Practical Use & Application of SPW 911 Software for Sheet Pile Design

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Types of Sheet Pile Structures SPW 911 can aid with Design:

- Bulkhead/Retaining Walls
- Sea Walls (maybe)
- Flood Walls/Levee Raisings
- Erosion Protection of Dams/Levees
- Dams/Weirs/Cofferdams
- Security Barrier/Noise Abatement/Eco Barrier
- Detention Ponds
- Shoring & Excavations

National Parks Service
2,000 LF
Vinyl Sheet Pile Bulkhead
Types of Sheet Pile Materials
(anything you can assign material properties)

- Steel
- Reinforced Concrete
- Vinyl
- Fiber reinforced plastic (FRP)
- Timber
- Aluminum

New Smyrna Beach, FL
FRP Sheet Pile Seawall
Exposed to Atlantic Ocean
SPW 911 – Ways to Model Supporting Sheet Pile
Cantilever
Single Beam/Wale Support
Multiple Beam/Wale Supports

National Park Service – Patchogue Ferry Terminal
2,800 LF of Vinyl Sheet Pile
Getting Started
Setup – Imperial or SI Units;
Company Address

Double click on screen
To get “Dialogue Box”
With tabs
Input Project Info

Select from database or enter in fields below.
Input Excavation Height, Water Levels, and Surcharge
Input Soil Strata and Location
Input Wall - Select Sheet Pile

Sheet: PZ27
Pressure: Rankine
Toe: Cantilever

Define:

Sheet Name: PZ27
T = 187.50 in^4/ft
E = 3.04E+07 psi
Stress: 24970.3 psi
Max. Bending Moment: 64506.5 ft-lb/ft
Max. Allowed Deflection: 0.0 in

Penetration:
- Free Earth
- Fixed Earth
- Defined FOS
- Manual

Miscellaneous:
- Upstand: 0.00 ft
- Toe: 27.78 ft
- FOS: 1.3
- K_p: 1.00
- Passive Soil Factors

Rules of thumb
Input Supports – Determine Number and Location
Results:
Side Elevation
Input/Output
Graphs
Table
Stauffer Chemical, Tarpon Springs, FL – 1,500 LF of ESP Vinyl Bulkhead
Various other Design Runs and Imputing Parameters

- Floodwall
- Eco Barrier
- Weir/Dam
- Cofferdam

Destin Harbor Steep Slope

Palm Coast FL Weir
FL DOT - U.S. 27, Tallahassee, FL
Eco-passage (Critter Wall) –
2 miles ESP 4.1 Vinyl
Stauffer Chemical, Tarpon Springs, FL
2,200 LF cut-off of Elemental Phosphorus Cutoff Wall and Cofferdam
1500 LF Detention Pond/Flood Wall

Nautilus Cove, Panama City Beach, FL
Be Careful

- “Garbage in, Garbage out”
- Consider long term effects of material (corrosion, creep, etc.)
- Consider sequence of construction (especially bracing for shoring sequence)
- Only use Terzaghi method for determining bracing loads for excavations
- Default F.S. = 1 for Cantilever (not 2.0 like braced models)
- Synthetic Sheets (vinyl and composite) – excessive deflection usually controls the design
- Understand short term and long term characteristics of soils (especially silts, clays, and organics)
- Clay or silt layers with low cohesion values may provide erroneous results (re input)
- Always consider potential for differential water lag
- Structural requirement determined with SPW 911 should NOT be the only basis for selection of the sheet pile (consider installation and driving conditions)
Thank You