



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION  
16 STATE HOUSE STATION  
AUGUSTA, MAINE 04333-0016

Janet T. Mills  
GOVERNOR

Bruce A. Van Note  
COMMISSIONER

December 19, 2022  
Subject: Replacement of Road  
Weather Information Systems  
State WIN: 024211.00  
Location: **Statewide**  
**Amendment No. 1**

Dear Sir/Ms.:

Make the following changes to the bid documents

In the Bid Book:

**CHANGE** on page 14 "NOTICE TO CONTRACTORS", the bid opening date in the first paragraph from "December 21, 2022" to read "**January 4, 2023**". Make this change in pen and ink

**Remove** page 63 titled SPECIAL PROVISION SECTION 654 INTELLIGENT TRANSPORTATION SYSTEMS (Road Weather Information System (RWIS) Equipment) dated November 15, 2022, totaling 12 pages and **Replace** with the attached titled SPECIAL PROVISION SECTION 654 INTELLIGENT TRANSPORTATION SYSTEMS (Road Weather Information System (RWIS) Equipment) dated December 16, 2022, totaling 12 pages

**Remove** page 75 SPECIAL PROVISION SECTION 654 INTELLIGENT TRANSPORTATION SYSTEMS [Mobile Road Weather Information system (RWIS) Equipment] dated November 15, 2022, totaling six pages, and **Replace** with the attached SPECIAL PROVISION SECTION 654 INTELLIGENT TRANSPORTATION SYSTEMS [Mobile Road Weather Information system (RWIS) Equipment] dated December 16, 2022, totaling six pages

In the Plan set:

**Remove** page four of the plan sheet titled DETAILS totaling one page and **Replace** with the attached plan sheet titled DETAILS totaling one page

**Remove** page five of the plan sheet titled CLIFTON SITE PLAN, totaling one page, and **Replace** with the attached plan sheet titled CLIFTON SITE PLAN, totaling one page

**Remove** page six of the plan sheet, titled MONSON SITE PLAN, totaling one page, and **Replace** with the attached plan sheet titled MONSON SITE PLAN totaling one page.

The following questions have been received:

**Question:** We would like to request an extension to the submission deadline to a date after the holiday season, Jan 11th. This would allow bidders to adjust responses based on the answers to submitted questions and allow bidders to engage with the required integrators.

**Response:** The bid opening has been rescheduled to January 4, 2023.

**Question:** Can Maine DOT please clarify the requirement for the contractor to pay for the first six months of the Road and Weather Licensing Fees for the fixed RWIS stations.

- given that the upgraded stations would be replacing the current stations, would they not take over the existing licensing fees?
- Can MaineDOT please provide the current monthly licensing fee being paid so bidders can incorporate these costs into their bids?
- has MaineDOT confirmed with the current vendor that the transfer of licenses is possible?
- has it been confirmed with the current vendor that it would allow the contractor to pay fees for stations within the MaineDOT contract portal?

**Response:** Special Provision 654 Road Weather Information System (RWIS) Equipment, first paragraph, states that the work shall consist of removing all existing weather sensors, cabinets, and other mounting hardware, and furnishing and installing a new RWIS. The rehabilitation of the Monson and Clifton RWIS locations will be considered new equipment for the Road and Weather software, requiring new licensing. MaineDOT anticipates that the existing license will be discontinued with the removal of the existing control equipment. The Contractor will be responsible for paying for the first six months of the new license fees for the new RWIS. The Contractor shall be responsible for obtaining current (2023) licensing fees for both permanent and mobile RWIS equipment from the Road and Weather Software vendor (Vaisala and WSP portal).

**Question:** Does the request for 24 hours of full function include sensor heaters? Requiring battery backup to provide sensor heating would require a large and costly battery bank system. It is typical that heaters be turned off should AC power not be available this ensures that critical sensor measurements continue for as long as possible until AC power is returned. Can MaineDOT confirm that during the loss of AC power sensor heaters can be disabled?

**Response:** MaineDOT is not specifically requesting heated sensors. If heated sensors are provided, the heaters will not need to be functional for periods when AC power is unavailable. The sensors will still need to function properly and measure accurately without the sensor heaters.

**Question:** Can MaineDOT please clarify the contradiction between Section 3 a) requesting sensor connectors and Section 6 a) requesting that the controller enclosure shall *not* have external connectors?

**Response:** Special Provision 654 Road Weather Information System (RWIS) Equipment, Section 654.026, part 3a refers to the connection between sensors and the power system. Section 654.026, part 6a is intended to mean that the sensor cables shall not terminate at the controller enclosure but shall instead enter the enclosure cabinet and connect to the controller directly.

**Question:** Can MaineDOT please clarify how the installation should be priced?

- 1) Assuming the Contractor must complete the installation of the mobile units or
- 2) assuming Maine will install, and any cost for the contractor to assist on-site would be negotiated post award?

**Response:** Special Provision 654 Mobile Road Weather Information System (RWIS) Equipment, Section 654.028 indicates that the Contractor shall furnish and support the installation of the Mobile RWIS mounting bracket. It is intended that MaineDOT personnel will install the mounting bracket to the mobile platform (i.e., MaineDOT truck) under the guidance and direction of the Contractor in accordance with the manufacturer's recommendation. Section 654.031 indicates that the Contractor shall furnish and complete the installation of the Mobile RWIS equipment to the mounting bracket installed by MaineDOT. The intent of Item 629.05 Hand Labor, Straight Time is to pay for the Contractor's support services by the hour during the mounting bracket installation. The costs for installation, calibration and testing of the Mobile RWIS equipment are incidental to Item 654.54.

**Question:** For either scenario (Contract install or support to Maine for the mobile RWIS). Will all 5 vehicles to be outfitted be brought to the same location, to limit the amount of contractor mobilizations required? If so can MaineDOT advise of the location?

**Response:** The five vehicles can be brought to the Region 2 office in Augusta, Maine for Mobile RWIS installation.

**Question:** Can MaineDOT please further define and delineate the responsibilities/expectations of the contractor - mobile RWIS maintenance and proper function is often dependent on the in-field user.

**Response:** The Contractor is responsible for providing a training program to the MaineDOT personnel responsible to install and operate the Mobile RWIS in accordance with Special Provision 654 for Mobile RWIS Equipment, Section 654.031 part 3. The MaineDOT expectation is that the training program is sufficient to qualify MaineDOT personnel to conduct routine care and maintenance as well as perform typical troubleshooting of the Mobile RWIS equipment. During the warranty period including the supplemental warranty period, the Contractor shall be responsible for preventative and on-demand emergency maintenance work on the Mobile RWIS equipment. An example of a maintenance requirement would be the cleaning of the equipment lens. The Contractor shall be responsible for the lens cleaning, which may include directing MaineDOT personnel in the cleaning of the lens if the

manufacturer warranty allows. The Contractor shall be responsible for the calibration of the Mobile RWIS equipment in accordance with the manufacturer's recommended calibration schedule and procedures. The Contractor may direct MaineDOT personnel in performing the calibration if the manufacturer warranty allows. The Contractor is fully responsible for the maintenance work and calibration efforts even if performed by MaineDOT personnel under the Contractor's direction.

**Question:** Central Control Testing - Can Maine confirm that this testing will be completed by MaineDOT personnel? As software access would be required to be granted to the contractor in order to verify/perform this testing, something that MaineDOT IT personnel have rejected in the past.

**Response:** Yes, the Central Control Testing will be conducted by MaineDOT personnel at the Transportation Management Center (TMC) in Augusta in accordance with Special Provision 654 Intelligent Transportation Systems. It is expected that the Contractor will be on site at the location of the RWIS under test to provide verification of functionality as required by MaineDOT (see 654.04, Section 1.g.iii).

**Question:** A requirement for subsurface temp probe is mentioned in the first paragraph, however there is no further mention nor specifications listed for the subsurface. Can MaineDOT please confirm if a subsurface temp probe is required to be installed?

**Response:** A subsurface temp probe is required. The Plan Sheets 4, 5, and 6 of 6 and Special Provision 654 for RWIS Equipment have been revised.

**Question:** With an eye toward cost savings can training be provided remotely?

**Response:** The Training will need to be completed in person.

**Question:** Given the MaineDOT has an existing provider of SIM Cards for cellular service and the MaineDOT network is private - it would be much more straight forward for MaineDOT to provide SIM cards for the mobile units. Can MaineDOT confirm it would supply SIM cards?

