FOR BIDDING PURPOSES ONLY

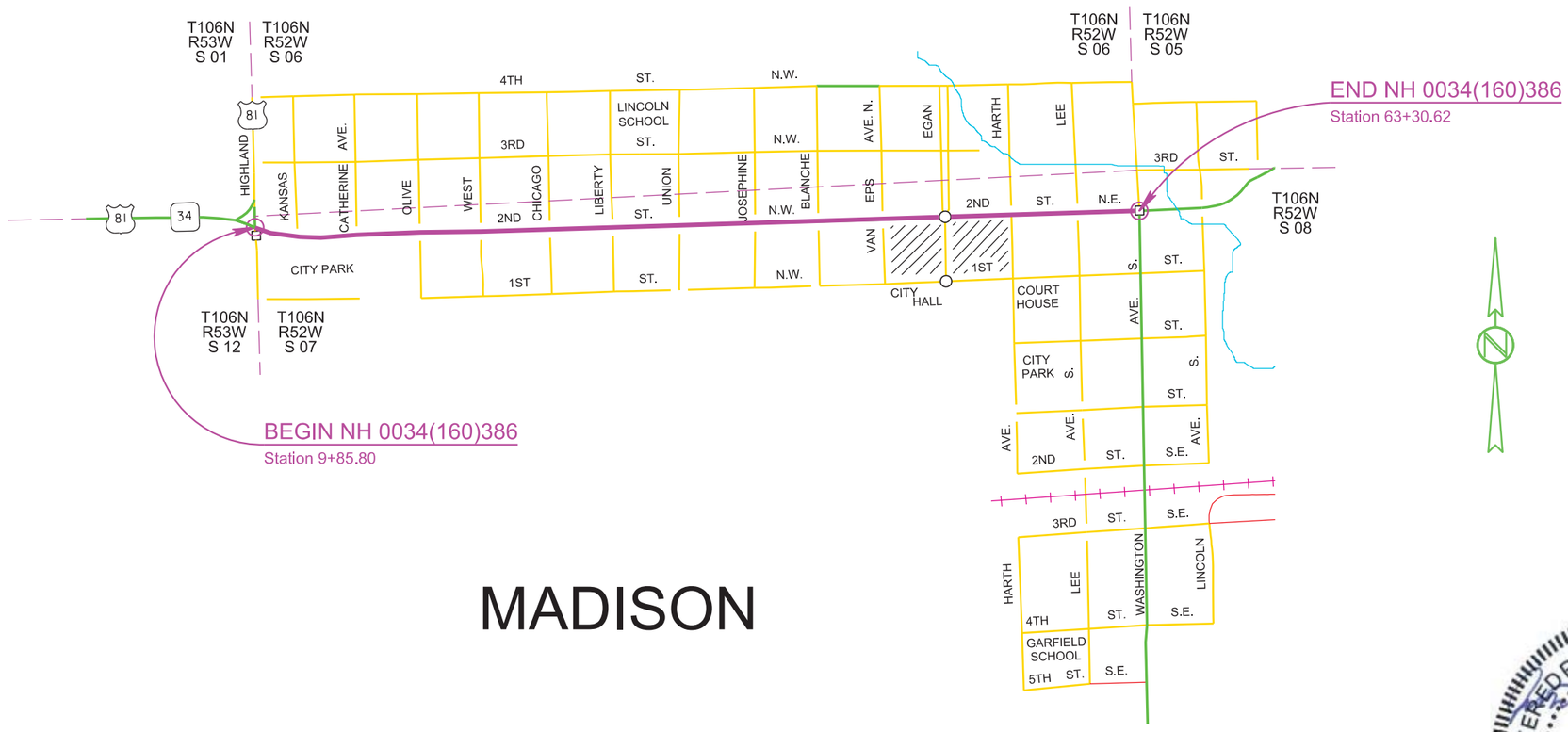
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L1	L39

Plotting Date: 11/30/2015

Section L: Signal & Lighting Plans

INDEX OF SHEETS

L1	General Layout W/Index
L2-L9	Estimate with General Notes & Tables
L10-L13	Existing Signal and Signal Layouts
L14-L25	Conduit Layouts
L26-L27	Signal Timings
L28-L31	Wiring Diagrams
L32-L39	Standard Plates



MADISON

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11769
JONATHAN D. WIEGAND
SOUTH DAKOTA
12/4/15

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Plotted From - kmay
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SECTION L ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1510	Remove Luminaire Pole	4	Each
110E1520	Remove Signal Equipment	Lump Sum	LS
110E1530	Remove Signal Pole Footing	2	Each
110E1540	Remove Luminaire Pole Footing	20	Each
110E5100	Salvage Luminaire Pole	13	Each
110E5110	Salvage Signal Equipment	Lump Sum	LS
635E0050	Breakaway Base Luminaire Pole with Arm, 50' Mounting Height	25	Each
635E2140	Signal Pole with 40' Mast Arm and Luminaire Arm	1	Each
635E3700	Roadway Luminaire, LED with Photoelectric Cell	33	Each
635E4010	1 Section Vehicle Signal Head	2	Each
635E5020	2' Diameter Footing	257.0	Ft
635E5030	3' Diameter Footing	24.0	Ft
635E5302	Type 2 Electrical Junction Box	29	Each
635E5303	Type 3 Electrical Junction Box	3	Each
635E5304	Type 4 Electrical Junction Box	4	Each
635E5380	Reset Electrical Junction Box	1	Each
635E5400	Electrical Service Cabinet	4	Each
635E5440	Master Controller	1	Each
635E5530	Preformed Detector Loop	25	Each
635E5535	Sawed-In, Preformed Detector Loop	11	Each
635E5550	Detector Unit	21	Each
635E5900	Pedestrian Push Button	16	Each
635E5910	Pedestrian Push Button Pole	16	Each
635E5922	Pedestrian Signal Head with Countdown Timer	8	Each
635E5930	Pedestrian Crossing Sign	16	Each
635E7500	Remove and Reset Luminaire Pole	1	Each
635E7510	Remove and Reset Signal Pole	1	Each
635E7530	Relocate Signal Equipment	Lump Sum	LS
635E8120	2" Rigid Conduit, Schedule 40	6,395	Ft
635E8140	4" Rigid Conduit, Schedule 40	55	Ft
635E8220	2" Rigid Conduit, Schedule 80	2,300	Ft
635E8230	3" Rigid Conduit, Schedule 80	830	Ft
635E9012	1/C #2 AWG Copper Wire	5,645	Ft
635E9014	1/C #4 AWG Copper Wire	14,505	Ft
635E9016	1/C #6 AWG Copper Wire	10,405	Ft
635E9020	1/C #10 AWG Copper Wire	1,840	Ft
635E9021	2/C #12 AWG Copper Wire	1,125	Ft
635E9024	1/C #14 AWG Copper Wire	90	Ft
635E9504	4/C #14 AWG Copper Tray Cable, K2	3,075	Ft
635E9507	7/C #14 AWG Copper Tray Cable, K2	475	Ft
635E9512	12/C #14 AWG Copper Tray Cable, K2	1,015	Ft
635E9519	19/C #14 AWG Copper Tray Cable, K2	330	Ft
635E9524	24/C #14 AWG Copper Tray Cable, K2	640	Ft
635E9600	#16 AWG Copper Twisted Shielded Pair	4,405	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	1,755	Ft
635E9924	24 Strand Fiber Optic Cable	1,250	Ft

SUPPLYING AS BUILT PLANS

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

SHOP DRAWING AND CATALOG CUTS SUBMITTALS

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

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

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

EXISTING LUMINAIRE POLES AND LUMINAIRE POLE FOOTINGS

Existing roadway lighting along SD 34/2nd Street is a combination of luminaire poles on footings or direct-bury luminaire poles. At certain locations, as noted in the plans, the luminaire poles originally on footings have been removed and replaced with a direct-bury luminaire pole next to the existing footing. The footings that have not been removed are noted in the plans for removal with this project. At each roadway lighting location for salvage or removals, the plans indicate whether the roadway luminaire pole is on an existing footing or a direct-bury and whether a footing is to be removed.

SALVAGE LUMINAIRE POLE

Existing direct-bury luminaire poles SEL 1-13 shall be salvaged and delivered to the City of Madison by the Contractor. The Contractor shall notify the City 5 days before the delivery of the salvaged luminaire poles. The City contact is Chad Comes at (605) 256-7514.

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

REMOVE LUMINAIRE POLE

Existing luminaire poles on footings shall be removed by the Contractor, identified as REL 1-4 in the plans.

All costs involved with removing existing luminaire poles shall be incidental to the contract unit price per each for “Remove Luminaire Pole”.

REMOVE LUMINAIRE POLE FOOTING

Revised 12/9/2015 KAM

Existing luminaire pole footings identified as RELF 1-20 in the plans shall be removed by the Contractor to a minimum of 2’ below the ground surface. Restoration of the disturbed area shall be to the satisfaction of the Engineer.

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

REMOVE SIGNAL EQUIPMENT

All existing signal equipment removed and not relocated as part of this project, salvaged by the SDDOT, or salvaged by the City of Madison shall become the property of the Contractor.

All costs for work involved in the removal of existing signal equipment shall be incidental to the contract lump sum price for “Remove Signal Equipment”.

SALVAGE SIGNAL EQUIPMENT

Existing signal equipment noted in the plan sheets for relocation shall be salvaged and stored by the Contractor until relocated to the respective signal pole.

All costs for work involved in the salvage and storage of the existing signal equipment shall be incidental to the contract lump sum price for “Salvage Signal Equipment”.

REMOVE AND RESET LUMINAIRE POLE

Existing luminaire pole EL1 shall be removed and reset at the new location as Reset EL1 as shown on the plan sheets. A recommendation from the manufacturer will be required to be supplied to the Engineer for the design of the anchor bolts. J-hook style is no longer acceptable.

The new pole footing, junction box, and conduit under Washington Avenue have been included under their respective bid items.

It shall be the Contractor’s responsibility to obtain the bolt circle pattern and anchor bolts for the relocated poles from the pole manufacturer.

A luminaire pole and luminaire damaged during relocation shall be repaired or replaced by the Contractor at no cost to the State.

The Contractor shall intercept the 4 #4 wire on the east side of Washington Avenue, install junction box JL 15 at location of interception, and splice in new 3 #4 wire to the reset luminaire pole. The Contractor shall be responsible for field verifying connection needs to the north of JL 15.

All costs involved with removing and resetting the existing luminaire pole including new anchor bolts with associated hardware shall be incidental to the contract unit price per each for “Remove and Reset Luminaire Pole”.

ON-SITE INSPECTION

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

REMOVE AND RESET SIGNAL POLE

Existing signal pole EB3 shall be removed and reset as RB3 as shown on the plan sheets. The Contract shall coordinate with the pole manufacturer to determine the necessary anchor rod dimensions to conform to Section 972C of the SDDOT Standard Specifications for Roads and Bridges. Manufacturer certification of the anchor rod design shall be provided by the Engineer.

It shall be the contractor's responsibility to obtain the bolt circle patter and anchor bolts for the relocated poles from the pole manufacturer listed below. The poles were originally installed under PH 0034(39)386).

Signal poles, luminaire extensions, and luminaires damaged during relocation shall be repaired or replaced by the Contractor at no cost to the State.

All costs involved with removing and resetting the exiting signal poles including new anchor bolts with associated hardware, shall be incidental to the contract unit price per each for "Remove and Reset Signal Pole".

TABLE OF FOOTING DATA

Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
L1-L25,	2' - 0"	10' - 0"	1' - 8"	65' - 3"	8-#7 x 9' - 6"
Reset EL1	2' - 0"	7' - 0"	1' - 8"	49' - 6"	8-#7 x 6' - 6"
RB3 & A3	3' - 0"	12' - 0"	2' - 8"	120' - 9"	14-#8 x 11' -6"

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

SUBSURFACE CONDITIONS

The subsurface soil along SD 34/2nd Street through Madison between stations 10+00 to 39+00+/- consist of a brown silt-clay with pebbles from 0' - 23.5'. From stations 39+00+/- to 57+00+/- the subsurface condition consists of a brown clay-silt from 0' - 3' followed by a brown gravel-sand from 3' - 12' then a heavy gravel from 12' – 18.5' all overlaying a blue-gray silt-clay. From stations 57+00+/- to 64+00 the subsurface condition consists of a gravel-sand from 0' - 15' overlaying a gray-brown gravel-clay from 15' - 23'. Groundwater was not measured during the borings. Caving was noted between stations 39+00 and 64+00 from 6' - 9.9' below the surface.

On the south side of the intersection of SD 34/2nd Street & SD 34/Washington Ave. the subsurface condition consists of a brown gravel from 0' – 7' followed by a brown clay-gravel from 7' – 9' over a brown fine sand from 9' – 16' all overlaying a gray clay from 16' – 30'. Cobbles were encountered from 21' – 24'. Water was encountered in the boring on the southeast corner at 16.3'. Caving was noted due to the gravel and general granular consistency of the material at 6' below the surface.

No borings were completed at the intersection of SD 34/2nd Street and Egan Ave. The Soils subsurface investigation from 2014 was completed within the vicinity of the intersection near the southwest corner. The subsurface condition at the intersection consists of brown silt-clay from 0' – 3' followed by light red gravel-sand from 3' – 15'. Groundwater was not encountered and caving occurred initially at 11.9' below the surface.

Due to the subsurface conditions, concrete placement operations should closely follow excavation procedures during construction. The longer the excavations are left open the more likely caving may occur. If caving soils are encountered during excavation, casing may be required to construct the cylindrical footings.

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

Casing will be required due to caving soils for the traffic signal footing at the corner of SD 34/2nd Street and SD 34/Washington Ave. Casing shall be of sufficient strength to withstand handling and installation procedures. The casing material may consist of sonotube, corrugated metal pipe, pvc, smooth metal pipe or any other material as approved by the Engineer.

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

POLES

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

Signal poles shall have rotatable mast arms.

Signal pole luminaire extensions (A3) shall have a 50 Ft. mounting height with 8 Ft. arm.

Luminaire pole extensions for L1, L2, L4, L6-L18 shall have a 50 Ft. mounting height with 8 Ft. arm. Luminaire pole extensions for L3, L5, L19-25 shall have a 50 Ft. mounting height with 4 Ft. arm.

Luminaire poles L1-25 shall be designed to include loadings created by banners that are 2.5 Ft. wide and 7 Ft. long, mounted 15 Ft. from the bottom of the pole to the bottom of the banner.

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

LUMINAIRES

The accepted design for the roadway luminaires L1 through L25 shall provide 1.2 and greater average maintained foot-candles and a uniformity ratio (average maintained to minimum maintained foot-candles) of 3:1 and less using the following parameters:

Setback:	0 Ft.
Lamp Loss Factor (LLF):	0.7
Width of Lighted Area:	60 Ft. (Edge of travel lane to edge of travel lane)
Spacing:	418 ft. one side, 209 ft. staggered
Configuration:	Two-sided, staggered
Mounting Height:	50 Ft.
Lamp:	LED

The following LED roadway luminaire meets the requirements for this design:

a.) Cooper Lighting:
Test No. NVN-AE-06-E-U-T2R.ies, P127669
Model # NVN-AE-06-E-U-T2R
Roadway Type II, Short, Semi-Cutoff Distribution
Luminaire Watts: 315W
Luminaire Input Voltage: 120 VAC
Luminaire Absolute Lumens: 32,542 lm, 4000K, 70 CRI
Luminaire Efficacy: 103 lm/W
Provide each luminaire with NEMA twist lock photo eye socket and photo eye
Finish: Gray polyester powder coat

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

LUMINAIRES ON SIGNAL POLES

The existing roadway luminaires on signal poles shall be removed and replaced with LED roadway luminaires (EB1, EB2, RB3, EB4, EA1, EA2, A3, EA4) that meet design requirements for roadway luminaires L1 through L25.

All costs for removing Roadway Luminaire, 400W with P.E. from signal pole extensions shall be incidental to the contract lump sum price for "Remove Signal Equipment".

All costs for installing Roadway Luminaire, LED with Photoelectric Cell (EB1, EB2, RB3, EB4, EA1, EA2, A3, EA4 on existing and new signal pole luminaire extensions as provided in the plans, materials, and labor shall be incidental to "Roadway Luminaire, LED with Photoelectric Cell".

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TRAFFIC SIGNAL CONTROLLER

The existing traffic signal controller and cabinet at the following intersections shall be salvaged and relocated within the respective intersection as shown on the plans.

1. SD 34/2nd Street and Egan Avenue intersection and
2. SD 34/2nd Street and Washington Avenue intersection

The controller cabinet shall be pad mounted.

The Contractor shall be responsible for programming controllers with the existing signal timings currently used in the controllers. If needed to reprogram the controllers, the Contractor shall be responsible for obtaining the existing signal timing prior to relocation of the controller and cabinet.

All costs for salvaging and relocating the existing traffic signal controller and cabinet at the SD 34/2nd Street and Egan Avenue intersection and SD 34/2nd Street and Washington Avenue intersection shall be incidental to the contract lump sum price for "Relocate Signal Equipment".

All costs for constructing the concrete pad and footing, materials, labor, and installing the relocated controller cabinet shall be incidental to the contract lump sum price for "Relocate Signal Equipment".

MASTER CONTROLLER

The master controller shall be capable of operating by the time of day or traffic responsive. The master controller shall be compatible with any new or existing equipment used by the City of Madison. Existing controllers at the SD 34/2nd Street intersections with Egan Avenue and Washington Avenue are the following:

Egan Avenue: Econolite ASC-2
Washington Avenue: Econolite ASC-3

The master controller for the coordinated signal system shall be located at the intersection of SD 34/2nd Street and Washington Avenue.

CONTROLLER SOFTWARE

Two copies of controller software shall be provided. One copy of the software shall be supplied to the City of Madison City Engineer and the second copy of the software shall be supplied to the South Dakota Department of Transportation Traffic Design Engineer in the Office of Road Design.

The controller software shall provide communication between a personal computer and the controllers being supplied by the contractor. The controller software shall allow permanent storage of all controller input data on a hard disk drive. The controller software shall work with isolated intersections as well as a closed loop system.

All costs for the controller software shall be incidental to the contract unit price per each for "Master Controller".

CONTROLLER PROGRAMMING

Existing controllers shall be reprogrammed to use the patterns and timings specified on the Signal Timing Sheets by a qualified technician. Costs for reprogramming the controllers shall be incidental to the contract lump sum price for "Relocate Signal Equipment".

The Contractor shall furnish the Road Design Office with a copy of the data programmed into the Controllers prior to the full operation of the Controller for approval. The address is as follows:

John Less
Traffic Design Engineer
Office of Road Design
700 East Broadway
Pierre, SD 57501

SIGNAL BACKPLATES

Signal backplates shall 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 shall be sized to permit the separate adjustment of the vehicle and pedestrian signal indication and may be less than 4 inches.

FIBER OPTIC CABLE MODEM

The Contractor shall furnish and install fiber optic modems in the relocated controllers at the SD 34/2nd Street intersections with Egan Avenue and Washington Avenue.

All costs for furnishing and installing fiber optic modems in relocated controllers shall be incidental to the contract lump sum price for "Relocate Signal Equipment".

SD34/2nd STREET AND EGAN AVENUE INTERSECTION PEDESTRIAN PUSH BUTTONS

The work at the Egan Avenue intersection includes the removal of pedestrian push buttons from existing signal poles.

New pedestrian push buttons shall be installed on new pedestrian push button poles as shown on the Signal Layout sheet.

All cost for labor and materials to fill or cover holes, to the satisfaction of the Engineer, in existing signal poles from the removed pedestrian push buttons shall be incidental to the contract lump sum price for "Relocate Signal Equipment".

SECONDARY SERVICE DISCONNECT

The Contractor shall install an additional NEMA 3R rainproof, 60 amp rated, non-fused safety switch (with lock) adjacent to the relocated traffic signal controller cabinets at the SD 34/2nd Street intersections with Egan Avenue and Washington Avenue. The disconnect shall be mounted on a galvanized steel post in accordance with Standard Plate 635.41.

All costs for work involved furnishing and installing the Secondary Service Disconnect shall be incidental to the contract unit price per each for "Electrical Service Cabinet".

CONDUIT AT 42+00-43' Lt. TO 42+55-43' Lt.

The Contractor shall intercept existing conduit at approximately Sta. 42+00-43' Lt., install junction box JL16 at Sta. 42+00-43' Lt., and install electrical conduit from Sta. 42+00-43' Lt. to Sta. 42+55-43' +/- Lt. as shown in the plans. The owner will be moving the sign to the east side of the property. Landowner is responsible for the electrical connections. The Contractor shall coordinate any driveway closures or access restrictions as part of the conduit installation with the property owner.

TRAFFIC SIGNAL METER SOCKETS

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

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12/4/15

Revised 12/9/2015 KAM

FIBER OPTIC CABLE

The fiber optic cable shall be a 24 strand fiber optic cable with 24 singlemode with each buffer containing six fibers. The buffer tubes shall be color coded according to EIA/TIA specifications.

Fiber optic cable provided on this project shall meet the latest applicable REA PE-90 Specifications for single mode. All fiber optic cable shall be rated for outdoor use.

