

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|-----------------------|---------|-------|--------------|
|                       | 471-492 | 1     | 8            |

Plotting Date: 04/29/2013

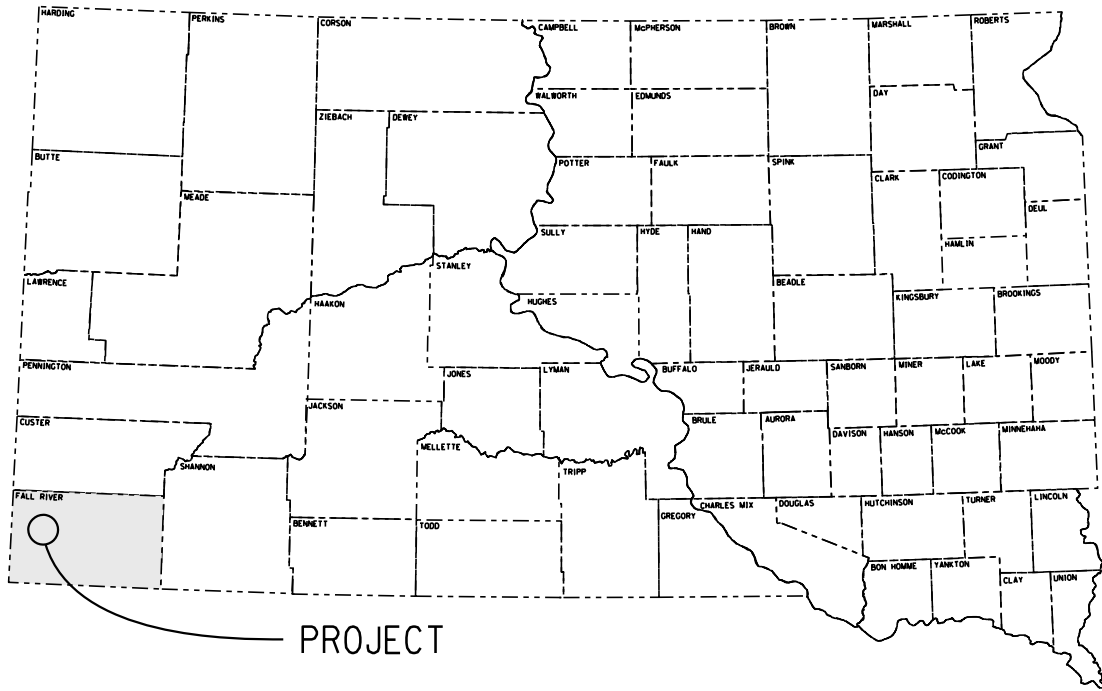
PLANS FOR PROPOSED  
**PROJECT 471-492**  
**SD HIGHWAY 471**  
**FALL RIVER COUNTY**

