

5.3 Construction Documentation

It is important, both for the property owner and for the Philadelphia Water Department (PWD), to ensure that all stormwater management practices (SMPs) are constructed in strict accordance with the Approved Post-Construction Stormwater Management Plan (PCSMP). Even small variations in the characteristics of an SMP (e.g., footprint area, elevations, layer thicknesses, pipe sizing) can have significant effects on the SMP's ability to perform its designed stormwater management function. To verify that SMPs have been properly installed, a Construction Certification Package and Record Drawing(s) for all PCSMP components must be prepared and submitted to PWD at the conclusion of construction activities. The contractor must maintain copies of all books, records, and documents pertaining to PCSMP construction for a period of five years following completion of the contract.

5.3.1 Construction Certification Package

As previously discussed, the contractor must install all on-site SMPs, conveyance piping, structures, and any other feature associated with the stormwater management design in strict accordance with the Approved PCSMP. The Construction Certification Package provides PWD with documentation that SMPs have been properly installed. Stormwater Retrofits have different requirements for Construction Certification Packages. The applicant is referred to [Section 2.3.4](https://water.phila.gov/development/stormwater-plan-review/manual/chapter-2/2-3-review-phases#2.3.4) for Stormwater Retrofit submission guidance.

Prior to Construction

SMP Construction Certification Forms are part of the Construction Certification Package. Prior to construction, an SMP Construction Certification Form must be prepared by the design engineer for each on-site SMP and provided to PWD for review as part of the PCSMP Review Phase ([Section 2.3.1](https://water.phila.gov/development/stormwater-plan-review/manual/chapter-2/2-3-review-phases#2.3.1)). A blank Construction Certification Package template, which houses the SMP Construction Certification Forms and instructions, can be found in [Appendix J](https://water.phila.gov/development/stormwater-plan-review/manual/appendices/j-construction-certification-package). Each Form must indicate the measurements that are most critical to the listed SMP's ability to perform its designed function (e.g., elevations, outlet control sizes, surface areas, layer depths, etc.). It is recommended that the SMP Construction Certification Form(s) be included in the construction bid documents for the project to ensure that the selected contractor is aware of the requirement that the Forms be completed during construction. The project's sequence of construction must identify all stages of SMP construction for which a registered professional must document the specific elevations and measurements found on the SMP Construction Certification Form(s). The applicant is referred to [Section 5.3.2](#) p. 6 for clarification on PWD Stormwater Plan Review's definition of a "registered professional." If a project field change necessitates a revision to any information on the

submitted SMP Construction Certification Forms, they must be updated accordingly and submitted along with the PCSMP Field Change submission.

During Construction

During the preconstruction meeting, the PWD Inspector will provide copies of the Construction Certification Package, as prepared and customized by the engineer and found acceptable by PWD during the PCSMP Review Phase. In order to demonstrate that all SMPs are properly installed, a registered professional must complete the SMP Construction Certification Forms contained within the Construction Certification Package. Each measurement documented on the Forms must be dated and initialed by the registered professional who took, or whose designee took, the measurement. Once all of the required measurements have been appropriately documented, the registered professional must execute and date the Form. *The contractor should not cover, backfill, or seal any SMP until the information required for the Record Drawing(s) and the Construction Certification Package has been acquired.*

All elevations identified on the Forms must be documented as they are measured. These Forms must be on-site and available for PWD inspection at all times. Upon completion of construction, SMP Construction Certification Forms must be submitted to PWD as part of the Construction Certification Package, and the measurements documented on these Forms must be reflected on the Record Drawing(s), which are discussed in the next Section.

The Construction Certification Package provided to PWD must include electronic copies of receipts for materials that pertain to SMPs. The material receipts must clearly specify the types, qualities, and quantities of the materials purchased. The materials for which receipts are required may include, but are not limited to, the following:

- Stone,
- Geotextile fabric,
- Perforated pipes,
- Subsurface storage units,
- Bioinfiltration/bioretention media,
- Filter media,
- Porous pavement,
- Impervious liners,
- Precast concrete structures,
- Traps or hoods,
- Vegetation or plantings, and
- Proprietary stormwater management systems/devices/components.

