

DOI-NFWF

42279 Building Ecological Solutions to Coastal Community Hazards

NJ DEP Office of Coastal and Land Use Planning

Municipal Project Narrative

Brigantine

Scope: The Brigantine NFWF funded activities are the design, development of permit documents, permit approvals, bidding, implementation and monitoring of vegetated embankments and shoreline restoration for four municipally owned dead end street right-of-ways off Atlantic Brigantine Boulevard (Atlantic County Route No. 638), the sole means of emergency evacuation for Brigantine. The right-of-ways run between the Boulevard and the shoreline of St George's Thorofare.

Goals: The goals of these activities are habitat enhancement/creation (pollinators), shoreline stabilization, tidal flood mitigation, stormwater management, and overall additional resiliency for the upland area beyond the sites.

Project Partners: NJ Department of Environmental Protection, National Wildlife Federation, Barnegat Bay Partnership, Partnership for the Delaware Estuary, Stevens Institute of Technology, City of Brigantine, Remington, Vernick and Walberg, and Rutala Associates

Project Funding:

DOI NFWF Grant

Brigantine City Match

Project Design: The four sites are all semi-improved dead end streets with existing vegetated shorelines between bulk-headed shorelines. They are used for parking and some limited access to residential units. The existing conditions were assessed for elevation, fetch, wave action, wildlife, habitat, tidal and storm flooding. The designs vary slightly with each site to reflect shoreline vegetation conditions. Each consists of stabilization of the shoreline through support of the existing vegetation, and vegetated embankments for pollinator habitat and flood mitigation. The tops of the embankments are at elevation nine to coordinate with the anticipated future flood levels. Upland, storm water infiltration trenches cross each site along the face of the embankments. The system is designed to slow the flow of the water, pipe it to the shoreline and release it onto small riprap areas and into the bay.

Project dimensions:

Hydrangea Way ROW: 50 linear feet wide by 110 feet long

Magnolia Way ROW: 50 linear feet wide by 110 feet long

S. Cherokee Blvd ROW: 80 linear feet wide by 110 feet long

Unnamed Street at 4100 Brigantine Blvd. ROW: 50 linear feet wide by 90 feet long

Value: This project reflects the common occurrence of gaps in bulk-headed shorelines. The shorelines of the sites are currently primarily vegetated. The activities will provide insight into the issues and benefits of using ecological solutions at such conditions. Other municipalities may learn from the project and apply similar techniques along their shorelines.

DEP and USACE Permit Approval Process:

Joint Permit Processing Meeting (1- for preliminary design review and permitting input)
DEP Coastal GP 24 – Habitat creation, restoration, enhancement and living shorelines activities
CAFRA (for activities above mean high water)
Water Quality Certificate
USACE Standard Permit

Monitoring: A monitoring plan will provide for documenting existing site conditions, monitoring during implementation, and post implementation monitoring through January 2018. Citizen scientist monitoring may be provided by locals.

Project Schedule

The implementation is anticipated to start in March 2017 and end in May 2017.

Associated Projects: Brigantine is currently planning improvements to Brigantine Boulevard to address tidal and storm flooding. They also have adopted a municipal ordinance that requires all new and reconstructed bulk-heads to be designed to Elevation Nine. The embankments have been designed to coordinate with this ordinance. Brigantine has received multiple grants that have assisted them in resiliency.

Read more at <http://nj.gov/dca/news/news/2016/approved/20161129.html>

Detailed Project Activities:

All four projects- Hydrangea Way, Magnolia Way, S. Cherokee Boulevard and “Unnamed” Street at 4100 Brigantine Boulevard- are located off of Atlantic-Brigantine Boulevard, Atlantic County Route No 638.

Hydrangea Way is a municipal right-of-way, 50’ wide by approximately 110’ long (from the Atlantic Brigantine Boulevard R.O.W. to the line of Mean High High Water) northeast of 4600 Atlantic Brigantine Boulevard and includes Block 5704, Lot 20 and Block 5605, Lot 21. The right of way has concrete curb cuts and loose gravel on the inland portion of the site while at the shoreline there is mapped bare ground and *Spartina Alterniflora* (low vigor).