Asphalt Concrete Patching  
PCN i30k

INDEX OF SHEETS

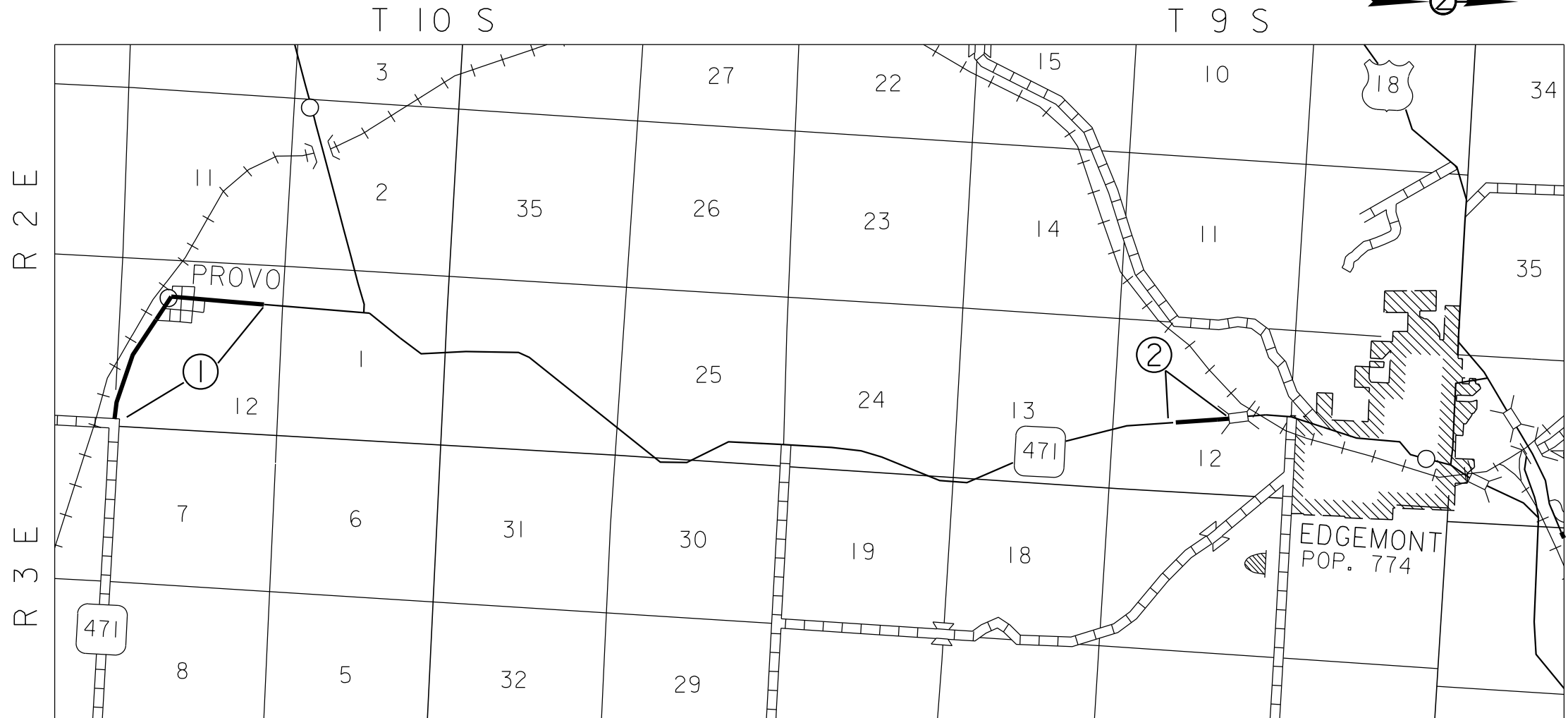
- Sheet 1: Title Sheet
- Sheet 2-4: Estimate of Quantities & Plan Notes
- Sheet 5: Asphalt Patching Detail
- Sheet 6: Pavement Marking Detail
- Sheet 7-8: Standard Plates

Plot Scale - 1:200



PROJECT

- ① MRM 19.625 to MRM 20.625
- ② MRM 27.290 to MRM 27.540



DESIGN DESIGNATION

|            |       |
|------------|-------|
| ADT (2012) | 200   |
| ADT (2032) | 293   |
| DHV        | 59    |
| D          | 53%   |
| T DHV      | 5.4%  |
| T ADT      | 11.9% |
| V          | 55    |

STORM WATER PERMIT  
No Permit Required

|                      |               |             |
|----------------------|---------------|-------------|
| Gross Length         | 6,600.00 FEET | 1.250 MILES |
| Length of Exceptions | 0.00 FEET     | 0.000 MILES |
| Net Length           | 6,600.00 FEET | 1.250 MILES |

Plotted From - TRRC11951

Plotted From -

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**ESTIMATE OF QUANTITIES (SD 471, PCN i30k)**

|                             |         |       |                 |
|-----------------------------|---------|-------|-----------------|
| STATE OF<br>SOUTH<br>DAKOTA | PROJECT | SHEET | TOTAL<br>SHEETS |
|                             | 471-492 | 2     | 8               |

| Bid Item Number | Item                           | Quantity | Unit |
|-----------------|--------------------------------|----------|------|
| 009E0010        | Mobilization                   | Lump Sum | LS   |
| 320E1200        | Asphalt Concrete Composite     | 1,988.1  | Ton  |
| 633E1300        | Pavement Marking Paint, White  | 42.3     | Gal  |
| 633E1305        | Pavement Marking Paint, Yellow | 15.4     | Gal  |
| 634E0010        | Flagging                       | 100      | Hour |
| 634E0020        | Pilot Car                      | 50       | Hour |
| 634E0100        | Traffic Control                | 374      | Unit |
| 634E0120        | Traffic Control, Miscellaneous | Lump Sum | LS   |
| 634E0630        | Temporary Pavement Marking     | 1.3      | Mile |

**SPECIFICATIONS**

Standard Specifications for Roads & Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.

**SEQUENCE OF OPERATIONS**

1. Set up traffic control to close one lane.
2. Perform Asphalt Patching. Install Temporary Pavement Marking if full roadway width is not complete prior to nightfall.
3. Switch traffic control to close adjacent lane.
4. Complete Asphalt Patching
5. Install Temporary Pavement Marking.
6. Install Permanent Pavement Marking.
7. Remove traffic control.

**WASTE DISPOSAL SITE**

The Contractor will be required to furnish a site(s) for the disposal of construction/demolition debris generated by this project.

Construction/demolition debris may not be disposed of within the State ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Highway, Road, and Railway Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) shall 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 Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

1. Construction/demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction/demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating "No Dumping Allowed".
2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall 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.

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) shall be incidental to the various contract items.

