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

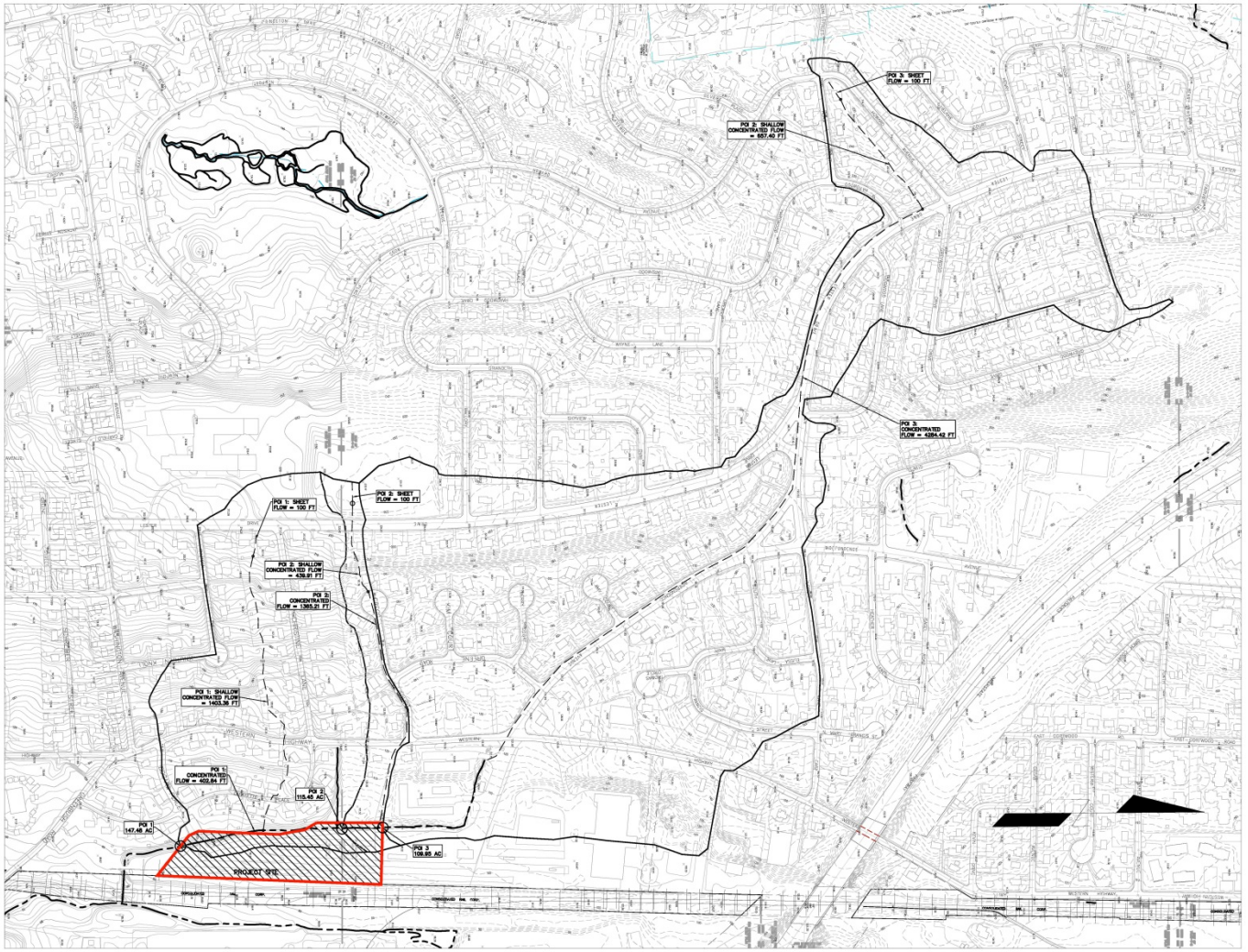
- To provide water quality enhancements on the Sparkill Creek, which is listed as a NYSDEC 303d watercourse.
- These are identified waters “that do not support appropriate uses and require a restoration strategy”
- NYSDEC stream classification of “C”, which indicates a best usage of fishing and fish 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)	7.37	1.46	38.66

