ORIGINATION FORM

Proposed Revisions to a Standard Plans Index

(Please provide all information — Incomplete forms will be returned)

Contact Information:

Date: June 30, 2023

Originator: Victor Johnson

Phone: (850) 921-7303

Email: Victor.Johnson@dot.state.fl.us

Standard Plans:

Index Number: 695-001

Sheet Number (s): 1 through 9

Index Title: Traffic Monitoring Site

Summary of the changes:

Sheet 1: Added modem antenna to cabinet; Removed "furnished separately" from Backplane callout; Moved J1 Mounting Bracket Details to Sheet 18; Added Table of Content; Updated Note 1D from "J1" to "P1"; Updated Note 4 to read “Provide and install Speed/Classification Unit, Modem, and Antenna."; Updated Note 5 to be consistent with other sheets; Updated Note 6 to read “Provide and install a 12-fiber single mode cable, a 12-port patch panel, and a managed field Ethernet switch." Titled sheet Continuous Count Station Traffic Monitoring Site - TTMS/CCS."

Sheet 2: Added modem antenna to cabinet; Removed "furnished separately" from Backplane callout; Updated Note 1D from "J1" to "P1"; Updated Note 4 to read “Provide and install Speed/Classification Unit, Modem, and Antenna."; Update Note 5 to be consistent with other sheets; Updated Note 6 to read “Provide and install a 12-fiber single mode cable, a 12-port patch panel, and a managed field Ethernet switch." Titled sheet "Continuous Count Station Traffic Monitoring Site - TTMS/CCS"; Changed Veh. Sensor Term. Strip to Piezo Sensor Terminal Strip.

Commentary / Background:

Motorized Vehicle: Updated the piezometer and inductive loop layout. All cabinet equipment will be furnished and installed by the Contractor.

Non-Motorized Vehicle: Added new class of vehicle. New piezometer, inductive loop, infrared sensor, equipment.

Other Affected Offices / Documents: (Provide name of person contacted)

Yes	No	
☐	☑	Other Standard Plans –
☐	☑	FDOT Design Manual –
☐	☑	Basis of Estimates Manual –
☑	☐	Standard Specifications – Daniel Strickland
☑	☐	Approved Product List – Karen Byram/Melissa Hollis
☑	☐	Construction – Olivia Townsend/Taylor Carlquist
☐	☑	Maintenance –

Origination Package Includes:

(Email or hand deliver package to Rick Jenkins)

Yes	N/A	
☑	☐	Redline Mark-ups
☐	☐	Proposed Standard Plan Instruction (SPI)
☐	☑	Revised SPI
☐	☐	Other Support Documents

Implementation:

- ☐ Design Bulletin (Interim)
- ☐ DCE Memo
- ☐ Program Mgmt. Bulletin
- ☑ FY-Standard Plans (Next Release)

Contact the Roadway Design Office for assistance in completing this form

Email to: Rick Jenkins rick.jenkins@dot.state.fl.us and Darren Martin darren.martin@dot.state.fl.us

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Index Number: 695-001

Sheet Number (s): 1 through 9

Index Title: Traffic Monitoring Site

Additional Information, as needed:

Sheet 3: Titled sheet for Continuous Count Station Traffic Monitoring Site - TTMS/CCS - Cabinet Backplane Details; Updated "Cnte" callout to "Cntr"

Sheet 4: Titled sheet for Continuous Count Station Traffic Monitoring Site - TTMS/CCS; Titled details "Pinout Chart, Receptacles, and Plug Details"; Corrected Equipment Cable Plug table to P1.

Sheet 5: Added "Traffic Flow" in each lane; Updated Note #3 to read “Twist loop leads at the rate of 8 to 16 twists per foot. Extend the twisted pair loop wire directly to the cabinet. No splicing of the loop leads will be permitted.” Deleted Note #6; Moved DETAILS 'A' THRU 'C' to Sheet 18; Titled sheet "Continuous Count Station Traffic Monitoring Site - TTMS/CCS - Lane Layout for TTMS/CCS Inductive Loop and Axle Sensors"; Updated callouts to specify "non weight" axle sensors; Renumbered notes

Sheet 6: New Sheet 11 - Weigh-In-Motion Monitoring Site -Redeveloped to show Lane Layout for TTMS/CCS Inductive Loop and Weigh-In-Motion Sensors.

NEW Sheet 6: - Short Term Traffic Monitoring Site - PTMS - Cabinet Layout Details (Four Lanes or Less).

Sheet 7: Deleted Sheet.

NEW Sheet 7: Short Term Traffic monitoring Site - PTMS - Cabinet Layout Details (Five to Eight Lanes).

Sheet 8: New Sheet 19 - Non-Intrusive Vehicle Sensor; Added Note 4 - "Cabinet, ground rod pull box, and maintenance service slab installed per Index 676-001, expect cabinet center will be 4 feet above grade."; Added Maintenance Service Slab and Pull Box for ground rod to the ELEVATION detail.

NEW Sheet 8: Short Term Traffic Monitoring Site - PTMS - Lane Layout for TMS Inductive Loop and Axle Sensors.

Sheet 9: New Sheet 20 - Added Title "Solar Power Pole with Pole Mounted Cabinet and Pedestal Mounted Cabinet Details"; Updated Note 1 to read "Cabinet, ground rod pull box, and maintenance service slab installed per Index 676-001, expect cabinet center will be 4 feet above grade."; Added Maintenance Service Slab and Pull Box for ground rod to the two ELEVATION details; Deleted ground rod clamps and added exothermic weld call out; Updated the DETAILS lettering sequence.

NEW Sheet 9: Weigh-In-Motion Monitoring Site - Cabinet Layout Details (Four Lanes or Less).

Sheet 10: New Sheet - Weigh-In-Motion Monitoring Site - Cabinet Backplane Details

Sheet 11: New Sheet - Previous Sheet 6.

Sheet 12: New Sheet - Non-Motorized Monitoring Site - Cabinet Layout Details.

Sheet 13: New Sheet - Non-Motorized Monitoring Site - Cabinet Sideplane and Cabinet Backplane Details.

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Standard Plans:

Index Number: 695-001

Sheet Number (s): 1 through 9

Index Title: Traffic Monitoring Site

Additional Information, as needed:

Sheet 14: New Sheet - Non-Motorized Monitoring Site - Narrow Side Path Configurations.

Sheet 15: New Sheet - Non-Motorized Monitoring Site - Large Shared Use Path Configurations.

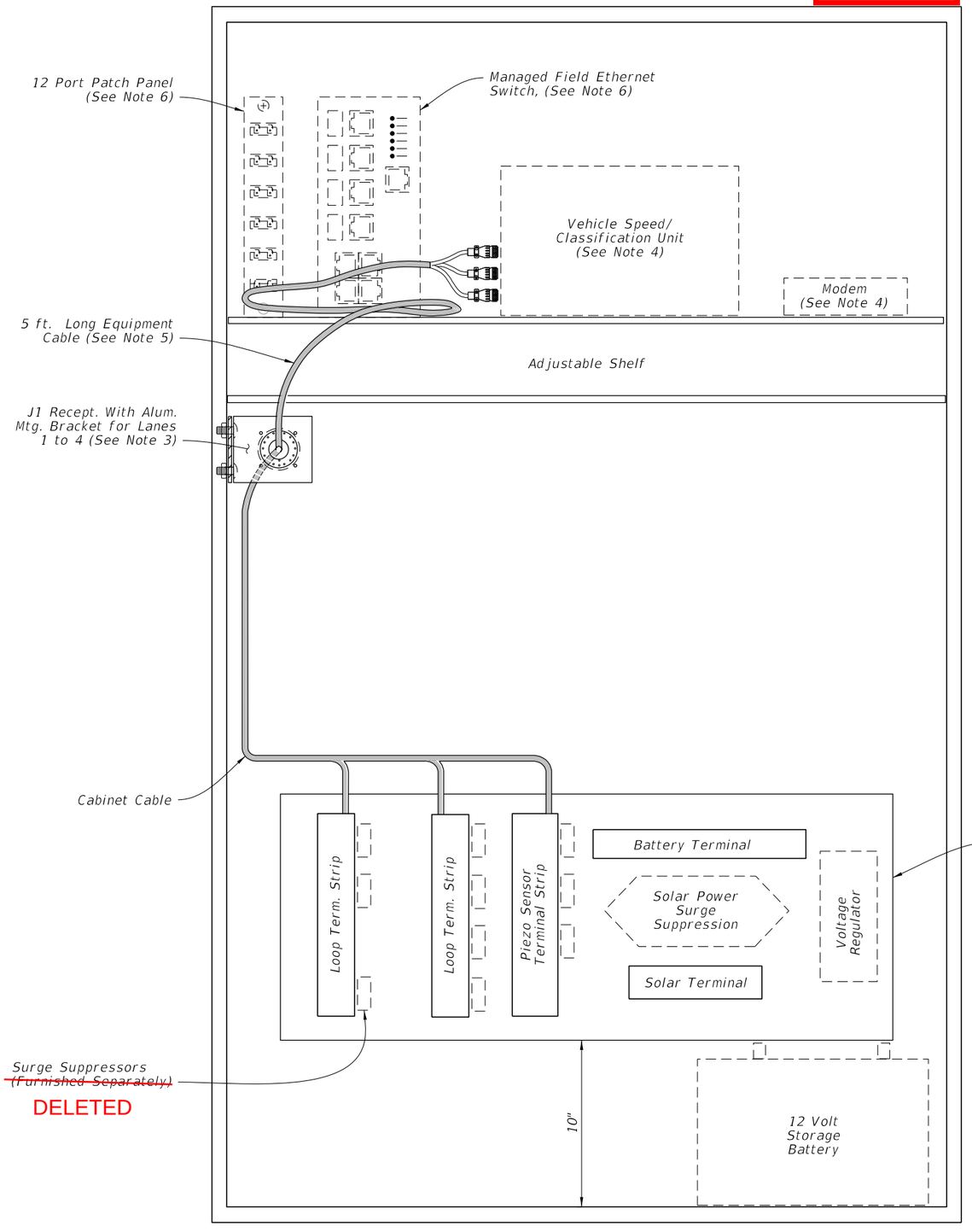
Sheet 16: New Sheet - Non-Motorized Monitoring Site - Extra Large Shared Use Path Configurations.

Sheet 17: New Sheet - Non-Motorized Monitoring Site - Paved Sidewalk Configuration.

Sheet 18: New Sheet - Details 'A' thru 'F'.

Sheet 19: New Sheet - Previous Sheet 8.

Sheet 20: New Sheet - Previous Sheet 9.



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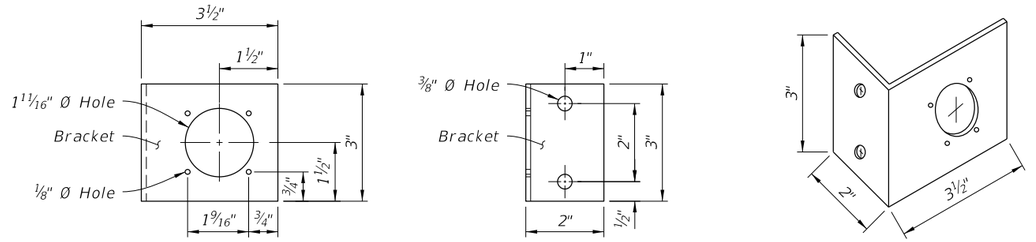
ADDED: Modem Antenna (See Note 4)

ADDED: Table of Cotents



NOTE:

Fabricate bracket out of 3/32" – ⅛" inch thick aluminum. Dimensions may vary depending on the manufacturer of the J1 receptacle being furnished. The cabinet manufacturer will construct the mounting bracket to fit the receptacle.

J1 MOUNTING BRACKET

MOVED TO: Sheet 18 as DETAIL 'A'

UPDATE NOTE:

D. One P1 equipment cable 5 ft. long (See Sheet 4);

UPDATE NOTES:

4. Provide and install a Speed/Classification Unit, Modem, and Antenna.

6. Provide and install a 12-fiber single mode cable, a 12-port patch panel, and a managed field ethernet switch.

NOTES:

1. Traffic monitoring site cabinet includes:
   A. One adjustable Shelf; (equipped as shown)
   B. One backplane assembly; (equipped as shown)
   C. One J1 receptacle with mounting bracket;
   ~~D. One J1 equipment cable 5 ft. long (Reference Sheet 4);~~
   E. All Associated wiring and wiring harnesses.

2. Basic backplane assembly consists of:
   A. Two inductive loop terminal strips;
   B. One piezo sensor terminal strip;
   C. One battery terminal strip;
   D. One solar panel terminal strip.

3. The contractor is responsible for contacting the TMS Manager at the Transportation Data and Analytics Office for lane number information and verification.

4. ~~Speed/Classification Unit and Modem furnished separately~~.

5. Cable ends must be fabricated to fit the vehicle speed/ classification unit. (Reference Sheet 4)

6. ~~Provide a 12 fiber single mode cable, a 12 port patch panel, and a managed field ethernet switch separately.~~

UPDATED NOTE 5
To be consistent with other sheets

UPDATE TITLE: Continuous Count Station Traffic Monitoring Site TTMS/CCS → CABINET LAYOUT DETAILS (Four Lanes or Less)

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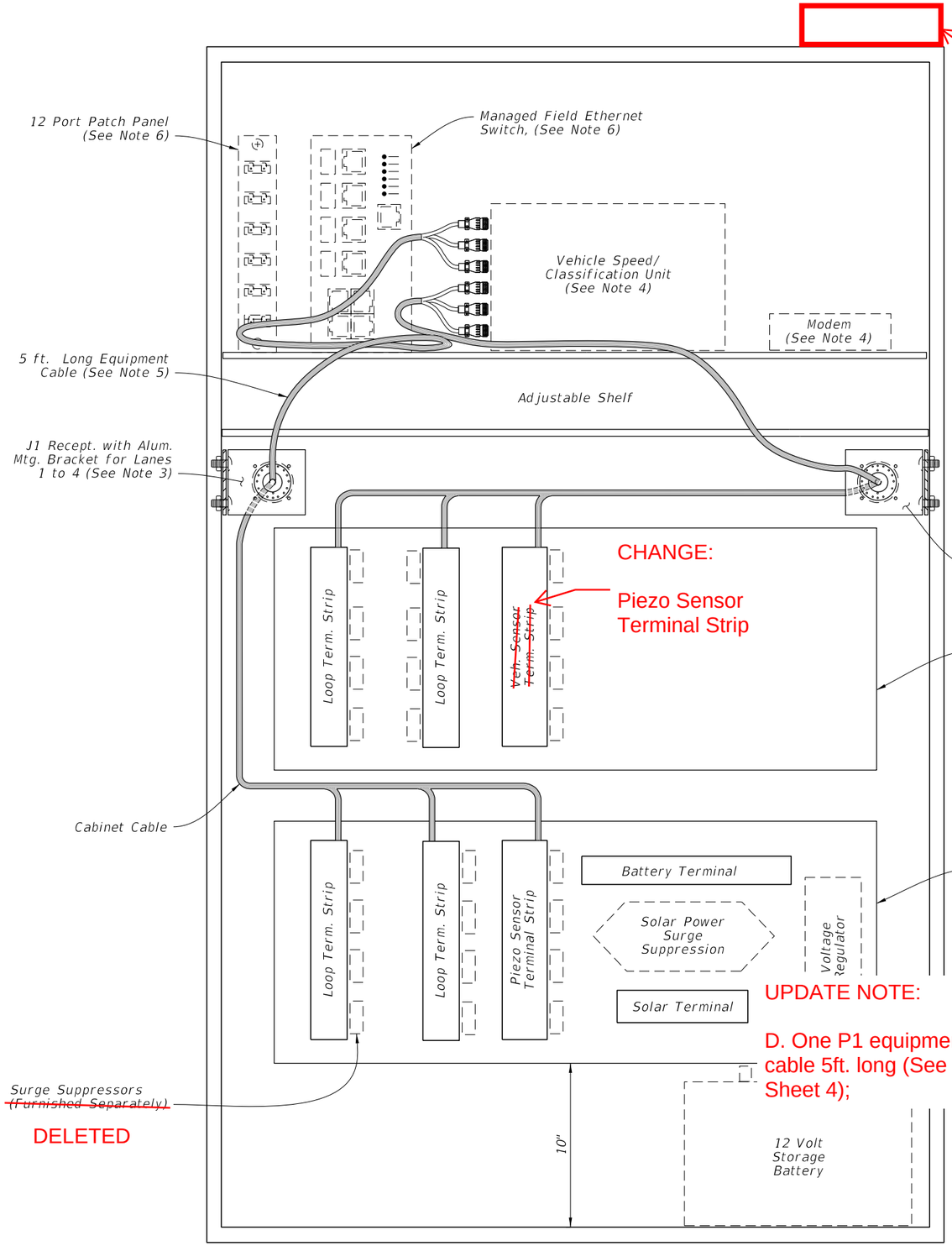
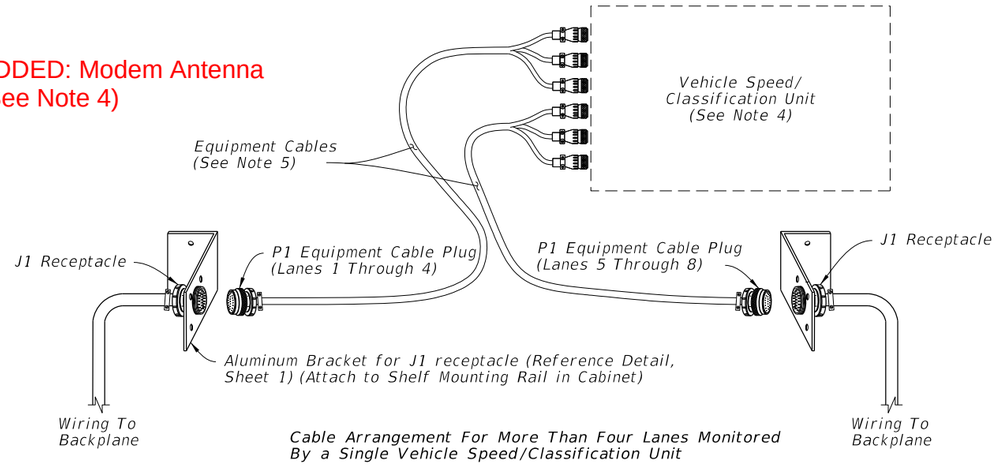
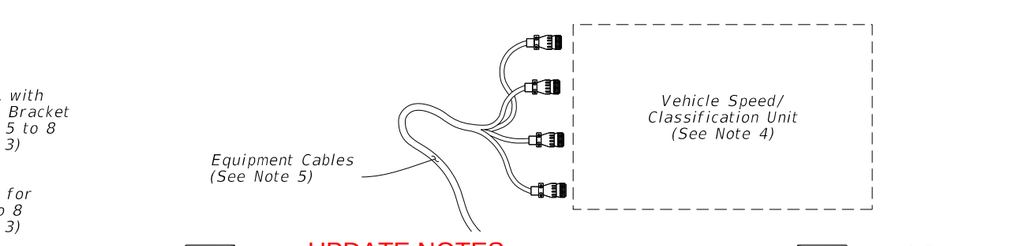




Cable Arrangement For More Than Four Lanes Monitored By a Single Vehicle Speed/Classification Unit

OPTION A (Shown)



UPDATE NOTES:

4. Provide and install a Speed/Classification Unit, Modem, and Antenna.

6. Provide and install a 12-fiber single mode cable, a 12-port patch panel, and a managed field ethernet switch.

n Four Lanes Monitored
fication Unit

SSEMBLY

UPDATED NOTE 5
To be consistent with other sheets

UPDATE NOTE:

D. One P1 equipment cable 5ft. long (See Sheet 4);

NOTES:

1. *Traffic monitoring site cabinet includes:*
   - A. *One adjustable Shelf; (equipped as shown)*
   - B. *Two backplane assembly; (equipped as shown)*
   - C. *Two J1 receptacle with mounting bracket;*
   - D. ~~*One J1 equipment cable 5 ft. long (Reference Sheet 4);*~~
   - E. *All Associated wiring and wiring harnesses.*
2. *Basic backplane assembly consists of:*
   - A. *Two inductive loop terminal strips;*
   - B. *One piezo sensor terminal strip;*
   - C. *One battery terminal strip;*
   - D. *One solar panel terminal strip.*
3. *The contractor is responsible for contacting the TMS Manager in the Transportation Data and Analytics Office for lane number information and verification.*
4. ~~*Speed/Classification Unit and Modem furnished separately.*~~
5. *Cable ends must be fabricated to fit the vehicle speed/classification unit. (Reference Sheet 4 for Pinout Charts, receptacle and plug details.*
6. ~~*Provide a 12 fiber single mode cable, a 12 port patch panel, and a managed field ethernet switch separately.*~~

UPDATE TITLE: Continuous Count Station Traffic Monitoring Site TTMS/CCS → *CABINET LAYOUT DETAILS (Five to Eight Lanes)*

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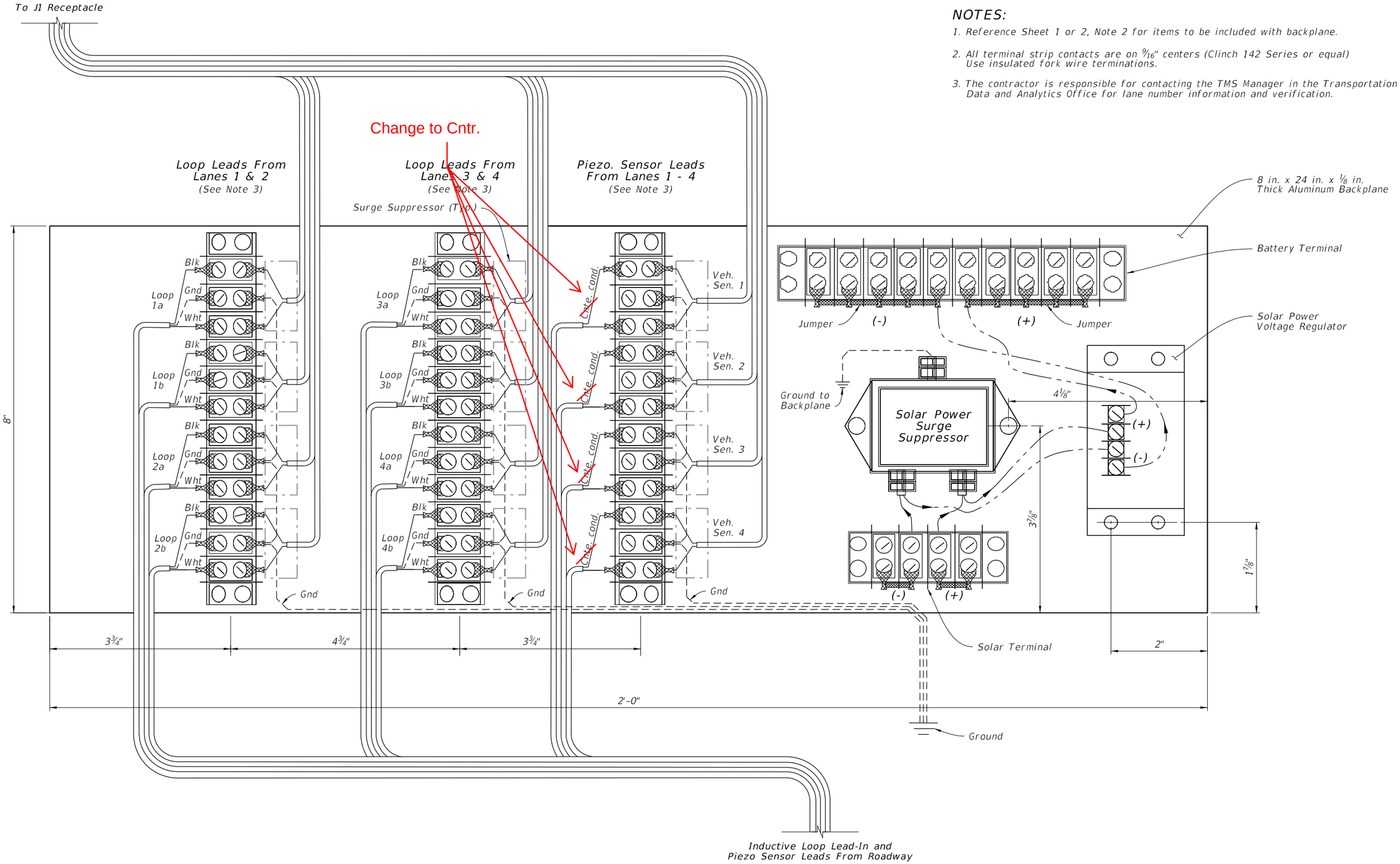
NOTES:

1. Reference Sheet 1 or 2, Note 2 for items to be included with backplane.
2. All terminal strip contacts are on 9/16" centers (Clinch 142 Series or equal) Use insulated fork wire terminations.
3. The contractor is responsible for contacting the TMS Manager in the Transportation Data and Analytics Office for lane number information and verification.