Singlemode optical cable shall have the following optical and physical characteristics:

1. Cladding diameter of 125µm +/- 2µm.
2. Zero dispersion slope shall be 0.092 ps/ (nm^2●km) or less.
3. Zero dispersion wavelength, 1300 to 1322 nm.
4. Cutoff wavelength, less than 1250 nm.
5. Maximum attenuation at 1310 nm shall be 0.4 dB per Kilometer.
6. The outside diameter shall be less than 22.1 nm.
7. One factory fusion splice per kilometer per fiber shall be allowed.

The fiber optic cable shall have a seven-core configuration, dielectric central strength member, and thermoplastic tubes. The minimum bending radii of the cable shall be 209.5 mm under a static load and 419.1 mm during installation. The installation tensile load rating shall be 2.7 kPa.

The cable core interstices shall be filled with water blocking material. If a gel compound is used, the gel compound shall be readily removable with a nontoxic solvent.

Fiber optic cable shall be terminated in the controller cabinet with a wall mounted distribution enclosure. The distribution enclosure shall be dust and moisture resistant. The size of the distribution enclosure shall be adequate for the number of fibers to be used. The distribution enclosure shall be mounted in the controller cabinet where it does not interfere with normal cabinet maintenance. The fiber optic cable shall be prepared in accordance with the manufacturer's recommendations and have sufficient length to reach the interface panel. Only fibers needed to operate the equipment plus two spare shall be terminated with LC connectors. The connector loss after 1000 matings shall be less than 0.2 dB. The connector return loss shall not be greater than 45 dB for singlemode. All other fibers shall be capped and sealed in accordance with the manufacturer's recommendations.

The fiber optic cable shall be installed in accordance with the manufacturer's recommendations and the NEC. Slack cable shall be left in each controller and junction box. All junction boxes except for the junction at the controller shall have 6.5' of slack. The junction box at the controller cabinet shall have 19.5' of slack. Controller cabinets shall have 2' of slack. Slack cable shall be coiled and tied in a minimum of three places around the coil. No splices shall be allowed in the fiber optic cable except in the controllers. Splices shall be of the epoxy/polish type.

The contractor shall test the fiber optic cable after the installation to verify the integrity of the fiber.

The supplier of the fiber optic cable shall supervise the installation and testing of the fiber optic cable. The supplier of the fiber optic cable shall provide training to personnel of the City in the installation and maintenance of the fiber optic cable.

The payment for supplying, installing, testing, and training of city personnel shall be incidental to the contract unit price per foot for "24 Strand Fiber Optic Cable".

ROADWAY LIGHTING AT US 81/SD 34 INTERSECTION ORDER OF WORK

The existing roadway lighting conduit and wires to be left-in-place at the US 81/SD 34 intersection has been noted in the plans. This information was obtained from project HES 0081-94 and F0081(99)94 and the project survey. The Contractor shall be responsible for field verifying existing roadway lighting conduit and wires to complete the work of the new connection.

Roadway luminaires EL2 and EL3 shall be connected to the existing power feed with the following order of work: The Contractor shall:

1. Locate and intercept existing power feeder. Cut and abandon south portion of feeder. Place new junction box over feeder (JL17) and re-route conduit and conductors into junction box. Splice feeder conductors to new conductors.
2. Route new conduit run into Existing Junction Box JB17. This may require boring under sections of existing pavement that will be left-ion-place. Disconnect existing feeder conductors and splice new feeder conductors to existing load conductors. Cut back and abandon existing feeder conduit/conductors in place. Existing Junction Box JB17 shall be reset with the construction of the curb ramps in the southwest quadrant.

All costs for modifications to the existing wires and conduit, including disconnecting and connecting existing conductors within JL17 and JB17, in order to make the roadway luminaires EL2 and EL3 fully operational shall be incidental to the contract unit price per foot for each respective conduit and wire items.

FOR BIDDING PURPOSES ONLY

TABLE OF CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L6	L39

Plotting Date: 11/30/15

Location to Location		Rigid Conduit: Schedule 40 2" Ft	Rigid Conduit: Schedule 40 4" Ft	Rigid Conduit: Schedule 80 2" Ft	Rigid Conduit: Schedule 80 3" Ft	Copper Wire: 1/C #4 AWG Ft	Copper Wire: 1/C #6 AWG Ft	IMSA Copper Cable, K2 #14 AWG: 4/C Ft	7/C Ft	12/C Ft	19/C Ft	24/C Ft	Twisted Shielded Pair: #16 AWG Ft	Pole and Bracket Cable: 2/C #10 AWG Ft	Fiber Optic Cable Ft
SD 34 and Egan Ave															
JB1	Service Cabinet	170				525	525								
JB1	Controller		30			105		280		210	70		385		
JB1	Signal Pole RB3	20					75			25	25				
JB1	Ped PB Pole PB5	20						25							
JB1	Ped PB Pole PB6	10						15							
JB1	JB2	20											75		
JB1	JB3				100		315	210		210			315		
JB3	Ped PB Pole PB7	20						25							
JB3	Ped PB Pole PB8	10						15							
JB3	Signal Pole EB4	30					105			70					
JB3	JB4	95											300		
JB1	JB6				105		325	435		325	110		545		
JB6	JB7	120											375		
JB6	Ped PB Pole PB3	15						20							
JB6	Ped PB Pole PB4	20						25							
JB6	Signal Pole EB2	20					75			50					
JB6	JB5				95		295	200		100	100		200		
JB5	Ped PB Pole PB1	25						30							
JB5	Ped PB Pole PB2	15						20							
JB5	Signal Pole EB1	20					50			25	25				
Signal Pole	EB1														
Signal Pole	EB2														
Signal Pole	RB3							175						65	
Signal Pole	EB4														
Ped PB Pole	PB1							10							
Ped PB Pole	PB2							10							
Ped PB Pole	PB3							10							
Ped PB Pole	PB4							10							
Ped PB Pole	PB5							10							
Ped PB Pole	PB6							10							
Ped PB Pole	PB7							10							
Ped PB Pole	PB8							10							
Fiber															
Egan Ave Contr	JF1	40													50
JF1	JF2			70											80
JF2	JF3	430		70											515
JF3	JF4	455		80											555
JF4	Wash Ave Contr	40													50
Subtotal:		1595	0	30	220	300	630	1765	1555	0	1015	330	0	2195	65	1250

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TABLE OF CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA | PROJECT: NH 0034(160)386 | SHEET: L7 | TOTAL SHEETS: L39

Plotting Date: 11/30/15

Location to Location		Rigid Conduit: Schedule 40 2" Ft	Schedule 40 4" Ft	Schedule 80 2" Ft	Schedule 80 3" Ft	Copper Wire: 1/C #4 AWG Ft	1/C #6 AWG Ft	IMSA Copper Cable, K2 #14 AWG: 4/C Ft	7/C Ft	12/C Ft	19/C Ft	24/C Ft	Twisted Shielded Pair: #16 AWG Ft	Pole and Bracket Cable: 2/C #10 AWG Ft	Fiber Optic Cable Ft
SD 34 and Washington Ave															
JA3	Service Cabinet	155				480	480								
JA1	Controller		25			90		240	90			120	330		
JA1	Signal Pole EA1	20					75		25			25			
JA1	JA2	15											40		
JA1	Ped PB Pole PA1	20						25							
JA1	Ped PB Pole PA2	15						20							
JA1	JA3				95	300	300	400	200			200	500		
JA3	Ped PB Pole PA3	30						35							
JA3	Ped PB Pole PA4	20						25							
JA3	Signal Pole EA2	25					90		30			30			
JA3	JA4	110											230		
JA3	JA5				95		300	200	100			100	300		
JA5	Ped PB Pole PA5	20						25							
JA5	Ped PB Pole PA6	15						20							
JA5	Signal Pole A3	25					90		30			30			
JA5	JA6	25											90		
JA1	JA7				110		345	230				115	345		
JA7	Ped PB Pole PA7	15						20							
JA7	Ped PB Pole PA8	20						25							
JA7	Signal Pole EA4	15					60					20			
JA7	JA8	120											375		
Signal Pole	EA1														
Signal Pole	EA2														
Signal Pole	A3							175						65	
Signal Pole	EA4														
Ped PB Pole	PA1							10							
Ped PB Pole	PA2							10							
Ped PB Pole	PA3							10							
Ped PB Pole	PA4							10							
Ped PB Pole	PA5							10							
Ped PB Pole	PA6							10							
Ped PB Pole	PA7							10							
Ped PB Pole	PA8							10							
Subtotal:		665	25	0	300	870	1740	1520	475	0	0	640	2210	65	0
Traffic Signals Total:		**2260**	**55**	**220**	**600**	**1500**	**3505**	**3075**	**475**	**1015**	**330**	**640**	**4405**	**130**	**1250**

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12/4/15

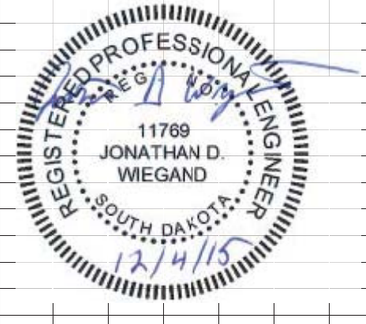
FOR BIDDING PURPOSES ONLY

TABLE OF CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L8	L39

Plotting Date: 11/30/15

Location to Location		Rigid Conduit Schedule 40 2" Ft	Rigid Conduit Schedule 80 2" Ft	Rigid Conduit Schedule 80 3" Ft	Copper Wire 1/C #2 AWG Ft	Copper Wire 1/C #4 AWG Ft	Copper Wire 1/C #6 AWG Ft	Copper Wire 1/C #10 AWG Ft	Copper Wire 1/C #14 AWG Ft	Copper Wire 2/C #12 AWG Ft	Pole and Bracket Cable 2/C #10 AWG Ft
Lighting - Highland to Union											
L1	L2		120				375				
L2	L3	160				660					
L3	JL1	235				970					
JL1	L4		80				250				
JL1	L5	195				805					
L5	JFA1							50			
L5	JL2	215				890		445			
JL2	L6		80				250				
JL2	L7	120	80			825		415			
L7	JL3	90				375		190			
JL3	JL4			80	330	250		170			
JL4	Service Cabinet			150	620	465		310			
JL4	L8	100					310	210			
L8	JFA2							50			
JL3	L9	240	80			1320					
L9	JL5	210				870					
JL5	L10		80				250				
JL5	L11	120	80			825					
L11	JL6	215				890					
JL6	L12		80				250				
JL6	L13	120	80			825					
L13	JL7	215				665					
JL7	L14		80				250				
Lighting - Union to Lee											
L15	JL8	200					620				
JL8	L16		80				250				
JL8	L17	110	80			785					
L17	JL9	200				825					
JL9	L18		85				265				
JL9	L19	135	80		890						
L19	JL10	215			890						
JL10	L20		80				250				
JL10	L21	120	110		950						
L21	JL11	140			580						
JL11	JL12	140	145		1175						
JL12	Service Cabinet	50			210		160				
JL12	JL13	135					560				
JL13	L22		75				235				
JL13	L23	100	95				805				
L23	JL14	215					890				
JL14	L24		80				250				
JL14	L25	140	80				680				
Subtotal:		4135	1830	230	5645	12245	6900	1840	0	0	0

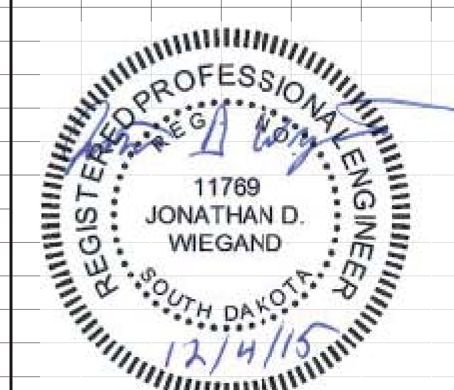


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L9	L39

TABLE OF CONDUIT AND CABLE QUANTITIES

Plotting Date: 11/30/15

Location to Location		Rigid Conduit Schedule 40 2" Ft	Rigid Conduit Schedule 80 2" Ft	Rigid Conduit Schedule 80 3" Ft	Copper Wire 1/C #2 AWG Ft	Copper Wire 1/C #4 AWG Ft	Copper Wire 1/C #6 AWG Ft	Copper Wire 1/C #10 AWG Ft	Copper Wire 1/C #14 AWG Ft	Copper Wire 2/C #12 AWG Ft	Pole and Bracket Cable 2/C #10 AWG Ft
Misc.											
42+00-43' Lt.	42+55-43' Lt.		55								
JL15	Reset EL1		70			220					
JL17	Existing JB17		125			540					
Luminaire Pole											
Luminaire Pole	L1									45	65
Luminaire Pole	L2									45	65
Luminaire Pole	L3									45	65
Luminaire Pole	L4									45	65
Luminaire Pole	L5									45	65
Luminaire Pole	L6									45	65
Luminaire Pole	L7									45	65
Luminaire Pole	L8									45	65
Luminaire Pole	L9									45	65
Luminaire Pole	L10									45	65
Luminaire Pole	L11									45	65
Luminaire Pole	L12									45	65
Luminaire Pole	L13									45	65
Luminaire Pole	L14									45	65
Luminaire Pole	L15									45	65
Luminaire Pole	L16									45	65
Luminaire Pole	L17									45	65
Luminaire Pole	L18									45	65
Luminaire Pole	L19									45	65
Luminaire Pole	L20									45	65
Luminaire Pole	L21									45	65
Luminaire Pole	L22									45	65
Luminaire Pole	L23									45	65
Luminaire Pole	L24									45	65
Luminaire Pole	L25									45	65
Luminaire Pole	Reset EL1								90		65
	Subtotal:	0	250	0	0	760	0	0	90	1125	1690
	Lighting Total:	**4135**	**2080**	**230**	**5645**	**13005**	**6900**	**1840**	**90**	**1125**	**1690**



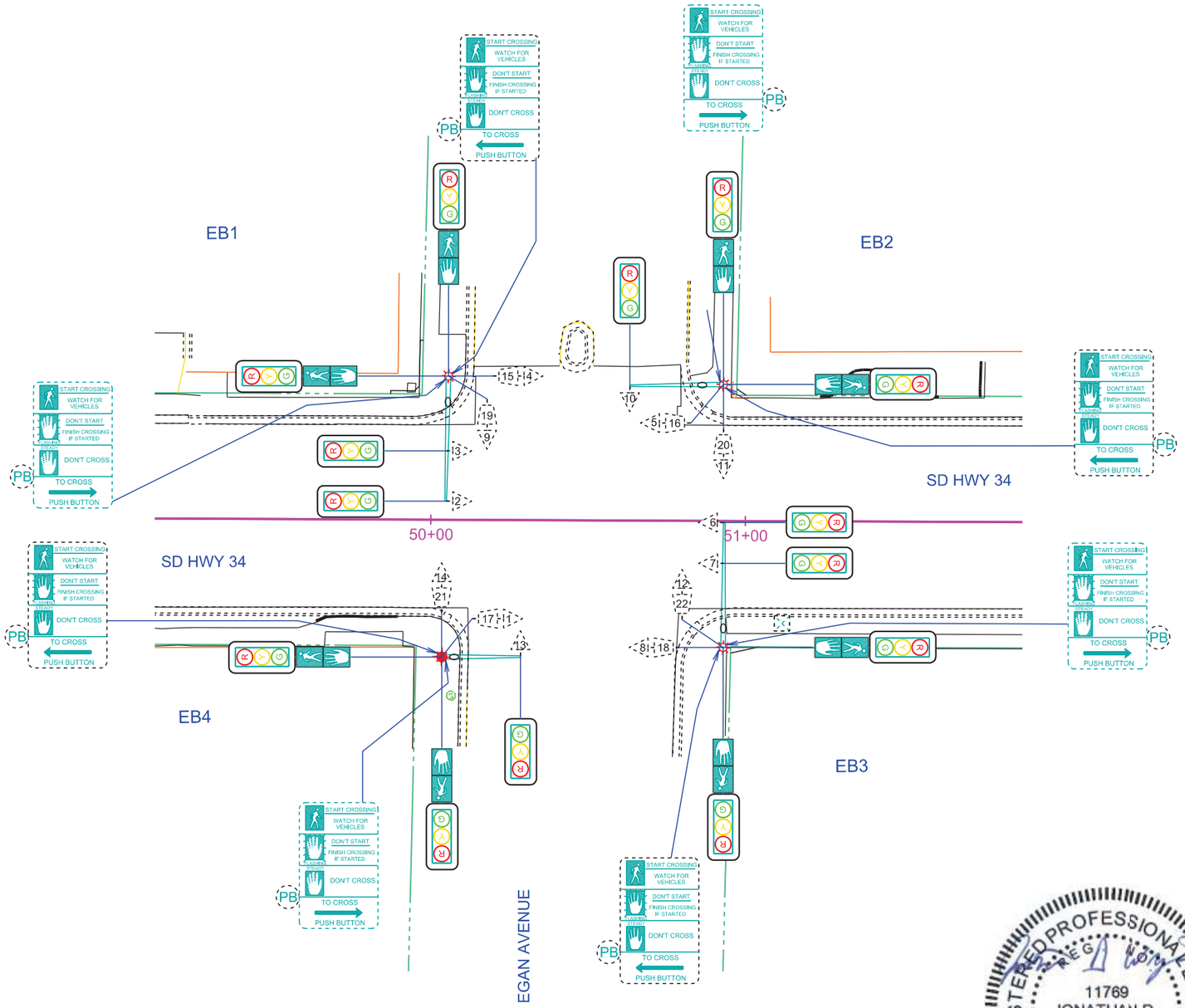
EXISTING SIGNAL LAYOUT

FOR BIDDING PURPOSES ONLY

SD HWY 34/2ND STREET & EGAN AVENUE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L10	L39

Plotting Date: 11/30/2015



REMOVE SIGNAL EQUIPMENT

KEY	ITEM
	ROADWAY LUMINAIRE, 400W WITH P.E. (EB1-EB4)
PB	PEDESTRIAN PUSH BUTTON
	PEDESTRIAN SIGNAL HEAD (15-22)
	PEDESTRIAN CROSSING SIGN

SALVAGE SIGNAL EQUIPMENT

KEY	ITEM
	TRAFFIC SIGNAL CONTROLLER (FOR RELOCATION WITHIN INTERSECTION)
	3 SECTION VEHICLE SIGNAL HEAD (6-8, 12) (FOR RESET ON RELOCATED MAST ARM)
	SIGNAL POLE W/40' MAST ARM AND LUMIN EXT (EB3) (FOR RESET ON NEW SIGNAL POLE FOOTING)

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	REMOVE SIGNAL EQUIPMENT	LUMP SUM	LS
	SALVAGE SIGNAL EQUIPMENT	LUMP SUM	LS
	REMOVE SIGNAL POLE FOOTING (EB3)	1	EACH

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SIGNAL LAYOUT

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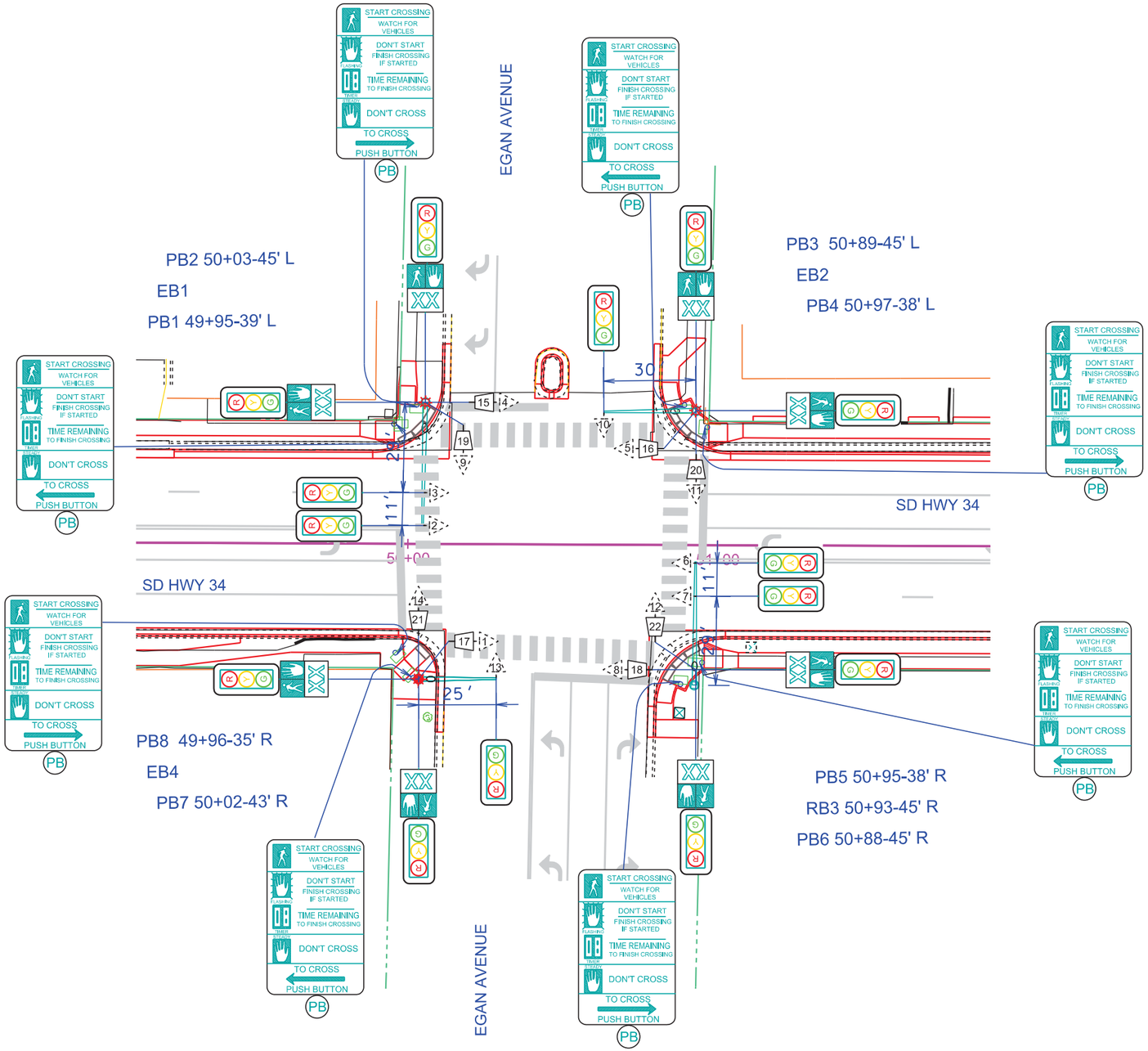
SD HWY 34/2ND STREET & EGAN AVENUE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L11	L39

