**ADVANCED DETECTION LOOP DISTANCE TABLE**

<table>
<thead>
<tr>
<th>APPROACH SPEED</th>
<th>DISTANCE FROM INTERSECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPH</td>
<td>K/HR</td>
</tr>
<tr>
<td>35</td>
<td>56</td>
</tr>
<tr>
<td>40</td>
<td>64</td>
</tr>
<tr>
<td>45</td>
<td>72</td>
</tr>
<tr>
<td>50</td>
<td>80</td>
</tr>
<tr>
<td>55</td>
<td>88</td>
</tr>
</tbody>
</table>

**NOTES**

1. ALL PULL BOXES ARE NOT TO BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE CONDUIT, EXCEPT FOR WHERE CALLED OUT IN THE PLANS.

2. ALL PULL BOXES PLACED FOR THE ADVANCED DETECTION WIRING SHALL BE PLACED APPROXIMATELY EVERY 100 FT AND SHALL BE INCLUDED IN THE COST OF THE CONDUIT.

3. FOR LAYOUT OF LOOP DETECTORS AND CONDUIT, THE CONTRACTOR SHALL NOTIFY DISTRICT 6 TRAFFIC SIGNAL SHOP, JEFF LANCASTER, (303) 757-9511, TWO WORKING DAYS IN ADVANCE.

4. SEE PLANS FOR ACTUAL LANE CONFIGURATIONS.

**INTERSECTION DETECTOR WIRING DIAGRAM (TYPICAL)**

**ADVANCE DETECTION WIRING DIAGRAM (TYPICAL)**

**SECTION**

**TYPICAL DETAIL**

**NON-INVASIVE MICRODETECTOR (DILEMMA ZONE)**

---

**COMPUTER FILE INFORMATION**

**CREATION DATE:** 07/31/19

**CREATED BY:** AVU

**LAST MODIFICATION DATE:**

**MODIFIED BY:**

**CAD VERS.:** MicroStation V8i Scale: Not to Scale Units: English

**COLORADO DEPARTMENT OF TRANSPORTATION**

**2829 W. HOWARD PL.**

**DENVER, CO 80204**

**PHONE: 303-757-9436**

**FAX: 303-757-9219**

**TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS**

**TRAFFIC & SAFETY ENGINEERING**

**MKB**

**PROJECT SHEET NUMBER:** 1

**STANDARD PLAN NO.:** S-614-43

**STANDARD SHEET NO. 1 OF 8**

---
**Loop Installation Procedure**

1. Cut slots in pavement to 3 in minimum depth.
2. Clean and dry slots with oil-free compressed air.
3. Omit continuous length of Lv/Co, Lv/Co, Rv/Co, Rv/Co, or Rv/HV wire shall be used for each loop from signal base or pull box around the loop with the number of turns specified and back to the signal base or pull box. Loop wire shall be duct type.
4. Splice lead-in first pull box on the side of the roadway.
5. Use a blunt, non-metallic instrument to push wire into slot. Do not coil leads.
6. Connect detector and test loop.
7. Install loops before final lift of asphalt on mill and fill projects.
8. Seal slots as specified.

**Wire Configuration**

- For Series loops (1 to 3 loops), use the same length of wire for each loop.
- For Parallel loops (4 to 6 loops), use the same length of wire for each loop.

**Standard Loop - Wiring and Connection Table**

<table>
<thead>
<tr>
<th>No. of Loops</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>24-36</th>
<th>40+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of Loop (Ft)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>TURNS PER LOOP AND TYPE CONNECTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S = Series, P = Parallel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Vehicle Detector Loop Saw Cut Details**

- For detail, see Section C-C, Sheet 3
- For use with vinyl tubing encased loop detector wire

**Standard Plan No.**

S-614-43

**Traffic & Safety Engineering**

MKB

Issued by Traffic & Safety Engineering Branch July 31, 2019

Project Sheet Number:
**TYPE 1 INDUCTION LOOP**

**NOTES**

1. TWIST LEAD-IN CABLES ALL THE WAY TO PULL BOX.
2. SPLICE LEAD-IN IN FIRST PULL BOX ON SIDE OF THE ROADWAY.

**STOP LINE LOOP WIRING DIAGRAM**

- **PLANS**
- **SEE CONDUIT STUB-OUT PLACEMENT DETAILS IN THE PLANS**
- **SEE CONDUIT STUB-OUT PLACEMENT DETAILS IN THE PLANS**

