### INDOT Hydraulics Process Modernization and Policy Updates

Stephanie Wagner, PE Director of Bridge Engineering Mark Bailey, PE Director of Hydraulics



#### How did we get here?



# I-90 (NY State Thruway) over Schoharie Creek

- Collapsed April 1987
  - 10 fatalities
  - 30-year-old bridge
  - 15,000 vehicles a day
- +/- 10' scour hole



Snowmelt + 5.9" of Rain = Est. 50 Yr. Flood



### Schoharie Bridge Investigation and Research



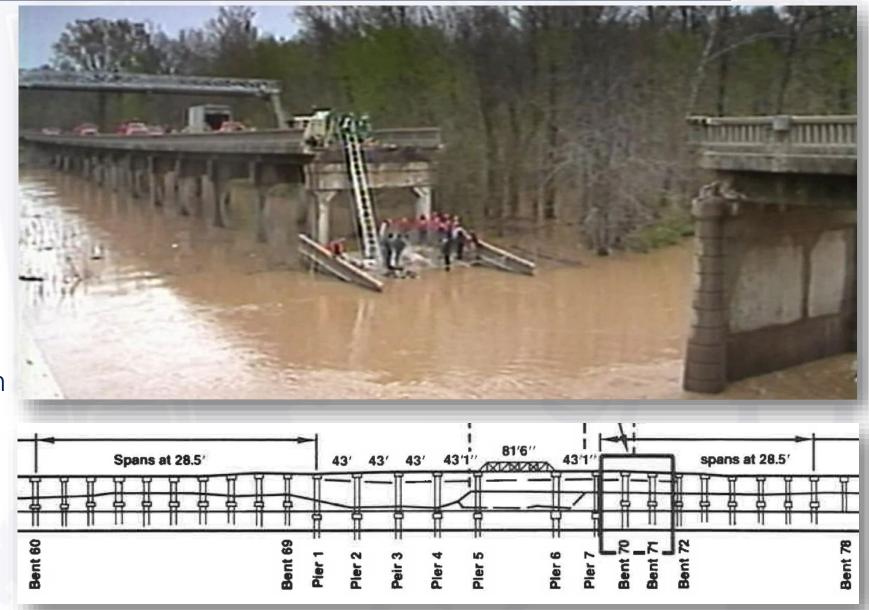
- 1:50 Scale Model
- Colorado State University

#### **Contributing Factors**

- Waterway Geometry
- Sheet Piling Removed
- Improperly Sized Riprap

## US 51 over Hatchie River

- Collapsed April 1989
  - 8 fatalities
  - Built in 1936
- Contributing Factors
- Stream Migration
- Foundations
  - Shallower in Floodplain
  - Independent Footings
- Adjacent Structure



#### National Reactions

- 1988 National Bridge Scour Program initiated by FHWA
  - Policy applied to every bridge over a waterway (existing or under design)
  - Design for scour resistance
  - Evaluate existing bridges for scour vulnerability
  - Determine prudent measures to be taken
- 1989 Indiana Dept of Highways releases updated Hydraulics Manual

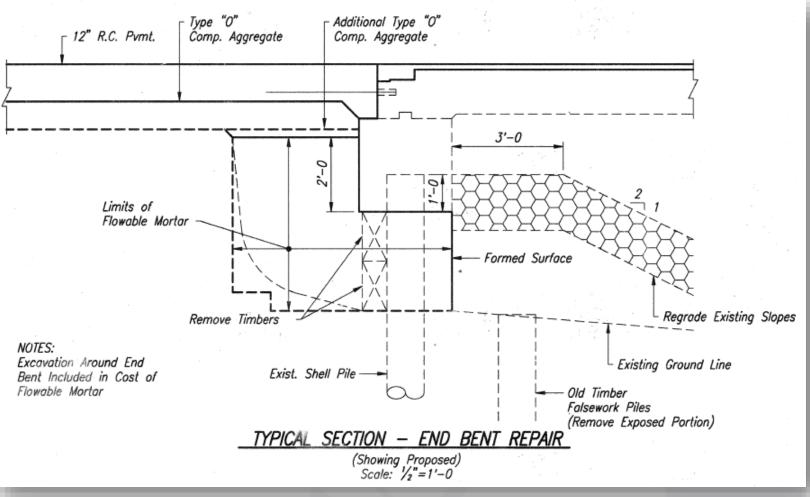
, **Next**Level

- Thru 1990's
  - Started process of evaluating every existing bridges
  - Prioritized by a risk-based approach and within rehab projects
  - Constant reminders to designers
  - Isolated issues throughout the state

