

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0040(214)	M1	M4

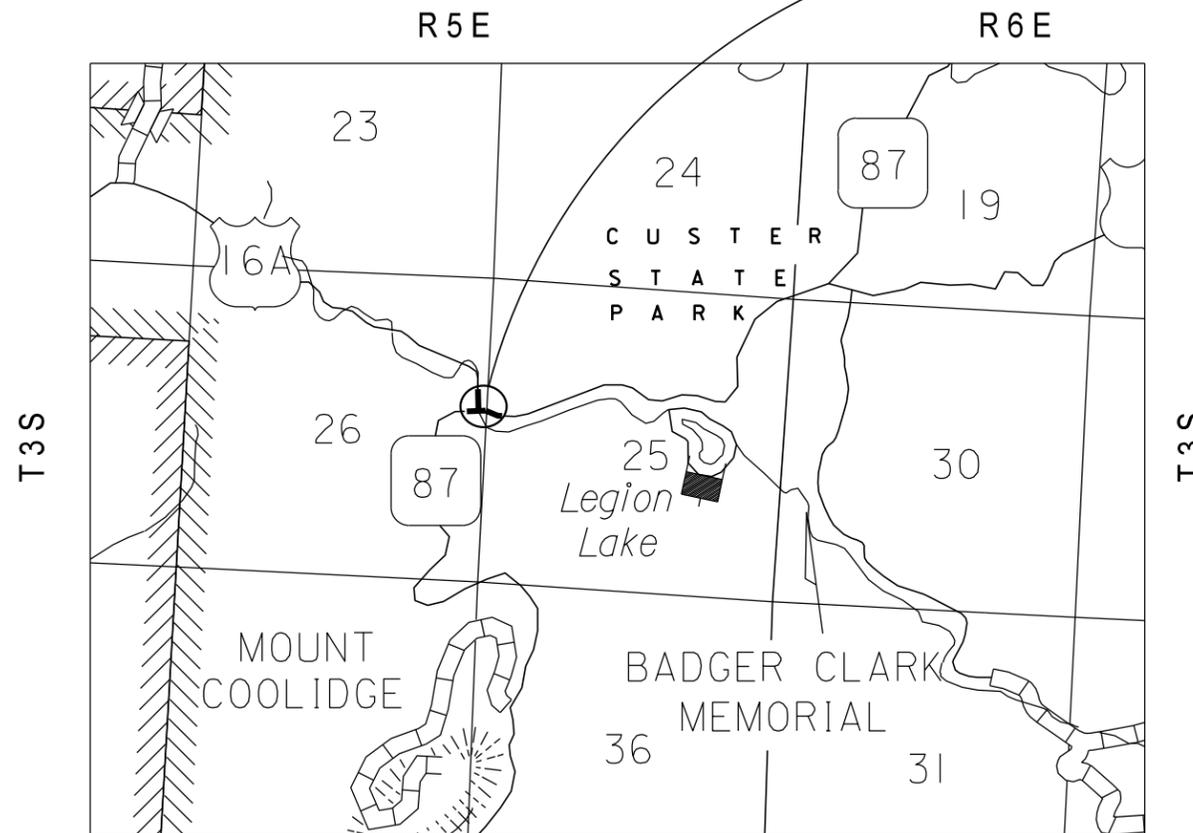
Plotting Date: 11/05/2015

Section M: Pavement Marking Plans

INDEX OF SHEETS

- M1: General Layout W/Index
- M2: Estimate of Quantities & Plan Notes
- M3: Pavement Marking Layout
- M4: Standard Plates

