CONSERVATION PLAN
FOR BLACK SANDSHELL MUSSELS
AND AMERICAN BROOK LAMPREY

(Application for an Incidental Take Authorization)
Per 520 ILCS 10/5.5 and 17 Ill. Adm. Code 1080

DATE: September 16, 2016

PROJECT APPLICANT: Mr. Brent Anderson, Director
Department of Public Works
401 Whitney Boulevard
Belvidere, Illinois 61008

PROJECT NAME: Newburg Road Bridge Rehabilitation

COUNTY: Boone

AREA OF IMPACT: Kishwaukee River at Newburg Road

Incidental taking of endangered and threatened species shall be authorized by the Illinois Department of Natural Resources (IDNR) only if an applicant submits a conservation plan to the Department that satisfies all the following criteria:

1. Description of the impact likely to result from the proposed taking

A) Identification of the area to be affected by the proposed action

All work shall be conducted at the existing bridge carrying Newburg Road/FAU 5009 over the Kishwaukee River in the City of Belvidere, Boone County, IL (42.253960° N, 88.930806° W). The structure is located on Newburg Road east of Shaw Road in the NE ¼ of Sec 31, Twp 44 N, R 3 E, 3rd PM. This is a public roadway bridge owned by the City of Belvidere. This location is within the Kishwaukee River Illinois Natural Areas Inventory (INAI) site.

B) Biological data on the affected species

The Illinois Natural History Survey (INHS) conducted a mussel survey at the bridge on August 17, 2015. Eleven species of freshwater mussels, including 13 individuals of the state-threatened Black Sandshell were collected alive.

The Illinois Natural History Survey (INHS) also conducted a fish survey at the bridge on August 17, 2015. A total of 69 individual fish representing six species were collected. No fish collected are listed as threatened or endangered at the state of federal level. The Natural Heritage Database contains records of American Brook Lamprey near this site, but the specialized lamprey survey techniques were not used during the survey. Therefore, the American Brook Lamprey is assumed to be present at this site because of the recent observation records at nearby sites and the presence of suitable habitat.

Copies of the mussel and fish surveys are included with this conservation plan.

The Black Sandshell (*Ligumia Recta*) is widely distributed but uncommon in much of the Midwest, occurring from the Great Lakes basin south into the Mississippi River drainage to Louisiana. The Black Sandshell is usually found in the riffle and run areas of medium to large rivers in areas dominated by firm sand or gravel. Black Sandshell are listed as threatened species in Illinois due to the decline in habitat, construction of dams which inhibit movement of host fish, and non-point and point source water pollution.

The shell of the Black Sandshell is elongate, moderately thick, and up to 20 cm (8 in.) long. The outside of the shell is smooth and shiny, dark brown or black, and often rayed. The nacre is white, pink, or purple and iridescent in the posterior. The anterior end is rounded while the females have a more truncate posterior and males have a more pointed posterior. The beak sculpture has a few indistinct double loops. The pseudocardinal and lateral teeth are well developed.

Eggs are usually fertilized in August and brooded up to 11 months, where they develop into glochidia larvae. The glochidia are then released into the water where they must attach to the gill filaments and/or general body surface of the host fish. The glochidia develop into juvenile mussels and are then sloughed off as free-living organisms. Host fish for the glochidia of the Black Sandshell include the bluegill, largemouth bass, sauger, and white crappie.

The American Brook Lamprey (Lampetra appendix) is about six to eight inches in length as an adult. Its larval form, the ammocoete, is about eight inches long. The adult is gray to black on the back and upper sides and tan to gray-white below. The larva is dark brown on the back and sides and yellow-brown on the belly and fins. The breeding adult is green-brown to pink-purple or black on the upper surface. Like all lampreys, this fish has no jaws, no scales, no bones, no paired fins, one nostril and seven pairs of gill openings. Its skeleton is made of cartilage. The dorsal fin has two parts with a distinct separation between them. The mouth disc when expanded is narrower than the head. The teeth in the oral disc are arranged in clusters instead of rows.

The American Brook Lamprey may be found in the northeastern one-fourth of Illinois, although it is rare throughout this range. The adult lives in fast riffles of large creeks and small rivers that have clear water. The ammocoete, or larval lamprey, lives in sandy or silty pools where it burrows into the substrate with only its head sticking out. It feeds by filtering small organisms from the water. Spawning occurs in late April and early May. More than 1,600 eggs per female are deposited. This lamprey is not parasitic, and the adults do not feed. They die soon after spawning. The eggs hatch in 20 to 22 days under the proper temperature conditions. The larval form takes five years or more to complete development.

C) Description of the activities that will result in taking of an endangered or threatened species

The proposed bridge rehabilitation includes cleaning and painting of the existing steel beams, replacement of guardrail and the placement of stone riprap for scour control.

Construction will begin with the installation of temporary erosion and sediment control measures including a stone causeway and cofferdams in the river for access and

dewatering. The temporary causeway will be created by placing stone riprap fill (minimum RR3, 5" median size) with a coarse aggregate surface. The causeway will have a maximum of 20' top width and 1V:1.5H side slopes. The causeway we be constructed in two parts extending from each bank. The causeway will not extend across the entire width of the river at any time during construction. The temporary works will be constructed from the upland area. Temporary stockpiles and staging of materials will be in upland areas only. No equipment or stockpiles of materials will be placed in the water during construction.

After construction of the causeway, cofferdams will be installed to isolate the areas planned for permanent riprap installation. The cofferdams will be constructed of non-erodible materials (i.e. sand bags, prefabricated rigid barriers, sheet piling) designed to withstand expected flows. Then, the coffered areas will be dewatered to aid in riprap installation. During dewatering, the intake hose will be placed in a stabilized sump pit and the outlet discharged above the water line on a non-erodible energy dissipating surface.

Stone riprap (RR5, 10" median size) will then be placed around the bridge abutments and piers as a permanent scour countermeasure. The bed for the riprap will be excavated so the finished surface of the riprap will conform to the existing channel. The stone riprap will be placed by mechanical means to its full course thickness in one operation. All excavated material will be removed from the channel and disposed in an upland location. Staging of materials will also be in an upland area. Temporary stockpiling of riprap or excavated material in the channel will not be allowed.

At the completion of construction, the temporary causeway and cofferdams will be removed from the river and the area restored to pre-construction elevations. Construction is planned for summer 2017. The duration of construction is estimated to be two months.

D) Explanation of the anticipated adverse effects on listed species

Individual mussels or fish remaining in the work area may be crushed or smothered by the construction. In addition, sediment can affect populations both within the project limits and downstream from the site. Sedimentation and suspended solids from erosion and construction practices can inhibit the mussel's crucial filter feeding functions. Sediment can cover the gravel beds used for lamprey spawning. Minimizing the amount of disturbed area within the project limits is necessary to reduce stirring of sediment within the stream bed as much as possible.

2) Measures the applicant will take to minimize and mitigate that impact and the funding that will be available to undertake those measures

A) Plans to minimize the area affected by the proposed action

The area of temporary impact for the causeway and cofferdams is estimated to be 5900 square feet (0.14 acre). The area of permanent impact due to the riprap is 3300 square feet (0.08 acres). The length of impact along the stream channel will be approximately 80 linear feet.

The proposed improvement will rehabilitate the existing bridge in its current location. There will be no change in use compared to the existing conditions. The proposed work area is the minimum needed to access the bridge for painting and the installation of riprap. The area impacted by permanent riprap is the minimum needed to control scour around the bridge piers.

B) Plans for management of the area affected by the proposed action that will enable continued use of the area by endangered or threatened species

After work is complete, the temporary causeway and cofferdams will be removed from the channel. The contractor will remove the temporary material in reverse operations of the placement. The stone will be excavated by equipment placed on the remaining causeway or on the channel banks. Some of the stone removed from the causeway can be reused in the permanent riprap aprons. The remainder of the temporary material will be removed from the site and disposed in an upland location. No equipment will be placed in the water during this work.

Following removal of the temporary works, the streambed and habitats will be controlled by natural processes. Similar suitable habitat exists both upstream and downstream of the project area and over time mussels and fish should move back into the area beneath the bridge.

C) Description of measures to avoid, minimize, and mitigate the effects of the proposed action on endangered or threatened species.

Prior to the start of construction, the INHS staff will resurvey the area and all mussels collected will be marked and relocated upstream to an area of suitable habitat outside the work area. This will minimize the number of mussels potentially affected during construction activity.

The temporary in-stream works will be constructed of non-erodible material and shall be constructed to withstand expected high flows. Temporary cofferdams will be used to dewater the work area and control release of sediment during installation of the stone riprap. Dewatering measures will be conducted in accordance with the latest version of the Illinois Urban Manual. Fish and other aquatic species will be removed from the coffered areas if observed during dewatering.

Any individuals remaining in the work area may be harmed by the proposed work. Juveniles are more likely to remain undiscovered due to their small size. An estimated total of 13 Black Sandshell mussels are expected to be taken during this work, based on the number identified during the original survey and an estimated 50% recovery rate. An estimated total of 1 to 3 American Brook Lamprey are expected to be taken.

Siltation has the greatest potential to cause harm downstream of the bridge. An Erosion and Sediment Control Plan will be prepared and included in the contract documents. The plan will address the potential for erosion from both upland and in-stream sources in the work area, and will include measures for permanent stabilization of disturbed upland areas.

All cleaning and paint residues will be collected and disposed in an off-site location. No construction debris will be deposited into the stream channel.

In-stream work will be conducted during seasonal low flow conditions (August through October). Work will be conducted outside the typical lamprey spawning season of April 15 through May 15. Normal flow within the stream will be maintained at all times. All materials used for temporary works will be removed to upland areas at the completion of construction.

A donation to the Illinois Wildlife Preservation Fund conservation fund is proposed in-lieu of on-site mitigation for the proposed taking of the listed mussels. In this case, the costs of the mussels if they were to be produced and stocked are used to determine mitigation costs.

Using the project specifics:

a. Thirteen (13) individuals of the black sandshell mussel were found under the structure during the August 2015 survey. Assuming a 50% discovery rate of the mussels during this survey and an equivalent rate during the relocation effort, a total of 13 black sandshell mussels may remain in the work area and require mitigation.

b. Assuming an average survival rate of 0.095 and a mitigation ratio of 5.5:1 yields the following:
   13 mussels / 0.095 x 5.5 = 753 mussels needed for replacement

c. An estimated replacement cost for the mussels is based on the following scientific publication: Southwick, R.I., and Loftus, A.J., 2003. Investigation and Monetary Values of Fish and Freshwater Mussel Kills. American Fisheries Society, Special Publication 30. Bethesda, Maryland.

   Standard formulas have been developed to determine the replacement costs of juvenile freshwater mussels. Cost categories for production of juvenile mussels are as follows: Easy=$0.44/mussel; Average=$0.73/mussel; and Difficult= $9.63/mussel.

   Black Sandshell mussels are Average cost category = $0.73/mussel

d. <u>Equivalent cost of mitigation = 753 mussels x $0.73 = $550.00</u>

Therefore, the applicant will provide the IDNR with a donation to the Illinois Wildlife Preservation Fund in the amount of: $550.00. This check shall be received within 6 months after formal implementation of the ITA. These funds will be used for management and recovery actions of listed mussels within the State of Illinois.

A donation in-lieu of on-site mitigation is proposed for the taking of the American Brook Lamprey. The applicant will provide an additional donation of $550.00, equivalent to the amount for the mussel species. The donation will be made to support research on the species life history in the State of Illinois.

D) Plans for monitoring the effects of measures implemented to minimize or mitigate the effects of the proposed action

Specified best management practices in the Erosion and Sediment Control Plan will be implemented by the contractor during construction. Inspections to ensure proper working

order and maintenance of practices will be made daily by the staff of the City of Belvidere. Additional inspections will be made immediately prior to and following events of heavy rain for the area as indicated in the Stormwater Pollution Prevention Plan.

Post construction mussel and fish surveys will be conducted at the construction site and relocation site two years and five years following completion of the project. Results will be sent to the IDNR within 60 days of completion of the surveys.

E) Adaptive management practices that will be used to deal with changed or unforeseen circumstances that affect the effectiveness of the measures instituted

The installation and effectiveness of the soil conserving practices will be monitored daily by the Resident Engineer from the City of Belvidere to observe if eroded soil is leaving the limits of construction. The Resident Engineer has the authority to require the Contractor install additional soil conserving practices not included in the approved Stormwater Pollution Prevention Plan but deemed necessary for site conditions.

