Signal Detection

- 8-20.3(14)c
- Induction loop Vehicle Detectors
- Video detection
- Pre-form loops
- Magnetometers
- 9-29.18 Vehicle Detectors

Loop Details
J-8a through J-8d
Skip J-8 drawings
Go to Circle Saw

Standard Plan J-8a

Type 1 Induction Loop

Entrance Sawcut Detail

Corner Sawcut Detail

Type 1 Stop Line Loop Wiring Diagram

NOTE
1. For Sections A and B, see Standard Plan J-8d.

Advance Loops

Advance Loops
NOTES
1. All of the loop lead-in wires shall return to the Junction Box.
2. For Splice Detail, see Standard Plan J-8d.
Standard Plan J-8c 2 of 3

NOTES
1. All of the loop lead-in wires shall return to the Junction Box.
2. For Splice Details, see Standard Plan J-6d.

TYPE 3A STOP LINE LOOP WIRING DIAGRAM
(SERIES SPLICE SHOWN)

TYPE 3 ADVANCE LOOP WIRING DIAGRAM

TYPE 3 SAMPLING LOOP WIRING DIAGRAM
(SERIES SPLICE SHOWN)
NOTE
1. Fill the conduit trench to the top of the existing or new surfacing with CSTC, sand or controlled density fill. See "Standard Specifications" Section 2-09.3(11E).
2. Minor Regional variation is allowed in the soft pocket closure. Consult with the Engineer or see the Contract for additional requirements.
3. Conductors shall be snug to the bottom of the sawcut. High temperature backer rod shall be snug to the conductors.

CONDUIT SIZING TABLE

<table>
<thead>
<tr>
<th>LOOP LEAD PAIRS</th>
<th>1-2</th>
<th>3-5</th>
<th>6-10</th>
<th>11-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDUIT SIZE (MIN)</td>
<td>1&quot;</td>
<td>1 1/4&quot;</td>
<td>1 1/2&quot;</td>
<td>2&quot;</td>
</tr>
</tbody>
</table>

INDUCTION LOOP DETAILS

STANDARD PLAN J-8d

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

05-20-04

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

NOTE: ALL PLANS ARE SET AT 1/2" = 1'-0" SCALE. DRAWN AS PER COURT OF DESIGN EXCEPT WHERE NOTED. LINES OR DIMENSIONS ARE NOT FOR CONSTRUCTION. FOR REFERENCE ONLY. CHECK SPECIFICATIONS AND CONTRACT FOR ADDITIONAL REQUIREMENTS.
Circle Saw Blade
Vacuum
Vacuum Slurry
Sand Bags Help Control Slurry
Home Runs Cut With Flat Saw
Home Run Cuts at 45 Degree Angles
Pressure Washer

NW region requires 1000 PSI (6.9 Mpa)
Wash Them and Dry Them
Loop Stub
Install Wire

Use a Wood Tool to Install So Wire Is Not Damaged

8-20.3(14)c

Pages 660, 61
Twist Each Pair of Loop Lead Wires 2 Times per Foot. Reverse Direction of Twist for each Successive Pair Installed. J-8d sheet 2 Loop Installation Note 6
Loop wire in Transition Cut From loop to Home Run

FEB 22 2005
Sealing Loops
With 3M 5000
QCM 2 Part Epoxy Loop Sealant
Mixing QCM Epoxy
Install QCM Loop Sealant
QCM Can Be Messy
Injection Pump in 5 Gallon Bucket
Cold Application Loop Sealants

• NW Region Sealants for ACP
  – RAI Pro-Seal 6006EX
  – QCM EAS-14
  – 3m Black 5000

• NW Region Sealants for PCC
  – QCM EAS-14
  – 3m Black 5000
  – Gold Label Flex 1P
Don’t Over Fill Cuts

These Look Good
Finished Product Poor Location
Piezo Loop With Clips installed
Piezo Loop / Coil of Coax
Seal Piezo Loops with Epoxy
Pre-form Loops
Pre-form Loop Homerun

Spare Loop Stub for Future with PVC Sleeve
Pre-form Header Loops
Loop Splicing
Solder and Tape
Video Detection Cameras
Video Detection Monitor Target
Test for Induction
Loops and Lead-in Cables

• 8-20.3(14)d
Record Loop Test Data
Form in Check Lists

<table>
<thead>
<tr>
<th>Loop Test 8-20.3(14)D</th>
<th>Date: __________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Contract Number:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Taken By:</th>
<th>Test A</th>
<th>Test B</th>
<th>Test C</th>
<th>Test D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop Number</td>
<td>Loop Type R1,R2,R3</td>
<td>Ohms. &lt;= 5</td>
<td>Meg. Test Shield/Gr. &gt;= 100</td>
<td>Meg. Test Loop/Gr. &gt;= 100</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Test “A” for long ITS loops should not exceed the values calculated using the formula below:
Resistance per 1000 ft of #14 AWG, $R = 3.16$ ohms / 1000 ft

