11-4-2003

Stormwater Basins and Aesthetics – Not a Contradiction!

Amy Prouty Gill
City of Nashua

Alan G. LeBlanc
CDM

John Z. Olcott Jr.
CDM

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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)

Looking Ahead – EPA's Final NPDES Phase II Stormwater Rule

- 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

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

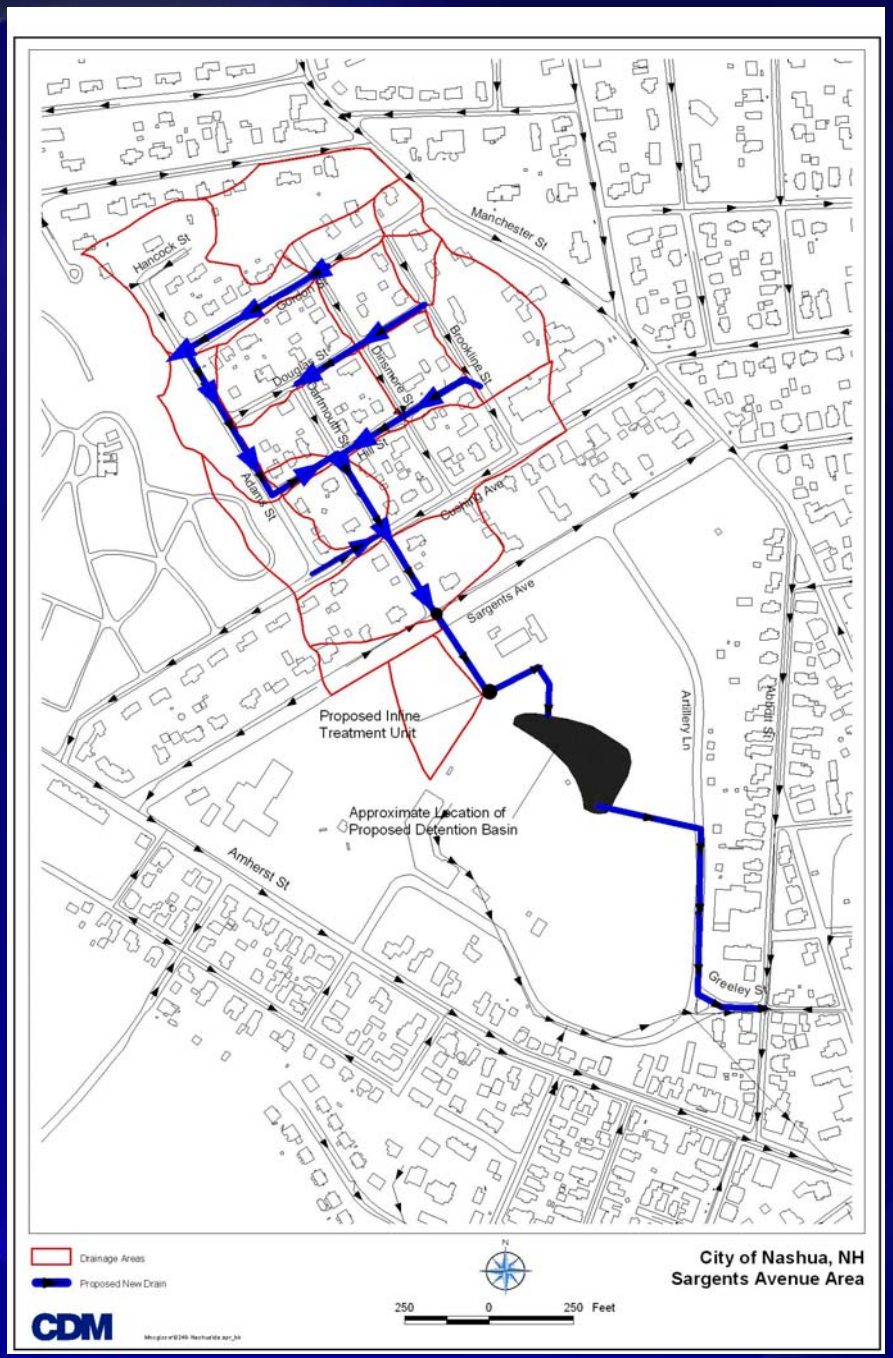
- Implementing localized separation, storage, and/or treatment as necessary

