

Roadway BMPs – Common Design Errors and Impacts from New CGP

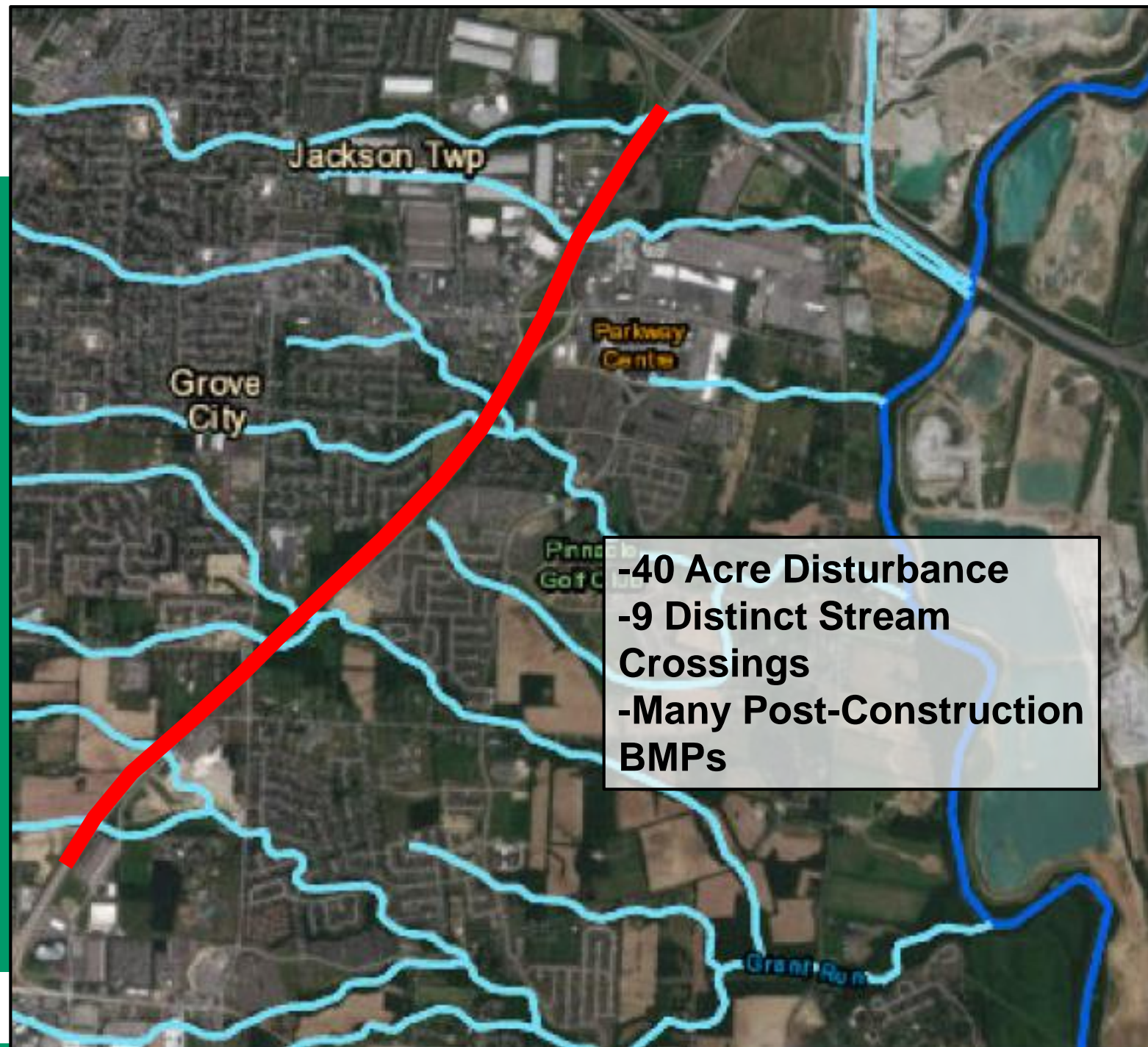
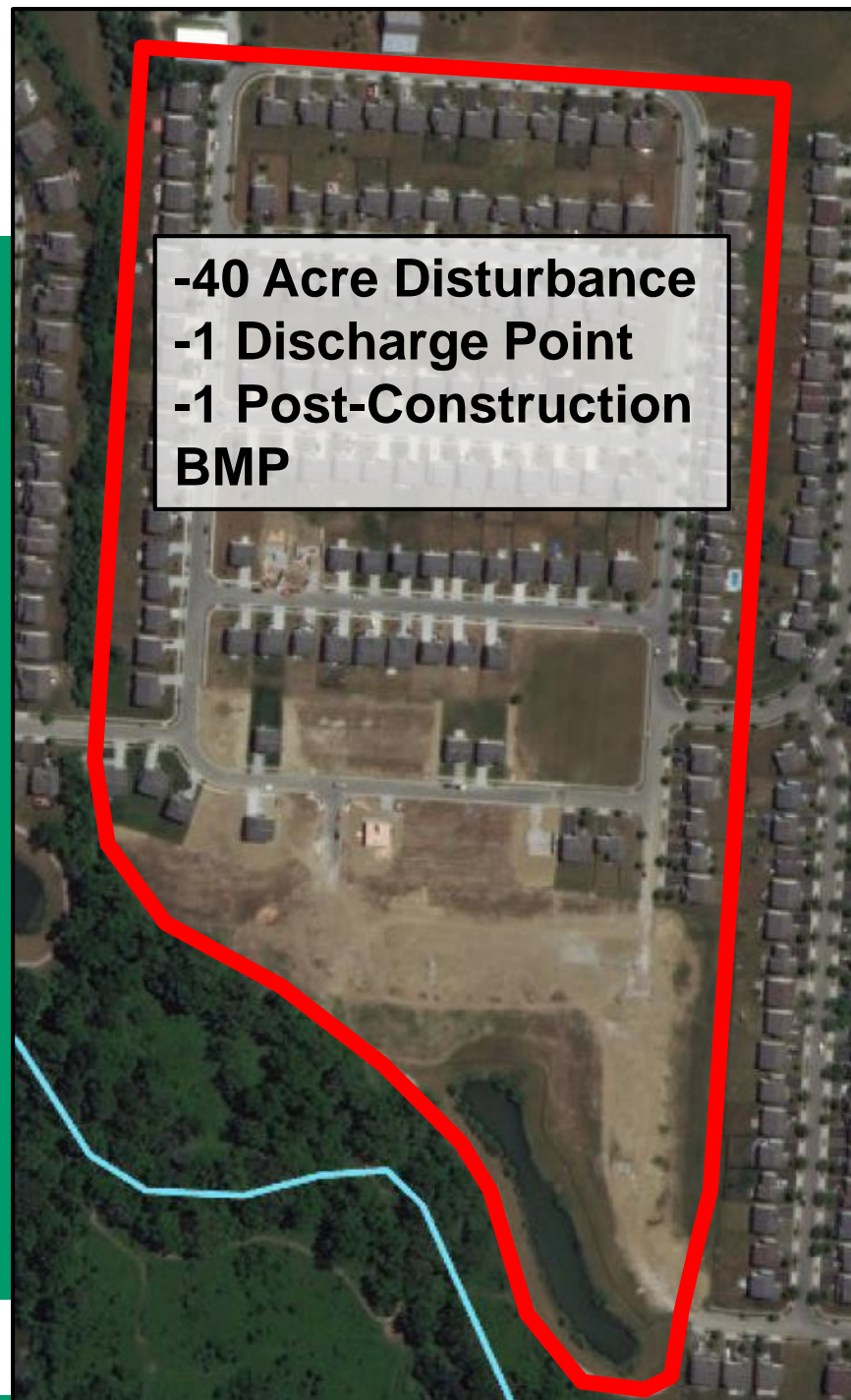
Roadway vs. Typical Site Construction

