

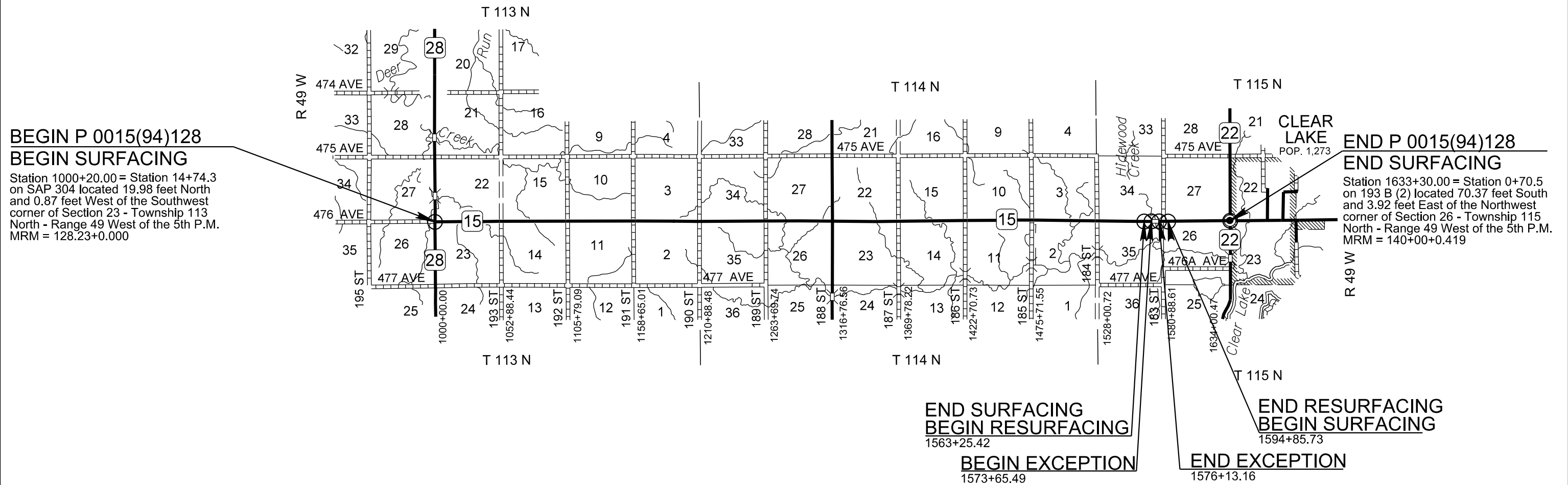
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0015(94)128	M1	M7

Plotting Date: 04/23/2024

SECTION M: PAVEMENT MARKING PLANS

INDEX OF SHEETS

- M1 General Layout with Index
- M2-M3 Estimate of Quantities and Notes
- M4-M5 Pavement Marking Layouts
- M6 Typical Pavement Marking Layout
- M7 Standard Plate



TRAB17901

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SECTION M ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
633E0030	Cold Applied Plastic Pavement Marking, 24"	109	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	6	Each
633E1200	High Build Waterborne Pavement Marking Paint, White	542	Gal
633E1206	High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow	182	Gal
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	109	Ft
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	6	Each

PAVEMENT MARKING PAINT

The Contractor will advise the Engineer a minimum of 3 weeks prior to the application of the permanent pavement marking to allow the State to check and mark the location of no passing zones.

The application of permanent pavement marking will begin no sooner than 7 calendar days following completion of the fog or flush seal. Application of permanent pavement marking will be completed within 14 calendar days following completion of the final surfacing.

WHITE HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

All materials will be applied as per manufacturer's recommendations. High build waterborne pavement marking paint will conform to the supplemental specifications for Section 980.1 B.

Reflective media will consist of glass beads. Reflective media will require a Certificate of Compliance for Certification for each source and lot. Acceptance sampling will not be required.

YELLOW HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

All materials will be applied as per manufacturer's recommendations. High build waterborne pavement marking paint will conform to the supplemental specifications for Section 980.1 B.