**Response:** MaineDOT will provide the SIM cards for cellular service. The requirement for five years of cellular service has been removed. See revised Special Provision 654 for the Mobile RWIS Equipment.

**Question:** Given that mobile RWIS data is not currently a function within Compass, can MaineDOT further describe its use case/expectations of data reporting and functionality within Compass? -To properly estimate the scope and cost building these features with the System Integrator.

**Response:** See response to SWRI question below.

**Question:** Can MaineDOT please clarify what the 80 hours of hand labor are meant to provide or cover within the scope of work? Is this meant to cover all labor within the scope - such as RWIS system install etc.?

**Response:** Item 629.05 Hand Labor, Straight Time is intended to be used for the Contractor's on-site support of the Mobile RWIS installations. See response to question above.

**Question:** Questions from SWRI: "On the RWIS RFP, we could use clarification from the end client on how they want mobile RWIS integrated into Compass. Some use cases would be helpful. Does the mobile RWIS devices need to show on the in-application map in real time? Should the mobile RWIS show historical locations on the in-application map? Would mobile RWIS appear on Esri Feature Layers hosted by Compass? What reporting and graphing capabilities will be required in Compass for mobile RWIS?"

**Response:** The expectation is that Mobile RWIS data be shown in near real time on the Compass map for the entire active run. The run should be color coded based on at least surface state, grip, or road temperature. This should be configurable. This is expected to be accomplished by Compass/ SwRI hosting an ESRI feature layer. Reporting under this contract will consist of an export of CSV-compatible tabular data over a specified date/time range for any number of Mobile RWIS at any given time. The data shall be inclusive of all collected data by the Mobile RWIS, with the exception of any images. The report shall be pulled from the Compass datahub through Power BI. This contract shall set up the report template for ad hoc use. The reporting is not expected to be completed in Compass by the end of the first winter maintenance period. In the interim, data export requirements can be achieved through the vendor or the Road and Weather software within Compass. The reports shall be intuitive and provide all needed data for external analysis. Work should be scheduled to fit logically within the Compass Thin Client deployment and should be completed no later than the end of the 2-year maintenance period. A rest endpoint shall be available for the ESRI feature layer. This functionality shall support additional mobile RWIS throughout the Compass software.

**Question:** In reference to the RFI previously sent, does the DOT have an expected date as to when answers may be ready? As the current deadline is fast approaching, we request that MaineDOT once again consider a deadline extension.

**Response:** The bid opening has been rescheduled to January 4, 2023.

Consider these changes and information prior to submitting your bid on **January 4, 2023**.

Sincerely,



George M. A. Macdougall P.E.  
Contracts & Specifications Engineer

**SPECIAL PROVISION**  
**SECTION 654**  
**INTELLIGENT TRANSPORTATION SYSTEMS**  
**(Road Weather Information System (RWIS) Equipment)**

**654.53 Road Weather Information Station:** This work shall consist of removing all existing weather sensors, cabinets, and other mounting hardware off of existing support structures (steel or wood). This work shall also include furnishing, installing, configuring, integrating, and testing a Road Weather Information System (RWIS). This RWIS shall include multiple weather sensors mounted to an existing steel structure or wood pole.

This work also includes integrating the data obtained by the RWIS into the Maine Department of Transportation (MaineDOT) Advanced Transportation Management System (ATMS), New England Compass ATMS (Compass ATMS). Compass was developed by the Southwest Research Institute (SwRI) and is used by Maine, New Hampshire, and Vermont. This integration effort shall include the development of a live, supported dataflow using an open vendor API from the RWIS Equipment to Compass ATMS and MaineDOT. RWIS data shall also be integrated into MaineDOT's existing Road and Weather software as part of this project.

MaineDOT currently maintains RWIS manufactured by Vaisala and Campbell Scientific. Both of these vendor's RWIS are currently integrated into both Compass and the existing Road and Weather software.

The Contractor shall provide a qualified System Integrator to integrate the RWIS data into Compass. The System Integrator shall be responsible for the full integration and function of new RWIS data in Compass. Integration into MaineDOT's Road and Weather software shall be the responsibility of the Contractor and can be done separately of the Compass integration. MaineDOT has an existing contract for the Road and Weather software and will pay any associated licensing fees after the initial six months following System Acceptance.

**654.021 General:** The following specifications detail a typical RWIS as currently deployed in the State of Maine. If any of the following hardware-specific requirements listed in the following sections cannot be met by a willing Bidder, but the Contractor believes that strict conformance to the given requirement is unnecessary or may be accomplished differently, the Contractor shall provide a list of the requirements that cannot be strictly met along with a justification for how the Contractor's proposed RWIS Equipment may be considered functionally equivalent in accordance with Special Provision 103.

654.026 RWIS Equipment – General

1. All software and data interfaces shall be designed to reflect the latest NTCIP and Traffic Management Data Dictionary Standards. Specifically, the system shall support NTCIP 1204 v03.08 protocol.
2. The RWIS shall include a controller (controller or Data Logger) that shall satisfy the following requirements:
  - a. The controller shall have a modern processor, manufactured within the previous 12 months.
  - b. The controller shall have a minimum of 512MB DDR3 and 2GB of NAND flash memory.
  - c. The controller shall have internal/integral Ethernet communications and support direct Ethernet connections.
  - d. The controller shall provide a means for real-time clock synchronization and location definition at least once daily.
  - e. The controller shall have remote access capability for local maintenance purposes (WLAN, WiFi, Bluetooth or equivalent).
  - f. The controller shall keep records and show calibration history of the attached sensors.
  - g. The controller shall operate in the temperature range of -34°F to +150°F.
3. The RWIS Equipment shall include a Sensor Interface and Power Management system that shall satisfy the following requirements:
  - a. All sensor connectors shall be MIL-SPEC circular connectors rated to IP66/IP68 or approved functional equivalent.
  - b. The controller shall include Ethernet interfaces for sensor and peripheral connections including at least two spare ports.
  - c. Ethernet connections shall support Power over Ethernet (PoE) functionality.
  - d. The controller shall have serial interfaces for sensor and peripheral connections without extension modules including at least two spare ports.
  - e. The controller shall have centralized bus-bar for sensor grounding. The bus-bar shall be copper.
  - f. Sensor cables shall be connected to bus-bar for grounding.
  - g. The controller shall have built-in surge arrestors that shall be field replaceable.
  - h. Where indicated on the Plans, the controller shall have the capability to operate with solar power technology (direct current).
  - i. Where indicated on the Plans, the controller shall have a battery charger.
4. The RWIS shall include a Power Supply that shall satisfy the following basic requirements:
  - a. Where public utility power is provided, the Power Supply shall withstand an alternating current (AC) range of 89VAC to 135VAC

- b. Power shall have in-built surge protection against transients.
  - c. Power shall be at least 240W to ensure sensor heating under all conditions.
  - d. Power supply shall have stable output of  $\pm 1$  percent.
  - e. Power supply shall allow parallel connection when additional power is required.
5. The AC Supply shall satisfy the following requirements:
- a. The controller AC supply shall have surge protection level at least 6kV/3kA. Surge protection units shall be field replaceable.
  - b. AC Supply shall include a main disconnect circuit breaker for maintenance purposes.
  - c. Where AC power systems are employed, the RWIS shall include a Battery Back-Up that shall satisfy the following requirements:
    - i. The battery back-up system shall provide sufficient power for all RWIS components for a minimum of 24 hours at full function in the absence of AC power. If sensors with heaters are provided, the heaters do not need to be functional for periods when AC power is unavailable.
    - ii. At the end of the initial 24 hours without AC power, the battery back-up system shall provide sufficient power for critical sensors (as defined by the manufacturer) for an additional 24 hours. This low power or survival mode may include less frequent polling of the sensor data but not less than once every ten (10) minutes.
    - iii. At the end of 48 hours without AC power, the battery back-up system shall not have discharged more than 50 percent of the rated capacity of the battery back-up system.
    - iv. Back-up batteries shall be sealed and spill proof and shall be considered maintenance-free.
    - v. The battery back-up system shall be Ethernet ready. The Contractor shall furnish and install an Ethernet patch cord to connect the battery-back-up system to the Ethernet switch in the controller cabinet.
    - vi. The Contractor shall submit for approval a Technical Submittal calculation for the battery back-up system that demonstrates compliance with the required hold-up time of the back-up system. This calculation shall include the manufacturer's specified loads for each sensor, the controller, and other pieces of equipment to be powered during the full function period and the low power/survival mode period. The battery calculation shall be measured from 0°F. The Technical Submittal shall be submitted in accordance with Special Provision 654.
6. The controller shall include a cabinet enclosure that shall satisfy the following requirements:
- a. The controller enclosure shall not have external connectors for sensors and other equipment, which may cause excessive amount of corrosion and malfunctions.

