DNR PERMITTING FROM A CONSULTANT'S PERSPECTIVE

Construction in a Floodway
Construction in a Floodway

- General Timeline
- DNR Administrative Actions
- Different Application Options
- Modeling Checklist
Permit Timeline
Permit Timeline (2)

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>Weeks</th>
<th>Non-Modeling</th>
<th>Modeling Additional Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permit Life</td>
<td>1-16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrative In Processing</td>
<td>1-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Notice</td>
<td>2-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Services Review</td>
<td>3-4</td>
<td></td>
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<tr>
<td>Review Routing</td>
<td>4-5</td>
<td></td>
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<tr>
<td>DoW Review</td>
<td>5-8</td>
<td></td>
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<tr>
<td>DoW Supervisor Review</td>
<td>8-13</td>
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<tr>
<td>Fish, Wildlife, &amp; Botanical</td>
<td>13-15</td>
<td></td>
<td></td>
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<tr>
<td>Technical Services Close Out</td>
<td>15</td>
<td></td>
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<tr>
<td>DoW Executive Review</td>
<td>15-16</td>
<td></td>
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</tr>
<tr>
<td>Administrative Out Processing</td>
<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ADMINISTRATIVE
Documents

- Application Form
- Statement of Affirmation
- Green Cards from Public Notice*
- Submitted Documents
- Hard Copies are Date/Time Stamped and Scanned
STATEMENT OF AFFIRMATION

I hereby swear or affirm, under the penalties of perjury, that the information submitted for this permit application is to the best of my knowledge and belief true, accurate, and complete. I further certify that I possess the authority to undertake the proposed or completed construction activities.

I hereby grant the Department of Natural Resources the right to enter the project location to inspect the proposed or completed work.

Signature of Applicant or Authorized Agent

Date (month, day, year)
Domestic Return Receipt USPS Form 3811
Submitted Documents

- Supporting documents that are requested on the Application Form 42946
  - Maps
  - Plans
  - Worksheets
  - Photos of Worksite
Deficiency

- Minimum needed to begin assessing the proposed project.
  - Administrative Deficiency.
- 30 Days to provide minimum submission.
Construction in a Floodway

- No Change in Effective Cross Section
- Ineffective Flow
- Replacement in Kind
- Modeling
Bridges and Culverts

- Bridge Non-Modeling Assessment Worksheet (Form 55233)
  - Bridge Non-Modeling Assessment Worksheet Companion Worksheet B (Form 55234)
- INDOT-DNR Bridge Replacement Assessment with No Road Overflow
An assessment using the Bridge Non-Modeling Worksheet is appropriate to use for a bridge replacement-in-kind, bridge widening, pier wrap, or scour repair project for roadway, railroad, pedestrian, golf cart, or private access structures. This non-modeling approach may be applicable to assess a bridge replacement project where the flow regime is not changing for:

- a bridge or culvert structure that is being replaced with a bridge structure, or
- a culvert structure that is being replaced with a culvert structure if:
  - the length of the proposed culvert is essentially the same as the existing culvert, AND
  - the proposed culvert is made of like-material to that of the existing culvert so that the roughness coefficient remains equal to or smaller than that of the existing culvert.

If multiple design options are being considered for any of the above replacement-in-kind proposals, the proposed design with the smallest waterway opening value should be used in completing the worksheet(s).

A non-modeling assessment approach cannot be used for any one of the following bridge projects:

- the flow regime of the existing structure is changing from energy flow to pressure flow on the proposed structure,
- the waterway opening beneath the replacement structure is smaller than the waterway opening beneath the existing structure,
- a new stream crossing structure is proposed and the existing structure is to remain in its current location,
- a bridge structure is being replaced with a culvert structure,
- the location of the replacement structure is more than 500’ from the location of the existing bridge structure.

If any one of the above five scenarios exist for the proposed project, computer modeling in accordance with the General Guidelines for the Hydrologic-Hydraulic Assessment of Floodplains in Indiana will be required to be submitted to assess the effect on the base flood elevation.
An assessment using the Bridge Non-Modeling Worksheet is appropriate to use for a bridge replacement in-kind (R-l-K), bridge widening, pier wrap, or scour repair project for roadway, railroad, pedestrian, golf cart, or private access structures. This non-modeling approach may be applicable to assess a bridge replacement project where the flow regime is not changing.

Enter data in sequence as directed by the instructions in the blue box below to adequately evaluate the project under a non-modeling assessment approach. Always start with a blank worksheet and complete from the top down so that projects are evaluated correctly.

