

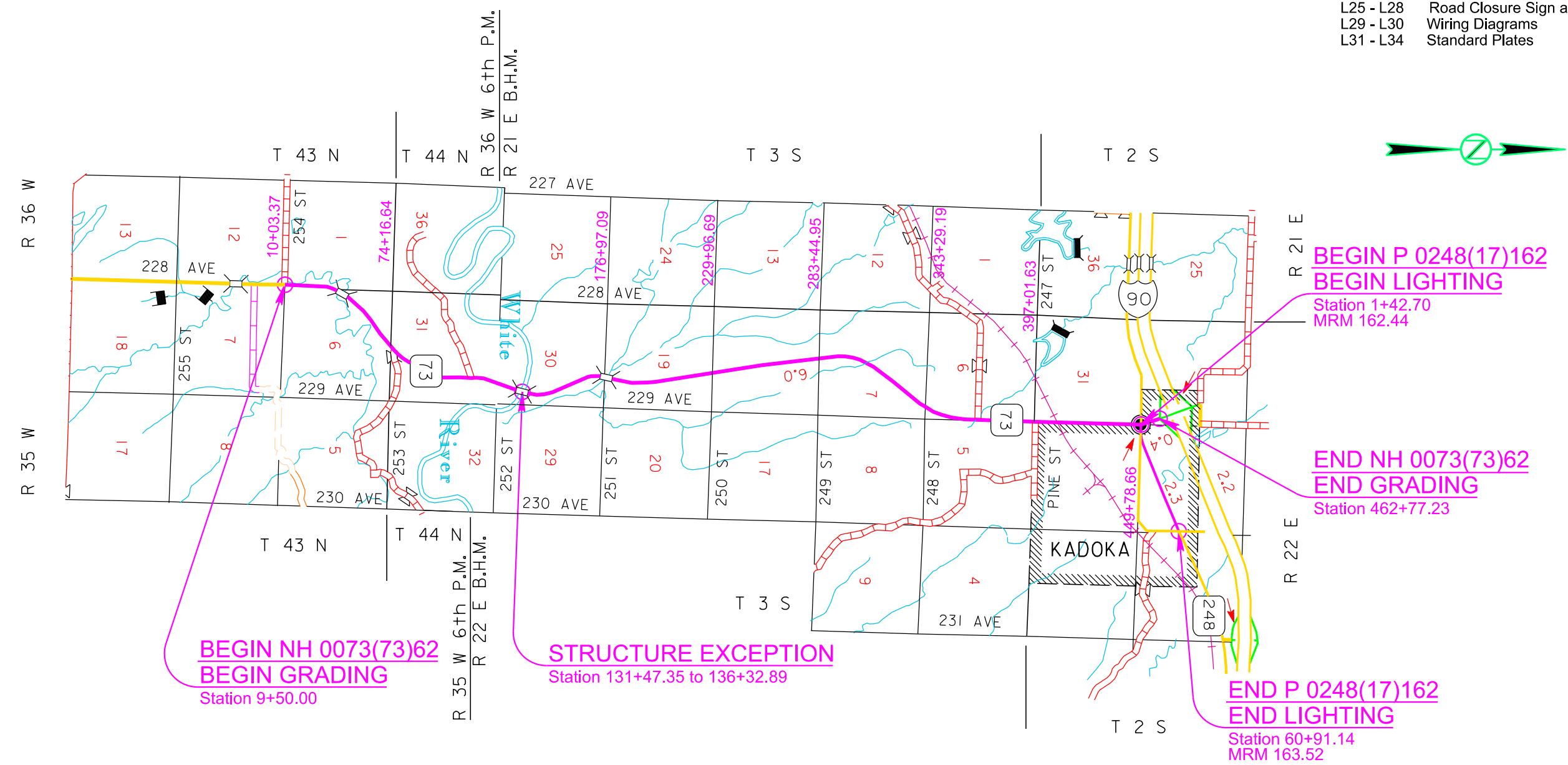
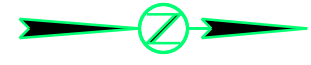
# SECTION L: LIGHTING PLANS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L1	L34

Plotting Date: 02/27/2023

### INDEX OF SHEETS

L1	General Layout W/Index
L2 - L3	Estimate With General Notes & Tables
L4 - L5	Conduit and Cable Quantities
L6 - L24	Conduit Layouts
L25 - L28	Road Closure Sign and Details
L29 - L30	Wiring Diagrams
L31 - L34	Standard Plates



Plot Scale - 1:200

Plotted From - TRR014286

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**SECTION L ESTIMATE OF QUANTITIES (NH 0073(73)62 – PCN05HV)**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
632E1225	W6x12 Steel Post	34.0	Ft
632E3115	Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity	58.8	SqFt
635E0050	Breakaway Base Luminaire Pole with Arm, 50' Mounting Height	11	Each
635E3700	Roadway Luminaire, LED with Photoelectric Cell	13	Each
635E4010	1 Section Vehicle Signal Head	2	Each
635E5020	2' Diameter Footing	88.0	Ft
635E5301	Type 1 Electrical Junction Box	1	Each
635E5400	Electrical Service Cabinet	1	Each
635E8015	1.5" Rigid Galvanized Steel Conduit	34	Ft
635E8120	2" Rigid Conduit, Schedule 40	1,780	Ft
635E8220	2" Rigid Conduit, Schedule 80	1,125	Ft
635E9018	1/C #8 AWG Copper Wire	9,000	Ft
635E9020	1/C #10 AWG Copper Wire	105	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	845	Ft

**SECTION L ESTIMATE OF QUANTITIES (P 0248(17)162 – PCN08EH)**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
250E0010	Incidental Work	Lump Sum	LS
635E0050	Breakaway Base Luminaire Pole with Arm, 50' Mounting Height	30	Each
635E3700	Roadway Luminaire, LED with Photoelectric Cell	30	Each
635E5020	2' Diameter Footing	240.0	Ft
635E5301	Type 1 Electrical Junction Box	11	Each
635E5400	Electrical Service Cabinet	1	Each
635E8120	2" Rigid Conduit, Schedule 40	6,845	Ft
635E8220	2" Rigid Conduit, Schedule 80	1,725	Ft
635E9010	1/C #0 AWG Copper Wire	580	Ft
635E9013	1/C #3 AWG Copper Wire	13,185	Ft
635E9016	1/C #6 AWG Copper Wire	6,685	Ft
635E9018	1/C #8 AWG Copper Wire	6,700	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	1,950	Ft

**SUPPLYING AS BUILT PLANS**

If the roadway lighting system 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:

[Joseph.Updike@state.sd.us](mailto:Joseph.Updike@state.sd.us)  
[Stacy.Bartlett@state.sd.us](mailto:Stacy.Bartlett@state.sd.us)

**LUMINAIRE POLES**

Luminaire poles L0 to L40 will have a mounting height of 50-feet with 6-foot arms.

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

**LUMINAIRE POLES L27 – L31**

Locations of L27 – L31 will need to be staked out in the field and approved by the Engineer prior to installation of pole footings. The location of L27 – L31 were placed beyond project survey. Edge of road and shoulder were established from aerial photos.

All costs associated with the staking of L27 – L31 will be incidental to the contract unit price per each for "Breakaway Base Luminaire Pole with Arm, 50' Mounting Height"

**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:	Varies.
Lamp Loss Factor (LLF):	0.8
Width of Lighted Area:	36 Ft.
Luminaire Cycle Length:	Varies
Configuration:	Staggered/Varies
Mounting Height:	50 Ft.
Arm Length	6 Ft.
Light Source:	LED

The following LED luminaires meet the requirements for this design:

a.) American Electric Lighting – Autobahn

ATB2\_P601\_Mvolt\_R2\_4K\_P7

b.) GE Lighting Solutions – Evolve LED

ERL2\_0\_30\_B5\_40\_A\_GRAY

**TABLE OF FOOTING DATA**

Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
L0 – L40	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 in the area consist of clay to sandy clay. Where groundwater was encountered along the lighting corridor, depths ranged from 4.7' to 8.6' during a subsurface investigation conducted in December 2019 and January 2020.

During construction of the cylindrical footings, concrete placement operations should closely follow excavation procedures. The longer the excavations are left open, the more likely caving may occur.

The contractor should not leave any excavation open for an extended period of time, as caving problems could occur due to soil type and high water table conditions. If the high water table prevents the contractor from placing the concrete for the footing with normal construction procedures, then permanent casing will be used.

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. If caving occurs during dewatering the concrete will be placed with a tremie or within a casing.

If permanent casing is used it will be of sufficient strength to minimize the amount of deformation in the cylindrical footing during the installation process. The material may consist of Sonotube, corrugated metal pipe, PVC, smooth metal pipe, or any other adequate strength material approved by the Engineer.

**LUMINAIRE EL1 and EL2**

The Contractor will disconnect, remove, and dispose of existing luminaires at EL1 and EL2. Contractor will install new "Roadway Luminaire, LED with Photoelectric Cell" matching the rest of the project. All costs for labor and material to disconnect, remove, and dispose of the existing luminaires will be incidental to the contract unit price per each for "Roadway Luminaire, LED with Photoelectric Cell."

**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.

**REMOVE LUMINAIRE POLE EL3 – EL5**

Existing luminaire poles EL3 – EL5 are owned by West Central Electric. Contractor to coordinate with the City of Kadoka concerning getting them removed.

City of Kadoka  
 Patrick Solon, Street Maintenance  
 605-837-2140  
[kadokacity@goldenwest.net](mailto:kadokacity@goldenwest.net)

**INCIDENTAL WORK**

Incidental work included in the L-section is for project P 0248(17)162 includes, but is not limited to, the restoration of all disturbed areas to the satisfaction of the Engineer.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L3	L34

Plotting Date: 08/10/2023 Revision Date: 08/09/2023 JU

## 1 SECTION VEHICLE SIGNAL HEAD 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 dull black finish. 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.

Signal will be aimed such that all the signals for each approach will be continuously visible for the minimum distance listed in the table in Section 4D.12 or the MUTCD.

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 "1 Section Vehicle Signal Head"

### GENERAL PERMANENT SIGNING

Sign installation will be as shown in the plans.

The installation height of signs will not exceed the minimum by more than 1.0 feet. Signpost will not extend beyond the top of the sign.

Sign will be installed per the Road Closure Gate and Signing Installation Tables.

Prior to ordering signs, the Contractor will verify dimensions, background, border, and legend of the signs.

### NEW PERMANET SIGNING – CA2

All signs will be manufactured in accordance with the sheeting manufacturer's recommendations utilizing a matched component system, including inks, electronic cuttable films, and protective overlay films.

All Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity will have sheeting in conformance with the requirements of ASTM D4956 Type IV. All Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity will have sheeting in conformance with the requirements of ASTM D4956 Type XI

Contractor to install sign assembly CA2, on existing footings and breakaway supports. All items shown in Detail D, are existing, with the exception of sign CA2 and associated hardware and sign conduits. Conduit and wiring from meter to junction box JA24 are in working condition. Contractor will need to make electrical connection in JA24.

All cost associated with furnishing and installing the new permanent sign, furnishing and installing stiffeners, and all hardware noted on erection detail will be incidental to the contract unit price per square foot for "Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity".

### SIGN DESIGN

Signs shall be constructed as required per the Manual on Uniform Traffic Control Devices (MUTCD), the latest edition of "Standard Highway Signs", and/or as specified on the Special Design Signs sheet shown in the plans.

All sign material shall comply with Section 982 of the Standard Specifications.

All upper/lower case letters and numerals shall be as required per the MUTCD, the latest edition of "Standard Highway Signs", and/or as illustrated on the Special Design Signs sheets.

### FABRICATION

Retroreflective sheeting will be applied to a properly cleaned and prepared aluminum sign blank in accordance with the retroreflective sheeting manufacturer's recommendations. Sign legend will be applied using digital print technologies and systems in accordance with the retroreflective sheeting manufacturer's recommendations and the requirements of these plans.

Finished signs will be free of ragged edges and must be supplied clean and free of scratches, grease, oil, lubricants or other contaminants. Minor blemishes (dirt speck, dust, etc.) may settle on the fresh ink surface or become entrapped between the sheeting surface and transparent overlay film due to static charge within the sign shop environment. Any blemish must be minor and not interfere with the communication of the sign message to the motorist. The blemish must not be visible to the naked eye when viewed from 30 feet or greater.

After application of the retroreflective sheeting, sign blanks will be stacked and packaged face to face, back to back, and protected in accordance with the sheeting manufacturer's recommendations. Finished signs will be securely packaged to prevent damage during transit or storage according to the sheeting manufacturer's recommendations.

### SIGN SHEETING

Signs shall be constructed using Super or Very High Intensity reflective sheeting. Super or Very High Intensity reflective sheeting is defined as that which meets the standards of Type IX as defined by AASHTO designation M268 (ASTM D4956). The fluorescent yellow reflective sheeting must meet the Fluorescent Daytime Color and Fluorescent Luminance Factor requirements, and shall conform to standard highway colors as defined in 23 CFR 655 subpart F.

All signs shall be manufactured in accordance with the sheeting manufacturer's recommendations utilizing a matched component system, including inks, electronic cuttable films, and protective overlay films. Digitally printed signs will not be accepted.

All black legend and borders shall be nonreflectorized (unless otherwise specified in these plans).

### INSTALLATION OF OVERLAY

The overlay sections will be fabricated as to minimize the number of seams. Overlays will be attached to the extruded aluminum panels beginning with the pieces along the top of the sign. Fastening will proceed from the top of the overlay downward working out any bulges.

Fasteners will be aluminum rivets 5/32" in diameter. Rivets will be placed at 9" +/- 1" centers along the horizontal and vertical seams. Rivets will be placed 1/4" to 1/2" from the edges of the overlay pieces. Adjoining overlays will be butted tightly together before fastening begins. In addition to the perimeter rivets, fasteners are required inside the overlay spaced approximately 1' vertically and 2' horizontally from the overlay piece edges.

Prior to installing overlays, all extruded aluminum panels will be level and edges plumb. Post clips on the back of the sign will be tightened to the post.

### SIGN COLORS SHALL BE AS SHOWN:





## DIGITALLY PRINTED SIGNS

Digitally printed signs will be allowed on this project. If the Contractor elects to provide digitally printed signs, such signs will adhere to the following specifications.

### PROTECTIVE OVERLAY FILM

Permanent traffic signs printed with digital ink systems will be fabricated with a full sign protective overlay film designed to provide a smooth surface needed for retroreflectivity, and to protect the sign from fading and UV degradation. The overlamine will comply with the retroreflective sheeting manufacturer's recommendations to ensure proper adhesion and transparency and will also meet the reflective film durability as identified in Table 1.

Table 1: Retroreflective Film Minimum Durability Requirements

ASTM D4956 Type	Full Sign Replacement Term (years)	Sheeting Replacement Term (years)
I	0	7
III	7	10
IV	7	10
VIII	7	10
IX	7	12
XI	7	12

### FABRICATION

Retroreflective sheeting will be applied to a properly cleaned and prepared aluminum sign blank in accordance with the retroreflective sheeting manufacturer's recommendations. Sign legend will be applied using digital print technologies and systems in accordance with the retroreflective sheeting manufacturer's recommendations and the requirements of these plans.

Finished signs will be free of ragged edges and must be supplied clean and free of scratches, grease, oil, lubricants or other contaminants. Minor blemishes (dirt speck, dust, etc.) may settle on the fresh ink surface or become entrapped between the sheeting surface and transparent overlay film due to static charge within the sign shop environment. Any blemish must be minor and not interfere with the communication of the sign message to the motorist. The blemish must not be visible to the naked eye when viewed from 30 feet or greater.

After application of the retroreflective sheeting, sign blanks will be stacked and packaged face to face, back to back, and protected in accordance with the sheeting manufacturer's recommendations. Finished signs will be securely packaged to prevent damage during transit or storage according to the sheeting manufacturer's recommendations.

### TRAFFIC SIGN PERFORMANCE WARRANTY PROVISIONS

Based on the ASTM Type of sheeting specified, traffic control signs will be warranted for the duration shown in Table 1. Full product terms and conditions are as established by each sheeting manufacturer and may contain certain limitations based on sheeting and ink colors, and geographic exposure of the sign. A copy of the warranty document with complete details of terms and conditions will be supplied if requested by the Engineer.

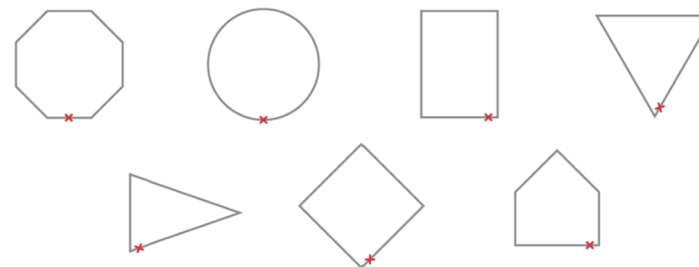
### CERTIFIED DIGITAL SIGN FABRICATOR

Sign fabricators using digital imaging methods to produce regulated traffic signs must be certified by the reflective sheeting manufacturer whose materials are used to produce the delivered signs.

### DATE TAGGING SIGNS WITH PERTINENT INFORMATION

All digitally printed signs are required to be date-tagged with the following 2 components:

1. Date tags on the back of signs  
Tags will have the following information and be fabricated with material and printing system that are as durable as the warranted sign.
  - Name of Sign Fabricator
  - Date the sign was fabricated (month and year)
  - Process that was used for sign fabrication (digitally printed)
  - Supplier of sheeting that was used for fabricating the sign.
2. Border date  
The month and year (mm/yyyy) of sign fabrication will be printed in the border of the sign in 3/8" sans serif font. Border date will be printed with the same warranted printed system as the sign face. The date should be printed in the locations indicated below.



### MILEAGE REFERENCE MARKERS

Mileage Reference Markers (MRMs) are not to be disturbed. If an MRM is attached to a sign listed for replacement it will be salvaged and reattached to the new sign in the same location. Payment for this work will be incidental to the various signing contract items.

# CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT NH 0073(73)62 P 0248(17)162	SHEET L4	TOTAL SHEETS L34
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Plotting Date: 02/27/2023

Location to Location		Rigid Conduit		Copper Wire				Pole and Bracket Cable	
		Schedule 40	Schedule 80	1/C #0 AWG	1/C #3 AWG	1/C #6 AWG	1/C #8 AWG	2/C #10 AWG	
		Ft	Ft	Ft	Ft	Ft	Ft	Ft	
<b>LIGHTING</b>									
SERVICE	JL7	115'				360'		360'	
JL7	L16		105'					325'	
JL7	JL6		70'			220'		220'	
JL6	L15	95'						295'	
L15	L14	100'	65'					510'	
L14	JL5	195'	70'					820'	
JL5	L13		70'					220'	
JL5	L12	280'						870'	
L12	L11	210'	80'					900'	
L11	JL4	190'	85'					850'	
JL4	L10	70'						220'	
JL4	L9	295'						915'	
L9	JL3	180'	125'					945'	
JL3	L8		75'					235'	
JL3	L7	185'	85'					835'	
L7	L6	305'						945'	
L6	L5	260'						805'	
JL6	L17	370'							
L17	JL8	170'	95'			1,145'			
JL8	L18		70'			820'			
JL8	L19	210'	90'					220'	
L19	JL9	230'				930'			
JL9	L20		70'			715'			
JL9	L21	315'						220'	
L21	JL10	270'				975'			
JL10	L22		70'			835'			
JL10	L23	300'						220'	
L23	JL11	200'	70'			930'			
JL11	L24		80'			835'			
JL11	L25	275'						250'	
L25	JL12	130'	160'			850'			
JL12	L26		85'			900'			
JL12	L27	275'						265'	
L27	L28	275'				850'			
L28	L29	275'				850'			
L29	L30	275'				850'			
L30	L31	275'				850'			
SERVICE	JL1	155'						480'	
JL1	L0	75'	65'					435'	
JL1	L1		120'					375'	
L1	L2	160'						495'	
L2	JL2	245'						760'	
JL2	L3		105'					325'	
JL2	L4	115'						360'	
L1	L36	195'	70'					820'	
L36	L35	70'	215'					885'	
L35	L34	175'	100'					850'	
L34	L33	275'						850'	
L33	L32	275'						850'	
JL1	L37	90'	100'					590'	
L37	L38	240'	75'					975'	
L38	L39	95'	200'					915'	
<b>Subtotal:</b>		8,490'	2,670'			580'	13,185'	6,685'	14,725'

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# CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT NH 0073(73)62 P 0248(17)162	SHEET L5	TOTAL SHEETS L34
Plotting Date: 02/27/2023			

Location to Location	Rigid Conduit				Copper Wire				Pole and Bracket Cable	
	Schedule 40		Schedule 80		1/C #0 AWG	1/C #3 AWG	1/C #6 AWG	1/C #8 AWG	2/C #10 AWG	
	2"	Ft	2"	Ft	Ft	Ft	Ft	Ft	Ft	Ft
<b>LIGHTING CONTD</b>										
L39										975'
<b>LUMINAIRES</b>										
L0										65'
L1										65'
L2										65'
L3										65'
L4										65'
L5										65'
L6										65'
L7										65'
L8										65'
L9										65'
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L31										65'
L32										65'
L33										65'
L34										65'
L35										65'
L36										65'
L37										65'
L38										65'
L39										65'
L40										65'
EL1										65'
EL2										65'
<b>Subtotal:</b>										
		135'		180'						975'
<b>Total:</b>										
		8,625'		2,850'				580'	13,185'	6,685'
										15,700'
										2,795'

Plot Scale - 1:200

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# CONDUIT LAYOUT

## SD HWY 73 & SD HWY 248

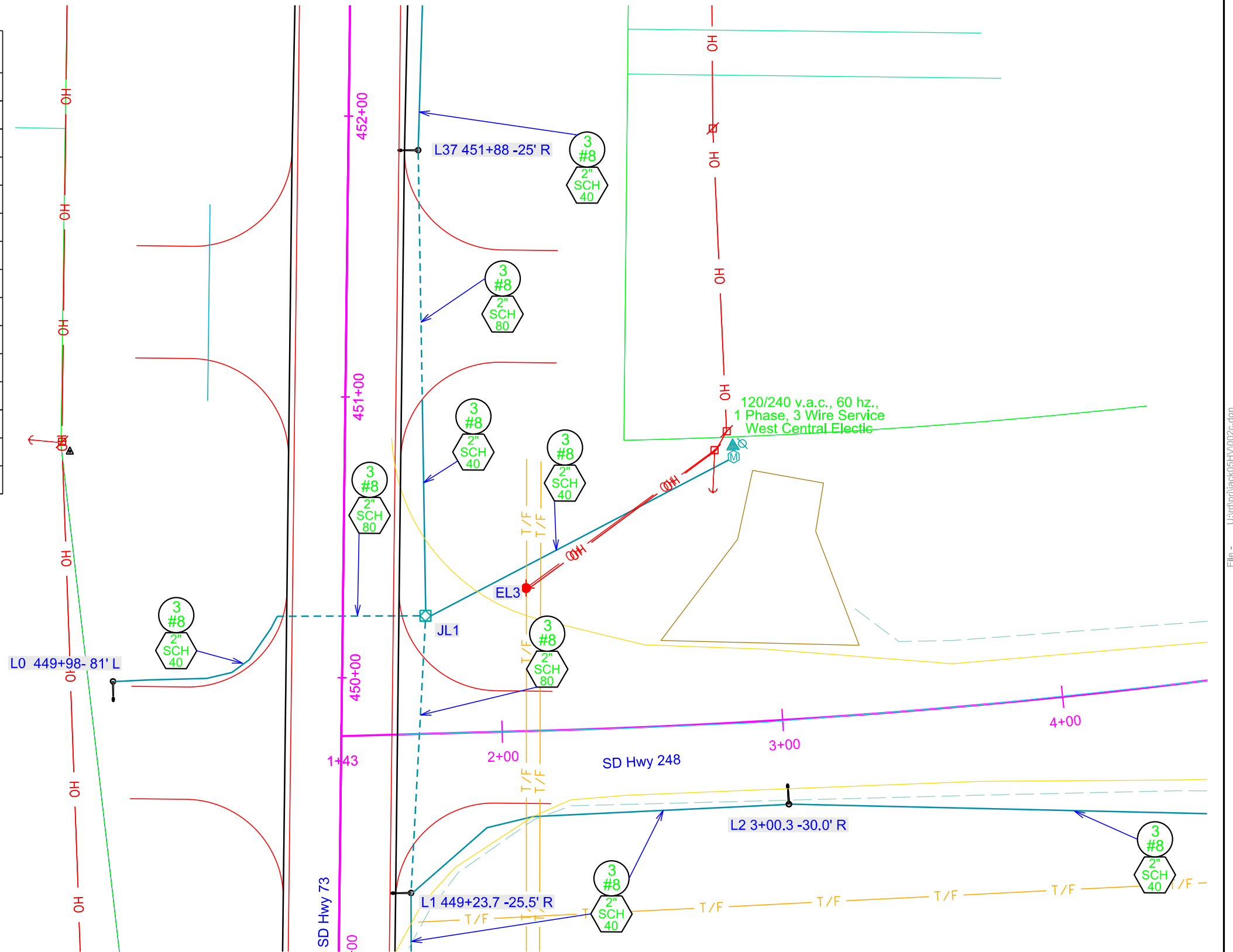
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L6	L34

Plotting Date: 02/27/2023



### ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	Breakaway Base Luminaire Pole w/6' Arm 50' Mounting Height (L0-L40)	41	EACH
	Roadway Luminaire, LED with P.E. (L0-L40, and EL1,EL2)	43	EACH
	2' Diameter Footing (L0-L40)	328	FT
	Type 1 Electrical Junction Box (JL1-JL12)	12	EACH
	Electrical Service Cabinet	2	EACH
	Galvanized Steel Utility Pole Not a Bid Item	2	EACH
	Meter Socket Not a Bid Item	2	EACH
	2" Rigid Conduit, Schedule 40	8,625	FT
	2" Rigid Conduit, Schedule 80	2,850	FT
	1/C #0 AWG Copper Wire	580	FT
	1/C #3 AWG Copper Wire	13,185	FT
	1/C #6 AWG Copper Wire	6,685	FT
	1/C #8 AWG Copper Wire	15,700	FT
	2/C #10 AWG Copper Pole & Bracket Cable	2,795	FT



Plot Scale - 1"=40'

Plotted From - TRR014286

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# CONDUIT LAYOUT

## SD HWY 248

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L7	L34

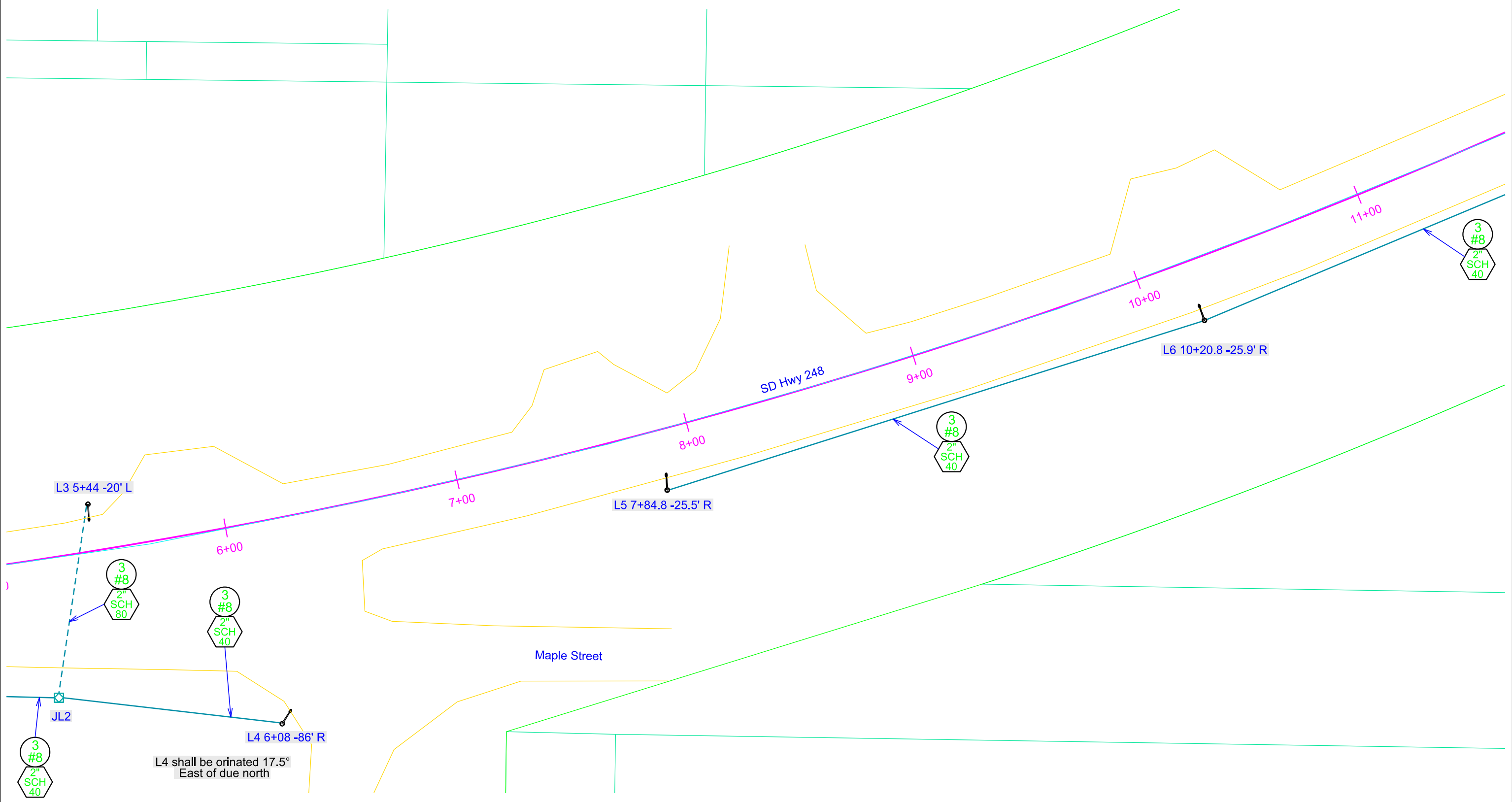
Plotting Date: 02/27/2023



Plot Scale - 1:40

Plotted From - TRR014286

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L4 shall be oriented 17.5° East of due north

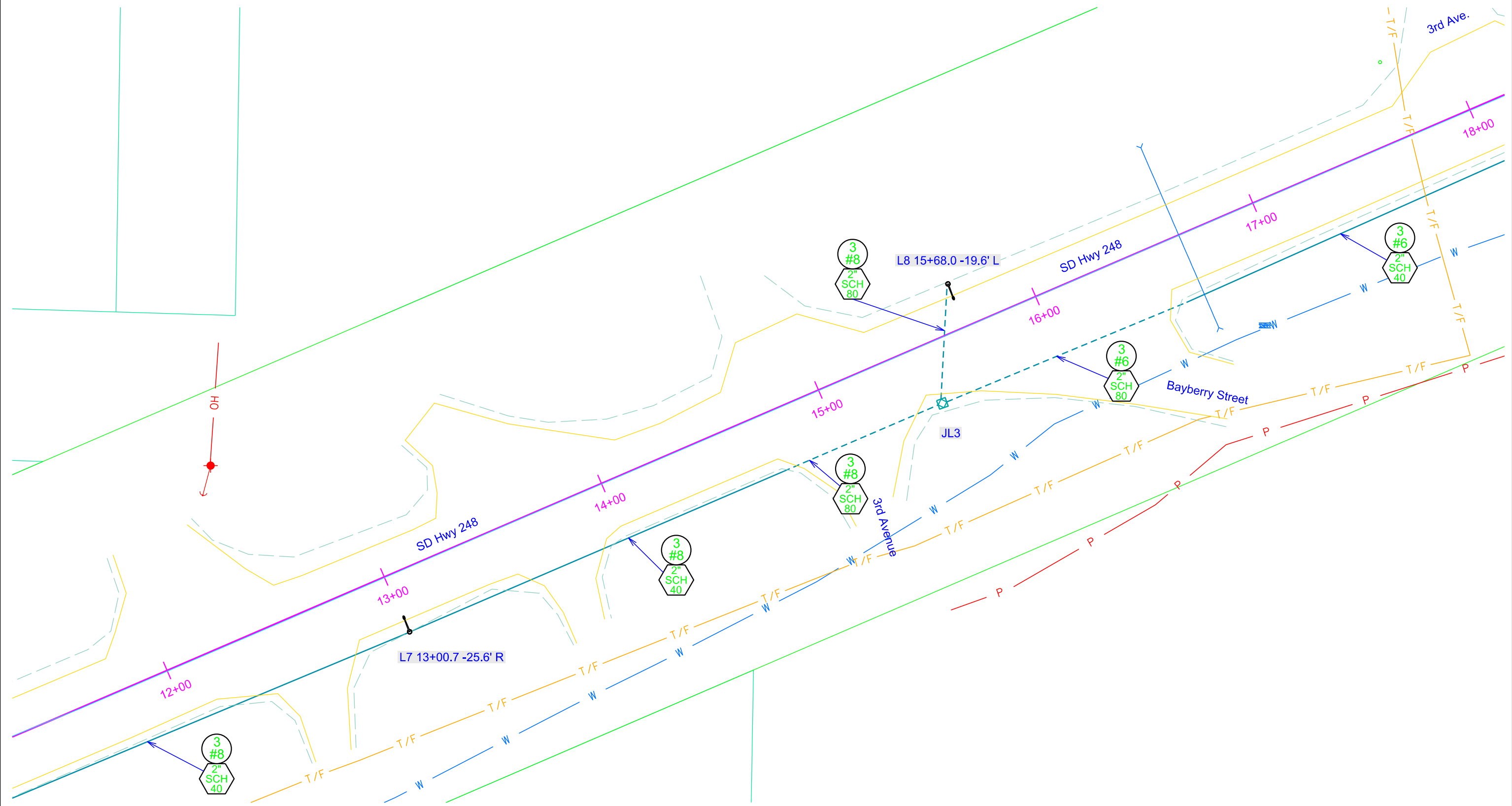


# CONDUIT LAYOUT SD HWY 248

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L8	L34
Plotting Date: 02/27/2023			



Plotted From: TRR014286  
Plot Scale: 1"=40'