- b. All entries to the controller enclosure shall be completely encased in conduit with appropriate bushings to prevent insect and moisture entry. The sensor cable inlets shall be vandal-proof.
- c. The controller enclosure material shall be made of bare aluminum or stainless steel.
- d. The controller enclosure shall be equal to IP66 or NEMA-equivalent rating.
- e. The controller enclosure door shall have wind lock mechanism to maintain the door in an open position during maintenance.

654.027 RWIS Sensors: The Contractor shall furnish, install, integrate and test environmental and weather sensors that shall measure several environmental characteristics. The following sensor equipment shall be included:

- Wind Speed and Direction Sensor
- Present Weather Detector (may include visibility, precipitation and accumulation sensors if the single sensor can meet the functional requirements)
- Visibility Sensor if the Present Weather Detector does not meet functional requirements of visibility measurement
- Precipitation and Accumulation Sensor if the Present Weather Detector does not meet functional requirements of precipitation and accumulation measurement
- Air Temperature and Humidity Sensor
- Barometric Pressure Sensor
- Road Surface Sensors (Non-Invasive and Subsurface Probe)
- Closed Circuit Television (CCTV) Camera

1. Wind Speed and Direction Sensor
  - a. The sensor shall measure both wind speed and wind direction.
  - b. The sensor shall be weather resistant (including ice) and have an operational temperature of -40°F to +140°F.
  - c. The sensor shall fully compensate for the effect of temperature, humidity and pressure.
  - d. Measurement Parameters:
    - i. The wind speed sensor shall have a measurement range of 0 to 150 miles per hour (mph).
    - ii. Wind speed shall be user selectable in units of miles per hour (mph) and meters per second (mps).
    - iii. Wind speed resolution shall be to the whole integer for the selected unit (i.e. 5 mph or 3 mps) and accuracy shall be within one (1) percent of actual.
    - iv. Wind direction shall be measured in degrees. Wind direction resolution shall be +/- 3 degrees.
    - v. Wind speed and direction shall be reported as instantaneous value and rolling average value to a customized average time.
    - vi. Wind speed and direction minimum and maximum values shall be available over a customized time period (i.e. 10 minutes).
    - vii. Wind speed shall be available as 3-second gust values.

2. Visibility Sensor (or visibility function of Present Weather Sensor)
  - a. The visibility sensor may be integrated into a single sensor unit that operates as a Present Weather Detector. If they are separate units, the visibility sensor shall meet the requirements of parts b. through g. below.
  - b. The sensor shall have a measurement range of up to 10 miles with an accuracy of +/- 10 percent.
  - c. The sensor shall utilize back scatter optical technology.
  - d. The sensor shall have an operational temperature range of -40°F to +131°F.
  - e. The sensor shall have an operating humidity range of 0-100 percent relative humidity.
  - f. The sensor shall be IP66 rated.
  - g. The sensor shall be capable of detection through the following weather conditions:
    1. Clear visibility
    2. Fog
    3. Mist
    4. Haze (from smoke or other particulates)
    5. Rain
    6. Freezing rain
    7. Snow
  
3. Precipitation and Accumulation Detector (or precipitation function of Present Weather Sensor)
  - a. The precipitation detector may be integrated into a single sensor unit that operates as a Present Weather Detector or may be provided as independent sensors.
  - b. The precipitation sensor shall meet the requirements of c. below, regardless whether it is part of a Present Weather Sensor or if it is a stand-alone sensor.
  - c. Measurement Parameters:
    - i. The sensor shall detect the following types of precipitation:
      1. Rain
      2. Freezing Rain
      3. Drizzle
      4. Freezing Drizzle
      5. Mixed Rain/Snow
      6. Snow
      7. Sleet/Ice Pellets
    - ii. The sensor shall be capable of measuring rain precipitation accumulation rate to an accuracy of 0.05 inches per hour measured over a 10 minute time period. This accuracy shall be met in Maine field-conditions.

- iii. The sensor shall be capable of measuring snow accumulation and amount of new snow since previous readings. Snow accumulation sensitivity shall be at least 0.5 inches per hour with an accuracy of +/- 10 percent. This accuracy shall be met in Maine field-conditions.
4. Air Temperature and Humidity Sensor
    - a. The sensor shall contain a radiation shield to protect the sensor from solar radiation influence and from precipitation. The radiation shield shall contain no moving parts.
    - b. The sensor shall combine air temperature detector (AT), relative humidity detector (RH), and dew point detector (DP) into a single unit. Alternatively, dew point may be calculated by the controller or via the Road and Weather software.
    - c. The sensor shall have integral surge protection.
    - d. The sensor shall be IP66 rated.
    - e. The AT detector shall have an operational range of -40°F to +140°F.
    - f. The RH detector shall have an operational range of 0-100 percent RH.
    - g. Measurement Parameters:
      - i. AT detector shall provide instantaneous and rolling one minute average values. The AT detector shall hold the previous five observations.
      - ii. AT detector shall have rolling 24-hour minimum and maximum temperature values.
      - iii. AT detector shall have an accuracy of 0.5°F over the range of 0°F to +100°F.
      - iv. RH detector shall provide rolling one minute average values from the previous six observations.
      - v. RH detector shall have an accuracy of two (2) percent and shall be reported to the nearest 0.1 percent (i.e. 90.8%).
      - vi. RH detectors shall provide a means (either directly or via software) to measure dew point temperature and frost point temperature.
      - vii. RH detector shall provide active measurements that maintain accuracy within 2% in condensing conditions.
  5. Barometric Pressure Sensor
    - a. The sensor shall be a silicon capacitive absolute pressure sensor designed for barometric pressure measurement.
    - b. Measurement Parameters:
      - i. The barometric pressure sensor shall conduct readings every 5 seconds and report the instantaneous readings.
      - ii. The barometric pressure sensor shall measure in units of inches of mercury (Hg).
      - iii. The barometric pressure sensor shall have an operational range of 18.0-31.0 inches Hg with a resolution of 0.03 inches Hg.

- iv. The barometric pressure sensor shall have an accuracy of +/- 0.12 inches Hg over the temperature range of 0°F to +140°F.

#### 6. Non-Invasive Pavement Sensors

- a. There shall be sensors that can measure the pavement surface temperature, ambient air temperature, relative humidity, pavement surface state, and friction coefficient remotely, without penetrating the roadway. The non-invasive sensors shall be Luft NIRS, Viasala DSC/DST, or equivalent.
- b. If a pavement sensor cannot meet the accuracy requirements for all of the measurements in part a., additional supplemental sensors shall be furnished and installed to meet the accuracy requirements.
- c. These non-invasive sensors shall have no moving parts.
- d. Non-invasive sensors shall collect data samples from the road surface in accordance with the performance standards established in this specification.
- e. The data generated by the non-invasive sensors shall be compatible with the current Road and Weather software currently in operation within the MaineDOT license for New England Compass ATMS.
- f. Measurement Parameters:
  - i. The pavement surface state sensor shall have an operational range of -40°F to +140°F and 0-100 percent RH.
  - ii. The pavement surface state sensor shall be capable of remote readings at the range of 6.5 feet to 48 feet.
  - iii. The pavement surface state sensor shall identify the condition of the pavement remotely with the following surface states:
    1. Dry
    2. Moist
    3. Wet
    4. Snow/Frost
    5. Ice
    6. Slush
  - iv. The pavement surface state sensor shall measure the depth of precipitation on the pavement surface as shown below, all at a resolution of 0.01 millimeters:
    1. Water/Rain at 0.0 - 2.0 millimeters
    2. Ice at 0.0 – 2.0 millimeters
    3. Snow at 0.0 to 10.0 millimeters
  - v. The pavement surface temperature sensor shall measure the pavement surface temperature every 60 seconds and have a resolution of 0.5°F.
  - vi. The pavement surface friction sensor shall estimate the friction coefficient (grip factor) at the range 0.01 to 1.00 at a resolution of 0.01 units.

