SIGN AND DELINEATOR
DESIGN GUIDELINES
FOR LOCAL ROADS

2018

South Dakota DOT
Connecting South Dakota and the Nation
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**PREFACE**

This manual is intended to act as a guide in the design and installation of Highway Signing Devices. The information in this manual is not intended to overrule the current edition of the Manual of Uniform Traffic Control Devices (MUTCD), the Standard Highway Signs and Markings (SHSM) or any other official publication, specification, Regional practice or work orders. All installations shall be in accordance with the manufacture guidelines. The Contract Administration Engineer should be consulted on questions you may have. To continue to provide clear and up-to-date information, your input as “hands on experts” is needed. Tables and diagrams are included in this manual for a quick reference. Periodic comparisons to official MUTCD, SHSM, standard notes, and standard plates shall be the designers’ responsibility to validate the information being used is correct.

**LAWS**

The designers shall familiarize themselves with the specific codes from South Dakota Codified Law (Appendix A) that deal directly or indirectly with local roads and have some implication as to signing needs and requirements. These laws were in effect at date of publication but it is the duty of every designer to know the state law, research any changes, and research any applicable local ordinances and/or resolutions which may override any standard set forth by practice or published literature.

**INVENTORY**

Survey, inspection, and recording of existing traffic control devices shall be conducted by the consultant by means of physically traveling each road, referencing landmarks, measuring distances, verifying sign sizes, referencing hazards, and ballbanking curves. Signs located within a given Right of Way (ROW) are owned by the governing body of the ROW and shall be included with their inventory unless documentation is provided identifying another entity with maintenance responsibility through a permit or other agreement. A copy of these exceptions shall be obtained by the consultant and retained with the project documentation. The DOT will provide a copy of the DOT Local Roads Inventory Software for each County project for the consultants use in the inventory process if they so desire. Instructions on use of this software are included in Appendix B.

All signs less than 5 years of age can remain in place provided it is still applicable and properly located under all current standards and provisions. All signs should have a visible date sticker attached to the back of the sign. All signs with age between 5 and 12 years with high intensity sheeting and those signs with super high intensity sheeting signs less than 18 years of age shall be stockpiled for local entity reuse. If the sign is older than these values or the sticker is missing, then the sign shall be stockpiled for recycle unless owner can identify age of individual signs. All salvaged or discarded signs remain the property of the local authority until such time they declare them as surplus and dispose as an entity to a recycling center – reference SDCL 31-28-28.

During the field inventory process, it is recommended to frequently reference in landmarks or centerline of crossroads to aid contractors in calibrating & resetting measuring equipment to retrace designer’s locations. All intersections with some form of stop/yield control shall be referenced. All one-way streets shall have the beginning and ending referenced as landmarks within the inventory. This beginning and ending point is associated with center of intersections and/or centerline intercept points of divided sections.

**ENCROACHMENTS**

A full encroachment survey does not need to be completed for the regional projects; however, each consultant shall keep a separate inventory of any hazardous (non-breakaway) encroachments within the clear zone. This separate inventory shall be submitted to the DOT Project Manager for follow-up with the local government entities.

**ANALYSIS**

Each consultant shall use and perform any Traffic Engineering Studies they deem necessary to properly analyze, apply national, state, and local laws/specification/standards, and sound Engineering Judgment in their recommendations for installation and removal of signs. Blanket replacement of existing devices will not be accepted without application of a Traffic Engineering Review.

**PLAN PREPARATION**

Generally, a set of signing plans will be assembled in the following order (refer to the SDDOT Road Design Guide for additional information):

- Title Sheet
- Estimate of Quantities
• General Notes

• Location Maps
  o Show breakdown of municipal boundaries and townships
  o Location of 0.0 MRP (Mile Reference Point) at western reference point for East-West routes and 0.0 MRP at the southern reference point for North-South routes- Note: use of geospatial locations may be used in lieu of MRP with approval of DOT.
  o All routes are to be classified as an East-West route or a North-South route
  o All towns and cities shall be detailed showing street names and MRP reference points
  o All MRP’s for towns, cities, and townships shall match same referenced location on other maps, i.e. Route Main Street (320th Ave.) in City X shows an MRP value of 18 on a county map and shall also show an MRP value of 18 on the city map.

• Tables
  o Permanent signing table shall include Route Name, MRP, sign size, Standard Highway Sign number, direction facing, square footage of new sign, sheeting type, new post data, description of sign, remarks/action that needs to be taken, two blank columns for Field Construction use.
  o New Sign Summary By Sign Number
  o New Post Summary By System

• Traffic Control – any special traffic control needs not covered by the MUTCD standard plates and/or special plan notes shall be detailed out in a plan drawing or addition of other standard plates.

• Sign layouts
  o Typical layouts and standard details shall be included in the plans.
  o All special layouts or complicated intersections shall also be detailed in a drawing showing sign placement
  o All non-standard highway sign shall be detailed showing exact placement of any symbols, legend, and/or arrows in relation to the edge of the sign as well as color, border, and radius requirements.

• Other standard details
  o Delineation standards

**SELECTION AND USE OF MATERIALS**

1. **Existing Sign and Post Assemblies:** All existing signing material shall remain the property of the governing entity whose property they are installed upon. Plans shall designate contact information of each entity so the Contractor can arrange delivery upon removal. The plans shall also specify that the assemblies shall be taken apart and all bolts, nuts, and washers shall be placed in individual 5-gallon pails. Backing materials shall be separated from the signs and may be reused at the Contractor’s discretion. Wooden posts shall be carefully removed to avoid damage and cleaned of excess dirt and neatly stockpiled separate from the steel posts. Signs that have been determined to still have useful life in them shall be carefully stockpiled separate from those that are intended to be recycled.

2. **New Posts:** The design preference is to use Telespar brand (or equals) posts and bases on all new standard highway signs as approved by the Engineer. All post materials shall conform to Section 982 of the Standard Specifications, and be in accordance with ASTM specifications. Signs designated as requiring a shear slip base shall have a 4 foot long base assembly with a shear breakaway base connecting the base to the signpost. The height of the post shall not exceed the minimum height needed by more than 0.5 feet. Any portion that extends above the sign shall be cut off. Each type of perforated tube posts will be paid for at the contract unit price per Each. The sign post contract items shall include post bases and all hardware. The lengths of the posts in the sign tables are approximate lengths only. The post lengths shall be verified by the Contractor. The Contractor is urged to cut posts to length on job site after site by site verification of post length. All posts and bases shall be accompanied by Certificates of Compliance and shall meet all safety standards as set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD). In some areas, signs may be placed on existing utility poles (with approval of pole owner). Number of posts per assembly shall be determined by the designer and specified per location within the plans as per the following windload calculation table:
3. **New Signs**: Details shall be provided within the plans identifying exact location of where new signs shall be installed and where existing signs are being replaced. Enough information shall be provided such that the Contractor can stake the signs and then be verified by the Engineer. Sheet Aluminum shall be as per Section 982 of the SD Standard Specifications for Roads and Bridges, 2004 Edition. The Contractor shall install a state/county/city furnished date decal on each new sign installed on the project and shall be detailed in the plans. When signs are vertically mounted in succession, they shall be 1-2 inches apart. Measurement of sign areas will include payment for the entire sign blank before trimming for rounded corners. The square unit measurement for each sign shall be as shown in the plans. Use the following square footage for these common shapes (all measurements are given in terms of inches):

- **48”x48”x36” = 5.6 SF (square feet)**

- **18”x18” = 1.9 SF (Bike Paths Only)**
  - 24”x24” = 3.3 SF
  - 30”x30” = 5.2 SF
  - 36”x36” = 7.5 SF
  - 30”x30” = 5.2 SF

- **30”x30”x30” = 2.7 SF**
  - 36”x36”x36” = 3.9 SF
  - 48”x48”x48” = 6.9 SF

- **36” diameter = 7.1 SF**
  - **48” diameter = 12.6 SF**
All legend and border utilizing the color black shall be vinyl or screen printed black, non-reflectorized material. All other legend and border shall be of same type of sheeting as the background of the same sign. All signs, except as noted below, shall have High Intensity background, Type IV as per M 268 (ASTM D4956). The following signs shall have super/very high intensity reflectorized background, Type XI as per M 268 (ASTM D4956):

- R1-1 STOP
- R1-2 YIELD
- R5-1 DO NOT ENTER
- R5-1a WRONG WAY
- All Warning Signs
- All Overhead Interstate Guide Signs
- All Delineators
- All School Zone Signs

The warning signs shall have fluorescent yellow background. All school zone signs shall utilize a fluorescent yellow-green color where applicable.

Type 3 single sided barricades and posts shall be paid per foot based on the length of each complete barricade assembly being furnished and installed. Barricades shall be supplied in 6’ or 8’ wide assemblies and shall include all three bars and two posts per assembly. Permanent (longer than 6 months) barricades shall be red and white in color. Flush mount bases may be specified for locations where the barricades may be removed periodically and the road reopened.

Sign design and layout shall conform to the standards provided in the MUTCD and the SHSM. Any sign that is not a standard highway sign shall be cad drafted and submitted for approval to the Contract Administration Engineer prior to manufacturing the sign.

4. **Sign Backing**: All signs (except yield signs) of 36 inches or more in width shall have a pair of stiffeners. Signs less than 36 inches (<48” for yield signs) in width do not require stiffeners except where multiple signs are being installed on a single assembly and these stiffeners should be placed horizontally across the back of the signs. Width of stiffeners shall not be wider than the sign unless it is being used to attach multiple signs on one assembly but shall not be wider than the entire assembly as a whole. Width shall also not be less than 2” shorter than the width of the sign(s) at the installation point. Aluminum U-Channel stiffeners shall conform to Alloy 6063-T6 or 6061-T6. The U-Channel shall be 2 inches in width and free of holes. The U-Channel stiffeners shall also be used to connect various signs and perforated tube posts together so that an entire sign can be erected as a single installation. Stiffeners may be fastened to signs by use of 1/4” drive rivets with a minimum of one on each end and one centered between each post. Installation of the stiffeners shall be incidental to other contract items however the designer shall include an estimate of the quantity of material that will be needed in the plans for informational purposes. Placement of stiffener is as shown in the Special Details for each type of sign.

5. **Hardware**: All hardware shall be rust proof. The basic hardware used to erect signs consists of bolts, lag screws, washers (nylon, rust proof metal or plastic), clamps, fittings and brackets. Brackets of aluminum or steel are used when multiple sign installations, large signs, or wind conditions necessitate stronger attachment to the post as opposed to the single or double bolt. For circular aluminum or steel posts or pipe, the sign may be clamped or banded. High intensity signs should always be fastened with either a 3/8” flat metal and or a 3/8” fender metal washer over a neoprene washer against the sign face. Stiffeners may be fastened to signs by use of 1/4” drive rivets with a minimum of one on each end and one centered between each post. A 3/8” diameter straight bolt (Grade 8) shall be used in all breakaway shear bases for the 2.5” perforated tube posts. All other perforated tube signpost base material shall be fastened with 5/16” diameter corner bolts (Grade 2). All perforated tube signposts shall have a soil stabilizer attached to the base. Soil stabilizers shall be a red painted MPJ Sign Wedge.
manufactured by MPJ Enterprises, Inc., 304 Spring Ave. N., Lake Preston, SD 57249 or equal as approved by the Engineer.

6. Crash Testing: All sign assemblies installed within public Right-of-Way shall meet the requirements of NCHRP Report 350 and/or MASH crash testing requirements or shall be protected by a crash-worthy device.

**SIGN PLACEMENT**

**Longitudinal Location:**
- Stop & Yield signs may be located up to 50 feet (maximum) away from edge of shoulder of a major road on intersections that have a wide throat.
- Warning signs should be placed as per the following table from the MUTCD and these should be used as minimum distances.

*Table 2C-4. Guidelines for Advance Placement of Warning Signs*

<table>
<thead>
<tr>
<th>Posted or 85th-Percentile Speed</th>
<th>Advance Placement Distance¹</th>
<th>Condition A: Speed reduction and lane changing in heavy traffic²</th>
<th>Condition B: Deceleration to the listed advisory speed (mph) for the condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>20mph</td>
<td>100 ft</td>
<td>N/A²</td>
<td>0⁴ 10⁴ 20⁴ 30⁴ 40⁴ 50⁴ 60⁴ 70⁴</td>
</tr>
<tr>
<td>25 mph</td>
<td>100 ft</td>
<td>N/A²</td>
<td>— — — — — — — —</td>
</tr>
<tr>
<td>30 mph</td>
<td>100 ft</td>
<td>N/A²</td>
<td>— — — — — — — —</td>
</tr>
<tr>
<td>35 mph</td>
<td>100 ft</td>
<td>N/A²</td>
<td>— — — — — — — —</td>
</tr>
<tr>
<td>40 mph</td>
<td>125 ft</td>
<td>100 ft³</td>
<td>0⁴ 10⁴ 20⁴ 30⁴ 40⁴ 50⁴ 60⁴ 70⁴</td>
</tr>
<tr>
<td>45 mph</td>
<td>125 ft</td>
<td>100 ft³</td>
<td>— — — — — — — —</td>
</tr>
<tr>
<td>50 mph</td>
<td>125 ft</td>
<td>100 ft³</td>
<td>— — — — — — — —</td>
</tr>
<tr>
<td>55 mph</td>
<td>125 ft</td>
<td>100 ft³</td>
<td>— — — — — — — —</td>
</tr>
<tr>
<td>60 mph</td>
<td>125 ft</td>
<td>100 ft³</td>
<td>— — — — — — — —</td>
</tr>
<tr>
<td>65 mph</td>
<td>125 ft</td>
<td>100 ft³</td>
<td>— — — — — — — —</td>
</tr>
<tr>
<td>70 mph</td>
<td>125 ft</td>
<td>100 ft³</td>
<td>— — — — — — — —</td>
</tr>
<tr>
<td>75 mph</td>
<td>125 ft</td>
<td>100 ft³</td>
<td>— — — — — — — —</td>
</tr>
</tbody>
</table>

¹The distances are adjusted for a sign legibility distance of 180 feet for Condition A. The distances for Condition B have been adjusted for a sign legibility distance of 250 feet, which is appropriate for an alignment warning symbol sign. For Conditions A and B, warning signs with less than 6-inch legend or more than four words, a minimum of 100 feet should be added to the advance placement distance to provide adequate legibility of the warning sign.

²Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Right Lane Ends. The distances are determined by providing the driver a PRT of 1.0 to 1.5 seconds for vehicle maneuvers (2005 AASHTO Policy, Exhibit 3-3, Decision Sight Distance, Avoidance Maneuver E) minus the legibility distance of 180 feet for the appropriate sign.

³Typical condition is the warning of a potential stop situation. Typical signs are Stop Ahead, Yield Ahead, Signal Ahead, and Intersection Warning signs. The distances are based on the 2006 AASHTO Policy, Exhibit 3-1, Stopping Sight Distance, providing a PRT of 2.5 seconds, a deceleration rate of 11.2 feet/second², minus the sign legibility distance of 180 feet.

⁴Typical conditions are locations where the road user must decrease speed to maneuver through the warned condition. Typical signs are Turn, Curve, Reverse Turn, or Reverse Curve. The distance is determined by providing a 2.5 second PRT, a vehicle deceleration rate of 10 feet/second² minus the sign legibility distance of 250 feet.

⁵No suggested distances are provided for these speeds, as the placement location is dependent on site conditions and other signing. An alignment warning sign may be placed anywhere from the point of curvature up to 100 feet in advance of the curve. However, the alignment warning sign should be installed in advance of the curve and at least 100 feet from any other signs.

⁶The minimum advance placement distance is listed as 100 feet to provide adequate spacing between signs.

**Lateral Location:**
- Lateral clearance is the distance from the edge of the shoulder to the nearest edge of the sign post, except STOP & YIELD signs, which are measured to the near edge of the sign from the edge of the driving lane (fog line).
- The minimum lateral offset shall be 12 feet from the edge of the shoulder (top of in-slope). If a shoulder wider than 6 feet exists, the minimum lateral offset shall be 6 feet from the edge of the shoulder. On low volume roads (less than 400 ADT) an offset of 2’ minimum may be used where terrain, shrubbery, and/or trees prevent the above offset to be used.
• On assemblies having more than one post, the lateral clearance is measured from the post closest to the road.
• Signs should be erected individually on separate posts or mountings except where one sign supplements another or where route or directional signs must be grouped.
• Sign location should optimize its’ night-time visibility.
• Design exceptions to lateral offset may be considered if necessary to accommodate clear zone adjustments to other modes of transportation within the ROW (snowmobile trails, pedestrian paths, bike paths, etc.).

Curve Signing:
All routes with horizontal curves shall be ballbanked by the consultant to evaluate appropriate signing.
• If the Ball Bank Indicator shows readings of 10 degrees or more at a speed of 10 mph over the statutory/posted speed limit, the appropriate alignment warning sign (winding road, reverse curve, curve or turn) shall be installed.
• Advisory speed plates - If the Ball Bank Indicator exceeds 10 degrees at speeds 5 mph less than the statutory/posted speed an advisory speed plate shall be installed indicating the speed to the nearest 5 mph. (Example: Ball bank reading = 10 degrees at 52 mph on road posted at 55 mph. Advisory speed plate shows 50 mph.) Advisory speed plates should never be mounted without a warning sign.
• Chevrons (W1-8) shall be installed for every curve and Large Arrow Signs (W1-6) shall be installed for every turn for each direction of travel that has an advisory speed 10 mph or more different than the statutory/posted speed except on Minimum Maintenance Roads.
• On Minimum Maintenance Roads Large Arrow Signs (W1-6) shall be installed for each direction of travel for every curve/turn that has an advisory speed 15 mph or more different than the statutory/posted speed.

Railroad Signing:
Railroad grade crossing advance warning signs shall be placed as per Section 5F.03 for low volume roads (less than 400 ADT) and Section 8B.06 of the MUTCD for all other roadways.

Intersection Signing:
Right-of-way Control Signs
Stop or Yield signs shall be installed on each approaching roadway to a roadway that has been designated as a through roadway. Stop or Yield signs shall also be installed if a roadway has an increased speed (has intersections where there are sight issues that by statute sets those intersections at 15 mph). Consideration of rotational crops, trees with leaves, and bushes in bloom should be reviewed during inventory process to see if location and/or elevation are cause for concern within sight triangles at intersections.

If all directions of a given intersection are required to Stop or Yield, an All Way (R1-4) sign shall be installed under each Stop or Yield sign.

All other applications of Stop or Yield signs shall conform to the requirements and recommendations of Section 5B.02 for low volume roadways and Section 2B.04 – 2B.10 of the MUTCD. Any engineering judgment or optional use of right-of-way control signs shall be documented by the consultant.

Warning Signs
Double Head Large Arrow signs (W1-7) shall be installed at the top of each rural T-intersection as detailed in the standard plates for intersection signing.

Stop Ahead and/or Yield Ahead signs shall be used only where the Stop or Yield sign is not visible for a sufficient distance to permit the traveler to come to a complete stop.

W2-1 through W2-6 Intersection Warning Signs should be used where there is not adequate sight distance of the intersecting roadway as per Condition B3 of Table 2C-4. A W2-4 sign shall not be used in advance of a Stop or Yield sign.

Special Signing
Increase sizes and/or additional intersection signing may be used at locations where a known accident history or other special circumstances exist (frequent fog as an example) upon request of the local road authority.
SIGN APPLICATION

No Maintenance and Minimum Maintenance Roads
The designer shall obtain copies of resolutions, meeting minutes, or an official map showing specific locations of roads that are designated as No Maintenance and Minimum Maintenance by the local road authority.

Minimum maintenance roads shall have the “MINIMUM MAINTENANCE” (W70-1) with a “TRAVEL AT YOUR OWN RISK” (W70-3) supplemental sign installed at each public access point to designated section. All “NO MAINTENANCE” (W70-2) signs shall have a NO TRAVEL ADVISED (W70-4) sign mounted with it.

An advisory speed plate should be installed with the W70-1 sign if none of the road section can be traveled at the statutory speed limit.

Minimum Maintenance Roads shall be signed with all the regulatory and warning signs specified in this manual, the MUTCD, and special provisions unless specifically stated as not applicable for Minimum Maintenance Roads.

No Maintenance Roads do not require any additional signing beyond the W70-2 & W70-4 signs as specified above.

Road Closures
If a section of road is under construction or is anticipated to be closed with no construction activity occurring for a duration of less than six (6) months, then all closure signing shall be considered temporary and shall conform to Part 6 of the MUTCD by the local road authority. Permanent signing projects shall not address temporary signs. If the closure is to last longer than six (6) months with no construction activity, then it shall be treated as a permanent closure and can be newly signed as permanent closures within a Traffic Safety Signing Project at the request of the local road authority. Additionally, if existing sections of roadway are permanently closed or frequently closed due to natural causes, they too can be eligible for review and replacement of signs. The local road authority must provide the consultant a copy of resolution and/or minutes of meeting in which official action has occurred for closing a roadway.

Designers shall include standard permanent closure details within the plans where signing is being addressed on these closures with the project. Consideration should be given to use of hinged signs and flush mount bases where appropriate to allow ease of removal/implementation of travel restriction.

Type 3 Barricades
Type 3 Barricades shall be used to close a roadway where the appearance of an existing road or path exists beyond the closure point. Consultants shall use a local industry standard width of six (6) feet wide Type 3 barricade assemblies when application requires use of barricades. Permanent installation of barricades shall constitute the use of red and white colors as per the MUTCD. When a hazard exists on an existing roadway, the barricades shall be installed across the full width of the roadway as close as possible to the nearest useable landowner required access point to the hazard. If there are no useable access points then the full closure should occur at the nearest intersecting roadway. A Road Closed sign (R11-2) shall be installed with each full-width road closure. If the closure point is not located at the nearest intersection and if the closure is not clearly visible from the nearest intersection, then a single Type 3 barricade with a Road Closed XX Miles (or Feet) Ahead Local Traffic Only (R11-3) shall be installed on the shoulder at the nearest intersection. These sign assemblies shall be installed with breakaway fixed location sign posts. Skid mounts are not an acceptable option for permanent closures. If local authority access is needed to the area, a gate style of closure should be considered in lieu of a barricade closure.

Type 4 Object Markers (End of Road Markers)
Where a road has been completely obliterated such that it no longer could be construed as a road or has never had the appearance of a road, red Type 4 OM’s should be installed across the roadway. A minimum of 3 assemblies should be installed on a 20’ wide road top. An additional sign assembly should be installed per every 5’ of width of road top. For added emphasis, additional signs can be mounted on each assembly; however, Traffic Safety Signing Projects will only pay for one sign per assembly.

All gates across roadways shall have Type 4 OM’s attached to the gate as well as proper advance warning signs installed of the road being blocked.
DELINEATION

Delineators

The Consultant shall include delineation notes and layout details within the plans and shall add a table showing per route delineation to the plan notes to provide any further detail to the Contractor to be able to install. No delineation is to be installed on Minimum Maintenance Roads. General rule of thumb of having visibility of at least 3 delineators on the same side of roadway at all times should be used to adjust delineator spacing up to the maximum distances specified. When normal spacing is interrupted by structures, crossroads, or ramps, delineators falling within such areas may be moved in either direction a distance not exceeding one-quarter of the standard spacing. Delineators still falling within such areas should be eliminated. Standard delineation shall be back-to-back installations except on one-way roadways.

One Back-to-Back blue reflector may be left in-place at a private approach. Blue delineators shall not be used to mark county/township roads or field entrances. Installation of new blue delineators will not be addressed with these Traffic Safety Signing Projects, however, if additional blue delineators exists then the Consultant shall identify and include their removal within the plans as incidental work for the Contractor. Red reflectors placed illegally on right of way by property owners shall be noted by Consultant and removed by the Contractor via plan note.

**Intersection Delineation:** Type IV delineators (4” round) shall be installed on all radii of intersecting roads in which the individual radius or a combination radius is greater than or equal to 75’ and also has stop/yield control existing or proposed. Refer to Special Detail L30 (1&2 of 2). At all other intersections that have stop/yield, or large arrows, one (1) Type IV delineator (4” round) shall be installed on each sign assembly.

**Guardrail Delineation:** Where guardrail is present, guardrail delineation shall be installed as per Standard Plate 632.40 (1-4 of 4).

**Hazard Delineation:** Any non-recoverable slope, non-transverable slope or where some other hazard is located within the clear zone and is not protected by guardrail shall have standard delineators installed at a maximum of 200’ spacing along the hazard. This requirement may be waived if no fixed object exists and the elevation difference between bottom of ditch and top of road does not exceed five (5) feet.

**Curve Delineation:** Delineators shall be installed on the outside of each curve with the degree of curve greater than 2.5 degrees and/or having a radius of less than 2300’, or where obstructions that block the line of sight along a curve less than 1,584 feet long. The spacing along the outside radius of horizontal curves and for three spaces in advance and for three spaces beyond the curve is given in the following table:

**Max. Spacing for Delineators on Outside Radius of Horizontal Curves with Degree of Curvature Greater than 2.5 Degrees and/or Radius Less than 2300 Feet (Distance in Feet Rounded to the Nearest 5 Feet)**

<table>
<thead>
<tr>
<th>Radius Of Curve</th>
<th>Spacing On Curve</th>
<th>Spacing in Advance &amp; Beyond Curve (in feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1st</td>
</tr>
<tr>
<td>50</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>150</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>250</td>
<td>40</td>
<td>85</td>
</tr>
<tr>
<td>300</td>
<td>50</td>
<td>95</td>
</tr>
<tr>
<td>400</td>
<td>55</td>
<td>110</td>
</tr>
<tr>
<td>500</td>
<td>65</td>
<td>125</td>
</tr>
<tr>
<td>600</td>
<td>70</td>
<td>140</td>
</tr>
<tr>
<td>700</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>800</td>
<td>80</td>
<td>165</td>
</tr>
<tr>
<td>900</td>
<td>85</td>
<td>175</td>
</tr>
<tr>
<td>1000</td>
<td>90</td>
<td>185</td>
</tr>
</tbody>
</table>

Spacing for specific radii not shown may be interpolated from table or computed from the formula \( S = 3\sqrt{(R-50)} \). The minimum spacing should be 20 feet. The spacing on curves should not exceed 300 feet. The spacing of the first delineator approaching a curve is 2xS, the second is 3xS and the third is 6xS but not to exceed 300 feet. If a spacing less than 300 feet is used approaching the curve, the distance shown above should be adjusted accordingly.

The requirement for delineation along the curve is not required where W1-8 (Chevron) signs are installed however; the delineators on the approach and departure to the curve are still required.
**Structure Delineation:** Bridges or culverts (meeting the federal definition of a bridge) that the end falls within the clear zone and are not protected by guardrail shall have delineation installed and shall consist of a minimum of four (back-to-back) delineators on each side of the roadway spaced 50 feet apart. The delineators shall be located in a straight line beginning a minimum of 200 feet from the corner of the bridge and at the normal offset distance outside the shoulder edge and tapering to the inside edge of the obstruction.

**Full Delineation:** Full standard delineation includes all the above referenced delineation plus delineators on tangent sections and inside radius of curves. Full delineation is recommended to be installed on all improved two-lane (or greater) through roads (gravel/AC/PCCP surfaced with minimum of 20’ width and a 4’ shoulder) with an ADT of 50 or greater. Quantity shall be based on back-to-back delineation at a standard spacing of 528 feet in tangent sections on the same side of roadway and staggered placement with those on the opposite side of the road in those tangents. The spacing for delineators on the inside radius of curves shall also be 528 feet. If the local entity has objections to this recommendation, the Consultant is to refer that objection to the DOT for discussion.

**Object Markers**

**Type 2 OM’s**
Type 2 Object Markers shall be installed at guardrail end terminals. If box culvert, pipe culvert or cattle pass ends are outside the shoulder area do the following:

- If the ends are within the clear zone recovery area recommended in the SDDOT Local Roads Manual, measure the longitudinal opening width(s) (opening plus wall thickness) at the clear zone boundary or at the end of the pipe-end treatment(s), whichever is applicable and for box culvert, pipe culvert or cattle pass ends with outside dimensions:
  - smaller than 30 inches may install 1 yellow steel fence post on the upstream traffic-flow side of the pipe at the discretion of the local road authority. *(Note: the cost for this must be paid by the local road authority - 100% non-participating.)*
  - 30 inches or larger but less than 60 inches install 1 Type 2 double-sided marker on the upstream traffic-flow side of the pipe or box opening.
  - for multiple pipes with a combined width of less than 60 inches, also install 1 Type 2 double-sided marker on the upstream traffic-flow side of the pipe.
- For all box culverts, pipe culverts or multiple pipes, or cattle pass ends with outside dimensions greater than or equal to 60 inches, install 4 single-sided posts, 1 at each of the four corners of the structure facing away from the structure.
- For appurtenances smaller than 60 inches in diameter and outside the clear zone, mark with a single marker such as a steel post painted yellow at the discretion of the local road authority. *(Note: the cost for this must be paid by the local road authority - 100% non-participating.)*

Type 2 object markers shall conform to Standard Specification Section 982. Payment for the Type 2 object markers shall be in conformance with Standard Specification 632.5C. Payment for yellow steel posts shall be per each as Pipe End Marker Post and shall be 100% non-participating.

