

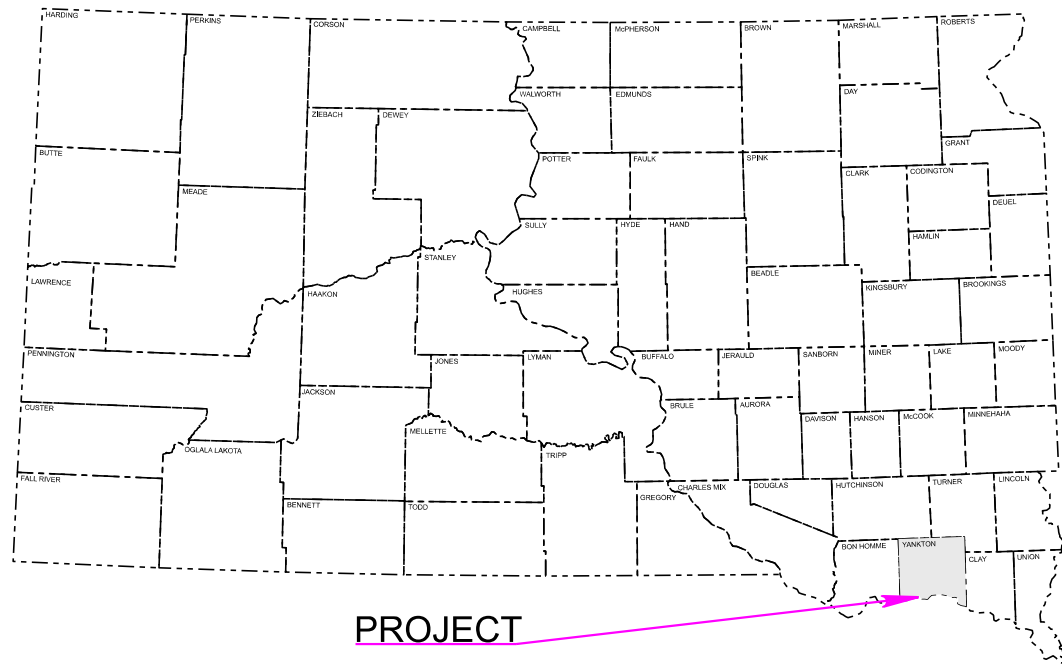
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT P 0052(09)340
SD HIGHWAY 52
YANKTON COUNTY

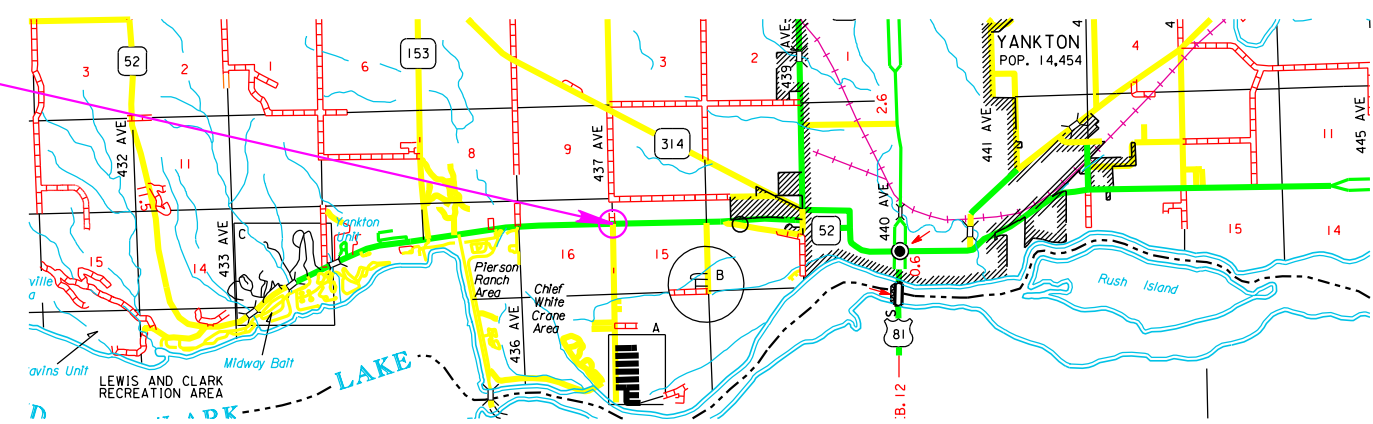
TRAFFIC SIGNALS & LIGHTING
PCN 09AU

INDEX OF SHEETS

1	General Layout with Index
2-7	Estimate with General Notes & Tables
8	Conduit and Cable Quantities
9	Traffic Control
10	Signal Layout
11	Conduit Layout
12	Pavement Markings
13	Signal Timings
14	Traffic Signal Wiring Table
15	Signing Table
16	Signing Layout
17	Special Signing Detail
18-28	Standard Plates



P 0052(09)340
MRM = 340.00 +0.299



YANKTON



DESIGN DESIGNATION

AADT (2022)	6,287
AADT (2052)	9,682
DHV	1,117
D	51%
DHV T%	0.5%
AADT T%	1.1%
V	50 mph

STORM WATER PERMIT

None Required

6

May 15, 2024

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0130	Remove Traffic Sign	4	Each
110E1510	Remove Luminaire Pole	2	Each
110E1540	Remove Luminaire Pole Footing	2	Each
110E7150	Remove Sign for Reset	1	Each
250E0010	Incidental Work	Lump Sum	LS
632E1320	2.0"x2.0" Perforated Tube Post	6.0	Ft
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	74.5	SqFt
632E3500	Reset Sign	1	Each
633E0210	Preformed Thermoplastic Pavement Marking, 4"	30	Ft
633E0225	Preformed Thermoplastic Pavement Marking, 24"	200	Ft
633E0235	Preformed Thermoplastic Pavement Marking, Arrow	2	Each
633E5000	Grooving for Cold Applied Plastic Pavement Marking, 4"	30	Ft
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	200	Ft
633E5037	Grooving for Cold Applied Plastic Pavement Marking, Symbol	2	Each
634E0110	Traffic Control Signs	230.7	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	6	Each
634E0330	Temporary Raised Pavement Markers	3,600	Ft
634E0420	Type C Advance Warning Arrow Board	2	Each
634E0560	Remove Pavement Marking, 4" or Equivalent	150	Ft
634E0565	Remove Pavement Marking, Arrow	2	Each
635E2140	Signal Pole with 40' Mast Arm and Luminaire Arm	1	Each
635E2150	Signal Pole with 50' Mast Arm and Luminaire Arm	2	Each
635E2155	Signal Pole with 55' Mast Arm and Luminaire Arm	1	Each
635E3700	Roadway Luminaire, LED with Photoelectric Cell	4	Each
635E4030	3 Section Vehicle Signal Head	12	Each
635E4080	3 Section Directional Vehicle Signal Head	4	Each
635E5030	3' Diameter Footing	53.0	Ft
635E5301	Type 1 Electrical Junction Box	3	Each
635E5303	Type 3 Electrical Junction Box	1	Each
635E5400	Electrical Service Cabinet	1	Each
635E5430	Traffic Signal Controller	1	Each
635E5515	Battery Backup System for Traffic Signal	1	Each
635E5520	Video Detection System	1	Each
635E5880	Accessible Pedestrian Signal	2	Each
635E5910	Pedestrian Push Button Pole	1	Each
635E5922	Pedestrian Signal Head with Countdown Timer	2	Each
635E5930	Pedestrian Crossing Sign	2	Each
635E8110	1" Rigid Conduit, Schedule 40	35	Ft
635E8120	2" Rigid Conduit, Schedule 40	140	Ft
635E8130	3" Rigid Conduit, Schedule 40	135	Ft
635E8220	2" Rigid Conduit, Schedule 80	70	Ft
635E8230	3" Rigid Conduit, Schedule 80	135	Ft
635E9018	1/C #8 AWG Copper Wire	2,170	Ft
635E9502	2/C #14 AWG Copper Tray Cable, K2	175	Ft
635E9504	4/C #14 AWG Copper Tray Cable, K2	685	Ft
635E9509	9/C #14 AWG Copper Tray Cable, K2	435	Ft
635E9519	19/C #14 AWG Copper Tray Cable, K2	1,240	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	260	Ft

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and 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 C: WATER

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

Action Taken/Required:

The Contractor will obtain the necessary permits from the regulatory agencies such as the South Dakota Department of Agriculture and Natural Resources (DANR) and the United States Army Corps of Engineers (USACE) prior to water extraction activities.

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at: <https://sdleastwanted.sd.gov/maps/default.aspx> >

< [South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species: https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04](https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04) >

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.

The Contractor must adhere to the "Special Provision Regarding Storm Water Discharge to Waters of the United States within Indian Reservations".

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 not 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 Agriculture 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 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 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.

Action Taken/Required (Continued):

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: HISTORIC PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historic Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans 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 in 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 within 150 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility 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.

SEQUENCE OF OPERATIONS

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the 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.

COORDINATION BETWEEN CONTRACTORS

A separate contract for Project NH-P 0023(68) – PCN 097C will be awarded to another Contractor for Asphalt Surface Treatment on SD52 adjacent to this project (PCN 09AU). The Asphalt Surface Treatment for PCN 097C will begin at MRM 332.25 and end at MRM 342.00 +0.318.

The Contractor will schedule work so as not to interfere with or hinder the progress of the work performed by the other Contractor on PCN 097C. Conflicting traffic control devices may need to be temporarily adjusted or removed as directed by the Engineer and at no additional cost to the contract.

GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the State.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

All construction operations will be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

A Type 3 Barricade will be installed at the end of a lane closure taper as detailed in these plans.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking.

TEMPORARY RAISED PAVEMENT MARKERS

Temporary raised pavement markers will be used for marking edge lines, lane lines, and centerlines. Temporary raised pavement markers will be used on all new permanent surfacing sections of roadway and on existing surfacing where temporary marking locations are different than existing marking locations, unless noted or as directed by the Engineer.

Temporary raised pavement markers will be attached to the roadway surface with a flexible non-permanent bituminous adhesive capable of being removed from the roadway surface or with an adhesive approved by the Engineer.

All costs to furnish, install, replace if necessary, and remove the markers will be incidental to the contract unit price per foot for "Temporary Raised Pavement Markers".

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	2	30"	5.2	10.4
R3-2	LEFT TURN PROHIBITION (symbol)	1	24" x 24"	4.0	4.0
W1-4	REVERSE CURVE (L or R)	2	48" x 48"	16.0	32.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W9-3	CENTER LANE CLOSED AHEAD	1	48" x 48"	16.0	16.0
W13-1P	ADVISORY SPEED (plaque)	1	30" x 30"	6.3	6.3
W20-1	ROAD WORK AHEAD	3	48" x 48"	16.0	48.0
W20-4	ONE LANE ROAD AHEAD	1	48" x 48"	16.0	16.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-1	ROAD WORK NEXT 1 MILE	2	36" x 18"	4.5	9.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					230.7

SUPPLYING AS BUILT PLANS

If the traffic signal 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
Stacy.Bartlett@state.sd.us

ON-SITE INSPECTION

An on-site inspection of the traffic signal will be conducted before acceptance of the project once the traffic signal is completed and operational. The on-site inspection will be conducted by the Project Engineer or Region Traffic Engineer with the Contractor, the City of Yankton Representative, and the Traffic Design Engineer present.

REMOVE LUMINAIRE POLE

The Contractor will be responsible for the disposal of the removed items, EL1-EL2. All costs associated with the disposal are incidental to the contract unit price per each for "Remove Luminaire Pole".

REMOVE LUMINAIRE POLE FOOTING

The footings of existing luminaire poles EL1-EL2 will be removed by the Contractor to a minimum of 2' below the ground surface. Restoration of the disturbed area will be to the satisfaction of the Engineer.

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

INCIDENTAL WORK

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

SIGNAL POLES

Cantilever traffic signal supports, including anchor bolts, will be designed for fatigue in accordance with Fatigue Importance Category II without galloping and truck induced gusts.

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

Signal poles will have rotatable mast arms.

Luminaire extension(s) will have a 50-foot mounting height with 6-foot arm.

LUMINAIRES

The lighting design used the following parameters and provides 1.3 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:	N/A
Lamp Loss Factor (LLF):	0.8
Width of Lighted Area:	75 Ft.
Luminaire Cycle Length:	Not applicable
Configuration:	Luminaire Extensions
Mounting Height:	50 Ft.
Arm Length	6 Ft.
Light Source:	LED

The following LED luminaires meet the requirements for this design:

- a.) Cooper Streetworks: BAA-ARCH-S-PA2-90-740-U-T2R-PR7
- b.) American Electric Lighting: BAA-ATB0-P303-MVOLT-R2-BAA-P7-PCSS

SIGNAL BACKPLATES

All new vehicle signal heads will have backplates with retroreflective border. The vehicle signal head backplates will have a factory applied 3-inch wide yellow retroreflective border. Sheeting for the border will be Type XI or Type IX in conformance with ASTM D4956. Backplates will be polycarbonate, aluminum, or aluminum-composite. Minimum material thicknesses are:

Polycarbonate, 0.10-inch
Aluminum, 0.06-inch
Aluminum-Composite, 0.08-inch

Signal backplates will extend not less than 5 inches from the edge of the signal head at the top, bottom, and sides. The bottom of the backplate on vehicle signal faces mounted directly above pedestrian signal indications will be sized to permit the separate adjustment of the vehicle and pedestrian signal indication and may be less than 4 inches.

All costs involved with furnishing and installing backplates with retroreflective border for the new vehicle signal heads will be incidental to the contract unit price per each for "3 Section Vehicle Signal Head", and "3 Section Directional Vehicle Signal Head".

TABLE OF FOOTING DATA

Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
A1, A2, A4	3' - 0"	13' - 0"	2' - 8"	129' - 3"	14-#8 x 12' -6"
A3	3' - 0"	14' - 0"	2' - 8"	137' - 6"	14-#8 x 13' -6"

* Footing depth will be below ground level.

** The size of all spirals will be #3.

SUBSURFACE

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.

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.

METER SOCKETS FOR TRAFFIC SIGNALS

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

TRAFFIC SIGNAL CONTROLLER

The new Traffic Signal Controller must be fully compatible with all features and functionality of Econolite Centracs Local Edition software.

The Contractor is responsible for programming the controller with the signal timings provided in these plans.

Controller and flashers are not required to have dimming capability.

Anchor bolts for traffic signal cabinets may have hooked ends.



PROJECT	SECTION	SHEET
P 0052(09)340	Non	4 of 28

Plotting Date: 03/06/2024

Revised: 03/05/2024 JU

All costs for the detector units necessary to operate the signal as shown in these plans, constructing the concrete pad and footing, materials, labor, and furnishing and installing the controller cabinet will be incidental to the contract unit price per each for "Traffic Signal Controller".

BATTERY BACKUP CABINET

The Contractor will supply cabinets with concrete pad and footing for housing the Battery Backup System for Traffic Signal at the signal. The 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."

VIDEO DETECTION SYSTEM

The video detection system will be one of the following, or an approved equal:

Product	Manufacturer
GRIDSMART System	GRIDSMART Technologies, Inc. Knoxville TN 37932 Phone: 1-865-482-2112 www.gridsmart.com
Autoscope AIS-IV or Vision	Econolite Anaheim, CA 92807 Phone: 1-714-630-3700 www.econolite.com
Vantage Next	Iteris, Inc. Santa Ana, CA 92705-5551 Phone: 1-949-270-9400 www.iteris.com
TrafficLink Detection	Miovision Technologies, Inc. 137 Glasgow St., Suite 110 Kitchener, Ontario Canada N2G 4X8 Phone: 1-519-513-2407 www.miovision.com

All cabling and hardware necessary to make the detection system operational will be incidental to the contract unit price per each for "Video Detection System".

ACCESSIBLE PEDESTRIAN SIGNAL

The work will consist of furnishing and installing accessible pedestrian signals (APS). Each APS will consist of an interactive vibrotactile pedestrian pushbutton with speaker, an informational sign, a latching light emitting diode (LED) indicator light, a solid-state electronic control board, a power supply, wiring, and all necessary mounting hardware. The operation and performance of the APS units will meet the requirements of MUTCD Sections 4E.08 to 4E.13. and the applicable sections of NEMA Standards Publication TS-2.

The APS units will be capable of supporting a minimum of 16 push button stations.

All mounting fasteners will be stainless steel; all threads will be coated with anti-seize compound meeting the requirements of USA Dept. of Defense specification MIL-PRF-907F.

The push button component of APS will meet the requirements of Section 985.1 S of the Specifications except that all housings and external hardware will be aluminum, powder coated yellow.

The APS control unit will include capability to monitor the push buttons and pedestrian signal head displays. Conflicts will cause the channel to be powered off.

The APS control unit will include capability to monitor communications with the push buttons. Communication faults will automatically reset the control unit.

Two licensed copies of any APS programming software will be furnished. All software programming, firmware updates, and audio message programming of the APS will be through USB port or Ethernet connection.

All costs for furnishing and installing the accessible pedestrian signal including labor, materials, and equipment, will be incidental to the contract unit price per each for "Accessible Pedestrian Signal".

PEDESTRIAN PUSH BUTTON POLE

Pedestrian push button poles will be aluminum and will conform to the following requirements:

Aluminum will conform to ASTM B221, Alloy 6061, and Temper T6.

Poles will be round with a minimum outside pole diameter of 4 inches, and the pole assembly will have a square, cast aluminum base with aluminum access door. The base will conform to the breakaway requirements of MASH.

The pole to base connection will be a threaded connection; threads will be 8 TPI, NPT. All bolt and connection threads will be coated with a commercially available anti-seize compound intended for use in aluminum-to-aluminum and steel-to-aluminum connections.

The pole finish will either be brushed satin or spun. The top of the pole will be sealed by an aluminum cap.

Anchor bolts for pedestrian push button poles may have hooked ends.

WIRE SPLICING FOR LIGHTING

All wire splices for lighting will be made using TE Connectivity GTAP connectors, NSI Industries Polaris Blue connectors, or an approved equal.

