														
SDIHO528664	DI 8664														
SDIHO528680	DI 8680														
SDIHO528682	DI 8682														
SDIHO528684	DI 8684														
SDIHO528688	DI 8688														
SDIHO528690	DI 8690														
SDIHO528692	DI 8692														
SDIHO528710	DI 8710														
SDIHO528712	DI 8712														
SDIHO528714	DI 8714														
SDIHO528716	DI 8716														
SDIHO528718	DI 8718														
SDIHO528730	DI 8730														

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO528732	DI 8732														
SDIHO528734	DI 8734														
SDIHO528736	DI 8736														
SDIHO528738	DI 8738														
SDIHO528874	DI 8874														
SDIHO528876	DI 8876														
SDIHO528880	DI 8880														
SDIHO538668	DI 8668														
SDIHO538670	DI 8670														
SDIHO538672	DI 8672														
SDIHO538696	DI 8696														
SDIHO538698	DI 8698														
SDIHO538700	DI 8700														
SDIHO538792	DI 8792														
SDIHO538794	DI 8794														
SDIHO538796	DI 8796														
SDIHO538798	DI 8798														
SDIHO538868	DI 8868														
SDIHO538890	DI 8890														
SDIHO538902	DI 8902														
SDIHO538904	DI 8904														
SDIHO538906	DI 8906														
SDIHO538908	DI 8908														
SDIHO538910	DI 8910														
SDIHO538912	DI 8912														
SDIHO609114	DI 9114														
SDIHO609116	DI 9116														
SDIHO609118	DI 9118														
SDIHO609120	DI 9120														
SDIHO609156	DI 9156														
SDIHO609158	DI 9158														
SDIHO010162	DI 0162														
SDIHO010172	DI 0172														

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIHO020174	DI 0174														
SDIHO020176	DI 0176														
SDIHO020178	DI 0178														

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor (Open Channels)
(See Attached Notes Instructions on Completing this Form)

GIS Unique Open Channel ID[1]	Open Channel Map Label[2]	Drain Inlet Type[3]	PhotoID Pre-Cleaning Location[4]	PhotoID Pre-Cleaning Detail[5]	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed[6]	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail[7]	Open Channel Structure Condition? (G/F/B)[8]	Are Repairs Required? (Yes/No)[9]	Stenciled? (Yes/No)[12]	Other Inspection Notes
SDOHO010257	SDO 0257											
SDOHO010259	SDO 0259											
SDOHO010261	SDO 0261											
SDOHO010263	SDO 0263											
SDOHO010265	SDO 0265											
SDOHO010267	SDO 0267											
SDOHO010269	SDO 0269											
SDOHO010271	SDO 0271											
SDOHO010273	SDO 0273											
SDOHO010275	SDO 0275											
SDOHO010277	SDO 0277											
SDOHO010279	SDO 0279											
SDOHO010281	SDO 0281											
SDOHO010283	SDO 0283											
SDOHO010285	SDO 0285											
SDOHO010287	SDO 0287											
SDOHO010289	SDO 0289											
SDOHO010291	SDO 0291											
SDOHO020533	SDO 0533											
SDOHO020543	SDO 0543											
SDOHO020553	SDO 0553											
SDOHO020563	SDO 0563											
SDOHO081515	SDO 1515											
SDOHO202701	SDO 2701											
SDOHO202703	SDO 2703											
SDOHO232815	SDO 2815											
SDOHO293621	SDO 3621											
SDOHO293673	SDO 3673											
SDOHO314049	SDO 4049											
SDOHO314071	SDO 4071											

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor (Open Channels)
(See Attached Notes Instructions on Completing this Form)

