

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT 018-392 & 044-392
SD HIGHWAYS 18 & 44
TRIPP COUNTY

EROSION & PIPE REPAIR
PCN IIN6 & IIN7

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	018-392 & 044-392	1	19

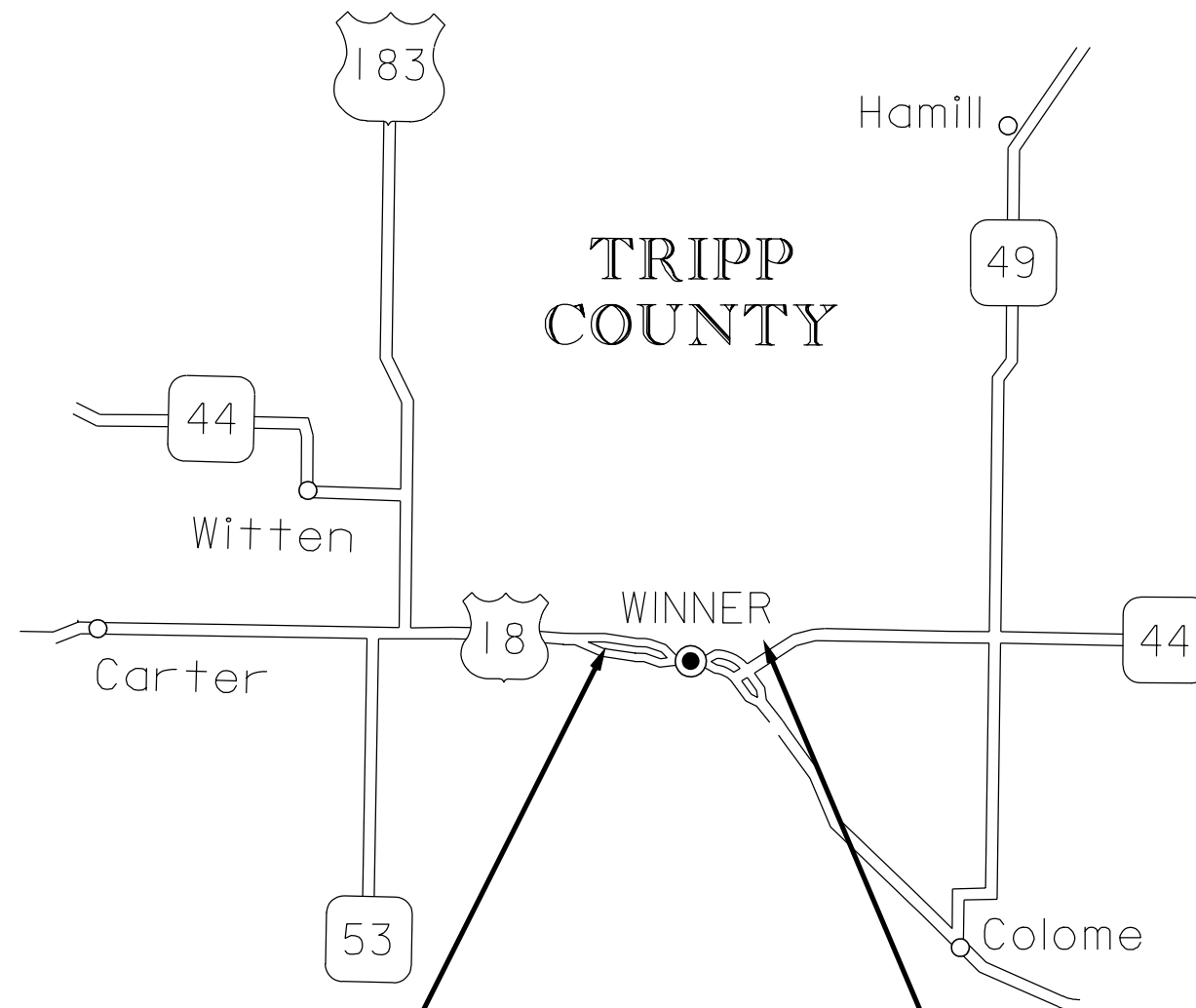
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DESIGN DESIGNATION

018-392		
ADT	(2008)	2800
ADT	(2028)	3660
DHV		550
D		50%
T DHV		7.5%
T ADT		16.5%

044-392		
ADT	(2008)	4320
ADT	(2028)	5295
DHV		795
D		50%
T DHV		0.8%
T ADT		1.7%



PROJECT 018-392
MRM 249.0 TO MRM 250.4 EB

PROJECT 044-392
MRM 253.7 WB

ESTIMATE OF QUANTITIES

PROJECT 018-392 PCN I1N6

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E7500	Remove Pipe for Reset	126	Ft
110E7510	Remove Pipe End Section for Reset	9	Each
120E0600	Contractor Furnished Borrow	117	CuYd
120E4100	Reprofiling Ditch	9.2	Sta
450E0123	18" RCP Class 3, Furnish	64	Ft
450E0130	18" RCP, Install	64	Ft
450E9000	Reset Pipe	126	Ft
450E9001	Reset Pipe End Section	9	Each
634E0100	Traffic Control	422	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
730E0210	Type F Permanent Seed Mixture	10	Lb
732E0100	Mulching	1.0	Ton

PROJECT 044-392 PCN I1N7

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	146	Ft
110E0510	Remove Pipe End Section	2	Each
120E0600	Contractor Furnished Borrow	15	CuYd
260E1080	Base Course, Salvaged, State Furnished	45.0	Ton
450E4768	24" CMP 14 Gauge, Furnish	164	Ft
450E4770	24" CMP, Install	164	Ft
450E5409	24" CMP Safety End with Bars, Furnish	4	Each
450E5411	24" CMP Safety End, Install	4	Each
462E0200	Controlled Density Fill	13.0	CuYd
634E0100	Traffic Control	340	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
730E0210	Type F Permanent Seed Mixture	1	Lb
732E0100	Mulching	0.2	Ton
734E0131	Type 1 Turf Reinforcement Mat	17.1	SqYd
734E0154	12" Diameter Erosion Control Wattle	100	Ft
734E0510	Shaping for Erosion Control Blanket	30	Ft

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018-392 & 044-392	3	19

SPECIFICATIONS

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

SEQUENCE OF OPERATIONS

The Contractor shall submit his/her proposed sequence of operations for the Engineer's approval at least two weeks prior to the preconstruction meeting. No preconstruction meeting will be allowed without the above submittal.

Access shall be maintained to businesses and local residences at ALL times.

PROJECT WORK HOURS

The Contractor may perform work at the work sites during daylight hours only, unless additional hours are approved by the Engineer.

Project 018-392

The contractor shall coordinate with the adjacent landowners to facilitate access to the two homes during the time period that the work is being completed until completion of the access work. Kathy Engel, 605-842-3146, is the homeowner at MRM 249.090 EB and Dean Engel, 605-842-2775, is the homeowner at MRM 249.150 EB. Vickie Cole, 605-842-2003, is the manager for Rushmore Homes located at MRM 249.2 EB.

MRM 249.025 (Sta. 0+54) Eastbound - The work at the west side of the access shall consist of removing and resetting the end section and one 4 foot section of 18" RCP. Two sets of tie bolts will be required. The area between the box culvert at Station 0+00 and the outlet of the pipe shall be reshaped. The work on the east side shall consist of removing the end section and one 4 foot section of 18" RCP. The 4 foot section shall be reset, an additional new 6 foot section shall be installed, and the end section reset. Three sets of tie bolts will be required.

MRM 249.034 (Sta. 1+00) to MRM 249.196 (Sta. 9+58) Eastbound - The contractor shall profile the ditch section in a continuous manner to reestablish the drainage flowline in this area. A 20 feet wide ditch bottom area between accesses will be profiled while maintaining the current general ditch shape. Adjustments may be made, as approved by the Engineer, to best fit the existing topography to facilitate drainage. Material removed during the reprofiling ditch work will consist of primarily sod and topsoil and may be used as fill material in the areas outside the shoulder of the approach or as topsoil. Any excavated ditch material not used or required to complete the work shall be disposed of by the contractor.

MRM 249.090 (Sta. 4+00) Eastbound - The work at this access shall consist of the removal of the existing 48 feet of 18" RCP & 2 ends, reset of the pipe & ends, and installation of 40 feet of new 18" RCP once the ditch shaping and the new drainage grade line has been established. All of the material removed from this approach shall be salvaged and reused during reinstallation of the approach. Sufficient approach material shall be removed to allow equipment to pass through during the ditch reshaping. Once the new ditch grade line has been approved by the Engineer the access shall have the previously removed pipe sections, the new pipe extension sections, and the salvaged pipe end sections installed. The east and west side of each access shall require six sets of tie bolts per access. The pipe shall be backfilled and compacted to the satisfaction of the Engineer, with the salvaged approach material and contractor furnished borrow. Any water required for compaction will be incidental to the various bid items.

MRM 249.150 (Sta. 7+08) Eastbound - The work at this access shall consist of the removal of the existing 46 feet of 18" RCP & 2 ends, reset the existing pipe & ends, and installation of 18 feet of new 18" RCP once the ditch shaping and the new drainage grade line has been established. All of the material removed from each approach shall be salvaged and reused during reinstallation of the approach. Sufficient approach material shall be removed to allow equipment to pass through during the ditch reshaping. Once the new ditch grade line has been approved by the Engineer the access shall have the previously removed pipe sections, the new pipe extension sections, and the salvaged pipe end sections installed. The east and west side of each access shall require six sets of tie bolts per access. The pipe shall be backfilled and compacted to the satisfaction of the Engineer, with the salvaged approach material and contractor furnished borrow. Any water required for compaction will be incidental to the various bid items.

MRM 249.201 (Sta. 9+82) Eastbound – The site work at this location consists of cleaning the sediment from the existing pipe to ensure proper drainage to the East.

MRM 250.4 Eastbound - The site work at this location consists of removing and resetting the end section and first 8 foot section of two 24" RCP, removing and resetting the end section and first 8 foot section of 18" RCP, installation of tie bars, and reestablishment of ditch drainage. Six sets of tie bolts will be required. The pipe shall be backfilled and compacted to the satisfaction of the Engineer, with the salvaged material and contractor furnished borrow. Any water required for compaction will be incidental to the various bid items.

Project 044-392

The access to the Family Dollar store located at MRM 253.727 WB currently has a twin 24" x 73' CMP & flared ends which has deteriorated and is no longer functioning properly, and channel and scour issues. The south pipe currently has no end sections and the North pipe has flared ends which will be replaced. The contractor shall coordinate with the manager of the Family Dollar store (Brandy Mausbach, 605-842-1195) to minimize disruption with the store's operating hours and delivery schedule. The contractor shall provide access to the store at all times. The Contractor and Engineer shall agree to a method to reestablish the new CMP at the same alignment and survey elevations of the current north pipe prior to any removal of items.

MRM 253.727 – The site work consists of saw cutting the existing asphalt full depth (3 inch to 5 inch depth) at the neat lines shown in the plans, excavating and removing 146 feet of existing 24" CMP and 2 flared ends, placing two new twin 82 feet x 24" CMP with 2 safety ends, placing 13.0 CuYd of Controlled Density Fill, shaping ditch and placing 30 feet of turf reinforcement mat at the outlet end, reshaping the ditch channel for 130 feet to the west, and placing 9 inches of "Base Course, Salvaged, State Furnished". The existing asphalt, 24" CMP, and 24" CMP ends which are removed shall become the property of the Contractor. The east end of the existing North 24" CMP shall remain unchanged in elevation and location and shall be the point of reference for all site work and the Engineer shall establish any correction in inlet and outlet elevations, if required. The south pipe shall be placed twelve to eighteen inches from the north pipe and set at the same inlet and outlet elevation as the north pipe. The contractor shall provide a method to preserve the alignment and to prevent the uplifting of the 24" CMP until the controlled density fill has been placed between the new twin 24" CMP as shown in the drawing. The quantity of the "Controlled Density Fill" shall be measured for payment.

