

Critical Findings

Joseph D. Clark, PE, NBIS Director
Bailey H. Spear, EI, Design Engineer

What is a Critical Finding?

- A critical finding is a structural or safety related deficiency that requires immediate follow-up inspection or action. –BIM
- A critical finding IS:
 - Full or partial closure of any bridge
 - An NSTM to be rated in serious or worse condition coded three (3) or less
 - A deck, superstructure, substructure, or culvert component to be rated in critical or worse condition coded two (2) or less
 - The channel condition or scour condition to be rated in critical or worse condition coded critical (2) or less
 - Immediate load restriction or posting, or immediate repair work to a bridge, including shoring, in order to remain open

What is a Critical Finding?

- A critical finding is a structural or safety related deficiency that requires immediate follow-up inspection or action. –BIM
- A critical finding IS NOT:
 - General deterioration
 - General maintenance items
 - Non-condition ratings (such as Item 72: Approach Roadway Alignment or Item 36: Traffic Safety Features)
 - For safety: non-regulatory/warning signs (such as Narrow Bridge or One Lane Bridge signs)
 - However, these issues should still be reported to the owner, even if they aren't critical findings.

Safety

- Anything that could jeopardize the safety of motorists or pedestrians.
- Non-structural
- Examples: missing or incorrect signage, loose or detached guardrail and/or missing posts, spalls in deck, roadway, or sidewalk, loss of roadway material at bridge.



04/15/2024 17:02

Structural

- Anything that can interrupt the load path, not allowing the loads to be transferred as designed. This can cause surrounding elements to become overstressed or unstable, potentially leading to partial or total collapse of the structure.
- Examples: voids through deck, large spalls in superstructure, cracks in steel beams, voids in abutments, rotten timber members, significant scour and undermining around substructure units.



04/18/2024 10:28

Reporting Critical Findings: At the Site

- Identify the deficiency
- Is it a Critical Finding (does it affect the safety, health, or welfare of the public?)
- Determine Urgent or Severe
 - Urgent – Requires action in 24 hours; close out within 3 days
 - Severe – Requires action in 72 hours; close out within 30 days
- If urgent: notify the owner and close bridge or portion of the bridge.
- If severe: notify the owner. Close or restrict bridge depending on the deficiency.

Proper Closures: Full Closures



Proper Closures: Partial Closures



Improper Closures



Reporting Critical Findings: Office

- How?
 - Over email and through iTAMS
- When?
 - Within 24 hours of the finding; but the sooner the better.
- What?
 - Anything and everything - Be descriptive and include pictures!!!
- Who?
 - Bridge owner (County Highway Director, County Engineer, INDOT Supervisor)
 - State Program Manager (Tony Marino)
 - Anyone at your company that this might be important to (Project Manager, other team leaders, load rating personnel, etc.)

Reporting Critical Findings: Email

79-00025 Critical Finding

From Bailey Spear <bspear@vsengineering.com>

Date Wed 9/25/2024 4:44 PM

To Stewart Kline [REDACTED] Marino, Anthony P <AMarino@indot.IN.gov>; Doug Payne [REDACTED]

Cc Joe Clark <JClark@vsengineering.com>

1 attachment (3 MB)

P1770162.JPG;

All,

While out on bridge inspections this afternoon, I came across a critical finding for bridge 79-00025. The bridge rail at the northwest corner was damaged as well as the two most northwest posts. The most northwest post is completely missing, while the next post is disconnected from the deck. The rest of the posts on the west side are solid and connected. The bridge rail itself has only minor damages. The attached photo shows this damage.

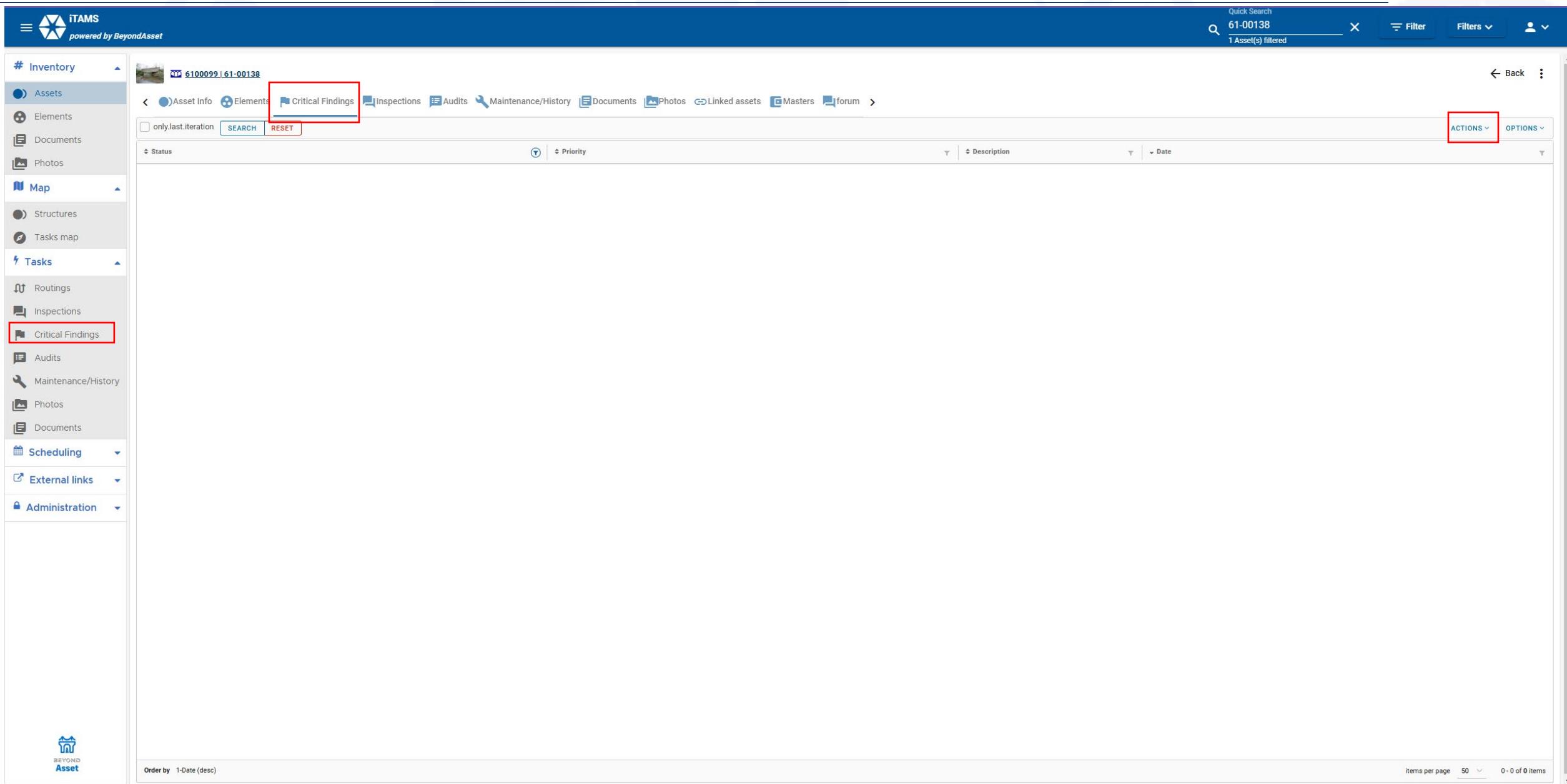
Immediate Recommended Action: Place Barrels Along the Northwest Guardrail.

