SECTION L: SIGNAL AND LIGHTING IP IN AFNESOSES ONLY DOT

PROJECT EM 0292(88)73 L1 IM 2292(104)0

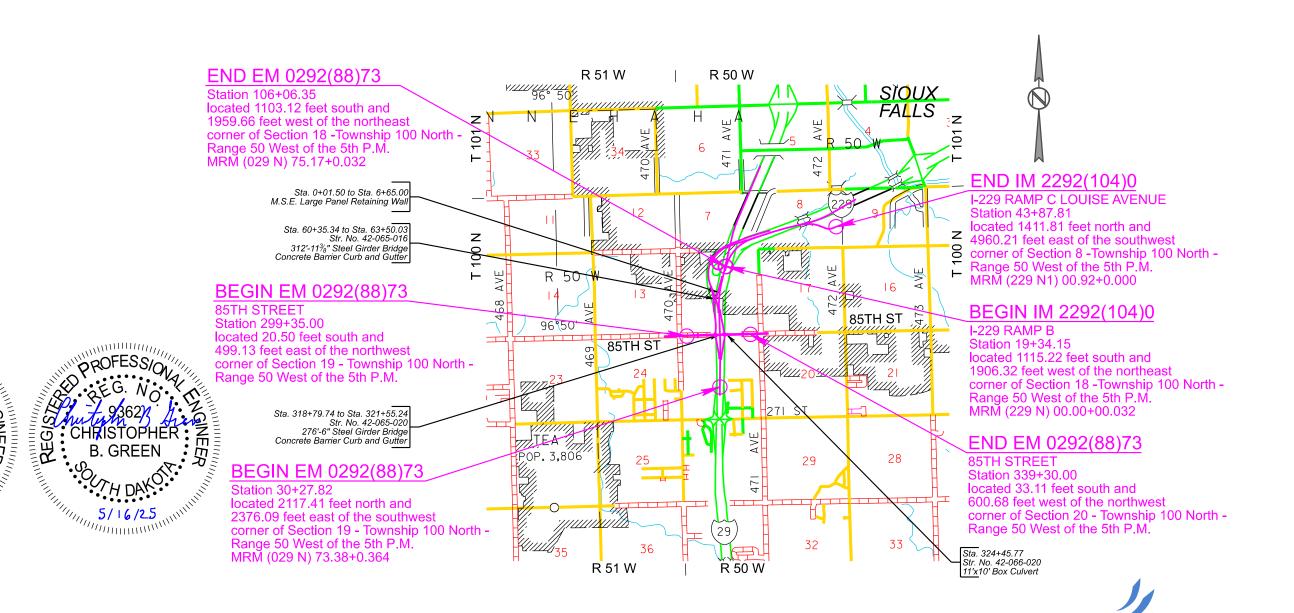
SHEET

TOTAL

L92

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General Layout with Index Estimate with General Notes & Tables L2-L24 L25 L26-L27 Overall Layout Signal Layouts L28-L52 Conduit Layouts L53 L54**-**L57 Signal Timings Signal Wiring Diagrams L58-L69 Lighting Wiring Diagrams L70 Pedestrian Underpass Details Special Detail L72-L92 Standard Plates



1 1/1/1/5/16/2025 :

SECTION L ESTIMATE OF QUANTITIES

PCN 06JQ

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1540	Remove Luminaire Pole Footing	2	Each
635E0040	Breakaway Base Luminaire Pole with Arm, 40' Mounting Height	34	Each
635E0140	Breakaway Base Luminaire Pole with Twin Arms, 40' Mounting Height	27	Each
635E0640	Fixed Base Luminaire Pole with Arm, 40' Mounting Height	1	Each
635E0740	Fixed Base Luminaire Pole with Twin Arms, 40' Mounting Height	1	Each
635E0900	Decorative Luminaire Pole	8	Each
635E2000	Pedestal Signal Pole	15	Each
635E2025	Signal Pole with 25' Mast Arm	3	Each
635E2030	Signal Pole with 30' Mast Arm	3	Each
635E2040	Signal Pole with 40' Mast Arm	1	Each
635E2045	Signal Pole with 45' Mast Arm	1	Each
635E3545	Under Bridge Deck Luminaire, LED	4	Each
635E3585	Tunnel Luminaire, LED	13	Each
635E3700	Roadway Luminaire, LED with Photoelectric Cell	83	Each
635E3810	Decorative Luminaire, LED	22	Each
635E3815	Decorative Luminaire, LED with Photoelectric Cell	8	Each
635E4030	3 Section Vehicle Signal Head	34	Each
635E5020	2' Diameter Footing	608.0	Ft
635E5030	3' Diameter Footing	97.0	Ft
635E5310	Special Electrical Junction Box	69	Each
635E5360	Surface Mounted Junction Box	7	Each
635E5400	Electrical Service Cabinet	7	Each
635E5420	Circuit Control Center	3	Each
635E5430	Traffic Signal Controller	2	Each
635E5450	Side Mounted Cabinet	4	Each
635E5515	Battery Backup System for Traffic Signal	2	Each
635E5520	Video Detection System	2	Each
635E5560	Emergency Vehicle Preemption Unit	2	Each
635E5570	Optical Detector	6	Each
635E5600	Surveillance Camera	1	Each
635E5880	Accessible Pedestrian Signal	12	Each
635E5910	Pedestrian Push Button Pole	2	Each
635E5922	Pedestrian Signal Head with Countdown Timer	12	Each
635E5930	Pedestrian Crossing Sign	12	Each
635E5980	Rectangular Rapid Flashing Beacon System	2	Each
635E6200	Miscellaneous, Electrical	Lump Sum	LS
635E7500	Remove and Reset Luminaire Pole	2	Each
635E7899	Locator Ball	3	Each
635E8008	0.75" Rigid Galvanized Steel Conduit	300	Ft
635E8010	1" Rigid Galvanized Steel Conduit	40	Ft
635E8030	3" Rigid Galvanized Steel Conduit	800	Ft
635E8108	0.75" Rigid Conduit, Schedule 40	15	Ft

PCN 06JQ (Continued)

BID ITEM	ITEM	QUANTITY	UNIT
NUMBER	II LIVI	QUANTITI	ONT
635E8110	1" Rigid Conduit, Schedule 40	220	Ft
635E8120	2" Rigid Conduit, Schedule 40	14,380	Ft
635E8130	3" Rigid Conduit, Schedule 40	225	Ft
635E8140	4" Rigid Conduit, Schedule 40	150	Ft
635E8150	5" Rigid Conduit, Schedule 40	40	Ft
635E8210	1" Rigid Conduit, Schedule 80	430	Ft
635E8220	2" Rigid Conduit, Schedule 80	3,120	Ft
635E8230	3" Rigid Conduit, Schedule 80	430	Ft
635E8240	4" Rigid Conduit, Schedule 80	550	Ft
635E8250	5" Rigid Conduit, Schedule 80	70	Ft
635E8420	1.5" Innerduct, SDR 13.5	7,420	Ft
635E8830	2/2/2/4 Aluminum Wire	8,780	Ft
635E9012	1/C #2 AWG Copper Wire	3,975	Ft
635E9014	1/C #4 AWG Copper Wire	5,390	Ft
635E9016	1/C #6 AWG Copper Wire	29,615	Ft
635E9018	1/C #8 AWG Copper Wire	10,790	Ft
635E9020	1/C #10 AWG Copper Wire	1,920	Ft
635E9022	1/C #12 AWG Copper Wire	13,065	Ft
635E9302	2/C #14 AWG IMSA Copper Cable, K1	195	Ft
635E9303	3/C #14 AWG IMSA Copper Cable, K1	240	Ft
635E9305	5/C #14 AWG IMSA Copper Cable, K1	1,115	Ft
635E9307	7/C #14 AWG IMSA Copper Cable, K1	1,070	Ft
635E9312	12/C #14 AWG IMSA Copper Cable, K1	2,640	Ft
635E9325	25/C #14 AWG IMSA Copper Cable, K1	1,510	Ft
635E9720	12/2 UF-B Copper Pole and Bracket Cable	5,405	Ft
635E9862	Outdoor Rated Cat6 Cable	265	Ft
635E9924	24 Strand Fiber Optic Cable	920	Ft

PCN 07D0

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1540	Remove Luminaire Pole Footing	2	Each
635E5020	2' Diameter Footing	16.0	Ft
635E5380	Reset Electrical Junction Box	3	Each
635E6200	Miscellaneous, Electrical	Lump Sum	LS
635E7500	Remove and Reset Luminaire Pole	2	Each
635E8120	2" Rigid Conduit, Schedule 40	1,960	Ft
635E8220	2" Rigid Conduit, Schedule 80	195	Ft
635E9012	1/C #2 AWG Copper Wire	4,540	Ft
635E9720	1/C #2 AWG Copper Wire 12/2 UF-B Copper Pole and Bracket Cable POFES	S/O1/1/1/130	Ft

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SPECIAL PROVISIONS

The following special provisions are attached to the project specifications and will be reviewed by the Contractor for furnishing and installing the proposed traffic equipment.

- Special Provision for Adaptive Traffic Signal Control System
- Special Provision for Optical Activated Emergency Vehicle Preemption System
- Special Provision for Traffic Signal Controller, Cabinets, Conflict Monitors, and Pedestrian Push Button Units.
- Special Provision for Traffic Signal Heads (LED Modules)

SUPPLYING AS BUILT PLANS

If the traffic signal system(s) or roadway lighting system(s) 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 and City Lighting Department. 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:

mylons@sehinc.com

Upon review of the submittals, they will be sent by the Engineer to the following email addresses for concurrence of approvals or remarks:

> Stacy.Bartlett@state.sd.us Hhoftiezer@siouxfalls.org

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 Traffic Engineer Consultant Design Engineer, City Light Department, and the Partic Design Engineer present.

GENERAL

Roadway lighting and traffic signal items will be installed as discussed in the plans and the City of Sioux Falls Standard Specifications for Traffic Signals - Section 635A, and for Roadway Lighting – Section 635B. The following notes are provided for the Contractor's clarification.

- The Standard Specifications can be viewed online at: http://www.siouxfalls.org/public-works/engineering/constructionmgmt/resources/specs-policies-manuals.
- The Contractor will refer to Section A of 635B.3 of the Construction Requirements in the Standard Specifications for the coordination and application process to follow for the electrical services.
- The Contractor will complete both the Roadway Lighting and Traffic Signal Checklists for installation of all items shown on the plans. The checklists can be found at the following website: http://www.siouxfalls.org/public-works/engineering/construction-mgmt/resources/forms-permits.
- The proposed luminaire poles will have breakaway transformer bases and will be installed on concrete footings, unless noted otherwise.
- The Contractor will furnish and install all traffic signal and street light wire and will pull all wires through the conduits, junction boxes, signal poles, and luminaire poles.
- The Contractor will make all line-to-line connections and will furnish and install all items listed under Section 635B.G (Connectors) in the Standard Specifications for fuses, fuse-holder kits, in-line fuse holders, splice kits, stub connection kits, and multi-cable connectors to be furnished and installed within the junction boxes, light pole bases, and meter locations. This will supersede the requirements stated in the Standard Specifications.
- The City light department will de-energize the lights to be removed.
- #12 AWG Tracer wire will be installed in all traffic conduit and interconnect conduit, and also in lighting conduits not carrying wire.
- The tracer wire will be paid for separately under its respective bid item, unless noted otherwise.
- The Contractor will be responsible for locating all lines, including those that will be removed and/or abandoned, from the start of the project.
- All hand digging due to potential utility conflicts as called out in the plans will be considered incidental to the various lighting and traffic signal bid items.

LABELING CIRCUITS, WIRE, CONDUIT

All wires and/or conduits within junction boxes and light bases will be permanently marked, clearly stating line direction and/or description of opposite end. Circuits will be marked in the breaker panel. The markings will be of sufficient durability to withstand the environment involved.

MISCELLANEOUS, ELECTRICAL - PCN 06JQ

The contract lump sum price for "Miscellaneous, Electrical" will include all costs for the following work items:

- Connecting / tying to existing conduits and junction boxes
- Removal and salvaging of existing traffic and lighting junction boxes
- Removal / abandonment of existing lighting and traffic conduits and cables
- Removal of existing fiber optic cable
- Removal of existing service cabinets and meters
- · Removal and savaging of existing fixtures on existing luminaire poles

MISCELLANEOUS, ELECTRICAL - PCN 07D0

The contract lump sum price for "Miscellaneous, Electrical" will include all costs for the following work items:

- Connecting / tying to existing conduits and junction boxes
- Removal and salvaging of existing lighting junction boxes
- Removal / abandonment of existing lighting conduits and cables

CONDUIT INSTALLATION

Each end of each conduit will be marked with a ½-inch dia. x 12-inch long reinforcing bar driven flush with the finished grade, except when the conduit end terminates inside a junction box. The ends of each conduit run will be capped to prevent water and soil from entering. This work will be done by the Lighting and Signal Contractor and will not be disturbed by the Grading Contractor.

ELECTRICAL SERVICE CABINET

All costs to furnish and install the Electrical Service Cabinets as shown on the plans and as discussed below will be incidental to the contract unit price per each for "Electrical Service Cabinet".

The electrical service cabinets will be U6281-XL-200-5T9 as manufactured by Milbank or approved equal. The electrical service cabinets will be mounted to 8'-6"x6" ground-contact pressure treated wood post, 3' burial depth. Conduits will be attached to post with strut and clamps at 6" above ground. Meter pedestals will be installed for each service cabinet as shown in the plans. (Meter M1, M2, M3, M4, M5, M6 and M7)

The City of Sioux Falls standard plates #635.41 and #635.42 are shown in the plans as general guidance for these electrical service cabinets.

Contact the City Light Department (#605-373-6979) to verify the field location of the service cabinets.

A total of 7 Electrical Service Cabinets are required for this project (2 for traffic signals and 5 for the lighting system). All will be single meter service cabinets.

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PROJECT SHEET

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Revised Date: 6/27/20

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Flotting Date. 1/21/2020

REMOVE LUMINAIRE POLE FOOTING

If existing footings are within the grading limits, verify the footing removal depth with Grading Engineer.

The footings of existing luminaire poles EL400, EL401, EL555 and EL556 will be removed by the Contractor to a minimum of 2-feet below the ground surface. Restoration of the disturbed area will be to the satisfaction of the Engineer.

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

REMOVE AND RESET LUMINAIRE POLE

The existing luminaire poles and luminaires (EL400, EL401, EL555 and EL556) will be removed, salvaged and reset. The Contractor will verify the final pole reset location with the Engineer.

It will be the Contractor's responsibility to obtain the bolt circle pattern and anchor bolts for the salvaged poles from the original pole manufacturer. The Contractor will determine the original pole manufacturer.

Luminaire poles and luminaires damaged during relocation will be repaired or replaced by the Contractor at no cost to the State. All costs involved with removing and resetting the existing luminaire poles and luminaires, including new anchor bolts with associated hardware, will be incidental to the contract unit price per each for "Remove and Reset Luminaire Pole".

SALVAGE JUNCTION BOX

The existing junction boxes (EJL1 - PCN 06JQ & EJL6 - PCN 07D0) will be salvaged and delivered to the City of Sioux Falls by the Contractor unless it is noted to be reset. The Contractor will notify the City of Sioux Falls Light Department at least 5 days before the delivery of the salvaged junction boxes. The City contact is:

CITY LIGHT SHOP Sioux Falls Municipal Light & Power Contact Jerry Jongeling (telephone 605-373-6979) 2000 N Minnesota Avenue Sioux Falls, SD 57117-7402

Junction boxes damaged during salvaging or delivery will be repaired or replaced by the Contractor at no cost to the State or City. All costs associated with removal, salvaging, and delivery of the junction boxes will be included in,

the contract tump sum once for "Miscellaneous, Electrical."

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JOHN M. C. REIN ONCE FOR "MISCELLANEOUS, Electrical."

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JOHN M. C. REIN ONCE FOR "MISCELLANEOUS, Electrical."

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B. GREEN

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RESET ELECTRICAL JUNCTION BOX - PCN 07D0

The existing electrical junction boxes (EJL4, EJL5, and EJL7) will be removed and reset.

Junction boxes damaged during relocation will be repaired or replaced by the Contractor at no cost to the State or City.

All costs associated with removing and resetting the existing junction boxes will be incidental to the contract unit price per each for "Reset Electrical Junction Box".

TABLE OF FOOTING DATA

EM 0	292(88)73 - F	PCN 06JQ (I	-29 / 85 th Str	eet Intercha	inge)
Site Designation	Footing Diameter	* Footing Depth	** Spiral Diameter	** Spiral Length	Vertical Reinforcement
A1, A2, A4, A6, A9, A10, A11, A12, B1, B4, B5, B6, B7, B8, B9 LL1-LL8	2' - 0"	6' - 0"	1' - 8"	44' - 3"	8-#7 x 5' - 6"
AL1-AL5, BL1-BL5, CL1-CL5, DL1-DL4, DL6-DL15, RDCL1-RDCL5	2' - 0"	7' - 0"	1' - 8"	49' - 6"	8-#7 x 6' - 6"
85L1-85L14, 85L16-85L28, EL555, EL556	2'-0"	8'-0"	1' - 8"	54' - 9"	8-#7 x 7' - 6"
A3, A5, A8, B2, B3, B10, B11	3' - 0"	12' - 0"	2' - 8"	120' - 9"	14-#8 x 11' - 6"
A7	3' - 0"	13' - 0"	2' - 8"	129' - 3"	14-#8 x 12' - 6"
IM 2292(104)	0 - PCN 07D	0 (I-29 / I- <mark>22</mark> 9	9 Aux. Lane	& I-229 Ran	np C Louise)
Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
EL400, EL401	2' - 0"	8' - 0"	1' - 8"	54' - 9"	8-#7 x 7' - 6"

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

SOILS INFORMATION

Footings will be placed in soils ranging from insitu sand clay (glacial till) to new fill. For footings that are placed in insitu soil, ground water may be encountered 2' to 4' below current ground elevation.

Footing locations that contain sand, gravel, and high water tables are potential candidates for caving soils. If caving soils are encountered during excavation procedures, it may be necessary to use temporary casing or drilling fluid to complete the excavation and concrete placement. If a temporary casing is used it 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.

Concrete will not be dropped through standing water. If water is present in the excavation it will be removed prior to concrete placement. If temporary casing or drilling fluid are used then the concrete will be tremied.

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.

All poles will have transformer bases.

Signal poles will have rotatable mast arms.

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 windinduced 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-toaluminum 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.

TRANSFORMER LOCATIONS - PCN 06JQ

The proposed transformer locations shown in the plans are approximate. The Contractor will coordinate with the Power Company to install the new services. If a transformer location is revised, the corresponding meter service will be moved in kind. Any changes to material quantities as a result of the revised transformer location at the direction of the Power Company will be considered incidental to the contract lump sum price for "Miscellaneous. Electrical."

Power Company contact information is provided below.

Xcel Energy Distribution

500 W Russell Street Sioux Falls. SD 57104 Attn: Aaron Bickett Email address: aaron.m.bickett@xcelenergy.com

Office:(605) 339-8315 Cell: (605) 261-1354

Southeastern Electric 47077 276th Street

Lennox. SD 57039 Attn: Adam Stark Email address: adam@southeastern.coop

Cell: (605) 368-4000

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LUMINAIRE POLES

85th Street luminaire poles 85L1-85L14 and 85L16-85L28 will have a mounting height of 40-feet with twin 8-feet arms.

85th Street luminaire pole 85L15 will have a mounting height of 40-feet with twin 8-feet arms and be barrier mounted (non-breakaway).

Ramp A luminaire poles AL1-AL5 will have a mounting height of 40-feet with an 8-feet arm.

Ramp B luminaire poles BL1-BL5 will have a mounting height of 40-feet with an 8-feet arm.

Ramp C luminaire poles CL1-CL5 will have a mounting height of 40-feet with an 8-feet arm.

Ramp D luminaire poles DL1-DL4 and DL6-DL12 will have a mounting height of 40-feet with an 8-feet arm.

Ramp D luminaire pole DL5 will have a mounting height of 40-feet with an 8feet arm and be barrier mounted (non-breakaway).

Ramp D Conn luminaire poles RDCL1-RDCL5 will have a mounting height of 40-feet with an 8-feet arm.

Landscaping luminaire poles LL1-LL8 will have a mounting height of 16-feet, top mounted. The following luminaire pole or an approved equal meet the requirements for this design:

Stresscrete Group KM93FF-16-DR, color standard KingCoat Black (See City of Sioux Falls Standard Plate #635.73 Historic Street Light)

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

VIBRATION DAMPENER

All proposed luminaire poles will be furnished and installed with a vibration dampener that is internal to the pole.

BRIDGE / BARRIER MOUNTED LUMINAIRE POLE

Luminaire Poles 85L15 and DL5 are barrier mounted poles. The anchor bolt will be designed by the pole fabricator and will not exceed the barrier height. Refer to Section E for mounting details.

The pole fabricator will be responsible the determining the number of anchor bolts. ¿ĖG Nö. ¿EG. No. number of anchor bolts CHRISTOPHER B. GREEN

85TH STREET LUMINAIRES

The 85th Street (85L1-85L28) lighting design used the following parameters to provide 1.1 and greater average maintained foot-candles and uniformity ratios of 3:1 (average maintained to minimum maintained foot-candles) and 5:1 (maximum maintained to minimum maintained foot candles):

> Light Loss Factor (LLF): 8.0 Configuration: Varies Mounting Height: 40 Ft. Arm Length 8 Ft. LED Source:

The following luminaire, or an approved equivalent, meet the requirements for this design for 85th Street luminaires 85L1-85L10, 85L12-85L13, 85L15, 85L17-85L18, and 85L20-85L28:

American Electric Lighting ATB2 P40X MVOLT R3 P7 AO SH NL RFD353306

The following luminaire, or an approved equivalent, meet the requirements for this design for 85th Street luminaires 85L11 and 85L14:

American Electric Lighting ATB2 P40X MVOLT R3 P7 AO SH NL RFD353305

The following luminaire, or an approved equivalent, meet the requirements for this design for 85th Street luminaires 85L16 and 85L19:

American Electric Lighting ATB2 P40X MVOLT R3 P7 AO SH NL RFD353304

I-29 & 85TH STREET RAMPS LUMINAIRES

The I-29 & 85th Street Ramps (AL1-AL5, BL1-BL5, CL1-CL5, DL1-DL15, and RDCL1-RDCL5) lighting design used the following parameters to provide 0.6 and greater average maintained foot-candles and uniformity ratios of 4:1 (average maintained to minimum maintained foot-candles) and 5:1 (maximum maintained to minimum maintained foot candles):

> Light Loss Factor (LLF): 8.0 Configuration: Varies Mounting Height: 40 Ft. Arm Length 8 Ft. Source: LED

The following luminaire, or an approved equivalent, meet the requirements for this design:

American Electric Lighting ATB2 P40X MVOLT R3 P7 AO SH NL RFD353306

UNDER DECK LUMINAIRES

The lighting design for UBL1-UBL4 used the following parameters to provide 0.8 and greater average maintained foot-candles and uniformity ratios of 4:1 (average maintained to minimum maintained foot-candles) and 5:1 (maximum maintained to minimum maintained foot candles):

> Light Loss Factor (LLF): 8.0 LED Source:

The following luminaire, or an approved equivalent, meet the requirements for this design:

Holophane: WCNG P5 40 U4W MVOLT ZT 10KV BZSDP LTCH NPR DF

PEDESTRIAN UNDERPASS LUMINAIRES

The pedestrian underpass (PU1-PU13) lighting design used the following parameters to provide day lighting 8.2 and greater average maintained footcandles and uniformity ratios of 4:1 (average maintained to minimum maintained foot-candles) and 4:1 (maximum to minimum maintained foot candles) and night lighting 6.6 and greater average maintained foot-candles and uniformity ratios of 4:1 (average maintained to minimum maintained footcandles) and 4:1 (maximum maintained to minimum maintained foot candles):

> Light Loss Factor (LLF): 8.0

Configuration: Surface mount

LED Source:

The following luminaire, or an approved equivalent, meet the requirements for this design:

Holophane EMX L24 4000LM FPFL MD MVOLT 40K 80CRI DGXD CR

LANDSCAPING LUMINAIRES

The landscaping luminaire (LL1-LL8) lighting design has no requirements for lighting levels and uniformity, as the luminaires are intended to be used as a wayfinding/trail lighting system, not a continuous lighting system.

> Light Loss Factor (LLF): Configuration: One Sided Mounting Height: 16 Ft. Source: LED

The following luminaire, or an approved equivalent, meet the requirements for

King Luminaire K118R-P4AR-III-75(SSL)-1030-120:277-K26-3K-PR7-

(See City of Sioux Falls Standard Plate #635.73 Historic Street Light)

PHOTOCELL CONTROL BOX (CIRCUIT CONTROL CENTER)

Photocell Control Boxes will be installed at the proposed meter pedestals installed at the southbound and northbound I-29 Ramps & 85th Street Interchange. They will provide controls for the decorative luminaires mounted within the bridge barrier, to allow the luminaires to turn on and off for night and day time.

The Photocell Control Boxes will be mounted on top of the meter pedestals, to be in clear view of the sky. The Photocell Control Boxes will be installed per the manufacturer's specifications. The Photocell Control Boxes will be per the City's Standard Specifications for Roadway Lighting – Section 635B.

All costs for the Photocell Control Boxes will be included in the contract unit price per each for "Circuit Control Center". This will include furnishing, installing, mounting to the meter pedestal and wire connections to provide a fully functional light control system for the barrier decorative luminaires.

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DECORATIVE LUMINAIRES

Decorative Luminaires will meet the specifications below and in the City's Standard Specifications for Roadway Lighting - Section 635B. Approved equivalents are allowed for these luminaires.

- Decorative Luminaire 12W LED
- Sistemalux SGHO-HOR-830-REM-35 or approved equal
- Voltage will be universal 120-277V
- Model will be horizontal orientation
- Distribution will be Downward Asymmetric
- Body will be die cast: diffuser will be toughened glass
- Recessed housing will be polypropylene; a back box will be included
- A single fuse and fuse holder will be provided.
- 10kA Surge Protection will be provided
- Finish color will be concrete (35)
- Absolute Lumens will be 491
- CCT will be 3000K, 80 CRI

The 85th Street bridge barrier luminaires will be as follows.

BRL1-BRL22 (bridge barrier / decorative luminaires)

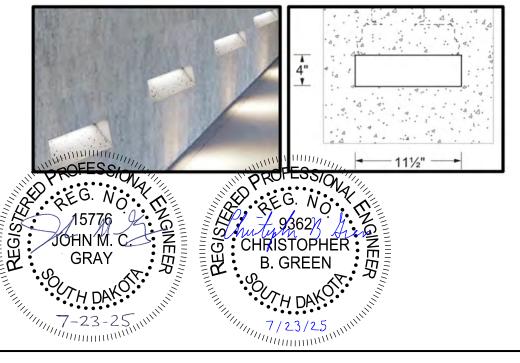
0 Ft. Setback: Light Loss Factor (LLF): 8.0 Width of Lighted Area: 12-16 Ft. 18 Ft. 3 In. Spacing: Configuration: Staggered

Mounting Height: 2 Ft. (See Section E)

0 Ft. Arm Extension Length:

Decorative Luminaire - 12W LED Luminaire:

The bridge barrier luminaire will be wall recessed cast in concrete. They will be supplied with a two-part housing installation kit, anchor screws, bolts, locking system and adhesive template to improve alignment during installation. See Section E for installation and mounting locations. The general appearance and dimensions of the bridge barrier luminaires at the face of the barrier wall are shown below.



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".

TRAFFIC SIGNAL HEADS

Traffic signal heads for vehicle and pedestrian traffic signal heads will be furnished and installed by the Contractor, as specified in the special provisions.

All costs for the traffic signal heads will be included in the appropriate signal head bid item.

In addition to the special provisions for the traffic signal heads, the following specifications will also apply:

- Signal head brackets will be Astro-Brac Galaxy Assy, 1-Way Cable Mount signal head brackets, as manufactured by Pelco Products, Inc.
- Vehicle and pedestrian signals heads colors will be Black body, Black doors, Black tunnel visors and Black backplates.
- All hardware associated with mounting the vehicle and pedestrian signals heads will have P33 Gloss Black color.
- Pedestrian signal heads will be two separate 12"x12" signal heads. The man/hand display head will be mounted above the countdown timer display head as shown below.



2" & 4" RIGID GALVANIZED STEEL CONDUIT

- 1. Conduit, with expansion fittings, junction boxes and pull tape will be provided at the location detailed in the plans.
- 2. Expansion devices are required at each Abutment on Str. No. 42-065-020. Fittings will be waterproof with insulating bushings and bonding jumper. Expansion devices will accommodate the full range of bridge joint movement shown in the plans. Junction boxes will be provided at spacing not to exceed 1000 feet.
- 3. Pull tape will be 1 inch tubular wave polyester pull tape with a minimum breaking strength of 6000 lbs.
- 4. Cast in place concrete inserts for conduit attachment will be Dayton Superior 1/4 inch bolt diameter stainless steel F-42 Loop Ferrule Inserts with ¼ inch stainless steel bolts conforming to ASTM F593.
- 5. Conduit, fittings and attaching hardware will meet the requirements of NFPA 70 National Electrical Code (NEC). All steel components will be hot dip galvanized in accordance with ASTM A123 or A153 as applicable. Isolate the galvanized conduit brackets from the stainless steel insert and bolt with fiber washers.
- 6. All costs to provide the 2 inch or 4 inch diameter conduit, including concrete inserts, conduit, attaching hardware, junction boxes, expansion devices, pull tape, labor, equipment and any incidentals necessary to install the conduit will be included in the contract unit price per foot for "2" Rigid Galvanized Steel Conduit" or "4" Rigid Galvanized Steel Conduit".

See Section E for additional conduit and expansion device details and quantities.

ATTACHING CONDUIT TO STRUCTURE

The proposed conduits to be installed on the bridge will be coordinated with the bridge Contractor. See Section E for utility chases that have been designed to allow for the conduits to be installed across the bridge. The surface mounted junction boxes for the conduits will be field determined for locations (approximate locations are shown on the plans). The Contractor will verify all locations with the Engineer prior to installation.

The proposed conduits to be installed on the bridge will be attached to the underside of the deck/structure. The proposed conduits will be attached to the bridge in a manner meeting all electrical codes. The conduit connection system will be corrosion resistant. All costs for installing the conduits on the bridge will be incidental to the conduit bid items. Expansion joints will be required to be installed by the Contractor for the conduit being installed on the bridge. See Section E for the quantities for the conduits to be installed on the proposed bridges.

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SURFACE MOUNTED JUNCTION BOXES

Surface mounted junction boxes will be per the City's Standard Specifications for Roadway Lighting – Section 635B, with the boxes meeting the latest NEC, in lieu of the 2008 NEC.

Surface mounted junction boxes JBSM6-JBSM7 will have a fuse holder for underdeck luminaires.

The Contractor will use \(\frac{1}{4} \) concrete inserts with \(\frac{1}{4} \) X 1 \(\frac{1}{2} \) bolts and washers to attach the surface mounted junction boxes to the bridges. Bolts and washers will be galvanized.

All costs for attaching the surface mounted junction boxes to the bridges, for the fuse holders, and for the terminal blocks will be incidental to the contract unit price per each for "Surface Mounted Junction Box".

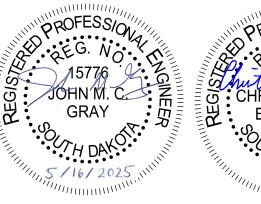
SPECIAL ELECTRICAL JUNCTION BOX

The proposed electrical junction boxes for traffic, innerduct and lighting will be the 24" (for lighting) or 30" (for traffic signals) diameter junction boxes as shown on City of Sioux Falls standard plates #635.31, 635.33 and 635.70.

All costs for the junction boxes, regardless of type or size, will be included in the contract unit price per each for "Special Electrical Junction Box".

METER SOCKETS FOR TRAFFIC SIGNALS

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





TRAFFIC SIGNAL CONTROLLER

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.

The traffic signal controller will be a Swarco McCain ATC eX2 NEMA Controller model as manufactured by Swarco McCain.

The traffic signal controller cabinet will be a Swarco McCain 350i ATC Cabinet as manufactured by Swarco McCain.

The traffic signal controller and controller cabinet will be furnished and installed by the Contractor to meet the specifications discussed in the special provisions. See the diagram below for signal controller cabinet details.

All costs for 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".

SIDE MOUNTED CABINET (FOR FIBER OPTIC CABLE)

The side mounted cabinet will house the fiber optic cable and will be furnished and installed by the Contractor.

The side mounted cabinet will be mounted on the side of the signal controller cabinet as shown on the graphic on this sheet. The side mounted cabinet will:

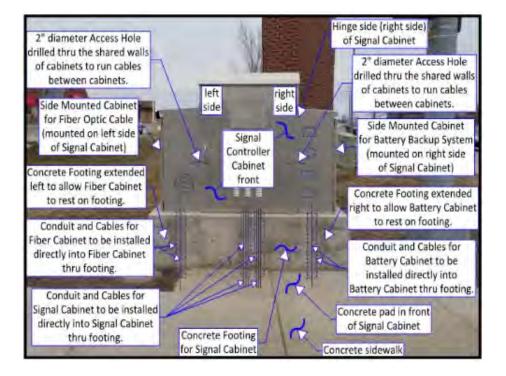
- Meet standards for a NEMA Traffic Enclosure for fiber optic cable
- Have dimensions of 56"H, 26.25"W, 14.625"D
- Be furnished with a door that includes ventilation louvers, fan, and filter
- Be provided with a No. 2 key for the main door with a 3-point locking mechanism which operates from a single easy turning handle
- Include at least 3 adjustable shelves
- Have lockable doors that swing open towards the rear of the main cabinet (hinges located to rear with handle located at front)
- Include LED lighting
- Be manufactured by Southern Manufacturing or approved equal

The side mounted cabinet will be plumb and level in reference to the back side of the signal controller cabinet. The Contractor must take precautions when positioning the side mounted cabinet to avoid damaging wire or equipment within the controller cabinet while drilling the mounting holes and the access hole. The access hole will be two-inch diameter and will be drilled through the side mounted cabinet into the controller cabinet. A grommet or bushing will be installed in the two-inch diameter hole to prevent damage during pull through of the fiber optic cable.

The side mounted cabinet will be mounted and tightened securely to the controller cabinet using a minimum of four bolts. A bead of clear silicon caulking will be placed in all gaps between the side mounted cabinet on BIDDING PURPOSES ONL DOT controller cabinet to prevent water intrusion into either cabinet.

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All costs to furnish and install the side mounted cabinet, including the concrete base, will be included in the contract unit price per each for "Side Mounted Cabinet".



SIDE MOUNTED CABINET (FOR BATTERY BACKUP SYSTEM)

The side mounted cabinet will house the battery backup and flash system will be furnished and installed by the Contractor.

The side mounted cabinet for the battery backup and flash system will be mounted on the side of the signal controller cabinet as shown on the graphic on this sheet. The side mounted cabinet will:

- Meet standards for a NEMA Traffic Enclosure
- Have dimensions of 56"H, 26.25"W, 14.625"D
- Be furnished with a door that includes ventilation louvers, fan, and
- Be provided with a No. 2 key for the main door with a 3-point locking mechanism which operates from a single easy turning handle
- Include the optional generator compartment and port / socket
- Include shelves that are sized accommodate 220GXL AlphaCell Gel Top Terminal Batteries and that slide out to provide easy access to batteries for testing
- Include an external LED indication light that will be activated when the cabinet is on generator power and utility power has been restored
- Include LED lighting and a white powder-coated interior
- Will have a thermostatically controlled exhaust fan and air filter
- Be manufactured by Southern Manufacturing or approved equal

The side mounted cabinet will be plumb and level in reference to the back side of the controller cabinet. The Contractor must take precautions when positioning the side mounted cabinet to avoid damaging wire or equipment within the controller cabinet while drilling the mounting holes and the access hole. The access hole will be two-inch diameter and will be drilled through the side mounted cabinet into the controller cabinet. A grommet or bushing will be

installed in the two-inch diameter hole to prevent damage during pull through of the battery / power cables. The side mounted cabinet will be mounted and tightened securely to the controller cabinet using a minimum of four bolts. A bead of clear silicon caulking will be placed in all gaps between the side mounted cabinet and controller cabinet to prevent water intrusion into either cabinet.

All costs to furnish and install the side mounted cabinet, including the concrete base, will be included in the contract unit price per each for "Side Mounted Cabinet".

TRAFFIC SIGNAL WIRING

The Contractor will use Buchanan crimp connectors and insulating caps approved equal, on all wire terminations in the signal bases.

All costs for this work will be incidental to the signal bid item.

OPTICAL DETECTOR

The optical detectors will be dual head with a single output. The detector eyes of each detector will be aimed at a single approach as dr. 5/16/2025 Engineer. All costs associated with providing, installing, and aiming the optical detectors will be incidental to the contract unit price per each for "Optical Detector".

OPTICAL ACTIVATED EMERGENCY VEHICLE PRE-EMPTION SYSTEM

Optical Activated Emergency Vehicle Preemption (EVP) Systems will be furnished and installed by the Contractor to meet the specifications discussed below and in the special provisions.

The Contractor will furnish and install the EVP Systems on the mast arms or street light poles at the intersections as shown on the plans.

The EVP detector heads and confirmation lights will be mounted to the signal mast arm or street light pole using 3/4-inch NPT electrical pipe materials including a malleable Iron "T" approved for rain-tight locations, threaded nipples, and single lamp holder approved for outdoor use. The use of a PELCO AB-0155-42 Band Mount Mini-Brac, or approved, equal will be used where no integrated threaded outlet exists on the mast arm or street light pole. All equipment will be securely mounted to be level/plumb and retain its alignment.

The Optical Activated Emergency Vehicle Preemption (EVP) Systems will be Opticom 722 Detectors as manufactured by Global Traffic Technologies.

Confirmation lights will be wired with IMSA 19-1, 2, or 3 - #14 AWG stranded wire cable for single direction indication and IMSA 19-1, 3 - #14 AWG stranded wire cable for dual direction indications.

The interface card and card cage for the EVP system will be installed within the controller cabinet's rack mount. One 4-channel card will be installed in the controller cabinet.

The preemption and conductor cables for the detector heads will be installed without splices from the heads to the controller cabinets.

FIBER OPTIC CABLE MODEM

New controller cabinets will be equipped with a fiber optic modem.

All costs for furnishing and installing fiber optic modems in new and existing controllers will be incidental to the contract unit price per each for "Traffic Signal Controller".

FIBER OPTIC ETHERNET SWITCH

The City of Sioux Falls will supply a field ethernet switch in the following traffic signal cabinets:

85th Street at I-29 Ramps A/B 85th Street at I-29 Ramps C/D

BATTERY BACKUP CABINET

The Contractor will supply cabinets with concrete pad and footing for housing the battery backup system for each new traffic signal system. The cabinets will be an aluminum NEMA 3R type. The cabinet 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."

BATTERY BACKUP SYSTEM

The signal head battery backup and flash system will be furnished and installed by the Contractor.

The signal head battery backup and flash system will be Alpha Backup Power System—2000 VA Power Module as manufactured by Alpha Technologies or approved equal. The battery backup system will also be supplied with an automatic transfer switch to transfer from line power to battery backup and a generator transfer switch to allow switching from line power or battery power to generator power. The transfer switches will be capable of transferring power in under 250 milliseconds permitting the traffic signal to operate normally without interruption to the traffic signal.

A terminal strip for input and output power connections in addition to neutral and ground connections will also be incorporated in the transfer switch design. An interface connector (preferably utilizing a 30-amp, twist lock recessed male plug) allows an external generator or vehicle inverter to be plugged into the system.

Upon loss of utility power, the battery backup system will switch to battery power. In cases of UPS failure, while on utility, the system will auto-bypass and remain in that mode until repaired. Should batteries deplete, while on batteries, the unit will auto-shutdown and return to normal operating mode once the utility power is restored. The By-pass switch will enable removal and replacement of the Traffic UPS without shutting down the traffic control system (i.e., "hot swap" capability). The UPS will support generator input without going to batteries.

The backup battery power system will be sized to accommodate the operation BIDDING PURPOSES ONL of the signal as shown on the plans for a minimum of 4 hours.