$R = \frac{3.16 \times \text{distance of lead-in cable (ft)}}{1000\ ft}$
Signal Standards

- 8-20.3(14)e
- 9-29.6 light and signal standards
- 9-29.6(1) steel light and signal standards
- 9-29.6(3) timber strain poles
Standard Plan J-7a
Mast Arm Pole

J-7a
8-20.3(4) All anchor bolt nuts must be tightened by the turn of the nut method. Minimum $\frac{1}{4}$ Max $\frac{1}{3}$ turn past snug tight. Permanent marks shall be set on the base plate and the nuts.
Grout

- 8-20.3(15)
Grout Pad Luminaire Base
Too Much Grout
Good Looking Grout Pad
From J-1b

**SLIP BASE ELEVATION**

- Plate washer (TYP)
- Pole base plate
- Keeper plate
- 1 1/4” anchor plate
- 1” clamping bolts
- Hardened washers (TYP)
- 1 3/8” slip plate
- Top of foundation
- 3/4” chamfer (TYP)
- Place grout even with top of foundation after plumbing light standard

- 6” hollow in center of grout pad

- 3” MIN

- 4” MAX

- Three 1” anchor bolts, 4’-6” long (see Notes 3 and 4)
Rat Screen
Traffic Signal Turn-on Checklist, Signal Turn-on Process Flow & Loop Installation Checklist

- Provided in Note book
ITS Controller Cabinet
Cabinet Labeling As Required by NW Region ITS
Sign Structures

• 8-21
Sign Structure On Bridge With Sign Lighter
Sign Lighter Open
Cantilever Sign Structure
With Two Sign Lighters
V.M.S. Sign
• Inside VMS
Putting Sign Bridge Together
Vibration Damper
Isolation Switch
Inside Isolation Switch
Post Mounted Sign With Light and Flasher
Flashing Signal Heads on Sign

TUNN 530 AM
Post Mounted Conduit Break-away

PLAN

TO CONDUIT RUN ALONG ROADWAY

1" STEEL CONDUIT

EDGE OF TRAVELED WAY

SIGN PANEL

TIMBER SIGN POST (TYP.)

CONCRETE ANCHOR

STEEL CONDUIT CLAMP (TYP.)
~ ATTACH TO THE POST W/ 2 LAG BOLTS, 1/4" Diam., x 1 1/2" LONG

STEEL CONDUIT (WITH THREADED END)

HOLE DRILLED THROUGH POST (STD. PL-1H-4B)

1" DIA. STEEL CONDUIT ATTACHED TO POST

POST-MOUNTED JUNCTION BOX

CONCRETE ANCHOR

STEEL CONDUIT ENTRANCE INTO CONC. ANCHOR

CONCRETE BOX

PVC CONDUIT

CONCRETE ANCHOR

SIGN PANEL

NOTCH IN POST (STD. PL-1H-4B)

TYPE 1 JUNCTION BOX (SEE STD. J-14)

CONDUIT BODY OR FLASHER CABINET (SEE CONSTRUCTION)

CONDUIT BODY (SHOWN)

BOTTOM OF SIGN PANEL

METALLIC FLEX CONDUIT

TIMBER SIGN POST

WATER TIGHT CONDUIT NUTS

STEEL CONDUIT

6" x 6" x 8" NEMA 3 JUNCTION BOX W/ HINGED LID

1/4" DIA. GROUNDING CONDUCTOR

CONNECT THE EQUIPMENT GROUNDING CONDUCTOR TO THE GROUNDING SYSTEM IN THE TYPE 1 JUNCTION BOX

STEEL CONDUIT CLAMPS

METALLIC FLEX CONDUIT

HINGED DOVER

2" DIA. RUBBER GASKET
~ GLUE THE GASKET TO THE BOTTOM OF THE J-BOX

PVC CONDUIT

STEEL CONDUIT DOWELING ~ INSTALL FLUSH WITH TOP OF ANCHOR

STEEL CONDUIT (WITH THREADED END)

1" DIA. PVC SCHED 40 CONDUIT

TOP OF CONC. ANCHOR

HOLE DRILLED BENDS

1/4" DIA. PVC SCHED 40 CONDUIT

STEEL CONDUIT DOWELING ~ INSTALL FLUSH WITH TOP OF ANCHOR

3/4" DIA. PVC CONDUIT

STEEL CONDUIT DOWELING ~ INSTALL FLUSH WITH TOP OF ANCHOR

1/4" DIA. PVC SCHED 40 CONDUIT

1/4" DIA. STEEL CONDUIT W/ HINGED LID

JUNCTION BOX

INTERNAL DETAIL

DETAIL VIEW A

DETAIL VIEW B

DETAIL VIEW C

SECTION C

NOTICE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT IS DRAWN FOR PLANNING PURPOSES. THE DESIGN, DRAWING AND APPROVAL OF THIS PLAN ARE APPROVED BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. THIS PLAN MAY BE USED AND MODIFIED FOR SPECIFIC PROJECTS.