MRM 253.727 – (CONTINUED) - The outlet of the new twin CMP shall have type 1 turf reinforcement mat installed 10 feet long by 14 feet wide and keyed in at the outlet as called for in these plans. The remaining approximate 120 feet of ditch shall be shaped to facilitate smooth sheet flow with a 10 feet ditch bottom.

The west side of the access will be extended approximately 9 feet. This area will require clean fill dirt that is not located on site. The Highway/sidewalk inslope shall transition with the access inslope to the satisfaction of the Engineer. The finished inslopes of the access shall be constructed with 6:1 side slopes and the salvaged topsoil replaced and the area seeded & mulched.

All disturbed areas will be reseeded with Type F Permanent Seed Mixture (estimate = 1 pound of seed).

The paved portion of the access shall match the existing width and this area shall be filled with “Base Course, Salvaged, State Furnished” and compacted to the satisfaction of the Engineer. The pipe will be covered by a minimum of 9 inches of salvaged base course. The access shall be paved with 3 inch thick asphalt by State maintenance forces. If the work is done prior to the State being able to provide asphalt the contractor shall fill the area in with “Base Course, Salvaged, State Furnished”.

PIPE NOTES

The Contractor shall verify the size of each pipe prior to ordering any pipe. If discrepancies are found, the Contractor shall notify the Engineer of the discrepancy before ordering. Pipe culverts that are removed and not reset shall become the property of the Contractor. Pipe culverts shall be removed and not in view from the project upon completion of the project.

All pipe sections that are left in place or removed and reset shall be cleared of sediment by a method approved by the Engineer. The method of cleaning shall be submitted for approval prior to the preconstruction meeting. The Contractor shall install an approved Erosion & Sediment BMP at the outlet of the pipe being cleaned to capture sediment. The sediment from the pipe may be used as Contractor Furnished Borrow, as approved by the Engineer. The cleaning of sediment from the pipes shall be completed to the satisfaction of the Engineer. All costs associated with the cleaning of the existing pipe, including labor, excavation, and equipment shall be incidental to the contract unit price for the pipe bid items.

PIPE NOTES (CONTINUED)

The excavation required to expose existing pipe and ends will be incidental to the contract unit prices for "Remove Pipe Culvert", "Remove Pipe End Section", and corresponding pipe install bid items.

When it is necessary to remove damaged CMP or a damaged CMP end, it may be cut with a torch. If the pipe is cut with a torch, it shall be painted with a galvanizing paint approved by the Engineer. The Contractor shall be aware of the OSHA requirements for Hazardous Materials when cutting pipe with galvanized coating. The cost of removing damaged portions of CMP shall be incidental to the contract unit price for CMP and pipe end sections.

Class II reinforced concrete pipe and high density polyethylene pipe may be substituted for corrugated metal pipe at approaches at no additional cost to the state. Acceptance of high density polyethylene pipe will be certification. The end sections for the high density polyethylene pipe shall be metal, conform to the type of end section as shown in the plans, and be compatible with the high density polyethylene pipe.

Corrugated metal pipes shall have 2 2/3-inch X ½-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans.

The cost of providing and installing the connecting collars shall be incidental to the contract unit price for CMP and pipe end sections.

TIE BOLTS FOR RCP

All RCP sections that are new or reset shall have tie bolts installed on the end section and first three sections of pipe. The Contractor shall field drill the existing RCP pipe and end sections to install the new tie bolts. Tie bolts shall be installed in accordance with Standard Plate No. 450.18.

Costs for removing tie bolts, drilling tie bolt holes, and furnishing/installing tie bolts shall be incidental to the contract unit prices for installing or resetting RCP and end sections.

CONTROLLED DENSITY FILL FOR PIPE

Controlled density fill shall be contained within the required limits with sandbags or other methods approved by the Engineer.

CONTROLLED DENSITY FILL FOR PIPE (CONTINUED)

Controlled density fill shall be a flowable mortar material. Materials shall be in accordance with the Standard Specifications, except as modified below. The mix design shall be one of the following:

Material	Rate per Cubic Yard
Portland Cement, Type II	100 Lb
Fine Aggregate	2600 Lb
Coarse Aggregate	None
Water	60 Gal
Fly Ash, Type C	300 Lb

Or alternative mix design with CLSM (Controlled Low Strength Material):

Material	Rate per Cubic Yard
Portland Cement, Type I	200 Lb
Fine Aggregate	2600 Lb
Coarse Aggregate	None
Water	35 Gal
“W.R. Grace – Darafill” or approved equal	1 (3 oz.) capsule or equivalent *

* Shall be one 3 ounce capsule or equivalent CLSM performance additive (foaming admixture).

The fine aggregate shall be natural sand consisting of mineral aggregate particles conforming to the following gradation requirements:

Passing 3/8 Inch Sieve	100%
Passing No. 200 Sieve	0.0-10.0%

Both of the mix designs shown above are designed to produce a minimum compressive strength of 100 psi. The Engineer may allow adjustments to the proportion of water at the site to provide the necessary consistency of the mix.

The Contractor shall prevent the flotation or movement of the culvert due to the buoyant force from the controlled density fill until the controlled density fill hardens. Overlying surfacing materials shall not be placed sooner than four hours after placement of the controlled density fill.

CONTROLLED DENSITY FILL FOR PIPE (CONTINUED)

All costs for furnishing and installing the controlled density fill, including sandbags, labor, materials, equipment and incidentals necessary to complete the work shall be included in the contract unit price per cubic yard for "Controlled Density Fill."

Plans quantity will be the basis for payment unless otherwise ordered by the Engineer.

SAWING OF EXISTING ASPHALT CONCRETE

Where new asphalt concrete is placed adjacent to existing asphalt concrete, the existing asphalt shall be sawed full depth to a true line with a vertical face. There will not be a separate payment made for sawing. All costs associated with sawing existing asphalt concrete shall be incidental to the various contract items.

BASE COURSE, SALVAGED, STATE FURNISHED

The Base Course, Salvaged, State Furnished shall be obtained from a stockpile site located at the SDDOT Winner Maintenance yard located on the North side of US Highway 44 on the east edge of Winner at MRM 254.

The moisture content for compaction of the Base Course, Salvaged, State Furnished shall be approximately optimum moisture of the material. The cost for water shall be incidental to the contract unit price for "Base Course, Salvaged, State Furnished".

This material is royalty free to the Contractor.

Furnish cost to the State for the Base Course, Salvaged, State Furnished is \$3.00 per ton.

Compaction shall be to the satisfaction of the Engineer.

All other requirements for Base Course shall apply.

CONTRACTOR FURNISHED BORROW

Contractor Furnished Borrow shall be required to build inslope transitions at all locations where pipe is added to lengthen existing pipe. The mainline inslope and adjacent approach inslope shall be warped as needed to match the end section of the pipe and as directed by the Engineer. Refer to Standard Plate 120.05 for details.

CONTRACTOR FURNISHED BORROW (CONTINUED)

The Contractor shall provide a suitable site for Contractor Furnished Borrow material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The Contractor may use material from within the SDDOT ROW at the Engineer's discretion. The borrow material shall be approved by the Engineer prior to removal and placement. The plans quantity for "Contractor Furnished Borrow" as shown in the Estimate of Quantities will be the basis of payment for this item.

Prior to placement of fill material, the Contractor will be required to remove 3 inches of topsoil and replace it on the inslopes of newly constructed embankments. Payment for the above shall be incidental to the contract unit price per cubic yard for "Contractor Furnished Borrow".

Once a work site is opened up at a given location, work shall proceed in a continuous manner to minimize the potential for erosion. Failure to pursue the work once work has begun at a given site will result in Liquidated Damages being assessed at a rate of \$100.00 per day.

It is anticipated that water for compaction will not be required. When, in the opinion of the Engineer, the fill material is dry, water may be ordered and placed to the satisfaction of the Engineer. The cost of water shall be incidental to the contract unit price per cubic yard for "Contractor Furnished Borrow".

All fill material shall meet with the approval of the Engineer. The Contractor will be required to obtain his own borrow sources. Borrow areas within the right-of-way may be available with prior approval of the Engineer.

Excavation quantities are computed using the volume of embankment plus 20 percent for shrinkage. Plans quantity will be paid for at the contract unit price per cubic yard for "Contractor Furnished Borrow" unless the Engineer orders changes.

The Contractors attention should be drawn, and consideration given, to Section 7.21 of the Standard Specifications prior to the planning and procurement of Borrow sites for the Contractor Furnished Borrow required on this project.

Restoration of the Contractor Furnished Borrow site(s) shall be the responsibility of the Contractor and shall be completed to the satisfaction of the Engineer.

Compaction shall be to the satisfaction of the Engineer.

HISTORICAL PRESERVATION OFFICE CLEARANCES

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). Provide SARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that no artifacts have been found on the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

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

To facilitate SHPO or THPO responses, the Contractor should submit a records search or cultural resources survey report to Tom Lehmkuhl, DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3721). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO/THPO approval. The Contractor is responsible for obtaining all required permits and clearances for staging areas, borrow sites, waste disposal sites, and all material processing sites. **The Contractor shall provide the required permits and clearances to the Engineer at the preconstruction meeting.**

WASTE DISPOSAL SITE

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

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

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

WASTE DISPOSAL SITE (CONTINUED)

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

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

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

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

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

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

FERTILIZING

Application of fertilizer will not be required on this project.

TOPSOIL

All disturbed slope flattening areas and non-ditch areas shall have salvage topsoil placed. The contractor shall disk and rake the topsoil such that there are not any clumps of sod or topsoil greater than 3 inches in diameter existing prior to seeding.

All topsoil shall be removed and salvaged from the approaches to receive slope flattening work and reused on the approaches. Costs for salvaging & replacing the topsoil shall be incidental to the contract unit price per cubic yard for "Contractor Furnished Borrow".

PERMANENT SEEDING

The area will be reseeded with Type F Permanent Seed Mixture (estimated @ 0.4 acres).

Permanent Seeding will be measured and paid for where embankment work is accomplished.

Seeding of borrow areas within the right-of-way will be required as specified above but will not be measured for payment. Restoration of borrow areas outside the right-of-way will be as per agreement with the landowner and will not be paid for.

Hand seeding devices approved by the Engineer will be allowed. All seed broadcast, including the use of a hydroseeder, must be raked or dragged in (incorporated) with the top 1/4 to 1/2 inch of topsoil to the satisfaction of the Engineer.

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 July; Winter Wheat: August through November		10
Total:		26

MULCHING (HAY OR STRAW)

Following permanent seeding, a mulch consisting of grass hay or straw shall be blown on at the rate of 2 tons per acre and punched in on slopes 3:1 and flatter and on 2:1 slopes where equipment can be operated without rutting the slope due to slippage. Bales with noxious weed contamination will be rejected and the Contractor will be required to remove the contaminated bales from the project.

SHAPING FOR EROSION CONTROL BLANKET & TURF REINFORCEMENT

The ditches shall be shaped for the erosion control blanket and turf reinforcement as specified on Standard Plate 734.01. All costs for shaping the ditches for turf reinforcement blanket including labor and equipment shall be incidental to the contract unit price per foot for "Shaping for Erosion Control Blanket".

TURF REINFORCEMENT MAT

Turf Reinforcement Mat shall be installed at locations shown in the table at the widths specified, and at locations determined by the Engineer during construction. The Contractor shall use a turf reinforcement mat from the approved products list. The approved product list for turf reinforcement mat may be viewed at the following internet site:

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

Installation of the Turf Reinforcement Mat shall be according to the manufacturer's installation instructions.