MULTICONDUCTOR CONTROL CABLE FOR SIGNAL CIRCUITS

The Conductor Jackets for the multiconductor control cables will be color coded in accordance with ICEA S-73-532 Table E2.

ELECTRICAL SERVICE

The existing electric service, located on the southeast corner, will be replaced, but the connection to transformer will be reused.

All costs associated with removing the electric service will be incidental to the contract unit price per each "Traffic Signal Controller".

GROOVING FOR PREFORMED THERMOPLASTIC PAVEMENT MARKING

The Contractor will establish a positive means for the removal of the grinding and/or grooving residue. Residue from dry grooving will be vacuumed. Solid residue will be removed from the pavement surfaces before being blown by traffic action or wind. The Contractor will conduct this work to control and minimize airborne dust and similar debris that may become a hazard to motor vehicle operation or nuisance to property owners. Residue from wet grooving will not be permitted to flow across lanes being used by public traffic or into gutter or drainage facilities. Residue, whether in solid or slurry form, will be disposed of in a manner that will prevent it from reaching any waterway in a concentrated state. The cleaning of the residue for grooving will be to the satisfaction of the Engineer and may require more than one pass to adequately remove material. All costs for removal of grinding and/or grooving residue will be included in the contract unit price per foot for "Grooving for Cold Applied Plastic Pavement Marking" contract item.

REMOVE PAVEMENT MARKING, 4" OR EQUIVALENT

Markings that fall outside of the new groove will be obliterated using additional methods approved by the Engineer. Removal of the existing markings will be accomplished without causing damage to the pavement, pavement joints, or joint sealant. The Contractor will repair any damage to the pavement, pavement joints, or joint sealant for no additional payment and at no cost to the State. All costs for materials, labor, and equipment necessary to remove the existing markings will be incidental to the contract unit price per foot for "Remove Pavement Marking, 4" or Equivalent".

PREFORMED THERMOPLASTIC PAVEMENT MARKING

General

- Made of prefabricated retroreflective, resilient thermoplastic material;
- Contains glass beads uniformly distributed through the entire cross-sectional area;
- Capable of being affixed to bituminous or concrete pavement by heating;
- Resistant to deterioration due to exposure to sunlight, water, salt, and adverse weather conditions;



PROJECT	SECTION	SHEET
P 0052(09)340	Non	5 of 28

Plotting Date: 03/06/2024

Revised: 03/05/2024 JU

- Under traffic wear, shows no appreciable fading in accordance with the color requirements, lifting, or shrinkage throughout the life of the marking;
- Capable of conforming to pavement contours, breaks, and faults through the action of traffic at normal pavement temperatures;
- Possesses resealing characteristics, such that it is capable of fusing with itself and previous thermoplastic markings when heated; and
- Protected during shipment and in storage.

Apply the preformed thermoplastic pavement marking as recommended by the manufacturer to provide a neat, durable marking that will not flow, distort, or crack due to temperature if the pavement surface remains stable. Use equipment and application methods specified by the manufacturer. Primer as required by the manufacturer will be provided with the material.

Application of the markings will include the use of any manufacturer recommended sealers. Sealers may be required on concrete pavements, inside grooves, or on older asphalt pavements. Prior to placing any markings on new concrete, the Contractor will remove any curing compounds. Removal will be by sandblasting or other standard industry methods.

Any required primers or sealers will be included in the contract unit price for the various preformed thermoplastic pavement marking items.

Provide precut messages and symbols meeting the requirements of the MUTCD and the Standard Signs Manual in custom kits. Use separate pieces or segments to form individual letters or symbols only to the extent supplied by the manufacturer. Provide shapes, sizes, and colors as required by the contract.

Color

- Will meet the color specification limits and luminance factors for Preformed Plastic Pavement Marking and Legends (Section 983.2 D, Tables 1 and 2).

Glass Beads

- Ensure the preformed thermoplastic pavement marking contains a minimum 30% intermixed glass beads by weight and a minimum 80% true spheres.
- Ensure preformed thermoplastic pavement markings contain only clear beads.

Skid Resistance

- Ensure the surface of the preformed thermoplastic pavement marking provides a skid resistance value of at least 45 British Pendulum Number (BPN) when tested in accordance with ASTM E303.

PREFORMED THERMOPLASTIC PAVEMENT MARKING (CONTINUED)

Retroreflectivity

- Provide preformed thermoplastic pavement marking meeting the minimum initial pavement marking retroreflectivity values using 30 m geometry and meeting the testing procedures of ASTM E1710:

PREFORMED THERMOPLASTIC PAVEMENT MARKING (CONTINUED)

Minimum Initial Pavement Marking Retroreflectivity		
	White	Yellow
Thermoplastic	400 mcd/sq. ft./ft.	250 mcd/sq. ft./ft.
Thermoplastic, enhanced skid resistance (ESR)	250 d/sq. ft./ft.	150 d/sq. ft./ft.

Thickness

- A longitudinal marking is a minimum 90 mils thick at the edges, and a maximum 125 mils thick at the center of the stripe.
- Transverse markings and symbols are a minimum 125 mils thick at the edges, and a maximum 160 mils thick at the center.

Sample

- Prior to application, the Contractor will provide a sample of the preformed thermoplastic pavement marking to be used on the project to the Region Traffic Engineer for inspection and approval.
- Do not begin application of the preformed thermoplastic pavement marking prior to obtaining the Region Traffic Engineer's approval of the preformed thermoplastic pavement marking material. The Region Traffic Engineer's approval of the preformed thermoplastic pavement marking does not void other preformed thermoplastic pavement marking requirements specified.

GENERAL PERMANENT SIGNING

New sign installations will be staked in the field by the Contractor and checked by the Engineer. The Contractor will give the Engineer a minimum of one week to check staked locations prior to signpost installation. Lateral offset of signs will be as shown in the plans or as directed by the Engineer.

The Contractor will be responsible for contacting South Dakota One Call to locate the utilities at the staked sign installation locations.

When signs are mounted in an assembly, they will be 1-2 inches apart vertically and horizontally.

The height of the post must not exceed the minimum height needed by more than 0.5 feet. Any portion that extends above the sign will be cut off. No separate payment will be made for cutting the post or for that length cut off.

Aluminum U-Channel stiffeners will be used on all signs 36 inches or greater in width and will conform to ASTM B221 Alloy 6063-T6 or 6061-T6. The U-Channel will be 2 inches in width and free of holes. The U-Channel stiffeners will also be used to connect various signs together so that an entire sign assembly can be erected on a single installation. Stiffeners may be fastened to signs by use of 1/4-inch diameter drive rivets.

The Contractor will use 3/8-inch diameter rust proof machine sign bolts, flat metal washers, neoprene washers (against the sign sheeting), lock washers, and nuts to fasten the sign to the channel aluminum and posts. A minimum of two bolts will extend through each post.

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

Prior to use, the Contractor will provide documentation for the sign support devices showing they meet the applicable NCHRP 350 or MASH requirements.

REMOVE TRAFFIC SIGN

Existing signs that are shown as being removed in the Permanent Signing Table will become the property of the Contractor. Existing signposts and bases will be removed in their entirety. All existing signs, posts, and/or hardware removed will not be reused. Holes remaining from the removal of wood posts will be backfilled and compacted with material placed in layers not to exceed 6 inches in depth.

All costs associated with the removal of existing signs, posts, hardware, and backfilled holes will be incidental to the contract unit price per each for "Remove Traffic Sign". Quantities will be per assembly at the contract unit price per each.

REMOVE SIGN FOR RESET AND RESET SIGN

Signs that are scheduled for reset will be dismantled and reassembled to the extent needed by the Contractor to properly reset the sign. Signs will be handled with care so that the existing signs, posts, and bases are not damaged during the relocation process. The Contractor will replace and pay for any reset signs damaged in their care. The Contractor will remove and dispose of any existing posts for all reset signs that require use of new posts as shown in the Table of Permanent Signing.

All costs for removing, dismantling, and disposing of any existing posts will be incidental to the contract unit price per each for "Remove Sign for Reset". All costs for resetting the existing signs will be incidental to the contract unit price per each for "Reset Sign". All quantities for Remove Sign for Reset and Reset Sign will be per assembly at the contract unit price per each.

Any 911 Emergency Number signs within the project work limits will not be stockpiled but temporarily repositioned at a location outside the work limits but within the immediate proximity of the existing location. To complete the project sign work, the 911 Emergency Number signs will be permanently installed at their original locations, or as near as practicable where entrances have been reconfigured by the project. The existing supports will be reused. Cost for removing, temporarily repositioning, and permanently resetting 911 Emergency Number signs will be included in the contract unit price per each for "Remove Sign for Reset" and "Reset Sign".

NEW PERMANENT SIGNING

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

All costs associated with furnishing and installing the new permanent signs, and with furnishing and installing stiffeners and hardware will be incidental to the contract unit price per square foot for "Flat Aluminum Sign, Nonremovable Copy High Intensity" or "Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity".

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.

DIGITALLY PRINTED SIGNS (CONTINUED).

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 Permanent Information

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

Date Tagging Signs With Permanent Information (Continued).

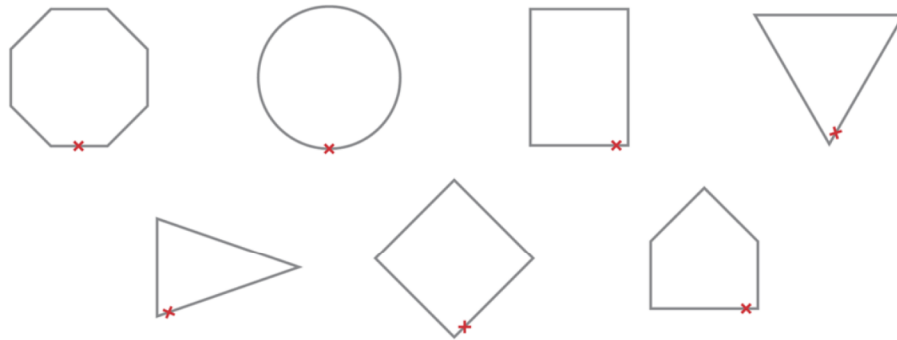
1. Date Tags on the Back of Signs

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.



SQUARE TUBE ANCHOR SLEEVE

The Contractor will furnish and install new 2.5" x 2.5" x 18", 12 Gauge square tube anchor sleeve or equivalent components as approved by the Engineer for 2.0" x 2.0" perforated tube posts. A 2.25" x 2.25" x 4', 12 Gauge perforated tube post will be used as the anchor post for installation with the square tube anchor sleeve.


OVERHEAD AND POLE MOUNTED SIGNS

The Contractor will install the new overhead signs with new connection hardware and mast arm mounting hardware.

Signs that are mounted on signal mast arms will be attached with high strength stainless steel bands or galvanized pole clamps. Signs will be attached as recommended by the manufacturer. All sign mounting hardware will be stainless steel or galvanized steel.

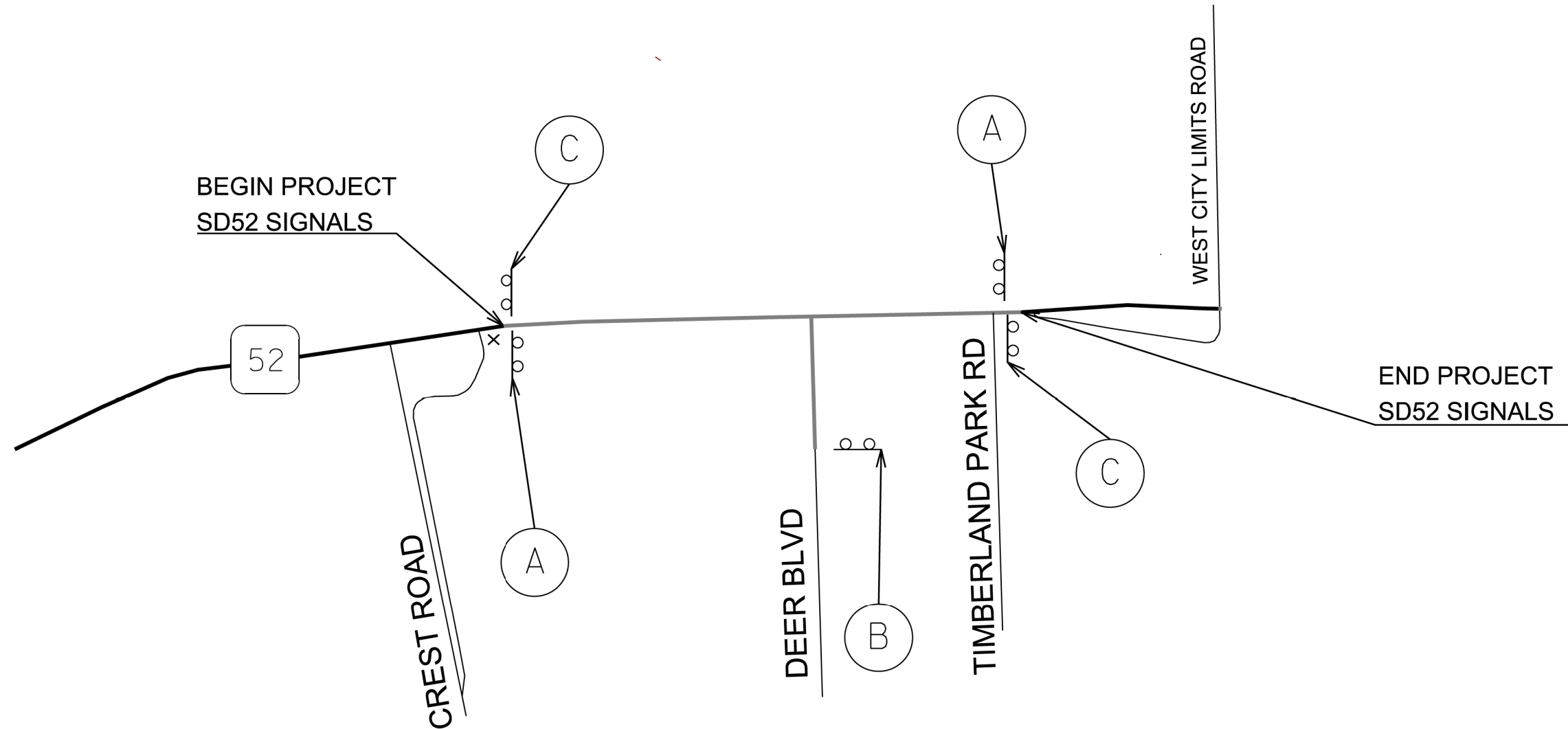
Pole mounted signs will be mounted a minimum of 7 ft above the ground. Mounting heights are measured to the bottom of the signs.

All costs for pole and mast arm sign mounting hardware will be incidental to the contract unit price per square foot for "Flat Aluminum Sign, Nonremovable Copy High Intensity" or "Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity".

	PROJECT	SECTION	SHEET
	P 0052(09)340	Non	7 of 28
Plotting Date: 03/06/2024	Revised: 03/05/2024 JU		

TRAFFIC CONTROL FIXED LOCATION SIGNS (GROUND MOUNTED SUPPORTS)

SD52 SIGNALS YANKTON COUNTY



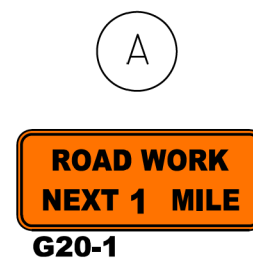
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (*)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000
75	2600

NOTES:

Road Work Next xx Miles and End Road Work signs will remain in place until pavement marking is complete.

X - Signs will be placed 150' to 200' from intersection. Exact location to be approved by the Engineer.

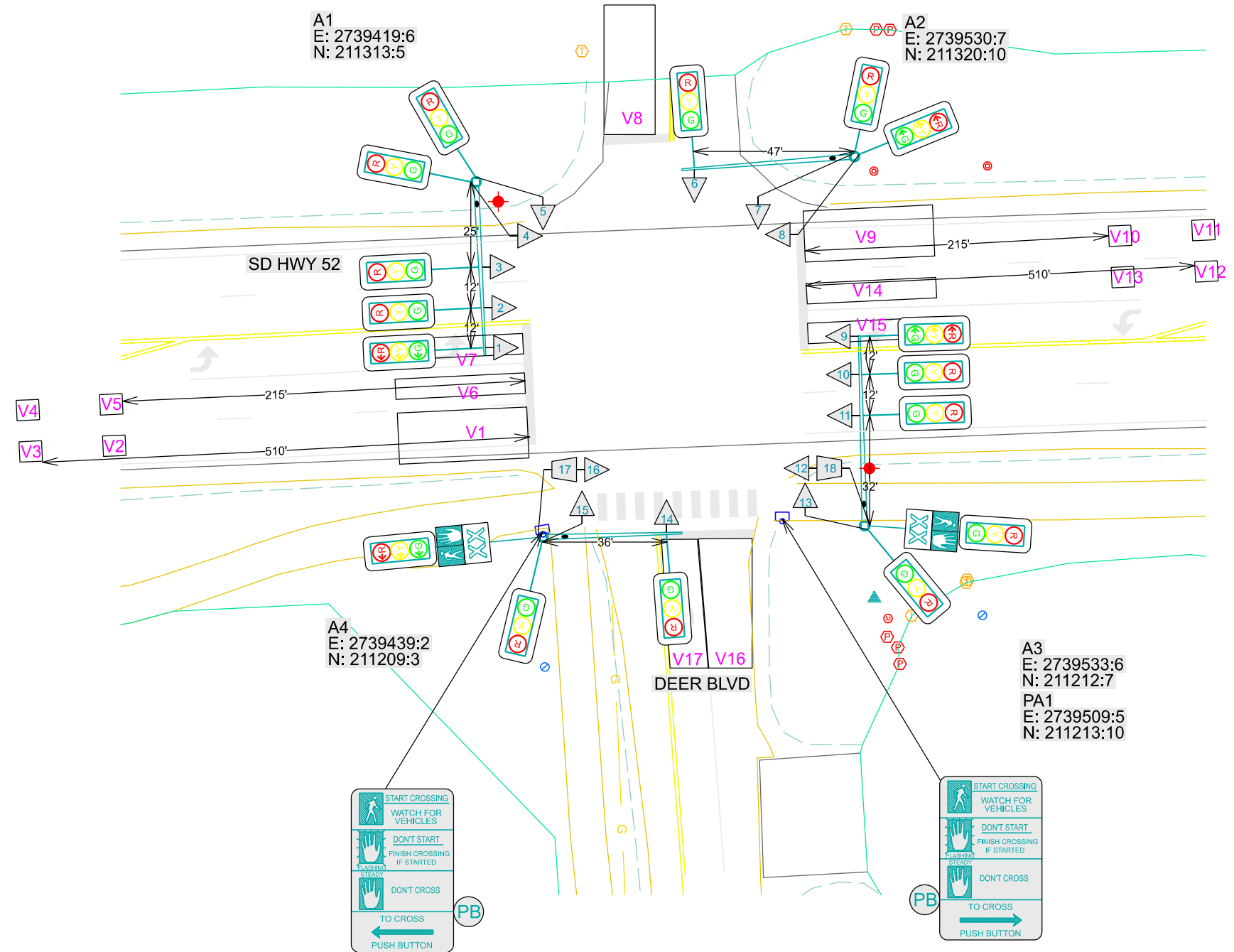
Construction signs will not obscure existing signs and must be installed a minimum of 100' from an existing sign.



