

# Homes for Heroes Green Infrastructure Project

Town of Orangetown, New York

Presented by:

Ken DeGennaro, PE, CFM

Brooker Engineering

# Background

- Site located on the east side of Western Highway
- Camp Shanks Site, which operated from 1943-1956
- Upper portion of the site was recently redeveloped to provide housing for military veterans
- Plans are being developed to add additional veteran housing in the center of the site.

# Green Infrastructure Project

- Town of Orangetown Highway Department and Department of Environmental Management and Engineering applied for and received a grant from NYS EFC to provide water quality enhancements within the Sparkill Creek watershed.

# Design Criteria and Standards

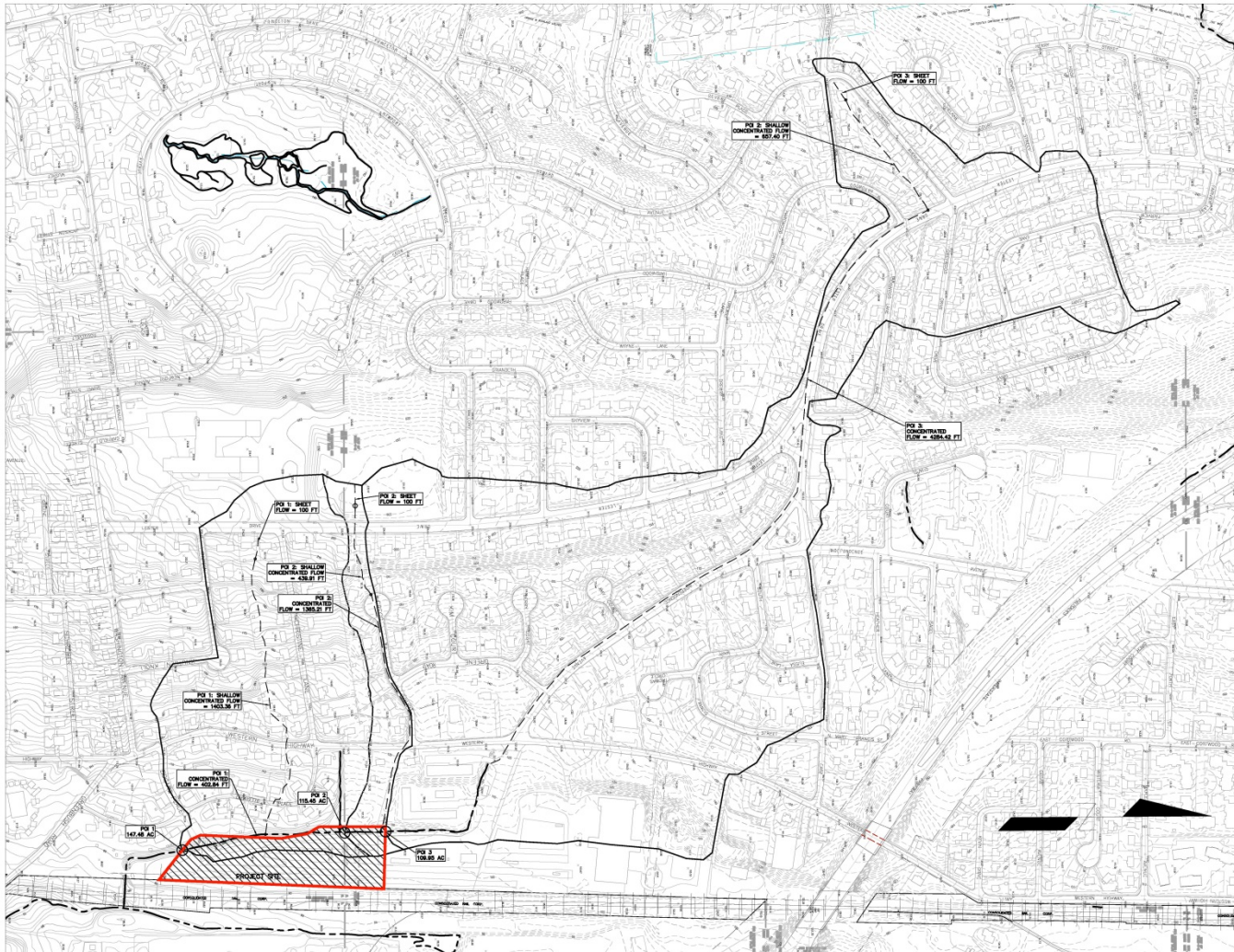
- To provide water quality enhancements on the Sparkill Creek, which is listed as a NYSDEC 303d watercourse.
- These are identified waters “that do not support appropriate uses and require a restoration strategy”
- NYSDEC stream classification of “C”, which indicates a best usage of fishing and fish propagation

