



TECHNICAL MEMORANDUM

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Subject: Gravel, synthetic turf and non-typical landcover

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

Gravel, synthetic turf and similar constructed landcover should be considered impervious when evaluating:

- 1. whether post-construction controls are required (projects that do not create any impervious surface are not required to provide post-construction BMPs),**
- 2. whether the site has existing impervious area to qualify as previously developed area, and**
- 3. when calculating $R_v = 0.05 + 0.9(i)$, where “i” represents the fraction of impervious surface.**

Neither the NPDES Construction General Permit #OHC00005 (CGP) nor the current *Rainwater and Land Development* (RLD) manual provide an explicit definition of impervious surface. As described in the document *Post-Construction Storm Water Q&A - Water Quality Volume* (10/2018), Ohio EPA considers impervious cover as an “area that will be unvegetated such as rooftops, paved or gravel roads and parking lots, sidewalks, detention basins and open water.” This guidance derives from the ASCE/WEF Manual of Practice (1998) discussion that “operationally, for mature urban areas, watershed imperviousness can be defined as the fraction of watershed that is unvegetated.”

This singular criterion can be used to differentiate pervious and impervious surface as it relates to the effect of construction activities on water quality and receiving streams. Vegetation is an indicator of soil structure that has or is capable of developing infiltration and evapotranspiration rates correlating to a volumetric runoff coefficient (R_v) near 0.05. As described in the *Soil Management* provisional practice of the RLD manual, vigorous vegetation is both a necessary factor in maintaining infiltrating soils and is a result or product of healthy soil. Area disturbed by construction activity, regardless of the final landcover, can be rendered impervious through clearing, grading, compaction, and filling.

Gravel, synthetic turf and similar landcovers are usually placed on a graded, compacted subgrade where the topsoil has been excavated (and often geotextile material used) to form a stable foundation. Although the surface of these landcovers, unlike concrete or asphalt pavement, can be somewhat porous, the lack of infiltration at the subgrade and evapotranspiration at the surface results in a R_v more equivalent to impervious pavement. Additionally, surface grading or subsurface drainage systems are usually included for rapid drainage.

Post-Construction Controls on Gravel and Synthetic Turf

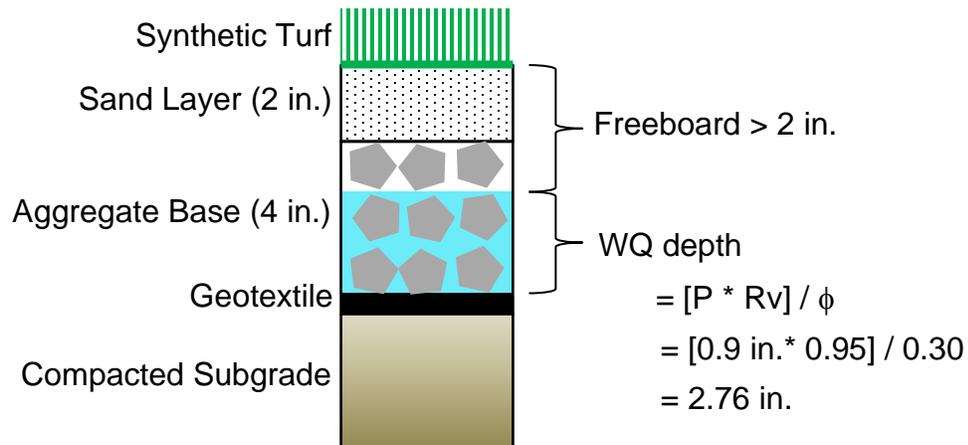
Loose gravel or synthetic turf covers do contain void space within the structure that could be utilized to provide extended detention of the Water Quality Volume (WQv) as a variation of permeable pavement.

These projects should be pre-approved by Ohio EPA and designed per the applicable specifications of the permeable pavement RLD standard as well as the following criteria:

- The area must be subject to direct rainfall only and receive no additional runoff from adjacent areas.
- The area must not be subject high traffic surface loadings or high-risk pollutants.
- The extended detention requirements must still be met. This will require an outlet structure configured to meet the 1) the 24-hour minimum WQv drain times and 2) not discharge more than the first half of the WQv in less than one-third of the drain time.
- A sand filter/ choker course is recommended.
- The aggregate layer must be clean, rinsed and free of silts and fines and consist of poorly or tightly graded aggregate (e.g. AASHTO #57, #4 or #2) or coarse sand. Well graded or gap grade aggregates such as ODOT 304 do not apply.
- The top of the water quality volume must be 2" or more from the surface.
- As referenced in the permeable pavement standard, a porosity (ϕ) of 0.30 is recommended for aggregate and 0.25 for coarse sand. This value accounts for the required additional 20% sediment storage.
- Areas with the potential to be paved over in the future should not be considered.

Where these criteria are not met, a standard Table 4a or 4b practice should be utilized.

Example: Schematic section view of a synthetic turf installation (not to scale)



REFERENCES

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