

5 | Post-Construction Storm Water Management in New Development and Redevelopment Program



State of Hawaii, Department of Transportation
Highways Division, Oahu District
SWMPP, February 2022



A downspout filter box captures pollutants under the H-1 Viaduct in the Waimalu Watershed.

The Post-Construction Storm Water Management in New Development and Redevelopment Program (Post-Construction Program) is designed to ensure that all private and public projects are reviewed for consistency with the criteria that requires the inclusion of post-construction BMPs to prevent or minimize water quality impacts to the MEP.

The Post-Construction Program includes the following control measures:

1. Implement the *Storm Water Post-Construction Best Management Practices Manual* to address post-construction BMPs, prioritizing low impact development (LID) BMPs to the MEP.
2. Review and accept project design plans to ensure that appropriate post-construction BMPs have been included in the project design and bid package.
3. Implement the AMS to track the frequency of inspections and maintenance of post-construction BMPs.
4. Provide annual training on inspecting post-construction BMPs and LID practices.

The Post-Construction Program is administered in accordance with the MS4 NPDES Permit requirements referenced in Table 5-1.

Table 5-1. MS4 NPDES Permit Requirements for the Post-Construction Program.

MS4 NPDES Permit Reference	SWMPP Section
<p>Part D.1.e – The Permittee shall further develop, implement, and enforce a program to address storm water runoff from all (i.e., both private and public) 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. The Permittee’s program must ensure that permanent controls are in place to prevent or minimize water quality impacts to the MEP. Review and update as necessary the criteria defining when and the types of permanent post-construction BMPs, including among other Low Impact Development (LID) techniques, must be included in a project design to address storm water impacts and pollutants of concern. For State waters on the State CWA Section 303(d) list or State established and EPA approved TMDLs, the pollutants of concern to be targeted shall include the parameters causing impairment. Consideration shall also be provided for trash reduction techniques as to comply with its short and long term plans as required in Section D.1.(f)(1)(v). The program shall include, at a minimum, the following elements:</p>	
<p>Part D.1.e.(1) Standards Revision – The Permittee shall continue implementing its revision to its standards for addressing post-construction BMPs, including LID requirements. LID refers to storm water management practices which seek to mimic a site’s predevelopment hydrology by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating storm water runoff close to its source. The standards shall ensure that the management practices are prioritized to favor infiltration, evapotranspiration, or harvesting/reuse of stormwater followed by other practices that treat and release stormwater. The standards shall be applicable to all construction projects disturbing at least one (1) acre and smaller projects that have the potential to discharge pollutants to the MS4. LID employs principles such as preserving and recreating natural landscape features and minimizing imperviousness to create functional and appealing site drainage that treats storm water as a resource, rather than a waste product. LID treatment measures include harvesting and use, infiltration, evapotranspiration, or biotreatment. The plan for the implementation of LID provisions in the DOT-HWYS’ standards shall include, at a minimum, the following:</p> <ul style="list-style-type: none"> ● Criteria for requiring implementation. ● Investigation into the development of quantitative criteria for a specific design storm to be managed by LID techniques. Examples of design storm requirements include: 24-hour, 85% storm through infiltration; on-site management of the first inch of rainfall within a 24-hour period; retention of the 100-year, 2-hour storm; or on-site management of the 24-hour, 95% storm. ● Feasibility criteria for circumstances in which a waiver could be granted for the LID requirements. 	Section 5.1

