


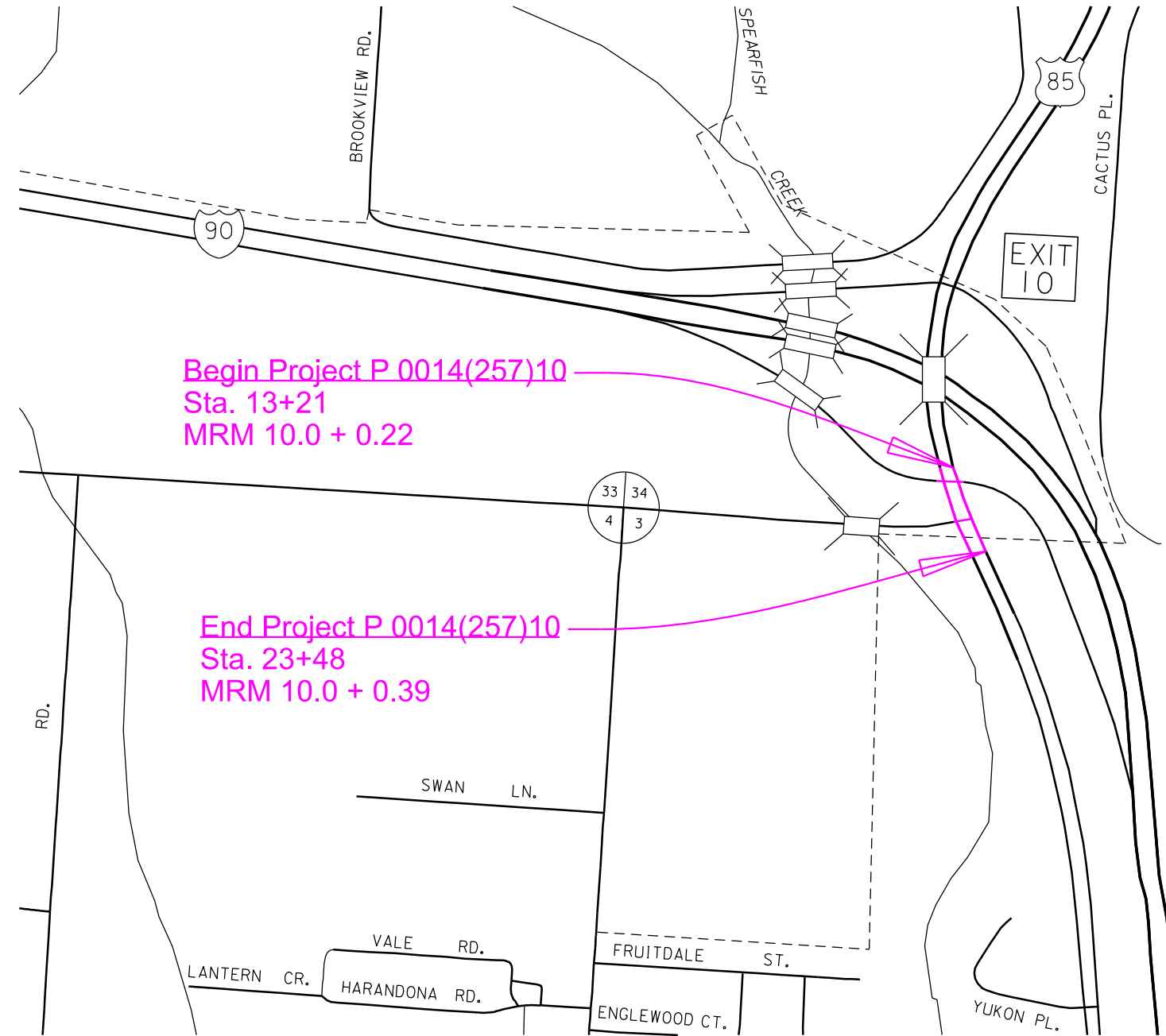
SECTION L: SIGNAL & LIGHTING PLANS

	PROJECT	SECTION	SHEET
	P 0014(257)10	L1	L28

Plotting Date: 3/13/2026

INDEX OF SHEETS

L1	General Layout with Index
L2-L4	Estimate With General Notes & Tables
L5-L6	Conduit and Cable Quantities
L7	Signal Layout
L8-L12	Conduit Layouts
L13-L15	Wiring Diagram
L16	Signal Timing
L17	Wiring Tables
L18	Sign and Beacon Installations
L19-L22	Special Detail
L23-L28	Standard Plates



Begin Project P 0014(257)10
Sta. 13+21
MRM 10.0 + 0.22

End Project P 0014(257)10
Sta. 23+48
MRM 10.0 + 0.39

SECTION L ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1540	Remove Luminaire Pole Footing	5	Each
635E0150	Breakaway Base Luminaire Pole with Twin Arms, 50' Mounting Height	1	Each
635E2000	Pedestal Signal Pole	2	Each
635E2140	Signal Pole with 40' Mast Arm and Luminaire Arm	1	Each
635E2145	Signal Pole with 45' Mast Arm and Luminaire Arm	1	Each
635E2155	Signal Pole with 55' Mast Arm and Luminaire Arm	1	Each
635E3700	Roadway Luminaire, LED with Photoelectric Cell	16	Each
635E4010	1 Section Vehicle Signal Head	4	Each
635E4030	3 Section Vehicle Signal Head	10	Each
635E4040	4 Section Vehicle Signal Head	2	Each
635E4080	3 Section Directional Vehicle Signal Head	2	Each
635E5020	2' Diameter Footing	60.0	Ft
635E5030	3' Diameter Footing	40.0	Ft
635E5301	Type 1 Electrical Junction Box	6	Each
635E5302	Type 2 Electrical Junction Box	4	Each
635E5313	Type 3A Electrical Junction box	1	Each
635E5405	Electrical Service Cabinet with Secondary Disconnect	1	Each
635E5430	Traffic Signal Controller	1	Each
635E5515	Battery Backup System for Traffic Signal	1	Each
635E5520	Video Detection System	1	Each
635E5560	Emergency Vehicle Preemption Unit	1	Each
635E5570	Optical Detector	3	Each
635E7500	Remove and Reset Luminaire Pole	5	Each
635E8120	2" Rigid Conduit, Schedule 40	1,730	Ft
635E8130	3" Rigid Conduit, Schedule 40	185	Ft
635E8220	2" Rigid Conduit, Schedule 80	260	Ft
635E8230	3" Rigid Conduit, Schedule 80	505	Ft
635E9011	1/C #1 AWG Copper Wire	2,125	Ft
635E9016	1/C #6 AWG Copper Wire	2,305	Ft
635E9018	1/C #8 AWG Copper Wire	3,115	Ft
635E9020	1/C #10 AWG Copper Wire	165	Ft
635E9504	4/C #14 AWG Copper Tray Cable, K2	1,610	Ft
635E9505	5/C #14 AWG Copper Tray Cable, K2	445	Ft
635E9515	15/C #14 AWG Copper Tray Cable, K2	615	Ft
635E9519	19/C #14 AWG Copper Tray Cable, K2	40	Ft
635E9600	#16 AWG Copper Twisted Shielded Pair	3,350	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	1,120	Ft

SUPPLYING AS BUILT PLANS

If the traffic signal system or 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

ON-SITE INSPECTION

An on-site inspection of the traffic signals will be conducted before acceptance of the project once the traffic signals are completed and operational. The on-site inspection will be conducted by the Project Engineer or Region Traffic Engineer with the Contractor and the Traffic Design Engineer present.

REMOVE LUMINAIRE POLE FOOTING

The footings of existing luminaire poles EL2-EL4, EL7, and EL8 will be removed by the Contractor to a minimum of 2 feet 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".

PEDESTAL SIGNAL POLES

Pedestal signal poles may be aluminum. Aluminum poles will conform to the following requirements:


Aluminum will conform to ASTM B221, Alloy 6061, and Temper T6.

Poles will be round with a minimum outside pole diameter of 4 inches, and the pole assembly will have a square, cast aluminum base with aluminum access door. The base will conform to the breakaway requirements of NCHRP 350 or MASH. A grounding lug will be provided in the base.

The pole to base connection will be a threaded connection; threads will be 8 TPI, NPT. A collar (integral or non-integral) to prevent wind-induced loosening of pole will be provided. All bolt and connection threads will be coated with a commercially available anti-seize compound intended for use in aluminum-to-aluminum and steel-to-aluminum connections.

The pole finish will either be brushed satin or spun. The top of the pole will be sealed by the traffic signal head mounting hardware or by an aluminum cap.

Measurement and payment for aluminum poles will be as specified in Specifications Section 635.

 <small>Plotting Date: 3/13/2026 Revised: 3/13/2026 - JU</small>	PROJECT	SECTION	SHEET
	P 0014(257)10	L2	L28

SIGNAL POLES

Cantilever traffic signal supports, including anchor bolts, will be designed for fatigue in accordance with Fatigue Importance Category III without galloping and truck induced gusts.

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

Signal poles will have rotatable mast arms.

Luminaire extensions will have a 50-foot mounting height with 8-foot arms.

LUMINAIRE POLES

Luminaire poles L1 and REL2-REL4 will have a mounting height of 50 feet with 8-foot arms.

Luminaire poles REL7 and REL8 have a mounting height of 50 feet with twin 3-foot arms.

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

The lighting design for L1, EL1, A1-A2, A4, REL2-REL4, and EL5-EL6, used the following parameters to provide 1.0 and greater average maintained foot-candles and uniformity ratios of 4:1 (average maintained to minimum maintained foot-candles) and 6:1 (maximum to minimum maintained foot candles):

Pole Setback:	5 feet
Lamp Loss Factor (LLF):	0.8
Width of Lighted Area:	64 feet
Luminaire Cycle Length:	190 feet
Configuration:	Staggered
Mounting Height:	50 feet
Arm Length	8 feet

The following luminaires, or an approved equal, will be used for this project:

- a.) Cooper ARCH-L-PA3-230-740-U-T3-AP-PR7-LLPC
- b.) Solarmax SMX-184WIE-NV-LL5-PH-4070-T302-P

The lighting design for REL7-REL8 and EL9 used the following parameters to provide 1.0 and greater average maintained foot-candles and uniformity ratios of 4:1 (average maintained to minimum maintained foot-candles) and 6:1 (maximum to minimum maintained foot candles):

Pole Setback:	22 feet
Lamp Loss Factor (LLF):	0.8
Width of Lighted Area:	48 feet
Luminaire Cycle Length:	190 feet
Configuration:	Median
Mounting Height:	50 feet
Arm Length	3 feet (Twin)

The following luminaires, or an approved equal, will be used for this project:

- a.) Cooper ARCH-L-PA3-180-740-U-T3-AP-PR7-LLPC
- b.) Solarmax SMX-134WIE-NV-LL5-PH-4070-T302-P

REPLACE LUMINAIRE FIXTURES

The contractor will remove and dispose of the existing HPS fixtures on EL1, EL5, EL6, and EL9 will replace them with the LED fixtures described in the previous note.

The existing pole and bracket wire in EL1, EL5, EL6, and EL9 will be removed and replaced.

All costs associated with the removal and disposal of the existing pole and bracket wire will be incidental to the contract unit price per foot for "2/C #10 AWG Copper Pole and Bracket Wire".

All costs associated with switching the existing luminaire fixtures from HPS to LED will be incidental to the contract unit price per each for "Roadway Luminaire, LED with Photoelectric Cell".

SIGNAL BACKPLATES

All new vehicle signal heads will have backplates with retroreflective border. The vehicle signal head backplates will have a factory applied 3 inch wide yellow retroreflective border. Sheeting for the border will be Type XI or Type IX in conformance with ASTM D4956. Backplates will be polycarbonate, aluminum, or aluminum-composite. Minimum material thicknesses are:

Polycarbonate, 0.10-inch
Aluminum, 0.06-inch
Aluminum-Composite, 0.08-inch

Signal backplates will extend not less than 5 inches from the edge of the signal head at the top, bottom, and sides. The bottom of the backplate on Vehicle signal faces mounted directly above pedestrian signal indications will be sized to permit the separate adjustment of the vehicle and pedestrian signal indication and may be less than 4 inches.

All costs involved with furnishing and installing backplates with retroreflective border for the new vehicle signal heads will be incidental to the contract unit price per each for "3 Section Vehicle Signal Head", and "4 Section Directional Vehicle Signal Head".

TABLE OF FOOTING DATA

Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
A3, A5	2' - 0"	6' - 0"	1' - 8"	44' - 3"	8-#7 x 5' - 6"
L1, REL2-REL4, REL7, REL8	2' - 0"	8' - 0"	1' - 8"	54' - 9"	8-#7 x 7' - 6"
A1-A2	3' - 0"	13' - 0"	2' - 8"	129' - 3"	14-#8 x 12' - 6"
A4	3' - 0"	14' - 0"	2' - 8"	137' - 6"	14-#8 x 13' - 6"

* Footing depth will be below ground level.

** The size of all spirals will be #3.

SUBSURFACE

Luminaire and signal footings will be placed in a fill section of soils derived from the Spearfish Formation. In-place Spearfish Formation may be encountered at depth during placement of the signal footings. The Spearfish Formation contains thin seams to massive beds of gypsum. The Spearfish-derived fills may contain fragments of these seams. It is possible that some gypsum will be encountered during drilling of the footings. Some of the gypsum may have to be prebored with a smaller bit and then drilled to the final footing diameter.

Groundwater was not encountered in the vicinity of the intersection during a subsurface investigation conducted in May 2009, but borings caved at depths ranging from 7.8' to 17.3' below existing ground surface.

During construction of the footings, concrete placement operations will closely follow excavation procedures. The longer the excavations are left open, the more likely caving will occur.

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.

ELECTRICAL SERVICE CABINET WITH SECONDARY DISCONNECT

The electrical service cabinet will be a standard electrical service cabinet located adjacent to the power source.

The Contractor will install a NEMA 3R rainproof, 60 amp rated, non-fused safety switch (with lock) adjacent to the traffic signal cabinet. The secondary disconnect will be mounted on a galvanized steel post in accordance with standard plate 635.41.

METER SOCKETS FOR TRAFFIC SIGNALS

The meter sockets provided for traffic signals by the Contractor will be a 200-amp, positive by-pass.

TRAFFIC SIGNAL CONTROLLER


The new Traffic Signal Controller will be Econolite Cobalt or EOS.

The Contractor is responsible for programming controller with the signal timings provided in these plans.

The controller and flasher are not required to have dimming capability.

Anchor bolts for the traffic signal cabinet may have hooked ends.

All costs for the detector units necessary to operate the signal as shown in these plans, constructing the concrete pad and footing, materials, labor, and furnishing and installing the controller cabinet will be incidental to the contract unit price per each for "Traffic Signal Controller".

 Plotting Date: 3/13/2026	PROJECT	SECTION	SHEET
	P 0014(257)10	L3	L28

BATTERY BACKUP CABINET

The Contractor will supply a cabinet with a concrete pad and footing for housing the battery backup system for traffic signal systems. The cabinet will be an aluminum NEMA 3R type. The cabinet will have a thermostatically controlled exhaust fan.

The cabinet will be securely attached to the concrete pad with steel anchors and to the back wall of the controller cabinet using chase nipples as approved by the Engineer. Anchor bolts for battery backup cabinet may have hooked ends.

All costs for constructing the concrete pad and footing, materials, labor, and furnishing and installing the battery backup cabinet will be incidental to the contract unit price per each for "Battery Backup System for Traffic Signal."

SPECIALTY VISORS FOR SIGNAL HEADS

Signal heads 9 and 13 will have 45° angled visors (louvers) installed to prevent visibility of the traffic signal indications by adjacent traffic lanes. The 45° visors on signal head number 13 will be oriented to prevent drivers on the I-90 Off Ramp (Eastbound) from seeing the illuminated signal head intended for US Hwy 85 (Southbound) traffic. The 45° visors on signal head number 9 will be orientated to prevent drivers on US Hwy 85 (Southbound) from seeing the illuminated signal head for I-90 Off Ramp (Eastbound) traffic.