Permanent Recommended Action: Repair Guardrail and Posts at the Northwest Corner.

I have added this information in iTAMS and have routed it to Tony for review. Please keep me updated with photos on the installation of barrels and the repair process.

-Bailey Spear

Reporting Critical Findings: iTAMS



The image shows the iTAMS software interface, specifically the Critical Findings module. The left sidebar contains a navigation menu with sections: Inventory (Assets, Elements, Documents, Photos, Map, Structures, Tasks map, Tasks, Routings, Inspections, Critical Findings), Scheduling, External links, and Administration. The Critical Findings section is highlighted with a red box. The main content area shows a navigation bar with tabs: Asset Info, Elements, Critical Findings (highlighted with a red box), Inspections, Audits, Maintenance/History, Documents, Photos, Linked assets, Masters, and forum. The Critical Findings tab is active. Below the navigation bar is a search bar with a quick search field containing '61-00138', a filter button, and a '1 Asset(s) filtered' message. The main content area displays a table with columns: Status, Priority, Description, and Date. The table is currently empty. The bottom of the screen shows a footer with the Beyond Asset logo, an order by dropdown set to '1-Date (desc)', a items per page dropdown set to '50', and a message '0 - 0 of 0 items'.

Quick Search: 61-00138
1 Asset(s) filtered

Filter

Filters

Back

Inventory

Assets

Elements

Documents

Photos

Map

Structures

Tasks map

Tasks

Routings

Inspections

Critical Findings

Audits

Maintenance/History

Photos

Documents

Scheduling

External links

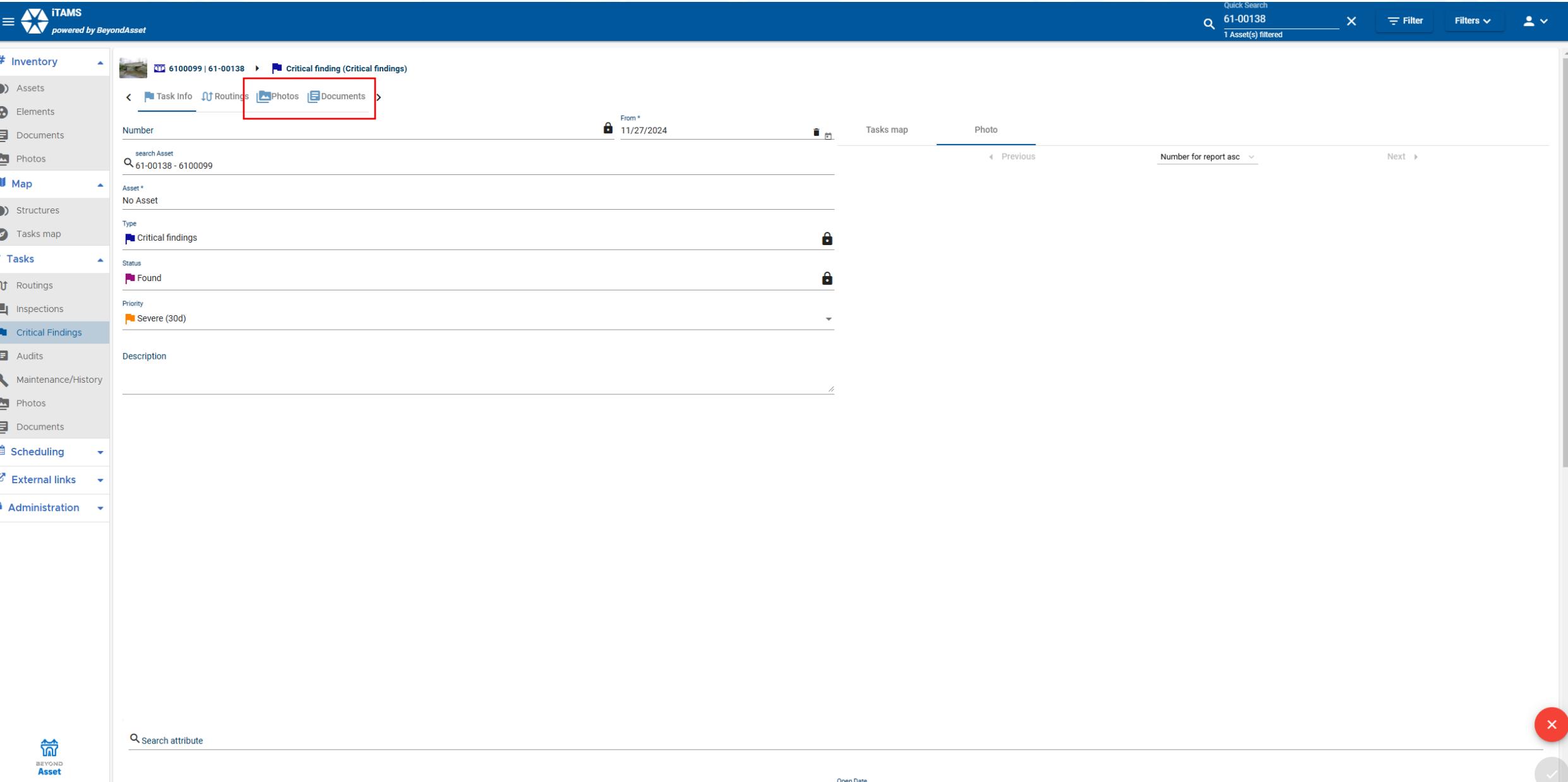
Administration

Order by: 1-Date (desc)

Items per page: 50

0 - 0 of 0 items

Reporting Critical Findings: iTAMS



The image shows the iTAMS software interface for reporting critical findings. The left sidebar navigation includes sections for Inventory (Assets, Elements, Documents, Photos), Map (Structures, Tasks map), Tasks (Routings, Inspections, Critical Findings, Audits, Maintenance/History, Photos, Documents), Scheduling, External links, and Administration. The main content area shows a task detail page for a critical finding. The task number is 6100099 | 61-00138, and the type is Critical finding (Critical findings). The task is assigned to No Asset, has a status of Found, and a priority of Severe (30d). The task is scheduled for 11/27/2024. The interface includes a search bar, filters, and navigation buttons for previous and next tasks. A red box highlights the 'Photos' and 'Documents' buttons in the top navigation bar of the task detail page.

Quick Search: 61-00138
1 Asset(s) filtered

Filter

Filters

Inventory

Assets

Elements

Documents

Photos

Map

Structures

Tasks map

Tasks

Routings

Inspections