TABLE OF TURF REINFORCEMENT MAT

Location	L/R	Width (Ft)	Type	Quantity (SqYd)
MRM 253.7	Left	14	1	17.1
Total Type 1 Turf Reinforcement Mat:				17.1

EROSION CONTROL WATTLE

The erosion control wattle provided shall be from the list shown below:

Product	Manufacturer
Curlex Sediment Log AEC Premier Straw Wattles	American Excelsior Company Arlington, TX Phone: 1-800-777-7645 www.amerexcel.com
Aspen Excelsior Logs and Excel Straw Logs	Western Excelsior Corporation Mancos, CO Phone: 1-800-833-8573 www.westernexcelsior.com
Earth Saver Rice Straw Wattles	R.H. Dyck Inc. Winters, CA Phone: 1-866-928-8537 www.earth-savers.com
Amber Waves Straw Wattles	Limpert Environmental Litchfield, MN Phone: 1-320-693-2565 www.limpertenvironmental.com
Bio Logs	Flaxtech, LLC Rock Lake, ND Phone: 1-866-444-3529
Stenlog	ECB Bioproducts St. Andrews, MB Phone: 1-866-317-3346 www.erosioncontrolblanket.com
Winters Wattles	Winters Excelsior Company Birmingham, AL Phone: 1-800-248-7237 www.wintersexcelsior.com
Patriot Wood Fiber Logs and Patriot Straw Wattles	Patriot Environmental Products, Inc. Mesa, AZ Phone: 1-480-345-7293 www.digitaldesigncore.com/patriot/WattleSpecs.pdf

EROSION CONTROL WATTLE (CONTINUED)

The Contractor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

A quantity of 100 feet of 12" Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control around excavation and/or borrow piles and at the pipe ends while pipe clean out work is being completed.

TABLE OF EROSION CONTROL WATTLE

MRM	L/R	Diameter (Inch)	Quantity (Ft)
MRM 253.7	Lt	12	100

GENERAL MAINTENANCE OF TRAFFIC

The Contractor's attention is drawn to Standard Plate Number 634.03, which details the traffic control measures necessary for this site work. The Contractor shall be allowed to work in only one work area. The Contractor may submit a proposal, for the Engineer's approval at the preconstruction meeting, to work in multiple work areas. Traffic Control units have been estimated based on one set-up for the 018-392 work and one set-up for the 044-392 work. Traffic Control devices moved between work sites on the same project will be paid for only once.

Removing, relocating, covering, salvaging and resetting of existing 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

GENERAL MAINTENANCE OF TRAFFIC (CONTINUED)

Contractor, at no expense to the State, and to the satisfaction of the Engineer.

All construction operations shall be conducted in the general direction of traffic movement. All signs shall be mounted on portable supports. The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas. Portable sign supports may be used as long as the duration is less than three days. If the duration is more than three days, the signs shall be on fixed supports. The three work areas for this contract will be signed as rural areas.

All breakaway sign supports shall comply with FHWA NCHRP 350 crashworthy requirements. The Contractor shall provide post installation details at the preconstruction meeting for all steel post breakaway sign support assemblies.

Traffic control signs furnished will be paid for only once. The cost of moving signs within project limits or from project to project shall be incidental to the contract unit price per unit for Traffic Control.

Additional standard signs, as ordered by the Engineer, shall be available within two (2) working days. Failure to provide signs within this time limit will result in Liquidated Damages being assessed in the amount of \$100 per Calendar Day. Payment for additional signs will paid using the contract unit price per unit for Traffic Control.

Traffic Control units, as shown in the Estimate of Quantities, are estimates. The Contractor's operation may require adjustments in quantities, either more or less. Payment will be based on the signs ordered by the Engineer and actually used on the project.

The contractor shall furnish, install and maintain "Truck Crossing" signs. The exact number and location will be determined on construction. Payment for these signs will be incidental to the contract unit price per unit for Traffic Control and will be paid for once on the project.

UTILITIES

The contractor shall contact the involved utility companies through South Dakota One Call prior to starting work. It shall be the responsibility of the Contractor to coordinate work with the utility company to avoid damage to existing facilities.

PROJECT WORK SUMMARY (FOR INFORMATION ONLY)

018-392 – MRM 249.0 TO 249.2 EB

DESCRIPTION	ACCESS & PROFILE WORK									
	0+54 Access		4+00 Access		7+08 Access		9+82 Access		TOTAL	UNIT
	West	East	West	East	West	East	West	East		
Remove 18" RCP For Reset	4	4	48	--	46	--	--	--	102	FT
Remove 18" RCP End Section For Reset	1	1	1	1	1	1	--	--	6	EACH
Contractor Furnished Borrow	--	13	31	49	12	12	--	--	117	CUYD
Reprofiling Ditch	15	258	--	238	--	218	--	30	759	FT
18" RCP Class 3, Furnish	--	6	16	24	8	10	--	--	64	FT
18" RCP, Install	--	6	16	24	8	10	--	--	64	FT
Reset Pipe	4	4	48	--	46	--	--	--	102	FT
Reset Pipe End Section	1	1	1	1	1	1	--	--	6	EACH
Traffic Control	--	--	--	--	--	--	--	--	422	UNIT
Tie Bolts	4	4	4	4	4	4	--	--	24	EACH
Type F Permanent Seed Mixture	0.5	2.5	0.5	2.5	0.5	2.0	--	0.5	9.0	LB
Mulching	0.05	0.25	--	0.3	--	0.25	--	0.05	0.9	TON

018-392 – MRM 250.4 EB

ACCESS & PROFILE WORK				
DESCRIPTION	West	East	TOTAL	UNIT
Remove 18" RCP For Reset	--	8	8	FT
Remove 18" RCP End Section For Reset	--	1	1	EACH
Remove 24" RCP For Reset	16	--	16	FT
Remove 24" RCP End Section For Reset	2	--	2	EACH
Reprofiling Ditch	90	75	165	FT
Reset Pipe	16	8	24	FT
Reset Pipe End Section	2	1	3	EACH
Tie Bolts	4	2	6	EACH
Type F Permanent Seed Mixture	0.5	0.5	1.0	LB
Mulching	0.05	0.05	0.1	Ton

044-392 - Twin 24" CMP (US 44 - MRM 253.727)

DESCRIPTION	TOTAL	UNIT
Remove 24" CMP	146	FT
Remove 24" CMP End Section	2	EACH
Contractor Furnished Borrow	15	CUYD
Base Course, Salvaged, State Furnished	45.0	TON
24" CMP 14 Gauge Furnish	164	FT
24" CMP, Install	164	FT
24" CMP Safety End with Bars, Furnish	4	EACH
24" CMP Safety End, Install	4	EACH
Controlled Density Fill	13.0	CUYD
Traffic Control	340	UNIT
Type F Permanent Seed Mixture	1	LB
Mulching	0.2	TON
Type 1 Turf Reinforcement Mat	17.1	SOYD
12" Diameter Erosion Control Wattle	100	FT
Shaping for Erosion Control Blanket	30	FT

ITEMIZED LIST FOR TRAFFIC CONTROL

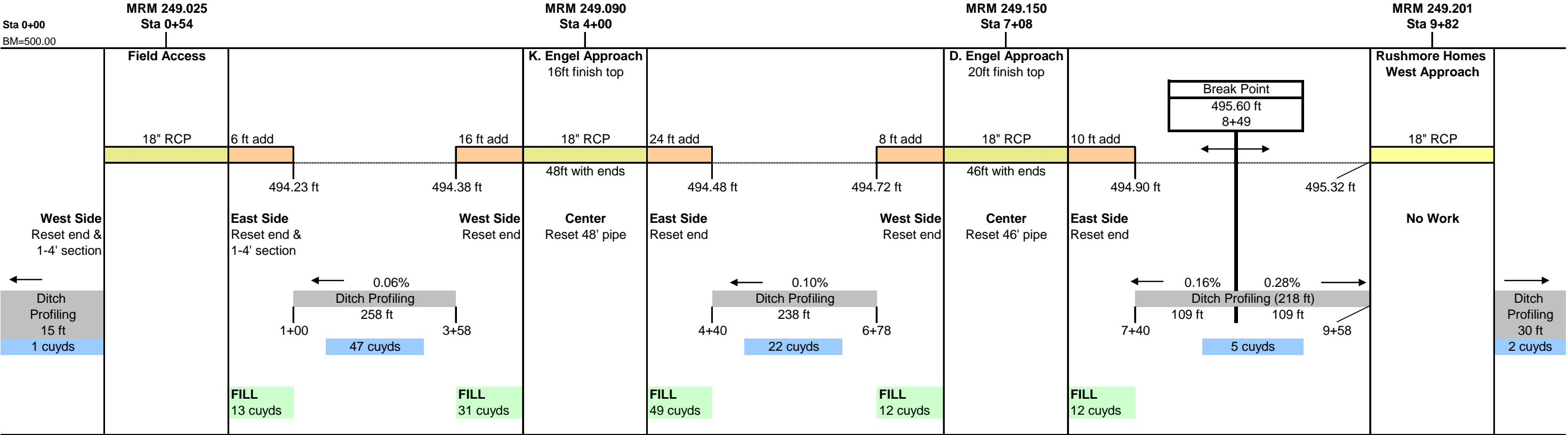
018-392 PCN I1N6

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-1	48" x 24"	ROAD WORK NEXT ## MILES	2	24	48
G20-2A	36" x 18"	END ROAD WORK	2	17	34
W8-6	48" x 48"	TRUCK CROSSING	2	34	68
W20-1	48" x 48"	ROAD WORK ##### FT. OR AHEAD	4	34	136
W21-5	48" x 48"	SHOULDER WORK	4	34	136
TOTAL UNITS					422

044-392 PCN I1N7

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-1	48" x 24"	ROAD WORK NEXT ## MILES	2	24	48
G20-2A	36" x 18"	END ROAD WORK	2	17	34
W8-1	36" x 36"	BUMP	2	27	54
W8-6	48" x 48"	TRUCK CROSSING	2	34	68
W20-1	48" x 48"	ROAD WORK ##### FT. OR AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
TOTAL UNITS					340

SUMMARY OF WORK (018-392) – MRM 249.0 TO 249.2 EASTBOUND DITCH



LEGEND

- = Existing Approach Pipe
- = Pipe Extension
- = Existing pipe to be Removed & Reset
- = Ditch Reshaping Area
- = Estimated Fill for Slope Flattening
- = Drainage Direction Arrows
- = Excavation from Ditch Reshaping

