



RICELAND WETLAND RESTORATION PROJECT

A Multi-Purpose Wetland Restoration Project – Freeborn Co.




RICELAND WETLAND RESTORATION PROJECT

- Completed in Partnership With:
 - BWSR
 - FSA
 - NRCS
 - SWCD
 - Turtle Creek Watershed District



RICELAND WETLAND RESTORATION PROJECT

- Land enrolled under the SE Conservation Reserve Enhancement Program (CREP)
- 5 perpetual conservation easements secured by the state of MN (BWSR)
- 309 acres of land



RICELAND WETLAND RESTORATION PROJECT

- Identified as a High Priority Restoration Site for Flood Control by the WD

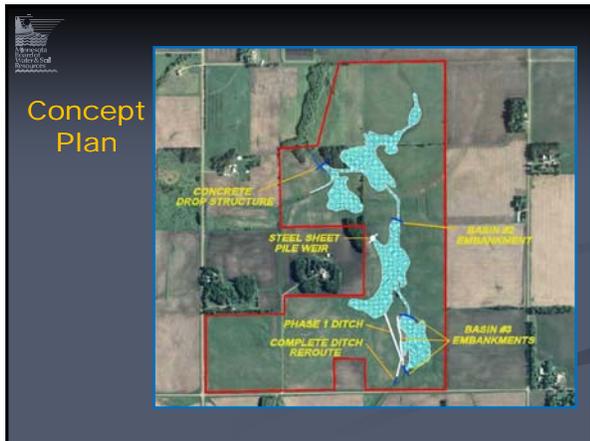
Design Challenge: Integrate a Flood Control Project (part of the CREP) into a Functional Wetland Restoration



RICELAND WETLAND RESTORATION PROJECT

- 2,060 acre Drainage Area
- 157 Acres of Wetland Restored (3 Main Pools)
- 2 Primary Outlet Structures
- 100 yr – 24 Storm
 - 304 acre-ft of Detention Storage
 - 58 Percent Reduction in Peak Flows (718 cfs to 304 cfs)





Minnesota
Water Control
District

- > 95 Tile Blocks Constructed
- > 6,270 feet of Ditch Abandoned
- > 66,000 feet of Tile Abandoned

Minnesota
Water Control
District

- > 12 Tile Outlets Installed

PHASE 2
(2010)

- > Completed Ditch Re-alignment

- > Constructed Two Large Dams (Ditch Plugs) w/rat fence

PHASE 2
(2010)



CONCRETE OUTLET STRUCTURE

- NRCS Type C Spillway
NEH Section 11 – Drop Spillways
- Foundation Investigation
 - Iowa NRCS drill rig
 - Borings
 - Dutch Cone
 - Sited structure on the LDS flood plain due to soft materials on the RDS side.

CONCRETE OUTLET STRUCTURE

- Analyzed Global Stability of structure and seepage.
- Concrete Design based on NRCS TR-67, Reinforced Concrete Strength Design.
 - More conservative than ACI-318, limits strain to reduce cracking.
 - Service Hydraulic Structure
- Designed with hydrostatic loads on outside of walls (no drains)