#### 7. Subsurface Pavement Sensor

- a. The sensor shall be a probe specifically designed for subsurface temperature measurement.
- b. The sensor probe shall be water-tight and weather-resistant.
- c. The sensor probe shall have an operational range of -40°F to +120°F.
- d. Measurement Parameters:
  - i. Temperature reading shall have an accuracy of +/- 1°F with a resolution of 0.5°F.
  - ii. Freezing point shall have an accuracy of +/- 1°F.

654.028 Closed Circuit Television (CCTV) Camera System: The Contractor shall furnish, install, integrate and test a digital closed circuit television (CCTV) camera at the RWIS location that shall provide streaming video adjacent to the RWIS. The CCTV camera shall be connected to the controller and shall be remotely controlled via the RWIS communication system.

1. The CCTV camera shall be digital, IP addressable and Ethernet ready.
2. The CCTV camera shall be Underwriter's Laboratory (UL) approved. The UL certification shall be provided with the technical submittal.
3. The CCTV shall have the capability to be viewed, controlled and tested locally at the controller utilizing a laptop computer with the manufacturer's software. This shall include the capability to locally retrieve operational status and fault data for the camera.
4. The CCTV shall have a minimum resolution of HDTV 800 x 600.
5. The CCTV shall be capable of streaming video with H.264 and/or Motion JPEG video compression format.
6. The CCTV shall be capable of time triggered FTP.
7. The CCTV shall be powered by an industrial grade Power Over Ethernet Injector (POEI). The POEI shall provide operating power and Ethernet data to the CCTV.
8. The CCTV shall be housed in an environmentally hardened enclosure suitable for continuous outdoor use. The CCTV shall have an operating range of -40°F to +100°F, minimum.
9. The CCTV housing shall be IP66-rated.

654.031 RWIS Construction Requirements: The Contractor shall install the RWIS equipment in accordance with the Plans. The Contractor shall be responsible for all other work to provide a fully functional, operational, and integrated RWIS at the locations identified in the Plans.

The Contractor shall remove and salvage all existing RWIS weather sensors, cabinets, wiring, communication equipment and any other hardware to MaineDOT. The Contractor shall be diligent to not damage the existing structure with the removal of the existing equipment. The Contractor shall be responsible for any damages done to the existing structure during the removal process. The Contractor shall salvage all existing equipment to MaineDOT at the MaineDOT Region 2 facility, located at 66 Industrial Drive in Augusta, Maine.

The Contractor shall install, configure, integrate, and test the RWIS data into the Compass ATMS and its Road and Weather software. The RWIS Equipment shall continuously measure and record RWIS data. The system data shall be available to MaineDOT in the Compass ATMS mapping feature and other related internal programs.

1. Power Requirements

- a. Each RWIS location shall be supplied with adequate power to meet the site and sensor design loads. The existing power is AC.

2. Grounding System Requirements

- a. All RWIS sites shall be grounded to a minimum of 25 ohms to ground. If other national, state, or local grounding requirements are more stringent than those of the manufacturer, the applicable national, state, or local code shall apply.
- b. After removing existing equipment and installing new equipment, the Contractor shall test the existing resistance to ground. If the existing installation does not meet the minimum grounding required, the Contractor shall install, and connect additional ground rods to meet the minimum grounding.
- c. The Contractor shall install solid copper or copper clad ground rod (minimum 3/4-inch x 10-foot) along with #4 AWG ground wire and fittings at the base of the RWIS equipment pole. The Contractor shall install additional ground rods required to meet the minimum grounding requirement.
- d. The Contractor shall install ground rod(s) for the solar panel support pole to achieve a minimum of 25 ohms to ground.
- e. The ground wire shall be exothermically welded to each ground rod installed with all ground rods attached to every other ground rod via the ground wire.
- f. The RWIS grounding system shall be bonded to the controller enclosure bus-bar and any steel support structure in accordance with National Electric Code (NEC) requirements.

3. Communication Requirements

- a. The Contractor shall furnish and install a cellular modem compatible with the RWIS and with the MaineDOT communications system.
- b. The communication system shall support 4G-LTE and shall be configurable to support 5G when available.
- c. The modem shall be able to support US Cellular, Verizon, and AT&T service plans. Switching between the three shall be achievable with firmware updates.
- d. The RWIS shall transmit weather sensor data to Compass and MaineDOT's Road and Weather software currently in operation.

- e. The Contractor shall provide all necessary equipment, cables, hardware, and ancillary equipment to capture the RWIS sensor data and transmit the data to Compass and to the Road and Weather software at the MaineDOT TMC.
- f. The communication system shall allow for configuration control and trouble-shooting of the RWIS equipment through both a local onsite connection and through a remote connection to the controller.

#### 4. Software and Integration Requirements

- a. The Contractor shall provide the qualifications of the System Integrator to the Department as a condition of Contract Award as described in Special Provision 103. All work associated with system integration shall be under the direct supervision of the System Integrator. The System Integrator shall demonstrate working knowledge of Compass and have experience working with the RWIS data to be supplied under this project.
- b. The RWIS shall be fully compatible with the Compass and the current MaineDOT Road and Weather software.
- c. If the Contractor proposes to supply equipment that is not fully compatible with Compass or the current Road and Weather software, the Contractor shall be required to fully integrate the non-compatible equipment into Compass and the Road and Weather software so that the new equipment operates in the programs in the same manner as the existing RWIS. All costs associated with software development, coordination with the New England Compass ATMS developer, and for all integration services shall be the responsibility of the Contractor.
- d. The Contractor shall be responsible for the cost of integration and for the first six months of the Road and Weather Software licensing fees. After the initial six month period, the software licensing fees will be paid by MaineDOT.
- e. The Contractor shall update the map feature and station summary pages of Compass for each new RWIS site installed on this project.
- f. The Contractor shall ensure that Compass and the Road and Weather software reporting functions include and incorporate the new RWIS sites installed on this project.
- g. The RWIS shall have the capability of generating alerts, watches, or warning. The user shall have the ability to set no less than two levels of alarms, both an audible and visual alarm, displayed on the operator's screen when viewing the Road and Weather software. The system shall have the ability to inform automatically via email when alarm criteria is met.
- h. RWIS data integration shall be accomplished with minimal interruption to the existing MaineDOT Traffic Management Center (TMC) operations or the existing Road and Weather software in use at the TMC. Any required downtime of the Compass ATMS shall be approved by the Resident at least seven (7) days in advance. The System Integrator shall use the Compass ATMS test environment to demonstrate the system operations prior to going live with the RWIS data.

## 5. System Testing

- a. All RWIS sensors and equipment installed under this project shall be tested prior to final acceptance. There are three stages of tests required: Stand-Alone Testing, Central Control Testing, and Operational Testing. Subsystem testing will not be required.
- b. Testing shall be conducted in accordance with Special Provision 654.
- c. Supplemental Testing Requirements
  - i. Stand-Alone Testing - If a sensor or unit fails to pass the stand-alone test, the Contractor shall correct the problem or replace the sensor or unit and retest until satisfactory results are achieved.
  - ii. Central Control Test Requirements – This test shall be performed at the TMC in Augusta in Compass and the MaineDOT Road and Weather software. This test shall verify that all the RWIS sensors and equipment and transmitting data to the appropriate software in accordance with the Contract Documents.
  - iii. Operational Testing – The RWIS must demonstrate successful transmission of data and be fully integrated with the TMC operations. In the event that there is a single failure associated with any RWIS component or data transmission, the test shall be suspended while the Contractor resolves the failure (either by fixing the sensor or replacing the sensor). Upon successful repair/replacement, the test shall continue to the end of the 30 days, or a minimum of seven days, whichever is longer. Upon the failure of any second sensor or equipment, the Operational Test period shall be restarted for the full 30 days upon repair/replacement. The completion of the Operational Test period and the submission of all test reports shall be documented as the date of Final System Acceptance, provided all other work has been completed to the satisfaction of the Resident.
- d. MaineDOT reserves the right to examine and test/retest any and all test steps for the project as Quality Assurance. If MaineDOT determines that any test procedure does not show the result indicated by the final test results, the Contractor shall update and/or repair the defect at no additional cost to the Department.
- e. As part of the final testing, the Contractor shall provide to MaineDOT a complete set of maintenance and user manuals along with all the wiring and assembly schematics/diagrams, including any material safety data sheets (MSDS), prepared by the manufacturer and any toxic substances (coatings, liquids, or other) used. Maintenance information shall include troubleshooting directions, maintenance schedule recommendations, and calibration recommendation/directions. All necessary equipment to complete calibrations shall be included.

