



THE NEW YORK BOTANICAL GARDEN

NEIWPCG Grant
NYBG Horticulture Operation Center: Stormwater Retrofit

Final Report
June 12, 2012

The New York Botanical Garden is pleased to submit this final report to the New England Interstate Water Pollution Control Commission (NEIWPCG) detailing the accomplishments of its *Horticulture Operations Center Stormwater Retrofit Project*, which was made possible in part by a grant of \$50,045 from the NEIWPCG. As of the date of this report, the Botanical Garden has completed 100% of the Design Phase and 82% of the Construction Phase for the *Horticulture Operations Center Stormwater Retrofit Project*. This work includes the scope funded by City of New York, National Fish and Wildlife Foundation, and the New England Interstate Water Pollution Control Commission.

Work Completed

- Removed over 21,000 SF of buildings
- Removed over 30,000 SF of impermeable pavement
- Installed over 20,000 SF permeable gravel pavement
- Installed over 8,000 SF of permeable asphalt with storm detention gravel bed
- Installed over 600 LF of storm capture infiltration trenches/tree pits
- Installed ConTech Storm Filter
- Installed Carbtrol re-circulating waste water treatment system
- Installed over 2000 SF of permeable woody plant nursery
- Installed over 120 LF of trench drain
- Installed over 375 CY of permeable planting beds

Site Conditions

To date, the only unanticipated conditions encountered during construction are the existence of unmapped storm lines and old greenhouse footings. The Garden's Operations staff traced the unmapped lines to ensure that they were abandoned, and the remaining storm structures were capped and filled with gravel. The unanticipated concrete footings have been removed or where appropriate the drainage was redesigned to avoid the obstacles.

The increased complexity of the site over what was originally anticipated resulted in increased time spent by the Civil Engineer on the project. The increase in complexity related to the close proximity to the Bronx River and the shallow rock bed.

Stormwater control

During construction, the contractor was able to divert storm flow from impermeable pavements into the new gravel parking area allowing a portion of the storm flow to be detained on site and limit the impact on the new Storm Filter. Storm flow during construction contains higher levels of sediment than normal, and this material would decrease the performance life of the cartridge filters in the Storm Filter.

The Garden was advised to substitute the original proposed On Site Detention to a different method of stormwater capture and detention. The proposed subsurface piping of 6" and 12" pipe, was replaced with an at grade trench drain. This change was initiated because the trench drain could handle a larger volume of water in a quicker manner (water runs directly into the drain and off the surface versus the original subsurface scenario which requires the water to infiltrate through the surface of soil or stone and then enter the piping for transport elsewhere). This substitution helped to reduce surface flow of stormwater, a significant water quality goal for the project.

Work Schedule

The site work contractor continues construction in the south end of the site including the driveway, cold frame area and woody plant nursery. The infiltration trenches are complete with the exception of the surface porous paving material (aggregate). The contractor will proceed with the installation of the new catch basin at the entrance to the HOC later this month. This catch basin will allow a system connection for the southern portion of the site to the Storm Filter. We expect to complete any remaining Stormwater related work by late June 2012.

Conclusion

The New York Botanical Garden is grateful to the New England Interstate Water Pollution Control Commission for its generous support of the Garden to help underwrite the costs associated with the Garden's *Horticulture Operations Center: Stormwater Retrofit* project.