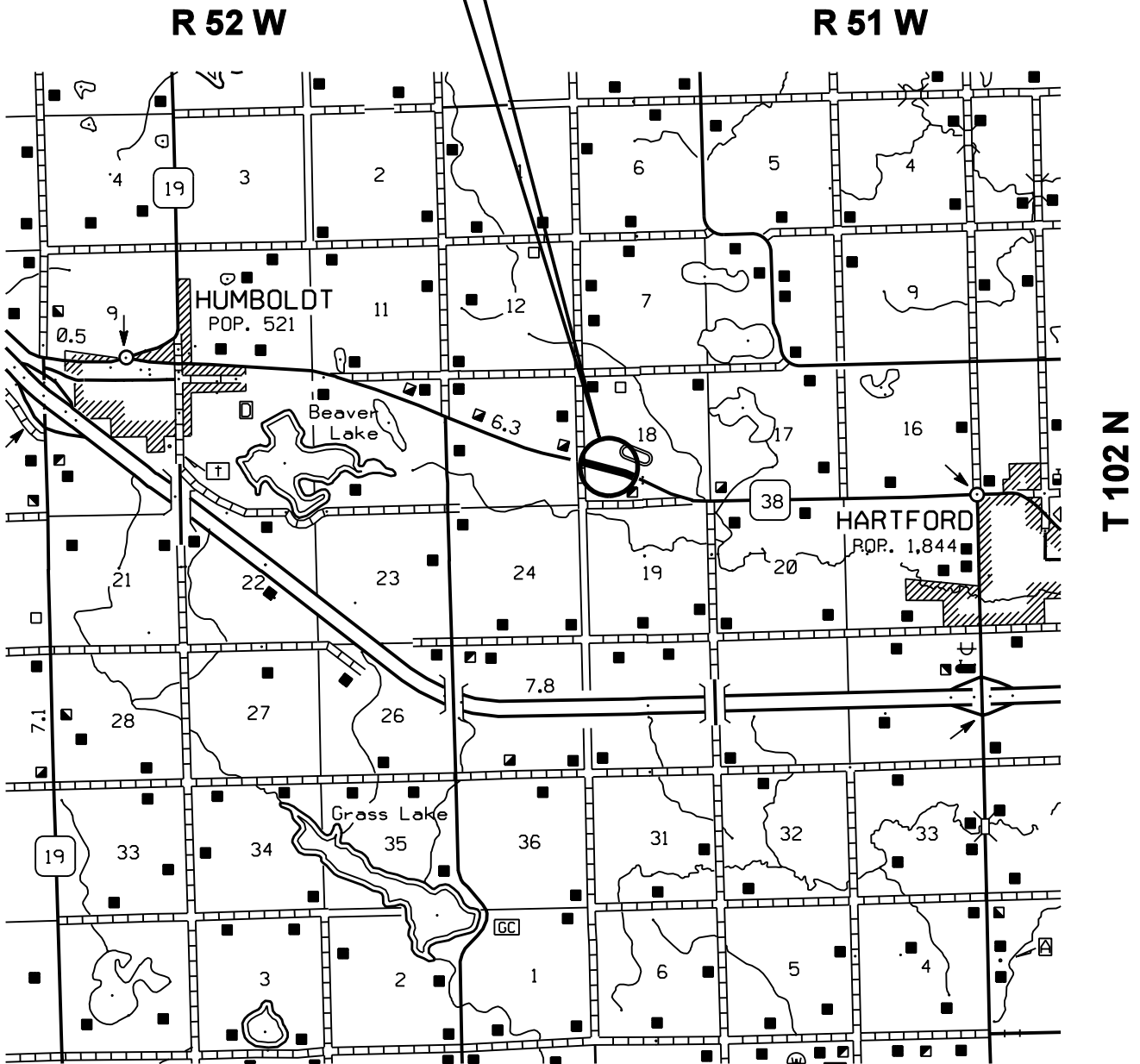


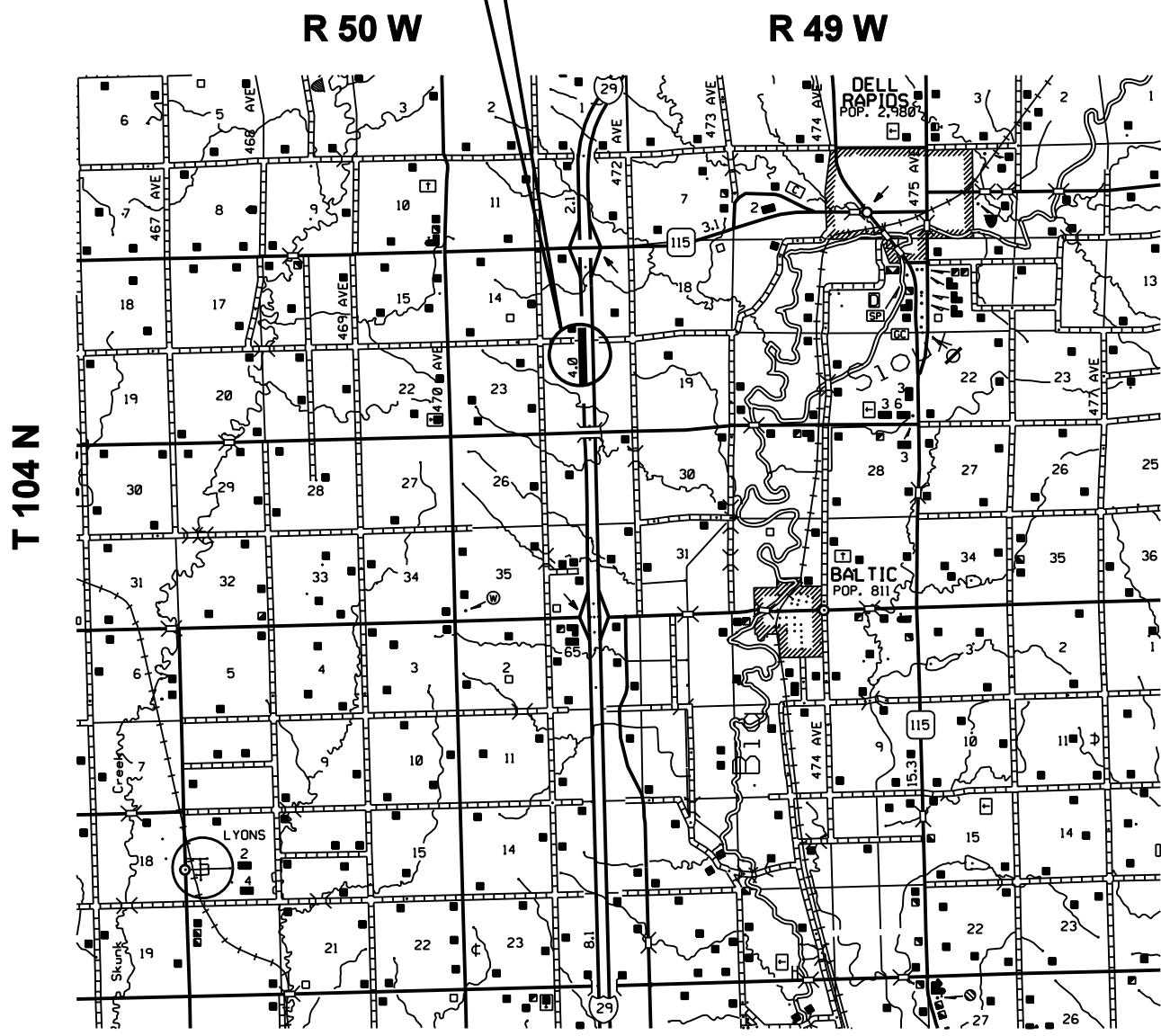
038-271 MINNEHAHA COUNTY PIPE REPAIR PCN 10L2

