| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|---|---|---|---|
| | | | |

Plotting Date: 06/08/2016

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

# PROJECT 090 E-451, 090 W-451, & 014A-451

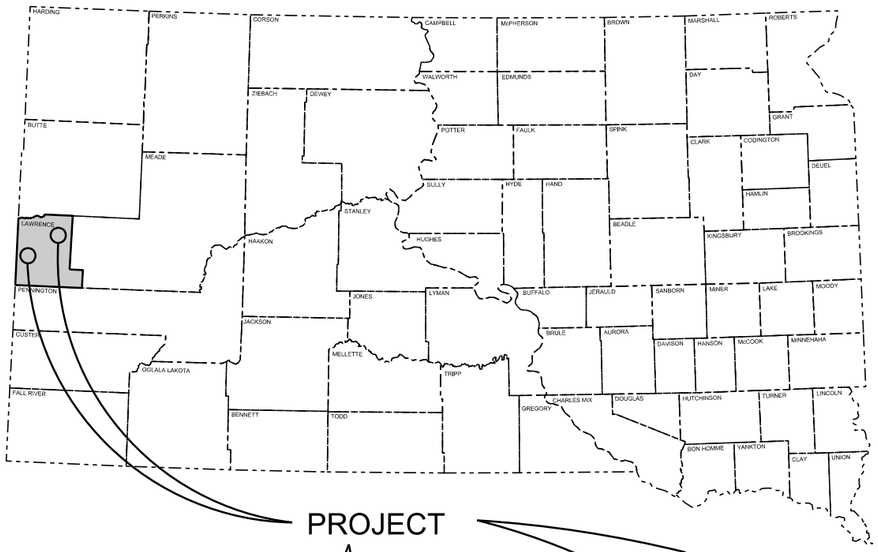
# INTERSTATE 90 & US 14A

# LAWRENCE COUNTY

INSTALL EDGE DRAINS & UNDERDRAIN
PCN i4dy, i4e0, & i4e8

INDEX OF SHEETS



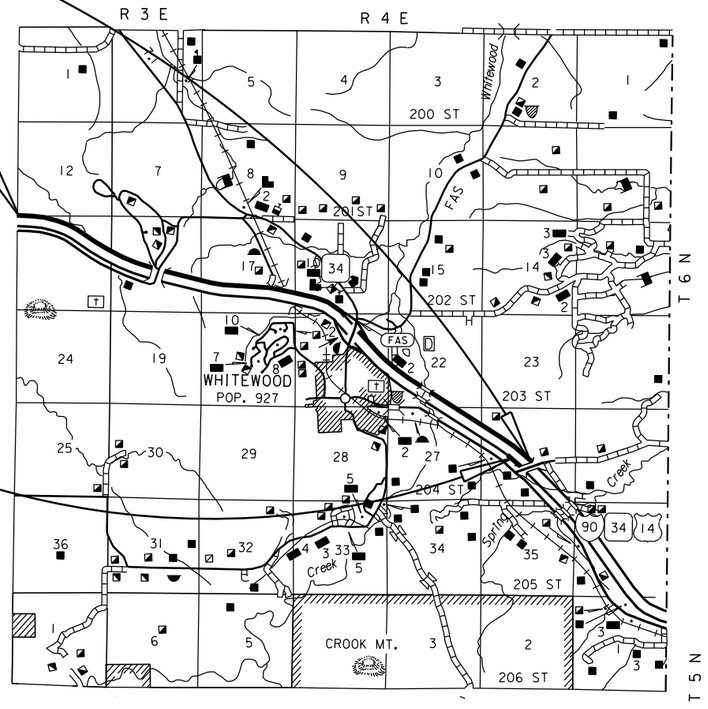


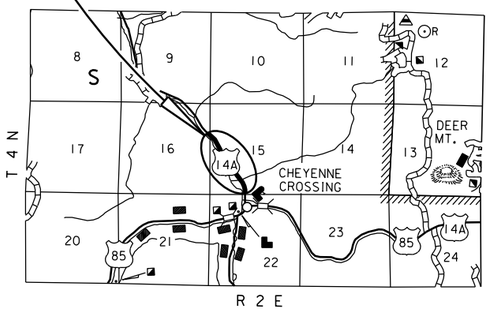

PROJECT

PCN i4e0, I90 WB
MRM 19.18 to MRM 26.08

PCN i4dy, I90 EB
MRM 26.13 to MRM 26.18

PCN i4e8, US 14A
MRM 28.609 to MRM 28.579




DESIGN DESIGNATION PCN i4dy, !-90 EB

| | |
|---|---|
| ADT (2015) | 5155 |
| ADT (2035) | 8624 |
| DHV | 1181 |
| D | 51% |
| T DHV | 9.7% |
| T ADT | 21.3% |
| V | 75 mph |

DESIGN DESIGNATION PCN i4e0, I-90 WB

| | |
|---|---|
| ADT (2015) | 5145 |
| ADT (2035) | 8523 |
| DHV | 1168 |
| D | 51% |
| T DHV | 9.7% |
| T ADT | 21.3% |
| V | 75 mph |

DESIGN DESIGNATION PCN i4e8, US 14A

| | |
|---|---|
| ADT (2015) | 682 |
| ADT (2035) | 923 |
| DHV | 146 |
| D | 51% |
| T DHV | 3.7% |
| T ADT | 8.1% |
| V | 35 mph |

STORM WATER PERMIT
None Required

## ESTIMATE OF QUANTITIES

**PCN i4dy – I-90 E**

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 009E0010 | Mobilization | Lump Sum | LS |
| 230E0100 | Remove and Replace Topsoil | Lump Sum | LS |
| 430E0700 | Precast Concrete Headwall for Drain | 2 | Each |
| 634E0010 | Flagging | 100.0 | Hour |
| 634E0110 | Traffic Control Signs | 296.0 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 634E0285 | Type 3 Barricade, 8' Double Sided | 2 | Each |
| 634E0420 | Type C Advance Warning Arrow Board | 2 | Each |
| 680E0240 | 4" Corrugated Polyethylene Drainage Tubing | 36 | Ft |
| 680E0440 | 4" Slotted Corrugated Polyethylene Drainage Tubing | 1,000 | Ft |
| 680E2500 | Porous Backfill | 222.2 | Ton |
| 734E0010 | Erosion Control | Lump Sum | LS |
| 831E0100 | Type A Drainage Fabric | 889 | SqYd |

**PCN i4e0 – I-90 W**

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 009E0010 | Mobilization | Lump Sum | LS |
| 230E0100 | Remove and Replace Topsoil | Lump Sum | LS |
| 430E0700 | Precast Concrete Headwall for Drain | 8 | Each |
| 634E0010 | Flagging | 100.0 | Hour |
| 634E0110 | Traffic Control Signs | 296.0 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 634E0285 | Type 3 Barricade, 8' Double Sided | 2 | Each |
| 634E0420 | Type C Advance Warning Arrow Board | 2 | Each |
| 680E0240 | 4" Corrugated Polyethylene Drainage Tubing | 144 | Ft |
| 680E0440 | 4" Slotted Corrugated Polyethylene Drainage Tubing | 4,162 | Ft |
| 680E2500 | Porous Backfill | 924.8 | Ton |
| 734E0010 | Erosion Control | Lump Sum | LS |
| 831E0100 | Type A Drainage Fabric | 3,701 | SqYd |

**PCN i4e8 – US 14A**

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 009E0010 | Mobilization | Lump Sum | LS |
| 230E0100 | Remove and Replace Topsoil | Lump Sum | LS |
| 430E0700 | Precast Concrete Headwall for Drain | 1 | Each |
| 634E0010 | Flagging | 100.0 | Hour |
| 634E0110 | Traffic Control Signs | 137.0 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 680E0240 | 4" Corrugated Polyethylene Drainage Tubing | 10 | Ft |
| 680E0440 | 4" Slotted Corrugated Polyethylene Drainage Tubing | 200 | Ft |
| 680E2500 | Porous Backfill | 14.8 | Ton |
| 700E0110 | Class A Riprap | 1.5 | Ton |
| 734E0010 | Erosion Control | Lump Sum | LS |
| 734E0154 | 12" Diameter Erosion Control Wattle | 160 | Ft |
| 831E0100 | Type A Drainage Fabric | 89 | SqYd |

## ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

### COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

**Action Taken/Required:**

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

### COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

**Action Taken/Required:**

Construction and/or demolition debris may not be disposed of within the Public ROW.