SIGNAL LAYOUT SD HWY 52 & DEER BLVD

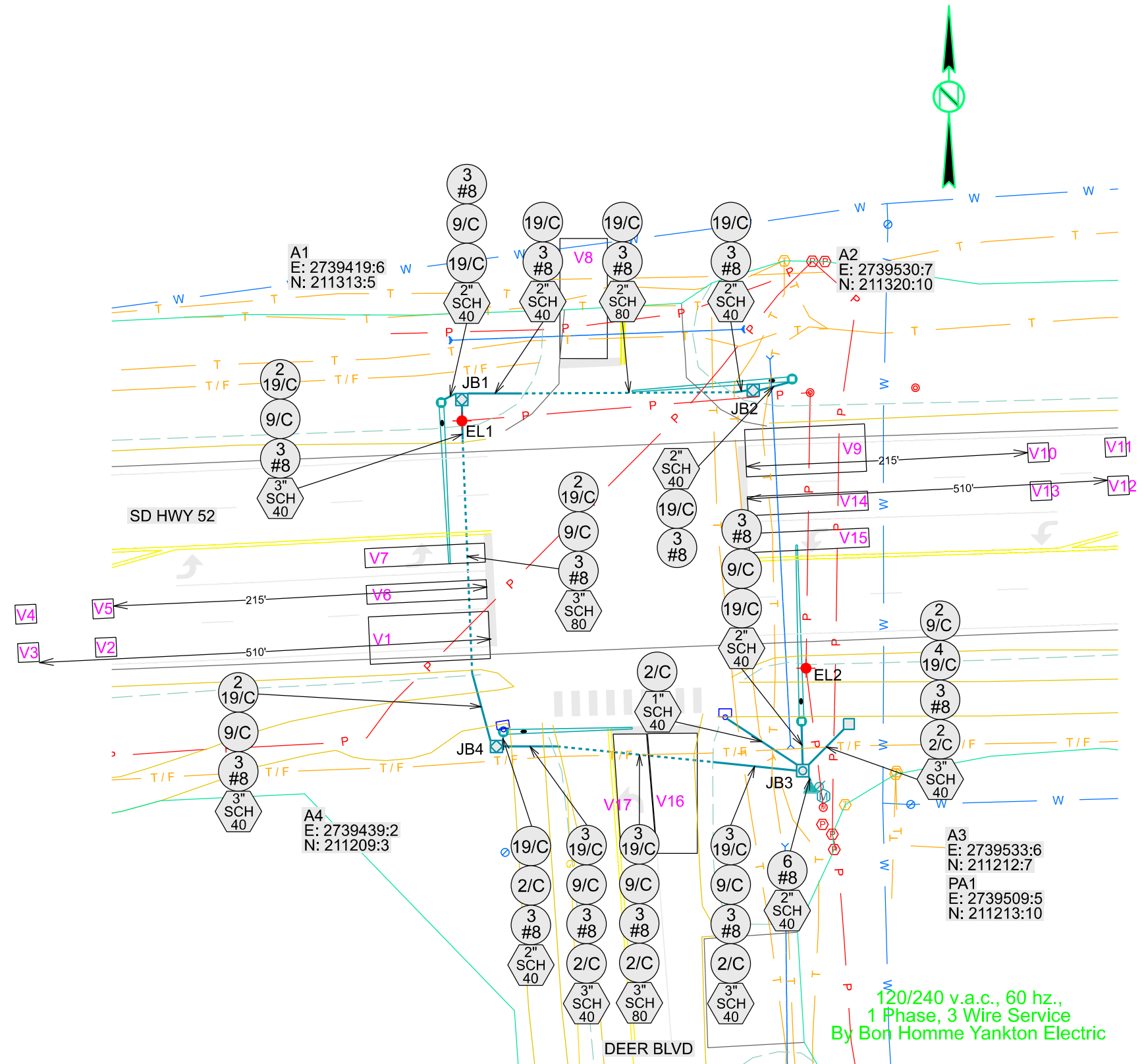


ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
	Signal Pole w/50' Mast Arm & 6' Lumin Arm (A1, A2)	2	EACH
	Signal Pole w/55' Mast Arm & 6' Lumin Arm (A3)	1	EACH
	Signal Pole w/40' Mast Arm & 6' Lumin Arm (A4)	1	EACH
	Roadway Luminaire, LED with P.E. (A1,A2,A3,A4)	4	EACH
	3 Section Vehicle Signal Head (2-7,10-15)	12	EACH
	3 Section Directional Vehicle Signal Head (1,8-9,16)	4	EACH
	Accessible Pedestrian Signal	2	EACH
	Pedestrian Push Button Pole (PA1)	1	EACH
	Pedestrian Signal Head w/Countdown Timer (17-18)	2	EACH
	Pedestrian Crossing Sign R10-3e (Left -1 /Right -2)	2	EACH



CONDUIT LAYOUT SD HWY 52 & DEER BLVD

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
	Remove Luminaire Pole (EL1-EL2)	2	EACH
	Remove Luminaire Pole Footing (EL1-EL2)	2	EACH
○	3' Diameter Footing (A1-A4)	53	FT
⊠	Type 3 Electrical Junction Box (JB3)	1	EACH
⊠	Type 1 Electrical Junction Box (JB1-JB2, JB4)	3	EACH
▲	Electrical Service Cabinet	1	EACH
⊗	Galvanized Steel Utility Pole Not a Bid Item	1	EACH
Ⓜ	Meter Socket Not a Bid Item	1	EACH
□	Traffic Signal Controller	1	EACH
⬡	1" Rigid Conduit, Schedule 40	35	FT
⬡	2" Rigid Conduit, Schedule 40	140	FT
⬡	3" Rigid Conduit, Schedule 40	135	FT
⬡	2" Rigid Conduit, Schedule 80	70	FT
⬡	3" Rigid Conduit, Schedule 80	135	FT
Ⓞ	2/C #14 AWG Copper Tray Cable, K2	175	FT
Ⓞ	9/C #14 AWG Copper Tray Cable, K2	435	FT
Ⓞ	19/C #14 AWG Copper Tray Cable, K2	1,240	FT
Ⓞ	1/C #8 AWG Copper Wire	2,170	FT
	2/C #10 AWG Copper Pole & Bracket Cable	260	FT
	4/C #14 AWG Copper Tray Cable, K2	685	FT
⊠	Video Detection Zones (V1-V17) (NOT A BID ITEM)	17	EACH

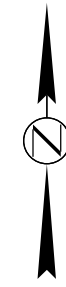


PAVEMENT MARKING LAYOUT SD HWY 52 & DEER BLVD

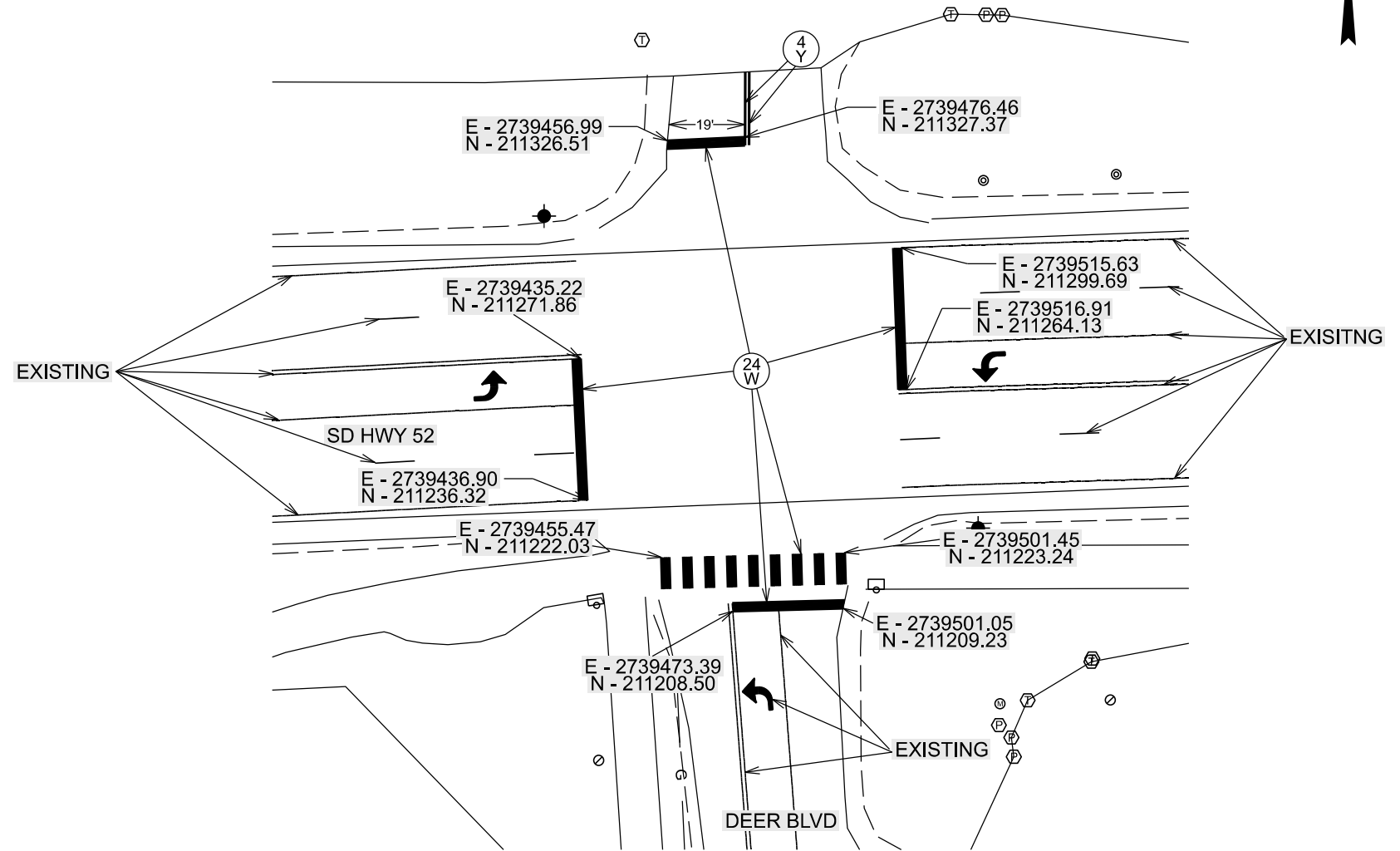


PROJECT	SECTION	SHEET
P 0052(09)340	Non	12 of 28

Plotting Date: 02/26/2024



ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
	Remove Pavement Marking, 4" or Equivalent	150	FT
	Remove Pavement Marking, Arrow	2	FT
Ⓢ	Preformed Thermoplastic Pavement Marking, 24" White	200	FT
Ⓞ	Preformed Thermoplastic Pavement Marking, 4" Yellow	30	FT
↶	Preformed Thermoplastic Pavement Marking, Arrow (Left 2, Right 0)	2	EACH
	Grooving For Cold Applied Plastic Pavement Marking, 4"	30	FT
	Grooving For Cold Applied Plastic Pavement Marking, 24"	200	FT
	Grooving For Cold Applied Plastic Pavement Marking, Symbol	2	EACH



SIGNAL TIMING

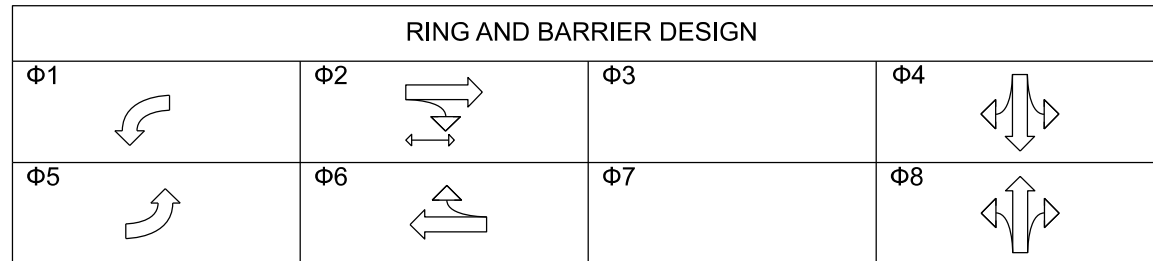
SD HWY 52 & DEER BLVD.

BASIC INTERVALS								
Phase	1	2	3	4	5	6	7	8
Movement	WBL	EB		SB	EBL	WB		NB
Lag								
Min Green	5	15		10	5	15		10
Extension	3	3		3	3	3		3
Max 1	9.5	34		13.5	5	38.5		13.5
Max 2								
Time Before								
Time to Reduce								
Minimum Gap								
Yellow	3.5	5		4.5	3.5	5		4.5
All Red	2	1		2	2	1		2
Walk		7						
Ped Clearance		15						
Recall		Min				Min		
Prog Flash Display	R	Y		R	R	Y		R
Start Up Ø		X				X		

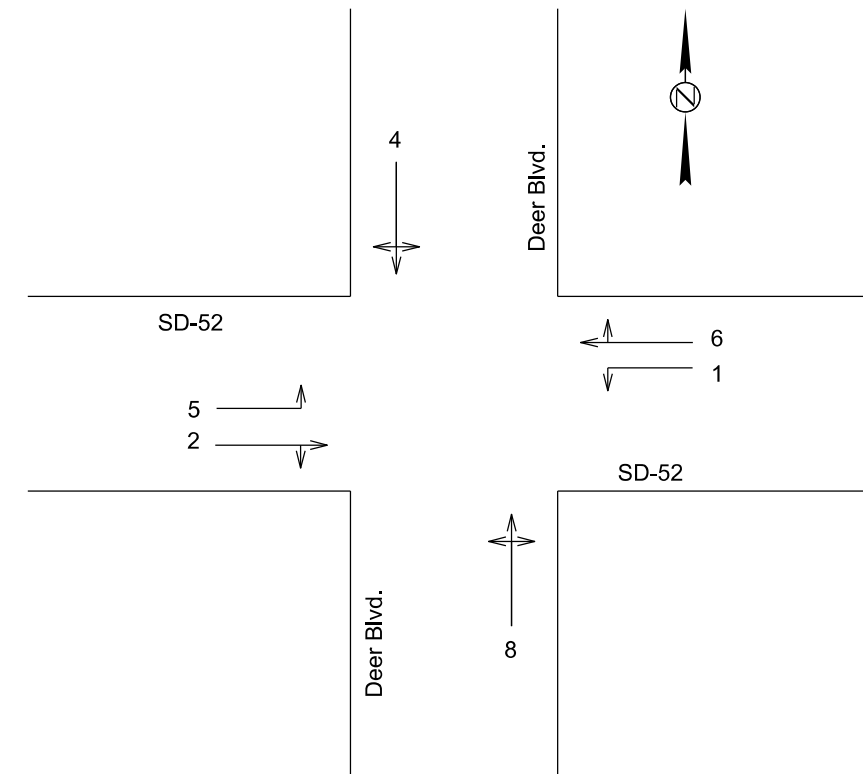
WEEKLY PROGRAM							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Timing Plan	2	1	1	1	1	1	2

TIMING PLAN 1	
Time of Day (TOD)	Pattern (C/S/O)
06:00	Free
23:00	Flash

TIMING PLAN 2	
Time of Day (TOD)	Pattern (C/S/O)
07:00	Free
22:00	Flash



DETECTOR TABLE															
Local Detector	Controller Detector #	Phase Called (Call/Call Locking/Extend)												Controller Settings	
		1	2	3	4	5	6	7	8	9	10	11	12	Extend	Delay
V1, V6	1		C												
V2, V5	2		E												
V3, V4	3		E											1	
V7	4					C									
V8	5				C/E										10
V9, V14	6				C		C								
V10, V13	7						E								
V11, V12	8						E							1	
V15	9	C													
V16, V17	10								C/E						10



TRAFFIC SIGNAL WIRING TABLES

POLE: A1 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	∅
6R	Red	RD	R	3	6
6Y	Orange	O	Y	3	6
6G	Blue	BL	G	3	6
N	Black	BK	N	3	6
6R	Red/Black	R	R	4	6
6Y	Yellow	O	Y	4	6
6G	Blue/Black	BL	G	4	6
N	Brown	BK	N	4	6
8R	Red/Blue	R	R	5	8
8Y	Yellow/Red	O	Y	5	8
8G	Blue/Red	BL	G	5	8
N	Brown/Black	BK	N	5	8
	Orange/Black				
	Yellow/Black				
	Black/Red				
	Orange/Red				
	Brown/Red				
	Black/Blue				
	Orange/Blue				

