SECTION L: SIGNAL AND LIGHTING PLANS

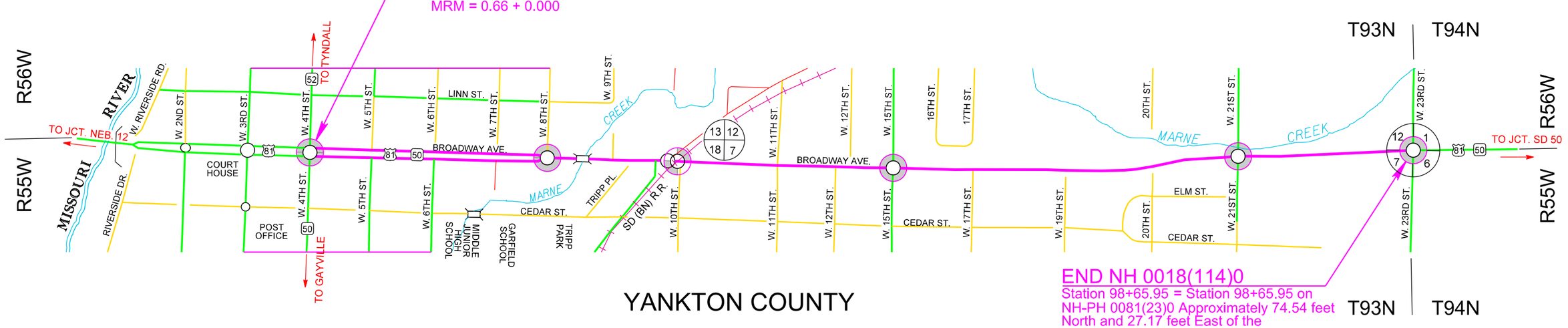
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L1	L43

Plotting Date: 02/22/2024

INDEX OF SHEETS

BEGIN NH 0018(114)0
Station 10+80.13 = Station 10+80.13 on NH-PH 0081(23)0 Approximately 1878.55 feet North and 21.08 feet West of the Southeast corner of Section 13 - Township 93 North - Range 56 West of the 5th P.M.
MRM = 0.66 + 0.000

YANKTON



YANKTON COUNTY

END NH 0018(114)0
Station 98+65.95 = Station 98+65.95 on NH-PH 0081(23)0 Approximately 74.54 feet North and 27.17 feet East of the Northwest corner of Section 12 - Township 93 North - Range 56 West of the 5th P.M.
MRM = 0.81 + 0.000

Plot Scale - 1:200
Plotted From - TRPR17199
File - U:\rdp\riyank07\DH\TitleL.dgn

SECTION L ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1510	Remove Luminaire Pole	1	Each
110E1520	Remove Signal Equipment	Lump Sum	LS
110E1530	Remove Signal Pole Footing	19	Each
110E1540	Remove Luminaire Pole Footing	1	Each
110E5110	Salvage Signal Equipment	Lump Sum	LS
420E0400	Structure Excavation, Miscellaneous	25	CuYd
460E0382	Install Dowel in Rock	10.0	Ft
462E0100	Class M6 Concrete	7.9	CuYd
480E0200	Epoxy Coated Reinforcing Steel	846	Lb
635E0040	Breakaway Base Luminaire Pole with Arm, 40' Mounting Height	1	Each
635E2025	Signal Pole with 25' Mast Arm	2	Each
635E2120	Signal Pole with 20' Mast Arm and Luminaire Arm	1	Each
635E2135	Signal Pole with 35' Mast Arm and Luminaire Arm	1	Each
635E2145	Signal Pole with 45' Mast Arm and Luminaire Arm	2	Each
635E2150	Signal Pole with 50' Mast Arm and Luminaire Arm	5	Each
635E2155	Signal Pole with 55' Mast Arm and Luminaire Arm	4	Each
635E2160	Signal Pole with 60' Mast Arm and Luminaire Arm	2	Each
635E2165	Signal Pole with 65' Mast Arm and Luminaire Arm	2	Each
635E3700	Roadway Luminaire, LED with Photoelectric Cell	89	Each
635E3815	Decorative Luminaire, LED with Photoelectric Cell	61	Each
635E4030	3 Section Vehicle Signal Head	49	Each
635E4050	5 Section Vehicle Signal Head	10	Each
635E4090	4 Section Directional Vehicle Signal Head	32	Each
635E5020	2' Diameter Footing	6.0	Ft
635E5030	3' Diameter Footing	240.0	Ft
635E5301	Type 1 Electrical Junction Box	15	Each
635E5303	Type 3 Electrical Junction Box	14	Each
635E5400	Electrical Service Cabinet	5	Each
635E5430	Traffic Signal Controller	5	Each
635E5515	Battery Backup System for Traffic Signal	5	Each
635E5520	Video Detection System	6	Each
635E5560	Emergency Vehicle Preemption Unit	5	Each
635E5570	Optical Detector	19	Each
635E5880	Accessible Pedestrian Signal	38	Each
635E5910	Pedestrian Push Button Pole	38	Each
635E5922	Pedestrian Signal Head with Countdown Timer	38	Each
635E5930	Pedestrian Crossing Sign	38	Each
635E6200	Miscellaneous, Electrical	Lump Sum	LS
635E8110	1" Rigid Conduit, Schedule 40	890	Ft
635E8120	2" Rigid Conduit, Schedule 40	765	Ft
635E8130	3" Rigid Conduit, Schedule 40	85	Ft
635E8140	4" Rigid Conduit, Schedule 40	120	Ft
635E8220	2" Rigid Conduit, Schedule 80	920	Ft
635E8230	3" Rigid Conduit, Schedule 80	1,315	Ft
635E9016	1/C #6 AWG Copper Wire	455	Ft
635E9018	1/C #8 AWG Copper Wire	7,005	Ft
635E9502	2/C #14 AWG Copper Tray Cable, K2	7,200	Ft
635E9503	3/C #14 AWG Copper Tray Cable, K2	920	Ft
635E9504	4/C #14 AWG Copper Tray Cable, K2	2,625	Ft
635E9505	5/C #14 AWG Copper Tray Cable, K2	1,400	Ft
635E9506	6/C #14 AWG Copper Tray Cable, K2	2,020	Ft
635E9507	7/C #14 AWG Copper Tray Cable, K2	1,435	Ft
635E9515	15/C #14 AWG Copper Tray Cable, K2	140	Ft
635E9519	19/C #14 AWG Copper Tray Cable, K2	710	Ft
635E9525	25/C #14 AWG Copper Tray Cable, K2	2,900	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	6,525	Ft

SUPPLYING AS BUILT PLANS

If the traffic signal systems are 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:

Ryley.Rapp@ state.sd.us
John.Less@state.sd.us
Stacy.Bartlett@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, City of Yankton personnel, and the Traffic Design Engineer present.

REMOVE SIGNAL POLE FOOTING

The footings of existing signal poles EA1 to EA4, EB1, EB3, EB4, EC1 to EC4, ED1 to ED4, and EE1 to EE4 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 signal poles will be incidental to the contract unit price per each for "Remove Signal Pole Footing".

REMOVE LUMINAIRE POLE FOOTING

The footing of existing luminaire pole EB2 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 footing of the existing luminaire pole will be incidental to the contract unit price per each for "Remove Luminaire Pole Footing".

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 the determining the diameter, length, and number of anchor bolts.

Signal poles will have rotatable mast arms.

Luminaire extension(s) will have a 50-foot mounting height with 6-foot arm.

SIGNAL POLE C2

A minimum of 4 weeks prior to installation of signal pole C2 the Contractor will contact MidAmerican Energy Company and coordinate the relocation of the gas line that is currently at the proposed location of C2. Contact information is:

Nicolle Rasmusson
MidAmerican Energy Company
1200 South Blauvelt Ave.
Sioux Falls, SD 57105
605-373-6081
Nicolle.Rasmusson@midamerican.com

SIGNAL POLE A2

The Contractor will coordinate the removal and reset of the Burger King Restaurant sign located on the NW corner of SD Hwy 50 and 4th Street with the installation of the spread footing for signal pole A2. Burger King Restaurant will be responsible for the removal and reset of the sign. The Contractor will notify Burger King Restaurant a minimum of 30 days prior to the installation of the spread footing for signal pole A2. The Burger King Restaurant contact is:

Dieter Maiwald
605-360-1709

Any damaged to the Burger King Restaurant sign footing during installation of the spread footing for signal pole A2 will be repaired or replaced by the Contractor at no cost to the State.

The Contractor will notify Burger King Restaurant when the installation of the spread footing for signal pole A2 is complete and the sign can be reset.

SALVAGE SIGNAL EQUIPMENT

The existing signal equipment identified on the plans will be salvaged and delivered to the city of Yankton by the Contractor. The Contractor will notify the city 5 days before the delivery of the salvaged signal equipment for a time and location of delivery. The city contact is:

Corey Potts
City of Yankton Street Department
605-668-5250

Any equipment 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 signal equipment will be incidental to the contract lump sum price for “Salvage Signal Equipment”.

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.

DECORATIVE LUMINAIRES

Decorative luminaire heads on the existing 15’ luminaire poles from the Missouri River Bridge to 10th Street (47 total) will be removed and replaced with a LED post top fixture. The 47 existing metal halide fixtures will be removed and disposed of by the contractor. Any damage done to the poles will be repaired, or the poles will be replaced, at the Contractor’s expense. All cost associated with removal, disposal and replacement of the fixtures will be incidental to the unit price for each “Decorative Luminaire, LED with Photoelectric Cell.”

Existing 2/C #10 AWG Copper Pole and Bracket Cable will be removed and replaced with new cable. Contractor will be responsible of disposing of the existing Pole and Bracket Cable. All cost associated with removal, disposal and replacement of Pole and Bracket Cable will be incidental to the cost for “2/C #10 AWG Copper Pole and Bracket Cable”.

The lighting design used the following parameters and provides 1.1 and greater average maintained foot-candles and uniformity ratios of 3:1 (average maintained to minimum maintained foot-candles).:

Pole Setback:	2 Ft.
Lamp Loss Factor (LLF):	0.8
Width of Lighted Area:	84 Ft.
Luminaire Cycle Length:	96 Ft.
Configuration:	Staggered
Mounting Height:	15 Ft.
Arm Length	NA
Light Source:	LED

The following LED luminaire meets the requirements for this design:

Holophane: AWDE3-P79-40K-MVOLT-SPL-AL3-BK-CL

DECORATIVE FLOODLIGHT, LED

The existing vertical flood lights mounted on the river-side of the decorative bridge columns of the Discovery Bridge (14 total) will be removed, disposed of, and replaced. The following LED luminaire (or an approved equivalent) meets the requirements for this design:

Beacon Alpha: AL-U / 60L-136 / 4K7 / 3x5 / sf3 / BLS

All costs associated with the removal & disposal of the existing vertical flood lights, and the installation of the new light will be incidental to the contract unit for each "Decorative Luminaire, LED with Photoelectric Cell".

STANDARD LUMINAIRES

The Contractor will remove the existing luminaires on the 40-ft poles between 10th and 23rd Street (57 total), and on the bridge pier towers of the Discovery Bridge (14 total). The existing HPS luminaires will be removed and disposed of by the contractor. New LED luminaires will be reinstalled onto the existing poles/bridge pier towers. All cost associated with the removal and disposal of the luminaires will be incidental to the unit price for each “Roadway Luminaire, LED with Photoelectric Cell”.

Existing 2/C #10 AWG Copper Pole and Bracket Cable will be removed and replaced with new cable. Contractor will be responsible of disposing of the existing Pole and Bracket Cable. All cost associated with removal, disposal and replacement of Pole and Bracket Cable will be incidental to the cost for “2/C #10 AWG Copper Pole and Bracket Cable”.

The lighting design used the following parameters and provides 1.1 and greater average maintained foot-candles and uniformity ratios of 3:1 (average maintained to minimum maintained foot-candles).

Pole Setback:	0 Ft.
Lamp Loss Factor (LLF):	0.8
Width of Lighted Area:	80 Ft.
Luminaire Cycle Length:	97 Ft.
Configuration:	Staggered
Mounting Height:	40 Ft.
Arm Length	8 Ft.
Light Source:	LED

The following LED luminaires meet the requirements for this design for all standard poles and luminaire extensions:

a.) GE Evolve: ERL2-0-19-C5-40-A

b.) AEL Autobahn ATB0-P452-MVOLT-R3-P7

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”, “3 Section Directional Vehicle Signal Head”, “4 Section Directional Vehicle Signal Head”. and “5 Section Vehicle Signal Head”,

TABLE OF FOOTING DATA

Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
B2	2’ - 0”	6’ - 0”	1’ - 8”	44’ - 3”	8-#7 x 5’ - 6”
B4	3’ - 0”	10’ - 0”	2’ - 8”	104’ - 3”	14-#8 x 9’ -6”
B3, C2, C4, D4, & E2	3’ - 0”	12’ - 0”	2’ - 8”	120’ - 9”	14-#8 x 11’ -6”
C3 & D2	3’ - 0”	13’ - 0”	2’ - 8”	129’ - 3”	14-#8 x 12’ -6”
A1, A3, A4, B1, C1, D1, D3, E1, E3, & E4	3’ - 0”	14’ - 0”	2’ - 8”	137’ - 6”	14-#8 x 13’ -6”
A2	See Special Detail on Sheet L37 for Spread Footing Details				

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

SUBSURFACE

The soils at the proposed traffic signal footing locations range from silt clay to clay sand.

Footing locations that have high water tables are potential candidates for caving soils. If caving soils are encountered, it may be necessary to use casing or drilling fluids to maintain an open excavation. Casing will be of sufficient strength to withstand handling and installation procedures. Casing material may consist of Sonotube, corrugated metal pipe, pvc, smooth metal pipe or any other material as approved by the Engineer. Drilling fluids can be water or other slurries as approved by the engineer. Concrete placed through drilling fluids will be tremied. If caving is not an issue but, water is present, it will be removed prior to concrete placement or the concrete will be tremied.

METER SOCKETS FOR TRAFFIC SIGNALS

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

EXISTING ELECTRICAL SERVICES

The existing electrical services at 4th Street, 8th Street, 15th Street, 21st Street, and 23rd Street will be removed by the Contractor and replaced as shown on the plans. Contractor will coordinate with NorthWestern Energy to connect new conduit and wire between the new service and the existing service. All cost associated with removal, disposal, and replacement of electrical services will be incidental to the contract unit price per each “Electrical Service Cabinet”.

The contact for NorthWestern Energy is:
Robert Gehm
605-668-4602
Robert.gehm@northwestern.com

TRAFFIC SIGNAL CONTROLLER

The new Traffic Signal Controllers must be fully compatible with all features and functionality of Econolite Centracs Local Edition software.

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

Controllers and flashers are not required to have dimming capability.

Anchor bolts for traffic signal cabinets 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”.

The Contractor will ensure that the Traffic Signal Controller at 23rd Street will be orientated that the door faces to the east.

BATTERY BACKUP CABINET

The Contractor will supply cabinets with concrete pad and footing for housing the battery backup system for each signal in the plans. The cabinets will be an aluminum NEMA 3R type and will have a thermostatically controller 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 cabinets 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.”

VIDEO DETECTION SYSTEM

The video detection system will be one of the following, or an approved equal:

Product	Manufacturer
GRIDSMART System	GRIDSMART Technologies, Inc. Knoxville TN 37932 Phone: 1-865-482-2112 www.gridsmart.com
Autoscope AIS-IV and RVP2	Econolite Anaheim, CA 92807 Phone: 1-714-630-3700 www.econolite.com
Vantage Next	Iteris, Inc. Santa Ana, CA 92705-5551 Phone: 1-949-270-9400 www.iteris.com
TrafficLink Detection	Miovision Technologies, Inc. 137 Glasgow St., Suite 110 Kitchener, Ontario Canada N2G 4X8 Phone: 1-519-513-2407 www.miovision.com

The new video detection system provided at 31st Street (North US81&SD50 intersection) will be capable of dilemma zone detection.

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”.

ACCESSIBLE PEDESTRIAN SIGNAL

The work will consist of furnishing and installing accessible pedestrian signals (APS). Each APS will consist of an interactive vibrotactile pedestrian pushbutton with speaker, an informational sign, a latching light emitting diode (LED) indicator light, a solid-state electronic control board, a power supply, wiring, and all necessary mounting hardware. The operation and performance of the APS units will meet the requirements of MUTCD Sections 4E.08 to 4E.13. and the applicable sections of NEMA Standards Publication TS-2.

The APS units will be capable of supporting a minimum of 16 push button stations.

The traffic signal cabinet must have four dedicated load switches for the pedestrian phases. If the traffic signal cabinet does not have four dedicated load switches for the pedestrian phases, then the Contractor will furnish and install the necessary number of load switches. All costs associated with furnishing and installing any additional load switches will be incidental to the contract unit price per each for “Accessible Pedestrian Signal”.

All mounting fasteners will be stainless steel; all threads will be coated with anti-seize compound meeting the requirements of USA Dept. of Defense specification MIL-PRF-907F.

The push button component of APS will meet the requirements of Section 985.1 S of the Specifications except that all housings and external hardware will be aluminum, powder coated yellow.

The APS control unit will include capability to monitor the push buttons and pedestrian signal head displays. Conflicts will cause the channel to be powered off.

The APS control unit will include capability to monitor communications with the push buttons. Communication faults will automatically reset the control unit.

Two licensed copies of any APS programming software will be furnished. All software programming, firmware updates, and audio message programming of the APS will be through USB port or Ethernet connection.

All costs for furnishing and installing the accessible pedestrian signal including labor, materials, and equipment, will be incidental to the contract unit price per each for “Accessible Pedestrian Signal”.

PEDESTRIAN PUSH BUTTON POLE

Pedestrian push button poles will be aluminum and 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 MASH.

The pole to base connection will be a threaded connection; threads will be 8 TPI, NPT. 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 an aluminum cap.

Anchor bolts for pedestrian push button poles may have hooked ends.

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.

EXISTING FIBER CABLE AT 4TH STREET

The existing fiber optic cables at the 4th Street intersection will be disconnected from the existing controller and pulled back in both directions. The existing conduit for the fiber optic cables will then be exposed and a new junction box will be placed at the locations indicated on the plans (JF1 and JF2). New conduit will then be run from each new junction box directly to the new controller cabinet, existing fiber optic cable will then be repulled through new junction boxes and conduit back to the new cabinet and reconnected to the new controller with LC connectors. All cost for disconnecting the existing conduit from the existing controllers, pulling back existing fiber cables, exposing existing fiber conduits, splicing existing fiber conduits, repulling existing fiber cables back to controller, and connecting fiber to new controller will be incidental to the contract unit price for “Miscellaneous Electric”.

EXISTING FIBER CABLE AT 8TH STREET

The existing fiber optic cables at the 8th Street intersection will be disconnected from the existing controller and pulled back in both directions. The existing conduit for the fiber optic cables will then be exposed and a new junction box will be placed at the locations indicated on the plans (JF3 and JF4). New conduit will then be run from each new junction box directly to the new controller cabinet, existing fiber optic cable will then be repulled through new junction boxes and conduit back to the new cabinet and reconnected to the new controller with LC connectors. All cost for disconnecting the existing conduit from the existing controllers, pulling back existing fiber cables, exposing existing fiber conduits, splicing existing fiber conduits, repulling existing fiber cables back to controller, and connecting fiber to new controller will be incidental to the contract unit price for “Miscellaneous Electric”.

EXISTING FIBER CABLE AT 15TH STREET

The existing fiber optic cables at the 15th Street intersection will be disconnected from the existing controller and pulled back in both directions. The existing conduit for the fiber optic cables will then be exposed and a new junction box will be placed at the locations indicated on the plans (JF5 and JF6). New conduit will then be run from each new junction box directly to the new controller cabinet, existing fiber optic cable will then be repulled through new junction boxes and conduit back to the new cabinet and reconnected to the new controller with LC connectors. All cost for disconnecting the existing conduit from the existing controllers, pulling back existing fiber cables, exposing existing fiber conduits, splicing existing fiber conduits, repulling existing fiber cables back to controller, and connecting fiber to new controller will be incidental to the contract unit price for “Miscellaneous Electric”.

EXISTING FIBER CABLE AT 21st STREET

The existing fiber optic cables at the 21st Street intersection will be disconnected from the existing controller and pulled back in both directions. The existing conduit for the fiber optic cables will then be exposed and a new junction box will be placed at the locations indicated on the plans (JF7 and JF8). New conduit will then be run from each new junction box directly to the new controller cabinet, existing fiber optic cable will then be repulled through

new junction boxes and conduit back to the new cabinet and reconnected to the new controller with LC connectors. All cost for disconnecting the existing conduit from the existing controllers, pulling back existing fiber cables, exposing existing fiber conduits, splicing existing fiber conduits, repulling existing fiber cables back to controller, and connecting fiber to new controller will be incidental to the contract unit price for “Miscellaneous Electric”.

EXISTING FIBER CABLE AT 23RD STREET

The existing fiber optic cable at the 23rd Street intersection will be disconnected from the existing controller and pulled back to the south. The existing conduit for the fiber optic cable will then be exposed and a new junction box will be placed at the location indicated on the plans (JF9). New conduit will then be run from the new junction box directly to the new controller cabinet, existing fiber optic cable will then be repulled through new junction box and conduit back to the new cabinet and reconnected to the new controller with LC connectors. All cost for disconnecting the existing conduit from the existing controller, pulling back existing fiber cable, exposing existing fiber conduit, splicing existing fiber conduit, repulling existing fiber cable back to controller, and connecting fiber to new controller will be incidental to the contract unit price for “Miscellaneous Electric”.

TRAFFIC SIGNAL CONTROLLER AT 31ST STREET

The existing traffic signal controller settings will not be changed. The detection zones drawn in the new video detection system will replicate the location of the existing in-pavement loops. For location information see plan sheets.

CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L6	L43

Plotting Date: 02/22/2024

		Rigid Conduit							Copper Wire											Preemptive Cable (Not a Bid Item)		Pole and Bracket
		Schedule 40					Schedule 80															
		1"	2"	3"	4"		2"	3"	1/C #8 AWG	1/C #6 AWG	2/C #14 AWG	3/C #14 AWG	4/C #14 AWG	5/C #14 AWG	6/C #14 AWG	7/C #14 AWG	15/C #14 AWG	19/C #14 AWG	25/C #14 AWG	PC		2/C #10 AWG
Location to Location		FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT			FT
4TH & BROADWAY INTERSECTION																						
METER	CONTROLLER		40'						125'	125'												
CONTROLLER	JA1				30'						250'				155'				125'	125'		
JA1	PA1	25'									30'											
JA1	PA2	25'									30'											
JA1	A1		20'						65'						25'				25'	25'		
JA1	JA4							170'	530'		700'				530'				350'	350'		
JA4	PA7	15'									20'				35'				35'	20'		
JA4	PA8	20'									25'											
JA4	A4		15'						50'						40'				20'			
JA4	JA3							125'	390'		260'				130'				130'	130'		
JA3	PA5	20'									25'											
JA3	PA6	30'									35'											
JA3	A3		15'						50'						20'				20'	20'		
JA1	JA2						120'		375'		250'				125'				125'	125'		
JA2	PA3	20'									25'											
JA2	PA4	25'									30'											
JA2	A2		25'						80'						30'				30'	30'		
JF1	CONTROLLER		25'																			
JF2	CONTROLLER						135															
Poles																						
A1	SIGNAL POLE											30'	130'	110'						80'		65'
A2	SIGNAL POLE											30'	135'	100'						65'		65'
A3	SIGNAL POLE											30'	130'	110'						75'		65'
A4	SIGNAL POLE											30'	45'	85'	65'					70'		65'
PA1	PUSHBUTTON POLE										10'											
PA2	PUSHBUTTON POLE										10'											
PA3	PUSHBUTTON POLE										10'											
PA4	PUSHBUTTON POLE										10'											
PA5	PUSHBUTTON POLE										10'											
PA6	PUSHBUTTON POLE										10'											
PA7	PUSHBUTTON POLE										10'											
PA8	PUSHBUTTON POLE										10'											
Subtotal:		180'	140'		30'		255'	295'	1,665'	125'	1,760'	120'	440'	405'	1,155'				860'	1,115'		260'

CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L7	L43

Plotting Date: 02/22/2024

		Rigid Conduit							Copper Wire											Preemptive Cable (Not a Bid Item)		Pole and Bracket
		Schedule 40					Schedule 80															
		1"	2"	3"	4"		2"	3"	1/C #8 AWG	1/C #6 AWG	2/C #14 AWG	3/C #14 AWG	4/C #14 AWG	5/C #14 AWG	6/C #14 AWG	7/C #14 AWG	15/C #14 AWG	19/C #14 AWG	25/C #14 AWG	PC		2/C #10 AWG
Location to Location		FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT			FT
8TH & BROADWAY INTERSECTION																						
METER	JB1		25'						80'	80'												
CONTROLLER	JB1				20'					25'	125'		25'		45'		25'	25'	45'	65'		
JB1	PB1	25'									30'											
JB1	PB2	20'									25'											
JB1	B1		15'						50'						20'				20'	20'		
JB1	JB2						90'		95'		190'						95'					
JB2	PB3	30'									35'											
JB2	PB4	25'									30'											
JB2	B2		15'						20'								20'					
JB1	JB4							125'	390'		260'		130'		130'			130'	130'	260'		
JB4	PB6	20'									25'											
JB4	B4		25'						80'				30'					30'		30'		
JB4	JB3			85'					265'		90'				90'				90'	90'		
JB3	PB5	20'									25'											
JB3	B3		15'						50'						20'				20'	20'		
JF3	CONTROLLER		30'																			
JF4	CONTROLLER						160'															
Poles																						
B1	SIGNAL POLE											30'	195'							70'		65'
B2	LUMINAIRE POLE											30'		15'								65'
B3	SIGNAL POLE											15'	110'	65'						60'		65'
B4	SIGNAL POLE											15'	125'							45'		
PB1	PUSHBUTTON POLE										10'											
PB2	PUSHBUTTON POLE										10'											
PB3	PUSHBUTTON POLE										10'											
PB4	PUSHBUTTON POLE										10'											
PB5	PUSHBUTTON POLE										10'											
PB6	PUSHBUTTON POLE																					
Subtotal:		140'	125'	85'	20'		250'	125'	1,030'	105'	885'	90'	615'	80'	305'		140'	185'	305'	660'		195'

CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L8	L43

Plotting Date: 02/22/2024

		Rigid Conduit							Copper Wire											Preemptive Cable (Not a Bid Item)	Pole and Bracket
		Schedule 40					Schedule 80														
		1"	2"	3"	4"		2"	3"	1/C #8 AWG	1/C #6 AWG	2/C #14 AWG	3/C #14 AWG	4/C #14 AWG	5/C #14 AWG	6/C #14 AWG	7/C #14 AWG	15/C #14 AWG	19/C #14 AWG	25/C #14 AWG	PC	2/C #10 AWG
Location to Location		FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT		FT
15TH & BROADWAY INTERSECTION																					
METER	CONTROLLER		15'							50'											
CONTROLLER	JC1				15'						140'				35'			20'	50'	65'	
JC1	PC1	25'									30'										
JC1	PC2	20'									25'										
JC1	C1		25'						80'						30'			30'	80'	55'	
JC1	JC2						85'		265'		180'							90'		90'	
JC2	PC3	25'									30'				30'				55'	30'	
JC2	PC4	30'									35'										
JC2	C2		15'						50'									20'		20'	
JC1	JC4							120'	375'		620'				125'				250'	250'	
JC4	PC7	25'									30'										
JC4	PC8	15'									20'										
JC4	C4		25'						80'		30'								30'		
JC4	JC3							85'	265'						90'				90'	90'	
JC3	PC5	20'									25'										
JC3	PC6	25'									30'										
JC3	C3		15'						50'						20'				20'	20'	
JF5	CONTROLLER		45'																		
JF6	CONTROLLER						85'														
Poles																					
C1	SIGNAL POLE											30'	145'	70'						70'	65'
C2	SIGNAL POLE											30'	75'	15'						60'	65'
C3	SIGNAL POLE											30'	135'	70'						65'	65'
C4	SIGNAL POLE											30'	100'	15'						45'	
PC1	PUSHBUTTON POLE										10'										
PC2	PUSHBUTTON POLE										10'										
PC3	PUSHBUTTON POLE										10'										
PC4	PUSHBUTTON POLE										10'										
PC5	PUSHBUTTON POLE										10'										
PC6	PUSHBUTTON POLE										10'										
PC7	PUSHBUTTON POLE										10'										
PC8	PUSHBUTTON POLE										10'										
Subtotal:		185'	140'		15'		170'	205'	1,165'	50'	1,275'	120'	455'	170'	330'			160'	575'	860'	195'

Plot Scale - 1:200

Plotted From - TRPR17199

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CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L9	L43

Plotting Date: 02/22/2024

		Rigid Conduit							Copper Wire											Preemptive Cable (Not a Bid Item)		Pole and Bracket
		Schedule 40					Schedule 80															
		1"	2"	3"	4"		2"	3"	1/C #8 AWG	1/C #6 AWG	2/C #14 AWG	3/C #14 AWG	4/C #14 AWG	5/C #14 AWG	6/C #14 AWG	7/C #14 AWG	15/C #14 AWG	19/C #14 AWG	25/C #14 AWG	PC		2/C #10 AWG
Location to Location		FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT			FT
21ST & BROADWAY INTERSECTION																						
METER	JD1		40'						125'	125'												
JD1	CONTROLLER				30'				95'		330'	65'				95'			165'	165'		
JD1	D1		25'						80'							30'			30'	30'		
JD1	PD1	20'									25'											
JD1	PD2	50'									55'											
JD1	JD2							115'	360'		240'	120'							120'	120'		
JD2	D2		30'						95'			35'							35'	35'		
JD2	PD3	20'									25'											
JD2	PD4	20'									25'											
JD1	JD4							125'	390'		515'	130'				390'			260'	260'		
JD4	D4		35'						110'							40'			40'	40'		
JD4	PD7		35'								40'											
JD4	PD8	20'									25'											
JD3	JD4							110'	340'		230'					230'			115'	115'		
JD3	D3		25'						80'							60'			30'	30'		
JD3	PD5	25'									30'											
JD3	PD6	30'									35'											
JF7	CONTROLLER		25'				160'															
JF8	CONTROLLER																					
	Poles																					
D1	SIGNAL POLE											30'	120'	95'	65'					75'		65'
D2	SIGNAL POLE											30'	90'	105'						65'		65'
D3	SIGNAL POLE											30'	115'	95'	55'					70'		65'
D4	SIGNAL POLE											30'	75'	85'						65'		65'
PD1	PUSHBUTTON POLE										10'											
PD2	PUSHBUTTON POLE										10'											
PD3	PUSHBUTTON POLE										10'											
PD4	PUSHBUTTON POLE										10'											
PD5	PUSHBUTTON POLE										10'											
PD6	PUSHBUTTON POLE										10'											
PD7	PUSHBUTTON POLE										10'											
PD8	PUSHBUTTON POLE										10'											
Subtotal:		185'	215'		30'		160'	350'	1,675'	125'	1,655'	470'	400'	380'	120'	845'			795'	1,070'		260'

CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L10	L43

Plotting Date: 02/22/2024

		Rigid Conduit							Copper Wire											Preemptive Cable (Not a Bid Item)	Pole and Bracket
		Schedule 40					Schedule 80														
		1"	2"	3"	4"		2"	3"	1/C #8 AWG	1/C #6 AWG	2/C #14 AWG	3/C #14 AWG	4/C #14 AWG	5/C #14 AWG	6/C #14 AWG	7/C #14 AWG	15/C #14 AWG	19/C #14 AWG	25/C #14 AWG	PC	2/C #10 AWG
Location to Location		FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT		FT
23RD & BROADWAY INTERSECTION																					
METER	CONTROLLER		15							50											
CONTROLLER	JE2				25						210			55		80		55	55	105	
JE2	PE3	30									35										
JE2	PE4	30									35										
JE2	E2		20						65							50		25		25	
JE2	JE1							90	280		190			95					95	95	
JE1	PE1	30									35										
JE1	PE2	20									25										
JE1	E1		35						110		75			40					40	40	
JE2	JE3							150	465		620			155		310		155	155	310	
JE3	PE5	25									30										
JE3	PE6	25									30										
JE3	E3		15						50					20		20			20	20	
JE3	JE4							100	310		210					105		105		105	
JE4	PE7	25									30										
JE4	PE8	15									20										
JE4	E4		20						65							25		25		25	
METER	JE2		40						125												
JF9	CONTROLLER						85														
Poles																					
E1	SIGNAL POLE											30	215							70	65
E2	SIGNAL POLE											30	125		50					70	65
E3	SIGNAL POLE											30	225		60					80	65
E4	SIGNAL POLE											30	150							70	65
PE1	PUSHBUTTON POLE										10										
PE2	PUSHBUTTON POLE										10										
PE3	PUSHBUTTON POLE										10										
PE4	PUSHBUTTON POLE										10										
PE5	PUSHBUTTON POLE										10										
PE6	PUSHBUTTON POLE										10										
PE7	PUSHBUTTON POLE										10										
PE8	PUSHBUTTON POLE										10										
Subtotal:		200'	145'		25'		85'	340'	1,470'	50'	1,625'	120'	715'	365'	110'	590'		365'	365'	1,015'	260'
Total:		890'	765'	85'	120'		920'	1,315'	7,005'	455'	7,200'	920'	2,625'	1,400'	2,020'	1,435'	140'	710'	2,900'	4,720'	1,170'

EXISTING SIGNAL LAYOUT
SD HWY 50 / BROADWAY AVE. & 4TH STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L11	L43

Revised 5/14/2024 - RR

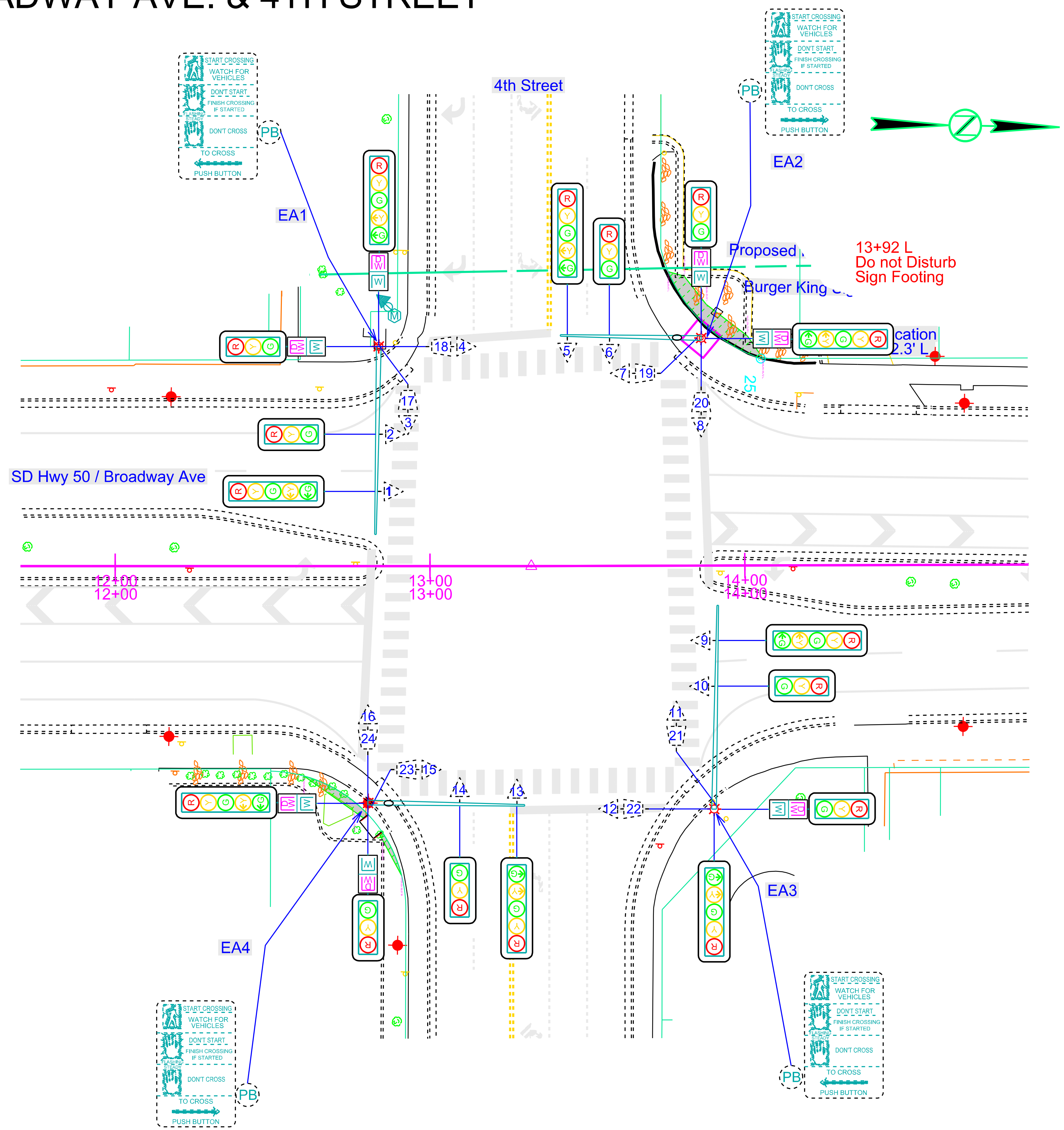
KEY	ITEM
	Existing Items
	Signal Pole w/55' Mast Arm & 8' Lumin Arm (EA1)
	Signal Pole w/50' Mast Arm & 8' Lumin Arm (EA2)
	Signal Pole w/65' Mast Arm & 8' Lumin Arm (EA3)
	Signal Pole w/40' Mast Arm & 8' Lumin Arm (EA4)
	Roadway Luminaire, 250w with P.E. (EA1-EA4)
	Traffic Controller
	3 Section Vehicle Signal Head (2,4,6,8,10,12,14,16)
	5 Section Vehicle Signal Head (1,3,5,7,9,11,13,15)
	Emergency Vehicle Preemption Unit (4-Channel)
	Optical Detector
PB	Pedestrian Push Button
	Pedestrian Signal Head w/Countdown Timer (17-24)
	Pedestrian Crossing Sign (Left - 2/Right - 2)

SALVAGE ITEMS

KEY	ITEM	EST QUANT	UNIT
	3 Section Vehicle Signal Head (2,4,6,8)	4	EACH
	5 Section Vehicle Signal Head (1,3,5,7)	4	EACH
	Traffic Controller	1	EACH

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	Remove Signal Equipment	LUMP SUM	LS
	Remove Signal Pole Footing (EA1-EA4)	4	EACH
	Salvage Signal Equipment	LUMP SUM	LS



SIGNAL LAYOUT

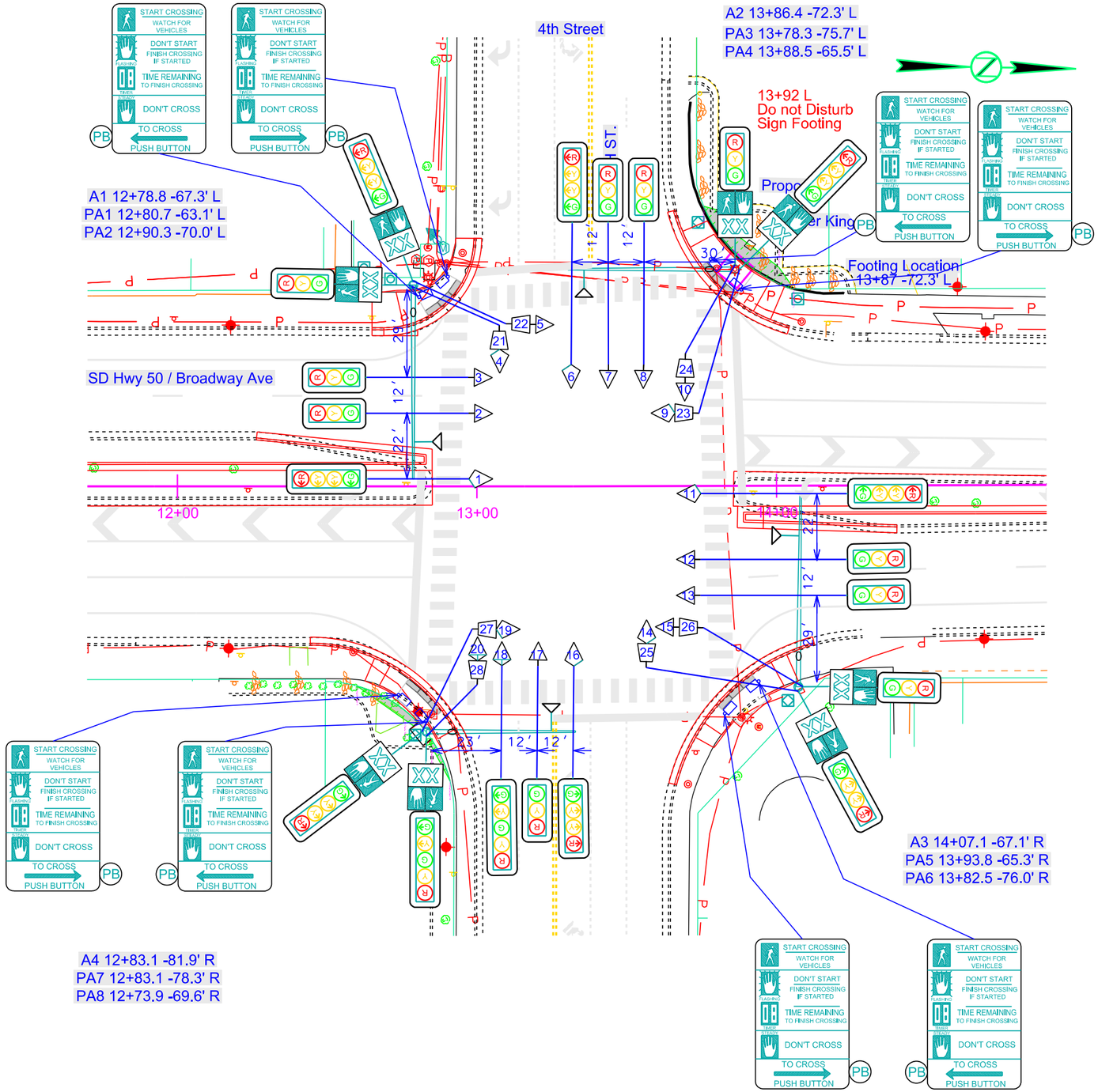
SD HWY 50 / BROADWAY AVE. & 4TH STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L12	L43

Revised 5/14/2024 - RR

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	Signal Pole w/65' Mast Arm & 6' Lumin Arm (A1, A3)	2	EACH
	Signal Pole w/55' Mast Arm & 6' Lumin Arm (A2)	1	EACH
	Signal Pole w/50' Mast Arm & 6' Lumin Arm (A4)	1	EACH
	Roadway Luminaire, LED with P.E. (A1,A2,A3,A4)	4	EACH
	3 Section Vehicle Signal Head (2, 3, 5, 7, 8, 10, 12, 13, 15, 17)	10	EACH
	4 Section Directional Vehicle Signal Head (1,4,6,9,11,14,16,19)	8	EACH
	5 Section Vehicle Signal Head (18,20)	2	EACH
	Emergency Vehicle Preemption Unit (4-Channel)	1	EACH
	Optical Detector	4	EACH
PB	Accessible Pedestrian Signal	8	EACH
	Pedestrian Push Button Pole (PA1-PA8)	8	EACH
	Pedestrian Signal Head w/Countdown Timer (21-28)	8	EACH
	Pedestrian Crossing Sign R10-3e (Left - 4 /Right - 4)	8	EACH



EXISTING SIGNAL LAYOUT
SD HWY 50 / BROADWAY AVE. & 8TH STREET

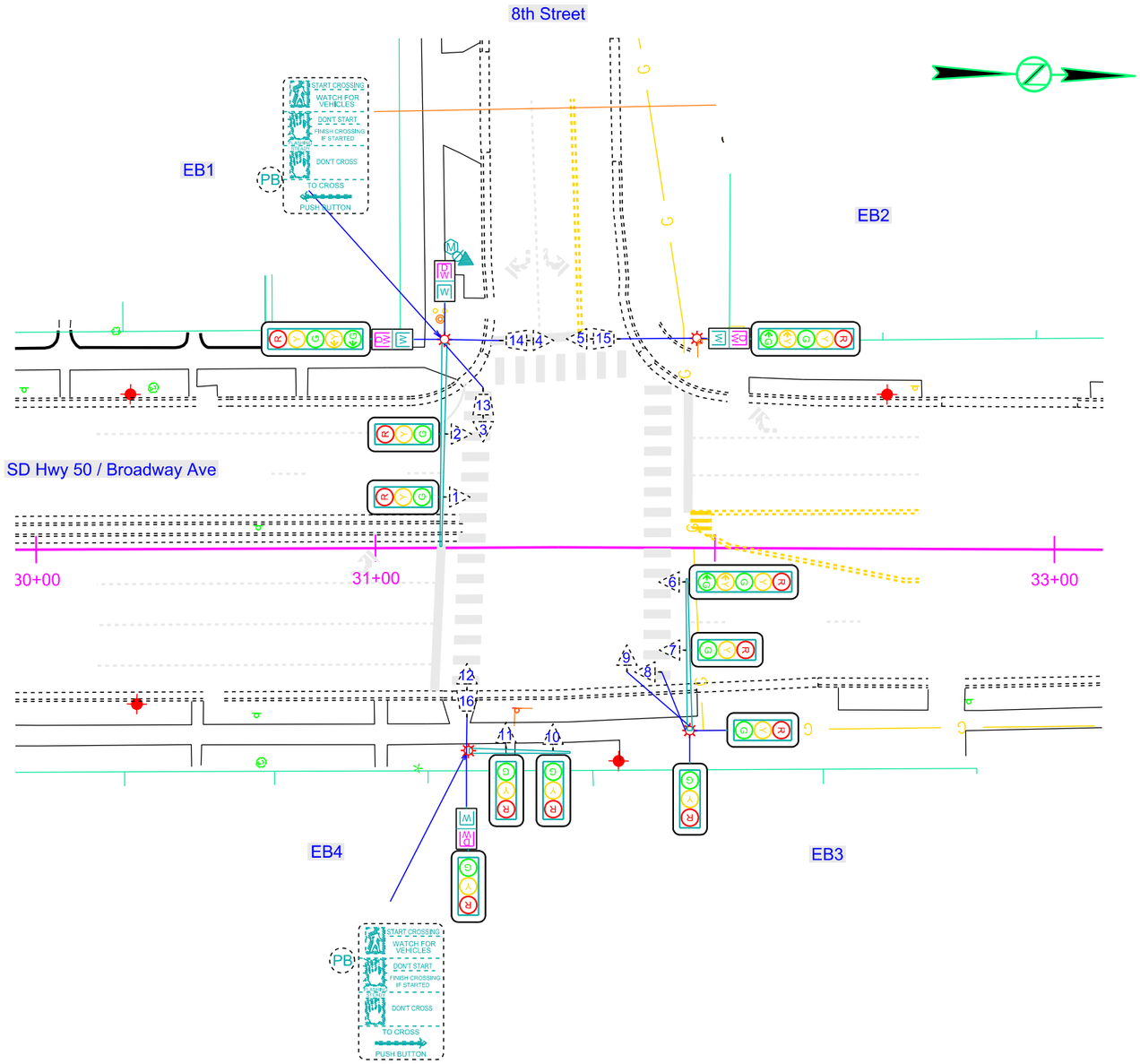
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L13	L43

Revised 4/04/2024 - RR

Existing Items	
KEY	ITEM
	Signal Pole w/40' Mast Arm & 8' Lumin Arm, (EB1)
	Luminaire Pole & 8' Arm (EB2)
	Signal Pole w/45' Mast Arm & 8' Lumin Arm (EB3)
	Signal Pole w/30' Mast Arm (EB4)
	Roadway Luminaire, 250w with P.E. (EB1-EB4)
	Traffic Controller
	3 Section Vehicle Signal Head (1-2, 7-12)
	5 Section Vehicle Signal Head (4-6)
	Emergency Vehicle Preemption Unit (4-Channel)
	Optical Detector
PB	Pedestrian Push Button
	Pedestrian Signal Head w/Countdown Timer (13-16)
	Pedestrian Crossing Sign (Left - 1/Right - 1)

SALVAGE ITEMS			
KEY	ITEM	EST QUANT	UNIT
	Traffic Controller	1	EACH

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
	Remove Signal Equipment	LUMP SUM	LS
	Remove Signal Pole Footing (EB1, EB3, EB4)	3	EACH
	Remove Luminaire Pole Footing (EB2)	1	EACH
	Remove Luminaire Pole (EB2)	1	EACH
	Salvage Signal Equipment	LUMP SUM	LS



SIGNAL LAYOUT

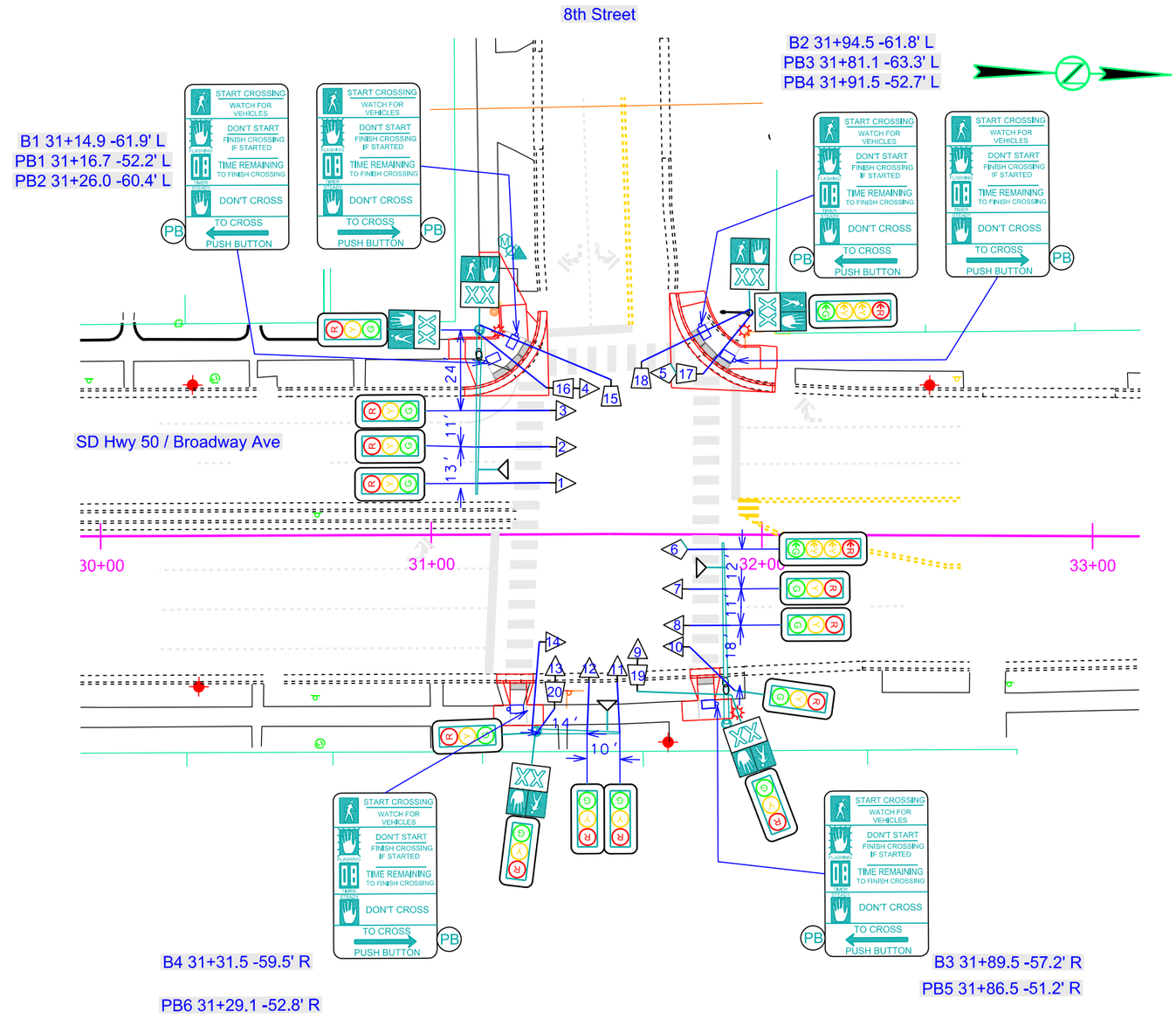
SD HWY 50 / BROADWAY AVE. & 8TH STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L14	L43

Plotting Date: 02/22/2024

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	Signal Pole w/50' Mast Arm & 6' Lumin Arm (B1)	1	EACH
	Breakaway Base Luminaire Pole with 8' arm, 40' Mounting Height (B2)	1	EACH
	Signal Pole w/55' Mast Arm & 6' Lumin Arm (B3)	1	EACH
	Signal Pole w/25' Mast Arm (B4)	1	EACH
	Roadway Luminaire, LED with P.E. (B1,B2, B3)	3	EACH
	3 Section Vehicle Signal Head (1-4, 7-14)	12	EACH
	4 Section Directional Vehicle Signal Head (5 and 6)	2	EACH
	Emergency Vehicle Preemption Unit (4-Channel)	1	EACH
	Optical Detector	3	EACH
PB	Accessible Pedestrian Signal	6	EACH
	Pedestrian Push Button Pole (PB1-PB6)	6	EACH
	Pedestrian Signal Head w/Countdown Timer (15-20)	6	EACH
	Pedestrian Crossing Sign R10-3e (Left - 3 /Right - 3)	6	EACH



