

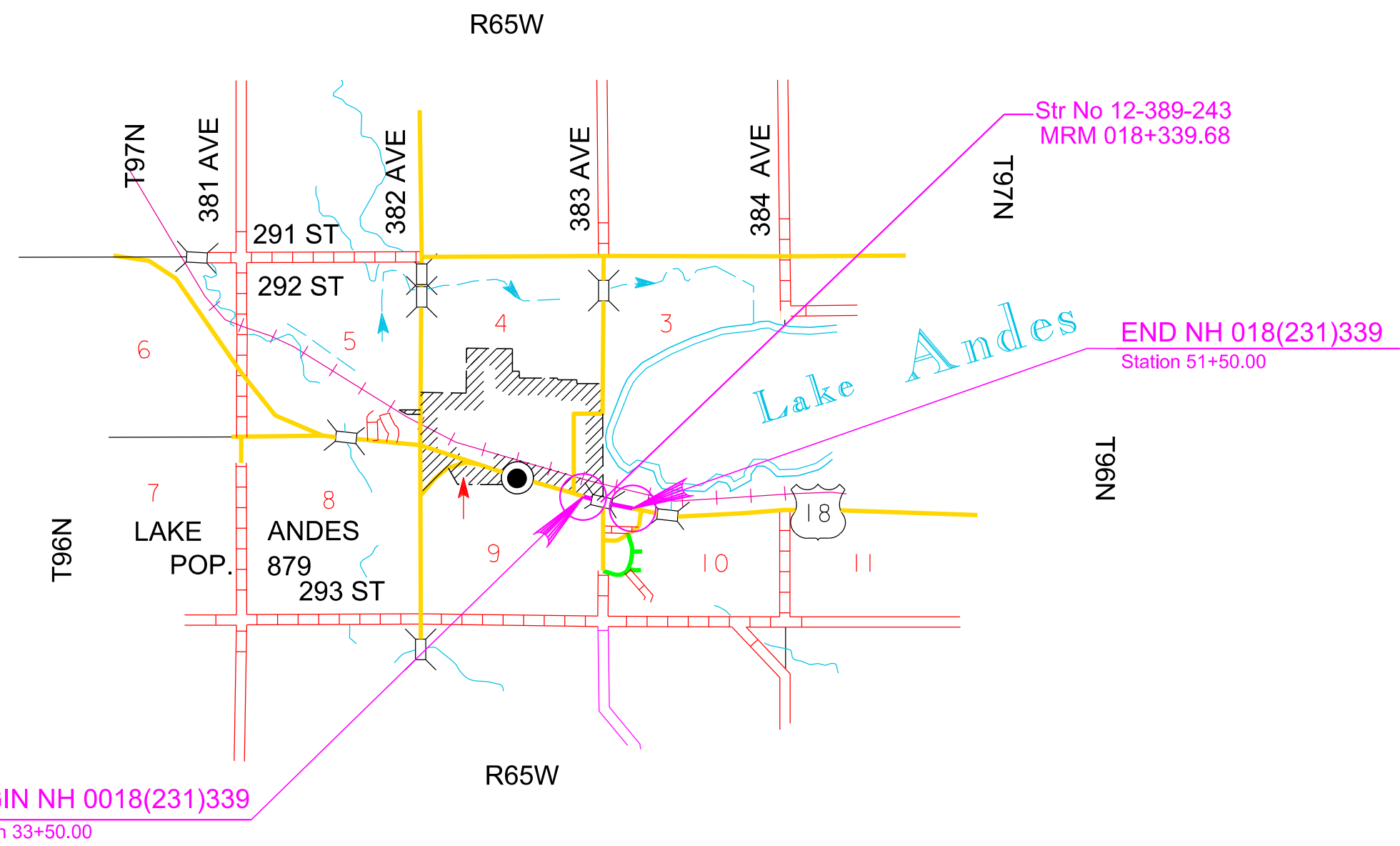
SECTION L: LIGHTING PLANS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0018(231)339	L1	L9

Plotting Date: 11/12/2024

INDEX OF SHEETS

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- L2-L3 Estimate with General Notes & Tables
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SECTION L ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
635E0040	Breakaway Base Luminaire Pole with Arm, 40' Mounting Height	2	Each
635E3700	Roadway Luminaire, LED with Photoelectric Cell	2	Each
635E5020	2' Diameter Footing	16.0	Ft
635E5301	Type 1 Electrical Junction Box	1	Each
635E5400	Electrical Service Cabinet	1	Each
635E8120	2" Rigid Conduit, Schedule 40	180	Ft
635E8220	2" Rigid Conduit, Schedule 80	75	Ft
635E9018	1/C #8 AWG Copper Wire	855	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	120	Ft

SUPPLYING AS BUILT PLANS

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

SHOP DRAWING AND CATALOG CUTS SUBMITTALS

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

PDF submittals will be sent to the following email addresses:

Ryley.Rapp@state.sd.us
Stacy.Bartlett@state.sd.us

LUMINAIRE POLES

Luminaire poles L1 to L2 will have a mounting height of 40-foot with 10-foot arms.

