

Sediment Basin Design Guidance Revisions

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Overview

- Background
- Proposed Programmatic Changes
- Proposed Structural Changes
- Discussion



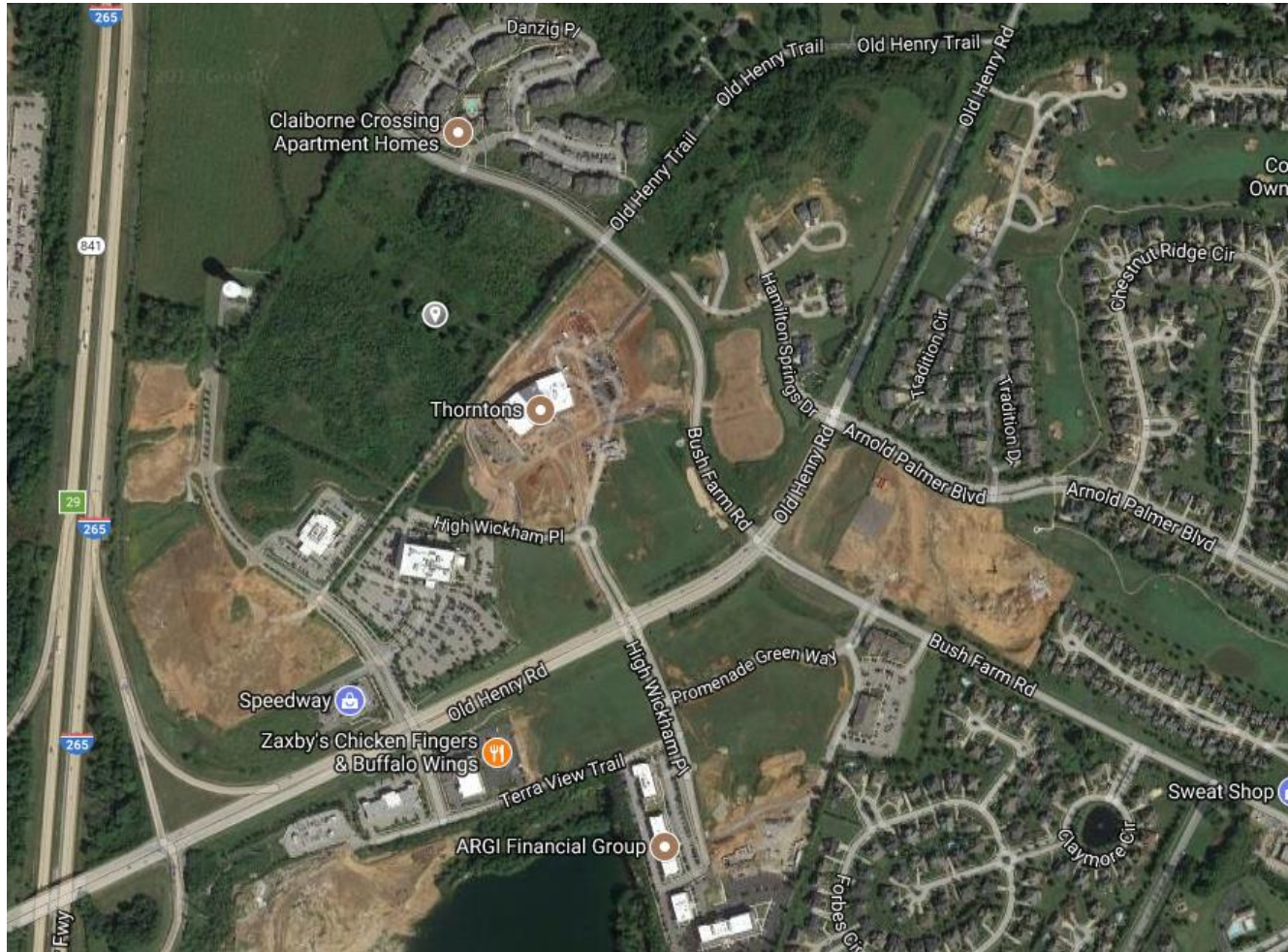
Background



Background

- Recent sediment basin issues prompted investigation into causes and solution
- Some basins not constructed per plan
- Mass grading has occurred before adequate basin volume is available
- Properly constructed basins still prone to high sediment concentrations in outflow
- Design guidance needs to be modernized