EXISTING SIGNAL LAYOUT
SD HWY 50 / BROADWAY AVE. & 15TH STREET

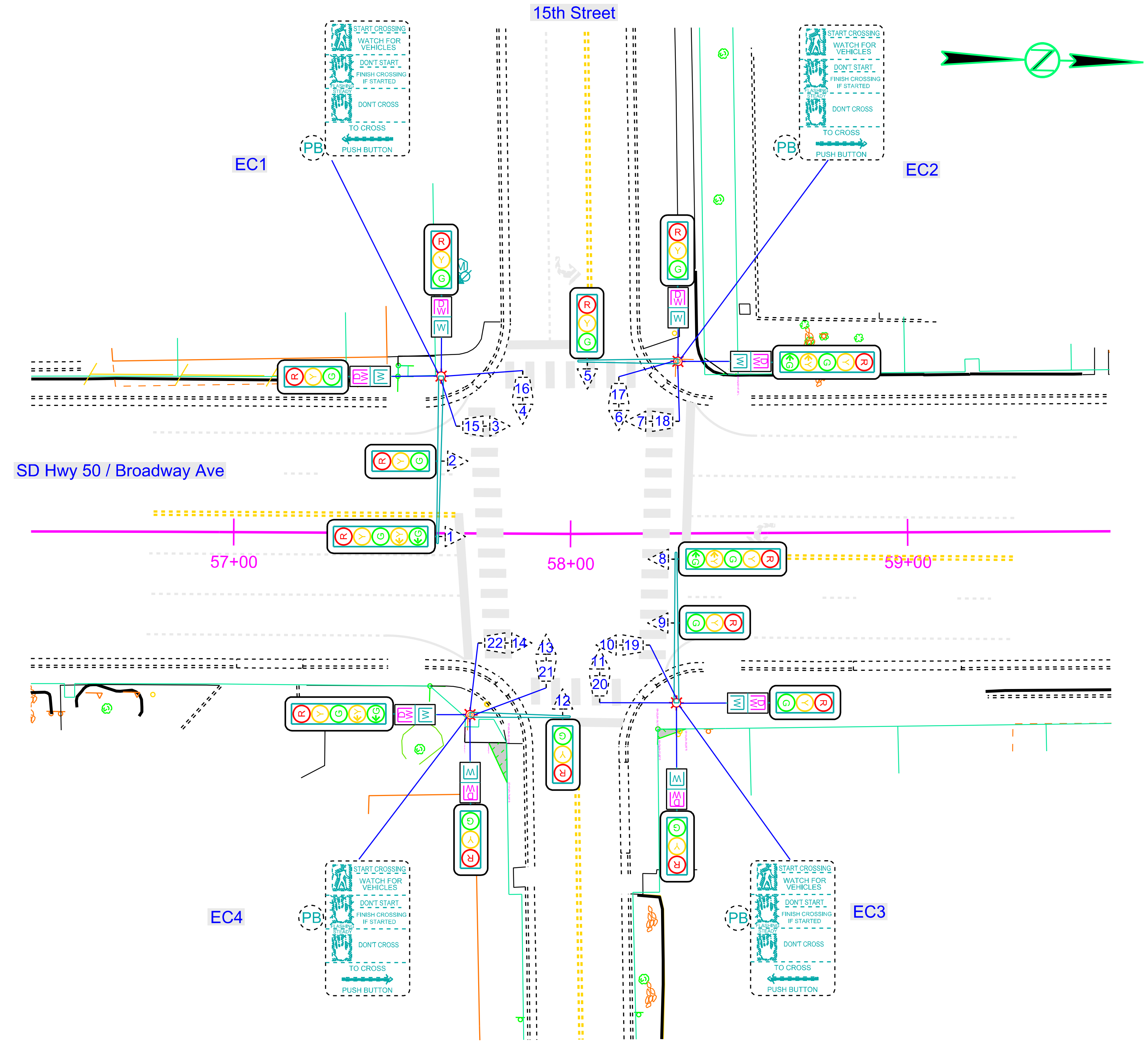
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L15	L43

Plotting Date: 02/22/2024

Existing Items	
KEY	ITEM
	Signal Pole w/40' Mast Arm (EC1)
	Signal Pole w/20' Mast Arm & 8' Lumin Arm (EC2)
	Signal Pole w/45' Mast Arm & 8' Lumin Arm (EC3)
	Signal Pole w/25' Mast Arm (EC4)
	Roadway Luminaire, 250w with P.E. (EC2-EC3)
	Traffic Controller
	3 Section Vehicle Signal Head (2-6,9-13)
	5 Section Vehicle Signal Head (1,7,8,14)
	Emergency Vehicle Preemption Unit (4-Channel)
	Optical Detector
PB	Pedestrian Push Button
	Pedestrian Signal Head w/Countdown Timer (15-22)
	Pedestrian Crossing Sign (Left - 2/Right - 2)

SALVAGE ITEMS			
KEY	ITEM	EST. QUANT	UNIT
	Traffic Controller	1	EACH

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST. QUANT	UNIT
	Remove Signal Equipment	LUMP SUM	LS
	Remove Signal Pole Footing (EC1-EC4)	4	EACH
	Salvage Signal Equipment	LUMP SUM	LS



Plot Scale - 1:40
TRPR17199
Plotted From -
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SIGNAL LAYOUT

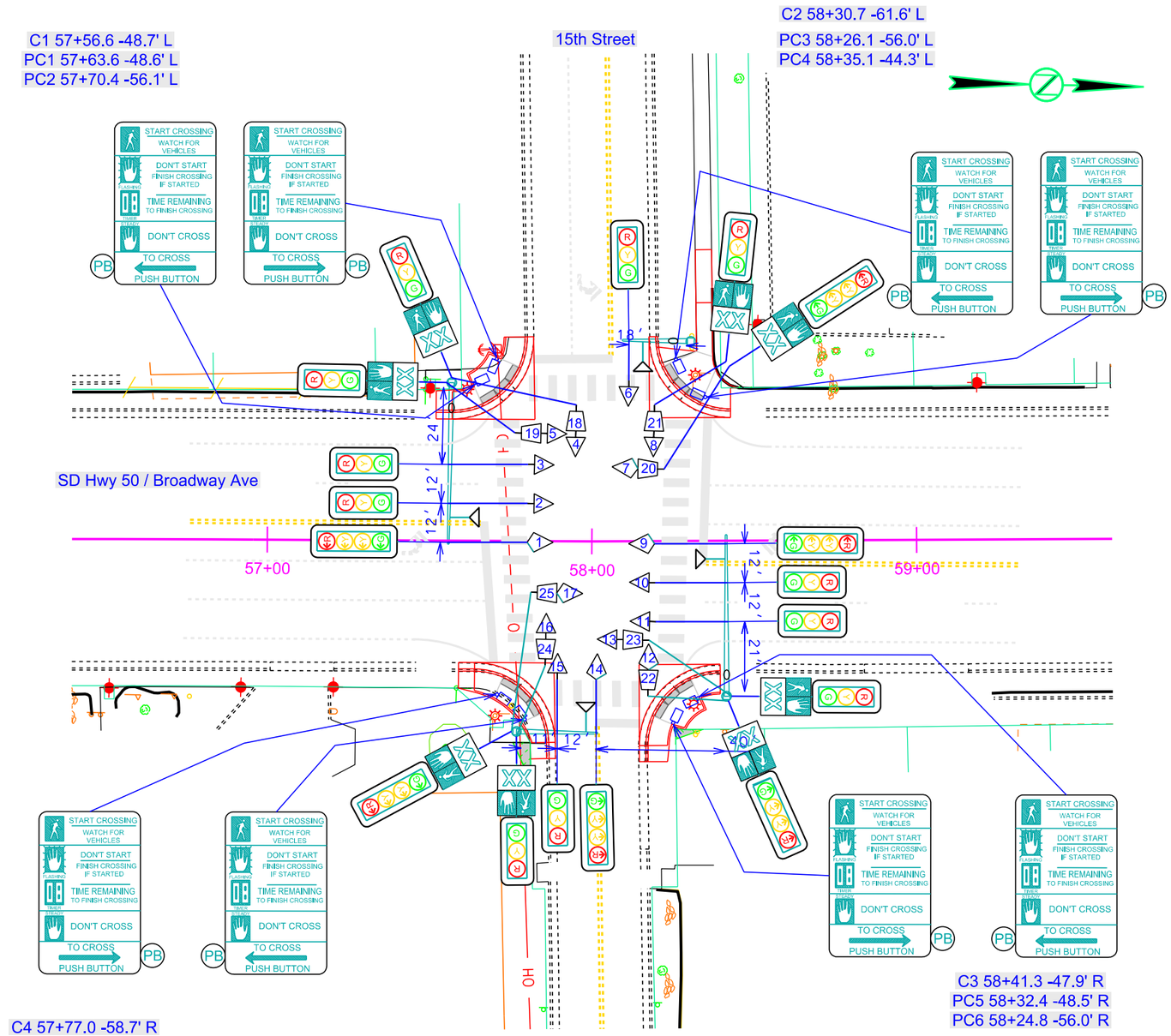
SD HWY 50 / BROADWAY AVE. & 15TH STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L16	L43

Plotting Date: 02/22/2024

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	Signal Pole w/50' Mast Arm & 6' Lumin Arm (C1,C3)	1	EACH
	Signal Pole w/20' Mast Arm & 6' Lumin Arm (C2)	1	EACH
	Signal Pole w/25' Mast Arm (C4)	1	EACH
	Roadway Luminaire, LED with P.E. (C1,C2,and C3)	3	EACH
	3 Section Vehicle Signal Head (2 - 6, 8, 10, 11, 13, 15, and 16)	11	EACH
	4 Section Directional Vehicle Signal Head (1, 7, 9, 12, 14, and 17)	6	EACH
	Emergency Vehicle Preemption Unit (4-Channel)	1	EACH
	Optical Detector	4	EACH
PB	Accessible Pedestrian Signal	8	EACH
	Pedestrian Push Button Pole (PC1-PC8)	8	EACH
	Pedestrian Signal Head w/Countdown Timer (18-25)	8	EACH
	Pedestrian Crossing Sign R10-3e (Left - 4 /Right - 4)	8	EACH



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L17	L43

Revised 3/21/2024 - RR

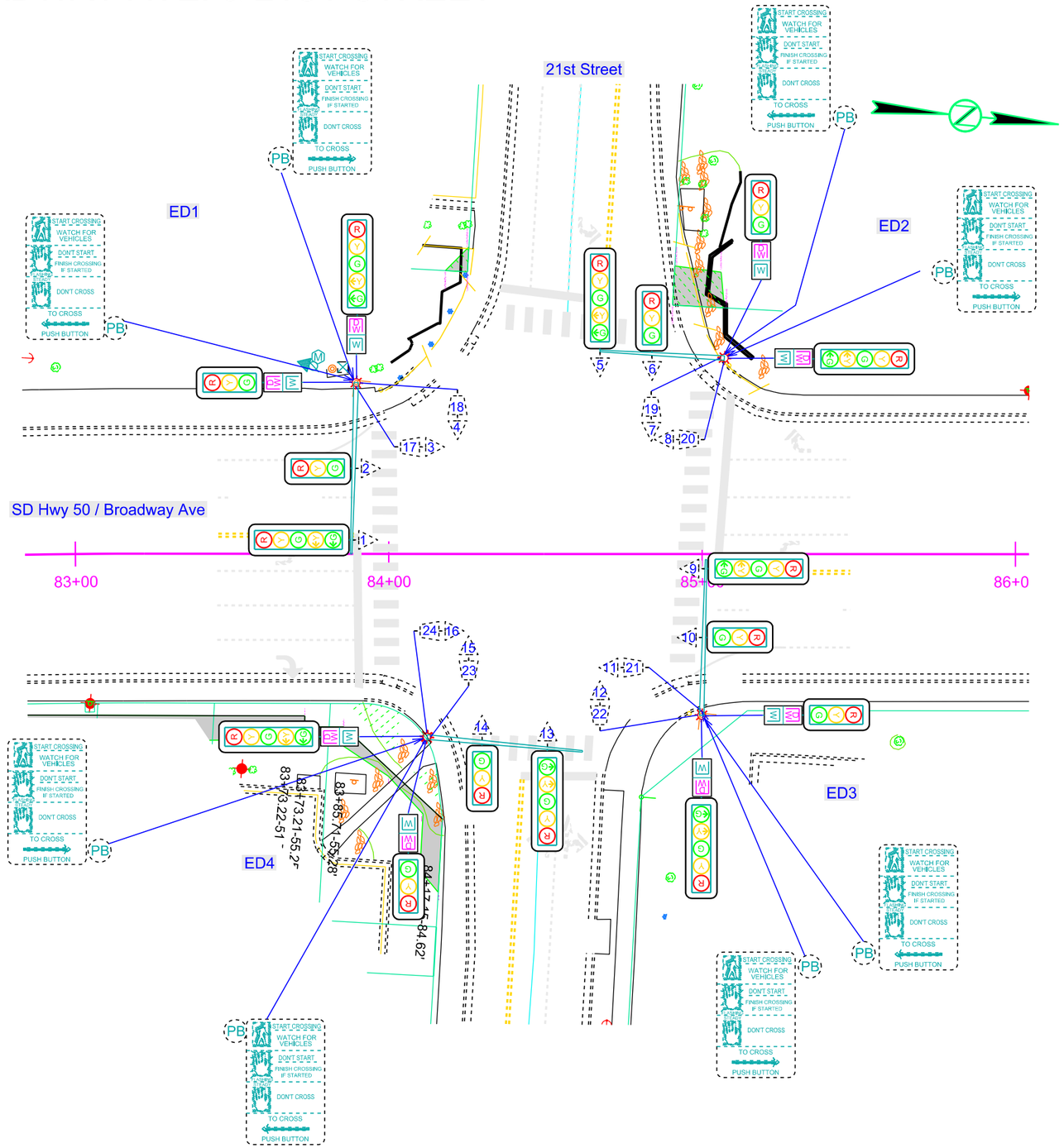
EXISTING SIGNAL LAYOUT

SD HWY 50 / BROADWAY AVE. & 21ST STREET

Existing Items	
KEY	ITEM
	Signal Pole w/55' Mast Arm & 8' Lumin Arm (ED1)
	Signal Pole w/50' Mast Arm & 8' Lumin Arm (ED2,ED3)
	Signal Pole w/35' Mast Arm & 8' Lumin Arm (EC3)
	Roadway Luminaire, 250w with P.E. (ED1-ED4)
	Traffic Controller
	3 Section Vehicle Signal Head (2-3, 6-7, 10-11, 14-15)
	5 Section Vehicle Signal Head (1, 4, 5, 8, 9, 12, 13, 16)
	Emergency Vehicle Preemption Unit (4-Channel)
	Optical Detector
PB	Pedestrian Push Button
	Pedestrian Signal Head w/Countdown Timer (17-24)
	Pedestrian Crossing Sign (Left - 4/Right - 4)

SALVAGE ITEMS			
KEY	ITEM	EST QUANT	UNIT
	Traffic Controller	1	EACH

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
	Remove Signal Equipment	LUMP SUM	LS
	Remove Signal Pole Footing (ED1-ED4)	4	EACH
	Salvage Signal Equipment	LUMP SUM	LS



SIGNAL LAYOUT

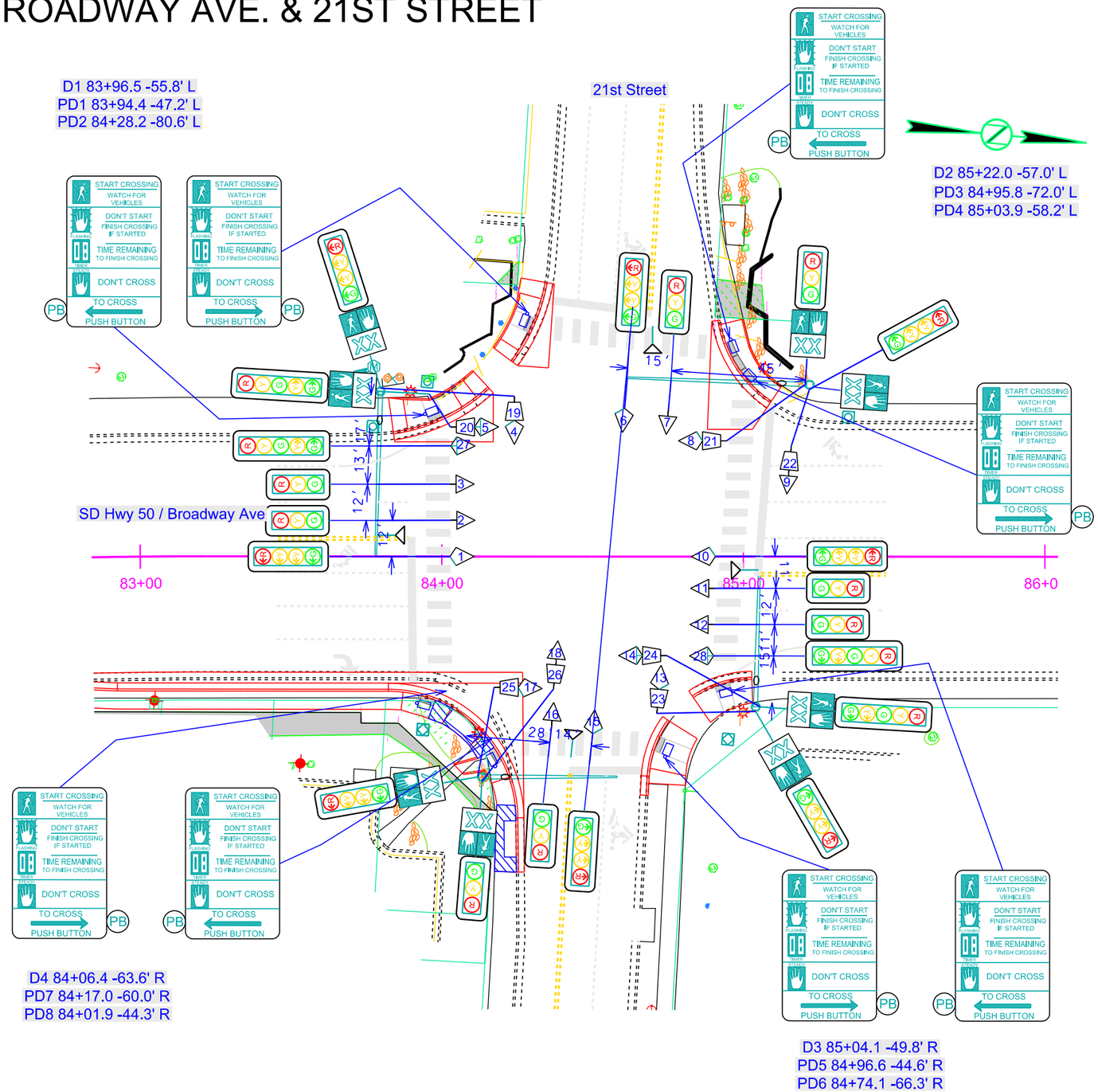
SD HWY 50 / BROADWAY AVE. & 21ST STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L18	L43

Plotting Date: 02/22/2024

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	Signal Pole w/55' Mast Arm & 6' Lumin Arm (D1)	1	EACH
	Signal Pole w/50' Mast Arm & 6' Lumin Arm (D3)	1	EACH
	Signal Pole w/60' Mast Arm & 6' Lumin Arm (D2)	1	EACH
	Signal Pole w/45' Mast Arm & 6' Lumin Arm (D4)	1	EACH
	Roadway Luminaire, LED with P.E. (D1,D2,D3,D4)	4	EACH
	3 Section Vehicle Signal Head (2, 3, 7, 8, 11, 12, 16, and 18)	8	EACH
	4 Section Directional Vehicle Signal Head (1, 4, 6, 9, 10, 13, 15, and 17)	8	EACH
	5 Section Vehicle Signal Head (27,28,19,20)	4	EACH
	Emergency Vehicle Preemption Unit (4-Channel)	1	EACH
	Optical Detector	4	EACH
PB	Accessible Pedestrian Signal	8	EACH
	Pedestrian Push Button Pole (PD1-PD8)	8	EACH
	Pedestrian Signal Head w/Countdown Timer (19-26)	8	EACH
	Pedestrian Crossing Sign R10-3e (Left - 4 /Right - 4)	8	EACH



EXISTING SIGNAL LAYOUT
SD HWY 50 / BROADWAY AVE. & 23RD STREET

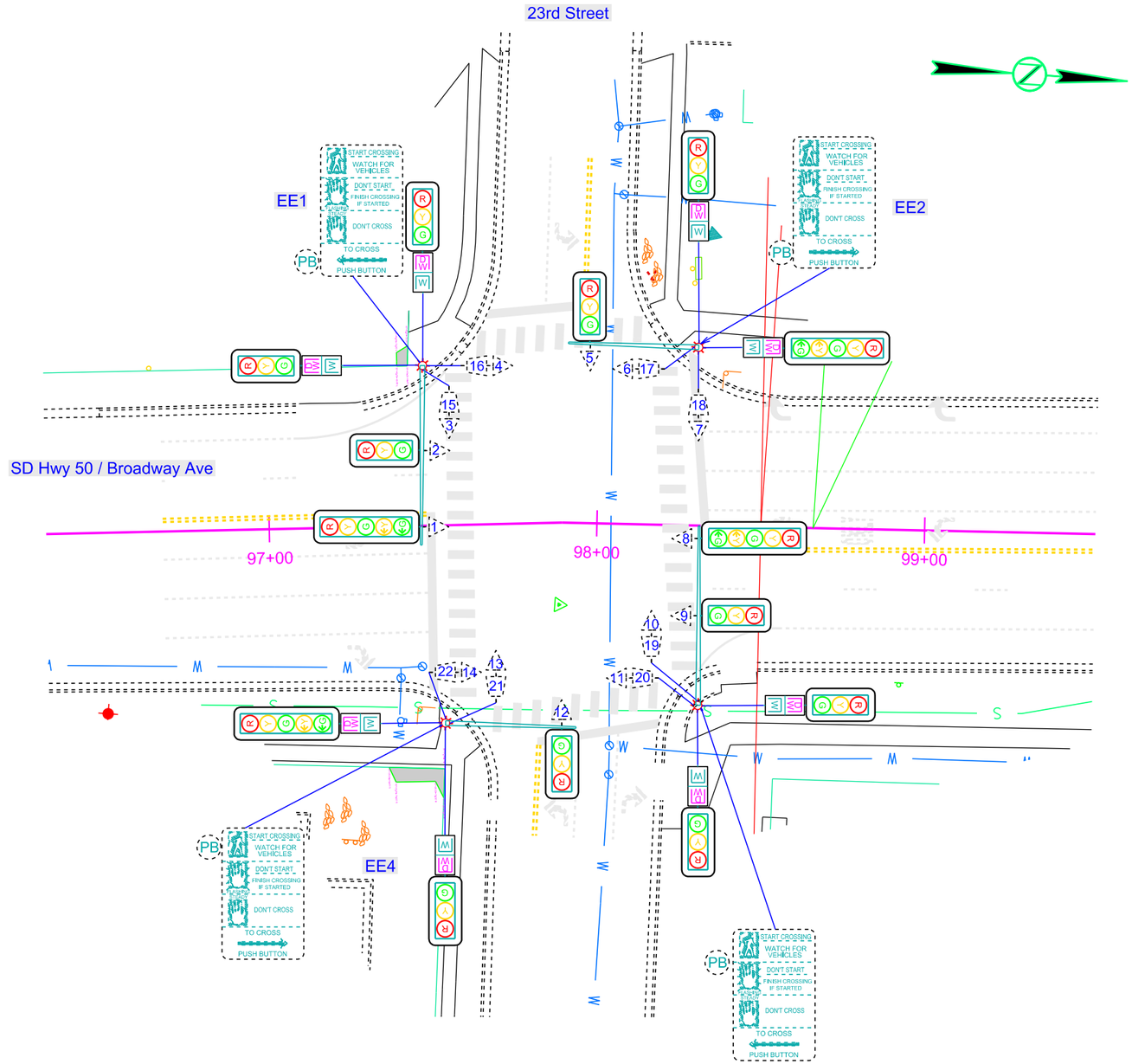
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L19	L43

Plotting Date: 02/22/2024

Existing Items	
KEY	ITEM
	Signal Pole w/55' Mast Arm & 8' Lumin Arm, (EE1)
	Signal Pole w/30' Mast Arm & 8' Lumin Arm (EE2, EE4)
	Signal Pole w/45' Mast Arm & 8' Lumin Arm (EE3)
	Roadway Luminaire, 250w with P.E. (EE1-EE4)
	Traffic Controller
	3 Section Vehicle Signal Head (2-5, 7, 9-13)
	5 Section Vehicle Signal Head (1,6,8,14)
	Emergency Vehicle Preemption Unit (4-Channel)
	Optical Detector
PB	Pedestrian Push Button
	Pedestrian Signal Head w/Countdown Timer (15-22)
	Pedestrian Crossing Sign (Left - 2/Right - 2)

SALVAGE ITEMS			
KEY	ITEM	EST QUANT	UNIT
	Traffic Controller	1	EACH

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
	Remove Signal Equipment	LUMP SUM	LS
	Remove Signal Pole Footing (EA1-EA4)	4	EACH
	Salvage Signal Equipment	LUMP SUM	LS



