



### Underwater Inspection Procedure Checklist

Acceptable written procedures communicate to the next field inspection team leader what is necessary to ensure a safe and successful inspection. Each bridge requiring underwater diving techniques must have written inspection procedures specific to each bridge which address items unique to that bridge. The prior inspection report condition ratings and inspection comments, by themselves, do not suffice for the required procedures. It is valuable to review these items but they do not serve the same purpose as the inspection procedures. The inspection report records what an inspector actually did, what was looked at, and what was found. Procedures lay out what should be done, looked at, for the life of the structure. This checklist is a framework and shall be completed for all underwater diving inspections when inspection procedures do not exist.

#### **I. Bridge Identification**

- a. Agency with Inspection Responsibility: Summit County Engineer
- Dive Frequency: 60 months
- SFN: 7751001 Bridge Number (County-Route-SLM-SD): SAG-111-0000 (Summit County)
- Superstructure Type Main Span Type: Prestressed Concrete Adjacent Box Beams (C03 B02)
- Approach Span: \_\_\_\_\_
- Substructure Type Abutment Type: R.C. Stub (C01 A02)
- Pier Type: Capped Pile Bent (C01 B03)
- Total Pier Count: 2
- Total Pier Count in water: 2
- Foundations: C.I.P. R.C. Pipe Piles (P03)
- Feature Intersected: Cuyahoga River

#### **b. Photographs**

- |                                    |                                          |                                                                 |
|------------------------------------|------------------------------------------|-----------------------------------------------------------------|
| <input type="checkbox"/> Endview   | <input type="checkbox"/> Upstream        | <input type="checkbox"/> Roadway                                |
| <input type="checkbox"/> Elevation | <input type="checkbox"/> Downstream      | <input type="checkbox"/> Items of Note from Previous Inspection |
| <input type="checkbox"/> Underside | <input type="checkbox"/> Reference Datum | <input type="checkbox"/> Elevation of Each Substructure Unit    |



## II. Office and Field Assessment

Prior to the inspection, obtain and review copies of the previous underwater inspection reports, routine inspection reports and design plans in preparation of the inspection. Divers should pay particular attention given to any observed areas of deterioration, the channel conditions and factors that may accelerate material deterioration. Changes shall be noted in the inspection procedure. Site conditions should be reviewed prior to diving

a. Channel Conditions

Y Waterway features

Y Rapid stream flows,

Y Significant debris accumulation

N Constricted waterway openings

N Soft or unstable streambeds

N Meandering channels

N Other which may promote scour

and undermining of substructure elements

N Navigable Waterway

N Flow Controls

b. Anticipated Water conditions which may affect the inspection

N Cold Water (Apprx. Temp\_\_\_\_)

N Black water

Y Rapid stream flows

N Near military facility

N Tribal fishing

N Water quality

N History of Log jams

c. Identify factors that may accelerate the deterioration of the bridge elements:

N Highly corrosive water

N Unprotected steel members

\_\_\_\_ Other

Risk Factor Narrative:

|  |
|--|
|  |
|--|



III. Contacts Prior to Work

(TO BE COMPLETED BY THE BRIDGE OWNER)

Point of contact for immediate action such as closing the bridge due to findings)

Contact Bridge Owner 14 (number) days before the proposed underwater inspection.

Special contracting and scheduling procedures prior to inspection, include recommended lead time

| Entity                  | Contact Name and Title | Contact Phone | Lead Time |
|-------------------------|------------------------|---------------|-----------|
| Coast Guard             |                        |               |           |
| Property Owner          |                        |               |           |
| Access Equipment        |                        |               |           |
| Lake or River draw-down |                        |               |           |
| Canal dry time          |                        |               |           |
| Tree removal            |                        |               |           |
| Other:                  |                        |               |           |
| Other:                  |                        |               |           |

**IV. Dive Team Shall Include the Following:**

Dive Team Narrative:

The Dive team shall be inspected using a three-member dive team: one supervisor to monitor the inspection and take notes, one diver, and one tender/standby diver. There shall be one NBIS Team Leader on-site at all times.

*Example: The Bridge shall be investigated using a three-member dive team: one supervisor to monitor rack box and take notes, one diver, and one tender/standby diver. There shall be one NBIS Team Leader onsite at all times.*

**V. Site Information**

Navigable waterway:

Y/NAnticipated current 2 ft/s

If Yes, waterway river point

          B.AP.03 - Scour Vulnerability:           Anticipated water visibility depth 2 ftPOA in place: Y/NAnticipated Dive depth 2 ftScour Monitoring devices present: Y/N

Verify the Scope of Services when work is contracted for the procedure for underwater elements that are not in water during an inspection.

Site Information Narrative:

Best practice is to come prepared for the worst case (surface supplied diving) and adapt accordingly based on the conditions at hand. Factors such as: temperature, flow, depth, debris and crew experience level are all factors that need to be taken into account. A common sense approach needs to be followed. Access is best at southeast quadrant. Recommend inspecting when Cuyahoga River gage at Independence is less than 600 cfs.



The underwater inspection consists of a visual and tactile examination of the accessible surfaces of the substructure items in water. Additional items should reference the scope of services in the contract. For reference the following items are in water:

| Item                           | Number of Units | Level of Inspection (1, 2 or 3) with<br>Commentary |
|--------------------------------|-----------------|----------------------------------------------------|
| Piers and Number of<br>Columns | 2, 6 piles each | Level 1                                            |
| Abutment                       | Not in water    |                                                    |
| Culvert                        |                 |                                                    |
| Scour Countermeasures          | 2               | Level 1                                            |
| Fenders or Dolphins            |                 |                                                    |

Photographs should be taken, if water clarity permits, for typical conditions, conditions that have changed since last inspection and significant or noteworthy deficiencies. The type of channel bottom material, the presence or extent of scour, the presence or extent of riprap, the presence or extent of drift and debris, and the location of any foundation exposure or undermining shall be quantified. Include depth, length, height, and location of deficiencies.

**VI. Equipment and Field Logistics**

- a. The inspection should be conducted using:

☐ Chest waders

☐ Hip waders

☒ Diving equipment

☐ SCUBA (Note that ADCI Consensus Standards require communication systems be employed for both SCUBA and Surface-Supplied (whether air or mixed-gas) dive modes)

☒ SCUBA with communication

☐ Surface Supplied with

communication

- b. The channel bottom should be sounded utilizing

☐ Digital fathometer

☒ Telescoping survey rod

☐ acoustic imaging

- c. During the inspection, the divers should work from

☒ Shore

☐ Boat

☐ Either

The note taker should work alongside the dive team.

- d. Access to the waterway should be obtained from the shore (north bank, southwest quadrant, driveway 30 yards north etc.)

Any bank

- e. The maximum depth of the channel is typically measured 0 feet from \_\_\_\_\_

middle of the channel

Reference Datum Bottom of Bent 1 cap at left (downstream) pile

Soundings should be dictated by the scope of work. When not detailed in the scope they should be repeated from the previous soundings. If neither exist then they need to be taken in a grid pattern between substructure units 100' upstream and 100' downstream  
Follow established grid from previous inspections



**Other Narrative Not Included In Previous Section**