The inner edge of the Type 2 object marker shall be installed at the opening of the pipe end section, box culvert, or cattle pass. Refer to Standard Plates 632.01, 632.10 and 632.40 for the placement of Type 2 object markers and post lengths.

**Type 3 OM’s**
Type 3 Object Markers shall be installed if box culvert, pipe culvert or cattle pass ends are inside the shoulder break point and are not protected by guardrail, install a Type 3 object marker at the opening on both sides of the road, with the inside edge of the marker in line with the inner edge of the opening. No Type 3 object markers on bridge ends will be used when guardrail end terminal object markers are used or if the bridge width exceeds the width of road and shoulder area.

All Type 3 OM’s installed with these Traffic Safety Projects shall consist of a flexible marker style design and shall conform to standard notes as provided to the Consultant.

**Type 4 OM’s**
See Road Closures for Type 4 Object Markers.

**Object Marker Mounting Height**
To mark appurtenances equal to or larger than 30 inches in diameter, mount object markers at the following heights in these circumstances:
- To mark objects in the roadway or 8 feet or less from the shoulder or curb, make the mounting height to the bottom of the object marker or top of the steel post at 4 feet above the roadway with the following exception; if the overall width perpendicular to the centerline of the roadway is 40’ or less between two object markers, the height of the markers shall be adjusted such that the top of the marker or post does not exceed 3’ above the edge of the driving surface.
- To mark objects more than 8 feet from the shoulder or curb, make the mounting height to the bottom of the object marker or top of steel post at 4 feet above the ground measured from the base of the post.

**GUIDE SIGNS**

Design of guide signs shall be as per the MUTCD and Highway Signs Manual (HSM). A layout detail for all guide signs, with exception (see below reference the D3-1 street name sign), shall be included in the plans. Additionally, a plan note shall be used requiring that shop drawings be submitted and approved prior to manufacturing of any special sign. The note should specify an email address of the project designer and Doug Kinniburgh (doug.kinniburgh@state.sd.us) and James Ainslie (James.Ainslie@state.sd.us) for the submittal. Formal approval shall be the responsibility of the DOT.

D3-1 Street Name Signs: Sign design shall include a border and conform to the HSM layout requirements. Street name sign sizes shall be estimated for the purpose of plan preparation and quantities based on the following guidelines:

- Local roads with speed limit of 25 mph or less and post-mounted locations:
  - shall utilize a 4” initial upper-case legend with a 3” lower case on a 9” sign blank.
  - Width of the 9” sign shall be estimated based on the following table:

<table>
<thead>
<tr>
<th>Street Name (example)</th>
<th>Characters (including spaces)</th>
<th>Hwy Font</th>
<th>Plate Length (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD 8</td>
<td>4</td>
<td>D</td>
<td>24</td>
</tr>
<tr>
<td>27 St</td>
<td>5</td>
<td>D</td>
<td>24</td>
</tr>
<tr>
<td>270 St</td>
<td>6</td>
<td>D</td>
<td>30</td>
</tr>
<tr>
<td>2701 St</td>
<td>7</td>
<td>D</td>
<td>30</td>
</tr>
<tr>
<td>27002 St</td>
<td>8</td>
<td>D</td>
<td>30</td>
</tr>
<tr>
<td>270003 St</td>
<td>9</td>
<td>D</td>
<td>36</td>
</tr>
<tr>
<td>2700004 St</td>
<td>10</td>
<td>C</td>
<td>36</td>
</tr>
<tr>
<td>27000005 St</td>
<td>11</td>
<td>C</td>
<td>36</td>
</tr>
<tr>
<td>270000006 St</td>
<td>12</td>
<td>C</td>
<td>36</td>
</tr>
<tr>
<td>270000007 St</td>
<td>13</td>
<td>B</td>
<td>36</td>
</tr>
<tr>
<td>2700000008 St</td>
<td>14</td>
<td>B</td>
<td>36</td>
</tr>
<tr>
<td>27000000009 St</td>
<td>15</td>
<td>B</td>
<td>42</td>
</tr>
<tr>
<td>Hidden Valley Rd</td>
<td>16</td>
<td>B</td>
<td>42</td>
</tr>
</tbody>
</table>

- All 2-lane roadways with post-mounted locations shall utilize a 6” initial upper case legend with a 4.5” lower case on a 12” high sign blank.
- Multi-lane roadways with speeds greater than 40 mph and post-mounted locations shall utilize an 8” initial upper case legend with a 6” lower case on a 12” high sign blank.
- Multi-lane roadways with speeds 40 mph or less and post-mounted locations shall utilize a 6” initial upper case legend with a 4.5” lower case on a 12” high sign blank.
- Width of the 12” high sign shall be estimated based on the following table:

<table>
<thead>
<tr>
<th>Street Name (example)</th>
<th>Characters (including spaces)</th>
<th>Hwy Font</th>
<th>Plate Length (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD 8</td>
<td>4</td>
<td>D</td>
<td>30</td>
</tr>
<tr>
<td>27 St</td>
<td>5</td>
<td>D</td>
<td>30</td>
</tr>
<tr>
<td>270 St</td>
<td>6</td>
<td>D</td>
<td>36</td>
</tr>
<tr>
<td>2701 St</td>
<td>7</td>
<td>D</td>
<td>36</td>
</tr>
<tr>
<td>27002 St</td>
<td>8</td>
<td>D</td>
<td>42</td>
</tr>
<tr>
<td>270003 St</td>
<td>9</td>
<td>D</td>
<td>48</td>
</tr>
<tr>
<td>2700004 St</td>
<td>10</td>
<td>D</td>
<td>48</td>
</tr>
<tr>
<td>27000005 St</td>
<td>11</td>
<td>D</td>
<td>54</td>
</tr>
<tr>
<td>270000006 St</td>
<td>12</td>
<td>C</td>
<td>54</td>
</tr>
<tr>
<td>270000007 St</td>
<td>13</td>
<td>B</td>
<td>48</td>
</tr>
<tr>
<td>2700000008 St</td>
<td>14</td>
<td>B</td>
<td>48</td>
</tr>
<tr>
<td>27000000009 St</td>
<td>15</td>
<td>B</td>
<td>54</td>
</tr>
<tr>
<td>Hidden Valley Rd</td>
<td>16</td>
<td>B</td>
<td>54</td>
</tr>
</tbody>
</table>
Street names that exceed the number of characters allowed in the table above shall be laid out as a multi-line sign and detail shall be included in the plans. General design criteria should be maintained with use of the Highway B Font as a minimum stroke width and limiting the width of the sign to 54 inches.

**SIGN ASSEMBLY AND INSPECTION**

Installation of the support shall be accomplished by driving the post into the soil or drilling and backfilling after placement of the post. The depth to be drilled will depend on soil conditions and type of post being installed. Square tubular posts bases shall be placed to a depth of 4 feet. The breakaway plane of the post shall not exceed 4” in height above the ground measured from any point within a 60” radius of the post.

Vertical plumb of the support should be checked during placement and/or backfill of the sign base. Appropriate measures shall be taken to ensure proper tamping of backfill material. Mound up soil around the base (not to exceed 4” in depth) to help moisture run off away from the base and minimize erosion.

Signs shall not be overlapped. A 2 inch separation should be left between signs and a 4 inch separation between set of signs. Cardinal direction signs (if used) should be in proper order as shown in this manual and have matching colors. **Hardware should not be over tightened.**

Signs of 30” and smaller are predrilled. New signs 36” and larger are not and must be drilled. **Care should be taken to not scratch the new sign.** Drilling should be on even inches to place the signs on metal predrilled supports. Plastic washer shall be used between a metal washer and the reflective sheeting.

**Project Inspection**

During the first week of construction, each installed device shall be inspected for full compliance. Subsequent weekly inspections shall be performed to document full compliance on 15% or more of devices installed during that week. A random selection of devices should be made to ensure a good representation of the work accomplished.

Documentation shall include the quantities and dimensions of each pay item installed, and the location and dates of installation. The Contractor may provide this information during the project for progress pay estimate purposes. Final pay quantities will be determined by the information provided in the As-Built Survey.

**As-Built Survey**

The Contractor shall provide an as-built inventory of all installed devices to the DOT Area Office within 30 calendar days of the completion of the field work. The inventory shall be delivered in electronic spreadsheet format and shall contain the following information:

1. Description of Device (include the MUTCD Sign Code)
2. Description of Support(s)
3. Date Installed
4. Location of Device (not required for white delineator items)
5. Owner of Device (County, Township, City, etc.)

The device location shall be provided in GPS format to an accuracy of 10 feet +/- . Elevations are not required. The DOT Area Office will review the inventory and provide a copy to the Owner(s) if requested

All costs for this work shall be incidental to the contract lump sum price for “As-Built Survey”. No separate payment will be made for As-Built Survey due to increases in the quantities of devices installed.

**Staking**

The Contractor shall stake all device locations prior to installation. The locations of the devices as noted in the plans are approximate. The lateral distance from the roadway and the height of each device shall be established by the Contractor in accordance with the Standard Plates and the current MUTCD.

All costs for this work shall be incidental to the contract unit price for the various signing bid items. No separate payment will be made for staking due to increases in the quantities of devices installed.
WARNING SIGN
(Drawing shown from face of sign)

Minimum 4' (Rural) or 6' (Urban) Above
Edge of Driving Lane

Variable Slope

Ground Line

Top of Inslope

See detail sheets for bases.

WARNING SIGN WITH SUPPLEMENTAL SIGN
(Drawing shown from face of sign)

Minimum 5' (Rural) or 7' (Urban) Above
Edge of Driving Lane

Variable Slope

Ground Line

Top of Inslope

See detail sheets for bases.

WARNING SIGN
(Drawing shown from face of sign)

Minimum 4' (Rural) or 6' (Urban) Above
Edge of Driving Lane

Variable Slope

Ground Line

Top of Inslope

See detail sheets for bases.

30" WARNING SIGNS
(Typical Sign Detail)

Sheet 1 of 1

December 9, 2013
**WARNING SIGN WITH SUPPLEMENTAL SIGN**

(Drawing shown from face of sign)

- **Minimum 4' (Rural) or 6' (Urban) Above Edge of Driving Lane**
- **Top of In-slope**
- **Ground Line**
- **Variable Slope**

This style of breakaway base shall be used when using a tubular post size of 2 1/4" or larger.

See detail sheets for bases.

- **Aluminum U-Channel Stiffeners**
- **Plastic Washer**
- **Channeled Stiffener**

**Stiffener and Post Spacing**

<table>
<thead>
<tr>
<th>Sign Size</th>
<th>W</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>36&quot;</td>
<td>24&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>48&quot;</td>
<td>30&quot;</td>
<td>30&quot;</td>
</tr>
</tbody>
</table>

- A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the metal washer shown.

---

**WARNING SIGN**

(Drawing shown from face of sign)

- **Minimum 5' (Rural) or 7' (Urban) Above Edge of Driving Lane**
- **Top of In-slope**
- **Ground Line**
- **Variable Slope**

This style of breakaway base shall be used when using a tubular post size of 2 1/4" or larger.

See detail sheets for bases.

- **Aluminum U-Channel Stiffeners**

---

**36" AND 48" WARNING SIGNS**

(Typical Sign and Stiffener Detail)

*December 9, 2013*
RECTANGULAR OR SQUARE SIGN < 36" IN WIDTH  
(Drawing shown from face of sign)

<table>
<thead>
<tr>
<th>Post Spacing</th>
<th>Stiffener Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign Width</td>
<td>Sign Height</td>
</tr>
<tr>
<td>36&quot;</td>
<td>18&quot; 12&quot;</td>
</tr>
<tr>
<td>42&quot;</td>
<td>24&quot; 18&quot;</td>
</tr>
<tr>
<td>48&quot;</td>
<td>30&quot; 24&quot;</td>
</tr>
<tr>
<td>54&quot;</td>
<td>36&quot; 24&quot;</td>
</tr>
<tr>
<td>60&quot;</td>
<td>42&quot; 36&quot;</td>
</tr>
<tr>
<td>66&quot;</td>
<td>48&quot; 36&quot;</td>
</tr>
</tbody>
</table>

For sign widths not shown in the above table, post spacing shall be rounded to the nearest six (6) inches based on 3/5 of the overall sign width. Stiffener spacing shall also be in six (6) inch increments but shall not be placed less than three (3) inches from the top or bottom of sign.

RECTANGULAR OR SQUARE SIGN > 36" IN WIDTH  
(Drawing shown from face of sign)

For sign widths not shown in the above table, post spacing shall be rounded to the nearest six (6) inches based on 3/5 of the overall sign width. Stiffener spacing shall also be in six (6) inch increments but shall not be placed less than three (3) inches from the top or bottom of sign.

A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the metal washer shown.

See detail sheets for bases.
A plastic washer, as recommended by the sheathing manufacturer, shall be installed between the sign face and the metal washer shown.

<table>
<thead>
<tr>
<th>One Way Stiffener and Post Spacing</th>
<th>Large Arrow Stiffener and Post Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign Width</td>
<td>w</td>
</tr>
<tr>
<td>60&quot;</td>
<td>30&quot;</td>
</tr>
<tr>
<td>60&quot;</td>
<td>36&quot;</td>
</tr>
</tbody>
</table>

June 10, 2013
Stiffeners

U-Channel

Aluminum

Variable Slope

(Drawing shown from face of sign)

3"

7' Minimum

12'

1"

Edge of Driving Lane or 7' (Urban) Above Minimum 5' (Rural)

48" OR 60" YIELD SIGN

A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the metal washer shown.

See detail sheets for bases.

Ground Line

Top of Inslope

Edge of Driving Lane

Variable Slope

(Sheet 1 of 1)
30" STOP OR 30"-36" YIELD
(Typical Sign Details)

Minimum 5' (Rural) or 7' (Urban) Above Edge of Driving Lane
12'

Top of Inslope
Edge of Driving Lane

Variable Slope
Ground Line

See detail sheets for bases.