F) Verification that adequate funding exists to support and implement all mitigation activities described in the conservation plan

The project is funded by the City of Belvidere with Motor Fuel Tax funds dedicated by City Resolution. The estimated cost includes funding for implementation of the erosion and sediment control measures and all mitigation activities described in this plan.

3) A description of alternative actions the applicant considered

Alternate 1: No-action
For this alternate, the existing bridge would be left in place with no in-stream work. There would be no potential taking of the listed species. The bridge piers would continue to be scour critical. The existing steel beams would continue in their deteriorated condition. This could lead to closure of the road, sudden collapse of the bridge and potential injury or loss of life; both human and to the threatened species. The “no-action” alternate is not considered feasible or prudent because it poses an unacceptable safety hazard and places intolerable restrictions on travel and transport.

Alternate 2: Painting from the bridge deck
Cleaning and painting of the steel beams could be completed by suspending a working platform from the bridge deck. This alternate may reduce the temporary impact area needed for working platforms in the stream. Temporary and permanent stream impacts would still be required for riprap placement. The structure would be closed to traffic for 30-45 days, which places a significant burden on the travelling public due to the high volume of traffic (7900 vehicles average daily traffic) and length of adverse travel required for a detour. This alternate was eliminated since the small reduction in temporary impacts did not justify the significant traffic disruption during road closure.

4) Data and information to indicate the proposed taking will not reduce the likelihood of the survival of the species in the wild within the State of Illinois.

The Black Sandshell is fairly widespread in Illinois occurring in 29 counties. Suitable habitat for the mussel is present upstream and downstream of the work area. Due to the small area affected by the installation of riprap and the proposed relocation of the

mussels, it is expected that this species will continue to exist in this reach of the Kishwaukee River.

The American Brook Lamprey is present at several sites along the Kishwaukee River and throughout northeastern Illinois. Suitable habitat for the lamprey is present upstream and downstream of the work area. Due to the small area of impact, the potential taking at this location is not expected to affect the survival of this species in the Kishwaukee River.

5) An implementing agreement, which shall include, but not be limited to:

A) The names and signatures of all participants in the execution of the conservation plan;

Mr. Brent Anderson
Department of Public Works
401 Whitney Blvd., Ste. 200
Belvidere, Illinois 61008

B) The obligations and responsibilities of each of the identified participants with schedules and deadlines for completion of activities included in the conservation plan and a schedule for preparation of progress reports to be provided to the IDNR

The Illinois Department of Natural Resources shall be responsible for the review of this Conservation Plan and for subsequent issuance of the Incidental Take Authorization.

The City of Belvidere is responsible for securing authorization for incidental take of state-listed species; securing all permits including Section 404 and Office of Water Resources. The City will conduct inspections of the work area and ensure contractor compliance with the contract documents.

The Illinois Department of Transportation is responsible for tasking the Illinois Natural History Survey to conduct post-construction monitoring and coordinating post-construction monitoring results with the resource agency.

Project construction is anticipated to begin in Summer 2017. The duration of construction is estimated to be two months. Black Sandshell relocation will be conducted no more than 30 days prior to the start of construction. The IDNR will be notified within 30 days of the start of construction and at the completion of site stabilization work.

Post construction fish and mussel surveys will be conducted at the construction site and relocation site two years and five years following completion of the project. Results will be sent to the IDNR within 60 days of completion of the surveys.

C) Certification that each participant in the execution of the conservation plan has the legal authority to carry out their respective obligations and responsibilities under the conservation plan;

The structure is under the jurisdiction and maintenance of the City of Belvidere. This project is authorized by the Illinois Department of Transportation, who oversees the use of state-distributed funding among local agencies.

D) Assurance of compliance with all other federal, State and local regulations pertinent to the proposed action and to execution of the conservation plan;

The City of Belvidere, as directed by the Illinois Department of Transportation, abides by the National Environmental Policy Act and associated state and federal environmental laws to ensure environmentally sensitive methods of transportation planning and engineering.

A Section 404 permit from the U.S. Army Corps of Engineers (ACOE) 404 is required for the project. The project is designed to comply with the terms and conditions of the Nationwide Permit 14 – Linear Transportation Projects. Written approval from the ACOE will be obtained prior to the start of work.

E) Copies of any final federal authorizations for a taking already issued to the applicant, if any.

Not applicable. The Black Sandshell mussel and American Brook Lamprey are not federally threatened or endangered.

Attachments:

1. Location Map
2. Site Photographs
3. Plan and Profile Sheet
4. Riprap Layout Plan
5. Erosion Control Plans
6. INHS Mussel Survey Report
7. INHS Fish Survey Report

