





Stormwater Treatment in an Urban Corridor –

Hydrodynamic Separators for ODOT I/70-71 Interchange







I-70/71 South Innerbelt Study



I-70/I-71 South Innerbelt Study Area







Columbus Crossroads Phase Map



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Phase 2B Corridor







Phase 2B – PCSWMM Hydraulic Model







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Design Parameters

- Must treat only flow from the ODOT Right-of-Way
- Must treat enough flow to meet the WQ_f requirements.

Solution

• Divert flow to an offline treatment system via a new storm sewer.





Phase 2B



Design Parameters

- Approved manufacturer per SS995
- Treat 75 cfs of flow
- Footprint
 - \circ 15ft wide x 36 ft long
 - o 30ft wide x 36 ft long
- No pre-approvals by ODOT or EOR





Phase 2B



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Phase 2B



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HDS Fundamentals

- Low velocity vortex action
 - Increases efficiency by increasing length of flow path
 - Concentrates solids in low velocity flow field
- Flow controls
 - Minimizes turbulence and velocity
 - Prevents flow surges and re-suspension
 - Retains floating pollutants
- Maintenance
 - Pollutants are captured in an easily accessed structure





Treatment Efficiency Evaluation

- Pollutant Concentration
 - High concentrations are easier to reduce
 - Typical SW TSS concentration is 50-300 mg/l
 - Testing should use similar concentrations
- Flow rate
 - Treatment efficiency increases as flowrate decreases
 - System should be tested across full range of design flows
- Particle size
 - Large particle sizes are easier to remove than small ones
 - An "apples to apples" product comparison must use the same Particle Size Distribution (PSD)





ODOT Requirements

- SS 995
 - Establishes performance requirements for approved BMPs to be utilized on roadway projects
- Performance Criteria
 - Offline configuration
 - 80% TSS capture of water quality flow (third party testing)
 - Influent concentration of 450mg/L or less
 - OK110 or F110 particle distribution
 - Capture all floatable free oil







ODOT Requirements

	ODOT Type	Max Water Quality Flow	CDS Model
Water Quality Flow Q = ciA i = 0.65 in/hr	1	1 cfs	CDS 2025
	2	2 cfs	CDS 3030
	3	3 cfs	CDS 4030
	4	6 cfs	CDS 4045













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