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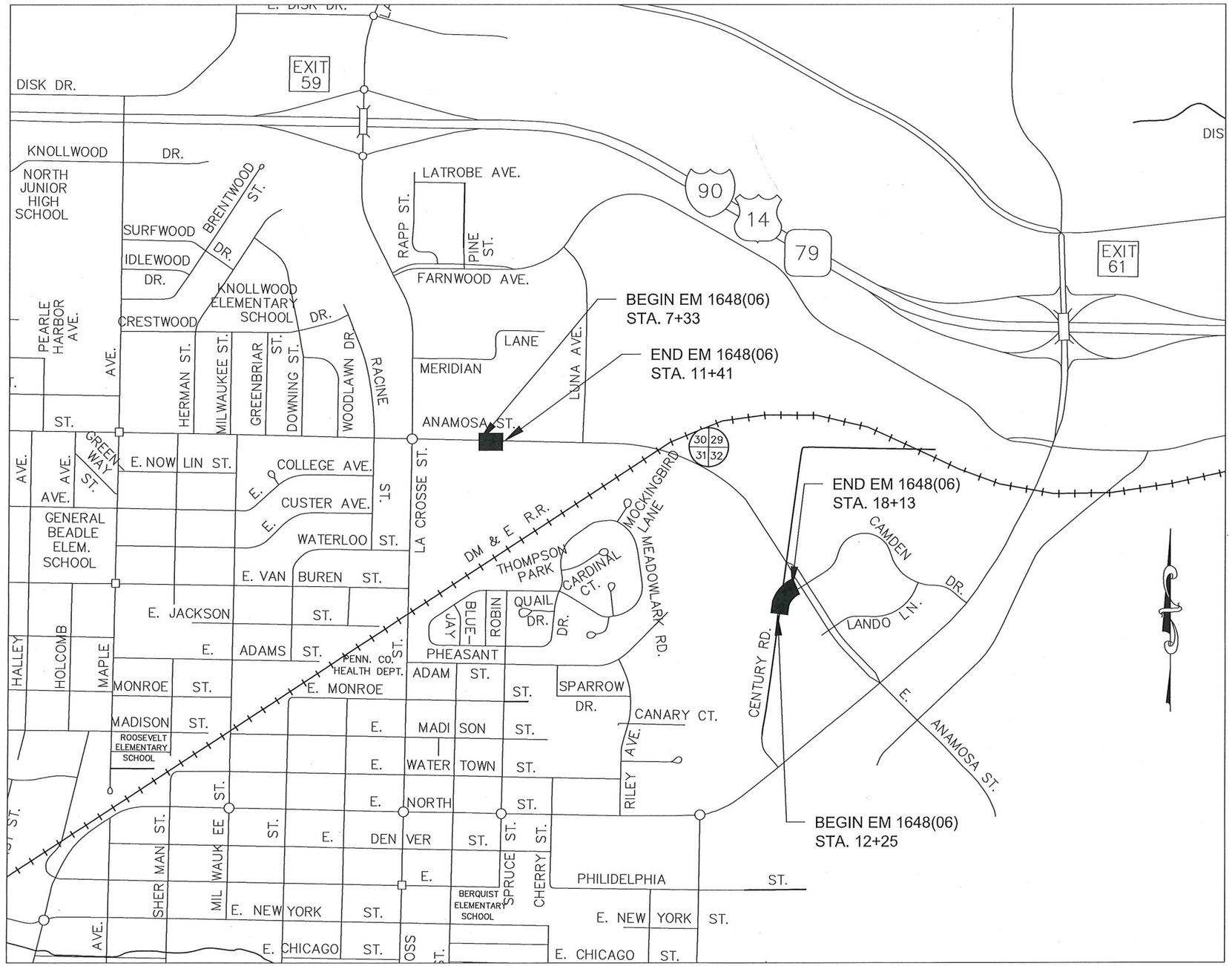
STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L1	L15
SIGNAL AND LIGHTING PLANS			

SECTION L: SIGNAL AND LIGHTING PLANS



RAPID CITY, SD

INDEX OF SHEETS

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REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9632
CHRISTOPHER HORNER
SOUTH DAKOTA
8-25-14

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SECTION L – ESTIMATE OF QUANTITIES			
BID ITEM NUMBER	ITEM DESCRIPTION	TOTAL QUANTITY	UNIT
635E2035	SIGNAL POLE WITH 35' MAST ARM	2	EACH
635E2530	GALVANIZED STEEL UTILITY POLE	1	EACH
635E4010	1 SECTION VEHICLE SIGNAL HEAD	8	EACH
635E5030	3' DIAMETER FOOTING	14	FT
635E5301	TYPE 1 ELECTRICAL JUNCTION BOX	2	EACH
635E5400	ELECTRICAL SERVICE CABINET	1	EACH
635E5510	SIGNAL FLASHER UNIT	1	EACH
635E5800	MISCELLANEOUS SIGNAL PARTS	LUMP SUM	LS
635E5900	PEDESTRIAN PUSH BUTTON	2	EACH
635E5910	PEDESTRIAN PUSH BUTTON POLE	2	EACH
635E5930	PEDESTRIAN CROSSING SIGN	2	EACH
635E8120	2" RIGID CONDUIT, SCHEDULE 40	70	FT
635E8370	2" INNERDUCT, SCHEDULE 80	85	FT
635E9018	1/C #8 AWG COPPER WIRE	105	FT
635E9020	1/C #10 AWG COPPER WIRE	184	FT
635E9304	4/C #14 AWG IMSA COPPER CABLE, K1	567	FT
635E9307	7/C #14 AWG IMSA COPPER CABLE, K1	151	FT

TRAFFIC SIGNAL CONTROL CABLE LABELS

TRAFFIC SIGNAL CABLE SHALL BE IDENTIFIED IN HAND HOLES, JUNCTION BOXES, PEDESTAL BASES, ELECTRICAL SERVICE CABINETS, AND CONTROLLER CABINETS AS INDICATED ON THE WIRING DIAGRAM. LABELS SHALL BE WRAPPED AROUND TRAFFIC SIGNAL CABLE TO INDICATE THE SIGNAL POLE AND SIGNAL HEAD THAT IT IS CONNECTED TO. LABELS SHALL BE SELF-ADHESIVE VINYL CLOTH WITH A PREPRINTED LEGEND. SIGNAL CONTROL CABLES TO THE POLES SHALL BE MARKED WITH A LEGEND.

SUPPLYING AS BUILT PLANS

IF THE TRAFFIC SIGNAL SYSTEMS OR ROADWAY LIGHTING SYSTEMS ARE CONSTRUCTED DIFFERENTLY THAN WHAT IS STATED IN THE PLANS, THE CONTRACTOR SHALL SUPPLY AS BUILT PLANS TO THE ENGINEER AND A COPY SHALL BE SENT TO THE CITY TRAFFIC ENGINEER AND TRAFFIC DESIGN ENGINEER. THE AS BUILT PLANS MAY INCLUDE CONDUIT LAYOUTS, WIRING DIAGRAMS, OR OTHER DRAWINGS DEPICTING THE CHANGES FROM THE ORIGINAL PLANS.

INCIDENTAL WORK

INCIDENTAL WORK INCLUDES, BUT IS NOT LIMITED TO, THE RESTORATION OF ALL DISTURBED AREAS TO THE SATISFACTION OF THE ENGINEER.

COORDINATION OF TRENCHING AND EQUIPMENT LOCATIONS WITH EXISTING AND PROPOSED SIDEWALKS, CURBS, UTILITIES (WATER, IRRIGATION, GAS, SEWER, POWER, CABLE, AND FIBER), ETC.

SHOP DRAWING AND CATALOG CUTS SUBMITTALS

THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CATALOG CUTS IN ACCORDANCE WITH SECTION 985 OF THE SPECIFICATIONS OR IN ADOBE PDF FORMAT. ADOBE PDF OR HARD COPY SUBMITTALS SHALL BE SENT TO THE FOLLOWING:

RON.WILLIAMS@KLJENG.COM
KLJ
330 KNOLLWOOD DRIVE (57701)
PO BOX 3416 (57709-3416)
RAPID CITY, SD

AFTER REVIEW, SHOP DRAWINGS WILL BE RETURNED TO THE CONTRACTOR WITH ANY REVISIONS NOTED. THE CONTRACTOR WILL SEND KLJ CORRECTED SHOP DRAWINGS. AFTER REVIEW THE SHOP DRAWINGS WILL BE FORWARDED TO THE SDDOT FOR FINAL REVIEW AND TO DISTRIBUTE THE SHOP DRAWINGS.

