Signals, Lighting & ITS Installation and Inspection

Part 6: ITS

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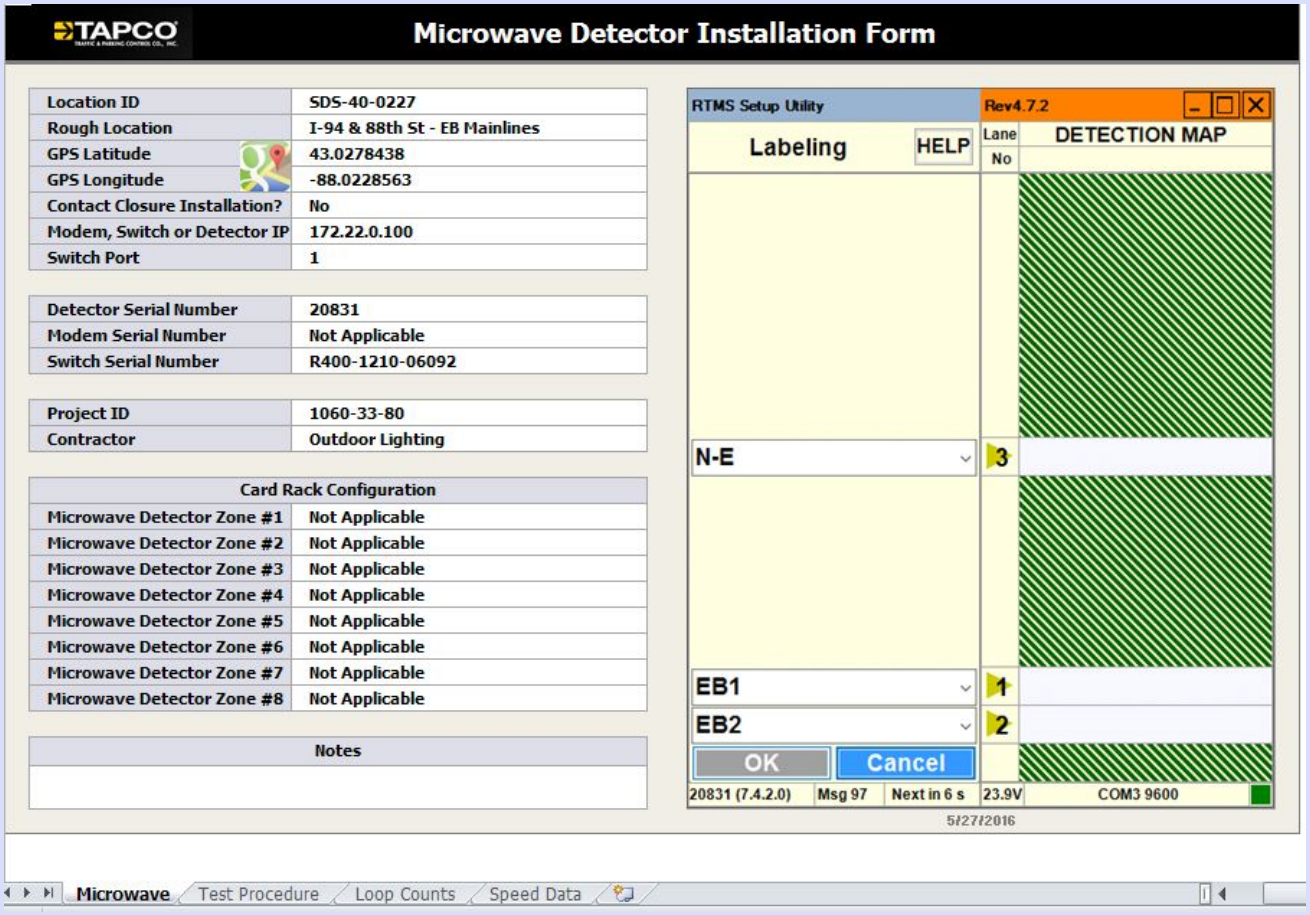
ITS (Intelligent Transportation System)