SIGNAL LAYOUT

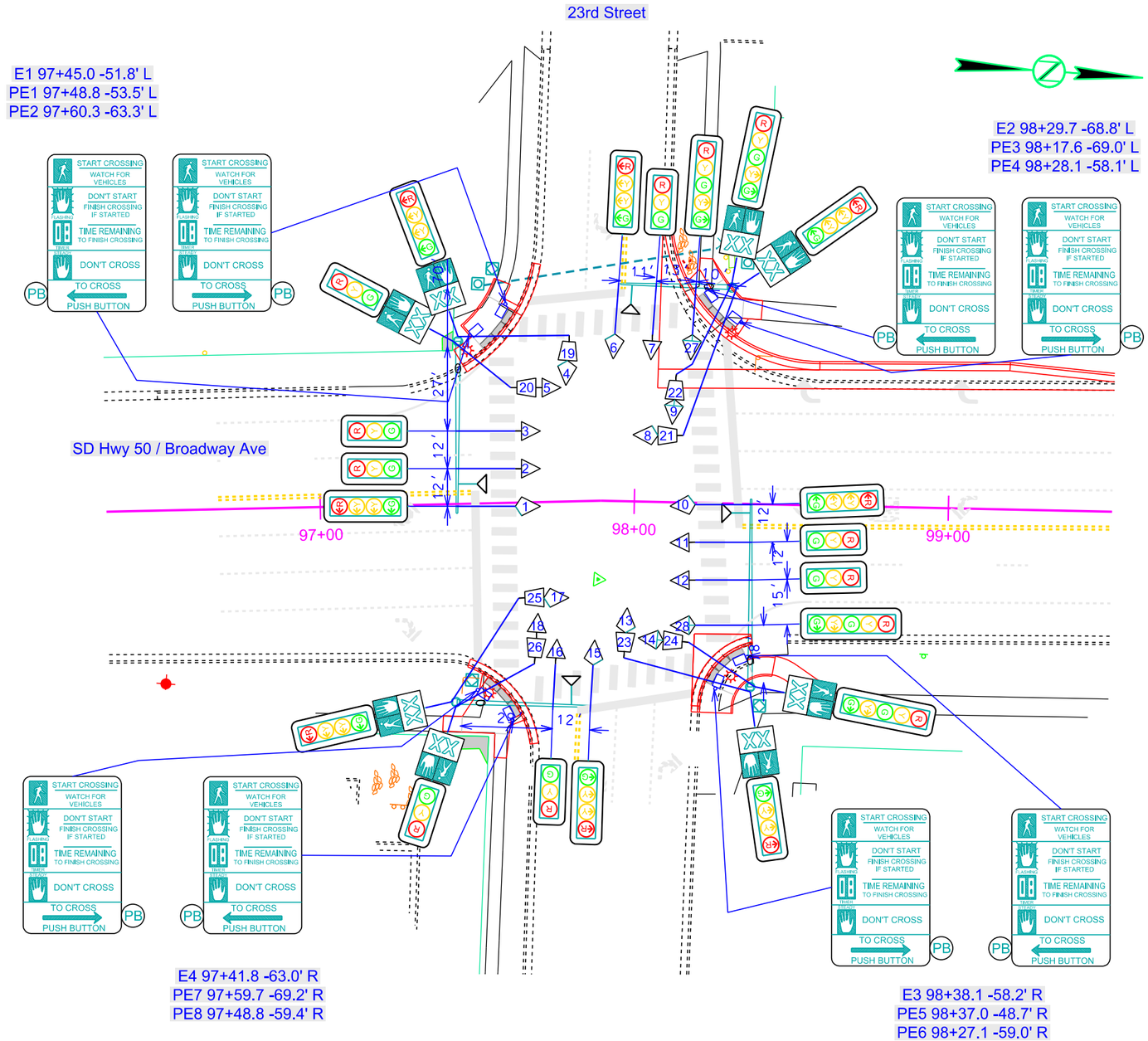
SD HWY 50 / BROADWAY AVE. & 23RD STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L20	L43

Plotting Date: 02/22/2024

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	Signal Pole w/60' Mast Arm & 6' Lumin Arm (E3)	1	EACH
	Signal Pole w/55' Mast Arm & 6' Lumin Arm (E1)	1	EACH
	Signal Pole w/35' Mast Arm & 6' Lumin Arm (E2)	1	EACH
	Signal Pole w/45' Mast Arm & 6' Lumin Arm (E4)	1	EACH
	Roadway Luminaire, LED with P.E. (E1,E2,E3,E4)	4	EACH
	3 Section Vehicle Signal Head (2, 3, 5, 7,11, 12,16, 18)	8	EACH
	4 Section Directional Vehicle Signal Head (1, 4, 6, 8,10, 13, 15, 17)	8	EACH
	5 Section Vehicle Signal Head (9,14,27,28)	4	EACH
	Emergency Vehicle Preemption Unit (4-Channel)	1	EACH
	Optical Detector	4	EACH
PB	Accessible Pedestrian Signal	8	EACH
	Pedestrian Push Button Pole (PE1-PE8)	8	EACH
	Pedestrian Signal Head w/Countdown Timer (19-26)	8	EACH
	Pedestrian Crossing Sign R10-3e (Left - 4 /Right - 4)	8	EACH



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L21	L43

Revised 5/14/2024 - RR

CONDUIT LAYOUT
SD HWY 50 & 4TH STREET

ESTIMATE OF QUANTITIES

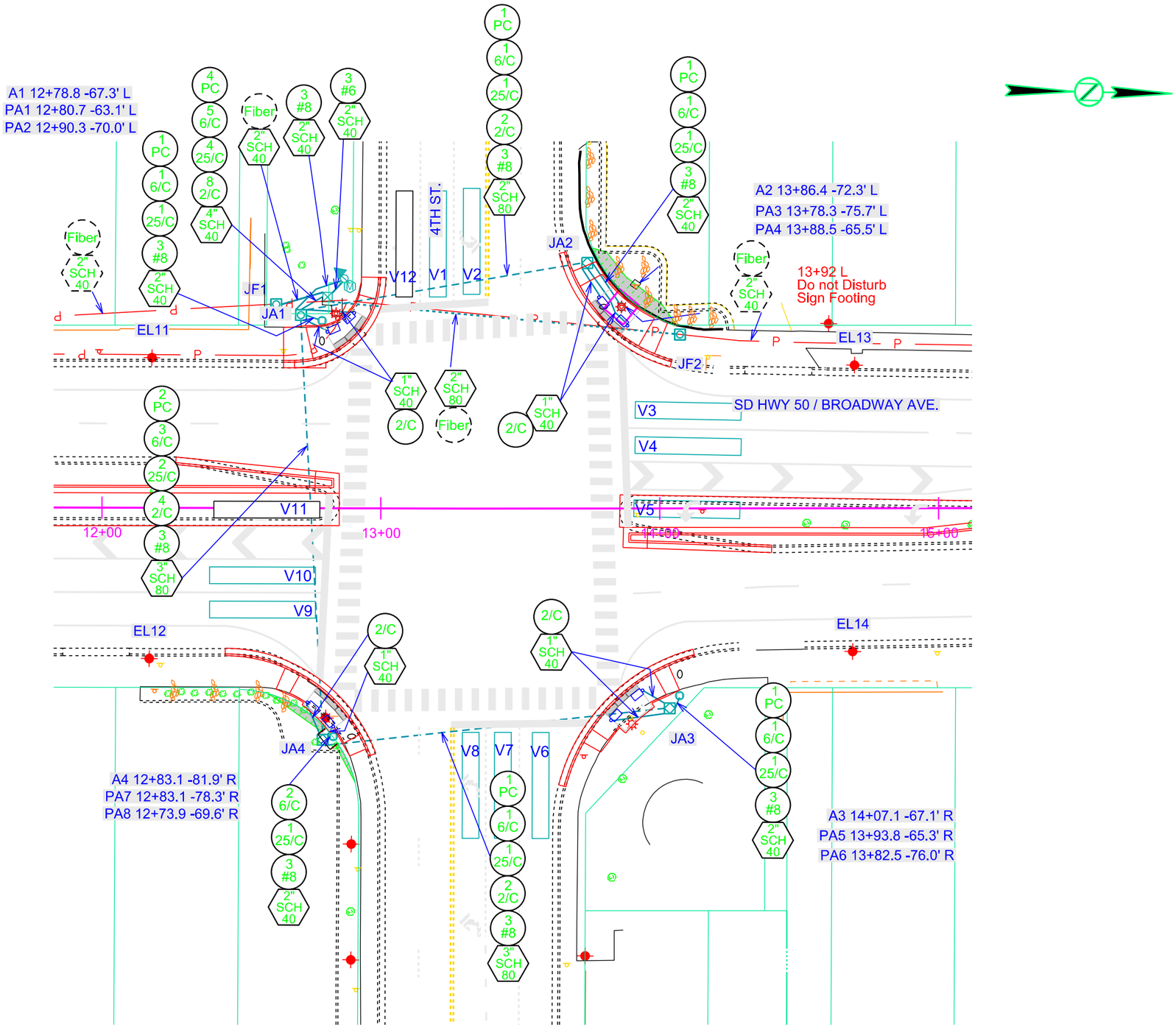
KEY	ITEM	EST QUANT	UNIT
	3' Diameter Footing (A1,A3,A4)	42	FT
	Type 1 Electrical Junction Box (JA2-JA4)	3	EACH
	Type 3 Electrical Junction Box (JA1,JF1,JF2)	3	EACH
	Electrical Service Cabinet	1	EACH
	Galvanized Steel Utility Pole (Not a Bid Item)	1	EACH
M	Meter Socket (Not a Bid Item)	1	EACH
	Traffic Signal Controller	1	EACH
	Battery Backup System	1	EACH
	Video Detection System	1	EACH
	Video Detection Zones 6' x 38' (Not a Bid Item) (V1-V11)	11	EACH
1" SCH 40	1" Rigid Conduit, Schedule 40	180	FT
2" SCH 40	2" Rigid Conduit, Schedule 40	140	FT
2" SCH 80	2" Rigid Conduit, Schedule 80	255	FT
3" SCH 80	3" Rigid Conduit, Schedule 80	295	FT
4" SCH 40	4" Rigid Conduit, Schedule 40	30	FT
#8	1/C #8 AWG Copper Wire	1665	FT
#6	1/C #6 AWG Copper Wire	125	FT
2/C	2/C #14 AWG Copper Tray Cable, K2	1760	FT
3/C	3/C #14 AWG Copper Tray Cable, K2	120	FT
4/C	4/C #14 AWG Copper Tray Cable, K2	440	FT
5/C	5/C #14 AWG Copper Tray Cable, K2	405	FT
6/C	6/C #14 AWG Copper Tray Cable, K2	1155	FT
25/C	25/C #14 AWG Copper Tray Cable, K2	860	FT
	2/C #10 AWG Copper Pole & Bracket Cable	260	FT
PC	Preemption Cable (Not a Bid Item)	1115	FT

ESTIMATE OF QUANTITIES FOR SPREAD FOOTING A2

KEY	ITEM	EST QUANT	UNIT
	Epoxy coated Reinforcing Steel	846	Lb.
	Class M6 Concrete	7.9	Cu. Yd.
	Structure Excavation, Miscellaneous	24.5	Cu. Yd.
	Install Dowel in Rock	10	FT

EXISTING ITEMS

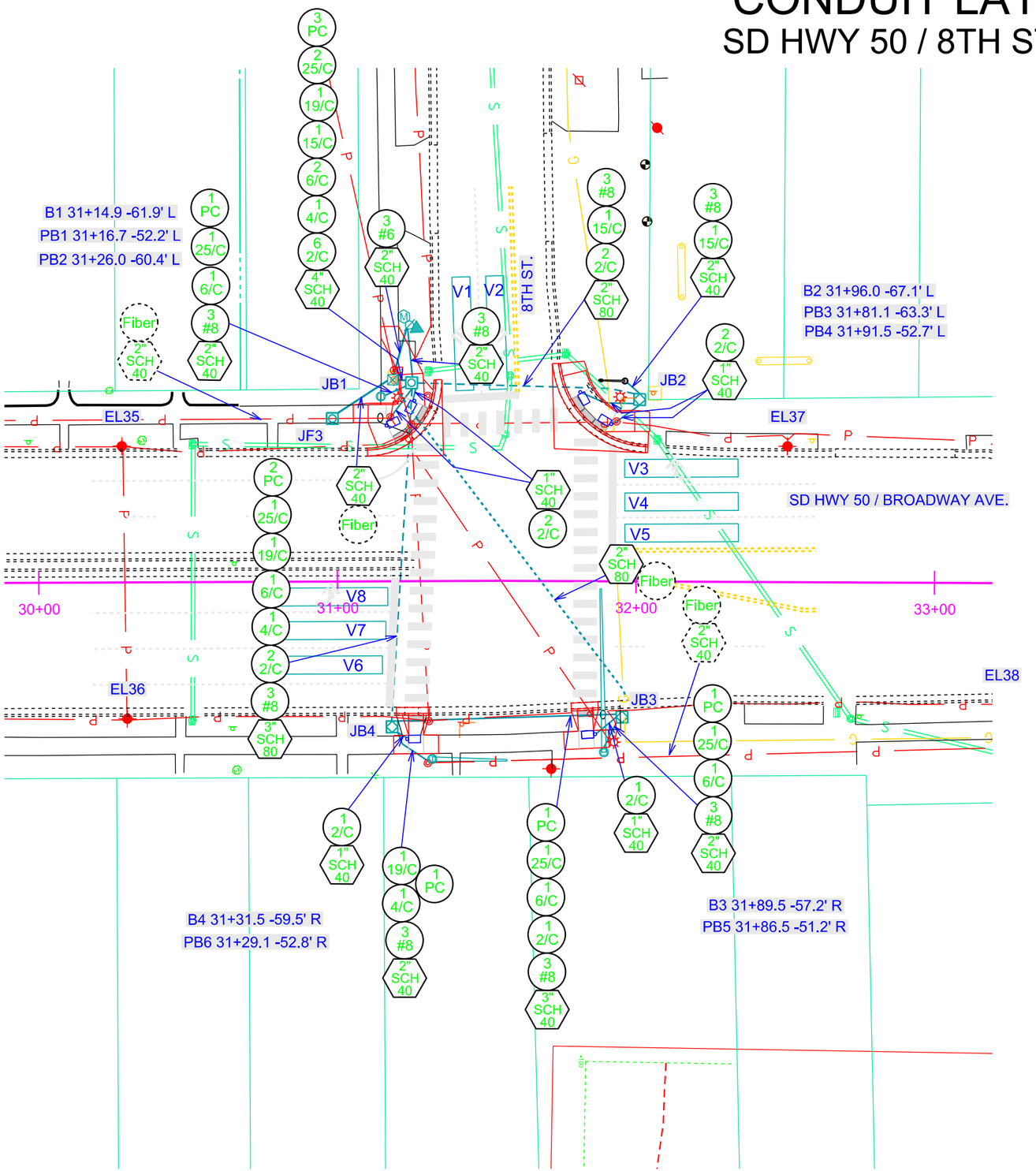
KEY	ITEM
2" SCH 40	2" Rigid Conduit, Schedule 40
Fiber	48 Strand Fiber Optic Cable



CONDUIT LAYOUT
SD HWY 50 / 8TH STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L22	L43

Plotting Date: 02/22/2024



ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	2' Diameter Footing (B2)	6	FT
	3' Diameter Footing (B1,B3,B4)	40	FT
	Type 1 Electrical Junction Box (JB2-JB4)	3	EACH
	Type 3 Electrical Junction Box (JB1,JF3,JF4)	3	EACH
	Electrical Service Cabinet	1	EACH
	Galvanized Steel Utility Pole Not a Bid Item	1	EACH
M	Meter Socket Not a Bid Item	1	EACH
	Traffic Signal Controller	1	EACH
	Battery Backup System	1	EACH
	Video Detection System	1	EACH
	Video Detection Zones 6' x 38' (Not a Bid Item) (V1-V8)	8	EACH
1" SCH 40	1" Rigid Conduit, Schedule 40	140	FT
2" SCH 40	2" Rigid Conduit, Schedule 40	125	FT
3" SCH 40	3" Rigid Conduit, Schedule 40	85	FT
4" SCH 40	4" Rigid Conduit, Schedule 40	20	FT
2" SCH 80	2" Rigid Conduit, Schedule 80	250	FT
3" SCH 80	3" Rigid Conduit, Schedule 80	125	FT
#8	1/C #8 AWG Copper Wire	1030	FT
#6	1/C #6 AWG Copper Wire	105	FT
2/C	2/C #14 AWG Copper Tray Cable, K2	885	FT
3/C	3/C #14 AWG Copper Tray Cable, K2	90	FT
4/C	4/C #14 AWG Copper Tray Cable, K2	615	FT
5/C	5/C #14 AWG Copper Tray Cable, K2	80	FT
6/C	6/C #14 AWG Copper Tray Cable, K2	305	FT
15/C	15/C #14 AWG Copper Tray Cable, K2	140	FT
19/C	19/C #14 AWG Copper Tray Cable, K2	185	FT
25/C	25/C #14 AWG Copper Tray Cable, K2	305	FT
	2/C #10 AWG Copper Pole & Bracket Cable	195	FT
PC	Preemption Cable (Not a Bid Item)	660	FT

EXISTING ITEMS

KEY	ITEM
2" SCH 40	2" Rigid Conduit, Schedule 40
Fiber	48 Strand Fiber Optic Cable

CONDUIT LAYOUT

SD HWY 50 / BROADWAY AVE. & 15TH STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L23	L43

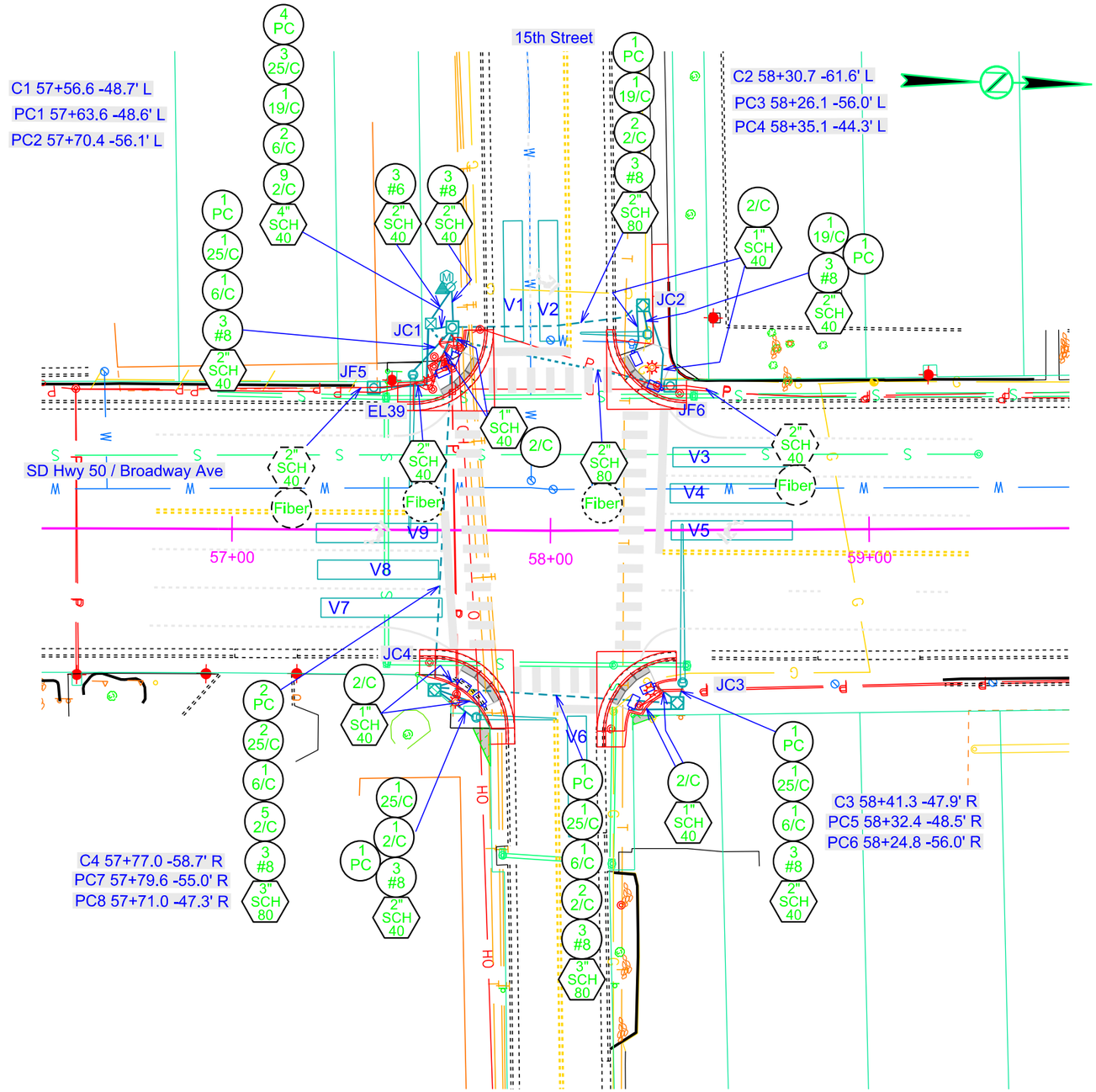
Plotting Date: 02/22/2024

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	3' Diameter Footing (C1-C4)	51	FT
	Type 1 Electrical Junction Box (JC2-JC4)	3	EACH
	Type 3 Electrical Junction Box (JC1,JF5,JF6)	3	EACH
	Electrical Service Cabinet	1	EACH
	Galvanized Steel Utility Pole Not a Bid Item	1	EACH
M	Meter Socket Not a Bid Item	1	EACH
	Traffic Signal Controller	1	EACH
	Battery Backup System	1	EACH
	Video Detection System	1	EACH
	Video Detection Zones 6' x 38' (Not a Bid Item) (V1-V9)	9	EACH
1" SCH 40	1" Rigid Conduit, Schedule 40	185	FT
2" SCH 40	2" Rigid Conduit, Schedule 40	140	FT
4" SCH 40	4" Rigid Conduit, Schedule 40	15	FT
2" SCH 80	2" Rigid Conduit, Schedule 80	170	FT
3" SCH 80	3" Rigid Conduit, Schedule 80	205	FT
#8	1/C #8 AWG Copper Wire	1165	FT
#6	1/C #6 AWG Copper Wire	50	FT
2/C	2/C #14 AWG Copper Tray Cable, K2	1275	FT
3/C	3/C #14 AWG Copper Tray Cable, K2	120	FT
4/C	4/C #14 AWG Copper Tray Cable, K2	455	FT
5/C	5/C #14 AWG Copper Tray Cable, K2	170	FT
6/C	6/C #14 AWG Copper Tray Cable, K2	330	FT
19/C	19/C #14 AWG Copper Tray Cable, K2	160	FT
25/C	25/C #14 AWG Copper Tray Cable, K2	575	FT
	2/C #10 AWG Copper Pole & Bracket Cable	195	FT
PC	Preemption Cable (Not a Bid Item)	860	FT

EXISTING ITEMS

KEY	ITEM
2" SCH 40	2" Rigid Conduit, Schedule 40
Fiber	48 Strand Fiber Optic Cable



CONDUIT LAYOUT

SD HWY 50 / BROADWAY AVE. & 21ST STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L24	L43

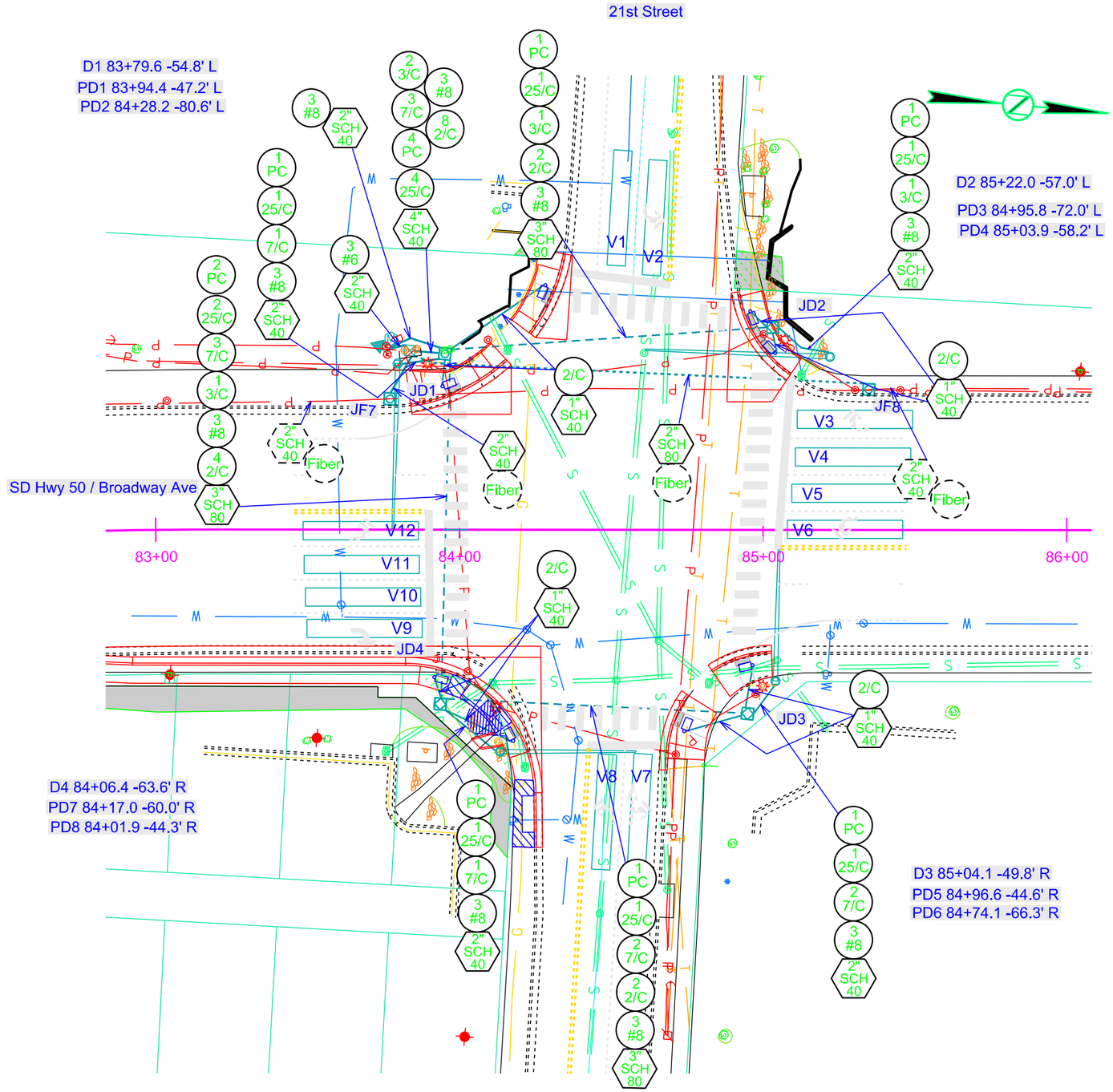
Plotting Date: 02/22/2024

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	3' Diameter Footing (D1-D4)	53	FT
	Type 1 Electrical Junction Box (JD2-JD4)	3	EACH
	Type 3 Electrical Junction Box (JD1,JF7,JF8)	3	EACH
	Electrical Service Cabinet	1	EACH
	Galvanized Steel Utility Pole Not a Bid Item	1	EACH
M	Meter Socket Not a Bid Item	1	EACH
	Traffic Signal Controller	1	EACH
	Battery Backup System	1	EACH
	Video Detection System	1	EACH
	Video Detection Zones 6' x 38' (Not a Bid Item) (V1-V12)	12	EACH
1" SCH 40	1" Rigid Conduit, Schedule 40	185	FT
2" SCH 40	2" Rigid Conduit, Schedule 40	215	FT
4" SCH 40	4" Rigid Conduit, Schedule 40	30	FT
2" SCH 80	2" Rigid Conduit, Schedule 80	160	FT
3" SCH 80	3" Rigid Conduit, Schedule 80	350	FT
#8	1/C #8 AWG Copper Wire	1675	FT
#6	1/C #6 AWG Copper Wire	125	FT
2/C	2/C #14 AWG Copper Tray Cable, K2	1655	FT
3/C	3/C #14 AWG Copper Tray Cable, K2	470	FT
4/C	4/C #14 AWG Copper Tray Cable, K2	400	FT
5/C	5/C #14 AWG Copper Tray Cable, K2	380	FT
6/C	6/C #14 AWG Copper Tray Cable, K2	120	FT
7/C	7/C #14 AWG Copper Tray Cable, K2	845	FT
25/C	25/C #14 AWG Copper Tray Cable, K2	795	FT
	2/C #10 AWG Copper Pole & Bracket Cable	260	FT
PC	Preemption Cable (Not a Bid Item)	1070	FT