## 6. Training

- a. The Contractor shall provide training for maintenance and calibration of all provided equipment. This training shall be consistent with the user manuals and directions provided.
- b. If the Contractor elects to provide new or modified Road and Weather software, the Contractor shall provide a training program consisting of the furnishing of educational training in the operation of the new software.
- c. The training shall be scheduled after Stand-Alone Testing but prior to the end of the Operational Testing period.
- d. The Contractor shall provide qualified instructors familiar with the operation of the software to conduct the training. Training shall consist of hands-on demonstrations as feasible.
- e. The Contractor shall develop and supply all necessary manuals, displays, class notes, visual aids, and other instructional materials as required to conduct the training program. The Contractor shall supply sufficient materials for up to 10 participants, plus one spare copy of all materials.
- f. Training will be conducted at the MaineDOT Main Office in Augusta, Maine. The Contractor shall coordinate a specific classroom facility with the Resident at least three weeks prior to the training date.
- g. The training session shall be up to four (4) hours and shall accommodate up to 10 people. Typical training topic areas include:
  - i. An overview of the software and its operation.
  - ii. New/modified features of the software.
  - iii. Interactions of the Road and Weather software with Compass ATMS.
  - iv. Producing reports using the Road and Weather software.

654.061 Method of Measurement: Road Weather Information System (RWIS) equipment will be measured for payment by the lump sum complete in place per site, satisfactorily installed, tested, operational, and accepted.

654.07 Basis of Payment: Road Weather Information System (RWIS) equipment will be paid for at the contract lump sum price for each location. Such price will be full compensation for furnishing and installing all materials, including but not limited to the sensors; CCTV camera; controller and enclosure cabinets with all internal hardware; communication equipment; grounding; integration and software modifications; system testing; training; warranties and guaranties; and all appurtenances and incidentals required for a complete and functional installation and for furnishing all assembly hardware, tools, labor, and testing necessary for completing the installation.

Payment will be made under the following:

<u>Pay Item</u>	<u>Pay Unit</u>
654.5301 Full Permanent RWIS, No Support Pole	LS

SPECIAL PROVISION  
SECTION 654  
INTELLIGENT TRANSPORTATION SYSTEMS  
(Mobile Road Weather Information System (RWIS) Equipment)

**654.54 Mobile Road Weather Information Station:** This work shall consist of furnishing, supporting installation, configuring, and integrating a Mobile Road Weather Information System (RWIS). This Mobile RWIS shall include the mobile RWIS Sensor, mobile cellular equipment and service, and all other equipment needed to create a fully functional mobile RWIS.

This work also includes integrating the data obtained by the Mobile RWIS into the Maine Department of Transportation (MaineDOT) Advanced Transportation Management System (ATMS), New England Compass ATMS (Compass ATMS). Compass was developed by the Southwest Research Institute (SwRI) and is used by Maine, New Hampshire, and Vermont. This integration effort shall include the development of a live, supported dataflow using an open vendor API from the RWIS Equipment to Compass ATMS and MaineDOT. RWIS data should also be integrated into MaineDOT's existing Road and Weather software as part of this project. The Mobile RWIS data shall transmit in near real-time from the mobile platforms to the Compass ATMS. Mobile RWIS shall be clearly viewable on the map for a configurable amount of time and shall update in real time. This work can be completed within the existing thin client deployment schedule.

MaineDOT currently maintains permanent (AKA fixed location) RWIS manufactured by Vaisala and Campbell Scientific. Both of these vendor's RWIS are currently integrated into both Compass and the existing Road and Weather software. MaineDOT also currently operates one Mobile RWIS manufactured by Vaisala and it is currently integrated into the existing Road and Weather software.

The Contractor shall provide a qualified System Integrator to integrate the RWIS data into Compass. The System Integrator shall be responsible for the full integration and function of new Mobile RWIS data in Compass. Integration into MaineDOT's Road and Weather software shall be the responsibility of the Contractor and can be done separately of the Compass integration. MaineDOT has an existing contract for the Road and Weather software and will pay any associated licensing fees after the initial six months following system acceptance.

The Contractor shall also provide weekly digital downloads of the collected Mobile RWIS data from all installed equipment to the MaineDOT Transportation Management Center (TMC) in a mutually agreed upon format for a period of five years following system acceptance. It is recommended that this requirement be met through the creation of a report in Compass or the Road and Weather Software that can be run by MaineDOT after which MaineDOT will not request data from the Contractor.

654.021 General: The following specifications detail a typical Mobile RWIS. If any of the following hardware-specific requirements listed in the following sections cannot be met by a willing Bidder, but the Contractor believes that strict conformance to the given requirement is unnecessary or may be accomplished differently, the Contractor shall provide a list of the requirements that cannot be strictly met along with a justification for how the Contractor's proposed Mobile RWIS Equipment may be considered functionally equivalent in accordance with Special Provision 103.

654.026 Mobile RWIS Equipment – General

1. All software and data interfaces shall be designed to reflect the latest NTCIP and Traffic Management Data Dictionary Standards. Specifically, the system shall support NTCIP 1204 v03.08 protocol.
2. The RWIS shall include a cellular mobile device that meets the following requirements:
  - a. The cellular mobile device shall have an integral camera of not less than 8 megapixels (MP).
  - b. The cellular mobile device shall have a data visualization mobile application installed and visible to the vehicle driver.
  - c. The cellular mobile device shall come with windshield mounting hardware, charging cable, and spare memory card.
  - d. MaineDOT will supply the SIM card for the cellular mobile device.
  - e. The cellular mobile device shall be capable of wifi service and cellular service and shall be 5G ready.
3. The Mobile RWIS shall include all power and communication connection equipment and cabling as recommended by the manufacturer.
  - a. The Mobile RWIS shall operate on direct current (DC) with a maximum power consumption of 15 watts.
  - b. The Mobile RWIS shall include Bluetooth access.

654.027 Mobile RWIS System Sensor(s): The Contractor shall furnish environmental and weather sensor(s) that are designed for installation and operation on a mobile platform, such as a pick-up or plow truck. The Mobile RWIS sensor(s) shall measure, document, and report several environmental and weather characteristics including:

- Grip
- Road Surface State
- Road Surface Precipitate (Depth/Thickness)
- Road Surface Temperature
- Air Temperature
- Dew Point and Frost Point
- Relative Humidity

The Mobile RWIS Sensor(s) shall meet the following requirements:

1. General Requirements
  - a. The sensor shall have an operational temperature range of -40°F to +140°F.

- b. The sensor shall have an operating humidity range of 0-100 percent relative humidity.
  - c. The sensor shall be IP68 rated.
  - d. The sensor shall measure at an interval of at least 30 times per second.
  - e. The sensor shall have a contamination diagnostic to determine and report the contamination of the view window.
2. Grip and Road Surface State Sensor
- a. The sensor shall measure both grip and surface state.
  - b. The sensor shall fully compensate for the effect of temperature, humidity, and pressure.
  - c. Measurement Parameters:
    - i. The grip sensor shall be able to report level of grip between 0.1 and 0.8.
    - ii. The surface state sensor shall be able to report the following surface states:
      - (1) Dry
      - (2) Moist
      - (3) Wet
      - (4) Snowy
      - (5) Icy
      - (6) Slushy
3. Road Surface Layer Precipitate Sensor
- a. The road surface layer precipitate sensor shall be capable of reporting the three states of precipitate (water, ice, and snow) simultaneously.
  - b. The surface layer thickness sensor shall have a water measurement range from 0 inches to 0.20 inches with an accuracy of +/- 10 percent.
  - c. The surface layer thickness sensor shall have an ice measurement range from 0 inches to 0.08 inches with an accuracy of +/- 10 percent.
  - d. The surface layer thickness sensor shall have a snow (water equivalent) measurement range from 0 inches to 0.04 inches with an accuracy of +/- 10 percent.
  - e. Surface Temperature Sensor shall have a measurement range from -40°F to +140°F.
4. Air Temperature and Humidity Sensor
- a. Air temperature (AT) shall have a measurement range of -40°F to +140°F.
  - b. Dew point (DP) shall have a measurement range of -40°F to +140°F.
  - c. Humidity (RH) shall have a measurement range of 0-100 percent relative humidity.

