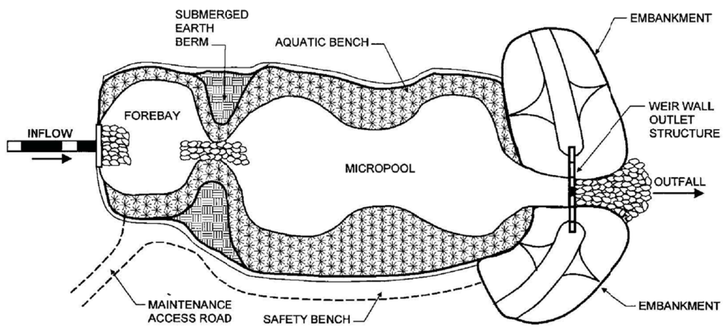
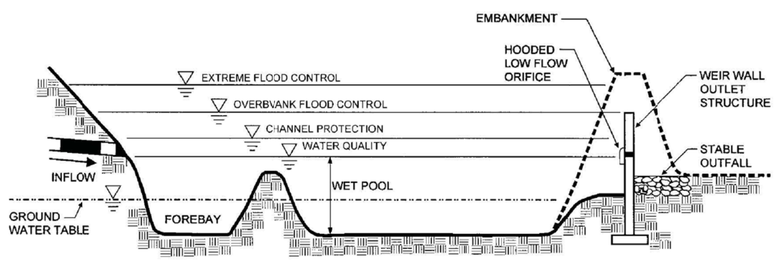
Stormwater Management Components at Benedict Farm Park

In New York State there are five sizing criteria that are considered when designing a stormwater management plan, which are the Water Quality Volume (90% of the average annual stormwater runoff), Runoff Reduction Volume (100% of the post-development water quality volume), Channel Protection Volume (1-year storm), Overbank Flood (10-year storm), and Extreme Storm (100-year storm). Once these volumes are calculated the design engineer can use the Stormwater Management Practice (SMP) matrix found in the New York State Stormwater Management Design Manual to determine the best combination of practices to handle the stormwater runoff. The following practices are all being used in Benedict Park.



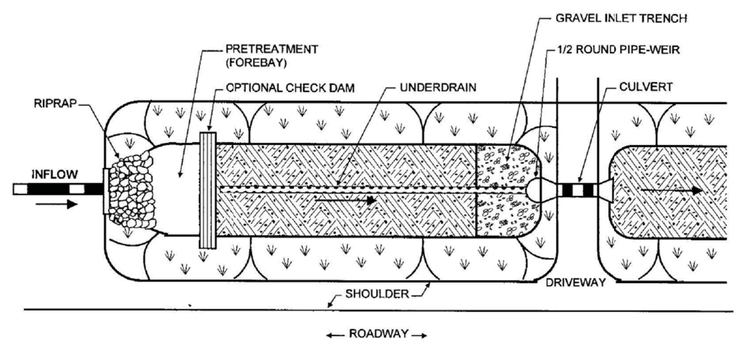
PLAN VIEW



Pocket Pond

PROFILE

1. ***Stormwater Pond***: a constructed stormwater retention basin. Ponds can serve one or two purposes: extended stormwater detention to prevent erosion and flooding, and/or water quality treatment in ponds that have permanent pools. Water quality ponds, also called Wet Detention Ponds, are among the most highly effective stormwater quality treatment measures. Runoff from each rain event is detained and treated in the permanent pool by settling and biological uptake mechanisms. A properly designed water quality pond incorporates several components to treat stormwater as it passes through the pond, including a small pool called a forebay to slow incoming water and remove sediment, an elongated design to promote settling while avoiding stagnation, and an outlet designed to avoid erosion. The type of water quality pond constructed in Benedict Farm Park is known as a Pocket Pond due to its small contributing drainage area. The Pocket Pond provides the final stage of water quality treatment and runoff reduction, and provides channel protection storage before the stormwater runoff discharges into the Wallkill River.



