Winona Lake Bank Stabilization Design/Build Report

Kosciusko County, Indiana

August 2009

Prepared For:

Kosciusko County Community Fair, Inc
c/o Frank Rhoades
1400 E. Smith Street
Warsaw, IN 46581

Prepared By:

Corporate Office
708 Roosevelt Road
Walkerton, IN 46574
(574) 586-3400

WINONA LAKE BANK STABILIZATION DESIGN/BUILD REPORT KOSCIUSKO COUNTY, INDIANA

EXECUTIVE SUMMARY

In 2008, the Kosciusko County Community Fair, Inc (KCCF) received an Indiana Department of Natural Resources (IDNR) Lake and River Enhancement (LARE) grant to design and build a bank stabilization project along the shoreline of Winona Lake in Warsaw, Indiana. The goal of the project was to design and implement a bioengineered shoreline stabilization technique for the purpose of reducing sedimentation and the delivery of sediment attached nutrients into the Lake. JFNew was contracted to complete the design, provide construction oversight, and install native plant material. G and G Hauling and Excavating was contracted to construct the project.

A total of thirteen hundred feet (396.2 m) of shoreline was stabilized utilizing three similar applications. Seven hundred seventy five feet (236.2 m) of shoreline was stabilized using a stone toe and soil-encapsulated lift bioengineering technique. A stone toe was established to provide stabilization to the previously eroded toe of slope. A soil-encapsulated lift was constructed on top of the stone toe to rebuild the bank. The soil-encapsulated lift was seeded with a mixture of deep-rooted native plant species that will provide long term bank stabilization. Native shrubs were installed between the stone toe and the soil encapsulated lift and emergent vegetation was planted within the stones to help stabilize the bank and provide overhead cover for fish and aquatic biota. A 20 foot (6.1 m) prairie buffer was also planted along the shoreline within this section to filter nutrients and sediments from overland stormwater runoff generated from the Fairgrounds.

Three hundred twenty five feet (99.1 m) of shoreline was stabilized using a stone toe only. The original bank was then dressed with topsoil and seeded with a cool season turf grass. Straw was spread over the area to protect the seed and facilitate germination.

Two hundred feet (61.0 m) of shoreline was stabilized using a stone toe and emergent vegetation. The original bank was dressed with topsoil and seeded with a cool season turf grass. The seeded area was then covered with a straw erosion control blanket to minimize erosion during the establishment period.

ACKNOWLEDGEMENTS

The Indiana Department of Natural Resources Division of Fish and Wildlife Lake and River Enhancement (LARE) Program, the Kosciusko County Community Fair, and the Winona Lake Preservation Association funded this design/build project. JFNew completed designs and surveys, provided environmental and shoreline assessment, provided construction oversight, and provided and installed all native plant material. G and G Hauling and Excavating completed the construction of the stone toe and installation of the soil encapsulated lifts. Frank Rhoades of the Kosciusko County Community Fair provided initiative and assistance in getting this project completed. Special thanks are due to G and G Hauling and Excavating for donating materials and providing reduced labor rates as in-kind match for this project; and Kent Tracey with the IDNR LARE program for his assistance in the administration of the projects. Thanks to the Kosciusko County Community Fair members and Chris Cummins and the Winona Lake Preservation Association for their support. Contributors to this project include Cary and Richard Groninger, G and G Hauling and Excavating; John Richardson, Mark Pranckus, Christine Dittmar, Tyson Edwards, Tom Estrem, and Scott Fetters with JFNew.

Cover Photos: Sidebar – Completed Stone Toe, Top Left – Installation of Stone Toe, Lower Right – Installation of Filter Fabric

TABLE OF CONTENTS

WINONA LAKE BANK STABILIZATION DESIGN/BUILD REPORT KOSCIUSKO COUNTY, INDIANA

1.0 STATEMENT OF PROJECT PURPOSE

The purpose of this project was to reduce the transfer of nutrients from the sediment-water interface to the water column by stabilizing 1,300 feet (396.2 m) of Winona Lake shoreline, provide fish and wildlife habitat, and provide shoreline restoration educational opportunities adjacent to the Kosciusko Community Fairgrounds.

2.0 GENERAL OVERALL PROJECT DESCRIPTION

Winona Lake is a 562-acre (277.4 ha) lake located one mile (1.6 km) southeast of Warsaw, Indiana in Kosciusko County. The bank stabilization site is located on the north side of the lake on a parcel owned by the Kosciusko County Community Fair (Figure 1).

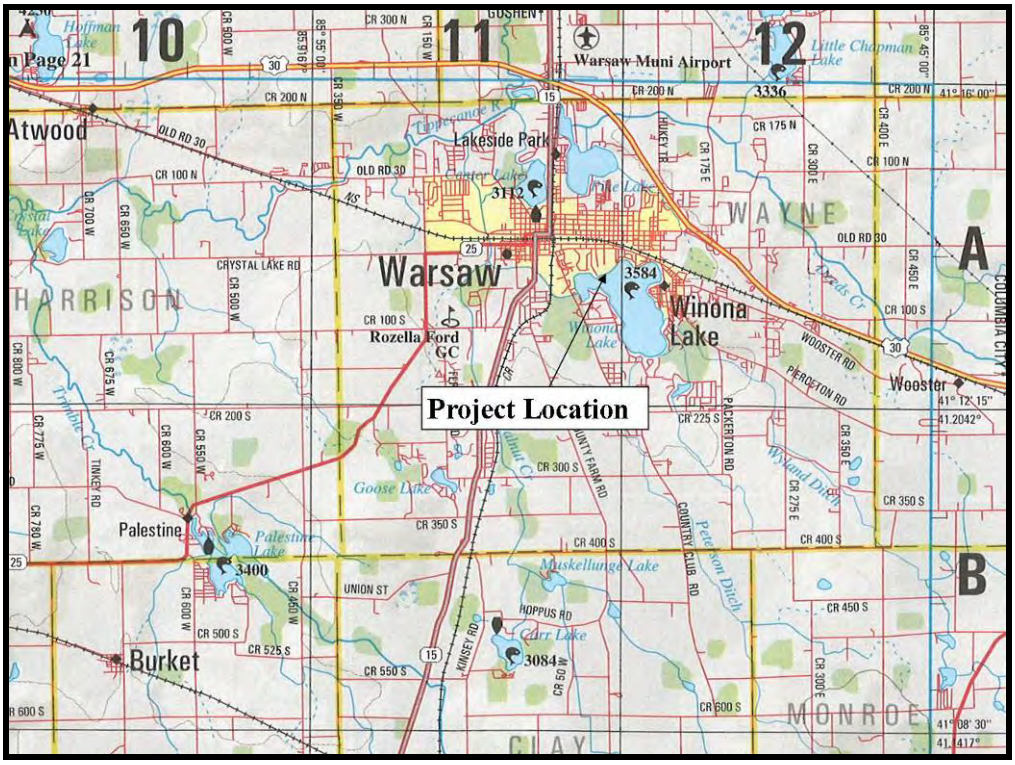

Figure 1. Approximate project location.

The Kosciusko Community County Fairground is located on the northern shoreline of Winona Lake. The fairground is used throughout the year for 4-H functions, including the annual county fair, and for various other events that are open to the public. Additionally, the Fair Board operates a semi-primitive campground during the summer months along the west end of the property. Approximately 1,300 feet (396.2 m) along the northern shoreline of Winona Lake was severely eroding into the lake. Previous efforts by the Fair Board to "clean up" the areas by removing vegetation and cutting trees resulted in an eroding shoreline, which has receded several feet over the past two decades (Figures 2 and 3). In communication with members of the Fair Board and maintenance staff, it was noted that trucks used to park on the lakeward side of the existing cottonwood trees. The erosion was occurring because the bank vegetation was composed primarily of turf grass, which provided very little resistance to wave action which was undermining the bank. Sediment derived from the bank was entering Winona Lake and contributing to the nutrient loading of the Lake.

Figure 2. Example of eroding shoreline near the west end of the project prior to construction.

Figure 3. Example of eroding shoreline near the east end of the project prior to construction.

2.1 Landowner Permission

At the November 2007 Kosciusko Fair Board meeting, the proposed bank stabilization project was presented by JFNew. The proposed project was approved after discussion during the December 2007 Fair Board meeting. Written permission was not obtained due to the bank stabilization project being located solely on the sponsor's property.

2.2 Permit Requirements

An Indiana Department of Natural Resources (IDNR) Lakes Preservation permit was required for the proposed project. The IDNR, Division of Water, issued a permit for the project on February 2, 2007. The proposed project also required a Section 401 Water Quality Certification from the Indiana Department of Environmental Management (IDEM) because the lake is a "Waters of the State". The Water Quality Certification from IDEM was issued on August 15, 2007. A copy of this was forwarded to the U.S. Army Corps of Engineers (USACOE) because the lake is a "Waters of the United States." The USACOE authorized the project under their Section 404 Regional General Permit in a letter dated June 12, 2007. Copies of the permits and correspondence can be found in Appendix A.

2.3 Contractors

G and G Hauling and Excavating, Warsaw, IN, was contracted to complete the installation of the stone toe and soil encapsulated lifts. JFNew was contracted to provide design, construction oversight and plant material along with the installation of the plant material, surveying, and environmental assessment.

2.4 Project Timing

In 2006, the Kosciusko County Fair Board received a complaint from neighboring properties that the erosion occurring at the Fairgrounds was contributing to the

sediment loading in a nearby channel thus restricting boat traffic. The Fair Board was requested to stabilize the erosion by the Kosciusko Soil and Water Conservation District. Early in 2007, the Fair Board applied for permits to install limestone rip rap that was denied by the permitting agencies. The permit application was then revised to include a bioengineered shoreline stabilization technique, which was then permitted.

After the permits were issued in 2007, a preliminary design was completed in November 2008. Construction activities began in late January 2009 by installing the stone toe during the drawdown of the lake. The soil encapsulated lifts were constructed beginning in May 2009 and the final native plant and seed installation was completed in May and June 2009.

2.5 Project Accomplishments

A total of 1,300 feet (396.2 m) of shoreline was stabilized. This included 1,300 feet (396.2 m) of stone toe, 775 feet (236.2 m) of soil-encapsulated lifts and 200 feet (61.0 m) of native shoreline planting. Seeding and erosion control material were utilized on 0.26 acres (0.11 ha) to protect areas above the shoreline that were disturbed during construction. A low profile prairie buffer was planted on 0.41 acres (0.17 ha) adjacent to the soil encapsulated lifts.

2.6 Future Project Inspection and Maintenance

The project was constructed entirely on land owned and managed by the Kosciusko County Fair. Although the site is privately owned, the public is often allowed to use the area for recreational activities such as camping. The Fair Board will primarily be responsible for the inspection and maintenance of the project site. The Kosciusko County Fair currently maintains the property and all facilities located on the Fairgrounds. The project site should be inspected on an annual basis for the next three to five years. At a minimum, the project site should be inspected in early spring soon after ice melt. Potential failure of erosion stabilization measures may include portions of the soil-encapsulated lifts being torn away from the shoreline, displacement of stone along the toe, or rill erosion caused by overland flow. Any issues identified within the project site shall be addressed as soon as possible by the Kosciusko County Fair. To ensure the success of the native vegetation, three weeding and two mowing events are recommended throughout the growing season for the first two years to remove non-native and exotic species. After the third year, periodic weeding shall be sufficient to maintain the vigor of the native vegetation. A maintenance schedule is included in Appendix B.