☉ Typical Site Construction

- ☉ Compact, one discharge point, control over drainage configuration, no off-site run on

☉ Roadway Construction

- ☉ Spread out, multiple discharge points, limited ability to change runoff patterns, significant off-site run on, narrow area to work in with limited space for BMPs



Overview

- ④ Ohio EPA CGP vs. ODOT L&D Volume 2
- ④ Earth Disturbing Area (EDA)
- ④ Impervious Area
- ④ Treatment Requirements and Treatment Credit
- ④ Quality vs. Quantity Treatment
- ④ Manufactured Systems
- ④ Projects that Don't Require Post-Construction BMPs
- ④ Renewed Construction General Permit



Overview

- ① **Ohio EPA CGP vs. ODOT L&D Volume 2**
- ① **Earth Disturbing Area (EDA)**
- ① **Impervious Area**
- ① **Treatment Requirements and Treatment Credit**
- ① **Quality vs. Quantity Treatment**
- ① **Manufactured Systems**
- ① **Projects that Don't Require Post-Construction BMPs**
- ① **Renewed Construction General Permit**



Ohio EPA CGP vs. ODOT L&D Vol. 2

Permit:

The construction of new roads and roadway improvement projects by public entities (i.e. the state, counties, townships, cities, or villages) may implement post-construction BMPs in compliance with the current version (as of the effective date of this permit) of the Ohio Department of Transportation's "Location and Design Manual, Volume Two Drainage Design" that has been accepted by Ohio EPA as an alternative to the conditions of this permit.