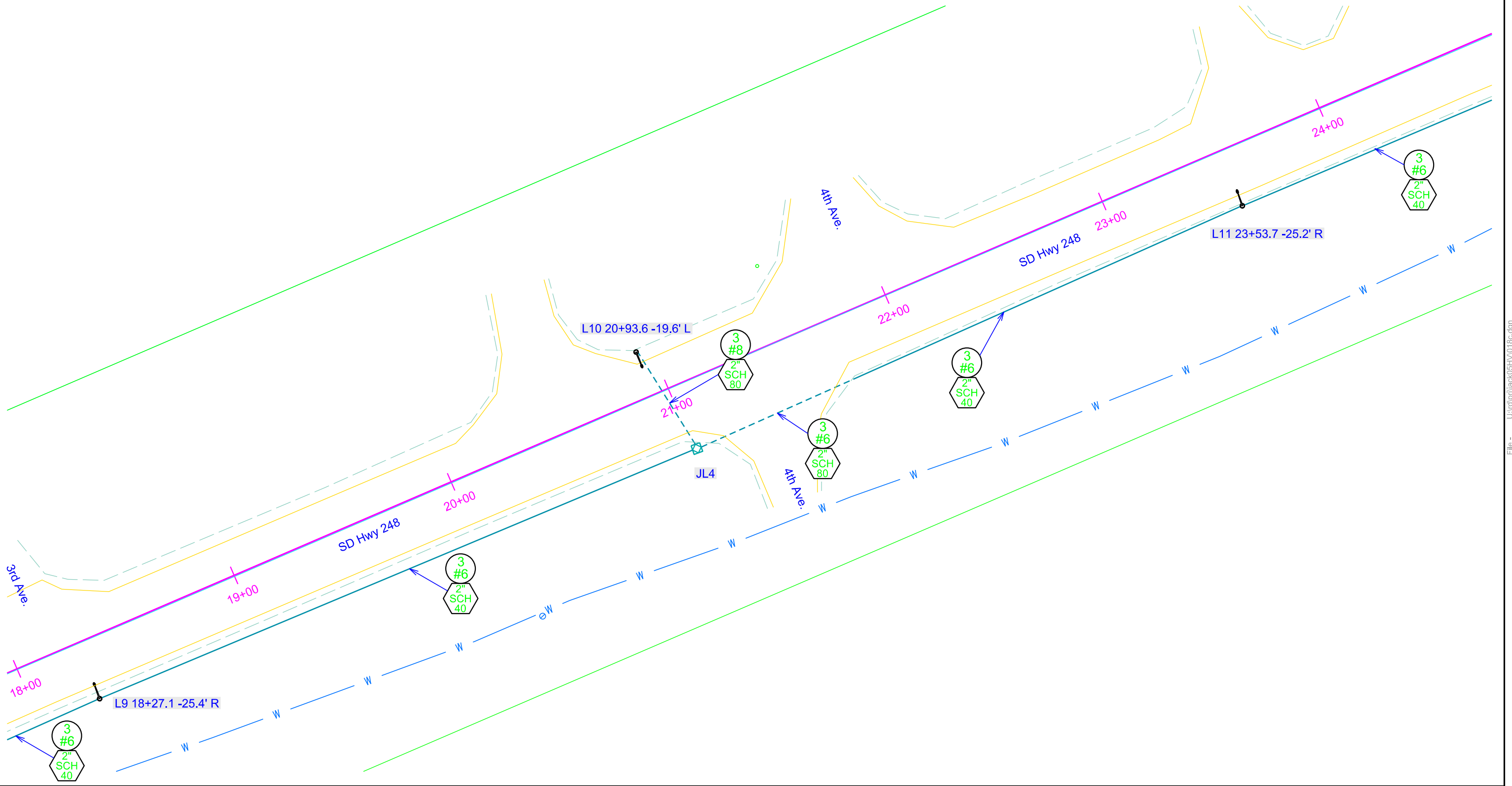
# CONDUIT LAYOUT SD HWY 248

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L9	L34
Plotting Date: 02/27/2023			



Plot Scale - 1:40

Plotted From - TRR014286



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# CONDUIT LAYOUT

## SD HWY 248

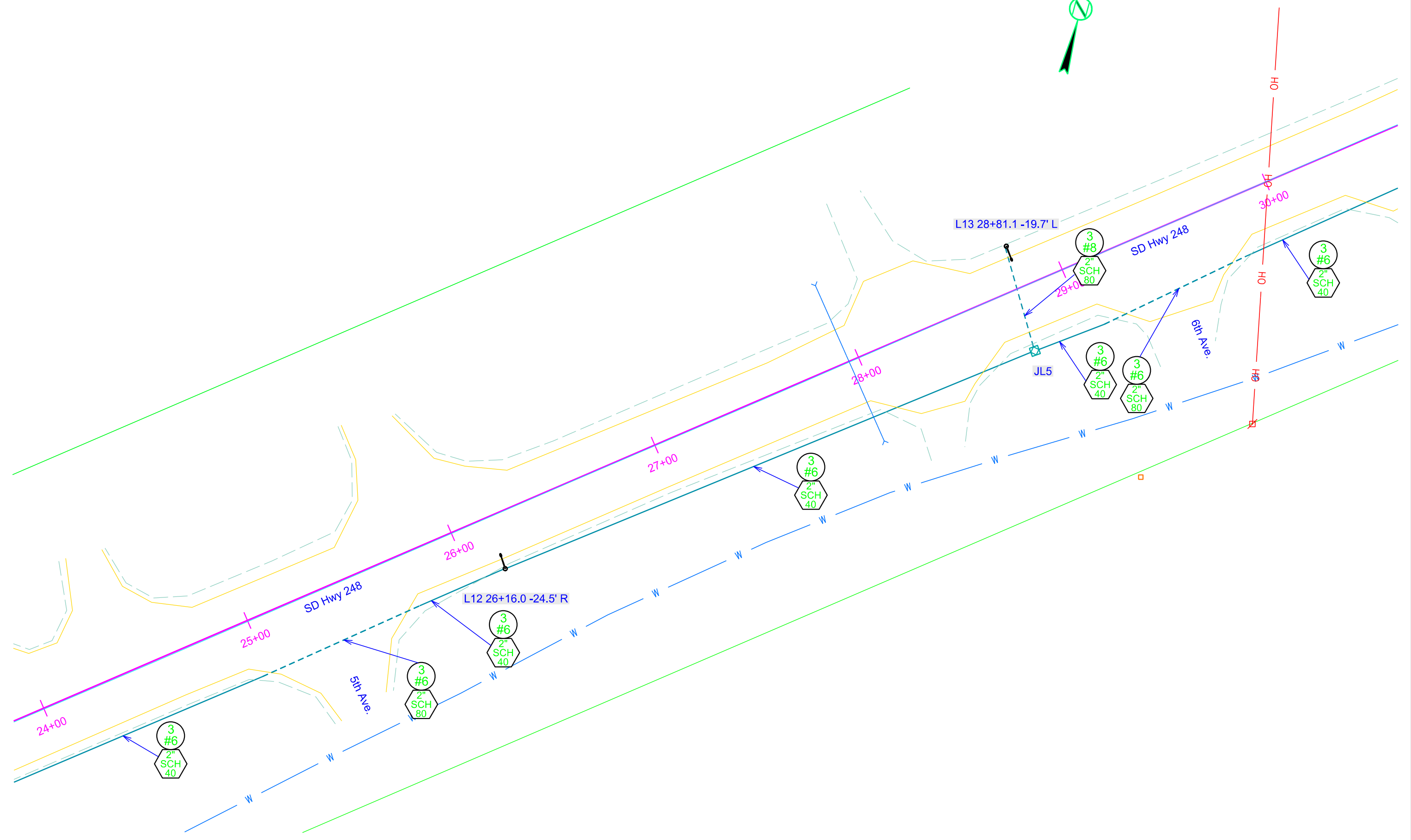
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L10	L34
Plotting Date: 02/27/2023			



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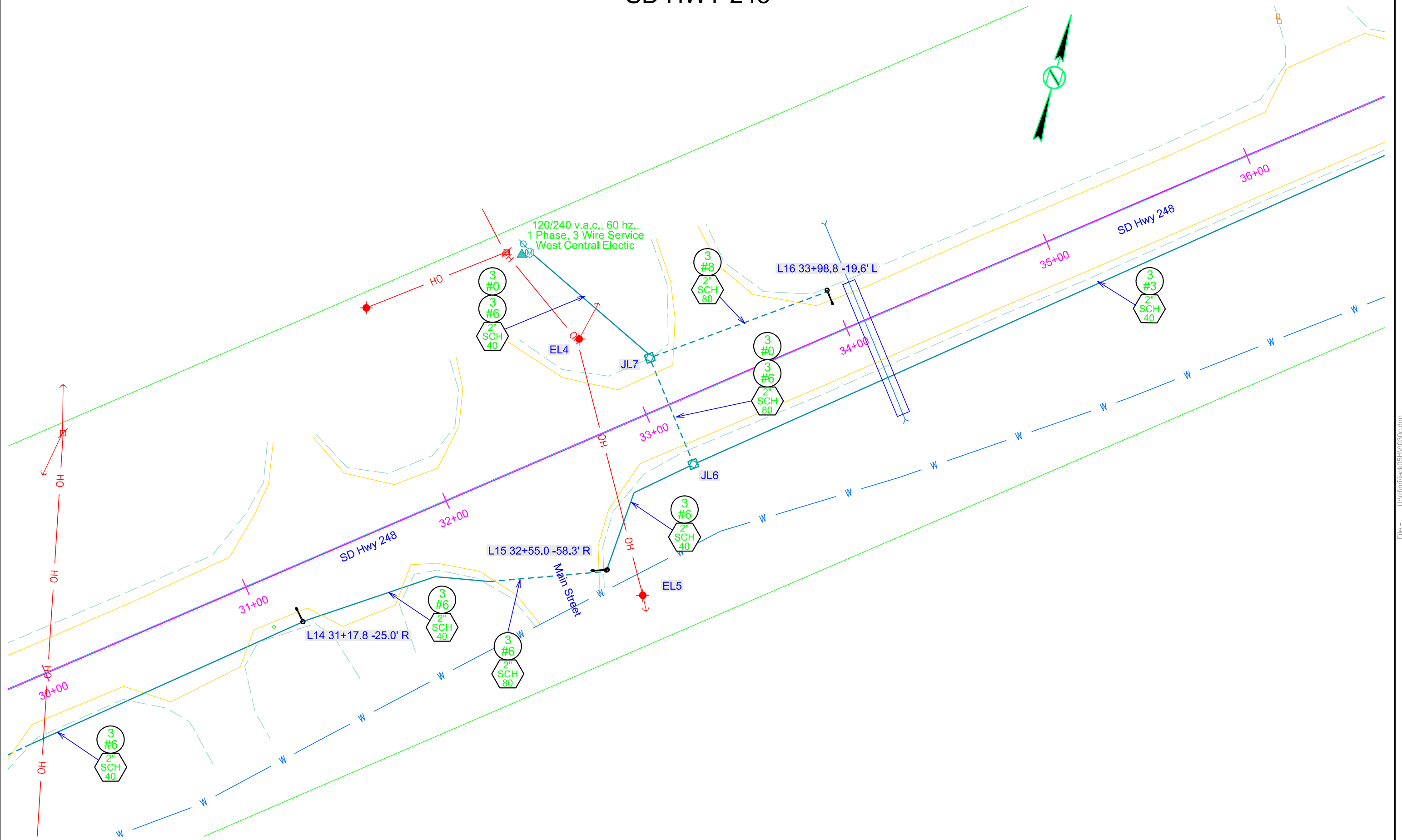
# CONDUIT LAYOUT SD HWY 248

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L11	L34
Plotting Date: 02/27/2023			

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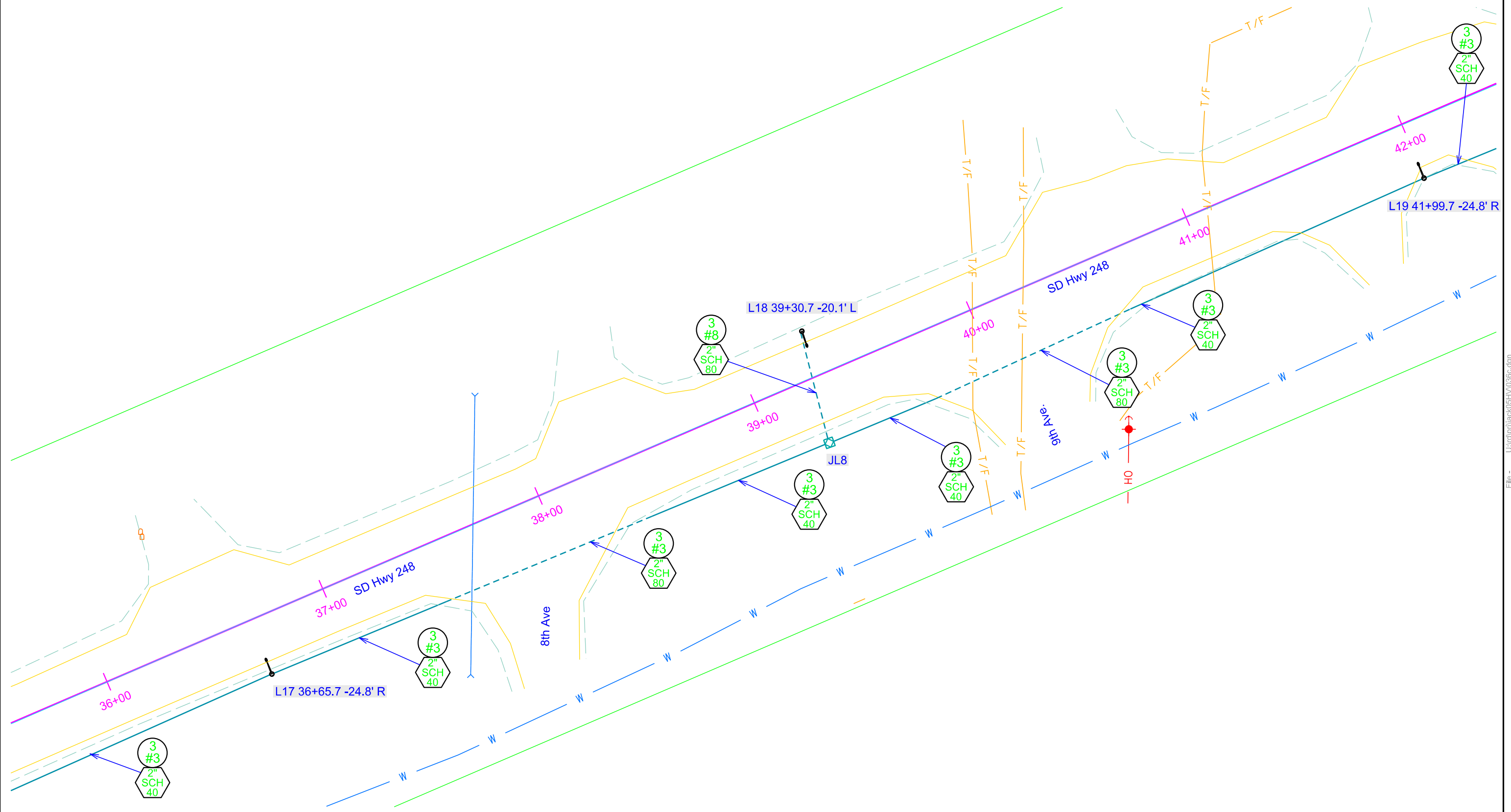
# CONDUIT LAYOUT

## SD HWY 248

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L12	L34
Plotting Date: 02/27/2023			



Plotted From: TRR014286 Plot Scale: 1:40



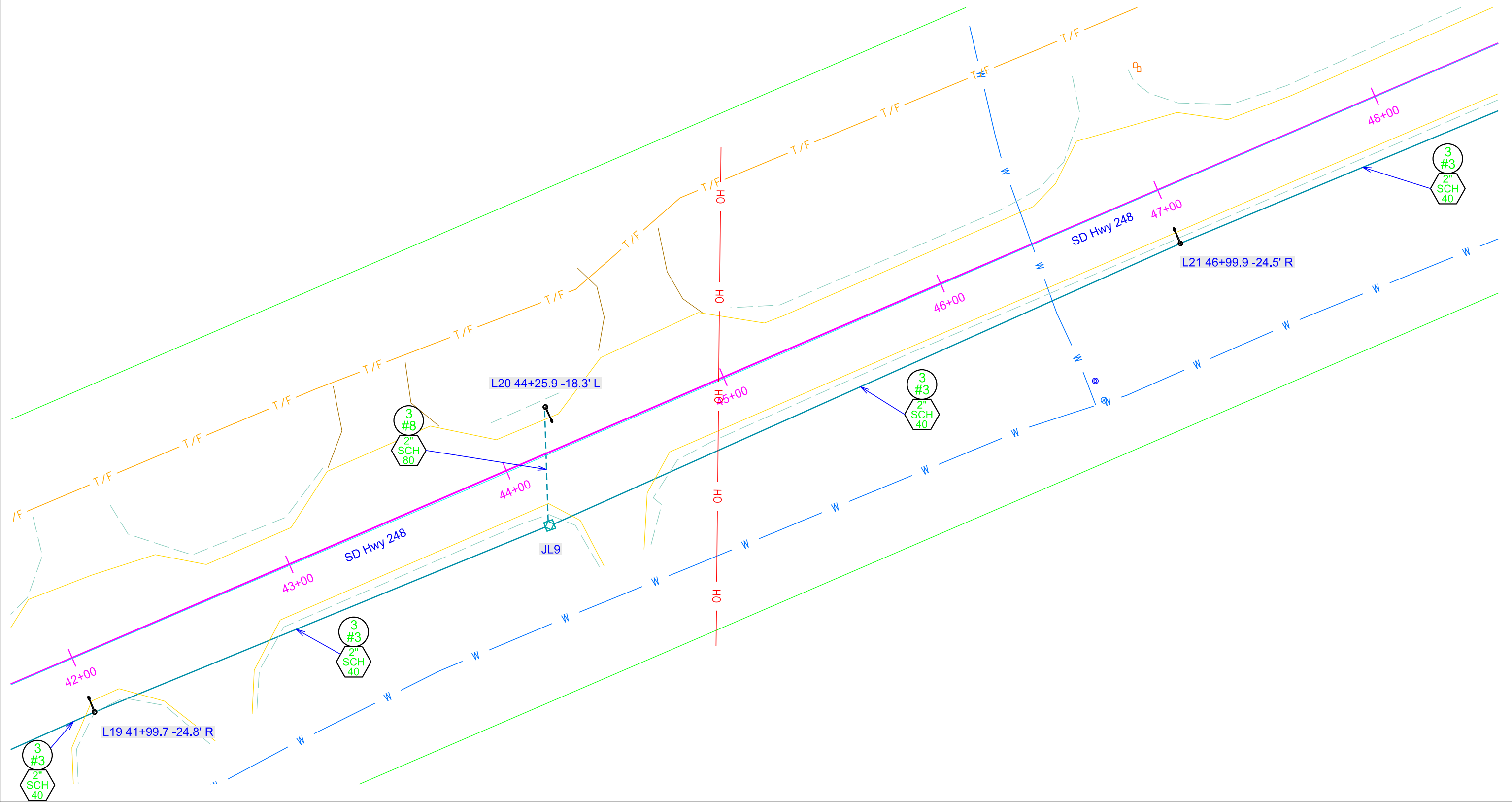


# CONDUIT LAYOUT SD HWY 248

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L13	L34
Plotting Date: 02/27/2023			



Plotted From: TRR014286  
Plot Scale: 1"=40'