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

LUMINAIRES

The lighting design used the following parameters and provides 1.1 and greater average maintained foot-candles and uniformity ratios of 3:1 (average maintained to minimum maintained foot-candles) and 5:1 (maximum to minimum maintained foot candles):

Pole Setback:	11 Ft. from edge of shoulder
Lamp Loss Factor (LLF):	0.8
Width of Lighted Area:	40 Ft.
Luminaire Cycle Length:	NA
Configuration:	Staggered
Mounting Height:	40 Ft.
Arm Length	10 Ft.
Light Source:	LED

The following LED luminaires, or an approved equal, meet the requirements for this design:

- a.) AEL Autobahn: ATBO-P304-MVOLT-R2-P7
- b.) GE Evolve ERL2-0-18-A5-40-A

TABLE OF FOOTING DATA

Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
L1-L2	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.

SUBSURFACE

Installation of the footings will take place in an area where the road grade was raised with granular material. Within the raised section, layers of geogrid wrap are present. Installation is not expected to encounter geogrid; however, if drilling does intercept the geogrid, stop drilling operations and contact the Office of Road Design.

Prior to drilling the footings, the crushed rock slope protection and underlying riprap will be removed from the ground surface.

Permanent steel casing of at least 4 feet in length will be required during drilling to prevent surrounding rock from entering the boring.

Following placement and curing of the footing, the rock will be replaced, and soil cover will be placed to re-establish a 4:1 slope.

Concrete will not be dropped through standing water. If water is present in the excavation, it will be removed prior to concrete placement, or the concrete will be tremied.

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.

EXISTING UTILITY LUMINAIRE POLE EL1

The Contractor will contact Northwestern Energy to have them remove the existing luminaire pole EL1 prior to the construction of the new luminaire poles. The Contractor will give Northwestern Energy a minimum of 2 weeks' notice prior to the start of construction. Contact information:

Robert Gehm
 Northwestern Energy
 605-668-4602

The cost for the Contractor to contact and coordinate the removal of pole EL1 will be incidental to the contract unit price for "Roadway Luminaire, LED with Photoelectric Cell".

CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT NH 0018(231)339	SHEET L3	TOTAL SHEETS L9
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CONDUIT AND CABLE QUANTITIES

Location to Location	Rigid Conduit		Copper Wire		Pole and Bracket Cable																								
	Schedule 40		Schedule 40		Copper Wire		Pole and Bracket Cable																						
	2"	2"	1/C #8 AWG Ft	2/C #10 AWG Ft																									
Lighting																													
Electric Service	JL1	35		170																									
	JL1	20		65																									
	L1	125	75	620																									
Luminaires																													
Luminare Pole	L1			60																									
Luminare Pole	L2			60																									
Total:		180	0	0	75	0	0	855	0	0	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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CONDUIT LAYOUT