**Step 1: Preliminary Questions**

Answer the following questions to determine if your project is eligible to use this worksheet.

**Instructions**

- What type of project is being evaluated?
- Is the project a new stream crossing structure with the existing structure to remain in its current location?
- Is a bridge structure being replaced with a culvert?
- Is the location of the proposed structure more than 500' from the location of the existing structure?

**Step 2: Describe Project**

Provide the information requested to describe your project. Not all information will be needed to evaluate your project. If multiple design options are being considered for any of the above replacement-in-kind proposals, the proposed design with the smallest waterway opening value should be used in completing this worksheet.

**Instructions**

Complete Step 1 before completing Step 2.

**Step 3: Analysis**

Provide the information requested to describe your project. Not all information will be needed to evaluate your project.

**Instructions**

- Complete Steps 1 and 2 before completing Step 3.

Compute and record the waterway opening areas in the appropriate fields and answer all questions in the chart below.

Area of waterway opening beneath the structure

<table>
<thead>
<tr>
<th>Proposed Profile Configuration</th>
<th>Downstream Extension</th>
<th>Proposed Cross Sectional Area</th>
<th>Proposed Structure Width</th>
<th>Proposed Structure Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

Taking into account the jurisdiction configuration, does the proposed road profile across the floodplain of the proposed project, match exactly with no variation, to that of the existing profile?

**Configuration Changes**

- Is the proposed road profile (approach roads) being raised or are guardrails being added?

**Results**

More information is needed to assess your project.

**Comments**

Be aware that after reviewing the submitted plans and computations in the worksheet, the IDNR staff may request additional documentation if sufficient evidence has not been provided that clearly demonstrates the effect that the project may have on the base flood elevation or impacts to fish, wildlife, and botanical resources in the floodway.
INDOT-DNR Bridge Replacement Assessment

**Bridge Data**

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Structure</td>
<td>Existing Structure</td>
</tr>
<tr>
<td>Area of waterway opening under bridge</td>
<td>Area of waterway opening under bridge</td>
</tr>
<tr>
<td>Column C</td>
<td>Results</td>
</tr>
<tr>
<td>Proposes minus Existing</td>
<td>Proposes minus Existing</td>
</tr>
</tbody>
</table>

**Instructions:** INDOT to complete pages 1 and 2. IDNR to complete page 3.

- Answer the following questions:
  - Is the project a new stream crossing?
  - Will the existing bridge remain in place?
  - Is the bridge being replaced with a culvert?
  - Is there road overflow and change in road profile and/or guardrail configuration?

If you have answered Yes to any of the above questions, do not use this worksheet for a bridge crossing project.

- Complete the chart below:

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream 100-year Existing Structure</td>
<td>Upstream 100-year Existing Structure</td>
</tr>
<tr>
<td>Flood Elevation</td>
<td>Flood Elevation</td>
</tr>
</tbody>
</table>

- Is the proposed low structure elevation higher than the 100-year elevation?
- Are the proposed and existing top of road elevations higher than the 100-year elevation?

**Permitability:** The statement by the INDOT engineer that the project satisfies the requirements of a Replacement in Kind Without Road Overflow Assessment is reasonable. The INDOT engineer has demonstrated that there is no road overflow during the 100-year frequency flood and that the proposed bridge opening is the same size or larger than the existing bridge opening.

- What source provided the 100-year flood elevation?
- Note: The proposed condition model archived on the website with this file has not been reviewed by the Department of Natural Resources.

**Recommendation:** The proposed project, in conjunction with any previously approved or currently proposed, or reasonably foreseeable future projects located in the floodway near the site, will have no adverse cumulative effect on the efficiency or capacity of the floodway nor will it pose an unreasonable hazard to the safety of life or property; therefore, approval is recommended.

- Include permit conditions FW01, FW03, FW05 if any part of the structure is below the 100-year flood elevation, FW12, FW15, FW16, FW17, FW19, FW06 modified to "riprap placed for bank stabilization must conform to annexation*. For ATF, add LP11. Add appropriate regulatory floodway condition.

**INDOT Engineer’s Justification/Additional Comments**

**DNR TSC Justifications/Additional Comments**
All Other Construction

- No Change in Effective Cross Sectional Flow Worksheet (Form 55238)
- Change in Effective Cross Sectional Flow Worksheet (Form 55236)
  - Companion Worksheet A (Form 55237)
- Ineffective Area of Contraction or Expansion Reach of a Stream Crossing Non-Modeling Worksheet (Form 55235)
An assessment using the No Change in Effective Cross Sectional Flow Area Non-Modeling Worksheet is appropriate to use to assess non-bridge projects that will result in no discernable loss of the effective cross sectional flow area. Project examples include bank stabilization, restoration projects, excavation, or fill of 6” or less when comparing pre-construction to post-construction conditions such as a trail, parking lot, access drive, or sidewalk.