PROJECT 038-271
PIPE LOCATION
MRM 353.29



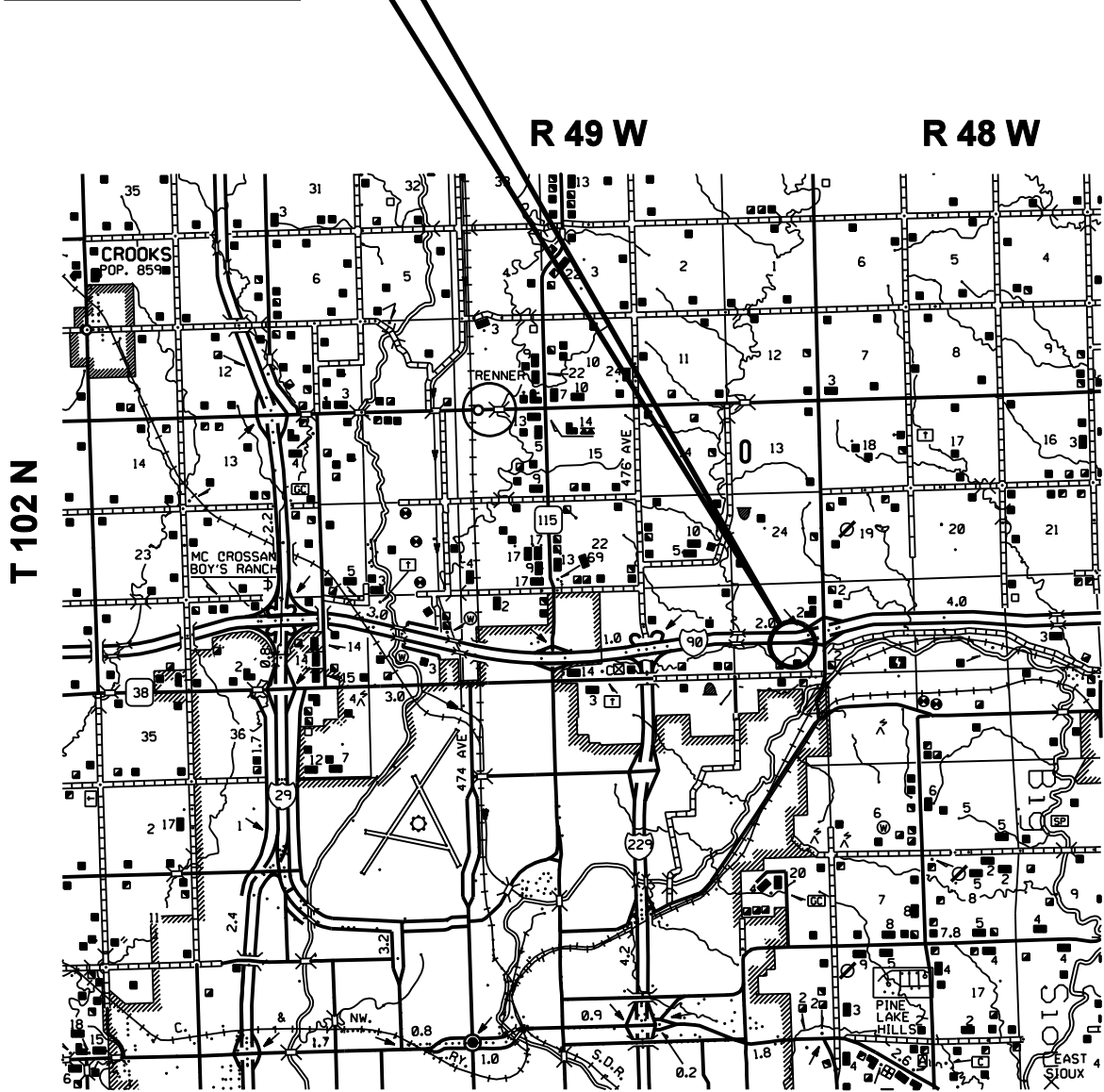
029 S-271 MINNEHAHA COUNTY PIPE REPAIR PCN 10L3

PROJECT 029-271
PIPE LOCATION
MRM 96.8



090 E-271 MINNEHAHA COUNTY PIPE REPAIR PCN 10L4

PROJECT 090-271
PIPE LOCATION
MRM 402.36



ADT(2005) 12690

INDEX OF PLANS SHEETS

| | |
|----------------|---|
| Sheets 1 - 3 | Layout Maps |
| Sheet 4 | Index of Plan Sheets |
| Sheet 5 | Estimate of Quantities |
| Sheet 6 | Table of Pipe Repair |
| Sheets 7 – 11 | Plan Notes |
| Sheets 12 – 13 | Details for SD 38 Gabions and Turf Reinforcement Mat |
| Sheet 14 | Details for I 29 Riprap |
| Sheet 15 | Details for I 90 Gabions |
| Sheet 16 | Itemized List for Traffic Control |
| Sheets 17 – 26 | Standard Plates |

ESTIMATE OF QUANTITIES

| BID ITEM NUMBER | DESCRIPTION | QUANTITY |
|------------------------|-----------------------------------|-----------------|
| 009E0010 | Mobilization | Lump Sum |
| 110E0500 | Remove Pipe Culvert | 18 Ft |
| 110E7500 | Remove Pipe For Reset | 54 Ft |
| 110E7510 | Remove Pipe End Section For Reset | 3 Each |
| 120E0010 | Unclassified Excavation | 53 CuYd |
| 120E0600 | Contractor Furnished Borrow | 73 CuYd |
| 250E0010 | Incidental Work | Lump Sum |
| 450E0192 | 42" RCP Class 2, Furnish | 6 Ft |
| 450E0200 | 42" RCP, Install | 6 Ft |
| 450E2032 | 42" RCP Flared End, Furnish | 2 Each |
| 450E2033 | 42" RCP Flared End, Install | 2 Each |
| 450E9000 | Reset Pipe | 54 Ft |
| 450E9001 | Reset Pipe End Section | 3 Each |
| 634E0100 | Traffic Control | 268 Unit |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum |
| 700E0310 | Class C Riprap | 75.0 Ton |
| 720E1015 | Bank / Channel Protection Gabion | 25.2 CuYd |
| 730E0204 | Type C Permanent Seed Mixture | 20 Lb |
| 732E0100 | Mulching | 4 Ton |
| 734E0132 | Type 2 Turf Reinforcement Mat | 33 SqYd |
| 734E0604 | High Flow Silt Fence | 150 Ft |
| 831E0110 | Type B Drainage Fabric | 146 SqYd |

TABLE OF PIPE REPAIR

| | Hwy 38 MRM 353.29 LT | Hwy 38 MRM 353.29 RT | I-90 MRM 402.36 | I-29 MRM 96.8 | TOTAL QUANTITY |
|-----------------------------------|----------------------------|----------------------------|-----------------------|---------------------|-------------------|
| ITEM DESCRIPTION | | | | | |
| Mobilization | ←———— Lump Sum —————→ | | | | Lump Sum |
| Remove Pipe Culvert | 6 | --- | 12 | --- | 18 Ft |
| Remove Pipe For Reset | 6 | 6 | 18 | 24 | 54 Ft |
| Remove Pipe End Section For Reset | --- | --- | 1 | 2 | 3 Each |
| Unclassified Excavation | --- | --- | --- | 53 | 53 CuYd |
| Contractor Furnished Borrow | 25 | 25 | 23 | --- | 73 CuYd |
| Incidental Work | ←———— Lump Sum —————→ | | | | Lump Sum |
| 42" RCP Class 2, Furnish | 6 | --- | --- | --- | 6 Ft |
| 42" RCP, Install | 6 | --- | --- | --- | 6 Ft |
| 42" RCP Flared End, Furnish | 1 | 1 | --- | --- | 2 Each |
| 42" RCP Flared End, Install | 1 | 1 | --- | --- | 2 Each |
| Reset Pipe | 6 | 6 | 18 | 24 | 54 Ft |
| Reset Pipe End Section | --- | --- | 1 | 2 | 3 Each |
| Traffic Control | --- | --- | --- | 268 | 268 Unit |
| Traffic Control, Miscellaneous | ←———— Lump Sum —————→ | | | | Lump Sum |
| Class C Riprap | --- | --- | --- | 75.0 | 75.0 Ton |
| Bank / Channel Protection Gabion | --- | 10.0 | 15.2 | --- | 25.2 CuYd |
| Type C Permanent Seed Mixture | 5 | 5 | 5 | 5 | 20 Lb |
| Mulching | 1 | 1 | 1 | 1 | 4 Ton |
| Type 2 Turf Reinforcement Mat | 16 | --- | --- | 17 | 33 SqYd |
| High Flow Silt Fence | 50 | --- | 50 | 50 | 150 Ft |
| Type B Drainage Fabric | --- | 28 | 30 | 88 | 146 SqYd |

SPECIFICATIONS

Standard Specifications for Road and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions are included in the Proposal.

SCOPE OF WORK

The scope of work on these projects shall include, but is not limited to the following:

1. Remove and reset/replace separated/damaged pipe culvert sections.
2. Install tie bolts on pipe sections.
3. Clean silt from ditches adjacent to pipe culverts.
4. Clean silt from inside pipe culverts.
5. Install erosion control as required.
6. Seed and mulch disturbed areas and install silt fence.

COMPLETION DATE

All work shall be completed on or before [November 3, 2007](#).

CONTRACTOR FURNISHED BORROW

The Contractor shall provide a suitable site for Contractor furnished borrow material. The borrow material shall be approved by the Engineer. The plans quantity for "Contractor Furnished Borrow" as shown in the Estimate of Quantities will be the basis of payment for this item. The Contractor is responsible for obtaining all required permits and clearances for the borrow site.

Compaction of the fill material shall be to the satisfaction of the Engineer. It is not anticipated that water for compaction will be required; however, if in the opinion of the Engineer the fill material is extremely dry, water may be ordered and placed to the satisfaction of the Engineer. Cost for water shall be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow.

To facilitate prompt SHPO response, the Contractor should submit a cultural resources survey report or the results of the literature search, a legal description of the site, a topographical map with the site clearly marked, and evidence of prior site disturbance to: Dave Graves, SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (1-605-773-5727). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO approval. The request for archeological clearance should include the project number and PCN.

To obtain SHPO clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. The Contractor shall arrange and pay for this survey. In lieu of a cultural resources survey, the Contractor could request a literature search on the site (contact Jim Donohue, State Archaeological Research Center (1-605-394-1937) for the literature search) and provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that no artifacts have been found on the site.

Restoration of the Contractor Furnished Borrow site shall be the responsibility of the Contractor.

SALVAGING, STOCKPILING, AND PLACING TOPSOIL

Prior to starting construction operations, a sufficient volume of topsoil shall be removed from the construction limits to cover the disturbed areas to the required thickness as indicated in these plans.

Following completion of grading operations, topsoil shall be spread evenly at a thickness of approximately 4" over the disturbed areas.

Removal and replacement of topsoil will not be measured for payment but shall be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow.

INCIDENTAL WORK – CLEANING OF EXISTING PIPE

Material in the existing pipes at locations shown in the Table of Pipe Repair shall be cleaned out by water flushing or other approved methods.

The ditches shall be excavated for approximately 50 feet in each direction (or as directed by the Engineer) from the new/reset pipe ends to obtain proper water flow through the pipe. The excavated material may be used as fill if soil is deemed acceptable by the Engineer. Unacceptable soil shall become the property of the contractor for disposal.

The cost for this work shall be included for the contract lump sum price for Incidental Work.

