TWO-STAGE CHANNEL
DESIGN & IMPLEMENTATION

PRESENTED BY: STEVE ROZNOWSKI, P.E.
SPICER GROUP

MWEA WATERSHED SUMMIT – MARCH 25, 2015
OVERVIEW

• BASICS OF 2-STAGE CHANNELS
• BENEFITS
• IMPLEMENTATION
• KEY CONSIDERATIONS
• PROJECT HIGHLIGHTS
• FUNDING
WHAT IS A TWO-STAGE CHANNEL?
BENEFITS

- INCREASED VELOCITY DURING LOW FLOW
  - DECREASED SEDIMENTATION & MAINTENANCE
- DECREASED VELOCITY DURING HIGH FLOWS
  - REDUCED EROSION & MAINTENANCE
- IMPROVED AESTHETICS
- NATURAL POLLUTION REMOVAL
- IMPROVED HABITAT
- INCREASED FLOOD STORAGE
WHERE SHOULD I CONSIDER A TWO-STAGE CHANNEL?

- ADEQUATE GRADE
- CONSISTENT BASE FLOW
- ADEQUATE SPACE
- PUBLIC BUY-IN
- STREAM MITIGATION
KEYS TO SUCCESSFUL IMPLEMENTATION

• EVALUATION OF EXISTING STABLE STREAM
• DETAILED DESIGN OF BANK STABILIZATION
• DETAILED EVALUATION OF GRADE STABILITY
• CAREFUL CONSIDERATION OF VEGETATION
• CAPABLE CONTRACTOR
  • EXCAVATION
  • RESTORATION
SPECIAL DESIGN FEATURES

• GRADE STABILITY
  • CROSS-VANES
  • RIFFLES

• BANK STABILITY
  • RIPRAP
  • TURF REINFORCEMENT

• SINUOSITY
  • HIGH FLOW & LOW FLOW

• VEGETATION TYPES
  • HIGH FLOW
  • LOW FLOW

• MAINTENANCE
  • MOWING
  • BURNING
PROJECT HIGHLIGHTS – TRAVER CREEK DRAIN

• WASHTENAW COUNTY WATER RESOURCES COMMISSIONER
• CITY OF ANN ARBOR
• LESLIE PARK GOLF COURSE
• MDEQ
• LJ CONSTRUCTION
• ANDERSON FISCHER & ASSOCIATES
TRAVER CREEK DRAIN
WASHTENAW COUNTY

- 3,300 FEET OF CHANNEL
- 6.5 ACRES OF WETLANDS CREATED
- 10+ ACRES OF NATIVE AREA RESTORATION
- 79 TREES PLANTED
- 347 SHRUBS PLANTED
- 30,000 CUBIC YARDS OF EARTH MOVED
- 50+ SPECIES OF WILDFLOWERS PLANTED
- AQUATIC HABITAT STRUCTURES INSTALLED
TRAVER CREEK DRAIN – FLOODPLAIN CREATION
TRAVER CREEK DRAIN – WETLAND PLANTINGS

• EMERGENT/SUBMERGENT
• LOW GROWING
• SEDGE MEADOW
• WET MEADOW/FLOODPLAIN
• NATIVE PARAIRIE
TRAVER CREEK DRAIN – MEANDERING CHANNEL
TRAVER CREEK DRAIN – GRADE STABILIZATION
TRAVER CREEK DRAIN – BANK STABILIZATION
TAKEAWAYS

• TWO-STAGE CHANNELS HAVE MANY BENEFITS
• REQUIRE SPECIAL SITE CHARACTERISTICS
• DESIGN MUST CAREFULLY CONSIDER INTERACTION OF VARIOUS COMPONENTS
• WORKS WELL IN CORRECT APPLICATIONS
• NOT SUITED FOR ALL SITES
FUNDING SOURCES

- MDEQ GRANT PROGRAMS
  - STATE REVOLVING FUND (SRF)
  - STORMWATER ASSET MANAGEMENT AND WASTEWATER (SAW)
  - STRATEGIC WATER QUALITY INITIATIVES FUND (SWQIF)
- DRAIN COMMISSIONER PROJECTS
- PRIVATE DEVELOPMENT