



TECHNICAL MEMORANDUM

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Date: October 15, 2019

Subject: Sediment storage design for post-construction practices

This technical memo provides interim technical guidance until the *Rainwater & Land Development* (RLD) manual is revised and republished.

NPDES Construction General Permit #OHC00005 (CGP) states “an additional volume equal to 20 percent of the WQ_v [Water Quality Volume] shall be incorporated into the [post-construction] BMP for sediment storage.” The RLD Practice Standards 2.6 Water Quality Ponds and 2.8 Sand & Organic Filter reflect this requirement in the design guidance and examples. However, it is not made clear how sediment storage should be applied to other practices such as underground systems with pretreatment, dry extended detention basins utilizing an acceptable alternative to a forebay and/or micropool, permeable pavement, bioretention and infiltration practices sized to the impervious area within the contributing drainage area.

The purpose of the sediment storage volume is to avoid reduced treatment effectiveness and maintenance frequency as sediment accumulates within the practice (WEF/ASCE, 2012). The intent of this criterion should apply to all post-construction practices, but additional sediment storage volume may only be necessary where sedimentation is the dominant treatment mechanism. The effectiveness of practices utilizing filtration and/or infiltration may be better maintained with a pretreatment practice that reduces the sediment load reaching the filtration or infiltration surface rather than increasing the filter or infiltration surface area or practice volume by 20 percent.

Additional storage volume may also be unnecessary where sediment is not readily accessible for removal such as in subsurface practices or permeable pavement. An effective pretreatment practice that concentrates sediment deposition at an accessible location coupled with frequent maintenance may better serve the long-term effectiveness of the practice.

Design parameters that could, where appropriate, be considered equivalent to the 20 percent of the WQ_v sediment storage criterion in the CGP are listed in the following table (see reverse). All pretreatment practices must meet the minimum design standards in the *Rainwater & Land Development* manual Pretreatment Provisional Practice. Designers should take into consideration the effect of long-term sediment build-up in the selection and design of all practices.

Table 4A Post-Construction Practice	Sediment Storage Design
Wet Extended Detention Basin	WQv*20% in permanent pool.
Constructed Extended Detention Wetland	WQv*20% in permanent pool.
Dry Extended Detention Basin ¹	WQv*10% in micropool and WQv*10% in forebay; or WQv*10% in micropool and pretreatment; or underdrain and pretreatment.
Permeable Pavement w/ Ext. Detention	Routine maintenance ² of pavement surface and pretreatment on other inlets.
Underground Storage w/ Ext. Detention	Routine maintenance ² of a 50% TSS removal certified pretreatment practice.
Sand & Other Media Filtration w/ Ext. Det.	WQv*20% in basin volume or pretreatment.
Table 4B Post-Construction Practice	Sediment Storage Design
Bioretention Area/Cell	Pretreatment providing 50% sediment removal through filter strips and/or swales; or pretreatment forebay(s) equivalent to 0.2 x WQv (volume of individual inlet forebays weighted to contributing impervious drainage area).
Infiltration Basin	Pretreatment providing 50% sediment removal through filter strips and/or swales; or pretreatment forebay(s) equivalent to 0.2 x WQv (volume of individual inlet forebays weighted to contributing impervious drainage area).
Infiltration Trench	Pretreatment providing 50% sediment removal through filter strips and/or swales; or pretreatment forebay(s) equivalent to 0.2 x WQv (volume of individual inlet forebays weighted to contributing impervious drainage area).
Permeable Pavement w/ Infiltration	Routine maintenance ² of pavement surface and pretreatment on other inlets.
Underground Storage w/ Infiltration	Routine maintenance ² of an 80% TSS removal certified pretreatment practice.

1 See Rainwater & Land Development, Appendix 10: Alternative Pre-treatment Options for Dry Extended Detention Basins – Rationale and Expectations (ODNR, 2006).

2 Routine maintenance is regularly scheduled, preventative maintenance (including sediment and debris removal) on at least an annual basis.

REFERENCES

Ohio EPA. 2018. General Permit Authorization for Storm Water Discharges Associated with Construction Activity under the National Pollutant Discharge Elimination System. Ohio EPA Permit Number OHC000005. Ohio Environmental Protection Agency, Columbus, OH.

WEF/ASCE. 2012. Design of Urban Stormwater Controls. WEF Manual of Practice No. 23 and ASCE Manual and Report on Engineering Practice No. 87. WEF Press, Alexandria, VA and American Society of Civil Engineers, Environmental and Water Resources Institute, Reston, VA.

ODNR. 2006 (with updates). Rainwater and Land Development Manual. Ohio Department of Natural Resources, Division of Soil and Water Conservation. Columbus, OH.