Bluebelt Beginnings – Green Preserves Blue on Staten Island

by James Garin, Dana F. Gumb, Jr., A. Dean Cavallaro, Nicholas Barbaro, Robert Smith, Sandeep Mehrotra and Brian Henn

As urbanization spread to the southern portion of Staten Island – the home of New York City's last large stand of freshwater wetlands – the New York City Department of Environmental Protection (NYCDEP) faced the challenge of preserving the wetlands while providing adequate drainage for local neighborhoods. Instead of constructing a network of underground pipes, the Department decided to capitalize on the existing waterways' natural ability to convey, store and filter stormwater. This allowed the Department to preserve and enhance existing wetlands, to improve stormwater quantity and quality control, and to save capital budget dollars compared to the expense of a conventional storm sewer system.

While a mention of New York City evokes images of an empire of concrete and steel, one corner of the City is an area that still feels like a small town, with open fields, forests, and tranquil homes and backyards. That area is the southern end of Staten Island, a place striving to maintain its identity under the ever increasing pressure of urban development. Here, also, are most of New York City's remaining freshwater wetlands and the last large part of the City without complete drainage infrastructure.

Photo courtesy of NYCDEP

Bluebelt stormwater wetlands, such as this one within Conference House Park on Staten Island, provide flow control and water quality benefits, while structures such as stone bridges use natural materials and reflect the area's agrarian past.

Understanding Area History

Understanding the development of Staten Island's unique infrastructure requires an examination of the history of the region. The Island's rich and diverse landscape is the product of its geological past. As a massive ice sheet retreated from the Island some 10,000 years ago, it left behind a terminal moraine – a ridge of hills formed by deposited rocks and debris. Among these steep slopes, the melting ice formed kettlehole ponds, streams and creeks that drained into the Atlantic Ocean.

More recently, Staten Island, then known as Richmond, became the fifth borough of New York City in 1898. By the middle of the 20th century, however, its small communities and open spaces gave it a rural flavor, and it was largely isolated from its urbanized neighbors to the north. But the wave of suburban expansion that followed World War II, accelerated by the opening of the Verrazano–Narrows Bridge in 1964, brought rapid development to the Island. As the sudden growth outpaced the City's ability to lay sewer lines, developers installed residential septic systems and made nominal improvements for storm drainage.

Although plans formulated in the early 1960s called for a conventional system of streets underlain by sanitary and storm sewers, the environmental fervor of the following decades would make the realization of these plans nearly impossible. The dispute revolved around the fact that Staten Island's southern region, known as South Richmond, has extensive freshwater wetlands. In his seminal book, *Design with Nature*, published in 1967, the late landscape architect Ian McHarg used the area as a case study to illustrate how human settlements could be constructed in harmony with natural resources. During the 1970s, the New York State Department of Environmental Conservation (NYSDEC) was given the authority to regulate the development of wetlands and placed stringent restrictions on construction in these areas.

It was clear by the late 1980s that some type of sewer system was needed to relieve the worsening drainage situation in South Richmond. Neighborhoods plagued by flooding and streams polluted by failing septic systems generated angry calls for sewers from the community. But the conventional piped system proposed in the early 1960s would have obliterated the region's wetlands by either permanently draining or filling them. The NYCDEP, the agency responsible for the City's water and sewer system, was faced with a daunting challenge: preserving the wetlands while providing adequate drainage.

Photo courtesy of NYCDEP

Wetlands can provide stormwater treatment and drainage.

Photo courtesy of NYCDEP

The Staten Island Bluebelt program is made up of watersheds that follow the topography of South Richmond. Recently three watersheds in the Mid-Island region (South Beach, New Creek, and Oakwood Beach) were incorporated into the Bluebelt.

The agency's novel solution was not only to preserve wetlands but also to restore and enhance them. Rather than divert runoff through underground pipes, the NYCDEP proposed that South Richmond's waterways be called upon to perform their natural functions – conveying, storing and filtering stormwater. The idea was a direct outgrowth of McHarg's thinking some 20 years earlier. Separate sanitary sewers would convey sanitary waste to an existing water pollution control plant near Staten Island's Great Kills Harbor.

Combining Bluebelt and Greenbelt

Energized by the new plan, the NYCDEP began a series of land acquisitions along the wetland corridors in 1991. Early estimates revealed that even with the costs of these purchases, the new drainage proposal would be less expensive than building large trunk storm sewer lines to replace the existing streams. The acquired property came to be called the Bluebelt, named to parallel the Greenbelt, a system of open spaces administered by the New York City Department of Parks and Recreation (NYCDPR) on Staten Island. Just as the Greenbelt helps to preserve trees and plants, so the Bluebelt is designed to preserve water resources. The Bluebelt area includes 16 watersheds covering a total of more than 12,000 acres, with three additional watersheds in the planning phase, covering an additional 5,000 acres.

As part of the acquisition program, the NYCDEP declared its intent to remove mapped but unbuilt streets – called paper streets – from the official city records. Many of these streets would have paved over parts of streams and adjacent flood plains. Having acquired the Bluebelt property and replaced the old drainage plan, the NYCDEP was poised to undertake a new approach to stormwater management.

