WATERFRONT ACCESS NORTH REDEVELOPMENT CASE STUDY
BURLINGTON VT WATERFRONT

WAN Project Done With
Resource Systems Group (Prime)
And SE Group (Landscape Architects)

Environmental Work Done by the Johnson Company

Engineering Ventures
Paul Boisvert, P.E. - Civil Engineer

Also Includes Moran Project
Freeman French Freeman (Moran Prime)
And SE Group (Landscape Architects)

Environmental Work Done by Waite Environmental

Project Area 2013 (Pre-Construction)

- Flat Site (1% typical)
- Elevation constrained to West, South, and East
- Class 3 wetland to North
- Groundwater 3’-5’ below grade, based on monitoring, seasonally variable
- PAH, Arsenic, some petroleum contamination
- Silty sands, fill soils
A Little Bit of Waterfront History

Moran Project
Late 2011

- Project team led by Freeman French Freeman Architects
- Concurrent and interrelated to WAN project
Waterfront Access North (WAN) Project, Late 2011

- Project team led by Resource Systems Group (RSG)
- Concurrent and interrelated to Moran project
- Electrical undergrounding dependent on VELCO gorge project
- Elements of Moran project brought into WAN

Stormwater Permit Thresholds

- Permit requirements triggered by:
  - Creation of 2.09 AC of new impervious surface (1 AC threshold)
  - Redevelopment of 1.40 AC of impervious surface (1 AC threshold)
- Removal of 0.86 AC of existing impervious
- Net increase: 1.23 AC
- Using final site configuration for following slides (varies from originally permitted plan)
Redevelopment requirements met by removal of greater than 20% (0.86 AC removed > 20% of 1.40 AC)

Treatment requirements for new impervious areas exceeded by use of:
- Two gravel wetland systems
- Two stormwater treatment swales

Recharge not required for fill and/or contaminated soils but could be met by treatment swales

Not required due to size of receiving water

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Stormwater Approach

- Site balancing approach to focus treatment of vehicle areas rather than new pedestrian area (individual permit required)
- Gravel wetland treatment for most road areas
  - Exceeded 80% sediment removal and 40% phosphorous removal targets
  - Currently approved at “Tier 2”
  - Requires only 3” to 6” of drop between inlet and outlet
  - Lined due to shallow groundwater
- Sheet flow and treatment swales to treat skatepark and sailing center runoff
  - Avoids drainage grates in and around skatepark
  - Reduces elevation loss in tanks and catch basins
  - Met 2002 treatment standards

North Gravel Wetland

Features:
- Two cells for sequential treatment
- Treatment area surface 3,460sf
- Surface area > ¼% of contributing drainage area, but sized to match UNH test site area ratio
- Approved for 2.48 AC area with 1.66 AC impervious
- 10% WQv in pretreatment
- 24 hour detention of WQv based on center of mass or minimum 1” orifice
- Horizontal flow
South Gravel Wetland

Features:
• Horizontal flow in long direction
• Surface area > ¼% of contributing drainage area, but sized to match UNH test site area ratio
• Approved for AC area with AC impervious
• 10% WQv in pretreatment
• 24 hour detention of WQv based on center of mass or minimum 1” orifice

South Water Quality Swale

• Flow-based practices, designed for 10 minute minimum residence time when modeled with a modified NRCS curve number
Some Challenges

- Started construction with location of water mains unconfirmed

Parties Involved

- City of Burlington: CEDO, Public Works, Parks, Planning and Zoning, Burlington Electric, Burlington Telecom, Mayor’s office
- State of Vermont: VTRANS, Agency of Natural Resources, Public Service Board (VELCO work)
- Federal: Army Corps, Federal Highway
- Vermont Railways
- Comcast, Fairpoint, VELCO
- Contractors: SD Ireland, Artisan, Engineers Construction
- 43 People listed on Meeting Minutes CC list during construction
- More at the ribbon cutting
VELCO Gorge Project

- Public Service Board approval needed for VELCO Gorge project – needed to allow undergrounding
- Potential schedule killer

Soil Management

- CAP divided site into soil management zones
- Soil cut & fill estimates were generated for trenching and overall
- Bid plans anticipated 8,000 CY of waste soil
- City snow storage area was tested and used for excess cut
- Looked for ways to encourage soil reuse within the contract
- Included special provisions (specifications) specific to soils:
  - Poly-encapsulation
  - Stockpile management
Soil Management

- City snow storage area was tested and used for excess cut
- CAP required indicator fabric and 6” of “clean” material or hardscape over full project area, including Flying A site (to right)
- Topsoil depth increased to 6” to satisfy CAP isolation requirements

Coal Tunnel

- Partially demolished, then filled with flowable fill
- BUT only after photo documenting since this is a historic feature
- Contractor required to provide a 4 hour window to archeology consultant to document after removing water
Dewatering

a) Dewatering: Water removed from excavations shall be handled in one of the following ways, depending on location and field evaluation by the Environmental Project Manager (EPM):
   i. Areas of known contamination: Pumped through a 25 micron bag filter, into a fixed axle 21,000 gallon frac tank. Tank to be parked in the fenced yard east of the Moran Plant.
   ii. Presumed contaminated: Pumped through a 25 micron bag filter, into a fixed axle 21,000 gallon frac tank. Tank to be parked in the fenced yard east of the Moran Plant.
   iii. Presumed clean: Pumped through a 25 micron bag filter into one of three infiltration areas noted on the plans.

b) Frac tanks to be pumped to the Municipal wastewater system following 24 hour settling period

Completed Gravel Wetlands – Following Rain, May of 2016

North Gravel Wetland  South Gravel Wetland
Finished Project from Google Earth

Well, not quite finished
• Marina construction underway in photo
• Moran project still under design

Some Lessons Learned About Brownfield Redevelopment

• These projects take time: started in 2008, WAN finished 2015-2016
• Account for soil testing delays
• Dewatering can be complicated
• Excavation will find the unexpected: fuel lines, old Asbestos Concrete catch basins, etc.
• Need good contractors
• Each one is an opportunity to replace an underutilized property with something better