

SECTION M: PAVEMENT MARKING PLANS

FOR BIDDING PURPOSES ONLY

| | | | |
|--------------------------|---------------------------|-------------|---------------------|
| STATE OF SOUTH DAKOTA | PROJECT IM 0909(92)387 | SHEET M1 | TOTAL SHEETS M11 |
| Plotting Date: 8/13/2024 | | | |

INDEX OF SHEETS

- M1 General Layout with Index
- M2 Notes
- M3 Table of Pavement Markings
- M4-M9 Pavement Marking Details
- M10-M11 Standard Plates

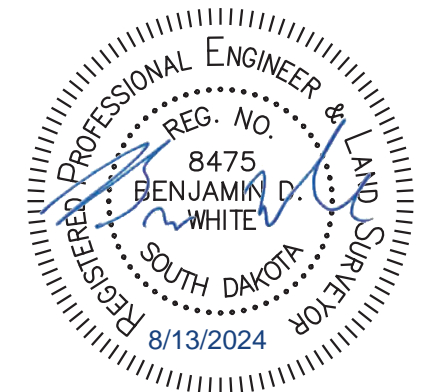
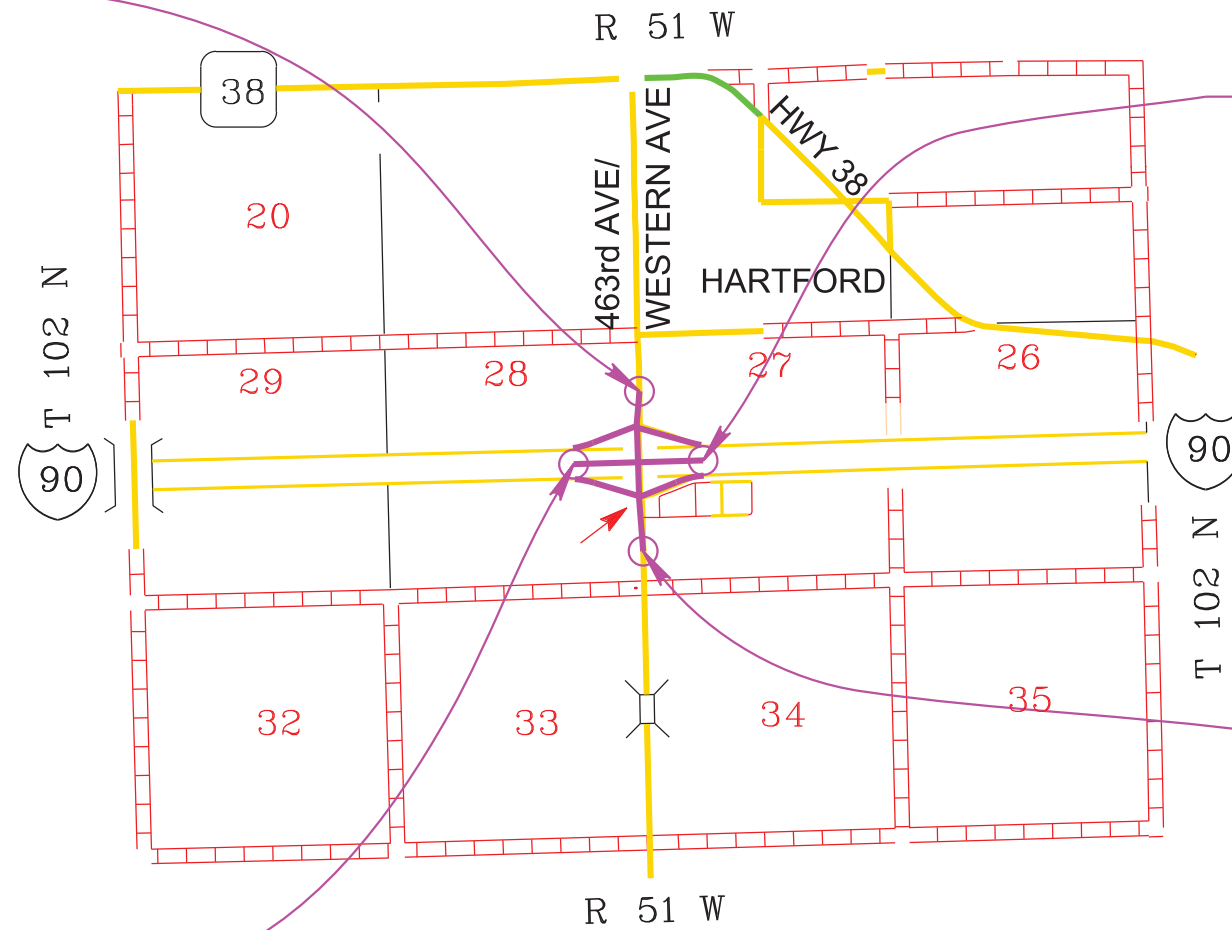


END IM 0909(92)387
STA. 29+10.00

END IM 0909(92)387
STA. 564+55.66

BEGIN IM 0909(92)387
STA. 2+00.00

BEGIN IM 0909(92)387
STA. 538+06.66



Plot Scale - 1:200

Plotted From - bryce.steffen

File - ...IPCN_0668\Design\Title_M.dgn

SECTION M ESTIMATE OF QUANTITIES

| | | | |
|-----------------------|----------------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | IM 0909(92)387 | M2 | M11 |

FOR BIDDING PURPOSES ONLY

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|-----------------|---|----------|------|
| 633E0211 | Preformed Thermoplastic Pavement Marking, 4" with Contrast Border | 20,103 | Ft |
| 633E0225 | Preformed Thermoplastic Pavement Marking, 24" | 518 | Ft |
| 633E0235 | Preformed Thermoplastic Pavement Marking, Arrow | 19 | Each |
| 633E0240 | Preformed Thermoplastic Pavement Marking, Combination Arrow | 5 | Each |
| 633E5004 | Grooving for Cold Applied Plastic Pavement Marking, 4" with Contrast Border | 20,103 | Ft |
| 633E5015 | Grooving for Cold Applied Plastic Pavement Marking, 24" | 518 | Ft |
| 633E5025 | Grooving for Cold Applied Plastic Pavement Marking, Arrow | 19 | Each |
| 633E5030 | Grooving for Cold Applied Plastic Pavement Marking, Combination Arrow | 5 | Each |

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 or each for "Grooving for Cold Applied Plastic Pavement Marking" contract items.

