



Post-Construction Stormwater Manual

Prepared for
City of Moberly, Missouri

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Post-Construction Stormwater Manual

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Contents

Post-Construction Stormwater Permit Process	1
1.0 Introduction	4
1.1 Post-Construction Stormwater Permit Program	4
1.2 Projects Requiring a Post-Construction Stormwater Permit	5
1.3 Who Obtains a Post-Construction Stormwater Permit?	5
1.4 Fee In Lieu of a Post-Construction Stormwater Permit	6
2.0 Pre-Submittal Meeting	8
2.1 Conceptual Stormwater Plan.....	8
2.2 Pre-Submittal Meeting	8
3.0 Stormwater Design Requirements	10
3.1 Overview.....	10
3.2 Design Objectives.....	10
3.3 Pre-Design Site Assessment.....	11
3.4 Preserve Natural Areas	12
3.5 Permanent BMP Selection.....	12
3.6 Design Criteria	13
3.7 Submittal Requirements	14
3.7.1 Design Plans	14
3.7.2 Calculations.....	14
3.7.3 Operation and Maintenance Plan and Agreements.....	15
4.0 Application and Design Review	16
4.1 Post-Construction Stormwater Permit Application.....	17
4.2 Stormwater Design Review and Acceptance	17
4.2.1 Stormwater Design Review.....	17
4.2.2 Stormwater Design Acceptance	18
4.2.3 Fiscal Security.....	18
4.3 Issuance of Post-Construction Stormwater Permit	18
5.0 Construction and Project Close-Out.....	19

5.1	Post-Construction Stormwater Close-Out Inspection.....	19
5.1.1	Preparing for Inspection.....	19
5.1.2	Inspection Attendees and Agenda.....	20
5.1.3	Corrections to Site	20
5.2	Stormwater Operating Permit Issuance.....	20
6.0	Stormwater Operating Permit Compliance.....	21
6.1	Continued Maintenance and Annual Inspections.....	21
7.0	Glossary of Terms	23
8.0	Revisions.....	25
9.0	References	26

List of Appendices

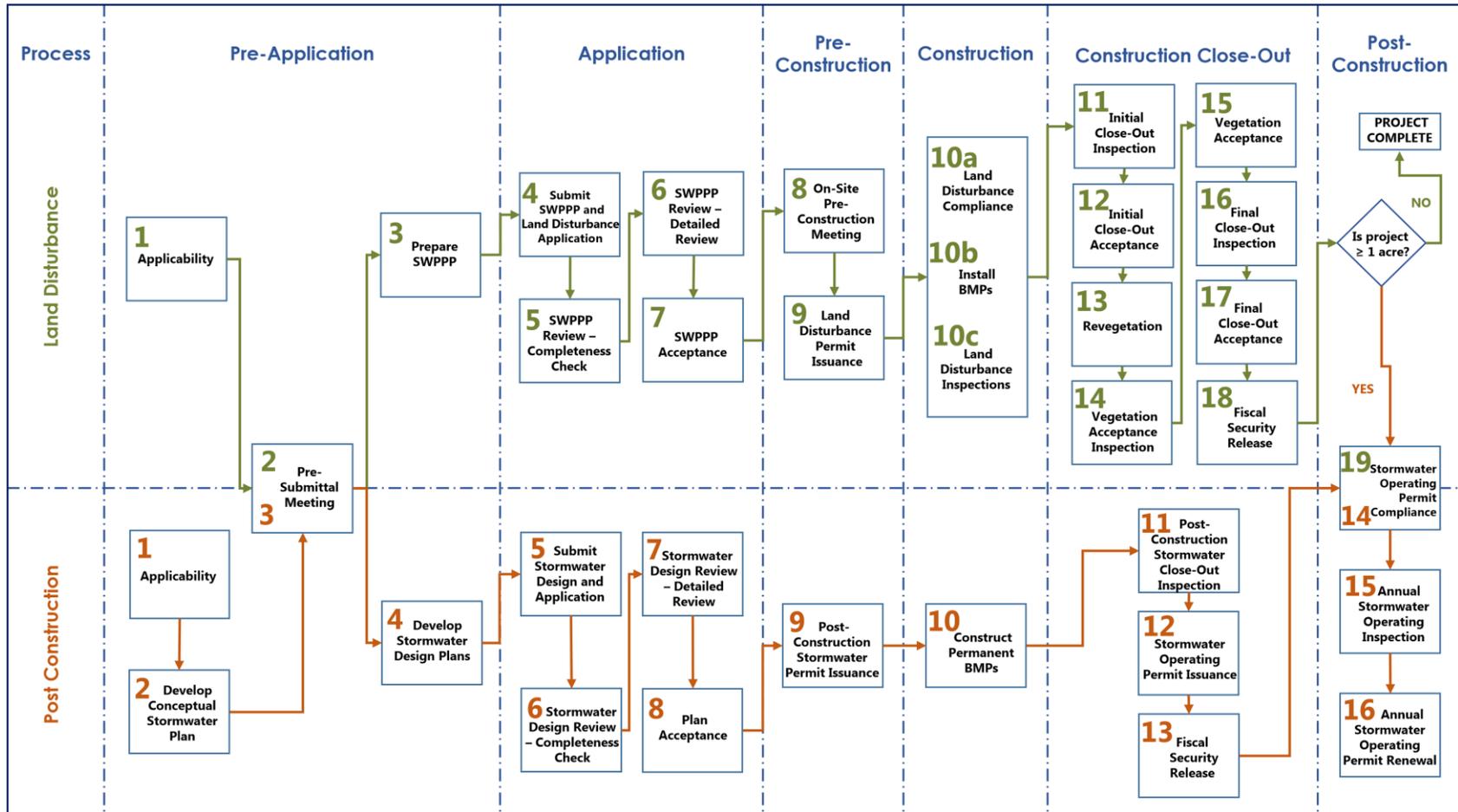
Appendix A	Required Checklist and Cost Estimate for a Fee in Lieu of Permanent BMP(s)
Appendix B	Contact List
Appendix C	Post-Construction Stormwater Permit Application
Appendix D	Required Checklist for Acceptance of Permanent BMPs
Appendix E	City Inspection Form