EXISTING ITEMS

KEY	ITEM
2" SCH 40	2" Rigid Conduit, Schedule 40
Fiber	48 Strand Fiber Optic Cable



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CONDUIT LAYOUT

SD HWY 50 / BROADWAY AVE. & 23RD STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L25	L43

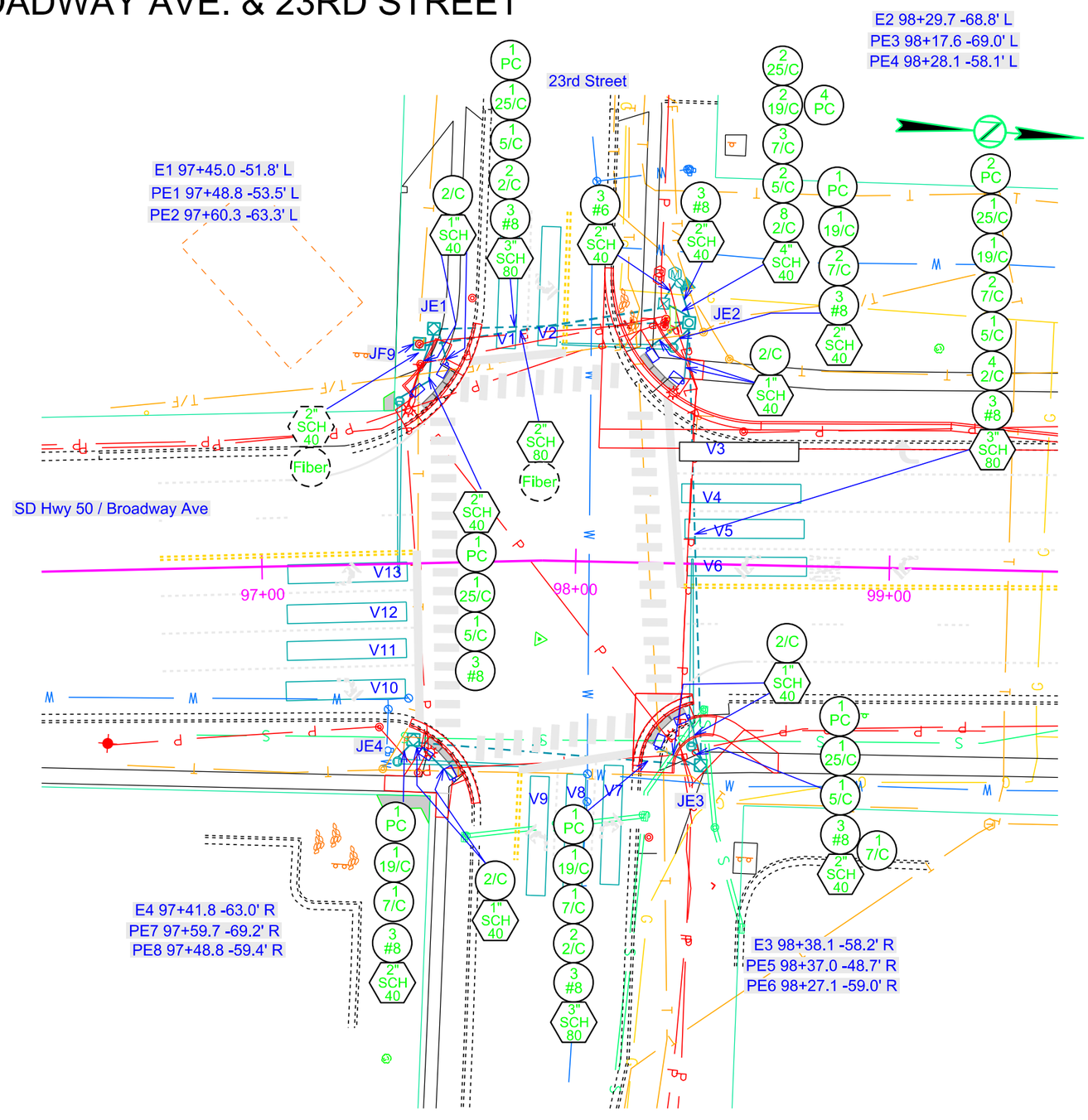
Plotting Date: 02/22/2024

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	3' Diameter Footing (E1-E4)	54	FT
	Type 1 Electrical Junction Box (JE1, JE3,JE4)	3	EACH
	Type 3 Electrical Junction Box (JE2,JF9)	2	EACH
	Electrical Service Cabinet	1	EACH
	Galvanized Steel Utility Pole Not a Bid Item	1	EACH
M	Meter Socket Not a Bid Item	1	EACH
	Traffic Signal Controller	1	EACH
	Battery Backup System	1	EACH
	Video Detection System	1	EACH
	Video Detection Zones 6' x 38' (Not a Bid Item) (V1-V12)	12	EACH
1" SCH 40	1" Rigid Conduit, Schedule 40	200	FT
2" SCH 40	2" Rigid Conduit, Schedule 40	145	FT
4" SCH 40	4" Rigid Conduit, Schedule 40	25	FT
2" SCH 80	2" Rigid Conduit, Schedule 80	85	FT
3" SCH 80	3" Rigid Conduit, Schedule 80	340	FT
#8	1/C #8 AWG Copper Wire	1470	FT
#6	1/C #6 AWG Copper Wire	50	FT
2/C	2/C #14 AWG Copper Tray Cable, K2	1625	FT
3/C	3/C #14 AWG Copper Tray Cable, K2	120	FT
4/C	4/C #14 AWG Copper Tray Cable, K2	715	FT
5/C	5/C #14 AWG Copper Tray Cable, K2	365	FT
6/C	6/C #14 AWG Copper Tray Cable, K2	110	FT
7/C	7/C #14 AWG Copper Tray Cable, K2	590	FT
19/C	19/C #14 AWG Copper Tray Cable, K2	365	FT
25/C	25/C #14 AWG Copper Tray Cable, K2	365	FT
	2/C #10 AWG Copper Pole & Bracket Cable	260	FT
PC	Preemption Cable (Not a Bid Item)	1015	FT

EXISTING ITEMS

KEY	ITEM
2" SCH 40	2" Rigid Conduit, Schedule 40
Fiber	48 Strand Fiber Optic Cable



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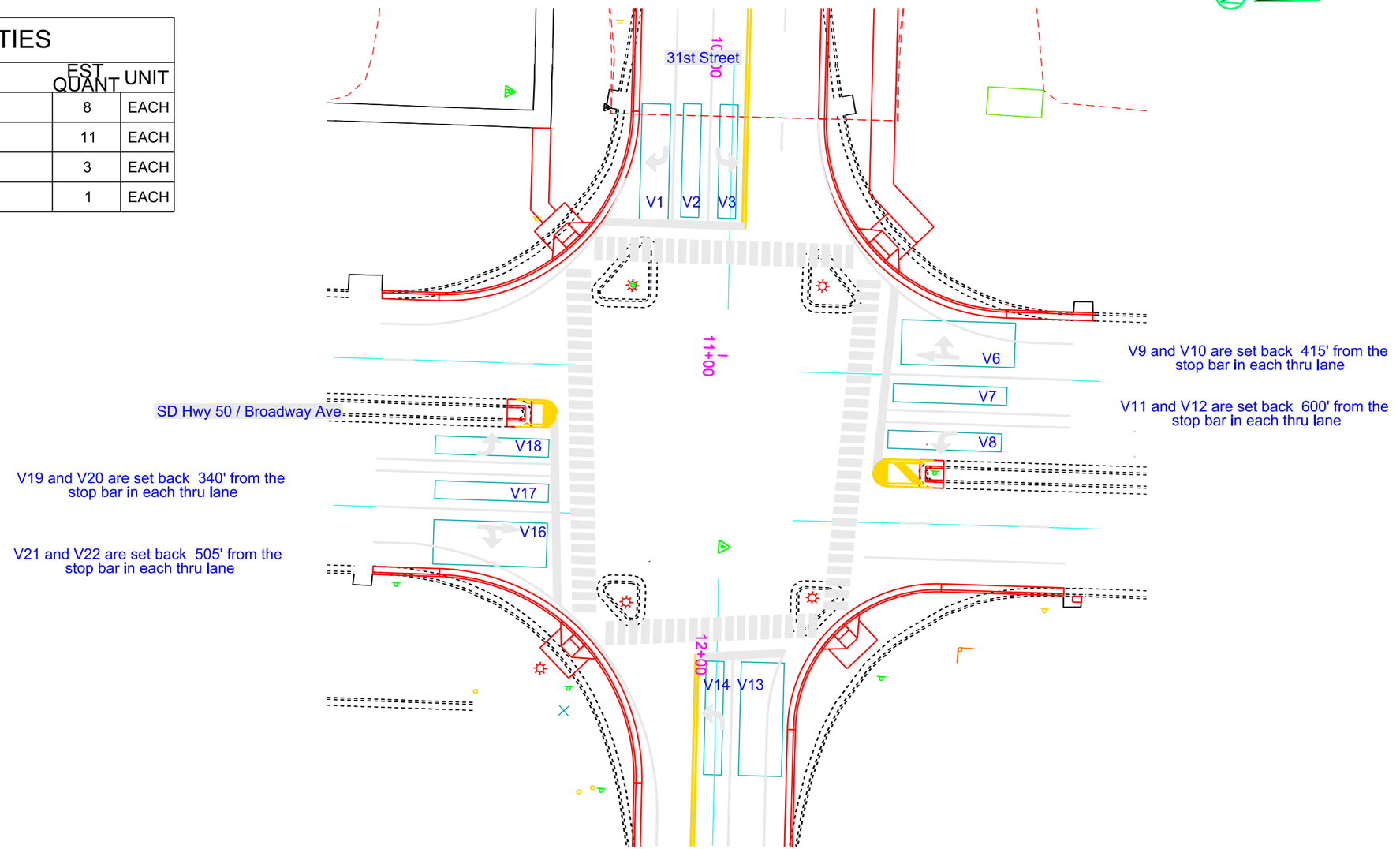
CONDUIT LAYOUT

SD HWY 50 / BROADWAY AVE. & 31ST STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L25-A	L43

Revised 3/21/2024 - RR

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
☐	Video Detection Zones 6' x 38' (Not a Bid Item) (V1-V3, V7-V8, V14, V17-V18)	8	EACH
☐	Video Detection Zones 6' x 6' (Not a Bid Item) (V4-V5, V9-V12, V15,V19-V22)	11	EACH
☐	Video Detection Zones 15' x 38' (Not a Bid Item) V6, V13, V16)	3	EACH
	Video Detection System	1	EACH



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L26	L43

Plotting Date: 02/22/2024

SIGNAL TIMING

SD HWY 50 / BROADWAY AVE. & 4TH STREET

BASIC INTERVALS								
Phase	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBT
Lag								
Min Green	5	15	5	15	5	15	5	156
Extension	2	2	2	2	2	2	2	2
Max 1	7	17.5	5	15.5	7.5	16.5	5	16
Max 2								
Time Before								
Time to Reduce								
Minimum Gap								
Yellow	3	4	3	12	3	4	3	3.5
All Red	3	1.5	4	2.5	3.5	1.5	4	2.5
Walk		7		11.5		7		8.5
Ped Clearance		24.5		34.5		22		36.5
Recall		MIN				MIN		
Prog Flash Display	R	Y	R	R	R	Y	R	R
Start Up Ø		X				X		

PREEMPTION				
Plan	3	4	5	6
Calls Ø	3 & 8	4 & 7	5 & 2	1 & 6
Output	CH13R	CH14R	CH15R	CH16R

WEEKLY PROGRAM							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Timing Plan	2	1	1	1	1	1	2

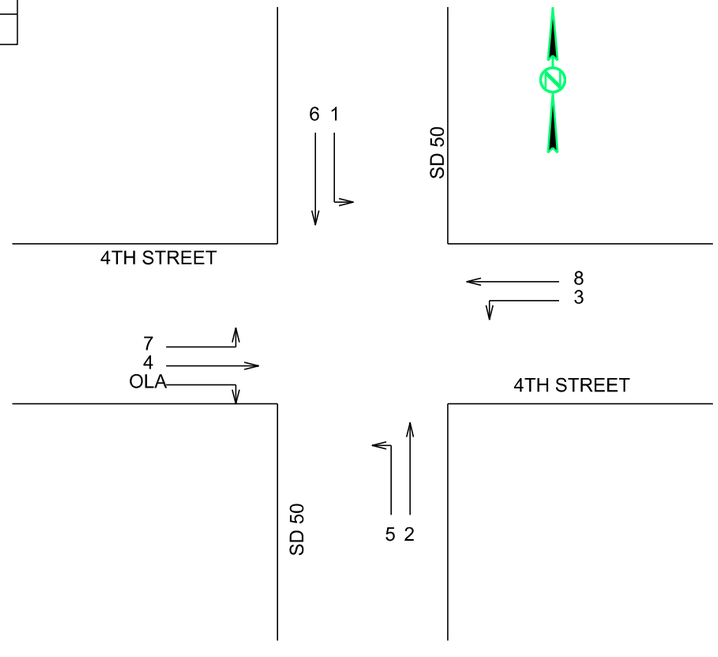
SPLIT PATTERNS										
	Φ1	Φ2	Φ3	Φ4	Φ5	Φ6	Φ7	Φ8		
Coord Phase		x				x				
Pattern (C/S/O)	Split	Split	Split	Split	Split	Split	Split	Split	Cycle Length	Offset
1/1/1	12	37.5	12	54.5	13	36.5	12	54.5	116	0
1/2/2	12	37.5	12	54.5	14.5	35	12	54.5	116	0
1/3/3	12	37.5	12	54.5	12.5	37	12	54.5	116	0
1/4/4	12	37.5	12	54.5	14	35.5	12	54.5	116	0
2/1/1	14	37.5	12	54.5	15	36.5	12	54.5	118	0

TIMING PLAN 1	
Time of Day (TOD)	Pattern (C/S/O)
6:00-7-:00	MAX1
7:00-8:30	1/1/1
8:30-11:00	1/2/2
11:00-13:30	1/3/3
13:30-15:00	1/4/4
15:00-18:00	2/1/1
18:00-22:30	MAX1
22:30-6:00	FLASH

TIMING PLAN 2	
Time of Day (TOD)	Pattern (C/S/O)
6:00-22:30	MAX1
22:30-6:00	FLASH

RING AND BARRIER DESIGN			
Φ1	Φ2	Φ3	Φ4
Φ5 OLA	Φ6	Φ7	Φ8

OVERLAP DEFINITIONS
OLA = 5 + 2 - 4P



DETECTOR TABLE															
		Phase Called (Call/Call Locking/Extend)												Controller Settings	
Local Detector	Controller Detector #	1	2	3	4	5	6	7	8	9	10	11	12	Extend	Delay
V1					C/E										
V2								C/E							
V3-V4							C/E								
V5		C/E													
V6-V7									C/E						
V8				C/E											
V9-V10			C/E												
V11						C/E									
V12					C/E										10

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L27	L43

Plotting Date: 02/22/2024

SIGNAL TIMING

SD HWY 50 / BROADWAY AVE. & 8TH STREET

BASIC INTERVALS								
Phase	1	2	3	4	5	6	7	8
Movement		NBT		EBL-R	NBL	SBT		
Lag								
Min Green		15		10	5	15		
Extension		2		2	2	2		
Max 1		33		16.5	7	20		
Max 2								
Time Before								
Time to Reduce								
Minimum Gap								
Yellow		4		3	3	4		
All Red		1		2.5	3	1		
Walk				7		7		
Ped Clearance				25.5		12		
Recall		MIN				MIN		
Prog Flash Display		Y		R	R	Y		
Start Up Ø		X				X		

PREEMPTION				
Plan	3	4	5	6
Calls Ø		4	5 & 2	6
Output		CH14R	CH15R	CH16R

WEEKLY PROGRAM							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Timing Plan	2	1	1	1	1	1	2

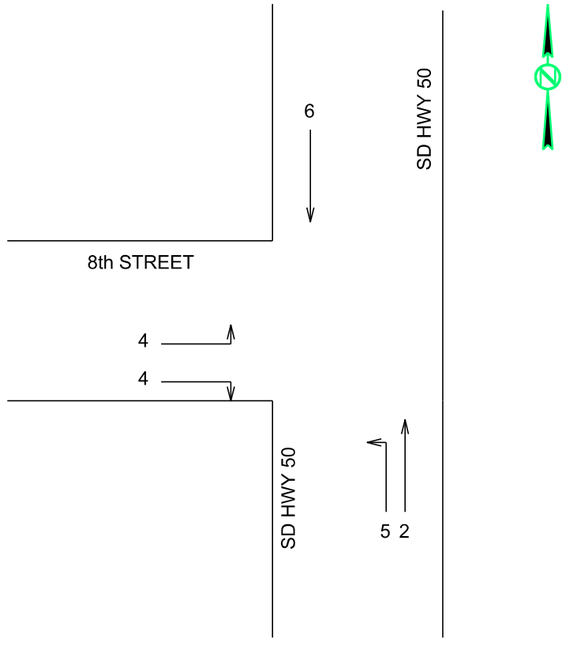
SPLIT PATTERNS										
	Φ1	Φ2	Φ3	Φ4	Φ5	Φ6	Φ7	Φ8		
Coord Phase		X				X				
Pattern (C/S/O)	Split	Split	Split	Split	Split	Split	Split	Split	Cycle Length	Offset
1/1/1		78		38	11	67			116	95
1/1/2		78		38	11	67			116	85
1/1/3		78		38	11	67			116	65
1/1/4		78		38	11	67			116	70
2/1/1		73		45	21	52			118	81

TIMING PLAN 1	
Time of Day (TOD)	Pattern (C/S/O)
6:00-7-:00	MAX1
7:00-8:30	1/1/1
8:30-11:00	1/1/2
11:00-13:30	1/1/3
13:30-15:00	1/1/4
15:00-18:00	2/1/1
18:00-22:30	MAX1
22:30-6:00	FLASH

TIMING PLAN 2	
Time of Day (TOD)	Pattern (C/S/O)
6:00-22:30	MAX1
22:30-6:00	FLASH

RING AND BARRIER DESIGN			
Φ1	Φ2 	Φ3	Φ4 
Φ5 	Φ6 	Φ7	Φ8

DETECTOR TABLE															
		Phase Called (Call/Call Locking/Extend)												Controller Settings	
Local Detector	Controller Detector #	1	2	3	4	5	6	7	8	9	10	11	12	Extend	Delay
V1-V4					C/E										
V3							C/E								10
V4-V5							C/E								
V6-V7			C/E												
V8						C/E									



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L28	L43

Plotting Date: 02/22/2024

SIGNAL TIMING

SD HWY 50 / BROADWAY AVE. & 15TH STREET

BASIC INTERVALS								
Phase	1	2	3	4	5	6	7	8
Movement	SBL	NBT		EBL	NBL	SBT		WBT
Lag								
Min Green	5	15		10	5	15		10
Extension	2	2		2	2	2		2
Max 1	5	25.5		14.5	5	25		14.5
Max 2								
Time Before								
Time to Reduce								
Minimum Gap								
Yellow	3	3.5		4	3	4		4
All Red	2	1		1.5	2	1		1.5
Walk		7		7		7		7
Ped Clearance		8		22		10.5		22
Recall		MIN				MIN		
Prog Flash Display	R	Y		R	R	Y		R
Start Up Ø		X				X		

PREEMPTION				
Plan	3	4	5	6
Calls Ø	8	4	5 & 2	1 & 6
Output	CH13R	CH14R	CH15R	CH16R

WEEKLY PROGRAM							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Timing Plan	2	1	1	1	1	1	2

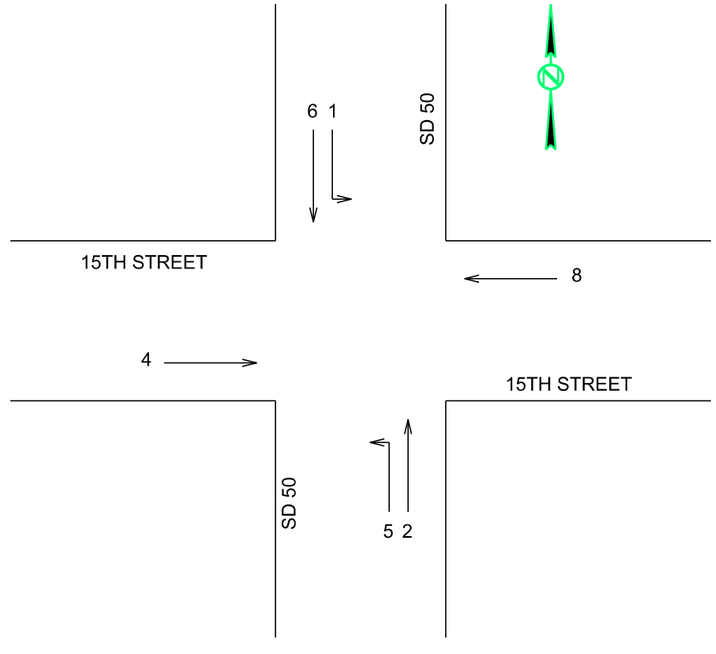
SPLIT PATTERNS										
	Φ1	Φ2	Φ3	Φ4	Φ5	Φ6	Φ7	Φ8		
Coord Phase		X				X				
Pattern (C/S/O)	Split	Split	Split	Split	Split	Split	Split	Split	Cycle Length	Offset
1/1/1	11	59		46	11	59		46	116	14
1/2/2	11	65		40	11	65		40	116	22
1/3/3	10	67		39	10	67		39	116	6
1/4/4	11	64		41	11	64		41	116	20
2/1/1	11	66		41	10	67		41	118	11

TIMING PLAN 1	
Time of Day (TOD)	Pattern (C/S/O)
6:00-7-:00	MAX1
7:00-8:30	1/1/1
8:30-11:00	1/2/2
11:00-13:30	1/3/3
13:30-15:00	1/4/4
15:00-18:00	2/1/1
18:00-22:30	MAX1
22:30-6:00	FLASH

TIMING PLAN 2	
Time of Day (TOD)	Pattern (C/S/O)
6:00-22:30	MAX1
22:30-6:00	FLASH

RING AND BARRIER DESIGN			
Φ1	Φ2	Φ3	Φ4
Φ5	Φ6	Φ7	Φ8

DETECTOR TABLE															
		Phase Called (Call/Call Locking/Extend)												Controller Settings	
Local Detector	Controller Detector #	1	2	3	4	5	6	7	8	9	10	11	12	Extend	Delay
V1					C										
V2					C										
V3-V4							C								
V5		C													
V6									C						
V7-V8			C												
V9						C									



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L29	L43

Plotting Date: 02/22/2024

SIGNAL TIMING

SD HWY 50 / BROADWAY AVE. & 21ST STREET

BASIC INTERVALS								
Phase	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBT	NBL	SBT	RBL	WBT
Lag								
Min Green	5	15	5	15	5	15	5	10
Extension	2	2	2	2	2	2	2	2
Max 1	5	18	6	15	6	17	6.5	14.5
Max 2								
Time Before								
Time to Reduce								
Minimum Gap								
Yellow	3	4	3	4	3	4	3	4
All Red	2	1	2	2	2	1	2.5	1.5
Walk		7		7		7		7
Ped Clearance		12		24		14.5		24.5
Recall		MIN				MIN		
Prog Flash Display	R	Y	R	R	R	Y	R	R
Start Up Ø								

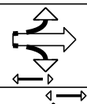
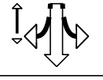
PREEMPTION				
Plan	3	4	5	6
Calls Ø	3 & 8	4 & 7	5 & 2	1 & 6
Output	CH13R	CH14R	CH15R	CH16R

WEEKLY PROGRAM							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Timing Plan	2	1	1	1	1	1	2

SPLIT PATTERNS										
	Φ1	Φ2	Φ3	Φ4	Φ5	Φ6	Φ7	Φ8		
Coord Phase		X				X				
Pattern (C/S/O)	Split	Split	Split	Split	Split	Split	Split	Split	Cycle Length	Offset
1/1/1	11.5	56	11	37.5	12	55.5	11.5	37	116	70
1/1/2	11.5	56	11	37.5	12	55.5	11.5	37	116	65
1/2/3	11.5	56.5	11	37	12	56	11.5	36.5	116	59
1/3/4	11.5	56.5	10.5	37.5	12	56	11.5	36.5	116	65
2/1/1	11.5	58.5	10.5	37.5	12	58	11.5	36.5	118	64

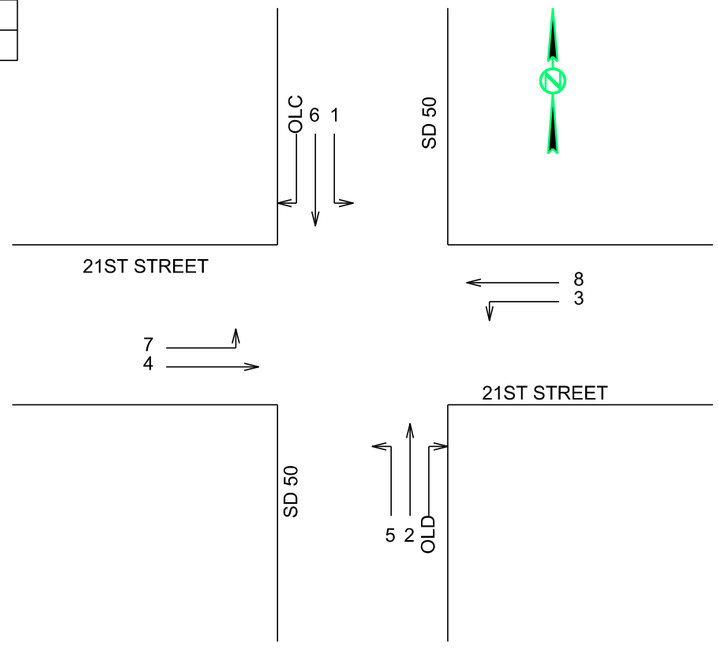
TIMING PLAN 1	
Time of Day (TOD)	Pattern (C/S/O)
6:00-7-:00	MAX1
7:00-8:30	1/1/1
8:30-11:00	1/1/2
11:00-13:30	1/2/3
13:30-15:00	1/3/4
15:00-18:00	2/1/1
18:00-22:30	MAX1
22:30-6:00	FLASH