# Design Criteria

- NYSDEC has many Best Management Practices including wet ponds, wetlands, infiltration (dry ponds), and boiretention.
- Extended Detention Shallow Wetland (NYSDEC BMP W-2) was selected for this project.
- This was based on the size of the contributing drainage area and the pollutant removal.
- Pollutants include pathogens (total coliform, fecal streptococcus), phosphorous levels, and oxygen demand.

# Contributing Drainage Area

- Part of the Sparkill Creek Watershed
- 130 acres of mostly developed land contribute stormwater runoff (Lester Drive, Independence Avenue, Howard Drive)
- Stormwater runoff is delivered to the site via a piped storm drainage system.
- Conveyed through the site by a well defined channel.
- The basin proposed basin provides a diversion to allow low flows in the swale to entire the wetland and be treated for stormwater quality.



	SUB-AREA 1	SUB-AREA 2	SUB-AREA 3
AREA (AC)	32.03	5.50	109.95
TIME OF CONCENTRATION (MIN)	14	20	35
IMPERVIOUS AREA (AC)	7.57	1.46	38.85

POINT OF INTEREST	CONTRIBUTING SUB-AREA	TOTAL CONTRIBUTING AREA (AC)
POI 1	SA 1, SA 2, SA 3	147.46
POI 2	SA 2, SA 3	115.45
POI 3	SA 3	109.95

REV	DESCRIPTION	BY	DATE

DESIGNER: UNDESIGNED ALTERNATE OF DESIGN TO THESE PLANS IS A VIOLATION OF THE STATE EDUCATION LAW ARTICLE 142, SECTION 1702B, SUBSECTION 2

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74 Lakeside Avenue, Suite 301      46 N. Central Avenue  
 Saratoga, NY 12851                  Poughkeepsie, NY 12560  
 (518) 387-4411                              (845) 486-1221

PROJECT: **HOMES FOR HEROES**  
 TOWN OF GRANGETTOWN  
 ROCKLAND COUNTY  
 NEW YORK

TITLE: **DRAINAGE AREA MAP**

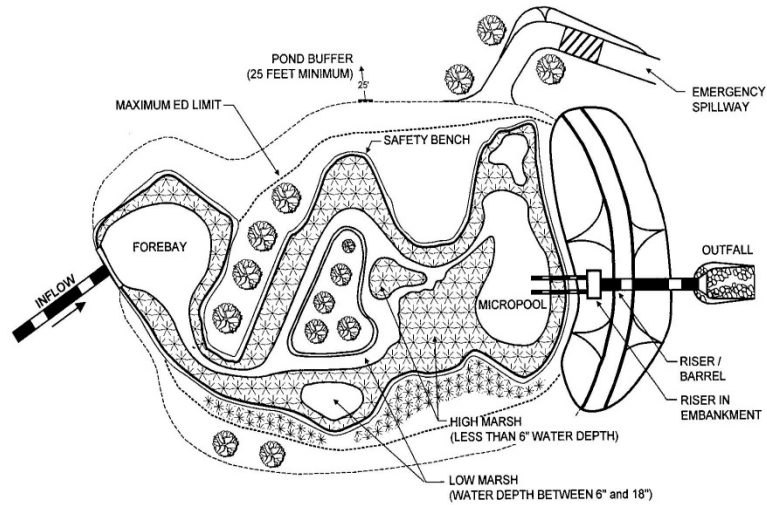
PROJECT NO.	DRAWN	CHECKED
18201	RW	KD

SCALE: 1"=200'

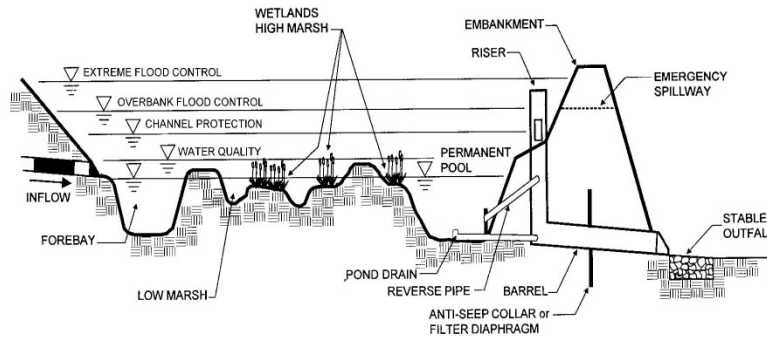
GRAPHIC SCALE:

DATE: 1/26/18      DRAWING NO: **1**

Figure 6.8 Extended Detention Shallow Wetland (W-2)



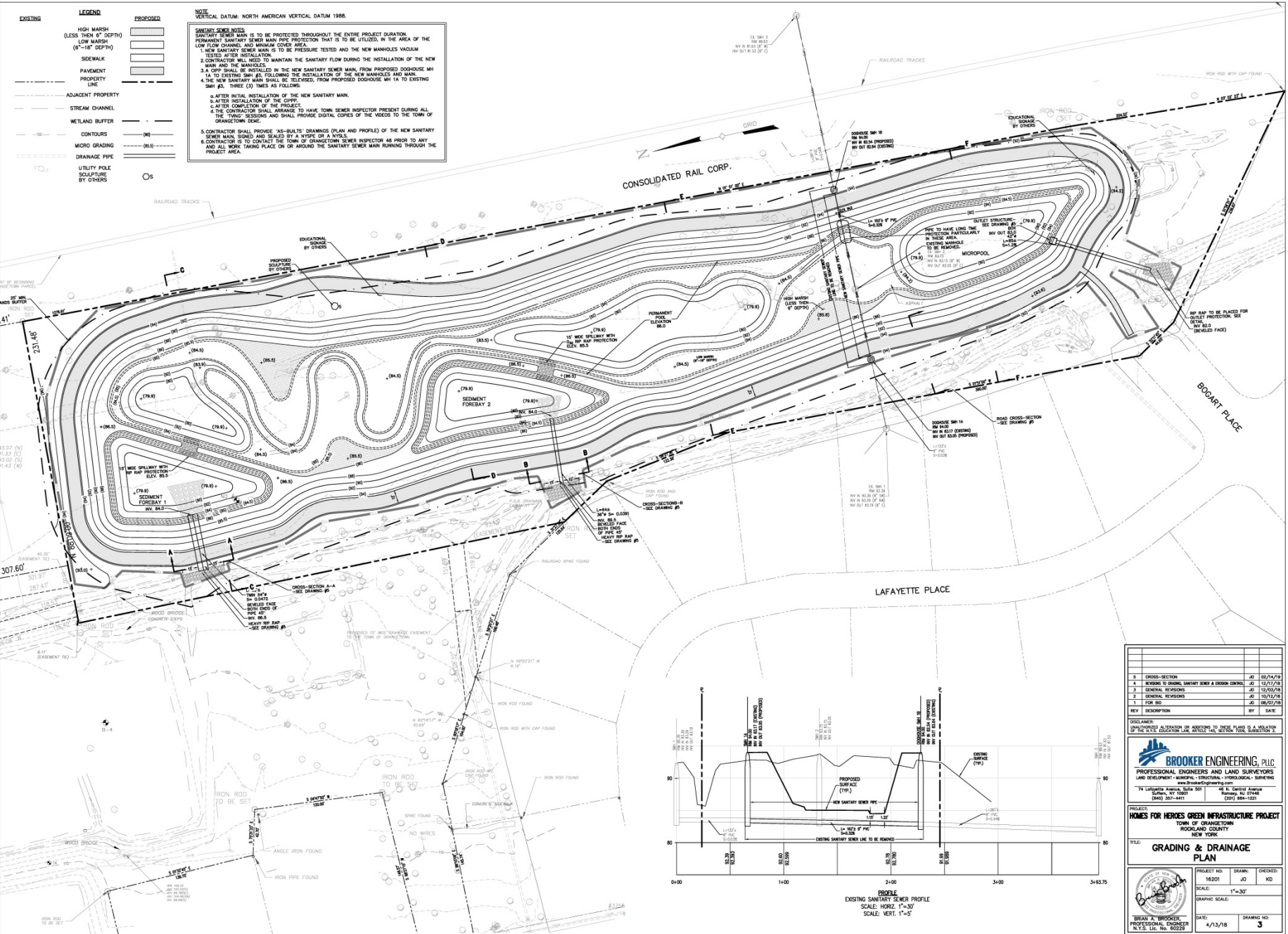
PLAN VIEW



PROFILE

# NYSDEC Schematic





**NOTE:**  
 VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988.

**SANITARY SEWER MAINS**  
 SANITARY SEWER MAIN IS TO BE PROTECTED THROUGHOUT THE ENTIRE PROJECT DURATION.  
 PERMANENT SANITARY SEWER MAIN PIPE PROTECTION THAT IS TO BE UTILIZED IN THE AREA OF THE LOW FLOW CHANNEL AND MINIMUM COVER AREA.