Implementing Bluebelt BMPs

To plan and implement the scheme, the NYCDEP assembled a multidisciplinary team of engineers, environmental planners, wetlands scientists and landscape architects. The first step in the process was to revise the existing drainage plans. In addition to incorporating the existing Bluebelt streams into the overall stormwater networks, the new plans included a separate sanitary sewer system routed around the protected wetlands in a way that would balance the twin concerns of minimizing the cost of construction and avoiding disturbance to existing natural areas.

From the outset, the NYCDEP's Bluebelt planning was concerned not only with flood control but also with improving the quality of the inland bodies of waters into which urban stormwater is discharged. To this end, the NYCDEP chose to employ what has become the most innovative aspect of the Bluebelt program – best management practices (BMPs). For the purposes of this project, BMPs are defined as engineered facilities that mitigate the effects of runoff, seek to improve water quality and manage its quantity.

The NYCDEP began with more than 100 different types of BMP designs that have been used in various parts of the country, then established a screening process to limit the number of alternatives that would be actively pursued. Local conditions, including design flows and land availability, were considered – as were particular BMP features – to determine those that would provide the best fit. The BMPs were chosen for their flood control and pollutant removal capabilities, among other factors.

Site selection for the BMPs was an important part of the drainage planning process. BMPs were positioned where storm sewers discharge into wetland areas – where the "hard" engineered sewer system must give way to the "soft" natural environment. Many of the wetland areas in South Richmond were seriously degraded. Invasive plant species are a significant problem, especially along the perimeters of the Bluebelt properties. These perimeter areas are often the same places where storm sewer outfalls are to be located, giving planners the opportunity to tie BMP development to wetland restoration and natural area enhancement.

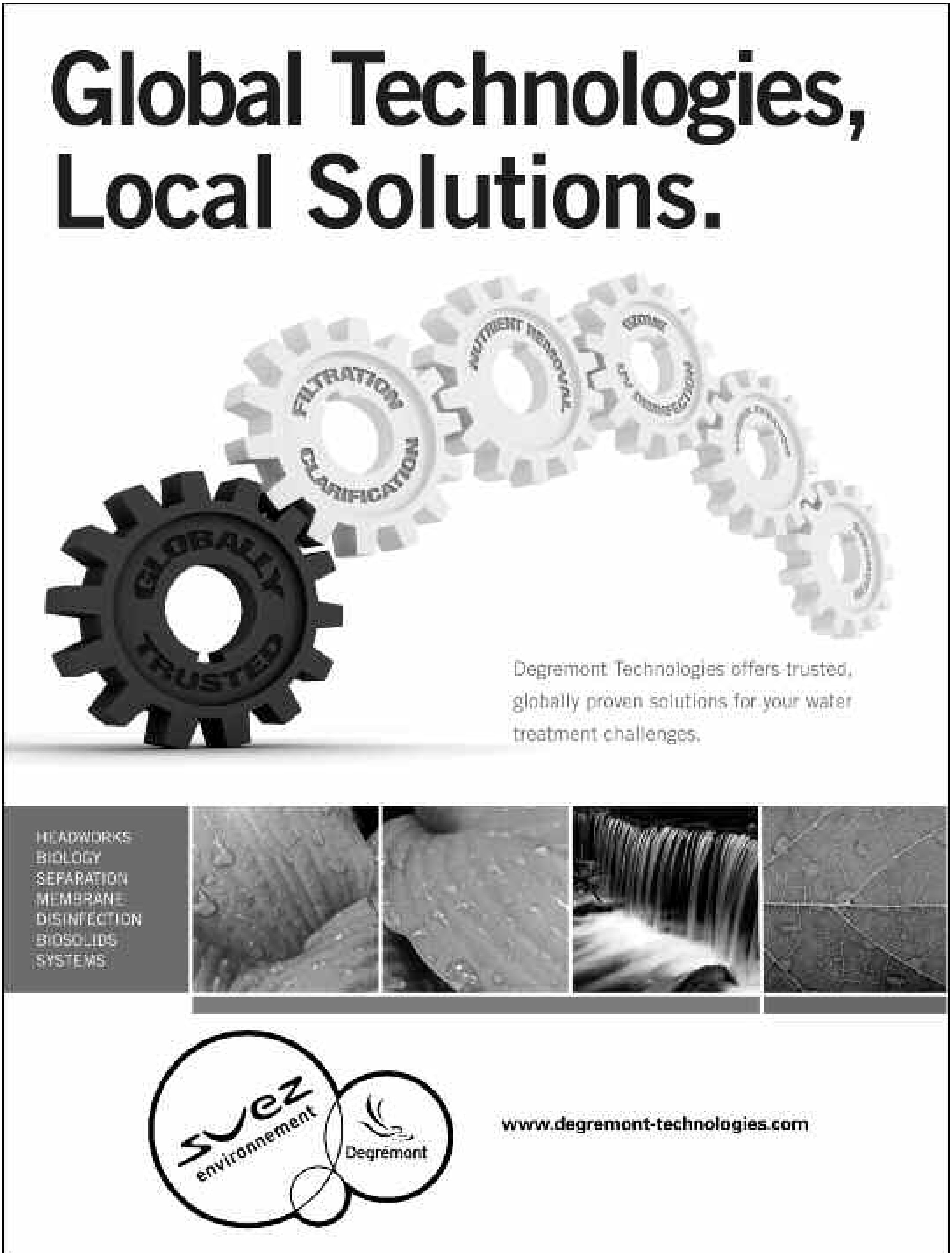
As the drainage plans were being developed, the NYCDEP conducted an extensive environmental review process to determine the effects of the project on the surrounding environs. All told, four environmental impact statements (EIS), covering the entire South Richmond area, have been prepared to evaluate the potential effects on local hydrology and water quality. An additional EIS will cover the Mid-Island Bluebelt, which consists of three watersheds in the central portion of Staten Island. The EISs include detailed inventories of the area's natural and cultural resources and discussions of how to protect these valued assets. The potential effects on socioeconomic conditions and community character in general were also taken into consideration.

