

Design and Review Process

What Should Be Reviewed, and When?

Overview

- 🕒 **Alternative Evaluation Report**
- 🕒 **Stage 1 Design Submittal**
- 🕒 **Stage 2 Design Submittal**
- 🕒 **Stage 3 Design Submittal**
- 🕒 **Design Review Checklists**
- 🕒 **ODOT Post-Construction Review Responsibilities**

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Alternative Evaluation Report (AER)

☉ L&D Vol. 3, Section 1403.4.2 AER Components:

- Determine construction limits based on typical cross-section criteria. Ditch flowline elevations are not normally established. Adjust construction limits for storm sewer outlets, service roads, temporary roads, interchange areas, channel work, culvert outlets, drive relocations, building removals, utility relocations, environmentally sensitive areas, Post Construction Storm Water Best Management Practice (BMP) locations, etc.

☉ Consider BMPs in setting construction limits

☉ Preliminary BMP selection and sizing

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Stage 1 Design Submittal

- ④ L&D Vol. 3, Section 1403.5.3 Stage 1 Review Submission Components:
- ④ “Final Post Construction Storm Water Best Management Practices (BMP) Design Calculations and documentation of any BMP implementation issues”

Stage 1 Design Submittal

- ④ **L&D Vol. 2, Section 1116.2 BMP Submittals; include the following information in the submittal:**
 - ④ Estimated Project Earth Disturbed Area
 - ④ Treatment Percent Calculation
 - ④ BMP selected
 - ④ Drainage area mapping
 - ④ Total contributing area to BMP
 - ④ Contributing area within ODOT right-of-way
 - ④ Plan sheets showing locations of BMPs
 - ④ Calculations for each BMP
 - ④ Explanation of any area that is not treated

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Stage 2 Design Submittal

- ⌚ BMP details in plan sheets (ODOT PDP)
- ⌚ Incorporate comments from Stage 1

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Stage 3 Design Submittal

- 🕒 **L&D Vol. 3, Section 1403.9.2 Stage 3 Detailed Design Activities:**
 - 🕒 Preparation of the Project Site Plan
- 🕒 **Project Site Plan: L&D Vol. 3 Section 1308**
 - 🕒 Includes many pieces of information showing NPDES permit compliance

Project Site Plan

- ④ **Project EDA**
- ④ **Contractor EDA**
- ④ **NOI EDA**
- ④ **Name and location of receiving streams, surface waters, wetlands, and jurisdictional ditches**
- ④ **Existing contours (drainage patterns)**
- ④ **Flow arrows indicating proposed drainage patterns**
- ④ **Culverts, storm sewers, and catch basins**
- ④ **Post construction BMP information**

Project Site Plan

🕒 **Post construction BMP information:**

- 🕒 Show and label all BMPs on plan sheet
- 🕒 Include BMP information in a table
- 🕒 Lat. and long of each BMP
 - 🕒 Beginning and end position for linear BMPs
 - 🕒 Outlet position for other BMPs
- 🕒 EDA treatment credit for each BMP
- 🕒 Width for linear BMPs

Project Site Plan

🗺 Sample Project Site Plan: SP 1308-1

BMP Type	Latitude/Longitude				BMP Width (Feet)	EDA Treatment Credit (Acres)
	Begin		End			
Vegetated Biofilter 1	39.219722	84.524444	39.219444	84.523056	10	8.9
Vegetated Biofilter 2	39.219167	84.524444	39.218889	84.522778	10	6.4
Manufactured System 1 (MS 1)	37.220833	84.525833	-	-	-	9.7
				Treatment Provided		25.0
				Treatment Required*		24.4

* Calculated per L&D Vol. 2, Sec. 1115.7

AER

Prelim. BMP Sizing

BMP Treat. Credit

BMP lat. and long.

BMP Calcs.

Project EDA

Project Site Plan

Final BMP Sizing

Drainage Areas

Prelim. Space for BMP

Prelim. BMPs ID'ed

Treat. Needs vs.
Treatment Credit

Treatment %

BMP Detail Sheets

BMP Trib. Area

Stage 1

Stage 2

Stage 3

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Post-Construction BMP Review Checklists

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Project Wide Review Checklists for ODOT-Let Projects:

Figure 1

Figure Provided?

Values, Calculations, or Descriptions

Value

Units

Project Earth Disturbed Area (EDA)

ac

Existing Impervious Area (Aix)

ac

New Impervious Area in New Permanent R/W (Ain)

ac

Treatment Percent

%

Treatment Requirements (Area)

ac

Quantity Treatment Required?