LOCATION MAP

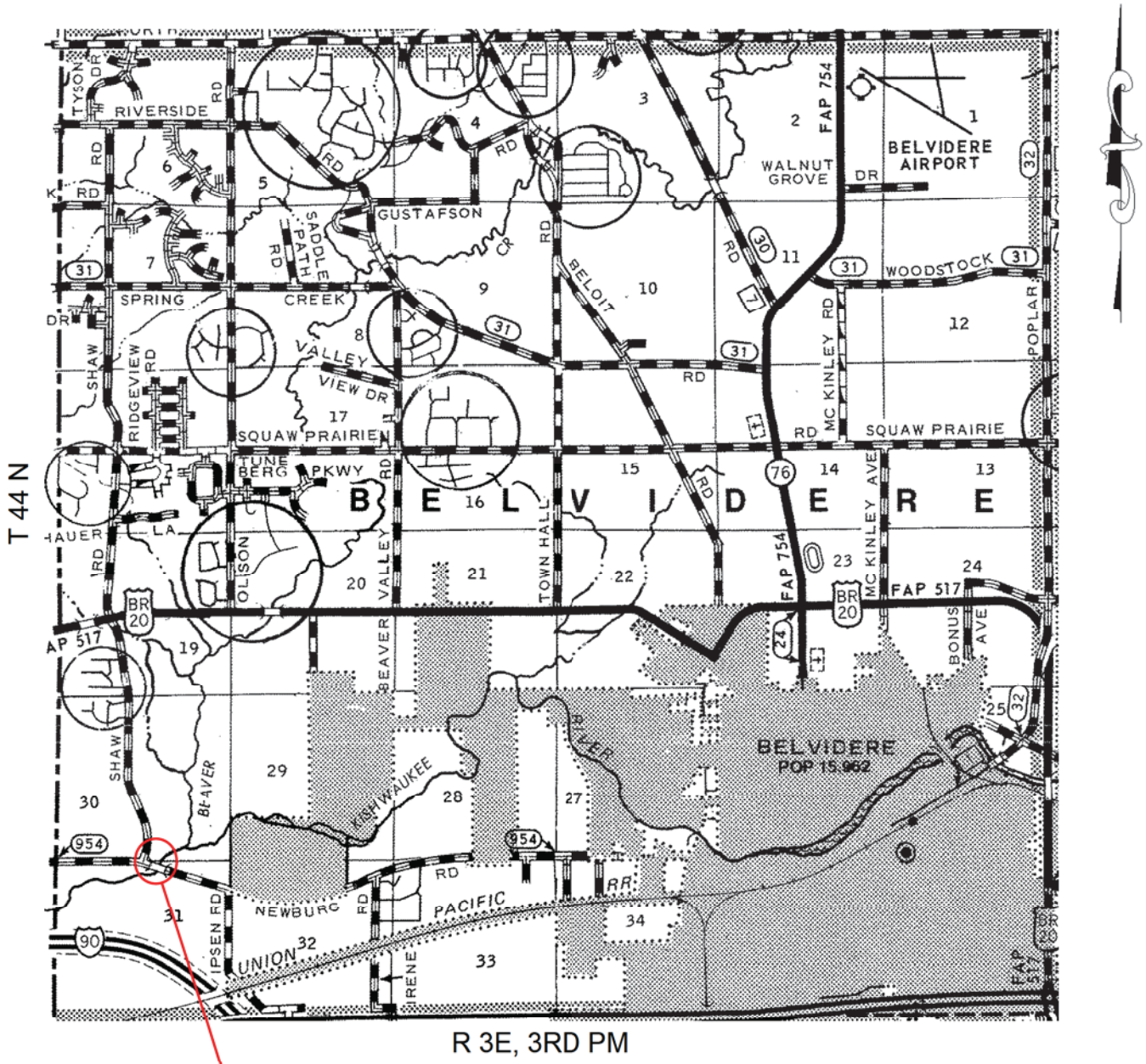


PHOTO LOG - 6/21/2012

City of Belvidere
Section 12-00110-00-BR
SN 004-3013

East Abutment

Looking East – Typical Deck

PHOTO LOG - 6/21/2012

City of Belvidere
Section 12-00110-00-BR
SN 004-3013

North Rail & Curbline

Looking West – East Abutment

PHOTO LOG - 6/21/2012

City of Belvidere
Section 12-00110-00-BR
SN 004-3013

North Elevation

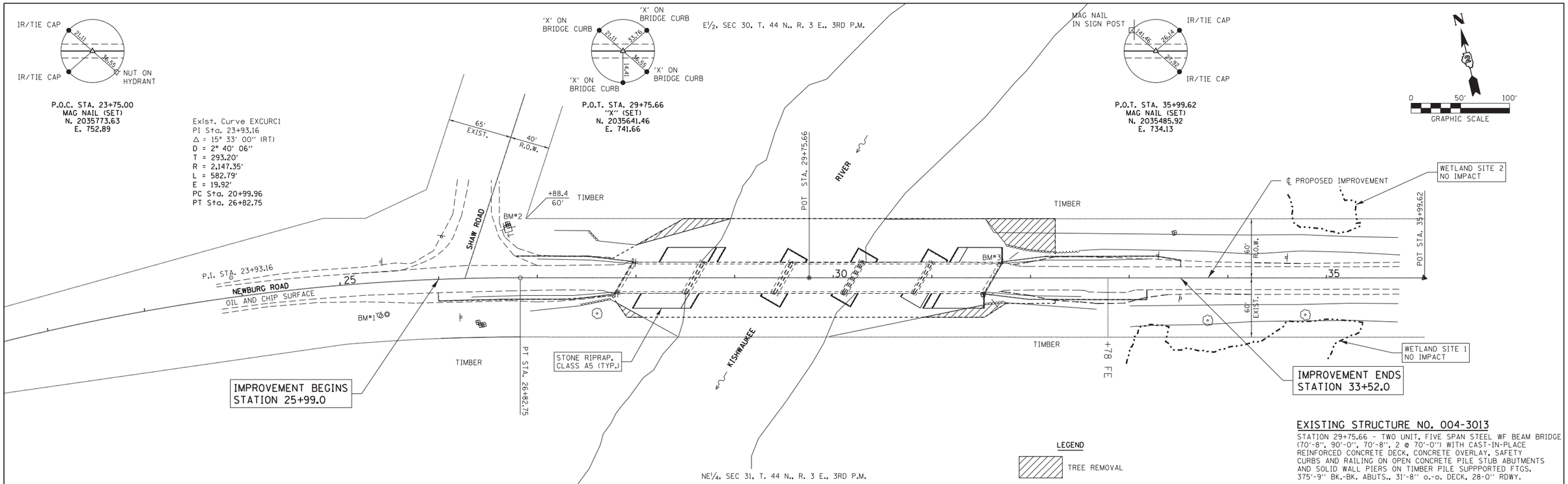
East Abutment Slope

Pier 3 – North Elevation

South Elevation – Eastern Spans

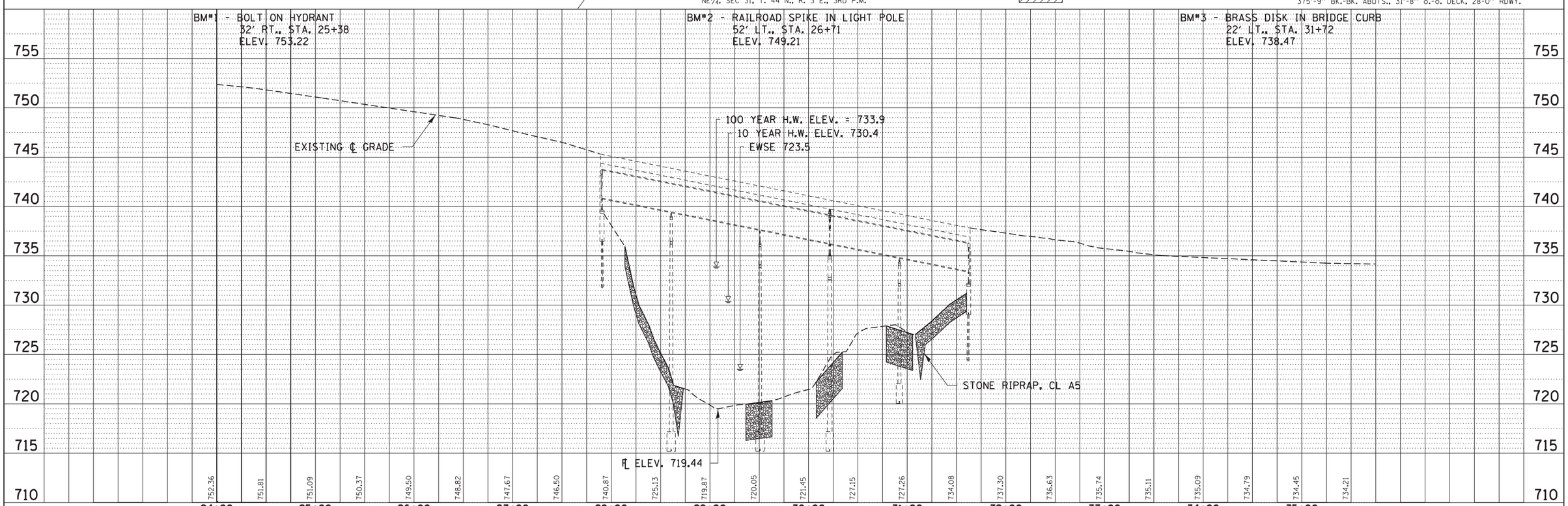
Pier 3 – South Elevation

East Abutment Slope – South Elevation



EXISTING STRUCTURE NO. 004-3013

STATION 29+75.66 - TWO UNIT, FIVE SPAN STEEL WF BEAM BRIDGE (70'-8", 90'-0", 70'-8", 2 @ 70'-0") WITH CAST-IN-PLACE REINFORCED CONCRETE DECK, CONCRETE OVERLAY, SAFETY CURBS AND RAILING ON OPEN CONCRETE PILE STUB ABUTMENTS AND SOLID WALL PIERS ON TIMBER PILE SUPPPORTED FTGS. 375'-9" BK.-BK. ABUTS., 31'-8" o.-o. DECK, 28-0" RDWY.



PLAN		BY	DATE
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PROFILE		BY	DATE
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STRUCTURE NOTATNS CHKD			
NOTE BOOK NO.			

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ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP. 184.000959	PLOT DATE = 7/14/2016	DATE - 01/26/16	REVISED -

CITY OF BELVIDERE
DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE
NEWBURG ROAD

SCALE: H10:V1 | SHEET NO. 1 OF 1 SHEETS | STA. 24+00.00 TO STA. 35+99.62

F.A.U.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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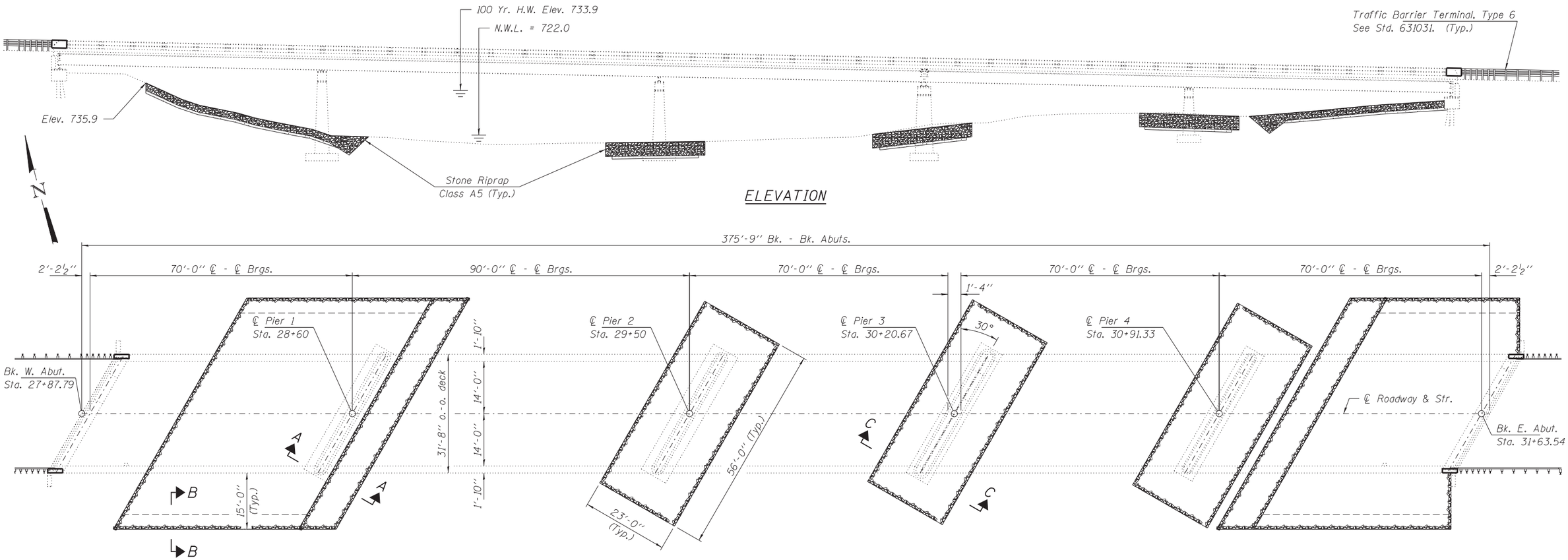
NEWBURG ROAD		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		



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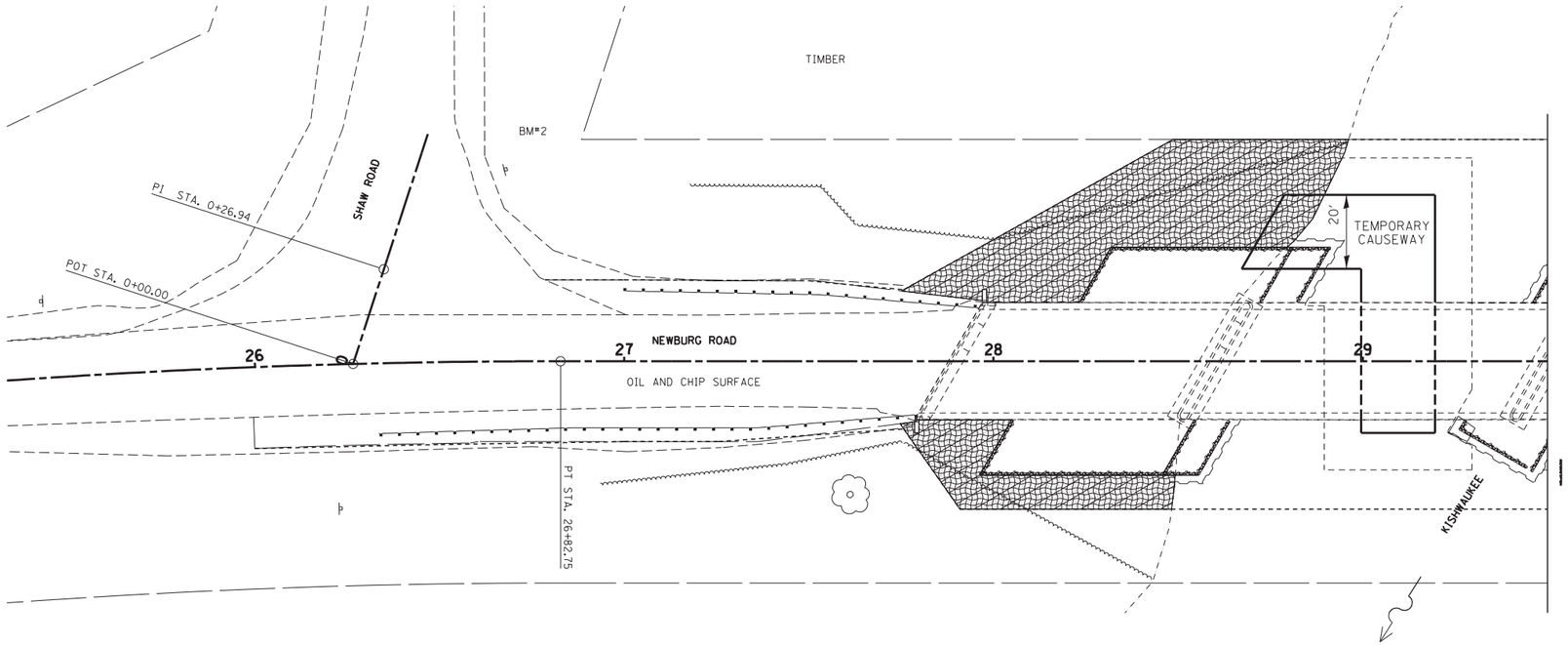
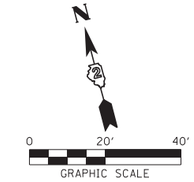
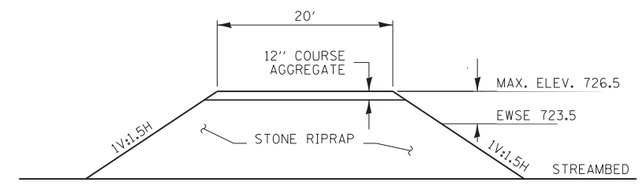
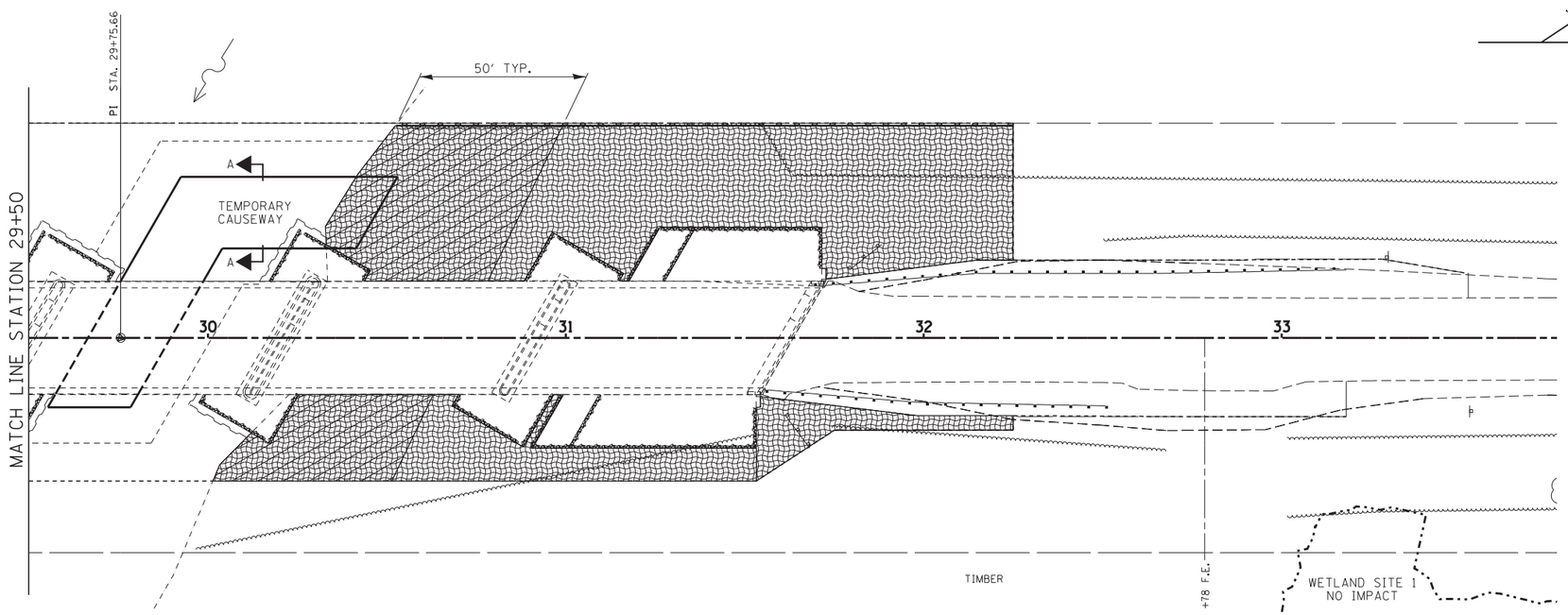
HAMPTON, LENZINI AND RENWICK, INC. 3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703		CHECKED - S.W.M.	REVISED -			5009	12-00110-00-BR	BOONE		
ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP. 184.000959	PLOT SCALE = $SCALE$	DRAWN - R.D.H.	REVISED -			NEWBURG ROAD		CONTRACT NO.		
	PLOT DATE = 7/14/2016	CHECKED - J.W.F.	REVISED -		SHEET NO. OF SHEETS		ILLINOIS FED. AID PROJECT			







SECTION A-A
TEMPORARY CAUSEWAY DETAIL



LEGEND

- COFFERDAMS
- PERIMETER EROSION BARRIER
- WETLAND LIMITS (NO IMPACTS)
- SEEDING CLASS 2 (SPECIAL) AND EROSION CONTROL BLANKET
- SEEDING CLASS 4 (SPECIAL) AND EROSION CONTROL BLANKET
- STONE RIPRAP, CLASS A5

FILE NAME = 120162-sht-eros.dgn	USER NAME = $USER$	DESIGNED - J.W.F.	REVISED -
HAMPTON, LENZINI AND RENWICK, INC. 3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703 ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP. 184.000959		DRAWN - T.W.K.	REVISED -
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	PLOT DATE = 7/14/2016	DATE - 03/25/16	REVISED -

CITY OF BELVIDERE
DEPARTMENT OF PUBLIC WORKS

EROSION CONTROL PLAN
NEWBURG ROAD

SCALE: | SHEET NO. 1 OF 3 SHEETS | STA. | TO STA.