POINT OF INTEREST	CONTRIBUTING SUB-AREA	TOTAL CONTRIBUTING AREA (AC)
POI 1	SA 1, SA 2, & SA 3	147.48
POI 2	SA 2, SA 3	115.45
POI 3	SA 3	109.95

REV	DESCRIPTION	BY	DATE

BROOKER ENGINEERING, PLLC
PROFESSIONAL ENGINEERS AND LAND SURVEYORS
LAND DEVELOPMENT - MUNICIPAL - STRUCTURAL - HYDROLOGICAL - SURVEYING
www.BrookerEngineering.com
74 Lafayette Avenue, Suite 501
Suffern, NY 10901
(845) 357-4411
40 N. Central Avenue
Ramsey, NJ 07446
(201) 684-1221

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

TITLE:
DRAINAGE AREA MAP

PROJECT NO:	DRAWN:	CHECKED:
16201	RW	KD

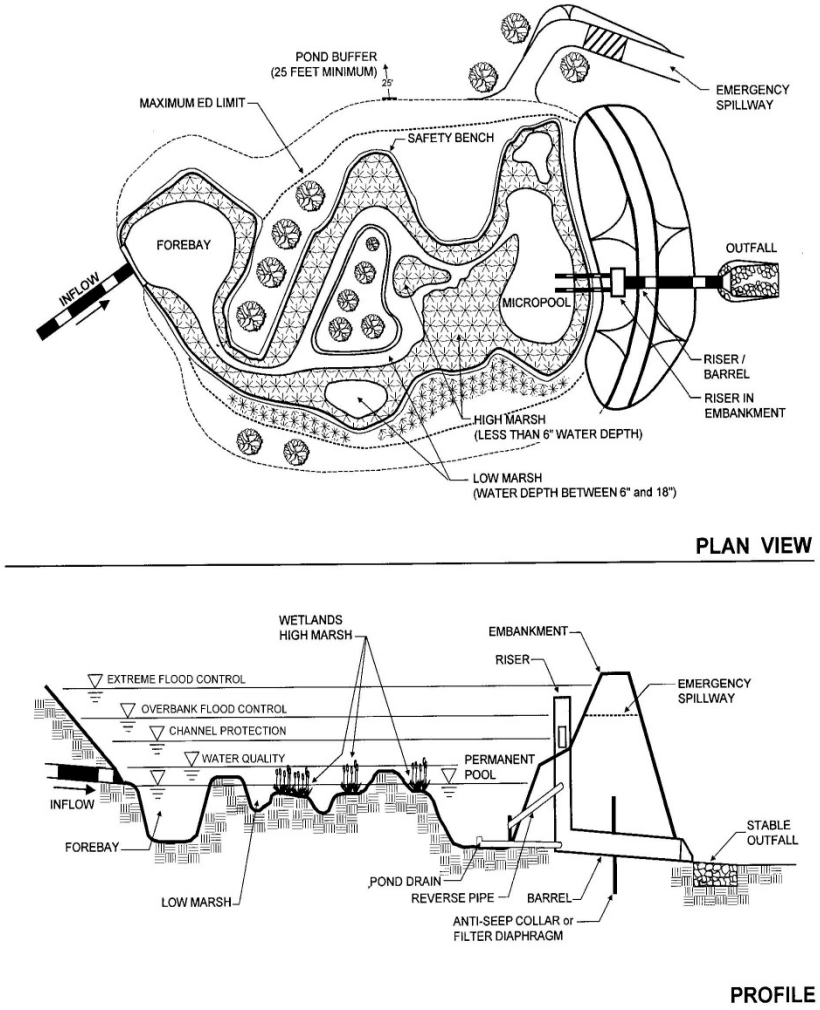
SCALE: 1"=200'