Post-Construction Stormwater Permit Process

Phase	Step No.	Post-Construction Stormwater Step Description	Section No.
Pre-Application	1	Applicability: Confirm that a Post-Construction Stormwater Permit is required.	1.2
	2	Develop Conceptual Stormwater Plan: With assistance of a design engineer (Missouri PE), develop a conceptual stormwater plan, including conceptual permanent best management practices (BMPs).	2.1
	3	<ul style="list-style-type: none"> • Pre-Submittal Meeting: Contact the City of Moberly Public Utilities Department (City) to schedule a pre-submittal meeting. • Meet with City to discuss applicable permits, post-construction stormwater requirements, and the conceptual stormwater plan. Required attendees at this meeting shall include, but are not limited to, the Applicant's design engineer. 	2.2
	4	Develop Stormwater Design Plans: A design engineer shall develop stormwater design plans that include appropriate permanent BMPs in accordance with Ch. 34, Art. IV of the City's Code of Ordinances and guidance provided in this Post-Construction Stormwater Manual (Manual).	3.1 - 3.7
Application	5	Submit Stormwater Design and Application: Submit Post-Construction Stormwater Application, stormwater design plans, and other required documents to City for review. An application fee shall be included with this submittal.	4.1
	6	Stormwater Design Review – Completeness Check: The City shall conduct a pre-review to check the stormwater design plans and supporting documents for a basic level of completeness based on compliance with Ch. 34, Art. IV of the City's Code of Ordinances and guidance provided in this Manual. If deemed incomplete, the submittal shall be returned to the Applicant for modification and resubmission.	4.2.1
	7	Stormwater Design Review – Detailed Review: Once the submittal is deemed complete, the City shall conduct a detailed review of the stormwater design plans and supporting documents for compliance with Ch. 34, Art. IV of the City's Code of Ordinances and guidance provided in this Manual. If deficiencies are noted, the City shall provide written comments to the Applicant; such comments may include questions, requests for additional information, and/or requests for modifications to the stormwater design in order to comply with applicable requirements. If such comments are received, the Applicant shall address each comment and resubmit revised documents along with a summary of how each comment was addressed.	4.2.1
	8	<p>Plan Acceptance:</p> <ul style="list-style-type: none"> • When City has found the stormwater design to meet the requirements of Ch. 34, Art. IV of the City's Code of Ordinances and guidance provided in this Manual, the stormwater design plans will be accepted. • The Applicant shall post the required fiscal security and submit at least 3 sets of the stormwater design plans, sealed and signed by a Missouri PE, to the City to be signed and returned. 	4.2.2

Phase	Step No.	Post-Construction Stormwater Step Description	Section No.
Pre-Construction	9	Post-Construction Stormwater Permit Issuance: If Applicant is in compliance with the requirements of Ch. 34, Art. IV of the City's Code of Ordinances and guidance provided in this Manual, the City shall issue a Post-Construction Stormwater Permit.	4.3
Construction	10	Construct Permanent BMPs: Ensure construction of permanent BMPs in accordance with the accepted stormwater designs, requirements of Ch. 34, Art. IV of the City's Code of Ordinances, and guidance provided in this Manual.	5.1.1
Construction Close-Out	11	Post-Construction Stormwater Close-Out Inspection: <ul style="list-style-type: none"> • After the site is stabilized (including final vegetation), contact the City to schedule the post-construction stormwater close-out inspection. • A representative of the Permittee shall attend the post-construction BMP inspection. • Correct deficiencies as requested by the City and, if requested, contact the City of schedule a follow-up inspection. 	5.1.2 - 5.1.3
	12	Stormwater Operating Permit Issuance: When City has found the stormwater BMP(s) to be constructed in accordance with the requirements of Ch. 34, Art. IV of the City's Code of Ordinances and guidance provided in this Manual, the City shall give the Owner a signed post-construction stormwater close-out inspection form and transition the Post-Construction Stormwater Permit to a Stormwater Operating Permit.	5.2
	13	Fiscal Security Release: Submit a Fiscal Security Release Form to the City to be signed and returned.	5.2
Post-Construction	14	Stormwater Operating Permit Compliance: Ensure compliance with the Stormwater Operating Permit.	6.1
	15	Annual Stormwater Operating Inspection: <ul style="list-style-type: none"> • Once a year, contact the City to schedule a stormwater operating inspection. • A representative of the Owner shall attend each stormwater operating inspection. • If deficiencies are noted by the City, the Owner must provide to the City, within 2 weeks of the inspection, a plan and schedule to correct the deficiencies. • Correct deficiencies as requested by the City as soon as practicable and no later than 3 months after the inspection, unless specifically arranged with the City. Once deficiencies are corrected, contact the City to schedule a follow-up inspection. • If deficiencies are not corrected within 3 months and no alternative arrangements have been made with the City, deficiencies will be corrected by the City at the Owner's expense. 	6.1
	16	Annual Stormwater Operating Permit Renewal: If Owner is in compliance with the Stormwater Operating Permit, the City shall renew the Permit after completion of the annual stormwater operating inspection.	6.1

Land Disturbance and Post-Construction Process Overview



1.0 Introduction

Step in Section 1.0:

Step 1 – Applicability:

Confirm that a Post-Construction Stormwater Permit is required. (Section 1.2)

1.1 Post-Construction Stormwater Permit Program

As required by the Missouri Department of Natural Resources (MDNR) State Operating Permit No. MO-R040030 for Regulated Small Municipal Separate Storm Sewer Systems (MS4), the City of Moberly (City) implements, and enforces a program developed to address the quality of long-term stormwater runoff from new development and redevelopment projects.¹ This Post-Construction Stormwater Permit Program establishes controls on the quantity and quality of stormwater released from post-construction developments and is designed to achieve the following objectives.²

- Protect against increased flooding and decreased water quality of downstream areas and streams due to effects of development;
- Protect the welfare of individuals and their property by reducing the effects of development;
- Protect the environment and aquatic habitat of fish and other species.

The City's Post-Construction Stormwater Permit Program is authorized by Chapter 34, Article IV of the City Code of Ordinances and administered and enforced by the City's Public Utilities Department through issuance of Post-Construction Stormwater Permits. Post-Construction Stormwater Permit requirements and guidance are contained within this *Post-Construction Stormwater Manual* (Manual). The City also implements and enforces a Land Disturbance Permit Program with requirements and guidance contained within the City's *Land Disturbance Manual* and supplemental *Land Disturbance Field Manual*.

The requirements within this Manual should be regarded as the minimum requirements for protecting the public health, safety, comfort, convenience, prosperity, and welfare of the residents of the City. The City reserves the right to apply more stringent criteria as it deems necessary. Additionally, the City reserves the right to change, modify, or alter these requirements at any time. The *Post-Construction Stormwater Manual* shall be construed to further its underlying purposes and intent. Whenever a provision in this Manual or any provision in any law, ordinance, resolution, rule, or regulation of any kind, contain requirements covering any of the same subject matter, whichever are more restrictive or impose higher standards shall govern.

¹ Adapted from Missouri State Operating Permit (No. MO-R040030), Part 4.2.5.1.

² Adapted from the City's Code of Ordinances, Ch. 34, Art. IV, Section 34-101.

1.2 Projects Requiring a Post-Construction Stormwater Permit

Step 1

Applicability

The City requires that a project’s owner and engineer obtain a Post-Construction Stormwater Permit prior to the start of activities within the City. All such projects within the City must obtain a Post-Construction Stormwater Permit even if the project has been approved by a state or federal agency.

Projects that require a Post-Construction Stormwater Permit:

- Any project that develops greater than or equal to one acre of land.
- Any project that develops less than one acre when part of a larger common plan of development or sale that will develop a cumulative total of one or more acres over the life of the project.^{3,4}
- Development activities less than one acre in size if the City deems it necessary⁵ to control the quantity and/or quality of post-construction stormwater runoff.