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

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

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

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

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

### COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

**Action Taken/Required:**

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

**COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES (CONTINUED)**

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

**UTILITIES**

The Contractor shall be responsible for locating and protecting any utility that would conflict with any work. Utilities are known to exist along US14A. If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the contractor shall contact the project engineer to determine modifications that will be necessary to avoid utility impacts.

Any damage done to a utility will be the Contractor's responsibility to repair.

Utilities within the limits of the proposed construction shall be adjusted by the owner unless otherwise indicated in these plans. The Contractor will need to coordinate with the utility company for any adjustments necessary.

**EDGE DRAINS**

At least two weeks prior to installation of the edge drain, a manufacturer's certification of material specification compliance shall be submitted to the Engineer.

The Geotextile shall be a Type A Drainage Fabric conforming to the requirements of Section 831.1 of the Standard Specifications and located as shown on the plans and in accordance with the manufacturer's recommendations. Fabric will be placed no higher than 2" from the top of the trench. The top 2 inches of the trench shall be filled with Porous Backfill.

Two weeks prior to beginning installation, the Contractor shall furnish the Engineer with copies of the manufacturer's literature with details, specifications, and installation requirements for edge drain and outlet pipe. In addition, the Contractor shall provide information on the type of trenching equipment to be used and the proposed procedure for installation of the edge drain and outlets. Installation of edge drain and edge drain outlets, and excavation and backfill of trenches shall be in accordance with the details shown on the plans, as specified herein, and in accordance with the manufacturer's recommendations.

Each segment of edge drain shall be spliced to the adjacent segment in accordance with manufacturer's recommendations prior to installation, kept in proper alignment, and not allowed to separate during installation. The porous backfill shall be placed to the depth indicated in the edge drain details and shall be compacted by a vibratory compactor or other means, satisfactory to the Engineer, which does not result in damage to the edge drain pipe.

Trenches for outlets shall be excavated as directed by the Engineer and shall be backfilled with fill material. The fill material shall be placed to the depth indicated in the edge drain details and shall be compacted by a vibratory compactor or other means, satisfactory to the Engineer, which does not result in damage to the outlet pipe.

Trenches shall not be left open during non-working hours.

The material removed from the edge drain trench and edge drain outlet trench, shall be disposed of by the Contractor at a site approved by the Engineer. Cost of disposal shall be incidental to the contract unit prices for various contract items.

**US14A UNDERDRAIN WORK**

The Contractor may need to wait until a drier period of time so that the underdrain trench can be installed. The Contractor shall locate the two existing springs in the backslope and intercept with an underdrain and "T" into the edge drain to be installed at this location. A quantity of 2-20' lengths of additional underdrain is provided to accomplish this work. The Contractor may need to remove some of the existing rip rap to install this underdrain to intercept the springs in the backslope. All costs associated with this work shall be incidental to the various underdrain bid items.

**TABLE OF EDGE DRAINS AND UNDERDRAINS**

**Table of Edge Drains and Underdrains**

| Direction | MRM | to | MRM | Shoulder | 4" Corrugated Polyethylene Drainage Tubing (Ft) | 4" Slotted Corrugated Polyethylene Drainage Tubing (Ft) | Type A Drainage Fabric (SqYd) | Porous Backfill (Ton) | Precast Concrete Headwall for Drain (Each) |
|---|---|---|---|---|---|---|---|---|---|
| **PCN i4dy** | | | | | | | | | |
| EB | 26.23 | | 26.03 | Median | 36 | 1000 | 889.3 | 222.2 | 2 |
| | | | | **Total** | 36 | 1000 | 889.3 | 222.2 | 2 |
| **PCN i4e0** | | | | | | | | | |
| WB | 26.01 | | 26.2 | Median | 36 | 1000 | 889.3 | 222.2 | 2 |
| Wb | 19.18 | | 19.38 | Median | 36 | 1000 | 889.3 | 222.2 | 2 |
| WB | 20.4 | | 20.6 | Median | 36 | 1000 | 889.3 | 222.2 | 2 |
| WB | 22.49 | | 22.71 | Median | 36 | 1162 | 1033.3 | 258.2 | 2 |
| | | | | **Total** | 144 | 4162 | 3701.2 | 924.8 | 8 |
| **PCN i4e8** | | | | | | | | | |
| | 28.61 | | 28.58 | | 10 | 200 | 89.1 | 14.8 | 1 |
| | | | | **Total** | 10 | 200 | 89.1 | 14.8 | 1 |

**TRAFFIC CONTROL – GENERAL NOTES**

1. Unless otherwise stated in these plans, no work will be allowed ring hours of darkness.
2. Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.
3. Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.
4. All construction operations shall be conducted in the general direction of traffic movement.
5. If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD – whichever is more stringent shall be used, as determined by the Engineer.
6. Construction related traffic shall not cross interstate traffic. Construction traffic shall only enter and exit the interstate by the use of existing interchanges.
7. All traffic shall be restored to normal during hours of darkness.

**MAINTENANCE CROSSOVER TRUCK CROSSING**

At the discretion of the Engineer, the use of maintenance crossovers will be allowed when the following criteria are met:

- The passing lanes in both directions are closed and signed as per the "Maintenance Crossover Truck Crossing Detail" traffic control sheet.
- Flaggers shall be used to prevent thru traffic from entering the passing lanes used by the turning trucks.
- A maintenance crossover shall not be used if it is within one mile of an existing interchange.
- Traffic shall not be subject to unnecessary weaving when construction operations occupy the driving lane. A minimum of one mile shall always be maintained from the end of an active construction work zone (in the driving lane) to the beginning of the lane taper (in the passing lane) for the truck maintenance crossover.
- All maintenance crossover use is subject to approval by the Engineer and will not be allowed if deemed unsafe for the physical conditions and traffic.
- All damage to the maintenance crossovers shall be repaired after mainline paving is completed. Payment for the required repairs will be made under the appropriate contract items.