Critical Findings

Audits

Maintenance/History

Photos

Documents

Scheduling

External links

Administration

6100099 | 61-00138

Critical finding (Critical findings)

Task Info

Routings

Photos

Documents

From * 11/27/2024

Tasks map

Photo

Number for report asc

Number

search Asset 61-00138 - 6100099

Asset * No Asset

Type Critical findings

Status Found

Priority Severe (30d)

Description

Search attribute

Open Date

Reporting Critical Findings: iTAMS

Quick Search: 61-00138 (1 Asset(s) filtered) Filter Filters User

Inventory Assets Elements Documents Photos

Map Structures Tasks map

Tasks Routings Inspections Critical Findings (selected) Audits Maintenance/History Photos Documents

Scheduling External links Administration

Search attribute:

Recommendation: Open Date: Lock

Date Found: Lock

Team leader:

Immediate Correction Action Taken: Lock

Date SPM Review: Lock

Final Resolution Taken: Lock

undefined

Date Immediate CA Done: Lock

Close out notes: Lock

Date Closed: Lock

Final Resolution Date: Lock

Red X Green Checkmark

BEYOND Asset

Reporting Critical Findings: iTAMS

Quick Search: 61-00138 | 1 Asset(s) filtered

Filter | Filters | User

Inventory | Assets | Elements | Documents | Photos | Map | Structures | Tasks map | Tasks | Routings | Inspections | Critical Findings | Audits | Maintenance/History | Photos | Documents | Scheduling | External links | Administration

6100099 | 61-00138 | Critical finding (Critical findings)

Task Info | Routings | Photos | Documents

From * 11/27/2024

Number: 61-00138 - 6100099

Type: Critical findings

Status: Found

Priority: Severe (30d)

Description: On 11/27/2024, a load rating was completed following the lowering of the superstructure rating from a 5 to a 4. The load rating returned values lower than what the bridge is currently posted. The bridge is currently posted for commercial vehicles 22 tons and emergency vehicles for 16/21/29 Tons. The new load rating requires the bridge to be posted commercial vehicle weight limit 11 tons and emergency vehicle weight limit 9/11/15 tons.

Tasks map | Photo | Previous | Next | Number for report asc

Search attribute: Recommendation | Open Date |

BEYOND Asset

Reporting Critical Findings: iTAMS

Quick Search: 61-00138 (1 Asset(s) filtered) Filter Filters User

Inventory Assets Elements Documents Photos

Map Structures Tasks map

Tasks Routings Inspections Critical Findings

Audits Maintenance/History Photos Documents

Scheduling

External links

Administration

Search attribute:

Recommendation

Immediate Recommended Action: Revise lost posting signs at the bridge and both intersections to commercial vehicle 11 Tons and emergency vehicle 9/11/15 Tons. If the signs cannot be revised in 30 days (by December 27) close the bridge until the signs have been revised.

Permanent Recommended Action: None.