#### I-74 over Branch of Black Creek (1996)

- Thursday of Race Weekend
- Water Overtopped I-74 Westbound
- Exposed Abutment Piles
- Closed Interstate





### SR 446 over Little Salt Creek (April 1998)

- Significant Spill-Slope Loss
- Unsupported 10" RCBA



#### SR 446 over Little Salt Creek (Repaired)



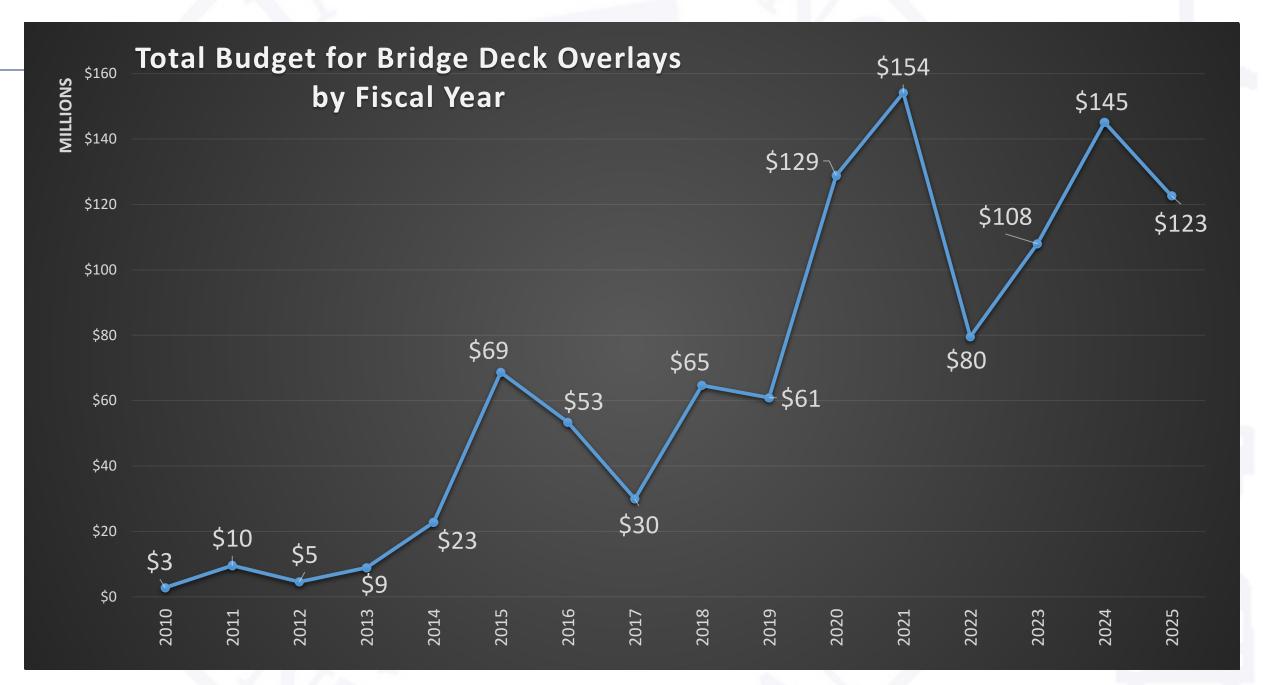
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# INDOT's Plan in Action

- New Bridges Design for Scour
- 18,000 Existing Bridges in Indiana??
  - Scour Analysis for every bridge project
  - Hundreds of design projects and targeted scour analysis contracts



- Meanwhile... Bridge Preventive Maintenance Program
  - Started in 2010's
  - Many new work types (joint replacements, polymeric overlays) w/ shorter design life's
  - Included existing work type: Rigid Overlays