The activity will include the following elements:

- A new stone access drive area approximately 38’ wide by 40’ long from the existing edge of pavement waterward as an improvement to the R.O. W. drive and parking area. A 4’ high split rail fence, approximately 40 long runs across the R.O.W. at the edge of the gravel area. The edges are held away from the property lines to allow public access to the shoreline.
- A new 3’ infiltration trench drain will be installed, running from property line to property line (50’) with stone. The trench has two inlets spaced 30’ apart with 12’ HDPE perforated pipe between and with 12’ HDPE pipe running at 90 degrees, approximately 35’, and sloped to the shoreline. These two pipes end at the shoreline in riprap stone scour protection: 1 with 10 sf wetland disturbance and 1 with 30 sf wetlands disturbance.
- Beginning at the infiltration trench waterward edge, a new embankment slopes up to Elev. 9’ NAVD 88, running from property line to property line across the R.O.W. (50’), is level for a 1 ‘ width and then slopes down to the shoreline. Within the embankment is approximately 40 linear feet of steel sheet piling running across the R.O.W. with a top

Elev. 8 NAVD 88. The embankment ends at the side property lines with stepped gabion baskets at Elevations 7-9 NAVD 88.

- Plantings on the back slope of the embankment consist of *Myrica Pennsylvania*. Plantings on the top of the embankment include four 36" bushes and vegetation tolerant of dry conditions. The waterward slope consists of brush layering on the upper slope, approximately 12' of slope by 50' across the R.O.W. with high marsh plantings and *Iva frutescens* below, to supplement the existing vegetation without disturbance, to the mean high high water line.

Impacts below the high tide line are vegetation (temporary impact) 193 sf, 3.57 CY and riprap stone, 5 sf, 0.12 CY. No additional impacts below the High tide line for construction access, de-watering or staging. Regulated fill within wetlands are riprap stone .93 CY, stormwater .07 CY for a total of 1 CY.

Magnolia Way is a municipal right-of-way, 50' wide by approximately 110' long (from the Atlantic Brigantine Boulevard R.O.W. to the line of Mean High High Water) northeast of 4400 Atlantic Brigantine Boulevard and includes Block 5705, Lot 9 and Block 5704, Lot 21. The right of way has concrete curb cuts and loose gravel on the inland portion of the site while at the shoreline there is mapped *Spartina alterniflora* (high vigor) and high marsh at MHHW line and inland.

The activity will include the following elements:

- A new stone access drive area approximately 38' wide by 40' long from the existing edge of pavement waterward as an improvement to the R.O.W. drive and parking area. A 4' high split rail fence, approximately 40' long runs across the R.O.W. at the edge of the gravel area. The edges are held away from the property lines to allow public access to the shoreline.
- A new 3' infiltration trench drain will be installed, running from property line to property line (50') with stone. The trench has two inlets spaced 30' apart with 12' HDPE perforated pipe between and with 12' HDPE pipe running at 90 degrees, approximately 35', and sloped to the shoreline. These two pipes end at the shoreline in riprap stone scour protection: 1 with 35 sf wetland disturbance and 1 with 36 sf wetlands disturbance.
- Beginning at the infiltration trench waterward edge, install a new embankment which slopes up to Elev. 9' NAVD 88, running from property line to property line across the R.O.W. (50'), is level for a 1' width and then slopes down meet the existing slope to the shoreline. Along the waterward slope install Envirolok soil bags, slope 1H:1V and vegetate both faces (typical both sides). Within the embankment is approximately 40 linear feet of 30' PZ22 steel sheet piling, running across the R.O.W., with a top Elev. 8 NAVD 88. The embankment ends at the side property lines with stepped gabion baskets at Elevations 7-9 NAVD 88.
- Plantings on the back slope of the embankment consist of *Myrica Pennsylvania*. Plantings on the top of the embankment include four 36" bushes and vegetation tolerant of dry conditions. The waterward slope consists of brush layering on the upper slope, approximately 12' of slope by 50' across the R.O.W. with high marsh plantings and *Iva Frutescens* below, to supplement the existing vegetation without disturbance, to the mean high high water line.

Proposed impacts below the high tide line are vegetation (temporary impact) 154 sf, 2.85 CY; riprap stone, 51 sf, 1.27 CY. No additional impacts below the High tide line for construction

access, de-watering or staging. Regulated fill within wetlands are riprap stone 1.37 CY, stormwater .44 CY for a total of 1.81 CY.

S. Cherokee Boulevard is a municipal right-of-way, 80' wide by approximately 110' long (from the Atlantic Brigantine Boulevard R.O.W. to the line of Mean High High Water) northeast of 4300 Atlantic Brigantine Boulevard. The right of way has loose gravel on the inland portion of the site while at the shoreline there is mapped *Spartina Alterniflora* (high vigor) and high marsh at MHHW line and inland.