**HISTORICAL PRESERVATION OFFICE CLEARANCES**

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). Provide SARC with the following: a topographical map or aerial view on 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 no artifacts have been found on the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

If any earth disturbing activities occur within the current geographical or historic boundaries of any South Dakota reservation, the Contractor shall obtain Tribal Historical Preservation Office (THPO) clearance. If no THPO exists, the required SHPO clearance shall suffice, with documentation of Tribal contact efforts provided to SHPO.

To facilitate SHPO or THPO responses, the Contractor should submit a records search or cultural resources survey report to the DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3268). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO/THPO approval. The Contractor is responsible for obtaining all required permits and clearances for staging areas, borrow sites, waste disposal sites, and all material processing sites. The Contractor shall provide the required permits and clearances to the Engineer at the preconstruction meeting.

**ASPHALT CONCRETE COMPOSITE**

Asphalt Concrete Composite shall be furnished by the Contractor.

Mineral Aggregate for Asphalt Concrete Composite shall conform to the requirements of the Standard Specifications for Class E, Type 1 Asphalt Concrete Specifications.

SS-1h or CSS-1h Emulsified Asphalt for Tack shall be applied at the rate of 0.05 gallons per square yard.

The asphalt binder used in the mixture shall be PG 58-28, PG 64-22 or PG 64-28 Asphalt Binder.

A Flush Seal will not be required on the asphalt concrete patching.

Locations and quantities of asphalt repair are subject to change. The exact locations will be determined in the field by the Engineer. The Engineer reserves the right to adjust quantities and/or add locations at no additional cost to the state.

**SURFACING THICKNESS DIMENSIONS**

Plans tonnage will be applied even though the thickness may vary from that shown in the plans. At those locations where material must be placed to achieve a required elevation for smoothness, plans tonnage may be varied to achieve the required elevation.

**TABLE OF ASPHALT CONCRETE PAVEMENT REPAIR (PCN i30k)**

| Highway | MRM to | MRM    | Description            | Width (Ft) | Length (Ft)  | Depth (Inches) | Asphalt Concrete Composite (Tons) | Tempoary Pavement Marking (Miles) | Pavement Marking Paint, Yellow (Gal) | Pavement Marking Paint, White (Gal) |
|---------|--------|--------|------------------------|------------|--------------|----------------|-----------------------------------|-----------------------------------|--------------------------------------|-------------------------------------|
| SD471   | 19.625 | 20.625 | Full Width of Pavement | 24         | 5,280        | 2.0            | 1,564.4                           | 1.00                              | 12.3                                 | 33.8                                |
| SD471   | 27.290 | 27.540 | Full Width of Pavement | 26         | 1,320        | 2.0            | 423.7                             | 0.25                              | 3.1                                  | 8.5                                 |
|         |        |        | <b>Totals</b>          |            | <b>6,600</b> |                | <b>1,988.1</b>                    | <b>1.25</b>                       | <b>15.4</b>                          | <b>42.3</b>                         |

**MAINTENANCE OF TRAFFIC**

Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate 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. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.

Unless otherwise stated in these plans, no work will be allowed during hours of darkness. Hours of darkness are defined, as 1/2 hour after sunset until 1/2 hour before sunrise.

Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of the vegetation, surfacing, embankment, delineators, and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

Existing guide, route, informational logo, regulatory, and warning signs shall be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Non-applicable signing shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 36 hours. The cost of removing or covering non-applicable signs shall be incidental to the contract lump sum price for, Traffic Control, Miscellaneous.

Construction signing mounted on portable supports shall not be used for a duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.

If inappropriate/conflicting pavement markings exist, the markings shall be removed and replaced with applicable temporary pavement markings when the work duration is more than 3 days. When the work duration is less than 3 days, the channelizing devices in the area where the pavement markings conflict shall be placed at a spacing of 1/2 G. Pavement marking removals shall be paid for at the contract unit price for Remove Pavement Marking, 4" or equivalent. Temporary pavement marking shall be paid for at the contract unit bid price for Temporary Pavement Marking. The additional channelizing devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

The quantity of signs paid for will be for the greatest number of installations per sign in place at any one time regardless of the number of set-ups on the project.

Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.

**MAINTENANCE OF TRAFFIC (CONTINUED)**

The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

The Contractor shall be required to have a person available 24 hour/day, 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.

The Contractor or designated traffic control subcontractor shall make night inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. The amber light shall be mounted on the uppermost part of the contractor's vehicle. Lights must have peak intensity within the range of 40 to 400 candelas and must flash at 75 ± 15 flashes per minute. Vehicle flasher/hazard lights are not acceptable.

All construction operations shall 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 shall be used.

Temporary Road Markers shall be used for lane closure tapers or lane shift tapers and lane lines. Temporary Pavement Marking installed in accordance with the traffic control standard plates will not be measured for payment and will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

Drums are required in all lane closure tapers.