Projects not requiring a Post-Construction Stormwater Permit shall seek to control the release rate and quality of stormwater in order to minimize detrimental downstream impacts.

In addition, any projects meeting the above criteria that have been designed and platted without post-construction stormwater controls are required to obtain a Post-Construction Stormwater Permit. The state of Missouri requires that lots which are part of a common plan of development, obtain a land disturbance permit, if the development is equal to or greater than one acre in size. The City recognizes this state requirement, and recognizes that there are subdivisions within city limits that were planned and platted prior to the implementation of these stormwater regulations. In such cases, the City may consider allowing the landowner to participate in off-site stormwater control or other means of stormwater mitigation to satisfy these requirements. Projects not meeting the criteria listed above are not required to obtain a Post-Construction Stormwater Permit.

1.3 Who Obtains a Post-Construction Stormwater Permit?

The Post-Construction Stormwater Permit shall be signed by the project owner, the engineer, and any third party acting on behalf of the owner or engineer (e.g., consultant, attorney). Before a Post-

³ An owner or developer may have several adjacent projects that individually may not be subject to the phasing requirements. Such projects should not be treated separately for purposes of erosion and sediment control. If the individually platted projects are adjacent to each other and grading may or may not be occurring at the same time, the City will treat the sum of the individual projects as one large project. The sum of the individual projects shall be subject to the area phasing requirements.

⁴ As defined in the Missouri State Land Disturbance Permit, a "Larger Common Plan of Development or sale" is a contiguous area where multiple separate and distinct construction activities are occurring under one plan; and, as defined in the USEPA Construction Stormwater General Permit, a "Common Plan of Development or Sale" is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one common plan. The "common plan" of development or sale 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.

⁵ Adapted from the City’s Code of Ordinances, Ch. 34, Art. IV, Section 34-103.

Construction Stormwater Permit is issued, the owner, the engineer, and any third party acting on behalf of the owner or engineer are referred to as "applicants." After the permit is issued, they are referred to as "permittee(s)." If the property changes ownership, the owner must provide information regarding the change of ownership to the City. The new owner must obtain a new Post-Construction Stormwater Permit.

A permittee is any person who is issued a Post-Construction Stormwater Permit by the City and that person(s) is legally responsible for complying with the Post-Construction Stormwater Permit. If a corporation applies for a permit, then a manager, officer of the corporation, or other legally authorized person must sign the permit as the Permittee.

Permittee(s) (owner, engineer, or any third party acting on behalf of the owner or engineer) are responsible for meeting all of the requirements of the City's Post-Construction Stormwater Permit Program. This Manual is used by a design engineer to develop stormwater control measures. This Manual covers the entire Post-Construction Stormwater Permit process.

1.4 Fee In Lieu of a Post-Construction Stormwater Permit

On a case-by-case basis, the City may identify an opportunity for construction or improvement of a multi-project (area-wide) permanent stormwater Best Management Practice (BMP). In the event of such an opportunity, the City may accept a fee in lieu of (FILO) a Post-Construction Stormwater Permit, and thus, construction of a permanent stormwater BMP. The purpose of the fees collected by the City through the FILO option is to provide an alternative Post-Construction Stormwater Permit for projects and a funding source for the construction and improvement of the City's stormwater management system.

Examples of opportunities when the FILO option may be appropriate include, but are not limited to, the following:

- Site characteristics restrict a project from achieving the stormwater design requirements of this Manual (refer to Section 3.0).
- The City recognizes an opportunity for construction or improvement of an area-wide permanent stormwater BMP that may prove favorable to a project-specific BMP.
- Stormwater management may be more impactful for a project in an off-site location, e.g., upstream of the project area.

If a project owner and engineer opt to pursue the FILO option, they should discuss the potential for this option during preliminary project meetings with the City. Upon approval of the FILO option for a project, the project owner and engineer shall provide a cost estimate to the City that includes, at minimum, the engineering, design, construction, and contingency costs for a permanent detention and/or infiltration BMP that adheres to the design requirements established in Section 3.0 of this Manual. Additionally, the cost estimate shall be developed with the assumption the detention and/or infiltration BMP would be constructed on the project site. The project owner and engineer shall use the required checklist and cost estimate form in Appendix A to develop the required cost estimate. Table 1 provides a summary of the

required items for the cost estimate. Additional details and requirements for the cost estimate are provided in Appendix A.

Table 1 Required FILO Option Cost Estimate Items

Category	Description
General Construction	Engineering and Design
	Permitting
	Mobilization
	Erosion Control
	Other, as needed ⁽¹⁾
Storm Sewer – Junction Box	Junction Box
	Pipe
	End Section
	Riprap
	Other, as needed ⁽¹⁾
Detention or Infiltration BMP ⁽¹⁾	Riprap
	Excavation
	Topsoil
	Grading
	Seeding
	Other, as needed ⁽¹⁾
Contingency	10% of Total

(1) To be determined by the project owner, engineer, and City staff pending site conditions and stormwater management needs.

2.0 Pre-Submittal Meeting

Steps in Section 1.4:

Step 2 – Develop Conceptual Stormwater Plan:

With assistance of a design engineer (Missouri PE), develop a conceptual stormwater plan, including conceptual permanent BMPs (Section 2.1).

Step 3 – Pre-Submittal Meeting:

- Contact the City’s Public Utilities Department (PUD) to schedule a pre-submittal meeting.
- Meet with the City to discuss applicable permits, post-construction stormwater requirements, and the conceptual stormwater plan. Required attendees at this meeting shall include, but are not limited to, the Applicant’s design engineer (Section 2.2).

2.1 Conceptual Stormwater Plan

Step 2

Develop Conceptual Stormwater Plan

In preparation for attending a pre-submittal meeting with PUD staff, a conceptual stormwater plan shall be developed with a design engineer’s assistance. The conceptual stormwater plan shall consist of a conceptual-level proposal of permanent stormwater BMPs that would be appropriate for the site and meet the requirements described in Section 3.0. Ideally, the design engineer shall conduct a pre-design site assessment, as described in Section 3.3, prior to preparing the conceptual stormwater plan.

2.2 Pre-Submittal Meeting

Step 3

Pre-Submittal Meeting

Before developing stormwater design plans or other submittal documents for a development project, a pre-submittal meeting with PUD staff is required, unless deemed otherwise by the City. The purpose of the pre-submittal meeting is to discuss applicable Post-Construction Stormwater Permit Program requirements and confirm what related plans and permits may be required. The meeting will also include initial discussion of a conceptual stormwater plan that may be appropriate for the site.

At minimum, the owner and the design engineer for the stormwater design plans shall attend the pre-submittal meeting. The owner or owner's representative should bring the following information to the meeting:

- Name, type, and location of development;
- Brief description of site topography and drainage features;
- Size of development site and anticipated developed area in acres;

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- Conceptual stormwater plan (Section 2.1); and
 - List of anticipated plans and applicable permits.