Reflective media consisting of glass beads as well as bonded core reflective elements will be adhered to the paint.

The bonded core reflective elements will contain either clear or yellow tinted microcrystalline ceramic beads bonded to the outer surface. The bonded core reflective elements will provide a 50/50 blend of dry to wet ratio of reflective element. All microcrystalline ceramic beads bonded to reflective elements will have a minimum index of refraction of 1.8 for dry retroreflectivity and 2.4 for wet retroreflectivity when tested using the liquid oil immersion method.

Reflective media will require a Certificate of Compliance for Certification for each type, source, and lot. Acceptance sampling will not be required.

The Department will take retroreflectivity readings on the pavement marking lines no sooner than 3 days and no later than 30 days after the completion of all line applications required for an individual highway route using a portable retroreflectometer conforming to 30-meter geometry. Retroreflectivity readings will be taken on a test location with cleaning being limited to light hand brooming.

Pavement markings not conforming to the retroreflectivity requirements will be removed and replaced. If replacement of markings cannot be applied within the same year, the Contractor will schedule subject work to be completed no later than June 15th in the following year. Upon replacement, the retroreflectivity testing process will be done again requiring new readings.

The Department will randomly select one test location per mile of each edge line including ramps and one test location per mile of centerline (solid and/or skip line will be considered as one centerline). Three retroreflectivity readings will be taken at each test location. The three readings will be averaged and become the reading for that test location.

Initial readings:

Pavement Marking Color	Minimum Value
White	350 mc/m ² /lux
Yellow	275 mc/m ² /lux

All pavement markings not conforming to the requirements provided in these plans will be considered deficient and will be removed and replaced. Additional retroreflectivity readings will be taken by the Department to determine the limits of removal. The removal will be accomplished using suitable sand blasting or grinding equipment unless the Engineer authorizes other means. The removal process will remove at least 90% of the deficient line, with no excessive scarring of the existing pavement. The removal width will be one inch wider all around the nominal width of the pavement marking to be removed. Removal and replacement of the pavement markings will be at the Contractor's expense, with no cost incurred by the State.

RATES OF MATERIALS FOR WHITE HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

Solid 4" line = 22.5 Gals/Mile
Dashed 4" line = 6.2 Gal/Mile
Glass Beads = 8 Lbs/Gal.

All cost for materials, labor and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

RATES OF MATERIALS FOR YELLOW HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT WITH REFLECTIVE ELEMENTS

Solid 4" line = 27.8 Gals/Mile
Dashed 4" line = 7.6 Gal/Mile
Glass Beads = 5.3 Lbs/Gal.
Composite Reflective Elements = 2.1 Lbs/Gal.

All cost for materials, labor and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

RETROREFLECTIVITY FOR PAVEMENT MARKING PAINT

The Department may take retroreflectivity readings on the pavement marking lines after 2 days and within 30 days of the line application using either a portable or mobile retroreflectometer that conforms to 30-meter geometry. If the Department chooses to take retroreflectivity readings, three retroreflectivity readings will be taken on each line at each test location. The three readings will be averaged and become the reading for that test location.

If the Department chooses to take retroreflectivity readings, three readings will be taken on the edge lines and lane lines in the direction of application. For combination solid yellow and skip yellow lines for turn lanes and for centerline markings on two-way roadways, three readings will be taken in one direction, the reflectometer will be turned 180 degrees and three more readings will be taken. The six readings for the centerline markings will be averaged and become the test reading for that test location.

If the Department chooses to take readings, the minimum retroreflectivity values will be 275 mc/m²/lux for white and 170 mc/m²/lux for yellow.

MARKINGS WITHIN SINUSOIDAL CENTERLINE RUMBLE STRIPES

Retroreflectivity readings will not be taken for pavement markings within the sinusoidal rumble stripe. Restriping of pavement markings to meet the specified application rate requirements and to provide a quality retroreflective line will be at the expense of the Contractor with no additional cost to the Department. Sections to be restriped will be determined by the Engineer.