Open Date: 11/27/2024 Lock

Date Found: 11/27/2024

Team leader: Bailey Spear Lock

Immediate Correction Action Taken

Date SPM Review

Final Resolution Taken

Date Closed

Final Resolution Date

Date Immediate CA Done

Close out notes Lock

BEYOND Asset Edit

Reporting Critical Findings: iTAMS

Quick Search: 61-00138 | 1 Asset(s) filtered

Filter | Filters | User

Inventory

- Assets
- Elements
- Documents
- Photos

Map

- Structures
- Tasks map

Tasks

- From user: Bailey Spear
- Send email (highlighted with a red box)

Routings

- Inspections
- Critical Findings
- Audits
- Maintenance/History
- Photos
- Documents

Scheduling

External links

Administration

6100099 | 61-00138 > Critical finding (Critical findings) > Routing (Xxx)

Status: SPM Review

Asset: 61-00138 - 6100099

Date sent: 11/27/2024

Include report in email

Task: Critical finding

Comments

From user: Bailey Spear

To user: Anthony P. Marino

CC Emails: CF-County-Adams, CF-County-Allen, CF-County-Bartholomew, CF-County-Benton, CF-County-Blackford, CF-County-Boone, CF-County-Brown, CF-County-Carroll, CF-County-Cass, CF-County-Clark, CF-County-Clay, CF-County-Clinton, CF-County-Crawford, CF-County-Davies, CF-County-Dearborn, CF-County-Decatur, CF-County-Dekalb, CF-County-Delaware, CF-County-Dubois, CF-County-Elkhart

Red X button

Green Checkmark button

Reporting Critical Findings: Email

1/25, 1:20 PM

Mail - Bailey Spear - Outlook



RE: 61-00138 Critical Finding

From Marino, Anthony P <AMarino@indot.IN.gov>

Date Mon 12/2/2024 11:43 AM

To Bailey Spear <bspear@vsengineering.com>; Highway [REDACTED]

Cc Joe Clark <JClark@vsengineering.com>; Rearick, Anne <arearick@indot.IN.gov>; Dittrich, Bill <BDITTRICH@indot.IN.gov>; Hart, Jennifer <JenHart@indot.IN.gov>; Heigert, Joshua (FHWA) <joshua.heigert@dot.gov>

External (amarino@indot.in.gov)

[Report This Email](#) [Protection by Teknabyte Consulting](#)

Hello Bailey,

Thank you for your notification concerning this Severe/30-day critical finding discovered and reported for NBI 6100099, Bridge 61-00138. I reviewed the CFR in iTAMS and routed it back to you in the iTAMS workflow at the Await. Immed. Corr. Action status. Once the recommended immediate corrective action recommendations have been done, update the CFR accordingly, attach photo documentation to the CFR showing the completed work, and then route it back to me in the iTAMS workflow at the next status step. Also, please keep me updated on actions done via this email correspondence.

I also recommend that the County install the height of the signs according to the MUTCD standards.

Sincerely,
Tony Marino

Anthony P. Marino, P.E. (IN, IL, KY)
Bridge Inspection Statewide Program Manager
Cell: (812) 681-1032
[Find us on social media!](#)

Reporting Critical Findings: iTAMS

Status

 Await. Immed. Corr. Action



Recommendation



Immediate Recommended Action: Revise last posting signs at the bridge and both intersections to commercial vehicle 11 Tons and emergency vehicle 9/11/15 Tons. If the signs cannot be revised in 30 days (by December 27) close the bridge until the signs have been revised.

Permanent Recommended Action: None.

12/2/2024: SPM review done; no exceptions taken.

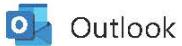
Date SPM Review

12/02/2024

Reporting Critical Findings: Email

1/25, 1:31 PM

Mail - Bailey Spear - Outlook



Re: 61-00138 Critical Finding

From Bailey Spear <bspear@vsengineering.com>

Date Tue 12/3/2024 9:59 AM

To Marino, Anthony P <AMarino@indot.IN.gov>; Highway <[REDACTED]>

Cc Joe Clark <JClark@vsengineering.com>; Rearick, Anne <arearick@indot.IN.gov>; Dittrich, Bill <BDITTRICH@indot.IN.gov>; Hart, Jennifer <JenHart@indot.IN.gov>; Heigert, Joshua (FHWA) <joshua.heigert@dot.gov>

4 attachments (16 MB)

20241203_075834.jpg; 20241203_080331.jpg; 20241203_080359.jpg; 20241203_080659.jpg;

Parke County Installed the new signs on 12/02/2024. Attached are the photos of the signs at the bridge and at each intersection. The heights of the signs are the same as they were after they were previously adjusted in September. I have added all of this information into iTAMS and have routed it back to Tony. I recommend close out.

-Bailey Spear



BAILEY SPEAR

Design Engineer

P: 765.742.0295 | M: 765.357.5469

bspear@vsengineering.com



Reporting Critical Findings: iTAMS

Team leader

Bailey Spear



— Immediate Correction Action Taken

— Parke County Installed the new signs on 12/02/2024.

Date Immediate CA Done

12/02/2024

Level
NA

Reporting Critical Findings: iTAMS

Final Resolution Taken

Bridge Rail Posts and Guardrail Repaired on 10/07/2024.

