Stormwater Basins and Aesthetics – Not a Contradiction!

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Nashua, New Hampshire – Introduction

- Southern New Hampshire
  - Population 86,000(+)
  - Sewer Service Population 100,000
- January Average Low Temp. = 12° F
- 270 miles gravity sewer (~25% of area has combined sewers)
As of 1997, experienced as many as 197 CSO discharges annually.

1997: Global assessment of alternatives; study used to select most cost-effective approach; accepted by state.

1999: City made policy decision to institute an integrated infrastructure program - Administrative Order issued

2000-2003: New City administration re-assessed this policy & reviewed available alternatives.
Stormwater Management in Nashua - Going Forward

- Approach will feature combination of elements identified in study - storage, treatment, and limited separation

- Implementing localized separation, storage, and/or treatment as necessary

- Anniversary Park Stormwater Detention Basin – First Implementation of This Approach!
How This Project Evolved

- Summer 2001 Flood Strikes Nashua!
- Sargents Avenue Area Flooded
- CDM Already Designing Sewer Separation Throughout Nashua
- Cost-Effective, Sensible Solution Needed!
Project Area Characteristics

- 31-Acre Suburban Neighborhood
- Undersized / Overloaded Combined Sewer
- Flat Terrain
- Nashua River 2 Miles Away
Remedies to Flooding - Alternatives

- Separate Sewers to River
- Infiltration
- In-Line Storage
- Basin Detention
Selected Remedy

- Detention Basin with Local Sewer Separation
- Detain & Restrict Flow
- Shave Peak, Bleed Back
- Achieve Some Treatment

- Re-Build Infrastructure
Implementing the Solution

- $2.4M Construction Bid; 12-months to Substantial Completion
- 2-Cell Detention Basin & Stormwater Treatment Unit Upstream of Basin
- Under-used Piece of Property Revitalized!
- How to Make It All Look Good?
Poorly Utilized Land Creates a “Wet Meadow”
Typical Basin
The Ugly, and Unusable, Hole in the Ground
Keep Out...again
Know the Subsurface Conditions
After seeding

Years later
Other Uses
Golf Course Water Hazard
Irrigation Source
Create a “Passive Recreational Park”
A Featureless Site
Alternative #1 – Single Cell Basin
Alternative #2 – Double Cell Basin
Final Concept and Plan – Double Cell Basin
Path Placement
Know the Site Users
Basin Overflow/Spillway Area
Stone Arched Culvert
Exposed portions of wingwalls, outside face of headwall, and all exposed sides of hand
height wall shall be covered with 6-in thick, rounded field stone masonry veneer, bonded
to backup walls with mortar. Non-corrosive, corrugated ties or anchors in dovetail slots
shall be furnished and installed onto backup walls per precast concrete manufacturer’s
recommendations. Length and width face sizes of natural stone shall range from 6-in min
to 18-in max in any dimension. Use larger stones and extra ties at corners. Protect stone
from staining by using non-staining cement mortar. Lay up stones in a random rubble
pattern, i.e. no apparent coursing, with bed joints approximately horizontal for
stability and appearance. Keep pointing at back of face to emphasize natural shape of
stones, with face pointing of mortar 1/4-in minimum and 1 1/4-in. maximum.

NOTE:

APPROXIMATE PATTERN OF MORTARED
RANDOM STONE RUBBLE TEXTURE
VENEER TO ALL EXPOSED SURFACES
New Park Features
Handicap Access
Stones in Channel

Upper Basin Inlet Area

Lower Basin Outlet Area
Wildlife Habitat
Stonework
Native Vegetation
Plants in Naturalized Groupings
“Showcase of Nature”
Multi-Discipline Design