Bench Mark Description

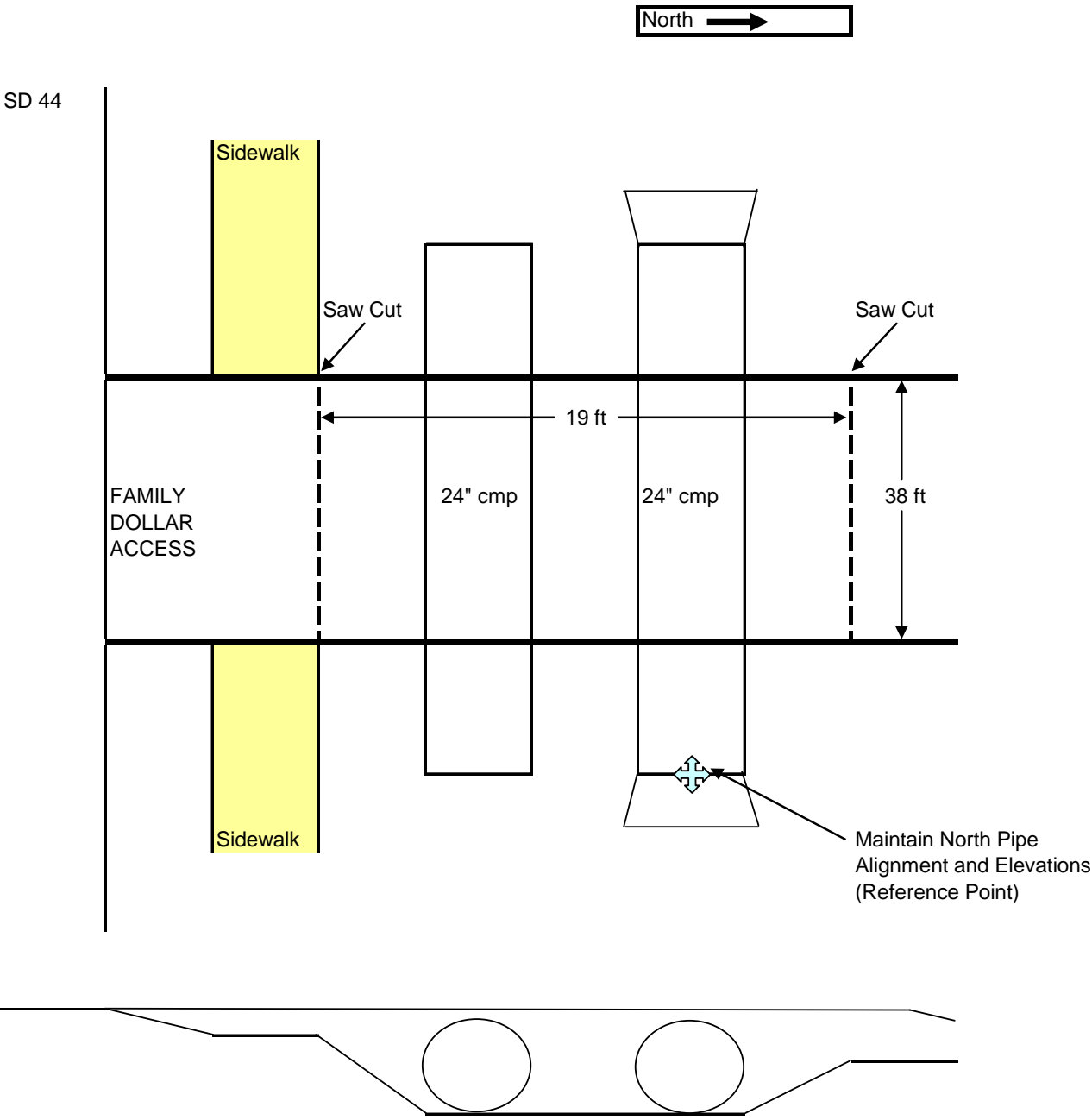
SW top corner of box culvert at Sta 0+00 = 500.00 ft



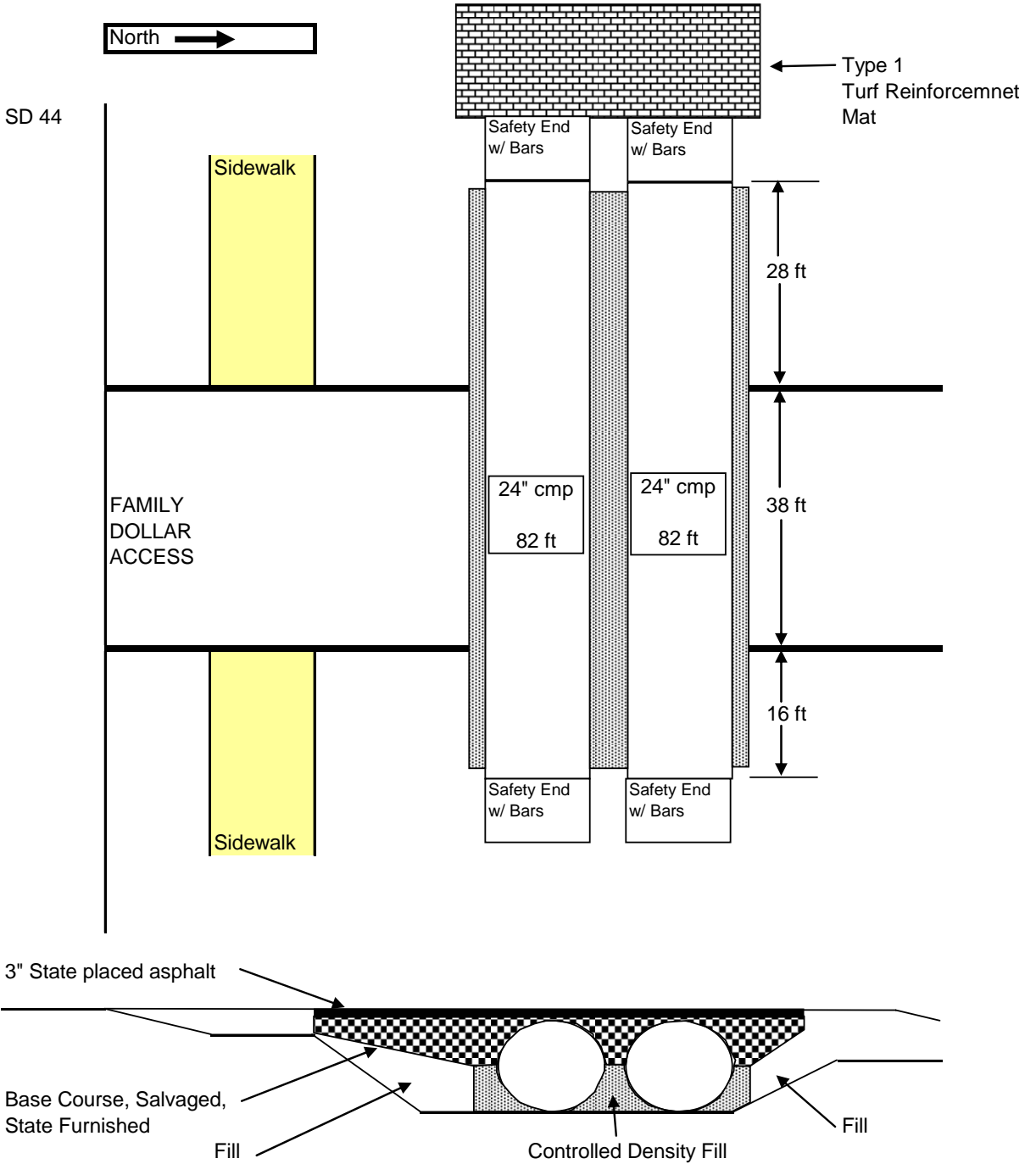
NOT TO SCALE

SUMMARY OF WORK (044-392) – MRM 253.7 WESTBOUND DITCH
FAMILY DOLLAR APPROACH

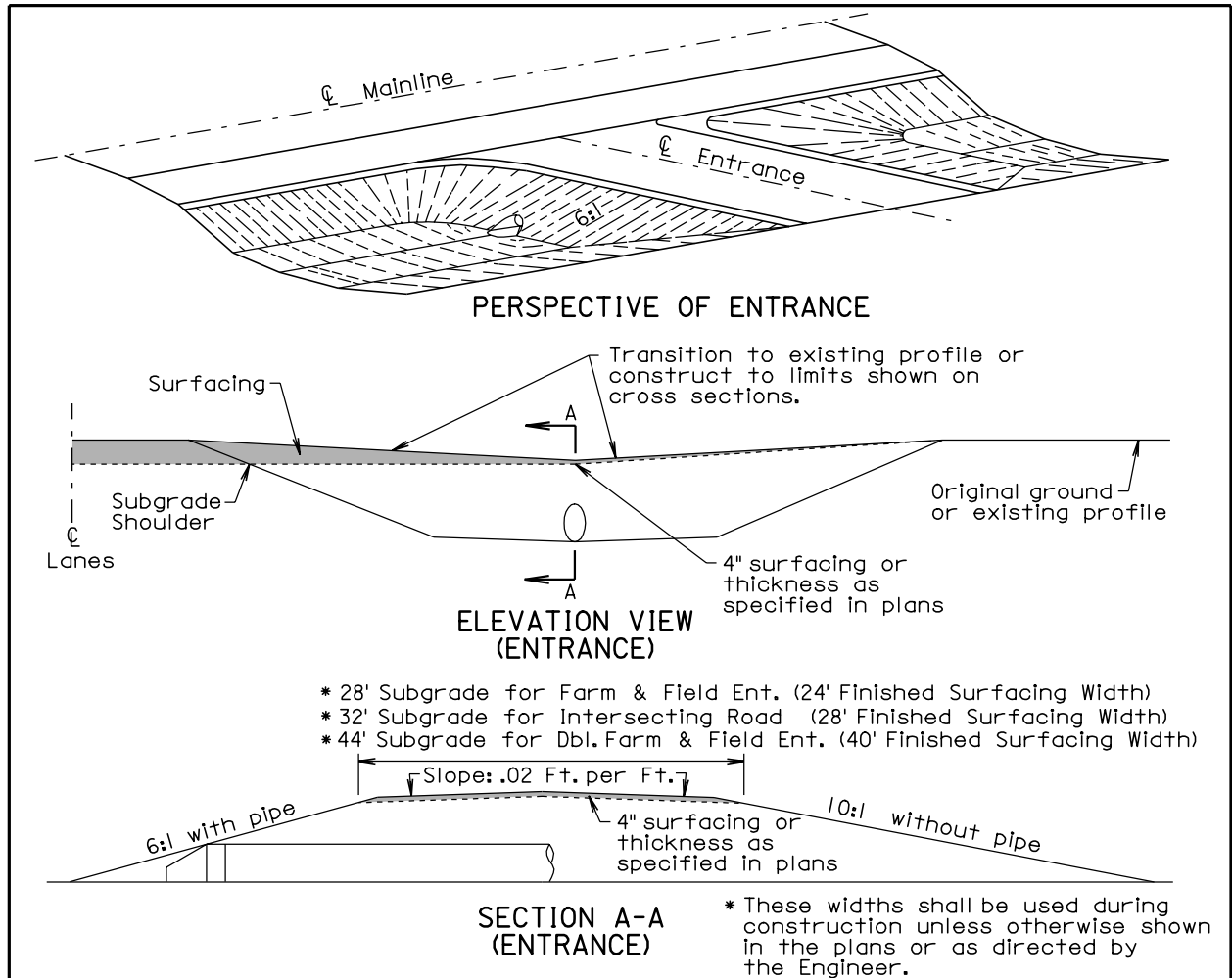
EXISTING



REPLACEMENT



NOT TO SCALE



GENERAL NOTES:

The ditch section shown above in the perspective and elevation view is only for illustrative purposes.

A 6:1 inslope shall be constructed for an entrance or intersecting road when a pipe is required. A 10:1 inslope shall be constructed when a pipe is not required.

Pipe lengths shall be adjusted if necessary during construction to obtain the 6:1 slopes. For grading projects, the pipe lengths are estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

The transition area between the mainline inslope and the approach inslope for intersecting road, farm and field entrances shall be rounded to eliminate an abrupt transition.