POLE: A2 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	∅
8R	Red	R	R	6	8
8Y	Orange	O	Y	6	8
8G	Blue	BL	G	6	8
N	Black	BK	N	6	8
8R	Red/Black	R	R	7	8
8Y	Yellow	O	Y	7	8
8G	Blue/Black	BL	G	7	8
N	Brown	N	N	7	8
5R	Red/Blue	R	RA	8	5
5Y	Yellow/Red	O	YA	8	5
5G	Blue/Red	BL	GA	8	5
N	Brown/Black	BK	N	8	5
	Orange/Black				
	Yellow/Black				
	Black/Red				
	Orange/Red				
	Brown/Red				
	Black/Blue				
	Orange/Blue				

POLE: A3 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	∅
2R	Red	R	R	11	2
2Y	Orange	O	Y	11	2
2G	Blue	BL	G	11	2
N	Black	BK	N	11	2
2R	Red/Black	R	R	12	2
2Y	Yellow	O	Y	12	2
2G	Blue/Black	BL	G	12	2
N	Brown	N	N	12	2
4R	Red/Blue	R	R	13	4
4Y	Yellow/Black	O	Y	13	4
4G	Blue/Red	BL	G	13	4
N	Black/Red	BK	N	13	4
9R	Brown/Red	R	DW	18	2P
9G	Orange/Blue	BL	W	18	2P
N	Black/Blue	BK	N	18	2P
	Orange/Black				
	Brown/Black				
	Orange/Red				
	Yellow/Red				

POLE: A4 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	∅
4R	Red	R	R	14	4
4Y	Orange	O	Y	14	4
4G	Blue	BL	G	14	4
N	Black	BK	N	14	4
4R	Red/Black	R	R	15	4
4Y	Yellow	O	Y	15	4
4G	Blue/Black	BL	G	15	4
N	Brown	N	N	15	4
1G	Blue/Red	BL	G	16	1
1R	Red/Blue	R	RA	16	1
1Y	Yellow/Black	O	YA	16	1
N	Black/Red	BK	N	16	1
9R	Brown/Red	R	DW	17	2P
9G	Orange/Blue	BL	W	17	2P
N	Black/Blue	BK	N	17	2P
	Orange/Black				
	Brown/Black				
	Orange/Red				
	Yellow/Red				

POLE: A1 CABLE SIZE: 9/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	∅
1R	Red	R	RA	1	1
1Y	Orange	O	YA	1	1
1G	Blue	BL	GA	1	1
N	Black	BK	N	1	1
6R	Red/Black	R	R	2	6
6Y	Yellow	O	Y	2	6
6G	Blue/Black	BL	G	2	6
N	Brown	BK	N	2	6
	Orange/Black				

POLE: A3 CABLE SIZE: 9/C

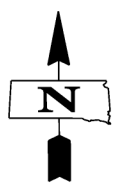
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	∅
5R	Red	R	RA	9	5
5Y	Orange	O	YA	9	5
5G	Blue	BL	GA	9	5
N	Black	BK	N	9	5
2R	Red/Black	R	R	10	2
2Y	Yellow	O	Y	10	2
2G	Blue/Black	BL	G	10	2
N	Brown	BK	N	10	2
	Orange/Black				



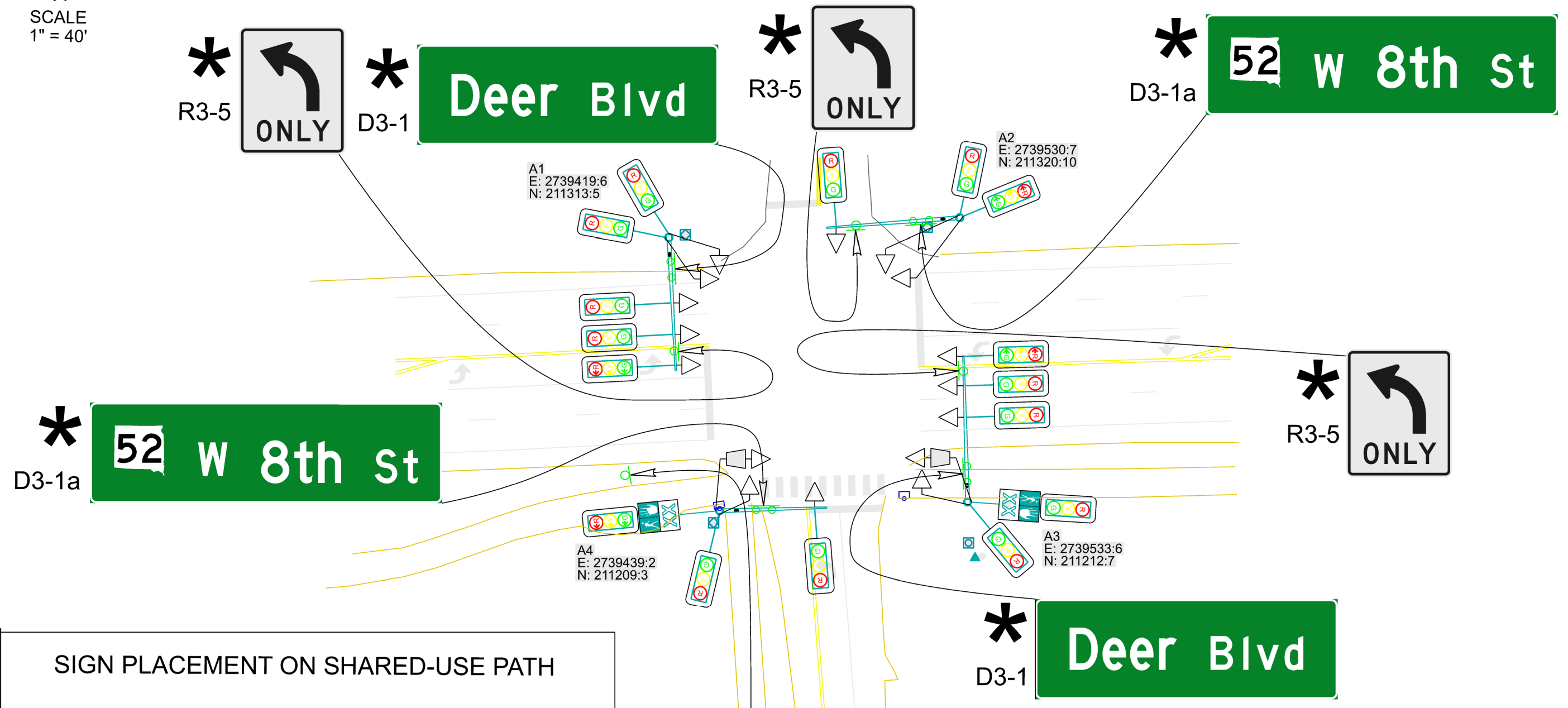
PERMANENT SIGNING TABLE

Distance from Pole to Right Edge of Sign	Description	Sign Code	Width (Inches)	Height (Inches)	632E3205 Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SQFT)	110E0130 Remove Traffic Sign (Each)	110E7150 Remove Sign For Reset (Each)	632E3500 Reset Sign (Each)	632E1320 2.0"x2.0" Perforated Tube Post 12 ga. (FT)	N.A. (N.A.B.I.) Square Tube Anchor Sleeve (Each)	Direction Sign Faces	Remarks	DOT USE	
POLE A4														
0'	W 8 ST	D3-1				1					NORTH	Street (D3-1) signs are back-to-back. Remove only.		
	W 8 ST	D3-1					SOUTH							
	Deer Blvd	D3-1					EAST	Street (D3-1) signs are back-to-back.						
	Deer Blvd	D3-1					WEST							
0'	STOP	R1-1				1				WEST	Remove sign and wood post.			
14.5'	[SD52] Symbol W 8th St	D3-1a	84	24	14.0						NORTH	Attach sign overhead on mast arm per Standard Plate 635.32		
38.5'	REST AREA ←	SPECIAL	24	18				1	1	6.0	1	EAST	Reinstall sign on perforated tube post 36' west and 13.5' north of pole A4. Install the sign 4 ft above the shared-use path. Then 2 ft. from the shared-use path to the left edge of sign. And, 2 ft. from the highway shoulder to the right edge of sign.	
POLE A1														
6.5'	Deer Blvd	D3-1	72	24	12.0						EAST	Attach sign overhead on mast arm per Standard Plate 635.32		
43.5'	[Left Turn] ONLY	R3-5	30	36	7.5						EAST	Attach sign overhead on mast arm per Standard Plate 635.32		
POLE A2														
21.5'	[SD52] Symbol W 8th St	D3-1a	84	24	14.0						SOUTH	Attach sign overhead on mast arm per Standard Plate 635.32		
41.5'	[Left Turn] ONLY	R3-5	30	36	7.5						SOUTH	Attach sign overhead on mast arm per Standard Plate 635.32		
POLE A3														
13.0'	Deer Blvd	D3-1	72	24	12.0						WEST	Attach sign overhead on mast arm per Standard Plate 635.32		
26.0'	STOP	R1-1				1					EAST	Remove existing wood post with bicycles signs (R1-1, R5-3, & D11-1). Existing post is 26 ft. west of new location for Pole A3.		
	BIKE ROUTE	D11-1					WEST							
	NO MOTOR VEHICLES	R5-3					WEST							
	[REFLECTIVE WHITE] PLAQUE	SPECIAL					NORTH-SOUTH							
31.0'	STOP	R1-1				1					SOUTH	Remove existing STOP sign and perforated tube post. Existing post is 31 ft. west of new location for Pole A3.		
50.5'	[Left Turn] ONLY	R3-5	30	36	7.5						WEST	Attach sign overhead on mast arm per Standard Plate 635.32		
TOTAL					74.5	4	1	1	6.0	1				

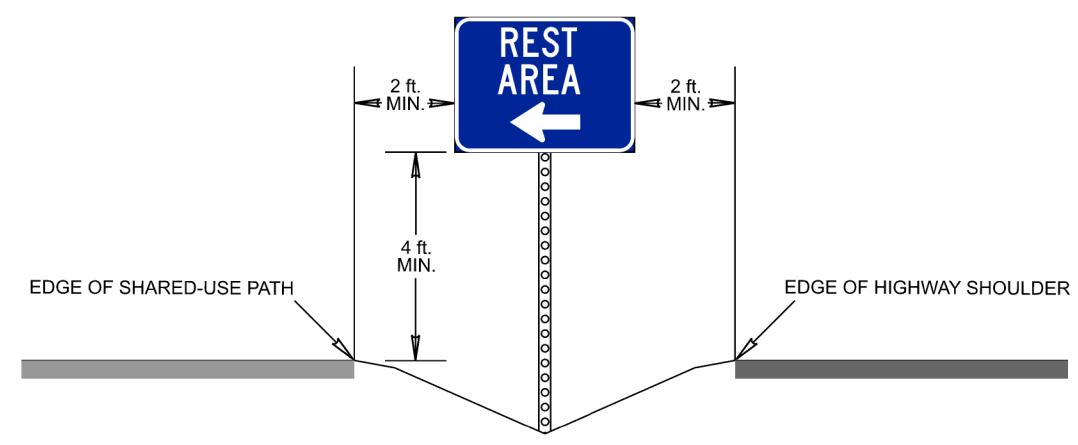
SD52 AND DEER BLVD (SPECIAL SIGN LAYOUT)



SCALE
1" = 40'



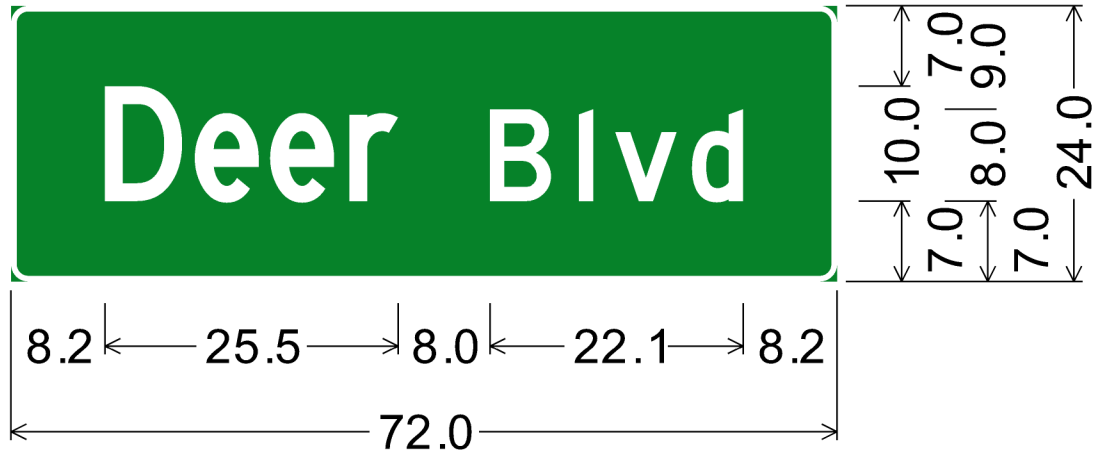
SIGN PLACEMENT ON SHARED-USE PATH



***** INSTALL SIGNS ON MAST ARMS
PER STANDARD PLATE 635.32

SPECIAL SIGN DETAIL

EXTRUDED ALUMINUM SIGNS WITH NONREMOVABLE COPY SUPER/VERY HIGH INTENSITY Type XI Sheeting

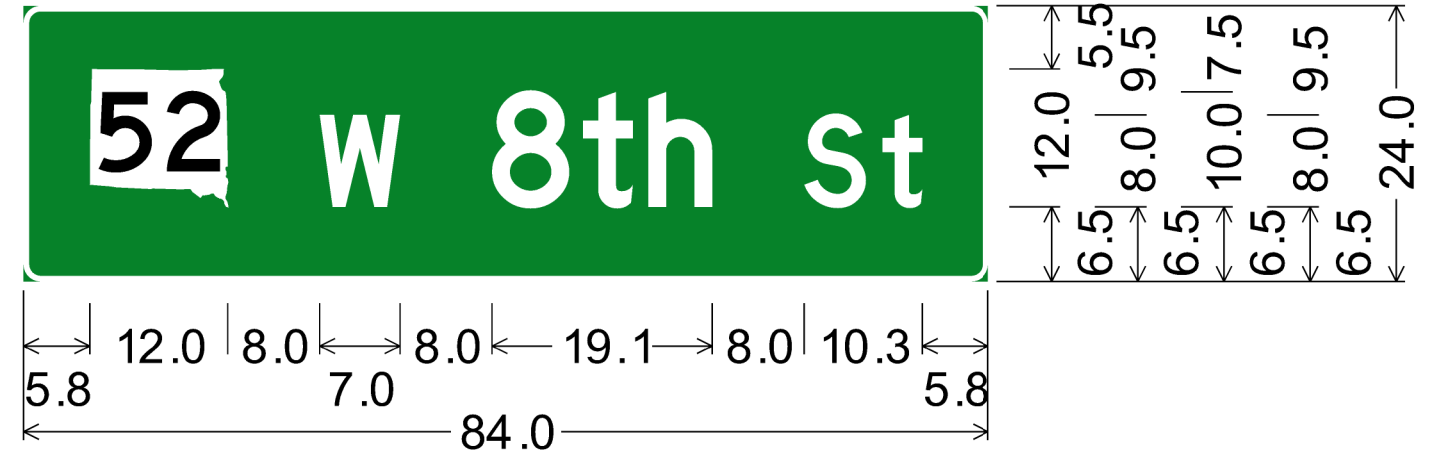


D3-1
1.5" Radius, 0.5" Border, White on Green;
"Deer", D 50% spacing;
"Blvd", D;