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.

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 WITH CONTRAST

Contrast borders will be black and have a minimum width of 1.5 inch.

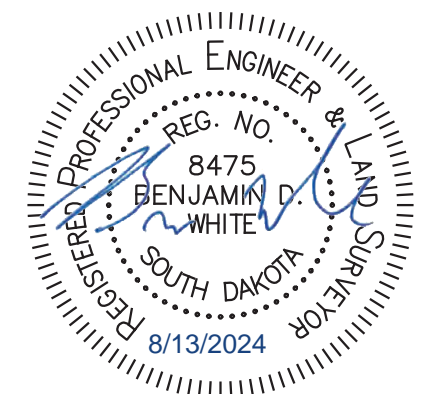


TABLE OF PAVEMENT MARKINGS (IM 0909(92)387)

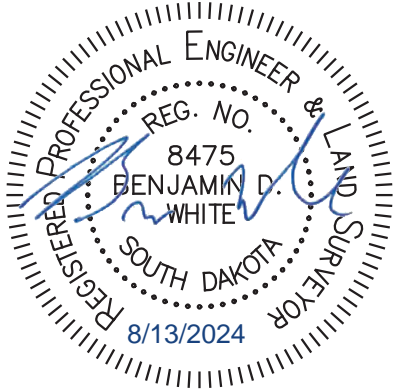
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA

PROJECT
IM 0909(92)387

SHEET
M3
TOTAL SHEETS
M11

| TABLE OF PAVEMENT MARKINGS (IM 0909(92)387) | | | | | | |
|---|--|--------------|-------------|-----------------------|--------------|----------------------|
| Location | PREFORMED THERMOPLASTIC PAVEMENT MARKING | | | | | |
| | 4" Grooved | | 24" Grooved | 24" Stop Line Grooved | Arrow (Left) | Arrow (Thru & Right) |
| | White (Ft) | Yellow (Ft) | Yellow (Ft) | White (Ft) | White (Each) | White (Each) |
| Western | | | | | | |
| Sta. 2+00 to 4+75 | 534 | 1115 | 70 | | | |
| Sta. 5+65 to 11+97 | 281 | 1980 | 130 | | 3 | |
| Sta. 13+32 to 20+99 | 1105 | 2071 | 62 | | 6 | |
| Sta. 22+36 to 26+51 | 190 | 1297 | 75 | | 3 | |
| Sta. 27+96 to 28+85 | 89 | 178 | | | 2 | |
| Ramp A | | | | | | |
| Sta. 0+00 to 13+36 | 1769 | 1223 | | 87 | 3 | 3 |
| Ramp B | | | | | | |
| Sta. 0+00 to 13+91 | 1443 | 1276 | | | | |
| Ramp C | | | | | | |
| Sta. 13+87 to 27+48 | 1613 | 1239 | | 94 | 2 | 2 |
| Ramp D | | | | | | |
| Sta. 19+07 to 32+94 | 1434 | 1266 | | | | |
| Totals: | 8458 | 11645 | 337 | 181 | 19 | 5 |
| Total Grooving: | 20103 | | 518 | | 19 | 5 |

