|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **METRIC 18**  **SCOUR ASSESSMENT REPORT** | | | | | | | | |
| **\_\_\_\_\_\_\_\_ over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ County, SC** | | | | | | | | |
| **Asset ID: \_ \_ \_ \_ \_** | | | | | | | | |
| **Structure Number: \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_** | | | | | | | | |
|  | Logo, company name  Description automatically generated | | | | | | |  |
| **Item 113** | | ***#*** | **POA?** | | ***Y/N*** | Prepared By:  *<Consultant Logo>*  *Version. 1.1*  *20210421* | | |
| *<Insert Seal>*  COA | | | *<Insert Seal>*  Hydraulic Engineer | | |
| **Certification**: *This assessment was performed in accordance with SCDOT Scour Analysis for Existing Structures, Jan 2021.* | | | | | | | | |
| Consultant Certification | | | | Signature: | | | Date: | |
| QA Acceptance: | | | | Signature: | | | Date: | |
| HDSO Acceptance: | | | | Signature: | | | Date: | |

|  |
| --- |
| 1. **Basis of Study** |
| * 1. FHWA Requirements |
| The Federal Highway Administration requires that “Every bridge over a waterway, whether existing or under design, should be evaluated as to its vulnerability to scour in order to determine the prudent measures to be taken for its protection (Technical Advisory T5140.23, October 21, 1991; 23 CFR 650.313 (e), (e3)). Bridges that are deemed vulnerable to scour are classified as scour critical in the National Bridge Inventory Database (see NBI, Item 113). Plans of Action (POA) that implement safety measures during a specified flood event must be developed for each bridge deemed scour critical or to have unknown foundations.  Compliance with the Federal Highway Administration’s policy regarding bridges over water requires that supporting documentation (such as the scour critical assessment, POA, and history of POA implementation during flood events) be on file and readily accessible for all bridges over water in the Bridge File System, which is housed in SCDOT’s ProjectWise Explorer V8i. SCDOT’s Bridge File System is organized by asset ID and houses all bridge-related files. |
| * 1. Scour Assessment Guidance: |
| Scour Assessment will be completed in accordance with the guidance provided in SCDOT *Scour Analysis for Existing Bridges*, January 2021, prepared specifically for the Scour Critical Assessment and Management System project. |

|  |  |
| --- | --- |
| **BRIDGE DATA** | |
| **Asset ID** |  |
| **Structure Number** |  |
| **County** |  |
| **Facility Carried** |  |
| **Waterbody** |  |
| **Skew Angle** |  |
| **Bridge Length** |  |
| **Bridge Width** |  |
| **FEMA Flood Map Number** |  |
| **FEMA Flood Zone** |  |
| **Year Built** |  |
| **Span Arrangement** |  |
| **Latitude** |  |
| **Longitude** |  |
| **Representative Pier** |  |
| **Pier Shape** |  |
| **Pier Width** |  |
| **Abutment Type** |  |
| **Roadway Alignment** |  |

|  |
| --- |
| **LOCATION MAP**  *(include enough definition with nearest Major Road / Intersection along with North Arrow and Bridge Label)* |
|  |

|  |
| --- |
| **AERIAL IMAGE**  *(include enough definition to see bridge along with North Arrow and Bridge Label)* |
|  |