The signal head battery backup and flash system will meet the following specifications:

Standard Features

- Hot-swappable Input/Output Surge Protection
- Intelligent boost operation for brownout protection
- Hot-swappable UPS and batteries
- Noise suppression, FCC Class A
- Multiple mounting configurations
- Rugged, outdoor weather resistant construction
- Lockable enclosure
- NRTL/CSA approved

General Specifications

- Output: Output Voltage Regulation +/-10% over input voltage range
- Waveform sine
- Typical Efficiency >95%
- Typical Output Voltage THD <3%
- Typical Transfer Time < 5 ms typical
- Audible Noise at 1m <55 dbA

Environmental:

Operating Temperature -35°C to +70°C

Agency Compliance:

- Lightning/Surge Protection: Passes ANSI/IEEE C.62.41/C.62.45 Cat A&B
- Safety: EN50091-1
- Low Voltage: EN50091-2

Power Modules

- 2000VA Power Module 60Hz
- Input/Output Voltage nominal 120VAC
- Input/Output Frequency nominal 60Hz
- Input Current 20A
- Input Voltage Variation 85-152VAC
- Output Power 2000VA
- Active Output Power 1500W
- Typical Efficiency >95%
- Max Charge Current 15 Amps
- Battery Backup Time 2–16 hrs

Communications and Alarms

 DB-9 compatible connector/RS-232 interface capable of monitoring, controlling, and calibrating the UPS, using ASCII commands with terminal emulation software.

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 External Alarm Signal with relay contacts for: a) line fail, b) low battery warning, and c) UPS needs service.

Brownout Protection

- Boost mode increases voltage by 12% of nominal line voltage if input voltage falls below 12% of nominal.
- All costs for furnishing and installing the signal head battery backup and flash system will be included in the contract unit price per each for "Battery Backup System for Traffic Signal".



VIDEO CAMERA DETECTION SYSTEM

The Video Camera, Processor Unit, and Cables will be furnished and installed by the Contractor to meet the specifications discussed below.

The Video Detection System will be a Miovision video detection unit as manufactured by Miovision Technologies Inc. or a NoTraffic video detection system as manufactured by General Traffic Controls, Inc.

All costs to furnish and install the complete Video Camera Detection System will be included in the contract unit price per each for "Video Detection System". These costs will include, but not be limited to:

- Camera, mounting brackets, and hardware
- Processor unit, cabling between processor and controller, outdoor rated CAT-6A cable or 6 SM fiber optic cable, and antenna
- All equipment required in the controller cabinet to provide a fully functioning video vehicle detection system
- The Video Camera Detection System will also be furnished and installed with the Performance Plus Module or approved equal, to allow the Video Camera Detection System to be capable of traffic counting and enhanced pedestrian and cyclist detection, as well as functionality for generating reports for traffic counts, length-based classifications, turning movements, red and green occupancy, and cycle lengths. The Performance Plus Module or approved equal will be incidental to the contract unit price per each for "Video Detection System". The Performance Plus Module or approved equal will be with no subscription fees or any other fees to be paid by the City / Owner for a 10-year time period.
- The outdoor rated CAT-6A cable (or 6 SM fiber optic cable for cable runs greater than 300 feet from cabinet to camera) for the Camera will be installed from the controller cabinet to the camera unit without splices. The Contractor will use only shielded cable approved by the camera manufacturer to protect against Electromagnetic Interference (EMI). Cable will be rated for outdoor use and installed according to the manufacturer's recommendations. All costs for the outdoor rated CAT-6A cable and/or 6 SM fiber optic cable will be incidental to the contract unit price per each for "Video Detection System".
- The Contractor will coordinate with the City prior to determining the final video camera mounting location. Contact Troy Miller (telephone 605-367-8624) of the City.

SURVEILLANCE CAMERA (SDDOT)

The traffic surveillance camera on luminaire pole 85L14 will be furnished and installed by the Contractor.

The traffic surveillance camera on luminaire pole 85L14 will be an AXIS Q6315-LE PTZ Dome Network Camera 60Hz model as manufactured by AXIS Communications or approved equal. The camera will be outdoor ready. The camera will be pre-equipped from the manufacturer with the following:

- pole mounting kit AXIS T91L61 or approved equal
- a power supply
- an outdoor rated power strip
- a lighting suppression device
- outdoor rated CAT-6A cable
- 64 MB SD Card
- all other required cables, connectors and jumpers to make a fully functional surveillance camera system

The Contractor will mount the camera so that the mounting bracket is on the luminaire extension as high as possible before the luminaire extension starts

All costs to furnish and install the traffic surveillance camera will be included in the contract unit price per each for "Surveillance Camera".

The CAT-6A cable (or 6 SM fiber optic cable for cable runs greater than 300 feet from cabinet to camera) for the traffic surveillance camera will be installed from the controller cabinet to the camera without splices. The cable will be rated for outdoor use and installed according to the manufacturer's recommendations. All costs for the CAT-6A and 6 SM fiber optic cable will be included in the contract unit price per each for "Surveillance Camera".

SURVEILLANCE CAMERA (CITY OF SIOUX FALLS)

The City of Sioux Falls will furnish and install traffic surveillance cameras on luminaire poles 85L10 and 85L18.

The Contractor will be responsible for installing conduit and pulling cable to the traffic surveillance cameras on luminaire poles 85L10 and 85L18.

The CAT-6A cable (or 6 SM fiber optic cable for cable runs greater than 300 feet from cabinet to camera) for the traffic surveillance camera will be installed from the controller cabinet to the camera without splices. The cable will be rated for outdoor use and installed according to the manufacturer's recommendations. All costs for the CAT-6A and/or 6 SM fiber optic cable will be included in the contract unit price per foot for "Outdoor Rated Cat6 Cable" and/or "6 Strand Fiber Optic Cable".

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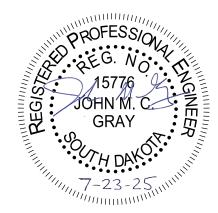
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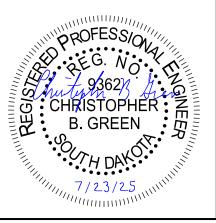
SPECIAL LUMINAIRE POLE TWIN ARM OFFSET ANGLES

The special luminaire pole twin offset arm angles as shown in the plans will be measured as the acute angle between the two twin arms and will represent the angle required to install the twin arms perpendicular to the adjacent edges of pavement.

TABLE OF SPECIAL LUMINAIRE POLE TWIN ARM OFFSET ANGLES

Luminaire Pole	Twin Arm Offset Angle (Degrees)
85L4	12
85L5	17
85L11	27
85L12	43
85L13	67
85L16	11
85L17	63
85L18	49
85L19	32
85L25	22
85L26	20





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 the current edition of the MUTCD 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 be IntelliCross as manufactured by Pelco Products, Inc. or iNS as manufactured by Polara Enterprises, LLC.

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.

In addition, the following requirements will be met for Accessible Pedestrian Signals:

- Accessible pedestrian push buttons will be in compliance with the current MUTCD.
- Shop drawings for approval of the push buttons, including materials, functionality, and color will be submitted.
- Accessible pedestrian signals will have both audible and vibritiac walk indications and will be capable of recording speecomes ages
- Accessible pedestrian signals will be in compliance with all MUTO and PROWAG guidance.

Pedestrian crossing signs will be required for each pedestrian BIDDING PURPOSES ONL button and are allowed to be furnished with the button as a complete assembly. The pedestrian crossing signs will be paid for separately from the pedestrian push buttons. Shop drawings depicting the proposed pedestrian crossing sign size, design, and language will be submitted.

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:

- Push button poles will use a 48" schedule 40, 4" diameter, aluminum pipe screwed into a frangible pedestal base that is designed to break away at the flange and/or the mid-section around the door to preserve anchor bolts and concrete.
- The pedestal base will have a 6" bolt circle.
- 4 anchors made of stainless steel threaded rod, washers, and nuts will be drilled and epoxied into the concrete.
- A cable tether system will be used to connect the pole to one of the anchor bolts keeping the pole from becoming a projectile in the event of a knock down.
- Shop drawings for approval of the push buttons poles will be

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

RECTANGULAR RAPID FLASHING BEACON SYSTEM

A Rectangular Rapid Flashing Beacon (RRFB) system will be in conformance with the current MUTCD and will consist of the following components:

- Individual RRFB displays as shown in the plans
- Accessible Pedestrian Signal push buttons as shown in the plans
- W11-2 (pedestrian crossing) signs as shown in the plans
- W16-7P (diagonal arrow) plaques as shown in the plans
- R10-25 (push button) signs as shown in the plans
- All necessary electronic programming and flash units, hardware, and wiring to make the system operational

One RRFB system is necessary for each pedestrian crossing location shown in the plans.

The programmed flash time will be 20 seconds per push button actuation, as per MUTCD guidelines.

A small light directed at and visible to pedestrians in the crosswalk will be installed integral to the RRFB or push button, to give confirmation that each beacon is in operation.



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All enclosures will be aluminum and comply with the requirements for NEMA 3R type.

All materials and installation costs necessary for the operation of each system will be incidental to the contract unit price per each for "Rectangular Rapid Flashing Beacon System", except that power cables from the controller cabinet to each RRFB pole will be measured and paid for separately.

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 IMSA 19-1 Table 5.1.

FIBER OPTIC CABLE

Fiber optic cable will be furnished and installed by the Contractor. Fiber optic cable will meet all requirements discussed in the City's specifications. Each fiber optic cable will have buffer tubes containing 12 fiber strands.

25 feet of fiber cable coil will be installed in the side mounted cabinet. The fiber optic cable will be installed continuous from traffic cabinet to traffic cabinet. No splices will be allowed in the fiber optic cable, except in the cabinets. All terminations and/or splicing will be completed by the City of Sioux Falls fiber optic specialist. For questions regarding the fiber optic cabling, contact Matt Rock at (605) 941-1143.

Note that cameras with power cable runs greater than 300 feet from traffic signal cabinet to camera will require that 6 strand single mode fiber optic cables be used instead of CAT 6A cables.

The fiber optic cable will be installed in accordance with the manufacturer's recommendations and the NEC. Slack cable will be left in each controller and iunction box. All junction boxes will have 50-feet of slack. Slack cable will be over / under coiled. Tying will be loose and kept to a minimum to prevent damage when operating lid. No splices will be allowed in the fiber optic cable except in the controllers. Splices will be of the fusion splice type. All fusion splices will be placed in a splice tray. Terminations will be of the epoxy/polish type, or fusion splice to pig tail type.

No testing will be completed on the fiber optic cable by the Contractor. All testing will be completed by the City outside of this project / contract/\free bairs are needed to be completed by the Contractor due to deficient and the completed by the Contractor due to deficient and the completed by the Contractor due to deficient and the complete as a contract of the the City during their testing, the Contractor will repair the (ib) Optio calle as required to correct these deficiencies at no cost to the City

All costs to furnish and install the 24 SM fiber optic cable is the contract unit price per foot for "24 Strand Fiber Optic Caple".

INNERDUCT

Innerduct will meet the following requirements:

- Compliant with NFPA70, National Electric Code
- UL listed
- Meets NEMA TC-7
- Have smooth exterior and longitudinally ribbed interior.

The innerduct conduit will be orange in color and longitudinally ribbed on the inside wall.

The innerduct bid items will include furnishing and installing the innerduct, as well as all work to seal the traffic interconnect conduit within the junction boxes.

Innerduct ends will be sealed using a mastic style tape wrapped around the end of the innerduct and fiber optic cable. If innerduct is empty, a heat shrinkable cap will be installed over the end of the innerduct.

All costs for the innerduct will be included in the contract unit price per foot for "1.5" Innerduct SDR 13.5".

TRAFFIC AND FIBER OPTIC CABLE CONDUIT

All nonmetallic conduit open ends will have an approved bell end or bushing installed to prevent damage to cable or conductors, per the City's specifications Section 635A.3.G.6. #12 AWG Tracer wire will be installed in all traffic conduit and interconnect. The tracer wire will be paid for separately under its respective bid item, unless noted otherwise.

SIGNAL AIMING

Signals will be aimed such that all signals for each approach will be continuously visible for the minimum distance listed in the table in Section 4D.06 of the MUTCD.

All costs required for this work are incidental to the "3 Section Vehicle Head" bid item.

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		Galva	anized			Schedule				Schedule				R 13.5	24 SM	6 SM FO	6 SM FO						AWG			(Signal)	(SF	EVD 8 3C			
		St	eel 3"	1"	2"	3"	4"	5"	1"	3"		5"	1.5"		FO	(Signal) (N.A.B.I.)	(DOT Cam.) (N.A.B.I.)	1/C	1/C	2/C	3/C	5/C	7/C	12/C	25/C		Camera)	(N.A.B.I.)		+	
					_								1.0			(14.5 ()	(*)	#6	#12	2,0	0,0	0,0	1,0	12/0	20/0	(14.5 (1.5.11.)		(14.7 ()			
								_									F+	AWG	AWG												
Location to 85TH STREET AT			Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	F1	Ft	Ft		Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft			
CC1	M5				25													120													
CC1	JS1							10										1.20	25				25	90	25						1
JS1	JS2											70							75				75	300	75						
JS2	A1				10														20					20							
JS2	JS3				40						70)							75				75	225	75						
JS3	A2				10														20						20						_
JS3	JS4										60	,							65				65	130	65						+
JS4	A3					10													20				00	100	20						+
JS4	A4					25													35					35							+
JS4	JS5									60									65				65	65							
JS5	A5				00	30													40				40	40							_
JS5	A6				30														40				40								-
CC1	A1																					20						250			-
CC1	A2																					20									+
CC1	A3															285						125									+
CC1	A4																				20	20						285			
CC1	A5																					135									
CC1	A6																				20										
	A 4 DD																			40											
A4 A6	A4 PB A6 PB																			10 10											+
Au	AOFB																			10											+
CC1	JF1 (FIBER)												40		35				35												-
JF1 (FIBER)	JF2 (FIBER)												1,750	1					3,510												+
JF2 (FIBER)	JF3 (FIBER)												420						850												
JF3 (FIBER)	JF4 (FIBER)												1,180	1					2,370												
CC1	JS6				25			30											45					85	85						+
JS6	A12				25			+							+				35				35								+
JS6	JS7							+			60)			+				65				65	125	125					.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	+
JS7	A11				10										1				20				20						1111.	ROFESSION 15776 JOHN M. C. GRAY	1
																													111/1/6	1401-00/01/1/1/	2
JS7	JS8						90												95					200	200					LEG NAIN	
JS8	A10				10														20					20						15776	2=
100	1011		450																455										E So		<u> </u>
JS8 JS8	JS14 JS9		450					1		55					+				455 60					60	120				# (D) • /	JUHN M. C	析量
JS8 JS9	A9					25		1		55									35					00	35				PEGIS/	GRAY	\$\frac{\tau}{\tau}
JS9	PB1			10		20		+							+				20						- 55				= .0		1//
																													1/1/2	H DAK	**
JS9	JS10							L			80)							85					85	85				11/1/1	5/16/2025	
JS10	A7					10													20						20					V/////////////////////////////////////	
								-																						5/16/2025 MILLIAN MILL	
05th Street -	t Ramps C/D Subtotal:		450	40	400	400	00	40		445	07	0 70	2 202		25	205		100	0 000	20	40	200	EEO	1 400	050						+
ostn Street at	i Kamps C/D Subtotal:	· <u> </u>	450	10	120	100	90	40		115	27	0 70	3,390	'	35	285		120	8,200	20	40	320	550	1,480	950			535			

[.] All cable quantities shown include 5' of slack/coil in each junction box, 5' of slack/coil in each pole base, and 7' of slack/coil in cabinet, unless otherwise noted.

^{2.} CAT6A signal camera cable and 6 FM FO signal camera cable are incidental to the "Video Detection System" bid item.

^{3.} See Lighting plan quantities regarding street lighting cable quantities between lighting junction boxes and roadway (signal pole mounted) street lights. 1. Coil and store 50' of 24 SM fiber optic cable in each fiber optic junction box.

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^{6.} CAT6A (DOT camera) cable and 6 FM FO (DOT camera) cable are incidental to the "Surveillance Camera" bid item.

PROJECT EM 0292(88)73 IM 2292(104)0

L92

	Rigid Conduit		Ri	igid Condu	uit			Rigid C	onduit		Inne	rduct		Fiber Optic	Cable	Copper	r Wire		IM	ISA Coppe	er Cable, K	1		CA	T6A	Preemption Cable
	Galvanized			Schedule 40				Schedu			SDR		24 SM	6 SM FO	6 SM FO					#14 /				(Signal)	(SF	EVP & 3C
	Steel											10.0	FO		(DOT Cam.)										Camera)	
	3"	1"	2"	3"	4"	5"	1"	3"	4"	5"	1.5"			(N.A.B.I.)	(N.A.B.I.)		1/C #12	2/C	3/C	5/C	7/C	12/C	25/C	(N.A.B.I.)		(N.A.B.I.)
															F.	AWG	AWG									
Location to Location	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft		Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
85TH STREET AT I-29 RAMPS C/D (CO	ONTINUED)			+-+				00									0.5					0.5				
JS10 JS11 A8				10				90)								95 20					95 20				
3311 A0				10													20					20				
CC1 A7														405					20	220						
CC1 A8																				40						
CC1 A9																			40							
CC1 A10																			20	20						480
CC1 A11																										
CC1 A12																										
A7 A7 PB				\vdash														10								
A9 A9 PB																		10								
A9 PB1																		50								
A10 A10 PB																		10								
IE4 IE5 (EIDED)											400		050				050									
JF1 JF5 (FIBER) JF5 (FIBER) JF6 (FIBER)	350										480		250 355				250									
JF3 (FIBER) JF6 (FIBER)	330			+									333													
CC1 85L10							105																		140	
CC1 85L14		200					240								490											
				+																						
				+																						
																										,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
																										RUFISSO
																										W. EG No. Y
																										15776
																										ROFESSION 15776 O JOHN M. C Z GRAY
				+																						U O O O O O O O O O O O O O O O O O O O
				\vdash																						GRAY SHE
																										H DAN
																										1/1/45/16/2025
				<u> </u>																						7H DAY
85th Street at Ramps C/D Subtotal	: 350	200		10			345	90)		480		605	405	490		365	80	80	280		115			140	480
85th Street at Ramps C/D Total		210	120		90	40	345		5 270	70			640	690		120					550		950		140	1,015

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PROJECT EM 0292(88)73 IM 2292(104)0 SHEET L14 L92

		Rigid	Conduit		R	igid Cond	luit			R	igid Cond	luit		Innerduct		Fiber Optic	Cable	Coppe	er Wire		IM	SA Coppe	er Cable,	K1		CA	T6A	Preemp	otion Cable
		Galva	anized			Schedule 4					Schedule			SDR 13.5	24 SM	6 SM FO	6 SM FO					#14 /				(Signal)	(SF	E\/D 8 3C	
		St	teel												FO	(Signal)	(DOT Cam.)										Camera)		
			3"	1"	2"	3"	4"	5"	1"		3"	4"	5"	1.5"		(N.A.B.I.)	(N.A.B.I.)	1/C	1/C	2/C	3/C	5/C	7/C	12/C	25/C	(N.A.B.I.)		(N.A.B.I.)	
																		#6 AWG	#12 AWG										
Location t	to Location		Ft	Ft	Ft	Ft	Ft	Ft	Ft		Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	
85TH STREET A																													
CC2	M6				60													240											
CC2	JS12						50												65				65	125	125				
JS12	B1				10														20				20						
JS12	JS13											95							100					200	200				
JS13	B2					20													30						30				
JS13	JS14										80								85					05					
JS13 JS14	B3					10					80								20					85 20					+ + + + + +
0017	50	1				10													20					20					
JS13	JS15	1										65							70					70	70				
JS15	B4	1				20													30						30				
JS15	PB2			10															20										
JS15	JS16										55								60					60					
JS16	B5					25													35					35					
CC2	B1																				20								
CC2	BI																				20								
CC2	B2																				20	145				220			+ + + + + + + + + + + + + + + + + + + +
CC2	B3																					70							
CC2	B4																				40	20							
CC2	B5																				20	20						670	
B1	B1 PB																			10									
B2	B2 PB																			10									
B4 B4	B4 PB PB2																			10 45									
B5	B5 PB																			10									
В0	5015																			10									
CC2	JF7 (FIBER)													40	20				20										
JF7 (FIBER)	JF6 (FIBER)													520	260				260										
																										-			
CC2	JS21	1					10											-	25			-	50	75	25				
JS21	B11	1				10													20					20					POFESSION 15776 DIOHNM. C Z
JS21	JS20	+										55							60					120	60				POF#SS/ON,
JS21 JS20	B10	1				10						55							20					120	20				
	3.0	1																											
JS20	JS19	1										65							70				140	140					15/16 15.0
JS19	B9					10													20					20					O: JOHN M. C. Z
																													最い GRAY : M
JS19	JS17	1									50								55				110	55					V. 7
JS17	B7	1				10													20					20					TH DAY
JS17	B8	1			40										-				50				50						
JS17	JS18	1									40								45				45						1/1,5/16/2025
JS17 JS18	B9	1			30						40								40				40						7H DAY
00.10	50	1																									1		
85th Street a	at Ramps A/B Subtotal	<u>:</u>		10	140	115	60				225	280		560	280			240	1,240	85	100	255	520	1,045	560	220		670	
		-												*															

[.] All cable quantities shown include 5' of slack/coil in each junction box, 5' of slack/coil in each pole base, and 7' of slack/coil in cabinet, unless otherwise noted.

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PROJECT EM 0292(88)73 IM 2292(104)0

SHEET L15 L92

		Rigid Conduit		F	Rigid Cond	duit			Ri	gid Cond	uit		Inne	rduct		Fiber Optic	Cable	Coppe	er Wire		IM	SA Copp	er Cable,	, K1		CA	T6A	Preemp	otion Cable
		Galvanized			Schedule -	40				chedule 8			SDR	13.5	24 SM	6 SM FO	6 SM FO					#14	AWG			(Signal)	(SF	EVP & 3C	
		Steel			_	_				ı	ı				FO	(Signal)	(DOT Cam.)				T						Camera)		
		3"	1"	2"	3"	4"	5"	1"		3"	4"	5"	1.5"			(N.A.B.I.)	(N.A.B.I.)	1/C	1/C	2/C	3/C	5/C	7/C	12/C	25/C	(N.A.B.I.)		(N.A.B.I.)	
																		#6	#12										
Location t	to Location	Ft	Ft	Ft	Ft	Ft	Ft	Ft		Ft	Ft	Ft	Ft		Ft	Ft	Ft	AWG Ft	AWG Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	
	RAMPS A/B (CONTINU																												
CC2	B6																					20						470	
CC2	B7																												
CC2	B8																												
CC2	B9																					20							
CC2	B10																				20	145				130		220	
CC2	B11																					75							
B10	B10 PB																			10									
																													
JF7 (FIBER)	JF8 (FIBER)												1,780						1,780										
JF8 (FIBER)	JF9 (FIBER)												460						460										
JF9 (FIBER)	JF10 (FIBER)												750						750										
																					1								
CC2	85L18							85																			125		
																					-								
			1																1	1	1								
																			1	1									
																													,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
																													ROFESS
																					1								PEO NO K
			-																1	1	1								POFESS/OVA/// A 15776 O OHN M. C GRAY
																			-		1								S COUNTY OF
			-	+															1	1	1								
			+																		1			-				1	GRAY C
																			 		1								TH DAY
																												1	1/1/1,5/16/2025
																													H DAN
85th Street a	at Ramps A/B Subtotal:							85					2,990						2,990	10	20	260				130	125	690	
	eet at Ramps A/B Total:		10	140	115	60		85		225	280		3,550		280			240					520	1,045	560	350	125	1,360	
	PCN 06JQ Signal Total:				225		40	430				70			920	690	490								1,510		265	2,375	

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^{3.} See Lighting plan quantities regarding street lighting cable quantities between lighting junction boxes and roadway (signal pole mounted) street lights.

Coil and store 50' of 24 SM fiber optic cable in each fiber optic junction box.

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PROJECT EM 0292(88)73 IM 2292(104)0

SHEET L16 L92

Rigid Conduit Rigid Conduit Rigid Conduit Aluminum Wire Copper Wire Pole and Schedule 80 **Bracket Cable** Galvanized Steel Schedule 40 0.75" 0.75" Alum. 1/C 1/C 1/C 1/C 1/C 12/2 2" 1/C 2/2/2/4 #2 #4 #6 #8 #10 #12 UF-B AWG AWG AWG AWG AWG AWG AWG Ft Location to Location I-29 EXIST CONDUIT 200 ESC3 EL556 55 EL557 645 215 EL556 JL21 140 450 60 JL21 JL22 120 390 215 JL22 EL555 45 165 55 EL555 EL554 35 645 215 ESC3 JL21 215 940 JBSM6 120 JL21 20 JBSM6 UBL1 15 100 JBSM6 UBL4 15 100 JL21 JL22 130 560 JL22 JBSM7 20 120 JBSM7 UBL2 15 100 JNSM7 UBL3 15 100 EL551 EL550 645 I-29 RAMP A JL1 35 165 55 JL1 AL5 25 105 35 AL5 AL4 215 675 225 AL4 AL3 215 225 AL3 AL2 215 675 225 AL2 AL1 210 675 225 AL1 JL2 190 660 200 JL2 85L16 195 I-29 RAMP B 180 570 190 BL4 210 220 BL5 660 BL3 210 220 BL4 660 BL2 210 220 BL3 660 BL2 BL1 210 660 220 Subtotal: 60 40 2,940 975 7,035 4,065 400 3,055 270

LIGHTING CONDUIT AND CABLE QUANTITIES FOR BIDDING PURPOSES ONLY DOT PINTED DATE OF THE POST OF THE POS

PROJECT EM 0292(88)73 IM 2292(104)0

L17 L92

		R	igid Cond	uit	Rigid Conduit	Rigid Conduit	Alumin	um Wire	Сорр	er Wire		Polo and				
		Gal	vanized S	Steel	Schedule 40	Schedule 80						Pole and Bracket Cable	9			
		0.75"	1"		0.75" 2"	2"	Alum. 2/2/2/4		1/C 1/C 1/C #2 #4 #6	1/C #8	1/C 1/C #10 #12	12/2 UF-B				
Location	to Location	Ft	Ft		Ft Ft	Ft	AWG Ft		AWG AWG AWG Ft Ft Ft	AWG Ft	AWG AWG Ft Ft	Ft				
	to Location RAMP C	11	11		11 11	11	11			11	11 11	11				
ESC2	CL1				245				795	265						
CL1	CL2				200				630	210						
CL2	CL3				205				645	215						
CL3	CL4				205				645	215						
CL4	CL5				205				645	215						
I-29 F	RAMP D															
ESC1	JL1				35				165	55						
JL1	JL3					155			495	165						
JL3	JL4				180	140			990	330						
JL4 DL11	DL11 DL12				50				180	60 205						
DL11	DL13	+			195 195				615 615	205						
DL13	DL14				195				615	205						
DL14	DL15				185				585	195						
DL15	JL5				195				615	205						
JL5	85L12					65			225	75						
JL4	DL10				145				465	155						
DL10	DL9				195				615	205						
DL9	DL8	-			195				615	205						
DL8 RDCL5	RDCL5 RDCL4				195 195				615	205 205						
RDCL4	RDCL4				195				615	205						
RDCL3	RDCL2				195				615	205						
RDCL2	RDCL1	1			195				615	205						
RDCL5	JL6					50			180	60						
JL6	DL7				50				180	60						
DL7	JL7				155				495	165						Hu
JL7 JBSM2	JBSM2 JL8							+ +	780 465	260 155					WACCE F	Sci
JBSM2 JL8	DL4				55				195	65					PKOIL	00/0///
DL4	DL3	+			200				630	210					M.ZEG.	No. X
DL3	DL2	1			200				630	210					1 -7 oh	327/ 1. 2 =
DL2	DL1				200				630	210					white	
															CHKIZI	OPHER :
JL7	DL6				55				195	65					B. GR	KEEN S
		1													· 60/_	SS/AVA
JBSM2	DL5								60	20				1	1.47.H	JAKO.
DL3	EJL2					120		+ +	390 130					1/1/1/1	7/12	1/2 5
DL3	EJLZ	+				120			390 130	1					///////////////////////////////////////)/ < J \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
		+														111111
	1	1														
	Subtota	ıl:			4,715	530			390 130 17,670	5,890						
												<u></u>		 		

PROJECT EM 0292(88)73 IM 2292(104)0

		R	igid Cond	duit	Rigid Conduit	Rigid Conduit	Aluminum Wire			Copper	Wire			Pole and		
		Gal	vanized \$	Steel	Schedule 40	Schedule 80								Bracket Cable		
		0.75"	1"		0.75" 2"	2"	Alum.	1/C	1/C	1/C	1/C	1/C	1/C	12/2		
		0.73	'		0.73		2/2/2/4	#2	#4	#6	#8	#10	#12	UF-B		
							AWG	AWG			AWG		AWG			
Location	to Location	Ft	Ft		Ft Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft		
	T WEST OF I-29															
ESC2	JL9				20			120	40							
JL9	JL10					50	60									
JL10	85L13				90		100									
JL10	JL18					155	165									
JL18	85L14				15		25									
85L14	JBSM1						215									
JBSM1	85L15						20									
JL10	JL11					70	80									
JL11	JL13				405	60	70		-							
JL13	85L12				105		115									
JL10	JL20				105		115		-							
JL10 JL20	JBSM3				100		260		+							
JBSM3	JL27						260									
ODOINIO	ULZI						200									
JL11	85L11				10		20									
85L11	WELCOME SIGN				60		70									
85L11	85L10				185		195									
85L10	85L9				185		195									
85L9	85L8				185		195									
85L8	85L7				185		195									
85L7	85L6				185		195									
85L6	JL14				10		20									
JL14	JL15					165	175									
ELX	JL17				85		95									
JL17	85L5				20	35	65									
11.45	11.40					7.5	05									
JL15	JL16				45	75	85									
JL16 85L4	85L4 CONST LIMITS				45 65		55						75			
0JL4	CONST LIMITS				0.5								10			(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
JL15	85L3				10		20									DROFESSION 11/1
85L3	85L2				230		240									
85L2	85L1				235		245									\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
85L1	NEXT LIGHT UNIT				155		265									\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
																CHRISTOPHER
ESC2	JL9				20				60	30						EH : B CDEEN
JL9	JL10					50			120	60						EX., D. OREE
JL10	JL11					70				80	-					
JL11	JL12				280					290						I DAY
JL12	IM1				300				620	320						7/1/1/ 7/13/2
																ROFESS/ON/1/2 PROFESS/ON/1/2 F 9362/2 F 9362/2 B GREEN B GREEN
	0	<u> </u>	1	<u> </u>	0.705	720	2.045	400	1 500	700			75			
	Subtotal:				2,785	730	3,815	120	1,580	780			75			

PROJECT EM 0292(88)73 IM 2292(104)0

SHEET L19 L92

Rigid Conduit Rigid Conduit Rigid Conduit Aluminum Wire Copper Wire Pole and Schedule 80 **Bracket Cable** Galvanized Steel Schedule 40 0.75" 0.75" 2" Alum. 1/C 1/C 1/C 1/C 1/C 12/2 1/C 2/2/2/4 #2 #4 #6 #8 #10 #12 UF-B AWG AWG AWG AWG AWG AWG AWG Ft Location to Location 85TH STREET EAST OF I-29 JL24 25 135 45 JL25 75 JL25 JL26 50 60 JL26 85L18 20 30 85L18 JL27 80 90 JL27 JL28 50 60 JL28 85L16 10 20 JL29 85 JL29 85L17 60 70 JBSM4 JL29 270 JBSM4 JL19 255 JL18 75 JL19 ESC4 LL1 75 LL1 LL2 80 270 LL3 75 85 LL2 255 LL4 75 LL3 255 85 JL31 LL4 60 210 70 JL31 LL5 270 90 85 LL5 LL6 285 95 LL6 LL7 85 285 95 LL7 LL8 85 285 95 JL27 JL30 145 155 JL30 85L19 20 10 ESC7 JL32 20 80 40 JL32 JL33 80 180 90 JL34 100 JL33 110 JL34 JL36 160 340 170 JL36 IM2 180 380 190 ESC7 JL32 20 80 40 JL32 JL33 90 JL37 70 JL33 60 140 JL37 JL38 275 570 285 JL38 IM3 170 360 ESC7 JI 32 20 120 40 JL32 JL33 80 90 85L25 40 50 85L25 CONST LIMITS 90 100 Subtotal: 1,740 980 1,415 255 2,615 3,605 780 100

LIGHTING CONDUIT AND CABLE QUANTITIES FOR BIDDING PURPOSES ONLY DOTE PIOTE DE LE PROPERTY DE LE

PROJECT EM 0292(88)73 IM 2292(104)0 L20

		R	igid Cond	uit Rigid Conduit	Rigid Conduit	Alumin	um Wire		Сор	per Wire			Del	e and	Plutting Date. 07/21/2029 Revised Date. 07/21/2029 NDG
		Gal	vanized S	Schedule 40	Schedule 80									e and et Cable	
		0.75"	1"	0.75" 2"	2"	Alum.		1/C	1/C 1/C	1/C	1/C	1/C	12/2		
						2/2/2/4		#2	#4 #6	#8	#10	#12	UF-B		
Location	to Location	Ft	Ft	Ft Ft	Ft	AWG Ft			AWG AWG	AWG Ft	AWG Ft	AWG Ft	Ft		
	to Location ST OF I-29 (CONT'D)	гι	гι	Ft Ft	FL	Ft		FL	FL FL	Г	ΓL	ΓL	Fί		
JL33	JL34				100	110									
JL34	85L24			55		65									
85L24	85L23			170		180									
85L23	85L22			190		200									
85L22	85L21			195		205									
85L21	85L20 85L19			205		215 210									
85L20 85L19	WELCOME SIGN			200		70									
00210	WELGGIVIE GIGIY					70									
JL34	JL35				55	65									
JL35	85L26			40		50									
85L26	CONST LIMITS			85								95			
JL33	JL37			10	60	70									
JL37 85L27	85L27 85L28			230		20 240									
85L28	NEXT LIGHT UNIT			185		200									
PEDESTRIAN	N UNDERPASS														
ESC4	JL23			35					165	55					
JL23	JBSM5	15		15							100				
JBSM5 JBSM5	PU1	30									160				
PU2	PU2 PU3	15 15									100				
PU3	PU4	15									100				
PU4	PU5	15									100				
PU5	PU6	15									100				
PU6	PU7	15									100				
PU7	PU8	15									100				
PU8 PU9	PU9 PU10	15 15									100				
PU10	PU11	15									100				
PU11	PU12	15									100				
PU12	PU13	30									160				
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	Subtotal:	240		15 1,660	215	1,900			165	55	1,520	95			

PROJECT EM 0292(88)73 IM 2292(104)0

		Rigid Conduit	R	Rigid Condui	it Rigid (Conduit	Aluminum Wire			Coppe	er Wire			Pole and	
		Galvanized Steel	S	Schedule 40) Sched	dule 80								Bracket Cable	
		0.75" 1"	0.75"	2"	2"		Alum. 2/2/2/4	1/C #2	1/C #4	1/C #6	1/C #8	1/C #10	1/C #12	12/2 UF-B	
							AWG	AWG		AWG			AWG	Ji - B	
Location t	to Location	Ft Ft	Ft	Ft	Ft		Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	
85TH STRE	ET BRIDGE														
ESC 2	JL9			25				135	45						
JL9	JL10				50		60								
JL10	JL18				155		165								
JL18	BRL12						55								
BRL12	BRL13						50								
RL13 RL14	BRL14						50								
RL14 RL15	BRL15 BRL16						50								
RL16	BRL17						50								
RL17	BRL18						50								
RL18	BRL19						50								
RL19	BRL20						50								
RL20	BRL21						50								
RL21	BRL22						50								
SC4	JL24			25				135	45						
JL24	JL25				85		95								
L25	JL26				50		60								
L26	JL27			95			100								
IL27	JL28				55		60								
JL28	BRL11						55								
RL11	BRL10						50								
RL10	BRL9						50								
BRL9	BRL8						50								
BRL8	BRL7						50								
BRL7 BRL6	BRL6 BRL5						50								
BRL5	BRL4						50 50								
BRL4	BRL3						50								
BRL3	BRL2						50								
BRL2	BRL1						50								
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	Subtota	al.		145	395		1,650	270	90	1	-				

PROJECT EM 0292(88)73 IM 2292(104)0

	Rigid Conduit	R	igid Conduit	Rigid Cor	nduit	Aluminum Wire			Coppe	er Wire			Pole and	
	Galvanized Steel	S	Schedule 40	Schedule	80								Bracket Cable	
	0.75" 1"	0.75"	2"	2"		Alum.	1/C	1/C	1/C	1/C	1/C	1/C	12/2	
						2/2/2/4	#2	#4	#6	#8	#10	#12	UF-B	
						AWG	AWG		AWG			AWG		
Location to Location	Ft Ft	Ft	Ft	Ft		Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	
LUMINAIRE POLES														
35L1													110	
35L2 35L3													110	
35L3													110	-
35L5													110	
5L6													110	
5L7													110	
5L8													110	
5L9													110	
5L10													110	
5L11													110	
5L12													110	
5L13													110	\perp
5L14													110	
5L15													110	
5L16 5L17													110	_
5L18													110	-
5L19													110	
5L20													110	
5L21													110	
5L22													110	
5L23													110	
5L24													110	
5L25													110	
5L26													110	
5L27													110	
5L28													110	
AL1													55	
AL2													55	
AL3													55	
AL4													55	
AL5													55	11111
													 55 55 55 55 55 55 55 55 55 55 55 55 55	3.51
BL1													55	'9/
BL2													55 EG.	N
BL3													55 936	2W 1
BL4													55 Onto	_/ / _ //
BL5													55 CHRISTO	<u> </u>
21.1													B. GR	=EN_
CL1													55 55	-\X_Z
CL2													55 55 Fig. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	AYY.
CL4													55 7/1/11 7/23	/2.
CL5													55	123,11
														11111
Subt	otal:												3,905	