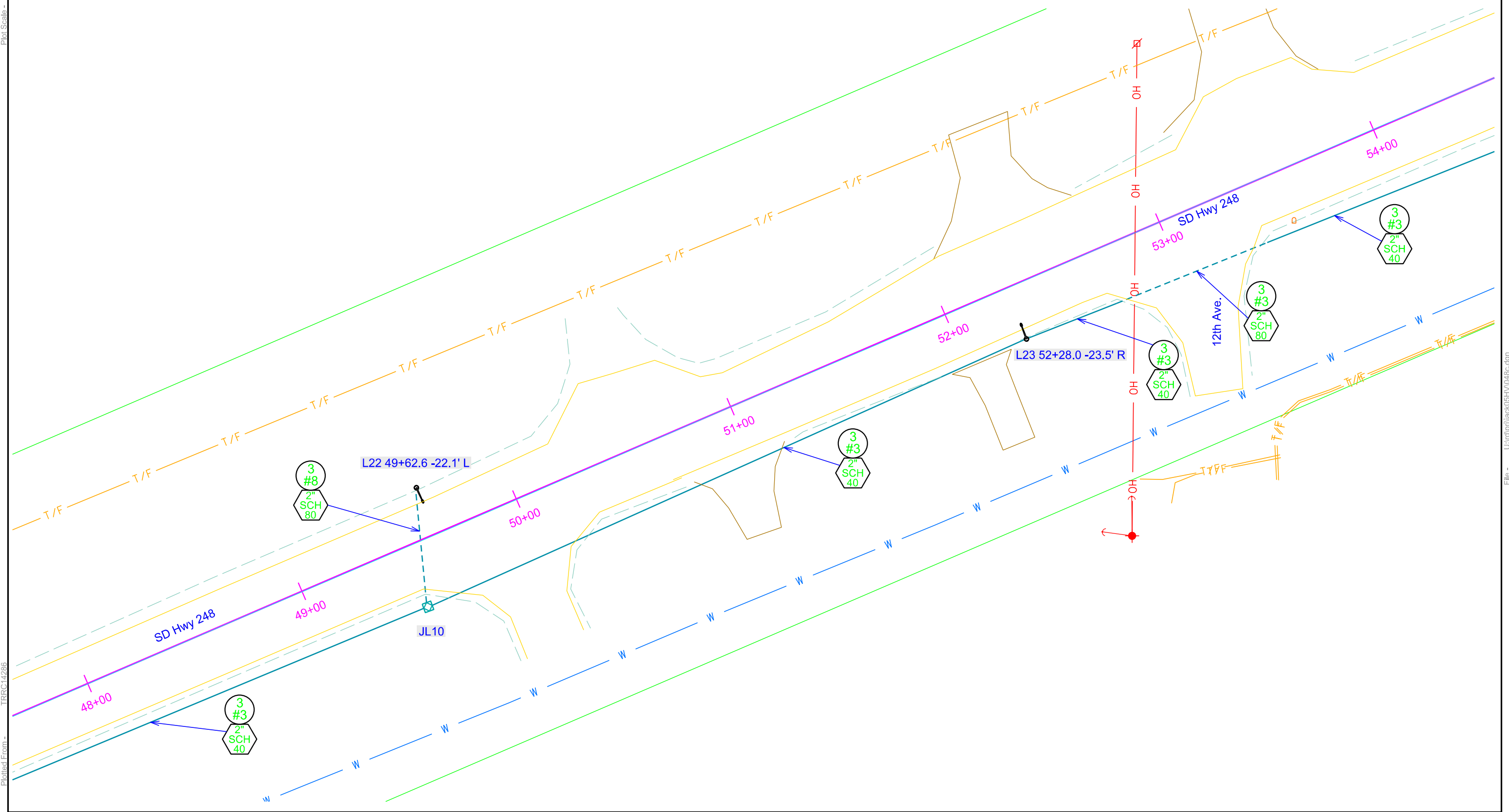


# CONDUIT LAYOUT SD HWY 248

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L14	L34
Plotting Date: 02/27/2023			



Plot Scale - 1:40  
Plotted From - TRR014286

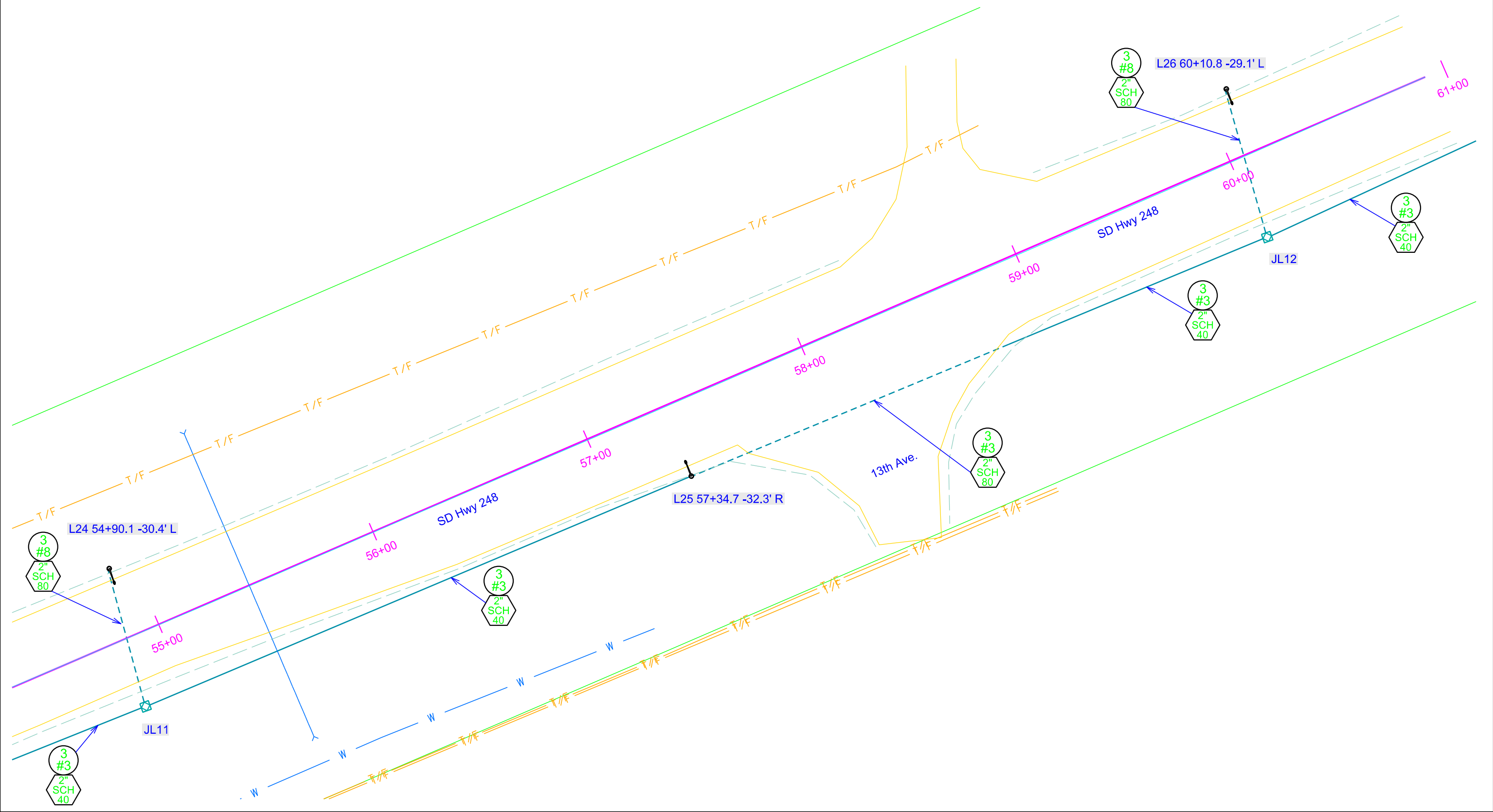


# CONDUIT LAYOUT SD HWY 248

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L15	L34
Plotting Date: 02/27/2023			



Plotted From: TRR014286 Plot Scale: 1"=40'



# CONDUIT LAYOUT SD HWY 248

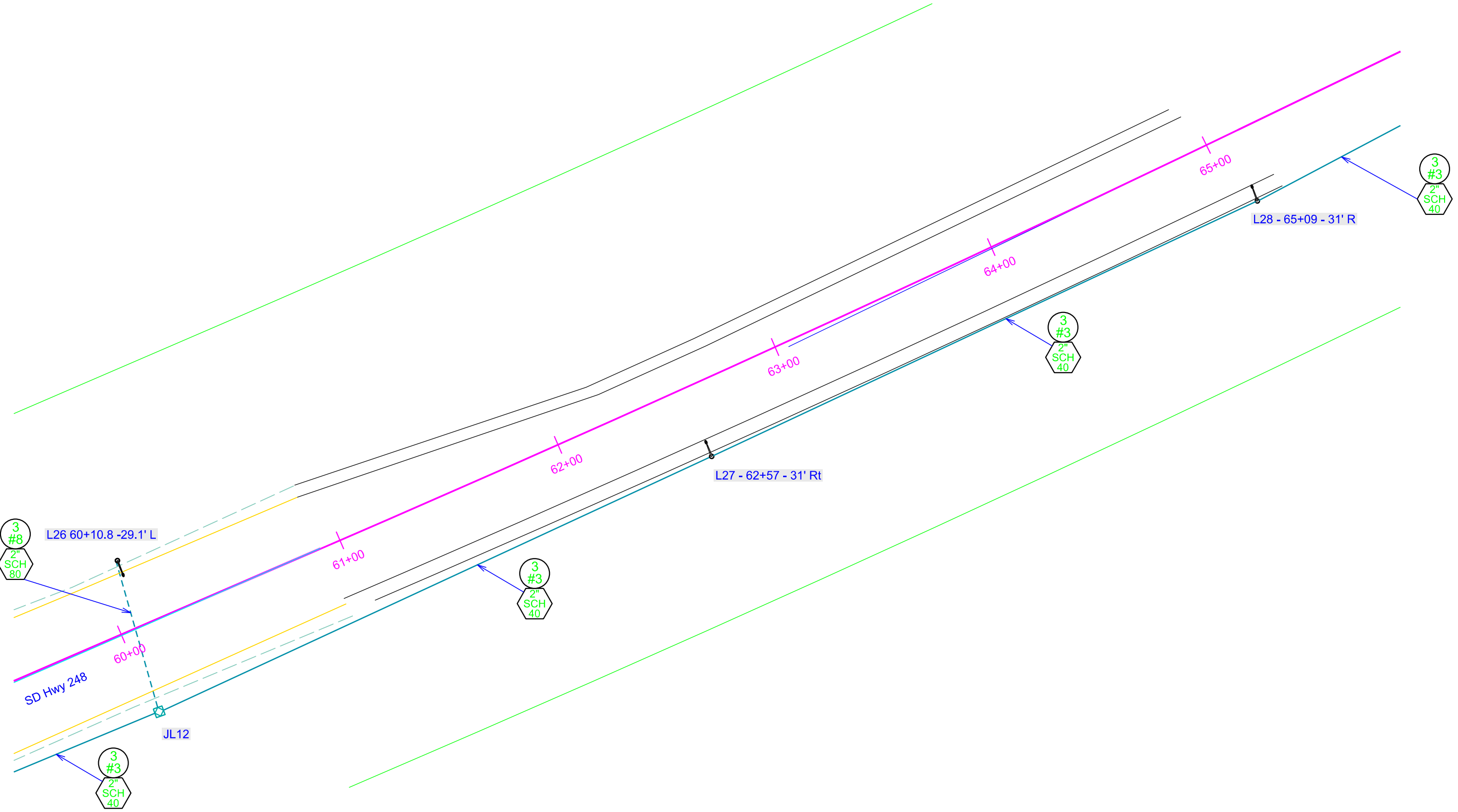
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L16	L34
Plotting Date: 02/27/2023			



Plot Scale - 1:40

Plotted From - TRR014286

File - U:\trproj\jack\05HV\0600.dgn



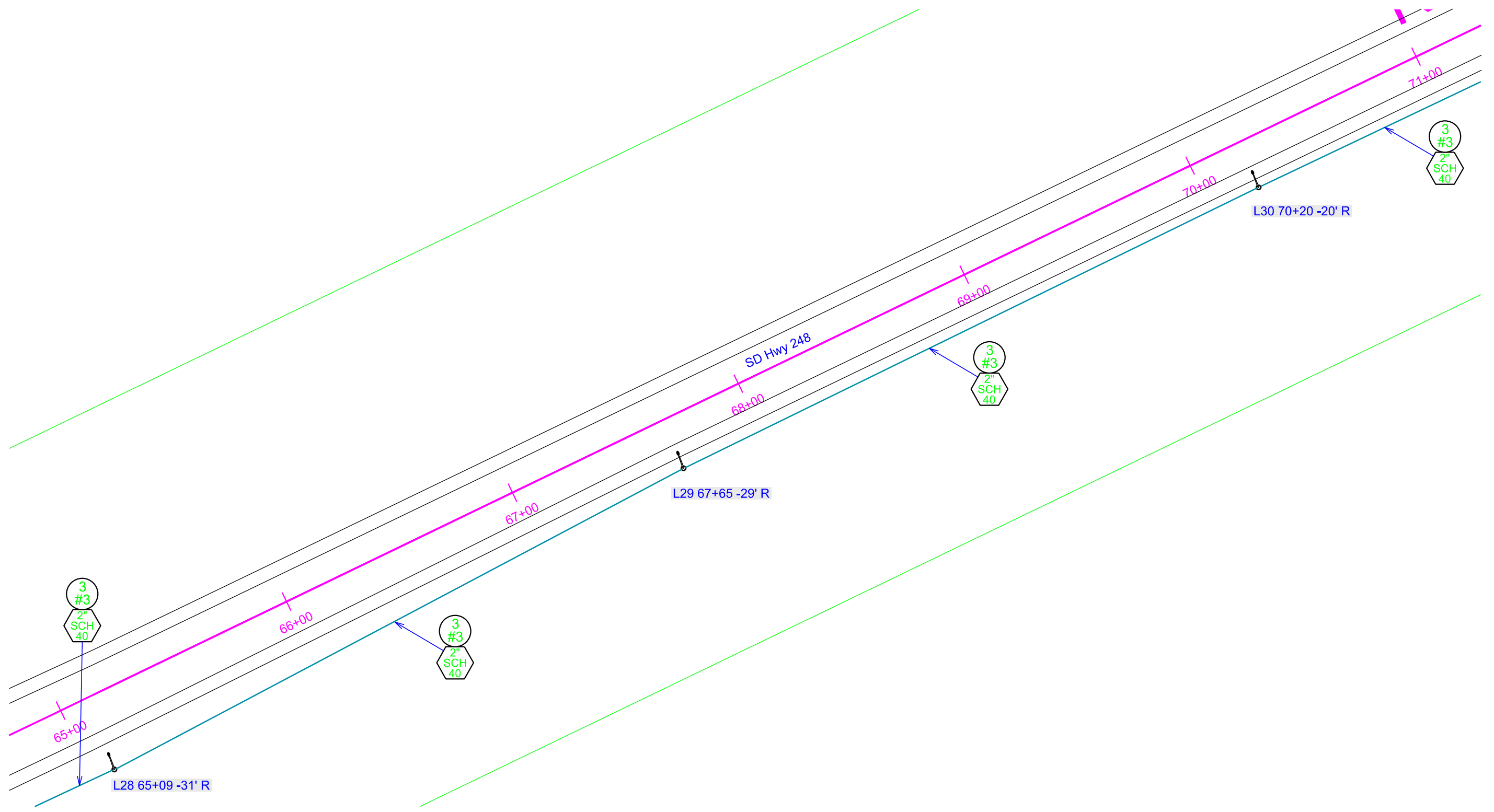
# CONDUIT LAYOUT SD HWY 248

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L17	L34
Plotting Date: 02/27/2023			



Plot Scale - 1:40

Plotted From - TRR014286



File - U:\trp\jjaek\05HV\065c.dgn



# CONDUIT LAYOUT SD HWY 248

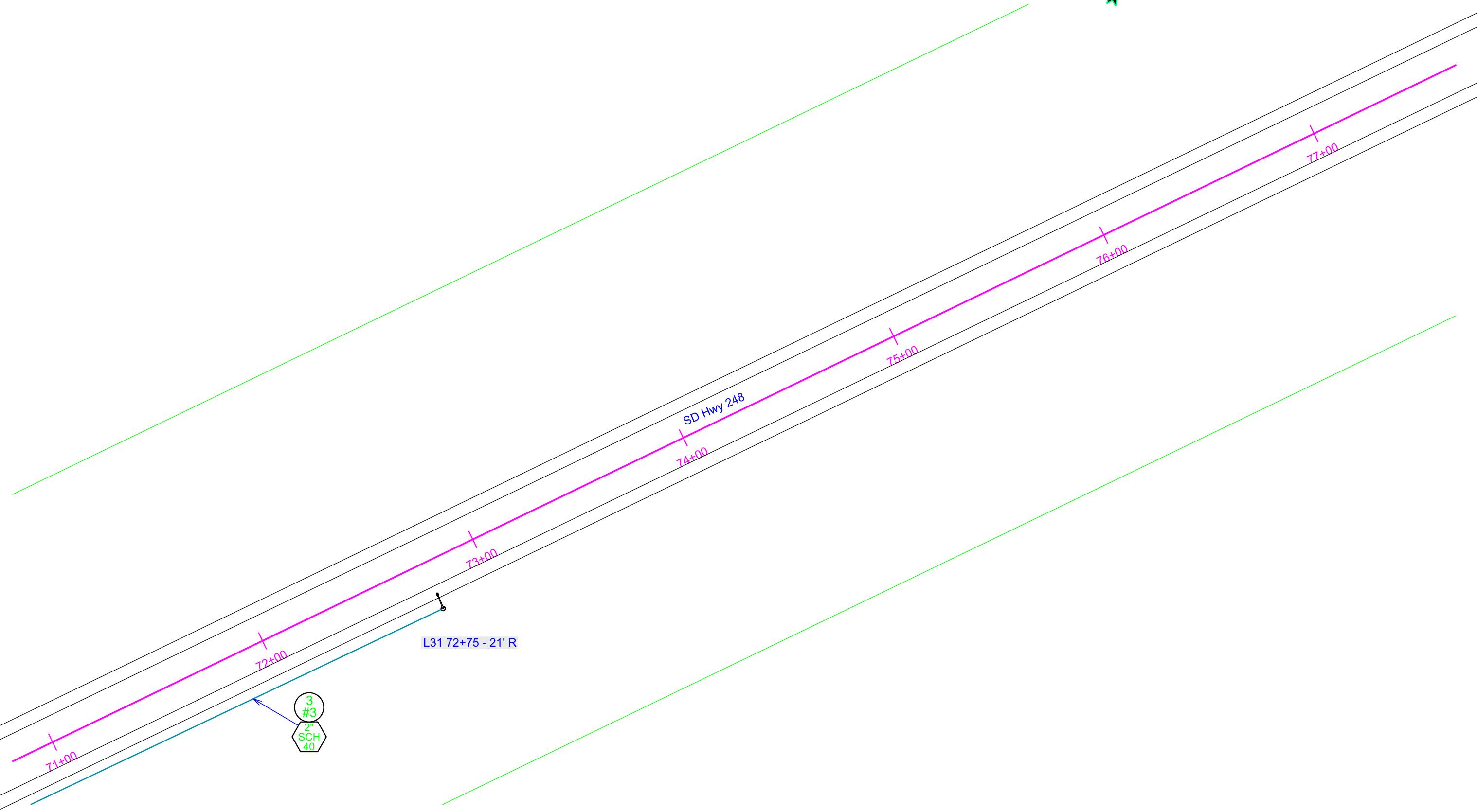
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L18	L34
Plotting Date: 02/27/2023			