The owner or design engineer may contact the City to schedule the pre-submittal meeting and it may be held in conjunction with a pre-submittal meeting for the Land Disturbance Permit Program. Other City, state, and federal permits may apply to a project, including a City Land Disturbance Permit. Contact information for the City, MDNR Northeast Regional Office, and U.S. Army Corps of Engineers – Kansas City District is provided in Appendix B. For more details on potentially applicable permits to stormwater and land disturbance projects, refer to Table 2-1 in the *Land Disturbance Manual*.

3.0 Stormwater Design Requirements

Step in Section 3.0:

Step 4 – Develop Stormwater Design Plans:

A design engineer shall develop stormwater design plans that include appropriate permanent BMPs in accordance with Ch. 34, Art. IV of the City’s Code of Ordinances and guidance provided in this Manual (Sections 3.1 through 3.7).



3.1 Overview

Stormwater design plans must be developed for all projects within the City that are required to obtain a Post-Construction Stormwater Permit (Section 1.2). All stormwater design plans must be prepared by, or under the responsible charge of, sealed (stamped), and signed by a professional engineer registered in the state of Missouri (referred to in this Manual as the “design engineer”). It is the design engineer’s responsibility to prepare the stormwater design plans according to the requirements found in this Manual.

Stormwater designs shall:

- Be designed to achieve the objectives described in Section 3.2;
- Be appropriate for site-specific conditions (assessed as described in Section 3.3);
- Preserve natural areas to the extent possible (as described in Section 3.4);
- Include appropriate permanent stormwater BMPs selected and designed as described in Sections 3.5 and 3.6.

Required stormwater design-related submittals are described in Section 3.7.

3.2 Design Objectives

To comply with the City’s Post-Construction Stormwater Permit Program, stormwater designs must include long-term controls on the quantity and quality of stormwater released from post-construction developments. Such long-term stormwater controls shall be designed to achieve the following objectives:⁶

⁶ Adapted from the City’s Code of Ordinances, Ch. 34, Art. IV, Section 34-101.

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- Protect against increased flooding and decreased water quality of downstream areas and streams due to effects of development;
 - Protect the welfare of individuals and their property by reducing the effects of development;
 - Protect the environment and aquatic habitat of fish and other species.

To achieve these design objectives, the City requires applicants to seek to control the quantity (volume and peak runoff rate) and quality of stormwater runoff to mimic pre-development conditions to the extent feasible (where pre-development condition is defined as the natural condition of a site before development occurred). Related design criteria are described further in Section 3.6.

3.3 Pre-Design Site Assessment

It is highly recommended that the design engineer visit the site to assess existing conditions prior to beginning design of permanent stormwater BMPs. Ideally, this site assessment shall occur prior to preparing a conceptual stormwater plan (Section 2.1) and participating in a pre-submittal meeting with the City (Section 2.2); however, if that is not possible, it should still occur prior to preparing stormwater design plans.

During this site assessment, the design engineer should consider how the proposed development of the site will alter these conditions and how permanent stormwater BMPs can be implemented so that post-development stormwater runoff conditions will mimic pre-development stormwater runoff conditions to the extent feasible. The site assessment should include the following:

- Existing stormwater drainage patterns, including:
 - Stormwater runoff;
 - Stormwater run-on from other areas;
 - Where stormwater currently discharges to and where it will discharge to after development (e.g., storm sewer, water body).
- Existing site topography (e.g., existing steep or mild slopes).
- Existing land cover, including:
 - Whether the site contains naturally vegetated areas that should, if possible, be preserved;
 - How existing land cover compares to proposed land cover (e.g., grassy or wooded areas, impervious surfaces such as asphalt, concrete, and rooftops).
- Existing or potential space restrictions (e.g., what is the current site layout, how might space restrictions affect permanent stormwater BMP design).

- Identifying downstream water bodies and downstream landowners, including potential for the proposed development to impact them.

3.4 Preserve Natural Areas

Natural areas that are stable and pervious, such as grass or tree covered spaces, should be preserved to the extent practical. Preserving natural area aids in maintaining the site's ability to infiltrate stormwater into the ground and thus:

- Allows natural recharge of water into the ground;
- Minimizes the increase in stormwater runoff leaving the site as the result of the development;
- Reduces the amount of stormwater that needs to be managed by permanent stormwater BMPs and thus reduces the size of such BMPs.

Stormwater runoff can also be directed to flow across natural areas and thus improve stormwater quality through filtration.

If a site already contains large amounts of impervious surfaces, it may be possible to return some of these areas to natural, pervious surfaces. Wherever feasible, site layout should be designed to minimize impervious surfaces and maximize pervious surfaces.

3.5 Permanent BMP Selection

The design engineer shall use their best professional judgement to select permanent stormwater BMPs that are appropriate for site-specific conditions and intended to achieve the objectives described in Section 3.2 and meet the design criteria described in Section 3.6. In some cases, multiple permanent stormwater BMPs may be necessary at a site to reliably achieve design objectives.

Potential permanent stormwater BMP options include, but are not limited to:

- Detention basins (i.e., dry ponds);
- Retention basins (i.e., wet ponds);
- Infiltration systems (e.g., infiltration basins, infiltration trenches);
- Filtration / biofiltration systems;
- Bioretention systems (e.g., rain gardens);
- Constructed wetlands;
- Bioswales / vegetated swales;
- Hydrodynamic separators;

- Pervious pavement / pavers;
- Green roofs;
- Rain barrels and cisterns.

Refer to resources such as the MDNR’s “Protecting Water Quality: A Field Guide to Erosion, Sediment and Stormwater Best Management Practices for Development Sites in Missouri and Kansas” and “Missouri Guide to Green Infrastructure Integrating Water Quality into Municipal Stormwater Management” for additional potential options and associated design considerations.

Note that the City has discretion to approve or disapprove the use of specific stormwater BMPs based on site-specific conditions both on site and downstream. Discussion of proposed stormwater BMPs with the City is recommended, beginning with discussion of a conceptual stormwater plan (Section 2.1) during the pre-submittal meeting (Section 2.2).

As an alternative to installing permanent stormwater BMPs on site, the applicant could also pursue one of the following options:

- Propose a stormwater design for a larger area that would include management of stormwater from the site. An area-wide stormwater design would be required to achieve the same design objectives (Section 3.2) and meet the same design criteria (Section 3.6) as an on-site design. If this is a preferred option, the design engineer shall contact the City to discuss the feasibility of implementing an area-wide design.
- Pay a fee in lieu of constructing a permanent stormwater BMP. If this is a preferred option, the applicant shall refer to Section 1.4 of this Manual.

3.6 Design Criteria

To achieve the design objectives described in Section 3.2, the City requires applicants to seek to control the quantity (volume and peak runoff rate) and quality of stormwater runoff to mimic pre-development conditions to the extent feasible (where pre-development condition is defined as the natural condition of a site before development occurred).