**DETAIL BELOW**

- **STOP LINE LOOP**
- **LOOP SEALANT**
- **PER PLANS OR '5 APPROVED BY THE ENGINEER**

**TYPE 1 STOP LINE LOOPS**

- **PLAN VIEW**
- **TOP OF EXISTING PAVEMENT OR LEVELING COURSE**
- **NEW PAVEMENT**

**TYPE 1 STOP LINE LOOPS - PLAN VIEW**

- **SAWCUT EXISTING PAVEMENT (BOTH SIDES OF TRENCH)**
- **TOP OF EXISTING PAVEMENT OR LEVELING COURSE OF NEW PAVEMENT**

**STOP LINE LOOP NUMBER MARKING DETAIL**

- **MATCH EXISTING PAVING MATERIAL**
- **CHISEL OUT %1 TO %2 CORNER**
- **REMOVE PAVEMENT TO SAWCUT DEPTH AND FILL WITH SEALANT**

**SECTION C-C**

- **SECTION C-C**

**SECTION D-D**

- **SECTION D-D**

**TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS**

**STANDARD PLAN NO:**

- **S-614-43**

**ISSUED BY:** Traffic & Safety Engineering

**STANDARD SHEET NO:**

- 3 of 8

**PROJECT SHEET NUMBER:**

- 3019

**CREATED:**

- CAD Ver: MicroStation V8 Scale: Not to Scale

**COMMENTS:**

- English

**NOTES:**

- **TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS**
- **SECTION D-D**
- **SECTION C-C**
- **TOP OF EXISTING PAVEMENT OR LEVELING COURSE**
- **NEW PAVEMENT**

**SPECIALTY:**

- **STOP LINE LOOP NUMBER MARKING DETAIL**
- **MATCH EXISTING PAVING MATERIAL**
- **CHISEL OUT %1 TO %2 CORNER**
- **REMOVE PAVEMENT TO SAWCUT DEPTH AND FILL WITH SEALANT**

**COMPUTER FILE INFORMATION**

- **Creation Date: 07/14/12**
- **Last Modification Date: 07/31/19**
- **Last Modified By: AVU**
- **CAD Ver: MicroStation V8 Scale: Not to Scale**
- **Language: English**

**COLORADO DEPARTMENT OF TRANSPORTATION**

- **2829 W. Howard Pl. Denver, CO 80204**
- **Phone: 303-757-9436**
- **Fax: 303-757-9219**
NOTES

1. ALL OF THE LOOP LEAD-IN WIRES SHALL RETURN TO THE PULL BOX.

TOP OF EXISTING
PAVEMENT OR
LEVELING COURSE
OF NEW PAVEMENT

GROUND SURFACE

SECTION C-C

SECTION D-D

TRAFFIC LOOP AND
MISCELLANEOUS SIGNAL
DETAILS

MKB

Traffic & Safety Engineering

Issued By: Traffic & Safety Engineering Branch July 30, 2019

Project Sheet Number:

STANDARD PLAN NO.
S-614-43

Standard Sheet No. 4 of 8

Colorado Department of Transportation
2829 W. Howard Pl.
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DETAILS

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Issued By: Traffic & Safety Engineering Branch July 30, 2019

Project Sheet Number:
NOTES

1. For wiring and conduit layout, see conduct stub-out placement detail in plans.

2. Splice lead-in in first pull box on the side of the roadway.
**NOTES**

1. PULL BOXES, PULL BOX COVERS AND EXTENSIONS SHALL BE MADE OF FIBERGLASS REINFORCED POLYMER CONCRETE. PULL BOXES SHALL BE VERIFIED BY A 3RD PARTY NATIONALMALLY-RECOGNIZED INDEPENDENT TESTING LABORATORY AS MEETING ALL TEST PROVISIONS OF THE LATEST ANSI/SCTE 77 SPECIFICATION FOR UNDERGROUND ENCLOSURE INTEGRITY, TIER 22 RATING. CERTIFICATION DOCUMENTS SHALL BE SUBMITTED WITH MATERIAL SUBMITTALS. THE PULL BOX SHALL HAVE A DETACHABLE COVER WITH A SKID-RESISTANT SURFACE AND HAVE THE WORDS "CIVIL ENGINEER" OR "CIVIL COMM" CAST INTO THE SURFACE. PAINTING THE TIER 22 RATING MUST BE LABELED OR STENCILED ON THE BOX AND OUTSIDE OF THE BOX AND ON THE UNDER SIDE OF THE COVER. THE COVER SHALL BE ATTACHED TO THE PULL BOX BODY BY MEANS OF A MINIMUM 1/2" - 7 UNIFIED NATIONAL COURSE UNIFIED STAINLESS STEEL PORTA HEAD BOLTS AND SHALL HAVE TWO LIFT SLOTS TO AID IN THE REMOVAL OF THE LID.