Plot Scale - 1:40

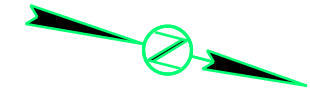
Plotted From - TRR014286

File - U:\trp\jjack\05HV\071.e.dgn



# CONDUIT LAYOUT SD HWY 73

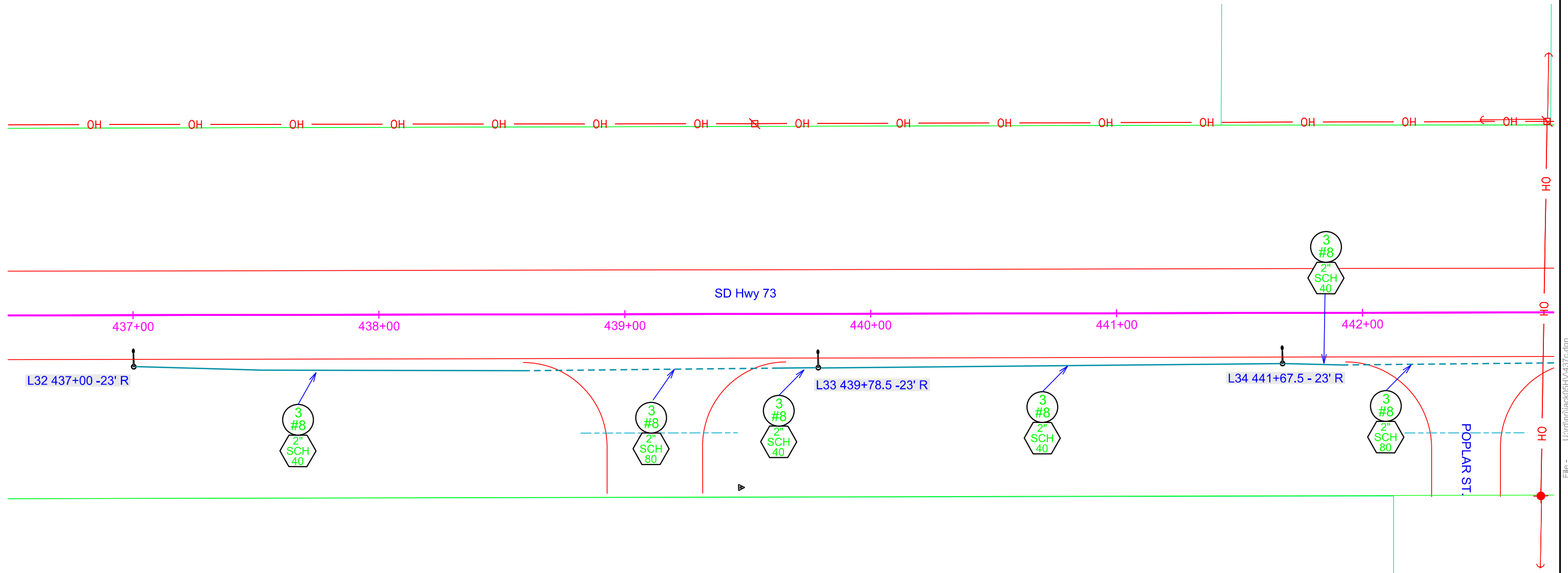
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L19	L34
Plotting Date: 02/27/2023			



Plot Scale - 1:40

Plotted From - TRR014286

File - U:\tr01\jacob\514\437.c.dgn



# CONDUIT LAYOUT SD HWY 73

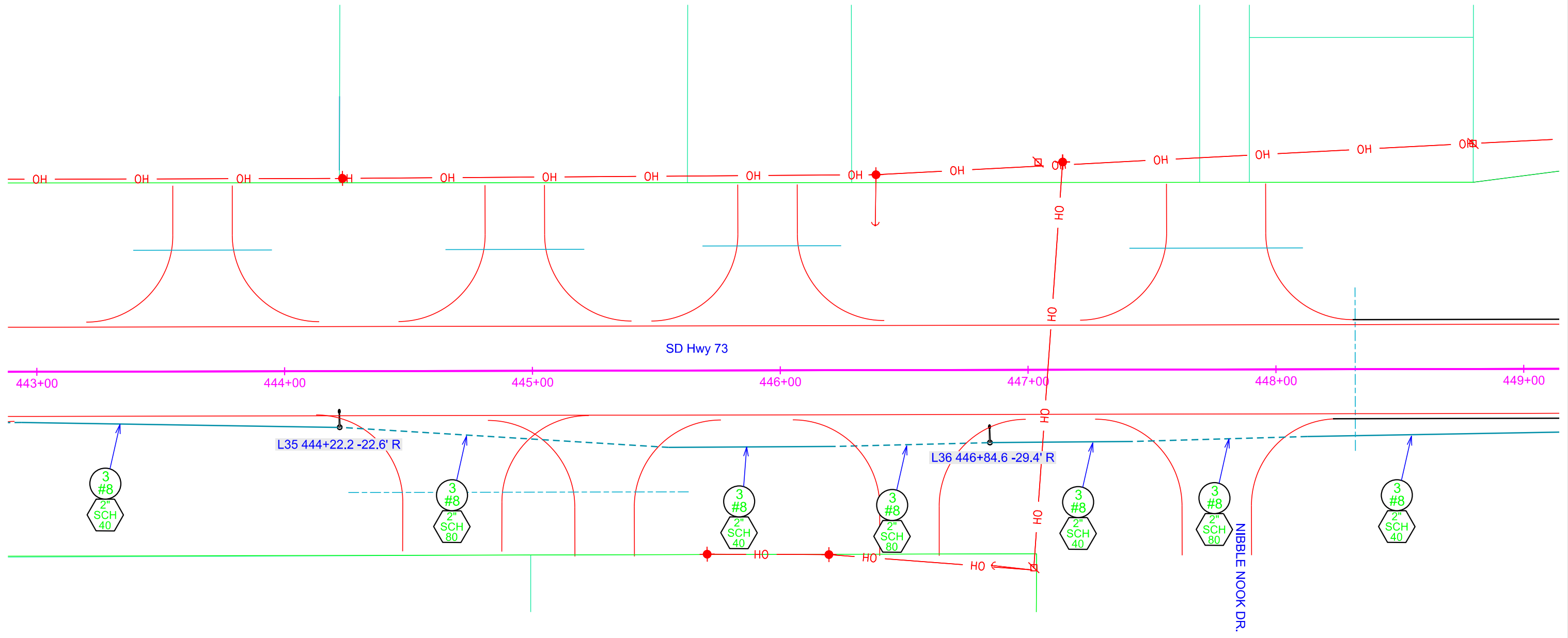
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L20	L34
Plotting Date: 02/27/2023			



Plot Scale - 1:40

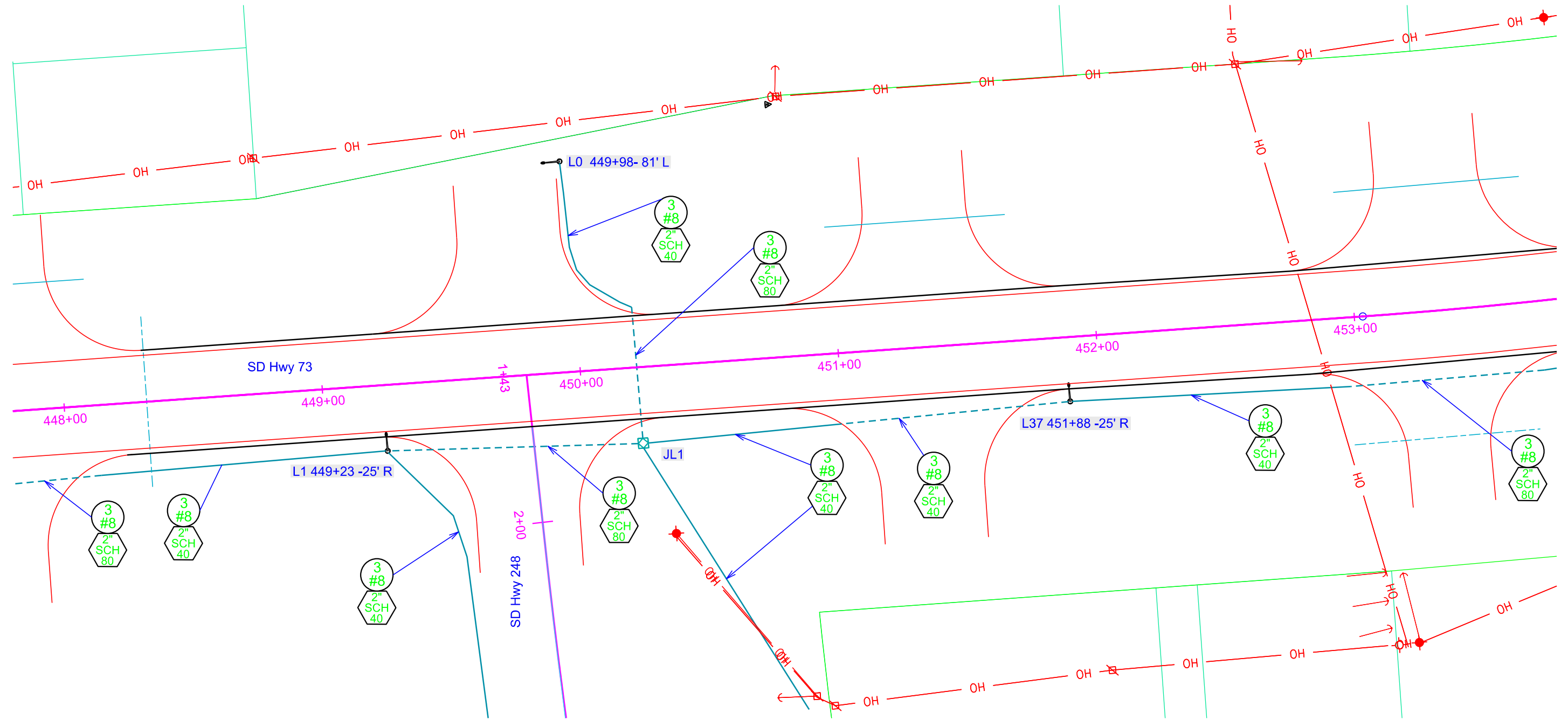
Plotted From - TRR014286

File - U:\trp\jacob51\443.cad



# CONDUIT LAYOUT SD HWY 73 & SD HWY 248

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L21	L34
Plotting Date: 02/27/2023			



Plot Scale - 1"=40'

Plotted From - TRR014286

File - U:\tr01\jacob\514\48.dgn

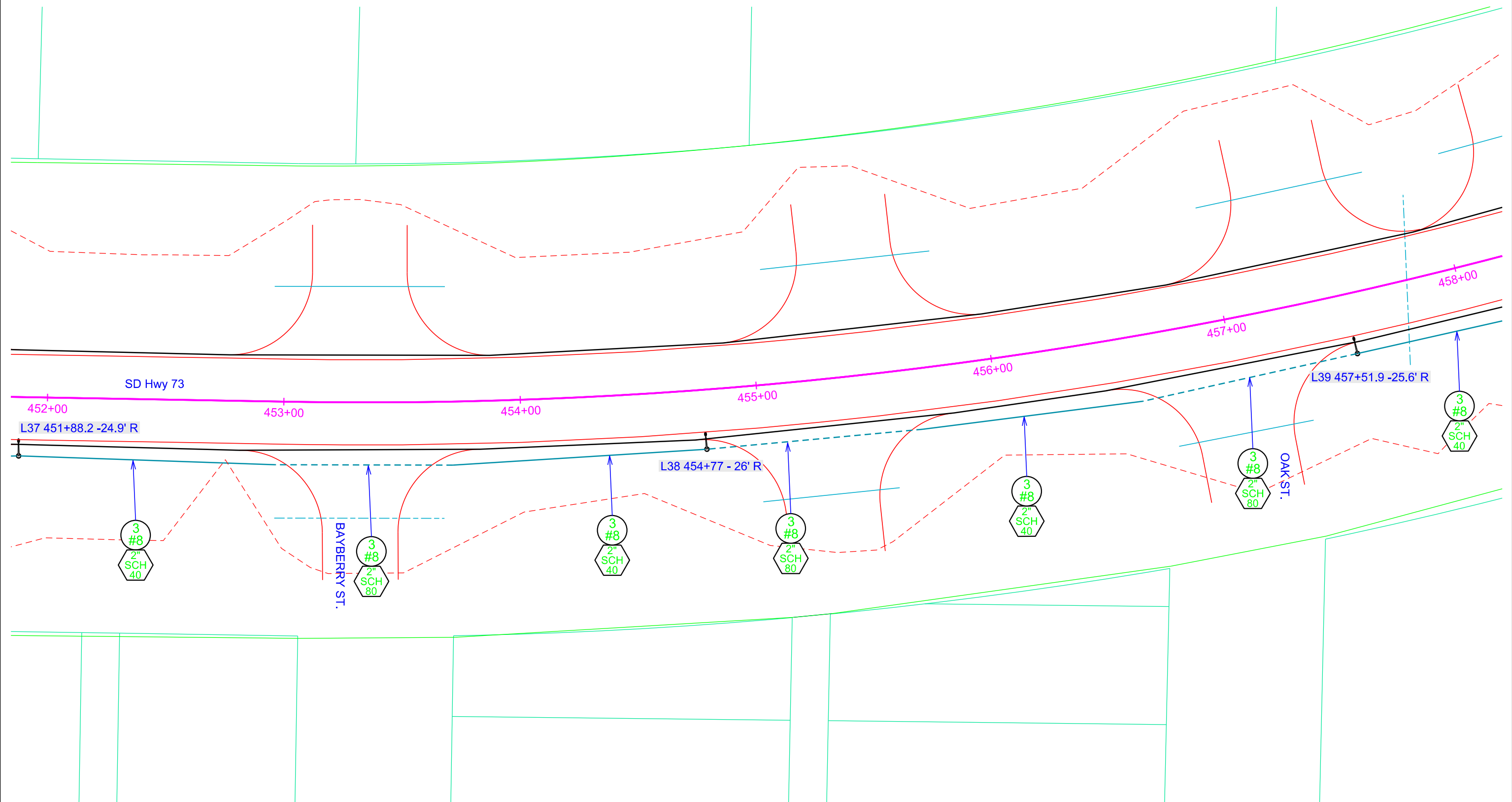
# CONDUIT LAYOUT SD HWY 73

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L22	L34
Plotting Date: 02/27/2023			



Plot Scale - 1:40

Plotted From - TRR014286

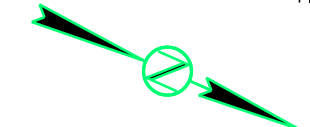


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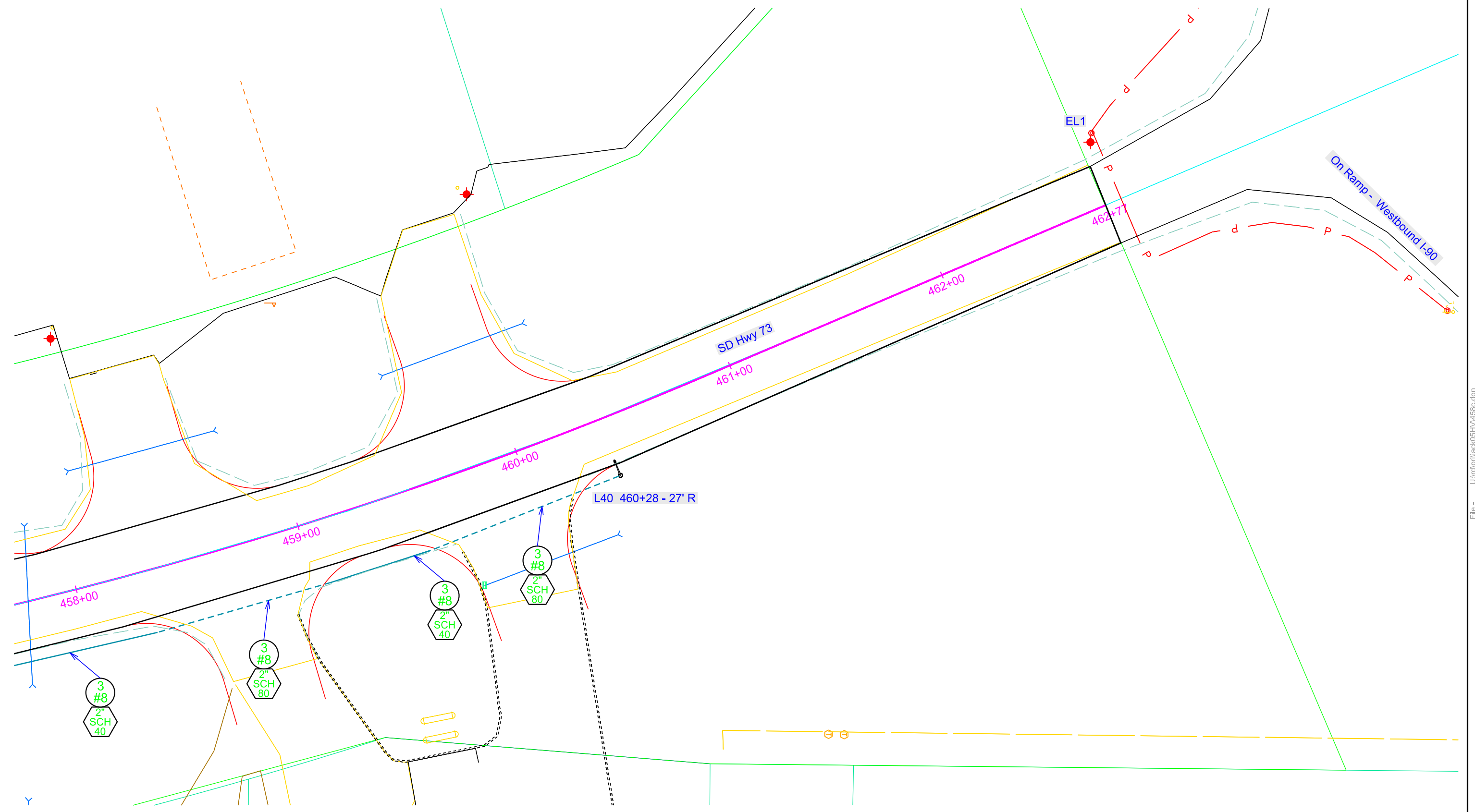