Plotting Date: 11/30/2015



RELOCATE SIGNAL EQUIPMENT

KEY	ITEM
	3-SECTION VEHICLE SIGNAL HEAD (6-8, 12)
	SIGNAL POLE W/40' MAST ARM & LUMINAIRE EXTENSION (RB3) (8' ARM, 50' MT HT)

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	RELOCATE SIGNAL EQUIPMENT	LUMP SUM	LS
	ROADWAY LUMINAIRE, LED WITH PHOTOELECTRIC CELL (EB1, EB2, RB3, EB4)	4	EACH
PB	PEDESTRIAN PUSH BUTTON	8	EACH
	PEDESTRIAN PUSH BUTTON POLE (PB1-PB8)	8	EACH
	PEDESTRIAN SIGNAL HEAD W/COUNTDOWN TIMER (15-22)	8	EACH
	PEDESTRIAN CROSSING SIGN R10-3e (LEFT - 4 / RIGHT - 4)	8	EACH

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EXISTING SIGNAL LAYOUT

SD HWY 34/2ND STREET & WASHINGTON AVENUE

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L12	L39

Plotting Date: 11/30/2015

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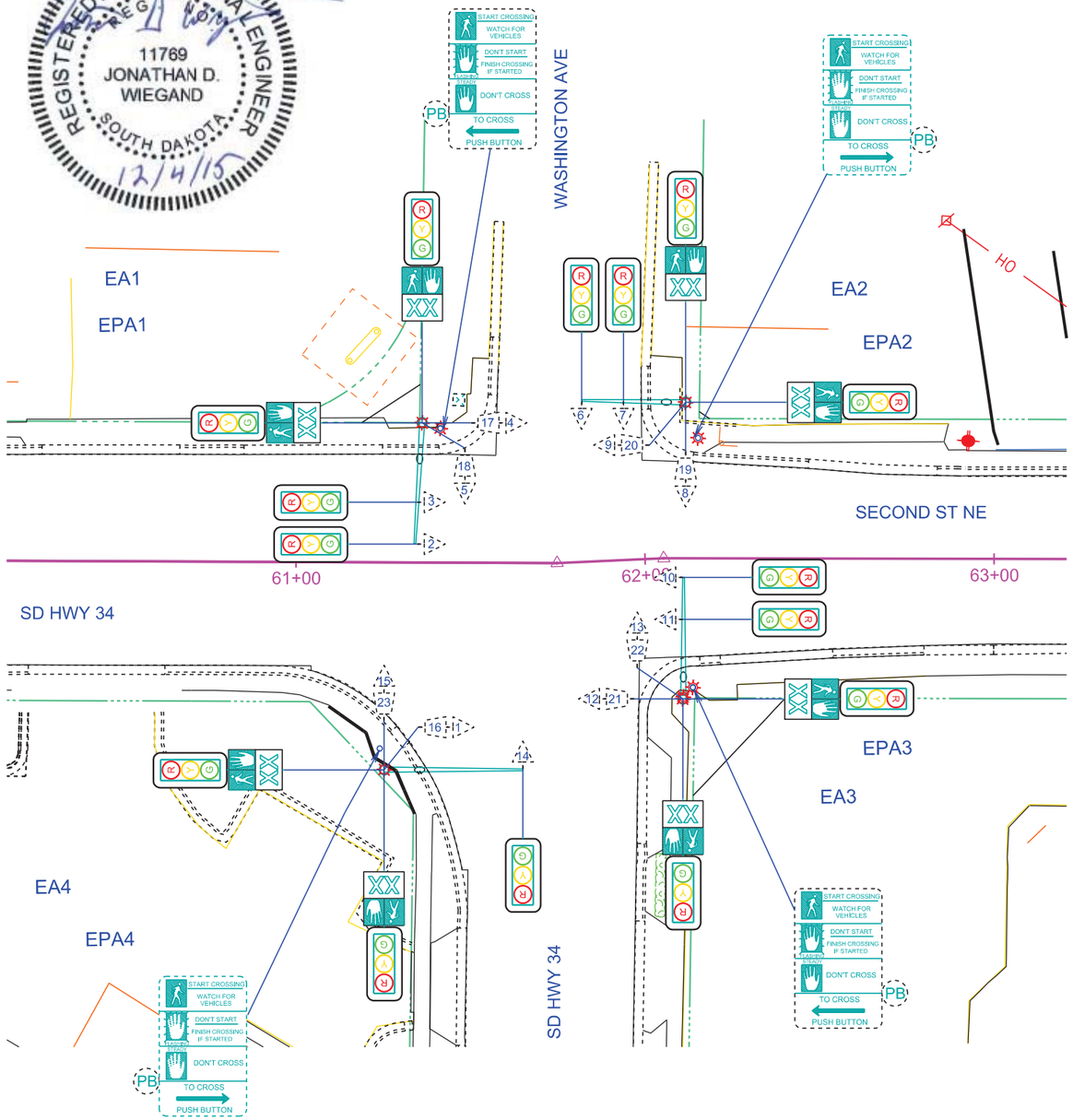


REMOVE SIGNAL EQUIPMENT

KEY	ITEM
	ROADWAY LUMINAIRE, 400W WITH P.E. (EA1-EA4)
	PEDESTRIAN PUSH BUTTON POLE (EPA1-EPA4)
PB	PEDESTRIAN PUSH BUTTON
	SIGNAL POLE W/35' MAST ARM & LUMINAIRE EXT (EA3)
	PEDESTRIAN CROSSING SIGN

SALVAGE SIGNAL EQUIPMENT

KEY	ITEM
	TRAFFIC SIGNAL CONTROLLER (FOR RELOCATION WITHIN INTERSECTION)
	3 SECTION VEHICLE SIGNAL HEAD (10-13) (FOR RESET ON NEW MAST ARM)
	PEDESTRIAN SIGNAL HEAD W/COUNTDOWN TIMER (21, 22) (FOR RESET ON NEW SIGNAL POLE A3)

ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	REMOVE SIGNAL EQUIPMENT	LUMP SUM	LS
	SALVAGE SIGNAL EQUIPMENT	LUMP SUM	LS
	REMOVE SIGNAL POLE FOOTING (EA3)	1	EACH

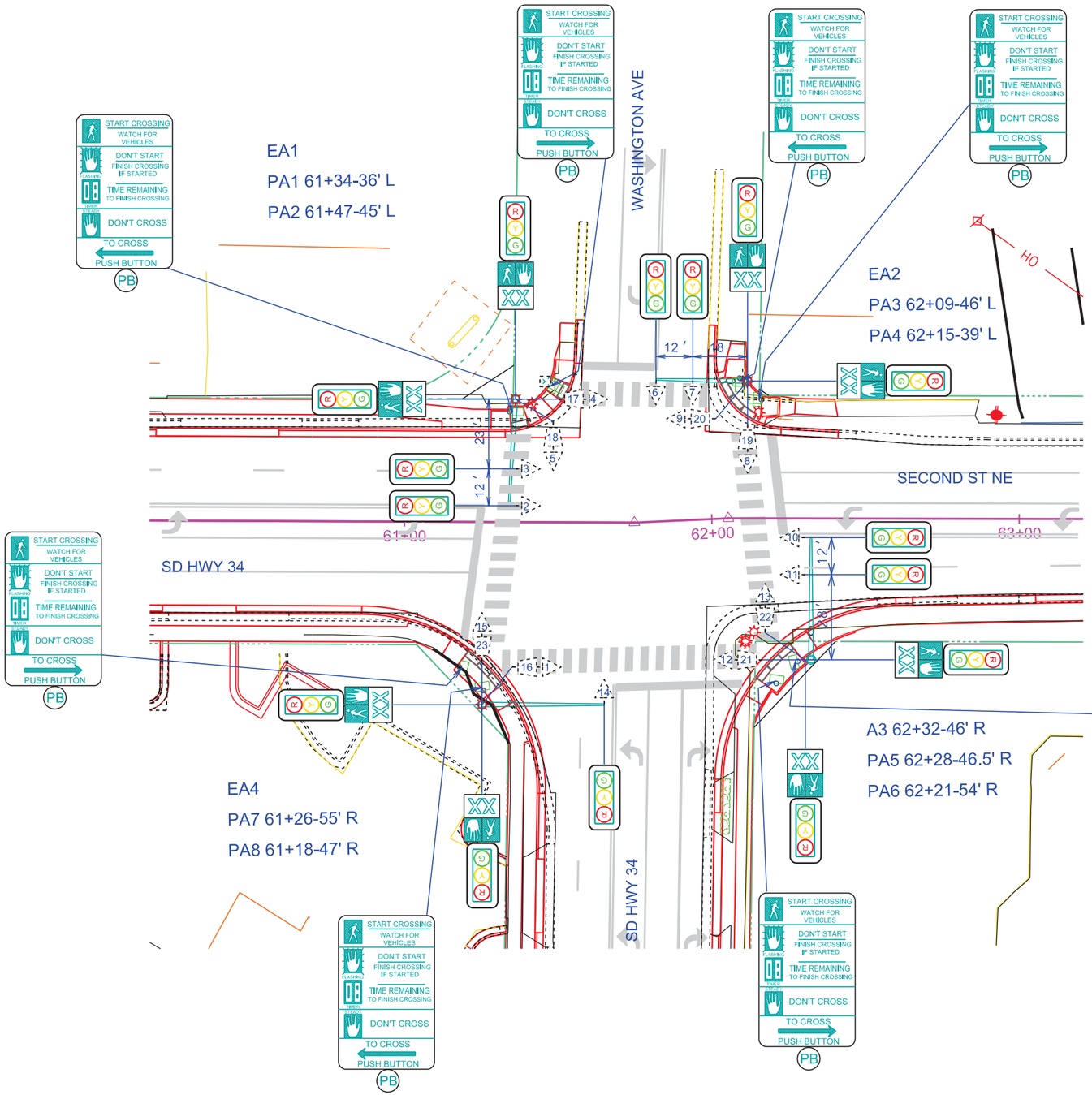
SIGNAL LAYOUT

FOR BIDDING PURPOSES ONLY

SD HWY 34/2ND STREET & WASHINGTON AVENUE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L13	L39

Plotting Date: 11/30/2015



RELOCATE SIGNAL EQUIPMENT	
KEY	ITEM
	3-SECTION VEHICLE SIGNAL HEAD (10-13)
	PEDESTRIAN SIGNAL HEAD W/COUNTDOWN TIMER (21, 22)

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
	RELOCATE SIGNAL EQUIPMENT	LUMP SUM	LS
	SIGNAL POLE W/40' MAST ARM & LUMIN ARM 8' ARM, 50' MT HT (A3)	1	EACH
	PEDESTRIAN CROSSING SIGN R10-3e (LEFT - 4 / RIGHT - 4)	8	EACH
PB	PEDESTRIAN PUSH BUTTON	8	EACH
	PEDESTRIAN PUSH BUTTON POLE (PA1-PA8)	8	EACH
	ROADWAY LUMINAIRE, LED WITH PHOTOELECTRIC CELL (EA1, EA2, A3, EA4)	4	EACH

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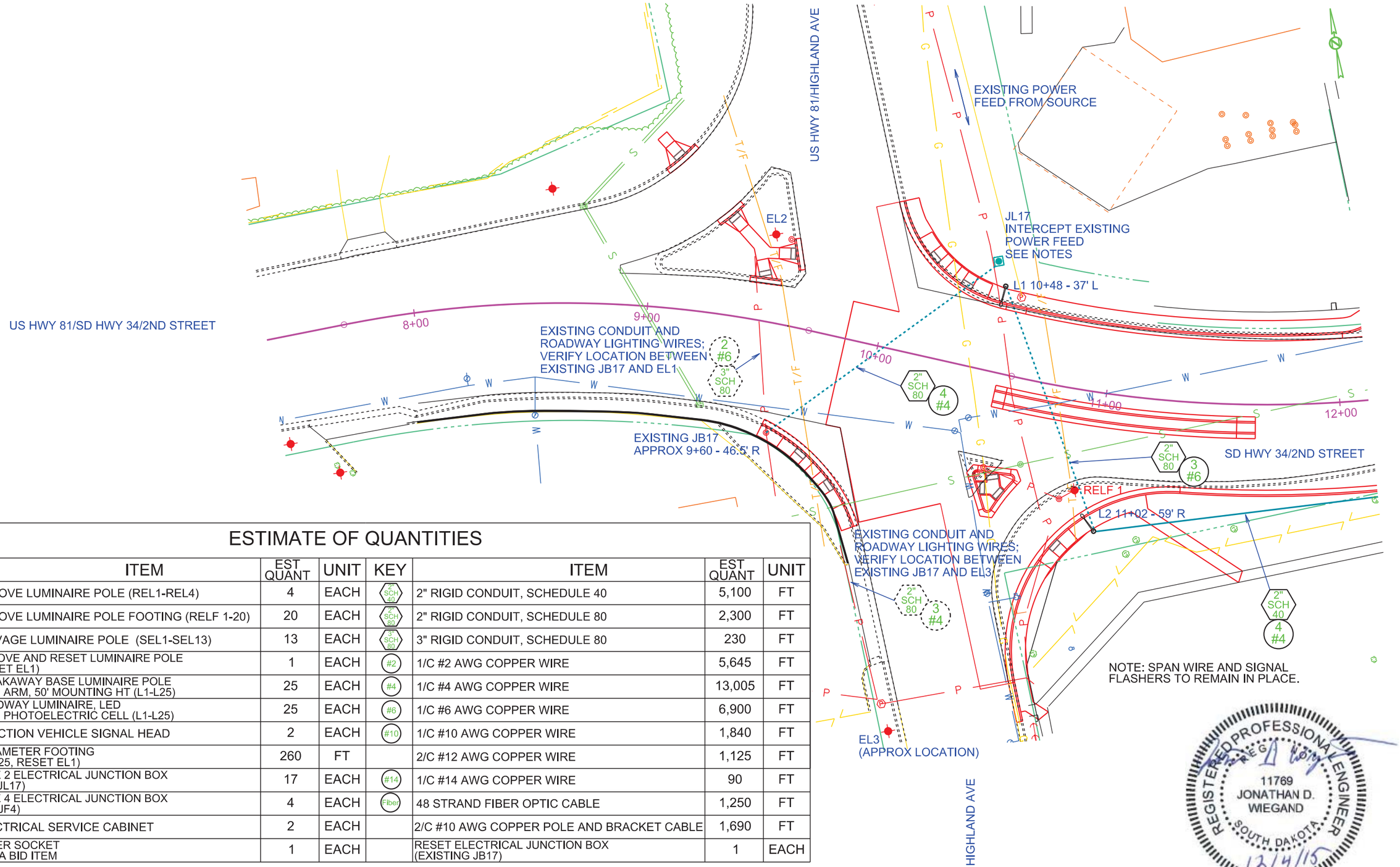
CONDUIT LAYOUT

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L14	L39

Plotting Date: 11/30/2015



ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT	KEY	ITEM	EST QUANT	UNIT
	REMOVE LUMINAIRE POLE (REL1-REL4)	4	EACH	2" SCH 40	2" RIGID CONDUIT, SCHEDULE 40	5,100	FT
	REMOVE LUMINAIRE POLE FOOTING (RELF 1-20)	20	EACH	2" SCH 80	2" RIGID CONDUIT, SCHEDULE 80	2,300	FT
	SALVAGE LUMINAIRE POLE (SEL1-SEL13)	13	EACH	3" SCH 80	3" RIGID CONDUIT, SCHEDULE 80	230	FT
	REMOVE AND RESET LUMINAIRE POLE (RESET EL1)	1	EACH	#2	1/C #2 AWG COPPER WIRE	5,645	FT
	BREAKAWAY BASE LUMINAIRE POLE WITH ARM, 50' MOUNTING HT (L1-L25)	25	EACH	#4	1/C #4 AWG COPPER WIRE	13,005	FT
	ROADWAY LUMINAIRE, LED WITH PHOTOELECTRIC CELL (L1-L25)	25	EACH	#6	1/C #6 AWG COPPER WIRE	6,900	FT
	1 SECTION VEHICLE SIGNAL HEAD	2	EACH	#10	1/C #10 AWG COPPER WIRE	1,840	FT
	2' DIAMETER FOOTING (L1-L25, RESET EL1)	260	FT		2/C #12 AWG COPPER WIRE	1,125	FT
	TYPE 2 ELECTRICAL JUNCTION BOX (JL1-JL17)	17	EACH	#14	1/C #14 AWG COPPER WIRE	90	FT
	TYPE 4 ELECTRICAL JUNCTION BOX (JF1-JF4)	4	EACH	Fiber	48 STRAND FIBER OPTIC CABLE	1,250	FT
	ELECTRICAL SERVICE CABINET	2	EACH		2/C #10 AWG COPPER POLE AND BRACKET CABLE	1,690	FT
M	METER SOCKET NOT A BID ITEM	1	EACH		RESET ELECTRICAL JUNCTION BOX (EXISTING JB17)	1	EACH

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CONDUIT LAYOUT

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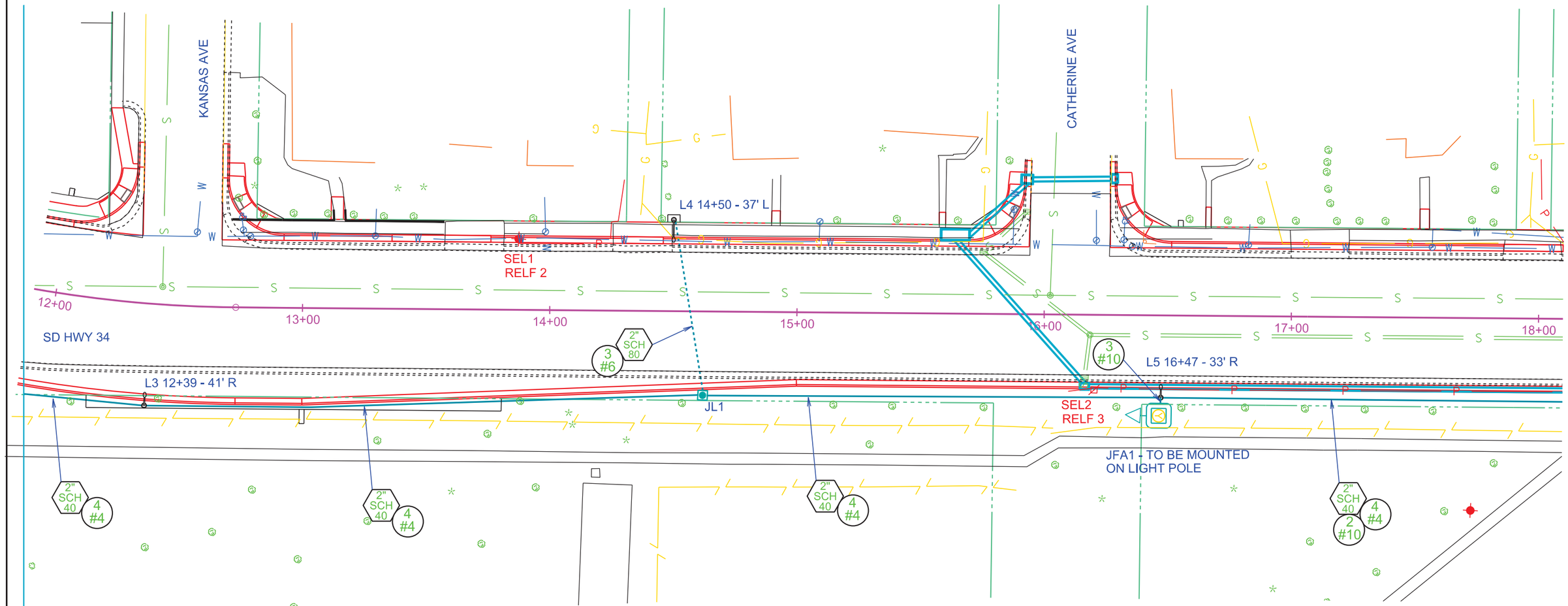
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L15	L39