Specifically, the permanent stormwater BMPs at a site shall be designed in accordance with the following criteria:

- **Water Quality Criteria:** BMPs designed to retain and release stormwater shall retain the 1-year, 24-hour storm event (at minimum) and release it over a 24-hour period (at minimum);
- **Water Quantity Criteria:**
 - Mimic pre-development condition stormwater runoff volume up to the 25-year, 24-hour design storm;

- Mimic pre-development condition peak stormwater runoff rates up to the 2-, 10-, and 25-year, 24-hour design storms (i.e., post-development peak discharge rate shall be equal to or less than the pre-development peak discharge rate for each frequency);
- Consider downstream capacity: if downstream stormwater structures are not capable of conveying flow from the 100-year, 24-hour design storm, then additional detention capacity or additional conveyance structures shall be provided.
- Prevent erosion by providing protection at any discharge point (e.g., velocity dissipation, stabilization);
- Provide a vehicle access and minimum 10-foot-wide easement for inspecting, operating, and maintaining all stormwater features. Easements shall include additional width to consider project features as needed (e.g., stormwater infrastructure, buried utilities, etc.).

This Manual is to serve as a minimum standard and guidance document. It is the responsibility of the design engineer to design measures that will adequately control stormwater.

If the design engineer determines that any of these design criteria are infeasible, the design engineer shall provide the City with documentation of infeasibility, along with proposed alternative methodology for achieving the design objectives (Section 3.2), to the extent feasible. Additionally, if the design engineer determines that any post-construction stormwater requirement poses a safety hazard on their particular project, it is the design engineer's responsibility to notify the City in writing of their concerns and recommend an approach to lessen potential problems.

Note that the City has discretion to disapprove stormwater designs that are deemed unlikely to consistently achieve the design objectives (Section 3.2) based on best professional judgment.

3.7 Submittal Requirements

3.7.1 Design Plans

Hard copy plans must be submitted to the City showing the design of all permanent stormwater BMPs. A site layout must be submitted showing the location of all BMPs on the site. Detail sheets must also be included to show the specific size and design of all BMPs to be constructed or installed. As applicable to the specific BMP, the details sheets shall include plan view(s), profile view(s), inlet detail(s), outlet structure detail(s), hydraulic profile(s) for features such as emergency spillways, pretreatment system detail(s), etc. All plan sheets shall be 24" x 36" unless otherwise approved by the City. Drawings submitted for final acceptance must be sealed and signed by the design engineer registered in the state of Missouri.

3.7.2 Calculations

Calculations that must be submitted are:

- Hydrologic calculations performed to determine pre- and post-development stormwater runoff;
- Outlet structure and spillway rating curve(s) (as applicable);

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- Stormwater routing calculations (as applicable).

If modeling software is used, sufficient documentation shall be provided in order to describe the inputs into the model, methods used, and final results.

3.7.3 Operation and Maintenance Plan and Agreements

An operation and maintenance plan shall also be submitted. This plan shall list the operations and maintenance that will be needed for all permanent stormwater BMPs once construction is complete in order to ensure that they continue working as designed in the future. The plan shall be designed to ensure adequate long-term operation and maintenance of all permanent stormwater BMPs, including, as appropriate, agreements between the permittee and other parties such as post-development landowners. If, during review or any point in the future, the maintenance plan is found to be inadequate for preserving the functionality of the permanent stormwater BMP(s), the City requires that it be amended to remedy deficiencies.

4.0 Application and Design Review

Steps in Section 4.0:

Step 5 – Submit Stormwater Design and Application:

The applicant submits the Post-Construction Stormwater Application, stormwater design plans, and other required documents to City for review. An application fee shall be included with this submittal (Section 4.1).

Step 6 – Stormwater Design Review – Completeness Check:

The City shall pre-review the stormwater design plans and supporting documents to check for a basic level of completeness based on compliance with Ch. 34, Art. IV of the City's Code of Ordinances and guidance provided in this Manual. If deemed incomplete, the submittal will be returned to the Applicant for modification and resubmission (Section 4.2.1).

Step 7 – Stormwater Design Review – Detailed Review:

Once the submittal is deemed complete, the City shall conduct a detailed review of the stormwater design plans and supporting documents for compliance with of the City's Code of Ordinances and guidance provided in this Manual. If deficiencies are noted, the City will provide written comments to the Applicant; such comments may include questions, requests for additional information, and/or requests for modifications to the stormwater design in order to comply with applicable requirements. If such comments are received, the Applicant shall address each comment and resubmit revised documents along with a summary of how each comment was addressed (Section 4.2.1).

Step 8 – Plan Acceptance:

- When the City has determined the stormwater design meets the requirements of Ch. 34, Art. IV of the City's Code of Ordinances and guidance provided in this Manual, the stormwater design plans will be accepted.
- The Applicant shall post the required fiscal security and submit at least three sets of the stormwater design plans, sealed and signed by a Missouri PE, to the City to be signed and returned (Section 4.2.2).

Step 9 – Post-Construction Stormwater Permit Issuance:

If the Applicant is in compliance with the requirements of Ch. 34, Art. IV of the City's Code of Ordinances and guidance provided in this Manual, the City shall issue a Post-Construction Stormwater Permit (Section 4.3).

4.1 Post-Construction Stormwater Permit Application

Step 5

Submit Stormwater Design and Application

After completing all applicable plans and designs in accordance with the requirements of this Manual, the permittee shall submit the following to the City:

- Stormwater design plans;
- All required calculations showing the stormwater design methodology and how the design meets applicable design criteria (as described in Section 3.6);
- Related permits and plans, including a maintenance plan;
- Stormwater permit application (Appendix C);
- Required checklist for acceptance of permanent BMPs (Appendix D);
- Stormwater permit application fee, which consists of a base fee and per acre charge.

4.2 Stormwater Design Review and Acceptance

4.2.1 Stormwater Design Review

Step 6

Stormwater Design Review – Completeness Check

The City will review the stormwater design for completeness within approximately 10 business days after the plans and documents are submitted. Upon submittal of the design, the applicant shall be prepared to respond promptly to any questions, requests for additional information, and/or requests for SWPPP modifications. If the design does not meet the requirements described in Section 3.0, it will be returned to the applicant for revisions. The one-week review period will begin again upon submittal of the revised design. The revision and review process will continue until the design is deemed complete by the City.

Step 7

Stormwater Design Review – Detailed Review

Once the City deems the stormwater design complete, a detail review based on the requirements outlined in Section 3.7 will take place. The proposed post-construction stormwater controls will be checked for proper application, timing, placement, design, and maintenance plan. Typically, written comments will be provided to the applicant within 25 business days of the City accepting the stormwater design as complete. This applies to initial submittals as well as resubmittals. The applicant shall revise the stormwater design and fully address each comment from the City. If the City does not deem the comment revisions sufficient, the stormwater design must be revised. Beginning with the third comment resubmittal, the City may charge an additional review fee each time the stormwater design must be resubmitted. After all review comments are addressed, the applicant will be notified by the City that the stormwater design has been preliminarily

Acceptance by the City does not preclude the applicant(s)/permittee(s) from complying with all other applicable federal, state, and local regulations.

accepted. Other permits, such as a building permit, will not be issued until a Post-Construction Stormwater Permit has been issued.