UPDATE TITLE: Continuous Count Station Traffic Monitoring Site TTMS/CCS → CABINET BACKPLANE DETAIL

LAST REVISION	REVISION	DESCRIPTION:				
~~11/01/21~~		11/01/23	FDOT FY 2023-24 STANDARD PLANS	TRAFFIC MONITORING SITE	INDEX 695-001	SHEET ~~3~~ 20 of 9

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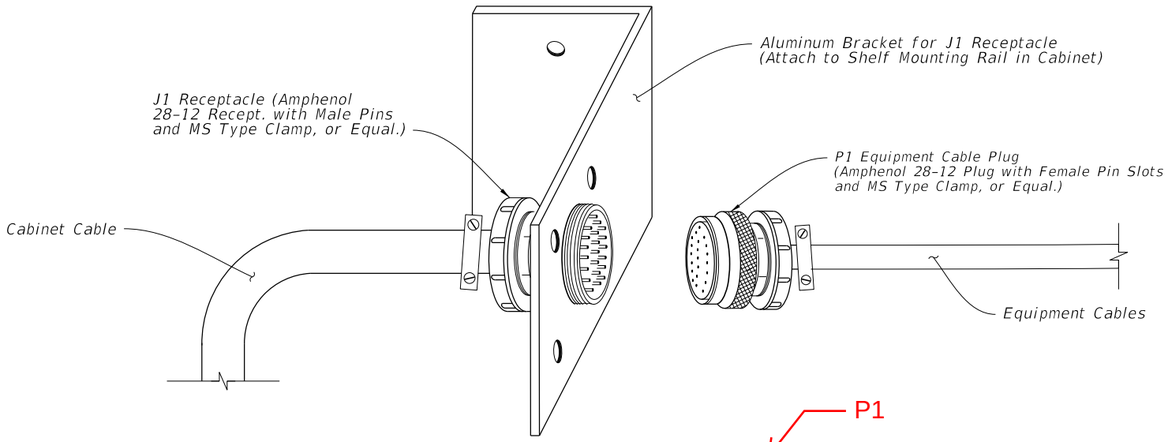
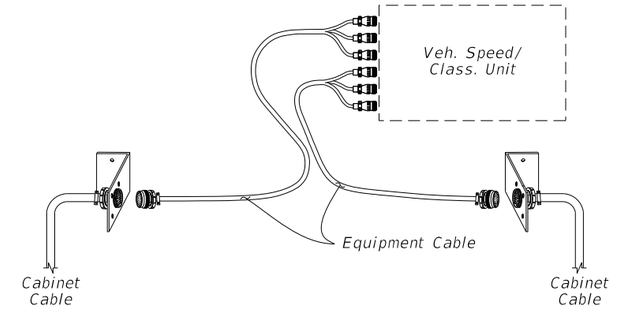


P1

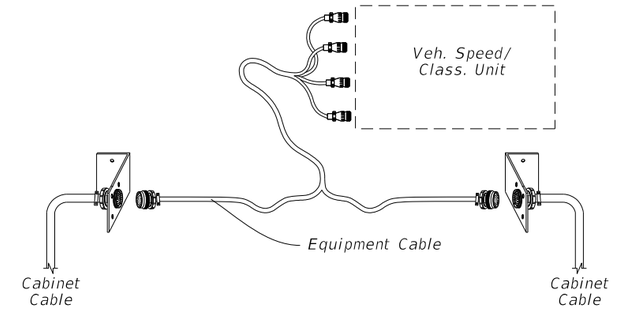
J1 RECEPTACLE PINOUT	
26 Recessed Male Pins	
A	Loop 1a (5a) white
B	Loop 1a (5a) black
C	Loop 1b (5b) red
D	Loop 1b (5b) black
E	Loop 2a (6a) green
F	Loop 2a (6a) blue
G	Loop 2b (6b) orange
H	Loop 2b (6b) tan
J	Loop 3a (7a) white
K	Loop 3a (7a) green
L	Loop 3b (7b) red
M	Loop 3b (7b) black
N	Gnd
P	Loop 4a (8a) w/white
R	Loop 4a (8a) w/black
S	Loop 4b (8b) w/red
T	Loop 4b (8b) w/green
U	Piezo 1 (5) (+) w/blue
V	Piezo 1 (5) sh w/orange
W	Piezo 2 (6) (+) w/green
X	Piezo 2 (6) sh w/red
Y	Piezo 3 (7) (+) w/black
Z	Piezo 3 (7) sh w/red/blk
a	Piezo 4 (8) (+) red/ green
b	Piezo 4 (8) sh w/green
c	Gnd

J1 EQUIPMENT CABLE PLUG		
26 Female Pin Slots		
A	Loop 1a (5a)	Connect To Electronics Unit
B	Loop 1a (5a)	
C	Loop 1b (5b)	
D	Loop 1b (5b)	
E	Loop 2a (6a)	
F	Loop 2a (6a)	
G	Loop 2b (6b)	
H	Loop 2b (6b)	
N	Gnd	
J	Loop 3a (7a)	Connect To Electronics Unit
K	Loop 3b (7b)	
L	Loop 3b (7b)	
M	Loop 3b (7b)	
P	Loop 4a (8a)	
R	Loop 4a (8a)	
S	Loop 4b (8b)	
T	Loop 4b (8b)	
d	Gnd	
U	Piezo 1 (5) (+)	Connect To Electronics Unit
V	Piezo 1 sh	
W	Piezo 2 (6) (+)	
X	Piezo 2 sh	
Y	Piezo 3 (7) (+)	
Z	Piezo 3 sh	
a	Piezo 4 (8) (+)	
b	Piezo 4 sh	

ADDED: Title:
Pinout Chart, Receptacle, and Plug Details



OPTION A



OPTION B

NOTES:

1. The contractor is responsible for contacting the TMS Manager in the Transportation Data and Analytics Office for lane number information and verification.
2. The equipment cable can accommodate up to four lanes of inductive loop and piezo sensor inputs. (Reference Sheet 1 for cabinet layout)
3. For more than four lanes and up to eight lanes of inputs, the following options are available:
   A. Second Vehicle Speed/Class. Unit and separate equipment cable connecting to a second J1 receptacle; or
   B. Single Vehicle Speed/Class. Unit capable of up to eight lanes of inputs and a single equipment cable with split ends to fit two J1 receptacles. (Reference Sheet 2 detail)
4. Numbers in parenthesis in the pinout chart identify lane numbers when a second backplane for lanes 5 through 8 is required.
5. Cable Ends must be fabricated to fit the vehicle Speed/Classification Unit.

UPDATE TITLE: Continuous Count Station Traffic Monitoring Site TTMS/CCS

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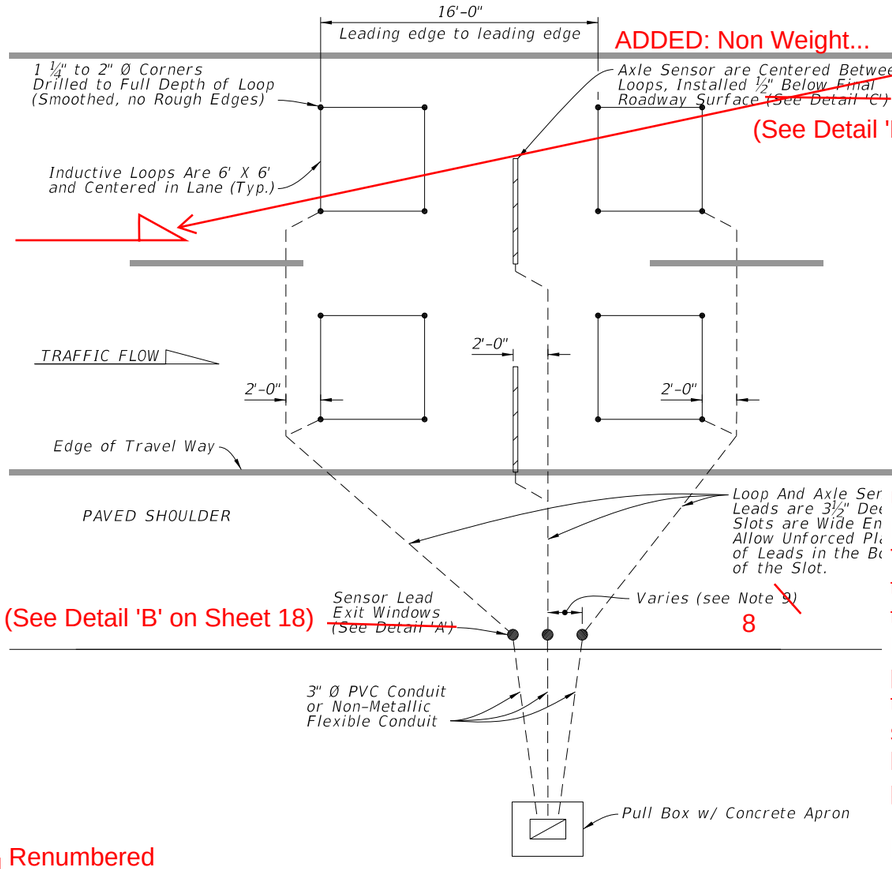
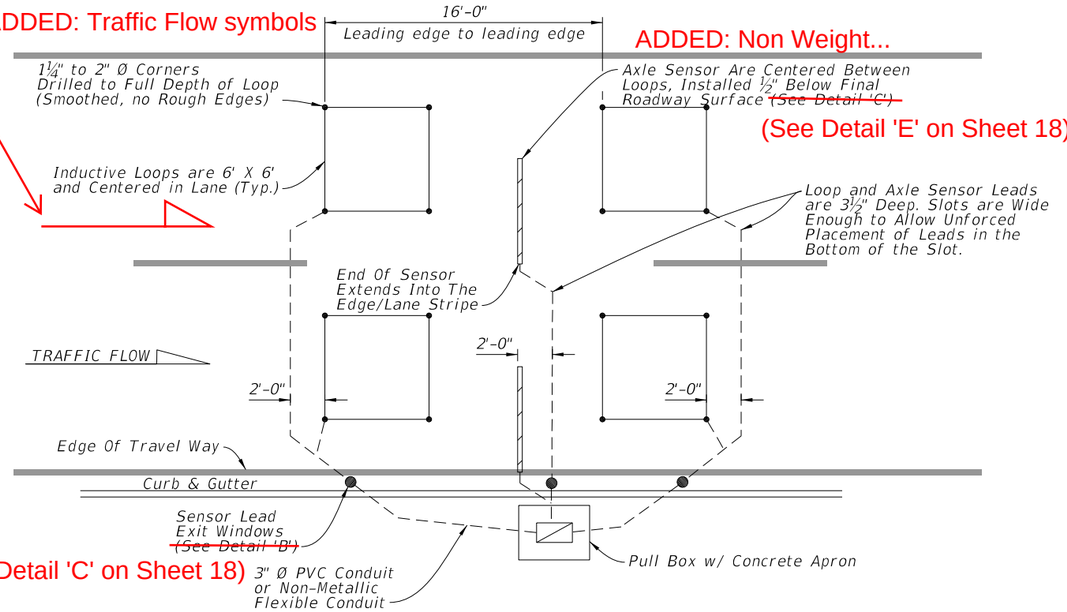


ADDED: Non Weight...

(See Detail 'E' on Sheet 18)

ADDED: Traffic Flow symbols



ADDED: Non Weight...

(See Detail 'E' on Sheet 18)

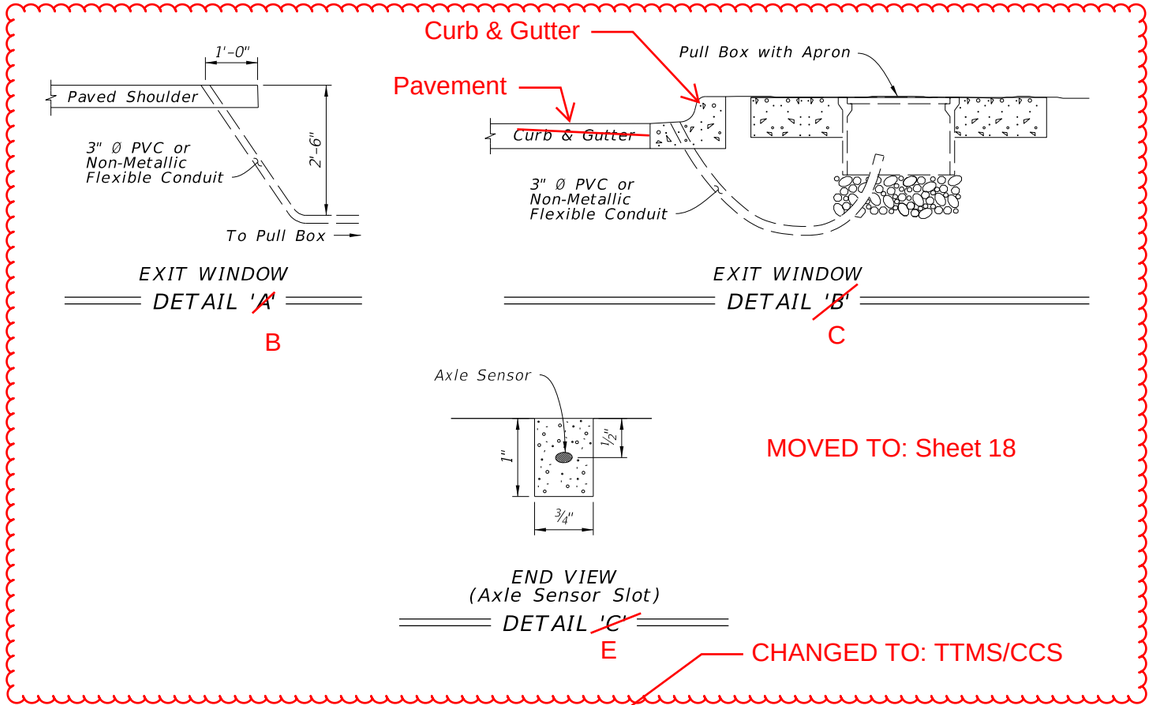
(See Detail 'C' on Sheet 18)

UPDATED NOTES

Note 3:
Twist loop leads at the rate of 8 to 16 twists per foot. Extend the twisted pair loop wire directly to the cabinet. No splicing of the loop leads will be permitted.

Note 5:
See Index 635-001 for pull box and concrete apron details

CURB & GUTTER ROADWAYS



EXIT WINDOW DETAIL 'A' ~~B~~

EXIT WINDOW DETAIL 'B' ~~C~~

END VIEW (Axle Sensor Slot) DETAIL 'C' ~~E~~

MOVED TO: Sheet 18

Renumbered

ROADWAYS WITH PAVED SHOULDERS

NOTES:

1. Install axle sensors and loops associated with axle sensors after placement of the friction course
2. Cut a 3½" deep slot for the Inductive loops. Loop slots will be cut wide enough to allow unforced placement of the wire into the bottom of the slot. Four turns of #14 AWG, place the IMSA 51-7 copper wire in the slot. Place short pieces of backer rod (2" to 3" in length) every 18" to 24" to hold the loop wire in the bottom of the slot.
3. Twist loop leads at the rate of 8 to 16 twists per foot. ~~Loops that are within 150' of the cabinet, extend the twisted pair loop wire directly to the cabinet. For distances over 150', #14 IMSA 50-2 shielded lead-in cable must be spliced to the loop wire twisted pair at the first pull box to which the loop wire is pulled.~~
4. Marking will consist of two rounds of contrasting colored tape, one color for the lane number and the second color for the lead loop location in the lane. The first band closest to the cabinet will represent the lane number, one round of tape will be for lane 1 and two rounds will be lane 2, etc. The lead loop in lane one would have one round of tape and a second round of a contrasting colored tape for the lead loop in the lane. The trailing loop would not have a second contrasting colored band of tape.
5. ~~See Index 635-001 for pull box and apron details.~~

DELETED: Note 6

6. ~~All splices will be performed using splice kits designed for direct burial. Splice kits will include screw on wire connectors and a housing with sufficient sealant to fully encapsulate the spliced connections. Taped splices are not permitted.~~
6. 7. Use a chalk line or string and paint to layout the position of the sensor and lead-in cable slots. Ensure saw cuts do not deviate more than 0.5 inches from the chalk line. Use a single blade or ganged blade saw wide enough to cut the axle sensor slot at full width in a single pass. Cutting two slots and chipping out roadway material between them is not allowed.
7. ~~8.~~ All sensor slots and any cuts in the roadway will be thoroughly blown out to ensure there is no dust or debris prior to installation of sensors or leads.
8. ~~9.~~ Install Exit Windows at least 2' apart.

TYPICAL FOR UP TO 4 LANES OF SENSOR LEADS PULLED TO ONE SIDE OF THE ROADWAY

UPDATE TITLE: Continuous Count Station Traffic Monitoring Site TTMS/CCS

CHANGED TO: TTMS/CCS

LANE LAYOUT FOR ~~TMS~~ INDUCTIVE LOOP AND AXLE SENSOR

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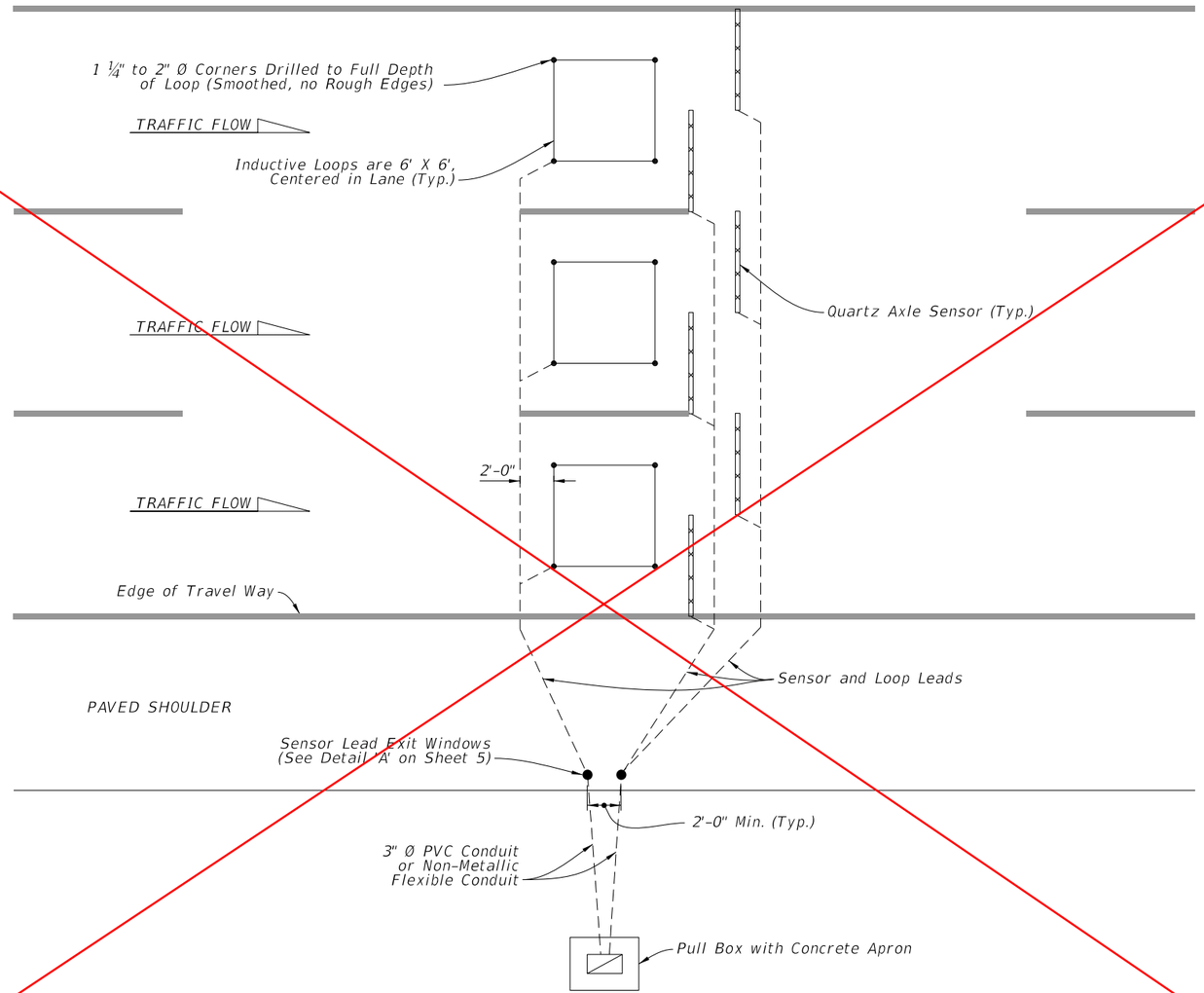
NEW SHEET 6

SHORT TERM TRAFFIC MONITORING SITE - PTMS

CABINET LAYOUT DETAILS
(Four Lanes or Less)

DELETED SHEET



TYPE III CONFIGURATION

(Commercial Vehicle Weight Enforcement System)

LANE CONFIGURATION FOR MAINLINE INDUCTIVE LOOP AND QUARTZ AXLE SENSOR

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NEW SHEET 7

SHORT TERM TRAFFIC MONITORING SITE - PTMS

CABINET LAYOUT DETAILS
(Five to Eight Lanes)

INDEX 695-001

SHEET 7 of 20

NEW SHEET 8

SHORT TERM TRAFFIC MONITORING SITE - PTMS

LANE LAYOUT FOR TMS INDUCTIVE LOOP AND AXLE SENSOR

(Typical for up to 4 Lanes of Sensor Leads Pulled to one Side of the Roadway)