GRAPHIC SCALE:

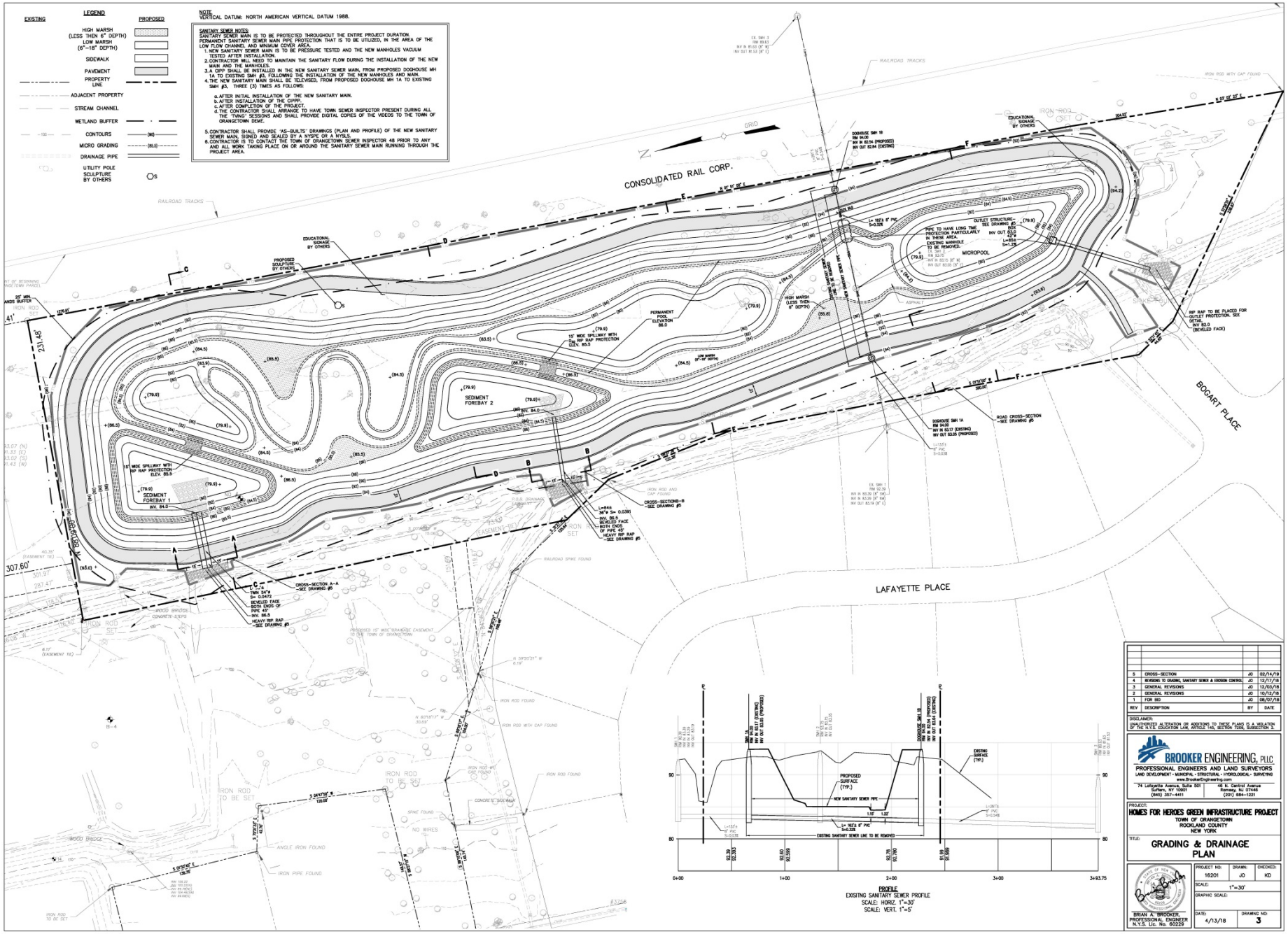
DATE: 1/26/18

DRAWING NO: 1

Figure 6.8 Extended Detention Shallow Wetland (W-2)



