Illinois Department of Transportation
2300 South Dirksen Parkway / Springfield, Illinois / 62764

November 2, 2007

SUBJECT: FAP Route 827 (IL 15)
Project BRF-HPP-0827 (005)
Section 12Z-3, 12BR
Wabash County
Contract No. 94450
Item No. 105, November 16, 2007 Letting
Addendum A

NOTICE TO PROSPECTIVE BIDDERS:

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

1. Revised page ii of the Table of Contents to the Special Provisions.
2. Revised pages 5 – 9, 16 – 23 and 26 of the Special Provisions.
3. Added pages 117 - 137 to the Special Provisions.

Prime contractors must utilize the enclosed material when preparing their bid and must include any Schedule of Prices changes in their bidding proposal.

Bidders using computer-generated bids are cautioned to reflect any and all Schedule of Prices changes, if involved, into their computer programs.

Very truly yours,

Eric E. Harm
Interim Bureau Chief
Bureau of Design and Environment

By: Ted B. Walschleger, P. E.
Engineer of Project Management

cc: Christine Reed, Region 4, District 7; Roger Driskell; R. E. Anderson; Estimates

TBW:DB:jc

Revised 11/02/2007

PIERS 4 & 5 FOUNDATION CONSTRUCTION

Revised November 1, 2007

Description.

This work shall consist of all labor, materials, equipment and services necessary to complete the foundation of Piers 4 & 5 in accordance with the details and dimensions shown in the plans, the applicable portions of the 2007 Illinois Standard Specifications for Road and Bridge Construction, Special Provision: "Setting Piles in Rock," this Special Provision and as directed by the Engineer.

Foundation construction as shown in the plans will include the placement of internal H-piles per the "Setting Piles in Rock" Special Provision, excavation required within the cofferdam and backfilling to the ground surface as it existed before any excavation was made. The foundation as shown in the plans shall be constructed utilizing a cofferdam and will include a seal coat and construction of the Pier footings. The sheeting and internal bracing of the cofferdam shall be removed according to the previously approved procedure.

The Contractor shall be responsible for detailed design calculations and drawings, which include all the necessary details, to successfully install and remove the cofferdams.

The Contractor shall make a thorough appraisal of the issues involved with constructing the cofferdam and must be prepared to excavate inside the cofferdam through all materials and obstructions encountered. The seal coat shall be placed on competent rock.

Submittals.

The Contractor shall submit the following:

(a) Cofferdam. The Contractor shall prepare and submit detailed design calculations and drawings of the cofferdam which include all the necessary details to successfully install the cofferdam, construct the foundation, and remove the cofferdam (sheeting and internal bracing). The computations and the detailed drawings for the cofferdam shall be submitted not less than 45 days in advance of the time the Contractor intends to start work to afford sufficient time for the Engineer's review. The design of the cofferdam shall be in accordance with the following criteria:

(1) The inside dimensions of the cofferdam shall be as required to allow the construction of the seal coat of the size specified in the plans.

(2) All construction surcharge loads shall be identified and applied.

(3) Contractor shall consider the potential effects of scour on cofferdam design. The presence of a temporary work bridge in the waterway may further affect the scour analysis, and should also be considered.

(4) A template system shall be used to ensure that the sheeting is aligned and plumb.

(5) The bedrock surface under the proposed foundation slopes downward from west to east at a rate of approximately 11%.

(6) The global stability of the cofferdam shall be accounted for in the design and detailing of the cofferdam.

(7) Dewatering of the cofferdam shall not commence until the seal coat has attained at least 75% of its design strength. The cofferdam shall be dewatered to allow construction of the footing in the dry.

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(b) The Contractor shall also address the following items in his submittals:

(1) A list of the proposed equipment to be used including cranes, excavation buckets, final cleaning equipment, tremies or concrete pumps, etc.

(2) Details of the overall construction operation sequence including equipment access and any other construction which the Contractor proposes to do which is not fully detailed in the plans.

(3) The Contractor shall provide a proposed method of cleaning of the rock at the foundation level to elevations shown in the plans or to such depth as determined by the Engineer.

(4) The Contractor shall provide a proposed method for determining that the rock is competent.

The Contractor's procedure, computations and drawings shall be prepared and sealed by an Illinois Licensed Structural Engineer. Review by the Engineer shall in no way relieve the Contractor of the responsibility to construct the work in accordance with the intent of the plans and these specifications. The cost of furnishing design computations and drawings shall be included with the contract price for the various pay items of work involved. No additional compensation will be allowed the Contractor for any delays resulting from compliance with the above requirements.

Materials.

The materials used for the construction of the foundation shall satisfy the following requirements:

(a) All materials and methods for the concrete construction shall be in accordance with the applicable portions of Section 503 of the Standard Specifications. All concrete in the Pier footing excluding the seal coat shall be in accordance with CONCRETE STRUCTURES.

(b) The concrete used for the seal coat shall be portland cement concrete Class SC according to Section 1020 of the Standard Specifications, except the mix design shall contain the materials and exhibit the properties as follows:

(1) Type II cement.

(2) Fly ash, Class F.

(3) The water/cement ratio (lb/lb) shall not exceed 0.44.

(4) Provisions for concrete placement shall be based on not exceeding a target peak temperature of 150° F with a maximum adiabatic heat rise of 80° F.

(5) The minimum compressive strength shall be 4000 psi at 28 days.

(6) The seal coat shall be poured in a single lift (no joints will be allowed).

(c) Concrete Trial Mixes - The Contractor shall propose and batch concrete trial mixes to demonstrate the attainment of the concrete properties specified above.

(1) All proposed concrete mix design shall be submitted for review and approval and shall identify all materials sources and include certifications that the constituent materials meet the material property requirements specified herein. Substitution of other sources or finely divided minerals shall require submittal of new mix designs for approval.

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(2) All proposed mix design submittals shall include test results from laboratories approved by the IDOT verifying that the proposed mix design meets all the concrete property requirements specified in the previous section.

(3) Admixture compatibility and performance shall be demonstrated for all trial mixes for the anticipated temperature ranges of use, and the Contractor shall provide a statement verifying such compatibility and performance with the proposed mix design submittal.

(4) All proposed mix design submittals for seal coat placements shall include adiabatic heat data.

a. An adiabatic heat curve through 28 days shall be provided for each trial mix submitted for mass concrete applications.

b. These data may be obtained by submitting the trial mix to the USACE Waterways Experiment Station in Vicksburg, Mississippi for adiabatic calorimeter testing. The Contractor shall be responsible for the arrangements and costs associated with this testing. Note that long lead times may be required for USACE testing, and any resultant schedule impacts shall be the responsibility of the Contractor.

c. Alternatively, these data may be developed with the use of a suitable adiabatic calorimeter, the design of which has been submitted to and approved by the Engineer. [See, for example, Gibbon, G.J., Ballim, Y., and Grieve, G.R.H., A Low-Cost, Computer-Controlled Adiabatic Calorimeter for Determining the Heat of Hydration of Concrete, Journal of Testing and Evaluation, JTEVA, Vol. 25, No. 2, March 1997, pp 261-266. See also Chapter 10 of RILEM Report 15, Prevention of Thermal Cracking in Concrete at Early Ages.] Data resulting from the use of a calorimeter that is not truly adiabatic will not be acceptable.

d. These data shall be submitted to the Engineer in both hard copy and electronically in Microsoft Excel format.

(5) The Concrete Trial Mixes shall be of sufficient size and shall include provisions as necessary to represent the conditions of mass concrete.

(6) Trial mix designs with all supporting test data shall be submitted to the Engineer for approval at least three months prior to placement of seal coat concrete.

(d) The Contractor shall submit for the Engineer's approval a concrete temperature monitoring plan to monitor the seal coat concrete temperatures during placement and curing.

(e) The trial mixes and the concrete temperature monitoring shall not be paid for separately but will be considered included with the contract price for the pay item SEAL COAT CONCRETE, SPECIAL.

General Construction Requirements.

H-Piles Installation:
H-Piles shown in the plans will be installed in accordance with the Special Provision "Setting Piles in Rock." H-Pile installation will take place prior to excavation within the cofferdam.