ON-SITE INSPECTION

AN ON-SITE INSPECTION OF THE TRAFFIC SIGNALS SHALL BE CONDUCTED BEFORE ACCEPTANCE OF THE PROJECT, ONCE THE TRAFFIC SIGNAL AND LIGHTING SYSTEM ARE COMPLETED AND OPERATIONAL. THE ON-SITE INSPECTION SHALL BE CONDUCTED BY THE CONTRACTOR, REGIONAL TRAFFIC ENGINEER, CITY TRAFFIC ENGINEER, PROJECT ENGINEER, AND THE TRAFFIC DESIGN ENGINEER.

PULL WIRES

PROVIDE A #10 AWG PULL WIRE IN ALL CONDUITS. THE COST OF PROVIDING AND INSTALLING PULL WIRES SHALL BE INCLUDED IN THE CONTRACT PRICE PER FOOT FOR 1/C #10 AWG COPPER WIRE.

TABLE OF FOOTING DATA

SITE DESIGNATION	FOOTING DIAMETER	*FOOTING DEPTH	**SPIRAL DIAMETER	**SPIRAL LENGTH	VERTICAL REINFORCEMENT
SIGNAL POLE W/ 35' MAST ARM	3' - 0"	7' - 0"	2' - 8"	71'-7"	8-#5 X 6'-6"

* FOOTING DEPTH SHALL BE BELOW GROUND LEVEL.
** THE SIZE OF ALL SPIRALS SHALL BE #3.

THE CONTRACTOR SHOULD BE AWARE THAT ANY OF THE FOOTING LOCATIONS THAT CONTAIN GRAVEL AND/OR SAND OR HAVE HIGH WATER TABLES ARE POTENTIAL CANDIDATES FOR CAVING SOILS. IF THESE SOILS ARE ENCOUNTERED DURING EXCAVATION IT MAY BE NECESSARY TO USE PERMANENT CASING TO COMPLETE THE EXCAVATION AND CONCRETE PLACEMENT OF THE DRILLED SHAFT TYPE FOOTING. THE CONTRACTOR SHALL BE PREPARED TO UTILIZE THE PERMANENT CASING CONSTRUCTION METHOD.

LIGHTNING PROTECTION

ALL LUMINAIRE POLES, TOWER LIGHTING POLES, AND SERVICE CABINETS SHALL BE EQUIPPED WITH INDUSTRIAL LIGHTNING ARRESTORS COMPLIANT WITH CURRENT NEMA AND UL STANDARDS FOR LIGHTNING ARRESTORS. COST FOR GROUND RODS AND LIGHTNING ARRESTORS SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE FOR THE CORRESPONDING LUMINAIRE POLE, TOWER LIGHTING POLE, AND SERVICE CABINET BID ITEM.

POLES

CANTILEVER TRAFFIC SIGNAL SUPPORTS, INCLUDING ANCHOR BOLTS, SHALL BE DESIGNED FOR FATIGUE IN ACCORDANCE WITH FATIGUE IMPORTANCE CATEGORY II WITHOUT GALLOPING AND TRUCK INDUCED GUSTS.

SIGNAL POLES SHALL HAVE ROTATABLE MAST ARMS.

ALL POLES SHALL HAVE TRANSFORMER BASES.

CONTRACTOR SHALL INSTALL A GROUND ROD ADJACENT TO EACH POLE AND CONCRETE FOUNDATION. PROVIDE ½ INCH PVC CONDUIT SWEEP FOR GROUND ROD. EACH GROUND ROD SHALL BE BONDED AS REQUIRED BY THE NEC.

TRAFFIC SIGNAL METER SOCKET

THE METER SOCKET PROVIDED BY THE CONTRACTOR SHALL BE A 200 AMP, POSITIVE BY-PASS.

MULTICONDUCTOR CONTROL CABLE FOR SIGNAL CIRCUITS

THE CABLE FURNISHED FOR SIGNAL CIRCUITS SHALL BE FURNISHED WITH THE NUMBER AND SIZE OF THE CONDUCTORS SHOWN IN THE PLANS AND SHALL MEET THE SPECIFICATIONS FOR EITHER OF THE TWO TYPES SPECIFIED BELOW.

1. GENERAL PURPOSE CONTROL CABLE WITH STRANDED COPPER CONDUCTORS, ICEA S-61-402, PE-PV INSULATED (20-10), 600 VOLTS.

2. GENERAL PURPOSE CONTROL CABLE, WITH STANDARD COPPER CONDUCTORS, AERIAL AND DUCT, IMSA 20-1, 600 VOLTS.

THE CONDUCTOR JACKETS FOR THE ABOVE CABLES SHALL BE COLOR CODED IN ACCORDANCE WITH ICEA S-61-402 APPENDIX K, TABLE K-1 OR IMSA 19-1 TABLE II.

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STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L3	L15
ESTIMATE WITH GENERAL NOTES, & TABLES			

SIGNAL HEADS AND BACKPLATES

SIGNAL HEADS SHALL BE POLYCARBONATE. SIGNAL BACKPLATES SHALL EXTEND NOT LESS THAN 5 INCHES FROM THE EDGE OF THE SIGNAL HEAD AT THE TOP, BOTTOM, AND SIDES. THE BOTTOM OF THE BACKPLATE ON VEHICLE SIGNAL FACES MOUNTED DIRECTLY ABOVE PEDESTRIAN SIGNAL INDICATIONS SHALL BE SIZED TO PERMIT THE SEPARATE ADJUSTMENT OF THE VEHICLE AND PEDESTRIAN SIGNAL INDICATION AND MAY BE LESS THAN 4 INCHES.

SIGNAL FLASHER UNIT

THE SIGNAL FLASHER UNIT SHALL BE ACTIVATED BY PEDESTRIAN PUSH BUTTONS USING A PROGRAMMABLE TIMING RELAY. THE TIMING RELAY SHALL BE CAPABLE OF BEING PROGRAMMED TO 100 SECONDS. THE TIMING RELAY SHALL BE PROGRAMMED TO 28 SECONDS.

WHEN ACTIVATED THE TWO YELLOW SIGNAL HEADS ON EACH POLE MAST ARM SHALL FLASH IN AN ALTERNATING "WIG-WAG" FLASHING SEQUENCE (LEFT LIGHT ON, THEN RIGHT LIGHT ON).

THE SIGNAL FLASHER UNIT SHALL BE HOUSED IN A NEMA WEATHERPROOF CABINET.

THE SIGNAL FLASHER UNIT SHALL BE BANDED TO SIGNAL STANDARD A2 BY THE CONTRACTOR AS INDICATED ON THE CONDUIT LAYOUT SHEETS.

ALL COSTS FOR CABINET AND LABOR AND MATERIALS REQUIRED TO MAKE THE SIGNAL FLASHER UNIT OPERATIONAL SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER EACH FOR "SIGNAL FLASHER UNIT".

CONDUIT INSTALLATION

CONDUIT SHALL BE INSTALLED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH APPLICABLE CODES.

THE CONTRACTOR SHALL CAP ALL ENDS OF SPARE CONDUIT RUNS. AT EACH CONDUIT END NOT INSTALLED IN A JUNCTION BOX, THE CONTRACTOR SHALL PLACE A PIECE OF REBAR FOR IDENTIFYING THE LOCATION AT A FUTURE DATE.

THE COST OF THE METHOD OF INSTALLATION SHALL BE INCLUDED IN THE CONTRACT PRICE OF THE ASSOCIATED CONDUIT.

INNERDUCT CONDUIT

SCHEDULE 80 2" INNERDUCT CONDUIT SHALL BE INSTALLED UNDERNEATH ROADWAYS. INNERDUCT CONDUIT SHALL MEET ASTM F2160 & UL 651B, SMOOTH INTERIOR/EXTERIOR. SCHEDULE 80 INNERDUCT SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER FOOT FOR 2" INNERDUCT, SCHEDULE 80.