Table of letter and object lefts

D	e	e	r
8.2	16.0	22.6	29.5

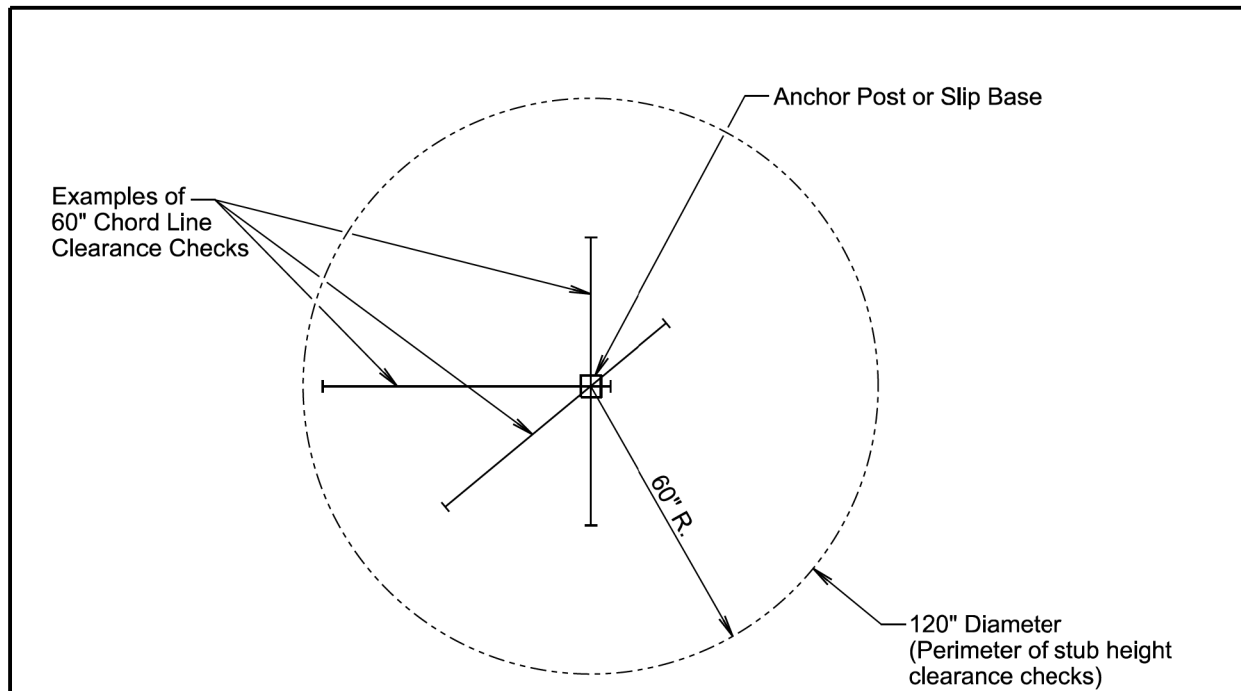
B	l	v	d
41.7	49.5	52.7	59.4



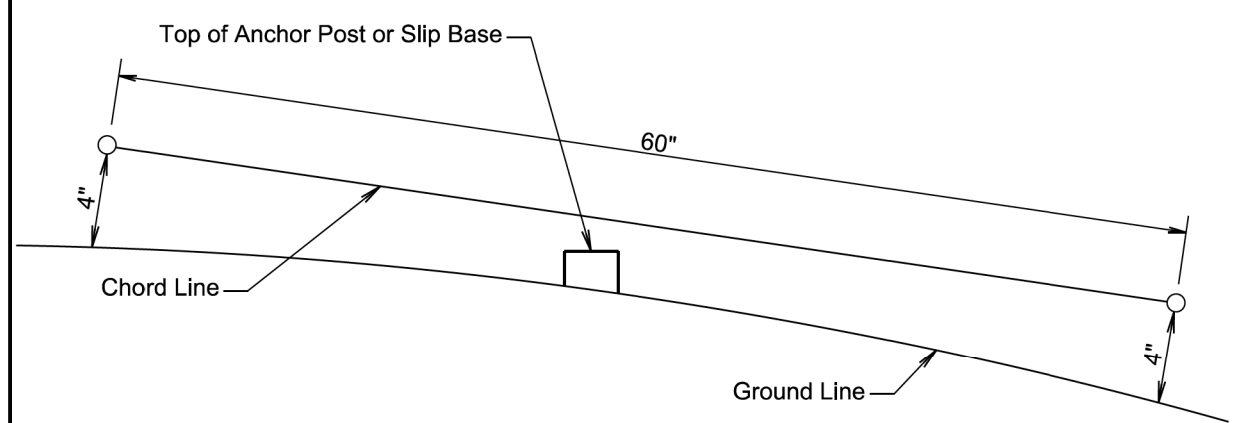
D3-1a
1.5" Radius, 0.5" Border, White on Green;
"W", D; "8th", D 50% spacing;
"St", D;

Table of letter and object lefts

■	W	8	t	h	S	t
5.8	25.8	40.8	48.7	54.4	67.9	74.7



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

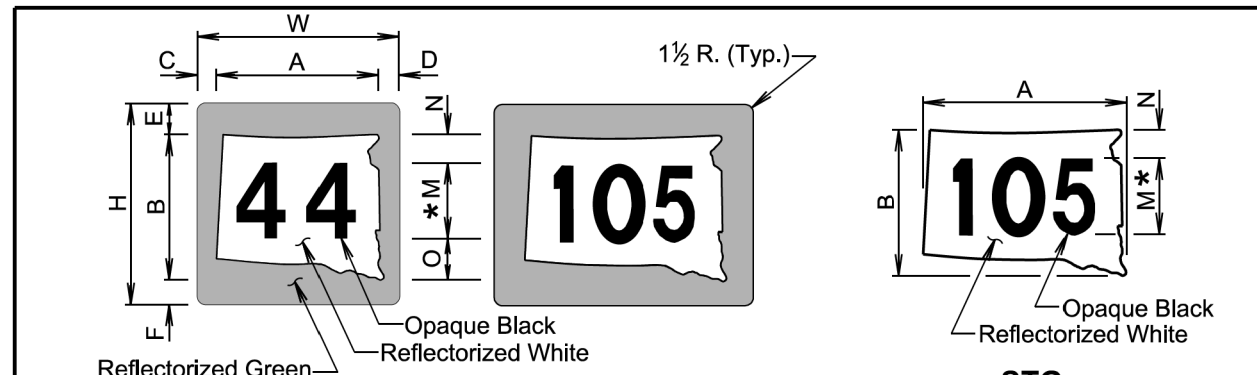
GENERAL NOTES:

The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

January 22, 2021

Published Date: 2024	SD DOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 632.18
			Sheet 1 of 1



M1-5

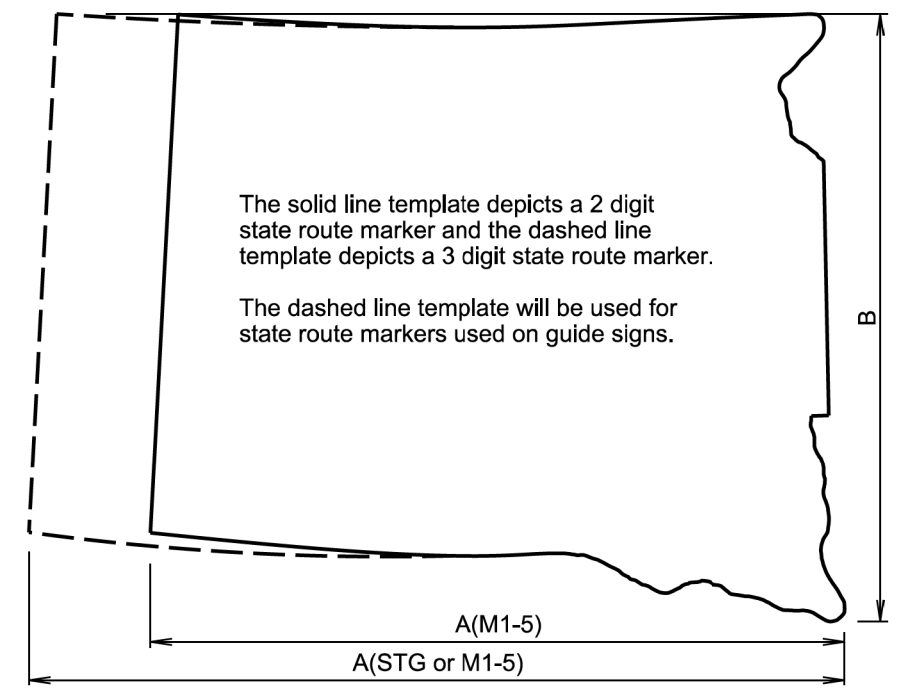
SIGN CODE	WxH	A	B	C	D	E	F	M*	N	O
M1-5	24x24	20 1/2	18	2	1 1/2	3 1/2	2 1/2	12D	2	4
M1-5 **	30x24	24	18	2 1/4	1 3/4	3 1/2	2 1/2	12D	2	4
M1-5	30x30	25 5/8	22 1/2	2 1/2	1 7/8	4 3/8	3 3/8	15D	2 1/2	5
M1-5	36x36	30 3/4	27	3	2 1/4	5 1/4	3 3/4	18D	3	6

STG

SIGN CODE	AxB	M*	N
STG-24	24x18	10D	4
STG-32	32x24	12D	4 3/4
STG-48	48x36	18D	7
STG-64	64x48	24D	9 1/2

* In the few cases where there is not enough space for the numerals, the standard D series font may be replaced with C series font if approved by the Engineer.

** 3 Digits



TEMPLATE FOR STATE ROUTE MARKER

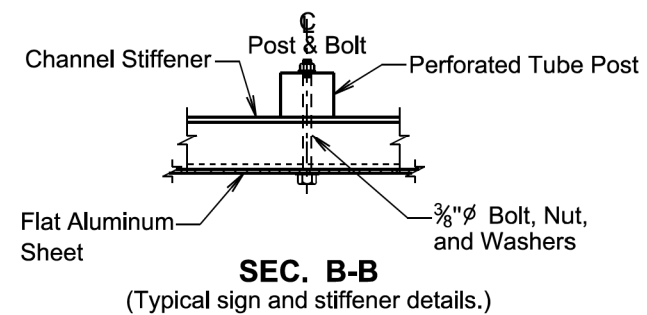
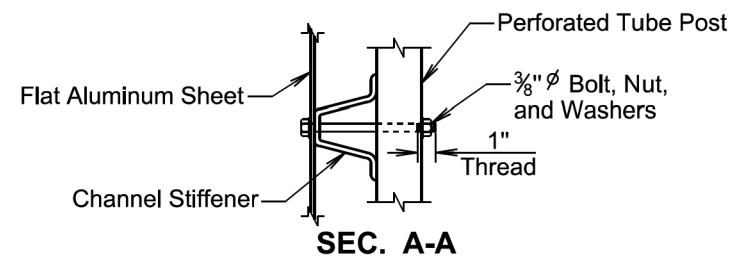
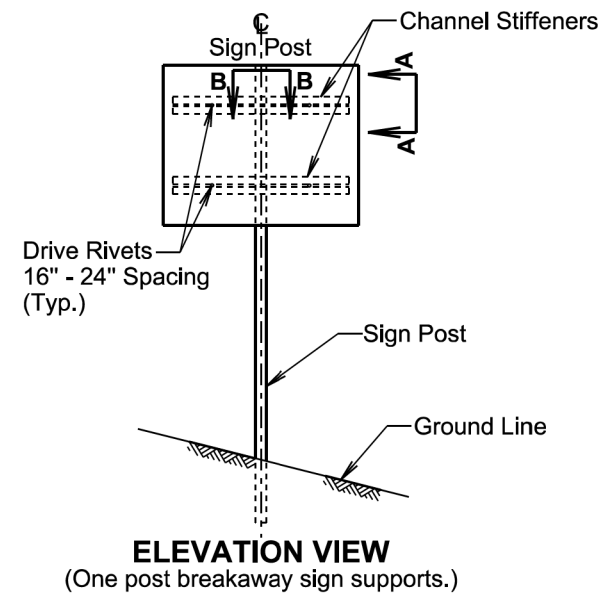
GENERAL NOTES:

The unit for all dimensions shown is inches.

Numerals will be D series font for all state route markers except as noted above.

December 23, 2019

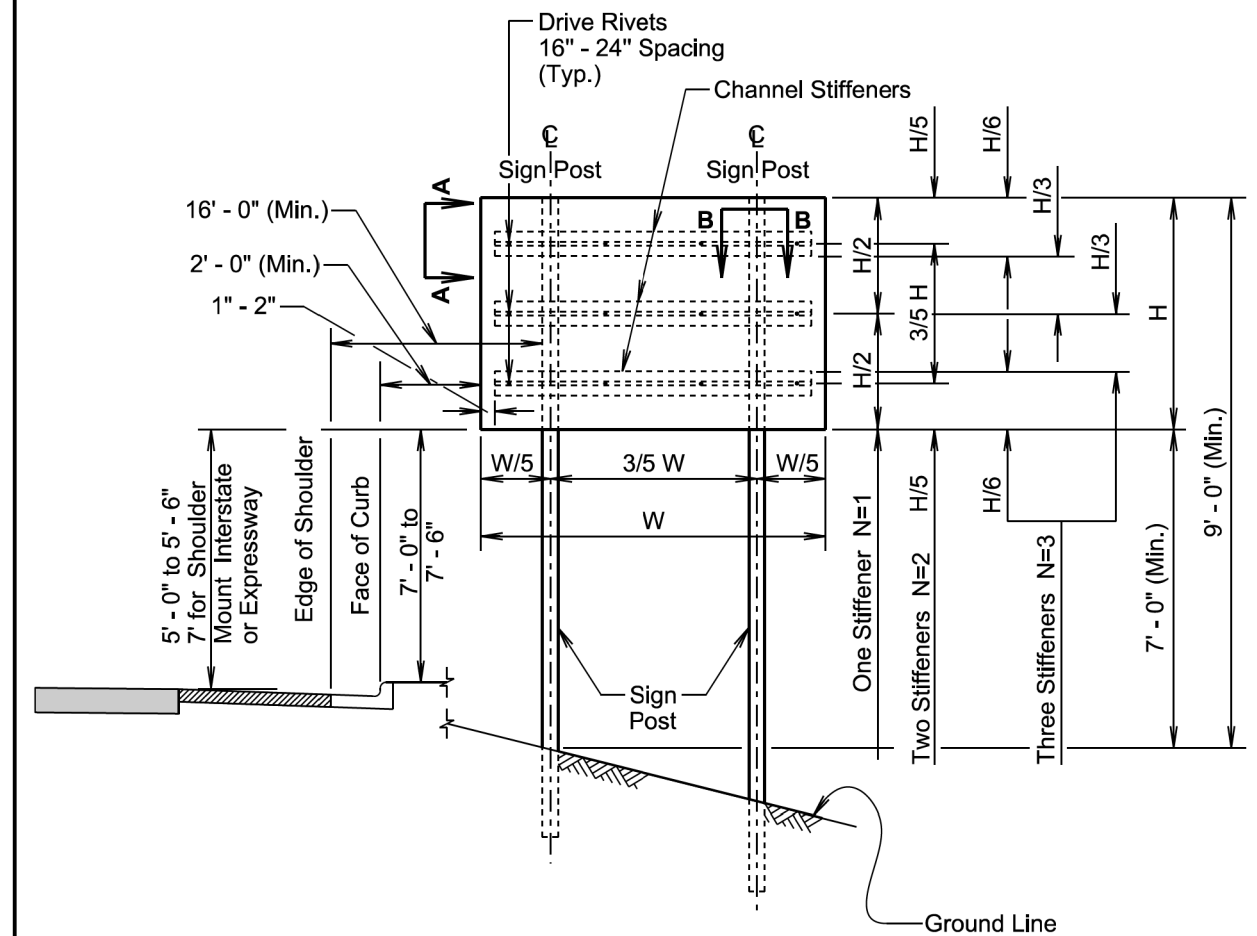
Published Date: 2024	SD DOT	STATE ROUTE MARKERS	PLATE NUMBER 632.20
			Sheet 1 of 1



∅ A plastic washer, as recommended by the sheeting manufacturer, will be installed between the sign face and the metal washer shown.

November 19, 2020

Published Date: 2024	SD DOT	SIGN STIFFENER DETAILS	PLATE NUMBER 632.60
			Sheet 1 of 2



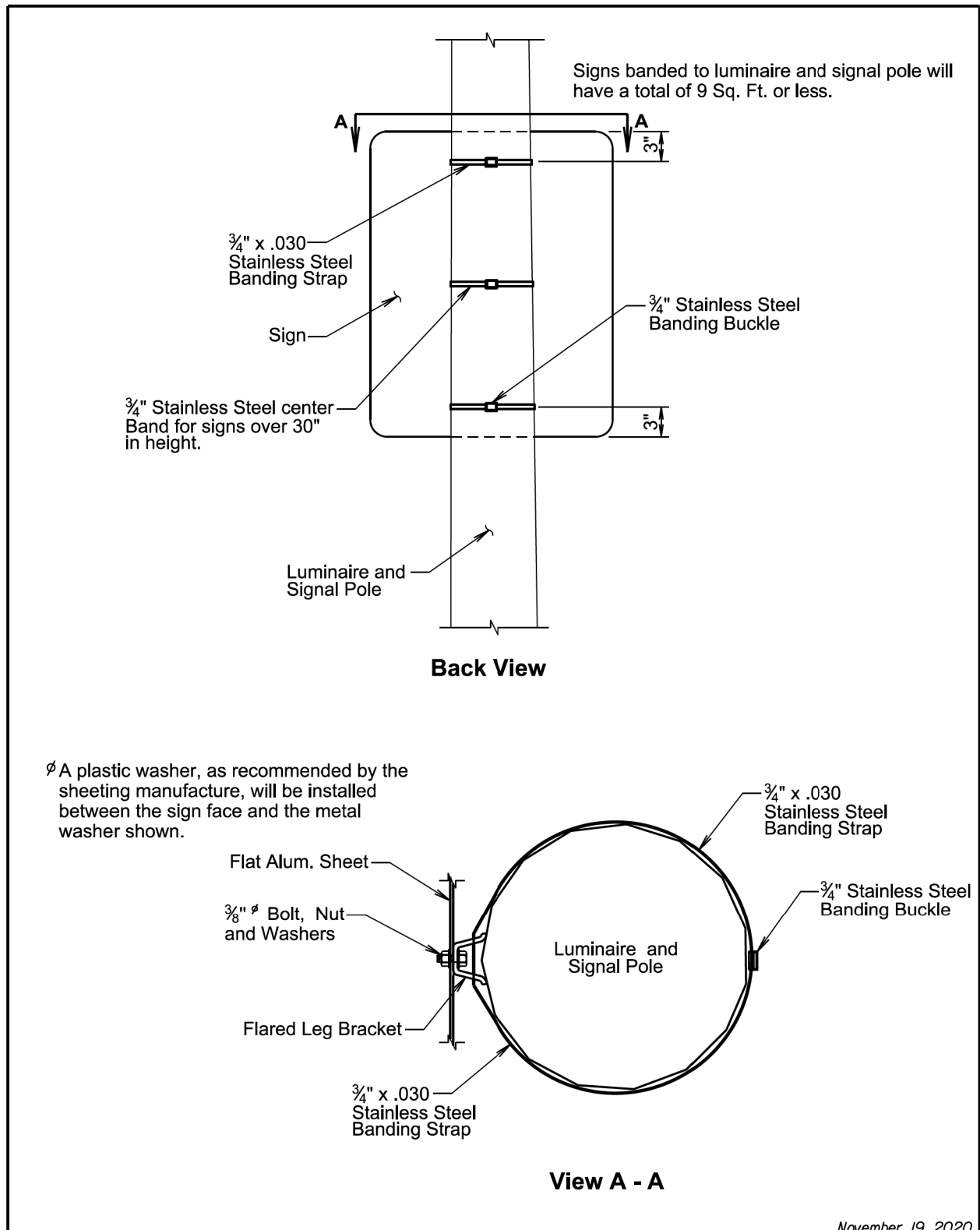
GENERAL NOTES:

The number of stiffeners used (N) will be as follows:
 If $H \leq 2' - 0''$ then $N = 1$
 if $2' - 0'' < H \leq 8' - 0''$ then $N = 2$
 if $8' - 0'' < H \leq 15' - 0''$ then $N = 3$
 where H is the vertical dimension of the sign.

