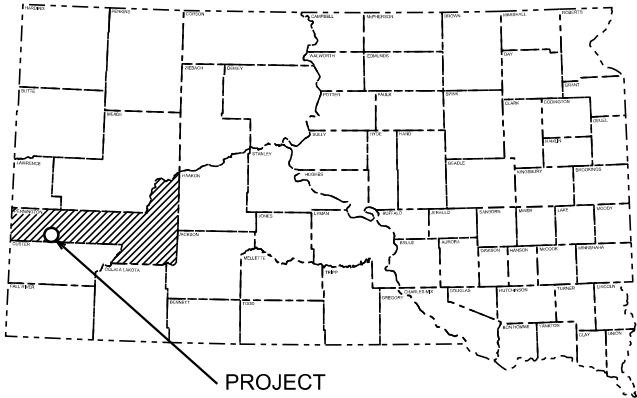


Plot Scale - 1:200

Plotted From - TRRC12221

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000P-469	1	14

Plotting Date: 10/17/2023



STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

PROJECT 000P-469 PCN I61D

US Hwy 16/385 & Railroad Ave - New Signal Cabinet & Controller  
US Hwy 16/385 & SD Hwy 244 - New Signal Cabinet & Controller  
US Hwy 16 & 16B in Hill City - New School Zone Flashing Beacons & Signing

NONSECTION INDEX OF PAGES

Sheet 1:	Title Sheet
Sheets 2-4:	Notes
Sheets 5-6:	Wiring Diagrams
Sheets 7-8:	Conduit Layouts
Sheets 9-10:	Timing Plans
Sheets 11-12:	Beacon & Signing Details
Sheets 13-14:	Standard Plates

New Signal Cabinet & Controller

School Zone Flashing Beacon Work

New Signal Cabinet & Controller



DESIGN DESIGNATION US HWY 16 MRM 40.51

AADT (2022)	6625
DHV	1711
DHV T%	51%
DHV T%	3%
AADT T%	6.2%

STORM WATER PERMIT  
Not Required

DESIGN DESIGNATION US HWY 16 MRM 40.51

AADT (2022)	6677
DHV	1725
DHV	51%
DHV T%	4.9%
AADT T%	10.8%



ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E5110	Salvage Signal Equipment	Lump Sum	LS
110E7150	Remove Sign for Reset	6	Each
250E0010	Incidental Work	Lump Sum	LS
632E1320	2.0"x2.0" Perforated Tube Post	72.0	Ft
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	6.6	SqFt
632E3500	Reset Sign	6	Each
634E0110	Traffic Control Signs	153.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0930	Intersection Control Beacon	4	Each
635E5410	Controller Cabinet	1	Each
635E5515	Battery Backup System for Traffic Signal	2	Each
635E5800	Miscellaneous Signal Parts	Lump Sum	LS
635E6200	Miscellaneous, Electrical	Lump Sum	LS
635E6960	Install Controller Cabinet	2	Each
635E6962	Install Traffic Signal Controller	2	Each

SPECIFICATIONS

Standard Specifications for Roads & Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor’s primary contact regarding matters associated with these commitments will be the Project Engineer. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT’s Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <<https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.pdf> >

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may be disposed of within the Public ROW.

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) will not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Environmental Office and the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements will apply:

- Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.
- Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste will be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) will be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

State Historical Preservation Office (SHPO or THPO) concurrence has not been obtained for this project.

Action Taken/Required:

All earth disturbing activities require a cultural resource review prior to scheduling the pre-construction meeting. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor will arrange and pay for a record search and when necessary, a cultural resource survey. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view of which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office to determine an appropriate course of action.

The Contractor is responsible for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

SCOPE OF WORK

This project consists of removing and replacing with new, the traffic signal cabinets and controllers and various other signal components at the signals in Hill City and at Oreville Junction on US HWY 16/385. The Contractor is encouraged to visit these signals ahead of bidding and construction to see the work site.

SEQUENCE OF OPERATIONS

Contractor requests to deviate from the sequence of operations will be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department’s intent for traffic control and sequencing of the work. An alternate sequence will be submitted for review a minimum of one week prior to potential implementation.