JUNCTION BOXES

ELECTRICAL JUNCTION BOXES SHALL BE NON METALLIC AND AS SHOWN IN THE DETAIL. JUNCTION BOX SHALL BE OF THE OPEN BOTTOM TYPE WITH CONDUIT ENTERING THROUGH THE BOTTOM. COARSE AGGREGATE SHALL BE INSTALLED AS BASES AS SHOWN IN THE DETAIL AND AS SPECIFIED IN THE SPECIFICATIONS.

JUNCTION BOX COVERS SHALL HAVE A NON-SKID SURFACE WITH A MINIMUM 0.50 COEFFICIENT OF FRICTION TESTED IN ACCORDANCE WITH ASTM C-1028.

ELECTRICAL SERVICE EQUIPMENT

THE CONTRACTOR SHALL COORDINATE WITH BLACK HILLS POWER ON PROVIDING NEW ELECTRICAL SERVICE (120/240 VOLTS, SINGLE PHASE) FOR EACH SIGNAL FLASHER UNIT AT THE LOCATIONS SHOWN. THE CONTRACTOR SHALL PROVIDE A 200 AMP BY-PASS METERSOCKET AND MOUNT ON THE PEDESTAL AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL ALSO MOUNT THE ELECTRICAL SERVICE DISCONNECT ON THE PEDESTAL. THE CONTRACTOR SHALL PROVIDE 2" UNDERGROUND CONDUIT FROM THE UTILITY TRANSFORMER TO THE BASE OF THE PEDESTAL. THE CONTRACTOR SHALL INSTALL A 2" RIGID STEEL CONDUIT RISER BELOW THE METERSOCKET FOR THE SERVICE CONDUCTORS. EXPOSED CONDUIT SHALL BE RIGID STEEL. THE CONTRACTOR SHALL PROVIDE AND INSTALL EQUIPMENT AND CONDUIT AS REQUIRED BY BLACK HILLS POWER.

CONFIRMATION LIGHTS

THE CONTRACTOR SHALL SUPPLY AND INSTALL A CONFIRMATION LIGHT ON EACH SIGNAL POLE. THE CONFIRMATION LIGHT SHALL INDICATE TO THE PEDESTRIAN THAT THE SIGNAL HEADS ARE FLASHING WHEN THE PEDESTRIAN ACTIVATES THE PUSHBUTTON. THE CONFIRMATION LIGHT SHALL BE MOUNTED ON THE SIGNAL POLE AND BE AIMED SO THAT A PEDESTRIAN CAN SEE IT FROM THE CROSSWALK ON THE OPPOSITE SIDE OF THE ROADWAY. THE CONFIRMATION LIGHT SHALL BE CONNECTED TO THE FLASHING BEACON CIRCUITS AT THE SIGNAL POLE TERMINAL BLOCK AS SHOWN ON THE WIRING DIAGRAM AND SHALL FLASH SYNCRONOUSLY WITH THE SIGNAL HEADS. THE CONFIRMATION LIGHT SHALL BE A STANDARD NEMA PAR TYPE LAMP AND SOCKET ASSEMBLY AS USED FOR EMERGENCY VEHICLE PREEMPTION UNITS.

ALL EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED TO INSTALL THE CONFIRMATION LIGHTS SHALL BE INCIDENTAL TO THE CONTRACT LUMP SUM PRICE FOR "MISCELLANEOUS SIGNAL PARTS".

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SYMBOLOGY & LEGEND

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STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L4	L15
	SYMBOLOGY AND LEGEND		

EXISTING SYMBOLS

- FLAG POLE
- BH — BOREHOLE
- MW — MONITORING WELL
- PULL BOX
- TRAFFIC SIGNAL
- CABLE TV OR TELEPHONE RISER
- CONIFEROUS TREE
- DECIDUOUS TREE
- BUSH
- HEDGE/TREE LINE
- RAILROAD CROSSING SIGNAL
- RAILROAD BATTERY BOX
- 1 POLE SIGN
- MAILBOX
- POST / BOLLARD
- YARD HYDRANT
- WATER METER
- FIRE HYDRANT
- GATE VALVE
- IRRIGATION VALVE
- SPRINKLER HEAD
- WATER MANHOLE
- CURB STOP
- TELEPHONE MANHOLE
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- CLEAN OUT
- SET PROPERTY CORNER
- FOUND PROPERTY CORNER
- CONTROL POINT
- BENCHMARK
- GAS VALVE
- GAS METER
- GAS MANHOLE
- ELECTRICAL MANHOLE
- LIGHT POLE
- GUY WIRE ANCHOR
- POWER POLE
- ELECTRICAL METER
- INLET
- S — SANITARY SEWER LINE
- SS — STORM SEWER LINE
- W — WATER LINE
- T — TELEPHONE LINE
- P — POWER LINE
- OH — OVERHEAD LINES
- G — GAS LINE
- FO — FIBEROPTIC LINE
- TV — CABLE TV LINE
- O — FENCE
- PROPERTY LINE
- EASEMENT LINE
- CENTER OF RAILROAD TRACKS

PROPOSED SYMBOLS

- THRUSTBLOCK
- 11 1/4° BEND
- 22 1/2° BEND
- 45° BEND
- CAP
- COUPLER
- CROSS
- DEFLECTION COUPLER
- TEE
- REDUCER
- GAS MANHOLE
- GAS METER
- BUSH
- CONIFEROUS TREE
- DECIDUOUS TREE
- HEDGE/TREE LINE
- ELECTRICAL MANHOLE
- CLEANOUT
- SANITARY SEWER MANHOLE
- 1 POST SIGN
- DRAINAGE ARROW
- STORM SEWER JUNCTION BOX
- STORM SEWER MANHOLE
- TYPE "B" INLET
- HANDICAP MARKING
- TELEPHONE MANHOLE
- BUTTERFLY VALVE
- CURB STOP
- FIRE HYDRANT
- GATE VALVE
- POST INDICATOR VALVE (PIV)
- WATER MANHOLE
- VERTICAL FIRE HYDRANT
- GUY WIRE ANCHOR
- POWER POLE
- LUMINAIRE – STANDARD
- 2' DIAMETER FOOTING
- W — WATER LINE
- WATER INSULATION
- WATER ENCASEMENT
- JOINT RESTRAINT LENGTH
- S — SANITARY SEWER LINE
- SS — STORM SEWER LINE
- STORM SEWER LINE GREATER THAN 36"
- P — ELECTRICAL LINE
- GRADING CATCH LINE
- RIGHT–OF–WAY
- EASEMENT
- TEMPORARY EASEMENT

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PROPOSED TRAFFIC SYMBOLS

- SIGNAL WITH MAST ARM
- 1 LIGHT SIGNAL HEAD
- 3 LIGHT SIGNAL HEAD
- 4 LIGHT SIGNAL HEAD
- 5 LIGHT SIGNAL HEAD
- CONFIRMATION LIGHT
- PEDESTRIAN PUSH BUTTON
- SIGNAL HEAD
- SIREN VEHICLE DETECTION UNIT
- VIDEO DETECTION
- PEDESTRIAN COUNTDOWN TIMER
- DISCONNECT
- JUNCTION BOX
- METER SOCKET
- SIGNAL CONTROLLER
- SIGNAL POLE

CONDUIT & WIRING LABELS

- 2" PVC — CONDUIT LABEL
- PB — PEDESTRIAN PUSH BUTTON
- VDC — CONDUIT USAGE LABEL
- 1 #10 — WIRE TYPE

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STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L5	L15
TABLE OF CONDUIT & CABLE QUANTITIES			