Interagency coordination proved to be of cardinal importance throughout the planning process. Multiple City departments – including the departments overseeing parks, recreation, transportation and city planning – had an interest in the proposed drainage improvements. The NYCDEP kept these players abreast of developments with monthly progress reports, organizing meetings to allow input when other agencies were directly concerned. The NYCDEP also implemented a comprehensive public participation program that included the formulation of a citizen's advisory committee, a group of about 30 people representing a variety of interests – from environmental, civic and homeowners' associations, to builders' organizations.

Obtaining Permits

One of the most critical parts of the planning stage was securing the permits necessary to proceed with the project. To obtain NYSDEC wetland permits, applicants are normally required to submit separate applications for each activity. For the Bluebelt program with its multiple BMP sites in many watersheds, this would have required the submission, review and approval of more than 80 separate permit

continued on page 13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continued from page 11

applications. The NYCDEP worked with the NYSDEC to create an approval process that could incorporate the drainage plans and the BMP sites within each watershed into a single permit at the watershed level. This permit satisfies the requirements of existing procedures while allowing for the approval of work on a conceptual level for the watershed as a whole. As a special condition, the NYCDEP is required to submit to the state detailed design drawings for individual capital sewer projects prior to construction, including each of the BMPs.

The preparation of permits on the watershed level has involved interagency coordination (at the city and state levels) that has proved key in planning, designing and developing the watersheds. As a bonus, the process has encouraged the involvement of community organizations and private citizens. This involvement has proved successful not only in providing the needed infrastructure but also in educating citizens about the importance of the natural environment and in establishing working relationships with the multiple entities involved.

Designing for Peak Runoff

The methodology used in the hydraulic design of the new drainage system considered a number of parameters. The networks of waterways were sized to accommodate the flow that would be generated if the entire area were built out in accordance with existing zoning regulations. The stormwater systems were designed to convey runoff from a five-year storm, that is, an event with a 20 percent chance of occurrence in any given year – the standard throughout New York City.

Various tools were utilized to complete these designs, including a comprehensive geographic information system (GIS) mapping database for the study area. Extensive hydrologic, hydraulic and water quality modeling of the streams and tributary watersheds was conducted. Computerized models developed by the US Army Corps of Engineers for flood control projects were employed in conjunction with the City's traditional method for estimating peak runoff rates. Those predictive methodologies were used to estimate how the water bodies would respond to storm events of various intensities ***(see Modeling article, page 32)***. The BMPs fall into three main categories: constructed wetlands, meandering streams and outlet stilling basins. Ranging in size from half an acre to more than two acres, the constructed wetlands are designed to improve water quality, attenuate flow and provide flood control. Each wetland includes a permanent pool, or pond, with a depth of 12 to 24 inches. The ponds are kept shallow for optimal plant growth. Extra depth is provided at the forebay and micropool, located respectively at the wetland's inlet and outlet, to accommodate the additional sedimentation that occurs in these regions. The wetlands are graded to supply wide shelves and gentle side slopes accommodating varying zones of vegetation, and a circuitous pathway for the stormwater is created from the inlet to the outlet to ensure maximum exposure to biofiltration.

Each pond is controlled by an orifice located in the outlet structure. During a rain event, the orifice creates a bottleneck that backs up the stormwater an additional 24 to 36 inches, slowly releasing it over 24 hours to prevent surcharging downstream. Sediment and pollutants settle out of the water during this period of storage. The objective of this design is to provide storage within the wetland for 90 percent of all storm events – roughly equivalent to the three-month storm, which has a rainfall depth of 1.25 inches. Additional flows simply spill over an outlet structure to downstream sections. Hydraulic structures such as culverts and weirs are sized to convey a five-year storm flow and have a capacity to pass a 100-year storm flow without exceeding the flood elevations established by the Federal Emergency Management Agency.

Meandering streams – the second category of BMPs – are designed to imitate naturally occurring streams, which tend to achieve gentle invert slopes, curving pathways, and pools that alternate with riffles (shallow streams with rippling water). By conveying stormwater in

continued on page 15

Photo courtesy of NYCDEP

The weir of the historic Mill Pond was rebuilt to safely convey flows from the storm sewer network that was constructed in the Richmond Creek watershed.

Photo courtesy of NYCDEP

The Lighthouse Avenue culvert provides capacity for Richmond Creek while utilizing a natural fieldstone design that recalls the area's rural history.

continued from page 13

open channels rather than pipes, meandering streams help to preserve and re-create natural riparian areas and to maintain and enhance existing ecosystems.