June 10, 2013

SDDOT

30" or 36"

Top of Inslope
Edge of Driving Lane

Variable Slope
Ground Line

Shef 1 of 1

SPECIAL DETAIL
L06
This style of breakaway base shall be used when using a tubular post size of 2 1/4" or larger.

A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the metal washer shown.

A variable slope base shall be used when using a tubular post size of 2 1/4" or larger.

Minimum 5' (Rural) or 7' (Urban) above edge of driving lane.

Ground Line

Top of Inslpde

36" OR 48" STOP SIGNS
(Typical Sign and Stiffener Details)

Stiffener and Post Spacing

<table>
<thead>
<tr>
<th>Sign Size</th>
<th>W</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>36&quot;</td>
<td>24&quot;</td>
<td>24&quot;</td>
</tr>
<tr>
<td>48&quot;</td>
<td>30&quot;</td>
<td>30&quot;</td>
</tr>
</tbody>
</table>

(Drawing shown from face of sign)
A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the metal washer shown.

**SEC. A A**

**NO PASS ZONE PENNANT**

(Typical Sign and Stiffener Details)
NOTE: The first Chevron shall be placed within 50' of beginning of curve from each direction of travel and shall be mounted as a single mount installation. All intermediate installations shall be mounted as a double mount installation with approach angle adjusted such that 3 sign faces are visible at all times when traveling through the curve.

<table>
<thead>
<tr>
<th>SIGN SIZE (IN)</th>
<th>12x18</th>
<th>18x24</th>
<th>24x30</th>
<th>30x36</th>
<th>36x48</th>
</tr>
</thead>
<tbody>
<tr>
<td>POST LENGTH L (FT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6:1</td>
<td>6/2</td>
<td>7</td>
<td>7 1/2</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>4:1</td>
<td>7</td>
<td>7 1/2</td>
<td>8</td>
<td>8 1/2</td>
<td>9 1/2</td>
</tr>
<tr>
<td>3:1</td>
<td>7 1/2</td>
<td>8</td>
<td>8 1/2</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

February 25, 2013
A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the bolt head and also between the sign and the nut.

NOTE: Sign assembly may be mounted above yield or stop sign - refer to plan note or Table of Permanent Signing for specific locations, when mounting above another sign, 2" of vertical clearance shall be maintained between signs.

Back-to-back signs over 24" in width shall be bolted to each other with at least one connector on each end of sign.

Minimum 5' (Rural) or 7' (Urban) Above

Edge of Driveway

12'

Ground Line

Top of Inslope

Variable Slope

See detail sheets for bases.

NOTE: Sign assembly may be mounted above yield or stop sign - refer to plan note or Table of Permanent Signing for specific locations. When mounting above another sign, 2" of vertical clearance shall be maintained between signs.

Back-to-back signs over 24" in width shall be bolted to each other with at least one connector on each end of sign.

Minimum 5' (Rural) or 7' (Urban) Above

Edge of Driveway

12'

Ground Line

Top of Inslope

Variable Slope

See detail sheets for bases.
3. The manufacturer shall also provide certification that the breakaway system furnished will develop the full shear and bending yield strength of the sign post section being applied.

4. All posts shall be galvanized in accordance with ASTM A653, Des. G-90.

5. All hardware shall be galvanized in accordance with ASTM A153.

GENERAL NOTES-

2. The manufacturer shall provide certification that the posts and hardware furnished have essentially the same chemistry, mechanical properties and geometry as that used in the FHWA tests, and that it will meet the FHWA change in velocity requirements.

3. The manufacturer shall also provide certification that the breakaway system furnished will develop the full shear and bending yield strength of the sign post section being applied.

4. All posts shall be galvanized in accordance with ASTM A653, Des. G-90.

5. All hardware shall be galvanized in accordance with ASTM A153.

Dimensions shown may vary by Manufacturer. The Contractor shall use manufacturer recommended assembly parts and procedures. Sign installations must meet or exceed NCHRP 350 or MASH breakaway requirements and be FHWA approved.

NOTE: The top of anchor post shall NOT extend more than 4" max.
SIGN BASE DETAILS FOR A 2" SIGN POST

NOTE:
Corner bolt shown is for attaching sign post to base.
The MPJ shall be attached to base using two 3/8" straight bolts for all new installations. If installing the MPJ on an existing post base, no bolts are used and the MPJ must be driven on a minimum of 2" below the ground line.

Height of h1 (distance between breakaway plane and top of MPJ) shall not be less than 9" and shall overlap the collar section such that at least 1 3/8" straight bolt shall be common for the base section, the collar section, and the MPJ.

SIGN BASE DETAILS FOR A 2 1/2" SIGN POST

NOTE:
A 3-piece base assembly is shown, however, a 2-piece (Hog Leg) assembly may also be used.

March 28, 2014

TUBULAR POST BASE DETAILS
(Typical Soil Installation)

SDDOT
SPECIAL DETAIL L21
Sheet 1 of 1
CONCRETE MODEL

CONCRETE MODELS ONLY

PER ASTM A-569

4" X 4" X .105" [65 x 65 x 5]

CAP

OPTIONAL WELDED STEEL BOTTOM CAP

4" X 4" X .105" [65 x 65 x 5]

PER ASTM A-569

CONCRETE MODELS ONLY

.75 ROUND X 7 [20 ROUND X 175]

STEEL WELDED CLEAN OUT BAR

PER ASTM A-36

48" Base

March 1, 2016
LATERAL OFFSET
(Typical Rural Sign Installations)
LATERAL OFFSET
(Typical Urban Sign Installations)
If $BW = \text{or} < 40'$, then $# = 3'$
If $BW > 40'$, then $# = 4'$

** If Guardrail is present, refer to Standard Plates 632.40 for installation of Type 2 Object Markers
4"x4" DELINEATORS
with Type XI reflective sheeting

4"x4" (WHITE)
4"x4" (AMBER)
DELINELATOR

3/4" Radius

VARIABLE SLOPE

EDGE OF DRIVING LANE
TOP EDGE OF SHOULDER

2'-8'

30 Holes
3/8" Diameter
5/8" Centers

1/2 lb./ft., Flanged channel post, painted green (delimiter post)

(Typical)

DETAIL FOR SINGLE MOUNTING
DELINELATORS ON POST

DETAIL FOR MOUNTING 4"x4" DELINELATORS BACK TO BACK ON POST

SPECIAL DETAIL
L30
Sheet 1 of 2

DELINEATORS
(Typical Placement and Mounting Details)

SDDD DOT

March 1, 2016
4" tubular delineator installed as shown only on intersections with radius or a combination radius greater than 75' and also has stop/yield control. At all other intersections with stop/yield control, one 4" tubular delineator shall be installed on each stop/yield sign assembly and large arrow (Tee-intersections).
TYPICAL SIGN LAYOUT FOR THROUGH ROADWAYS WITH IMPROVED SIDERoad AT ACUTE ANGLE
TYPICAL SIGN LAYOUT FOR THROUGH ROADWAYS WITH IMPROVED SIDEROAD

July 24, 2012
TYPICAL SIGN LAYOUT FOR ROADWAYS WITH UNIMPROVED SIDEROAD

EDGE OF DRIVING LANE
EDGE OF SHOULDER

* Variable distance based on radius (max. 50').

June 10, 2013

L42

Sheet 1 of 1
TYPICAL SIGN LAYOUT FOR DIVIDED ROADWAYS WITH SIDEROAD

Variable distance based on radius (max. 50').

** For medians greater than 30 feet wide.

June 10, 2013

SPECIAL DETAIL
L43
Sheet 1 of 1
Legend and border shall be black vinyl non-reflective material on fluorescent yellow super/very high intensity background conforming to AASHTO M 268 (ASTM D4956).

The W70-3 shall be installed at each location where a W70-1 is installed and a W70-4 shall be installed at each location where a W70-2 is installed.

Use of the W70-2 & W70-4 sign shall be limited to Township Roads only.
Type 2 object marker (6'x12")

Edge of driving lane

Edge of shoulder

1.12 Lb./Ft. flanged channel post painted green (delineator post)

1/2"Radius (Typ)

5/8" Dia. Hole (Typ)

1/4" to 1/4" grip range

1/4" twin rivet (single and back to back)

* Type 2 object markers to be in same line as existing delineators. If no delineators are present, place type 2 object markers 6' from the edge of shoulder.

** Type 2 object markers shall be 4' above the ground when placed more than 8' from edge of shoulder.

<table>
<thead>
<tr>
<th>Distance To Marker (Ft.)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Length L (Ft.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope</td>
<td>4H</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>3H</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
TYPE 2 OBJECT MARKER DETAILS AND POST ORIENTATION

GENERAL NOTES:
The type 2 object markers and the 1.12 lb/ft flanged channel posts shall be in conformance with Specifications Section 982.2 J.

Payment for the type 2 object markers shall be in conformance with Specification Section 632.5 B.

June 26, 2015

Published Date: 2nd Qtr. 2018

TYPE 2 OBJECT MARKER INSTALLATION AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES

PLATE NUMBER

632.10

Sheet 1 of 1
GENERAL NOTES:
Background shall be high intensity green.
Legend shall be high intensity white.
Signs shall have squared corners with no border.
Sign locations shall be staked by the Engineer.

Published Date: 2nd Qtr. 2018

SDDOT

NON-INTERSTATE MILEAGE REFERENCE MARKERS

PLATE NUMBER 632.30

Sheet 1 of 1

December 23, 2003
TYPICAL GUARDRAIL LAYOUTS

- **B** Steel Beam Guardrail Delineation
- **HT** High Tension Cable Guardrail Delineation
- **E** Guardrail End Terminal Object Marker
- **M** Type 2 Object Marker
- ▲ 3 Cable Guardrail Delineation

*For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.*
**STEEL BEAM GUARDRAIL DELINEATION**

White or fluorescent yellow sheeting. Sheet color shall match edgeline color. A minimum of 16 square inches of sheeting area is required.

Guardrail delineators may be fabricated from 0.080" aluminum or flexible plastic. Dimensions of flexible delineators may vary by manufacturer.

**ADHESIVE OBJECT MARKER**

Adhesive object marker dimensions may vary due to shape of terminal end. A minimum of 256 square inches of object marker sheeting area is required. The sheeting shall be fluorescent yellow.
3 CABLE GUARDRAIL DELINEATION

4.00 lbs/ft Steel Post

3 CABLE GUARDRAIL DELINEATION

1 1/2' Radius (Typ.)
5/8' Diameter Hole

1.12 lbs/ft Flanged Channel Steel Post Painted Green (Direct Drive)

3/8' Diameter Holes (Typ.)

Variable Slope

TYPE 2 OBJECT MARKER

(For Marking 3 Cable Guardrail Anchor, High Tension Cable Guardrail Anchor, and Trailing End Terminal)

June 9, 2017

Published Date: 2nd Qtr. 2018

Delineation of Guardrail

Sheet 3 of 4
GENERAL NOTES:

The delineation of high tension cable guardrail shall be reflective sheeting placed back to back on every other post cap or cable spacer. The sheeting shall be type XI in conformance with ASTM D4956. The color of the reflective sheeting shall be the same as the nearest pavement marking.

The delineators for steel beam guardrail and sheeting on 3 cable guardrail posts shall be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting shall be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting shall be on both sides of the delineators and guardrail posts and shall be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

When steel beam guardrail is attached to a bridge the first delineator shall be attached to the post nearest the bridge.

At bridges with guardrail less than 200 feet in length, a minimum of 4 delineators shall be placed in addition to the end terminal yellow object marker. The spacing between the delineators shall be approximately one third of the length of the guardrail.

At bridges with guardrail 200 feet and greater in length, including bridges that have steel beam guardrail transitioning to 3 cable guardrail, the delineators shall be placed at a spacing of approximately 50 feet. Delineation shall extend throughout the length of the guardrail system.

Steel beam guardrail that is not attached to a bridge and is less than 200 feet in length, a minimum of 4 delineators shall be placed in addition to the end terminal yellow object markers. The spacing between the delineators shall be approximately one third of the length of the guardrail.

Steel beam guardrail that is not attached to a bridge and is 200 feet and greater in length, including steel beam guardrail transitioning to 3 cable guardrail, the delineators shall be placed at a spacing of approximately 50 feet. Delineation shall extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation on 3 cable guardrail and steel beam guardrail shall be included in the contract unit price per each for "Guardrail Delineator".

All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail shall be incidental to the respective high tension cable guardrail bid item.

An adhesive object marker shall be placed on the end of the W beam guardrail or MSG end terminal. The adhesive object marker dimensions may vary due to the size of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting shall be fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the adhesive object marker shall be incidental to various contract items.

A type 2 object marker shall be placed adjacent to the 3 cable guardrail anchor, high tension cable guardrail anchor, and trailing end terminal at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") shall have fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware shall be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

June 9, 2017
Full Road Closure **

Optional - Advance barricade and Road Closure Ahead assembly.

Install on Shoulder of driving lane in direction of travel at nearest intersecting road.

- Optional advance warning depicting specific hazard.
- Barricades may be staggered to allow access to the road hazard.

June 13, 2017

GUIDES FOR TRAFFIC CONTROL DEVICES
ROAD CLOSED FOR HAZARD ON IMPROVED ROADWAY

SPECIAL DETAIL L70

Sheet 1 of 1
Where possible, closure point should be located near a driveway or approach where a vehicle can safely maneuver to turn around.

- Advance signing may be omitted if roadway is clearly not possible from sight of crossroad.

** If road section is newly obliterated, temporary Type 3 Barricades shall be used in lieu of OM4-3 until vegetation is established.

<table>
<thead>
<tr>
<th>Posted Speed Prior to Work (M.P.H.)</th>
<th>Spacing of Advanced Warning Signs (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 30</td>
<td>325</td>
</tr>
<tr>
<td>35 - 40</td>
<td>350</td>
</tr>
<tr>
<td>45 - 50</td>
<td>500</td>
</tr>
<tr>
<td>55 - 65</td>
<td>750</td>
</tr>
</tbody>
</table>

February 8, 2016
**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.

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**Published Date:** 2nd Qtr. 2018

**Plate Number:** 634.99

Sheet 1 of 1
Appendix A

The following statutes are for general reference only. As of July 1, 2018, numerous changes in specific language of many of the following laws have been enacted. Please refer to current language.

SD State Codified Laws on No Maintenance and Minimum Maintenance Roads

31-12-46. Minimum maintenance roads established.
The board of county commissioners may designate any road on the county highway system as a minimum maintenance road if the board determines that the road or a segment of the road is used only occasionally or intermittently for passenger and commercial travel. The board shall identify the beginning and end points of the road designated as minimum maintenance. A minimum maintenance road may be maintained at a level less than the minimum standards for full maintenance roads, but shall be maintained at the level required to serve the occasional or intermittent traffic.