The Construction Certification Package must also include electronic copies of photographs documenting all SMP installations. The photographs must clearly depict the installation of all components of the SMP. This may include, but is not limited to, photographs of the following:

- Basin excavation,
- Subgrade preparation,
- Fabric or liner placement,
- Stone placement,
- Filter media placement,
- Pipe placement,
- Pipe perforation,
- Subsurface vault installation,
- Pretreatment system installation,
- Inlet control installation,
- Outlet control installation, and
- Landscaping.

Representative photographs of SMP installations are shown below.



An example of pipe diameter measurement during construction in Philadelphia



An example of SMP installation in Philadelphia

5.3.2 Record Drawings

Along with the Construction Certification Package, PWD requires that Record Drawing(s) be submitted at the close of the project to ensure that the SMPs and their elements were constructed in general accordance with the Approved PCSMP, and to document any field changes. Record Drawing(s) are required for SMP verification and are a key component of PWD's compliance reporting.

Record Drawings are construction drawings revised to represent the site's as-built conditions, including, at a minimum, all locations, dimensions, elevations, and materials as constructed and installed. PWD uses Record Drawing(s) to verify compliance of the constructed site with the [PWD Stormwater Regulations](https://water.phila.gov/development/stormwater-plan-review/manual/appendices/c-pwd-stormwater-regulations/) (Stormwater Regulations) and to document and verify the quantity of stormwater managed on a site. If compliance issues were observed during construction, PWD may request that the City of Philadelphia Department of Licenses and Inspections (L&I) hold the Certificate of Occupancy until the Record Drawing Review Phase or final inspection is complete. It is critical that the Record Drawing(s) reflect any changes from the Approved PCSMP design, approved field change or otherwise, that may affect the performance of the SMPs.

It is important that the property owner/developer be aware of the Record Drawing requirements within this Manual and within the Stormwater Regulations, budget accordingly, and consider these requirements when issuing the project for construction bid.

To properly prepare Record Drawing(s), the contractor must keep the Approved PCSMP on-site at all times throughout the construction process and document all changes from the Approved PCSMP as they occur. PWD recommends marking up and tracking changes on an actual copy of the Approved PCSMP to simplify preparation of the Record Drawing(s). Using the Approved PCSMP as a base, the Record Drawing(s) should highlight information confirmed to be in accordance with the Approved PCSMP in yellow, and must identify any deviations in red ink. The Record Drawing(s) must be clear and legible.

Record Drawings may be prepared by registered professionals, which PWD Stormwater Plan Review defines as Professional Engineers, Registered Architects, Landscape Architects, Professional Land Surveyors, Professional Geologists, or Licensed Contractors. PA DEP may have different requirements concerning the types of professionals who may prepare Record Drawings. For projects that require a NPDES Permit, the applicant is strongly encouraged to refer to PA DEP's requirements for Record Drawings before selecting a professional to prepare Record Drawing(s) for PWD. The preparer of the plan must provide the Record Drawing drafting date and prominently display their signature and professional seal, or, in the case of Licensed Contractors, their signature, printed name, business title, company name, and L&I Contractor License Number, all of which must be clearly labeled, on each Record Drawing plan sheet. The information provided on the Record Drawing(s) will be assumed to be correct unless it conflicts with any observations made by PWD staff during inspections/site visits.

Most non-residential and some condominium projects confirmed to be in compliance with the Stormwater Regulations or Stormwater Retrofit design standards through a Record Drawing review and final inspection may be eligible for credit toward their Stormwater Management Service Charge (Stormwater Charge). The applicant is referred to [Section 6.3](https://water.phila.gov/development/stormwater-plan-review/manual/chapter-6/6-3-stormwater-credits/) for more information on the stormwater credits.

For more information on Record Drawing Submission Package requirements and its submission and review process, the designer is referred to **Section 2.3** water.phila.gov/development/stormwater-plan-review/manual/chapter-2/2-3-review-phases/, Review Phases, and the Record Drawing Requirements table, **Table E-8** water.phila.gov/development/stormwater-plan-review/manual/appendices/e-plan-and-report-checklists/table-e-8-record-drawing-requirements, in **Appendix E** water.phila.gov/development/stormwater-plan-review/manual/appendices/e-plan-and-report-checklists. Samples which demonstrate how Approved PCSMP plan sheets should be marked-up in order to prepare Record Drawings are provided in **Appendix K** water.phila.gov/development/stormwater-plan-review/manual/appendices/k-record-drawing-sample.