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

United States Environmental Protection Agency | Office of Water Washington, D.C. | EPA 832-F-99-018 September 1999

EPA

Storm Water Technology Fact Sheet

Infiltration Drainfields

Selected Remedy

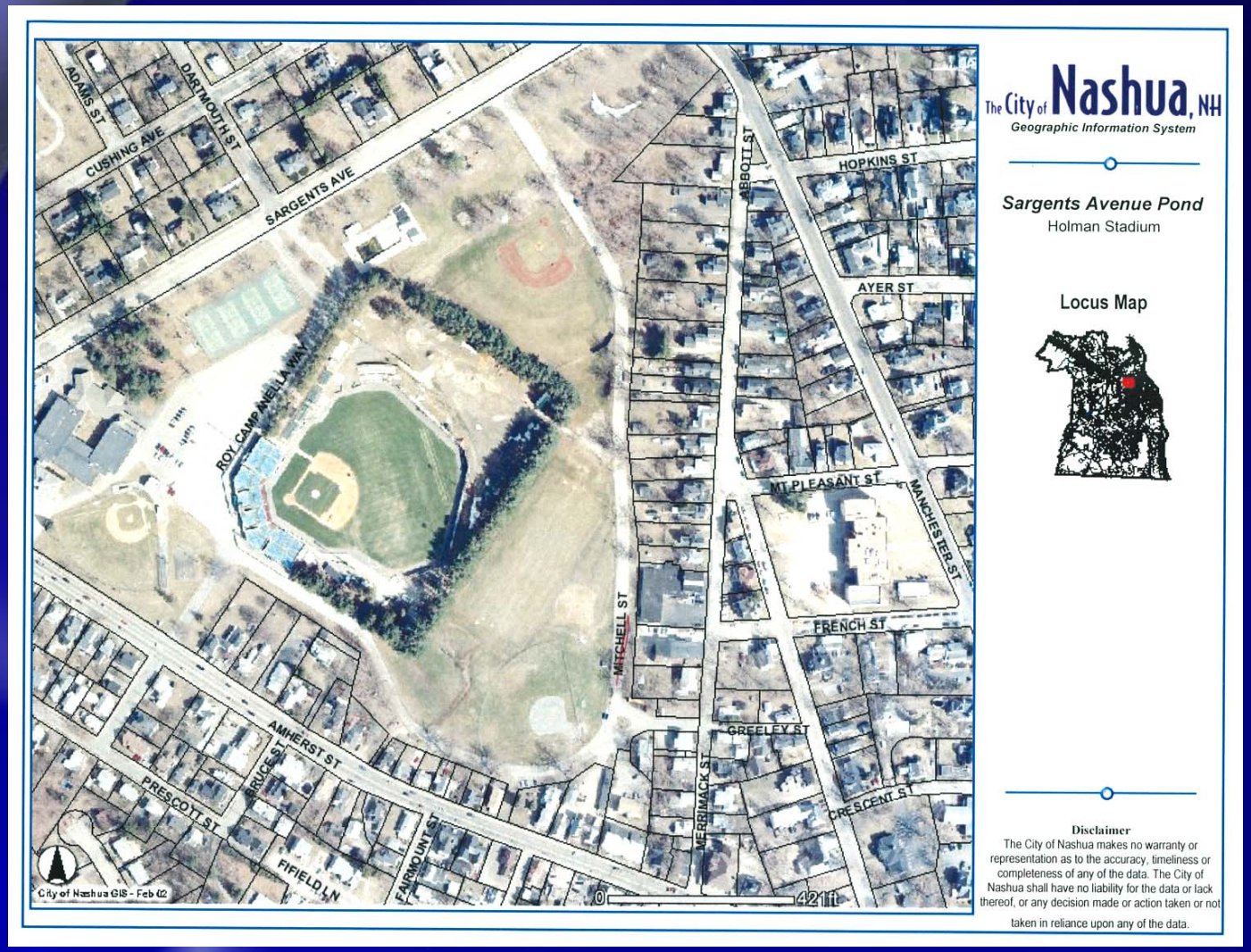
- Detention Basin with Local Sewer Separation
- Detain & Restrict Flow
- Shave Peak, Bleed Back
- Achieve Some Treatment