3.0 PROJECT SPECIFIC DESIGN AND CONSTRUCTION

The shoreline stabilization project incorporated the use of three techniques: soil-encapsulated lifts constructed on a stone toe, which incorporated a native vegetation buffer, and shrubs; a stone toe with native emergent vegetation; and a stone toe (Figure 4). In total, 1,300 feet (396.24 m) of stabilization took place along the lakeshore which included 200 feet (61.0 m) of stone with emergent vegetation (Treatment 1), 775 feet (236.2 m) of soil-encapsulated lifts/stone toe/native vegetation (Treatment 2) and 325 feet (99.1 m) of stone toe (Treatment 3). Four access points to the lake were constructed using glacial field stone to halt erosion at concentrated stormwater runoff points and provide access for persons using the lake for recreational purposes. Details for each treatment area can be found in Appendix C.

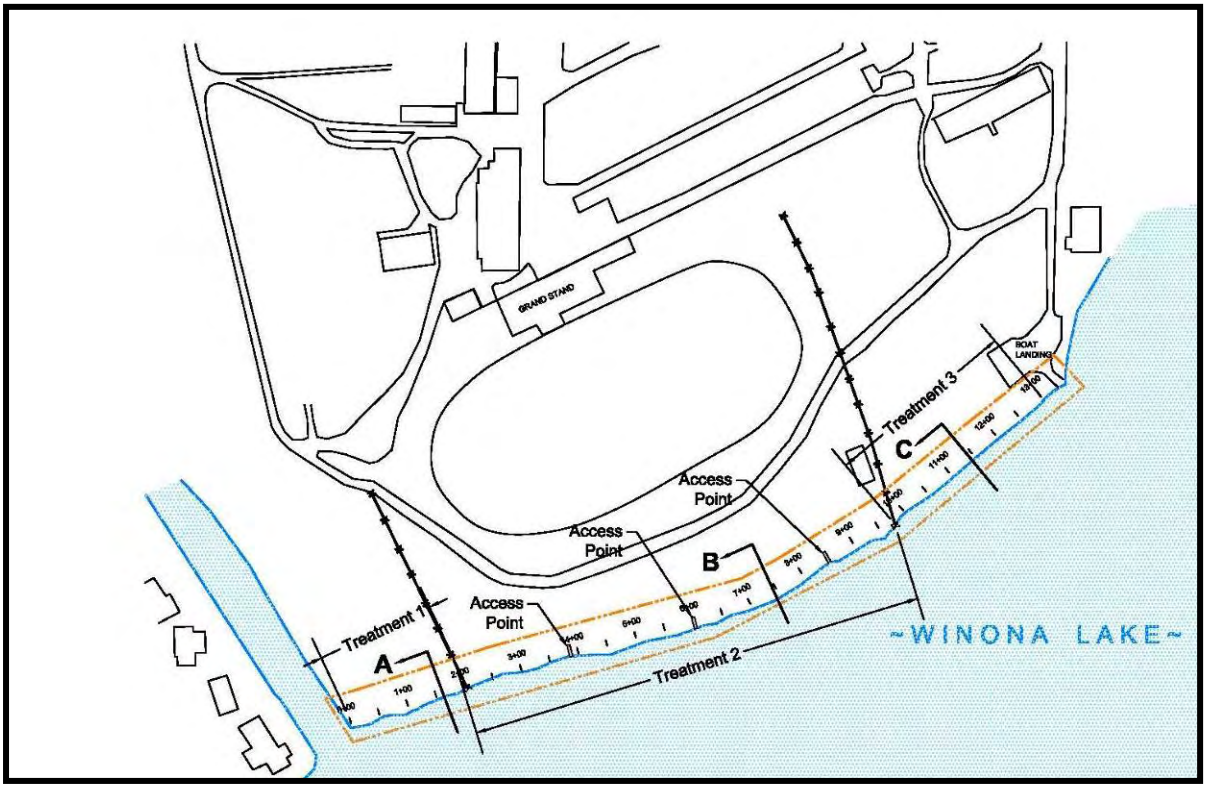

Figure 4. Location of shoreline stabilization along Winona Lake's northern shoreline.

Treatment 1 consisted of 6-inch (15.2 cm) glacial stone toe approximately three feet (0.9 m) high and four feet (1.2 m) wide placed on a non-woven geotextile fabric (Figure 5). This stone toe was placed directly against the original bank to minimize disturbance along the shoreline. A blend of cool season turf grass was seeded at a rate of 135 lb/ac (152.6 kg/ac) on a layer of topsoil immediately above the stone toe and blended into the existing grade. 190 native plant plugs were installed within the rock toe and along the water's edge (Table 1). A typical representation of a completed section of Treatment 1 can be found in Figure 6.

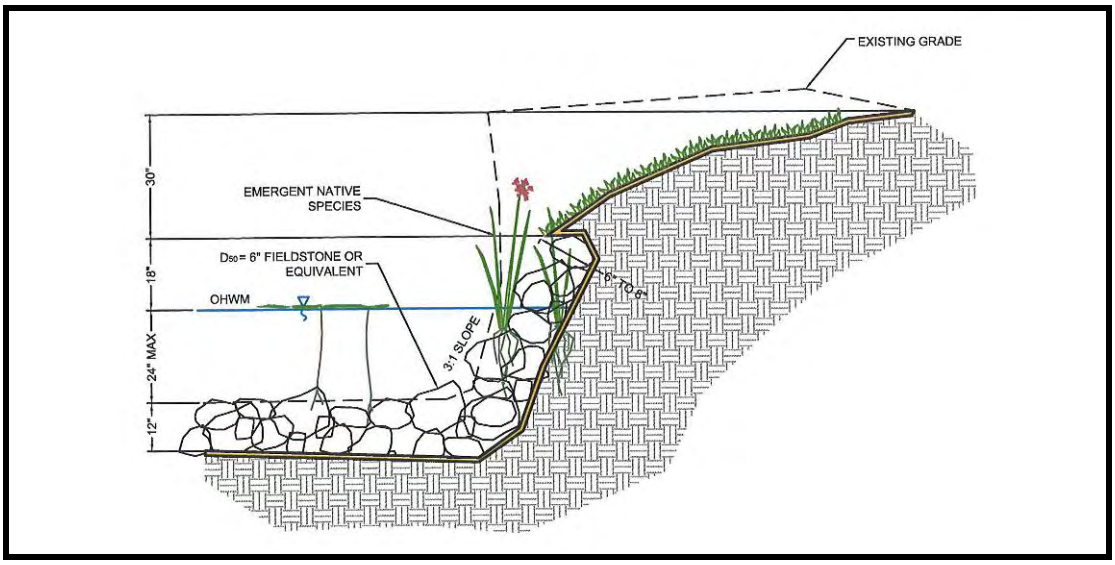

Figure 5. Typical cross section of Treatment 1.

Figure 6. Completed section of Treatment 1.

Table 1. Native plant plugs installed in Treatment area 1.

Common Name	***Scientific Name***	**Quantity**
Sweet Flag	*Acorus calamus*	**38**
Blue Flag Iris	*Iris virginica shrevei*	**38**
Common Arrowhead	*Sagittaria latifolia*	**38**
Hard-stemmed Bulrush	*Scirpus acutus*	**38**
Great Bulrush	*Scirpus validus*	**38**
	Total	**190**

Soil-encapsulated lifts were used for construction along 775 feet (236.2 m) of shoreline in Treatment 2 of the project site as this portion of the shoreline was the most suitable for lift construction and receives the least foot traffic (Figure 2). A glacial stone toe consisting of 6-inch (15.2 cm) diameter fieldstone was installed 3 feet (0.9 m) out into the lake to a height of approximately three foot (0.9 m) (Figure 4). The stone toe is designed to dissipate the wave's energy, thereby preventing further shoreline erosion along this portion of the shoreline. The toe was also used as the base for creating soil-encapsulated lifts. Lifts were constructed by wrapping coir fabric around a soil lift that was keyed into the bank (Figure 7).

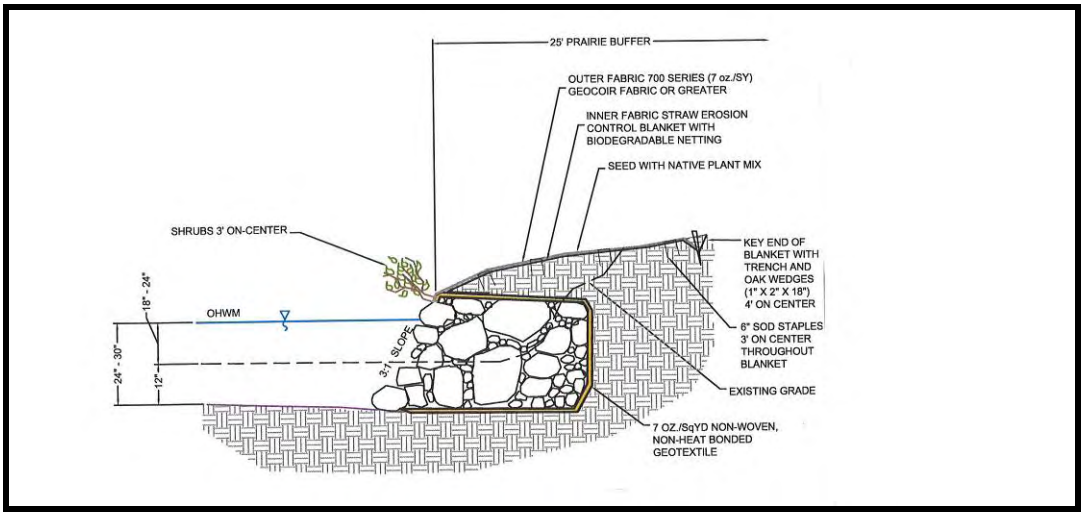

Figure 7. Typical cross section of Treatment 2.

A native grass seed mix was used beneath the coir fabric while a native seed mix comprised of native grasses and forbs were installed as a buffer above the lift using a no-till drill. Specific species included in these seed mixes can be found in Appendix B within the plan set. Native red-osier dogwood shrubs were placed between the stone toe and the soil-encapsulated lift approximately every three feet (0.9 m). 532 native plant pugs were installed within the upland portion of the project and adjacent to the access areas (Table 2). The objective of the plug planting was to provide demonstration areas for fairground users to observe native plants used for shoreline stabilization projects. The native plants and shrubs will provide protection and habitat for fish and wildlife along the water's edge while the deep rooted grasses will help

stabilize the banks. The fabric will typically last for a minimum of three years, allowing enough time to establish permanent vegetation cover for erosion control. Figure 8 illustrates the soil-encapsulated lift treatment during construction.

Figure 8. Construction of soil-encapsulated lift in Treatment 2.

Utilizing the same stone as the toe with an additional layer of No. 2 stone, four access points were constructed by placing the stone on a non-woven geotextile fabric to a width of six feet (1.8 m). These access points will allow lake users direct access to the water without walking through the vegetation (Figure 9).

Figure 9. Stone access point located in Treatment 2.

Table 2. Native plant plugs installed in Treatment area 2.

