Bank Stabilization, Flood Reduction and Water Quality Improvement Design Build Project

ASFPM 2017
Presenter: Ajay Jain, PE, CFM, Practice Leader
PROJECT LOCATION / CURRENT REGULATORY MAP

ZONE AE
ZONE A
PORTION OF STREAM BURIED
LAKE MARIAN ROAD
ILLINOIS ROUTE 25
FOX RIVER
MAPLE AVENUE
SPRING ST.
FLOODPLAIN LIMITS PER DETAILED STUDY
EXISTING CHANNEL CONDITIONS
EXISTING CHANNEL CONDITIONS
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SUMMARY OF FINDINGS / FUNDING OPPORTUNITIES

PRELIMINARY SOLUTIONS IDENTIFIED
- Upsize Culverts
- Increase channel capacity/stabilize banks
- Achieved the desired objective of FLOOD REDUCTION.
- $Approx. $2.8M IN TOTAL COSTS, FUNDING WAS AN ISSUE!

CREATIVE FUNDING OPPORTUNITIES
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- Maple Avenue culvert replacement included with funded road project ($0.6M)
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PROJECT LOCATION

SPRING ST.

MAPLE AVENUE

FOX RIVER

SPRING ST.

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CREATIVE FUNDING OPPORTUNITIES
- Maple Avenue culvert replacement included with funded road project ($0.6M)
- Existing TIF District expanded to include 2 other culvert rep. ($1.1M±)
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CREATIVE FUNDING OPPORTUNITIES

- Maple Avenue culvert replacement included with funded road project ($\$0.6M$)
- Existing TIF District expanded to include 2 other culvert rep. ($\$1.1M\pm$)
- Jelkes Creek Fox River Watershed Plan Approved by IEPA
- Portions of stream identified as critical areas for water quality
- Revised design to meet funding requirements/proposed as DESIGN-BUILD
PROPOSED CONDITIONS DESIGN / CONSTRUCTION

EXISTING CHANNEL

PROPOSED CHANNEL
PROPOSED CONDITIONS DESIGN / CONSTRUCTION
Two-Stage Channel in Tight Corridor Locations

BEGIN CARPENTERS CREEK MAIN CHANNEL IMPROVEMENTS
STA. 100+80±

PROPERTY LINE FOR ADJACENT BUSINESS

BROOK ST
TWO-STAGE CHANNEL SECTION

SEEDING (IDOT CLASS 2A) (TO LIMITS OF RESTORATION (TYP.)

SEE SEEDING (IDOT CLASS 1) (TO LIMITS OF RESTORATION (TYP.)

SEE LANDSCAPE RESTORATION MESIC PRAIRIE

N.A.G. S75 BN EROSION CONTROL BLANKET

WET PRAIRIE PLUGS
   (2 ROWS TYP 3' O.C. TRIANGULAR WITH WET PRAIRIE PLANTINGS

N.A.G. SC-150 BN EROSION CONTROL BLANKET

EROSION CONTROL BLANKET TO BE KEPT IN (TYP.)

6.0' BOTTOM OF CHANNEL

PLANTING LEGEND

RAIN GARDEN PLUGS
WET PRAIRIE PLUGS
WET PRAIRIE SEED
EMERGENT PLUGS & SEED
SHOWY MESIC PRAIRIE
MESIC PRAIRIE
PROP. SEEDING (SEE PLANTING TYPICAL SECTION FOR CLASS)
N.A.G. SC-150 BN EROSION CONTROL BLANKET
N.A.G. S75 BN EROSION CONTROL BLANKET
TOP SOIL
NATIVE SOIL

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- Applied for and secured Section 319 funding ($1.14M with 60/40 split)
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- Applied for and secured Section 319 funding ($1.14M with 60/40 split)
- Developer fee in lieu contributions ($380,000±) used for 40% local match
- Trucking and some other work items completed by Village for in-kind match
- Village worked with private landowners to donate land, etc.
SECTION 319 GRANT Reporting Requirements

- Preliminary/Final Design Forms/Plans need to be submitted to IEPA
- Prepare and submit BMP forms consistent with the grant application
- Need to submit copies of permits and landowner agreements
- Need a minimum of 10-year Operation and Maintenance Plan
- Need to provide interpretive signage/educational signs
- Prepare and submit a draft and final project evaluation report
- Prepare and submit for reimbursements as costs are incurred and consistent with the Project Costs Summary Form
Earthwork and Construction
Earthwork and Construction
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Earthwork and Construction
Erosion Control
Carpenter Creek Stream Restoration Project - Fox River Watershed

Restoration with Native Plant Species

Native plants provide a variety of ecological functions for stream improvement, not the least of which is improved water quality. Deep rooted native plants reduce erosion from streambanks and the deep roots help absorb stormwater runoff and pollution from directly entering the stream. Native plants also provide excellent wildlife habitat. They require minimal maintenance and do not require fertilizer which is important because fertilizer runoff is a major reason for poor water quality in the stream.

In contrast, shallow-rooted lawn grass (such as Kentucky bluegrass, far left) offers very little erosion control, water infiltration, sediment removal or wildlife habitat. Plus, much of the fertilizer applied to lawn grass runs off into the stream.

Grant No.: C995200014
For more information, contact Illinois EPA at (217)782-3362
FAA Number: 3191407
Restoration
BMP SUMMARY

- 7,973 linear feet of bank stabilization
- 8 meanders and a two-stage channel
- 5 vane weir grade control structures
- 8 pool and riffle sections
- 8 wetland basins totaling 1.4 acres of wetland
- 8 rain gardens in Carpenter Park
- 1 acre of riparian buffer strip in Carpenter Park

Pollutant reduction:

- Sediment: 499 TONS/year
- Total Suspended Solids (TSS): 192,383 lbs/year
- Phosphorus: 612 lbs/year
- Nitrogen: 1,607 lbs/year
**PROJECT OUTCOME**

- **Win-Win** (Achieved flood protection and water quality benefits)
- Approx. 40 parcels out of floodplain after project.
- Secured $1.14M in Section 319 Grant (Village share - $507,724)
- $380,000 in developer fee in lieu money to offset local match.
- Maple Avenue culvert replaced and funded through STP money.
- Other culvert improvements included as part of TIF improvement.
- Letter of Map Revision Submitted to FEMA and IDNR-OWR
- *First design-build project for the Village.*
- **Village Costs for the Project were less than $200,000**
- Received IAFSM Sustainable Project of the Year Award.
QUESTIONS
FROM THE AUDIENCE
Ask away…

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