MS4 NPDES Permit Reference	SWMPP Section
<ul style="list-style-type: none"> When a LID waiver is granted, alternatives such as offsite mitigation and/or non-LID treatment control BMPs could be required. 	
<p>Part D.1.e.(2) Review of Plans for Post-Construction BMPs – For design-bid-build projects, the Permittee shall not advertise any construction project nor award any construction contract until the project design has been reviewed and accepted to ensure that appropriate post-construction BMPs, which include LID practices, have been included in the project design and are included in the bid package to ensure compliance with this part of the permit. For design-build projects, the Permittee shall review and approve the project design the same as for design-bid-build projects prior to implementation. No project shall proceed without the inclusion of appropriate post-construction BMPs unless a waiver is granted by DOT-HWYS based on specific documentation demonstrating that such post-construction BMPs are not feasible. Project documents for projects that will include installation of post-construction BMPs shall also include appropriate requirements for their future continued maintenance.</p>	Section 5.2
<p>Part D.1.e.(3) BMP, Operation and Maintenance, and Inspection Database – The Permittee shall implement its Asset Management System to track the frequency of inspections and maintenance of the post-construction BMPs. In addition to the standard information collected for all projects (e.g., project name, owner, location, start/end date, etc.), the database shall also include, at a minimum:</p> <ul style="list-style-type: none"> Type and number of LID practices Type and number of Source Control BMPs Type and number of Treatment Control BMPs Latitude/Longitude coordinates of controls using Global Positioning Systems (GPS) and NAD83 or other Datum as long as the datum remains consistent Photographs of controls Operation and maintenance requirements Frequency of inspections Frequency of maintenance <p>All DOT-HWYS post-construction and LID BMPs shall be inspected at least once a year for proper operation; maintenance shall be performed as necessary to ensure proper operation.</p>	Section 5.3
<p>Part D.1.h.(3) Post-Construction Storm Water Management in New Development and Redevelopment – The Permittee shall provide annual training on inspecting post-construction BMPs and LID practices to all DOT-HWYS staff and those contractors under DOT-HWYS contract responsible for post-construction inspections.</p>	Section 5.4

5.0 Program Organization

To fulfill the MS4 NPDES Permit requirements of the Post-Construction Program, the following organizational structure has been established, as shown in Figure 5-1.