Excavation:
The Contractor shall make all excavations of every nature, in whatever material is encountered, and do all the work necessary to build the foundation to the required depth, including the removal of all obstacles which may be encountered. There will be neither direct payment for the removal of any obstacles encountered, nor for delays on account of unforeseen excavation operations, nor for any unanticipated conditions or materials, but payment therefore shall be covered by the prices paid for COFFERDAM EXCAVATION, SPECIAL.

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Excess dredged material shall not be used on site. It is to be removed and disposed of per Standard Specification for Road and Bridge Construction Article 202.03. The proposed landfill should be an upland, non-water of the United States. This landfill location is subject to approval by the District 7 Environmental Coordinator.

No excavation shall be made outside of the cofferdam, and the natural stream bed outside of the cofferdam shall not be disturbed without the written permission of the Engineer. If the Contractor construction operations should cause settlements of the ground outside the cofferdam, the Contractor shall, when directed by the Engineer, backfill all such excavations or depressions to the original ground surface or stream bed with stone material as specified for riprap.

The Contractor is expected to found the bottom of the seal coat on competent rock at plan elevations. However, if competent rock is not found at that elevation, the bottom of the seal coat shall be lowered as directed by the Engineer. If the Contractor is directed to lower the elevation of the bottom of the seal coat, the provisions of Section 104 of the Standard Specifications shall apply for extra work.

Final acceptance of the founding level by the Engineer will be based on the requirement that a minimum of ninety (90) percent of the bottom area shall be clean of all loose soil, rock and foreign materials. Localized areas of the bottom surface not clean shall not exceed one (1) percent of the total bottom area.

The Contractor shall have available a competent black water diver or divers to assist in removing any obstructions during excavation, to check final cleaning conditions before sealing, to ascertain that the surface of the excavation is down to competent rock and to assist in the removal of the internal braces of the cofferdam. The cost of this work will not be paid for separately but will be considered included with the contract price for the various pay items of work involved.

Regardless of the elevation at which the bottom of the seal coat is founded, the elevation of the top of the seal coat shall be as shown in the plans.

Seal Coat Concrete Placement:

The seal coat thickness, to provide a watertight cofferdam, was determined for water elevation of 388.62 for Pier 4 and 373.50 for Pier 5. Due to the limited depth for seal coat construction, Pier 5 may require driving sheeting into shale, supplemental pumping, a water elevation below 373.50, or other acceptable means to address the hydrostatic head. The cost of this work, if required, will not be paid for separately but will be considered included with the contract price for the pay item SEAL COAT CONCRETE, SPECIAL.

The seal coat concrete shall be placed as soon as possible after cleaning the bottom area. The pour shall be made in a continuous manner from the top of rock until the cofferdam excavation is full and until good quality, uncontaminated concrete is evident at the top of seal concrete elevation shown in the plans. The concrete shall be deposited in such a manner that the development of a cold joint between successive layers or stages of placement is avoided. This shall be accomplished by placing the concrete layers in sufficient depth to accommodate satisfactory tremie operation while insuring that the previously-placed layer has not taken initial set. Materials and methods used in tremie sealing shall conform to the applicable provisions of the Standard Specifications and to the requirements specified therein under Section 503.08 for depositing concrete under water.

After dewatering, concrete contaminated with foreign material or laitance or otherwise unsound concrete at the top of seal coat shall be removed using scraping, chipping or by other means to sound concrete to the satisfaction of the Engineer. The cost of this work will not be paid for separately but will be considered included with the contract price for the pay item SEAL COAT CONCRETE, SPECIAL.

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Method of Measurement.

For COFFERDAM EXCAVATION, SPECIAL the measurement for payment will be made in cubic yards of the excavation actually performed within the limits of the cofferdam as shown in the plans and accepted by the Engineer.

The item SEAL COAT CONCRETE, SPECIAL will be measured for payment in cubic yards within the cofferdam sheeting. The vertical dimension used in computing the volume will be the average thickness of the seal between the top of the seal not to exceed the elevation shown in the plans for the bottom of the footing and the measured top of rock. The horizontal dimensions used will be the average measurement from center to center of the interlocks of the sheet piling in opposite walls of the cofferdam, but in no case will these dimensions extend beyond the dimensions shown on the plans, except that provisions may be made for a sump at one end of the cofferdam if necessary.

Basis of Payment.

Except as provided, the work specified in this special provision will not be paid for as a separate item.

The Cofferdam will be paid for at the contract unit price each for COFFERDAM, at the locations specified. This item shall include the detailed design and drawing of the cofferdam, preparing the site for all equipment access, all submittals outlined herein, dewatering of the cofferdam, installing and anchoring the sheeting system and the internal bracing of the cofferdam, preventing the inflow of materials inside the cofferdam, and removing the sheeting system and internal bracing according to the previously approved procedure.

The excavation within the cofferdam will be paid for at the contract unit price per cubic yard for COFFERDAM EXCAVATION, SPECIAL. This item shall include all labor and equipment needed to excavate inside the cofferdam, clean the top of rock, and verify that the rock surface is competent and clean.

The concrete for the seal coat will be paid for at the contract unit price per cubic yard for SEAL COAT CONCRETE, SPECIAL. This item shall include all labor and equipment necessary to complete depositing the seal concrete including the tremie pipes, pumps, trial mix, dewatering and the removal of laitance or contaminated concrete at the top of the seal coat after dewatering.

The rock sockets as shown in the plans, will be paid for at the contract unit price each for SETTING PILES IN ROCK. This item shall include all labor and equipment necessary to excavate and inspect the rock sockets as shown in the plans, any shaft excavations through soil, setting the piles in rock and backfilling any shaft excavation, and any temporary casing utilized.

The footing concrete will be paid for separately under the contract pay item CONCRETE STRUCTURES.

The price of the various contract items of work shall include all temporary and permanent materials, falsework, docks, and all means of construction, all labor, plant, tools, equipment, and incidentals necessary to satisfactorily complete the foundation construction.

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Installation. Form liners shall be installed in accordance with the manufacturer's recommendations to achieve the highest quality concrete appearance possible. Form liners shall withstand concrete placement pressures without leakage causing physical or visual defects. After each use, liners shall be cleaned and made free of build-up prior to the next placement, and visually inspected for blemishes or tears. If necessary, the form liners shall be repaired in accordance with the manufacturer's recommendations. All form liner panels that will not perform as intended or are no longer repairable shall be replaced.

The liner shall be securely attached to the forms according to the manufacturer's recommendations. Liners shall be attached to each other with flush seams and seams filled as necessary to eliminate visible evidence in cast concrete. Liner butt joints shall be blended into the pattern so as to create no visible vertical or horizontal seams or conspicuous form butt joint marks. Liner joints must fall within pattern joints or reveals. Finished textures shall be continuous without visual disruption and properly aligned over adjacent and multiple liner panels. Continuous or single liner panels shall be used where liner joints may interrupt the intended pattern.

Wall ties shall be coordinated with the liner and form to achieve the least visible result. Curing methods shall be compatible with the desired aesthetic result. Use of curing compounds will not be allowed. Concrete slump requirements shall meet the form liner manufacturer's recommendations for optimizing the concrete finish.

It is the intention of this specification that no rubbing of flat areas or other repairs shall be required after form removal. The finished exposed formed concrete surfaces shall be free of visible vertical seams, horizontal seams, and butt joint marks. Grinding and chipping of finished formed surfaces shall be avoided.

Method of Measurement. Form liner textured surface will be measured for payment in place and the area computed in square feet of actual concrete surface area formed with concrete form liners.

Add "No deductions will be made for the volume of concrete displaced by form lined surfaces." after the last sentence of the first paragraph of Article 503.21(b) of the Standard Specifications.

Basis of Payment. Form liner textured surface will be paid for at the contract unit price per square feet for FORM LINER TEXTURED SURFACE.

PLANTING SCHEMES FOR AREAS IMPACTED BY TEMPORARY CONSTRUCTION ACTIVITIES

Revised November 1, 2007

Description.

This work shall consist of all labor, materials and equipment necessary for the treatment of areas impacted by temporary construction activities as shown on the plans, details, and specified herein. This work shall be performed at the direction of the Engineer, and in accordance with the requirements of Section 250 and 253 of the Standard Specifications except as modified herein.

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Construction Requirements.