Common Name	***Scientific Name***	**Quantity**
Sand Coreopsis	*Coreopsis lanceolata*	**76**
Pale Purple Coneflower	*Echinacea pallida*	**76**
Rattlesnake Master	*Eryngium yuccifolium*	**38**
Marsh Blazing Star	*Liatris spicata*	**38**
Wild Bergamont	*Monarda fistulosa*	**76**
Royal Catchfly	*Silene regia*	**38**
Compass plant	*Silphium perfoliatum*	**38**
Prairie Dock	*Silphium terebinthinaceum*	**38**
Little Bluestem	*Schizachyrium scoparium*	**76**
Common Spiderwort	*Tradescantia ohiensis*	**38**
	Total	**532**

Treatment 3 utilized 6-inch (15.2 cm) diameter glacial stone to protect 325 feet (99.1 m) of shoreline along the eastern portion of the site (Figure 10). The stone was placed over a non-woven geotextile fabric to create a toe approximately four feet (1.2 m) wide with a height of approximately three foot (0.9 m) (Figure 8). Due to the heavy foot traffic and number of boat docks located within this area, native vegetation was not utilized within this area. After placing topsoil to blend the stone toe into the surrounding grade, a mixture cool season turfgrass was seeded at a rate of 135 lb/ac (152.6 kg/ac) and covered with straw to facilitate germination. Figure 11 illustrates the installation of the stone toe along Treatment 3.

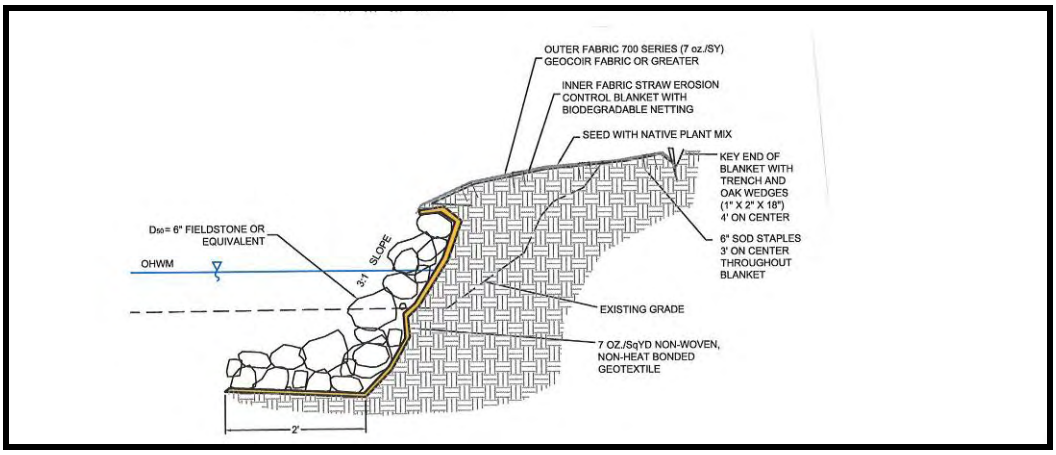

Figure 10. Typical cross section of Treatment 3.

Figure 11. Treatment 3 after installation of stone toe.

4.0 PROJECT SUMMARY

Waves generated from wind energy and boat wakes were pounding against the Winona Lake shoreline causing portions of shoreline to become eroded. The turbulence caused by wave action against the shoreline causes the toe of the slope to cut away thus allowing the upper portion of the bank to fall in. This turbulence also re-suspends bottom sediments thereby increasing the transfer of nutrients from the sediment-water interface to the water column. Continuous disturbance in shallow areas along the shoreline also reduces the growth of shoreline vegetation. The purpose of this project was to reduce erosion along the Winona Lake shoreline and the delivery of eroded materials from the project site into Winona Lake. This was accomplished by stabilizing a portion of the eroded shoreline along Winona Lake's north shore. The construction of the project was completed in June 2009. Monitoring of the project site is recommended for the next three to five years.

APPENDIX A

PERMITS

WINONA LAKE BANK STABILIZATION DESIGN/BUILD
DRAFT REPORT
KOSCIUSKO COUNTY, INDIANA

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
INDIANAPOLIS REGULATORY OFFICE
9799 BILLINGS ROAD
INDIANAPOLIS, INDIANA 46216-1055
http://www.lrl.usace.army.mil

Frank
594-5899
5 pages

June 12, 2007

Operations Division
Regulatory Branch (North)
ID No. LRL-2007-695-djd

Mr. Frank Rhoades
Kosciusko County 4-H
and Community Fair Association
Post Office Box 1093
Warsaw, IN 46581

Dear Mr. Rhoades:

This is in regard to your application dated May 18, 2007, for a Department of the Army permit. Authorization was requested to excavate 0.07 acre of lake bed and place glacial stone and soil along 1,090 feet of shoreline for the construction of a seawall. The proposal is located on Winona Lake in the Northwest 1/4 of Section 16, Township 32 North, Range 6 East, in Warsaw, Kosciusko County, Indiana. We have reviewed the submitted data relative to Section 404 of the Clean Water Act (CWA).

The excavation of the lake bed will not require a placement of dredged or fill material in the unnamed tributary provided the one-step removal method is used. This method normally involves excavating or dredging the material with a type of bucket loader such as a backhoe or tracked excavator. The material must be placed directly into an enclosed truck bed such as a dump truck and hauled to an approved disposal site. We will consider upland area of higher lands an approved disposal site in this case. The fallback of dredged material into any waters of the United States incidental to the removal activity is considered "de minimis". Consequently, this aspect of your proposal is not subject to regulation pursuant to Section 404 CWA and a Department of the Army permit is not required.

The Louisville and Detroit Districts issued Regional General Permit (RGP) No. 1 on December 15, 2004 under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 CWA, for certain activities having minimal impact in Indiana. Since the placement of glacial stone and soil is considered to have minimal impact on the aquatic environment, this portion of your project is authorized under the provisions of the RGP.

However, the Section 401 Water Quality Certification (WQC) issued by the Indiana Department of Environmental Management (IDEM) on July 6, 2004, prohibits impacting more than 300 feet of shoreline. An individual Section 401 Water Quality Certification (WQC) must be obtained from the Indiana Department of Environmental Management

(IDEM) prior to commencement of the proposed activity. The responsibility for obtaining the state WQC rests with the applicant. You may contact IDEM as follows:

IDEM-OWQ
Section 401 WQC Program
100 North Senate Avenue
Indianapolis, IN 46204
Telephone: 317-234-1221

After you obtain your WQC from IDEM and furnish a copy to us, you are authorized under this RGP and may proceed with the work without further contact or verification from us. Under the provisions of this authorization, you must comply with the enclosed RGP general conditions. If IDEM issues a WQC, you must also comply with any conditions imposed in the WQC as it is part of your RGP authorization. **You do not have authorization for the proposed project until we receive a copy of the WQC.**

Upon completion of the work authorized by this RGP, the enclosed Compliance Certification form must be completed and returned to this office. This authorization is valid until December 15, 2009.

If you have any questions concerning this matter or cannot use the one-step removal method, please contact me by writing to the above address or by calling 317-532-4197. Any correspondence should reference our assigned Identification Number LRL-2007-695-djd.

Sincerely,

Deborah Duda Snyder
Project Manager
Indianapolis Regulatory Office

Enclosures

Copy furnished: IDEM (Slater-Atwater)

Compliance Certification

Permit Number: LRL-2007-695-djd

Permittee: Kosciusko County 4-H and Commission Fair, Inc.

Date of Issuance: June 12, 2007

Upon completion of the activity authorized by this permit and any mitigation required by this permit, sign this certification and return it to the following address:

USACE – Louisville District
Indianapolis Regulatory Office
9799 Billings Road
Indianapolis, IN 46216

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

_____ _____

Signature of Permittee (Frank Rhoades) Date

REGIONAL GENERAL PERMIT GENERAL CONDITIONS

1. Discharges of dredged or fill material into waters of the United States must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site). The permittee shall provide a mitigation/monitoring plan for any activity where the adverse impact on special aquatic sites exceeds 0.10 acre (4,356 sq. ft.) or is determined to be more than minimal impact. In determining the minimal impact threshold, the Districts will consider the direct and secondary impacts of the fill or work and any mitigation measures. A wetland delineation report is also required. NOTE: An important element of any mitigation plan for projects in or near streams, other open waters and wetlands is the requirement for vegetated buffers. Therefore, all mitigation plans should include a minimum 50-foot wide buffer between the edge of the project site and the waters and/or wetlands to be affected unless a lesser distance has been specifically approved under the RGP.

2. The permittee shall, if mitigation is required, develop the mitigation site concurrently with site construction. This will assure that aquatic functions are not lost for long periods of time which could adversely affect water quality and wildlife.

3. The permittee shall ensure that sedimentation and soil erosion control measures are in place prior to any construction activity. This shall include the installation of straw bale barriers, silt fencing and/or other approved methods to control sedimentation and erosion.

4. The permittee shall ensure that areas disturbed by any construction activity, including channel banks, are immediately stabilized and revegetated with a combination of grasses, legumes and shrubs compatible to the affected area.

5. The permittee shall ensure that all in-stream construction activity is not performed during periods of high stream flow or during the fish spawning season between April 1 through June 30 without first contacting the IDNR, Division of Fish and Wildlife for their expertise on impacts to the fishery resource. Additionally, the discharge of dredged and/or fill material in known waterfowl breeding areas must be avoided to the maximum extent practicable.

6. The permittee will ensure that the activity authorized will not disrupt movement of those aquatic species indigenous to the waterbody, including those species which normally migrate through the area unless the activity's specific purpose is to impound water.

7. The permittee shall ensure that all construction equipment is refueled and maintained on an upland site away from existing streams, drainageways and wetland areas. Heavy equipment working in wetlands must be placed on mats, or other measures taken to minimize soil disturbance.

8. The permittee must provide a copy of the site specific State Section 401 WQC before the Corps will authorize a project under the RGP.

9. The permittee must comply with any case specific special conditions added by the Corps or by the State Section 401 WQC. The conditions imposed in the State Section 401 WQC are also conditions of this RGP.

10. The permittee shall assure that no activity authorized by the RGP may cause more than a minimal adverse effect on navigation.

11. The permittee shall ensure proper maintenance of any structure or fill authorized by this RGP, including maintenance to ensure public safety.

12. The permittee shall not perform any work within any Wild and Scenic Rivers or in any river officially designated as a "study river" for possible inclusion in the system, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity authorized by the RGP will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal Land Management agency in the area (e.g. U.S. Forest Service, Bureau of Land Management or the U.S. Fish and Wildlife Service).

13. The permittee shall not perform any work under the RGP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species. The permittee shall notify

the District Engineer if any listed species or critical habitat might be affected or is in the vicinity of the project, and shall not begin work under the RGP until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. Authorization of an activity under the RGP does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act.

14. The permittee shall not perform any activity under the RGP which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places until the District Engineer has complied with the provisions of 33 CFR Part 325, Appendix C. The permittee must notify the District Engineer if the activity authorized by the RGP may affect any historic properties listed, determined to be eligible or which the permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin construction until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology. If the permittee discovers any previously unknown historic or archaeological remains while accomplishing the activity authorized by the RGP, work must be immediately stopped and this office immediately notified of what you have found. The District will initiate the Federal, tribal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

15. The permittee shall not perform any work under the RGP where the discharge of dredged and/or fill material would occur in the proximity of a public water supply intake except where the activity is for the repair of the public water supply structure or adjacent bank stabilization.

16. No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material may consist of unsuitable materials (e.g. trash, debris, car bodies, asphalt, etc.) and that materials used for construction or discharge must be free from toxic pollutants in toxic amounts.

17. The permittee shall, to the maximum extent practicable, design the project to maintain pre-construction downstream flow conditions. Furthermore, the work must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose is to impound water) and that the structure or discharge of fill must withstand expected high flows. The project must provide, to the maximum extent practicable, for retaining excess flows from the site and for establishing flow rates from the site similar to pre-construction conditions.

18. The permittee shall ensure that if the activity approved by the RGP includes impoundment of water, measures will be taken to minimize adverse effects on the aquatic ecosystem caused by the accelerated passage of water and/or the restriction of flow.