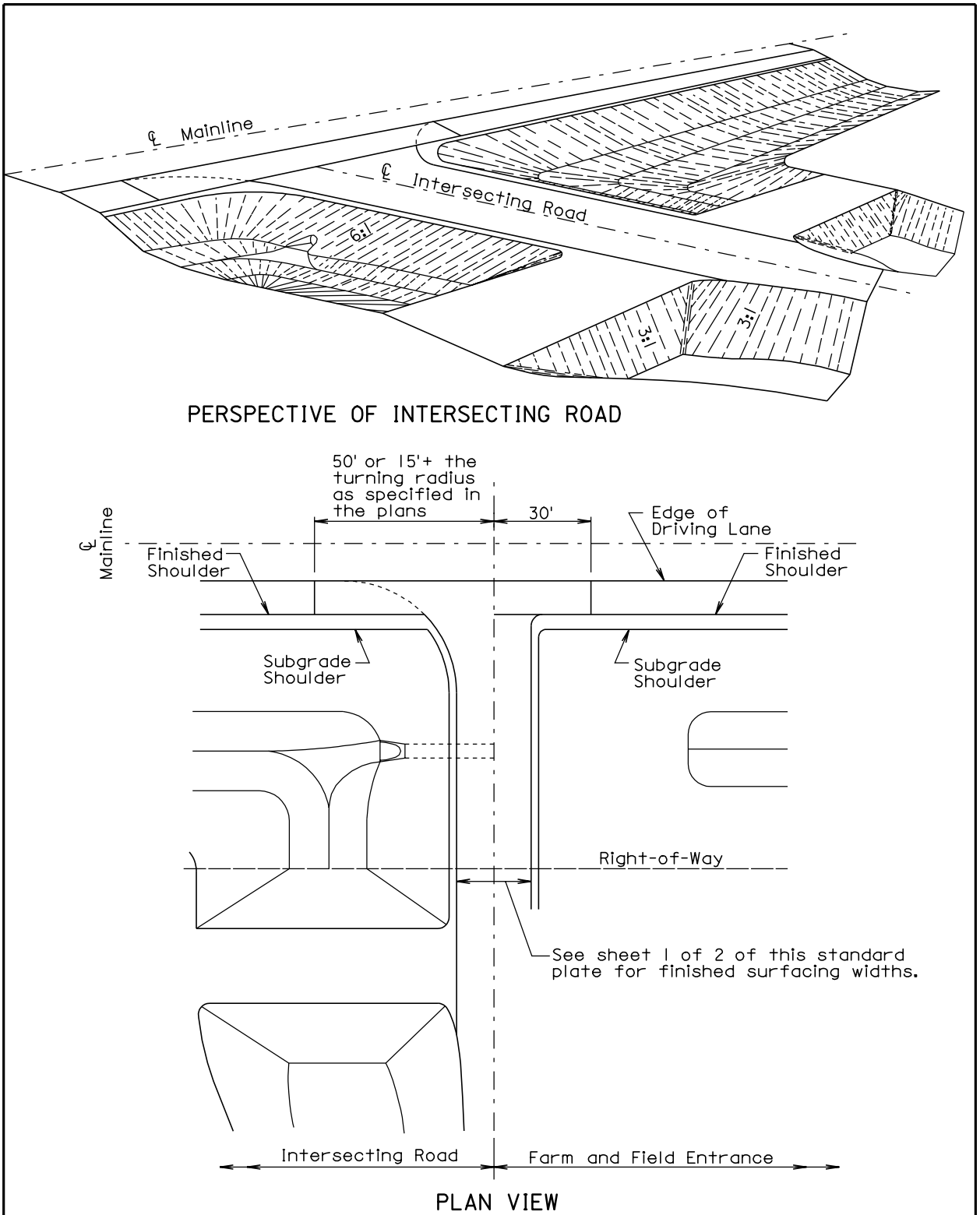
A minimum practical radius shall be constructed between the approach inslope and mainline inslope for farm and field entrances.

The turning radii shall be 35' for intersecting roads unless stated otherwise in the plans.

At locations where the new intersecting road ties into the existing mainline road, it may be necessary to construct field entrances back and ahead on the intersecting road beyond the mainline right-of-way in order to fit the flatter inslopes of the new approach to the steep inslopes of the existing intersecting road. At locations where these approaches have not been provided in the plans, they may be added at the discretion of the Engineer in order to obtain a suitable transition to the existing section.

September 14, 2001

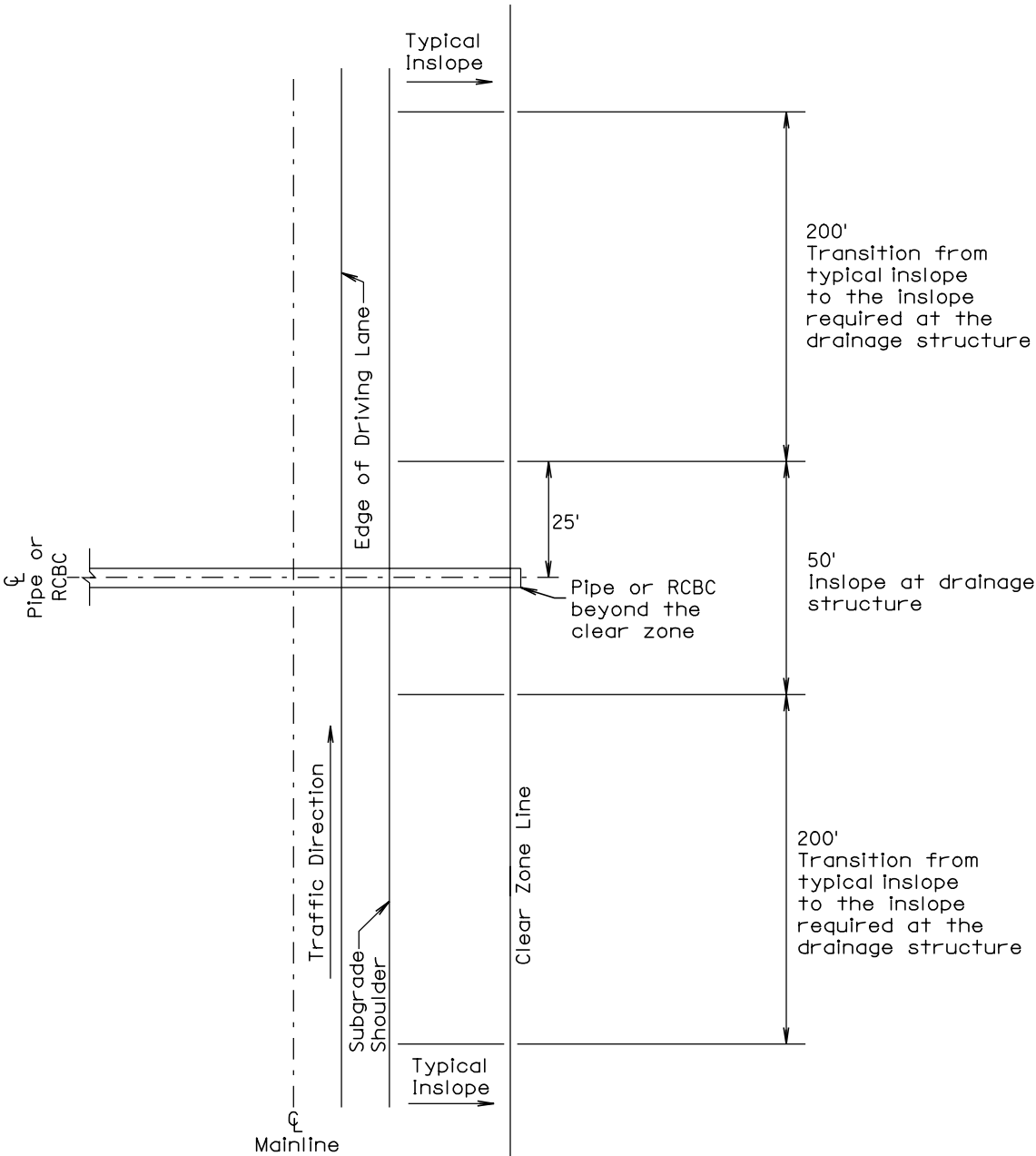
Published Date: 4th Qtr. 2009	S D D O T	INTERSECTING ROAD, FARM AND FIELD ENTRANCE	PLATE NUMBER 120.01
			Sheet 1 of 2



September 14, 2001

Published Date: 4th Qtr. 2009	S D D O T	INTERSECTING ROAD, FARM AND FIELD ENTRANCE	PLATE NUMBER 120.01
			Sheet 2 of 2

Plotting Date: 30-DEC-2009



March 31, 2000

Published Date: 4th Qtr. 2009

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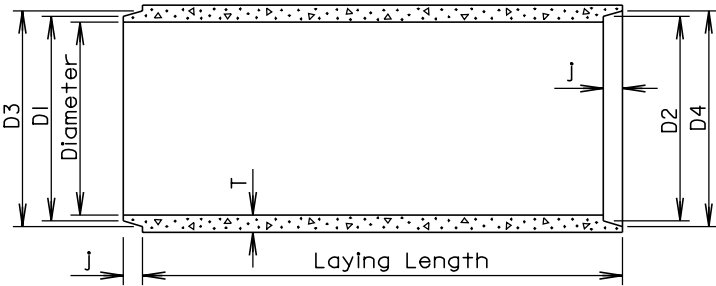
INSLOPE TRANSITION

PLATE NUMBER
120.05

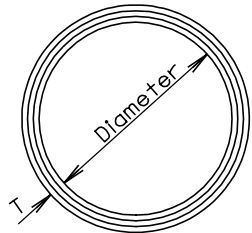
Sheet 1 of 1

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 3/8
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

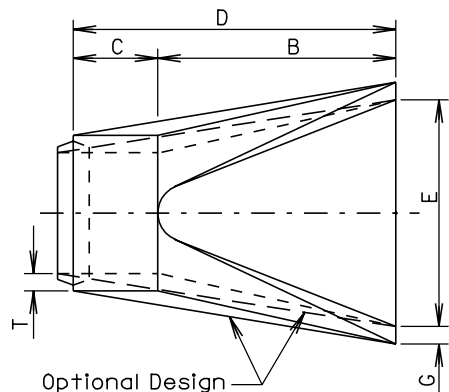
Published Date: 4th Qtr. 2009

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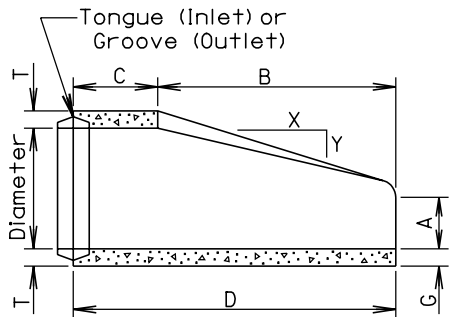
REINFORCED CONCRETE PIPE

PLATE NUMBER
450.01

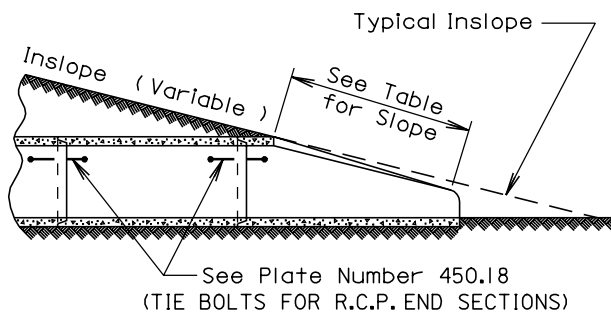
Sheet 1 of 1



TOP VIEW



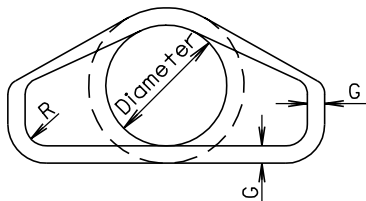
LONGITUDINAL SECTION



SLOPE DETAIL

GENERAL NOTES:

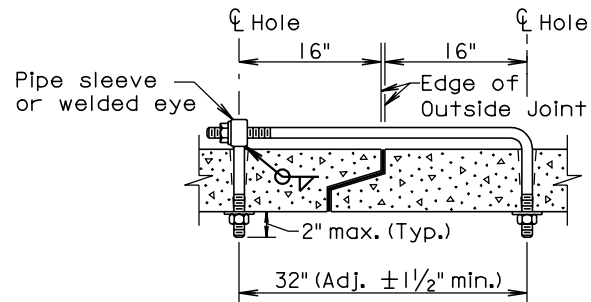
Lengths of concrete pipe shown on Plan Sheets are between flared Ends only.
Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.



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

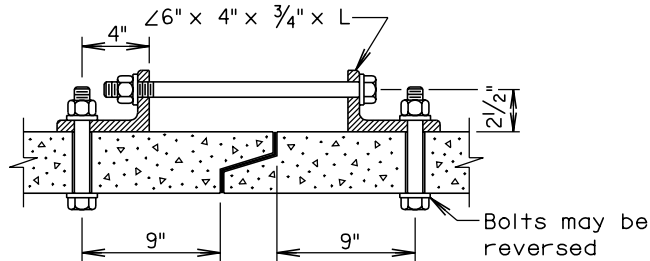
March 31, 2000



ADJUSTABLE EYE BOLT TIE

GENERAL NOTES:

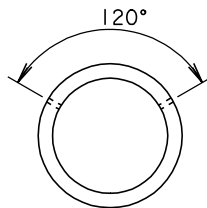
Tie bolts to be furnished with 2 washers and 2 nuts except for the 9/16" rod which has unthreaded legs.
Use 9/16" rod diameter and 5/8" thread diameter for pipe wall thickness of 2" to 3/4".
Use 1/16" rod diameter and 3/4" thread diameter for pipe wall thickness of 3/2" to 6 1/2".
Use 29/32" rod diameter and 1" thread diameter for pipe wall thickness of 7" and larger.