Plotting Date: 11/30/2015



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CONDUIT LAYOUT

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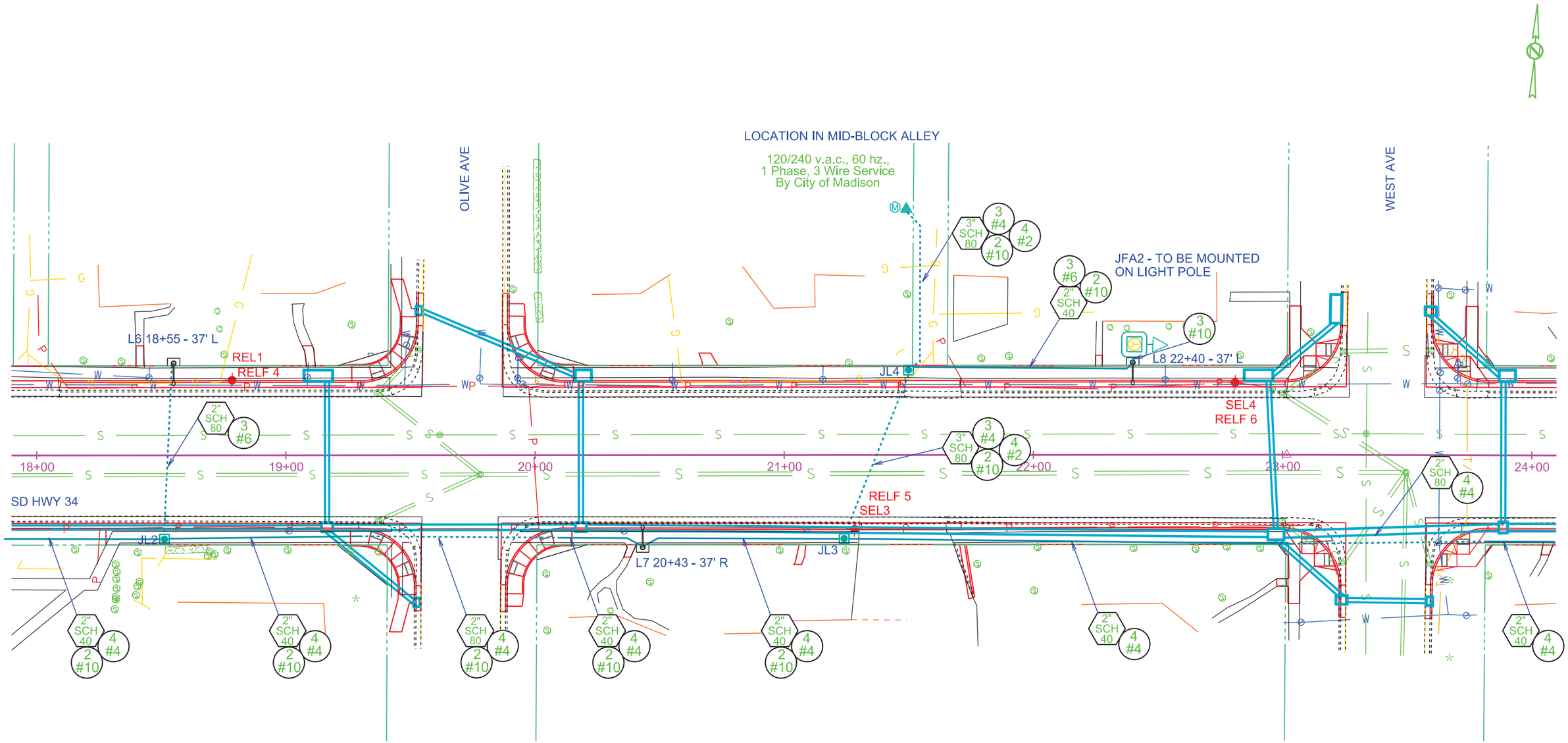
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L16	L39

Plotting Date: 11/30/2015



CONDUIT LAYOUT

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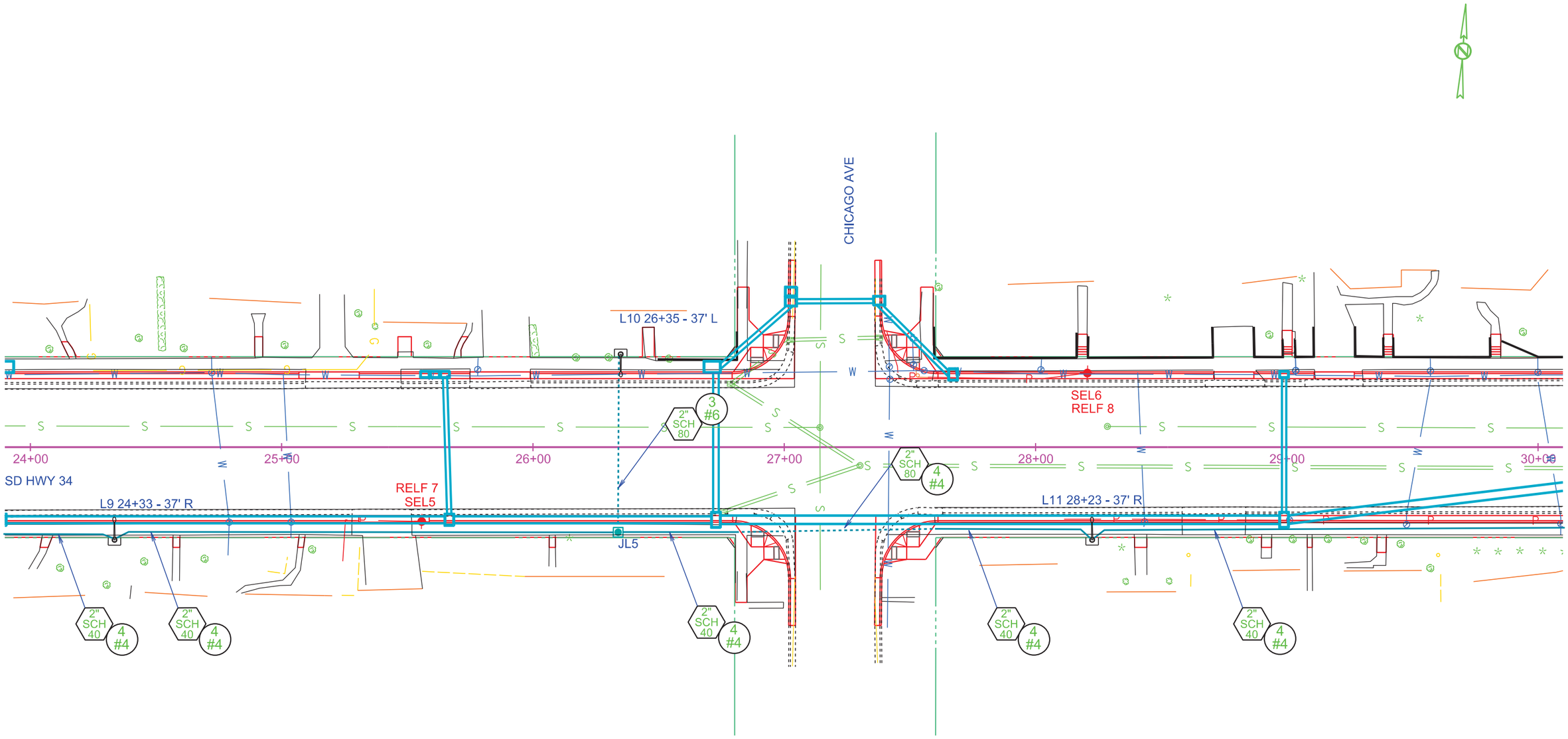
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L17	L39

Plotting Date: 11/30/2015



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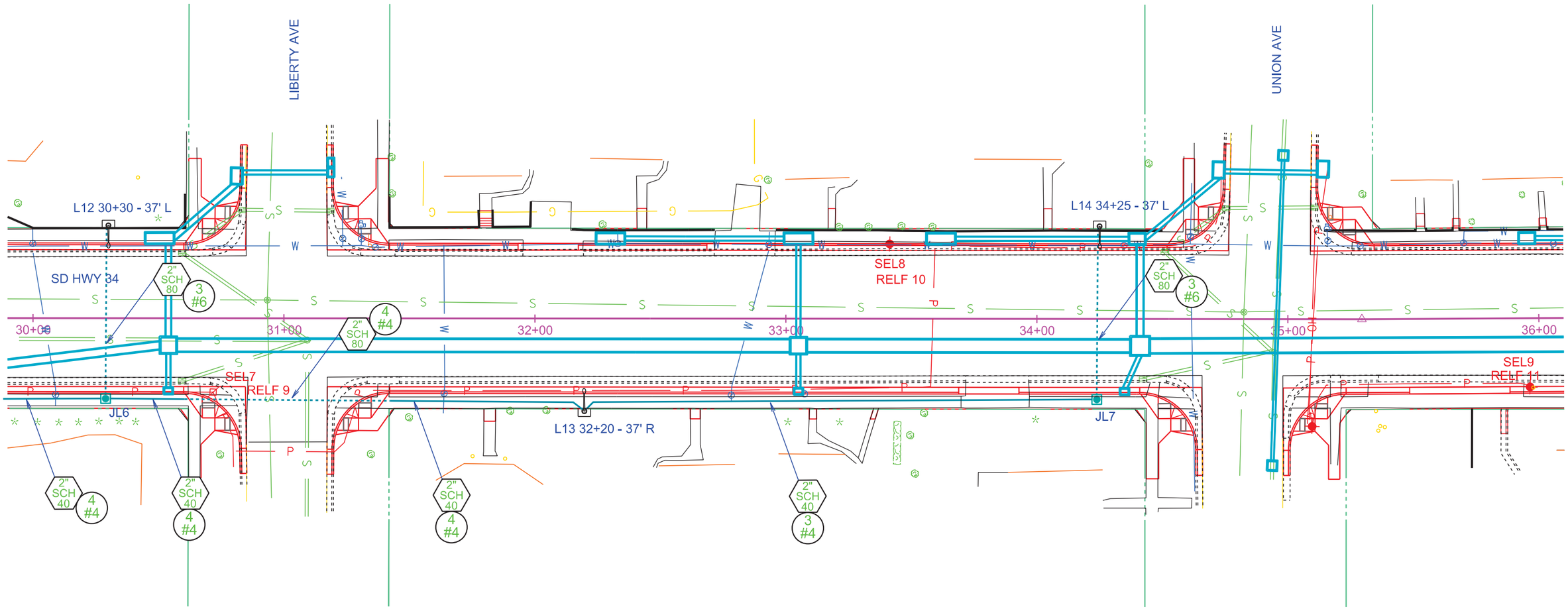
CONDUIT LAYOUT

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L18	L39

Plotting Date: 11/30/2015



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CONDUIT LAYOUT

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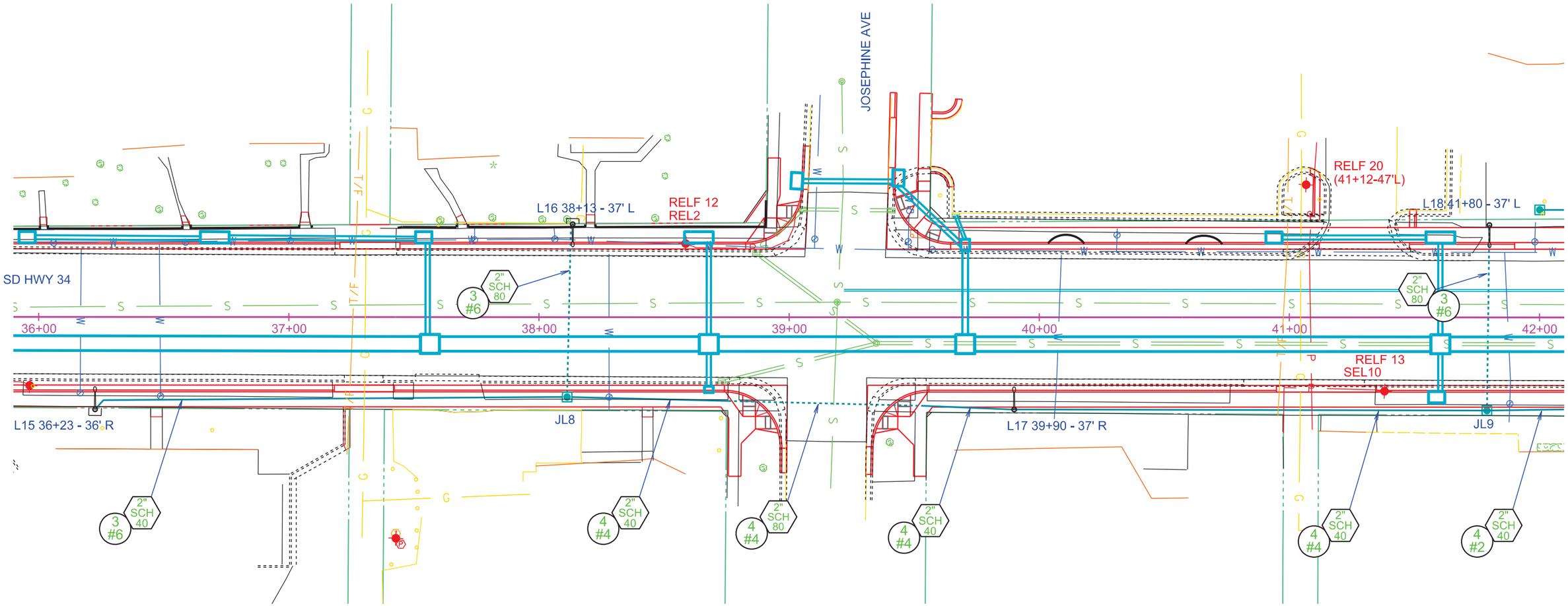
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L19	L39

Plotting Date: 11/30/2015



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CONDUIT LAYOUT

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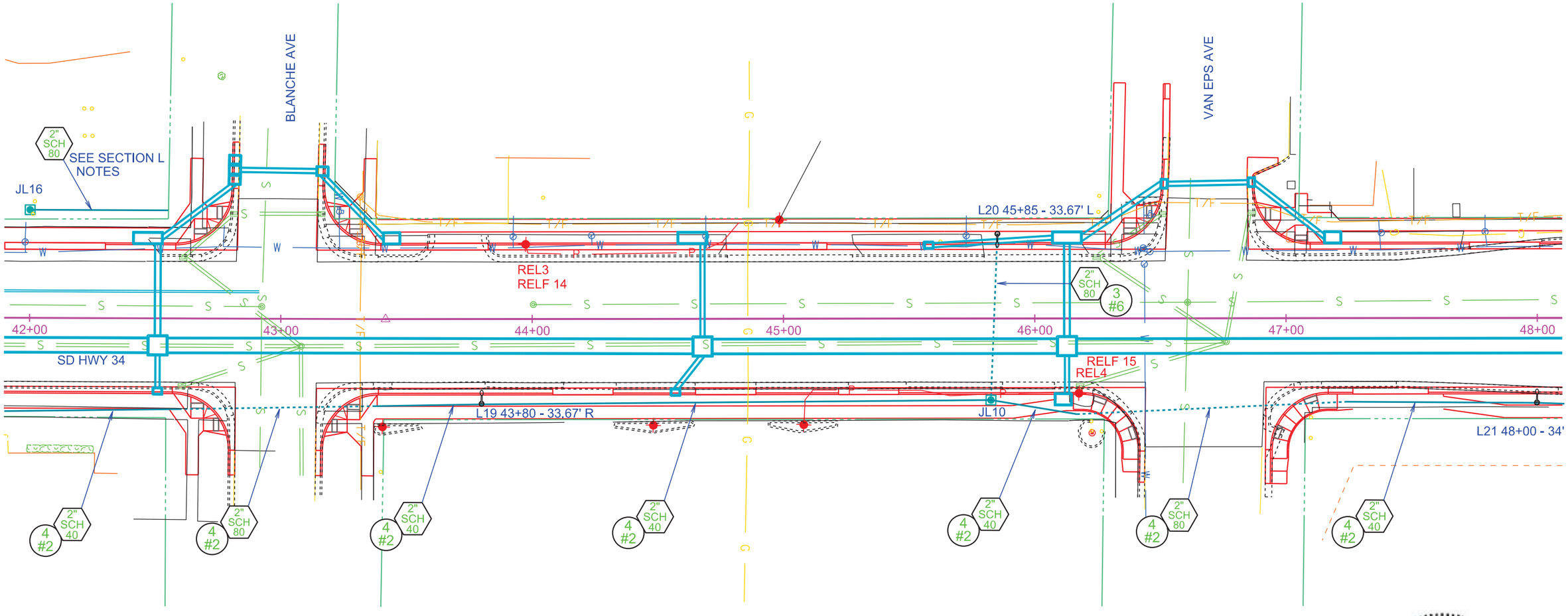
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L20	L39

Plotting Date: 11/30/2015



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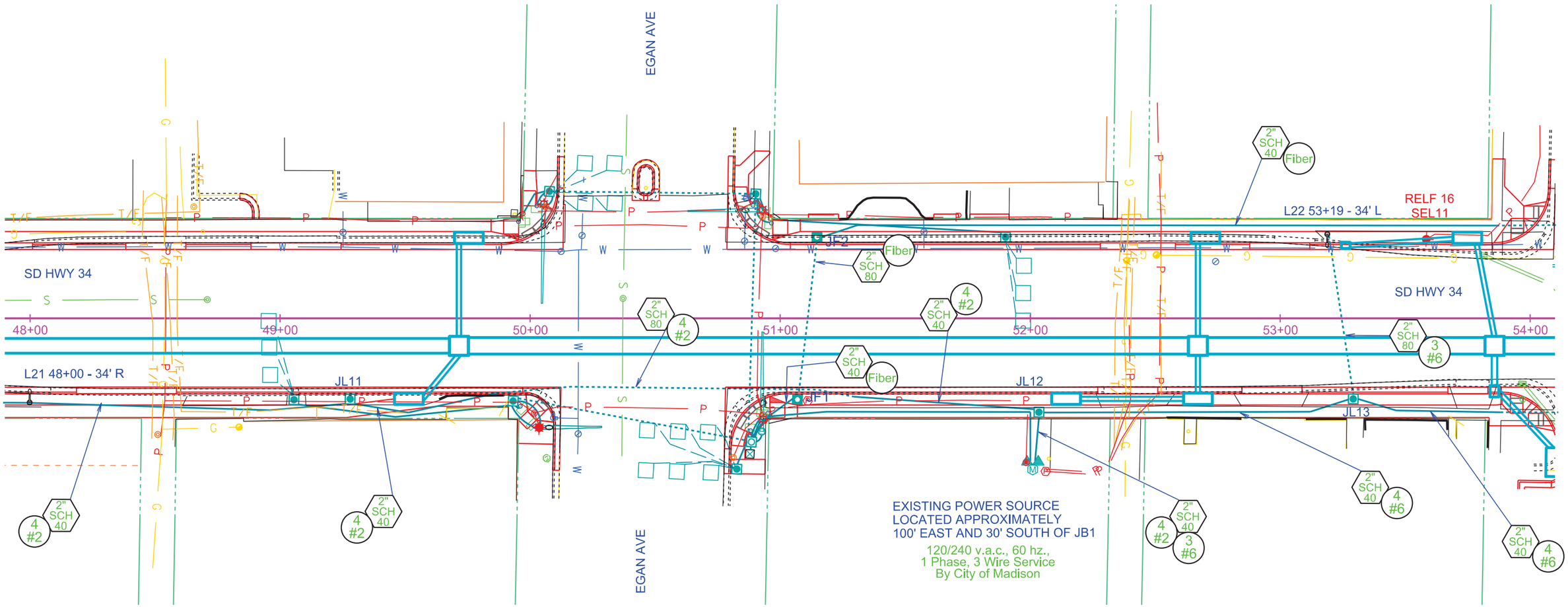
CONDUIT LAYOUT