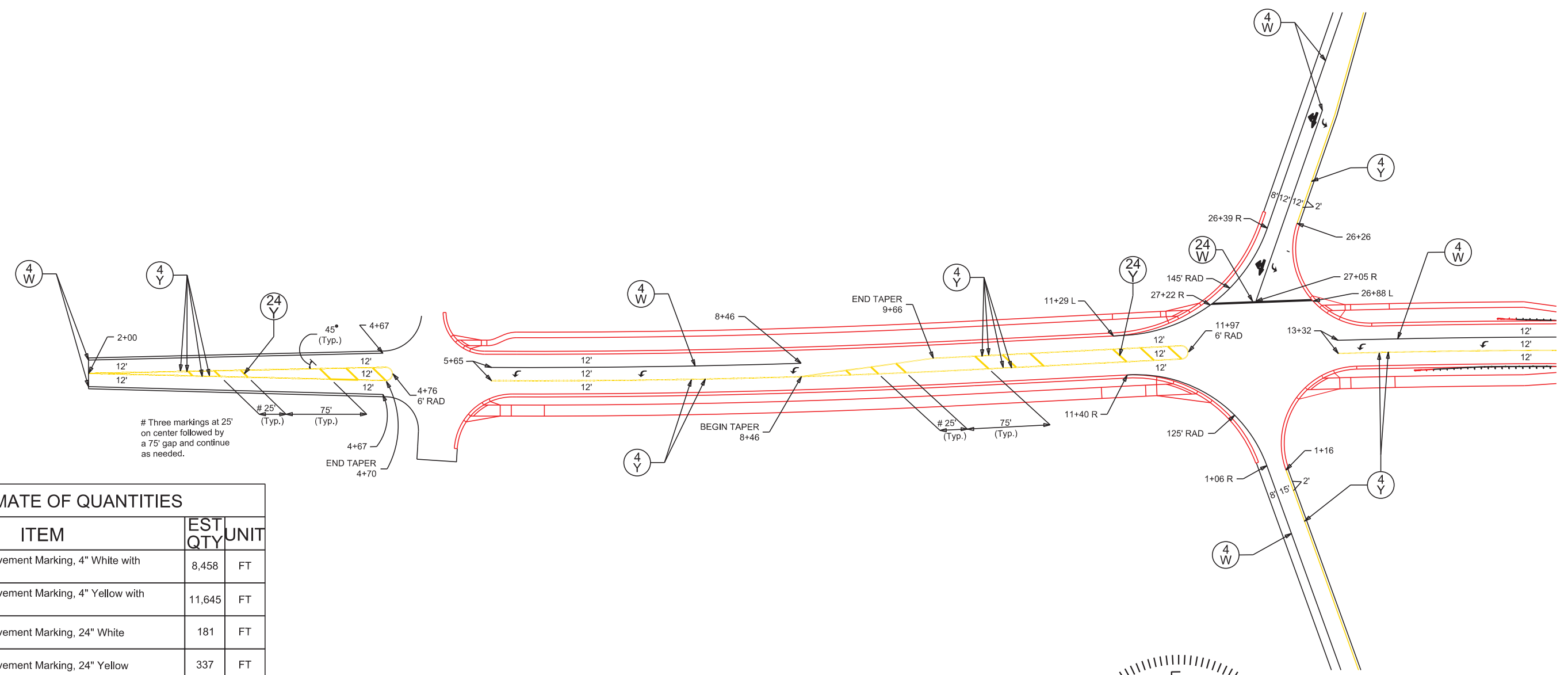


PAVEMENT MARKING WESTERN AVENUE

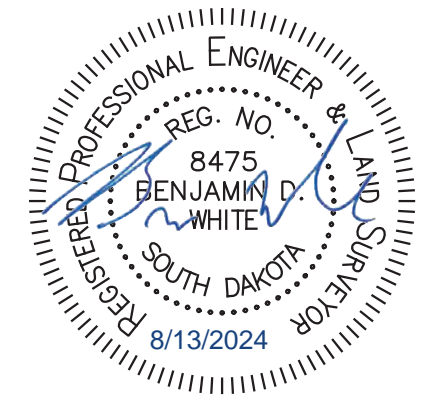
FOR BIDDING PURPOSES ONLY

| | | | |
|-----------------------|---------------------------|-------------|---------------------|
| STATE OF SOUTH DAKOTA | PROJECT IM 0909(92)387 | SHEET M4 | TOTAL SHEETS M11 |
|-----------------------|---------------------------|-------------|---------------------|

Plotting Date: 8/13/2024



| ESTIMATE OF QUANTITIES | | | |
|------------------------|---|---------|------|
| KEY | ITEM | EST QTY | UNIT |
| (4 W) | Thermoplastic Pavement Marking, 4" White with Contrast Border | 8,458 | FT |
| (4 Y) | Thermoplastic Pavement Marking, 4" Yellow with Contrast Border | 11,645 | FT |
| (24 W) | Thermoplastic Pavement Marking, 24" White | 181 | FT |
| (24 Y) | Thermoplastic Pavement Marking, 24" Yellow | 337 | FT |
| ↩ | Thermoplastic Pavement Marking, Arrow (Left) | 19 | EACH |
| ↪ | Thermoplastic Pavement Marking, Combination Arrow (Thru/Right) | 5 | EACH |
| | Grooving For Thermoplastic Pavement Marking, 4" with Contrast Border | 20,103 | FT |
| | Grooving For Thermoplastic Pavement Marking, 24" | 518 | FT |
| | Grooving For Thermoplastic Pavement Marking, Arrow (Left) | 19 | EACH |
| | Grooving For Thermoplastic Pavement Marking, Combination Arrow (Thru/Right) | 5 | EACH |



Plot Scale - 1:100

Plotted From - bryce.steffen

File - ...10668_PavementMarking.dgn

PAVEMENT MARKING FOR BIDDING PURPOSES ONLY

WESTERN AVENUE

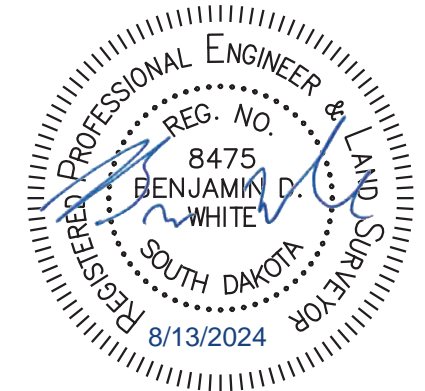
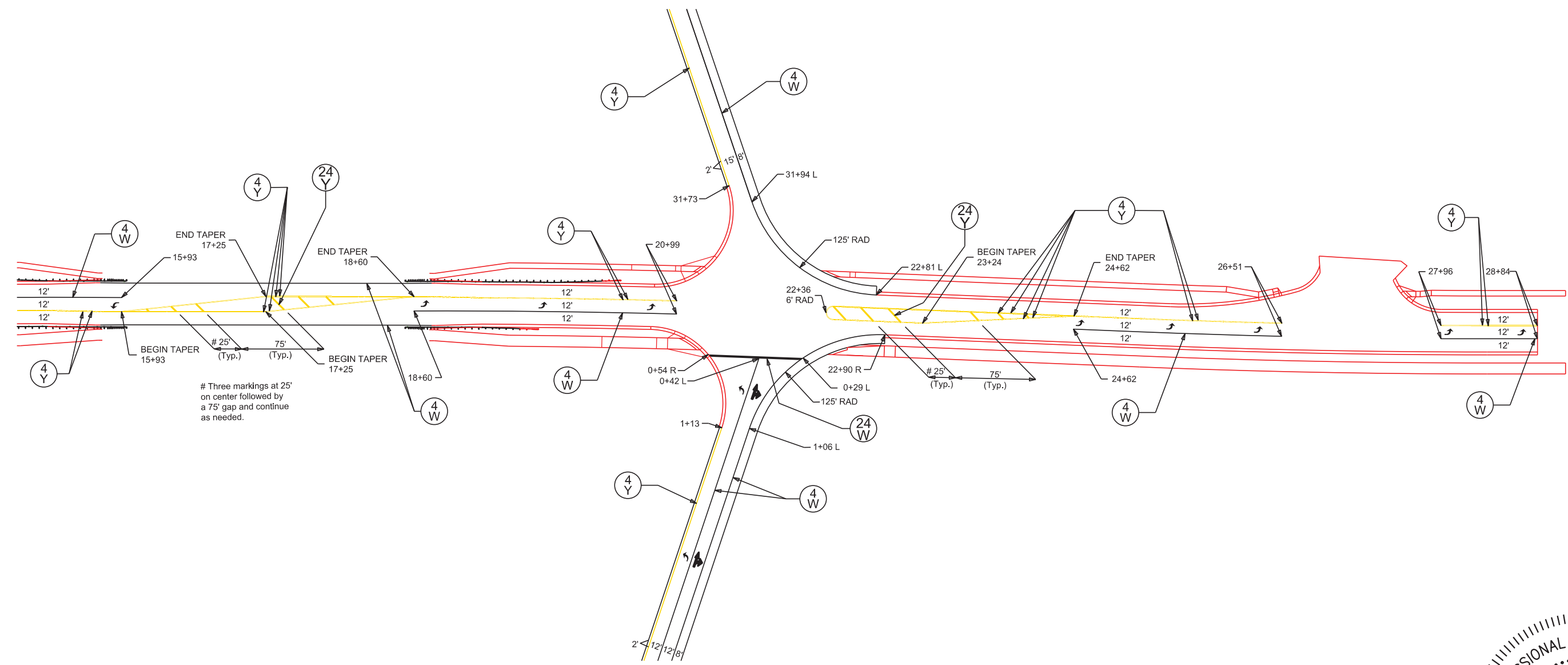
| | | | |
|-----------------------|---------------------------|-------------|---------------------|
| STATE OF SOUTH DAKOTA | PROJECT IM 0909(92)387 | SHEET M5 | TOTAL SHEETS M11 |
|-----------------------|---------------------------|-------------|---------------------|