19. The permittee shall ensure that all temporary fills, authorized under the RGP, be removed in their entirety and the affected areas returned to pre-construction elevation.

20. Representatives from the Corps of Engineers and/or IDEM may inspect any authorized activity or mitigation site at any time deemed necessary to ensure compliance with the terms and conditions of the RGP, Section 401 WQC, and applicable laws.

21. All work authorized by this RGP must be completed by the expiration date of this RGP or 1 year after the date of the Corps authorization letter, whichever occurs later. If you find you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 3 months before the expiration date.

22. The permittee after completion of work under the RGP shall submit a signed certification letter regarding the completed work and required mitigation, if applicable. The certification letter will include a statement that the work was done in accordance with the RGP authorization including compliance with all general and special conditions and completion of mitigation work.

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August 15, 2007

VIA CERTIFIED MAIL 7002 0510 0003 8209 9387

Mark Prancikus
574/586-3446
4 pages

Mr. Frank Rhoades
Kosciusko County 4-H & Community Fair Association, Inc.
1400 East Smith Street
P.O. Box 1093
Warsaw, Indiana 46581-1093

Dear Mr. Rhoades:

Re: Section 401 Water Quality Certification
Project: 4-H Shoreline Stabilization
IDEM No.: 2007-322-43-SSA-A
COE No.: LRL-2007-695-djd
County: Kosciusko

Office of Water Quality staff has reviewed your application for Section 401 Water Quality Certification dated May 18, 2007 and received June 1, 2007. According to the application, you propose to construct a bioengineered seawall to deter shoreline erosion along 1,090 linear feet of Winona Lake. Of this, 144 linear feet is proposed to be stabilized by installing rock toe structures and an erosion control blanket and planting with native grasses. The remaining 946 linear feet will be stabilized by installing an encapsulated lift/rock toe structure. Native grasses, forbs, and shrubs will also be installed. In addition, you propose to dredge a portion of a channel on the southwest corner of the Kosciusko County Fairgrounds. Dredged material is proposed to be placed in an upland location. The project is located at the Kosciusko County Fairgrounds, 1400 East Smith Street, near Warsaw on Winona Lake (Section 16, Township 32 North, Range 6 East).

Based on available information, it is the judgment of this office that the proposed project will comply with the applicable provisions of 327 IAC 2 and Sections 301, 302, 303, 306, and 307 of the Clean Water Act if the recipient of the certification complies with the conditions set forth below. Therefore, subject to the following conditions, the Indiana Department of Environmental Management (IDEM) hereby grants Section 401 Water Quality Certification for the project described in your application received June 1, 2007. Any changes in project design or scope not detailed in the application described above or modified by the conditions below are not authorized by this certification.

CONDITIONS OF THE SECTION 401 WATER QUALITY CERTIFICATION:

The recipient of the certification shall:

1) Deposit any dredged material in a contained upland disposal area to prevent sediment runoff to any waterbody.

2) Install erosion control methods prior to any soil disturbance to prevent soil from leaving the construction site. Appropriate erosion control methods include, but are not limited to, straw bale barriers, silt fencing, erosion control blankets, phased construction sequencing, and earthen berms. Monitor and maintain erosion control structures and devices regularly, especially after rain events, until all soils disturbed by construction activities have been permanently stabilized.

3) Install silt fence or other erosion control measures around the perimeter of any wetlands and/or other waterbodies to remain undisturbed at the project site.

4) Allow the commissioner or an authorized representative of the commissioner (including an authorized contractor), upon the presentation of credentials:

   a) to enter the property of the recipient of the certification;
   b) to have access to and copy at reasonable times any records that must be kept under the conditions of this certification;
   c) to inspect, at reasonable times, any monitoring or operational equipment or method; collection, treatment, pollution management or discharge facility or device; practices required by this certification; and any mitigation wetland site;
   d) to sample or monitor any discharge of pollutants or any mitigation wetland site.

5) Complete all approved discharges no later than two (2) years of the date of issuance of this Section 401 Water Quality Certification. The applicant may request a one (1) year extension to the Section 401 Water Quality Certification by submitting a written request ninety (90) days prior to the deadline stated above. The written request shall contain an account of which discharges and mitigation have been completed and list the reasons an extension is requested.

This certification does not relieve the recipient of the responsibility of obtaining any other permits or authorizations that may be required for this project or related activities from IDEM or any other agency or person. You may wish to contact the Indiana Department of Natural Resources at 317-232-4160 (toll free at 877-928-3755) concerning the possible requirement of natural freshwater lake or floodway permits. In addition, you may wish to contact IDEM's Stormwater Permits Section at 317-233-1864 concerning the possible need for a 327 IAC 15-5 (Rule 5) permit if you plan to disturb greater than one (1) acre of soil during construction.

This certification does not:

(1) authorize impacts or activities outside the scope of this certification;
(2) authorize any injury to persons or private property or invasion of other private rights, or any infringement of federal, state or local laws or regulations;
(3) convey any property rights of any sort, or any exclusive privileges;
(4) preempt any duty to obtain federal, state or local permits or authorizations required by law for the execution of the project or related activities; or
(5) authorize changes in the plan design detailed in the application.

Failure to comply with the terms and conditions of this Section 401 Water Quality Certification may result in enforcement action against the recipient of the certification. If an enforcement action is pursued, the recipient of the certification could be assessed up to $25,000 per day in civil penalties. The recipient of the certification may also be subject to criminal liability if it is determined that the Section 401 Water Quality Certification was violated willfully or negligently.

This certification is effective eighteen (18) days from the mailing of this notice unless a petition for review and a petition for stay of effectiveness are filed within this 18-day period. If a petition for review and a petition for stay of effectiveness are filed within this period, any part of the certification within the scope of the petition for stay is stayed for fifteen (15) days, unless or until an Environmental Law Judge further stays the certification in whole or in part.

This decision may be appealed in accordance with IC 4-21.5, the Administrative Orders and Procedures Act. The steps that must be followed to qualify for review are:

1) You must petition for review in writing that states facts demonstrating that you are either the person to whom this decision is directed, a person who is aggrieved or adversely affected by the decision, or a person entitled to review under any law.

2) You must file the petition for review with the Office of Environmental Adjudication (OEA) at the following address:

Office of Environmental Adjudication
100 North Senate Avenue
IGCN Room N1049
Indianapolis, IN 46204

3) You must file the petition within eighteen (18) days of the mailing date of this decision. If the eighteenth day falls on a Saturday, Sunday, legal holiday, or other day that the OEA offices are closed during regular business hours, you may file the petition the next day that the OEA offices are open during regular business hours. The petition is deemed filed on the earliest of the following dates: the date it is personally delivered to OEA; the date that the envelope containing the petition is postmarked if it is mailed by United States mail; or, the date it is shown to have been deposited with a private carrier on the private carrier's receipt, if sent by private carrier.

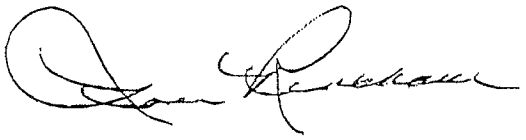
Identifying the certification, decision, or other order for which you seek review by number, name of the applicant, location, or date of this notice will expedite review of the petition.

Note that if a petition for review is granted pursuant to IC 4-21.5-3-7, the petitioner will, and any other person may, obtain notice of any prehearing conferences, preliminary hearings, hearings, stays, and any orders disposing of the proceedings by requesting copies of such notices from OEA.

If you have procedural questions regarding filing a petition for review you may contact the Office of Environmental Adjudication at 317-232-8591.

If you have any questions about this certification, please contact Ms. Sara Slater-Atwater, Project Manager, of my staff at 317-234-1221, or you may contact the Office of Water Quality through the IDEM Environmental Helpline (1-800-451-6027).

Sincerely,



Marylou Poppa Renshaw, Chief
Watershed Planning Branch
Office of Water Quality

cc: Deborah Duda Snyder, USACE-Indianapolis Field Office
Liz McCloskey, USFWS
Keith Poole, IDNR

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

MAILED FEB 02 2007

CERTIFICATE OF APPROVAL
PUBLIC FRESHWATER LAKE

RECEIVED 2/6/07

APPLICATION # : PL-20549

LAKE : Winona Lake

APPLICANT : Kosciusko County 4-H & Commission Fair Inc
Frank Rhoades
1400 East Smith Street
PO Box 1093
Warsaw, IN 46581-1093

AUTHORITY : IC 14-26-2 with 312 IAC 11

DESCRIPTION : A bioengineered seawall will be constructed across the applicant's 1090' frontage. Beginning at the westernmost limit of the project, approximately 144' of the shoreline will be stabilized using glacial stone over geotextiles, with native plantings and an erosion control blanket placed at the top of the bank. The remaining 946' of shoreline will be regraded and then stabilized with a rock toe, consisting of glacial stone over geotextiles, with soil encapsulated lifts and native plantings placed on the bank. In addition, an approximate 50' by 60' area of an existing channel will be dredged. Approximately 80 cubic yards of accumulated muck and debris will be removed from the channel bed by dredging to a maximum depth of 4.5' below the lake's legal level at the center of the channel and sloping uniformly to the shoreline. The excavated material will be transported to an upland containment area for dewatering and disposal. Details of the project are contained in information and plans received at the Division of Water on September 11, 2006, September 19, 2006, October 12, 2006, October 25, 2006, January 8, 2007, and January 10, 2007.

LOCATION : At the Kosciusko County Fairgrounds, 1400 East Smith Street near Warsaw, Wayne Township, Kosciusko County
N½, S½, NW¼, Section 16, T 32N, R 6E, Warsaw Quadrangle
UTM Coordinates: Downstream 4564874 North, 597298 East

APPROVED BY :

James J. Hebenstreit, P.E., Assistant Director
Division of Water

APPROVED ON : February 2, 2007

Attachments: Notice Of Right To Administrative Review
General Conditions
Special Conditions
Service List

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

NOTICE OF RIGHT TO ADMINISTRATIVE REVIEW

APPLICATION #: PL- 20549

This signed document constitutes the issuance of a permit by the Department of Natural Resources, subject to the conditions and limitations stated on the pages entitled "General Conditions" and "Special Conditions".

The permit or any of the conditions or limitations which it contains may be appealed by applying for administrative review. Such review is governed by the Administrative Orders and Procedures Act, IC 4-21.5, and the Department's rules pertaining to adjudicative proceedings, 312 IAC 3-1.

In order to obtain a review, a written petition must be filed with the Division of Hearings within 18 days of the mailing date of this notice. The petition should be addressed to:

Mr. Stephen L. Lucas, Director
Division of Hearings
Room W272
402 West Washington Street
Indianapolis, Indiana 46204

The petition must contain specific reasons for the appeal and indicate the portion or portions of the permit to which the appeal pertains.

If an appeal is filed, the final agency determination will be made by the Natural Resources Commission following a legal proceeding conducted before an Administrative Law Judge. The Department of Natural Resources will be represented by legal counsel.

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

GENERAL CONDITIONS

APPLICATION #: PL- 20549

(1) If any archaeological artifacts or human remains are uncovered during construction, federal law and regulations (16 USC 470, et seq.; 36 CFR 800.11, et al) and State Law (IC 14-21-1) require that work must stop and that the discovery must be reported to the Division of Historic Preservation and Archaeology within 2 business days.

Division of Historic Preservation and Archaeology
Room W274
402 West Washington Street
Indianapolis, IN 46204

Telephone: (317) 232-1646, FAX: (317) 232-8036

(2) This permit must be posted and maintained at the project site until the project is completed.