NEW SHEET 9

WEIGH-IN-MOTION MONITORING SITE
CABINET LAYOUT DETAILS

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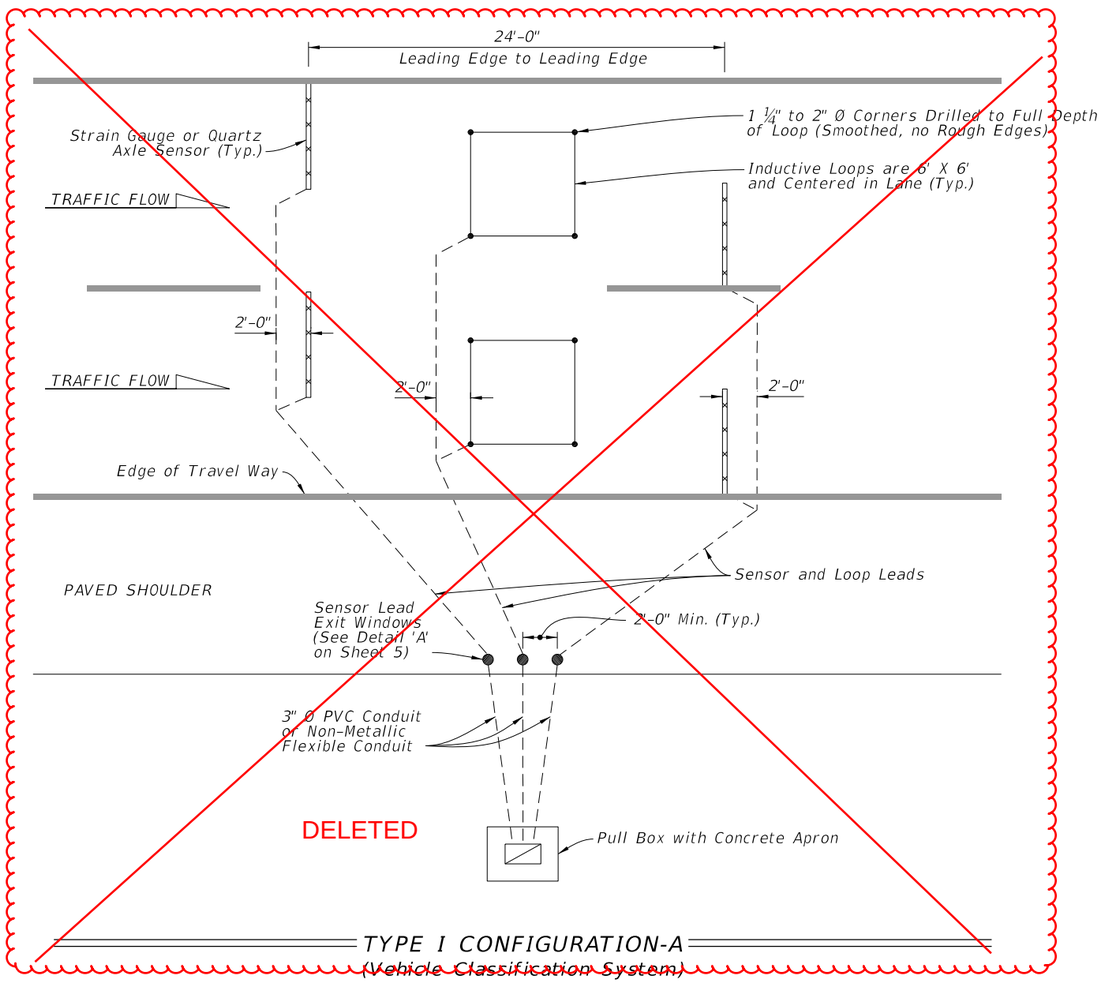
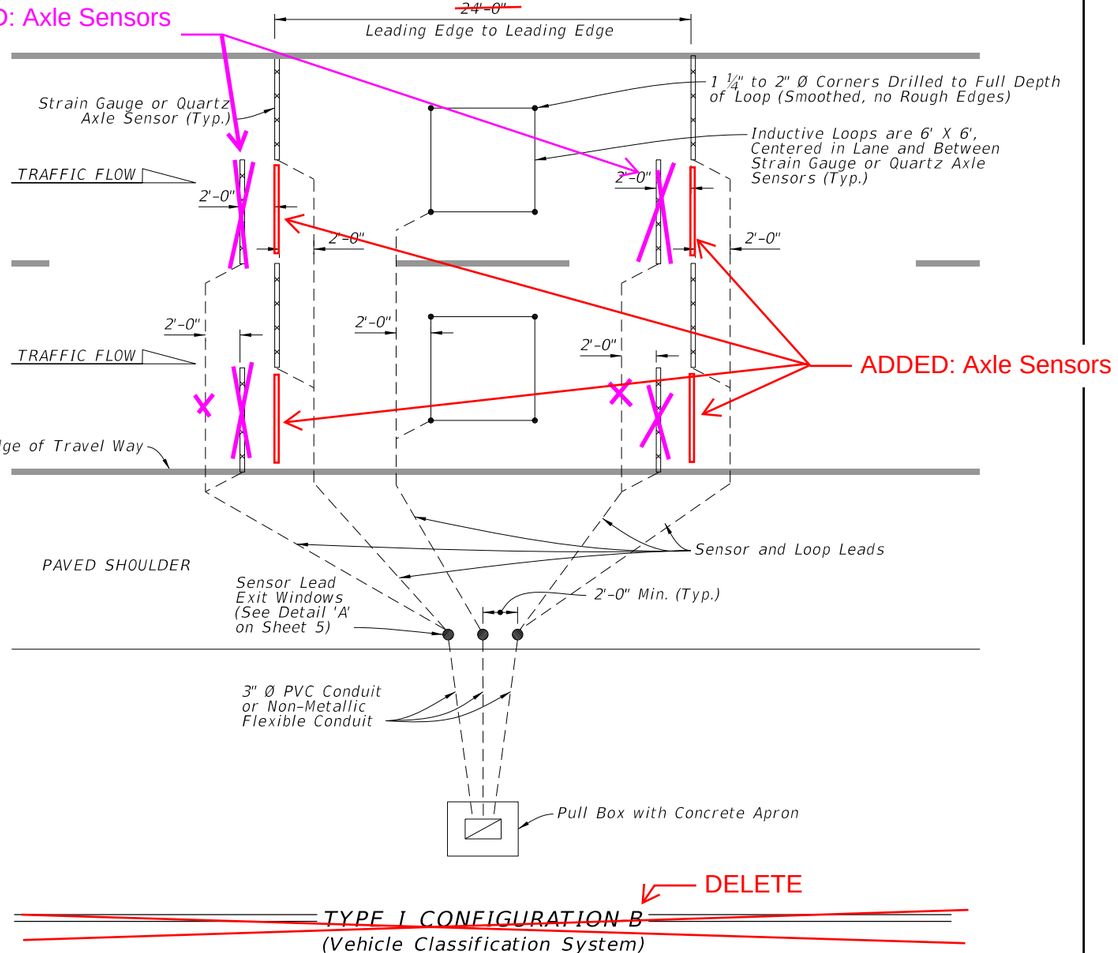
NEW SHEET 10

WEIGH-IN-MOTION MONITORING SITE
CABINET BACKPLANE DETAILS



DELETED: Axle Sensors

CHANGED TO: 12'-0"



ADDED: Axle Sensors

DELETE

ADDED NOTES: From Sheet 5

DELETED

~~NOTE:~~

~~Configuration-A and Configuration-B are based on the vehicle Speed/classification unit. Contact the TMS Manager in the Transportation Data and Analytics Office for the correct configuration.~~

UPDATE TITLE: ..AND WEIGH-IN-MOTION SENSORS

CHANGED TO: TTMS/CCS

LANE ~~CONFIGURATION~~ FOR ~~TMS~~ INDUCTIVE LOOP AND ~~STRAIN GAUGE/QUARTZ AXLE SENSOR~~

LAYOUT

WEIGH-IN-MOTION MONITORING SITE

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NEW SHEET 12

NON-MOTORIZED MONITORING SITE

CABINET LAYOUT DETAILS

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SHEET 12 of 20

NEW SHEET 13

NON-MOTORIZED MONITORING SITE

CABINET SIDEPLANE DETAILS AND CABINET BACKPLANE DETAILS

INDEX 695-001

SHEET 13 of 20

NEW SHEET 14

NON-MOTORIZED MONITORING SITE

NARROW SIDE PATH CONFIGURATIONS

NEW SHEET 15

NON-MOTORIZED MONITORING SITE

LARGE SHARED USE PATH CONFIGURATIONS

NEW SHEET 16

NON-MOTORIZED MONITORING SITE

EXTRA LARGE SHARED USE PATH CONFIGURATIONS

NEW SHEET 17

NON-MOTORIZED MONITORING SITE

PAVED SIDEWALK CONFIGURATION

NEW SHEET 18

DETAILS 'A' THRU 'F'

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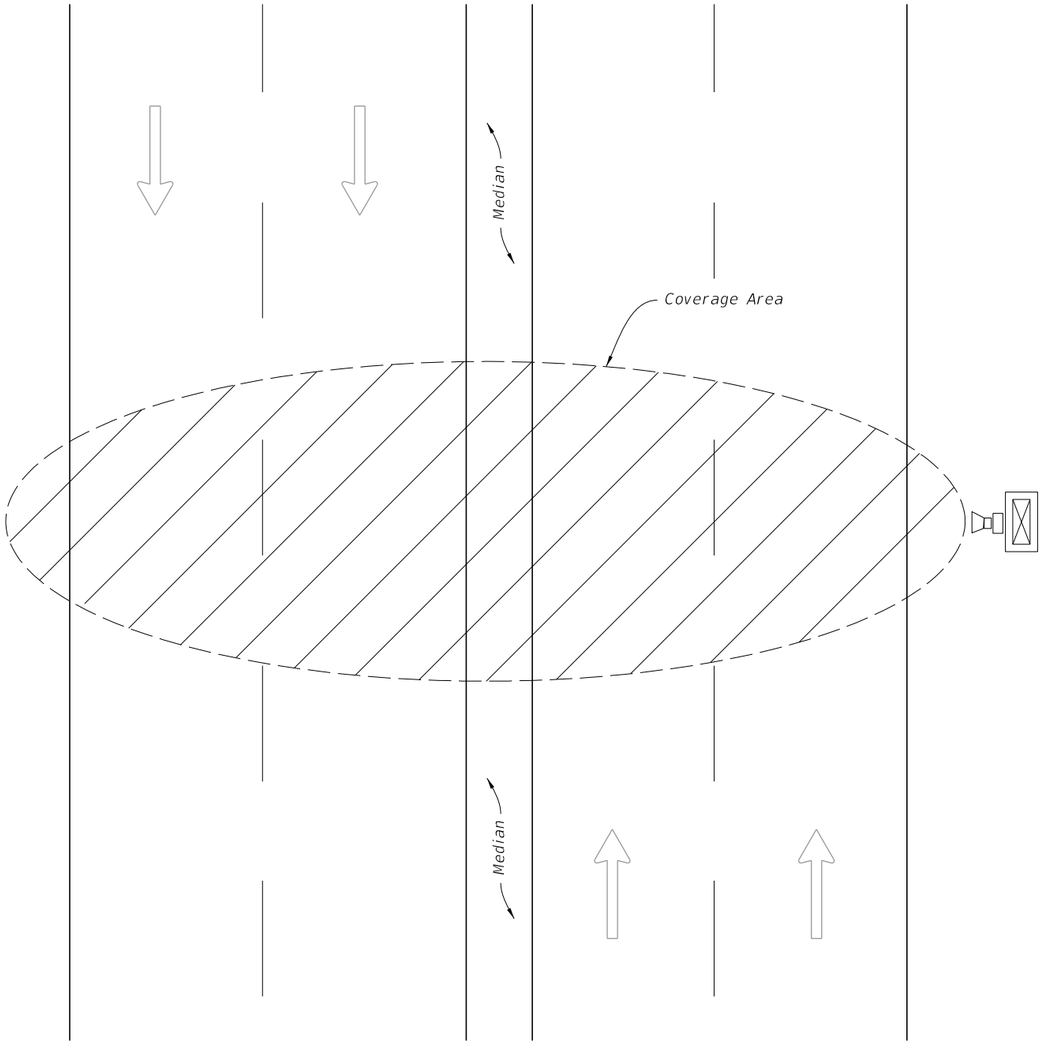
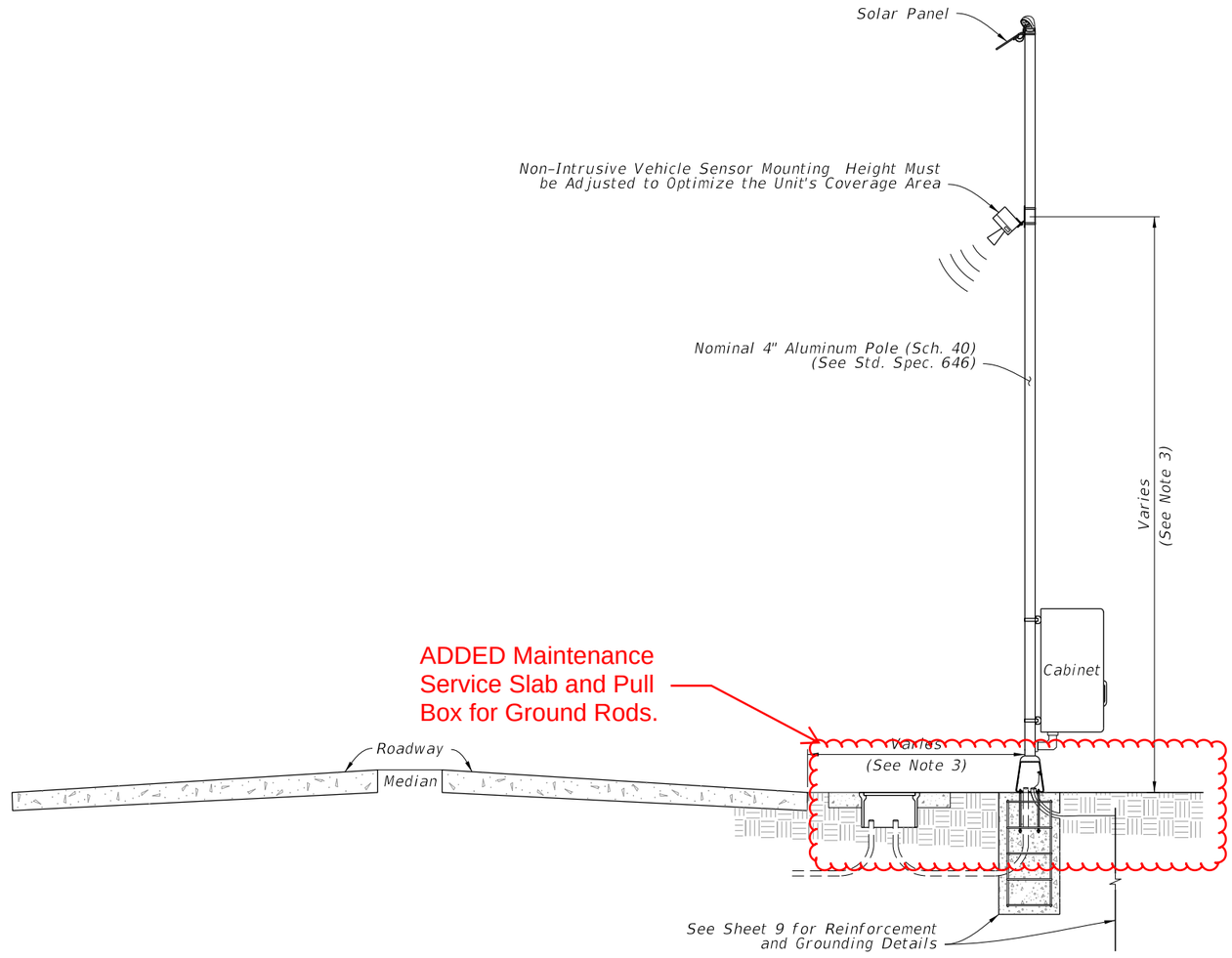
SHEET 18 of 20



PLAN



ELEVATION

NOTES:

1. The unit must be capable of detecting up to eight lanes of traffic (in either or both directions) when mounted perpendicular to the roadway.
2. Coverage area of the unit is affected by the roadway geometry: distance from the travel lanes, median type and width, barrier walls, etc.
3. Mounting height of the unit and offset from the roadway must be determined on a site-by-site basis, in accordance with the manufacturer's recommended guidelines. Offset of pole must be greater than or equal to minimum clear zone requirements.

ADDED Note 4:
Cabinet, ground rod pull box, and maintenance service slab installed per Index 676-010, expect cabinet center will be 4 feet above grade.

NON-INTRUSIVE VEHICLE SENSOR

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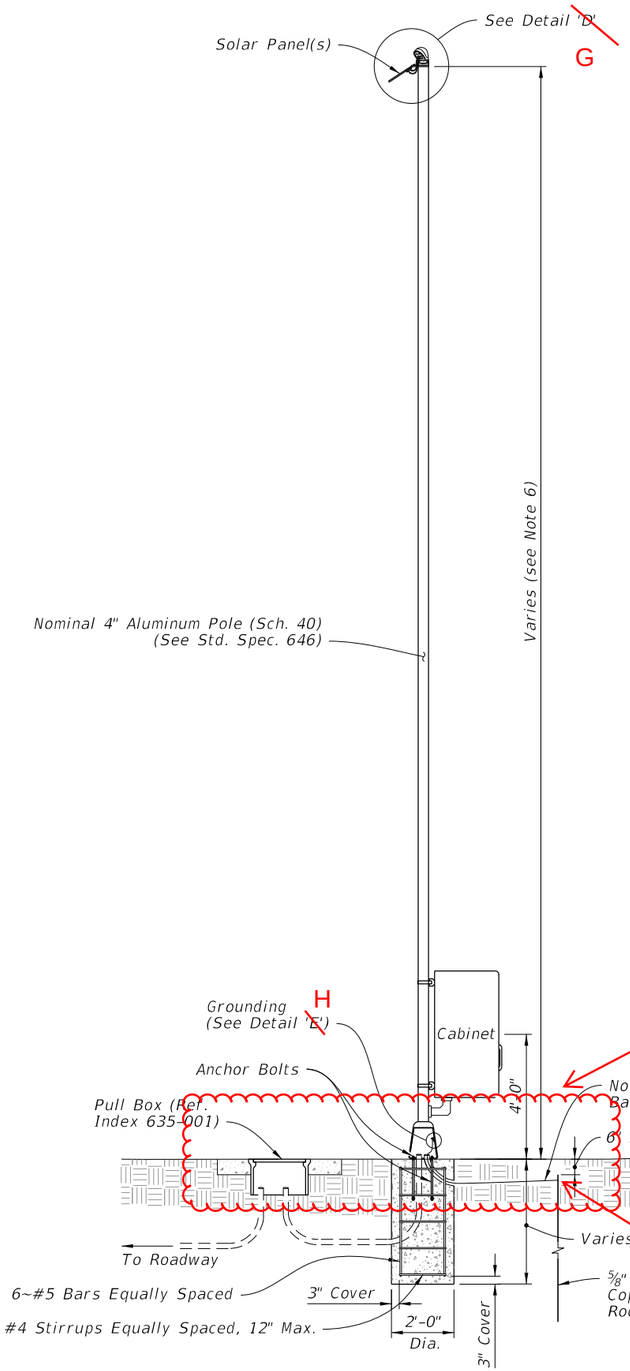


NOTES:

1. ~~Cabinet installed per Index 676-010 except cabinet center will be 4 feet above grade.~~

2. Meet the requirements of Specification 646.

3. Use #10 AWG stranded copper wire for Solar Panel Array installations, Red insulation is THHN or THWN for positive 12 volts wiring, Black insulation is THHN or THWN for negative, 12 volts wiring, Green insulation is THHN or THWN for ground bonding of the solar panel frame to the pole and earth.

4. Solar panel should be installed facing due south with angle of tilt equal to the sum of the following equation. The Latitude of the panel's location, multiplied by 0.76, plus 3.1 degrees. Equation expressed as (LAT)X(0.76)+(3.1°)

5. Encase all wiring from the weather head to the solar panel in outdoor flexible conduit.

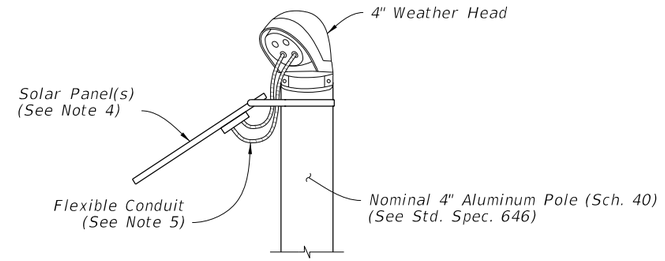
6. Concrete Base Dimensions:

   a. 4' poles: depth of 2'-0"

   b. 12' or 15' poles: depth of 3'-0"

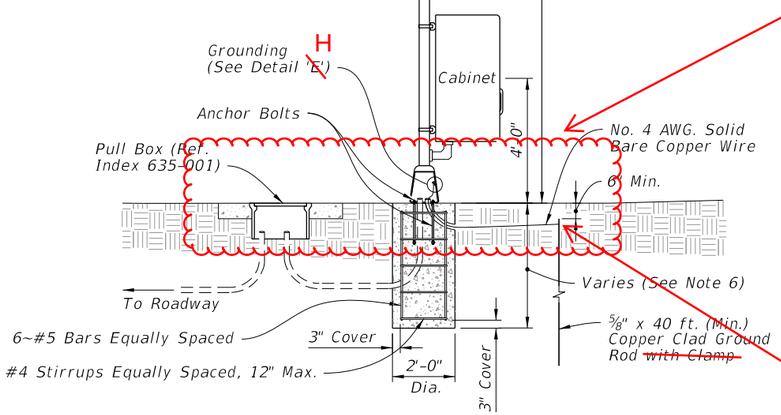
   c. 20' or 30' poles: depth of 4'-0"

UPDATED NOTE 1:
Cabinet, ground rod pull box, and maintenance service slab installed per Index 676-001, expect cabinet center will be 4 feet above grade.



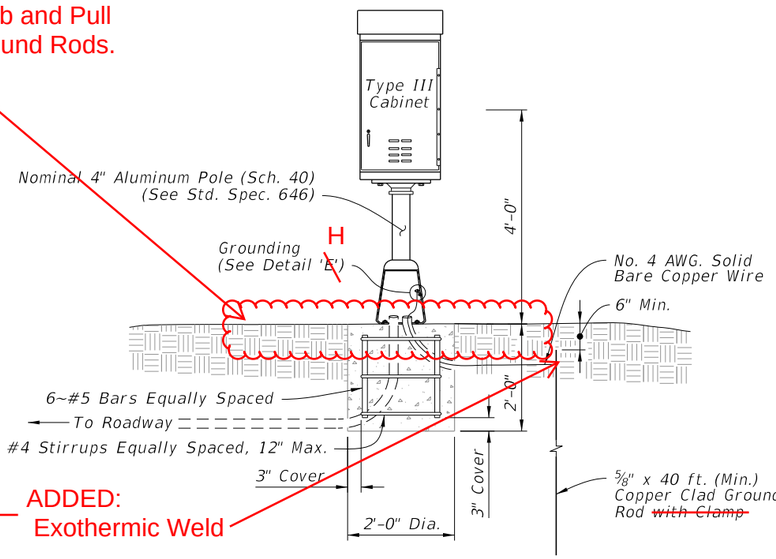
DETAIL 'D'
G

ADDED Maintenance Service Slab and Pull Box for Ground Rods.