- 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

Keep Out…again

Know the Subsurface Conditions

After seeding

Years later

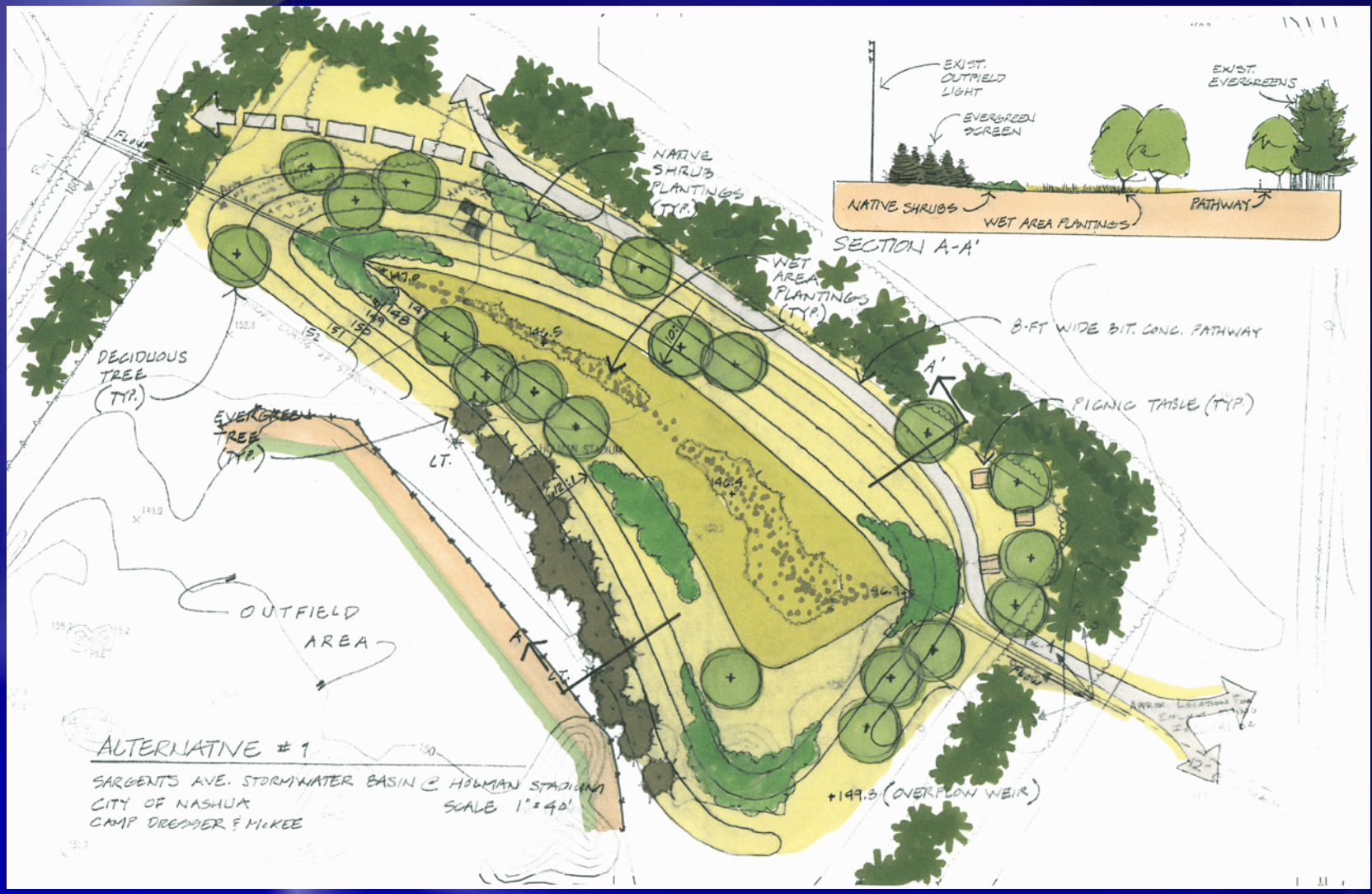