REINFORCED CONCRETE PIPE

All reinforced concrete pipe used on this project is Class II unless otherwise noted in the plans

TIE BOLTS FOR RCP/RCP ARCH CULVERTS

The last three sections (including end sections), at a minimum, shall have tie bolts installed for the inlets and/or outlets listed in the estimate of quantities. All reset and new pipe/end sections shall have tie bolts installed.

Cost for removing tie bolts for reuse, drilling tie bolt holes and providing, installing and reinstalling tie bolts shall be incidental to the contract unit prices for installing or resetting RCP Culverts and End Sections. No separate measurement or payment will be made.

For informational purposes:

Field drilling may be required to install the tie bolts on reset culverts, on reset culvert ends, and on existing culvert when installing a new/reset end section.

BANK AND CHANNEL PROTECTION GABIONS

Bank and channel protection gabions shall be installed in the locations stated in the Table of Pipe Repair. Baskets shall be installed as per the standard plate 720.01 and the cell layout details provided for each pipe in these plans. Gabions shall be placed within the right-of-way and without disturbing the right-of-way fence. Any right-of-way fence damaged or removed by the contractor shall be reset by the contractor at no expense to the state. Gabion placement shall be adjusted slightly in the field to achieve an installation acceptable to the Engineer while remaining within the right-of-way.

TABLE OF BANK AND CHANNEL PROTECTION GABIONS

| Hwy Number | MRM | L/R | Quantity (CuYd) |
|------------|------------|-----|-----------------|
| SD 38 | MRM 353.29 | Rt | 10.0 |
| I 90 E | MRM 402.36 | Rt | 15.2 |
| Total: | | | 25.2 |

RIPRAP

All Rip-Rap placed in this contract shall be Class C. The Class C Rip-Rap shall be constructed to the configuration, limits and excavated to the depth shown in the details provided for each pipe in these plans, or as directed by the Engineer. The excavated material may be used as fill if soil is deemed acceptable by the Engineer. Unacceptable and excess soil shall become the property of the contractor for disposal.

DRAINAGE FABRIC

All drainage fabric in this contract shall be Type B. Drainage fabric shall be placed under and along all sides of the Bank and Channel Protection Gabions and Rip-Rap that are in contact with earth.

TURF REINFORCEMENT MAT

Turf Reinforcement Mat shall be placed as shown in the details for the various pipe in these plans and as directed by the Engineer. All Turf Reinforcement Mat in these plans shall be Type 2. The Contractor shall use a turf reinforcement mat from the approved products list at the following internet site.

<http://www.state.sd.us/Applications/HC54ApprovedProducts/main.asp>

Installation of the Turf Reinforcement Mat shall comply with the manufacturer's guidelines for installation.

TABLE OF TURF REINFORCEMENT MAT

| Hwy Number | MRM | L/R | Type | Location | Quantity (SqYd) |
|--------------------------------------|--------|-----|------|----------------|-----------------|
| SD 38 | 353.29 | Lt | 2 | Pipe Inlet | 16.0 |
| I 29 S | 96.8 | Lt | 2 | Embankment toe | 17.0 |
| Total Type 2 Turf Reinforcement Mat: | | | | | 33.0 |

HIGH FLOW SILT FENCE

The high flow silt fence fabric provided shall be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site:

<http://www.state.sd.us/Applications/HC54ApprovedProducts/main.asp>

High flow silt fence shall be placed at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.05 for details.

The amount of High Flow Silt Fence has been estimated at 50 feet for each pipe end for temporary sediment control. The actual amount of silt fence required will be determined on site by the Engineer. Pay quantities will be those actually used even though they may vary significantly from the plan estimates.

PERMANENT SEEDING

The areas to be seeded and mulched include all disturbed areas within the right-of-way resulting from the work required by this contract.

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. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

South Dakota native grown seed is an acceptable alternative to any of the seed varieties listed below. South Dakota native grown seeds used as an alternative shall conform to the same specification and requirements for that individual seed type.

Type C Permanent Seed Mixture shall consist of the following:

| Grass Species | Variety | Pure Live Seed (PLS) (Pounds/Acre) |
|--------------------|--------------------------------|------------------------------------|
| Western Wheatgrass | Flintlock, Rodan, Rosanna | 16 |
| Slender Wheatgrass | Adanac, Pryor, Primar, Revenue | 2 |
| Total: | | 18 |

MULCHING (GRASS HAY OR STRAW)

Bales with noxious weed contamination will be rejected and the Contractor will be required to remove the contaminated bales from the project.

The area to be seeded and mulched is estimated at 1.3 acres.

GENERAL MAINTENANCE OF TRAFFIC

Removing, relocating, covering, salvaging and resetting of permanent traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost for this work shall be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work.

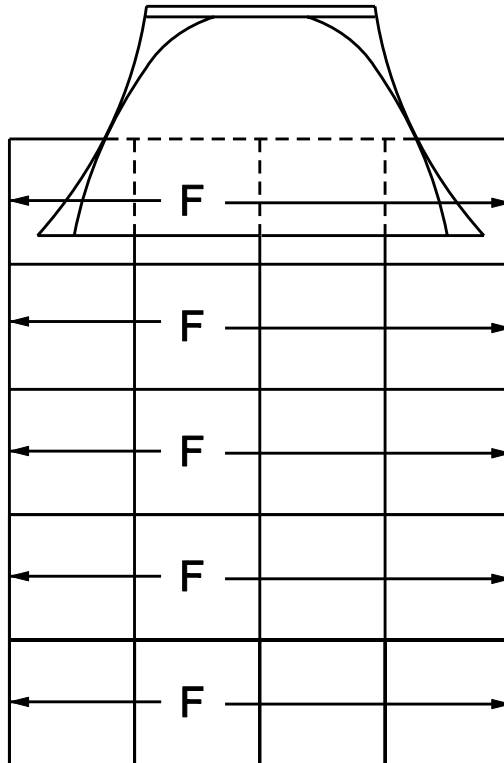
Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

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

Sufficient traffic control devices have been included in these plans to sign one workspace. If the Contractor elects to work on additional sites simultaneously, the cost for additional traffic control devices shall be incidental to the contract unit price per unit for Traffic Control.

BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS ON SD 38 MRM 353.29

42" RCP



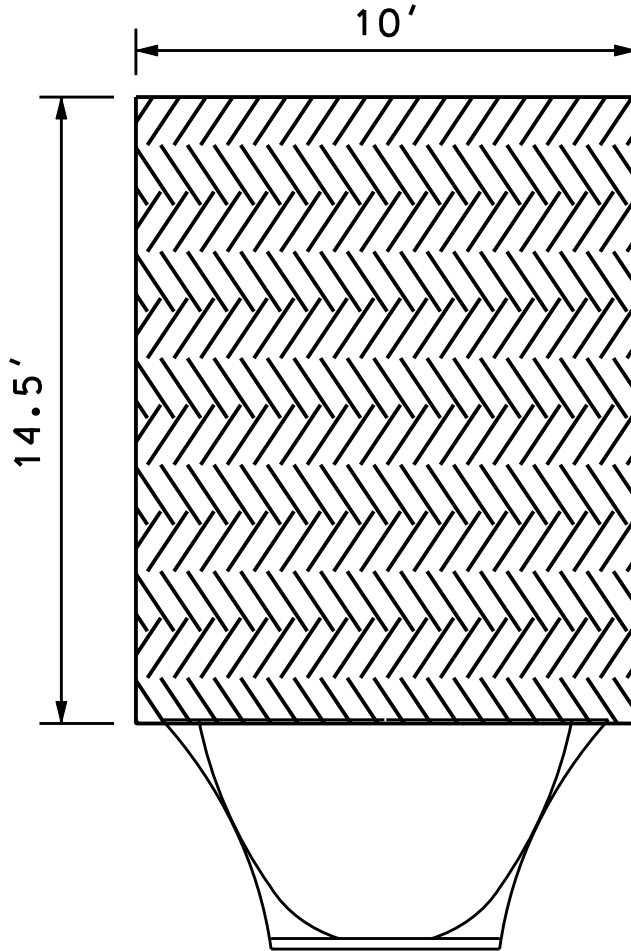
10.0 CuYds

GENERAL NOTES:

Gabion placement shall be adjusted in the field to stay within the Right-Of-Way.