GIS Unique Open Channel ID$_1$	Open Channel Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Open Channel Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDOHO314109	SDO 4109											
SDOHO314391	SDO 4391											
SDOHO324385	SDO 4385											
SDOHO344381	SDO 4381											
SDOHO354380	SDO 4380											
SDOHO354382	SDO 4382											
SDOHO385003	SDO 5003											
SDOHO385057	SDO 5057											
SDOHO385059	SDO 5059											
SDOHO385107	SDO 5107											
SDOHO395581	SDO 5581											
SDOHO395591	SDO 5591											
SDOHO395595	SDO 5595											
SDOHO405401	SDO 5401											
SDOHO405403	SDO 5403											
SDOHO518031	SDO 8031											
SDOHO518181	SDO 8181											
SDOHO518185	SDO 8185											
SDOHO518189	SDO 8189											
SDOHO518193	SDO 8193											
SDOHO518197	SDO 8197											
SDOHO518201	SDO 8201											
SDOHO518205	SDO 8205											
SDOHO518209	SDO 8209											
SDOHO518231	SDO 8231											
SDOHO518235	SDO 8235											
SDOHO518241	SDO 8241											
SDOHO518265	SDO 8265											
SDOHO518269	SDO 8269											
SDOHO518271	SDO 8271											

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor (Open Channels)
(See Attached Notes Instructions on Completing this Form)

GIS Unique Open Channel ID$_1$	Open Channel Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Open Channel Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDOHO518277	SDO 8277											
SDOHO518285	SDO 8285											
SDOHO518291	SDO 8291											
SDOHO528213	SDO 8213											
SDOHO528517	SDO 8517											
SDOHO528541	SDO 8541											
SDOHO528545	SDO 8545											
SDOHO528555	SDO 8555											
SDOHO528559	SDO 8559											
SDOHO528571	SDO 8571											
SDOHO528577	SDO 8577											
SDOHO528601	SDO 8601											
SDOHO528607	SDO 8607											
SDOHO528611	SDO 8611											
SDOHO528631	SDO 8631											
SDOHO528637	SDO 8637											
SDOHO528641	SDO 8641											
SDOHO528751	SDO 8751											
SDOHO528753	SDO 8753											
SDOHO528755	SDO 8755											
SDOHO528757	SDO 8757											
SDOHO528759	SDO 8759											
SDOHO528761	SDO 8761											
SDOHO528763	SDO 8763											
SDOHO528765	SDO 8765											
SDOHO528769	SDO 8769											
SDOHO528771	SDO 8771											
SDOHO528877	SDO 8877											
SDOHO538563	SDO 8563											
SDOHO538579	SDO 8579											

Appendix B: Storm Drain Inspection Cleaning Form for Honolulu Harbor (Open Channels)
(See Attached Notes Instructions on Completing this Form)

GIS Unique Open Channel ID$_1$	Open Channel Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Open Channel Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDOHO538583	SDO 8583											
SDOHO538585	SDO 8585											
SDOHO538613	SDO 8613											
SDOHO538617	SDO 8617											
SDOHO538619	SDO 8619											
SDOHO538643	SDO 8643											
SDOHO538647	SDO 8647											
SDOHO538649	SDO 8649											
SDOHO538651	SDO 8651											
SDOHO609165	SDO 9165											
SDOHO609181	SDO 9181											
SDOHO609185	SDO 9185											
SDOHO609189	SDO 9189											
SDOHO609190	SDO 9190											
SDOHO609191	SDO 9191											

Appendix B: Storm Drain Inspection Cleaning Form for Kalaeloa Barbers Point Harbor
(See Attached Notes Instructions on Completing this Form)

GIS Unique Drain Inlet ID$_1$	Drain Inlet Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Drain Inlet Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Inlet Pipe Material(s)$_{10}$	Inlet Pipe Diameter Sizes (Inches)	Inlet Pipe Condition(s) (G/F/B)$_{11}$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDIBP044102	DI 4102														
SDIBP055002	DI 5002														
SDIBP055202	DI 5202														
SDIBP055302	DI 5302														
SDIBP055502	DI 5502														
SDIBP055702	DI 5702														
SDIBP055902	DI 5902														
SDIBP066202	DI 6202														
SDIBP066502	DI 6502														
SDIBP066802	DI 6802														
SDIBP077002	DI 7002														
SDIBP077102	DI 7102														
SDIBP077115	DI 7115														
SDIBP077128	DI 7128														
SDIBP077202	DI 7202														
SDIBP077302	DI 7302														
SDIBP077402	DI 7402														
SDIBP077602	DI 7602														

