

SECTION 5
Post-Construction Storm Water Management Program

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(Permit Part D.1.e.)

I. Introduction

The purpose of the US Army Garrison, Hawaii (USAG-HI) Post-Construction Storm Water Management Program is to ensure that permanent post-construction controls, including Low Impact Development (LID) practices, are implemented to prevent or minimize the discharge of pollutants of concern into the garrison's Municipal Separate Storm Sewer System (MS4). LID pertains to storm water management practices which aim to mimic a site's predevelopment hydrology by minimizing ground disturbance and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating storm water runoff close to its source. LID practices treat storm water as a resource rather than a waste product.

The goal of the program is to ensure that for new development and redevelopment projects that result in a land disturbance of one (1) acre or more and smaller projects that have the potential to discharge pollutants to the MS4, permanent controls are in place to prevent or minimize water quality impacts to the Maximum Extent Practicable (MEP). To achieve this goal, USAG-HI will implement the following Best Management Practices (BMPs):

- Establish standards to define the requirements for permanent post-construction BMPs and LID.
- Establish a procedure for the review of project documents for permanent post-construction BMPs.
- Implement an Asset Management System (AMS) to track the inspection and maintenance of permanent post-construction BMPs.
- Provide educational material on permanent post-construction BMP and LID requirements to Directorate of Public Works (DPW) Engineering Division, Operations and Maintenance Division, and Master Planning Division staff.
- Provide annual training to DPW staff responsible for inspecting permanent post-construction BMPs and LID.

II. Legal Authority

Section 438 of the Energy Independence and Security Act of 2007 (EISA Section 438) provides the legal authority establishing strict storm water design requirements for Federal development and redevelopment projects. Under these requirements, "any development or redevelopment project

involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.”

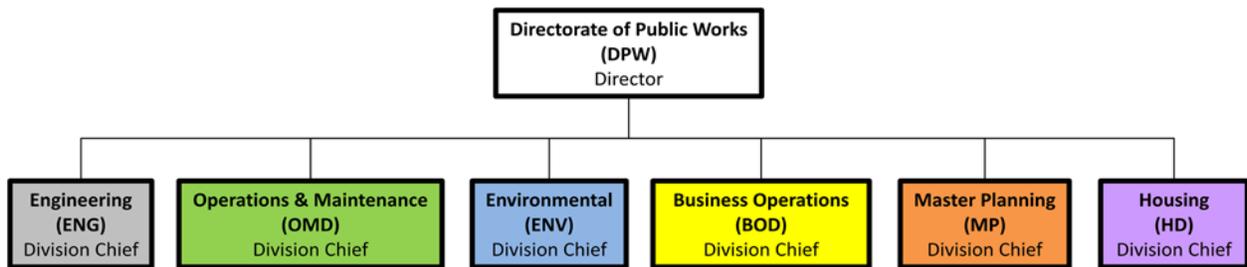
Resulting from the legislation, a Deputy under Secretary of Defense, Installation and Environment memorandum defined Department of Defense (DoD) policy for implementation of EISA Section 438 using LID techniques and required the policy be incorporated into applicable DoD Unified Facilities Criteria (UFC). The UFC system provides planning, design, and construction criteria for DoD projects.

On September 21, 2015 the Director of Operations of the Office of Assistant Chief of Staff for Installation Management (OACSIM) signed a memorandum, “*Army Stormwater Management Using Low Impact Development*” that states effective fiscal year 2015, all Army funded projects greater than 5000 square feet will incorporate LID BMPs as a means to manage storm water runoff. A copy of the memo can be found at **PC Appendix A**.

III. Roles and Responsibilities

Each federal agency or department is responsible for ensuring compliance with EISA Section 438. Since DPW is responsible for reviewing and approving development and redevelopment projects within the USAG-HI, DPW is also responsible to ensure compliance with DoD policy for implementation of EISA Section 438 using LID techniques. Additionally, DPW is responsible for managing and implementing the USAG-HI National Pollutant Discharge Elimination System (NPDES) MS4 permit, which includes developing and implementing the Storm Water Management Plan (SWMP) and associated Post-Construction Storm Water Management Program.