Background



Properly Constructed Basin



Properly Constructed Basin



Sediment Basin Effluent



Sediment Basin Effluent



Sediment Basin Effluent



MSD

Lexington and Jefferson County
Metropolitan Sewer District
700 W. Liberty Street
Lexington, Kentucky
40503-1913

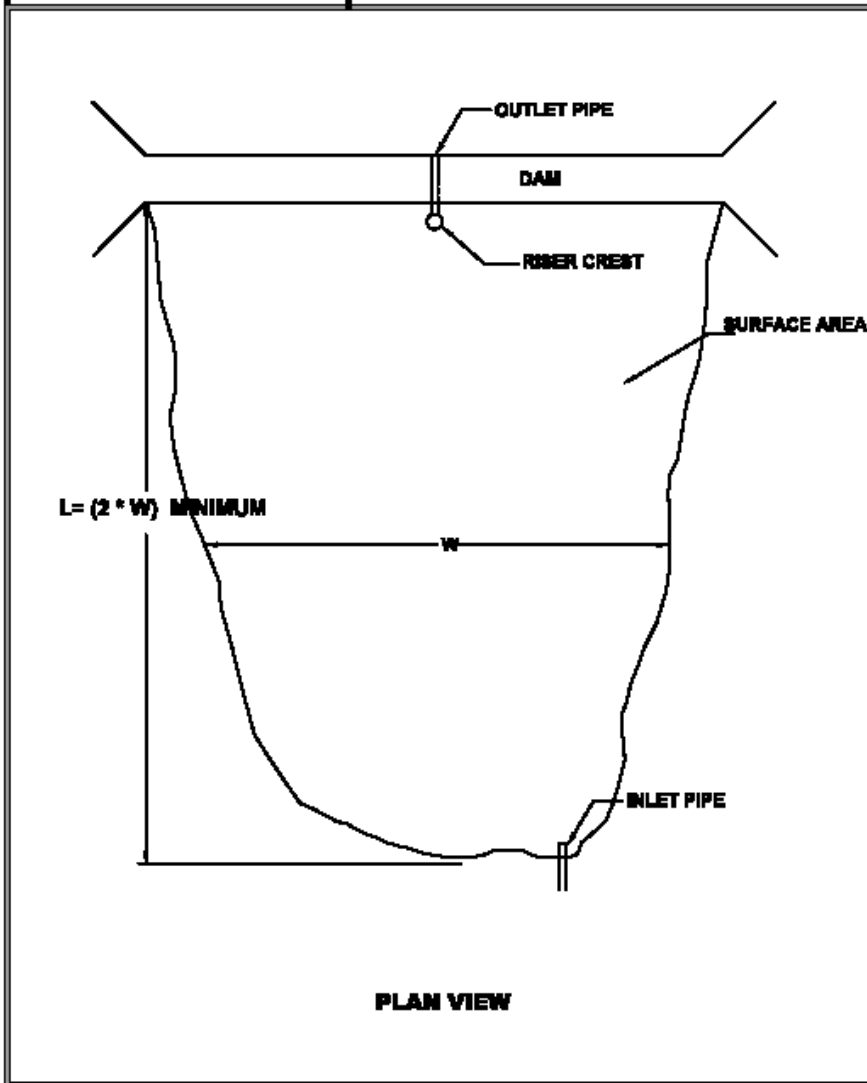
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EXHIBIT 12-8B
TEMPORARY SEDIMENT BASIN

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EFFECTIVE DATE: JUNE 30, 2009

