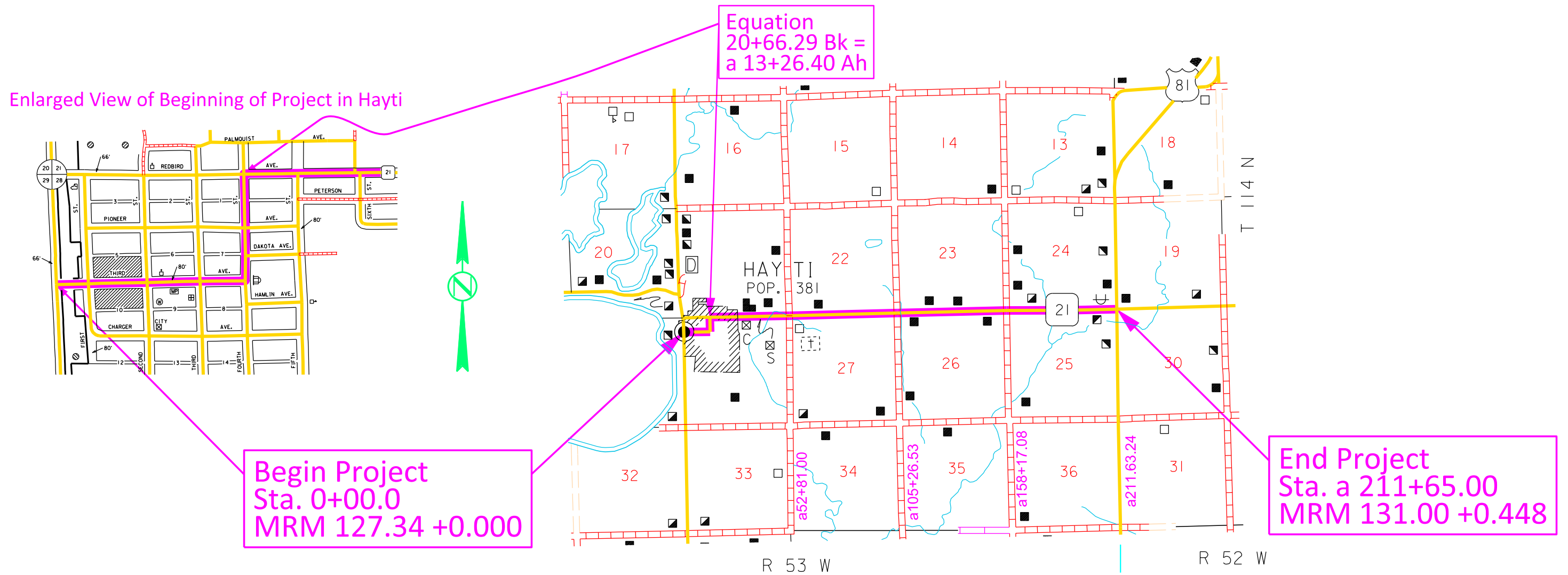


# SECTION M: PAVEMENT MARKING PLANS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	M1	M6
Plotting Date: 12/21/2023			

## INDEX OF SHEETS

- M1 General Layout W/Index
- M2-M3 Quantity Estimate and Plan Notes
- M4-M5 Pavement Marking Layout
- M6 Pavement Marking Layout at US-81



**SECTION M ESTIMATE OF QUANTITIES**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
633E0030	Cold Applied Plastic Pavement Marking, 24"	40	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	3	Each
633E0255	Preformed Thermoplastic Pavement Marking, Symbol	7	Each
633E1200	High Build Waterborne Pavement Marking Paint, White	233	Gal
633E1205	High Build Waterborne Pavement Marking Paint, Yellow	110	Gal
633E1220	High Build Waterborne Pavement Marking Paint, 4" White	2,658	Ft
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	40	Ft
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	3	Each
633E5037	Grooving for Cold Applied Plastic Pavement Marking, Symbol	7	Each

**PERMANENT PAVEMENT MARKING**

The Contractor will be required to repaint all existing pavement markings including centerline, edge line, lane lines. This list is approximate. The Contractor will be required to document and be able to relocate for replacement of the existing, before the markings are obliterated. The cost to duplicate the existing marking locations will be incidental to the contract unit prices for the various contract items.