**NEW SANITARY SEWER MAIN IS TO BE:**  
 1. NEW SANITARY SEWER MAIN IS TO BE PRESSURE TESTED AND THE NEW MANHOLES VACUUM TESTED AFTER INSTALLATION.  
 2. CONTRACTOR WILL NEED TO MAINTAIN THE SANITARY FLOW DURING THE INSTALLATION OF THE NEW MAIN AND THE MANHOLES.  
 3. A COP SHALL BE INSTALLED IN THE NEW SANITARY SEWER MAIN, FROM PROPOSED DOGHOUSE MH 1A TO EXISTING SANI #1. FOLLOWING THE INSTALLATION OF THE NEW MANHOLES AND MAIN.  
 4. THE NEW SANITARY MAIN SHALL BE RELEASED, FROM PROPOSED DOGHOUSE MH 1A TO EXISTING SANI #1. THESE (3) TIMES AS FOLLOWS:  
 a. AFTER INITIAL INSTALLATION OF THE NEW SANITARY MAIN.  
 b. AFTER INSTALLATION OF THE COPPP.  
 c. AFTER COMPLETION OF THE PROJECT.  
 4. THE CONTRACTOR SHALL ARRANGE TO HAVE TOWN SENIOR INSPECTOR PRESENT DURING ALL THE TESTING SESSIONS AND SHALL PROVIDE DIGITAL COPIES OF THE VIDEOS TO THE TOWN OF ORANGETOWN TOWNSHIP.

**5. CONTRACTOR SHALL PROVIDE "AS-BUILT" DRAWINGS (PLAN AND PROFILE) OF THE NEW SANITARY SEWER MAIN, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER.**  
 6. CONTRACTOR IS TO CONTACT THE TOWN OF ORANGETOWN SENIOR INSPECTOR 48 HOURS IN ADVANCE AND ALL WORK TAKING PLACE ON OR AROUND THE SANITARY SEWER MAIN RUNNING THROUGH THE PROJECT AREA.

REV	DESCRIPTION	BY	DATE
5	CROSS-SECTION	JD	02/14/19
4	REVISION TO DRAINAGE SANITARY SEWER & DRAINAGE CONTROL	JD	12/17/18
3	GENERAL REVISIONS	JD	10/25/18
2	GENERAL REVISIONS	JD	10/17/18
1	FOR ISS	JD	08/20/18

**DISCLAIMER:**  
 THIS PLAN IS A PRELIMINARY DESIGN AND IS SUBJECT TO CHANGE WITHOUT NOTICE. THE USER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND REGULATORY APPROVALS.

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**PROJECT:**  
 HOMES FOR HEROES GREEN INFRASTRUCTURE PROJECT  
 TOWN OF ORANGETOWN  
 ROCKLAND COUNTY  
 NEW YORK

**TITLE:**  
 GRADING & DRAINAGE PLAN

PROJECT NO:	18201	DRAWN:	JD	CHECKED:	KD
SCALE:	1"=30'	DATE:	4/13/18	DRAWING NO:	3

**TSEAN A. BROOKER**  
 PROFESSIONAL ENGINEER  
 N.Y.S. Lic. No. 90222

# Wetland Pond Features

- Forebays (located at outfalls delivering flow to the pond)
- Micropool (located at pond exit)
- Low marsh (6"-18" deep)
- High marsh (6" deep)
- Meandering channel within basin
- Maximum distance from inflow to outflow

# Design Criteria

- Property area = 6.3 acres
- Surface area of pond = 3.3 acres
- Cumulative flood storage provided = 24.2 acre-feet.
- Water Quality Volume provided = 11.3 acre-feet

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## Ancillary Benefits

- 100-year peak discharge entering the pond = 522 cfs
- 100-year peak discharge leaving the pond = 300 cfs
- Length of walking path = 0.6 miles