The following is a sequence of operations for the Contractor to follow:

- 1. Remove old infrastructure
- 2. Install new infrastructure
- 3. Verify Signals operate the way they did before construction
- 4. Restore disturbed areas to satisfaction of the Engineer

US HWY 16/385/RAILROAD AVE & MAIN ST (HILL CITY SIGNAL)

This portion of the project will consist of replacing the traffic signal cabinet, and all of its contents with new equipment. The Contractor will remove the old cabinet and base and install a new, larger TS2 type cabinet on a new, standard-height concrete base. The new base will be located three feet closer to the main junction box to provide slack in the wiring. Anchor bolts for cabinets may have hooked ends. Costs for removing the old cabinet base will be incidental to the contract lump sum price for “Remove Signal Equipment”. Costs for installing the cabinet base and associated 3” conduit will be incidental to the contract unit price per each for “Install Controller Cabinet”.

The Contractor will install a SDDOT furnished traffic signal cabinet and McCain controller. Costs for installing the new controller will be incidental to contract unit price per each for “Install Traffic Signal Controller”.

A Timing sheet is provided in these plans, The Contractor will program new controller with these timings. The new cabinet will have manual control capabilities. Costs for installing the contents of the DOT furnished cabinet will be incidental to the contract lump sum price for “Miscellaneous Electrical”. An existing wiring diagram will be provided in these plans for The Contractor to reference, (see sheet 4). The Contractor will verify that the signal functions exactly as it did prior, after new cabinet is installed.

The Contractor will reinstall all traffic detectors (inductive loops) in new cabinets ensuring full functionality as before. Any new parts needed to reconnect detectors/install completely new detectors will be paid for as incidental to the contract lump sum price for “Miscellaneous Signal Parts”. All labor involved with these installations will be incidental to the contract lump sum price for “Miscellaneous Electrical”.

US HWY 16/385 & SD HWY 244 (OREVILLE JUNCTION SIGNAL)

This portion of the project will consist of replacing the traffic signal cabinet, and all of its contents with new equipment. The Contractor will remove the old cabinet and install a new NEMA size G (36in) Econolite “Plug-N-Go Lite TS2 Type-1” or approved equal cabinet mounted to the pole. The cabinet will be fully enclosed except for conduit entering the bottom. Costs for installing the cabinet, and associated splicing of conduit into bottom of cabinet will be incidental to the contract price per each for “Install Controller Cabinet”. Costs for the new cabinet will be incidental to contract unit price per each for “Traffic Signal Cabinet”.

An existing wiring diagram will be provided in these plans for The Contractor to reference (see sheet 5). The Contractor will verify that the signal functions exactly as it did prior, after new cabinet is installed.

The Contractor will install a SDDOT furnished McCain controller in the new cabinet. The Contractor is encouraged to research compatibility of a McCain controller in an Econolite cabinet before bidding. A Timing sheet is provided in these plans, The Contractor will program new controller with these timings. Costs for installing the new controller will be incidental to contract unit price per each for “Install Traffic Signal Controller”.

The new cabinet will have manual control capabilities. There is a manual control box that is pole-mounted on the SE quadrant of the intersection, The Contractor will maintain functionality of this control box; cost for this will be incidental to the contract lump sum price for “Miscellaneous Electrical”.

The Contractor will reinstall all traffic detectors (inductive loops) in new cabinets ensuring full functionality as before. Any new parts needed to reconnect detectors/install completely new detectors will be paid for as incidental to the contract lump sum price for “Miscellaneous Signal Parts”. All labor involved with these installations will be incidental to the contract lump sum price for “Miscellaneous Electrical”.

DOT FURNISHED CONTROLLERS & CABINET

The Contractor will contact Nick Wuebben, SDDOT RC Region traffic technician (605-381-9875) for delivery of McCain controllers, and cabinet (located at south yard, inside building) for Hill City Signal.