Ohio EPA CGP vs. ODOT L&D Vol. 2

- ④ ODOT's L&D Vol. 2: alternative to post-construction BMP requirements
- ④ L&D post-construction BMP guidance reviewed by Ohio EPA
- ④ Conformance with ODOT's L&D a condition of funding from FHWA



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Earth Disturbing Area (EDA)

Permit:

- For the purposes of this permit, construction activities include any clearing, grading, excavating, grubbing and/or filling activities that disturb one or more acres.
- This permit also authorizes storm water discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas)”
- For all construction activities that will disturb one or more acres of land..., the post-construction (BMPs) shall manage storm water



Earth Disturbing Area (EDA)

L&D:

Project EDA: EDA that occurs within the project construction limits

Contractor EDA: EDA from support activity sources such as field offices, batch plants, borrow/waste pits, and temporary access routes.

Total EDA = Project EDA + Contractor EDA

Earth Disturbing Area (EDA)

- **Total EDA = Project EDA + Contractor EDA**
- **When Total EDA \geq 1ac; NOI required**
- **When Project EDA \geq 1ac; BMP required**
- **Treatment Requirements based on Project EDA (not Total EDA)**
- **Example**
 - Project EDA = 0.9 ac
 - Contractor EDA = 0.15 ac
 - Total EDA = 1.05 ac
 - NOI required
 - Post-construction BMP not required



Overview

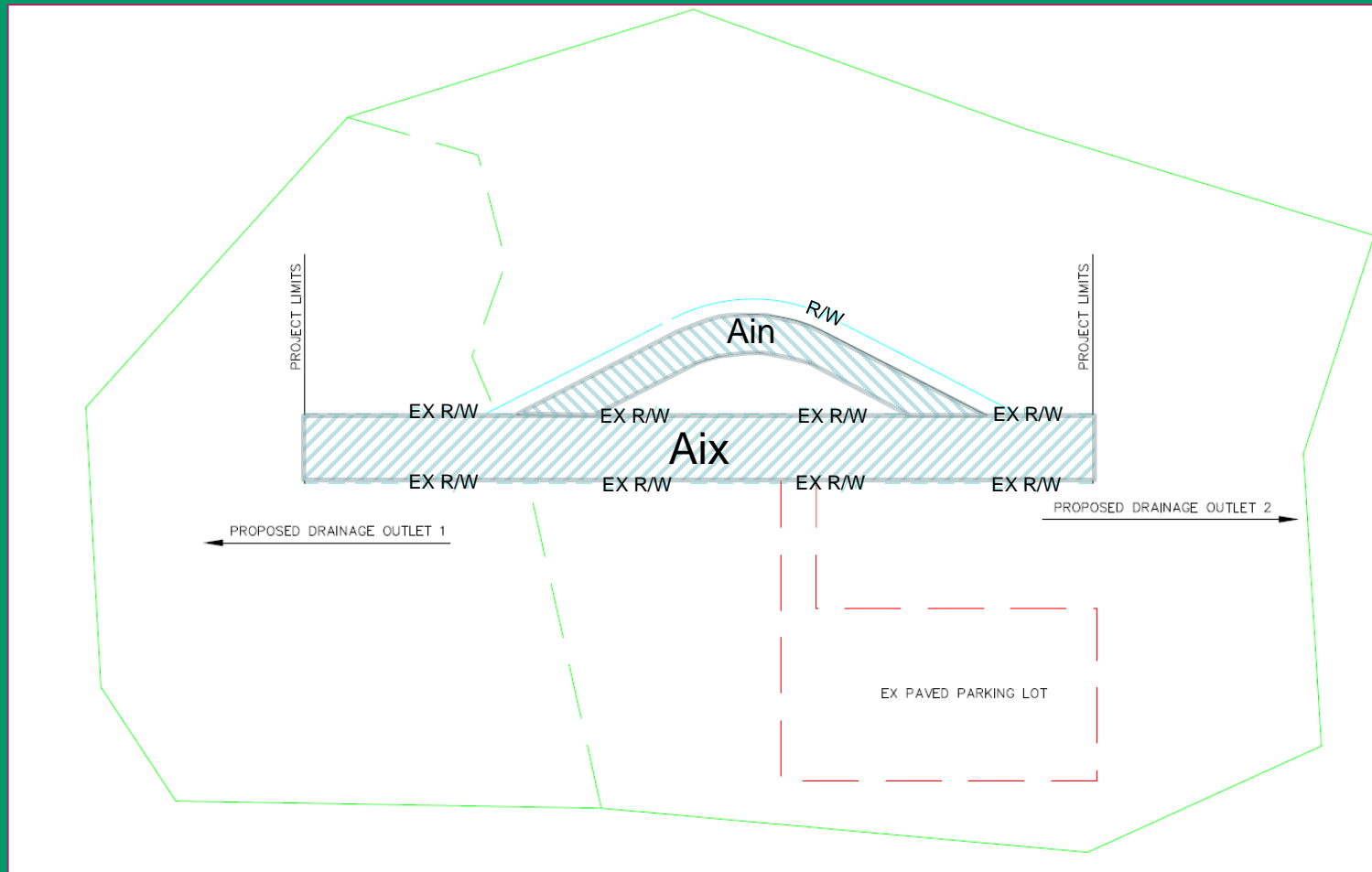
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Impervious Area