- CCTV- Closed Circuit Television Cameras
- RM - Ramp Meters
- DMS – Dynamic Message Sign
- FOC - Fiber Optic Cable
- SDS – System Detector Stations
- RG - Ramp Gates

ITS General Requirements – Section 670

- Perform ITS work with onsite assistance and under the supervision of a qualified **Field System Integrator.**
- Responsible for overall system functionality, setting up progress meetings, documentation, as-builts, manuals, and testing procedures.
- Perform all work for fiber optic terminations, splicing, and testing with Certified **Fiber Optic Technician.**

ITS General Requirements



TAPCO

Microwave Detector Installation Form

Location ID	SDS-40-0227
Rough Location	I-94 & 88th St - EB Mainlines
GPS Latitude	43.0278438
GPS Longitude	-88.0228563
Contact Closure Installation?	No
Modem, Switch or Detector IP	172.22.0.100
Switch Port	1

Detector Serial Number	20831
Modem Serial Number	Not Applicable
Switch Serial Number	R400-1210-06092

Project ID	1060-33-80
Contractor	Outdoor Lighting

Card Rack Configuration	
Microwave Detector Zone #1	Not Applicable
Microwave Detector Zone #2	Not Applicable
Microwave Detector Zone #3	Not Applicable
Microwave Detector Zone #4	Not Applicable
Microwave Detector Zone #5	Not Applicable
Microwave Detector Zone #6	Not Applicable
Microwave Detector Zone #7	Not Applicable
Microwave Detector Zone #8	Not Applicable

Notes

Microwave | Test Procedure | Loop Counts | Speed Data

ITS General Requirements

DeepBlue Sensor Assembly
Installation and Testing Documentation

This Test Procedure will test the DeepBlue Sensor Assemblies installed in the field.

PROJECT DETAILS

Cabinet #:	WDS-0139
Project #:	5569-00-72
Contractor:	Westphal
Drawing Page #:	340
Tested By:	Dave Bentfield
Date:	2/9/2016

SENSOR DETAILS

Rough Location:	USH 14 @ Morse St
Decimal Latitude:	42.717931
Decimal Longitude:	-88.98816
Remote Access IP:	166.165.80.230:8318
Serial Number:	20121191

Bluetooth | Documentation

TAPCO Bluetooth Sensor Installation Form

WDS Location ID	WDS-0139
Installation Location ID	WDS-0139
Rough Location	USH 14 @ Morse St
GPS Latitude	42.717931
GPS Longitude	-88.98816
Bluetooth Sensor IP	192.168.121.3
Modem or Switch IP	166.165.80.230
Remote Access IP	166.165.80.230:8318

Detector Serial Number	20121191
Modem or Switch Serial Number	MB19D4B1HB

Project ID	5569-00-72
Contractor	Westphal

ITS Documentation

- **Pre-Construction Work** Provide equipment list, catalog cut-sheets, and drawings within 28 days after notice of award to the engineer. The engineer will review the equipment list and drawings within 30 days of submittal.
- **Post-Construction Work** Submit 5 copies of ITS documentation including
  - Operator's and Maintenance procedures manuals
  - Cabinet fiber optic wiring diagram
  - As-built drawings and Equipment inventory list