CONCRETE OUTLET STRUCTURE

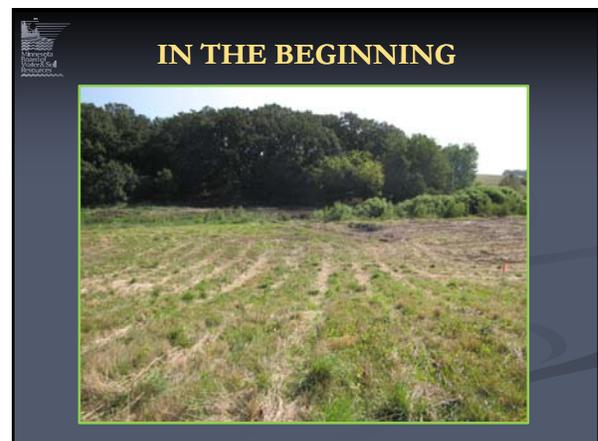
- Modeled structure using RISA-3D

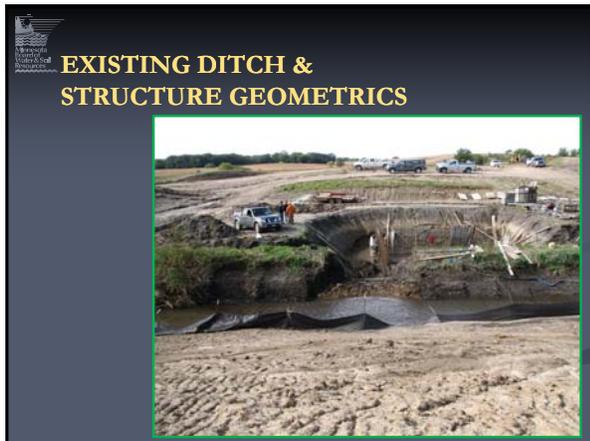
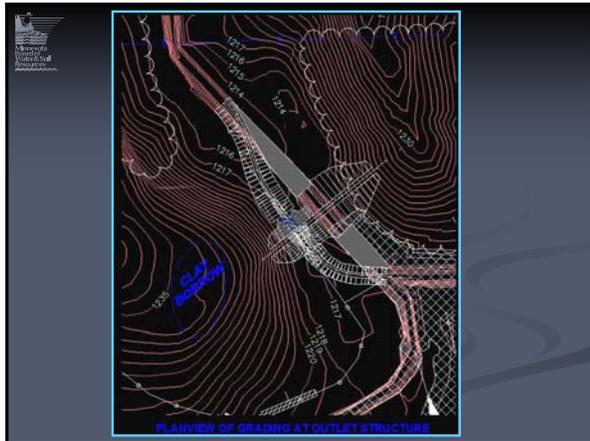
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CONCRETE OUTLET STRUCTURE

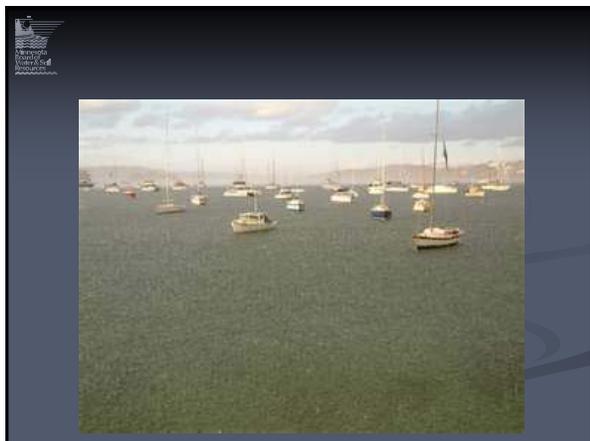
- Modeled structure using RISA-3D

Mx











SEPTMBER 28, 2010
LOOKING BETTER



Construction

CONCRETE OUTLET STRUCTURE

Construction Issues

- Agency Responsibilities
- Pour Height
 - Inspection
 - Workmanship
 - Safety
- Layout – Contractor did not establish his own after initial NRCS establishment
 - Make contractor responsible

CONCRETE OUTLET STRUCTURE

Construction Issues (cont'd)

- Excavation Limits
- Dewatering
- Foundation Cut Off Walls
 - Did not specify how to construct
 - Place directly against soil
 - Form and backfill
 - Layout

CONCRETE OUTLET STRUCTURE

■ Construction Issues (cont'd)

- Mud Slab benefits
 - Prevent muck (uncompacted foundation)
 - Support steel
- Cone Ties
- Test Cylinder diameter, 4" or 6"

CONCRETE OUTLET STRUCTURE

■ Construction Issues (cont'd)

- Concrete Strength Test Results
 - Weak Breaks, 7 & 14 day
3060 & 3450 psi vs Avg 7 day 4388 psi
 - Anticipated 28 day strength, 3806 psi
 - Suggested Mitigation,
Crystalline Capillary Waterproofing Coating
 - 28 day passed, 4590 psi

 **EVERYTHING BUT THE GREEN**



 **Thanks to NRCS Staff Involved**

- Doug Christianson
- Scott Swanberg
- John Brach
- Area 7 Staff
 - Aaron Peter
 - Willis Goll



 **QUESTIONS**