Other Uses

Golf Course Water Hazard Irrigation Source

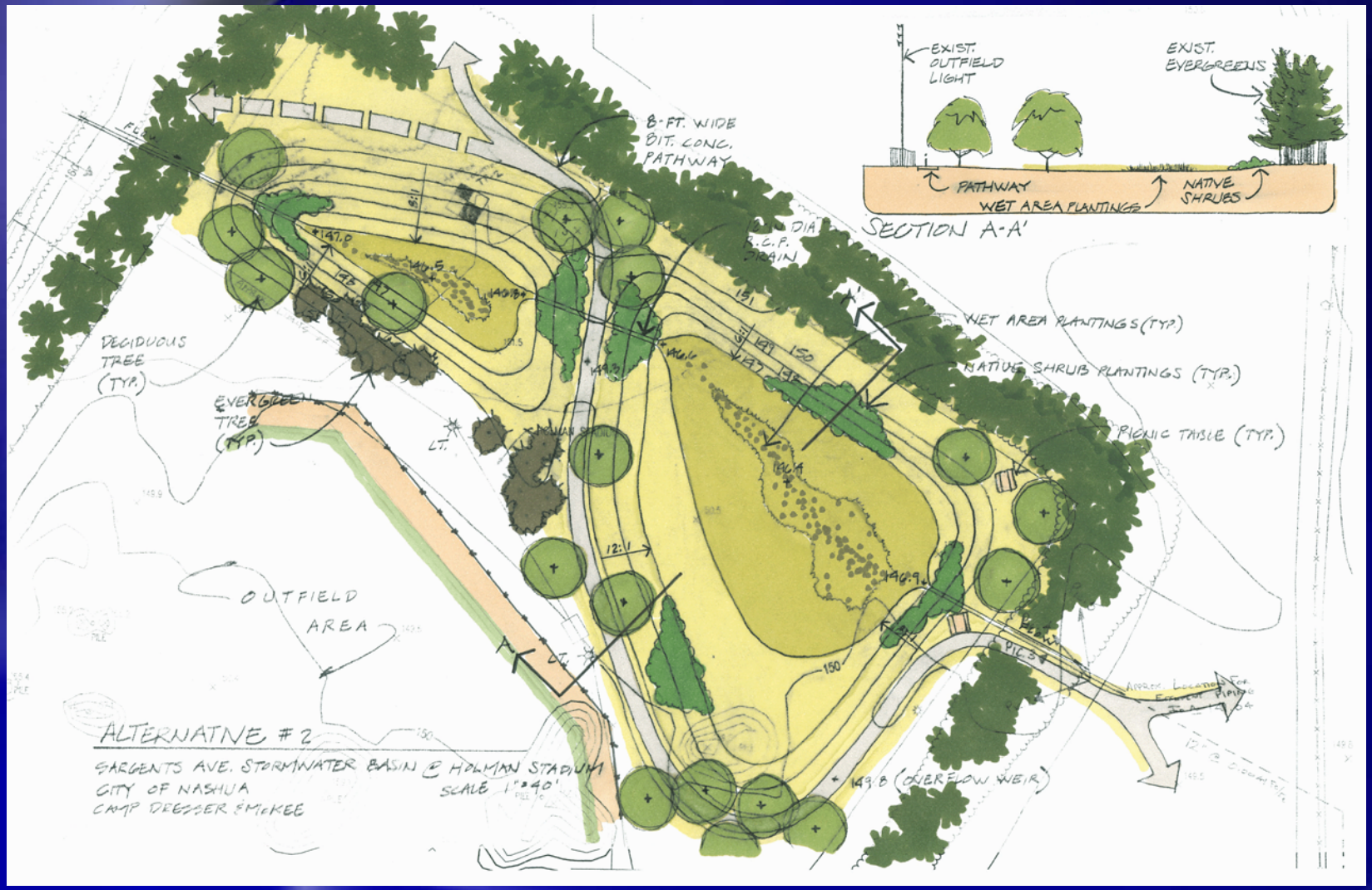
Create a "Passive Recreational Park"

