

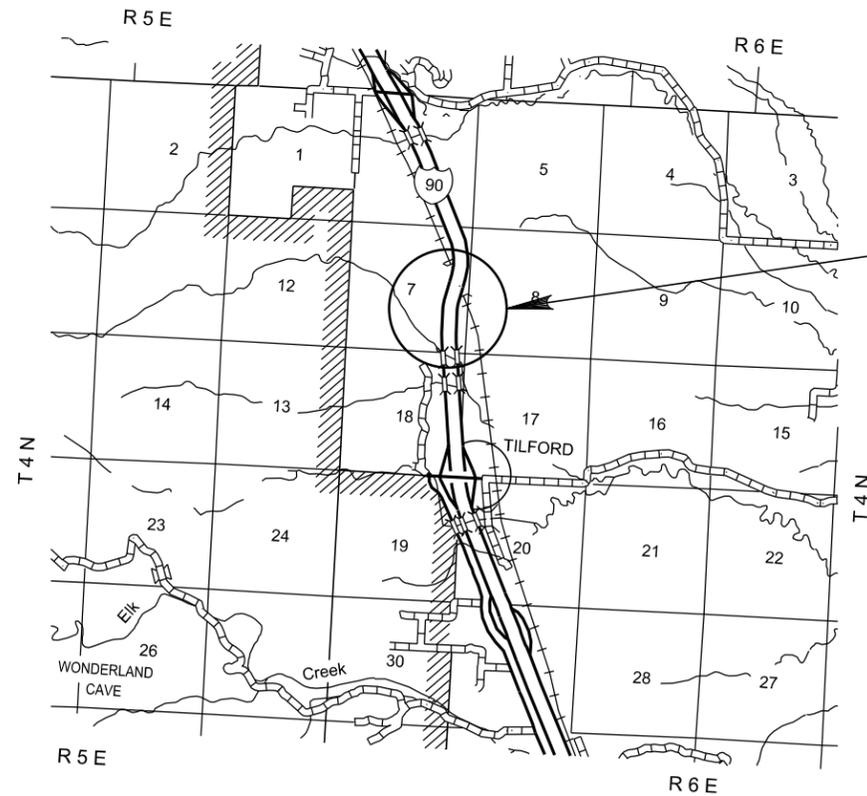
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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	HR Y505(01)	G1	G17

SECTION G: COMMERCIAL VEHICLE IDENTIFICATION SYSTEM PLANS

INDEX OF SHEETS

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G2-G4	General Notes
G5	Table of Conduit Quantities
G6	Overall Layout & Conduit Notes
G7-G11	Plan Sheets with Details
G12	Vehicle Detection Loop Details
G13-G15	Electrical Plan Sheets
G16-G17	Standard Plates



PROJECT
Tilford Port of Entry
MRM 38.67 +0.377 (Approx.)
Eastbound Lanes



1. SECTION G - ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3490	Commercial Vehicle Identification System	1	Each
635E5302	Type 2 Electrical Junction Box	8	Each
635E5303	Type 3 Electrical Junction Box	4	Each
635E8110	1" Rigid Conduit, Schedule 40	118	Ft
635E8112	1.25" Rigid Conduit, Schedule 40	423	Ft
635E8120	2" Rigid Conduit, Schedule 40	1193	Ft
635E9016	1/C #6 AWG Copper Wire	2234	Ft
635E9020	1/C #10 AWG Copper Wire	364	Ft

2. PROJECT OVERVIEW

This section outlines the basic items of work and equipment to be furnished by the Contractor under this contract. This summary is provided to familiarize the prospective bidder with the basic scope of the project. All labor, scheduling, general supervision and equipment necessary for installation is to be supplied by the Contractor.

2.1. SITE DESCRIPTION

The Commercial Vehicle Identification System consists of:

- one License Plate Reader Camera and two Changeable Message Signs installed in the eastbound lanes on Interstate 90 West of Tilford and west of the Tilford Port of Entry. The new Commercial Vehicle Identification System will be installed in existing concrete pavement.



2.2. COMMERCIAL VEHICLE IDENTIFICATION SYSTEM VENDOR

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The Contractor shall contract with a vendor to supply all of the required components and technical assistance to construct a Commercial Vehicle Identification System in accordance with the plans and specifications. The SDDOT Office of Research is aware of one vendor that can supply a Commercial Vehicle Identification System that meets the requirements of these plans and specifications. Use of any other vendor must be approved by the SDDOT Office of Research. The following vendor is suggested:

International Road Dynamics (IRD)
702 43rd Street East
Saskatoon, SK Canada S7K3T9
Phone (306) 653-6600 Fax (306) 242-5599

International Road Dynamics shall henceforth be "IRD" in these plans.

Locations of IRD-supplied equipment are shown in the plans. IRD shall provide technical instructions and assistance during installation. All equipment and materials shown as supplied or installed by IRD shall be supplied, installed, and paid for under this contract except where indicated otherwise.

All costs associated with the vendor contract, including equipment and technical assistance costs, shall be incidental to the various bid items indicated in the plans.

2.3. SCOPE OF WORK

The Contractor shall install equipment approximately as follows:

- One License Plate Reader (LPR) Camera, illuminator and power pack hardware
- Two Changeable Message Signs
- One iROC E-Screening System – using LPR for lookup and must be able to use existing transponder reader for lookup
- Fiber optic cable
- Electrical copper wiring

IRD-supplied equipment under this contract is approximately as follows:

- One License Plate Reader (LPR) Camera, illuminator and power pack hardware
- Two Changeable Message Sign
- One iROC E-Screening System
- Three inductive loops
- All fiber optic cable

2.4. DESIGN/MANUFACTURE

All equipment furnished under this contract, including any equipment purchased from other manufacturers, shall be new and of the latest design currently in production. Used equipment or discontinued models shall not be accepted.

2.5. DELIVERY

The Contractor shall coordinate equipment delivery dates and notify the SDDOT Project Engineer 30 days prior to equipment delivery. The Contractor shall supply four (4) sets of system schematic drawings for review and approval at least 30 days prior to equipment delivery.

2.6. INSTALLATION

The Contractor shall coordinate equipment installation dates and notify the SDDOT Project Engineer 30 days prior to installation. The installation of all equipment shall be the responsibility of the Contractor, and shall integrate directly with the existing Port of Entry equipment. The Contractor shall install all material furnished by IRD in accordance to IRD specifications and installation instructions. SDDOT personnel must be present to observe and inspect the installation. The Contractor shall coordinate with the manufacturer to correct any defective equipment or other technical problems. If unforeseen technical problems develop with this installation, the Contractor shall provide all engineering and manufacturer's technical assistance needed for proper installation.

2.7. STORAGE

Contractor may use an area designated by the Project Engineer within the Port of Entry to store new components of the Commercial Vehicle Identification System. Any components stored there shall be the responsibility of the Contractor and will not be monitored by Port of Entry personnel. The Contractor shall coordinate storage with the SDHP Motor Carrier Services group at (605) 773-4578.

2.8. RISK OF DESTRUCTION OR DAMAGE

The Contractor shall be responsible for any destruction or damage to equipment purchased or provided by SDDOT under this contract until the equipment has been installed as specified, inspected, and accepted by SDDOT.

2.9. INCIDENTAL WORK

Incidental work includes, but is not limited to the following items: Contractor shall pull all wiring and terminate all connections. Contractor shall coordinate all material deliveries with IRD. All costs for this incidental work shall be incidental to the contract unit price per each for "Commercial Vehicle Identification System".

3. INFORMATION TO BE SUBMITTED

3.1. ITEMS TO BE SUBMITTED

Upon being awarded the project, the Contractor shall submit the following information to the SDDOT Office of Research:

- A technical description, system block diagram, equipment specifications, and an equipment list with model numbers and options of all equipment proposed to be furnished, including any equipment purchased from other manufacturers.
- A method by which replacement parts may be obtained. The Commercial Vehicle Identification System vendor must stock system replacement parts for a minimum of ten (10) years from which SDDOT may order.
- A warranty description, including the procedure and authorized warranty service station(s) used to obtain warranty service. The Contractor shall warrant all equipment supplied, including equipment from other manufacturers, against defective materials and workmanship. The minimum warranty shall be as follows:

"During the first 120 days following Installation Acceptance by SDDOT, all repairs, including factory labor and materials necessary to correct any failures shall be made at the Contractor's sole cost. During the following 610 days, the warranty shall be limited to the replacement of any materials including shipping charges. Any labor costs during the 610-day period will be the responsibility of SDDOT. SDDOT, at its discretion, may require that complete replacement modules be supplied."

If the Contractor's normal warranty exceeds the warranty terms specified in this section, the Contractor shall provide a copy of the warranty in his bid proposal.

3.2. AS-BUILT ITEMS TO BE SUBMITTED

If any elements of the Commercial Vehicle Identification System are constructed differently from what is stated in the plans, the Contractor shall supply as-built plans to IRD to draft onto existing drawings for future reference. The final as-built plans shall be furnished to the SDDOT Office of Research. The as-built plans shall include conduit layouts, wiring diagrams, or other drawings depicting the changes from the original plans.



4. SENSOR INSTALLATION

The Contractor shall install sensors for detecting vehicle presence/sign trigger.

4.1. INSTALL LOOP DETECTORS

Contractor shall install IRD-supplied preformed loops at all locations specified in the plans and in accordance with IRD installation instructions.

An IRD representative shall direct installation of loops. The wiring from each lane's instrumentation shall exit the pavement through conduit to a pull box in the nearest shoulder's inslope. Pavement sensor locations shall be determined and all the conduit and pull boxes for sensor cabling shall be installed. The wiring shall then be pulled through conduit from the pull boxes to the cabinet.

All costs to sawcut and install the loops, pull wire, and terminate all connections shall be incidental to the contract unit price per each for "Commercial Vehicle Identification System".

4.2. INSTALL LICENSE PLATE READER CAMERA

Contractor shall install camera equipment including camera housing and brackets/cabling on the License Plate Reader pole. Contractor shall install illuminator, power pack, junction box, and brackets/cabling on the Illuminator pole. Contractor shall furnish, install, and terminate all electrical wiring in accordance with plans to run power from the junction box to the camera equipment and illuminator equipment.

All costs to install all camera and illuminator equipment, pull all wiring, and terminate all connections shall be incidental to the contract unit price per each for "Commercial Vehicle Identification System".

5. ELECTRONIC EQUIPMENT

5.1. CHANGEABLE MESSAGE SIGN

Contractor shall install IRD-supplied changeable message signs at the locations specified on sheets G8 and G9 of the plans and in accordance with IRD installation instructions. An IRD representative shall direct installation of changeable message signs. All costs to install all changeable message sign equipment shall be incidental to the contract unit price per each for "Commercial Vehicle Identification System".

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5.2. CONDUIT INSTALLATION

The Contractor shall supply and install all cabling, conduit, conduit fittings, junction boxes and apparatus necessary for all cabling shown on the plan sheets.

The conduit shall be buried at a minimum depth of 4 feet beneath the roadway surface and a minimum of 3 feet under all other areas within the ROW such that it will not be damaged.

Trenching shall include all sand bedding, backfilling, refurbishing, compacting and removal of all excavated materials as required. Boring, if necessary shall be done in accordance with SDDOT's Specifications

The Contractor shall leave pull ropes for cables in all spare conduits.

All cost to furnish and install conduit and all conduit fittings shall be incidental to the contract unit price per foot for "1" Rigid Conduit, Schedule 40", "1.25" Rigid Conduit, Schedule 40", and "2" Rigid Conduit, Schedule 40".

5.3. PULLBOXES/JUNCTION BOXES

Contractor shall furnish and install all pullboxes/junction boxes as necessary for cabling. Pullboxes/Junction boxes shall be Type 2 for all fiber optic wiring and be spaced no further than 200' apart. Type 3 Junction boxes shall be used for all electrical wiring and be spaced no further than 500' apart. Junction boxes shall be placed at all 90° bends.

Cabling and splices shall be high quality and waterproof. The pull boxes shall be strategically located such that they are high on the inslope near the shoulder's edge and easily accessible. If cable splices are necessary, they shall be located in the pull boxes and meet SDDOT specifications.

All cost to furnish and install pullboxes/junction boxes shall be incidental to the contract unit price per each for "Type 2 Electrical Junction Box" and "Type 3 Electrical Junction Box". See standard plate 635.65.

5.4. ELECTRICAL SERVICE

Contractor shall furnish and install all materials to provide working electrical service as shown on plan sheets G13-G15. All cost to furnish and install all materials needed to provide working electrical services shall be incidental to the contract bid items for Type 3 Electrical Junction Box, Rigid Conduit, and Copper Wire.

6. SYSTEM ACCEPTANCE

The testing procedures to demonstrate compliance with the contract requirements must be carried out jointly by the Contractor, IRD, and SDDOT personnel at the site.

Acceptance of the system shall consist of two parts. The first part follows installation, calibration, and testing and is termed 'Installation Acceptance'. The second part follows a successful 30-day performance period and is termed 'Final Acceptance'. The SDDOT Office of Research shall review all acceptance testing results prior to Installation Acceptance and Final Acceptance.

6.1. INSTALLATION ACCEPTANCE

The Contractor shall test the system, as specified in Subsections A and B to SDDOT's satisfaction.

A. COMMERCIAL VEHICLE AUTOMATIC SIGNALLING TESTING

Verify that the Mainline CMS signals vehicles that have been assigned a report" decision with a "Truck Must Exit to Weighstation" message.

Verify that the Mainline CMS signals vehicles that have been assigned a "bypass" decision with a "Truck OK to Bypass Weigh Station" message.

B. AUTOMATIC LICENSE PLATE TESTING

Determine the read accuracy rate (plate number and jurisdiction) of readable plates under reasonable conditions of weather, congestion etc. (including only plates from those jurisdictions for which the ALPR system was configured). Quantify read rate based on minimum 50 commercial vehicle plates tested during day time hours and 50 commercial vehicle plates tested during night time hours.

Record the results for reference as ALPR performance benchmark.

6.2. Upon FINAL ACCEPTANCE

INSTALLATION ACCEPTANCE and after verbal notification by IRD to the SDDOT Project Engineer the system shall undergo a 30-day performance period constituting 30 consecutive days in which no remedial action or intervention is required by the Contractor, IRD, or SDDOT personnel to view or obtain data and tables that are being accumulated.

Upon completion of 30 consecutive days of successful operation, beginning with the start of the most recent 30-day test period, the system will be considered accepted. SDDOT reserves the option to check the performance of the system at any time during the life of this contract following testing procedures outlined in Section 6.1. Major malfunctions will be taken into consideration of acceptance or rejection of the system.

7. MEASUREMENT AND PAYMENT

7.1. METHOD OF MEASUREMENT

Measurement for the Commercial Vehicle Identification System will not be made. The quantity shown in the plans will be the quantity used for payment.

7.2. BASIS OF PAYMENT

Payment to the Contractor for the Commercial Vehicle Identification System portion of the contract shall be as follows:

A. The first partial payment will be 25% of the contract unit price per each for "Commercial Vehicle Identification System". The first partial payment will be made upon delivery of the IRD-supplied equipment under this contract as defined in Section 2.3.

B. The second partial payment will be 45% of the contract unit price per each for "Commercial Vehicle Identification System". The second partial payment will be made upon Installation Acceptance as defined in Section 6.1.

C. The final payment will be 30% of the contract unit price per each for "Commercial Vehicle Identification System". Final payment will be made upon Final Acceptance as defined in Section 6.2.

Payment will be full compensation for labor, equipment, tools, materials, and all other items of work required to furnish, install, and test the Commercial Vehicle Identification System.

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CONDUIT AND CABLE QUANTITIES

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Location to Location	Rigid Conduit				Copper Wire		Junction Boxes																
	Schedule 40					1/C #6 AWG Ft	1/C #10 AWG Ft	Type 2 Each	Type 3 Each														
	1" Ft	1.25" Ft	2" Ft																				
Interstate 90 West of Tilford																							
WIM Location EBL																							
WIM Cabinet	Pullbox - A								1														
Pullbox - A	Lic. Plate Reader (LPR1) & Illuminator (11)																						
Pullbox - A	Pullbox - F								5														
Pullbox - F	19																						
Pullbox - F	Pullbox - G								1														
Pullbox - G	19																						
Pullbox - G	Pullbox - H								1														
Pullbox - H	19																						
Electrical																							
WIM Cabinet	Pullbox - J						77		1														
Pullbox - J	Lic. Plate Reader (LPR1) & Illuminator (11)						287		1														
Existing Pullbox	Pullbox - L				236		1224		1														
Pullbox - L	Changeable Mess. Sign (CMS1)				7		55																
Pullbox - L	Pullbox - M				173		900		1														
Pullbox - M	Changeable Mess. Sign (CMS1)				7		55																
Total:																							
	118	423	1193				2234	364	8	4													



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EXISTING I-90 EB
MAINLINE WIM
INSTALLATION

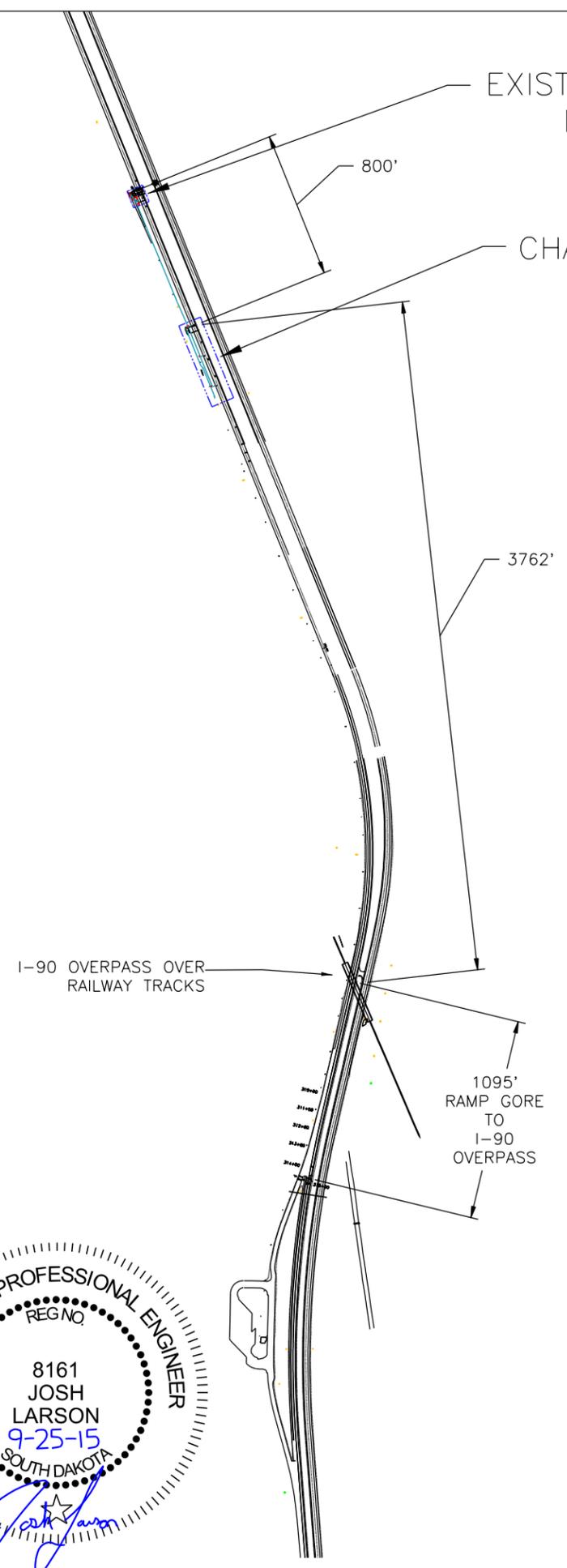
CHANGEABLE MESSAGE SIGN
- SEE DETAIL B
- SHEET G8

POWER CONDUITS: (All items supplied by Contractor)

- ① CMS SWITCHED POWER (REPORT/BYPASS SIGNALS)
CMS CONSTANT POWER
- ② LPR POWER
LPR ILLUMINATOR POWER

SIGNAL CONDUITS: (All conduit supplied by Contractor)
(All wiring supplied by IRD)

- ① 1" CONDUIT
2-LOOP WIRE
- ② 2" CONDUIT
1-CAT5 NETWORK CABLE (LPR)
1-2C 18AWG LPR TRIGGER CABLE
- ③ 2" CONDUIT
3-2C 18AWG (LOOP LEADS)
- ④ 2" CONDUIT
2-2C 18AWG (LOOP LEADS)
- ⑤ 2" CONDUIT
1-2C 18AWG (LOOP LEADS)
- ⑥ 2" CONDUIT
1-CAT5 NETWORK CABLE (LPR)
1-2C 18AWG LPR TRIGGER CABLE
3-2C 18AWG (LOOP LEADS)



LEGEND:

- L - INDUCTIVE LOOP
- CMS - CHANGEABLE MESSAGE SIGN
- LPR - LICENSE PLATE READER CAMERA
- NB - NORTHBOUND
- AVI - AUTOMATIC VEHICLE IDENTIFICATION
- WIM - WEIGH IN MOTION
- LED - LIGHT EMITTING DIODE
- ① - SIGNAL CONDUIT
- ① - POWER CONDUIT
- △ - NOTE
- Ⓩ - TYPE 2 JUNCTION BOX
- Ⓜ - TYPE 3 JUNCTION BOX

GENERAL NOTES:

TYPICAL LAYOUT IS SHOWN. OTHER SENSORS MAY BE REQUIRED AND ARE SHOWN IN PROJECT DOCUMENTATION.

SENSOR SPACING SHOWN IS TYPICAL SPACING REQUIREMENT, ACTUAL SENSOR SPACING MAY BE ALTERED TO SUIT SITE CONDITIONS BY THE IRD FIELD REPRESENTATIVE.

ALL CONNECTIONS BETWEEN SENSORS AND LEAD CABLES ARE DONE IN PULL BOX AND ARE SOLDERED THEN SEALED FOR WATERPROOFING. NUMBER AND PLACEMENT OF PULL BOXES NOT SHOWN.

CABLES MUST BE PROTECTED BY PVC SLEEVES WHERE THEY CROSS PAVEMENT JOINTS/CRACKS.

IRD RECOMMENDS THAT PULL BOXES BE NO FURTHER THAN 200' APART.
IRD RECOMMENDS THE MINIMUM SIZE FOR PULL BOXES IS 18" X 18" X 12".

EXACT ROUTING OF CONDUIT TO BE DETERMINED ON SITE.

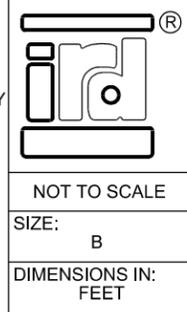
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**SITE LAYOUT
TILFORD POE, SOUTH DAKOTA DOT**

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DIMENSIONS IN: FEET

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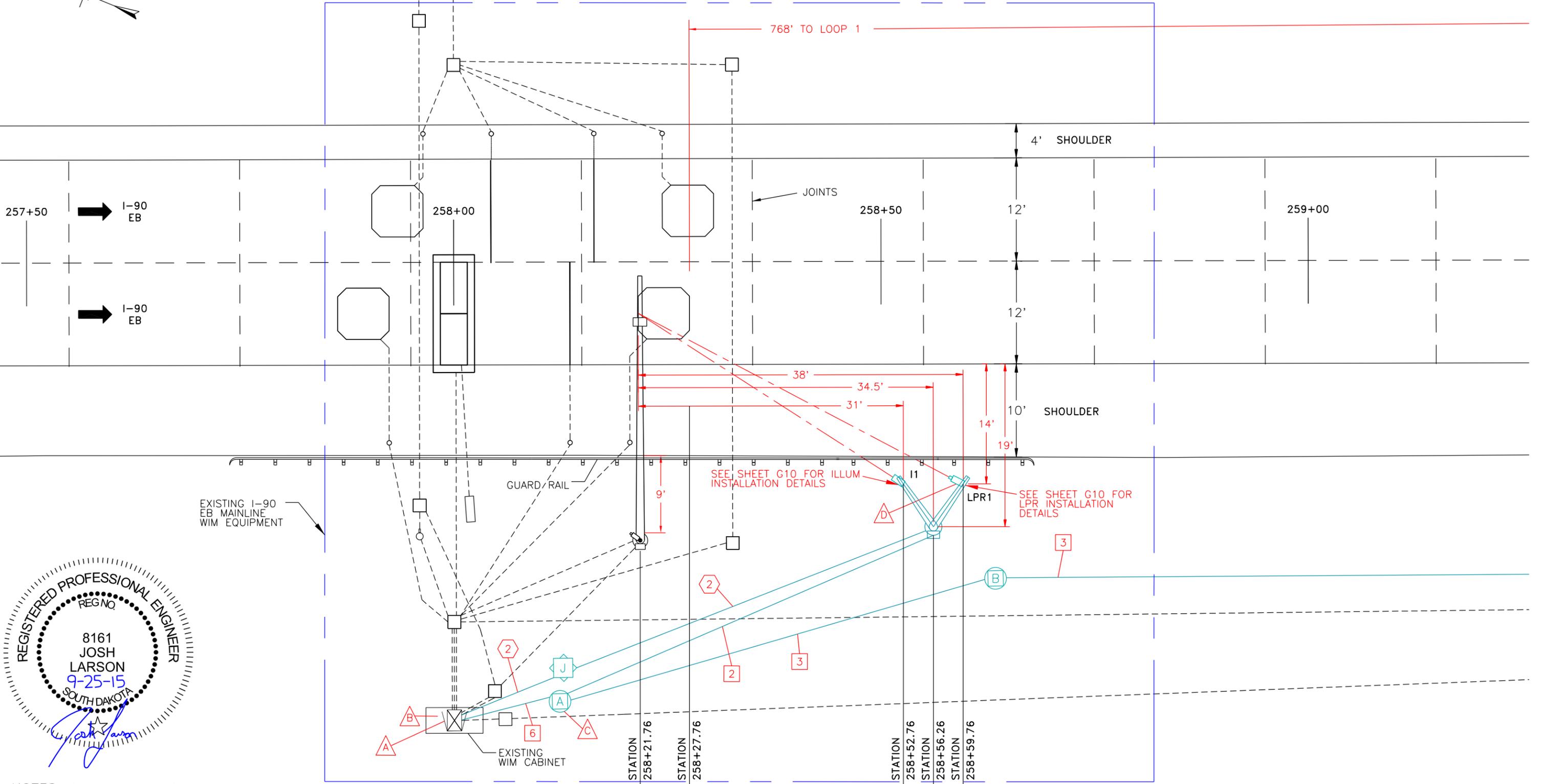
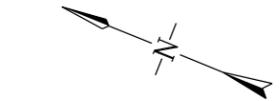
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SHEET OF

DETAIL A

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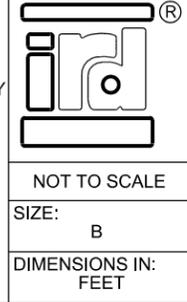


NOTES: (THIS SHEET ONLY)

- A** EXISTING CABINET WITH WIM ELECTRONICS
- B** EXISTING CABINET BASE
- C** PULL BOX.
- D** POLE LOCATION MUST ALLOW ADEQUATE RIGHT-OF-WAY OR PROTECT WITH GUARDRAIL OR USE OF BREAK-AWAY POLE AS REQUIRED BY LOCAL CONSTRUCTION CODES.

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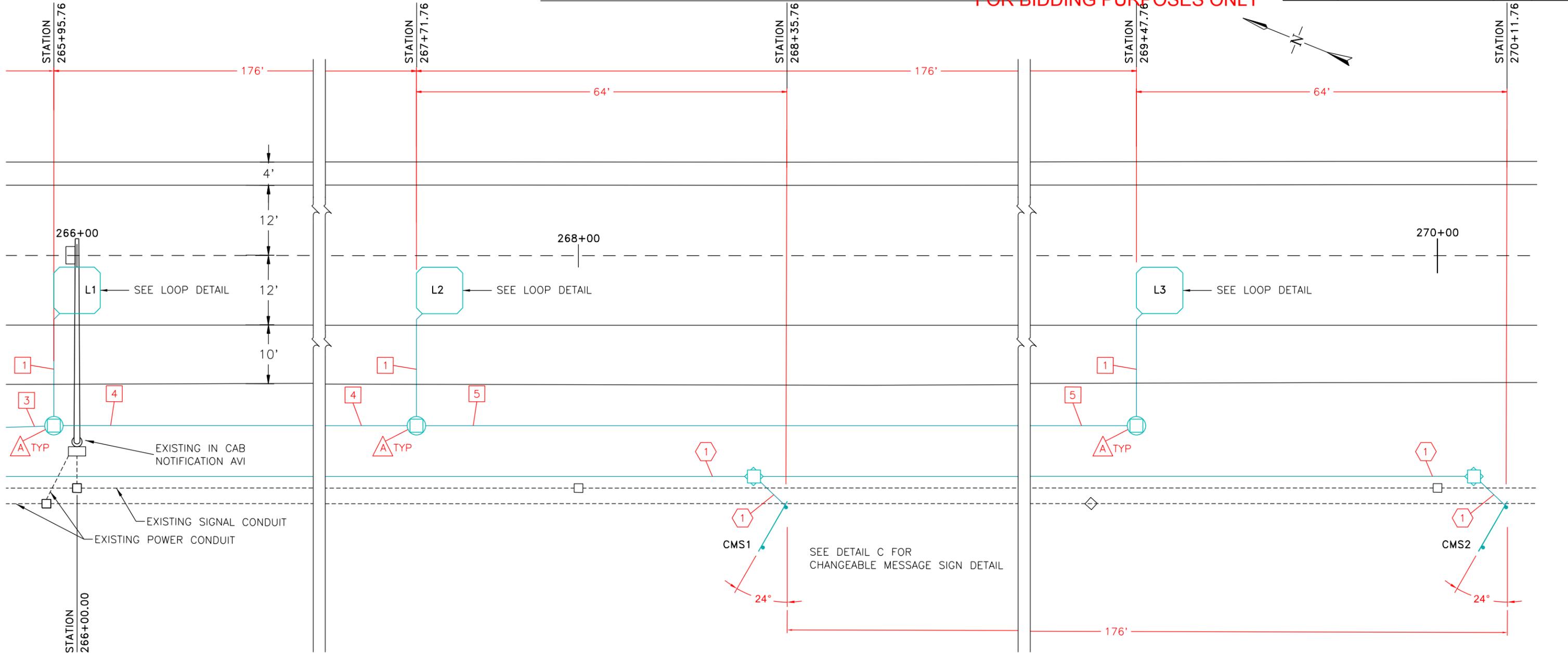
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DETAIL B - CHANGEABLE MESSAGE SIGNS

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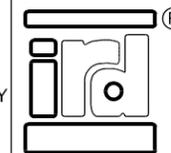
PULL BOX.



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DWG. No.

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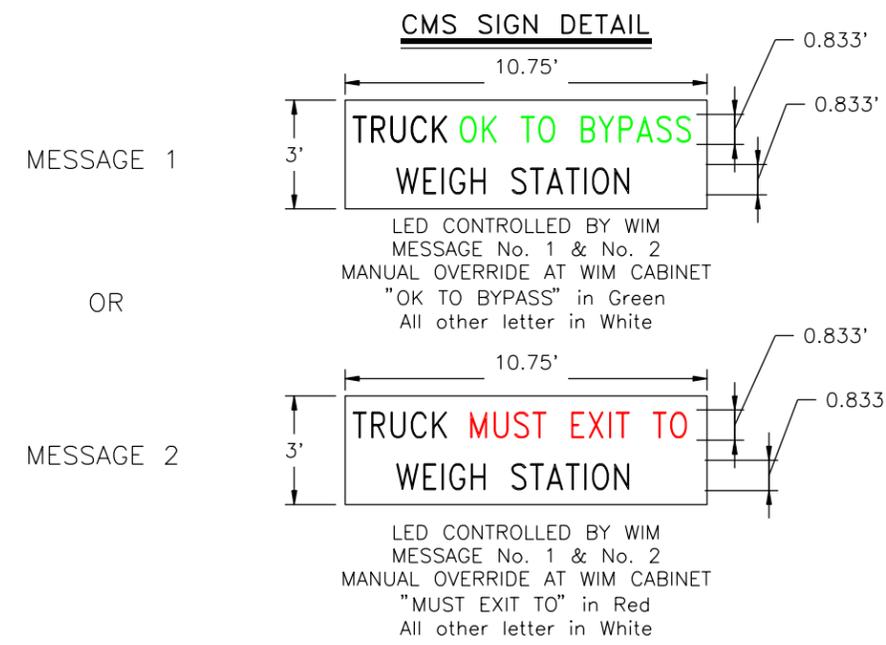
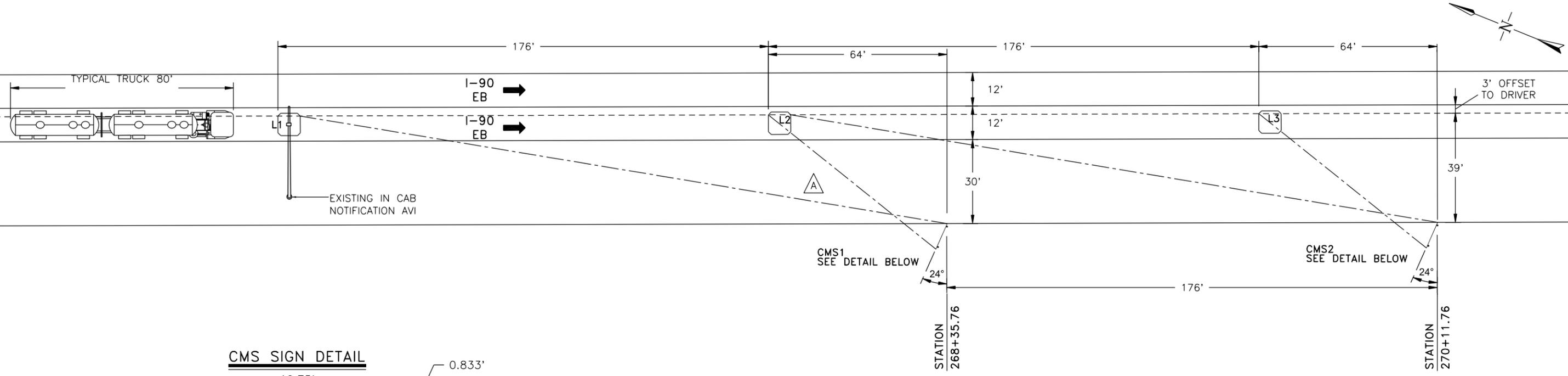
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DETAIL C – CHANGEABLE MESSAGE SIGN DETAIL

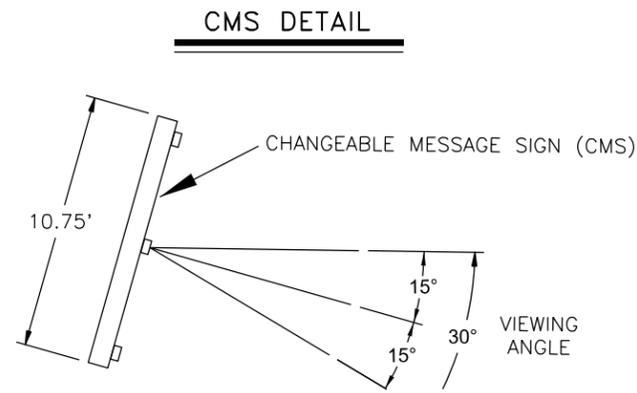
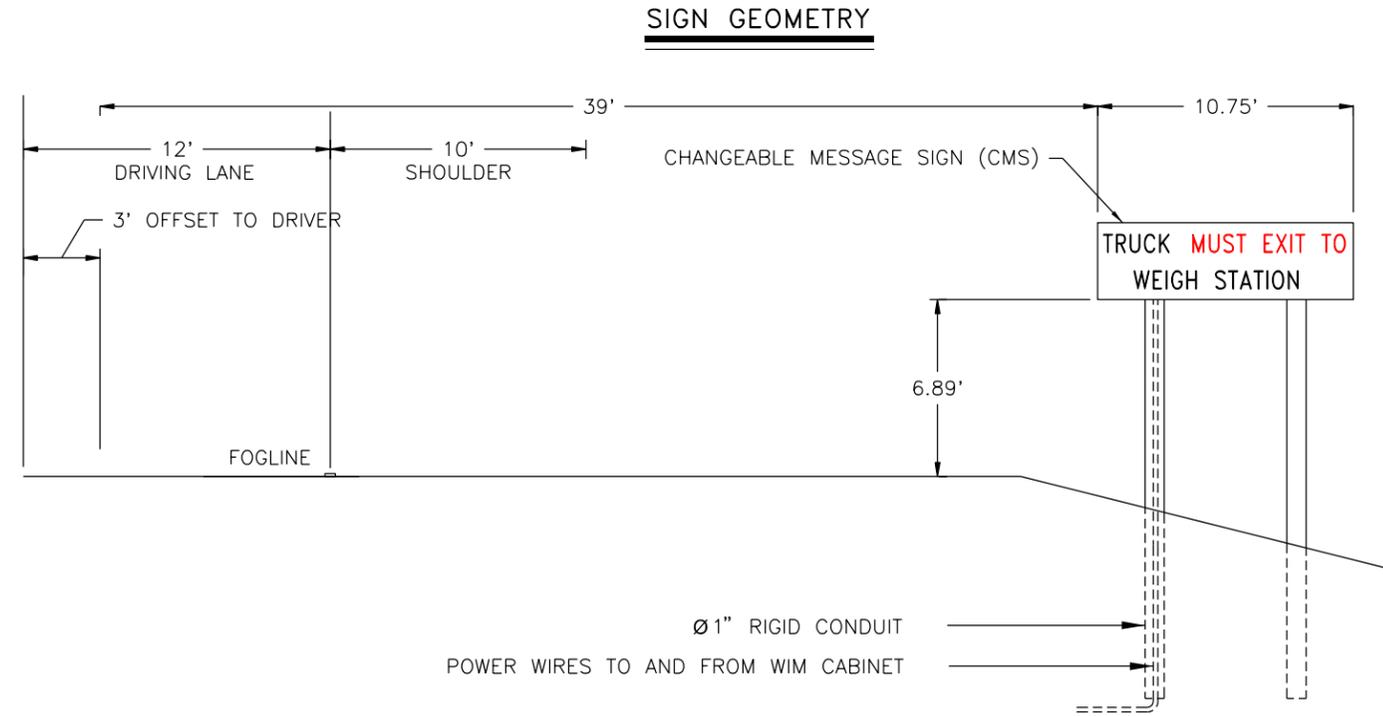
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NOTES: (THIS SHEET ONLY)

▲ SIGNS SET TO ENSURE MINIMUM 100' FULL VISIBILITY.



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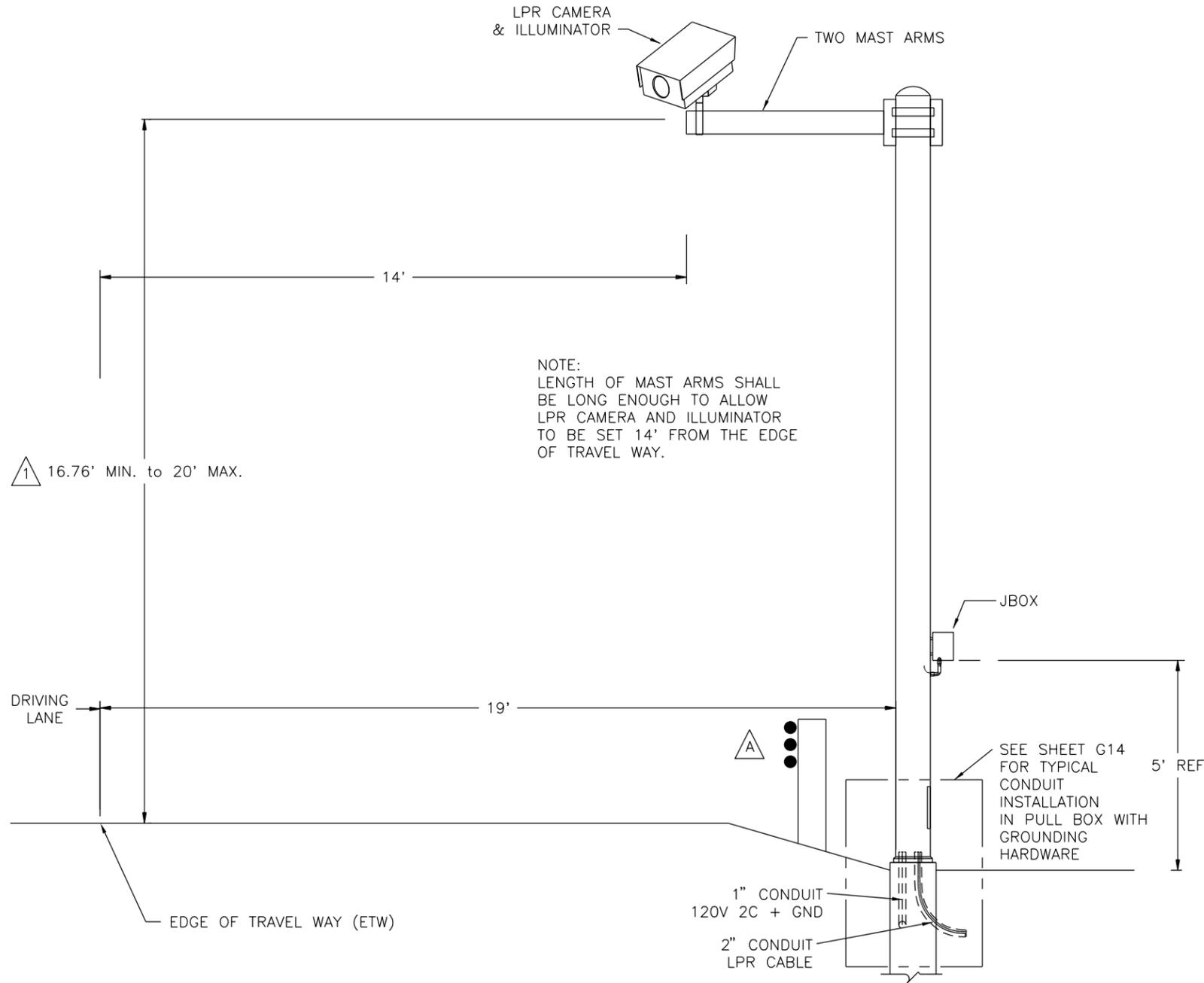
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ILLUMINATOR AND LICENSE PLATE READER CAMERA INSTALLATION DETAIL

(VIEW FACING DOWNSTREAM)

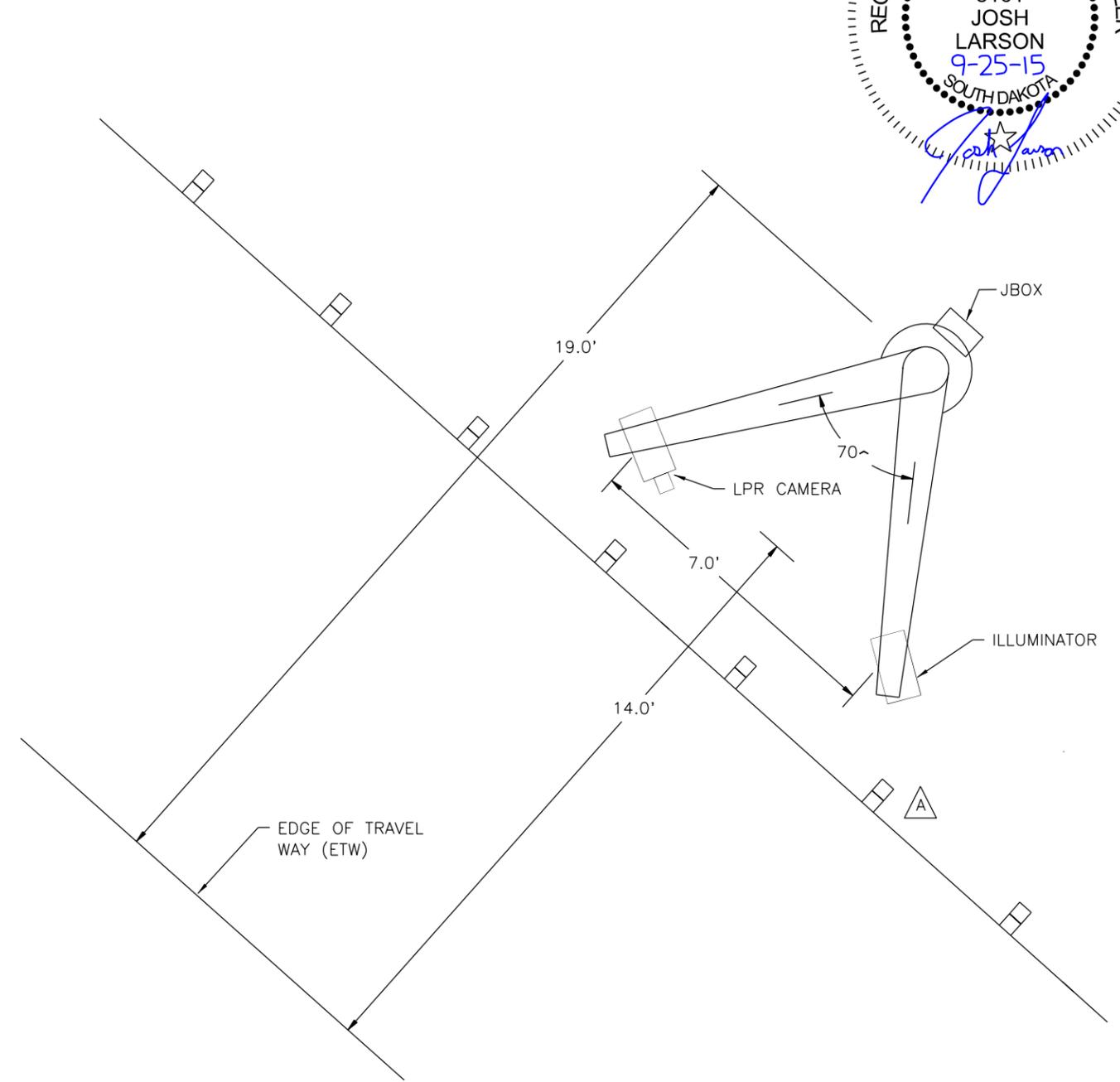
STATION 258+56.26



ILLUMINATOR AND LICENSE PLATE READER CAMERA INSTALLATION DETAIL

(TOP VIEW)

STATION 258+56.26



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NOTES: (THIS SHEET ONLY)

- △ HEIGHT RELATIVE TO HIGHEST POINT OF ROADWAY.
- △ GUARDRAIL IS REQUIRED - SEE SECTION F FOR DETAILS

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**SITE LAYOUT
TILFORD POE, SOUTH DAKOTA DOT**

DWG. No. REV.:

CAD FILE: SHEET OF

LICENSE PLATE READER CAMERA INSTALLATION DETAIL **FOR BIDDING PURPOSES ONLY**

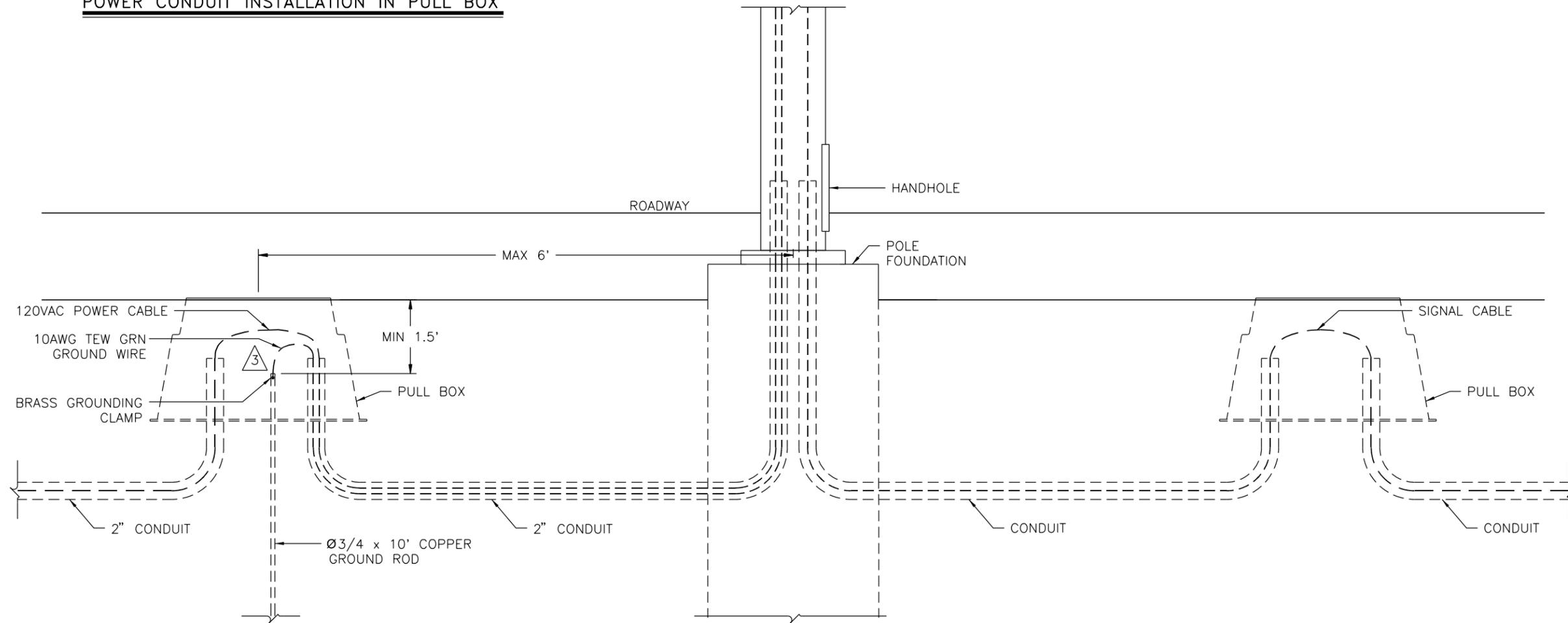
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REAR VIEW – FACING ROADWAY
TYPICAL CONDUIT INSTALLATION IN PULL BOX

STATION 258+56.26



POWER CONDUIT INSTALLATION IN PULL BOX



NOTES:

- 1 POLE AND FOUNDATION DESIGN NOT PROVIDED BY IRD.
- 2 CONDUITS TO MEET LOCAL ELECTRIC CODE.
- 3 EQUIPMENT TO BE CONNECTED TO EARTH GROUND IN COMPLIANCE WITH NATIONAL ELECTRICAL CODE AND LOCAL STANDARDS.

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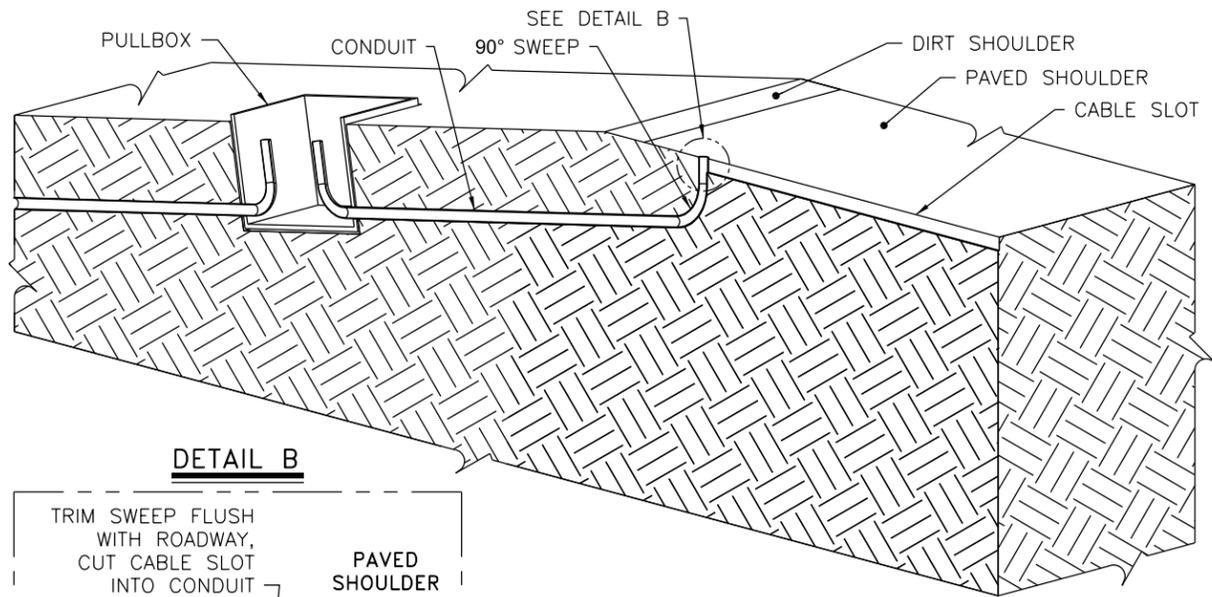
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SASKATOON SASKATCHEWAN CANADA

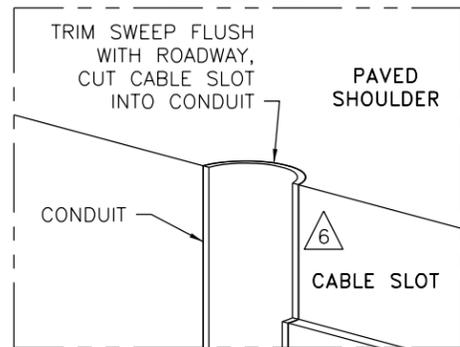
DWG. TITLE:
SITE LAYOUT
TILFORD POE, SOUTH DAKOTA DOT

DWG. No. REV.:
CAD FILE: SHEET OF

CABLE ROUTING DETAILS

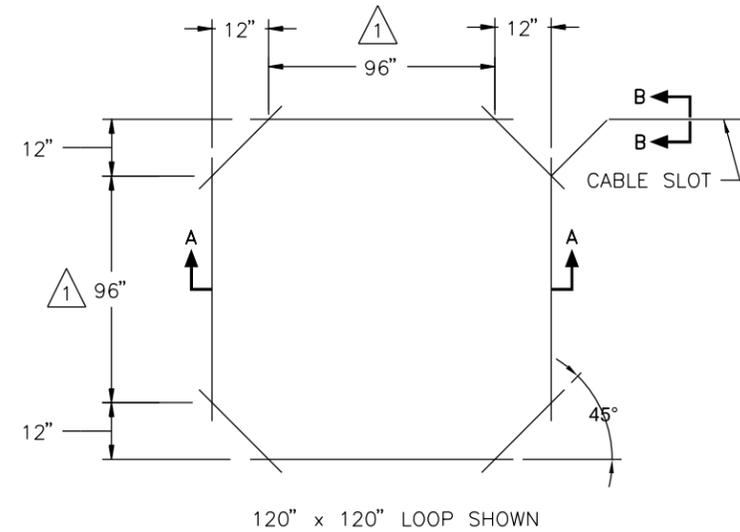


DETAIL B

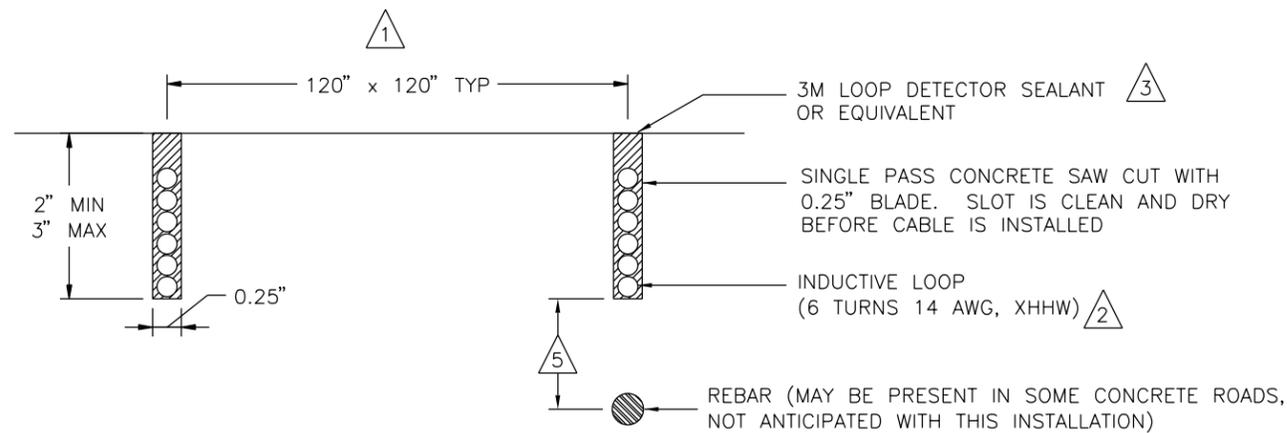


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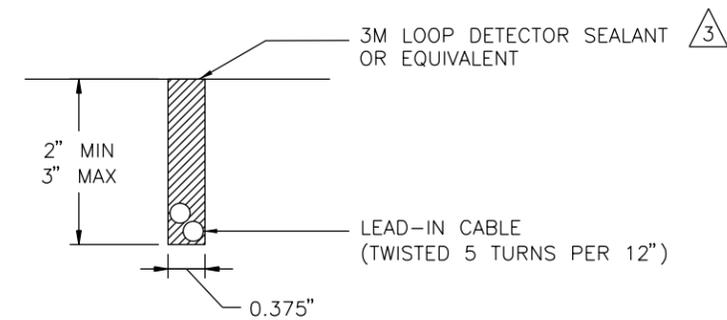
OCTAGON LOOP DIMENSION DETAIL



SECTION A-A



SECTION B-B

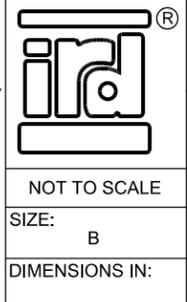


NOTES:

- 1 LOOP SIZE AS SPECIFIED ON SITE LAYOUT AND IN ACCORDANCE WITH IRD 3EGR0001.
- 2 NUMBER OF TURNS AS SPECIFIED ON SITE LAYOUT AND IN ACCORDANCE WITH IRD 3EGR0001.
- 3 USE CAULKING GUN
- 4 LOOP INSTALLATION MANUALS:
690279 - PERMANENT OCTAGON LOOPS
690289 - PERMANENT SQUARE LOOPS
- 5 IF THE LOOP IS INSTALLED OVER REBAR, THERE MUST BE A MINIMUM OF 2" CONCRETE BELOW AND A MINIMUM OF 1" FILL ABOVE THE WIRES.
- 6 CORE DRILL OR CUT NOTCH IN PAVED SHOULDER FOR SWEEP. PLUG SWEEP OPENING, COVER WITH LOOP SEALANT.

REV.	DESCRIPTION	DWN/DSN	APPR.	APPR.	DATE

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INTERNATIONAL ROAD DYNAMICS INC. SASKATOON SASKATCHEWAN CANADA

DWG. TITLE: **INSTALLATION VEHICLE DETECTION LOOPS**

DWG. No. **81300101** REV.:
CAD FILE: SHEET OF

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	HR Y505(01)	G13	G17

ABBREVIATIONS

THESE ABBREVIATIONS COMPRISE A STANDARD LIST; NOT ALL ABBREVIATIONS MAY APPEAR ON THIS PROJECT.

A or AMP	AMPERE	MCB	MAIN CIRCUIT BREAKER
A.C.	ALTERNATING CURRENT	MDP	MAIN DISTRIBUTION PANEL
A/E	ARCHITECT & ENGINEER	MFS	MAIN FUSIBLE SWITCH
A.F.F.	ABOVE FINISHED FLOOR	M.H.	METAL HALIDE
A.F.G.	ABOVE FINISHED GRADE	M.L.O.	MAIN LUG ONLY
A.H.J.	AUTHORITY HAVING JURISDICTION	MTD	MOUNTED
A.I.C.	AMPERE INTERRUPTING CURRENT	M.V.	MERCURY VAPOR
B.U.H.	BLAST UNIT HEATER	N.C.	NORMALLY CLOSED
b.c.	BELOW COUNTER	N.E.C.	NATIONAL ELECTRIC CODE
C or COND	CONDUIT	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
CB OR C/B	CIRCUIT BREAKER	NEU	NEUTRAL
CCT	CIRCUIT	N.L.	NIGHT LIGHT
CU	COPPER	N.O.	NORMALLY OPEN
C.U.H.	CABINET UNIT HEATER	O.H.	OVERHEAD
D.C.	DIRECT CURRENT	P	POLE
DC	DISTRIBUTION CABINET	PB	PUSH BUTTON
DISC	DISCONNECT	PH	PHASE
DN	DOWN	PLBG	PLUMBING
E.C.	ELECTRICAL CONTRACTOR	PR	PAN
EC	ELECTRICAL CABINET	P.R.V.	POWER ROOF VENTILATION
FBO	FURNISHED BY OTHERS	PS	PULL SWITCH
FLA	FULL LOAD AMPERES	PVC	PLASTIC CONDUIT
FLU	FLUORESCENT	PWR	POWER
FUS	FUSE OR FUSIBLE	QTZ	QUARTZ
G.C.	GENERAL CONTRACTOR	REC OR RECEPT	RECEPTACLE
GEN	GENERATOR	REFRIG	REFRIGERATOR
GND or GRD	GROUND	R.H.	RADIANT HEAT
HZ	HERTZ (CYCLES)	R.M.S.	ROOT MEAN SQUARE
ISO	ISOLATED / ISOLATION	SFR	SAFETY RECEPTACLE
IG	ISOLATED GROUND RECEPTACLE	SPR	SPLIT WIRE RECEPTACLE
I.C.	INTERRUPTING CURRENT	SOC	SHORT CIRCUIT CURRENT
I.M.C.	INTERMEDIATE METAL CONDUIT	SHLD	SHIELD OR SHIELDED
INC	INCANDESCENT	S.N.	SOLID NEUTRAL
JB	JUNCTION BOX	SW	SWITCH
KCMIL	THOUSAND CIRCULAR MIL	T.C.	TEMPERATURE CONTROL
KV	KILOVOLT	TC	TELEPHONE CABINET
KVA	KILOVOLT-AMPERE	TEL	TELEPHONE
KW	KILOWATT	TR or TRANS	TRANSFORMER
		U.G.	UNDERGROUND
		U.H.	UNIT HEATER
		U.V.	UNIT VENTILATOR
		V	VOLT
		W	WATT or WIRE
		w/	WITH
		WP	WEATHERPROOF
		WTR OR H2O	WATER
		XFMR	TRANSFORMER
		∅	PHASE

INDEX OF ELECTRICAL DRAWINGS

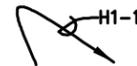
G13 ELECTRICAL TITLE SHEET
G14 LPR POWER PLAN
G15 CMS POWER PLAN

CONDUIT



UNDERGROUND CONDUIT

HOMERUNS



1 - SINGLE POLE CIRCUIT
(Circuit No's)

PANELS AND TERMINATIONS BOARDS



LOCAL DISCONNECT SWITCH

REFERENCE INDICATION



SEE NOTE INDICATED BY NUMBER



SEE EQUIPMENT INDICATED BY NUMBER



REVISION



REVISION CLOUD

MOTORS



MOTOR CONNECTION

OTHER

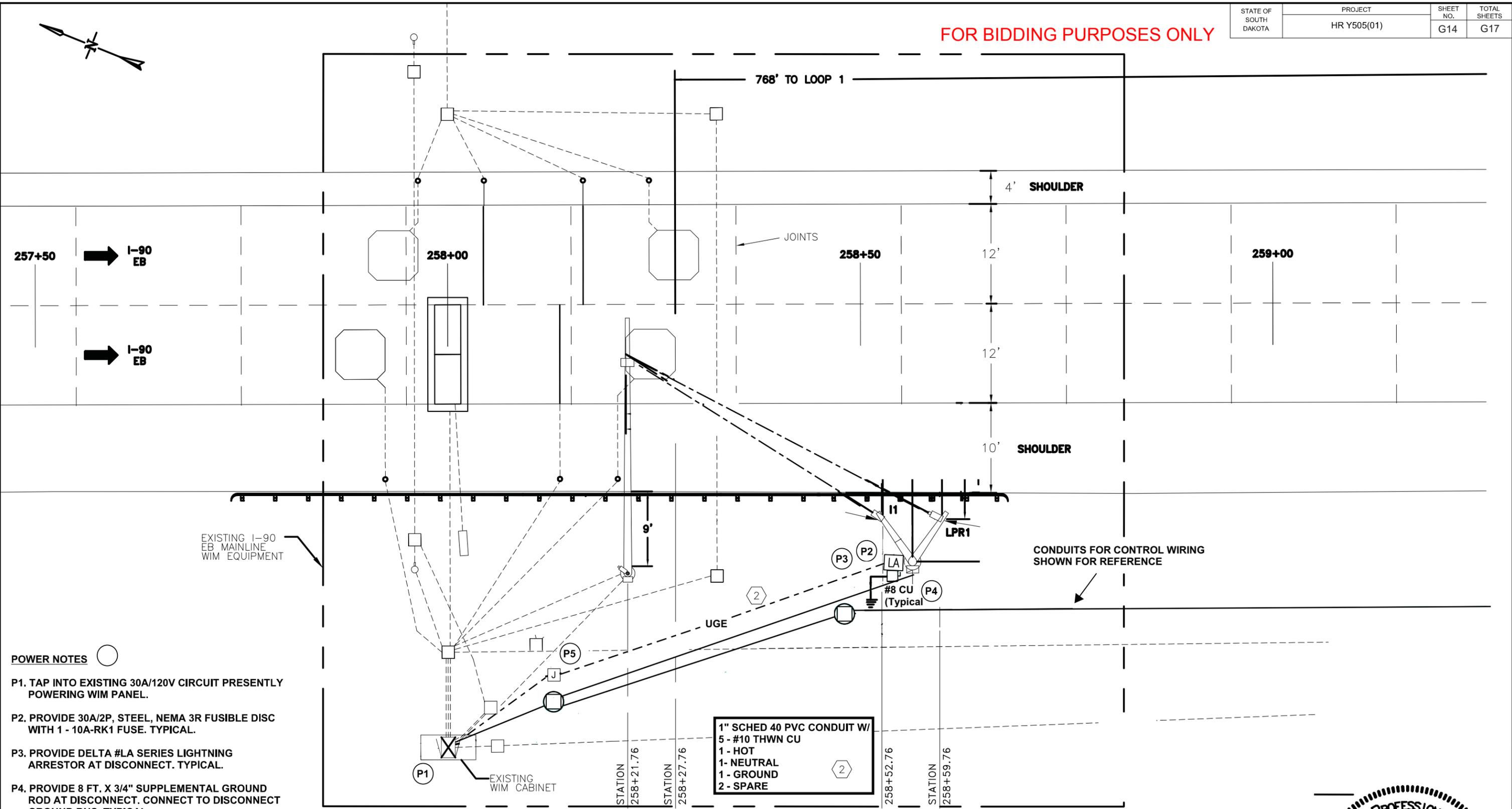


JUNCTION/PULLBOX

SEE DRAWINGS FROM IRD FOR FURTHER ELECTRICAL REQUIREMENTS. ELECTRICAL SPECIFICATIONS PROVIDED WITH THESE DOCUMENTS APPLY TO ALL ELECTRICAL WORK DONE ON THIS PROJECT.

TILFORD POE
SOUTH DAKOTA DOT
LPR/ILLUMINATOR/CMS
INSTALLATION

FOR BIDDING PURPOSES ONLY



- POWER NOTES**
- P1. TAP INTO EXISTING 30A/120V CIRCUIT PRESENTLY POWERING WIM PANEL.
 - P2. PROVIDE 30A/2P, STEEL, NEMA 3R FUSIBLE DISC WITH 1 - 10A-RK1 FUSE. TYPICAL.
 - P3. PROVIDE DELTA #LA SERIES LIGHTNING ARRESTOR AT DISCONNECT. TYPICAL.
 - P4. PROVIDE 8 FT. X 3/4" SUPPLEMENTAL GROUND ROD AT DISCONNECT. CONNECT TO DISCONNECT GROUND BUS. TYPICAL.
 - P5. PROVIDE 24" X 24" IN GROUND J-BOX/PULLBOX. UTILIZE QUAZITE CONCRETE POLYMER ENCLOSURE.

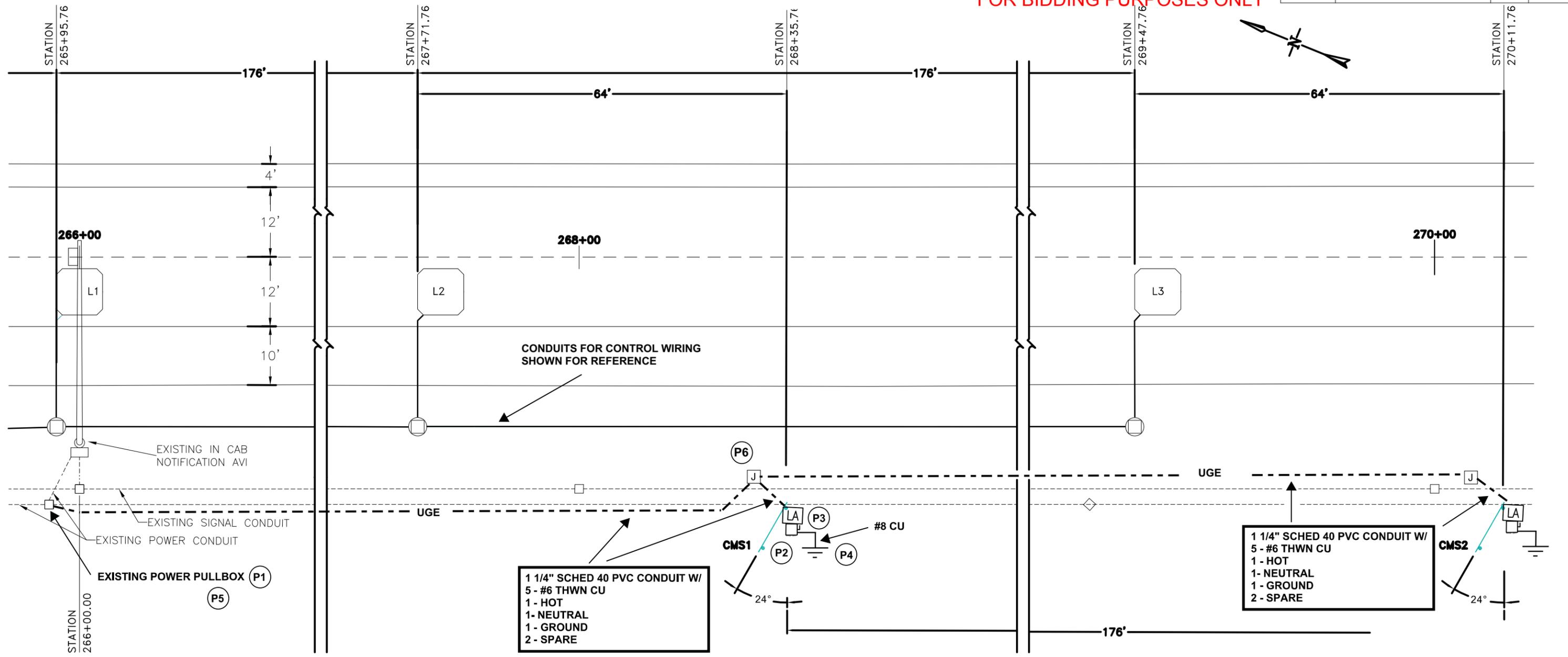
LPR POWER PLAN



225 NORTH MAIN AVE. - PARKER, SD - 57706
 4669 262nd STREET - SIOUX FALLS, SD - 57107
 PH: (605) 277-0447 - FAX: (605) 277-0681
 Email: info@pegrouppeng.com



FOR BIDDING PURPOSES ONLY



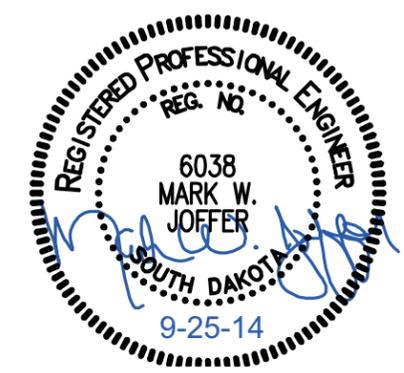
POWER NOTES

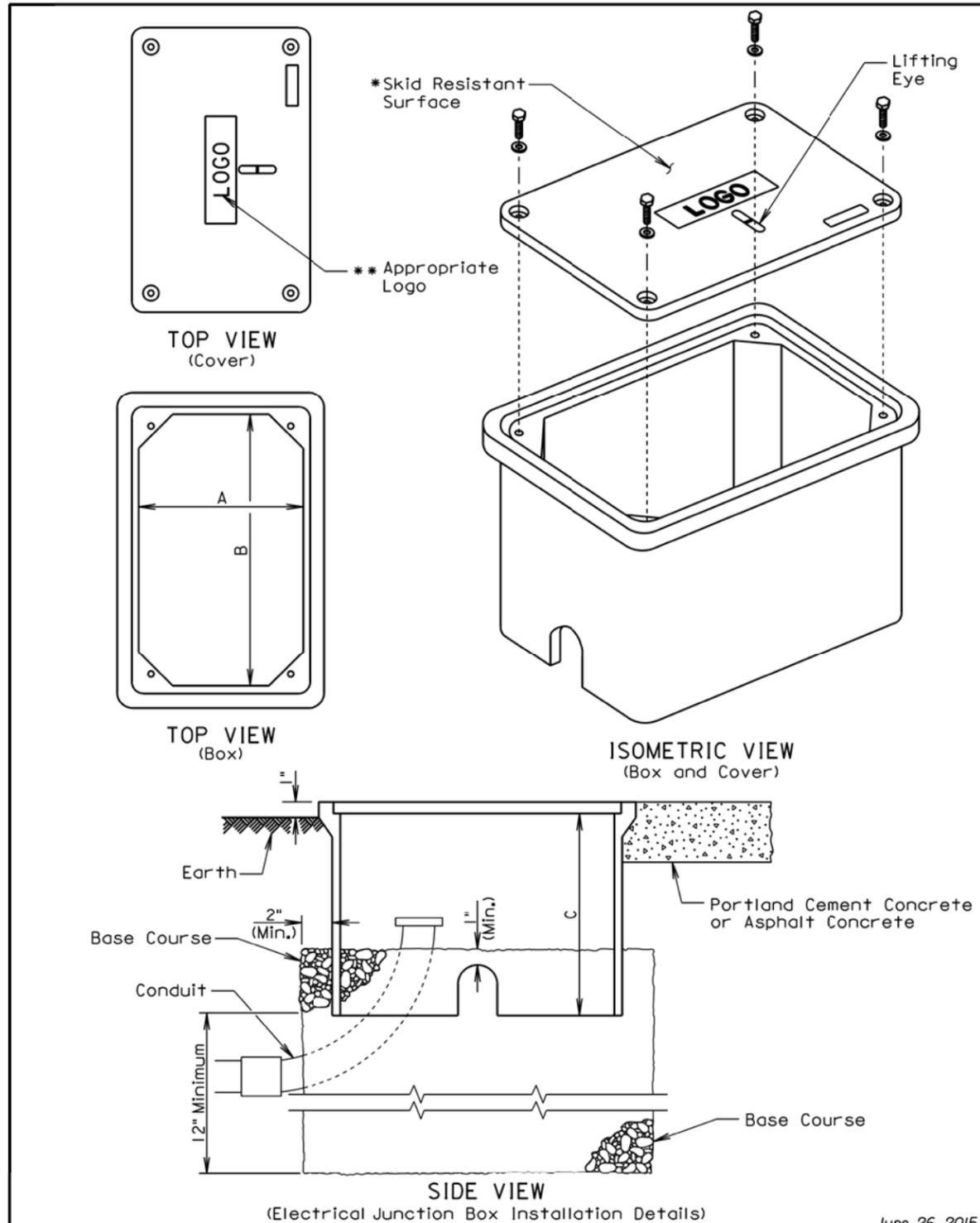
- P1. TAP INTO EXISTING 30A/120V CIRCUIT PRESENTLY POWERING WIM PANEL.
- P2. PROVIDE 30A/2P, STEEL, NEMA 3R FUSIBLE DISC WITH 1 - 10A-RK1 FUSE. TYPICAL.
- P3. PROVIDE DELTA #LA SERIES LIGHTNING ARRESTOR AT DISCONNECT. TYPICAL.
- P4. PROVIDE 8 FT. X 3/4" SUPPLEMENTAL GROUND ROD AT DISCONNECT. CONNECT TO DISCONNECT GROUND BUS. TYPICAL.
- P5. UTILIZE IDEAL B-TAP SERIES INSULATION PIERCING TAP CONNECTOR FOR SPLICING. TYPICAL FOR ALL SPLICES ON THIS SHEET.
- P6. PROVIDE 24" X 24" IN GROUND J-BOX/PULLBOX. UTILIZE QUAZITE CONCRETE POLYMER ENCLOSURE.

CMS POWER PLAN



225 NORTH MAIN AVE. PARKER, SD • 57088
 46639 22nd STREET • SIOUX FALLS, SD • 57107
 PH: (605) 257-8647 • FAX: (605) 257-8681
 Email: info@pegroupeng.com





ELECTRICAL JUNCTION BOX

TYPE	DESCRIPTION	DIMENSIONS		
		A	B	C
1	Open Bottom with Gasket	11"-15"	18"-21"	18" (Min.)
2	Open Bottom with Gasket	13"-18"	23"-28"	18" (Min.)
3	Open Bottom with Gasket	17"-22"	24"-30"	18" (Min.)
4	Open Bottom with Gasket	28"-33"	36"-48"	24" (Min.)

GENERAL NOTES:

The cover shall be gasketed with a minimum of two stainless steel bolts and washers.

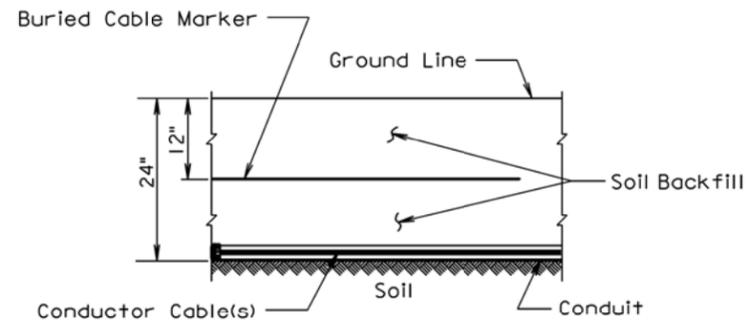
The cover shall have a lifting eye.

*The surface of the cover shall have a minimum wet and dry coefficient of friction value of 0.5 as determined by ASTM F 609.

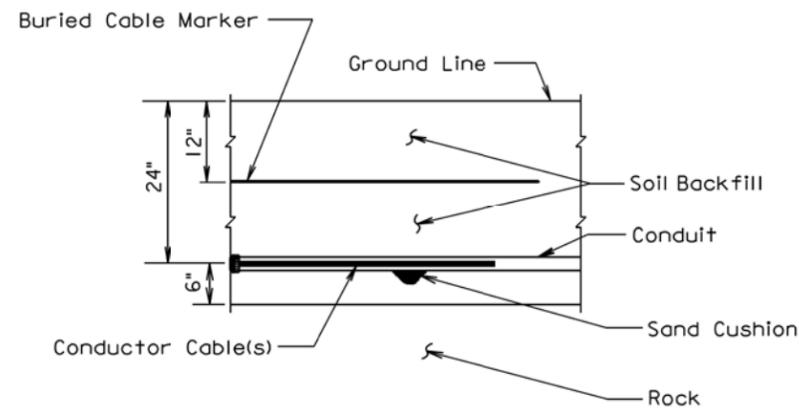
**The cover of the junction box shall have the appropriate logo in one inch size letters and shall be recessed. When the junction box contains cables or wires for a traffic signal then the logo shall be "Signal". When the junction box contains lighting conductors then the logo shall be "Lighting".

The electrical junction boxes shall comply with the American National Standards Institute (ANSI)/Society of Cable Telecommunications Engineers (SCTE) 77 2007 Specification for Underground Enclosure Integrity. The loading requirement for all the electrical junction boxes shall be Tier 8 of ANSI/SCTE 77 2007.

The electrical junction boxes shall be UL listed.



SECTION VIEW



SECTION VIEW

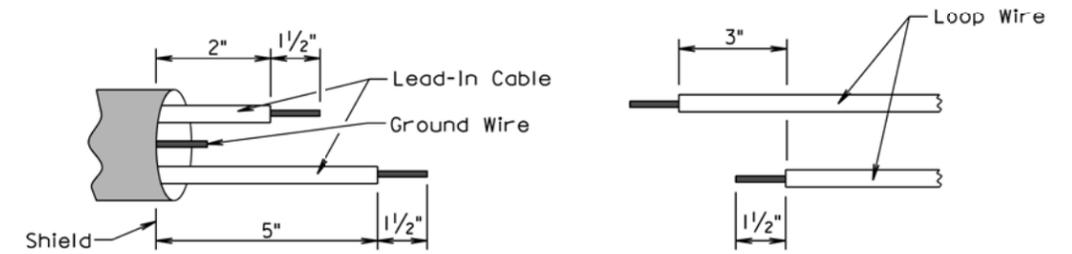
GENERAL NOTE:

The Buried Cable Marker shall be plastic, approximately 6" wide, and shall be capable of sustaining a minimum of a 350% tolerance of elongation without tearing. The Buried Cable Marker shall have a life expectancy approximately equal to that of the conductor(s) beneath it. A phrase indicating the presence of a buried electric circuit below shall be printed in a contrasting color on the cable marker. The Buried Cable Marker shall be subject to approval by the Engineer. All costs associated with furnishing and installing the Buried Cable Marker shall be incidental to the contract unit price per Foot for the bid item used for the electrical conductor.

March 31, 2000

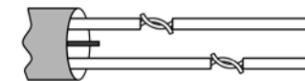
Published Date: 3rd Qtr. 2015	S D D O T	CONDUIT INSTALLATION	PLATE NUMBER 635.76
			Sheet 1 of 1

Step 1. Strip loop wires and lead-in cable.

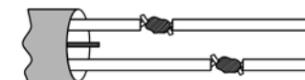


Step 2. Connect and solder.

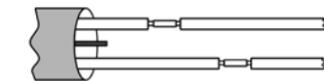
Twist bare conductors together



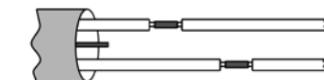
and solder with 60/40 (tin/lead) resin solder



Crimp bare conductors together with an uninsulated butt connector



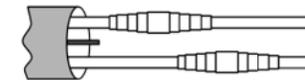
and solder with 60/40 (tin/lead) resin solder



OR

Step 3. Insulate each solder joint seperately.

Electrical Tape



Shrink Tube



OR

Step 4. Environmentally seal total splice against weather, moisture and abrasion. Methods for environmentally sealing the splice include heat-shrinkable tubing, special sealing kits, special forms to be filled by sealant, and tape and coating.



June 20, 2000

Published Date: 3rd Qtr. 2015	S D D O T	DETECTOR LOOP WIRE SPLICING	PLATE NUMBER 635.77
			Sheet 1 of 1