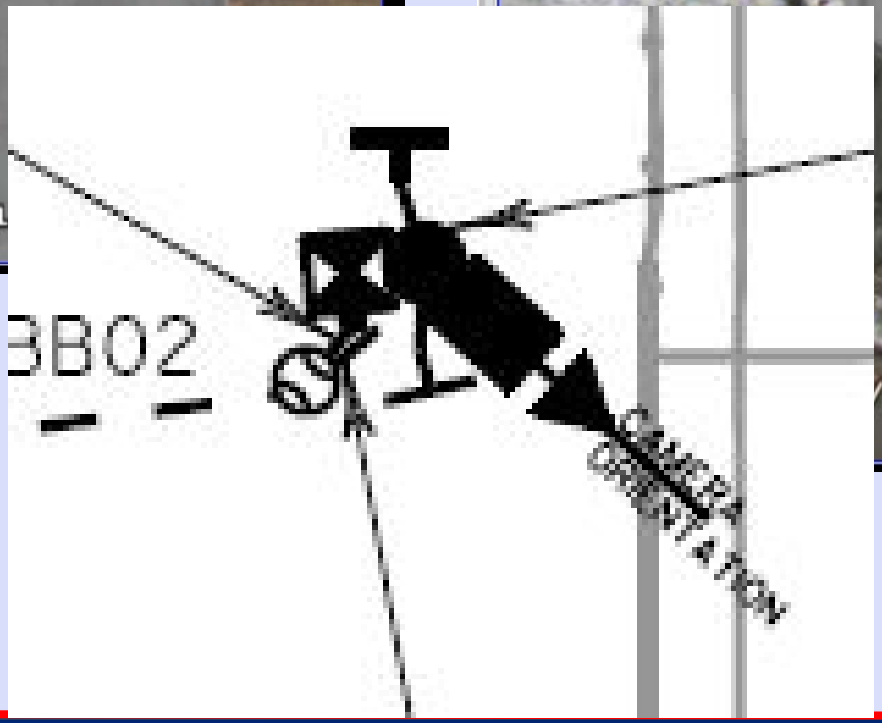
State Furnished Equipment

- List of State-furnished equipment is listed in the Control of Materials section of the specials.
- WISDOT typically provides cameras, camera poles, cabinets, microwave detectors, Bluetooth detectors, solar assemblies, dynamic message signs, fiber optic cable, termination panels, ramp meter controllers, wireless radios, various antennas, cellular modems, Ethernet switches, and optics.
- Proven equipment, good pricing, ease of maintenance and troubleshooting, control of ordering, and simplifies contract documents.
- Typically WISDOT or TAPCO will have the equipment.

CCTV Installations

- WISDOT provides camera, pole, lowering system, anchor bolts for base, and cabinet.
- Things to watch for:
  - Complete form DT2321
  - Anchor rod and conduit placement in concrete footing.
  - Lowering system and wireless radio placement. Don't block important camera views.

CCTV Installations



CCTV Installations

Make sure your electrical contractor puts rat screen on the camera poles!