A Featureless Site

Alternative #1 – Single Cell Basin



Alternative #2 – Double Cell Basin



Final Concept and Plan – Double Cell Basin

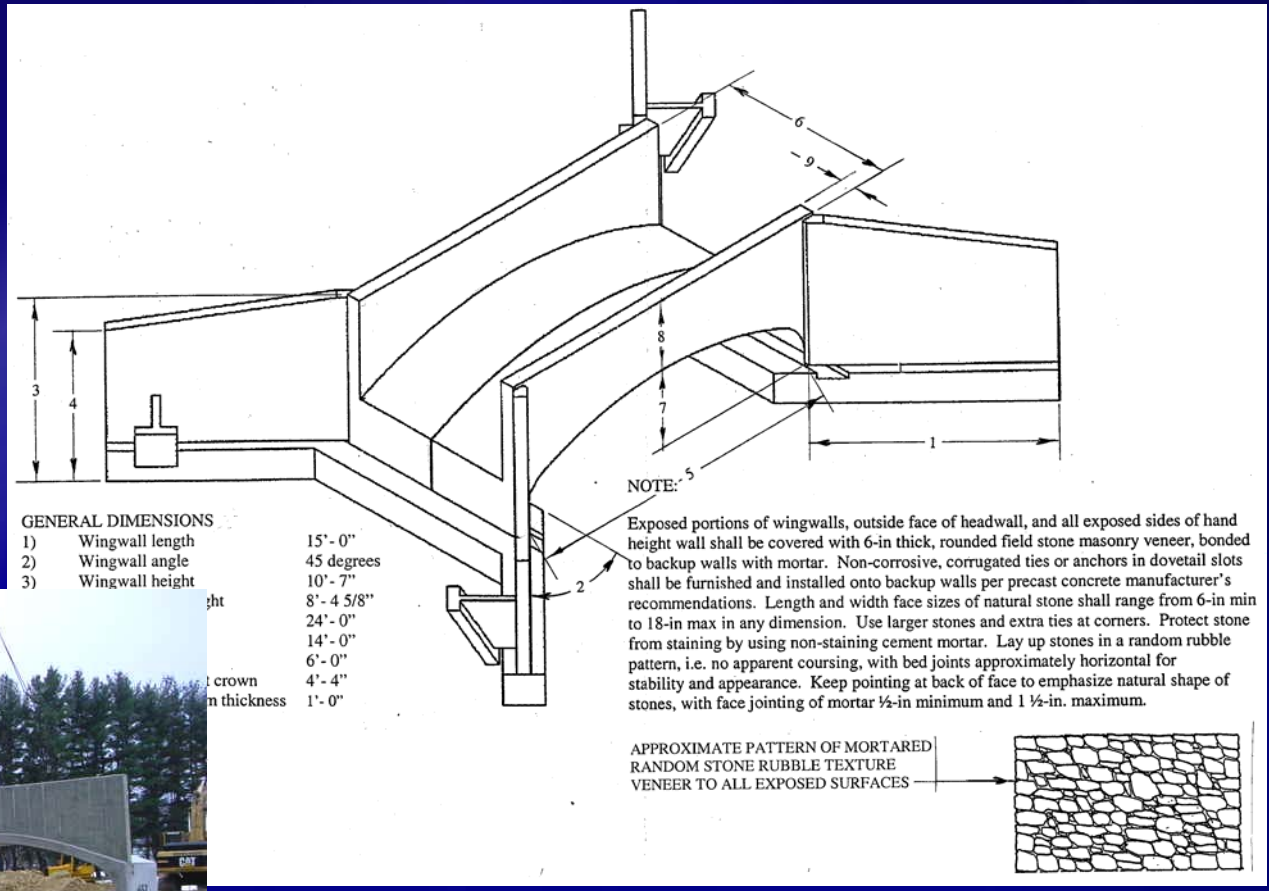
Path Placement

Know the Site Users

Basin Overflow/Spillway Area

Stone Arched Culvert

Precast Concrete Structure



GENERAL DIMENSIONS

1)	Wingwall length	15'- 0"
2)	Wingwall angle	45 degrees
3)	Wingwall height	10'- 7"
	ght	8'- 4 5/8"