TABLE OF CONDUIT AND CABLE QUANTITIES

Location to Location		Conduit			Copper Wire			IMSA Copper Cable, K1	
		Rigid Conduit, Schedule 40	Innerduct, Schedule 80		1/C	1/C		4/C	7/C
		2"	2"		#8 AWG	#10 AWG		#14 AWG	#14 AWG
		Ft	Ft		Ft	Ft		Ft	Ft
E ANAMOSA FLASHING BEACON									
UTILITY TRANSFORMER	UTILITY POST	21			105				
UTILITY POST	SIGNAL STANDARD A2	4				54			
SIGNAL STANDARD A2	JA2	8				8		36	18
JA2	PEDPBP PA2	7				7		10	
JA2	JA1		85			85		91	91
JA1	SIGNAL STANDARD A1	25				25			35
JA1	PEDPBP PA1	5				5		8	
PEDPBP PA1								7	
PEDPBP PA2								7	
SIGNAL STANDARD A1								204	
SIGNAL STANDARD A2								204	7
Subtotal:		70	85		105	184		567	151

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STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L6	L15
SIGNAL LAYOUT			

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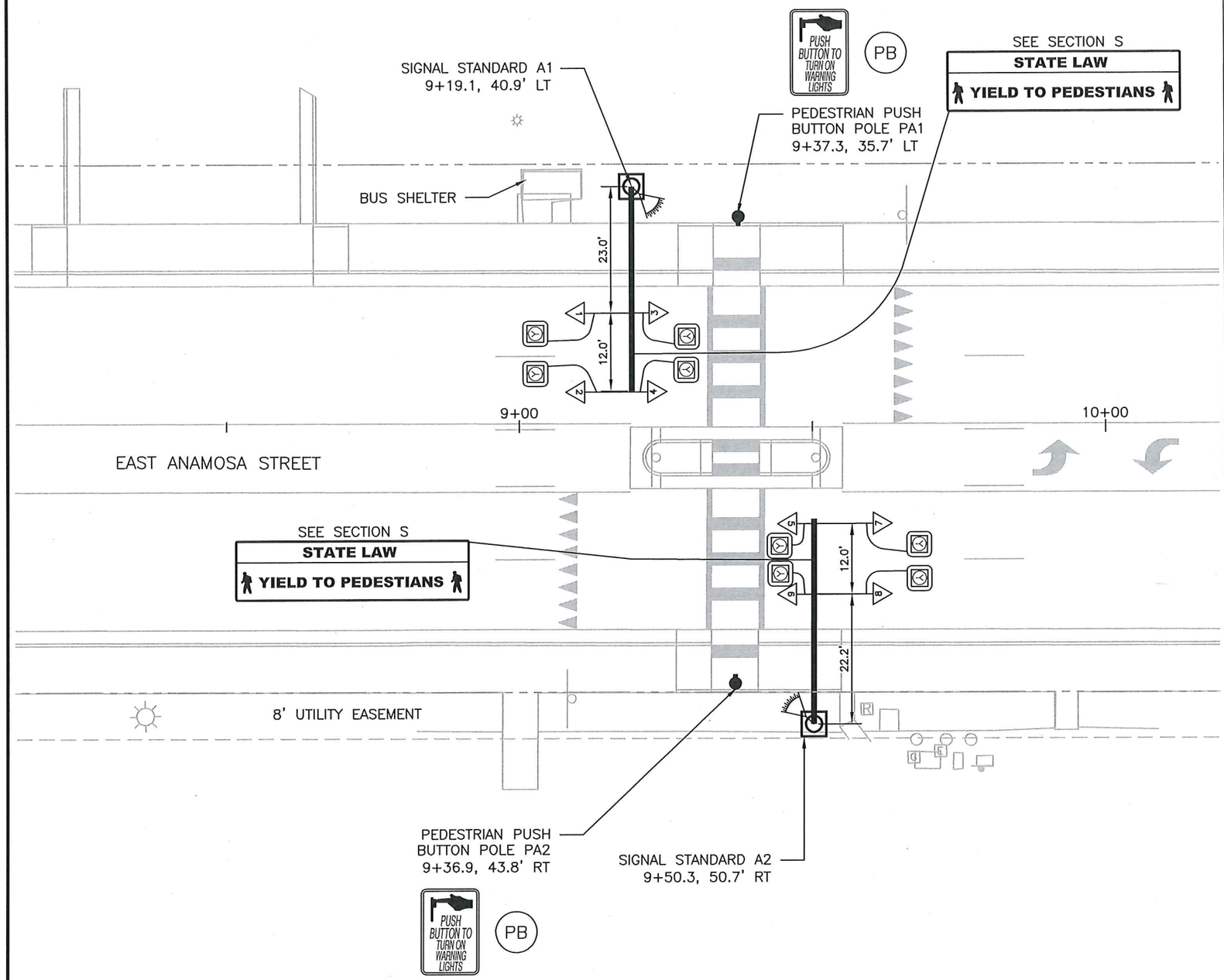
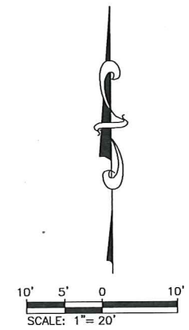
PROPOSED SIGNAL LAYOUT
E. ANAMOSA STREET PEDESTRIAN CROSSING



ESTIMATE OF QUANTITIES

KEY	ITEM	APPROXIMATE QUANTITY
	SIGNAL POLE WITH 35' MAST ARM (A1, A2)	2 EACH
	1 SECTION VEHICLE SIGNAL HEAD (1-8)	8 EACH
	CONFIRMATION LIGHT	2 EACH
PB	PEDESTRIAN PUSH BUTTON	2 EACH
	PEDESTRIAN PUSH BUTTON POLE	2 EACH
PUSH BUTTON TO TURN ON WARNING LIGHTS	PEDESTRIAN CROSSING SIGN (R10-25)	2 EACH



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STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L7	L15
SIGNAL CABLE & CONDUIT LAYOUT			