Project PH 0040(214)
Sta 0+00 to 10+00
MRM 29.110 to 29.244
R 6 E



Plot Scale - 1:200

Plotted From - trcs12695

PLOT NAME -

FILE - ..\P\0040\PH0040(214)\M3\M3.TITLEM.DGN

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
633E0010	Cold Applied Plastic Pavement Marking, 4"	1,211	Ft
633E0020	Cold Applied Plastic Pavement Marking, 8"	152	Ft
633E0030	Cold Applied Plastic Pavement Marking, 24"	96	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	3	Each
633E1200	Waterborne Pavement Marking Paint with High Grade Polymer, White	13	Gal
633E1205	Waterborne Pavement Marking Paint with High Grade Polymer, Yellow	15	Gal
633E5000	Grooving for Cold Applied Plastic Pavement Marking, 4"	1,211	Ft
633E5005	Grooving for Cold Applied Plastic Pavement Marking, 8"	152	Ft
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	96	Ft
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	3	Each
633E5100	Grooving for Durable Pavement Marking, 4"	2,510	Ft
634E0560	Remove Pavement Marking, 4" or Equivalent	200	Ft

PERMANENT PAVEMENT MARKINGS

Work on this project consists of removing existing pavement marking, grooving, applying Cold Applied Plastic Pavement Markings and applying Waterborne Pavement Marking Paint with High Grade Polymer.

US16A: – Asphalt Concrete Surfacing

MRM 29.00+0.110 to MRM 29.00+0.244

Centerlines & Diagonal Crosshatch Markings

- Grooved-In Cold Applied Plastic Pavement Markings from STA 3+50 to 7+00
- Grooved-In Paint with High-Grade Polymer on the remainder

Edge Lines

- Waterborne Paint with High Grade Polymer

Lane Lines & Line Extensions

- Grooved-In Cold Applied Plastic Pavement Markings

Arrows

- Grooved-In Cold Applied Plastic Pavement Markings

SD87: – Asphalt Concrete Surfacing

Tie-In Point to US16A

Centerlines

- Grooved-In Paint with High-Grade Polymer

Edgelines

- Waterborne Paint with High Grade Polymer

Arrows & Stop Bar

- Grooved-In Cold Applied Plastic Pavement Markings

Pavement markings that differ from the Pavement Marking Layout south of the tie-in point on SD Hwy 87 shall be removed to the satisfaction of the Engineer.

All materials shall be applied as per manufacturer's recommendations.

COLD APPLIED PLASTIC PAVEMENT MARKING

The Contractor shall apply the Cold Applied Plastic Pavement Marking material as per manufacturer's instructions.

Cold applied plastic pavement markings shall be placed into a recessed groove on the surface.

Final locations of markings will be determined by Engineer.

Description	Quantity	Unit
Left Turn Arrow	3	Ea
4" White Pavement Marking	111	Ft
4" Yellow Pavement Marking	1100	Ft
8" White Pavement Marking	144	Ft
8" Yellow Pavement Marking	8	Ft
24" White Pavement Marking	12	Ft
24" Yellow Pavement Marking	84	Ft

GROOVE PAVEMENT

The grooving shall be completed within the following tolerance:

Depth of Groove: 110 mils, with a tolerance of +10 mils.

The bottom of the groove shall be uniform and free of loose material. The groove shall be flat and of uniform depth for the entire width of the groove.

Markings that fall outside of the groove shall be removed (at least 90%) using additional methods approved by the Engineer. All costs for materials, labor, and equipment necessary to remove the existing markings shall be incidental to the contract unit price per foot for Grooving for Cold Applied Plastic Marking, 4"; Grooving for Cold Applied Plastic Marking, 8"; Grooving for Cold Applied Plastic Marking, 24"; or Grooving for Cold Applied Plastic Marking, Arrow.

GROOVING FOR COLD APPLIED PLASTIC PAVEMENT MARKING

The Contractor shall establish a positive means for the removal of the grinding and/or grooving residue. Residue from dry grooving shall be vacuumed. Solid residue shall be removed from the pavement surfaces before being blown by traffic action or wind. Residue from wet grooving shall 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, shall be disposed of in a manner that will prevent it from reaching any waterway in a concentrated state. All costs for removal of grinding and/or grooving residue shall be included in the contract unit price per foot for Grooving for Cold Applied Plastic Pavement Marking.