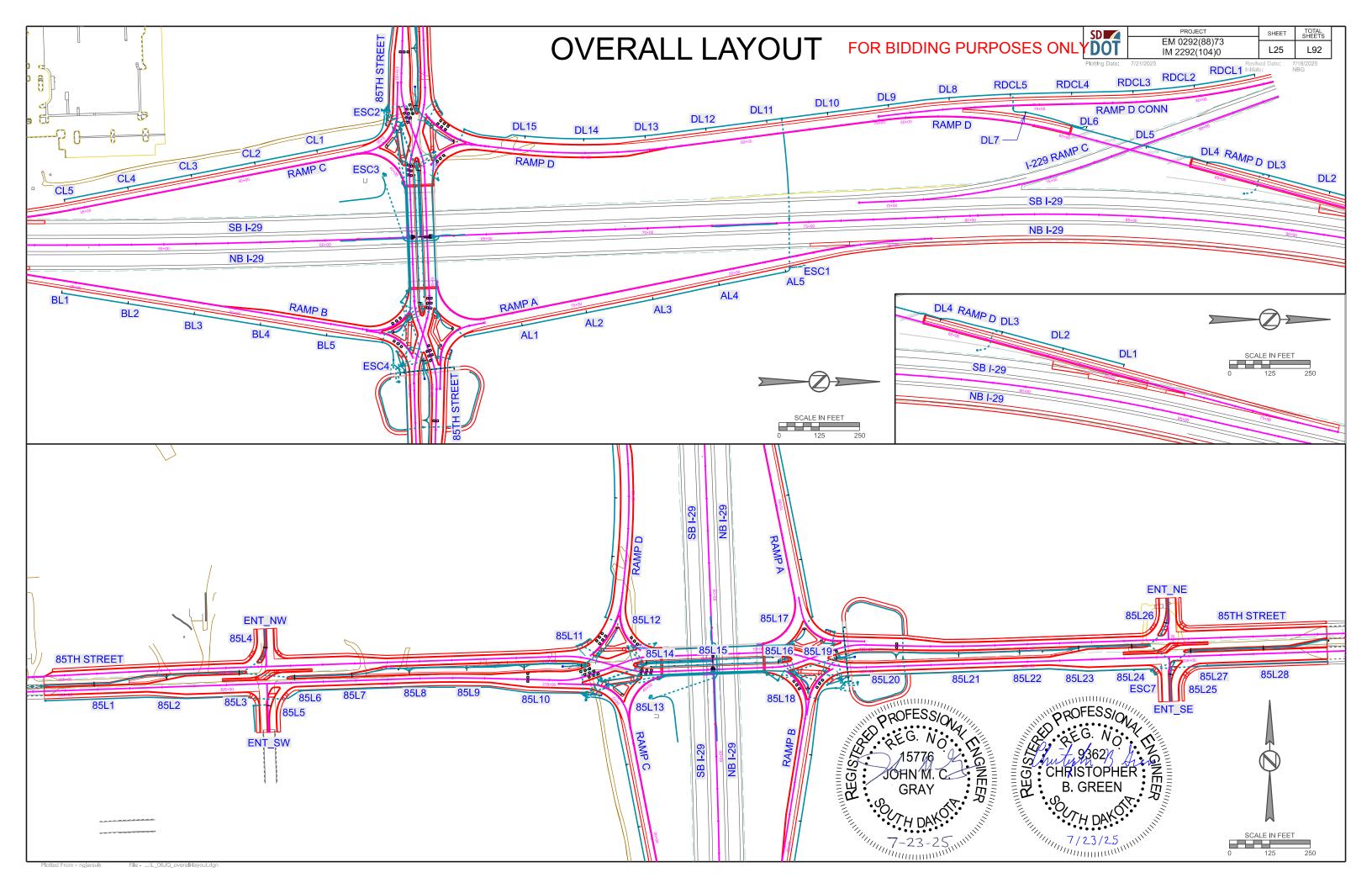
PROJECT EM 0292(88)73 IM 2292(104)0

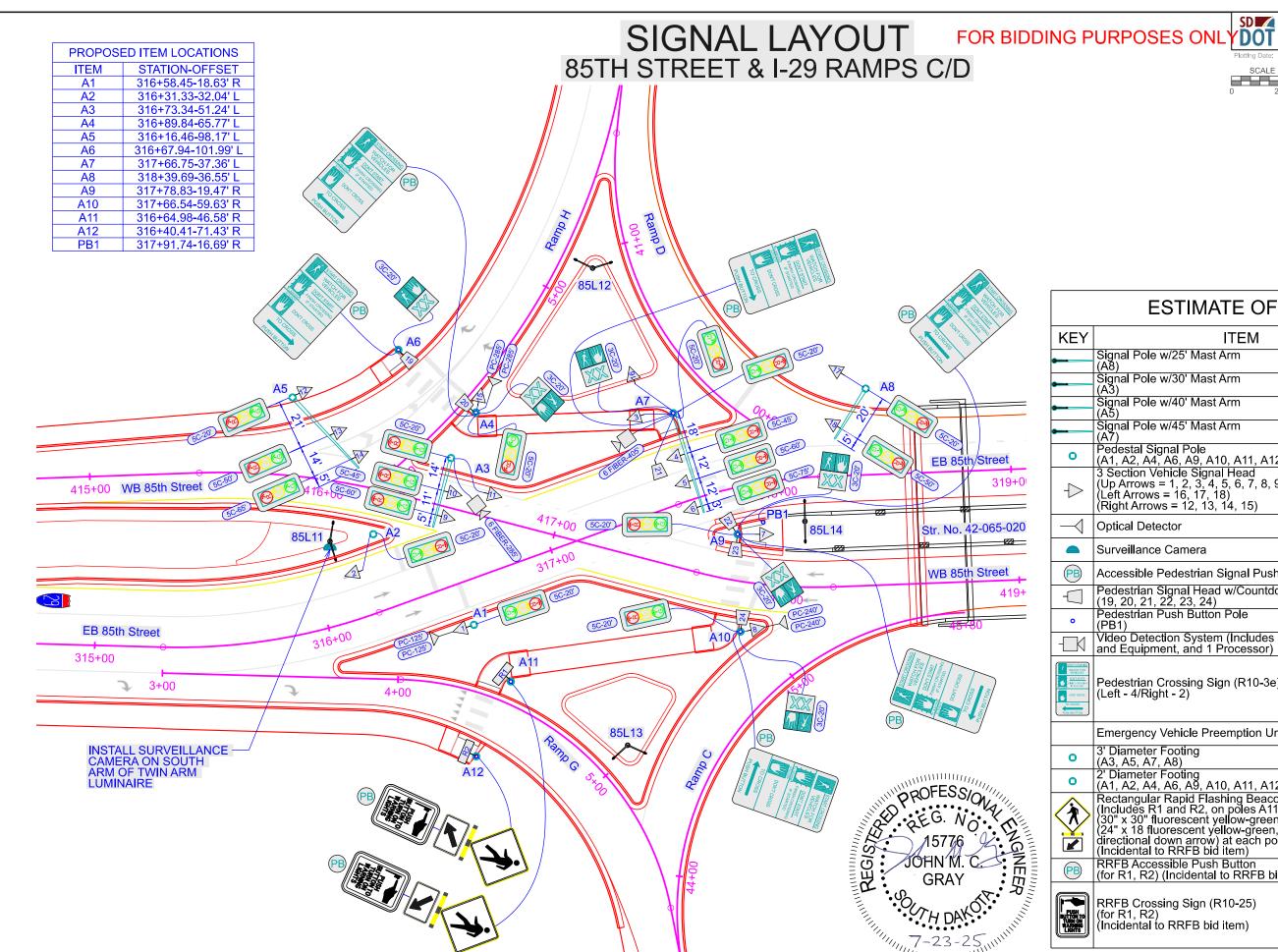
SHEET L23 L92

Rigid Conduit Rigid Conduit Rigid Conduit Aluminum Wire Copper Wire Pole and **Bracket Cable** Schedule 40 Schedule 80 Galvanized Steel 0.75" 0.75" 2" Alum. 1/C 1/C 1/C 1/C 1/C 1/C 12/2 2/2/2/4 #2 #4 #6 #8 #10 #12 UF-B AWG AWG AWG AWG AWG AWG AWG Ft Location to Location **LUMINAIRE POLES** 55 55 DL3 55 DL4 55 DL5 55 DL6 55 DL7 55 DL8 55 55 DL9 DL10 55 DL11 55 DL12 55 55 DL14 55 55 DL15 RDCL1 55 RDCL2 55 RDCL3 55 RDCL4 55 RDCL5 55 20 LL2 20 LL3 20 LL4 20 LL5 20 LL6 20 20 LL7 LL8 20 EL555 120 EL556 120 Subtotal: 1,500 PCN 06JQ Total: 300 40 15 14,100 3,120 8,780 3,975 | 5,390 | 29,255 | 10,790 | 1,920 | 270 5,405

PROJECT EM 0292(88)73 IM 2292(104)0

	Rigid Conduit	Rigid Conduit	Rigid Conduit	Aluminum Wire		Copper Wire		Pole and		
	Galvanized Steel	Schedule 40	Schedule 80					racket Cab	е	
	0.75" 1"	0.75" 2"	2"	Alum.	1/C	1/C 1/C 1/C 1/C 1/C	1	2/2		
				2/2/2/4	#2	#4 #6 #8 #10 #12	U	F-B		
Location to Location	Ft Ft	Ft Ft	Ft	AWG Ft	AWG Ft	AWG AWG AWG AWG Ft Ft Ft Ft		Ft		
I-229										
EJL3 EJL4			115		360					
EJL4 EJL5		565			1,150					
EJL5 EL400		570			1,160					
EL400 EL401 EL401 EJL7		280 545			580 1,110					
EJL7 EJL8		340	80		180					
LUMINAIRE POLES										
EL400								65		
EL401								65		
										(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
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										/////
Subtotal:		1,960	195		4,540			130		
PCN 07D0 Total:		1,960	195		4,540			130		
Project Total:		15 16,060	3,315	8,780		5,390 29,255 10,790 1,920 270		535		- - -





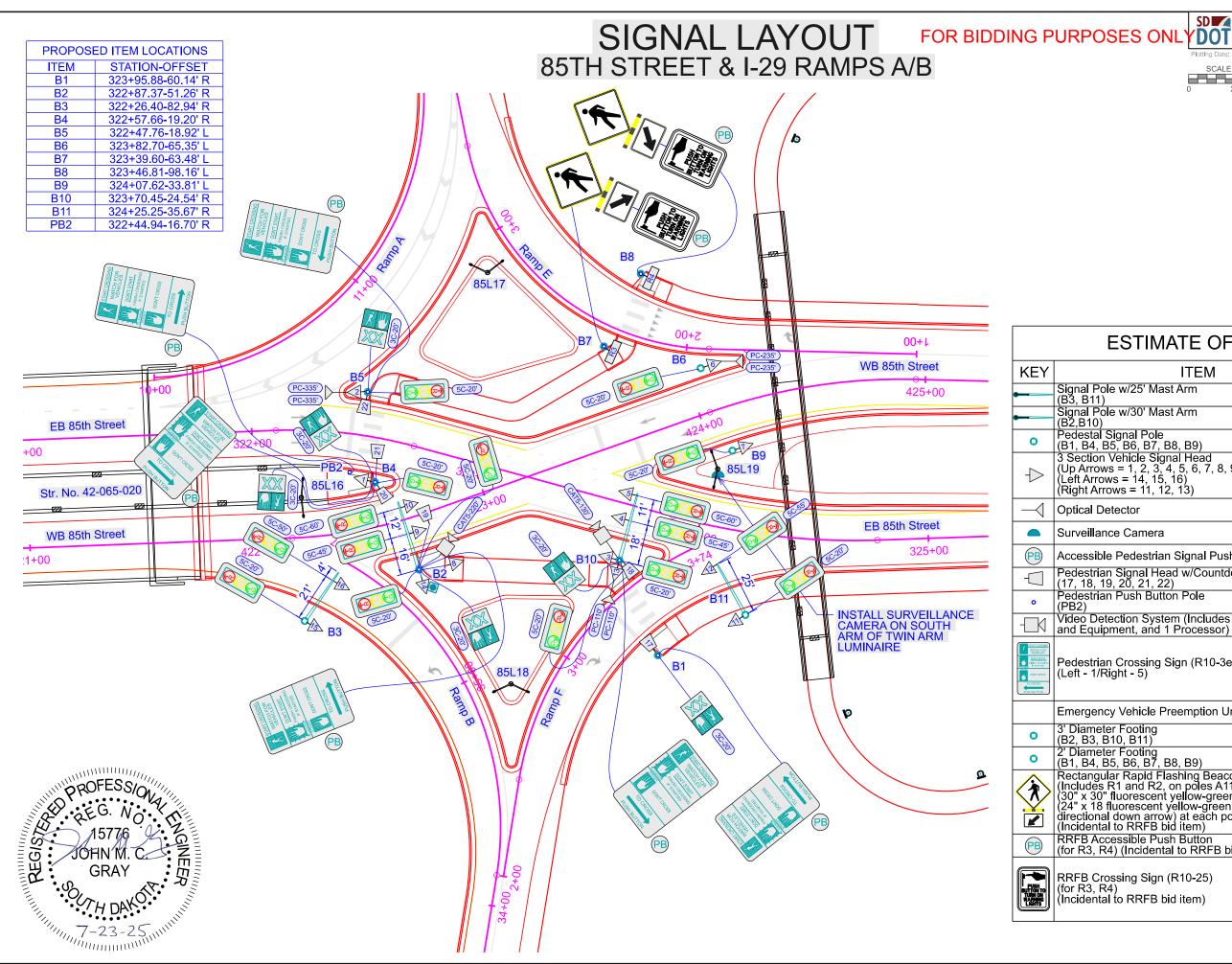
KEY	ITEM	LESTIT	UNIT
	Signal Pole w/25' Mast Arm (A8)	1	EACH
_	Signal Pole w/30' Mast Arm (A3)	1	EACH
-	Signal Pole w/40' Mast Arm (A5)	1	EACH
_	Signal Pole w/45' Mast Arm (A7)	1	EACH
0	Pedestal Signal Pole (A1, A2, A4, A6, A9, A10, A11, A12)	8	EACH
\Rightarrow	3 Section Vehicle Signal Head (Up Arrows = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11) (Left Arrows = 16, 17, 18) (Right Arrows = 12, 13, 14, 15)	18	EACH
	Optical Detector	3	EACH
	Surveillance Camera	1	EACH
PB	Accessible Pedestrian Signal Push Button	6	EACH
	Pedestrian Signal Head w/Countdown Timer (19, 20, 21, 22, 23, 24)	6	EACH
0	Pedestrian Push Button Pole (PB1)	1	EACH
	Video Detection System (Includes 2 Signal Cameras and Equipment, and 1 Processor)	1	EACH
START CRISSING VIGATOR FOR VIGHTALES VIGHTALES VIGHTANT FRANCH ORDERNO IN CRISSING DON'T CHOSS TO CHOSS FUSH BUTTON	Pedestrian Crossing Sign (R10-3e) (Left - 4/Right - 2)	6	EACH
	Emergency Vehicle Preemption Unit	1	EACH
0	3' Diameter Footing (A3, A5, A7, A8)	49.0	FT
0	2' Diameter Footing (A1, A2, A4, A6, A9, A10, A11, A12)	48.0	FT
1	Rectangular Rapid Flashing Beacon System (RRFB) (Includes R1 and R2, on poles A11 and A12) with W11-2 (30" x 30" fluorescent yellow-green) and W16-7p (24" x 18 fluorescent yellow-green, with appropriate directional down arrow) at each pole location (Incidental to RRFB bid item)	1	EACH
PB	RRFB Accessible Push Button (for R1, R2) (Incidental to RRFB bid item)	2	EACH
PUSH BUTTON TO TURN ON WARRING LIGHTS	RRFB Crossing Sign (R10-25) (for R1, R2) (Incidental to RRFB bid item)	2	EACH

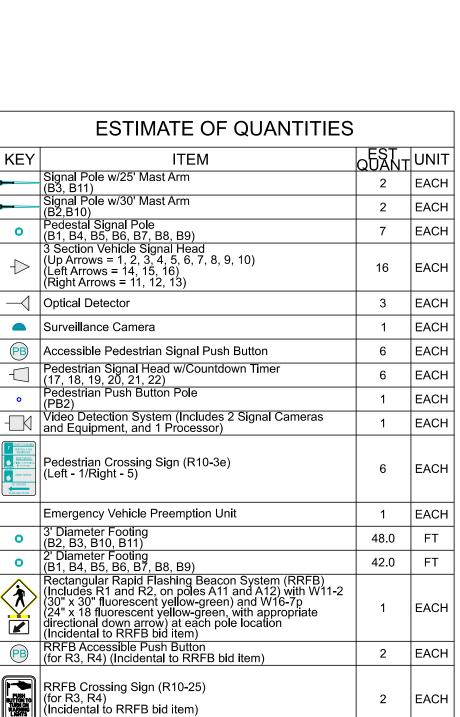
PROJECT EM 0292(88)73 IM 2292(104)0

SHEET

L26

TOTAL SHEETS





PROJECT

EM 0292(88)73

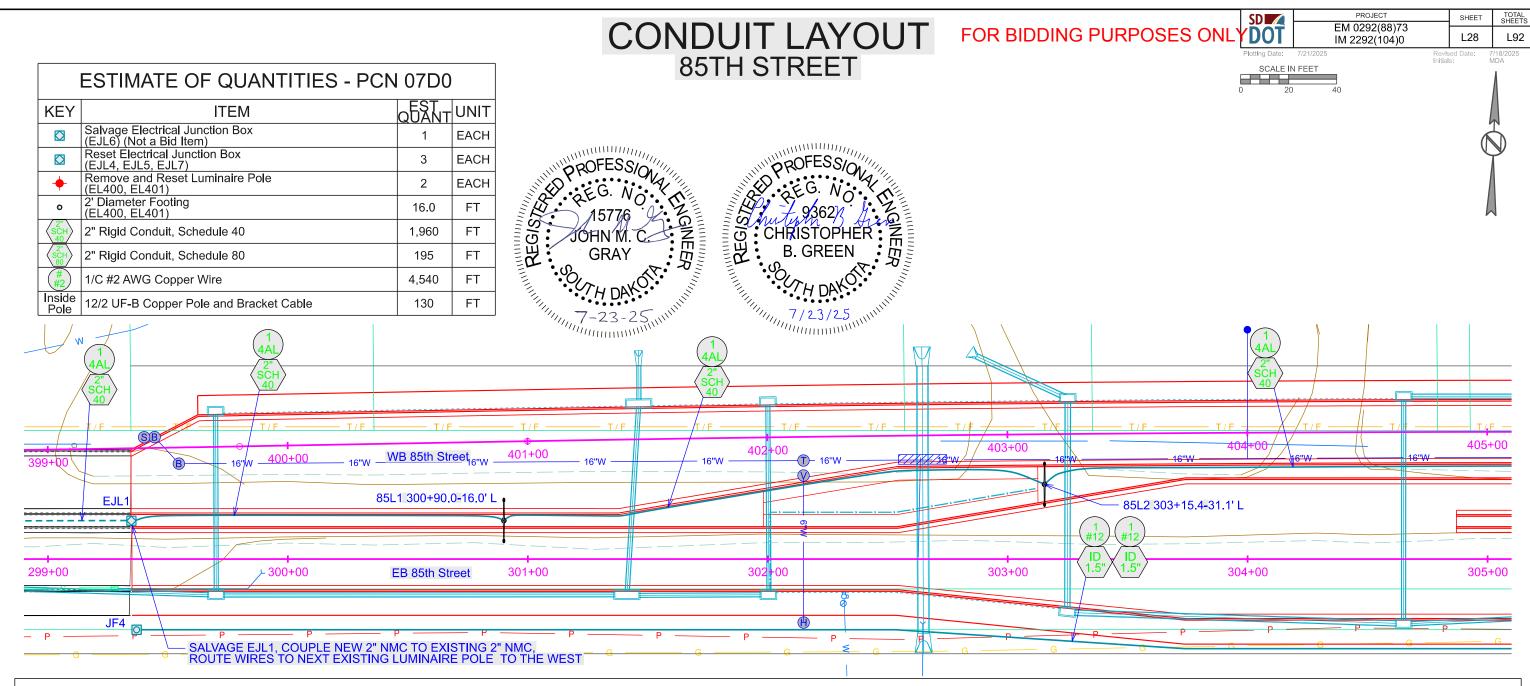
IM 2292(104)0

SCALE IN FEET

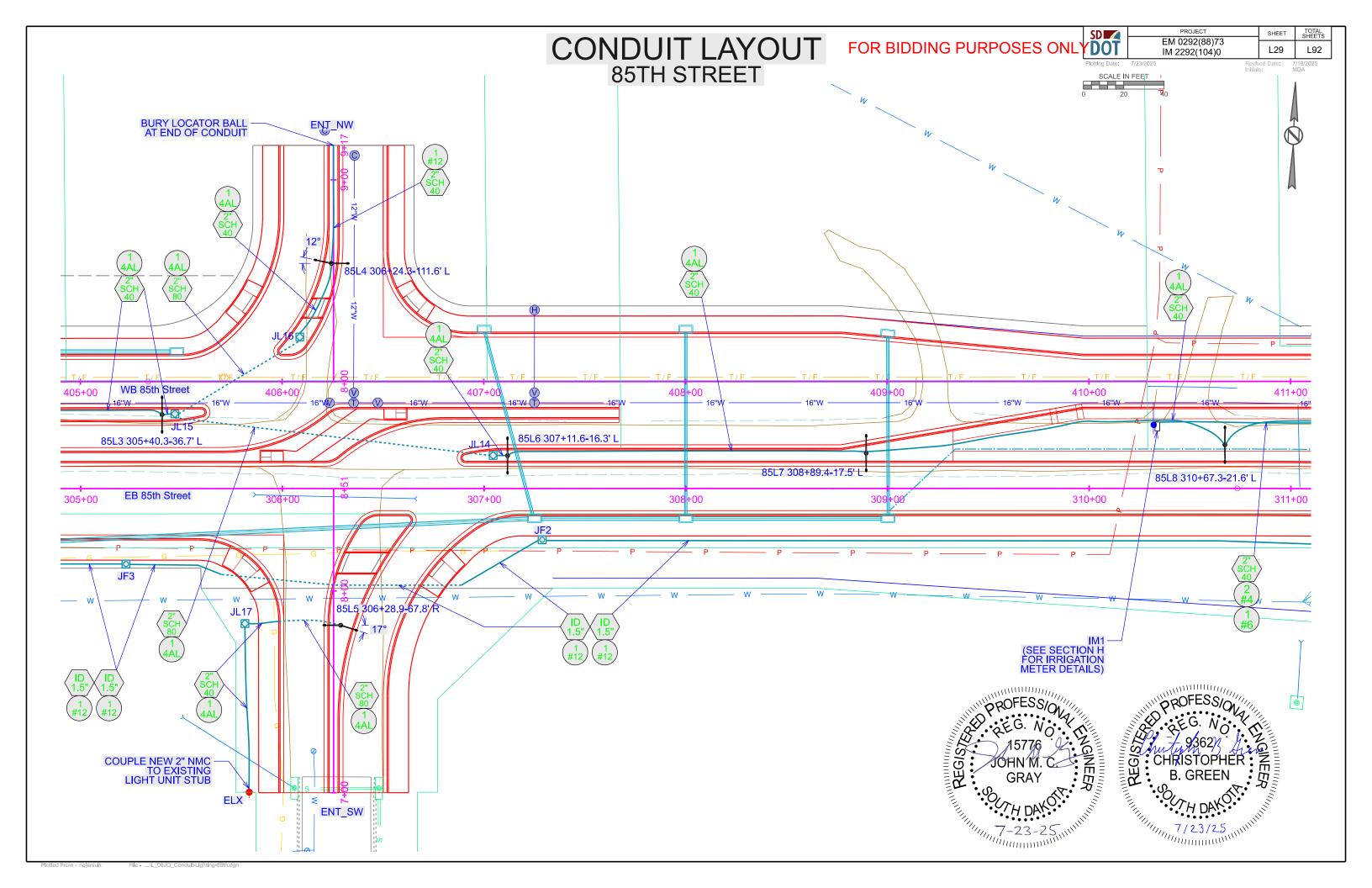
SHEET

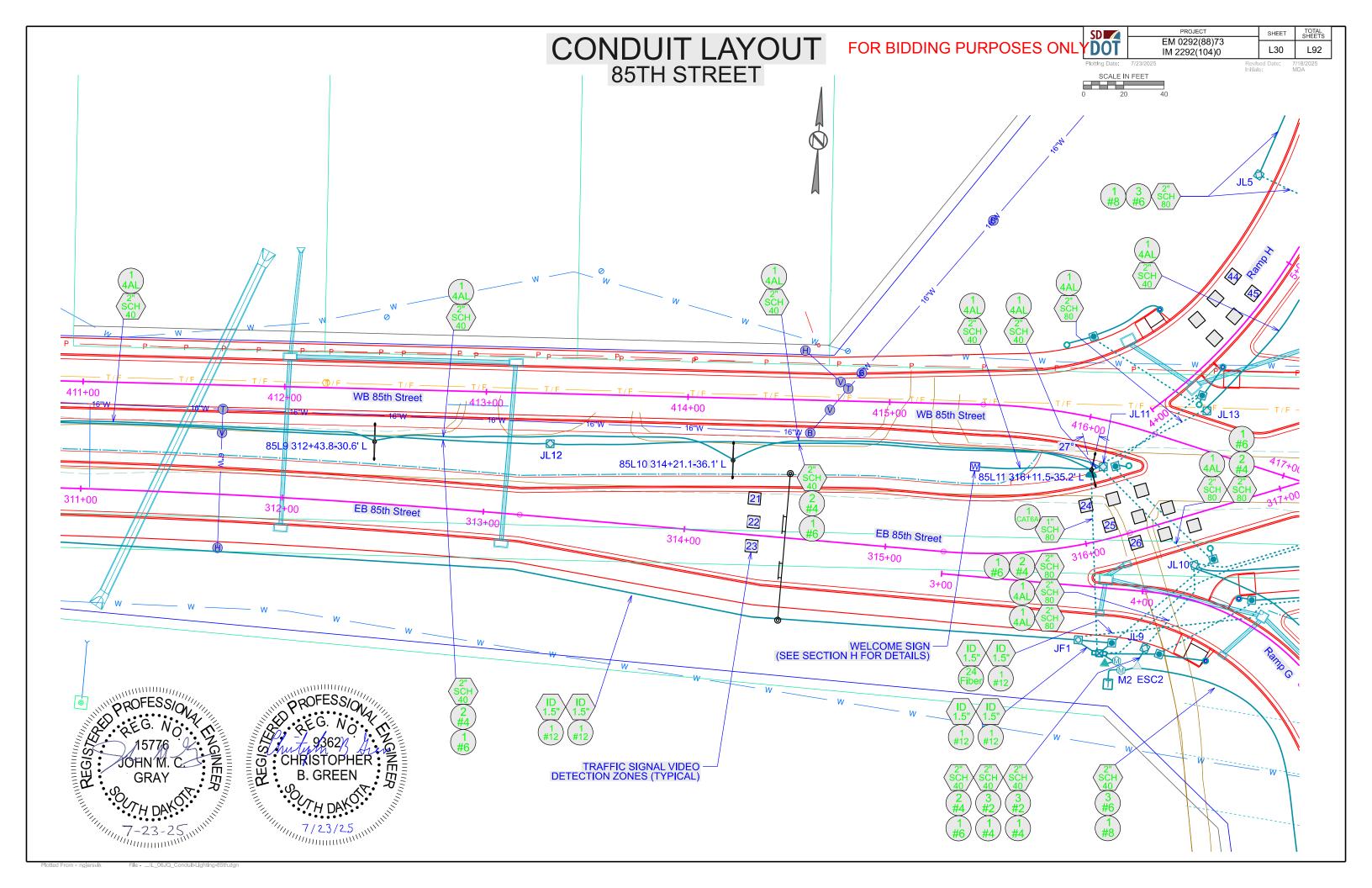
L27

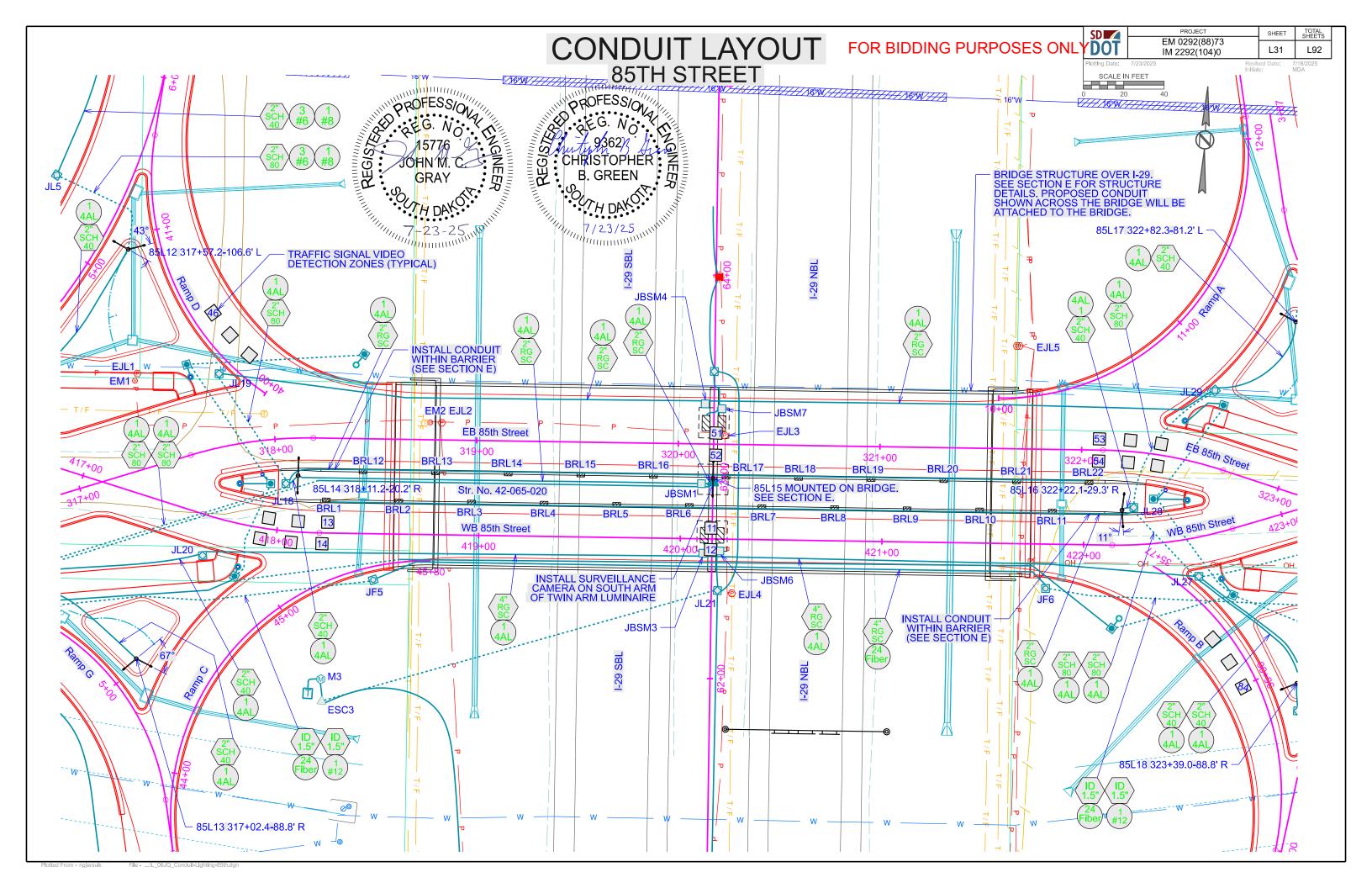
TOTAL SHEETS

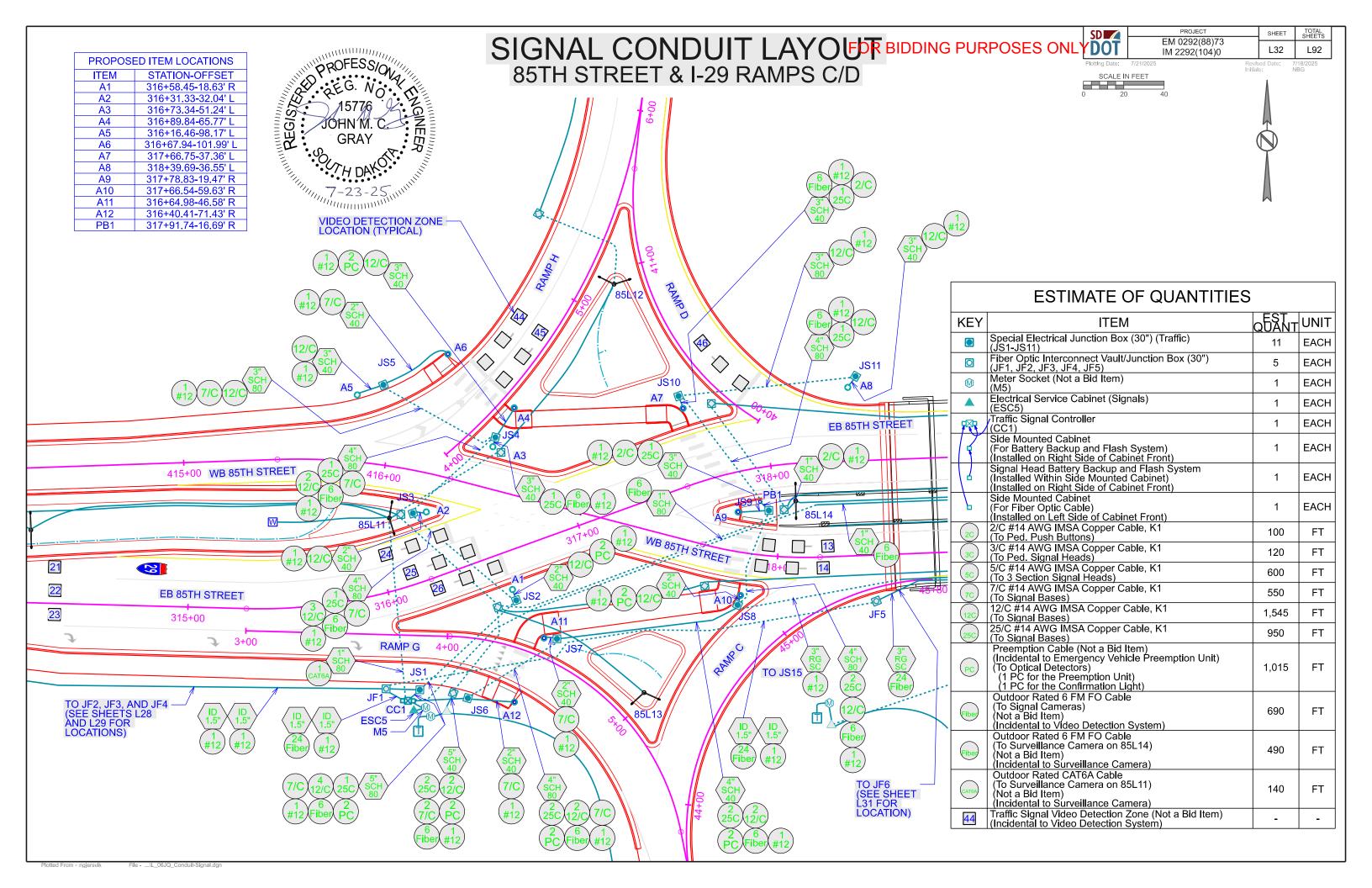


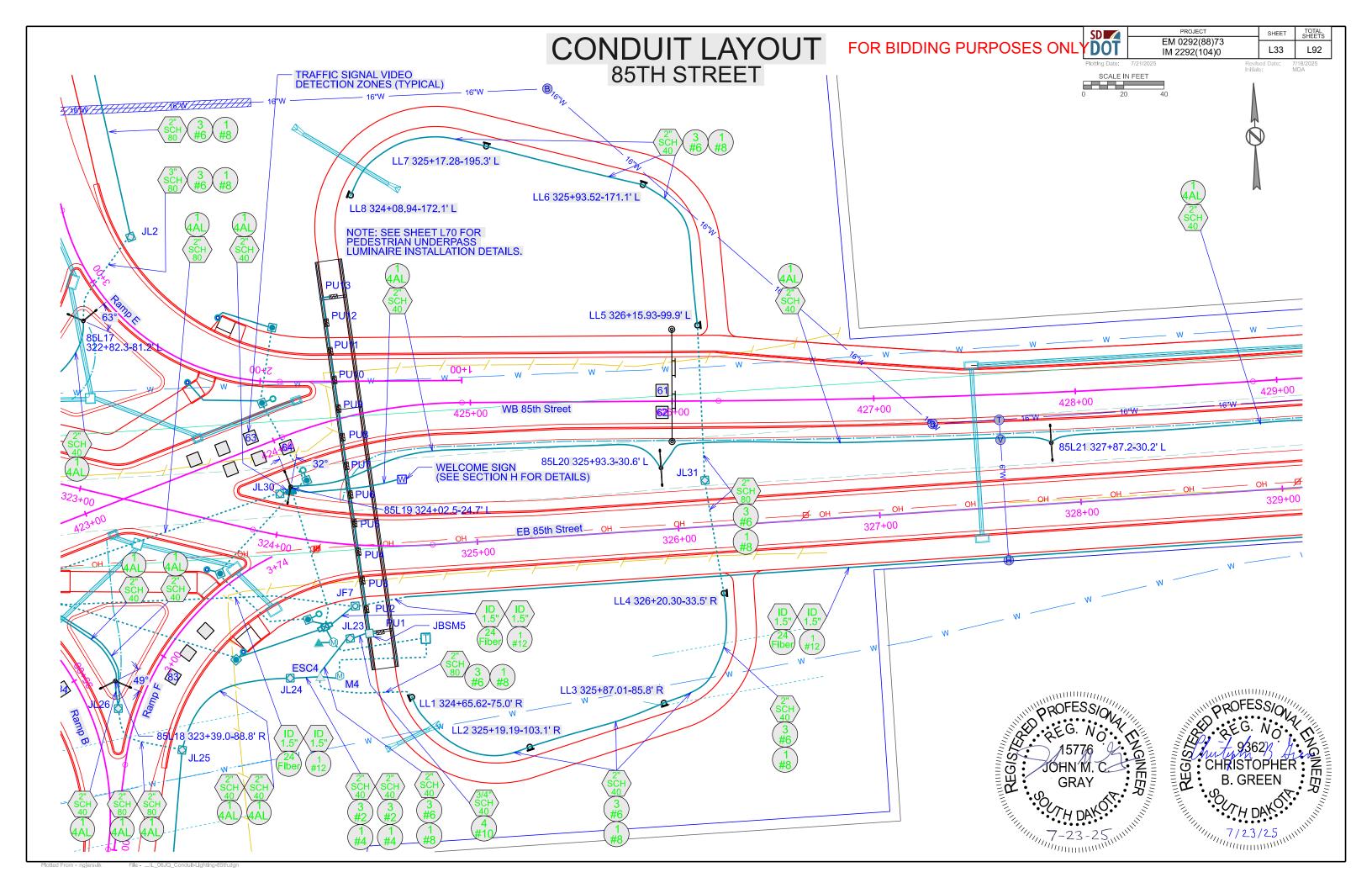
					ESTIMATE OF LIGHTIN	IG QU	JANT	ITIES	6 - PCN 06JQ						
KEY	ITEM	EST QUANT	UNIT	KEY	ITEM	EST QUANT	UNIT	KEY	ITEM	QUAN	TUNIT	KEY	ITEM	QUANT	UNIT
00	Remove Meter Service (EM1-EM2) (Not a Bid Item)	2	EACH	•	Roadway Luminaire, LED with Photoelectric Cell (85L1-85L28, AL1-AL5, BL1-BL5, CL1-CL5,	91	EACH		Locator Ball	3	EACH	#2	1/C #2 AWG Copper Wire	3,975	FT
	Salvage Electrical Junction Box (EJL1) (Not a Bid Item)	1	EACH	<u> </u>	DL1-DL15, RDCL1-RDCL5) Under Bridge Deck Luminaire, LED	Δ	EACH		Circuit Control Center	3	EACH	#4	1/C #4 AWG Copper Wire	5,390	FT
+	Remove and Reset Luminaire Pole (EL555, EL556)	2	EACH	<u> </u>	(UBL1-UBL4) Tunnel Luminaire, LED	- 13	EACH	RG SC	3/4" Rigid Galvanized Steel Conduit	300	FT	#6	1/C #6 AWG Copper Wire	29,255	FT
•	Breakaway Base Luminaire Pole w/8' Arm 40' Mounting Height (AL1-AL5, BL1-BL5, CL1-CL5, DL1-DL4, DL6-DL15, RDCL1-RDCL5)	34	EACH		(PU1-PU13) Decorative Luminaire, LED	22	EACH	RG SC	1" Rigid Galvanized Steel Conduit	40	FT	#8	1/C #8 AWG Copper Wire	10,790	FT
	Breakaway Base Luminaire Pole w/ Twin 8' Arms	27	EACH		(BRL1-BRL22) 2' Diameter Footing			SCH 40	3/4" Rigid Conduit, Schedule 40	15	FT	(# ₁₀)	1/C #10 AWG Copper Wire	1,920	FT
	40' Mounting Height (85L1-85L14, 85L16-85L28) Fixed Base Luminaire Pole w/ 8' Arm	1	EACH	0	(85L1-85L14, 85L16-85L28, AL1-AL5, BL1-BL5, CL1-CL5, DL1-DL4, DL6-DL15, RDCL1-RDCL5, EL555, EL556, LL1-LL8)	474.0	FT	SCH 40	2" Rigid Conduit, Schedule 40	14,100	FT	(# ₁₂)	1/C #12 AWG Copper Wire (Tracer)	270	FT
• •	40' Mounting Height (DL5) Fixed Base Luminaire Pole w/ Twin 8' Arms	1	EACH	_	Decorative Luminaire, LED with Photoelectric Cell	8	EACH	SCH 80	2" Rigid Conduit, Schedule 80	3,120	FT	(4AL)	2/2/2/4 Aluminum Wire	8,780	FT
٥	40' Mounting Height (85L15) Decorative Luminaire Pole (LL1-LL8)	8	EACH		(LL1-LL8) Special Electrical Junction Box (Lighting) (JL1-JL38)	38	EACH	\(\begin{align*} 1.5"\end{align*}	1.5" Innerduct, SDR 13.5	7,420	FT	Pole	12/2 UF-B Copper Pole and Bracket Cable	5,405	FT
M	Meter Socket (Not a Bid Item)	7	EACH		Surface Mounted Junction Box (JBSM1-JBSM7)	7	EACH								
	Electrical Service Cabinet (ESC1-ESC7)	7	EACH	0	Special Electrical Junction Box (Innerduct) (JF1-JF10)	10	EACH								