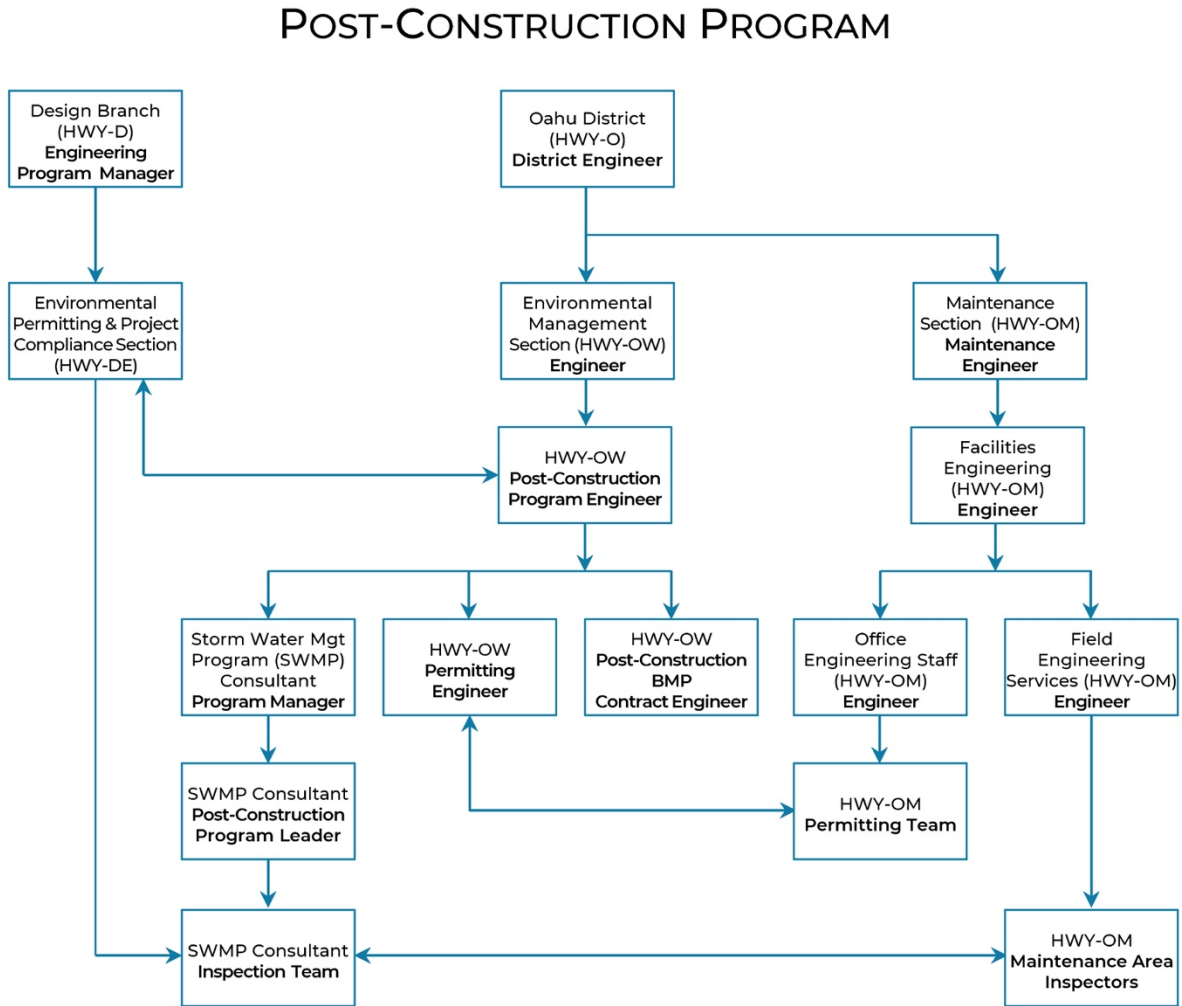


Figure 5-1. Post-Construction Program Organizational Chart.

5.1 Post-Construction BMP Design Standards | MS4 NPDES Permit Part D.1.e.(1)

DOT-HWYS has further developed standards to address post-construction BMPs, prioritizing LID BMPs. LID refers to storm water management practices which seek to mimic a site's predevelopment hydrology by minimizing disturbed areas and impervious cover. The post-construction BMP requirements and design standards are provided in the *Storm Water Post-Construction Best Management Practices Manual* (Appendix E.1). Significant revisions to the manual were completed in December 2021, with an effective date of July 1, 2022.

Key components of the *Storm Water Post-Construction Best Management Practices Manual* revision include:

- General organizational changes to the structure of the manual to increase clarity and improve usability.
- Separate post-construction BMP criteria for areas covered under an MS4 NPDES Permit and rural areas not covered under a permit.
- Revised criteria for MS4 NPDES Permit areas to increase the implementation of post-construction BMPs, prioritizing LID BMPs.
- Revised evaluation process to determine whether a project qualifies for a variance from LID BMP requirements or an exemption from post-construction BMPs.
- An Alternative Compliance process for projects in which the full required treatment area cannot be addressed by post-construction BMPs on-site.

The individuals and section highlighted in Figure 5-2 are responsible for implementing the control measures described in this section.