General

Floodway areas that are impacted by temporary construction activities associated with this project shall be restored to their prior condition following construction. These impacted areas are identified on the road design plans and are also listed in Table 6 of this special provision. Restoration shall involve removal of all fill material and re-establishment of the pre-construction ground elevations. Temporarily impacted areas shall be replanted in accordance with the Planting Schemes detailed in this special provision. Measures shall be taken to avoid and correct any soil compaction resulting from construction activities. Practices that can be utilized to avoid or lessen compaction include:

- Work when the ground is frozen
- Use equipment with longer reach to avoid the need to enter a wetland with equipment
- Use low ground pressure equipment such as machines with wide tires, duals, tire tracks, bogies, tracks, light weight, and/or central tire inflation (CTI)
- Use temporary wetland crossings such as wood mats, wood panels, wood pallets, bridge decking, expanded metal grating, PVC and HDPE pipe mats or plastic road, tire mats, corduroy, pole rails, and/or wood aggregate,

Upon completion of work in temporarily impacted areas all material used for temporary wetland crossings shall be removed and the soils shall be tilled to a depth of 24 inches where compaction has occurred. If the conditions at the site are too wet to allow tilling then the soil shall be harrowed to a depth of 6 inches.

Any substitutions to the plantings listed in this special provision shall be approved by the U.S. Army Corps of Engineers.

PLANTING SCHEMES:

There are 5 Planting Schemes: Type 1, Type 2 Type 3, Type 4, and Type 5. These are described below

Type 1 Planting Scheme

The seasonally-flooded, forested wetlands shall be planted with 1 inch caliper, 3 gallon container grown trees at a density of 302 stems per acre (12x12' spacing). These areas shall also be planted with 3 gallon containerized shrubs at a density of 151 stems per acre. Shrubs shall be placed at the center of the 12x12 tree plantings. The trees and shrubs shall be planted as shown in the Planting Layout Detail drawing (Figure 1). These areas shall be seeded with the low growing herbaceous mix specified in Table 1.

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Table 1: Seasonally Flooded Forested Wetland – Herbaceous Mix – Permanent Seed Mix

Common Name	Scientific Name	Ounces/Acre
Graminoids		
Frank's Sedge	*Carex frankii*	2
Common Hop Sedge	*Carex lupilina*	2
Pointed Oval Sedge	*Carex tribuloides*	2
Fox Sedge	*Carex vulpinoidea*	2
Stout Wood Reedgrass	*Cinna arundinacea*	2
Riverbank Wild Rye	*Elymus riparius*	16
Virginia Wild Rye	*Elymus virginicus*	64
Fowl Manna Grass	*Glyceria striata*	1
Forbs		
Wingstem	*Actinomeris alternifolia*	2
Side-Flowering Aster	*Aster lateriflorus*	2
Flat-Top White Aster	*Aster umbellatus*	4
Nodding Beggar-Ticks	*Bidens cernua*	4
Great Blue Lobelia	*Lobelia siphilitica*	1
Monkey Flower	*Mimulus ringens*	1
Green-Headed Coneflower	*Rudbeckia lacinata*	2
Late Goldenrod	*Solidago gigantea*	2
	TOTAL	**109**

Trees shall be selected from the list in Table 2, with the final selections meeting the following criteria:

- A minimum of 10 species,
- No species shall make up more than 20% of the total stems,
- At least 5 species shall be canopy species and make up 80% of the total stems
- At least 5 species shall be understory species and make up 20% of the total stems
- The final list shall include at least 1 hickory (genus Carya) and at least 2 oaks (genus Quercus)

Shrubs shall be selected from the list in Table 2. A minimum of 3 species of shrubs shall be utilized. No shrub species shall make up more than 35% of the total stems.

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Table 2: Type 1 Seasonally Flooded Forested Wetland – Trees and Shrubs

Common Name	Scientific Name	Form	Indicator	C-Value
Swamp White Oak	*Quercus bicolor*	Tree – Canopy	FACW+	7
Overcup Oak	*Quercus lyrata*	Tree – Canopy	OBL	7
Pin Oak	*Quercus palustris*	Tree – Canopy	FACW	3
Shumard's Oak	*Quercus shumardii*	Tree – Canopy	FACW-	7
Swamp Chestnut Oak	*Quercus michauxii*	Tree – Canopy	FACW	7
Pecan	*Carya illinoinensis*	Tree – Canopy	FACW	4
Shellbark Hickory	*Carya laciniosa*	Tree – Canopy	FACW	8
Water Locust	*Gladitsia aquatica*	Tree – Understory	OBL	8
Persimmon	*Diospyros Virginia*	Tree – Understory	FAC	5
Deciduous Holley	*Ilex decidua*	Tree – Understory	FACW	7
Buttonbush	*Cephalanthus occidentalis*	Shrub – Understory	OBL	5
Swamp Privet	*Forestiera acuminata*	Shrub – Understory	OBL	8
Spicebush	*Lindera benzoin*	Shrub – Understory	FACW-	5
False Indigobush	*Amorpha fruticosa*	Shrub – Understory	FACW+	3
Winterberry	*Ilex verticillata*	Shrub – Understory	FACW+	8

Type 2 Planting Scheme

The semi-permanently flooded forested wetland area shall be planted with 1 inch caliper, 5 gallon container grown Bald cypress (Taxodium distichium) at a rate of 302 stems per acre (12x12' spacing).

These areas shall also be planted with 3 gallon containerized shrubs at a density of 151 stems per acre. Shrubs shall be placed at the center of the 12x12 tree plantings. The trees and shrubs shall be planted as shown in the Planting Layout Detail drawing (Figure 1). Shrubs shall be selected from the shrubs listed in Table 3.

Table 3: Type 2 Shrubs

Common Name	Scientific Name
Swamp Privet	*Forestiera acuminata*
Buttonbush	*Cephalanthus occidentalis*

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The edge of the open water associated with the Type 2 areas shall also be planted with equivalent quantities of the plugs listed in Table 4. The plugs shall be installed on 3x3 foot spacing. The plugs shall be planted in the area found 1 foot below the ordinary high water mark and 1 foot above the ordinary high water mark. The plugs shall be covered by goose grid in order to protect the vegetation from grazing by waterfowl. The grid shall be installed in accordance with the manufacturer's specifications. The water level shall be drawn down during installation of wetland plugs.

Table 4: Emergent Wetland Plugs

Common Name	Scientific Name
Blue Flag Iris	*Iris virginicus shrevei*
Pickerel Weed	*Pontendaria cordata*
Lizard Tail	*Saururus cernuus*
Spider Lilly	*Hymenocallis occidentalis*
Common Arrowhead	*Sagitaria latifolia*

Type 3 Planting Scheme

The bottomland hardwood forest area shall be planted with 1 inch caliper, 3 gallon container grown trees at a density of 302 stems per acre (12x12' spacing). These areas shall also be planted with 3 gallon containerized shrubs at a density of 151 stems per acre. Shrubs shall be placed at the center of the 12x12 tree plantings. The trees and shrubs shall be planted as shown in the Planting Layout Detail drawing (Figure 1). These areas shall be seeded with the low growing herbaceous mix specified in Table 1.

Trees shall be selected from the list in Table 5 with the final selections meeting the following criteria:

- A minimum of 10 species,
- No species shall make up more than 20% of the total stems,
- At least 5 species shall be canopy species and make up 80% of the total stems
- At least 5 species shall be understory species and make up 20% of the total stems
- The final list shall include at least 1 hickory (genus Carya) and at least 2 oaks (genus Quercus)

Shrubs shall be selected from the list in Table 5. A minimum of 5 species of shrubs shall be utilized. No shrub species shall make up more than 20% of the total stems.

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Table 5: Type 3 Non-Wetland Forest – Trees and Shrubs

Common Name	Scientific Name	Form
Red maple	Acer rubrum	Canopy
Persimmon	Diospyros virginia	Understory
Alternate-leaf dogwood	Cornus alternifolia	Understory
Black gum	Nyssa sylvatica	Understory
American basswood	Tilia Americana	Canopy
Slippery elm	Ulmus rubra	Canopy
Ohio buckeye	Aesculus glabra	Understory
Bitternut hickory	Carya cordiformis	Canopy
Deciduous Holly	Ilex deciduous	Understory
Bur oak	Quercus macrocarpa	Canopy
Southern Red oak	Quercus falcate	Canopy
Shumard oak	Quercus shumardii	Canopy
Pin oak	Quercus palustris	Canopy
Swamp Chestnut oak	Quercus michauxii	Canopy
Roughleaf dogwood	Cornus drummondii	Shrub
Black chokeberry	Aroniana melanocarpa	Shrub
Gray dogwood	Cornus racemosa	Shrub
Hazelnut	Corylus Americana	Shrub
Smooth hydrangea	Hydrangea arborescens	Shrub
Spicebush	Lindera benzoin	Shrub
Common ninebark	Physocarpus opulifolius	Shrub
Carolina rose	Rosa Carolina	Shrub
Pasture gooseberry	Ribes cynosbati	Shrub
American bladdernut	Staphylea trifolia	Shrub
Black haw	Viburnum prunifolium	Shrub

Type 4 Planting Scheme
These areas shall be seeded with the low growing herbaceous mix specified in Table 1.