- ④ For post-construction BMP calculations: consider all area within existing right-of-way to be impervious, even grassy areas.
- ④ In new right-of-way, grass is considered pervious and paved area is considered impervious

Impervious Area



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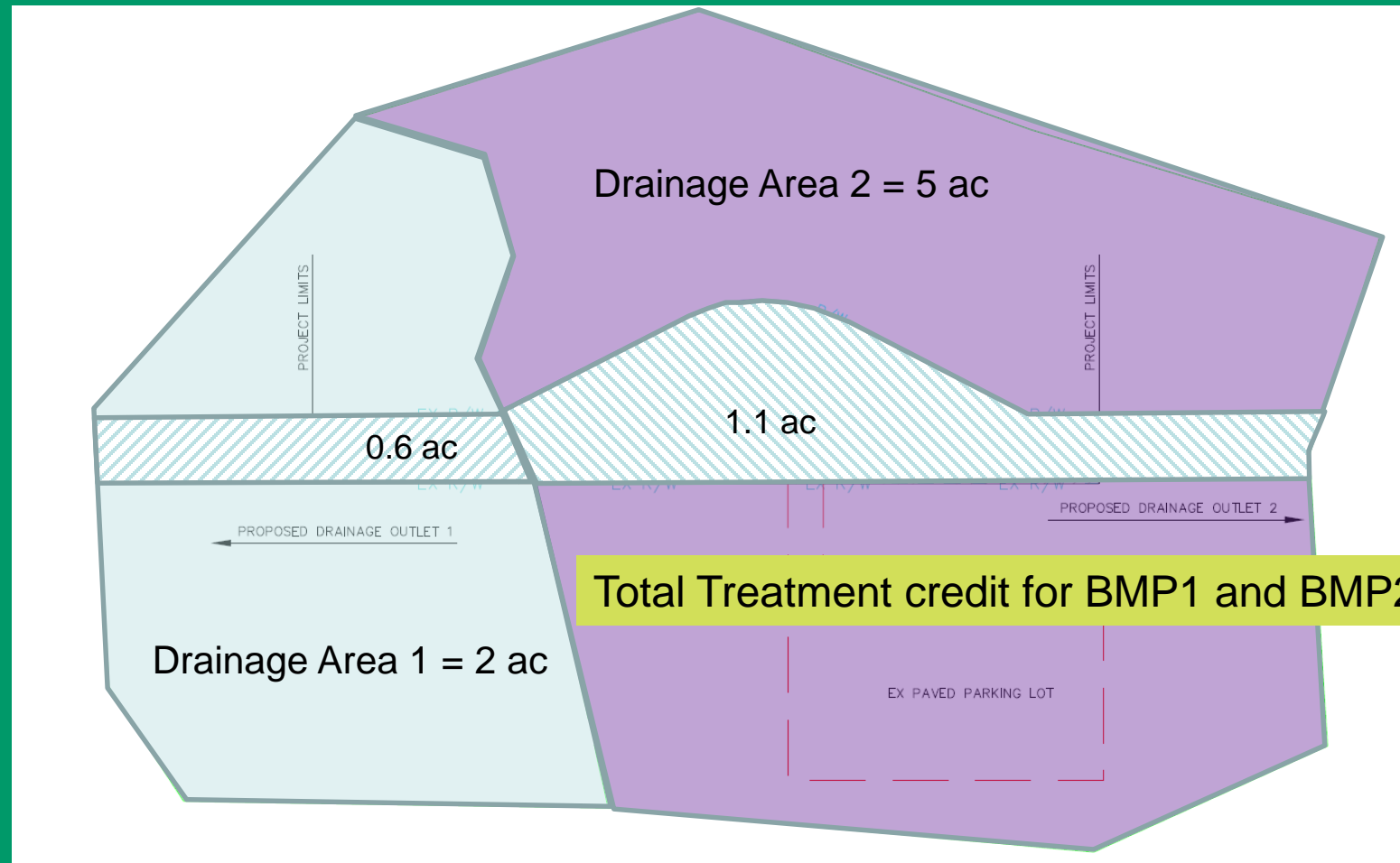
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Treatment Requirements & Treatment Credit