Date Closed

11/06/2024



Final Resolution Date

10/07/2024

Level
NA

Reporting Critical Findings: iTAMS

Quick Search: 61-00138 (1 Asset(s) filtered) | Filter | Filters | User

Inventory | Assets | Elements | Documents | Photos | Map | Structures | Tasks map | Tasks | Routings | Inspections | Critical Findings | Audits | Maintenance/Histor | Photos | Documents

6100099 | 61-00138 | Critical finding (Critical findings) | Go to Asset | More

Task Info | Routings (selected) | Photos | Documents | Back | Forward

YOUR WORK | Only active status | Only Last | SEARCH | RESET | ACTIONS | OPTIONS

Status	Date sent	From user	To user	Comments
Closed	12/05/2024	Anthony P. Marino	Anthony P. Marino	
Immed. Corr. Action Done	12/03/2024	Bailey Spear	Anthony P. Marino	
Await. Immed. Corr. Action	12/02/2024	Anthony P. Marino	Bailey Spear	
SPM Review	11/27/2024	Bailey Spear	Anthony P. Marino	
Found	11/27/2024	Bailey Spear	Bailey Spear	

Order by: 1-Date sent (desc) | items per page: 50 | 1 - 5 of 5 items

Reporting Critical Findings: Email

1/25, 1:32 PM

Mail - Bailey Spear - Outlook



RE: 61-00138 Critical Finding

From Marino, Anthony P <AMarino@indot.IN.gov>

Date Thu 12/5/2024 1:32 PM

To Bailey Spear <bspear@vsengineering.com>; Highway [REDACTED]

Cc Joe Clark <JClark@vsengineering.com>; Rearick, Anne <arearick@indot.IN.gov>; Dittrich, Bill <BDITTRICH@indot.IN.gov>; Hart, Jennifer <JenHart@indot.IN.gov>; Heigert, Joshua (FHWA) <joshua.heigert@dot.gov>

External (amarino@indot.in.gov)

[Report This Email](#) [Protection by Teknabyte Consulting](#)

Hello Bailey,

Thank you for the update concerning the immediate corrective action taken for this critical finding due to missing weight limit posting. I reviewed the CFR that you routed to me and have routed it through the iTAMS workflow to the Closed status. I decided to forego with the iTAMS auto generated email notification; this email correspondence is sufficient. The closed CFR may still be viewed in the iTAMS bridge asset file.

If you haven't done so already, please verify that NBI Item 41/SNBI B.PS.01 and 02 are coded correctly in BRADIN.

Sincerely,
Tony Marino

Anthony P. Marino, P.E. (IN, IL, KY)
Bridge Inspection Statewide Program Manager
Cell: (812) 681-1032
[Find us on social media!](#)



Critical Finding?

Critical Finding?

- A bridge is required to be posted for commercial and emergency vehicles. This bridge is posted at both approaches and at one intersection, but the sign(s) are missing at the other intersection. The post remains and past reports indicate a weight limit sign and a W16-3aP distance plaque was there.



Critical Finding?

- Yes! Safety, Severe (30d)
- The missing weight limit sign is a regulatory sign and considered a critical finding. However, the missing W16-3aP distance plaque is not a regulatory sign and is not considered a critical finding. However, it should still be reported as a maintenance item.



Critical Finding?

- A bridge is required to be posted Narrow Bridge. The sign is in place at the east approach, but it is missing at the west approach.



Critical Finding?

- No!
- Narrow Bridge signs are considered warning signs and not regulatory. Therefore, they are not considered critical findings.



Critical Finding?

- After a heavy rainfall, a bridge length culvert was discovered to be washed out. The roadway around one of the culvert barrels on the upstream side was eroded approximately half of the roadway width. The other half of the roadway was fine, and vehicles could still get around it. The roadway is an access road to a boat ramp and sees less than 50 cars per day.



Critical Finding?

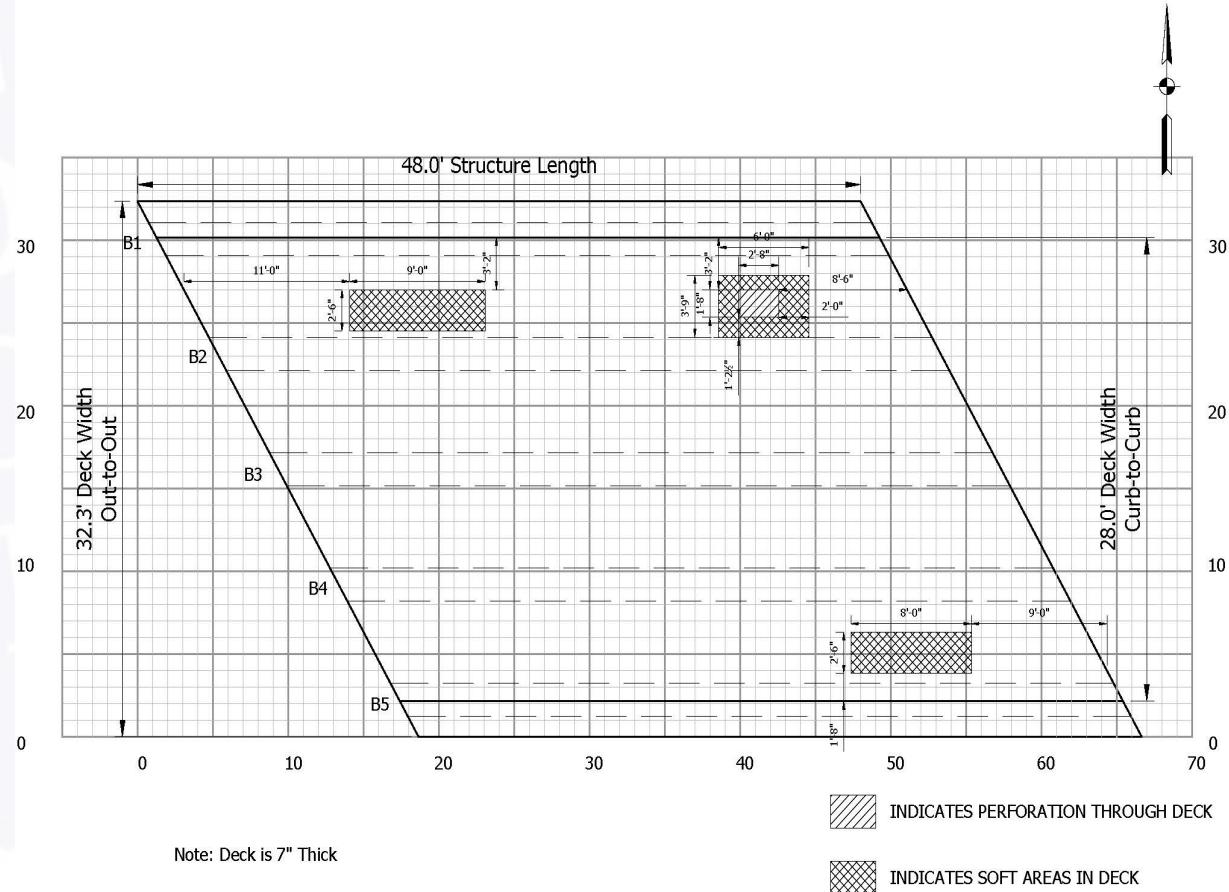
- Yes! Safety, Urgent (3d)
- The roadway is washed out, creating a safety hazard for the motor vehicles. Even though the other half of the roadway is intact, it is still dangerous for vehicles to cross. There is a high potential the remaining roadway will be washed out. The traffic volume information is irrelevant.
- Be careful when approaching this type of defect, as there may not be backfill under the asphalt and it could collapse. Ensure you don't become the Critical Finding!



