**MOVABLE BRIDGE ELECTRICAL INSPECTION REPORT**

Wisconsin Department of Transportation

DT2014 6/2017 s.84.17 Wis. Stats.

|  |  |
| --- | --- |
| Bridge Number | Overall Rating of Electrical System |
| Bridge Name | Date Inspected |
| Lead Electrical Inspector | Weather |
| Inspection Team Leader |  |

Follow the bridge’s Lockout-Tagout procedures and wear proper PPE for inspecting both energized and de-energized electrical equipment.

Notes:

* This form provides specific inspection detail in conjunction with the items provided in the HSI Movable Inspection Tab. While there may be some overlap with the routine inspection, updates to the Elements and Assessments Inspections Tabs are not necessarily required.
* Place comments in each box next to the component inspected.
* For each component rating, enter “(1)” for Good, “(2)” for Fair, “(3)” for Poor, or “(4)” for Severe.
* If the component does not apply to this bridge enter “NA”.
* Include a comment and photo reference documenting any components rated (3) or (4).

**Power Distribution Panels/Panelboards** Component Rating:

|  |  |
| --- | --- |
| **Component** | **Finding/Comment** |
| **Circuit Breakers** – Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels |  |
| **Fuses & Fuse holders** – Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels. |  |
| **Grounds** – Check for resistance. Visually inspect bonded grounding conductors to disconnect switches, meter, racks and cabinets. Look for any corrosion on connections. Check for any damaged conductors, missing ground wires, or loose terminals. Look for any discoloration or scorching. Inspect ground rod if accessible and check for any damage to rod or grounding conductors such as cut or frayed wires. Lightly tug on grounding lugs or rod to check for any loose connections. Visually inspect any bonded connections to bridge structure and components. |  |
| **Contactors** – Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels |  |
| **Terminals** – Check for any loose connections, damaged conductors, missing labels |  |
| **Voltages** – Test and record incoming Voltage |  |

**Motor Control Centers/Panels** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **Circuit Breakers** – Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels. |  |
| **Fuses & Fuse holders** – Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels. |  |
| **Grounds** – Check for resistance. Look for any physical damage such as cut or frayed wires and for any discoloration or scorching. Inspect any grounding/bonding conductors to racks and cabinets. Lightly tug on ground lugs to check for any loose connections. Look for any corrosion on connections. |  |
| **Starters/Contactors** - Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels |  |
| **Terminals** – Check for any loose connections, damaged conductors, missing labels |  |
| **Misc.** – Visually check for any new components and new conductors or jumpers |  |

**PLC/Relay Control Panels** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **Circuit Breakers** – Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels. |  |
| **Fuses & Fuse holders** – Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels. |  |
| **Grounds** – Check for resistance. Look for any physical damage such as cut or frayed wires and for any discoloration or scorching. Inspect any grounding/bonding conductors to racks and cabinets. Lightly tug on ground lugs to check for any loose connections. Look for any corrosion on connections. |  |
| **Relays** – Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels. |  |
| **PLC** – Visually observe PLC status lights for any faults or errors. Inspect for any damage, dirt debris, discoloration or scorching, missing covers, missing labels. |  |
| **Terminals** – Check for any loose connections, damaged conductors, missing labels. |  |
| **Misc.** – Visually check for any new components and new conductors or jumpers. |  |

**Control Console** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **Switches and Pushbuttons** – Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, damaged or incorrect nameplates. Operate all devices to check spring or detent action. |  |
| **Indicator lights** – Visually inspect for any damage lenses, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, damaged or incorrect nameplates. Check that all lights illuminate properly |  |
| **Terminals** – Check for any loose connections, damaged conductors, missing labels. |  |
| **HMI Touchscreen** – Visually inspect for any damage and cleanliness of screen. Check alarm history for any recurring alarms or problems. |  |
| **Relays and or PLCs** – See above section for details. |  |
| **Misc.** – Visually check for any new components and new conductors or jumpers. Check that operating instructions are clearly posted. Observe any notes taped or attached to devices on the console. Visually inspect the condition of nameplates. |  |

**Transformers** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **Panel Doors** – Check hinges and gasket seal condition. |  |
| **Transformers** – Check for damage, corrosion, lost paint and unusual noises. Measure and record the operating temperature. |  |
| **Conduit** – Check for loose supports, corrosion, dirt and debris build-up. |  |
| **Conduit Fittings** – Check for loose connections, and condition of gasket seals. |  |
| **Junction Boxes and Terminal Boxes** – Check for missing covers, gasket seals and corrosion. |  |
| **Wire and Cable** – Check for abrasion, cracking, discoloration, overheating, kinks and moisture infiltration. |  |
| **Terminations** – Check for loose connections, untagged wires, damaged wires and terminal corrosion. |  |
| **Flexible Cables** – Check during bridge operation to verify range of motion. Check for abrasion, cracking or damage. |  |
| **Submarine, Droop, and Aerial Cables** – Check for deterioration and cable supports. Resistance test the insulation of the individual wires and record the values. |  |