Current Detail



Proposed Programmatic Changes



Proposed Programmatic Changes

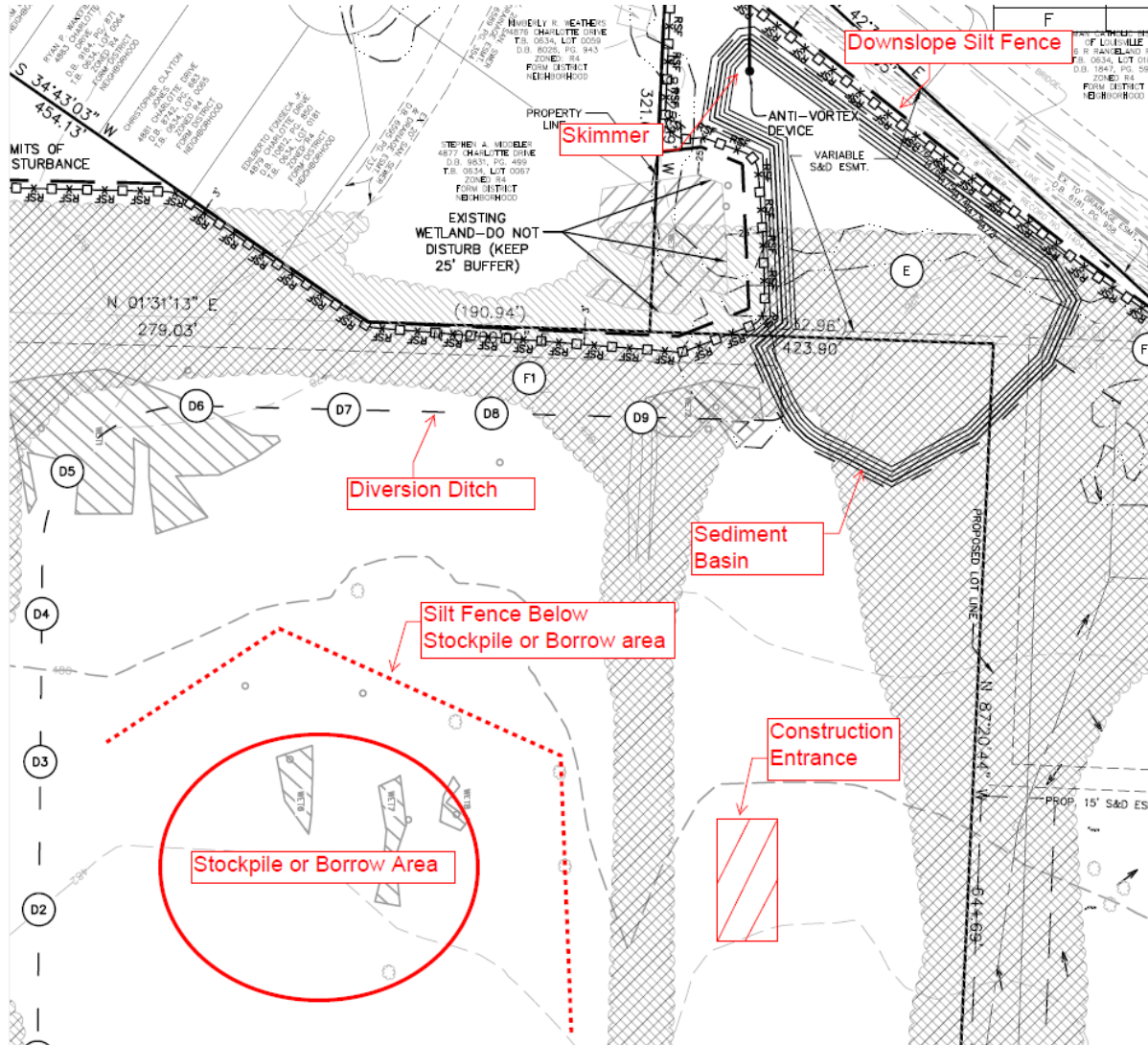
- Require Preliminary EPSC plan (PEPSC) prior to full construction approval
- Require side slope stabilization on construction detail
- Eliminate low flow orifice as dewatering mechanism; replace with skimmer
- Transition sediment basin design guidance from Exhibit to Standard Drawing



PEPSC Plan Background/Needs Statement

- In early stages, developments can reach full disturbance very quickly
- Contractors are often not highly involved in formulation of clearing/grading plans-additional involvement should be solicited
- PEPSC Plan would allow for MSD to implement additional oversight over sediment basin design

Proposed PEPSC Plan



Proposed Structural Changes

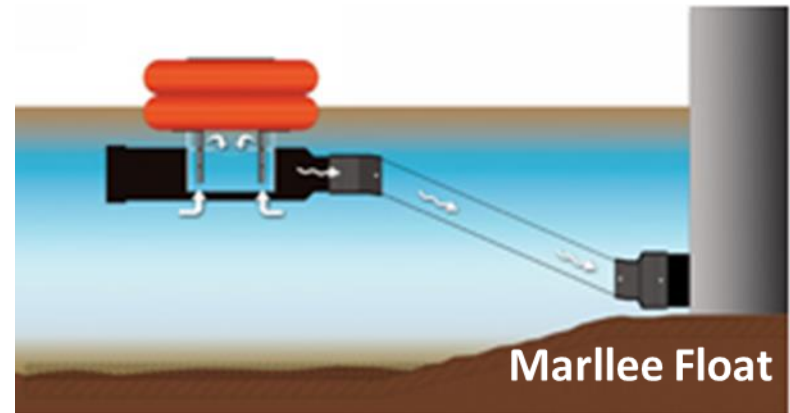


Proposed Structural Changes – Skimmers

- Skimmers draw from top of water where only finest sediment particles are
- Slow, consistent outflow promotes further settling
- Skimmers are industry standard