NYSDEC Schematic



REV	DESCRIPTION	BY	DATE
5	CROSS-SECTION	JO	02/14/19
4	REVISIONS TO GRADING, SANITARY SEWER & EROSION CONTROL	JO	12/17/18
3	GENERAL REVISIONS	JO	12/03/18
2	GENERAL REVISIONS	JO	10/12/18
1	FOR BID	JO	08/07/18

DISCLAIMER:
UNAUTHORIZED ALTERATION OR ADDITIONS TO THESE PLANS IS A VIOLATION OF THE N.Y.S. EDUCATION LAW, ARTICLE 145, SECTION 7209, SUBSECTION 2.

BROOKER ENGINEERING, PLLC
PROFESSIONAL ENGINEERS AND LAND SURVEYORS
LAND DEVELOPMENT - MUNICIPAL - STRUCTURAL - HYDROLOGICAL - SURVEYING
www.BrookerEngineering.com
74 Lafayette Avenue, Suite 501, Suffern, NY 10901, (845) 357-4411
46 N. Central Avenue, Ramsey, NJ 07446, (201) 684-1221

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

TITLE:
GRADING & DRAINAGE PLAN

BRIAN A. BROOKER
PROFESSIONAL ENGINEER
N.Y.S. Lic. No. 60229

PROJECT NO:	DRAWN:	CHECKED:
16201	JO	KD

SCALE: 1"=30'
GRAPHIC SCALE:
DATE: 4/13/18
DRAWING NO: 3

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

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

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)

KEY CONSIDERATIONS

MUST MEET ALL OF THE REQUIREMENTS OF STORMWATER PONDS.

CONVEYANCE

- Minimum flowpath of 2:1 (length to width)
- Flowpath maximized

TREATMENT

- Micropool at outlet, capturing 10% of the WQ_v
- Minimum surface area to drainage area ratio of 1:100
- ED no greater than 50% of entire WQ_v (permanent pool at least 50% of the volume) 25% of the WQ_v in deepwater zones.
- 35% of the total surface area in depths six inches or less, and 65% shallower than 18"

LANDSCAPING

- Landscaping plan that indicates methods to establish and maintain wetland coverage. Minimum elements include: delineation of pondscaping zones, selection of species, planting plan, and sequence for bed preparation.
- Wetland buffer 25 feet from maximum surface elevation, with 15 foot additional setback for structures.
- Donor plant material must not be from natural wetlands

MAINTENANCE REQUIREMENTS

- Reinforcement plantings after second season if 50% coverage not achieved

POLLUTANT REMOVAL

G	**Phosphorus**
G	**Nitrogen**
F	**Metals** - Cadmium, Copper, Lead, and Zinc removal
G	**Pathogens** - Coliform, Streptococci, E.Coli removal

Key: G=Good **F**=Fair **P**=Poor

STORMWATER MANAGEMENT SUITABILITY

- [X] **Water Quality**
- [X] **Channel Protection**
- [X] **Overbank Flood Protection**
- [X] **Extreme Flood Protection**

Accepts Hotspot Runoff: *Yes*
(2 feet minimum separation distance required to water table)

IMPLEMENTATION CONSIDERATIONS

M **Capital Cost**

Maintenance Burden:

M	Shallow Wetland
M	ED Shallow Wetland
H	Pocket Wetland
M	Pond/Wetland

Residential Subdivision Use: Yes
High-Density/Ultra-Urban: *No*

Soils: *Hydrologic group 'A' and 'B' soils may require liner*

Key : L=Low M=Moderate H=High

NYSDEC Design Criteria