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 locations of no passing zones.

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

**COLD APPLIED PLASTIC PAVEMENT MARKING**

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

- STOP Bar at beginning and end of project and at north end of north-south segment in Hayti.
- TURN LANE ARROW at US 81 intersection.

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

**RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT**

Solid 4" Line = 27.8 Gal/Mile  
Dashed 4" Line = 7.6 Gal/Mile  
Glass Beads = 8 Lb/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.

High Build Waterborne Pavement Marking Paint, 4" White will be used to mark parking stalls within the city of Hayti and measured by the linear foot. All other High Build Waterborne Pavement Markings will be measured by the gallon.

**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.

**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 retroreflectometer 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 as follows:

Pavement Marking Color	Minimum Value
White	275 mc/m <sup>2</sup> /lux
Yellow	275 mc/m <sup>2</sup> /lux

**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, symbol and each for "Grooving for Cold Applied Plastic Pavement Marking" contract items.

**PAVEMENT MARKING SYMBOL FOR ACCESSIBLE PARKING SPACES**

The International Symbol of Accessibility Parking Space Marking with blue background and white border, meeting the minimum dimensions shown in Part 3 of the MUTCD will be placed in accessible parking spaces having the required regulatory signing. The blue background and white border symbol will be required for all accessible parking spaces for persons with disabilities.

Color	Chromaticity Coordinates (corner points)								Min. Luminance Factor (Y%)
	X	Y	X	Y	X	Y	X	Y	
Blue	0.105	0.1	0.22	0.18	0.2	0.26	0.06	0.22	5

All costs for furnishing and installing the International Symbol of Accessibility Parking Space Marking will be incidental to the contract unit price per each for "Preformed Thermoplastic Pavement Marking, Symbol".

**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;
- 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.

**PREFORMED THERMOPLASTIC PAVEMENT MARKING CONT.**

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 Cold Applied 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.

**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:

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**

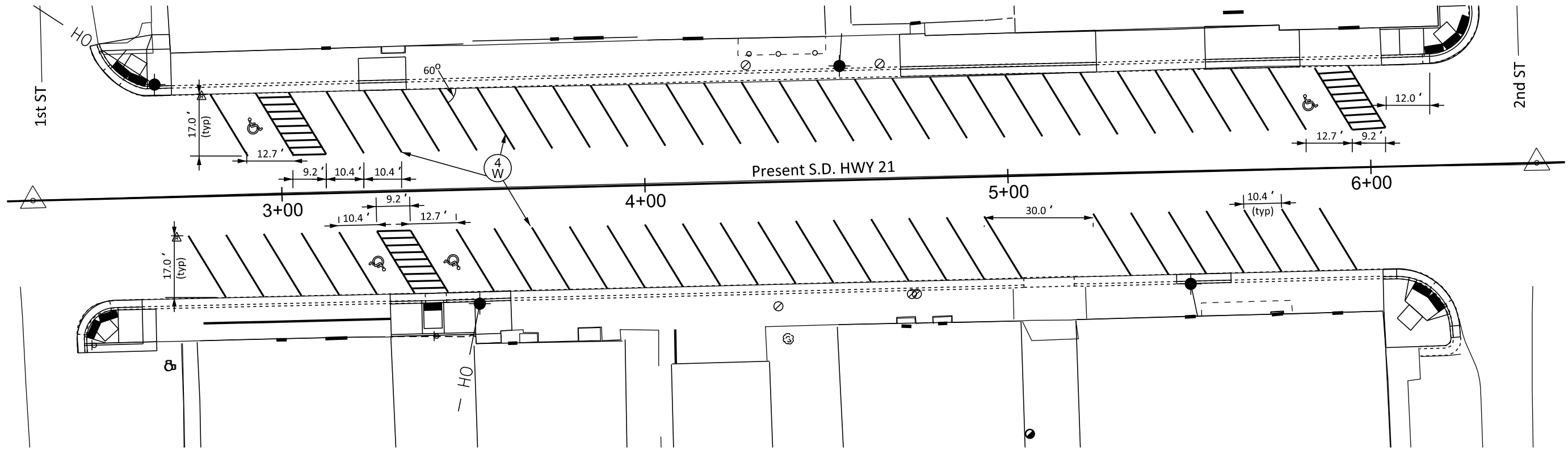
- A longitudinal marking is a minimum 90 mils thick at the edges, and a maximum 125 mils thick at the center of the stripe.
- Transverse markings and symbols are a minimum 125 mils thick at the edges, and a maximum 160 mils thick at the center.