ELEVATION

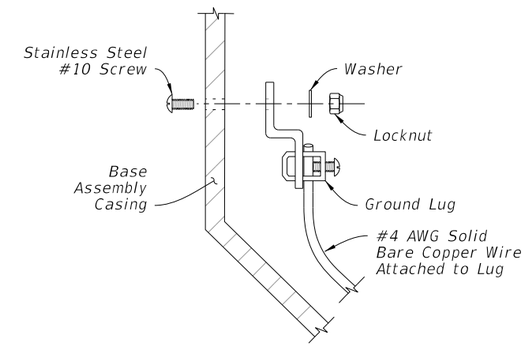
SOLAR POWER POLE
WITH POLE MOUNTED CABINET
~~(Telemeter Sites)~~
CHANGED TO: (Continuous Count Site-TTMS/CCS)



ADDED:
Exothermic Weld

ELEVATION

PEDESTAL MOUNTED CABINET
~~(Portable Traffic Monitoring Sites)~~
CHANGED TO: (Short-Term Traffic Monitoring Site-PTMS)



DETAIL 'E'
H

ADDED: Title

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LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2023-24 STANDARD PLANS	TRAFFIC MONITORING SITE	INDEX	SHEET
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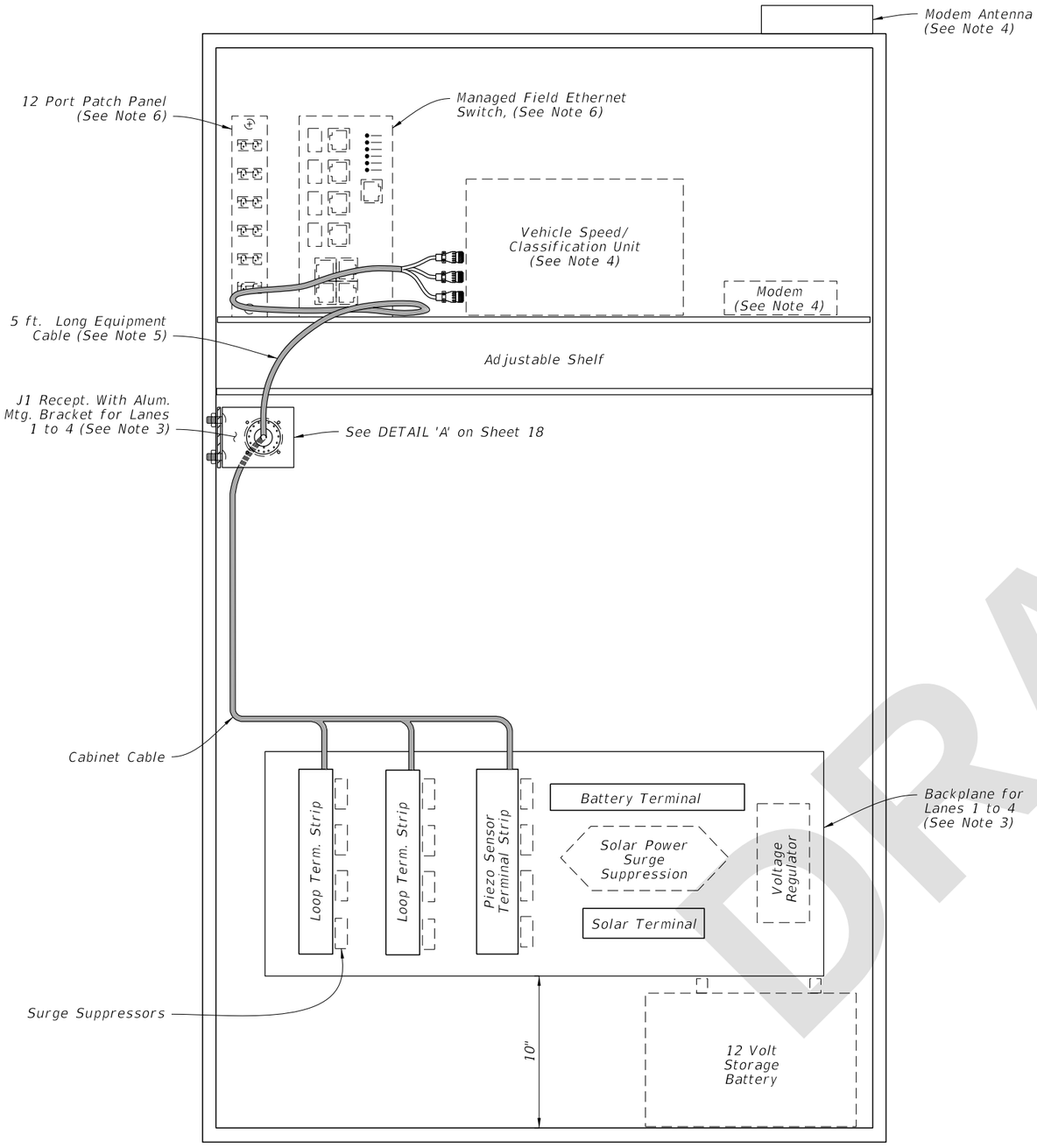

TABLE OF CONTENTS:

Sheet	Description
1	Continuous Count Station Traffic Monitoring Site – TTMS/CCS – Cabinet Layout Details (Four Lanes or Less)
2	Continuous Count Station Traffic Monitoring Site – TTMS/CCS – Cabinet Layout Details (Five to Eight Lanes)
3	Continuous Count Station Traffic Monitoring site – TTMS/CCS – Cabinet Backplane Details
4	Continuous Count Station Traffic Monitoring Site – TTMS/CCS – Pinout Chart, Receptacle, and Plug Details
5	Continuous Count Station Traffic Monitoring Site – TTMS/CCS – Lane Layout for TMS Inductive Loop and Axle Sensors
6	Short Term Traffic Monitoring Site – PTMS – Cabinet Layout Details (Four Lanes or Less)
7	Short Term Traffic Monitoring Site – PTMS – Cabinet Layout Details (Five to Eight Lanes)
8	Short Term Traffic Monitoring Site – PTMS – Lane Layout for PTMS Inductive Loop and Axle Sensors
9	Weigh-In-Motion Monitoring Site – Cabinet Layout Details
10	Weigh-In-Motion Monitoring Site – Cabinet Backplane Details
11	Weigh-In-Motion Monitoring Site – Lane Layout for TTMS/CCS Inductive Loop and Weigh-In-Motion Sensors
12	Non-Motorized Monitoring Site – Cabinet Layout Details
13	Non-Motorized Monitoring Site – Cabinet Sideplane and Cabinet Backplane Details
14	Non-Motorized Monitoring Site – Narrow Side Path Configuration
15	Non-Motorized Monitoring Site – Large Shared Use Path Configurations
16	Non-Motorized Monitoring Site – Extra Large Shared Use Path Configurations
17	Non-Motorized Monitoring Site – Paved Sidewalk Configuration
18	Details 'A' thru 'F'
19	Non-Intrusive Vehicle Sensor
20	Solar Power Pole With Pole Mounted Cabinet and Pedestal Mounted Cabinet Details

NOTES:

1. Traffic monitoring site cabinet includes:
   A. One adjustable shelf; (equipped as shown)
   B. One backplane assembly; (equipped as shown)
   C. One J1 receptacle with mounting bracket;
   D. One P1 equipment cable 5 ft. long (See Sheet 4);
   E. All associated wiring and wiring harnesses.

2. Basic backplane assembly consists of:
   A. Two inductive loop terminal strips;
   B. One piezo sensor terminal strip;
   C. One battery terminal strip;
   D. One solar panel terminal strip.

3. The contractor is responsible for contacting the TMS Manager at the Transportation Data and Analytics Office for lane number information and verification.

4. Provide and install a Speed/Classification Unit, Modem, and Antenna.

5. Cable ends must be fabricated to fit the vehicle speed/classification unit. See Sheet 4 for Pinout Charts, receptacle and plug details.

6. Provide and install a 12-fiber single mode cable, a 12-port patch panel, and a managed field ethernet switch.

CABINET LAYOUT DETAILS
(Four Lanes or Less)

CONTINUOUS COUNT STATION TRAFFIC MONITORING SITE - TTMS/CCS

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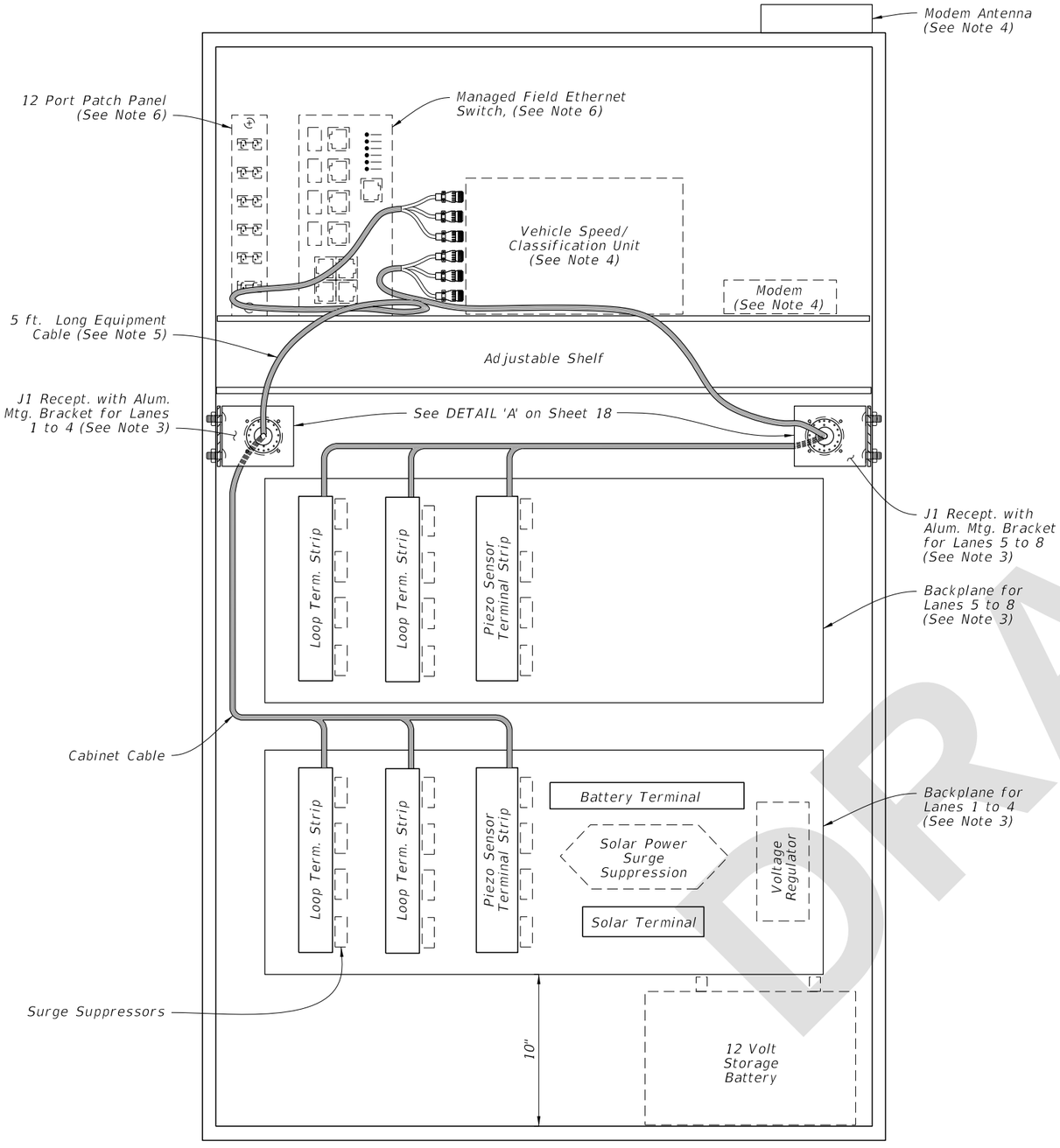
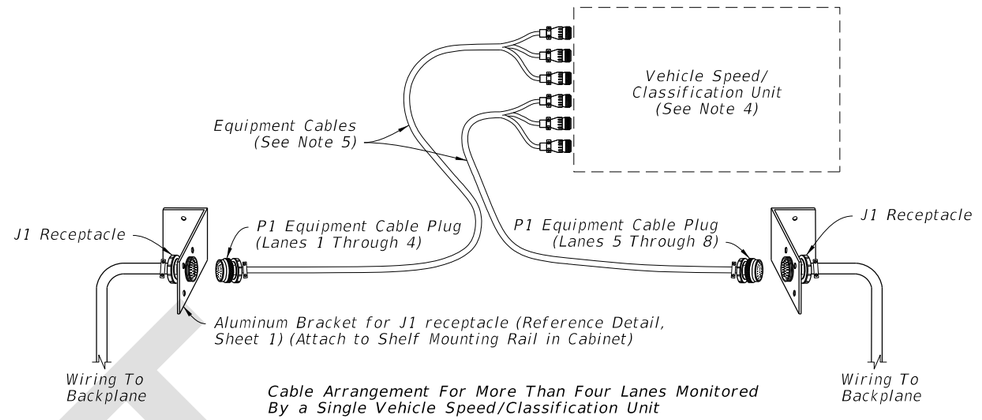
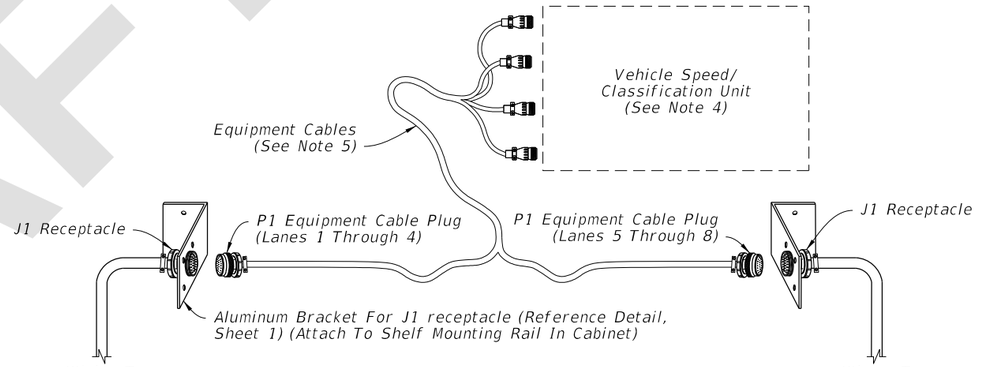




Cable Arrangement For More Than Four Lanes Monitored By a Single Vehicle Speed/Classification Unit

OPTION A
(Shown)



Cable Arrangement For More Than Four Lanes Monitored By a Single Vehicle Speed/Classification Unit

OPTION B

EQUIPMENT CABLE ASSEMBLY

NOTES:

1. Traffic monitoring site cabinet includes:
   - A. One adjustable shelf; (equipped as shown)
   - B. Two backplane assembly; (equipped as shown)
   - C. Two J1 receptacle with mounting bracket;
   - D. One P1 equipment cable 5 ft. long (See Sheet 4);
   - E. All associated wiring and wiring harnesses.
2. Basic backplane assembly consists of:
   - A. Two inductive loop terminal strips;
   - B. One piezo sensor terminal strip;
   - C. One battery terminal strip;
   - D. One solar panel terminal strip.
3. The contractor is responsible for contacting the TMS Manager in the Transportation Data and Analytics Office for lane number information and verification.
4. Provide and install Speed/Classification Unit, Modem, and Antenna.
5. Cable ends must be fabricated to fit the vehicle speed/classification unit. See Sheet 4 for Pinout Charts, receptacle and plug details.
6. Provide and install a 12-fiber single mode cable, a 12-port patch panel, and a managed field ethernet switch.

CABINET LAYOUT DETAILS
(Five to Eight Lanes)

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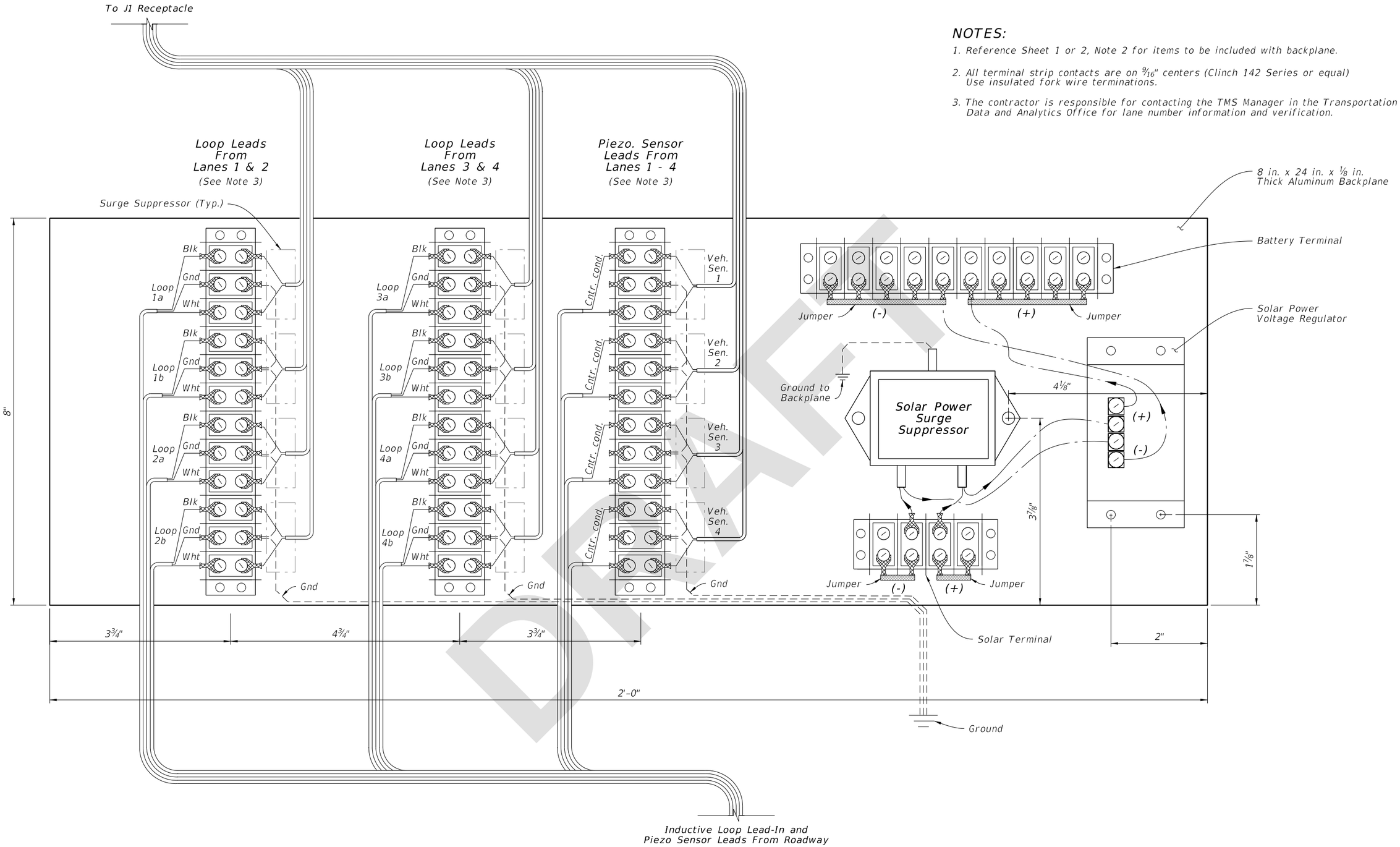
NOTES:

1. Reference Sheet 1 or 2, Note 2 for items to be included with backplane.
2. All terminal strip contacts are on 9/16" centers (Clinch 142 Series or equal) Use insulated fork wire terminations.
3. The contractor is responsible for contacting the TMS Manager in the Transportation Data and Analytics Office for lane number information and verification.



CABINET BACKPLANE DETAIL

CONTINUOUS COUNT STATION TRAFFIC MONITORING SITE - TTMS/CCS

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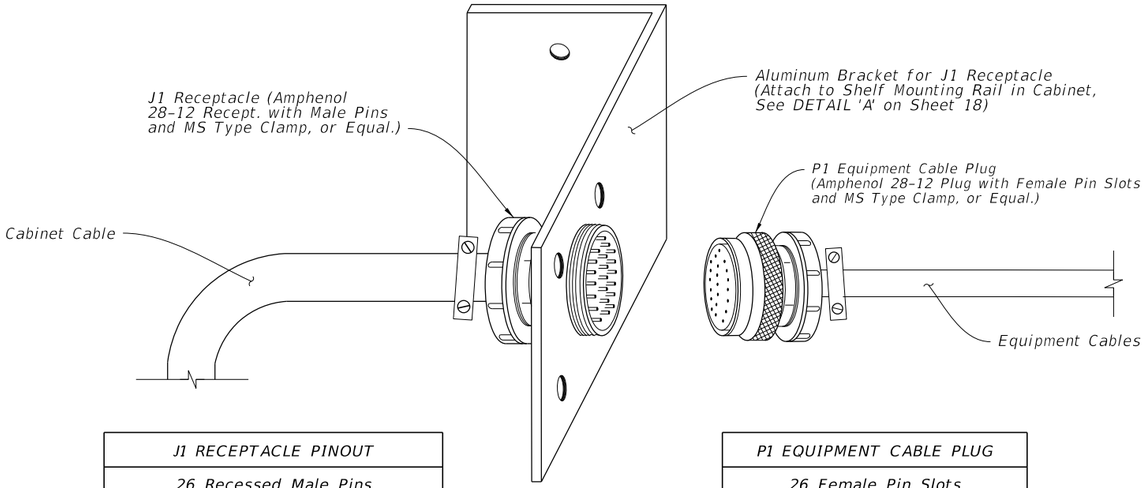
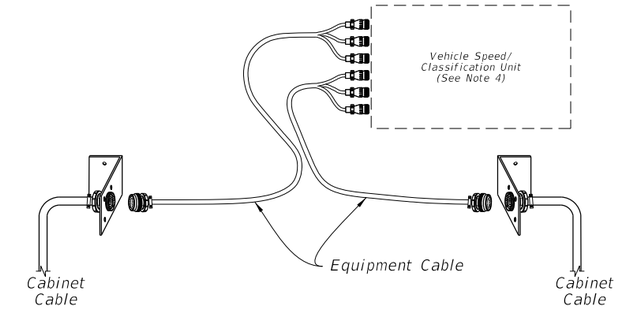


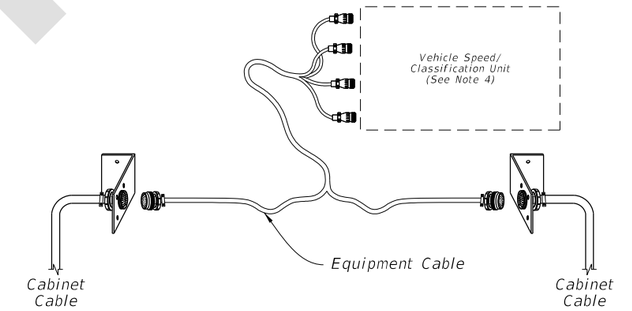
J1 RECEPTACLE PINOUT	
26 Recessed Male Pins	
A	Loop 1a (5a) white
B	Loop 1a (5a) black
C	Loop 1b (5b) red
D	Loop 1b (5b) black
E	Loop 2a (6a) green
F	Loop 2a (6a) blue
G	Loop 2b (6b) orange
H	Loop 2b (6b) tan
J	Loop 3a (7a) white
K	Loop 3a (7a) green
L	Loop 3b (7b) red
M	Loop 3b (7b) black
N	Gnd
P	Loop 4a (8a) w/white
R	Loop 4a (8a) w/black
S	Loop 4b (8b) w/red
T	Loop 4b (8b) w/green
U	Piezo 1 (5) (+) w/blue
V	Piezo 1 (5) sh w/orange
W	Piezo 2 (6) (+) w/green
X	Piezo 2 (6) sh w/red
Y	Piezo 3 (7) (+) w/black
Z	Piezo 3 (7) sh w/red/blk
a	Piezo 4 (8) (+) red/ green
b	Piezo 4 (8) sh red/white
d	Gnd green

P1 EQUIPMENT CABLE PLUG		
26 Female Pin Slots		
A	Loop 1a (5a)	Connect To Electronics Unit
B	Loop 1a (5a)	
C	Loop 1b (5b)	
D	Loop 1b (5b)	
E	Loop 2a (6a)	
F	Loop 2a (6a)	
G	Loop 2b (6b)	
H	Loop 2b (6b)	
N	Gnd	
J	Loop 3a (7a)	Connect To Electronics Unit
K	Loop 3b (7b)	
L	Loop 3b (7b)	
M	Loop 3b (7b)	
P	Loop 4a (8a)	
R	Loop 4a (8a)	
S	Loop 4b (8b)	
T	Loop 4b (8b)	
d	Gnd	
U	Piezo 1 (5) (+)	Connect To Electronics Unit
V	Piezo 1 sh	
W	Piezo 2 (6) (+)	
X	Piezo 2 sh	
Y	Piezo 3 (7) (+)	
Z	Piezo 3 sh	
a	Piezo 4 (8) (+)	
b	Piezo 4 sh	

PINOUT, RECEPTACLE, AND PLUG DETAILS



OPTION A



OPTION B

NOTES:

1. The contractor is responsible for contacting the TMS Manager in the Transportation Data and Analytics Office for lane number information and verification.
2. The equipment cable can accommodate up to four lanes of inductive loop and piezo sensor inputs. (See Sheet 1 for cabinet layout)
3. For more than four lanes and up to eight lanes of inputs, the following options are available:
   A. Second Vehicle Speed/Classification Unit and separate equipment cable connecting to a second J1 receptacle; or
   B. Single Vehicle Speed/Classification Unit capable of up to eight lanes of inputs and a single equipment cable with split ends to fit two J1 receptacles. (See Sheet 2 detail)
4. Numbers in parenthesis in the pinout chart identify lane numbers when a second backplane for lanes 5 through 8 is required.
5. Cable Ends must be fabricated to fit the vehicle Speed/Classification Unit.