The activity will include the following elements:

- A new stone access drive area approximately 38' wide by 40' long from the existing edge of pavement waterward as an improvement to the R.O. W. drive and parking area. A 4' high split rail fence, approximately 70' long runs across the R.O.W. at the edge of the gravel area. The edges are held away from the property lines to allow public access to the shoreline.
- Behind the split rail fencing an area of plantings will be installed including an area 8' wide by 90' of meadow, two sections of maritime forest, each 18' by 35' and divided by a t-shaped area FACW or FAC species of back dune /maritime forest plantings, 18' by 20' and 10' by 90'.
- A new 3' infiltration trench drain will be installed, running from property line to property line (50') with stone. The trench has three inlets spaced 25' apart with 12' HDPE perforated pipe between and with 12' HDPE pipe running at 90 degrees, approximately 35', and sloped to the shoreline. These three pipes end at the shoreline in riprap stone scour protection: 2 with 36 sf wetland disturbance and 1 with 38 sf wetlands disturbance.
- Beginning at the infiltration trench waterward edge, install a new embankment which slopes up to Elev. 9' NAVD 88, running from property line to property line across the R.O.W. (80'), is level for a 1' width and then slopes down meet the existing slope to the shoreline. Along the waterward slope install Envirolok soil bags, slope 1H:1V and vegetate both faces (typical both sides). Within the embankment is approximately 75 linear feet of 30' PZ22 steel sheet piling, running across the R.O.W., with a top Elev. 8 NAVD 88. The embankment ends at the side property lines with stepped gabion baskets at Elevations 7-9 NAVD 88.
- Plantings on the back slope of the embankment consist of *Myrica Pensylvanica*. Plantings on the top of the embankment include four 36" bushes and vegetation tolerant of dry conditions. The waterward slope consists of brush layering on the upper slope, averaging 18' of slope by 80' across the R.O.W. with high marsh plantings and *Iva Frutescens* below, to supplement the existing vegetation without disturbance, to the mean high high water line.

Proposed impacts below the high tide line are vegetation (temporary impact) 97 sf, 1.80 CY and riprap stone, 81 sf, 2.01 CY. No additional impacts below the High tide line for construction access, de-watering or staging. Regulated fill within wetlands are riprap stone 2.07 CY, stormwater .74 CY for a total of 2.81 CY.

"Unnamed" Street at 4100 Brigantine Boulevard is a municipal right-of-way, 50' wide by approximately 90' long (from the Atlantic Brigantine Boulevard R.O.W. to the line of Mean High High Water) northeast of 4400 Atlantic Brigantine Boulevard and includes Block 5705, Lot 9 and Block 5704, Lot 21. The right of way has concrete curb cuts and loose gravel on the

inland portion of the site while at the shoreline there is mapped *Spartina Alterniflora* (high vigor) and high marsh at MHHW line and inland.

The activity will include the following elements:

- A new stone access drive area approximately 38' wide by 40' long from the existing edge of pavement waterward as an improvement to the R.O. W. drive and parking area. A 4' high split rail fence, approximately 30 long runs across the R.O.W. at the edge of the gravel area and then returns parallel to the side property lines to meet the ends of the curb cuts.
- Behind the split rail fencings, areas of plantings will be installed including two areas of meadows, each 6' by 10'; two sections of maritime forest, each 10' by 10' and two sections of FACW or FAC species of back dune /maritime forest plantings, each 8' by 10'.
- A new 3' infiltration trench drain will be installed, running from property line to property line (50') with stone. The trench has two inlets spaced 30' apart with 12' HDPE perforated pipe between and with 12' HDPE pipe running at 90 degrees, approximately 35', and sloped to the shoreline. These two pipes end at the shoreline in riprap stone scour protection: 1 with 23 sf wetland disturbance and 1 with 17 sf wetlands disturbance.
- Beginning at the infiltration trench waterward edge, install a new embankment which slopes up to Elev. 9' NAVD 88, running from property line to property line across the R.O.W. (50'), is level for a 1' width and then slopes down meet the existing slope to the shoreline. Within the embankment is approximately 40 linear feet of 30' PZ22 steel sheet piling, running across the R.O.W., with a top Elev. 8 NAVD 88. The embankment ends at the side property lines with stepped gabion baskets at Elevations 7-9 NAVD 88.
- Plantings on the back slope of the embankment consist of *Myrica Pensylvanica*. Plantings on the top of the embankment include vegetation tolerant of dry conditions. The waterward slope consists of brush layering on the upper slope, approximately 12' of slope by 50' across the R.O.W. with high marsh plantings and *Iva Frutescens* below to supplement the existing vegetation without disturbance, to the mean high high water line.

Proposed impacts below the high tide line are vegetation (temporary impact) 168 sf, 3.11 CY; riprap stone, 1 sf, .02 CY. No additional impacts below the High tide line for construction access, de-watering or staging. Regulated fill within wetlands are riprap stone 1.00 CY, stormwater .00 CY for a total of 1.00 CY.