**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.

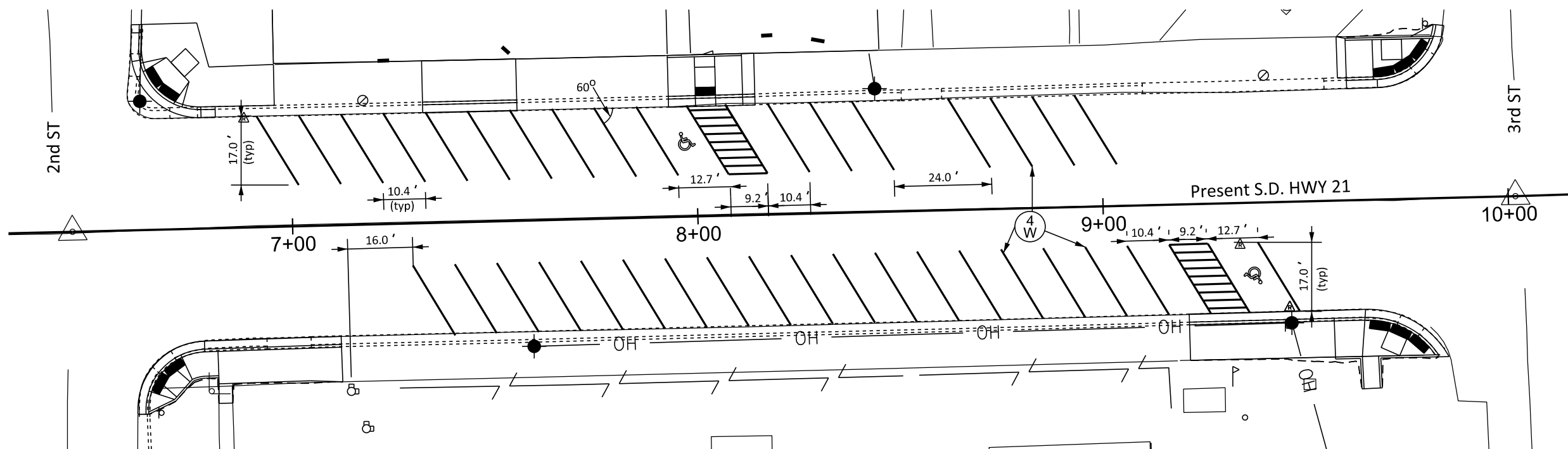
# PAVEMENT MARKING LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	M4	M6
Plotting Date: 04/11/2023			



For a typical parking stall width of 9' the stall width parallel to centerline is 10.4'.  
Loading Zone stalls will be 8' wide (9.2' parallel to centerline).

