# ITS Device Site Test

THIS SITE TEST SHALL BE CONDUCTED FOR ALL PERMANENT ITS INSTALLATIONS. COMPLETE ONE COPY OF THIS TEST FORM FOR EACH ITS DEVICE & CABINET INSTALLED ON THE PROJECT, ALONG WITH ONE COPY OF THE APPROPRIATE TEST FORM FOR THE SPECIFIC TYPE OF DEVICE INSTALLED.

## DMS: General Information

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| **Site General Information** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
| Project Number: | | | | |  | Project Name: | | | | | |  | |
| Project Stationing: | | | | |  | Date of Test: | | | |  | | | |
| Device Name: | | |  | | | Manufacturer: | | | | |  | | |
| Serial #: |  | | | | | Model #: |  | | | | | | |
| Username (If Required): | |  | | | | Password (If Required): | | | | | | |  |
| Communication Method: | | | |  | | IP Address: | |  | | | | | |
| Subnet Mask: | |  | | | | Inspector: | | |  | | | | |

## DMS: Prerequisites

| **Site Prerequisites\*** | | |
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| **Requirement** | **Pass Fail** | **Notes** |
| All testing must occur on a complete site installation with all the same components that will be utilized in day-to-day operations. |  |  |
| The device must be tested with the final power source (utility or solar) and proper grounding that will be used on a day-to-day basis (no generators allowed). |  |  |
| Contractor shall perform a successful site pre-test before actual testing with NHDOT. |  |  |
| Contractor shall be ready, with all necessary parties and preparation, to start the testing on time. |  |  |

\*-Failure to meet any of the prerequisite requirements shall be grounds for immediate testing termination.

## DMS: General Requirements

| **Site General Requirements** | | |
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| **Requirement** | **Pass Fail** | **Notes** |
| Verify location of equipment cabinet is as per the plans.  Cabinet offset from edge of travel lane: \_\_\_\_\_\_\_\_\_\_\_  Latitude:\_\_\_\_\_\_\_\_\_\_\_\_\_ Longitude:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |  |
| Verify the site concrete work pad, if required, is installed, accessible and level. |  |  |
| Verify all installed devices and equipment (including components inside of cabinets) match the approved shop drawings and catalog cuts. |  |  |

## DMS: Control Cabinet

| **Equipment Cabinets** | | |
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| **Requirement** | **Pass Fail** | **Notes** |
| If the cabinet is **ground mounted**, verify the cabinet doors open parallel to adjacent traffic. |  |  |
| If the cabinet is **pole mounted**, verify that the top of the cabinet is between 4’ to 7’ above finished grade. |  |  |
| If the cabinet is **pole mounted**, verify the cabinet is securely strapped to the pole using at least 2 stainless steel bands. (Top and bottom). |  |  |
| If the cabinet is **pole mounted**, verify incoming power feeds and communications feeds enter the cabinet through separate external conduit risers and not through the mounting pole. |  |  |
| If the cabinet is **pole mounted**, verify the opening of both the cabinet doors, and all support pole equipment handholes, is not impeded by the mounting location of the cabinet on the support pole. |  |  |
| Verify the cabinet has two locking doors located on opposite sides of the cabinet. |  |  |
| Verify the Contractor has furnished 3 copies of control cabinet-wiring diagrams, in a watertight container, for each cabinet. |  |  |
| Inspect the interior and exterior of the cabinet for structural damage and water intrusion. |  |  |
| Verify that all conduits terminating in the cabinet are sealed with a proper duct sealant. |  |  |
| Verify that all wiring is neat and routed properly throughout the cabinet. Wire ties are utilized to bundle common wires, and all wires and components are properly labeled within the cabinet. |  |  |
| Visually inspect all terminations within the cabinet that connections are tight, clean, landed in the correct polarity/alignment, wiring is of the proper size and color, and meets manufacturer’s recommendations. |  |  |
| Verify that all earth terminal grounds external to the cabinet are cadwelded by visual inspection. Terminals must be left uncovered or dug up. |  |  |
| Verify the cabinet has 2 internal lights located inside the top of each cabinet door. Open the cabinet doors, and verify the lights function by pressing and releasing door switches to turn lights on and off. |  |  |
| Verify installation of a new cabinet air filter (paper- based filters are prohibited). All fans shall be located above the air filters at the top of the cabinet. |  |  |
| Verify installation of cabinet fan, and accompanying thermostat. Thermostats shall be able to adjust in the range of 50° F to 120° F. |  |  |
| Verify installation of the radiant heater in the lower portion of the cabinet, is not blocking or touching other equipment or cables, is not directly under a shelf, is hardwired to the cabinet power distribution buss, and has an on/off switch and thermostat with a minimum turn on range of 10°F to 60°F. |  |  |
| Verify fan, heater and thermostats are all functional by use of a heat gun, or adjusting the thermostats until fan/heater turns on/off at the appropriate temperatures. |  |  |