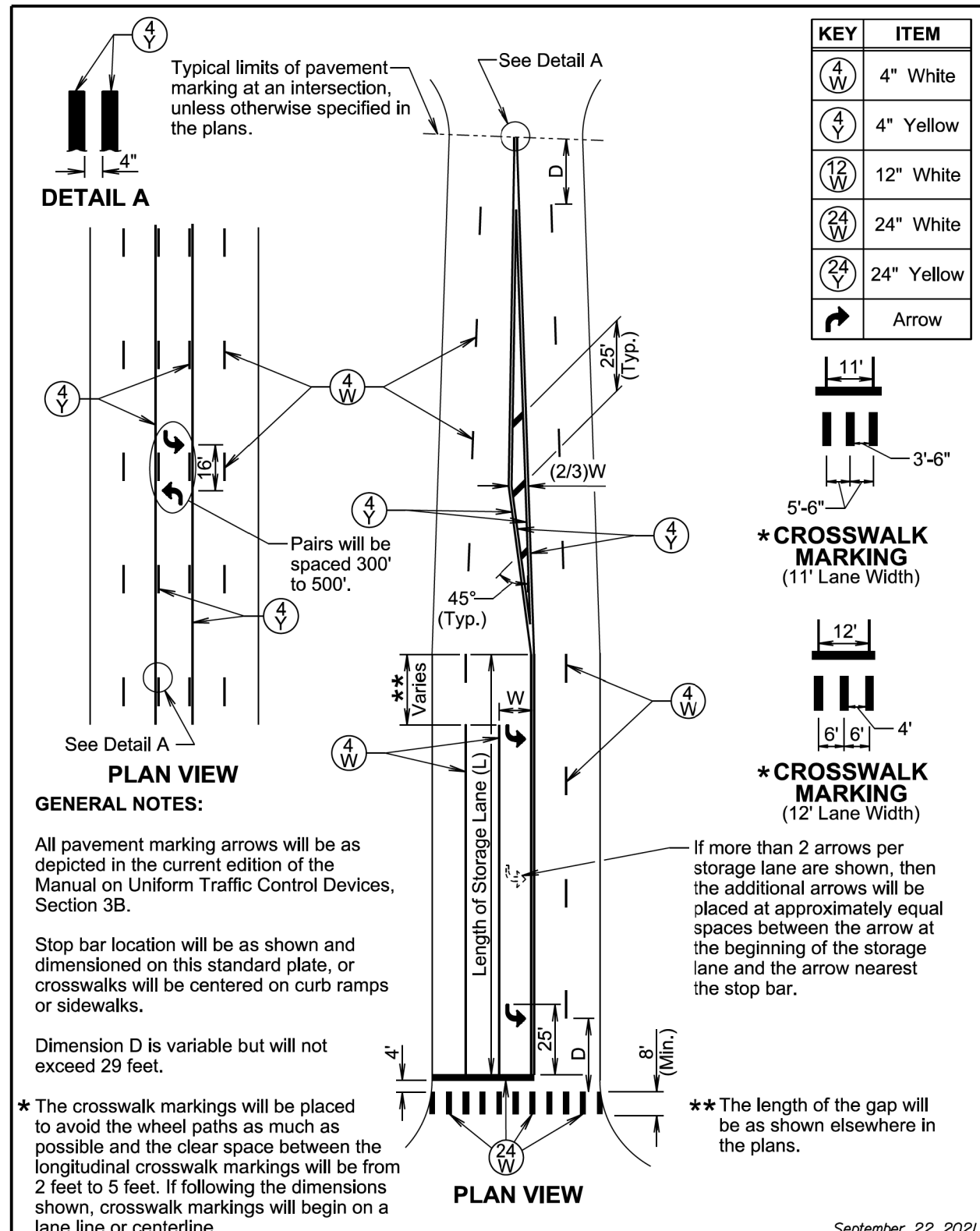
A minimum of two bolts will be required to fasten the sign to each post.

November 19, 2020

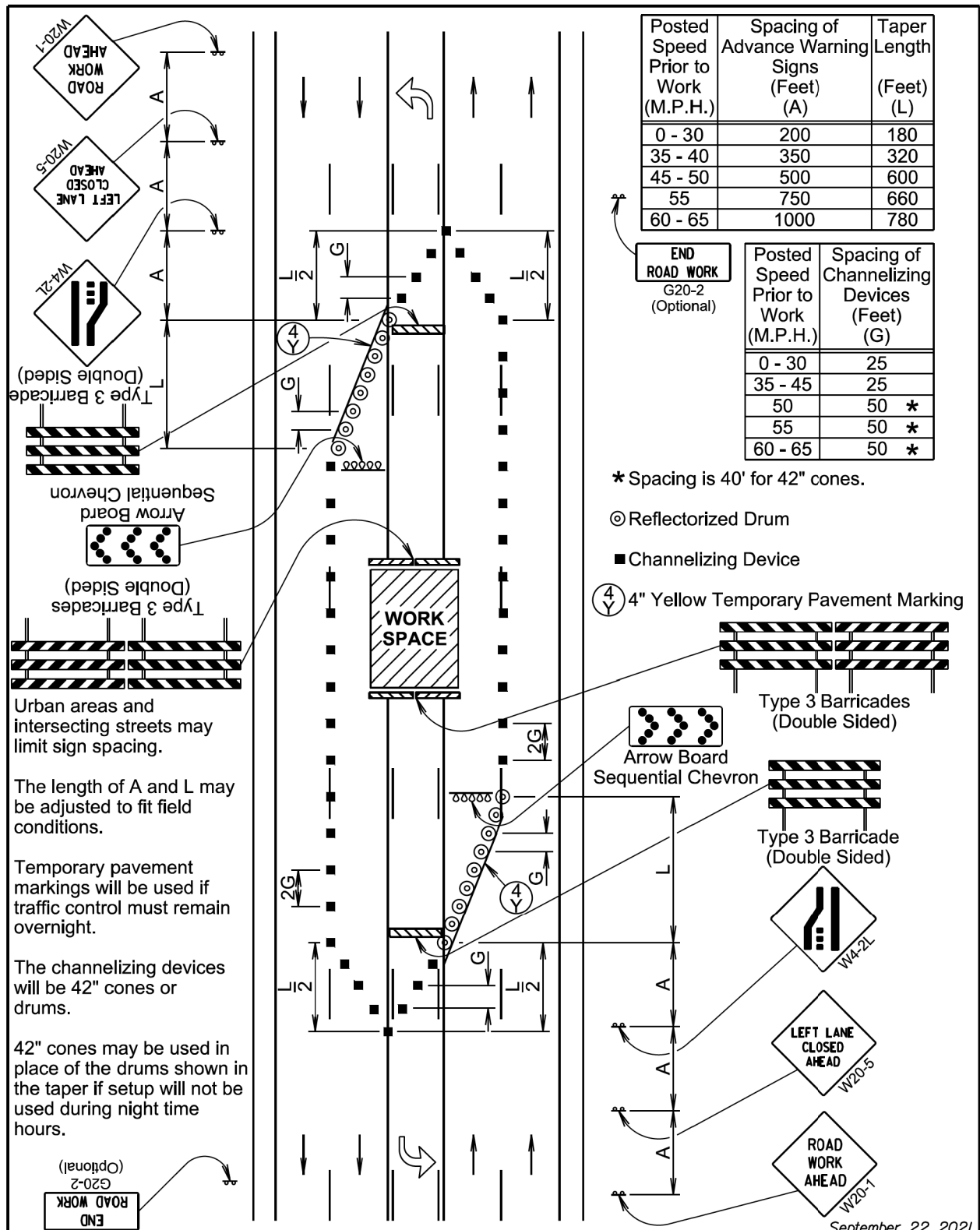
Published Date: 2024	SD DOT	SIGN STIFFENER DETAILS	PLATE NUMBER 632.60
			Sheet 2 of 2



Published Date: 2024	SD DOT	BANDING SIGN TO LUMINAIRE AND SIGNAL POLE	November 19, 2020
			PLATE NUMBER 632.80
			Sheet 1 of 1



Published Date: 2024	SD DOT	PAVEMENT MARKINGS FOR ADJACENT INTERSECTIONS AND CENTER TURN LANE	September 22, 2021
			PLATE NUMBER 633.01
			Sheet 1 of 1