No trees shall be included in Type 4 planting scheme.

Type 5 Planting Scheme
These areas shall be planted with 2 inch caliper, properly staked trees at the density of 88 stems per acre (22'x22' spacing). The trees shall be planted as shown in the Planting Layout Detail drawing (Figure 1 except the spacing shall be a 22' x 22' grid). Seeding for these areas shall be as specified elsewhere.

Trees shall be selected from the list in Table 6 with the final selections meeting the following criteria:

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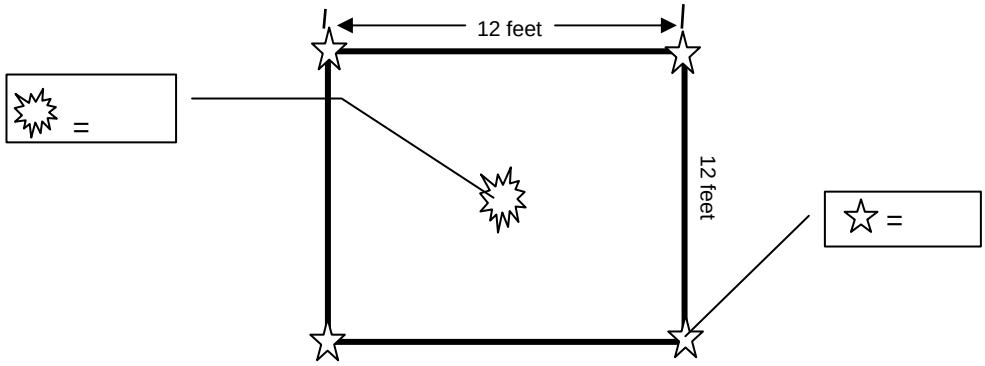
Table 6: Type 5 Trees

IDOT Code No.	Common Name	Scientific Name	% of Plants
A2005816	Sycamore	Platanus Occidentalis	14.28%
A2007716	Shawnee Brave Bald Cypress	Taxodium Distichum Shawnee Brave	14.28%
D2002972	Eastern White Pine	Pinus Strobus	14.28%
B2001116	Eastern Redbud	Cercis Canadensis	14.28%
A2002416	Heritage River Birch	Betula Nigra Heritage	14.28%
A2001016	Red Maple	Acer Rubrum	14.28%
C2001560	Grey Dogwood	Cornus Racemosa	14.28%

Figure 1:Planting Layout Detail



ADDITIONAL PLANTING SPECIFICATIONS

- Trees and shrubs shall be planted in a random fashion while maintaining appropriate spacing.
- All plants and seed for Indiana planting shall be obtained from nurseries run by Indiana DNR or commercial sources within American National Standards Institute (ANSI) Plant Hardiness Zones 5 or 6.
- All plant material shall be kept moist during transportation and storage.
- Plant material shall not be subjected to freezing, drying, or excessive warming.
- Only the number of saplings that can reasonably be planted during a single day may be removed from storage. They shall be kept moist at all times.
- Saplings shall be planted during the period from September 15 until the ground has frozen; or after the frost leaves the ground in spring to June 1.
- Saplings shall be planted in accordance with sound horticultural practices, including proper planting depth and soil compaction following planting.
- Saplings shall be planted so the root collar is no deeper than ½ inch below the ground surface. Roots shall not be forced into an improper planting hole which would restrict their ability to grow and support the saplings thereby reducing the overall survival rate.

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- All planting in Indiana shall be in accordance with INDOT Specifications Section 622 – Planting Trees, Shrubs, and Vines.
- If herbaceous vegetation has become established onsite, prior to planting of trees and shrubs, the planting area shall be mowed to a height of 6 inches or less to provide a suitable planting area generally free of vegetative competition no longer than ten days before the saplings are planted.
- All trees shall be properly staked.

Table 7: Site Number and Planting Scheme

SITE	PLANTING SCHEME	APROXIMATE AREA OF REPLANTING (acres)
6a	Type 1	0.56
6c	Type 1	0.77
9	Type 2	0.80
14b	Type 1	0.15
23	Type 1	0.06
A	Type 3	1.46
4	Type 5	0.21
5	Type 5	0.54
6	Type 4	1.30
TOTAL		5.85

Method of Measurement. This work shall be measured in place, and the quantity calculated in acres.

Basis of Payment. This work shall be paid for at the contract unit price per acre for PLANTING SCHEME, TYPE 1, PLANTING SCHEME, TYPE 2, PLANTING SCHEME, TYPE 3, PLANTING SCHEME, TYPE 4, and PLANTING SCHEME, TYPE 5.

SIGN PANEL - SPECIAL
Revised June 19, 2007

Description. These signs shall be placed at the boundaries of areas where seedlings for wildlife habitat have been placed. The locations and spacing of the signs shall be as shown on the plans or as directed. The sign shall otherwise be in accordance with Indiana Specification 621.06(h).

Method of Measurement. "Do Not Mow or Spray" Signs will be measured by the number installed and accepted.

Basis of Payment. "Do Not Mow or Spray" Signs shall be paid for as SIGN PANEL – SPECIAL at the contract price per unit each.

Revised 11/02/2007

Submittals: The erection plans and procedures shall be submitted to the Engineer for review and acceptance prior to starting the work. Review, acceptance and/or comments by the Department shall not be construed to guarantee the safety or final acceptability of the work or compliance with all applicable specifications, codes, or contract requirements, and shall neither relieve the Contractor of the responsibility and liability to comply with these requirements, nor create liability for the Department. Significant changes to the erection plan in the field must be approved by the Erection Engineer and accepted by the Engineer for the Department.

General Construction Requirements: Because there are multiple fixed piers in the steel girder bridge unit, steel girders shall be erected only if the outside temperature is between 5 °F and 95 °F.

Basis of Payment: This work shall not be paid for separately but shall be included in the applicable pay items according to Art. 505.13 of the Standard Specifications.

PROTECTION OF RIVER CONTOURS

Revised November 1, 2007

Description. This work shall include all labor, materials, equipment and services necessary to verify that all debris has been removed and no obstructions are left behind after construction and demolition are complete.

Construction Requirements. Prior to the beginning of construction, a survey of the ground line and river bed from 50 feet upstream of the existing bridge to 50 feet downstream of the proposed bridge over the Wabash River is required.

After construction of the proposed bridge is complete and the existing bridge has been removed, a second survey of the ground line and river bed from 50 feet upstream of the existing bridge to 50 feet downstream of the proposed bridge is required.

The surveys, at a minimum, shall consist of cross sections perpendicular to the river centerline at 25’ station intervals. River bed elevation shall be established every 10’ along each cross section. In addition, cross sections shall be taken along the upstream face, centerline, and downstream face of the existing bridge piers.

If the second survey indicates the presence of debris, obstructions, or protrusions, the Contractor shall remove these objects from the work site to the satisfaction of the Engineer and re-survey the immediate area to verify the obstructions have been removed.

The Contractor shall submit documentation for all surveys demonstrating that debris, obstructions, and protrusions have been removed.

Basis of Payment. The work of surveying the existing and final ground line and river bed will be paid for at the contract unit price each for PROTECTION OF RIVER CONTOURS. Payment for the work of removing debris from the river is not included in this item, but is paid for at the contract unit price for REMOVAL OF EXISTING STRUCTURES or is included in the unit price for other various project pay items.

Revised 11/02/2007

DEPARTMENT OF THE ARMY PERMIT

This permit is also known as the Individual 404 Permit. The Contractor shall comply with all of the General Conditions and items 2, 3, 4, and 10 (see United States Fish and Wildlife – Biological Opinion special provison) of the Special Conditions.