# CONDUIT LAYOUT SD HWY 73

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L23	L34
Plotting Date: 02/27/2023			



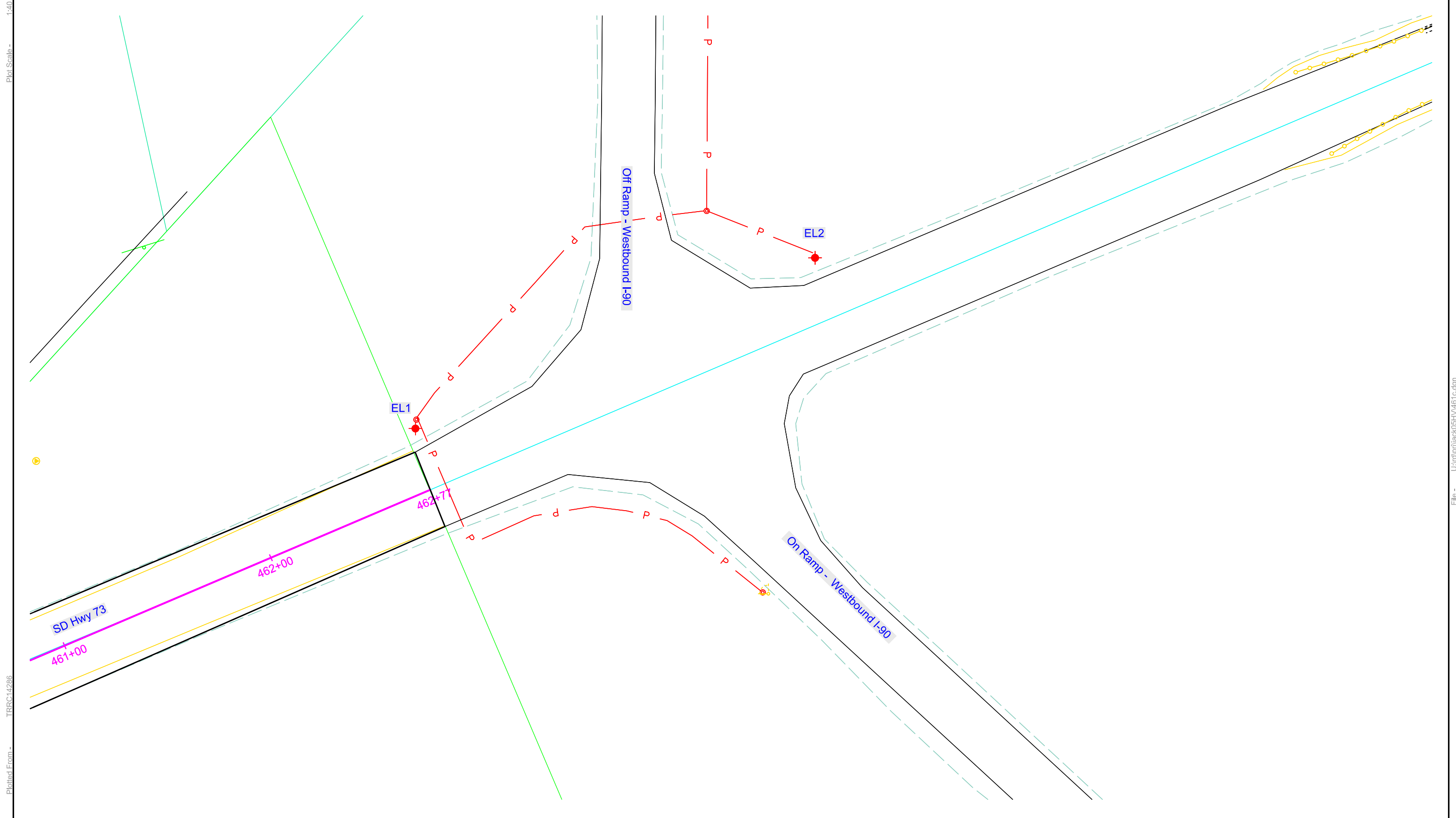
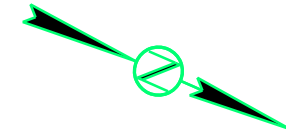
Plot Scale - 1:40  
Plotted From - TRR014286



File - U:\trp\proj\ack\051\HV458c.dgn

# CONDUIT LAYOUT SD HWY 73

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L24	L34
Plotting Date: 02/27/2023			



Plot Scale - 1:40

Plotted From - TRR014286

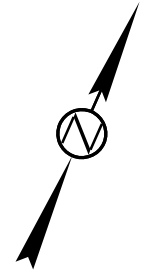
File - U:\trp\proj\ack\05HV\461.c.dgn

# EXISTING LAYOUT DETAIL

## I-90 EXIT 150

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L25	L34

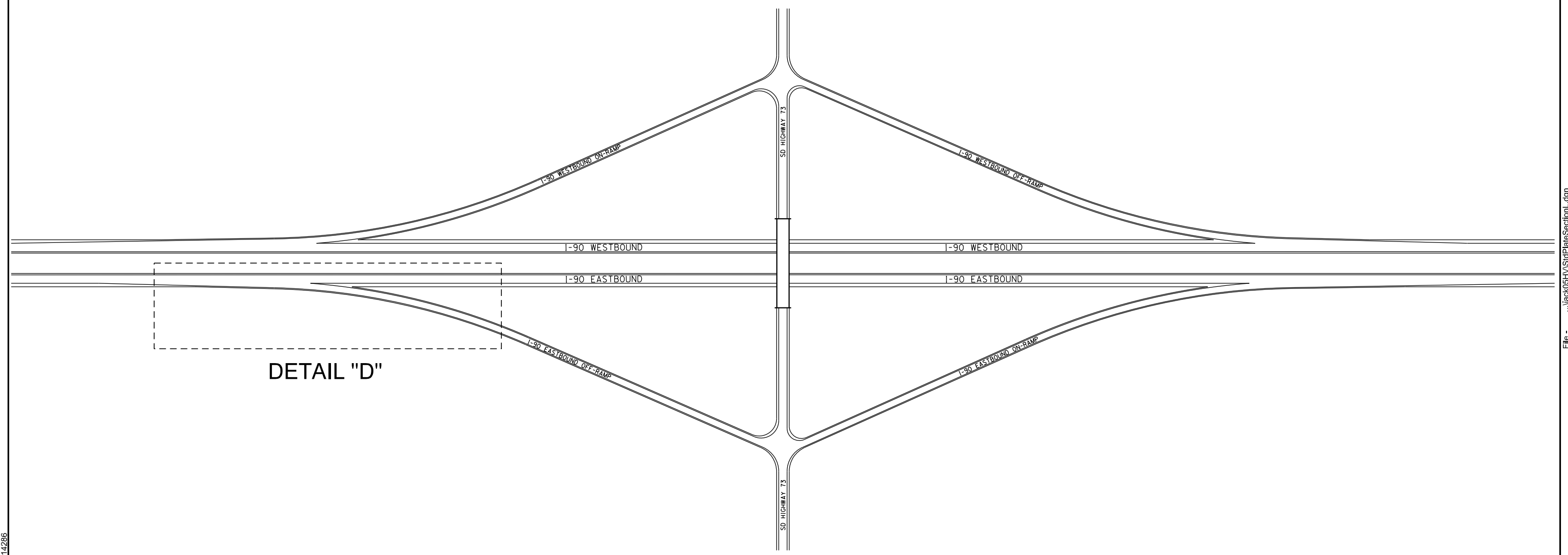
Plotting Date: 02/27/2023



Plot Scale - 1:200

Plotted From - TRRC14286

File - ...\\jack05HY\Std\PlateSectionL.dgn



DETAIL "D"

# ROAD CLOSURE, SIGNING & CONDUIT LAYOUT DETAILS

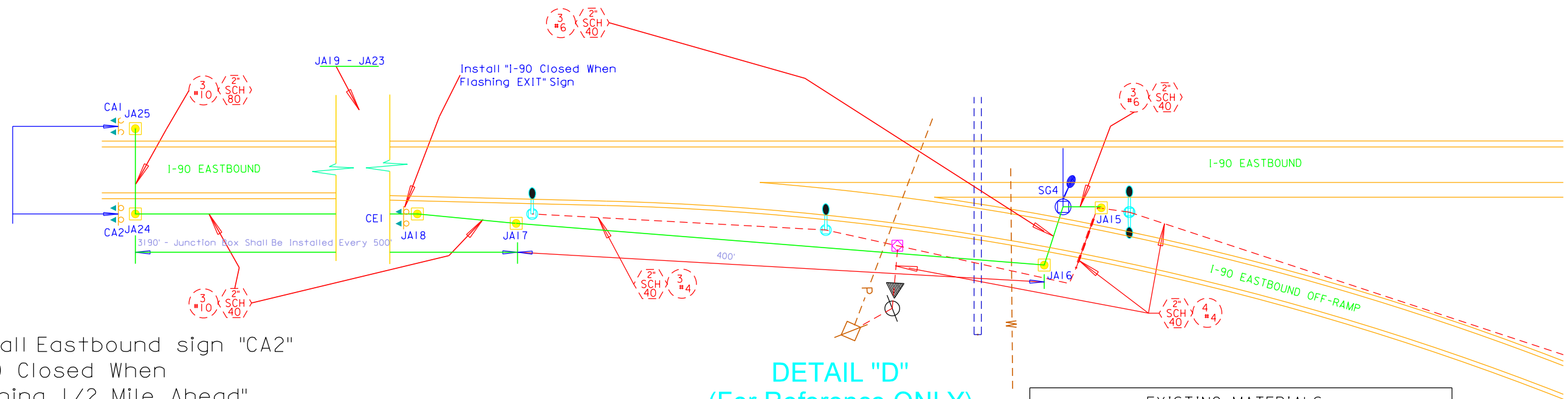
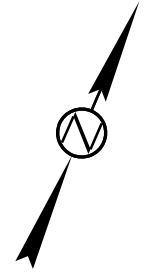
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L26	L34

Plotting Date: 02/27/2023

## I-90 EXIT 150 ~ EASTBOUND

### INSTALLATION TABLES

SIGN DATA										POST DATA					FOOTING DATA			ELECTRICAL DATA										REMOVALS					
EXIT #	SIGN or GATE NUMBER	SIGN DESCRIPTION	CODE	SIGN SIZE (FT)	SIGN AREA (SQ FT)		DIR OF TRAVEL	OFFSET RIGHT LEFT OVER-HEAD	POST LENGTHS (ABOVE GROUND)		(N)EW or (R)EUSE	SIZE & QTY		DROP ARM GATE (EA)	GATE ARM LENGTH (FT)	BKWY 1'-9" DIA (FT)	GATE 2'-6" DIA (FT)	FOOTING LENGTH(S)	RDWY LUMIN 250 W (EA)	1-SEC SIG HEAD (EA)	18" JUNC BOX (EA)	24" JUNC BOX (EA)	1 1/2" RGSC (FT)	2" RGSC (FT)	2" SCH 40 (FT)	2" SCH 80 (FT)	FLASHER		1/C #6 AWG (FT)	1/C #10 AWG (FT)	REMOVE SNOW GATE (EACH)		
					EA	FA			IN	OUT		632E1225	632E1255														600E0045	632E0014				635E5025	EACH
150	CA2	I-90 CLOSED WHEN FLASHING 1/2 MILE AHEAD	SPECIAL	9 X 6.5	58.5		EB	R	16.5	17.5	N	N	34.0				8.0		4'-0"		2	6		34.0		2735.0			1		8490.0		



Install Eastbound sign "CA2"  
"I-90 Closed When Flashing 1/2 Mile Ahead"

DETAIL "D"  
(For Reference ONLY)

ESTIMATE OF QUANTITIES				
Bid Item Number	ITEM	LOCATION	INSTALLATION	
			Quantity	Unit
632E1225	W6x12 Steel Post	Eastbound	34	Ft
632E3115	Extruded Aluminum Sign, Nonremovable Copy Super / Very High Intensity	Eastbound	58.8	Sq. Ft
635E4010	1 Section Vehicle Signal Head	Eastbound	2	Each
635E8015	1.5" Rigid Galvanized Steel Conduit	Eastbound	34	Ft
635E9020	1/C #10 AWG Copper Wire	Eastbound	105	Ft

EXISTING MATERIALS	
KEY	ITEM
	Existing Luminaire
	Existing Junction Box
	Existing Conductor
	Existing Conduit
	Existing Electrical Service Cabinet
	Existing Utility Post
	Drop Arm Closure Gate (SC"")
	18" Type 2 Electrical Junction Box

Plot Scale - 1:200

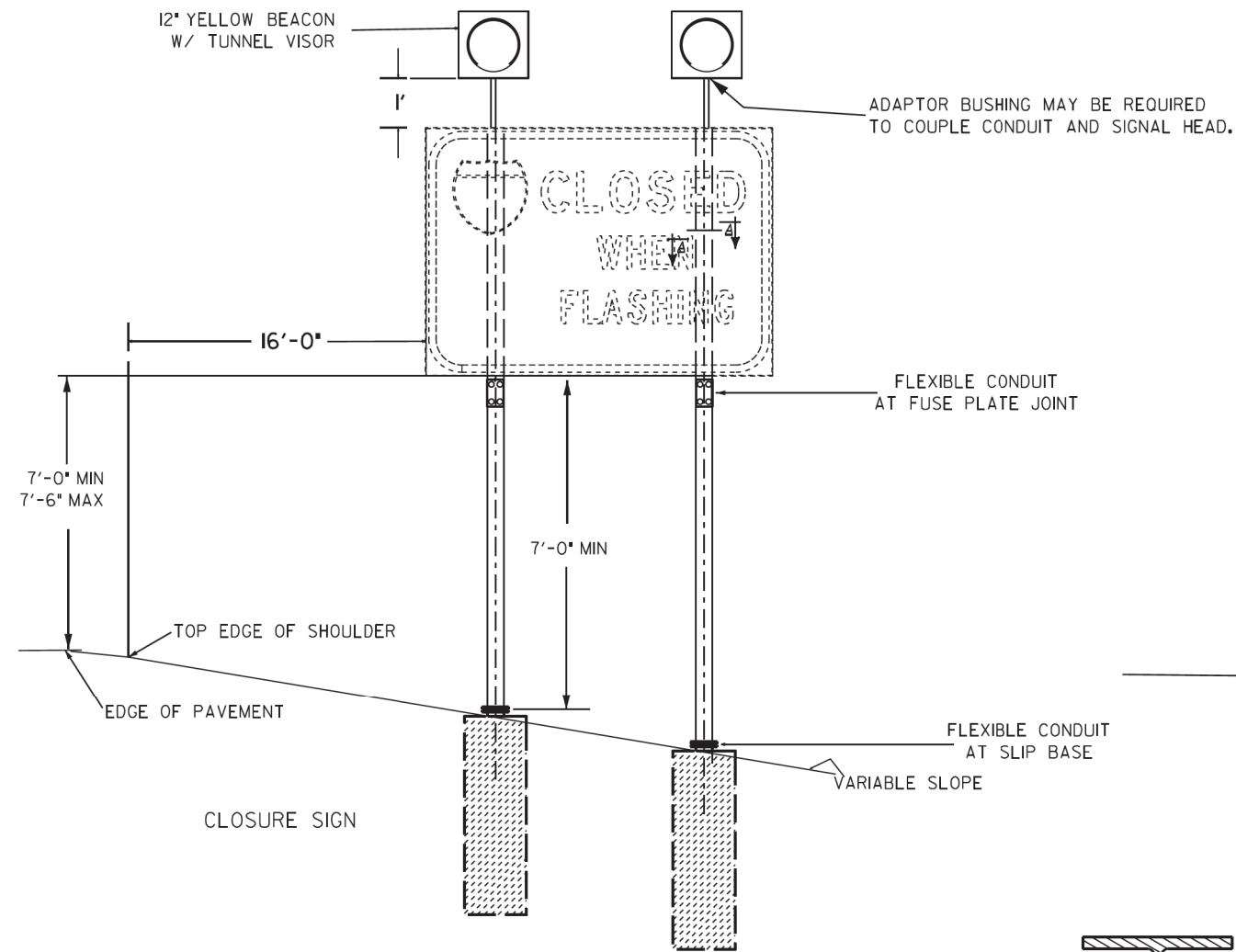
Plotted From - TRR014286

File - ... \jacket05HY\Std\PlateSectionL.dgn

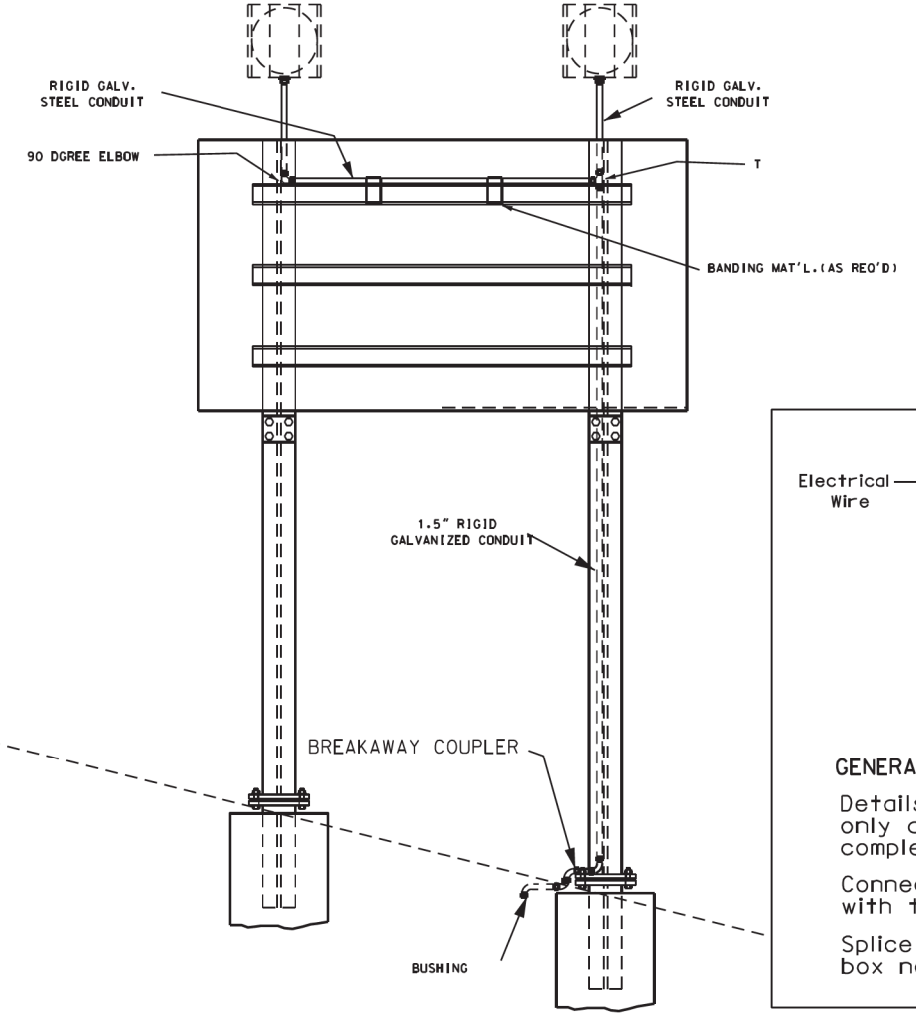
# ERECTION DETAILS FOR INTERSTATE HIGHWAY SIGNS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L27	L34