Plotting Date: 8/13/2024



Plot Scale - 1:100

Plotted From - bryce.steffen



File - ...10668_PavementMarking.dgn

PAVEMENT MARKING

FOR BIDDING PURPOSES ONLY

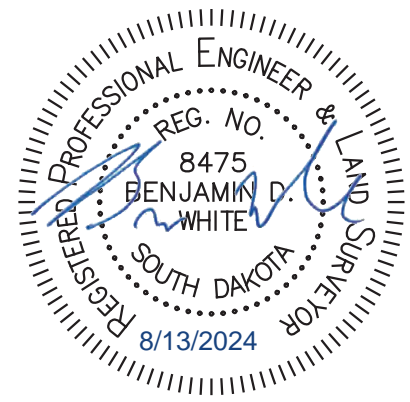
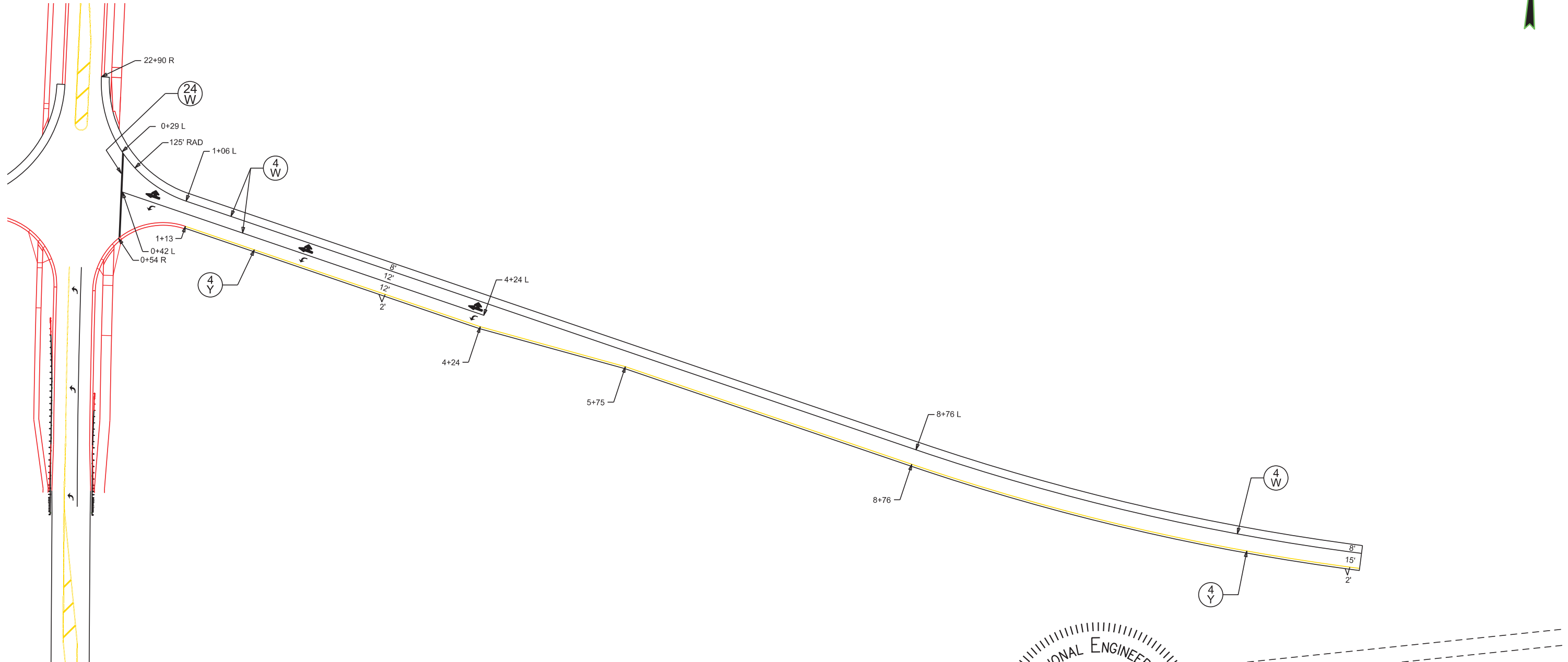
RAMP A

| | | | |
|--------------------------|---------------------------|-------------|---------------------|
| STATE OF SOUTH DAKOTA | PROJECT IM 0909(92)387 | SHEET M6 | TOTAL SHEETS M11 |
| Plotting Date: 8/13/2024 | | | |