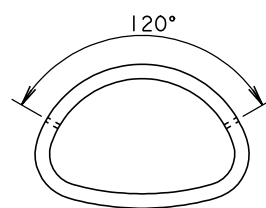
ANGLE AND BOLT TIE

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"



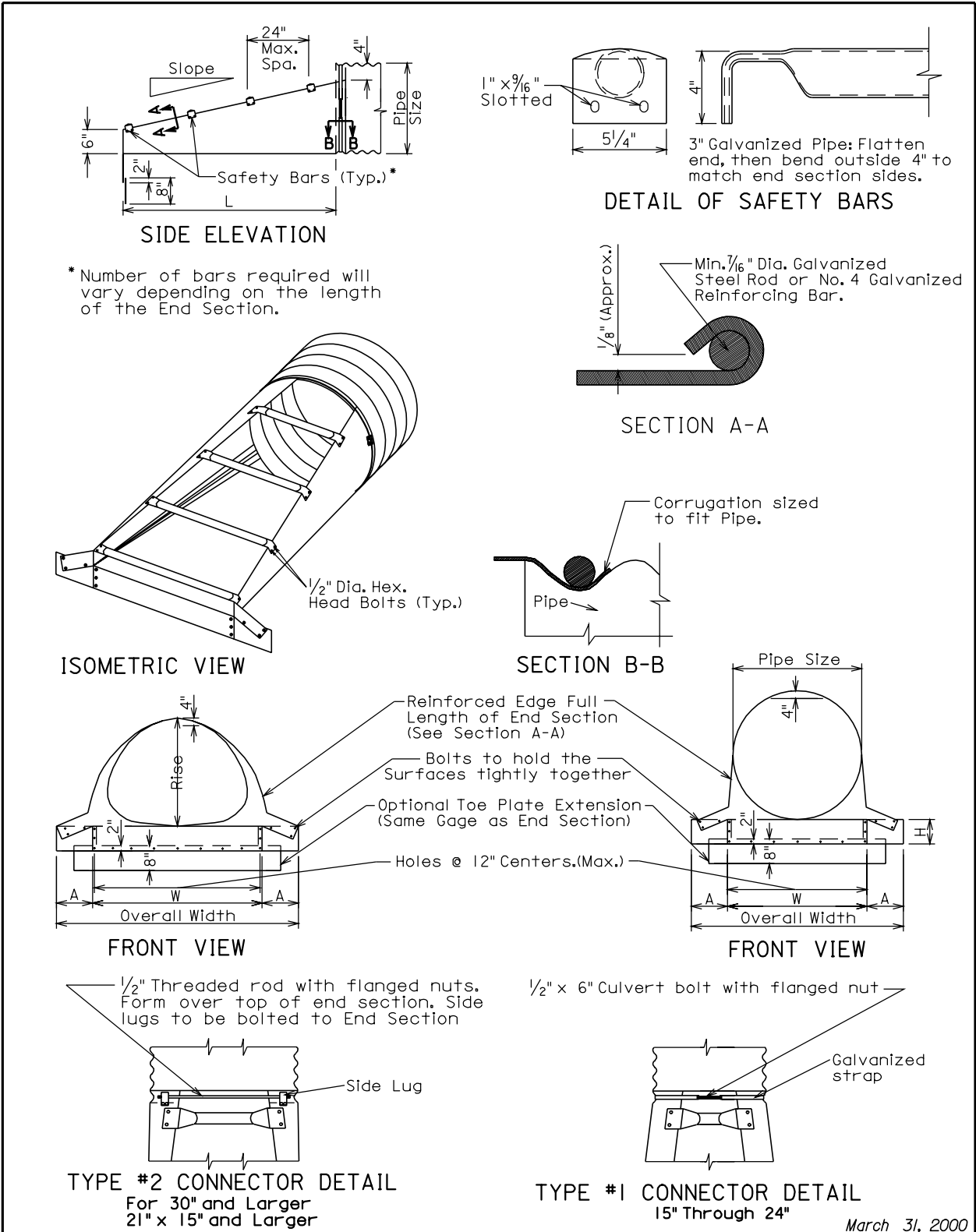
END VIEW
"ARCH"

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

Plotting Date: 30-DEC-2009



March 31, 2000

ARCH C.M.P. SAFETY ENDS										
Equiv. Dia. (In.)	(Inches)		Min. Thick.		Dimensions (Inches)				L Dimensions	
	Span	Rise	In.	Gage	A	H	W	Overall Width	Slope	Length (In.)
18	21	15	.064	16	8	6	27	43	6:1	30
21	24	18	.064	16	8	6	30	46	6:1	48
24	28	20	.064	16	8	6	34	50	6:1	60
30	35	24	.079	14	12	9	41	65	6:1	84
36	42	29	.109	12	12	9	48	72	6:1	114
42	49	33	.109	12	16	12	55	87	6:1	138
48	57	38	.109	12	16	12	63	95	6:1	168
54	64	43	.109	12	16	12	70	102	6:1	198
60	71	47	.109	12	16	12	77	109	6:1	222
72	83	57	.109	12	16	12	89	121	6:1	282

CIRCULAR C.M.P. SAFETY ENDS									
Pipe Dia. (In.)	Min. Thick.		Dimensions (Inches)					L Dimensions	
	In.	Gage	A	H	W	Overall Width	Slope	Length (In.)	
15	.064	16	8	6	21	37	6:1	30	
18	.064	16	8	6	24	40	6:1	48	
21	.064	16	8	6	27	43	6:1	66	
24	.064	16	8	6	30	46	6:1	84	
30	.109	12	12	9	36	60	6:1	120	
36	.109	12	12	9	42	66	6:1	156	
42	.109	12	16	12	48	80	6:1	192	
48	.109	12	16	12	54	86	6:1	228	
54	.109	12	16	12	60	92	6:1	264	
60	.109	12	16	12	66	98	6:1	300	

GENERAL NOTES:

Safety bars shall be attached to safety ends over 24" in diameter only.

Safety ends shall be fabricated from galvanized steel conforming to the requirements of the Standard Specifications.

Safety bars shall be fabricated from steel pipe conforming to the requirements of ASTM A-53 Schedule 40 Specifications.

Slotted holes for safety bar attachment shall be provided for all end sections.

Attachment to circular pipes 15" through 24" diameter shall be made with Type #1 straps. All other sizes shall be attached with Type #2 rods and lugs.

When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with 3/8" diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section. Dimensions shall be overall width less 6" by 8" high.

Installation shall be performed in accordance with the Standard Specifications.

All work and materials required for fabrication and installation of safety ends shall be incidental to the bid items for the various sizes of safety ends.

March 31, 2000

Plotting Date: 30-DEC-2009

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

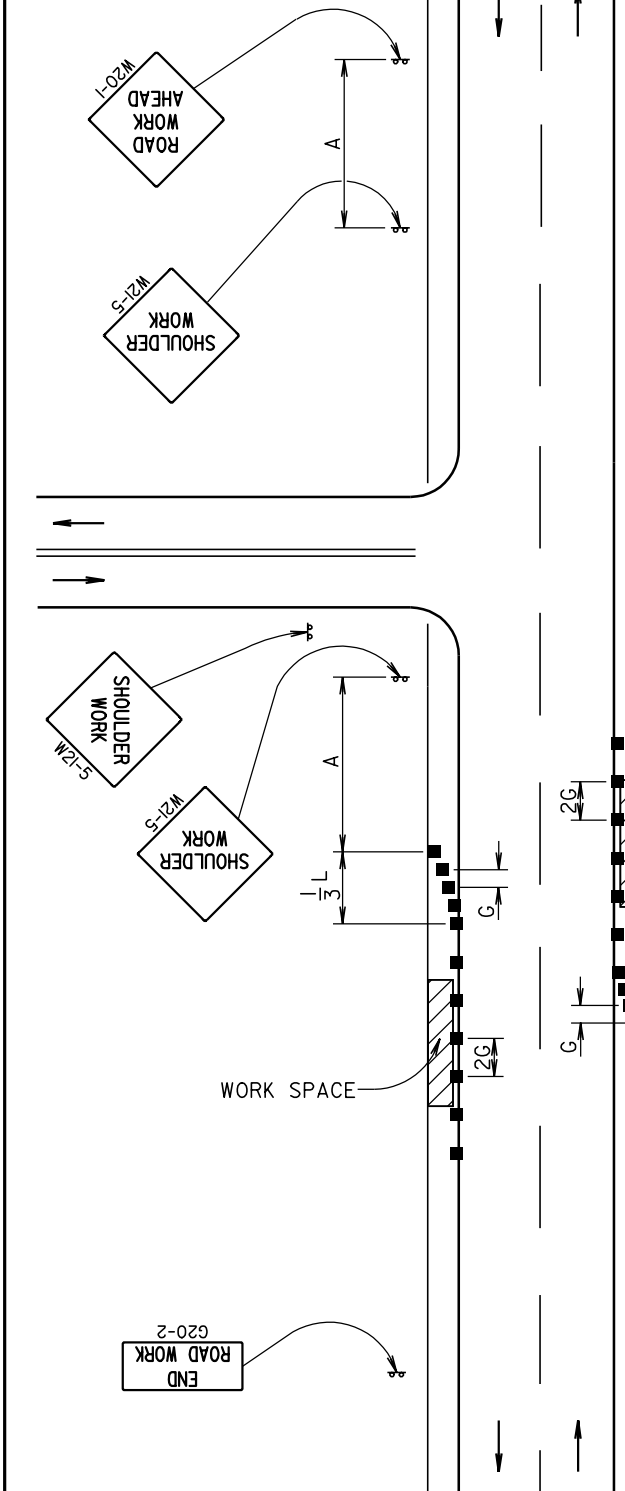
Published Date: 4th Qtr. 2009

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GUIDES FOR TRAFFIC CONTROL DEVICES
WORK BEYOND THE SHOULDER

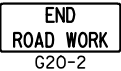
PLATE NUMBER
634.01

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



The channelizing devices shall be drums or type II barricades if traffic control must remain overnight or longer.

For short duration operations (1 hour or less) all signs and 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.

WORK SPACE



July 1, 2005

Published Date: 4th Qtr. 2009

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GUIDES FOR TRAFFIC CONTROL DEVICES
WORK ON SHOULDERS

PLATE NUMBER
634.03

Sheet 1 of 1

Plotting Date: 30-DEC-2009

* In situations where multiple work locations in a limited distance make it practical to place stationary signs, the distance between the advance warning sign and the work should not exceed 5 miles.

The ROAD WORK NEXT xx MILES sign may be used instead of the ROAD WORK AHEAD sign if the work locations occur over a distance of more than 2 miles.

