



RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
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Freshwater Wetlands Program and Stormwater Construction Permitting Porous Precast Concrete Slabs Design Guidance

This document serves as a design guidance for the preparation of freshwater wetland and stormwater construction permit applications that propose to utilize porous precast concrete slabs to treat the water quality volume. This guidance is intended to help design professionals prepare applications in a manner that allows for a timely and efficient review by the Rhode Island Department of Environmental Management Office of Water Resources (RIDEM OWR).

This document addresses some of the requirements of the [Rhode Island Stormwater Management Design and Installation Rules](#) (Stormwater Rules) (250-RICR-150-10-8) and the [Rhode Island Stormwater Design and Installation Manual](#) (RISDISM) as well as the [Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act](#) (Wetland Rules) (250-RICR-150-15-3) that are especially relevant and applicable to projects that propose to utilize porous precast concrete slabs to treat the water quality volume. It is not intended to be a substitute for those or any other applicable rules or regulations. Applicants are encouraged to review the Stormwater Rules, the RISDISM, the Wetland Rules and all applicable rules and regulations (i.e., [RIPDES General Permit for Stormwater Discharge Associated with Construction Activity](#) (CGP), Groundwater Discharge (GWD)/Underground Injection Control (UIC) Program ([Groundwater Discharge Rules](#); 250-RICR-150-05-3), etc.) to ensure that all requirements are met.

Porous precast concrete slabs may be used to treat the water quality volume when the system is designed with a contributing impervious area to slab area ratio of 5:1 or less (e.g., $\leq 5,000 \text{ ft}^2$ of pavement draining into $1,000+ \text{ ft}^2$ of porous precast concrete slabs) on a case-by-case basis only if all of the following requirements are met:

General Requirements:

- The applicant must submit a written technical justification which explains how the proposed design will not result in excessive nitrogen loading to coastal embayments (see Stormwater Rule 250-RICR-150-10-8.22-D.6). Projects that discharge to either critical resource areas, nitrogen impaired waters, or coastal waters must utilize an 18" sand filter layer beneath the slabs to prevent excessive nitrogen loading.
- The applicant must demonstrate that the proposed design meets all other requirements stated in the Permeable Paving section of the Stormwater Rules (250-RICR-150-10-8.22).
- The design must incorporate a "sacrificial" run-on row of porous precast concrete slabs to serve as pretreatment and protect the rest of the system's infiltration capacity. The run-on row slabs must be at least 2 feet wide with respect to the direction of stormwater flow. The run-on row area shall not be included in the calculation of the contributing impervious area to slab area ratio.

- The contributing impervious “run-on” area must not exceed 50’ in length for each system. Care should also be taken to avoid directing additional/excessive amounts of pervious areas towards the porous precast concrete slabs so as to not overload the system.
- Sites with high water table or ledge problems where infiltration is not feasible must incorporate a lined 18” sand filter with underdrain below the slab reservoir course in order to receive credit for treating the water quality volume.
- Porous precast concrete slabs used to treat the water quality volume are recommended for sites with low to moderate sediment loading (i.e., parking lots, walkways, low traffic residential roads, etc.). Porous precast concrete slabs are not appropriate for sites with high sediment loading such as highways and main roads ($\geq 1,000$ vehicles/day). However, porous precast concrete slabs may be used on highways and main roads ($\geq 1,000$ vehicles/day) on a case-by-case basis if the applicant can clearly demonstrate that the system(s) will receive an adequate level of enhanced maintenance to prevent clogging.
- Porous precast concrete slabs alone may not be able to meet the overbank flood control or channel protection minimum standards. Porous precast concrete slabs may be combined with detention/infiltration chambers to provide additional storage volume.
- Porous precast concrete slab systems must be designed to exfiltrate the entire water quality volume through the floor of each practice (sides are not considered in sizing). However, the sides may be considered in the sizing for storms greater than that of the 1.2” 24-hour Type-III water quality design storm.

Maintenance Requirements:

- The slabs must be equipped with permanent lifting points that are sufficient for removing slabs that are to be removed or replaced.
- The applicant must demonstrate that the proposed project-specific Operation and Maintenance (O&M) Plan provides an adequate amount of maintenance for both the entire system (run-on row slabs, infiltrating slabs, stone reservoir, etc.) and the contributing catchment area so as to protect the system’s long-term infiltration capacity.
- The project-specific O&M plan must include a copy of the manufacturer’s O&M Plan and applicants must ensure that the manufacturer’s O&M Plan is strictly followed.

Other Design Tips:

- The surface area and storage volume associated with the stone reservoir (and sand filter layer in some instances) located beneath the porous precast concrete run-on rows may be utilized when modeling for exfiltration and/or peak flow attenuation.
- The footprint of the porous precast concrete slab system’s stone reservoir (and sand filter layer in some instances) may extend beyond that of the footprint of the slabs themselves. The entire footprint of the system’s stone reservoir (and sand filter layer in some instances) may be utilized when modeling for peak flow attenuation and exfiltration.