**TYPE 2 TURF REINFORCEMENT MAT
PLACEMENT AT PIPE INLET
ON SD 38 MRM 353.29**

42" RCP

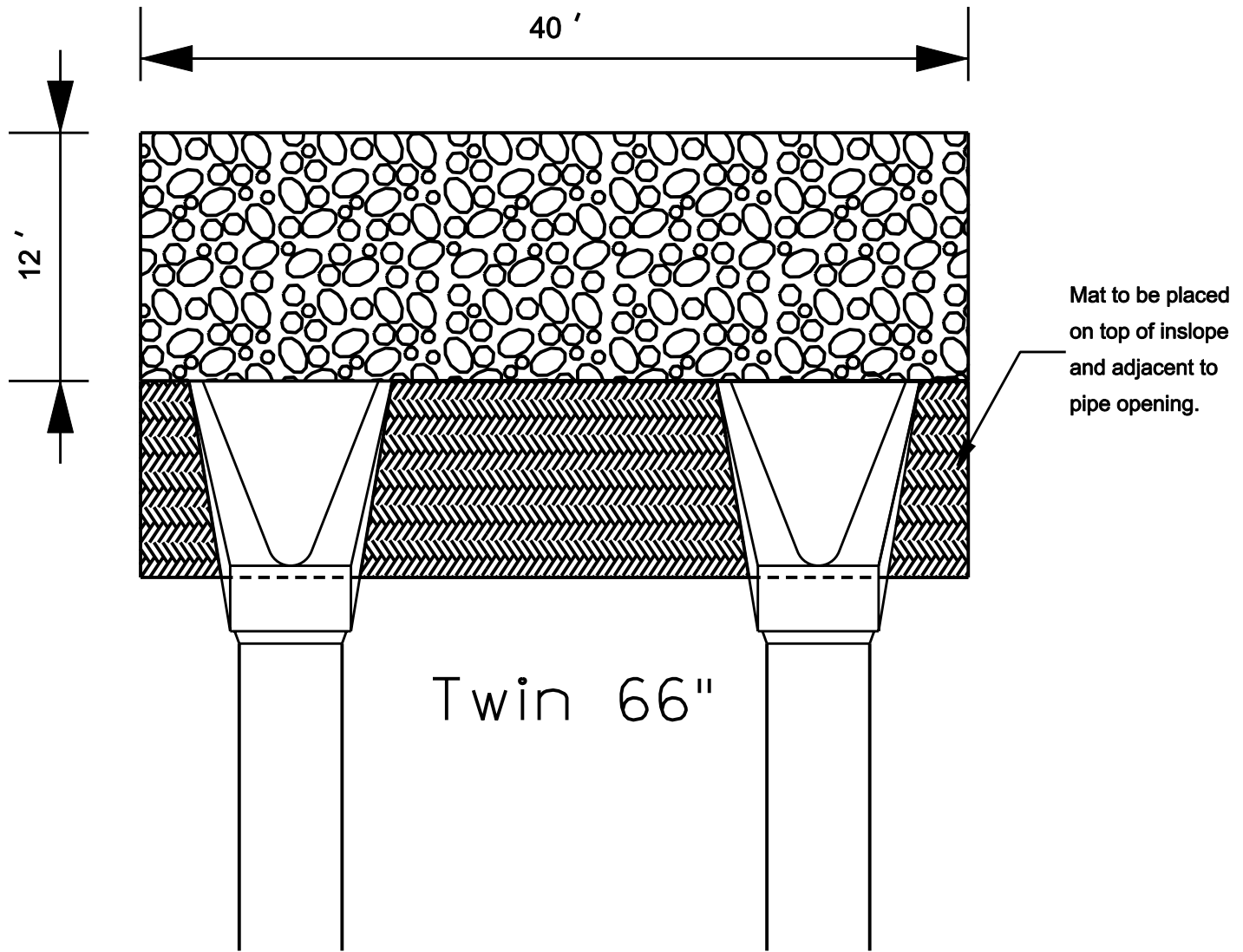


16.0 SqYds

GENERAL NOTES:

Turf Reinforcement placement shall be adjusted in the field to stay within the Right-Of-Way.

INLET AND BANK PROTECTION DETAIL
RIPRAP AND TRM PLACEMENT
ON I29 MRM 96.8



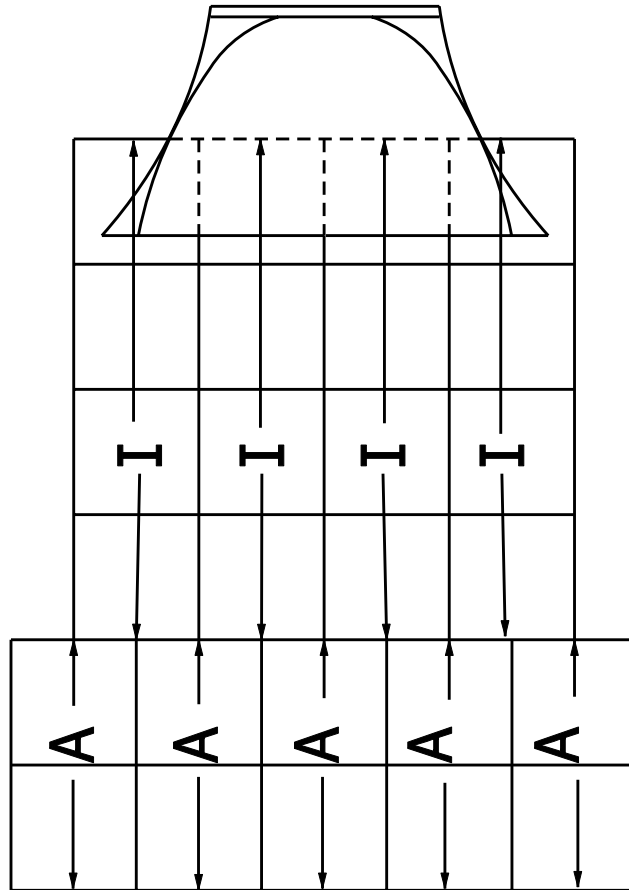
= Type 2 Turf Reinforcement Mat



= Class "C" Riprap (3' Deep)

BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS ON I90 MRM 402.36

60" RCP



15.2 CuYds

GENERAL NOTES:

Gabion placement shall be adjusted in the field to stay within the Right-Of-Way.

ITEMIZED LIST FOR TRAFFIC CONTROL

| SIGN CODE | SIGN SIZE | DESCRIPTION | NUMBER REQUIRED | UNITS PER SIGN | UNITS |
|--------------------|------------------|---|----------------------------|---------------------------|--------------|
| G20-2a | 48" x 24" | END ROAD WORK | 1 | 24 | 24 |
| W20-1 | 48" x 48" | ROAD WORK AHEAD | 2 | 34 | 68 |
| W21-5a | 48" x 48" | RIGHT SHOULDER CLOSED | 2 | 34 | 68 |
| W21-5b | 48" x 48" | RIGHT SHOULDER CLOSED AHEAD | 2 | 34 | 68 |
| ***** | ***** | TYPE III BARRICADE - 8 FT. SINGLE SIDED | 1 | 40 | 40 |
| TOTAL UNITS | | | | | 268 |

TOLERANCES IN DIMENSIONS

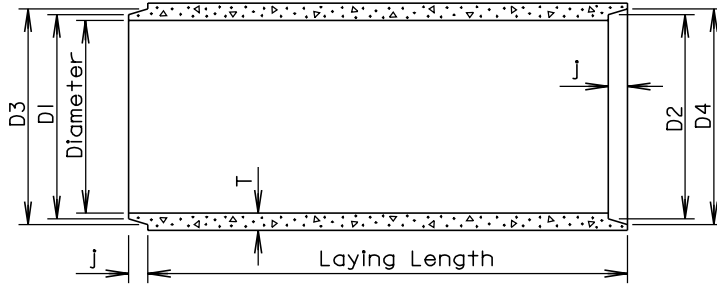
Diameter: $\pm 1.5\%$ for 24" Dia. or less and $\pm 1\%$ or $\frac{3}{8}$ " whichever is more for 27" Dia. or greater.

Diameters at Joints: $\pm 3/16$ " for 30" Dia. or less and $\pm 1/4$ " for 36" or greater.

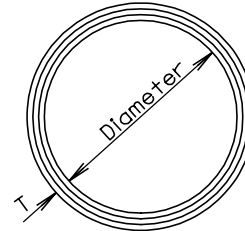
Length of Joint (J): $\pm 1/4$ ".

Wall thickness (T): not less than design T by more than 5% or $\frac{3}{16}$ ", whichever is greater.

Laying length: shall not underrun by more than $\frac{1}{2}$ ".



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

Construction of R.C.P. shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.

Not more than 2 four foot sections shall be permitted near the ends of any culvert. Four foot lengths shall be used only to secure the required length of culvert.

| Diam. (in.) | Approx. Wt. /Ft. (lb.) | T (in.) | J (in.) | D1 (in.) | D2 (in.) | D3 (in.) | D4 (in.) |
|-------------|------------------------|-------------------------------|-------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 12 | 92 | 2 | 1 ³ / ₄ | 13 ¹ / ₄ | 13 ⁵ / ₈ | 13 ⁷ / ₈ | 14 ¹ / ₄ |
| 15 | 127 | 2 ¹ / ₄ | 2 | 16 ¹ / ₂ | 16 ⁷ / ₈ | 17 ¹ / ₄ | 17 ⁵ / ₈ |
| 18 | 168 | 2 ¹ / ₂ | 2 ¹ / ₄ | 19 ⁵ / ₈ | 20 | 20 ³ / ₈ | 20 ³ / ₄ |
| 21 | 214 | 2 ³ / ₄ | 2 ¹ / ₂ | 22 ⁷ / ₈ | 23 ¹ / ₄ | 23 ³ / ₄ | 24 ¹ / ₈ |
| 24 | 265 | 3 | 2 ³ / ₄ | 26 | 26 ³ / ₈ | 27 | 27 ³ / ₈ |
| 27 | 322 | 3 ¹ / ₄ | 3 | 29 ¹ / ₄ | 29 ⁵ / ₈ | 30 ¹ / ₄ | 30 ⁵ / ₈ |
| 30 | 384 | 3 ¹ / ₂ | 3 ¹ / ₄ | 32 ³ / ₈ | 32 ³ / ₄ | 33 ¹ / ₂ | 33 ⁷ / ₈ |
| 36 | 524 | 4 | 3 ³ / ₄ | 38 ³ / ₄ | 39 ¹ / ₄ | 40 | 40 ¹ / ₂ |
| 42 | 685 | 4 ¹ / ₂ | 4 | 45 ¹ / ₈ | 45 ⁵ / ₈ | 46 ¹ / ₂ | 47 |
| 48 | 867 | 5 | 4 ¹ / ₂ | 51 ¹ / ₂ | 52 | 53 | 53 ¹ / ₂ |
| 54 | 1070 | 5 ¹ / ₂ | 4 ¹ / ₂ | 57 ⁷ / ₈ | 58 ³ / ₈ | 59 ³ / ₈ | 59 ⁷ / ₈ |
| 60 | 1296 | 6 | 5 | 64 ¹ / ₄ | 64 ³ / ₄ | 66 | 66 ¹ / ₂ |
| 66 | 1542 | 6 ¹ / ₂ | 5 ¹ / ₂ | 70 ⁵ / ₈ | 71 ¹ / ₈ | 72 ¹ / ₂ | 73 |
| 72 | 1810 | 7 | 6 | 77 | 77 ¹ / ₂ | 79 | 79 ¹ / ₂ |
| 78 | 2098 | 7 ¹ / ₂ | 6 ¹ / ₂ | 83 ³ / ₈ | 83 ⁷ / ₈ | 85 ⁵ / ₈ | 86 ¹ / ₈ |
| 84 | 2410 | 8 | 7 | 89 ³ / ₄ | 90 ¹ / ₄ | 92 ¹ / ₈ | 92 ⁵ / ₈ |
| 90 | 2740 | 8 ¹ / ₂ | 7 | 95 ³ / ₄ | 96 ¹ / ₄ | 98 ¹ / ₈ | 98 ⁵ / ₈ |
| 96 | 2950 | 9 | 7 | 102 ¹ / ₈ | 102 ⁵ / ₈ | 104 ¹ / ₂ | 105 |
| 102 | 3075 | 9 ¹ / ₂ | 7 ¹ / ₂ | 109 | 109 ¹ / ₂ | 111 ¹ / ₂ | 112 |
| 108 | 3870 | 10 | 7 ¹ / ₂ | 115 ¹ / ₂ | 116 | 118 | 118 ¹ / ₂ |