Skimmers



Skimmers Shall Meet SCDOT Standard: SC-M-815-14

Proposed Structural Changes – Forebays and Porous Baffles

- Forebays help spread out concentrated flow and trap heaviest particles and trash
- Porous baffles help reduce turbulence promoting sedimentation



Proposed Design Standards

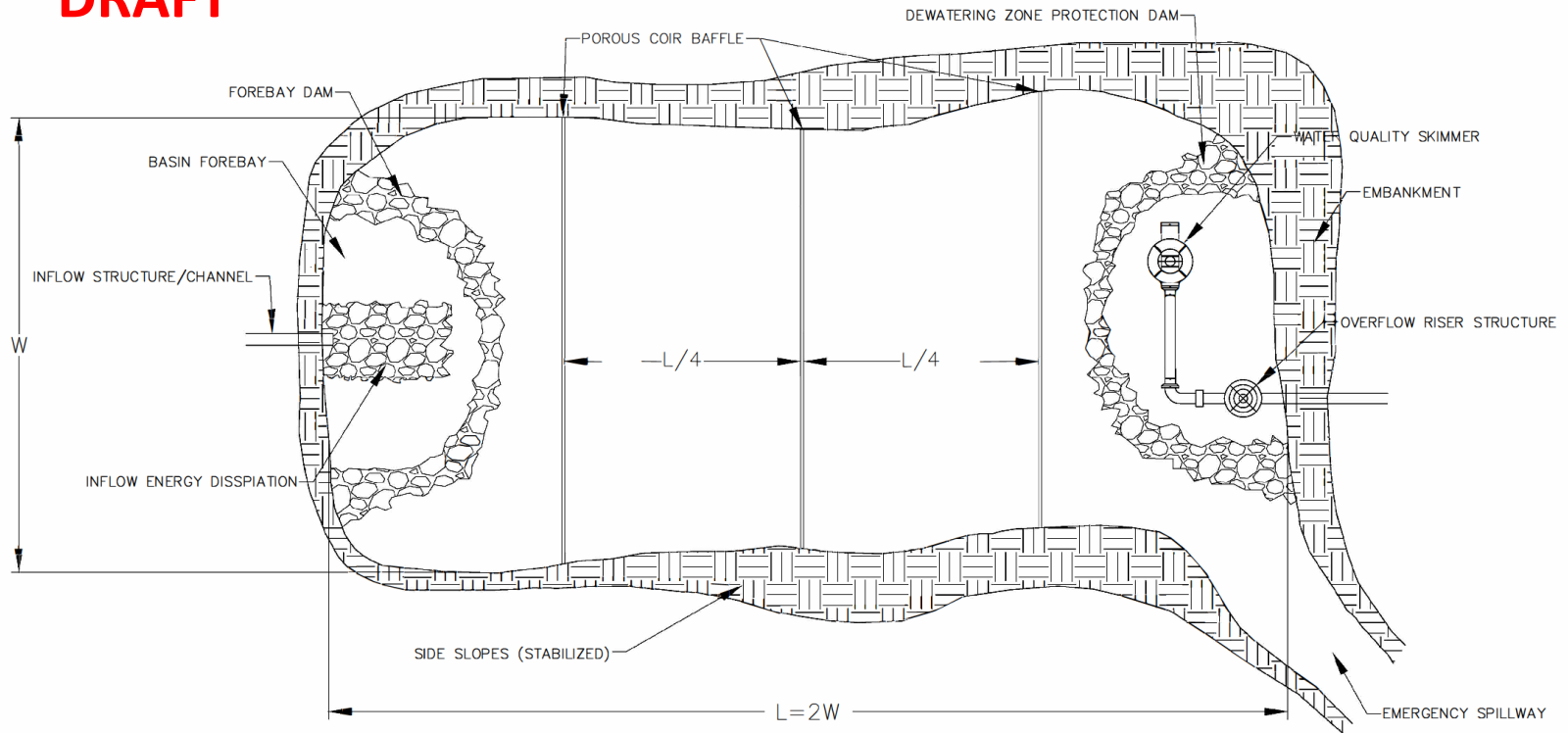
- Basins must still meet 80% TSS removal efficiency for 10-yr, 24-hr storm
- Outflow through three spillway devices:
 - Primary Riser (10-yr, 24-hr WSE at 6" max above riser)
 - Floating Skimmer (drain within 48 hrs)
 - Emergency Spillway (pass 100 yr, 24 hr storm)