Yes / No

Treatment Provided by all BMPs (Area) (within R/W)

ac

Treatment Provided by BMP #1 (Area) (within R/W)

ac

Treatment Provided by BMP #2 (Area) (within R/W)

ac

Treatment Provided by BMP #3 (Area) (within R/W)

ac

Treatment Provided by BMP #4 (Area) (within R/W)

ac

Description of any Deviation from Treatment Requirements

Treatment Provided by BMP #1 (Area) (within R/W)

ac

Treatment Provided by BMP #2 (Area) (within R/W)

ac

Treatment Provided by BMP #3 (Area) (within R/W)

ac

Treatment Provided by BMP #4 (Area) (within R/W)

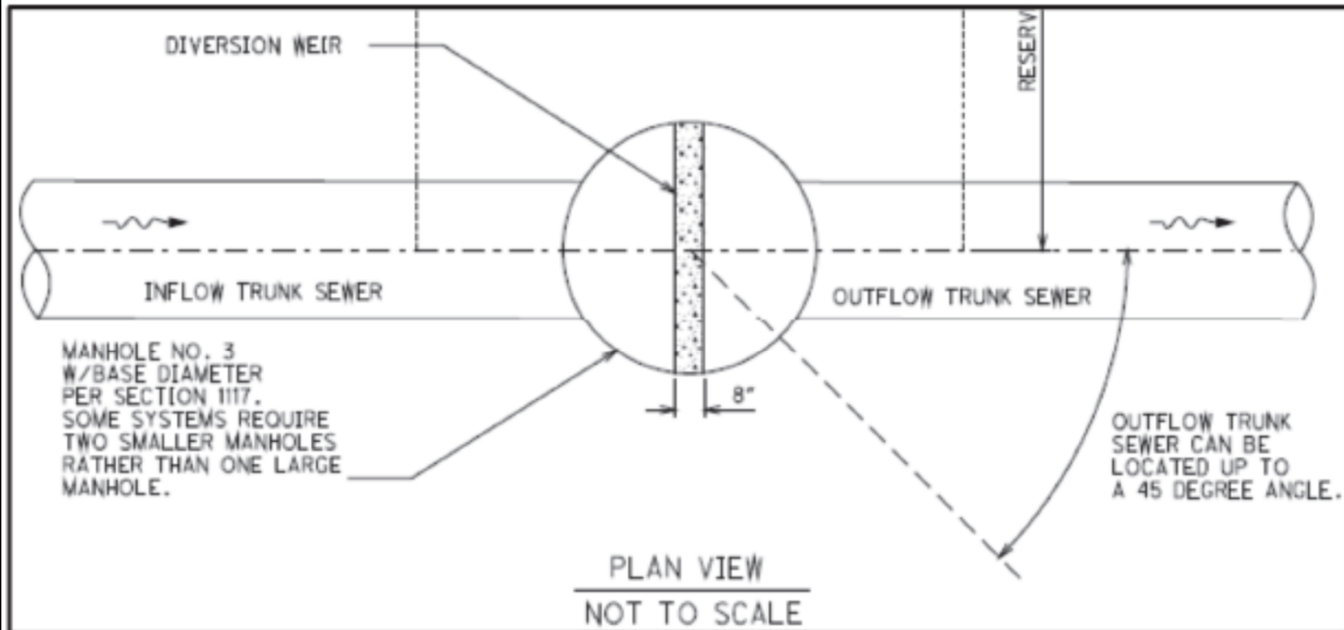
ac

Description of any Deviation from Treatment Requirements



Manufactured System

Manufactured System Review Checklist:



Manufactured System Review	Value	Units
BMP Tributary Area		ac
Area within R/W Draining to BMP		ac
Percent Impervious (for BMP Trib. Area)		%
Coefficient of Runoff (C)		NA
Water Quality Flow (WQ _F)		cfs
Manufactured System Type		1,2,3, or 4
Unit Footprint (length, width, depth)		ft
Description of Maintenance Access		Yes / No

Vegetated Filter Strip

Vegetated Filter Strip Review Checklist:

Table 1117-3

Maximum Pavement Width (ft.)	Slope (H:V)	Filter Strip Width (ft. minimum)
22	3:1 and flatter	15
24	3:1 and flatter	17
26	3:1 and flatter	18.5
28	3:1 and flatter	20.5
30	3:1 and flatter	22
32	3:1 and flatter	24
34	3:1 and flatter	25
48	6:1 and flatter	25

Vegetated Filter Strip Review	Value	Units
BMP Tributary Area		ac
Area within R/W Draining to BMP		ac
Width of Impervious Area Draining to Filter Strip		ft
Width of Vegetated Filter Strip		ft
Slope of Vegetated Filter Strip (Horizontal : Vertical)		ft:ft
Limits of Item 670, Slope Erosion Protection, Shown on the Plans?		Yes / No
Limits of Item 659, Topsoil, Shown on the Plans?		Yes / No