The streams are designed to carry runoff in three stages: the base flow channel can carry a design storm with a return interval of seven to 14 days; the bankful channel carries the six-month to one-year storm; and the floodplain is designed for either the 100-year flow or the maximum inlet discharge, whichever is greater. The velocity in each of the stages is targeted at three to five feet per second to avoid stream bank failure. The channels are designed to imitate natural watercourses of moderate sinuosity, a characteristic defined as the ratio of a waterway's curved length to its straight length. Pools alternate with riffles along the channel to enhance the aquatic habitat and maintain a gentle stream channel invert.

Outlet stilling basins, the simplest type of the Bluebelt BMPs, are designed to attenuate high velocities of stormwater exiting a sewer so as to prevent downstream erosion. In accordance with a procedure prescribed by the US Department of Agriculture's Natural Resources Conservation Service, they are lined with rock called riprap to absorb the energy of the inlet pipe's full-flow discharge.

One of the most distinctive features of the Bluebelt BMPs is the extensive landscape planning incorporated into each design. Vegetation forms an integral component of many BMPs because of its biofiltration and soil stabilization benefits. The project team has used this opportunity to enhance local flora by promoting a variety of native species and by seeking to eliminate invasive, exotic ones. As a result, landscaping often constitutes as much as 25 percent of a BMP's construction cost. One pleasant byproduct of this approach has been that indigenous forms of wildlife such as egrets, ducks and snapping turtles are becoming increasingly common in the Bluebelt ***(see Riparian Ecology article, page 46).***

Maintaining Essentials

The designers of the Bluebelt paid special attention to maintenance requirements, which are essential in ensuring that the BMPs will deliver long-term flood control and water quality benefits. The forebays and micropools, for example, are underlain with concrete-embedded riprap so that crews removing sediment know when they have hit bottom. Long-term maintenance, which requires each pool to be emptied after 25 to 30 years, is facilitated by a drain valve in the outlet structure and what is called a reno mattress under the open water area. This mattress-shaped structure is made up of a series of six-foot-wide, rock-filled gabions that provide a solid base for maintenance vehicles once the wetland is dewatered ***(see Maintenance article, page 27).***

Over the course of the program, an extensive collection of design details has been developed expressly for BMP construction. Seeking to employ environmentally friendly soil stabilization techniques, the designers have called for bioengineering wherever possible using live stakes to stabilize stream banks and brush mattresses to strengthen side slopes. Goose exclusion techniques and herbivore exclusion fencing give the vegetation a chance to mature by reducing predation. Maintenance access roads are paved with perforated concrete blocks so that grass can grow through the spaces, combining a natural appearance with a solid driving surface.

To reflect the region's agrarian past, the designers have also incorporated such elements as stone facing on headwalls, split-rail wooded fences, and guide rails that have a rustic look in keeping with a natural area. Hydraulic structures in many places have been architecturally designed to blend in with the natural environment. These features give the Bluebelt a distinctive look.

Retaining Flexibility

In 1997, six years after the initial property acquisitions, the City of New York awarded the first Bluebelt construction contract. Focused on the Richmond Creek watershed and managed by the New York City Department of Design and Construction, the contract included seven miles (11 km) of sanitary sewer, three miles (five km) of storm sewer, and five BMPs: two constructed wetlands, two outlet stilling basins with culvert replacements, and one underground sand filter.

To ensure compliance with the NYSDEC's wetland permit conditions and proper implementation of the BMP designs, the NYCDEP retained the services of New York City-based Hazen and Sawyer, the firm that designed the Bluebelt system, to monitor the construction. In addition, specialists in natural area restoration and wetland creation were also made available to supervise the various aspects of the construction. One of the many accomplishments of this project was the implementation of a comprehensive sediment and erosion control program, the first watershed-level application of its kind in New York City. If not addressed, increased sedimentation within streams, ponds and other wetlands would degrade their value and reduce their capacity to convey stormwater. The program, which was reviewed and approved by the NYSDEC, includes reinforced silt fencing, surface water collectors, portable sediment tanks and sediment traps lined with crushed stone.

The outlet stilling basin at Lighthouse Avenue was the first BMP project to be completed, in the spring of 1998. Since then, 51 others have been built in seven additional watersheds, with an additional BMP currently under construction. While the original intent of the Bluebelt program has remained unchanged, the design process has undergone a continual refinement as the project team has gained experience in the field. Construction monitors recently discovered, for example, that the low-flow channels, or thalwegs, of some of the meandering streams were not receiving the expected flows. It soon became apparent that the actual base flows were lower than the design base flows because full build-out conditions had not yet been realized. The Bluebelt engineers responded by modifying the design and allowing the base flows to establish their own thalwegs. The result has been stable stream morphologies more characteristic of natural watercourses in the area.

Blue Heron Watershed's Bluebelt System

An excellent example of a watershed-wide implementation of the Bluebelt is the Blue Heron watershed in Staten Island. The Blue Heron watershed extends over 322 acres of suburban terrain in the Annadale neighborhood of Staten Island. Its centerpiece is the 153-acre Blue Heron Park, traversed by three streams that converge at Seguine Pond before entering Raritan Bay to the south. Managed by the NYCDPR, the park's forests and marshlands include hiking trails and nesting areas for native waterfowl.