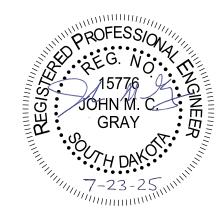






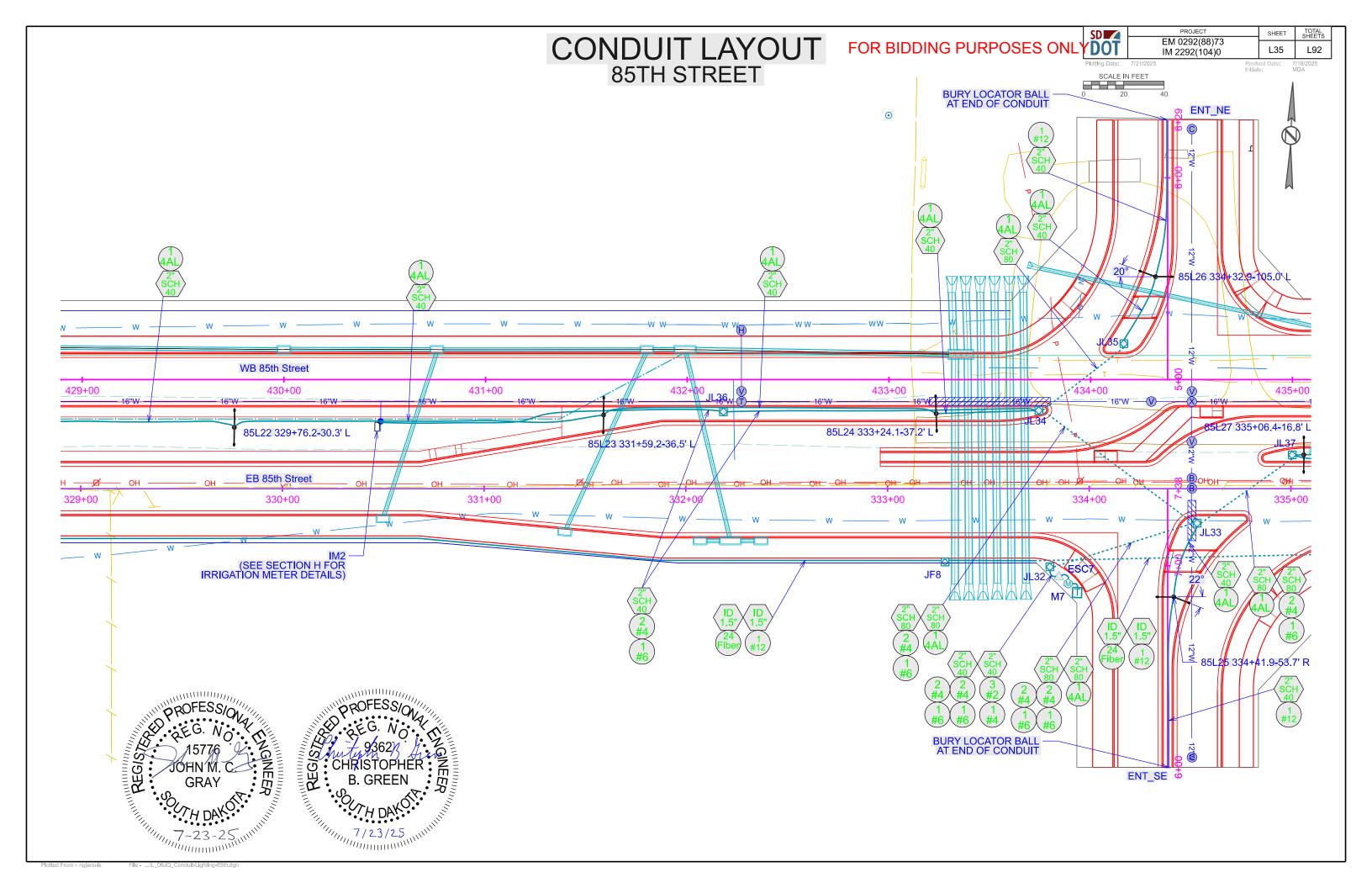


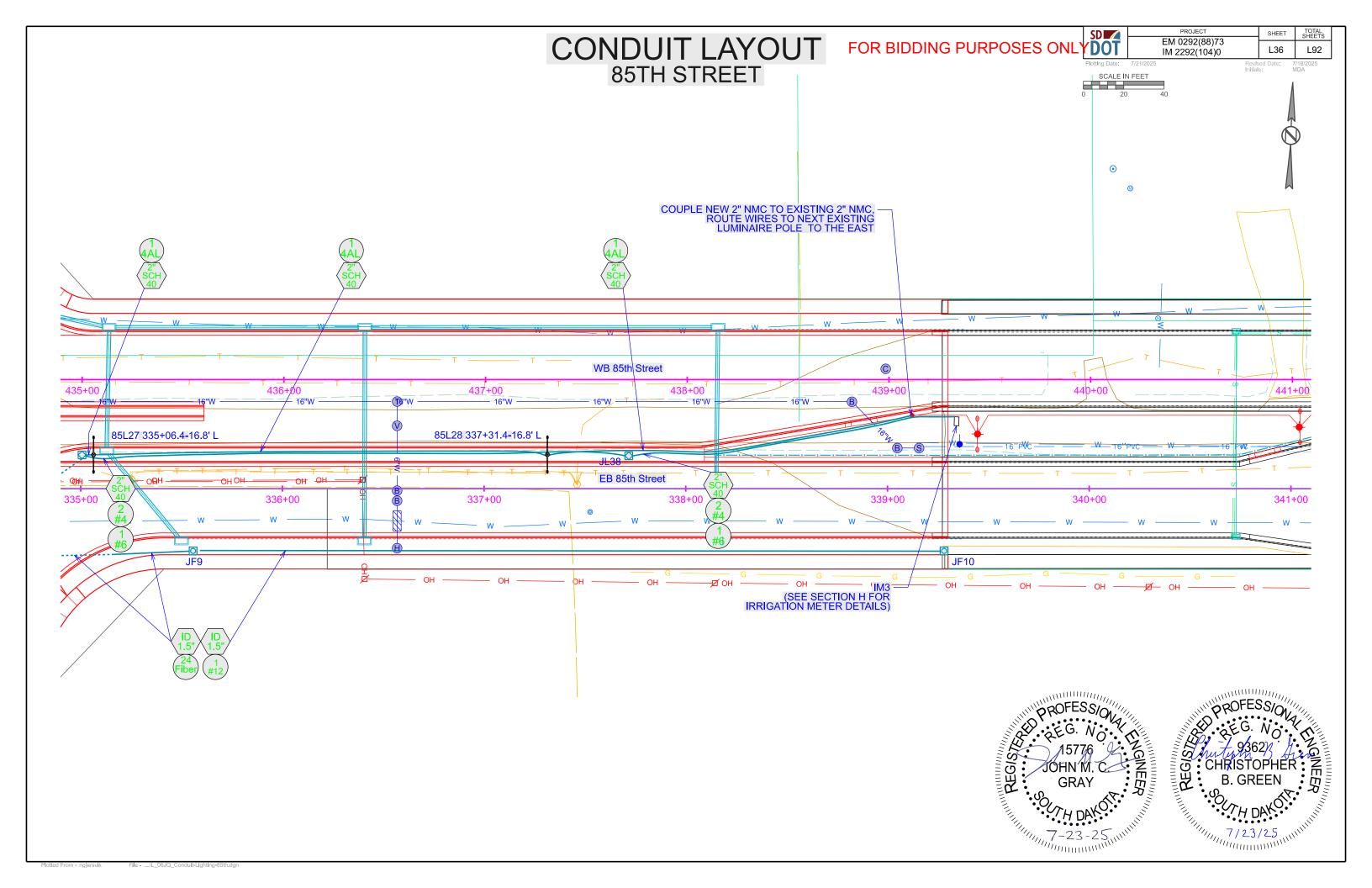
PROPOSI	ED ITEM LOCATIONS
ITEM	STATION-OFFSET
B1	323+95.88-60.14' R
B2	322+87.37-51.26' R
B3	322+26.40-82.94' R
B4	322+57.66-19.20' R
B5	322+47.76-18.92' L
B6	323+82.70-65.35' L
B7	323+39.60-63.48' L
B8	323+46.81-98.16' L
B9	324+07.62-33.81' L
B10	323+70.45-24.54' R
B11	324+25.25-35.67' R
PB2	322+44.94-16.70' R

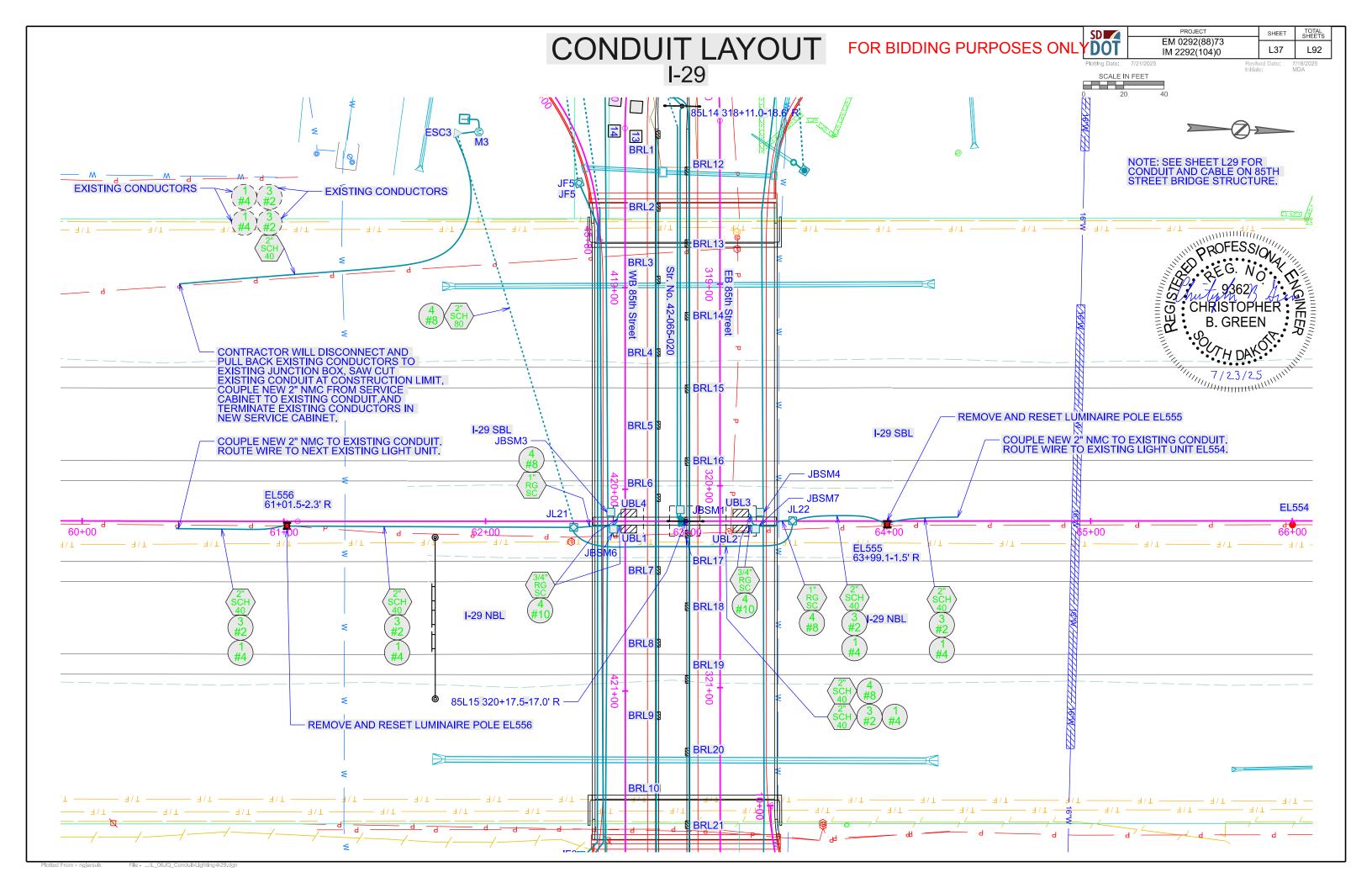


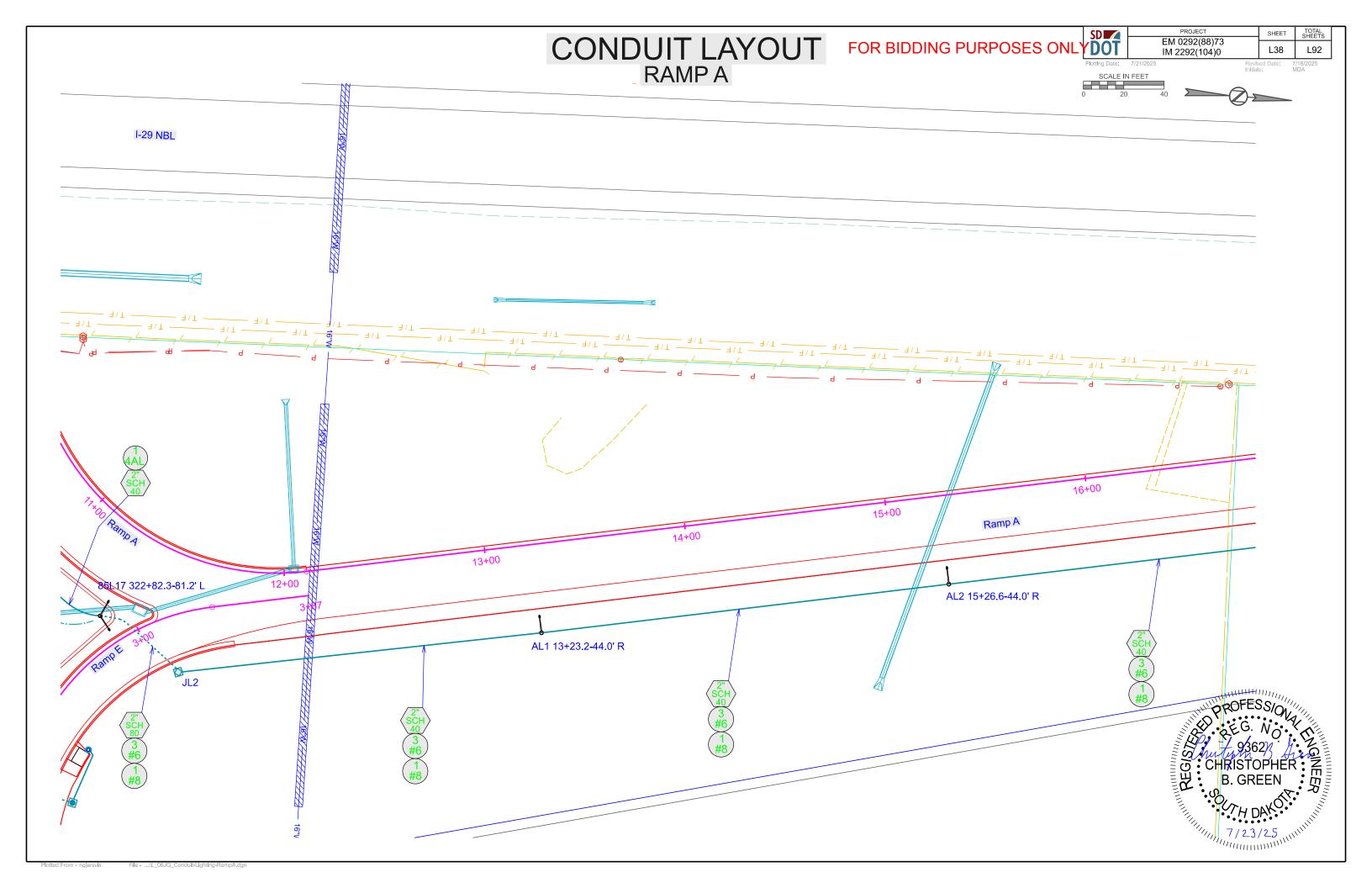
	SIGNAL COND 85TH STREET & I-	UIT LAYOUT BI 29 RAMPS A/B	DDING PURPOSES (Plotting Date: 7/21/2025 SCALE IN FEET 0 20 44		SHEET TOTAL SHEETS L34 L92 and Date: 7/18/2025 NBG
			1 #12	0 20 40		
(12/C) (1	1 2 12/C 3" 12 PC 12/C 3" SCH 40 2 PC 3"	5K17	7/C 2" SCH 40 3" SCH 80 3" SCH 40	7/C #12 112/C PC #12	3" 12/C 2 2 SCH 80 PC	1
0+00	B5	1" 2/C #12 BI 40 JS17 SCH 40 JS17	SCH 40	00+1 2/C #12 425+00 WB	3 85TH STREET	61 625+00
EB 85TH STRE	322+054 - 7	2 2 7/C 12/C 4" 1 2 SCH 80 423+00 #12 PC	35L19 B9 W	1" SCH 80 1 CAT6A 2 2 4 1 1 12/C 7/C PC CAT6A #1	2)	85L20
	ET 422+00 B2 JF6	1 (25C) (2/C) #12) B10 JS20	3-14 3" SCH 40 12/C #12 JF7 CC2		85TH STREET	326+00
TO JS9 TO JS9 TO JS9 TO JS9 TO JS5 SC TH12 TO JF5 (SEE SH LOCATIO	1.5" JS14 #12 3" SCH 12/C 40 12/C 12/C 40 40 40 40 40 40 40 40 40 4	85L18 83 JS12 85CH 83 JS12 4" SCH 80 40 2 25C 25C 2 12/C PC 2 1 CAT6A 1 1 2 412 1 412		ID 1.5" 1.5" 24 1 Fiber #12	ID ID 1.5" 1.5" 1.5" 1.5" 1.5" 1.5" 1.5" 1.5"	D JF10 35 AND TIONS)

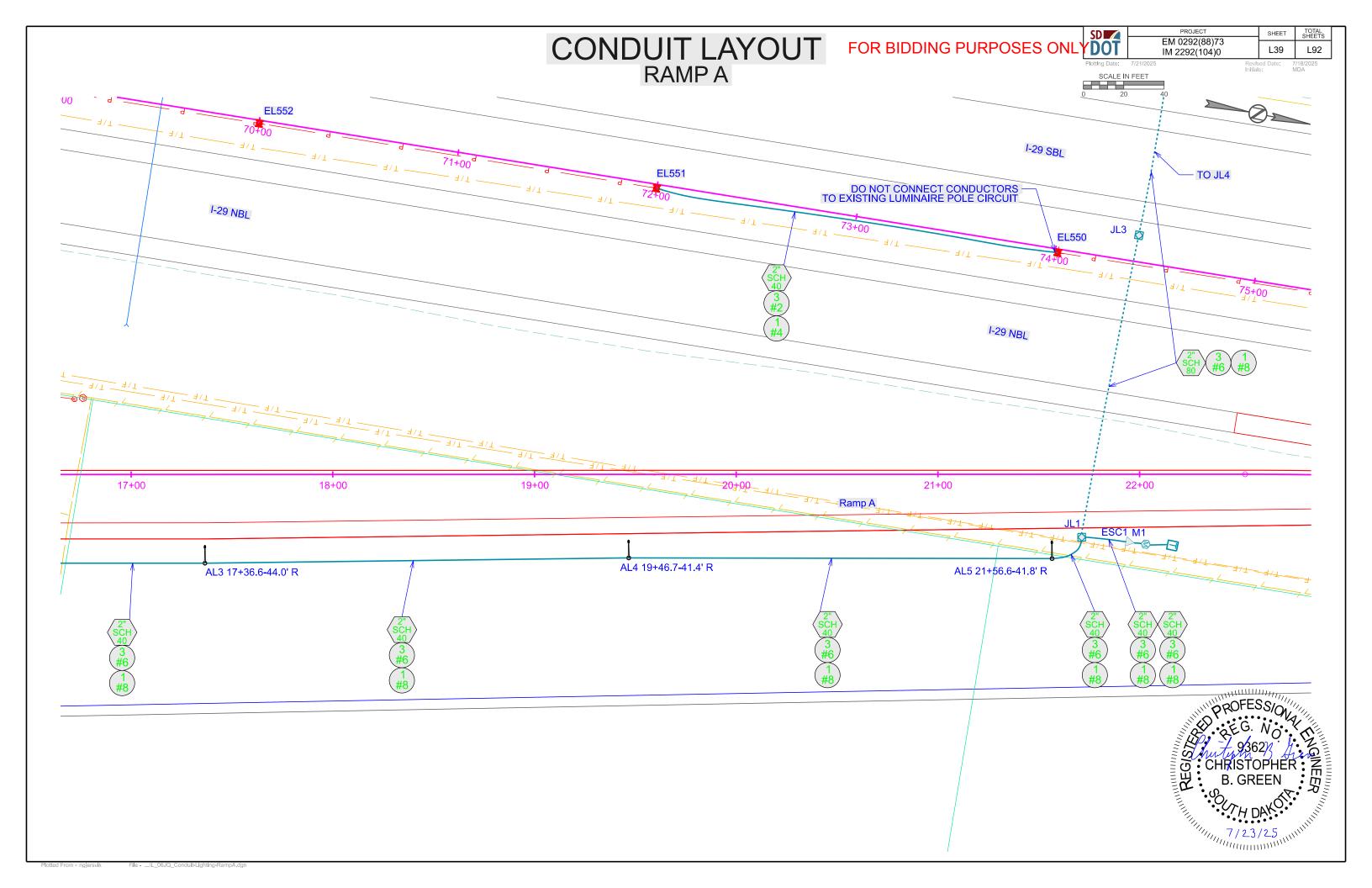
	ESTIMATE OF QUANTITIE	ES	
KEY	ITEM	QUANT	UNIT
	Special Electrical Junction Box (30") (Traffic) (JS12-JS21)	10	EACH
0	Fiber Optic Interconnect Vault/Junction Box (30") (JF6, JF7, JF8, JF9, JF10)	5	EACH
M	Meter Socket (Not a Bid Item) (M6)	1	EACH
	Electrical Service Cabinet (Signals) (ESC6)	1	EACH
7 83	/Traffic Signal Controller (CC2)	1	EACH
	Side Mounted Cabinet (For Battery Backup and Flash System) (Installed on Right Side of Cabinet Front)	1	EACH
7	Signal Head Battery Backup and Flash System (Installed Within Side Mounted Cabinet) (Installed on Right Side of Cabinet Front)	1	EAC
7	Side Mounted Cabinet (For Fiber Optic Cable) (Installed on Left Side of Cabinet Front)	1	EAC
2C	2/C #14 AWG IMSA Copper Cable, K1 (To Ped. Push Buttons)	95	FT
3C	3/C #14 AWG IMSA Copper Cable, K1 (To Ped. Signal Heads)	120	FT
5C	5/C #14 AWG IMSA Copper Cable, K1 (To 3 Section Signal Heads)	515	FT
7C	7/C #14 AWG IMSA Copper Cable, K1 (To Signal Bases)	520	FT
12C	12/C #14 AWG IMSA Copper Cable, K1 (To Signal Bases)	1,045	FT
25C	25/C #14 AWG IMSA Copper Cable, K1 (To Signal Bases)	560	FT
PC	Preemption Cable (Not a Bid Item) (Incidental to Emergency Vehicle Preemption Unit) (To Optical Detectors) (1 PC for the Preemption Unit) (1 PC for the Confirmation Light)	1,360	FT
CAT6A	Outdoor Rated CAT6a Cable (To Signal Cameras) (Not a Bid Item) (Incidental to Video Detection System)	350	FT
CAT6A	Outdoor Rated CAT6A Cable (To Surveillance Camera on 85L19) (Not a Bid Item) (Incidental to Surveillance Camera)	125	FT
44	Traffic Signal Video Detection Zone (Not a Bid Item) (Incidental to Video Detection System)	-	-