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|---|---|---|---|
| | 090 E-451, 090 W-451, & 014A-451 | 4 | 13 |

## INVENTORY OF TRAFFIC CONTROL DEVICES

### PCN i4dy

| SIGN CODE | SIGN DESCRIPTION | EXPRESSWAY / INTERSTATE NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
|---|---|---|---|---|---|
| W4-2 | LEFT or RIGHT LANE ENDS (symbol) | 4 | 48" x 48" | 16.0 | 64.0 |
| W20-1 | ROAD WORK AHEAD | 5 | 48" x 48" | 16.0 | 80.0 |
| W20-5 | LEFT or RIGHT LANE CLOSED AHEAD | 4 | 48" x 48" | 16.0 | 64.0 |
| W20-7 | FLAGGER (symbol) | 2 | 48" x 48" | 16.0 | 32.0 |
| W21-5 | SHOULDER WORK | 2 | 48" x 48" | 16.0 | 32.0 |
| G20-2 | END ROAD WORK | 3 | 48" x 24" | 8.0 | 24.0 |
| | | EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT | | | 296.0 |

#### TYPE 3 BARRICADES

| ITEM DESCRIPTION | QUANTITY |
|---|---|
| Type 3 Barricade, 8' Double Sided | 2 Each |

#### ARROW BOARDS

| ITEM DESCRIPTION | QUANTITY |
|---|---|
| Type C Advance Warning Arrow Board | 2 Each |

### PCN i4e0

| SIGN CODE | SIGN DESCRIPTION | EXPRESSWAY / INTERSTATE NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
|---|---|---|---|---|---|
| W4-2 | LEFT or RIGHT LANE ENDS (symbol) | 4 | 48" x 48" | 16.0 | 64.0 |
| W20-1 | ROAD WORK AHEAD | 5 | 48" x 48" | 16.0 | 80.0 |
| W20-5 | LEFT or RIGHT LANE CLOSED AHEAD | 4 | 48" x 48" | 16.0 | 64.0 |
| W20-7 | FLAGGER (symbol) | 2 | 48" x 48" | 16.0 | 32.0 |
| W21-5 | SHOULDER WORK | 2 | 48" x 48" | 16.0 | 32.0 |
| G20-2 | END ROAD WORK | 3 | 48" x 24" | 8.0 | 24.0 |
| | | EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT | | | 296.0 |

#### TYPE 3 BARRICADES

| ITEM DESCRIPTION | QUANTITY |
|---|---|
| Type 3 Barricade, 8' Double Sided | 2 Each |

#### ARROW BOARDS

| ITEM DESCRIPTION | QUANTITY |
|---|---|
| Type C Advance Warning Arrow Board | 2 Each |

### PCN i4e8

| SIGN CODE | SIGN DESCRIPTION | NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
|---|---|---|---|---|---|
| W20-1 | ROAD WORK AHEAD | 3 | 48" x 48" | 16.0 | 48.0 |
| W20-4 | ONE LANE ROAD AHEAD | 2 | 48" x 48" | 16.0 | 32.0 |
| W20-7 | FLAGGER (symbol) | 2 | 48" x 48" | 16.0 | 32.0 |
| W21-5 | SHOULDER WORK | 1 | 48" x 48" | 16.0 | 16.0 |
| G20-2 | END ROAD WORK | 2 | 36" x 18" | 4.5 | 9.0 |
| | | CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT | | | 137.0 |

## EROSION CONTROL

Areas disturbed or damaged during subgrade repairs shall be seeded and mulched.

All permanent seed shall be planted in the topsoil at a depth of ¼" to ½".

All seed broadcast must be raked or dragged in (incorporated) within the top ¼" to ½" of topsoil when possible. Hand raking may be required. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

Type F Permanent Seed Mixture shall consist of the following:

| Grass Species | Variety | Pure Live Seed (PLS) (Pounds/Acre) |
|---|---|---|
| Western Wheatgrass | Flintlock, Rodan, Rosana | 7 |
| Green Needlegrass | Lodorm | 4 |
| Sideoats Grama | Butte, Killdeer, Pierre, Trailway | 3 |
| Blue Grama | Bad River, Willis | 2 |
| Oats or Spring Wheat: April through May; Winter Wheat: August through November | | 10 |
| | Total: | 26 |

Fiber mulch shall be applied in a separate operation following permanent seeding.

An additional 2% by weight of tackifier shall be added to the fiber mulch product selected from the list below. If the product selected has guar gum tackifier included, then the additional 2% of tackifier shall be guar gum. If the product selected has synthetic tackifier included, then the additional 2% of tackifier shall be synthetic.

Fiber mulch shall be applied at the rate of 2000 pounds per acre.

The Contractor shall allow the fiber mulch to cure a minimum of 18 hours prior to watering or any storm event to ensure proper cohesion between the soil and fiber particles.

All costs for the additional tackifier added to the fiber mulch including labor, equipment, and materials shall be incidental to the contract unit price per lump sum for Erosion Control.

The fiber mulch used on this project shall be one from the list below:

| Product | Manufacturer |
|---|---|
| Mat-Fiber Plus | Mat, Inc.<br>Floodwood, MN<br>Phone: 1-888-477-3028<br>www.matinc.biz |
| Conwed Hydro Mulch 2000 | Profile Products LLC<br>Buffalo Grove, IL<br>Phone: 1-800-366-1180<br>www.conwedfibers.com |
| EcoFibre Plus Tackifier | Profile Products LLC<br>Buffalo Grove, IL<br>Phone: 1-800-366-1180<br>www.profile-eco.com |
| Terra Wood with Tacking Agent 3 | Profile Products LLC<br>Buffalo Grove, IL<br>Phone: 1-800-726-6371<br>www.terra-mulch.com |
| Bindex Wood WT | American Excelsior Co.<br>Arlington, TX<br>Phone: 1-800-777-7645<br>www.curlex.com |
| Second Nature Wood Fiber Mulch Plus | Central Fiber LLC<br>Canton, OH<br>Phone: 1-888-452-2630<br>www.centralfiber.com |

All costs associated with permanent seeding and fiber mulching shall be incidental to the contract unit price per lump sum for Erosion Control.

## 12" EROSION CONTROL WATTLE

12" Erosion Control Wattles shall be placed above the Class A Riprap as shown on the typical section.

12" Erosion Control Wattles for restraining the flow of runoff and sediment shall be installed at locations noted in the table and at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor shall provide certification that the 12" Erosion Control Wattles do not contain noxious weed seeds.

The 12" Erosion Control Wattles provided shall be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

http://sddot.com/business/certification/products/Default.aspx

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|---|---|---|---|
| | 090 E-451, 090 W-451, & 014A-451 | 6 | 13 |