31-12-47. Posting notification of minimum maintenance road.
The board of county commissioners shall post signs on a minimum maintenance road to notify the motoring public that it is a minimum maintenance road and that the public travels on the road at its own risk. The signs shall be posted at the entry points to and at regular intervals along a minimum maintenance road. A properly posted sign shall be prima facie evidence that adequate notice of a minimum maintenance road has been given to the motoring public.

31-13-1. Township supervisors responsible for secondary roads.
The board of township supervisors shall construct, repair, and maintain all of the township roads within the township except for section lines designated as no maintenance section lines pursuant to § 31-13-1.4. The township road system consists of section line roads; judicially declared roads; roads impliedly accepted by the township through routine performance of certain maintenance activities, such as grading, graveling and snow removal, and accepting funds from the county pursuant to §§ 32-11-4.1 and 32-11-6 for a period of at least fifteen years; and any other roads designated by resolution of the board as being on the township road system. A road may only be vacated through the process specified in chapter 31-3. Before a road may be added to the township road system, the road shall meet the minimum requirements specified in §§ 31-18-2 and 31-13-4, unless the board, by resolution, waives this requirement.

31-13-1.1. Designation of minimum maintenance road--Level of maintenance.
The board of township supervisors may designate a secondary road within the township as a minimum maintenance road if the board determines that the road or a segment of the road is used only occasionally or intermittently for passenger and commercial travel. The board shall identify the beginning and end points of the road designated as minimum maintenance. A minimum maintenance road may be maintained at a level less than the minimum standards for full maintenance roads, but shall be maintained at the level required to serve the occasional or intermittent traffic.

31-13-1.2. Posting of warning signs on minimum maintenance roads.
The board of township supervisors shall post signs on a minimum maintenance road to notify the motoring public that it is a minimum maintenance road and that the public travels on the road at its own risk. The signs shall be posted at the entry points to and at regular intervals along a minimum maintenance road. A properly posted sign shall be prima facie evidence that adequate notice of a minimum maintenance road has been given to the motoring public.

31-13-1.3. Designation of full and minimum maintenance roads at annual meeting--Map.
The board shall, at its annual meeting, designate which township roads are full maintenance roads and which are minimum maintenance roads. The board of township supervisors shall publish any resolution designating a township road as minimum maintenance if the road is a school route. The designation is final, after a lapse of thirty days, unless appealed as provided in chapter 31-3. Following its annual meeting, the board shall submit to the county auditor an official map showing each road on the township road system, including any road designated as a minimum maintenance road.

31-13-1.4. Designation of no maintenance section line.
The board of township supervisors may designate an unimproved section line not maintained for vehicle travel as a no maintenance section line. The board shall identify the beginning and end point of the section line designated as no maintenance. The board does not have any responsibility on a no maintenance section line except to require removal or remediation of a manmade obstruction, if needed, to maintain the public access.

31-13-1.5. Posting of signs on no maintenance section line.
The board of township supervisors shall post signs on a no maintenance section line to notify the motoring public that it is a no maintenance section line and that no travel is advised. The signs shall be posted at each entry point and at regular
intervals along a no maintenance section line. A properly posted sign is prima facie evidence that adequate notice of a no maintenance section line has been given to the motoring public.

31-13-1.6. Designation of road unsafe for vehicle travel as no maintenance road.
The board of township supervisors may designate a road that is unsafe for vehicle travel as a no maintenance road. The board shall identify the beginning and end point of the road designated as no maintenance. The board does not have any responsibility on a no maintenance road except to require removal or remediation of a manmade obstruction, if needed, to maintain the public access.

31-13-1.7. Posting of signs that no vehicle travel is advised on no maintenance road.
The board of township supervisors shall post signs on a no maintenance road to notify the motoring public that it is a no maintenance road and that no vehicle travel is advised. The signs shall be posted at each entry point and at regular intervals along a no maintenance road. A properly posted sign is prima facie evidence that adequate notice of a no maintenance road has been given to the motoring public.

As of July 1, 2018 new statutes provide authority to County to declare a no maintenance road along with required signing. Please refer to SDCL for further information.

SD State Codified Laws on Local Roads

31-12-7. Divisions of system into sections--Recording in county road book.
The county highway superintendent shall maintain in a county road book a complete record of the divisions of the county highway system into sections, each section being designated by some appropriate number, name, or letter, and the starting point and terminus of each section being clearly designated at length.

31-12-18. Width of culverts.
All culverts constructed on the county highway system shall have a clear roadway of not less than twenty-four feet.

Each board of county commissioners and county superintendent of highways in organized counties shall construct, repair, and maintain all secondary roads within the counties not included in any municipality, organized civil township, improvement district organized pursuant to chapter 7-25A, or county road district organized pursuant to chapter 31-12A.

Plans and specifications for contracts let by the board of township supervisors shall provide that all highway grades shall be not less than twenty feet in width.

31-3-6. Power of county commissioners and township supervisors to vacate, change, or locate highway on petition - Contents of petition.
Upon receiving the petition of two or more voters of an organized civil township or of the number of voters equal to or greater than one percent of the ballots cast for the last gubernatorial election in the affected county, the board of supervisors of the township or the board of county commissioners wherein the highway is located or is proposed to be located may, except as provided in §§ 31-3-12 and 31-3-44, vacate, change, or locate any highway located or to be used within the township or county, if the public interest will be better served by the proposed vacating, changing, or locating of the highway. The petition of the voters shall set forth the beginning, course, and termination of the highway proposed to be located, changed, or vacated, together with the names of the owners of the land through which the highway may pass.

31-3-6.1. Exception--Access to public lands.
Notwithstanding any other provisions of this chapter, no county or township may vacate a highway which provides access to public lands. For the purposes of this section, public land does not include any school and public lands.

31-3-8. Resolution and order of board--Description of land--Map maintained by county auditor.
The resolution and order provided for in § 31-3-7 shall describe the highway vacated, changed, or located in general language by description of the land across which the highway extends, or by landmarks or survey designate the particular highway intended. The county auditor shall prepare and maintain a current map showing the course and location of all county highways within or on the border of the county. The county auditor shall, within thirty days of the resolution and order provided for in § 31-3-7, make those changes to the map as necessary to reveal the course and location of any county highway vacated, changed, or located.
31-3-13. Highway on township line--Joint resolution.
In case the highway to be vacated, changed, or located is upon a township line, it shall be necessary that the board of supervisors of the adjoining civil township, or the board of county commissioners of the county, if the adjoining congressional township is unorganized, as the case may be, pass a like resolution and enter an order vacating, changing, or locating said highway.

31-3-18. Width of highway.
All public highways located under §§ 31-3-6 to 31-3-37, inclusive, shall be not less than four rods in width, and may be six rods in width when all residents of land adjoining such highway shall petition for such width, except that highways not exceeding one-half mile in length and not located on section lines may be not less than two rods in width when, in the judgment of the board of county commissioners, such width will be sufficient to accommodate properly the travel thereon. Every order locating or changing any highway shall specify the width thereof.

31-9-1. Relinquishment of highways in national parks--Cession of jurisdiction.
The Department of Transportation and the board of county commissioners of an affected county, may relinquish to the United States for use and construction and control of highways by the secretary of interior, acting through the national park service, all of the interest of the state and the county in such portions of public highways lying within the boundaries of national parks and national monuments. The relinquishment of interest in the highways shall operate as a cession to the United States of jurisdiction for highway purposes over such portions of the highways lying within said national parks or national monuments.

31-9-4. County roads used by National Forest Service--Cooperative agreement for joint construction and use.
The board of county commissioners may enter into cooperative agreements with the Forest Service of the United States Department of Agriculture for the joint construction, maintenance, and use of roads located within the boundaries of the county, where such roads are used by the Forest Service in the protection, administration, and utilization of the national forests and are also used by communities or persons within or adjacent to such national forests in the use and development of the resources thereof or where such roads otherwise serve the needs of the public. Costs incurred by the county pursuant to the provisions of this section shall be appropriated from the county general fund.

31-14-2. County commissioners' responsibility for bridges and culverts.
The duty to construct and maintain all bridges and culverts throughout the county, except upon the state trunk highway system, is hereby imposed upon the board of county commissioners, subject to conditions relating to bridges and culverts on secondary highways in townships.

31-14-33. Inspection of township culverts--Duty of board of supervisors.
The township board of supervisors shall have each culvert on the secondary highways within the township annually inspected and, if necessary, repaired.

31-14-34. Inspection of culverts on secondary highways and county highway system--Duty of county highway superintendent.
The county highway superintendent shall make inspection of all culverts on secondary highways other than those described in § 31-14-33 and of all culverts on the county highway system and report to the board of county commissioners, which shall cause necessary repairs to be made.

31-17-1. County highway system on state line--Agreements for assignment of responsibility.
If any portion of a county highway system lies on a state line, the Department of Transportation may confer with the authorities of the bordering state and agree upon the assignment of portions of the highway to the counties of the two states for construction, repair, and maintenance.

31-17-4. County highway system on county line--Effect of assignment to county.
Any portion of a county highway system lying on a county line and assigned to a county by the Transportation Commission for construction and maintenance shall be considered as lying fully within the county and all procedure and requirements apply as if the road lay wholly within the limits of one county.

31-17-5. Secondary highway on county line--Assignment of responsibility.
The secondary highways on county lines shall be assigned to the charge of the boards of supervisors of organized civil townships or the board of county commissioners in the case of unorganized territory as may be agreed upon by the respective boards of county commissioners and in case of disagreement, as determined by the Transportation Commission.
31-17-6. Secondary highway on township line--Assignment of responsibility.
The secondary highways wholly within one county on lines between organized townships shall be assigned to the charge of such townships as the respective boards of supervisors may agree, and, in case of disagreement, as the board of county commissioners shall determine; and those on the line between organized civil townships and unorganized territory as the board of commissioners shall determine.

31-17-7. Boundary line highways between organized townships--Equal contribution by townships required unless mutual agreement reached.
Adjoining townships shall contribute equally to the construction, improvement, and repair of any township highway that lies on a section line forming the boundary between the townships. However, this section and §§ 31-17-8 to 31-17-15, inclusive, do not prohibit the supervisors of adjoining townships, by a majority of the supervisors from each township, from scheduling and holding a joint meeting of their township boards to mutually agree on alternative procedures for apportioning the responsibilities and costs of constructing, altering, or repairing any township boundary line highway, bridge, or culvert. Each township clerk shall record the time and location of the joint meeting and shall immediately publish notice of the proposed joint meeting in the same manner provided in §§ 8-3-4 and 8-3-5. Any order, notice, award, or apportionment contract, and any other documents resulting from the joint meeting shall be produced in duplicate, filed with each township office, and recorded by each township clerk. Any order, contract, or mutual agreement made before July 1, 1995, between adjoining township boards of supervisors apportioning or reapportioning a township boundary line road, bridge, or culvert is hereby validated and has the same force and effect as though executed after that date.

31-17-16. Secondary highways on municipal boundaries--Assignment of responsibility.
The secondary highways on the boundary line of any municipality shall be assigned to such municipality and adjoining civil township or unorganized territory as provided in §§ 31-17-5 and 31-17-6.

31-18-1. Existence of section-line highways by operation of law.
There is along every section line in this state a public highway located by operation of law, except where some portion of the highway along such section line has been heretofore vacated or relocated by the lawful action of some authorized public officer, board, or tribunal.

31-18-2. Width of highways--Side from which taken.
Every statutory section-line highway shall be sixty-six feet wide and shall be taken equally from each side of the section line, unless changed as provided in this title, but nothing herein contained shall prevent the highway authority charged with the construction, reconstruction, or repair of any public highway along a section line from purchasing or condemning right-of-way for widening the highway to more than sixty-six feet or from purchasing or condemning more right-of-way on one side of the section line than on the other, provided they deem it necessary so to do in order to provide a better highway, to avoid destruction of trees or valuable buildings or to avoid unsuitable terrain.

31-18-3. Vacation or change of location of highways.
The board of county commissioners may vacate or change the location of any section-line highway within its county and the board of supervisors of an organized township may vacate or change the location of any section-line highway within its township, as provided in this title, but neither board may vacate or change any portion of the state trunk highway system or any highway constructed by state or federal aid or any highway within the limits of a municipal corporation, nor may a board of supervisors vacate or change any portion of the county highway system. In addition, no board of county commissioners or board of supervisors may vacate a section-line highway which provides access to public lands. This section does not prohibit the closing of a section-line highway to vehicular traffic if the highway is unsafe for vehicular traffic. For the purposes of this section, public land does not include any school and public lands.

The apportionment, division, or survey of lands acquired by reliction, either by the owner or owners of such lands, or by virtue of the judgment of any court, pursuant to the provisions of this code, shall not in any manner operate as an abandonment or vacation of any legal highway along or across any such lands, and all section-line highways along or across any such lands shall continue to be public highways until changed or vacated in the manner provided by law.

31-24-1. Duty of highway authorities to provide access to abutting property at public expense--New construction.
If the construction, improvement, and repair of any public highway by the state, or by any county or township, leaves a ditch or elevation along the roadside and deprives any abutting landowner of easy and convenient access from the owner's land to the highway, the highway authority, except as provided by chapters 31-7 and 31-8, shall provide the owner of the abutting tract or farm, as well as each church, school, park, playground, or other public building or ground, with one point of easy and convenient access to a public highway by constructing at the public expense, such grades, approaches, bridges, culverts, or other structures as may be necessary for that purpose. However, the provision
authorizing construction of entrances at the expense of the authority having charge of the maintenance only applies to new construction.

Approaches required by § 31-24-1 shall be built by the highway authority constructing the highway if the building of such approach becomes necessary as a result of highway construction. In all cases any such structure, culvert, bridge, or approach so constructed shall be maintained and kept in repair by the highway authorities who are charged with the maintenance of the highway.

31-24-3. Limitation on number of farm entrances--Additional entrances at owner's expense.
The owner, as a matter of right, is not entitled under § 31-24-1 to the construction of more than one farm entrance on any one tract or parcel of land at the expense of the public authority whose duty it is to maintain the highway. However, the owner may at the owner's expense upon making application to and receiving written consent of the authority construct other entrances if the entrances are constructed at the place and in the manner designated by the authority in its written permit.