(3) This permit does not relieve the permittee of the responsibility for obtaining additional permits, approvals, easements, etc. as required by other federal, state, or local regulatory agencies. These agencies include, but are not limited to:

Agency	Telephone Number
*US Army Corps of Engineers, Louisville District	(502) 315-6733
Indiana Department of Environmental Management	(317) 233-8488 or (800) 451-6027
Local city or county planning or zoning commission	

(4) This permit must not be construed as a waiver of any local ordinance or other state or federal law.

(5) This permit does not relieve the permittee of any liability for the effects which the project may have upon the safety of the life or property of others.

(6) This permit may be revoked by the Department of Natural Resources for violation of any condition, limitation or applicable statute or rule.

(7) This permit shall not be assignable or transferable without the prior written approval of the Department of Natural Resources. To initiate a transfer contact

Mr. Michael W. Neyer, PE, Director
Division of Water
Room W264
402 West Washington Street
Indianapolis, IN 46204

Telephone: (317) 232-4160, Toll Free: (877) 928-3755
FAX: (317) 233-4579

(8) The Department of Natural Resources shall have the right to enter upon the site of the permitted activity for the purpose of inspecting the authorized work

(9) The receipt and acceptance of this permit by the applicant or authorized agent shall be considered as acceptance of the conditions and limitations stated on the pages entitled "General Conditions" and "Special Conditions".

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

SPECIAL CONDITIONS

APPLICATION #: PL- 20549

PERMIT VALIDITY : This permit is valid for 24 months from the "Approved On" date shown on the first page. If work has not been completed by February 02, 2009 the permit will become void and a new permit will be required in order to continue work on the project.

This permit becomes effective 18 days after the "MAILED" date shown on the first page. If both a petition for review and a petition for a stay of effectiveness are filed before this permit becomes effective, any part of the permit that is within the scope of the petition for stay is stayed for an additional 15 days.

CONFORMANCE : Other than those measures necessary to satisfy the "General Conditions" and "Special Conditions", the project must conform to the information received by the Department of Natural Resources on: September 11, 2006, September 19, 2006, October 12, 2006, October 25, 2006, January 8, 2007 and January 10, 2007. Any deviation from the information must receive the prior written approval of the Department.

Number	Special Condition
(1)	minimize the movement of resuspended bottom sediment from the immediate project area
(2)	if sediment is removed hydraulically and transported to an upland dewatering basin, adequate slurry detention time and sediment removal measures must be used to ensure that the water returned to the lake is not carrying excessive sediment back to the lake
(3)	revegetate all bare and disturbed areas landward of the shoreline with a mixture of grasses (excluding all varieties of tall fescue) and legumes as soon as possible upon completion
(4)	all excavated material must be properly spread landward of the shoreline on the property described on page 1 under "DESCRIPTION" or completely removed from the project site such that erosion and off-site sedimentation of the material is prevented
(5)	pursuant to 312 IAC 11-4-2 (h), do not place an impermeable material or structure (including but not limited to concrete, steel, or vinyl retaining walls) directly behind the new seawall approved by this permit
(6)	submit digital or standard photographs of the completed bioengineered seawall to the Division of Water within 30 days from the completion of the project; photographs must be taken from the lake side and show how each end of the project ties in to the adjoining shoreline; digital photos can be emailed as jpeg files to enorton@dnr.in.gov or mailed to Department of Natural Resources, Division of Water, 402 W. Washington Street, Room W264, Indianapolis, IN 46204
(7)	livestakes such as dogwood, cottonwood, or willow or other vegetative plantings must be incorporated into the fieldstone at a spacing of no greater than 3 x 3 feet; the livestakes and/or plantings must extend from the upland and extend through the legal shoreline into the lake

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

SPECIAL CONDITIONS

APPLICATION #: PL- 20549

(8) dredging must be initiated after June 30 and be completed by December 31 in any calendar year unless an extension waiver is granted; an extension waiver may be granted by the department upon written request by the licensee to extend a dredging project through January 31 of the subsequent year in order to complete a dredging project that began prior to October 1; an extension waiver may also be granted by the department upon written request by the licensee to extend a dredging project using hydraulic suction through February 28 of the subsequent year in order to complete a dredging project that began prior to November 1; before approving an extension, the department may consider the likelihood of any additional adverse impacts and the likelihood of completion of the project; additional mitigation may be required

(9) livestakes and plantings in field stone must be placed such that the root zone of the plant is supported in soil.

(10) bioengineered seawalls must be maintained as bioengineered; the biological components must be replaced in the result of a die off or if the vegetation is killed off; do not use herbicides on the seawall with the exception of controlling exotic species

(11) construct the seawall in conformance with the attached sketch

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

SERVICE LIST

APPLICATION #: PL- 20549

Kosciusko County 4-H & Commission Fair Inc
Frank Rhoades
1400 East Smith Street
PO Box 1093
Warsaw, IN 46581-1093

US Army Corps of Engineers, Louisville District
Jim Townsend
Regulatory Functions Branch
PO Box 59
Louisville, KY 40201-0059

Indiana Department of Natural Resources
Division of Law Enforcement
North Region Headquarters Dist 1
1124 North Mexico Road
Peru, IN 46970-7522

Kosciusko County Area Plan Commission
Court House, 1st Floor, Room 26
100 West Center Street
Warsaw, IN 46580-2872

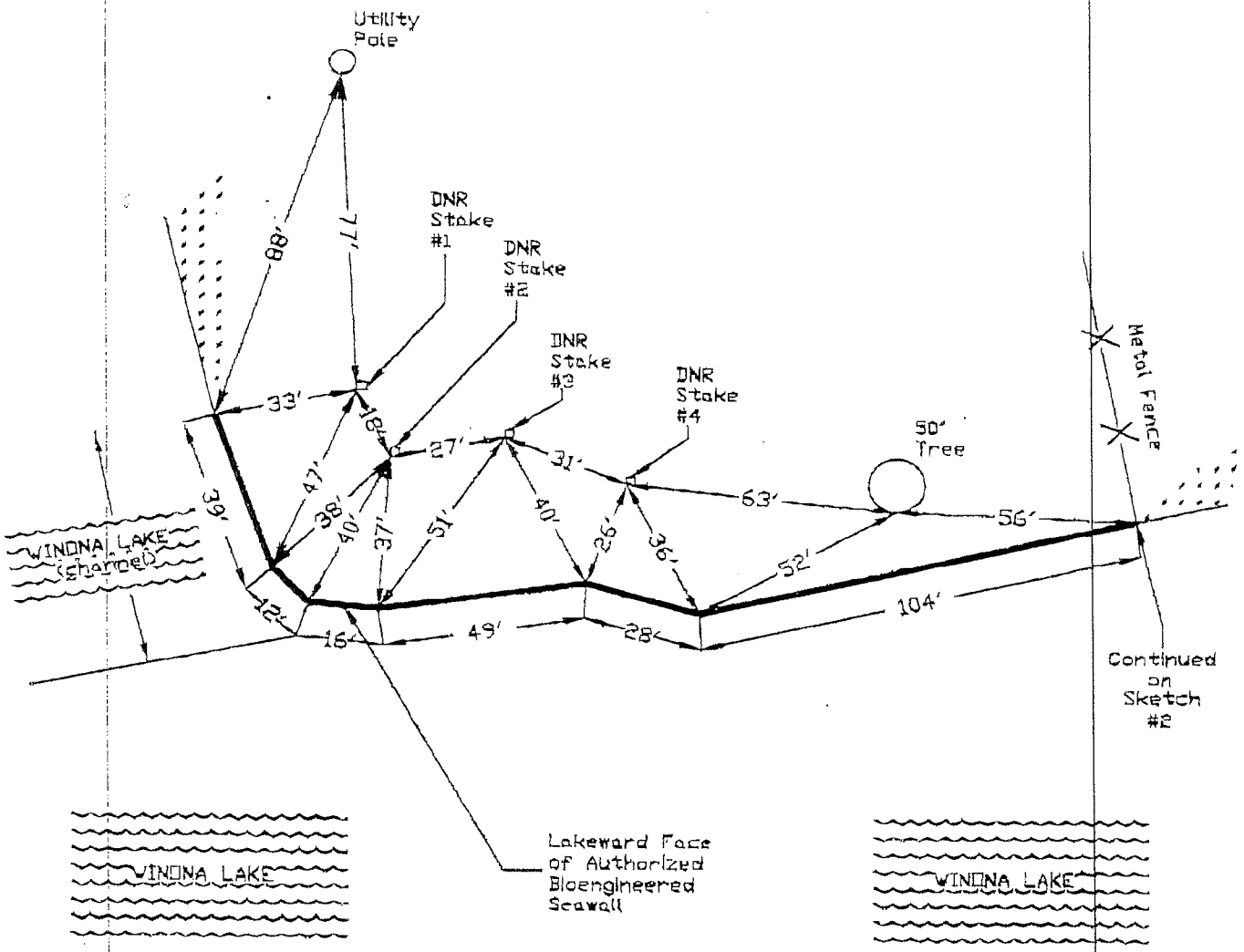
Kosciusko County Soil and Water Conservation District
217 Bell Drive
Warsaw, IN 46580-9362

Warsaw Planning Department
794 West Center Street
PO Box 557
Warsaw, IN 46581-0557

Staff Assignment:

Administrative : Emily N. Norton
Technical : Joseph D. Mapes
Environmental : Christie L. Stanifer

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER



SCALE: 1" = 40'

SKETCH TO ACCOMPANY PL-20549

Sketch #1 of 5

Drawn on: 10/13/2006

Kosciusko County 4H and Commision Fair

WINONA LAKE, KOSCIUSKO COUNTY

NOTES

ALL DISTANCES FROM TREES ARE MEASURED FROM THE LAKEWARD FACE OF THE TRUNK, SEE DRAWING ABOVE.

POSITIONS OF PROPERTY LINES AND REFERENCE POINTS DEPICTED ARE APPROXIMATE.

APPENDIX B

MAINTENANCE AND MONITORING

WINONA LAKE BANK STABILIZATION DESIGN/BUILD
DRAFT REPORT
KOSCIUSKO COUNTY, INDIANA

JFNew

Winona Lake – Kosciusko County Community Fair
Recommended Lakeshore Maintenance Activities

Natural Buffer Area Maintenance

Natural areas are dynamic systems, and a maintenance plan requires flexibility in order to accommodate the development of the site. Native plants tend to germinate and develop at a slower rate than ornamental perennials or turfgrass. Regular maintenance during the native plant establishment period, usually three to seven years, greatly improves the success of the project. The maintenance of the natural areas can include exotic and invasive species control, reseeding, replanting, and monthly site inspections. Species such as **canada thistle, cattails, reed canary grass, common reed, and purple loosestrife** are noxious weeds that establish quickly in newly disturbed area. Upon establishment, these species spread exponentially to nuisance levels, crowding out other desirable plants and reducing the overall diversity and aesthetics of a site. A focused and dedicated maintenance program will reduce the competition from weed species, allowing desirable native plants to develop. Techniques such as mowing, chemical applications, prescribed burning, hand weed removal, overseeding, and replanting need to be implemented to ensure project success.

Overview of Techniques

MOWING

During the establishment period the developing native plants concentrate their energy toward expanding their root systems. Non-native plants tend to concentrate energy towards developing the above-ground portions (vegetative) of the plants. Due to this difference in development we can suppress the non-native plants without negatively impacting the desirable natives by mowing. The native areas should be mowed at approximately 6- 8 inches with a tractor-mounted rotary mower (bush hog). 1-3 mowings may be performed during a growing season, depending on the height and growth of the given vegetation. **Ragweed, Queen Anne's lace, and clover** species are best controlled through mowing events.