Plot Scale - 1:100

Plotted From - bryce.steffen



File - ...10668_PavementMarking.dgn

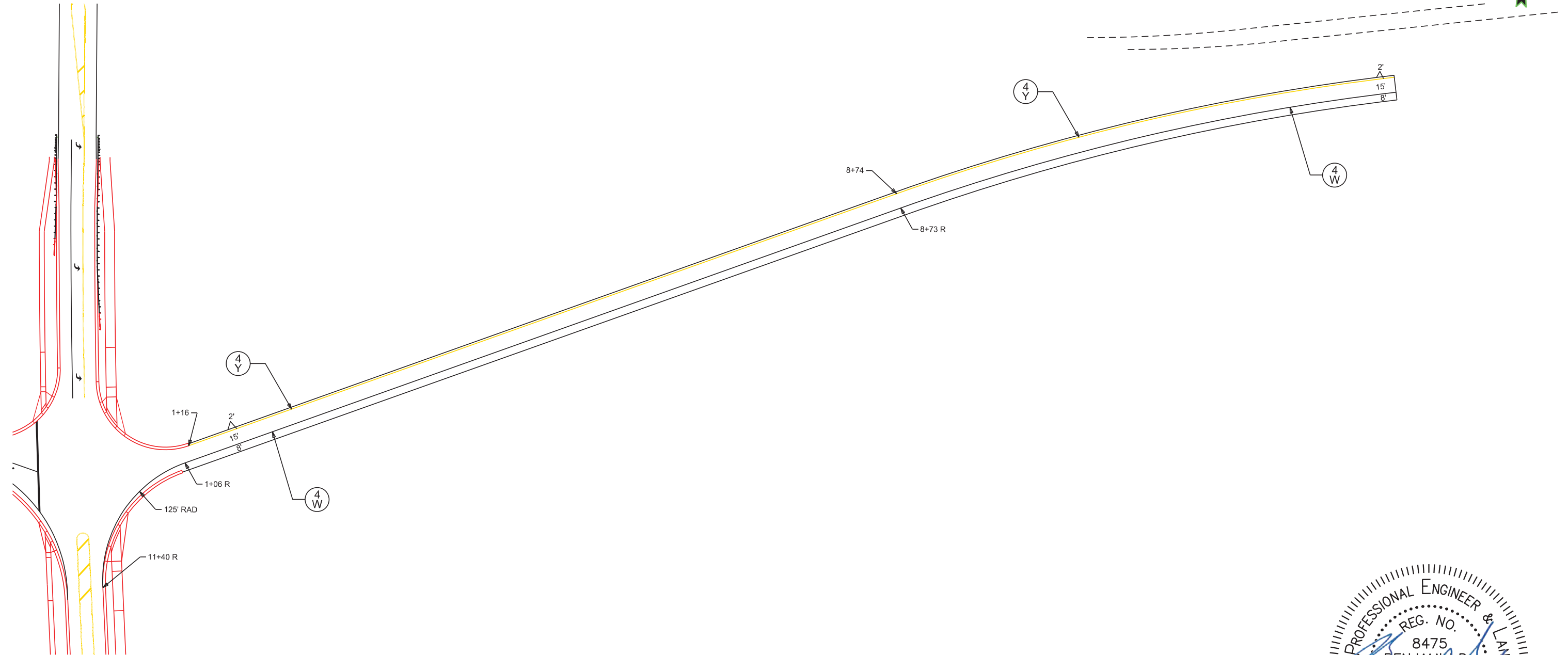
PAVEMENT MARKING

RAMP B

FOR BIDDING PURPOSES ONLY

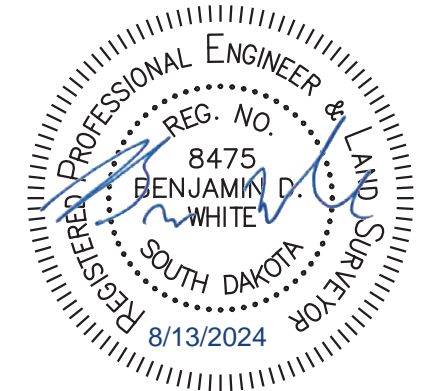
| | | | |
|--------------------------|---------------------------|-------------|---------------------|
| STATE OF SOUTH DAKOTA | PROJECT IM 0909(92)387 | SHEET M7 | TOTAL SHEETS M11 |
| Plotting Date: 8/13/2024 | | | |