31-24-4. Additional entrances to property previously having more than one farm entrance--Limitations.
Notwithstanding § 31-24-3, if at the time of the construction, improvement, or repair of any public highway the abutting owner has more than one farm entrance to the highway, which entrance has been in reasonably constant use for more than two years prior to the new construction the owner shall be furnished a like number of entrances by the authority having charge of the construction, improvement, or repair, if the entrances do not materially add to the hazard of public travel on the highway. However, no owner of property adjoining the highway is entitled to more than two such entrances at the expense of the authority charged with the maintenance of the highway, on any one continuous half mile of adjoining property.

31-28-6. Warning signs at points of danger--Maintenance--Violation as misdemeanor.
The public board or officer whose duty it is to repair or maintain any public highway shall erect and maintain at points in conformity with standard uniform traffic control practices on each side of any sharp turn, blind crossing, or other point of danger on such highway, except railway crossings marked as required in § 31-28-7, a substantial and conspicuous warning sign. The sign shall be on the right-hand side of the highway approaching such point of danger. Failure to comply with the provisions of this section is a Class 1 misdemeanor.

31-28-7. Railway crossing signs--Maintenance--Violation as misdemeanor.
The public board or officer whose duty it is to repair or maintain any public highway shall erect and maintain at points in conformity with standard uniform traffic control practices on each side of the place at which a highway crosses an operational railway track or right-of-way, except within the limits of municipalities, a standard railroad advance warning sign. The sign shall be on the right-hand side of the highway approaching such crossing and at a distance from the crossing as the department or other controlling body shall direct. Any legally abandoned or nonoperational track which is crossed by a public highway and at which the crossing has been properly marked as a railway grade crossing may be marked with a supplemental sign, meeting uniform traffic control practices, to inform drivers of vehicles identified in § 32-29-5 that a stop is not required at that crossing. Failure to comply with the provisions of this section is a Class 1 misdemeanor.

The department and boards of county commissioners may designate certain state and county highways, or portions thereof, as preferential or arterial highways. The traffic upon any highway so designated shall have the right-of-way. Failure to comply with the provisions of this section is a Class 2 misdemeanor.

31-28-28. Unauthorized possession of official signs or markers as misdemeanor.
No person may possess any sign, guide board, mileage post, signal, or marker erected by the state or by any governmental subdivision unless obtained in a legal manner. A violation of this section is a Class 1 misdemeanor.

32-14-6. Restrictions respecting weight of vehicle--Duration of period of restriction--Signs designating restricted area.
Local authorities, including road districts, may by ordinance or resolution prohibit the operation of vehicles upon any highway or impose restrictions as to the weight of vehicles allowed. Such prohibitions or restrictions apply only to vehicles to be operated upon any highway under the jurisdiction of and for the maintenance of which such local authorities are responsible and only if the highway by reason of physical condition, rain, snow, or other climatic conditions will be seriously damaged or destroyed unless the use of vehicles on the highway is prohibited or the permissible weights of the vehicles are reduced. Any local authority enacting any such ordinance or resolution shall erect and maintain or cause to be erected and maintained signs designating the provisions of the ordinance or resolution at
each end of that portion of any highway affected by the ordinance or resolution. The ordinance or resolution is not valid unless such signs are erected and maintained.

32-14-7. Prohibiting trucks or commercial vehicles from use of designated highways–Erection of signs. Local authorities, including road districts, may by ordinance or resolution prohibit the operation of trucks or other commercial vehicles or impose limitations as to the weights of such vehicles on designated highways. The prohibitions and limitations shall be designated by appropriate signs placed on such highways.

32-22-47. Maximum vehicle weight on bridges–Required and permissible signs–Exception. The board of county commissioners of any county, the board of supervisors of any township, the board of trustees of any road district, or the Department of Transportation, shall erect and maintain at a point on the right-of-way and within six hundred feet of both entrances to any bridge and may, where it is deemed necessary, erect and maintain at the nearest road intersection in each direction from any bridge, upon any public highway which it is the duty of the board or department to maintain and repair, a conspicuous sign specifying in large numerals, the maximum weight of any vehicle, laden or unladen, which may enter upon or cross over the bridge. No bridge signing is necessary for bridges which can accommodate motor vehicles operating under the legal weight maximums provided in § 32-22-16.

32-25-17. Posting stop signs at intersections with increased maximum–Illumination of stop signs. Local authorities shall place and maintain upon all through highways under their jurisdiction upon which the permissible speed is increased adequate signs giving notice of such special regulations. Local authorities shall also place and maintain upon each and every highway under their jurisdiction intersecting any said through highway, appropriate stop signs which shall be illuminated at night or so placed as to be illuminated by the headlights of an approaching vehicle.

32-29-1. Indication of right-of-way by stop or yield signs. Preferential right-of-way at an intersection may be indicated by stop signs or yield signs as authorized in § 32-29-2.

32-29-2. Stop and yield signs to designate through highways–Visibility at night. The Department of Transportation with reference to state highways and local authorities with reference to highways under their jurisdiction may designate main traveled or through highways by erecting at the entrances thereto from intersecting highways stop or yield signs. All such signs shall be illuminated at night or so placed as to be illuminated by headlights of an approaching vehicle.

32-30-2.4. No-parking zones posted by department–Temporary zones–Signs–Violation as misdemeanor. The Department of Transportation with respect to highways under its jurisdiction may promulgate rules pursuant to chapter 1-26 to prohibit or restrict the stopping, standing, or parking of vehicles on any highway if such stopping, standing, or parking is dangerous to those using the highway or if the stopping, standing, or parking of vehicles would unduly interfere with the free movement of traffic thereon. If such a rule is promulgated, the highway shall be signed to indicate where such stopping, standing, or parking is prohibited. The secretary of transportation may establish a temporary no parking zone, not to exceed ninety days, if the secretary of public safety and the secretary of transportation, after consultation with the director of the highway patrol, agree that a no parking zone is necessary for the protection of life and property. Such signs are official signs and no person may stop, stand, or park any vehicle in violation of the restrictions stated on such signs. A violation of this section is a Class 2 misdemeanor.

32-30-11.9. Signs to state penalties for illegal use of designated parking spaces–Certain penalties apply although not stated. Each sign designating a parking space for a person with a physical disability shall state the penalty for illegal use of the parking space. This section only applies to a new sign or a sign that replaces an existing sign after July 1, 2002. However, any fine imposed pursuant to § 32-30-11.3, 32-30-11.4, or 32-30-11.8 applies whether or not the penalty is stated on the sign.

SD State Codified Laws on Speed Limits

32-25-1.1. Maximum daytime speed–Violation as misdemeanor. Except as provided by § 32-25-4 or pursuant to § 32-25-7, no person may drive a vehicle upon a street or highway at a speed in excess of sixty-five miles per hour. A violation of this section is a Class 2 misdemeanor.

32-25-9.1. Establishment of speed zones by county commissioners–Posting of zones. Any board of county commissioners may determine and establish speed zones upon all or any part of the highways under its jurisdiction and upon streets and highways on the request of and after any other local authority, including any road
district, having charge of the maintenance of the highway has declared its intention to post speed zones. Such speed zones shall be conspicuously posted at the beginning and ending of the zones.

32-25-9.2. **Township road speed limit.**
Unless otherwise provided pursuant to § 32-25-9.1, no person may drive a vehicle on a township road in excess of fifty-five miles per hour. Driving in excess of the speed limit established in this section is a Class 2 misdemeanor.

32-25-12. **Speed limit in unposted urban areas--Violation as misdemeanor.**
In urban areas which are not zoned or posted as provided in § 32-25-7, the maximum lawful speed shall be twenty-five miles per hour. A violation of this section is a Class 2 misdemeanor.

32-25-13. **Speed limit at obstructed railway crossings--Violation as misdemeanor.**
When approaching within fifty feet of a grade crossing of any railway when the driver's view is obstructed, the maximum speed shall be fifteen miles per hour. A driver's view is obstructed if at any time during the last two hundred feet of his approach to such crossing he does not have a clear and uninterrupted view of any traffic on such railway for a distance of four hundred feet in each direction. A violation of this section is a Class 2 misdemeanor.

32-25-14. **Speed limit in school zones--Violation as misdemeanor.**
When passing a school during a school recess or while children are going to or leaving school during the opening or closing hours, the maximum lawful speed shall be fifteen miles per hour. A violation of this section is a Class 2 misdemeanor.

32-25-15. **Speed limit at intersections with obstructed view--Violation as misdemeanor.**
When approaching within fifty feet of and when traversing an intersection of highways when the driver's view is obstructed the maximum lawful speed shall be fifteen miles per hour. A driver's view is obstructed if at any time during the last fifty feet of his approach to such intersection, he does not have a clear and uninterrupted view of such intersection and of the traffic upon all of the highways entering such intersection for a distance of two hundred feet from such intersection. A violation of this section is a Class 2 misdemeanor.

32-25-18. **Special speed limits for bridges--Posting signs--Violation of posted speed limit as misdemeanor--Established speed as conclusive maximum safe speed.**
The transportation commission upon request from any local authorities shall, or upon its own initiative may, conduct an investigation of any public bridge, causeway, or viaduct, and if it finds that such structure cannot with safety to itself withstand vehicles traveling at the speed otherwise permissible under this chapter, the commission shall determine and declare the maximum speed of vehicles which such structure can withstand and shall cause or permit suitable signs stating such maximum speed to be erected and maintained before each end of such structure. Violating such posted speed limits is a Class 2 misdemeanor.

The findings and determination of the commission shall be conclusive evidence of the maximum speed which can with safety to any such structure be maintained thereon.
# Appendix B

## County Sign Inventory Instructions

Last Updated By Frost, Tim  05/09/2018 3:48:08 PM

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System Overview

This application is intended to provide reports showing the sign and post material needed to upgrade signing on county/township roads. It can also generate a report (Sign Summary By Milepost) which lists signs in order by route, along with instructions for what should be added and/or removed. This is intended to be the contractor’s instructions for upgrading the signs. It can also serve as an inventory of the signs as they currently exist.

![Figure 1: Main Screen](image-url)
Installation

These installation instructions are intended to be used when first installing the application, databases and supporting software on a laptop or desktop. There are separate instructions for installing upgrades to the application, databases and supporting software.

To downloaded the needed software to install HZ01 County Sign Inventory system (HZ01CSI) open the Windows Explorer (not Internet Explorer) and at the top of the screen (where it says “Computer (C:) Local Disk) type in ftp://ftp.state.sd.us/DOT/HZ01CSI/ and press enter. See Figure 2.

Figure 2: Windows Explorer
The following Log On As popup screen will appear which you will need to submit the following Username and Password:

![Log On As popup Screen](image)

**Figure 3: Log On As popup Screen**

**Username:** dothz01csi (can be upper or lowercase)

**Password:** C49s3#I2 (Upper and lower case as shown)

The following HZ01CSI File Folder should appear:

![HZ01CSI File Folder](image)

1) Drill down until you get to your Company’s folder

**Figure 4: HZ01CSI File Folder**
Figure 5: Folder to be copied to C:

1) Select the HZ01CSI File folder for your Company, right click on it and select “Copy”

2) Double click your (C:) Local Disk folder, right click and select “Paste”
You should now have a HZ01CSI folder under your C: drive.

Figure 6: After copying folder
1) Select the HZ01CSI folder and double click

2) Select the NewInstall folder and double click

3) Select the HZ01CSISetup.bat file, right click and select "Run As Administrator"
The following install screen will appear. The installation process could take up to 45 minutes to install depending on your system’s speed. Depending on your security setup, there may also be several User Account Control screens which will popup, click the “Yes” button on all of them to continue.

Figure 8: Install Screen
Once the installation screen closes, you should see a new HZ01CSINewCounty Icon on your desktop. You will double click this icon whenever you are starting a new project. This will install and setup the necessary folders, files, icons and database for a new project.

![HZ01CSINewCounty Icon](image)

Figure 9: HZ01CSINewCounty Icon

The following setup screen will appear after double clicking the icon above. Leave the “From Project (Old)” as HZ01CSI – this will install a predefined database, otherwise if you wish to copy data from an existing project just type the name of the project name or select from the list. The “To Project (New)” should be the name of the new project which you want setup. Click the “Add” button to setup the new project’s folders, files and database.

![New Project Setup Screen](image)

Figure 10: New Project Setup Screen

After clicking the “Add” button an Icon similar to this one will appear on your desktop.

![County CSI (County Sign Inventory)](image)

Figure 11: County CSI (County Sign Inventory)

******************************************* VERY IMPORTANT *******************************************

Do not move or rename any folders or files created by this system. The system/database will be looking for very specific folder and file names on your C: drive. If you have any questions contact SD DOT/BIT.

******************************************* VERY IMPORTANT *******************************************
HZ01 County Sign Inventory System Screens

Double click the County Icon you wish to work with.

Figure 12: County CSI (County Sign Inventory)

If this is the first time accessing the county, you will need to fill out the following Project Information screen prior to proceeding. Enter the project number and project control number for this project. The project description is optional. Click the “Save” button. You can return to this screen at any time by clicking on the “Project Info” menu selection at the top of the Main screen on the next page.
The first time accessing a project, the Main screen will be blank except for the Project Information. To begin adding Sign Summary data click on the “Add” button at the bottom of the screen or click on the Sign Summary menu option at the top of the screen.
All fields will be blank at startup. After adding the first sign summary, certain fields will be filled in with the previous sign summary record’s data. These fields are the fields least likely to change (i.e. System Type, Route and Travel Direction). Change any fields necessary to reflect the new information. Some fields will be restricted to the information listed in the drop down selection, like the System Type field. Others fields, like the Route field, can be selected from the drop down list or a new route typed in. A Sign Number must have been setup prior to trying to add a Sign Summary record. Depending on which type of Sign has been chosen, more fields will appear or be hidden on the screen. For example if the Sign can have legends, they will appear below the Sign Number field.

If you do not know a sign number, hit the “Find Sign” button, you can enter any characters which may appear in the description of the sign in the “Sign Description” box and hit the “Find” button. If there are any sign numbers which have the characters’ you typed in, in the description, they will appear in the list. Highlight the sign you wish to select and either double click it or hit the “Select” button and you will be returned to the previous screen.

Once you have entered all the information, click the “Save” button to save the record. Click the Delete button to remove a record from the database.

Click Exit to return to the Main screen.

Note: Each Sign Summary record does not need to represent a sign. You can add records that are “For Reference”. For example, you may add a record indicating the location of the intersection of the route you are working on with 554th Ave. These references can help someone looking at the inventory, orient themselves on the route. You must select “REF – For Reference” as the Sign Number for a reference entry.
Each Sign Summary record will have an entry on the main screen. The list on the left represents all the Routes which have been entered into the system. By selecting the Route, all MRM Numbers/Sign Numbers associated with the Route will be displayed in the right list. By double clicking an entry in the right list or hitting the “Update” button, the Sign Summary screen will display for the selected entry.