F.A.U.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
5009	12-00110-00-BR	BOONE		
NEWBURG ROAD		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

GENERAL NOTES FOR SOIL EROSION AND SEDIMENT CONTROL

1. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED ACCORDING TO THE STANDARDS AND SPECIFICATIONS IN THE 2013 ILLINOIS URBAN MANUAL (IUM), THE ILLINOIS DEPARMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, ADOPTED APRIL 1, 2016 AND THE PLAN DETAILS.

2. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON SITE AT ALL TIMES. IT SHALL BE PRESENTED UPON REQUEST FROM ANY AUTHORIZED AGENT.

3. THE EROSION CONTROL MEASURES INDICATED ON THE PLANS ARE THE MINIMUM REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE ENGINEER AND KDSWCD

4. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO INFORM ANY SUB-CONTRACTOR(S) WHO MAY PERFORM WORK ON THIS PROJECT, OF THE REQUIREMENTS IN IMPLEMENTING AND MAINTAINING THESE EROSION CONTROL PLANS AND THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS SET FORTH BY THE ILLINOIS EPA.

5. SOIL EROSION AND SEDIMENT CONTROL FEATURES SHALL BE CONSTRUCTED PRIOR TO THE COMMENCEMENT OF UPLAND DISTURBANCE. SOIL DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER TO MINIMIZE EROSION. SOIL STABILIZATION MEASURES SHALL CONSIDER THE TIME OF YEAR, SITE CONDITIONS AND THE USE OF TEMPORARY OR PERMANENT MEASURES.

6. PRIOR TO COMMENCING LAND-DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING BUT NOT LIMITED TO, ADDITIONAL PHASES OF DEVELOPMENT AND OFF-SITE BORROW OR WASTE AREAS) A SUPPLEMENTARY EROSION CONTROL PLAN SHALL BE SUBMITTED TO THE OWNER FOR REVIEW.

7. THE CONTRACTOR SHALL CLEANUP AND GRADE THE WORK AREA AS THE PROJECT PROGRESSES TO ELIMINATE THE CONCENTRATION OF RUNOFF. THE PAVEMENT SHALL BE CLEANED DAILY TO REMOVE EARTH MATERIAL TO THE SATISFACTION OF THE ENGINEER. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS WORK.

8. ALL TEMPORARY EROSION CONTROL MEASURES MUST BE MAINTAINED AND IMMEDIATELY REPLACED AS NEEDED AND AS DIRECTED BY THE ENGINEER. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL INSPECTION AND REPAIR. THE CONTRACTOR SHALL INSPECT AND COMPLETE MAINTENANCE OF ALL ITEMS A MINIMUM OF EVERY 7 DAYS AND WITHIN 24 HOURS OF A ONE-HALF INCH RAINFALL. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SEEDING IS ACHIEVED. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS WORK.

9. REMOVAL OF TRAPPED SEDIMENT SHALL BE PAID FOR AS EARTH EXCAVATION. SEDIMENT SHALL BE REMOVED WHEN SILTATION REACHES 50% OF THE HEIGHT OF THE BARRIER.

10. TEMPORARY STOCKPILES OF MATERIALS MAY NOT BE LOCATED IN WETLANDS, CHANNELS, OR DRAINAGE SWALES. THE LOCATION OF ANY TEMPORARY STOCKPILE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. STOCKPILES TO REMAIN IN PLACE MORE THAN THREE DAYS SHALL BE FURNISHED WITH EROSION & SEDIMENT CONTROL (I.E. PERIMETER EROSION BARRIER). STOCK PILES TO REMAIN IN PLACE FOR THIRTY DAYS OR MORE SHALL RECEIVE TEMPORARY SEEDING. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS WORK.

11. THE CONTRACTOR SHALL MAINTAIN AND PRESERVE ANY EXISTING SUB SURFACE DRAINAGE SYSTEMS (i.e. FIELD TILES) ACCORDING TO SECTION 611 OF THE IDOT STANDARD SPECIFICATIONS.

12. CLEANING OF VEHICLES AND EQUIPMENT SHALL BE PERFORMED IN A MANNER TO AVOID POLLUTANT DISCHARGE TO OPEN WATERS TO THE MAXIMUM EXTENT POSSIBLE. IF THE CONTRACTOR PROPOSES TO USE AN ON-SITE WASHOUT LOCATION, THE CONTRACTOR SHALL SUBMIT ALOCATION AND DESIGN OF THE PROPOSED TEMPORARY CONCRETE WASHOUT FACILITY TO THE ENGINEER FOR APPROVAL AT LEAST 10 DAYS PRIOR TO THE FIRST POUR. THE PLAN SHALL CONFORM TO THE IUM STANDARD 654. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS WORK.

13. ALL NECESSARY MEASURES SHALL BE TAKEN TO CONTAIN ANY FUEL OR POLLUTION RUNOFF. LEAKY EQUIPMENT OR SUPPLIES SHALL BE IMMEDIATELY REPAIRED OR REMOVED FROM THE SITE.

14. THE CONTRACTOR SHALL LAY EROSION CONTROL BLANKET (IUM STANDARD 530) ON ALL DISTURBED EARTH SLOPES. (SEE IUM STANDARD 530) EROSION CONTROL BLANKET WITH GREEN DYE IS NOT PERMITTED.

15. TEMPORARY SEEDING SHALL BE COMPLETED ON ALL AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE OR ON WHICH CONSTRUCTION WILL BE STOPPED FOR A PERIOD OF MORE THAN 14 CALENDAR DAYS. WINTER SHUTDOWN SHALL BE ADDRESSED EARLY IN THE FALL GROWING SEASON SO THAT SLOPES AND OTHER BARE EARTH AREAS MAY BE STABILIZED WITH TEMPORARY AND/OR PERMANENT VEGETATIVE COVER FOR PROPER EROSION AND SEDIMENT CONTROL.

IN-STREAM WORK NOTES

1. WORK IN THE WATERWAY SHALL BE TIMED TO TAKE PLACE DURING LOW OR NO-FLOW CONDITIONS. LOW FLOW CONDITIONS ARE FLOW AT OR BELOW THE NORMAL WATER ELEVATION. DURING AUGUST, SEPTEMBER ANS OCTOBER.

2. THE CONTRACTOR SHALL DESIGN AN IN-STREAM WORK PLAN TO ALLOW FOR THE CONVEYANCE OF THE LOW FLOW PAST THE WORK AREA WITHOUT OVERTOPPING. THE LOW FLOW RATE IS ESTIMATED AS 300 CFS. THE CONTRACTOR SHALL SUBMIT PLANS OF THE PROPOSED CAUSEWAY AND COFFERDAM TO THE ENGINEER FOR APPROVAL PRIOR TO WORK.

3. WATER SHALL BE ISOLATED FROM THE IN-STREAM WORK AREA USING A COFFERDAM CONSTRUCTED OF NON-ERODIBLE MATERIALS (STEEL SHEETS, AQUA BARRIERS, RIP RAP AND GEOTEXTILE LINER, ETC.). EARTHEN COFFERDAMS ARE NOT PERMISSIBLE.

4. THE COFFERDAM SHALL BE CONSTRUCTED FROM THE UPLAND AREA AND NO EQUIPMENT MAY ENTER FLOWING WATER AT ANY TIME. IF THE INSTALLATION OF THE COFFERDAM CANNOT BE COMPLETED FROM SHORE AND ACCESS IS NEEDED TO REACH THE AREA TO BE COFFERED, OTHER MEASURES, SUCH AS THE CONSTRUCTION OF A CAUSEWAY, WILL BE NECESSARY TO ENSURE THAT EQUIPMENT DOES NOT ENTER THE WATER. ONCE THE COFFERDAM IS IN PLACE AND THE AREA IS DEWATERED, EQUIPMENT MAY ENTER THE COFFERED AREA TO PERFORM THE WORK.

5. IF BYPASS PUMPING IS NECESSARY, THE INTAKE HOSE SHALL BE PLACED ON A STABLE SURFACE OR FLOATED TO PREVENT SEDIMENT FROM ENTERING THE HOSE. THE BYPASS DISCHARGE SHALL BE PLACED ON A NON-ERODIBLE, ENERGY DISSIPATING SURFACE PRIOR TO REJOINING THE STREAM FLOW AND SHALL NOT CAUSE EROSION. FILTERING OF BYPASS WATER IS NOT NECESSARY UNLESS THE BYPASS WATER HAS BECOME SEDIMENT-LADEN AS A RESULT OF THE CURRENT CONSTRUCTION ACTIVITIES.

6. DURING DEWATERING OF THE COFFERED AREA, THE HOSE INTAKE SHALL BE PLACED IN A SUMP PIT (IUM STANDARD 650) AND THE OUTLET DSCHARGED ON A NON-ERODIBLE ENERGY DISSIPATING SURFACE. ALL SEDIMENT-LADEN WATER MUST BE FILTERED. POSSIBLE OPTIONS FOR SEDIMENT REMOVAL INCLUDE BAFFLE SYSTEMS, ANICNINC POLYMER SYSTEMS, DEWATERING BAGS, OR OTHER APPROPRIATE METHODS. WATER SHALL HAVE SEDIMENT REMOVED PRIOR TO BEING RE-INTRODUCED TO THE DOWNSTREAM WATERWAY. A STABILIZED CONVEYENACE FROM THE DEWATERING DEVICE TO THE WATERWAY MUST BE IDENTIFIED IN THE PLAN. DISCHARGE WATER IS CONSIDERED CLEAN IF IT DOES NOT RESULT IN A VISUALLY IDENTIFIABLE DEGRADATION OF WATER CLARITY. THE EXACT MEANS, METHODS, AND LOCATIONS OF DEWATERING SHALL BE SHALL BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK.

7. THE AREA FROM THE TOE TO THE TOP OF THE SIDE SLOPE SHALL BE TEMPORARILY STABILIZED DURING CONSTRUCTION TO REDUCE THE POTENTIAL FOR EROSION. ALL AREAS DISTURBED DUE TO CONSTRUCTION ACTIVITIES SHALL BE RESTORED TO PROPOSED CONDITIONS AND FULLY STABILIZED PRIOR TO ACCEPTING FLOWS.