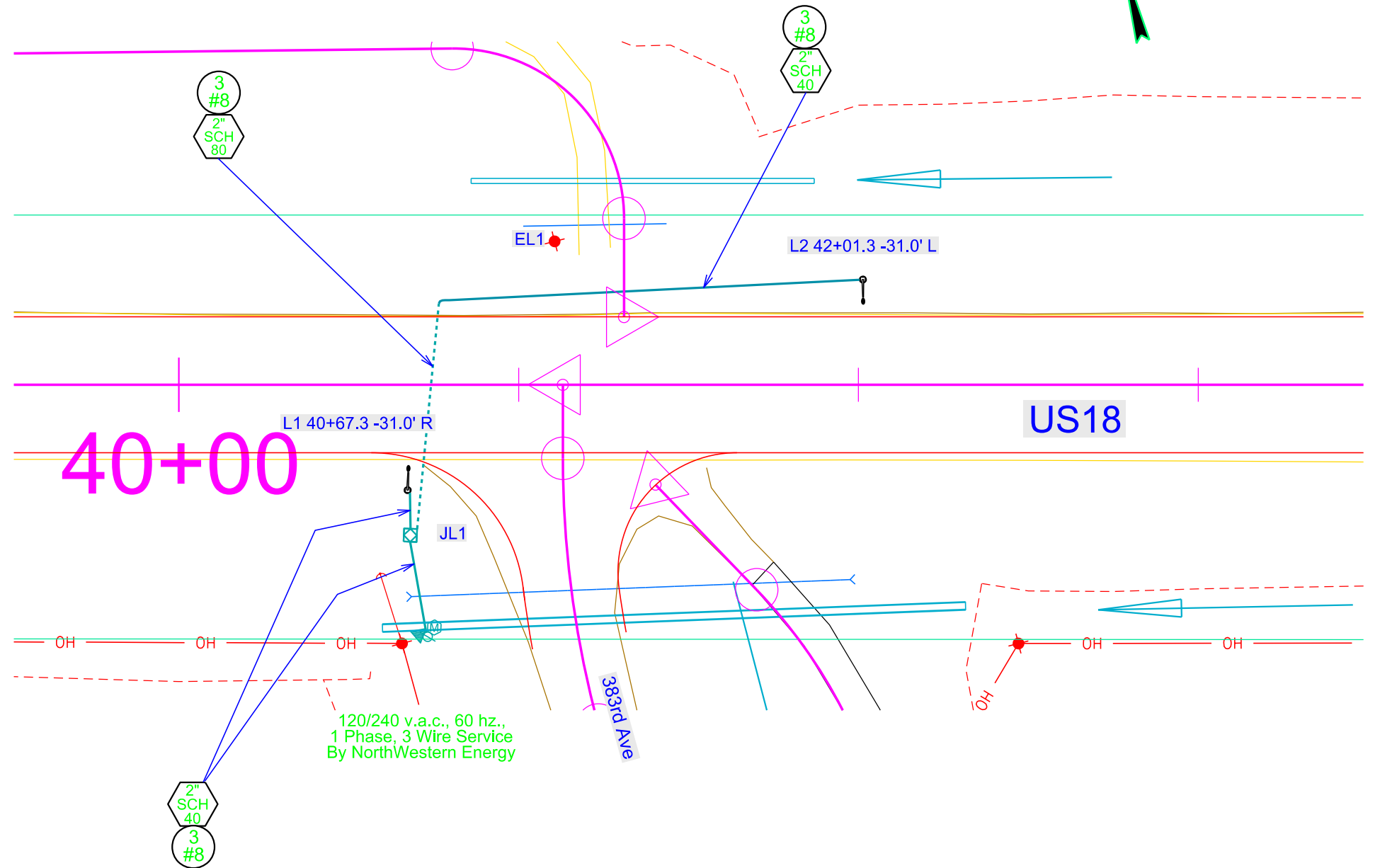
US HWY 18 / 383rd AVE

STATE OF SOUTH DAKOTA	PROJECT NH 0018(231)339	SHEET L4	TOTAL SHEETS L9
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ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	Breakaway Base Luminaire Pole w/10' Arm 40' Mounting Height (L1-L2)	2	EACH
	Roadway Luminaire, LED with P.E. (L1-L2)	2	EACH
	2' Diameter Footing (L1-L2)	16	FT
	Type 1 Electrical Junction Box (JL1)	1	EACH
	Electrical Service Cabinet	1	EACH
	Galvanized Steel Utility Pole Not a Bid Item	1	EACH
	Meter Socket Not a Bid Item	1	EACH
	2" Rigid Conduit, Schedule 40	180	FT
	2" Rigid Conduit, Schedule 80	75	FT
	1/C #8 AWG Copper Wire	855	FT
	2/C #10 AWG Copper Pole & Bracket Cable	120	FT



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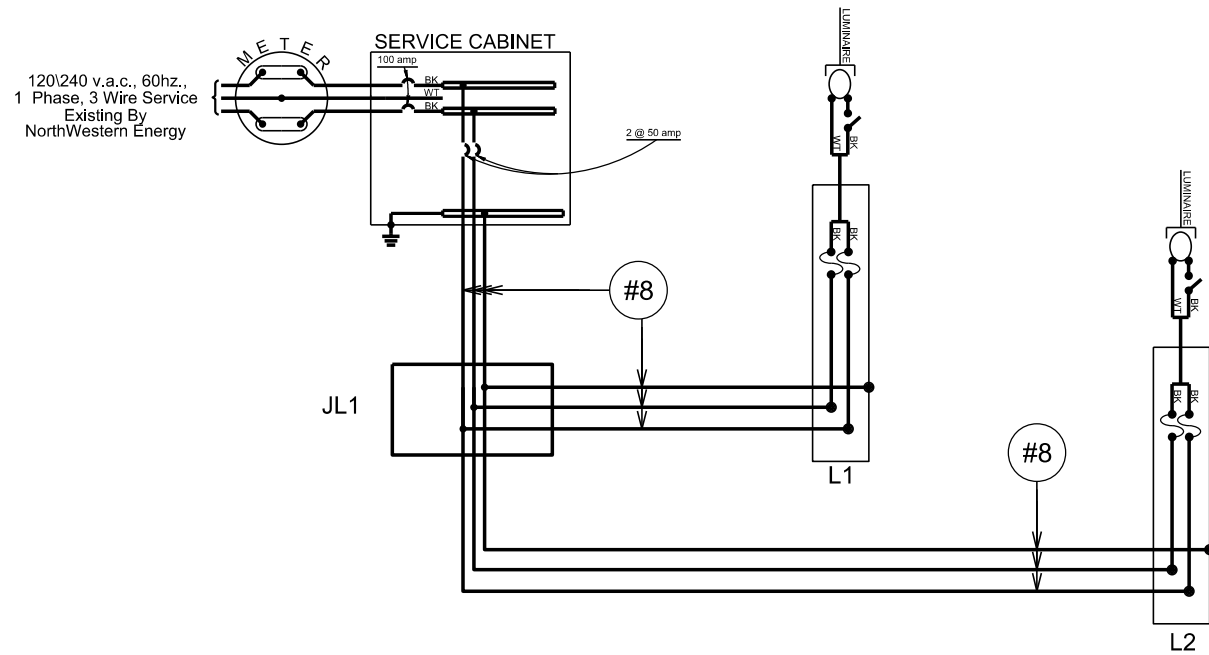
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WIRING DIAGRAM

