

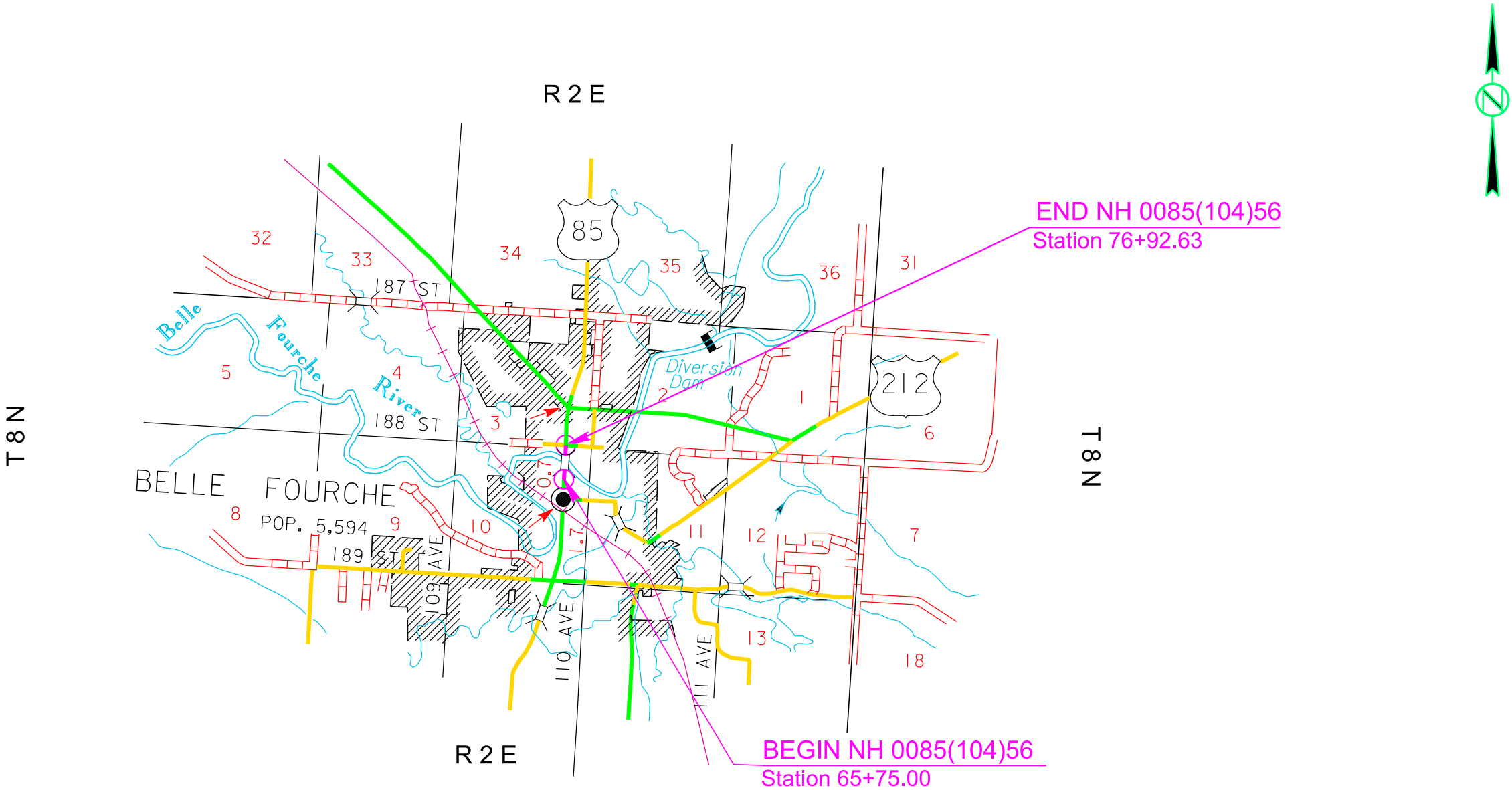
SECTION L: LIGHTING PLANS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0085(104)56	L1	L13

Plotting Date: 09/15/2026

INDEX OF SHEETS

L1	General Layout with Index
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L4	Conduit and Cable Quantities
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L10-L13	Standard Plates



Plot Scale - 1:200

Plotted From - TRR017/15

Plot Scale - 1:200

Plotted From - TRR011715

SECTION L ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1540	Remove Luminaire Pole Footing	3	Each
110E5100	Salvage Luminaire Pole	5	Each
632E3720	Relocate Radar Speed Sign	1	Each
635E0901	Decorative Luminaire Pole with Arm	18	Each
635E3545	Under Bridge Deck Luminaire, LED	2	Each
635E3815	Decorative Luminaire, LED with Photoelectric Cell	18	Each
635E5020	2' Diameter Footing	84.0	Ft
635E5301	Type 1 Electrical Junction Box	4	Each
635E5400	Electrical Service Cabinet	2	Each
635E8120	2" Rigid Conduit, Schedule 40	1,605	Ft
635E8220	2" Rigid Conduit, Schedule 80	260	Ft
635E9014	1/C #4 AWG Copper Wire	950	Ft
635E9016	1/C #6 AWG Copper Wire	6,650	Ft
635E9018	1/C #8 AWG Copper Wire	1,385	Ft
635E9020	1/C #10 AWG Copper Wire	45	Ft
635E9024	1/C #14 AWG Copper Wire	1,410	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	870	Ft

SUPPLYING AS BUILT PLANS

If the roadway lighting system is constructed differently than what is stated in the plans, the Contractor will supply as built plans to the Engineer and a copy will be sent to the Traffic Design Engineer The as built plans may include conduit layouts, wiring diagrams, or other drawings depicting the changes from the original plans.

SHOP DRAWING AND CATALOG CUTS SUBMITTALS

The Contractor will submit shop drawings and catalog cuts in accordance with Section 985 of the Specifications.

PDF submittals will be sent to the following email addresses:

Stacy.Bartlett@state.sd.us
Joseph.Updike@state.sd.us

REMOVE LUMINAIRE POLE FOOTING

The footings of existing luminaire poles EL1, EL2, and EL5 will be removed by the Contractor to a minimum of 2’ below the ground surface. Restoration of the disturbed area will be to the satisfaction of the Engineer.

All costs for removing the footings of the existing luminaire poles will be incidental to the contract unit price per each for “Remove Luminaire Pole Footing”.

SALVAGE LUMINAIRE POLE

Existing luminaire poles EL1-EL5 will be salvaged and delivered to the City of Belle Fourche by the Contractor. The Contractor will notify the city 5 days before the delivery of the salvaged luminaire poles.

The City contact is Ryan Stedillie at (605) 892-5287 or Ryan Reeves at (605) 641-0564. The poles will be delivered to:

211 N. 8th Avenue
Belle Fourche, SD, 57717

Poles damaged during salvaging or delivery will be repaired or replaced by the Contractor at no cost to the State.

All costs for work involved in the salvage and delivery of the existing luminaire poles will be incidental to the contract unit price per each for “Salvage Luminaire Pole”.

DECORATIVE LUMINAIRE POLE

Luminaire poles L1 to L18 will be decorative street lighting using Holophane black, round tapered steel, fluted poles, with 4-feet Boston Harbor Arms.

Luminaire poles L1 to L8, and L15 to L18 will have a mounting height of 30-feet and will be equipped with a breakaway base.

The pole fabricator will be responsible for the determining the diameter, length, and number of anchor rods.

Luminaire poles L9 to L14 are bridge mounted poles and will have a mounting height of 40-feet and will be equipped with fixed bases. Refer to Section E for mounting details and bent cap details.

Decorative Luminaire poles L1 to L18 will be designed to include loadings created by holiday decorations that weigh 15-lbs and are 3’ x 6’. The bottom of the decorations will be 24 feet from the top of the footing for poles L9 to L14, and 14 ft from the top of the footing for poles L1 to L8 and L15 to L18.

Decorative Luminaire poles L1 to L18 will have a convenience duplex festoon outlet receptacle (15-amp, 3 wire) suitable for outdoor use. Festoon will be placed 90° counterclockwise to the pole arm. All cost associated with making the festoon receptacles operational including but not limited to, the necessary hardware, will be incidental to the contract unit price per each “Decorative Luminaire Pole with Arm”.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0085(104)56	L2	L13

Plotting Date: 09/15/2026

LUMINAIRES

The lighting design for L1-L2 used the following parameters to provide 1.2 and greater average maintained foot-candles and uniformity ratios of 3:1 (average maintained to minimum maintained foot-candles) and 6:1 (maximum to minimum maintained foot candles):

Pole Setback: 4.5 Ft.
Lamp Loss Factor (LLF): 0.8
Width of Lighted Area: 50 Ft.
Luminaire Cycle Length: 135 Ft.
Configuration: Opposite
Mounting Height: 30 Ft.
Arm Length 4 Ft.

The lighting design for L3-L8 and L15-L18 used the following parameters to provide 1.2 and greater average maintained foot-candles and uniformity ratios of 3:1 (average maintained to minimum maintained foot-candles) and 6:1 (maximum to minimum maintained foot candles):

Pole Setback: 10 Ft.
Lamp Loss Factor (LLF): 0.8
Width of Lighted Area: 55 Ft.
Luminaire Cycle Length: 135 Ft.
Configuration: Opposite
Mounting Height: 30 Ft.
Arm Length 4 Ft.

The lighting design for L9-L14 used the following parameters to provide 1.2 and greater average maintained foot-candles and uniformity ratios of 3:1 (average maintained to minimum maintained foot-candles) and 6:1 (maximum to minimum maintained foot candles):

Pole Setback: 9 Ft.
Lamp Loss Factor (LLF): 0.8
Width of Lighted Area: 55 Ft.
Luminaire Cycle Length: 171 Ft.
Configuration: Opposite
Mounting Height: 30 Ft.
Arm Length 4 Ft.

The following luminaire will be used for L1-L14 for this design:

Holophane: ELS3-P25S-40K-MVOLT-TG2-NPT-BK-PR7-SS

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TRR011715

UNDER BRIDGE LUMINAIRE

The proposed under bridge luminaires at the US-85 / SD-212 bridge will be installed under the bridge deck at the locations shown in Section E. The Contractor will coordinate with the Engineer and the bridge Contractor prior to installing the under-bridge luminaires.

All costs for the under-bridge luminaires on the bridge abutment will be included in the contract unit price per each for “Under Bridge Deck Luminaire, LED.”

The following luminaire, or an approved equivalent, will be used for this design:

American Electric Lighting:

WCNG_P1_40K_U4W_MVOLT_ZT_10KV_BKSDP_TMPS_PR7_SF_PCLL_RSBOR_ELCW_WCNLWG

TABLE OF FOOTING DATA

Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
L1-L8, L15-L18	2' - 0"	7' - 0"	1' - 8"	49' - 6"	8-#7 x 6' - 6"
L9-L14	Coordinate with Structural Contractor.				

- * Footing depth will be below ground level.
** The size of all spirals will be #3.

SUBSURFACE

Soils on the south side of the bridge consist of dark brown silt sand. Soils on the north side of the bridge consist of brown silt clay.

Concrete placement operations should closely follow excavation procedures. The longer the excavations are left open, the more likely caving may occur. Operations should be sequenced so that concrete placement operations closely follow excavation procedures but at a minimum placed the same working day.

Concrete will not be dropped through standing water. If water is present in the excavation it will be removed prior to concrete placement or the concrete will be tremied.

2” RIGID GALVANIZED STEEL CONDUIT

- Conduit, with expansion fittings, junction boxes and pull tape will be provided at the locations detailed in the Section E plans.
- Attachment for under bridge deck luminaires is detailed in the Section E plans.
- Expansion devices are required at each abutment. Fittings will be waterproof with insulating bushings and bonding jumper. Expansion devices will accommodate the full range of bridge joint movement shown in the plans.
- Junction boxes are required at each Abutment where luminaire poles are located. Conduit will be placed from the junction box to the luminaire pole located on the abutment.
- Pull tape will be 1” tubular wave polyester pull tape with a minimum breaking strength of 6000 lbs.
- Cast in place concrete inserts for conduit attachment will be Dayton Superior ¼” bolt diameter stainless steel F-42 Loop Ferrule Inserts with ¼” stainless steel bolts conforming to ASTM F593.
- Conduit, fittings and attaching hardware will meet the requirements of NFPA 70 National Electrical Code (NEC). All steel components will be hot dip galvanized in accordance with ASTM A123 or A153 as applicable. Isolate the galvanized conduit brackets from the stainless steel insert and bolt with fiber washers.
- All costs to provide the 2” diameter conduit, including concrete inserts, conduit, attaching conduit hardware, junction boxes, attaching under bridge deck luminaire hardware, expansion devices, pull tape, labor, equipment and any incidentals necessary to install the conduit will be included in the contract unit price per foot for “2” Rigid Galvanized Steel Conduit.” Quantities for 2” Rigid Galvanized Steel Conduit are in Section E of the plans.

ELECTRICAL SERVICE CABINET

An externally mounted receptacle and accompanying enclosure will not be required at electrical service cabinets.

At the location noted on the plans, the Contractor will remove the existing electrical service cabinets and install new electrical service cabinets, Meter 1 and Meter 2.

The Contractor will coordinate with Black Hills Energy to install the new electric services at least two weeks prior to needing the power.

The Black Hills Energy contact is Ken Meirose at 605-206-2968.

All costs associated with coordinating, removing, and de-energizing of the electric service and activating the new electric services will be incidental to the contract lump sum price for “Electric Service Cabinet”.

WIRE SPLICING FOR LIGHTING

All wire splices for lighting will be made using TE Connectivity GTAP connectors, NSI Industries Polaris Blue connectors, or an approved equal.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0085(104)56	L3	L13

Plotting Date: 09/15/2026

RELOCATE RADAR SPEED SIGN

The existing radar speed sign attached to existing luminaire pole EL2 will be relocated onto decorative luminaire pole L5. The distance from the bottom of the sign to the top of the footing will be 7 Ft.

All costs associated with relocating the radar speed sign, including disconnecting the existing electrical connection, will be incidental to the contract unit price per each for “Relocate Radar Speed Sign.”

WIRING IN EJL1 TO EL6

Existing junction box EJL1 will not be disturbed in the field. New conduit will be installed between EJL1 and new junction box JL3. New #4 wires will run from the service cabinet through the new conduit and will connect to existing #4 wires in EJL1. All wires will be connected to ensure all existing lights to the north are operational.

All costs associated with splicing new conduit to the existing junction box, reconnecting all #4 wires, and making luminaires operational will be incidental to the contract unit price per each for “Type 1 Electrical Junction Box.”

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Location to Location		Rigid Conduit Schedule 40		Rigid Conduit Schedule 80		Copper Wire				Festoons	Pole & Bracket			
		2" SCH 40 Ft		2" SCH 80 Ft		1/C #8 AWG	1/C #6 AWG	1/C #4 AWG	1/C #10 AWG	1/C #14 AWG	2/C #10 AWG Ft			
LUMINAIRES														
METER 1	JL1				65'				295'					
JL1	JL2				65'				235'					
L1	L1		30'					125'						
L1	L3		105'					360'						
L3	L5		130'					435'			45'			
L5	L7		140'					465'						
JL2	L2		25'						110'					
L2	L4		105'						360'					
L4	L6		90'		40'				435'					
L6	L8		140'						465'					
METER 2	JL3		60'							560'				
JL3	EJL1		15'							80'				
JL3	JL4				90'					310'				
JL3	L17		85'						295'					
L17	L15		135'						450'					
L15	L13								510'					
L13	L11								560'					
L11	L9								560'					
JL4	L18		80'						280'					
L18	L16		150'						495'					
L16	L14		145'						480'					
L14	L12		170'						560'					
L12	L10								560'					
AND BRACKET & FEST														
L1											75'	45'		
L2											75'	45'		
L3											75'	45'		
L4											75'	45'		
L5											75'	45'		
L6											75'	45'		
L7											75'	45'		
L8											85'	55'		
L9											85'	55'		
L10											85'	55'		
L11											85'	55'		
L12											85'	55'		
L13											85'	55'		
L14											75'	45'		
L15											75'	45'		
L16											75'	45'		
L17											75'	45'		
L18											75'	45'		
Total:			1,605'			260'			1,385'	6,650'	950'	45'	1,410'	870'

Plotting Date: 09/15/2026

Plotted From - TRRC11715

CONDUIT LAYOUT

US HWY 85

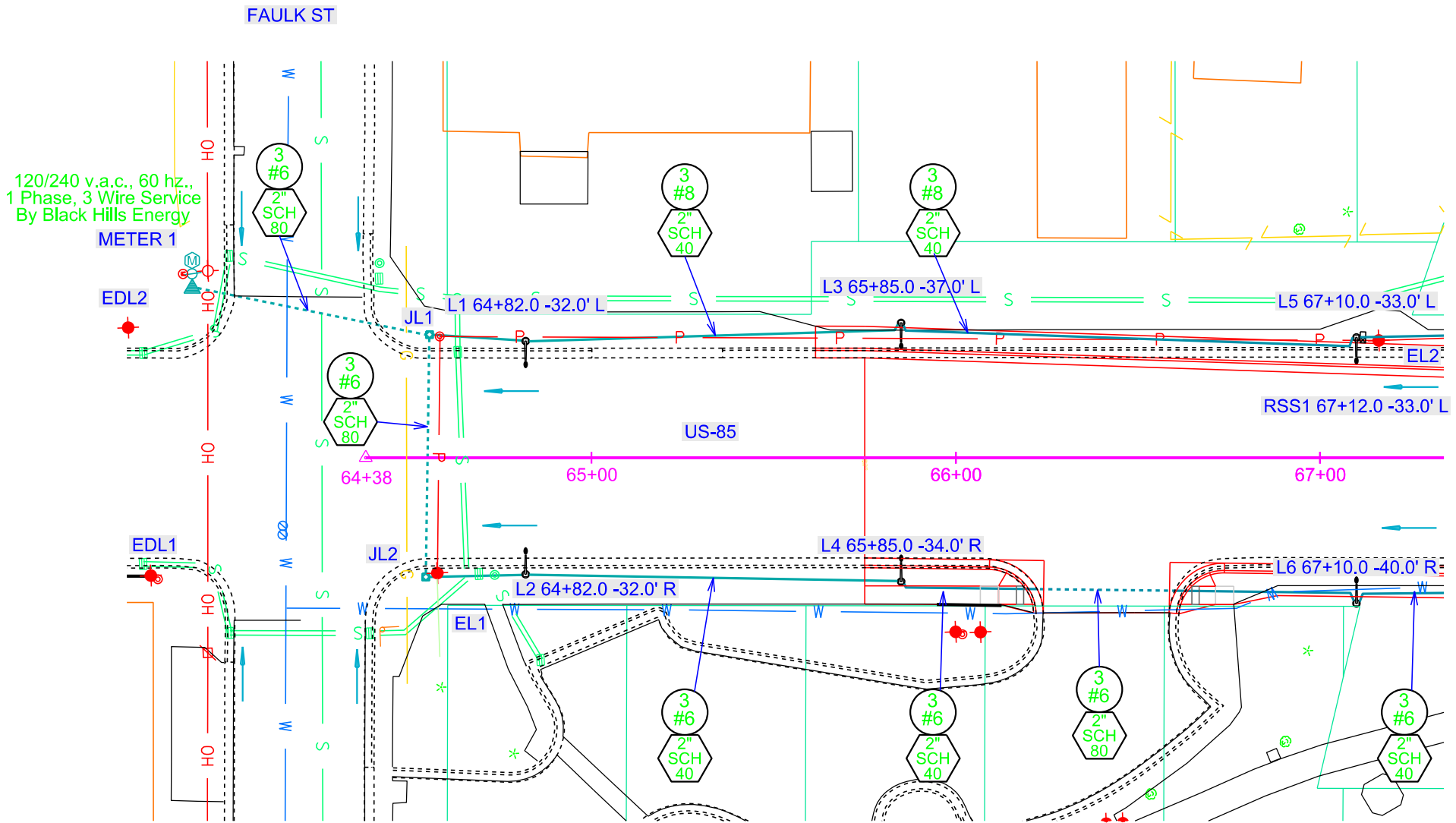
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0085(104)56	L5	L13

Plotting Date: 09/15/2026



ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
	Salvage Luminaire Pole (EL1-EL5)	5	EACH
	Remove Luminaire Pole Footing (EL1, EL2, EL5)	3	EACH
	Decorative Luminaire Pole w/4' Arm 40' Mounting Height (L9-L14) - Bridge Mounted	6	EACH
	Decorative Luminaire Pole w/4' Arm 30' Mounting Height (L1-L8, L15-L18) - Breakaway Base	12	EACH
	Decorative Luminaire, LED with P.E. (L1-L18)	18	EACH
	2' Diameter Footing	84	FT
	Type 1 Electrical Junction Box (JL1-JL4)	4	EACH
	Electrical Service Cabinet	2	EACH
	Galvanized Steel Utility Pole Not a Bid Item	2	EACH
	Meter Socket Not a Bid Item	2	EACH
	2" Rigid Conduit, Schedule 40	1,605	FT
	2" Rigid Conduit, Schedule 80	260	FT
	1/C #4 AWG Copper Wire	950	FT
	1/C #6 AWG Copper Wire	6,650	FT
	1/C #8 AWG Copper Wire	1,385	FT
	1/C #14 AWG Copper Wire - Festoons	1,410	FT
	2/C #10 AWG Copper Pole & Bracket Cable	870	FT
	1/C #10 AWG Copper Wire	45	FT
	Under Bridge Luminaire, LED (UBL1-UBL2)	2	EACH
	Relocate Radar Speed Feedback Sign (RSS1)	1	EACH

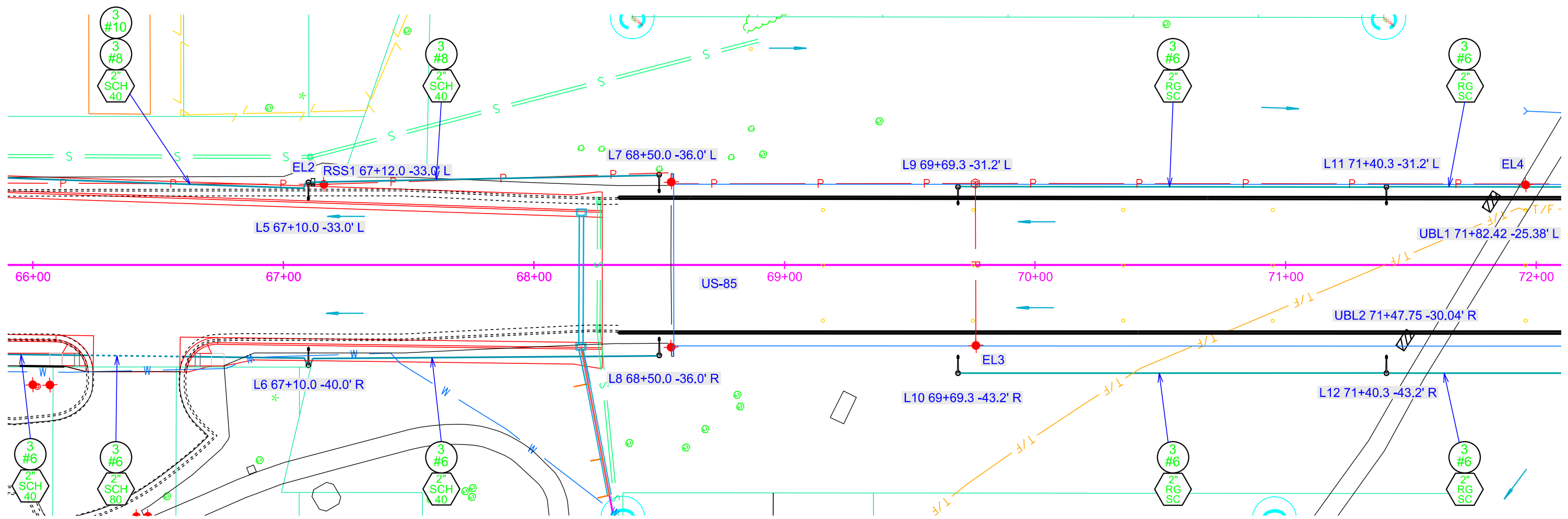
EXISTING ITEMS	
KEY	ITEM
	Luminaire Pole (EL6)
	Decorative Luminaire Pole (EDL1-EDL2)



CONDUIT LAYOUT

US HWY 85

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0085(104)56	L6	L13
Plotting Date: 09/15/2026			



REFER TO SECTION E FOR DETAILS ON ATTACHING CONDUIT AND UNDER-BRIDGE LUMINAIRE TO STRUCTURE

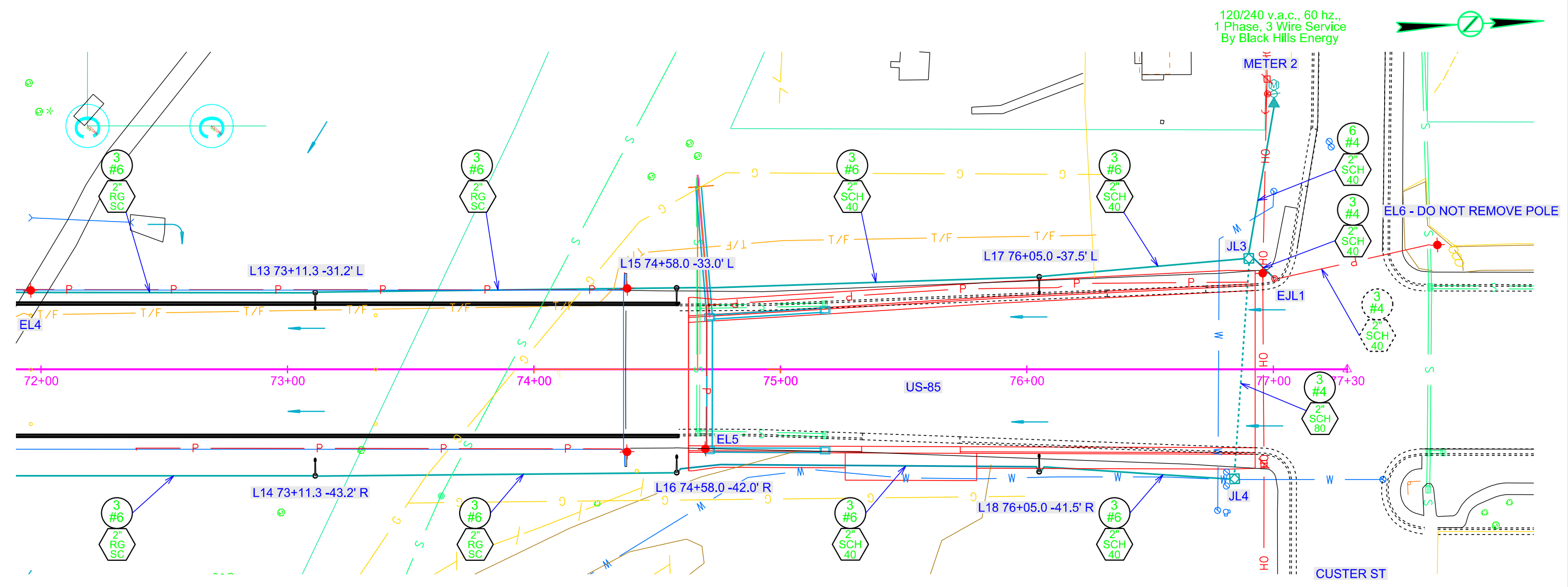
CONDUIT LAYOUT US HWY 85

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0085(104)56	L7	L13

Plotting Date: 09/15/2026

Plot Scale - 1"=40'

Plotted From - TRR017/15



REFER TO SECTION E FOR DETAILS ON ATTACHING CONDUIT TO STRUCTURE

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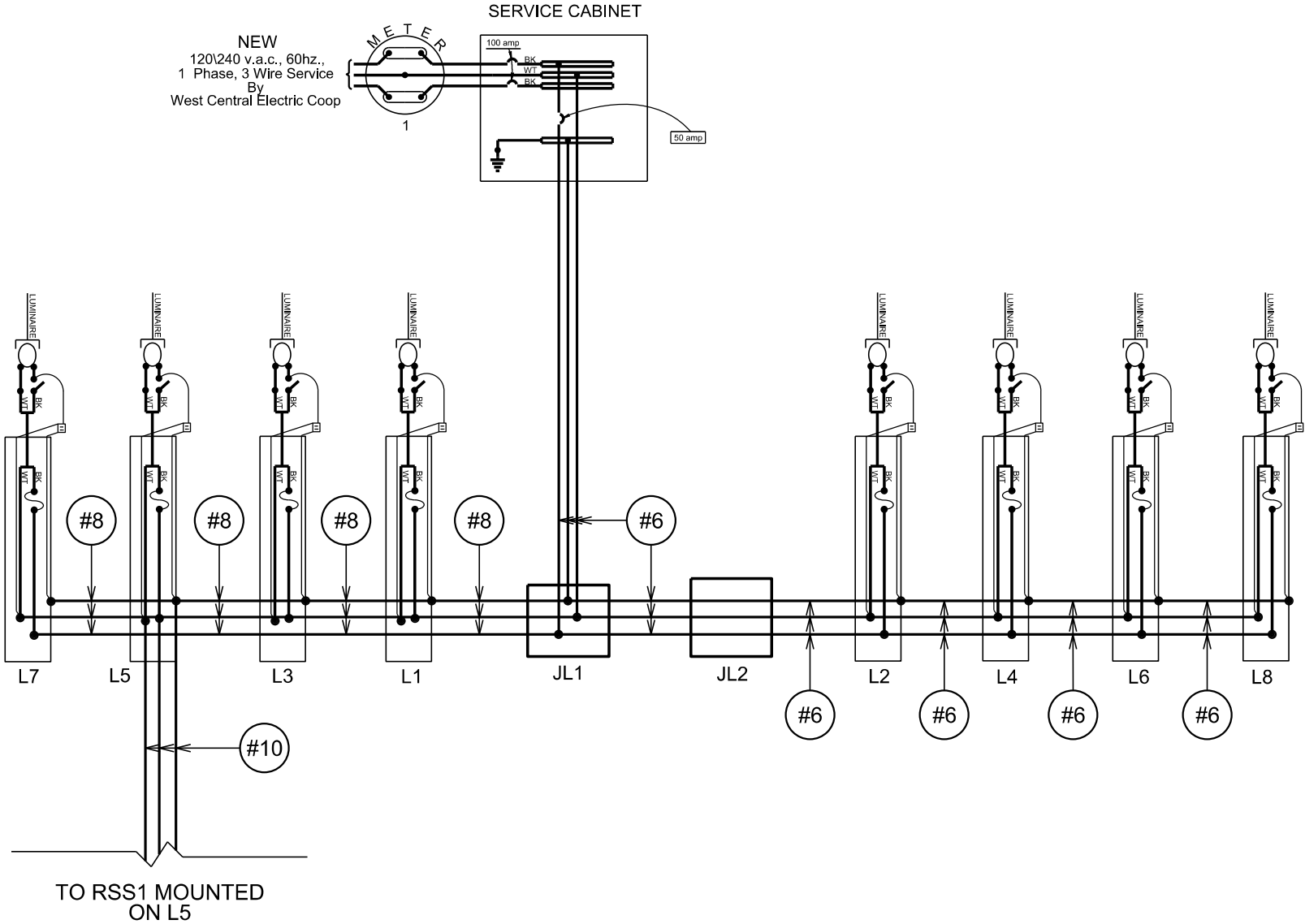
Plotted From -

NOTE:
All circuits shall be bonded in accordance with the NATIONAL ELECTRICAL CODE.
Quantities for bonding conductors are not included in these plans.

WIRING DIAGRAM

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0085(104)56	L8	L13

Plotting Date: 09/15/2026



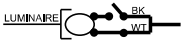
LEGEND:



FUSE: 10 amp.



LUMINAIRE: LED



PHOTOCELL (TYPICAL OF ALL)



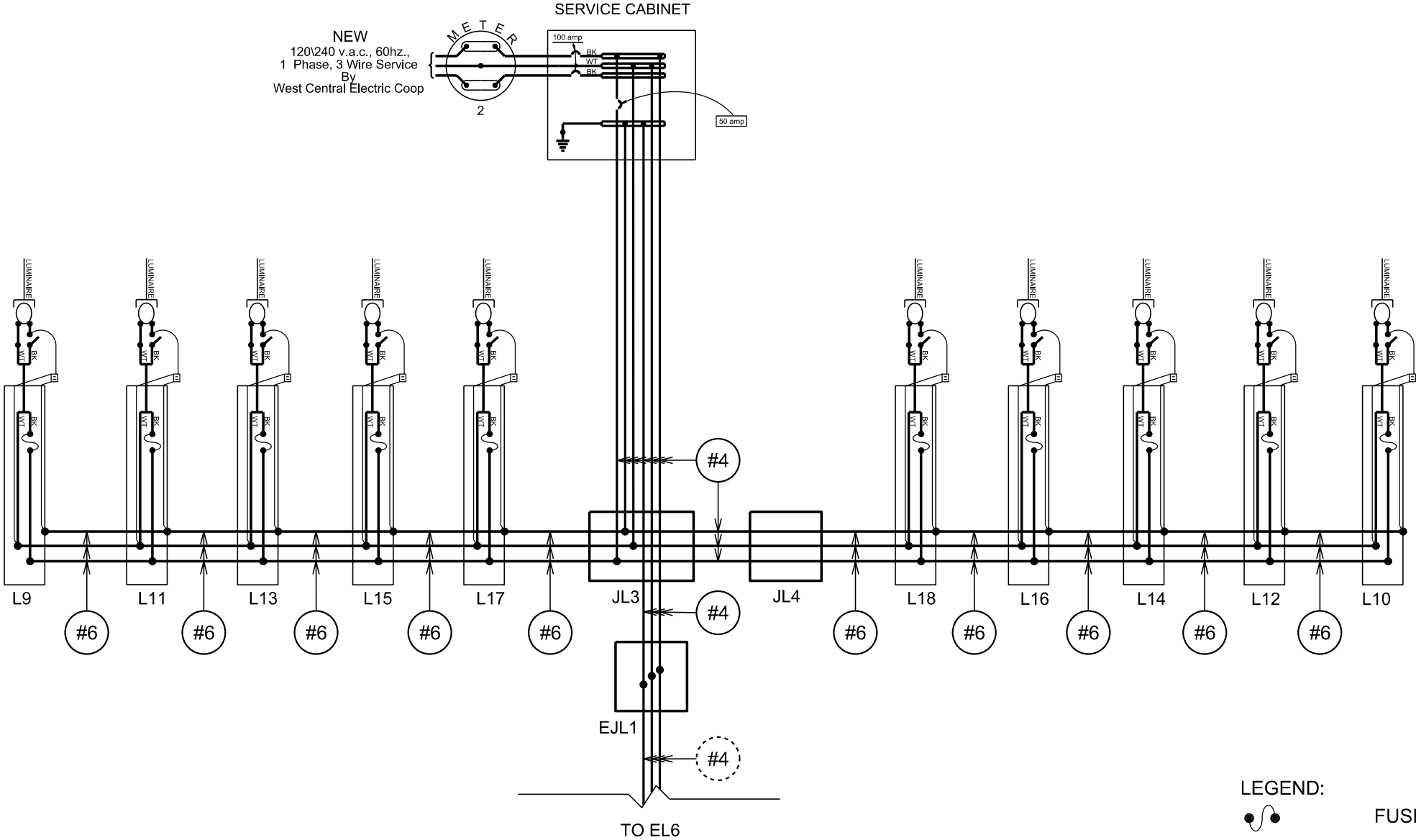
PHOTOCELL W/ #14 WIRE
AT FESTOON (TYPICAL OF ALL)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0085(104)56	L9	L13

Plotting Date: 09/15/2026

WIRING DIAGRAM

NOTE:
All circuits shall be bonded in accordance
with the NATIONAL ELECTRICAL CODE.
Quantities for bonding conductors are not
included in these plans.



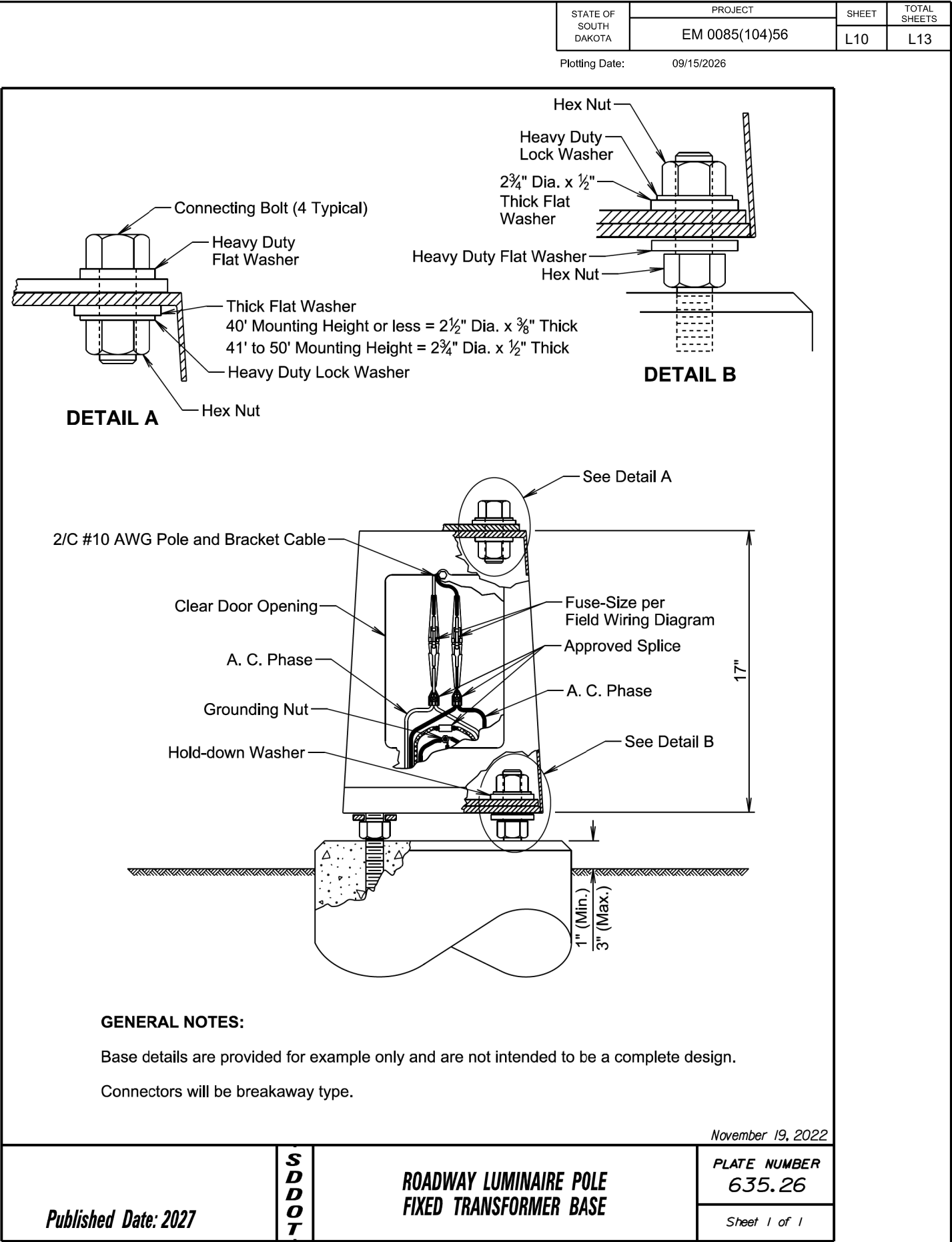
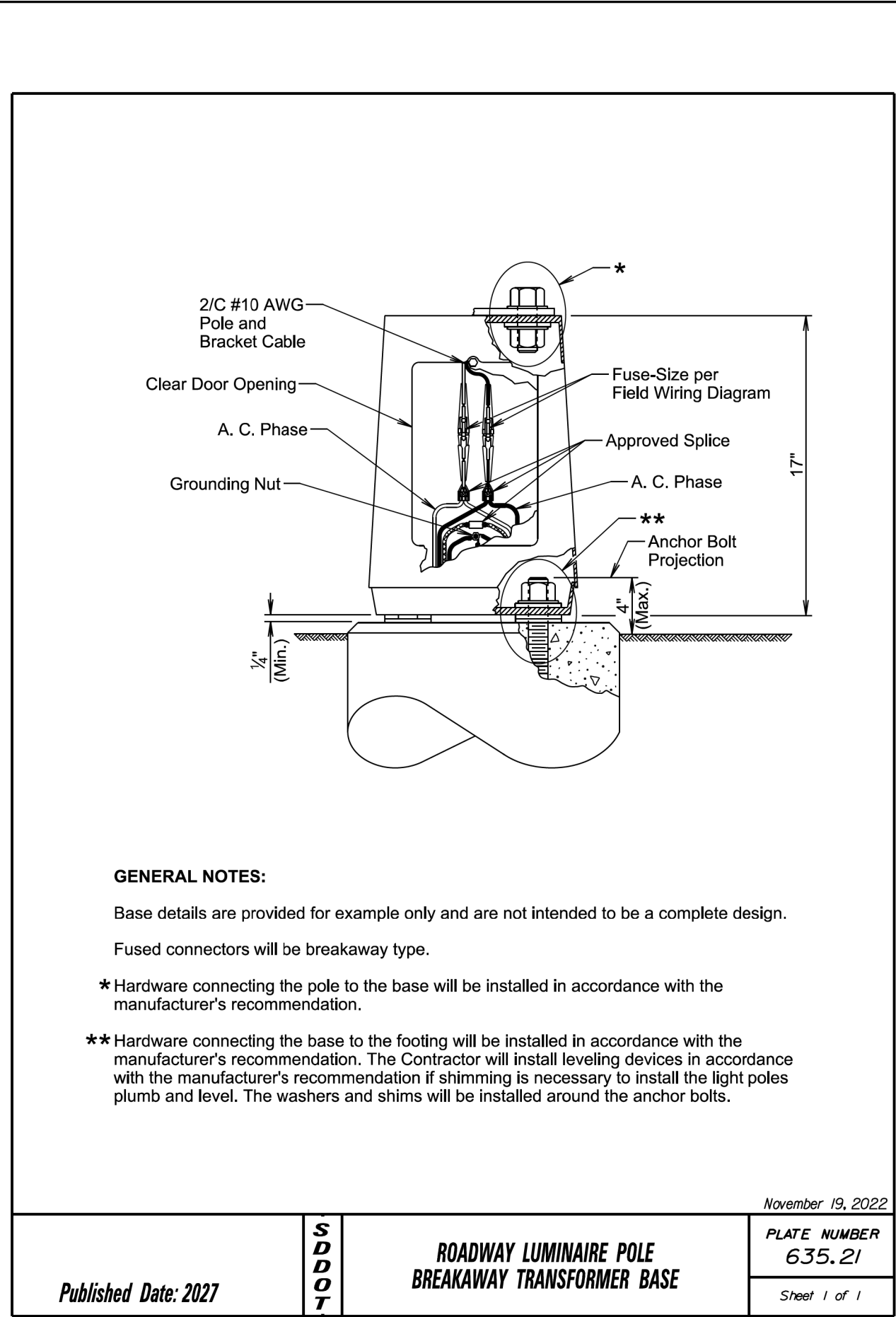
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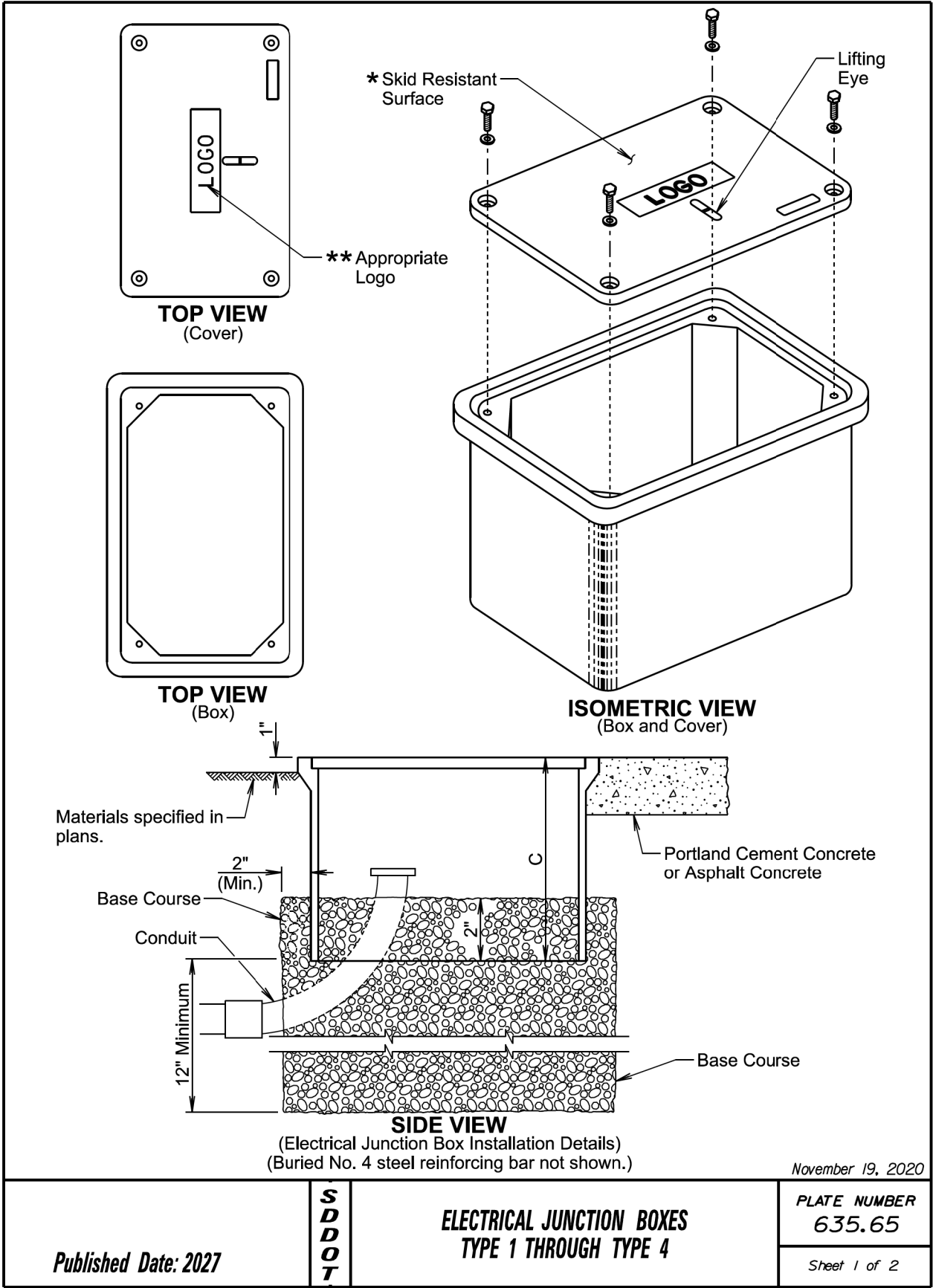
FUSE: 10 amp.

LUMINAIRE: LED

PHOTOCELL (TYPICAL OF ALL)

PHOTOCELL W/ #14 WIRE AT FESTOON (TYPICAL OF ALL)





ELECTRICAL JUNCTION BOX			
TYPE	DESCRIPTION	APPROXIMATE COVER SIZE	MINIMUM DEPTH (C)
1	Open Bottom with Gasket	11"x18"	18"
2	Open Bottom with Gasket	13"x24"	18"
3	Open Bottom with Gasket	17"x30"	18"
3A	Open Bottom with Gasket	24"x36"***	24"
4	Open Bottom with Gasket	30"x48"***	24"

GENERAL NOTES:

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

The cover will have a lifting eye.

** The surface of the cover will have a minimum wet and dry coefficient of friction value of 0.5 as determined by ASTM F609.

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

*** Two piece covers will be used for Type 3A and Type 4 junction boxes.

The electrical junction boxes will 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 electrical junction boxes and covers will be Tier 22 of ANSI/SCTE 77 2007.

The electrical junction boxes will be UL listed.

For junction boxes located outside of pavement, a No. 4 steel reinforcing bar with a minimum length of 18" will be buried adjacent to the long side of the junction box. All costs associated with furnishing and placing the steel reinforcing bar will be incidental to the contract unit price per each for "Type _ Electrical Junction Box".

November 19, 2020

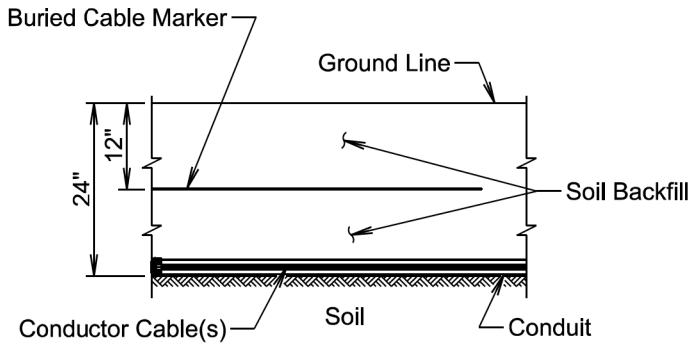
Published Date: 2027	S D D O T	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65
			Sheet 2 of 2

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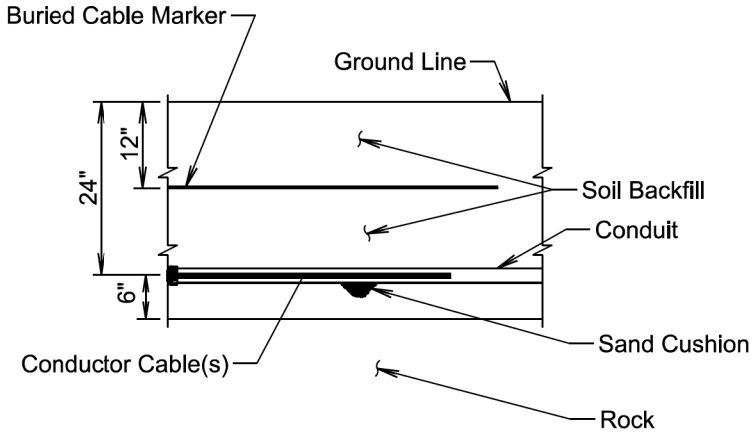
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TRR011715

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0085(104)56	L13	L13

Plotting Date: 09/15/2026



SECTION VIEW



SECTION VIEW

GENERAL NOTE:

The Buried Cable Marker will be plastic, approximately 6" wide, and will be capable of sustaining a minimum of a 350% tolerance of elongation without tearing. The Buried Cable Marker will 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 will be printed in a contrasting color on the cable marker. The Buried Cable Marker will be subject to approval by the Engineer. All costs associated with furnishing and installing the Buried Cable Marker will be incidental to the contract unit price per foot for the bid item used for the electrical conductor.

November 19, 2022

<i>Published Date: 2027</i>	S D D O T	CONDUIT INSTALLATION	<i>PLATE NUMBER</i> 635.76
			<i>Sheet 1 of 1</i>

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