SOIL STABILIZATION CHART

STABILIZATION TYPE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
PERMANENT SEEDING				A		*	*					
DORMANT SEEDING	B										B	
TEMPORARY SEEDING			C									
EROSION CONTROL	D											

A. SEEDING CLASS 2 (SPECIAL)
SEEDING CLASS 4A (SPECIAL)

B. INCREASE SEEDING RATE BY 25% WHEN DORMANT SEEDING

C. TEMPORARY EROSION CONTROL SEEDING AND MULCH, METHOD 2

D. EROSION CONTROL BLANKET (PERMANENT SEED AREAS ONLY)

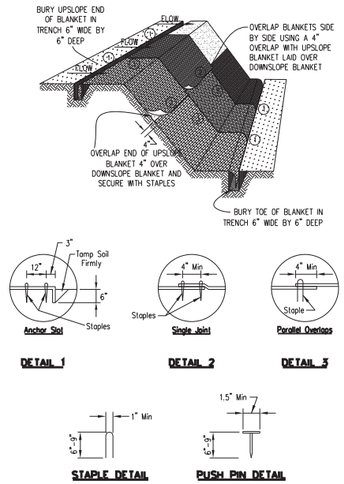
* IRRIGATION MAY BE NEEDED DURING JUNE AND JULY

SEEDING MIXTURES

CLASS - TYPE	SEEDS	LB/ACRE
2- ROADSIDE MIXTURE	TALL FESCUE	100
	PERENNIAL RYEGRASS	50
	CREEPING RED FESCUE	40
	RED TOP	10
4A- LOW PROFILE NATIVE GRASS	ANDROPOGON SCOPARIUS (LITTLE BLUE STEM)	5
	BOUTELOUA CURTIPENDULA (SIDE-OATS GRAMA)	5
	ELYMUS CANADENSIS (CANADA WILD RYE)	1
	SPOROBOLUS HETEROLEPSIS (PRAIRIE DROPSEED)	0.5
	ANNUAL RYEGRASS	25
	OATS, SPRING	25
	PERENNIAL RYEGRASS	15

RECOMMENDED CONSTRUCTION SEQUENCE FOR EROSION CONTROL

1) INSTALL EROSION CONTROL AND TEMPORARY CAUSEWAY.
2) INSTALL COFFERDAMS AND DEWATER PIERS 1 THROUGH 3.
3) EXCAVATE AREAS FOR RIPRAP PLACEMENT.
4) PLACE RIRAP ON ABUTMENT SLOPES AND AROUND PIERS.
5) CLEAN AND PAINT STEEL GIRDERS.
6) REMOVE TEMPORARY WORKS.
7) INSTALL TRAFFIC BARRIERS.
8) PERFORM PERMANENT SEEDING.



DETAIL 1 — DETAIL 2 — DETAIL 3

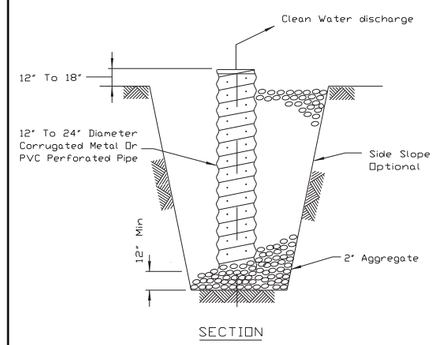
STAPLE DETAIL — PUSH PIN DETAIL

NOTES:

1. Staples shall be placed in a diamond pattern at 2 per s.y. for sticked blankets. Non-sticked shall use 4 staples per s.y. of material. This equates to 200 staples with sticked blanket and 400 stapels with non-sticked blanket per 100 s.y. of material.
2. Staple or push pin lengths shall be selected based on soil type and conditions. (minimum staple length is 6")
3. Erosion control material shall be placed in contact with the soil over a prepared seedbed.
4. All anchor slots shall be stapled at approximately 12" intervals.

8-11-94	EROSION CONTROL BLANKET INSTALLATION DETAILS	STANDARD DWG. NO. IL-650

SUMP PIT PLAN

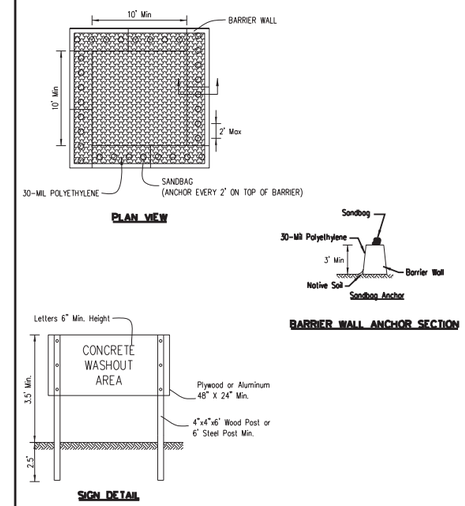


SECTION

NOTES:

1. Pit dimensions are optional.
2. The standpipe will be constructed by perforating a 12"-24" diameter corrugated metal or PVC pipe.
3. A base of 2" aggregate will be placed in the pit to a minimum depth of 12". After installing the standpipe, the pit surrounding the standpipe will then be backfilled with 2" aggregate.
4. The standpipe will extend 12" to 18" above the lip of the pit.
5. If discharge will be pumped directly to a storm drainage system, the standpipe will be wrapped with filter fabric before installation.
6. If desired, 1/4"-1/2" hardware cloth may be placed around the standpipe prior to attaching the filter fabric. This will increase the rate of water seepage into the pipe.

REFERENCE Project / Designed / Checked / Approved — Date	NRCS Natural Resources Conservation Service	STANDARD DWG. NO. IL-650 SHEET 1 OF 1 DATE 8-11-94



PLAN VIEW

BARRIER WALL ANCHOR SECTION

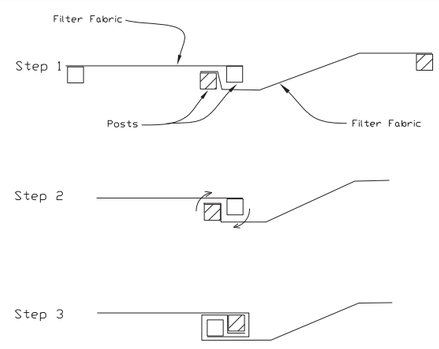
SIGN DETAIL

NOTES:

1. Maintaining temporary concrete washout facilities shall include removing and disposing of hardend concrete and/or slurry and returning the facilities to a functional condition.
2. Facility shall be cleaned or reconstructed in a new area once washout becomes two-thirds full.

8-11-94	TEMPORARY CONCRETE WASHOUT FACILITY - BARRIER WALL	

SILT FENCE - SPLICING TWO FENCES

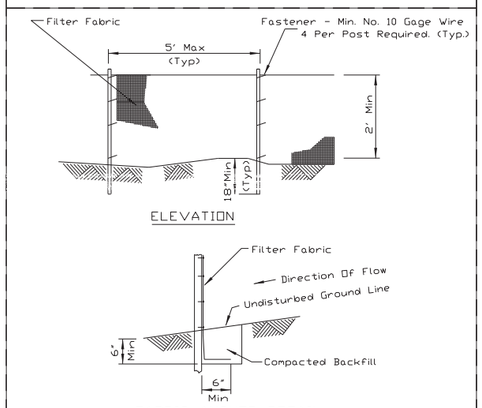


ATTACHING TWO SILT FENCES

1. Place the end post of the second fence inside the end post of the first fence.
2. Rotate both posts at least 180 degrees in a clockwise direction to create a tight seal with the fabric material.
3. Cut the fabric near the bottom of the stakes to accommodate the 6" flap.
4. Drive both posts a mininum of 18 inches into the ground and bury the flap.
5. Compact backfill (particularly at splices) completely to prevent stormwater piping.

REFERENCE Project / Designed / Checked / Approved — Date		STANDARD DWG. NO. IUM-620B(W) SHEET 1 OF 1 DATE 3-16-2012

SILT FENCE PLAN



ELEVATION

FABRIC ANCHOR DETAIL

NOTES:

1. Temporary sediment fence shall be installed prior to any grading work in the area to be protected. They shall be maintained throughout the construction period and removed in conjunction with the final grading and site stabilization.
2. Filter fabric shall meet the requirements of material specification 592 Geotextile Table 1 or 2, Class I with equivalent opening size of at least 30 for nonwoven and 40 for woven.
3. Fence posts shall be either standard steel post or wood post with a minimum cross-sectional area of 3.0 sq. in.

REFERENCE Project / Designed / Checked / Approved — Date		STANDARD DWG. NO. IUM-620 SHEET 1 OF 2 DATE 3-16-12

FILE NAME = 120162-sht-eros.dgn	USER NAME = $USER$	DESIGNED - J.W.F.	REVISED -
HAMPTON, LENZINI AND RENWICK, INC. 3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703 ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP. 184.000959		DRAWN - T.W.K.	REVISED -
	PLOT SCALE = $SCALE$	CHECKED - S.W.M.	REVISED -
	PLOT DATE = 7/14/2016	DATE - 03/25/16	REVISED -

CITY OF BELVIDERE
DEPARTMENT OF PUBLIC WORKS

EROSION CONTROL STANDARDS
NEWBURG ROAD

SCALE: | SHEET NO. 3 OF 3 SHEETS | STA. | TO STA.

F.A.U.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
5009	12-00110-00-BR	BOONE		
NEWBURG ROAD		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE

AQUATIC SURVEY REPORT

Survey for Freshwater Mussels in the Kishwaukee River at the Newburg Road bridge (IDOT Sequence No. 18568) near Belvidere, Boone County, Illinois

Prepared by:
Jeremy S. Tiemann

INHS/IDOT Statewide Biological Survey & Assessment Program
Program Report 2015 (46)

31 August 2015

ATTACHMENT 5

PROJECT SUMMARY

This report is submitted in response to a request from IDOT for INHS personnel to conduct a freshwater mussel survey in the Kishwaukee River at the Newburg Road bridge (IDOT Sequence No. 18568; Section 12-001100-00-BR; S.N. 004-3013) near Belvidere, Boone County, Illinois. We conducted the freshwater mussel survey for this project area on 17 August 2015.

Freshwater mussels were collected by hand-picking and snorkeling along a 55 yard stretch of stream for 4 person-hours. Eleven species of freshwater mussels, including 13 individuals of the state-threatened Black Sandshell (*Ligumia recta*) were collected alive. No other species collected are listed at the state or federal level. All live animals collected were placed back into suitable habitat in the project area.

The Mussel Community Index score for the Kishwaukee River at the Newburg Road project area was 17, which classifies the site as a "Unique" mussel resource (very high species richness; moderate abundance; intolerant species typically present; recruitment noted for most species).

Approved By: Kevin Cummings, Further Studies Aquatics Group Coordinator-Malacologist

Surveys Conducted By: Jeremy S. Tiemann, Aquatic Zoologist
Josh L. Sherwood, Fisheries Biologist
Andrew J. Stites, Fisheries Biologist
Tyson R. Dallas, INHS Technician

Edited by: Mark J. Wetzel, INHS emeritus

GIS Layers: Janet L. Jarvis, GIS and Remote Sensing Specialist

University of Illinois
Prairie Research Institute
Illinois Natural History Survey
Statewide Biological Survey and Assessment Program
1816 South Oak Street
Champaign, Illinois 61820

TABLE OF CONTENTS

Project summary 2

Introduction 4

Project Location 4

Habitat characterization 4

Background 4

Methods 6

Results and Discussion 6

Acknowledgements 6

Literature Cited 7

Tables

Table 1 – List of freshwater mussels from the Kishwaukee River mainstem in Winnebago and Boone counties (INHS Freshwater Mollusk Collection database) and those collected by INHS personnel at the Newburg Road project area (IDOT Sequence No. 18568), Boone County, Illinois, on 17 August 2015 8

Figures

Figure 1 – Map of the Newburg Road project area (IDOT Sequence No. 18568; Section 12-001100-00-BR; S.N. 004-3013), near Belvidere, Boone County, Illinois, where a survey for freshwater mussels was conducted in the Kishwaukee River by INHS personnel on 17 August 2015 9

Figure 2 – The state-threatened Black Sandshell (*Ligumia recta*) and its distribution in Illinois 10

Appendices

Appendix 1. A cover page referencing < 18568_Mussel_Survey_GIS.zip >, an ArcGIS shapefile which includes sampling point information for the Kishwaukee River at the Newburg Road project area (IDOT Sequence No. 18568; Section 12-001100-00-BR; S.N. 004-3013) near Belvidere, Boone County, Illinois, where a survey for freshwater mussels was conducted by INHS personnel on 17 August 2015. 11

Cover photo: Kishwaukee River at the Newburg Road bridge, approximately 4.5 miles west of Belvidere, Boone County, Illinois (Latitude 42.25383°N, Longitude 88.93018°W) on 17 August 2015. Photo is facing upstream in a northerly direction (Jeremy S. Tiemann photo).

INTRODUCTION

This report is submitted in response to a request made by Susan Hargrove (Illinois Department of Transportation, Springfield – IDOT) to Wendy Schelsky (Illinois Natural History Survey, Champaign – INHS) dated 3 February 2015 for a fish and freshwater mussel survey at the Newburg Road bridge near Belvidere, Boone County, Illinois (IDOT Sequence No. 18568; IDOT Section 12-001100-00-BR; INHS Project No. FS-745).