STATE OF SOUTH DAKOTA	PROJECT NH 0018(231)339	SHEET L5	TOTAL SHEETS L9
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LEGEND:

FUSE: 10 amp.

LUMINAIRE: LED

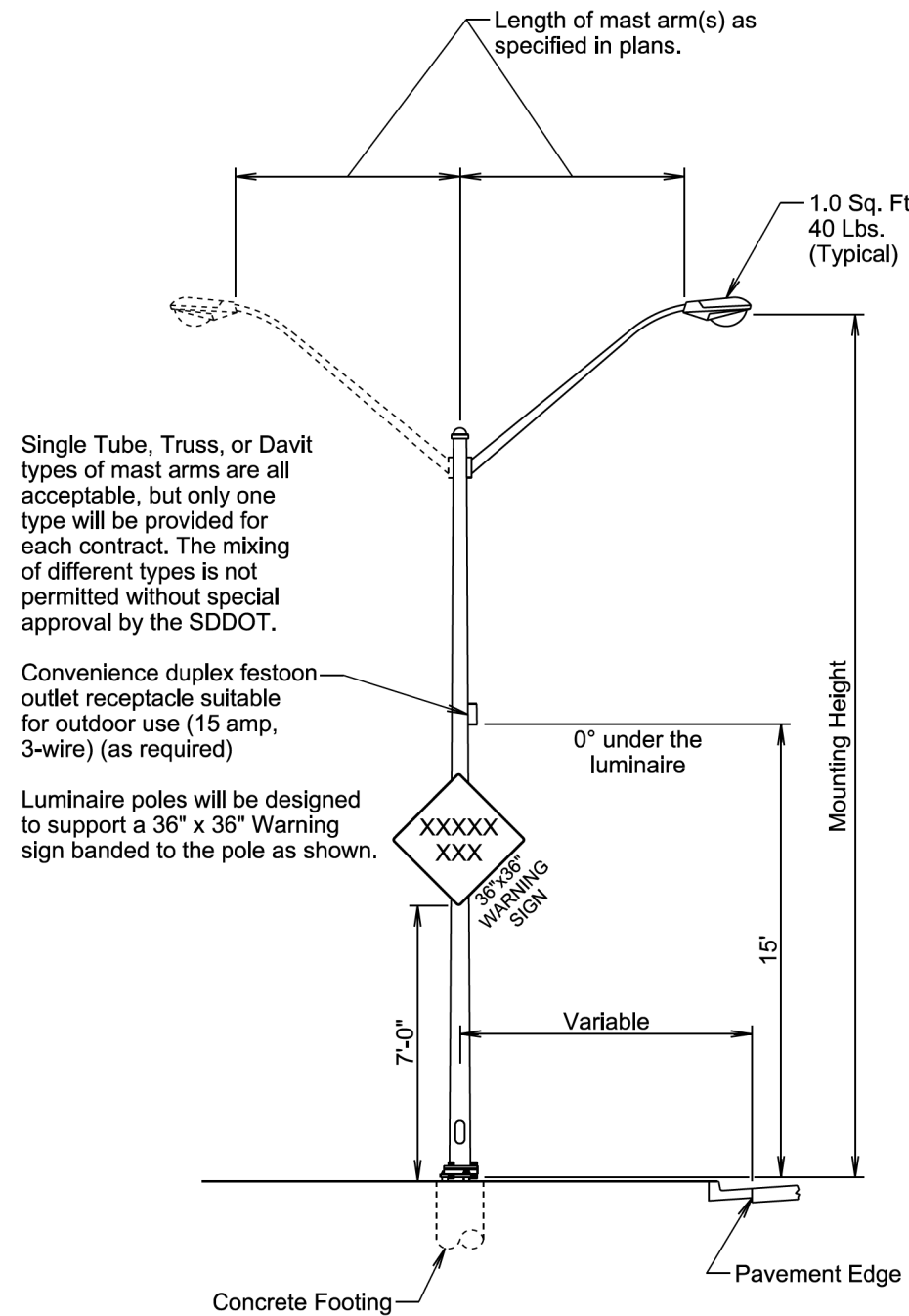
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NOTE:
All circuits will be bonded in accordance with the NATIONAL ELECTRICAL CODE. Quantities for bonding conductors are not included in these plans.

