



1

## Lake Leopold at Prairie Crossings

Unique considerations for performing shoreline restoration in a Threatened & Endangered Species Hatchery

# Lake Leopold



# Project Purpose

## Stop Migration of Shoreline

- Migration of Shoreline due to wave action
- Migration from toe loss due to muskrat activity
- Turn art into engineering



# Project Purpose

## Design & Permitting

- Turn concept into construction (art into engineering)
- Paperwork - Permitting



**WATERSHED DEVELOPMENT PERMIT APPLICATION** Revised 10/2015

1. PROJECT ADDRESS: 4100 L. Rte 3 #14, Long Grove, IL 60047

2. NAME & ADDRESS OF UNDERWRITER: Manhard Consulting, Ltd., 900 Woodlands Parkway, Warren Hills, IL 60091

3. STREAMWATER PERMIT #

4. COUNTY APT. NO. (to be supplied by County)

5. NAME & ADDRESS OF CERT. REVIEW SPECIALIST: Valerie Jabocki, Ballinger Environmental Inc., 4801 Forest Ave., Suite C, Downers Grove, IL 60515

6. NAME & ADDRESS OF PROPERTY OWNER: Heather McArthur, 4100 L. Rte 3 #14, Long Grove, IL 60047

7. NAME & ADDRESS OF CERT. REVIEW SPECIALIST: Valerie Jabocki, Ballinger Environmental Inc., 4801 Forest Ave., Suite C, Downers Grove, IL 60515