DEPARTMENT OF THE ARMY PERMIT

Permittee: Illinois Department of Transportation Region 4/District 7

Permit Number: LRL-2006-1440-GJD

Issuing Office: U.S. Army Engineer District, Louisville

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: Construction of a 20 bridge span structure and reallignment of a 1.8 mile stretch of IL15/IN64. The project would necessitate the permanant filling of 3.1 acres of palustrine forested wetlands (PFO), 0.99 acres of open water (OW), 0.39 acres of farmed wetlands, and 0.38 acres of palustrine emergant wetlands (PEM). The project would also require the construction of 19 new piers to support the crossing. Six of these piers would be constructed within the Wabash River. Cofferdams and pier placement would require the the excavation of 6,671 cubic yards of dredged material. The dredged material would be reused on site for bed and embankment fill if it meets Illinois Department of Transportation specifications. Otherwise the material would be removed to an offsite upland location. Construction of the proposed structure would include temporal wetland impacts associated with access and traffic run arounds. Temporal wetland impacts would include 1.39 acres of PFO, 1.08 acreas of OW, and 0.41 PEM. The new structure would have a vertical clearance over the Wabash River of 9' above the 100 year flood elevation of 405.38'. The existing structure provides a clearance of 25' above the 405.38' elevation. The existing horizontal clearance between piers of the existing structure is 227' center to center with a minimum clearance of 215'. There would be similar clearance with the proposed structure. The proposal also includes removing the existing structure after the proposed structure is complete and open to traffic use. The existing structure would be removed by placing explosives on the truss, deck and piers above and below the water. The explosives would be detonated to drop the structure into the river and adjacent floodplain and wetlands. The demolition debris would then be cut and removed from the river for upland disposal or reuse.

Project Location: The project is located within the Wabash River, along both banks of the Wabash River and its' adjacent wetlands at the IL Highway 15/IN State Road 64 crossing, Wabash County, Illinois and Gibson County, Indiana.

Permit Conditions:

General Conditions:

1. The time limit for completing the authorized activity ends on October 31, 2013. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification from this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal 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.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of your permit.

Special Conditions:

1) The permittee shall comply with the "SR64/IN15 New Bridge over Wabash River Wetland Mitigation and Monitoring Plan" dated October 2006, attached to the November 17, 2006 application, amended in a letter dated May 17, 2006, and special conditions herein this permit.

2) The permittee shall comply with the May 4, 2007 Indiana Department of Environmental Management Section 401 Water Quality Certification IDEM # 2007-016-26-JWR-A.

3) The permittee shall comply with the July 16, 2007 Illinois Environmental Protection Agency Section 401 Water Quality Certification Log # C-0943-06.

4) The permittee shall post signage at the nearest upstream and downstream public boat ramp access points located on both the Indiana and Illinois shorelines. This signage should provide information to river users of the location of the project, estimated period of construction, and potential hazards. Appropriate signage shall also be placed in-river, both upstream and downstream of the project area, advising approaching boaters of the nearby hazards and appropriate route of travel.

5) At least 2 weeks prior to the demolition of the existing structure, the applicant shall notify the Corps of Engineers, Newburgh Regulatory Office, PO Box 489, Newburgh, Indiana, 27629, Attn: Mr. George DeLancey (CELRL-OP-FW),of the impending demolition project. The notice shall include the following information: name, type and number of equipment, duration of project, hours of operation, location of equipment during non-work hours, contact person, phone number, and any other pertinent data.

6) At least 2 weeks prior to the demolition of the existing structure, the applicant shall notify and publish a public notice in the local newspapers of record serving the surrounding counties. The notice shall include the following information: name, type and number of equipment, duration of project, hours of operation, location of equipment during non-work hours, contact person, phone number, and any other pertinent data.

7) Within 30 days of project completion, the permittee shall submit a written report, including any supportive documentation, from the contractor and project engineer certifying that all sheet piling have been completely removed from the river bed or cut at least 1 foot below the riverbed elevation.

8) Within 30 days of demolition completion, the permittee shall submit a pre and post survey of the Wabash River bed demonstrating that all debris has been removed from the demolition project. The Corps will review the submitted information and make a final determination if addition debris recovery/removal will be required to be completed by the permittee.

9) The permittee shall complete the proposed mitigation as outlined "Wetland Mitigation and Monitoring Plan for Impacts Associated with SR64/IL15 Bridge Replacement Over the Wabash River, Gibson County, Indiana and

Wabash County, Illinois," revised and submitted May 17, 2007, with the following additional special conditions which apply to both onsite and off site mitigation areas;

a. Prior to the planting of any mitigation area, both on site and off site restoration, the permittee shall submit a proposed planting list for final approval by the Corps of Engineers, Newburgh Regulatory Office.
b. The success criteria for the planted tree and shrub species shall be 85% survivability at the end of monitoring. No one species shall comprise of more that 25% of the surviving stock.
c. The mitigation sites shall be managed so as to remove volunteer and invasive species during monitoring.
d. The herbaceous ground cover success criteria of 70% shall be of planted native desirable species and is subject to Corps review and approval. No one species shall make up more than 40% of that ground cover at the end of monitoring.
e. Site inspections shall be completed on a bi-annual basis, first and last month of the growing season, to be included on with the annual monitoring reports.

10) The permittee shall comply with all "Reasonable and Prudent Measures," "Terms and Conditions," and "Conservation Recommendations" listed in the United States Fish and Wildlife Services Biological Opinion dated October 24, 2007.

11) The permittee's responsibility to complete the project in accordance with the required compensatory mitigation proposal and listed Special Conditions 1 - 10 will not be considered fulfilled until compliance and mitigation success has been demonstrated and written verification is received from the U. S. Army Corps of Engineers.

Further Information:

1. Congressional Authorities. You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data. The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measure ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give you favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE) (DATE) 10-31-07

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

RAYMOND G. MIDKIFF
COLONEL, CORPS OF ENGINEERS
(COMMANDER AND DISTRICT ENGINEER) (DATE) 31 October 2007

BY: Mr. George DeLancey
Regulatory Specialist
Regulatory Branch

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) *(DATE)*

UNITED STATES FISH AND WILDLIFE SERVICE – BIOLOGICAL OPINION

This Biological Opinion is referenced in the Individual 404 Permit. The Contractor shall comply with items 2-5 of the Reasonable and Prudent Measures and the following items under Terms and Conditions: 5, 6, 7 (see SPILL PLAN special provision), 8 (see ZEBRA MUSSEL DECONTAMINATION), and 9 (see MUSSEL WORK RESTRICTIONS).

United States Department of the Interior
Fish and Wildlife Service

Bloomington Field Office (ES)
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273

October 22, 2007

Mr. Eric Harm
Deputy Director of Highways
Illinois Dept. Of Transportation
2300 South Dirksen Parkway
Springfield, Illinois 62764

Dear Mr. Harm:

This document transmits the Fish and Wildlife Service's (Service) biological opinion for the proposed Illinois Department of Transportation, (IDOT) Route 15 bridge removal and replacement project (FAP 827) over the Wabash River at Mount Carmel, in Wabash County, Illinois and Gibson County, Indiana. The attached biological opinion addresses the effects of the federal action on the endangered fat pocketbook pearly mussel *(Potamilus capax)* in accordance with Section 7 (a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C.1531 et seq.). The Federal Highway Administration's September 14, 2007 request for formal consultation and accompanying information was received at the Service's Bloomington, Indiana Field Office on September 17, 2007. Although this consultation is being conducted with IDOT, the Federal Highway Administration (FHWA) is the federal action agency. Therefore, we are notifying the FHWA of the results of this consultation by copy of this letter.

This biological opinion is based on the NEPA early coordination beginning in 1995, Environmental Assessment dated February, 1998, subsequent information provided by your office related to project design and construction plans, Illinois Natural History Survey (INHS) mussel survey memoranda dated September 4, 1995, September 10, 2004, August 10, 2007 and September 14, 2007, and other sources of information. The September 14, 2007 survey information is a focal point of our consultation because it was the first survey to find live *P. capax* in the action area. A complete administrative record of this consultation is on file at the Service's Bloomington, Indiana Field Office.