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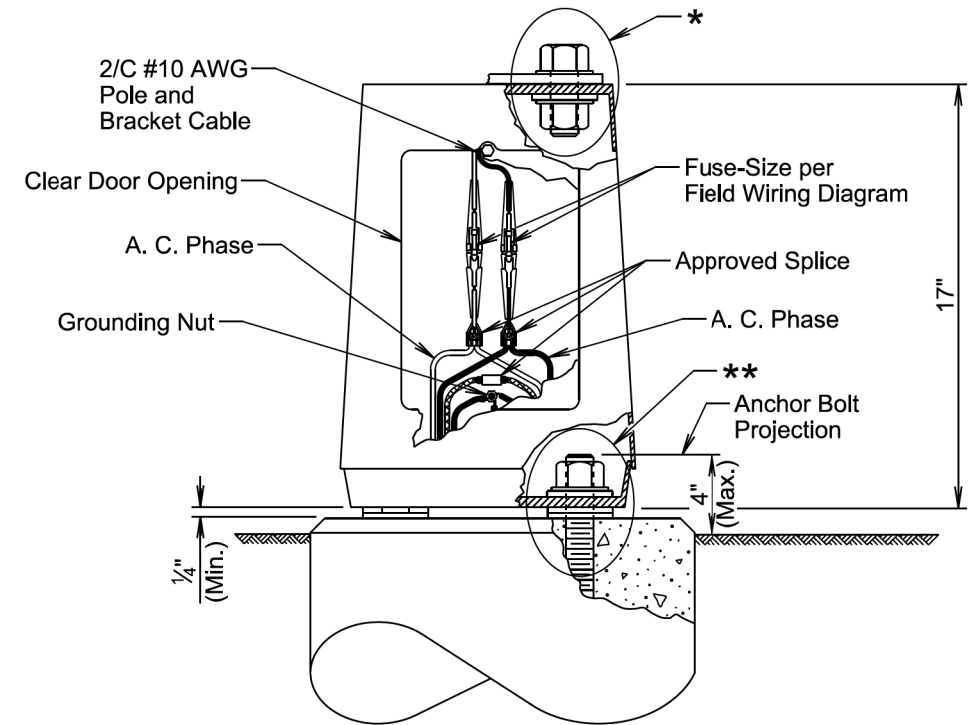
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STEEL ROADWAY LUMINAIRE POLE WITH MAST ARM(S)

PLATE NUMBER
635.01

Sheet 1 of 1



GENERAL NOTES:

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

Fused connectors will be breakaway type.