Ramp Meter Installations

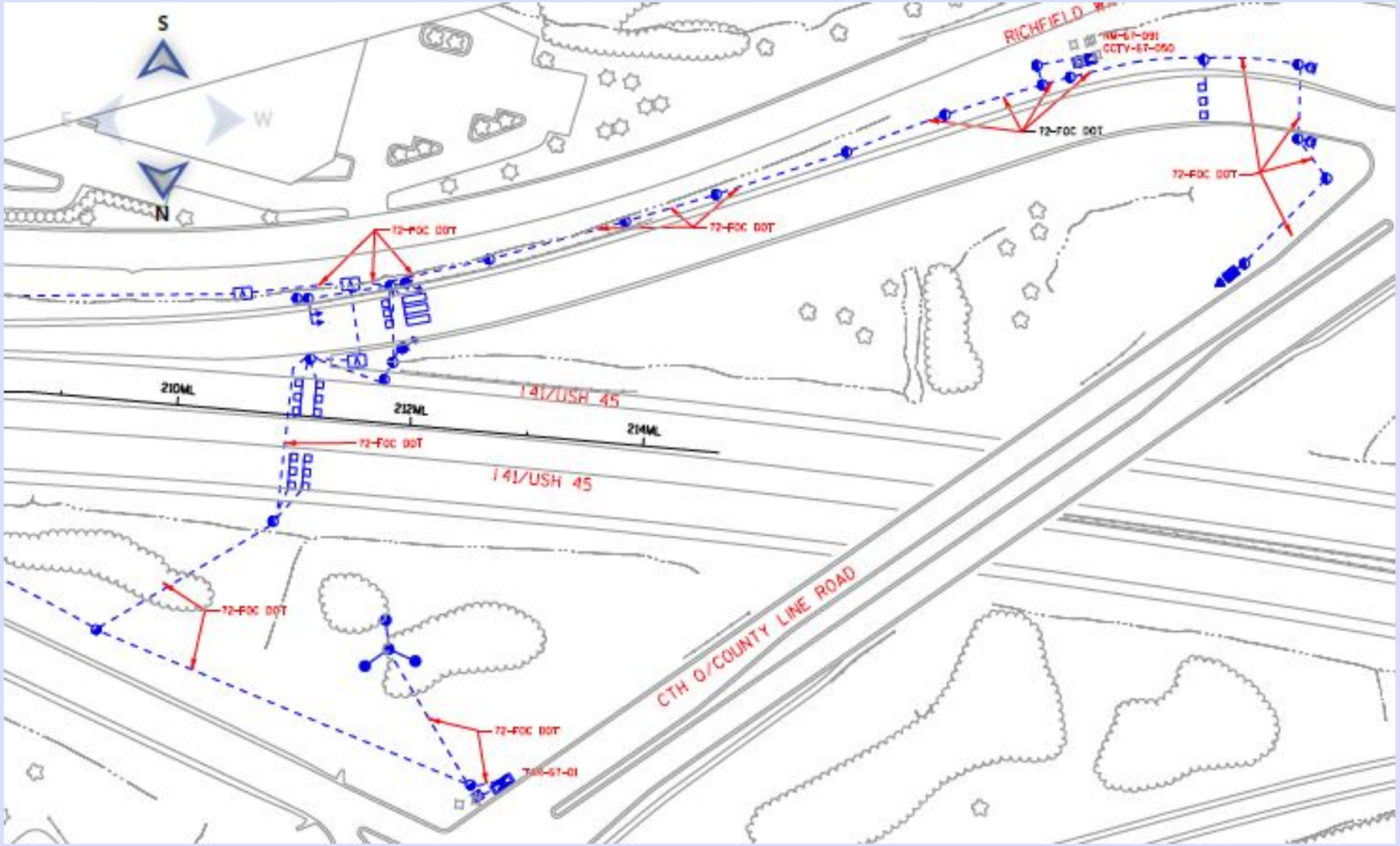
- WISDOT provides ramp meter controller, loop cards, and cabinet.
- Things to watch for:
  - Proper placement of loops, signal heads, advance flashers, signing, and pavement markings.
  - Cable type and routing.