654.028 Mobile RWIS Mounting Hardware: The Contractor shall furnish and support the installation of manufacturer-recommended mounting brackets for the Mobile RWIS sensor(s). The mounting shall be flexible enough to allow for mounting in several configurations based on the specific vehicle platform. Actual installation configurations will be determined by MaineDOT upon selection of the mobile platform.

654.031 Mobile RWIS Construction Requirements: The Contractor will be responsible for installing the Mobile RWIS sensor(s) to the mobile platform unless MaineDOT agrees to install with consultation and support for the installation from the Contractor. The

Contractor shall also be responsible for providing all mounting brackets, hardware, wiring, and ancillary hardware necessary for MaineDOT personnel to install the sensor(s) to each vehicle(s).

The Contractor shall configure and integrate the Mobile RWIS data into the Compass ATMS and its Road and Weather software. The Mobile RWIS Equipment shall continuously measure and record RWIS System data in near real-time. The system data shall be available to MaineDOT in the Compass ATMS mapping feature and other related internal programs.

1. The Contractor shall provide on-site assistance in the installation of the mobile RWIS unit and shall make available all cabling and associated equipment. The Contractor shall ensure that each Mobile RWIS sensor(s) and related equipment shall be installed per manufacturer recommendations.
2. Calibration and Testing
  - a. Following successful installation, the Contractor shall be responsible for sensor(s) configuration and calibration in accordance with manufacturer requirements. Calibration equipment shall be provided to MaineDOT at the completion of the project.
  - b. All Mobile RWIS sensor(s) and equipment installed under this project shall be tested prior to final system acceptance. There are two stages of tests required: Central Control Testing and Operational Testing.
  - c. Testing shall be conducted in accordance with Special Provision 654.
  - d. Supplemental Testing Requirements
    - i. Central Control Test Requirements – This test shall be performed at the TMC in Augusta within the Compass ATMS system and the MaineDOT Road and Weather software and on the mobile application on the cellular mobile device within the mobile platform. This test shall verify that the Mobile RWIS sensor(s) and equipment are transmitting data to the appropriate software in accordance with the Contract Documents.
    - ii. Operational Testing – The Mobile RWIS must demonstrate successful collection, transmission, and reporting of environmental and weather data and be fully integrated with the TMC operations. In the event that there is a single failure associated with any Mobile RWIS component or data transmission, the test shall be suspended while the Contractor resolves the failure (either by resolving the failure, fixing the sensor(s) or replacing the sensor(s)). Upon successful repair/replacement, the test shall continue to the end of the 30 days, or a minimum of seven days, whichever is longer. Upon the failure of any second sensor or equipment, the Operational Test period shall be restarted for the full 30 days upon repair/replacement. The completion of the Operational Test period and the submission of all test reports shall be documented as the date of system acceptance, provided all other work has been completed to the satisfaction of the Resident.

- e. MaineDOT reserves the right to examine and test/retest any and all test steps for the project as Quality Assurance for a period of up to one year following system acceptance. If MaineDOT determines that any test procedure does not show the result indicated by the Contractor's operational test results, the Contractor shall update and/or repair the defect at no additional cost to the Department.
- f. As part of the operational testing, the Contractor shall provide to MaineDOT a complete set of maintenance and user manuals along with all the wiring and assembly schematics/diagrams, including any material safety data sheets (MSDS), prepared by the manufacturer and any toxic substances (coatings, liquids, or other) used. Maintenance information shall include troubleshooting directions, maintenance schedule recommendations, and calibration recommendations/directions. All necessary equipment to complete calibrations shall be included.

### 3. Training

- a. The Contractor shall provide a brief training program to the maintenance staff who will install and operate the Mobile RWIS consisting of the furnishing of educational training in the operation of the new equipment and associated software.
- b. The training shall be scheduled after installation but prior to the end of the Operational Testing period.
- c. The Contractor shall provide qualified instructors familiar with the operation of the equipment software to conduct the training. Training shall consist of hands-on demonstrations.
- d. The Contractor shall develop and supply all necessary manuals, displays, class notes, visual aids, and other instructional materials as required to conduct the training program. The Contractor shall supply sufficient materials for up to five (5) participants, plus one spare copy of all materials.
- e. Training will be conducted at the maintenance facility where the mobile platform on which the equipment has been installed is assigned. MaineDOT will provide a facility suitable for the training through the Resident at least three weeks prior to the scheduled training date.
- f. The training session shall be up to two (2) hours and shall accommodate up to 5 people. Typical training topic areas include:
  - i. An overview of the equipment and its operation.
  - ii. Operation of the mobile application on the cellular mobile device.
  - iii. Care and maintenance of the Mobile RWIS equipment.
  - iv. Typical troubleshooting for the Mobile RWIS equipment.
- g. Additionally, two training sessions designed for TMC operators (up to five per session) shall be conducted at the MaineDOT headquarters in Augusta. The two training sessions shall be scheduled around the TMC operator shifts with each session lasting up to two (2) hours. Typical training topic areas include:
  - i. An overview of the equipment and its operation.
  - ii. An overview of the Mobile RWIS software.

- iii. Interactions of the Road and Weather software with Compass ATMS.
- iv. Producing reports using the software.

654.051 Supplemental Warranty: The Contractor shall be responsible for Mobile RWIS calibration and performance for a minimum of two (2) winter maintenance periods following system acceptance. A winter maintenance period shall be considered November 1<sup>st</sup> to April 30<sup>th</sup>. For example, if system acceptance occurs on June 15, 2023, the supplemental warranty period will continue until April 30, 2025. The Contractor shall also be responsible for maintaining cellular service to the cellular data device for five year from system acceptance.

654.061 Method of Measurement: Mobile Road Weather Information System (RWIS) equipment will be measured for payment by each unit furnished, configured and calibrated, integrated into the Road and Weather Software, tested, operational, and accepted.

The Mobile RWIS Compass Configuration Support will be measured for payment by the lump sum for configuration of all Mobile RWIS into the Compass Software, tested, and accepted.

654.07 Basis of Payment: Mobile Road Weather Information System (RWIS) equipment will be paid for at the contract unit price each complete in place. Such price will be full compensation for furnishing all materials, including but not limited to the sensor(s); cellular mobile device; communication equipment and cables; power equipment and cables; software and hardware configuration and calibration; integration into the Road and Weather Software; testing; and all warranties and guaranties.

Mobile RWIS Compass Configuration Support will be paid for at the contract lump sum price for the configuration of all Mobile RWIS equipment installed under the contract. Such price will be full compensation for software and hardware configuration, integration into the Compass Software, and testing.

Payment will be made under the following:

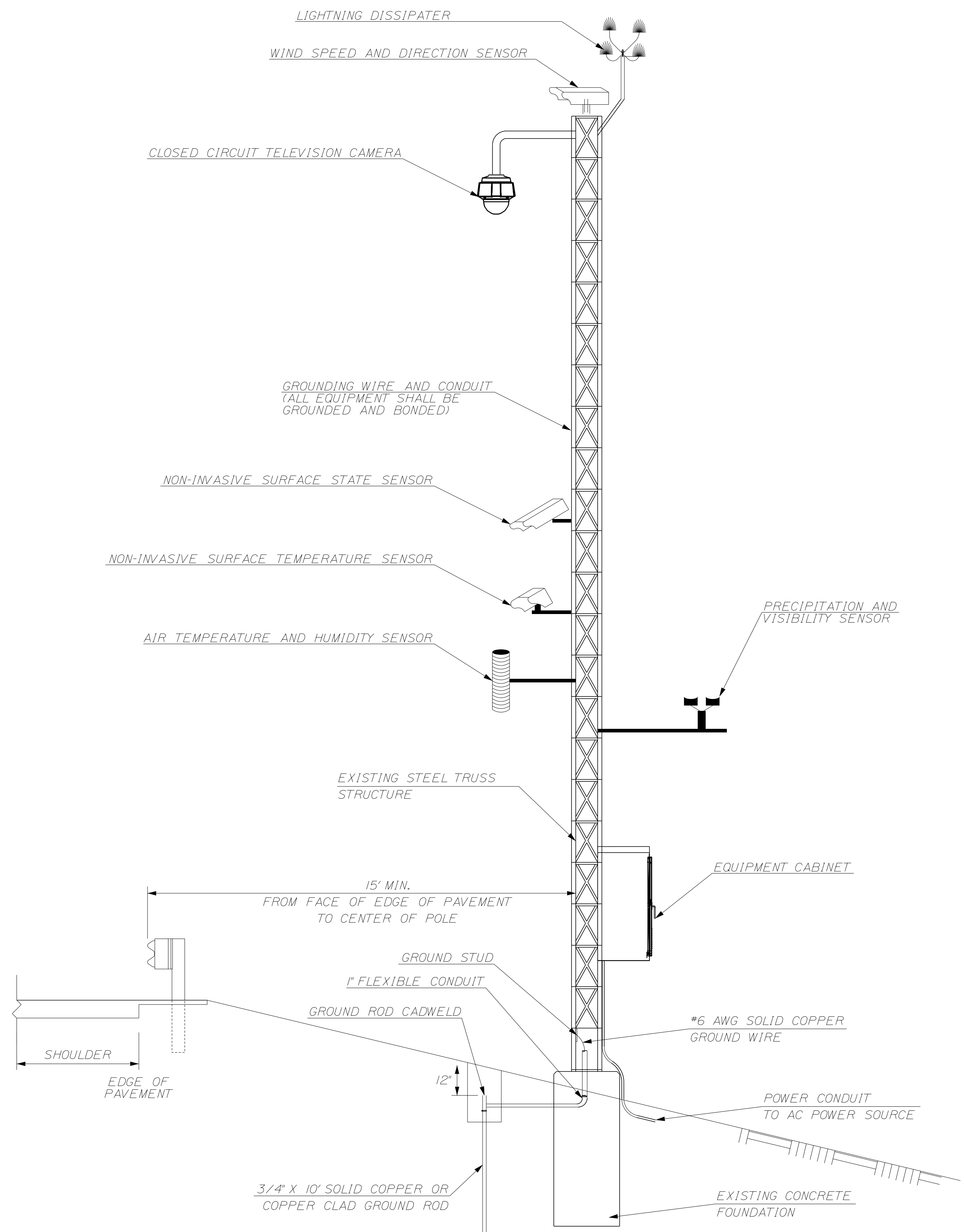
<u>Pay Item</u>	<u>Pay Unit</u>
654.54            Full Mobile Road Weather Information System (RWIS)	EA
654.541          Mobile RWIS Compass Configuration Support	LS

Date: \$date\$

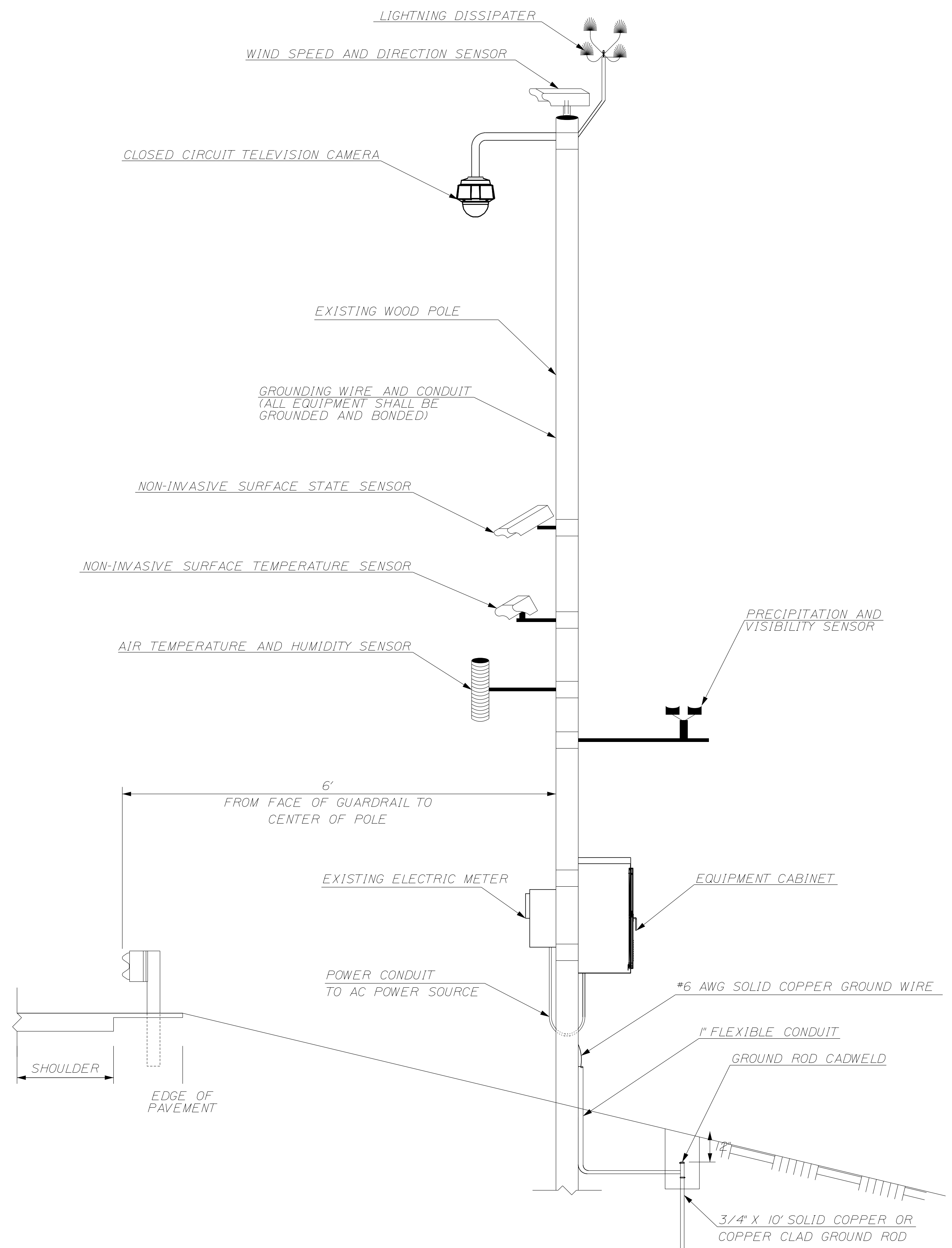
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Division: \$wkgroup\$

Filename: \$file\$

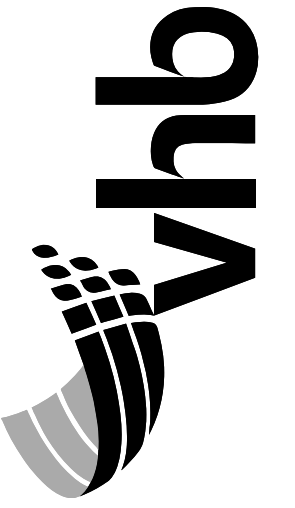


ROAD WEATHER INFORMATION STATION STEEL TRUSS STRUCTURE DETAIL  
NOT TO SCALE



ROAD WEATHER INFORMATION STATION WOOD POLE DETAIL  
NOT TO SCALE

- NOTES:
- HEIGHT OF EQUIPMENT PER MANUFACTURER'S STANDARDS AND RECOMMENDATION.
  - BAROMETER LOCATED IN EQUIPMENT CABINET.
  - NON-INVASIVE SURFACE STATE SENSOR AND NON-INVASIVE SURFACE TEMPERATURE SENSOR MAY BE ONE UNIT OR TWO SEPARATE UNITS.
  - PRECIPITATION SENSOR AND VISIBILITY SENSOR MAY BE ONE UNIT OR TWO SEPARATE UNITS.
  - SUBSURFACE TEMPERATURE PROBES SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.



