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Hurricane Damage Repair Required Careful Timing

New Providence officials balanced numerous deadlines and requirements to replace storm drains

By Allen Morgan,
Mayor, New Providence

It's always a challenge, as well as a learning process, to find ways to pay for unanticipated repairs to infrastructure that is damaged by a storm. It also takes time. Every governmental agency has its own requirements and deadlines. Even though the funding for this project took several years, once we got the final approvals, construction was completed in 30 days. The primary reason this worked so smoothly is because we maximized the use of our timelines and resources.

The extent of Hurricane Irene's destruction in 2011 reached further into the future than anyone imagined at the time. The severe flooding experienced by municipalities along the Passaic River in Union County wreaked as much havoc on stormwater systems as it did on fixed annual infrastructure budgets. In New Providence, Hurricane Irene completely destroyed several stormwater outfalls discharging into the river including the pipes, headwalls and outlet protection.



After re-grading, the slopes were stabilized by installing a 100 percent coconut fiber erosion control blanket held together with 100 percent biodegradable jute netting and 100 percent biodegradable stakes made of bio-plastic resin.

Hurricane Damage Repair



Flooding in municipalities along the Passaic River wreaked as much havoc on stormwater systems as it did on fixed annual infrastructure budgets.

During the hurricane, high velocity stormwater carved out channels that were between 20-30 feet wide and 10-15 feet deep. In the two most severely eroded outfall systems, located in residential neighborhoods, the damage was begin-

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ning to impact the roadways. These channels also fell within the boundaries of the Passaic River Parkway, a recreational greenway that is part of the Union County Master Plan, and intersected some of the popular walking trails, creating a safety hazard.

Since the damage was caused by a declared disaster (Hurricane Irene) we were eligible for a FEMA Public Assistance Grant to reimburse the Borough

for 75 percent of the cost of engineering and construction to rebuild both stormwater outfalls to their pre-disaster condition, with a stable bank. However, after working with the NJDEP, we realized that our reconstruction plans would require a Flood Hazard Area Individual Permit (FHA IP) in addition to a wetlands General Permit 11 (GP11). Additionally, it would be expensive to rebuild within the Flood Hazard Area. Using the plans as they were, we would have to apply for the FHA IP, which meant extensive engineering and permitting costs. This would have taken time that risked not meeting the FEMA grant deadline. It also didn't guarantee that the NJDEP would approve an FHA IP. Therefore, we modified our design to relocate the outfalls out of the Flood Hazard Area and Riparian Zone of the Passaic River, to avoid impacts on the sensitive ecology of the Passaic River. The outfalls were relocated as close to

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the Flood Hazard Area as feasible in order to minimize future erosion and satisfy FEMA requirements that a facility be reconstructed to its pre-disaster condition. We also received Somerset-Union Soil Conservation District (SUSCD) certification, which allowed us to disturb soil for construction activities and ultimately stabilize the area.

Another hurdle we had to address was the NJDEP determined that the construction had potential to affect a federally listed species or habitat (Indiana Bat). Therefore, we were not allowed to clear trees from April 1 to November 15. With the FEMA funding deadline looming on August 31, and knowing we had to perform the construction within this summer window, we had our DPW have the trees cleared prior to mobilization of the contractor.

Bank Stabilization Each site had an approximately 25 foot deep eroded area with exposed soil and was on a relatively steep slope with stormwater discharging into the eroded area. This made it unstable and caused expansion as soil continually washed into the Passaic River. With the help of Doug Marvin, our Borough Administrator, and Andrew Hipolit, PE our Borough Engineer from Maser



New Providence Mayor Allen Morgan looks over a completed storm drain.

Consulting P.A., our design included the replacement of the previously washed-out manholes, stormwater pipes and headwalls with new ones, backfilling the eroded areas, and re-stabilizing the areas with rip rap at the outfalls.

The outfalls had to be relocated outside of both the Flood Hazard Area and Riparian Zone of the Passaic River, which otherwise would have triggered additional NJDEP permits beyond the already required wetlands permit. Stabilization of these areas also made it safer for hikers on the wooded paths that run parallel to the Passaic River. At Pine Way we used gabion basket walls to stabilize

the slope and installed locust post and rail fence as fall protection.

After re-grading the slopes (up to 2:1), we stabilized them in the most environmental friendly way possible by installing a 100 percent coconut fiber erosion control blanket held together with 100 percent biodegradable jute netting and 100 percent biodegradable stakes made of bio-plastic resin to hold the blanket to the ground. This blanket protects the seed, increasing the germination rate, while providing temporary stabilization until vegetation is permanently established. Since the site is in a wooded area, we specified a Conservation Shade Mix specifically composed of grasses that are shade tolerant, which helped stabilize steep slopes.

Although the process for permitting allocation for this project was a little complicated, all agencies cooperated. The approval of our design modifications saved us over \$50,000 and helped us meet the funding deadline, which saved us an additional \$200,000 in construction costs. Even though the paperwork process was lengthy, we used our time as proactively and efficiently as possible by clearing the trees ahead of time, modifying our design to fit the GP11 instead of submitting for FHA IP and working around the Indiana Bat restriction.

The ultimate success of this project depended on timing, effective decision making, the ability to get the job done, knowledge of the permitting parameters and creativity. We, and our residents who live nearby and use the area for recreation, are pleased with the results. ♻️

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