Plot Scale - 1:100



Plotted From - bryce.steffen

File - ...10668_PavementMarking.dgn



PAVEMENT MARKING

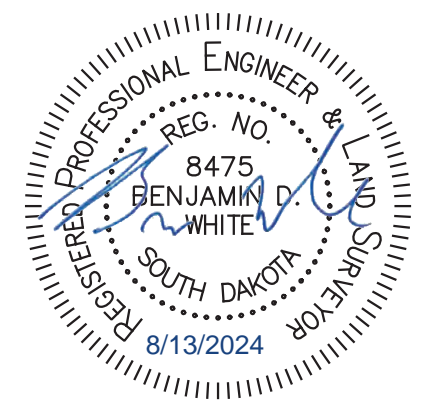
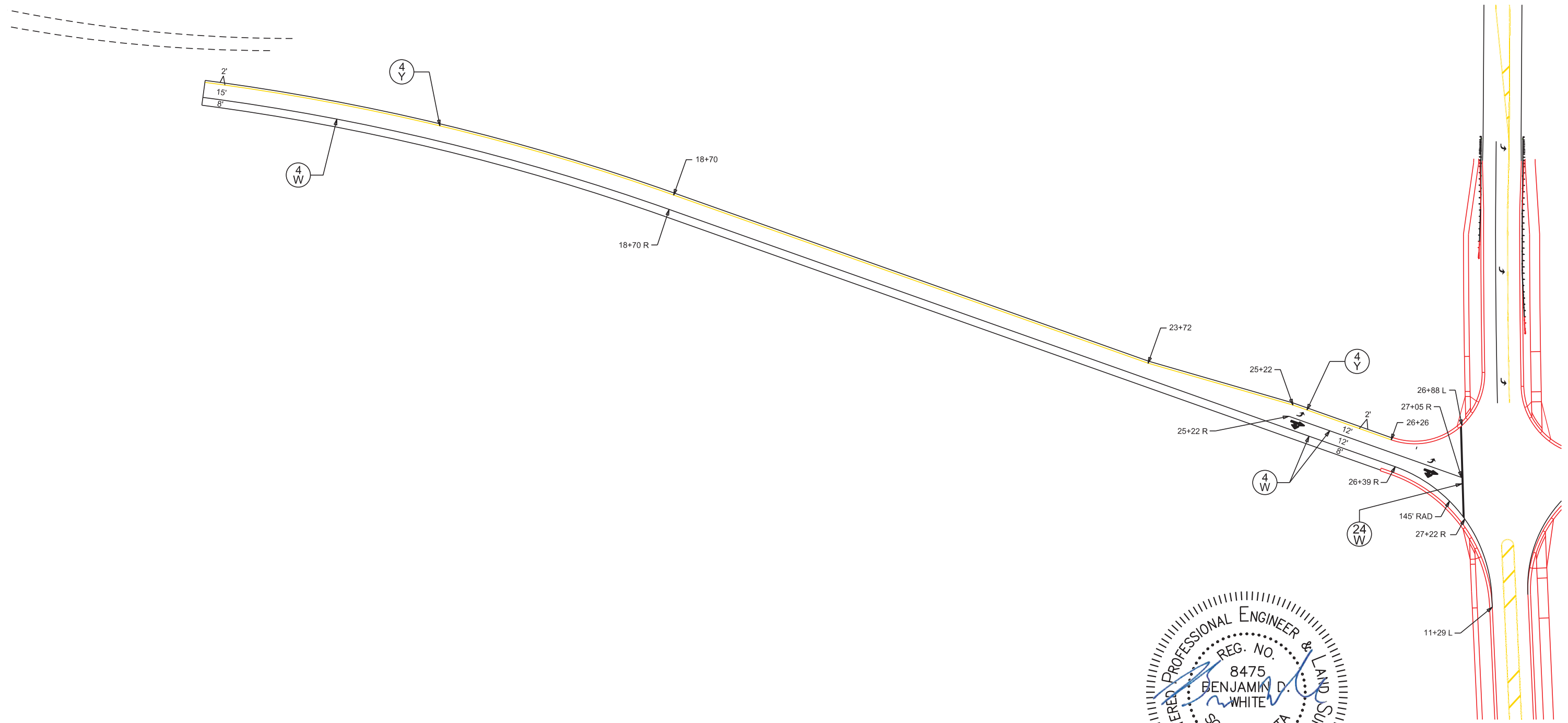
FOR BIDDING PURPOSES ONLY

RAMP C

| | | | |
|-----------------------|----------------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | IM 0909(92)387 | M8 | M11 |

Plotting Date: 8/13/2024

Plot Scale - 1:100
Plotted From - bryce.steffen



File - ...10668_PavementMarking.dgn

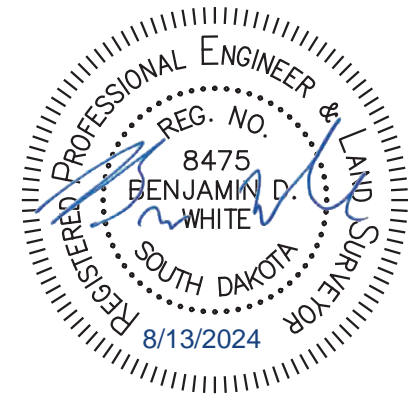
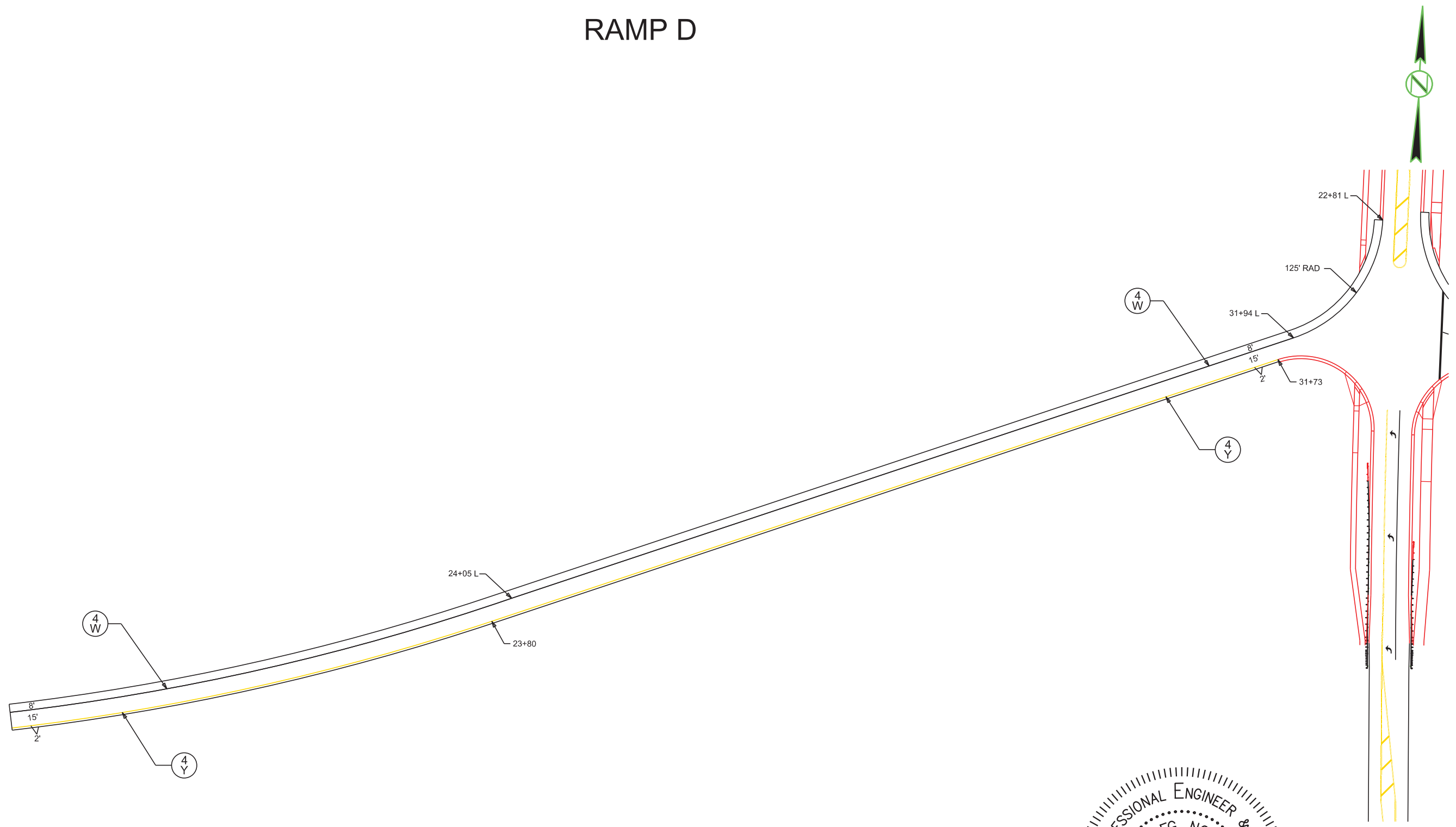
PAVEMENT MARKING FOR BIDDING PURPOSES ONLY