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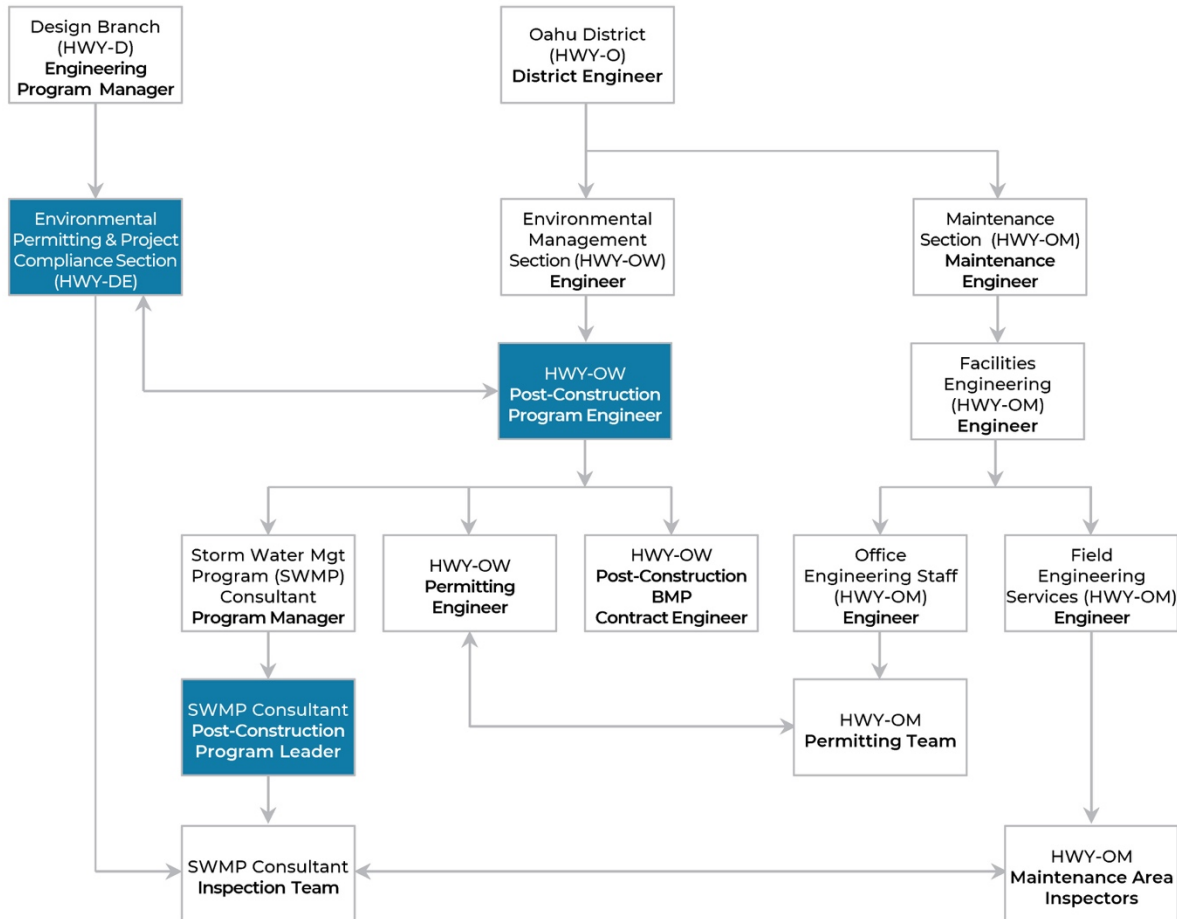


Figure 5-2. Post-Construction Program Organizational Chart for Roles and Responsibilities Related to Post-Construction BMP Design Standards.

5.2 Review of Plans for Post-Construction BMPs | MS4 NPDES Permit Part D.1.e.(2)

DOT-HWYS utilizes the Storm Water Post-Construction BMP Design Checklist to review all public and private construction project plans to ensure compliance with the post-construction BMP criteria. DOT-HWYS does not advertise or award any public construction project, nor award any construction contract, until the project plans have been reviewed

and accepted to ensure the appropriate post-construction BMPs, prioritizing LID BMPs, have been included in the project design and bid package in accordance with the standards and criteria set forth in the *Storm Water Post-Construction Best Management Practices Manual*. Projects that include post-construction BMPs must also include appropriate requirements for future maintenance activities. DOT-HWYS reviews and updates the criteria that defines when and what types of post-construction BMPs must be included in project designs, as necessary.

The individual and section highlighted in Figure 5-3 are responsible for implementing the control measures described in this section.