8. CHECK THE ONE CONDITION THAT APPLIES:

9. CHECK THE ONE CONDITION THAT APPLIES:

10. STREAMWATER PERMIT SUMMARY:

11. WETLAND DATA SUMMARY:

12. WETLAND DATA SUMMARY:

13. CHECK THE ONE CONDITION THAT APPLIES:

14. CHECK THE ONE CONDITION THAT APPLIES:

15. CHECK THE ONE CONDITION THAT APPLIES:

16. CHECK THE ONE CONDITION THAT APPLIES:

17. CHECK THE ONE CONDITION THAT APPLIES:

18. CHECK THE ONE CONDITION THAT APPLIES:

19. CHECK THE ONE CONDITION THAT APPLIES:

20. CHECK THE ONE CONDITION THAT APPLIES:

21. CHECK THE ONE CONDITION THAT APPLIES:

22. CHECK THE ONE CONDITION THAT APPLIES:

23. CHECK THE ONE CONDITION THAT APPLIES:

24. CHECK THE ONE CONDITION THAT APPLIES:

25. CHECK THE ONE CONDITION THAT APPLIES:

26. CHECK THE ONE CONDITION THAT APPLIES:

27. CHECK THE ONE CONDITION THAT APPLIES:

28. CHECK THE ONE CONDITION THAT APPLIES:

29. CHECK THE ONE CONDITION THAT APPLIES:

30. CHECK THE ONE CONDITION THAT APPLIES:

31. CHECK THE ONE CONDITION THAT APPLIES:

32. CHECK THE ONE CONDITION THAT APPLIES:

33. CHECK THE ONE CONDITION THAT APPLIES:

34. CHECK THE ONE CONDITION THAT APPLIES:

35. CHECK THE ONE CONDITION THAT APPLIES:

36. CHECK THE ONE CONDITION THAT APPLIES:

37. CHECK THE ONE CONDITION THAT APPLIES:

38. CHECK THE ONE CONDITION THAT APPLIES:

39. CHECK THE ONE CONDITION THAT APPLIES:

40. CHECK THE ONE CONDITION THAT APPLIES:

41. CHECK THE ONE CONDITION THAT APPLIES:

42. CHECK THE ONE CONDITION THAT APPLIES:

43. CHECK THE ONE CONDITION THAT APPLIES:

44. CHECK THE ONE CONDITION THAT APPLIES:

45. CHECK THE ONE CONDITION THAT APPLIES:

46. CHECK THE ONE CONDITION THAT APPLIES:

47. CHECK THE ONE CONDITION THAT APPLIES:

48. CHECK THE ONE CONDITION THAT APPLIES:

49. CHECK THE ONE CONDITION THAT APPLIES:

50. CHECK THE ONE CONDITION THAT APPLIES:

51. CHECK THE ONE CONDITION THAT APPLIES:

52. CHECK THE ONE CONDITION THAT APPLIES:

53. CHECK THE ONE CONDITION THAT APPLIES:

54. CHECK THE ONE CONDITION THAT APPLIES:

55. CHECK THE ONE CONDITION THAT APPLIES:

56. CHECK THE ONE CONDITION THAT APPLIES:

57. CHECK THE ONE CONDITION THAT APPLIES:

58. CHECK THE ONE CONDITION THAT APPLIES:

59. CHECK THE ONE CONDITION THAT APPLIES:

60. CHECK THE ONE CONDITION THAT APPLIES:

61. CHECK THE ONE CONDITION THAT APPLIES:

62. CHECK THE ONE CONDITION THAT APPLIES:

63. CHECK THE ONE CONDITION THAT APPLIES:

64. CHECK THE ONE CONDITION THAT APPLIES:

65. CHECK THE ONE CONDITION THAT APPLIES:

66. CHECK THE ONE CONDITION THAT APPLIES:

67. CHECK THE ONE CONDITION THAT APPLIES:

68. CHECK THE ONE CONDITION THAT APPLIES:

69. CHECK THE ONE CONDITION THAT APPLIES:

70. CHECK THE ONE CONDITION THAT APPLIES:

71. CHECK THE ONE CONDITION THAT APPLIES:

72. CHECK THE ONE CONDITION THAT APPLIES:

73. CHECK THE ONE CONDITION THAT APPLIES:

74. CHECK THE ONE CONDITION THAT APPLIES:

75. CHECK THE ONE CONDITION THAT APPLIES:

76. CHECK THE ONE CONDITION THAT APPLIES:

77. CHECK THE ONE CONDITION THAT APPLIES:

78. CHECK THE ONE CONDITION THAT APPLIES:

79. CHECK THE ONE CONDITION THAT APPLIES:

80. CHECK THE ONE CONDITION THAT APPLIES:

81. CHECK THE ONE CONDITION THAT APPLIES:

82. CHECK THE ONE CONDITION THAT APPLIES:

83. CHECK THE ONE CONDITION THAT APPLIES:

84. CHECK THE ONE CONDITION THAT APPLIES:

85. CHECK THE ONE CONDITION THAT APPLIES:

86. CHECK THE ONE CONDITION THAT APPLIES:

87. CHECK THE ONE CONDITION THAT APPLIES:

88. CHECK THE ONE CONDITION THAT APPLIES:

89. CHECK THE ONE CONDITION THAT APPLIES:

90. CHECK THE ONE CONDITION THAT APPLIES:

91. CHECK THE ONE CONDITION THAT APPLIES:

92. CHECK THE ONE CONDITION THAT APPLIES:

93. CHECK THE ONE CONDITION THAT APPLIES:

94. CHECK THE ONE CONDITION THAT APPLIES:

95. CHECK THE ONE CONDITION THAT APPLIES:

96. CHECK THE ONE CONDITION THAT APPLIES:

97. CHECK THE ONE CONDITION THAT APPLIES:

98. CHECK THE ONE CONDITION THAT APPLIES:

99. CHECK THE ONE CONDITION THAT APPLIES:

100. CHECK THE ONE CONDITION THAT APPLIES:

**TABILIZATION**

INDEX OF SHEETS

1. SHEET NO. 1 OF 1

2. SHEET NO. 2 OF 1

3. SHEET NO. 3 OF 1

4. SHEET NO. 4 OF 1

5. SHEET NO. 5 OF 1

6. SHEET NO. 6 OF 1

7. SHEET NO. 7 OF 1

8. SHEET NO. 8 OF 1

9. SHEET NO. 9 OF 1

10. SHEET NO. 10 OF 1

11. SHEET NO. 11 OF 1

12. SHEET NO. 12 OF 1

13. SHEET NO. 13 OF 1

14. SHEET NO. 14 OF 1

15. SHEET NO. 15 OF 1

16. SHEET NO. 16 OF 1

17. SHEET NO. 17 OF 1

18. SHEET NO. 18 OF 1

19. SHEET NO. 19 OF 1

20. SHEET NO. 20 OF 1

21. SHEET NO. 21 OF 1

22. SHEET NO. 22 OF 1

23. SHEET NO. 23 OF 1

24. SHEET NO. 24 OF 1

25. SHEET NO. 25 OF 1

26. SHEET NO. 26 OF 1

27. SHEET NO. 27 OF 1

28. SHEET NO. 28 OF 1

29. SHEET NO. 29 OF 1

30. SHEET NO. 30 OF 1

31. SHEET NO. 31 OF 1

32. SHEET NO. 32 OF 1

33. SHEET NO. 33 OF 1

34. SHEET NO. 34 OF 1

35. SHEET NO. 35 OF 1

36. SHEET NO. 36 OF 1

37. SHEET NO. 37 OF 1

38. SHEET NO. 38 OF 1

39. SHEET NO. 39 OF 1

40. SHEET NO. 40 OF 1