4.2.2 Stormwater Design Acceptance

Step 8

Plan Acceptance

When the City has determined the stormwater design plans comply with the guidance provided in this Manual, the design plans will be accepted. Once the design plans have been accepted, the applicant shall submit the following to the City:

- Specified number of sealed design plan copies signed by a professional engineer registered in the state of Missouri . The number of copies may be dependent upon the project.
- Fiscal security must also be submitted at this time.

Final acceptance will occur when the design plans are signed by the City and fiscal security has been submitted.

4.2.3 Fiscal Security

The City requires applicants to post fiscal security for any project needs a Post-Construction Stormwater Permit. This allows the City to complete permanent stormwater BMPs if the permittee does not fulfill the requirements of the permit within the timeframe specified by the City. The amount of fiscal security required for a Post-Construction Stormwater Permit is based on the probable cost of installing the permanent stormwater BMPs required on a site.

The City accepts an Irrevocable Letter of Credit (ILOC) to allow for the security to be held until final close-out acceptance, which is when the Stormwater Operating Permit is issued. If the ILOC expires prior to the final close-out acceptance, the letter of credit needs to be extended a minimum of 14 days prior to the expiration date. The City will draw upon the fiscal security if it is not extended prior to the 14-day deadline.

4.3 Issuance of Post-Construction Stormwater Permit

Step 9

Post-Construction Stormwater Permit Issuance

Once all plans, designs, and fiscal security have been received and accepted by the City, the City will issue the Post-Construction Stormwater Permit, which is valid for one year from the date the permit is signed by the City. If additional time is needed, the permittee(s) should contact the City and start the renewal process at least 14 days prior to the expiration date of the original permit. Permittee(s) must have a valid Post-Construction Stormwater Permit at all times.

5.0 Construction and Project Close-Out

Steps in Section 5.0:

Step 10 – Construct Permanent BMPs:

Permanent BMPs must be constructed in accordance with the accepted stormwater designs, requirements of Ch. 34, Art. IV of the City's Code of Ordinances, and guidance provided in this Manual (Section 5.1.1).

Step 11 – Post-Construction Stormwater Close-Out Inspection:

- After the site is stabilized (including final vegetation), contact the City to schedule the post-construction stormwater close-out inspection.
- A representative of the Permittee shall attend the post-construction BMP inspection.
- The permittee must correct any deficiencies the City identifies and contact the City to schedule a follow-up inspection (Sections 5.1.2 and 5.1.3).

Step 12 – Stormwater Operating Permit Issuance:

When the City has found the stormwater BMP(s) have been constructed in accordance with the requirements of Ch. 34, Art. IV of the City's Code of Ordinances and guidance provided in this Manual, the City shall give the Owner a signed post-construction stormwater close-out inspection form and transition the Post-Construction Stormwater Permit to a Stormwater Operating Permit (Section 5.2).

Step 13 – Fiscal Security Release:

The permittee will submit a Fiscal Security Release Form to the City to be signed and returned (Section 5.2).

5.1 Post-Construction Stormwater Close-Out Inspection

5.1.1 Preparing for Inspection

Step 10

Construct Permanent BMPs

In preparation for the post-construction stormwater close-out inspection, before the permittee(s) leave the site, the following shall be completed:

- All permanent stormwater BMPs shall be constructed as shown on the design plans in accordance with the guidance provided in this Manual;
- All disturbed areas should be seeded and mulched, or otherwise stabilized, per the City's land disturbance criteria.

Failure to properly complete these items may result in a hold being placed on the issuance of any new building permits or the closing of existing building permits and allowing occupancy.

Once all items are complete, the permittee shall contact the City to schedule the post-construction stormwater close-out inspection. The inspection should be scheduled after the BMPs have been constructed to obtain the first stormwater operating permit. The Post-Construction Stormwater Permit expires once the BMP construction is complete.

5.1.2 Inspection Attendees and Agenda

Step 11

Post-Construction Stormwater Close-Out Inspection

The permittee(s) representative(s) shall attend the post-construction stormwater close-out inspection with the City Inspector.

The following agenda items will be addressed at the post-construction stormwater close-out inspection:

- **Permanent stormwater BMP inspection.** All final BMPs will be inspected to determine general agreement with the design plans and correct installation.
- **Soil stabilization.** The City will confirm steps have been taken to stabilize the soil (seeding, mulching, erosion control blankets, and riprap). This needs to be done to protect against erosion and prevent sediment from being washed downstream. Even after the stormwater measures are approved and an operating permit is obtained, vegetation must still be established as required by the *Land Disturbance Manual* for all areas of the site.

5.1.3 Corrections to Site

The permittee(s) shall make any corrections to the site that the City Inspector has requested. If the corrections are substantial, the City Inspector may require a follow-up inspection prior to issuing acceptance and the Stormwater Operating Permit.

5.2 Stormwater Operating Permit Issuance

Step 12

Stormwater Operating Permit Issuance

After confirming the permanent stormwater BMP(s) have been constructed in accordance with this Manual, the City shall give the Owner a signed post-construction stormwater close-out inspection form. The inspection form allows the issuance of the Stormwater Operating Permit for one year. Re-inspection must be performed each year before the expiration of the Stormwater Operating Permit. The owner must keep the inspection forms on file.

Step 13

Fiscal Security Release

After construction of the permanent stormwater BMPs has been approved, the City will release the fiscal security.

6.0 Stormwater Operating Permit Compliance

Steps in Section 6.0:

Step 14 – Stormwater Operating Permit Compliance:

This allows the City to confirm compliance with the Stormwater Operating Permit (Section 6.1).

Step 15 – Annual Stormwater Operating Inspection:

- Once a year, the Owner’s representative will contact the City to schedule a stormwater operating inspection.
- The Owner’s representative shall attend each stormwater operating inspection.
- If deficiencies are noted by the City, the Owner must provide a plan and schedule to correct the deficiencies to the City, within 2 weeks of the inspection.
 - The Owner must correct deficiencies requested by the City as soon as practicable, and no later than 3 months after the inspection, unless specifically arranged with the City. Once deficiencies are corrected, the Owner should contact the City to schedule a follow-up inspection.
 - If deficiencies are not corrected within 3 months and no alternative arrangements have been made with the City, deficiencies will be corrected by the City at the Owner’s expense (Section 6.1) and the Stormwater Operating Permit may be revoked

Step 16 – Annual Stormwater Operating Permit Renewal:

If the Owner is in compliance with the Stormwater Operating Permit, the City shall renew the Permit after completing the annual stormwater operating inspection (Section 6.1). If the Owner is not in compliance with the Stormwater Operating Permit, the City may revoke the Permit. If the City revokes the Permit, the Owner will need to pay the permit application fee for a new permit.