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L21	L39

Plotting Date: 11/30/2015



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12/4/15

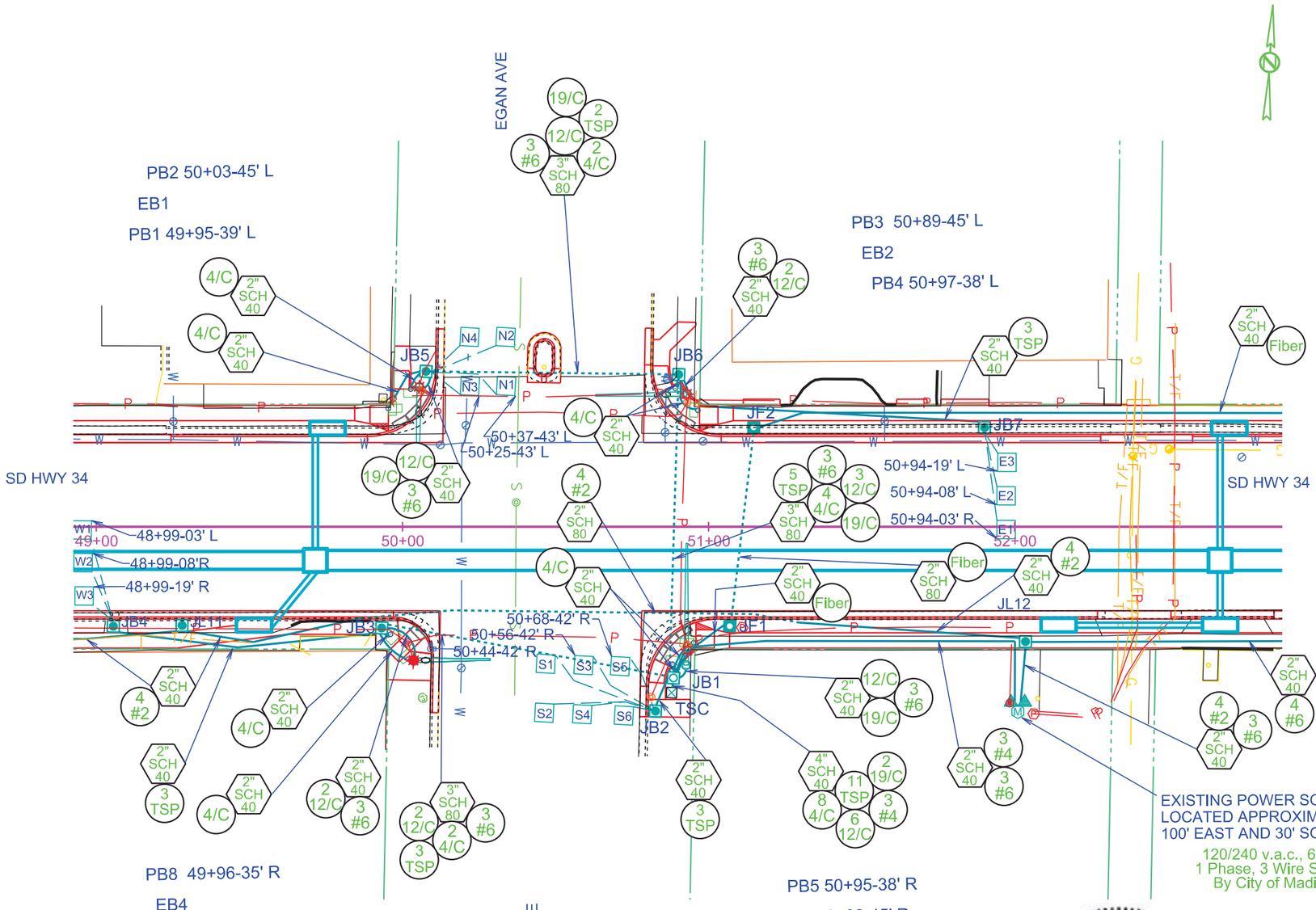
CONDUIT LAYOUT

SD HWY 34/2ND STREET & EGAN AVENUE

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L22	L39

Plotting Date: 11/30/2015



ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	3' DIAMETER FOOTING (RB3)	12	FT
	TYPE 2 ELECTRICAL JUNCTION BOX (JB2-JB7)	6	EACH
	TYPE 3 ELECTRICAL JUNCTION BOX (JB1)	1	EACH
	ELECTRICAL SERVICE CABINET	1	EACH
M	METER SOCKET NOT A BID ITEM	1	EACH
	PREFORMED DETECTOR LOOP (E1-E3,N1,N3,S1,S3,S6,W1-W3)	11	EACH
	SAWED-IN, PREFORMED DETECTOR LOOP (N2, N4, S2, S4, S6)	5	EACH
	DETECTOR UNIT	11	EACH
2" SCH 40	2" RIGID CONDUIT, SCHEDULE 40	630	FT
4" SCH 40	4" RIGID CONDUIT, SCHEDULE 40	30	FT
3" SCH 80	3" RIGID CONDUIT, SCHEDULE 80	300	FT
#4	1/C #4 AWG COPPER WIRE	630	FT
#6	1/C #6 AWG COPPER WIRE	1,765	FT
4/C	4/C #14 AWG COPPER TRAY CABLE, K2	1,555	FT
12/C	12/C #14 AWG COPPER TRAY CABLE, K2	1,015	FT
19/C	19/C #14 AWG COPPER TRAY CABLE, K2	330	FT
TSP	#16 AWG COPPER TWISTED SHIELDED PAIR	2,195	FT
	2/C #10 AWG COPPER POLE & BRACKET CABLE	65	FT
	RELOCATE SIGNAL EQUIPMENT	LS	LUMP SUM

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RELOCATE SIGNAL EQUIPMENT

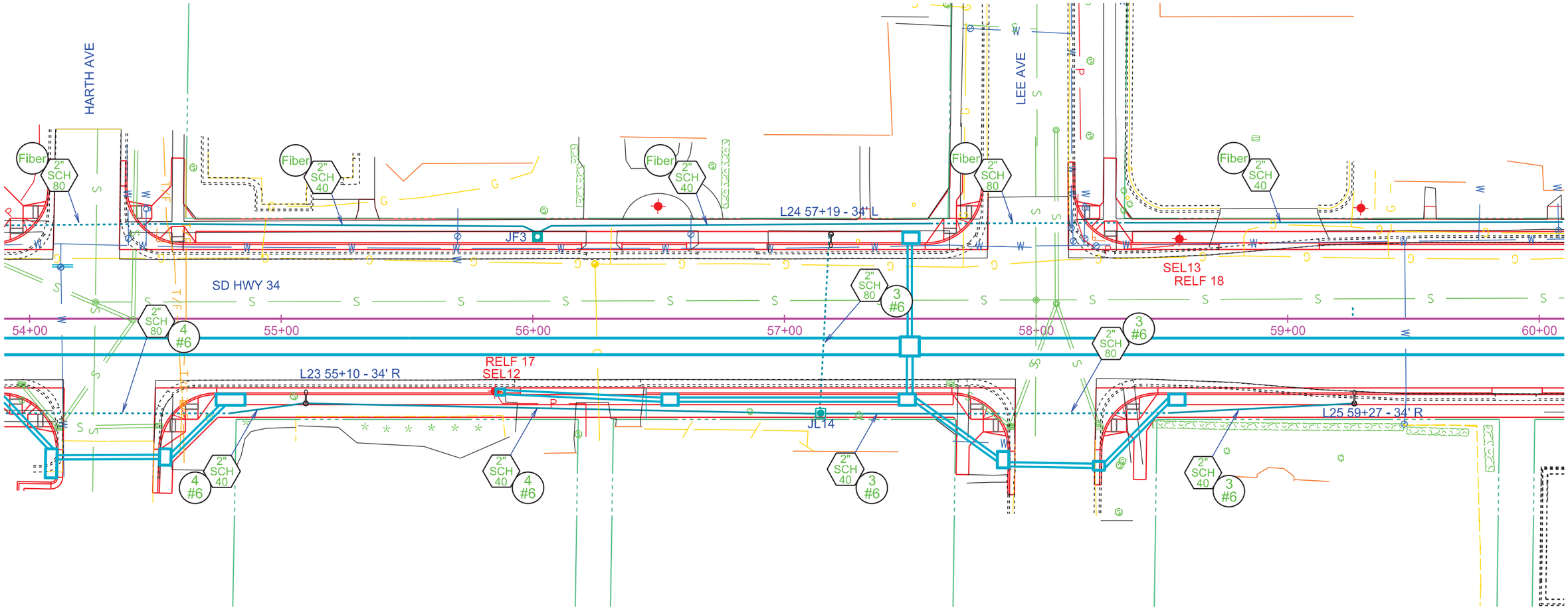
KEY	ITEM
	TRAFFIC SIGNAL CONTROLLER

CONDUIT LAYOUT

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L23	L39

Plotting Date: 11/30/2015



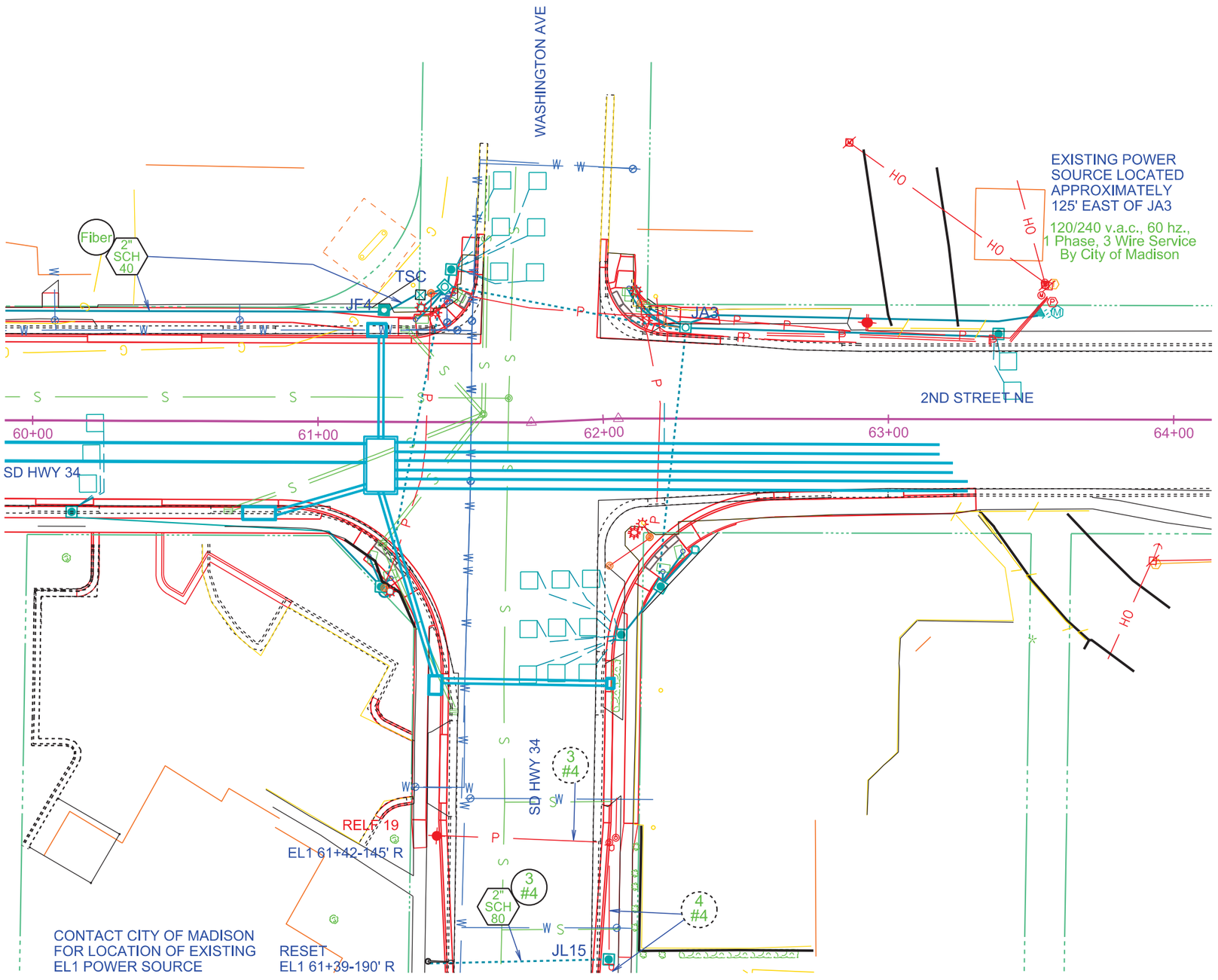
CONDUIT LAYOUT

FOR BIDDING PURPOSES ONLY

SD HWY 34/2ND STREET & WASHINGTON AVENUE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L24	L39

Plotting Date: 11/30/2015



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CONDUIT LAYOUT

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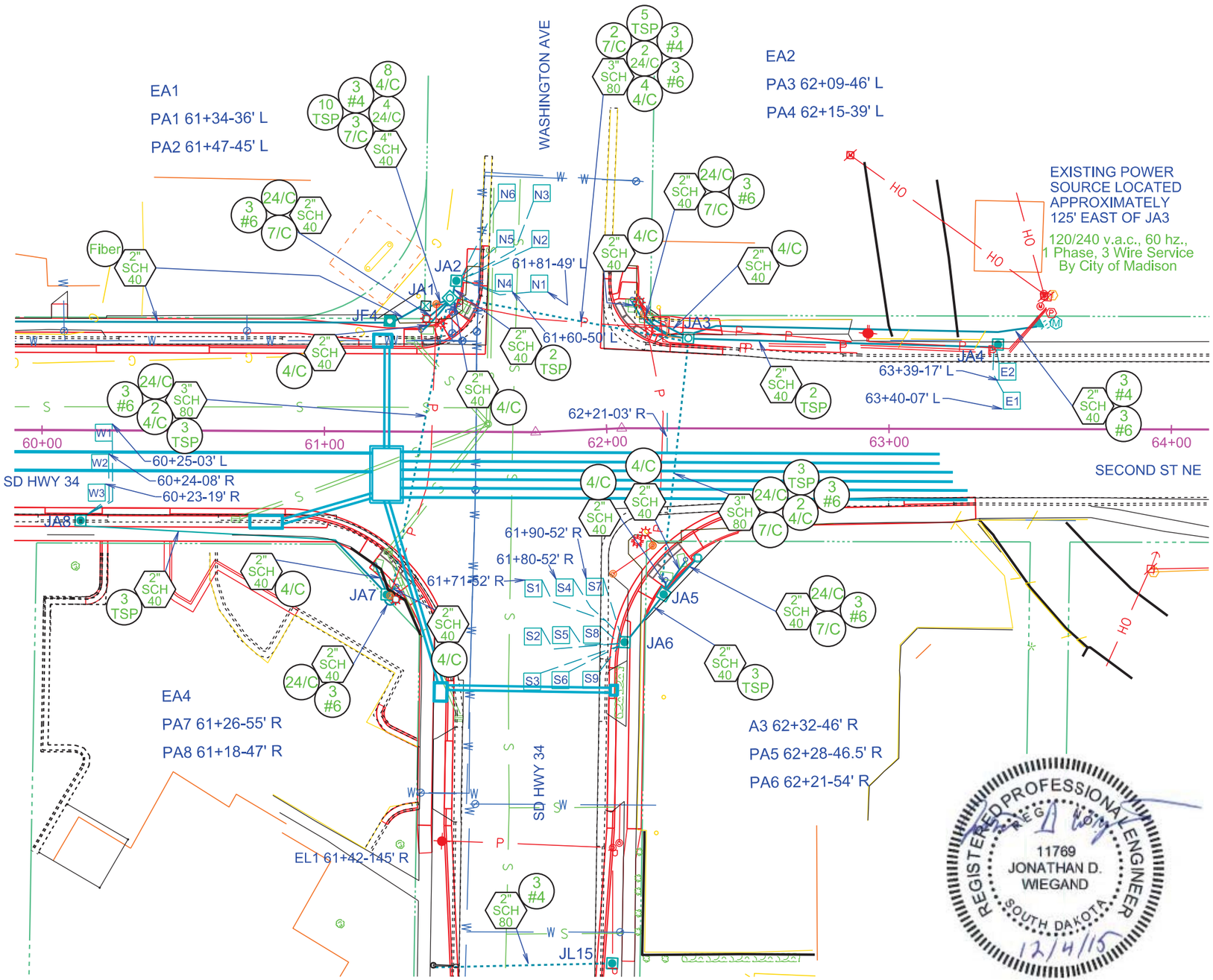
SD HWY 34/2ND STREET & WASHINGTON AVENUE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L25	L39

Plotting Date: 11/30/2015



ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	3' DIAMETER FOOTING (A3)	12	FT
	TYPE 2 ELECTRICAL JUNCTION BOX (JA2, JA4-JA8)	6	EACH
	TYPE 3 ELECTRICAL JUNCTION BOX (JA1, JA3)	2	EACH
	ELECTRICAL SERVICE CABINET	1	EACH
M	METER SOCKET NOT A BID ITEM	1	EACH
	PREFORMED DETECTOR LOOP (N1, N4, S1-S9, W1-3)	14	EACH
	SAWED-IN, PREFORMED DETECTOR LOOP (N2, N3, N5, N6, E1, E2)	6	EACH
	DETECTOR UNIT	10	EACH
2" SCH 40	2" RIGID CONDUIT, SCHEDULE 40	665	FT
4" SCH 40	4" RIGID CONDUIT, SCHEDULE 40	25	FT
3" SCH 80	3" RIGID CONDUIT, SCHEDULE 80	300	FT
#4	1/C #4 AWG COPPER WIRE	870	FT
#6	1/C #6 AWG COPPER WIRE	1,740	FT
4/C	4/C #14 AWG COPPER TRAY CABLE, K2	1,520	FT
7/C	7/C #14 AWG COPPER TRAY CABLE, K2	475	FT
24/C	24/C #14 AWG COPPER TRAY CABLE, K2	640	FT
TSP	#16 AWG COPPER TWISTED SHIELDED PAIR	2,210	FT
	2/C #10 AWG COPPER POLE & BRACKET CABLE	65	FT
	RELOCATE SIGNAL EQUIPMENT	LS	LUMP SUM

RELOCATE SIGNAL EQUIPMENT

KEY	ITEM
⊠	TRAFFIC SIGNAL CONTROLLER

REGISTERED PROFESSIONAL ENGINEER
11769
JONATHAN D. WIEGAND
SOUTH DAKOTA
12/4/15

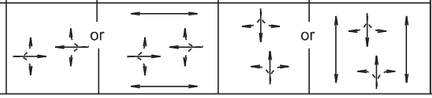
SIGNAL TIMING

FOR BIDDING PURPOSES ONLY

SD HWY 34/2ND STREET & EGAN AVENUE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L26	L39

Plotting Date: 11/30/2015

PHASING AND SEQUENCING															
INTERVAL / SIGNAL HEAD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	FLASH DISPLAY
1, 2, 3, 4, 5, 6, 7, 8	G	Y		G	G	Y									Y
9, 10, 11, 12, 13, 14								G	Y		G	G	Y		R
EB & WB: 15,16,17,18	DW	DW	DW	W	F DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	NO DISPLAY
NB & SB: 19,20,21,22	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	F DW	DW	DW	NO DISPLAY
MOVEMENTS	2&6			2&6 W/PED				4&8			4&8 W/PED				
PHASES															

CONTROLLER TIMINGS (FREE OPERATION)								
MOVEMENT	1	2	3	4	5	6	7	8
PHASE								
MIN GREEN		12		7		12		7
ADDED INITIAL								
MAX INITIAL								
PASSAGE TIME		3.5		3		3.5		3
MAXIMUM 1		38		32		38		32
MAXIMUM 2								
TIME BEFORE								
TIME TO REDUCE								
MINIMUM GAP								
YELLOW CHANGE		4		3		4		3
RED CLEARANCE		2.5		3		2.5		3
WALK		7		7		7		7
PED CLEARANCE		25		22		25		22
RECALL		SOFT		OFF		SOFT		OFF

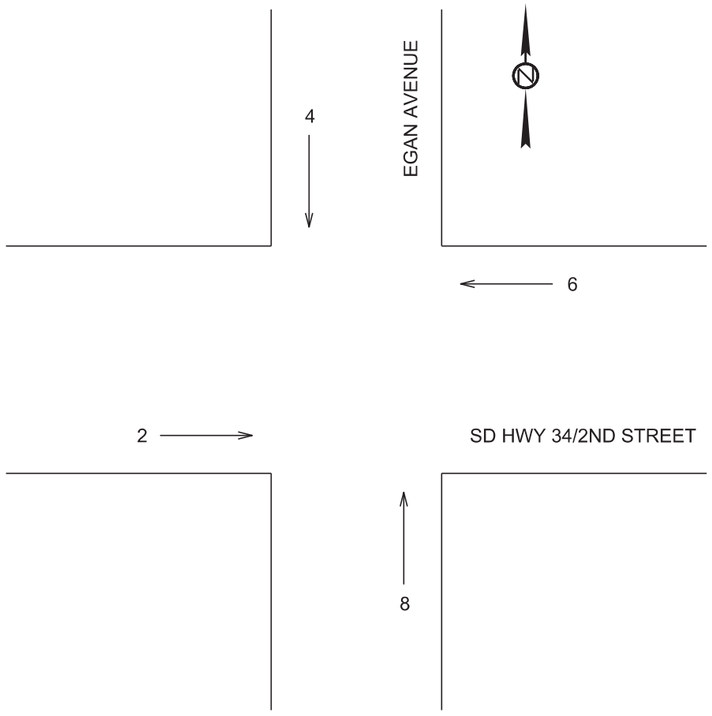
WEEKLY PROGRAM							
	SUN	MON	TUE	WED	THU	FRI	SAT
TIMING PLAN	1	1	1	1	1	1	1

TIMING PLAN 1	
TIME OF DAY (TOD)	PATTERN (C/S/O)
6:00 - 7:00	FREE
7:00 - 9:00	1/1/1
9:00 - 11:00	FREE
11:00 - 13:30	1/1/2
13:30 - 16:00	FREE
16:00 - 18:30	1/2/2
18:30 - 23:00	FREE
23:00 - 6:00	FLASH