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

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

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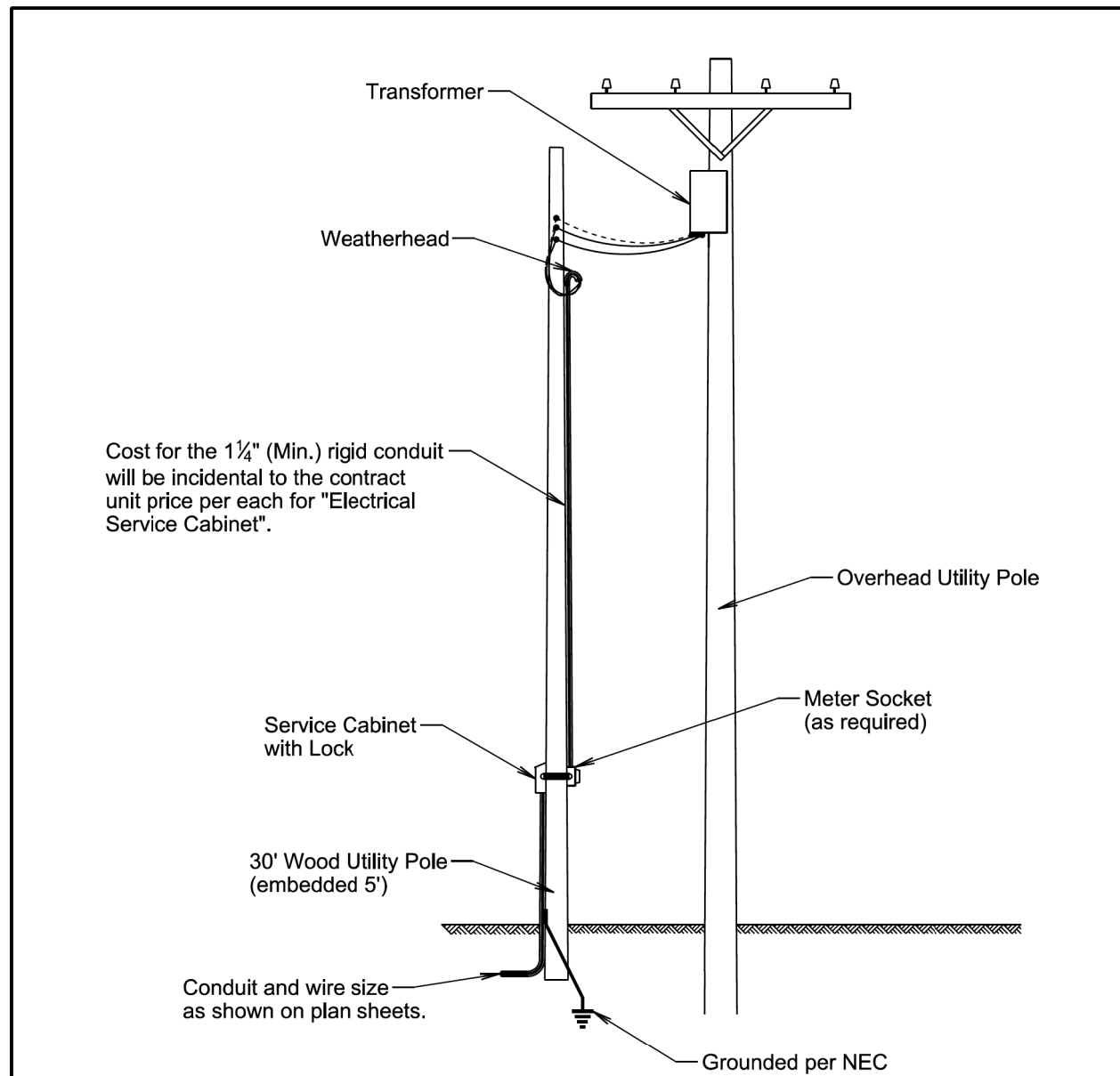
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ROADWAY LUMINAIRE POLE BREAKAWAY TRANSFORMER BASE

PLATE NUMBER
635.21

Sheet 1 of 1



Cost for the 1/4" (Min.) rigid conduit will be incidental to the contract unit price per each for "Electrical Service Cabinet".

ELEVATION VIEW

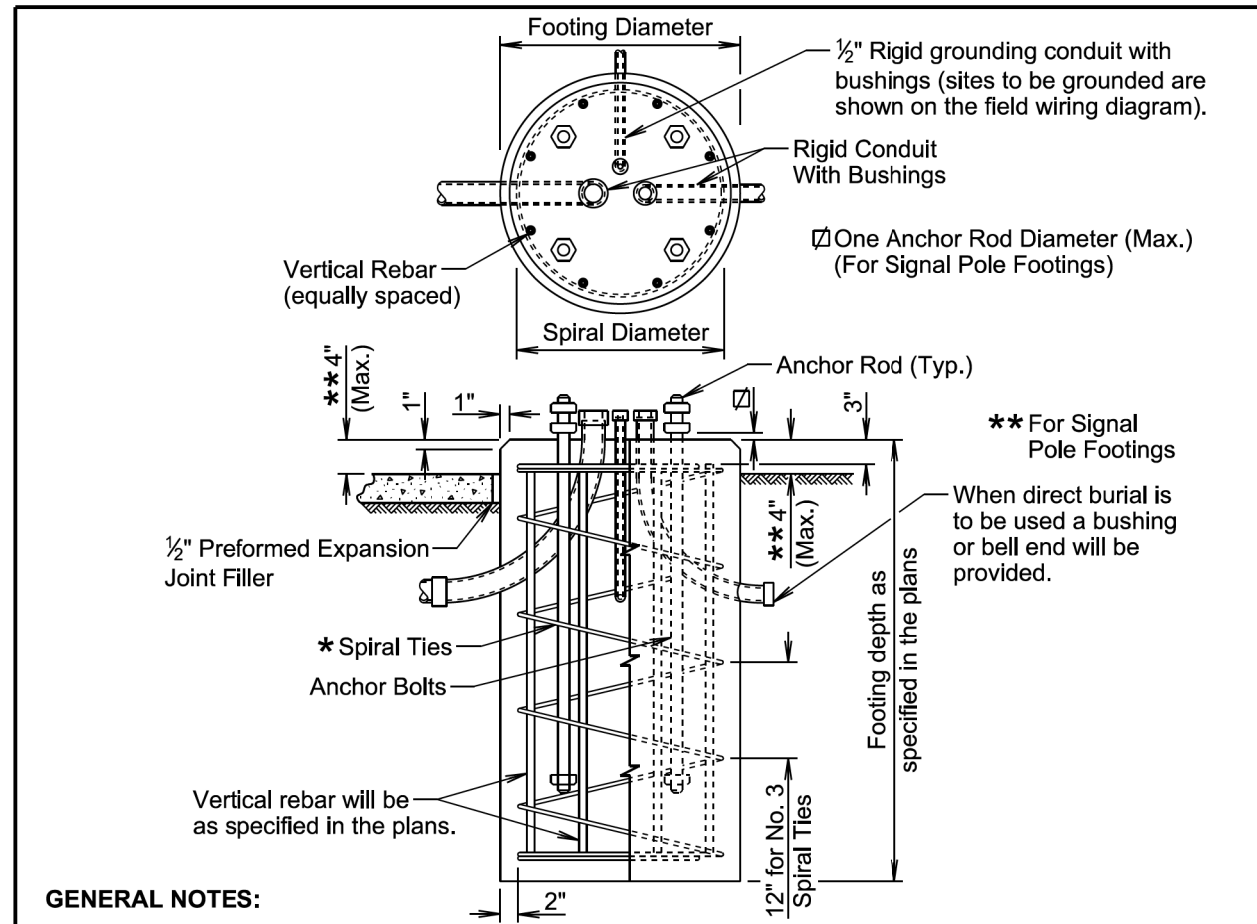
GENERAL NOTES:

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

March 31, 2024

S D D O T	30' WOOD UTILITY POLE WITH OVERHEAD UTILITY POLE	PLATE NUMBER 635.37
		Sheet 1 of 1

Published Date: 2025



GENERAL NOTES:

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

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S D D O T	POLE FOOTING	PLATE NUMBER 635.55
		Sheet 1 of 1

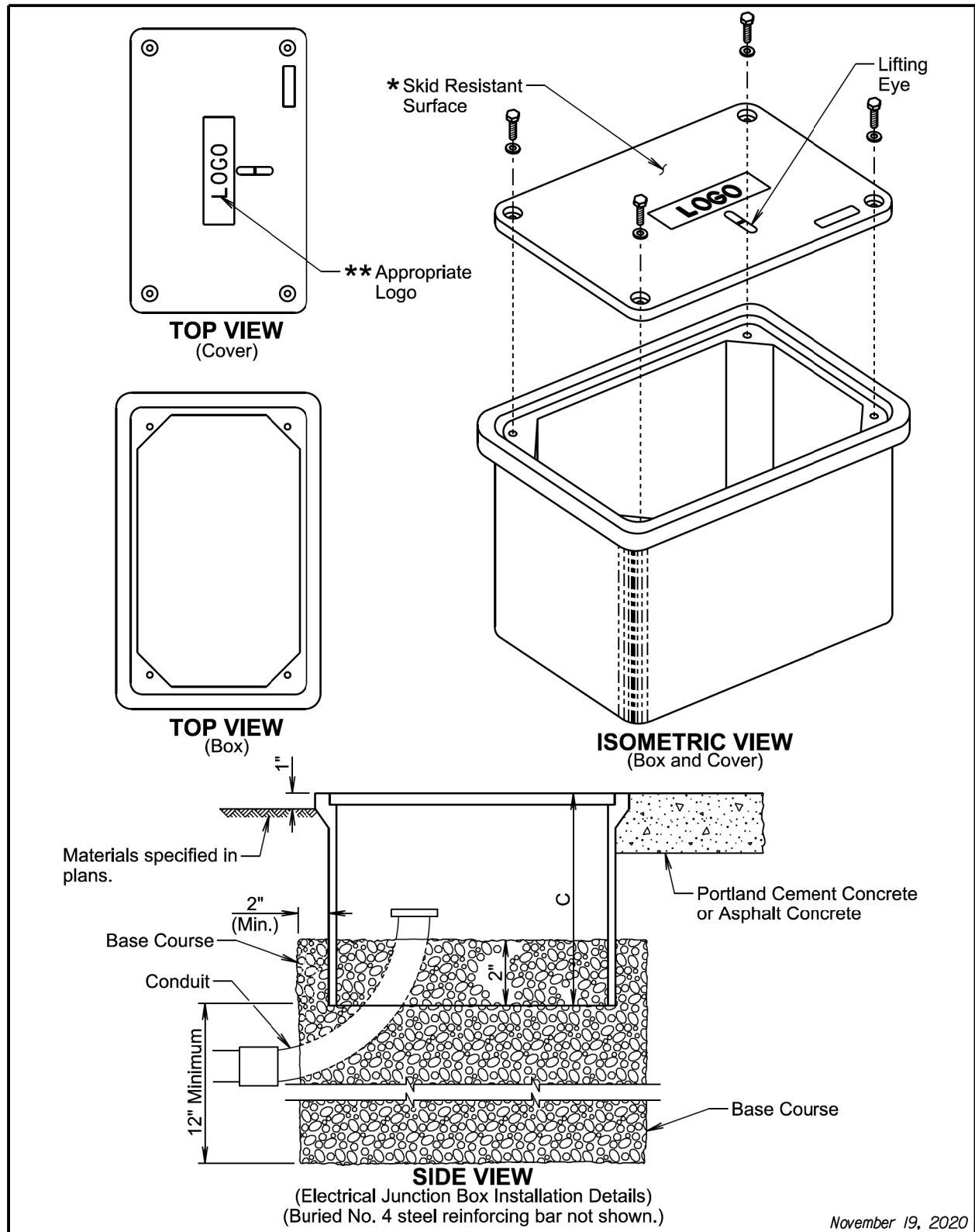
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S D D O T	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65
		Sheet 1 of 2