Sincerely,

Scott E. Pruitt,
Field Supervisor

RECEIVED
OCT 26 2007
ENVIRONMENT
SECTION

cc: FHWA, (Matt Fuller Springfield, IL and Larry Heil, Indianapolis, IN,)
Illinois DNR, (Steve Hamer, Springfield, IL and Joseph Kath, Champaign, IL)
Indiana DNR, Indianapolis, IN (Katie Smith)
USFWS Region 3, Twin Cities, MN (Jennifer Szymanski)
Illinois DOT (Barbara Stevens, Charles Perino, Springfield, IL)
Illinois DOT (Gary Welton, Effingham, IL)
Indiana DOT, Indianapolis, IN (Michelle Allen, Steve Sperry)
US Army Corps of Engineers, Newburgh, IN (George DeLancey)

Endangered Species Act Section 7 Consultation - Biological Opinion

Action Agency: Federal Highway Administration

Action Considered: Replacement of Mount Carmel Bridge over the Wabash River on Illinois Route 15 and Indiana State Road 64

Consultation By: Region 3, U.S. Fish and Wildlife Service

Date of Issuance: October 22, 2007

CONSULTATION HISTORY

The Service initially reviewed the Mount Carmel bridge replacement project during early NEPA coordination in early 1995. An Illinois Natural History Survey memorandum dated September 4, 1995 transmitted the results of a mussel survey carried out at the project site during August 1995. Based on that document we concurred with the conclusion that the project was not likely to adversely affect the federally endangered fat pocketbook mussel *(Potamilus capax)* or other federally listed mussels. Subsequent mussel surveys were conducted on August 10, 2004 and August 7, 2007. The 2004 survey again failed to collect any evidence of living *P. capax*, however the August 2007 survey found one fresh dead specimen of that species immediately downstream from the project site near the head of Patoka Island. The results of that survey indicated the possible presence of *P. capax*, therefore the Service requested a more detailed survey to be conducted prior to construction. Another survey was conducted on September 12, 2007, designed to intensively search the entire impact area of the proposed project. That survey used 10 wading searchers, 4 SCUBA searchers and an intensive brailing survey, whereas previous surveys at the site had used brailing and typically 2-3 wading searchers but no SCUBA searches.

By e-mails of September 12, 2007 from Mr. Jeremy Tiemman of the Illinois Natural History Survey, the Service was notified that live individuals of *P. capax* were found within the study area. A survey report memorandum from Mr. Tiemann to the Illinois Department of Transportation dated September 14, 2007 and copied to the FWS, stated that the September 12 survey found 8 live *P. capax* between the current bridge and the head of Patoka Island (which begins approximately 300 feet downstream from the current bridge). The majority of those individuals were found within or immediately downstream from the proposed project construction zone, with the remainder slightly further downstream along the riverward side of Patoka Island. The Service's Bloomington Field Office received the Federal Highway Administration's request to initiate formal consultation via a letter dated September 17, 2007. The Service confirmed our receipt of this letter and subsequent information in a response dated September 21, 2007.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

IDOT and the Indiana DOT (INDOT) propose to remove the existing bridge where Illinois Route 15 crosses the Wabash River at Mount Carmel and replace it with an improved bridge structure downstream from the current bridge. The existing bridge, which would be retained for traffic maintenance during construction of the new bridge, is 2726 feet long and 23.5 feet wide. The new bridge will be approximately 2900 feet long and 50 feet wide. Instream work to construct the new bridge piers and to remove the existing bridge would be conducted from a temporary work bridge, from a work barge and from the existing bridge. Removal of the truss superstructure and removal of bridge piers, to one foot below the river bed, would be by use of explosives. Debris from each span and pier will be removed from the river within 7 days after the completion of removal of the subject span or pier. Additional work will involve reconstruction of approach roads and additional bridge supports within the floodplain. Standard specifications for erosion and pollution control are proposed to avoid long-term, adverse impacts to water quality and aquatic fauna.

The proposed bridge removal and replacement will span a river reach approximately 200 feet in length and 1000 feet wide (bank to bank), including removal of the existing bridge and construction of a new bridge approximately 90 feet downstream of the existing bridge (centerline to centerline). The Action Area is defined as the entire construction zone plus the area downstream that may be adversely impacted by sedimentation effects resulting from soil and substrate disturbance. The Action Area extends from bank to bank and from 50 feet upstream of the existing bridge to 175 feet downstream of the existing bridge, a total linear river distance of 225 feet.

The project is located within the Wabash River, highly valued for its unique length of free-flowing river channel within the Midwest geographic area, great abundance and diversity of fish and mussel fauna, extensive floodplain/wetland habitat and fishing/recreational opportunities. Throughout its length the Wabash supports at least 2 federally endangered mussels and several species of fish and mussels listed as endangered, threatened or special concern by the States of Illinois and/or Indiana. Several reaches of the Wabash River are listed in the National Park Service's Nationwide Rivers Inventory, including the reach immediately upstream from the Mount Carmel bridge, which qualifies those river reaches as candidates for inclusion in the national Wild and Scenic Rivers System (National Park Service, 2004). The entire river within Indiana is included on Indiana's Outstanding Rivers List. Land use in the immediate project area is urban on the west side of the river (City of Mount Carmel, Illinois) and a mixture of floodplain forest rural development and power plant development on the east (Indiana) side. The mouth of the Patoka River is approximately 1500 feet upstream from the bridge and the head of Patoka Island is approximately 400 feet downstream.

According to Tiemann and Phillips (2007) the substrate at the Mount Carmel bridge consists of sand and mud with small patches of gravel and accumulations of woody debris and detritus. The water level was relatively low with water depth ranged from 0.1-9 feet at the time of their mussel

survey which collected live specimens of *P. capax*. The stream banks were steep, muddy and tree-lined.

SPECIES CONSIDERED IN THIS BIOLOGICAL OPINION

The project area is within the range of, and contains habitat for, the federally endangered Indiana bat (*Myotis sodalist*) and fat pocketbook pearly mussel (*Potamilus capax*). Based on previous surveys and conservation measures the Service concurred with the finding of IDOT and FHWA that the project is not likely to adversely affect the Indiana bat. The only species being considered in this biological opinion is the fat pocketbook pearly mussel. If other listed species are subsequently found in the action area, consultation will be reinitiated and this biological opinion will be revised as necessary to address them.

STATUS OF THE SPECIES

The fat pocketbook is a filter-feeding species from the Unionidea family. The fat pocketbook was first described by J. Green (1832) as *Unio capax*. The anterior end of the fat pocketbook is broad, rounded, and slightly angular near the hinge; the posterior margin is very narrow and rounded. The valves do not close perfectly on each other but gape at the posterior margin. This is more obvious in older individuals. The visceral tissue is smooth, yellowish, and frequently clouded with brown. The nacre is bluish white and often iridescent. The beaks are curved over the tegument. The teeth resemble those of *L. cardium*, but they are much thinner.

La Rocque (1967) reported that *P. capax* in the Mississippi River appeared to prefer mud bottoms. Parmalee (1967) described it as a large river species found in mud and sand substrate at depths of a few inches to eight or more feet. Museum records indicate *P. capax* is a large river species requiring flowing water and stable substrates (USFWS 1985). In the St. Francis River in Arkansas and lower Wabash River, fat pocketbooks have been found to utilize sand, mud and fine gravel substrates (Bates and Dennis 1983; Clarke 1985, Cummings 1993). Fuller (1978) noted that *P. capax* habitat seemed to involve lentic waters.

Freshwater mussel reproduction involves a period of parasitism before young can continue development and growth. Embryonic mussels (termed glochidia) must attach to a host (usually fish gill plates) where they metamorphose into free living individuals. In 1992, a study was conducted to examine fish captured in the lower Wabash and Ohio Rivers for glochidia. Thirty--two species were examined, and three species were found with encysted glochidia. A single glochidium identified as *P. capax* was found on a freshwater drum, *Aplodinotus grunniens* collected in the month of June. More recent studies have indicated that the freshwater drum is the primary host fish for *P. capax* (Cummings and Mayer 1993, Barnhart, 1997, Watters 2007).