KEY	ITEM
(4 W)	4" White Point



PLOT SCALE - 1:30

PLOTTED FROM - TRAB17882

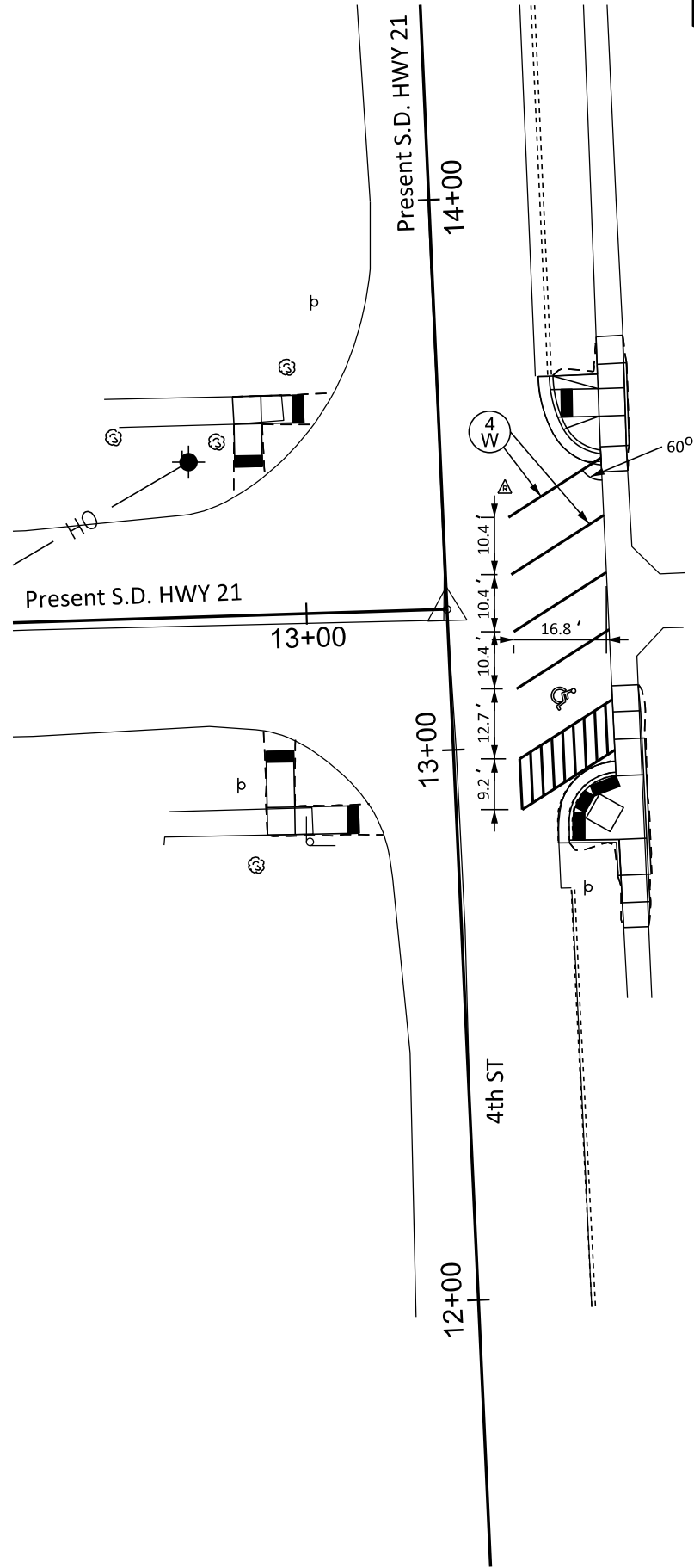
PLOT NAME - 1

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# PAVEMENT MARKING LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021 (174)127	M5	M6
Plotting Date: 04/11/2023			

PLOT SCALE - 1"=30'



KEY	ITEM
(4 W)	4" White Paint

ADA PARKING STALL SYMBOL DETAILS

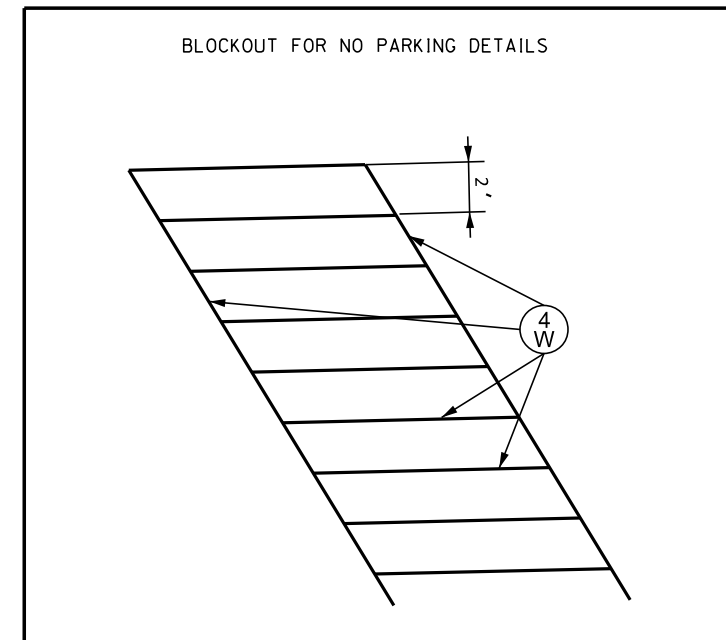
Height of symbol:  
Minimum = 28 inches  
Special = 41 inches