41. SHEET NO. 41 OF 1

42. SHEET NO. 42 OF 1

43. SHEET NO. 43 OF 1

44. SHEET NO. 44 OF 1

45. SHEET NO. 45 OF 1

46. SHEET NO. 46 OF 1

47. SHEET NO. 47 OF 1

48. SHEET NO. 48 OF 1

49. SHEET NO. 49 OF 1

50. SHEET NO. 50 OF 1

51. SHEET NO. 51 OF 1

52. SHEET NO. 52 OF 1

53. SHEET NO. 53 OF 1

54. SHEET NO. 54 OF 1

55. SHEET NO. 55 OF 1

56. SHEET NO. 56 OF 1

57. SHEET NO. 57 OF 1

58. SHEET NO. 58 OF 1

59. SHEET NO. 59 OF 1

60. SHEET NO. 60 OF 1

61. SHEET NO. 61 OF 1

62. SHEET NO. 62 OF 1

63. SHEET NO. 63 OF 1

64. SHEET NO. 64 OF 1

65. SHEET NO. 65 OF 1

66. SHEET NO. 66 OF 1

67. SHEET NO. 67 OF 1

68. SHEET NO. 68 OF 1

69. SHEET NO. 69 OF 1

70. SHEET NO. 70 OF 1

71. SHEET NO. 71 OF 1

72. SHEET NO. 72 OF 1

73. SHEET NO. 73 OF 1

74. SHEET NO. 74 OF 1

75. SHEET NO. 75 OF 1

76. SHEET NO. 76 OF 1

77. SHEET NO. 77 OF 1

78. SHEET NO. 78 OF 1

79. SHEET NO. 79 OF 1

80. SHEET NO. 80 OF 1

81. SHEET NO. 81 OF 1

82. SHEET NO. 82 OF 1

83. SHEET NO. 83 OF 1

84. SHEET NO. 84 OF 1

85. SHEET NO. 85 OF 1

86. SHEET NO. 86 OF 1

87. SHEET NO. 87 OF 1

88. SHEET NO. 88 OF 1

89. SHEET NO. 89 OF 1

90. SHEET NO. 90 OF 1

91. SHEET NO. 91 OF 1

92. SHEET NO. 92 OF 1

93. SHEET NO. 93 OF 1

94. SHEET NO. 94 OF 1

95. SHEET NO. 95 OF 1

96. SHEET NO. 96 OF 1

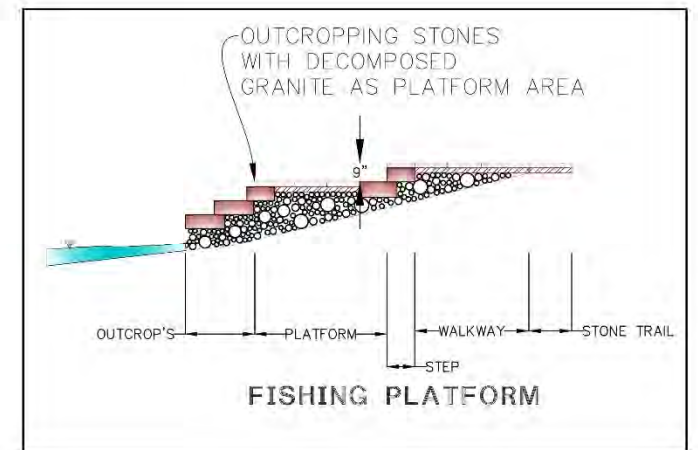
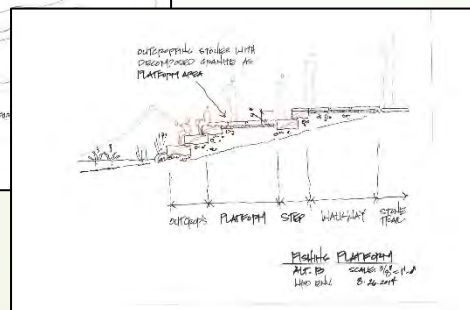
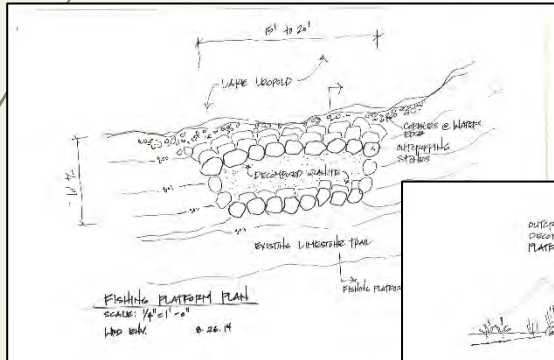
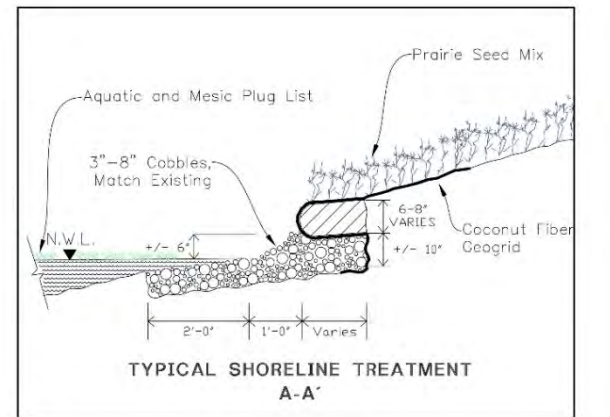
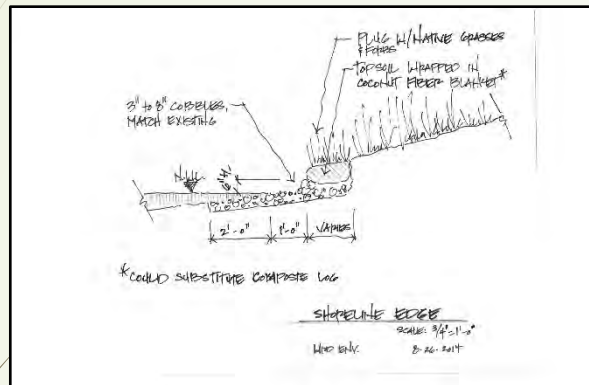
97. SHEET NO. 97 OF 1

98. SHEET NO. 98 OF 1

99. SHEET NO. 99 OF 1

100. SHEET NO. 100 OF 1

# Project Purpose



# Project Purpose

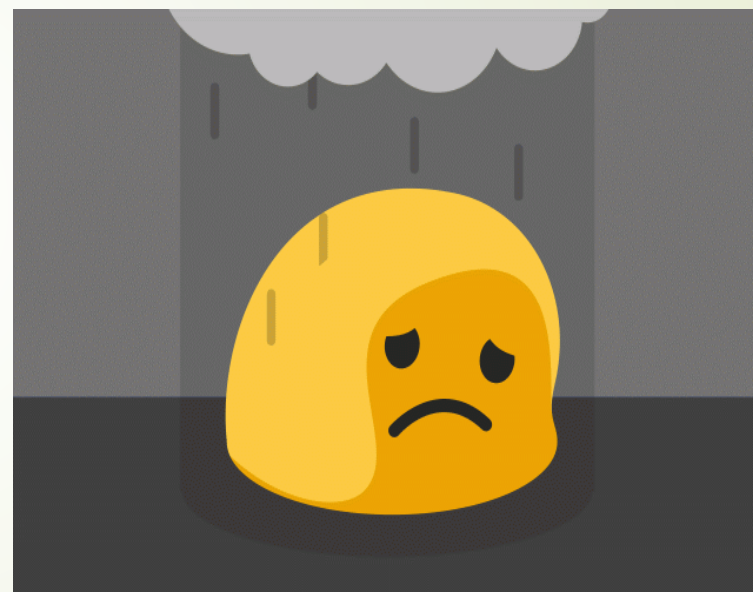
- ▶ Addition of pier adds a community sense of purpose to project.
- ▶ Adding educational components to any environmental project is important.
- ▶ Can serve as meeting location(s) for community discussion



# Project Purpose

## PROGRAMMING NOTES

- ▶ Try never to dwell on the negative (or perceived negatives)
- ▶ Every project is unique
- ▶ How can we improve the process?
  - ▶ Cost perspective
  - ▶ Time perspective
  - ▶ Overall perspective
    - ▶ Environmentally
    - ▶ Educationally



# *Background & Understanding*

- ▶ Engineering and the Natural Environment
- ▶ I am not an Engineer
- ▶ I am not a Biologist
  - ▶ Biological Processes
  - ▶ Geological Processes
- ▶ I am a hydrologist
- ▶ In the State of IL (any many others) Engineers rule.