COORDINATION TIMING								
CYCLE 1 = 75 SEC								
MOVEMENT	1	2	3	4	5	6	7	8
PHASE								
TIME - SPLIT 1		40		35		40		35
COORDINATED PHASE		X				X		
OFFSET 1 = 59 SEC								

COORDINATION TIMING								
CYCLE 1 = 75 SEC								
MOVEMENT	1	2	3	4	5	6	7	8
PHASE								
TIME - SPLIT 1		40		35		40		35
COORDINATED PHASE		X				X		
OFFSET 2 = 1 SEC								

COORDINATION TIMING								
CYCLE 1 = 75 SEC								
MOVEMENT	1	2	3	4	5	6	7	8
PHASE								
TIME - SPLIT 2		41		34		41		34
COORDINATED PHASE		X				X		
OFFSET 2 = 1 SEC								



DETECTOR SETTINGS								
DETECTOR LABEL	AMPLIFIED CHANNEL DETECTOR	DETECTOR TYPE	DETECTOR OPERATION			LOCKING CALL	MOVEMENT CALLED	MOVEMENT EXTENDED
			CALLS & EXTENDS	CALLS ONLY	EXTENDS ONLY			
N1,N2	1	PREFORMED	X				4	4&8
N3,N4	2	PREFORMED	X				4	4&8
E1,E2,E3	3	PREFORMED	X			X	6	2&6
S1,S2	4	PREFORMED	X				8	4&8
S3,S4	5	PREFORMED	X				8	4&8
S5,S6	6	PREFORMED	X				8	4&8
W1,W2,W3	7	PREFORMED	X			X	2	2&6

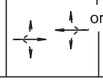
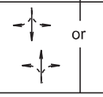
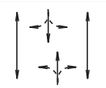
SIGNAL TIMING

FOR BIDDING PURPOSES ONLY

SD HWY 34/2ND STREET & WASHINGTON AVENUE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L27	L39

Plotting Date: 11/30/2015

PHASING AND SEQUENCING															
INTERVAL / SIGNAL HEAD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	FLASH DISPLAY
1,2,3,4,9,10,11,12	G	Y		G	G	Y									Y
5,6,7,8,13,14,15								G	Y		G	G	Y		R
EB & WB: 15,16,17,18	DW	DW	DW	W	F DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	NO DISPLAY
NB & SB: 19,20,21,22	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	F DW	DW	DW	NO DISPLAY
MOVEMENTS	2&6			2&6 W/PED				4&8			4&8 W/PED				
PHASES	 or 							 or 							

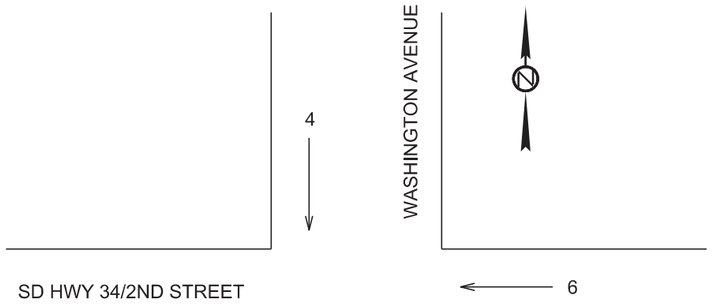
CONTROLLER TIMINGS (FREE OPERATION)								
MOVEMENT	1	2	3	4	5	6	7	8
PHASE								
MIN GREEN		12		10		12		10
ADDED INITIAL								
MAX INITIAL								
PASSAGE TIME		3.5		3		3.5		3.5
MAXIMUM 1		39		36		39		36
MAXIMUM 2								
TIME BEFORE								
TIME TO REDUCE								
MINIMUM GAP								
YELLOW CHANGE		4		4		4		4
RED CLEARANCE		3		2.5		3		2.5
WALK		7		7		7		7
PED CLEARANCE		27		25		27		25
RECALL		SOFT		OFF		SOFT		OFF

TIMING PLAN 1	
TIME OF DAY (TOD)	PATTERN (C/S/O)
6:00 - 7:00	FREE
7:00 - 9:00	1/1/1
9:00 - 11:00	FREE
11:00 - 13:30	1/2/1
13:30 - 16:00	FREE
16:00 - 18:30	1/2/1
18:30 - 23:00	FREE
23:00 - 6:00	FLASH

WEEKLY PROGRAM							
	SUN	MON	TUE	WED	THU	FRI	SAT
TIMING PLAN	1	1	1	1	1	1	1

COORDINATION TIMING								
CYCLE 1 = 75 SEC								
MOVEMENT	1	2	3	4	5	6	7	8
PHASE								
TIME - SPLIT 1		40		35		40		35
COORDINATED PHASE		X				X		
OFFSET 1 = 0 SEC								

COORDINATION TIMING								
CYCLE 1 = 75 SEC								
MOVEMENT	1	2	3	4	5	6	7	8
PHASE								
TIME - SPLIT 2		39		36		39		36
COORDINATED PHASE		X				X		
OFFSET 1 = 0 SEC								



DETECTOR SETTINGS								
DETECTOR LABEL	AMPLIFIED CHANNEL DETECTOR	DETECTOR TYPE	DETECTOR OPERATION			LOCKING CALL	MOVEMENT CALLED	MOVEMENT EXTENDED
			CALLS & EXTENDS	CALLS ONLY	EXTENDS ONLY			
N1,N2,N3	1	PREFORMED	X				4	4&8
N4,N5,N6	2	PREFORMED	X				4	4&8
E1,E2	3	PREFORMED	X			X	6	2&6
S1,S2,S3	4	PREFORMED	X				8	4&8
S4,S5,S6	5	PREFORMED	X				8	4&8
S7,S8,S9	6	PREFORMED	X				8	4&8
W1,W2,W3	7	PREFORMED	X			X	2	2&6

WIRING DIAGRAM

SD HWY 34/2ND STREET & EGAN AVENUE

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L28	L39

Plotting Date: 11/30/2015

CONTROLLER

#4 Z2 · X2 · Y2 · Fiber · FF1 — FIBER

BK · WT — AUX. · MAIN — Breakers Sized by Mfr. — NEUT. BUS

19/c A1 — 9 · 2 · 3 · 4 — 6 · 7 · 8 · 12 — L1 19/c

12/c B1 — 15 · 19 — 18 · 22 — M1 12/c

12/c C1 — 5 · 10 · 11 — 1 · 13 · 14 — N1 12/c

12/c D1 — 16 · 20 — 17 · 21 — O1 12/c

4/c E1 — PED. BUTTON PB1 — P1 4/c

4/c F1 — PED. BUTTON PB2 — Q1 4/c

4/c G1 — PED. BUTTON PB3 — R1 4/c

4/c H1 — PED. BUTTON PB4 — S1 4/c

TSP I1 — DETR. N1, N2 — T1 TSP

TSP J1 — DETR. N3, N4 — U1 TSP

TSP K1 — DETR. E1 — V1 TSP

TSP MM1 — DETR. E2 — W1 TSP

TSP NN1 — DETR. E3 — OO1 TSP

PB5 PED. BUTTON — P1 4/c

PB6 PED. BUTTON — Q1 4/c

PB7 PED. BUTTON — R1 4/c

PB8 PED. BUTTON — S1 4/c

S1, S2 DETR. — T1 TSP

S3, S4 DETR. — U1 TSP

S5, S6 DETR. — V1 TSP

W1 DETR. — W1 TSP

W2 DETR. — OO1 TSP

W3 DETR. — PP1 TSP

SERVICE CABINET

METER — 120/240 v.a.c., 60hz., 1 Phase, 3 Wire Service By City Electric

#6 AA1 · BB1 · CC1 — #4 Z1 · Y1 · X1

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

LEGEND:

FUSE: 6 amp. Non-Time Delay

LUMINAIRE: LED

JB1

A1 A2 · B1 B2 · C1 C2 · D1 D2 · E1 E2 · F1 F2 · G1 G2 · H1 H2 · I1 I2 · J1 J2 · K1 K2 · L1 L2 · M1 M2 · N1 N2 · 01 02 · P1 P2 · Q1 Q2 · R1 R2 · S1 S2 · T1 T2 · U1 U2 · V1 V2 · W1 W2 · AA2 AA1 · BB2 BB1 · CC2 CC1 · GG1 · HH1 · II1 · JJ1 · KK1 · LL1 · Z2 Z1 · Y2 Y1 · X2 X1 · MM1 MM2 · NN1 NN2 · OO1 OO2 · PP1 PP2

JB6

A2 A3 · B2 B3 · C2 C3 · D2 D3 · E2 E3 · F2 F3 · G2 G3 · H2 H3 · I2 I3 · J2 J3 · K2 K3 · AA2 AA3 · BB2 BB3 · CC2 CC3 · DD1 · EE1 · FF1 · MM2 MM3 · NN2 NN3

JB5

A3 A4 · B3 B4 · E3 E4 · F3 F4 · AA3 AA4 · BB3 BB4 · CC3 CC4 · TSP I3 N1 N2 · TSP J3 N3 N4

JB3

N2 N3 · 02 03 · R2 R3 · S2 S3 · JJ1 JJ2 · KK1 KK2 · LL1 LL2 · W2 W3 · OO2 OO3 · PP2 PP3

JB2

TSP T2 S1 S2 · TSP U2 S3 S4 · TSP V2 S5 S6

JB4

TSP W3 W1 · TSP OO3 W2 · TSP PP3 W3

JB7

TSP K3 E1 · TSP MM3 E2 · TSP NN3 E3

JF1

FF1 FF2

JF2

FF2 FF3 TO JF3

E8

E9

EB1

#6 CC4 · BB4 — BK · WT — LUMINAIRE

19/c A4 — 9 · 2 · 3 · 4

12/c B4 — 15 · 19

#6 AA4

RB3

#6 II1 · HH1 — BK · WT — LUMINAIRE

19/c L2 — 6 · 7 · 8 · 12

12/c M2 — 18 · 22

#6 GG1

EB2

#6 FF1 · EE1 — BK · WT — LUMINAIRE

12/c C3 — 5 · 10 · 11

12/c D3 — D · W — 16 · 20

#6 DD1

EB4

#6 LL2 · KK2 — BK · WT — LUMINAIRE

12/c N3 — 1 · 13 · 14

12/c 03 — D · W — 17 · 21

#6 JJ2

PB1 PED. BUTTON — E4 4/c

PB2 PED. BUTTON — F4 4/c

PB3 PED. BUTTON — G3 4/c

PB4 PED. BUTTON — H3 4/c

PB5 PED. BUTTON — P2 4/c

PB6 PED. BUTTON — Q2 4/c

PB7 PED. BUTTON — R3 4/c

PB8 PED. BUTTON — S3 4/c

REGISTERED PROFESSIONAL ENGINEER
11769
JONATHAN D. WIEGAND
SOUTH DAKOTA
12/4/15

WIRING DIAGRAM

SD HWY 34/2ND STREET & WASHINGTON AVENUE

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L29	L39

Plotting Date: 11/30/2015

CONTROLLER

#4 X3, Y3, Z3 — Fiber — FF5 — FIBER

BK — AUX. / MAIN — WT — Breakers Sized by Mfr. — NEUT. BUS

N1, N2, N3 — DETR. — BK, RD — K1 — TSP

N4, N5, N6 — DETR. — BK, RD — L1 — TSP

24/c A1 — 2, 3, 4, 5 — 6, 7, 8, 9 — M1 — 24/c

24/c B1 — 1, 14, 15, 16, 23 — 10, 11, 12, 13 — N1 — 24/c

7/c C1 — 17, 18 — 19, 20 — O1 — 7/c

4/c D1 — PED. BUTTON — PA1

4/c E1 — PED. BUTTON — PA2

4/c F1 — PED. BUTTON — PA3

4/c G1 — PED. BUTTON — PA4

TSP H1 — DETR. — S1, S2, S3

TSP I1 — DETR. — S4, S5, S6

TSP J1 — DETR. — S7, S8, S9

TSP JJ1 — DETR. — E1

KK1 — DETR. — E2

21, 22 — PA5, PA6 — Q1, R1 — 4/c — 7/c P1

PA7, PA8 — S1, T1 — 4/c — TSP MM1, NN1, OO1

W1, W2, W3 — DETR. — BK, RD

JA1

A1	A2
B1	B2
C1	C2
D1	D2
E1	E2
F1	F2
G1	G2
H1	H2
I1	I2
J1	J2
K1	K2
L1	L2
M1	M2
N1	N2
01	02
P1	P2
Q1	Q2
R1	R1
S1	S1
T1	T1
U3	U2
V3	V2
W3	W2
	GG1
	HH1
	II1
X3	X2
Y3	Y2
Z3	Z2
JJ1	JJ2
KK1	KK2
MM1	MM2
NN1	NN2
QO1	OO2

120\240 v,a,c., 60hz., 1 Phase, 3 Wire Service By CITY OF MADISON

METER — SERVICE CABINET — 100 amp — 50 amp

#4 Z1, Y1, X1 — #6 W1, U1, V1

JA3

F2	F3
G2	G3
H2	H3
I2	I3
J2	J3
M2	M3
N2	N3
O2	O3
P2	P3
Q2	Q3
R2	R3
U2	U1
V2	V1
W2	W1
	AA1
	BB1
	CC1
	DD1
	EE1
	FF1
X2	X1
Y2	Y1
Z2	Z1
JJ2	JJ3
KK2	KK3

JA2

TSP K2 — N1, N2, N3

TSP L2 — N4, N5, N6

JA5

H3	H4
I3	I4
J3	J4
N3	N4
P3	P4
Q3	Q4
R3	R4
DD1	DD2
EE1	EE2
FF1	FF2

JA6

TSP H4 — S1, S2, S3

TSP I4 — S4, S5, S6

TSP J4 — S7, S8, S9

JA4

TSP JJ3 — E1

TSP KK3 — E2

JA7

B2	B3
S2	S3
T2	T3
U3	U4
V3	V4
W3	W4
MM2	MM3
NN2	NN3
OO2	OO3

JA8

TSP MM3 — W1

TSP NN3 — W2

TSP OO3 — W3

PA5 — PED. BUTTON — BK, RD, BL, OR — Q4 — 4/c

PA6 — PED. BUTTON — BK, RD, BL, OR — R4 — 4/c

PA7 — PED. BUTTON — BK, RD, BL, OR — S3 — 4/c

PA1 — PED. BUTTON — BK, RD, BL, OR — D2 — 4/c

PA2 — PED. BUTTON — BK, RD, BL, OR — E2 — 4/c

PA3 — PED. BUTTON — BK, RD, BL, OR — F3 — 4/c

PA4 — PED. BUTTON — BK, RD, BL, OR — G3 — 4/c

PA8 — PED. BUTTON — BK, RD, BL, OR — T3 — 4/c

EA1

#6 HH1, II1 — BK, WT — LUMINAIRE

24/c A2 — BK, RD, BL, OR, YL, BN, RD/BK, BL/BK, OR/BK, YL/BK, BN/BK, BK/RD, BL/RD, OR/RD, YL/RD, BN/RD, BK/BL, RD/BL, OR/BL, YL/BL, BN/BL, BK/OR, RD/OR, BL/OR — R, Y, G — 2, 3, 4, 5

7/c C2 — D, W — 17, 18

#6 GG1

EA2

#6 BB1, CC1 — BK, WT — LUMINAIRE

24/c M3 — BK, RD, BL, OR, YL, BN, RD/BK, BL/BK, OR/BK, YL/BK, BN/BK, BK/RD, BL/RD, OR/RD, YL/RD, BN/RD, BK/BL, RD/BL, OR/BL, YL/BL, BN/BL, BK/OR, RD/OR, BL/OR — R, Y, G — 6, 7, 8, 9

7/c O3 — D, W — 19, 20

#6 AA1

A3

#6 EE2, FF2 — BK, WT — LUMINAIRE

24/c N4 — BK, RD, BL, OR, YL, BN, RD/BK, BL/BK, OR/BK, YL/BK, BN/BK, BK/RD, BL/RD, OR/RD, YL/RD, BN/RD, BK/BL, RD/BL, OR/BL, YL/BL, BN/BL, BK/OR, RD/OR, BL/OR — R, Y, G — 10, 11, 12, 13

7/c P4 — D, W — 21, 22

#6 DD2

EA4

#6 V4, W4 — BK, WT — LUMINAIRE

24/c B3 — BK, RD, BL, OR, YL, BN, RD/BK, BL/BK, OR/BK, YL/BK, BN/BK, BK/RD, BL/RD, OR/RD, YL/RD, BN/RD, BK/BL, RD/BL, OR/BL, YL/BL, BN/BL, BK/OR, RD/OR, BL/OR — R, Y, G — 1, 14, 15, 16, 23

#6 U4

JF4

FF4 — FF5 — TO JF3

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

LEGEND:
FUSE: 6 amp. Non-Time Delay
LUMINAIRE: LED

REGISTERED PROFESSIONAL ENGINEER
11769
JONATHAN D. WIEGAND
SOUTH DAKOTA
12/4/15

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L30	L39

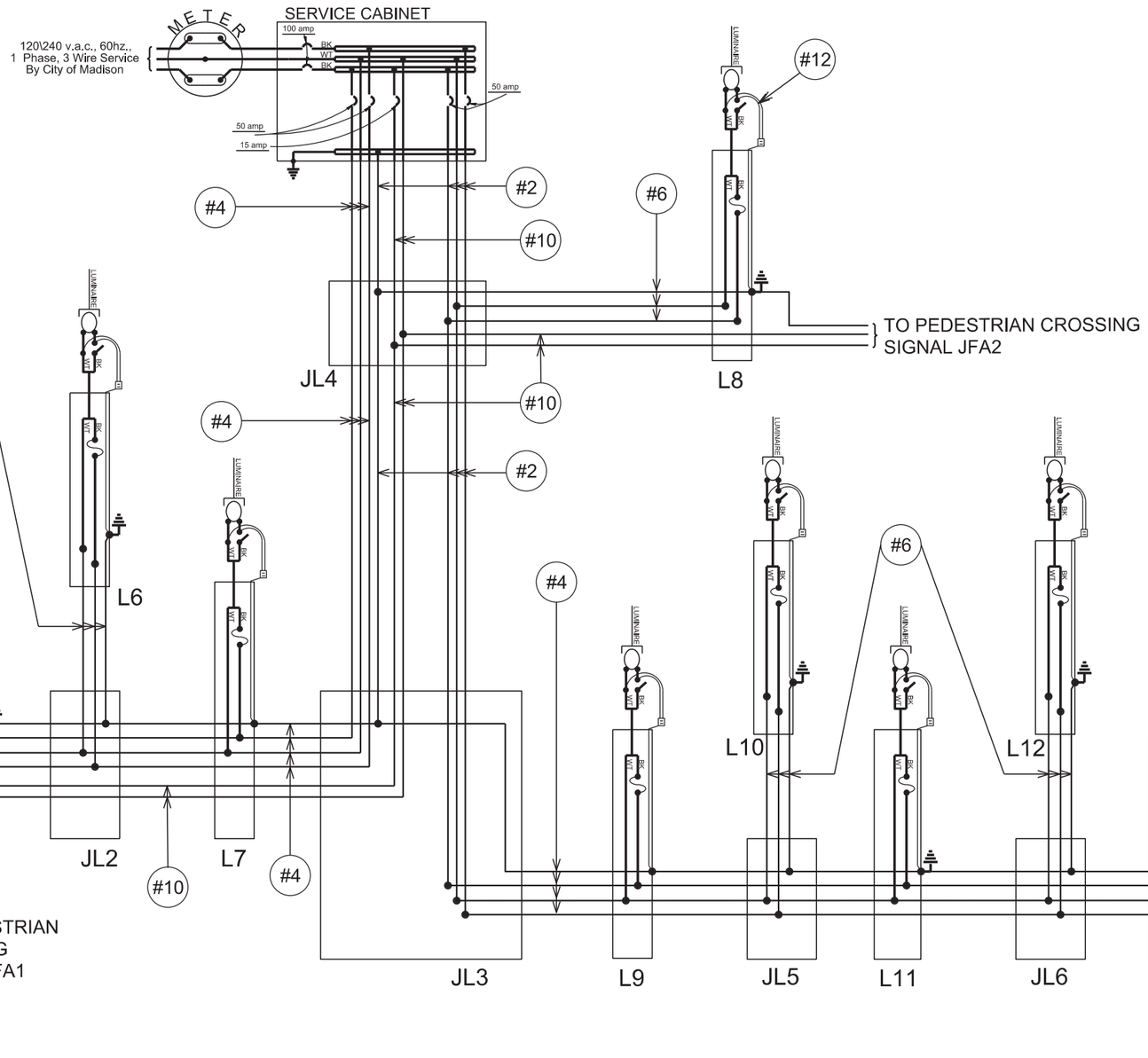
Plotting Date: 11/30/2015

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

LEGEND:

FUSE: 15 amp. Non-Time Delay

LUMINAIRE: LED



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0034(160)386	L31	L39

FOR BIDDING PURPOSES ONLY

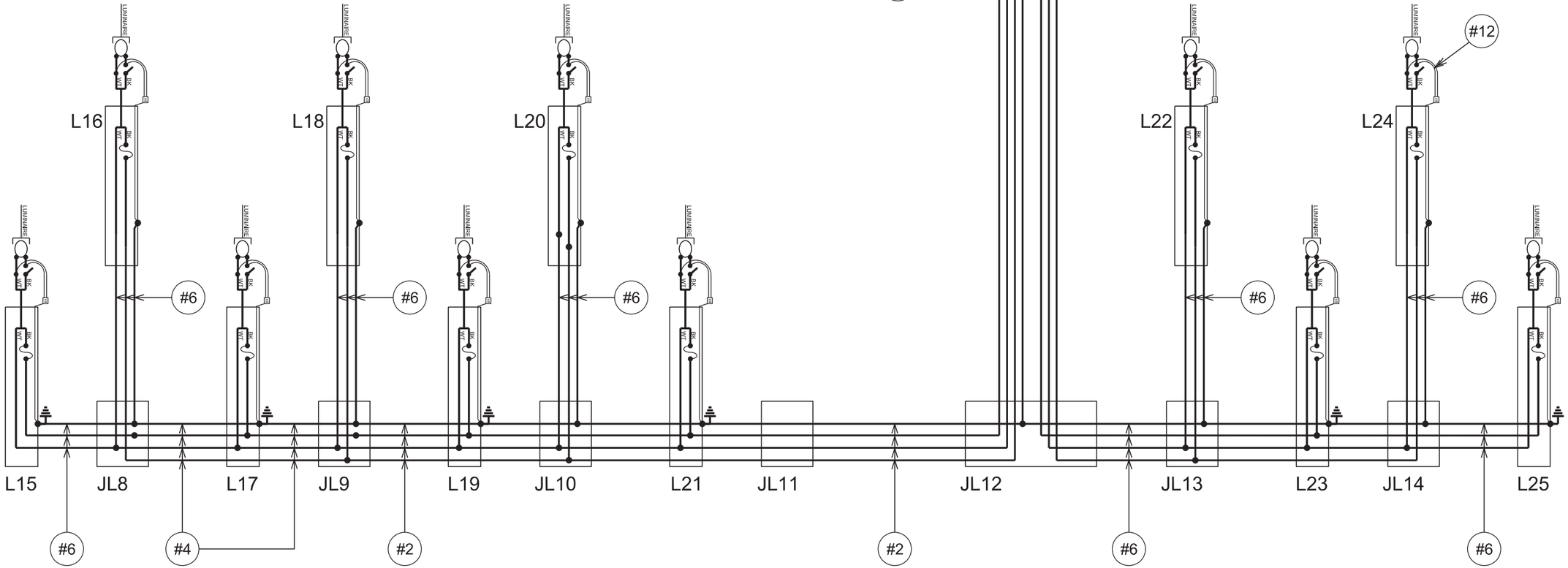
Plotting Date: 11/30/2015

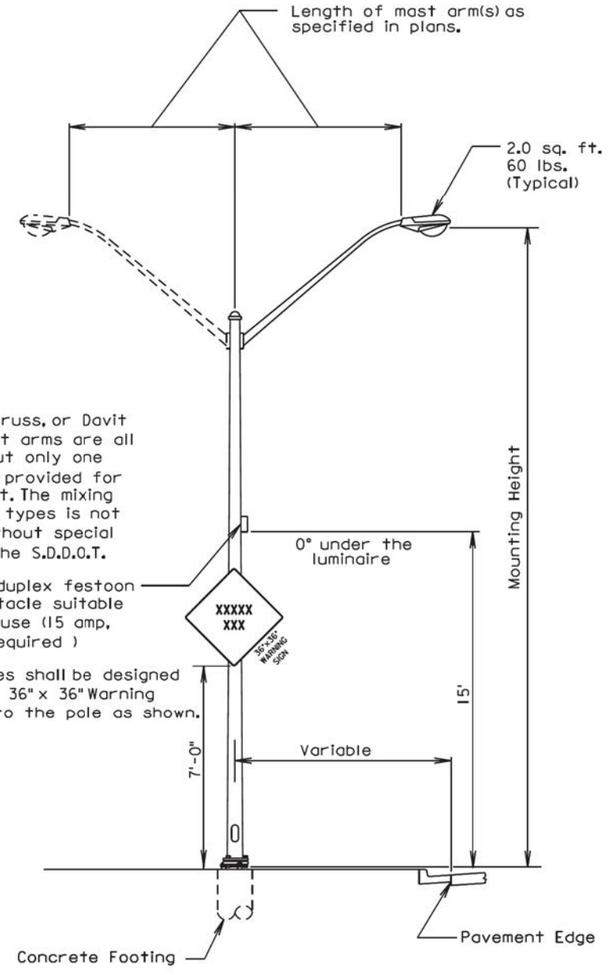
NOTE:
All circuits shall be bonded in accordance with the NATIONAL ELECTRICAL CODE. Quantities for bonding conductors are not included in these plans.

LEGEND:

FUSE: 15 amp. Non-Time Delay

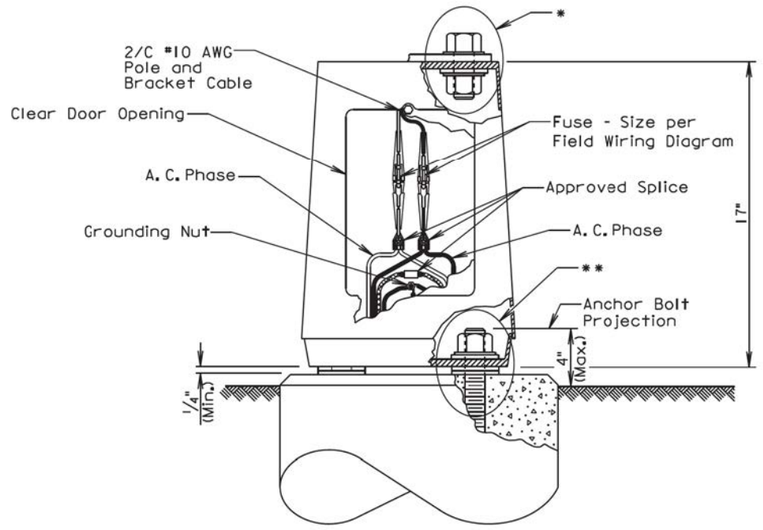
LUMINAIRE: LED





March 31, 2000

Published Date: 4th Qtr. 2015	SDDOT	STEEL ROADWAY LUMINAIRE POLE WITH MAST ARM(S)	PLATE NUMBER 635.01 Sheet 1 of 1



GENERAL NOTES:

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

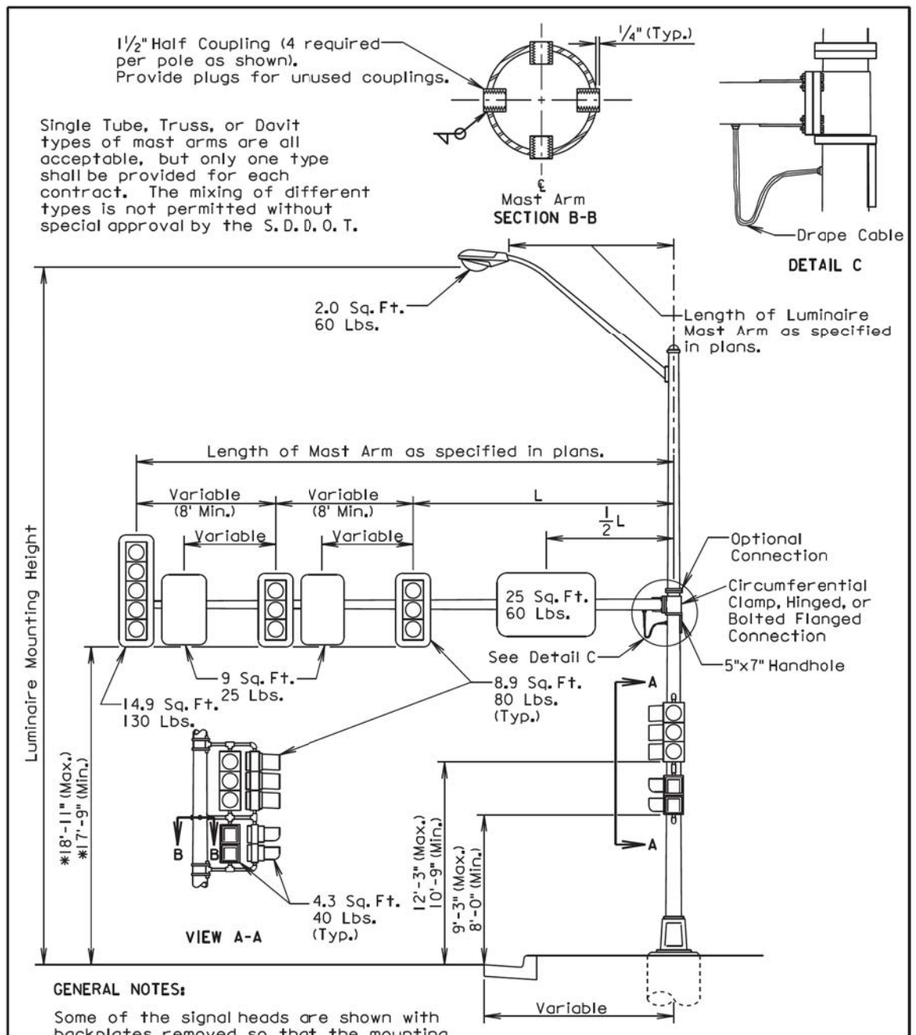
Fused connectors shall be breakaway type.

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

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

September 6, 2015

Published Date: 4th Qtr. 2015	SDDOT	ROADWAY LUMINAIRE POLE BREAKAWAY TRANSFORMER BASE	PLATE NUMBER 635.21 Sheet 1 of 1



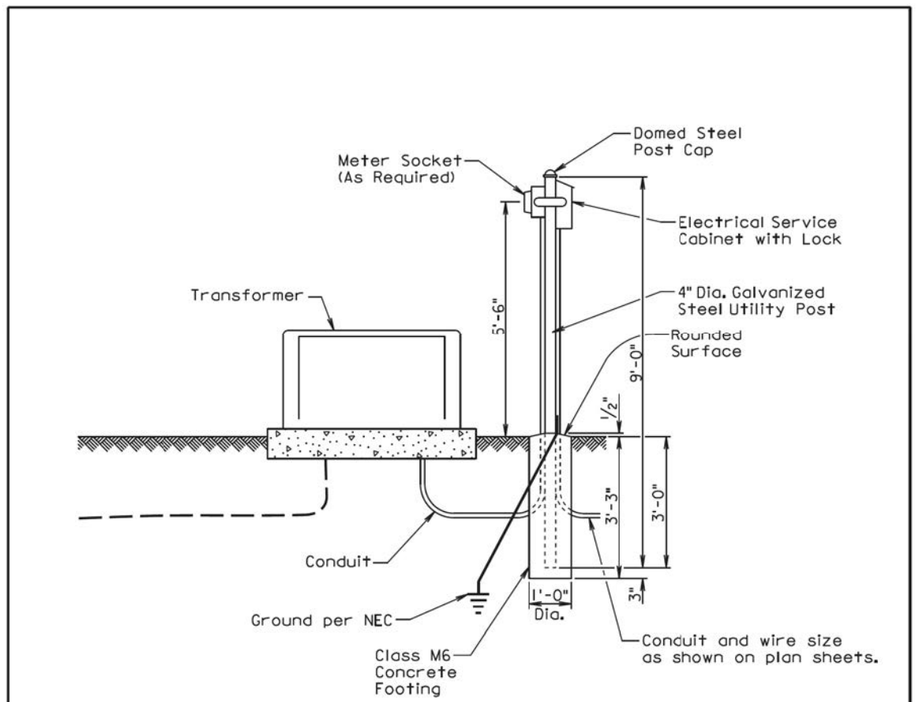
GENERAL NOTES:

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 shall be as specified in Section 4D.15 of the MUTCD.

December 23, 2008

Published Date: 4th Qtr. 2015	SDDOT	**SIGNAL POLE (WITH MAST ARM AND LUMINAIRE EXTENSION)**	PLATE NUMBER 635.32 Sheet 1 of 1



ELEVATION

GENERAL NOTES:

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

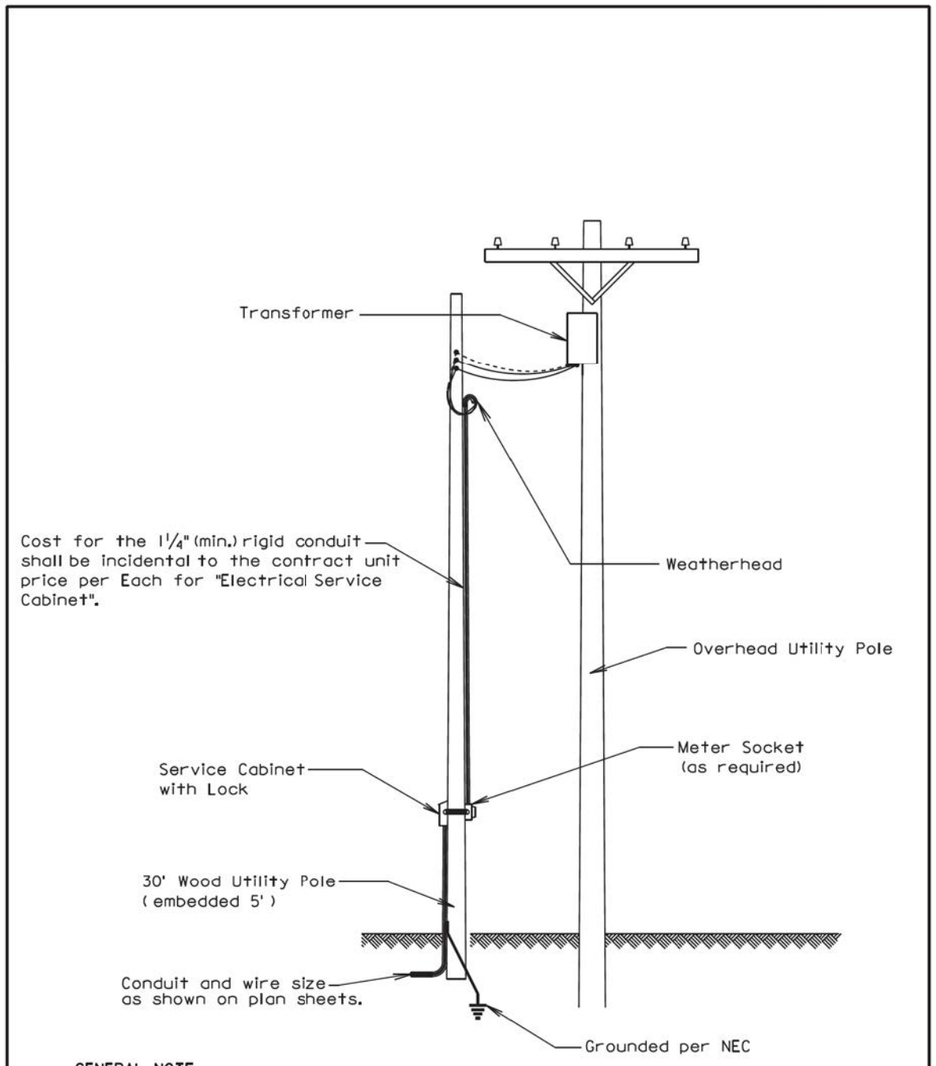
The 4" diameter galvanized steel utility post shall be 9' long and shall be in conformance with AASHTO Standard Specifications M181. The post shall be Type 1 and either Grade 1 or Grade 2. The domed steel post cap shall be in conformance with AASHTO Standard Specifications M181 and shall be Type 1.

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

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

June 26, 2006

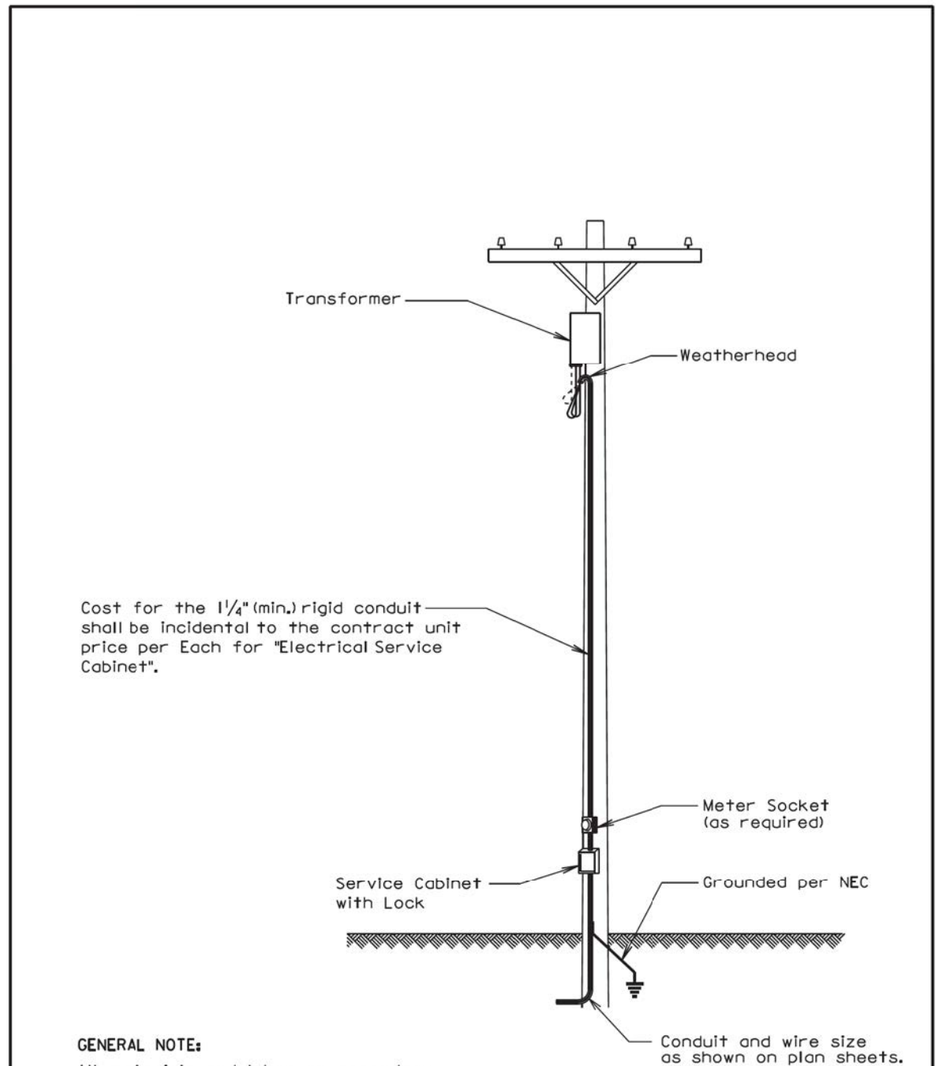
Published Date: 4th Qtr. 2015	SDDOT	**SERVICE FROM PAD MOUNTED TRANSFORMER WITH METER ON A GALVANIZED STEEL UTILITY POST**	PLATE NUMBER 635.41 Sheet 1 of 1



GENERAL NOTE:
All materials and labor on secondary side of transformer shall be supplied by the Contractor.

March 31, 2000

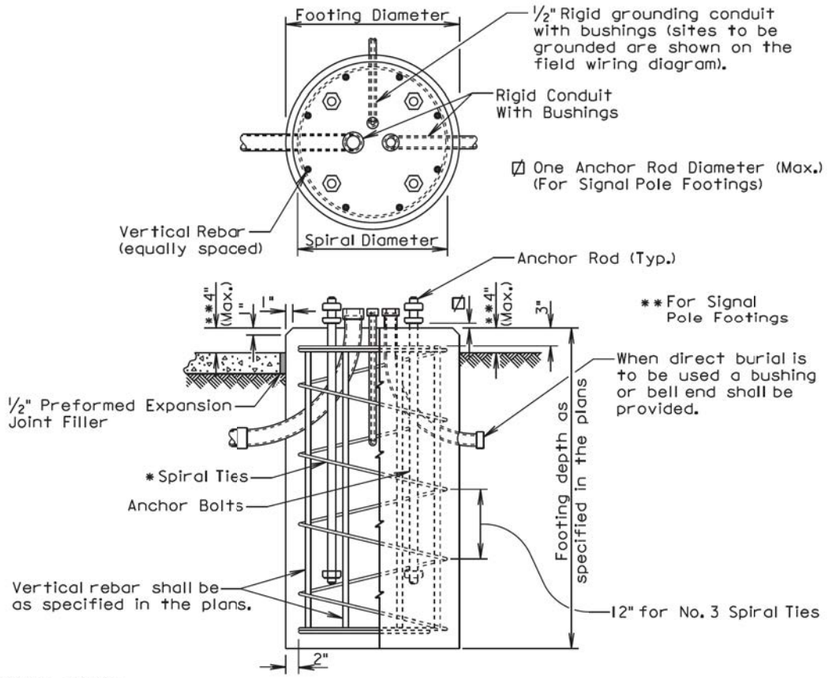
Published Date: 4th Qtr. 2015	SDDOT	30' WOOD UTILITY POLE WITH OVERHEAD UTILITY POLE	PLATE NUMBER 635.37
			Sheet 1 of 1



GENERAL NOTE:
All materials and labor on secondary side of transformer shall be supplied by the Contractor.