The USAG-HI is the overseeing command for the Directorate of Public Works (DPW) as well as multiple other directorates. DPW is responsible for managing and implementing the NPDES MS4 permit. DPW is composed of several divisions: Business Operations Division (BOD), Engineering (ENG) which comprise of Construction and Utilities branches, Environmental (ENV) which comprise of Compliance and Conservation branches, Master Planning (MP), Operations and Maintenance Division (OMD), and Housing (HD). The chart below is a simplified organizational chart of DPW where the color and departmental codes are used to identify the responsible divisions for executing specific responsibilities detailed in section IV, *Procedures and Best Management Practices*. A complete detailed organizational chart can be found in the **INTRO Appendix C**.



As a partner federal agency, the US Army Corps of Engineers (USACE) serves as a primary design, construction, and project management consultant to DPW and is therefore responsible to ensure compliance with DoD policy for implementation of EISA Section 438 using LID methods. The role of the USACE as DPW’s project-specific technical expert is described in following sections.

IV. Program Elements and Best Management Practices

DPW has identified and selected the following BMPs to achieve the goals of the program and to ensure that permanent post-construction controls, including LID practices, are in place to prevent or minimize the discharge of pollutants of concern into the garrison’s MS4.

BMP# PC – 1:

Standards Revisions to Address Post-Construction BMPs and LID.

Permit Part D.1.e.(1)

Divisions responsible:



It is important for proponents and designers of new development or redevelopment within USAG-HI to understand the requirements for permanent post-construction BMPs and LID. Standards are in place to define these requirements and are accessible to everyone in the DoD, including DPW and USACE personnel.

The guidance signed by the Director of Operations OACSIM on September 21, 2015, titled, “*Army Stormwater Management Using Low Impact Development*” that states effective fiscal year 2015, all Army funded projects greater than 5000 square feet will incorporate LID BMPs as a means to manage storm water runoff also includes a plan and procedures to implement the guidance. A copy of the implementation plan can be found at **PC Appendix B**.

The plan's intent is to provide an initial description of the following: criteria for requiring implementation of LID, quantitative criteria for a specific design storm to be managed by LID techniques, infeasibility criteria for circumstances in which a waiver could be granted for the LID requirements, and a list of alternatives that may be implemented when an LID waiver is granted. Additionally, the plan includes a LID planning and design example checklist and draft LID.

As a follow up to the aforementioned plan and also required by the USAG-HI NPDES MS4 permit, the USAG-HI standards for addressing post-construction BMPs and LID requirements were submitted to the HDOH in April 2015. The DoD Unified Facilities Criteria (UFC), Low Impact Development, UFC 3-210-10, dated 15 November 2010 are the established USAG-HI standards (**PC Appendix C**). The criteria previously described in the *Plan for Requiring LID in the Standards* originate from UFC 3-210-10. The DoD UFC program represents the facilities and infrastructure component of the Defense Standardization Program. UFC documents provide planning, design, construction, sustainment, restoration, and modernization criteria, and apply to the Military Departments, the Defense Agencies, and the DoD Field Activities. UFC are distributed only in electronic media and are effective upon issuance.

In addition to the UFC the Army also adopted a post construction LID user guide titled, "*Army Low Impact Development Technical User Guide*," prepared by the U.S. Army Corps of Engineers, January 2013, available in **PC Appendix D**. The guide discusses BMP selection, installation and maintenance.

The primary responsibility for reviewing, updating, and administering UFC 3-210-10 belongs to the USACE, Naval Facilities Engineering Command, and the Air Force Civil Engineer Center. However, related responsibilities exist for DPW ENG, HD, MP, and ENV.

DPW ENG provides engineering technical expertise and guidance, design review, construction management, and project management for DPW projects on USAG-HI installations. DPW ENG is responsible for being the primary point of contact to answer engineering or technical questions on the standards. If it is determined that installation specific supplemental criteria or technical guidance are needed, DPW ENG will be responsible to develop, implement, and administer such standards.