The minimum documentation and computations specified below in this document must be submitted to the Division of Water along with a completed, signed, and dated application form [State Form 42946] and the appropriate application fee.

Unless the instructions in this document direct you otherwise, all plan details, questions and computations in this worksheet must be addressed to adequately evaluate a project under a non-modeling assessment approach.
An assessment using the Change in Effective Cross Sectional Flow Area Non-Modeling Worksheet is appropriate to use to assess most projects, but not new and replacement-in-kind bridge projects, projects that are located entirely within the ineffective area of the expansion or contraction zone of a bridge, a dam construction project or the reconstruction of a building.

The minimum documentation specified below in this document must be submitted to the Division of Water along with a completed, signed, and dated application form (State Form 42946) and the appropriate application fee.

Unless the instructions in this document direct you otherwise, all plan details, questions and computations in this worksheet must be addressed to adequately evaluate a project under a non-modeling assessment approach.
This companion worksheet can be used to provide documentation to justify that computer modeling may not be required when the post-construction, cross-sectional flow area(s) of the project is larger than the existing cross-sectional flow areas both upstream and downstream of the project site.

1) Upstream and Downstream Cross Sectional Flow Areas

If the post-construction, cross-sectional flow area(s) at the most restrictive segment(s) of the project, as recorded in Question #3 on the Change in Effective Cross Sectional Flow Area Non-Modeling Worksheet is smaller than the upstream and downstream cross-sectional flow areas, the potential for a change to the base flood elevation could result.

To demonstrate that the upstream and downstream cross-sectional flow areas are smaller than the post-construction cross-sectional flow area(s) at the most restrictive segment(s) of the project, complete the charts below. Use a separate sheet to record additional upstream and downstream cross-sectional flow areas if there is more than one restrictive segment of the project.

<table>
<thead>
<tr>
<th>Cross sectional area</th>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream of project</td>
<td>Area (square feet)</td>
<td>Indicate the Cross Section letter and plan sheet number</td>
</tr>
<tr>
<td>Downstream of project</td>
<td>sq ft</td>
<td>sq ft</td>
</tr>
</tbody>
</table>

As recorded in Question #3 on the Change in Effective Cross Sectional Flow Area Non-Modeling Worksheet, indicate the post-construction cross-sectional area(s) at the most restrictive segment(s) of the project in the following chart. Use a separate sheet to record multiple restrictive cross sections of the project.

<table>
<thead>
<tr>
<th>Cross sectional area at the most restricted segment of the project</th>
<th>Area (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-construction conditions</td>
<td>sq ft</td>
</tr>
</tbody>
</table>

Submit a separate document if additional project details and/or justifications are necessary to support this non-modeling assessment approach.

Be aware that after reviewing the submitted plans and computations in the worksheet, the Division of Water staff may request additional documentation if sufficient evidence has not been provided that clearly demonstrates the effect that the project may have on the base flood elevation.

Name of Preparer  ___________________________ Date (month, day, year) ______________
Ineffective Area of Contraction or Expansion Reach

An assessment using the Ineffective Area of the Contraction or Expansion Reach of a Stream Crossing Non-Modeling Worksheet is appropriate to use for a project that is located entirely within the ineffective area of the contraction or expansion reach of a bridge AND the base flood event is conveyed solely through the bridge opening (no road overflow). Project examples appropriate for this worksheet would include a pedestrian bridge, fill, a non-residential building, etc. If a project is partially in the contraction or expansion reach, a non-modeling assessment approach cannot be used; computer modeling in accordance to the General Guidelines for the Hydrologic-Hydraulic Assessment of Floodplains in Indiana will be required to be submitted with the permit application.

The minimum documentation specified below in this document must be submitted to the Division of Water along with a completed, signed, and dated application form (State Form 42946) and the appropriate application fee.

Unless the instructions in this document direct you otherwise, all plan details, questions, and computations in this worksheet must be addressed to adequately evaluate a project under a non-modeling assessment approach.
Deficiency (2)

- Minimum needed to begin reviewing proposed impacts of the project.

- Permit Deficiency.