- ④ Ohio EPA: based on WQ_v
- ④ ODOT L&D: based on Area
 - ④ Required Treatment = Project EDA * T%
 - ④ Treatment credit only for area within right-of-way
 - ④ Credit given to all right-of-way area, not just disturbed area
 - ④ BMPs sized for full tributary area

Treatment Requirements & Treatment Credit



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Quality vs. Quantity Treatment

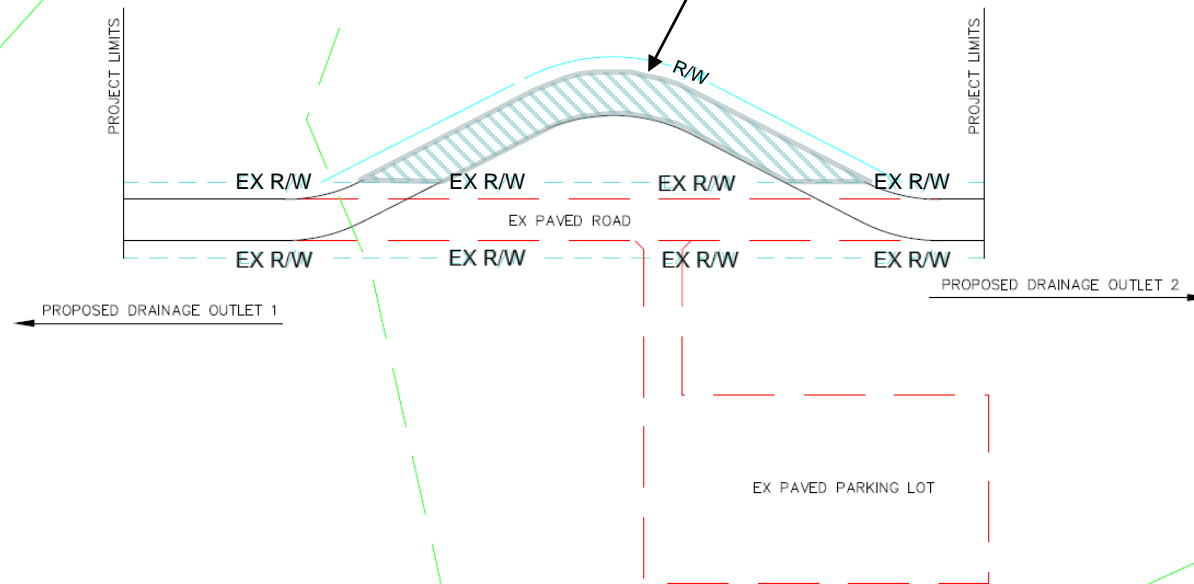
- ⌚ Permit: post-construction storm water practices shall provide perpetual management of runoff quality and quantity
- ⌚ Permit: development that creates less than one acre of impervious surface or discharges to a large river is considered to have a negligible impact to physical stream integrity
- ⌚ Ohio EPA BMPs all address quality and quantity

Quality vs. Quantity Treatment

- ☉ **L&D: Some BMPs address only quality, only quantity, or both**
- ☉ **Quality only BMPs:**
 - ☉ Vegetated Filter Strips
 - ☉ Vegetated Biofilters
 - ☉ Manufactured Systems
- ☉ **Quantity only BMPs:**
 - ☉ Underground Detention
 - ☉ Stream Grade Control
- ☉ **Quality and Quantity BMPs:**
 - ☉ Extended Detention / Retention
 - ☉ Bioretention
 - ☉ Infiltration (Basin / Trench)
 - ☉ Constructed Wetland

Quality vs. Quantity Treatment

If this new impervious area is less than one acre,
water quantity treatment is not required.