		24'- 0"
		14'- 0"
		6'- 0"
	l crown	4'- 4"
	n thickness	1'- 0"

NOTE:

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 jointing of mortar ½-in minimum and 1 ½-in. maximum.

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

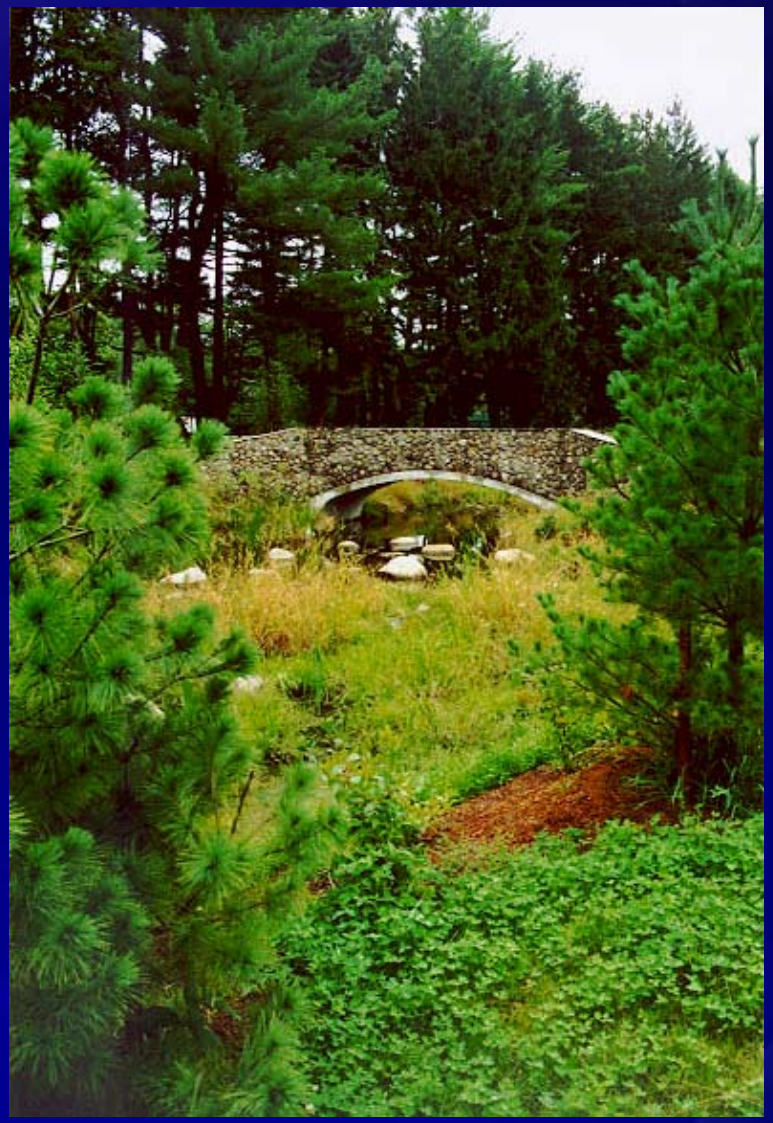
Wildlife Habitat

Stonework

Native Vegetation

Plants in Naturalized Groupings

“Showcase of Nature”



Multi-Discipline Design

Dedication