BATTERY BACKUP CABINET

The Contractor will supply battery backup cabinets/systems in Hill City and at Oreville Jct. In Hill city The Contractor will supply an added concrete footing for housing the battery backup cabinet. At the Oreville Junction signal the battery backup cabinet will be attached to the side of the signal cabinet without a footing. The battery backup cabinets will be an aluminum NEMA 3R type. The cabinet will have a thermostatically controlled 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.”

SALVAGE SIGNAL EQUIPMENT

Removed signal cabinets and all their contents will be salvaged and delivered to RC Region Traffic office at 2300 Eglin St in Rapid City, SD, costs for this will be incidental to contract lump sum price for “Salvage Signal Equipment”. Any equipment damaged during salvaging or delivery will be repaired or replaced by the Contractor at no cost to the State.

Contractor will contact Nick Wuebben, SDDOT RC Region traffic technician (605-381-9875) for delivery of salvaged cabinets.

INCIDENTAL WORK

Incidental work includes, but is not limited to, the restoration of all disturbed areas to the satisfaction of the Engineer.

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:

John.Less@state.sd.us

SUPPLYING AS BUILT PLANS

If the new wiring and signal equipment 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 Rapid City Region Traffic Engineer. The as built plans may include conduit layouts, wiring diagrams, or other drawings depicting the changes from the original plans.

SIGNAL HEAD WIRING CHANGES

The signal heads at Oreville Junction intersection currently have detachable trailer-plug type wiring connectors on the backside of each head. The Contractor will splice in new, continuous, and permanent wiring in place of these trailer-plug connectors, and seal up holes. Costs for installing the new signal head wiring will be incidental to the contract lump sum price for “Miscellaneous Electrical”.

RE-MOUNT SIGNAL HEAD

At the Oreville Junction Signal, the lowest 3-section signal head on the vertical pole just above the controller cabinet will be remounted with all new mounting hardware. Costs for remounting this signal head will be incidental to the contract lump sum price for “Miscellaneous Signal Parts”.







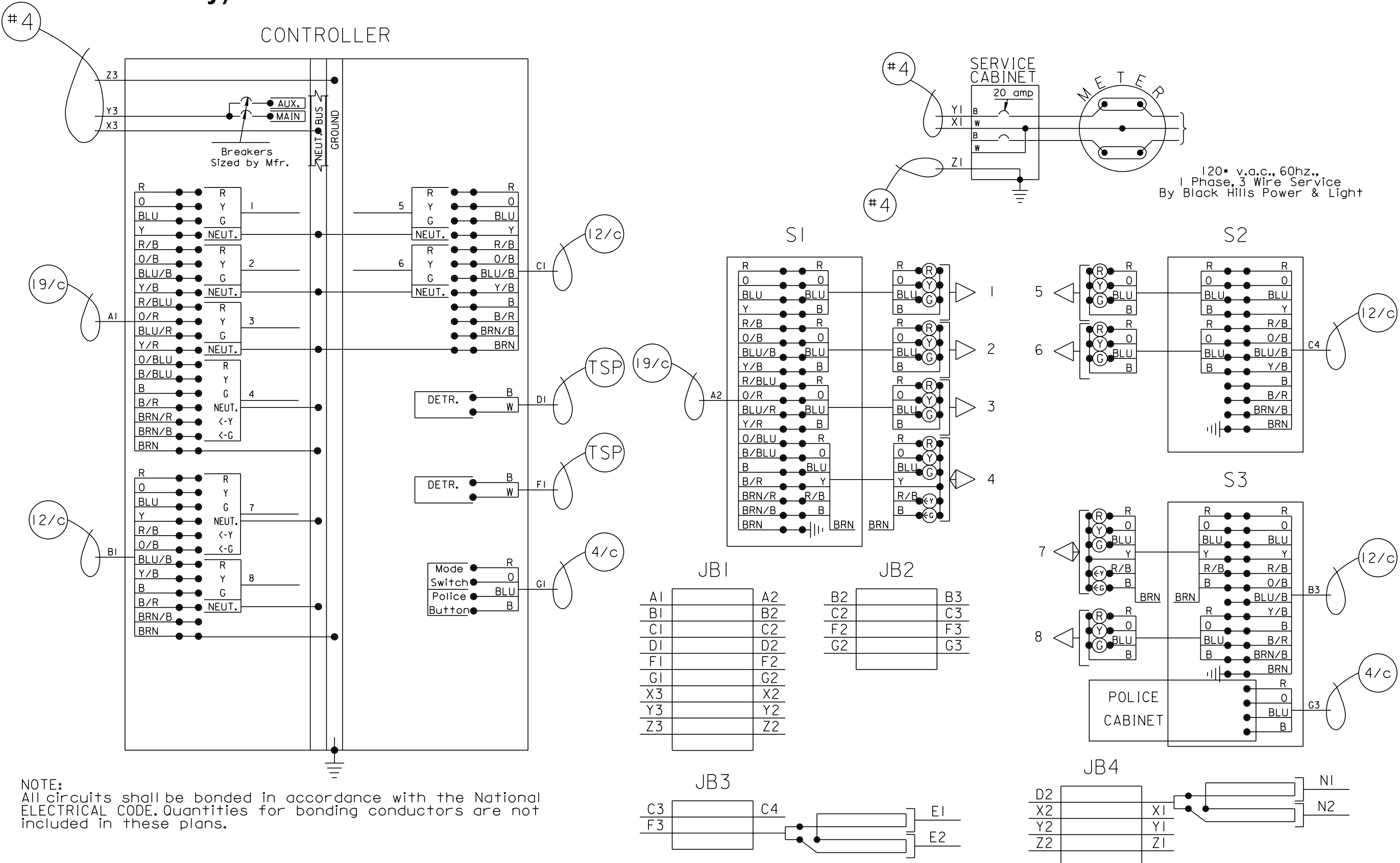
US HWY 16/385 & SD HWY 244 (OREVILLE JUNCTION) SIGNAL FIELD WIRING DIAGRAM  
(for reference only)