The pilot car shall be a four wheeled vehicle with the Contractor's name prominently displayed on both sides of the vehicle. A 36" x 18" black on orange sign G20-4, PILOT CAR (top line) FOLLOW ME (bottom line) shall be mounted in a conspicuous position on the rear of the vehicle. The pilot car will be equipped with a flashing amber light.

When a pilot car is used, the delay to the traveling public shall not exceed 15 minutes.

**TABLE OF TRAFFIC CONTROL (SD 471, PCN i30k)**

| SIGN CODE          | SIGN SIZE | DESCRIPTION         | # | UNITS PER SIGN | UNITS      |
|--------------------|-----------|---------------------|---|----------------|------------|
| G20-2              | 36" x 18" | END ROAD WORK       | 2 | 17             | 34         |
| W3-4               | 48" x 48" | BE PREPARED TO STOP | 2 | 34             | 68         |
| W8-11              | 48" x 48" | UNEVEN LANES        | 2 | 34             | 68         |
| W20-1              | 48" x 48" | ROAD WORK AHEAD     | 2 | 34             | 68         |
| W20-4              | 48" x 48" | ONE LANE ROAD AHEAD | 2 | 34             | 68         |
| W20-7a             | 48" x 48" | FLAGGER             | 2 | 34             | 68         |
| <b>TOTAL UNITS</b> |           |                     |   |                | <b>374</b> |

**TEMPORARY PAVEMENT MARKING**

Temporary Road Markers shall be used for temporary pavement marking.

The Contractor shall be responsible for maintaining a visible and reflective centerline throughout the project. Any marking covered or damaged shall be replaced prior to the end of the day. All costs associated with this work shall be incidental to the contract unit price per mile "Temporary Pavement Marking".

All costs for temporary pavement marking including furnishing, applying, maintenance, removal and disposing of tabs shall be incidental to the contract unit price per mile for Temporary Pavement Marking.

It is estimated that 1.25 miles of Temporary Pavement Marking will be required for SD 471 on the project. These quantities are only for opening completed repair areas to traffic. The temporary pavement marking for traffic control in accordance with the standard plates shall be incidental to the contract unit price per lump sum for "Traffic Control, Miscellaneous".

**PERMANENT PAVEMENT MARKINGS**

The location and type of the existing pavement marking shall be documented prior to removal, so that replacement can match existing conditions.

Application of permanent pavement marking shall be completed within 14 calendar days following completion of the pavement repair.

**RATES OF APPLICATION**

- \*Edgeline striping – 16.9 gallons per mile
- Glass beads – 8.0 pounds per gallon

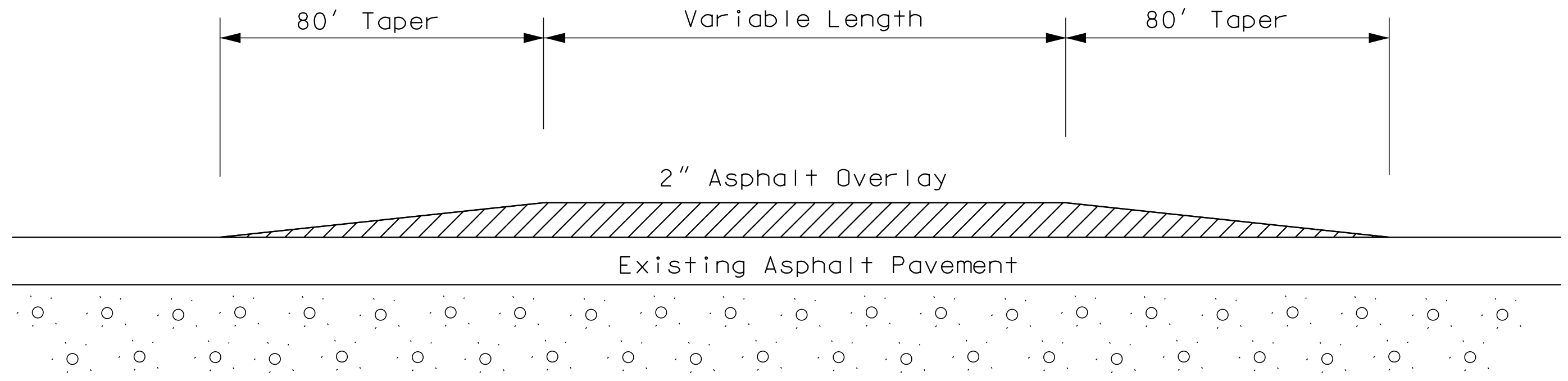
\*Rate is the Region average and is for one 4" edgeline.

|                       |         |       |              |
|-----------------------|---------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|                       | 471-492 | 5     | 8            |