Note: This screen was designed to be mouse free. In other words, you can use the Tab key, Up/Down Arrow keys and the Enter key to maneuver around the screen. If you have selected a Sign Number and hit the enter key, the Sign Summary screen will display for the selected entry.
Utilities Menu

The following options are available in the Utilities dropdown menu:

1) Find Sign Summary
2) Find Sign In Catalog
3) Find And Replace Sign Summary Data
This screen will allow you find Sign Summary records based on the selection criteria you enter. The grid on the left will display by row, all data about a Sign Summary record. If there are multiple Sign Post entries, the Sign Summary record will be displayed for each Sign Post entry. By hitting the Export button you can export the data in the grid to an Excel spreadsheet. By double clicking on a row in the grid, you can modify or delete a Sign Summary record (the Sign Summary Maintenance screen will appear). By hitting the Clear Criteria button, all selection criteria you entered is cleared out. The Exit button will return you to the Main screen.
The Find Sign In Sign Catalog screen allows you to find a sign(s) which matches the criteria you have entered. For example, if you wanted to see all signs which started with “D”, you would enter “D” in the Sign Number field and click the “Find” button. All Sign Numbers beginning with “D” would appear in the list. By selecting a Sign Number in the list and either double clicking or hitting the Enter key, the Sign Catalog Maintenance screen will appear and allow you to make changes to the sign.

To add a new sign, click the Add New button and the Sign Catalog Maintenance screen will appear.

If you wish to see a list of all signs in the Sign Catalog, clear all the criteria and hit the Find button.

Click the Exit button to return to the Main screen.
Certain fields are required on the Sign Catalog Maintenance screen. They are Sign Number, Description, Width, Height and Area Formula.

The Area Formula is used to calculate the amount of sign stock material needed to construct the sign. This information is used in a variety of reports. The standard formula is \((\text{Width} \times \text{Height})/144\). This calculates the sign material, in square feet, needed to fabricate a rectangular sign. It is also used for odd shaped signs, like stop signs, where the material outside of the rectangle will be waste. The formula for a Yield sign is \((\text{Height} \times \text{Height} \times 0.003006)\), as the material can be used more efficiently if the signs are laid out correctly. The formula is calculated, based on the Height and Width entered, and the result is stored in the Area field.

Click the Delete button to delete a sign from the database.

Click the Exit button to return to the Find Sign In Sign Catalog screen.
This screen will allow you to do a mass change on the selected field. To begin, select the field you wish to change. Then enter the value you wish to find in the field and click the Find button. If there are records found which contain the “Find Value” data you entered, enter a value in the “Replace Value” field and click the Replace button. This will replace the “Find Value” value with the “Replace Value” value for the field selected above. This will happen for all records appearing in the grid on the right. Hit the Exit button to return to the Main screen.
This is an internal report intended to provide help finding records where the comment, post material, or post dimensions contains a certain word or phrase. For example, you can limit the report to only use those entries which use U-Channel for posts.
This report prints sign information in order by system, route, milepost and sign number. It doesn’t provide any totals and isn’t meant to be included in any final reports or plans.
Figure 24: Channel Stiffener Totals Report

This report will show all signs requiring channel stiffener ordered by route, milepost, sign number, width and height. A total number of posts required by sign dimension will also be calculated.
This report is intended to provide a set of guidelines for what posts and signs are in place and what actions need to be taken (Add, Remove signs. Replace signs.) to bring the signing up to standards. This report is included along with plans used to solicit bids for off system signing projects. The criteria screen lets you indicate the information you want to include in the report. If no criteria are specified, all Sign Summary information is included.
Figure 26: Sign Summary By Milepost Report

This report prints Sign Summary information in order by route, milepost and sign number. It provides a print out of the inventory of signs along with instructions about what signs to add and remove, where to replace posts, etc.
This report is intended to provide a list of the signs which need to be purchased and installed to bring the signing up to standard. The criteria screen lets you indicate the information you want to include in the report. If no criteria are specified, all Sign Summary information is included where the sign count is greater than zero and the sign flag is “Install New Sign” or “Replace Sign”.

Figure 27: New Sign Summary By Sign Number Criteria Screen
<table>
<thead>
<tr>
<th>Number</th>
<th>Width</th>
<th>Height</th>
<th>Legend</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Del1</td>
<td>4</td>
<td>4'</td>
<td>4' x 4' White Delineator Barrette Back w/Pod (0 ft post)</td>
<td>32</td>
</tr>
<tr>
<td>Del8</td>
<td>12</td>
<td>4'</td>
<td>4' Tubular White Delineator w/Pod (0 ft post)</td>
<td>296</td>
</tr>
<tr>
<td>CM3-2V</td>
<td>6</td>
<td>12</td>
<td>Type 2 Object Marker Back-to-Back (7 ft post)</td>
<td>118</td>
</tr>
<tr>
<td>CM3-2Vb</td>
<td>6</td>
<td>12</td>
<td>Type 2 Object Marker Single Sided (7 ft post)</td>
<td>20</td>
</tr>
<tr>
<td>CM3-L</td>
<td>12</td>
<td>36</td>
<td>Type 3 Object Marker-Left (No Posts)</td>
<td>1</td>
</tr>
<tr>
<td>CM3-L</td>
<td>12</td>
<td>36</td>
<td>Type 3 Object Marker-Left (5 ft post)</td>
<td>1</td>
</tr>
<tr>
<td>CM3-LS</td>
<td>12</td>
<td>36</td>
<td>Type 3 Flexible Object Marker-Left (No Posts)</td>
<td>2</td>
</tr>
<tr>
<td>CM3-R</td>
<td>12</td>
<td>36</td>
<td>Type 3 Object Marker-Right (5 ft post)</td>
<td>2</td>
</tr>
<tr>
<td>CM3-RS</td>
<td>12</td>
<td>36</td>
<td>Type 3 Flexible Object Marker-Right (No Posts)</td>
<td>2</td>
</tr>
<tr>
<td>R1-1</td>
<td>30</td>
<td>30</td>
<td>Speed Limit (30 MPH)</td>
<td>24</td>
</tr>
<tr>
<td>R1-2</td>
<td>36</td>
<td>36</td>
<td>Yield</td>
<td>1</td>
</tr>
<tr>
<td>R12-1</td>
<td>24</td>
<td>30</td>
<td>Weight Limit (40,000 pounds)</td>
<td>1</td>
</tr>
<tr>
<td>R12-2</td>
<td>24</td>
<td>30</td>
<td>Axle Weight Limit (7 Tons)</td>
<td>1</td>
</tr>
<tr>
<td>R2-1</td>
<td>24</td>
<td>30</td>
<td>Speed Limit (35 MPH)</td>
<td>3</td>
</tr>
<tr>
<td>WL-1L</td>
<td>10</td>
<td>30</td>
<td>Turn (Left)</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 28: New Sign Summary By Sign Number Report

This report prints new sign information in order by sign number, width, height, legend and system.
This report is intended to provide a list, by route, which need to be purchased and installed to bring the signing up to standard. The criteria screen lets you indicate the information you want to include in the report. If no criteria are specified, all Sign Summary information is included where the sign count is greater than zero and the sign flag is “Install New Sign” or “Replace Sign”.

Figure 29: New Sign Summary By Route Criteria Screen
Figure 30: New Sign Summary By Route Report

This report prints new sign information in order by route, sign number, width, height, legend and system.

<table>
<thead>
<tr>
<th>Route</th>
<th>Number</th>
<th>Width</th>
<th>Height</th>
<th>Legend</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>268 ST</td>
<td>Dd8</td>
<td>12</td>
<td>5'4&quot; Tubular White Delineator w/ Post (9 ft post)</td>
<td>NFAS</td>
<td>16</td>
</tr>
<tr>
<td>265 ST</td>
<td>OM2-2V</td>
<td>6</td>
<td>12 Type 2 Object Marker Back-to-Back (7 ft post)</td>
<td>NFAS</td>
<td>44</td>
</tr>
<tr>
<td>265 ST</td>
<td>OM2-2Vb</td>
<td>6</td>
<td>12 Type 2 Object Marker Single Sided (7 ft post)</td>
<td>NFAS</td>
<td>4</td>
</tr>
<tr>
<td>265 ST</td>
<td>R1-1</td>
<td>10</td>
<td>30 Stop</td>
<td>NFAS</td>
<td>2</td>
</tr>
<tr>
<td>265 ST</td>
<td>R12-1</td>
<td>24</td>
<td>30 Weight Limit XX Tons (60000 Pounds)</td>
<td>NFAS</td>
<td>1</td>
</tr>
<tr>
<td>265 ST</td>
<td>R2-1</td>
<td>24</td>
<td>30 Speed Limit (15 MPH)</td>
<td>NFAS</td>
<td>1</td>
</tr>
<tr>
<td>268 ST</td>
<td>W1-1L</td>
<td>30</td>
<td>30 Turn (Left)</td>
<td>NFAS</td>
<td>1</td>
</tr>
<tr>
<td>268 ST</td>
<td>W1-2L</td>
<td>30</td>
<td>30 Curve (Left)</td>
<td>NFAS</td>
<td>1</td>
</tr>
<tr>
<td>268 ST</td>
<td>W13-1P</td>
<td>15</td>
<td>16 Advisory Speed (Plaque) (40 MPH 2 MPH 3 MPH)</td>
<td>NFAS</td>
<td>1</td>
</tr>
<tr>
<td>268 ST</td>
<td>W13-1P</td>
<td>15</td>
<td>16 Advisory Speed (Plaque) (40 MPH)</td>
<td>NFAS</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>268 ST</td>
<td>Dd7</td>
</tr>
<tr>
<td>269 ST</td>
<td>Dd8</td>
</tr>
<tr>
<td>269 ST</td>
<td>OM2-2V</td>
</tr>
<tr>
<td>269 ST</td>
<td>OM2-2Vb</td>
</tr>
<tr>
<td>269 ST</td>
<td>OM3-2L</td>
</tr>
<tr>
<td>269 ST</td>
<td>OM3-2L</td>
</tr>
<tr>
<td>269 ST</td>
<td>OM3-2S</td>
</tr>
<tr>
<td>269 ST</td>
<td>OMJ-R</td>
</tr>
<tr>
<td>269 ST</td>
<td>OMJ-RS</td>
</tr>
</tbody>
</table>
This report is intended to provide a list, broken down by route and system, of new posts which are needed to bring the signing up to standard. The criteria screen lets you indicate the information you want to include in the report. If no criteria are specified, all Sign Summary information is included where the post count is greater than zero and the post flag is “Install New Sign” or “Replace Sign”.

Figure 31: New Post Summary By Route Criteria Screen
Figure 32: New Post Summary By Route Report

This report prints new post information in order by route, system, post material, dimension and post length.
This report is intended to provide a list of the signs which are to be discarded (not left in place or reused) to bring the signing up to standard. The criteria screen lets you indicate the information you want to include in the report. If no criteria are specified, all Sign Summary information is included where the sign count is greater than zero and the sign flag is “Discard”.

Figure 33: Discarded Sign Summary By Sign Number Criteria Screen
Figure 34: Discarded Sign Summary By Sign Number Report

The report prints discarded sign information in order by sign number, width, height, legend and system.
This report is intended to provide a list of the posts, broken down by system material, dimension and length, which are to be discarded (not left in place or reused) to bring the signing up to standard. The criteria screen lets you indicate the information you want to include in the report. If no criteria are specified, all Sign Summary information is included where the post count is greater than zero and the post flag is “Discard”.

Figure 35: Discarded Post Summary By System Criteria Screen
The report prints discarded post information in order by system, material, dimension and post length.
This report is intended to provide a summary of sign material (sheeting and delineators) and posts broken down by system. It is intended to provide information needed to bid a contract to bring the signs up to standard. The criteria screen lets you indicate the information you want to include in the report. If no criteria are specified, all Sign Summary information is included where the post count is greater than zero and the post flag is “Install New Post” or “Replace Post” and where the sign count is greater than zero and the sign flag is “Install New Sign” or “Replace Sign”.

Figure 37: Sign Material Summary By System Criteria Screen
The system calculates the square feet of aluminum, number of steel, wood and plastic posts, Type 3 Barricade, number of Type I Delineators, number of Type II Object Markers, and number of Type III Object markers needed in each system. The square feet of aluminum sign is computed as follows: If the width and height are both greater than zero, the width and height are divided by 12 to convert them from inches to feet. The results are multiplied and the resulting square footage is multiplied by the sign count. If just the width is greater than zero, the sign number and width are used to find the sign in the description file and get the area from that.
This report is intended to provide a summary of posts broken down by system. It is intended to provide information needed to bid a contract to bring the signs up to standard. The criteria screen lets you indicate the information you want to include in the report. If no criteria are specified, all Post Summary information is.
Figure 40: Post Material Summary By System Report

<table>
<thead>
<tr>
<th>System</th>
<th>Material</th>
<th>Dimension</th>
<th>Post Length</th>
<th># of Posts</th>
<th>Total Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFAS</td>
<td>SQ TUBE</td>
<td>2&quot; X 2&quot; SQ TUBI</td>
<td>0</td>
<td>4</td>
<td>0.0</td>
</tr>
<tr>
<td>NFAS</td>
<td>SQ TUBE</td>
<td>2&quot; X 2&quot; SQ TUBI</td>
<td>7</td>
<td>184</td>
<td>1,288.0</td>
</tr>
<tr>
<td>NFAS</td>
<td>SQ TUBE</td>
<td>2&quot; X 2&quot; SQ TUBI</td>
<td>8</td>
<td>3</td>
<td>24.0</td>
</tr>
<tr>
<td>NFAS</td>
<td>SQ TUBE</td>
<td>2&quot; X 2&quot; SQ TUBI</td>
<td>9</td>
<td>26</td>
<td>234.0</td>
</tr>
<tr>
<td>NFAS</td>
<td>SQ TUBE</td>
<td>2&quot; X 2&quot; SQ TUBI</td>
<td>10</td>
<td>393</td>
<td>3,930.0</td>
</tr>
<tr>
<td>NFAS</td>
<td>SQ TUBE</td>
<td>2&quot; X 2&quot; SQ TUBI</td>
<td>11</td>
<td>502</td>
<td>5,522.0</td>
</tr>
<tr>
<td>NFAS</td>
<td>SQ TUBE</td>
<td>2&quot; X 2&quot; SQ TUBI</td>
<td>12</td>
<td>838</td>
<td>10,058.0</td>
</tr>
<tr>
<td>NFAS</td>
<td>SQ TUBE</td>
<td>2&quot; X 2&quot; SQ TUBI</td>
<td>13</td>
<td>223</td>
<td>3,029.0</td>
</tr>
<tr>
<td>NFAS</td>
<td>SQ TUBE</td>
<td>2&quot; X 2&quot; SQ TUBI</td>
<td>14</td>
<td>39</td>
<td>546.0</td>
</tr>
<tr>
<td>NFAS</td>
<td>SQ TUBE</td>
<td>2&quot; X 2&quot; SQ TUBI</td>
<td>15</td>
<td>6</td>
<td>90.0</td>
</tr>
</tbody>
</table>