A stormwater operating permit must be renewed each year after a re-inspection.

6.1 Continued Maintenance and Annual Inspections

Step 14

Stormwater Operating Permit Compliance

The Stormwater Operating Permit requires all permanent stormwater BMPs to be maintained according to the maintenance plan developed during the design phase.

**Step 15****Annual Stormwater Operating Permit Inspection**

In order for annual renewal of the Stormwater Operating Permit, the City will perform an inspection each year in order to verify that all permanent stormwater BMPs are being properly maintained (Appendix E). The City has the right to perform an inspection in less than one year if the City believes it is needed due to complaints, known problems, or other concerns. It is the responsibility of the owner to contact the City each year to schedule a re-inspection before the expiration of the stormwater operating permit. A representative of the Owner shall attend each stormwater operating permit inspection.

If adequate maintenance is not being performed, the inspector will list the items that require action before the permit can be renewed and provide the list of deficiencies through written communication to the Owner. Within two weeks of the inspection, the Owner must provide a plan and schedule to fix the deficiencies. The Owner must take the required actions to fix the deficiencies as soon as practicable, and no later than, 3 months after the inspection. Once deficiencies are corrected, the Owner shall contact the City to schedule a follow-up inspection. If deficiencies are not corrected within 3 months, the City will correct the deficiencies at the Owner's expense. The City may grant additional time to fix the deficiencies due to special circumstances.

**Step 16****Annual Stormwater Operating Permit Renewal**

If the inspector approves the condition of the permanent stormwater BMPs, the operating permit will be renewed.

7.0 Glossary of Terms

Following is a glossary of some of the terms used in this Manual.

Applicant(s) refers to the owner and engineer who complete and sign the Post-Construction Stormwater Permit application.

Best Management Practice (BMP) refers in this Manual to a measure implemented to control stormwater.

Common Plan of Development or Sale refers to a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one common plan. The "common plan" of development or sale 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.

Construction refers to the implementation of a proposed plan of improvements by a contractor that may include excavating, site grading, utility work, paving, building, and other activities that may contribute to the disturbance of land and elevated levels of erosion and sediment.

Design Engineer refers to the professional engineer responsible for the development of the SWPPP.

Development refers to the process of creating new residential, commercial, office, or other land uses through the process of construction.

Erosion is the process by which the land surface is worn away by the action of wind, water, ice, and gravity.

Fiscal Security refers to an irrevocable letter of credit that an owner submits to the City of Moberly to be held as security during the construction process and to be drawn upon in the case of nonperformance on the part of the permittee(s).

Inspector refers to the City of Moberly representative who visits sites to check for compliance with the Post- Construction Stormwater Permit.

Moberly Public Utilities or City Utilities refers to the department within the City of Moberly that has the authority and responsibility to manage, enforce, and regulate stream buffer activities within the City of Moberly.

Permittee(s) refers to the owner and engineer who obtain a Post-Construction Stormwater Permit.

Post-Construction Stormwater Permit refers to the permit obtained from the City of Moberly prior to commencement of land-disturbing activities as defined in this Manual.

Post-Construction Stormwater Permit Process refers to the process applicants proceed through to obtain a Post-Construction Stormwater Permit from the City of Moberly.

Post-Construction Stormwater Program refers to the program developed and administered by the City of Moberly to regulate the quantity and quality of stormwater within the unincorporated limits of the City of Moberly.

Pre-Development Condition refers to the natural condition of a site before development occurred.

Professional Engineer refers to an individual currently registered with the Missouri State Board of Registration as a professional engineer, practicing engineering in accordance with state law.

Sediment Basin refers to an impoundment that captures sediment-laden runoff and releases it slowly, providing prolonged settling times to capture coarse and fine-grained soil particles.

Stormwater means runoff generated as a result of a precipitation event.

Stormwater Pollution Prevention Plan (SWPPP) refers to the complete package of required information submitted to the City of Moberly for review and acceptance for a land disturbance permit which include drawings, Land Disturbance report, Report Checklist, and Option of Probable Cost Example Worksheet.

8.0 Revisions

This section is intended to provide a location for any revisions and updates to the information in this Manual that may be made available by the City prior to the complete republishing of the Manual.

Any revisions will be dated and will refer back to the section modified. It is suggested that revisions be kept in chronological order within this section.

Date	Section	Revision
December 2021	3.7.3, 6.0	Revised text for requirements of the new Comprehensive MS4 Permit, effective October 1, 2021.

9.0 References

- Columbia, Missouri. Stormwater Management & Water Quality Manual. February 1, 2009. Douglas County, Colorado. Grading, Erosion, and Sediment Control (GES) Manual. March 2004.
- Gribbin, John E. Introduction to Hydraulics and Hydrology with Applications for Stormwater Management. 3rd Edition. Thomson Delmar Learning. Clifton Park, NY. 2007.
- Huff, Floyd A and Angel, James R. Bulletin 71 - Rainfall Frequency Atlas of the Midwest. Illinois State Water Survey. 1992.
- Maryland Department of the Environment and Center for Watershed Protection. Maryland Stormwater Design Manual Volumes I & II. 2000.
- Minnesota Stormwater Steering Committee. Minnesota Stormwater Manual Version 2. Minnesota Pollution Control Agency. St. Paul, MN. January 2008.
- Missouri Department of Natural Resources. Storm Water Information Clearinghouse.
<http://www.dnr.mo.gov/env/wpp/stormwater/index.html>.
- New Jersey Department of Environmental Protection - Division of Watershed Management. New Jersey Stormwater Best Management Practices Manual. April 2004.
- The Stormwater Manager's Research Center. A Stormwater Design Manual Toolbox.
<http://www.stormwatercenter.net/>.
- United States Department of Agriculture - Natural Resources Conservation Service. TR-55 Urban Hydrology for Small Watersheds. June 1986.
- United States Environmental Protection Agency. National Menu of Stormwater Best Management Practices. 9 Jan. 2008. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index>. Cfm.
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Appendices

Appendix A

Required Checklist and Cost Estimate for a Fee in Lieu of Permanent BMP(s)

Required Checklist and Cost Estimate for a Fee in Lieu of Permanent BMP(s)



Item Category	Item Description	Quantity	Unit Measurement	Unit Price	Total Price	Notes <i>Include estimate justification and relevant details/assumptions</i>	Approval/Comments (City Use Only):
General Construction	Engineering and Design			\$	\$		
	Permitting			\$	\$		
	Mobilization			\$	\$		
	Erosion Control			\$	\$		
	Other, as needed ⁽¹⁾			\$	\$		
Subtotal							
Storm Sewer - Junction Box	Junction Box			\$	\$		
	Pipe			\$	\$		
	End Section			\$	\$		
	Riprap			\$	\$		
	Other, as needed ⁽¹⁾			\$	\$		
Subtotal							
Detention or Infiltration BMP⁽¹⁾	Riprap			\$	\$		
	Excavation			\$	\$		
	Topsoil			\$	\$		
	Grading			\$	\$		
	Seeding			\$	\$		
	Other, as needed ⁽¹⁾			\$	\$		
Subtotal					\$		
Total Estimate, with Contingency					\$		
Contingency (10% of Total Fee)					\$		
Total Estimate, with Contingency					\$		

(1) To be determined by the project owner, engineer, and City staff pending site conditions and stormwater management needs.