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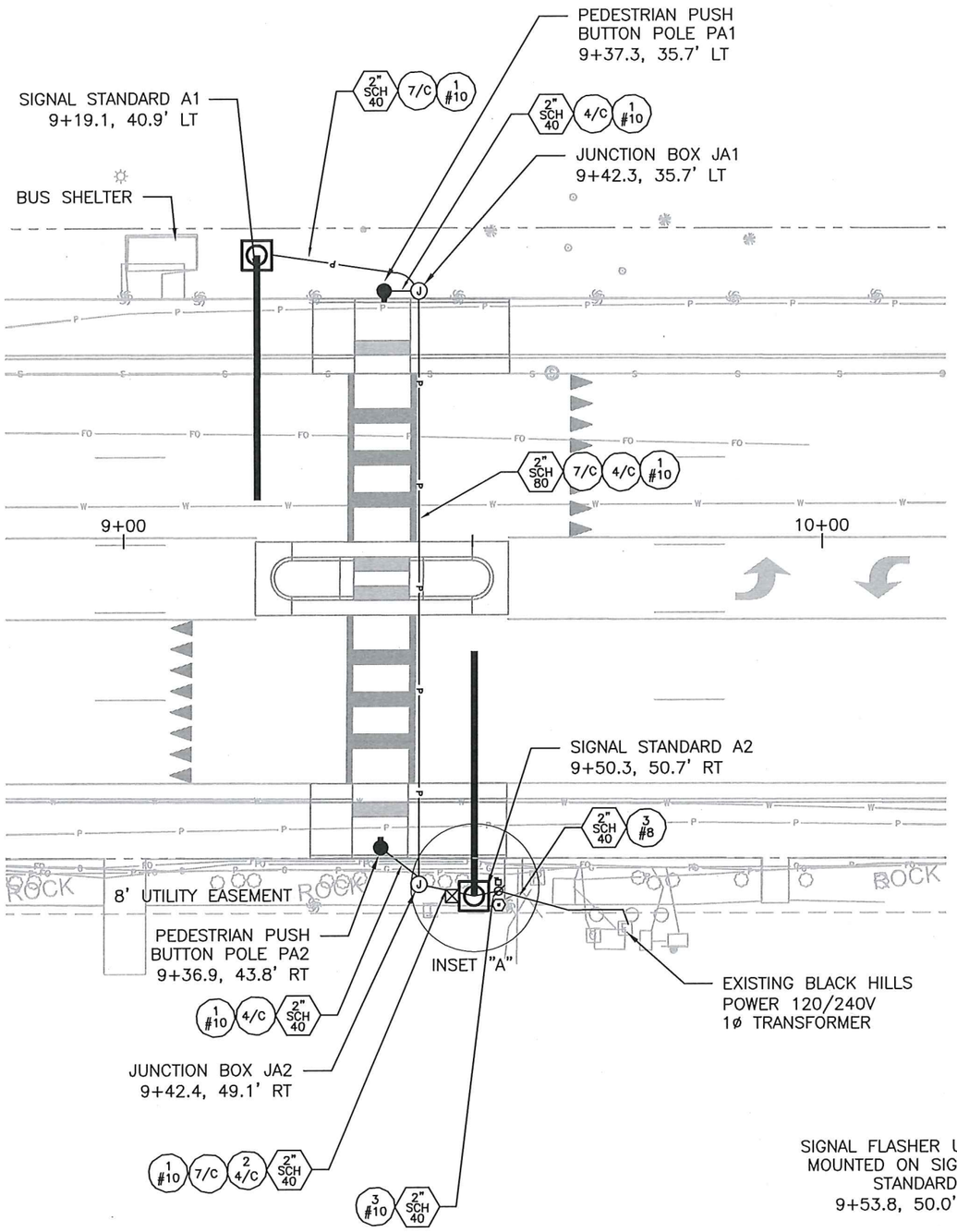
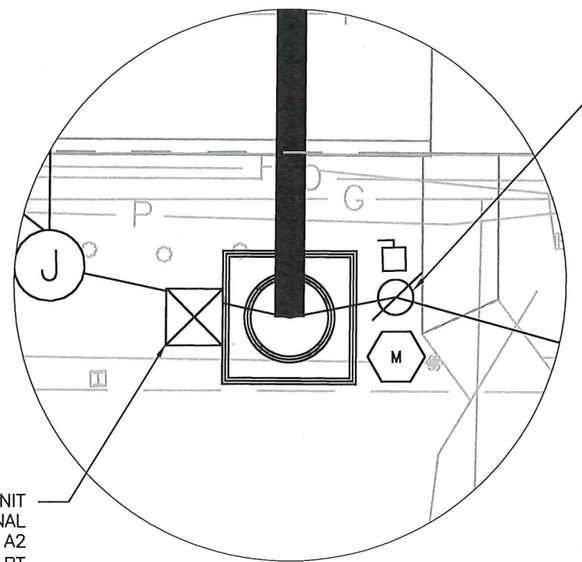
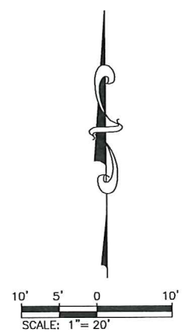
PROPOSED CABLE & CONDUIT LAYOUT
E. ANAMOSA STREET PEDESTRIAN CROSSING







ESTIMATE OF QUANTITIES

KEY	ITEM	QUANTITY
⊠	SIGNAL FLASHER UNIT	1 EACH
M	METER SOCKET	1 EACH
J	TYPE 1 ELECTRICAL JUNCTION BOX	2 EACH
	DISCONNECT	1 EACH
∅	GALVANIZED STEEL UTILITY POLE	1 EACH
○—	SIGNAL STANDARD W/MAST ARM	2 EACH
2" SCH 80	2" INNERDUCT, SCHEDULE 80	85 FT
2" SCH 40	2" RIGID CONDUIT, SCHEDULE 40	70 FT
•	PEDESTRIAN PUSH BUTTON POLE	2 EACH
1 #8	1/C #8 AWG COPPER WIRE	105 FT
1 #10	1/C #10 AWG COPPER WIRE	184 FT
4/C	4/C #14 AWG COPPER TRAY CABLE, K1	567 FT
7/C	7/C #14 AWG COPPER TRAY CABLE, K1	151 FT

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WIRING DIAGRAM
E ANAMOSA STREET PEDESTRIAN CROSSING

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STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L8	L15
	WIRING DIAGRAM		

ELECTRICAL SERVICE DISCONNECT SWITCH

30 AMP RATED MAIN DISCONNECT

FUSED AT 30 AMPS

PROPOSED METER

#8

X1
Y1
Z1
120/240 VAC, 60 HZ, 1 PHASE SERVICE. FROM BLACK HILLS POWER PAD MTD. TRANSFORMER

CONTRACTOR TO VERIFY BREAKER SIZE AND WIRING.

U1
V1
W1

#10

EXISTING BLACK HILLS POWER PAD MTD. TRANSFORMER

X1
Y1
Z1

#8

PA2

4/C

D3

BK
WT
RD
GN

PED. BUTTON

PA1

4/C

C4

BK
WT
RD
GN

PED. BUTTON

FLASHER UNIT (MTD. ON SIGNAL STD. A2)

#10

W1 — GN

U1 — BK
V1 — WT

AUX
MAIN

BREAKERS SIZED BY MANUFACTURER. COORDINATE SIZE SO THAT MAIN DISCONNECT FUSE RATING IS NOT EXCEEDED.

NEUT. BUS

GROUND

COMPONENT

COMPONENT

7/C

B1

BK
WT
RD
GN
OR
BL
WT/BK

Y1 1,3,5,7 FLASHERS

NEUT.

Y2 2,4,6,8 FLASHERS

PED. BUTTON

BK
WT
RD
GN

C1

4/C

PED. BUTTON

BK
WT
RD
GN

D1

4/C

JA2

B2	B3
C2	C3
D2	D3

JA1

B3	B4
C3	C4

SIGNAL STANDARD A2

B1

7/C

BK
WT
RD
GN
OR
BL
WT/BK

Y

5
6
7
8

To Confirmation Light

4/C

B2

7/C

C1

4/C

D1

4/C

C2

4/C

D2

4/C

SIGNAL STANDARD A1

B4

7/C

BK
WT
RD
GN
OR
BL
WT/BK

Y

1
2
3
4

To Confirmation Light

4/C

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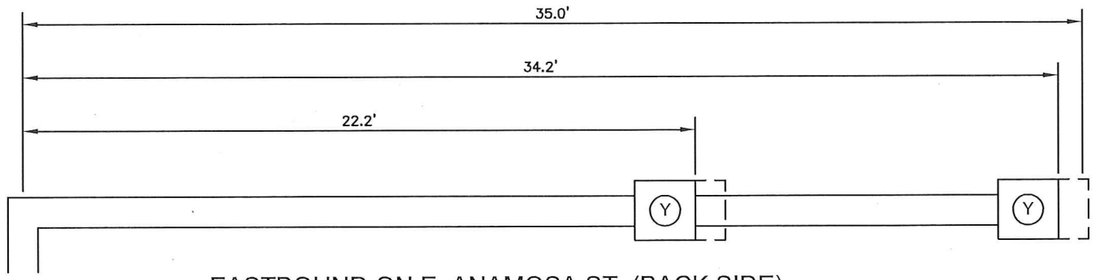
STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L9	L15
SPECIAL DETAILS			