Published Date: 2025

ELECTRICAL JUNCTION BOX			
TYPE	DESCRIPTION	APPROXIMATE COVER SIZE	MINIMUM DEPTH (C)
1	Open Bottom with Gasket	11"x18"	18"
2	Open Bottom with Gasket	13"x24"	18"
3	Open Bottom with Gasket	17"x30"	18"
3A	Open Bottom with Gasket	24"x36"***	24"
4	Open Bottom with Gasket	30"x48"***	24"

GENERAL NOTES:

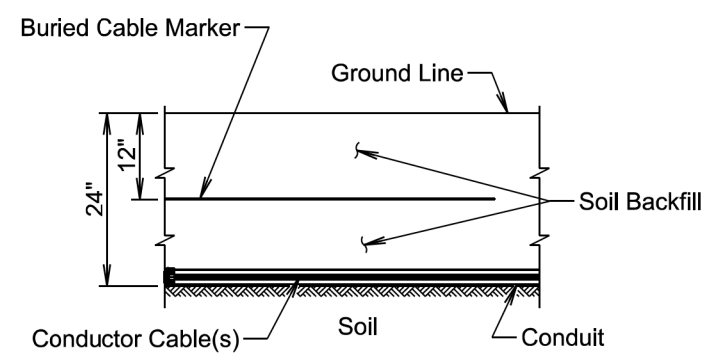
- The cover will be gasketed with a minimum of two stainless steel bolts and washers.
 - The cover will have a lifting eye.
 - ** The surface of the cover will have a minimum wet and dry coefficient of friction value of 0.5 as determined by ASTM F609.
 - *** The cover of the junction box will have the appropriate logo in one inch size letters and will be recessed. When the junction box contains cables or wires for a traffic signal then the logo will be "Signal". When the junction box contains lighting conductors then the logo will be "Lighting".
 - *** Two piece covers will be used for Type 3A and Type 4 junction boxes.
- The electrical junction boxes will comply with the American National Standards Institute (ANSI)/Society of Cable Telecommunications Engineers (SCTE) 77 2007 Specification for Underground Enclosure Integrity. The loading requirement for all electrical junction boxes and covers will be Tier 22 of ANSI/SCTE 77 2007.
- The electrical junction boxes will be UL listed.
- For junction boxes located outside of pavement, a No. 4 steel reinforcing bar with a minimum length of 18" will be buried adjacent to the long side of the junction box. All costs associated with furnishing and placing the steel reinforcing bar will be incidental to the contract unit price per each for "Type _ Electrical Junction Box".

S D D O T	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65
		Sheet 2 of 2

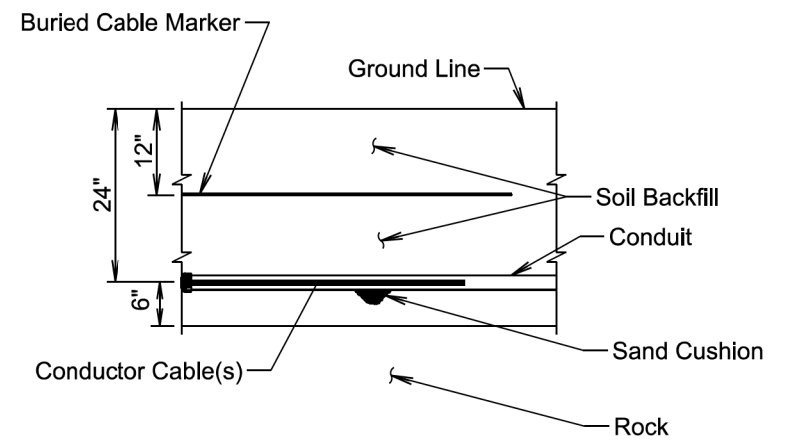
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SECTION VIEW



SECTION VIEW

GENERAL NOTE:

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

November 19, 2022

<i>Published Date: 2025</i>	S D D O T	CONDUIT INSTALLATION	PLATE NUMBER 635.76
			Sheet 1 of 1