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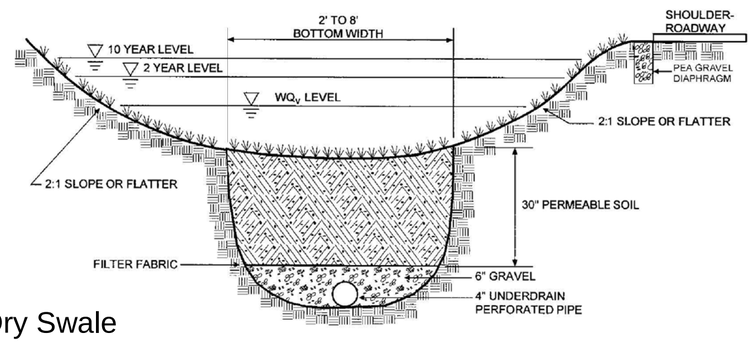
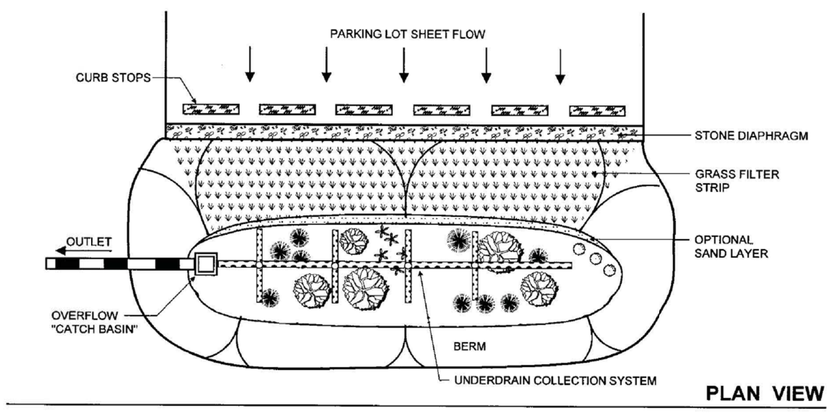


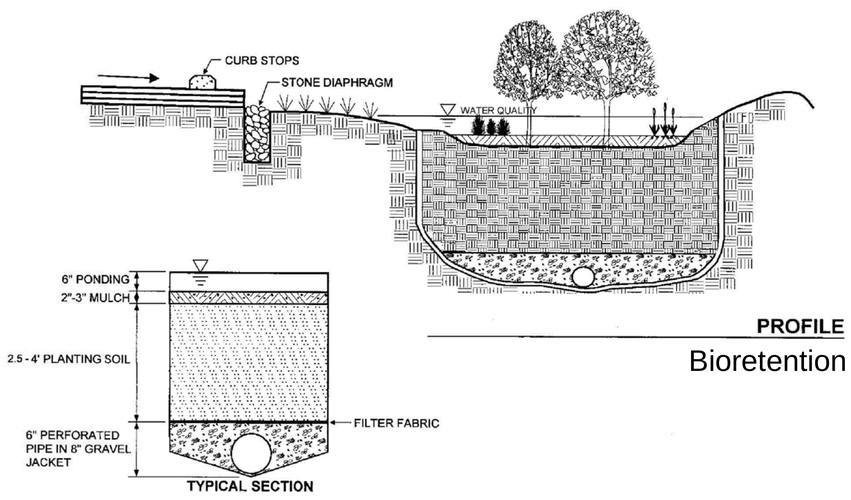
Dry Swale

SECTION

2. ***Open Channel System***: a vegetated swale that is explicitly designed and constructed to capture and treat the water quality runoff volume. There are two types of channel systems known as wet and dry swales. Both are grass-lined, shallow ditches that transport stormwater runoff at non-erosive velocities giving sediment and contaminants a chance to filter out of the runoff. Dry Swales are primarily applicable for land uses such as roads, residential development and pervious areas. Wet swales are usually restricted from residential areas because of the potential for stagnant water and nuisance ponding. While adequate at providing water quality treatment, open channel systems are not appropriate for mitigating channel protection, flood protection, or extreme storm runoff volumes. Dry Swales are used in Benedict Farm Park to provide initial water quality treatment of the runoff from the playing fields, roadway and parking areas, and to convey the runoff to the Pocket Pond for further treatment.



PLAN VIEW



PROFILE

Bioretention

3. ***Bioretention***: a shallow stormwater basin, structure, or landscaped depression that captures and temporarily stores the water quality volume, which passes through a filter bed. Filtered runoff may be collected and returned to the conveyance system, or allowed to partially infiltrate into the ground. While adequate at providing water quality treatment, filtering systems are not appropriate for mitigating channel protection, flood protection, or extreme storm runoff volumes. The type of filtering system employed in Benedict Farm Park is called Bioretention, which is a shallow landscaped feature established with carefully chosen native vegetation and engineered organic soil layers to capture and treat the water quality runoff. The plants and natural micro-organisms thriving in the bioretention area capture and absorb nutrients and pollutants from the runoff. This practice is often located in parking lot islands, but is also effective for treating residential areas. In Benedict Farm Park the Bioretention area is located near the Baseball Field.

4. ***Stream Buffer Preservation and Restoration***: The streamside buffer along the Muddy Kill was constructed to conserve the area adjacent to the stream, also known as the riparian area. When functioning properly streamside buffers serve as a vegetated protective area between a body of water and human activity. A healthy vegetated buffer improves stream health and water quality by filtering and slowing stormwater runoff, preventing soil erosion, providing upland habitat, contributing essential nutrients for the food chain, providing woody debris for in-stream habitat, and shading the stream to keep water temperatures down. Buffers also help absorb flood waters to protect human life and property.