Plotting Date: 06/02/2016

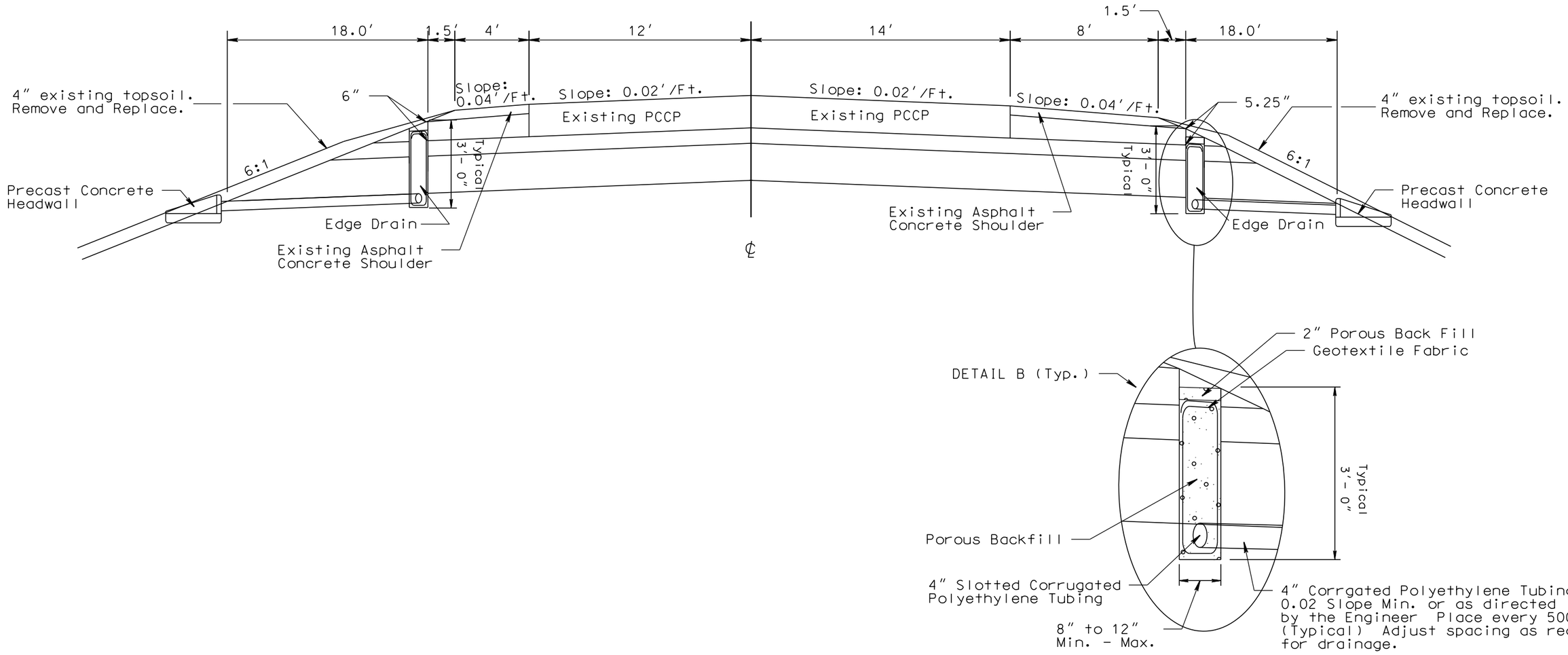
# TYPICAL EDGE DRAIN INSTALLATION I-90

PCN i4dy

EB Median MRM 26.23 to MRM 26.03

PCN i4eo

WB Median MRM 26.01 to MRM 26.20
WB Median MRM 19.18 to MRM 19.38
WB Median MRM 20.40 to MRM 20.60
WB Median MRM 22.49 to MRM 22.71




Plot Scale - 1:5.55612

Plotted From - trrc12608

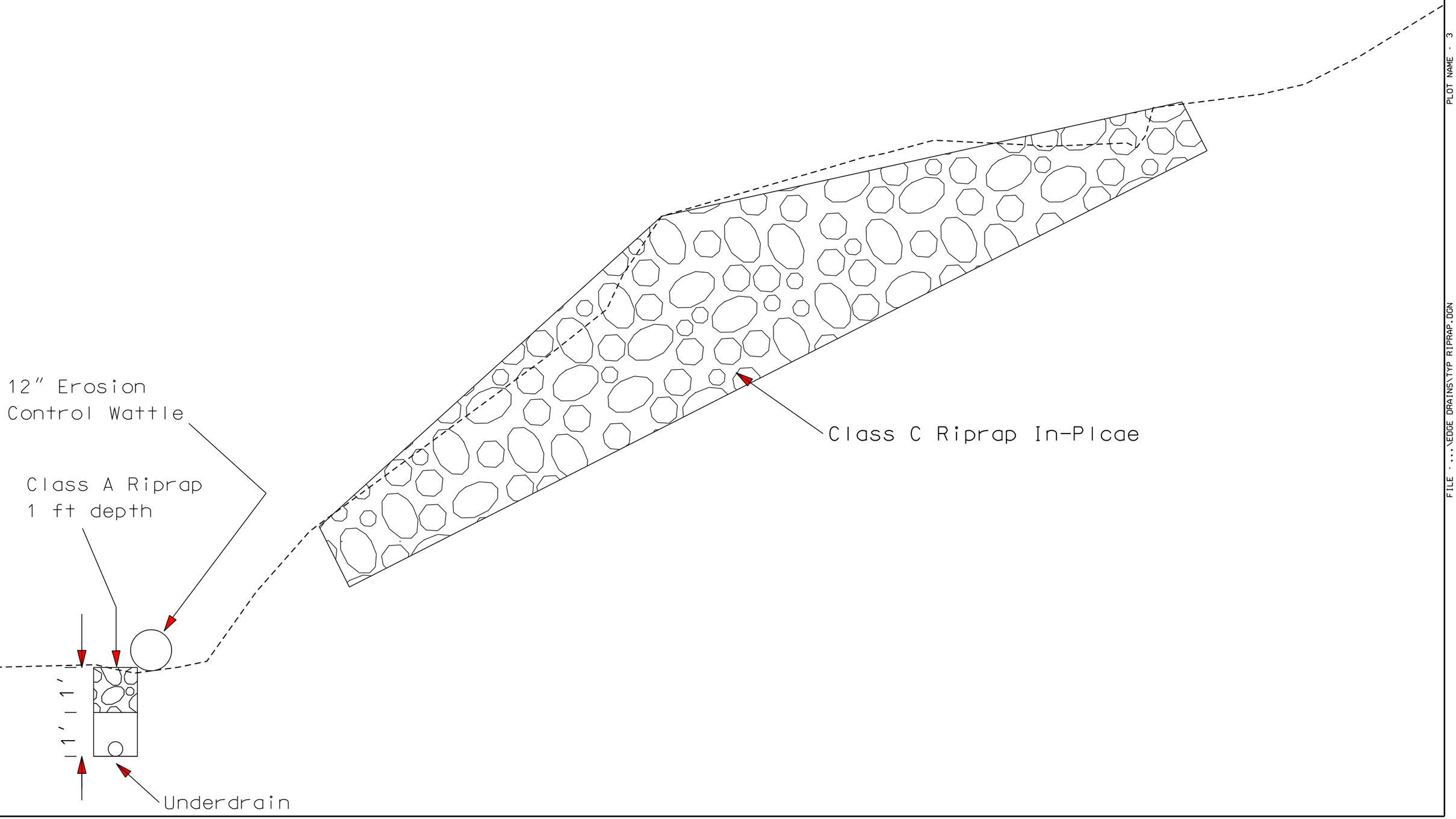
File - ...\plans\Edge Drains\TYP_3d.dgn

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 090 E-451, 090 W-451, & 014A-451 | 7 | 13 |