Under the Bluebelt plan, seven BMPs, strategically located along the drainage corridor, are being constructed in the park. The plan also includes 5.5 miles of underground storm piping and 10 miles of sanitary sewer.

At the headwaters of the main stream that flows through the park, two shallow ponds currently receive uncontrolled runoff, which has caused extreme scouring and sedimentation. The first BMP, a one acre extended detention pond serving a drainage area of 44 acres, helps to expand and restore the wetlands while controlling the

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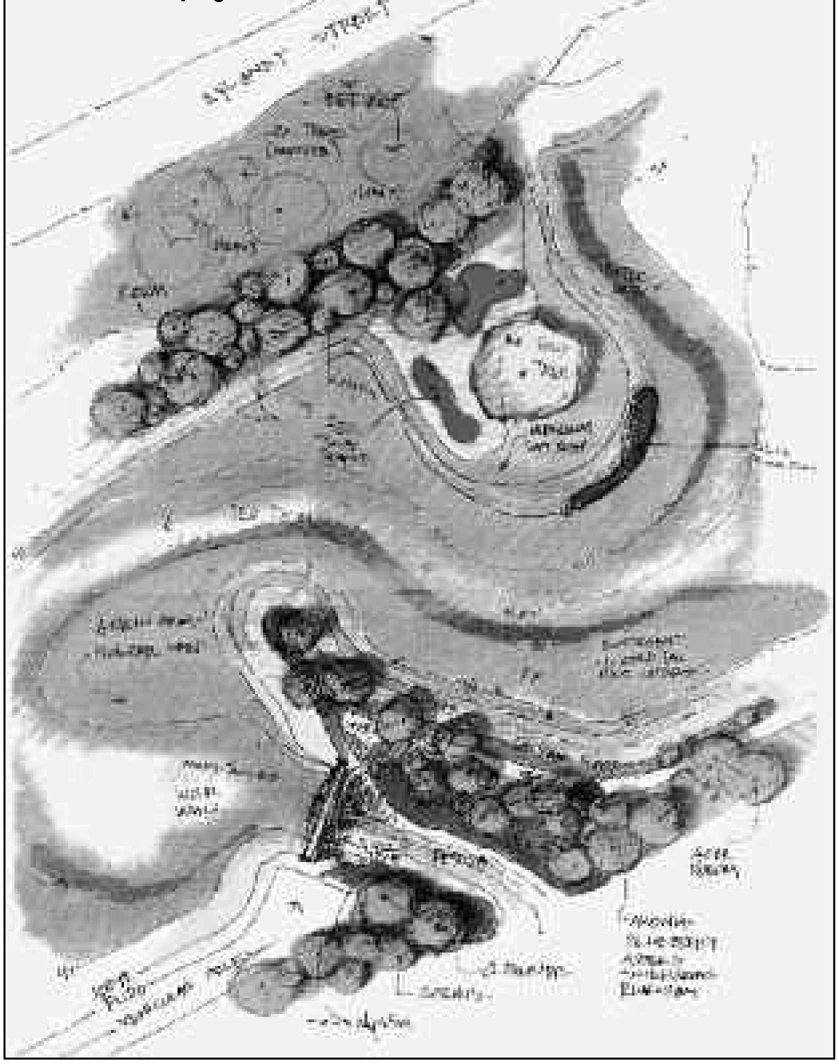
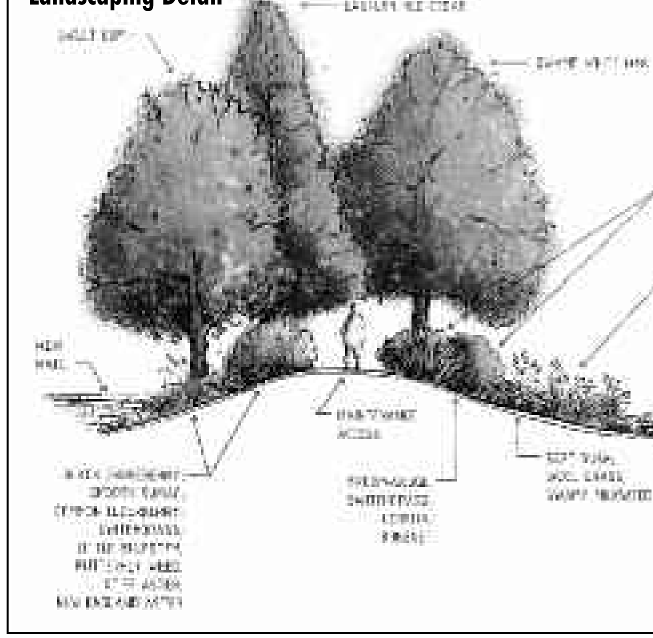
continued from page 15