DPW HD is responsible to provide engineering technical expertise, design review, and project management for housing projects on USAG-HI installations. As needed, DPW HD is responsible to consult with DPW ENG regarding engineering or technical questions on the standards.

DPW MP is in charge of planning and programming and plays the main role in developing the installation wide strategy for storm water management that includes LID to the maximum extent possible. DPW MP is responsible to have an understanding of the standards and to ensure the standards are part of the programming process.

DPW ENV develops and has oversight of the USAG-HI SWMP. DPW ENV is responsible for being the primary point of contact to answer questions about environmental regulations referenced in the standards.

BMP# PC – 2:
Plan Review for Post-Construction BMPs.
Permit Part D.1.e.(2)

Divisions responsible:



Design-bid-build projects shall not be advertised for construction and shall not be awarded contracts for construction until the project design has been reviewed and approved to ensure that appropriate permanent post-construction BMPs, including LID practices, have been incorporated in the design and bid packages. Design-build projects shall be reviewed and approved in the same way prior to execution. If during the review process a project is found to not include appropriate permanent post-construction BMPs the project shall not proceed unless a waiver is granted by DPW based on specific documentation demonstrating that permanent post-construction BMPs are not feasible. Projects that will include installation of permanent post-construction BMPs shall require documentation of appropriate requirements for the BMPs future continued maintenance.

To ensure the above conditions are met, DPW will follow the guidance signed by the Director of Operations OACSIM on September 21, 2015, titled, “*Army Stormwater Management Using Low Impact Development*”. A copy of the guidance can be found at **PC Appendix B**.

DPW ENG and DPW MP are responsible for developing and implementing the overarching LID guidance that requires technical review and approval to ensure that suitable permanent post-construction BMPs, including LID practices, have been included in design-bid-build and design-build project documents. DPW ENG and DPW MP shall conduct technical review and approval in accordance with the established USAG-HI standards, i.e. UFC 3-210-10. It is also DPW ENG and DPW MP’s responsibility to develop and implement a waiver process for projects that do not include appropriate permanent post-construction BMPs. DPW ENG and DPW MP shall not allow such projects to proceed unless the engineering reviewer approves a waiver based on specific documentation showing that permanent post-construction BMPs are infeasible. DPW ENG and DPW MP project managers are responsible to ensure that the guidance and waiver process are being followed for their projects. Additionally, DPW ENG is responsible to provide project review information to DPW ENV upon request.

DPW HD has the responsibility to coordinate with DPW ENG and DPW MP on the portion of the LID guidance establishing technical review of housing project documents for appropriate permanent post-construction BMPs. DPW HD project managers are responsible to ensure that their housing projects are being reviewed and approved by DPW ENG according to the SOP and waiver process. DPW HD is responsible to provide project review information to DPW ENV upon request.

DPW OMD Engineering Branch is responsible for developing and implementing the portion of the LID guidance that requires OMD review to verify that project documents provide appropriate requirements for future continued maintenance of planned permanent post-construction BMPs. DPW OMD Engineering Branch is responsible to ensure their portion of the LID guidance is properly coordinated with DPW ENG such that the OMD review process is completed prior to projects being advertised for construction or awarded contracts. DPW OMD Engineering Branch is responsible to provide project review information to DPW ENV upon request.

DPW ENV has the responsibility to report on the LID guidance development and implementation to HDOH. DPW ENV is responsible to collect project review information and data from the other divisions to include in Annual Reports or to satisfy other SWMP reporting requirements.

BMP# PC – 3:

Implement a Tracking System for Post-Construction BMP Inspection and Maintenance.

Permit Part D.1.e.(3)

Divisions responsible:



As required by the USAG-HI NPDES MS4 permit, an Asset Management System (AMS) will be implemented to track inspections and maintenance of permanent post-construction BMPs. It is important that plans be made for long-term operation and maintenance of permanent post-construction BMPs because if maintenance is inadequate or ceases the BMPs will fail.