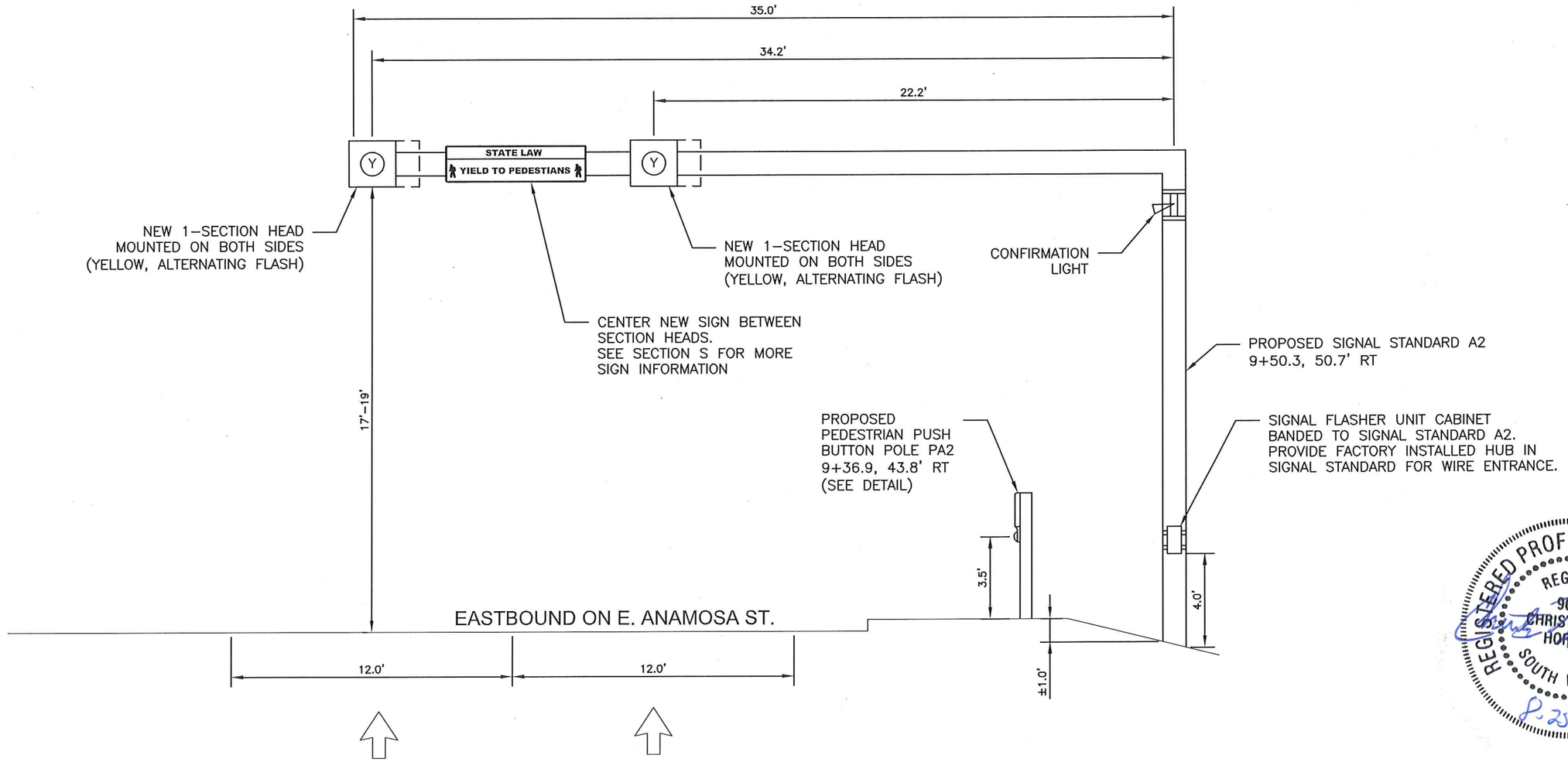
FOR BIDDING PURPOSES ONLY

PROPOSED SIGNAL ELEVATION VIEW
E. ANAMOSA STREET PEDESTRIAN CROSSING
SIGNAL STANDARD A2

2.5' 1.25' 0 2.5'
SCALE: 1"= 5'



EASTBOUND ON E. ANAMOSA ST. (BACK SIDE)



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9632
CHRISTOPHER HORNER
SOUTH DAKOTA
8-25-14

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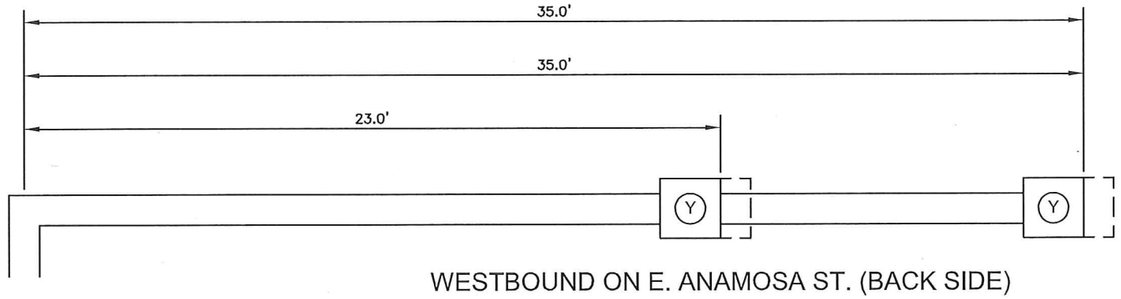
FOR BIDDING PURPOSES ONLY

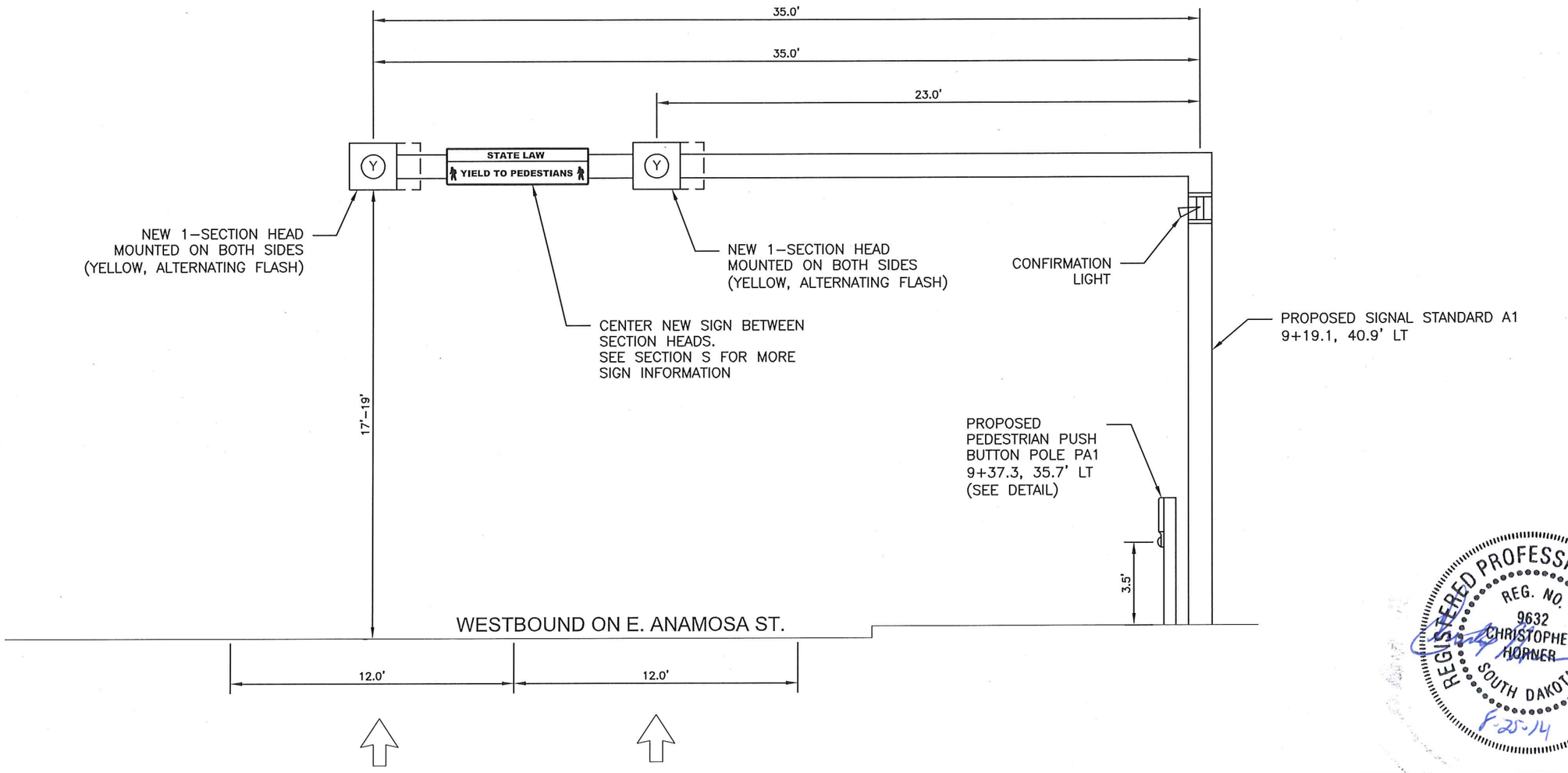
STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L10	L15
SPECIAL DETAILS			