CHEMICAL APPLICATIONS

Selective herbicide applications should be used to reduce the unwanted non-native weed populations in the natural areas. Selective herbicide applications will consist of a crew of state-licensed herbicide applicators canvassing the area in search of undesirable plant species. Many perennial weed species in upland and wetlands, such as canada thistle, cattails, and purple loosestrife are best controlled through chemical applications.

PRESCRIBED BURNING

Prescribed burning simulates historical processes that once maintained prairies, and can be very effective in native plant management. Burning will greatly reduce the number of woody species, while enhancing the health of the herbaceous species. Fire also clears thatch, making way for new growth in the spring. The black, burned surface absorbs and retains heat, giving natives an early start in the spring. At the end of the third season of establishment, the site should possess a sufficient fuel matrix to conduct a prescribed burn. This is the ideal and most cost effective form of management for native plant communities. A prescribed burn should only occur after a burn plan has been developed and local permits have been acquired. Professional companies, IDNR staff, and local fire departments are sources for burning service. As a general rule of thumb, fall burning will tend to favor the forbs, while spring burning favors the grasses.

HAND WEED REMOVAL

On very small infestation areas or on sites where chemical applications cannot be performed target species may be removed by hand. Removed plants will be discarded off-site and/ or left on-site in a manner that will not allow the plant to regrow.

OVERSEEDING/ REPLANTING

The need for overseeding or replanting can usually be determined by the middle of the first growing season following installation. It is important to note that most native species grow slowly from seed. Therefore, it may be difficult to assess the development of a recently planted site by searching for native grass and forb species. However, some indicators are usually present that will forecast a successful planting, such as cover crop germination. Overseeding and/or replanting should be done in areas that are in need of remediation.

Maintenance Schedule

Year	Timing	Maintenance Required
2009	August	Mow buffer area 6"- 8". Use weed whips to trim shoreline where lifts were installed. *Heavy equipment should not be used on the constructed lift portion of the shoreline.
	September 15-30	Overseed bare areas of the constructed lift with **a slope stabilization seed mix** which can be purchased from JFNew.
	October	Remove temporary fencing used to protect shoreline planting from goose damage.
2010	May	Selectively apply appropriate herbicide to perennial weeds identified within the planting area such as **canada thistle, curly dock, cattails and purple loosestrife**.
	June 15-30	Mow buffer area 6"- 8". Use weed whips to trim shoreline where lifts were installed. *Heavy equipment should not be used on the constructed lift portion of the shoreline.
	July	Selectively apply appropriate herbicide to perennial weeds identified within the planting area such as **canada thistle, curly dock, cattails and purple loosestrife**.
	August	Mow buffer area 6"- 8". Use weed whips to trim shoreline where lifts were installed. *Heavy equipment should not be used on the constructed lift portion of the shoreline.
	September	Selectively apply appropriate herbicide to perennial weeds identified within the planting area such as **canada thistle, curly dock, cattails and purple loosestrife**.
2011	May	Selectively apply appropriate herbicide to perennial weeds identified within the planting area such as canada thistle, curly dock, cattails and purple loosestrife.
	June 15-30	Mow buffer area 6"- 8". Use weed whips to trim shoreline where lifts were installed. *Heavy equipment should not be used on the constructed lift portion of the shoreline.
	July	Selectively apply appropriate herbicide to perennial weeds identified within the planting area such as **canada thistle, curly dock, cattails and purple loosestrife**.
	August	Assess the growth of the native red-osier dogwood shrubs and trim if necessary. Also remove and treat stumps with herbicide for other aggressive woody species such as **cottonwood and willow**.
	October	Implement a prescribed burn within the buffer area. Prescribed burn assistance can be provided by JFNew upon request.

APPENDIX C

DESIGN PLAN SET

WINONA LAKE BANK STABILIZATION DESIGN/BUILD
DRAFT REPORT
KOSCIUSKO COUNTY, INDIANA

JFNew

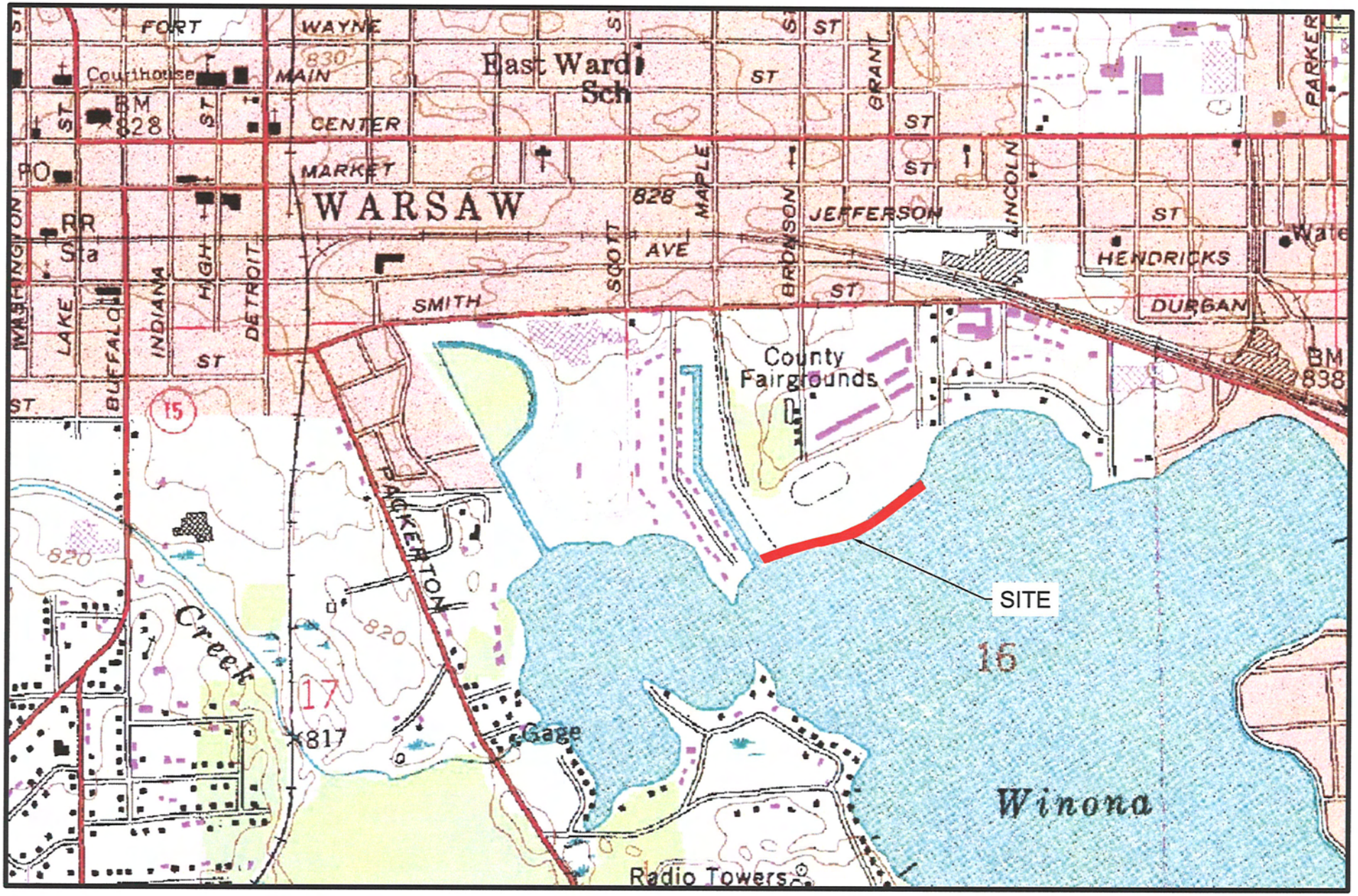


Figure 1 : Project Location
Kosciusko County Fairgrounds
Winona Lake
Warsaw, Indiana
JFNew # 0810131.00

N

0 250' 500' 1000'
Feet

Notes

1.) Base map obtained from http://www.usgs.gov/

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

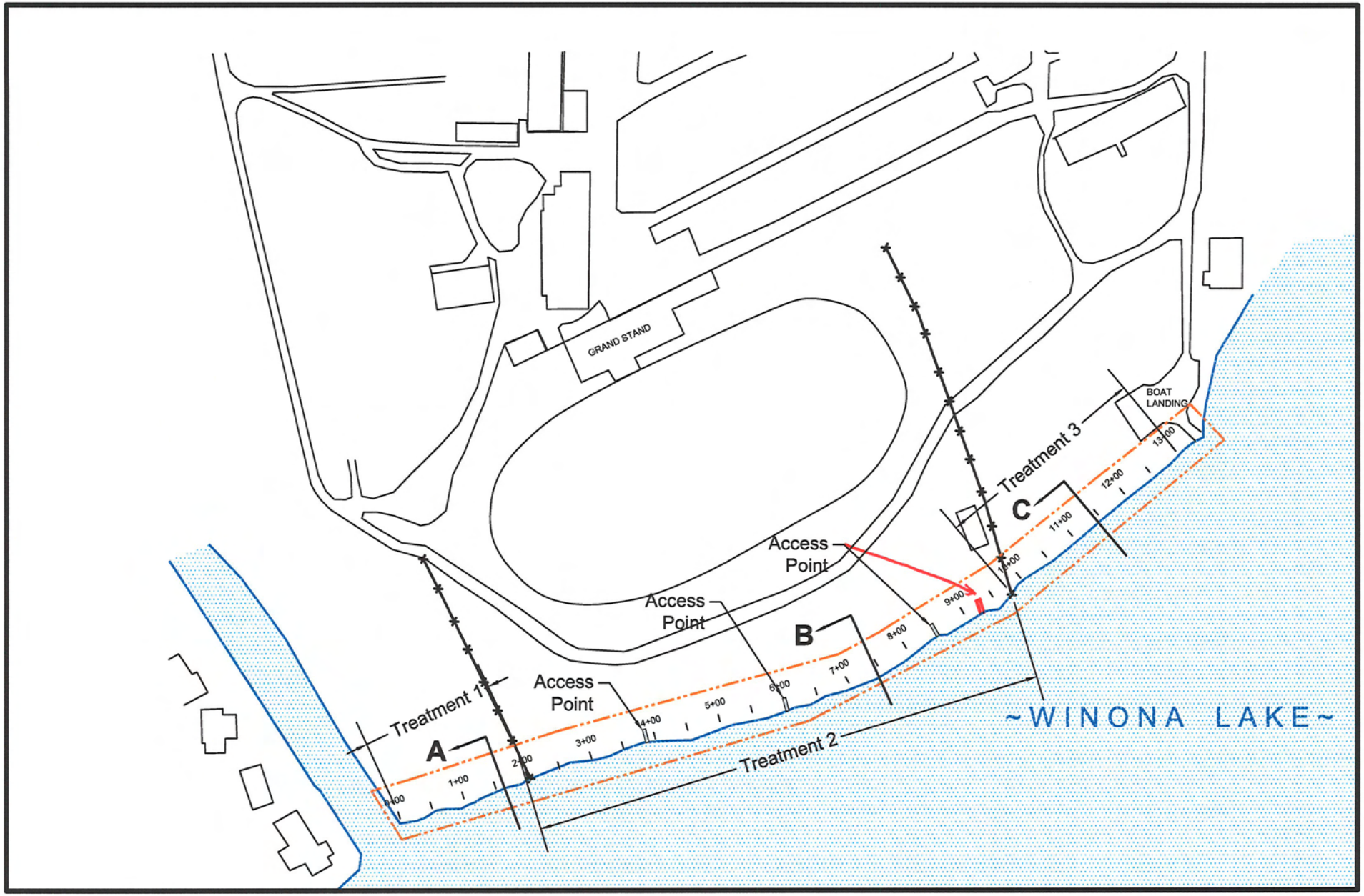


Figure 2 : Proposed Plan
Kosciusko County Fairgrounds
Winona Lake
Warsaw, Indiana
JFNew # 0810131.00

N

0 50' 100' 200'
Feet

Legend

Project Limits

Notes

1.) Refer to Figures 3 and 4 for detail treatments at cross-sections and proposed access points.