DPW's AMS shall be developed, implemented, and managed to track the frequency of inspections and maintenance of permanent post-construction BMPs. All storm water treatment and LID BMPs shall be inspected at least annually for proper operation. Maintenance shall be performed as needed to ensure proper operation. The AMS shall include standard project information (e.g. project name, owner, location, start and end dates, etc.) as well as the following data:

- Type and number of LID practices
- Type and number of source control BMPs
- Type and number of treatment control BMPs

- Latitude and longitude coordinates of controls using a consistent datum (e.g. NAD83)
- Photographs of controls
- Operation and maintenance requirements
- Frequency of inspections
- Frequency of maintenance

Operating and maintaining permanent post-construction BMP assets, especially in a constrained budget environment, will require a concerted effort across the directorate. Every division in DPW has responsibilities related to implementing and AMS and supporting its success. These responsibilities are described below.

DPW OMD's function is to ensure proper operation and maintenance of DPW-owned infrastructure. Because of this, DPW OMD is responsible to perform inspection and maintenance of permanent post-construction BMPs; to be the primary proponent for the development, implementation, and upkeep of an AMS to track inspection and maintenance actions; and to perform data entry into the AMS. It is DPW OMD's responsibility to determine the type of AMS to implement and whether the AMS will be managed by in-house OMD staff or through a contract. If it is determined a contract is needed, DPW OMD as proponent is responsible to obtain and provide information needed to develop the contract and write the scope of work; fund the contract; and work collaboratively with the DPW BOD Service Contracts Branch and other DPW offices as necessary to properly execute and maintain the contract.

DPW BOD has the responsibility to assist DPW OMD with in-house technical systems and database support for setting up an AMS and, if a contract is needed, to assist with contract management and execution. As needed, DPW BOD is also responsible to assist DPW ENG with coordinating the receipt and distribution of as-built drawings and operation and maintenance (O&M) manuals to be provided to DPW OMD for reference and input into the AMS.

DPW ENG is responsible for tracking the design and construction of permanent post-construction BMPs for DPW projects and obtaining necessary data for input into the AMS such as the type, number, and location of BMPs. DPW ENG is also responsible for performing project management to ensure that as-built drawings and O&M manuals for permanent post-construction BMPs are received from consultants/contractors in a timely manner and provided to DPW OMD for reference and input into the AMS.

DPW MP is responsible to ensure permanent post-construction BMPs are included on documents for Transfer and Acceptance of DoD Real Property (DD Form 1354s) and to assign identification numbers to the BMPs as needed for appropriate classification in the AMS. DPW MP is also responsible to ensure permanent post-construction BMP features are drawn and properly labeled in DPW's Geographic Information System (GIS).

DPW HD is responsible for tracking the design and construction of permanent post-construction BMPs for housing projects and obtaining necessary data for input into the AMS such as the type, number, and location of BMPs. Since IPC may be responsible for inspection and maintenance of most or all of the housing project BMPs, DPW HD is responsible for obtaining inspection and maintenance data from IPC and coordinating data entry into the AMS with DPW OMD and GIS data with DPW MP. Alternately, DPW HD is responsible to ensure IPC develops, implements, and upkeeps an IPC-managed AMS to track IPC's inspection and maintenance actions. If IPC manages its own AMS, it is DPW HD's responsibility to promptly obtain and provide IPC data to requesting DPW divisions at any time the data may be requested.

DPW ENV has the responsibility to report on the AMS development and implementation to HDOH. DPW ENV is responsible to collect permanent post-construction BMP inspection and maintenance data from the other divisions to include in Annual Reports or to satisfy other SWMP reporting requirements.

BMP# PC – 4:

Education and Training for Post-Construction BMP and LID Requirements to DPW Project Proponents
Permit Part D.1.e.(4)(i)

Divisions responsible:



It is essential that the appropriate staff are aware of and informed about the requirements for permanent post-construction BMPs and LID. In order to achieve this goal, education and outreach material covering permanent post-construction BMP requirements will be provided to DPW project management personnel. According to their functions, various DPW divisions are responsible to provide expertise and collaborate on the development of the educational material. DPW project proponents will need to review the educational material, apply the information to projects they manage, and disseminate the information as needed to project consultants and contractors.