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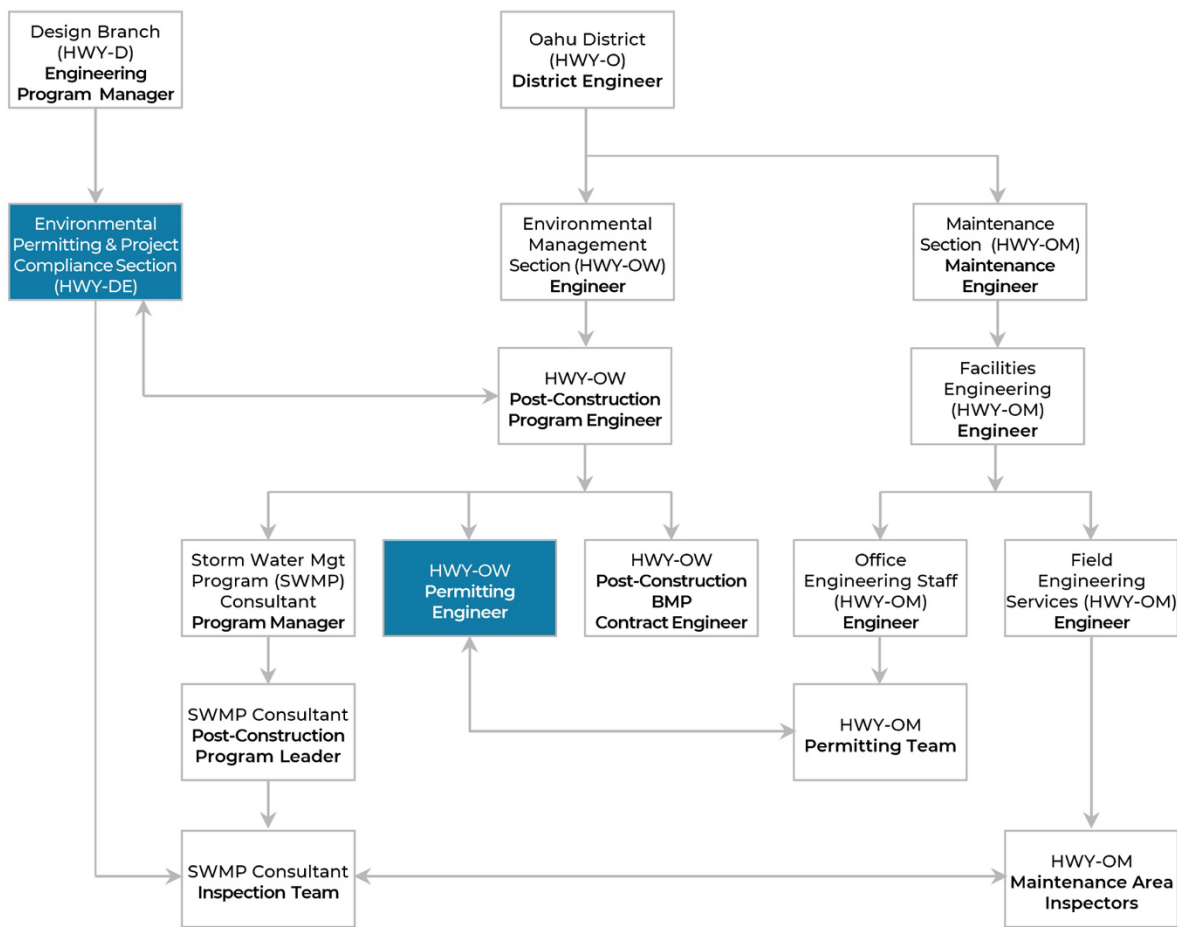


Figure 5-3. Post-Construction Program Organizational Chart for Roles and Responsibilities Related to Review of Plans for Post-Construction BMPs.