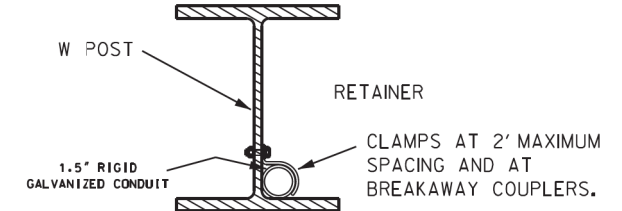
Plotting Date: 02/27/2023



**FRONT VIEW**



**REAR VIEW**



**SEC. A - A**

**Breakaway Splice**

**GENERAL NOTES:**  
 Details are provided for example only and are not intended to be a complete design.  
 Connectors shall be breakaway type with the male plugs pointing down.  
 Splice may be located within junction box nearest the base of the sign.

1.5" Rigid Galvanized Steel Conduit Has been included in the Estimate of Quantities For Each Sign That has Flashing Beacons. Payment for all Clamps, Couplers, and Bushings Required to Connect and Fasten The Conduit to the sign shall be incidental to the Contract Unit Price For 1.5" RIGID GALVANIZED STEEL CONDUIT

Plot Scale - 1:200

Plotted From - TRR014286

File - ...jacket05HY\Std\PlateSectionL.dgn

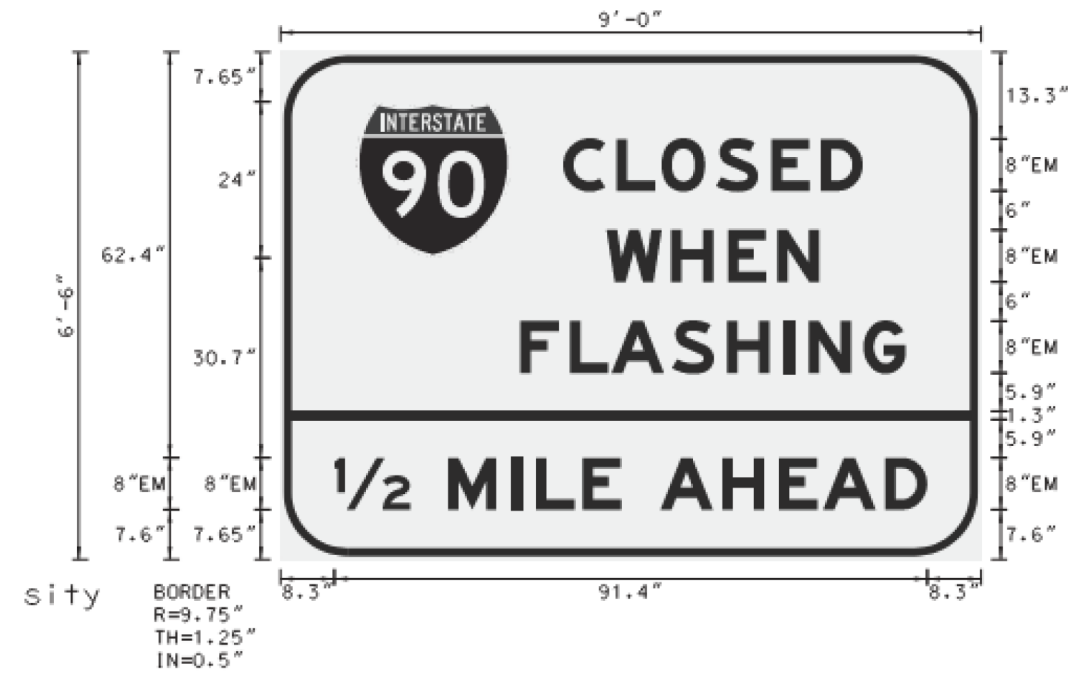


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0073(73)62 P 0248(17)162	L28	L34

Plotting Date: 02/27/2023

# Permanent Signing Details

## CA2



Signs shall be constructed using extruded aluminum panels, with Super/Very High Intensity Sheeting and Non-removable copy.

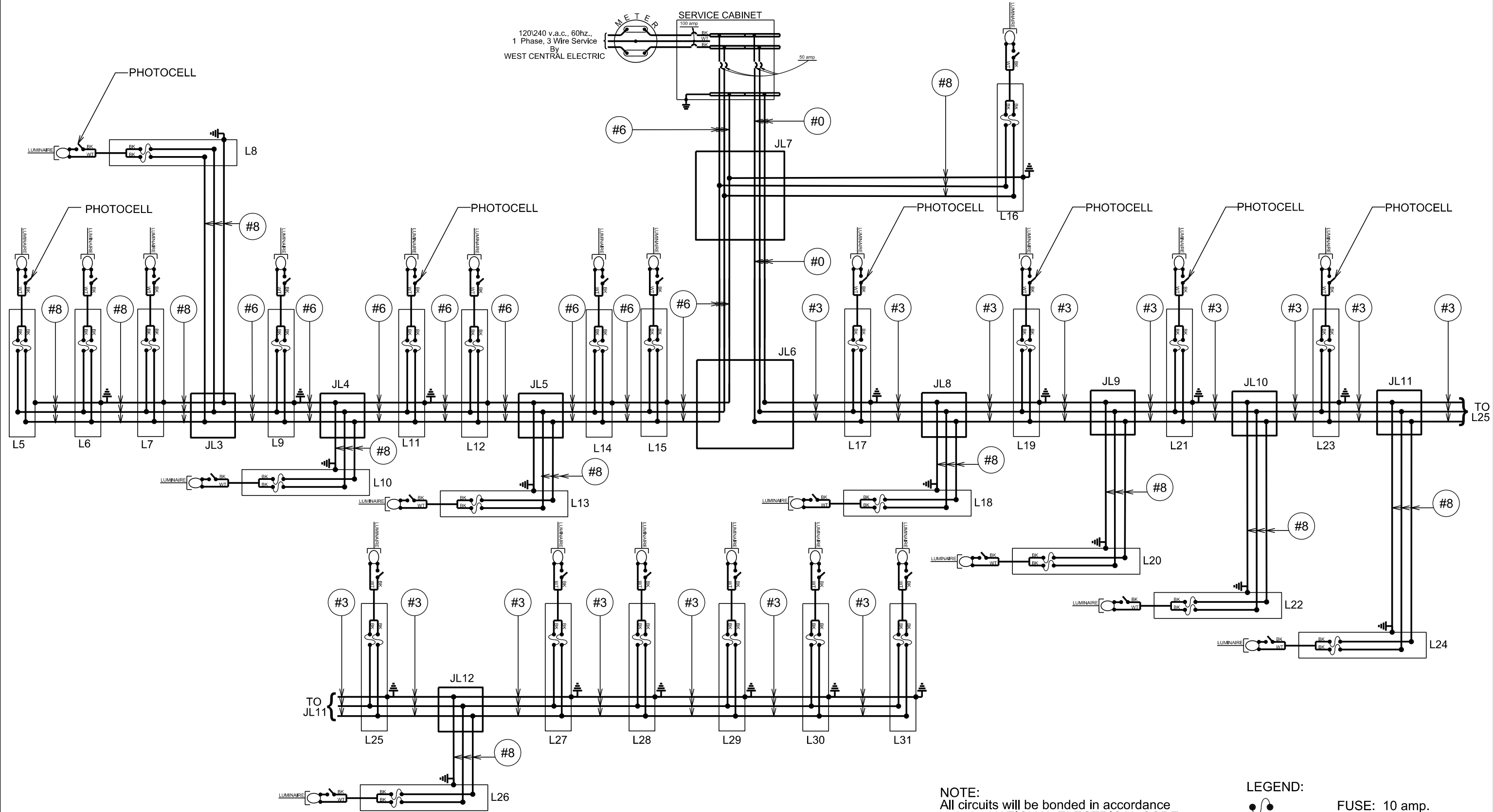
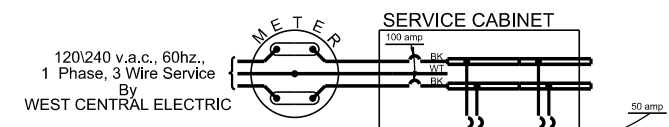
# WIRING DIAGRAM

STATE OF SOUTH DAKOTA	PROJECT NH 0073(73)62 P 0248(17)162	SHEET L29	TOTAL SHEETS L34
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Plotting Date: 02/27/2023

Plot Scale - 1:40

Plotted From - TRRC14286



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

- LEGEND:**
- FUSE: 10 amp.
  - LUMINAIRE: LED

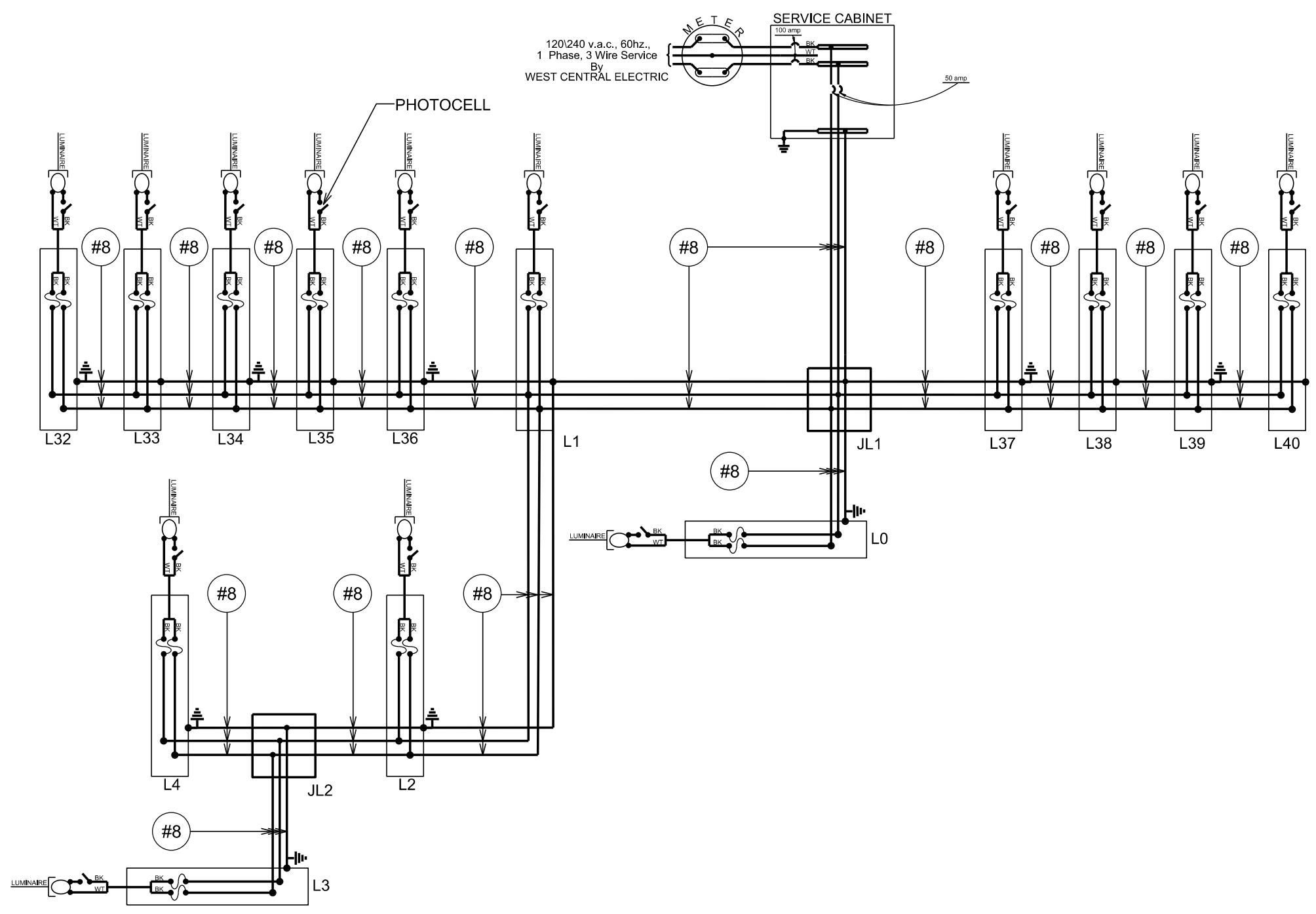
File - U:\trproj\jack05HV1040w.dgn

# WIRING DIAGRAM

STATE OF SOUTH DAKOTA	PROJECT NH 0073(73)62 P 0248(17)162	SHEET L30	TOTAL SHEETS L34
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Plotting Date: 02/27/2023

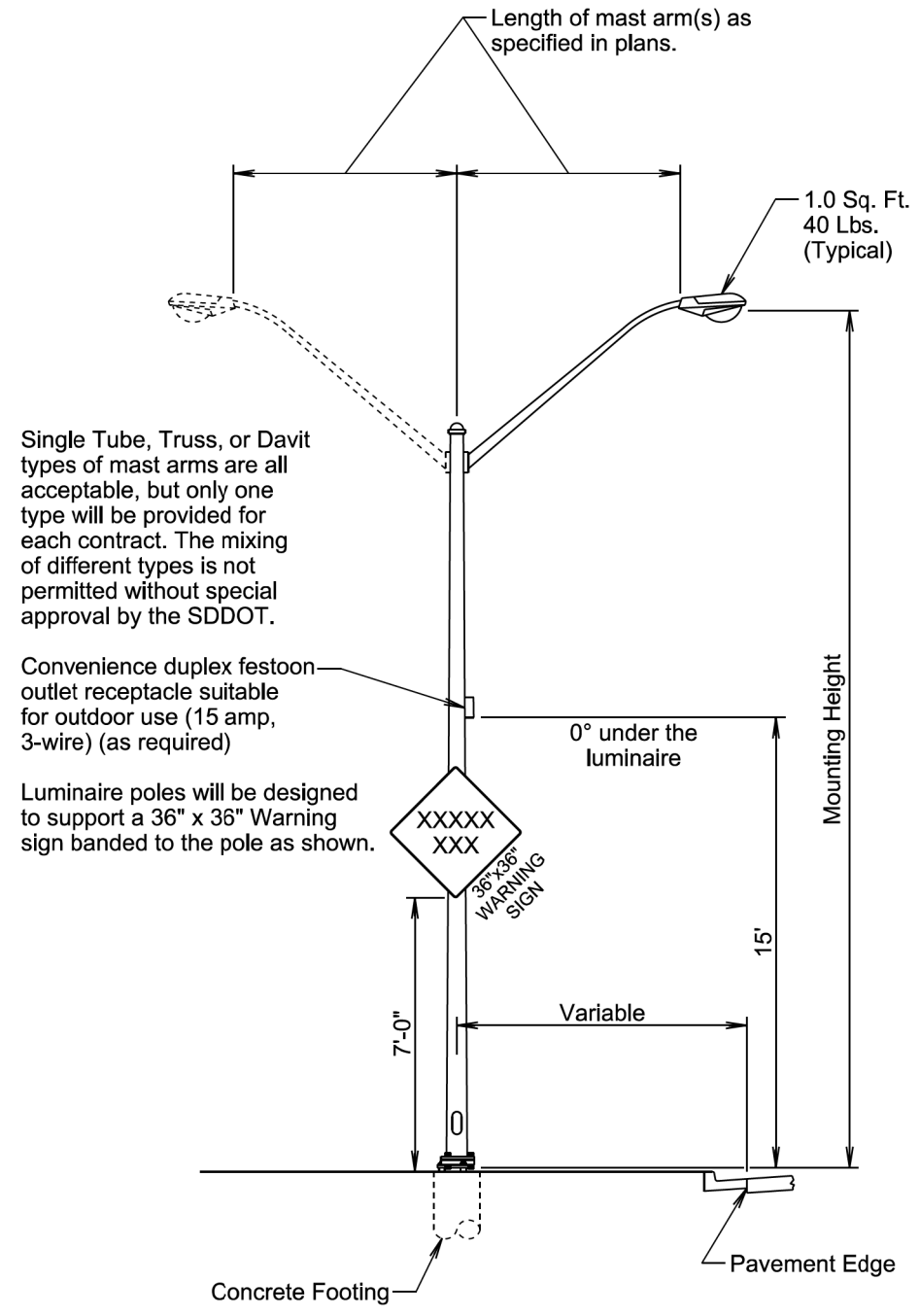
Plot Scale - 1:40  
Plotted From - TRRC14286



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

**LEGEND:**

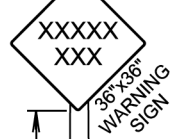
●●	FUSE: 10 amp.
○	LUMINAIRE: LED



Single Tube, Truss, or Davit types of mast arms are all acceptable, but only one type will be provided for each contract. The mixing of different types is not permitted without special approval by the SDDOT.