Vegetated Biofilter

Vegetated Biofilter Review Checklist

Vegetated Biofilter (Grass Swale) Review	Value	Units
BMP Tributary Area		ac
Area within R/W Draining to BMP		ac
Percent Impervious (for BMP Trib. Area)		%
Coefficient of Runoff (C)		NA
Water Quality Flow (WQ _F)		cfs
Channel Bottom Width		ft
Channel Fore Slope (Horizontal : Vertical) (Z:1)		ft:ft
Channel Back Slope (Horizontal : Vertical) (Z:1)		ft:ft
Longitudinal Channel Slope		ft:ft
Normal Depth of Flow during WQ _F		in
Velocity of Flow for during WQ _F		fps
Length of Vegetated Biofilter		ft
Design Storm Flow Rate		cfs
Scour Analysis and Scour Protection (if necessary)		Yes / No
Limits of Item 670, Slope Erosion Protection, Shown on the Plans?		Yes / No
Limits of Item 659, Topsoil, Shown on the Plans?		Yes / No

Extended Detention

Extended Detention Basin Review Checklist:

Extended Detention Basin Review	Value	Units
BMP Tributary Area		ac
Inflow and Discharge Design Velocities		fps
Description of any Inflow or Discharge Scour Protection		Yes / No
Overflow Structure Sizing Calculations		Yes / No
Description of Tailwater Assumptions		Yes / No
Detention Basin located outside the Floodplain?		Yes / No
Limits of Item 670, Slope Erosion Protection, Shown on the Plans?		Yes / No
Anti-Seep Collars shown on the Plans?		Yes / No
Maintenance (Vehicle) Access to Outlet Structure?		Yes / No
Have Safety Concerns been Considered / Addressed?		Yes / No
Summary Input and Output from any Software Used		Yes / No
Forebay Volume		ac-ft
Micropool Volume		ac-ft

Description of Tailwater Assumptions		Yes / No
Detention Basin located outside the Floodplain?		Yes / No
Limits of Item 670, Slope Erosion Protection, Shown on the Plans?		Yes / No
Anti-Seep Collars shown on the Plans?		Yes / No
Maintenance (Vehicle) Access to Outlet Structure?		Yes / No
Have Safety Concerns been Considered / Addressed?		Yes / No



Bioretention








Bioretention Cell Review	Value	Units
BMP Tributary Area		ac
Area within R/W Draining to BMP		ac
Impervious area Tributary to BMP		ac
Bioretention Cell Area		ac
Surface Ponding Depth		ft
Side Slopes		ft:ft
Depth of Soil Media Layer		in
Depth of Filter Sand Layer		in
Depth of Filter Pea Gravel Layer		in
Depth of Gravel Drainage Layer		in
Underdrain shown in Drawing		Yes / No
Description of Pretreatment Provided		Yes / No
Inflow and Discharge Design Velocities		fps
Description of any Inflow or Discharge Scour Protection		Yes / No
Overflow Structure Sizing Calculations		Yes / No
Depth: Bottom of Cell to Seasonal High Water Table		ft
Depth: Bottom of Cell to Bedrock		ft
Maintenance (Vehicle) Access to BMP?		Yes / No

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Review Responsibilities

ODOT Let

-  Quality vs. Quality/Quantity treatment
-  Treatment %
-  Treatment area required
-  Drainage area to each BMP
-  ODOT R/W to each BMP
-  WQ_V or WQ_F calculations
-  Consistent with all L&D requirements

Review Responsibilities

Local Let

-  Is a BMP required?
-  Quality vs. Quality/Quantity treatment required?
-  Is a BMP provided?
-  Local holds NPDES permit and responsibility

Local-Let Review Checklist

Review Questions	Input	
Is a Post-Construction BMP Required?		Yes / No
Is the Project EDA 1 or more acres		Yes / No
Is the project a routine maintenance project		Yes / No
Is Water Quantity Treatment Required?		Yes / No
Is more than 1 acre of new impervious area in new permanent right-of-way being added?		Yes / No
Is the project discharging directly to a 4 th order stream or a stream that has a drainage area greater than 100 square miles?		Yes / No
Is an Appropriate Post-Construction BMP Provided?		Yes / No

Updates from Construction General Permit

- ⌚ Larger WQ_v
- ⌚ Larger WQ_F for manufactured systems
- ⌚ Retention basin storage larger
 - ⌚ 2018: 75% below and 75% above
 - ⌚ 2019: 100% below and 100% above
- ⌚ Stage 2 submittal before Jan. 31, 2019
 - ⌚ Current Design
- ⌚ After: larger WQ_v and WQ_F

Updates from Construction General Permit

- ④ What about volume reduction in new CGP?
- ④ Allowed by Ohio EPA
- ④ Unclear how they would be applicable on roadway projects
- ④ ODOT OHE must approve any use of runoff reduction methods

Questions ?

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