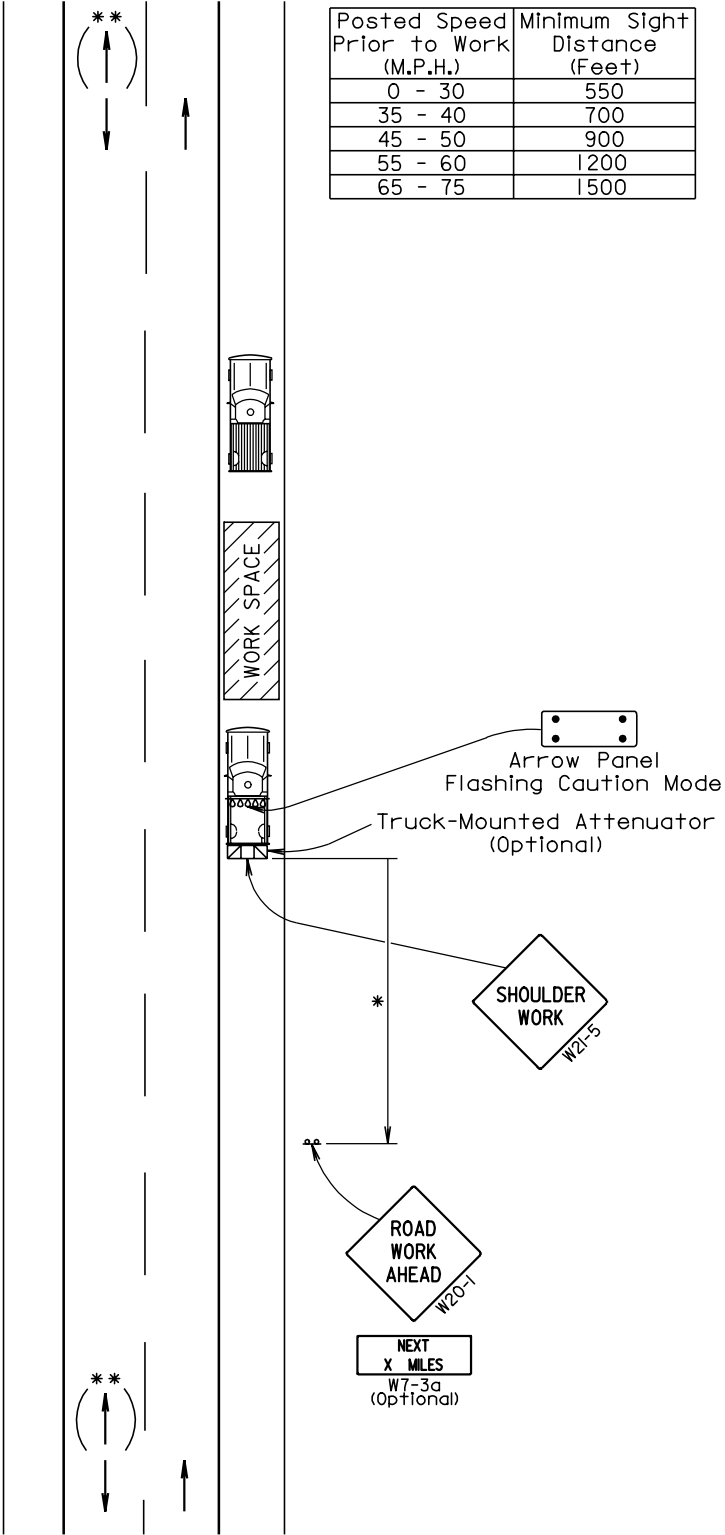
An activated flashing or yellow light on vehicles may be used for short duration (1 hour or less) only.

Arrow panel is required for mobile (intermittent and continuously moving) operations with no sight restriction and work exceeds 1 hour.

ROAD WORK AHEAD sign is required only when sight distance is restricted. (See Table)

** 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.

Posted Speed Prior to Work (M.P.H.)	Minimum Sight Distance (Feet)
0 - 30	550
35 - 40	700
45 - 50	900
55 - 60	1200
65 - 75	1500



July 1, 2005

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.

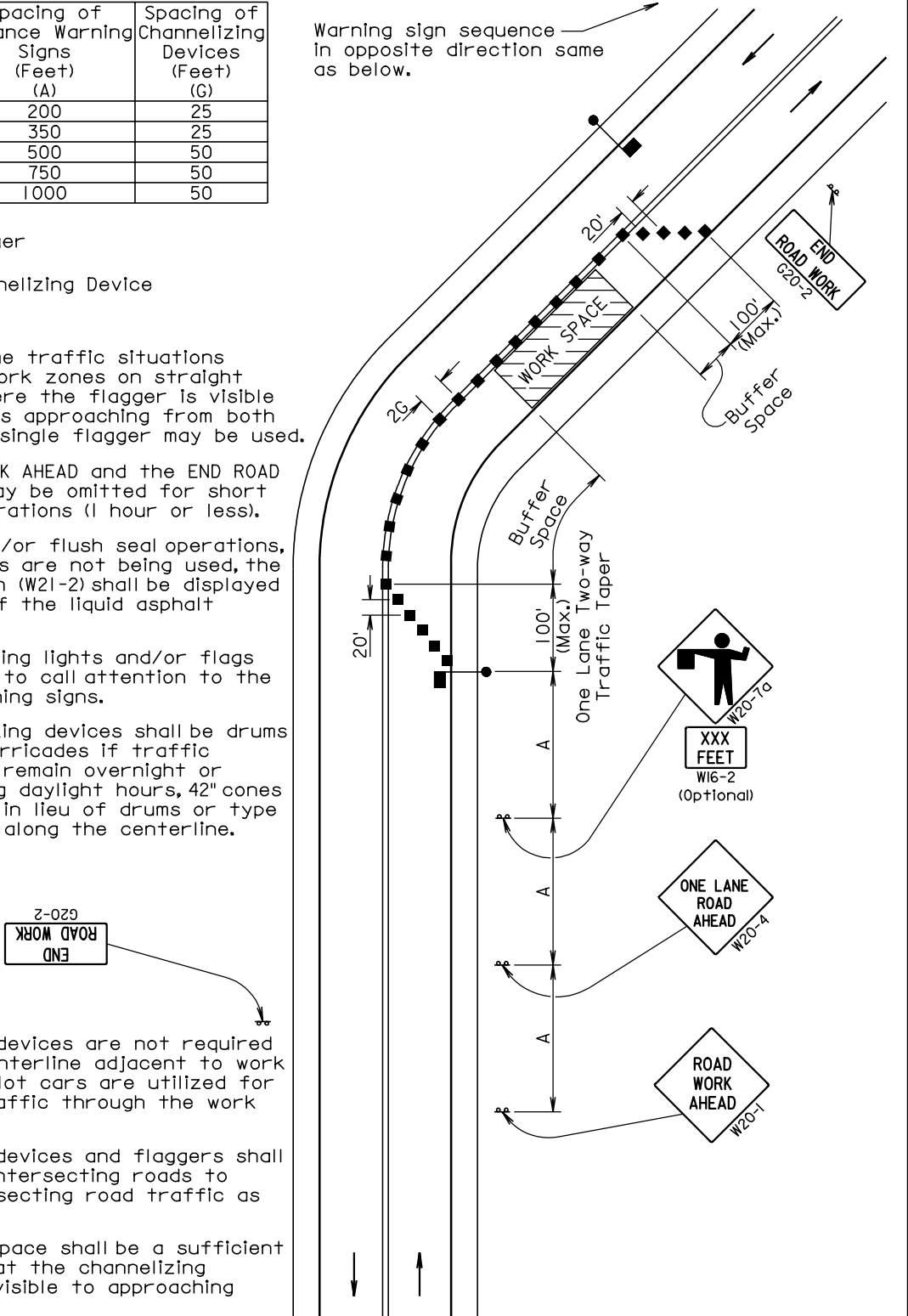
The channelizing devices shall be drums or type II barricades if traffic control must remain overnight or longer. During daylight hours, 42" cones may be used in lieu of drums or type II barricades along the centerline.

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

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

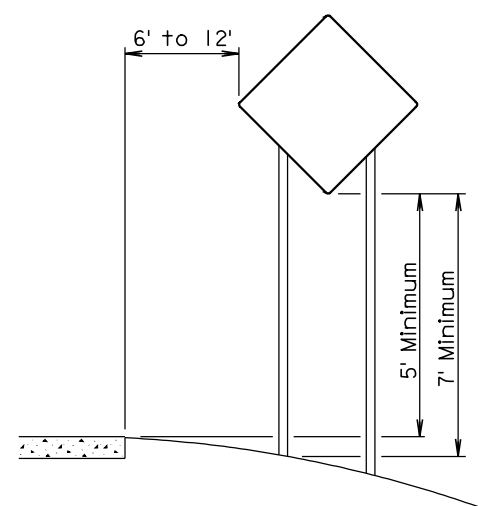
The buffer space shall be a sufficient length so that the channelizing devices are visible to approaching traffic.

Warning sign sequence in opposite direction same as below.

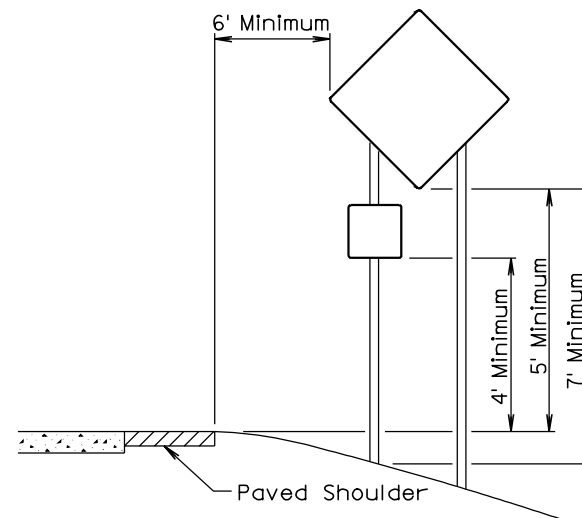


June 26, 2006

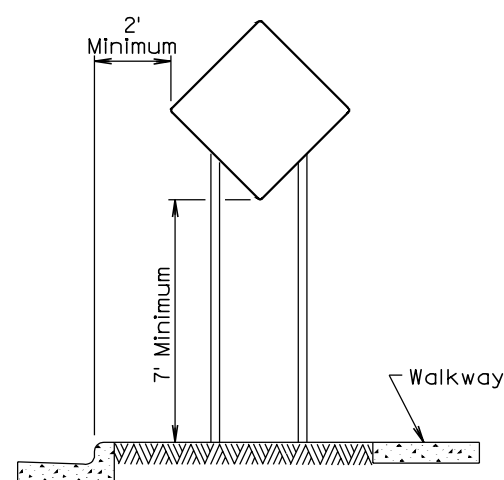
Plotting Date: 30-DEC-2009



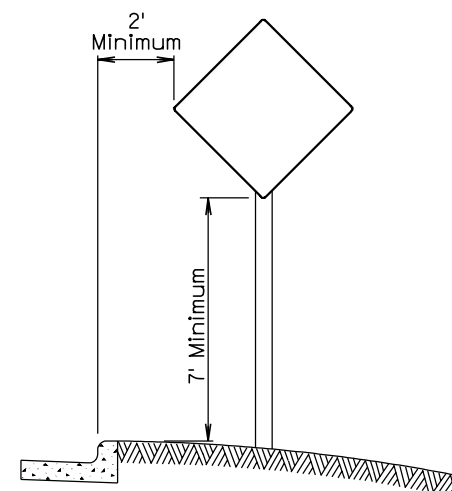
RURAL DISTRICT



RURAL DISTRICT WITH
SUPPLEMENTAL PLATE



URBAN DISTRICT



URBAN DISTRICT

December 23, 2003

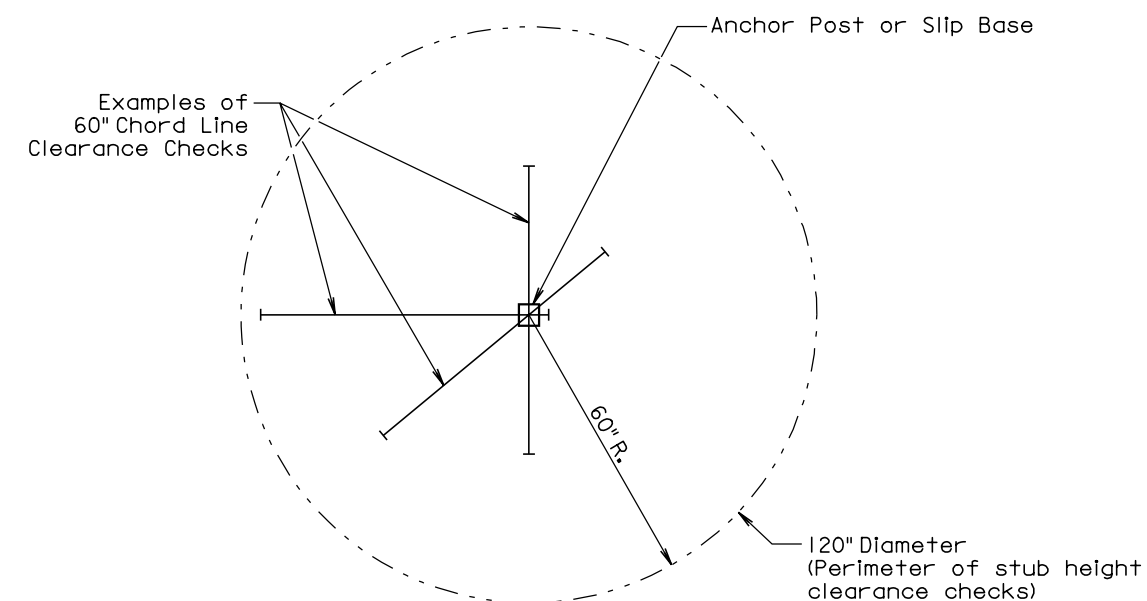
Published Date: 4th Qtr. 2009

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BREAKAWAY SIGN SUPPORTS
(Typical Construction Signing)