Plotting Date: 04/29/2013

# TAPERS AT EACH END OF ASPHALT PATCHES

LONGITUDINAL SECTION ALONG CENTERLINE  
(FULL ROADWAY WIDTH)



Plot Scale - 1/4"

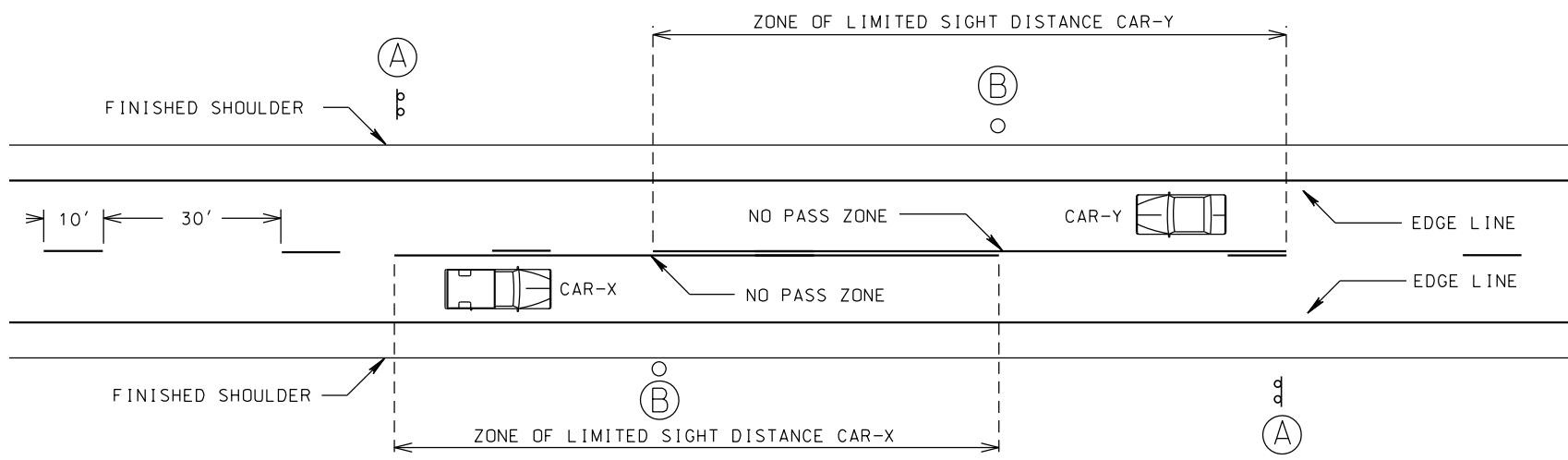
Plotted From - TRRC11951

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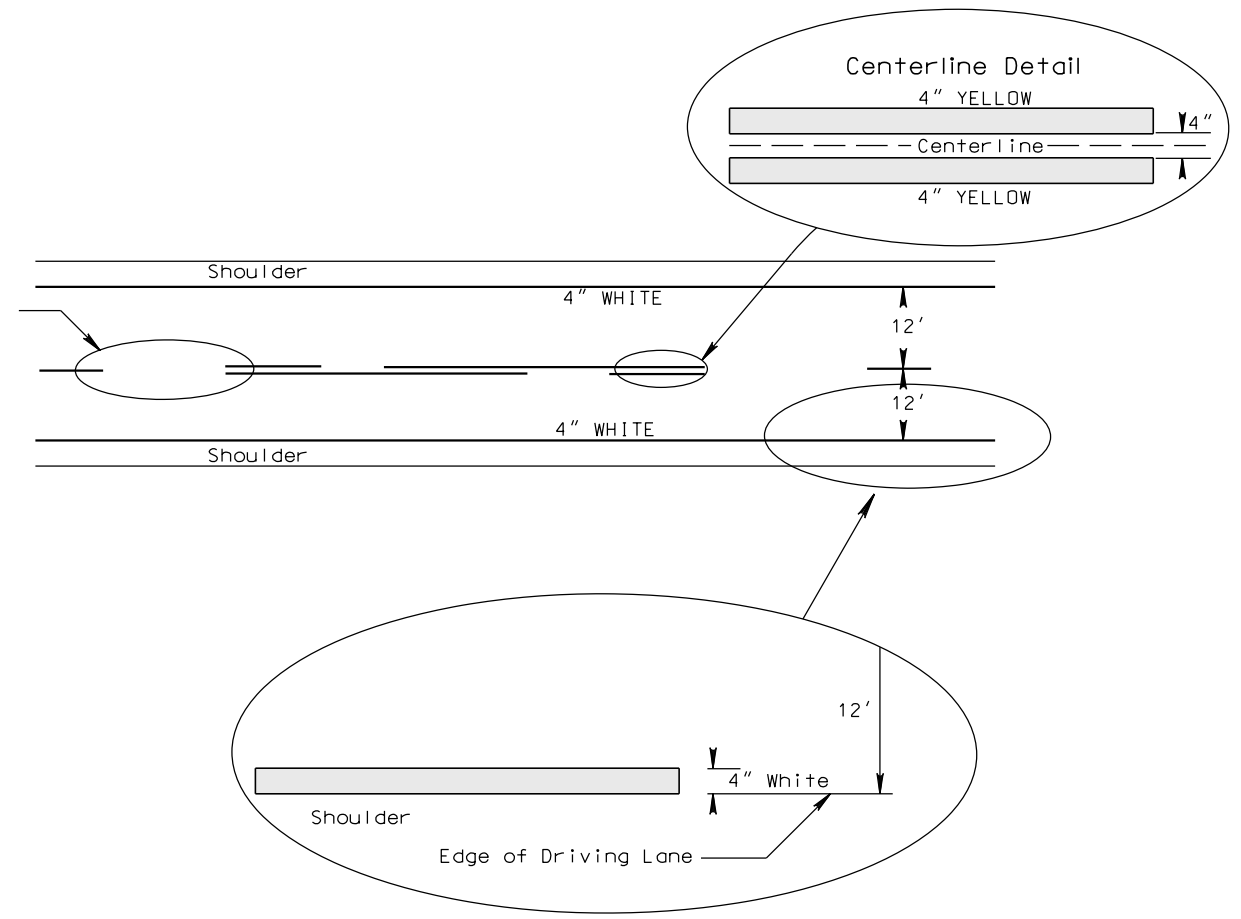
# TYPICAL PAVEMENT MARKING LAYOUT