In this report, we summarize the results of the freshwater mussel survey conducted by INHS personnel on 17 August 2015. A separate report will summarize the results of the fish survey of the Kishwaukee River at this site.

PROJECT LOCATION

The Newburg Road bridge project area consisted of one stream crossings (**Figure 1**) – the Kishwaukee River, approximately 4.5 miles west of Belvidere, Boone County, Illinois; Latitude 42.25383°N, Longitude 88.93018°W (**cover photo**).

HABITAT CHARACTERIZATION

The Kishwaukee River was sampled from 25 yards upstream of the Newburg Road bridge to 30 yards downstream (including the area under the bridge). The stream was approximately 53 yards wide and ≤3 feet deep, and had a flow rate of ≤0.5 feet/second (maximum values). From the right descending bank to approximately 15 yards away from the shore (= from the west side shoreline to approximately the first bridge pillar), the Kishwaukee River was embedded cobble and boulder intermixed with sand. The remainder of the streambed was sandy gravel. No aquatic vegetation or undercut banks were evident, but small patches of wood debris were present.

Appendix 1 references an ArcGIS shapefile, which includings sampling point information for the Kishwaukee River at the Newburg Road project area as discussed in this report.

BACKGROUND

The Kishwaukee River basin drains approximately 1,250 mi^2 in McHenry, Boone, Winnebago, Ogle, DeKalb, Lee, and Kane counties, and is one of the principal basins in the lower Rock River drainages in Illinois (Page et al., 1992; Shasteen et al., 2013). The basin is characterized by open oak woodland and prairie country on low undulating land, but steeper topography occurs in the northern parts of Boone and Winnebago counties (Page et al., 1992; Shasteen et al., 2013). At one time, sloughs and marshes were evident throughout the basin, but there have been drained for agriculture (Page et al., 1992). Approximately three-quarters of the land is devoted to agriculture with croplands accounting for nearly two-thirds of the surface area (Shasteen et al., 2013). The flow of the Kishwaukee River is generally unimpeded except for a 10-foot dam in

Belvidere (Page et al., 1992). The Biological Stream Characterization (Bertrand et al., 1996) rated portions of the Kishwaukee River as a Class "A" stream (Unique Aquatic Resource). The Newburg Road project area lies within this stretch of the Kishwaukee River.

Shasteen et al. (2013) sampled 33 sites in the Kishwaukee River basin, including four sites in the lower mainstem downstream of the dam in Belvidere in Winnebago and Boone counties. Of these four sites, one was rated as a "Unique" mussel resource ("Very high species richness (10+ species) and/or abundance (CPUE >80); intolerant species typically present; recruitment noted for most species") and the other three were rated as a "Highly Valued" mussel resource ("High species richness (7-9 species) &/or abundance (CPUE 51-80); intolerant species likely present; recruitment noted for several species").

An examination of the INHS Mollusk Collection database indicated that at least 28 species of freshwater mussels are known from Kishwaukee River basin, and all but two have been reported from the lower mainstem in Winnebago and Boone counties (**Table 1**). Included in this total are the Slippershell Mussel (*Alasmidonta viridis*), Spike (*Elliptio dilatata*), and Black Sandshell (*Ligumia recta*) – all of which are listed as state-threatened (IESPB, 2015). All other species are common inhabitants of northern Illinois streams that are not listed as endangered or threatened at the state or federal level (Cummings and Mayer, 1992; Cummings and Mayer, 1997; Tiemann et al., 2007; IESPB, 2015).

Of the three state-listed species reported from the Kishwaukee mainstem in Winnebago and Boone counties, only the Black Sandshell (**Figure 2**) has been collected alive; both the Slippershell Mussel and Spike have only been found as relict in this area in the past 100 years (INHS Mollusk Collection database). Historically, state-threatened Black Sandshell was widely distributed in medium to large rivers in riffles or raceways in gravel or firm sand (Cummings and Mayer, 1992). However, it is now uncommon in much of the upper Midwest. Within Illinois, the Black Sandshell is found sporadically in the northern half of the state, including the Rock River drainage, as well as in the Ohio River (Cummings and Mayer, 1997; Tiemann et al., 2007; **Figure 2**). The Black Sandshell has been collected from 15 sites within the Kishwaukee River mainstem in Winnebago and Boone counties since 1989 (data from INHS Mollusk Collection Champaign), with the two closest to the Newburg Road Project area being:

- 3.5 mi W Belvidere, Distillery Road Conservation Area, Boone County (Latitude 42.25686°N, Longitude 88.91120°W) on 22 August 2011 by INHS personnel S.A. Bales, J.L. Sherwood, et al. (N = 2 live + 1 fresh-dead – INHS 41910). This site is less than one mile upstream of the Newburg Road project area.
- Southeastern edge of Rockford at the I-90 bridge, Winnebago County (Latitude 42.24701°N, Longitude 88.94429°W) on 30 May 2013 by INHS personnel J.S. Tiemann, M.J. Dreslik, et al. (N = 8 live – no voucher specimens). This site is less than one mile downstream of the Newburg Road project area.

A literature review and a search of the INHS Mollusk Collection's database were conducted for historical and recent records of freshwater mussels in the Newburg Road project area. Prior to the 2015 survey, no collections of freshwater mussels had been made at the Kishwaukee River at the Newburg Road bridge.

METHODS

The freshwater mussel survey was conducted at the Newburg Road bridge on 17 August 2015 by INHS personnel J.S. Tiemann, J.L. Sherwood, Andrew J. Stites, and T.R. Dallas. Freshwater mussels were collected by hand-picking and snorkeling (e.g., visual detection such as trails, siphons, and exposed shell) along a 55 yard stretch of stream (including the area under Newburg Road) for 4 person-hours. Efforts were made to cover all available habitat types present at a site including riffles, pools, slack water, and areas of differing substrates. Additionally, both banks and dried areas were visually searched for the presence of shells. All live mussels were identified, counted, and released back into the project area, whereas dead shell was retained for deposition into the INHS Mollusk Collection, Champaign (**Table 1**).

The freshwater mussel resource in the Kishwaukee River at the Newburg project area was classified as Unique, Highly Valued, Moderate, Limited, or Restricted based on the Mussel Community Index criteria outlined by Szafoni (2001). These criteria included extant species richness, presence of rare or listed species, total number of individuals collected expressed as catch-per-unit-effort (CPUE – number of individuals collected per hour), and recent recruitment if individuals less than 30 mm in length or with 3 or fewer growth rings were recorded.

Nomenclature used for freshwater mussels discussed in this report follows Graf and Cummings (2007) with slight modifications. The current status of threatened and endangered species of freshwater mussels and freshwater mussels discussed in this report are taken from U.S. Department of Interior, Fish and Wildlife Service (USDI, FWS) (1996, 1997) and the Illinois Endangered Species Protection Board (IESPB) (2015).

RESULTS AND DISCUSSION

A total of 90 individuals representing 11 species, including 13 individuals of the state-threated Black Sandshell, was collected alive from the Kishwaukee River at this Newberg Road project area by INHS personnel on 17 August 2015 (**Table 1**). All other species are common inhabitants of north-central Illinois streams (Cummings and Mayer, 1992; Cummings and Mayer, 1997; Tiemann et al., 2007). One additional species was collected only as relict shells (**Table 1**).

The Mussel Community Index (Szafoni, 2001) score for the Kishwaukee River at the Newburg Road project area was 17, which classifies the site as a “Unique” mussel resource (very high species richness; moderate abundance; intolerant species typically present; recruitment noted for most species). There were 11 extant species present, of which 5 species showed recent recruitment. CPUE was 22.5 individuals per hour and two intolerant species [Black Sandshell and Flutedshell (*Lasmigona costata*)] were present.

ACKNOWLEDGMENTS

Josh L. Sherwood (INHS), Andrew J. Stites (INHS), and Tyson R. Dallas (INHS) assisted in the field, Janet L. Jarvis (INHS) prepared the map in **Figure 1** and the associated shape file referenced in

Appendix 1, and Mark J. Wetzel (INHS) and Alison P. Stodola (INHS) edited early drafts of the report.

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Table 1. List of freshwater mussels from the Kishwaukee River mainstem in Winnebago and Boone counties (INHS Freshwater Mollusk Collection database) and those collected by INHS personnel at the Newburg Road project area (IDOT Sequence No. 18568), Boone County, Illinois, on 17 August 2015. Data from the 2015 survey include number of live individuals and relict (R) specimens. Notations for special status species: ST – state-threatened.

Subfamily	Scientific name	Common name	Newburg Road
Anodontinae	*Alasmidonta marginata*	Elktoe	8
	Alasmidonta viridis ST	Slippershell Mussel	
	Anodontoides ferussacianus	Cylindrical Papershell	
	Lasmigona complanata	White Heelsplitter	2
	Lasmigona compressa	Creek Heelsplitter	
	Lasmigona costata	Flutedshell	5
	Pyganodon grandis	Giant Floater	1
	Strophitus undulatus	Creeper	4
	Utterbackia imbecillis	Paper Pondshell	
Amblemilinae	*Amblema plicata*	Threeridge	
	Amphinaias (Quadrula) pustulosa	Pimpleback	5
	Elliptio dilatata ST	Spike	
	Fusconaia flava	Wabash Pigtoe	1
	Pleurobema sintoxia	Round Pigtoe	
Lampsilinae	*Actinonaias ligamentina*	Mucket	12
	Lampsilis cardium	Plain Pocketbook	30
	Lampsilis siliquoidea	Fatmucket	
	Lampsilis teres	Yellow Sandshell	
	Leptodea fragilis	Fragile Papershell	9
	Ligumia recta ST	Black Sandshell	13
	Potamilus alatus	Pink Heelsplitter	
	Potamilus ohiensis	Pink Papershell	
	Toxolasma parvum	Lilliput	
	Truncilla donaciformis	Fawnsfoot	R
	Truncilla truncata	Deertoe	
	Venustaconcha ellipsiformis	Ellipse	
Total number of extant species			11
Total number of species			12

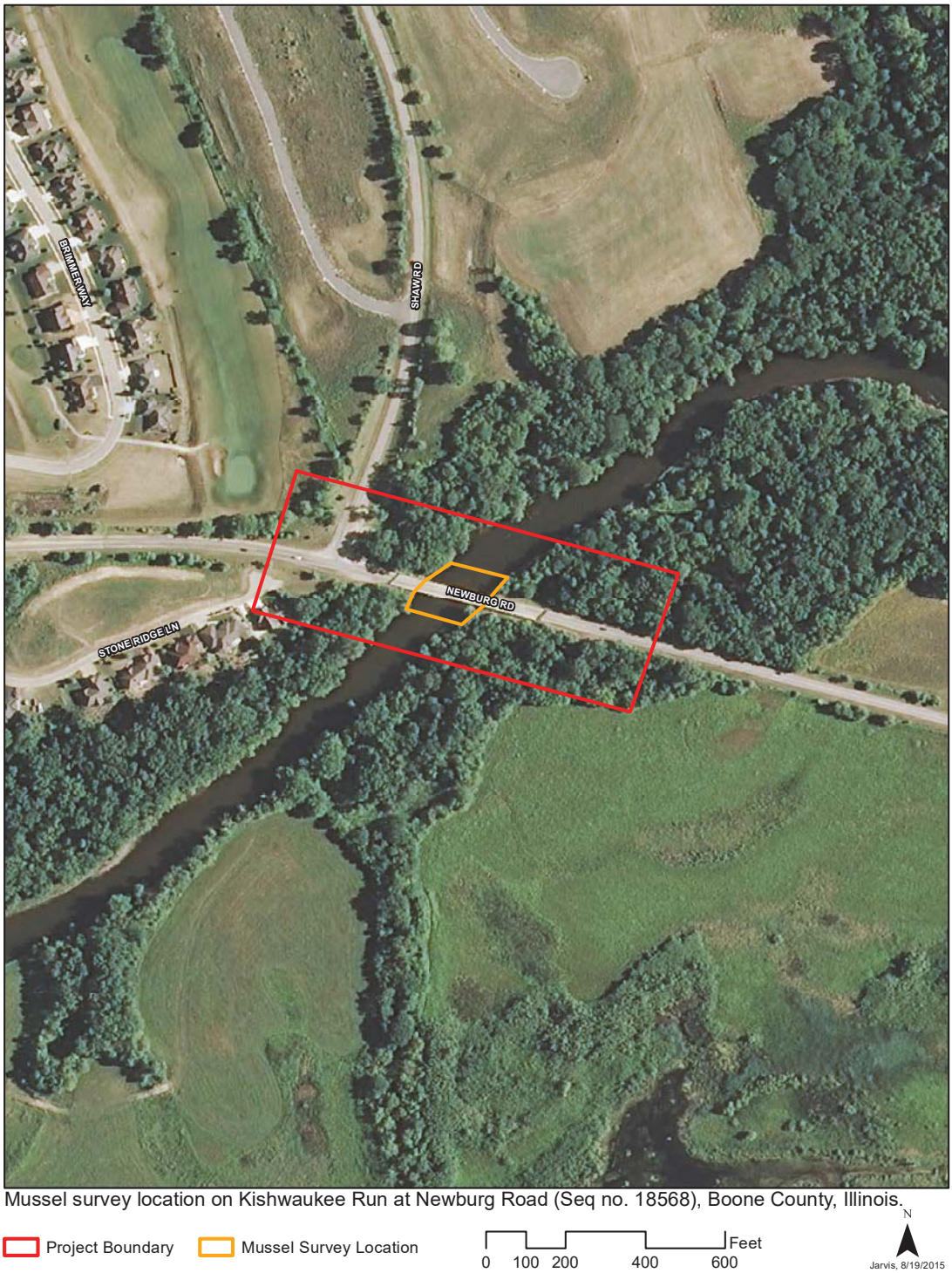

Figure 1. Map of the Newburg Road project area (IDOT Sequence No. 18568; Section 12-001100-00-BR; S.N. 004-3013), near Belvidere, Boone County, Illinois, where a survey for freshwater mussels was conducted in the Kishwaukee River by INHS personnel on 17 August 2015 (map created by Janet L. Jarvis).

