Main Avenue Green Infrastructure Project (Clinton, Iowa)

March 2, 2015
CLINTON, IOWA
Mississippi River Management

- As outlined in the Economic Profile of the Upper Mississippi River Region, March 1999, “the Mississippi River is critical to our economic well being. Individuals and businesses have come to rely on the river for transportation, water, food, recreation, and a variety of other goods and services. As a result, the regional economies surrounding the river, as well as the national economy, benefit from careful conservation and management of the Mississippi.” As such, the proposed Project is consistent with efforts to mitigate annual pollutant loads to this indispensable river.
Clinton Iowa Brief Sewer History

- Original Clinton & Lyons were built as Combined Sewer Towns

- Even after Original Treatment Plant, Clinton was discharging waste virtually every time it rained.

- New Treatment Plant was built with additional necessary capacity, new equipment, & nutrient removal technology.

- Even now, Clinton is discharging waste virtually every time it rains over ¼ inch at 6 CSO locations.

- One of these locations is at 25th Avenue North & Main Avenue
$75 MILLION CONSENT ORDER
WITH STATE OF IOWA

• 25th Avenue North Pumping Station Project (SRF Funded)
  - 2013-2014 Construction
  - $6 Million Project
  - Sized for 5 year storm event

• Main Avenue Sewer Separation Project
  - 2015 Construction
  - $2 Million Project
  - Separate Main Avenue & 25th Ave N
  - Implement Green Infrastructure to treat Water Quality Volume, &
    achieve 5 year sizing criteria.
25th Avenue N Drainage Basin
Main Avenue Combined Sewer Basin

- Old Combined Sewers between Turtle Creek Levee & Main Avenue (Outlet to Mississippi)
  - Currently up to 40 CSO per year at River
  - City intends to drop to 0-6 per year
  - City intends to Improve Water Quality during smaller Storm Events

- How will we achieve this?
  - Larger Storm Water Pump Station
  - Larger Sanitary Pump Station
  - Sewer Separation of Basin
  - Green Infrastructure Implementation
Main Avenue Downtown
DNR Sponsored Project Program

- Green Infrastructure Project for Water Quality in conjunction with existing SRF Loan Project
Main Avenue Drainage Basin
Project Description

Construct Sewer Separation & Streetscape Project Using Green Infrastructure instead of Grey Infrastructure While Treating Water Quality Volume

Green Infrastructure

- Permeable Paver Parking along Main Avenue
- Five Green Alleys with Permeable Pavers
- Bio-Retention Cells
- Silva Cells / Permeable Sidewalks / Trees
- Soil Quality Restoration
Project Area Map
BMP Components

The Iowa Stormwater Management Manual provides water quality results for a parking lot completed on the Iowa State University campus in 2006. Table below shows pollutant removal rates for suspended solids, phosphorous, bacteriological contaminants, nitrogen, heavy metals, and hydrocarbons.
Silva Cells

- Permeable blocks
- 12" filter aggregate
- Geotextile, 18" min overlap past excavation
- 1" air space between Silva cell deck and planting soil
- Inspection riser
- Existing walk paving
- Screw cell decks to frames after snapping in place (typ)
- Geogrid, 4' x 6' min below backfill at base, overlap 12" min at top of cells
- 3/16" x 14" zip ties, attaching geogrid to Silva cells at each level and at cell deck
- Backfill installed in 8' lifts, w/in 4'-6" from top of decks, compacted to 95%
- Anchor each Silva cell to ground w/4) 10" spikes, see cell base for spike holder
- Silva cell base slope to max 5%
- Silva cell planting soil installed in 8' lifts (2 lifts per cell; 90% sand, 10% compost and 40% native soil
- Perforated sub-drain to run length of planter; see detail 6/0000501
- Concrete curb
- Permeable blocks at parking
- Aggregate drainage
- Deeproot UB16-2 root barrier
- Tree root package, size varies
- Backfill, tamped to max 85% compaction below root package
- 4" aggregate subbase, compacted to 95%
- Geotextile on compacted subgrade
- Subgrade below geotextile and aggregate base course, compacted to 95%
- 2" mulch above tree pit
- Inspection riser
- 6" below grade concrete curb positioned over cell posts, attached to street curb
- 4' opening
Bio Retention Cells

Diagram showing a cross-section of a bio retention cell, including layers such as erosion control blanket, modified soil mix, and storage aggregate.
Permeable Pavers/Green Alleys
Construction of Green Alleys
Construction of Green Alleys
Construction of Green Alleys
Main Avenue Project Benefits

Measurable Benefits of the Sponsored Project

• Drain Portion of Smaller Storms into Underlying Soils (Project Area)
• Lower Amount of Combined Sewer Overflows at Outfall into Mississippi
• Improve Water Quality at Storm Outfall by Treating Water Quality Volume
• Limit Number of CSO using Green instead of Gray Infrastructure

Monetary Benefits of the Sponsored Project

• Allow Smaller Storm Water Pump Station for 2013 Project
• Allow Future 5 year Storm Sewer Sizing instead of 10
• Project is financed with no increased cost to City of Clinton

Ancillary Benefits

• Provide Lyons & Main Avenue with a Streetscape Project
• Fulfill Separation Requirement of Consent Order