Plotting Date: 10/17/2023

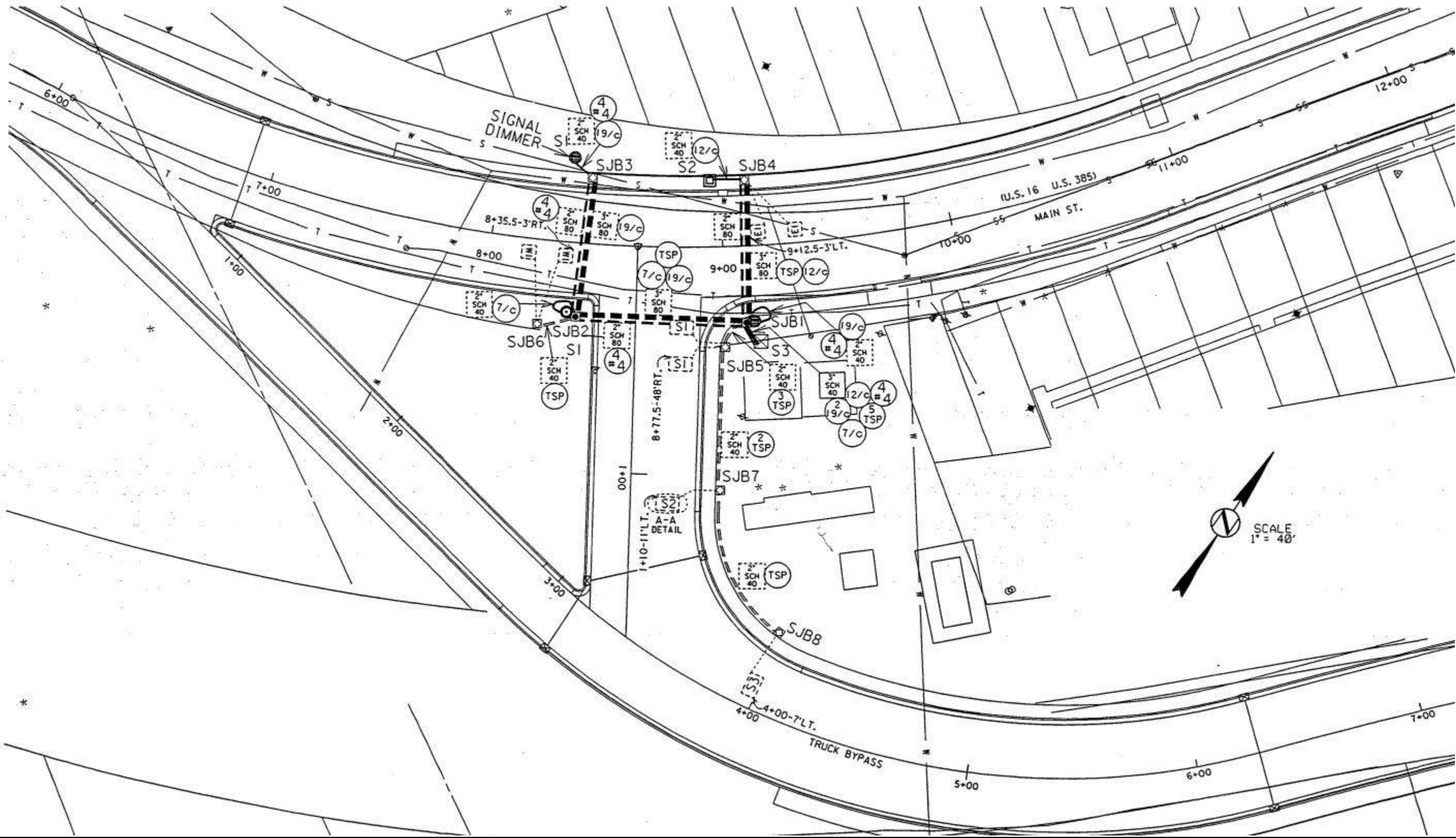
PLOT SCALE - 1:245.559

PLOT NAME - 11

FILE - ... \OREVILLE\_16-244\_WIRINGDIAGRAM.DGN



**HILL CITY SIGNAL EXISTING CONDUIT LAYOUT (For Reference Only)**



PLOT SCALE - 1:54.6265

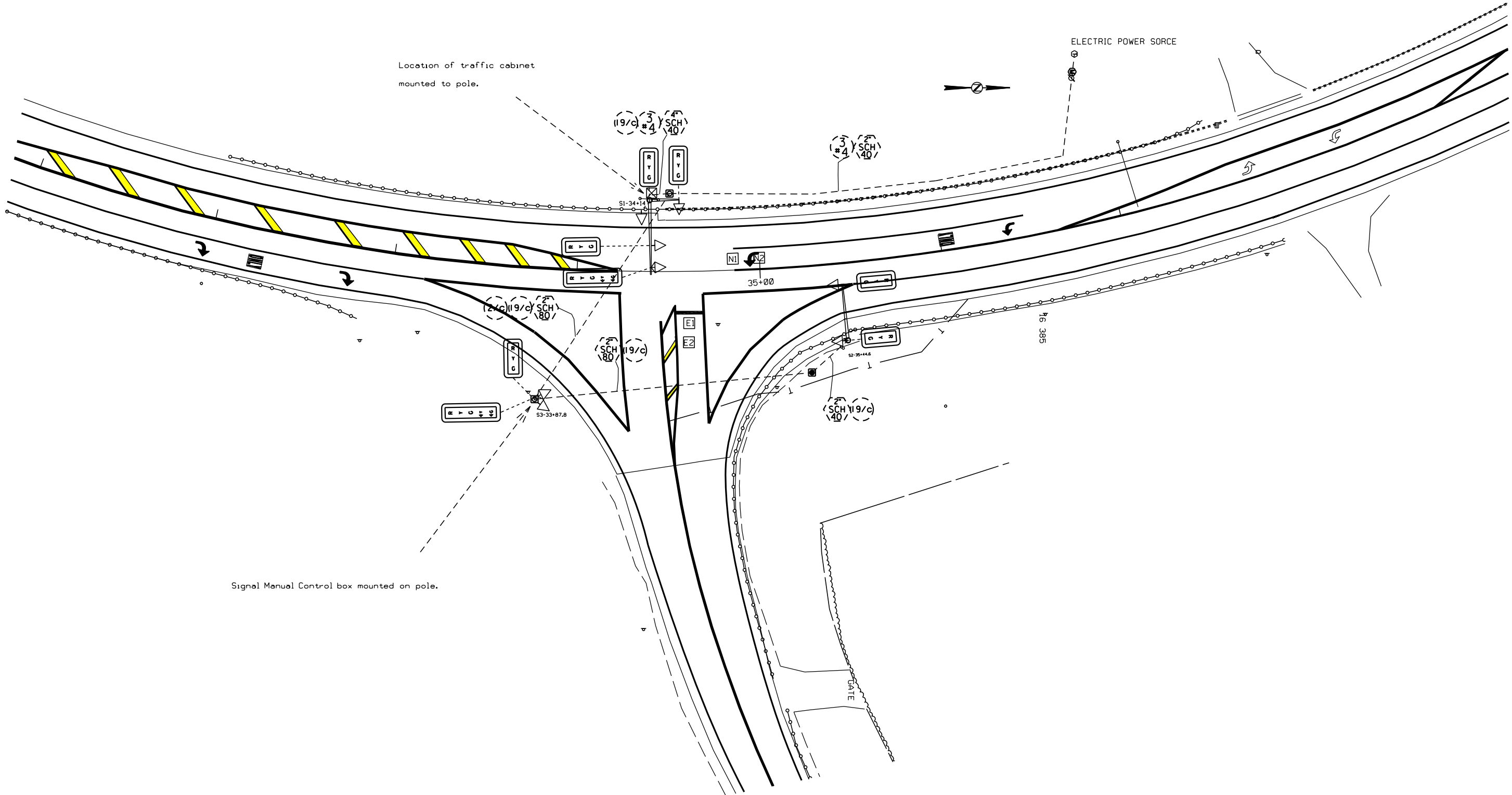
PLOTTED FROM - TRRC12221

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000P-469	8	14

Plotting Date: 10/17/2023

# US16/385 & SD 244 (OREVILLE JUNCTION) SIGNAL LAYOUT

EXISTING LAYOUT: FOR REFERENCE ONLY








## Plot Scale - 1:41.8881

Plotted From - TRRC12221

File - ...SignalTimingSeed.dgn

TOURIST SEASON BASIC INTERVALS								
Phase	1	2	3	4	5	6	7	8
Movement		NB				SB		WB
Lag								
Min Green		7				7		7
Extension		3				3		3
Max 1		25				25		15
Max 2		25				25		15
Time Before								
Time to Reduce								
Minimum Gap								
Yellow		4				4		3
All Red		2				2		2
Walk								7
Ped Clearance								16
Recall		MIN				MIN		
Prog Flash Display		Y				Y		R
Start Up Ø		X				X		

TIMING PLAN 1	
Time of Day (TOD)	Pattern (C/S/O)
0000 - 0600	FLASH
0600 - 2200	FREE

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

## Plot Scale - 1:41,888

Plotted From - TRRC12221

File - ... \SignalTimingSeed.dgn

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

YEARLY PROGRAM												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
FLASH	X	X	X	X	-	-	-	-	-	-	X	X

- \* Allow controller to back up to serve this phase.

The first floor plan shows a large rectangular area labeled 'SD 244' on the right side. On the left side, there is a vertical corridor labeled 'US 16 / 385'. At the bottom left, there is a small rectangular area labeled '2'. A north arrow is located in the bottom right corner, pointing upwards. A scale bar is located in the bottom left corner, with a length of 6 units and a width of 1 unit.