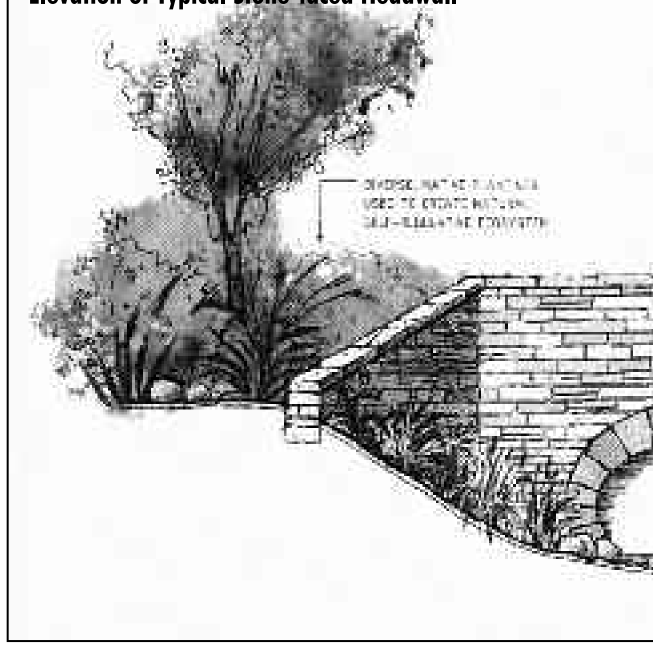
Landscaping Plan for Stormwater Wetland in Blue Heron Park

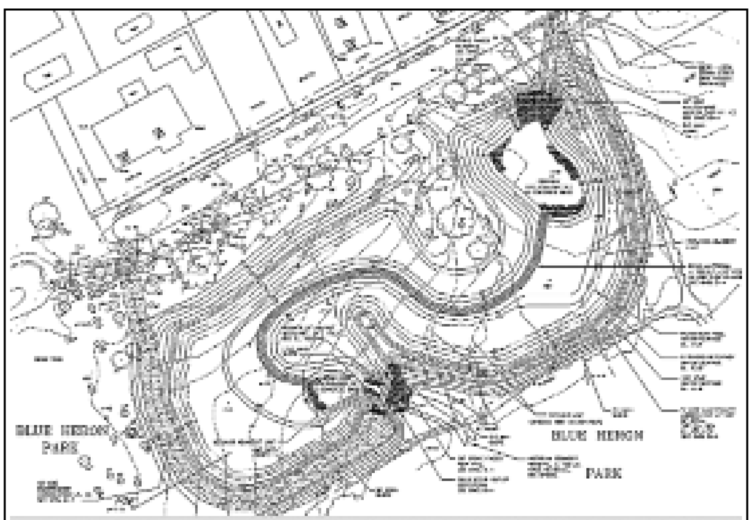


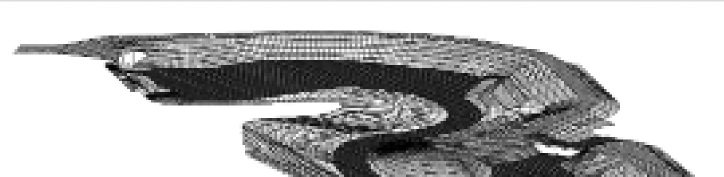
Cross-section through Stormwater Wetland Showing Landscaping Detail