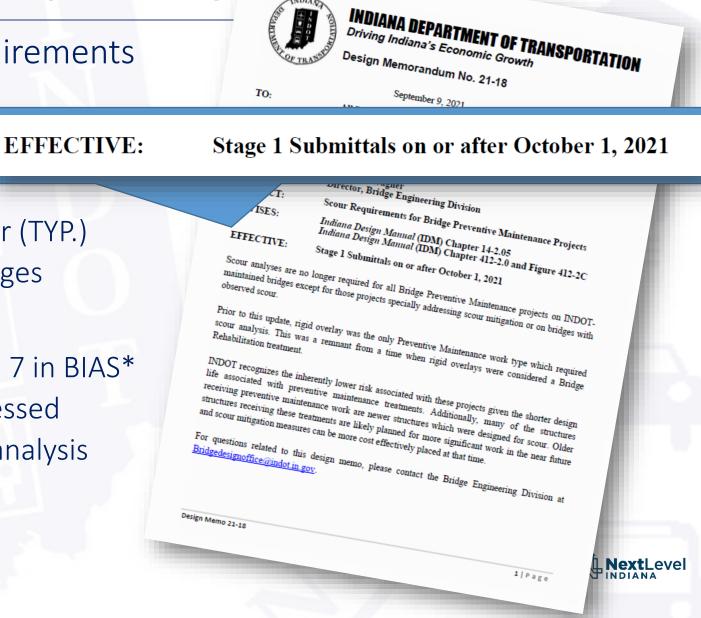
# Today

- Schedule surprises
  - Waterway Permits
  - R/W Acquisition



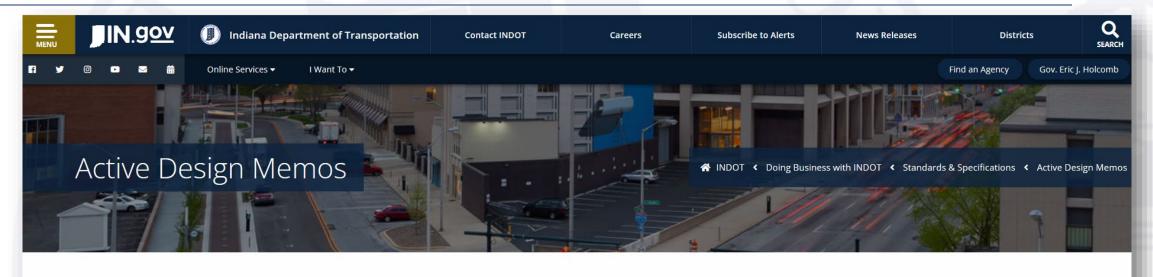
# Design Memorandum No. 21-18

- Eliminates the scour analysis requirements for all PM projects
- Why?
  - Shorter design life (lower risk)
  - Newer structures designed for scour (TYP.)
  - Existing scour analysis for most bridges
- Exceptions
  - Bridges with Scour Analysis Status = 7 in BIAS\*
  - Field observed scour must be addressed
  - Scour specific projects still require analysis



\* Revision forthcoming

# Sign Up for Our Listserv



#### Active Design Memos

- Link to Archived Memos
- Subscribe or Unsubscribe to Design Consultant GovDelivery to receive notification of changes concerning design memos and Design Manual updates
- Link to Construction Memos

Design Memos are published between the first Monday and subsequent Thursday of each month. All revisions to the *Design Manual* described in these memos have been incorporated into the current <u>Indiana Design Manual</u> (IDM).

Memos appear on this page for a period of 1 year following the date of the memo. After 1 year, they are moved to the Archived Design Memos page.

# **Queue Seamless Transition...**



#### Hydraulics Process Modernization and Policy Updates

- Policy Updates
  - 1. Design Memo 21-18
  - 2. Design Memo <del>21-XX</del> 22-XX
  - 3. Indiana Design Manual re-write
  - 4. Prequalifications
  - 5. In-kind replacements
- Process Modernization
  - 1. Hydraulics Request Application (HRA)
  - 2. BIAS update



• Memo was revised 2/9/2022

Scour analyses are no longer required for all Bridge Preventive Maintenance projects on INDOTmaintained bridges except in the following circumstances:

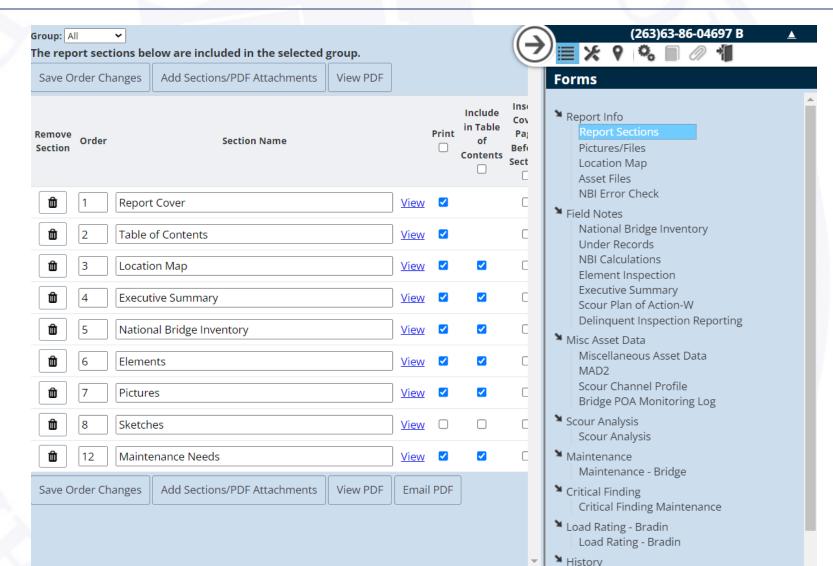
- 1. Projects specifically addressing scour mitigation
- 2. Bridges with observed scour in the field.
- Bridge with a Scour Analysis Status equal to 7 in BIAS



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						006-17-04695 B [001850] (01.81 W SR 427) @ (I-69 NB/SB)	
						018-09-01971 A [004690] (01.90 E SR 29) @ (GRASS RUN CREE	
						041-42-05083 BSBL [014690] (00.58 S US 50) @ (KELSO CREEK	()
						056-39-02469 [020340] (00.18 W SR 7) @ (ABANDONED RR)	
						057-26-01469 A [020520] (01.39 S SR 168) @ (SMITH FORK)	
						066-88-07469 A [023685] (01.00 W US 150) @ (HONEY CREEK)	
						067-18-05469 B [024190] (03.64 S SR 3) @ (NO NAME CREEK)	
						071-04-05833 B [024690] (00.26 S SR 18) @ (SALMON CREEK)	•
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		<ul> <li>Critical Finding</li> <li>Critical Finding Maintenance</li> </ul>
		🎽 Load Rating - Bradin

IS 5-Scou - Scour Analysis Date

- 1-Scour Analysis on file
- 2-Scour POA on file
- 3-Scour Analysis is NOT on file, bridge should have been designed for scour
- 4-Scour Analysis is not on file, scour analysis being performed in house
- 5-Scour Analysis not on file, scour analysis needed
- ol 6-Scour Analysis not needed. Structure type is not susceptible to scour

7-Bridge programmed to be rehabbed or s replaced

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• Design Memo 22-XX (Requiring all hydraulic submittals to use the HRA starting on XX/22)

#### Policy Updates – Design Manual re-write

- Updates to 202
- Re-write of 203
  - Incorporating the developing design guidance from the hydraulics website
  - Clarifying some grey areas, plugging some holes
  - Taking a corridor wide design approach instead of individual design elements
    - Bridge
    - Small Structure
    - Storm Drains
    - Ditches
    - Detention



#### Policy Updates - Prequalifications

- Prequalifications
  - Quantity Trigger 15 or more in a rolling 12-month period

• % Trigger - >= 60%

#### Policy Updates – In-kind replacements

- Operations Memorandum 11-06
  - d. <u>Capital Project Development</u>. Culvert work that is programmed as a capital project should go through the capital project development process.