Source: SCDOT Stormwater Quality Design Manual Appendix A

Proposed Standard Drawing - Layout

DRAFT

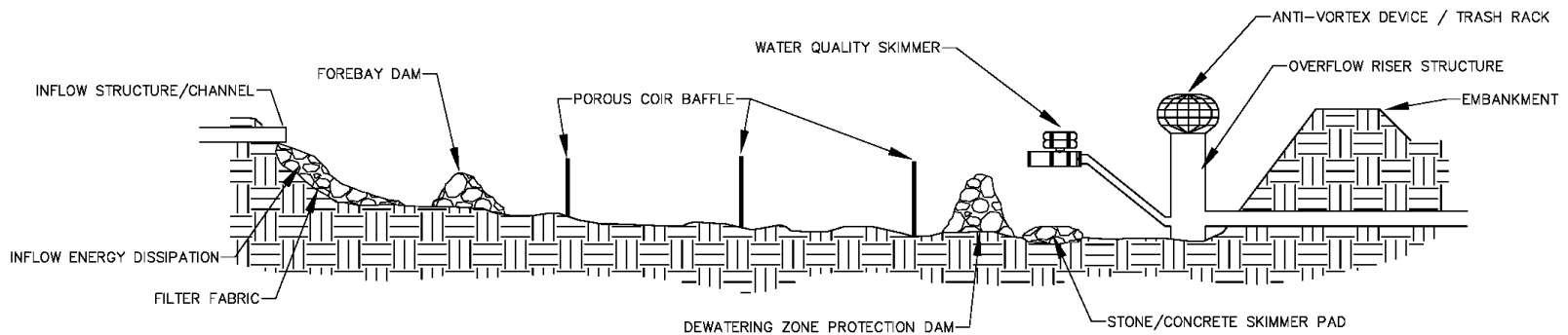


1. For Sediment Storage Volume (SSV) calculations, refer to MSD Design Manual Exhibit 12.6.1.
2. The Forebay shall be sized to provide 20% of the basin's SSV.
3. Clean out marking stake should be installed to indicate when sediment storage capacity has been reached (SSV is being fully utilized); and clean out should occur when sediment level reaches 1/3rd of the full SSV elevation.
4. Side slopes should not be steeper than 3H:1V, and must be fully stabilized when basin is in service.
5. Anti-seep collars should be fitted on all penetrations through the embankment/dam.

Louisville and Jefferson County Metropolitan Sewer District 700 W. Liberty Street Louisville, Kentucky 40203-1913 <small>502-587-0603 - WWW.LOUISVILLEMSD.ORG</small>	
SEDIMENT BASIN - LAYOUT	
STANDARD DRAWING NO.	EB-03-01
APPROVED BY: _____	DATE _____
CHIEF ENGINEER	

Proposed Standard Drawing - Section

DRAFT



1. Forebay and Dewatering Zone Protection Dams shall be a minimum of 1' high and shall have a top elevation of 1' above the SSV.
2. The 10-year, 24-hr storm elevation should be 6" above the crest of the overflow riser structure.
3. The crest of the emergency spillway should be located a minimum of 18" above the crest of the overflow riser structure.
4. The top of the embankment/dam should be located a minimum of 1' above the 100-yr, 24-hr storm elevation.

Louisville and Jefferson County Metropolitan Sewer District 700 W. Liberty Street Louisville, Kentucky 40203-1913 <small>File: 10/2013/Development/Drawings/Standard/Section EB-03-02.dwg Drawing for local reference</small> 502-587-0603 - WWW.LOUISVILLEMSD.ORG	
SEDIMENT BASIN - SECTION	
STANDARD DRAWING NO.	EB-03-02
APPROVED BY:	CHIEF ENGINEER _____ DATE _____

Challenges

- Sediment basins will hold water longer
 - Standing water of 6-12” likely in sediment basins at all times.
 - Contractor will either need to drain with sediment bag or treat with Mosquito tablets
- Increased upfront cost for skimmer
 - \$3000-\$5000 range for reuseable proprietary product
 - Could allow custom fabrication but would need engineered design
- Basin size and layout constrained by overall development

Questions

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