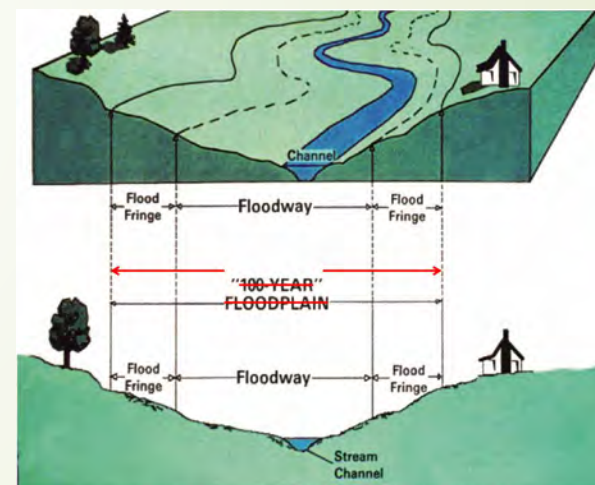
# Background & Understanding

## What is a Hydrologist?

a science dealing with the properties, distribution, and circulation of water on and below the earth's surface and in the atmosphere.

## What does a hydrologist do?

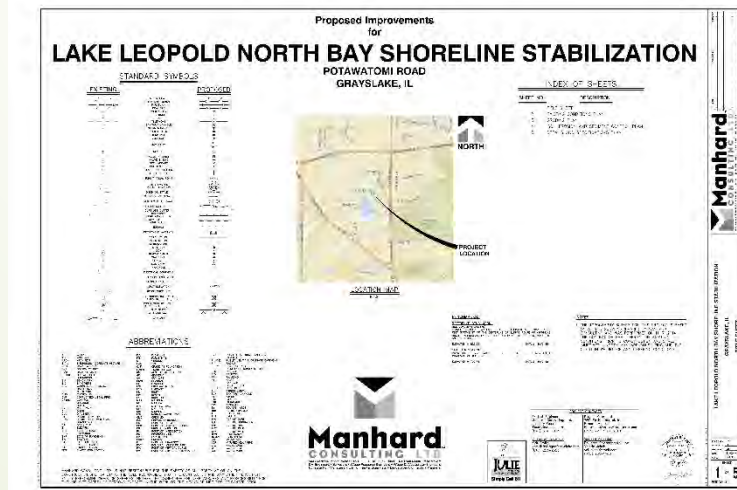
- ▶ Stormwater/flood simulation
- ▶ Lakes, creeks, streams projects
- ▶ Dredging, stream relocation, SESC
- ▶ Identify when additional specialty is needed
- ▶ Permitting for all of the above



# Challenges to the Project

## Review the project scope (Contract)

- ▶ Develop Engineering drawings for construction & permitting
- ▶ Just exactly what does that entail from a consultant standpoint
- ▶ Client expectation vs reality vs agency expectation
- ▶ We construct with steam shovels, not teaspoons



# Challenges to the Project

- ▶ Take beautiful artistic sketches and make them real
- ▶ This consists of what, exactly? Key elements:
  - ▶ Topographical source – survey or other
  - ▶ Aerial photography review: perspective
  - ▶ In a previously engineered environment: engineering plans



## Challenges to the Project (cont)

Key elements, continued:

- ▶ List of review agencies
- ▶ List of applicable rules and ordinances that might trigger
- ▶ Understanding of who has jurisdiction
- ▶ Key client contact that communicates clearly



## Challenges to the Project (cont)

Not Mandatory but Extremely Helpful:

- ▶ Properly scoped project
- ▶ Knowledge of agency personnel who may review the project
- ▶ Understanding of permitting processes and timelines
- ▶ Control over bidding (or an ability to recommend contractors)
- ▶ Clients who let you do your job.