COLD APPLIED PLASTIC PAVEMENT MARKING

All materials will be applied as per the manufacturer's recommendations.

Cold Applied Plastic Pavement Markings will be 3M Series 380 AW or an approved equal.

Cold Applied Plastic Pavement Marking Table

ITEM	LOCATION	QUANTITY
Cold Applied Plastic Pavement Marking, 24" (Stop Bar)	SD 15 and SD 28 Intersection	15 ft
Cold Applied Arrows	SD 15 and 188 St. Intersection	6 Each
Cold Applied Plastic Pavement Marking, 24" (Goring Details)	SD 15 and 188 St. Intersection	94 Ft

GROOVING FOR COLD APPLIED PLASTIC 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 or each, for "Grooving for Cold Applied Plastic Pavement Marking" contract items.

PAVEMENT MARKING LAYOUT

SD HWY 15 & 188 St. Intersection

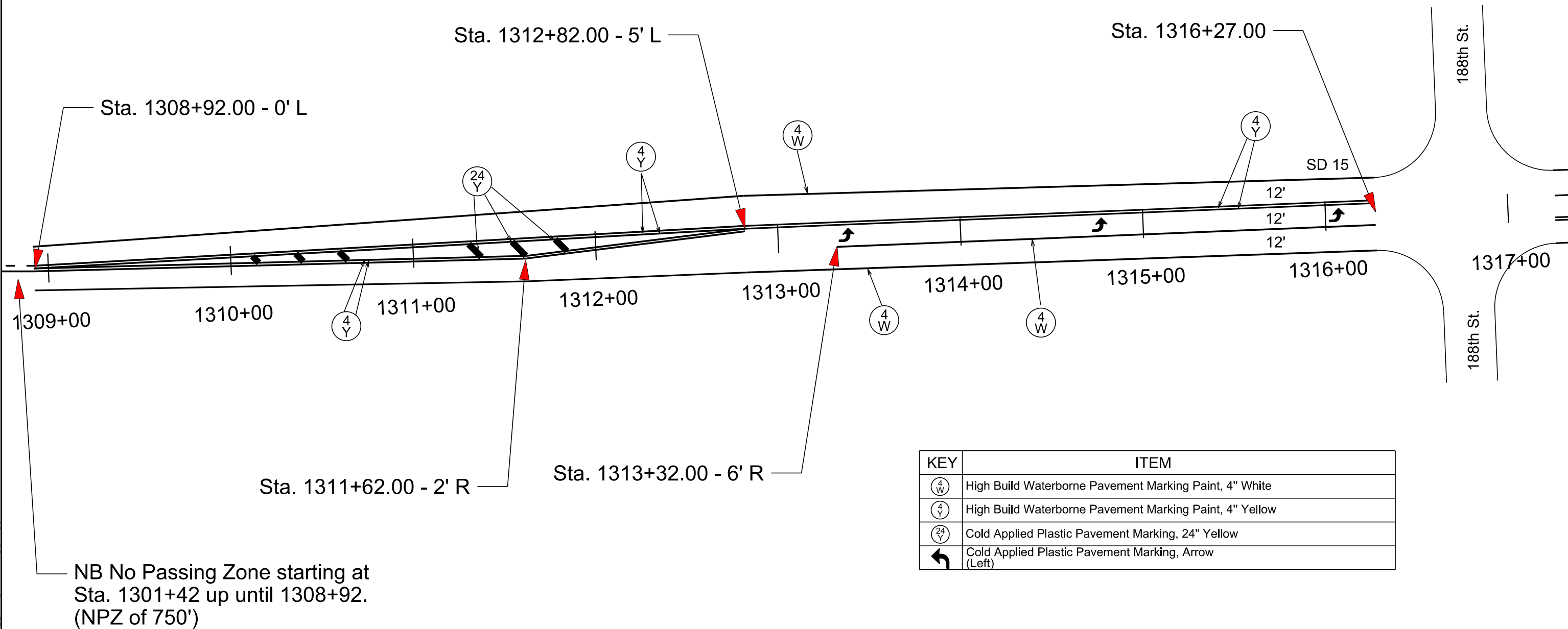


PLOT SCALE - 1:53,706

PLOT NAME - 1

PLOTTED FROM - TRAB17901

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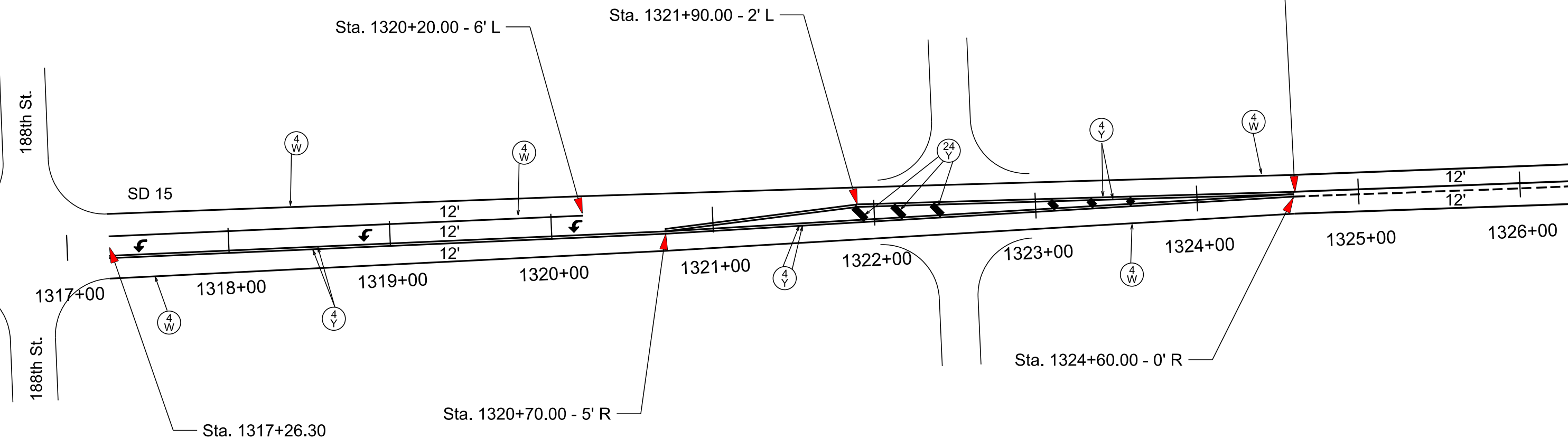
KEY	ITEM
(4 W)	High Build Waterborne Pavement Marking Paint, 4" White
(4 Y)	High Build Waterborne Pavement Marking Paint, 4" Yellow
(24 Y)	Cold Applied Plastic Pavement Marking, 24" Yellow
↩	Cold Applied Plastic Pavement Marking, Arrow (Left)

PAVEMENT MARKING LAYOUT

SD HWY 15 & 188 St Intersection



SB No Passing Zone starting at
Sta. 1324+60 up until 1332+10.
(NPZ of 750')