TIMING PLAN 2	
Time of Day (TOD)	Pattern (C/S/O)
6:00-22:30	MAX1
22:30-6:00	FLASH

RING AND BARRIER DESIGN			
Φ1 	Φ2 	Φ3 	Φ4 
Φ5 	Φ6 	Φ7 	Φ8 

OVERLAP DEFINITIONS
OLC = 7 + 6 - 6P
OLD = 3 + 2 - 2P

DETECTOR TABLE															
		Phase Called (Call/Call Locking/Extend)												Controller Settings	
Local Detector	Controller Detector #	1	2	3	4	5	6	7	8	9	10	11	12	Extend	Delay
V1					C/E										
V2								C/E							
V3							C/E								15
V4-V5							C/E								
V6		C/E													
V7									C/E						
V8				C/E											
V9			C/E												15
V0-V11			C/E												
V12						C/E									



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L30	L43

Plotting Date: 02/22/2024

SIGNAL TIMING

SD HWY 50 / BROADWAY AVE. & 23RD STREET

BASIC INTERVALS								
Phase	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBT
Lag								
Min Green	5	15	5	10	5	15	5	10
Extension	2	2	2	2	2	2	2	2
Max 1	5	16	5	15	6.5	15.5	5	16
Max 2								
Time Before								
Time to Reduce								
Minimum Gap								
Yellow	3	4	4	5	3	3.5	4	4
All Red	3	1	3	1	2.5	1	3	1
Walk		7		8.5		7		8.5
Ped Clearance		16.5		26.5		14.5		26.5
Recall		MIN				MIN		
Prog Flash Display	R	Y	R	R	R	Y	R	R
Start Up Ø		X				X		

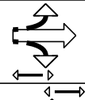
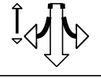
PREEMPTION				
Plan	3	4	5	6
Calls Ø	3 & 8	4 & 7	5 & 2	1 & 6
Output	CH13R	CH14R	CH15R	CH16R

WEEKLY PROGRAM							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Timing Plan	2	1	1	1	1	1	2

SPLIT PATTERNS										
	Φ1	Φ2	Φ3	Φ4	Φ5	Φ6	Φ7	Φ8		
Coord Phase		X				X				
Pattern (C/S/O)	Split	Split	Split	Split	Split	Split	Split	Split	Cycle Length	Offset
1/1/1	11	52	12	41	10.5	52.5	12	41	116	70
1/1/2	11	52	12	41	10.5	52.5	12	41	116	65
1/1/3	11	52	12	41	10.5	52.5	12	41	116	60
1/1/4	11	52	12	41	10.5	52.5	12	41	116	67
2/1/1	11	54	12	41	10.5	54.5	12	41	118	64

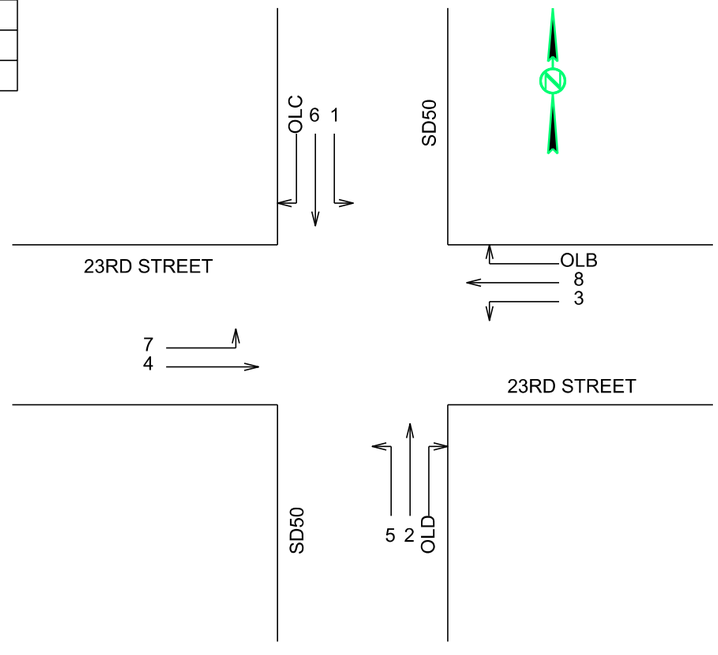
TIMING PLAN 1	
Time of Day (TOD)	Pattern (C/S/O)
6:00-7-:00	MAX1
7:00-8:30	1/1/1
8:30-11:00	1/1/2
11:00-13:30	1/1/3
13:30-15:00	1/1/4
15:00-18:00	2/1/1
18:00-22:30	MAX1
22:30-6:00	FLASH

TIMING PLAN 2	
Time of Day (TOD)	Pattern (C/S/O)
6:00-22:30	MAX1
22:30-6:00	FLASH

RING AND BARRIER DESIGN			
Φ1 	Φ2 	Φ3 	Φ4 
Φ5 	Φ6 	Φ7 	Φ8 

OVERLAP DEFINITIONS
OLB = 1 + 8 - 8P
OLC = 7 + 6 - 6P
OLD = 3 + 2 - 2P

DETECTOR TABLE															
		Phase Called (Call/Call Locking/Extend)												Controller Settings	
Local Detector	Controller Detector #	1	2	3	4	5	6	7	8	9	10	11	12	Extend	Delay
V1					C/E										
V2								C/E							
V3							C/E								10
V4-V5							C/E								
V6		C/E													
V7									C/E						10
V8									C/E						
V9				C/E											
V10			C/E												10
V11-V12			C/E												
V13						C/E									



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Plotted From - TPPR17199

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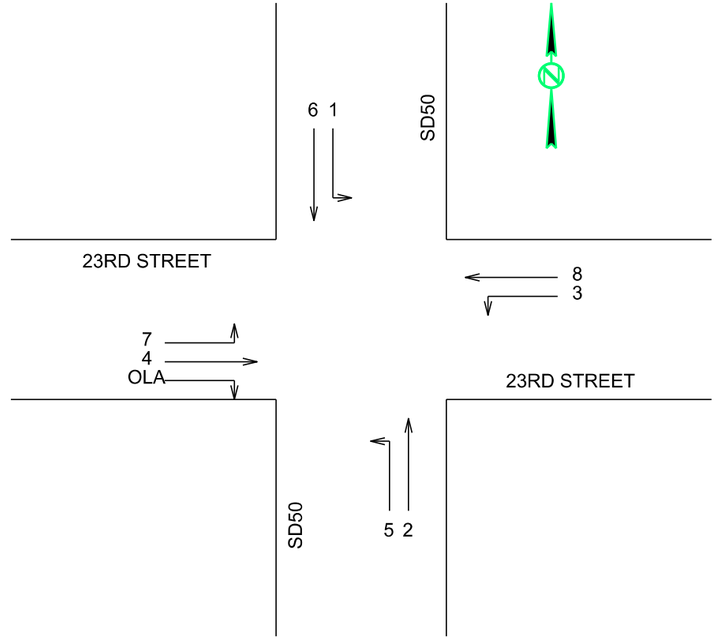
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L30-A	L43

Revised 3/21/2024 - RR

SIGNAL TIMING

SD HWY 50 / BROADWAY AVE. & 31ST STREET

DETECTOR TABLE															
		Phase Called (Call/Call Locking/Extend)												Controller Settings	
Local Detector	Controller Detector #	1	2	3	4	5	6	7	8	9	10	11	12	Extend	Delay
V1					C/E										
V2								C/E							
V3							C/E								10
V4-V5							C/E								
V6		C/E													
V7									C/E						10
V8									C/E						
V9				C/E											
V10			C/E												10
V11-V12			C/E												
V13						C/E									



TRAFFIC SIGNAL WIRING TABLES

SD HWY 50/BROADWAY AVE. & 4TH STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L31	L43

Plotting Date: 02/22/2024

POLE: A1 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
1R	Red	RED	RA	1	1
1Y	Orange	ORANGE	YA	1	1
9Y	Yellow	YELLOW	FYA	1	1
1G	Blue	BLUE	GA	1	1
N	Black	BLACK	N	1	1
6R	Red/Black	RED	R	2	6
6Y	Orange/Black	ORANGE	Y	2	6
6G	Blue/Black	BLUE	G	2	6
N	Yellow/Black	BLACK	N	2	6
6R	Black/Red	RED	R	3	6
6Y	Orange/Red	ORANGE	Y	3	6
6G	Blue/Red	BLUE	G	3	6
N	Brown/Black	BLACK	N	3	6
6R	Brown/Red	RED	R	5	6
6Y	Orange/Blue	ORANGE	Y	5	6
6G	Red/Blue	BLUE	G	5	6
N	Black/Blue	BLACK	N	5	6
10R	Red/Orange	RED	DW	21	4P
10G	Blue/Orange	BLUE	W	21	4P
N	Brown/Blue	BLACK	N	21	4P
11R	Yellow/Red	RED	DW	22	6P
11G	Yellow/Blue	BLUE	W	22	6P
N	Black/Orange	ORANGE	N	22	6P
	Yellow/Orange				
	Brown				

POLE: A1 CABLE SIZE: 6/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
3R	Red	RED	RA	4	3
3G	Blue	BLUE	GA	4	3
N	Black	BLACK	N	4	3
3Y	Orange	ORANGE	YA	4	3
10Y	Yellow	YELLOW	FYA	4	3
	Brown				

POLE: A2 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
3R	Red	RED	RA	6	3
3Y	Orange	ORANGE	YA	6	3
10Y	Yellow/Orange	YELLOW	FYA	6	3
3G	Blue	BLUE	GA	6	3
N	Black	BLACK	N	6	3
8R	Red/Black	RED	R	7	8
8Y	Orange/Black	ORANGE	Y	7	8
8G	Blue/Black	BLUE	G	7	8
N	Yellow/Black	BLACK	N	7	8
8R	Black/Red	RED	R	8	8
8Y	Orange/Red	ORANGE	Y	8	8
8G	Blue/Red	BLUE	G	8	8
N	Brown/Black	BLACK	N	8	8
8R	Red/Blue	RED	R	10	8
8Y	Orange/Blue	ORANGE	Y	10	8
8G	Yellow/Blue	BLUE	G	10	8
N	Black/Blue	BLACK	N	10	8
11R	Yellow/Red	RED	DW	23	6P
11G	Blue/Orange	BLUE	W	23	6P
N	Brown	BLACK	N	23	6P
12R	Red/Orange	RED	DW	24	8P
12G	Brown/Blue	BLUE	W	24	8P
N	Black/Orange	BLACK	N	24	8P
	Yellow				
	Brown/Red				

POLE: CABLE SIZE: 6/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
5R	Red	RED	RA	9	5
5Y	Orange	ORANGE	YA	9	5
11Y	Yellow	YELLOW	FYA	9	5
5G	Blue	BLUE	GA	9	5
N	Black	BLACK	N	9	5
	Brown				

POLE: A3 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
5R	Red	RED	RA	11	5
5Y	Orange	ORANGE	YA	11	5
11Y	Yellow	YELLOW	FYA	11	5
5G	Blue	BLUE	GA	11	5
N	Black	BLACK	N	11	5
2R	Red/Black	RED	R	12	2
2Y	Orange/Black	ORANGE	Y	12	2
2G	Blue/Black	BLUE	G	12	2
N	Yellow/Black	BLACK	N	12	2
2R	Black/Red	RED	R	13	2
2Y	Orange/Red	ORANGE	Y	13	2
2G	Blue/Red	BLUE	G	13	2
N	Brown/Black	BLACK	N	13	2
7R	Red/Blue	RED	RA	14	7
7Y	Orange/Blue	ORANGE	YA	14	7
12Y	Yellow/Red	YELLOW	FYA	14	7
7G	Yellow/Blue	BLUE	GA	14	7
N	Black/Blue	BLACK	N	14	7
12R	Red/Orange	RED	DW	25	8P
12G	Brown/Blue	BLUE	W	25	8P
N	Black/Orange	BLACK	N	25	8P
9R	Brown/Red	RED	DW	26	2P
9G	Blue/Orange	BLUE	W	26	2P
N	Brown	BLACK	N	26	2P
	Yellow/Orange				

POLE: A3 CABLE SIZE: 6/C

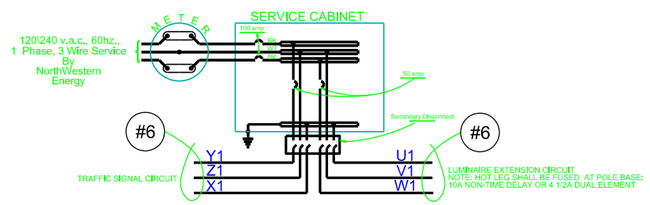
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
2R	Red	RED	R	15	2
2Y	Orange	ORANGE	Y	15	2
2G	Blue	BLUE	G	15	2
N	Black	BLACK	N	15	2
	Yellow				
	Brown				

POLE: A4 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
7R	Red	RED	RA	16	7
7Y	Orange	ORANGE	YA	16	7
12Y	Yellow	YELLOW	FYA	16	7
7G	Blue	BLUE	GA	16	7
N	Black	BLACK	N	16	7
4R	Red/Black	RED	R	17	4
4Y	Orange/Black	ORANGE	Y	17	4
4G	Blue/Black	BLUE	G	17	4
N	Yellow/Black	BLACK	N	17	4
1R	Black/Red	RED	RA	19	1
1Y	Orange/Red	ORANGE	YA	19	1
9Y	Yellow/Blue	YELLOW	FYA	19	1
1G	Red/Blue	BLUE	GA	19	1
N	Brown/Black	BLACK	N	19	1
9R	Red/Orange	RED	DW	27	2P
9G	Blue/Orange	BLUE	W	27	2P
N	Black/Orange	BLACK	N	27	2P
10R	Brown/Red	RED	DW	28	4P
10G	Brown/Blue	BLUE	W	28	4P
N	Brown	BLACK	N	28	4P
	Blue/Red				
	Orange/Blue				
	Black/Blue				
	Yellow/Red				
	Yellow/Orange				

POLE: A4 CABLE SIZE: 6/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
4R	Red	RED	R	18	4
4Y	Orange	ORANGE	Y	18	4
4G	Blue	BLUE	G	18	4
13Y	Yellow	YELLOW	YA	18	4
13G	Brown	BROWN	GA	18	4
N	Black	BLACK	N	18	4



TRAFFIC SIGNAL WIRING TABLES

SD HWY 50/BROADWAY AVE. & 8TH STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L32	L43

Plotting Date: 02/22/2024

POLE: A4 CABLE SIZE: 6/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
4R	Red	RED	R	20	4
4Y	Orange	ORANGE	Y	20	4
4G	Blue	BLUE	G	20	4
13Y	Yellow	YELLOW	YA	20	4
13G	Brown	BROWN	GA	20	4
N	Black	BLACK	N	20	4

POLE: B1 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
6R	Red/Black	RED	R	1	6
6Y	Orange/Black	ORANGE	Y	1	6
6G	Blue/Black	BLUE	G	1	6
N	Yellow/Black	BLACK	N	1	6
6R	Black/Red	RED	R	2	6
6Y	Orange/Red	ORANGE	Y	2	6
6G	Blue/Red	BLUE	G	2	6
N	Brown/Black	BLACK	N	2	6
6R	Red	RED	R	4	6
6Y	Orange	ORANGE	Y	4	6
6G	Blue	BLUE	G	4	6
N	Black	BLACK	N	4	6
10R	Brown/Red	RED	DW	15	4P
10G	Red/Blue	BLUE	W	15	4P
N	Black/Blue	BLACK	N	15	4P
11R	Red/Orange	RED	DW	16	6P
11G	Blue/Orange	BLUE	W	16	6P
N	Black/Orange	BLACK	N	16	6P
	Yellow				
	Brown				
	Yellow/Red				
	Orange/Blue				
	Yellow/Blue				
	Brown/Blue				
	Yellow/Orange				

POLE: B1 CABLE SIZE: 6/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
6R	Red	RED	R	3	6
6Y	Orange	ORANGE	Y	3	6
6G	Blue	BLUE	G	3	6
N	Black	BLACK	N	3	6
	Yellow				
	Brown				

POLE: B2 CABLE SIZE: 15/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
5R	Red	RED	RA	5	5
5Y	Orange	ORANGE	YA	5	5
11Y	Yellow	YELLOW	FYA	5	5
5G	Blue	BLUE	GA	5	5
N	Black	BLACK	N	5	5
11R	Red/Black	RED	DW	17	6P
11G	Blue/Black	BLUE	W	17	6P
N	Orange/Black	BLACK	N	17	6P
15R	Black/Red	RED	DW	18	8P
12G	Blue/Red	BLUE	W	18	8P
N	Brown/Black	BLACK	N	18	8P
	Brown				
	Yellow/Black				
	Orange/Red				
	Yellow/Red				

POLE: B3 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
2R	Red	RED	R	7	2
2Y	Orange	ORANGE	Y	7	2
2R	Blue	BLUE	G	7	2
N	Black	BLACK	N	7	2
2R	Red/Black	RED	R	8	2
2Y	Orange/Black	ORANGE	Y	8	2
2G	Blue/Black	BLUE	G	8	2
N	Yellow/Black	BLACK	N	8	2
4R	Red/Blue	RED	R	9	4
4Y	Orange/Blue	ORANGE	Y	9	4
4G	Yellow/Blue	BLUE	G	9	4
N	Black/Blue	BLACK	N	9	4
2R	Black/Red	RED	R	10	2
2Y	Orange/Red	ORANGE	Y	10	2
2G	Blue/Red	BLUE	G	10	2
N	Brown/Black	BLACK	N	10	2
12R	Red/Orange	RED	R	19	8P
12G	Blue/Orange	BLUE	G	19	8P
N	Black/Orange	BLACK	N	19	8P
	Yellow				
	Brown				
	Yellow/Red				
	Brown/Red				
	Brown/Blue				
	Yellow/Orange				

POLE: CABLE SIZE: 6/C

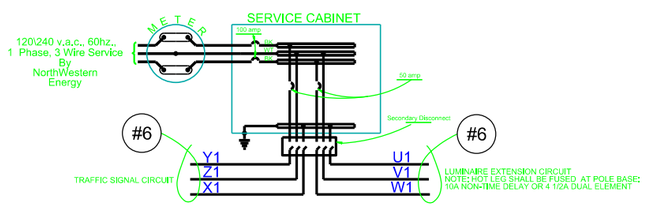
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
5R	Red	RED	RA	6	5
5Y	Orange	ORANGE	YA	6	5
11Y	Yellow	YELLOW	FYA	6	5
5G	Blue	BLUE	GA	6	5
N	Black	BLACK	N	6	5
	Brown				

POLE: B4 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
4R	Red	RED	R	11	4
4G	Blue	BLUE	Y	11	4
4Y	Orange	ORANGE	G	11	4
N	Black	BLACK	N	11	4
4R	Red/Black	RED	R	12	4
4Y	Orange/Black	ORANGE	Y	12	4
4G	Blue/Black	BLUE	G	12	4
N	Yellow/Black	BLACK	N	12	4
4R	Black/Red	RED	R	13	4
4Y	Orange/Red	ORANGE	Y	13	4
4G	Blue/Red	BLUE	G	13	4
N	Brown/Black	BLACK	N	13	4
6R	Brown/Red	RED	R	14	6
6Y	Orange/Blue	ORANGE	Y	14	6
6G	Red/Blue	BLUE	G	14	6
N	Black/Blue	BLACK	N	14	6
	Yellow				
	Brown				
	Yellow/Red				

POLE: CABLE SIZE: 4/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
10R	Red	RED	DW	20	4P
10G	Blue	BLUE	W	20	4P
N	Black	BLACK	N	20	4P
	Orange				



TRAFFIC SIGNAL WIRING TABLES

SD HWY 50/BROADWAY AVE. & 15TH STREET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L33	L43

Plotting Date: 02/22/2024

POLE: C1 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
6R	Red	RED	R	2	6
6Y	Orange	ORANGE	Y	2	6
6G	Blue	BLUE	G	2	6
N	Black	BLACK	N	2	6
6R	Red/Black	RED	R	3	6
6Y	Orange/Black	ORANGE	Y	3	6
6G	Blue/Black	BLUE	G	3	6
N	Yellow/Black	BLACK	N	3	6
8R	Red/Blue	RED	R	4	8
8Y	Orange/Blue	ORANGE	Y	4	8
8G	Yellow/Blue	BLUE	G	4	8
N	Black/Blue	BLACK	N	4	8
6R	Black/Red	RED	R	5	6
6Y	Orange/Red	ORANGE	Y	5	6
6G	Blue/Red	BLUE	G	5	6
N	Brown/Black	BLACK	N	5	6
10R	Red/Orange	RED	DW	18	4P
10G	Blue/Orange	BLUE	W	18	4P
N	Black/Orange	BLACK	N	18	4P
11R	Brown/Red	RED	DW	19	6P
11G	Brown/Blue	BLUE	W	19	6P
N	Brown	BLACK	N	19	6P
	Yellow				
	Yellow/Red				
	Yellow/Orange				

POLE: C2 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
8R	Red/Black	RED	R	6	8
8Y	Orange/Black	ORANGE	Y	6	8
8G	Blue/Black	BLUE	G	6	8
N	Yellow/Black	BLACK	N	6	8
5R	Red	RED	RA	7	5
5Y	Orange	ORANGE	YA	7	5
11Y	Yellow	YELLOW	FYA	7	5
5G	Blue	BLUE	GA	7	5
N	Black	BLACK	N	7	5
8R	Black/Red	RED	R	8	8
8Y	Orange/Red	ORANGE	Y	8	8
8G	Blue/Red	BLUE	G	8	8
N	Brown/Black	BLACK	N	8	8
11R	Brown/Red	RED	DW	20	6P
11G	Orange/Blue	BLUE	W	20	6P
N	Black/Blue	BLACK	N	20	6P
12R	Yellow/Red	RED	DW	21	8P
12G	Red/Blue	BLUE	W	21	8P
N	Brown	BLACK	N	21	8P

POLE: C3 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
5R	Red	RED	RA	9	5
5Y	Orange	ORANGE	YA	9	5
11Y	Yellow	YELLOW	FYA	9	5
5G	Blue	BLUE	GA	9	5
N	Black	BLACK	N	9	5
2R	Red/Black	RED	R	10	2
2Y	Orange/Black	ORANGE	Y	10	2
2G	Blue/Black	BLUE	G	10	2
N	Yellow/Black	BLACK	N	10	2
2R	Black/Red	RED	R	11	2
2Y	Orange/Red	ORANGE	Y	11	2
2G	Blue/Red	BLUE	G	11	2
N	Brown/Black	BLACK	N	11	2
2R	Yellow/Red	RED	R	13	2
2Y	Orange/Blue	ORANGE	Y	13	2
2G	Red/Blue	BLUE	G	13	2
N	Black/Blue	BLACK	N	13	2
12R	Red/Orange	RED	DW	22	8P
12G	Brown/Blue	BLUE	W	22	8P
N	Black/Orange	BLACK	N	22	8P
9R	Brown/Red	RED	DW	23	2P
9G	Blue/Orange	BLUE	W	23	2P
N	Brown	BLACK	N	23	2P
	Yellow/Blue				
	Yellow/Orange				

POLE: C4 CABLE SIZE: 25/C

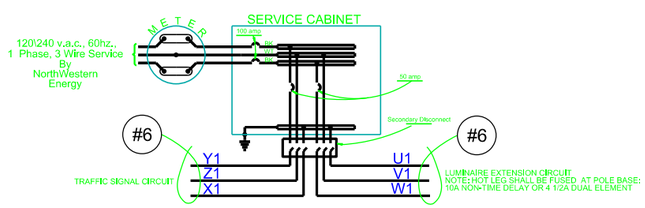
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
4R	Red/Black	RED	RA	14	4
4Y	Orange/Black	ORANGE	YA	14	4
12Y	Yellow/Black	YELLOW	FYA	14	4
N	Blue/Black	BLACK	N	14	4
4R	Black/Red	RED	R	15	4
4Y	Orange/Red	ORANGE	Y	15	4
4G	Blue/Red	BLUE	G	15	4
N	Brown/Black	BLACK	N	15	4
4R	Yellow/Red	RED	R	16	4
4Y	Orange/Blue	ORANGE	Y	16	4
4G	Black/Blue	BLUE	G	16	4
N	Black/Orange	BLACK	N	16	4
1R	Red	RED	RA	17	1
1Y	Orange	ORANGE	YA	17	1
9Y	Yellow	YELLOW	FYA	17	1
1G	Blue	BLUE	GA	17	1
N	Black	BLACK	N	17	1
10R	Red/Blue	RED	DW	24	4P
10G	Yellow/Blue	BLUE	W	24	4P
N	Brown/Blue	BLACK	N	24	4P
9R	Red/Orange	RED	DW	25	2P
9G	Blue/Orange	BLUE	W	25	2P
N	Brown/Red	BLACK	N	25	2P
	Brown				
	Yellow/Orange				

POLE: C1 CABLE SIZE: 7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
1R	Red	RED	RA	1	1
1Y	Orange	ORANGE	YA	1	1
9Y	Yellow	YELLOW	FYA	1	1
1G	Blue	BLUE	GA	1	1
N	Black	BLACK	N	1	1
	Brown				

POLE: C3 CABLE SIZE: 7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
4R	Red	RED	RA	12	4
4Y	Orange	ORANGE	YA	12	4
12Y	Yellow	YELLOW	FYA	12	4
N	Black	BLACK	N	12	4
	Blue				
	Brown				



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L34	L43

Plotting Date: 02/22/2024

TRAFFIC SIGNAL WIRING TABLES

SD HWY 50/BROADWAY AVE. & 21ST STREET

POLE: D1 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
1R	Red	RED	RA	1	1
1Y	Orange	ORANGE	YA	1	1
9Y	Yellow	YELLOW	FYA	1	1
1G	Blue	BLUE	GA	1	1
N	Black	BLACK	N	1	1
6R	Black/Red	RED	R	2	6
6Y	Orange/Red	ORANGE	Y	2	6
6G	Blue/Red	BLUE	G	2	6
N	Black/Blue	BLACK	N	2	6
3R	Red/Blue	RED	R	3	6
3Y	Orange/Blue	ORANGE	Y	3	6
3G	Yellow/Blue	BLUE	G	3	6
N	Black/Orange	BLACK	N	3	6
3R	Red/Black	RED	RA	4	3
3Y	Orange/Black	ORANGE	YA	4	3
10Y	Yellow/Black	YELLOW	FYA	4	3
3G	Blue/Black	BLUE	GA	4	3
N	Brown/Black	BLACK	N	4	3
10R	Red/Orange	RED	DW	19	4P
10G	Blue/Orange	BLUE	W	19	4P
N	Brown	BLACK	N	19	4P
11R	Yellow/Red	RED	DW	20	6P
11G	Brown/Blue	BLUE	W	20	6P
N	Brown/Red	BLACK	N	20	6P
	Yellow/Orange				