Plotting Date: 06/02/2016

# TYPICAL UNDERDRAIN INSTALLATION

## US14A, MRM 28.58 to 28.6




PLOT SCALE - 1:100

PLOTTED FROM - TRRC12608

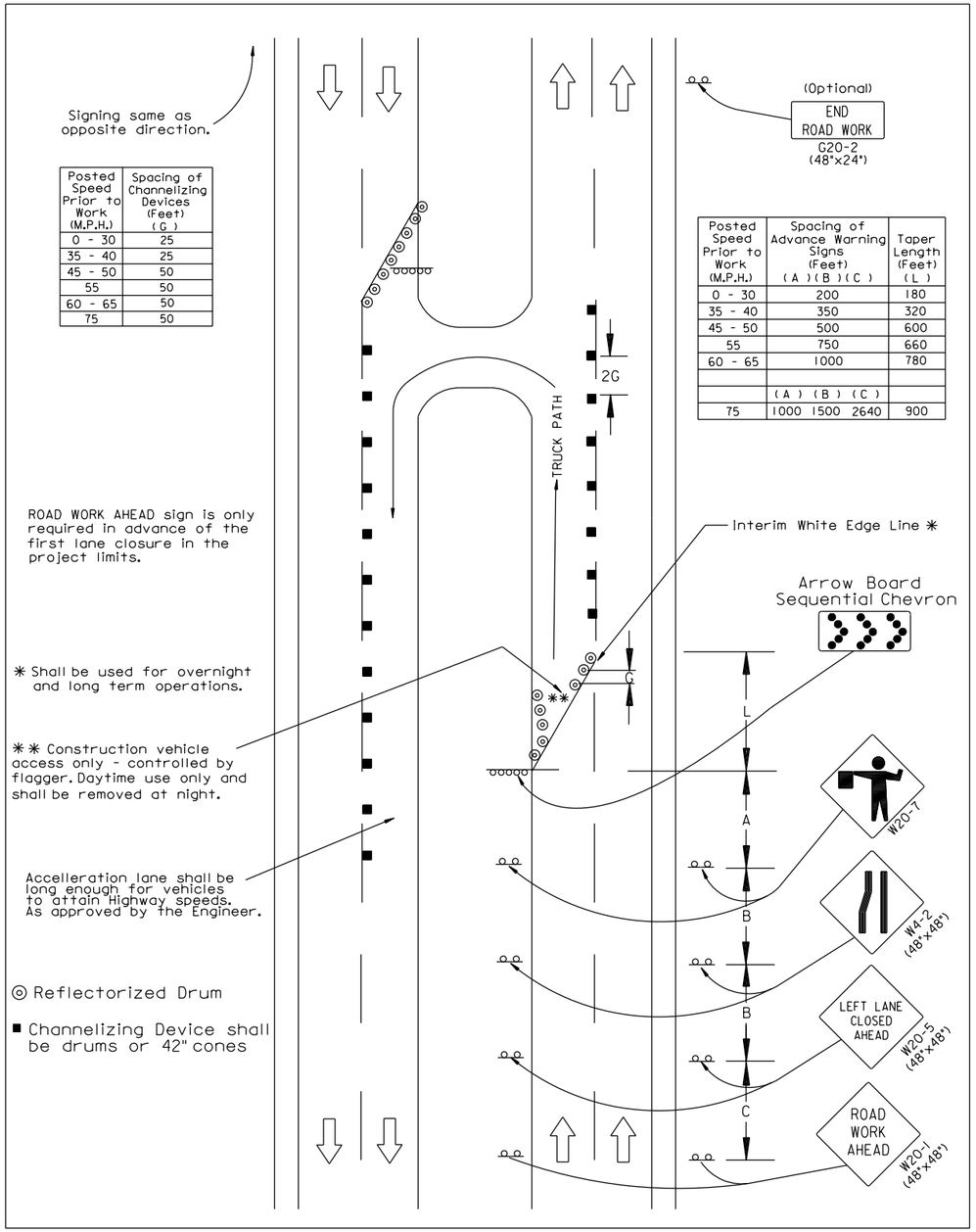
PLOT NAME - 3

FILE - ...\EDGE DRAINS\TYP RIPRAP.DGN

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|---|---|---|---|
| | 090 E-451, 090 W-451, & 014A-451 | 8 | 13 |

Plotting Date: 06/02/2016

# MAINTENANCE CROSSOVER TRUCK CROSSING DETAIL




| Posted Speed Prior to Work (M.P.H.) | Spacing of Channelizing Devices (Feet) ( G ) |
|---|---|
| 0 - 30 | 25 |
| 35 - 40 | 25 |
| 45 - 50 | 50 |
| 55 | 50 |
| 60 - 65 | 50 |
| 75 | 50 |

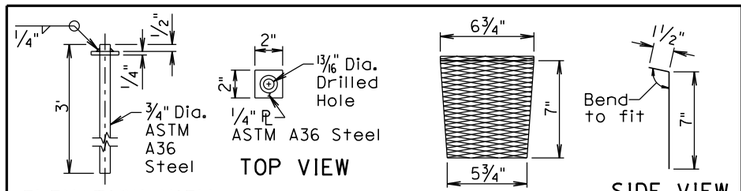
| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) ( A )( B )( C ) | Taper Length (Feet) ( L ) |
|---|---|---|
| 0 - 30 | 200 | 180 |
| 35 - 40 | 350 | 320 |
| 45 - 50 | 500 | 600 |
| 55 | 750 | 660 |
| 60 - 65 | 1000 | 780 |
| | | |
| | ( A ) ( B ) ( C ) | |
| 75 | 1000 1500 2640 | 900 |

One mile minimum to work zone in driving lane.

Plot Scale - 1:40

Plotted From - trrc12608

File - ...\Maintenance Crossover Truck Crossing Detail.dgn









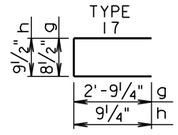


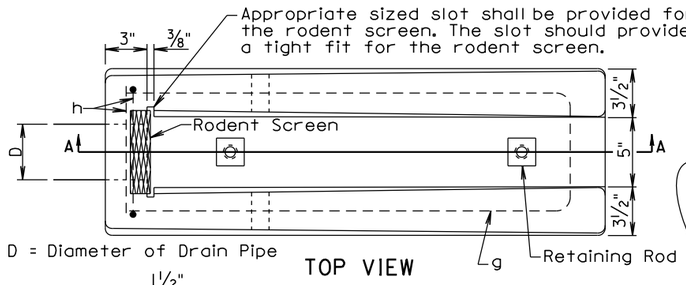


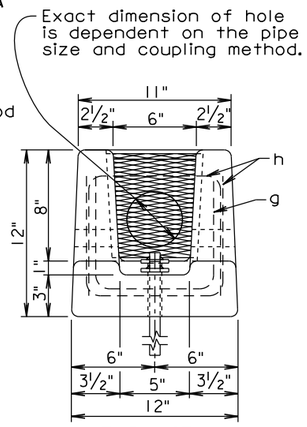
| REINFORCING SCHEDULE | | | | |
|---|---|---|---|---|
| MK. | No. | Size | Length | Type |
| g | 1 | 4 | 6'-3" | 17 |
| h | 2 | 4 | 2'-4" | 17 |

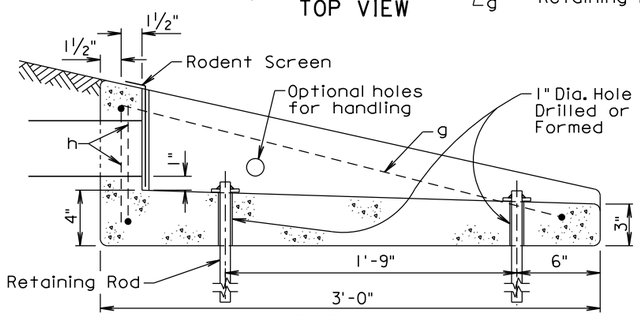
**NOTE:**
All dimensions are out to out of bars.

Bending Details




**GENERAL NOTES:**

The concrete shall be Class M6. The concrete shall conform to the requirements of Section 462 of the Specifications. It is estimated that each unit weighs approximately 210 pounds.

All reinforcing steel shall conform to ASTM A615 Grade 60 and shall be epoxy coated. The reinforcing steel shall be securely retained to prevent displacement during placement of concrete. It is estimated that 7.3 pounds of reinforcing steel is required for each unit.

The pipe shall be placed in the concrete headwall with the pipe end flush with the concrete surface adjacent to the rodent screen.

The rodent screen shall be galvanized 13 Ga. steel with a diamond shaped flattened mesh pattern. The size shall be 1/2". The size refers to the measurement across the smallest diamond shaped opening measured from the centers of the wires.