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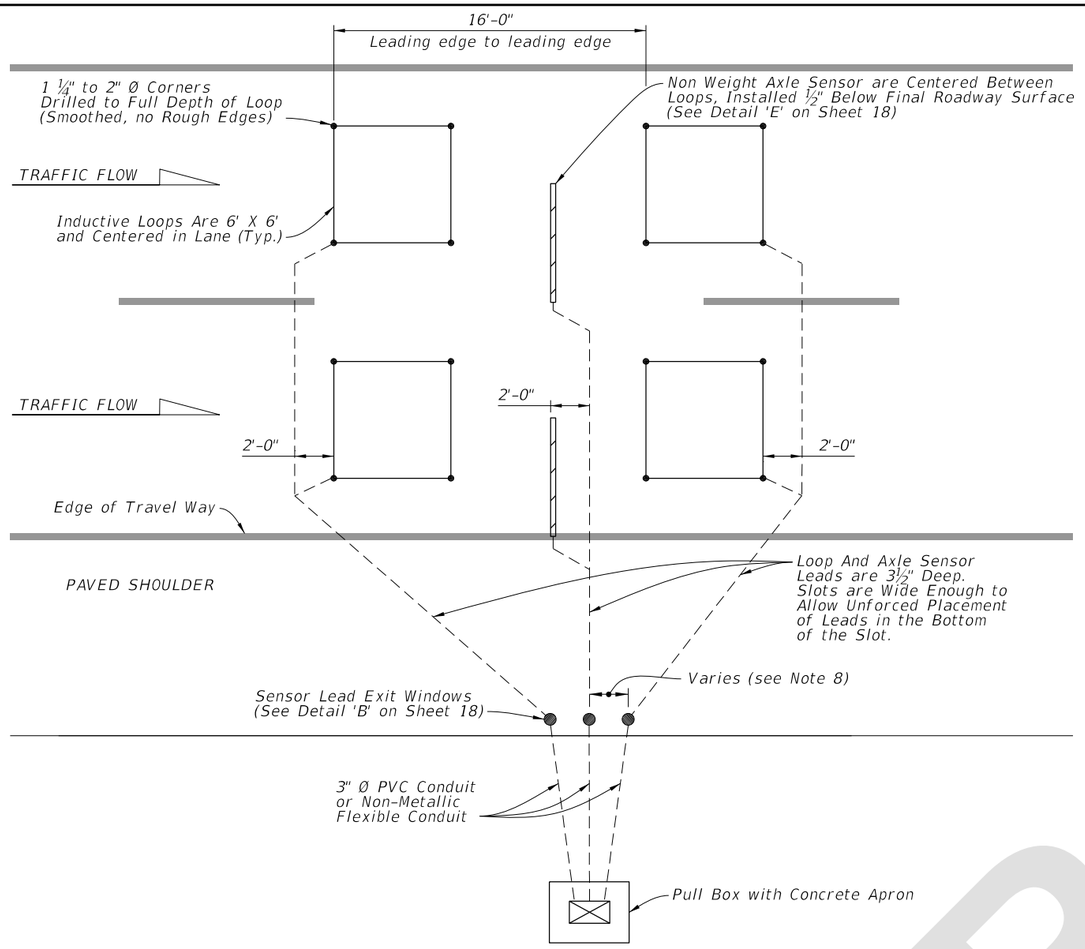
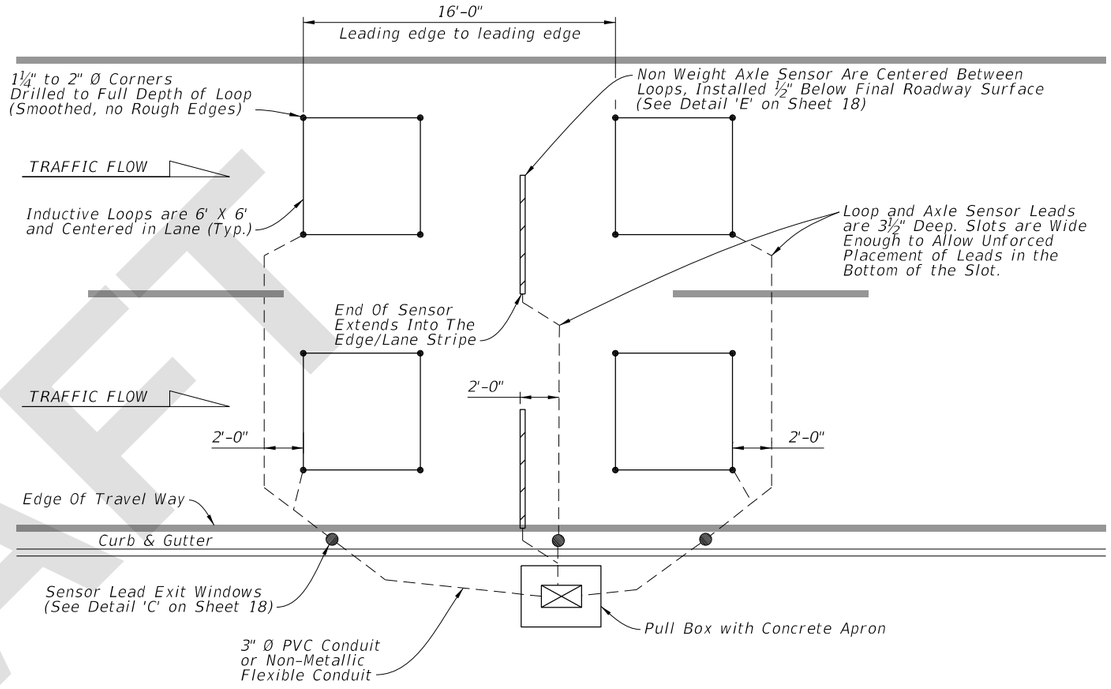


ROADWAYS WITH PAVED SHOULDERS



CURB & GUTTER ROADWAYS

NOTES:

1. Install axle sensors and loops associated with axle sensors after placement of the friction course.
2. Cut a 3½" deep slot for the Inductive loops. Loop slots will be cut wide enough to allow unforced placement of the wire into the bottom of the slot. Four turns of #14 AWG, place the IMSA 51-7 copper wire in the slot. Place short pieces of backer rod (2" to 3" in length) every 18" to 24" to hold the loop wire in the bottom of the slot.
3. Twist loop leads at the rate of 8 to 16 twist per foot. Extend the twisted pair loop wire directly to the cabinet. No splicing of the loop leads will be permitted.
4. Marking will consist of two rounds of contrasting colored tape, one color for the lane number and the second color for the lead loop location in the lane. The first band closest to the cabinet will represent the lane number, one round of tape will be for lane 1 and two rounds will be lane 2, etc. The lead loop in lane one would have one round of tape and a second round of a contrasting colored tape for the lead loop in the lane. The trailing loop would not have a second contrasting colored band of tape.
5. See Index 635-001 for pull box and concrete apron details.
6. Use a chalk line or string and paint to layout the position of the sensor and lead-in cable slots. Ensure saw cuts do not deviate more than ½" from the chalk line. Use a single blade or ganged blade saw wide enough to cut the axle sensor slot at full width in a single pass. Cutting two slots and chipping out roadway material between them is not allowed.
7. All sensor slots and any cuts in the roadway will be thoroughly blown out to ensure there is no dust or debris prior to installation of sensors or leads.
8. Install Exit Windows at least 2' apart.

LANE LAYOUT FOR TTMS/CCS INDUCTIVE LOOP AND AXLE SENSORS
(Typical for up to 4 Lanes of Sensor Leads Pulled to one Side of the Roadway)

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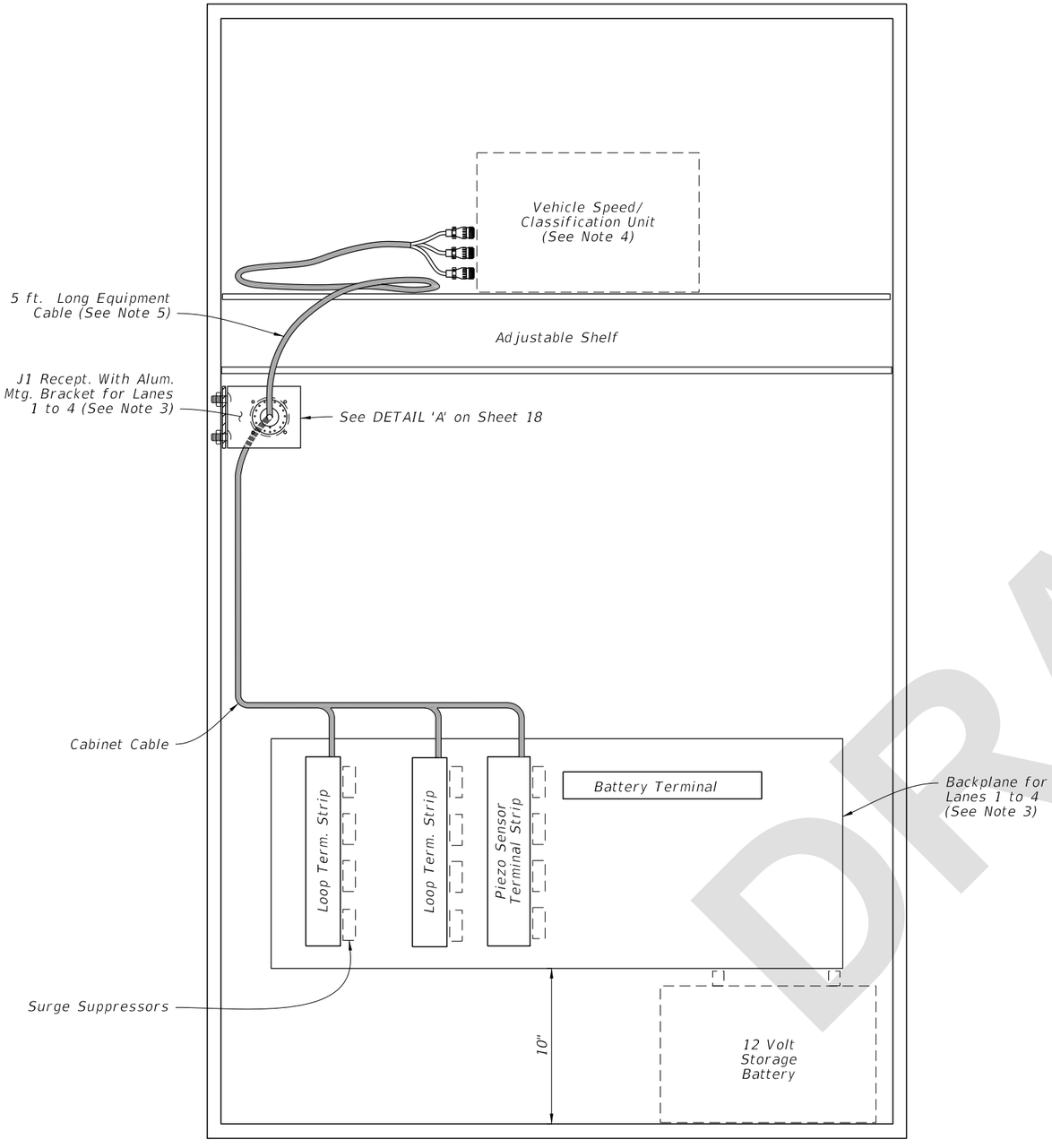
CONTINUOUS COUNT STATION TRAFFIC MONITORING SITE - TTMS/CCS



NOTES:

1. Traffic monitoring site cabinet includes:
   A. One adjustable shelf; (equipped as shown)
   B. One backplane assembly; (equipped as shown)
   C. One J1 receptacle with mounting bracket;
   D. One P1 equipment cable 5 ft. long (See Sheet 4);
   E. All associated wiring and wiring harnesses.

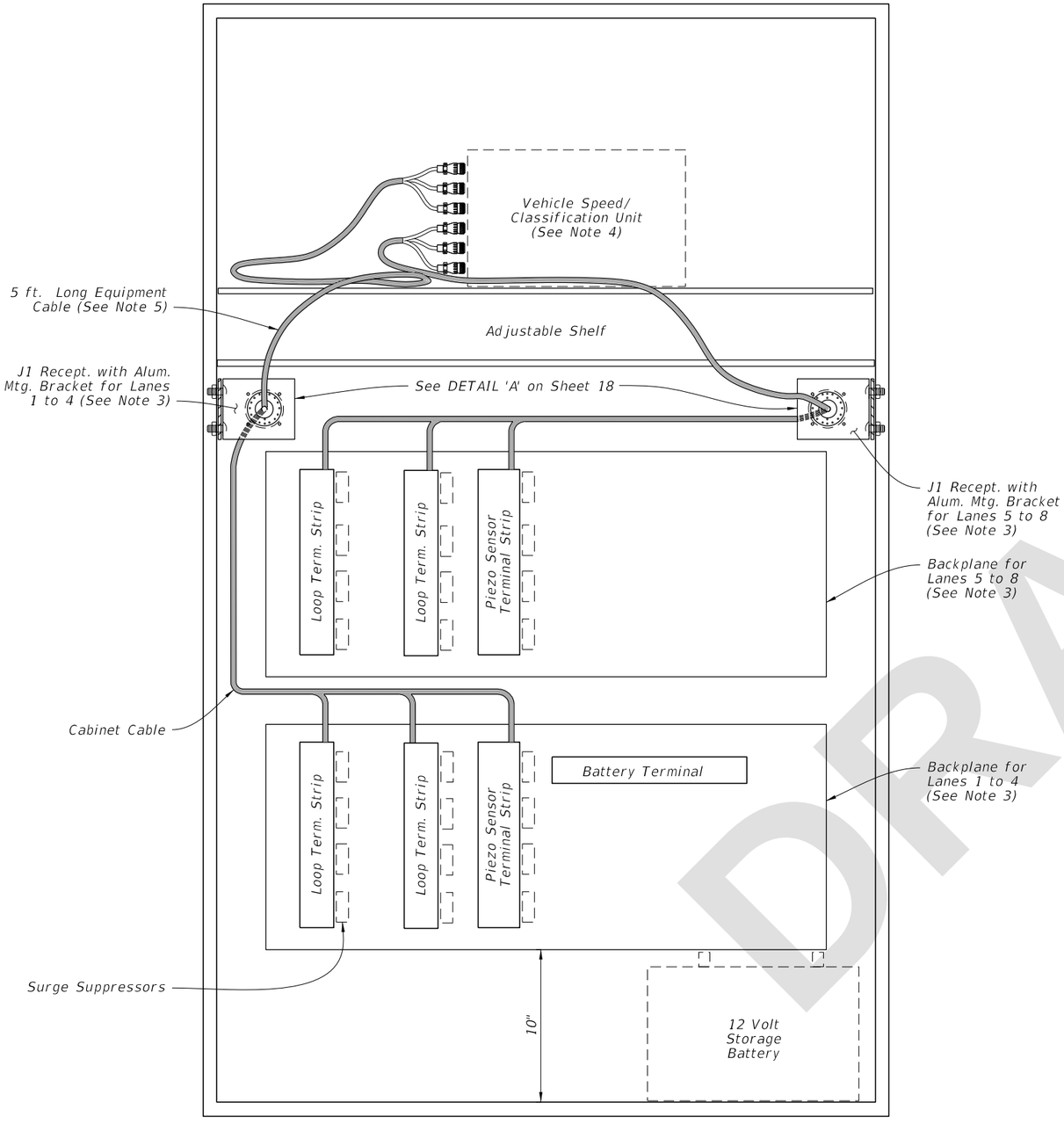
2. Basic backplane assembly consists of:
   A. Two inductive loop terminal strips;
   B. One piezo sensor terminal strip;
   C. One battery terminal strip.

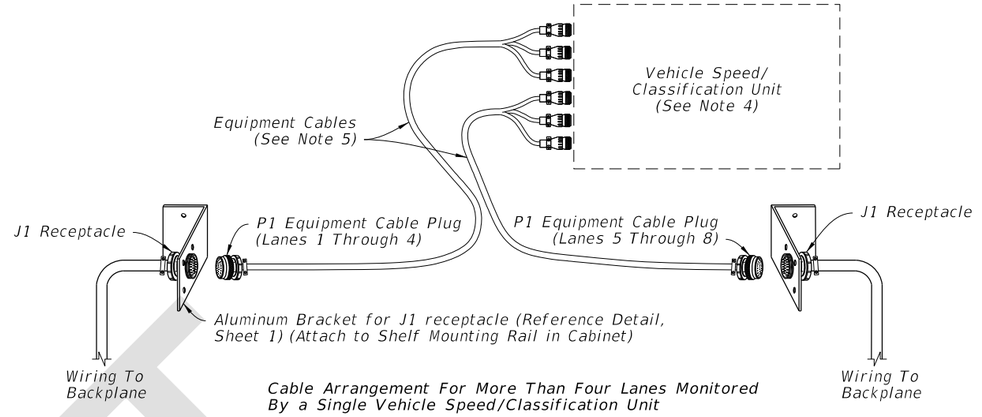
3. The contractor is responsible for contacting the District Data Collection Coordinator for lane numbering.

4. Proved and install a Speed/Classification Unit.

5. Cable ends must be fabricated to fit the vehicle speed/ classification unit. See Sheet 4 for Pinout Charts, receptacle and plug details.

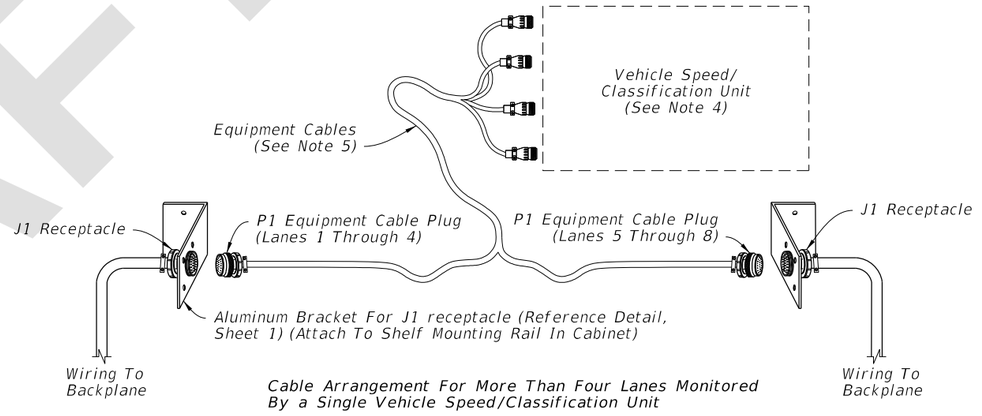
CABINET LAYOUT DETAILS
(Four Lanes or Less)





Cable Arrangement For More Than Four Lanes Monitored By a Single Vehicle Speed/Classification Unit

OPTION A (Shown)



Cable Arrangement For More Than Four Lanes Monitored By a Single Vehicle Speed/Classification Unit

OPTION B

EQUIPMENT CABLE ASSEMBLY

NOTES:

1. Traffic monitoring site cabinet includes:
   A. One adjustable shelf; (equipped as shown)
   B. Two backplane assembly; (equipped as shown)
   C. Two J1 receptacle with mounting bracket;
   D. One P1 equipment cable 5 ft. long (See Sheet 4);
   E. All Associated wiring and wiring harnesses.
2. Basic backplane assembly consists of:
   A. Two inductive loop terminal strips;
   B. One piezo sensor terminal strip;
   C. One battery terminal strip.
3. The contractor is responsible for contacting the TMS Manager in the Transportation Data and Analytics Office for lane number information and verification.
4. Provide and install Speed/Classification Unit.
5. Cable ends must be fabricated to fit the vehicle speed/classification unit. See Sheet 4 for Pinout Charts, receptacle and plug details.