March 31, 2000

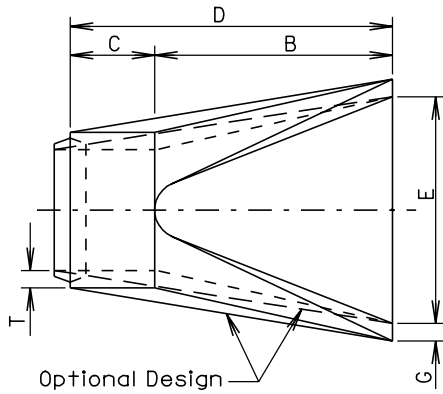
Published Date: 4th Qtr. 2006

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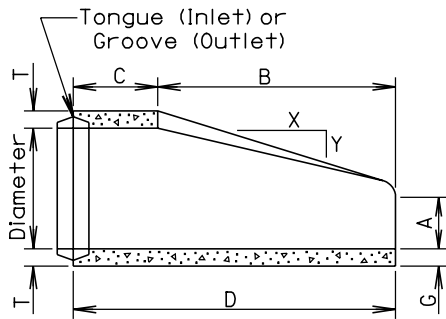
REINFORCED CONCRETE PIPE

PLATE NUMBER
450.01

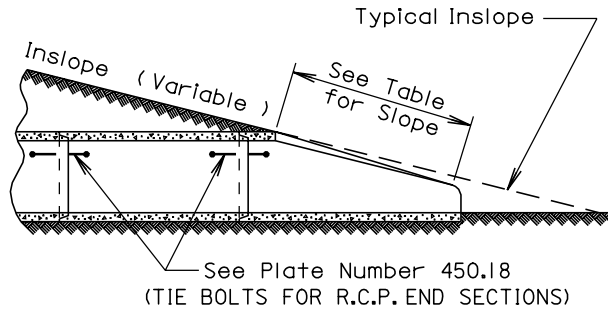
Sheet 1 of 1



TOP VIEW



LONGITUDINAL SECTION

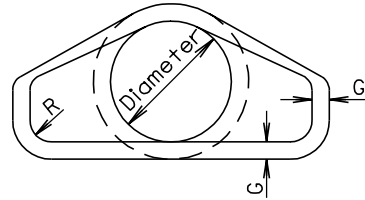


SLOPE DETAIL

GENERAL NOTES:

Lengths of concrete pipe shown on Plan Sheets are between Flared Ends only.

Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.



END VIEW

| Dia. (In.) | Approx. Wt. of Section (lbs.) | Approx. Slope (X to Y) | T (In.) | A (In.) | B (In.) | C (In.) | D (In.) | E (In.) | G (In.) | R (In.) |
|------------|-------------------------------|------------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------|-------------------------------|-------------------------------|
| 12 | 530 | 2.4: 1 | 2 | 4 | 24 | 48 ⁷ / ₈ | 72 ⁷ / ₈ | 24 | 2 | 1 ¹ / ₂ |
| 15 | 740 | 2.4: 1 | 2 ¹ / ₄ | 6 | 27 | 46 | 73 | 30 | 2 ¹ / ₄ | 1 ¹ / ₂ |
| 18 | 990 | 2.3: 1 | 2 ¹ / ₂ | 9 | 27 | 46 | 73 | 36 | 2 ¹ / ₂ | 1 ¹ / ₂ |
| 21 | 1280 | 2.4: 1 | 2 ³ / ₄ | 9 | 36 | 37 ¹ / ₂ | 73 ¹ / ₂ | 42 | 2 ³ / ₄ | 1 ¹ / ₂ |
| 24 | 1520 | 2.5: 1 | 3 | 9 ¹ / ₂ | 43 ¹ / ₂ | 30 | 73 ¹ / ₂ | 48 | 3 | 1 ¹ / ₂ |
| 27 | 1930 | 2.5: 1 | 3 ¹ / ₄ | 10 ¹ / ₂ | 49 ¹ / ₂ | 24 | 73 ¹ / ₂ | 54 | 3 ¹ / ₄ | 1 ¹ / ₂ |
| 30 | 2190 | 2.5: 1 | 3 ¹ / ₂ | 12 | 54 | 19 ³ / ₄ | 73 ³ / ₄ | 60 | 3 ¹ / ₂ | 1 ¹ / ₂ |
| 36 | 4100 | 2.5: 1 | 4 | 15 | 63 | 34 ³ / ₄ | 97 ³ / ₄ | 72 | 4 | 1 ¹ / ₂ |
| 42 | 5380 | 2.5: 1 | 4 ¹ / ₂ | 21 | 63 | 35 | 98 | 78 | 4 ¹ / ₂ | 1 ¹ / ₂ |
| 48 | 6550 | 2.5: 1 | 5 | 24 | 72 | 26 | 98 | 84 | 5 | 1 ¹ / ₂ |
| 54 | 8240 | 2: 1 | 5 ¹ / ₂ | 27 | 65 | 33 ¹ / ₄ | 98 ¹ / ₄ | 90 | 5 ¹ / ₂ | 1 ¹ / ₂ |
| 60 | 8730 | 1.9: 1 | 6 | 35 | 60 | 39 | 99 | 96 | 5 | 1 ¹ / ₂ |
| 66 | 10710 | 1.7: 1 | 6 ¹ / ₂ | 30 | 72 | 27 | 99 | 102 | 5 ¹ / ₂ | 1 ¹ / ₂ |
| 72 | 12520 | 1.8: 1 | 7 | 36 | 78 | 21 | 99 | 108 | 6 | 1 ¹ / ₂ |
| 78 | 14770 | 1.8: 1 | 7 ¹ / ₂ | 36 | 90 | 21 | 111 | 114 | 6 ¹ / ₂ | 1 ¹ / ₂ |
| 84 | 18160 | 1.6: 1 | 8 | 36 | 90 ¹ / ₂ | 21 | 111 ¹ / ₂ | 120 | 6 ¹ / ₂ | 1 ¹ / ₂ |
| 90 | 20900 | 1.5: 1 | 8 ¹ / ₂ | 41 | 87 ¹ / ₂ | 24 | 111 ¹ / ₂ | 132 | 6 ¹ / ₂ | 6 |

March 31, 2000

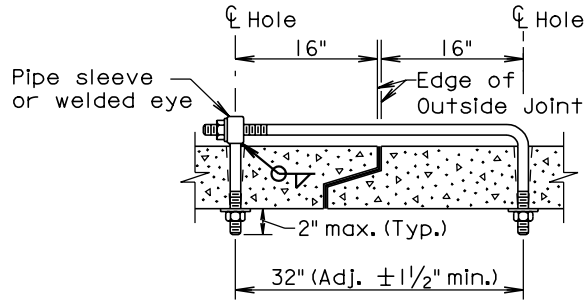
Published Date: 4th Qtr. 2006

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R. C. P. FLARED ENDS

PLATE NUMBER
450.10

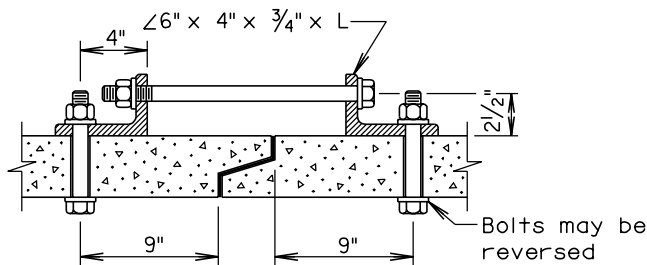
Sheet 1 of 1



ADJUSTABLE EYE BOLT TIE

GENERAL NOTES:

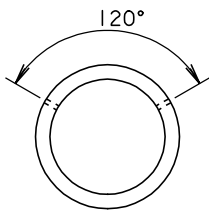
Tie bolts to be furnished with 2 washers and 2 nuts except for the 9/16" rod which has unthreaded legs.
 Use 9/16" rod diameter and 5/8" thread diameter for pipe wall thickness of 2" to 3 1/4".
 Use 1 1/16" rod diameter and 3/4" thread diameter for pipe wall thickness of 3 1/2" to 6 1/2".
 Use 2 3/32" rod diameter and 1" thread diameter for pipe wall thickness of 7" and larger.