PM 3:56 OCT/25/2021

Critical Finding?

- A bridge was discovered to have a 48" long x 30" wide void through the deck at the northeast corner. Other "soft" areas of deck were noted in the northwest and southeast corners. The rest of the area was determined to be in good condition.



Critical Finding?

- Yes! Structural, Urgent (3d)
- Holes and “soft” areas in the deck are considered a structural issue. Therefore, the bridge should be partially closed and restrict traffic away from the affected areas.



Critical Finding?

- A bridge has a crack/spalls at the connection between the abutment and the northwest wingwall. The wingwall is newer than the abutment, and a poor closure pour appears to be the issue. The crack/spalls are documented in the past couple of reports and have no change in the width of the crack or area of the spalls. The abutment and wingwall are plumb with no loss of fill or loss of bearing at the superstructure.



Critical Finding?

- No!
- The crack and spalls haven't changed since the last inspection. As there is no settling or loss of bearing, a critical finding is not warranted. However, this should be monitored closely.



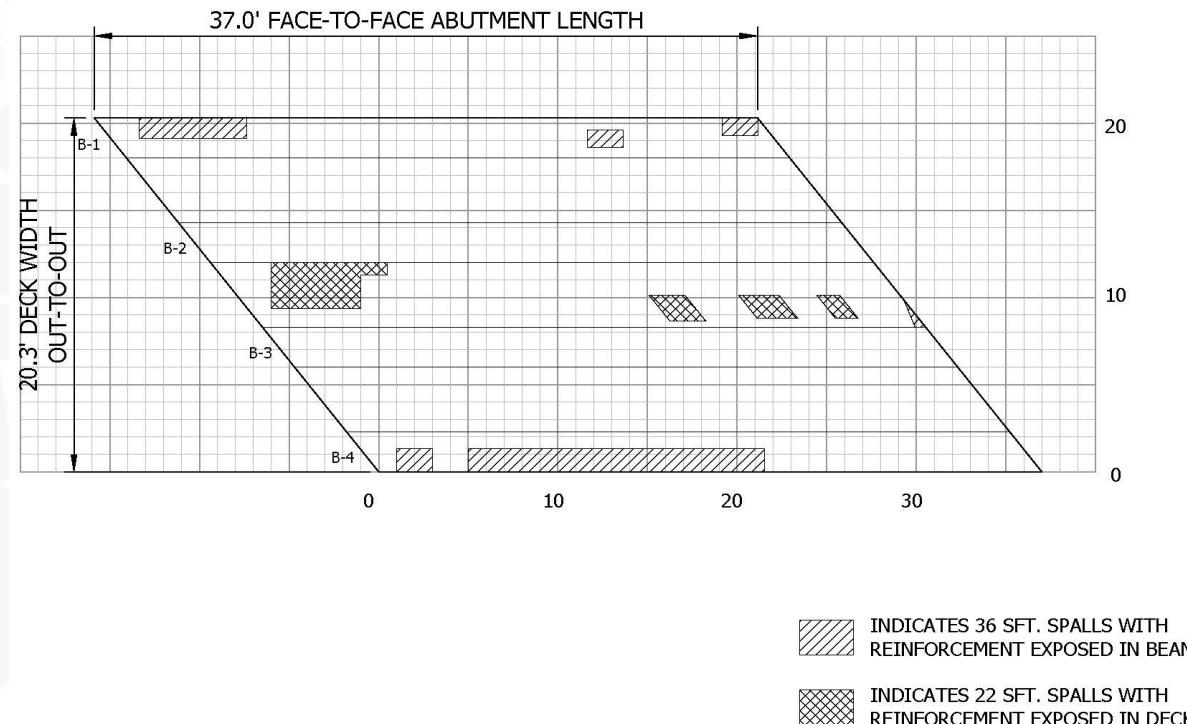
Critical Finding?