- 30 Days to provide revised submission.
Reasons for Modeling

- Reduction in bridge flow area
- More than a 5% decrease in cross sectional area
- More than 0.14 foot surcharge
- Lengthening a culvert
- Work beneath base flood elevation
Modeling Checklist

This checklist will assist the staff at the Division of Water in the review of modeling for the definition of the floodway, for evaluation of a Construction in a Floodway permit application, for state concurrence of a Letter of Map Revision or a Flood Insurance Study or any other modeling that is submitted for review. The checklist items are based on the document “General Guidelines for the Hydrologic-Hydraulic Assessment of Floodplains in Indiana.” The modeler should be familiar with this document and any discrepancies between the general guidelines and the submitted modeling should be discussed with the Division of Water Engineering Services staff prior to submittal.

This completed checklist must be submitted to the Division of Water along with your models. The Division of Water will not review any modeling submittal that is not accompanied by a completed checklist.
Four Models

- Duplicate Effective
- Corrected Effective
- Existing
- Proposed
Reach Length Equation

- Provide all values used within equation
- If the equation isn’t being used, explain in comment section

\[ L = \frac{150 \, HD^{0.8}}{S} \]
Models for Cumulative Impacts

- All previous models which impact the project area must be included

- Hydrology and Hydraulics Model Library: [Link here](#)
Discharges

- Coordinated Discharge Curves preferred
- Allow for one month to IDNR approved flow determination
Boundary Conditions

- Flood Insurance Study is preferred
- Indiana Floodplain Information Portal’s
  Best Available layer
- Energy Slope
Deficiency

- No reach equation listed
- Previous models not accounted for in submittal
- Incorrect discharge used
- Incorrect boundary condition
MODELING DOCUMENTATION
Documents to Include

- Modeling Checklist
- Narrative
- Project Evaluation Results
- FIS Map (if applicable)
- Check-RAS Output
- Cross Section Plots
- HEC-RAS “Standard Table 1”
<table>
<thead>
<tr>
<th>LOCATION DESCRIPTION</th>
<th>Published Data (ft NAVD) (based on FIS Table)</th>
<th>MODELING RESULTS</th>
<th>COMPARISONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>U/S end of reach</td>
<td></td>
<td>Duplicate Effective FIS Model Water Surface Elevation (ft NAVD 1988)</td>
<td>Difference in Water Surface Elevation (Existing - Effective) (ft)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Corrected Effective Water Surface Elevation (ft NAVD 1988)</td>
<td>Difference in Water Surface Elevation (Proposed - Effective) (ft)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Existing Water Surface Elevation (ft NAVD 1988)</td>
<td>Difference in Water Surface Elevation (Proposed - Existing) (ft)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Proposed Water Surface Elevation (ft NAVD 1988)</td>
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<tr>
<td></td>
<td></td>
<td>Difference (ft)</td>
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<td>CR 550 Culvert</td>
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<tr>
<td>Indianapolis Rd Bridge</td>
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<td></td>
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</tr>
<tr>
<td>D/S end of reach</td>
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</table>

**Notes**

Project Evaluation Results
FIS Map

- Include if FIS is being used as part of design
- FEMA Flood Map Center: [Link here](#)
Check-RAS Output

- Address Check-RAS comments

**cHECk-RAS Report**

<table>
<thead>
<tr>
<th>Message ID</th>
<th>Message</th>
<th>Cross sections affected</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>BR PW 01</td>
<td>This is a Bridge Section. The selected profile is $profilename$. Type of flow is sluice gate pressure and weir flow because, 1. $egel3$ is greater than $minTopRd$ of $minelweirflow$. 2. $egel3$ is equal to or greater than $mxlocdu$ of $mxlocdu$. 3. $wsel2$ is less than $mxLoCdD$ of $mxlocdd$.</td>
<td>3.544 (Bridge-UP)</td>
<td></td>
</tr>
</tbody>
</table>
Deficiency (3)

- No project evaluation results
- No Check-RAS output
- Not all models submitted
Unity

- New online submittal portal

  - [IDNR - DOW Unity v1.02](#)
General References

- Permit Application Assistance Manual
  - https://www.in.gov/dnr/water/4953.htm
- Indiana Floodplain Mapping Quick Links
  - https://www.in.gov/dnr/water/5647.htm
- General Guidelines for the Hydrologic-Hydraulic Assessment of Floodplains in Indiana
  - https://www.in.gov/dnr/water/5710.htm
- Division of Water Online Research Center (DoWORC)
  - https://www.in.gov/dnr/water/9578.htm
Thank you!

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