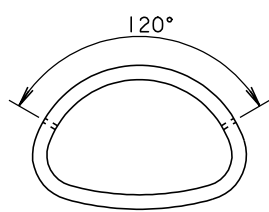
ANGLE AND BOLT TIE

GENERAL NOTES:

L = 4" for 3/4" Bolt. L = 6" for 1" Bolt.
 Use 3/4" Tie Bolts for pipe diameters less than 48".



**END VIEW
"CIRCULAR"**



**END VIEW
"ARCH"**

GENERAL NOTES:

In lieu of Tie Bolts detailed above, Tecktonius Fasteners or other type Tie Bolt connections may be installed if approved by the Engineer.
 There will be no separate measurement or payment for Tie Bolts.
 The cost of the Tie Bolts shall be incidental to the contract unit price per Foot for the corresponding Bid Item for R.C.P. and/or R.C.P. Arch.
 The first three Sections (both inlet and outlet) on R.C.P. and R.C.P. Arch up to and including the 78" diameter or equivalent pipe shall be tied with Tie Bolts. Pipe sizes above 78" diameter or equivalent diameter shall have all Sections tied. Each End Section is considered as one section.

March 31, 2000

Published Date: 4th Qtr. 2006

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**TIE BOLTS FOR
R.C.P. END SECTIONS**

**PLATE NUMBER
450.18**

Sheet 1 of 1

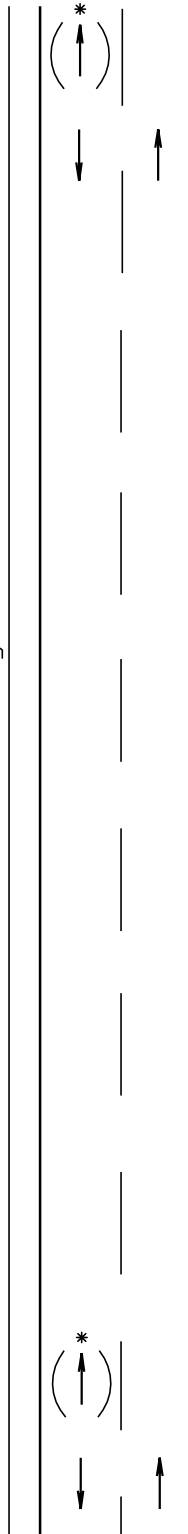
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

The signs illustrated shall be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.



| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) |
|-------------------------------------|---|
| 0 - 30 | 200 |
| 35 - 40 | 350 |
| 45 - 50 | 500 |
| 55 | 750 |
| 60 - 75 | 1000 |



July 1, 2005

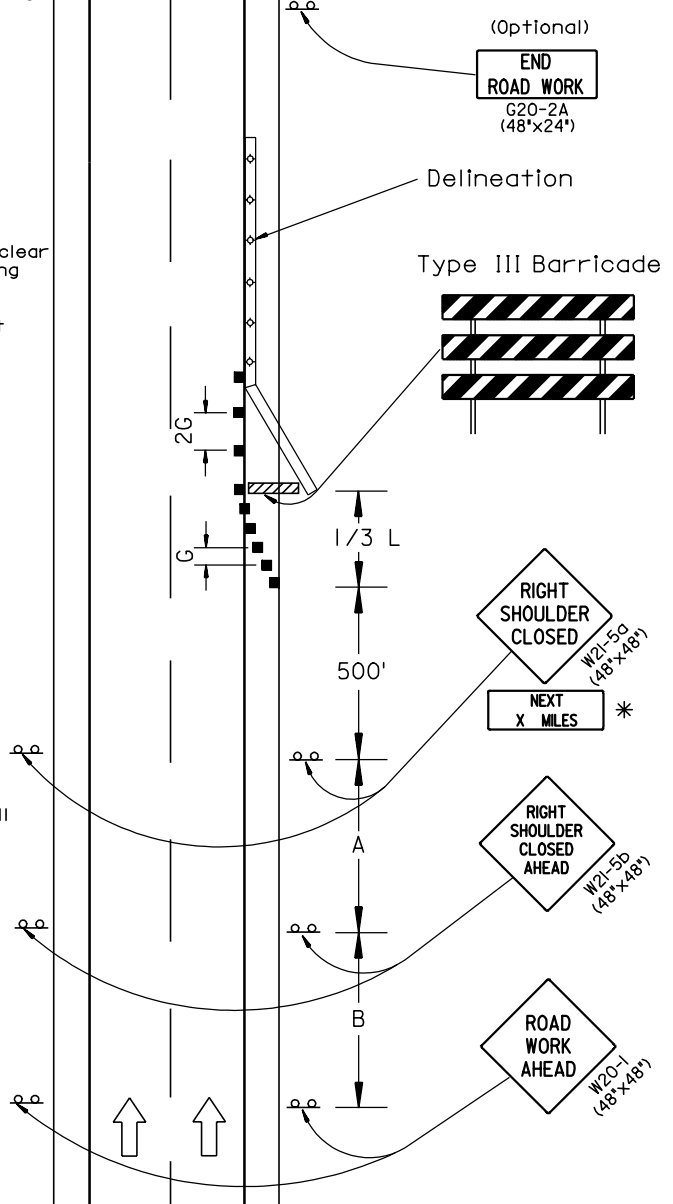
| | | | |
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| <p><i>Published Date: 4th Qtr. 2006</i></p> | <p>S D D O T</p> | <p>GUIDES FOR TRAFFIC CONTROL DEVICES WORK BEYOND THE SHOULDER</p> | <p>PLATE NUMBER 634.01</p> |
| | | | <p>Sheet 1 of 1</p> |

1. The barrier in this diagram shows one method that may be used to close a shoulder of a long term project. The use of a barrier should be based on the need determined by the Highway Authority.

2. Barriers should be flared beyond the clear zone to prevent vehicles from impacting their leading ends. Flare rate shall be 11:1. An alternative procedure is to place an impact attenuator to protect traffic from the end of the barrier.

- - Channelizing Devices
Drums or Type II Barricades shall be used.
- ▬ - Concrete Barrier
- * - For distances 1/2 mile or greater.

| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) | | | Taper Length (Feet) (L) | Spacing of Channelizing Devices (Feet) (G) |
|-------------------------------------|---|------|-----|-------------------------|--|
| | (A) | (B) | (C) | | |
| 0 - 30 | 200 | | | 180 | 25 |
| 35 - 40 | 350 | | | 320 | 25 |
| 45 - 50 | 500 | | | 600 | 50 |
| 55 | 750 | | | 660 | 50 |
| 60 - 65 | 1000 | | | 780 | 50 |
| | (A) (B) | | | | |
| 75 | 1000 | 1600 | | 1125 | 50 |



March 31, 2000

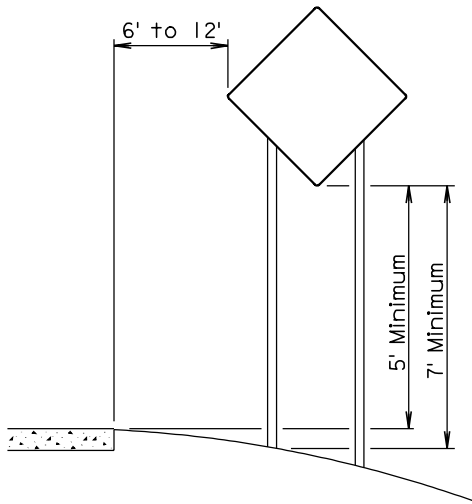
Published Date: 4th Qtr. 2006

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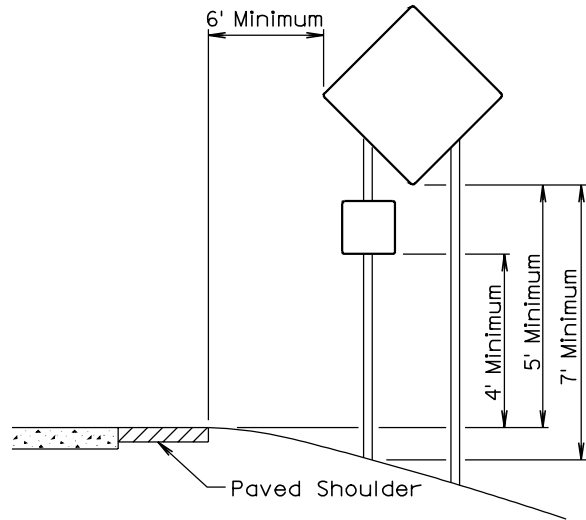
**GUIDES FOR TRAFFIC CONTROL DEVICES
SHOULDER CLOSED**