PROPOSED SIGNAL ELEVATION VIEW
E. ANAMOSA STREET PEDESTRIAN CROSSING
SIGNAL STANDARD A1

2.5' 1.25' 0 2.5'
SCALE: 1"= 5'



WESTBOUND ON E. ANAMOSA ST. (BACK SIDE)



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REG. NO. 9632
CHRISTOPHER HORNER
SOUTH DAKOTA
8-25-14

Aug 15, 2014 – 2:10pm – J:\trans\10213101\CAD\plan\sheets\2125_L–DETL.dwg

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STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L11	L15
SPECIAL DETAILS			

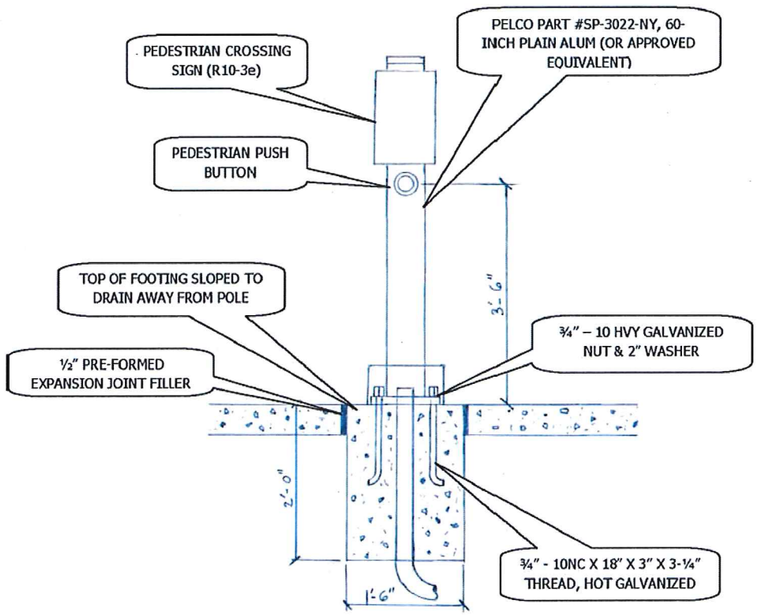
CITY OF RAPID CITY PEDESTRIAN PUSH BUTTON POLE

NOTES

1) CONCRETE FOR FOOTING SHALL BE CLASS M6.

2) ALL COSTS FOR FURNISHING & INSTALLING (INCLUDING LABOR, EQUIPMENT & MATERIALS) FOR POLE ASSEMBLY, SIGN, FOOTING AND CONDUIT SHALL BE INCIDENTAL TO THE UNIT PRICE FOR "PEDESTRIAN PUSH BUTTON POLE".

NOTE:
INSTALL PEDESTRIAN CROSSING SIGN R10-25 IN LIEU OF SIGN R10-3e SHOWN AND SHALL BE PAID FOR BY EACH "PEDESTRIAN CROSSING SIGN".



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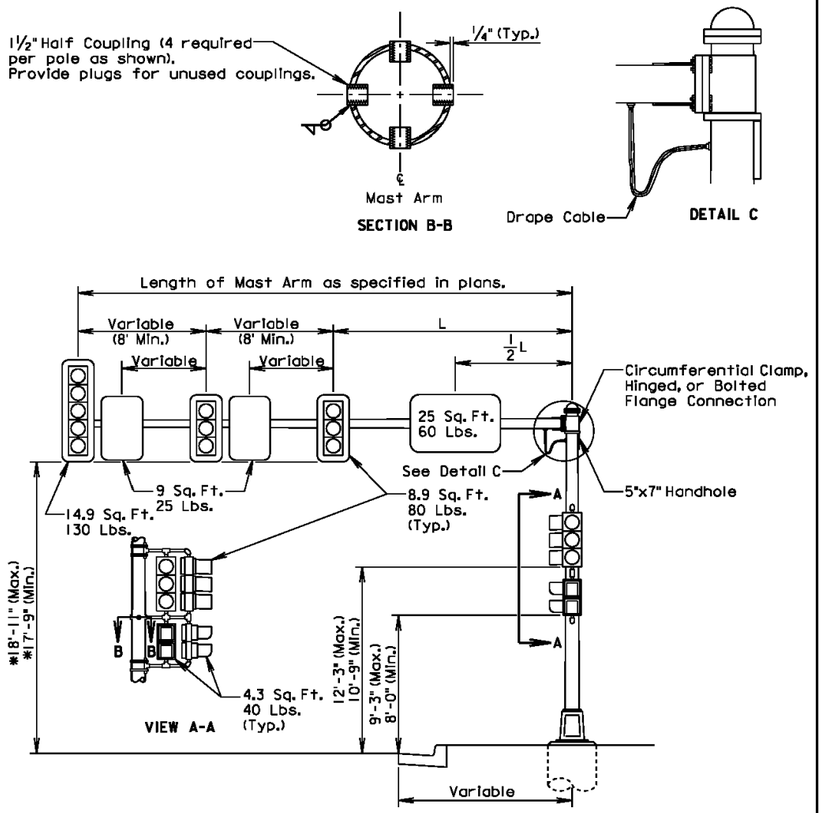
STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L12	L15
SDDOT STANDARD PLATES			



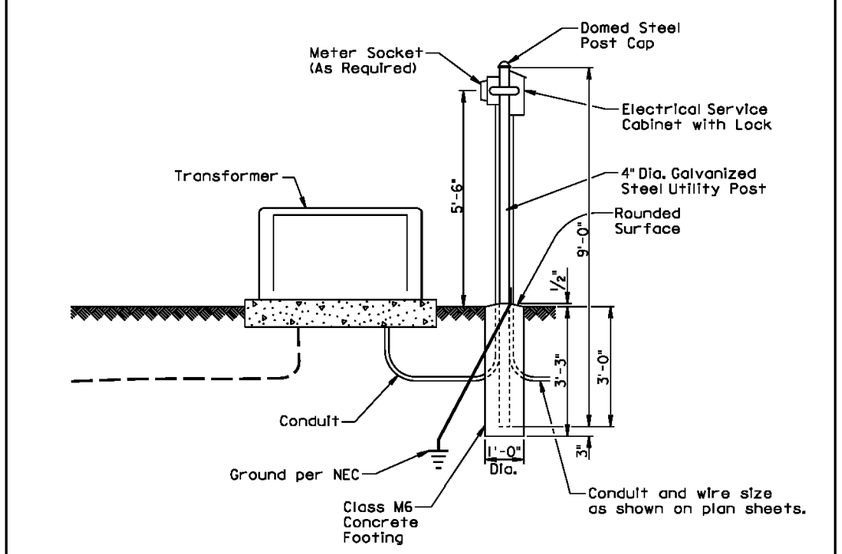
GENERAL NOTES:

Some of the signal heads are shown with backplates removed so that the mounting hardware is visible.

*The signal height allowances shown above are based on a horizontal distance greater than 53' between the signals and stop line. For horizontal distance of 53' and less between the signals and the stop line, the height allowances shall be as specified in Section 4D.15 of the MUTCD.