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

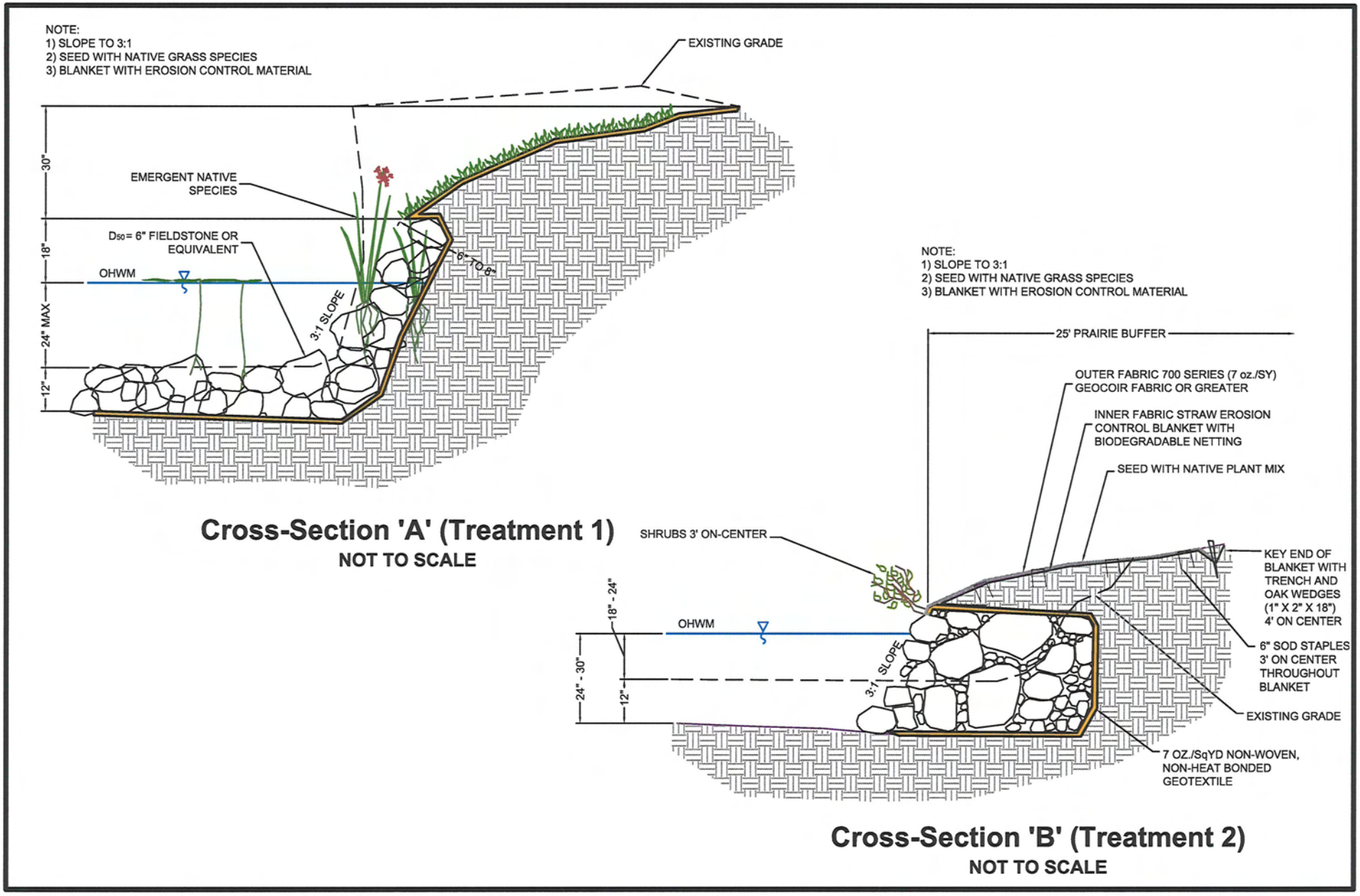
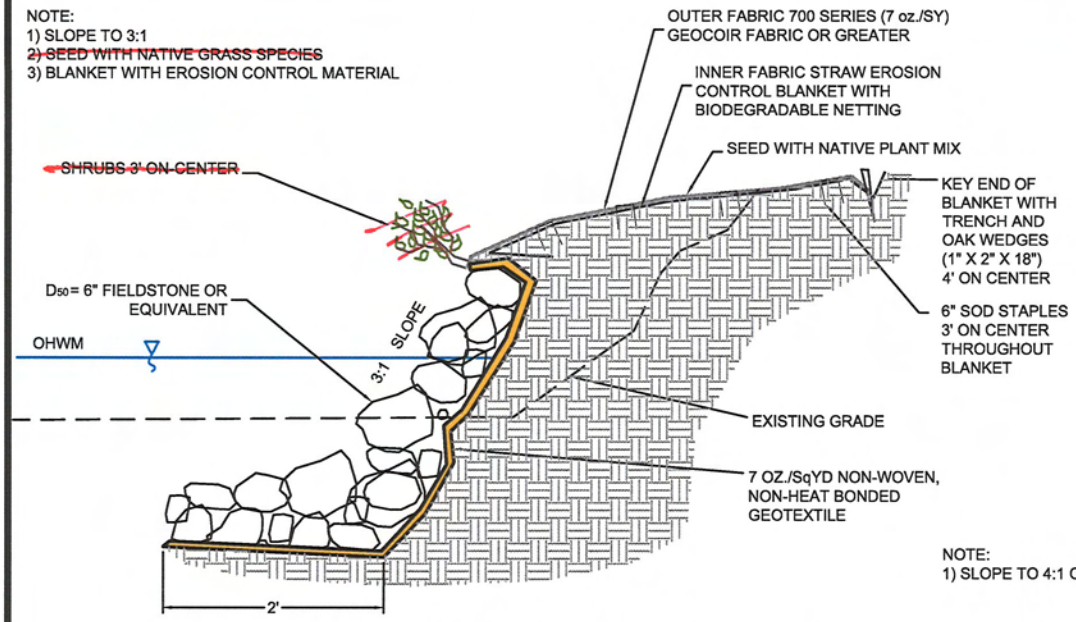
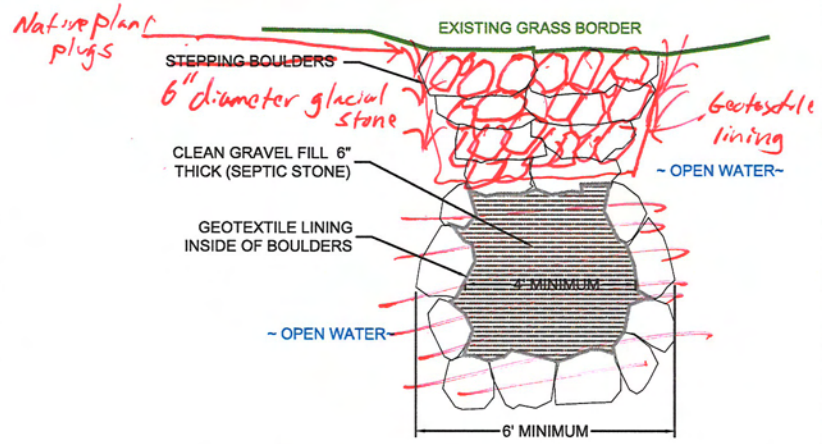


Figure 3 : Cross-Section Treatment Details
Kosciusko County Fairgrounds
Winona Lake
Warsaw, Indiana
JFNew # 0810131.00

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

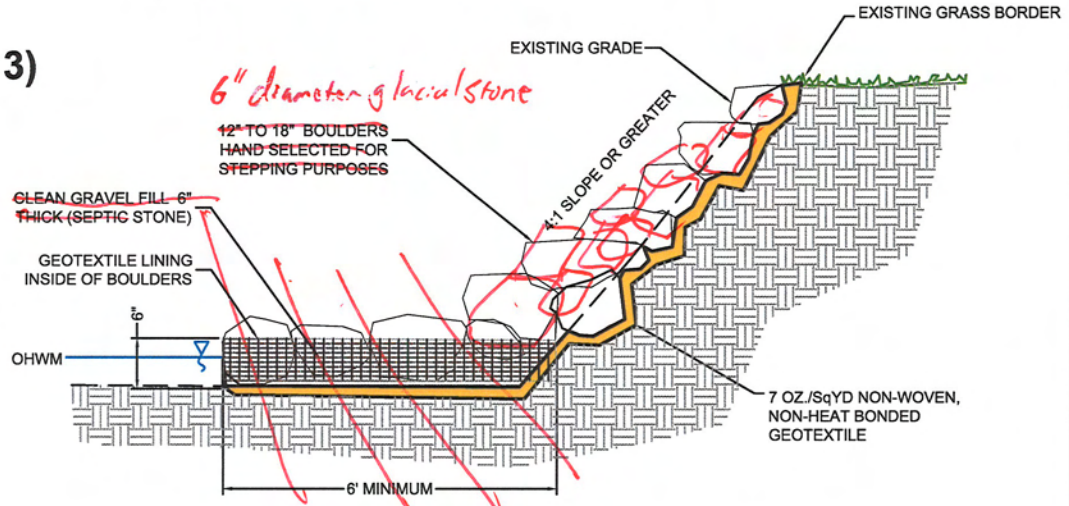


Cross-Section 'C' (Treatment 3)
NOT TO SCALE



Access Point Detail (PLAN VIEW)
NOT TO SCALE

NOTE:
1) SLOPE TO 4:1 OR NATURAL ANGLE, WHICHEVER IS GREATER



Access Point Detail (PROFILE)
NOT TO SCALE

Figure 4 : Cross-Section Treatment and Access Point Detail
Kosciusko County Fairgrounds
Winona Lake
Warsaw, Indiana
JFNew # 0810131.00

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

Construction Specifications

1.0 Rock Toe Installation

A. A key trench shall be excavated on the outer edge of the rock toe for each of the three treatment types. The key trench shall be approximately 1 ft wide by 1 ft deep and run parallel to the shoreline throughout the project area.

B. Material excavated from the key trench shall be placed in an upland location and disposed of properly.

C. Prior to the placement of stone material, non-woven, non-heat bonded, geotextile fabric shall be placed against the bank and along the bottom of the key trench. No geotextile fabric will be used for Treatment A. After rock toe is installed, fabric that is showing shall be trimmed back to the face of the rock toe.

D. The rock toe shall be composed of glacial field stone or rip rap. Material shall be clean and free of debris and other trash. Average diameter of material used shall be 6 inches or greater.

E. Rock toe for each treatment shall conform to dimensions specified on Plan Sheet 2.

2.0 Soil-encapsulated Lift Installation

A. Bare-root or live stake plant material shall be placed between rock toe and soil-encapsulated lift at a minimum of 3 ft on-center spacing.

B. One layer of non-woven, non-heat bonded, geotextile fabric shall be placed on top of the rock toe prior to adding soil back fill material.

C. Inner erosion control material shall be at a minimum a straw erosion control blanket (ECB). Outer ECB shall be coir (coconut) netting with a minimum weight of 7 ounces/square yard.