Appendix B: Storm Drain Inspection Cleaning Form for Kalaeloa Barbers Point Harbor (Open Channels)
(See Attached Notes Instructions on Completing this Form)

GIS Unique Open Channel ID$_1$	Open Channel Map Label$_2$	Drain Inlet Type$_3$	PhotoID Pre-Cleaning Location$_4$	PhotoID Pre-Cleaning Detail$_5$	Was Cleaning Necessary? (Yes/No)	Type of Debris Removed$_6$	Estimate of Debris Removed (lbs)	PhotoID Post Cleaning Detail$_7$	Open Channel Structure Condition? (G/F/B)$_8$	Are Repairs Required? (Yes/No)$_9$	Stenciled? (Yes/No)$_{12}$	Other Inspection Notes
SDOBP05001A	SDO 001A											
SDOBP05002A	SDO 002A											
SDOBP05002B	SDO 002B											
SDOBP05002C	SDO 002C											
SDOBP05002D	SDO 002D											
SDOBP05002E	SDO 002E											
SDOBP05002F	SDO 002F											
SDOBP05002F	SDO 002F											
SDOBP05002G	SDO 002G											
SDOBP05002H	SDO 002H											
SDOBP05002I	SDO 002I											
SDOBP05002J	SDO 002J											
SDOBP05002K	SDO 002K											
SDOBP05002L	SDO 002L											
SDOBP0502A1	SDO 02A1											
SDOBP0502A1	SDO 02A1											
SDOBP0502B1	SDO 02B1											
SDOBP0502B1	SDO 02B1											
SDOBP0502C1	SDO 02C1											
SDOBP077131	SDO 7131											
SDOBP077133	SDO 7133											
SDOBP077135	SDO 7135											

Appendix B: Notes and Instructions for Storm Drain Inspection and Cleaning Forms

No.	Notes & Instructions
1	Drain Inlet ID refers to the DOT Harbors designated GIS identification number for each drain inlet & is identifiable on the listings provided to the Contractor.
2	Drain Inlet Map Label identifier corresponds to those labels for each drain inlet shown on the map books provided to the Contractor.
3	Drain Inlet Type refers to one of the following: Drain Inlet (DI), Catch Basin (CB), Trench Drain (TD) or Other Structure (O).
4	PhotoID for the Pre-Cleaning general location photograph should follow the corresponding naming nomenclature: DrainInletID_PreCln_Loc_Date (MM/DD/YY)_PhotographerInitials. Example, if the storm drain inlet 5935 was photographed in wide view to show location of the intlet and vicinity area on July 6, 2014 by John Doe then the ID would read :DI5935_PreCln_Loc_070614_JD.
5	PhotoID for Pre-Cleaning detail view photograph should follow the corresponding naming nomenclature: DrainInletID_PreCln_Det_Date (MM/DD/YY)_PhotographerInitials. Example, if the storm drain inlet 5935 was photographed to show detail of the inlet on July 6, 2014 by John Doe then the ID would read:DI5935_PreCln_Det_070614_JD.
6	Provide a list of debris primary composition such as: Dirt, Sediment, Sludge, Green Waste (trees, grass, etc.), Trash (wrappers, cups, paper, etc.).
7	PhotoID for photograph taken after cleaning activity should follow the corresponding naming nomenclature: DrainInletID_PostCln_Det_Date (MM/DD/YY)_PhotographerInitials. Example, if the storm drain inlet 5935 was photographed after cleaning to show a detailed view of the inlet after cleaning on July 6, 2014 by John Doe then the ID would read: DI5935_PostCln_Det_070614_JD. For this photograph use approximately the same orientation and zoom as the pre-cleaning detail photograph.
8	Structure condition: Note the condition of the drain inlet structure in accordance with the C&C Honolulu criteria of Good, Fair or Bad as follows; G = Good condition indicating that no deterioration or wear or signs of corrosion on steel rungs is exhibited; F = Fair condition indicating that concrete is chipped or worn with no exposed rebar and steel rungs exhibit corrosion; and B = Bad condition when the drain inlet structure has experienced significant deterioration including large cracks in the concrete, exposed rebar and/or broken drain pipes.
9	Are repairs required? If the Contractor notices obvious compromise of the drain inlet structure (rust, broken parts, etc.) then this field should be entered as "Yes".
10	Record storm drain inlet pipe material (s) such as reinforced concrete (RC), cast iron (CI), HDPE, etc.
11	Record the inlet pipe conditions as Good (G), Fair (F) or Bad (B) based on the C&C Honolulu criteria explained in Note 8.
12	The Contractor should note (Yes/No) as to whether stenciling is present and clearly legible at the drain inlet.