Ramp Meter Installations

Advance Flasher Assembly

Ramp Meter Cabinet

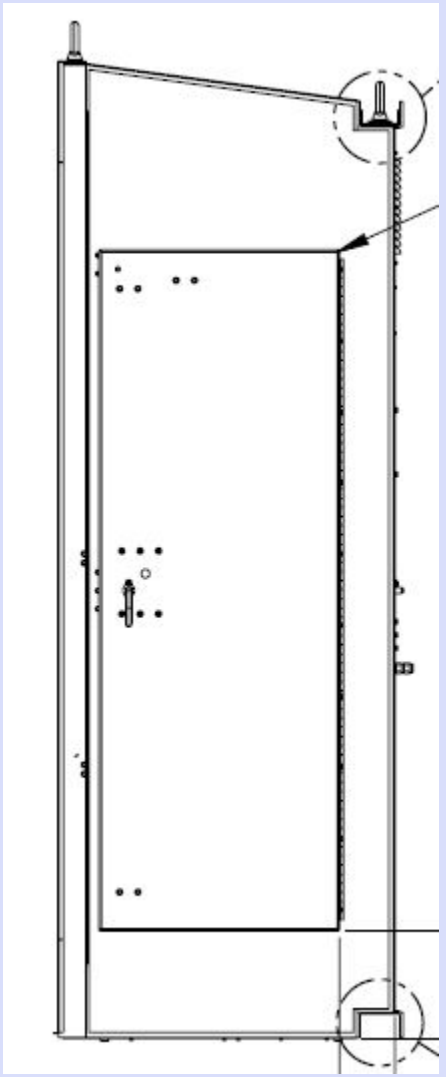
Ramp Meter Installations



Dynamic Message Sign Installations

- WISDOT provides DMS and cabinet.
- Things to watch for:
  - Proper placement of sign over lanes and proper clearance.
  - Connection of walk-in DMS to sign bridge. Structure plans typically account for vertical I-beams between DMS and sign bridge, however, there can be confusion.
  - Conduit placement in footings for power and communication.
  - Conduit location and type for use on structure.
  - Slight angle/offset for side-mount versions.