- A bridge has 4 concrete tee beams as a superstructure. The exterior beams have spalls with reinforcement shown on the bottoms. There are no spalls on the 2 interior beams. A sketch was made which shows 10% of the total bottom of beam area is spalled. The spalls have not changed in area since the last bridge inspection. The bridge is currently posted commercial vehicle 11 tons and emergency vehicle 9/11/15 tons.



Critical Finding?

- No!
- The spalls haven't changed since the last inspection and account for only 10% of the area. This is not enough to warrant a critical finding. The bridge has been load rated and is posted correctly; if no weight limit signs were in place, and all rating factors were above 1.0, then a critical finding may be warranted.



Critical Finding?

- A bridge has seven precast box beams as a superstructure. During the inspection it is noted that beam 3 has deflected 2" lower than the rest of the beams. There is no note from the previous report about a beam deflection. The asphalt wearing surface is cracked and spalled along the beam lines of beam 3. From below, there are no spalls, cracks, or obvious signs of deterioration in any of the beams.



Critical Finding?

- Yes! Structural (Urgent, 3d)
- The beam has permanently deflected, indicating it is acting independently from the rest of the beams, and is overstressed. Bridge should be closed (or partial lane closure) until repairs can be made.



Critical Finding?

- A timber covered bridge has both an arch and a truss system, which includes a stringer/floor beam system, as part of its superstructure. During an inspection it was found that one of the arches has a 40" long by 2" wide crack at the base of the interior arch member, rendering it useless. All other members are in good condition. Note: Typically, floor beams control the load rating.



PM12:42 APR/ 5/2022

Critical Finding?

- Yes! Structural, Urgent (3d)
- Even though in most cases the floor beams control the load rating, this is a primary member that is ineffective and is causing additional stress on the other members. Until a new load rating is performed and shows that there is no reduction in load, a critical finding should be filed and the bridge closed.



PM12:42 APR/ 5/2022

Critical Finding?

- A bridge is required to be posted for commercial and emergency vehicles as well as narrow bridge. The signs are stacked together on one post. The bottom of the lowest sign is only about 1 foot above the ground level.



Critical Finding?

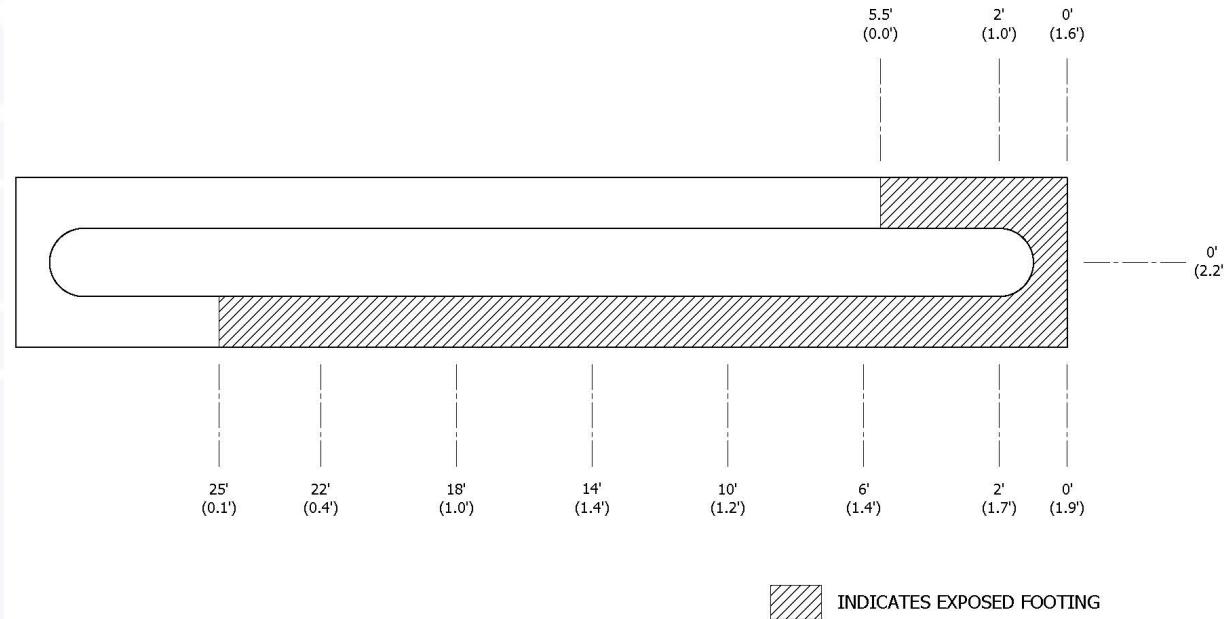
- Yes! Safety, Severe (30d)
- From INDOT Standard Drawing E 802-SNPL-02:
 - Minimum 5 ft. to bottom of single sign
 - Minimum 4 ft. to bottom of secondary sign

NOTES:

- ① If a secondary sign is mounted below another sign, the secondary sign shall be installed at least 5 ft. above the level of the pavement edge.
- ② The height to the bottom of a secondary sign mounted below another sign may be 1 ft. less than the height specified above.

Critical Finding?

- A bridge has scour around one of its piers. A sketch was made showing that the top of the footing was exposed for approximately half its area. The upstream end was exposed up to 2.2'. There is no undermining. There was no sketch from the previous inspection, and it only noted that the footing was exposed 1.0' at the upstream end. The plans indicate that the footing is 2.5' deep and is on pilings 20' deep and on good soil.