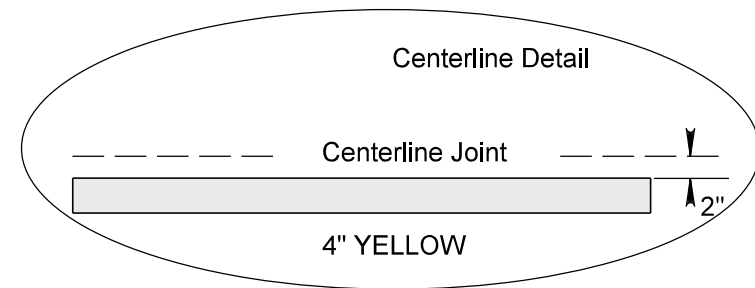
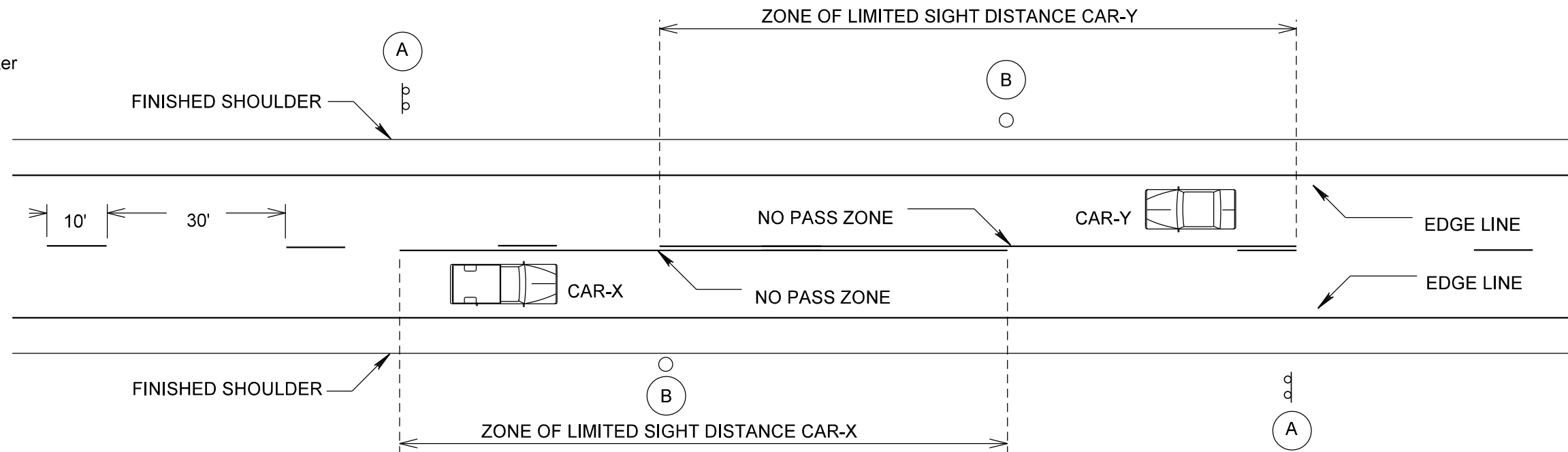
KEY	ITEM
(4W)	High Build Waterborne Pavement Marking Paint, 4" White
(4Y)	High Build Waterborne Pavement Marking Paint with Reflective Elements, 4" Yellow
(24Y)	Cold Applied Plastic Pavement Marking, 24" Yellow
←	Cold Applied Plastic Pavement Marking, Arrow (Left)

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
(24Y)	Cold Applied Plastic Pavement Marking, 24" Yellow	94	FT
←	Cold Applied Plastic Pavement Marking, Arrow (Left)	6	EACH
	Grooving For Cold Applied Plastic Pavement Marking, 24"	94	FT
	Grooving For Cold Applied Plastic Pavement Marking, Arrow (Left)	6	EACH