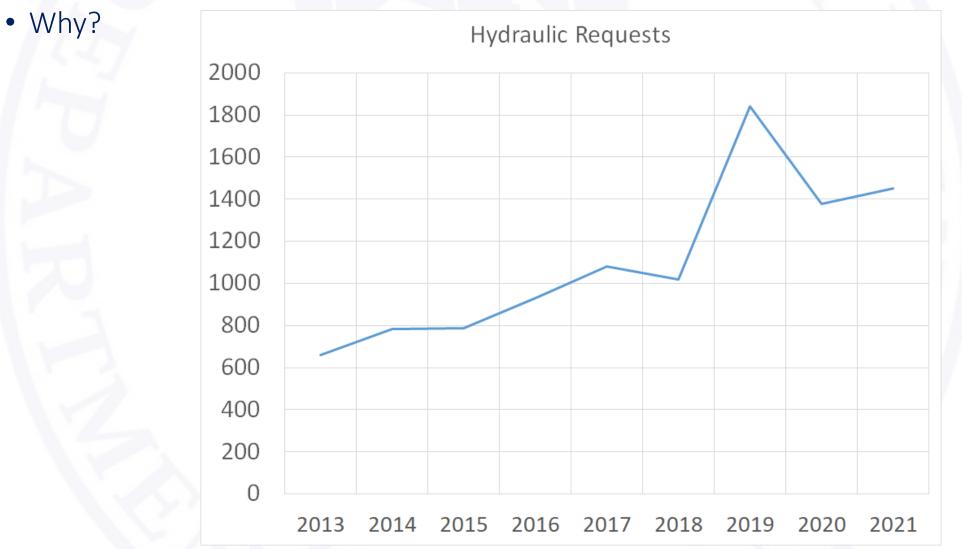
# Designers

# INDOT Maintenance V



### Hydraulics Request Application (HRA)

Process Modernization



#### Hydraulics Request Application (HRA)

- History
  - One year of development time
  - Went live 3/26/2021 with a soft internal rollout
  - 6/29/2021 opened up for everyone
  - As of 3/7/2022 (roughly 8 months)
    - 306 users
    - 44 firms
    - 2,281 requests processed
      - 13,500 emails eliminated
      - At an average of 10 min. per request of time savings, 380 hours (so far)



- <u>https://itap.indot.in.gov/</u>.
- Click Enroll New Application

Applications		C	Action Links	
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Electronic Permit System	Launch	0		
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Archives - Bridge File Documents	Lounch *			
Archives - Crawfordsville	Launch +			

Bonus Automation System	Launch	0
Employee Development Training Admin	Launch	0
Employee Development Training Request	Launch	0
HR Organizational Charts	Launch	0
Hydraulics Request Application	Launch	24
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¥	HRA Requester	HRA Requester		Not Auto-Assigned	No	Internal, External (excl. An	Active 3/25/2021
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#### **Request Determination**

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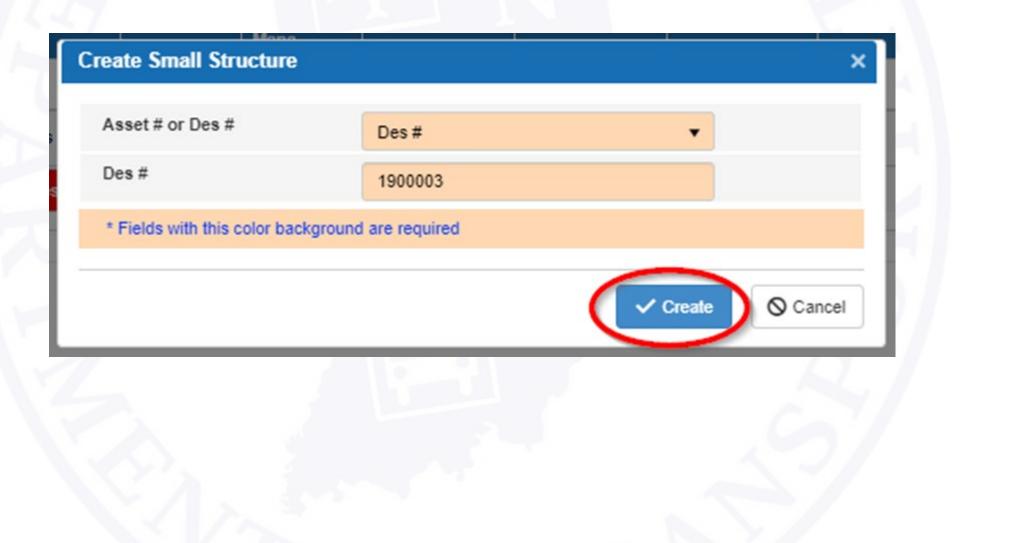




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Date :06/21/2021

DES #: 1900003

#### CONTRACT #: R 43595

LETTING DATE: 01/19/2023

FEDERAL PLACE CODE:

SPECIAL FUND CATEGORY:

#### ADDL'L ELEMENTS:

SPONSORED BY: Indiana Department of Transportation Seymour District MANAGED BY: FHWA OVERSIGHT/PODI: Assumed/State Administered WORK ZONE IMPACT: DS DESIGNER: Consultant State - On Call

#### **BRIDGE/CULVERT INFORMATION**

#### INDOT FULL PROJECT LISTING

LEAD: 1900003			ORIGIN #: 1900003
CONTRACT AWA	RD DATE:		FCR COMPLETE DATE:
PROGRAM CLAS	S: Normal Pr	roject	
URBANIZED ARE	A: Not Applica	able	
ROUTE #:	US - 52		
LOCATION:	Intersection	n of US 52 and Holla	and Rd, 3.1 miles E of SR 252
WORK TYPE:	Intersect. I	mprov. W/ Added Tu	um Lanes
WORK CATEGOR	Y: District Inte	ersection Improveme	nt Project
LPA DESIGNED C	ERTIFIED:		
ALTERNATE BID:			ROUTE TRANSFER:
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ASSET GROUP: District Discretionary

