

Please See the USACE Responses to the FEMA Review comments below:

Modeling Items:

1. The levee elevations shown in the post-project conditions HEC-RAS model do not match the elevations provided as part of the as-built survey elevations listed in Appendix F (National Levee Database, Survey Elevations). Please provide clarification for the elevation values defined for the levee system in the post-project conditions model.
 - a. The team has reviewed and confirmed that the NLD data and the H&H models do match along with the final as-built survey data. The as-built survey does include survey points for the bottom of the inspection trench as well as other intermediate grading elevations. These additional survey points were likely the source of confusion for the reviewer.
2. Review of the post-project analysis shows the stationing of the ineffective flow area (IFA) on the right overbank for cross section 240.8 is inconsistent with the IFA stationing used for adjacent cross sections 240.78, 240.79, and 240.82. A more appropriate station would be approximately 3470 feet. Please adjust the stationing of the right overbank IFA for cross section 240.8 or provide justification for the current IFA station.
 - a. Concur. Ineffective area stationing for XS 240.8 has been revised to station 3488 to better correspond to the bridge opening. Similarly, the left ineffective area on XS 240.79 was moved riverward by approximately 130-ft (station 3059) to better correspond to the bridge opening.
3. Review of the post-project floodway analysis shows encroachment stations have not been set for cross section 237.87. As the regulatory floodway is mapped for this cross section and the base floodplain is not limited to the channel, please add an encroachment station at approximately 702 feet for this cross section.
 - a. Concur. Encroachment stations have been applied to cross section 237.87, as well as associated upstream revisions.

Mapping Items:

4. The document titled 'IndyN Topo Map Series.pdf', which was submitted as the topographic work map, shows that the proposed delineations of the regulatory floodway and floodplains do not adequately tie-in with the effective delineations at the upstream limit of revision at lettered section BH. As the submitted HEC-RAS model extends farther upstream to lettered section BJ, please extend the upstream limits of revision to this location. The requirement that revised water surface profiles must tie in with the effective profiles within 0.5' will not be required at this location. Please provide updated topographic work maps, annotated FIRMs, and spatial (GIS) files for all items shown on the work maps.
 - a. Concur. Mapping has been extended upstream to cross section BJ. Tie-in with effective mapping has been adopted as proposed by FEMA Reviewer.
5. To meet mapping requirements, the channel distances between cross sections defined in the post-project conditions HEC-RAS model should match the channel distances shown on the topographic work map within 5-percent of the effective FIRM scale, or 5-percent of each other, whichever is larger. Based on the provided post-project model and topographic work map shapefiles, the following channel distance downstream of the following cross sections does not meet tolerance. Please revise the corrected effective and post-project conditions models so that the channel distances between cross sections in the revision area meets the tolerance requirement.

XS	Channel Distance (ft)			
	Map	Model	Difference	Tolerance
243.6	2286.5	2433.4	146.9	121.7
243.15	355.6	404.4	48.8	25.0
242.81	791.2	863.3	72.1	43.2

- a. Concur. The discrepancy between the map and model channel distances was due to different stream centerlines being used in the map versus the model. The mapped stream centerline has been updated to match the centerline used in modeling and channel distances now match.

6. The submitted topographic work map does not include essential information necessary to complete review of this request. Please provide updated topographic work maps that incorporate the following items:
 - a. The location and alignment of the line of protection of the levee system. Please also confirm what alignment should be shown at the College Avenue and Kessler Boulevard crossings.
 - b. Delineation of the post-project (revised) regulatory floodway.
 - c. Delineation of the 500-year floodplain landward of the levee system. The delineation should be based on the results of the natural valley analysis.
 - d. Locations and alignments of all cross-sections used in the hydraulic model.
 - e. The flow line used in the hydraulic model.
 - f. Delineations of the ponding areas identified from the interior drainage analysis with average depths greater than 1 foot.
 - a. Concur. Mapping has been updated to include items specified above.