All costs involved with furnishing and installing specialty visors for the new vehicle signal heads, and ensuring that they block the view from the appropriate lanes, will be incidental to the contract unit price per each for "3 Section Vehicle Signal Head", and "4 Section Directional Vehicle Signal Head".

VIDEO DETECTION SYSTEM

The following video detection system will be used:

<u>Product</u>	<u>Manufacturer</u>
Autoscope AIS-IV or Vision	Econolite Anaheim, CA 92807 Phone: 1-714-630-3700 www.econolite.com

All cabling and hardware necessary to make the detection system operational will be incidental to the contract unit price per each for "Video Detection System".

REMOVE AND RESET LUMINAIRE POLE

Existing luminaire poles EL2-EL4, and EL7- EL8 will be removed and reset as REL2-REL4 and REL7-REL8 as shown on the plan sheets.

The poles were originally installed with Project IM 0901(101)10, Drawing No. 80B865 for REL7-REL8 and 10B471 for REL2-REL4 as shown in the Special Details.

Millerbernd Manufacturing
P.O. Box 98
Winsted, MN 55395
Phone: (320) 485-2111

Shop drawing records show that the existing anchor bolts are 1 ¼ inch diameter and 48 inch length with a bolt circle diameter of 17 inches, and a 4 inch bolt projection. The replacement anchor bolts will be in conformance with the Specifications.

Luminaire poles and luminaires damaged during removal or resetting will be repaired or replaced by the Contractor at no cost to the State.

All costs involved with removing and resetting the existing luminaire poles including new anchor bolts with associated hardware, will be incidental to the contract unit price per each for "Remove and Reset Luminaire Pole".

All costs associated with disconnecting and pulling back existing wires, exposing the existing conduit, modifying the existing conduit, placing the new junction boxes, and re-pulling and connecting wires will be incidental to the contract unit price per each for "Remove and Reset Luminaire Pole".

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.

MULTICONDUCTOR CONTROL CABLE FOR SIGNAL CIRCUITS

The Conductor Jackets for the multiconductor control cables will be color coded in accordance with ICEA S-73-532 Table E2.

WIRING IN EL9

The existing wires and conduit on the north side of EL9 will be removed and replaced by new conduit and wires as indicated on the plans. The wires and conduit connected on the east side of EL1 will not be disturbed during construction.

New wires to EL9 will be connected to the existing wires in EL9. The Contractor will ensure all lights are operational.

All costs associated with the removal and disposal of the existing pole and bracket wire will be incidental to the contract unit price per foot for "1/C #1 AWG Copper Wire".

ELECTRICAL SERVICE CABINET – BLACK HILLS ENERGY

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

The Contractor will be responsible for coordinating the installation of the electrical services and connection to the electrical service. The Contractor will contact Black Hills Energy at least 2 weeks prior to needing the electrical service installed. The contact for Black Hills Energy is Ken Meirose at 605-206-2968, ken.meirose@blackhillscorp.com.

All cost for contacting the utility company and coordinating the electrical service installations and all hookup fees will be incidental to the contract unit price per each for "Electrical Service Cabinet."

ELECTRICAL SERVICE CABINET – BUTTE ELECTRIC

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


The Contractor will be responsible for coordinating the installation of the electrical services and connection to the electrical service. The Contractor will contact Butte Electric at least 2 weeks prior to needing the electrical service installed. The contact for Butte Electric is Brett Fosheim at 1-800-928-8839, brett@butteelectric.com.

All cost for contacting the utility company and coordinating the electrical service installations and all hookup fees will be incidental to the contract unit price per each for "Electrical Service Cabinet."

ADVANCE WARNING SIGNAL

Two 1 Section Vehicle Signal Heads will be installed above each new "PREPARE TO STOP" sign, YL1 and YL2. The Advance Warning Signals will be installed as shown in the Special Details. Wires providing power to these signals will be connected to the signal controller cabinet. The traffic signal controller cabinet will be programmed to set the advance warning signal to flash in a wig-wag pattern 7-seconds prior to the start of the yellow phase and will continue to flash throughout the duration of the yellow and red phases.

All cost associated with the installation of the signal heads, and ensuring they operate as intended, will be incidental to the contract unit price per each "1 Section Vehicle Signal Head".

	PROJECT	SECTION	SHEET
	P 0014(257)10	L4	L28

Plotting Date: 3/13/2026

CONDUIT AND CABLE QUANTITIES



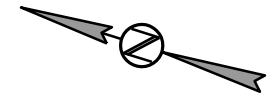
PROJECT	SECTION	SHEET
P 0014(257)10	L5	L28

Plotting Date: 3/13/2026

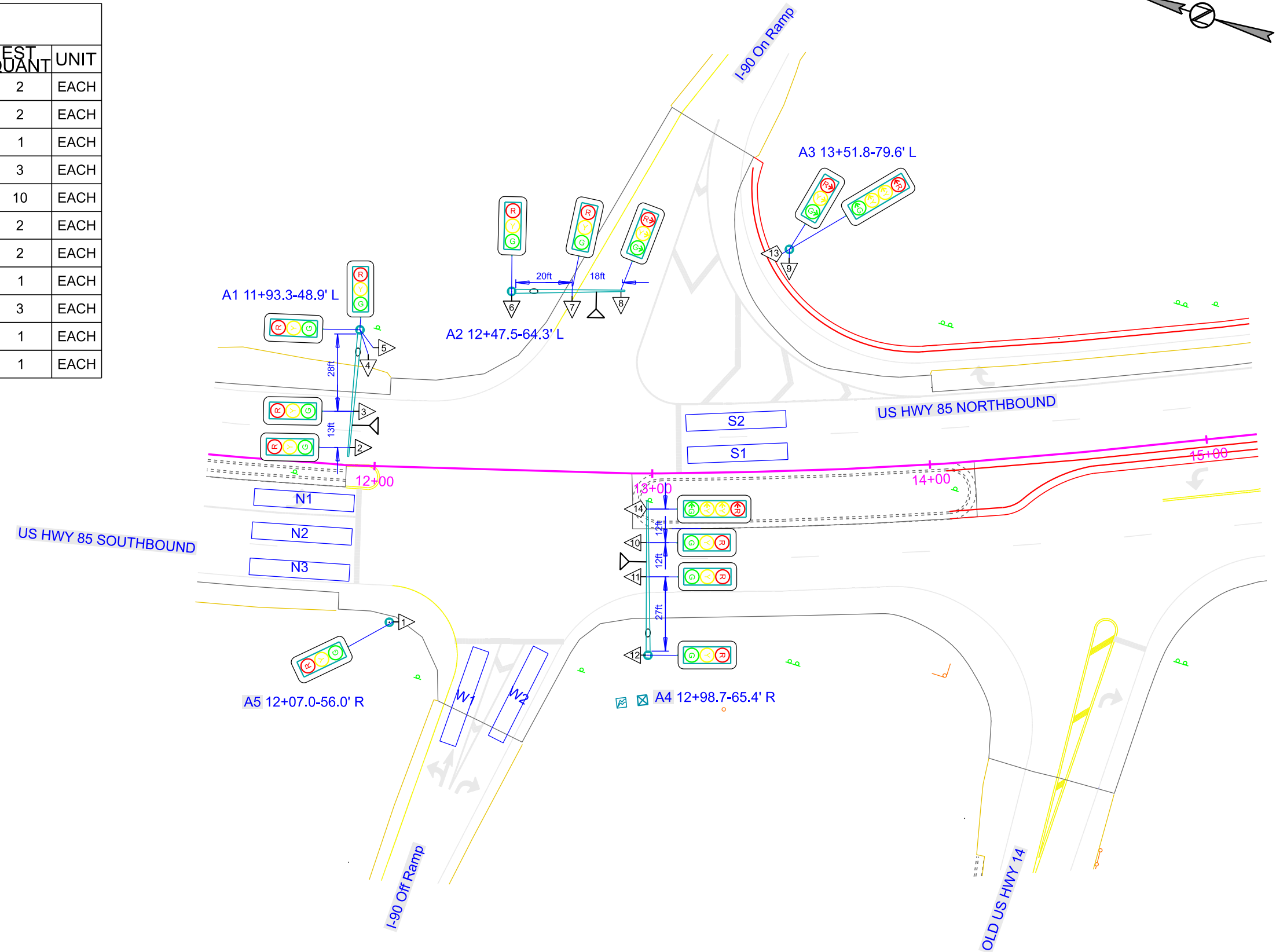
Location to Location		Rigid Conduit								Copper Wire				Copper Tray Cable, K2				Preemption Cable	Pole and Bracket	AWS Signs				
		Schedule 40				Schedule 80				1/C #8	1/C #6	1/C #1	1/C #10	4/C #14	5/C #14	15/C #14	19/C #14	PC NOT A BID ITEM	2/C #10	TSP #16				
		40 SCH	40 SCH			80 SCH	80 SCH			AWG Ft	AWG Ft	AWG Ft	AWG Ft	AWG Ft	AWG Ft	AWG Ft		AWG Ft	AWG Ft					
LUMINAIRES																								
EJL4	JL1							95'																
JL1	REL4	75'																						
EL6	JL2	195'																						
JL2	REL7							50'																
REL7	REL8	200'																						
REL8	EL9	155'						45'																
JA2	REL2	75'							265'															
JA1	REL3	170'							560'															
EJL3	L1	65'								235'														
SIGNAL WIRING																								
M1	JA7	15'							140'	50'														
JA7	JA6	180'							590'	650'														
JA6	SECONDARY DISC.	130'						70'	650'	650'														
SECONDARY DISC.	JA3		10'						35'	65'														
SECONDARY DISC.	TRAFFIC CONTROLLE		10'							65'														
TRAFFIC CONTROLLE	JA3		10'										105'	45'	45'	25'	105'							
JA3	A4		10'										25'	25'		15'	25'							
JA3	JA2							95'					325'		220'		220'							
JA2	JA1							115'	390'				260'		260'		260'							
JA1	A1	15'							80'				30'		30'		30'							
JA1	A2	45'							170'				60'		60'		60'							
JA3	JA4	65'							235'				80'	80'			80'							
JA4	JA5							145'					160'	160'			160'							
JA5	A3	10'											25'	25'			25'							
JA2	A5	10'											25'				25'							
JA5	JA1							150'				165'												
WIRING INSIDE POLES																								
A1													180'				60'	70'						
A2													135'				60'	70'						
A3													25'	25'										
A4													150'	85'			60'	70'						
A5													25'											
VANCE WARNING SIG																								
SIGNAL CONTROLLER																								
JA3	JA2																		45'					
JA2	JS1	20'																	65'					
JS1	YL1																		1,545'					
JA3	JA4																		155'					
JA4	JA5																		320'					
JA5	JS2	230'																	495'					
JS2	YL2	220'																	505'					
Subtotal:																								
		1,730'	185'					260'	505'					3,115'	2,305'	2,125'	165'	1,610'	445'	615'	40'	1,170'	210'	3,350'

SIGNAL LAYOUT

US HWY 85/NORTH AVE & OLD US HWY 14



ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
○	Pedestal Signal Pole (A3, A5)	2	EACH
—○—	Signal Pole w/45' Mast Arm & 8' Lumin Arm (A1, A2)	2	EACH
—○—	Signal Pole w/55' Mast Arm & 8' Lumin Arm (A4)	1	EACH
●	Roadway Luminaire, LED with Photoelectric Cell (A1-A2, A4)	3	EACH
▷	3 Section Vehicle Signal Head (1-7, 10-12)	10	EACH
▷	3 Section Directional Vehicle Signal Head (8-9)	2	EACH
▷	4 Section Directional Vehicle Signal Head (13-14)	2	EACH
—	Emergency Vehicle Preemption (EVP) Unit (4-Channel)	1	EACH
—▷	Optical Detector	3	EACH
—	Video Detection System	1	EACH
—	Video Detector Zone 38' x 6' (Not a Bid Item) (W1-W3, E1-E3, S1)	1	EACH



CONDUIT LAYOUT US HWY 85 / NORTH AVE

SD DOT	PROJECT	SECTION	SHEET
	P 0014(257)10	L8	L28
Plotting Date: 3/13/2026			



TSP WIRES POWERING ADVANCE WARNING SIGN YL1 WILL USE EXISTING LIGHTING CONDUIT TO CROSS THE BRIDGE.

YL1 WILL BE MOUNTED ON EXISTING LUMINAIRE POLE EL0, WHICH IS LOCATED APPROXIMATELY 890 FT NORTH OF THE INTERSECTION OF US14 AND THE I-90 OFF RAMP.

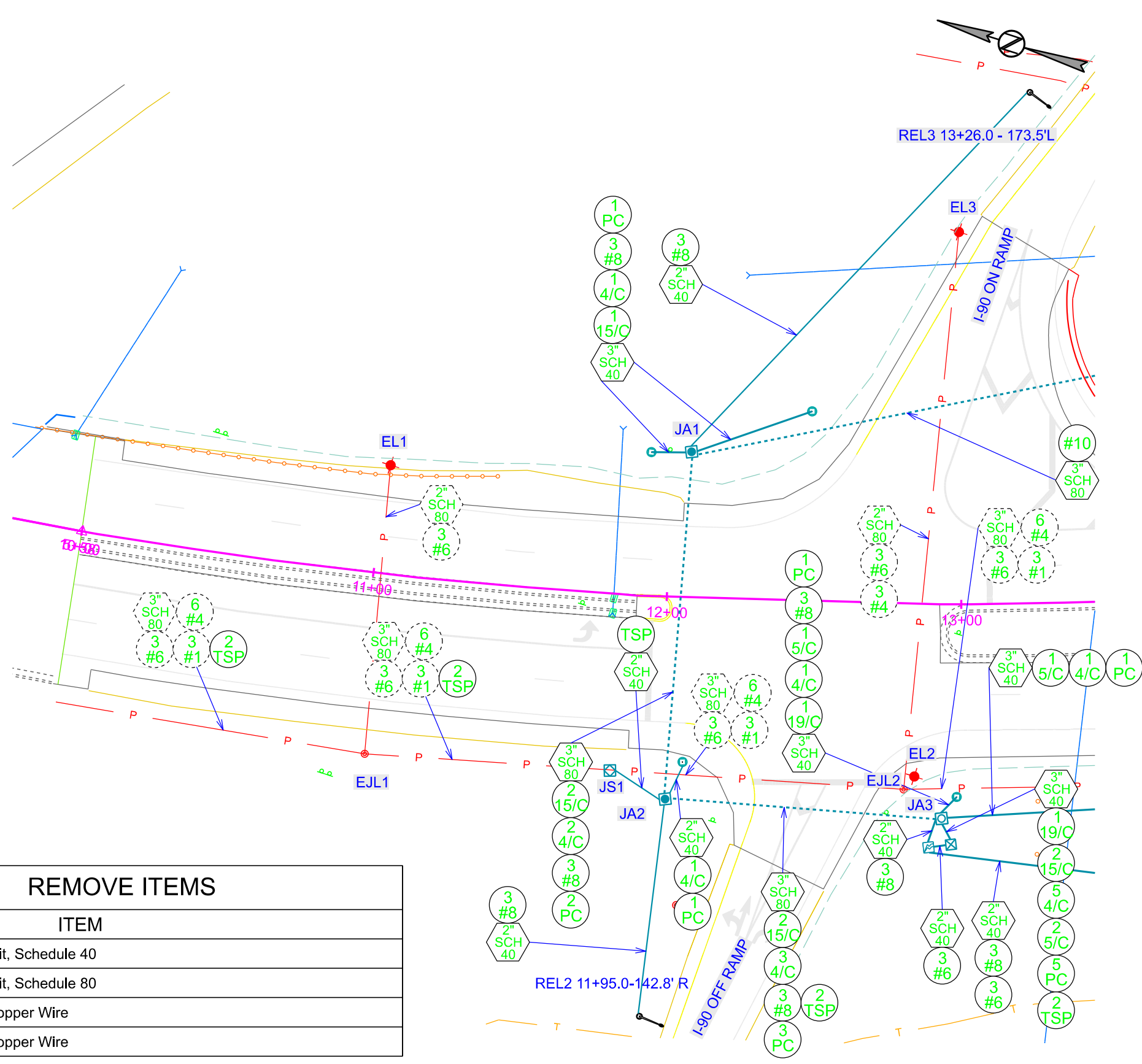
ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
◆	Remove Luminaire Pole Footing (EL2-EL4, EL7-EL8)	5	EACH
◆	Remove and Reset Luminaire Pole (EL2-EL4, EL7-EL8)	5	EACH
—	Breakaway Base Luminaire Pole w/8' Arm 50' Mounting Height (L1)	1	EACH
●	Roadway Luminaire, LED with Photoelectric Cell (L1, EL1, A1-A2, A4, REL2-REL4, EL5-EL6, REL7-REL8, EL9)	16	EACH
○	3' Diameter Footing (A1, A2, A4)	40	FT
○	2' Diameter Footing (L1, A3, A5, REL2-REL4, REL7, REL8)	60	FT
□	1 Section Vehicle Signal Head (YL1-YL2)	4	EACH
□	Type 1 Electrical Junction Box (JA6-JA7, JL1-JL2, JS1-JS2)	6	EACH
□	Type 2 Electrical Junction Box (JA1-JA2, JA4-JA5)	4	EACH
□	Type 3A Electrical Junction Box (JA3)	1	EACH
△	Electrical Service Cabinet with Secondary Disconnect	1	EACH
△	Secondary Disconnect Not a Bid Item	1	EACH
☒	Traffic Signal Controller	1	EACH
☒	Battery Backup System for Traffic Signal	1	EACH
○	2" Rigid Conduit, Schedule 40	1,730	FT
○	3" Rigid Conduit, Schedule 40	185	FT
○	2" Rigid Conduit, Schedule 80	260	FT
○	3" Rigid Conduit, Schedule 80	505	FT
○	1/C #1 AWG Copper Wire	2,125	FT
○	1/C #6 AWG Copper Wire	2,305	FT
○	1/C #8 AWG Copper Wire	3,115	FT
○	1/C #10 AWG Copper Wire	165	FT
○	4/C #14 AWG Copper Tray Cable, K2	1,610	FT
○	5/C #14 AWG Copper Tray Cable, K2	445	FT
○	15/C #14 AWG Copper Tray Cable, K2	615	FT
○	19/C #14 AWG Copper Tray Cable, K2	40	FT
○	2/C #10 AWG Copper Pole & Bracket Cable	1,120	FT
○	Preemption Cable (Not a Bid Item)	1,170	FT
○	Twisted Shielded Pair #16 AWG Copper Wire	3,350	FT