PROJ. MANAGER	J. DOSTIE	BY	DATE
DESIGN-DETAILED	DJS	JAR	11/15/22
CHECKED-REVIEWED	DJS	MMS	11/15/22
DESIGN-DETAILED			
REVISIONS			
REVISIONS			
REVISIONS			
REVISIONS			
FIELD CHANGES			

STATEWIDE  
RWIS INSTALLATIONS  
DETAILS

SHEET NUMBER

4

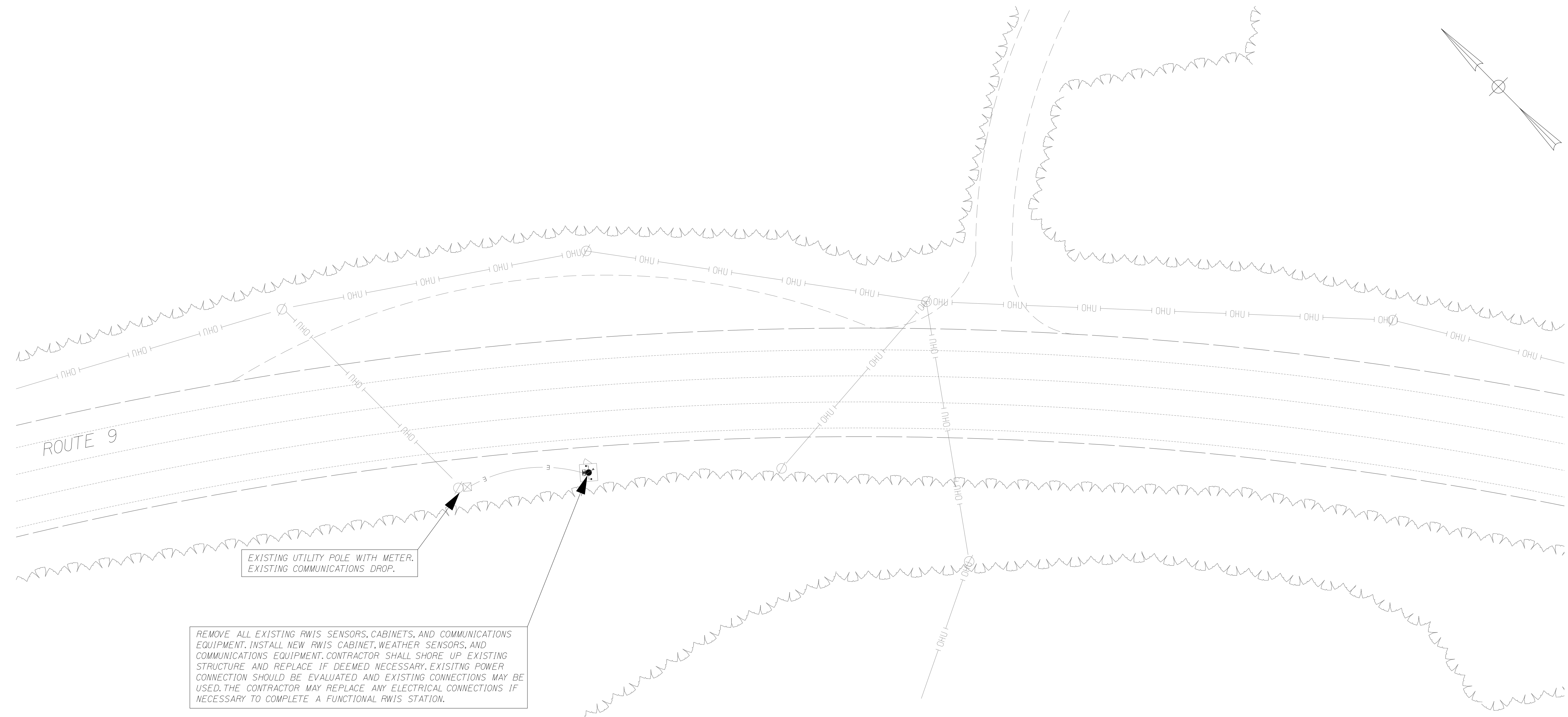
OF 6

Date: \$date\$

Username: \$user\$

Division: \$wkgroup\$

Filename: \$file\$



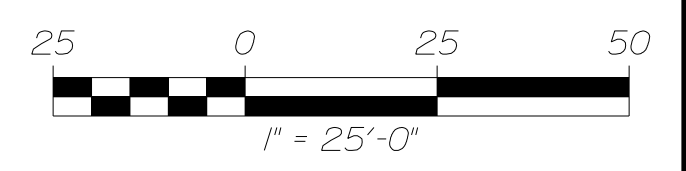
REMOVE ALL EXISTING RWIS SENSORS, CABINETS, AND COMMUNICATIONS EQUIPMENT. INSTALL NEW RWIS CABINET, WEATHER SENSORS, AND COMMUNICATIONS EQUIPMENT. CONTRACTOR SHALL SHORE UP EXISTING STRUCTURE AND REPLACE IF DEEMED NECESSARY. EXISTING POWER CONNECTION SHOULD BE EVALUATED AND EXISTING CONNECTIONS MAY BE USED. THE CONTRACTOR MAY REPLACE ANY ELECTRICAL CONNECTIONS IF NECESSARY TO COMPLETE A FUNCTIONAL RWIS STATION.

EXISTING UTILITY POLE WITH METER, EXISTING COMMUNICATIONS DROP.

LIST OF MAJOR ITEMS

ITEM NO.	EQUIPMENT AND WORK ITEMS	QUANTITY
654.5301	ROAD WEATHER INFORMATION SYSTEM	1 LS

**NOTES**  
 1. THE CONTRACTOR SHALL INSTALL THE SUBSURFACE PROBE PER THE MANUFACTURER'S RECOMMENDATIONS.



PROJ. MANAGER	J. DOSTIE	BY	DATE
DESIGN-DETAILED	DJS	JAR	11/15/22
CHECKED-REVIEWED	DJS	MIS	11/15/22
DESIGN-DETAILED			
DESIGN-DETAILED			
REVISIONS 1	▲	ADDENDUM 1	12/16/22
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

STATEWIDE  
 RWIS INSTALLATIONS  
 CLIFTON  
 SITE PLAN

SHEET NUMBER

5

OF 6

Date: \$date\$

Username: \$user\$

Division: \$wkgroup\$

Filename: \$file\$

REMOVE ALL EXISTING RWIS SENSORS, CABINETS, AND COMMUNICATIONS EQUIPMENT. INSTALL NEW RWIS CABINET, WEATHER SENSORS, AND COMMUNICATIONS EQUIPMENT. EXISTING POWER CONNECTION SHOULD BE EVALUATED AND EXISTING CONNECTIONS MAY BE USED. THE CONTRACTOR MAY REPLACE ANY ELECTRICAL CONNECTIONS IF NECESSARY TO COMPLETE A FUNCTIONAL RWIS STATION.



ROUTE 6  
GREENVILLE RD

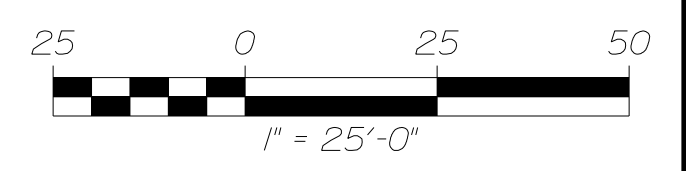
APPALACHIAN TRAIL  
GREENVILLE RD  
PARKING LOT

LIST OF MAJOR ITEMS

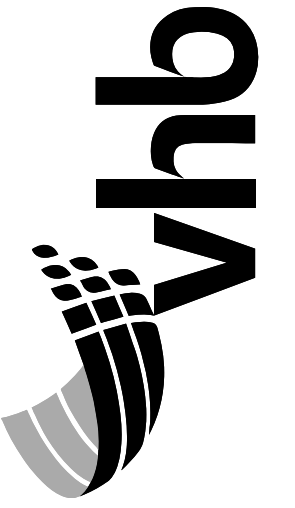
ITEM NO.	EQUIPMENT AND WORK ITEMS	QUANTITY
654.5301	ROAD WEATHER INFORMATION SYSTEM	1 LS

NOTES

1. THE CONTRACTOR SHALL INSTALL THE SUBSURFACE PROBE PER THE MANUFACTURER'S RECOMMENDATIONS.



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION  
PROJECT NO. 2421100  
WIN  
024211.00  
ITS PLANS



PROJ. MANAGER	J. DOSTIE	BY	DATE
DESIGN DETAILED	DJS	JAR	11/15/22
CHECKED-REVIEWED	DJS	MIS	11/15/22
DESIGN DETAILED			
DESIGN DETAILED			
REVISIONS 1	ADDENDUM 1		12/16/22
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

STATEWIDE  
RWIS INSTALLATIONS  
MONSON  
SITE PLAN

SHEET NUMBER

6

OF 6