DPW ENV is responsible for coordinating and distributing the educational material to the other DPW divisions. DPW ENV is also responsible to provide information in the educational material on the environmental regulatory requirements for permanent post-construction BMPs and LID.

DPW ENG has the responsibility to provide information in the educational material on the selection, design, and installation of permanent post-construction BMPs and LID.

DPW OMD is responsible to provide information in the educational material on the operation and maintenance of permanent post-construction BMPs and LID.

BMP# PC – 5:
Education and Training for Post-Construction BMP Inspectors.
Permit Part D.1.e.(4)(ii)

Divisions responsible:



Well trained staff are essential to ensure proper operation and maintenance of permanent post-construction BMPs and LID. Because permanent post-construction BMPs and LID are technologies just beginning to be implemented on USAG-HI installations, DPW personnel have not been trained on how to inspect these new technologies to ensure they are adequately maintained and functioning properly. Therefore, annual training shall be provided to DPW staff responsible for inspecting permanent post-construction BMPs and LID.

Since local industry knowledge of permanent post-construction BMPs and LID is generally limited, it may not be possible to obtain creditable training from local sources. It is recommended that training is obtained from a provider who is confirmed to have established credentials in the areas of inspecting and maintaining permanent post-construction BMPs and LID.

It is the responsibility of the Director of Public Works to ensure DPW staff receive annual training on inspecting permanent post-construction BMPs and LID as required by the permit.

DPW ENV is responsible to establish annually recurring funding for providing training to appropriate DPW ENV personnel on inspecting permanent post-construction BMPs and LID.

DPW ENG is responsible to establish annually recurring funding for providing training to appropriate DPW ENG personnel on inspecting permanent post-construction BMPs and LID.

DPW OMD is responsible to establish annually recurring funding for providing training to appropriate DPW OMD personnel on inspecting permanent post-construction BMPs and LID.

IV. Measurable Goals

The measurable goals listed in the table below will be used to monitor the BMPs' progress and evaluate the Post-Construction program's success.

BMP#	BMP Description	Measurable Goal	Area of Responsibility	Schedule
PC – 1	Standards Revisions to Address Post-Construction BMPs and LID	1. 1 year after submittal of the SWMP, 95% of construction projects with greater than 5,000 square feet of new impervious area will include descriptions regarding storm water control practices and site designs that comply with the criteria and guidance specified in the standards	   	1. One year after SWMP submittal
PC – 2	Plan Review for Post-Construction BMPs	1. 4 months after submittal of the SWMP, develop and implement SOPs 2. 1 year after submittal of the SWMP, 95% of construction projects will be reviewed for permanent post-construction BMPs according to the SOPs	   	1. 4 months after SWMP submittal 2. 1 year after SWMP submittal
PC – 3	Implement a Tracking System for Post-Construction BMP Inspection and Maintenance	1. 6 months after submittal of the SWMP, conduct an inventory of BMPs 2. 1 year after submittal of the SWMP, develop an AMS to integrate the location of BMPs with schedules for regular inspection and maintenance. Conduct annual inspections of each BMP and conduct regular maintenance as needed to ensure proper operation.	     	1. 6 months after SWMP submittal, 2. 1 year after SWMP submittal

BMP#	BMP Description	Measurable Goal	Area of Responsibility	Schedule
PC – 4	Education and Training for Post-Construction BMP and LID Requirements to DPW Project Proponents	1. Provide educational material to 100% of appropriate DPW staff annually	  	1. Annual
PC – 5	Education and Training for Post-Construction BMP Inspectors	1. Train 100% of appropriate DPW staff annually	   	1. Annual

V. Reporting

A summary of activities, surveys and projects will be presented in the annual SWMP report that will be submitted to the HDOH CWB and EPA CWB. The information will be compiled in a table that illustrates the effectiveness of the BMPs as related to each measurable goal.