The historic range of the species includes the upper Mississippi River above St. Louis; the Ohio River; the Wabash and White Rivers in Indiana; the St. Francis, White, and Black Rivers in Arkansas; the Spoon and Illinois Rivers in Illinois; the Des Moines and Iowa Rivers in Iowa; the Cumberland River in Kentucky; and the Neosho River in Kansas. Since 1970, it has been collected from the St. Francis River and Right Hand Chute Little River and drainage ditches associated with these streams in Arkansas and Missouri, the lower Wabash and White Rivers in

Indiana, the lower Cumberland River in Kentucky, and the upper Mississippi River. Specimens have also been found in the Mississippi River from near Helena, Arkansas downstream to Jackson, Mississippi and from the Tyronza River in Arkansas (U.S. Fish and Wildlife Service, 2007).

In 1987, during a survey of the unionid fauna of the Wabash River drainage, nine live P. capax were found in the lower part of the river. Subsequent surveys of the Wabash River detected populations of various sizes at sample sites from the confluence with the Ohio River upstream to Knox County, Indiana (Cummings et al. 1990, Miller 1995, Frankland, 1996, Heidi Dunn, Ecological Specialists, personal communication). Based on the results of these surveys the population of fat pocketbooks in the lower Wabash River appears to be stable and large relative to other sympatric mussels.

Although *P. capax* was historically widespread within much of its original range, populations have declined in the last 50 years. The main reason for decline of the species is channelization, impoundment and dredging of rivers, but contributing factors include siltation and pollution, and possibly range reductions of fish hosts, (U.S. Fish and Wildlife Service, 1989, 1997). More recently, infestations of the exotic invasive zebra mussel (*Dreissena polymorpha*) are contributing to the decline of all native Unionid mussels (Layzer er. al. 1996, Ricciardi et. al. 1998). Because of the severe reduction in range of the species, the fat pocketbook pearly mussel was listed as an endangered species on June 14, 1976. No estimate of total population was included on the 1985 recovery plan (USFWS 1985).

ENVIRONMENTAL BASELINE

The project reach of the Wabash River receives a substantial sediment load from the mouths of the White River and Patoka River, both immediately upstream of the Mount Carmel bridge, yet continues to harbor substantial numbers of mussels. Municipal and industrial wastewater effluent may adversely affect mussels downstream from the effluent discharge area. Chemical and petroleum based pollutants from stormwater discharge into the Wabash River may be a potential threat to the health of aquatic organisms. The extent of impacts of storm water pollution on freshwater mussels is site-specific and needs further study. Similarly, nutrient enrichment and siltation from agriculture and residential construction poses a threat to mussel populations. *P. capax* prefers stable silt/mud bottom substrate conditions.

Status of the Species in the Project Area

Some of the recent Wabash River mussel surveys included the Mount Carmel bridge project area. Live *P. capax* were found a few miles downstream from the project site near South Bend and upstream in Knox County, Indiana (Frankland 1996). A fresh dead specimen of *P. capax* was found near the Mt. Carmel bridge in 1999 (Brant Fisher, personal communication) but no live specimens had been found near the project site. Mussel surveys were conducted for the Mount Carmel bridge replacement project in 1995 (Cummings et. al. 1995) and 2004 (Cummings et. al. 2004) with negative results for *P. capax* and generally poor results for all mussels. A subsequent mussel survey for the project conducted on August 7, 2007 discovered a fresh dead specimen of *P. capax* downstream from the bridge at the head of Patoka Island (Tiemann and Phillips 2007).

The aforementioned September 12, 2007 survey found 8 live *P. capax*, including juveniles, and the survey report concluded that *P. capax* is reproducing in the project area, however the population size is not known.

Effects of the Action

IDOT has agreed to re-survey the action area prior to construction, and to relocate all *P. capax* they find and monitor the success of these relocation efforts. Take of *P. capax* will occur incidental to mussel relocation efforts, in the form of stress on mussels, interruption of normal behavior patterns and the potential for direct mortality. Furthermore, because previous surveys have demonstrated that it is difficult to find all specimens of *P. capax* in a large river, additional take may occur as a result of construction activities. Direct mortality of any *P. capax* remaining after mussel relocation could occur as a result of construction of a temporary work bridge, construction of the new bridge piers, and demolition of the existing bridge and piers (including falling demolition debris).

Indirect effects may occur as a result of short term changes in water quality and substrate due to construction activities. Construction and relocation of bridges may result in changes in flow patterns which may alter existing substrates and habitat suitability, however we do not anticipate any substantial long-term flow or substrate changes as a result of this project. Zebra mussels may be introduced into the project zone if instream equipment was contaminated with zebra mussels prior to construction. The Wabash River already contains zebra mussel veligers but due to its free flowing nature, thus far has not shown any indication of problematic colonization by adult zebra mussels (Brant Fisher, Indiana DNR, personal communication). These indirect effects would be difficult to quantify and are not expected to alter the overall distribution of mussels in the Wabash River.

The project consists only of replacement of an existing bridge. There are no indirect, interrelated or interdependent effects of other projects associated with this agency action.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area. The Service is not aware of any such actions. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Endangered Species Act (Act).

CONCLUSION

After reviewing the current status of *P. capax,* the environmental baseline for the action area, the effects of the proposed bridge replacement and the cumulative effects, it is the Service's biological opinion that the bridge replacement as proposed is not likely to jeopardize the continued existence of the fat pocketbook pearly mussel. No critical habitat has been designated for this species, therefore, none will be affected.

INCIDENTAL TAKE

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the FHWA, through the IDOT, so that they become binding conditions of any grant, permits or contracts, as appropriate, for the exemption in section 7(o)(2) to apply. The IDOT has a continuing duty to regulate the activity covered by this Incidental Take Statement. If IDOT (1) fails to assume and implement the terms and conditions or (2) fails to require the contractor to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to the grant, permit or contract, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, IDOT must report the progress of the action and its impact on the species to the Service as specified in the Incidental Take Statement. [50 CFR § 402.14 (1)(3)]

AMOUNT OR EXTENT OF TAKE

The Wabash River has been recognized previously as supporting a major reproducing population of *P. capax*, and the results of the most recent survey at the Mount Carmel bridge suggest that intensive survey methods would reveal more mussels than have been discovered so far. Due to the recent intensive surveys at this location it is reasonable to suppose that the *P. capax* records at this site provides a good indication of *P. capax* present at that time, however it is also likely that the number of *P. capax* present at any time is affected by stream flow conditions and by the variability of dispersion by fish hosts.

The Service authorizes the FHWA and IDOT to relocate all *P. capax* found during the pre-construction mussel relocation survey and all subsequent mussel surveys conducted in accordance with this biological opinion. Take will occur from disruption of normal behavioral patterns and possibly injury to some individuals. Because that number will be determined accurately at the time of the survey, IDOT or its agent must notify the Service of the number of *P. capax* found and relocated.

The success of mussel relocations is dependent on the knowledge of the personnel involved and the techniques used, and success has increased considerably in recent years as techniques have improved. Based on the personnel and the mussel relocation plan for this project we anticipate a high survival rate of *P. capax* as a result of this relocation effort. We authorize take through injury or direct mortality of 2 relocated *P. capax*. Post-construction monitoring of the mussel relocation site will provide information regarding the success of the relocation.

Direct take of live *P. capax* during construction will be low to non-existent due to the pre-construction survey and mussel relocation, but it is reasonable to assume that some *P. capax* may escape detection and remain in the construction zone. Take is also possible immediately downstream from the construction zone due to soil and sediment deposition during construction.

The Service also authorizes the FHWA and IDOT to take up to 2 fat pocketbook pearly mussels as a direct result of the proposed bridge construction project. The incidental take is expected to be in the form of death and injury.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat. With implementation of the reasonable and prudent measures presented below, incidental take is not anticipated to result in injury or mortality of more than 4 individual mussels. Take in the form of injury or mortality of more than 4 individuals is considered to be an adverse affect which will require reevaluation of this incidental take statement and discussion of the need for reinitiation of consultation.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measure(s) are necessary and appropriate to minimize take of fat pocketbook pearly mussels.

1. Prior to construction in the river, relocate all unionids from within the existing bridge right-of-way to a suitable habitat area that will not be adversely influenced by the bridge construction or other adverse impacts. Relocation must be conducted by a qualified malacologist.

2. Prior to construction ensure that all contractors and construction personnel receive training regarding legal and ecological aspects of *P. capax* conservation.