PLATE NUMBER
634.61

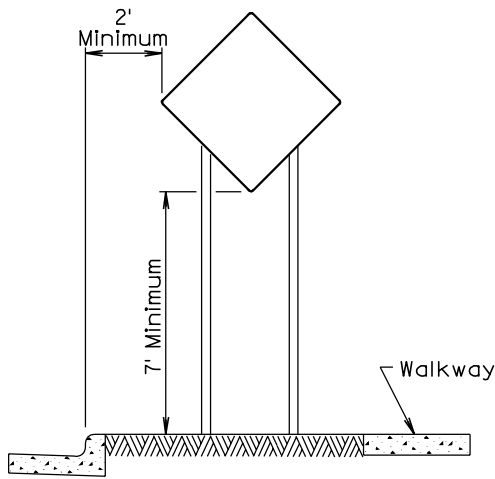
Sheet 1 of 1



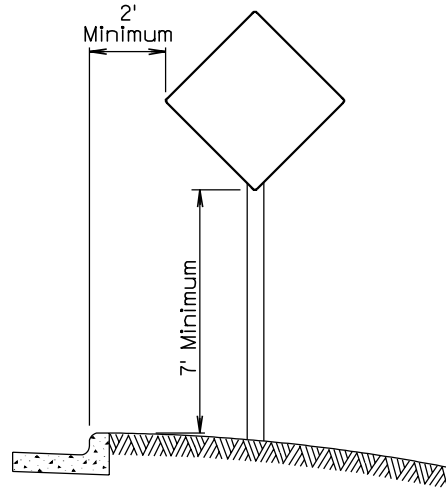
RURAL DISTRICT



RURAL DISTRICT WITH
 SUPPLEMENTAL PLATE



URBAN DISTRICT



URBAN DISTRICT

December 23, 2003

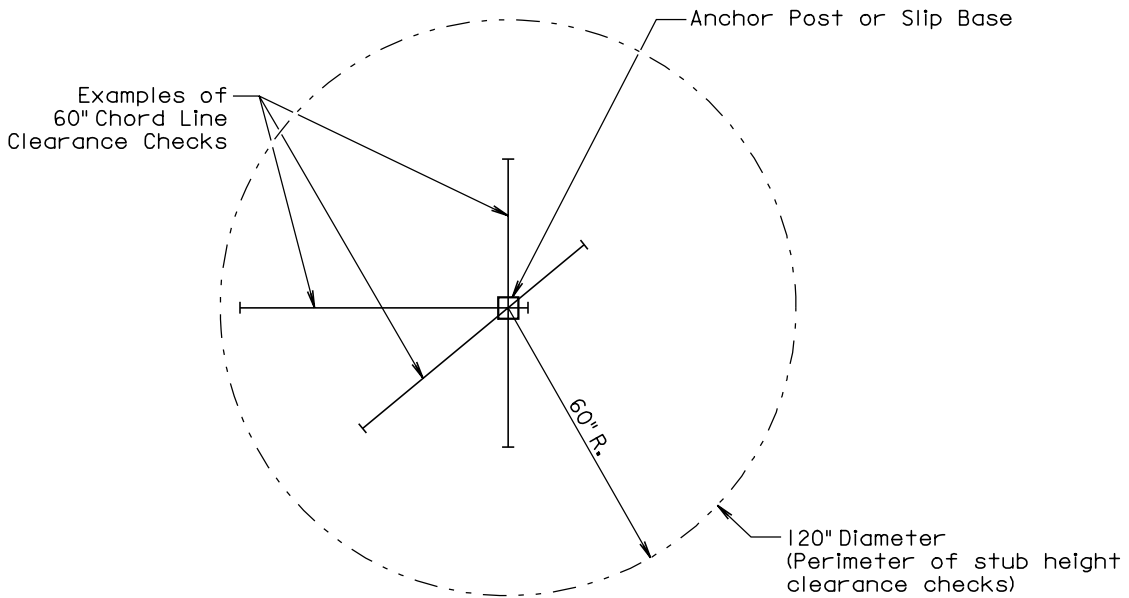
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BREAKAWAY SIGN SUPPORTS
 (Typical Construction Signing)

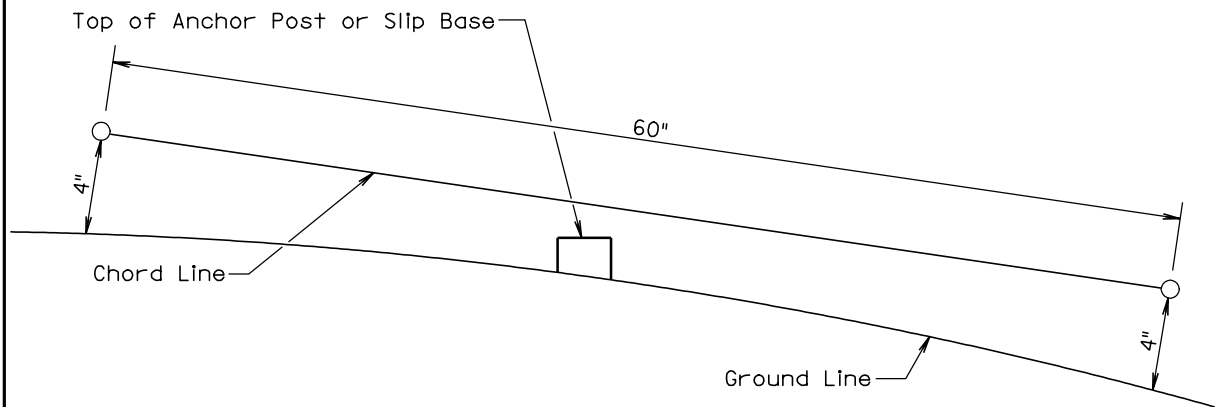
PLATE NUMBER
 634.85

Sheet 1 of 1



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

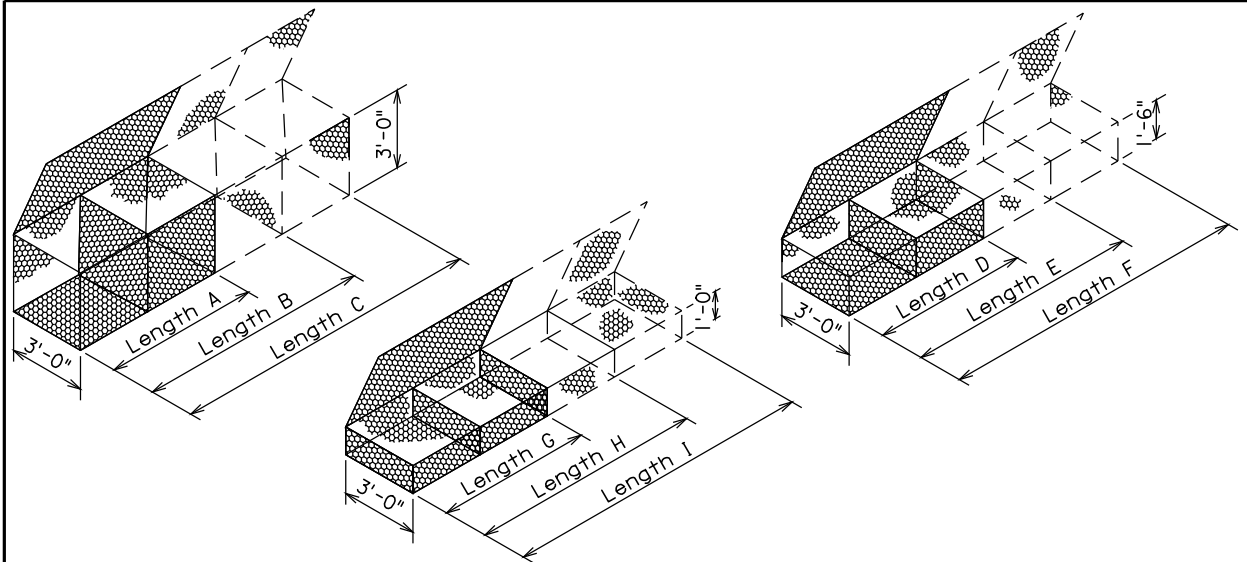
The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

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

| | | | |
|---|---|--|---------------------------------------|
| <p><i>Published Date: 4th Qtr. 2006</i></p> | <p>S D D O T</p> | <p>BREAKAWAY SUPPORT STUB CLEARANCE</p> | <p>PLATE NUMBER 634.99</p> |
| | | | <p>Sheet 1 of 1</p> |



GABION DETAILS
STANDARD SIZES

| SIZE | LENGTH | WIDTH | HEIGHT | NUMBER OF CELLS | CAPACITY, Cu. Yd. |
|------|--------|-------|--------|-----------------|-------------------|
| A | 6'-0" | 3'-0" | 3'-0" | 2 | 2.0 |
| B | 9'-0" | 3'-0" | 3'-0" | 3 | 3.0 |
| C | 12'-0" | 3'-0" | 3'-0" | 4 | 4.0 |
| D | 6'-0" | 3'-0" | 1'-6" | 2 | 1.0 |
| E | 9'-0" | 3'-0" | 1'-6" | 3 | 1.5 |
| F | 12'-0" | 3'-0" | 1'-6" | 4 | 2.0 |
| G | 6'-0" | 3'-0" | 1'-0" | 2 | 0.7 |
| H | 9'-0" | 3'-0" | 1'-0" | 3 | 1.0 |
| I | 12'-0" | 3'-0" | 1'-0" | 4 | 1.3 |

Above Dimensions subject to mill tolerances.

GENERAL NOTES:

Lacing and internal connecting wire shall be 0.0866 inch diameter steel wire ASTM A641 Class 3 soft temper measured after galvanizing and for PVC coated gabions shall be 0.0866 inch diameter steel wire measured after galvanizing but before PVC coating.

The lacing procedure is as follows:

1. Cut a length of lacing wire approximately $1 \frac{1}{2}$ times the distance to be laced but not exceeding 5 feet.
2. Secure the wire terminal at the corner by looping and twisting.
3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.
4. Securely fasten the other lacing wire terminal.

Wire lacing or interlocking type fasteners shall be used for gabion assembly and final construction of gabion structures. Interlocking fasteners for galvanized gabions shall be high tensile 0.120 inch diameter galvanized steel wire measured after galvanizing. The galvanizing shall conform to ASTM A641-92 Class 3 coating. Fasteners shall also be in accordance with ASTM A764, Class II, Type III.

Interlocking fasteners for PVC coated gabions shall be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class I. The spacing of the interlocking fasteners during all phases of assembly and construction shall not exceed 6 inches.