POLE: D1 CABLE SIZE: 7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
6R	Red	RED	R	5	6
6Y	Orange	ORANGE	Y	5	6
6G	Blue	BLUE	G	5	6
15Y	Yellow	YELLOW	YA	5	OLC
15G	Brown	BROWN	GA	5	OLC
N	Black	BLACK	N	5	6
	Red/Black				

POLE: D1 CABLE SIZE: 7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
6R	Red	RED	R	27	6
6Y	Orange	ORANGE	Y	27	6
6G	Blue	BLUE	G	27	6
15Y	Yellow	YELLOW	YA	27	OLC
15G	Brown	BROWN	GA	27	OLC
N	Black	BLACK	N	27	6
	Red/Black				

POLE: D2 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
3R	Red	RED	RA	6	3
3Y	Orange	ORANGE	YA	6	3
10Y	Yellow	YELLOW	FYA	6	3
3G	Blue	BLUE	GA	6	3
N	Black	BLACK	N	6	3
8R	Blue/Red	RED	R	7	8
8Y	Orange/Red	ORANGE	Y	7	8
8G	Red/Blue	BLUE	G	7	8
N	Black/Blue	BLACK	N	7	8
5R	Red/Black	RED	RA	8	5
5Y	Orange/Black	ORANGE	YA	8	5
11Y	Yellow/Black	YELLOW	FYA	8	5
5G	Blue/Black	BLUE	GA	8	5
N	Brown/Black	BLACK	N	8	5
8R	Yellow/Red	RED	R	9	8
8Y	Orange/Blue	ORNAGE	Y	9	8
8G	Yellow/Blue	BLUE	G	9	8
N	Black/Red	BLACK	N	9	8
12R	Red/Orange	RED	DW	22	8P
12G	Blue/Orange	BLUE	W	22	8P
N	Black/Orange	BLACK	N	22	8P
	Brown				
	Brown/Red				
	Brown/Blue				
	Yellow/Orange				

POLE: D2 CABLE SIZE: 3/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
11R	Red	RED	DW	21	6P
11G	Blue	BLUE	W	21	6P
N	Black	BLACK	N	21	6P

POLE: D3 CABLE SIZE: 25/C

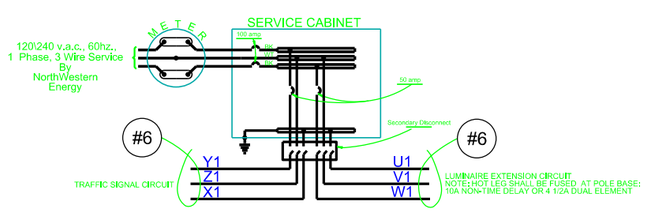
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
5R	Red	RED	RA	10	5
5Y	Orange	ORANGE	YA	10	5
11Y	Yellow	YELLOW	FYA	10	5
5G	Blue	BLUE	GA	10	5
N	Black	BLACK	N	10	5
2R	Yellow/Red	RED	R	11	2
2Y	Orange/Red	ORANGE	Y	11	2
2G	Blue/Red	BLUE	G	11	2
N	Black/Red	BLACK	N	11	2
2R	Red/Blue	RED	R	12	2
2Y	Orange/Blue	ORANGE	Y	12	2
2G	Yellow/Blue	BLUE	G	12	2
N	Black/Blue	BLACK	N	12	2
7R	Red/Black	RED	RA	13	7
7Y	Orange/Black	ORANGE	YA	13	7
12Y	Yellow/Black	YELLOW	FYA	13	7
7G	Blue/Black	BLUE	GA	13	7
N	Brown/Black	BLACK	N	13	7
12R	Brown/Red	RED	DW	23	8P
12G	Brown/Blue	BLUE	W	23	8P
N	Black/Orange	BLACK	N	23	8P
9R	Red/Orange	RED	DW	24	2P
9G	Blue/Orange	BLUE	W	24	2P
N	Brown	BLACK	N	24	2P
	Yellow/Orange				

POLE: D3 CABLE SIZE: 7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
2R	Red	RED	R	14	2
2Y	Orange	ORANGE	Y	14	2
2G	Blue	BLUE	G	14	2
16Y	Yellow	YELLOW	YA	14	OLD
16G	Brown	BROWN	GA	14	OLD
N	Black	BLACK	N	14	2
	Red/Black				

POLE: D3 CABLE SIZE: 7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
2R	Red	RED	R	28	2
2Y	Orange	ORANGE	Y	28	2
2G	Blue	BLUE	G	28	2
16Y	Yellow	YELLOW	YA	28	OLD
16G	Brown	BROWN	GA	28	OLD
N	Black	BLACK	N	28	2
	Red/Black				



TRAFFIC SIGNAL WIRING TABLES

SD HWY 50/BROADWAY AVE. & 23RD STREET

POLE: D4 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
4R	Red/Black	RED	R	16	4
4Y	Orange/Black	ORANGE	Y	16	4
4G	Blue/Black	BLUE	G	16	4
N	Yellow/Black	BLACK	N	16	4
1R	Red	RED	RA	17	1
1Y	Orange	ORANGE	YA	17	1
9Y	Yellow	YELLOW	FYA	17	1
1G	Blue	BLUE	GA	17	1
N	Black	BLACK	N	17	1
4R	Black/Red	RED	R	18	4
4Y	Orange/Red	ORANGE	Y	18	4
4G	Blue/Red	BLUE	G	18	4
N	Brown/Black	BLACK	N	18	4
9R	Brown/Red	RED	DW	25	2P
9G	Red/Blue	BLUE	W	25	2P
N	Black/Blue	BLACK	N	25	2P
10R	Red/Orange	RED	DW	26	4P
10G	Blue/Orange	BLUE	W	26	4P
N	Black/Orange	BLACK	N	26	4P
	Brown				
	Yellow/Red				
	Orange/Blue				
	Yellow/Blue				
	Brown/Blue				
	Yellow/Orange				

POLE: D4 CABLE SIZE: 7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
7G	Blue	BLUE	G	15	7
7R	Red	RED	RA	15	7
7Y	Orange	ORANGE	YA	15	7
12Y	Yellow	YELLOW	FYA	15	7
N	Black	BLACK	N	15	7
	Brown				
	Red/Black				

POLE: E1 CABLE SIZE: 25/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
1R	Red	RED	RA	1	1
1Y	Orange	ORANGE	YA	1	1
1G	Blue	BLUE	GA	1	1
N	Black	BLACK	N	1	1
6R	Red/Black	RED	R	2	6
6Y	Orange/Black	ORANGE	Y	2	6
6G	Blue/Black	BLUE	G	2	6
N	Yellow/Black	BLACK	N	2	6
6R	Yellow/Red	RED	R	3	6
6Y	Orange/Red	ORANGE	Y	3	6
6G	Blue/Red	BLUE	G	3	6
N	Brown/Black	BLACK	N	3	6
6R	Brown/Red	RED	R	5	6
6Y	Orange/Blue	ORANGE	Y	5	6
6G	Red/Blue	BLUE	G	5	6
N	Black/Blue	BLACK	N	5	6
10R	Red/Orange	RED	DW	19	4P
10G	Blue/Orange	BLUE	W	19	4P
N	Black/Orange	BLACK	N	19	4P
11R	Black/Red	RED	DW	20	6P
11G	Yellow/Blue	BLUE	W	20	6P
N	Brown	BLACK	N	20	6P
	Yellow				
	Brown/Blue				
	Yellow/Orange				

POLE: E1 CABLE SIZE: 5/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
3R	Red	RED	RA	4	3
3Y	Orange	ORANGE	YA	4	3
10Y	Yellow	YELLOW	FYA	4	3
N	Black	BLACK	N	4	3
	Blue				

POLE: E2 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
3R	Red	RED	RA	6	3
3Y	Orange	ORANGE	YA	6	3
10Y	Yellow	YELLOW	FYA	6	3
N	Black	BLACK	N	6	3
8R	Red/Black	RED	R	7	8
8Y	Orange/Black	ORANGE	Y	7	8
8G	Blue/Black	BLUE	G	7	8
N	Yellow/Black	BLACK	N	7	8
5R	Blue/Red	RED	RA	8	5
5Y	Orange/Red	ORANGE	YA	8	5
5G	Orange/Blue	BLUE	GA	8	5
N	Brown/Black	BLACK	N	8	5
11R	Brown/Red	RED	DW	21	6P
11G	Black/Blue	BLUE	W	21	6P
N	Black/Red	BLACK	N	21	6P
12R	Yellow/Red	RED	DW	22	8P
12G	Red/Blue	BLUE	W	22	8P
N	Brown	BLACK	N	22	8P
	Blue				

POLE: E2 CABLE SIZE: 7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
8R	Red	RED	R	9	8
8Y	Orange	ORANGE	Y	9	8
8G	Blue	BLUE	G	9	8
14Y	Yellow	YELLOW	YA	9	OLB
14G	Brown	BROWN	GA	9	OLB
N	Black	BLACK	N	9	8
	Red/Black				

POLE: E2 CABLE SIZE: 7/C

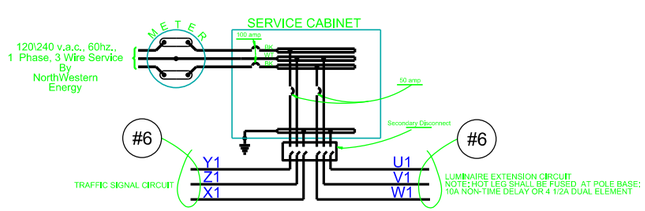
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
8R	Red	RED	R	27	8
8Y	Orange	ORANGE	Y	27	8
8G	Blue	BLUE	G	27	8
14Y	Yellow	YELLOW	YA	27	OLB
14G	Brown	BROWN	GA	27	OLB
N	Black	BLACK	N	27	8
	Red/Black				

POLE: E3 CABLE SIZE: 5/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
5R	Red	RED	RA	10	5
5G	Blue	BLUE	YA	10	5
5Y	Orange	ORANGE	GA	10	5
N	Black	BLACK	N	10	5
	Yellow				

POLE: E3 CABLE SIZE: 7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
2R	Red	RED	R	28	2
2Y	Orange	ORANGE	Y	28	2
2G	Blue	BLUE	G	28	2
16Y	Yellow	YELLOW	YA	28	OLD
16G	Brown	BROWN	GA	28	OLD
N	Black	BLACK	N	28	2
	Red/Black				



TRAFFIC SIGNAL WIRING TABLES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L36	L43

Plotting Date: 02/22/2024

POLE: E3 CABLE SIZE: 25/C

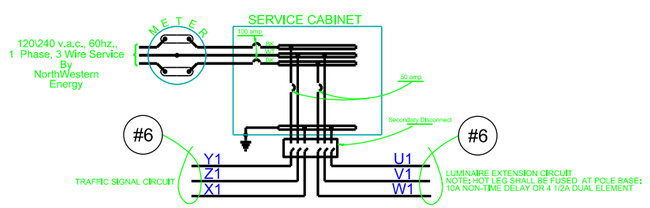
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
2R	Red/Black	RED	R	11	2
2Y	Orange/Black	ORANGE	Y	11	2
2G	Blue/Black	BLUE	G	11	2
N	Yellow/Black	BLACK	N	11	2
2R	Black/Red	RED	R	12	2
2Y	Orange/Red	ORANGE	Y	12	2
2G	Blue/Red	BLUE	G	12	2
N	Brown/Black	BLACK	N	12	2
7R	Yellow/Red	RED	RA	13	7
7Y	Orange/Blue	ORANGE	YA	13	7
12Y	Yellow/Blue	YELLOW	FYA	13	7
N	Black/Blue	BLACK	N	13	7
2R	Red	RED	R	14	2
2Y	Orange	ORANGE	Y	14	2
2G	Blue	BLUE	G	14	2
16Y	Yellow	YELLOW	YA	14	OLD
16G	Brown	BROWN	GA	14	OLD
N	Black	BLACK	N	14	2
12R	Red/Blue	RED	DW	23	8P
12G	Blue/Orange	BLUE	W	23	8P
N	Black/Orange	BLACK	N	23	8P
9R	Red/Orange	RED	DW	24	2P
9G	Brown/Blue	BLUE	W	24	2P
N	Brown/Red	BLACK	N	24	2P
	Yellow/Orange				

POLE: E4 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
7R	Red	RED	RA	15	7
7Y	Orange	ORANGE	YA	15	7
12Y	Yellow	YELLOW	FYA	15	7
N	Black	BLACK	N	15	7
4R	Red/Black	RED	R	16	4
4Y	Orange/Black	ORANGE	Y	16	4
4G	Blue/Black	BLUE	G	16	4
N	Yellow/Black	BLACK	N	16	4
4R	Black/Red	RED	R	18	4
4Y	Orange/Red	ORANGE	Y	18	4
4G	Blue/Red	BLUE	G	18	4
N	Brown/Black	BLACK	N	18	4
9R	Brown/Red	RED	DW	25	2P
9G	Orange/Blue	BLUE	W	25	2P
N	Black/Blue	BLACK	N	25	2P
10R	Yellow/Red	RED	DW	26	4P
10G	Red/Blue	BLUE	W	26	4P
N	Brown	BLACK	N	26	4P
	Blue				

POLE: E4 CABLE SIZE: 7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
1R	Red	RED	RA	17	1
1Y	Orange	ORANGE	YA	17	1
1G	Blue	BLUE	GA	17	1
N	Black	BLACK	N	17	1
	Yellow				
	Brown				
	Red/Black				



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L37	L43

Plotting Date: 02/22/2024

SPECIFICATIONS

1. *Design Specifications: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, Sixth Edition 2013 with 2015 interims.*
2. *Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.*

GENERAL NOTES

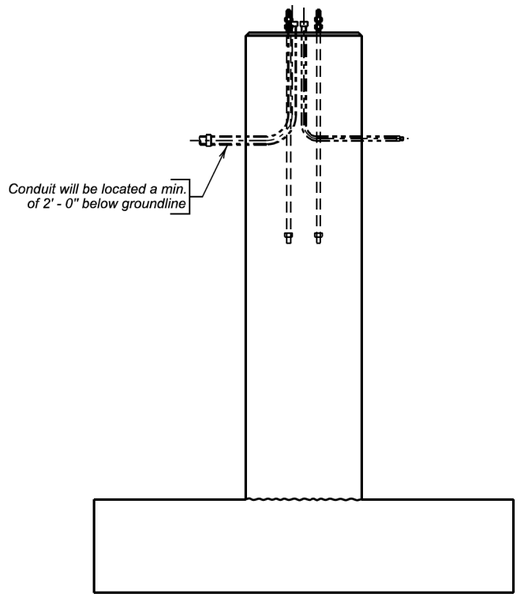
1. *Design Material Strength: Concrete f'c = 4500 p.s.i.*
   Reinforcing Steel fy = 60000 p.s.i.
2. *All concrete will be Class M6 conforming to Section 462.*
3. *All reinforcing steel will conform to ASTM A615 Grade 60.*
4. *All exposed edges will be chamfered ¾ inch.*
5. *The subsurface conditions within the limits of the project primarily consist of silt-clay to clay sand.*
6. *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.*

SPREAD FOOTING ON ROCK

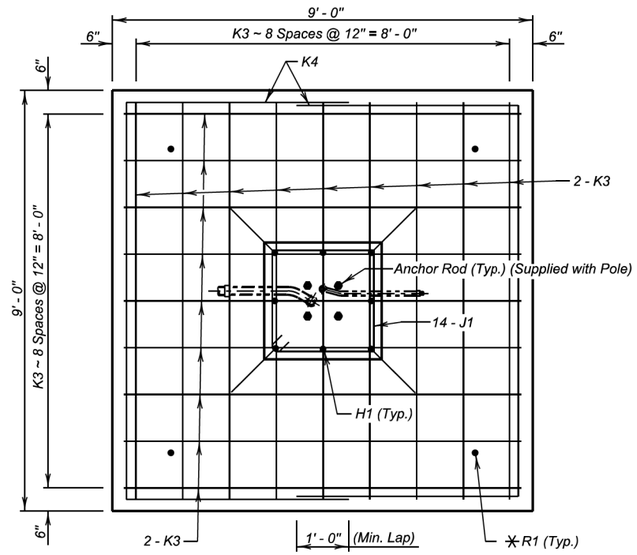
1. *The rock surface will be cleaned of all soil and debris prior to placing reinforcing steel for the spread footing. Cleaning will be accomplished by water washing and/or air jetting. Material washed from the rock surface will be directed into a sump or low area and physically removed from the exposed rock surface.*
2. *The cost of cleaning the rock will be included in the unit price bid for Structure Excavation, Miscellaneous. Payment will be considered full compensation for all materials, labor equipment and incidentals necessary to satisfactorily complete the work.*

ROCK DOWELS

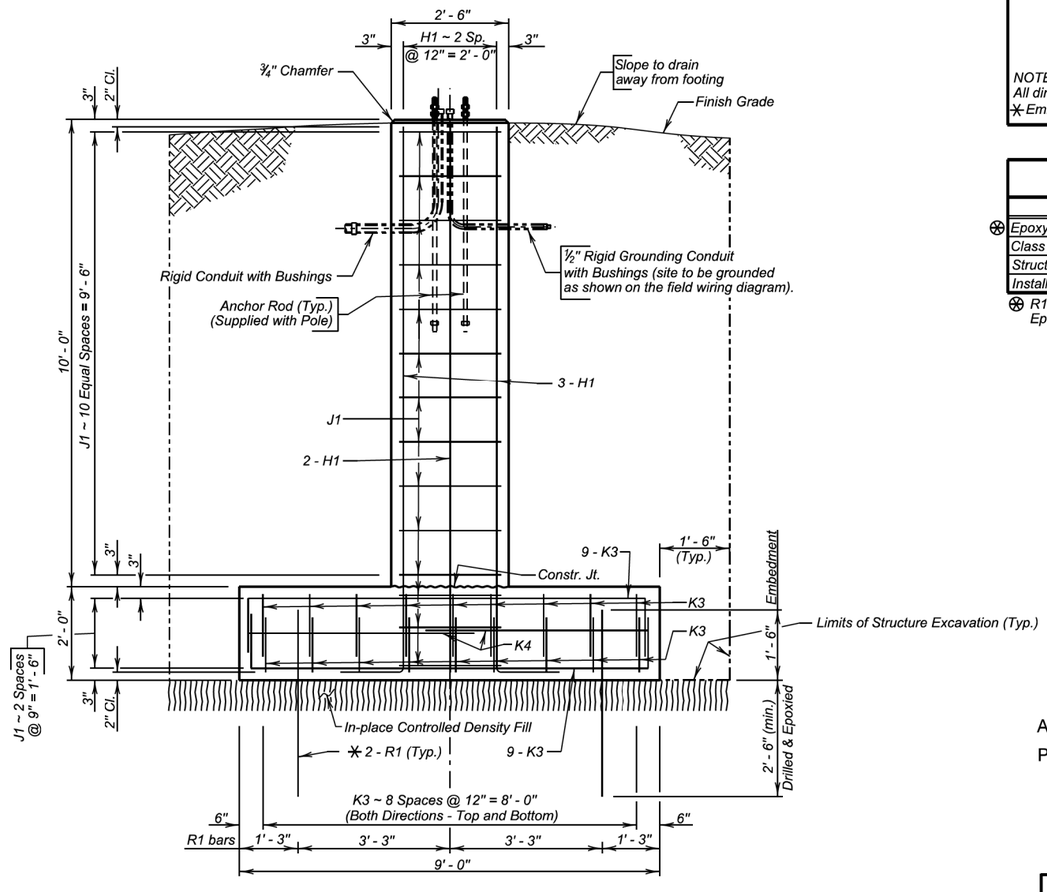
1. *Dowel bond material will be suitable for bonding steel dowel bars to rock in the existing moisture conditions. The Contractor will submit dowel bonding material product data to the Engineer for approval. Site mixed and cartridge resins will be commercially available and manufactured for rock dowel installation in this particular rock type. The diameter of the hole, drilled into the rock, will be a maximum of ⅜ inch larger than the diameter of the steel dowel, or as specified by the dowel bond material manufacturer. The drilled holes will be blown out with compressed air using a device that will reach the bottom of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.*
2. *Install Dowel in Rock will not be measured unless a change is ordered. Payment will be for the lineal foot of embedment into the rock, and will be considered full compensation for all materials, labor, equipment and incidentals necessary to satisfactorily complete the work.*
3. *The steel dowel for use with the item Install Dowel in Rock is included in the Reinforcing Schedule and will be paid for at the unit price bid for Epoxy Coated Reinforcing Steel.*



ELEVATION



PLAN

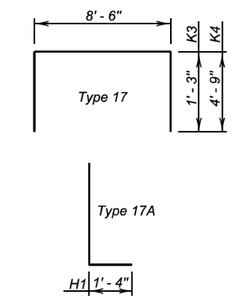


ELEVATION

REINFORCING SCHEDULE
(For One Footing)

Mk.	No.	Size	Length	Type
H1	8	8	13' - 0"	17A
J1	14	4	9' - 5"	T1
K3	36	5	11' - 0"	17
K4	2	4	18' - 0"	17
✳ R1	4	8	4' - 0"	Str.

Bending Details



NOTES:
All dimensions are out to out of bars.
✳ Embedment length to be a minimum of 2' - 6" into rock and 1' - 6" into footing.

ESTIMATED QUANTITIES
(For One Footing)

ITEM	UNIT	QUANTITY
⊛ Epoxy Coated Reinforcing Steel	Lb.	846
Class M6 Concrete	Cu. Yd.	7.9
Structure Excavation, Miscellaneous	Cu. Yd.	24.5
Install Dowel in Rock	Ft.	10

⊛ *R1 rock dowels estimated total length = 16' - 0" and is included in the Epoxy Coated Reinforcing Steel bid item.*

SPECIAL DETAIL

DETAILS
FOR
SPREAD FOOTING FOR SIGNAL POLE

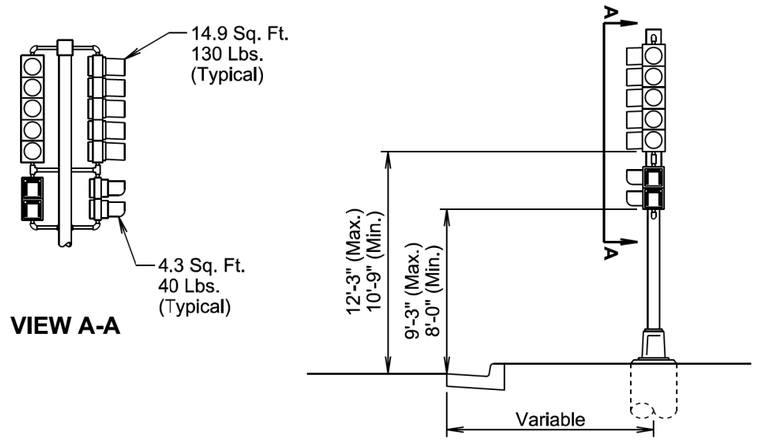
A2 NH 0081(114)0
PCN 07DH

YANKTON COUNTY
S. D. DEPT. OF TRANSPORTATION
JANUARY 2024

DESIGNED BY	CK. DES. BY	DRAFTED BY	
CHM	AU	BT	Steven A Johnson BRIDGE ENGINEER
YANK07DH	07DHTA01		

PLANS BY :
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

Plot Scale - 1:200
Plotted From - TRPR17199
File - ...\Yank07DH\StdPlateSection\L.dgn

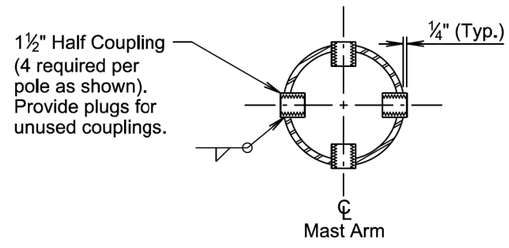


GENERAL NOTE:

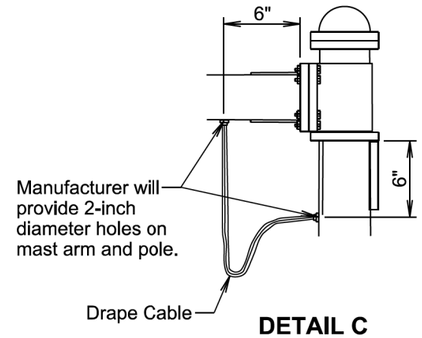
The signal heads are shown with backplates removed so that the mounting hardware is visible.