## DMS: Electrical

| **AC Power\*** | | |
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| **Requirement** | **Pass Fail** | **Notes** |
| \*-See device specific test plans for additional testing requirements. | | |
| Verify that all power conductors are of the size and type required and properly terminated. |  |  |
| Verify voltage at cabinet is within +/- 5% of 120 VAC or 240 VAC. |  |  |
| Test the earth ground rods, wires, and connections by use of the ground resistance tester (3-point fall of potential method) and record values below. Verify that the resistance is less than manufacturer’s recommended resistance to ground, or a maximum of 25 ohms, whichever is less.  Earth ground wire from power source:\_\_\_\_\_\_  Wire to ground rod(s) at equipment cabinet:\_\_\_\_\_\_  Wire to device from equipment cabinet:\_\_\_\_\_\_  Wire at device to ground rod(s) at device:\_\_\_\_\_\_\_ |  |  |
| Verify that the AC circuit breaker is properly sized (per Plans), installed on DIN rail, and connected to AC line. |  |  |
| Verify that the AC surge protector is properly installed on DIN rail and connected to circuit breaker and AC neutral. |  |  |
| Verify that the power supply is connected to AC surge protector on input side and to each lightning surge protector on output side. |  |  |
| Verify that the DIN rail is properly grounded by confirming continuity from the DIN ground to the grounding cable through a dedicated lug and conductor. |  |  |
| Verify cabinet is properly grounded by confirming continuity from the cabinet to the grounding cable through a dedicated lug and conductor. |  |  |
| Verify that the device manufacturer’s recommended power/communication cable is being used and is of adequate length. |  |  |
| Verify power supply has AC to DC converter mounted to DIN rail and measure output voltage of power supply. |  |  |
| Verify that the power distribution panel is functional, with proper sized circuit breakers.   * Disconnect power at the point of service or local disconnect and verify power at the main breaker and distribution panel is 0 volts. * Reconnect the power and verify power from the breaker and distribution panel is 120 or 240 VAC (+/- 5%). * Switch main breaker to the OFF position and verify a voltage of 0 VAC is measured at the distribution panel. * Return main breaker to ON position. |  |  |
| Verify cabinet power switch and all electrical outlets are properly wired and working by flipping the switch on/off, and verify voltages are within +/- 5% of 120 VAC using a receptacle tester and/or digital multimeter, |  |  |

| **UPS and Backup Power** | | |
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| **Requirement** | **Pass Fail** | **Notes** |
| Verify that cabinet UPS has a configured network management card (if not integral to unit) with Ethernet interface through a ping test. |  |  |
| Verify UPS is plugged into a Non-GFCI outlet. |  |  |
| Supply UPS load calculations for site. Verify the UPS is sized to provide power to all device components, plus 50% extra power capacity. |  |  |
| Add additional load to UPS (using incandescent lamps or a heat gun) equal to the 50% extra capacity calculated above. Cut power to cabinet, and verify UPS backup batteries provide the required run time for the device (4 hours if powering a VSLS; 15 minutes for all other devices). Reconnect power when completed. |  |  |
| Verify that during transfer from utility power to UPS power that there is no device downtime. Reconnect power to the cabinet when UPS tests are complete. |  |  |
| Power cycle all equipment in the field. Verify equipment restarts with the proper configurations and is functioning. |  |  |
| Verify that the batteries are being charged and/or at full charge when main power is connected. |  |  |
| Verify wiring of batteries or battery pack is correct (series or parallel). |  |  |
| Record the voltage of each disconnected battery :  Battery 1:\_\_\_\_\_\_\_\_\_\_\_\_ Battery 2:\_\_\_\_\_\_\_\_\_\_\_  Battery 3:\_\_\_\_\_\_\_\_\_\_\_\_ Battery 4:\_\_\_\_\_\_\_\_\_\_\_  Battery 5:\_\_\_\_\_\_\_\_\_\_\_\_ Battery 6:\_\_\_\_\_\_\_\_\_\_\_ |  |  |
| Log into remote power manager web interface. Verify that device is configured properly, and all ports are labeled in web interface. |  |  |
| Remotely power cycle each outlet. Verify related equipment restarts with the proper configurations and is functioning. |  |  |

Overall Site Test: 🞏 Pass 🞏 Fail

Inspector Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Organization: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_

Witness Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Organization: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_