CABINET LAYOUT DETAILS (Five to Eight Lanes)

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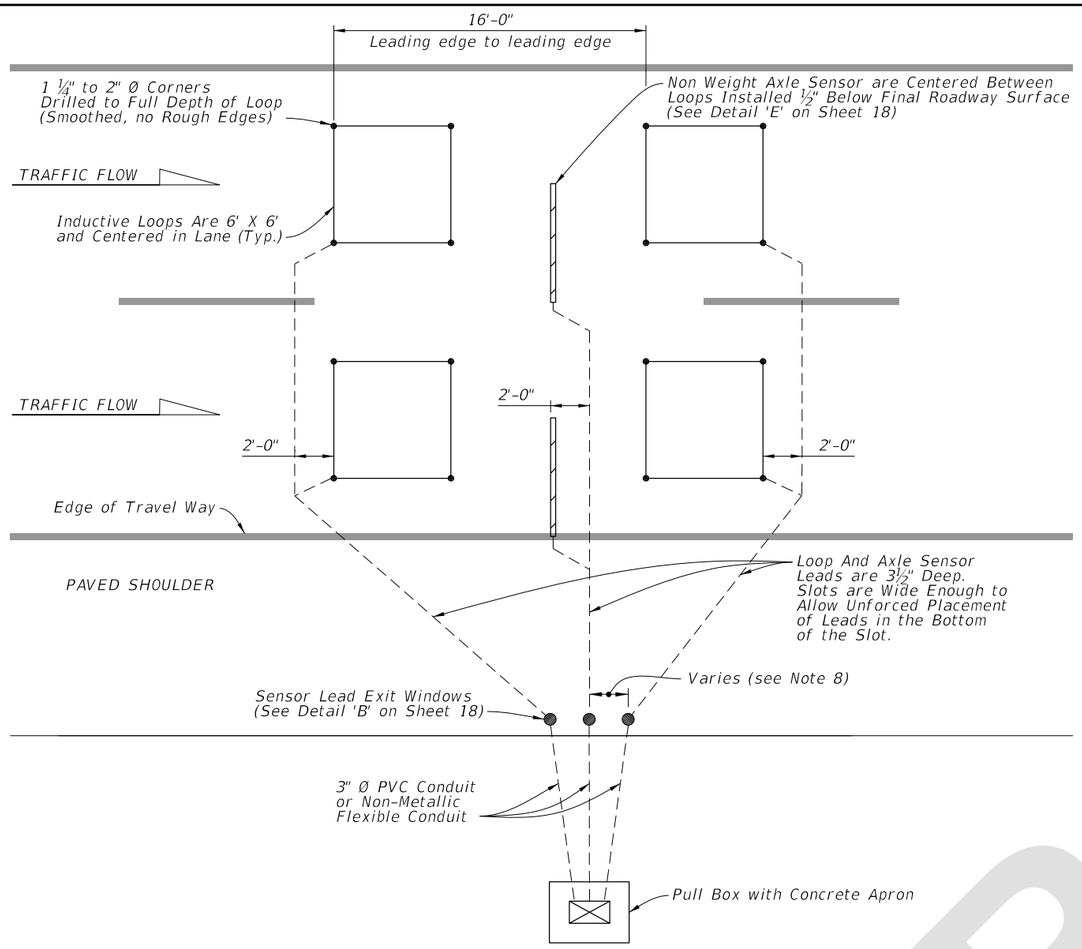
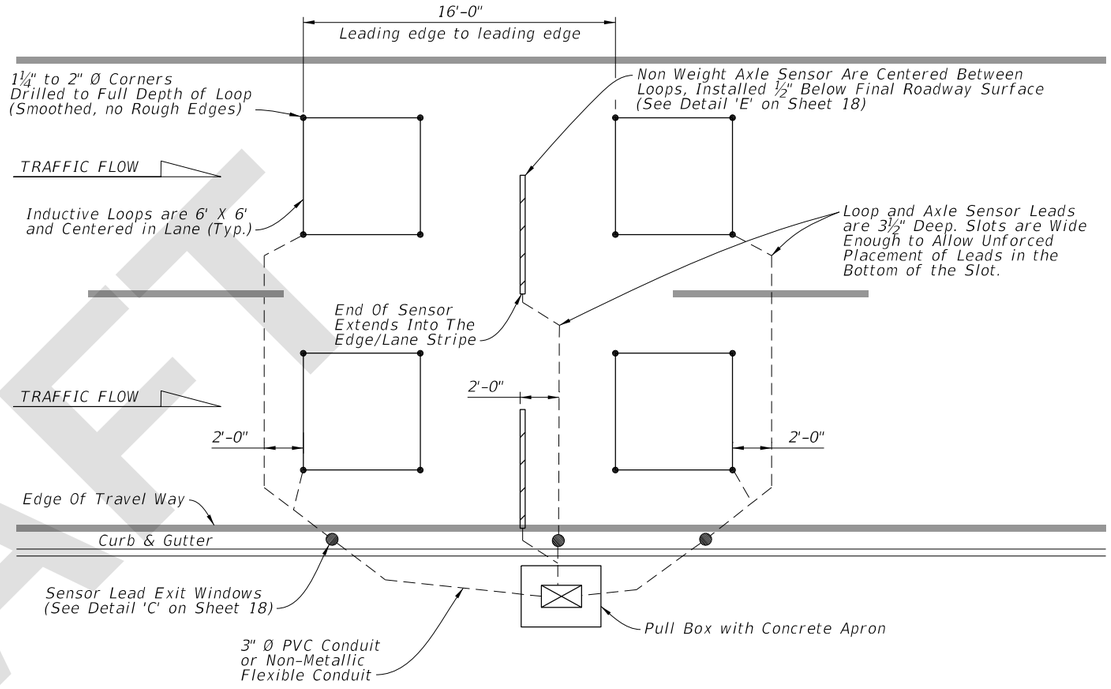


ROADWAYS WITH PAVED SHOULDERS



CURB & GUTTER ROADWAYS

NOTES:

1. Install axle sensors and loops associated with axle sensors after placement of the friction course.
2. Cut a 3½" deep slot for the Inductive loops. Loop slots will be cut wide enough to allow unforced placement of the wire into the bottom of the slot. Place four turns of #14 AWG IMSA 51-7 coper wire in the slot. Place short pieces of backer rod (2" to 3" in length) every 18" to 24" to hold the loop wire in the bottom of the slot.
3. Twist loop leads at the rate of 8 to 16 twists per foot. Extend the twisted pair loop wire directly to the cabinet. No splicing of the loop leads will be permitted.
4. Marking will consist of two rounds of contrasting colored tape, one color for the lane number and the second color for the lead loop location in the lane. The first band closest to the cabinet will represent the lane number, one round of tape will be for lane 1 and two rounds will be lane 2, etc. The lead loop in lane one would have one round of tape and a second round of a contrasting colored tape for the lead loop in the lane. The trailing loop would not have a second contrasting colored band of tape.
5. See Index 635-001 for pull box and concrete apron details.
6. Use a chalk line or string and paint to layout the position of the sensor and lead-in cable slots. Ensure saw cuts do not deviate more than ½" from the chalk line. Use a single blade or ganged blade saw wide enough to cut the axle sensor slot at full width in a single pass. Cutting two slots and chipping out roadway material between them is not allowed.
7. All sensor slots and any cuts in the roadway will be thoroughly blown out to ensure there is no dust or debris prior to installation of sensors or leads.
8. Install Exit Windows at least 2' apart.

LANE LAYOUT FOR PTMS INDUCTIVE LOOP AND AXLE SENSORS

(Typical for up to 4 Lanes of Sensor Leads Pulled to one Side of the Roadway)

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SHORT TERM TRAFFIC MONITORING SITE - PTMS

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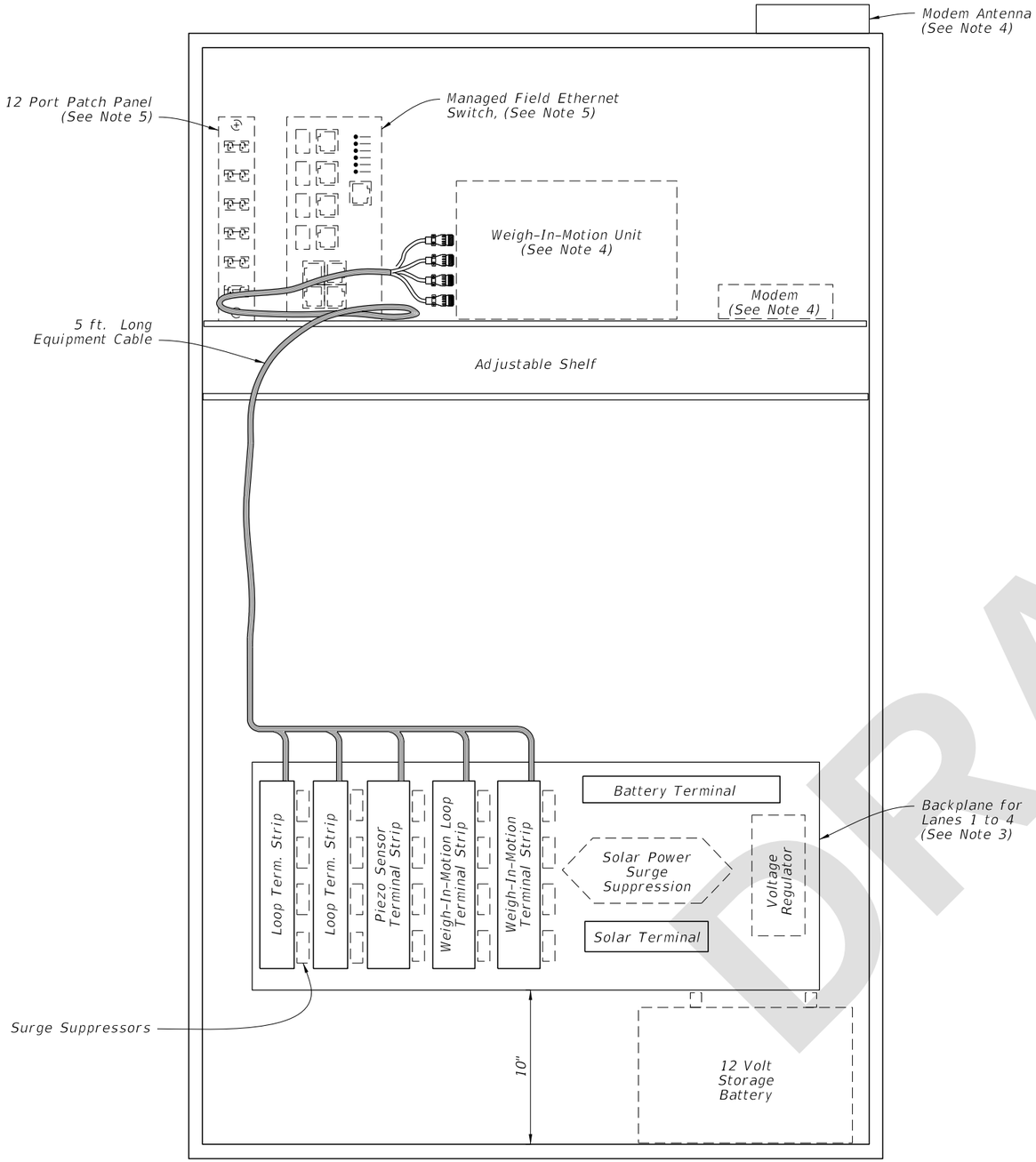

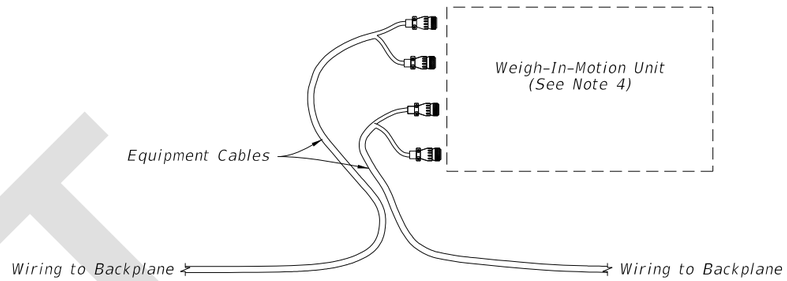

EQUIPMENT CABLE ASSEMBLY

NOTES:

1. Traffic monitoring site cabinet includes:
   A. One adjustable shelf; (equipped as shown)
   B. One backplane assembly; (equipped as shown)
   C. All associated wiring and wiring harnesses.

2. Basic backplane assembly consists of:
   A. Two inductive loop terminal strips;
   B. One piezo sensor terminal strip;
   C. Two weigh-in-motion termainal strips;
   D. One battery terminal strip;
   E. One solar panel terminal strip.

3. The contractor is responsible for contacting the TMS Manager at the Transportation Data and Analytics Office for lane number information and verification.

4. Provide and install a Weigh-In-Motion Unit, Modem, and Antenna.

5. Provide and install a 12-fiber single mode cable, a 12-port patch panel, and a managed field ethernet switch.

CABINET LAYOUT DETAILS

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To Weigh-In-Motion Unit

Loop Leads From Lanes 1 & 2 (See Note 3)

Loop Leads From Lanes 3 & 4 (See Note 3)

Piezo. Sensor Leads From Lanes 1 - 4 (See Note 3)

Weigh-In-Motion Loop Leads Sensor Leads From Lanes 1 - 4 (See Note 3)

Weigh-In-Motion Sensor Leads From Lanes 1 - 4 (See Note 3)

Surge Suppressor (Typ.)

8"

Loop 1a, Loop 1b, Loop 2a, Loop 2b, Loop 3a, Loop 3b, Loop 4a, Loop 4b: Blk, Gnd, Wht

Cntr. cond.

Veh. Sen. 1, Veh. Sen. 2, Veh. Sen. 3, Veh. Sen. 4

WIM Loop 1, WIM Loop 2, WIM Loop 3, WIM Loop 4: Blk, Gnd, Wht

WIM Sen. 1, WIM Sen. 2, WIM Sen. 3, WIM Sen. 4

1¾" 3¼" 3¼" 3¼" 3¼" 3¼"

2'-0"

Inductive Loop, Piezo Sensor, and Weigh-In-Motion (WIM) Leads From Roadway

8 in. x 24 in. x ⅛ in. Thick Aluminum Backplane

Battery Terminal

Solar Power Voltage Regulator

Jumper (-) (+) Jumper

Ground to Backplane

Solar Power Surge Suppressor

4⅛"

3⅞"

1⅞"

2"

Solar Terminal

Ground

NOTES:

1. Reference Sheet 9, Note 2 for items to be included with backplane.
2. All terminal strip contacts are on 9/16" centers (Clinch 142 Series or equal) Use insulated fork wire terminations.
3. The contractor is responsible for contacting the TMS Manager in the Transportation Data and Analytics Office for lane number information and verification.

CABINET BACKPLANE DETAILS

WEIGH-IN-MOTION MONITORING SITE

NOTES:

1. Install axle sensors and loops associated with axle sensors after placement of the friction course.

2. Cut a 3½" deep slot for the Inductive loops. Loop slots will be cut wide enough to allow unforced placement of the wire into the bottom of the slot. Place four turns of #14 AWG IMSA 51-7 copper wire in the slot. Place short pieces of backer rod (2" to 3" in length) every 18" to 24" to hold the loop wire in the bottom of the slot.

3. Twist loop leads at the rate of 8 to 16 twists per foot. Extend the twisted pair loop wire directly to the cabinet. No splicing of the loop leads will be permitted.

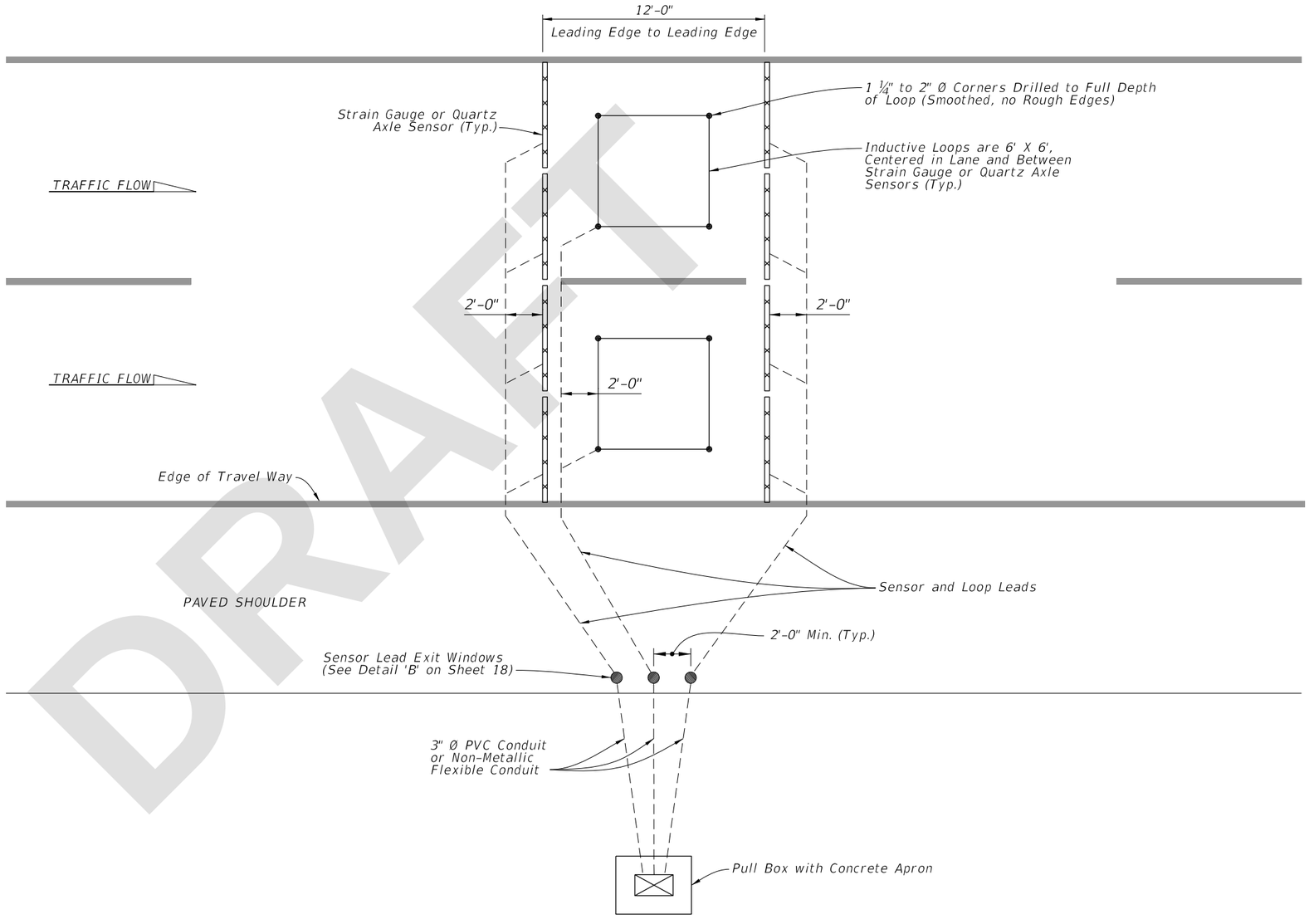
4. Marking will consist of two rounds of contrasting colored tape, one color for the lane number and the second color for the lead loop location in the lane. The first band closest to the cabinet will represent the lane number, one round of tape will be for lane 1 and two rounds will be lane 2, etc. The lead loop in lane one would have one round of tape and a second round of a contrasting colored tape for the lead loop in the lane. The trailing loop would not have a second contrasting colored band of tape.

5. See Index 635-001 for pull box and concrete apron details.

6. Use a chalk line or string and paint to layout the position of the sensor and lead-in cable slots. Ensure saw cuts do not deviate more than ½" from the chalk line. Install the sensor according to manufacturer's recommendations.

7. All sensor slots and any cuts in the roadway will be thoroughly blown out to ensure there is no dust or debris prior to installation of sensors or leads.

8. Install Exit Windows at least 2' apart.



LANE LAYOUT FOR TTMS/CCS INDUCTIVE LOOP AND WEIGH-IN-MOTION SENSORS

WEIGH-IN-MOTION MONITORING SITE

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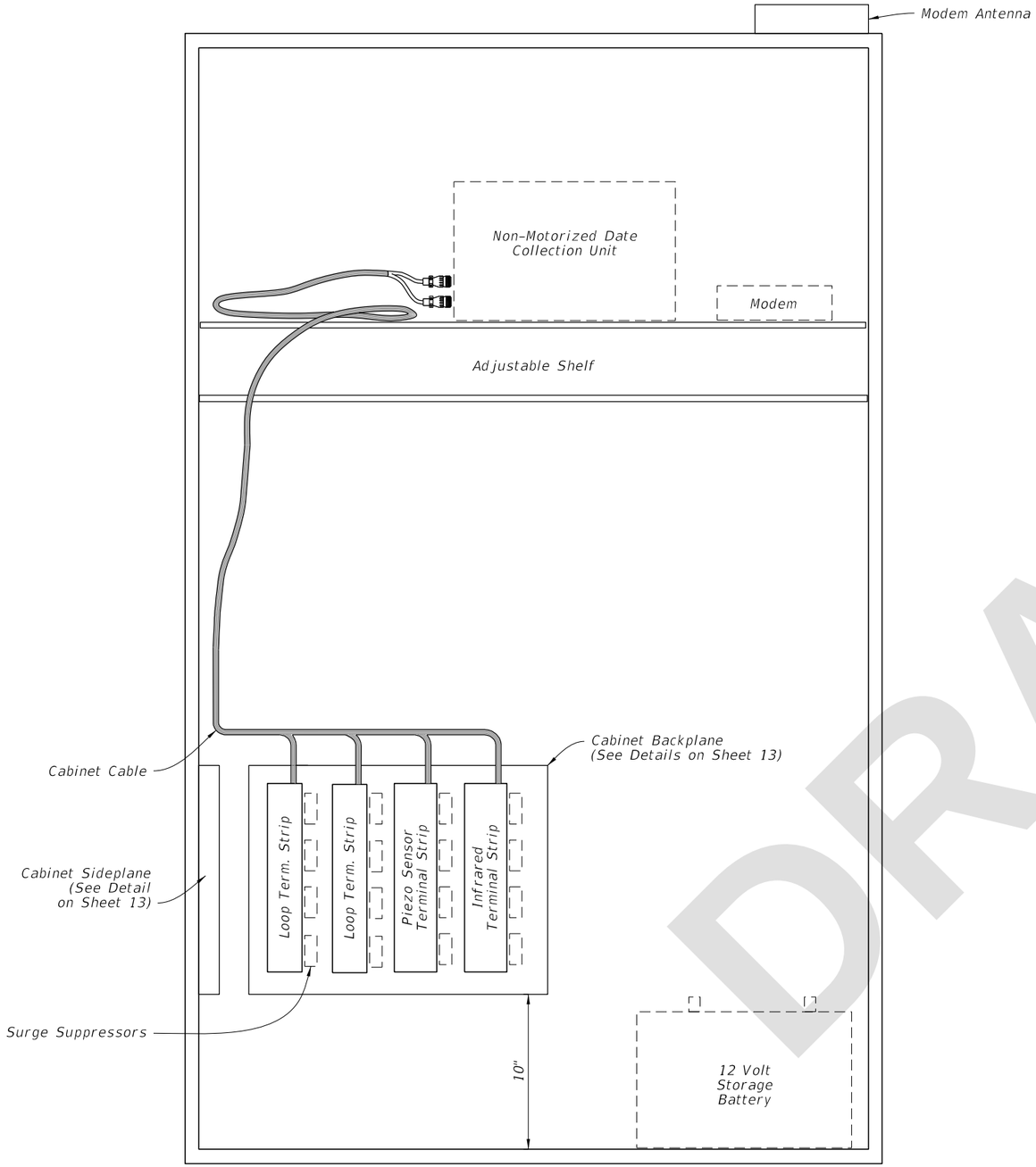

NOTES:

1. Traffic monitoring site cabinet includes:
   A. One adjustable shelf; (equipped as shown)
   B. One backplane assembly; (equipped as shown)
   C. One sideplane assembly; (equipped as shown);
   D. Infrared sensor and piezo sensor cables.

2. Basic backplane assembly consists of:
   A. Two inductive loop terminal strips;
   B. One piezo sensor terminal strip:
   C. One infrared sensor terminal strip;.