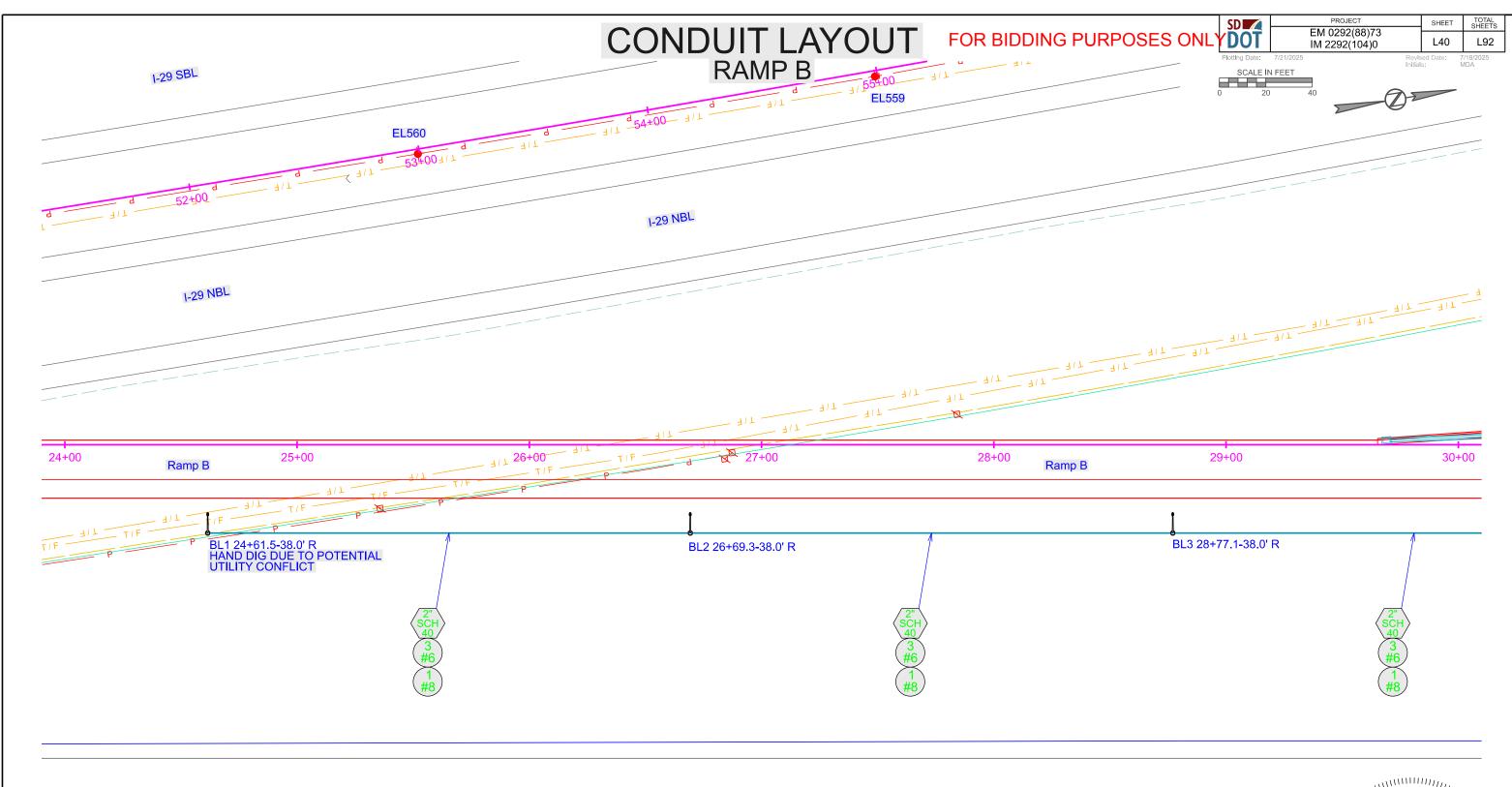




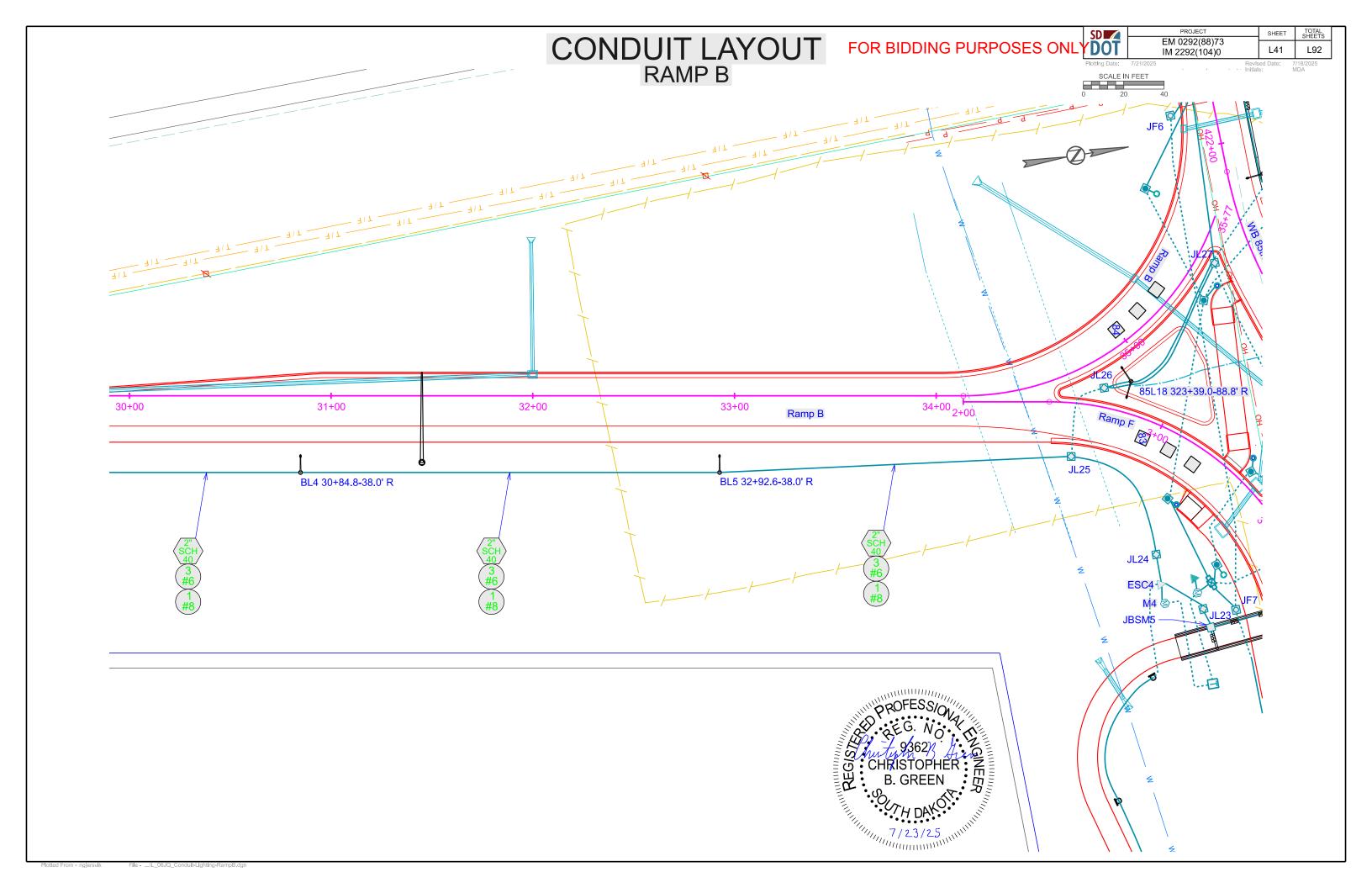


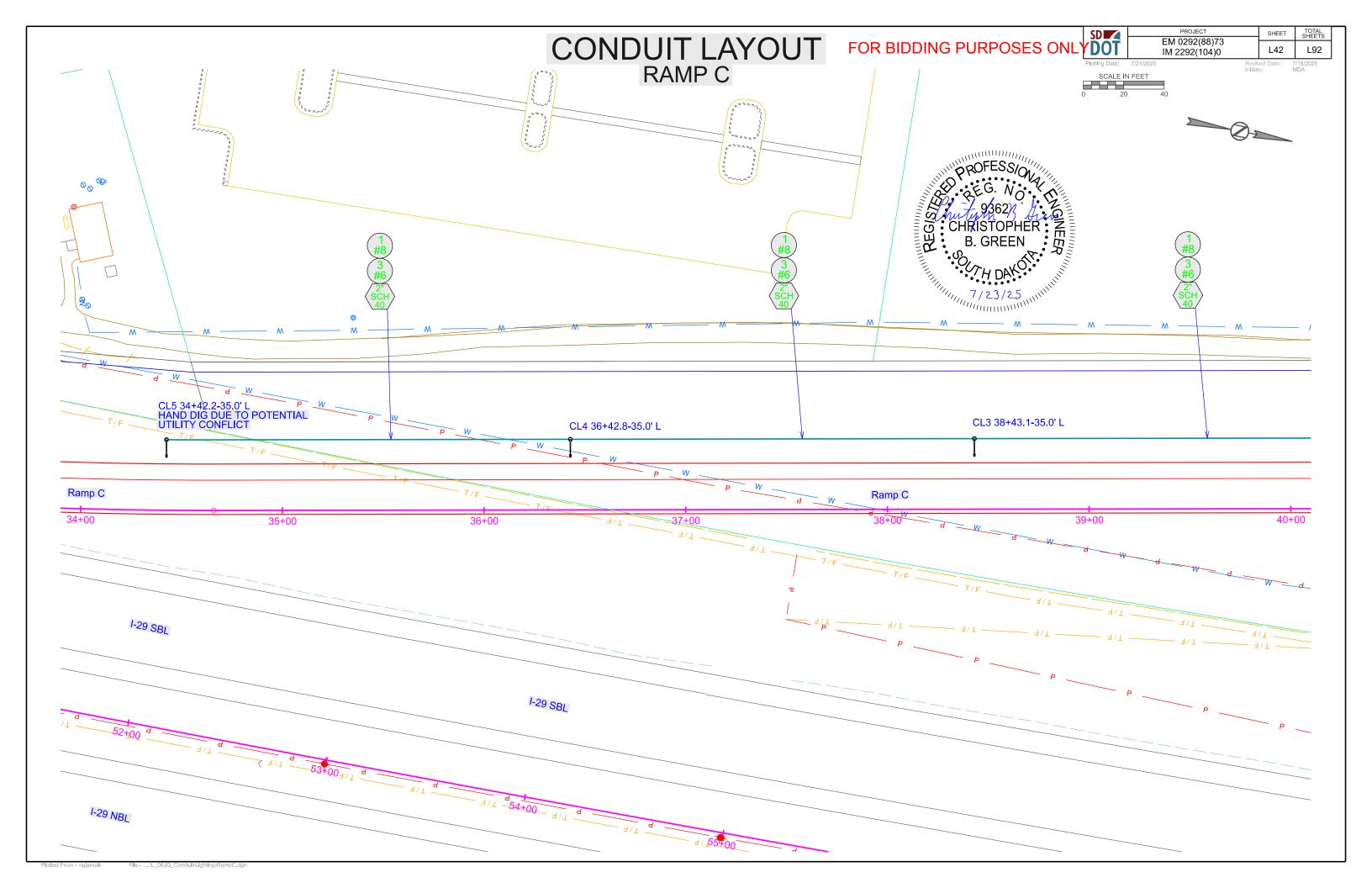


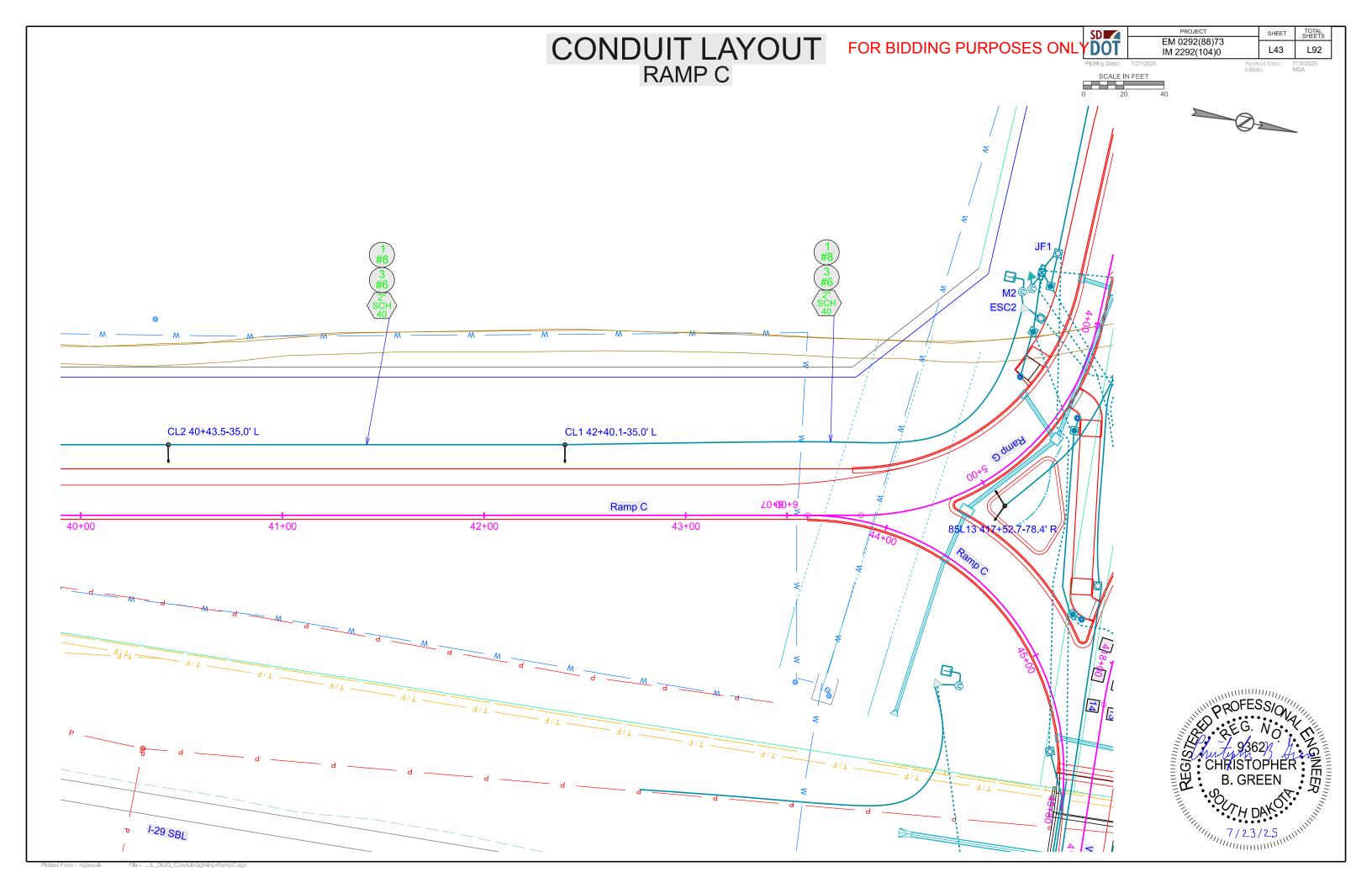


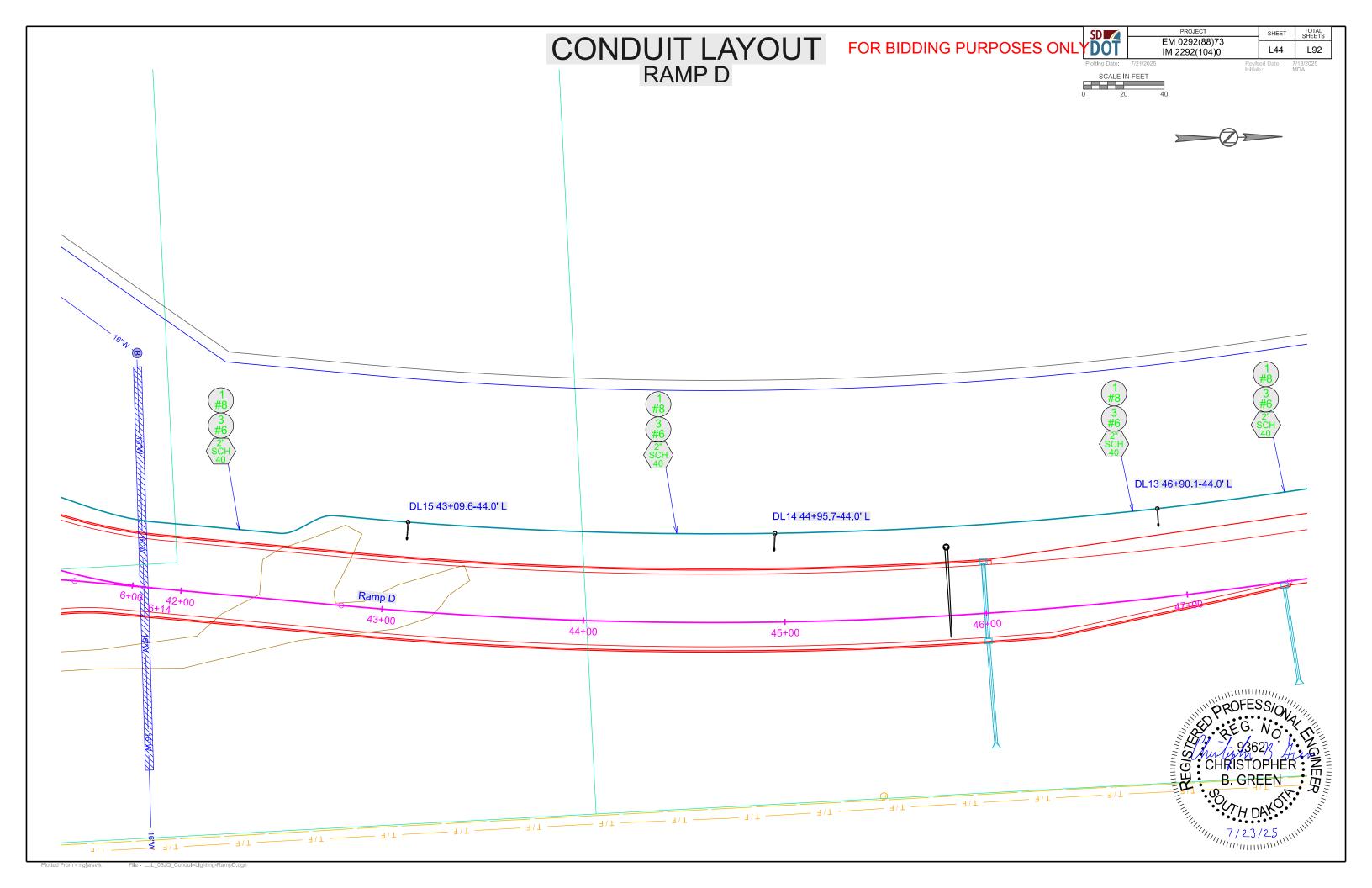


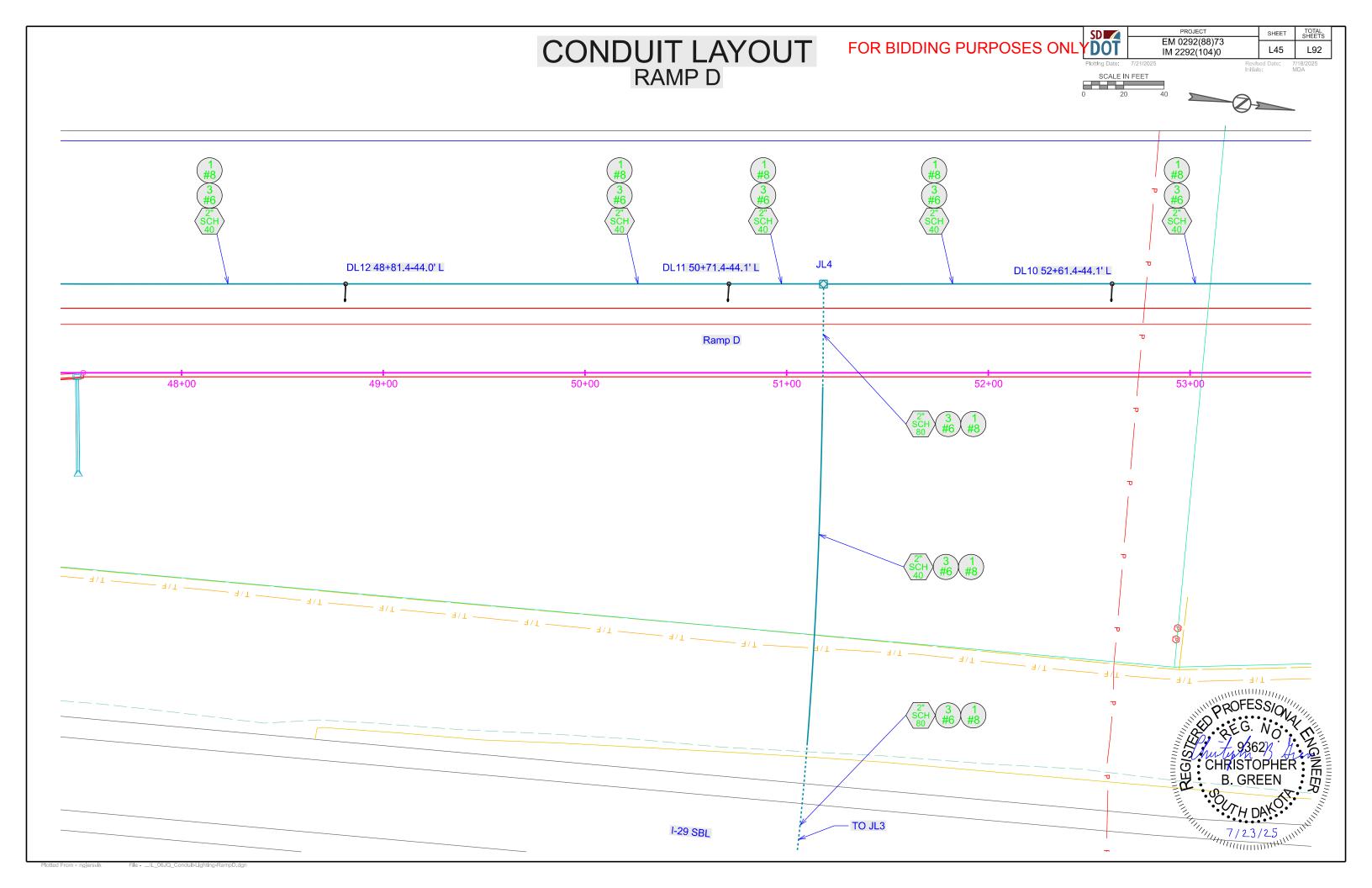


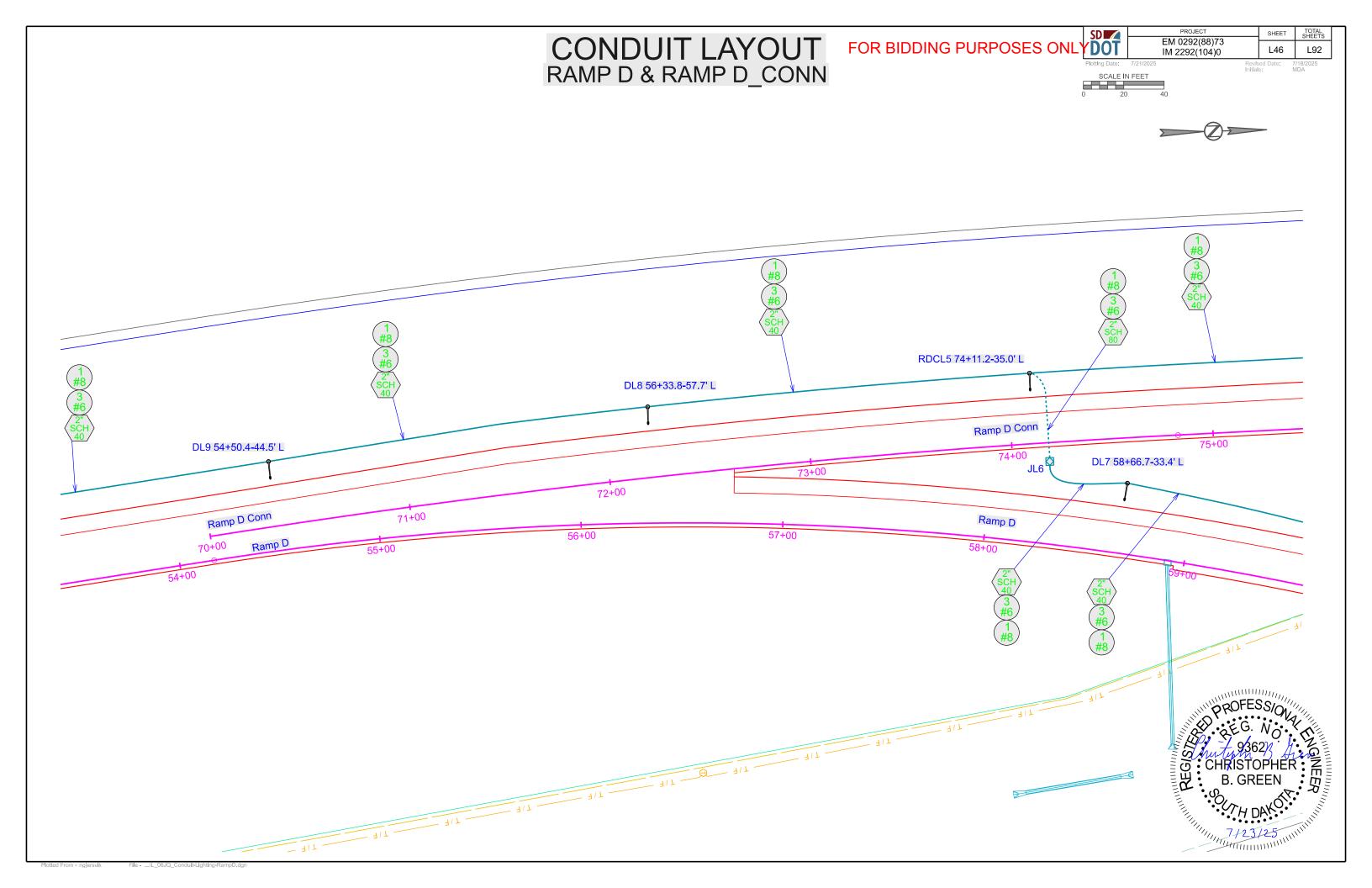


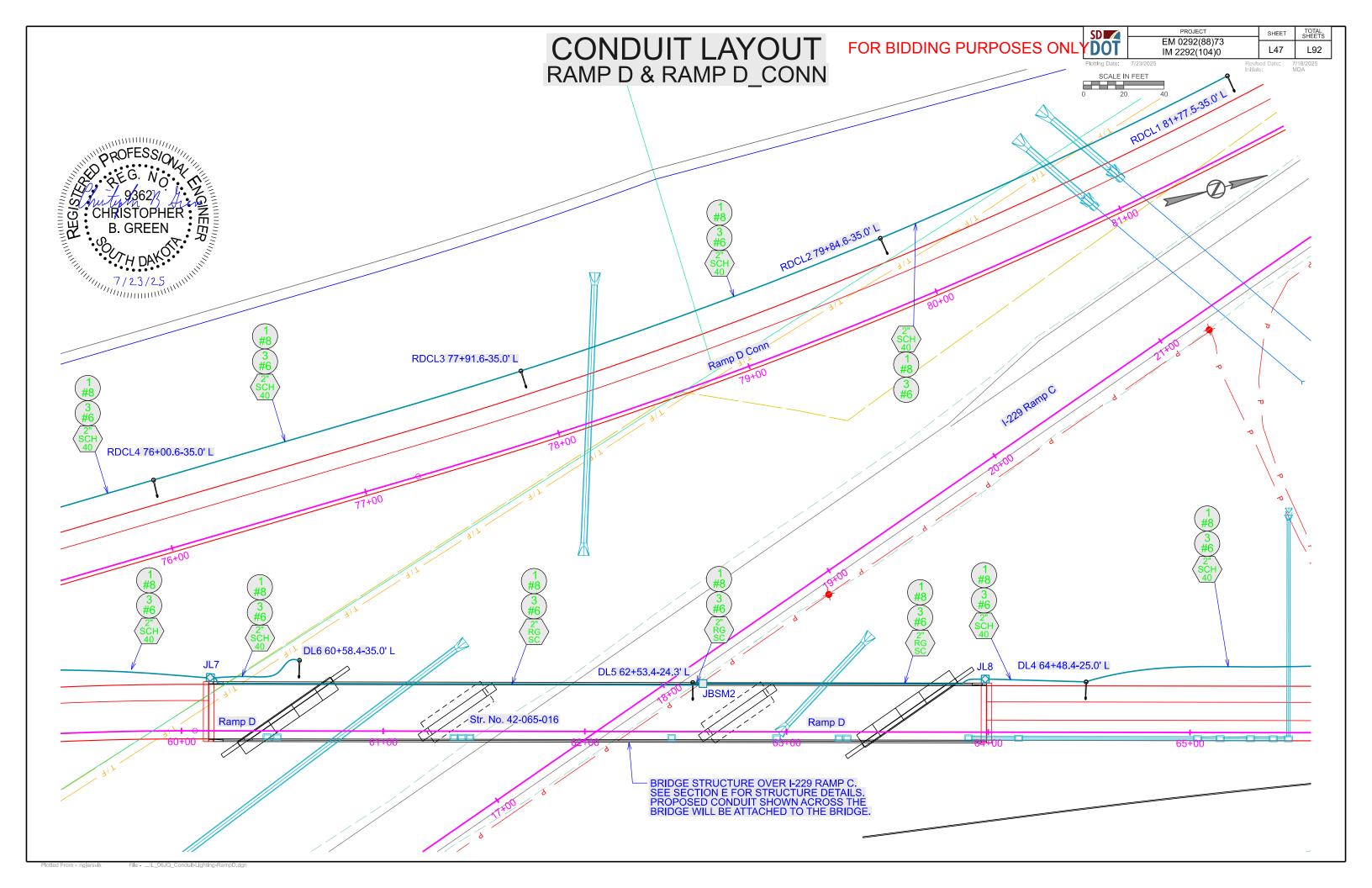


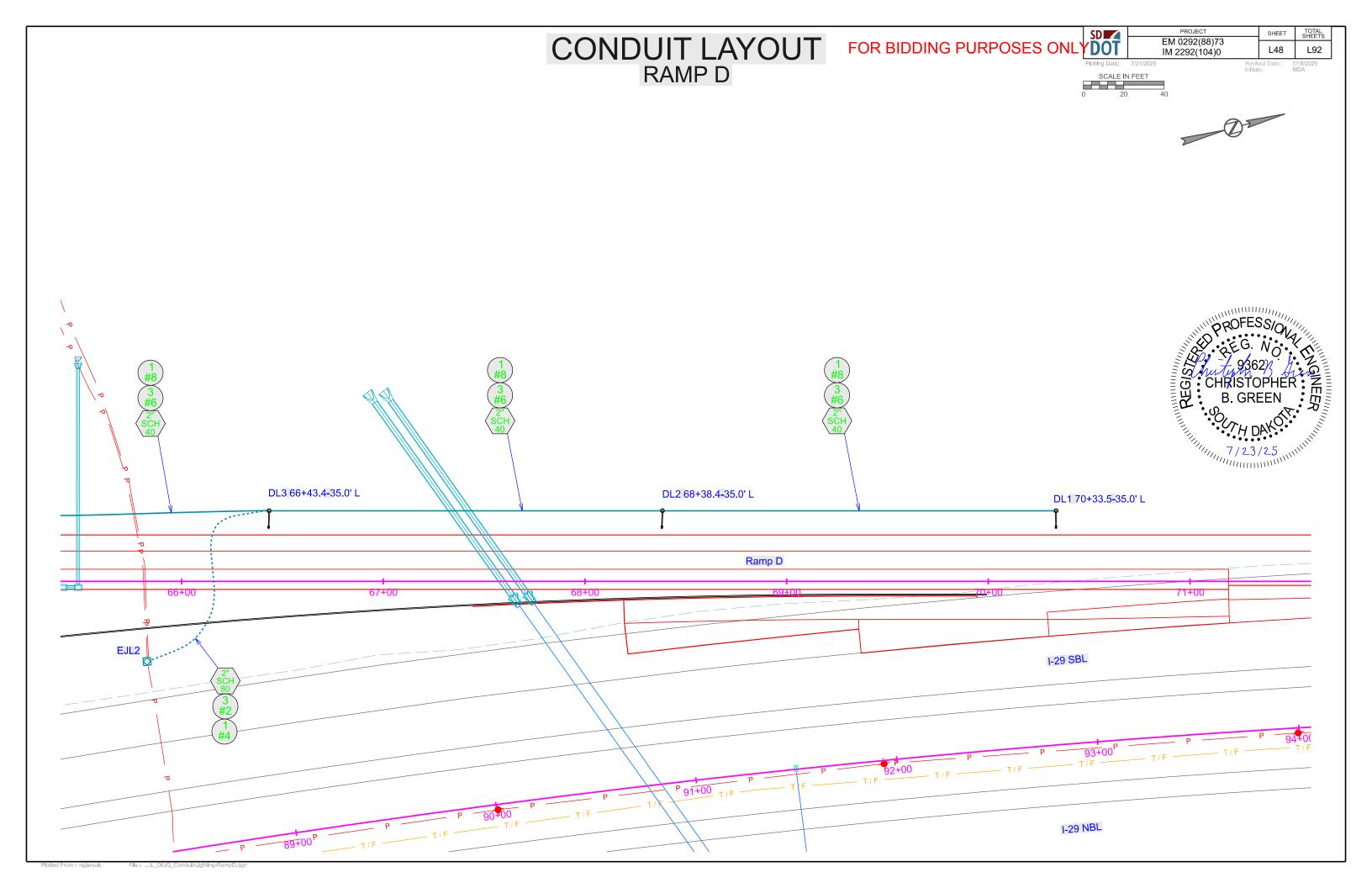


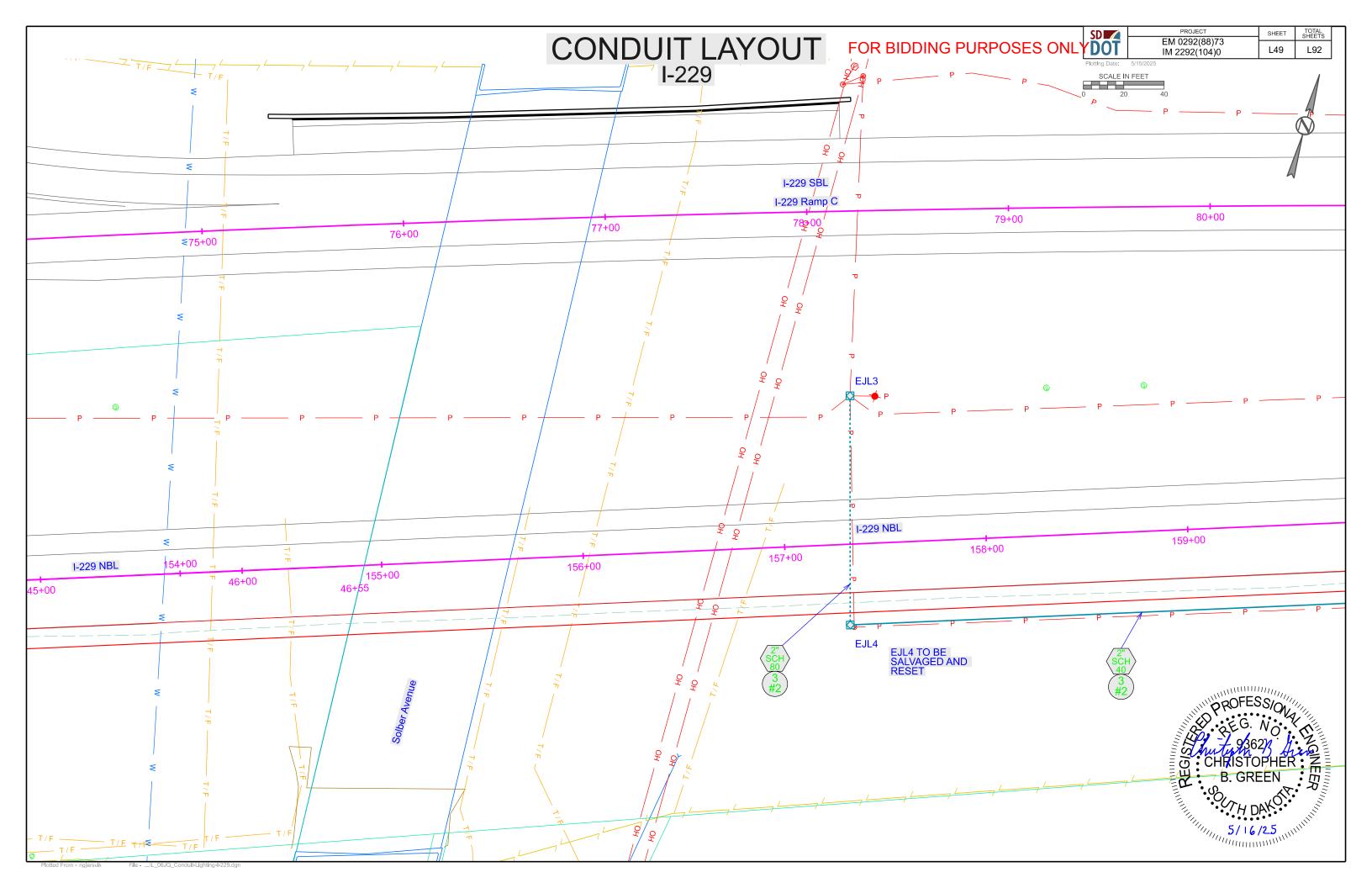


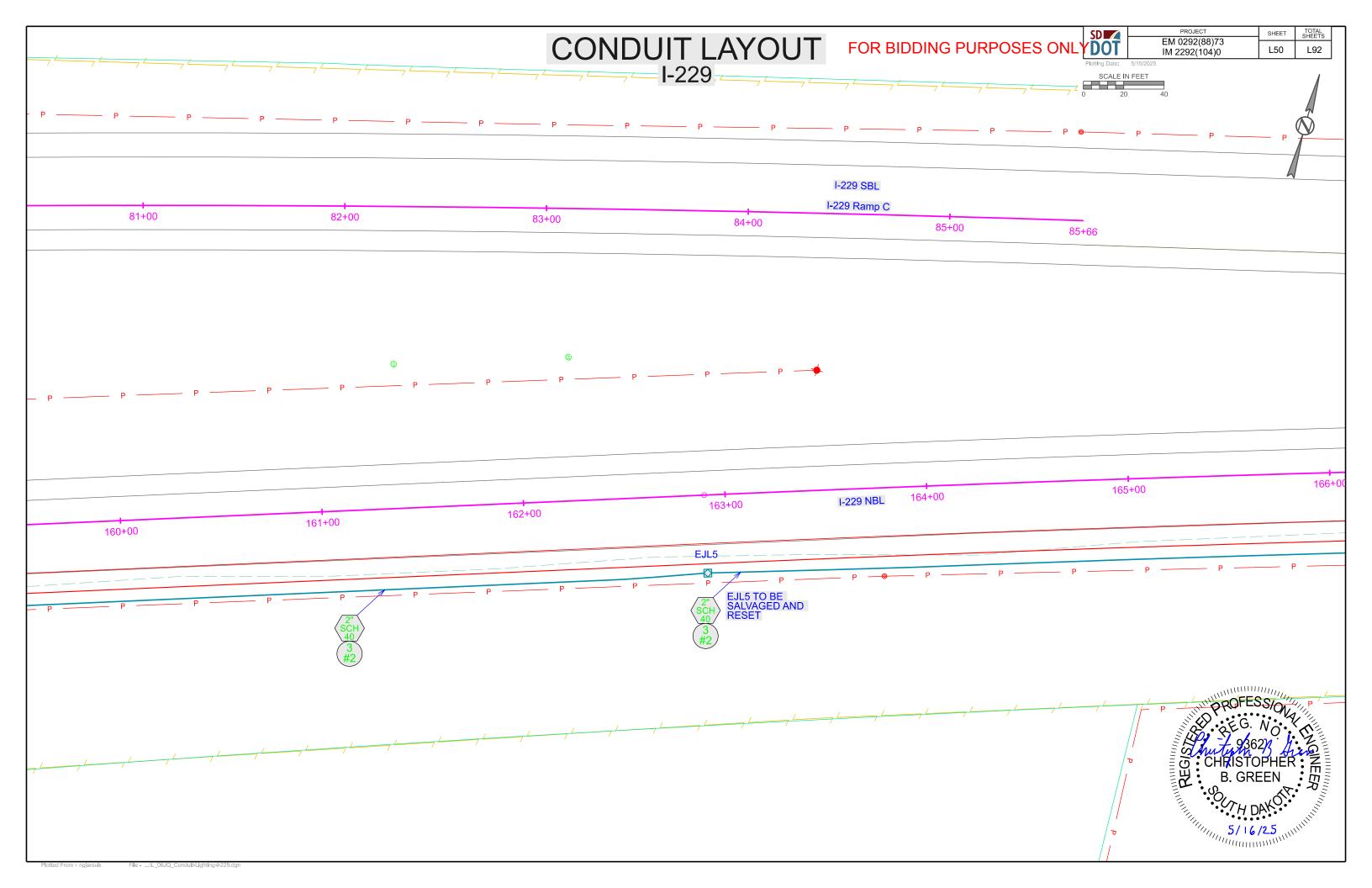


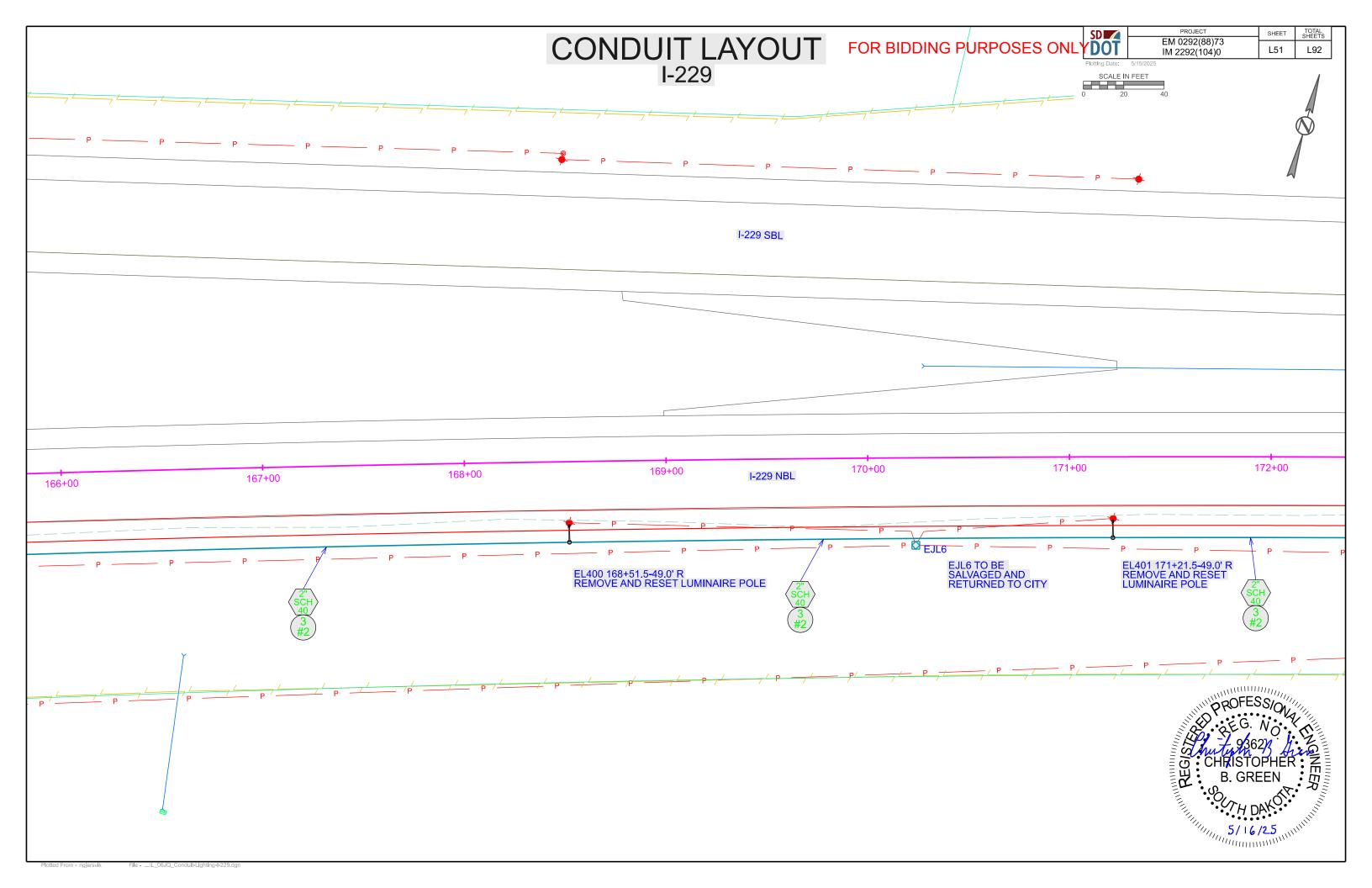


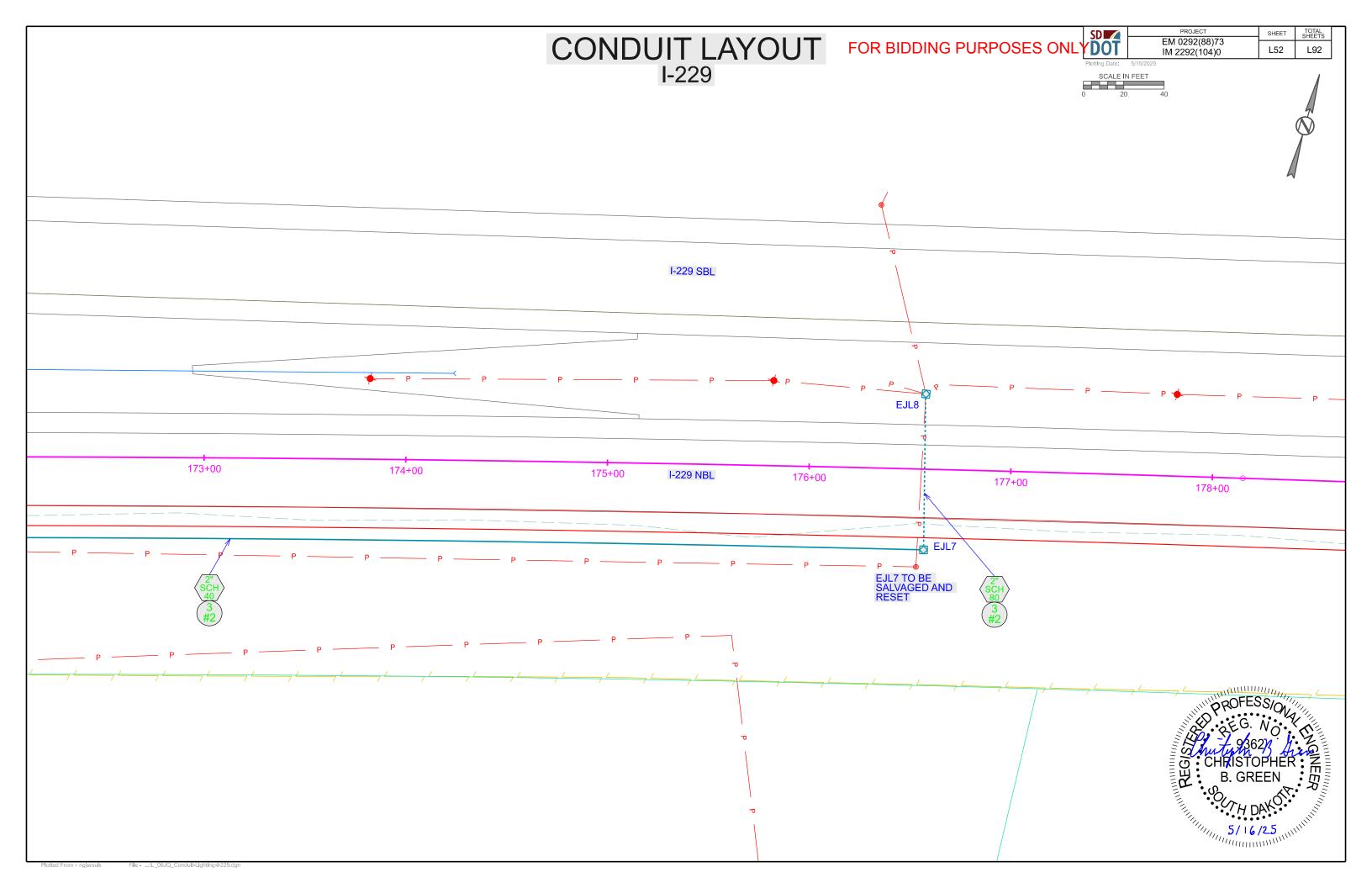












FOR BIDDING PURPOSES ONLY DOT

PROJECT EM 0292(88)73 IM 2292(104)0

TOTAL SHEETS L53 L92

SIGNAL TIMING 85TH STREET & I-29 RAMPS

	BASIC INTERVALS							
Phase	1	2	3	4	5	6	7	8
Movement	WB	EB		SB	EB	WB		NB
Lag								
Min Green	15	15		15	15	15		15
Extension								
Max 1	45	45		45	45	45		45
Max 2								
Time Before								
Time to Reduce								
Minimum Gap								
Yellow	3.5	3.5		3.5	3.5	3.5		3.5
All Red	2	2		2	2	2		2
Walk	7	7			7	7		
Ped Clearance	16	13			13	13		
Recall	MIN	MIN			MIN	MIN		
Prog Flash Display	R	R		R	R	R		R
Start Up Ø	Χ				Х			

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

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

SIGNAL SYSTEM OPERATIONS

- Any phase on Ring 1 may run concurrently with any phase on Ring 2.
 Phase 1 and 2 may be reversed. Phase 5 and 6 may be reversed.
 Phases 4 or 8 (or both) may be
- omitted

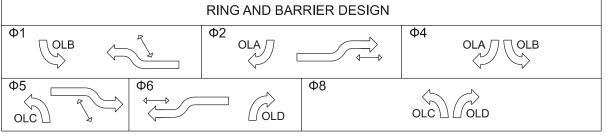
TIMING PLAN 1					
Time of Day (TOD)	Pattern (C/S/O)				
00:00 - 23:59	Free				

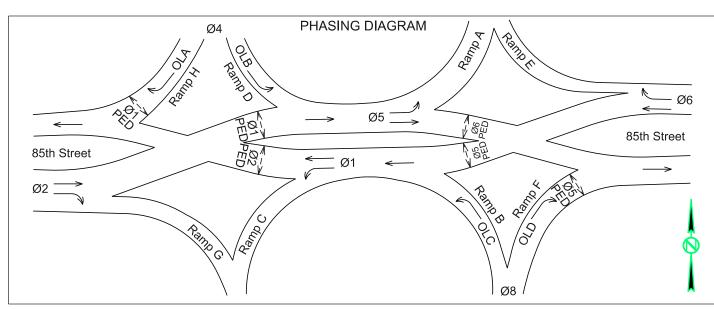
OVERLAP DEFINITIONS
OLA = 2 + 4
OLB = 1 + 4
OLC = 5 + 8
OLD = 6 + 8



RING 1

RING 2





	DETECTOR TABLE															
					Phas	e Called	d (Call/0	Call Loc	king/E	xtend)				Controlle	Controller Settings	
Local Detector	Controller Detector #	1	2	3	4	5	6	7	8	9	10	11	12	Extend	Delay	
11-12	1	Е												5		
13-14	2	C/E												2		
21-23	3		Е											5		
24-26	4		C/E											2		
41-42	5				Е									5		
43	6				Е									5		
44-45	7				C/E									2		
46	8				C/E									2		
51-52	9					Е								5		
53-54	10					C/E								2		
61-62	11						Е							5		
63-64	12						C/E							2		
81	13								Е					5		
82	14								Е					5		
83	15								C/E					2		
84	16								C/E					2		

TRAFFIC SIGNAL WIRING DIAGRAM PURPOSES ONLY BOTTON

PROJECT EM 0292(88)73 IM 2292(104)0

L54

85TH STREET & I-29 RAMPS C/D

POLE: A1 CABLE SIZE:

POLE: A3 CABLE SIZE: 25/C

POLE: A4 CABLE SIZE: 12/C

POLE: A6

CABLE SIZE:

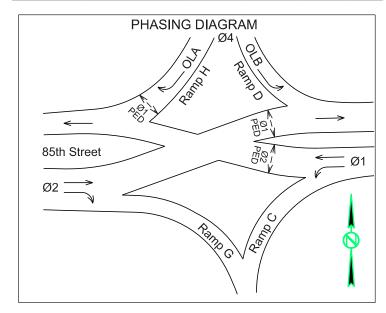
7/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
N	Black	BK	N	1	2
2R	Red	R	R	1	2
2G	Blue	BL	G	1	2
2Y	Orange	О	Y	1	2
	Yellow				
	Brown				
	Red/Black				
	Blue/Black				
	Orange/Black				
	Yellow/Black				
	Brown/Black				
	Black/Red				
DOL 5:				4010	

POLE:	A2	CABLE SIZE:	12/C

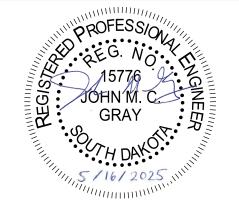
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
N	Black	BK	N	2	2
2R	Red	R	R	2	2
2G	Blue	BL	G	2	2
2Y	Orange	О	Y	2	2
	Yellow				
	Brown				
	Red/Black				
	Blue/Black				
	Orange/Black				
	Yellow/Black				
	Brown/Black				
	Black/Red				

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
N	Black	BK	N	9	1
1R	Red	R	R	9	1
1G	Blue	BL	G	9	1
1Y	Orange	О	Y	9	1
	Yellow				
	Brown				
1R	Red/Black	R	R	10	1
1G	Blue/Black	BL	G	10	1
1Y	Orange/Black	О	Y	10	1
N	Yellow/Black	BK	N	10	1
	Brown/Black				
N	Black/Red	N	N	11	1
1G	Blue/Red	BL	G	11	1
1Y	Orange/Red	О	Y	11	1
1R	Yellow/Red	R	R	11	1
	Brown/Red				
	Black/Blue				
	Red/Blue				
	Orange/Blue				
	Yellow/Blue				
	Brown/Blue				
	Black/Orange				
	Red/Orange				
	Blue/Orange				
	Yellow/Orange				



CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	15	4
4R	Red	R	R	15	4
4G	Blue	BL	G	15	4
4Y	Orange	О	Y	15	4
	Yellow				
	Brown				
9R	Red/Black	R	DW	20	1P
9G	Blue/Black	BL	W	20	1P
	Orange/Black				
N	Yellow/Black	BK	N	20	1P
13R	Brown/Black	R	PB	PB	1P
N	Black/Red	BK	N	PB	1P
POLE:	A5	CABLE S	IZE:	12/C	

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
N	Black	BK	N	12	4
4R	Red	R	R	12	4
4G	Blue	BL	G	12	4
4Y	Orange	О	Y	12	4
4Y	Yellow	О	Y	13	4
N	Brown	BK	N	13	4
4R	Red/Black	R	R	13	4
4G	Blue/Black	BL	G	13	4
4Y	Orange/Black	О	Y	14	4
N	Yellow/Black	BK	N	14	4
4G	Brown/Black	BL	G	14	4
4R	Black/Red	R	R	14	4



CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	19	1P
9R	Red	R	DW	19	1P
9G	Blue	BL	W	19	1P
	Orange				
	Yellow				
13R	Brown	R	PB	PB	1P
N	Red/Black	BK	N	PB	1P
POLE:	A7	CABLE SIZE:		25/C	

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	3	2
2R	Red	R	R	3	2
2G	Blue	BL	G	3	2
2 Y	Orange	О	Y	3	2
13R	Yellow	R	PB	PB	1P
N	Brown	BK	N	21	1P
2R	Red/Black	R	R	4	2
2 G	Blue/Black	BL	G	4	2
2Y	Orange/Black	О	Y	4	2
N	Yellow/Black	BK	N	4	2
N	Brown/Black	BK	N	5	2
2R	Black/Red	R	R	5	2
2G	Blue/Red	BL	G	5	2
2Y	Orange/Red	О	Y	5	2
2R	Yellow/Red	R	R	6	2
9R	Brown/Red	R	DW	21	1P
N	Black/Blue	BK	N	6	2
2G	Red/Blue	BL	G	6	2
2Y	Orange/Blue	О	Y	6	2
9G	Yellow/Blue	BL	W	21	1P
N	Brown/Blue	BK	PB	PB	1P
N	Black/Orange	BK	N	16	4
4R	Red/Orange	R	R	16	4
4G	Blue/Orange	BL	G	16	4
4Y	Yellow/Orange	0	Y	16	4

TRAFFIC SIGNAL WIRING DIAGRAM PURPOSES ONLY DOT

EM 0292(88)73 IM 2292(104)0

L92

85TH STREET & I-29 RAMPS C/D

POLE: CABLE SIZE: 12/C

POLE: A9 CABLE SIZE: 25/C

POLE: A10 CABLE SIZE: 12/C

POLE: A11

CABLE SIZE:

7/C

L55

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
N	Black	BK	N	17	4
4R	Red	R	R	17	4
4G	Blue	BL	G	17	4
4Y	Orange	О	Y	17	4
	Yellow				
	Brown				
4R	Red/Black	R	R	18	4
4G	Blue/Black	BL	G	18	4
4Y	Orange/Black	О	Y	18	4
N	Yellow/Black	N	N	18	4
	Brown/Black				
	Black/Red				

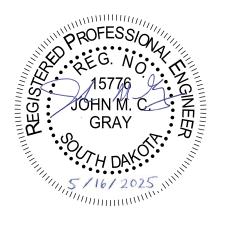
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
N	Black	BK	N	7	1
1R	Red	R	R	7	1
1G	Blue	BL	G	7	1
1Y	Orange	О	Y	7	1
	Yellow				
	Brown				
9R	Red/Black	R	DW	22	1P
9G	Blue/Black	BL	W	22	1P
N	Orange/Black	BK	N	22	1P
	Yellow/Black				
N	Brown/Black	BK	N	23	2P
10R	Black/Red	R	DW	23	2P
10G	Blue/Red	BL	W	23	2P
	Orange/Red				
	Yellow/Red				
	Brown/Red				
N	Black/Blue	BK	N	PB	1P
13R	Red/Blue	R	PB	PB	1P
	Orange/Blue				
	Yellow/Blue				
	Brown/Blue				
N	Black/Orange	BK	N	PB	2P
14R	Red/Orange	R	PB	PB	2P
	Blue/Orange				

Yellow/Orange

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	8	1
1R	Red	R	R	8	1
1G	Blue	BL	G	8	1
1Y	Orange	О	Y	8	1
	Yellow				
N	Brown	BK	N	24	2P
10R	Red/Black	R	DW	24	2P
10G	Blue/Black	BL	W	24	2P
	Orange/Black				
	Yellow/Black				
14R	Brown/Black	R	PB	PB	2P
N	Black/Red	BK	N	PB	2P

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	R1	F
12R	Red	R	RRFB	R1	F
	Blue				
12R	Orange	Y	RRFB	R1	F
	Yellow				
16R	Brown	R	PB	PB	F
N	Red/Black	BK	N	PB	F
POLE:	Δ12	CABLES	CABLE SIZE:		

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	R2	F
12R	Red	R	RRFB	R2	F
	Blue				
12R	Orange	Y	RRFB	R2	F
	Yellow				
16R	Brown	R	PB	PB	F
N	Red/Black	BK	N	PB	F



TRAFFIC SIGNAL WIRING DIAGRAM PURPOSES ONLY DOT

POLE:

EM 0292(88)73 IM 2292(104)0

TOTAL SHEETS L56 L92

12/C

85TH STREET & I-29 RAMPS A/B

CABLE SIZE:

7/C

PB

 \mathbf{G}

PB

14

14

PB

PB

8

8

5P

5P

5P

5P

PB

PB

25/C

POLE:

CABLE SIZE:

POLE: B4 CABLE SIZE:

25/C

CABLE SIZE:

POLE:	B1

15R

8Y

8G

 \mathbf{N}

N

15R

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	17	5P
11R	Red	R	DW	17	5P
11G	Blue	BL	W	17	5P
	Orange				
	Yellow				

BK

POLE

POLE: **CABLE SIZE:**

Brown

Red/Black

CABLE

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	8	6
6R	Red	R	R	8	6
6G	Blue	BL	G	8	6
6Y	Orange	О	Y	8	6
	Yellow				
	Brown				
6R	Red/Black	R	R	9	6
6G	Blue/Black	BL	G	9	6
6Y	Orange/Black	О	Y	9	6
N	Yellow/Black	BK	N	9	6
N	Brown/Black	BK	N	19	5P
N	Black/Red	BK	N	10	6
6G	Blue/Red	BL	G	10	6
6Y	Orange/Red	О	Y	10	6
6R	Yellow/Red	R	R	10	6
11R	Brown/Red	R	DW	19	5P
11G	Black/Blue	BL	W	19	5P
8R	Red/Blue	R	R	14	8

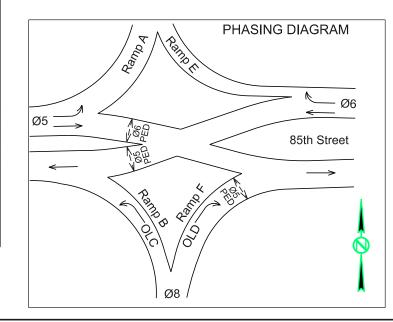
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	15	8
8R	Red	R	R	15	8
8G	Blue	BL	G	15	8
8Y	Orange	О	Y	15	8
	Yellow				
	Brown				
8R	Red/Black	R	R	16	8
8G	Blue/Black	BL	G	16	8
8Y	Orange/Black	О	Y	16	8
N	Yellow/Black	N	N	16	8
	Brown/Black				
	Black/Red				

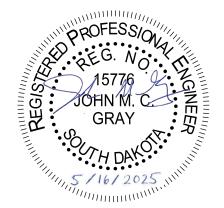
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	1	5
5R	Red	R	R	1	5
5G	Blue	BL	G	1	5
5Y	Orange	О	Y	1	5
	Yellow				
	Brown				
11R	Red/Black	R	DW	20	5P
11G	Blue/Black	BL	W	20	5P
N	Orange/Black	BK	N	20	5P
	Yellow/Black				
N	Brown/Black	BK	N	21	6P
12R	Black/Red	R	DW	21	6P
12G	Blue/Red	BL	W	21	6P
	Orange/Red				
	Yellow/Red				
	Brown/Red				
N	Black/Blue	BK	N	PB	5P
15R	Red/Blue	R	PB	PB	5P
	Orange/Blue				
	Yellow/Blue				
	Brown/Blue				
N	Black/Orange	BK	N	PB	6P
16R	Red/Orange	R	PB	PB	6P
	Blue/Orange				
	Yellow/Orange				

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
N	Black	BK	N	2	5
5R	Red	R	R	2	5
5G	Blue	BL	G	2	5
5Y	Orange	О	Y	2	5
	Yellow				
	Brown				
12R	Red/Black	R	DW	22	6P
12G	Blue/Black	BL	W	22	6P
	Orange/Black				
N	Yellow/Black	BK	N	22	6P
16R	Brown/Black	R	PB	PB	6P
N	Black/Red	BK	N	PB	6P
DOI E	De	CABLES	175.	12/0	

POLE:	86	CABLE SIZE:	12/C
'		•	

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	6	6
6R	Red	R	R	6	6
6G	Blue	BL	G	6	6
6Y	Orange	О	Y	6	6
	Yellow				
	Brown				
	Red/Black				
	Blue/Black				
	Orange/Black				
	Yellow/Black				
	Brown/Black				
	Black/Red				





Orange/Blue

Yellow/Blue

Brown/Blue

Black/Orange

Red/Orange

Blue/Orange Yellow/Orange

TRAFFIC SIGNAL WIRING DIAGRAM PURPOSES ONLY BOTTON

TOTAL SHEETS

EM 0292(88)73 IM 2292(104)0 L57 L92

85TH STREET & I-29 RAMPS A/B

POLE: CABLE SIZE:

7/C

POLE: B10 CABLE SIZE: 25/C

POLE: B11 CABLE SIZE: 12/C

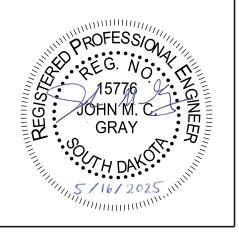
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	R3	F
9R	Red	R	RRFB	R3	F
	Blue				
9R	Orange	Y	RRFB	R3	F
	Yellow				
13R	Brown	R	PB	PB	F
N	Red/Black	BK	N	PB	F
POLE:	B8	CABLE SIZE:		7/C	

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	R4	F
9R	Red	R	RRFB	R4	F
	Blue				
9R	Orange	Y	RRFB	R4	F
	Yellow				
13R	Brown	R	PB	PB	F
N	Red/Black	BK	N	PB	F
POLE:	В9	CABLE SIZE:		12/C	

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

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	3	5
5R	Red	R	R	3	5
5G	Blue	BL	G	3	5
5Y	Orange	О	Y	3	5
	Yellow				
	Brown				
5R	Red/Black	R	R	4	5
5G	Blue/Black	BL	G	4	5
5Y	Orange/Black	О	Y	4	5
N	Yellow/Black	BK	N	4	5
N	Brown/Black	BK	N	18	5P
N	Black/Red	BK	N	5	5
5G	Blue/Red	BL	G	5	5
5Y	Orange/Red	О	Y	5	5
5R	Yellow/Red	R	R	5	5
11R	Brown/Red	R	DW	18	5P
11G	Black/Blue	BL	W	18	5P
8R	Red/Blue	R	R	13	8
8Y	Orange/Blue	О	Y	13	8
8G	Yellow/Blue	BL	G	13	8
N	Brown/Blue	BK	N	13	8
N	Black/Orange	BK	N	PB	5P
15R	Red/Orange	R	PB	PB	5P
	Blue/Orange				
	Yellow/Orange				

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
N	Black	BK	N	11	8
8R	Red	R	R	11	8
8G	Blue	BL	G	11	8
8Y	Orange	О	Y	11	8
	Yellow				
	Brown				
8R	Red/Black	R	R	12	8
8G	Blue/Black	BL	G	12	8
8Y	Orange/Black	О	Y	12	8
N	Yellow/Black	N	N	12	8
	Brown/Black				
	Black/Red				



#8

AL1

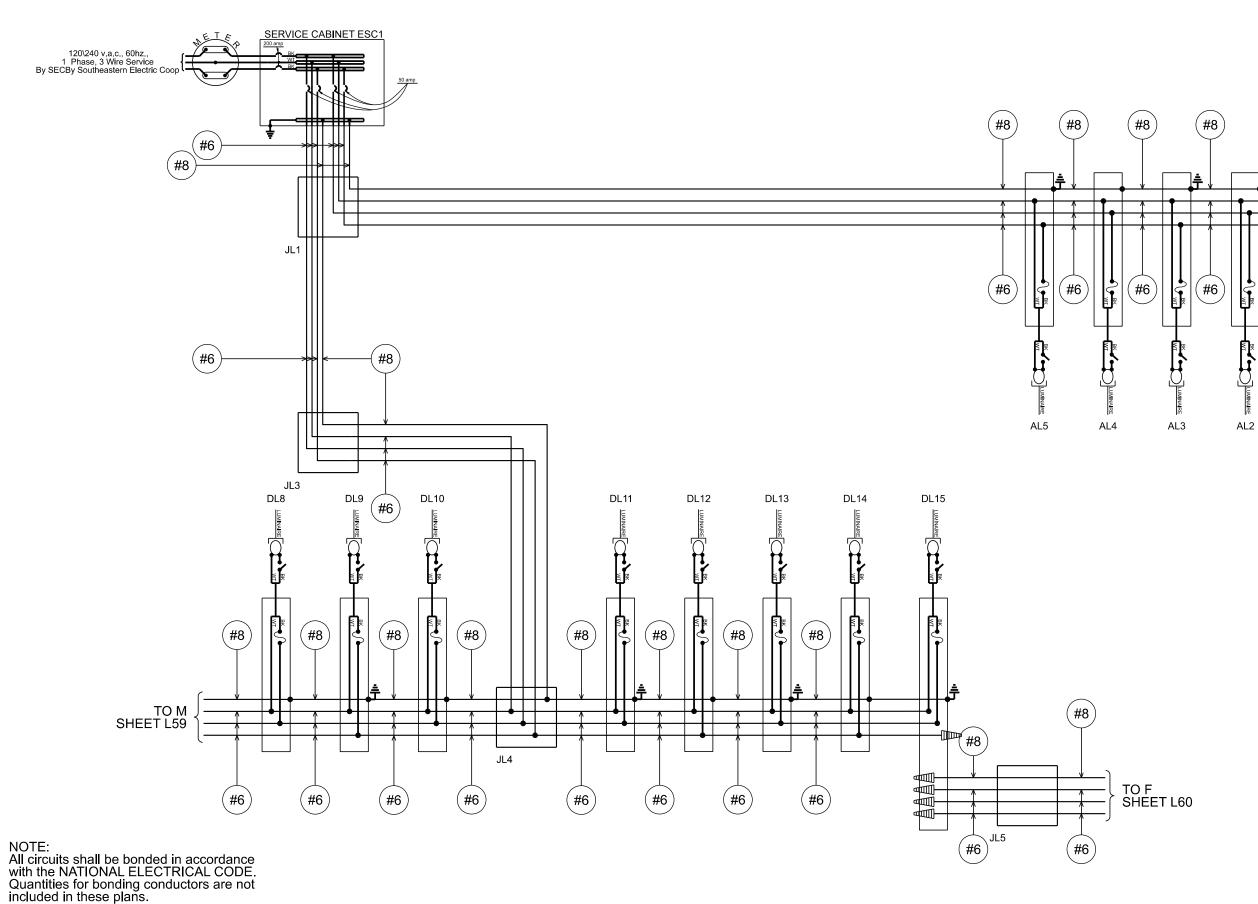
EM 0292(88)73 IM 2292(104)0

JL2

TOTAL SHEETS L58 L92

TO L SHEET L66





LEGEND:

FUSE: 20 amp.



LUMINAIRE: LED Wire nut

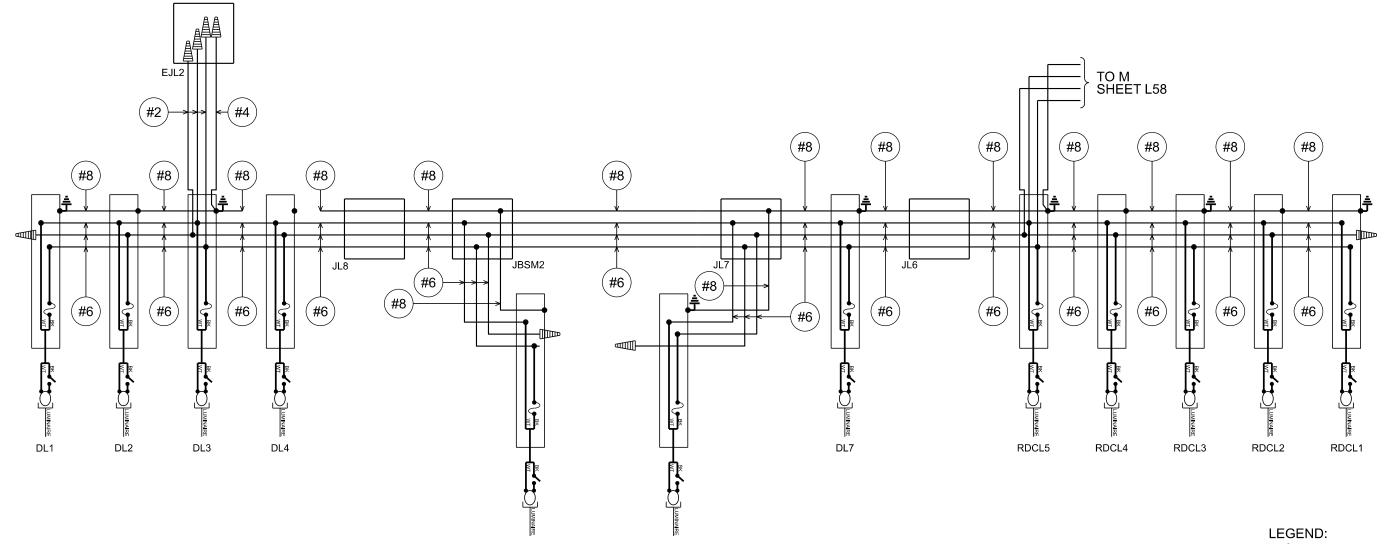
Copper conductor single #6

Copper conductor single #8

PROJECT EM 0292(88)73 IM 2292(104)0

TOTAL SHEETS L59 L92

RAMP A, RAMP D AND RAMP D CONN



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

FUSE: 20 amp.



LUMINAIRE: LED





Copper conductor single #2



Copper conductor single #4



Copper conductor single #6



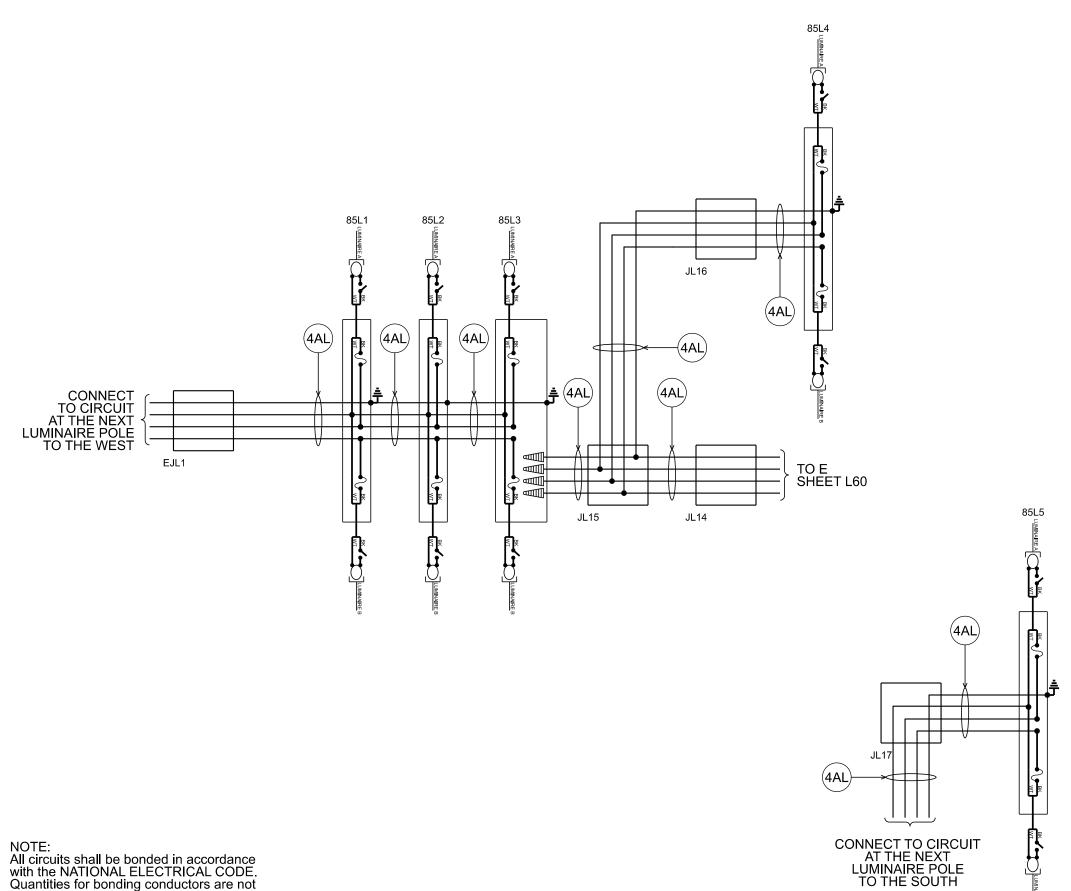
Copper conductor single #8

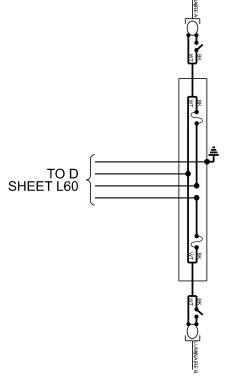
LIGHTING WIRING DIAGRAMIDDING PURPOSES ONLY DOT PROJECT TOTAL SHEETS EM 0292(88)73 L60 L92 IM 2292(104)0 85TH STREET AND RAMP C IM1 120\240 v.a.c., 60hz., 1 Phase, 3 Wire Service By Southeastern Electric Coop 120V, 20A NEMA5-20R #6 PHOTOCELL CONTROL BOX (#2) #4 JL12 (#4) (#4) ์#6` SEE SECTION H FOR DETAILS 85L11 85L14 85L15 TO A SHEET L62 (4AL) TO O SHEET L66 (4AL) (4AL) (4AL) (4AL) (4AL) (4AL) TO WELCOME SIGN TO B SHEET L62 TO E SHEET L61 JL11 JL10 JBSM1 JL18 (4AL) (4AL (4AL) (4AL TO C SHEET L62 (4AL) (4AL) (4AL) LEGEND: FUSE: 20 amp. LUMINAIRE: LED Wire nut TO D SHEET L61 SHEET L58 Aluminum triplex wire 2/2/2/4 JL13 Copper conductor single #2 7/23/25 mm Copper conductor single #4 Copper conductor single #6 NOTE: All circuits shall be bonded in accordance with the NATIONAL ELECTRICAL CODE. Copper conductor single #8 Quantities for bonding conductors are not included in these plans. Splice

85L13

PROJECT EM 0292(88)73 IM 2292(104)0 SHEET TOTAL SHEETS L61 L92









LEGEND:

FUSE: 20 amp.



LUMINAIRE: LED Wire nut



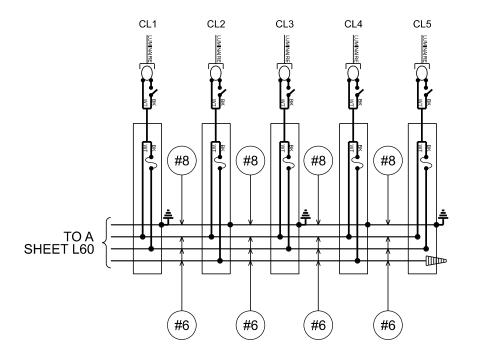
Aluminum triplex wire 2/2/2/4

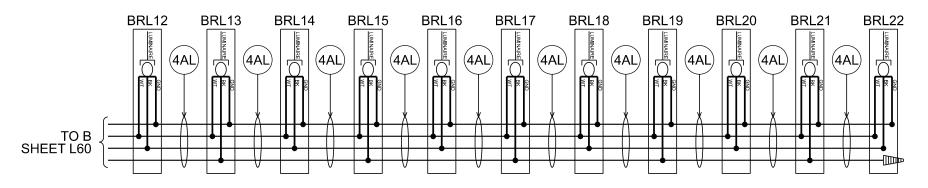
Splice

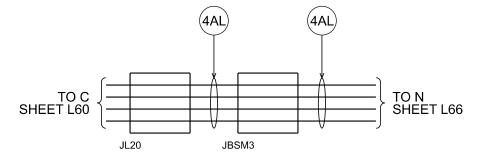
All circuits shall be bonded in accordance with the NATIONAL ELECTRICAL CODE. Quantities for bonding conductors are not included in these plans.

PROJECT EM 0292(88)73 IM 2292(104)0 SHEET TOTAL SHEETS L62 L92

85TH STREET AND RAMP C







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



LEGEND:

FUSE: 20 amp.



LUMINAIRE: LED Wire nut



Aluminum triplex wire 2/2/2/4



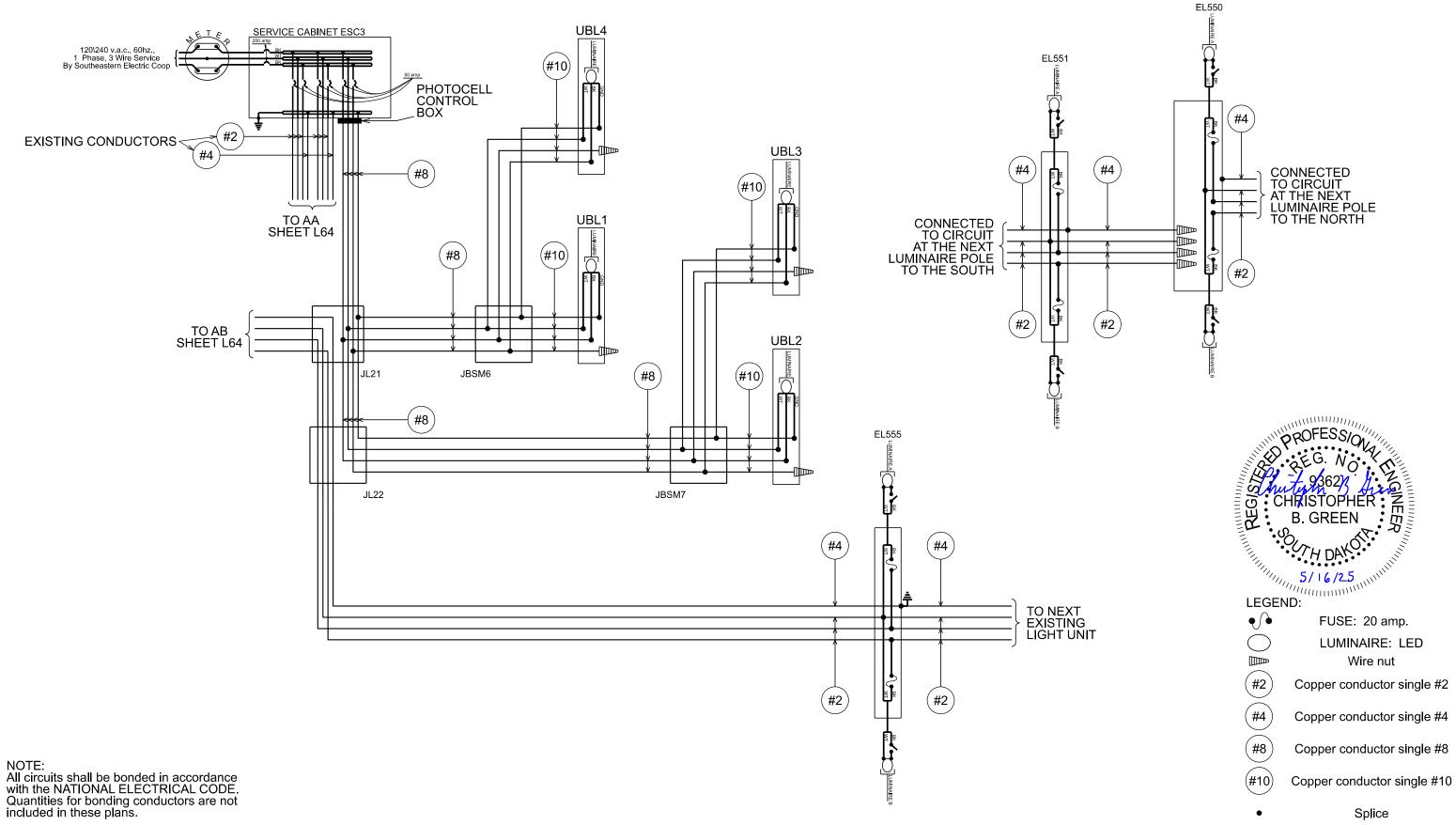
Copper conductor single #6



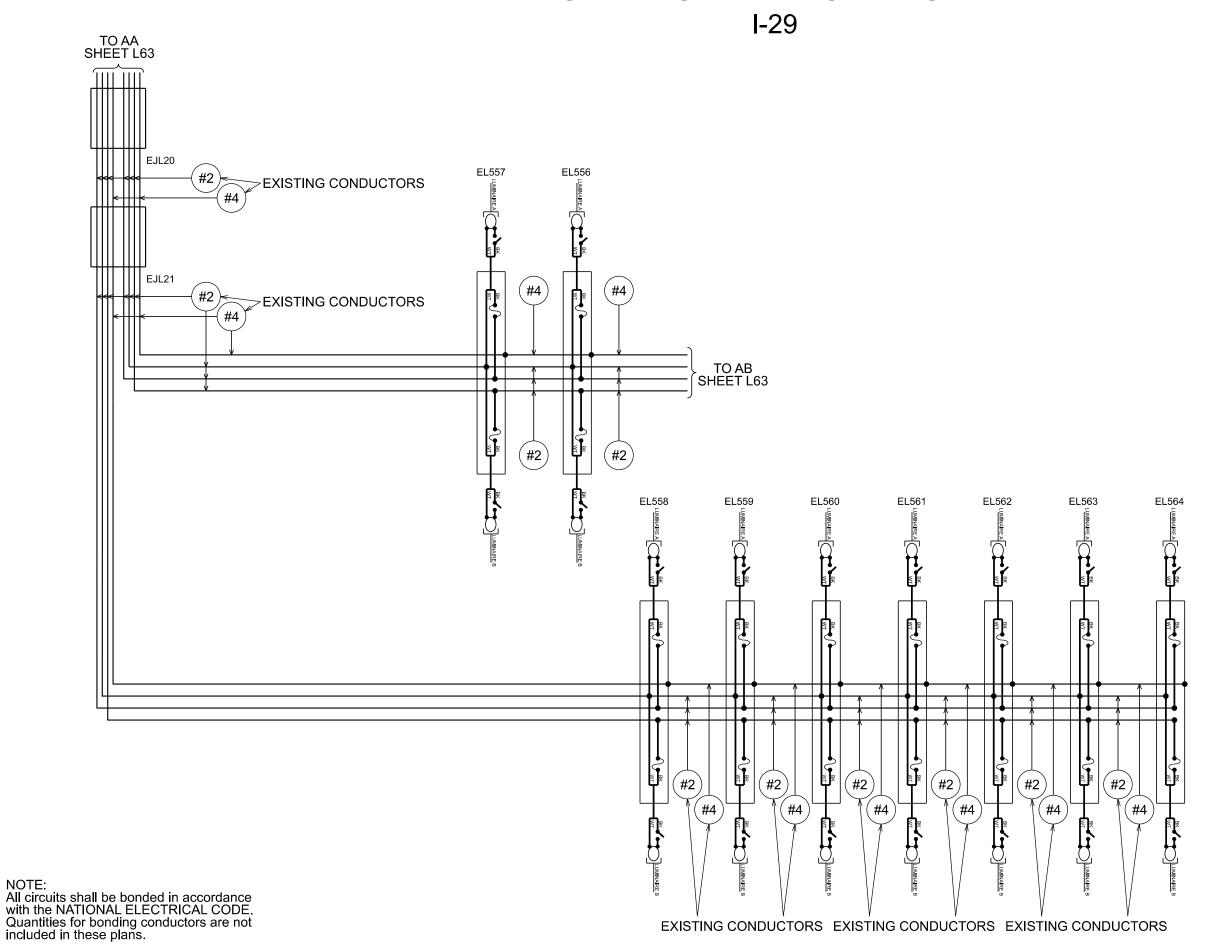
Copper conductor single #8

PROJECT EM 0292(88)73 IM 2292(104)0 SHEET TOTAL SHEETS L63 L92

I-29



PROJECT EM 0292(88)73 IM 2292(104)0 SHEET TOTAL SHEETS L64 L92





LEGEND:

FUSE: 20 amp.

LUMINAIRE: LED

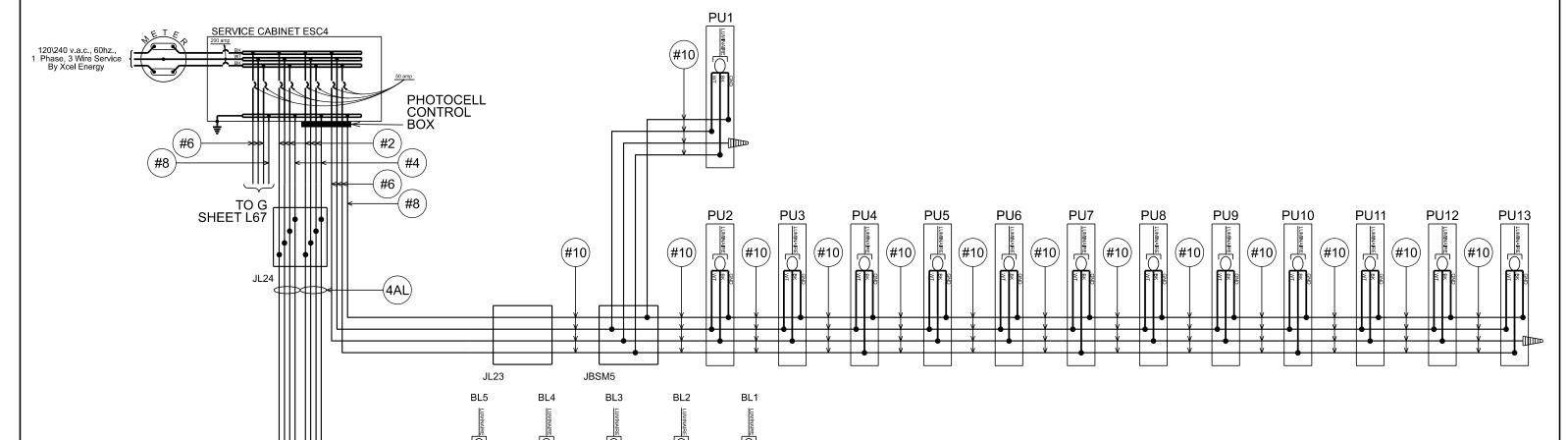
Copper conductor single #2

Copper conductor single #4

EM 0292(88)73 IM 2292(104)0

TOTAL SHEETS L65 L92

85TH STREET, PEDESTRIAN UNDERPASS AND RAMP B



#8 #6 #6

TO H TO I SHEET L66 SHEET L66

(4AL)

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: 20 amp. LUMINAIRE: LED

Wire nut

Aluminum triplex wire 2/2/2/4

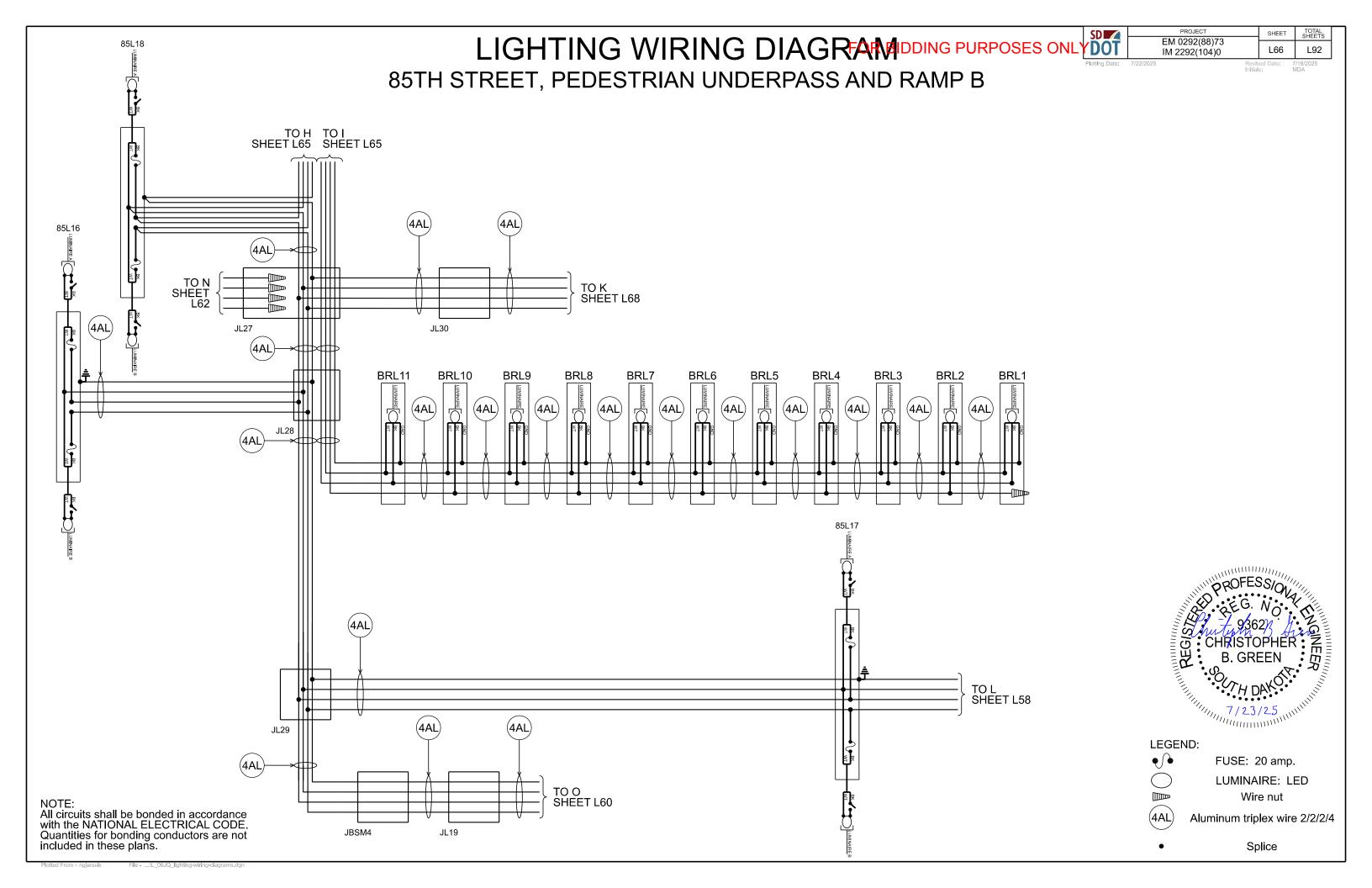
Copper conductor single #2

Copper conductor single #4

Copper conductor single #6

(#8) Copper conductor single #8

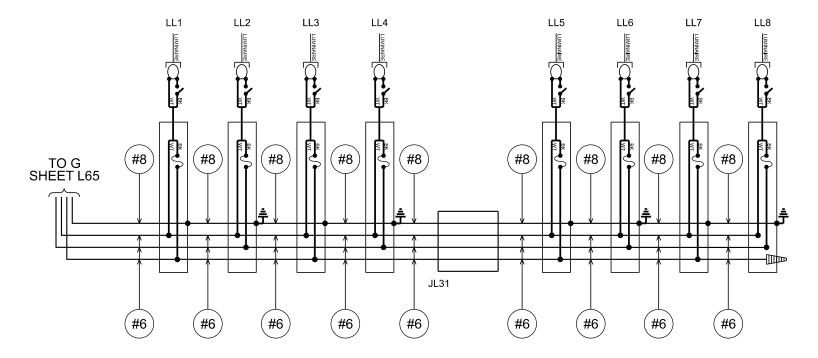
Copper conductor single #10

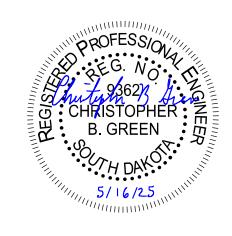


PROJECT EM 0292(88)73 IM 2292(104)0

TOTAL SHEETS L67 L92

85TH STREET, PEDESTRIAN UNDERPASS AND RAMP B





LEGEND:

FUSE: 20 amp.