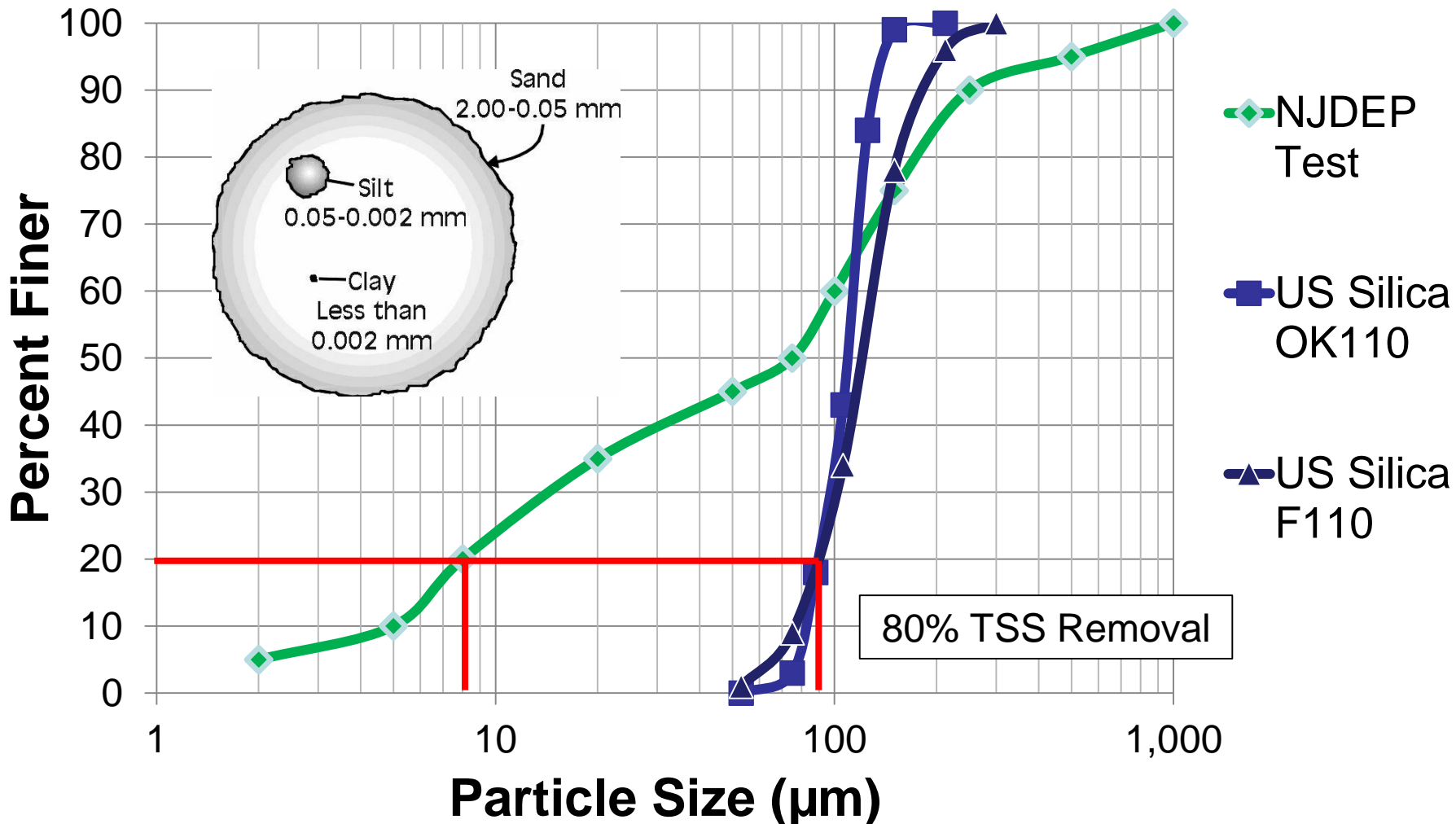
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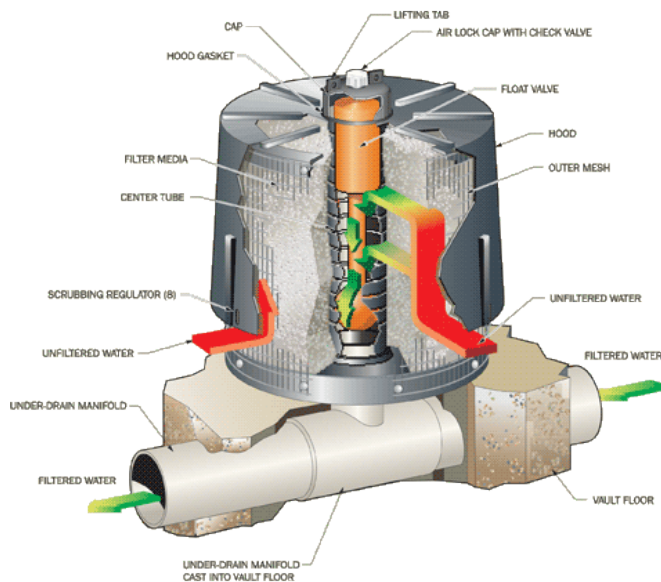
Manufactured Systems