Width of symbol:  
Minimum = 24 inches  
Special = 36 inches

\*Stroke width:  
Minimum = 3 inches  
Special = 4 inches

Notes:

1. Size shall at least meet the minimum requirements listed above and be consistent throughout the projects.
2. Blue Background and White Border on Symbol are required.



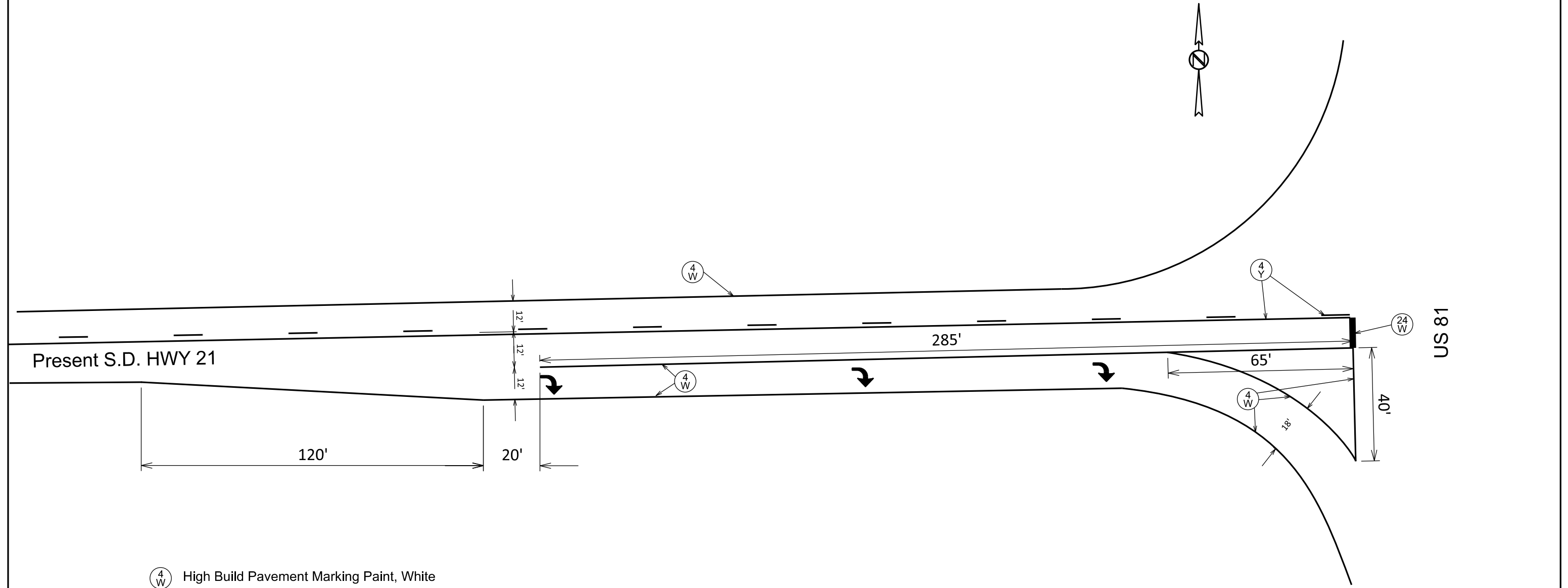
PLOTTED FROM - TRAB17882

PLOT NAME - 2

FILE - ... \REGION DESIGN\13PM.DGN

# PAVEMENT MARKING LAYOUT US 81 JCT

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	M6	M6



- ④ W High Build Pavement Marking Paint, White
- ④ Y High Build Pavement Marking Paint, Yellow
- ②④ W Cold Applied Plastic Pavement Marking, 24" White