D. Outer fabric will be spread out along the rock toe with a minimum of 2.5 ft on top of the rock toe with the remainder hanging over the rock face. The outer fabric is added and shall overlap with the landward edge of the outer fabric.

E. Soil shall be added in 6 in. layers. Each layer is compacted via the use of hand tamps, plate compactors, or "Jumping jacks".

F. Once the lift reaches a height of 12 – 18 in. or matches the existing bank, the face of the lift is seeded with the specified seed mixture.

G. The inner fabric shall be flipped around and pulled tight against the lift.

A. The outer fabric shall be flipped around and pulled tight against the lift.

B. The outer 1.5 ft edge of the fabric shall be folded back and a key trench shall be excavated so that once the fabric is folded back the end will be buried.

C. One row of wooden oak wedges (18 in. x 1in. x 2 in.) shall be driven through the edge of the outer blanket in the key trench on 3 ft on-center spacing.

D. The key trench shall be backfilled with soil and graded to match the existing landward bank.

E. Six-inch sod staples shall be placed throughout the width of the soil-encapsulated lift with a minimum spacing of 3 ft on-center.

1.0 Planting and Seeding – Areas other than Soil-encapsulated Lifts

A. Treatment Area A – Plant material will be placed throughout treatment area from the top of the slope, extending below the legal lake level. Planting density will be at a minimum 3 ft on-center.

B. Prairie buffer seeding – Site shall be prepared by applying a 1-2% glyphosate solution to the defined project boundaries prior to seeding. Seed will be distributed at a minimum rate of 591 ounces/acre. Seed may be disturbed by hand or machinery. Seed applied to the surface shall be worked into the soil to a depth of no greater than 0.25 in. or less.

C. Access area planting – Plant plugs shall be planted along a 10 ft width on both sides of the access path for each access area. Plugs shall be spaced 2 ft on-center.

D. Disturbed areas seeding – Areas disturbed during construction shall be seeded with specified turf mixture or equivalent and covered with a minimum of 1 in. of straw or equivalent ECB.

2.0 Site Clean-up

A. Areas disturbed during construction shall be returned to the pre-existing state.

B. Disturbed areas shall be graded to match the existing elevations.

C. Disturbed areas shall be free of large rocks, debris, and other trash.

Figure 5 : Construction Specifications
Kosciusko County Fairgrounds
Winona Lake
Warsaw, Indiana
JFNew # 0810131.00

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708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
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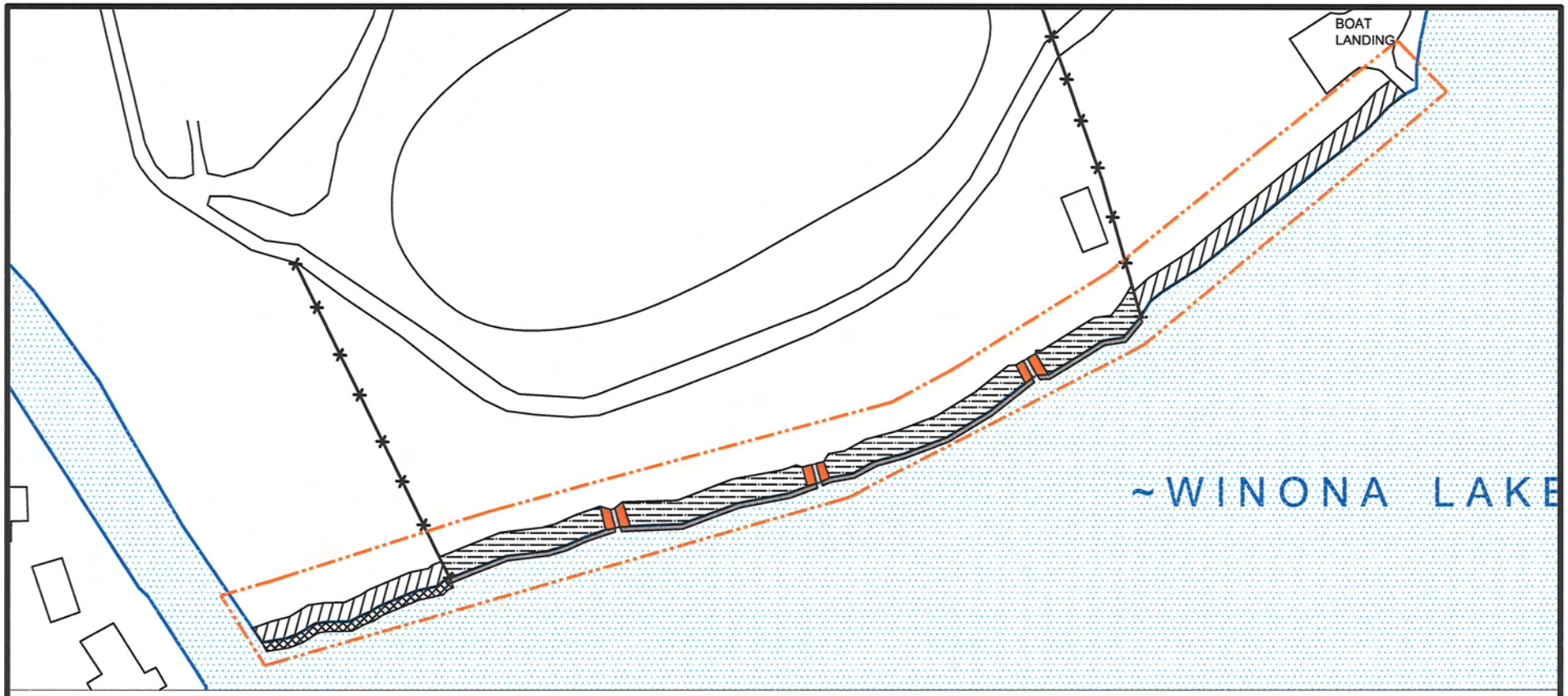

Legend

- ***Project Limits***
- ***Shoreline Planting (0.05 Acre±)***
- ***Disturbed Area Seeding (0.26 Acre±)***
- ***Soil-encapsulated Lift Planting (0.09 Acre±)***
- ***Low Profile Prairie Buffer (0.41 Acre±)***
- ***Access Area Planting (0.03 Acre±)***

Notes

1.) Refer to Figures 7 for plant list.

Figure 6 : Planting Plan
Kosciusko County Fairgrounds
Winona Lake
Warsaw, Indiana
JFNew # 0810131.00

N

0 40' 80' 160'
Feet

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DRAFT

Treatment Area A
Shoreline Planting

Botantical Name	Common Name	No. of plant plugs
Acorus calamus	Sweet Flag	38
Iris virginica	Blue Iris	38
Sagittaria latifolia	Common Arrowhead	38
Scirpus acutus	Hard-stemmed Bulrush	38
Scirpus validus	Great Bulrush	38
	Total Number of Plants	**190**

Treatment Area A and C
Disturbed Area Seeding

Botantical Name	Common Name	PLS Ounces/Acre
Festuca spp.	Tall Fescue	55
Lolium multiflorum	Annual Rye	45
Poa pratensis	Kentucky Bluegrass	35
	Total	**135**

Treatment Area A and C
Disturbed Area Seeding

Botantical Name	Common Name	PLS Ounces/Acre
Festuca spp.	Tall Fescue	55
Lolium multiflorum	Annual Rye	45
Poa pratensis	Kentucky Bluegrass	35
	Total	**135**

Treatment Area B
Soil-encapsulated Lifts

Botanical Name	Common Name	PLS Ounces/Acre
Permanent Grasses:		
Andropogon gerardii	Big Bluestem	48
Bouteloua curtipendula	Side-Oats Gramma	32
Carex sparganioides v. cephaloide	Rough-Clustered Sedge	4
Elymus canadensis	Canada Wild Rye	32
Panicum virgatum	Switch Grass	8
Schizachyrium scoparium	Little Bluestem	32
Sorghastrum nutans	Indian Grass	32
	Total	**188**
Temporary Cover:		
Avena sativa	Common Oats	552
Lolium multiflorum	Annual Rye	222
	Total	**734**
Shrubs		**No. of Bare-root trees**
Cornus sericea	Red-osier dogwood	400
	Total	**400**

Treatment Area B
Access Area Planting

Botantical Name	Common Name	No. of plant plugs
Coreopsis lanceolata	Sand Coreopsis	76
Echinacea pallida	Pale Purple Coneflower	76
Eryngium yuccifolium	Rattlesnake Master	38
Liatris spicata	Marsh Blazing Star	38
Monarda fistulosa	Wild Bergamot	76
Silene regia	Royal Catchfly	38
Silphium perfoliatum	Compass Plant	38
Silphium terebinthinaceum	Prairie Dock	38
Schizachyrium scoparium	Little Bluestem	76
Tradescantia ohiensis	Common Spiderwort	38
	Total No. of Plants	**532**

Treatment Area B
Low-profile Prairie Buffer

Botanical Name	Common Name	PLS Ounces/Acre
Permanent Grasses:		
Bouteloua curtipendula	Side-Oats Gramma	10
Carex bicknellii / Carex brevior	Prairie Sedge Mix	1
Elymus canadensis	Canada Wild Rye	16
Koeleria pyramidata	June Grass	2
Panicum virgatum	Switch Grass	1
Schizachyrium scoparium	Little Bluestem	28
Sporobolus heterolepis	Prairie Dropseed	3
	Total	**61**
Temporary Cover:		
Avena sativa	Common Oats	360
Lolium multiflorum	Annual Rye	120
	Total	**480**
Forbs:		
Amorpha canescens	Lead Plant	1
Anemone cylindrica	Thimbleweed	0.5
Aquilegia canadensis	Wild Columbine	0.5
Asclepias tuberosa	Butterfly Milkweed	2
Aster ericoides	Heath Aster	0.25
Aster laevis	Smooth Blue Aster	0.75
Aster novae-angliae	New England Aster	0.25
Baptisia lactea	White Wild Indigo	1
Chamaecrista fasciculata	Partridge Pea	9
Coreopsis lanceolata	Sand Coreopsis	1.5
Coreopsis palmata	Prairie Coreopsis	1
Dalea purpurea	Purple Prairie Clover	1.5
Echinacea purpurea	Broad-Leaved Purple Coneflov	3.5
Eryngium yuccifolium	Rattlesnake Master	2.5
Kuhunia eupatorioides v. corymbu	False Bone-Set	0.5
Lespedeza capitata	Round-Head Bush Clover	2
Liatris aspera	Rough Blazing Star	0.5
Lupinus perennis	Wild Lupine	2
Monarda fistulosa	Wild Bergamot	0.5
Parthenium integrifolium	Wild Quinine	1
Penstemon digitalis	Foxglove Beard Tongue	0.5
Petalostemum candidum	White Prairie Clover	1.5
Physostegia virginiana	Obedient Plant	0.25
Pycnanthemum virginianum	Common Mountain Mint	1
Ratibida pinnata	Yellow Coneflower	3
Rudbeckia hirta	Black-Eyed Susan	2
Rudbeckia subtomentosa	Sweet Black-Eyed Susan	1
Silphium integrifolium	Rosin Weed	0.5
Silphium terebinthinaceum	Prairie Dock	2
Solidago nemoralis	Old-Field Goldenrod	0.25
Solidago rigida	Stiff Goldenrod	1
Tradescantia ohiensis	Common Spiderwort	0.75
Vernonia gigantea	Smooth Tall Ironweed	1.75
Veronicastrum virginianum	Culver's Root	0.25
	Total	**49.75**

Figure 7 : Plant List
Kosciusko County Fairgrounds
Winona Lake
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COD

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