Walk-in DMS Installations



Cantilever Arterial DMS Installations

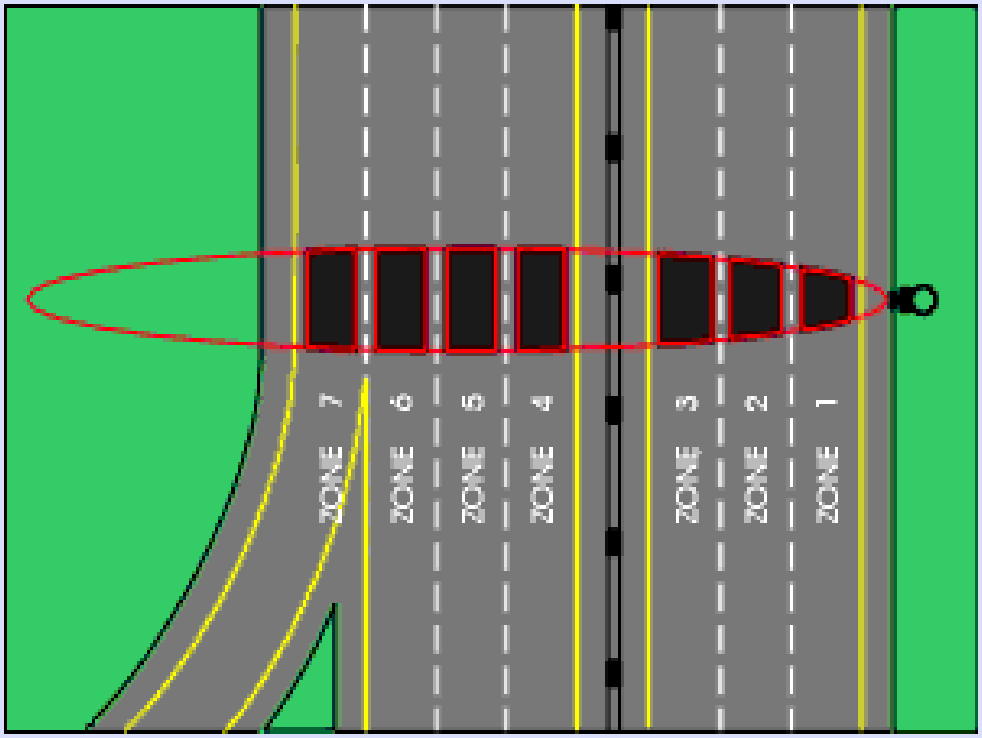
Side-Mount DMS Installations

Hybrid DMS Installations

SDS Installations

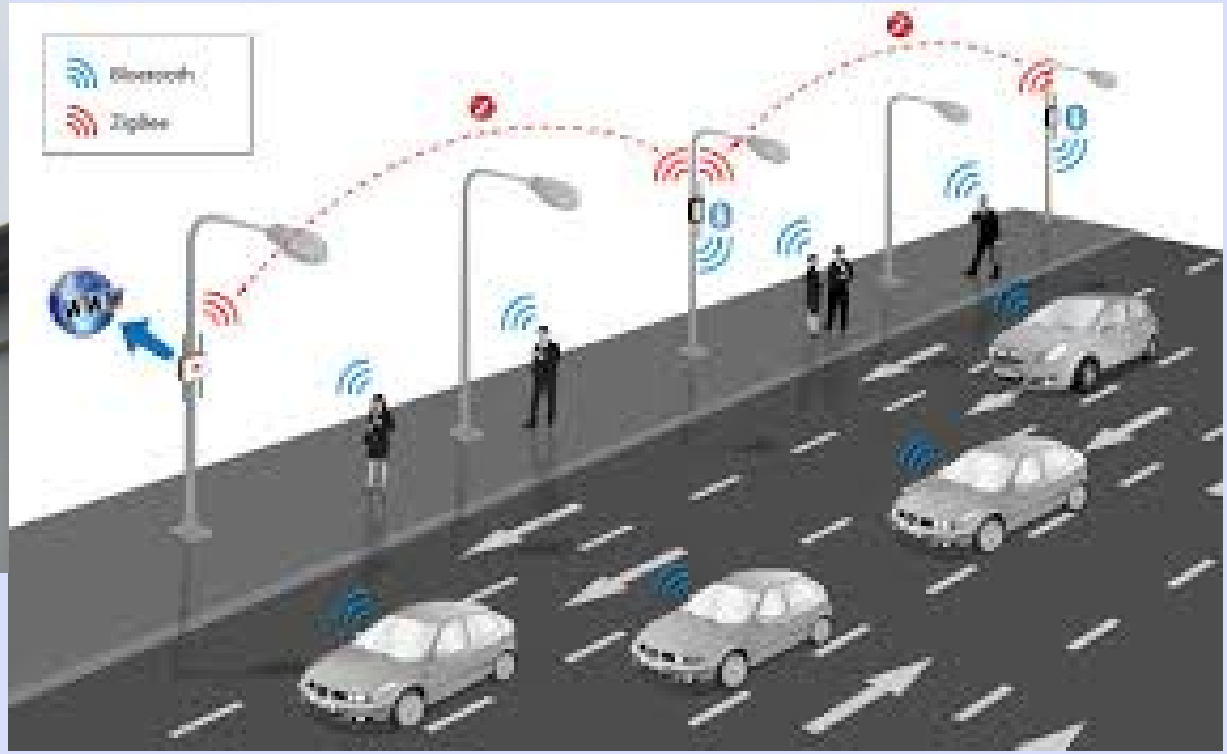
- WISDOT provides microwave detector, Bluetooth detector, cabinet, and solar assemblies, if required.
- Things to watch for:
  - Proper placement of pole and height of detector. Avoid ditches. Be aware of snow plowing operations.
  - Median barrier wall and other obstructions can cause detection problems.