2. PULL SLOTS SHALL BE RATED FOR A MINIMUM PULL OUT OF 3,000 POUNDS.

3. TYPE 4 AND 5 PULL BOX COVERS SHALL BE A TWO-PIECE COVER.

4. MAGNESIUM CHLORIDE TESTS SHOULD BE PERFORMED IN ACCORDANCE WITH THE LATEST ANSI/SCTE 77 SPECIFICATION FOR UNDERGROUND ENCLOSURE INTEGRITY, TIER 22 RATING.

5. PULL BOXES SHALL HAVE A CONCRETE APRON SLOPED AWAY FROM PULL BOX OPENING. THE COST OF THE CONCRETE APRON SHALL BE PAID FOR AS PART OF THE PULL BOX ITEM.

---

**TABLE OF DIMENSIONS (MINIMUMS)**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION</th>
<th>DIMENSIONS (IN.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PULL BOX - (02' X 38&quot; X 12&quot;)</td>
<td>A11'4&quot; B11'4&quot; C11'4&quot; D11'4&quot; E11'4&quot; F11'4&quot; G11'4&quot; H11'4&quot;</td>
</tr>
<tr>
<td>2</td>
<td>PULL BOX - (02' X 24&quot; X 12&quot;)</td>
<td>A13'4&quot; B13'4&quot; C13'4&quot; D13'4&quot; E13'4&quot; F13'4&quot; G13'4&quot; H13'4&quot;</td>
</tr>
<tr>
<td>3</td>
<td>PULL BOX - (02' X 30&quot; X 12&quot;)</td>
<td>A15'4&quot; B15'4&quot; C15'4&quot; D15'4&quot; E15'4&quot; F15'4&quot; G15'4&quot; H15'4&quot;</td>
</tr>
<tr>
<td>4</td>
<td>PULL BOX - (24&quot; X 36&quot; X 24&quot;)</td>
<td>A23'4&quot; B23'4&quot; C23'4&quot; D23'4&quot; E23'4&quot; F23'4&quot; G23'4&quot; H23'4&quot;</td>
</tr>
</tbody>
</table>

---

**STANDARD PULL BOXES**

Computer File Information
Creation Date: 07/14/12
Created By: KEN
Last Modification Date: 07/31/19
Last Modified By: AVU

Traffic Loop and Miscellaneous Signal

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NOTES

1. SIGNAL HEAD CONFIGURATIONS SHALL BE AS SHOWN ON PLANS.

2. INSTALL MOUNTING BRACKETS ACCORDING TO THE MANUFACTURER’S INSTRUCTIONS.

3. USE ASTRO-TYPE MOUNTING BRACKETS FOR MOUNTING EXCEPT FOR LIGHTED SIGNS ON MAST ARMS, SEE STANDARD PLAN S-614-20, USING 1/4 INCH WIDE BANDING.

4. LIGHTED STREET NAME SIGNS SHALL UTILIZE ASTRO-TYPE DESIGNED FOR THE REQUIRED DESIGN LOADING AND BE FREE-SWINGING TO REDUCE WIND LOADING EFFECT.

5. THE CABLE INSIDE THE TOP HEAD MOUNT SHOULD BE INSIDE THE HEAD.

6. THE INSIDE OF THE VISOR IS TO BE POWDER COATED BLACK MOUNTING BRACKETS OVERHEAD SIGNS.

7. CABLE SUPPORT BRACKET AND SAFETY CABLE FROM MAST ARM TO HEAD SHALL BE PROVIDED.

1. SIGNAL HEAD CONFIGURATIONS SHALL BE AS SHOWN ON PLANS.

2. INSTALL MOUNTING BRACKETS ACCORDING TO THE MANUFACTURER’S INSTRUCTIONS.

3. USE ASTRO-TYPE MOUNTING BRACKETS FOR MOUNTING EXCEPT FOR LIGHTED SIGNS ON MAST ARMS, SEE STANDARD PLAN S-614-20, USING 1/4 INCH WIDE BANDING.

4. LIGHTED STREET NAME SIGNS SHALL UTILIZE ASTRO-TYPE DESIGNED FOR THE REQUIRED DESIGN LOADING AND BE FREE-SWINGING TO REDUCE WIND LOADING EFFECT.

5. THE CABLE INSIDE THE TOP HEAD MOUNT SHOULD BE INSIDE THE HEAD.

6. THE INSIDE OF THE VISOR IS TO BE POWDER COATED BLACK MOUNTING BRACKETS OVERHEAD SIGNS.

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