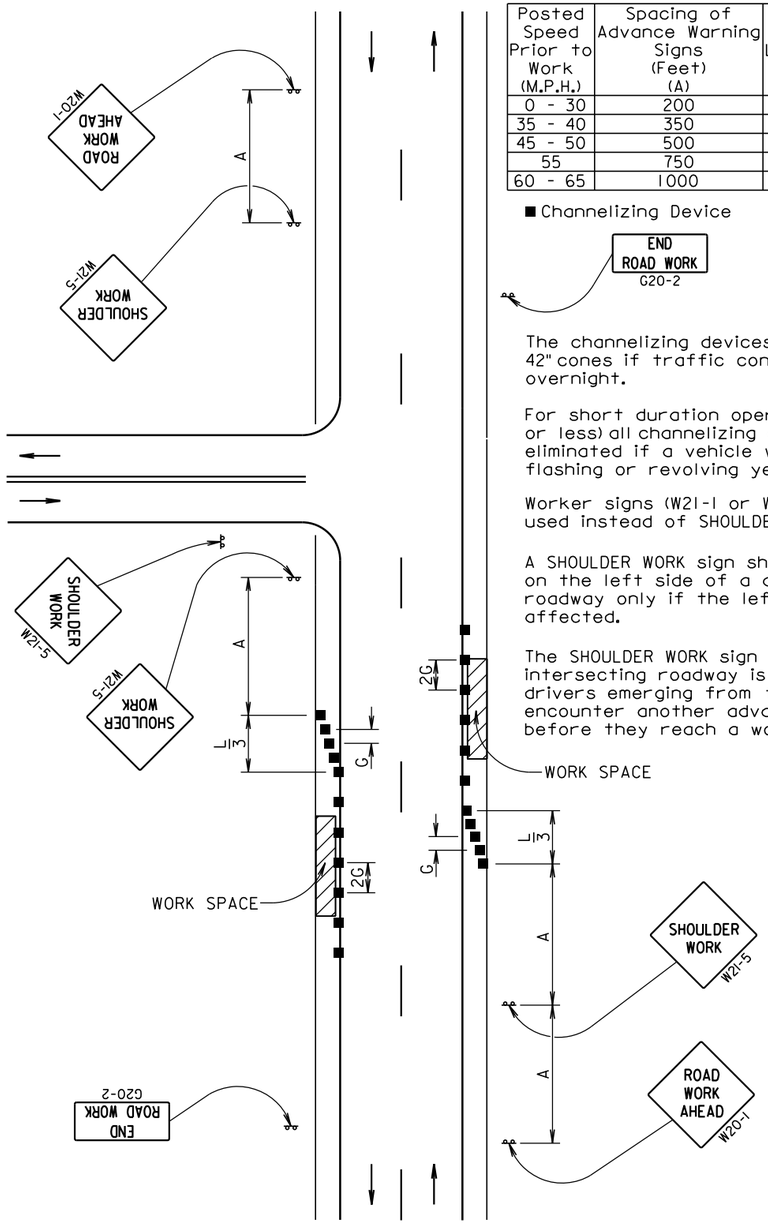
The retaining rod shall be galvanized in accordance with ASTM A123 after all shop welding has been completed.

The drawing indicates using 1/2" fillets; however, 3/4" chamfers may be substituted for the 1/2" fillets.

All costs for furnishing and installing the concrete headwall including equipment, labor, and materials including concrete, reinforcing steel, retaining rods, and rodent screen shall be incidental to the contract unit price per each for "Precast Concrete Headwall for Drain".

*June 26, 2015*

| | | | |
|---|---|---|---|
| ***Published Date: 2nd Qtr. 2016*** | **SDDOT** | ***PRECAST CONCRETE HEADWALL FOR DRAIN*** | *PLATE NUMBER* 430.50 |
| | | | *Sheet 1 of 1* |




| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) | Taper Length (Feet) (L) | Spacing of Channelizing Devices (Feet) (G) |
|---|---|---|---|
| 0 - 30 | 200 | 180 | 25 |
| 35 - 40 | 350 | 320 | 25 |
| 45 - 50 | 500 | 600 | 50 |
| 55 | 750 | 660 | 50 |
| 60 - 65 | 1000 | 780 | 50 |

■ Channelizing Device

END ROAD WORK G20-2

The channelizing devices shall be drums or 42" cones if traffic control must remain overnight.

For short duration operations (1 hour or less) all channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

A SHOULDER WORK sign should be placed on the left side of a divided or one-way roadway only if the left shoulder is affected.

The SHOULDER WORK sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign before they reach a work activity area.

September 22, 2014

| Published Date: 2nd Qtr. 2016 | SDDOT | GUIDES FOR TRAFFIC CONTROL DEVICES WORK ON SHOULDERS | PLATE NUMBER 634.03 |
|---|---|---|---|
| | | | Sheet 1 of 1 |

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

■ Flagger

■ Channelizing Device

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

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

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

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

The channelizing devices shall be drums or 42" cones.

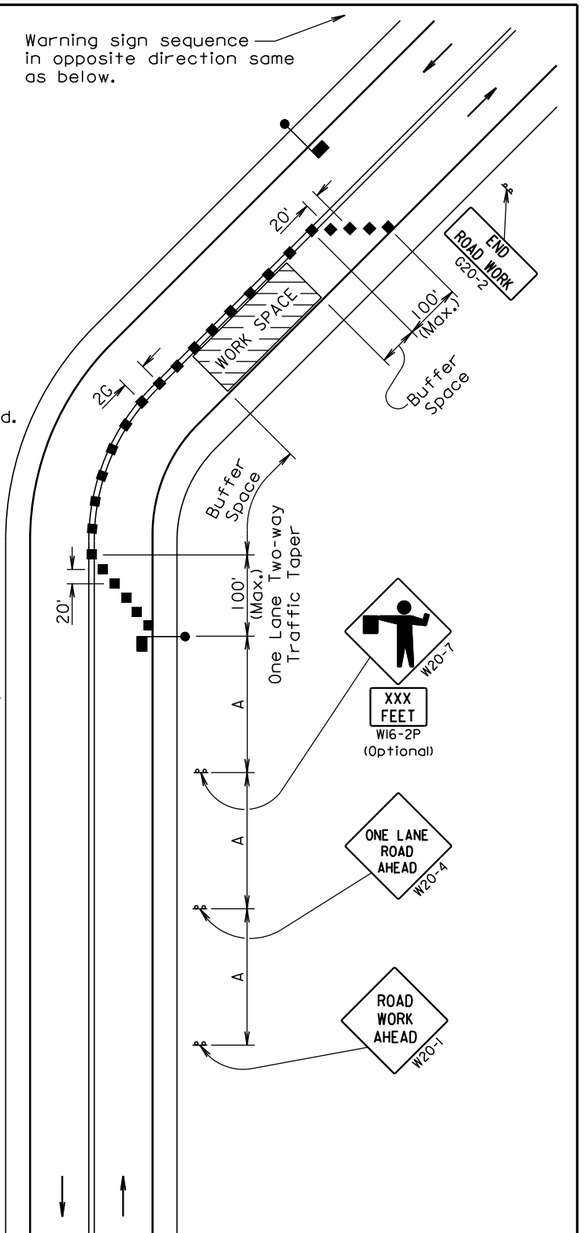
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