|  |
| --- |
| **BRIDGE PLAN SHEET or BRIDGE SCHEMATIC SHEET** |
| *<Include the entire Plan Sheet. Bridge Plan Sheet is preferred, and if unavailable, the Schematic Plan Sheet will be acceptable>* |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. **Data Collection** | | | | | | | | | | | | | | | |
| * 1. **Records (please check all that apply)** | | | | | | | | | | | | | | | |
| Roadway Plans | | | | |  | | | Routine Inspect | | | | | | |  |
| Bridge Plans | | | | |  | | | Pile Log | | | | | | |  |
| FEMA Maps | | | | |  | | | FIS Study | | | | | | |  |
| USGS StreamStats | | | | |  | | |  | | | | | | |  |
| As-builts | | | | |  | | | Soils Data | | | | | | |  |
| * 1. **Site Inspection and QuickBase Report** | | | | | | | | **Date of Inspection:** | | | | | | |  |
| Tapedowns | | | | |  | | | Soil Samples | | | | | | |  |
| Photos | | | | |  | | |  | | | | | | |  |
| * 1. **Other Measurements** | | |  | | | | | | | | | | | | |
| * 1. **Existing Model Data** | | | **Source:**  **Type:** | | | | | | | | | | | | |
| * 1. **Scour and Inspection History:** | | | | | | | | | | | | | | | |
| *(Include any items such as Rip Rap Condition, waterway adequacy, debris, erosion and scour issues)* | | | | | | | | | | | | | | | |
| **Hydrologic Summary** | | | | | | | | | | | | | | | |
| **Drainage Area:** |  | | | | | | | | | sq mi | | | | | |
| **High Water Mark (ft):** |  | | | **Source:** | | |  | | | **Datum:** | | |  | | |
|  | | **10% AEP**  **(10-Yr.)** | | | | **4% AEP**  **(25-Yr.)** | | | **2% AEP**  **(50-Yr.)** | | **1% AEP**  **(100-Yr.)** | | | **0.2% AEP**  **(500-Yr.)** | |
| *<Stream Name>* **Design Flow Rate (StreamStats) (cfs)** | |  | | | |  | | |  | |  | | |  | |
| **Design Flow (from Plans)(cfs)** | |  | | | |  | | |  | |  | | |  | |
| **Water Surface Elevation** | |  | | | |  | | |  | |  | | |  | |
| **Velocity (from Plans) (fps)** | |  | | | |  | | |  | |  | | |  | |
| * 1. **Field Conditions from Inspection Notes:** | | | | | | | | | | | | | | | |
| *(Include items such as Confirmation of Bent Configuration, Abutment Type and Condition, Abutment Protection Condition, Channel/Waterway Condition, Utility Obstructions, Debris Accumulation, Channel Bank Stability, other Erosion or Scour Issues)* | | | | | | | | | | | | | | | |
| * 1. **Notes and Assumptions on Data Collected** | | | | | | | | | | | | | | | |
| Datum Conversion | |  | | | | | | Soil Type | | | |  | | | |
| Pile Tip Elev/Embedment Source (*ie: As-Builts, Plan Sheets, Pile Logs, Foundation testing Report, etc*) | |  | | | | | | D50 | | | |  | | | |
| General Terrain (Hilly/Flat/Etc) | |  | | | | | |  | | | |  | | | |
| Other Notes: | |  | | | | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. **Scour Assessment** | | | | | | | | | | | |
| * 1. Scour Estimate | | | | | | | | | | | |
|  | | | | | | | | | | | |
| **Summary of Results** | | | | | | | | | | | |
| **Bent #** | **Bent Location** | **Pier Scour (ft)** | **Contraction Scour** | | | **Abutment Scour (ft)** | **Total Scour (ft)** | **Ground Elevation**  **(GE)**  **(ft)** | **Scour Hole Top Width (ft)** | **Initial Pile Embedment (ft)** | **Remaining Pile Embedment (ft)** |
| **Clear Water Scour (ft)** | **Live Bed Scour (ft)** | |
| 1 | *End Bent (No Scour)* | | | | | | | | | | |
| 2 | *LABUT* |  |  |  | |  |  |  |  |  |  |
| 3 | *LOB* |  |  |  | |  |  |  |  |  |  |
| 4 | *CH* |  |  |  | |  |  |  |  |  |  |
| 5 | *ROB* |  |  |  | |  |  |  |  |  |  |
| 6 | *RABUT* |  |  |  | |  |  |  |  |  |  |
|  | *<Insert additional rows as needed for total number of bents>* | | | | | | | | | | |
| *n* | *End Bent (No Scour)* | | | | | | | | | | |
| **Geometric Contraction Ratio (m)** | | | | | *Include a schematic in Appendix B showing a graphical representation* | | | | | | |
| * 1. Pile Embedment/Foundation Stability | | | | | | | | | | | |
|  | | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Critical Tape Down Measurements** | | | | | | | | |
| **Bent No.** | **Bent Location** | **Finished Grade Elevation** | **Benchmark Element** | | **Benchmark Elevation (BME) (ft)** | | **Tape Down Measurement**  **(BME – GE) + (Total Sour)** | |
| 1 |  |  |  | |  | |  | |
| 2 |  |  |  | |  | |  | |
| 3 |  |  |  | |  | |  | |
| 4 |  |  |  | |  | |  | |
| 5 |  |  |  | |  | |  | |
| 6 |  |  |  | |  | |  | |
| *n* |  |  |  | |  | |  | |
| **Critical Tape Down Measurement in the Channel** | | | | *Insert Maximum from table* | | **Bent No.** | |  |
| **Critical Tape Down Measurement in the Overbank** | | | | *Insert Maximum from table* | | **Bent No.** | |  |

|  |
| --- |
| * 1. Scour Profile Plot |
| *<Insert scour plot here (show scour depths, side slopes, top widths, AEP, bent designations consistent with Bridge diagram). If a plan sheet is not available, a scour plot is not needed.>* |

|  |
| --- |
| 1. **Conclusions** |
| * 1. Assumptions and Triggers |
| *<Include any assumptions or triggers that should be considered where the scour code could change due to changes in existing site conditions>* |
| * 1. Item 113 Code Recommendation |
|  |

|  |
| --- |
| **APPENDICES** |

1. Available Plan Excerpts
2. Available Mapping
3. StreamStats and Other Relevant Data
4. QuickBase Inspection Report
5. USGS Spreadsheets
6. Hydraulic Model
7. HEC-18 Calculations
8. QC Checklist

*(Reports should include all appendices, mark “not applicable” as required.)*

|  |
| --- |
| **APPENDIX A. Available Plan Excerpts** |

*(Include only pertinent plan sheets with relevant bridge information. Full plan sets not required)*

|  |
| --- |
| **APPENDIX B. Available Mapping** |

|  |
| --- |
| **APPENDIX C. StreamStats and Other Relevant Data** |

|  |
| --- |
| **APPENDIX D. QuickBase Inspection Report** |

|  |
| --- |
| **APPENDIX E. USGS Spreadsheets** |

|  |
| --- |
| **APPENDIX F. Hydraulic Model (HEC-RAS, SRH2D)** |

|  |
| --- |
| **APPENDIX G. HEC-18 Calculations** |

|  |
| --- |
| **APPENDIX H. QC Checklist** |

|  |
| --- |
| **- End of Metric 18 Scour Assessment Report -** |