LUMINAIRE: LED Wire nut



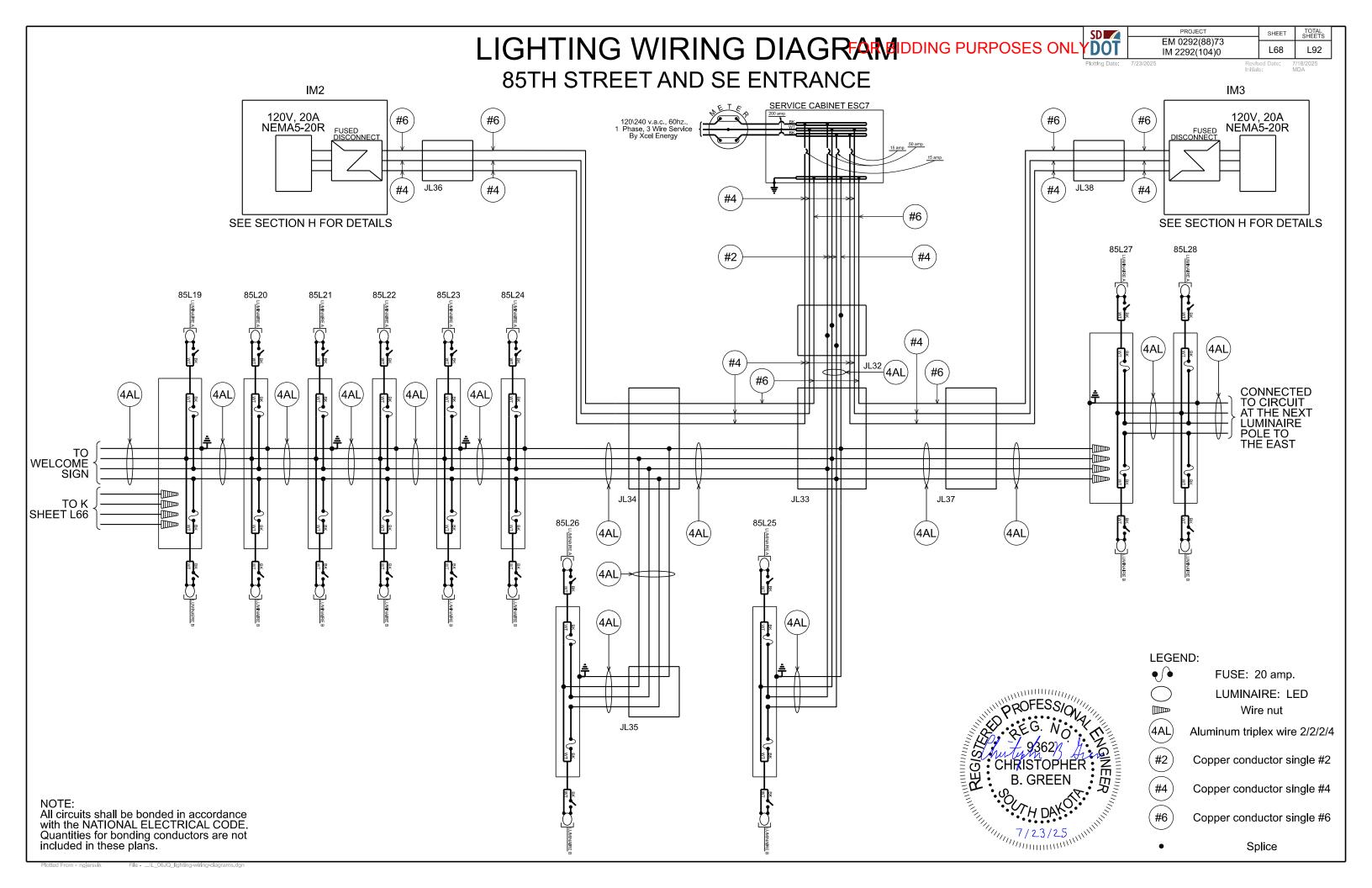
Copper conductor single #6



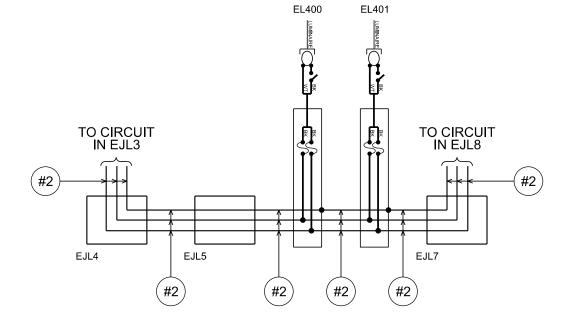
Copper conductor single #8

Splice

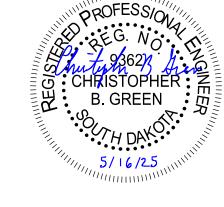
All circuits shall be bonded in accordance with the NATIONAL ELECTRICAL CODE. Quantities for bonding conductors are not included in these plans.



PROJECT EM 0292(88)73 IM 2292(104)0 SHEET TOTAL SHEETS L69 L92



I-229



LEGEND:

FUSE: 20 amp. LUMINAIRE: LED



Copper conductor single #2

Splice

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

PEDESTRIAN UNDERPASS DETACLOS PURPOSES ONL 85TH STREET

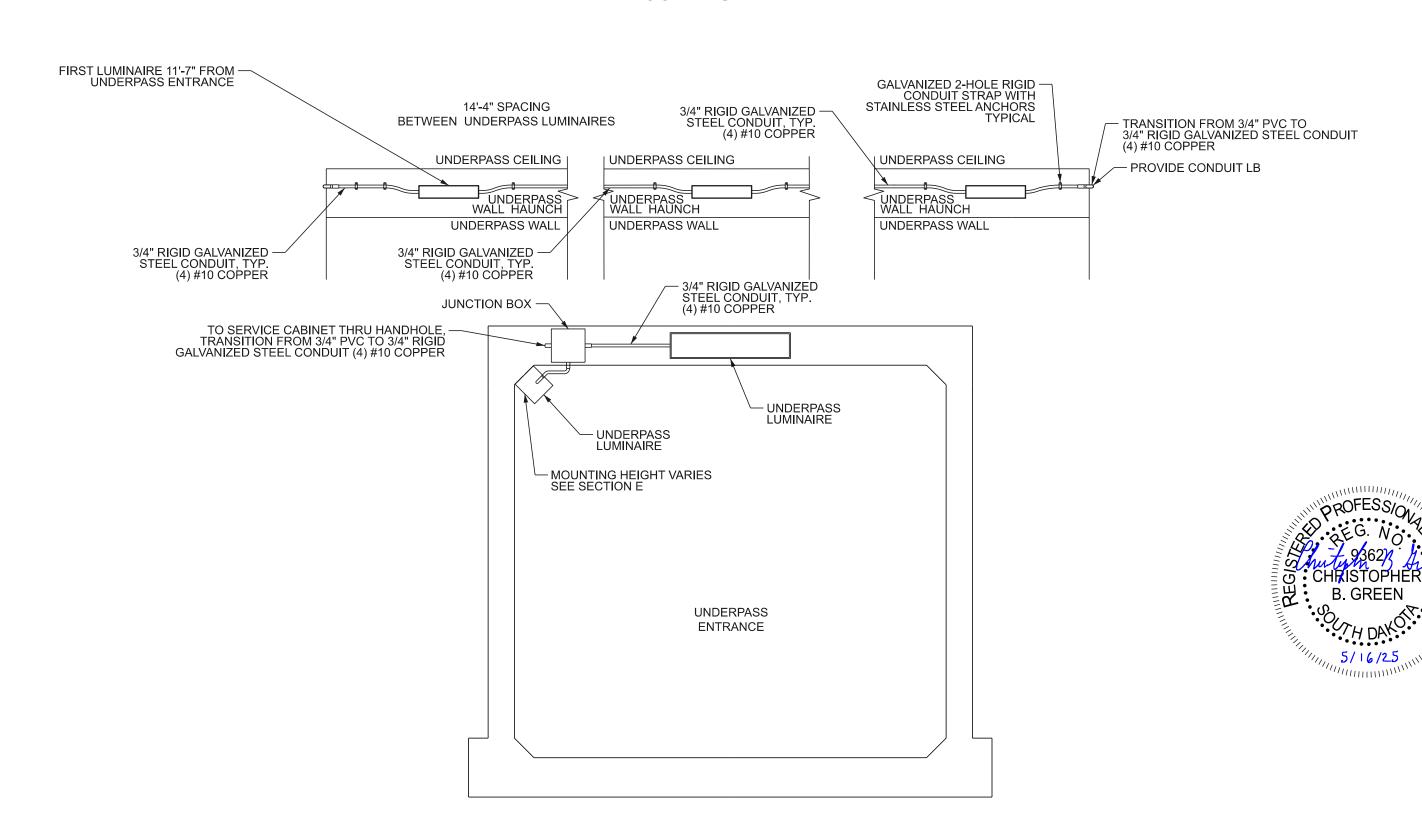
DOT

PROJECT SHEET
EM 0292(88)73
IM 2292(104)0 L70

TOTAL SHEETS

L92

Date: 5/15/2025



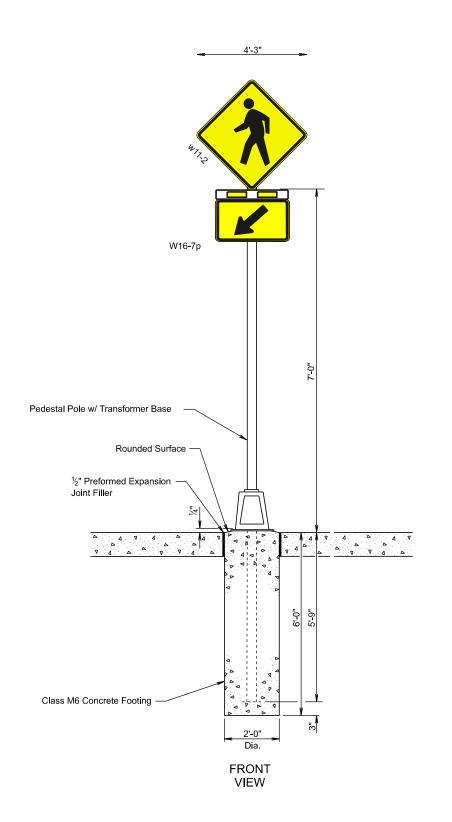
UNDERPASS ELEVATION UNDERPASS LUMINAIRE MOUNTING DETAIL

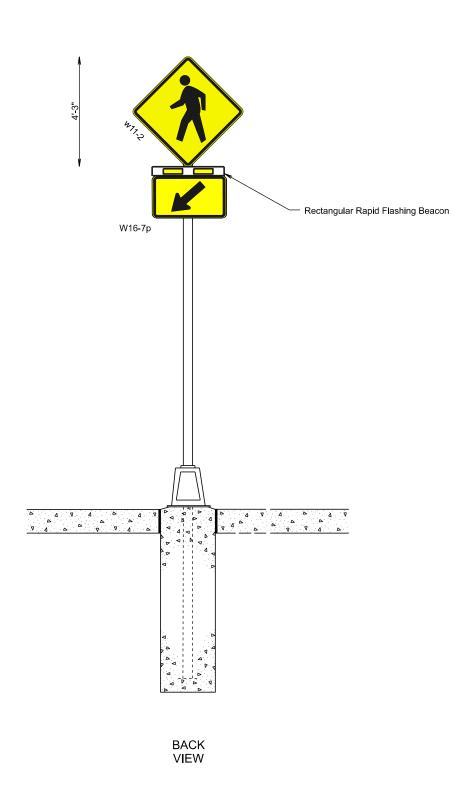
NOT TO SCALE

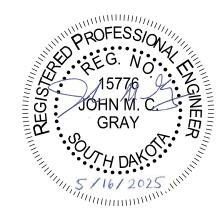
PROJECT EM 0292(88)73 IM 2292(104)0 L71

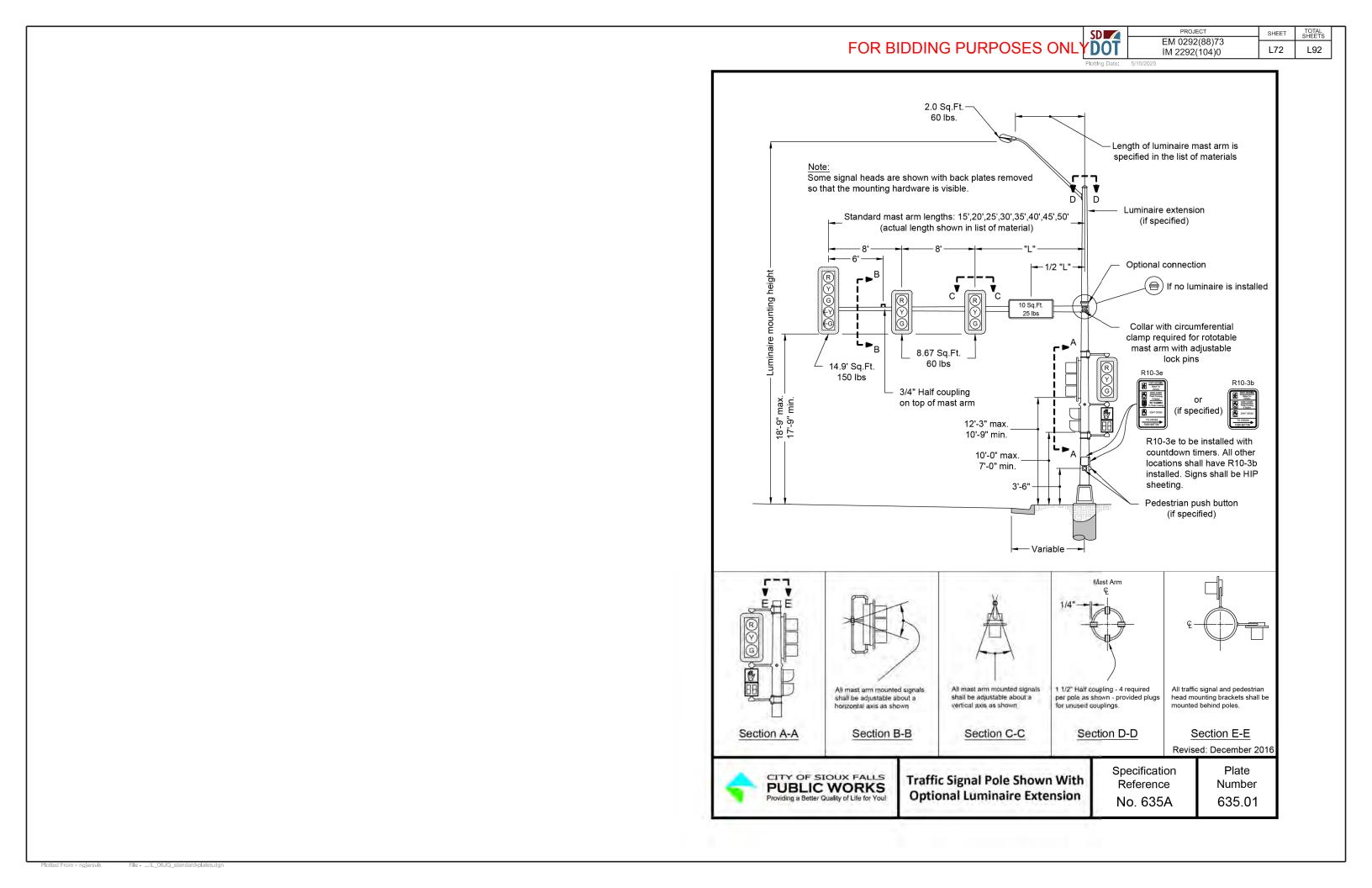
SHEET TOTAL SHEETS L92

RECTANGULAR RAPID FLASHING BEACONS & SIGNS





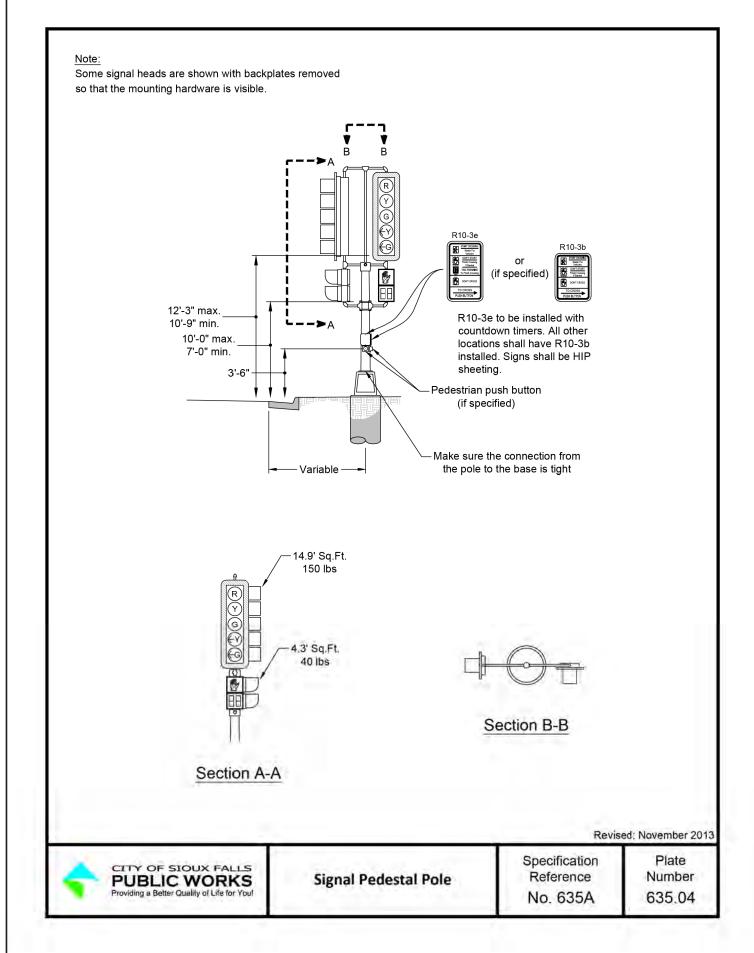


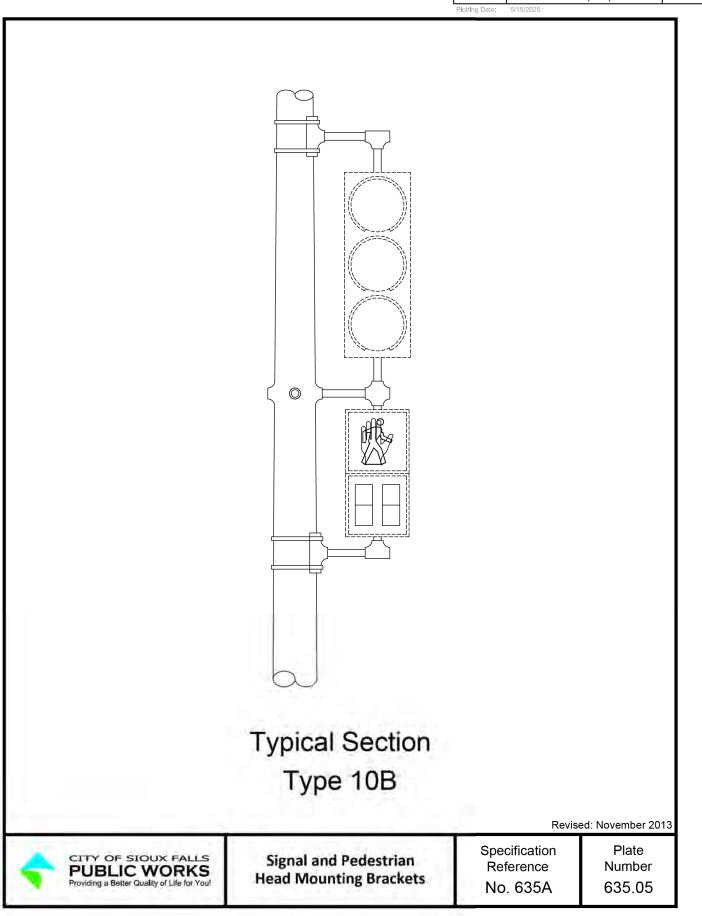


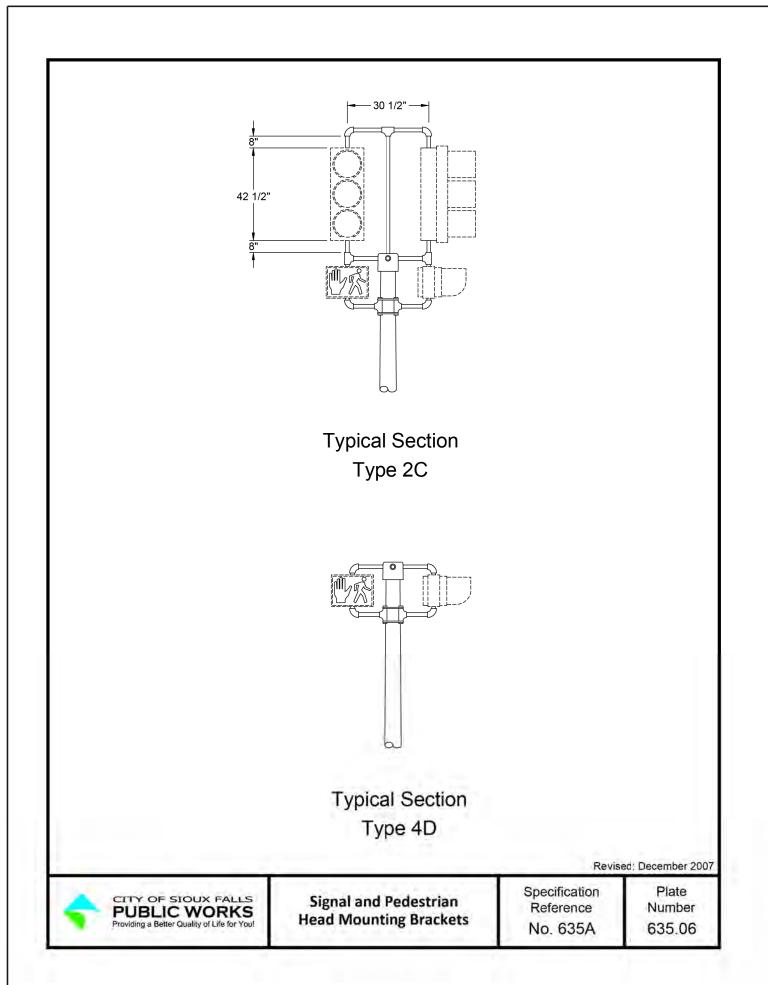
SHEET

PROJECT EM 0292(88)73 IM 2292(104)0



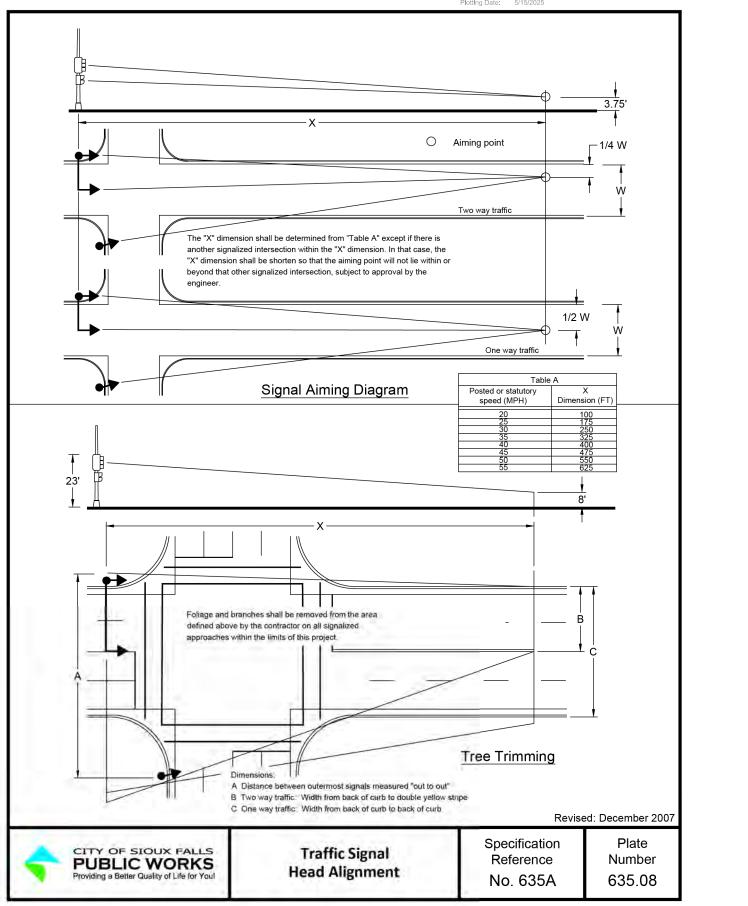


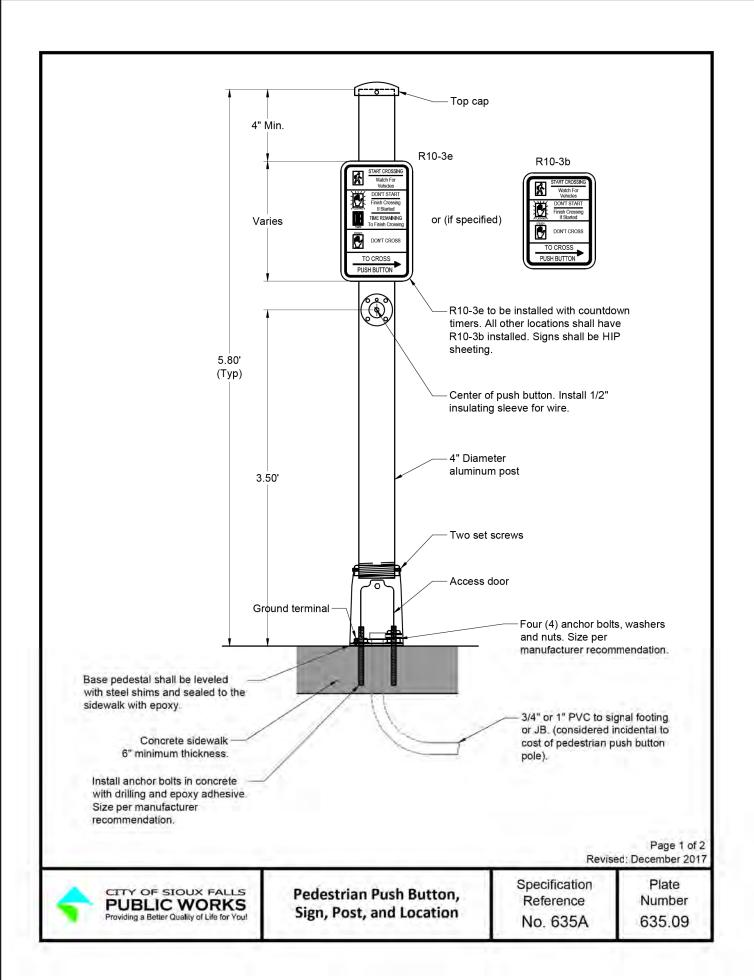






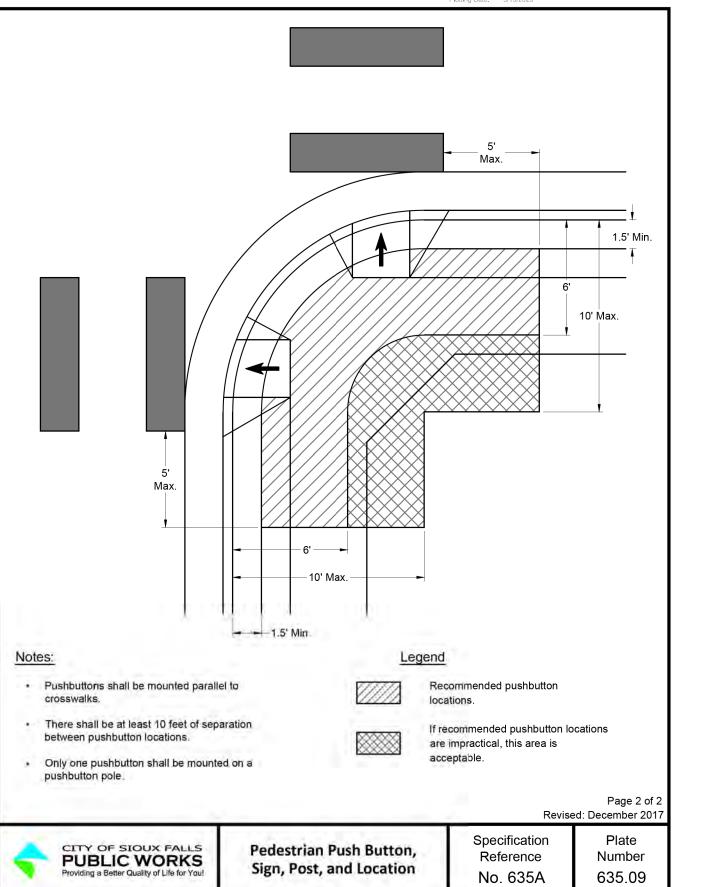
SHEET TOTAL SHEETS L74 L92

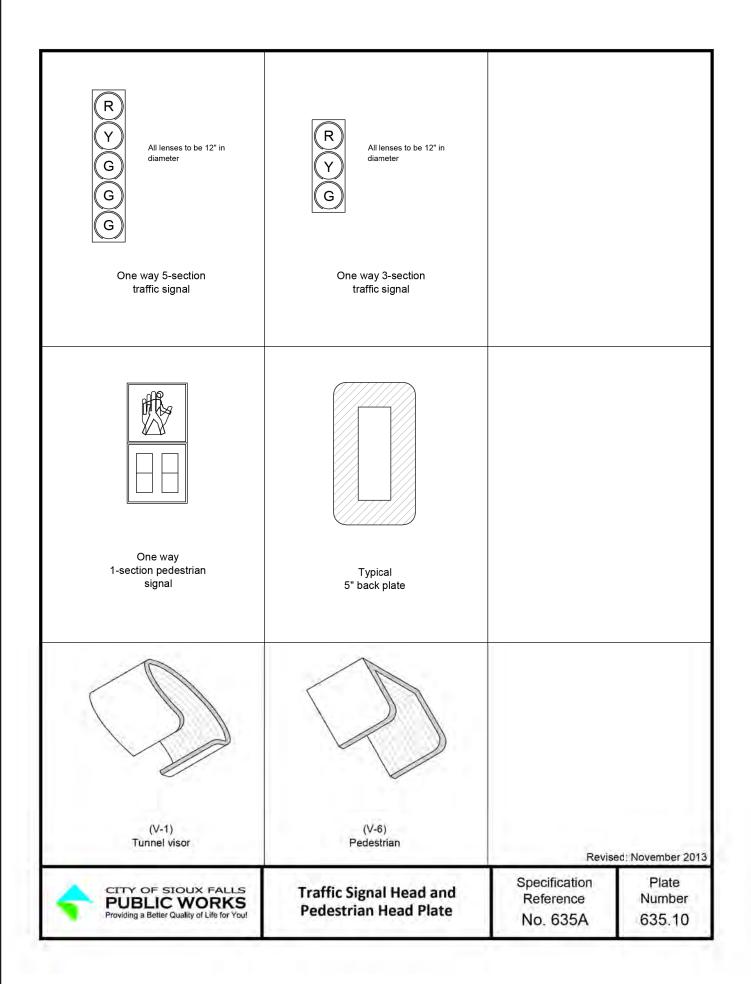




PROJECT EM 0292(88)73 IM 2292(104)0

SHEET TOTAL SHEETS L75 L92





Vertical rebar equally spaced

about inside of spiral

5/8"x8'

(as specified by manufacturer)

3/4" PVC conduit

2"-6" below finish grade

5/8"x8' Ground rod

below finish grade

2" Rigid steel

- 2" Rigid steel

(spare)

-3" CL.

2" Min. - 3" max

above concrete surface

Ground rod

— Footing diameter ——

Spiral diameter

6 1/2"

3/4" PVC

Expansion Jt.

3" Max. height

above top of curb or Ç of road

2" Rigid

conduit

PROJECT EM 0292(88)73 IM 2292(104)0

SHEET TOTAL SHEETS L76 L92

General Notes:

If base of pole is larger then that of the top of footing, then the top one foot of the footing shall be formed mono-lithically to match the pole base.

Expansion joint material - a two-inch (2") expansion strip, asphalt concrete Type "E", compacted as directed by the engineer, shall isolate footing from other concrete. Cost of expansion strip to be included in the bid price for footings.

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

Cost of the RGSC and conduit bushing shown in footings detail to be included in the bid price for footings.

All concrete shall be class M-6

Use current City of Sioux Falls Standard Specifications for traffic signals. Section 635A.

All reinforcing steel shall conform to A.S.T.M. A-615, Grade 40.

Cap all unused conduit.

Finished base will be level and have steel trowel finish.

Anchor bolts shall be threaded at both ends with nuts placed at the bottom.

Anchor bolts shall be equal distance from the center of the footing.

Conduits shall be centered in the footing leaving adequate room for the bushings.

Footing Data All footings shall be class M6 concrete, Type II cement							
Footing diameter	Footing depth	Spiral diameter	Spiral size	Approx. spiral length	Vertical rebar		
3'-0"	9'	2'-8"	#3	97'±	12 - #7x8'-6"		
3'-0"	10'	2'-8"	#3	106'±	12 - #7x9'-6"		
3'-0"	11'	2'-8"	#3	113'±	12 - #7x10'-6"		
3'-0"	12'	2'-8"	#3	122'±	12 - #7x11'-6"		
3'-0"	13'	2'-8"	#3	130'±	12 - #7x12'-6"		
3'-0"	14'	2'-8"	#3	139'±	12 - #7x13'-6"		

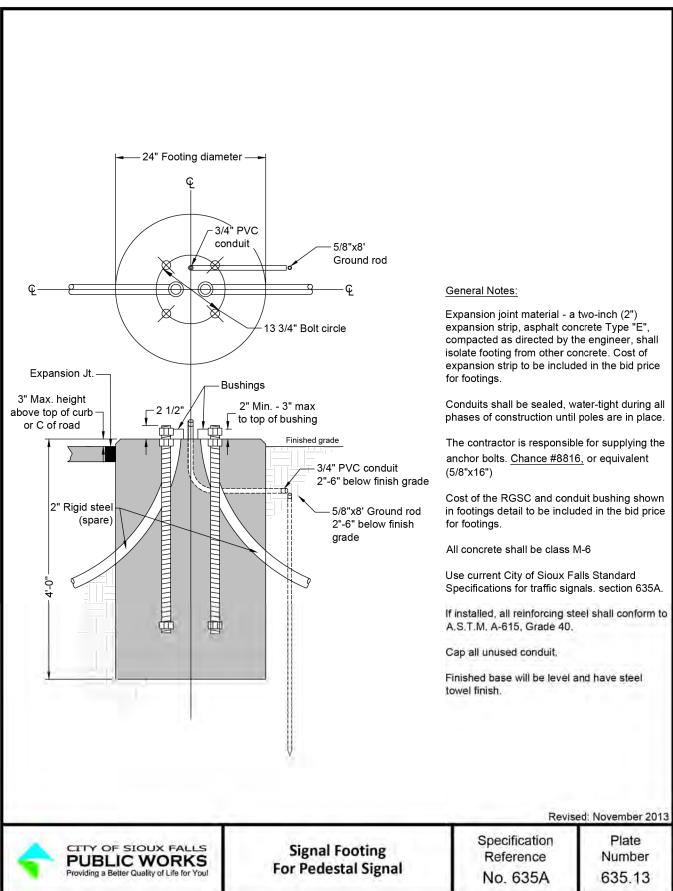
2" CL. -

CITY OF SIOUX FALLS **PUBLIC WORKS**

Signal Footing For Mast Arm Signal Specification Reference No. 635A

Plate Number 635.12

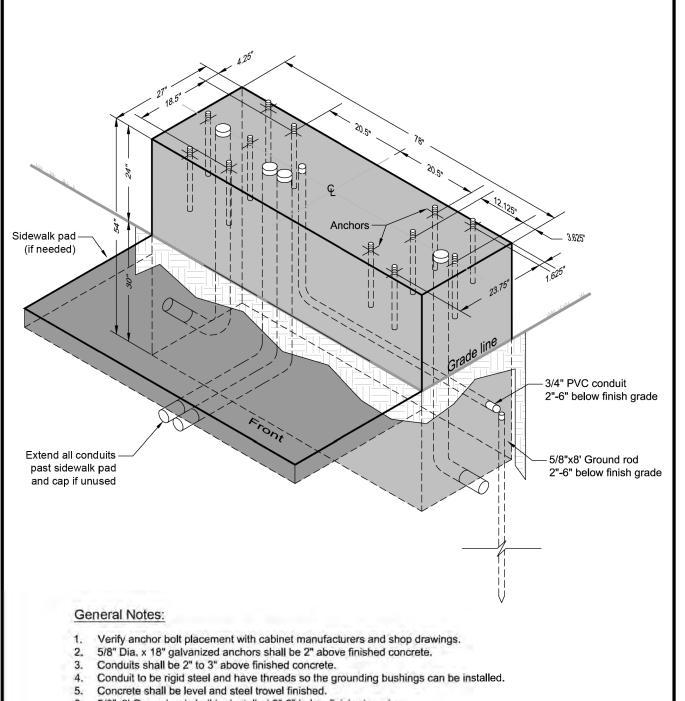
Revised: October 2020



PROJECT EM 0292(88)73 IM 2292(104)0

SHEET

TOTAL SHEETS L77 L92



5/8"x8' Ground rod shall be installed 2"-6" below finished grade.

3/4" PVC conduit shall end adjacent to the ground rod.

CITY OF SIOUX FALLS **PUBLIC WORKS**

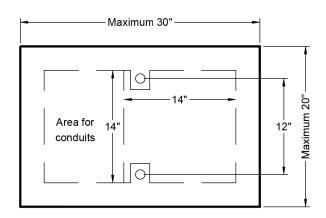
Controller Cabinet Footing for Eight Phase Signal

Specification Reference No. 635A

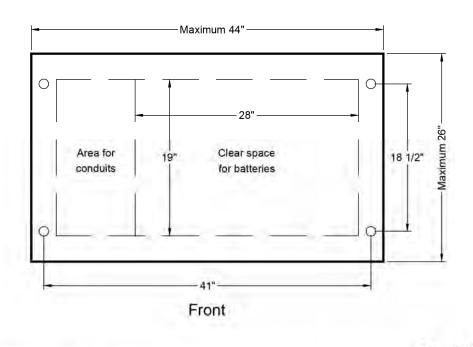
Plate Number 635.17

Revised: December 2017

Top View Four-Phase Controller Cabinets:



Top View Eight-Phase Controller Cabinets:

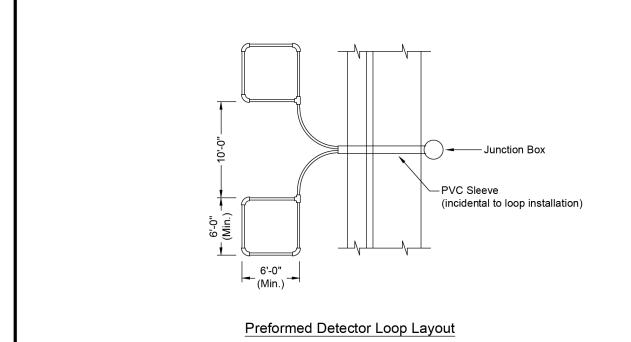


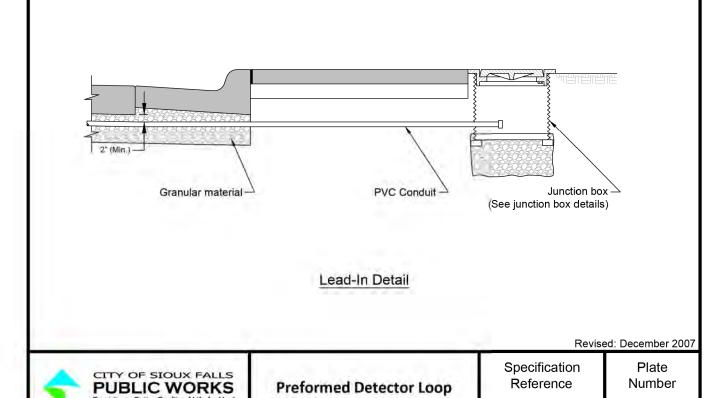
PUBLIC WORKS

Traffic Signal Controller Cabinet Size and Bolt Hole Requirements

Specification Reference No. 635A

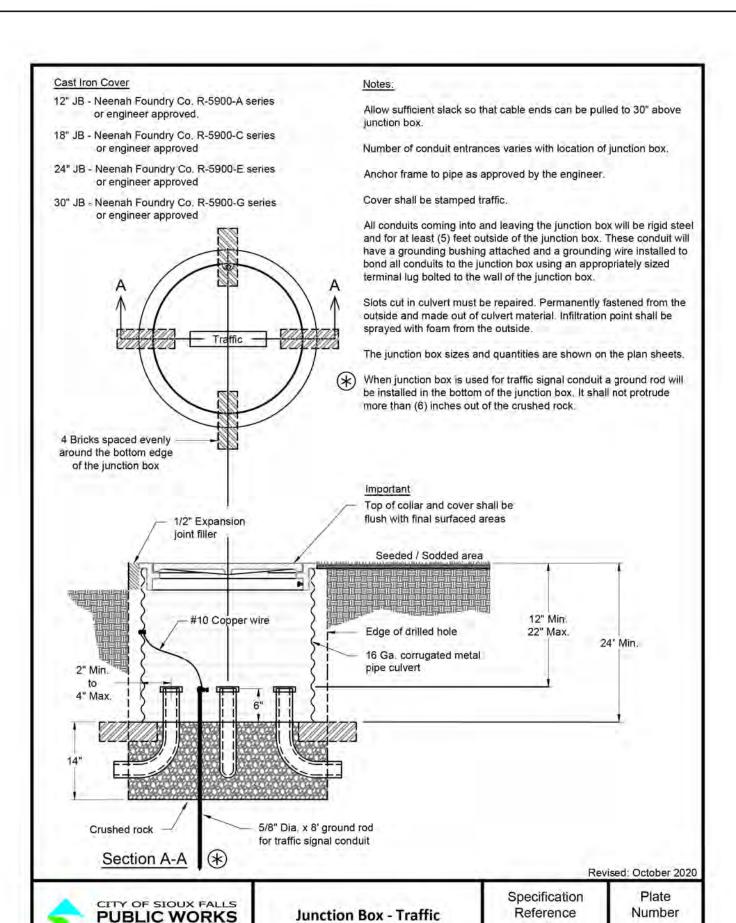
Revised: November 2013 Plate Number 635.19





No. 635A

635.20



No. 635A

635.31

FOR BIDDING PURPOSES ONLY DOT

EM 0292(88)73 IM 2292(104)0

SHEET

PROJECT TOTAL SHEETS L79 L92

18" JB - Neenah Foundry Co. R-5900-C series or engineer approved

Cast Iron Cover

- 24" JB Neenah Foundry Co. R-5900-E series or engineer approved
- 30" JB Neenah Foundry Co. R-5900-G series or engineer approved

Notes:

Allow sufficient slack so that cable ends can be pulled to 30" above junction box.