**Raceway and Conduit System** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **Conduit** – Check for loose supports, corrosion, dirt and debris build-up. |  |
| **Conduit Fittings** – Check for loose connections, and condition of gasket seals. |  |
| **Junction Boxes and Terminal Boxes** – Check for missing covers, gasket seals and corrosion. |  |
| **Wire and Cable** – Check for abrasion, cracking, discoloration, overheating, kinks and moisture infiltration. |  |
| **Terminations** – Check for loose connections, untagged wires, damaged wires and terminal corrosion. |  |
| **Flexible Cables** – Check during bridge operation to verify range of motion. Check for abrasion, cracking or damage. |  |
| **Submarine, Droop, and Aerial Cables** – Check for deterioration and cable supports. Resistance test the insulation of the individual wires and record the values. |  |

**Electrical Machinery** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **Motors** – Visually inspect for any damage, dirt, debris, discoloration or scorching, missing covers, lack of or excess grease. Check mounting bolts for looseness, inspect keys, bolts and pins for proper position. Check for unusual noises or vibration. Check electrical connections. Perform dielectric test to check insulation resistance values on all motors. Inspect brushes, springs and rings/armatures. Record ammeter readings as the bridge is operated. |  |
| **Brakes** – Verify manual hand release is working properly. Check for uneven wear on drum. Check for shoe and drum alignment. Test insulation of brake motor and record results. Test spring and detent action of limits. |  |
| **Auxiliary Motors** – Visually inspect for any damage, dirt, debris, discoloration or scorching, missing covers, lack of or excess grease. Check mounting bolts for looseness, inspect keys, bolts and pins for proper position. Check for unusual noises or vibration. Check electrical connections. Perform dielectric test to check insulation resistance values on all motors. Inspect brushes, springs and rings/armatures. Verify interlocking limit switches are triggered by clutch operation. Record ammeter readings as the bridge is operated. |  |
| **Warning and Barrier Gates** – Visually inspect for any damage, dirt, debris, discoloration or scorching, missing covers, lack of or excess grease. Check mounting bolts for looseness, inspect keys, bolts and pins for proper position. Check for fluid and debris buildup. Check for unusual noises or vibration. Check electrical connections. Perform dielectric test to check insulation resistance values on all motors. Record ammeter readings as the bridge is operated.  Observe gates during operation, making sure they are balanced and operate smoothly. Verify gong and light operation. Verify no manual override is required for bridge operation. |  |

**Field devices and Instruments** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **Limit Switches** – Inspect for damage, corrosion or build-up of dirt. Verify free movement of switch. Inspect striker plate for any damage. Observe during operation. |  |
| **Span Position Indication (Inclinometer/Selsyn)** – Inspect for damage, corrosion or build-up of dirt. Check couplings and mounting bolts. Observe during operation. Check calibration of devices. |  |
| **Pressure and Flow Instruments** – Inspect for damage, corrosion or build-up of dirt and leaks. Check calibration of devices. |  |

**Lighting Systems** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **Roadway Lighting** – Verify proper operation. Inspect for damaged anchor bolts or missing covers. |  |
| **Traffic Signals and Advance Warning Signals** – Inspect signals and supports. Verify proper light operation. Inspect for damaged anchor bolts or missing covers. |  |
| **Navigation Lighting** – Check for damage, broken lenses, loose mountings and corrosion. Check center channel lights for proper operation when bridge is fully opened and closed. Check operation of photo-eye. |  |
| **Service Lighting and Receptacles** – Check for damaged or inoperable lights and receptacles. |  |
| **Electrical Utilities** – Check heating and air-conditioning equipment and water heater for damages or signs of developing problems. |  |

**Communication and Monitoring Systems** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **CCTV systems** – check for proper operation for viewing roadway, sidewalks and waterway. |  |
| **Public address system** – Check for proper operation and ability to clear hear verbal direction by the operator from the roadway and sidewalks. |  |
| **Mariner communications** – Check Ship-to-shore radio and navigation horns for proper operation. |  |

**Operational Testing by Full Opening and Closing Cycles** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **Operating Modes** – Verify bridge can be fully operated without any issues under all applicable modes – Manual, Automatic, Remote, etc. Note any alarms that occur during operation. |  |
| **Bypasses** – Verify bridge can be fully operated in all modes without any bypasses being activated. |  |
| **Safety Interlocking System** – Verify under all modes of operation that the safety interlock system and logic fully operates as designed and in proper sequence – taking into account bridge traffic signals, traffic gages, locks, machinery and operating brakes, span motors, and other applicable devices. |  |
| **Backup Power/Alternate Power System** – Verify bridge can be operated under back-up power or alternate utility grid power source as applicable. Verify automatic/manual transfer switch between power sources operates properly. |  |

**Generator Function** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| **Function** – Operate the bridge under generator power. Record the voltage while slightly and fully loaded. |  |

**Transfer Switch** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| Inspect panel and wiring. Test switch in accordance with bridge operations manual. Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels. Verify bridge operates when switched to alternate power sources. |  |

**Sump Pump** Component Rating:

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| --- | --- |
| **Component** | **Finding/Comment** |
| Test pump operation. Check for unusual noises or vibration. Visually inspect for any damage, dirt, debris, damaged conductors, loose conductors, discoloration or scorching, missing covers, missing labels. |  |

**Additional Electrical Component:**  Component Rating:

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**Recommended Short Term Actions & Repairs for Electrical System:**

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**Recommended Long Term Rehabilitation Needs for Electrical System:**

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**General Remarks – Electrical** Overall Rating *(Also enter on page 1)*:

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