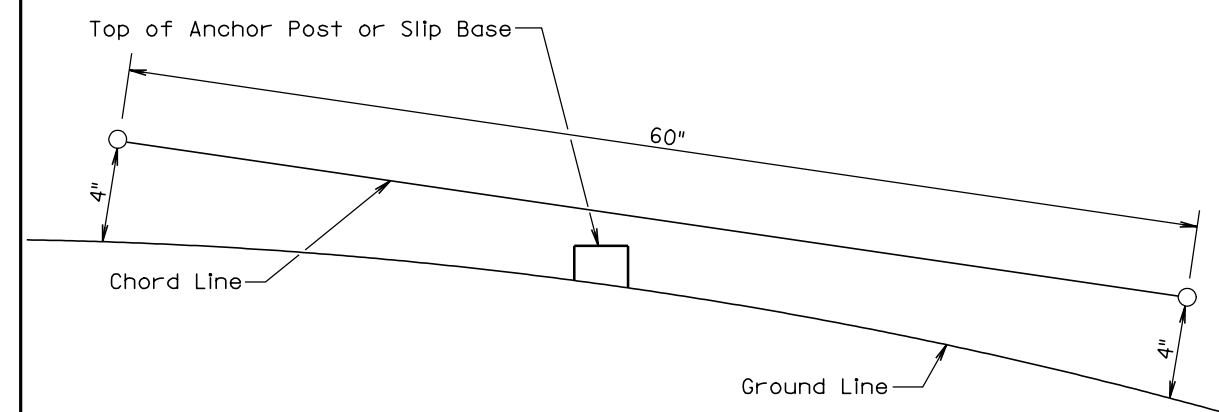
PLATE NUMBER
634.85

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

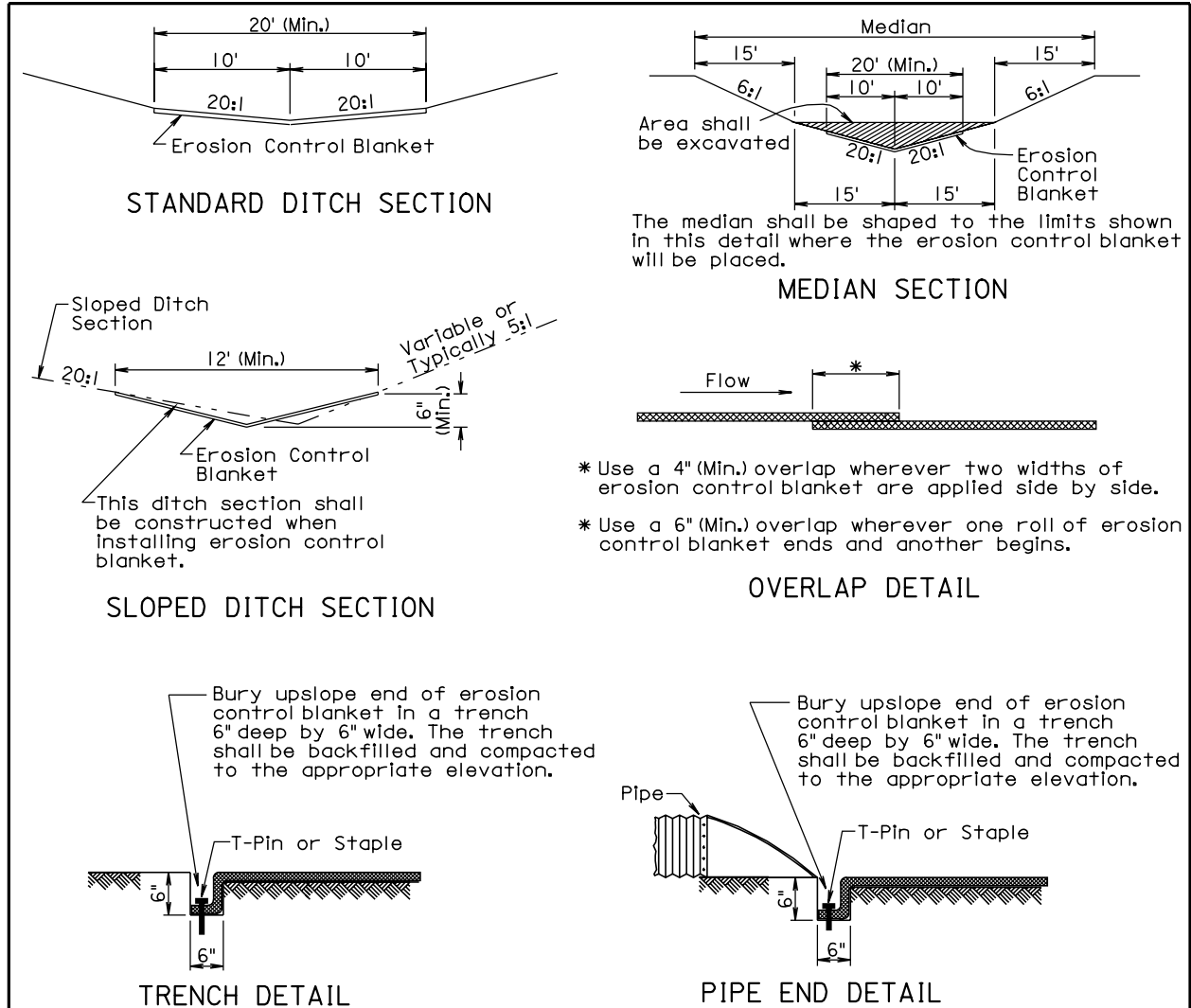
Published Date: 4th Qtr. 2009

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BREAKAWAY SUPPORT STUB CLEARANCE

PLATE NUMBER
634.99

Sheet 1 of 1



GENERAL NOTES:

Prior to placement of the erosion control blanket, the areas shall be properly prepared, shaped, seeded, and fertilized.

Erosion control blanket shall be unrolled in the direction of the flow of water when placed in ditches and on slopes. The upslope end of the erosion control blanket shall be buried in a trench 6" wide by 6" deep. There shall be at least a 6" overlap wherever one roll of erosion control blanket ends and another begins, with the upslope erosion control blanket placed on top of the downslope erosion control blanket.

The erosion control blanket shall be pinned to the ground according to the manufacturer's installation recommendations.

After the placement of the erosion control blanket, the Contractor shall fine grade along all edges of the blanket to maintain a uniform slope adjacent to the blanket and level any low spots which might prevent uniform and unrestricted flow of side drainage directly onto the erosion control blanket.

All ditch sections shall be shaped when installing the erosion control blanket. All costs for shaping the ditches shall be incidental to the contract unit price per foot for "Shaping for Erosion Control Blanket".

December 23, 2004

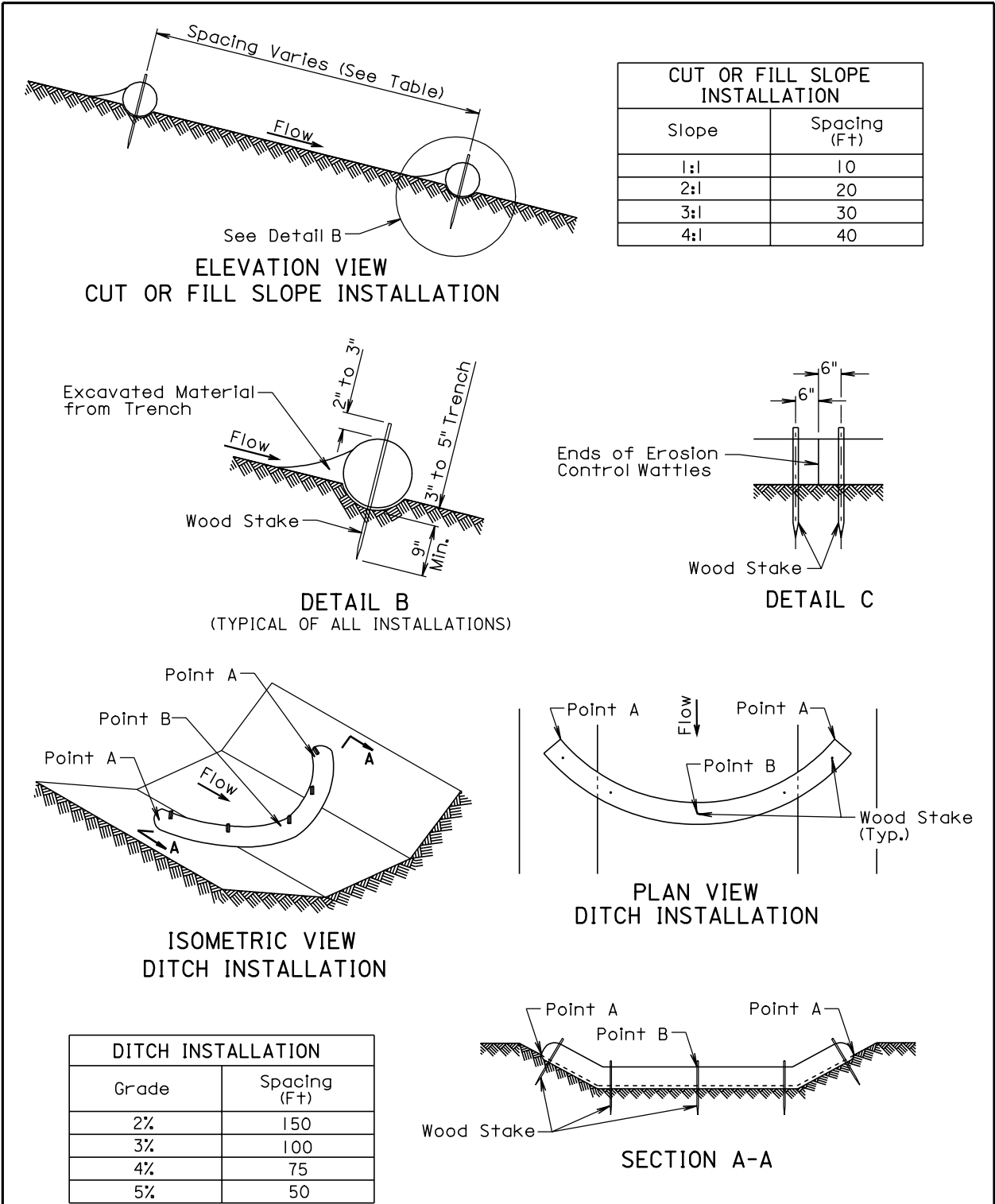
Published Date: 4th Qtr. 2009

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EROSION CONTROL BLANKET

PLATE NUMBER
734.01

Sheet 1 of 1



December 23, 2004

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 1/2". 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