TYPICAL PAVEMENT MARKING LAYOUT

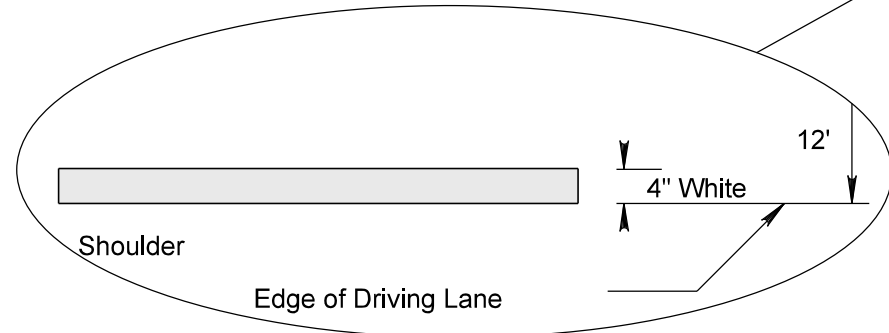
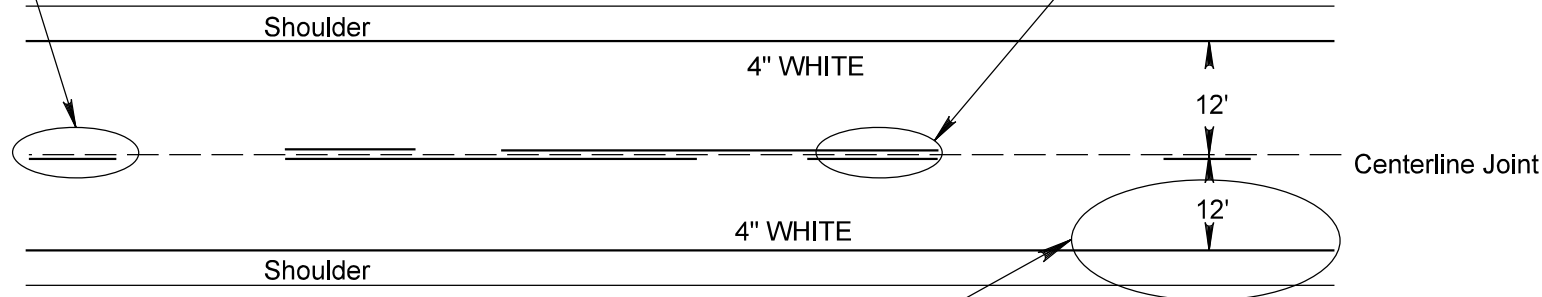
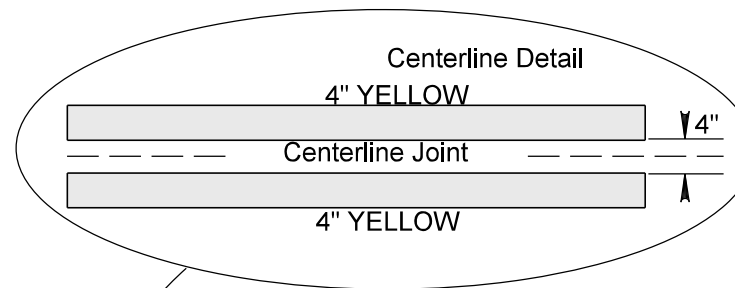


B End of Zone Marker



NOTE: A TWO "GUN" SYSTEM WILL BE USED TO OBTAIN THIS PATTERN.

WHEN A SINGLE SKIP LINE EXISTS, THE SKIP WILL BE PLACED TO THE SOUTH OR EAST OF THE CENTERLINE JOINT.