3. Basic sideplane assembly consists of:
   A. One battery terminal strip;
   B. One solar panel terminal strip.

CABINET LAYOUT DETAILS

NON-MOTORIZED MONITORING SITE

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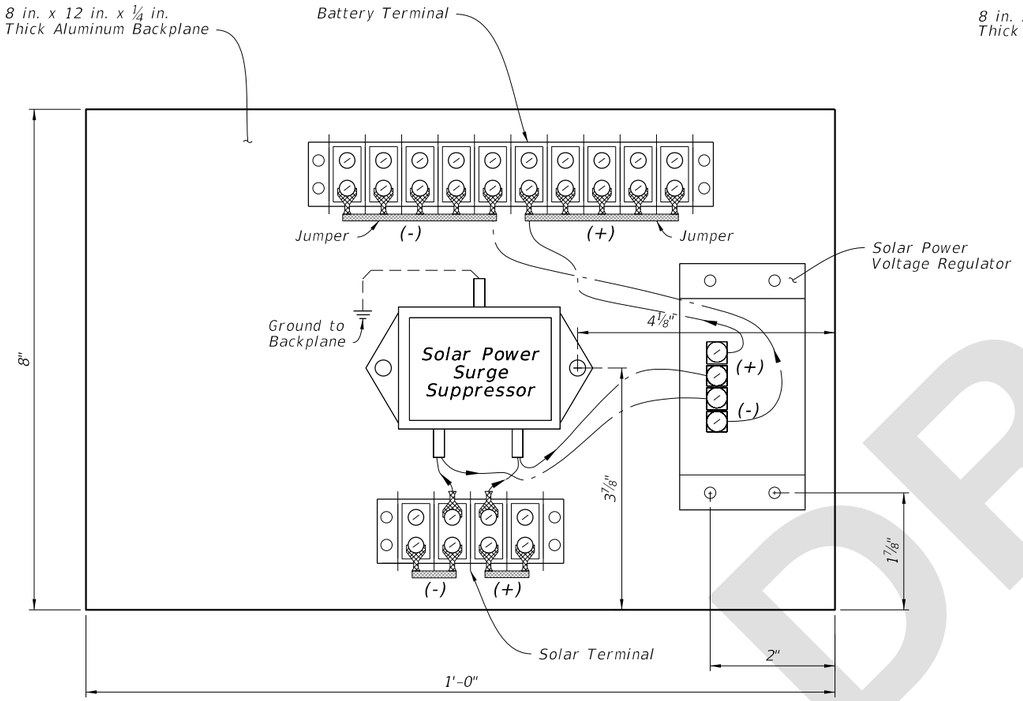
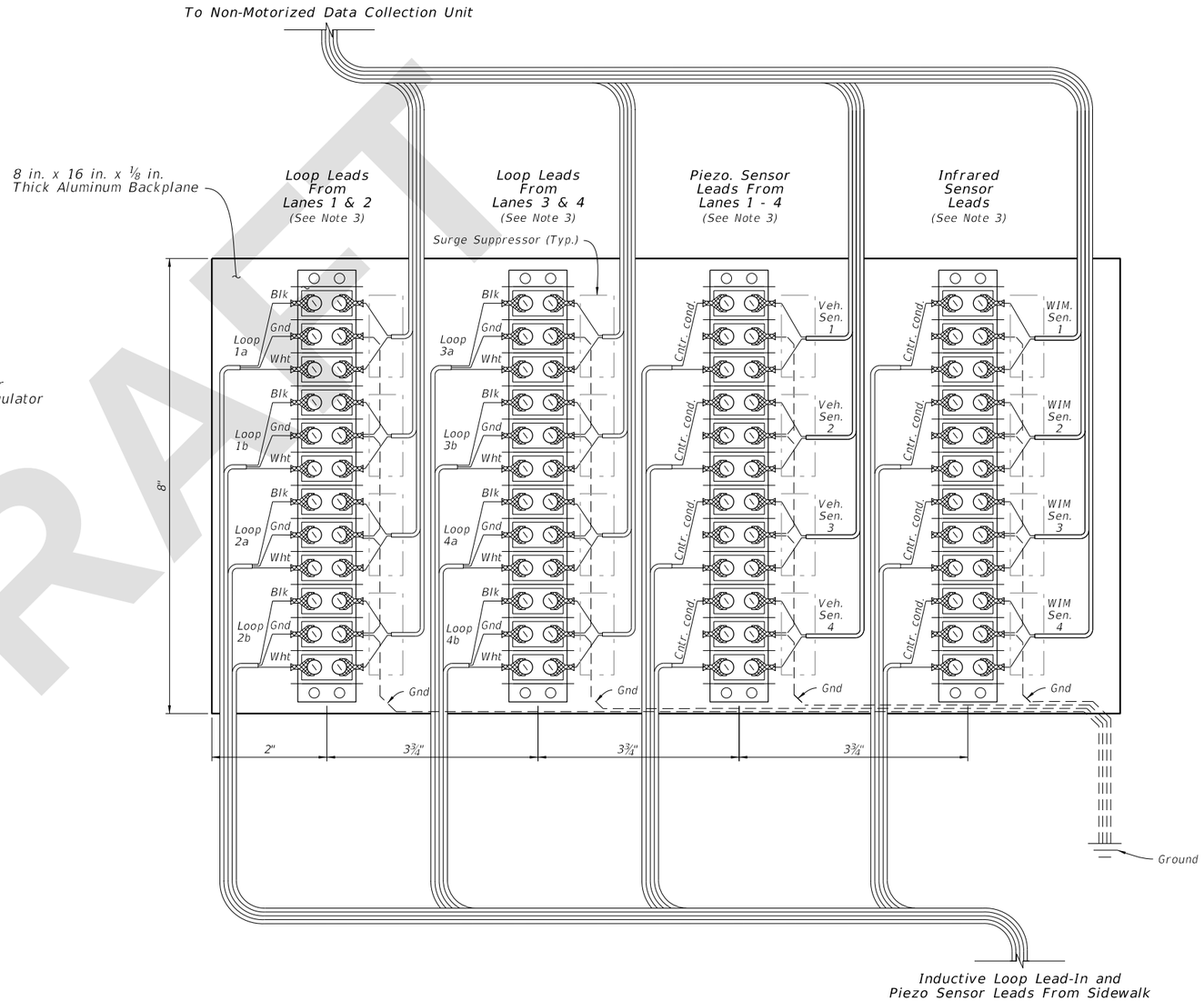
NOTES:

1. Reference Sheet 12, Note 2 for items to be included with backplane.
2. All terminal strip contacts are on $^{9}/_{16}$" centers (Clinch 142 Series or equal) Use insulated fork wire terminations.
3. The contractor is responsible for contacting the TMS Manager in the Transportation Data and Analytics Office for lane number information and verification.



CABINET SIDEPLANE DETAILS



CABINET BACKPLANE DETAILS

NON-MOTORIZED MONITORING SITE

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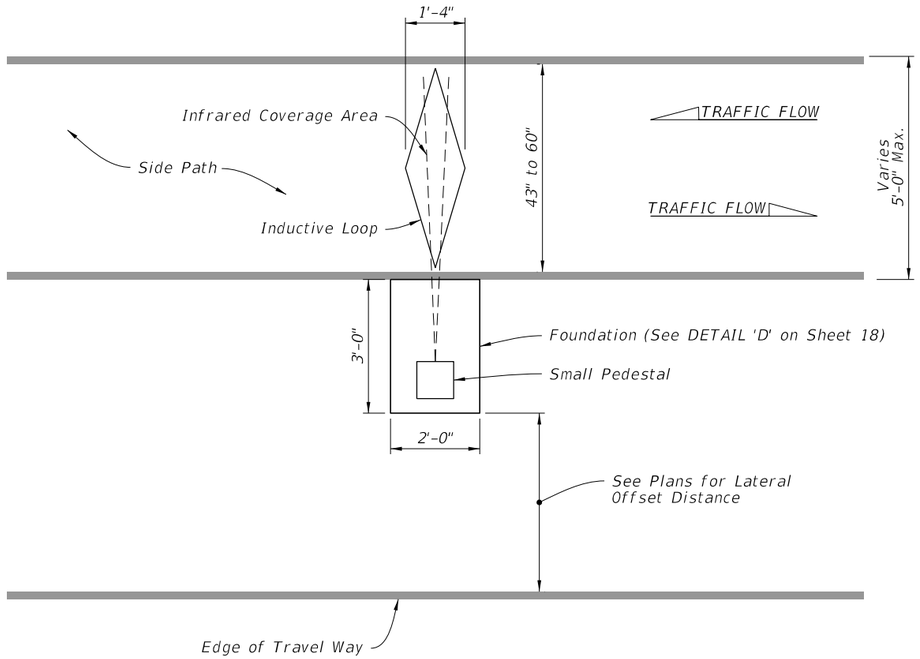
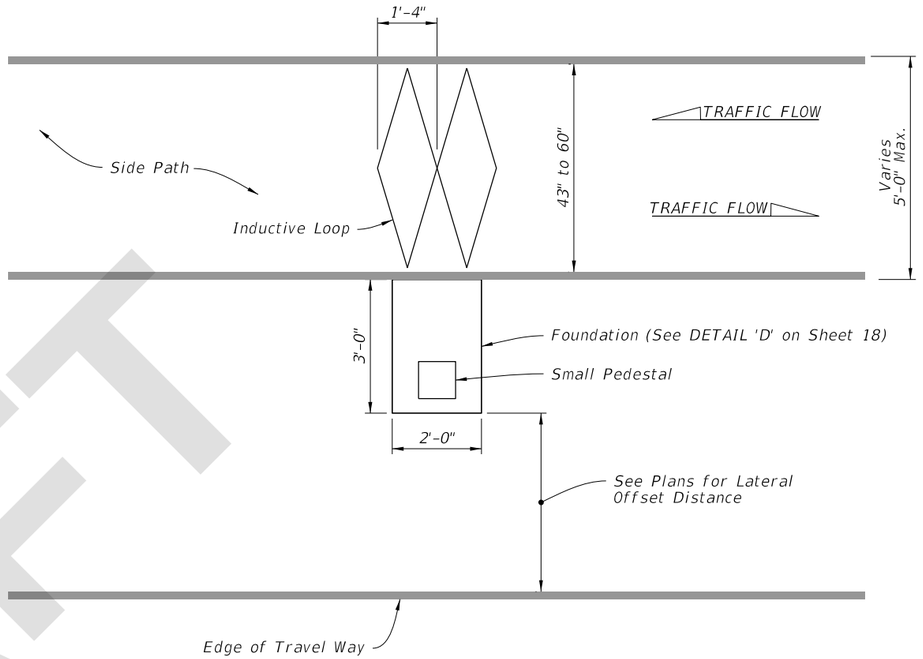


SINGLE LOOP ASSEMBLY

(Directional Recognition With Infrared)



DUAL LOOP ASSEMBLY

(Directional Recognition Without Infrared)

NON-MOTORIZED MONITORING SITE NOTES:

1. Use a chalk line or string and paint to layout the position of the sensor and lead-in cable slots. Ensure saw cuts do not deviate more than 0.5 inches from the chalk line. Use a single blade or ganged blade saw wide enough to cut the axle sensor at full width in a single pass. Cutting two slots and chipping out roadway material between them is not allowed.
2. Cut a ¼" to ½" wide slot.
3. All sensor slots and any cuts in the pathway will be thoroughly blown out to ensure there is no dust or debris prior to installation of the loops and leads.
4. Place eight turns of loop wire in each slot.
5. Twist loop leads at the rate of 10 twists per foot.
6. Extend the twisted pair loop wire directly to the termination point with no splices.
7. For the side-by-side configuration, install the farthest loop lead through the near side loop slot.
8. At the termination point, for north-south pathways, mark the north piezometer and inductive loop sensor lead(s) with one tape. For east-west pathways, mark the east piezometer and inductive loop sensor lead(s) with one tape. Mark the south and west sensor lead(s) with two tapes.
9. Do not point infrared sensors towards a path where motor vehicles pass, a metallic or reflective surface, surfaces exposed to sunlight or vegetation that are likely to move.
10. Avoid placing infrared sensors near heat sources, steep surfaces, high voltage power cables, and telecommunications equipment.
11. If crossing pavement joints see DETAIL "F" on Sheet 18.

NARROW SIDE PATH CONFIGURATIONS

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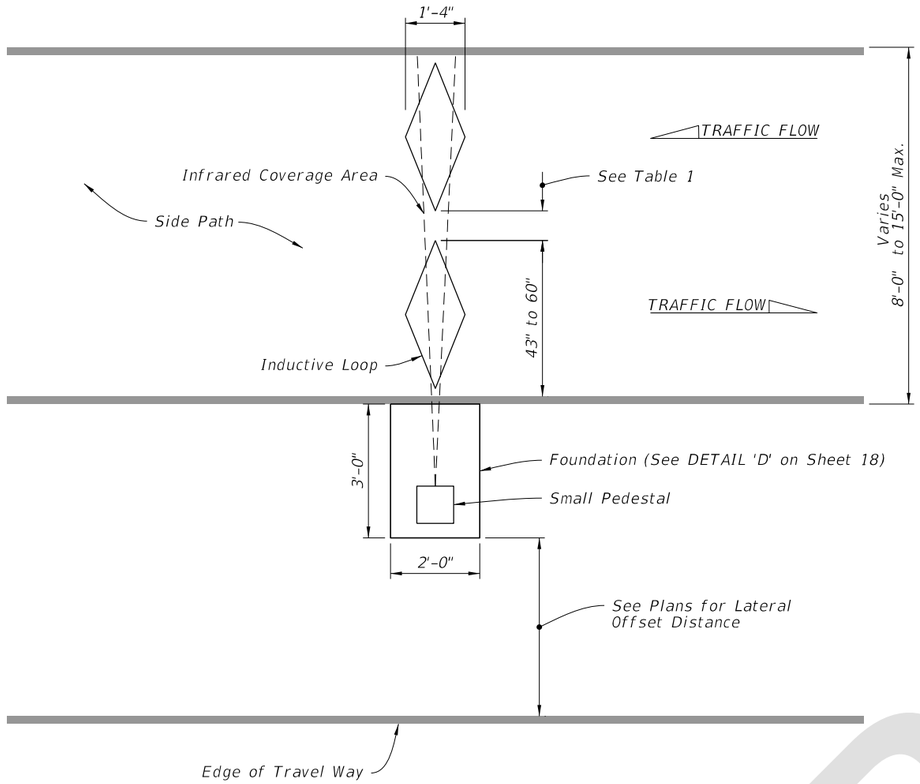
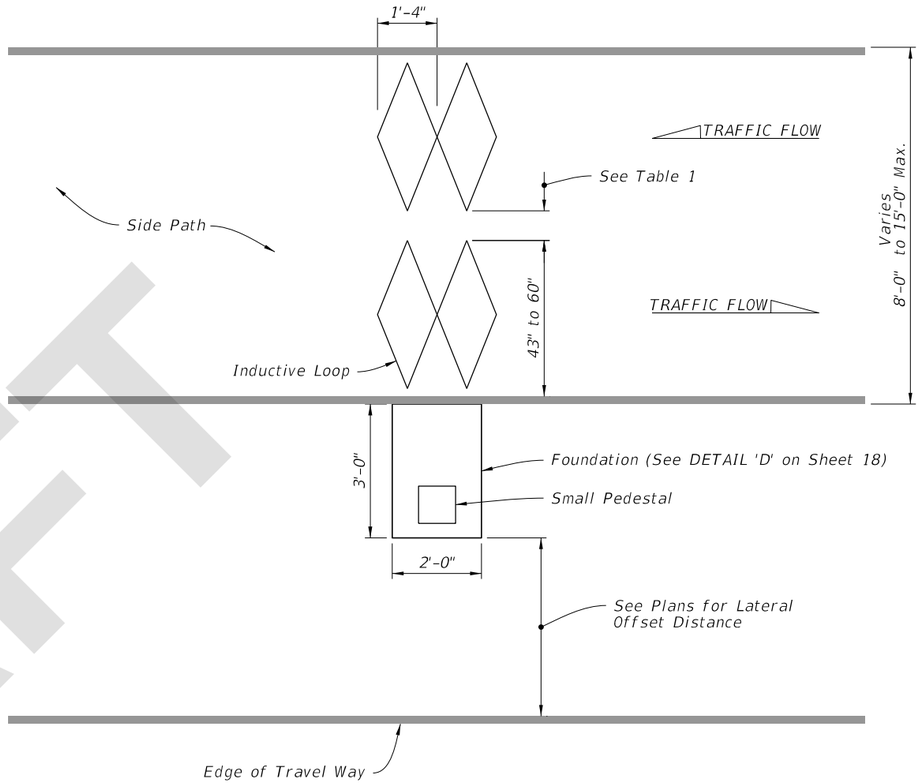
NON-MOTORIZED MONITORING SITE



DUAL LOOP ASSEMBLY

(Directional Recognition With Infrared)



QUAD LOOP ASSEMBLY

(Directional Recognition Without Infrared)

TABLE 1	
Loop Length	Distance
Greater than 59"	Contact Manufacturer to evaluate the feasibility
59"	3.00"
55"	4.00"
51"	4.75"
47"	5.50"
43"	6.25"
Less than 43"	Contact Manufacturer to evaluate the feasibility

LARGE SHARED USE PATH CONFIGURATIONS

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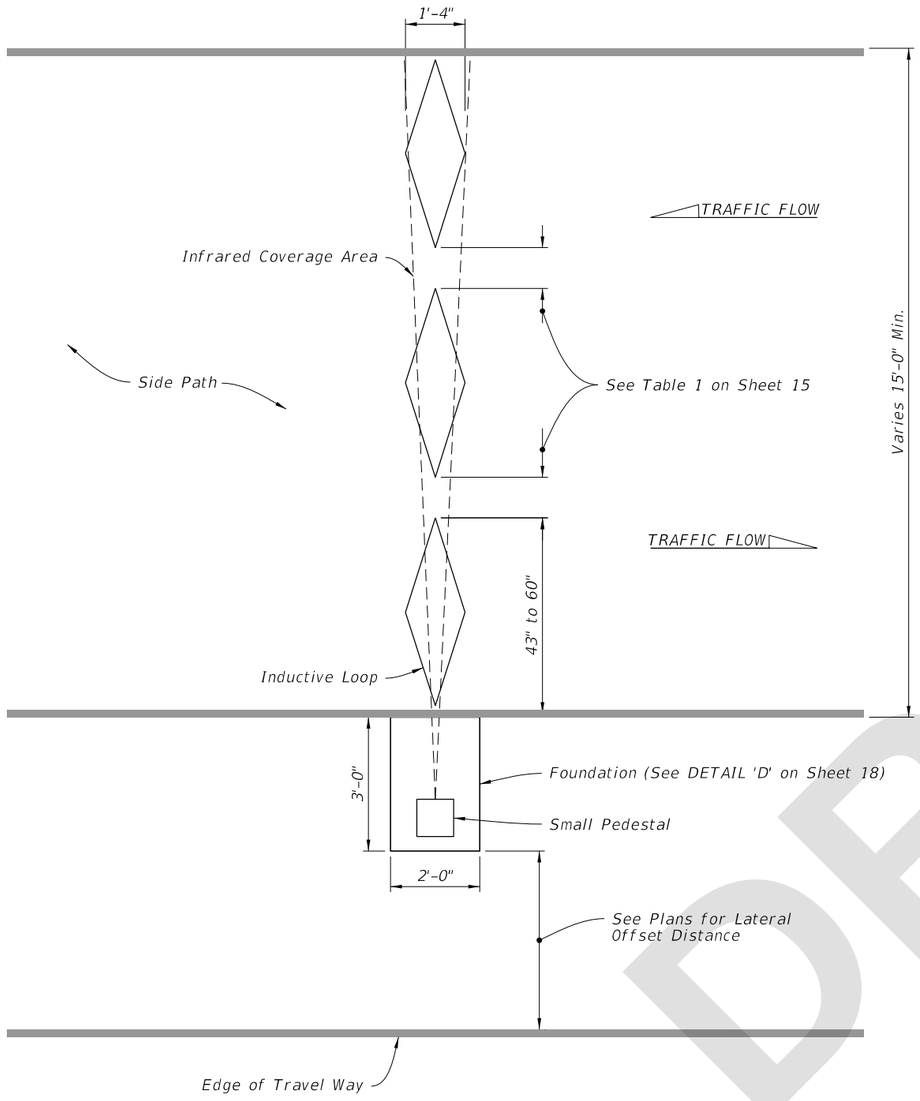
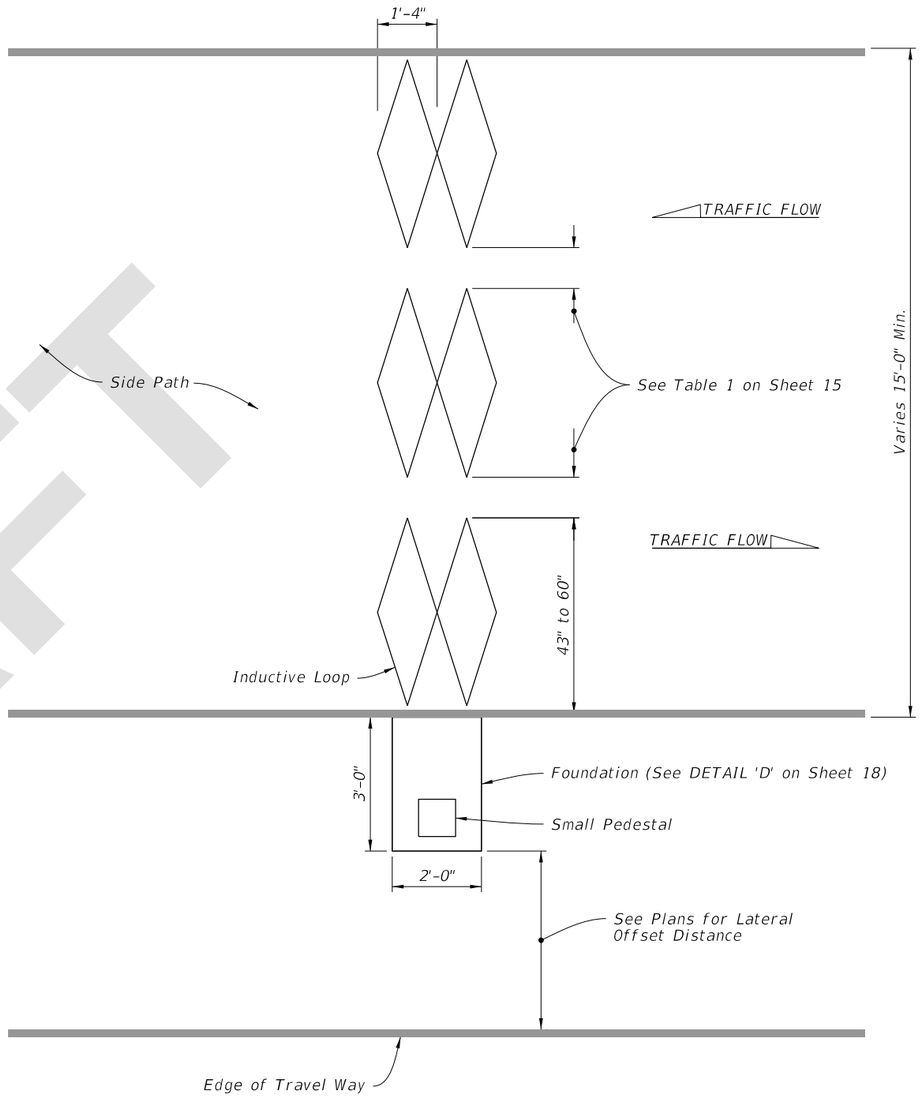
NON-MOTORIZED MONITORING SITE