Elevation of Typical Stone-faced Headwall

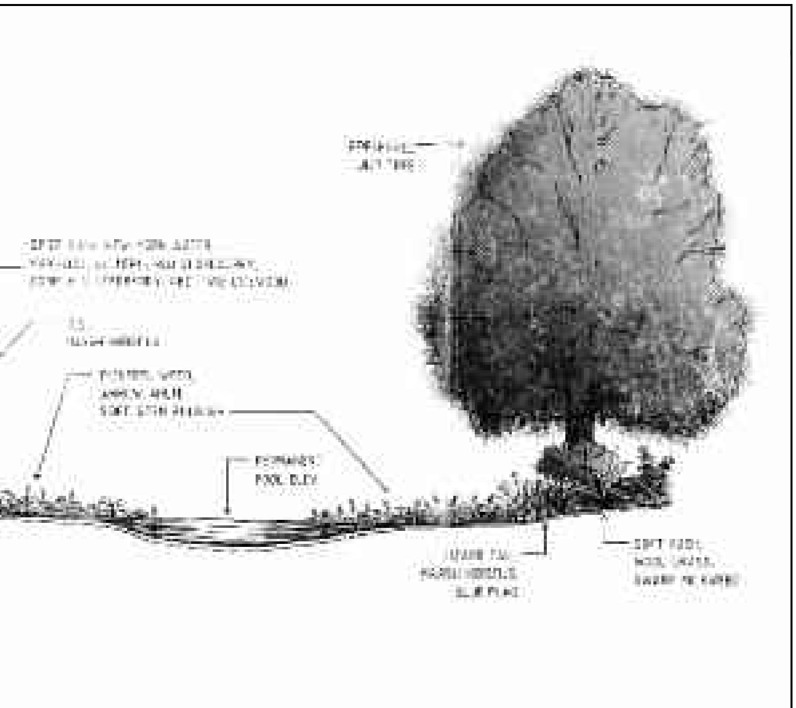


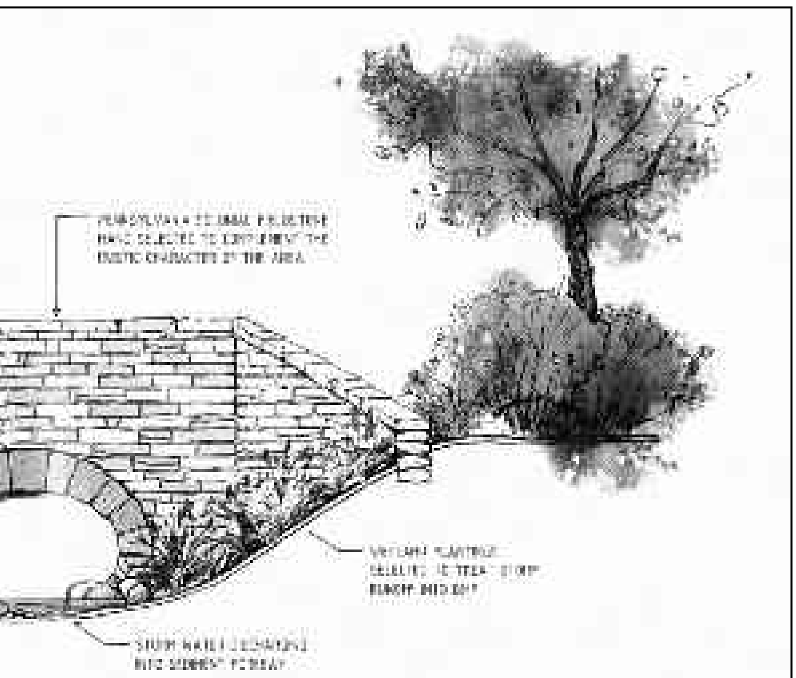




3D CAD View

From the planning stage, through design to construction, each Bluebelt BMP is individualized to meet the hydrologic, ecological and aesthetic needs of the particular site and the watershed. Here (right), the progression of construction at one of the Blue Heron BMP sites from conception to reality is shown in its final stage.





Images courtesy of NYCDEP

continued on page 18

continued from page 17

discharge to reduce erosion.

The second Blue Heron watershed BMP takes the form of a 2.2- acre extended detention wetland and pond system on what was a disturbed site, marred as it was by construction debris and fill. This wetland contains a regulated outlet structure that provides downstream flood control, and its high and low marshes improve stormwater quality. It serves a drainage area of 118 acres.

A third BMP, a 0.8-acre high-marsh wetland for the extended detention of stormwater, was created on the site of a degraded wetland. It serves a drainage area of 45 acres. As part of the project, an open stream channel was constructed to replace a collapsed culvert, and a pedestrian path and bridge were built to maintain access to Blue Heron Park.

To address a problem of street flooding during rain events, a fourth BMP involved constructing an improved outlet structure, including a 0.1-acre micropool, for an existing pool called Jansen Pond. In addition, an underground flow splitter just downstream of the pond diverts heavy storm flows to an open channel. This project serves a drainage area of 51 acres.

The open channel forms the fifth BMP, a 550 foot-long stream meandering through the woodlands of Blue Heron Park. Prior to construction, stormwater along this reach was carried by an undersized pipe, the discharge from which eroded the downstream banks. The stream serves a drainage area of 64 acres.

The sixth and seventh BMPs – two outlet stilling basins, each just 0.02 acres – serve drainage areas of 59 acres and three acres, respectively. The basins are located at the pipe/stream interfaces along the western drainage corridor. As stormwater exits the pipes, it is slowed by the basins' riprap lining before flowing into the open channels downstream. All storm sewer and BMP construction in the Blue Heron watershed was completed in 2005. The quality of life for Annadale residents has been significantly improved, and the natural resources of the park have been preserved and enhanced.

Future of the Bluebelt

After nearly two decades of activity, the Bluebelt plan has achieved a considerable level of momentum. Thirty-six additional BMPs have been designed and will be constructed under NYCDEP's capital contracts in the coming years. In 2005, planning began on the Mid-Island Bluebelt, which is proposed to cover three watersheds and include over 30 BMPs in this flood-prone region of Staten Island. A full-time Bluebelt staff of 10, supported by about 20 consultants and 30 representatives from other agencies, give individualized attention to each BMP.

As the list of completed BMPs grows, questions of monitoring and maintenance are replacing what were once issues of design and construction. The proper upkeep of the Bluebelt system will be a challenge faced by the NYCDEP in the years to come. Monitoring studies of water quality and hydraulic effects are in their infancy and may be able to provide valuable data to others in the country involved in the BMP field. Perhaps the greatest testament to the success of the Bluebelt is that during major rain events over the past decade, including tropical storms and nor'easters, the BMPs have conveyed runoff flows without a significant instance of flooding.

The Bluebelt has proved to be a forerunner in the City of New York's efforts to promote sustainability and progressive stormwater management strategies. In 2006, the Mayor's Office announced an ambitious new set of initiatives, collectively called PlaNYC 2030, to transform New York City so that it can meet the climatic, infrastructural and demographic challenges of the next several decades. Among these plans was a comprehensive plan for sustainable stormwater management across the city. The Plan calls for the implementation of infiltration practices, tree planting and green spaces to help reduce combined sewer overflows (CSOs) and improve the urban quality of life.