RAMP D

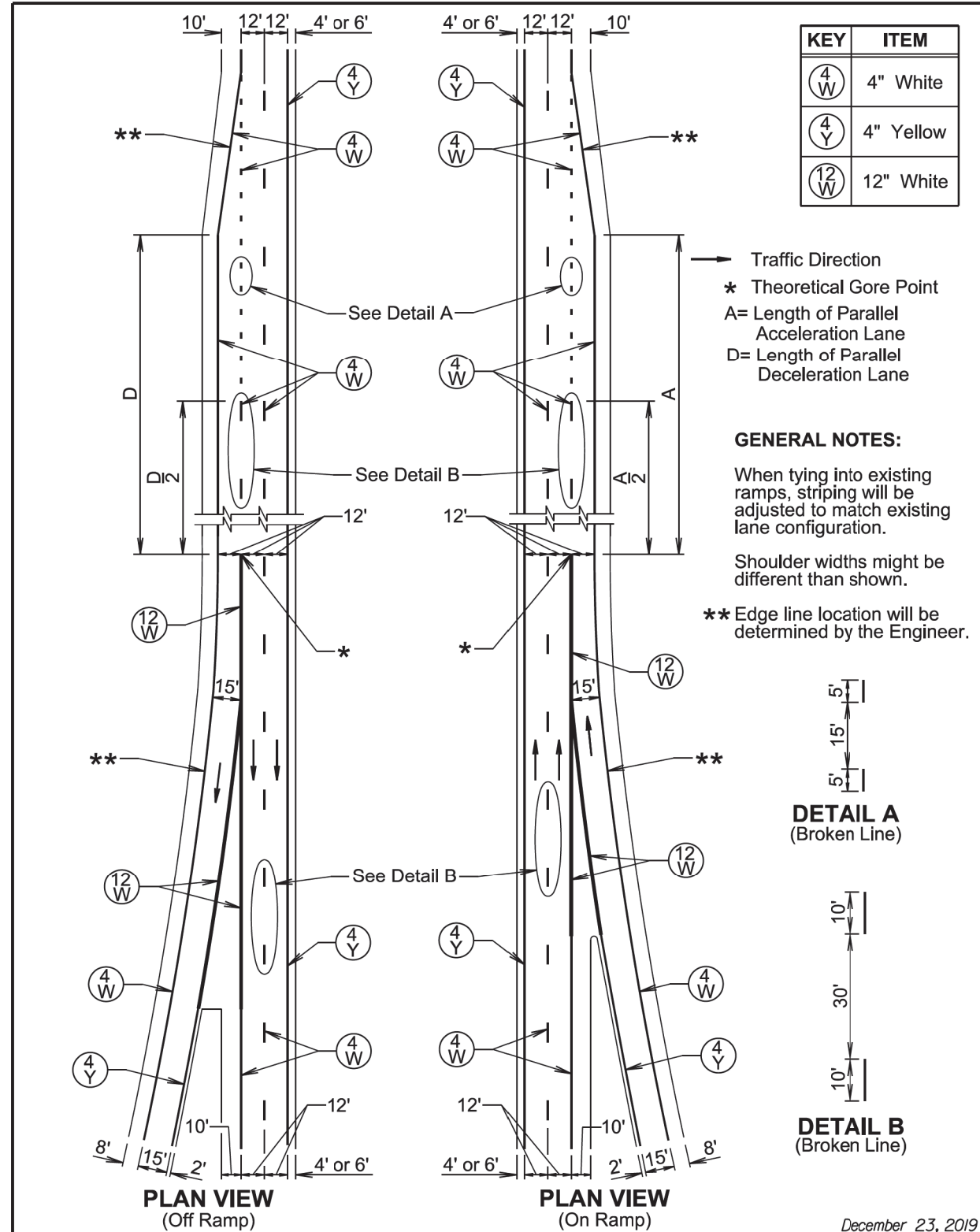
| | | | |
|--------------------------|----------------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | IM 0909(92)387 | M9 | M11 |
| Plotting Date: 8/13/2024 | | | |

Plot Scale - 1:100

Plotted From - bryce.steffen



File - ...10668_PavementMarking.dgn



| KEY | ITEM |
|--------|-----------|
| (4 W) | 4" White |
| (4 Y) | 4" Yellow |
| (12 W) | 12" White |

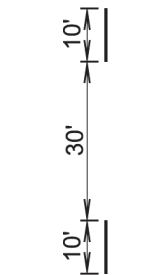
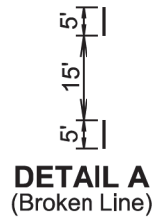
Traffic Direction
 * Theoretical Gore Point
 A= Length of Parallel Acceleration Lane
 D= Length of Parallel Deceleration Lane

GENERAL NOTES:

When tying into existing ramps, striping will be adjusted to match existing lane configuration.