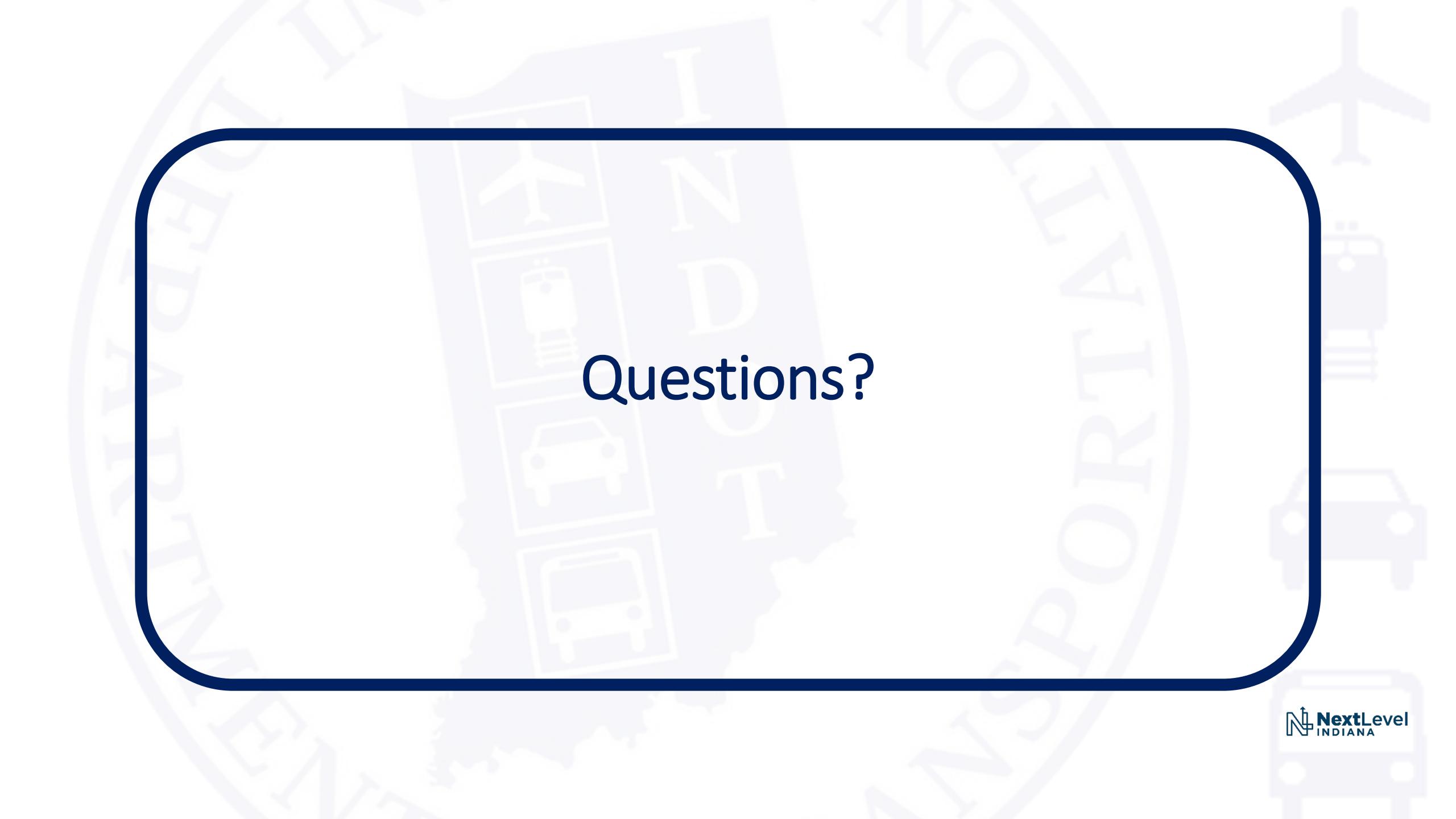
PIER 4 | SCOUR PROFILE AGAINST SUBSTRUCTURE

Critical Finding?

- No!
- Although the scour is increasing and the footing is almost undermined, the pier is on 20' deep piling and on good soil. Following Form 6B in the BIM (Scour Assessment), item 113 (scour rating) would be a 5. This bridge is not scour critical, and since the pier is determined to be stable with the structural integrity not affected, no critical finding is necessary. However, continued monitoring is important!

All of the following questions (8.k through 8.r) assume that the bridge has a pile foundation are friction piles in cohesive soils.

- l. ... and a minimum 3-ft layer w/ $Qu > 1.5$ tsf in upper $\frac{1}{2}$ of embedded pile length required, where minor/no existing scour is present or has occurred previously with Pile tips $\geq 15'$ deep?
 - Yes, assign a rating of "8"
 - No, go to 8.m
- m. ... and a minimum 3-ft layer w/ $Qu > 1.5$ tsf in upper $\frac{1}{2}$ of embedded pile length required, where minor/no existing scour is present or has occurred previously with Pile tips $< 15'$ deep?
 - Yes, assign a rating of "5"
 - No go to 8.n
- n. ... and a minimum 3-ft layer w/ $Qu > 1.5$ tsf in upper $\frac{1}{2}$ of embedded pile length required with a history of significant scour/erosion with Pile tips $\geq 35'$ deep?
 - Yes, assign a rating of "8"
 - No, go to 8.o
- o. ... and a minimum 3-ft layer w/ $Qu > 1.5$ tsf in upper $\frac{1}{2}$ of embedded pile length required with a history of significant scour/erosion with Pile tips $< 35'$ and $\geq 20'$ deep
 - Yes, assign a rating of "5"
 - No, go to 8.p
- p. ... and a minimum 3-ft layer w/ $Qu > 1.5$ tsf in upper $\frac{1}{2}$ of embedded pile length required with a history of significant scour/erosion with Pile tips $< 20'$ deep without significant scour present
 - Yes, assign a rating of "4"
 - No, go to 8.q



Questions?