## *Challenges to the Project (cont)*

### Not Generally Anticipated: T & E Species Presence

- ▶ Screening performed during Joint Application Process
  - ▶ Should be anticipated any time you enter a river, creek, lake, or low lying wetland area
  - ▶ This is one case where it was a pleasant surprise to see the system working
- ▶ Review correspondence from Illinois Department of Natural Resources (IDNR)



## Challenges to the Project (cont)

### State Endangered Species Identified:

- ▶ Blacknose Shiner (*Notropis heterolepis*)
- ▶ Pugnose Shiner (*Notropis anogenus*)



## Challenges to the Project (cont)

### State Threatened Species Identified:

- ▶ Banded Killifish (*Fundulus diaphanus*)
- ▶ Blackchin Shiner (*Notropis heterodon*)
- ▶ Iowa Darter (*Etheostoma exile*)





## *Challenge becomes Opportunity*

The need to complete the project includes the chance to make available better breeding and forage habitat for many of the species on this list.

How does this new requirement or opportunity affect the project?



# Project Challenges Solved?

Sit back, take a deep breath and apply what you have learned:

- ▶ This is where a good consultant can differentiate themselves
  - ▶ Can they solve the problem with limited delays?
  - ▶ Can they solve the problem with minimal change orders?
  - ▶ Can they communicate the problem to the client?
- ▶ Interpretation of code, ordinance, laws can vary from project to project and among different agency staff
  - ▶ Seems to be more prevalent today than ever.
  - ▶ Change orders, project revision cannot always be avoided

# Project Challenges Solved?

## IDNR Restrictions due to T&E spp. Presence

- ▶ Pumping restrictions
  - ▶ Where to pump
  - ▶ Pump Screening (on intake)
  - ▶ Pump velocity at intake
- ▶ Non-pumping related restrictions (recommended)
  - ▶ Time of construction to not coincide with spawning season (May 1<sup>st</sup> – July 31<sup>st</sup>). Typically not a good time for planting.
  - ▶ Install aeration measures and prey refuge. This was not something we were willing to take on, or recommend for that matter.
- ▶ All other demands and recommendations met.

# *Project Challenges Solved?*

Demands met, commence bidding



# *Local Review*

## Floodplain & Stormwater

- ▶ Community has control over regulation of the above
- ▶ Comments typically provided by Village Engineer
- ▶ Can at times seem abstract or non-applicable
- ▶ Village can request escrow fees for costs to offset consultant review fees.

# Local Review

## Floodplain & Stormwater

- ▶ You may be able to discuss with local officials to reduce review fees (not always possible)
- ▶ Restoration is not development
- ▶ Village is under mandate by EPA to encourage water quality improvement and green infrastructure projects
- ▶ In Lake County, Lake County Stormwater Management Commission (SMC) is under contract to review Soil Erosion and Sediment Control (SESC) measure by the US Army Corps of Engineers. SMC is generally very cooperative and willing to assist with questions and examples, however
- ▶ Nothing replaces the experience of a qualified consultant.

## *In Summary (1)*

In Most Cases (most environmental projects):

Typically consist of components reviewed by multiple agencies and the local official (Lake Co. if in unincorporated areas). Areas of review:

- ▶ Wetlands
- ▶ Floodplains (and floodway)
- ▶ Soil Erosion & Sediment Control (SESC)
- ▶ Stormwater
- ▶ Engineering

## *In Summary (2)*

Most projects will be successful if:

- ▶ The project is properly scoped
- ▶ The appropriate time to complete the project is accounted for
- ▶ The budgeted amount includes contingencies for unanticipated permitting
- ▶ Everyone is allowed to do their job, including:
  - ▶ Review agencies, local officials
  - ▶ Consultants
  - ▶ Contractors
  - ▶ The environment



# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos





# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos





# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos



# Construction Photos



# Post-Construction Photos



# *Post-Construction Photos*



## *Post-Construction Photos*





## *Post-Construction Photos*



# *Post-Construction Photos*



# *Post-Construction Photos*



# *Post-Construction Photos*



# Post-Construction Photos



## *Post-Construction Photos*



# Post-Construction Photos



# Post-Construction Photos





# Post-Construction Photos



# Post-Construction Photos



# Post-Construction Photos



# Post-Construction Photos



# Post-Construction Photos



# Post-Construction Photos



# Post-Construction Photos



# Post-Construction Photos





# Post-Construction Photos



# Post-Construction Photos



# Post-Construction Photos



# Post-Construction Photos



# Post-Construction Photos



# QUESTIONS?

Brian Valleskey, CFM, CLP  
Senior Water Resources Specialist  
Manhard Consulting, Ltd.  
900 Woodlands Parkway  
Vernon Hills, IL 60061  
(847) 325-7224