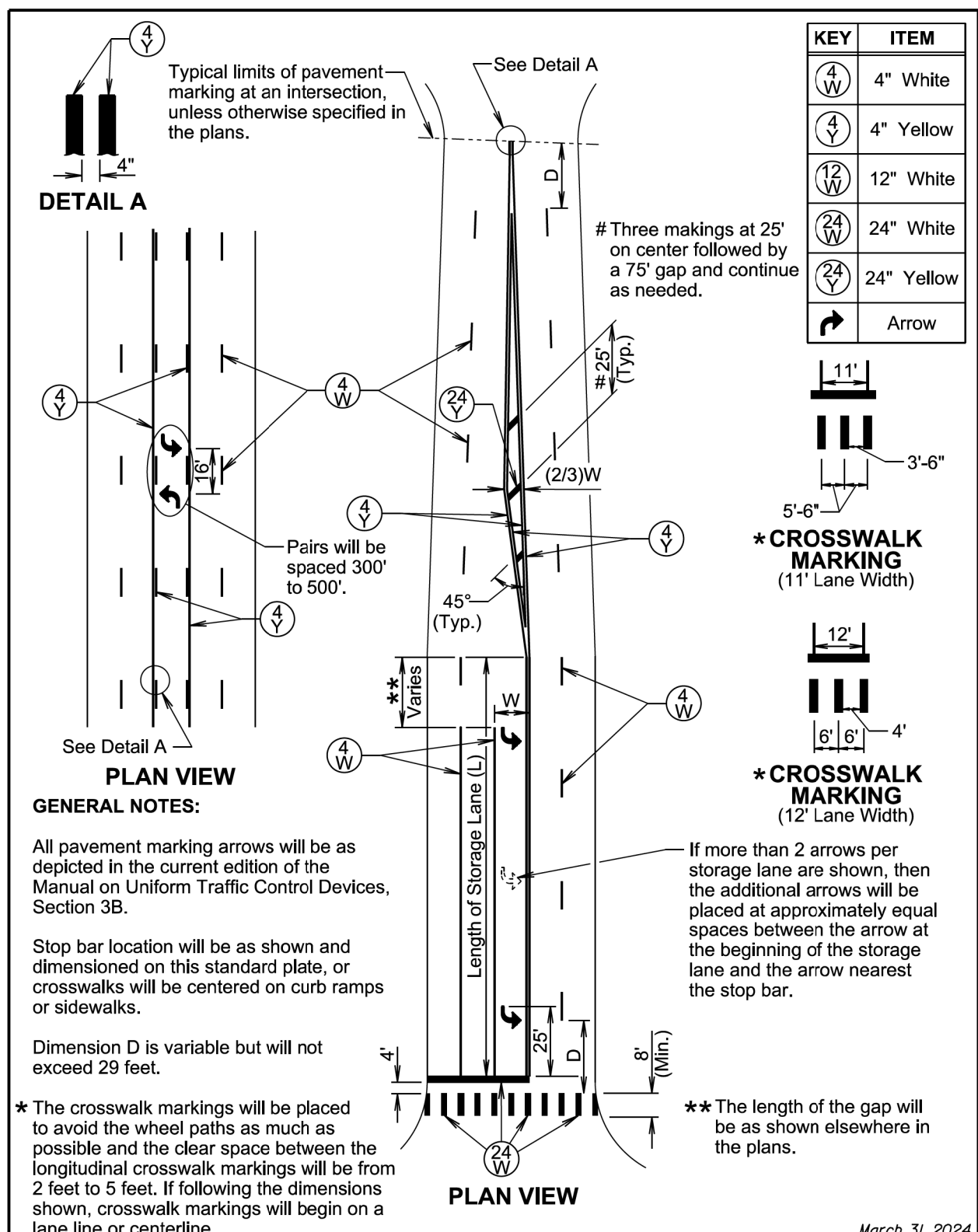
FURNISHING AND APPLYING HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

- The typical pavement markings as shown on this sheet will be applied throughout the entire length of the project.
- Exact location of the NO PASSING ZONE lines will be determined in the field by the Engineer. A dash of white paint will mark the beginning and end of all no passing zones. NO PASSING ZONE signs and the ending post in fence lines, if present, will not be used as the beginning and ending NO PASSING ZONE lines.
- Traffic Control will be incidental to the cost of application. The striping and advance or trailing warning vehicle will be equipped with flashing amber lights or advance warning arrow panel.

PLOT SCALE - 1:200

PLOT NAME - 1

FILE - ... \REGION DESIGN\STD. PLATES.DGN



GENERAL NOTES:

All pavement marking arrows will be as depicted in the current edition of the Manual on Uniform Traffic Control Devices, Section 3B.

Stop bar location will be as shown and dimensioned on this standard plate, or crosswalks will be centered on curb ramps or sidewalks.

Dimension D is variable but will not exceed 29 feet.

* The crosswalk markings will be placed to avoid the wheel paths as much as possible and the clear space between the longitudinal crosswalk markings will be from 2 feet to 5 feet. If following the dimensions shown, crosswalk markings will begin on a lane line or centerline.

If more than 2 arrows per storage lane are shown, then the additional arrows will be placed at approximately equal spaces between the arrow at the beginning of the storage lane and the arrow nearest the stop bar.

** The length of the gap will be as shown elsewhere in the plans.

March 31, 2024

S D D O T	PAVEMENT MARKINGS FOR ADJACENT INTERSECTIONS AND CENTER TURN LANE	PLATE NUMBER 633.01
	Published Date: 2025	Sheet 1 of 1