The bottom of the groove shall be uniform and free of loose material. The groove shall be flat and of uniform depth for the entire width of the groove.

WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

All materials shall be applied as per manufacturer's recommendations.

This material shall consist of a durable high build, low VOC, fast drying, waterborne traffic paint with a 100% acrylic polymer (Dow DT-400 or DOW HD-21A or equivalent) and with reflective media adhered to the paint. The

reflective media shall consist of glass beads as well as bonded core reflective elements.

The bonded core reflective elements shall contain either clear or yellow tinted microcrystalline ceramic beads bonded to the outer surface. All microcrystalline ceramic beads bonded to reflective elements shall have a minimum index of refraction of 1.8 when tested using the liquid oil immersion method.

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

RATES OF MATERIALS FOR HIGH GRADE POLYMER PAINT

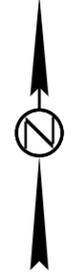
Solid 4" Line = 27.8 Gals/Mile
Glass Beads – 5.3 Lbs/Gal
Composite Reflective Elements – 2.1 Lbs/Gal

All cost for materials, labor, and equipment necessary to furnish and install the pavement markings shall be incidental to the contract unit price per gallon for Waterborne Pavement Marking Paint with High Grade Polymer, White or Yellow.

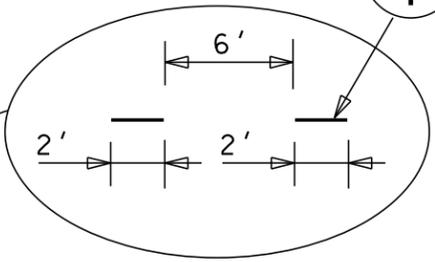
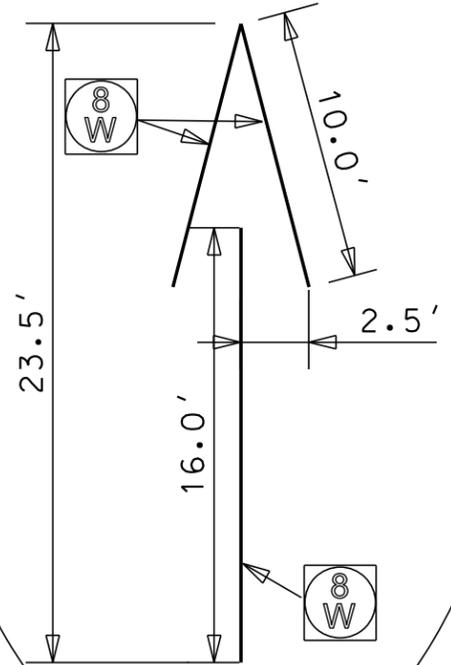
PAVEMENT MARKING LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0040(214)	M3	M4
Plotting Date: 11/05/2015			