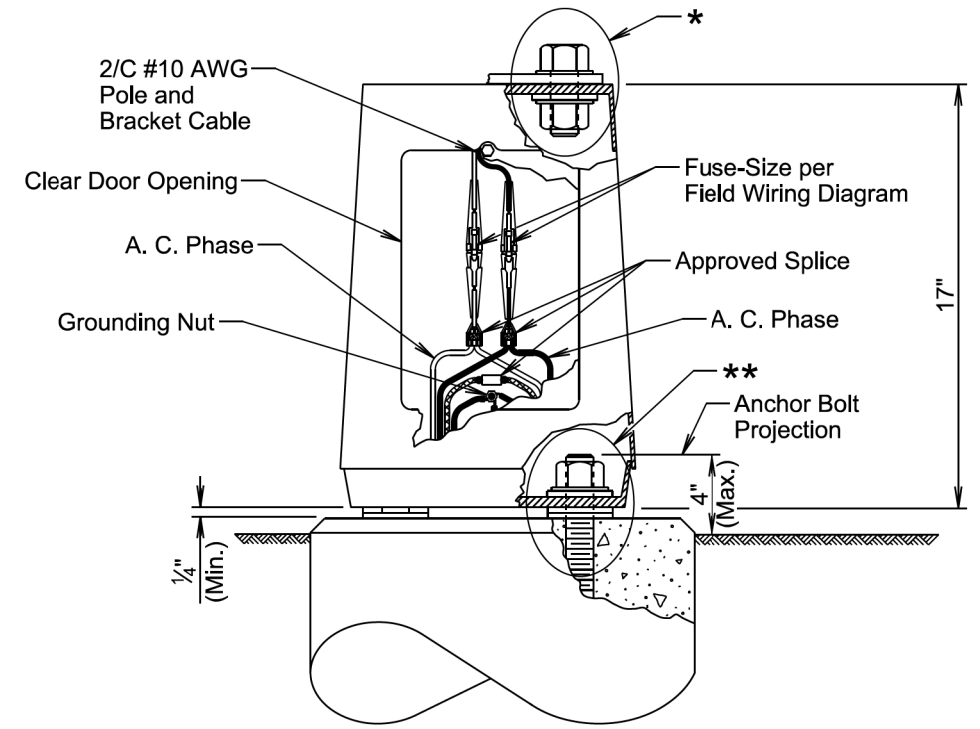
Convenience duplex festoon outlet receptacle suitable for outdoor use (15 amp, 3-wire) (as required)

Luminaire poles will be designed to support a 36" x 36" Warning sign banded to the pole as shown.



November 19, 2022

<i>Published Date: 2025</i>	<b>S D D O T</b>	<b>STEEL ROADWAY LUMINAIRE POLE WITH MAST ARM(S)</b>	PLATE NUMBER <b>635.01</b>
			Sheet 1 of 1



**GENERAL NOTES:**

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

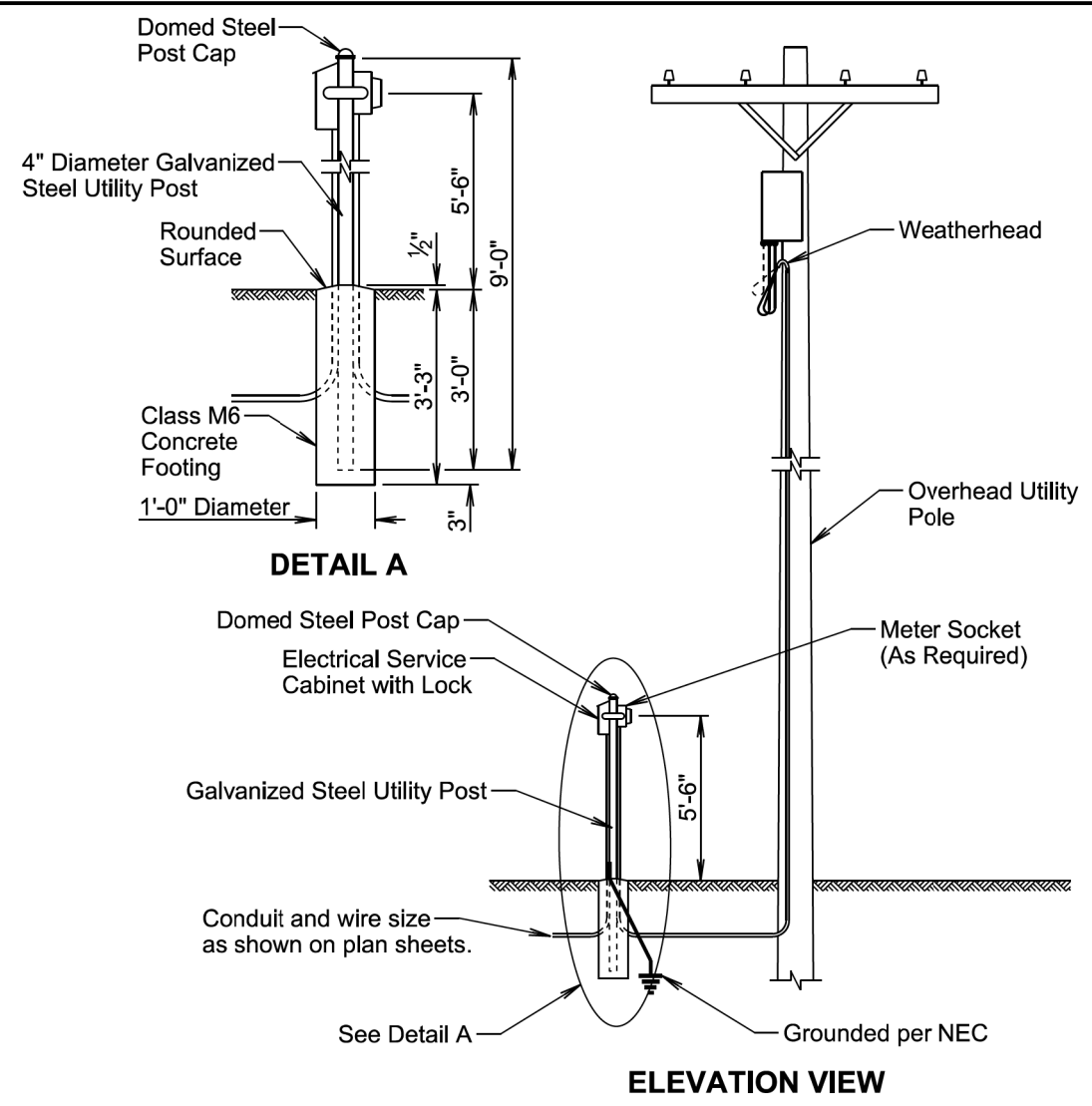
Fused connectors will be breakaway type.

\* 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.

November 19, 2022

<i>Published Date: 2025</i>	<b>S D D O T</b>	<b>ROADWAY LUMINAIRE POLE BREAKAWAY TRANSFORMER BASE</b>	PLATE NUMBER <b>635.21</b>
			Sheet 1 of 1



**GENERAL NOTES:**

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.

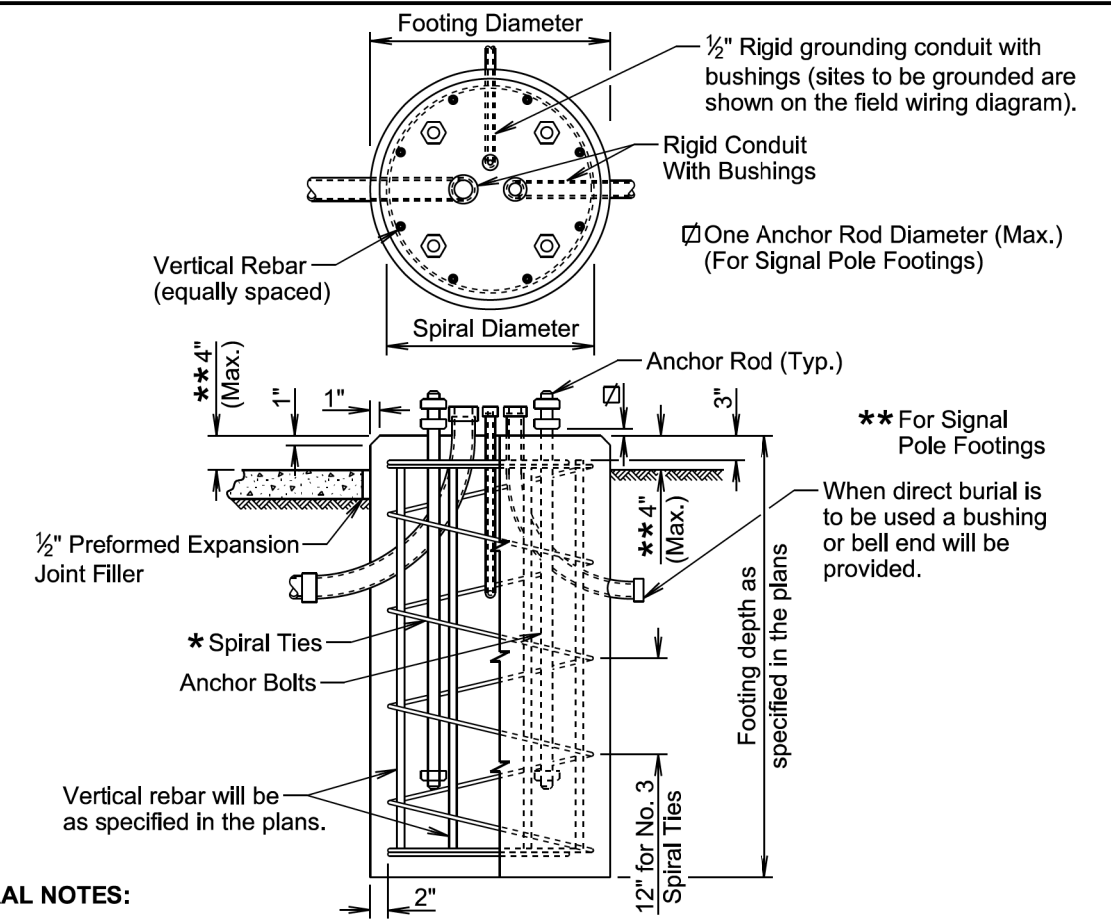
The Contractor will contact and coordinate his/her work with the Utility Companies regarding hookup requirements, fees, materials, and equipment necessary.

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

<b>S D D O T</b>	<b>GALVANIZED STEEL UTILITY POST WITH OVERHEAD UTILITY POLE</b>	PLATE NUMBER 635.35
		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.

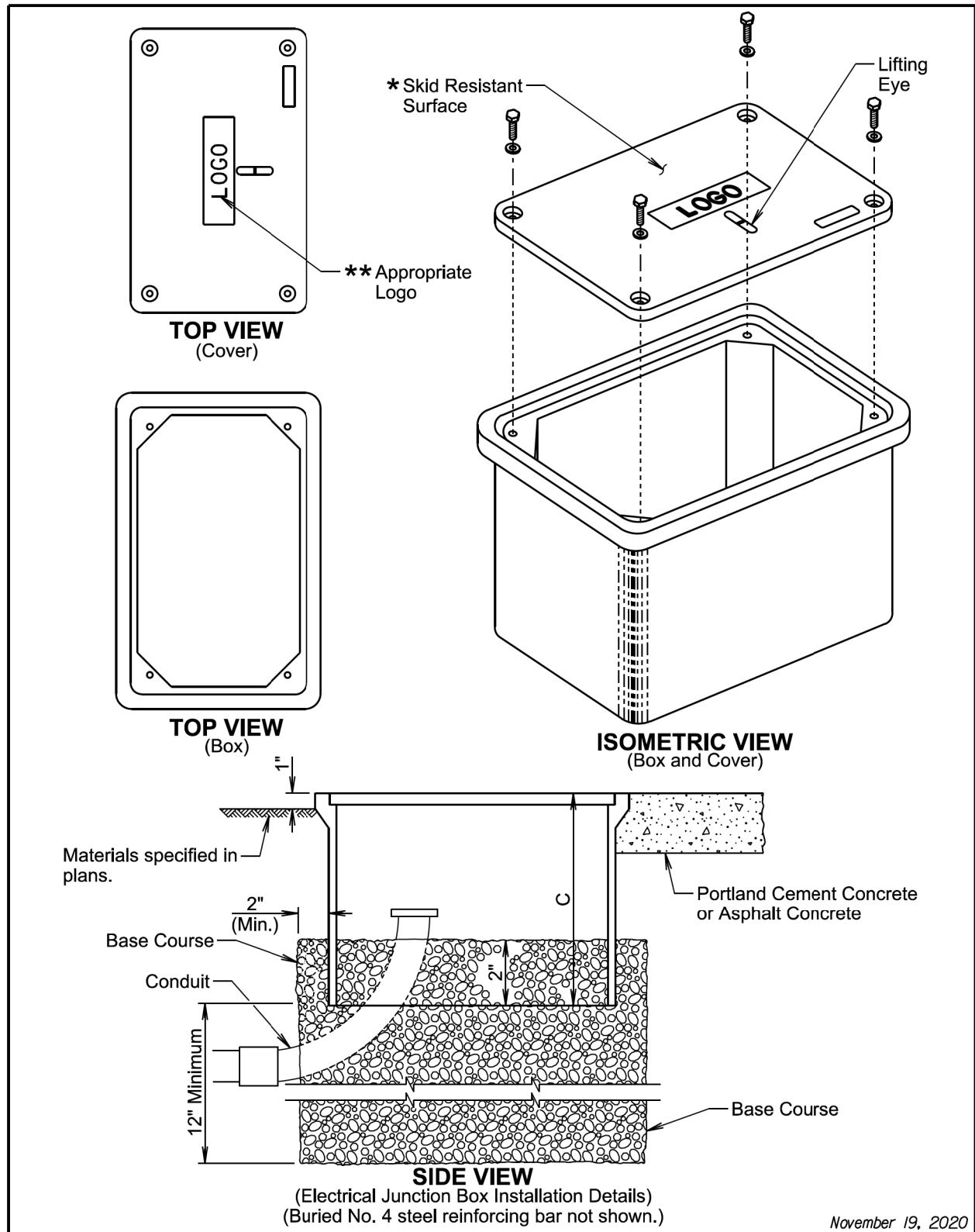
November 19, 2022

<b>S D D O T</b>	<b>POLE FOOTING</b>	PLATE NUMBER 635.55
		Sheet 1 of 1

Published Date: 2025

1:200  
Plotted From: TRRC15924  
File: ...\\jack05HY\\StdPlateSectionL.dgn

Plot Scale - 1:200



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

**GENERAL NOTES:**

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

The cover will have a lifting eye.

\*\* The surface of the cover will have a minimum wet and dry coefficient of friction value of 0.5 as determined by ASTM F609.

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

\*\*\* Two piece covers will be used for Type 3A and Type 4 junction boxes.

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

The electrical junction boxes will be UL listed.

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

November 19, 2020

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

Published Date: 2025

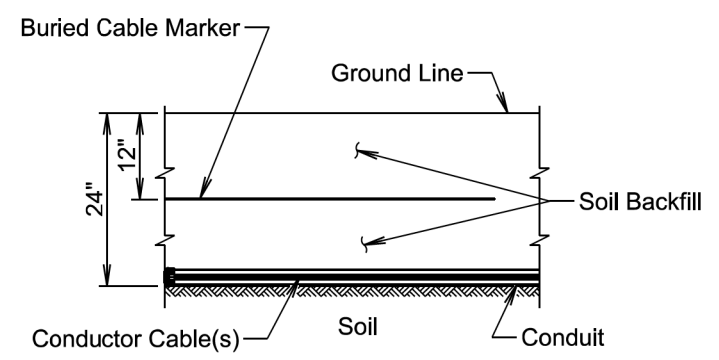
<b>S D D O T</b>	<b>ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4</b>	PLATE NUMBER 635.65
		Sheet 2 of 2

Published Date: 2025

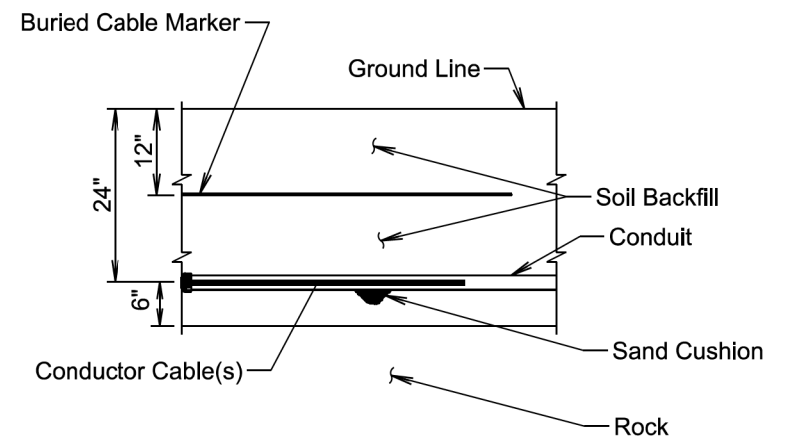
Plotted From - TRRC15924

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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>	<b>S D D O T</b>	<b>CONDUIT INSTALLATION</b>	PLATE NUMBER <b>635.76</b>
			Sheet 1 of 1