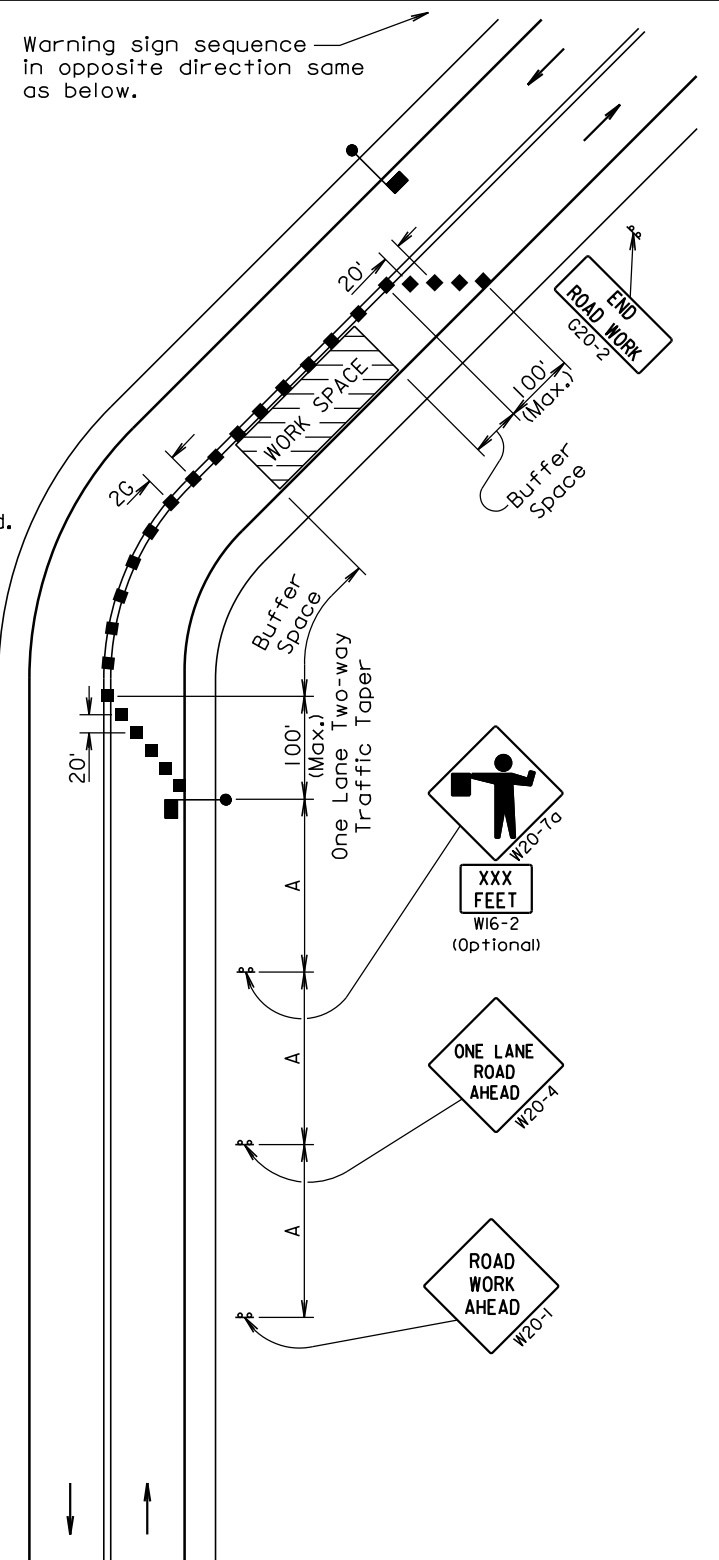
(A) NO PASSING ZONE  
(B) End of Zone Marker