SDS Installations



SDS Installations

Bluetooth detection
Providing real time travel times on freeways and arterials

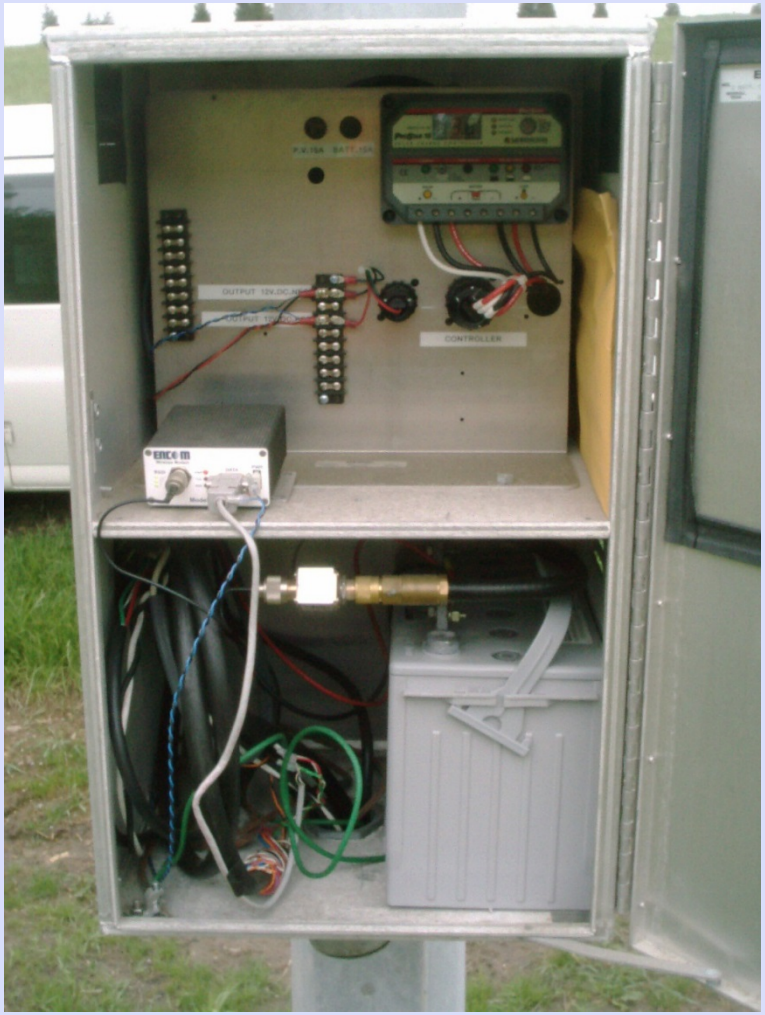


Solar Powered System Installations

- WISDOT will provide solar panels, batteries, charge regulator, and cabinet.
- Things to watch for:
  - Make sure solar panel array faces south.
  - Check for proper mounting and fastening of equipment.
  - Wiring should be neat and have drip loops.

Solar Powered System Installations

Solar Power System Installations



Cabinet Installations

- WISDOT will provide the cabinet and most of the equipment inside of it.
- Things to watch for:
  - Install pole-mount cabinets 3’ above finished grade.
  - Fasten securely with stainless steel straps.
  - Plug conduits with duct seal.

Cabinet Installations

- Observe proper construction techniques to keep water from entering cabinet.
- Mount cabinet (door) away from traffic flow.
- Make sure ID plaque is installed.
- Wiring and equipment should be neat and orderly.

Cabinet Installations

- Be aware of final grade in relation to concrete cabinet base.
- Install required conduits in concrete bases.
- Plug conduits with duct seal.

Ramp Gate Installations

- WISDOT will provide…….nothing.
- Things to watch for:
  - Proper placement of bases.
  - Check gate arm length and final position when closed.
  - Be aware of sidewalks, traffic lights, drainage features, and other conflicts.

Ramp Gates

- Adjust gate arm guides so they rest against gate arm when fully open.
- Verify solar powered units are wired properly.
- ID plaques should be installed for each gate arm.
- Backfill around bases to prevent snagging if hit.

ITS Questions

- **1. The Field System Integrator is responsible for:**

a.) Setting up progress meetings b.) Turning in as-builts
c.) Performing test procedures d.) All of the above

- **2. The list of state-furnished materials is included in the Wisconsin Standard Specifications.**

True False

- **3. The two most important things you can do to protect against rodent damage is to install:**

_____ and

_____

Questions?

ITS Contacts

- Dean Beekman – BTO/Statewide
- Randy Asman – NE Region
- Jeff Madson – BTO/SE Region
- Kyle Hemp – SW Region
- Ron Johnson – NC Region
- Chad Hines – NW Region