Total 2" X 2" SQ TUBE SQ TUBE (4) 14,719.0
This report lists the sign catalog in order by Sign number. It is intended to provide a reference for people adding sign summary information into the system.
## Data Dictionary

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Definition</th>
<th>Required</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>County</td>
<td>County where the sign is located.</td>
<td>Yes</td>
<td>Choose from list of all counties in South Dakota.</td>
</tr>
<tr>
<td>Project Number</td>
<td>Identifies the project which this entry pertains to. Enter the value you want. List of values is made up of all Project Numbers which currently exist on Sign Summary records.</td>
<td>Yes</td>
<td>Generally only one project at a time is contained in the Sign Inventory database. If multiple projects are to be worked on, multiple copies of the database are created. Obtain this number from DOT.</td>
</tr>
<tr>
<td>Project Control Number</td>
<td>Identifies the project control number which this entry pertains to.</td>
<td>Yes</td>
<td>Obtain this number from DOT.</td>
</tr>
<tr>
<td>Project Description</td>
<td>Description of this county project.</td>
<td>No</td>
<td>Optional.</td>
</tr>
<tr>
<td>System</td>
<td>Indicates the type of roadway system this sign is on. Examples are FAS (Federal Aid System), Township, City/Town. Choose from preset values or enter the value you want.</td>
<td>Yes</td>
<td>Used in developing signing plans where different entities will be splitting the cost of bringing the signing up to standard. For example, one set of signing plans may include both Township and City roads where the Township and City are each going to pay for all or part of their signing upgrade.</td>
</tr>
<tr>
<td>Route</td>
<td>Description of the roadway which the sign is on. Examples are 170th St, 451 Ave. List of values is made up of all Routes which currently exist on Sign Summary records. To add a new route, simply type in the value when creating the sign summary record. Once which information is saved, the new route number will start showing up in the list of choices.</td>
<td>Yes</td>
<td>Try for meaningful name.</td>
</tr>
<tr>
<td><strong>Sign Side of the Road</strong></td>
<td>Side of the road the sign is located on</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------------</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td><strong>MRM</strong></td>
<td>Mileage Reference Marker. Represents the distance in miles between this location and the beginning of the route.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The MRM is used to order the sign information in the order you would encounter the signs as you drive the route.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sign Number</strong></td>
<td>Identifies the sign (from the sign catalog) which this sign summary entry represents.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Must choose from the list. To add new choices, or remove obsolete choices, update the sign catalog.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Legend(s)</strong></td>
<td>If the sign has legends, up to 3 fields will open up with a description of each legend. For example, Name, Miles and Inches.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enter the value you want separated by a comma. For example, if the sign legend is tons, then you would enter 10,20,30.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sign Facing</strong></td>
<td>Direction the sign faces. Choices are N, S, N&amp;S, E, W, E&amp;W</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Choices N, S, N&amp;S, E, W, E&amp;W are used for those signs, like object markers, which are mounted on both sides of the posts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: This field is not required if the Sign number is “REF – For Reference”</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sign Location</strong></td>
<td>Side of the road the sign appears on. This is from the perspective of a motorist who would make use of the sign. Choices are L for Left, R for Right, X for X-Road and C for Center</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>As you come up to the sign, is it on your left or right? X-Road is used for signs which face traffic coming in from a cross-road to the route, for example, stop signs which apply to traffic about to enter the roadway.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: This field is not required if the Sign number is “REF – For Reference”</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>Width of the sign, in inches.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Used to calculate the material needed to fabricate the sign. Also indicates the size of the sign, for informational purposes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: This field is not required if the Sign number is “REF – For Reference”</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>Height of the sign, in inches.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Used to calculate the material needed to fabricate the sign. Also indicates the size of the sign, for informational purposes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: This field is not required if the Sign number is “REF – For Reference”</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sign Flag</strong></td>
<td>Indicates action to be taken with this sign. Choices are Install New Sign, Discard Sign, Leave Existing Sign In</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Automatically set to “Reference” if the Sign Number is “REF – Reference”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
<td>Required</td>
<td>Notes</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sign Count</td>
<td>Indicates the number of signs represented by the information in this record.</td>
<td>Yes</td>
<td>Needs to be greater than zero if the Sign Flag is not “Reference”.</td>
</tr>
<tr>
<td>Post Material</td>
<td>Material the post is made from. Choose from None, Plastic, Steel, Sq. Tube, U-Channel, Wood</td>
<td>Yes</td>
<td>None should be used with the sign represented by this entry is not mounted on a post. For example, a sign which is mounted on a light pole or a building. If None is used, the location of the sign should be noted in the Comment.</td>
</tr>
<tr>
<td>Post Dimension</td>
<td>Size of the post. Enter the value you want. List of values is made up of all Post Dimensions which currently exist on Sign Summary records.</td>
<td>Yes</td>
<td>Description of the post. May include 2X2, 5 Inch Round, 2.5 lb/ft</td>
</tr>
<tr>
<td>Post Count</td>
<td>Number of posts represented by this Delineator or Object Marker entry.</td>
<td>No (only for Delineators and Object Markers)</td>
<td>This field will open only when you have chosen a Delineator or Object Marker sign.</td>
</tr>
<tr>
<td>Post Length</td>
<td>Length of the post(s) to be used, in feet by this Delineator or Object Marker entry.</td>
<td>No (only for Delineators and Object Markers)</td>
<td>This field will open only when you have chosen a Delineator or Object Marker sign.</td>
</tr>
<tr>
<td>Township</td>
<td>Township where the sign is located.</td>
<td>Yes</td>
<td>Enter the value you want. List of values is made up of all Townships which currently exist on Sign Summary records.</td>
</tr>
<tr>
<td>Entered Date</td>
<td>Date the sign summary information was first entered into the system.</td>
<td>No</td>
<td>Is filled in by the system.</td>
</tr>
<tr>
<td>Last Updated</td>
<td>Date the sign summary information was last updated in the system.</td>
<td>No</td>
<td>Is filled in by the system.</td>
</tr>
<tr>
<td>Comment</td>
<td>Additional information describing this sign location.</td>
<td>No</td>
<td>Limited to 100 characters.</td>
</tr>
<tr>
<td>Action</td>
<td>Indicates action to be taken with this post. Choices are Install New Post, Discard Post, Leave Existing Post In Place, Replace Post, Other (light pole, etc.)</td>
<td>Yes (non Ref)</td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>Number of posts represented by this</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Field Name</td>
<td>Definition</td>
<td>Req</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>Sign Number</td>
<td>Code reference to the sign represented by this entry. Examples are W1-1L, W10-1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Description of the sign. Examples are Turn Left, Railroad Advance</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>Width of the sign</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>Height of the sign</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Area Formula</td>
<td>Formula which can be used to calculate the sign area. Must be a single numeric value, or a valid mathematical equation. When the equation is evaluated, the word “Width” is replaced with the width of the sign, and the work “Height” is replaced with the height of the sign.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>Result calculated by evaluating the Area Formula, using the specified Width and Height</td>
<td>Auth Calc</td>
<td></td>
</tr>
<tr>
<td>Area Calc Type</td>
<td>Used in reporting to group signs together</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Sign Type</td>
<td>General grouping of types of signs</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Sheeting Type</td>
<td>Type of sheeting used for the sign. DG or HI</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Legend Type</td>
<td>Type of legend, if any, this particular sign uses. Must choose one of: Miles, County, Route, MPH, Distance, Tons, Feet, % Grade, % Grade &amp; Miles, Feet &amp; Inches</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

Note: Each Sign Summary record has room for a sign Post Material and Post Dimension value. Each Sign Summary record can have 2 or more combinations of Action/Count/Length. This application assumes which a sign assembly can use multiple supports. If so, it assumes which mixed materials will not be used – you would never have one square tubing support and one wood support. The multiple values for action, count and length allow you to specify a need to add 2 posts, 1 6 ft. long and 1 9 ft. long. Or to keep one 7 foot post, and replace one 9 foot post.
catalog entry will include fields to specify the legend information. This means which a Sign Summary record which references a Speed Limit sign in the catalog will include a field to specify the MPH. The % Grade & Miles legend and Feet & Inches legend require 2 values. Any Sign Summary records which reference them will include 2 fields to collect the required information.

Feel free to add signs as needed. Signs can be deleted from the catalog as long as they are not being referenced by the Sign Summary data.
Initial Software Install For Uploading To FTP Site

If this is the first time you are uploading data to the DOT FTP Site, you will need to install FTP software. Go to the following website [http://www.wsftple.com/](http://www.wsftple.com/).

![WS_FTP LE](image_url)

**Ipswitch WS_FTP LE**

*The Perfect FTP Solution For Personal Use*

WS_FTP LE is brought to you by Ipswitch File Transfer, the makers of WS_FTP and MOVEit brands of secure and managed file transfer solutions. For nearly 20 years, Ipswitch has been delivering file transfer solutions to over 40 million users worldwide.

**WS_FTP LE: Fast. Simple. Reliable.**

*With WS_FTP LE, you can:*

![Download and Learn More buttons](image_url)

Figure 42: [www.wsftple.com](http://www.wsftple.com)
Once you are in the site click on the “Download>>” button. Enter your email address, Country, State, First Name and Last Name as shown below. Then hit the “Download Now>>” button.

Figure 43: Download Form
You should then receive the following message screen.

Figure 44: Ipswitch Instructions
You should then receive an email similar to this one. Just click on “Install WS FTP LE” and the download will begin.

Figure 45: WS_FTP LE email
Figure 46: WS_FTP Install Screen 1

Click the Next button to continue.
Make sure “I accept the terms of the license agreement” is selected then hit the Next button.
Click the Next button to continue.
Figure 49: WS_FTP Install Screen 4

Click the Next button to continue.
Figure 50: WS_FTP Install Screen 5

Click the Next button to continue.
Figure 51: WS_FTP Install Screen 6

Once you receive this screen, WS_FTP 12 has been installed. Leave the “Launch WS_FTP 12.3” selection selected and click the Finish button.
Click the Next button to continue.
Enter “DOT FTP SITE” in to the Site Name box as shown above and click the Next button to continue.
Select “FTP” from the Connection Type drop down list and click the Next button to continue.
Enter \texttt{ftp://ftp.state.sd.us} into the Server Address box as shown above and click the Next button to continue.
Enter the following into the appropriate box:

**Username:** dothz01csi (can be upper or lowercase)
**Password:** C49s3#I2 (Upper and lower case as shown)

Click the Next button to continue.
Click the Finish button to continue.
There may be times when system updates and/or database updates are necessary. In order to insure none of the data you have entered into the system is lost during these updates, it is necessary to send SD DOT/BIT your current system(s) and database(s). This will be accomplished by uploading your C:\HZ01CSI folder to the DOT FTP Site.

************************************************************************ VERY IMPORTANT **************************************************************************

Once you have uploaded your C:\HZ01CSI folder to the DOT FTP Site, DO NOT MAKE CHANGES TO YOUR COUNTY DATABASE(S). If you do make changes, they will be lost once the system/database updates have been made by SD DOT/BIT. You can view information and run reports but any changes to the actual data will be lost when you download the system/database changes from the DOT FTP Site.

************************************************************************ VERY IMPORTANT **************************************************************************
You should have the above icon on your desktop; double click it to begin upload process to the DOT FTP Site.

Figure 59: WS_FTP Upload Screen 1

After clicking the icon, a screen similar to Figure 53 should appear. Scroll down the right folder and double click on the DOT folder as shown above.
Figure 60: WS_FTP Upload Screen 2

Double click on the HZ01CSI fold as shown above.
Double click on the Upload To This Site folder as shown above. Then continue to drill down to your Company's folder. You will want to copy
Select the HZ01CSI folder on the left and then click the green arrow as shown above. This will begin the upload process and could take several minutes depending on the size of the folder and the speed of your computer.
Once the upload process has completed, you will see a folder on the right as shown above.

Notify your BIT/DOT contact either by email or phone to inform them your HZ01CSI folder has been uploaded to the DOT FTP site.

************************* VERY IMPORTANT *************************
Once you have uploaded your C:\HZ01CSI folder to the DOT FTP Site, DO NOT MAKE CHANGES TO YOUR COUNTY DATABASE(S). If you do make changes, they will be lost once the system/database updates have been made by SD DOT/BIT. You can view information and run reports but any changes to the actual data will be lost when you download the system/database changes from the DOT FTP Site.

************************* VERY IMPORTANT *************************
System Software and/or Database Updates

Go to the C: drive in Windows Explorer, right click on the C:\HZ01CSI folder, select Rename. Rename the HZ01CSI folder to HZ01CSI-OLD.

To downloaded the latest System software and/or Database updates to the HZ01 County Sign Inventory system (HZ01CSI) open the Windows Explorer (not Internet Explorer) and at the top of the screen (where it says “Computer (C:) Local Disk) type in ftp://ftp.state.sd.us/DOT/HZ01CSI/ and press enter. See Figure 64.

![Windows Explorer](image)

Figure 64: Windows Explorer
The following Log On As popup screen will appear which you will need to submit the following Username and Password:

![Log On As popup Screen](image)

**Username:** dothz01csi (can be upper or lowercase)
**Password:** C49s3#I2 (Upper and lower case as shown)

The following HZ01CSI File Folder should appear after you have drilled down to your Company folder:

![HZ01CSI File Folder](image)
1) Select the HZ01CSI File folder, right click on it and select “Copy”

2) Double click your (C:) Local Disk folder, right click and select “Paste”

Figure 67: Folder to be copied to C:
You should now have a HZ01CSI folder under your C: drive.

Figure 68: After copying folder

You should now be able to use any of your County Icons on your desktop.

Figure 69: County CSI (County Sign Inventory)