### Stormwater Wetlands



**Description:** Stormwater wetlands (a.k.a. constructed wetlands) are structural practices that incorporate wetland plants into the design to both store and treat runoff. As stormwater runoff flows through the wetland, pollutant removal is achieved through settling and biological uptake within the practice

**Design Options:**  
Shallow wetland (W-1), Extended Detention Wetland (W-2), Pond/Wetland (W-3), Pocket Wetland (W-4)

<u>KEY CONSIDERATIONS</u>	<u>STORMWATER MANAGEMENT SUITABILITY</u>								
<p>MUST MEET ALL OF THE REQUIREMENTS OF STORMWATER PONDS.</p> <p><b>CONVEYANCE</b></p> <ul style="list-style-type: none"> <li>• Minimum flowpath of 2:1 (length to width)</li> <li>• Flowpath maximized</li> </ul> <p><b>TREATMENT</b></p> <ul style="list-style-type: none"> <li>• Micropool at outlet, capturing 10% of the WQ<sub>v</sub></li> <li>• Minimum surface area to drainage area ratio of 1:100</li> <li>• ED no greater than 50% of entire WQ<sub>v</sub>, (permanent pool at least 50% of the volume) 25% of the WQ in deepwater zones.</li> <li>• 35% of the total surface area in depths six inches or less, and 65% shallower than 18"</li> </ul> <p><b>LANDSCAPING</b></p> <ul style="list-style-type: none"> <li>• Landscaping plan that indicates methods to establish and maintain wetland coverage. Minimum elements include: delineation of pondscape zones, selection of species, planting plan, and sequence for bed preparation.</li> <li>• Wetland buffer 25 feet from maximum surface elevation, with 15 foot additional setback for structures.</li> <li>• Donor plant material must not be from natural wetlands</li> </ul> <p><b>MAINTENANCE REQUIREMENTS</b></p> <ul style="list-style-type: none"> <li>• Reinforcement plantings after second season if 50% coverage not achieved</li> </ul> <p style="text-align: center;"><b><u>POLLUTANT REMOVAL</u></b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; border: 1px solid black; width: 20px;"><b>G</b></td> <td><b>Phosphorus</b></td> </tr> <tr> <td style="text-align: center; border: 1px solid black;"><b>G</b></td> <td><b>Nitrogen</b></td> </tr> <tr> <td style="text-align: center; border: 1px solid black;"><b>F</b></td> <td><b>Metals</b> - Cadmium, Copper, Lead, and Zinc removal</td> </tr> <tr> <td style="text-align: center; border: 1px solid black;"><b>G</b></td> <td><b>Pathogens</b> - Coliform, Streptococci, E.Coli removal</td> </tr> </table> <p style="text-align: center; border: 1px solid black; margin-top: 5px;"><b>Key: G=Good F=Fair P=Poor</b></p>	<b>G</b>	<b>Phosphorus</b>	<b>G</b>	<b>Nitrogen</b>	<b>F</b>	<b>Metals</b> - Cadmium, Copper, Lead, and Zinc removal	<b>G</b>	<b>Pathogens</b> - Coliform, Streptococci, E.Coli removal	<p><b>Water Quality</b></p> <p><b>Channel Protection</b></p> <p><b>Overbank Flood Protection</b></p> <p><b>Extreme Flood Protection</b></p> <p><b>Accepts Hotspot Runoff:</b> <i>Yes</i> <i>(2 feet minimum separation distance required to water table)</i></p> <p style="text-align: center;"><b><u>IMPLEMENTATION CONSIDERATIONS</u></b></p> <p><b>Capital Cost</b></p> <p style="text-align: center;"><b>Maintenance Burden:</b></p> <p><b>Shallow Wetland</b></p> <p><b>ED Shallow Wetland</b></p> <p><b>Pocket Wetland</b></p> <p><b>Pond/Wetland</b></p> <p><b>Residential Subdivision Use:</b> <i>Yes</i> <b>High-Density/Ultra-Urban:</b> <i>No</i></p> <p><b>Soils:</b> <i>Hydrologic group 'A' and 'B' soils may require liner</i></p> <p style="text-align: center;">Key : L=Low M=Moderate H=High</p>
<b>G</b>	<b>Phosphorus</b>								
<b>G</b>	<b>Nitrogen</b>								
<b>F</b>	<b>Metals</b> - Cadmium, Copper, Lead, and Zinc removal								
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# NYSDEC Design Criteria