Black sandshell (*Ligumia recta*)

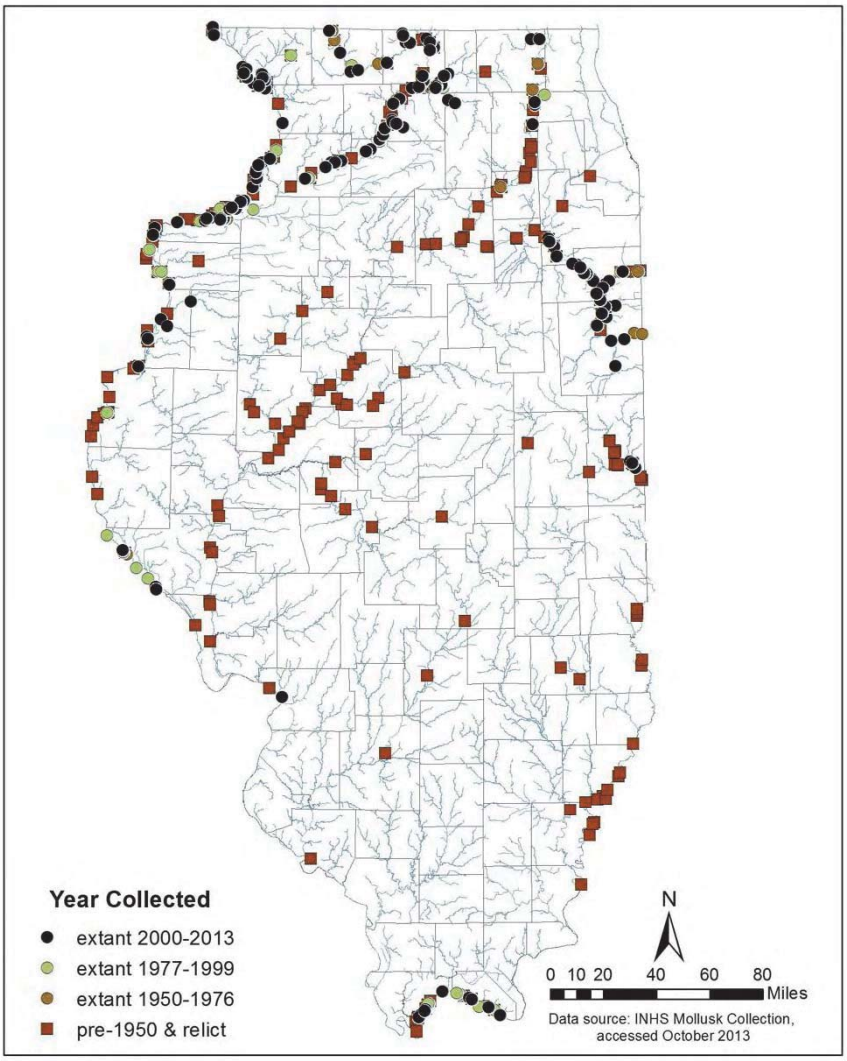

Figure 2. The state-threatened Black Sandshell (*Ligumia recta*) and its distribution in Illinois (K.S. Cummings photo; map from Stodola et al., 2014).

Appendix 1

This **Appendix 1** cover page references **< 18568_Mussel_Survey_GIS.zip >**, an ArcGIS shapefile which includes sampling point information for the Kishwaukee River at the Newburg Road project area (IDOT Sequence No. 18568; Section 12-001100-00-BR; S.N. 004-3013) near Belvidere, Boone County, Illinois, where a survey for freshwater mussels was conducted by INHS personnel on 17 August 2015.

The ArcGIS shapefile and this report were both submitted to IDOT via the IDOT Site Assessment Tracking System extranet website (Frostycap) on 31 August 2015.

ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE

AQUATIC SURVEY REPORT

Survey for Fishes in the Kishwaukee River at the Newburg Road bridge (IDOT Sequence No. 18568) near Belvidere, Boone County, Illinois

Prepared by:
Jeremy S. Tiemann

INHS/IDOT Statewide Biological Survey & Assessment Program
Program Report 2015 (47)

4 September 2015

PROJECT SUMMARY

This report is submitted in response to a request from IDOT for INHS personnel to conduct a fish survey in the Kishwaukee River at the Newburg Road bridge (IDOT Sequence No. 18568; Section 12-001100-00-BR; S.N. 004-3013) near Belvidere, Boone County, Illinois. Specifically, the IDOT tasking inquired about the presence of the state-threatened Gravel Chub (*Erimystax x-punctatus*). We conducted the fish survey for this project area on 17 August 2015.

The preferred habitat of the Gravel Chub is gravel bars with moderate flow. Therefore, efforts were focused on areas with current. Fishes were collected by pull-seining and kick-seining along a 55-yard stretch of stream centered on the bridge. A total of 69 individuals representing six species were collected. No fishes collected from this site are listed at the state or federal level. The portion of the Kishwaukee River near the Newburg Road was a slow run (i.e., no swift current) and not similar to habitats where the fish has been collected in the past.

Approved By: Kevin Cummings, Further Studies Aquatics Group Coordinator-Malacologist

Surveys Conducted By: Jeremy S. Tiemann, Aquatic Zoologist
Josh L. Sherwood, Fisheries Biologist
Andrew J. Stites, Fisheries Biologist
Tyson R. Dallas, INHS Technician

Edited by: Alison P. Stodola, INHS emeritus

GIS Layers: Janet L. Jarvis, GIS and Remote Sensing Specialist

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TABLE OF CONTENTS

Project summary 2

Introduction 4

Project Location 4

Habitat characterization 4

Background 4

Methods 5

Results and Discussion 6

Acknowledgements 6

Literature Cited 6

Tables

Table 1 – List of fishes from the Kishwaukee River mainstem in Winnebago and Boone counties (INHS Freshwater Fish Collection database) and those collected by INHS personnel at the Newburg Road project area (IDOT Sequence No. 18568), Boone County, Illinois, on 17 August 2015 9

Figures

Figure 1 – Map of the Newburg Road project area (IDOT Sequence No. 18568; Section 12-001100-00-BR; S.N. 004-3013), near Belvidere, Boone County, Illinois, where a survey for fishes was conducted in the Kishwaukee River by INHS personnel on 17 August 2015 11

Figure 2 – The state-threatened Gravel Chub (*Erimystax x-punctatus*) 12

Appendices

Appendix 1. A cover page referencing < 18568_Fish_Survey_GIS.zip >, an ArcGIS shapefile which includes sampling point information for the Kishwaukee River at the Newburg Road project area (IDOT Sequence No. 18568; Section 12-001100-00-BR; S.N. 004-3013) near Belvidere, Boone County, Illinois, where a survey for fishes was conducted by INHS personnel on 17 August 2015. 13

Cover photo: Kishwaukee River at the Newburg Road bridge, approximately 4.5 miles west of Belvidere, Boone County, Illinois (Latitude 42.25383°N, Longitude 88.93018°W) on 17 August 2015. Photo is facing upstream in a northerly direction (Jeremy S. Tiemann photo).

INTRODUCTION

This report is submitted in response to a request made by Susan Hargrove (Illinois Department of Transportation, Springfield – IDOT) to Wendy Schelsky (Illinois Natural History Survey, Champaign – INHS) dated 3 February 2015 for a fish and freshwater mussel survey at the Newburg Road bridge near Belvidere, Boone County, Illinois (IDOT Sequence No. 18568; IDOT Section 12-001100-00-BR; INHS Project No. FS-745).

In this report, we summarize the results of the fish survey conducted by INHS personnel on 17 August 2015. A separate report summarizing the results of the freshwater mussel survey of the Kishwaukee River at this site (Tiemann, 2015) was uploaded to the IDOT's Site Assessment Tracking System Project Files page ("FrostyCap") on 31 August 2015.

PROJECT LOCATION

The Newburg Road bridge project area consisted of one stream crossing (**Figure 1**) – the Kishwaukee River, approximately 4.5 miles west of Belvidere, Boone County, Illinois; Latitude 42.25383°N, Longitude 88.93018°W (**cover photo**).

Appendix 1 references an ArcGIS shapefile, which includes sampling point information for the Kishwaukee River at the Newburg Road project area as discussed in this report.

HABITAT CHARACTERIZATION

As reported in Tiemann (2015), the Kishwaukee River was sampled from 25 yards upstream of the Newburg Road bridge to 30 yards downstream (including the area under the bridge). The stream was approximately 53 yards wide and $\leq$3 feet deep, and had a flow rate of $\leq$0.5 feet/second (maximum values). This portion of the Kishwaukee River was a slow run with no riffle habitat. From the right descending bank to approximately 15 yards away from the shore (= from the west side shoreline to approximately the first bridge pillar), the Kishwaukee River was embedded cobble and boulder intermixed with sand. The remainder of the streambed was sandy gravel. No aquatic vegetation or undercut banks were evident, but small patches of wood debris were present. The Kishwaukee River flows in a south-southwesterly direction at the Newburg Road location.

BACKGROUND

The Kishwaukee River basin drains approximately 1,250 mi^2 in McHenry, Boone, Winnebago, Ogle, DeKalb, Lee, and Kane counties, and is one of the principal basins in the lower Rock River drainages in Illinois (Page et al., 1992; Shasteen et al., 2013). The basin is characterized by open oak woodland and prairie country on low undulating land, but steeper topography occurs in the northern parts of Boone and Winnebago counties (Page et al., 1992; Shasteen et al., 2013). At one time, sloughs and marshes were evident throughout the basin, but there have been

drained for agriculture (Page et al., 1992). Approximately three-quarters of the land is devoted to agriculture with croplands accounting for nearly two-thirds of the surface area (Shasteen et al., 2013). The flow of the Kishwaukee River is generally unimpeded except for a 10-foot dam in Belvidere (Page et al., 1992). The Biological Stream Characterization (Bertrand et al., 1996) rated portions of the Kishwaukee River as a Class "A" stream (Unique Aquatic Resource). The Newburg Road project area lies within this stretch of the Kishwaukee River.

An examination of the INHS Fish Collection database indicated that nearly 80 species of fishes are known from Kishwaukee River basin, and 50 have been reported from the lower mainstem in Winnebago and Boone counties (**Table 1**). Included in this total is the Gravel Chub *Erimystax x-punctatus* (**Figure 2**), which is listed as state-threatened in Illinois (IESPB, 2015). All other species reported from the lower Kishwaukee River mainsteam are common inhabitants of northern Illinois streams that are not listed as endangered or threatened at the state or federal level (Smith, 1979; IESPB, 2015).