Shoulder widths might be different than shown.

** Edge line location will be determined by the Engineer.

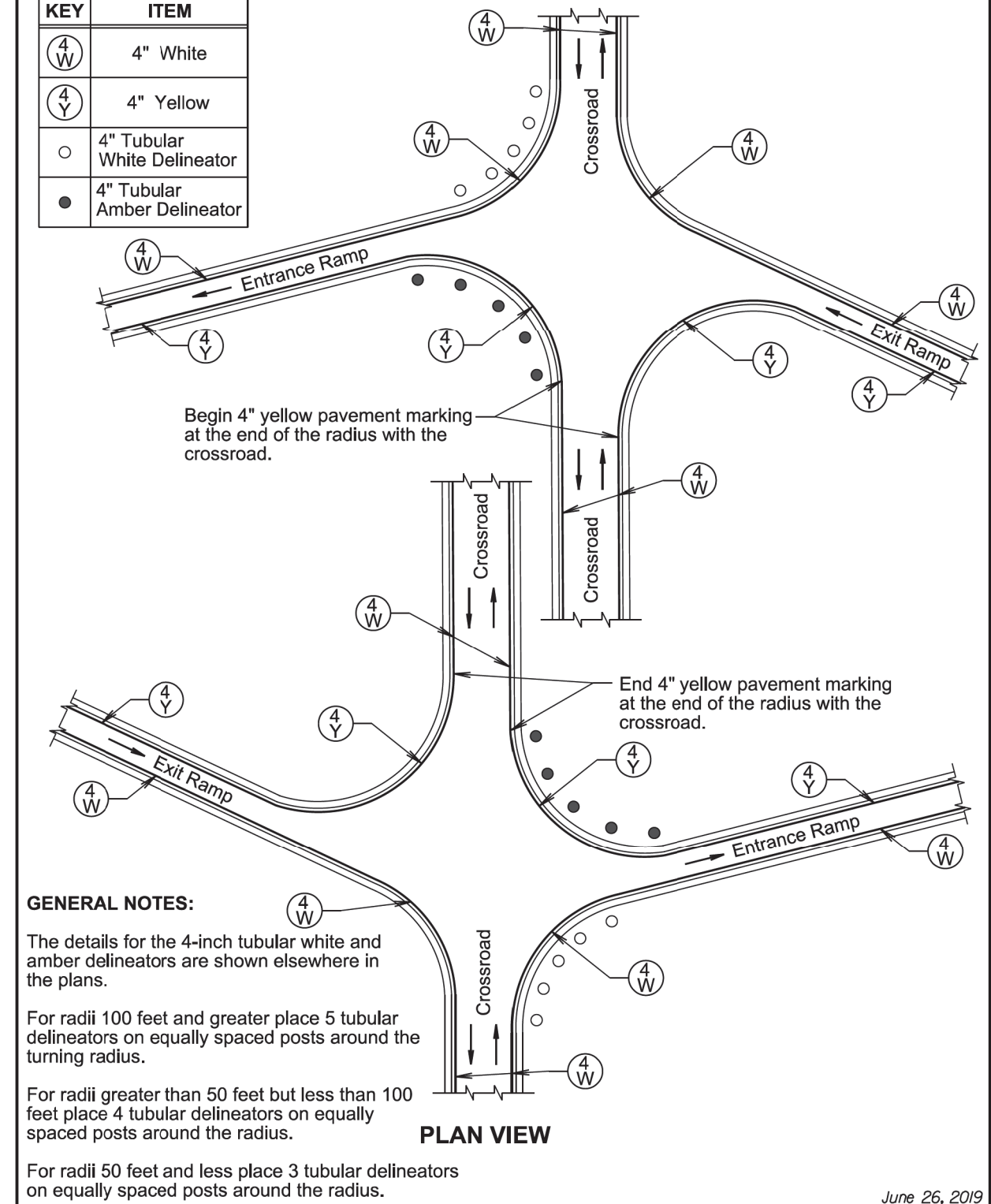


DETAIL B
(Broken Line)

December 23, 2019

| | | | |
|----------------------|-----------------------|--|------------------------|
| Published Date: 2025 | S D D O T | PAVEMENT MARKING LAYOUT FOR PARALLEL INTERSTATE RAMPS | PLATE NUMBER 633.06 |
| | | | Sheet 1 of 1 |

| KEY | ITEM |
|-------|-----------------------------|
| (4 W) | 4" White |
| (4 Y) | 4" Yellow |
| ○ | 4" Tubular White Delineator |
| ● | 4" Tubular Amber Delineator |



GENERAL NOTES:

The details for the 4-inch tubular white and amber delineators are shown elsewhere in the plans.

For radii 100 feet and greater place 5 tubular delineators on equally spaced posts around the turning radius.

For radii greater than 50 feet but less than 100 feet place 4 tubular delineators on equally spaced posts around the radius.

For radii 50 feet and less place 3 tubular delineators on equally spaced posts around the radius.

PLAN VIEW

June 26, 2019

| | | | |
|----------------------|-----------------------|--|------------------------|
| Published Date: 2025 | S D D O T | PAVEMENT MARKINGS AND DELINEATION FOR JUNCTION OF INTERSTATE RAMPS AND CROSSROAD | PLATE NUMBER 633.07 |
| | | | Sheet 1 of 1 |