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| **SCOUR ASSESSMENT – TYPE 2** *Reference Metric 18 Scour Analysis For Existing Structures Section 1.4 for additional details on justification categories, suggested Item 113 coding and POA requirements.* |
| **BRIDGE DATA** |
| **Asset ID** |  | **Structure Number** |  |
| **County** |  | **Facility Carried** |  |
| **Waterbody** |  | **Skew Angle** |  |
| **Bridge Length (ft)** |  | **Bridge Width (ft)** |  |
| **Year Built** |  | **Span Arrangement** |  |
| **Longitude** |  | **Pier Size (ft)** |  |
| **Latitude** |  | **Pier Shape** |  |
| **Abutment Type** |  | **Roadway Alignment** |  |
| **JUSTIFICATION SELECTION** |
|  **JUSTIFICATION** | **DESCRIPTION** (See p. 3 for Detailed Instructions) |
| **Foundations embedded in rock** | A plan sheet or boring data showing the elevation of rock is required. For bridges with piles, the pile logs or pile tip information must show 5 or more feet embedment into rock. For bridges with drilled shafts, the plans must show that the shafts are within the limits of the rock. For bridges with spread footings, the spread footings must be shown on the plans or quantities for rock excavation included in the As-Let or As-Built plans. |
| **Foundations with penetration into Marl or similar consolidated material** | A plan sheet or boring data showing 5 or more feet of penetration into consolidated material for piles or drilled shafts is required.For spread footings, 2 or more feet of penetration must be shown on the plans. |
| **Unknown foundations in the Piedmont Region** | The bridge must be located in the Piedmont or Blue Ridge Region of SC, have timber piles with unknown penetration depths. |
| **Unknown foundations** | The bridge must not have foundation information available. |
| **Nondesigned Countermeasures installed** | The bridge must have nondesigned countermeasures installed. |
| **Bridge Size Culverts** | The culvert must have an opening of 20 feet or more and have a bottom.  |
| **Bridges over Reservoirs** | The bridge must be over a reservoir and have a geometric contraction ratio less than 0.75. |
| **DETERMINATION** |
| **Justification** *Insert justification from list above* **is selected with a scour code Item 113 of** *##* **.** **A POA is** *(required/not required)***.** |
| **Certification**: *This assessment was performed in accordance with Metric 18 Scour Analysis For Existing Structures, May 2021.* |
| Consultant Certification | Signature: | Date: |
| QA Acceptance | Signature: | Date: |
| HDSO Approval | Signature: | Date: |

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| SUPPORTING NARRATIVE AND INFORMATION  |
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| INSTRUCTIONS FOR USING A TYPE 2 SCOUR ASSESSMENT |
| **Justification Selection:**1. **Foundations embedded in rock**

Bridge foundations that are embedded into competent rock are exempt from scouring due to the hardness of the rock material and its resistance to scour. The presence of competent rock indicates that the foundations are safe from the normal processes causing scour. A scour code of Item 113 = 5 or 8 is assigned.* 1. Rock is shown on the plan sheets, soil borings, or structural details.
	2. Plans have quantities for rock excavation at the foundation elements.
	3. Drilled shafts are used for the substructure and elevations are shown on the details for penetration and/or a rock line is noted.
	4. The plan sheet includes a note for rock sockets.
	5. Spread footings are called for on the plans in an area with competent rock.
	6. As-built information includes rock sockets, quantities for rock excavation, or additional foundation information.
	7. Pile log shows pile tips embedded into rock and the proper pile tips are called for on the plans for driving into rock.
1. **Foundations with penetration into Marl or similar consolidated material**

It has been determined that Marl exhibits very similar scour resistance as rock. The rate of scour in Marl has been determined to be so slow that ultimate scour depths would not be reached within the service life of the structure and therefore, can be considered scour resistant. A scour code of Item 113 = 5 or 8 is assigned.* 1. Marl is shown on the plan sheets, soil borings, or structural details.
	2. Plans have notes about foundation elements being in Marl.
	3. Drilled shafts are used for the substructure and elevations are shown on the details for penetration into Marl.
	4. Spread footings are called for on the plans and are placed an adequate depth into the Marl.
	5. Pile Log show pile tips embedded into Marl.
1. **Unknown foundations in the Piedmont Region**

When a bridge is founded on timber piles in the Piedmont and Blue Ridge regions of SC, where rock is relatively shallow and pile penetration is limited by the depth to rock, the timber foundations are scour critical when the depth to rock is less than five (5) feet from the surface. A scour code of Item 113 = 3 is assigned.* 1. Foundation elements are made of timber and are located in the Piedmont or Blue Ridge regions.
	2. Foundations are classified as unknown.
1. **Unknown foundations**

Foundation data is not available to properly describe the type and depth of foundations. A scour code of Item 113 = U is assigned.1. **Nondesigned Countermeasures installed**

Nondesigned countermeasures are installed at a bridge. Since the countermeasures were not properly designed, its effectiveness is not a known quantity. A scour code of Item 113 = 7 is assigned.* 1. A countermeasure without design information is present and the bridge is already coded as Item 113 =7.
	2. A Type 1 scour assessment is not possible.
1. **Bridge Size Culverts**

Culverts are not normally subject to scour unless they are bottomless. Bottomless culverts should be analyzed as bridges to determine the scour assessment type to be used. There have been cases where issues with stream degradation and abutment-like scour affects bridge-sized culverts. These cases typically occur at locations where a bridge should be used instead of a culvert. A scour code of Item 113 = 8 is assigned.1. **Bridges over Reservoirs**

Bridges over reservoirs are generally at low risk of scour. If the constriction is severe (m ≥0.75), a Type 1 scour study should be conducted. If the constricted crossings over reservoirs has a geometric contraction ratio < 0.75, available site-specific data (such as historical tape down measurements and geotechnical borings) can be used to assign a scour code of Item 113 = 5 or 8.**Supporting Narrative and Information:**1. Provide 1-3 paragraphs specifying available information and identifying information(available/missing) on the asset ID that supports the selected justification.
2. Provide supporting data including plans, site visit information, aerial photograph, topographic map, and other information needed to document the justification and Item 113 Coding.
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