

INDOT Post-Construction Stormwater BMPs

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Outline

- INDOT as an MS4
- Target Pollutant
- BMP Selection
- Considerations
- Infeasibility Analysis
- Implementation

INDOT as an MS4

- Characteristics
 - State of Indiana
 - Linear - 11,000 centerline miles
 - 4,800 miles within another MS4
 - Buildings and grounds (rest areas, district offices, maintenance facilities)
- Compliance
 - “ordinance or other regulatory mechanism”
 - “local requirements”
 - Design Manual, Standard Specifications, etc.

West Fork White River, Morgan County, Indiana

Target Pollutant

- Sediment
 - Most common water pollutant (US EPA)
 - Primary pollutant in stormwater run-off from pavement
- Permanent BMPs target sediment removal
- 80 % - sediment removal rate target as Total Suspended Solids (TSS)

BMP Selection

Structural BMP	Description	Pollutant Removal Mechanism	Priority
Dry Turf Grass Swale	A broad and shallow channel planted with grass. Fully drains between rainfall events.	Sedimentation, physical filtration, and biofiltration	1
Dry Native Grass Swale	A broad and shallow channel planted with dense specialized plants. Fully drains between rainfall events.	Sedimentation, physical filtration, and biofiltration	1
Filter Strip	A vegetated linear section of land. Also often referred to as a buffer strip.	Physical filtration, sorption, biofiltration	1
Dry Detention Pond	An engineered basin planted with grass. Fully drains between rainfall events. Includes an outlet structure to control flow.	Sedimentation, physical filtration, and biofiltration	1
Wet Swale	A broad and shallow channel planted with grass. Designed with a permanent pool and an elevated outlet structure.	Sedimentation, physical filtration, and biofiltration	2
Wet Retention Pond	Engineered basin designed to permanently store run-off. Designed with a permanent pool and an elevated outlet structure.	Sedimentation, physical filtration, and biofiltration	2
Infiltration Swale	A broad and shallow channel with permeable soil planted with grass. Designed to infiltrate run-off into the underlying soil.	Sedimentation, physical filtration, infiltration, sorption, and biofiltration	3
Infiltration Basin	An engineered basin with permeable soil planted with grass. Designed to infiltrate run-off into the underlying soil.	Sedimentation, physical filtration, infiltration, sorption, and biofiltration	3
Proprietary Device	Hydrodynamic separators.	Sedimentation and physical filtration	4

Considerations

- Available right-of-way
- Steep slopes and other topographic constraints
- Infiltration not allowed in karst areas
- High water-table, some BMPs must drain between rainfall events
- Bedrock near ground surface – expensive to excavate
- Large off-site areas draining to BMPs – require more space – can lead to high velocities
- Adjacent land-use draining to INDOT right-of-way
- Underlying soil type – affects infiltration and support for needed vegetation

Infeasibility Analysis

- Economically infeasible
 - Limited right-of-way, utility relocations, topographic constraints, and amount of added flow from offsite
 - Ability to treat existing runoff in another location in watershed instead of new
- TMDLs
 - Must consider receiving streams on the current 202(d) list of impaired waters
 - Pollutants not from INDOT ROW may be infeasible to remove in post-construction BMPs
- Documentation
 - Submitted with application

Implementation

- Design Manual Chapter 204 reference to Post-Construction BMP Guidance Document
 - Allow for modifications
 - Development of related modifications – standard specifications, pay items, other design manual chapters, standard specifications
- Effective date/project development stage (TBD)
 - Infeasible to apply to projects beyond – ROW, Stage 2/3 design,?
 - Include in all projects currently being scoped (2025-27 construction)
 - Include in all future scoping