5.3 Post-Construction BMPs Inspection and Maintenance Database | MS4 NPDES Permit Part D.1.e.(3)

DOT-HWYS utilizes the AMS Maximo Post-Construction BMPs Module to track information for projects with post-construction BMPs, as follows:

- Project information (e.g., project name, owner, location, start/end date, etc.)
- Type and number of LID practices
- Type and number of source control BMPs
- Type and number of treatment control BMPs
- Latitude/longitude coordinates using Global Positioning System (GPS)
- Photographs of controls
- Operation and maintenance requirements
- Frequency of post-construction BMP inspections
- Frequency of post-construction BMP maintenance

All post-construction BMPs maintained by DOT-HWYS are inspected at least once a year for proper operation. Maintenance is performed as necessary to ensure proper operation.

The AMS Maximo Post-Construction Module dashboard displays open cleaning requests and KPIs for inspection frequency.

Open PBMP Cleaning Inspections Filter Search Download Print

Work Order	Asset	Route ID	Description	Cycle	Cycle Year	Work Type	Target Start	Target Finish
No Data Found.								

PBMP Monthly - Actual COMP vs Target COMP Update

Last Run: 9/21/21 6:00 PM

Current Year MONTHLY 9 - Cycle Ends 9/30/2021

Status	KPI	Actual	Target	Variance
-	Current Year MONTHLY 9 - Cycle Ends 9/30/2021	47	48	-1

Open Monthly Inspections Filter Search Download Print

Work Order	Asset	Route ID	Description	Cycle	Cycle Year	Work Type	Target Start	Target Finish
568971	800117	H3	800117 NSBB 7 PBMP	MONTHLY 1	2021	PMI	1/1/21 12:00 AM	1/31/21 12:00 AM
568987	800117	H3	800117 NSBB 7 PBMP	MONTHLY 2	2021	PMI	2/1/21 12:00 AM	2/28/21 12:00 AM
568939	800117	H3	800117 NSBB 7 PBMP	MONTHLY 11	2020	PMI	11/1/20 12:00 AM	11/30/20 12:00 AM
568955	800117	H3	800117 NSBB 7 PBMP	MONTHLY 12	2020	PMI	12/1/20 12:00 AM	12/31/20 12:00 AM
569051	800117	H3	800117 NSBB 7 PBMP	MONTHLY 6	2021	PMI	6/1/21 12:00 AM	6/30/21 12:00 AM
569067	800117	H3	800117 NSBB 7 PBMP	MONTHLY 7	2021	PMI	7/1/21 12:00 AM	7/31/21 12:00 AM
569083	800117	H3	800117 NSBB 7 PBMP	MONTHLY 8	2021	PMI	8/1/21 12:00 AM	8/31/21 12:00 AM
569003	800117	H3	800117 NSBB 7 PBMP	MONTHLY 3	2021	PMI	3/1/21 12:00 AM	3/31/21 12:00 AM
569035	800117	H3	800117 NSBB 7 PBMP	MONTHLY 5	2021	PMI	5/1/21 12:00 AM	5/31/21 12:00 AM
569019	800117	H3	800117 NSBB 7 PBMP	MONTHLY 4	2021	PMI	4/1/21 12:00 AM	4/30/21 12:00 AM

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PBMP Quarterly - Actual COMP vs Target COMP Update

Last Run: 9/21/21 6:00 PM

Current Year QUARTER 3 - Cycle Ends 9/30/2021

Status	KPI	Actual	Target	Variance
-	Current Year QUARTER 3 - Cycle Ends 9/30/2021	24	24	0

The individuals and team highlighted in Figure 5-4 are responsible for implementing the control measures described in this section.

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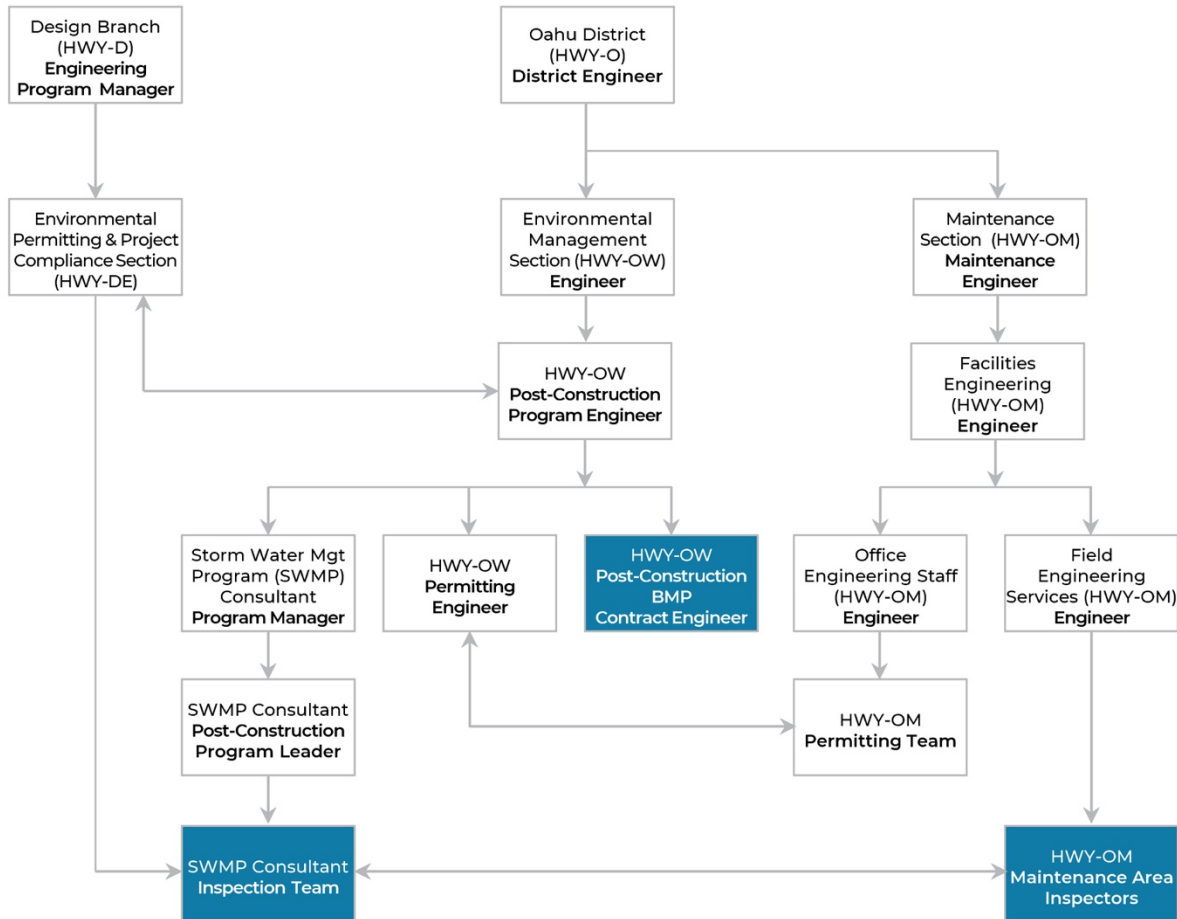


Figure 5-4. Post-Construction Program Organizational Chart for Roles and Responsibilities Related to Post-Construction BMPs Inspection and Maintenance Database.

5.4 Training | MS4 NPDES Permit Part D.1.h.(3)

DOT-HWYS provides annual training to all DOT-HWYS staff and contractors responsible for inspecting post-construction BMPs. The training covers inspection and maintenance procedures and provides feedback that DOT-HWYS uses to refine and improve the post-construction BMP operations and maintenance program.

The individuals highlighted in Figure 5-5 are responsible for implementing the control measures described in this section.

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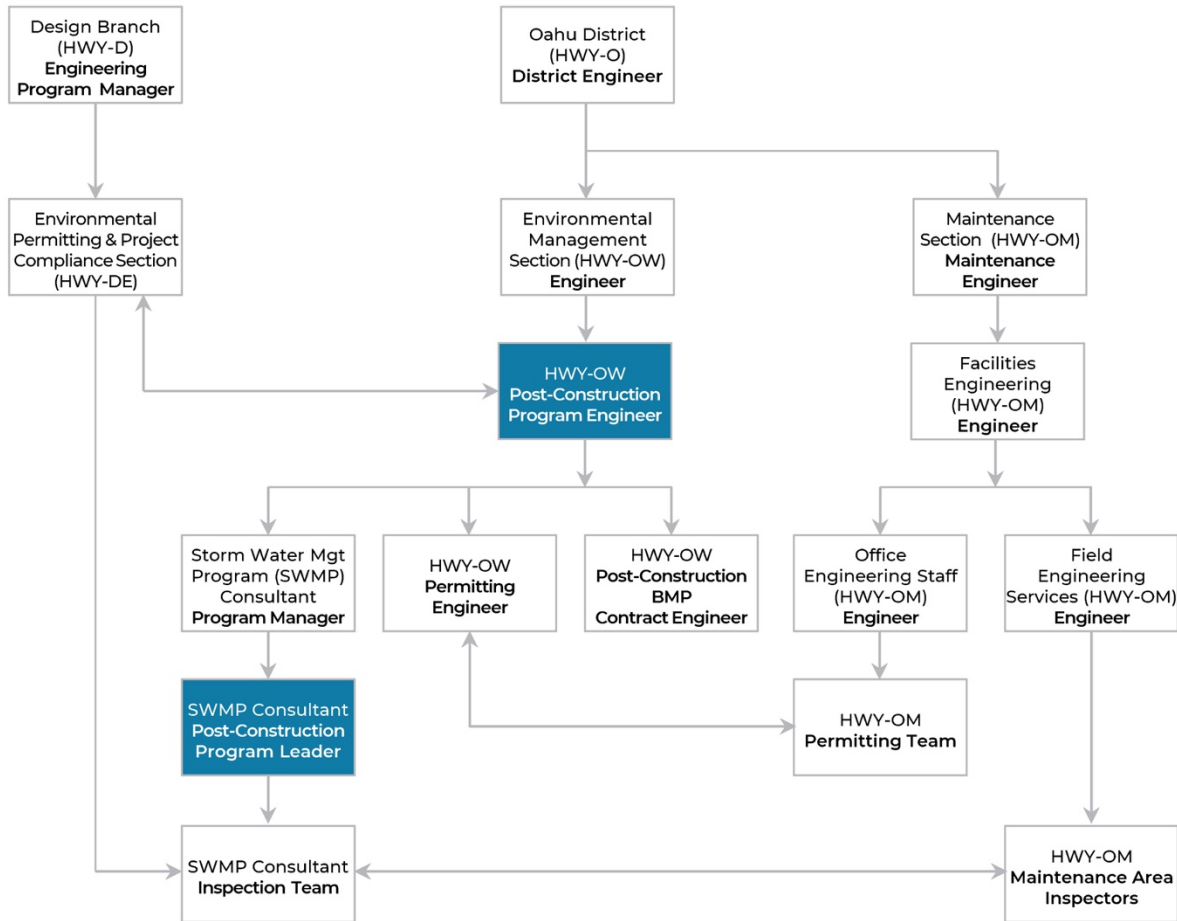


Figure 5-5. Post-Construction Program Organizational Chart for Roles and Responsibilities Related to Training.

5.5 Monitoring Program Effectiveness

The *Program Effectiveness Strategy* (Appendix A.3, Table 8) provides the measurable standards and/or milestones for each Program BMP, including the outcome level, data collection method, and assessment parameter