September 22, 2021

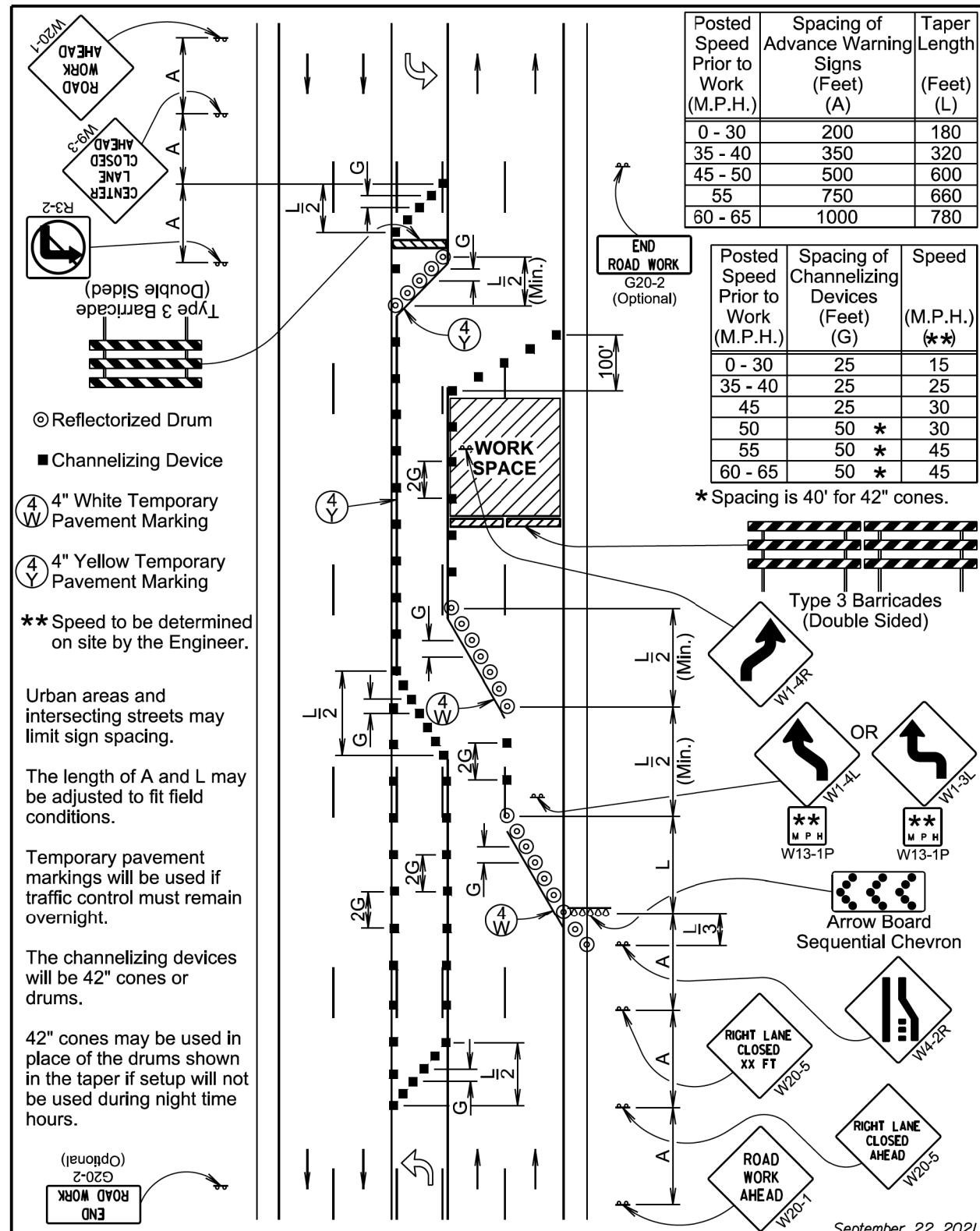
SD DOT

5-LANE, CENTER 3 LANES CLOSED

PLATE NUMBER 634.57

Published Date: 2024

Sheet 1 of 1



September 22, 2021

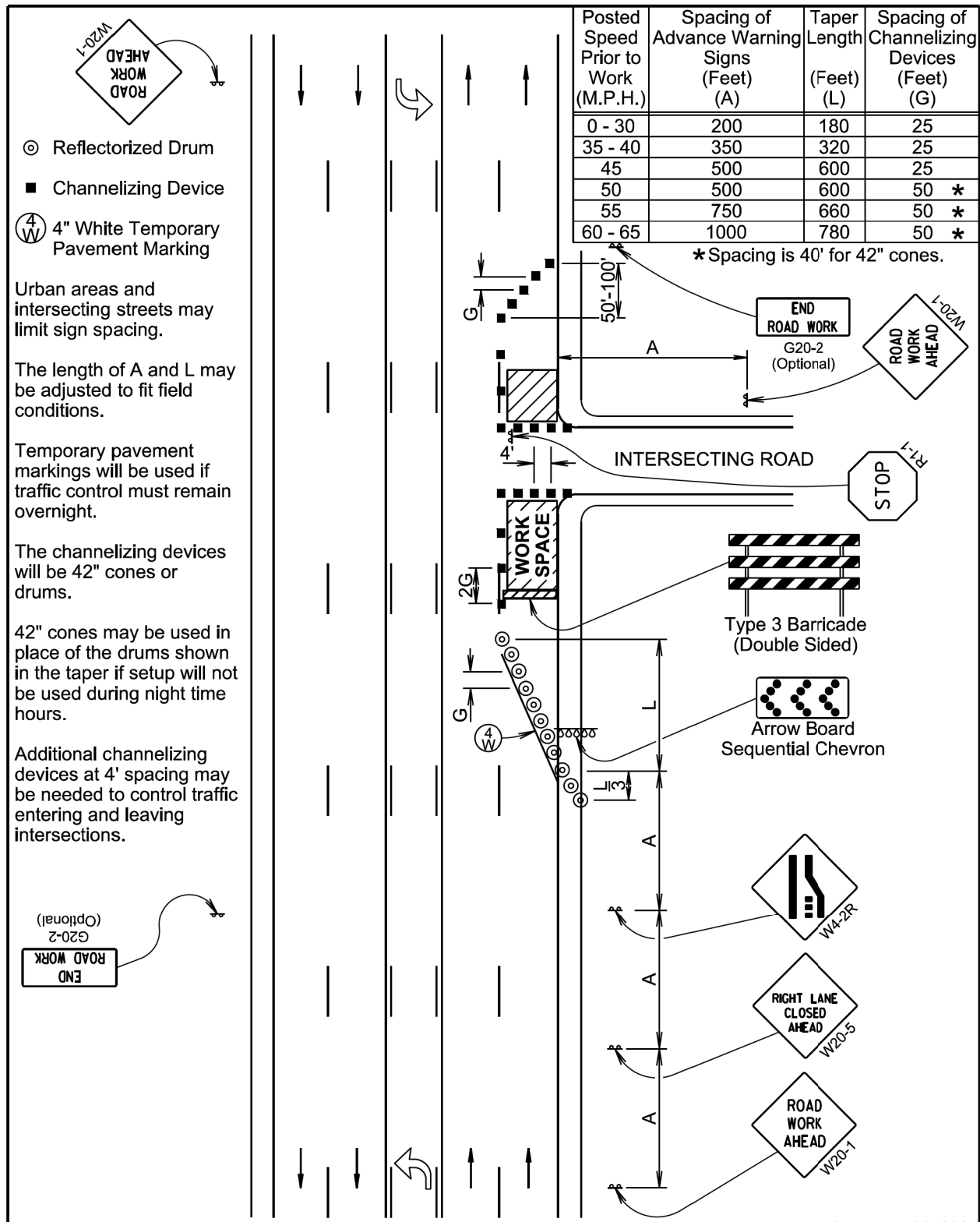
SD DOT

5-LANE, 2 LANES CLOSED ONE SIDE

PLATE NUMBER 634.58

Published Date: 2024

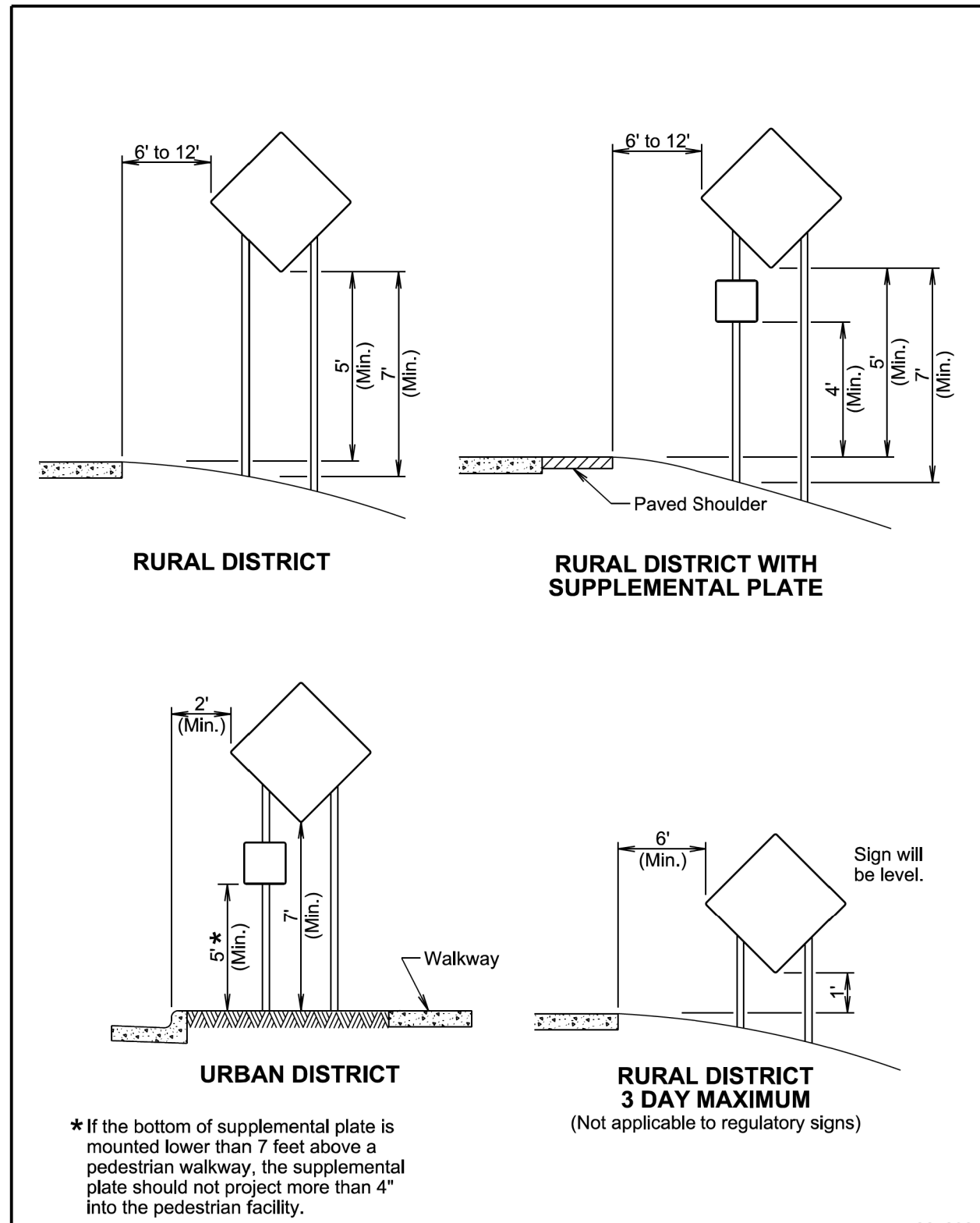
Sheet 1 of 1



September 22, 2021

SD DOT	5-LANE, OUTSIDE LANE CLOSED	PLATE NUMBER 634.60
		Sheet 1 of 1

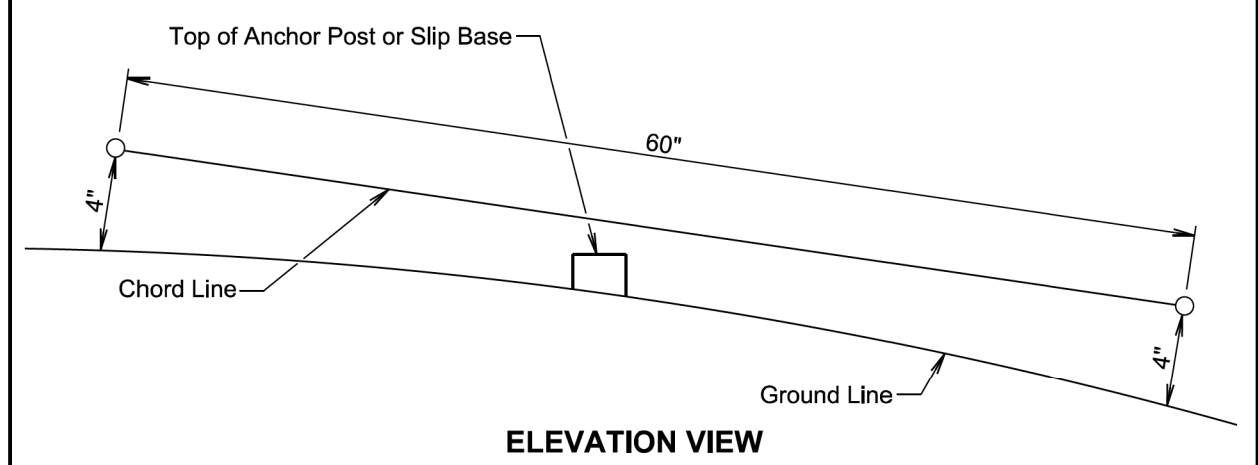
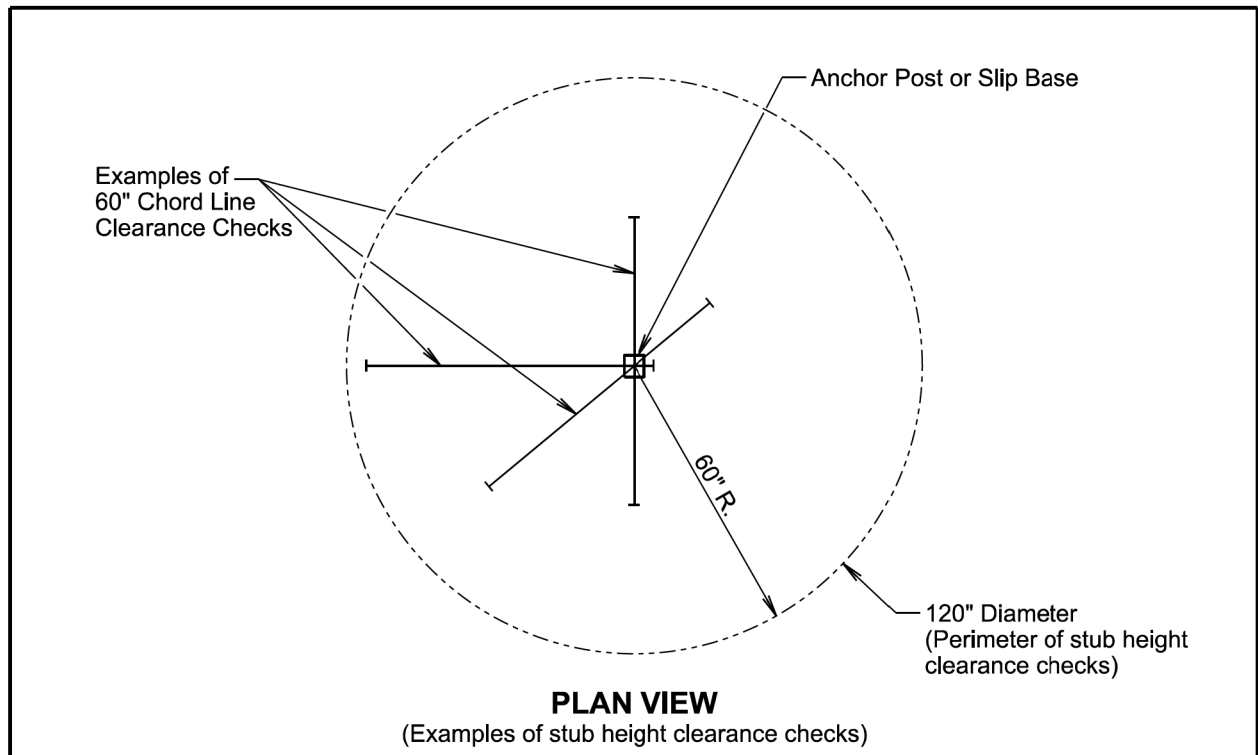
Published Date: 2024



January 22, 2021

SD DOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
		Sheet 1 of 1

Published Date: 2024



GENERAL NOTES:

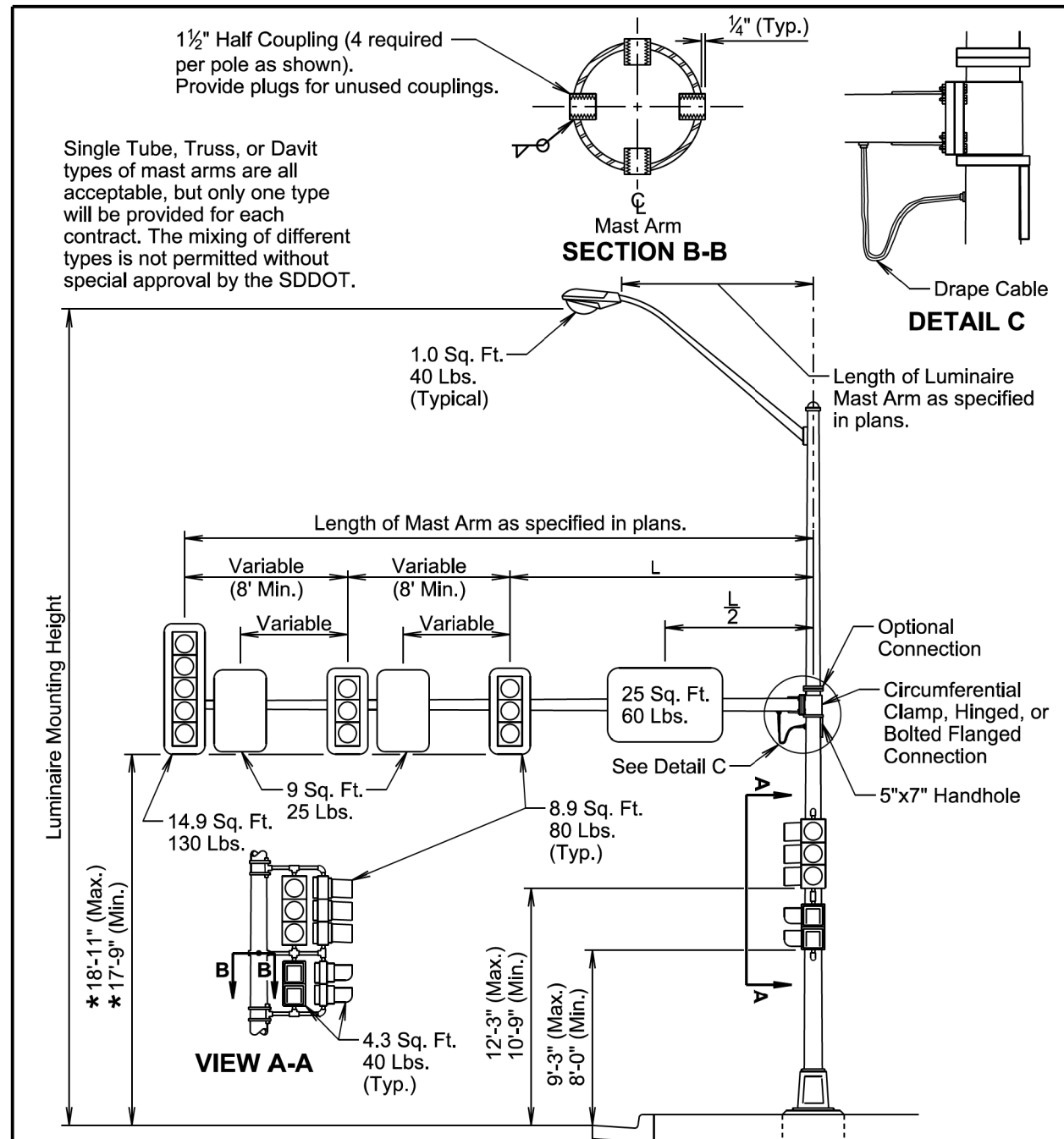
The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

January 22, 2021

S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
		Sheet 1 of 1
Published Date: 2024		



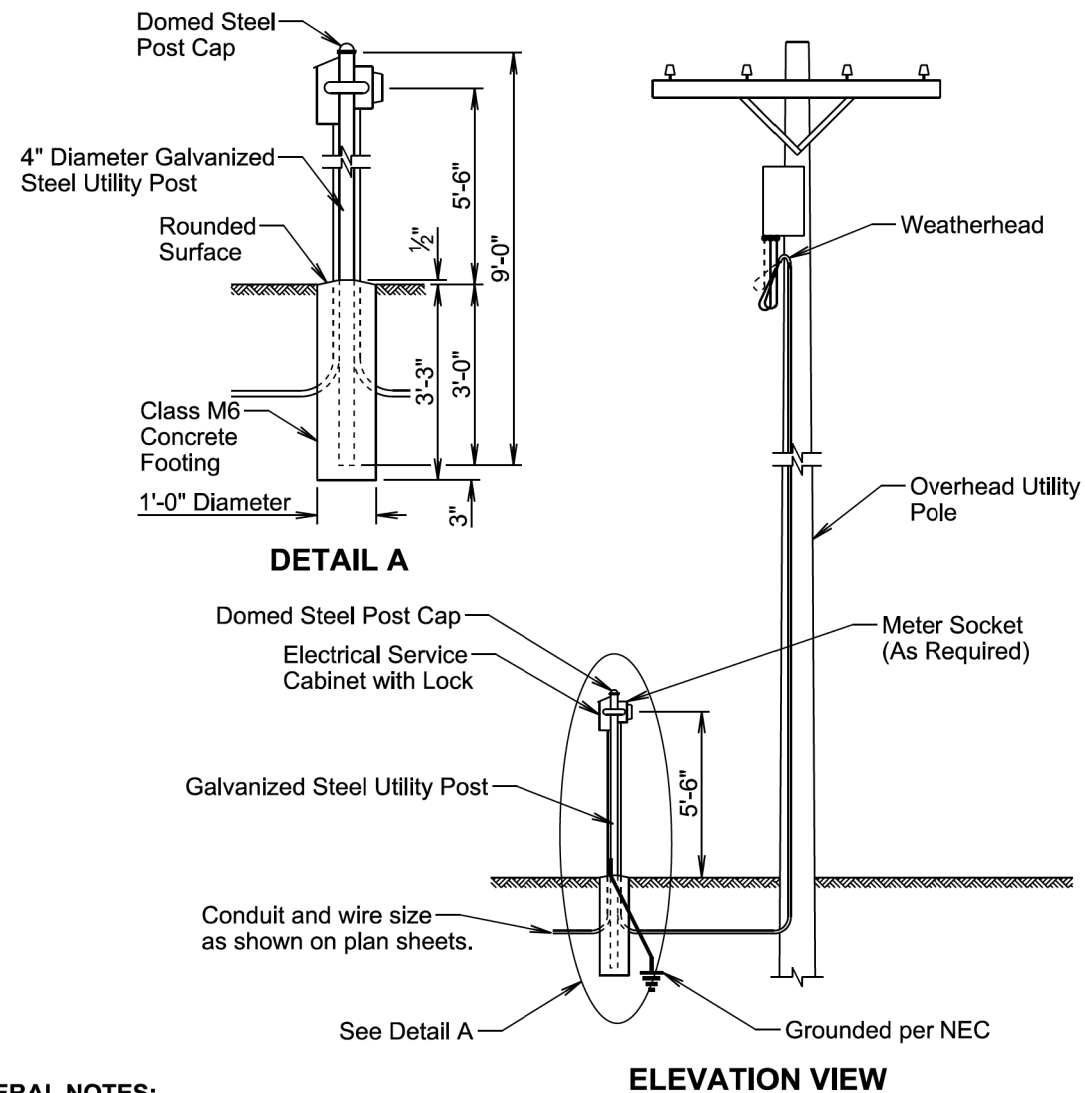
GENERAL NOTES:

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

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

November 19, 2022

S D D O T	SIGNAL POLE (WITH MAST ARM AND LUMINAIRE EXTENSION)	PLATE NUMBER 635.32
		Sheet 1 of 1
Published Date: 2024		



GENERAL NOTES:

The service cabinet will include an externally mounted 15A receptacle outlet. The receptacle will be housed in a lockable NEMA 3R enclosure. The Contractor will furnish a lock and keys to the Engineer as directed.

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

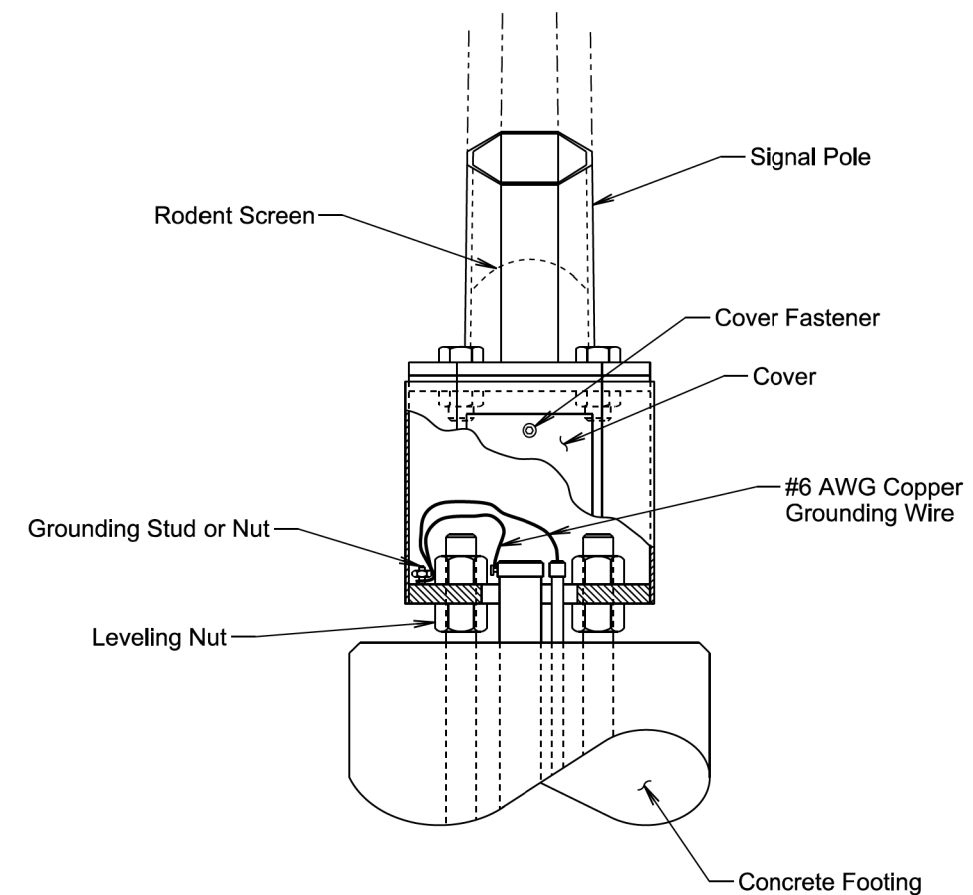
The 4" diameter galvanized steel utility post will be 9' long and will be in conformance with AASHTO Standard Specifications M181. The post will be Type 1 and either Grade 1 or Grade 2. The domed steel post cap will be in conformance with AASHTO Standard Specifications M181 and will be Type 1.