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PROGRAM YEAR: 2023 SCORE:

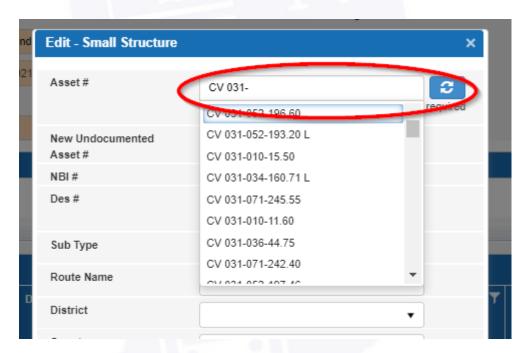
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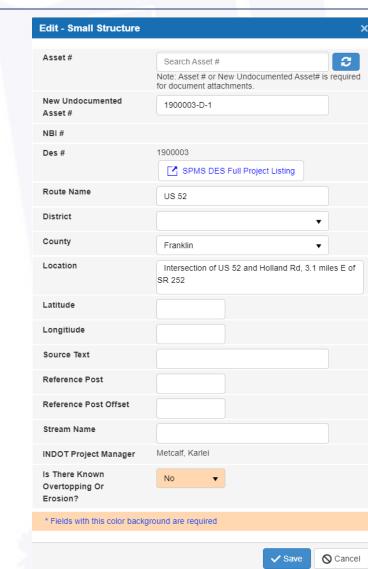
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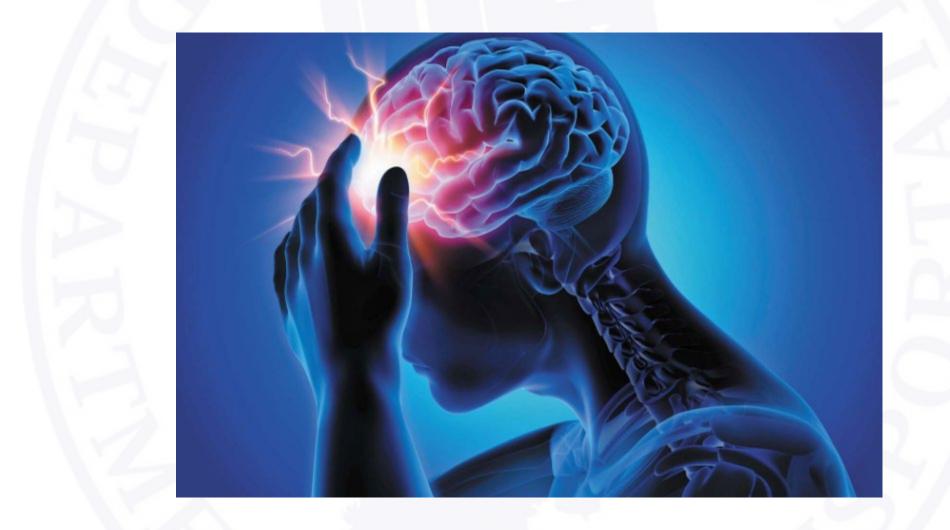
















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Design Review	Review	Created User Organization	INDOT - Hydraulics E
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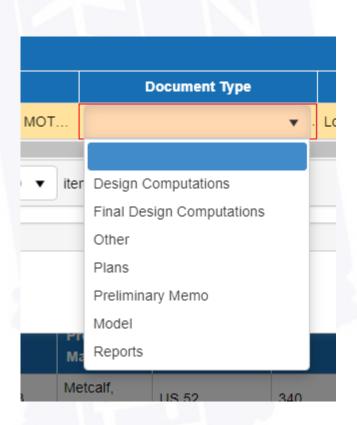


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# Q&A / The End



### Contact Info

- Stephanie Wagner
   (317) 233-2095
   swagner2@indot.IN.gov
- Design Questions: <u>BridgeDesignOffice@indot.IN.gov</u>

- Mark Bailey (317) 233-2096
  - mbailey1@indot.in.gov
- Design Questions: <u>hydraulics@indot.in.gov</u>