December 23, 2008

Published Date: 3rd Qtr. 2015	SDDOT	SIGNAL POLE (WITH MAST ARM)	PLATE NUMBER 635.31
			Sheet 1 of 1



ELEVATION

GENERAL NOTES:

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

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

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

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

June 26, 2006

Published Date: 3rd Qtr. 2015	SDDOT	SERVICE FROM PAD MOUNTED TRANSFORMER WITH METER ON A GALVANIZED STEEL UTILITY POST	PLATE NUMBER 635.41
			Sheet 1 of 1

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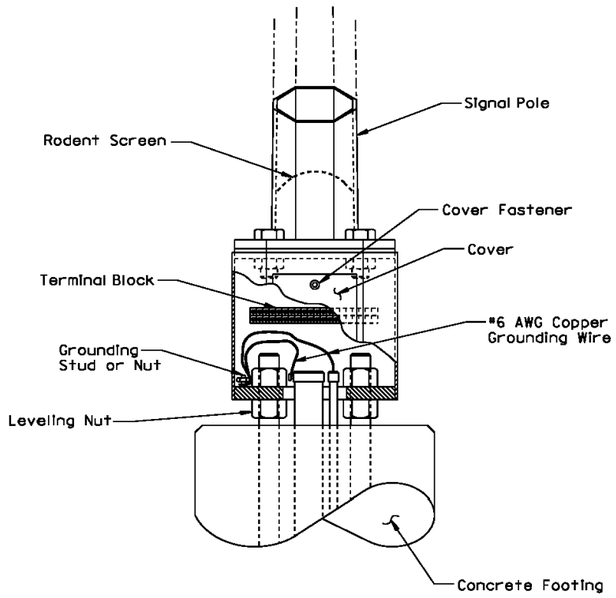
STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L13	L15
SDDOT STANDARD PLATES			



GENERAL NOTES:

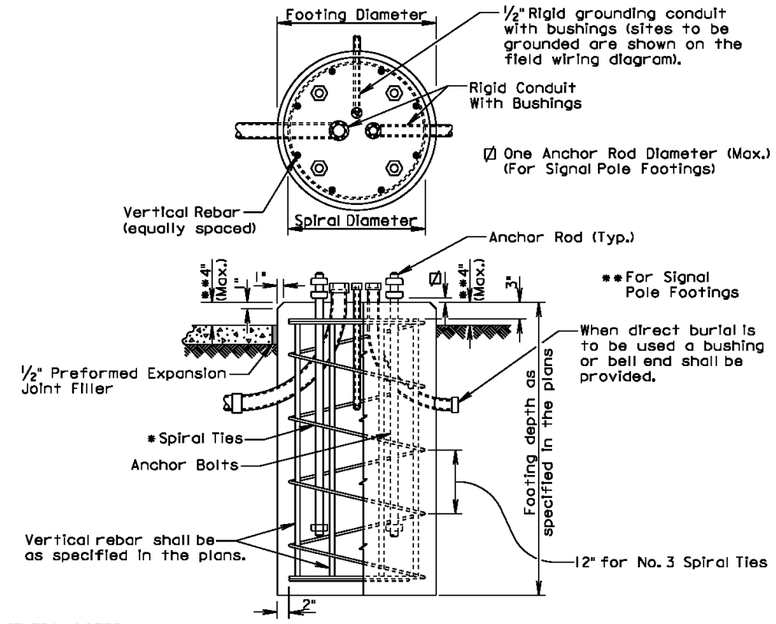
Base details are provided for example only and are not intended to be a complete design.

The Contractor shall furnish and install a rodent screen in the signal pole above the tranformer base. The rodent screen shall be a galvanized steel mesh with a maximum opening size of 1/4 inch. The rodent screen shall 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 shall be incidental to the contract unit price per each for the corresponding signal pole bid item.

December 23, 2008

Published Date: 3rd Qtr. 2015	SDDOT	TRANSFORMER SIGNAL POLE BASE	PLATE NUMBER 635.50
			Sheet 1 of 1



GENERAL NOTES:

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

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

See Section 985 of the Specifications for footing materials.

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

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

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

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

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

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

June 26, 2015

Published Date: 3rd Qtr. 2015	SDDOT	POLE FOOTING	PLATE NUMBER 635.55
			Sheet 1 of 1

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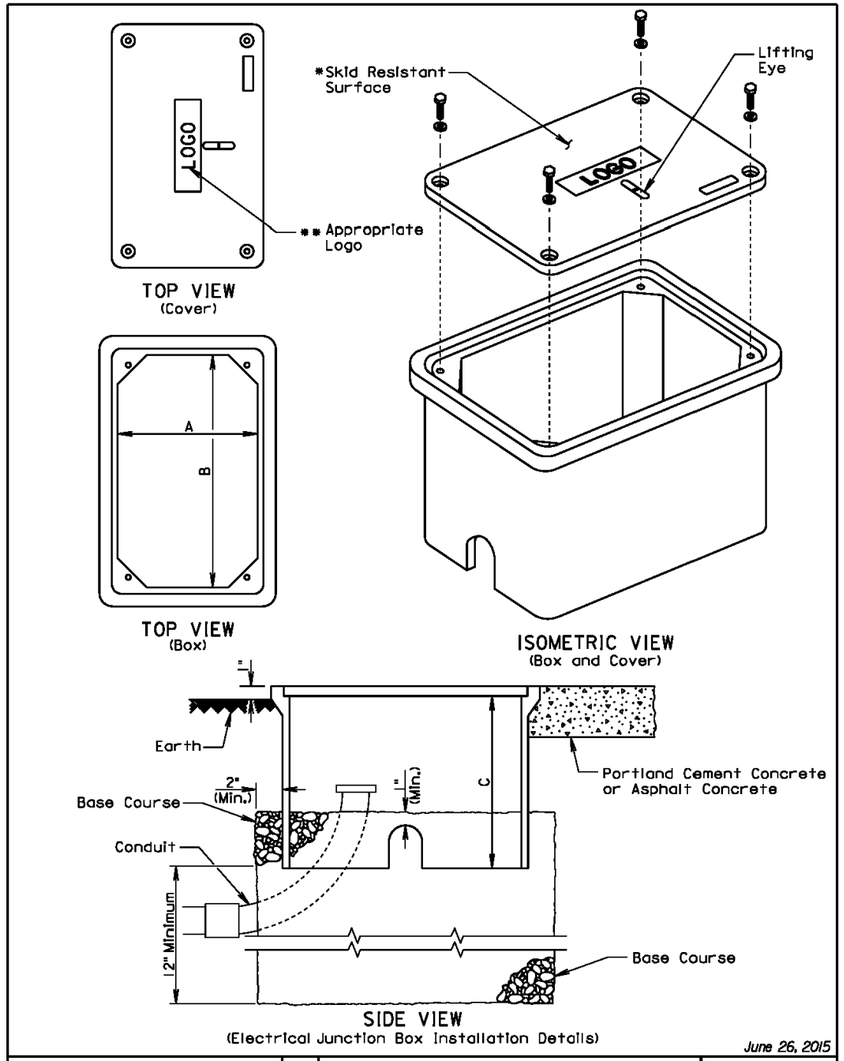

June 26, 2015

Published Date: 3rd Qtr. 2015

SDDOT

ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4

PLATE NUMBER 635.65

Sheet 1 of 2

ELECTRICAL JUNCTION BOX

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

GENERAL NOTES:

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

The cover shall have a lifting eye.

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

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

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

The electrical junction boxes shall be UL listed.

June 26, 2015

Published Date: 3rd Qtr. 2015

SDDOT

ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4

PLATE NUMBER 635.65

Sheet 2 of 2

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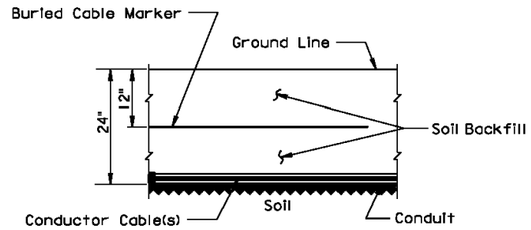
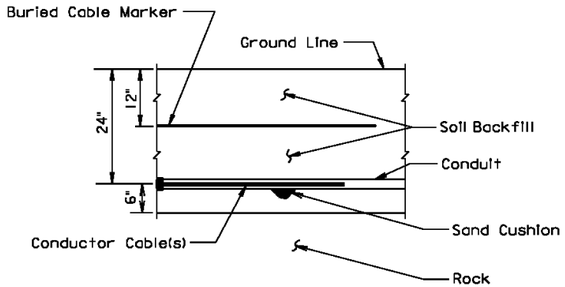
STATE OF SOUTH DAKOTA	PROJECT NO.	SHEET NUMBER	TOTAL SHEETS
	EM 1648(06)	L15	L15
SDDOT STANDARD PLATES			



SECTION VIEW



SECTION VIEW

GENERAL NOTE:

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

March 31, 2000

Published Date: 3rd Qtr. 2015	**SDDOT**	***CONDUIT INSTALLATION***	*PLATE NUMBER* 635.76
			Sheet 1 of 1

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