Sediment Particle Distributions

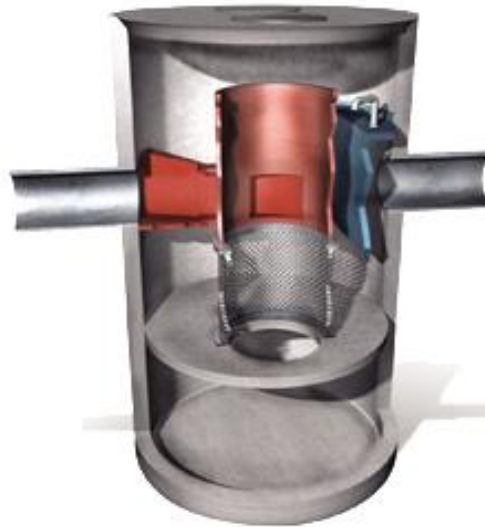


Manufactured Systems

- 🕒 **Cartridge & Membrane Filters: 80% NJDEP Sand**
- 🕒 **Hydrodynamic Separators: 80% ODOT Sand, 50% NJDEP**
- 🕒 **Catch Basin Inserts: May Capture >200 microns, reg. maint.**



Cartridge (Contech)

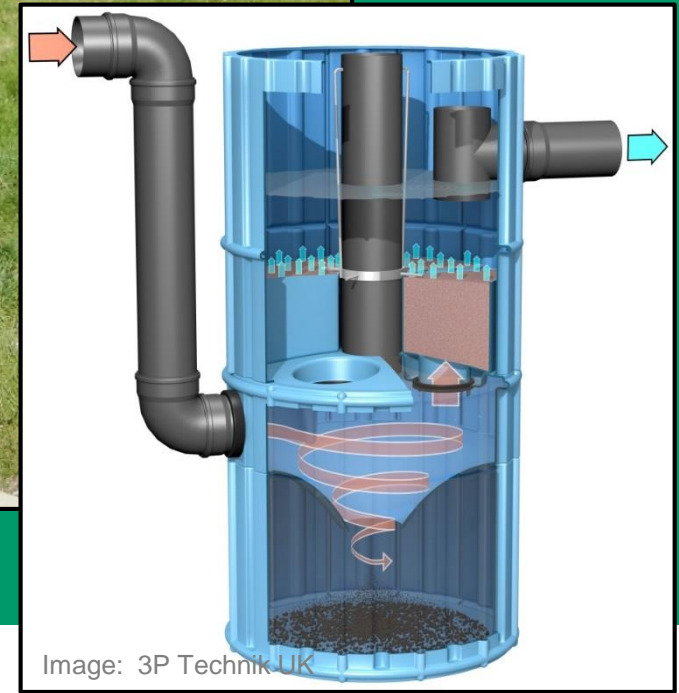


Hydro. Sep. (Contech)



Basin Insert (Contech)

Manufactured Systems



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No Post-Construction BMPs Required

- ④ New utility line, fence, guard rail, or noise wall projects
- ④ Routine Maintenance Activities
 - ④ US EPA: Activity that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site
 - ④ US EPA: Applicable to any size site
 - ④ Ohio EPA: Website listing typical routine maintenance activities
 - ④ Ohio EPA: Limit routine maintenance to < 5 acres

No Post-Construction BMPs Required

🕒 Routine Maintenance Activities (< 5 acres Total EDA)

- 🕒 Repair/replace fence, guard rail, noise wall, signs, lighting, signals, culverts, curbs, sidewalk, utility lines
- 🕒 Bridge repair/replace – includes approach, abutments, and deck
- 🕒 Tree/brush removal, ditch cleanout, linear grading (for proper drainage)
- 🕒 Land slide repair – includes grading/repairing features affected by slide
- 🕒 Unpaved/Gravel roadway or shoulder maintenance – dragging, blading, adding aggregate, etc.
- 🕒 Full depth pavement repair/replace – no changes to the purpose, horizontal alignment, or hydraulic capacity and no additional impervious area is added outside of the existing edge of paved roadway.