END ROAD WORK G20-2

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

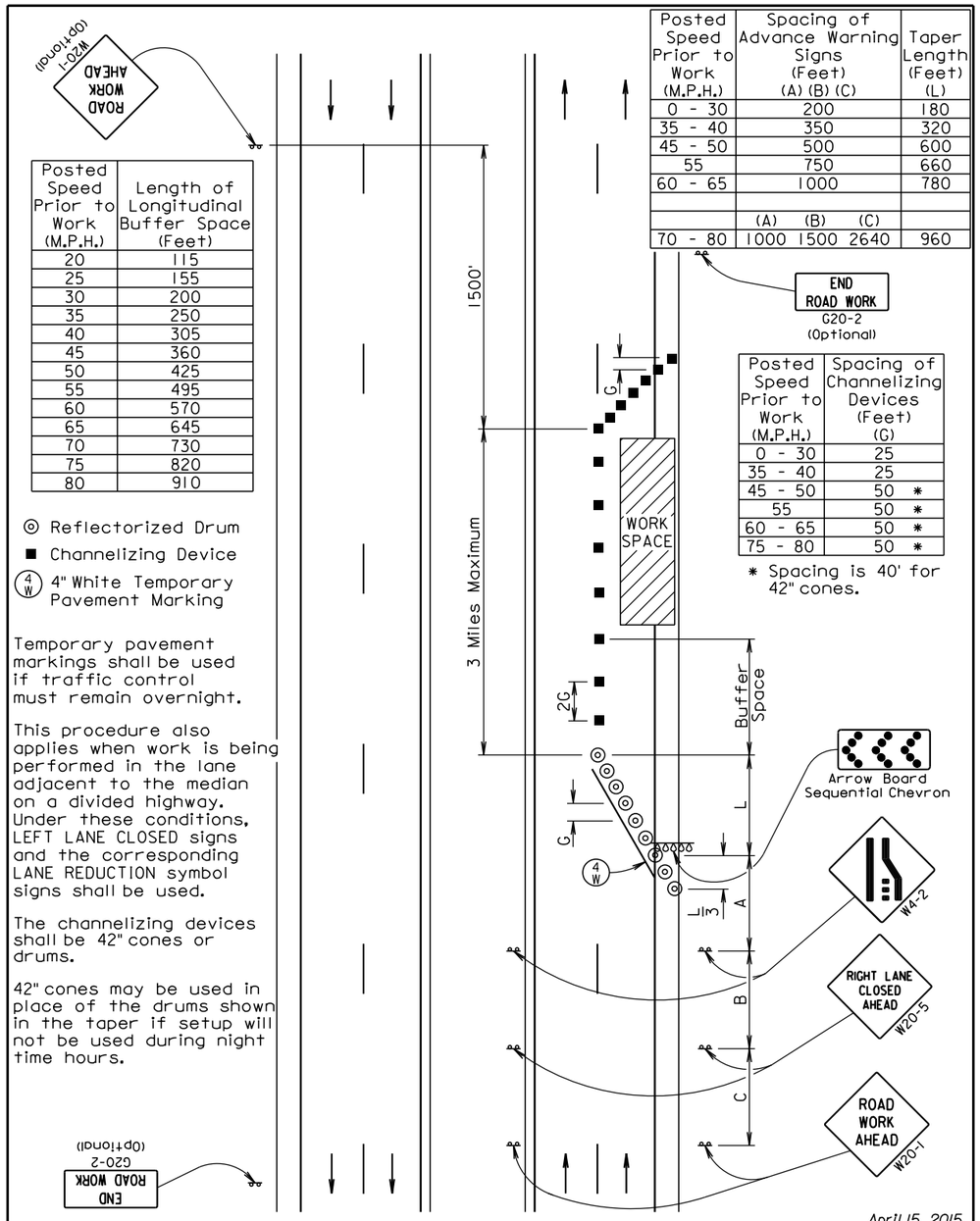
The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

The length of A may be adjusted to fit field conditions.




September 22, 2014

| Published Date: 2nd Qtr. 2016 | SDDOT | GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED | PLATE NUMBER 634.23 |
|---|---|---|---|
| | | | Sheet 1 of 1 |




| Posted Speed Prior to Work (M.P.H.) | Length of Longitudinal Buffer Space (Feet) |
|---|---|
| 20 | 115 |
| 25 | 155 |
| 30 | 200 |
| 35 | 250 |
| 40 | 305 |
| 45 | 360 |
| 50 | 425 |
| 55 | 495 |
| 60 | 570 |
| 65 | 645 |
| 70 | 730 |
| 75 | 820 |
| 80 | 910 |

◎ Reflectorized Drum

■ Channelizing Device

(4W) 4" White Temporary Pavement Marking

Temporary pavement markings shall be used if traffic control must remain overnight.

This procedure also applies when work is being performed in the lane adjacent to the median on a divided highway. Under these conditions, LEFT LANE CLOSED signs and the corresponding LANE REDUCTION symbol signs shall be used.

The channelizing devices shall be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

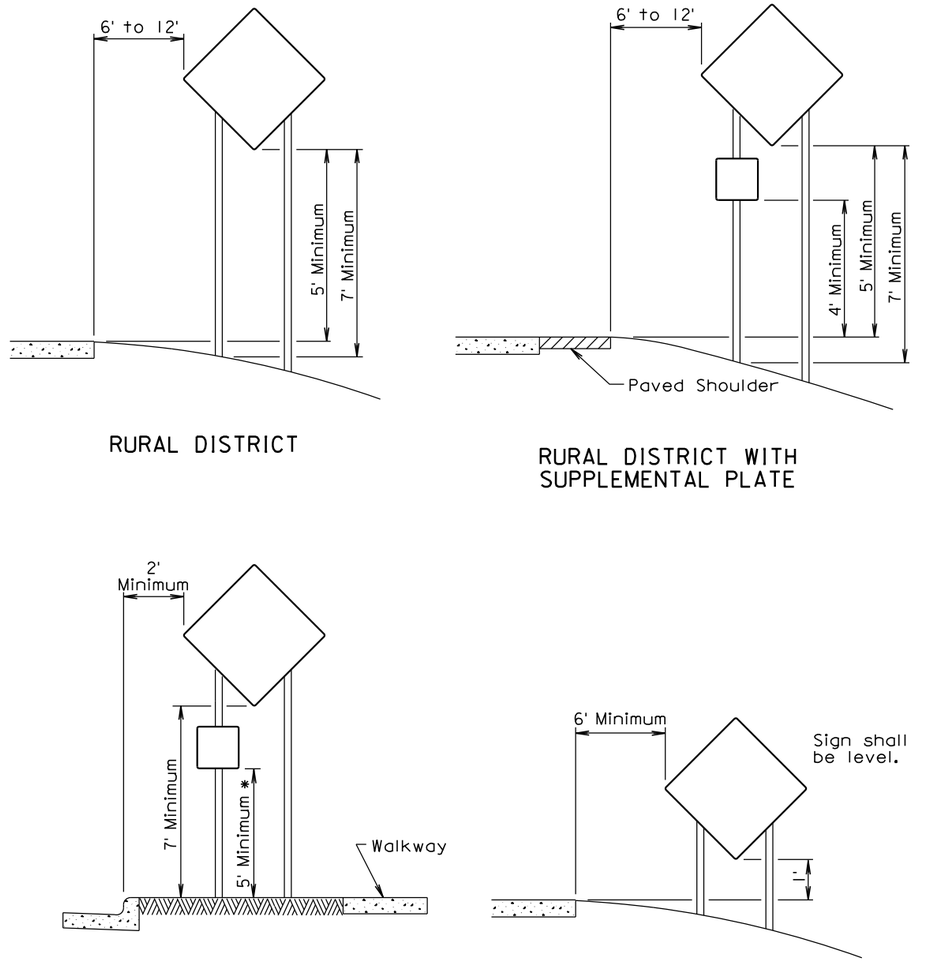
| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) (B) (C) | Taper Length (Feet) (L) |
|---|---|---|
| 0 - 30 | 200 | 180 |
| 35 - 40 | 350 | 320 |
| 45 - 50 | 500 | 600 |
| 55 | 750 | 660 |
| 60 - 65 | 1000 | 780 |
| | | |
| | (A) (B) (C) | |
| 70 - 80 | 1000 1500 2640 | 960 |

| Posted Speed Prior to Work (M.P.H.) | Spacing of Channelizing Devices (Feet) (G) |
|---|---|
| 0 - 30 | 25 |
| 35 - 40 | 25 |
| 45 - 50 | 50 * |
| 55 | 50 * |
| 60 - 65 | 50 * |
| 75 - 80 | 50 * |

* Spacing is 40' for 42" cones.