7. Per state preference, floodway boundaries that are adjacent to levees in Indiana are to be drawn at the landward toe of the levee embankment/floodwall. For locations where the floodway encroachment is at the levee structure or defined by the channel geometry directly adjacent to the defined levee structure in the post-project conditions model, please show the floodway delineation on the landward toe of the levee embankment/floodwall. Examples of locations where is this needed are at cross sections 242.3, 241.1, and 240.6.
 - a. Concur. Floodway boundaries have been revised to map to the landward toe of the levee where appropriate. There are a few exceptions to this, which are described below:
 - i. The Indianapolis Art Center (between effective cross sections BB and BC) are constructed on a strip of high ground on the river-side of the levee. At this location the floodway widths match the modeled encroachment widths.
 - ii. The Town of Rocky Ripple (between effective cross sections AM and AT) is located entirely between the White River channel and floodwall along Westfield Blvd. At this location the floodway widths match the modeled encroachment widths.
 - iii. Along Riverview Dr (between effective cross sections AX and BB) the floodway is constructed parallel to the roadway. Due to the presence of levee drainage infrastructure under the roadway, the City of Indianapolis has proposed mapping the floodway to the centerline of the roadway.

8. To meet mapping requirements, floodway topwidths shown in the post-project conditions hydraulic model should correspond to the floodway topwidths shown on the topographic work map within a 5-percent tolerance. As of now, the following cross sections have floodway topwidths that do not meet this requirement. Please revise the post-project conditions floodway analysis and/or floodway delineation shown on the work map as needed so that the widths match within 5-percent of the effective FIRM scale, or 5-percent of each other, whichever is larger. The additional width that is added to the mapped floodway so that it reaches the landward toe of the levee/floodwall can be neglected. Additionally, please ensure that the floodway delineation lies within the boundary of the base floodplain for the full revision area.

XS	Regulatory Floodway Topwidth (ft)			
	Map	Model	Difference	Tolerance
242.44	411.1	443.0	31.9	25.0
241.1	322.4	284.0	38.4	25.0
239.81	598.5	568.2	30.3	29.9
238.7	375.3	349.0	26.3	25.0

- a. Concur. Floodway encroachment has been revised along with floodway delineation to meet required tolerance. The floodway delineation has also been revised to lie within the boundary of the base floodplain.

44 CFR Section 65.10 Items:

9. As-builts were provided as Appendix B, with final survey data for the top of levee incorporated for Phase 3B-2. The survey data shown on Page 332/782 of Appendix B shows there is a small section of the levee with elevations at approximately 715.5' – 716.5' NAVD88. From the results of the post-project conditions HEC-RAS model, the base flood elevation in this area is approximately 714.0' NAVD88, indicating that the levee does meet the minimum freeboard requirements. Please provide confirmation of the top-of-levee elevations at this location.
- a. Phase 3B-2 Levee was completed prior to phase 3B-3 I-wall. The portion in question is station 36+00. See Appendix B Page 374 for the complete grading in the As-built condition.
10. As-builts were provided in Appendix B, with final survey data for the top of levee incorporated for Phase 3B-2. The document provided for Phase 3B-2 does not indicate the date of the as-built survey. Please provide clarification for the dates of the collected survey.
- a. The survey is stamped by a licensed surveyor and dated October 23, 2019. See Appendix B page 332 and 333.
11. Appendix L (Flood Response Plan) includes two versions of the Flood Response Plan, with each plan labeled with a different version number and date. Please provide the finalized copy of the Flood Response Plan and ensure the document has the most recent version number and date as adopted by the community.
- a. Appendix L (Flood Response Plan) date April 2022 is the most recent RFP and it is adopted by the city for their use. See the PDF titled "OandM and FRP adoption ltr to Moore 3.29.2023" in appendix U. In this letter the Director or DPW makes note of both plans and states the following:

“This letter is to certify that the Operations, Maintenance, Repair, Replacement and Rehabilitation Manual (O&M) dated September 2020 and subsequent revisions has been officially adopted and is in use by the City of Indianapolis. The May 2019 Flood Response Plan (FRP) has since been superseded by the adoption of the April 2022 version of the FRP. A copy of the revised FRP is included with this submittal.”