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".

November 19, 2022

Published Date: 2024	SD DOT	GALVANIZED STEEL UTILITY POST WITH OVERHEAD UTILITY POLE	PLATE NUMBER 635.35
			Sheet 1 of 1



GENERAL NOTES:

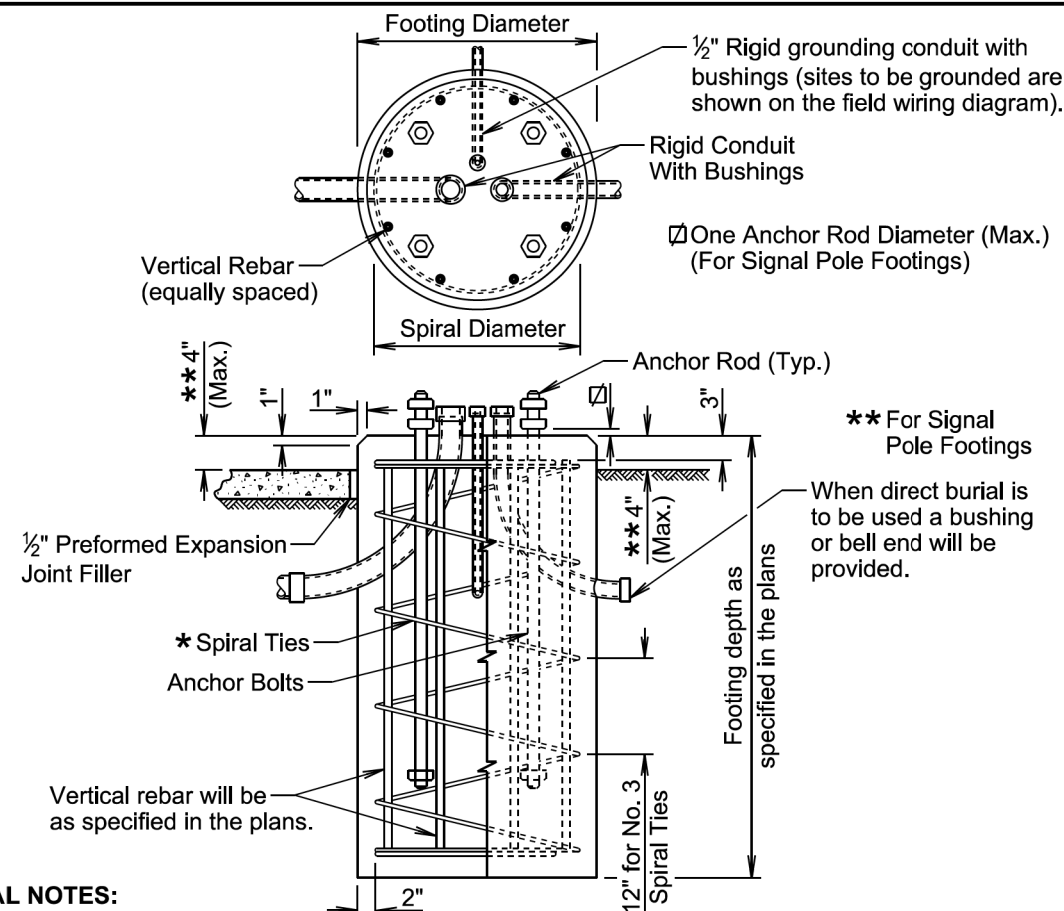
Base details are provided for example only and are not intended to be a complete design.

The Contractor will furnish and install a rodent screen in the signal pole above the transformer base. The rodent screen will be a galvanized steel mesh with a maximum opening size of 1/4 inch. The rodent screen will be friction fitted or installed by other methods approved by the Engineer.

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

February 14, 2020

Published Date: 2024	SD DOT	TRANSFORMER SIGNAL POLE BASE	PLATE NUMBER 635.50
			Sheet 1 of 1

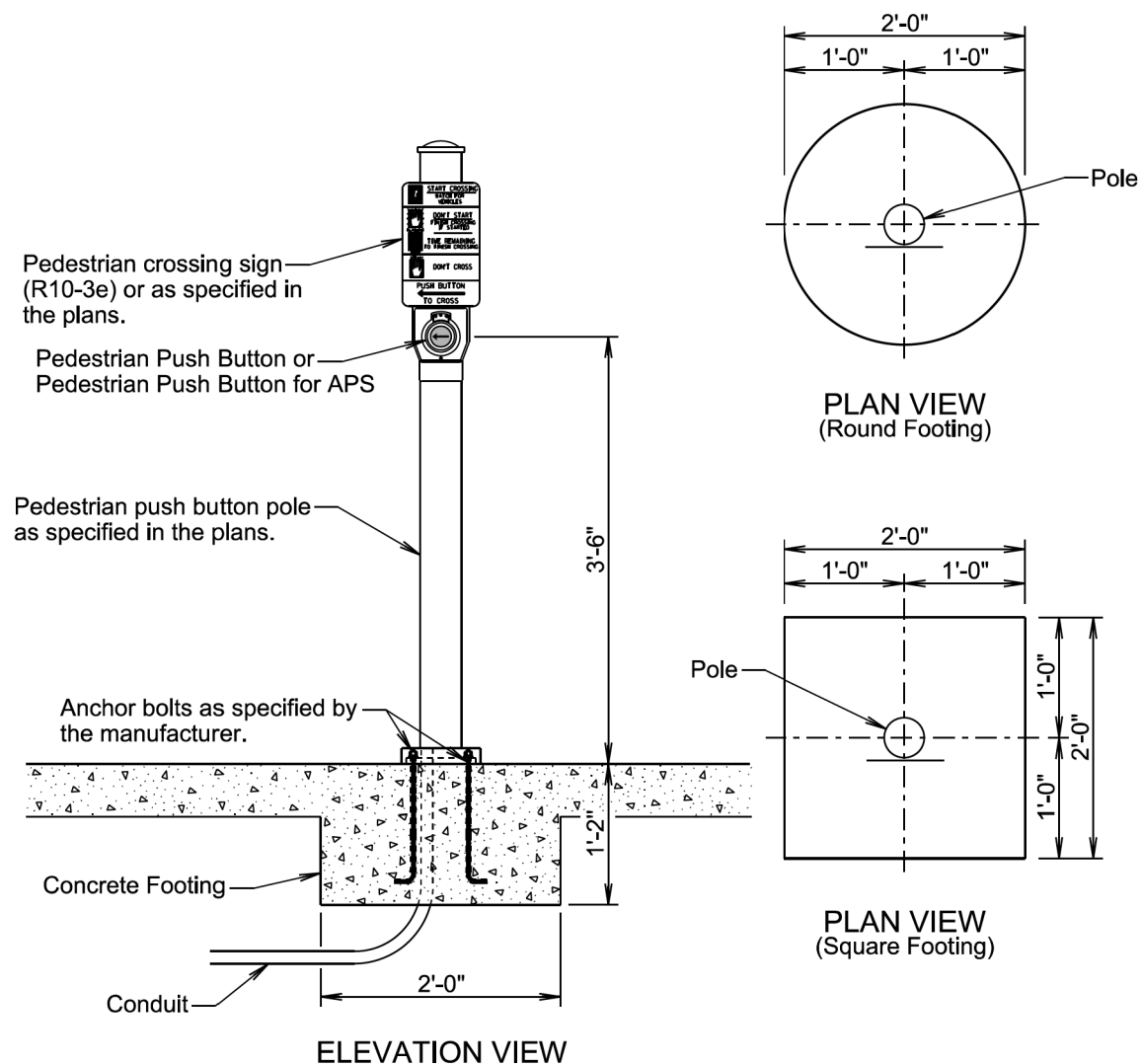


GENERAL NOTES:

- * Circular ties may be used in lieu of the spiral ties. The No. 3 ties will be spaced 12 inches apart except for the top two which will be spaced 6 inches apart. The ties will be lapped 18 inches and the laps will be staggered around the cage.
- Spiral ties will have 1-1/2 extra turns at each end.
- See Section 985 of the Specifications for footing materials.
- Conduits and bushings may project 2½ inches to 6 inches above footing for fixed base poles but will not project above the slip plane or fracture plane for breakaway poles.
- Conduits will be sealed water-tight during all phases of construction until poles are in place.
- The anchor rods will fit inside the reinforcing steel cage. If the anchor rods designed by the Pole Manufacturer do not fit, contact the Office of Bridge Design for footing redesign. No additional payment will be made for the redesigned footing.
- Costs of conduit and conduit bushings shown on footing detail will be incidental to the footing bid item(s).
- The pole will not be installed until the concrete has attained design strength (4000 psi).
- 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

Published Date: 2024	SD DOT	POLE FOOTING	PLATE NUMBER 635.55
			Sheet 1 of 1



GENERAL NOTES:

- The pedestrian push button pole will be as specified in the plans.
- The Contractor will install either the round or the square concrete footing. For informational purpose, the quantity of concrete for one footing is 0.14 cubic yards for the round footing and 0.17 cubic yards for the square footing.
- The concrete for the footing will be class M6 concrete.
- All costs for furnishing and installing the concrete footing will be incidental to the contract unit price per square foot for the corresponding concrete sidewalk bid item.
- All costs for furnishing and installing the pedestrian push button pole including labor, equipment, and materials including the pole, cap, and the conduit in the footing will be incidental to the contract unit price per each for "Pedestrian Push Button Pole".

May 9, 2020

Published Date: 2024	SD DOT	PEDESTRIAN PUSH BUTTON POLE	PLATE NUMBER 635.57
			Sheet 1 of 2

Push Button Relationship To Curb Ramp And Crosswalk

Push Button Orientation To Crosswalk

Clear Ground Space Dimensions

Correct Relationship

Incorrect Relationship

General Notes:

Pedestrian Push Buttons Location and Orientation Requirements:

(A) Within 10 feet from the front face of curb.
 (B) Where two push buttons are provided, the push buttons should have at least 10 feet of separation from each other.
 (C) If two curb ramps are used, the push button should be within 5 feet of the backside of the crosswalk.
 (D) The push button should be mounted adjacent to a clear ground space (within 10 inches maximum reach). The clear ground space will be a least 30 inches x 48 inches and will slope no more than 50:1 (2%) in any direction. The push button will be centered on either side of the clear ground space (either the 30 inch or 48 inch side). The 30 inch x 48 inch clear ground space shouldn't touch the detectable warning panel.
 (E) The push button should face the edge of roadway.
 (F) The push button face should be parallel to the crosswalk being used.

The push button poles will not interfere with the minimum clear width of the Pedestrian Access Route.

May 9, 2020

SD DOT	PEDESTRIAN PUSH BUTTON POLE	PLATE NUMBER 635.57
	Published Date: 2024	Sheet 2 of 2

SECTION A-A

SECTION B-B

ELEVATION VIEW (Base Mounted)

ELEVATION VIEW (Pedestal Mounted)

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.

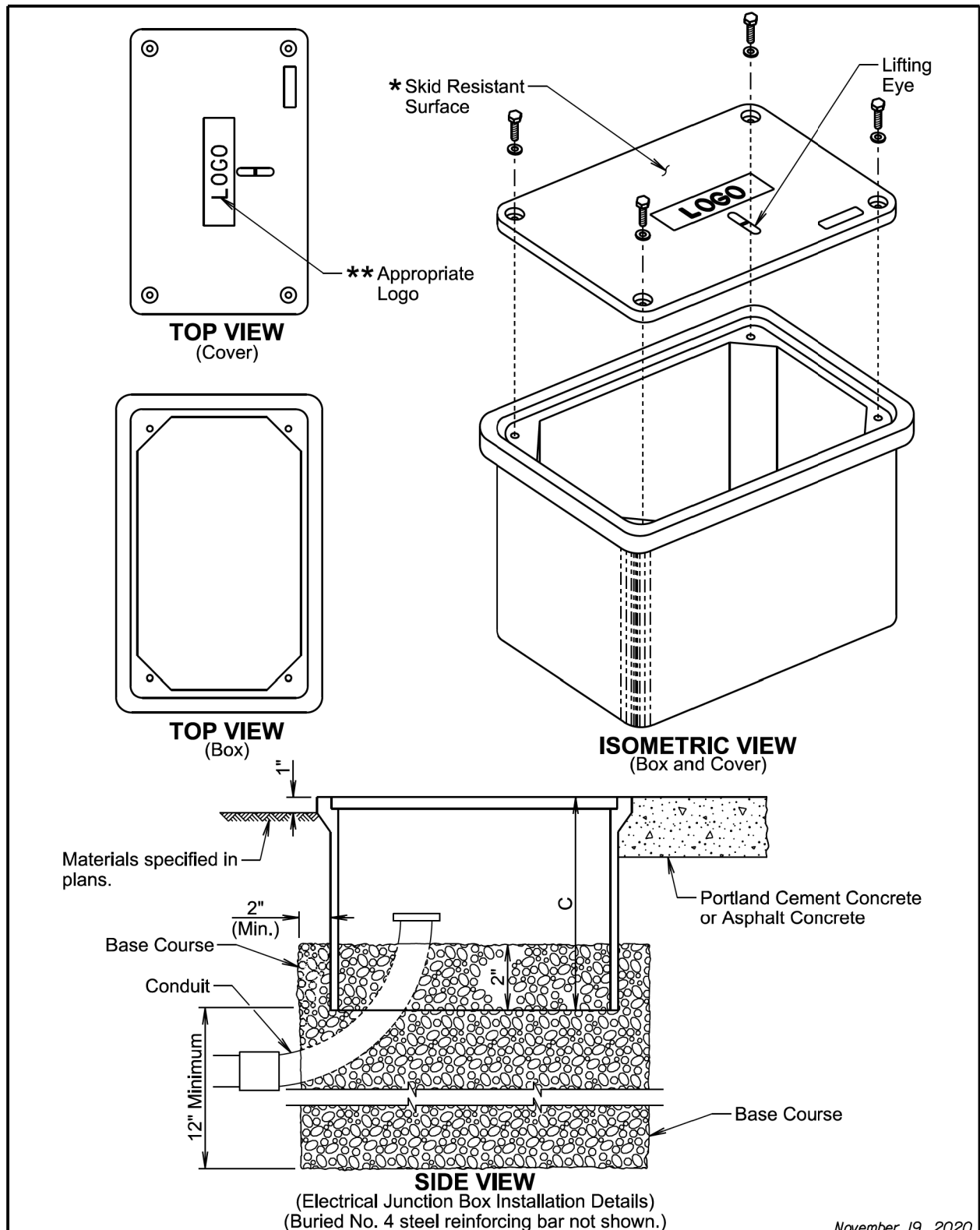
Anchor bolts and related hardware will conform to the controller and battery backup cabinets manufacturer's specifications.

A continuous bead of silicone rubber caulk will provide a weather-tight seal between the concrete pad or footing, and the cabinet or base.

November 19, 2022

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

SD DOT	CONTROLLER CABINET AND FOOTING	PLATE NUMBER 635.60
	Published Date: 2024	Sheet 1 of 1



November 19, 2020

SD DOT Published Date: 2024	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65
		Sheet 1 of 2

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.

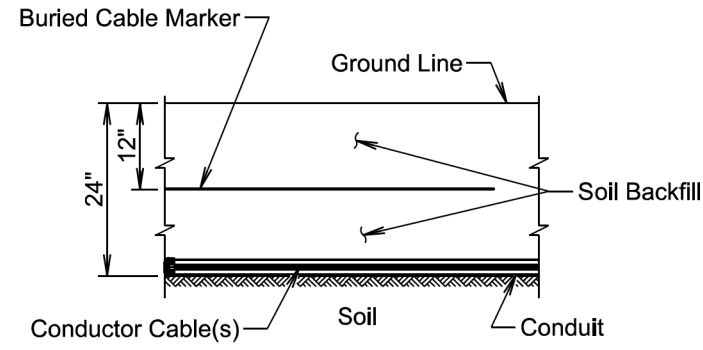
The electrical junction boxes will comply with the American National Standards Institute (ANSI)/Society of Cable Telecommunications Engineers (SCTE) 77 2007 Specification for Underground Enclosure Integrity. The loading requirement for all electrical junction boxes and covers will be Tier 22 of ANSI/SCTE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

The electrical junction boxes will be UL listed.

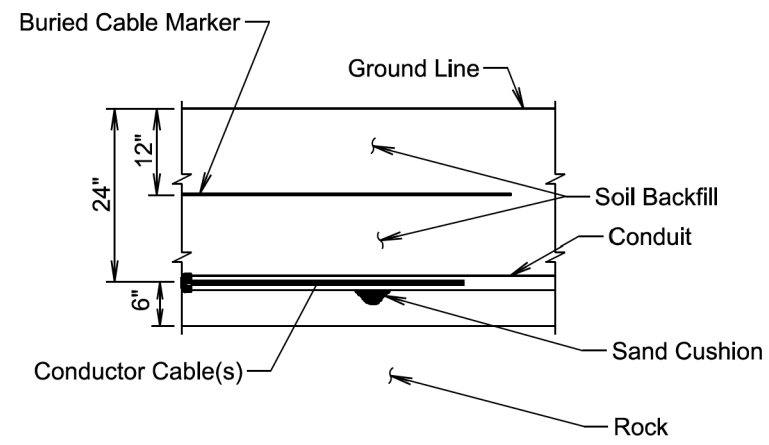
For junction boxes located outside of pavement, a No. 4 steel reinforcing bar with a minimum length of 18" will be buried adjacent to the long side of the junction box. All costs associated with furnishing and placing the steel reinforcing bar will be incidental to the contract unit price per each for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

November 19, 2020

SD DOT Published Date: 2024	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65
		Sheet 2 of 2



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

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