The Gravel Chub is a small-bodied (<3") cyprinid that occupies deeper riffles and runs of moderate to fast current over firm, silt-free sand-gravel substrates in medium to large streams (Smith, 1979; Becker, 1983; Mullen, 1992; Kansas Fish Committee [KFC], *in press*). The fish rests under rocks in riffles to reduce the effects of strong currents (Becker, 1983; KFC, *in press*). The Gravel Chub is believed to spawn in spring when water temperatures approach 60°F (e.g., April – May) (Smith, 1979; Becker, 1983; Mullen, 1992; KFC, 2014).

With the exception of the Rock River, the Gravel Chub has experienced a decline in distribution in Illinois as a result of siltation in streams (Smith, 1971; Smith 1979; Mullen, 1992). The Gravel Chub has been collected throughout the Rock River basin, including the Kishwaukee River, both historically and recently (INHS Fish Collection database). The Gravel Chub has been collected from 2 sites within the Kishwaukee River mainstem in Winnebago and Boone counties since 1989 (data from INHS Fish Collection Champaign):

- Southeastern edge of Rockford at the Blackhawk Road bridge, Winnebago County (Latitude 42.1948°N, Longitude 88.9992°W) on 18 July 1997 by IDNR Stream Crew (N = 1 individuals – INHS 45225).
- Southeastern edge of Rockford at the I-90 bridge, Winnebago County (Latitude 42.2472°N, Longitude 88.9437°W) on 7 June 2012 by INHS personnel J.S. Tiemann, C.A. Phillips, et al. (N = 3 individuals – INHS 106132; Dreslik et al., 2013). This site is less than one mile downstream of the Newburg Road project area.

METHODS

The fish survey was conducted at the Newburg Road bridge on 17 August 2015 by INHS personnel J.S. Tiemann, J.L. Sherwood, A.J. Stites, and T.R. Dallas. Fishes were collected along the 55-yard stretch of stream (including the area under Newburg Road). Efforts were focused on areas likely to harbor Gravel Chub (e.g., gravel bars with moderate flow). Fishes were collected from 100-ft^2 area sampling points by kicking the substrate 10 feet upstream from a stationary 10 foot long, ¼"-mesh seine and proceeding downstream to the seine in a back and forth path covering the width of the seine. Twelve points were established downstream of the

Newburg bridge, seven points under the bridge, and six points upstream of the bridge. To minimize disturbance, points were sampled from downstream to upstream and sampled from near shore to far shore. This kick-seining method has been shown to be an appropriate quantitative method for sampling benthic fishes (Tiemann et al., 2004; Tiemann 2008). In addition to kick-seining, nine 30-foot seine hauls were pulled in the project area (four downstream of the bridge, two under the bridge, and three upstream of the bridge).

All live fishes were identified, counted, and released back into the project area. Nomenclature used for fishes discussed in this report follows Page and Burr (2011). The current status of threatened and endangered species of fishes and freshwater mussels discussed in this report are taken from U.S. Department of Interior, Fish and Wildlife Service (USDI, FWS) (1996, 1997) and the Illinois Endangered Species Protection Board (IESPB) (2015).

RESULTS AND DISCUSSION

A total of 69 individuals representing six species was collected from the Kishwaukee River at the Newberg Road project area by INHS personnel on 17 August 2015 (**Table 1**). All fishes are common inhabitants of northern Illinois streams (Smith, 1979). No fishes collected are listed as threatened or endangered at the state or federal level. However, two species collected [Smallmouth Bass (*Micropterus dolomieu*) and Banded Darter (*Etheostoma zonale*)] are listed as Intolerant by Smogor (2000). These species are intolerant of various chemical and physical perturbations, and are typically the first species to disappear following a disturbance.

The portion of the Kishwaukee River near the Newburg Road was a slow run (i.e., no swift current), and was not similar to the habitat where the Gravel Chub was collected at the I-90 bridge (J.S. Tiemann, personal observation) or at prior IDOT sites in the Rock River basin (i.e., Turtle Creek – Tiemann, 2014). The fish faunal composition collected at the Newburg Road bridge project area was similar to that reported just downstream at the I-90 bridge by Dreslik et al. (2013). The six species collected at the Newburg Road bridge were all among the ten most common species captured at the I-90 site.

ACKNOWLEDGMENTS

Josh L. Sherwood (INHS), Andrew J. Stites (INHS), and Tyson R. Dallas (INHS) assisted in the field, Janet L. Jarvis (INHS) prepared the map in **Figure 1** and the associated shape file referenced in **Appendix 1**, and Alison P. Stodola (INHS) edited early drafts of the report.

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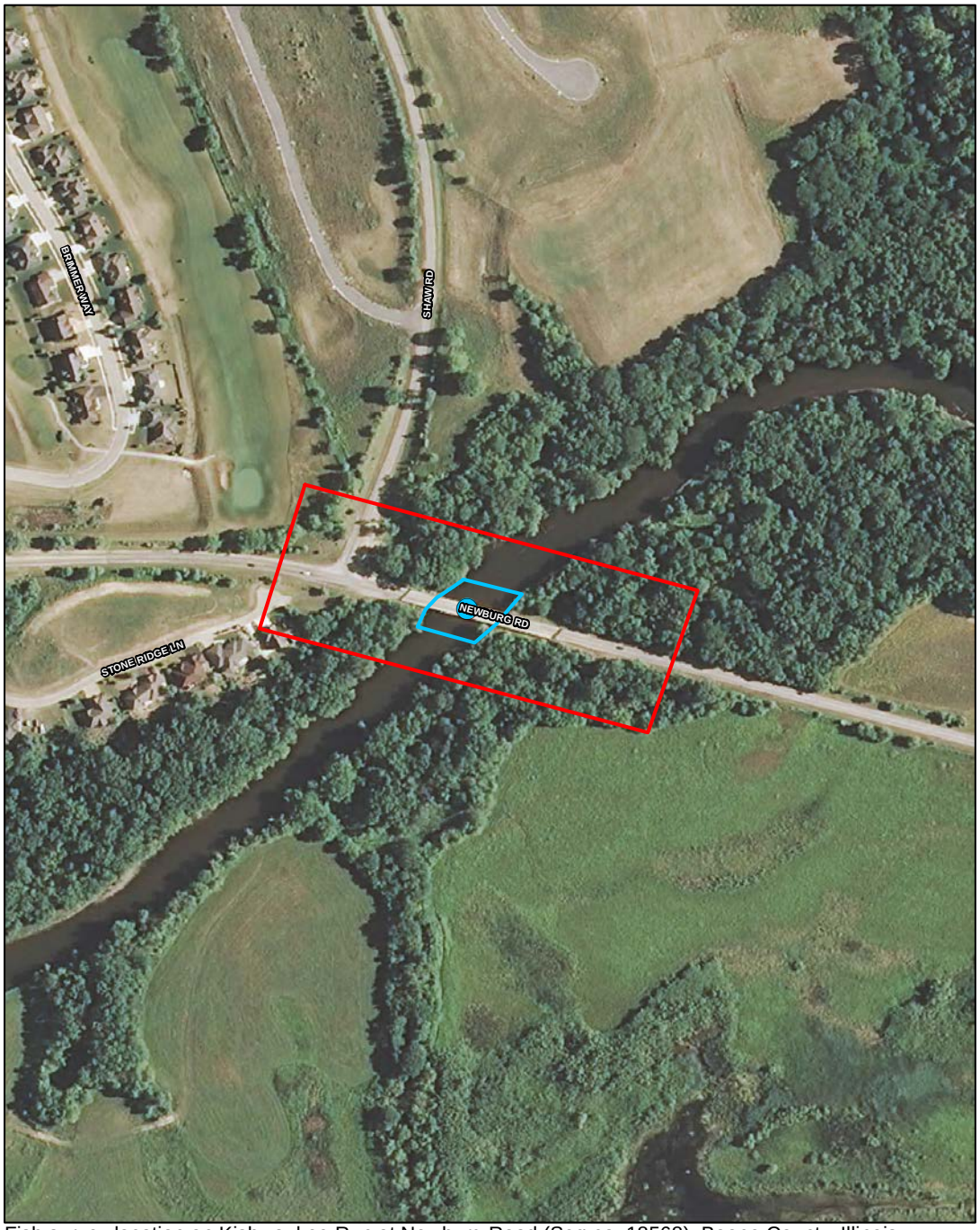
Table 1. List of fishes from the Kishwaukee River mainstem in Winnebago and Boone counties (INHS Freshwater Fish Collection database; Dreslik et al., 2013) and those collected by INHS personnel at the Newburg Road project area (IDOT Sequence No. 18568), Boone County, Illinois, on 17 August 2015. Notations for special status species: [ST] – state-threatened.

Family	Scientific name	Common name	Newburg Road
Petromyzontidae	*Lampetra appendix*	American brook lamprey	
Cyprinidae	*Campostoma anomalum*	Central Stoneroller	
	Campostoma oligolepis	Largescale Stoneroller	
	Chrosomus erythrogaster	South Redbelly Dace	
	Cyprinella spiloptera	Spotfin Shiner	
	Cyprinus carpio	Common Carp	
	Erimystax x-punctatus [ST]	Gravel Chub	
	Luxilus cornutus	Common Shiner	
	Lythrurus umbratilis	Redfin Shiner	
	Nocomis biguttatus	Hornyhead Chub	
	Notemigonus crysoleucas	Golden Shiner	
	Notropis dorsalis	Bigmouth Shiner	17
	Notropis hudsonius	Spottail Shiner	
	Notropis nubilus	Ozark Minnow	
	Notropis percobromus	Carmine Shiner	
	Notropis stramineus	Sand Shiner	13
	Pimephales notatus	Bluntnose Minnow	
	Pimephales promelas	Fathead Minnow	
	Rhinichthys atratulus	Blacknose Dace	
	Semotilus atromaculatus	Creek Chub	
Catostomidae	*Carpiodes cyprinus*	Quillback	
	Catostomus commersoni	White Sucker	
	Hypentelium nigricans	Northern Hogsucker	3
	Moxostoma anisurum	Silver Redhorse	
	Moxostoma duquesnei	Black Redhorse	
	Moxostoma erythrurum	Golden Redhorse	
	Moxostoma macrolepidotum	Shorthead Redhorse	1
Ictaluridae	*Ictalurus punctatus*	Channel Catfish	
	Noturus flavus	Stonecat	
Esocidae	*Esox americanus*	Grass Pickrel	
	Esox lucius	Northern Pike	

Umbridae	*Umbra limi*	Central Mudminnow	
Fundulidae	*Fundulus notatus*	Blackstripe Topminnow	
Poeciliidae	*Gambusia affinis*	Western Mosquitofish	
Gasterosteidae	*Culaea inconstans*	Brook Stickleback	
Centrarchidae	*Ambloplites rupestris*	Rockbass	
	Lepomis cyanellus	Green Sunfish	
	Lepomis gibbosus	Pumpkinseed	
	Lepomis humilis	Orangespotted Sunfish	
	Lepomis macrochirus	Bluegill	
	Micropterus dolomieu	Smallmouth Bass	7
	Micropterus salmoides	Largemouth Bass	
Percidae	*Etheostoma caeruleum*	Rainbow Darter	
	Etheostoma microperca	Least Darter	
	Etheostoma nigrum	Johnny Darter	
	Etheostoma zonale	Banded Darter	28
	Percina caprodes	Logperch	
	Percina maculata	Blackside Darter	
	Percina phoxocephala	Slenderhead Darter	
	Sander canadensis	Sauger	
Number of species			6



Fish survey location on Kishwaukee Run at Newburg Road (Seq no. 18568), Boone County, Illinois.

Project Boundary Fish Survey Location 0 100 200 400 600 Feet N Jarvis, 9/2/2015

Figure 1. Map of the Newburg Road project area (IDOT Sequence No. 18568; Section 12-001100-00-BR; S.N. 004-3013), near Belvidere, Boone County, Illinois, where a survey for fishes was conducted in the Kishwaukee River by INHS personnel on 17 August 2015 (map created by Janet L. Jarvis).

Figure 2. Gravel Chub *Erimystax x-punctatus* (Photo downloaded from the North American Native Fishes Association webpage [gallery.nanfa.org]).

Appendix 1

This **Appendix 1** cover page references **< 18568_Fish_Survey_GIS.zip >**, an ArcGIS shapefile which includes sampling point information for the Kishwaukee River at the Newburg Road project area (IDOT Sequence No. 18568; Section 12-001100-00-BR; S.N. 004-3013) near Belvidere, Boone County, Illinois, where a survey for fishes was conducted by INHS personnel on 17 August 2015.

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