April 15, 2015

| Published Date: 2nd Qtr. 2016 | SDDOT | GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITHOUT BARRIER | PLATE NUMBER 634.64 |
|---|---|---|---|
| | | | Sheet 1 of 1 |

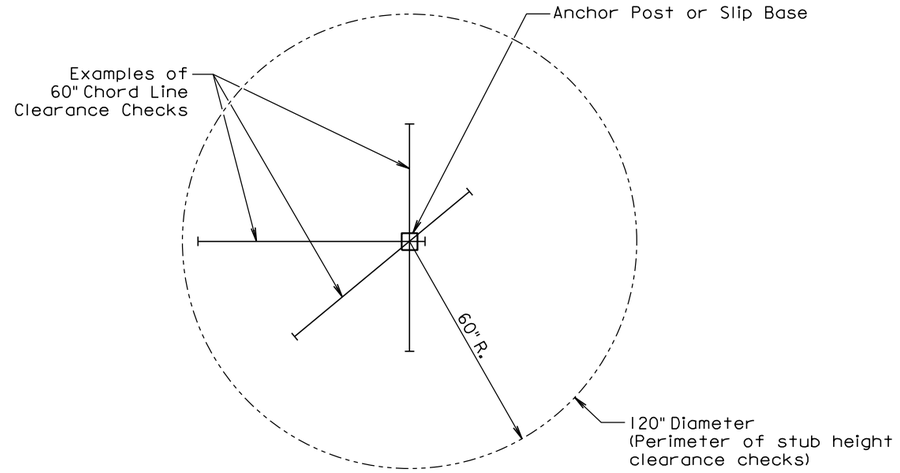



* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

(Not applicable to regulatory signs)

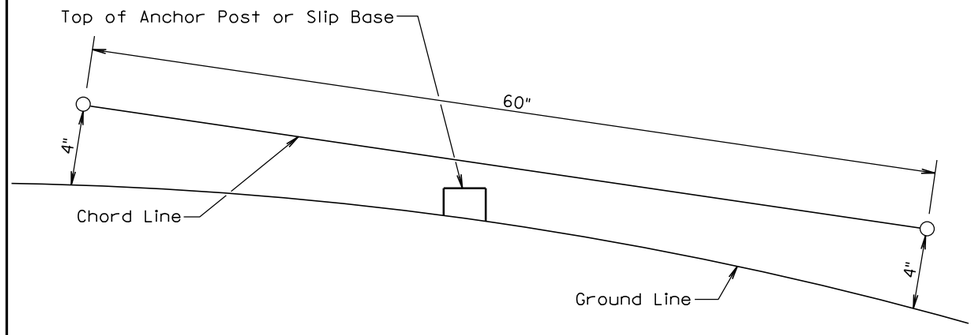
September 22, 2014

| Published Date: 2nd Qtr. 2016 | SDDOT | CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing) | PLATE NUMBER 634.85 |
|---|---|---|---|
| | | | Sheet 1 of 1 |




PLAN VIEW

(Examples of stub height clearance checks)




ELEVATION VIEW

**GENERAL NOTES:**

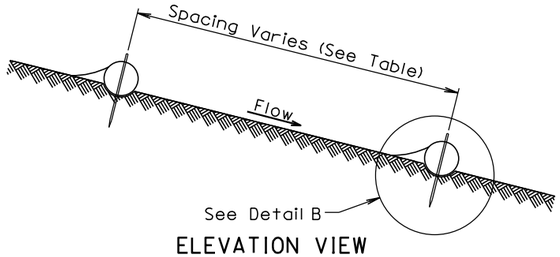
The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

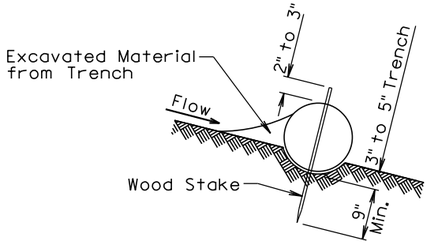
*July 1, 2005*

| | | | |
|---|---|---|---|
| ***Published Date: 2nd Qtr. 2016*** | **SDDOT** | ***BREAKAWAY SUPPORT STUB CLEARANCE*** | ***PLATE NUMBER*** *634.99* |
| | | | *Sheet 1 of 1* |

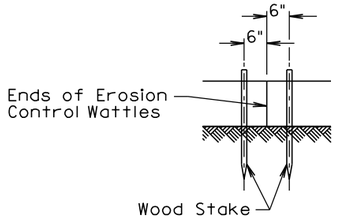



ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

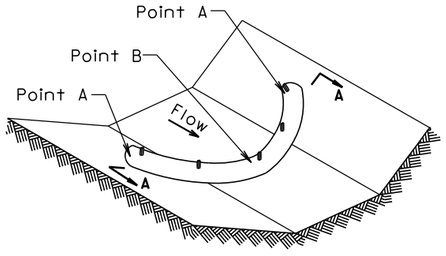
| CUT OR FILL SLOPE INSTALLATION | |
|---|---|
| Slope | Spacing (Ft) |
| 1:1 | 10 |
| 2:1 | 20 |
| 3:1 | 30 |
| 4:1 | 40 |



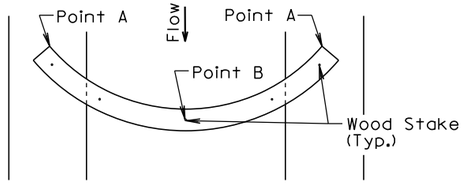

DETAIL B
(TYPICAL OF ALL INSTALLATIONS)




DETAIL C

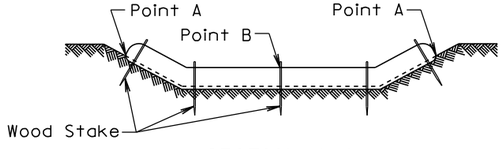



ISOMETRIC VIEW
DITCH INSTALLATION




PLAN VIEW
DITCH INSTALLATION

| DITCH INSTALLATION | |
|---|---|
| Grade | Spacing (Ft) |
| 2% | 150 |
| 3% | 100 |
| 4% | 75 |
| 5% | 50 |




SECTION A-A

December 23, 2004

| Published Date: 2nd Qtr. 2016 | SDDOT | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 |
|---|---|---|---|
| | | | Sheet 1 of 2 |

GENERAL NOTES:

At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes shall be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

Where installing running lengths of wattles, the Contractor shall butt the second wattle tightly against the first and shall not overlap the ends. See Detail C.

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than ½". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials shall be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

December 23, 2004

| Published Date: 2nd Qtr. 2016 | SDDOT | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 |
|---|---|---|---|
| | | | Sheet 2 of 2 |