PLOT SCALE - 1:154.6265

PLOTTED FROM - TRRC12221

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000P-469	11	14

Plotting Date: 10/19/2023

# US16/385 SCHOOL SPEED ZONE BEACON INSTALLATION DETAILS



PLOT NAME - 4

FILE - ...HILL CITY - SIGNAL LAYOUT.DGN



US16/385 SCHOOL SPEED ZONE BEACON INSTALLATION DETAILS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000P-469	12	14

Plotting Date: 10/19/2023



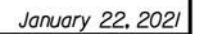
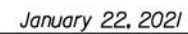
PLOT SCALE - 1:54.6265

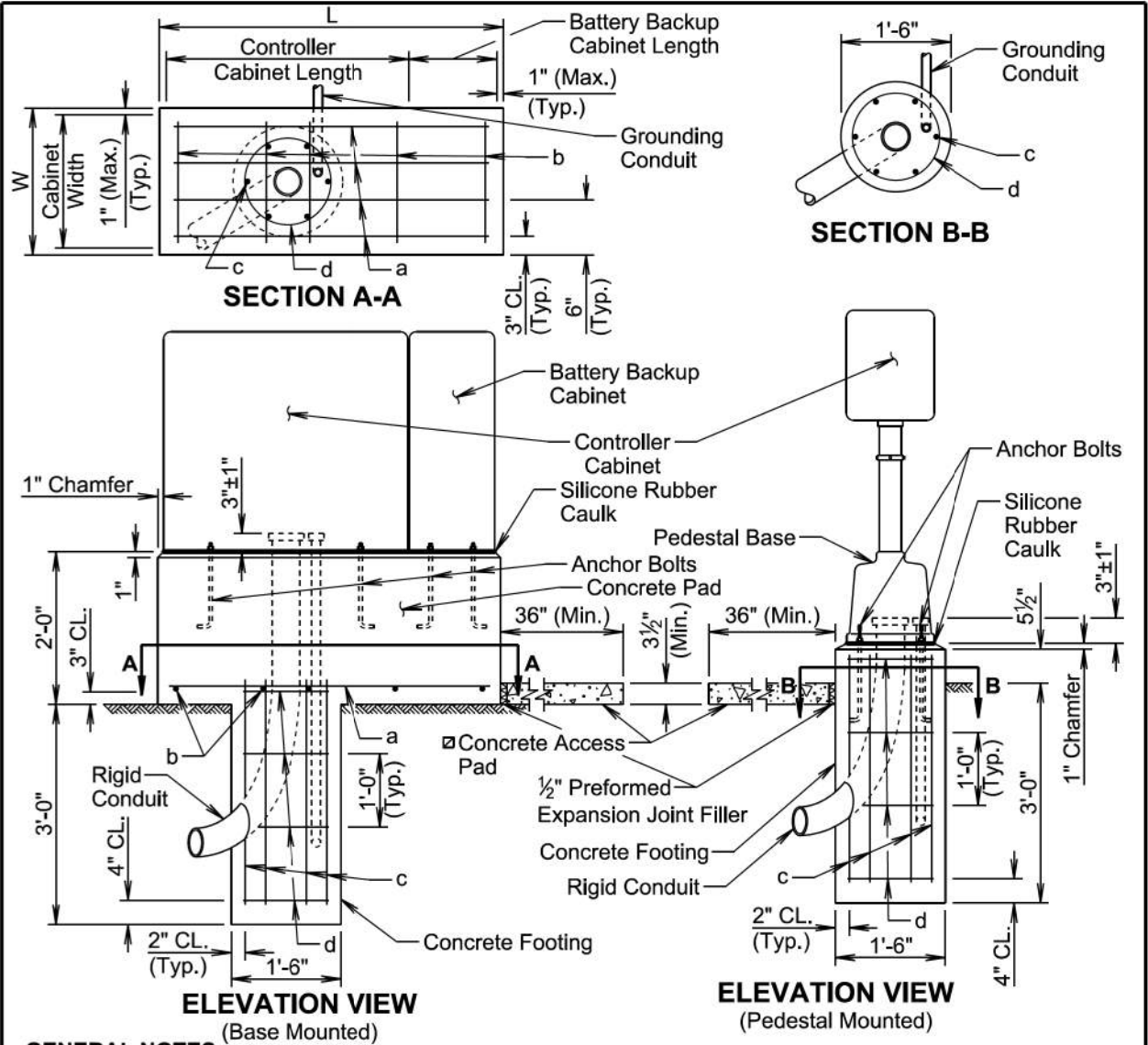
PLOTTED FROM - TRRC12221

PLOT NAME - 5

FILE - ...NORVILLE - SIGNAL LAYOUT.DGN




Plotting Date: 10/17/2023



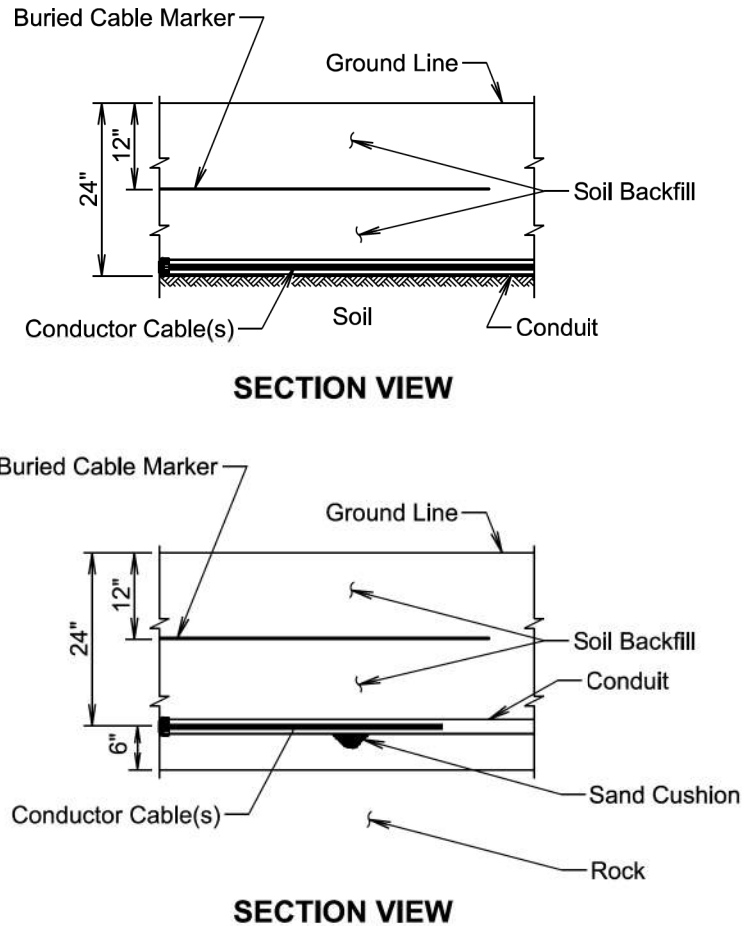
GENERAL NOTES:

- The concrete pad will conform to the base of the controller and battery backup cabinets to the satisfaction of the Engineer.
- Conduits will be sealed water-tight until the conductor cables are installed.
- If the controller and battery backup concrete pad and footing is not located within or adjacent to an existing sidewalk, the Contractor will provide a concrete access pad as directed by the Engineer.
- Anchor bolts and related hardware will conform to the controller and battery backup cabinets manufacturer's specifications.
- A continuous bead of silicone rubber caulk will provide a weather-tight seal between the concrete pad or footing, and the cabinet or base.

REINFORCING SCHEDULE (for one footing)					
Mk.	No.	Size	Length	Type	Bending Detail
a	*	3	L-4"	Str.	
b	*	3	W-4"	Str.	
c	6	6	3'-0"	Str.	
d	4	3	4'-0"	T3	
<p>Note: Dimensions are out to out of bar</p> <p>* Vary number of bars as required by footing size.</p>					

November 19, 2022

Published Date: 2024	S D D O T	CONTROLLER CABINET AND FOOTING	PLATE NUMBER 635.60
			Sheet 1 of 1



GENERAL NOTE:

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

November 19, 2022

Published Date: 2024	S D D O T	CONDUIT INSTALLATION	PLATE NUMBER 635.76
			Sheet 1 of 1