Appendix 10 Illicit Discharge Reporting Form

Reset Form | Print Form

PROTECT OUR WATER MĀLAMA I KA WAI

Hawaii Department of Transportation – Harbors Division

Suspected Illicit Discharge Reporting Form

General Information: Use this form to report a suspected illicit discharge. If you are unsure, please contact your supervisor or HAR-EE. Examples of illicit discharges: uncontained vehicle/equipment/building/sidewalk washing, sink discharging directly to ground or storm drain inlet, petroleum spills/sheens, unpermitted vessel discharges, uncontained vessel painting/chipping/sandblasting/cleaning, etc.

Observer Information

Name:			
Office Code:		Telephone Number:	
Report Date:			

Description of Suspected Illicit Discharge

Address or Location:		Time and Date:	
Description: (Include Substance and Amount, if known)			

Media into which the discharge occurred:

☐ Air ☐ Natural Soil ☐ Concrete/Asphalt Pavement ☐ Stream ☐ Ocean ☐ Other:_____

Responsible Party: (if known)	
Cause of Discharge: (if known)	
Clean-up Actions: (if applicable)	
Notifications Made:	

Please forward completed form and/or picture(s) to HAR-EE office. Fax Number: (808) 587-1964

Point of Contact for Reporting

Agency	Telephone Number
Harbor Traffic Control (Aloha Tower)	(808) 587-2076, (808) 368-5993 (Cellular)
Hawaii Department of Transportation Harbors Division, Engineering Environmental Section [HAR-EE]	(808) 587-1962, (808) 587-1976, (808) 587-1960

Additional Follow-up By HAR-EE (to be filled by HAR-EE):

Appendix 11 Witness Statement Form

State of Hawaii / Department of Transportation / Harbors Division
WITNESS STATEMENT FORM

nent of:	Date of Incident:	Type of Violation:
ess:	Employer:	Occupation:
Work Phone:	Cell Phone:	Fax No.:

Please give a detailed statement answering all of the following questions:

1. DATE and TIME it happened?
2. WHERE did it happen?
3. WHO was involved?
4. What WITNESSES do you know of?
5. WHAT happened?
6. HOW did it happen?
7. WHY did it happen? (prior event)
8. Did you IDENTIFY the vessel?
9. Did you IDENTIFY any suspect(s)?
10. Did you identify any violations?
11. Any photographs or video taken??
12. ANY OTHER relevant information?

The undersigned freely and voluntarily provides the following statement:

I have read this statement preparedy by _____ which consists of this typed/handwritten page and ____ continuation page(s), and have been given the opportunity to make corrections thereon. I attest that this statement is true and correct to the best of my knowledge, and that I gave this statement freely and voluntarily without coercion and promise of reward.

_____ Witness' Signature

_____ Investigator's Signature

Date: _____ Time:_____

Date: _____ Time:_____