TRIPLE LOOP ASSEMBLY

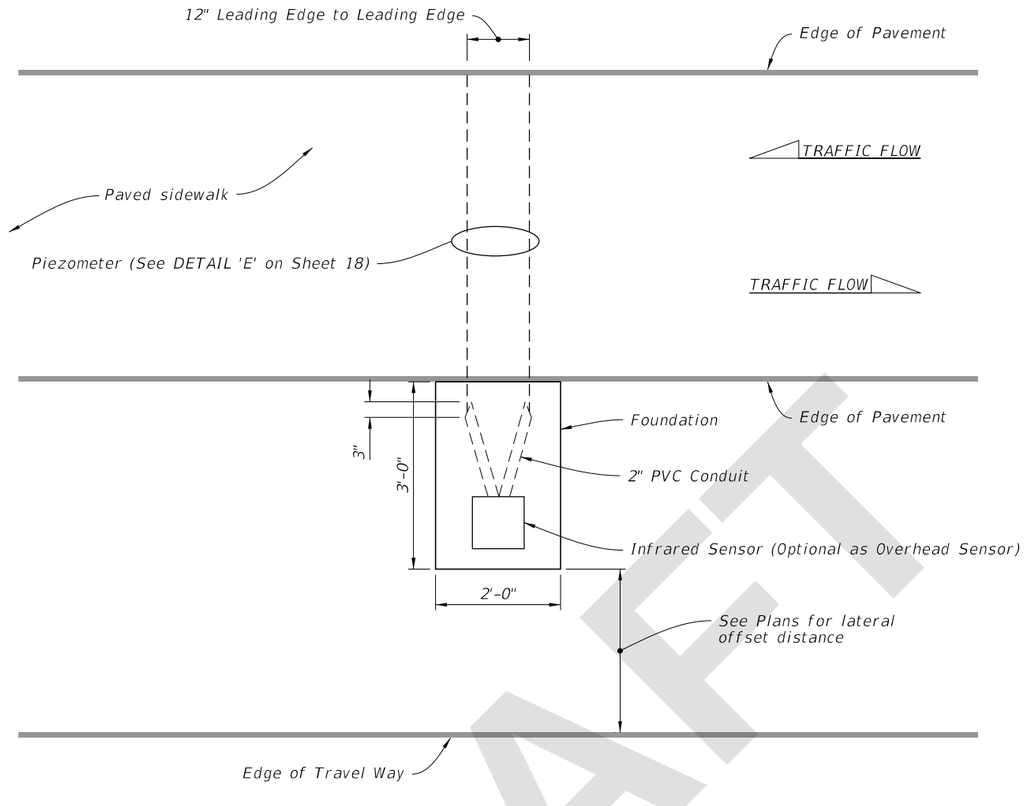
(Directional Recognition With Infrared)



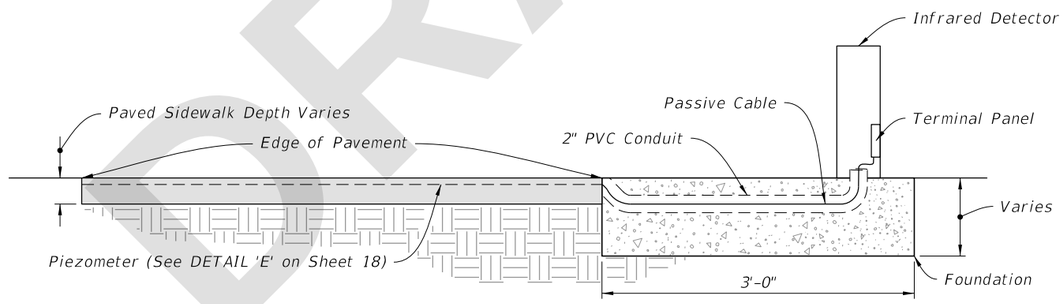
SEXTUPLE LOOP ASSEMBLY

(Directional Recognition Without Infrared)

EXTRA LARGE SHARED USE PATH CONFIGURATIONS



PLAN VIEW



ELEVATION

PAVED SIDEWALK CONFIGURATION

NON-MOTORIZED MONITORING SITE

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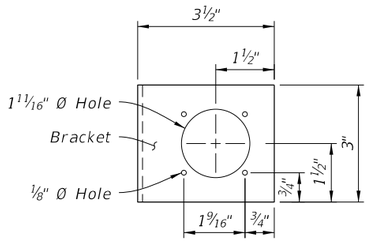
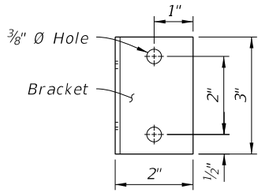
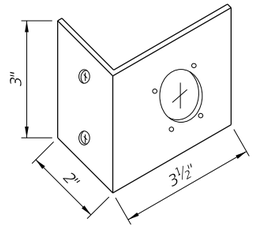


FRONT VIEW



SIDE VIEW



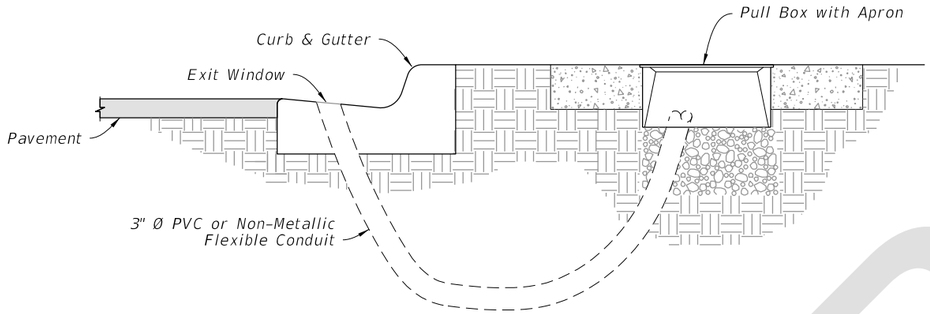
ISOMETRIC VIEW

NOTE:

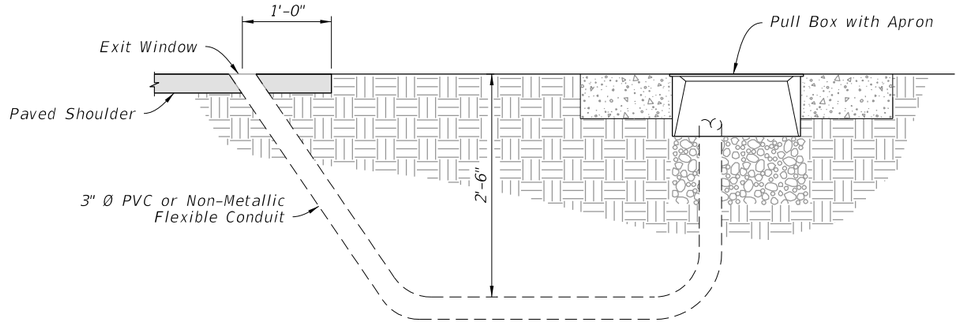
Fabricate bracket out of 3/32" – ⅛" inch thick aluminum. Dimensions may vary depending on the manufacturer of the J1 receptacle being furnished. The cabinet manufacturer will construct the mounting bracket to fit the receptacle.

J1 MOUNTING BRACKET

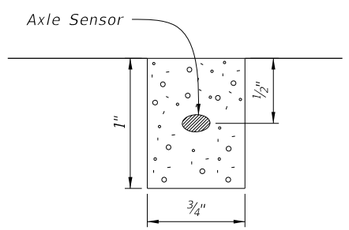
DETAIL 'A"



DETAIL 'B'

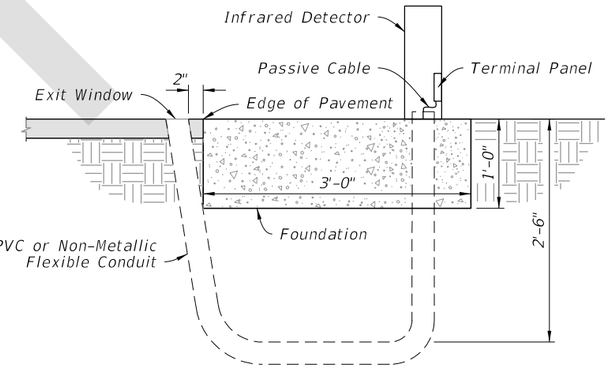


DETAIL 'C'

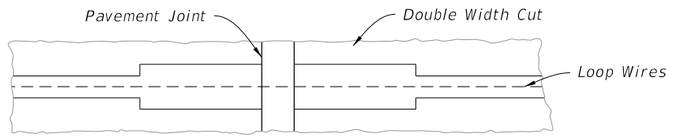


END VIEW
(Axle Sensor Slot)

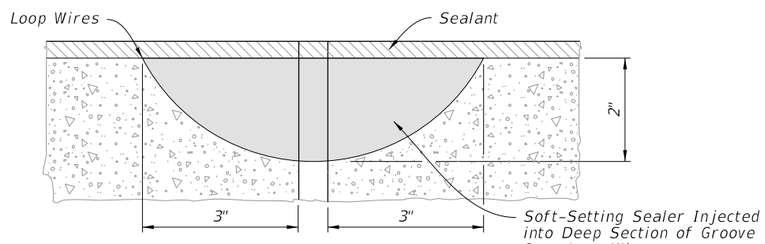
DETAIL 'D'



DETAIL 'E'



PLAN VIEW



VERTICAL SECTION

DETAIL 'F'

DETAILS 'A' THRU 'F'

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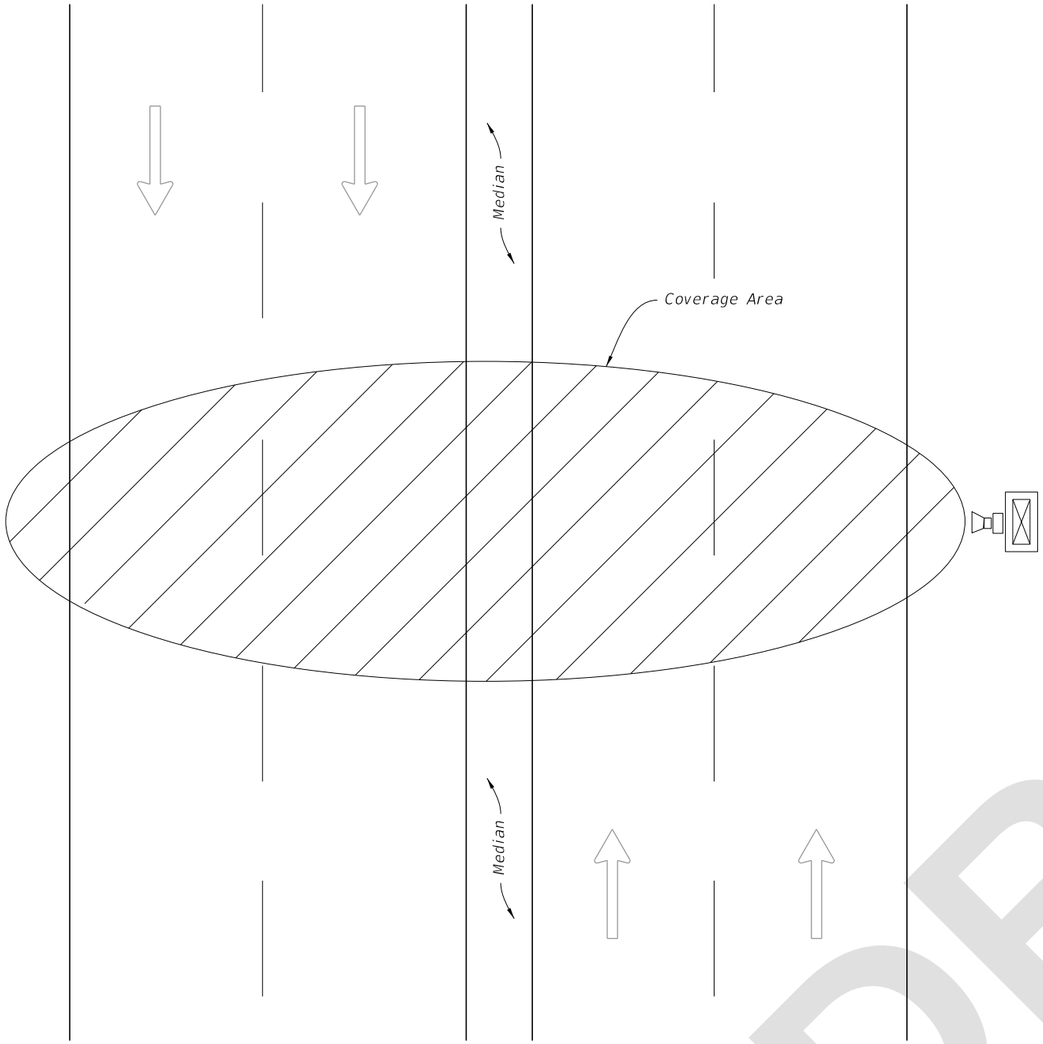
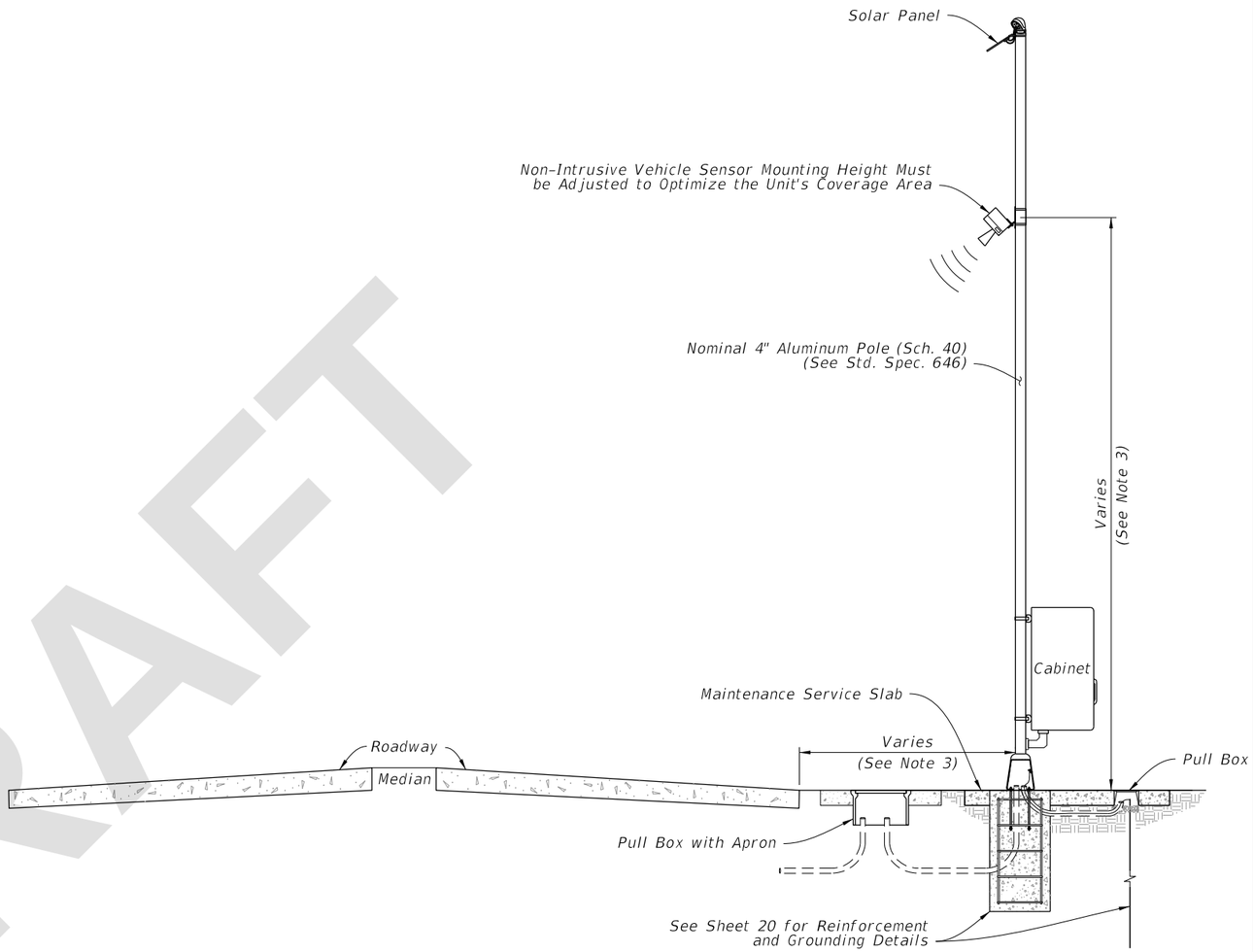


PLAN



ELEVATION

NOTES:

1. The unit must be capable of detecting up to eight lanes of traffic (in either or both directions) when mounted perpendicular to the roadway.
2. Coverage area of the unit is affected by the roadway geometry: distance from the travel lanes, median type and width, barrier walls, etc.
3. Mounting height of the unit and offset from the roadway must be determined on a site-by-site basis, in accordance with the manufacturer's recommended guidelines. Offset of pole must be greater than or equal to minimum clear zone requirements.
4. Cabinet, ground rod pull box, and maintenance service slab installed per Index 676-010, except cabinet center will be 4 feet above grade.

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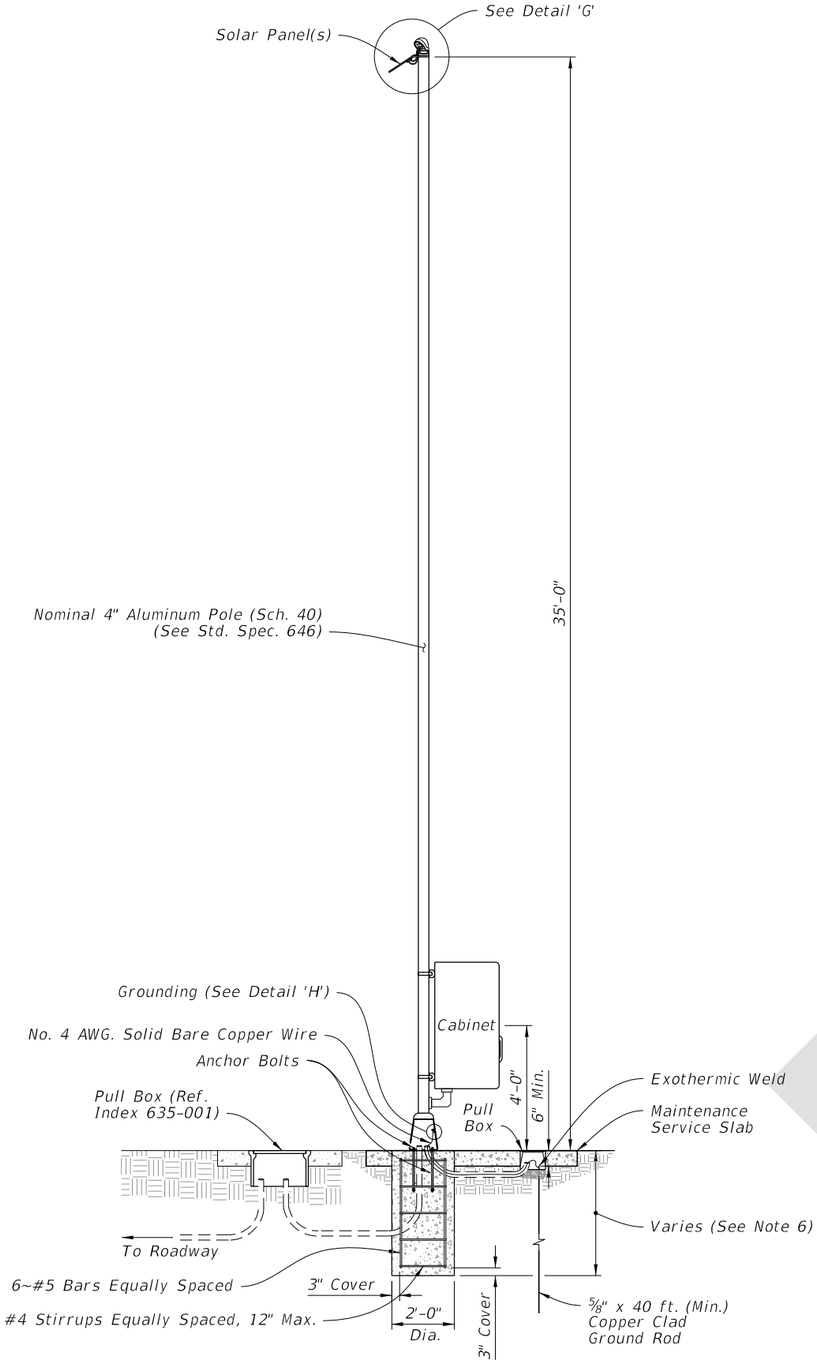
NON-INTRUSIVE VEHICLE SENSOR



ELEVATION

SOLAR POWER POLE WITH POLE MOUNTED CABINET

(Continuous Count Site - TTMS/CCS)

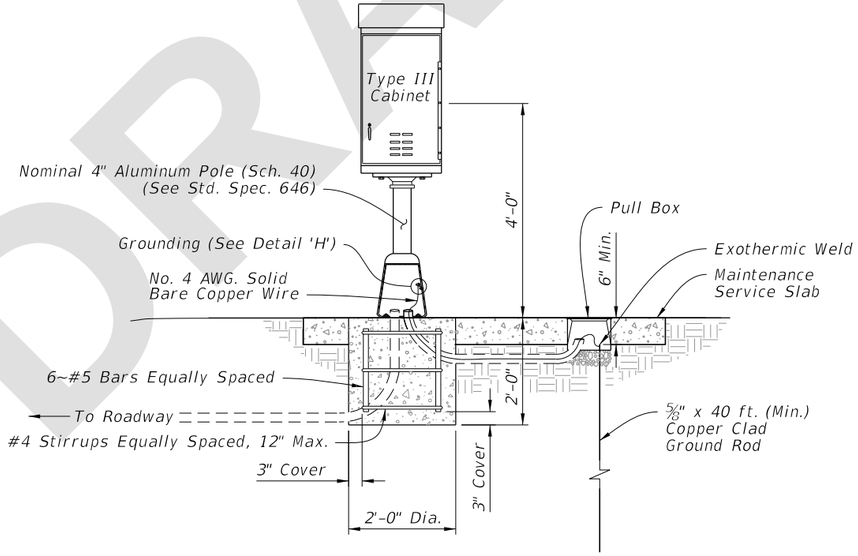
NOTES:

1. Cabinet, ground rod pull box, and maintenance service slab installed per Index 676-010, except cabinet center will be 4 feet above grade.
2. Meet the requirements of Specification 646.
3. Use #10 AWG stranded copper wire for Solar Panel Array installations, Red insulation is THHN or THWN for positive 12 volts wiring, Black insulation is THHN or THWN for negative, 12 volts wiring, Green insulation is THHN or THWN for ground bonding of the solar panel frame to the pole and earth.
4. Solar panel should be installed facing due south with angle of tilt equal to the sum of the following equation. The Latitude of the panel's location, multiplied by 0.76, plus 3.1 degrees. Equation expressed as (LAT)X(0.76)+(3.1°)
5. Encase all wiring from the weather head to the solar panel in outdoor flexible conduit.
6. Concrete Base Dimensions:

   a. 4' poles: depth of 2'-0"

   b. 12' or 15' poles: depth of 3'-0"

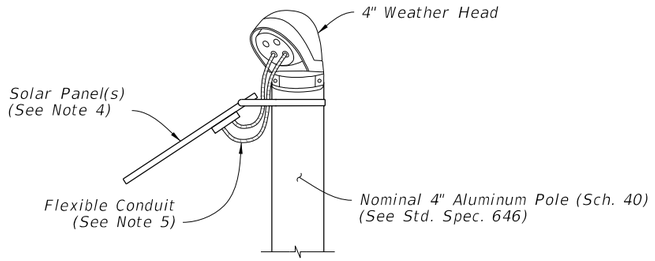
   c. 20' or 30' poles: depth of 4'-0"



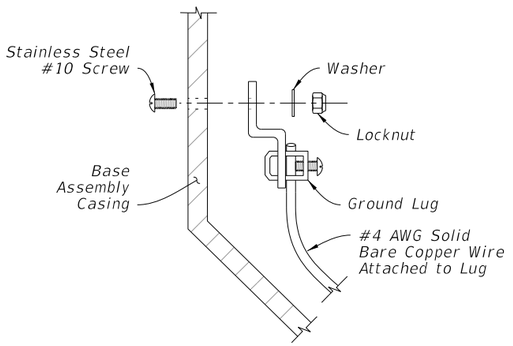
ELEVATION

PEDESTAL MOUNTED CABINET

(Short Term Traffic Monitoring Sites - PTMS)



DETAIL 'G'



DETAIL 'H'

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SOLAR POWER POLE WITH POLE MOUNTED CABINET AND PEDESTAL MOUNTED CABINET DETAILS

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