

protecting water quality with the S75 and C350



Background:

Numerous changes have occurred over the last two decades in US government policy, and in the opinions of the scientific community and the general public on the importance of wetlands. The resulting changes include the rewriting of government legislation that controls the future of designated wetland sites. The government's past view of "drain those mosquito breeding havens, and farm or develop them" has taken a complete 180 degree turn to the current view of protecting and remediating these areas as important environmental and economic commodities. The scientific community has further substantiated this philosophy by providing evidence on the environmental importance of wetlands. Numerous environmental benefits are afforded by wetlands including, but not limited to, an increase in the bio-diversity of an area, habitat improvement for migratory waterfowl and a reduction in sediment and subsequent pollution contained in runoff. These benefits have provided economic alternatives to communities for decreasing the treatment requirements of drinking water. The vast social ramifications that the benefits project has further bolstered the protection and remediation of these fragile areas.

The economic implications of treating water for sediment and pollution from an 80 acre urban watershed were cited as primary considerations in the design and construction of Bailey Brook Water Quality Pond. The artificial wetland was designed and constructed by the Eastern Rhode Island Conservation District with technical assistance from the United States Department of Agriculture Natural Resource Conservation Service. The wetland will function as a natural bio-filtration system to remove sediment and pollutants from runoff flowing into Bailey Brook. The project was sponsored by the Environmental Protection Agency through the Rhode Island Department of Environmental Management, State Water Resources Board, and the City of Newport.



Problem:

From the onset of the project there was a need for immediate erosion control, reduction of both on and off-site runoff velocities, sediment content, and rapid vegetation establishment in the development of a bio-filtration system. Immediate and permanent sediment and erosion control were vital for this site in sustaining its functional longevity and the subsequent reduction in drinking water treatment required for the communities downstream. The reduction in runoff velocities would allow the sediment and attached pollutants to settle from the slower moving water. The pollutants would then be exposed to phyto- and bio-remediation that naturally occur in the soil and vegetation interstitial

zone. Economically, runoff velocities had to be reduced prior to entering the pond system to allow sediment to settle out of the water or there would be a diminished functional longevity of the wetlands due to sediment filling the pond.



Solution:

North American Green S75 Single Net Straw Erosion Control Blankets and C350 Erosion Control / Turf Reinforcement Mats were determined to meet the short and long term erosion control needs for this artificial wetland. Mike Ganem, Northeast Regional Manager for North American Green, Inc. and Ken DiFonzo of E.J. Prescott, Inc. provided on-site design and technical assistance in the selection of erosion control materials for this site. The S75's straw fiber matrix would provide excellent temporary erosion control for the moderate slopes surrounding the wetlands. Designed to also function as a mulch material, the straw fibers of the S75 would regulate environmental extremes at the seedbed, thus, improving seed germination rates and assist in rapid vegetation establishment.



Numerous environmental advantages were afforded to this site by the C350 Erosion Control / Turf Reinforcement Mat. The C350 was selected to permanently reinforce vegetation in those areas where runoff flows concentrated. The matting's permanent three dimensional net structure promotes stem and root entanglement and would ultimately provide permanent vegetation reinforcement. The significantly cusped middle net forms prominent ridges across the matting which would help slow runoff velocities to allow sediment to fall-out and result in self soil filling of the matting. Much like the straw fibers of the S75 blanket, the coconut fiber matrix in the C350 affords immediate erosion protection and excellent mulching capabilities for regulation of environmental extremes at the seedbed.



Results:

In consideration of all these factors, the S75 and C350 would provide an economic savings for this project through reduced installation costs and water treatment as compared to hard armor alternatives (riprap), while increasing the functional longevity of the wetlands. The S75 and C350 installation, conducted by J.A.M. Construction, began on December 11, 1997 and was completed by December 28, 1997.

This use of S75 and C350 erosion control products in wetlands remediation has demonstrated the environmental and economic importance of geosynthetic erosion control materials. These products have effectively reduced the amount

of sediment impacting the artificial wetlands, avoiding immediate failure of this system and extending its functional longevity. The economic benefits provided by the S75 and C350 erosion control blankets is transferred to the downstream towns of Newport and Middletown through a substantial reduction in drinking water treatment.

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14649 Highway 41 North | Evansville, Indiana 47711
800-772-2040 | 812-867-6632 | Canada: 800-448-2040
www.nagreen.com

