

BEST RETROFIT IN THE BAY

MedStar Harbor Hospital Clean Water Community Healing Project

The MedStar Harbor Hospital (MHH) Clean Water Community Healing Project is being submitted for the Best Retrofit in the Bay as a model for massively reducing stormwater runoff, dramatically transforming an urban waterfront edge with conservation landscaping, significantly increasing the urban tree canopy, and engaging the community on the important links between environmental and public health—all in a historically marginalized, highly visible and highly utilized area of Baltimore.

The Clean Water Community Healing Project, completed in 2018, retrofitted the hospital's four major parking lots with two raingardens, nine micro-bioretenion areas, three bioretention areas, 16,724 sf of conservation landscaping (a healing garden), and 81 new trees. The hospital previously had no stormwater management facilities and championed the project as a voluntary restoration to help restore local water quality. The goal of the project was to maximize impervious cover treatment using Environmental Site Design (ESD) and standard infiltration practices; and increase the knowledge, attitudes, and behaviors of the MHH community as it connects stormwater management to patient, staff, and community health.

The project followed on 10 years of sustainability efforts that MHH has been pursuing to lessen their environmental impact and improve community health. It was also the result of three separate grants that allowed for a comprehensive visioning process, strong partnerships, and thorough involvement of the hospital Green Team.

At the onset, the MHH campus had over 12.6 acres of impervious surface. The team removed 1.2 acres of impervious cover to accommodate the BMPs and new tree pits. However, the team also took advantage of existing open space to the maximum degree possible to limit loss of parking spaces. Full implementation of the project resulted in the effective treatment of 5.2 acres of the remaining impervious surface (41%), with estimated annual load reductions 39 pounds of nitrogen, 6 pounds of phosphorus and 1.2 tons of sediment.

Runoff conveyance had to be creatively constructed in order to maximize the impervious area captured by the retrofits. A combination of new vegetated swales, curb cuts, and trench drains were installed to convey runoff from the parking lots and driveways. A concrete retaining wall was used to mitigate slope variations between the existing grade and proposed stormwater management areas. The project also improved pedestrian safety and ADA accessibility.

Planning and design were fully funded by two CBT grants for \$35K and \$70k respectively. The hospital acquired construction funds through Maryland DNR, with Blue Water Baltimore (BWB) helping to monitor the site's condition for one year following installation. MHH will maintain the

GI installations in perpetuity. The \$70k in design costs represent just 5.8% of the total construction cost, a considerable leveraging of design into a significant \$1.2 million of implementation. A typical industry standard ratio of design to construction costs is 20%.

Directly upslope from MHH is the Cherry Hill neighborhood of Baltimore City in which BWB lead a community GI master planning effort in conjunction with the MHH effort. Baltimore DPW also lead a public ESD campaign during this time.

MHH is one of two waterfront hospitals in Maryland, with an extensive lawn and numerous parking lots directly on the Patapsco River. The majority of the campus's 30 acres are impervious with rain water and pollution flowing off the property directly into the river and subsequently the Chesapeake Bay. PSS and BWB identified MHH as an anchor institution where stormwater interventions could have a significant and highly visible impact on water quality. CBT grant funds allowed a multi-stakeholder team of non-profit, consulting and government staff to work with MHH's Facilities Department and Green Team to evaluate MHH's current stormwater management practices, challenges and plan for improvements. This is the first stormwater management project at a Baltimore hospital and the largest private voluntary restoration project to date in Baltimore; and as such, provides an excellent model on which to build.

During construction, various constraints were mitigated by the construction contractors, Stormwater Maintenance and Consulting and SBC Outdoor Services. Ambulance service to the hospital entrance had to be constantly available, so steel plates and maintenance of traffic flow were used during street cuts to accommodate emergency situations. In addition, several abandoned tanks were discovered during excavation of one of the BMPs. The contractors fully removed the tanks and properly prepared the subsurface for support of the retaining walls. Finally, this installation occurred during one of the wettest years on record, pushing construction and schedule dates throughout the process. Fortunately, the team worked closely to adjust tasks as necessary, and the project came in on budget and only one month behind schedule.

The project began in 2015 with education and outreach to MHH's executive leadership and Green Team. For well over a decade previously, MHH was a leading participant in Maryland Hospitals for a Healthy Environment, (MD H2E), an initiative of the University of Maryland, Baltimore, which focused on environmental health and sustainability in hospitals. While MD H2E's initial focus was on healthy food, waste prevention, and energy efficiency, MD H2E pivoted to focus on climate resiliency and stormwater management prior to its closing in 2015. Plisko Sustainable Solutions, LLC, an environmental health and sustainability consultancy, brought the project from MD H2E and partnered with BWB.

With a Planning grant from CBT, PSS, BWB and the Neighborhood Design Center (NDC) worked with the MHH Green Team to create a GI Master Plan for MHH. This process included strategic meetings, a values-based assessment, and a site visit to better understand existing stormwater problem areas and identify potential opportunities. Collectively, the team analyzed and scored potential projects using a decision matrix, that looked at environmental, social and economic considerations. NDC compiled the list of potential projects and drafted the Green Infrastructure Master Plan. Baltimore DPW provided feedback on the entire master plan and provided additional information on drainage systems. PSS and BWB developed a GI Education Plan for MHH to promote the use and benefits of the improved campus.

Since installation, MHH has hosted Project Green Classrooms to tour the innovative retrofits and have scheduled tour groups such as the Choose Clean Water conference, the National Aquarium and local schools for summer 2019. The hospital is also planning a 5k run later this year to highlight the project.

MHH employs over 1,500 people and has around 10,000 inpatient admissions and close to 60,000 emergency department visits per year. MHH's waterfront attracts large crowds of visitors several times per year during harbor events such as Independence Day fireworks displays, Maryland Fleet Week airshows, and Tall Ships regalia. In addition, the Middle Branch Park bike trail crosses through campus, making the retrofits visible to hundreds of additional recreational users each year. The design plans took advantage of this high visibility by strategically locating educational signage throughout the campus, directly adjacent to the retrofits, in order to illustrate the importance of environmental stewardship and responsible stormwater management for improved water quality, a healthier Chesapeake Bay, greater climate resiliency, and improved human health.