Number of conduit entrances varies with location of junction box.

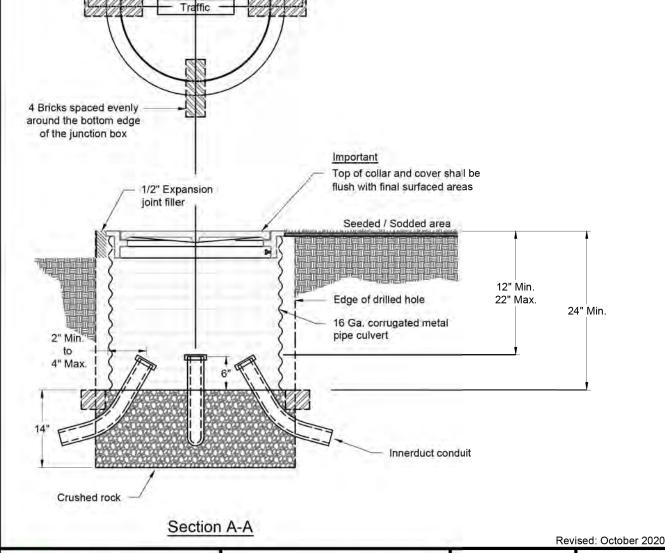
Anchor frame to pipe as approved by the engineer.

Cover shall be stamped traffic.

The ends of the innerduct conduit in the junction box shall be sealed with a water proof sealant to prevent water infiltration into the conduit.

Slots cut in culvert must be repaired. Permanently fastened from the outside and made out of culvert material. Infiltration point shall be sprayed with foam from the outside.

The junction box sizes and quantities are shown on the plan sheets.

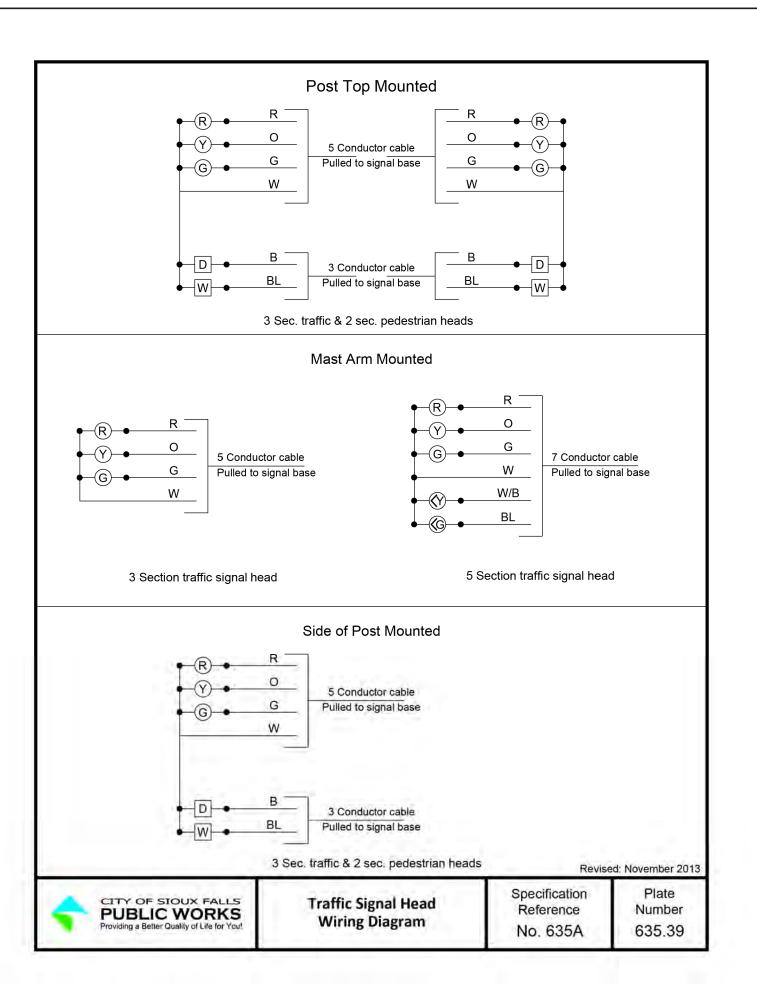




Junction Box - Innerducts

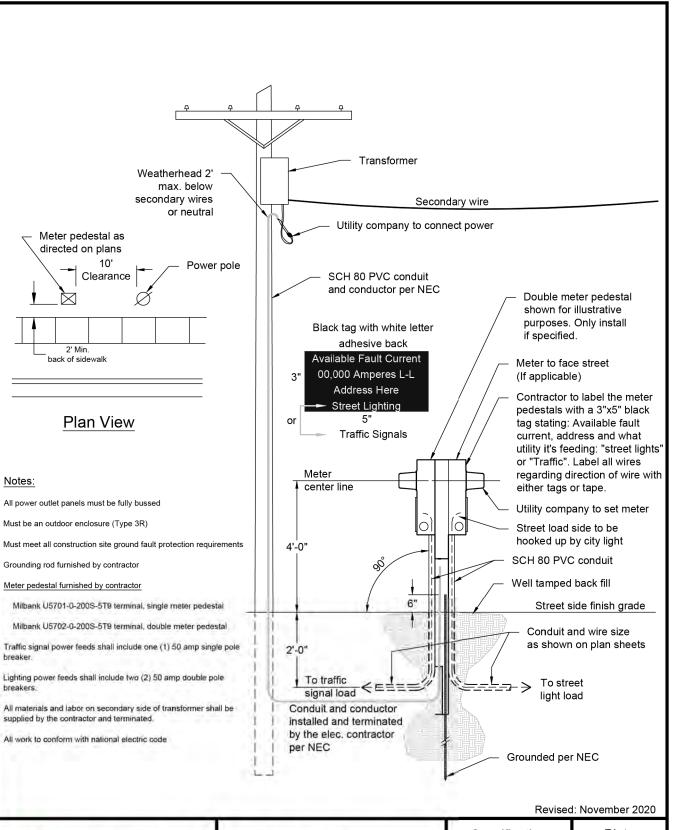
Specification Reference No. 635A

Plate Number 635.33



PROJECT EM 0292(88)73 IM 2292(104)0

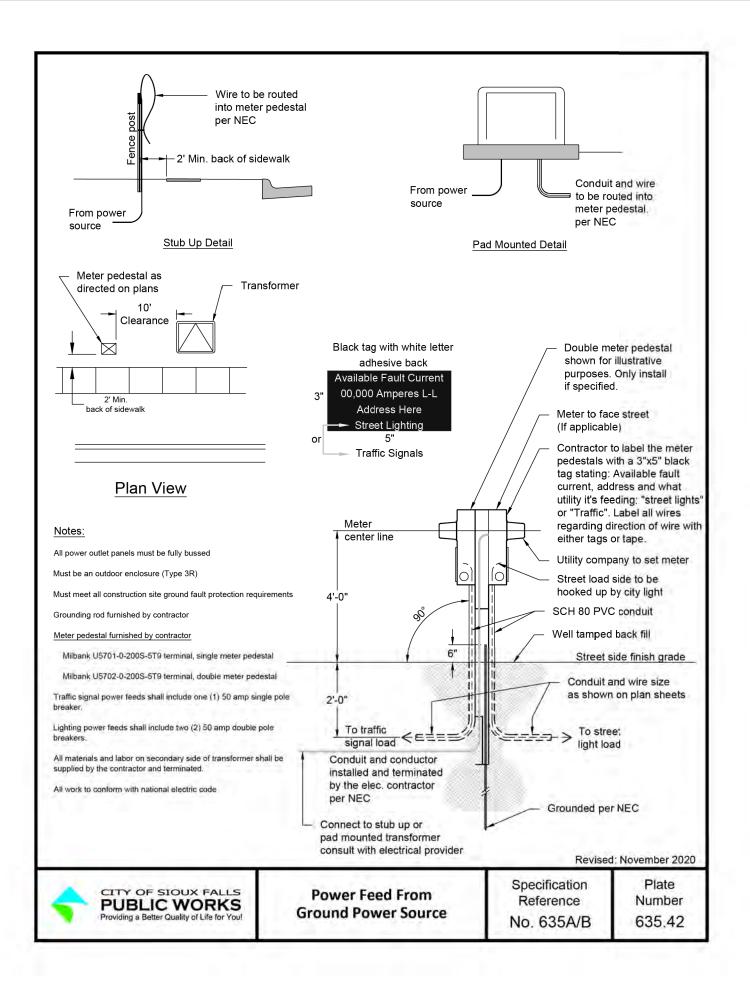
SHEET TOTAL SHEETS L80 L92





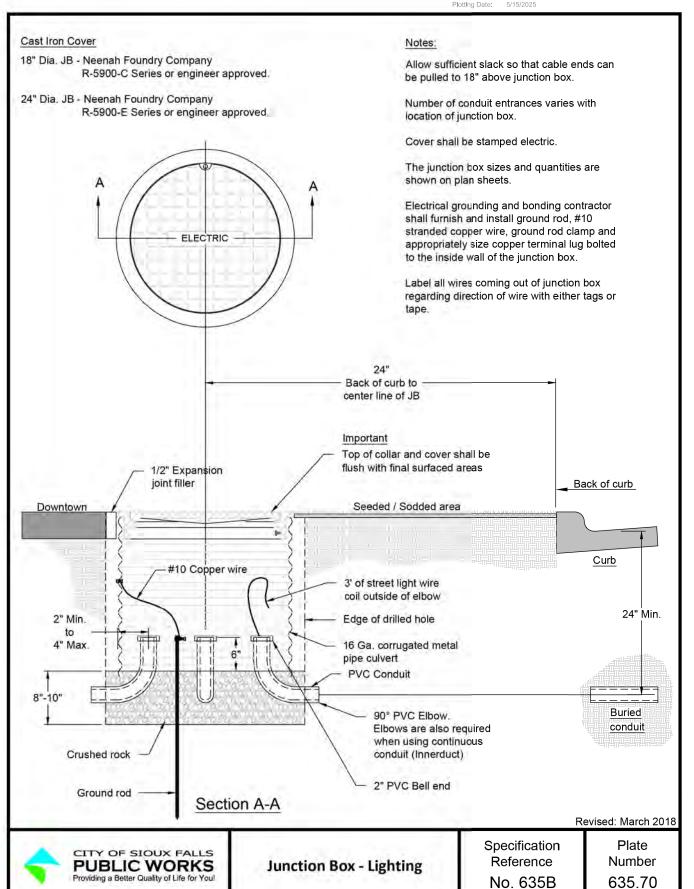
Power Feed From **Elevated Transformer** Specification Reference No. 635A/B

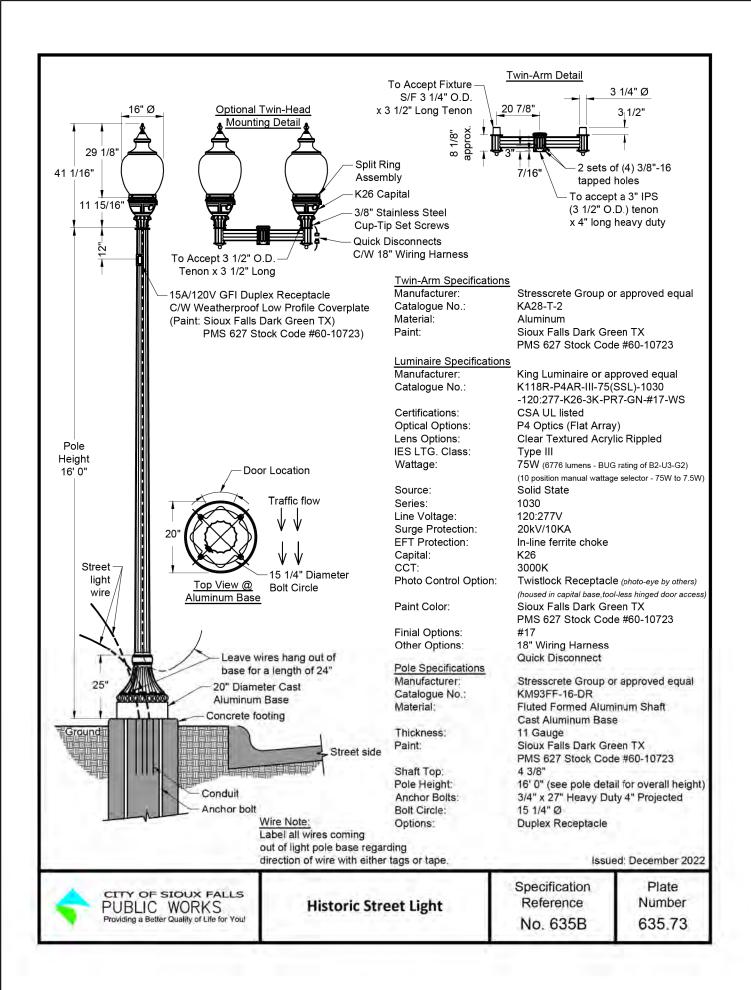
Plate Number 635.41



PROJECT EM 0292(88)73 IM 2292(104)0

SHEET TOTAL SHEETS L81 L92

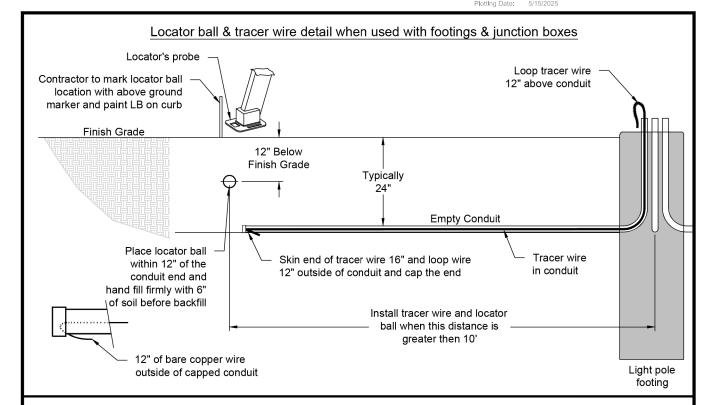




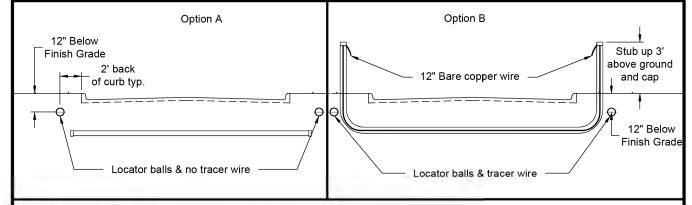
NLY DO

PROJECT EM 0292(88)73 IM 2292(104)0 SHEET TOTAL SHEETS

L82 L92



Street crossings only no footings or junction boxes



Locator Ball Marker Notes:

- 1. Before placing the locator ball over the key point, decide if a fie-down procedure is necessary to keep it in place. If so, secure the ball by inserting a cable tie through one or both tie-down tabs and to the key point (E.G. pipe or cable).
- 2. If the key point is metallic, then the locator ball should be separated from it with a minimum of 4 inches of dirt.
- 3. Otherwise, put the locator ball over the desired point.

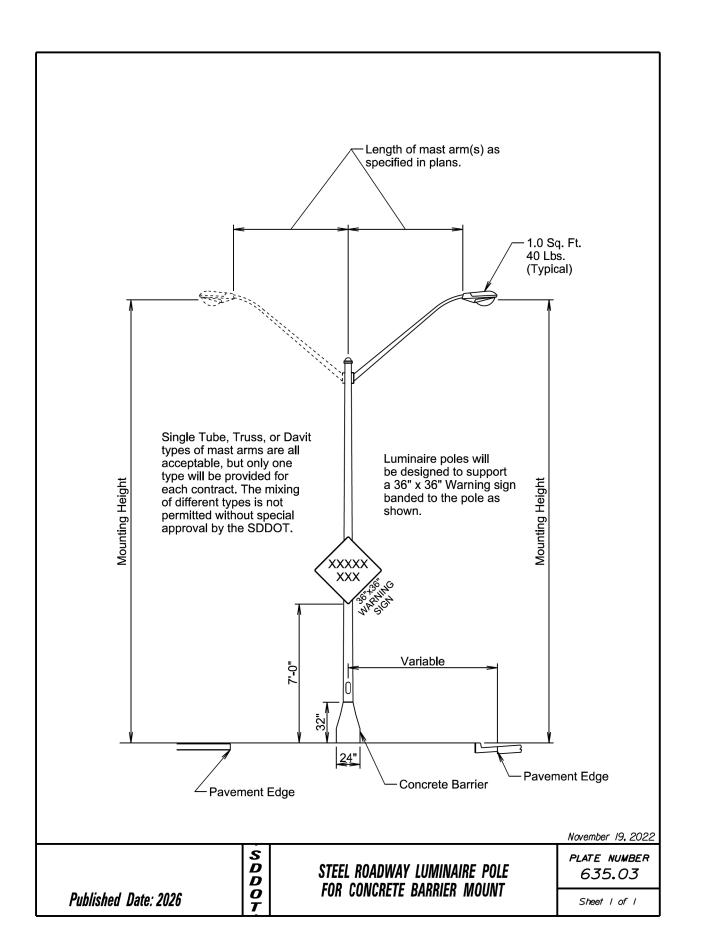
Important: The locator ball cannot reliably reradiate the locator's signal at a separation greater than 5 ft. (1.5M). This is the maximum allowable distance between the locator ball and the locator. This implies that the ball marker should be buried at a distance less than 5 ft. to allow for the distance between the locator's probe and the ground surface.

- 4. Hand fill at least six inches of soil over the locator ball.
- 5 Backfill the hole

Revised: September 2020

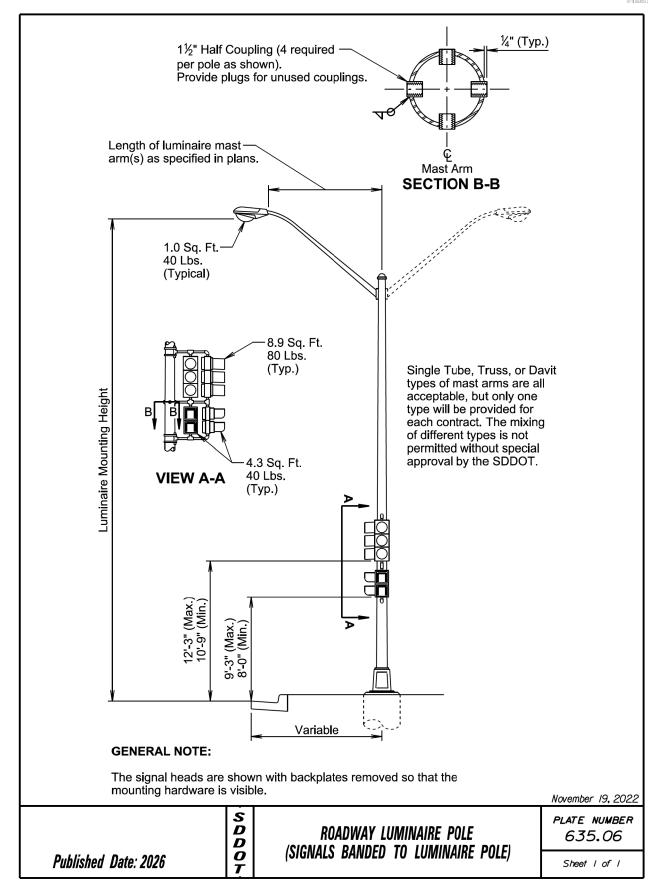


Locator Ball and Tracer Wire Specification Reference No. 635B Plate Number 635.81



PROJECT EM 0292(88)73 IM 2292(104)0

SHEET TOTAL SHEETS L83 L92



SHEET TOTAL SHEETS L84 L92

2/C #10 AWG-Pole and **Bracket Cable** -Fuse-Size per Clear Door Opening-Field Wiring Diagram A. C. Phase-Approved Splice -A. C. Phase Grounding Nut-Anchor Bolt Projection

GENERAL NOTES:

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

Fused connectors will be breakaway type.

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

November 19, 2022

Published Date: 2026

S D D O T

ROADWAY LUMINAIRE POLE BREAKAWAY TRANSFORMER BASE PLATE NUMBER 635.21

635.30

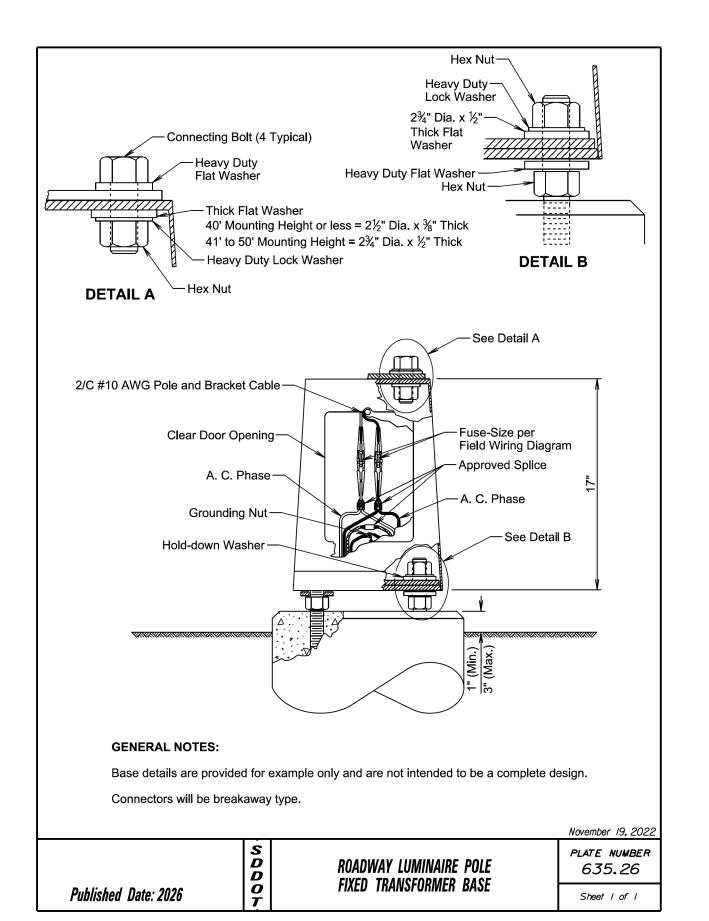
Sheet I of I

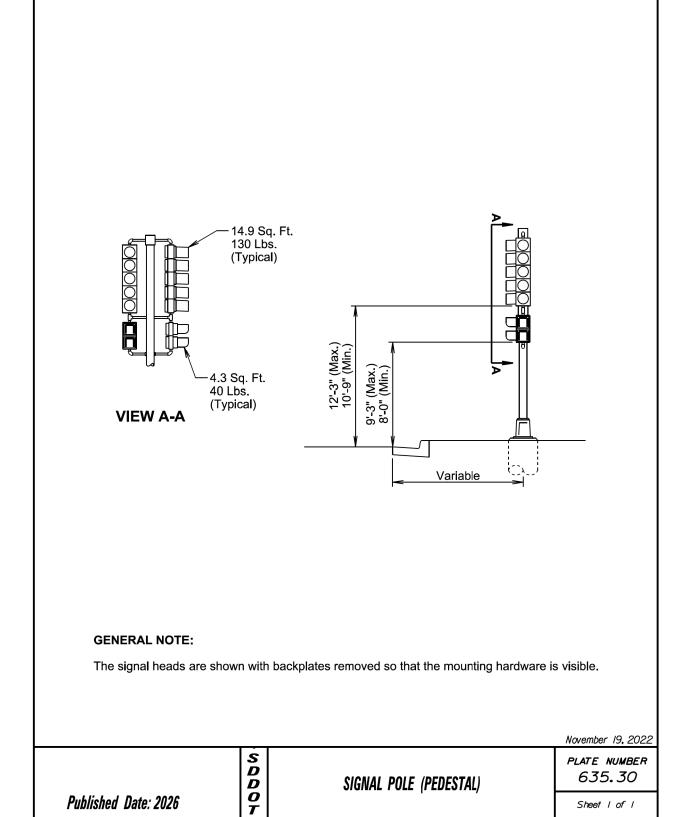
L85 L92

SHEET

TOTAL SHEETS





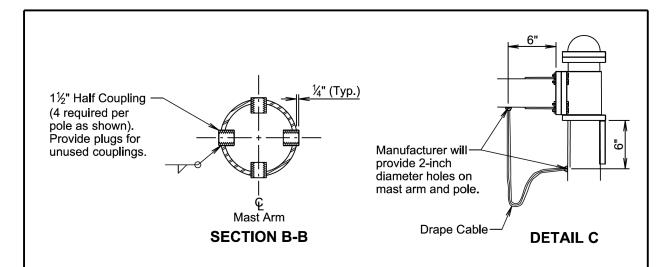


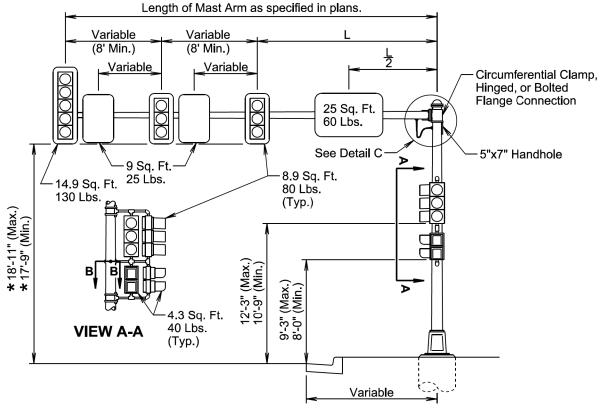
SIGNAL POLE (PEDESTAL)

Published Date: 2026

SHEET TOTAL SHEETS L86 L92







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.

D D

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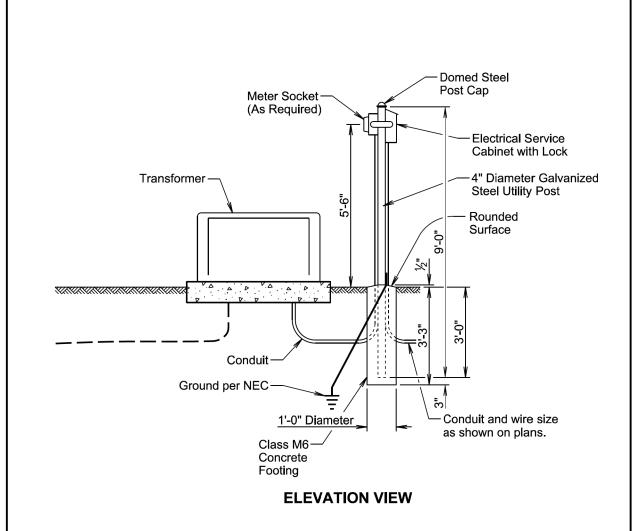
November 19, 2022

Published Date: 2026

SIGNAL POLE (WITH MAST ARM)

PLATE NUMBER 635.31

Sheet I of I



GENERAL NOTES:

Published Date: 2026

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

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

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

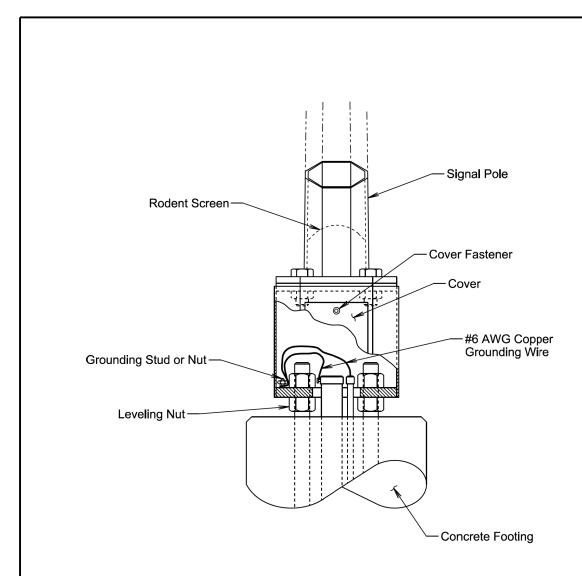
All costs for furnishing and installing all materials from the electrical service cabinet to the transformer including labor, equipment, hookup fees, all items within the cabinet, lockable enclosure with receptacle outlet, lock and keys, post, concrete footing, post cap, meter socket if required, conduit,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

March 31, 2024

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SERVICE FROM PAD MOUNTED TRANSFORMER WITH METER ON A GALVANIZED STEEL **UTILITY POST**

PLATE NUMBER 635.41



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 $\frac{1}{2}$ inch. The rodent screen will be friction fitted or installed by other methods approved by the Engineer.

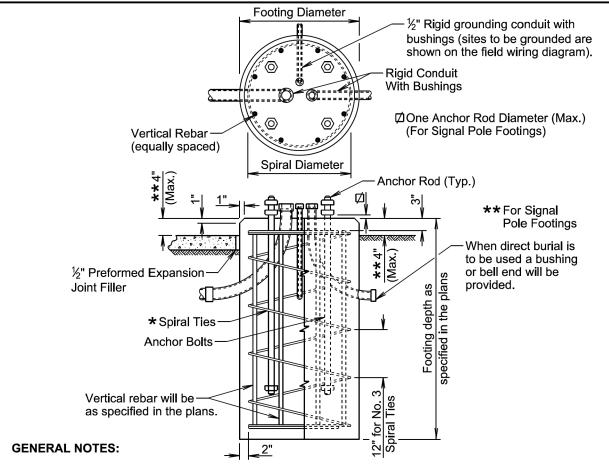
All costs for furnishing and installing the rodent screen including labor, equipment, and materials will be incidental to the contract unit price per each for the corresponding signal pole contract item.

February 14, 2020 PLATE NUMBER D D 635.50 TRANSFORMER SIGNAL POLE BASE O Published Date: 2026 Sheet I of I

FOR BIDDING PURPOSES ONLY DOT

PROJECT EM 0292(88)73 IM 2292(104)0

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★ 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).

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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 PLATE NUMBER

Published Date: 2026

POLE FOOTING

635.55

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.

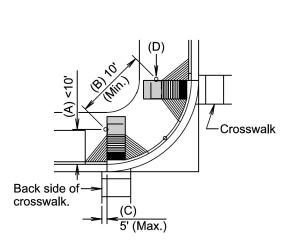
All costs for furnishing and installing the pedestrian push button pole including labor, equipment, and materials including the pole, cap, and the conduit in the footing will be incidental to the contract unit price per each for "Pedestrian Push Button Pole".

April 8, 2025 PLATE NUMBER D D 635.57 PEDESTRIAN PUSH BUTTON POLE O Published Date: 2026 Sheet I of 2

FOR BIDDING PURPOSES ONLY DOT

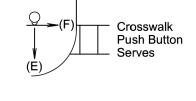
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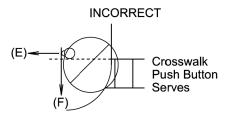


Push Button Relationship

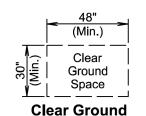
To Curb Ramp And Crosswalk



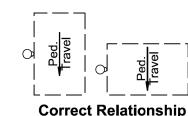
CORRECT

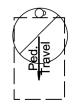


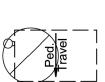
Push Button Orientation To Crosswalk



Space Dimensions







Clear space not adjacent to push button

Incorrect Relationship 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
- (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 2.1% 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.

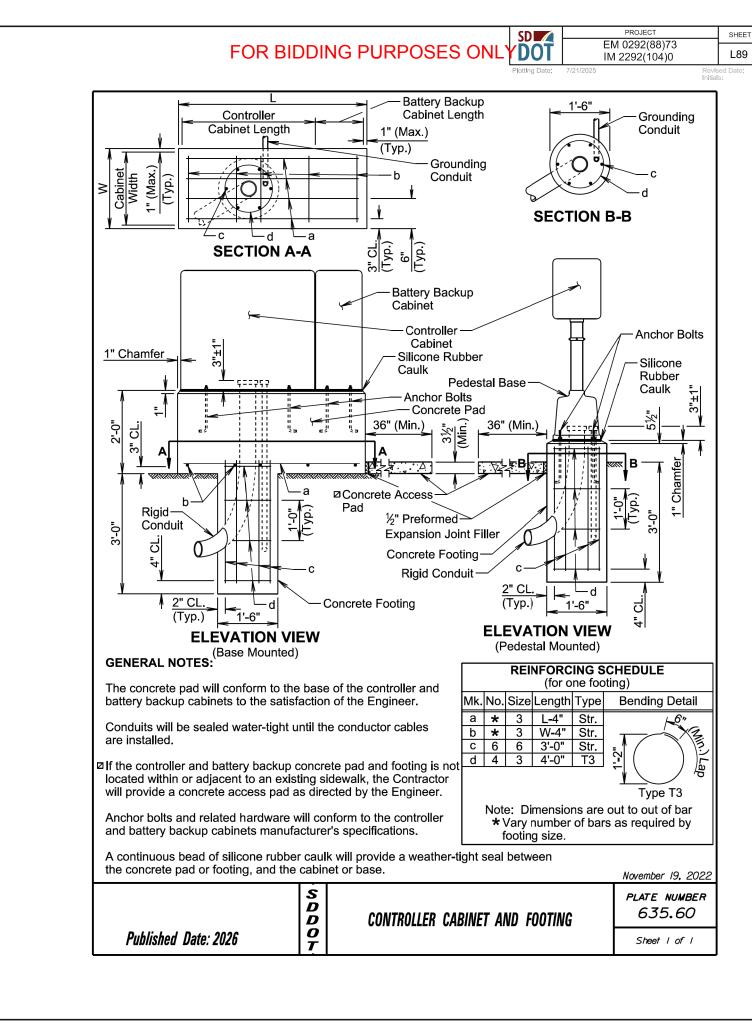
April 8, 2025

S D D 0 Published Date: 2026

PEDESTRIAN PUSH BUTTON POLE

PLATE NUMBER 635.57

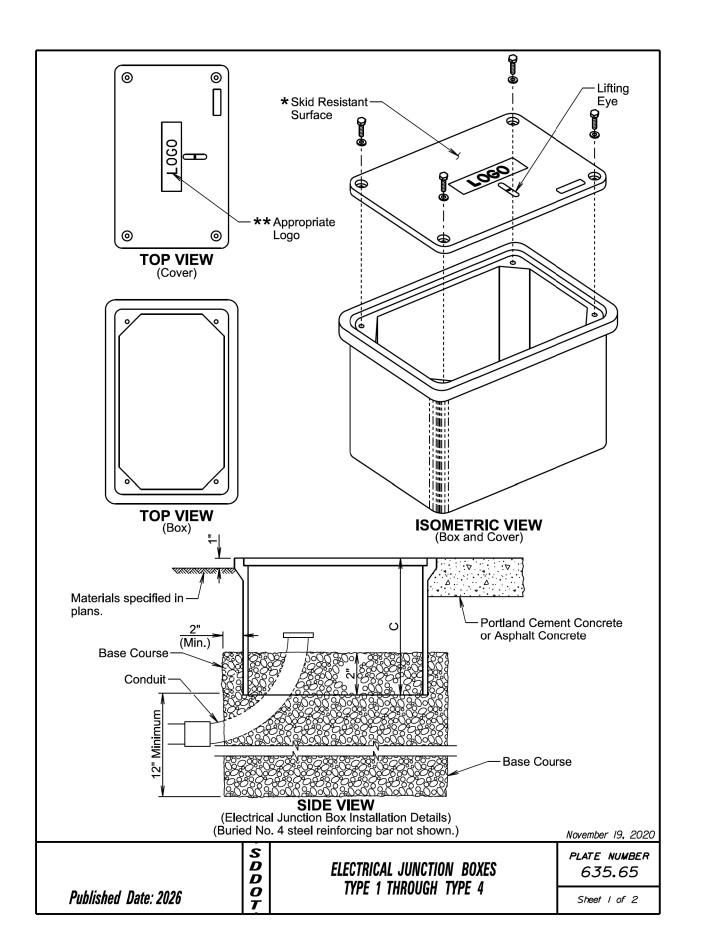
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TOTAL SHEETS

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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"			
ЗА	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 ANŠI/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".

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S D D 0 Published Date: 2026

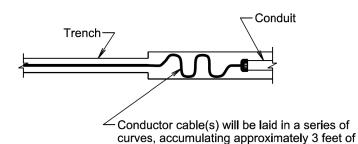
ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4

PLATE NUMBER *635.65*

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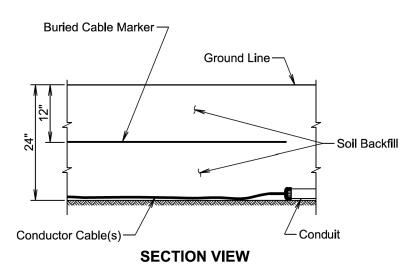
PROJECT EM 0292(88)73 IM 2292(104)0

SHEET TOTAL SHEETS L91 L92



slack before entering conduit.

PLAN 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

SDDO Published Date: 2026

DIRECT BURIAL INSTALLATION OF CONDUCTOR CABLE(S)

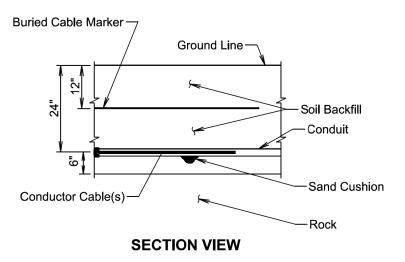
PLATE NUMBER 635.75



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Buried Cable Marker Ground Line-Soil Backfill Soil Conduit Conductor Cable(s)

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.

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CONDUIT INSTALLATION

PLATE NUMBER 635.76