March 31, 2000

Published Date: 4th Qtr. 2015	SDDOT	SERVICE CABINET ON OVERHEAD UTILITY POLE	PLATE NUMBER 635.40
			Sheet 1 of 1



GENERAL NOTES:

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

Spiral ties shall have 1-1/2 extra turns at each end.

See Section 985 of the Specifications for footing materials.

Conduits and bushings may project 2½ inches to 6 inches above footing for fixed base poles but shall not project above the slip plane or fracture plane for breakaway poles.

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

The anchor rods shall fit inside the reinforcing steel cage. If the anchor rods designed by the Pole Manufacturer do not fit, contact the Office of Bridge Design for footing redesign. No additional payment will be made for the redesigned footing.

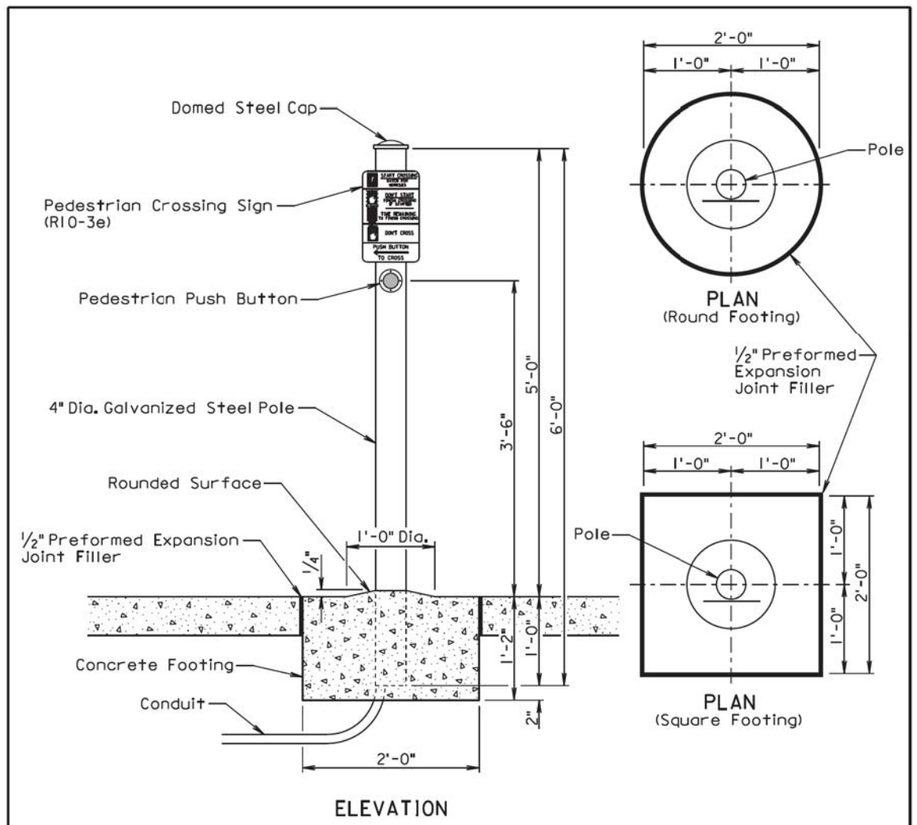
Costs of conduit and conduit bushings shown on footing detail shall be incidental to the footing bid item(s).

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

The contour of the area surrounding the breakaway pole shall be flat, though not necessarily level for a distance of 5 feet in all directions. The Contractor may be required to provide finish grading at some breakaway pole locations.

June 26, 2015

Published Date: 4th Qtr. 2015	SDDOT	POLE FOOTING	PLATE NUMBER 635.55
			Sheet 1 of 1



GENERAL NOTES:

The Contractor shall 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.

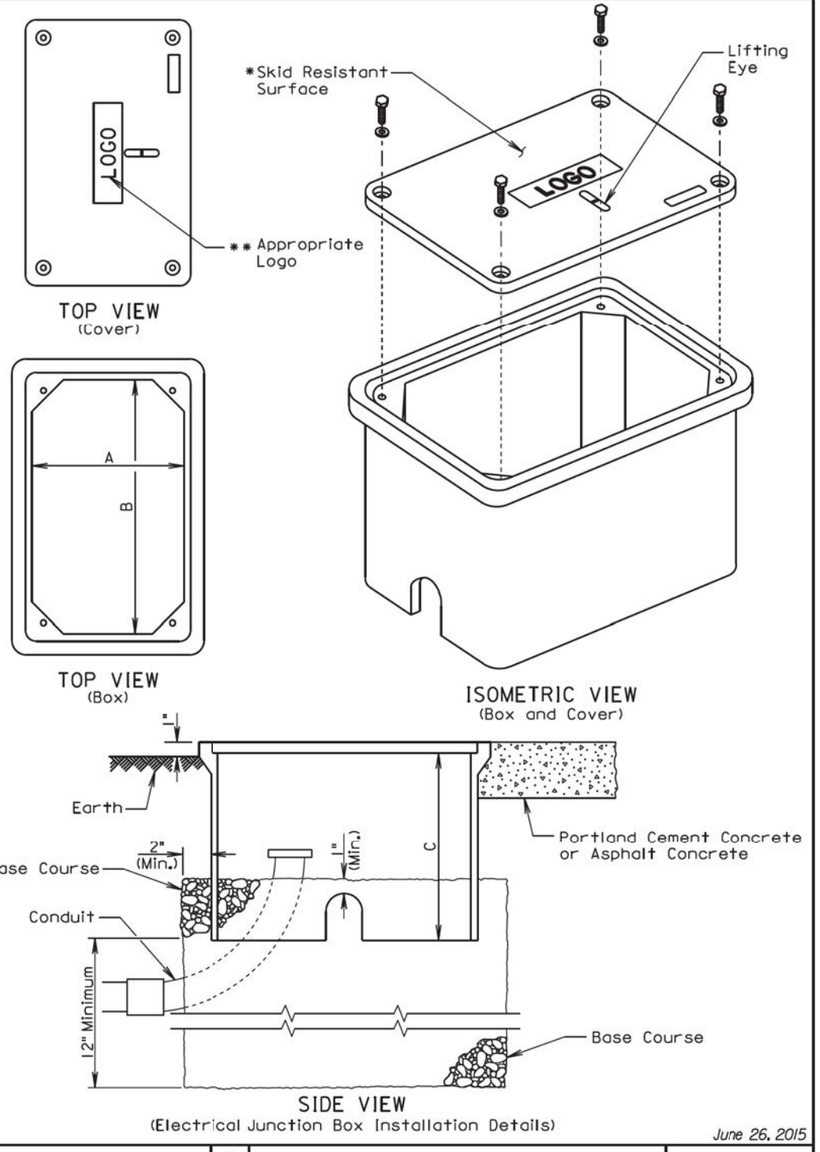
The concrete for the footing shall be class M6 concrete.

The 4" diameter galvanized steel pole shall be 6' long and shall be in conformance with AASHTO Standard Specifications M181. The pole shall be Type 1 and either Grade 1 or Grade 2. The domed steel pole cap shall be in conformance with AASHTO Standard Specifications M181 and shall be Type 1.

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

February 14, 2010

Published Date: 4th Qtr. 2015	SDDOT	PEDESTRIAN PUSH BUTTON POLE	PLATE NUMBER 635.57
			Sheet 1 of 1



June 26, 2015

Published Date: 4th Qtr. 2015	SDDOT	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65 Sheet 1 of 2

ELECTRICAL JUNCTION BOX

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

GENERAL NOTES:

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

The cover shall have a lifting eye.

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

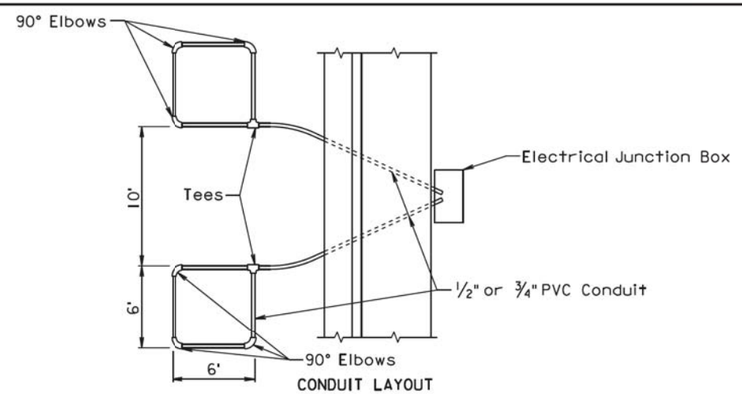
** The cover of the junction box shall have the appropriate logo in one inch size letters and shall be recessed. When the junction box contains cables or wires for a traffic signal then the logo shall be "Signal". When the junction box contains lighting conductors then the logo shall be "Lighting".

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

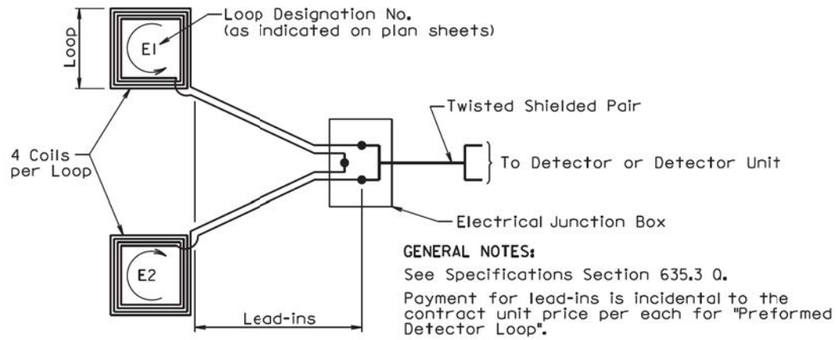
The electrical junction boxes shall be UL listed.

June 26, 2015

Published Date: 4th Qtr. 2015	SDDOT	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65 Sheet 2 of 2



CONDUIT LAYOUT

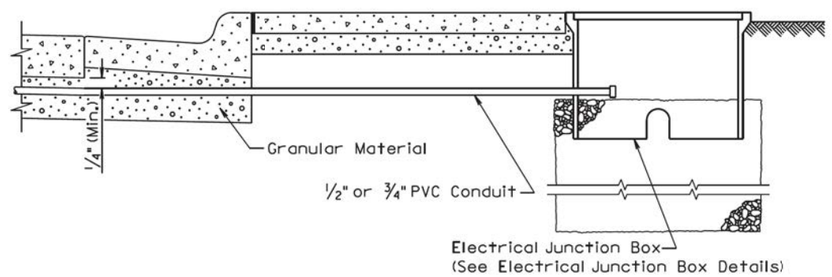


GENERAL NOTES:

See Specifications Section 635.3 0.

Payment for lead-ins is incidental to the contract unit price per each for "Preformed Detector Loop".

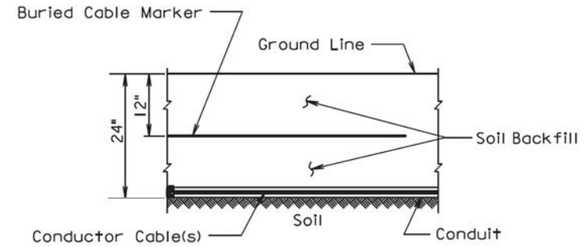
WIRING DIAGRAM



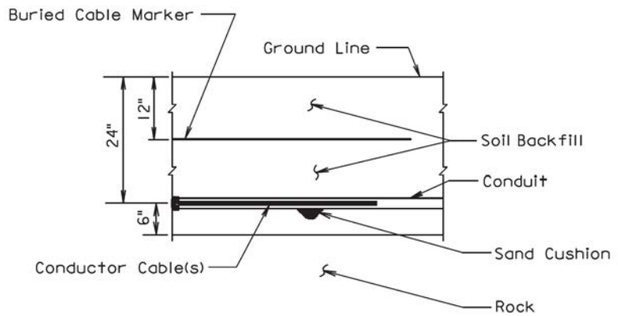
LEAD-IN DETAIL

June 26, 2015

Published Date: 4th Qtr. 2015	SDDOT	PREFORMED DETECTOR LOOP	PLATE NUMBER 635.70
			Sheet 1 of 1



SECTION VIEW



SECTION VIEW

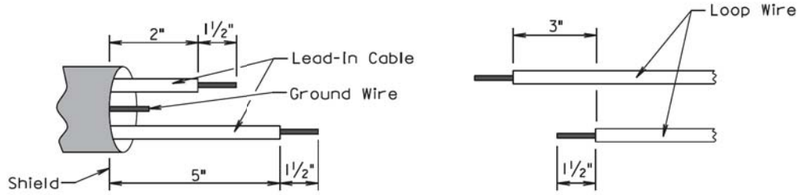
GENERAL NOTE:

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

March 31, 2000

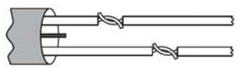
Published Date: 4th Qtr. 2015	SDDOT	CONDUIT INSTALLATION	PLATE NUMBER 635.76
			Sheet 1 of 1

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



Step 2. Connect and solder.

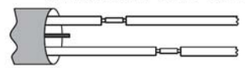
Twist bare conductors together



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

OR

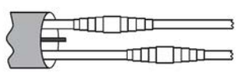
Crimp bare conductors together with an uninsulated butt connector



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

Step 3. Insulate ecch solder joint seperately.

Electrical Tape



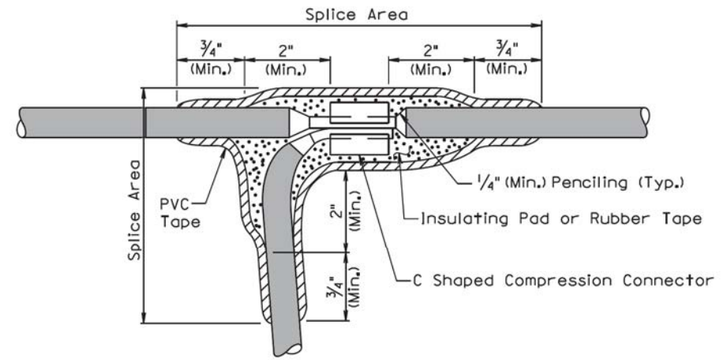
OR

Shrink Tube

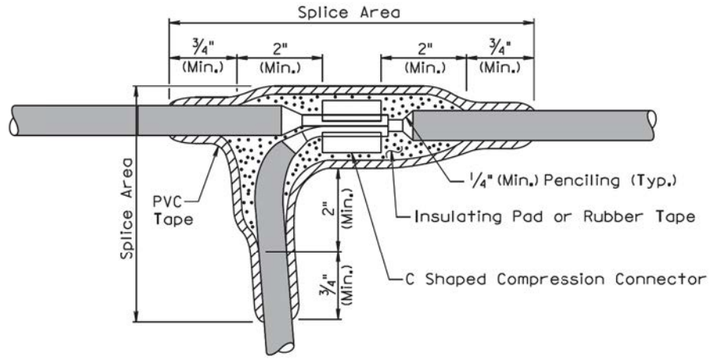
Step 4. Environmentally seal total splice against weather, moisture and abrasion. Methods for environmentally sealing the splice include heat-shrinkable tubing, special sealing kits, special forms to be filled by sealant, and tape and coating.

June 20, 2000

Published Date: 4th Qtr. 2015	SDDOT	DETECTOR LOOP WIRE SPLICING	PLATE NUMBER 635.77
			Sheet 1 of 1



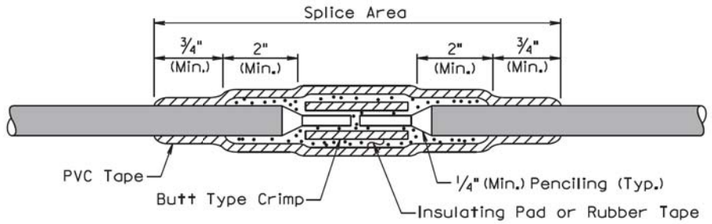
TYPE C SPLICE
(Between 1 free end and 1 through conductor)



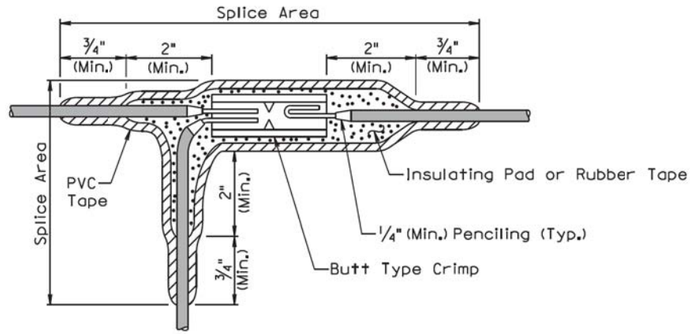
TYPE T SPLICE
(For 3 free ends)

February 14, 2010

Published Date: 4th Qtr. 2015	SDDOT	WIRE SPLICING FOR LIGHTING (LOW VOLTAGE CIRCUITS (0 to 600 V))	PLATE NUMBER 635.80
			Sheet 1 of 2



TYPE S SPLICE
(Between 2 free ends)



TYPE ST SPLICE
(For 3 free ends)

GENERAL NOTES:

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

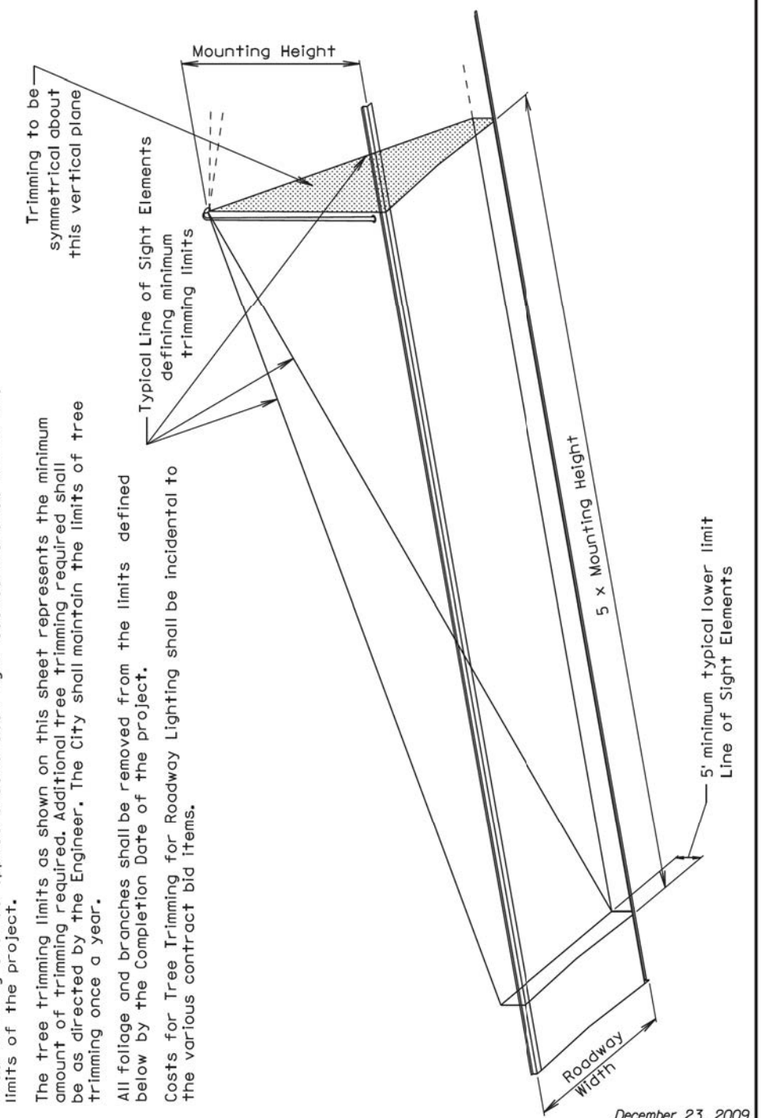
The rubber tapes shall be rolled after application.

Method for insulating splice area:

1. The splice area shall be completely covered with electrical insulating coating and dried.
2. Apply two layers of ⅛" minimum thickness electrical insulating pad or two layers of half lapped synthetic oil resistant self fusing rubber tape.
3. Three layers of half lapped polyvinyl chloride tape shall be applied.
4. The entire splice area shall be covered with electrical insulating coating and dried.

February 14, 2010

Published Date: 4th Qtr. 2015	SDDOT	***WIRE SPLICING FOR LIGHTING (LOW VOLTAGE CIRCUITS (0 to 600 V))***	*PLATE NUMBER* 635.80
			Sheet 2 of 2



GENERAL NOTES:

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

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

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

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

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

December 23, 2009

Published Date: 4th Qtr. 2015	SDDOT	***TREE TRIMMING FOR ROADWAY LIGHTING***	*PLATE NUMBER* 635.99
			Sheet 1 of 1