NOTE: A THREE "GUN" SYSTEM SHALL BE USED TO OBTAIN THIS PATTERN.



| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) | Spacing of Channelizing Devices (Feet) (C) |
|-------------------------------------|---|--|
| 0 - 30                              | 200   | 25   |
| 35 - 40                             | 350   | 25   |
| 45 - 50                             | 500   | 50   |
| 55                                  | 750   | 50   |
| 60 - 65                             | 1000  | 50   |



● Flagger  
 ■ Channelizing Device

For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used.

The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.

Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

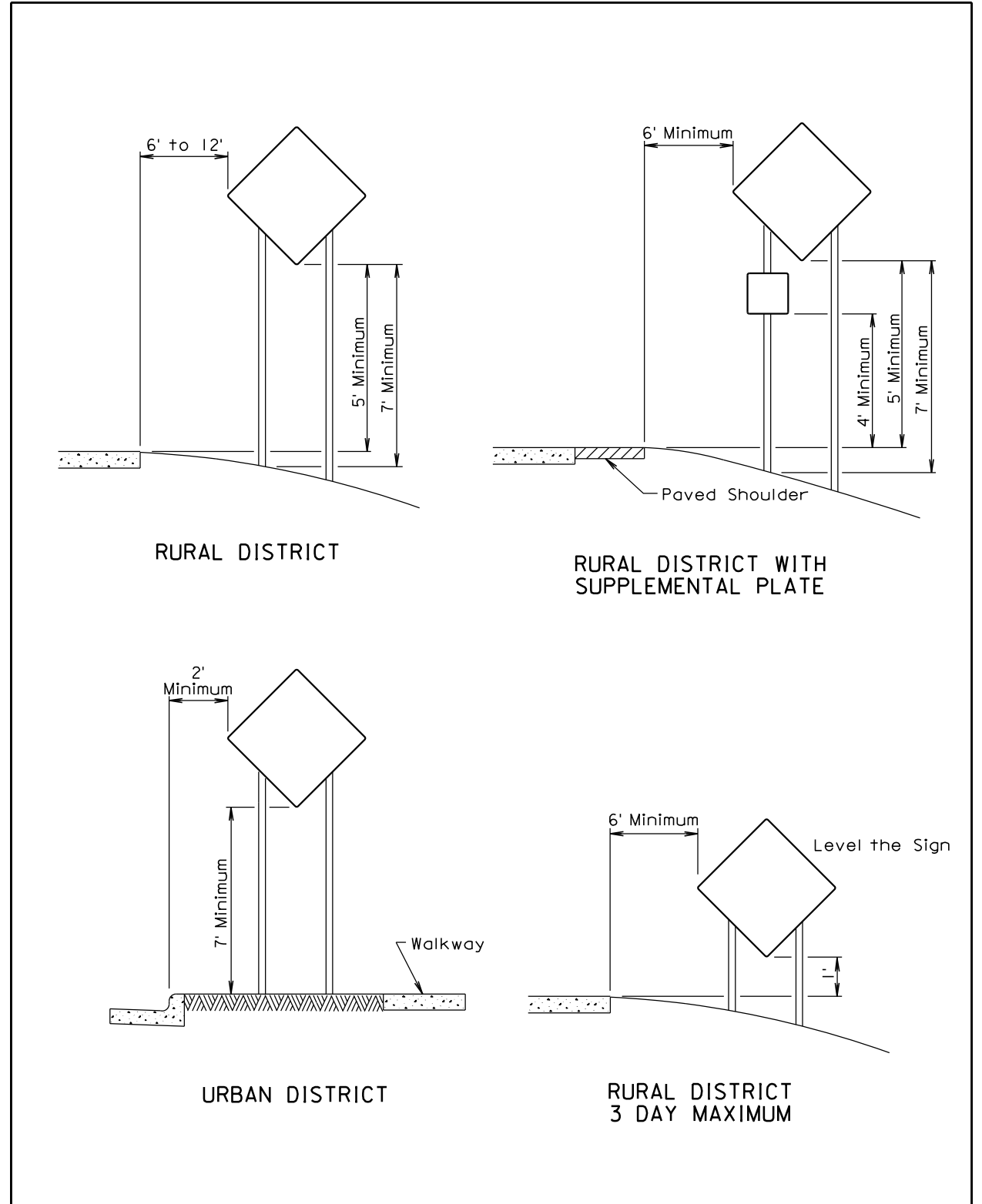
The channelizing devices shall be drums or 42" cones.

Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

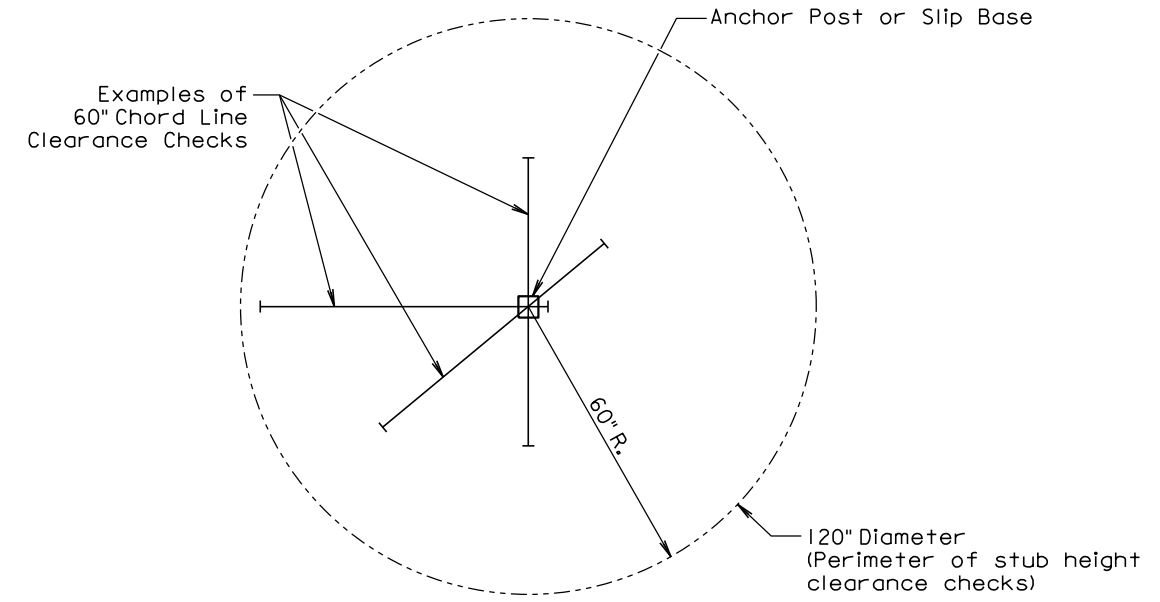
Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

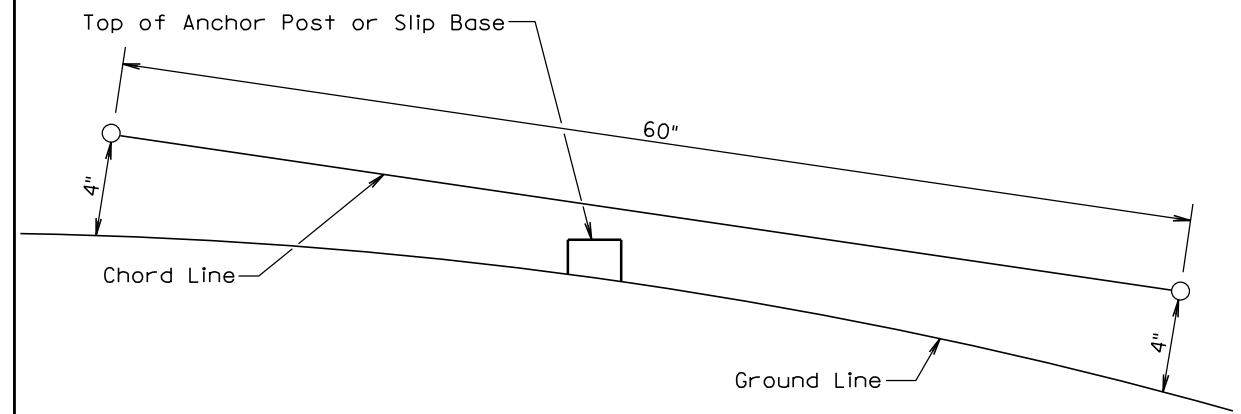
February 14, 2011



February 14, 2011



**PLAN VIEW**  
(Examples of stub height clearance checks)



**ELEVATION VIEW**

**GENERAL NOTES:**

The top of anchor posts and slip bases SHALL 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 shall 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.

July 1, 2005

|                                  |   |                               |
|----------------------------------|---|-------------------------------|
| <b>S<br/>D<br/>D<br/>O<br/>T</b> | <b>BREAKAWAY SUPPORT STUB CLEARANCE</b> | PLATE NUMBER<br><b>634.99</b> |
|                                  |   | Sheet 1 of 1                  |

Published Date: 2nd Qtr. 2013