The Bluebelt experience is especially relevant to PlaNYC's effort to promote sustainable stormwater management. PlaNYC calls for the expansion of the Bluebelt system, and in 2008 NYCDEP acquired 70 additional acres of wetlands for the Bluebelt network. In addition, PlaNYC recommends that the City transfer 76 additional small wetland parcels to the Bluebelt. This approach may be useful in other parts of the City where isolated streams and wetlands may offer the opportunity for Bluebelt-style stormwater management ***(see Stormwater Plan article, page 53)***.

Rarely has a BMP project of such scale and complexity been attempted. Of greater significance, however, is that the Bluebelt program reflects what is fast becoming a new trend in environmentalism. Rather than protect natural features at all costs, the Bluebelt program seeks to actively restore and enhance them, even cutting down trees or disturbing wetlands with the ultimate goal of achieving stronger ecosystems that serve both nature and society. Balancing human needs with those of our natural environment will be one of the biggest challenges our society will face as it continues to grow, and the Bluebelt program is exactly the type of program that will help surmount that challenge.

continued on page 20

continued from page 18

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"A Burst of Blue" "Bluebelt Genius"

"Accolades for Bluebelt System Are Flooding In"

Bluebelt Generates Grateful Community Response

Since its inception, the Bluebelt project has received accolades from environmental groups, community leaders and the press as South Shore of Staten Island has stood up to serious flooding. On October 4, 2009, American Rivers, a national environmental group, named the Bluebelt as one of the eight best water-wise projects in the country. The Staten Island Advance newspaper editorialized on November 2, 2009 that: "One of the big successes of the modern era on Staten Island has been the Bluebelt."

The natural drainage system has experienced trials of torrential rains, including those in September 2004, when three times the normal amount of rain (over 10 inches) fell for the month. In the past, heavy amounts of rain would have meant, "a nightmare of flooded streets and watery basements, especially on the South Shore where residential development has outpaced infrastructure construction," reported an October 13, 2004 editorial in the Advance titled, "Bluebelt Genius."

"But not this time," it continued. "That's because enlightened borough and city officials decided a decade ago to create a 'bluebelt.' Not only does the bluebelt protect neighborhoods from flooding even amid torrential downpours, but it also provides beautiful open space areas that enhance the quality of life in the community."

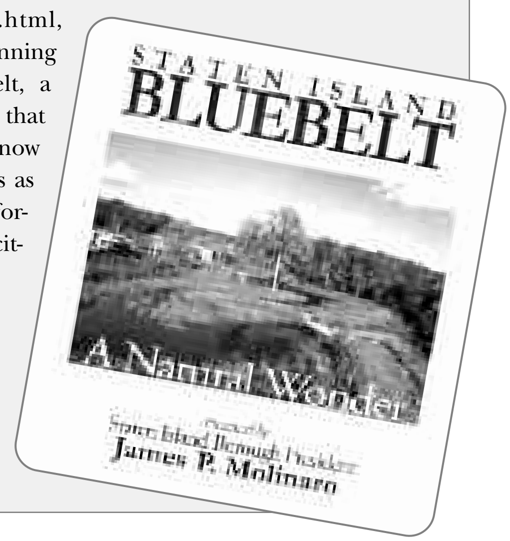
An article in The Advance dated October 10, 2004, also had reported that, "according to those used to taking complaints from angry residents - occasionally up to their knees and hips in water during storms – the Bluebelt passed with flying colors." A Community Board 3 district manager was quoted: "The Bluebelt was the best thing to happen for the South Shore. Whoever came up with the idea of a Bluebelt – what a genius. They're really an asset to the Island."

A commendation letter to the NYCDEP in May 1999 from the Borough of Staten Island Community Board 3, also extolled the Bluebelt's virtues: "We hope that the innovative design approaches developed by DEP for the Bluebelt system here on Staten Island, receive wide publication so that other municipalities can evaluate what has been done here and take advantage of the wonderful ingenuity and cutting edge technology that has taken place."

Another letter from Community Board 3 to the NYCDEP in September 1999 sums up general community reaction to the Staten Island Bluebelt program:

> *"We wish to commend the Department of Environmental Protection, and staff, for a job well done before and during the storm, Hurricane Floyd. We especially thank the Bluebelt staff and maintenance personnel for the marvelous work on all the Bluebelt areas.*
>
> *For the first time in years, areas that experienced flooding and damage were made safe and passable to motorists and the community. One example is Maguire Avenue at Woodrow Road, near P.S. #56. Since the Bluebelt staff worked in this area there was no flooding on the street. Sweetbrook Creek was another example. The community of Eltingville and Great Kills was protected from serious damage and flooding during the storm.*
>
> *It was evident that the work and planning the Department of Environmental Protection took for the protection and safety of the district has paid off.*
>
> *Again, thank you and keep up the good work!"*

An informational DVD titled, "Staten Island Bluebelt: A Natural Wonder," was produced by Staten Island Borough President James Molinaro. The video, which can be viewed online at: www.statenislandusa.com/videos.html, "depicts the award-winning Staten Island Bluebelt, a jewel of our borough that very few Islanders know exists. This film serves as an educational and informational tool for our citizens," said Molinaro.



The DVD may also be downloaded at: http://www.nyc.gov/dep, (under A-Z Index, select Bluebelt).