November 19, 2022

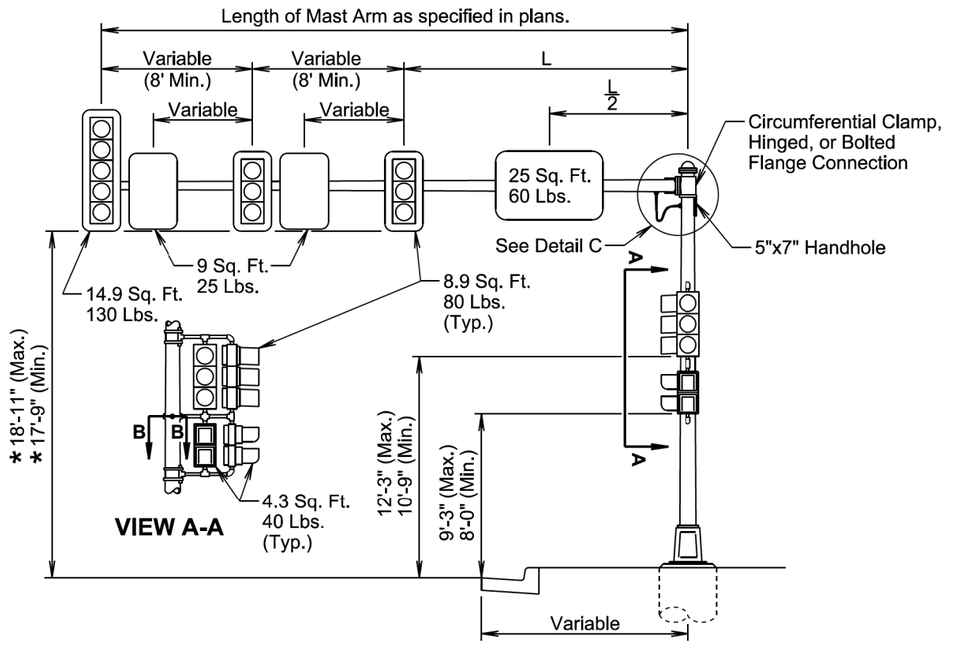
Published Date: 2024	SDDOT	SIGNAL POLE (PEDESTAL)	PLATE NUMBER 635.30
			Sheet 1 of 1



SECTION B-B



DETAIL C



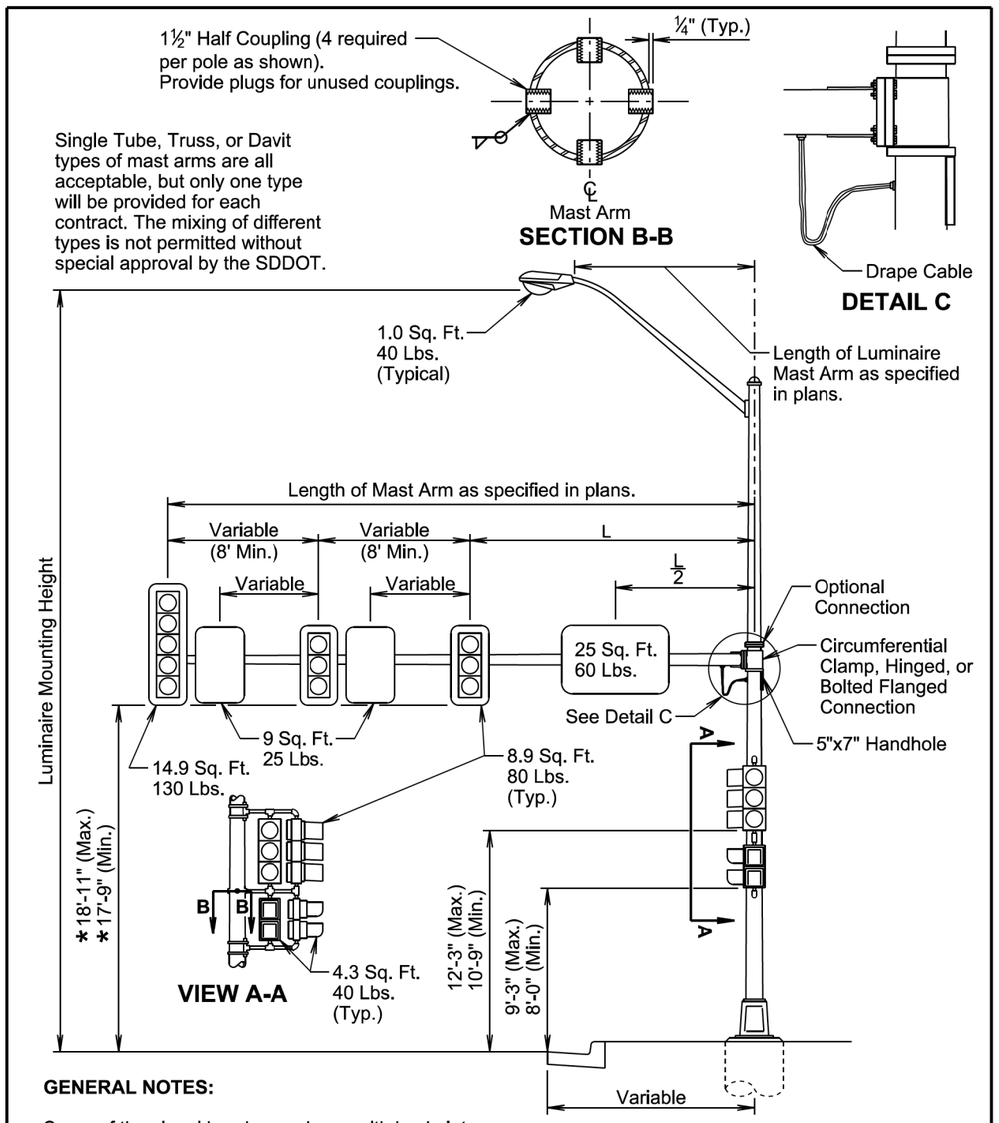
GENERAL NOTES:

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: 2024	SDDOT	SIGNAL POLE (WITH MAST ARM)	PLATE NUMBER 635.31
			Sheet 1 of 1



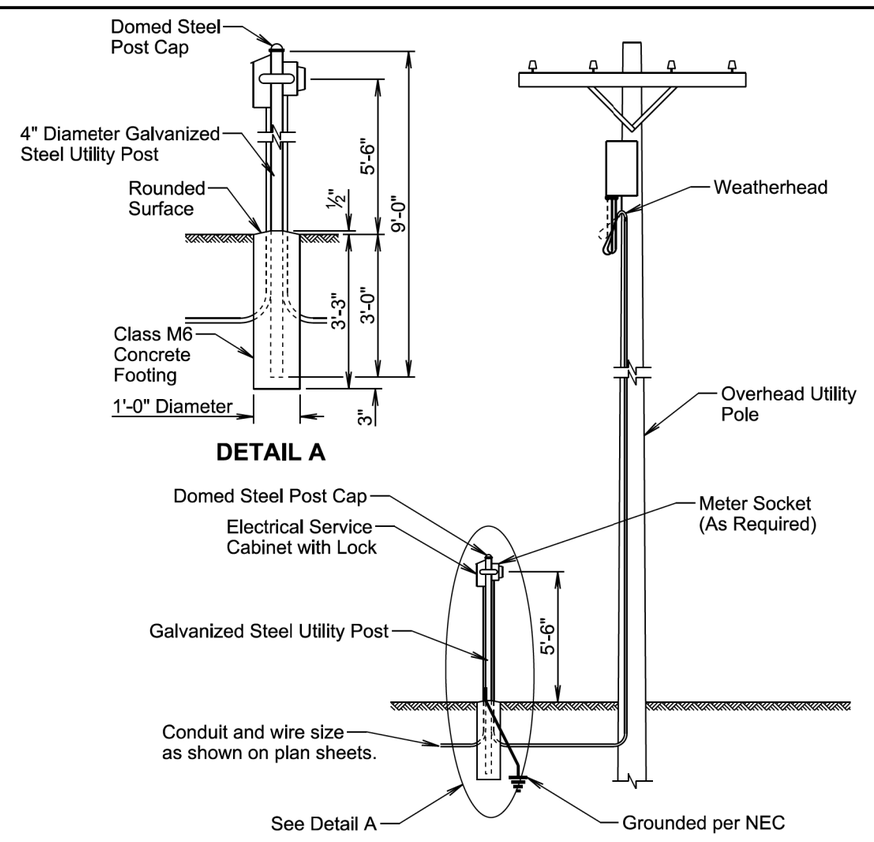
GENERAL NOTES:

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: 2024	SDDOT	SIGNAL POLE (WITH MAST ARM AND LUMINAIRE EXTENSION)	PLATE NUMBER 635.32 Sheet 1 of 1



GENERAL NOTES:

The service cabinet will include an externally mounted 15A receptacle outlet. The receptacle will be housed in a lockable NEMA 3R enclosure. The Contractor will furnish a lock and keys to the Engineer as directed.

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

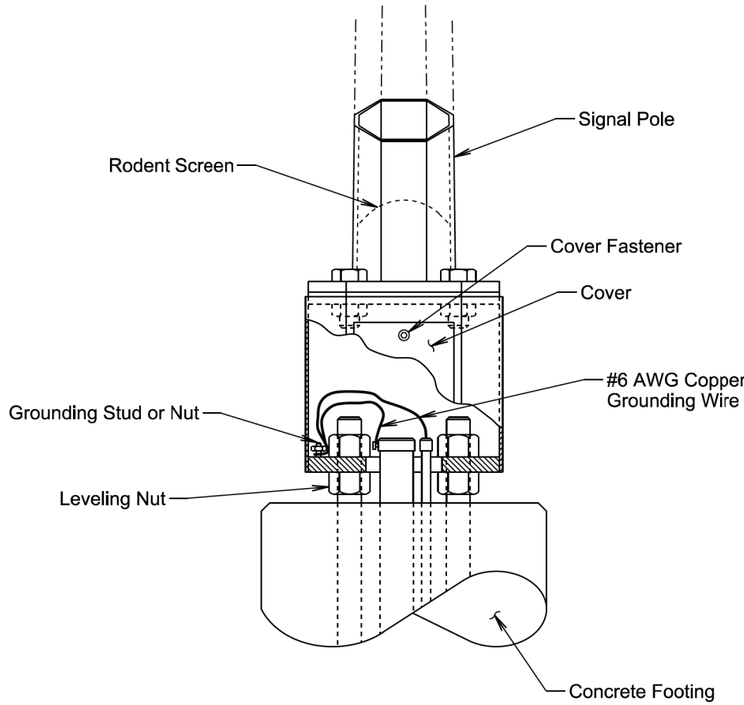
The 4" diameter galvanized steel utility post will be 9' long and will be in conformance with AASHTO Standard Specifications M181. The post will be Type 1 and either Grade 1 or Grade 2. The domed steel post cap will be in conformance with AASHTO Standard Specifications M181 and will be Type 1.

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".

November 19, 2022

Published Date: 2024	SDDOT	GALVANIZED STEEL UTILITY POST WITH OVERHEAD UTILITY POLE	PLATE NUMBER 635.35 Sheet 1 of 1



GENERAL NOTES:

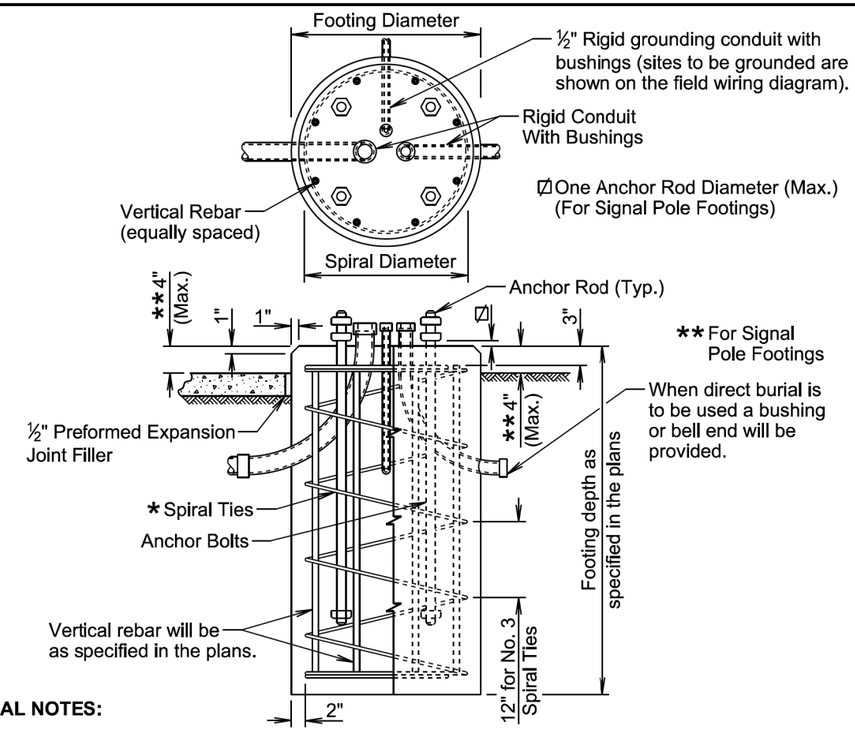
Base details are provided for example only and are not intended to be a complete design.

The Contractor will furnish and install a rodent screen in the signal pole above the tranformer base. The rodent screen will be a galvanized steel mesh with a maximum opening size of ¼ 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: 2024	SDDOT	***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 2½ 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.

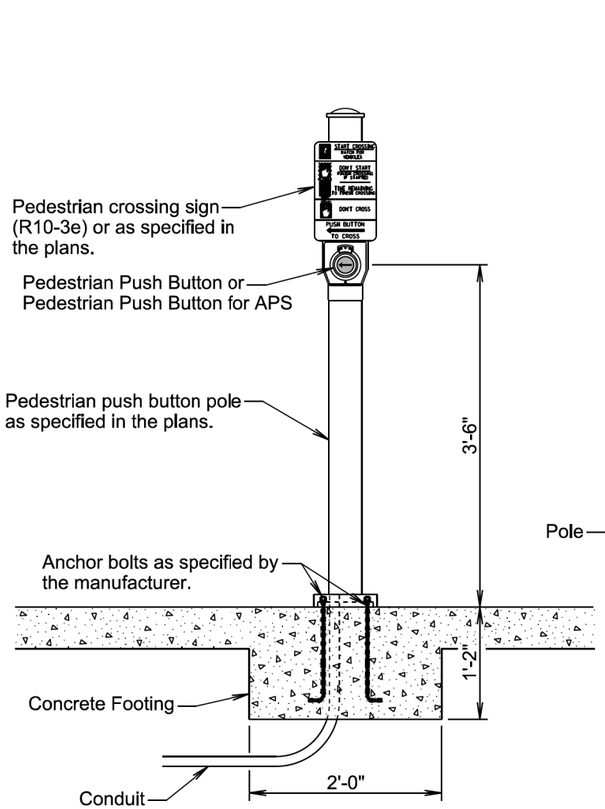
Costs of conduit and conduit bushings shown on footing detail will be incidental to the footing bid item(s).

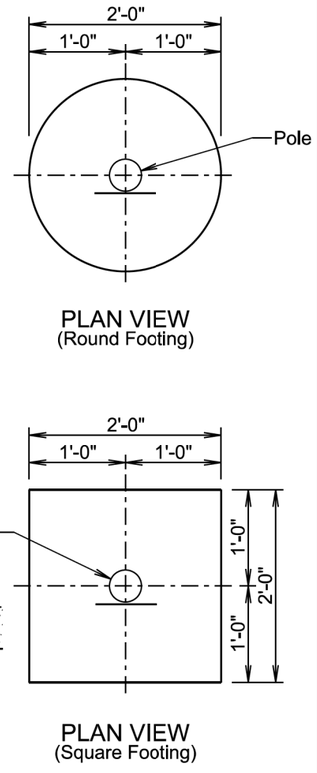
The pole will not be installed until the concrete has attained design strength (4000 psi).

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: 2024	SDDOT	***POLE FOOTING***	*PLATE NUMBER* 635.55 *Sheet 1 of 1*





GENERAL NOTES:

The pedestrian push button pole will be as specified in the plans.

The Contractor will install either the round or the square concrete footing. For informational purpose, the quantity of concrete for one footing is 0.14 cubic yards for the round footing and 0.17 cubic yards for the square footing.

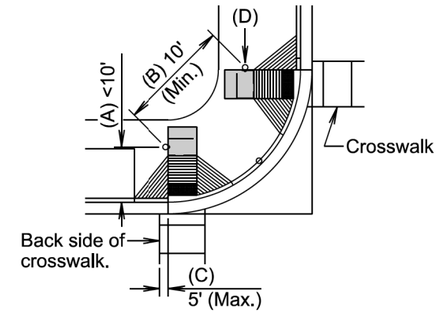
The concrete for the footing will be class M6 concrete.

All costs for furnishing and installing the concrete footing will be incidental to the contract unit price per square foot for the corresponding concrete sidewalk bid item.

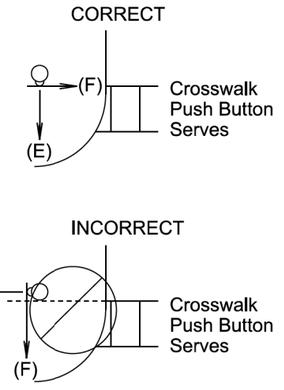
All costs for furnishing and installing the pedestrian push button pole including labor, equipment, and materials including the pole, cap, and the conduit in the footing will be incidental to the contract unit price per each for "Pedestrian Push Button Pole".

May 9, 2020

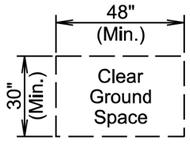
Published Date: 2024	SDDOT	***PEDESTRIAN PUSH BUTTON POLE***	*PLATE NUMBER* 635.57 *Sheet 1 of 2*



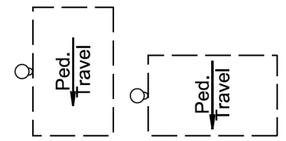
Push Button Relationship To Curb Ramp And Crosswalk



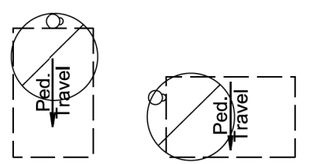
Push Button Orientation To Crosswalk



Clear Ground Space Dimensions



Correct Relationship



Incorrect Relationship

Clear space not adjacent to push button

Push button not Centered on Clear space

General Notes:

Pedestrian Push Buttons Location and Orientation Requirements:

(A) Within 10 feet from the front face of curb.
(B) Where two push buttons are provided, the push buttons should have at least 10 feet of separation from each other.
(C) If two curb ramps are used, the push button should be within 5 feet of the backside of the crosswalk.
(D) The push button should be mounted adjacent to a clear ground space (within 10 inches maximum reach). The clear ground space will be a least 30 inches x 48 inches and will slope no more than 50:1 (2%) in any direction. The push button will be centered on either side of the clear ground space (either the 30 inch or 48 inch side). The 30 inch x 48 inch clear ground space shouldn't touch the detectable warning panel.
(E) The push button should face the edge of roadway.
(F) The push button face should be parallel to the crosswalk being used.

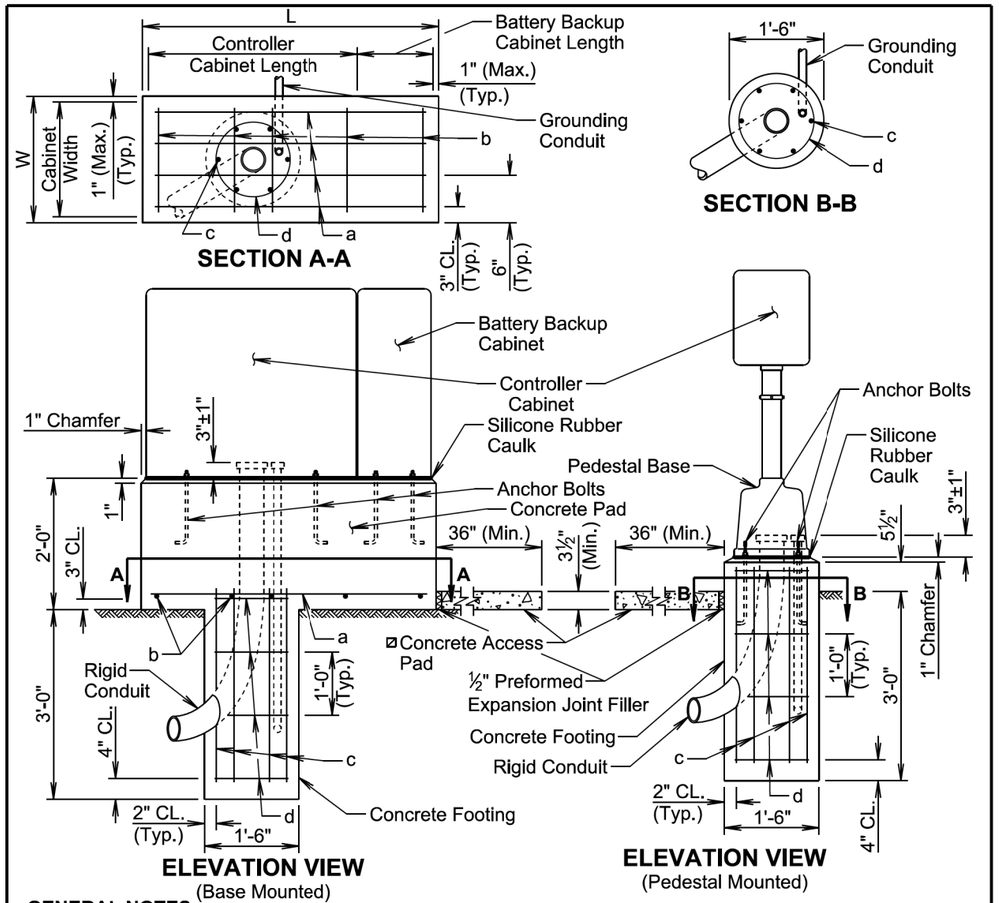
The push button poles will not interfere with the minimum clear width of the Pedestrian Access Route.

May 9, 2020

Published Date: 2024	SDDOT	***PEDESTRIAN PUSH BUTTON POLE***	*PLATE NUMBER* 635.57 *Sheet 2 of 2*

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(114)0	L42	L43

Plotting Date: 02/22/2024



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.

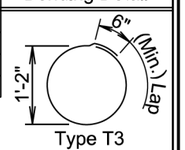
☑ If the controller and battery backup concrete pad and footing is not located within or adjacent to an existing sidewalk, the Contractor will provide a concrete access pad as directed by the Engineer.

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)

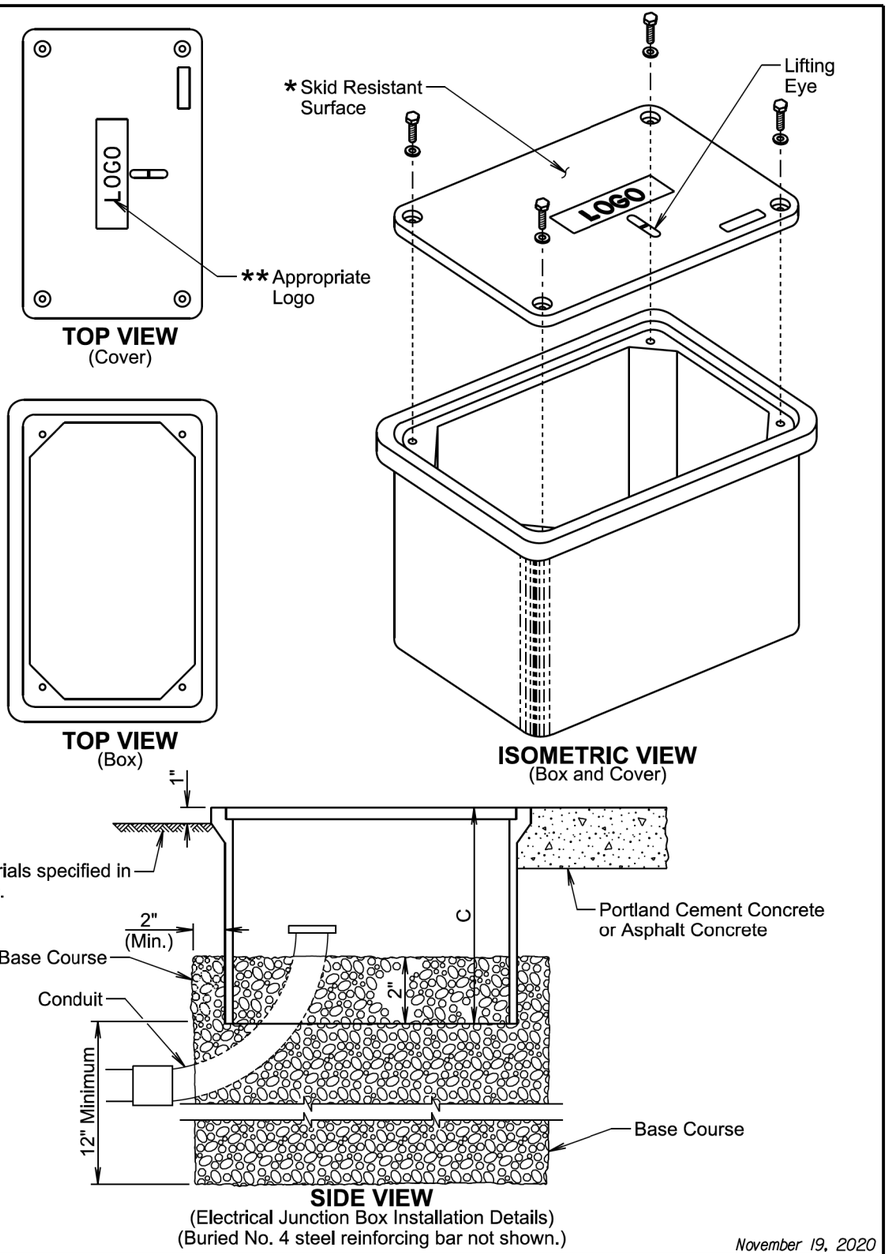
Mk.	No.	Size	Length	Type	Bending Detail
a	*	3	L-4"	Str.	
b	*	3	W-4"	Str.	
c	6	6	3'-0"	Str.	
d	4	3	4'-0"	T3	



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

November 19, 2022

Published Date: 2024	SDDOT	CONTROLLER CABINET AND FOOTING	PLATE NUMBER 635.60
			Sheet 1 of 1



November 19, 2020

Published Date: 2024	SDDOT	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65
			Sheet 1 of 2

Plot Scale - 1:200
Plotted From - TRPP17199
File - ...\yank07\DHStdPlateSectionL.dgn

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.

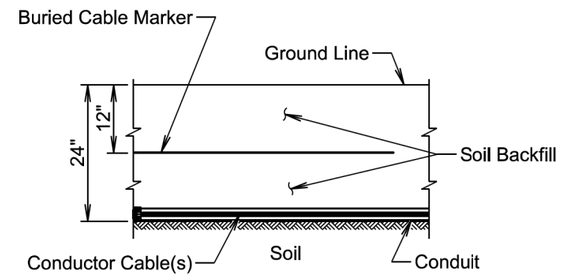
The electrical junction boxes will comply with the American National Standards Institute (ANSI)/Society of Cable Telecommunications Engineers (SCTE) 77 2007 Specification for Underground Enclosure Integrity. The loading requirement for all electrical junction boxes and covers will be Tier 22 of ANSI/SCTE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

The electrical junction boxes will be UL listed.

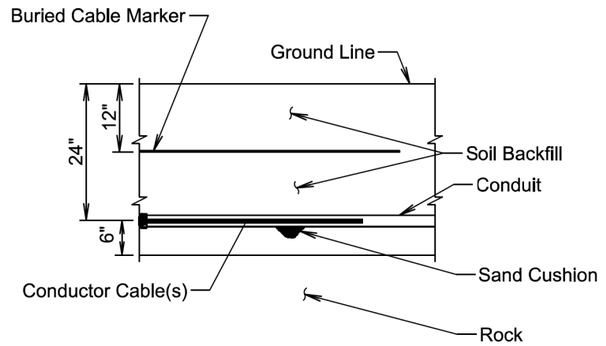
For junction boxes located outside of pavement, a No. 4 steel reinforcing bar with a minimum length of 18" will be buried adjacent to the long side of the junction box. All costs associated with furnishing and placing the steel reinforcing bar will be incidental to the contract unit price per each for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

November 19, 2020

Published Date: 2024	SDDOT	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: 2024	SDDOT	CONDUIT INSTALLATION	PLATE NUMBER 635.76
			Sheet 1 of 1