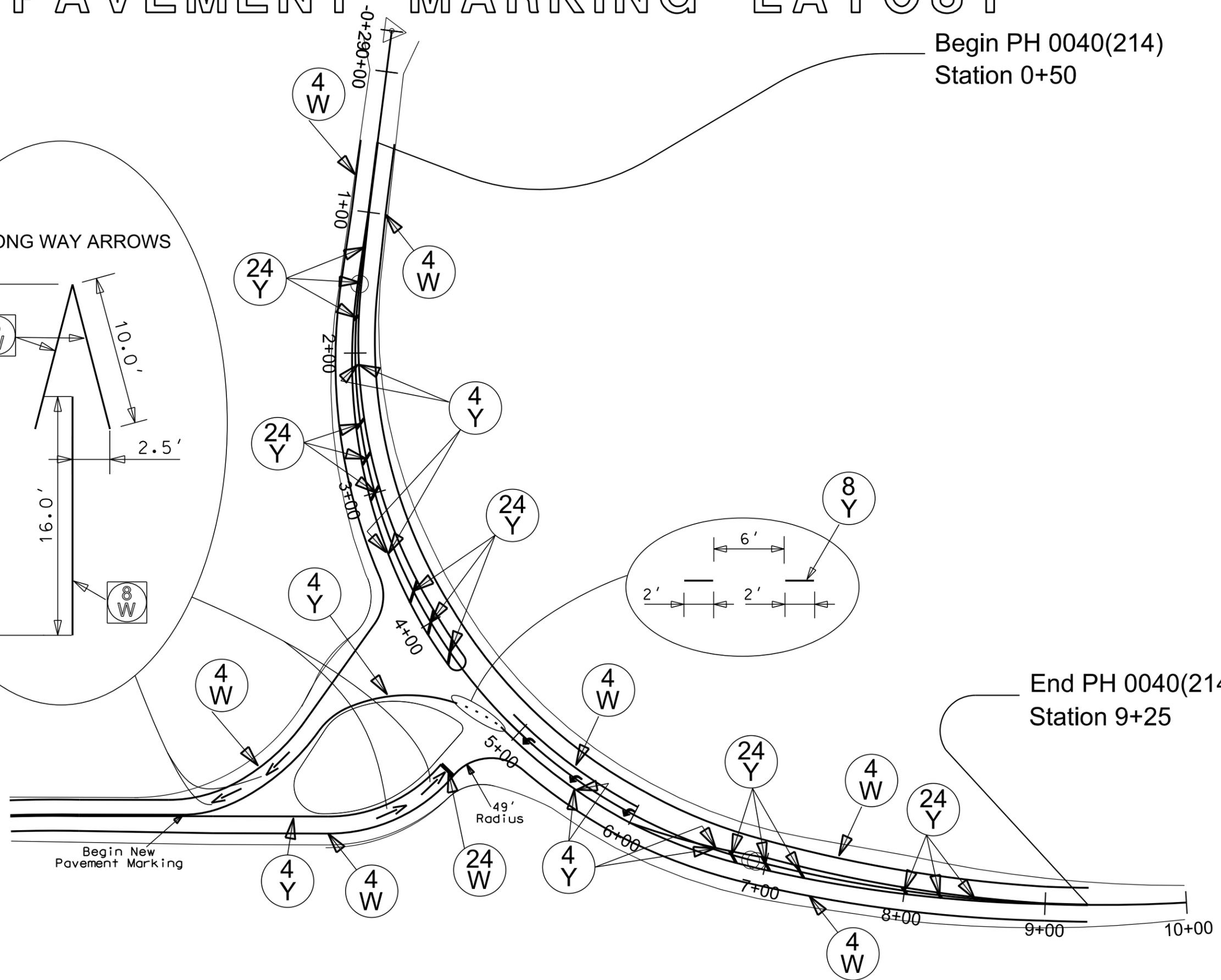
Begin PH 0040(214)
Station 0+50



WRONG WAY ARROWS



End PH 0040(214)
Station 9+25



Plot Scale - 1:100

Plotted From - trcs12695

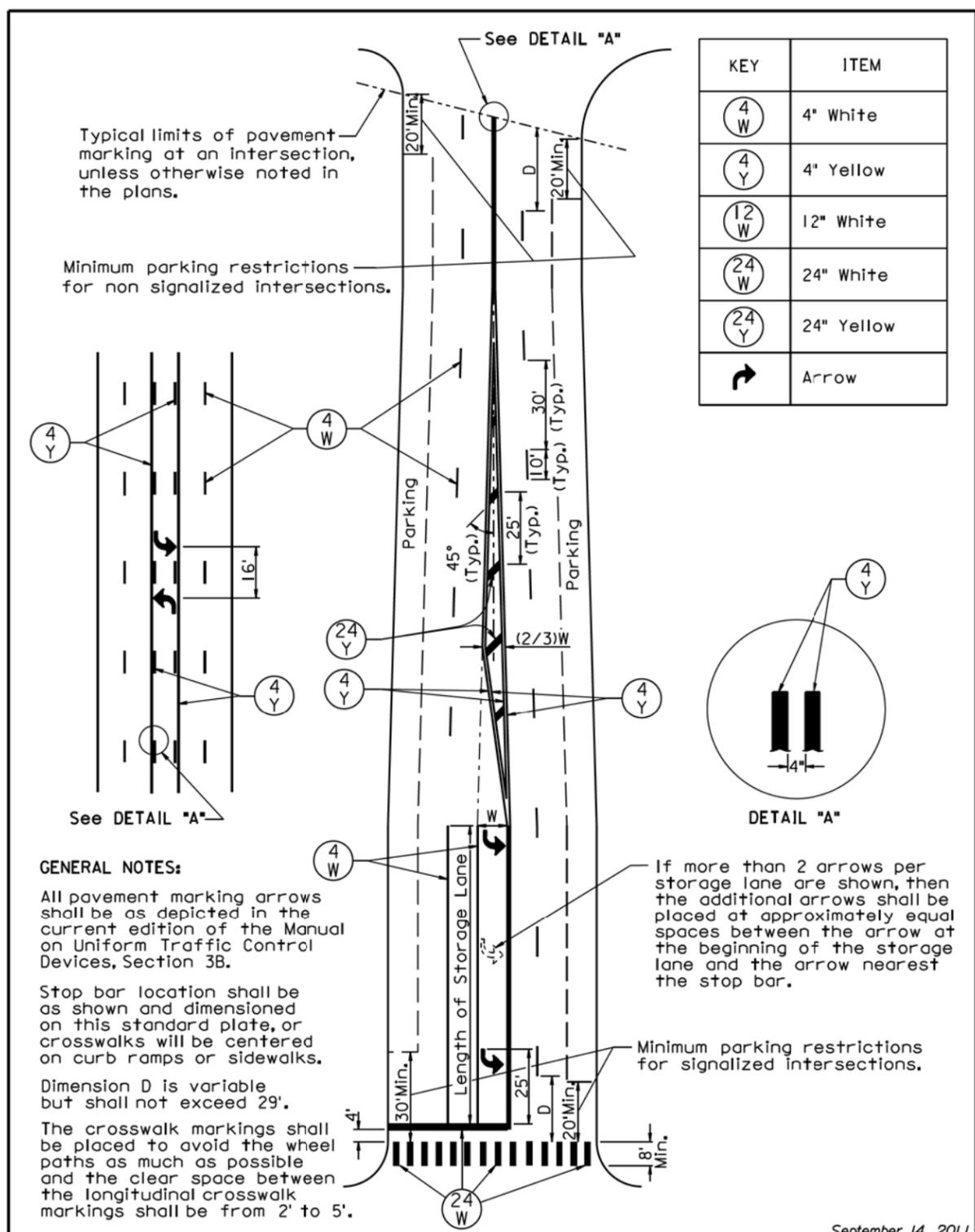
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PLOT SCALE - 1:200

PLOT NAME - 3

FILE - ... \CUST046R-SECTIONSTDPLATE1.DGN



Typical limits of pavement marking at an intersection, unless otherwise noted in the plans.

Minimum parking restrictions for non signalized intersections.

(4 Y)

(4 W)

(24 Y)

(4 Y)

(4 Y)

(4 Y)

DETAIL "A"

GENERAL NOTES:

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

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

Dimension D is variable but shall not exceed 29'.

The crosswalk markings shall be placed to avoid the wheel paths as much as possible and the clear space between the longitudinal crosswalk markings shall be from 2' to 5'.

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

Minimum parking restrictions for signalized intersections.

September 14, 2011

S D D O T	PAVEMENT MARKINGS FOR ADJACENT INTERSECTIONS AND CENTER TURN LANE	PLATE NUMBER 633.01
	Published Date: 4th Qtr. 2015	Sheet 1 of 1