EXISTING ITEMS

KEY	ITEM	EST QUANT	UNIT
◆	Roadway Luminaire Pole EL1, EL5, EL6, EL9	5	EACH
□	Junction Box (EJL1-EJL7)	6	EACH
△	Electrical Service Cabinet (EM1)	1	EACH
○	2" Rigid Conduit, Schedule 40	1,730	FT
○	3" Rigid Conduit, Schedule 40	185	FT

CONDUIT LAYOUT US HWY 85 / NORTH AVE

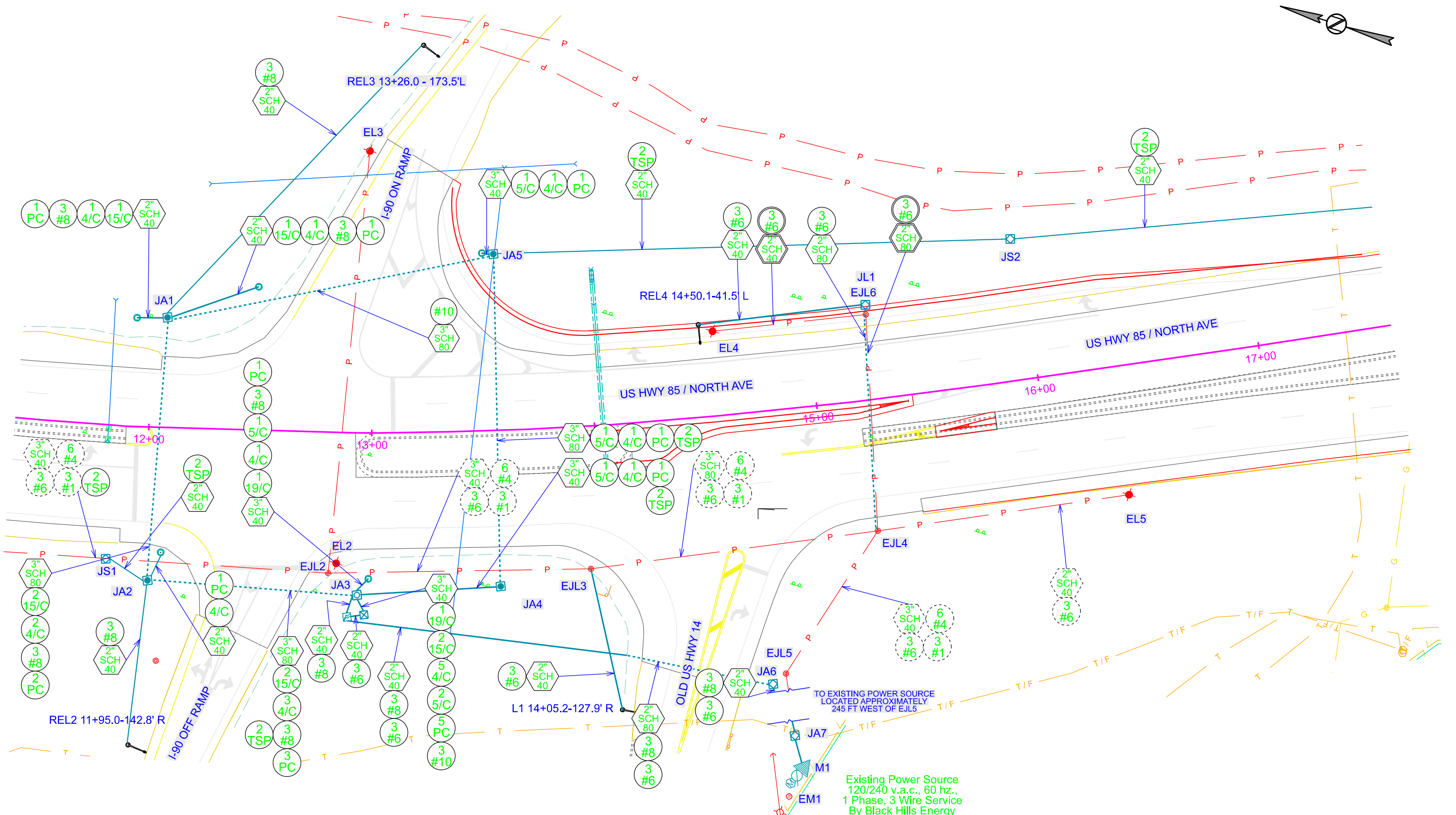
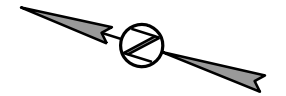


REMOVE ITEMS

KEY	ITEM	EST QUANT	UNIT
○	2" Rigid Conduit, Schedule 40	185	FT
○	2" Rigid Conduit, Schedule 80	260	FT
○	1/C #1 AWG Copper Wire	2,125	FT
○	1/C #6 AWG Copper Wire	2,305	FT

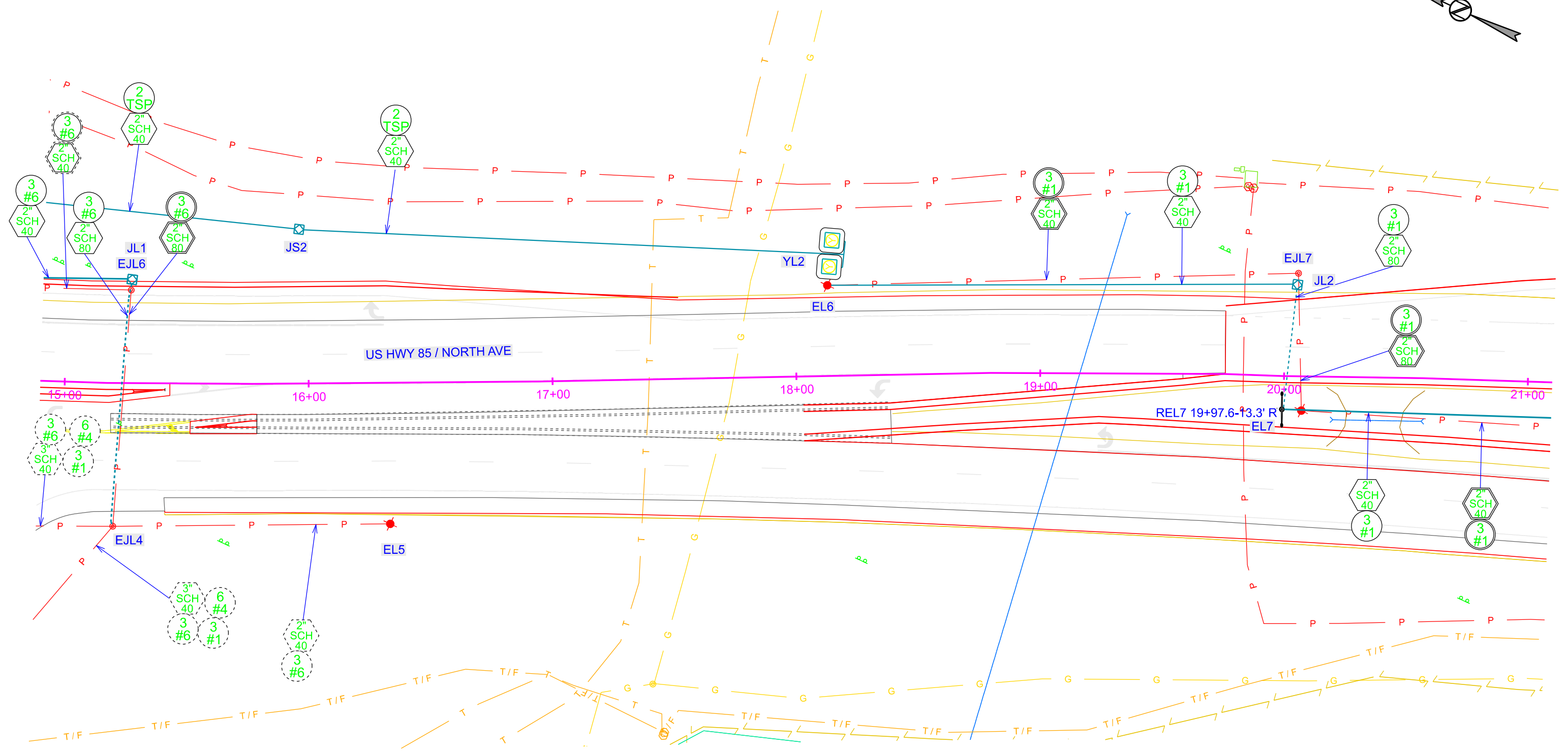
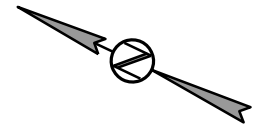
CONDUIT LAYOUT US HWY 85 / NORTH AVE

SD DOT	PROJECT	SECTION	SHEET
	P 0014(257)10	L10	L28
Plotting Date: 3/13/2026			



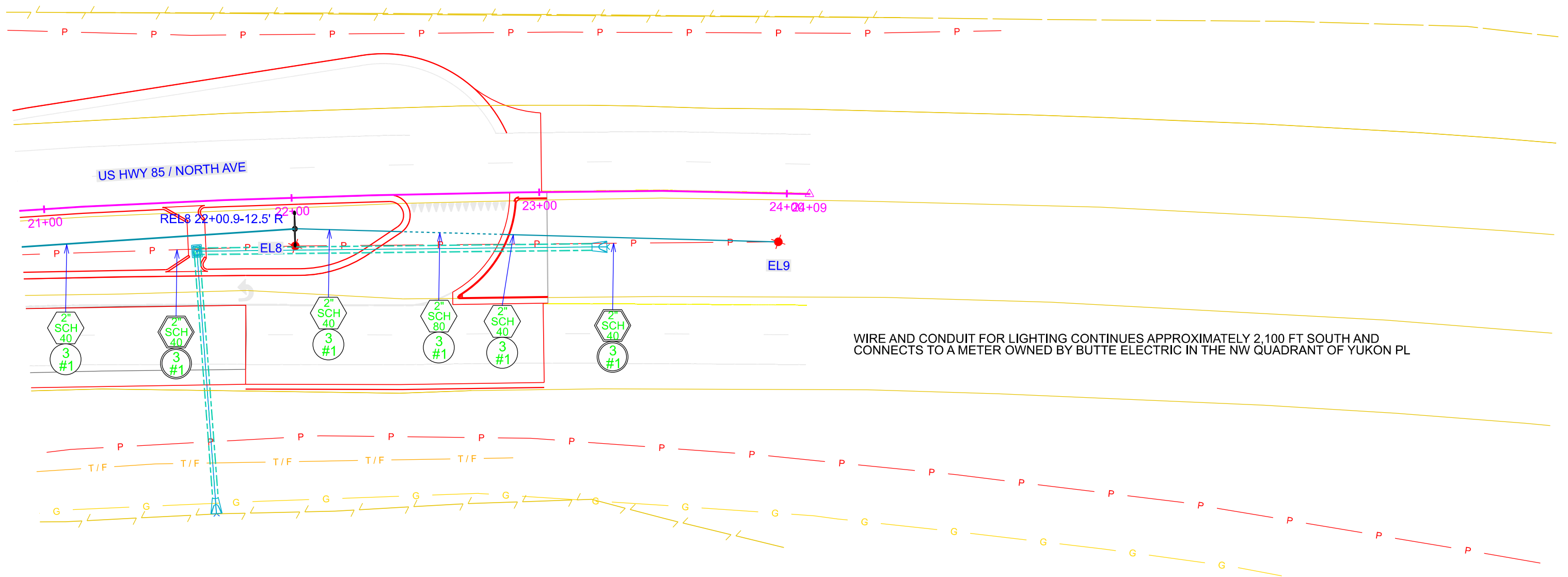
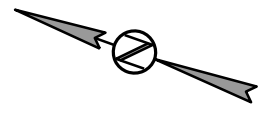
CONDUIT LAYOUT US HWY 85 / NORTH AVE

SD DOT	PROJECT	SECTION	SHEET
	P 0014(257)10	L11	L28
Plotting Date: 3/13/2026			



CONDUIT LAYOUT US HWY 85 / NORTH AVE

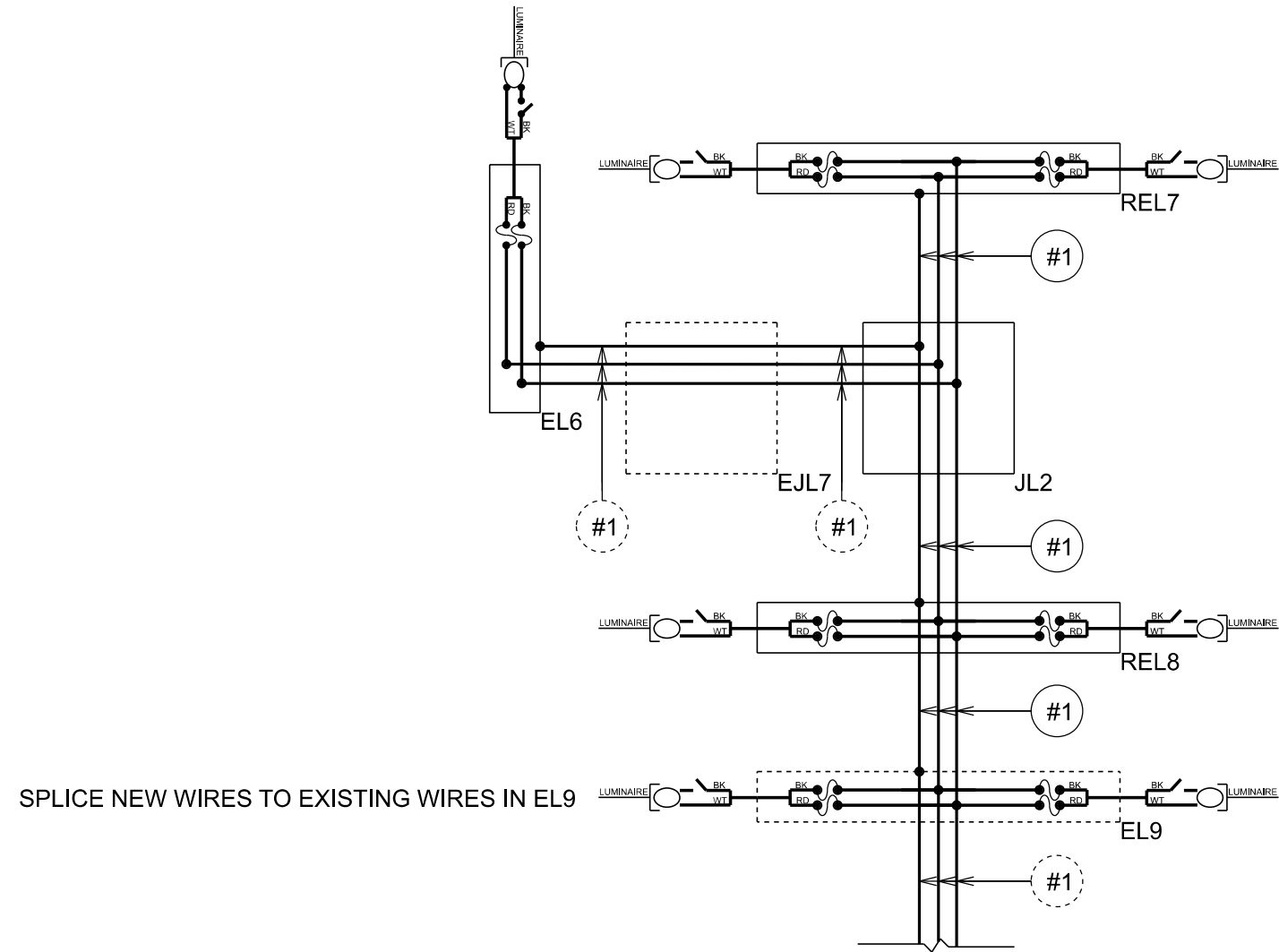
SD DOT	PROJECT	SECTION	SHEET
	P 0014(257)10	L12	L28
Plotting Date: 3/13/2026			



WIRING DIAGRAM

SD DOT	PROJECT	SECTION	SHEET
	P 0014(257)10	L14	L28

Plotting Date: 3/13/2026



SPlice NEW WIRES TO EXISTING WIRES IN EL9

CONNECTS TO POWER SOURCE BY BUTTE ELECTRIC
NEAR NW QUANDRANT OF YUKON PL INTERSECTION

LEGEND:

 FUSE: 10 amp.

 LUMINAIRE: LED

 PHOTOCELL (TYPICAL OF ALL)

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

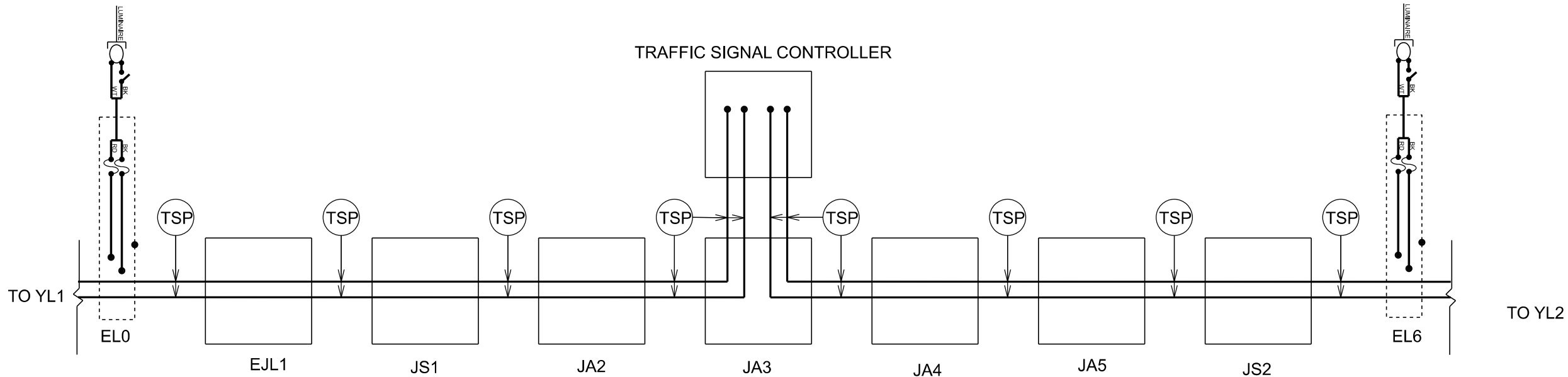
WIRING DIAGRAM FOR ADVANCE WARNING FLASHERS



PROJECT
P 0014(257)10

SECTION SHEET
L15 L28

Plotting Date: 3/13/2026



SIGNAL TIMING

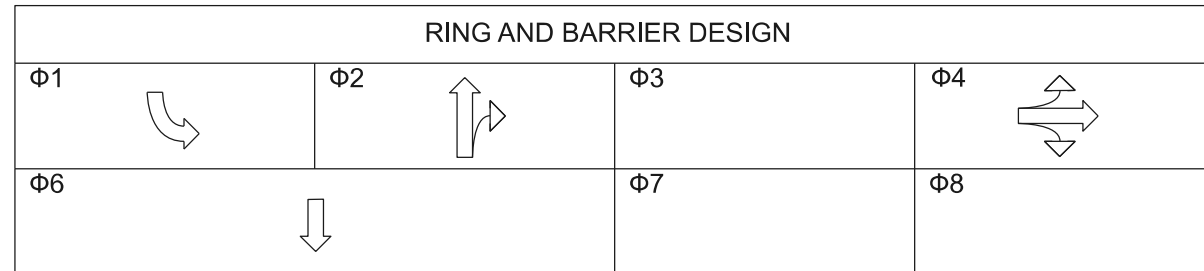
I-90 EXIT 10 EB TERMNAL

BASIC INTERVALS								
Phase	1	2	3	4	5	6	7	8
Movement	SBL	NB		EB		SB		
Lag								
Min Green	7	12		12		12		
Extension	3	3		3		3		
Max 1	20	50		25		50		
Max 2								
Time Before								
Time to Reduce								
Minimum Gap								
Yellow	3	5		5		5		
All Red	3	1		1		1		
Walk								
Ped Clearance								
Recall		MIN				MIN		
Prog Flash Display								
Start Up Ø		X				X		

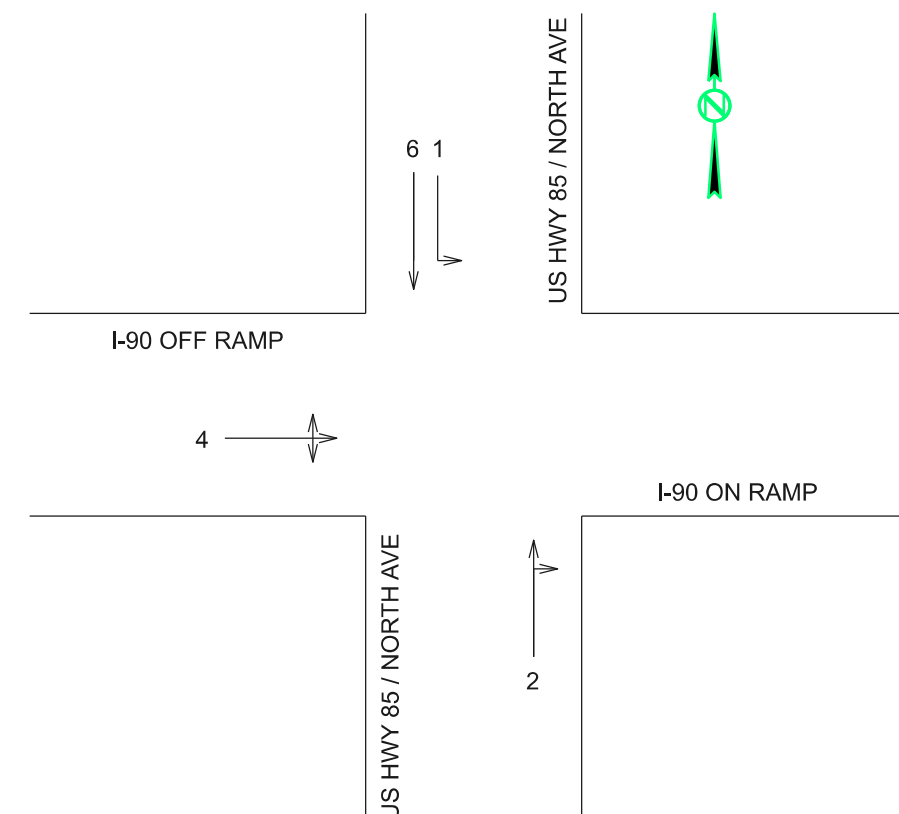
PREEMPTION				
Plan	1	2	3	
Calls Ø	4	2	1 & 6	
Output	CH14R	CH15R	CH16R	

TIMING PLAN 1	
Time of Day (TOD)	Pattern (C/S/O)
0:00-0:00	MAX 1

WEEKLY PROGRAM							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Timing Plan	1	1	1	1	1	1	1



DETECTOR TABLE															
Local Detector	Controller Detector #	Phase Called (Call/Call Locking/Extend)												Controller Settings	
		1	2	3	4	5	6	7	8	9	10	11	12	Extend	Delay
N1-N3	1		C/E												
S1-S2	2						C/E								
W1	3				C/E										
W2	4				C/E									10	



WIRING TABLES

Plotting Date: 3/13/2026

POLE: A1 CABLE SIZE: 15/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	Black	N	2	2
2R	Red	Red	R	2	2
2G	Blue	Blue	G	2	2
2Y	Orange	Orange	Y	2	2
2R	Red/Black	Red	R	3	2
2G	Blue/Black	Blue	G	3	2
2Y	Orange/Black	Orange	Y	3	2
N	Yellow/Black	Black	N	3	2
N	Brown/Black	Black	N	5	2
2R	Black/Red	Red	R	5	2
2G	Blue/Red	Blue	G	5	2
2Y	Orange/Red	Orange	Y	5	2
	Yellow				
	Brown				
	Yellow/Red				

POLE: A2 CABLE SIZE: 15/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
4R	Red	Red	R	6	4
4Y	Orange	Orange	Y	6	4
4G	Blue	Blue	G	6	4
N	Black	Black	N	6	4
4R	Red/Black	Red	R	7	4
4Y	Orange/Black	Orange	Y	7	4
4G	Blue/Black	Blue	G	7	4
N	Yellow/Black	Black	N	7	4
4R	Black/Red	Red	R	8	4
4Y	Yellow	Orange	Y	8	4
4G	Blue/Red	Blue	G	8	4
N	Brown/Black	Black	N	8	4
	Brown				
	Orange/Red				
	Yellow/Red				

POLE: A3 CABLE SIZE: 5/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	Black	N	13	1
1R	Red	Red	RA	13	1
1G	Blue	Blue	GA	13	1
1Y	Orange	Orange	YA	13	1
9Y	Yellow	Yellow	FYA	13	1

POLE: A3 CABLE SIZE: 4/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	Black	N	9	4
4R	Red	Red	R	9	4
4G	Blue	Blue	G	9	4
4Y	Orange	Orange	Y	9	4

POLE: A4 CABLE SIZE: 19/C

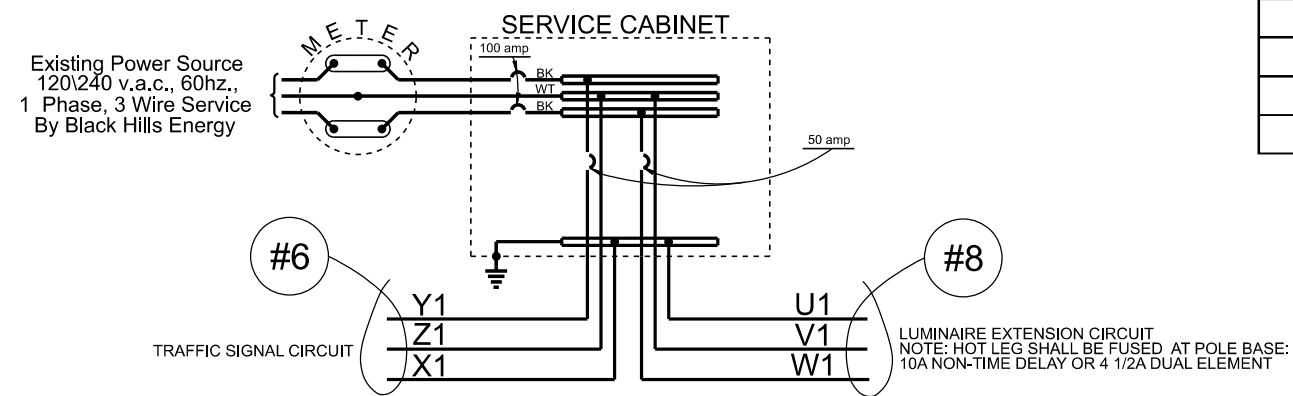
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
6R	Red	Red	R	10	6
6Y	Orange	Orange	Y	10	6
6G	Blue	Blue	G	10	6
N	Black	Black	N	10	6
6R	Red/Black	Red	R	11	6
6Y	Orange/Black	Orange	Y	11	6
6G	Blue/Black	Blue	G	11	6
N	Yellow/Black	Black	N	11	6
6R	Red/Blue	Red	R	12	6
6Y	Yellow	Orange	Y	12	6
6G	Black/Blue	Blue	G	12	6
N	Brown	Black	N	12	6
6R	Black/Red	Red	R	14	1
6Y	Orange/Red	Orange	Y	14	1
6G	Blue/Red	Blue	G	14	1
9Y	Yellow/Red	Yellow	FYA	14	1
N	Brown/Black	Black	N	14	1
	Brown/Red				
	Orange/Blue				

POLE: A1 CABLE SIZE: 4/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	Black	N	4	4
2R	Red	Red	R	4	4
2G	Blue	Blue	G	4	4
2Y	Orange	Orange	Y	4	4

POLE: A5 CABLE SIZE: 4/C

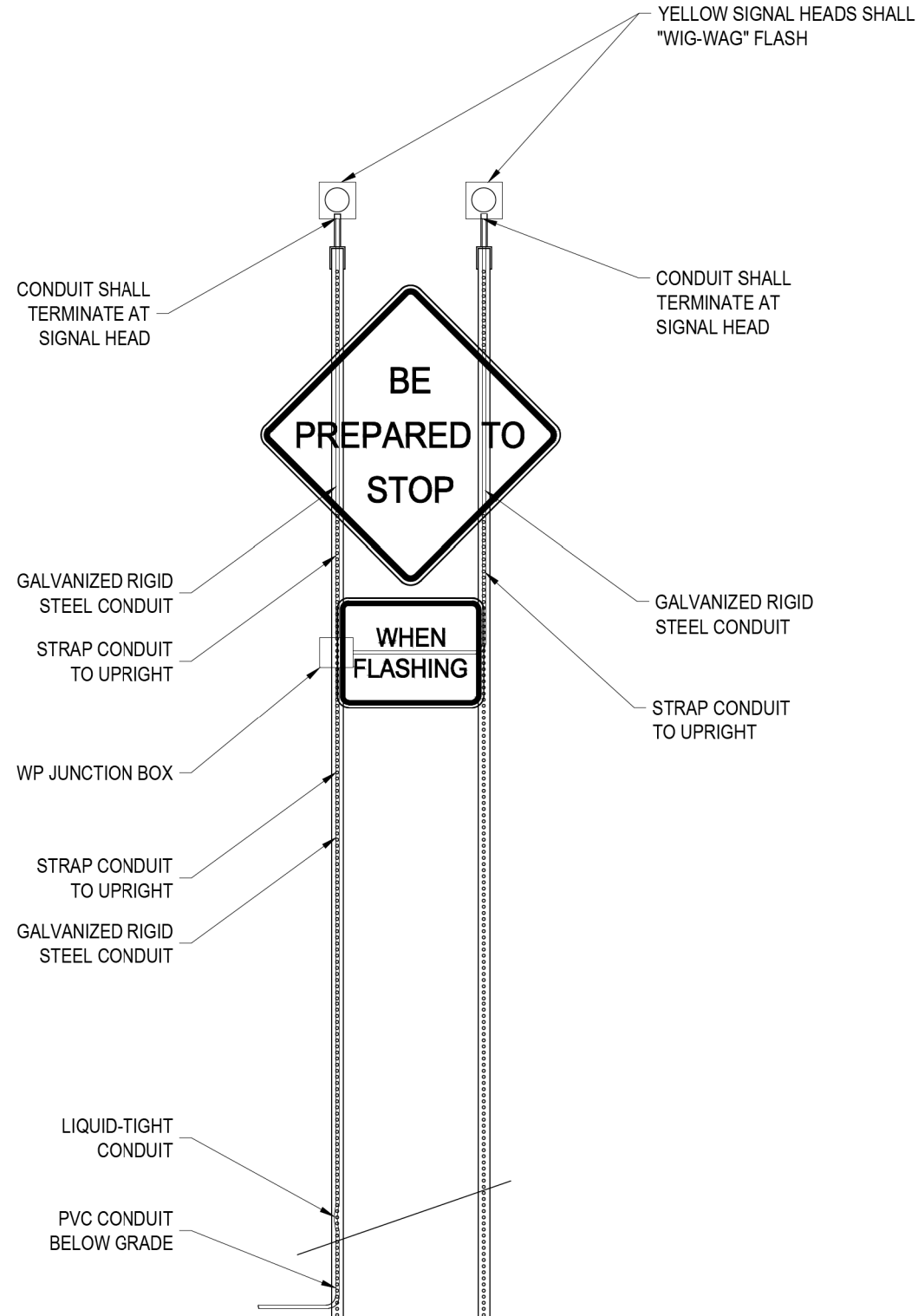
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	Black	N	1	2
2R	Red	Red	R	1	2
2G	Blue	Blue	G	1	2
2Y	Orange	Orange	Y	1	2



SPECIAL DETAILS

ADVANCE WARNING FLASHING SIGN

	PROJECT	SECTION	SHEET
	P 0014(257)10	L18	L28
Plotting Date: 3/13/2026			

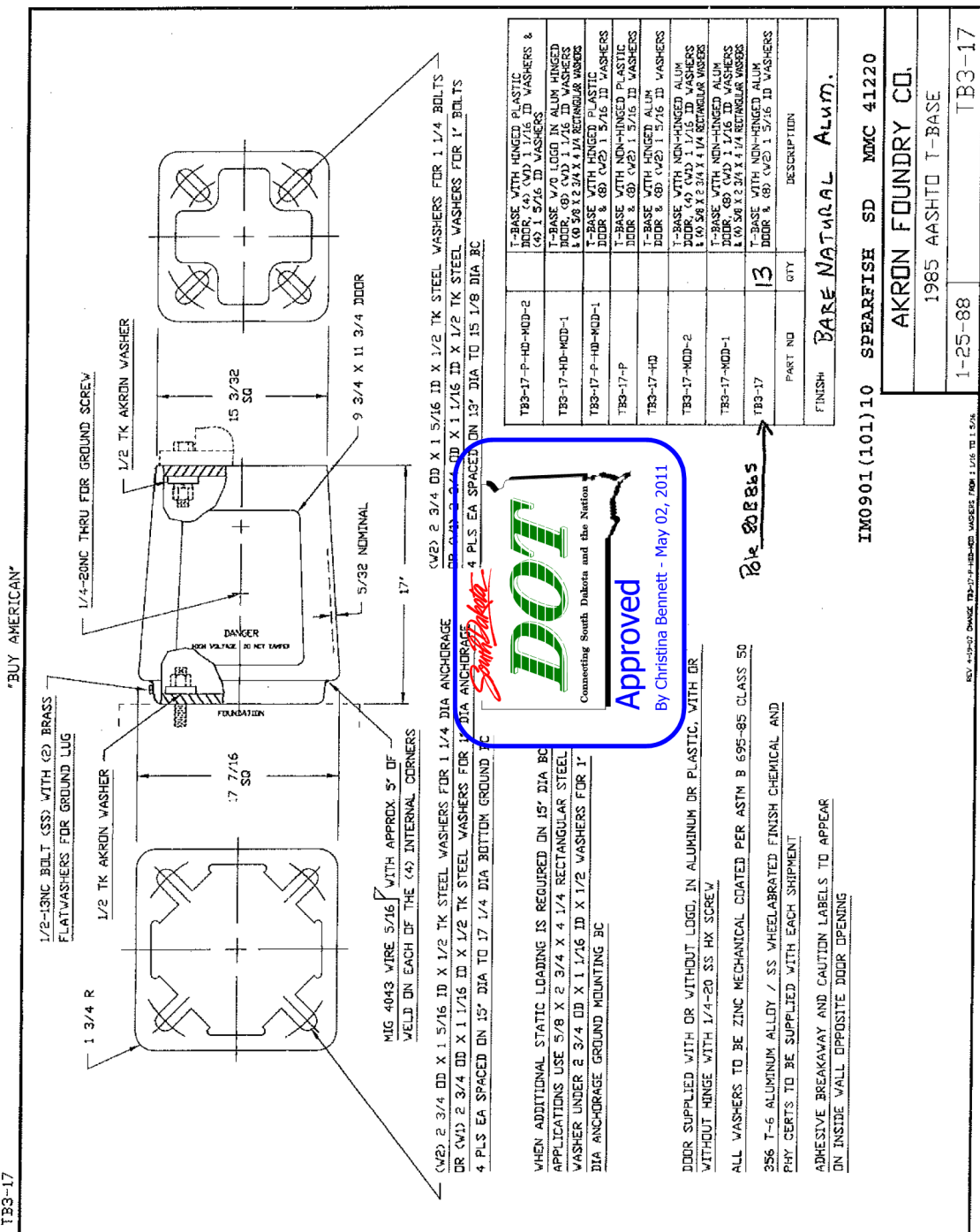
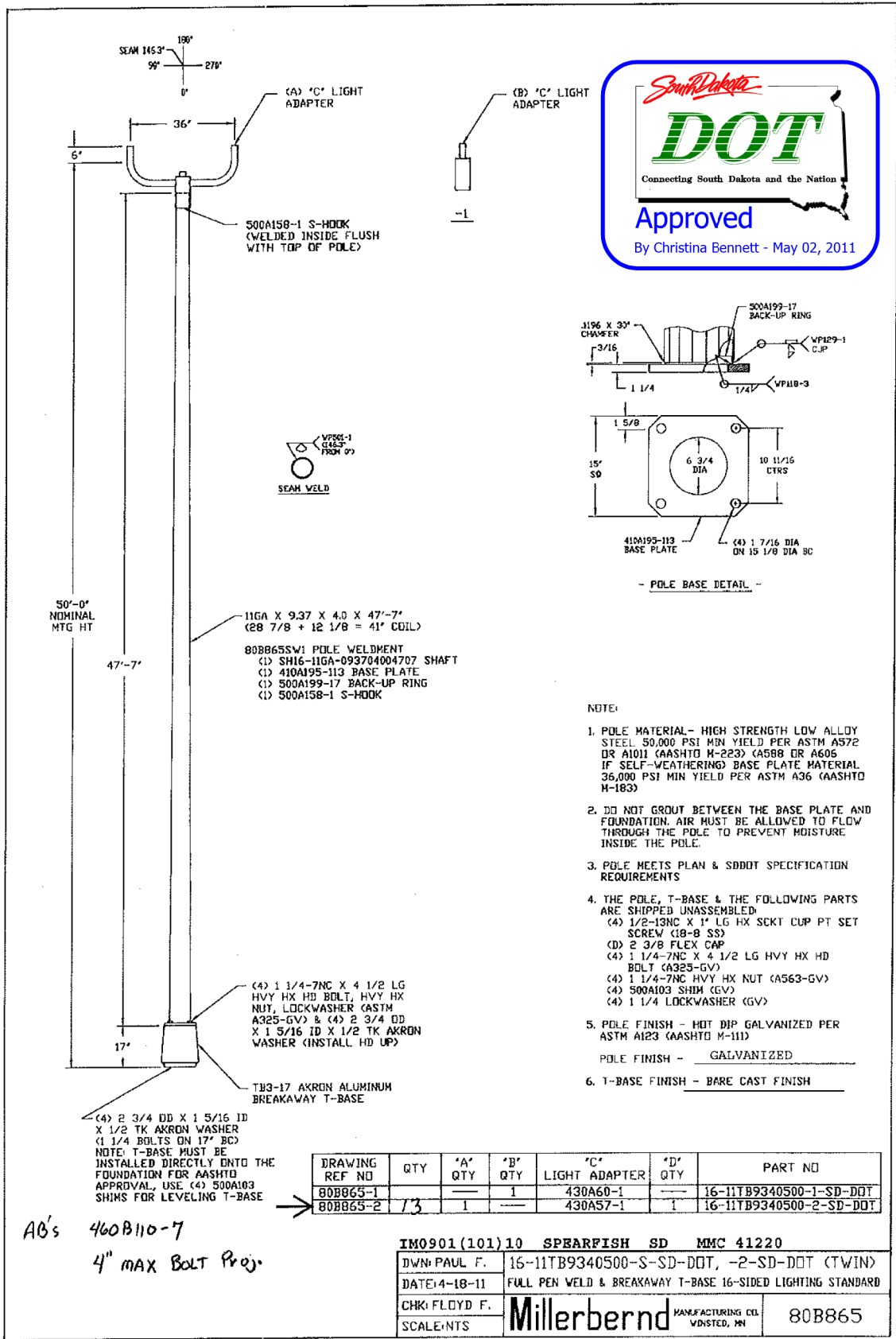


1

RETROFIT AWS ASSEMBLY

SCALE: NO TO SCALE

SPECIAL DETAIL FOR REMOVE AND RESET LUMINAIRE POLE

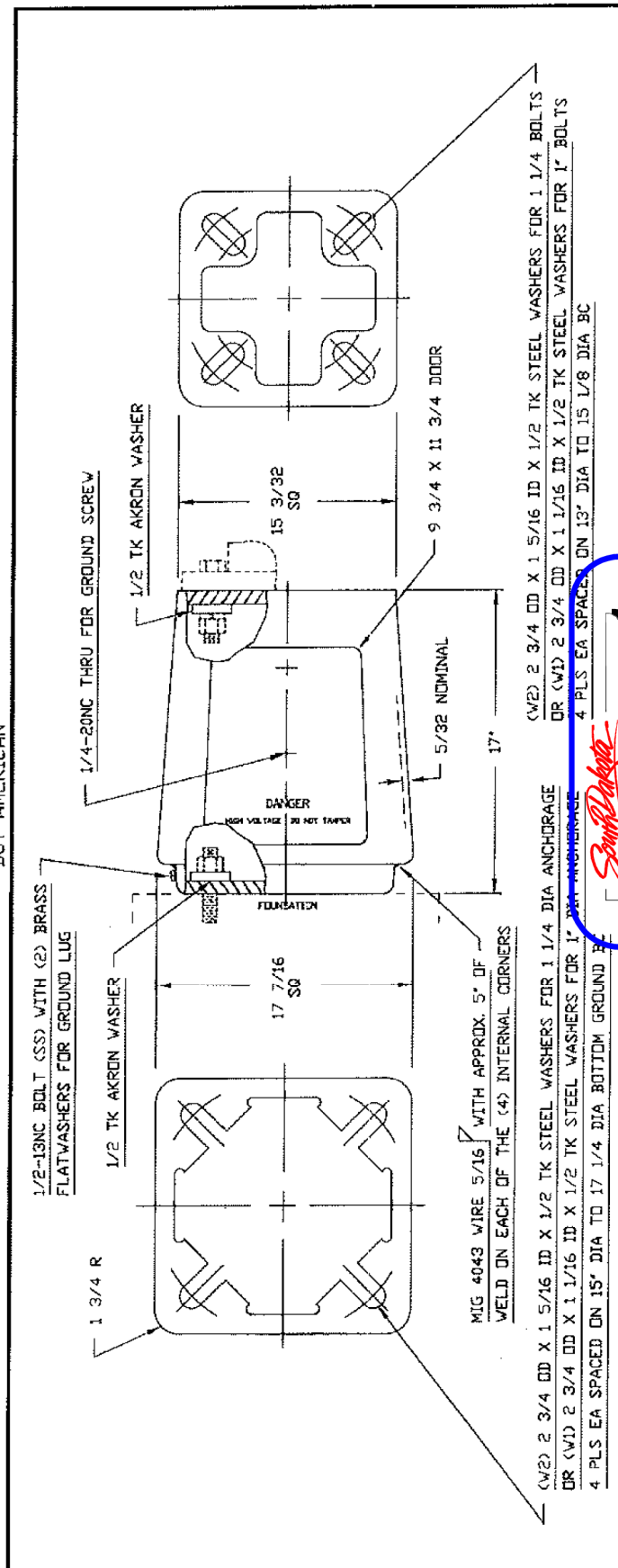
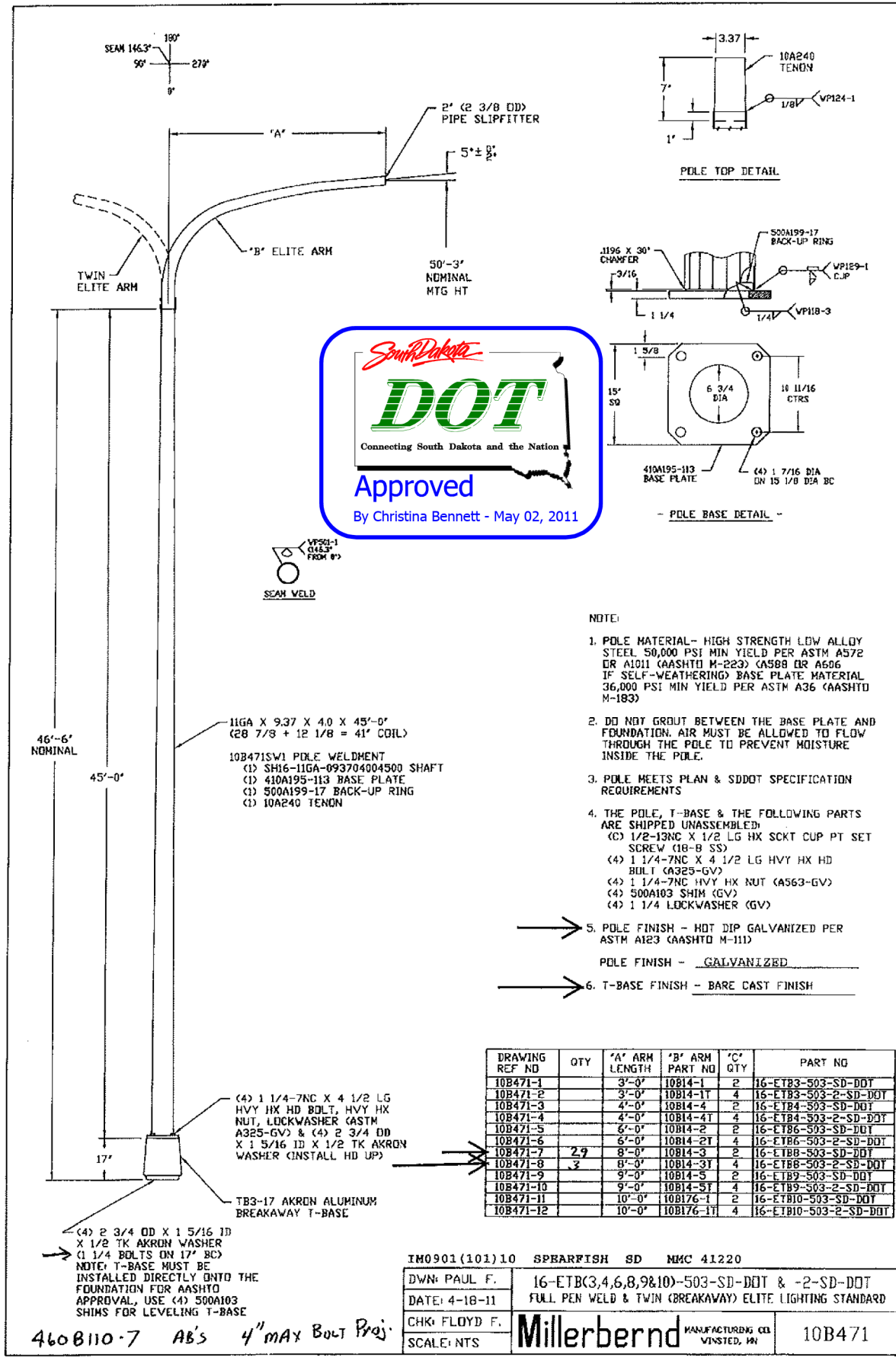


IM0901(101)10 SPEARFISH SD MMC 41220			
DWN: PAUL F.	16-11TB9340500-S-SD-DOT, -2-SD-DOT (TWIN)		
DATE: 4-18-11	FULL PEN WELD & BREAKAWAY T-BASE 16-SIDED LIGHTING STANDARD		
CHK: FLOYD F.	Millerbernd		
SCALE: NTS	MANUFACTURING CEN VINSTED, WI	80B865	

MATERIAL MELTED AND MANUFACTURED IN THE USA CASTINGS PRODUCED IN THE USA

IM0901(101)10 SPEARFISH SD MMC 41220	AKRON FOUNDRY CO.
1985 AASHTO T-BASE	TB3-17
1-25-88	
FINISH: BARE NATURAL ALUM.	

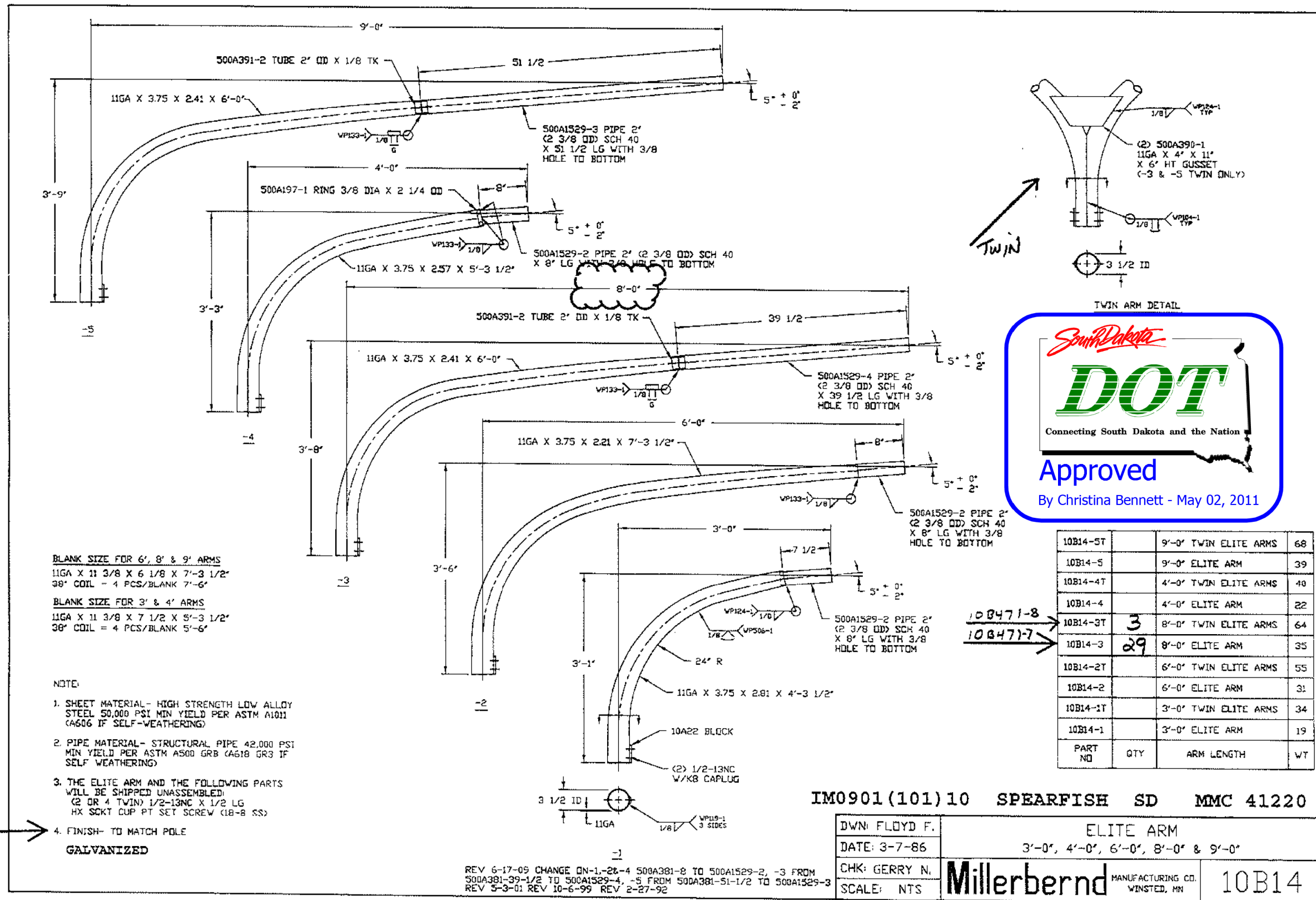
SPECIAL DETAIL FOR REMOVE AND RESET LUMINAIRE POLE

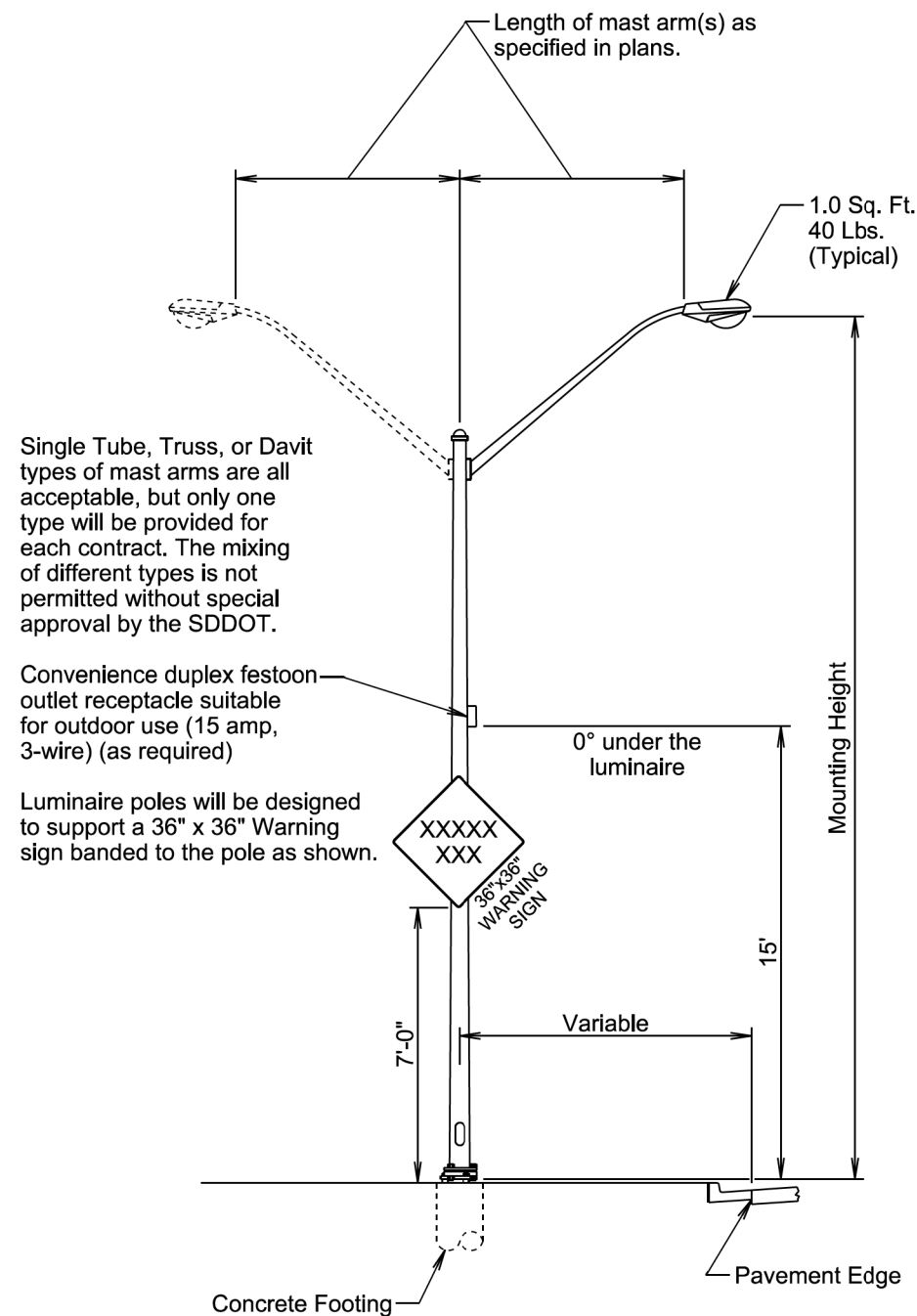


PART NO	QTY	DESCRIPTION
16-ETB3-503-SD-DDT		T-BASE WITH HINGED PLASTIC DOOR, (4) (4) 1 1/16 ID WASHERS & (4) 1 1/16 ID WASHERS
16-ETB4-503-SD-DDT		T-BASE WITH LOGO IN ALUM HINGED DOOR, (4) (4) 1 1/16 ID WASHERS & (4) 5/8 X 2 3/4 X 4 1/4 RECTANGULAR WASHERS
16-ETB6-503-SD-DDT		T-BASE WITH HINGED PLASTIC DOOR & (8) (4) 1 1/16 ID WASHERS
16-ETB8-503-SD-DDT		T-BASE WITH HINGED PLASTIC DOOR & (8) (4) 1 1/16 ID WASHERS
16-ETB9-503-SD-DDT		T-BASE WITH HINGED ALUM DOOR & (8) (4) 1 1/16 ID WASHERS
16-ETB10-503-SD-DDT		T-BASE WITH NON-HINGED ALUM DOOR, (4) (4) 1 1/16 ID WASHERS & (4) 5/8 X 2 3/4 X 4 1/4 RECTANGULAR WASHERS
16-ETB11-503-SD-DDT		T-BASE WITH NON-HINGED ALUM DOOR, (8) (4) 1 1/16 ID WASHERS & (4) 5/8 X 2 3/4 X 4 1/4 RECTANGULAR WASHERS
16-ETB12-503-SD-DDT	32	T-BASE WITH NON-HINGED ALUM DOOR & (8) (4) 1 1/16 ID WASHERS
		FINISH: BARE NATURAL ALUM.

MATERIAL MELTED AND MANUFACTURED IN THE USA CASTINGS PRODUCED IN THE USA

SPECIAL DETAIL FOR REMOVE AND RESET LUMINAIRE POLE





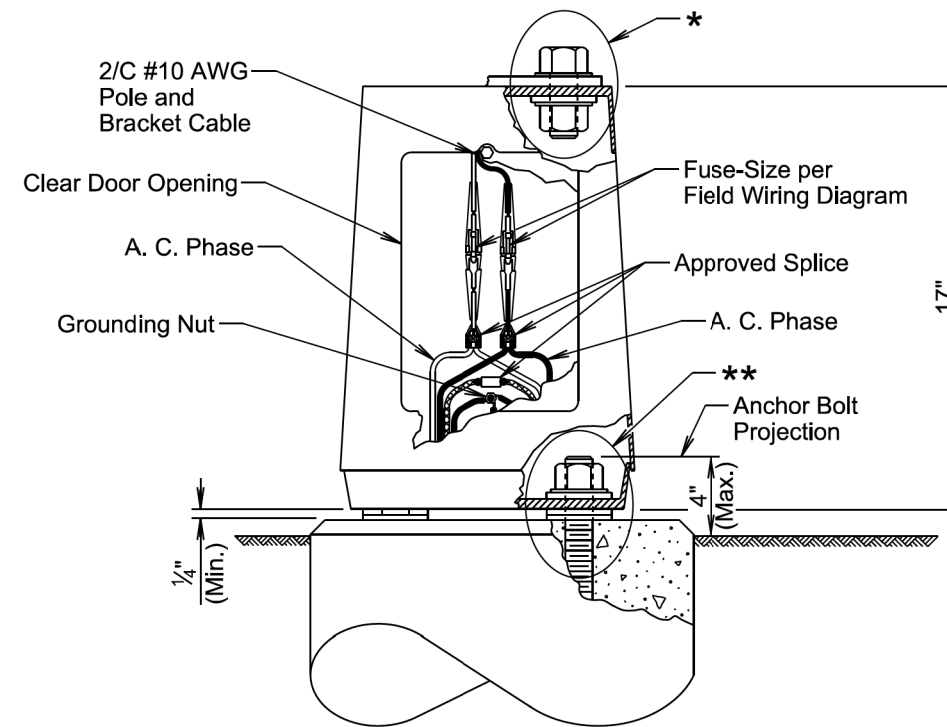
Single Tube, Truss, or Davit types of mast arms are all acceptable, but only one type will be provided for each contract. The mixing of different types is not permitted without special approval by the SDDOT.

Convenience duplex festoon outlet receptacle suitable for outdoor use (15 amp, 3-wire) (as required)

Luminaire poles will be designed to support a 36" x 36" Warning sign banded to the pole as shown.

November 19, 2022

Published Date: 2026	S D D O T	STEEL ROADWAY LUMINAIRE POLE WITH MAST ARM(S)	PLATE NUMBER 635.01
			Sheet 1 of 1



GENERAL NOTES:

Base details are provided for example only and are not intended to be a complete design.

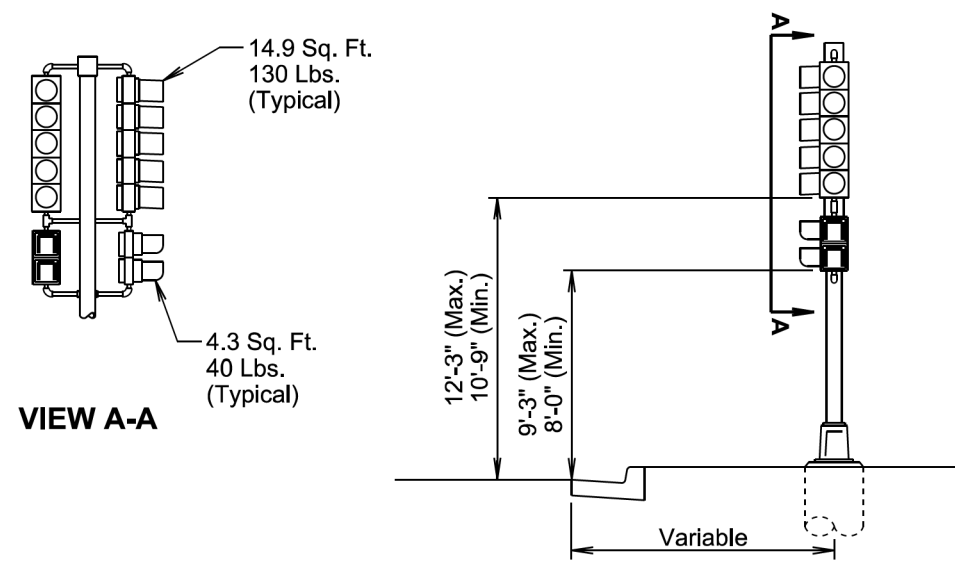
Fused connectors will be breakaway type.

* Hardware connecting the pole to the base will be installed in accordance with the manufacturer's recommendation.

** Hardware connecting the base to the footing will be installed in accordance with the manufacturer's recommendation. The Contractor will install leveling devices in accordance with the manufacturer's recommendation if shimming is necessary to install the light poles plumb and level. The washers and shims will be installed around the anchor bolts.

November 19, 2022

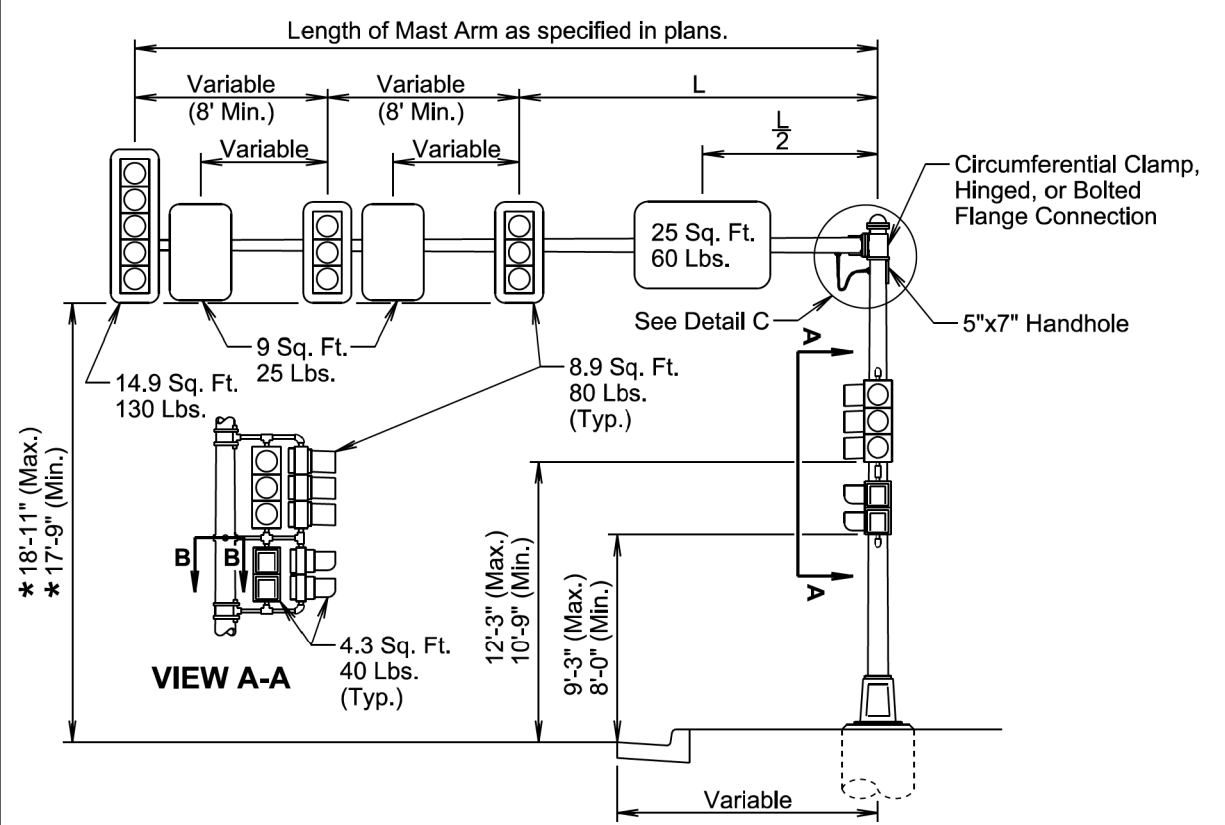
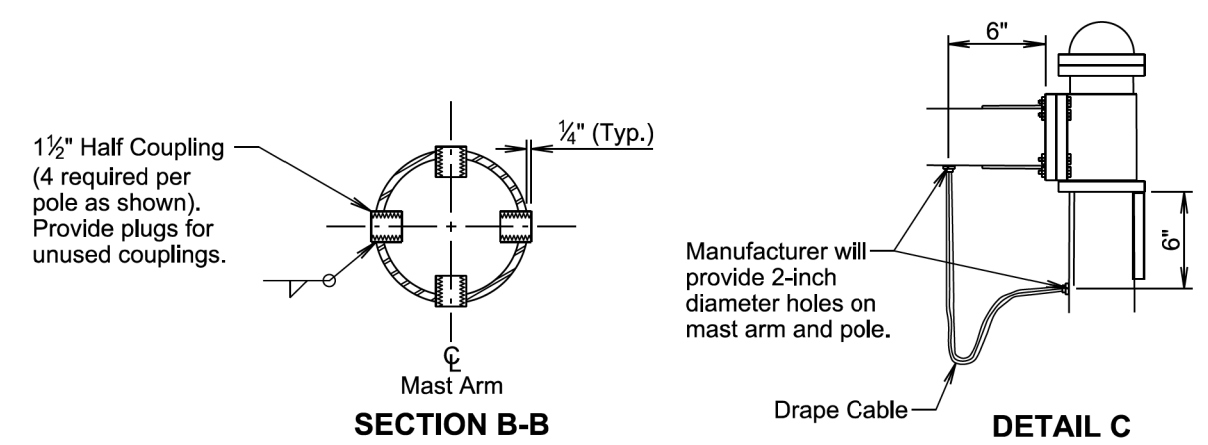
Published Date: 2026	S D D O T	ROADWAY LUMINAIRE POLE BREAKAWAY TRANSFORMER BASE	PLATE NUMBER 635.21
			Sheet 1 of 1



GENERAL NOTE:
The signal heads are shown with backplates removed so that the mounting hardware is visible.

November 19, 2022

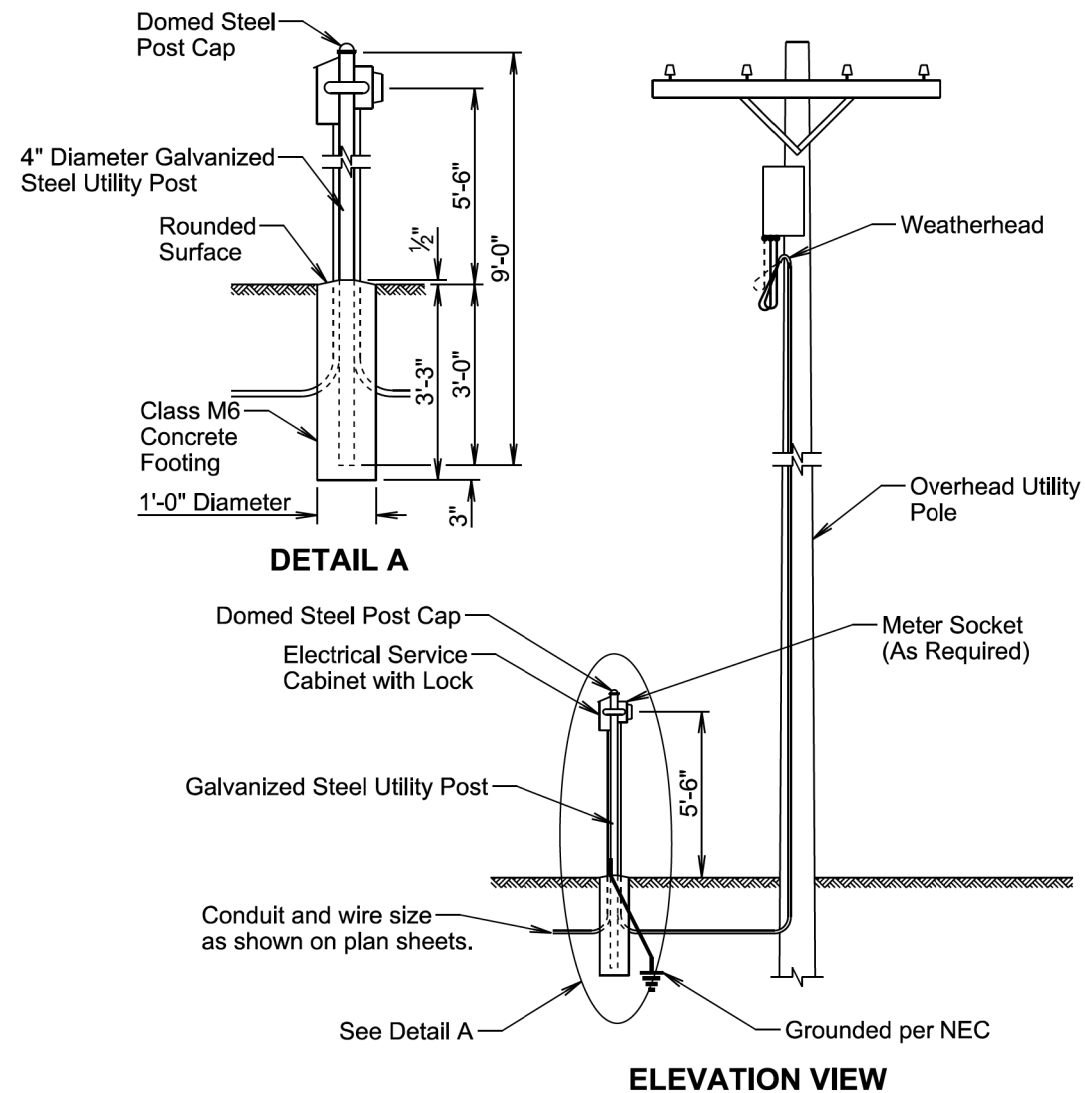
Published Date: 2026	SD DOT	SIGNAL POLE (PEDESTAL)	PLATE NUMBER 635.30
			Sheet 1 of 1



GENERAL NOTES:
Some of the signal heads are shown with backplates removed so that the mounting hardware is visible.
* The signal height allowances shown above are based on a horizontal distance greater than 53' between the signals and stop line. For horizontal distance of 53' and less between the signals and the stop line, the height allowances will be as specified in Section 4D.15 of the MUTCD.

November 19, 2022

Published Date: 2026	SD DOT	SIGNAL POLE (WITH MAST ARM)	PLATE NUMBER 635.31
			Sheet 1 of 1



GENERAL NOTES:

The concrete for the post footing will be class M6 concrete.

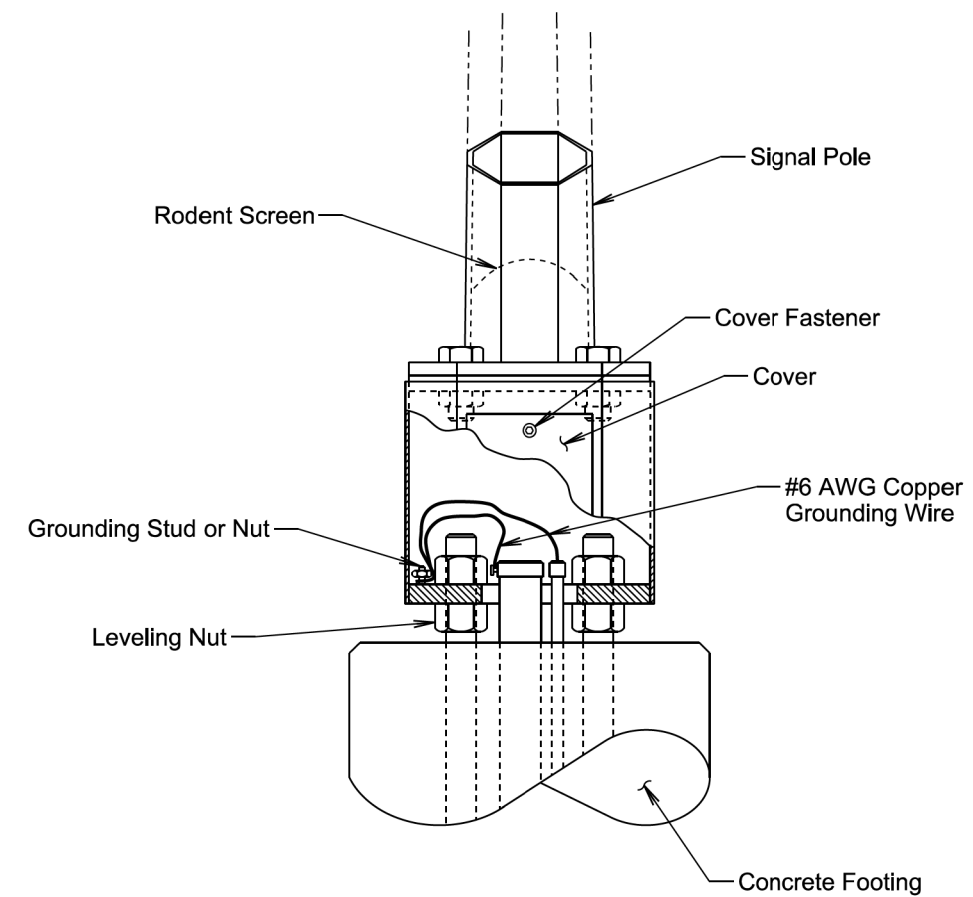
The 4" diameter galvanized steel utility post will be 9' long and will be in conformance with AASHTO Standard Specifications M181. The post will be Type 1 and either Grade 1 or Grade 2. The domed steel post cap will be in conformance with AASHTO Standard Specifications M181 and will be Type 1.

The Contractor will contact and coordinate his/her work with the Utility Companies regarding hookup requirements, fees, materials, and equipment necessary.

All costs for furnishing and installing all materials from the electrical service cabinet to the transformer including labor, equipment, hookup fees, all items within the cabinet, lockable enclosure with receptacle outlet, lock and keys, post, concrete footing, post cap, meter socket if required, conduit, and incidentals will be incidental to the contract unit price per each for "Electrical Service Cabinet".

March 31, 2024

Published Date: 2026	SD DOT	GALVANIZED STEEL UTILITY POST WITH OVERHEAD UTILITY POLE	PLATE NUMBER 635.35
			Sheet 1 of 1



GENERAL NOTES:

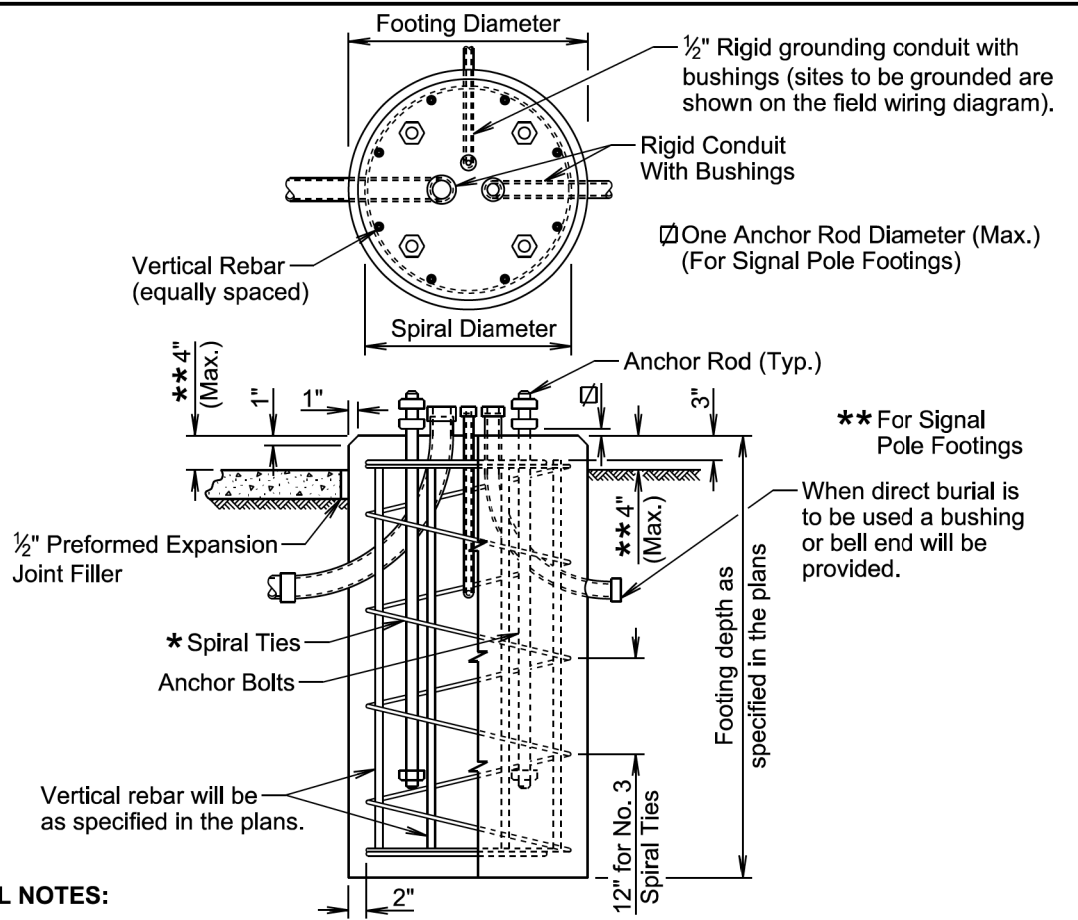
Base details are provided for example only and are not intended to be a complete design.

The Contractor will furnish and install a rodent screen in the signal pole above the transformer base. The rodent screen will be a galvanized steel mesh with a maximum opening size of 1/4 inch. The rodent screen will be friction fitted or installed by other methods approved by the Engineer.

All costs for furnishing and installing the rodent screen including labor, equipment, and materials will be incidental to the contract unit price per each for the corresponding signal pole contract item.

February 14, 2020

Published Date: 2026	SD DOT	TRANSFORMER SIGNAL POLE BASE	PLATE NUMBER 635.50
			Sheet 1 of 1

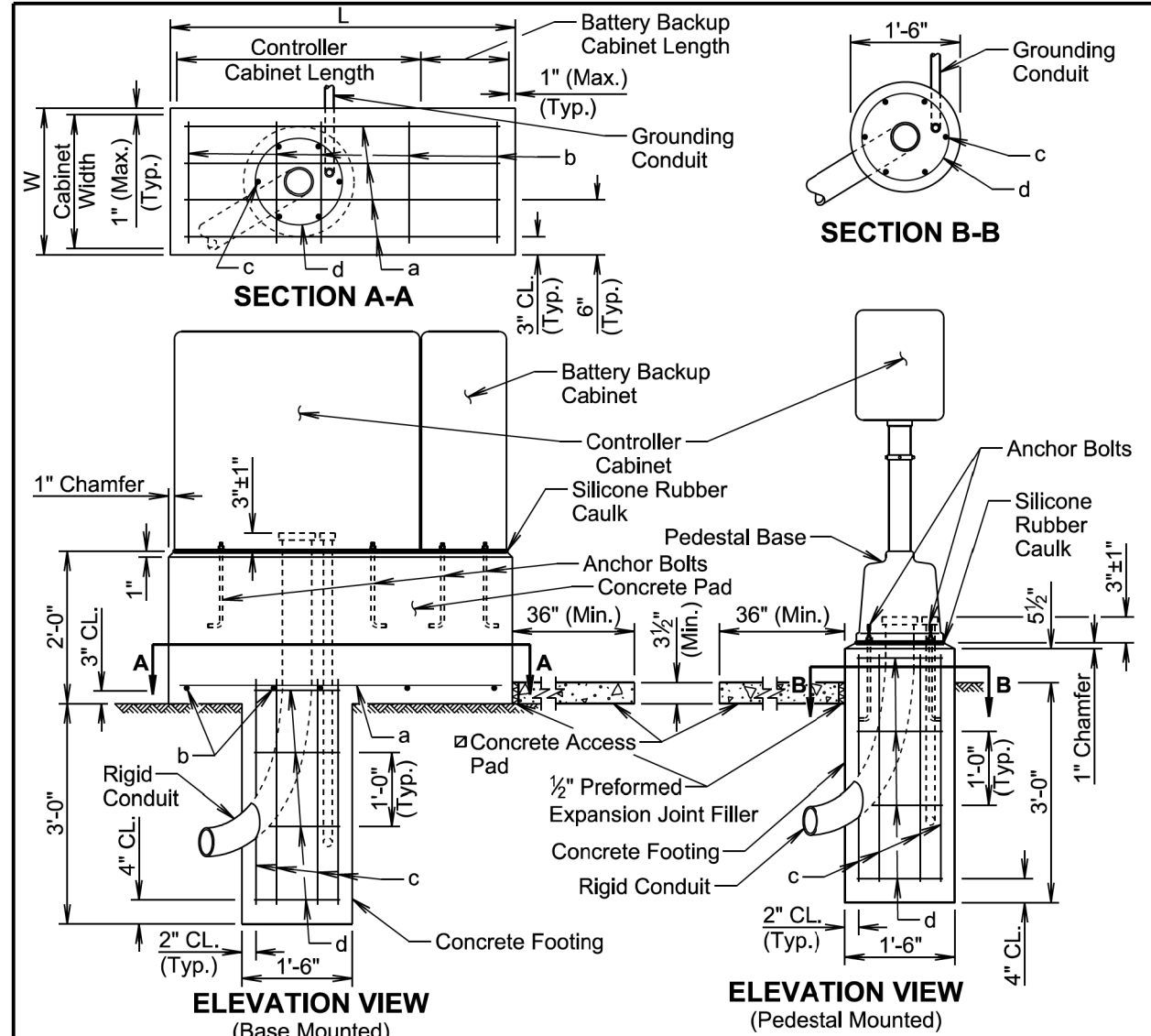


GENERAL NOTES:

- * Circular ties may be used in lieu of the spiral ties. The No. 3 ties will be spaced 12 inches apart except for the top two which will be spaced 6 inches apart. The ties will be lapped 18 inches and the laps will be staggered around the cage.
- Spiral ties will have 1-1/2 extra turns at each end.
- See Section 985 of the Specifications for footing materials.
- Conduits and bushings may project 2 1/2 inches to 6 inches above footing for fixed base poles but will not project above the slip plane or fracture plane for breakaway poles.
- Conduits will be sealed water-tight during all phases of construction until poles are in place.
- The anchor rods will fit inside the reinforcing steel cage. If the anchor rods designed by the Pole Manufacturer do not fit, contact the Office of Bridge Design for footing redesign. No additional payment will be made for the redesigned footing.
- Costs of conduit and conduit bushings shown on footing detail will be incidental to the footing bid item(s).
- The pole will not be installed until the concrete has attained design strength (4000 psi).
- The contour of the area surrounding the breakaway pole will be flat, though not necessarily level for a distance of 5 feet in all directions. The Contractor may be required to provide finish grading at some breakaway pole locations.

November 19, 2022

Published Date: 2026	SD DOT	POLE FOOTING	PLATE NUMBER 635.55
			Sheet 1 of 1



GENERAL NOTES:

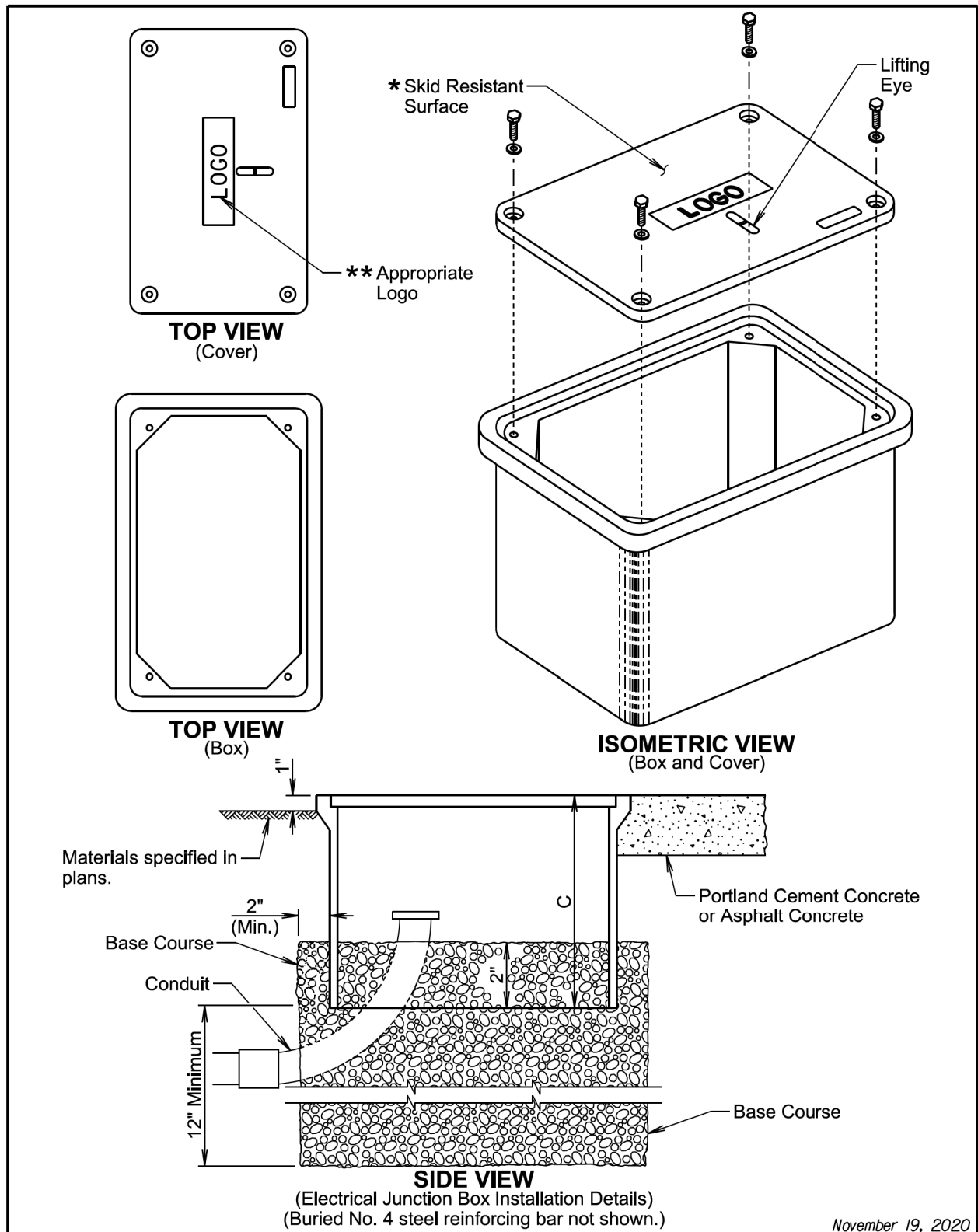
- The concrete pad will conform to the base of the controller and battery backup cabinets to the satisfaction of the Engineer.
- Conduits will be sealed water-tight until the conductor cables are installed.
- ☑ If the controller and battery backup concrete pad and footing is not located within or adjacent to an existing sidewalk, the Contractor will provide a concrete access pad as directed by the Engineer.
- Anchor bolts and related hardware will conform to the controller and battery backup cabinets manufacturer's specifications.
- A continuous bead of silicone rubber caulk will provide a weather-tight seal between the concrete pad or footing, and the cabinet or base.

REINFORCING SCHEDULE (for one footing)					
Mk.	No.	Size	Length	Type	Bending Detail
a	*	3	L-4"	Str.	
b	*	3	W-4"	Str.	
c	6	6	3'-0"	Str.	
d	4	3	4'-0"	T3	

Note: Dimensions are out to out of bar
* Vary number of bars as required by footing size.

November 19, 2022

Published Date: 2026	SD DOT	CONTROLLER CABINET AND FOOTING	PLATE NUMBER 635.60
			Sheet 1 of 1



November 19, 2020

SD DOT Published Date: 2026	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65
		Sheet 1 of 2

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.

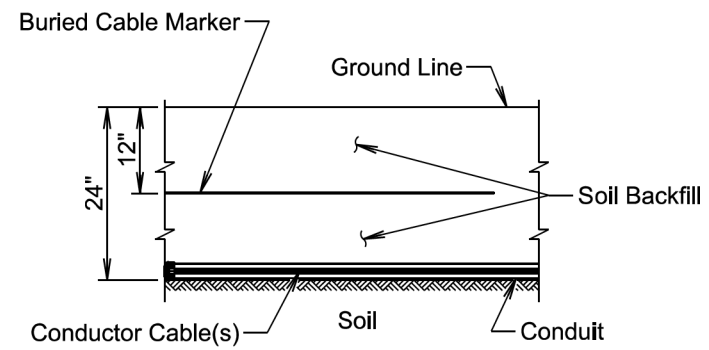
The electrical junction boxes will comply with the American National Standards Institute (ANSI)/Society of Cable Telecommunications Engineers (SCTE) 77 2007 Specification for Underground Enclosure Integrity. The loading requirement for all electrical junction boxes and covers will be Tier 22 of ANSI/SCTE 77 2007.

The electrical junction boxes will be UL listed.

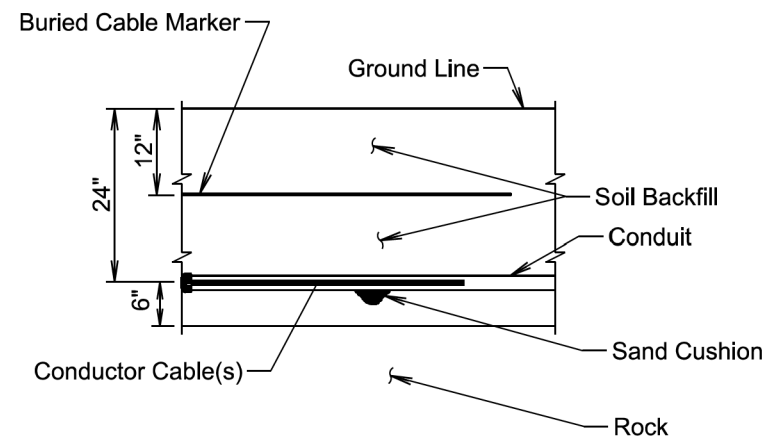
For junction boxes located outside of pavement, a No. 4 steel reinforcing bar with a minimum length of 18" will be buried adjacent to the long side of the junction box. All costs associated with furnishing and placing the steel reinforcing bar will be incidental to the contract unit price per each for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

November 19, 2020

SD DOT Published Date: 2026	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65
		Sheet 2 of 2



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

Published Date: 2026	SD DOT	CONDUIT INSTALLATION	PLATE NUMBER 635.76
			Sheet 1 of 1