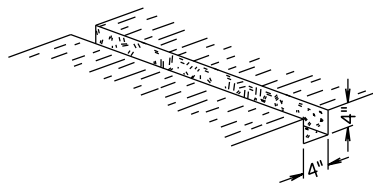
All fasteners shall be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

June 26, 2001

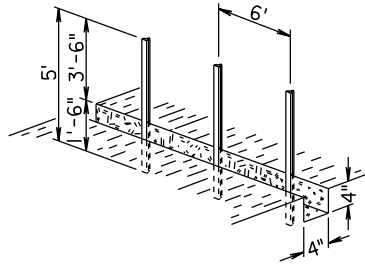
| | | |
|--------------|--|-------------------------------|
| SDDOT | BANK AND CHANNEL PROTECTION GABIONS | PLATE NUMBER 720.01 |
| | | Sheet 1 of 1 |

Published Date: 4th Qtr. 2006

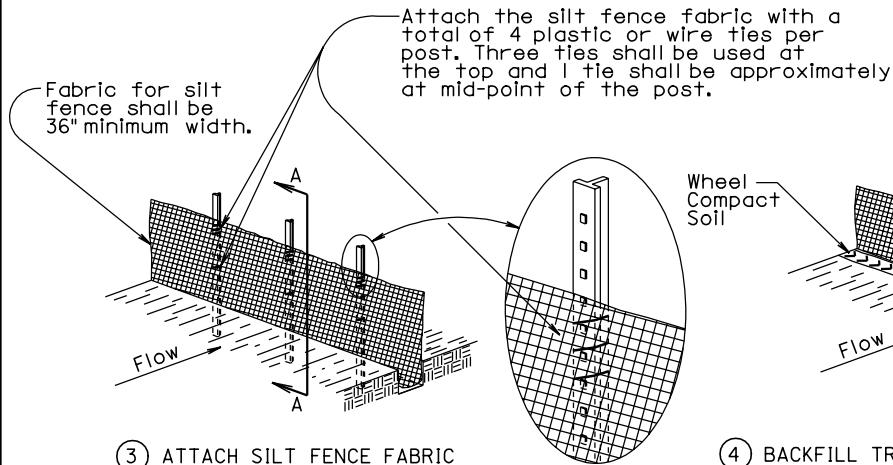
MANUAL HIGH FLOW SILT FENCE INSTALLATION



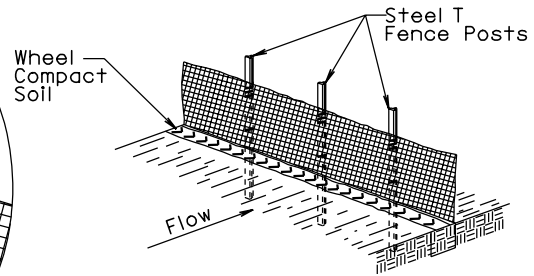
① EXCAVATE TRENCH



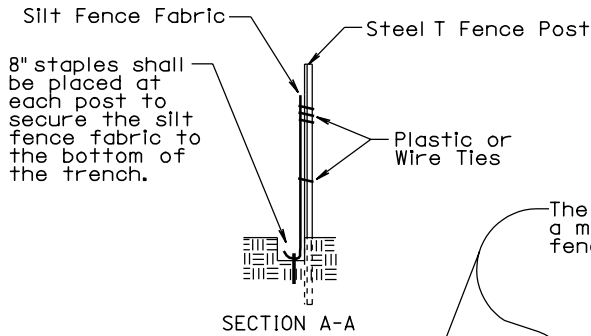
② DRIVE STEEL T FENCE POSTS



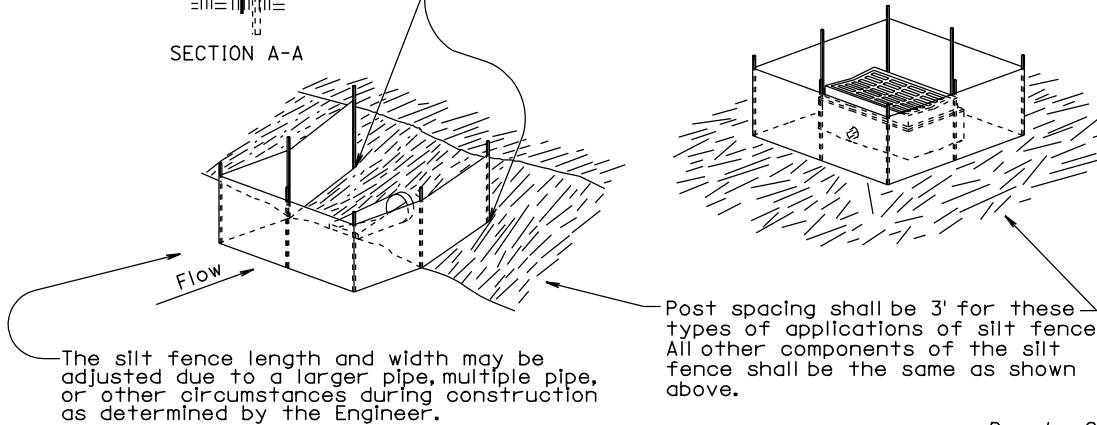
③ ATTACH SILT FENCE FABRIC



④ BACKFILL TRENCH AND WHEEL COMPACT SOIL



The elevation at these locations shall be, at a minimum, higher than the top of the silt fence fabric at its lowest elevation.



December 23, 2003

Published Date: 4th Qtr. 2006

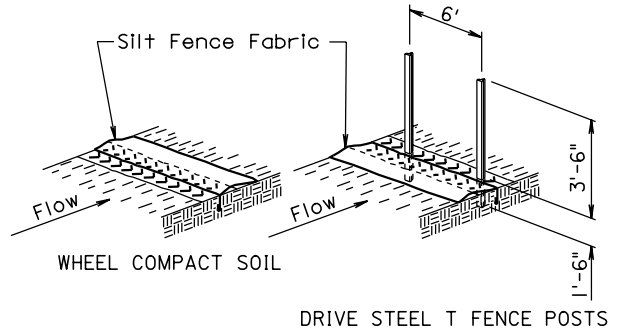
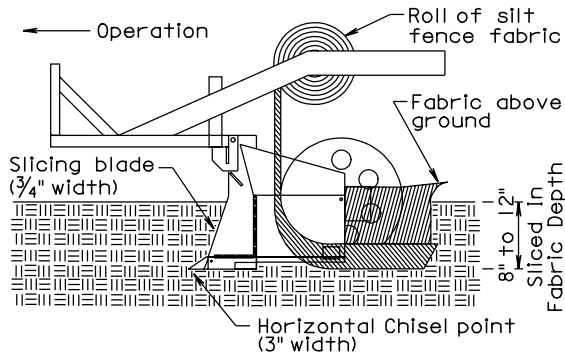
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HIGH FLOW SILT FENCE

PLATE NUMBER
734.05

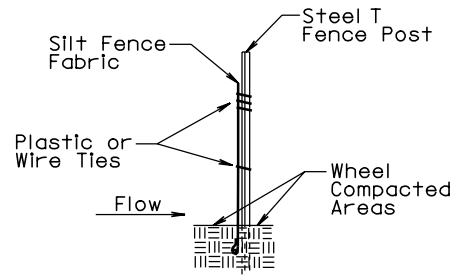
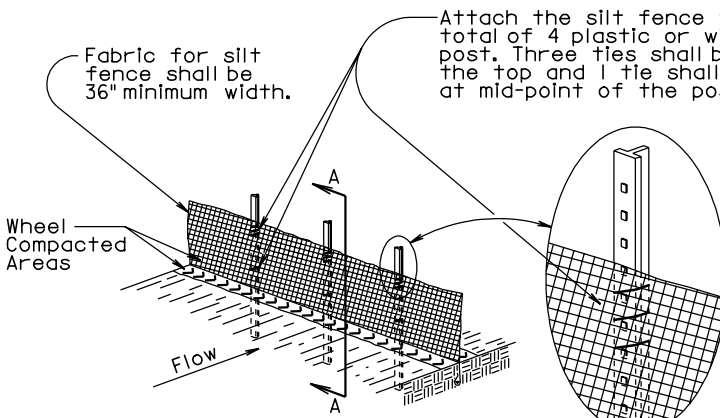
Sheet 1 of 2

MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION



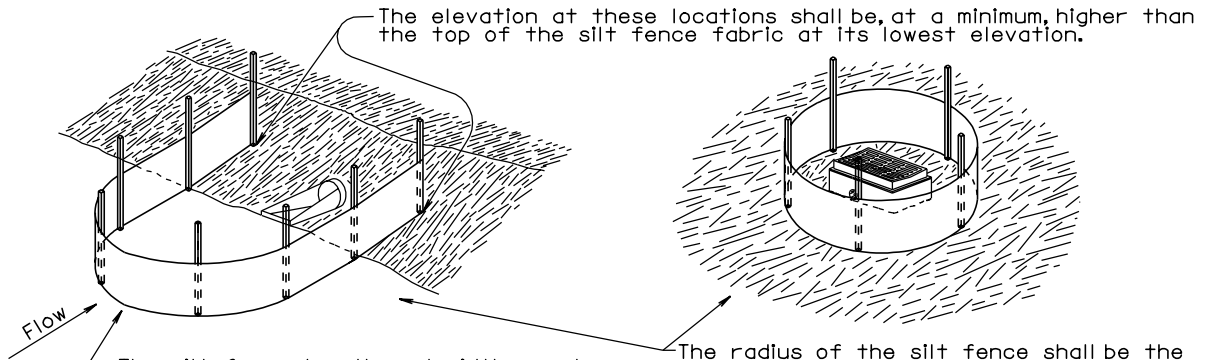
① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

② WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.



③ ATTACH SILT FENCE FABRIC

SECTION A-A



GENERAL NOTE:

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end shall be provided on top of the extra length of silt fence fabric to prevent underflow.

December 23, 2003

Published Date: 4th Qtr. 2006

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HIGH FLOW SILT FENCE

PLATE NUMBER
734.05

Sheet 2 of 2