LOOP DETECTION DEFINITION

WHAT DO YOU KNOW ABOUT LOOP INDUCTANCE?

Prefabricated Loops

CONNECTIONS MUST BE PROPERLY SOLDERED AND SEALED

LEAD-IN CABLE

TWISTED LOOP WIRES

OUTPUT LINES (RELAYS)

MATING HARNESS

POWER CONNECTIONS

HOT
NEUTRAL
CHASSIS GROUND

LOOPS (1st PART OF THE SYSTEM)
LOOP DESIGNS

DIFFERENT TYPES

LOOP DESIGNS

CALTRANS TYPES

1 ft = 0.3 m
LOOP DETECTION MADE SIMPLE
DESIGN ESSENTIALS

NEEDS FOR A GOOD LOOP INSTALLATION

• Installing the loop
  – “Wound in the Ground” loop
  – Prefabricated loop type
• How many turns of wire in the loop?
  – Use the math formula’s to figure for:
    • the amount of turns in the loop
    • the loop inductance of the loop
    • the loop inductance of the loop and lead-in
    • the loop efficiency of the loop
    • the detection height of the loop

RECORD LOOP INSTALLATION

A record of the following readings at installation should be kept for future reference:

- Loop/Lead-In Total Inductance
- Insulation Test (meg-Ohm reading should be greater than 200Meg at install)
- Loop/Lead-In Total Resistance
CROSS-LINKED POLYETHYLENE

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Cross-linked polyethylene has a melting point of 426°F

LOOP LEAD-IN CABLE

- Cross-linked Polyethylene (XLPE) is the preferred insulation for Loop Lead-In cable.
- In most cases, the wire gauge is not critical to proper operation of the loop detector.
- The currently used Beldon cable has a PVC jacket and is not a good as XLPE for sitting in water filled conduits.
- Direct burial version available for construction zones.
WHY PREFABRICATED LOOPS?

- A PREFABRICATED LOOP IS STRONGER THAN A STANDARD LOOP
- MANUFACTURED IN A CONTROLLED ENVIRONMENT
- COST EFFECTIVE
- EASY TO HANDLE, SHIP, AND INSTALL

PREFABRICATED LOOPS

NOT PREFORMED – PLB

- Adjustable (± 2 feet)
- XLPE construction
  - Cross Linked Poly – Ethylene
  - Multiple layers of insulation
  - Nick and chemical resistant
  - Flexible
  - ¼ inch Saw cut
- Can be saw cut or put in before overlay.
- Constructed in a controlled environment and quality checked before shipment
- Warranted for 10 years from manufacturer’s defects.
PLB INSTALLATION

SIMPLE STEPS

1. Cut the loop (6 x 6)
2. Knock out corners (A)
3. Start at far corner (B)
4. Pull loop to near corner (C)
5. Pull loop taut
6. Mark splice box location (D)
7. Drill 1” hole for splice box (E)
8. Drop Splice box in whole
9. Seal loop
PREFABRICATED LOOPS

UNDERLAY LOOP INSTALLATION

Prefabricated Loop Installation
Asphalt Roadway

3/31/2017 Author: Matt Zinn
FIVE LAYERS OF INSULATION

PLH FOR UNDERLAYS AND NEW INSTALLATIONS

1) .035" XLPE Outer Jacket
2) .030" XLPE Middle Jacket
3) Moisture Resistant Mylar Binder
4) Water Block Gel
5) .020" XLPE Conductor Insulation

BENEFITS OF DOUBLE JACKET

- Outer Jacket relieves stress on Inner Jacket and wire
- Minor nicks and cuts in the Outer Jacket will not reflect into the Second Jacket
PREFABRICATED LOOPS

BEFORE CONSTRUCTION

- Best way to install loops
- Will last a life time
- Install above rebar
  - Perpendicular to rebar
  - Not parallel to rebar

EASY TO INSTALL

TEN TO FIFTEEN MINUTES TO POSITION LOOP AND LEAD-IN
MOUNTING LOOP ABOVE REBAR

PROMOTES LONGER ROADWAY LIFE

NEW INSTALLATIONS UNDER CONCRETE OR ASPHALT

- Eliminates loop failures and pavement degradation associated with saw cut loops
- No saw cuts to propagate road surface cracking
- Loop sealant failure eliminated
- Eliminates the possibility of loop and/or lead-in wires becoming exposed
LOOP DETECTION MADE SIMPLE
DESIGN ESSENTIALS (CONT.)

OTHER TOOLS IN OUR BOX

• Use a SIMPLE and ACCURATE tool to do the math for you!

   Reno A&E Loop calculator and help sheet

DETECTION (2ND PART OF THE SYSTEM)
GOOD (DIP SWITCH MODELS)

DETECTION

BEST (LCD DETECTORS)

DETECTION
ADVANCED DETECTION
COUNTING - DIRECTIONAL LOGIC AND ANTI-TAILGATING

BIKE DETECTION
BIKE DETECTION AND DIFFERENTIATION
THE DETECTION

TYPICAL INSTALLATIONS

Dual Use Lane with existing stop bar detection

Left Turn Lane

Dual Use Lane using bike loop as stop bar detection.

Designated Bike Lane

TSP / SECURE GATE ACCESS

AVI DETECTION
GATE ACCESS
CLARK COUNTY, NV

THANK YOU
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