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Renewed Construction General Permit

- ④ Increased water quality volume (WQ_v)
- ④ No distinction between small and large construction
- ④ Redevelopment
- ④ Water quality flow intensity/duration curve
- ④ Runoff reduction method
- ④ Electronic submittal of SWPPPs

Renewed Construction General Permit

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Renewed Construction General Permit

- ④ **ODOT BMPs sized for WQ_v :**
 - ④ Extended Detention Basin
 - ④ Underground Detention
 - ④ Retention Basin
 - ④ Infiltration Trench / Basin
 - ④ Constructed Wetland
- ④ **ODOT BMPs affected by WQ_F intensity/duration curve**
 - ④ Manufactured Systems

Renewed Construction General Permit

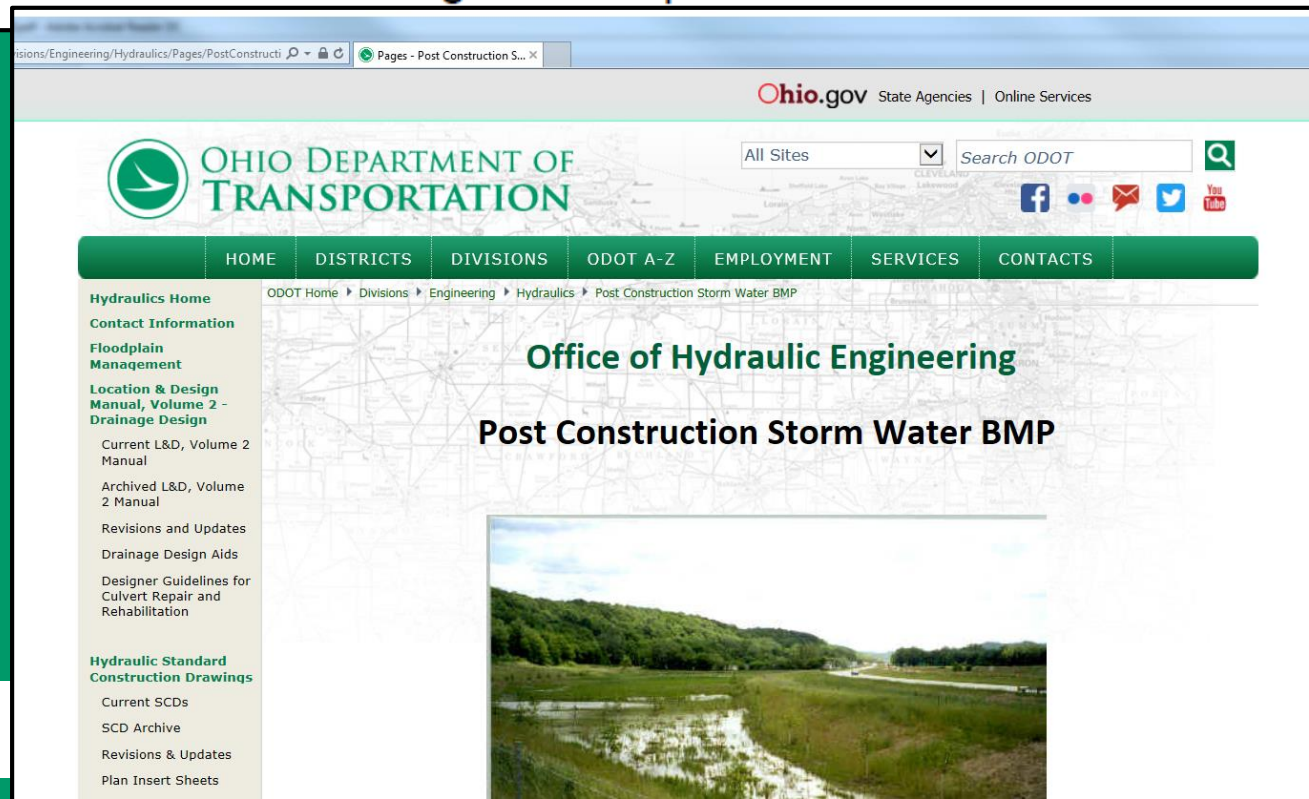
- ④ **ODOT BMPs not affected by updated CGP**
 - ④ Vegetated Filter Strip (sized based on contributing length)
 - ④ Vegetated Biofilter (retaining $i = 0.65$ in/hr instead of new curve)
 - ④ Bioretention Cells (sized based on impervious area)
 - ④ Stream Grade Control (sized based on culvert diameter)

Confused? Use ODOT's Design Resources!

The following design resources are available on the ODOT, Office of Hydraulic Engineering's website:
<http://www.dot.state.oh.us/Divisions/Engineering/Hydraulics/Pages/PostConstructionStormWaterBMP.asp>

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- Post-Construction BMP Design Review Checklist
- BMP Calculation Spreadsheet
- Post-Construction BMP Design Examples
- Post-Construction BMP Training Workshop Slides



Questions ?

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