3. Conduct demolition work in a manner that will minimize the footprint and duration of bridge debris in the river.

4. Utilize best available methods to minimize erosion, soil runoff and spills of hazardous materials.

5. Avoid introduction of zebra mussels into the work zone during construction.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the Act, the IDOT must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The action agency or its agent must provide the Service with a mussel relocation plan for review and approval, in accordance with the most recent established mussel relocation protocols. The mussel relocation cannot take place until the Service has reviewed and approved the plan. Relocation of fat pocketbook pearly mussels must adhere to all components of the approved relocation plan, including but not limited to: time of year and water temperature, relocation site, minimization of stress on mussels while in transit, and post-construction monitoring techniques for the work site and relocation site. The plan can identify multiple relocation sites, and the mussel surveyors must select the site that in their judgment is best suited for mussel relocation and survival based on river conditions at the time of the mussel survey.

2. Notify the Service prior to conducting the mussel survey and relocation.

3. Monitor the relocated mussels at approximately 3 months after relocation, or as close to 3 months as weather and river conditions allow, and at least once during appropriate water conditions in the year following the relocation.

4. Provide reports to the Service as soon as possible after relocation and after each monitoring survey, but no later than 3 months after each effort.

5. Provide educational materials for all construction personnel concerning the purpose and implementation of mussel conservation measures. Materials can consist of a fact sheet or pamphlet explaining the purpose of freshwater mussel conservation and the relevance of the Endangered Species to this project.

6. Provide the Service with advance notification of the start of construction and an opportunity to meet with the IDOT project manager and construction contractor on-site.

7. Best management practices must be used for prevention and containment of spills of hazardous materials. The contractor must locate the fuel storage and refueling area in a manner that will prevent accidental spills from entering the river. If significant spills occur (as from a tank or fuel line rupture), provide notice to the Service's Bloomington Field Office as soon as possible.

8. Provide documentation to the Service that all equipment to be used in the Wabash River (during construction and/or mussel relocation) has not been in zebra mussel infested waters for at least a week without exposure to rain, or that such equipment has been appropriately cleaned and inspected for zebra mussel adults and veligers prior to entering the Wabash River. We have provided an attachment which describes standard methods with 2 options for zebra mussel decontamination.

9. Conduct follow-up mussel surveys of the construction site as described below:

a. If instream construction and demolition are not completed within 1 year following the initial mussel relocation, the construction/demolition area must be resurveyed to determine if unionids have recolonized and at what density. Follow-up surveys of the construction site must be repeated at one year intervals while construction is ongoing.

b. The geographic scope of follow-up surveys can be reduced to reflect the remaining extent of the construction area (i.e. mussel habitat impact area). If no fat pocketbooks are found, construction work can continue uninterrupted except as necessary to provide adequate conditions for mussel surveyors.

c. If fat pocketbook mussels are found they must be relocated using the same techniques as in the approved relocation plan. Only mussels found in areas that are likely to be adversely affected by the remaining construction should be relocated. The mussel relocation can occur on the same day as the mussel survey, and construction work must stop until the mussels have been removed for relocation.

d. Notify the Service prior to each follow-up mussel survey, including any proposed changes in the geographic extent of the survey area. Provide survey results to the Service immediately after completion.

10. All *P. capax* that are moribund or have died recently are to be preserved according to standard museum practices, properly identified or indexed (date of collection, complete scientific and common name, latitude and longitude of collection site, description of collection site), and submitted to the Illinois Natural History Survey, with notification to the Service.

11. Provide all required reports and notifications to the Service's Bloomington, Indiana and Marion Illinois Field Offices.

CONSERVATION RECOMMENDATIONS

Section 7(a)(I) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Establish a policy in cooperation with IDOT and INDOT to design and implement future construction projects on the lower Wabash River to incorporate mussel surveys and conservation measures for *P. capax*.

2. Establish a policy with IDOT and Indiana DOT to incorporate conservation measures for *P. capax* into bridge and road maintenance activities on the lower Wabash River. Maintenance activities to be considered include the following:

a. Using coating materials that require minimal sandblasting and painting.

b. Using non-toxic or least toxic road de-icing materials.

c. Spill prevention during resurfacing.

d. Avoiding or minimizing use of heavy equipment and fill material in the river channel.

3. Develop an inventory of potential transplant sites for *P. capax* in the lower Wabash River.

4. Provide assistance to organizations and programs that work to restore *P. capax* in the lower Wabash and Ohio Rivers.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, please provide notification to our Indiana and Illinois field offices of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed Route 15 bridge removal and replacement project (FAP 827) over the Wabash River at Mount Carmel, in Wabash County, Illinois and Gibson County, Indiana, in response to the FHWA's September 14, 2007 request for initiation of formal consultation. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat that was not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat designated that may be affected by the action; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate the opportunity to work cooperatively with your staff to develop this biological opinion. Please contact me at (812) 334-4261 should you have any questions.

Scott Pruitt, Field Supervisor

10/23/07
Date

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ZEBRA MUSSEL DECONTAMINATION

DESCRIPTION OF WORK

The purpose of this special provision is to provide consistent guidelines for sterilizing zebra mussel (Dreissena polymorpha) contaminated equipment. All equipment that has been exposed to zebra mussel contamination must be decontaminated prior to reuse in areas that are, or thought to be free from zebra mussel infestation.

CONSTRUCTION REQUIREMENTS

All equipment must be decontaminated by on of the following two options:

1. Power spraying the entire surface of all equipment with hot water at a temperature of 60 degrees Celsius for 5 minutes: or
2. Power spraying the entire surface of all equipment with steam at a temperature > 100 degrees Celsius for 5 minutes.

In addition, all equipment shall be disinfected using a sodium hypochlorite (chlorine bleach) solution. All debris (vegetation, rocks, sand, shells, etc.) shall be removed from the equipment. The solution shall be mixed at a ratio of 1 part bleach per 50 parts water. Surfaces, which are exposed to the river, shall be sprayed with the solution. The solution shall be properly disposed of according to the State's water quality control agency's regulations.

Attachment

ILLINOIS NATURAL HISTORY SURVEY

24 September 2007

To: Susan Dees, Illinois Department of Transportation

From: Jeremy Tiemann & Kevin Cummings, Illinois Natural History Survey

Subject: *Potamilus capax* relocation at Mt. Carmel

When tasked by the Illinois Department of Transportation (IDOT), staff from the Illinois Natural History Survey will take the lead on a fat pocketbook (*Potamilus capax*) relocation project. A freshwater mussel survey will be conducted in the Wabash River in the vicinity of the IL Rte 15 / IN Rte 64 bridge near Mt. Carmel, Wabash County, Illinois and Gibson County, Indiana. *Potamilus capax*, and other species if assigned, will be relocated to suitable habitat either upstream or downstream of the project area. Protocols established by Dunn and Sietman (1997) will be employed. These guidelines include:

1) Use of personnel that have expertise at collecting and identifying freshwater mussels (e.g., staff from INHS, IL DNR, and IN DNR).
2) Selection of a relocation area with stable substrates and a similar unionid assemblage that is near the collection area (e.g., either ~2,000 m upstream of the construction zone or downstream near the end of Patoka Island). If one is not provided in the relocation plan, it will be sent to the USFWS as an addendum prior to the relocation.
3) Temporary holding of unionids in containers that allow the animals to remain moist and un-crowded (e.g., holding in mesh bags in the river or in buckets or totes with river water and battery-powered aerators for no more than 4 h). The relocation will occur between May 1 and November 1 and will be done as to avoid extreme temperatures.
4) A follow-up survey and monitoring will occur. Monitoring of the relocation site will occur as close as feasible to 3 months after relocation, and monitoring of the relocation site and construction site will occur at least once during appropriate water levels in the following year.

As per IDOT's initial request, the survey area will include the proposed construction / demolition area (50' upstream of center of existing bridge piers and 145' downstream of center of existing bridge piers), and an additional 100' downstream of the project area to account for the silt plume. This survey will use a variety of techniques to increase the likelihood of finding *P. capax*. As in previous surveys, hand groping either by wading and SCUBA/SNUBA will occur in areas likely to harbor *P. capax* (e.g., where the slope of the stream bank or island meet the stream bed) and brailing will occur in other areas of the river (e.g., the sandy areas in the main channel of the river). All relocated freshwater mussels will be marked for subsequent identification. If there are any questions regarding the relocation, we may be contacted by email (jtiemann@inhs.uiuc.edu or ksc@uiuc.edu) or telephone (JT = 217-778-7032 and KC = 217-333-1623).

References:

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Attachment