Required Checklist and Cost Estimate for a Fee in Lieu of Permanent BMP(s)



Item Category	Item Description	Quantity	Unit Measurement	Unit Price	Total Price	Notes <i>Include estimate justification and relevant details/assumptions</i>	Approval/Comments (City Use Only):
General Construction	Engineering and Design			\$	\$		
	Permitting			\$	\$		
	Mobilization			\$	\$		
	Erosion Control			\$	\$		
	Other, as needed ⁽¹⁾			\$	\$		
Subtotal							
Storm Sewer - Junction Box	Junction Box			\$	\$		
	Pipe			\$	\$		
	End Section			\$	\$		
	Riprap			\$	\$		
	Other, as needed ⁽¹⁾			\$	\$		
Subtotal							
Detention or Infiltration BMP⁽¹⁾	Riprap			\$	\$		
	Excavation			\$	\$		
	Topsoil			\$	\$		
	Grading			\$	\$		
	Seeding			\$	\$		
	Other, as needed ⁽¹⁾			\$	\$		
Subtotal					\$		
Total Estimate, with Contingency					\$		
Contingency (10% of Total Fee)					\$		
Total Estimate, with Contingency					\$		

(1) To be determined by the project owner, engineer, and City staff pending site conditions and stormwater management needs.

Appendix B

Contact List

Contact Information

(Information is subject to change)

City of Moberly Public Utilities Department

101 West Reed Street
Moberly, MO 65270
Phone: (660) 269-8705

Missouri Department of Natural Resources

Northeast Regional Office
1709 Prospect Drive
Macon, MO 63552
Phone: (660) 385-8000
Fax: (660) 385-8090

U.S. Army Corps of Engineers – Kansas City District

Missouri State Regulatory Office
221 Bolivar Street, Suite #103
Jefferson City, MO 65101
Phone: (573) 634-2248
Fax: (573) 634-7960

Appendix C

Post-Construction Stormwater Permit Application

**STORMWATER PERMIT APPLICATION
MOBERLY, MO**



PROPERTY OWNER		CONTRACTOR	
Name:		Name:	
Address:		Address:	
Contact Name:	Phone:	Contact Name:	Phone:
ADDITIONAL SIGNATORY		ADDITIONAL SIGNATORY	
Name:		Name:	
Title:		Title:	
Project Role:		Project Role:	
Address:		Address:	
Contact Name:	Phone:	Contact Name:	Phone:
Project Name:			
Location:			
Acres Disturbed:			
Stormwater Design Description (also attach plans):			
Stormwater Volume Treated by Design:			
<p>By signing below, all applicants hereby apply for a City of Moberly Stormwater Permit for the aforementioned property and certify as follows:</p> <ol style="list-style-type: none"> To the best of my/our knowledge, the information provided herein is correct; Stormwater Design Plans and Calculations for the site were prepared and submitted in accordance with the Post-Construction Stormwater Manual, all local, state, and federal permits; and I certify I am legally authorized to sign on behalf of and bind the above-listed entity. <p>The Stormwater Permit is granted with the explicit understanding that it is the Permittee's responsibility to:</p> <ol style="list-style-type: none"> Allow the City of Moberly unrestricted access to the site to conduct regular site inspections; Comply with all requirements of the Post-Construction Stormwater Manual; and Comply with all local, state, and federal requirements. 			
PROPERTY OWNER		ENGINEER OF RECORD	
Signature:		Signature:	
Print Name:		Print Name:	
Date:		Date:	

ADDITIONAL SIGNATORY		ADDITIONAL SIGNATORY			
Signature:		Signature:			
Print Name:		Print Name:			
Title:		Title:			
Date:		Date:			
PERMIT APPROVAL (CITY USE ONLY)					
Base Fee: \$250.00	Additional cost: \$25 x _____ disturbed acres = \$ _____	Base Fee:	\$ _____	Renewal <input type="checkbox"/>	\$100
		Permit Fee:	\$ _____	Transfer <input type="checkbox"/>	\$100
		Total Fee:	\$ _____		
Date Paid:	Amount:	<input type="checkbox"/> Check (list check # _____) <input type="checkbox"/> Cash			
Engineer's Estimate \$ _____ x 1.15 = Total Security \$ _____			Security Received: <input type="checkbox"/> Y <input type="checkbox"/> N		
Date Application Accepted:					
STAFF APPROVAL			STAFF APPROVAL		
Signature:			Signature:		
Print Name:			Print Name:		
Title:			Title:		
Date:			Date:		

Appendix D

Required Checklist for Acceptance of Permanent BMPs

Required Checklist for Acceptance of Permanent BMPs



1. Design Plans (submit 24" x 36" plan sheets via hard copy)

- yes no 1. Site layout that shows the location of each BMP
- yes no 2. BMP details, as appropriate:
 - yes no a. Plan view(s)
 - yes no b. Profile view(s)
 - yes no c. Inlet detail(s)
 - yes no d. Outlet structure detail(s)
 - yes no e. Hydraulic profile(s) for features such as emergency spillways, pretreatment system details, etc.
 - yes no f. Additional design feature(s), if applicable

2. Calculations

- yes no 1. Hydrologic calculations performed to determine pre- and post-development stormwater runoff
- yes no 2. Outlet structure and spillway rating curve(s), if applicable
- yes no 3. Modeling methods, inputs, and final results, if applicable

3. Maintenance Plan (one for each permanent stormwater BMP)

- yes no 1. Maintenance required for continued operation of the BMP after construction
- yes no 2. Maintenance agreements between BMP owner and other parties, if applicable

Appendix E

City Inspection Form

Stormwater Operating Permit – Initial Inspection? Yes No

If yes:

- **Yes No** Address areas that need action and schedule a re-inspection?
- **Yes No** Stormwater work is approved. The Stormwater Operating Permit is valid for one year from date of the inspection. In order to renew, schedule an inspection with the City of Moberly before the one year period ends.

Stormwater Operating Permit – Annual Inspection? Yes No

If yes:

- **Yes No** Address areas that need action and schedule a re-inspection?
- **Yes No** Stormwater work is approved. The Stormwater Operating Permit is renewed for one year. In order to renew, schedule an inspection with the City of Moberly before the one year period ends.

By signing below, all signatories hereby declare their presence and/or awareness the inspection dated on this form occurred:

PROPERTY OWNER	ADDITIONAL SIGNATORY
Signature:	Signature:
Print Name:	Print Name:
Date:	Title:
	Date:
STAFF APPROVAL	STAFF APPROVAL
Signature:	Signature:
Print Name:	Print Name:
Title:	Title:
Date:	Date: