

Section L: Lighting Plans

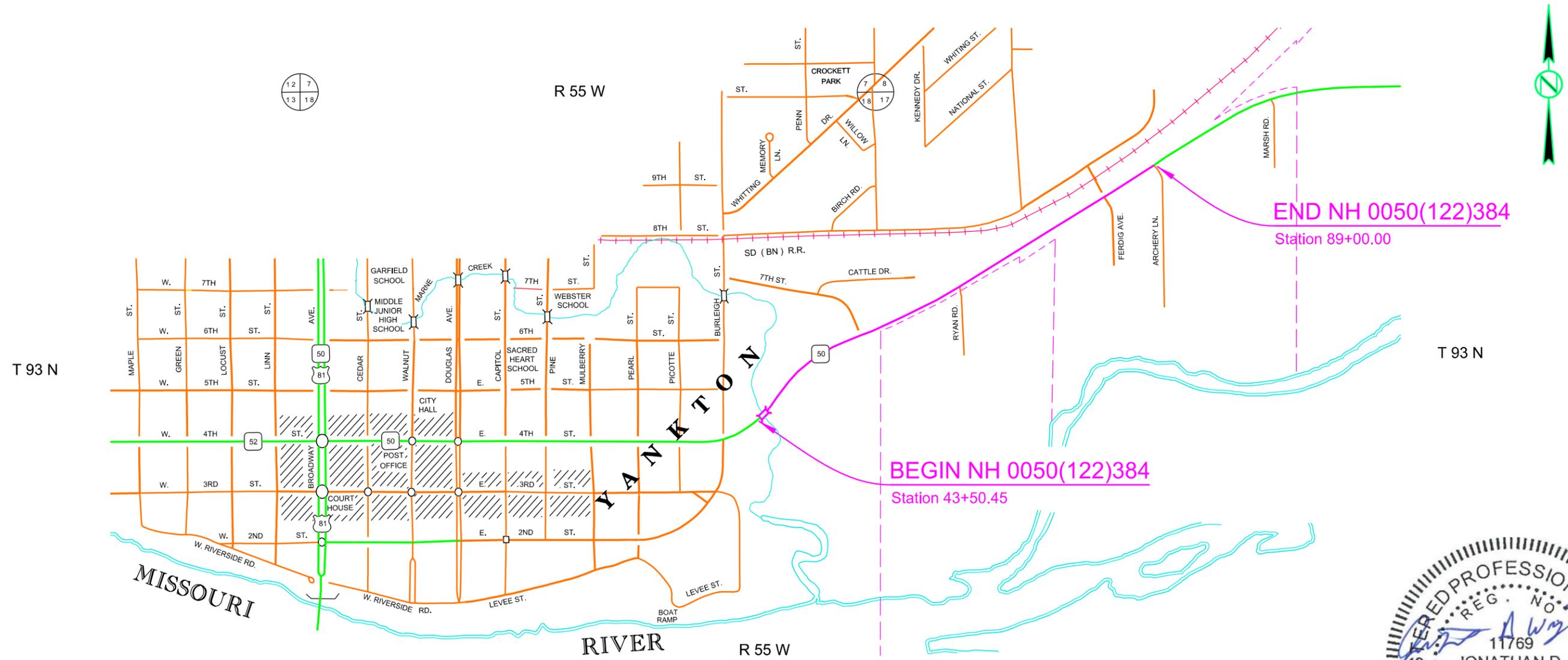
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0050(122)384	L1	L25

Plotting Date: 5/20/2016

INDEX OF SHEETS

- L1 General Layout W/Index
- L2-L6 Estimate with General Notes & Tables
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- L19 Special Details
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SECTION L ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1540	Remove Luminaire Pole Footing	20	Each
110E5100	Salvage Luminaire Pole	20	Each
635E0040	Breakaway Base Luminaire Pole with Arm, 40' Mounting Height	30	Each
635E0900	Decorative Luminaire Pole	6	Each
635E3410	Decorative Luminaire, 400 Watt	6	Each
635E3800	Roadway Luminaire, LED	30	Each
635E4010	1 Section Vehicle Signal Head	2	Each
635E5020	2' Diameter Footing	264.0	Ft
635E5302	Type 2 Electrical Junction Box	37	Each
635E5400	Electrical Service Cabinet	1	Each
635E5420	Circuit Control Center	2	Each
635E8015	1.5" Rigid Galvanized Steel Conduit	30	Ft
635E8120	2" Rigid Conduit, Schedule 40	4,640	Ft
635E8130	3" Rigid Conduit, Schedule 40	955	Ft
635E8220	2" Rigid Conduit, Schedule 80	515	Ft
635E8230	3" Rigid Conduit, Schedule 80	340	Ft
635E9014	1/C #4 AWG Copper Wire	2,440	Ft
635E9016	1/C #6 AWG Copper Wire	26,010	Ft
635E9018	1/C #8 AWG Copper Wire	5,940	Ft
635E9020	1/C #10 AWG Copper Wire	5,025	Ft
635E9021	2/C #12 AWG Copper Wire	720	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	1,800	Ft

SUPPLYING AS BUILT PLANS

If the traffic signal systems or roadway lighting systems are constructed differently than what is stated in the plans, the Contractor shall supply as built plans to the Engineer and a copy shall 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 shall submit shop drawings and catalog cuts in accordance with Section 985 of the Specifications.

Adobe PDF submittals shall be sent to the following email address:
jwiegand@hrgreen.com

Upon review of the submittals, they will be sent by the Engineer to the following email address for concurrence of approvals or remarks:
John.Less@state.sd.us

ON-SITE INSPECTION

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

SALVAGE LUMINAIRE POLE

Existing luminaire poles SEL30-SEL49 shall be salvaged and delivered to the City of Yankton by the Contractor. The Contractor shall notify the City 5 days before the delivery of the salvaged luminaire poles. The City contact is Brad Moser at (605) 668-5255.

It shall be the Contractor's responsibility to protect the salvaged luminaire pole materials until delivery to the City of Yankton. If the Engineer determines that the Contractor damaged salvaged materials, the Contractor shall dispose of the materials and replace the damaged materials with new materials.

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

REMOVE LUMINAIRE POLE FOOTING

The footings of existing luminaire poles SEL30-SEL49 shall be removed by the Contractor to a minimum of 2' below the ground surface. Restoration of the disturbed area shall be to the satisfaction of the Engineer.

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

TABLE OF FOOTING DATA

Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
L55-L60	2' - 0"	4' - 0"	1' - 8"	33' - 9"	8-#7 x 3' - 6"
L62-L90, L65A	2' - 0"	8' - 0"	1' - 8"	54' - 9"	8-#7 x 7' - 6"

* Footing depth shall be below ground level.

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

SUBSURFACE CONDITIONS

The subsurface soils along SD50 within the project limits consist of brown silt-clay to clay-silt with an occasional gravel layer below 5 feet. Groundwater was encountered in the boring placed at station 67+00 – 24.5' Lt at a depth of 6.7 feet. All other borings conducted within the limits of the project were dry at the time of the investigation but caved between 7.3 feet and 17.1 feet below the surface.

During construction of the cylindrical footings, concrete placement operations should closely follow excavation procedures. The longer the excavations are

left open the more likely caving may occur. If caving soils are encountered during excavation, casing may be required to construct the cylindrical footings.

Concrete shall not be dropped through standing water. If water is present in the excavation it shall be removed prior to concrete placement or the concrete shall be tremied. If caving occurs during dewatering the concrete shall be placed through a tremie or by means of a casing.

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The boring logs and laboratory tests are available for review at the Central Office in Pierre. If questions arise or additional information is needed contact the Geotechnical Engineering Activity in Pierre at 605.773.3401.

CIRCUIT CONTROL CENTERS

The Circuit Control Centers CCC3-CCC4 shall provide centralized control of roadway luminaires as shown on the plans. The Circuit Control Centers shall provide power to the roadway luminaires and duplex receptacles mounted on the luminaire poles.

For each Circuit Control Center, refer to applicable wiring diagrams, elementary control wiring diagrams, and Circuit Control Center equipment lists in Section L for components of each controller.

The location of service meter shall be installed as noted below for each Circuit Control Center.

Circuit Control Center 3 (CCC3)

The meter is mounted to the CCC3 cabinet.

Circuit Control Center 4 (CCC4)

The meter is mounted to the CCC4 cabinet.

All costs associated with furnishing and installing the new Circuit Control Centers shall be included in the contract unit price per each for "Circuit Control Center".

EXISTING LIGHTING

There are five (5) existing light pole assemblies at the east end of the project that will remain and will require reestablishment of electrical service to these lights. The existing service cabinet serving these lights will be impacted due to relocation of an electric utility pole. The Contractor shall construct/install a new service cabinet ESC1 with meter, as per Standard Plate 635.35, and where indicated on the plans. A new feeder circuit shall be installed from the new service cabinet to the remaining lighting circuit run in EJB2 to refeed the five (5) light poles.



FOR BIDDING PURPOSES ONLY

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DECORATIVE LUMINAIRE POLES

Decorative luminaire poles L55-L60 shall have identical color and shall match the appearance of existing decorative luminaire poles along US Highway 81 (Broadway Street) installed as part of project NH 0050(99)383. Mounting height shall be 14 Ft.

Decorative Luminaire Poles shall be designed to include loadings created by 2' x 4'-2" banner mounted at 12' from the bottom of the pole to the top mounting bracket.

Each Decorative Luminaire Pole shall have a convenience duplex festoon outlet receptacle (15 amp, 3 wire) suitable for outdoor use.

The following luminaire pole or equivalent meets the requirements for this design:

- 14 Ft. Holophane North Yorkshire Series
- Model # NYA-14-FTJ-20-PO7-LAB-GN-R162A-S156C-E120C-FGIUS_S-DG-BA-24-BO-H-4-GN
- Pole: North Yorkshire, fluted, tapered, 14 Ft. mounting height
- Tenon: 3 in. O.D. x 3 in. long
- Base: 20" round anchor bolt style with 15" diameter bolt circle
- Pole and Base Material: Aluminum
- Receptacle: Dark green, wet location, with weatherproof-while-in-use cover
- Banner Arm: Bolt-on, cast aluminum, 24 in. length, 1 in. diameter half sphere finial
- Eye Bolt: Bolt-on eyebolt at bottom of banner
- Finish: Dark green polyester powder coat – all components

LUMINAIRE POLES

Luminaire poles L62-L90 and L65A shall be self-weathering steel and match the appearance of existing self-weathering poles in the City of Yankton, SD. Each Luminaire Pole shall have 40 Ft. mounting height with 6 Ft. davit arm.

Luminaire Poles shall be designed to include loadings created by 2' x 4'-2" banner mounted 22.5' from the bottom of the pole to the top mounting bracket and one standard sign as shown on South Dakota standard plate 635.01.

Each Luminaire Pole shall have a convenience duplex festoon outlet receptacle (15 amp, 3 wire) suitable for outdoor use.

The following luminaire pole or equivalent meets the requirements for this design:

- Millerbernd Manufacturing Company LDTB6-400-SD-DOT-CE-SW
- Davit Arm
- Breakaway transformer base
- 6 Ft. luminaire arm
- 40 Ft. mounting height
- Festoon duplex receptacle with in-use cover
- Cor Ten self-weathering steel

LUMINAIRES

The accepted design for the roadway luminaires L55-L60 shall provide 1.2 and greater average maintained foot-candles and a uniformity ratio (average maintained to minimum maintained foot-candles) of 3:1 and less using the following parameters:

- Setback: 3 Ft.
- Lamp Loss Factor (LLF): 0.7
- Width of Lighted Area: 55 Ft. (Edge of travel lane to edge of travel lane)
- Spacing: 156 Ft.
- Configuration: Opposite
- Luminaire Mounting Height: 14 Ft.
- Light Center: 16 Ft.
- Lamp: 400W Pulse MH

The following luminaire or equivalent meets the requirements for this design

- a.) Holophane: Test No. WA400MH00X4X4.IES
- Washington Postlite Acorn Style Luminaire with Finial
- Model # WA-400PM-24-N-4-N-4-V-73531
- 400W pulse-start metal halide
- 45 7/8" tall by 17 1/4" wide
- Prismatic borosilicate glass reflector and refractor
- IES Type IV, Medium, Non-Cutoff distribution
- Housing and Finial: Cast aluminum
- Housing and Trim Color: Dark green polyester powder coat
- 400W Pulse Start Metal Halide Clear Lamp

Three copies of the isofootcandle charts and utilization curves shall be furnished to the Engineer for approval. The Contractor must get approval from the Engineer prior to installation of the luminaires.

The approved isofootcandle data for each case shall be used to determine the correct socket position at each site. Each luminaire shall be installed with its lamp socket in the proper position and in a level attitude.

The accepted design for the roadway luminaires L62-L90 and L65A shall provide 1.2 and greater average maintained foot-candles and a uniformity ratio (average maintained to minimum maintained foot-candles) of 3:1 and less using the following parameters:

- Setback: 0 Ft.
- Lamp Loss Factor (LLF): 0.7
- Width of Lighted Area: 60 Ft. (Edge of travel lane to edge of travel lane)
- Spacing: 149 Ft.
- Configuration: One-sided
- Mounting Height: 40 Ft.
- Lamp: LED

The following LED roadway luminaires meet the requirements for this design:

- a.) American Electric Lighting:
 - Test No. ATB2_80BLEDE10_XXXXX_R3_5K.IES
 - ATB2 Autobahn LED
 - Model # ATB2-80BLEDE10-MVOLT-R3-5K
 - Roadway Type III, Medium, Full Cutoff Distribution
 - Luminaire Watts: 284W
 - Luminaire Absolute Lumens: 25,425
 - Luminaire Efficacy: 89.5 lm/W
 - Finish: Gray polyester powder coat
- b.) Cooper Lighting:
 - Test No. NVN-AE-05-E-U-SL3.IES
 - Model # NVAE-05-E-U-SL3-AP
 - Roadway Type III, Medium, Non-Cutoff Distribution
 - Luminaire Watts: 264W
 - Luminaire Absolute Lumens: 25,888
 - Luminaire Efficacy: 98 lm/W
 - Finish: Gray polyester powder coat

WARNING SIGN WITH BEACON

The Contractor shall install an amber flashing beacon above the "Watch for Turning Traffic" sign at stations 75+40R and 87+00L as indicated on the Conduit Sheets and in Section S. A detail of the TYPICAL 48" WARNING SIGN ASSEMBLY WITH BEACON is provided in Section S.

Costs for furnishing and installing 1 1/2" Galvanized Conduit on the sign support structures, furnishing and installing the attachment hardware, and furnishing and installing the frangible conduit coupler shall be paid for by the contract unit price per foot for "1.5" Rigid Galvanized Steel Conduit".

All costs for materials, labor, and furnishing and installing the beacon and making the advance warning signal system operational shall be incidental to the contract price per each for "1 Section Vehicle Signal Head".



TABLE OF CONDUIT AND CABLE QUANTITIES FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA

PROJECT
NH 0050(122)384

SHEET
L4
TOTAL SHEETS
L25

Plotting Date:
5/20/2016

Location to Location	Rigid Conduit						Copper Wire					Pole and Bracket Cable						
	Galvanized Steel		Schedule 40			Schedule 80			1/C #4 AWG Ft	1/C #6 AWG Ft	1/C #8 AWG Ft	1/C #10 AWG Ft	2/C #12 AWG Ft	2/C #10 AWG Ft				
	1.5"		2"	3"	2"	3"												
Lighting: CCC2 - East																		
JL63	L55			55						60	230							
JL64	L56			55						60	230							
Lighting: CCC3 - West																		
JL66	L58			20						25	85							
JL66	JL65					80				415								
JL65	L57			5						10	25							
JL65	JL67			130						805								
JL67	L59			5						10	25							
JL67	JL68					90				465								
JL68	L60			5						10	25							
JL67	JL69			150						930								
JL69	L62			5						10	25							
JL69	JL70			150						930								
JL70	L63			5						10	25							
JL70	JL71			160						990								
JL71	L64			5						10	25							
JL71	JL72			170						1055								
JL72	L65			5						10	25							
JL72	JL72A			140						870								
JL72A	L65A			5						10	25							
JL72A	JL73			125						775								
JL73	L66			35						40	145							
JL73	JL74							90		560								
JL74	CCC3					35				400								
CCC3	Utility Serv Pole			100														
Lighting: CCC3 - East																		
JL73	JL75			175						1085								
JL75	L67			5						10	25							
JL75	JL76					180				1115								
JL76	L68			5						10	25							
JL76	JL77			120						745								
JL77	L69			5						10	25							
JL77	JL78			140						870								
JL78	L70			5						10	25							
JL78	JL79			140						870								
JL79	L71			5						10	25							
JL79	JL80			150						930								
JL80	L72			5						10	25							
JL80	JL81					165				1020								
JL81	L73			5						10	25							
JL81	JL82			165						850								
JL82	L74			5						10	25							
Subtotal:		0		2260		35		515		90			15680	345	1090	0		0



TABLE OF CONDUIT AND CABLE QUANTITIES

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA

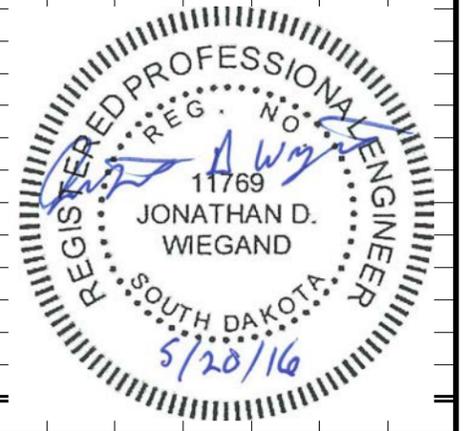
PROJECT
NH 0050(122)384

SHEET
L5
TOTAL SHEETS
L25

Plotting Date:

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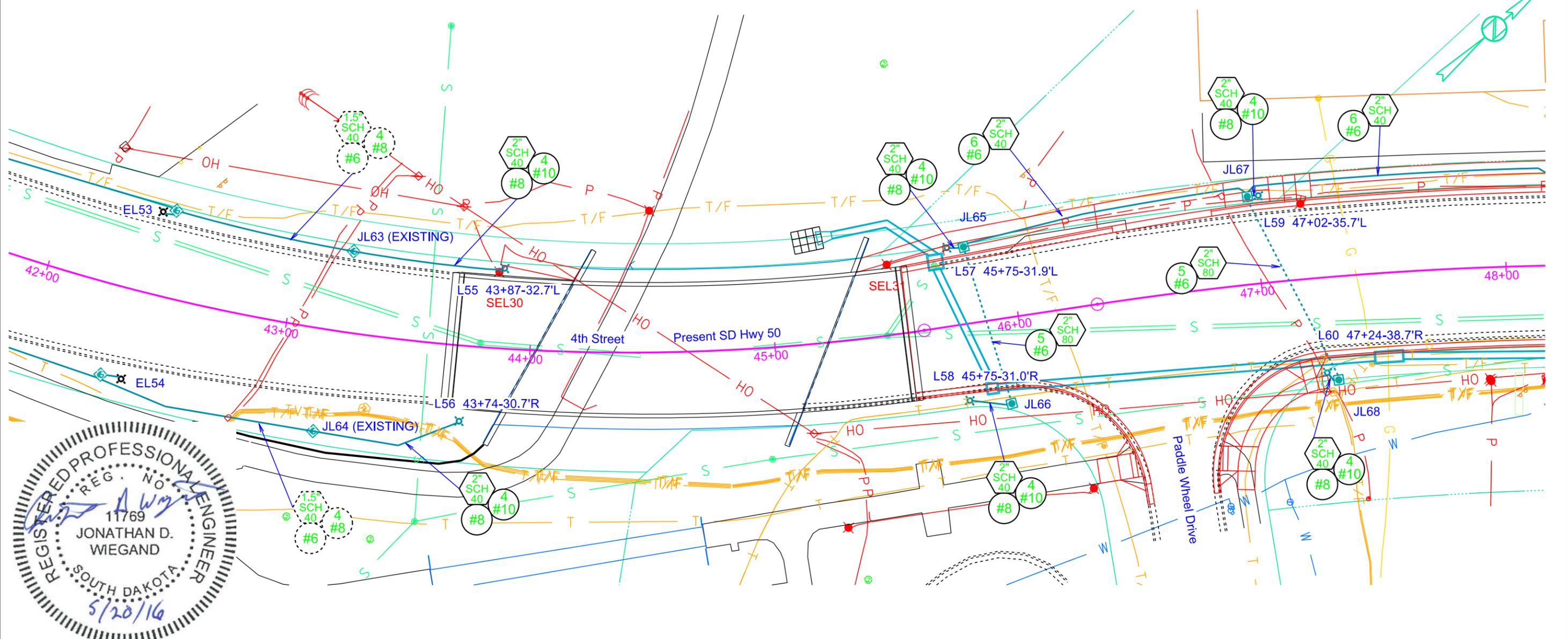
Location to Location	Rigid Conduit									Copper Wire					Pole and Bracket Cable		
	Galvanized Steel			Schedule 40			Schedule 80			1/C #4 AWG Ft	1/C #6 AWG Ft	1/C #8 AWG Ft	1/C #10 AWG Ft	2/C #12 AWG Ft	2/C #10 AWG Ft		
	1.5" Ft			2" Ft		3" Ft	2" Ft		3" Ft								
Lighting: CCC4 - West																	
JL83	L75			5								10	25				
JL83	JL84			130								405	270				
JL84	L76			5								10	25				
JL84	JL85			150								620	310				
JL85	L77			5								10	25				
JL85	JL86			150								620	310				
JL86	L78			5								10	25				
JL86	JL87			160								660	330				
JL87	L79			5								10	25				
JL87	JL88			125								515	260				
JL88	L80			5								10	25				
JL88	JL89			140								580	290				
JL89	L81			5								10	25				
JL89	JL90			175								725	360				
JL90	L82			5								10	25				
JL90	JL91			125								515	260				
JL91	JL92								90			650	375	190			
JL92	CCC4					45						325	190	190			
CCC4	Prop Util Serv Pole			95													
JL92	Beacon Sign	15		215										715			
Lighting: CCC4 - East																	
JL91	L83			35								40	145				
JL91	JL93					200						825	415	415			
JL93	L84			5								10	25				
JL93	JL94					150						620	310	310			
JL94	L85			5								10	25				
JL94	JL95					135						560	280	280			
JL95	L86			5								10	25				
JL95	JL96					60			160			910	455	455			
JL96	L87			5								10	25				
JL96	JL97					155						640	320	320			
JL97	L88			5								10	25				
JL97	JL98					175						725	365	365			
JL98	L89			20								25	85				
JL98	Beacon Sign	15		20										115			
JL98	JL99			140								435	290				
JL99	L90			5								10	25				
Lighting: Electrical Service Cab.																	
Prop Util Pole	ESC1			40													
ESC1	JL100			310								1280					
JL100	EJB2			280								1160					
Subtotal:		30		2380		920		0		250		2440	10330	5595	3935	0	0



CONDUIT LAYOUT FOR BIDDING PURPOSES ONLY

SD HWY 50 / 4TH STREET

STATE OF SOUTH DAKOTA	PROJECT NH 0050(122)384	SHEET L7	TOTAL SHEETS L25
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ESTIMATE OF QUANTITIES

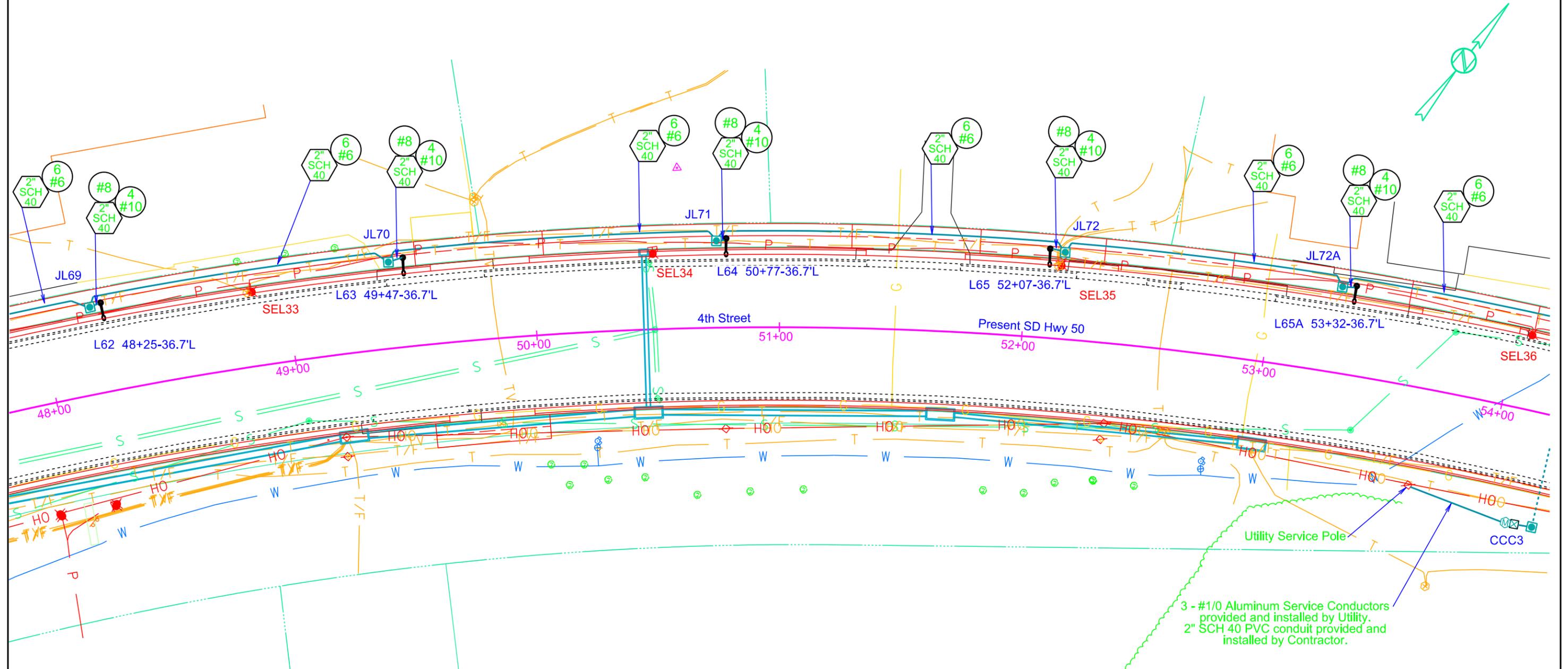
KEY	ITEM	EST QUANT	UNIT	KEY	ITEM	EST QUANT	UNIT	KEY	ITEM	EST QUANT	UNIT
◆	REMOVE LUMINAIRE POLE FOOTING (SEL30-SEL49)	20	EACH	■	TYPE 2 ELECTRICAL JUNCTION BOX (JL65-JL100, JL72A)	37	EACH	③	3" RIGID CONDUIT, SCHEDULE 80	340	FT
◆	SALVAGE LUMINAIRE POLE (SEL30-SEL49)	20	EACH	▲	ELECTRICAL SERVICE CABINET	1	EACH	④	1/C #4 AWG COPPER WIRE	2440	FT
⊖	BREAKAWAY BASE LUMINAIRE POLE WITH ARM, 40' MOUNTING HT (L62-L90, L65A)	30	EACH	⊠	CIRCUIT CONTROL CENTER (CCC3 - CCC4)	2	EACH	⑥	1/C #6 AWG COPPER WIRE	26010	FT
◆	DECORATIVE LUMINAIRE POLE (L55-L60)	6	EACH	Ⓜ	METER SOCKET NOT A BID ITEM	3	EACH	⑧	1/C #8 AWG COPPER WIRE	5940	FT
	DECORATIVE LUMINAIRE, 400 WATT (L55-L60)	6	EACH		1.5" RIGID GALVANIZED STEEL CONDUIT	30	FT	⑩	1/C #10 AWG COPPER WIRE	5025	FT
○	ROADWAY LUMINAIRE, LED (L62-L90, L65A)	30	EACH	②	2" RIGID CONDUIT, SCHEDULE 40	4640	FT		2/C #12 AWG COPPER WIRE	720	FT
Ⓜ	1 SECTION VEHICLE SIGNAL HEAD	2	EACH	③	3" RIGID CONDUIT, SCHEDULE 40	955	FT		2/C #10 AWG COPPER POLE AND BRACKET CABLE	1800	FT
	2' DIAMETER FOOTING (L55-L60, L62-L90, L65A)	264	FT	④	2" RIGID CONDUIT, SCHEDULE 80	515	FT				

CONDUIT LAYOUT

SD HWY 50 / 4TH STREET

FOR BIDDING PURPOSES ONLY

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3 - #1/0 Aluminum Service Conductors provided and installed by Utility.
2" SCH 40 PVC conduit provided and installed by Contractor.

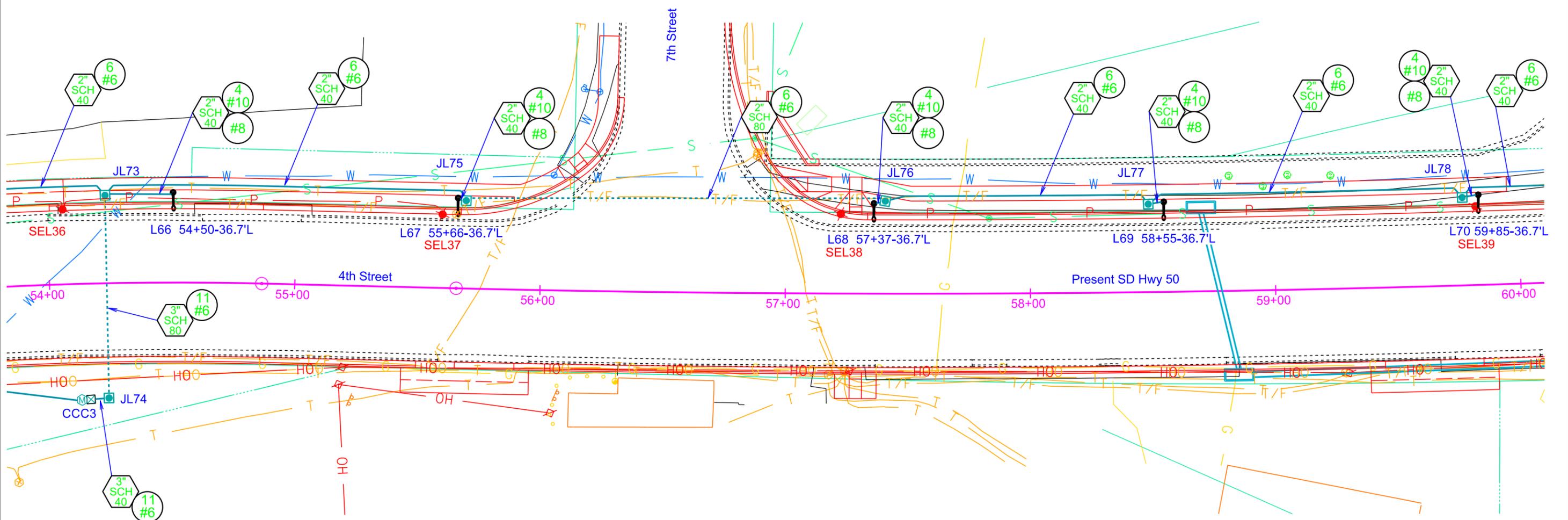
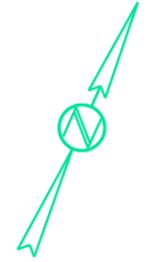


CONDUIT LAYOUT

SD HWY 50 / 4TH STREET

FOR BIDDING PURPOSES ONLY

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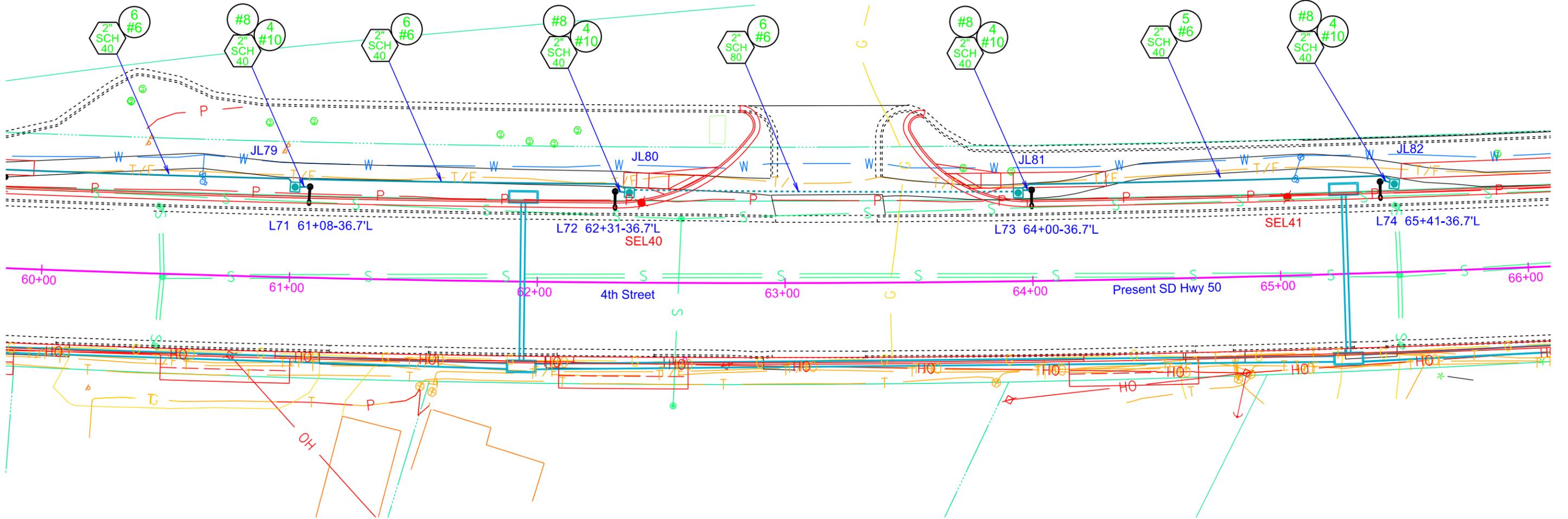
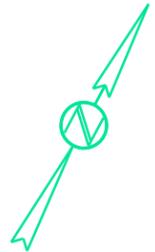


CONDUIT LAYOUT

SD HWY 50 / 4TH STREET

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT NH 0050(122)384	SHEET L10	TOTAL SHEETS L25
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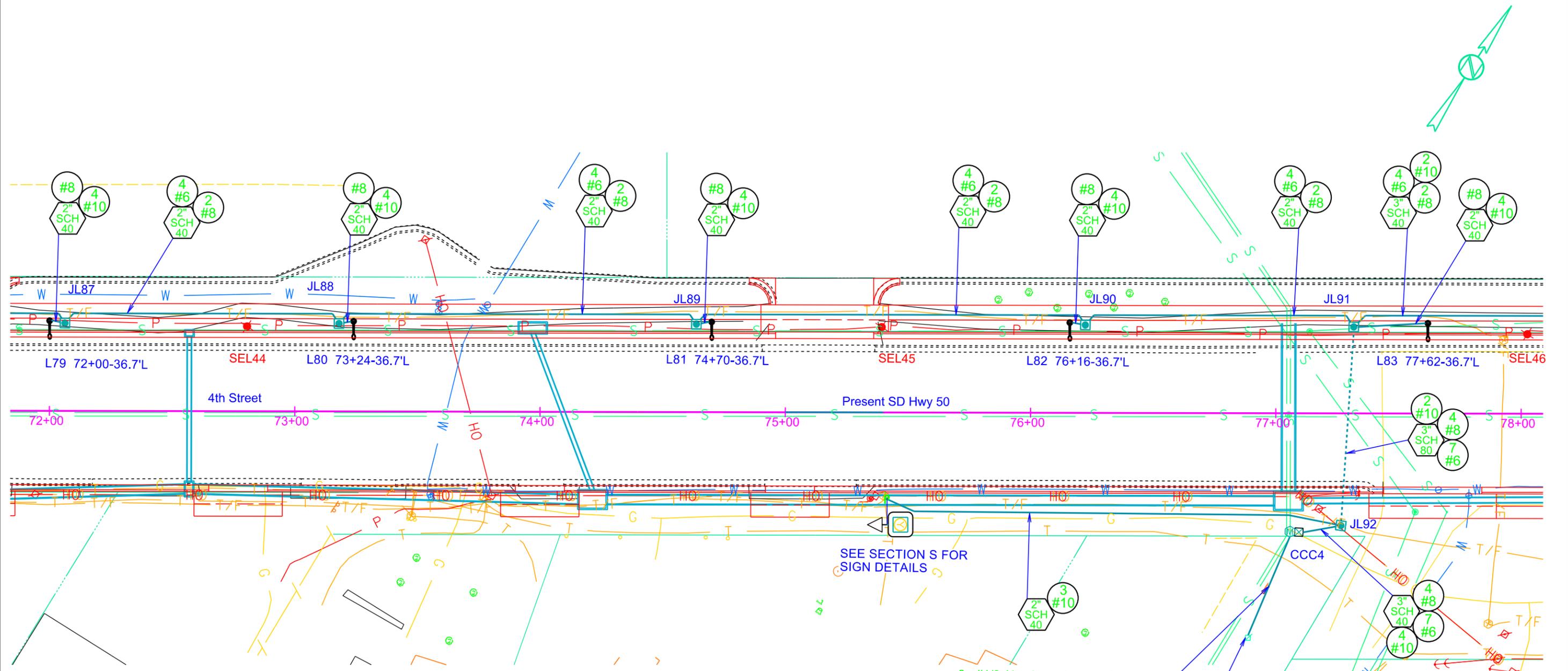


CONDUIT LAYOUT

SD HWY 50 / 4TH STREET

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT NH 0050(122)384	SHEET L12	TOTAL SHEETS L25
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SEE SECTION S FOR SIGN DETAILS

3 - #1/0 Aluminum Service Conductors provided and installed by Utility.
2" SCH 40 PVC conduit provided and installed by Contractor.

Proposed Utility Service Pole

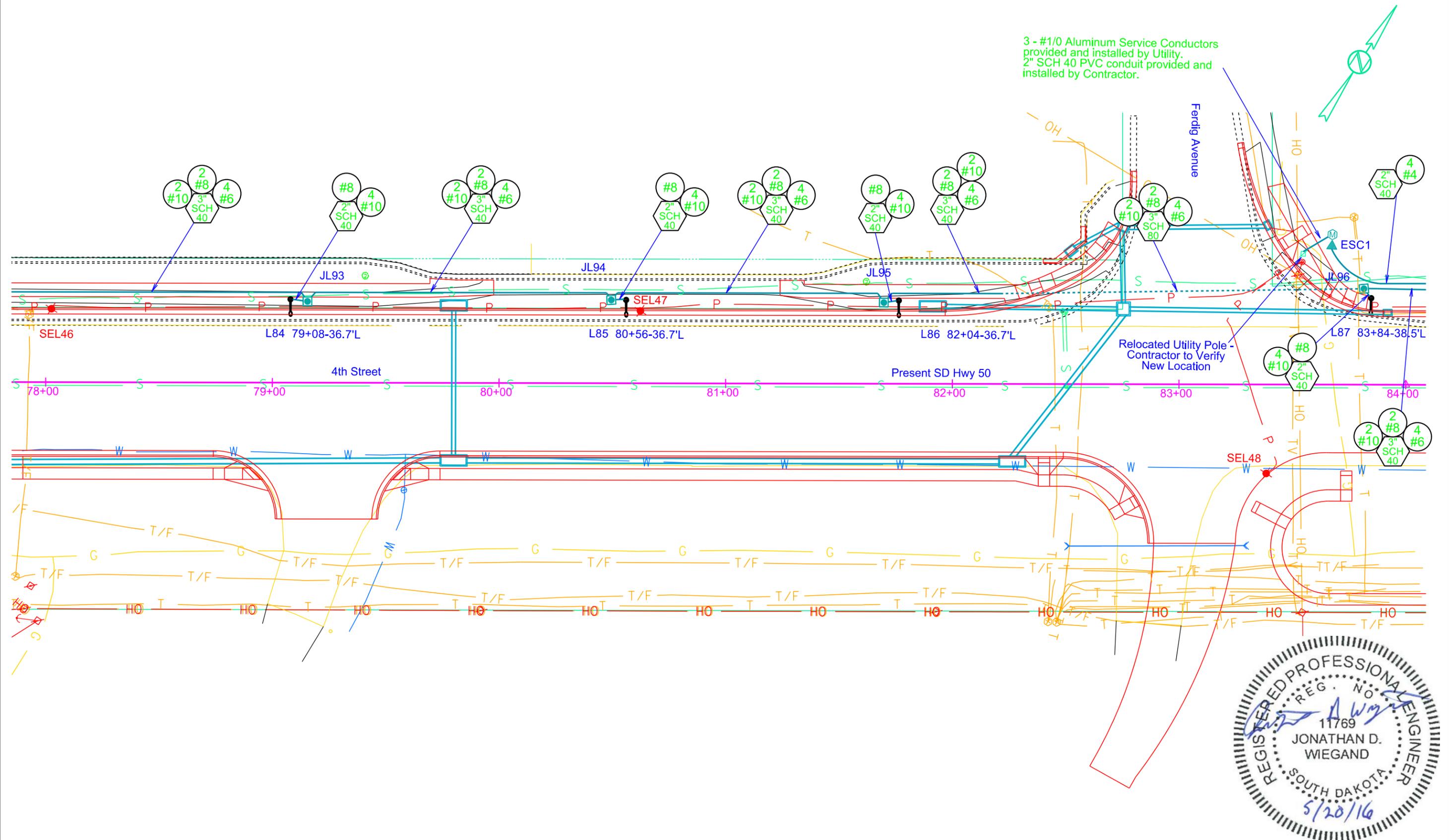


CONDUIT LAYOUT

SD HWY 50 / 4TH STREET

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT NH 0050(122)384	SHEET L13	TOTAL SHEETS L25
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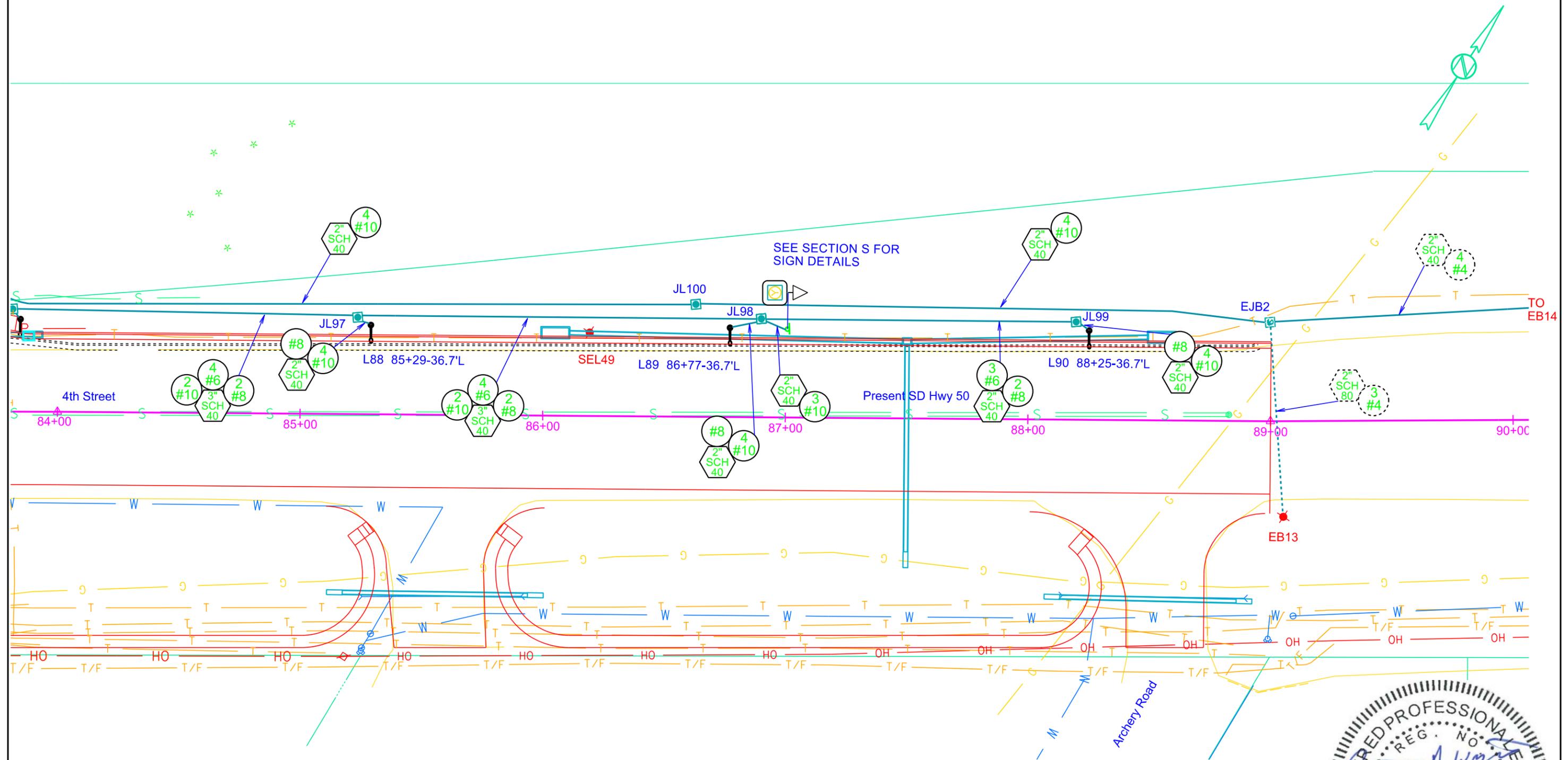


CONDUIT LAYOUT

SD HWY 50 / 4TH STREET

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT NH 0050(122)384	SHEET L14	TOTAL SHEETS L25
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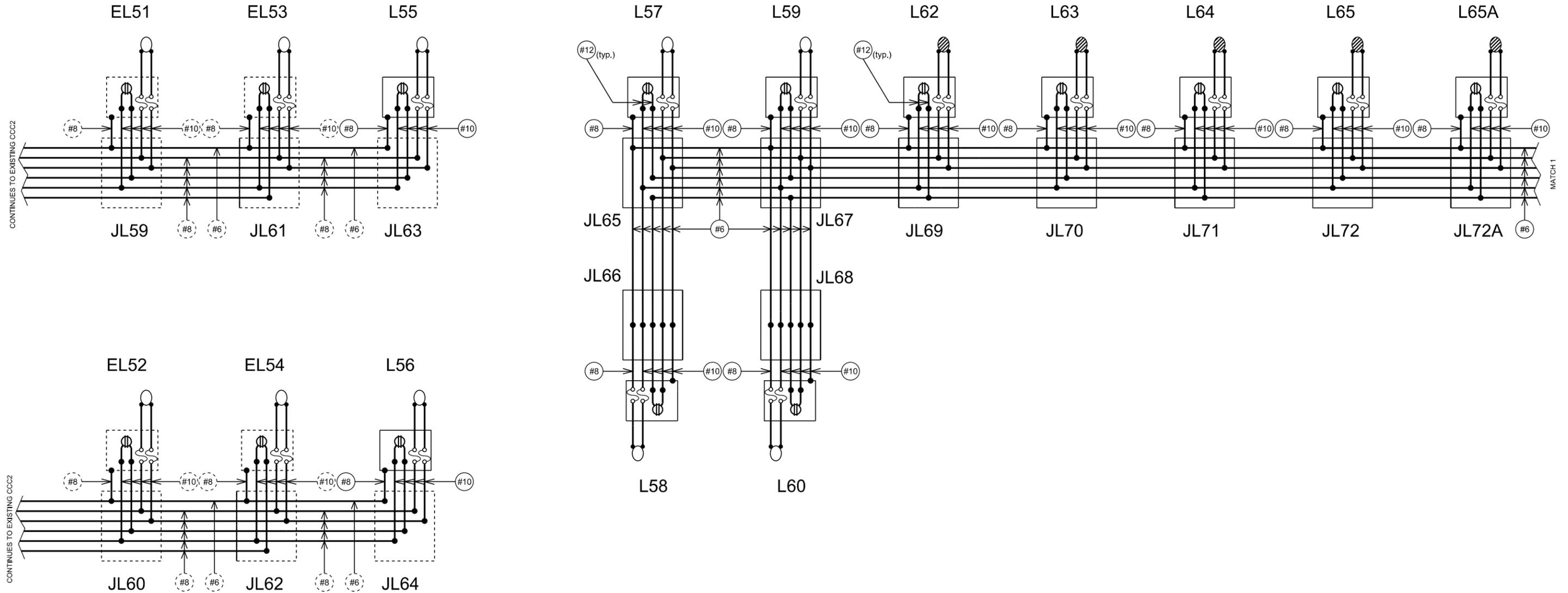
WIRING DIAGRAM

SD HWY 50 / 4TH STREET

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0050(122)384	L15	L25

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LEGEND:

- LUMINAIRE: 400 watt Metal Halide Post-top
- ◐ LUMINAIRE: 284 watt LED Cobrahead
- ⊗ FUSE:
Metal Halide: 5 amp. Non-Time Delay
2 8/10 amp Dual Element
LED: 4 amp Non-Time Delay
2 amp Dual Element
- ⊕ OUTLET

NOTES

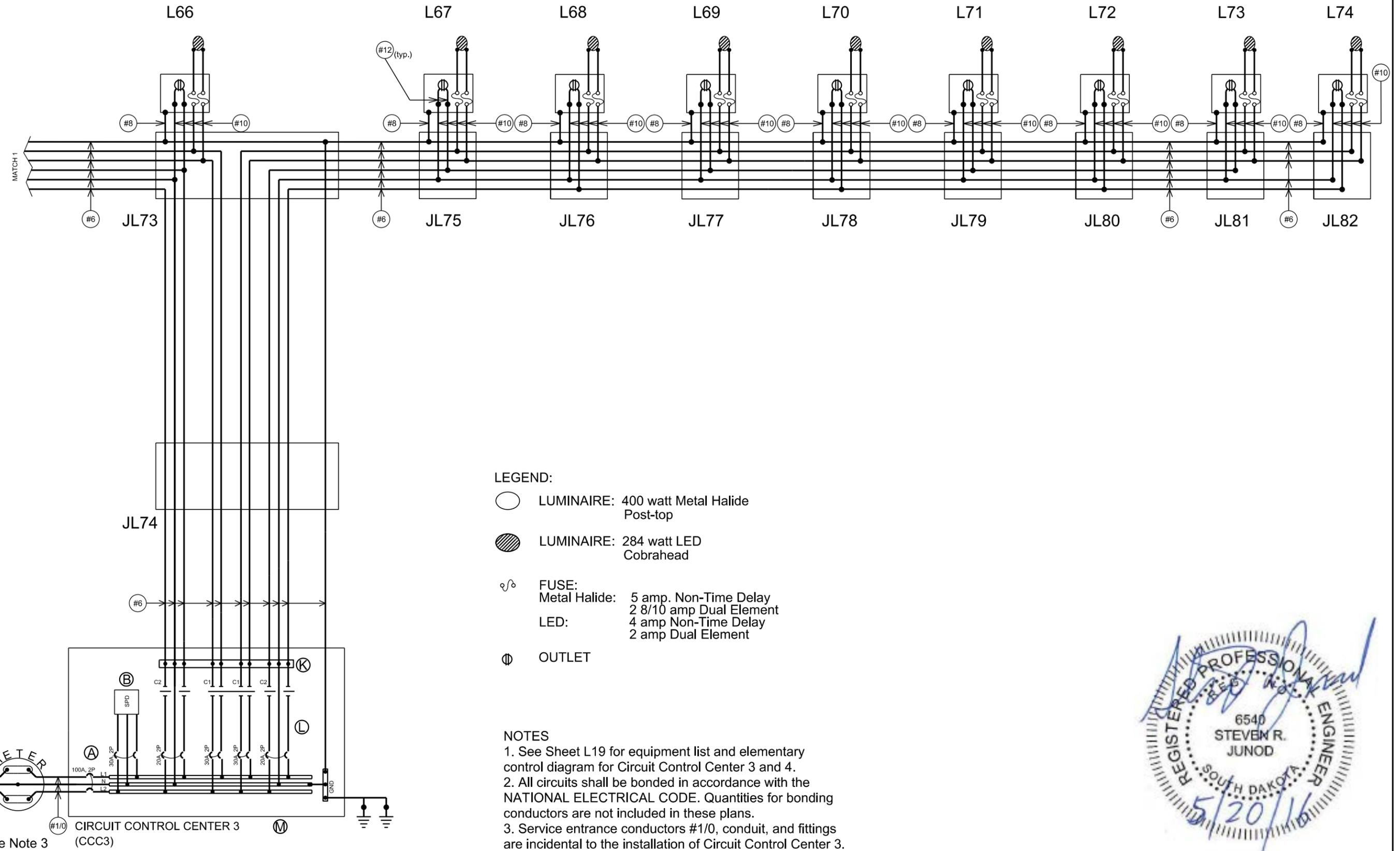
1. All circuits shall be bonded in accordance with the NATIONAL ELECTRICAL CODE. Quantities for bonding conductors are not included in these plans.
2. 10' of lead length has been provided for each conductor in JL63 and JL64 for extension to L55 and L56, respectively.



WIRING DIAGRAM FOR BIDDING PURPOSES ONLY

SD HWY 50 / 4TH STREET

STATE OF SOUTH DAKOTA	PROJECT NH 0050(122)384	SHEET L16	TOTAL SHEETS L25
Plotting Date: 5/20/2016			



LEGEND:

- LUMINAIRE: 400 watt Metal Halide Post-top
- LUMINAIRE: 284 watt LED Cobrahead
- FUSE:
Metal Halide: 5 amp. Non-Time Delay
2 8/10 amp Dual Element
LED:
4 amp Non-Time Delay
2 amp Dual Element
- OUTLET

NOTES

1. See Sheet L19 for equipment list and elementary control diagram for Circuit Control Center 3 and 4.
2. All circuits shall be bonded in accordance with the NATIONAL ELECTRICAL CODE. Quantities for bonding conductors are not included in these plans.
3. Service entrance conductors #1/0, conduit, and fittings are incidental to the installation of Circuit Control Center 3.

120/240 VAC, 60hz,
1 Phase, 3 Wire Service
By NorthWestern

#1/0 ALUM.
By Utility



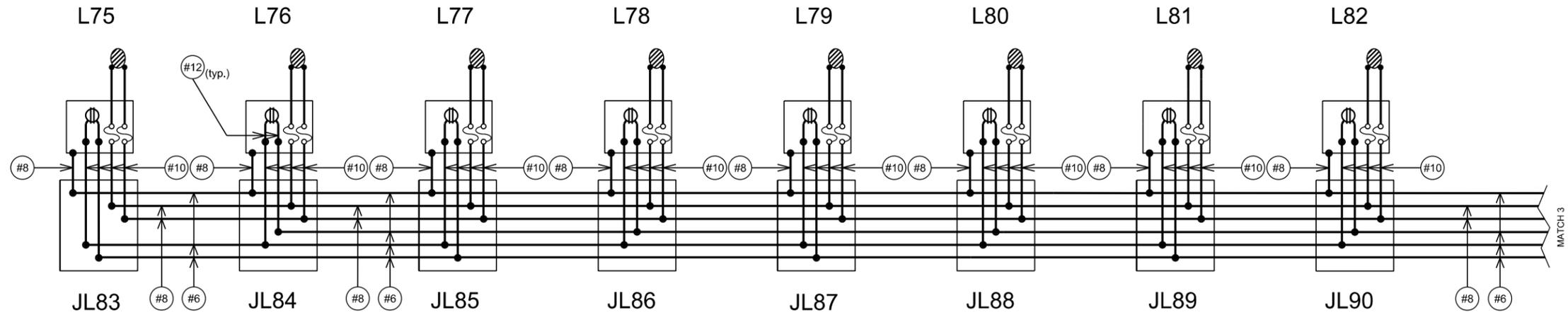
See Note 3

WIRING DIAGRAM

SD HWY 50 / 4TH STREET

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT NH 0050(122)384	SHEET L17	TOTAL SHEETS L25
Plotting Date: 5/20/2016			



LEGEND:

- LUMINAIRE: 400 watt Metal Halide Post-top
- ◐ LUMINAIRE: 284 watt LED Cobrahead
- ⌚ FUSE:
Metal Halide: 5 amp. Non-Time Delay
2 8/10 amp Dual Element
LED: 4 amp Non-Time Delay
2 amp Dual Element
- ⊕ OUTLET

NOTES

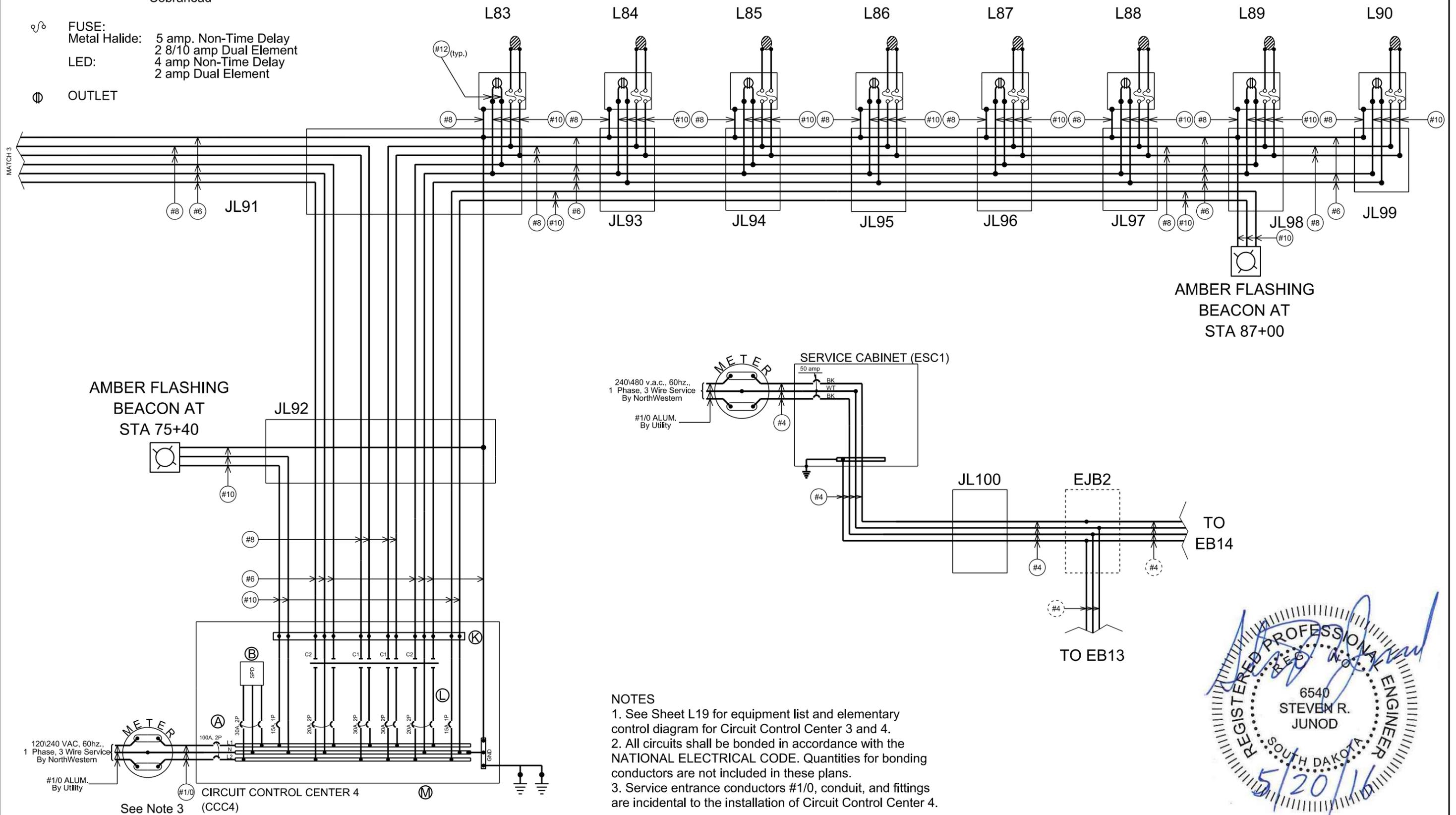
1. All circuits shall be bonded in accordance with the NATIONAL ELECTRICAL CODE. Quantities for bonding conductors are not included in these plans.



WIRING DIAGRAM FOR BIDDING PURPOSES ONLY

SD HWY 50 / 4TH STREET

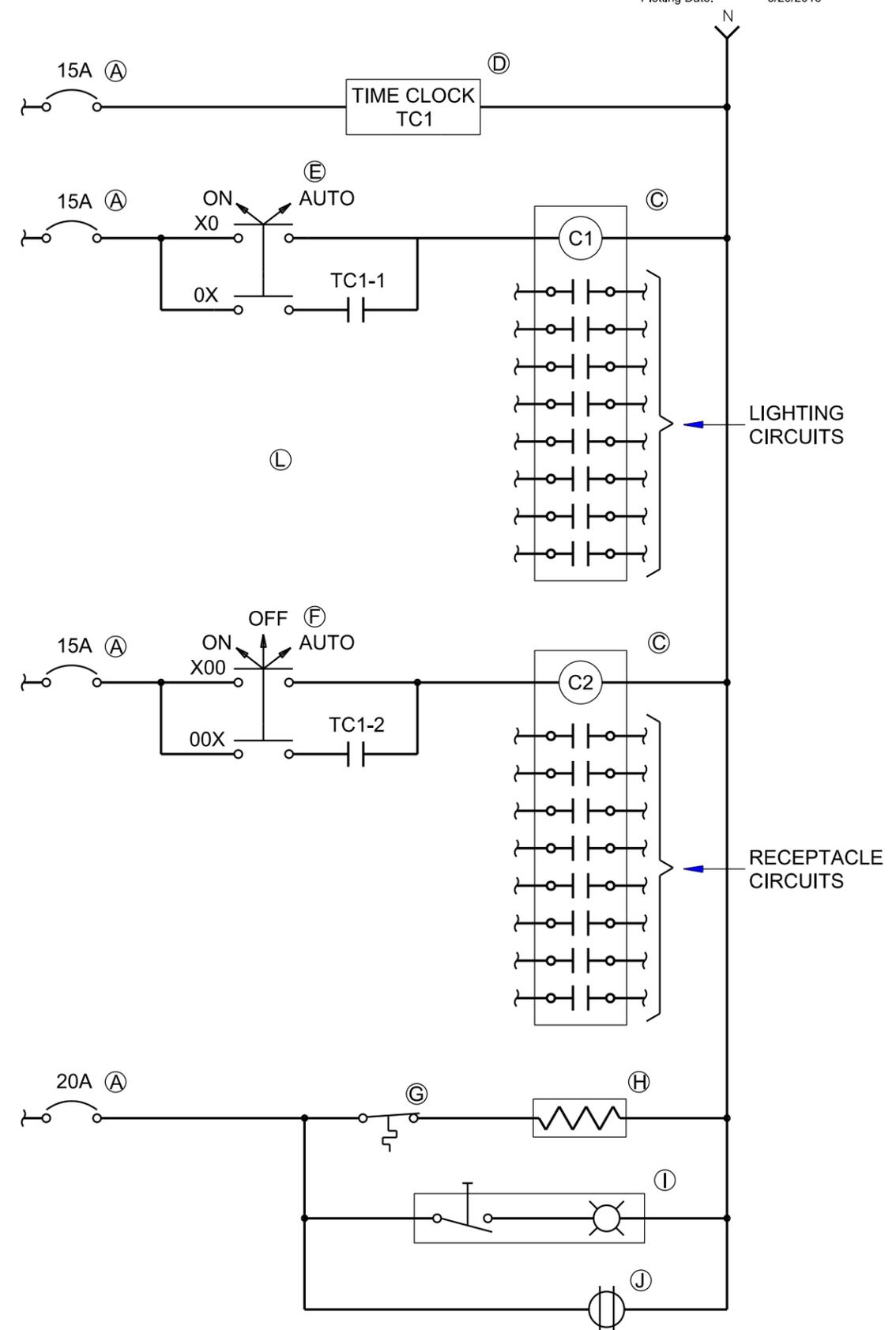
- LEGEND:**
- LUMINAIRE: 400 watt Metal Halide Post-top
 - ◐ LUMINAIRE: 284 watt LED Cobrahead
 - ⊂ FUSE: Metal Halide: 5 amp. Non-Time Delay
2 8/10 amp Dual Element
LED: 4 amp Non-Time Delay
2 amp Dual Element
 - ⊕ OUTLET



- NOTES**
1. See Sheet L19 for equipment list and elementary control diagram for Circuit Control Center 3 and 4.
 2. All circuits shall be bonded in accordance with the NATIONAL ELECTRICAL CODE. Quantities for bonding conductors are not included in these plans.
 3. Service entrance conductors #1/0, conduit, and fittings are incidental to the installation of Circuit Control Center 4.

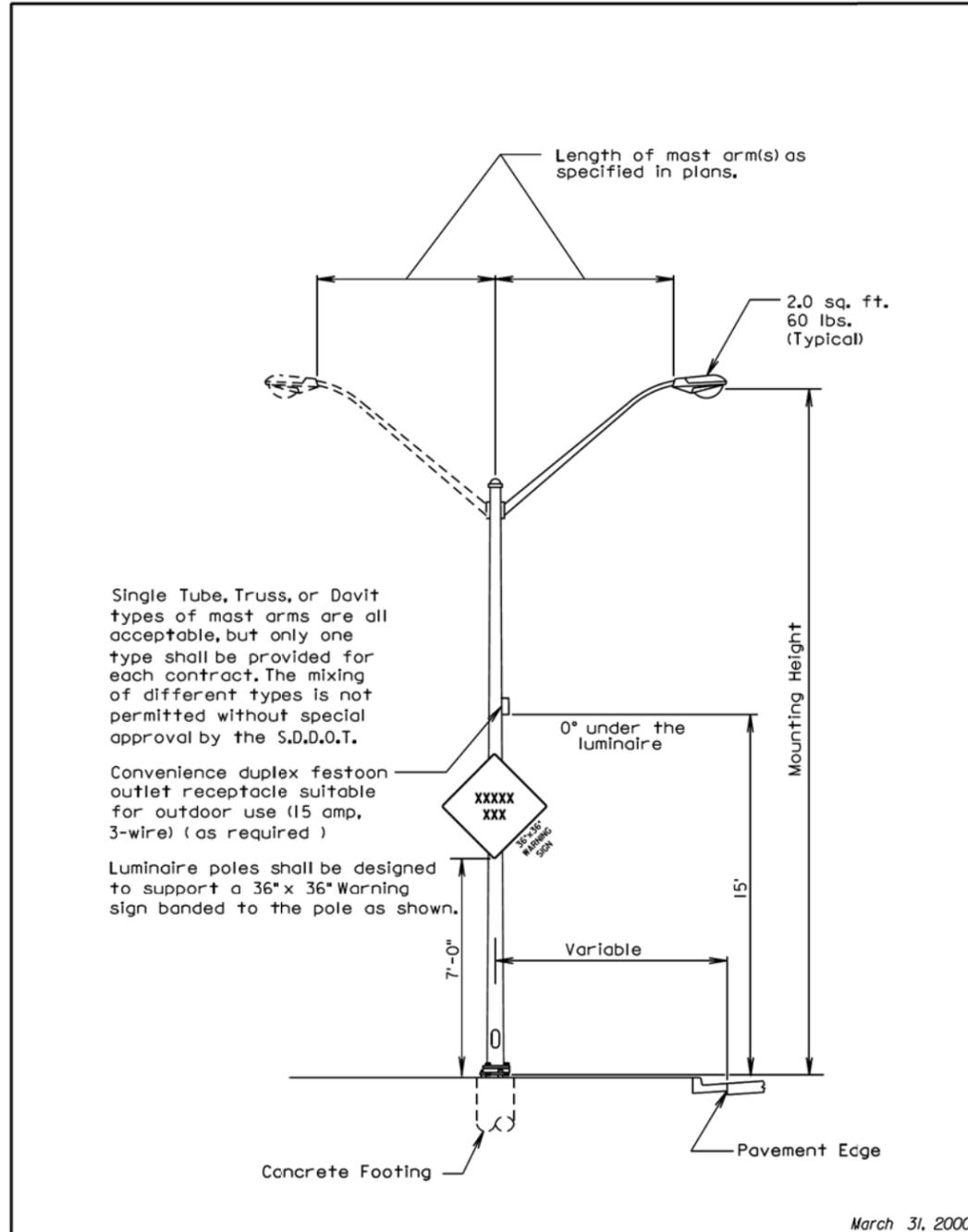


LIGHTING CONTROLLER EQUIPMENT LIST	
ITEM	DESCRIPTION
A	Branch Circuit Panel: Interior only, mounted in controller cabinet on cabinet back panel. Include copper line/neutral/ground buses, with main circuit breaker and bussing sized as indicated. Service-entrance rated. Provide indicated lighting/receptacle/control branch circuit breakers, bolt-on type. Branch panel sized for circuit breakers plus min. four extra spaces. 22k AIC series rating.
B	Surge Protection Device: Modes of protection L-L, L-N, N-G; 160kA per phase, 80kA per mode. Mount in cabinet minimizing lead length.
C	Lighting Contactor: Electrically held, provide each with minimum of 8 poles and capable of expanding to 12 poles (provide LC1 lighting contactor with 9 poles), 30A rated contacts, 120VAC coil.
D	Time Clock: electronic microprocessor based programmable astronomical type with minimum of two output contacts each independently programmable, contacts rated 120VAC, 5A min. 7-day and 5/2-day repeat cycle scheduling, full year control with automatic daylight savings and leap year adjustment, integral keypad and LED display, non-volatile program memory, battery backed time and calendar functions. Locate inside control cabinet. Intermatic Model ET70215C, or equal.
E	Selector Switch: 2-position, 2-pole, NEMA 4/12. Provide legend plate with function and position labels. Mount inside control cabinet.
F	Selector Switch: 3-position, 2-pole, NEMA 4/12. Provide legend plate with function and position labels. Mount inside control cabinet.
G	Thermostat to control operation of heater.
H	Strip Heater: 120VAC, sized to maintain cabinet interior at 10 deg. above ambient for condensation protection.
I	Cabinet Light: 120VAC fluorescent light assembly with integral plunger switch, mounted at top of door opening to turn on light when door is opened.
J	Duplex convenience receptacle with surface-mount box and cover, mounted inside cabinet.
K	Terminal Block(s): Provide terminal block(s) to land incoming circuit conductors.
L	Internal Wiring: insulated, stranded copper conductors for power and control, sized per NEC for connected overcurrent protection device.
M	Enclosure: Base-mount type NEMA 3R stainless steel or aluminum with equipment mounting back panel, enclosure sized to contain branch circuit panel and all other control elements/components. Provide with rotating handle latching mechanism(s) with integral keyed cylinder lock(s). Provide anchor bolts.

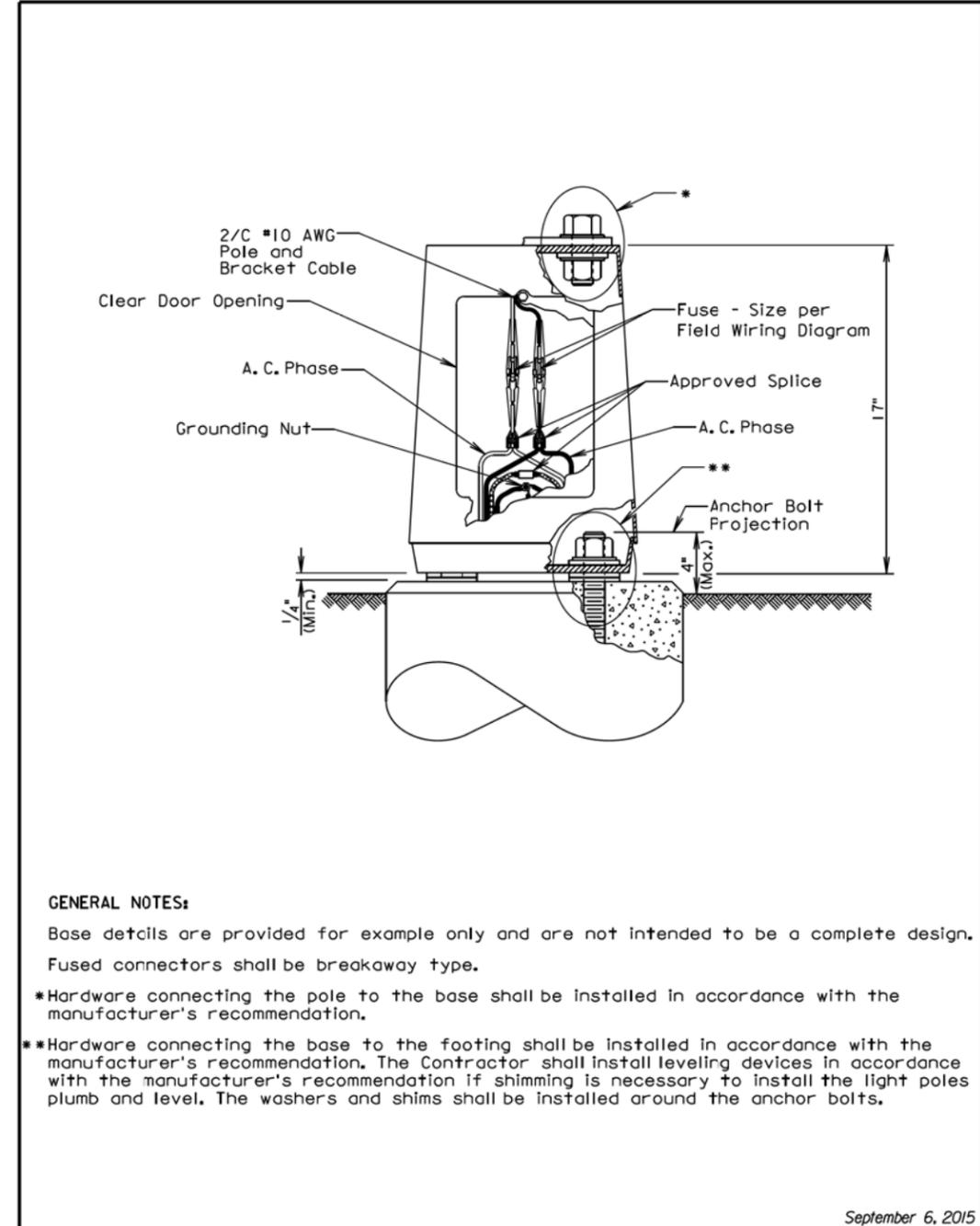


ELEMENTARY CONTROL WIRING DIAGRAM
(TYPICAL FOR ALL CONTROLLERS)

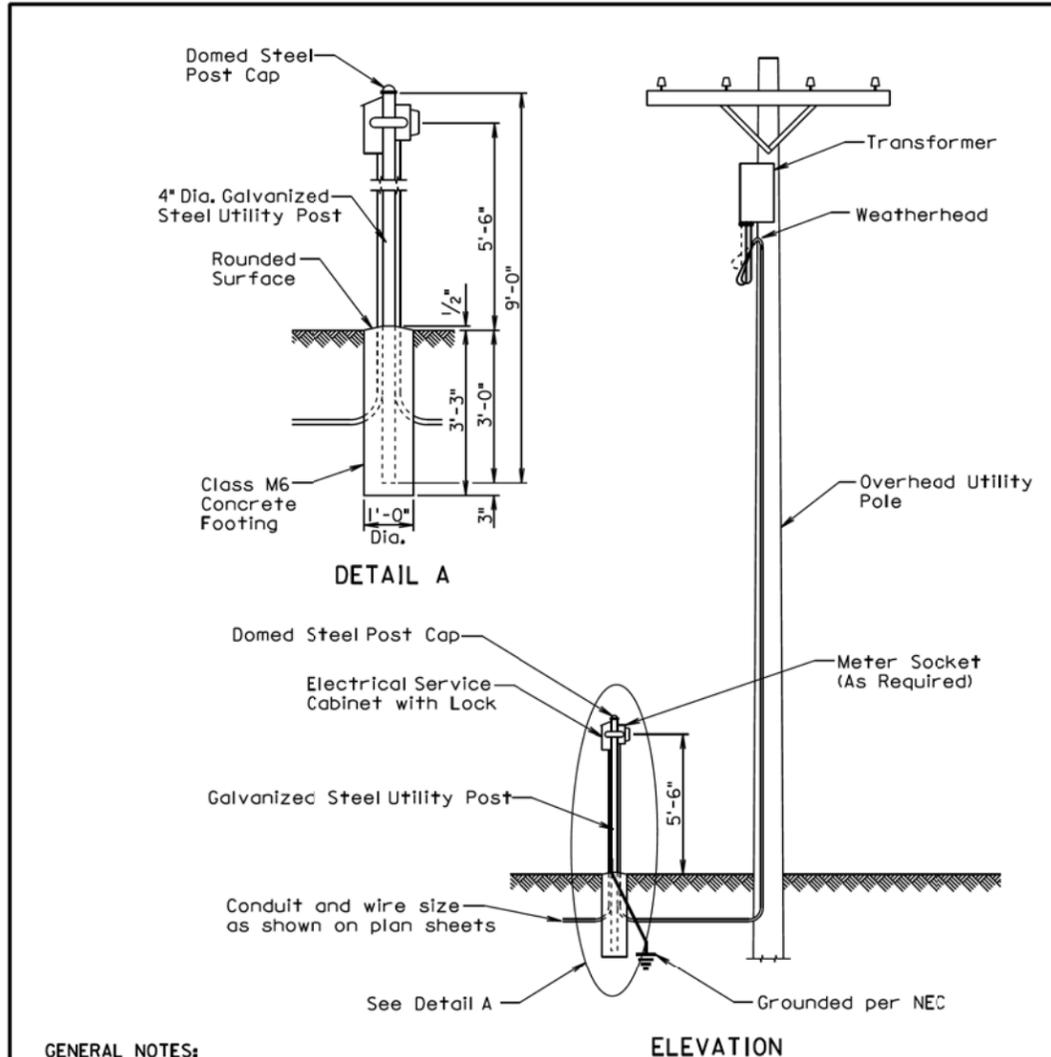




Published Date: 2nd Qtr. 2016	S D D O T	STEEL ROADWAY LUMINAIRE POLE WITH MAST ARM(S)	PLATE NUMBER
			635.01
			Sheet 1 of 1



Published Date: 2nd Qtr. 2016	S D D O T	ROADWAY LUMINAIRE POLE BREAKAWAY TRANSFORMER BASE	PLATE NUMBER
			635.21
			Sheet 1 of 1



GENERAL NOTES:

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

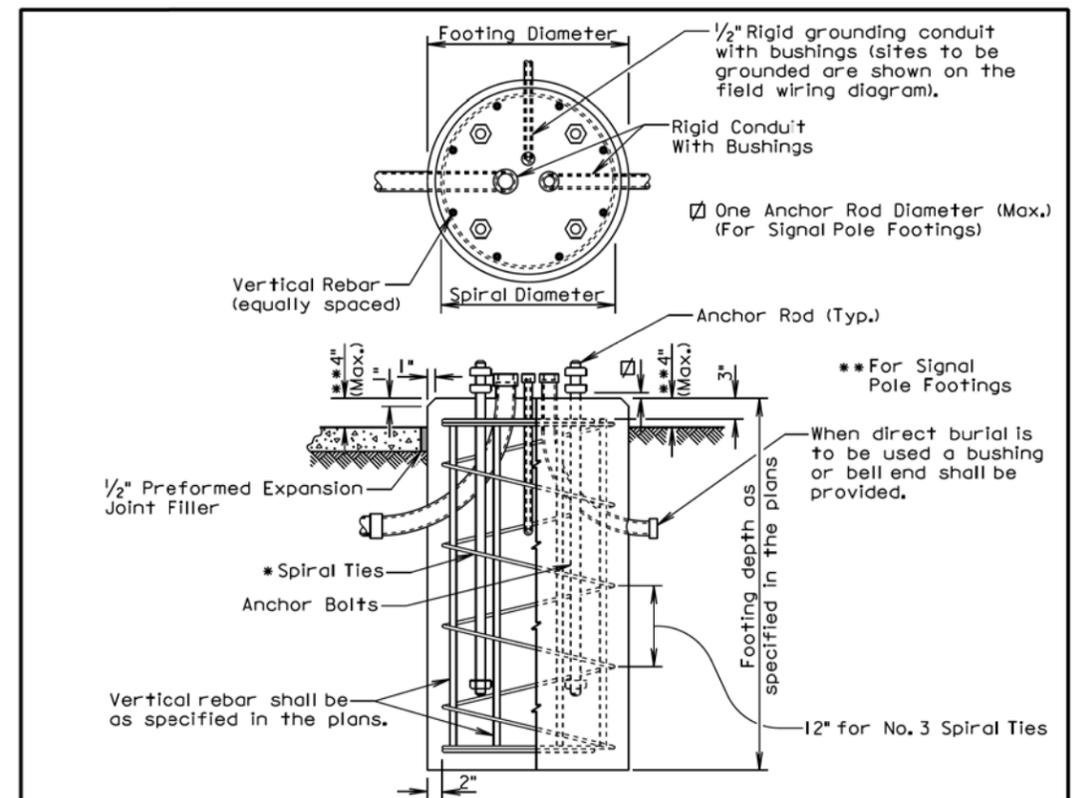
The 4" diameter galvanized steel utility post shall be 9' long and shall be in conformance with AASHTO Standard Specifications M181. The post shall be Type I and either Grade 1 or Grade 2. The domed steel post cap shall be in conformance with AASHTO Standard Specifications M181 and shall be Type I.

The Contractor shall 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, post, concrete footing, post cap, meter socket if required, conduit, and incidentals shall be incidental to the contract unit price per each for "Electrical Service Cabinet".

June 26, 2006

Published Date: 2nd Qtr. 2016	S D D O T	GALVANIZED STEEL UTILITY POST WITH OVERHEAD UTILITY POLE	PLATE NUMBER
			635.35
			Sheet 1 of 1



GENERAL NOTES:

* Circular ties may be used in lieu of the spiral ties. The No. 3 ties shall be spaced 12 inches apart except for the top two which shall be spaced 6 inches apart. The ties shall be lapped 18 inches and the laps shall be staggered around the cage.

Spiral ties shall 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 shall not project above the slip plane or fracture plane for breakaway poles.

Conduits shall be sealed water-tight during all phases of construction until poles are in place.

The anchor rods shall 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.

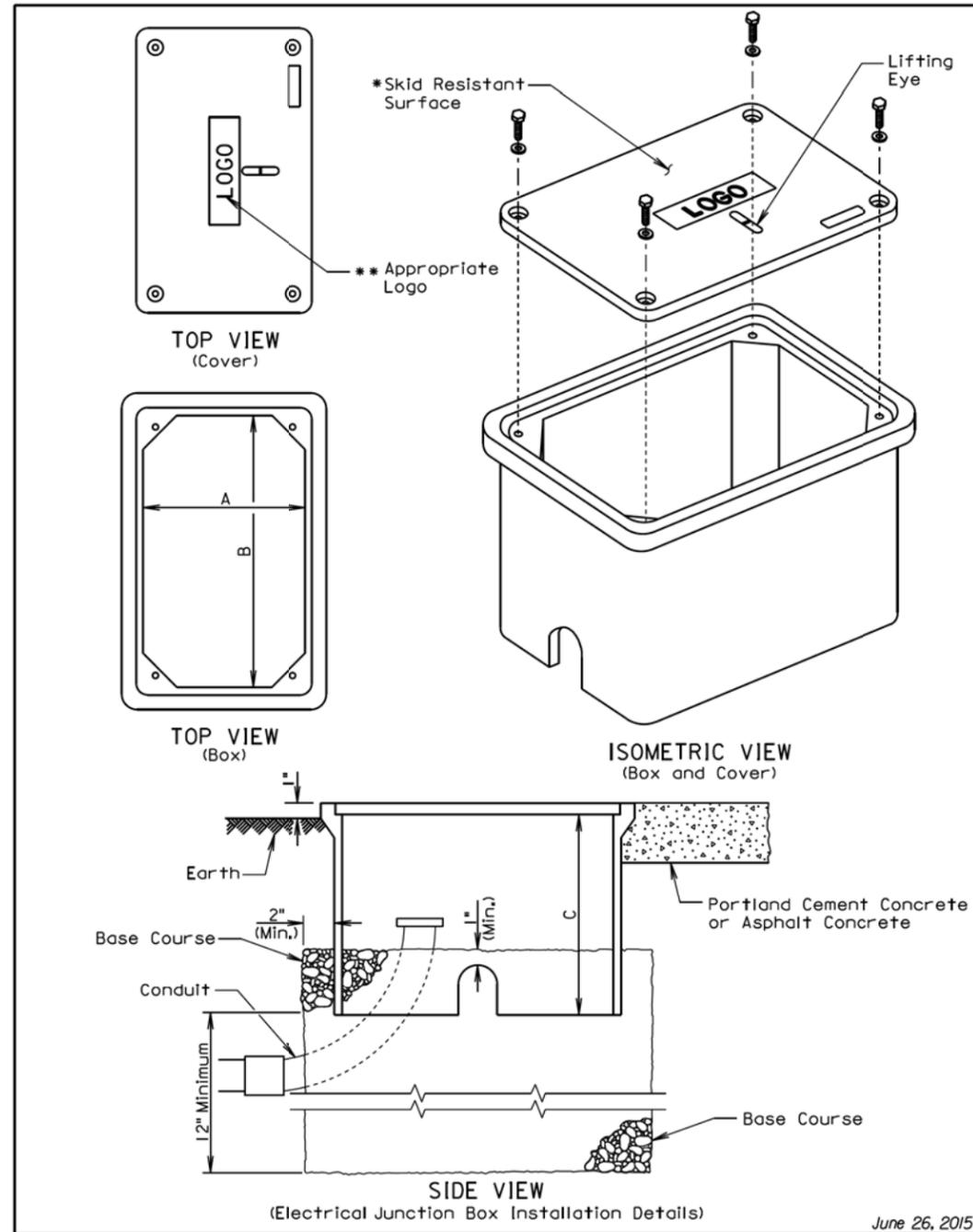
Costs of conduit and conduit bushings shown on footing detail shall be incidental to the footing bid item(s).

The pole shall not be installed until the concrete has attained design strength (4000 psi).

The contour of the area surrounding the breakaway pole shall 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.

June 26, 2015

Published Date: 2nd Qtr. 2016	S D D O T	POLE FOOTING	PLATE NUMBER
			635.55
			Sheet 1 of 1



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.

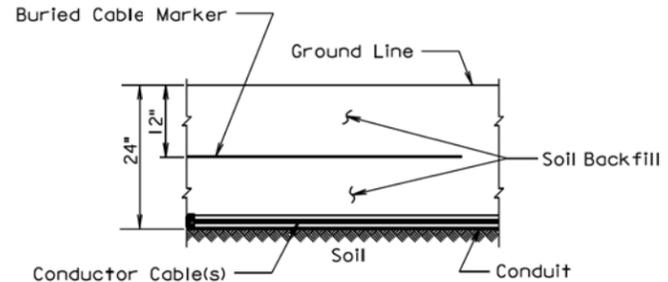
The cover shall have a lifting eye.

*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.

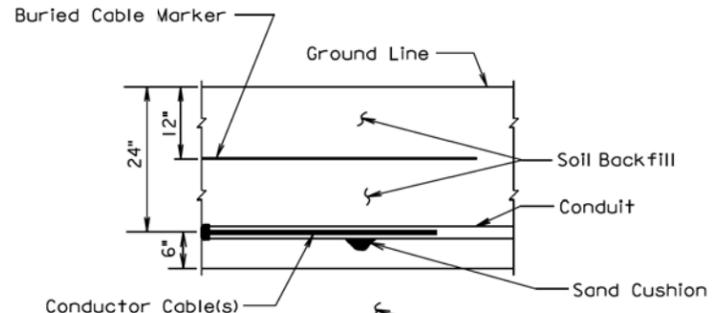
**The cover of the junction box shall have the appropriate logo in one inch size letters and shall be recessed. When the junction box contains cables or wires for a traffic signal then the logo shall be "Signal". When the junction box contains lighting conductors then the logo shall be "Lighting".

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



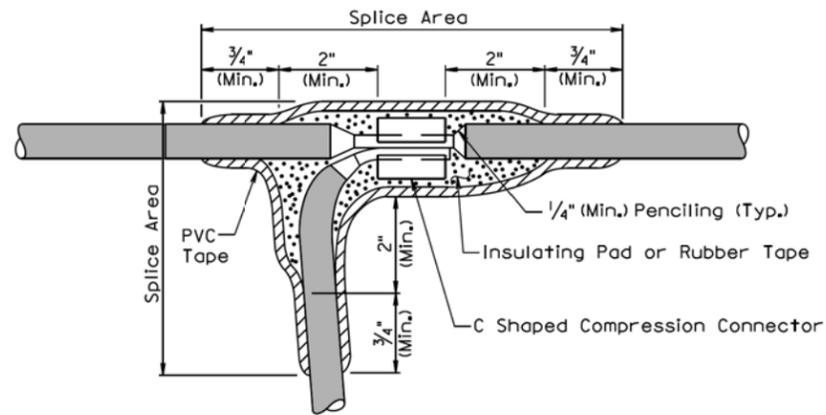
SECTION VIEW

GENERAL NOTE:

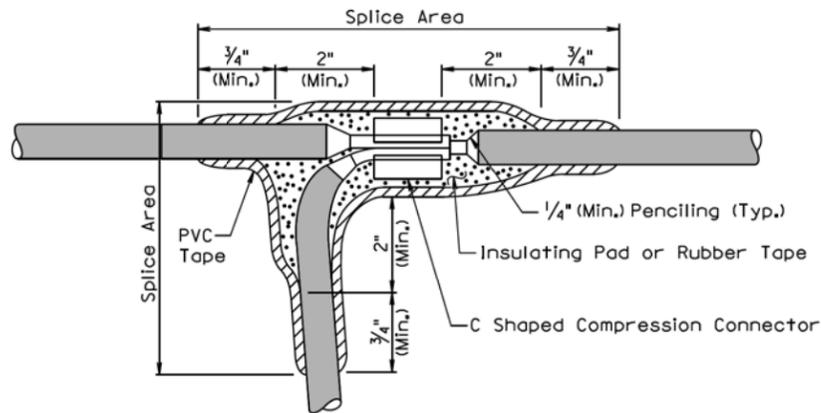
The Buried Cable Marker shall be plastic, approximately 6" wide, and shall be capable of sustaining a minimum of a 350% tolerance of elongation without tearing. The Buried Cable Marker shall have a life expectancy approximately equal to that of the conductor(s) beneath it. A phrase indicating the presence 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

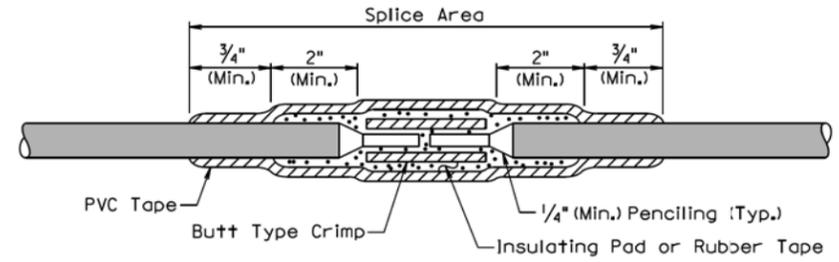
Published Date: 2nd Qtr. 2016	S D D O T	CONDUIT INSTALLATION	PLATE NUMBER
			635.76
			Sheet 1 of 1



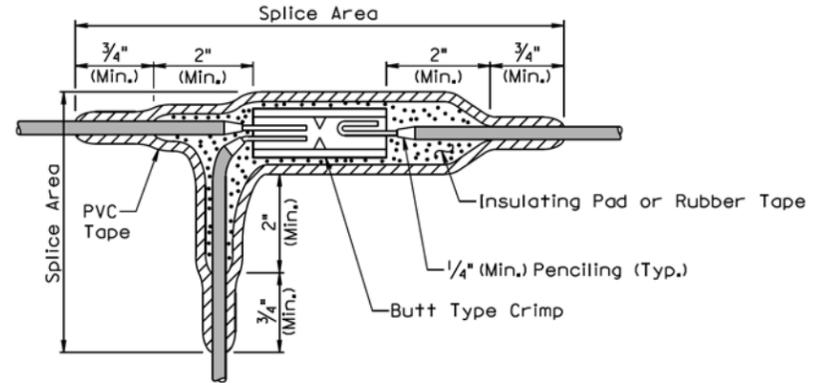
TYPE C SPLICE
(Between 1 free end and 1 through conductor)



TYPE T SPLICE
(For 3 free ends)



TYPE S SPLICE
(Between 2 free ends)



TYPE ST SPLICE
(For 3 free ends)

GENERAL NOTES:

The splice shall be environmentally sealed for protection from weather, moisture, and abrasion in accordance with the method stated below.

The rubber tapes shall be rolled after application.

Method for insulating splice area:

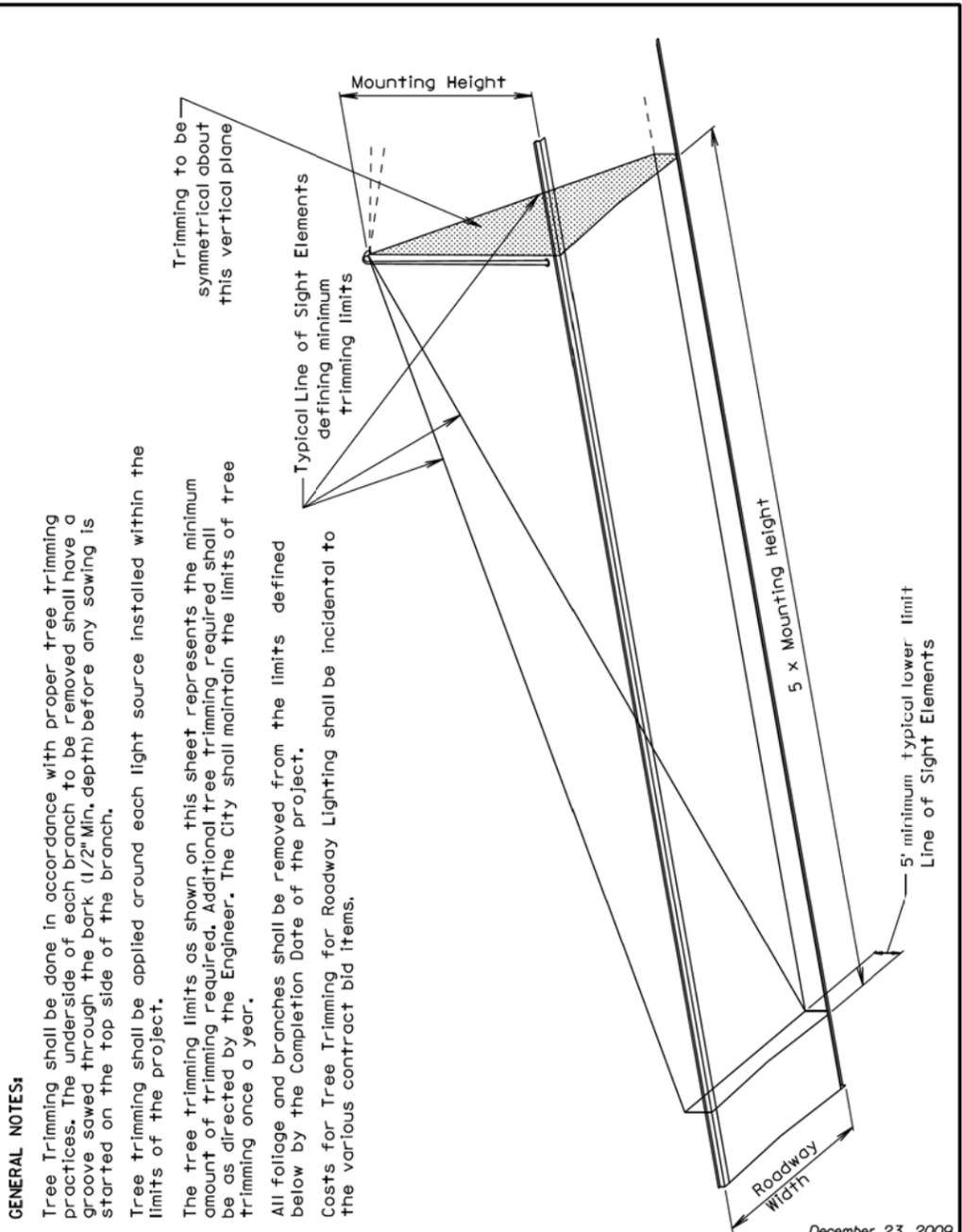
1. The splice area shall be completely covered with electrical insulating coating and dried.
2. Apply two layers of 1/8" minimum thickness electrical insulating pad or two layers of half lapped synthetic oil resistant self fusing rubber tape.
3. Three layers of half lapped polyvinyl chloride tape shall be applied.
4. The entire splice area shall be covered with electrical insulating coating and dried.

February 14, 2010

February 14, 2010

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0050(122)384	L25	L25

Plotting Date: mmm-ddd-yyy



GENERAL NOTES:

Tree Trimming shall be done in accordance with proper tree trimming practices. The underside of each branch to be removed shall have a groove sawed through the bark (1/2" Min. depth) before any sawing is started on the top side of the branch.

Tree trimming shall be applied around each light source installed within the limits of the project.

The tree trimming limits as shown on this sheet represents the minimum amount of trimming required. Additional tree trimming required shall be as directed by the Engineer. The City shall maintain the limits of tree trimming once a year.

All foliage and branches shall be removed from the limits defined below by the Completion Date of the project.

Costs for Tree Trimming for Roadway Lighting shall be incidental to the various contract bid items.

December 23, 2009

Published Date: 2nd Qtr. 2016	S D D T	TREE TRIMMING FOR ROADWAY LIGHTING	PLATE NUMBER
			635.99
			Sheet 1 of 1